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*About **A Surgeon's History of Anorectal Disease***
*and **A Surgeon's Clinical Manual of Anorectal Disease***

"Thank you for the excellent books. They are ideal for all surgeons, a good choice for quick revision, and help to further enhance knowledge. I greatly appreciate Dr O P Bhandari Sir for his dedication, hard work and service to the profession."

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"Great write-up, Sir."

— Dr Kamal Gupta
Past Secretary, Association of Colon and Rectal Surgeons of India (ACRSI)

A SURGEON'S HISTORY OF ANORECTAL DISEASE

From Ancient Medicine to Modern Surgery

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This book is intended for educational purposes for medical students, surgical trainees, and practising clinicians. It is not a substitute for individual clinical judgement. Readers should verify current guidelines and drug information before applying any information contained herein to a specific case.

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FOREWORD



Dr. N.K. Malpani
Senior Surgical Adviser, GSP-SPCI; Professor of Surgery (Ex-HOD), RNT Medical College Udaipur & SMS Medical College Jaipur; Medical Director, Malpani Multispeciality Hospital, Jaipur

I have known Dr. Om Prakash Bhandari for well over four decades — since the years when I was a young lecturer in the surgical unit of Dr. Ved Prakash Sharma, and he was a postgraduate resident finding his feet in the operating theatre. It was my privilege, in those early years, to teach him and his colleagues surgery directly at the table. I did not know then that I was training a future author who would one day ask me to write the foreword to his book.

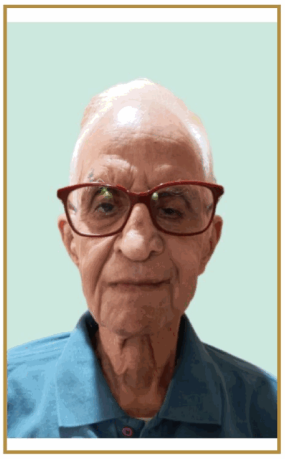
Dr. Bhandari has always combined two qualities that rarely sit together: a surgeon's restlessness to improve technique, and a historian's patience to understand why a technique came to be. Both are on display in *A Surgeon's History of Anorectal Disease*. This is not a dry chronicle of dates and names. It is written by a working surgeon who has spent a career at the point where history meets the operating table, and who has clearly asked, at every step, why this problem has been solved this way and not another.

I have watched Dr. Bhandari's contribution to this field develop over the years, and I recognise in this book the same rigour I saw in him as a young resident: careful observation, honest reporting, and respect for what came before.

I recommend this book to surgical trainees, practising colorectal surgeons, and to anyone with a genuine curiosity about how medicine arrives at its present understanding. It is a fitting record, and I am glad to have played a small part in the surgeon who wrote it.

(15 August 2026)

FOREWORD



Dr. Ved Prakash Sharma
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Dr. Om Prakash Bhandari trained as a postgraduate resident in the surgical unit I had the privilege of heading. He and his fellow residents assisted me through many long hours in the operating theatre, and I remember him as a young doctor of unusual sincerity and quiet determination.

It gives me great satisfaction, in my ninety-plus years, to learn that the young man who once stood beside me at the operating table has gone on to build a career of such distinction, and now offers this book to the wider surgical community. A Surgeon's History of Anorectal Disease reflects the same discipline and sincerity I remember in him as a resident, now applied to a lifetime's study of his chosen field.

I am glad to give this book my blessings, and I commend it to every surgeon and student who wishes to understand not only how anorectal disease is treated today, but how that understanding came to be.



24-8-26 *(24 August 2026)*

PREFACE

From Wick Lamp to Operating Lamp

A Surgeon's Journey Through the History of Anorectal Disease

There is a particular kind of curiosity that does not wait for permission. As a boy in Mandalgarh, studying by the light of a wick lamp because our village had no electricity, I remember dissecting a frog in secret after my eighth standard examinations — not because any teacher asked me to, but because I needed, with my own eyes, to see a heart beat and lungs breathe. That small act of disobedience was, in hindsight, the first page of the book I am now attempting to write.

Anorectal disease is among the oldest recorded afflictions of humankind, and yet it remains one of the most quietly endured. Unlike diseases of the heart or the brain, disorders of the anus and rectum have always carried a burden beyond the physical — a burden of embarrassment, delay, and silence. Patients have suffered them in private for millennia, and physicians, across every civilisation, have been compelled to treat them with equal parts ingenuity and humility. This book is an attempt to trace that long, largely unglamorous, but deeply human story: how the treatment of piles, fistula, fissure, prolapse, and the many other afflictions of this region evolved from ritual and empiricism into the precision of modern allopathic surgery.

I did not set out, as a young MBBS student entering RNT Medical College Udaipur in 1971, to become a historian of my own speciality. Like most surgeons, I was trained to look forward — toward the next technique, the next case, the next refinement. But four and a half decades in the operating room have a way of turning a surgeon into an accidental historian. Each time I modified a lateral internal sphincterotomy to deliver the internal anal sphincter to the wound surface under direct vision — what I would eventually describe and publish as MOLIS[1] — I found myself asking not only "does this work better?" but "why has this problem been solved this way, and not otherwise, for so long?" That question kept leading backward: to Hippocrates and the Egyptian papyri, to Sushruta and the surgical traditions of ancient India, to the barber-surgeons of medieval

[1] MOLIS — Modified Open Lateral Internal Sphincterotomy, the author's own refinement of lateral internal sphincterotomy for anal fissure, described in Chapter 16.

Europe, to the antiseptic revolution of Lister, to Milligan and Morgan, to Parks, and finally to the laparoscopic and robotic era in which I now practise.

This book, then, is written from an unusual vantage point: not that of a professional medical historian looking in from outside, but of a working surgeon who has spent a career standing at the very point where that history terminates — in the operating theatre, with a patient on the table. I have tried to bring to this narrative the same discipline I would bring to a case: careful sourcing, honest acknowledgement of uncertainty where the historical record is thin, and respect for every surgeon, named and unnamed, whose trial and error made today's outcomes possible.

This book is written with a further, very deliberate purpose. It is meant to be of real use — to the patient quietly suffering an anorectal complaint who wants to understand what is happening to their own body; to the undergraduate meeting this subject for the first time; and to the postgraduate preparing for a sub-speciality that India is, at last, formally recognising. With the MCh programme in Colorectal Surgery poised to begin in this country, this book is offered also as a foundation text — one that builds every later chapter, historical and clinical alike, on a single, clear understanding of anorectal anatomy and physiology, so that no reader is ever required to look elsewhere merely to follow along.

My hope is that this book will serve several audiences at once. For the surgical trainee, I hope it offers context — an understanding that every step in a modern anorectal procedure carries the fingerprints of centuries of failed and successful attempts before it. For the practising colorectal surgeon, I hope it offers perspective on techniques we now consider standard. And for the general reader with an interest in medical history, I hope it offers what first drew me to medicine as a boy: the simple, stubborn wish to understand how something works, and why.

My postgraduate surgical training began under Dr. D.L. Kanwar, a very senior Professor of Surgery and head of the 2nd Unit. Dr. Malpani and I, along with my fellow residents, worked under him in those early years. When Dr. Kanwar transferred to SMS Medical College, Jaipur, I continued my training in the 4th Unit, headed by Dr. Ved Prakash Sharma. Dr. Malpani was then a lecturer in that unit. Dr. Rakesh Naithani was my colleague there, and Dr. Ashok Gupta and Dr. M.A. Khan were our immediate seniors. My fellow resident and I assisted Dr. Sharma in the operating theatre, while it was Dr. Malpani who took us through surgery hands-on, teaching us directly at the table. That early, direct grounding shaped the surgeon I became. I record my gratitude to Dr. Sharma, now in his nineties. His consent to be named here was conveyed through his daughter, herself a doctor, who cares for him. It is fitting that decades later, Dr. Malpani reviews the pages of this very book.

This project also owes a debt to my parents, Nand Lal Bhandari and Mohan Devi Bhandari, who taught me — through their own lives of struggle and reform — that documenting a difficult history honestly is itself an act of service to those who come after. It is in that spirit that I offer this book.

Dr. Om Prakash Bhandari

Consultant Surgeon, Chittorgarh, Rajasthan

CHAPTER 0

Anorectal Anatomy and Physiology

The Essential Foundation

Learning Objectives

By the end of this chapter, the reader should be able to:

• Describe the boundaries of the anal canal and the surgical significance of the dentate line.

• Distinguish the internal and external anal sphincters by structure, nerve supply, and function.

• Explain the anorectal angle and the role of the puborectalis in continence.

• Identify the corrugator cutis ani and describe its role in perianal skin tone and its surgical relevance.

• Describe the anterior relationship of the rectum to the vagina and uterus in the female pelvis, and explain how uterine retroversion can cause extraluminal obstructed defecation.

• Outline the blood supply, lymphatic drainage, and nerve supply of the rectum and anal canal, and state why each matters clinically.

• Describe the continence mechanism, including the rectoanal inhibitory reflex and the "sampling" phenomenon.

Every chapter that follows in this book — whether it concerns an ancient Egyptian remedy for piles or a twenty-first century robotic resection — ultimately returns to the same few centimetres of anatomy. A reader who is secure in the anatomy and physiology of this chapter will find every later chapter, historical or clinical, immediately easier to follow. This chapter is therefore deliberately placed before Chapter 1, and deliberately written so that a student with only basic undergraduate anatomy needs no other reference to follow it.

0.1 The Anal Canal: Boundaries and Landmarks

The surgical anal canal extends from the anorectal ring above — the level at which the puborectalis sling is palpable on digital examination — to the anal verge below, where the anal skin merges with the perianal skin. This surgical definition is slightly longer than the older "anatomical" anal canal, which was defined as extending only from the dentate line to the anal verge. In an adult, the surgical anal canal measures approximately 3 to 4 centimetres in length, though this varies with sex, parity, and age.

The single most important landmark within the anal canal is the *dentate line* (also called the pectinate line), situated roughly midway along its length. The dentate line marks the junction between the hindgut-derived mucosa above (columnar, insensate, endodermal in origin) and the ectoderm-derived anoderm below (squamous, richly sensate). This single embryological boundary explains a remarkable number of clinical observations that a student will meet repeatedly in later chapters: why internal haemorrhoids above the dentate line are painless when they bleed or prolapse, while an anal fissure below it is exquisitely painful; why the blood supply, venous drainage, lymphatic drainage, and even the histological type of cancer differ sharply between structures that lie only a centimetre or two apart.

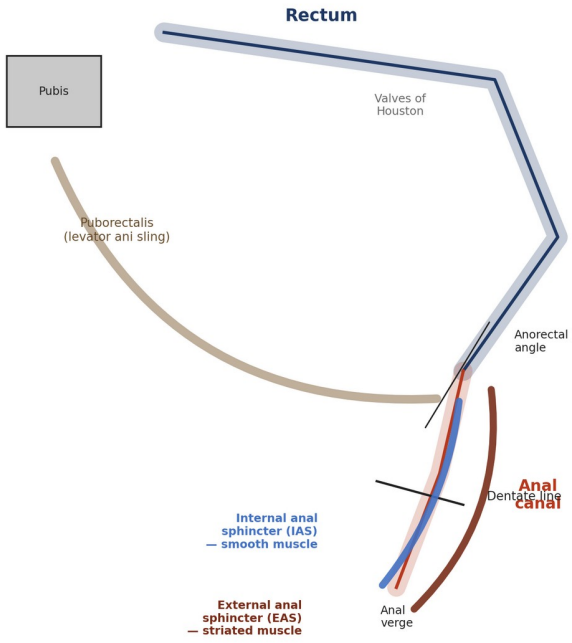


Fig. 0.1 Sagittal schematic of anorectal anatomy (not to anatomical scale)

Fig. 0.1 — Sagittal schematic of anorectal anatomy, showing the rectum, anorectal angle, puborectalis sling, dentate line, and anal sphincter complex (not to anatomical scale).

0.2 The Anal Sphincter Complex

Continence depends on two concentric muscular rings working together, supported by the puborectalis sling. A clear grasp of these three structures is worth more to a surgical trainee than any other single fact in this chapter, since nearly every anorectal operation described later in this book is, in essence, a negotiation with this complex.

0.2.1 The Internal Anal Sphincter (IAS)[2]

The IAS is the thickened, distal continuation of the circular smooth muscle layer of the rectum. It is *involuntary*, under autonomic control, and is responsible for the greater part of resting anal canal pressure — commonly cited as 55 to 70 percent of resting tone, though estimates vary across studies. Being smooth muscle, the IAS is in a state of continuous tonic contraction, relaxing only transiently in response to rectal distension (the rectoanal inhibitory reflex, discussed in Section 0.4) or under the influence of certain drugs and anaesthetic agents. Its clinical importance cannot be overstated: hypertonia of the IAS is central to the pathophysiology of the chronic anal fissure, and controlled, partial division of the IAS — as in lateral internal sphincterotomy and its modifications — remains one of the most effective operations in anorectal surgery precisely because it targets this muscle specifically.

0.2.2 The External Anal Sphincter (EAS)[3]

The EAS is striated muscle, under voluntary control via the pudendal nerve (S2–S4), and is conventionally described in three parts — subcutaneous, superficial, and deep — although in practice the EAS behaves functionally as a single continuous cylinder of muscle rather than three separate rings. The EAS is responsible for voluntary squeeze pressure: the deliberate, short-lived contraction that allows a person to defer defecation when the rectum signals fullness. Unlike the IAS, the EAS fatigues within a minute or two of sustained contraction, which is why voluntary deferral of defecation has a limited time window.

[2] IAS — Internal Anal Sphincter, the involuntary inner muscle ring of the anal canal.
[3] EAS — External Anal Sphincter, the voluntary outer muscle ring of the anal canal.

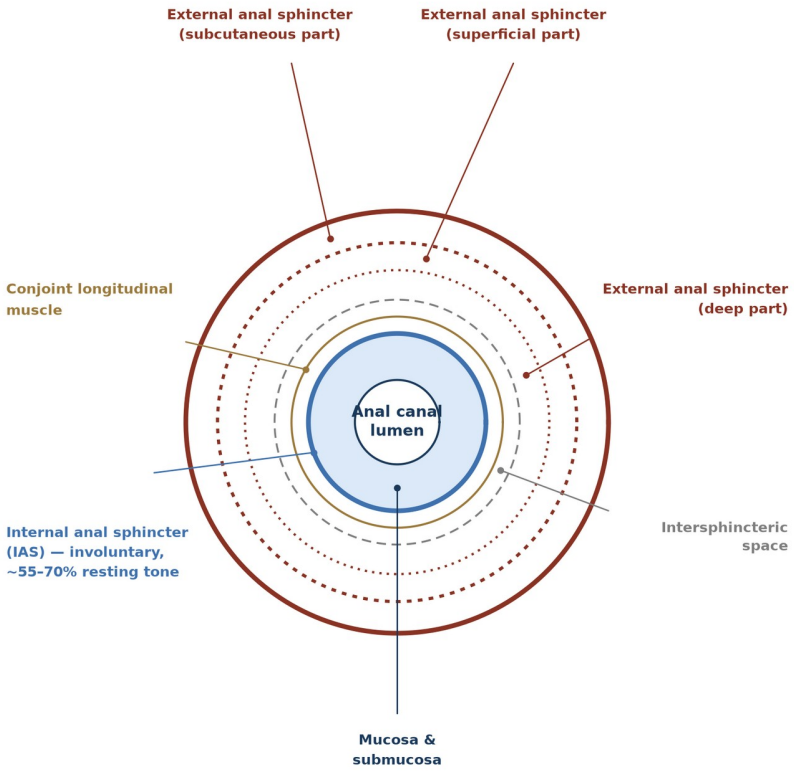


Fig. 0.2 Schematic axial cross-section of the anal sphincter complex

Fig. 0.2 — Schematic axial cross-section of the anal sphincter complex, showing the relationship between the internal and external anal sphincters and the intersphincteric plane.

0.2.3 The Puborectalis and the Anorectal Angle

The puborectalis is a U-shaped sling of the levator ani that arises from the pubic bone, passes behind the anorectal junction, and slings the rectum forward toward the pubis. Its continuous tonic contraction creates the *anorectal angle* — typically around 90 to 100 degrees at rest, opening further to roughly 110 to 130 degrees during defecation as the puborectalis voluntarily relaxes. This angle acts as a mechanical flap valve: intra-abdominal pressure is transmitted onto the angulated rectum in a way that reinforces closure at rest, and straightens only when the puborectalis relaxes during defecation. Failure of this relaxation mechanism — paradoxical or non-relaxing puborectalis — is an important and frequently under-recognised cause of obstructed defecation, a topic returned to in the chapters on rectal prolapse and functional anorectal disorders.

0.2.4 The Corrugator Cutis Ani (Ellis's Muscle)

A smaller and often overlooked structure deserves specific mention here, since it is one that an operating surgeon encounters directly rather than merely reads about. The *corrugator cutis ani* —

also called Ellis's muscle — is not a separate sphincter but the terminal, smooth (involuntary) fibres of the conjoined longitudinal muscle, which pass through the lowermost part of the external anal sphincter and insert directly into the perianal skin. Their contraction draws the perianal skin into the characteristic radiating folds seen around a healthy anus, and is thought to contribute to the fine, watertight closure of the anal orifice at rest — a finishing touch to continence layered on top of the IAS and EAS described above.

Because this muscle is anchored directly into richly sensate perianal skin (Section 0.5), it functions as the effector arm of a short reflex arc between skin and sphincter. Light stimulation of the perianal skin produces a brief, visible reflex contraction of this muscle together with the external sphincter — the basis of the *anocutaneous reflex* ("anal wink") tested clinically to assess the integrity of the sacral reflex arc and pudendal innervation. In this sense, although the corrugator cutis ani itself is a contractile structure rather than a sensory one, it couples perianal skin sensation to overall perineal tone, and its presence and reflex behaviour are worth checking whenever sacral nerve integrity is in question.

This muscle is also of direct, practical relevance to the reader interested in the author's own MOLIS technique (Chapter 16): during the manoeuvre of delivering the internal anal sphincter to the surface of the wound, fibres of the corrugator cutis ani are commonly encountered and visible at the wound edge, and are gently displaced with a cotton gauze pledget to expose the IAS cleanly for controlled division. Recognising this structure intraoperatively — rather than mistaking it for a stray strand of the EAS — helps the surgeon avoid inadvertent injury to either the corrugator fibres or the true sphincter during this step.

0.3 The Rectum

The rectum begins at the rectosigmoid junction (conventionally at the level of the sacral promontory) and ends at the anorectal ring, measuring approximately 12 to 15 centimetres in the adult. Unlike the sigmoid colon, the rectum lacks a mesentery, a well-defined taenia coli, and appendices epiploicae over most of its length. Its lumen typically shows three lateral curves corresponding to the internal shelf-like folds known as the *valves of Houston*, which help support the weight of faecal matter and are of practical importance to anyone performing rigid or flexible sigmoidoscopy.

The peritoneal relationship of the rectum changes along its length: the upper third is covered by peritoneum on its front and sides, the middle third only on its front, and the lower third lies entirely below the peritoneal reflection, extraperitoneal throughout. This transition matters enormously in

rectal cancer surgery, since a perforation or anastomotic leak above versus below the peritoneal reflection carries very different consequences — a distinction explored further in the chapter on anorectal malignancy.

The rectal ampulla, the dilated distal segment of the rectum, is highly compliant: it can accommodate a considerable volume of stool with only a modest rise in intraluminal pressure, a property called *rectal compliance*. This compliance, together with sensory feedback from stretch receptors in the rectal wall and surrounding pelvic floor, is what permits a person to sense fullness and defer defecation voluntarily rather than evacuating reflexively, as an infant does.

0.3.1 Anterior Relations of the Rectum in the Female Pelvis

The rectum does not exist in isolation, and in the female pelvis its anterior relationship to the vagina and uterus is of direct clinical importance to the anorectal surgeon, not merely to the gynaecologist. The rectum lies immediately posterior to the vagina, separated from it by a thin fibromuscular layer, the *rectovaginal septum*, and posterior to this in turn lies the uterus, normally held in an anteverted, anteflexed position — tilted forward over the bladder — by its supporting ligaments and by the tone of the pelvic floor itself. In this normal configuration, the rectum follows the sacral hollow largely undisturbed by the uterus lying anteriorly.

In some women, however, the uterus lies retroverted — tilted posteriorly rather than forward — and in this position it can come to lie directly between the rectum and the sacral hollow, particularly under the increased intra-abdominal pressure of straining. Where this occurs, the retroverted uterus can mechanically compress the rectum against the bony sacrum, producing a functional, purely extraluminal obstruction to defecation that will appear entirely normal on endoscopy, since there is nothing wrong with the rectal lumen or mucosa itself to see. This mechanism, and two contrasting real cases in which it was diagnosed by bimanual examination and treated with outcomes ranging from lasting resolution to eventual hysterectomy, are presented as a case vignette in Chapter 11.

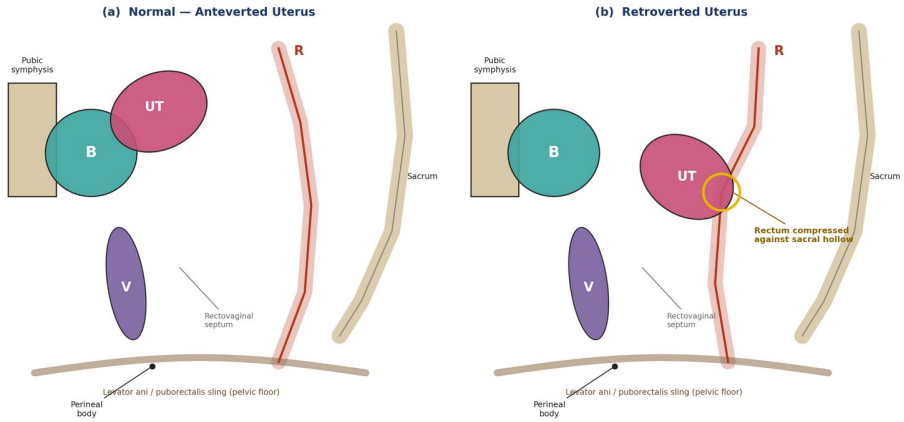


Fig. 0.4 Schematic sagittal comparison of the female pelvis: (a) the normal anteverted uterus lies clear of the rectum; (b) a retroverted uterus can lie posteriorly and compress the rectum against the sacral hollow — the mechanism discussed in the obstructed defecation case vignette, Chapter 11.

Fig. 0.4 — Schematic sagittal comparison of the female pelvis: (a) the normal anteverted uterus lies clear of the rectum; (b) a retroverted uterus can compress the rectum against the sacral hollow — the mechanism discussed in the Chapter 11 case vignette.

0.4 The Continence Mechanism

Continence is not the product of any single structure but of an integrated system: rectal compliance and sensation, the resting tone of the IAS, the voluntary reserve of the EAS, the anorectal angle maintained by the puborectalis, and a remarkable reflex that allows the body to distinguish gas from liquid from solid stool without the person's conscious effort.

When stool or gas enters the rectal ampulla and distends its wall, stretch receptors trigger the *rectoanal inhibitory reflex* (RAIR)[4]: the IAS relaxes briefly and involuntarily. This relaxation exposes a small volume of rectal content to the highly sensate anal mucosa immediately above the dentate line, which is richly supplied with receptors capable of discriminating gas from liquid from solid — a phenomenon commonly called the *sampling reflex*. Based on this sensory information, and on social circumstance, the person then makes a conscious decision: to relax further and evacuate, or to consciously contract the EAS and puborectalis, restoring the anorectal angle and deferring defecation until convenient. This reflex arc, simple as it sounds, is the physiological explanation for a great deal of clinical anorectal practice — including why loss of the RAIR (for instance after certain sphincter-disrupting operations, or in Hirschsprung's disease, where the RAIR is characteristically absent) has such significant clinical consequences.

[4] RAIR — Rectoanal Inhibitory Reflex, the reflex relaxation of the internal sphincter when the rectum distends.

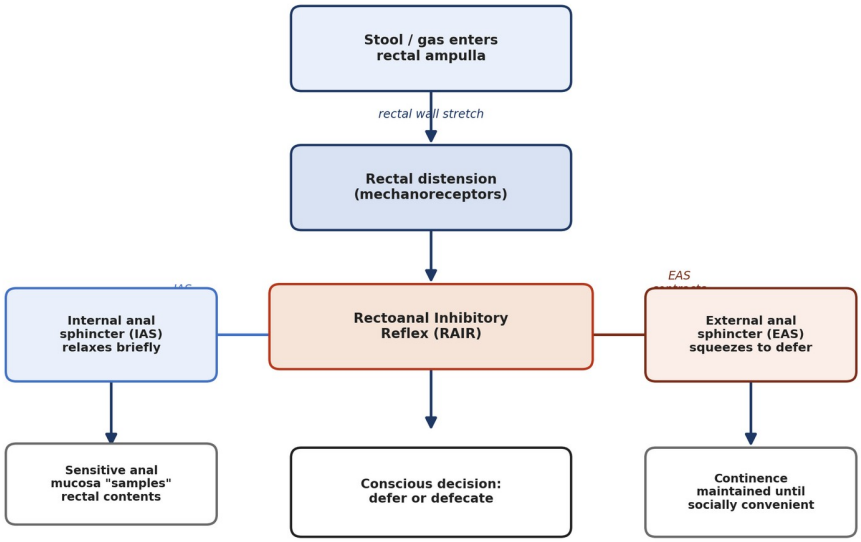


Fig. 0.3 Simplified continence mechanism: the sampling reflex

Fig. 0.3 — Simplified schematic of the continence mechanism, showing the rectoanal inhibitory reflex and the sampling response.

0.5 Blood Supply, Lymphatic Drainage, and Nerve Supply

A working knowledge of these three systems explains much of the clinical behaviour of anorectal disease described throughout this book, and is summarised only briefly here.

- *Arterial supply* — The rectum and anal canal receive blood from three sources: the superior rectal artery (a continuation of the inferior mesenteric artery, supplying the upper and middle rectum), the middle rectal arteries (from the internal iliac arteries), and the inferior rectal arteries (from the internal pudendal arteries, supplying the anal canal and sphincter complex). This dual supply from the portal and systemic systems has direct relevance to the anatomy of the anal cushions and the pathophysiology of haemorrhoidal disease, covered in the corresponding chapter.
- *Venous drainage* — Venous drainage mirrors the arterial supply. It straddles two systems: portal above the dentate line, systemic below it. Above the dentate line, blood drains via the superior rectal vein into the portal system. Below the dentate line, it drains via the inferior rectal veins into the systemic (caval) system. This split explains two things. First, it is why rectal varices can develop in portal hypertension. Second, it is why the submucosal venous plexus above the dentate line is the site of origin of internal

haemorrhoids. One more detail matters here. This rectal venous plexus is essentially valveless, like the portal system it drains into. Its possible link to human erect posture is discussed at length in the chapter on haemorrhoidal disease.

- *Lymphatic drainage* — Again divided by the dentate line: above it, lymph drains upward to the inferior mesenteric and internal iliac nodes; below it, lymph drains to the superficial inguinal nodes. This distinction is of direct surgical importance in anal canal malignancy, where the level of the tumour relative to the dentate line materially affects the expected pattern of nodal spread and the fields that must be considered in staging and treatment.
- *Nerve supply* — The rectum and upper anal canal (above the dentate line) receive autonomic innervation only (sympathetic via the hypogastric nerves, parasympathetic via the pelvic splanchnic nerves), and are therefore insensate to pain from cutting or cautery — the physiological reason internal haemorrhoids can be injected or banded without local anaesthesia. The lower anal canal (below the dentate line) is supplied by the somatic inferior rectal nerve, a branch of the pudendal nerve, and is exquisitely sensitive to pain, touch, and temperature — the reason any procedure below the dentate line requires anaesthesia, and the reason a fissure in this territory is so disproportionately painful.

0.6 Chapter Summary

Key Points

• The dentate line is the single most important landmark in the anal canal, separating insensate hindgut-derived mucosa above from sensate ectoderm-derived anoderm below — with direct consequences for pain, blood supply, venous drainage, lymphatic drainage, and cancer type.

• The internal anal sphincter (IAS) is smooth muscle, involuntary, and provides most resting tone; the external anal sphincter (EAS) is striated muscle, voluntary, and provides squeeze pressure. The puborectalis maintains the anorectal angle. The corrugator cutis ani — terminal fibres of the conjoined longitudinal muscle inserting into perianal skin — provides a finer, reflex-linked closure and is directly relevant intraoperatively in MOLIS.

• The rectum's peritoneal covering changes along its length — fully covered above, uncovered (extraperitoneal) below — which matters greatly in rectal cancer surgery.

• Continence is a system, not a single muscle: rectal compliance and sensation, IAS tone, EAS reserve, the anorectal angle, and the rectoanal inhibitory ("sampling") reflex all act together.

• Blood supply, venous drainage, and lymphatic drainage all divide sharply at the dentate line

— the anatomical basis for much of the clinical behaviour of anorectal disease described in later chapters.

• In the female pelvis, the rectum lies directly posterior to the vagina and uterus; a retroverted uterus can mechanically compress the rectum against the sacral hollow, producing extraluminal obstructed defecation that endoscopy cannot detect (Chapter 11).

Clinical Correlation — Why This Chapter Matters to Every Later Chapter

Every technique described later in this book is, at its core, an argument with one part of this anatomy. The chronic anal fissure and lateral internal sphincterotomy (Chapter 10) are a direct consequence of IAS hypertonia described in Section 0.2.1. Haemorrhoidal disease (Chapter 7–8) arises from the vascular anal cushions described in Section 0.5. Fistula surgery (Chapter 9) is, at heart, a question of how much of the sphincter complex described in Section 0.2 can safely be divided or preserved. And the author's own technique, MOLIS (Chapter 16), is built entirely on the principle of delivering the IAS to the wound surface for controlled division under direct vision — a manoeuvre that only makes sense once the anatomy in Section 0.2 is secure, and during which the corrugator cutis ani fibres of Section 0.2.4 are directly encountered and must be recognised rather than mistaken for sphincter muscle. Readers are encouraged to return to this chapter whenever a later chapter assumes anatomical knowledge it does not re-explain.

Glossary — Chapter 0

- *Anal verge* — the junction of anal skin and perianal skin, marking the lower limit of the anal canal.
- *Anorectal ring* — the palpable upper border of the anal sphincter complex, formed largely by the puborectalis; the surgical upper limit of the anal canal.
- *Corrugator cutis ani (Ellis's muscle)* — terminal smooth-muscle fibres of the conjoined longitudinal muscle, passing through the lowermost external anal sphincter to insert into perianal skin; causes perianal skin puckering and is the effector of the anocutaneous reflex.

- *Dentate (pectinate) line* — the embryological junction between hindgut-derived rectal mucosa and ectoderm-derived anoderm.
- *Rectal compliance* — the capacity of the rectal wall to accommodate volume with minimal rise in pressure.
- *Rectoanal inhibitory reflex (RAIR)* — reflex relaxation of the IAS in response to rectal distension, permitting the sampling reflex.
- *Rectovaginal septum* — the thin fibromuscular layer separating the rectum from the vagina in the female pelvis; the anatomical basis for the extraluminal obstructed-defecation mechanism discussed in Chapter 11.
- *Sampling reflex* — the ability of sensate anal mucosa, exposed during RAIR-mediated IAS relaxation, to discriminate gas, liquid, and solid rectal contents.

CHAPTER 1

Anorectal Disease in Antiquity

Egyptian Papyri, Hippocratic Writings, and Greco-Roman Surgical Texts

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Learning Objectives

By the end of this chapter, the reader should be able to:

• Describe the earliest documented evidence of anorectal disease and its treatment in ancient Egypt.

• Explain the origin of the word "haemorrhoid" and summarise the Hippocratic approach to its treatment.

• Describe how Roman surgeons, particularly Celsus, treated anal fistula, and why their approach shows an early awareness of sphincter preservation.

• Trace the direct technical lineage from ancient ligature and thread techniques to instruments still used in anorectal surgery today.

Long before anaesthesia, antisepsis, or any understanding of anatomy beyond what the eye could see in a wound, anorectal disease was already named, described, and actively treated. This chapter traces that early record across three civilisations — Egypt, Greece, and Rome — whose surviving texts show a surprisingly sophisticated, if technically limited, engagement with the very structures described in Chapter 0. What is most striking, reading these ancient sources with a modern surgeon's eye, is not how primitive they were, but how much of their basic logic — ligation, cautery, and a wary respect for the sphincter — survives, in modified form, in the operating theatre today.

1.1 Ancient Egypt: The World's First Proctologists

Ancient Egyptian medicine was, by the standards of its time, remarkably specialised. Herodotus, visiting Egypt around 450 BC, observed with some astonishment that Egyptian physicians did not practise general medicine but each treated only a single class of disease — one physician for the eyes, another for the teeth, another for the head, and so on. Among these recognised specialities was a role given the formal court title *neru pehut* — variously translated as "Guardian of the Anus," "Shepherd of the Royal Anus," or "Herdsman of the Anus" — a physician specifically responsible for the pharaoh's rectal health, qualified to administer medicines and enemas rectally. The title is attested on the tomb of at least two known holders: Khuy, who served at the court in roughly the twenty-eighth century BC, and his successor Ir-en-akhty, who held the post during the First Intermediate Period some four centuries later. That a royal court maintained a dedicated proctological physician for over four hundred years is, on its own, a remarkable indication of how seriously anorectal health was taken in one of the world's earliest organised civilisations.

The written medical record from this period is dominated by several surviving papyri. The Edwin Smith Papyrus, dated to around 1600 BC, is largely a systematic surgical trauma text, while the Ebers Papyrus, dated to roughly 1550 BC and considerably longer, is a broader compendium of remedies covering conditions from head to foot — including, in a dedicated section, diseases of the anus. Later, the Chester Beatty Papyrus, dated to around the thirteenth century BC, goes further still: it survives as what is essentially a short, focused monograph on diseases of the anus and their treatment, making it arguably the oldest specialist proctological text known to exist.

The remedies these papyri record are overwhelmingly non-surgical: poultices, ointments, and suppositories compounded from plant, animal, and mineral substances. The Ebers Papyrus lists garlic as a mild laxative believed to shrink swollen piles, bayberry prescribed for haemorrhoids and ulceration, and — perhaps most strikingly to a modern reader — suppositories of hemp (an early recorded use of cannabis in medicine) used specifically to relieve haemorrhoidal pain. There is no clear surgical intervention described for haemorrhoids in the Egyptian record; the emphasis throughout is on symptomatic and astringent relief rather than excision or ligation, an approach that would not fundamentally change until the Greek surgical tradition several centuries later.

1.2 Hippocrates and the Birth of Anorectal Surgery

It is with the Hippocratic Corpus — the body of medical writing attributed to Hippocrates of Kos (c. 460–375 BC) and his students — that anorectal disease first receives surgical attention. It is Hippocrates who is credited with coining the term that gives this entire field its name:

haemorrhoid, from the Greek *haima* (blood) and *rhoos* (flowing) — literally, "a flowing of blood." The Hippocratic treatise *On Haemorrhoids* offers a vivid clinical description of the condition, comparing the prolapsing internal piles to clusters of small dark grapes projecting from within the bowel, and noting that they bleed when the anus is forced outward — a description any surgeon examining a patient with second-degree haemorrhoidal disease today would immediately recognise.

Two Hippocratic treatises, *On Haemorrhoids* and *On Fistulae*, describe what remain, in principle, the two oldest surgical strategies in this field: ligation and cautery. For ligation, the text describes transfixing each haemorrhoid with a needle and tying it off at its base with thick woollen thread, causing the tissue to wither and separate — a technique whose direct descendant is rubber band ligation, still one of the most widely performed office procedures for internal haemorrhoids today. For more severe cases, the Hippocratic text describes cauterisation: multiple iron instruments heated red-hot and applied in sequence to burn each haemorrhoidal mass until fully desiccated, with the patient purged by medicine on the preceding day and instructed not to suppress crying out during the procedure, since the resulting involuntary bearing-down was thought to push the anal tissue outward and improve surgical access. The same body of work also describes an early rectal speculum used to examine and expose the anal canal for these procedures — a recognisable ancestor of the modern proctoscope.

For anal fistula, the Hippocratic approach again centred on thread: a length of lint or flax thread was drawn through the fistula tract and tied, left in place to work the tract open gradually by pressure necrosis, and either advanced or tightened over successive days until the tract was divided. This slow, staged division of tissue by a retained thread is, in essence, the same working principle as the modern *seton* — a suture or elastic band still used today in fistula surgery specifically because it divides tissue gradually enough to allow the surrounding sphincter muscle to scar and stabilise as it goes, reducing the risk of incontinence. The continuity here, discussed further in Section 1.4, is one of the most direct technical through-lines in the whole of anorectal surgical history.

1.3 Rome: Celsus, Galen, and an Early Awareness of the Sphincter

Roman medicine, in this field as in most others, built directly upon Greek foundations rather than departing from them. Aulus Cornelius Celsus, writing in the first century AD, produced *De Medicina* — an eight-volume encyclopaedia of which the surgical books represent one of the most important surviving accounts of ancient operative technique, and the most significant medical document to survive from antiquity after the Hippocratic Corpus itself. For haemorrhoids, Celsus

described a ligature technique closely following the Hippocratic model. For anal fistula, he described two distinct approaches: passing a probe through the tract and drawing a linen thread through behind it to be tied as a seton, in the Hippocratic manner, or alternatively laying the tract open by incision along a probe passed through it as a guide — a technique directly recognisable as the ancestor of the modern fistulotomy.

What is most notable about the Roman surgical record, however, is not the techniques themselves but a piece of judgement behind them. Roman surgeons appear to have understood — evidently from accumulated clinical experience rather than any formal knowledge of the anatomy described in Chapter 0 — that excising a fistula tract in its entirety risked destroying the surrounding sphincter muscle and causing permanent incontinence. They deliberately favoured the more conservative thread and staged-division techniques over radical excision specifically to avoid this outcome. This is, in effect, the same governing principle that shapes every fistula operation described later in this book: the constant negotiation between eradicating the disease and preserving the sphincter complex first described in Section 0.2. That a Roman surgeon two thousand years ago had already arrived at this trade-off through observation alone is a detail worth pausing on.

Galen of Pergamon (c. AD 130–200), physician to the emperor Marcus Aurelius and the dominant medical authority for the next thirteen centuries of Western medicine, added comparatively little that was technically new to anorectal surgery, but did contribute a topical treatment for haemorrhoids combining laxatives with leeching, alongside descriptions of thread ligation consistent with the Hippocratic tradition. Galen's true influence on this field, as on medicine generally, lay less in original technique than in the sheer durability of his authority: his writings, transmitted and re-transmitted through the medieval Islamic and European traditions covered in the next two chapters, would shape anorectal practice for well over a thousand years after his death.

1.4 What Survived: A Thread Across Two Millennia

Read together, the Egyptian, Greek, and Roman record establishes a pattern that recurs throughout this book: real technical progress in this field has almost always come from a small number of enduring principles, rediscovered and refined by successive generations rather than reinvented from nothing. The Hippocratic and Roman thread techniques for fistula are the clearest example — the same basic mechanism of staged, pressure-guided tissue division that a Greek surgeon used in the fifth century BC remains, in modified form, standard practice in the seton techniques described in Chapter 9. The ligature principle for haemorrhoids followed an equally long path, surviving in essentially unbroken form until it was formalised into rubber band ligation in the twentieth century.

Even the Roman instinct to spare the sphincter, arrived at without any understanding of the anatomy in Chapter 0, anticipates by two thousand years the entire logic of sphincter-preserving surgery that runs through this book — including the author's own MOLIS technique described in Chapter 16, which is, at its core, another attempt to solve the same old problem these ancient surgeons were already circling: how to treat the disease without destroying the muscle that holds the patient together.

1.5 Chapter Summary

Key Points

• Ancient Egyptian medicine recognised anorectal disease as a distinct speciality, with dedicated court physicians ("Guardians of the Anus") and a specialist text, the Chester Beatty Papyrus, dating to roughly 1200 BC. Egyptian treatment was overwhelmingly topical and herbal rather than surgical.

• Hippocrates (c. 460–375 BC) coined the term "haemorrhoid" and established the two foundational surgical strategies for the condition — ligation and cautery — along with a thread technique for fistula that is the direct ancestor of the modern seton.

• Roman surgery, principally through Celsus's *De Medicina* (1st century AD), refined these techniques and showed a clear, empirically-derived awareness that aggressive fistula excision risked sphincter injury and incontinence — an early version of the central trade-off in all modern fistula surgery.

• Several ancient techniques — ligation, the thread/seton principle, and sphincter-conscious fistula management — survive in direct, recognisable form in anorectal surgery today.

Clinical Correlation — Why Ancient Technique Still Matters

The Hippocratic description of prolapsing internal haemorrhoids as clusters of dark grapes is not merely a historical curiosity — it is a clinically accurate description of the submucosal venous plexus above the dentate line discussed in Section 0.5, observed and recorded without any knowledge of that underlying anatomy. Similarly, the ancient ligature principle is the direct conceptual ancestor of modern rubber band ligation, and the Hippocratic/Roman thread techniques for fistula are the direct ancestor of the seton described in Chapter 9. Readers approaching Chapter 9 or Chapter 16 are encouraged to recall that the central question those

chapters address — how much tissue can safely be divided without destroying continence — is the same question Roman surgeons were already asking two thousand years ago.

Glossary — Chapter 1

- *Chester Beatty Papyrus* — an Egyptian text dated to c. 1200 BC, considered the oldest surviving specialist monograph on anorectal disease.
- *De Medicina* — an 8-volume Latin medical encyclopaedia by Aulus Cornelius Celsus (1st century AD), the most significant surviving surgical text from ancient Rome.
- *Ebers Papyrus* — an Egyptian medical compendium dated to c. 1550 BC, containing a dedicated section on diseases of the anus.
- *Hippocratic Corpus* — the body of Greek medical writings (c. 5th–4th century BC) attributed to Hippocrates of Kos and his students; source of the term "haemorrhoid" and of the earliest described surgical techniques for haemorrhoids and fistula.
- *Neru pehut* — ancient Egyptian court title, literally "Guardian/Shepherd of the Anus"; a physician specialising in rectal health, attested from the 28th century BC.
- *Seton* — a thread, suture, or band drawn through a fistula tract and left in place to divide tissue gradually; traceable in principle to Hippocratic and Roman thread techniques and still used in modern fistula surgery (Chapter 9).

CHAPTER 2

The Ayurvedic Tradition

Sushruta Samhita and Kshara Sutra — India's Parallel Surgical Lineage

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Learning Objectives

By the end of this chapter, the reader should be able to:

• Describe the *Sushruta Samhita* and its place in the history of surgery.

• Explain the Ayurvedic classification and four-tier treatment of Arsha (haemorrhoids).

• Describe Bhagandara (fistula-in-ano) as classified by Sushruta, and explain the Kshara Sutra technique.

• Compare the Ayurvedic thread technique with the Hippocratic/Roman seton described in Chapter 1, and trace Kshara Sutra's path into validated modern practice.

Chapter 1 traced a single lineage running from Egypt through Greece to Rome. But that lineage was not the only ancient surgical tradition to engage seriously with anorectal disease. Independently, in the Indian subcontinent, a parallel and in some respects more technically sophisticated tradition developed — one whose central innovation for fistula-in-ano is not merely a historical curiosity but a therapy still practised, still being clinically trialled, and still holding its own against modern surgery in India today. This chapter examines that tradition through its foundational text, the *Sushruta Samhita*, and its most enduring surgical contribution to this field, the Kshara Sutra.

2.1 The Sushruta Samhita: India's Foundational Surgical Text

The *Sushruta Samhita* is a Sanskrit compendium on surgery (*shalya tantra*) attributed to the sage-physician Sushruta, traditionally placed somewhere between the seventh and sixth century BC, though the text as it survives today was compiled, redacted, and expanded over many centuries —

most scholars date its present form to roughly the early centuries AD, with later commentators such as Dalhana adding further layers. As with the Hippocratic Corpus discussed in Chapter 1, "Sushruta" is best understood not as a single author but as a tradition and a name attached to a text with multiple historical contributors. This should not be read as diminishing its achievement: in its current form, the Samhita documents an extraordinary 1,120 named medical conditions, some 700 medicinal plants, around 300 surgical procedures, and 121 surgical instruments, and is best known internationally for its detailed description of reconstructive nasal surgery — a technique so far ahead of its European counterparts that Sushruta is widely credited as the historical founder of plastic surgery.

India's ancient medical tradition, Ayurveda, divided its practitioners into two classes: the *Kaya-cikitsakas*, physicians of internal medicine, whose foundational text was the *Charaka Samhita*, and the *Salya-cikitsakas*, surgeons, whose foundational text was the *Sushruta Samhita*. This division of labour between physician and surgeon, formalised in India well over two thousand years ago, anticipates by many centuries the separation of medicine and surgery that would not become firmly established in Europe until the medieval period, covered in Chapter 3. Within this surgical tradition, diseases of the anorectal region receive detailed, dedicated attention under two named conditions: *Arsha* (haemorrhoids) and *Bhagandara* (fistula-in-ano), both counted among the *Ashtamahagada* — the eight great diseases considered particularly difficult to cure.

2.2 Arsha: A Graded, Four-Tier Approach to Haemorrhoids

Sushruta's treatment of Arsha is notable for a quality that a modern surgeon will recognise immediately: it is explicitly graded, escalating from the least invasive option to the most invasive only as clinical severity demands, rather than defaulting to surgery. Four therapeutic principles are described — *Bheshaja chikitsa* (medicinal management, using astringent and anti-inflammatory herbal preparations), *Kshara karma* (application of a caustic alkaline paste to the haemorrhoidal mass via a slit proctoscope, a chemical cauterisation of sorts), *Agni karma* (thermal cautery, applied when Kshara karma alone is insufficient), and *Shastra karma* (surgical excision, reserved for masses that are prominent, broad-based, and heavily bleeding). Sushruta himself is recorded as cautioning that any disease curable by medicine alone should not be subjected to the risks of surgery — a principle of conservative escalation that would not sound out of place in a modern surgical textbook.

The haemorrhoids themselves are further classified by presumed cause and appearance into several types — broadly corresponding to dry, non-bleeding masses versus moist, bleeding, protruding masses — with different management recommended for each, again anticipating the modern

clinical distinction between the management of, for example, low-grade non-prolapsing disease and higher-grade bleeding or prolapsing disease. The Kshara karma technique in particular deserves note: administered through a specially designed slit proctoscope allowing the caustic paste to be applied directly and precisely to the haemorrhoidal mass while sparing the surrounding mucosa, it represents a level of instrumental sophistication in outpatient anorectal treatment that has few parallels in the ancient world outside India.

2.3 Bhagandara and the Origin of the Kshara Sutra

Sushruta's account of Bhagandara — fistula-in-ano — is, if anything, still more consequential for modern practice. He classified the condition into five types according to the course and character of the fistulous tract, described its origin from suppuration and unhealthy discharge, and set out treatment combining *Shastra karma* (surgical opening of the tract), *Kshara karma* (caustic application), and *Bheshaja chikitsa* (medicinal management) according to the type and complexity of the fistula. Where the tract could not safely be laid open by incision, Sushruta describes an alternative: a thread coated with caustic, alkaline paste, drawn through the fistulous tract and left in place, allowing it to work through the tissue slowly under the combined action of gentle mechanical pressure and chemical cauterisation — the technique that later Ayurvedic commentators — notably Chakradatta, some centuries afterward — would elaborate for Arsha and Bhagandara under the name that survives to this day: *Kshara Sutra*.

It is worth pausing on how this compares with the Hippocratic and Roman thread techniques described in Chapter 1. Both traditions, entirely independently and with no evidence of contact between them, arrived at the same basic mechanical insight: that a fistula tract can be divided gradually by a retained thread, more safely than by a single decisive cut through unknown quantities of sphincter muscle. But the Ayurvedic version adds something the Greco-Roman tradition did not have: the thread itself is not inert. In the classical formulation, it is repeatedly dipped and dried in a sequence of medicated coatings — typically the latex of *Snuhi* (a caustic plant sap), an alkaline *Kshara* preparation (traditionally from *Apamarga*, *Palasha*, or other ash-derived alkalis), and *Haridra* (turmeric, valued for its antiseptic properties) — so that the thread cuts, cauterises, and disinfects simultaneously as it slowly transects the tract. This is not merely a mechanical seton; it is closer, in modern terms, to a combined chemical-and-mechanical instrument, applied continuously over days to weeks rather than delivered once.

2.4 What Survived: Kshara Sutra in Modern Practice

Unlike most of the ancient techniques discussed in this book, which survive today only in modified or conceptual form, the Kshara Sutra survives as a living, largely unmodified therapy, still prepared and used according to essentially the same logic Sushruta and his commentators described more than two thousand years ago. Its passage into validated modern medicine came in the twentieth century through the sustained research of P. J. Deshpande and colleagues at the Department of Shalya Tantra, Institute of Medical Sciences, Banaras Hindu University, who standardised the thread's preparation — typically twenty-one sequential coatings of *Snuhi* latex, *Apamarga kshara*, and turmeric powder — into a reproducible clinical protocol. This standardised Kshara Sutra was then subjected to a multicentric randomised controlled trial coordinated by the Indian Council of Medical Research, published in the Indian Journal of Medical Research in 1991, and has since been directly compared against conventional fistulotomy and fistulectomy in further randomised trials. The consistent finding across this body of research is that Kshara Sutra achieves cure rates comparable to conventional surgery, with significantly less postoperative pain, reliable sphincter preservation, and outpatient feasibility, at the cost of a longer overall healing time measured in weeks rather than days.

The result is a genuinely unusual position in the history of this field: a two-thousand-year-old therapy that has not merely survived as an interesting antecedent, like the Hippocratic thread technique, but has been formally tested against modern surgical alternatives on modern evidentiary terms — and remains, on that evidence, a legitimate first-line option for fistula-in-ano in contemporary Indian surgical practice, discussed further alongside the seton techniques of Chapter 9.

2.5 Chapter Summary

Key Points

• The *Sushruta Samhita*, India's foundational surgical text, treats anorectal disease under two named conditions — Arsha (haemorrhoids) and Bhagandara (fistula-in-ano) — both classed among the Ashtamahagada, the eight diseases considered hardest to cure.

• Arsha was managed by an explicitly graded, four-tier approach — medicine, caustic (Kshara), cautery (Agni), and surgery (Shastra) — escalating only as severity required.

• Bhagandara was classified into five types, with a thread technique — later formalised as Kshara Sutra — offering an alternative to direct incision for tracts unsafe to lay open.

• Kshara Sutra combines the same mechanical principle as the Hippocratic/Roman seton (Chapter 1) with a caustic, medicated coating, arrived at entirely independently in India.

• Standardised at Banaras Hindu University in the 20th century and validated in ICMR[5]-coordinated randomised trials, Kshara Sutra remains in active clinical use today — one of the few ancient anorectal therapies to survive into modern practice essentially unmodified.

Clinical Correlation — Two Traditions, One Insight

Placed side by side, the Greco-Roman seton (Chapter 1) and the Ayurvedic Kshara Sutra are a striking case of convergent discovery: two surgical cultures, with no contact between them, independently concluded that a fistula tract is more safely divided slowly by a retained thread than cut open in one stroke — the same principle that governs the modern seton techniques described in Chapter 9. Readers approaching that chapter, or the author's own MOLIS technique in Chapter 16, should note that this same underlying trade-off — dividing tissue against preserving the sphincter — is the thread, so to speak, that runs through every era of this book.

Glossary — Chapter 2

- *Agni karma* — thermal cautery, one of Sushruta's four therapeutic principles for Arsha, used when Kshara karma alone is insufficient.
- *Arsha* — the Ayurvedic term for haemorrhoids, one of the Ashtamahagada (eight diseases considered hardest to cure).
- *Ashtamahagada* — the eight great diseases of Ayurvedic classification considered particularly difficult to cure; Arsha and Bhagandara are both included.
- *Bhagandara* — the Ayurvedic term for fistula-in-ano, classified by Sushruta into five types.
- *Kshara karma* — caustic (alkaline paste) therapy, applied via a slit proctoscope in the management of Arsha.

[5] ICMR — Indian Council of Medical Research.

- *Kshara Sutra* — a thread repeatedly coated with caustic and medicinal preparations (Snuhi latex, alkaline Kshara, turmeric), drawn through a fistula tract to divide it gradually by combined chemical and mechanical action; standardised at Banaras Hindu University and validated in modern randomised trials.
- *Shastra karma* — surgical excision, the most invasive of Sushruta's four therapeutic principles, reserved for advanced disease.
- *Sushruta Samhita* — the foundational Sanskrit text of Indian surgery (shalya tantra), traditionally attributed to Sushruta and compiled over several centuries.

CHAPTER 3

Medieval and Islamic Golden Age Contributions

Al-Zahrawi (Albucasis) and the Design of the Surgical Instrument

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Learning Objectives

By the end of this chapter, the reader should be able to:

• Explain the role of the Islamic Golden Age translation movement in preserving and transmitting classical surgical knowledge.

• Describe Al-Zahrawi and his *Kitab al-Tasrif*, and its significance as the first illustrated surgical text.

• Summarise Al-Zahrawi's approach to haemorrhoids and anal fistula, including his use of the seton and his awareness of incontinence risk.

• Trace the transmission of this knowledge into medieval Europe and explain its five-century influence on European surgical training.

Between the world of Celsus and Galen described in Chapter 1 and the European barber-surgeons described in Chapter 4, there lies a period of roughly six centuries in which the centre of gravity of surgical knowledge shifted decisively eastward. While Western Europe's engagement with classical medicine fragmented after the fall of Rome, the great cities of the Islamic world — Baghdad, Cairo, Córdoba — became the place where that inheritance was not only preserved but substantially expanded. Nowhere is this more visible than in the career of a single Andalusian surgeon whose work on anorectal disease would go on to shape European surgical training for the better part of five hundred years.

3.1 The Translation Movement: Preserving the Classical Inheritance

From the eighth century onward, scholars working in Baghdad's House of Wisdom and similar institutions undertook a sustained, state-sponsored project to translate the surviving Greek medical corpus — Hippocrates, Galen, and others — into Arabic. Physician-translators such as Hunayn ibn Ishaq did far more than render Greek into Arabic word for word: they corrected errors accumulated through centuries of copying, added their own clinical commentary, and in the process kept classical medicine alive and actively developing at a time when much of it had become inaccessible in Latin-speaking Europe. This was not a passive act of preservation. Physicians across the Islamic world, writing in Arabic, treated the classical inheritance as a living body of knowledge to be tested, corrected, and built upon — and nowhere was that building more consequential for this book's subject than in the work of Abu al-Qasim al-Zahrawi.

3.2 Al-Zahrawi and the Kitab al-Tasrif

Abu al-Qasim Khalaf ibn al-Abbas al-Zahrawi — known in the Latin West as Albucasis — was born around 936 AD near Córdoba, in Islamic Spain, where he served as court physician and practised for most of his life. His life's work, completed around the year 1000, was the *Kitab al-Tasrif* ("The Method"), a thirty-volume medical encyclopaedia distilling roughly fifty years of clinical experience. Its final volume, *On Surgery and Instruments*, is the section that would prove most consequential to the history of this field: it is the earliest surviving surgical text to systematically illustrate its own instruments, describing and depicting over 200 tools — scalpels, forceps, retractors, curettes, specula, and cauterising irons among them — many of which al-Zahrawi designed himself. For a physician working specifically on anorectal disease, this matters directly: several of the specula and instruments al-Zahrawi describes for anal and rectal examination and treatment are recognisable ancestors of instruments still in surgical use today, illustrated in a medical text for the first time in history.

3.3 Al-Zahrawi's Anorectal Surgery

Al-Zahrawi divided haemorrhoids into internal and external types and, in a pattern now familiar from Chapters 1 and 2, favoured a conservative-first approach — beginning with non-invasive therapeutic measures before proceeding to more invasive treatment, an approach he set out in earlier chapters of the *Tasrif* before turning to surgery proper. For fistula-in-ano, his described methods included cauterisation, unroofing (laying open) the tract, and — the detail of most direct relevance to Chapters 1, 2, and 9 — the insertion of spun yarn or thread into the fistula tract, a

technique modern reviewers of his work have identified explicitly as a forerunner of the seton still used today. Al-Zahrawi performed these procedures with the patient positioned in lithotomy, and, notably, he documented the possible complications of fistula surgery with a frankness a modern surgeon will recognise: damage to the anal sphincter and resulting faecal incontinence, particularly in deep or complex fistulae — the same anxiety that shaped Roman practice in Chapter 1, now stated as an explicit, named surgical risk rather than an implicit caution.

It is worth being precise about what this represents historically. Al-Zahrawi's seton is not, like the Ayurvedic Kshara Sutra of Chapter 2, an independent invention arrived at with no knowledge of the Hippocratic tradition — the translation movement described in Section 3.1 means the Greek thread technique was almost certainly known to him, directly or indirectly, through the Arabic Hippocratic and Galenic corpus. What al-Zahrawi contributed was not the initial insight but its refinement and systematisation: more precise positioning, a broader instrument set purpose-built for the procedure, and an explicit, documented awareness of sphincter risk that goes beyond anything preserved from the Hippocratic or Roman record. Three separate traditions — Greco-Roman, Ayurvedic, and Islamic Golden Age — had by this point each converged, by inheritance or by independent reasoning, on the same fundamental answer to the same fundamental problem.

3.4 What Survived: Five Centuries in the European Curriculum

The *Tasrif*'s surgical volume was translated into Latin in the twelfth century by Gerard of Cremona, working at the Toledo School of Translators in recently reconquered Castile — the same channel through which a great deal of Greek and Arabic scientific knowledge re-entered Western Europe. Circulating under the Latin title *Liber Chirurgiae* (or *De Chirurgia*), al-Zahrawi's surgical text became a core teaching text at the medical schools of Salerno, Montpellier, and Bologna, and remained the standard surgical reference across Europe for close to five hundred years, printed in at least ten Latin editions between 1497 and 1544. Nearly every major European surgical author of the twelfth through sixteenth centuries — Roger of Salerno, Lanfranchi, Guy de Chauliac among them — drew directly on al-Zahrawi's text, in some cases citing it hundreds of times. Guy de Chauliac, whose own surgical writing would shape the barber-surgeon tradition discussed in the next chapter, is recorded as having referenced al-Zahrawi's work more than two hundred times.

This makes al-Zahrawi something more than a historical bridge figure. His illustrated instrument design, his explicit staged approach to haemorrhoidal disease, and his frank documentation of sphincter risk in fistula surgery did not merely pass through medieval Europe on their way to the modern era — they were, for practical purposes, medieval European anorectal surgery, taught from

his text in its original or translated form for five centuries. The barber-surgeons of Chapter 4 inherited this tradition directly, whether or not they were aware of its Andalusian origin.

3.5 Chapter Summary

Key Points

• The Islamic Golden Age translation movement, centred on institutions such as Baghdad's House of Wisdom, preserved and actively expanded the Greek medical corpus at a time when it was largely inaccessible in Western Europe.

• Al-Zahrawi (Albucasis, 936–1013 AD) authored the *Kitab al-Tasrif*, whose final volume is the earliest surviving surgical text to systematically illustrate over 200 surgical instruments.

• Al-Zahrawi described a conservative-first, staged approach to haemorrhoids, and treated fistula-in-ano with cauterisation, unroofing, and thread (seton) placement — while explicitly documenting the risk of sphincter injury and incontinence.

• His seton represents a refinement of the Hippocratic thread technique (Chapter 1) rather than an independent invention like the Ayurvedic Kshara Sutra (Chapter 2) — three distinct historical routes converging on the same surgical principle.

• Translated into Latin by Gerard of Cremona in the 12th century, al-Zahrawi's surgical text became the standard reference across European medical schools for roughly five hundred years, directly shaping the barber-surgeon tradition of Chapter 4.

Glossary — Chapter 3

- *Al-Zahrawi (Albucasis)* — Andalusian physician and surgeon (936–1013 AD), author of the *Kitab al-Tasrif*, widely regarded as the father of operative surgery.
- *Gerard of Cremona* — 12th-century Italian scholar working at the Toledo School of Translators, who translated al-Zahrawi's surgical volume into Latin.
- *House of Wisdom* — an institution in Baghdad central to the 8th–9th century movement translating Greek scientific and medical texts into Arabic.
- *Kitab al-Tasrif* — al-Zahrawi's 30-volume medical encyclopaedia, completed c. 1000 AD; its final volume on surgery and instruments is the earliest illustrated surgical text known to survive.

- *Liber Chirurgiae (De Chirurgia)* — the Latin title under which al-Zahrawi's surgical volume circulated in medieval Europe.

CHAPTER 4

The Barber-Surgeon Era

Europe's Craft Surgeons and the Persistence of Folk Remedies

Learning Objectives

By the end of this chapter, the reader should be able to:

• Explain how and why surgery in medieval Europe became separated from university medicine and associated with barbers.

• Describe John of Arderne's probe-guided technique for fistula-in-ano and its direct relationship to modern fistulotomy.

• Describe the formation and eventual dissolution of the Company of Barber-Surgeons.

• Explain why folk and herbal remedies for anorectal disease persisted alongside, rather than being replaced by, formal surgical progress in this period.

Chapter 3 closed with al-Zahrawi's surgical text becoming the standard reference across European medical schools. But possessing a good text is not the same as possessing a respected profession, and for several centuries after that text arrived in Europe, the person most likely to actually operate on a patient with anorectal disease was not a university-trained physician at all, but a barber. This chapter examines how that curious arrangement came about, its single most remarkable practitioner, and why, even as surgical technique advanced during this period, most ordinary people continued to rely on home remedies no more sophisticated than those described in Chapter 1.

4.1 From Monastery to Marketplace: How Surgery Became a Craft

Surgery's low status in medieval Europe has a specific, traceable origin. Early medieval medical care, including minor surgery and bloodletting, was frequently provided within monasteries —

practical, hands-on work that university-trained physicians, occupied with Latin texts and humoral theory, generally avoided. In 1163, the Council of Tours, under Pope Alexander III, reinforced the principle *ecclesia abhorret a sanguine* — the Church abhors the shedding of blood — restricting clergy from performing bloodletting and invasive procedures. Monks had traditionally employed barbers to shave their tonsures; with clergy now barred from procedures involving blood, those same barbers, already equipped with sharp instruments and steady hands, absorbed the practical surgical work the monks left behind. From this accident of ecclesiastical politics, rather than any deliberate design, the barber-surgeon was born.

By the thirteenth century, barber-surgeons in London, Paris, and the German towns had begun to organise into guilds, formalising apprenticeships and enforcing standards of practice. A rigid two-tier hierarchy of medical care resulted, and persisted for centuries: university-educated physicians, trained in Latin and Greek medical theory, occupied the top of the profession and generally declined to operate with their own hands; barber-surgeons, trained by apprenticeship rather than by degree, did the actual cutting — bloodletting, tooth extraction, lancing of boils and fistulae, and, for those who specialised, more ambitious procedures including anorectal surgery. The familiar red-and-white barber's pole — red for blood, white for the bandages used to bind the arm during bloodletting — survives today as the last visible trace of this arrangement.

4.2 John of Arderne: A Fistula Surgeon's Fortune

Against this backdrop of a generally low-status profession, one English barber-surgeon achieved something remarkable: genuine wealth and fame, built almost entirely on a single anorectal operation. John of Arderne (c. 1307 – c. 1380), who practised in Newark and later London, is credited today as the father of English surgery, and more specifically as the father of proctology, on the strength of his treatise, commonly known as *Practica de Fistula in Ano*, written around 1376. Fistula-in-ano was, by Arderne's account, especially common among knights and men-at-arms — a plausible consequence of long hours in the saddle in heavy armour during the campaigns of the Hundred Years' War, though later historians note other contributing causes were likely also at work. Arderne's treatise opens with an account of his successful treatment of a nobleman, Sir Adam Everingham, and Arderne is traditionally associated with the retinue of John of Gaunt — connections that, true or embellished, reflect the elite clientele his reputation attracted.

Arderne's operation is described in unusually precise, step-by-step detail, illustrated with instruments drawn to scale — a rarity in medieval medical manuscripts. His toolkit included the *sequere me* ("follow me"), a flexible probe passed along the fistula tract as a guide; the *acus rostrata* or "snouted needle," a grooved director along which a scalpel was then passed to divide

the tract cleanly; a strong ligature called the *fraenum Caesaris*, used to constrict tissue on the rectal side of the fistula; and the *tendiculum*, a device for keeping that ligature taut during division. In essence, Arderne had developed what is, in its core operative logic, still the principle underlying probe-guided fistulotomy today: dividing the tract cleanly over a grooved guide rather than cutting blindly. He further favoured simple sponge pressure to control bleeding and conservative aftercare, deliberately avoiding the harsh cauterisation and purgatives common among his contemporaries, and reported a cure rate of roughly fifty percent — a genuinely remarkable outcome for the period.

Arderne was also, by his own account, a careful guardian of his commercial advantage. He gave his instruments and remedies deliberately obscure, fanciful Latin names, and disguised certain charms in corrupted Greek lettering, explicitly so that his methods could not easily be copied by rival barbers or the laity. Surgical secrecy of this kind — a master craftsman protecting a lucrative technique rather than freely publishing it for the benefit of the profession — was a common feature of the medieval surgical world, and stands in instructive contrast to the more openly disseminated, text-based traditions of Chapters 1 through 3.

4.3 The Company of Barber-Surgeons and the Limits of Progress

The uneasy coexistence of barbers and surgeons within a shared trade was formalised in England in 1540, when King Henry VIII merged the Fellowship of Surgeons and the Company of Barbers into the Company of Barber-Surgeons, an event commemorated in a well-known painting by Hans Holbein the Younger. The new charter attempted to separate the two roles — surgeons were not to cut hair, barbers were not to perform major surgery, though both continued to extract teeth — and granted the Company the bodies of four executed criminals each year for anatomical dissection, an early legal foothold for the anatomical study that would transform surgery in Chapter 5. The alliance remained tense for two centuries; surgeons, increasingly confident in their own status, formally separated from the barbers in 1745, eventually becoming England's Royal College of Surgeons.

It would be a mistake, however, to read the achievements of figures like Arderne as evidence that anorectal care had broadly modernised during this period. Arderne's skill, and his fees, placed him within reach of knights and nobility; for the great majority of the medieval population, care for piles, fistula, and fissure continued to mean exactly what it had meant in ancient Egypt: home-prepared poultices, astringent herbal washes, charms, and the humoral dietary advice that dominated popular medical thinking well into the early modern period. Formal surgical progress and folk medicine did not succeed one another in this era so much as run in parallel, separated less

by time than by a patient's ability to pay — a divide in access to care that, in different forms, this book will return to in later chapters.

4.4 Chapter Summary

Key Points

• Surgery's association with barbers, rather than physicians, traces to the 1163 Council of Tours, which restricted clergy from procedures involving bloodshed — pushing practical surgical work from monasteries onto the barbers who had long served them.

• John of Arderne (c. 1307–c. 1380) built his fame and fortune on a single speciality: fistula-in-ano surgery, described in unprecedented step-by-step, illustrated detail in his *Practica de Fistula in Ano*.

• Arderne's probe-guided technique — a flexible guide followed by a grooved director along which the scalpel was passed — is the direct conceptual ancestor of modern probe-guided fistulotomy, and his conservative aftercare contributed to a reported cure rate of roughly fifty percent.

• The Company of Barber-Surgeons, formed in England in 1540 and dissolved in 1745, formalised — without fully resolving — the tension between craft-trained surgeons and university-trained physicians.

• Elite surgical care and popular folk remedies coexisted throughout this period rather than one replacing the other, divided chiefly by a patient's ability to pay for a master surgeon's fees.

Clinical Correlation — The Grooved Director's Long Afterlife

Arderne's acus rostrata — a grooved director along which a scalpel is passed to divide tissue cleanly and under control — is not merely of antiquarian interest. The same basic principle, a guide inserted along a tract to direct safe division of overlying tissue, remains central to fistulotomy as taught and practised today, discussed fully in Chapter 9. Readers who found the thread-based seton techniques of Chapters 1 through 3 conceptually familiar will find Arderne's probe-guided approach equally recognisable: medieval English surgery contributing its own distinct, lasting thread to the same rope this book has been following since Chapter 1.

Glossary — Chapter 4

- *Acus rostrata* — John of Arderne's "snouted needle," a grooved director along which a scalpel was passed to divide a fistula tract cleanly.
- *Company of Barber-Surgeons* — the English guild formed in 1540, merging the Fellowship of Surgeons and the Company of Barbers; dissolved in 1745.
- *Council of Tours (1163)* — an ecclesiastical council whose restriction on clergy performing bloodshed-involving procedures is credited with shifting practical surgical work from monks to barbers.
- *John of Arderne* — English barber-surgeon (c. 1307 – c. 1380), author of the *Practica de Fistula in Ano*, regarded as the father of English surgery and of proctology.
- *Sequere me* — Arderne's flexible probe ("follow me"), used to locate and guide instruments along a fistula tract.
- *Tendiculum* — an instrument described by Arderne for keeping a ligature taut during fistula division.

CHAPTER 5

Anatomical Rediscovery and the Rise of Formal Surgical Training

Vesalius, Paré, a King's Fistula, and the Birth of Scientific Surgery

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Learning Objectives

By the end of this chapter, the reader should be able to:

• Explain the significance of Vesalius's anatomical revolution for the practice of surgery.

• Describe Ambroise Paré's contribution to surgical technique and to the status of the barber-surgeon.

• Describe the operation performed on Louis XIV for anal fistula, and explain its significance for the standing of surgery as a discipline.

• Explain John Hunter's role in establishing surgery as a formally taught, evidence-based profession.

Chapter 4 left surgery as a craft — respected within its own guild, but institutionally and socially subordinate to university medicine, still separated from physicians by a gulf of status rather than of skill. This chapter follows the two centuries in which that gulf began, gradually and unevenly, to close: first through a revolution in what surgeons and anatomists actually knew about the human body, then through a single, spectacular anorectal operation performed on the most powerful man in Europe, and finally through one Scottish surgeon's insistence that surgery be taught as a science rather than passed down as a trade secret.

5.1 Vesalius and the Anatomical Revolution

In 1543, the Flemish anatomist Andreas Vesalius published *De Humani Corporis Fabrica* ("On the Fabric of the Human Body"), a seven-volume, systematically illustrated anatomical text based not on the received authority of Galen but on Vesalius's own extensive human dissections. This

distinction matters more than it may first appear. Galen, working over a thousand years earlier, had dissected animals — chiefly Barbary macaques — and extrapolated his findings onto human anatomy; his errors had been copied, uncorrected, through fourteen centuries of medical education. Vesalius insisted on performing his own dissections rather than delegating the physical work to an assistant while he merely lectured from a raised chair, the standard practice at the medical schools of his day, and in doing so corrected hundreds of Galenic errors at a stroke.

The consequences for surgery were profound, if not immediate. A discipline whose practitioners now had access to accurate, systematically illustrated human anatomy was, for the first time, equipped to reason about the body it operated on rather than simply repeat inherited technique. The anatomical foundation described in Chapter 0 — precise, testable, correctable through direct observation — has its origin here, in Vesalius's insistence that the dissecting table, not the ancient text, was the final authority.

5.2 Ambroise Paré: A Barber-Surgeon at Court

Ambroise Paré (c. 1510–1590), a French barber-surgeon trained by apprenticeship in the tradition described in Chapter 4, rose to become surgeon to four successive French kings — a trajectory that would have been unthinkable for a craft-trained surgeon a century earlier. Paré's best-known technical contribution was his revival of arterial ligature in place of cauterisation to control bleeding after amputation, a technique gentler on the patient and, though not yet understood in these terms, less likely to cause the fatal shock associated with searing a fresh wound with a red-hot iron. He designed a purpose-built instrument for the technique, the *bec de corbeau* ("crow's beak"), a direct ancestor of the modern haemostat.

Paré's significance for this book's argument, however, lies less in any single anorectal technique than in what his career demonstrated: that a barber-surgeon, through skill, publication, and results, could rise to serve kings and be remembered as one of the fathers of modern surgery. His success, and his widely read published works, did much to begin narrowing the gulf in prestige between the craft-trained surgeon and the university-trained physician — a gulf this chapter will watch narrow further in Sections 5.3 and 5.4.

5.3 The Sun King's Fistula: Surgery's Coming of Age

If any single event marks the moment European surgery began to shed its inferior status, it is arguably not a treatise or a discovery but a single operation, performed in a royal bedchamber at Versailles on 18 November 1686. King Louis XIV of France had developed a perianal abscess in

early 1685 which progressed, despite a year of enemas, poultices, and the usual remedies of the physicians, into a persistent anal fistula. By late 1686, unable to ride or sit comfortably, the King consented to surgery — itself a significant concession, since medicine, not surgery, was the senior discipline at court, and the King's own physicians had resisted surgical intervention for months.

The operation fell to Charles-François Félix de Tassy, the King's surgeon. Rather than operate immediately, Félix spent months preparing: he studied the surgical literature on fistula reaching back to the Hippocratic era described in Chapter 1, drew on the revived and refined technique published by the Italian surgeon Pietro Marchetti in 1654 (based on some 600 of his own operations), and — in an approach a modern reader will recognise as a rudimentary form of technique validation before high-stakes application — practised and refined his method on some 75 ordinary fistula patients in the hospitals of Paris and Versailles before ever approaching the King. He designed a purpose-built curved instrument for the occasion, *le bistoury à la royale*, combining a probe and blade in a single instrument to divide the fistula tract along a controlled path, in direct conceptual descent from the grooved-director principle of John of Arderne described in Chapter 4.

The operation itself, performed without anaesthesia, took the better part of three hours and required two further corrective procedures over the following weeks before the fistula finally healed in January 1687. Louis XIV is recorded as having borne the procedure with remarkable composure — a matter of considerable political importance, since an operation on the King's body was, in an absolute monarchy, a matter of state, conducted before witnesses and reported through the court. The operation's success made a sensation: 1686 came to be remembered in France as "the year of the fistula," courtiers reportedly underwent or claimed to have undergone similar operations out of solidarity or fashion, and Félix himself was ennobled and granted a substantial pension and estate. More consequentially for this book's subject, the widely publicised success of a fistula operation performed on the King of France did more to elevate the public standing of surgery as a serious, respectable discipline than perhaps any single event of the preceding two centuries.

5.4 John Hunter and the Birth of Scientific Surgery

The final step this chapter traces belongs to John Hunter (1728–1793), a Scottish surgeon who arrived in London at twenty with almost no formal education and became, within his own lifetime, the figure most credited with transforming surgery from a craft learned by apprenticeship into a discipline grounded in systematic observation and experiment. Trained initially as a dissection assistant to his elder brother William, an established anatomist, Hunter distinguished himself through comparative anatomy — studying structure and function across species, not only in

humans — and through an insistence that surgical practice be justified by evidence rather than inherited custom.

Hunter opened his own anatomy school in 1764 and began lecturing publicly on the theory and practice of surgery in the early 1770s, deliberately making formal surgical education available beyond the closed apprenticeship system described in Chapter 4. His teaching museum, eventually housing nearly 14,000 anatomical and pathological specimens, became a resource for generations of students, the best known of whom, Edward Jenner, would go on to pioneer vaccination. Hunter died in 1793, during an argument with fellow surgeons over access to surgical training at St George's Hospital — a fittingly symbolic end for a man whose life's work was the insistence that surgical knowledge should be taught openly and grounded in evidence, rather than guarded as a trade secret in the manner of John of Arderne four centuries earlier.

5.5 Chapter Summary

Key Points

• Andreas Vesalius's *De Humani Corporis Fabrica* (1543) replaced Galenic authority with direct human dissection, giving surgery, for the first time, an accurate anatomical foundation to reason from.

• Ambroise Paré's revival of arterial ligature over cauterisation, and his rise to serve four French kings, demonstrated that skill and results could elevate a craft-trained barber-surgeon's standing.

• The 1686 operation on Louis XIV for anal fistula — prepared by Félix's practice on some 75 prior patients and performed with a purpose-built instrument — was a landmark event that dramatically raised the public and professional standing of surgery.

• John Hunter established surgery as a formally taught, evidence-based discipline grounded in comparative anatomy and experiment, opening surgical education beyond the closed apprenticeship system.

• Across this chapter, surgery's status rose primarily through demonstrated results — accurate anatomy, successful high-profile operations, and open, evidence-based teaching — rather than through any single decree or title.

Clinical Correlation — Validation Before the King

Félix's decision to test and refine his fistula technique on 75 ordinary patients before operating on Louis XIV is a strikingly early instance of a principle this book has returned to before: that a technique should be proven on a broader population before being trusted in a single high-stakes case. Readers will recognise the same underlying instinct — evidence before application — in the modern randomised trials validating Kshara Sutra described in Chapter 2, and in the case-series methodology underlying the author's own MOLIS technique in Chapter 16. The instruments and anaesthesia have changed beyond recognition; the underlying discipline of testing before trusting has not.

Glossary — Chapter 5

- *Bec de corbeau* — Paré's "crow's beak" instrument for arterial ligature, a direct ancestor of the modern haemostat.
- *Bistoury à la royale* — the purpose-built curved probe-and-blade instrument designed by Félix de Tassy for the 1686 operation on Louis XIV.
- *De Humani Corporis Fabrica* — Andreas Vesalius's 1543 seven-volume anatomical text, based on direct human dissection rather than Galenic authority.
- *John Hunter* — Scottish surgeon (1728–1793) credited with founding scientific, formally taught surgery grounded in comparative anatomy and experiment.
- *Ligature* — tying off a blood vessel with thread to control bleeding, revived by Paré as an alternative to cauterisation.

CHAPTER 6

Anaesthesia and Antisepsis

How Morton, Semmelweis, and Lister Made Elective Anorectal Surgery Possible

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Learning Objectives

By the end of this chapter, the reader should be able to:

• Describe the first public demonstration of surgical anaesthesia and explain its significance for anorectal surgery specifically.

• Describe Semmelweis's discovery regarding puerperal fever and explain its relevance to anorectal wound sepsis.

• Describe Lister's antiseptic system and its basis in Pasteur's germ theory.

• Explain why anaesthesia and antisepsis, taken together, mark the transition from emergency anorectal surgery to controlled, elective anorectal surgery.

Every anorectal operation described so far in this book — Hippocratic cautery, Sushruta's Kshara Sutra, Arderne's probe-guided fistulotomy, even Félix's celebrated operation on Louis XIV — was performed on a fully conscious patient, by a surgeon working as fast as skill allowed, in a field with no understanding of why wounds so often turned fatal days after an apparently successful procedure. This chapter covers roughly two decades in the middle of the nineteenth century in which three separate discoveries, none of them originally about anorectal disease at all, together removed both of those constraints — and in doing so made the entire remainder of this book possible.

6.1 Anaesthesia: Ether Day and the End of the Screaming Patient

On 16 October 1846, in the surgical amphitheatre of Massachusetts General Hospital now preserved as the "Ether Dome," the Boston dentist William T. G. Morton administered inhaled

ether to a patient, Edward Gilbert Abbott, while surgeon John Collins Warren removed a tumour from Abbott's neck. The patient remained still and reported no pain. Warren is recorded as turning to the assembled audience and remarking, "Gentlemen, this is no humbug." Priority for the underlying discovery was immediately and bitterly contested — the chemist Charles Jackson, the dentist Horace Wells, and the Georgia physician Crawford Long each had earlier claims to using ether or nitrous oxide for pain relief — but it was Morton's public, witnessed demonstration that convinced the medical world and marks the conventional beginning of the anaesthetic era.

For anorectal surgery in particular, the significance of anaesthesia is difficult to overstate. Every technique this book has described up to this point had to be fast by necessity, since the patient was conscious, in agony, and physically struggling. Félix's operation on Louis XIV, for all its careful preparation, was still a race against the King's endurance. Anaesthesia removed that constraint entirely. For the first time, a surgeon operating in the anal canal could work slowly, deliberately, and with the kind of careful attention to the sphincter complex described in Chapter 0 that a struggling, screaming patient simply does not permit. Every sphincter-sparing principle this book will describe in its modern chapters — the graded, controlled division that runs from Kshara Sutra through Arderne's grooved director to the author's own MOLIS technique — depends, at a basic practical level, on the patient holding still.

6.2 Semmelweis and the Unheeded Warning

In 1846, the Hungarian obstetrician Ignaz Semmelweis was assigned to the First Obstetrical Clinic of Vienna General Hospital, where medical students and physicians trained. He observed that maternal mortality from puerperal (childbed) fever in his clinic ran several times higher than in the hospital's Second Clinic, staffed by midwives who did not perform autopsies. The puzzle resisted every explanation then current — miasma, overcrowding, the emotional state of the mothers — until, in 1847, Semmelweis's colleague Jakob Kolletschka died of an infection after cutting his finger during a post-mortem examination, displaying symptoms strikingly similar to those of childbed fever. Semmelweis concluded that physicians and students, moving directly from the dissecting room to the delivery ward without washing, were themselves carrying "cadaverous particles" that caused the infection.

From May 1847, Semmelweis required every physician and student entering his clinic to scrub their hands in a solution of chlorinated lime. The effect was immediate and dramatic: mortality in the First Clinic fell from figures as high as eighteen percent to close to two percent within roughly a year, bringing it in line with the midwives' ward. The medical establishment's response was not gratitude but hostility; Semmelweis's theory implicated his own colleagues as the unwitting cause

of their patients' deaths, and it was rejected on grounds of both pride and an absence, at the time, of any accepted mechanism to explain it. Semmelweis died in 1865 in an asylum, from an infected wound of his own, only a year or two before Lister's published work, building on Pasteur's germ theory, would vindicate exactly the mechanism he had proposed. His story is included here not merely as tragedy but as a warning with particular relevance to anorectal surgery: a field operating in permanent proximity to faecal flora has more reason than almost any other surgical speciality to take contamination seriously, and Semmelweis's unheeded insight — that the surgeon's own hands can be the vector of infection — anticipates precisely the hygienic discipline that would make safe anorectal surgery possible.

6.3 Lister and the Birth of Antiseptic Surgery

Joseph Lister, appointed Professor of Surgery at Glasgow in 1860, faced the same problem that had defeated Semmelweis — wound sepsis killing a substantial proportion of surgical patients — but arrived at a solution with the benefit of a mechanism Semmelweis never had. In 1864, Lister was introduced to the germ theory of the French chemist Louis Pasteur, who had shown that fermentation and putrefaction were caused by living microorganisms carried in the air, not by spontaneous generation. Lister reasoned that if airborne organisms caused wounds to putrefy, a chemical barrier between the wound and the surrounding environment might prevent it. He selected carbolic acid (phenol) as that barrier, first testing it on compound fractures — wounds open to the skin and thus especially prone to infection — from 1865 onward.

Lister published his results in a series of six papers in *The Lancet* between March and July 1867, reporting a dramatic reduction in wound sepsis and the amputations that so often followed it. His full protocol extended well beyond the wound itself: instruments, dressings, sutures, and the surgeon's own hands were all treated with carbolic acid solution, and for a period the operating theatre air itself was sprayed with a fine carbolic mist. "Listerism," as it became known, met significant early resistance — the carbolic spray was unpleasant and irritating, and many surgeons remained unconvinced by germ theory itself — but the consistency of Lister's results gradually overcame that resistance, and antiseptic technique became the accepted standard within a generation.

6.4 What These Three Discoveries Together Made Possible

None of Morton, Semmelweis, or Lister set out to improve anorectal surgery specifically, and none of them are remembered primarily for it. But taken together, their combined effect on this

particular field was transformative in a way few other branches of surgery experienced as acutely. Anorectal operations sit at a uniquely difficult intersection: they demand fine, unhurried control near a sphincter complex that cannot be rushed without risking permanent incontinence, and they are performed in a field of dense, unavoidable bacterial contamination. Before this chapter's discoveries, both of those realities made careful, elective anorectal surgery close to impossible — every operation this book has described so far was a fast, brutal necessity, undertaken despite the patient's pain and despite the surgeon's total ignorance of why so many wounds turned fatal. Anaesthesia removed the first obstacle; antisepsis, building on the mechanism Semmelweis had glimpsed without being able to prove, removed the second. Every technique described in the remainder of this book — the standardised haemorrhoidectomy of Chapter 8, the modern fistula surgery of Chapter 9, the lateral sphincterotomy of Chapter 10, and the author's own MOLIS technique in Chapter 16 — is built on the assumption that the patient will feel nothing and the wound will not turn septic. This chapter is where that assumption first became true.

6.5 Chapter Summary

Key Points

• William Morton's public demonstration of ether anaesthesia on 16 October 1846 marked the conventional beginning of the anaesthetic era, removing the need for anorectal surgery to be performed at speed on a conscious, struggling patient.

• Ignaz Semmelweis (1847) correctly identified that physicians' unwashed hands transmitted fatal infection from autopsy to delivery ward, reducing maternal mortality dramatically with chlorinated lime handwashing — but was rejected by his contemporaries and died before his insight was vindicated.

• Joseph Lister (1867), building on Pasteur's germ theory, developed carbolic acid antisepsis, dramatically reducing surgical wound sepsis and establishing the mechanism Semmelweis had lacked.

• Anorectal surgery, operating near both the sphincter complex and dense faecal bacterial flora, had unusually acute need for both discoveries — precise, unhurried technique and rigorous sepsis control.

• Together, anaesthesia and antisepsis mark the transition from anorectal surgery as a fast, high-risk necessity to a controlled, elective procedure — the foundation on which every technique in the remainder of this book depends.

Clinical Correlation — The Hinge of This Book

This chapter is a genuine hinge point in the history this book tells. Every chapter before it describes surgeons achieving remarkable results despite pain and infection they could neither control nor fully explain — Sushruta's graded caution, Arderne's careful aftercare, Félix's extensive pre-testing on 75 patients, all partial workarounds for problems that would not be properly solved until this chapter. Every chapter after it — haemorrhoidectomy, fistula surgery, lateral sphincterotomy, MOLIS — assumes anaesthesia and antisepsis as background conditions no longer worth mentioning, because by then they no longer needed to be won. Readers are encouraged to notice, moving forward, how much of the confident, unhurried precision described in later chapters was simply unavailable to every surgeon this book has discussed so far.

Glossary — Chapter 6

- *Antisepsis* — the use of chemical agents to destroy microorganisms on or around a wound, pioneered by Lister using carbolic acid.
- *Carbolic acid (phenol)* — the antiseptic agent selected by Lister, applied to wounds, instruments, dressings, and the surgical field.
- *Ether Dome* — the surgical amphitheatre at Massachusetts General Hospital where Morton's 1846 public demonstration of ether anaesthesia took place.
- *Germ theory* — Louis Pasteur's demonstration that fermentation and putrefaction are caused by living microorganisms, the scientific basis for Lister's antisepsis.
- *Puerperal fever* — childbed fever; a frequently fatal postpartum infection whose transmission via unwashed hands Semmelweis identified in 1847.

CHAPTER 7

Early Haemorrhoidectomy Techniques and the First Surgical Societies

From St Mark's Hospital to the American Proctologic Society

Learning Objectives

By the end of this chapter, the reader should be able to:

• Describe the founding of St Mark's Hospital and its significance for anorectal disease as a recognised medical field.

• Outline the author's three-part hypothesis on the gravitational and mechanical origins of haemorrhoidal disease, and the historical and modern theories it engages with.

• Describe Whitehead's circumferential haemorrhoidectomy and explain why it fell out of favour.

• Describe the founding of the American Proctologic Society and its significance for anorectal disease as a recognised speciality.

Chapter 6 supplied anorectal surgery with anaesthesia and antisepsis — the two preconditions for careful, elective operating. This chapter follows what the field did with that gift across the second half of the nineteenth century: a dedicated hospital was founded to study and treat rectal disease specifically; a bold, technically radical operation for haemorrhoids was attempted, and partly failed; and, in response to a marketplace of itinerant quacks exploiting desperate patients, a group of serious physicians organised themselves into the first professional society dedicated to this field.

7.1 St Mark's Hospital: The First Institution for Rectal Disease

In 1835, the London surgeon Frederick Salmon founded what would become St Mark's Hospital — initially named, with characteristic Victorian directness, the Infirmary for the Relief of the Poor Afflicted with Fistula and Other Diseases of the Rectum and Lower Intestines. Salmon had already

published several well-regarded books on rectal disease, but found himself shut out of a hospital appointment by a medical establishment then run largely on personal connection rather than merit. Rather than continue seeking entry to that closed world, he built his own institution: a single room with seven beds at 11 Aldersgate Street in the City of London, treating 131 patients in its first year. Among the hospital's early patients was the author Charles Dickens, who is said to have blamed his need for surgery on "too much sitting at my desk."

St Mark's significance for this book's argument goes well beyond its size. It was among the first institutions in the world built specifically around the premise that diseases of the rectum deserved dedicated study, dedicated expertise, and a dedicated home — rather than being treated as a minor, faintly embarrassing subcategory of general surgery. Growing steadily through the nineteenth and twentieth centuries, St Mark's would go on to train generations of specialists in this field, several of whom appear later in this book, and its influence reached across the Atlantic: as Section 7.4 will show, the physician who founded the first American society devoted to this field had himself studied at St Mark's.

7.2 The Gravitational Theory of Haemorrhoidal Disease: An Evolutionary Perspective

With rectal disease now established as a legitimate field of institutional study, this is the natural point in the book's narrative to set out a hypothesis on the origin of haemorrhoidal disease itself — the author's own synthesis, offered in the same spirit of open clinical reasoning as the physicians whose institutions and societies this chapter describes.

The idea that human erect posture bears some responsibility for haemorrhoidal disease is not new; it is traceable, in outline, to observations made by the Italian anatomist Giovanni Battista Morgagni in the seventeenth century, and has been periodically revisited since. In its classical form, the theory holds that the rectal venous plexus — like the portal venous system it drains into, and as described in Section 0.5 — is essentially valveless, so that upright posture imposes a continuous, unbroken hydrostatic column of pressure on these veins that a quadruped's horizontal posture never would. The theory fell into some disfavour in the twentieth century following the discovery of porto-systemic anastomoses within the haemorrhoidal plexus, which can partly dissipate this pressure, and modern accounts increasingly favour the sliding anal cushion theory and vascular hyperplasia as the primary mechanisms of disease. The gravitational theory is best understood today not as a complete explanation on its own, but as one genuine contributing factor among several.

The author's own synthesis extends this classical postural theory with two further observations from decades of clinical practice. First, the chronic hydrostatic load described above is compounded by an acute mechanical factor: the straining required to expel the firmer first portion of formed stool produces repeated, Valsalva-type spikes in intra-abdominal pressure, transmitted directly through the same valveless venous system with no valve to break the surge. This second observation is offered explicitly as clinical impression, not measured data, based on digital examination rather than instrumentation: some patients presenting with severe bleeding but without external prolapse (a first-degree pattern) appear, on examination, to have a variable or hypertrophied internal anal sphincter. The proposed mechanism is that a hypertonic sphincter raises outlet resistance, compounding the straining factor above, while simultaneously anchoring the vascular cushions mechanically in place and preventing the prolapse that might otherwise accompany such severe bleeding. Together, these three factors — chronic postural load, acute straining load, and a possible sphincter-related mechanical component — are offered as a connected, if still provisional, account of why this disease behaves as it does, to be weighed alongside the sliding cushion and hyperplasia theories rather than in place of them.

7.3 Walter Whitehead and the Radical Excision

In 1882, the British surgeon Walter Whitehead proposed a bold departure from the localised excision techniques that had descended, with modification, from the Hippocratic and Roman ligature methods described in Chapter 1: rather than removing individual haemorrhoidal masses, Whitehead excised the entire circumferential ring of pile-bearing mucous membrane at the level of the dentate line in a single continuous incision, suturing the cut edge of rectal mucosa directly to the anal skin below. In 1887 he published his first 300 consecutive cases, reporting, by his own account, no cases of the strictures or ectropion that critics would later make the operation notorious for.

Whitehead's technique gained wide popularity in the following decades precisely because it was so thorough: unlike more conservative excisions, it left essentially no diseased tissue behind, promising a low recurrence rate. But that same thoroughness proved to be its undoing. As the operation spread beyond Whitehead's own careful hands, complication rates in general use proved considerably higher than his published series suggested — significant blood loss, and, most characteristically, a mucosal ectropion ("Whitehead's deformity") caused by imprecise suturing of the mucocutaneous junction, along with anal stenosis from circumferential scarring. By the twentieth century the operation had acquired a poor reputation and was largely abandoned in its original form, though modified versions occasionally resurface today for carefully selected cases

of extensive, circumferential disease. Whitehead's operation stands, in this book's narrative, as an instructive cautionary tale: a technically ambitious solution to a real problem, undone less by a flawed concept than by insufficient attention to exactly the kind of precise, sphincter- and mucosa-conscious technique this book has traced since Chapter 1.

7.4 "Shoals of Quacks": The Case for a Real Speciality

By the late nineteenth century in the United States, the treatment of piles had become, in the words of one historian of the field, populated by "shoals of quacks" — itinerant "pile doctors" who travelled from town to town offering a proprietary carbolic acid injection treatment, credited to Milton W. Mitchell and aggressively commercialised by entrepreneurs such as Alexander Brinkerhoff, often with little regard for patient safety or medical legitimacy. Mainstream American medicine had largely ignored anorectal disease throughout the century; most medical school curricula included no formal instruction in the subject at all, leaving a vacuum that itinerant charlatans were only too willing to fill.

Joseph McDowell Mathews, a Kentucky surgeon, represents the serious countercurrent to this trend. Mathews studied at St Mark's Hospital in London during the winter of 1877–1878 — a direct institutional link back to Section 7.1 of this chapter — and returned to the United States determined to establish rectal disease as a legitimate medical speciality. He headed a Special Commission on Rectal Diseases for the Kentucky State Medical Society in 1878, established a Department of Proctology at the Kentucky School of Medicine in 1883, and in 1894 launched *Mathews' Medical Quarterly*, the world's first dedicated proctologic journal. His efforts, and those of a small number of like-minded colleagues who had been meeting informally for years to discuss the field's shared problems, set the stage for the event described in Section 7.5.

7.5 The American Proctologic Society (1899)

On 7 June 1899, thirteen physicians met in Columbus, Ohio, at the call of Dr J. Rawson Pennington, and formally established the American Proctologic Society — the direct institutional ancestor of today's American Society of Colon and Rectal Surgeons. Joseph Mathews was elected the society's first president. The founders' stated goals were threefold: to establish a dedicated journal, to create an objective process for certifying genuine expertise in the field, and to separate serious anorectal medicine, once and for all, from the itinerant quackery described in Section 7.4. The society grew steadily through the early twentieth century, and its long institutional project culminated in the formal recognition of the American Board of Proctology in 1949 — later

renamed the American Board of Colon and Rectal Surgery — placing this field, at last, on the same formal professional footing as any other surgical speciality.

This pattern — informal expert consultation gradually formalising into a dedicated society, journal, and certifying board — has since repeated itself in national colorectal societies around the world, including in India, and represents as significant a milestone in this book's narrative as any single surgical technique: it marks the point at which anorectal surgery ceased to depend on the individual reputation of gifted practitioners like Salmon or Mathews, and became a self-sustaining, self-regulating profession capable of setting and enforcing its own standards.

7.6 Chapter Summary

Key Points

• Frederick Salmon founded St Mark's Hospital in 1835 as the first institution dedicated specifically to rectal disease, after being excluded from the closed medical establishment of his day.

• The author's Gravitational Theory hypothesis proposes three connected factors in haemorrhoidal disease: chronic postural venous load (after Morgagni), acute straining-related pressure spikes, and a possible IAS-hypertonia mechanical component — offered as a contribution to, not a replacement for, modern sliding-cushion and hyperplasia theories.

• Whitehead's 1882 circumferential haemorrhoidectomy was technically thorough but proved prone to serious complications (ectropion, stenosis) once in general use, and stands as a cautionary tale about surgical ambition outrunning technique.

• Widespread quackery in late 19th-century America — itinerant 'pile doctors' exploiting a medical vacuum — provoked the serious countercurrent led by Joseph Mathews, who had studied at St Mark's Hospital.

• The American Proctologic Society, founded by 13 physicians in 1899, formally established anorectal disease as a self-regulating medical speciality, eventually becoming today's American Society of Colon and Rectal Surgeons.

Clinical Pearl — A Two-Stage Digital Examination

Independent of the hypothesis above, the author offers a practical examination technique

developed over years of practice. At the patient's first consultation — before any bowel preparation — a lubricated digital examination assesses the anal canal in its natural state, from the anal verge up to the anorectal ring/puborectalis sling, giving an overall impression of the canal's structure. A second examination is then performed immediately before surgery, after the author has personally administered an enema: with the rectum clean, this second examination allows a far more precise assessment of internal anal sphincter thickness, degree of spasm, and length than the first examination, or a single office visit, could provide alone. This two-stage approach — mapping the whole structure first, then sharpening the specific findings on a clean field — is offered as a practical technique rarely described explicitly in the literature, though it will be familiar in spirit to any experienced examiner.

Clinical Correlation — Institutions as Technique

This chapter's true subject is not any single operation but the institutional machinery — hospitals, societies, certifying boards — that allows a surgical technique to be tested, corrected, and safely disseminated, rather than depending on one gifted practitioner's unrepeated results. Readers will recognise the same underlying logic in Chapter 2's account of Kshara Sutra's standardisation at Banaras Hindu University, and in the peer review and editorial structures that govern how the author's own MOLIS technique, described in Chapter 16, has been documented and shared. Whitehead's operation, by contrast, shows what can go wrong when a useful technique spreads faster than the institutional means to teach and monitor it properly.

Glossary — Chapter 7

- *American Proctologic Society* — founded 1899 in Columbus, Ohio; the direct institutional ancestor of the American Society of Colon and Rectal Surgeons.
- *Gravitational theory* — the hypothesis, traceable to Morgagni, that human erect posture and valveless rectal veins contribute to haemorrhoidal disease; extended in this chapter with straining and IAS-hypertonia factors.
- *St Mark's Hospital* — founded by Frederick Salmon in 1835 as the Infirmary for the Relief of the Poor Afflicted with Fistula and Other Diseases of the Rectum; the first dedicated institution for rectal disease.

- *Whitehead's deformity* — mucosal ectropion resulting from imprecise technique in Whitehead's circumferential haemorrhoidectomy.
- *Whitehead's operation* — Walter Whitehead's 1882 technique of circumferential excision of the entire pile-bearing mucosal ring, notable for both its thoroughness and its later reputation for complications.

CHAPTER 8

Milligan-Morgan Haemorrhoidectomy and Its Era

The Operation That Solved Whitehead's Problem

Learning Objectives

By the end of this chapter, the reader should be able to:

• Explain how the Milligan-Morgan technique specifically addressed the failure mode of Whitehead's operation.

• Describe the Milligan-Morgan operation in outline: positioning, the three primary pedicles, and the open wound principle.

• Describe Ferguson's closed technique and how it differs from Milligan-Morgan.

• Explain why both techniques remain the reference standard against which newer haemorrhoid treatments continue to be measured.

Chapter 7 left haemorrhoid surgery with a genuine problem still unsolved. Whitehead's circumferential excision removed disease thoroughly but, in general use, left too many patients with stenosis or ectropion, because a continuous circumferential wound gives the healing anal canal no untouched tissue to hold its shape. The operation described in this chapter, developed at the same institution that opened Chapter 7's account of this field, solved that problem with a single, elegant structural insight — and in doing so produced the operation that would remain, for the better part of a century, the worldwide reference standard for haemorrhoidal surgery.

8.1 Milligan and Morgan: Solving Whitehead's Problem

In 1937, the surgeons E. T. C. Milligan and C. Naunton Morgan, working with colleagues L. E. Jones and R. Officer at St Mark's Hospital — the same institution founded a century earlier by Frederick Salmon, described in Chapter 7 — published "Surgical Anatomy of the Anal Canal and

the Operative Treatment of Haemorrhoids" in *The Lancet*. Their central insight was almost disarmingly simple once stated: haemorrhoids characteristically develop at three fairly consistent primary sites around the anal circumference, and it is neither necessary nor safe to excise the tissue between them. By removing only the three primary haemorrhoidal masses and deliberately leaving intact bridges of anoderm and mucosa between each excision, Milligan and Morgan's technique preserved exactly the untouched, unscarred tissue that Whitehead's continuous circumferential wound had eliminated — removing Whitehead's mechanism for anal stenosis at its root, without sacrificing the thoroughness that had made his approach attractive in the first place.

8.2 The Technique in Outline

With the patient positioned in lithotomy and under anaesthesia, the three primary haemorrhoidal pedicles — conventionally described at the 3, 7, and 11 o'clock positions, though exact orientation varies somewhat with patient positioning and surgeon convention — are each grasped, drawn outward, and dissected free from the underlying internal sphincter. The vascular pedicle supplying each mass is transfixed and ligated at its base, and the haemorrhoidal tissue is excised in a V-shaped incision extending from perianal skin to just above the dentate line. Crucially, the resulting wounds are left open rather than sutured closed, allowed to heal by secondary intention — the feature that gives this operation its common name, the "open" haemorrhoidectomy — while the bridges of tissue between the three excision sites remain untouched, preserving both sensation and the structural integrity of the anal canal.

The operation's combination of thoroughness and structural conservatism proved durable. Follow-up studies through the mid-twentieth century reported consistently low recurrence rates, and the technique spread rapidly through Britain, Ireland, and much of the Commonwealth and Europe, becoming — and to a considerable extent remaining today — the technique against which every subsequent innovation in haemorrhoid surgery has had to prove itself.

8.3 Ferguson's Answer: The Closed Technique

Not every surgeon was satisfied that an open wound was the best solution. In the United States, James A. Ferguson and Richard J. Heaton, working at the Ferguson-Droste-Ferguson Clinic in Grand Rapids, Michigan, published a modification in 1959: a dissection performed similarly to Milligan and Morgan's, but with the mucosal and skin edges of each wound sutured closed at the end of the procedure rather than left open. The stated aim was to reduce postoperative pain and

bleeding and to speed healing by closing the raw surfaces immediately, rather than leaving them to granulate over several weeks.

Ferguson's closed technique became, and remains, the more commonly practised approach in the United States, while Milligan-Morgan has remained dominant in the United Kingdom, Ireland, and much of continental Europe and Asia — a genuine, persistent regional divide in surgical practice rather than a case of one technique simply superseding the other. Decades of subsequent randomised trials comparing the two have found the picture more nuanced than either camp's early advocates expected: closed technique is often associated with somewhat faster primary wound healing, while open technique avoids the specific risk of wound breakdown that can occur when a closed suture line fails under tension — and neither has demonstrated a clear, consistent advantage in postoperative pain across the accumulated evidence.

8.4 An Era, Not Just an Operation

It is worth being precise about why this chapter is titled "Milligan-Morgan haemorrhoidectomy and its era," rather than simply describing a single operation. For roughly sixty years following 1937, and to a substantial degree still today, essentially every subsequent development in haemorrhoid surgery — the stapled haemorrhoidopexy introduced by Longo in the 1990s, energy-sealing devices, Doppler-guided haemorrhoidal artery ligation, and the many further refinements discussed in later chapters — has been developed, tested, and reported specifically in comparison to Milligan-Morgan or Ferguson technique as the established baseline. National society guidelines, including those of the Association of Colon and Rectal Surgeons of India, continue to reference the Milligan-Morgan operation as a benchmark technique for advanced haemorrhoidal disease. Few operations in the history of this field have proved so durable, or so difficult to definitively improve upon rather than merely modify.

8.5 Chapter Summary

Key Points

• Milligan and Morgan (1937), at St Mark's Hospital, solved Whitehead's stenosis problem with a single structural insight: excise only the three primary haemorrhoidal masses, leaving intact anodermal/mucosal bridges between them.

• The Milligan-Morgan ('open') technique transfixes and ligates each pedicle, excises the mass, and leaves the wound open to heal by secondary intention.

• Ferguson's 1959 modification closes each wound with sutures instead — the 'closed' technique — and became the dominant approach in the United States, while Milligan-Morgan remained dominant in the UK, Ireland, and much of the rest of the world.

• Comparative trials show a genuine trade-off rather than a clear winner: closed technique often heals somewhat faster; open technique avoids closed-wound breakdown risk.

• Both techniques together define the baseline against which nearly every subsequent haemorrhoid treatment innovation — stapled haemorrhoidopexy, energy devices, Doppler-guided ligation — continues to be measured, including in current Indian national guidelines.

Clinical Correlation — Preserving the Bridge

Milligan and Morgan's central insight — that deliberately preserved, untouched tissue between excision sites is what prevents the stenosis Whitehead's operation produced — is a direct structural cousin of the principle underlying the author's own MOLIS technique described in Chapter 16. Both operations succeed specifically by identifying which tissue must be divided and which must be deliberately spared, rather than pursuing thoroughness for its own sake. Readers approaching Chapter 16 are encouraged to recall this chapter: the difference between a durable operation and a notorious one is very often not how much tissue is removed, but how precisely the surgeon has decided what to leave behind.

Glossary — Chapter 8

- *Closed haemorrhoidectomy* — Ferguson's 1959 modification of the open technique, in which wound edges are sutured closed rather than left open.
- *Ferguson technique* — see Closed haemorrhoidectomy.
- *Milligan-Morgan haemorrhoidectomy* — the 1937 St Mark's Hospital technique excising the three primary haemorrhoidal masses while preserving intact anodermal/mucosal bridges between them; also called the open haemorrhoidectomy.
- *Open haemorrhoidectomy* — see Milligan-Morgan haemorrhoidectomy.
- *Primary pedicles* — the three characteristic sites (conventionally described near the 3, 7, and 11 o'clock positions) where haemorrhoidal masses most consistently develop.

CHAPTER 9

Fistula Surgery

From Seton to Sphincter-Preserving Techniques

Learning Objectives

By the end of this chapter, the reader should be able to:

• Explain the cryptoglandular hypothesis of fistula origin.

• State Goodsall's rule and describe its actual, evidence-based accuracy.

• Describe the Parks classification of fistula-in-ano and explain its clinical importance.

• Describe the LIFT[6] procedure and explain how it continues the sphincter-preservation principle traced throughout this book.

This chapter gathers a thread that has run, only partly visible, through nearly every chapter of this book so far: the Hippocratic and Roman thread technique of Chapter 1, the Ayurvedic Kshara Sutra of Chapter 2, al-Zahrawi's refinement of Chapter 3, and John of Arderne's grooved director of Chapter 4 were all, at their core, attempts to solve the same problem now addressed with modern anatomical understanding and modern instrumentation: how to eliminate a fistula tract without destroying the sphincter complex around it.

9.1 The Cryptoglandular Hypothesis

Modern understanding of why fistula-in-ano occurs at all centres on the anal glands described in Chapter 0 — eight to ten small glands arranged circumferentially at the level of the dentate line, which penetrate the internal sphincter and terminate in the intersphincteric plane. The cryptoglandular hypothesis holds that infection begins within one of these glands, tracks through the intersphincteric space, and forms an abscess that, whether drained surgically or discharging

[6] LIFT — Ligation of the Intersphincteric Fistula Tract, a sphincter-preserving fistula operation.

spontaneously, leaves behind an epithelialised tract connecting the anal canal to the perianal skin — the fistula itself. This hypothesis, now the dominant explanation for the great majority of fistulas not associated with Crohn's disease, trauma, or malignancy, gives the surgeon a precise anatomical target: not simply a tunnel to be destroyed, but a specific infected gland, in a specific anatomical plane, whose relationship to the sphincter complex determines everything about how safely it can be treated.

9.2 Goodsall and the Rule That Predicted — Imperfectly

In 1887, the British surgeon David Henry Goodsall presented an observation to the West London Medico-Chirurgical Society, later published with his colleague William Ernest Miles in their 1900 text *Diseases of the Anus and Rectum*: that a fistula's external opening bears a predictable relationship to its internal opening. Goodsall's rule states that an external opening anterior to an imaginary transverse line across the anus tends to connect by a straight, radial path to the nearest point on the dentate line, while an external opening posterior to that line tends to curve around to a single internal opening in the posterior midline. For well over a century, this simple rule has been a standard part of surgical teaching for anticipating a fistula's course before it is fully explored.

In the same spirit as Chapter 7's treatment of Whitehead's operation, it's worth asking how well Goodsall's rule actually performs. Systematic evaluation against modern imaging and operative findings has found its accuracy considerably short of the confidence with which it is often taught — overall figures in published series cluster around 60 to 77 percent, and the rule performs markedly worse for anterior fistulas, particularly in women, than for posterior ones. A proposed modern alternative, the Midline Rule, holds that the great majority of fistulas of any external location in fact originate from a midline internal opening, and reports somewhat higher predictive accuracy in direct comparison. Goodsall's rule remains a useful first orientation and a piece of enduring surgical folklore, but this book's position is the same one it has taken toward every historical technique so far: usefulness, not age, is what should determine whether a rule still governs practice, and a good surgeon confirms with imaging or careful examination rather than probing aggressively on the strength of a rule alone.

9.3 Parks and the Modern Classification

The most consequential modern contribution to this field came in 1976, when Sir Alan Parks, working at St Mark's Hospital, together with Peter Gordon and John Hardcastle, published "A Classification of Fistula-in-Ano" in the *British Journal of Surgery*, based on an analysis of 400

cases treated over fifteen years. The Parks classification organises fistulas into four principal types according to their anatomical relationship to the external anal sphincter: *intersphincteric*, running only in the plane between the internal and external sphincters; *transsphincteric*, crossing both sphincters to reach the ischioanal fossa; *suprasphincteric*, arching up and over the puborectalis before descending to the skin; and *extrasphincteric*, bypassing the sphincter complex entirely to connect the rectum directly to the perianal skin, typically as a consequence of trauma, pelvic disease, or a prior failed operation rather than simple cryptoglandular infection.

The significance of this classification is not merely descriptive. Because each type carries a different relationship to the sphincter complex described in Chapter 0, each dictates a fundamentally different treatment strategy and a different level of risk to continence: a low intersphincteric or low transsphincteric fistula can often be laid open (fistulotomy) with minimal sphincter division and low continence risk, while a high transsphincteric, suprasphincteric, or extrasphincteric fistula demands one of the sphincter-preserving strategies discussed in the remainder of this chapter. Parks's classification remains, very nearly fifty years on, the common language surgeons use to communicate the complexity of a given fistula and to select an appropriate operation.

9.4 The Seton, Modernised

The ancient thread principle traced across Chapters 1, 2, and 4 survives in modern practice in two related but distinct forms. A *loose (draining) seton* — typically a length of vessel loop or heavy suture passed through the tract — is left untied or loosely tied, its purpose purely to maintain drainage and allow inflammation to settle, particularly for high or complex fistulas being staged toward a later definitive procedure. A *cutting seton*, by contrast, is progressively tightened over successive clinic visits, working through the encircled tissue slowly enough that the divided sphincter fibres scar and fix in place as they go — the same underlying mechanism Sushruta's commentators achieved with a caustic-coated thread, and Hippocrates with plain linen, now achieved with modern synthetic materials and a controlled, staged tightening protocol.

9.5 LIFT and the New Generation of Sphincter-Preserving Techniques

In 2007, the Thai colorectal surgeon Arun Rojanasakul described a novel approach: the *ligation of the intersphincteric fistula tract*, or LIFT. Rather than dividing the sphincter at all, the LIFT procedure approaches the fistula through the intersphincteric plane itself — the same anatomical space where the infected gland originates, per the cryptoglandular hypothesis of Section 9.1 —

dissecting the tract free from surrounding sphincter muscle without cutting it, then ligating and dividing the tract at that level. The intersphincteric wound is closed, while the external opening is left to drain. Because no sphincter fibre is divided at any point in the procedure, continence is, in principle, fully preserved.

Rojanasakul's initial results were striking — healing rates above ninety percent with no reported continence disturbance — and the technique spread rapidly, particularly across Asia, as a simple, learnable, sphincter-sparing option for exactly the high transsphincteric fistulas that fistulotomy cannot safely treat. As has now become a familiar pattern in this book's account of surgical innovation, longer follow-up and wider adoption produced a more modest, if still respectable, picture: subsequent series report healing rates more typically in the range of forty to eighty percent, particularly lower in patients who have already undergone multiple prior fistula operations. LIFT today sits alongside advancement flaps, fibrin glue, the fistula plug, and several further techniques as one option within a broader modern armamentarium — no single sphincter-preserving technique has yet proven definitively superior across every type of fistula, and the choice between them remains, appropriately, a matter of matching the specific anatomy described by Parks's classification to the technique best suited to it.

9.6 Chapter Summary

Key Points

• The cryptoglandular hypothesis explains most fistula-in-ano as originating from infection in the anal glands at the dentate line, tracking through the intersphincteric plane.

• Goodsall's rule (1887/1900) predicts internal opening location from external opening position, but modern evidence shows only moderate accuracy (roughly 60-77%), notably worse for anterior fistulas — a reminder that surgical tradition should be tested, not simply trusted.

• The Parks classification (1976) — intersphincteric, transsphincteric, suprasphincteric, extrasphincteric — remains the standard framework for matching fistula anatomy to appropriate treatment and continence risk.

• The ancient seton principle survives today as the loose (draining) seton and the cutting seton, both direct descendants of the thread techniques traced in Chapters 1, 2, and 4.

• LIFT (Rojanasakul, 2007) approaches the fistula through the intersphincteric plane without dividing any sphincter muscle, joining advancement flaps, fibrin glue, and fistula plugs as part of the modern sphincter-preserving armamentarium.

Clinical Correlation — The Same Question, Every Century

This chapter closes a loop opened in Chapter 1. Every fistula technique this book has described, from the Hippocratic thread to LIFT, is an answer to a single unchanging question: how much tissue must be divided to cure the disease, and how much must be spared to preserve the patient? Sushruta's commentators, John of Arderne, and Arun Rojanasakul never met and worked nearly two and a half millennia apart, yet each, in their own idiom, arrived at some version of the same governing principle. The author's own MOLIS technique, described in Chapter 16, extends this same principle to a different disease — the chronic anal fissure — and readers approaching that chapter are invited to recognise it as one more entry in the lineage this chapter has just traced to its modern conclusion.

Glossary — Chapter 9

- *Cryptoglandular hypothesis* — the theory that most fistula-in-ano originates from infection in the anal glands at the dentate line.
- *Cutting seton* — a seton progressively tightened over successive visits, dividing encircled tissue slowly enough to allow scarring in place.
- *Goodsall's rule* — a clinical rule (1887/1900) predicting a fistula's internal opening from its external opening position, of moderate and unevenly distributed accuracy.
- *LIFT (Ligation of the Intersphincteric Fistula Tract)* — a 2007 sphincter-preserving fistula technique approaching and dividing the tract entirely within the intersphincteric plane.
- *Loose (draining) seton* — a seton left untied or loosely tied to maintain drainage without cutting through tissue, often used to stage complex fistulas.
- *Parks classification* — the 1976 anatomical classification of fistula-in-ano (intersphincteric, transsphincteric, suprasphincteric, extrasphincteric) that remains the standard framework for treatment planning.

CHAPTER 10

Lateral Internal Sphincterotomy for Fissure

Origins and Evolution

Learning Objectives

By the end of this chapter, the reader should be able to:

• Describe the historical theories of fissure causation that preceded Eisenhammer's identification of the internal sphincter's role.

• Explain why posterior midline sphincterotomy was abandoned in favour of the lateral approach.

• Compare open and closed lateral internal sphincterotomy.

• Describe Lord's anal dilatation and explain why it fell out of mainstream favour.

Of every operation described in this book, the one this chapter covers sits closest to the author's own surgical career. Lateral internal sphincterotomy is, in its essentials, a controlled, partial division of the internal anal sphincter — precisely the manoeuvre described anatomically in Section 0.2.1, and precisely the operation the author's own MOLIS technique, described in Chapter 16, sets out to refine. Understanding how this operation reached its present form is, in a real sense, understanding the direct surgical ancestry of that later chapter.

10.1 The Long Search Before Eisenhammer

For over a century before the operation described in this chapter took its modern form, surgeons treating chronic anal fissure were essentially guessing at a mechanism they did not yet understand. Boyer is credited with first proposing division of the sphincter as a treatment for fissure as early as 1818, and Brodie documented a sphincterotomy for the condition in 1839, but for much of the following century the dominant explanation lay elsewhere. At St Mark's Hospital — the institution

already familiar from Chapters 7 and 8 — Lockhart-Mummery proposed that chronic fissure resulted from a fibrous "pecten band" forming within the external sphincter as a consequence of chronic inflammation ("crypititis"), and treatment accordingly centred on fissurectomy combined with division of this band, rather than on the internal sphincter specifically.

10.2 Eisenhammer and the Discovery of the Real Culprit

In 1951, the South African surgeon S. Eisenhammer published work demonstrating that the true pathological driver of chronic anal fissure was not Lockhart-Mummery's pecten band but pathological hypertonicity of the internal anal sphincter itself — the same smooth, involuntary muscle whose physiology is described in Section 0.2.1. Eisenhammer's proposed treatment, internal sphincterotomy, directly addressed this mechanism by surgically reducing the sphincter's resting tone. His original technique divided the sphincter in the posterior midline, at the site of the fissure itself, and the operation was adopted with increasing frequency through the 1950s as the underlying physiological logic proved compelling — a conclusion later confirmed directly by anal manometry, which consistently demonstrated pathologically elevated resting pressures before surgery and a durable drop following it.

10.3 The Keyhole Deformity: Solving a Problem by Moving Sideways

Eisenhammer's posterior midline approach, however, reproduced a lesson this book has now encountered more than once: operating at the site of disease is not always the safest place to operate. A posterior midline incision passes through tissue that is both relatively poorly vascularised and already compromised by the chronic fissure itself, and healing there frequently proved troublesome, producing a persistent, gaping defect that became known as the "keyhole deformity" — a chronic groove in the posterior anal margin prone to soiling and mucous discharge. The parallel to Whitehead's circumferential haemorrhoidectomy in Chapter 7 is direct: a technically sound insight about the underlying pathology, undermined by an incision sited at exactly the wrong place for reliable healing.

The solution, as with Milligan and Morgan's structural insight in Chapter 8, was to move the operation away from the site of disease rather than to abandon the underlying principle. Parks described a lateral approach to internal sphincterotomy in 1967, and in 1969 Notaras published a refined, closed "lateral subcutaneous sphincterotomy" technique that would come to dominate practice: rather than incising directly over the fissure, the internal sphincter is divided laterally, in healthy, well-vascularised tissue entirely away from the fissure itself, achieving the same reduction

in sphincter tone without leaving a wound at the one site least able to heal cleanly. The keyhole deformity all but disappeared from practice once the incision was moved.

10.4 Open Versus Closed: A Familiar Debate

As with Milligan-Morgan and Ferguson haemorrhoidectomy in Chapter 8, lateral internal sphincterotomy developed two parallel technical traditions. The open technique exposes the internal sphincter fibres directly under vision through a small radial incision before dividing them with scalpel or scissors; the closed technique, following Notaras's original description, divides the sphincter using a blade introduced subcutaneously, guided by palpation rather than direct visualisation, without formally opening the overlying skin. Comparative studies have found the two approaches broadly equivalent: healing rates cluster in the low-to-mid nineties for both techniques, and no consistent difference in the rate of major incontinence — typically reported in the range of 2 to 5 percent for either approach — has been demonstrated between them. The choice between open and closed technique, as with Milligan-Morgan versus Ferguson, today remains largely a matter of surgeon training and preference rather than one approach being clearly superior.

10.5 Lord's Alternative and Its Fall

Not every surgeon in this era pursued a sphincterotomy at all. In 1968, the British surgeon P. H. Lord introduced an entirely different approach for both haemorrhoidal disease and anal fissure: forceful manual dilatation of the anal canal under anaesthesia, intended to disrupt the same pathological sphincter tone Eisenhammer had identified, without any incision whatsoever. Lord's anal stretch achieved genuine popularity through the 1960s and 1970s, particularly valued for its simplicity and its avoidance of a formal wound.

Its fundamental weakness, however, was precision, or the lack of it. Unlike a controlled surgical division of a defined portion of the sphincter, manual dilatation produces an unpredictable, uncontrolled pattern of muscle tearing that varies with the force applied and the individual patient's anatomy — closer, in principle, to Whitehead's problem of thoroughness without precision than to the controlled, structural solutions of Notaras or Milligan and Morgan. A Cochrane review pooling seven randomised controlled trials found sphincterotomy significantly superior to anal stretch on both efficacy and, more importantly, the risk of resulting incontinence to flatus or stool. Lord's procedure has, as a consequence, been largely abandoned in mainstream practice in favour of controlled sphincterotomy, though it continues to be practised in some settings, and more recent

work proposing standardised, deliberately gentler dilatation protocols suggests the underlying debate about how much control a technique needs to remain safe is not entirely closed.

10.6 Chapter Summary

Key Points

• Eisenhammer (1951) identified internal anal sphincter hypertonicity, not Lockhart-Mummery's 'pecten band', as the true pathological driver of chronic anal fissure — a finding later confirmed directly by manometry.

• Eisenhammer's original posterior midline sphincterotomy frequently caused a 'keyhole deformity' due to poor healing at the fissure site itself.

• Parks (1967) and Notaras (1969) solved this by moving the incision laterally, into healthy, well-vascularised tissue away from the fissure — directly paralleling Milligan and Morgan's structural solution to Whitehead's operation in Chapter 8.

• Open and closed lateral internal sphincterotomy show broadly equivalent healing and incontinence rates; the choice remains a matter of training and preference.

• Lord's anal dilatation (1968), an uncontrolled alternative to sphincterotomy, has been largely abandoned after trial evidence confirmed a significantly higher risk of incontinence compared to controlled sphincterotomy.

Clinical Correlation — The Direct Ancestor of MOLIS

This chapter's operation is not merely thematically related to the author's own work — it is its direct surgical ancestor. Lateral internal sphincterotomy, as refined by Notaras, established the governing principle that a controlled, partial division of the internal anal sphincter, performed away from the fissure itself, safely resolves the pathological hypertonicity Eisenhammer identified. The author's MOLIS technique, described fully in Chapter 16, takes this same principle one step further: rather than dividing the IAS by positional judgement in a relatively obscured field, as in conventional lateral sphincterotomy, MOLIS delivers the IAS to the surface of the wound for division under direct vision. Readers are encouraged to hold this chapter's history in mind when they reach Chapter 16: MOLIS is best understood not as a departure from lateral internal sphincterotomy, but as its next refinement.

Glossary — Chapter 10

- *Closed lateral internal sphincterotomy* — Notaras's technique dividing the internal sphincter subcutaneously, guided by palpation rather than direct vision.
- *Keyhole deformity* — a chronic posterior anal groove resulting from poor healing after posterior midline sphincterotomy.
- *Lord's anal dilatation* — P. H. Lord's 1968 technique of forceful manual anal stretch, largely abandoned due to unpredictable, uncontrolled sphincter injury and higher incontinence risk.
- *Open lateral internal sphincterotomy* — a technique dividing the internal sphincter under direct vision through a small radial incision.
- *Pecten band* — Lockhart-Mummery's proposed fibrous band in the external sphincter, an earlier and since-superseded theory of fissure causation.

CHAPTER 11

Rectal Prolapse Surgery

From Perineal to Abdominal Approaches

Learning Objectives

By the end of this chapter, the reader should be able to:

• Describe the historical development of perineal approaches to rectal prolapse, from emergency amputation to Delorme and Altemeier.

• Describe the development of abdominal rectopexy, from Ripstein and Wells to modern laparoscopic ventral mesh rectopexy.

• Explain the clinical reasoning behind choosing a perineal versus an abdominal approach.

• Recognise that not every case of obstructed defecation or pelvic floor symptoms originates in the rectum itself.

Rectal prolapse presents a surgeon with an unusual dilemma among the diseases described in this book: unlike haemorrhoids, fistula, or fissure, it cannot always be reached by working locally at the anal canal alone. As a result, its surgical history divides into two largely separate traditions developing side by side — one perineal, working from below, and one abdominal, working from above — each answering the same problem with a different set of trade-offs between invasiveness and durability. More than 130 distinct operations have been described for this single condition over the past century and a half, a fact that itself tells the reader something important: no operation described in this chapter has yet proved so clearly superior that the search for a better one has stopped.

11.1 The Perineal Era: From Emergency Amputation to Delorme

The earliest attempts to treat rectal prolapse surgically were born of necessity rather than design. In 1882, Auffret performed what appears to be the first reported rectosigmoidectomy: an emergency amputation of an irreducible, gangrenous prolapse, undertaken because the alternative was almost certainly fatal. In 1888, Mikulicz described a small series of six such perineal rectal amputations for incarcerated prolapse, with no reported mortality or recurrence — a genuinely striking result for the pre-antibiotic era, and one that attached his name to the operation for several decades. William Ernest Miles, already familiar to readers of Chapter 9 for his work with Goodsall, published a detailed description of the technique in 1933, and the operation reached its lasting modern form and name through William Altemeier's influential account of nineteen years' experience with the procedure in elderly and frail patients, published in 1971.

A gentler perineal alternative had, in fact, already been described some three decades before Altemeier's paper. In 1900, the French military surgeon Edmond Delorme presented a technique that did not remove the full thickness of the prolapsed bowel at all: the rectal mucosa alone was stripped from the prolapse, and the exposed muscular tube beneath was gathered and sutured into accordion-like folds, effectively shortening and reinforcing the rectal wall before the mucosa was closed back over it. Delorme's technique attracted little attention for most of the twentieth century, only gaining real popularity following a 1979 report by Uhlig and Sullivan describing its use in modern practice — a reminder, familiar by now from Chapter 10's account of Lord's dilatation, that a technique's eventual fate is not always settled at the moment of its first description.

11.2 Altemeier's Procedure: Perineal Rectosigmoidectomy

Altemeier's procedure, as it is now generally performed, resects the full thickness of the prolapsed rectum and a variable length of redundant sigmoid colon entirely through the perineum, restoring bowel continuity with a hand-sewn or stapled anastomosis at the level of the dentate line, frequently combined with an anterior levatorplasty to repair the separated pelvic floor musculature seen in long-standing prolapse. Because it avoids an abdominal incision and general anaesthesia is not strictly required, it has become particularly associated with elderly and medically frail patients — precisely the population for whom the abdominal alternatives described in Section 11.4 carry the greatest anaesthetic risk. Its principal drawback is a reported recurrence rate ranging remarkably widely, from close to zero to over fifty percent across different published series, reflecting both genuine variation in technique and the heterogeneous, high-risk populations in whom it is typically performed.

11.3 The Abdominal Alternative: Rectopexy

Working from above rather than below, a separate surgical tradition developed around fixing the mobilised rectum to the sacral hollow, preventing it from prolapsing in the first place rather than resecting it after the fact. Ripstein described an abdominal technique in 1952 using a sling of synthetic mesh wrapped anteriorly around the mobilised rectum and fixed to the sacral promontory; Wells, in 1959, described a comparable posterior approach securing a sheet of Ivalon sponge behind the mobilised rectum. Frykman, in 1955, had already proposed combining this abdominal fixation with resection of the redundant sigmoid colon — a resection rectopexy intended to address the frequently co-existing problem of severe constipation as well as the prolapse itself. These techniques generally reported lower recurrence rates than the perineal operations of Sections 11.1 and 11.2, at the cost of a formal abdominal operation and its associated anaesthetic and recovery burden — precisely the trade-off that continues to define the choice between perineal and abdominal approaches today.

11.4 The Modern Era: Laparoscopic Ventral Mesh Rectopexy

The most significant recent development in this field addressed a specific complication of the earlier abdominal techniques: posterior rectal mobilisation, as required for Wells's operation, risked injury to the autonomic nerves running along the pelvic sidewall, sometimes producing new constipation even as it successfully corrected the prolapse. In 2004, D'Hoore and Penninckx described a laparoscopic ventral mesh rectopexy, approaching the rectum from in front rather than behind, avoiding the posterior dissection and its associated nerve injury while still securing the rectum to the sacral promontory with mesh. This minimally invasive approach, combining the durability of abdominal fixation with a smaller incisional burden than open surgery, has become an increasingly favoured option for suitable candidates, and represents, in miniature, the same laparoscopic transformation of surgical practice that later chapters of this book will trace across other anorectal conditions.

11.5 Perineal or Abdominal? The Ongoing Debate

More than a century after Mikulicz's first series, no consensus exists on a single preferred operation for rectal prolapse — an unusual situation compared to the haemorrhoidal, fistula, and fissure surgery discussed in earlier chapters, each of which has settled on a reasonably clear reference standard. Current guidance, including that of the American Society of Colon and Rectal Surgeons, instead favours a tailored approach: abdominal rectopexy for younger, fitter patients able to

tolerate a laparotomy or laparoscopy in exchange for lower recurrence, and perineal procedures — Delorme's or Altemeier's — for older or frailer patients in whom a shorter, lower-risk operation matters more than the marginal recurrence advantage of the abdominal route. The UK's PROSPER trial, begun in 2004 and designed to randomise 1,000 patients across all four principal techniques, was undertaken specifically because the existing evidence had never been strong enough to settle the question definitively — a genuinely rare admission, this deep into the history this book has traced, that the field still does not know, with confidence, which operation is best.

11.6 Case Vignette — When the Cause Isn't the Rectum at All

The author offers the following two cases, drawn from personal clinical experience, as a deliberate counterpoint to this chapter's focus on rectal prolapse itself. Both cases are presented as individual clinical experience rather than as a validated series.

The first patient presented profoundly puzzled by obstructed defecation: on attempting to defecate, something seemed to physically obstruct the passage of stool, and straining only worsened the obstruction. She had undergone extensive endoscopic evaluation, with entirely normal findings, and had consulted numerous specialists without relief. On examination — one finger placed in the rectum and another in the vagina simultaneously, with the patient asked to strain in the squatting position — a retroverted uterus was found to be pushing the rectum directly against the sacral hollow, the mechanism illustrated schematically in Figure 0.4 of Chapter 0. Manual anteversion of the uterus relieved the problem, but only for a few days before symptoms recurred; a repeat anteversion performed under general anaesthesia, with the uterus fixed in a more acutely anteverted position, again provided only temporary relief. With the patient's family complete, a hysterectomy was ultimately performed, which resolved the problem definitively.

The second patient, presenting with the same underlying mechanism some years later, had a materially different outcome: a single manual anteversion of the retroverted uterus fully resolved her symptoms. She was reviewed once in follow-up, found to be entirely well, and was not seen again for this problem.

Read together, these two cases illustrate a genuine spectrum of outcomes for the same underlying mechanism — a retroverted uterus mechanically compressing the rectum against the sacral hollow, producing an obstructive symptom that mimics rectal outlet obstruction despite entirely normal endoscopic and, in a narrower sense, rectal findings. The practical lesson for the surgeon is twofold: conservative correction deserves a genuine trial before more invasive measures are considered, since it can occasionally be fully and lastingly curative on its own; but when it is not,

escalation to a definitive procedure should not be delayed indefinitely once the underlying mechanism is clearly understood. More broadly, both cases are a reminder that a symptom complex resembling rectal prolapse or obstructed defecation does not always originate in the rectum itself, and that the bimanual, dynamic examination described here — assessing the pelvis under the same straining load that produces the patient's symptoms — can reveal a mechanism no amount of endoscopy will ever show.

11.7 Chapter Summary

Key Points

• Perineal surgery for rectal prolapse began as emergency necessity (Auffret, 1882; Mikulicz, 1888) before reaching its modern forms in Delorme's mucosal-stripping technique (1900, popularised from 1979) and Altemeier's full-thickness perineal rectosigmoidectomy (1971).

• Abdominal rectopexy (Ripstein, 1952; Wells, 1959; Frykman, 1955) generally offers lower recurrence than perineal surgery, at the cost of a larger operation.

• Laparoscopic ventral mesh rectopexy (D'Hoore and Penninckx, 2004) reduced the nerve-injury risk of earlier posterior abdominal approaches and has become an increasingly favoured modern option.

• No single operation has emerged as a clear gold standard; current practice, reflected in the ongoing PROSPER trial, tailors the choice of perineal versus abdominal approach to the individual patient's fitness and priorities.

• A retroverted uterus can mechanically compress the rectum against the sacral hollow, producing an obstructive symptom complex that mimics rectal pathology despite normal endoscopic findings — underscoring the value of dynamic, bimanual pelvic examination.

Clinical Correlation — A Field Still Searching

This chapter closes on a note this book has not struck before: genuine, unresolved uncertainty. Every other operation described so far — Milligan-Morgan haemorrhoidectomy, LIFT, lateral internal sphincterotomy — has, in time, converged on something close to a reference standard. Rectal prolapse surgery has not, and more than 130 described operations is itself evidence of a problem no single technique has fully solved. Readers should take from this chapter not a settled answer but an honest appreciation of how much of even modern anorectal surgery

remains a matter of clinical judgement rather than fixed protocol — the same judgement the author's case vignette in Section 11.6 asked of a surgeon facing a diagnosis no textbook algorithm would have supplied.

Glossary — Chapter 11

- *Altemeier's procedure* — perineal rectosigmoidectomy: full-thickness perineal resection of the prolapsed rectum and redundant sigmoid, reaching its modern form via Altemeier's 1971 paper.
- *Delorme's procedure* — a 1900 perineal technique stripping rectal mucosa and plicating the underlying muscular wall, without full-thickness resection.
- *Levatorplasty* — surgical repair of the separated levator ani muscles, often combined with Altemeier's procedure.
- *Rectopexy* — abdominal fixation of the mobilised rectum to the sacral promontory, with or without mesh, to prevent recurrent prolapse.
- *Ventral mesh rectopexy* — D'Hoore and Penninckx's 2004 laparoscopic technique fixing the rectum via an anterior approach, avoiding posterior nerve injury.

CHAPTER 12

Rise of Colorectal Surgery as a Distinct Sub-Speciality

From Proctology to a Formal Discipline, in America and in India

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Learning Objectives

By the end of this chapter, the reader should be able to:

• Explain the significance of the shift in terminology from 'proctology' to 'colorectal surgery'.

• Describe the formal certification history of colorectal surgery in the United States.

• Describe the founding and development of the Association of Colon & Rectal Surgeons of India.

• Explain why formal certification remains an unfinished project even in a field this old.

Chapter 7 described the founding of the American Proctologic Society in 1899 as the moment this field first organised itself against the itinerant quackery of its day. This chapter follows what happened to that same institution, and its counterparts elsewhere, over the following century: a change of name reflecting a genuine change of scope, formal certification hard-won against considerable institutional resistance, and, in India, a parallel story that remains, even as this book is written, not yet fully complete.

12.1 What's in a Name: From Proctology to Colorectal Surgery

For most of the twentieth century, this field was known by a name drawn from the Greek *proktos*, meaning anus: proctology. The term accurately reflected the field's origins, traced across Chapters 7 through 10, in haemorrhoids, fistula, and fissure. But as surgeons in this speciality increasingly took on colon cancer, inflammatory bowel disease, and other conditions of the colon well beyond the anal canal, the old name no longer described the work being done. The American Board of Proctology formally renamed itself the American Board of Colon and Rectal Surgery in 1961; the

American Proctologic Society followed suit rather more slowly, becoming the American Society of Colon and Rectal Surgeons only in 1973, a twelve-year gap between the two institutions that itself suggests how gradual and contested this kind of formal rebranding can be, even once the underlying scope of practice has already changed.

12.2 Formal Certification: The American Board

Certification followed a similarly gradual path. In 1934, representatives of the American Proctologic Society sought recognition from the Council on Medical Education and Hospitals and the Advisory Board for Medical Specialists, establishing the American Board of Proctology. For some years thereafter, certification instead ran through a Central Certifying Committee in Proctology operating under the American Board of Surgery, before the Board of Proctology was finally granted full, independent primary board status on 15 June 1949 — the eighteenth such board recognised in the United States. This is the same institutional milestone already noted in Chapter 7; this chapter simply follows its consequence, the Board's 1961 renaming, through to its modern form as the American Board of Colon and Rectal Surgery, sponsored jointly by the Society, the Association of Program Directors for Colon and Rectal Surgery, the American Medical Association, and the American College of Surgeons.

12.3 The Literature Follows

A speciality's coming of age is generally marked as much by its literature as by its institutions. *Diseases of the Colon & Rectum*, established in 1958 as the official journal of the American Proctologic Society under the early stewardship of Louis A. Buie, gave the field a dedicated venue for exactly the kind of accumulated, peer-reviewed evidence this book has traced through Chapters 8, 9, and 10 — the randomised comparisons of open and closed haemorrhoidectomy, the LIFT outcome series, the sphincterotomy trials. A field without a journal of its own is, in a real sense, still borrowing space in someone else's; from 1958 onward, this one no longer needed to.

12.4 A Parallel Story in India

India's own path to a formally recognised colorectal speciality followed a distinct, and in some respects still unfinished, trajectory. Recognition of coloproctology as a discipline in its own right began with the initiative of surgeons in Mumbai, who established dedicated Colon and Rectal Surgery departments in the city's hospitals as early as 1960. In 1968, Dr R. K. Menda, Dr S. J. Aptekar, and Dr I. D. Sood organised an International Seminar on the Diseases of the Colo-Rectum

and Anus, its proceedings later published as *Advances in Colo-Rectal Surgery*, and Dr Menda went on to found the Asian Federation of Colo-Proctology in the same period.

Formal institutional recognition within India proved harder won. Two attempts, in 1974 and 1975, to secure the Association of Surgeons of India's sanction for a dedicated Colo-Rectal Section were unsuccessful; only at the ASI[7]'s annual conference in Delhi on 28 December 1976 was the decision finally taken, with the section formally established the following year as the Association of Colon & Rectal Surgeons of India (ACRSI)[8]. The organisation's first sectional programme was held alongside the ASI's annual conference at Gauhati in 1978, and its educational reach expanded substantially two decades later: a week-long hands-on training programme began at Ajmer in 1997, and the Fellowship of the Association of Colon & Rectal Surgeons of India (FACRSI)[9] followed in 1999.

What distinguishes the Indian story from its American counterpart, described in Sections 12.1 and 12.2, is that the final step — a formally recognised postgraduate degree in colorectal surgery, comparable to the American Board's certification, the UK's specialist training overseen by the Royal College of Surgeons and the Association of Coloproctology of Great Britain and Ireland, or the European Society of Coloproctology's own standards — has not yet been achieved through India's Medical Council and National Board, despite sustained effort by ACRSI's leadership over many years. In the absence of that formal degree, ACRSI's own fellowship programme has, for over two decades, done the work a national qualifying board would otherwise do. It is this specific, still-unresolved gap that the MCh programme in Colorectal Surgery, referenced in this book's Preface, is intended at last to close — making this book's own stated purpose, in a very literal sense, part of the same institutional story this chapter has just told.

12.5 Chapter Summary

Key Points

• The renaming from 'proctology' to 'colorectal surgery' — the American Board in 1961, the American Society in 1973 — reflected a genuine broadening of the field's scope beyond the anal canal into the whole colon.

• Formal American certification took a quarter-century to achieve full primary board status:

[7] ASI — Association of Surgeons of India.
[8] ACRSI — Association of Colon & Rectal Surgeons of India.
[9] FACRSI — Fellowship of the Association of Colon & Rectal Surgeons of India.

sought in 1934, achieved in 1949, renamed in 1961.

• Diseases of the Colon & Rectum (1958) gave the field its own dedicated peer-reviewed literature, underpinning the evidence base traced through Chapters 8-10.

• India's own path began with Mumbai's 1960 departments and the 1968 International Seminar, formalising as ACRSI in 1976-77, with its own FACRSI fellowship established in 1999 in the continued absence of formal national degree recognition.

• This gap in formal Indian recognition is the specific, still-live problem the MCh programme in Colorectal Surgery is intended to solve — connecting this chapter directly to this book's own stated purpose.

Clinical Correlation — An Unfinished Institutional Story

This chapter's true subject, like Chapter 7's, is institutional machinery rather than surgical technique — but where Chapter 7 described that machinery being successfully built, this chapter closes by noting that in India, it remains, even now, incomplete. Readers should take from this a clear-eyed sense of where this field currently stands in this country: over two decades of ACRSI's own FACRSI fellowship training, atop nearly five decades of the organisation's own existence, have substituted, competently but informally, for a national qualification that other countries settled decades ago. This book was written, in part, in the hope of being useful reading once that qualification finally exists.

Glossary — Chapter 12

- *ACRSI* — the Association of Colon & Rectal Surgeons of India, a section of the Association of Surgeons of India, formally established 1976-77.
- *American Board of Colon and Rectal Surgery* — the US certifying board for the speciality, established as the American Board of Proctology in 1934, granted primary board status in 1949, renamed in 1961.
- *American Society of Colon and Rectal Surgeons (ASCRS)*[10] — the US professional society for the speciality, founded as the American Proctologic Society in 1899, renamed in 1973.

[10] ASCRS — American Society of Colon and Rectal Surgeons.

- *Diseases of the Colon & Rectum* — the official journal of the American Proctologic Society/ASCRS, established 1958.
- *FACRSI* — the Fellowship of the Association of Colon & Rectal Surgeons of India, established 1999.

CHAPTER 13

Minimally Invasive and Stapled Techniques

PPH and THD

Learning Objectives

By the end of this chapter, the reader should be able to:

• Describe Longo's stapled haemorrhoidopexy (PPH)[11] and explain why it causes less pain than conventional excisional haemorrhoidectomy.

• Summarise the complications identified once PPH moved from Longo's original series into wider practice.

• Describe Doppler-guided transanal haemorrhoidal dearterialisation (THD)[12] and how it differs conceptually from both Milligan-Morgan and PPH.

• Explain why the anatomical position of dissection, more than the amount of tissue removed, determines postoperative pain in haemorrhoid surgery.

Chapter 8 established Milligan-Morgan and Ferguson haemorrhoidectomy as the durable, worldwide reference standard for haemorrhoidal disease — techniques whose principal drawback, shared by nearly every excisional operation this book has described, is significant postoperative pain from a wound in the richly sensate anoderm below the dentate line. This chapter follows two techniques developed at the very end of the twentieth century that approached the same disease from a different anatomical starting point entirely: working above the dentate line, in the relatively insensate tissue described in Section 0.5, rather than at or below it.

[11] PPH — Procedure for Prolapse and Haemorrhoids, Longo's stapled haemorrhoidopexy technique.
[12] THD — Transanal Haemorrhoidal Dearterialisation, Morinaga's Doppler-guided technique.

13.1 Longo and Stapled Haemorrhoidopexy (PPH)

In June 1998, the Italian surgeon Antonio Longo presented a genuinely new approach to the 6th World Congress of Endoscopic Surgery in Rome. Rather than excising the haemorrhoidal masses themselves, Longo's technique — soon known as the Procedure for Prolapse and Haemorrhoids, or PPH — used a circular stapling device to resect a circumferential ring of redundant rectal mucosa and submucosa several centimetres above the dentate line, simultaneously stapling the cut edges together. The effect was twofold: the prolapsing, redundant tissue that had allowed the haemorrhoidal cushions to descend was excised and lifted back into position (an *anopexy*, in Longo's own term), and the stapled ring interrupted a portion of the arterial blood supply feeding the cushions from above, reducing their engorgement without removing them directly.

Because the entire dissection and staple line sit above the dentate line, in tissue innervated only by the insensate autonomic supply described in Chapter 0, Longo's original series of 144 patients reported strikingly low postoperative pain — a visual analogue pain score of around 2 out of 10 on the first two postoperative days, falling below 1 within days thereafter — a marked contrast to the days of significant discomfort typically following Milligan-Morgan or Ferguson haemorrhoidectomy. At twelve months, Longo reported relief of bleeding in 79 percent of patients, of pain in 67 percent, of soiling in 63 percent, and complete resolution of oedema and thrombosis.

13.2 Complications and the Verdict from Trials

As with several techniques already discussed in this book — Whitehead's operation in Chapter 7 chief among them — early enthusiasm for PPH gave way, as the technique spread into wider practice, to a more complete and more sobering picture. Randomised trials published in *The Lancet* in 2000 confirmed less postoperative pain and faster return to normal activity compared with conventional excisional haemorrhoidectomy, and the technique was rapidly adopted worldwide. But subsequent, larger-scale experience also identified a distinct set of complications specific to the stapled approach and largely unseen with Milligan-Morgan or Ferguson: rare but serious cases of rectal perforation, pelvic sepsis, and rectovaginal fistula, generally attributable to the staple line being placed too close to, or through, structures beyond the rectal wall itself. Longer-term follow-up and meta-analyses have also suggested a somewhat higher recurrence rate for prolapse after PPH compared with conventional excision, particularly for the most advanced grades of disease. The technique remains in wide use today, but — in a pattern this book's readers will by now recognise — with a clearer, more qualified understanding of exactly which patients it suits best than Longo's original enthusiastic report alone could have provided.

13.3 Morinaga and the Doppler-Guided Alternative (THD)

A conceptually distinct approach emerged slightly earlier, in 1995, when the Japanese surgeon K. Morinaga described a technique using a specially devised proctoscope, the Moricorn, fitted with a Doppler ultrasound probe to directly locate the terminal branches of the superior rectal artery feeding each haemorrhoidal cushion, allowing each artery to be individually identified and ligated by suture, entirely without excising any tissue at all. This technique, later refined and standardised by Dal Monte and colleagues into what is now known as transanal haemorrhoidal dearterialisation (THD), represents perhaps the most conservative approach to haemorrhoidal disease described in this entire book: rather than removing tissue, as every previous chapter's techniques have done in one form or another, or repositioning it, as PPH does, THD simply reduces the blood supply feeding the problem and leaves the anatomy otherwise undisturbed. Modern THD protocols typically add a mucopexy — suturing redundant prolapsing mucosa back into position — to address prolapse alongside the arterial ligation itself.

Because THD, like PPH, works entirely above the dentate line and involves no excisional wound at all, it shares PPH's advantage of markedly reduced postoperative pain, and, being non-excisional, avoids the specific stapler-related complications described in Section 13.2. Its principal limitation is one of scope: THD is generally best suited to lower-grade disease and to haemorrhoids without extensive prolapse, and is less effective for the most advanced, bulky disease that Milligan-Morgan and Ferguson remain better equipped to treat definitively. The UK's National Institute for Health and Care Excellence has recognised Doppler-guided arterial ligation as a legitimate alternative to conventional haemorrhoidectomy for appropriately selected patients.

13.4 What These Techniques Reveal About Pain Itself

Read together, PPH and THD illustrate a principle this book has been assembling piece by piece since Chapter 0: postoperative pain in anorectal surgery is determined less by how much tissue is treated than by precisely where the surgeon works relative to the dentate line described in Section 0.1. Milligan-Morgan and Ferguson, however skilfully performed, necessarily create a wound in richly sensate anoderm; PPH and THD, by design, do not. This is not evidence that the older techniques are obsolete — Sections 13.1 and 13.3 both noted real limitations in scope and durability that keep Milligan-Morgan and Ferguson the more definitive choice for advanced disease — but it is a clear demonstration of how far a precise understanding of anorectal anatomy, rather than a new instrument alone, can move a field forward.

13.5 Chapter Summary

Key Points

• Longo's stapled haemorrhoidopexy (PPH, 1998) excises and lifts a ring of tissue above the dentate line rather than excising the haemorrhoids themselves, markedly reducing postoperative pain compared with conventional excisional surgery.

• Wider adoption of PPH revealed rare but serious complications (rectal perforation, pelvic sepsis, rectovaginal fistula) and a somewhat higher recurrence rate than Milligan-Morgan for advanced disease — a now-familiar pattern of early enthusiasm followed by more qualified real-world evidence.

• Morinaga's Doppler-guided technique (1995), refined into modern THD, ligates the arterial supply to haemorrhoidal cushions without excising any tissue, and is best suited to lower-grade disease.

• Both PPH and THD achieve reduced pain by working above the dentate line, in relatively insensate tissue — a direct application of the anatomy described in Chapter 0.

• Neither PPH nor THD has replaced Milligan-Morgan or Ferguson haemorrhoidectomy for the most advanced, bulky disease; each technique now occupies a defined place in a broader modern armamentarium rather than serving as a universal replacement.

Clinical Correlation — Anatomy as the Real Innovation

The genuine innovation in this chapter is not the stapling device or the Doppler probe as pieces of technology, but the anatomical insight each exploits: that the dentate line described in Section 0.1 is not merely a histological curiosity but a practical boundary a surgeon can work above to spare a patient significant pain. Readers should recognise the same underlying logic — precise anatomical targeting in preference to broader excision — in the author's own MOLIS technique described in Chapter 16, even though that technique addresses fissure rather than haemorrhoidal disease.

Glossary — Chapter 13

- *Anopexy* — Longo's term for the repositioning and fixation of prolapsed rectal tissue achieved by stapled haemorrhoidopexy.
- *Mucopexy* — suturing redundant prolapsing mucosa back into position, often combined with modern THD.
- *PPH (Procedure for Prolapse and Haemorrhoids)* — Longo's 1998 stapled haemorrhoidopexy technique, excising a ring of tissue above the dentate line and interrupting haemorrhoidal blood supply.
- *THD (Transanal Haemorrhoidal Dearterialisation)* — a non-excisional technique, originating with Morinaga's 1995 Doppler-guided artery ligation, that reduces haemorrhoidal blood supply without removing tissue.

CHAPTER 14

Laparoscopic and Robotic Approaches

To Rectal Prolapse and Anorectal Disease

Learning Objectives

By the end of this chapter, the reader should be able to:

• Explain the origin of the laparoscopic revolution and its arrival in colorectal surgery.

• Describe the specific technical challenges the pelvis poses for conventional laparoscopy.

• Describe Pigazzi's introduction of robotic total mesorectal excision and the advantages the robotic platform offers in the pelvis.

• Describe how robotic technology extended the laparoscopic ventral mesh rectopexy already described in Chapter 11.

Chapter 11 has already described one landmark of minimally invasive anorectal surgery: D'Hoore and Penninckx's 2004 laparoscopic ventral mesh rectopexy. This chapter steps back to place that achievement within a broader technological story — the laparoscopic revolution that transformed general surgery from the late 1980s onward, the specific technical obstacles that made the pelvis a stubborn holdout even as laparoscopy conquered most of the rest of the abdomen, and the robotic platform that, from the mid-2000s, offered a genuine answer to those obstacles.

14.1 The Laparoscopic Revolution Reaches the Rectum

The German surgeon Erich Mühe performed the first laparoscopic cholecystectomy in 1985, but it was the French surgeon Philippe Mouret's video-assisted version, performed in Lyon in March 1987, that is generally credited with igniting the global laparoscopic revolution — the operation was witnessed, discussed, and rapidly disseminated in a way Mühe's earlier, more isolated achievement had not been. Within only a few years, laparoscopic cholecystectomy had displaced

open surgery as the standard approach to gallbladder disease, and surgeons across every abdominal sub-speciality began asking the same question of their own operations: could this be done through small incisions too? Colorectal surgery answered relatively early — Patrick Leahy performed the first laparoscopic rectal resection in 1990 — but the rectum, sitting deep within the bony confines of the pelvis, proved considerably more resistant to the new technique than more accessible organs like the gallbladder or the colon above it.

14.2 Why the Pelvis Resisted

The specific difficulty is worth understanding, since it explains why this chapter's second technology emerged when it did. Conventional laparoscopic instruments are long, rigid, and straight, operated through fixed entry points and viewed on a flat, two-dimensional screen — a workable compromise in the relatively open confines of the upper abdomen, but a genuine handicap in the narrow, bony, often fat-laden pelvis, particularly in male patients, where the surgeon must dissect precisely around the rectum while avoiding the autonomic nerves responsible for bladder and sexual function. Achieving the fine, angled movements this dissection demands with straight instruments, through fixed ports, viewed in two dimensions, pushed conventional laparoscopy to the edge of what the technology could reliably deliver — and left an opening for a more capable platform.

14.3 Pigazzi and Robotic Total Mesorectal Excision

In 2006, the surgeon Alessio Pigazzi, then working in the United States, and colleagues published the first substantial report of robotic-assisted total mesorectal excision for rectal cancer, performed using the da Vinci surgical system. The robotic platform addressed the specific limitations described in Section 14.2 directly: wristed instruments capable of movement impossible for a rigid laparoscopic tool, a stable, three-dimensional view magnified well beyond unaided vision, and tremor filtration that steadies the surgeon's hand at exactly the fine scale pelvic dissection demands. Pigazzi's early series, and the substantial body of comparative research that followed it, reported outcomes including lower conversion rates to open surgery and, in some studies, reduced rates of postoperative erectile dysfunction compared with conventional laparoscopic technique — a direct clinical consequence of more precise nerve-sparing dissection in the confined pelvic space described above.

14.4 From Cancer Surgery to Benign Disease: Robotic Ventral Mesh Rectopexy

Although Pigazzi's original work addressed rectal cancer, the same technical advantages apply equally to benign anorectal disease, and nowhere more directly than to the laparoscopic ventral mesh rectopexy already described in Chapter 11. Robotic platforms have since been applied to exactly that operation, offering the same improved dexterity and visualisation for the fine anterior dissection and precise mesh fixation the procedure demands, without requiring the posterior mobilisation that risked nerve injury in the earlier Wells technique of Section 11.3. The trade-offs are practical rather than technical: robotic surgery requires a substantial capital investment in equipment, dedicated surgeon training, and typically longer operating theatre setup time than laparoscopic surgery, meaning its adoption for benign disease specifically has, so far, tracked well behind its adoption for rectal cancer, where the stakes of nerve injury and incomplete resection are higher and the additional cost more readily justified.

14.5 Chapter Summary

Key Points

• Mühe performed the first laparoscopic cholecystectomy in 1985, but Mouret's witnessed, video-assisted 1987 operation is credited with igniting the wider laparoscopic revolution.

• Laparoscopic rectal resection began relatively early (Leahy, 1990), but the narrow, bony pelvis — especially in male patients — remained technically resistant to conventional straight-instrument, two-dimensional laparoscopy.

• Pigazzi's 2006 report of robotic total mesorectal excision demonstrated that wristed instruments, 3D visualisation, and tremor filtration directly addressed the pelvis's specific technical challenges, with measurable benefits including reduced conversion rates and, in some studies, better nerve preservation.

• Robotic platforms have since been extended to laparoscopic ventral mesh rectopexy for benign rectal prolapse (Chapter 11), though cost and training requirements have so far limited adoption for benign disease compared with cancer surgery.

• The pelvis's resistance to conventional laparoscopy is a direct consequence of its bony anatomy — the same anatomical reality that has shaped anorectal surgical technique throughout this book, from Chapter 0 onward.

Clinical Correlation — Technology in Service of Anatomy, Again

This chapter's pattern will be familiar to readers of Chapter 13: a new piece of technology succeeds specifically because it solves a problem anatomy itself creates. Just as PPH and THD succeeded by exploiting the dentate line's sensory boundary, robotic surgery succeeds in the pelvis by directly compensating for the narrow, fixed, nerve-laden anatomical space described in Section 14.2 — a space no amount of surgical skill could fully overcome with straight instruments and flat vision alone. The recurring lesson of this book's contemporary chapters is that lasting surgical innovation has consistently followed anatomical understanding, rather than technology alone driving progress on its own terms.

Glossary — Chapter 14

- *da Vinci surgical system* — the robotic surgical platform used in Pigazzi's 2006 robotic total mesorectal excision and in subsequent robotic colorectal surgery.
- *Total mesorectal excision (TME)*[13] — the standard oncological technique for rectal cancer resection, removing the rectum together with its surrounding mesorectal fat and lymph nodes.
- *Wristed instruments* — robotic surgical instruments capable of articulated movement beyond the range of rigid, straight conventional laparoscopic tools.

[13] TME — Total Mesorectal Excision, the standard technique for rectal cancer surgery.

CHAPTER 15

Modern Understanding of Sphincter Physiology

Measuring and Preserving Continence

Learning Objectives

By the end of this chapter, the reader should be able to:

• Describe the development of endoanal ultrasound and its contribution to sphincter imaging.

• Describe pudendal nerve terminal motor latency testing and its evolving clinical role.

• Describe sacral nerve stimulation and how it differs conceptually from every other technique in this book.

• Explain why objective measurement, rather than clinical impression alone, has become central to modern continence-preserving surgery.

Every technique this book has described for dividing, ligating, excising, or repositioning tissue near the anal sphincter complex has rested, ultimately, on the surgeon's judgement of how much the sphincter could safely tolerate — from Eisenhammer's clinical assessment of hypertonicity in Chapter 10 to the author's own digital examination technique described in Chapter 7. This chapter traces the tools that, from the 1980s onward, finally allowed that judgement to be measured directly: to see the sphincter's internal structure, to test its nerve supply electrically, and, remarkably, to restore function to a sphincter that could no longer be repaired by any conventional surgical means.

15.1 Making the Invisible Visible: Endoanal Ultrasound

Before 1989, a surgeon assessing sphincter integrity had only digital examination and clinical judgement to rely on — precise, in experienced hands, but entirely subjective and impossible to record or compare objectively between examiners. That changed with the work of Clive Bartram at

St Mark's Hospital, the same institution already familiar to readers of Chapters 7, 8, and 10 for its role in this field's history. Adapting an ultrasound probe originally designed for prostatic imaging, Bartram made a simple but decisive modification: replacing the soft rubber balloon that had previously covered the rotating transducer with a rigid plastic cone, allowing the probe to be withdrawn safely through the anal canal without the balloon tearing. Published with Peter Law in 1989, the resulting technique, endoanal ultrasound, was the first imaging method capable of resolving the internal and external anal sphincters as distinct, individually visible structures.

The clinical impact was immediate and lasting. For the first time, a sphincter defect following childbirth or previous surgery could be directly visualised and characterised rather than inferred from history and examination alone, and endoanal ultrasound remains, even against the later arrival of MRI, one of the highest-resolution and most practical tools for this purpose — quick, well tolerated, and requiring nothing more invasive than a probe passed through the same anal canal whose digital examination was already described in Chapters 0 and 7.

15.2 Listening to the Nerve: Pudendal Nerve Terminal Motor Latency

A structurally intact sphincter is not necessarily a functioning one, and in 1984, two researchers — again working at St Mark's Hospital — addressed the nerve supply side of that equation. Building on an electrical stimulation technique originally developed for an entirely different purpose (electro-ejaculation, described by Brindley in 1981), Elizabeth Kiff and Michael Swash devised pudendal nerve terminal motor latency (PNTML)[14] testing: a gloved, finger-mounted electrode stimulates the pudendal nerve near the ischial spine, and the time taken for the external sphincter to respond is measured directly. A prolonged latency suggested nerve damage — from childbirth, chronic straining, or prior surgery — even when the sphincter muscle itself appeared structurally normal on the endoanal ultrasound of Section 15.1.

PNTML's story, however, is not one of uncomplicated triumph. Later, larger studies found the correlation between PNTML results and actual continence outcomes considerably weaker and less consistent than early enthusiasm had suggested, and a number of subsequent papers concluded the test provided limited useful guidance for treatment decisions in practice. PNTML remains a historically important proof of concept — that the pudendal nerve's function could be measured directly at all — even as its everyday clinical utility has been increasingly questioned by the evidence that followed it.

[14] PNTML — Pudendal Nerve Terminal Motor Latency, a test of pudendal nerve conduction speed.

15.3 Restoring What Is Lost: Sacral Nerve Stimulation

Every technique described so far in this book, however refined, shares one assumption: that the sphincter complex, or enough of it, remains present and repairable. Sacral nerve stimulation (SNS)[15] breaks that assumption entirely. First applied to urinary incontinence in the late 1980s, SNS was adapted for faecal incontinence by Klaus Matzel and colleagues, who published the first case series in *The Lancet* in 1995: a small electrode implanted near the sacral nerve roots delivers mild, continuous electrical stimulation, improving continence not by repairing damaged muscle but by modulating the nerve signals governing the entire pelvic floor and rectal sensation, even in some patients with substantial sphincter defects who would not be candidates for conventional repair. The United States Food and Drug Administration approved SNS specifically for faecal incontinence in 2011, and it now occupies a distinct place in this field's toolkit: not an operation on the sphincter at all, but an intervention on the nervous system that controls it.

15.4 What This Understanding Enables

Read together, this chapter's three technologies transformed continence preservation from an art practised on clinical judgement alone into a field with genuine, if imperfect, objective measurement. Endoanal ultrasound answers the structural question — is the sphincter intact? PNTML attempted, with mixed lasting success, to answer the neurological question — does the nerve supply still function? And sacral nerve stimulation demonstrated that continence could sometimes be restored by treating the nervous system rather than the muscle at all. Every technique in this book that depends on preserving sphincter function — the lateral internal sphincterotomy of Chapter 10, the LIFT procedure of Chapter 9, and the author's own MOLIS technique of Chapter 16 — is, whether or not the individual surgeon uses these specific tools in every case, practised within a field that these technologies fundamentally reshaped: one where continence is no longer simply assumed to be preserved by careful technique, but can, when necessary, actually be measured.

15.5 Chapter Summary

Key Points

• Endoanal ultrasound, developed by Clive Bartram at St Mark's Hospital and published with Peter Law in 1989, was the first technique to image the internal and external anal sphincters as

[15] SNS — Sacral Nerve Stimulation, an implanted device treatment for faecal incontinence.

distinct structures.

• Pudendal nerve terminal motor latency testing, described by Kiff and Swash at St Mark's in 1984, measures pudendal nerve conduction directly, but later evidence has considerably narrowed its practical clinical value.

• Sacral nerve stimulation (Matzel et al., 1995; FDA-approved for faecal incontinence in 2011) restores continence by modulating nerve signals rather than repairing sphincter muscle — a fundamentally different therapeutic strategy from every other technique in this book.

• Together, these technologies moved continence assessment from purely clinical judgement toward genuine, though still imperfect, objective measurement.

• St Mark's Hospital, already responsible for major milestones in Chapters 7, 8, and 10, is the shared origin of two of this chapter's three technologies — a testament to sustained institutional focus on this field across nearly two centuries.

Clinical Correlation — Measurement in Service of Judgement

This chapter's tools do not replace the clinical judgement described throughout this book — Eisenhammer's assessment of sphincter tone in Chapter 10, or the author's own two-stage digital examination in Chapter 7 — so much as give that judgement something to be checked against. Readers approaching Chapter 16 should note that the author's own case series, like any modern surgical series, exists within a field now equipped, when needed, to measure objectively what earlier generations of surgeons in this book could only assess by hand and by experience.

Glossary — Chapter 15

- *Endoanal ultrasound* — an imaging technique, developed by Bartram and Law (1989), using a rotating ultrasound probe to visualise the internal and external anal sphincters as distinct structures.
- *Pudendal nerve terminal motor latency (PNTML)* — an electrophysiological test, described by Kiff and Swash (1984), measuring the conduction time of the pudendal nerve to assess its function.

- *Sacral nerve stimulation (SNS)* — a technique, adapted for faecal incontinence by Matzel et al. (1995), using an implanted electrode to modulate sacral nerve signals and improve continence without directly repairing the sphincter.

CHAPTER 16

MOLIS

The Ongoing Refinement of Sphincter-Sparing Fissure Surgery

Learning Objectives

By the end of this chapter, the reader should be able to:

• Explain the specific limitation of conventional lateral internal sphincterotomy that MOLIS was designed to address.

• Describe the MOLIS technique and the anatomical structures encountered during the manoeuvre.

• Summarise the outcomes of the author's 333-case prospective series.

• Describe the multi-site and contralateral MOLIS modifications, and the clinical circumstances each addresses.

Every chapter in this book has, in some sense, been building toward this one. Chapter 10 traced lateral internal sphincterotomy from Eisenhammer's original insight through Parks's and Notaras's relocation of the incision away from the fissure itself. Chapter 0 established the anatomy — the internal and external sphincters, the corrugator cutis ani — that any such operation must negotiate. Chapter 15 described the tools that now allow continence to be measured rather than merely assumed. This chapter describes the author's own contribution to that continuous, still-unfinished project: a modification of lateral internal sphincterotomy developed and refined over a prospective series of 333 cases between January 2016 and December 2025.

16.1 The Problem MOLIS Sets Out to Solve

Conventional lateral internal sphincterotomy, as described in Chapter 10, divides the internal anal sphincter by positional judgement: the surgeon works in a relatively obscured surgical field,

estimating by feel and experience how much of the sphincter has been divided rather than observing it directly. This has served the field well for over half a century, but it leaves the precision of the division dependent on the individual surgeon's experience in a way few other steps in modern anorectal surgery still tolerate. Modified Open Lateral Internal Sphincterotomy (MOLIS) was developed specifically to remove that uncertainty: rather than dividing the internal anal sphincter where it lies, the technique delivers the internal anal sphincter to the surface of the wound first, so that the lower one-third of the muscle can be identified, confirmed, and divided under direct vision, rather than by positional judgement in an obscured field.

16.2 The MOLIS Technique

The core manoeuvre of MOLIS is the deliberate delivery of the internal anal sphincter to the wound surface before division. Once delivered, the lower one-third of the sphincter — the segment established, since Eisenhammer's original work described in Chapter 10, as the appropriate extent of division for durable relief of hypertonicity without excessive continence risk — is divided under direct vision, rather than estimated positionally as in the conventional technique. During this manoeuvre, fibres of the corrugator cutis ani, described anatomically in Section 0.2.4, are commonly encountered at the wound edge; recognising this structure for what it is, rather than mistaking it for a stray strand of the external sphincter, and gently displacing it with a cotton gauze pledget, is a small but genuinely important technical detail that allows the internal sphincter to be exposed cleanly without inadvertent injury to either structure.

16.2.1 The Technique in Plain Language

For colleagues outside colorectal surgery, and for postgraduate students meeting MOLIS for the first time, the eight steps below restate Section 16.2 in everyday language, without the anatomical vocabulary.

- **Step 1 — Look and feel:** Under anaesthesia, the surgeon examines the fissure and checks how tight the sphincter muscle is.
- **Step 2 — Find the groove:** The surgeon feels for the natural groove between the two ring muscles of the anus, using one finger inside the anal canal and the thumb outside.
- **Step 3 — Small cut:** A tiny 1 cm cut is made in the skin over that groove.
- **Step 4 — Open the plane:** A fine forceps is used to gently separate the tissue layers. The internal sphincter looks pale and glistening, and is easy to tell apart from the pinker muscle lying beside it.

- **Step 5 — Bring the muscle to the surface (the key MOLIS step):** The internal sphincter is gently lifted and delivered right up to the surface of the wound, guided by a finger inside the anal canal and a thumb outside it with a small or micro-Ellis's forceps. A second micro-Ellis's forceps is then placed across the muscle, matching its span exactly to the height of the fissure itself — no more, no less.
- **Step 6 — Cut only what was measured:** The muscle held between the two forceps is divided, either with scissors or with a fine bipolar cautery. Because only the measured portion is ever brought forward for division, cutting too much becomes structurally impossible.
- **Step 7 — Stop any bleeding:** Firm pressure with Babcock's forceps for 3 to 5 minutes usually controls bleeding without any need for cautery.
- **Step 8 — Close up:** The wound is usually left open to heal on its own, or closed with a single loose stitch. Any skin tag or swollen tissue nearby is trimmed away at the same time.

The plain-language account above and the anatomical description in Section 16.2 describe the same operation. The one idea worth remembering is this: the sphincter is delivered to the surface and measured against the fissure *before* it is cut, so the surgeon divides exactly the length of muscle the fissure itself indicates — nothing is cut by estimation or guesswork.

16.3 The 333-Case Series

Between January 2016 and December 2025, the author performed and prospectively followed 333 cases of MOLIS for chronic anal fissure. Continence was assessed using the Wexner Incontinence Score at each postoperative timepoint, and across the full series, no case of postoperative incontinence was recorded at any Wexner Score timepoint. This series is reported here as the author's own prospectively collected clinical experience, presented, like every other technique in this book, with its limitations stated plainly: a single-surgeon series, not yet a multicentre or independently replicated trial, and offered as an honest account of results achieved rather than as a claim of definitive, universally reproducible superiority over the conventional lateral sphincterotomy described in Chapter 10. As with Kshara Sutra's path from Ayurvedic technique to ICMR-validated therapy in Chapter 2, the natural next step for any technique reported this way is external, multicentre validation — the same evidentiary path this book has traced, in one form or another, since Chapter 5's account of Félix testing his method on 75 patients before Louis XIV.

16.4 Two Further Applications

16.4.1 Multi-Site MOLIS for Severe Anal Canal Stenosis

For severe anal canal stenosis, a single division — even performed precisely under direct vision — may be insufficient to achieve adequate luminal widening. The author's approach for these cases is to perform MOLIS at four separate sites, positioned at the 10, 2, 8, and 4 o'clock positions. This siting is deliberate: it avoids both the 6 o'clock posterior midline, the site responsible for Eisenhammer's original 'keyhole deformity' described in Chapter 10 owing to poor local vascularity, and the 12 o'clock anterior midline, while remaining offset from the traditional 3 and 9 o'clock lateral sites used in conventional sphincterotomy.

At each of the four sites, division is deliberately restricted to the lower one-third of the internal anal sphincter as the standard, fully safe depth. For surgeons still developing the judgement to gauge this depth precisely by feel, restricting division to the lower one-quarter at each site instead provides a wider margin of safety, with the adequacy of the resulting luminal widening then checked immediately and objectively, intraoperatively, using numbered calibrated anal dilators — rather than relying on subjective impression alone. Distributing the release across four shallow divisions rather than concentrating it in one or two deeper ones is, conceptually, the same underlying logic as Milligan and Morgan's solution to Whitehead's operation in Chapter 8: achieving adequate effect through distributed, bridge-preserving technique rather than a single, more extensive intervention.

16.4.2 Contralateral MOLIS for Fissure Recurrence

When a fissure recurs following an initial lateral sphincterotomy or MOLIS, re-operating at the original site risks working through tissue already scarred from the first procedure, a situation with its own healing and continence considerations. The author's approach in this circumstance is contralateral MOLIS: performing the second procedure at a fresh site on the opposite side of the anal canal, rather than re-entering the original surgical field. This preserves the same principle of controlled, direct-vision division described in Section 16.2, while avoiding the less predictable healing environment of previously operated tissue.

16.5 Where MOLIS Sits in This Book's Story

Readers who have followed this book from Chapter 1 onward will recognise the shape of what this chapter describes. The Hippocratic thread, the Ayurvedic Kshara Sutra, al-Zahrawi's refinement,

John of Arderne's grooved director, Milligan and Morgan's preserved bridges, Notaras's relocation of the sphincterotomy incision — every one of these, across two and a half millennia and several independent surgical traditions, addressed some version of the same problem: how to divide diseased or hypertonic tissue without destroying the structure that holds the patient together. MOLIS does not depart from that lineage; it is this book's most recent entry in it, applying the direct-vision principle already established by endoanal ultrasound and the other measurement tools of Chapter 15 to the sphincterotomy itself, so that the division is not merely performed carefully, but performed under observation.

16.6 Video Demonstrations

The following operative videos accompany this chapter, illustrating the technique described above in practice.

▶️ **Video 1 — MOLIS for Chronic Anal Fissure**

Standard MOLIS technique for chronic anal fissure: delivery of the internal anal sphincter to the wound surface, identification and management of corrugator cutis ani fibres, and controlled division of the lower one-third of the sphincter under direct vision.

https://youtu.be/PhrJpJqPRaA

▶️ **Video 2 — Multi-Site MOLIS for Severe Anal Canal Stenosis**

Demonstration of the four-site technique (10, 2, 8, and 4 o'clock) for severe stenosis, including intraoperative calibration with numbered dilators to confirm adequacy of luminal widening.

https://www.youtube.com/watch?v=Hrci7ib7974

▶️ Video 3 — Contralateral MOLIS for Fissure Recurrence

Technique for managing fissure recurrence by performing MOLIS at a fresh contralateral site rather than re-entering the previously operated field.

https://www.youtube.com/watch?v=zjsJSb_v9X0

16.7 Chapter Summary

Key Points

• MOLIS addresses the central limitation of conventional lateral internal sphincterotomy (Chapter 10): division by positional judgement in an obscured field, rather than under direct vision.

• The technique delivers the internal anal sphincter to the wound surface, allowing controlled division of its lower one-third under direct observation, with the corrugator cutis ani (Section 0.2.4) recognised and gently displaced rather than injured.

• The author's prospective 333-case series (January 2016 – December 2025) recorded no postoperative incontinence at any Wexner Score timepoint, reported here transparently as a

single-surgeon series pending wider external validation.

• Multi-site MOLIS (10, 2, 8, 4 o'clock; lower 1/3 or, for less experienced surgeons, lower 1/4 per site, calibrated intraoperatively with numbered dilators) extends the technique to severe anal canal stenosis while deliberately avoiding the poorly-vascularised 6 and 12 o'clock positions.

• Contralateral MOLIS offers a fresh-site salvage option for fissure recurrence, avoiding the less predictable healing of previously operated tissue.

Clinical Correlation — The Same Question, Answered Again

This book opened, in Chapter 1, with Hippocrates asking how much tissue must be divided to cure a disease, and how much must be spared to preserve the patient. MOLIS is this book's most recent answer to that same question — not a final answer, since no technique described in this book has ever been the last word on its problem, but the author's own attempt to move the answer forward, in the same spirit of open clinical reasoning as every surgeon this book has described, from Sushruta's commentators to Notaras. Readers are encouraged to view MOLIS not as this book's conclusion, but as its most recent chapter in a history that will continue being written after this book is finished.

Glossary — Chapter 16

- *Contralateral MOLIS* — a salvage technique performing MOLIS at a fresh site opposite the original operative field, used for fissure recurrence.
- *MOLIS (Modified Open Lateral Internal Sphincterotomy)* — the author's technique delivering the internal anal sphincter to the wound surface for controlled division of its lower one-third under direct vision.
- *Multi-site MOLIS* — MOLIS performed at four sites (10, 2, 8, 4 o'clock) for severe anal canal stenosis, with division depth restricted at each site and intraoperatively calibrated with numbered dilators.
- *Wexner Incontinence Score* — a standardised scoring system used to assess and quantify faecal incontinence, used throughout the author's 333-case series to assess continence outcomes.

CHAPTER 17

Anorectal Malignancy

A Concise Clinical and Historical Overview

This book's focus, as its preface makes clear, is benign anorectal disease — the fissures, fistulas, haemorrhoids, and prolapse that have occupied every chapter so far. Malignant disease of the anus and rectum is a distinct field with its own extensive literature, deserving a book of its own rather than a chapter appended to this one. This chapter is offered deliberately short: a concise historical orientation for the reader, sufficient to place malignant disease in context alongside the benign conditions this book has traced in depth, without attempting the comprehensive oncological treatment the subject properly requires elsewhere.

Learning Objectives

By the end of this chapter, the reader should be able to:

• Describe Miles's contribution to curative rectal cancer surgery.

• Describe Heald's total mesorectal excision and its impact on outcomes.

• Explain why anal squamous cell carcinoma is treated differently from rectal adenocarcinoma, and describe the Nigro protocol.

17.1 Miles and the Birth of Curative Rectal Cancer Surgery

William Ernest Miles — already familiar to readers of this book from Chapters 9 and 11 for his 1900 collaboration with Goodsall and his detailed 1933 description of perineal rectosigmoidectomy — made his most consequential contribution to surgery in an entirely different register: the treatment of rectal cancer. Before Miles, rectal cancer was managed by perineal resection alone, with recurrence rates approaching ninety percent. In 1908, publishing in *The Lancet*, Miles proposed that recurrence resulted from tumour spread not only downward but

upward and laterally through the pelvic lymphatics — and that a cure therefore required removing the rectum, anal canal, and surrounding lymphatic field together, via a combined abdominal and perineal approach. His abdominoperineal resection (APR)[16] carried a high operative mortality in its earliest series, but as anaesthesia and blood transfusion improved through the twentieth century, it became, and long remained, the gold standard for curative rectal cancer surgery.

17.2 Heald and Total Mesorectal Excision

Miles's operation endured for most of the twentieth century, but local recurrence after conventional resection remained troublingly common. In 1982, the British surgeon Richard Heald described total mesorectal excision (TME): removing the rectum together with its surrounding mesorectal fat and lymph nodes as a single, intact anatomical package, dissected along the embryologically defined plane between the mesorectum and the pelvic sidewall. The effect on local recurrence rates was dramatic, and TME rapidly became the new standard of care. Just as importantly for the patients this book has focused on throughout, TME's precise, plane-based dissection made sphincter-preserving anterior resection feasible for a much larger proportion of rectal cancers than before, meaning Miles's original abdominoperineal resection — once the default operation — is today reserved for a comparatively small minority of low rectal tumours where sphincter preservation is not oncologically safe.

17.3 A Different Disease: Nigro and Chemoradiation for Anal Cancer

Cancer of the anal canal itself is worth distinguishing clearly from rectal cancer, since the two behave, and have historically been treated, quite differently — a distinction this book's readers are well placed to appreciate, given Chapter 0's account of how blood supply, lymphatic drainage, and tissue type all diverge sharply at the dentate line. The great majority of anal cancers are squamous cell carcinomas, biologically and histologically distinct from the adenocarcinomas that dominate rectal cancer, and, before the 1970s, they too were managed primarily by abdominoperineal resection, with five-year survival in the range of fifty to seventy percent at the cost of a permanent stoma.

In 1974, the American surgeon Norman Nigro and colleagues at Wayne State University published a small but transformative series: three patients with anal squamous cell carcinoma treated with combined radiotherapy, 5-fluorouracil, and mitomycin C before planned surgery, intended simply to shrink the tumour preoperatively. All three showed no residual tumour on subsequent

[16] APR — Abdominoperineal Resection, Miles's operation removing the rectum, anus, and surrounding tissue.

pathological examination — a complete response to chemoradiation alone, without the operation ever needing to remove the sphincter. The regimen that became known as the Nigro protocol has since become the standard first-line treatment for most anal squamous cell carcinoma, reserving abdominoperineal resection for salvage in cases of persistent or recurrent disease. It stands as a different kind of victory for sphincter preservation than any surgical technique described in earlier chapters: not a more precise operation, but the discovery that, for this particular cancer, no operation at all was often the better cure.

17.4 Chapter Summary

Key Points

• William Ernest Miles's 1908 abdominoperineal resection, based on his insight into the lymphatic zones of rectal cancer spread, transformed rectal cancer from a near-universally recurrent disease into a curable one.

• Richard Heald's 1982 total mesorectal excision dramatically reduced local recurrence and made sphincter-preserving surgery feasible for the majority of rectal cancers, restricting APR to a smaller minority of low tumours.

• Anal squamous cell carcinoma is biologically distinct from rectal adenocarcinoma, reflecting the anatomical divide at the dentate line described in Chapter 0.

• The Nigro protocol (1974) — combined chemoradiation — replaced surgery as first-line treatment for most anal squamous cell carcinoma, achieving cure without sphincter sacrifice through non-surgical means.

Clinical Correlation — One More Face of the Same Question

Even in malignant disease, this book's recurring question reappears: how to cure without destroying the structure that holds the patient together. Heald's answer was a more precise dissection plane; Nigro's was to remove surgery from the equation almost entirely. Readers should recognise both as further entries in the same lineage traced from Chapter 1 through the author's own MOLIS technique in Chapter 16 — proof that the question this book has followed applies as much to cancer surgery as to the benign disease that remains its central subject.

Glossary — Chapter 17

- *Abdominoperineal resection (APR)* — Miles's 1908 combined abdominal and perineal operation removing the rectum, anal canal, and surrounding lymphatic field for rectal cancer.
- *Nigro protocol* — the combined chemoradiation regimen (radiotherapy, 5-fluorouracil, mitomycin C), described by Nigro et al. in 1974, that replaced surgery as first-line treatment for most anal squamous cell carcinoma.
- *Total mesorectal excision (TME)* — Heald's 1982 technique of removing the rectum and mesorectum as an intact package along an embryologically defined plane, reducing local recurrence and enabling wider sphincter preservation.

CHAPTER 18

Reflections

What the History of This Field Teaches About Its Future

In This Chapter

This closing chapter does not introduce new technique or new history. It steps back from the seventeen chapters that preceded it to ask what pattern, if any, connects Hippocrates to MOLIS — and what that pattern might suggest about where this field goes next.

A history of any surgical field risks becoming a mere chronicle — one technique after another, dates and names accumulating without any thread to hold them together. This book has tried to resist that risk by returning, chapter after chapter, to a single question: how much tissue must be divided to cure the disease, and how much must be spared to preserve the patient. Having now traced that question from Egyptian papyri to the author's own operating table, it is worth asking, in closing, what this long history actually teaches — not only about the past of anorectal surgery, but about its likely future.

18.1 What This History Has Shown

Three patterns recur throughout this book clearly enough to be called something more than coincidence. The first is convergent discovery: the Hippocratic thread of Chapter 1, the Ayurvedic Kshara Sutra of Chapter 2, al-Zahrawi's refinement of Chapter 3, and John of Arderne's grooved director of Chapter 4 each arrived, by inheritance or by independent reasoning, at some version of the same governing principle — that tissue divided gradually and under control is safer than tissue divided all at once. Separated by centuries and, in several cases, by complete absence of contact between the traditions involved, this repeated convergence suggests the underlying anatomical

problem has a genuinely limited number of good solutions, discoverable by careful observation regardless of the era or culture doing the observing.

The second pattern is honest reassessment. Whitehead's operation in Chapter 7, Goodsall's rule in Chapter 9, pudendal nerve terminal motor latency in Chapter 15, and stapled haemorrhoidopexy in Chapter 13 were each greeted, in their moment, with an enthusiasm that later, larger-scale evidence complicated or narrowed. None of these techniques were failures in any simple sense; each taught the field something real. But each also demonstrates that a promising early result is a beginning, not a conclusion, and that this field has, across two and a half millennia, been at its best when it kept testing its own excitement rather than settling into it.

The third pattern is institutional. Frederick Salmon's St Mark's Hospital, founded in Chapter 7 out of simple exclusion from the medical establishment of his day, went on to produce Milligan and Morgan's operation, Parks's fistula classification, Bartram's endoanal ultrasound, and Kiff and Swash's pudendal nerve testing — a concentration of achievement across nearly two centuries that no single gifted individual could have sustained alone. The American Proctologic Society of Chapter 7, and the Association of Colon & Rectal Surgeons of India traced in Chapter 12, tell the same story in a different register: durable progress in this field has depended as much on the institutions built to sustain, test, and disseminate good technique as on the technique itself.

18.2 The Same Question, Every Generation

What should strike any reader who has followed this book from its first chapter is how little the central question has actually changed, even as the tools for answering it have been transformed almost beyond recognition. Sushruta's commentators worked by caustic thread and clinical courage; the author's own MOLIS technique, described in Chapter 16, works by direct vision and objective calibration, informed by the measurement tools traced in Chapter 15. The instruments, the anaesthesia, the antisepsis, the imaging — every material condition of practice described in this book has changed. The question underneath all of it has not. This is, if anything, the most useful thing a history of this field can offer a student or a trainee: not a museum of superseded techniques, but a demonstration that the problem they are learning to solve is the same problem surgeons have been solving, with the tools available to them, since before written history began.

18.3 Where the Field Seems to Be Heading

Any attempt to predict a field's future from its past risks overconfidence, and this book has been careful throughout to distinguish established fact from reasonable inference. With that caution

stated plainly, several trends traced across its later chapters seem likely to continue rather than reverse. The movement from clinical judgement toward objective measurement, described in Chapter 15, shows no sign of slowing, and will likely extend further into exactly the domains — depth of sphincter division, adequacy of luminal widening — where the author's own multi-site MOLIS technique already relies on intraoperative calibration rather than feel alone. The movement toward working precisely at, or above, the dentate line rather than through richly sensate tissue, visible in PPH and THD in Chapter 13 and in robotic pelvic surgery in Chapter 14, seems likely to keep shaping new technique as thoroughly as it has shaped the last three decades of it. And the institutional story of Chapter 12 — India's own path toward formal recognition of this speciality, still incomplete as this book goes to print — will very likely have concluded, one way or another, well before this book's readers have finished their own careers, changing how the next generation of Indian surgeons in this field is trained from the ground up.

18.4 A Closing Reflection

This book's preface opened with a boy in Mandalgarh, dissecting a frog in secret by wick lamp because no one had told him he needed permission to be curious. That same curiosity, sustained across more than five decades in medicine and finally turned on the history of the author's own field, is what produced the book now closing. It found a story far older, far more international, and more continuous than any single surgeon's career could have suggested from the inside of an operating theatre alone — a story running from Egyptian court physicians through Ayurvedic commentators, medieval barber-surgeons, and the founders of two continents' colorectal societies, arriving, for now, at a single surgeon in Chittorgarh still asking the same question they all asked.

It will not end there. Some reader of this book — quite possibly a student encountering this field for the first time through the anatomy of Chapter 0, or a postgraduate preparing for India's own MCh programme, as this book's preface hoped — will one day find something in current practice worth questioning, exactly as Eisenhammer questioned Lockhart-Mummery's pecten band theory, exactly as Parks and Notaras questioned Eisenhammer's posterior midline approach, exactly as the author questioned conventional lateral sphincterotomy. When that happens, this book will have done what a history of any living field should do: not settle the matter, but hand the question on.

Key Points

- Three patterns recur across this book's history: convergent discovery of similar solutions across independent traditions; honest reassessment of early enthusiasm as evidence accumulates; and durable progress driven as much by institutions as by individual technique.
- The central question of this book — how much tissue to divide, how much to spare — has remained essentially unchanged from antiquity to the present, even as every material tool for answering it has been transformed.
- Continuing trends include the shift from clinical judgement to objective measurement, the preference for working at or above the dentate line, and the still-unresolved institutional story of formal colorectal training in India.
- This book is offered not as a final word on its subject, but as an account of a question still being actively answered — by the author's own generation, and by the generations of readers this book was written for.

A Final Word

Thank you for reading this history to its end. If it has done its work, you will return to Chapter 0 — or to Chapter 16 — not with a settled sense of what anorectal surgery is, but with a clearer sense of the long, human, still-unfinished conversation you have joined.

BACK MATTER

Appendix A

A Chronological Timeline

The following timeline gathers the principal dates traced across this book into a single chronological reference, with each entry cross-referenced to the chapter in which it is discussed in full.

Date	Event	Ch.
c. 2800 BC	Khuy holds the Egyptian court title "Guardian of the Anus" (neru pehut)	1
c. 2300 BC	Ir-en-akhty succeeds Khuy in the same royal role	1
c. 1600 BC	Edwin Smith Papyrus	1
c. 1550 BC	Ebers Papyrus, including remedies for piles	1
c. 1200 BC	Chester Beatty Papyrus, the oldest known specialist proctological text	1
c. 460–375 BC	Hippocrates and the Hippocratic Corpus ("On Haemorrhoids", "On Fistulae")	1
c. 600 BC – 4th c. AD	Compilation of the Sushruta Samhita	2
1st century AD	Celsus, De Medicina	1
8th–9th century AD	Baghdad translation movement (House of Wisdom)	3
936–1013 AD	Al-Zahrawi (Albucasis)	3
c. 1000 AD	Kitab al-Tasrif completed	3

Date	Event	Ch.
1163	Council of Tours restricts clergy from procedures involving blood	4
c. 1307 – c. 1380	John of Arderne	4
1376	Arderne's Practica de Fistula in Ano	4
1497–1544	Latin editions of al-Zahrawi's surgical text printed across Europe	3
1540	Company of Barber-Surgeons founded (England)	4
1543	Vesalius, De Humani Corporis Fabrica	5
17th century	Morgagni's observations on posture and venous disease	7
1686	Operation on Louis XIV for anal fistula (Félix de Tassy)	5
1745	Barber-Surgeons formally separate from surgeons	4
1818	Boyer proposes sphincter division for fissure	10
1835	Frederick Salmon founds St Mark's Hospital	7
1839	Brodie documents an anal sphincterotomy	10
1846	Morton's public ether demonstration	6
1847	Semmelweis introduces handwashing at Vienna General Hospital	6
1860	Lister appointed Professor of Surgery, Glasgow	6
1864	Lister introduced to Pasteur's germ theory	6
1865	Death of Semmelweis	6
1867	Lister publishes his antiseptic surgery papers in The Lancet	6
1882	Whitehead describes circumferential haemorrhoidectomy; Auffret's emergency	7, 11

Date	Event	Ch.
	perineal rectosigmoidectomy	
1887	Goodsall presents his rule; Whitehead publishes his 300-case series	9, 7
1888	Mikulicz's series of perineal rectal amputations	11
1899	American Proctologic Society founded	7
1900	Goodsall & Miles, Diseases of the Anus and Rectum; Delorme's perineal procedure described	9, 11
1908	Miles describes abdominoperineal resection	17
1933	Miles's detailed description of perineal rectosigmoidectomy	11
1934	American Board of Proctology established	12
1937	Milligan-Morgan haemorrhoidectomy described	8
1949	American Board of Proctology granted primary board status	12
1951	Eisenhammer identifies IAS hypertonicity as the cause of chronic fissure	10
1952	Ripstein's abdominal rectopexy	11
1955	Frykman's resection rectopexy	11
1958	Diseases of the Colon & Rectum journal established	12
1959	Ferguson's closed haemorrhoidectomy; Wells's posterior rectopexy	8, 11
1960	Mumbai's first Colon and Rectal Surgery departments established	12
1961	American Board renamed Colon and Rectal Surgery	12
1967	Parks describes the lateral approach to sphincterotomy	10
1968	Menda, Aptekar & Sood's International Seminar (India); Lord's anal dilatation	12, 10
1969	Notaras's closed lateral internal sphincterotomy	10

Date	Event	Ch.
1971	Altemeier's influential paper on perineal rectosigmoidectomy	11
1973	American Society of Colon and Rectal Surgeons renamed	12
1974	Nigro protocol for anal squamous cell carcinoma	17
1976	ACRSI formally established; Parks classification of fistula-in-ano published	12, 9
1979	Uhlig & Sullivan popularise Delorme's procedure	11
1981	Brindley's electro-ejaculation stimulation technique (precursor to PNTML)	15
1982	Heald describes total mesorectal excision	17
1984	Kiff & Swash describe pudendal nerve terminal motor latency testing	15
1985	Mühe performs the first laparoscopic cholecystectomy	14
1987	Mouret's witnessed video-assisted laparoscopic cholecystectomy	14
1989	Bartram & Law describe endoanal ultrasound	15
1990	Leahy performs the first laparoscopic rectal resection	14
1995	Morinaga's Doppler-guided haemorrhoidal artery ligation; Matzel's sacral nerve stimulation series	13, 15
1997	ACRSI's hands-on training programme begins (Ajmer)	12
1998	Longo's stapled haemorrhoidopexy (PPH)	13
1999	FACRSI fellowship established	12
2000	Randomised trials comparing PPH to conventional haemorrhoidectomy published	13
2004	D'Hoore & Penninckx describe laparoscopic ventral mesh rectopexy; PROSPER trial begins	11
2006	Pigazzi's robotic total mesorectal excision	14
2007	Rojanasakul describes LIFT	9

Date	Event	Ch.
2011	FDA approves sacral nerve stimulation for faecal incontinence	15
2016–2025	The author's prospective 333-case MOLIS series	16

Appendix B

Glossary of Historical Instruments and Named Techniques

The following consolidates the named instruments and eponymous techniques described across this book's chapters, for ease of reference.

- *Acus rostrata* — John of Arderne's grooved director for fistula surgery (Chapter 4).
- *Bec de corbeau* — Ambroise Paré's ligature instrument, ancestor of the modern haemostat (Chapter 5).
- *Bistoury à la royale* — the combined probe-and-blade instrument designed for the operation on Louis XIV (Chapter 5).
- *Fraenum Caesaris* — Arderne's ligature for constricting fistula tissue (Chapter 4).
- *Kshara Sutra* — the medicated thread of Ayurvedic surgery, coated in Snuhi latex, alkaline Kshara, and turmeric (Chapter 2).
- *Moricorn* — Morinaga's Doppler-fitted proctoscope for haemorrhoidal artery ligation (Chapter 13).
- *Sequere me* — Arderne's flexible fistula-tract probe (Chapter 4).
- *Tendiculum* — Arderne's device for maintaining ligature tension during fistula division (Chapter 4).

Appendix C

Self-Assessment MCQs for MS/MCh Examinations

Organised by chapter. Single-best-answer format. Answers and brief explanations follow each set. These questions are offered as exam-preparation practice, not as an exhaustive or validated question bank, and should be checked against current curricula and reviewed by the author before use.

MCQs — Chapter 0: Anorectal Anatomy and Physiology

Q1. The dentate line marks the embryological junction between:

A. Ectoderm and mesoderm

B. Hindgut-derived mucosa and ectoderm-derived anoderm

C. The internal and external anal sphincters

D. The rectum and sigmoid colon

Answer: B. This single boundary explains the sharp differences in sensation, blood supply, venous/lymphatic drainage, and cancer type seen above versus below it. (Section 0.1)

Q2. The internal anal sphincter is responsible for approximately what proportion of resting anal canal pressure?

A. 10–20%

B. 30–40%

C. 55–70%

D. 90–100%

Answer: C. Being smooth muscle in continuous tonic contraction, the IAS provides the majority of resting tone. (Section 0.2.1)

Q3. The external anal sphincter differs from the internal anal sphincter in that it:

A. Is smooth muscle under autonomic control

B. Fatigues within a minute or two of sustained voluntary contraction

C. Provides the majority of resting tone

D. Relaxes reflexively in response to rectal distension

Answer: B. The EAS is striated, voluntary muscle supplied by the pudendal nerve (S2–S4); its rapid fatigability limits how long defecation can be voluntarily deferred. (Section 0.2.2)

Q4. The corrugator cutis ani (Ellis's muscle) is best described as:

A. A distinct fourth sphincter separate from the IAS and EAS

B. Terminal smooth-muscle fibres of the conjoined longitudinal muscle inserting into perianal skin

C. The muscular sling responsible for the anorectal angle

D. A vestigial structure with no clinical relevance

Answer: B. It causes perianal skin puckering and is the effector of the anocutaneous ("anal wink") reflex; it is also directly encountered during the MOLIS manoeuvre. (Section 0.2.4)

Q5. The anorectal angle at rest is typically:

A. 45–60 degrees

B. 90–100 degrees

C. 130–150 degrees

D. 160–180 degrees

Answer: B. Maintained by tonic puborectalis contraction, it opens to roughly 110–130 degrees during defecation as the puborectalis relaxes. (Section 0.2.3)

Q6. Above the dentate line, venous drainage is via the superior rectal vein into which system?

A. Systemic (caval) system

B. Portal system

C. Azygos system

D. Directly into the inferior vena cava

Answer: B. This explains both the origin of internal haemorrhoids from this valveless portal-draining plexus and the occurrence of rectal varices in portal hypertension. (Section 0.5)

Q7. The rectoanal inhibitory reflex (RAIR) is characteristically absent in which condition?

A. Chronic anal fissure

B. Hirschsprung's disease

C. Third-degree haemorrhoids

D. Rectal prolapse

Answer: B. Absence of RAIR is a key diagnostic feature in suspected Hirschsprung's disease. (Section 0.4)

Q8. A retroverted uterus can produce which clinical picture, per the mechanism described in this chapter?

A. Rectal bleeding due to direct mucosal compression

B. Extraluminal obstructed defecation from mechanical compression of the rectum against the sacral hollow

C. Faecal incontinence due to pudendal nerve stretch

D. Internal haemorrhoid prolapse

Answer: B. This produces a functional, purely extraluminal obstruction that appears entirely normal on endoscopy — diagnosed by bimanual examination under straining, as illustrated in the Chapter 11 case vignette. (Section 0.3.1)

MCQs — Chapter 1: Anorectal Disease in Antiquity

Q1. The ancient Egyptian court title "neru pehut" is best translated as:

A. Keeper of the royal seal

B. Guardian/Shepherd of the Anus

C. Chief embalmer

D. Physician of the eyes

Answer: B. Attested from the 28th century BC (Khuy) through the First Intermediate Period (Ir-en-akhty), this was a dedicated proctological role at the Egyptian court. (Section 1.1)

Q2. The term "haemorrhoid" derives from Greek roots meaning:

A. Swollen vein

B. A flowing of blood

C. Painful mass

D. Rectal prolapse

Answer: B. From *haima* (blood) and *rhoos* (flowing), coined in the Hippocratic tradition. (Section 1.2)

Q3. Which Egyptian papyrus is considered the oldest surviving specialist monograph on anorectal disease?

A. Edwin Smith Papyrus

B. Ebers Papyrus

C. Chester Beatty Papyrus

D. Kahun Gynaecological Papyrus

Answer: C. Dated to roughly the 13th century BC, it is essentially a focused text on diseases of the anus and their treatment. (Section 1.1)

Q4. The two foundational surgical strategies for haemorrhoids described in the Hippocratic Corpus are:

A. Excision and cryotherapy

B. Ligation and cautery

C. Sclerotherapy and banding

D. Fistulotomy and seton placement

Answer: B. These remain, in modified form (rubber band ligation and modern diathermy), the conceptual ancestors of current practice. (Section 1.2)

Q5. Roman surgical practice, as reflected in Celsus's *De Medicina*, showed an early empirical awareness of which principle in fistula surgery?

A. The germ theory of infection

B. The risk of sphincter injury and incontinence with radical tract excision

C. The cryptoglandular origin of fistula

D. The value of antiseptic technique

Answer: B. Roman surgeons favoured conservative thread techniques over radical excision specifically to avoid destroying the sphincter — arrived at through clinical observation alone, without any formal anatomical knowledge. (Section 1.3)

Q6. Galen's principal influence on this field derived from:

A. Original surgical technique for haemorrhoids

B. The durability of his authority, which shaped practice for over a millennium after his death

C. His discovery of the dentate line

D. His invention of the seton

Answer: B. Galen added comparatively little that was technically new, but his writings dominated Western and Islamic medicine for the next thirteen centuries. (Section 1.3)

Q7. *De Medicina*, the most significant surviving Roman surgical text, was authored by:

A. Galen of Pergamon

B. Hippocrates of Kos

C. Aulus Cornelius Celsus

D. Sushruta

Answer: C. An eight-volume encyclopaedia of which the surgical books are among the most important surviving accounts of ancient operative technique. (Section 1.3)

Q8. The Hippocratic thread technique for anal fistula is considered the direct conceptual ancestor of which modern device?

A. The circular stapler

B. The Doppler probe

C. The seton

D. The laparoscope

Answer: C. A thread drawn through the tract and tied, dividing tissue gradually by pressure necrosis — the same working principle as the modern seton. (Section 1.2, 1.4)

MCQs — Chapter 2: The Ayurvedic Tradition

Q1. In Ayurvedic classification, Arsha (haemorrhoids) and Bhagandara (fistula-in-ano) are both classed among:

A. The Panchakarma

B. The Ashtamahagada (eight diseases hardest to cure)

C. The Tridosha

D. The Nadi Vrana group

Answer: B. Reflecting the recognised difficulty of these conditions in classical Ayurvedic surgical thought. (Section 2.1)

Q2. Sushruta's four-tier approach to Arsha, in order of escalating invasiveness, is:

A. Shastra karma → Agni karma → Kshara karma → Bheshaja chikitsa

B. Bheshaja chikitsa → Kshara karma → Agni karma → Shastra karma

C. Kshara karma → Bheshaja chikitsa → Shastra karma → Agni karma

D. Agni karma → Shastra karma → Bheshaja chikitsa → Kshara karma

Answer: B. Medicine, then caustic application, then thermal cautery, then surgery only as a last resort — a principle of conservative escalation recognisable to any modern surgeon. (Section 2.2)

Q3. The classical Kshara Sutra thread is sequentially coated with:

A. Turmeric only

B. Snuhi latex, alkaline Kshara, and Haridra (turmeric)

C. Carbolic acid and beeswax

D. Honey and neem extract

Answer: B. This combination cuts, cauterises, and disinfects simultaneously as it slowly transects the fistula tract. (Section 2.3)

Q4. Modern standardisation of Kshara Sutra preparation (typically 21 sequential thread coatings) is credited to research conducted at:

A. All India Institute of Medical Sciences, Delhi

B. Banaras Hindu University, under P. J. Deshpande

C. Christian Medical College, Vellore

D. King George's Medical University, Lucknow

Answer: B. This standardisation made the therapy reproducible enough for formal clinical trial. (Section 2.4)

Q5. The multicentric randomised controlled trial validating Kshara Sutra for fistula-in-ano was coordinated by which body and published in which year?

A. WHO, 1985

B. ICMR, 1991

C. NIH, 1995

D. Cochrane Collaboration, 2001

Answer: B. Published in the Indian Journal of Medical Research, this remains a landmark instance of an ancient therapy validated on modern evidentiary terms. (Section 2.4)

Q6. Compared with conventional fistulotomy/fistulectomy, Kshara Sutra has shown:

A. Higher cure rates but significantly more postoperative pain

B. Comparable cure rates, less postoperative pain, and reliable sphincter preservation, at the cost of longer healing time

C. Lower cure rates but faster healing

D. No demonstrable difference in any outcome measure

Answer: B. Cure rates comparable to surgery, with the trade-off of healing measured in weeks rather than days. (Section 2.4)

Q7. The Sushruta Samhita is internationally best known for its detailed description of which procedure?

A. Cataract couching

B. Reconstructive nasal surgery

C. Lithotomy

D. Trepanation

Answer: B. This is why Sushruta is widely credited as the historical founder of plastic surgery. (Section 2.1)

Q8. Compared with the Hippocratic/Roman seton, the Ayurvedic Kshara Sutra differs principally in that:

A. It was derived directly from Greek texts via the Silk Road

B. The thread itself is medicated, combining mechanical division with chemical cauterisation and antisepsis

C. It was used exclusively for haemorrhoids, never fistula

D. It required general anaesthesia, unlike the Greek technique

Answer: B. Both traditions arrived independently at the mechanical principle of gradual thread division; the Ayurvedic version adds active medicated action the Greco-Roman thread lacked. (Section 2.3)

MCQs — Chapter 3: Medieval and Islamic Golden Age Contributions

Q1. Al-Zahrawi (Albucasis) is best known for authoring which text?

A. Canon of Medicine

B. Kitab al-Tasrif

C. Al-Hawi

D. Continens Liber

Answer: B. A 30-volume encyclopaedia whose final volume, on surgery and instruments, is the earliest surviving surgical text to systematically illustrate its own instruments. (Section 3.2)

Q2. The Islamic Golden Age translation movement, centred on institutions such as Baghdad's House of Wisdom, primarily achieved which contribution to this field's history?

A. Independent discovery of the sphincter-sparing principle with no reference to Greek sources

B. Preservation and active expansion of the Greek medical corpus at a time it was largely inaccessible in Western Europe

C. The first description of rubber band ligation

D. The invention of general anaesthesia

Answer: B. Scholars such as Hunayn ibn Ishaq corrected, commented on, and actively developed the classical inheritance rather than passively copying it. (Section 3.1)

Q3. Al-Zahrawi's approach to fistula-in-ano notably included frank documentation of which risk?

A. Postoperative bleeding requiring transfusion

B. Damage to the anal sphincter and resulting faecal incontinence

C. Anaesthetic mortality

D. Wound infection from unwashed instruments

Answer: B. His explicit, named acknowledgement of this risk goes beyond anything preserved from the Hippocratic or Roman record. (Section 3.3)

Q4. Unlike the Ayurvedic Kshara Sutra, Al-Zahrawi's seton for fistula represents:

A. An entirely independent invention with no link to prior traditions

B. A refinement and systematisation of the Greek thread technique, transmitted via the Arabic Hippocratic/Galenic corpus

C. A technique borrowed directly from Chinese medicine

D. The first recorded use of a synthetic suture material

Answer: B. The translation movement means the Greek technique was almost certainly known to him, directly or indirectly. (Section 3.3)

Q5. Al-Zahrawi's surgical volume was translated into Latin in the 12th century by:

A. Constantine the African

B. Gerard of Cremona

C. Guy de Chauliac

D. William of Saliceto

Answer: B. Working at the Toledo School of Translators, under the Latin title *Liber Chirurgiae* (or *De Chirurgia*). (Section 3.4)

Q6. Al-Zahrawi's surgical text remained a core teaching reference in European medical schools for approximately how long?

A. 50 years

B. 100 years

C. Close to 500 years

D. Under 25 years

Answer: C. Printed in at least ten Latin editions between 1497 and 1544, and cited extensively by figures such as Guy de Chauliac. (Section 3.4)

Q7. Which European surgical author is recorded as having cited Al-Zahrawi's work more than two hundred times?

A. Ambroise Paré

B. Guy de Chauliac

C. John Hunter

D. Andreas Vesalius

Answer: B. Whose own writing would go on to shape the barber-surgeon tradition described in the following chapter. (Section 3.4)

Q8. Al-Zahrawi's approach to haemorrhoidal disease is best characterised as:

A. Surgery-first, reserving conservative measures for treatment failures

B. Conservative-first, escalating to more invasive treatment only when needed

C. Exclusively pharmacological, with no surgical component described

D. Identical in every respect to Hippocratic practice, with no modification

Answer: B. Consistent with the graded, escalating pattern seen independently in the Ayurvedic tradition. (Section 3.3)

MCQs — Chapter 4: The Barber-Surgeon Era

Q1. The historical association of surgery with barbers, rather than physicians, in medieval Europe traces most directly to:

A. The 1163 Council of Tours restricting clergy from procedures involving bloodshed

B. A royal decree of Henry VIII

C. The founding of the Royal College of Surgeons

D. The Black Death's effect on physician numbers

Answer: A. *Ecclesia abhorret a sanguine* — with clergy barred from bloodletting, the monastery's own barbers absorbed the practical surgical work. (Section 4.1)

Q2. John of Arderne is regarded as the father of English surgery, and of proctology specifically, on the strength of which text?

A. Kitab al-Tasrif

B. Practica de Fistula in Ano

C. De Humani Corporis Fabrica

D. Chirurgia Magna

Answer: B. Written around 1376, describing his fistula-in-ano technique in unusually precise, illustrated, step-by-step detail. (Section 4.2)

Q3. Arderne's "acus rostrata" (snouted needle) functioned as:

A. A ligature for constricting tissue

B. A grooved director along which a scalpel was passed to divide the fistula tract cleanly

C. A cautery iron

D. A rectal speculum

Answer: B. The direct conceptual ancestor of modern probe-guided fistulotomy. (Section 4.2)

Q4. Arderne's reported cure rate for fistula-in-ano was approximately:

A. 10%

B. 25%

C. 50%

D. 90%

Answer: C. A genuinely remarkable outcome for the period, attributed partly to his conservative aftercare and avoidance of harsh cauterisation. (Section 4.2)

Q5. The Company of Barber-Surgeons was formed in England in which year, under which monarch?

A. 1485, Henry VII

B. 1540, Henry VIII

C. 1601, Elizabeth I

D. 1745, George II

Answer: B. Merging the Fellowship of Surgeons and the Company of Barbers; the two roles formally separated in 1745. (Section 4.3)

Q6. Arderne's practice of giving his instruments and remedies deliberately obscure names reflects which broader feature of medieval surgical culture?

A. Standardised international terminology

B. Surgical secrecy protecting a craftsman's commercial advantage

C. Formal peer-reviewed publication

D. Universal literacy among barber-surgeons

Answer: B. In contrast to the more openly disseminated, text-based traditions of Egypt, Greece, Rome, and the Islamic Golden Age. (Section 4.2)

Q7. During this period, care for anorectal disease among the general population was chiefly provided by:

A. University-trained physicians

B. Home-prepared poultices, astringent herbal washes, and humoral dietary advice

C. Formally certified proctologists

D. Monastic infirmaries exclusively

Answer: B. Elite surgical skill (as practised by Arderne) and folk remedy coexisted throughout this period, divided chiefly by a patient's ability to pay. (Section 4.3)

Q8. The Company of Barber-Surgeons was granted which privilege relevant to the anatomical rediscovery described in the next chapter?

A. A royal monopoly on wound dressings

B. The bodies of four executed criminals annually for dissection

C. Exclusive rights to sell surgical instruments

D. Tax exemption on medical texts

Answer: B. An early legal foothold for the anatomical study that would transform surgery under Vesalius. (Section 4.3)

MCQs — Chapter 5: Anatomical Rediscovery and the Rise of Formal Surgical Training

Q1. Vesalius's *De Humani Corporis Fabrica* (1543) was significant chiefly because it:

A. Introduced anaesthesia to surgical practice

B. Was based on Vesalius's own extensive human dissections rather than Galenic authority

C. Described the first successful haemorrhoidectomy

D. Established the first surgical society

Answer: B. Correcting hundreds of Galenic errors — themselves derived from animal (largely Barbary macaque) dissection — at a stroke. (Section 5.1)

Q2. Ambroise Paré's principal technical contribution was:

A. Germ theory

B. Revival of arterial ligature over cauterisation to control bleeding after amputation

C. The first description of the seton

D. Rubber band ligation

Answer: B. Using his purpose-built "bec de corbeau," a direct ancestor of the modern haemostat. (Section 5.2)

Q3. The 1686 operation on Louis XIV was performed for which condition?

A. Rectal prolapse

B. Anal fistula

C. Internal haemorrhoids

D. Anal fissure

Answer: B. Performed by Charles-François Félix de Tassy, who spent months preparing and practising on some 75 prior patients before operating on the King. (Section 5.3)

Q4. The significance of the Louis XIV operation for this field's history lies chiefly in:

A. Introducing a technically novel operative principle unknown before

B. Dramatically raising the public and professional standing of surgery as a discipline

C. Being the first fistula operation performed under anaesthesia

D. Establishing the first surgical certifying board

Answer: B. The widely publicised success did more to elevate surgery's standing than perhaps any single event of the preceding two centuries. (Section 5.3)

Q5. John Hunter's principal contribution to surgery was:

A. Discovery of the cryptoglandular hypothesis

B. Establishing surgery as a formally taught, evidence-based discipline grounded in comparative anatomy

C. The first description of endoanal ultrasound

D. Popularising the closed haemorrhoidectomy technique

Answer: B. Opening his own anatomy school in 1764 and insisting surgical practice be justified by evidence rather than inherited custom. (Section 5.4)

Q6. Félix's practice of operating on approximately 75 ordinary patients before treating Louis XIV illustrates which recurring principle in this book?

A. Surgical secrecy

B. Validation of a technique on a broader population before high-stakes application

C. The cryptoglandular hypothesis

D. Sphincter-sparing surgery

Answer: B. A principle the book traces forward to Kshara Sutra's randomised trials and the author's own case-series methodology. (Section 5.5)

Q7. Who among Hunter's students is noted for pioneering vaccination?

A. William Hunter

B. Edward Jenner

C. Joseph Lister

D. Astley Cooper

Answer: B. One of the best-known graduates of Hunter's teaching museum and school. (Section 5.4)

Q8. The instrument designed specifically for the 1686 royal operation, combining a probe and blade in one device, was called:

A. Bec de corbeau

B. Bistoury à la royale

C. Acus rostrata

D. Sequere me

Answer: B. In direct conceptual descent from John of Arderne's grooved-director principle. (Section 5.3)

MCQs — Chapter 6: Anaesthesia and Antisepsis

Q1. The conventional beginning of the anaesthetic era is dated to Morton's public ether demonstration on:

A. 4 July 1776

B. 16 October 1846

C. 1 January 1900

D. 22 March 1867

Answer: B. At Massachusetts General Hospital's "Ether Dome," with surgeon John Collins Warren remarking, "Gentlemen, this is no humbug." (Section 6.1)

Q2. Semmelweis's key observation in 1847 was that maternal mortality from puerperal fever was linked to:

A. Overcrowding in the maternity ward

B. Physicians moving from the dissecting room to the delivery ward without washing their hands

C. Miasma from open sewers

D. The emotional state of labouring mothers

Answer: B. Handwashing in chlorinated lime reduced mortality from as high as 18% to close to 2% within roughly a year. (Section 6.2)

Q3. Lister's antiseptic system was built on the germ theory developed by:

A. Robert Koch

B. Louis Pasteur

C. Edward Jenner

D. Ignaz Semmelweis

Answer: B. Pasteur showed fermentation and putrefaction were caused by living microorganisms, giving Lister the mechanism Semmelweis had lacked. (Section 6.3)

Q4. The antiseptic agent Lister selected as a chemical barrier against wound infection was:

A. Iodine

B. Carbolic acid (phenol)

C. Ethanol

D. Mercury chloride

Answer: B. First tested on compound fractures from 1865 onward, published in *The Lancet* in 1867. (Section 6.3)

Q5. Anaesthesia's significance for anorectal surgery specifically lay chiefly in allowing:

A. Bloodless surgical fields

B. Slow, deliberate, careful sphincter-sparing dissection rather than speed-driven operating on a conscious, struggling patient

C. The first use of rubber band ligation

D. Outpatient procedures for the first time

Answer: B. Every sphincter-sparing principle traced later in this book depends, at a basic practical level, on the patient holding still. (Section 6.1)

Q6. Semmelweis's story is included in this chapter chiefly as:

A. An example of a surgeon whose technique was widely adopted immediately

B. A warning with particular relevance to anorectal surgery, given its proximity to faecal flora

C. The first description of the cryptoglandular hypothesis

D. An early example of a randomised controlled trial

Answer: B. He died in 1865, before his insight was vindicated by Lister's work only a year or two later. (Section 6.2)

Q7. Together, anaesthesia and antisepsis mark the transition of anorectal surgery from:

A. Experimental to standardised

B. A fast, high-risk necessity to a controlled, elective procedure

C. Open to laparoscopic technique

D. Proctology to colorectal surgery

Answer: B. The essential precondition for every technique described in the book's later chapters. (Section 6.4)

Q8. Which of the following priority claimants to the discovery of anaesthesia is specifically named alongside Morton in this chapter?

A. Horace Wells

B. James Simpson

C. Crawford Long (also named) — and Charles Jackson

D. All of the above

Answer: D. Priority was immediately and bitterly contested among Jackson, Wells, and Long, but Morton's public, witnessed demonstration is what convinced the medical world. (Section 6.1)

MCQs — Chapter 7: Early Haemorrhoidectomy Techniques and the First Surgical Societies

Q1. St Mark's Hospital was founded in 1835 by:

A. Walter Whitehead

B. Frederick Salmon

C. Joseph Mathews

D. J. Rawson Pennington

Answer: B. After being excluded from a hospital appointment by the closed medical establishment of his day; among its early patients was Charles Dickens. (Section 7.1)

Q2. Whitehead's circumferential haemorrhoidectomy fell out of favour chiefly due to:

A. Excessive operating time

B. Mucosal ectropion ("Whitehead's deformity") and anal stenosis from circumferential scarring in general use

C. Failure to remove diseased tissue adequately

D. Incompatibility with anaesthesia

Answer: B. Its very thoroughness — a continuous circumferential wound — left no untouched tissue to preserve the canal's shape. (Section 7.3)

Q3. The American Proctologic Society was founded in which year, and by how many physicians?

A. 1899, by thirteen physicians

B. 1908, by five physicians

C. 1873, by twenty physicians

D. 1934, by two physicians

Answer: A. Meeting in Columbus, Ohio, at the call of Dr J. Rawson Pennington, with Joseph Mathews elected first president. (Section 7.5)

Q4. The proliferation of itinerant "pile doctors" using a proprietary carbolic acid injection in late 19th-century America is most closely associated with:

A. Joseph Mathews

B. Milton W. Mitchell and Alexander Brinkerhoff

C. Frederick Salmon

D. Walter Whitehead

Answer: B. This unregulated marketplace provoked the serious countercurrent led by Mathews and colleagues. (Section 7.4)

Q5. The author's Gravitational Theory hypothesis proposes which combination of factors in haemorrhoidal disease?

A. Sliding cushion theory alone

B. Chronic postural venous load, acute straining-related pressure spikes, and a possible IAS-hypertonia mechanical component

C. Vascular hyperplasia exclusively

D. Porto-systemic anastomosis dysfunction alone

Answer: B. Offered as a contribution to, not a replacement for, the modern sliding-cushion and hyperplasia theories, and extending the classical postural theory traceable to Morgagni. (Section 7.2)

Q6. Joseph Mathews established a direct institutional link to St Mark's Hospital by:

A. Studying there during the winter of 1877–1878

B. Founding a branch hospital in Kentucky

C. Translating its case records into English

D. Serving as its president

Answer: A. Returning to the US determined to establish rectal disease as a legitimate speciality, subsequently founding the world's first dedicated proctologic journal. (Section 7.4)

Q7. Which classical anatomist's observations are credited as the origin of the postural/gravitational theory of haemorrhoidal disease?

A. Andreas Vesalius

B. Giovanni Battista Morgagni

C. Ambroise Paré

D. Richard Heald

Answer: B. Seventeenth-century observations later revisited and, in this book, extended by the author. (Section 7.2)

Q8. The rectal venous plexus's relevance to the gravitational theory stems from the fact that it is:

A. Densely valved, like peripheral limb veins

B. Essentially valveless, like the portal system it drains into

C. Supplied exclusively by the systemic circulation

D. Absent above the dentate line

Answer: B. Exposing it to an unbroken hydrostatic column of pressure under upright posture that a quadruped's horizontal posture would not produce. (Section 7.2, cross-referenced with Section 0.5)

MCQs — Chapter 8: Milligan-Morgan Haemorrhoidectomy and Its Era

Q1. Milligan and Morgan's central structural insight, published in 1937, was that:

A. All haemorrhoidal tissue should be excised circumferentially

B. Haemorrhoids develop at fairly consistent primary sites, and intact tissue bridges between them should be deliberately preserved

C. Haemorrhoidectomy should always be performed under local anaesthesia

D. The dentate line should be excised along with the haemorrhoidal mass

Answer: B. This directly solved Whitehead's stenosis problem by preserving exactly the untouched tissue his continuous wound had eliminated. (Section 8.1)

Q2. The three primary haemorrhoidal pedicles are conventionally described at which clock positions?

A. 12, 4, 8 o'clock

B. 3, 7, 11 o'clock

C. 2, 6, 10 o'clock

D. 1, 5, 9 o'clock

Answer: B. Though exact orientation varies with patient positioning and surgeon convention. (Section 8.2)

Q3. The Milligan-Morgan technique is also known as the "open" haemorrhoidectomy because:

A. It is performed with the patient's legs in an open lithotomy position

B. The resulting wounds are left open to heal by secondary intention

C. It requires an open (not laparoscopic) approach

D. It was the first technique described in an open-access journal

Answer: B. In contrast to Ferguson's later closed (sutured) modification. (Section 8.2)

Q4. Ferguson's closed haemorrhoidectomy technique, published in 1959, differs from Milligan-Morgan chiefly in that:

A. It excises a circumferential ring of mucosa above the dentate line

B. The mucosal and skin edges of each wound are sutured closed rather than left open

C. It uses Doppler guidance to identify feeding arteries

D. It is performed entirely without anaesthesia

Answer: B. Aiming to reduce postoperative pain and bleeding and speed healing. (Section 8.3)

Q5. Comparative trials of open versus closed haemorrhoidectomy have generally shown:

A. A clear, consistent advantage for open technique in every outcome measure

B. Closed technique often heals somewhat faster, while open technique avoids the risk of closed-wound breakdown under tension

C. No difference has ever been demonstrated between them

D. Closed technique carries a significantly higher recurrence rate

Answer: B. A genuine trade-off rather than one technique clearly superseding the other. (Section 8.3)

Q6. Ferguson's closed technique became the dominant approach in which region, while Milligan-Morgan remained dominant elsewhere?

A. The United States

B. The United Kingdom

C. Continental Europe

D. Scandinavia

Answer: A. A persistent regional divide in surgical practice rather than one technique simply superseding the other. (Section 8.3)

Q7. Milligan-Morgan and Ferguson haemorrhoidectomy continue to serve which function in current practice?

A. They have been entirely superseded by stapled haemorrhoidopexy

B. They remain the reference standard against which newer haemorrhoid treatments are measured

C. They are used only in resource-limited settings

D. They are no longer taught in surgical training

Answer: B. Including in current national guidelines such as those of the Association of Colon and Rectal Surgeons of India. (Section 8.4)

Q8. The institution at which the Milligan-Morgan technique was developed had also been the site of which earlier milestone described in this book?

A. The founding of the American Proctologic Society

B. Frederick Salmon's founding of St Mark's Hospital

C. Eisenhammer's discovery of IAS hypertonicity

D. Longo's development of PPH

Answer: B. Milligan and Morgan worked at St Mark's Hospital, founded a century earlier by Salmon. (Section 8.1)

MCQs — Chapter 9: Fistula Surgery

Q1. The cryptoglandular hypothesis attributes the origin of most fistula-in-ano to infection arising in structures located at which anatomical level?

A. The anorectal ring

B. The dentate line

C. The anal verge

D. The rectosigmoid junction

Answer: B. The anal glands (8–10 in number) are arranged circumferentially at the dentate line and penetrate the internal sphincter to terminate in the intersphincteric plane — infection here is the origin point in the cryptoglandular hypothesis. (Section 9.1)

Q2. Goodsall's rule is least reliable in predicting the internal opening of a fistula in which clinical situation?

A. Posterior fistulas in male patients

B. Anterior fistulas in female patients

C. Posterior fistulas within 3 cm of the anal verge

D. Anterior fistulas in male patients

Answer: B. Published accuracy of Goodsall's rule clusters around 60–77% overall, but performs markedly worse for anterior fistulas, particularly in women — a distinction the "Midline Rule" was proposed to address. (Section 9.2)

Q3. A fistula tract that crosses both the internal and external anal sphincters to reach the ischioanal fossa is classified, per Parks (1976), as:

A. Intersphincteric

B. Transsphincteric

C. Suprasphincteric

D. Extrasphincteric

Answer: B. Transsphincteric fistulas cross both sphincters; intersphincteric tracts stay confined to the plane between the two sphincters; suprasphincteric tracts arch over the puborectalis; extrasphincteric tracts bypass the sphincter complex entirely. (Section 9.3)

Q4. The Parks classification (1976) was based on an analysis of how many cases, and over what period?

A. 144 cases over 5 years

B. 400 cases over 15 years

C. 333 cases over 10 years

D. 75 cases over 3 years

Answer: B. Parks, Gordon, and Hardcastle's landmark *British Journal of Surgery* paper analysed 400 cases treated over fifteen years. (Section 9.3)

Q5. A cutting seton achieves fistula division primarily through which mechanism?

A. Chemical cauterisation of the tract

B. Immediate mechanical transection at a single sitting

C. Gradual, staged division allowing sphincter fibres to scar and fix in place as they are divided

D. Thrombosis of the feeding vessel to the tract

Answer: C. A cutting seton is progressively tightened over successive visits, dividing tissue slowly enough that the encircled sphincter fibres scar and stabilise as they go — the same underlying principle traced back to the Hippocratic and Kshara Sutra thread techniques. (Section 9.4)

Q6. In the LIFT (Ligation of Intersphincteric Fistula Tract) procedure, the fistula tract is approached and divided in which plane?

A. Submucosal plane

B. Ischioanal fossa

C. Intersphincteric plane

D. Presacral space

Answer: C. LIFT dissects the tract free within the intersphincteric plane — the same space where the infected gland originates per the cryptoglandular hypothesis — without dividing any sphincter muscle. (Section 9.5)

Q7. Which statement best reflects the evidence on LIFT outcomes as reported in longer-term, wider-adoption series (as opposed to Rojanasakul's original 2007 report)?

A. Healing rates remained consistently above 90% across all subsequent series

B. Healing rates fell to a more modest 40–80% range, particularly lower after multiple prior fistula operations

C. LIFT was found to cause significant continence disturbance in the majority of patients

D. LIFT was abandoned entirely in favour of fistulotomy

Answer: B. As with several other techniques in this book's history, initial enthusiasm (>90% healing, no continence disturbance) gave way to a more modest picture on wider follow-up — 40–80% healing, worse in patients with prior failed fistula surgery. (Section 9.5)

Q8 (Vignette). A 34-year-old man presents with a fistula whose external opening lies 4 cm from the anal verge, posterior to the transverse anal line. Per Goodsall's rule, the internal opening is most likely to be found:

A. At the nearest point on the dentate line along a straight radial line

B. In the posterior midline, via a curved tract

C. At the anterior midline

D. Goodsall's rule does not apply to openings this far from the verge

Answer: B. Openings posterior to the transverse line are predicted to curve toward a single internal opening in the posterior midline — the classic (if imperfect) formulation of Goodsall's rule. (Section 9.2)

MCQs — Chapter 10: Lateral Internal Sphincterotomy for Fissure

Q1. Before Eisenhammer's 1951 work, Lockhart-Mummery attributed chronic anal fissure to which mechanism?

A. Internal anal sphincter hypertonicity

B. A fibrous "pecten band" within the external sphincter secondary to chronic crypititis

C. Pudendal nerve neuropathy

D. Rectal prolapse-related mucosal trauma

Answer: B. Lockhart-Mummery's pecten-band theory was the dominant (and, as later shown, mistaken) explanation before Eisenhammer identified IAS hypertonicity as the true driver. (Section 10.1)

Q2. Eisenhammer's original sphincterotomy, performed at the posterior midline (the site of the fissure itself), was later associated with which complication?

A. Rectovaginal fistula

B. Keyhole deformity

C. Whitehead's deformity

D. Anal stenosis from circumferential scarring

Answer: B. Posterior midline division passes through relatively poorly vascularised, already-compromised tissue, frequently producing a chronic gaping defect — the "keyhole deformity" — prone to soiling and discharge. (Section 10.3)

Q3. The rationale for moving internal sphincterotomy from the posterior midline to a lateral site (Parks 1967, Notaras 1969) most closely parallels which other structural solution described elsewhere in this book?

A. Longo's stapled haemorrhoidopexy working above the dentate line

B. Milligan and Morgan's preservation of anodermal bridges between excision sites

C. The LIFT procedure's intersphincteric approach

D. Heald's total mesorectal excision plane

Answer: B. In both cases, the solution was not to abandon the underlying principle but to move the incision away from the site of disease into healthier, better-vascularised tissue — Milligan-Morgan preserving bridges between haemorrhoidal excision sites, Notaras moving the sphincterotomy laterally away from the fissure. (Section 10.3; cross-referenced with Chapter 8)

Q4. Comparative studies of open versus closed lateral internal sphincterotomy have shown:

A. Closed technique has significantly higher incontinence rates

B. Open technique has significantly higher healing rates

C. Broadly equivalent healing (low-to-mid 90s%) and incontinence rates (2–5%) between the two approaches

D. Closed technique is no longer performed anywhere due to inferior outcomes

Answer: C. Neither approach has shown a consistent advantage over the other; the choice remains largely one of surgeon training and preference. (Section 10.4)

Q5. Which of the following best describes the mechanism of injury in Lord's anal dilatation, and the reason it fell out of favour?

A. Controlled division of a measured segment of IAS; abandoned due to cost

B. Uncontrolled, variable tearing of sphincter muscle; abandoned after trial evidence showed higher incontinence risk than sphincterotomy

C. Chemical cauterisation of the fissure bed; abandoned due to poor healing

D. Excision of the pecten band; abandoned as anatomically incorrect

Answer: B. A Cochrane review pooling seven RCTs found sphincterotomy significantly superior to anal stretch on both efficacy and incontinence risk — the fundamental weakness of Lord's technique was its lack of control over how much and which fibres tore. (Section 10.5)

Q6. Anal manometry in patients with chronic anal fissure typically demonstrates:

A. Reduced resting anal pressure that normalises after sphincterotomy

B. Pathologically elevated resting pressure that drops durably after sphincterotomy

C. Normal resting pressure with elevated squeeze pressure

D. No consistent manometric abnormality

Answer: B. Manometry confirmed Eisenhammer's clinical observation directly — elevated resting pressure preoperatively, with a durable drop following sphincterotomy. (Section 10.2)

Q7. The typically reported range of major incontinence (flatus or stool) following lateral internal sphincterotomy, across both open and closed techniques, is approximately:

A. <1%

B. 2–5%

C. 10–15%

D. 20–25%

Answer: B. This range is consistent across comparative studies of both technique variants. (Section 10.4)

Q8 (Vignette). A patient undergoes lateral internal sphincterotomy for chronic anal fissure. Six weeks later, examination shows a well-healed lateral wound with no residual fissure, but the patient reports no change in symptoms of intermittent soiling that predate surgery and were not part of the original presentation. What is the most appropriate next step?

A. Repeat sphincterotomy at the same lateral site

B. Reassure the patient — this is an expected consequence of any sphincterotomy

C. Evaluate the soiling as a separate, pre-existing problem rather than assuming it is a sphincterotomy complication

D. Proceed directly to sacral nerve stimulation

Answer: C. Since the soiling pre-dated surgery and was not part of the fissure presentation, it should be worked up on its own merits rather than reflexively attributed to the sphincterotomy. (Sections 10.4, 0.4)

MCQs — Chapter 11: Rectal Prolapse Surgery

Q1. Altemeier's procedure (perineal rectosigmoidectomy) is particularly associated with which patient population?

A. Young, fit patients seeking the lowest possible recurrence rate

B. Elderly and medically frail patients, since it avoids an abdominal incision and general anaesthesia is not strictly required

C. Paediatric patients with congenital prolapse

D. Patients with concurrent inflammatory bowel disease only

Answer: B. Its principal drawback is a reported recurrence rate ranging widely (near zero to over 50%) across published series. (Section 11.2)

Q2. Delorme's procedure, first described in 1900, is characterised by:

A. Full-thickness resection of the prolapsed rectum

B. Stripping the rectal mucosa alone and plicating the underlying muscular wall into accordion-like folds

C. Abdominal fixation of the rectum with mesh

D. Circumferential stapled excision above the dentate line

Answer: B. It attracted little attention for most of the 20th century until a 1979 report by Uhlig and Sullivan revived interest in it. (Section 11.1)

Q3. Laparoscopic ventral mesh rectopexy, described by D'Hoore and Penninckx in 2004, was developed chiefly to avoid which complication of earlier posterior abdominal approaches?

A. Anastomotic leak

B. Injury to autonomic pelvic sidewall nerves during posterior rectal mobilisation, risking new constipation

C. Mesh erosion into the rectum

D. Excessive blood loss

Answer: B. By approaching the rectum from in front rather than behind. (Section 11.4)

Q4. Which trial was specifically designed to compare all four principal rectal prolapse operations, reflecting the field's persistent lack of consensus?

A. The MRC CLASICC trial

B. The PROSPER trial

C. The COLOR trial

D. The ROLARR trial

Answer: B. Begun in 2004, intended to randomise 1,000 patients — a genuinely rare admission this deep into the book's history that the field does not yet know, with confidence, which operation is best. (Section 11.5)

Q5. Current guidance on choosing between perineal and abdominal approaches to rectal prolapse favours:

A. Abdominal rectopexy universally, regardless of patient fitness

B. A tailored approach — abdominal rectopexy for fitter patients accepting a larger operation for lower recurrence, perineal procedures for frailer patients

C. Perineal procedures universally, given their lower cost

D. Neither approach, favouring medical management alone

Answer: B. Reflecting the trade-off between invasiveness and durability that runs through this chapter. (Section 11.5)

Q6. In the case vignette described in this chapter, a retroverted uterus compressing the rectum against the sacral hollow was diagnosed by:

A. Flexible sigmoidoscopy

B. Bimanual examination with the patient straining in the squatting position

C. Barium enema

D. MRI defecography alone

Answer: B. One finger in the rectum, one in the vagina, with the patient asked to strain — revealing a mechanism no amount of endoscopy would show. (Section 11.6)

Q7. Mikulicz's 1888 series of perineal rectal amputations for incarcerated prolapse was notable for:

A. A mortality rate exceeding 50%

B. No reported mortality or recurrence, a striking result for the pre-antibiotic era

C. Being the first documented rectal surgery in history

D. Introducing the use of general anaesthesia to prolapse surgery

Answer: B. This attached his name to the operation for several decades before Altemeier's later, more detailed account. (Section 11.1)

Q8. Frykman's 1955 contribution to abdominal rectopexy was to combine fixation with:

A. Doppler-guided arterial ligation

B. Resection of the redundant sigmoid colon, addressing coexisting constipation

C. A circumferential mesh sling anteriorly

D. Posterior mucopexy

Answer: B. A resection rectopexy intended to treat both the prolapse and the frequently co-existing severe constipation. (Section 11.3)

MCQs — Chapter 12: Rise of Colorectal Surgery as a Distinct Sub-Speciality

Q1. The American Board of Proctology was renamed the American Board of Colon and Rectal Surgery in which year?

A. 1949

B. 1958

C. 1961

D. 1973

Answer: C. The American Society (formerly the American Proctologic Society) followed suit more slowly, renaming in 1973. (Section 12.1)

Q2. *Diseases of the Colon & Rectum*, the official journal of the American Proctologic Society/ASCRS, was established in which year?

A. 1899

B. 1934

C. 1949

D. 1958

Answer: D. Under the early stewardship of Louis A. Buie, giving the field a dedicated venue for peer-reviewed evidence. (Section 12.3)

Q3. The Association of Colon & Rectal Surgeons of India (ACRSI) was formally established following a decision taken at the ASI's annual conference on:

A. 15 June 1949

B. 28 December 1976

C. 7 June 1899

D. 1 January 1958

Answer: B. With the section formally established the following year, after two earlier (1974, 1975) attempts had been unsuccessful. (Section 12.4)

Q4. India's Fellowship of the Association of Colon & Rectal Surgeons of India (FACRSI) was instituted in which year?

A. 1978

B. 1997

C. 1999

D. 2004

Answer: C. In the continued absence, even today, of a formally recognised national postgraduate degree in colorectal surgery through India's Medical Council and National Board. (Section 12.4)

Q5. The renaming from "proctology" to "colorectal surgery" chiefly reflected:

A. A change in the dominant anaesthetic technique

B. A genuine broadening of the field's scope beyond the anal canal into the whole colon (cancer, inflammatory bowel disease)

C. A merger with general surgery societies

D. A change in required examination format

Answer: B. The old name, drawn from Greek *proktos* (anus), no longer described the work being done. (Section 12.1)

Q6. Formal recognition of the American Board of Proctology as an independent primary board was achieved in:

A. 1934

B. 1949

C. 1961

D. 1973

Answer: B. The eighteenth such board recognised in the United States, following some years operating through a Central Certifying Committee under the American Board of Surgery. (Section 12.2)

Q7. India's earliest dedicated Colon and Rectal Surgery hospital departments were established in which city, starting in 1960?

A. Delhi

B. Chennai

C. Mumbai

D. Kolkata

Answer: C. By surgeons who would go on to organise the 1968 International Seminar on the Diseases of the Colo-Rectum and Anus. (Section 12.4)

Q8. The specific, still-unresolved gap in India's colorectal training pathway that this book's Preface identifies its own purpose with is:

A. Lack of a national professional society

B. Absence of a formally recognised MCh degree programme in Colorectal Surgery

C. Lack of any peer-reviewed Indian colorectal journal

D. Absence of hands-on training courses

Answer: B. ACRSI's own FACRSI fellowship has, for over two decades, substituted informally for this still-missing national qualification. (Section 12.4)

MCQs — Chapter 13: Minimally Invasive and Stapled Techniques

Q1. Longo's stapled haemorrhoidopexy (PPH), first presented in 1998, achieves its effect by:

A. Excising the haemorrhoidal masses directly at the dentate line

B. Resecting a circumferential ring of rectal mucosa/submucosa above the dentate line and interrupting part of the arterial supply to the cushions

C. Injecting a sclerosant into each haemorrhoidal pedicle

D. Applying Doppler-guided arterial ligation without any tissue excision

Answer: B. Termed an "anopexy" by Longo — the redundant tissue is excised and lifted back into position, reducing cushion engorgement without direct excision. (Section 13.1)

Q2. The markedly lower postoperative pain reported with PPH compared with conventional excisional haemorrhoidectomy is explained by:

A. Use of a more potent local anaesthetic

B. The entire dissection and staple line sitting above the dentate line, in relatively insensate tissue

C. A shorter average operating time

D. Reduced blood loss

Answer: B. A direct application of the dentate-line anatomy established in Chapter 0. (Section 13.4)

Q3. Serious complications identified with wider adoption of PPH include:

A. Anal stenosis exclusively

B. Rectal perforation, pelvic sepsis, and rectovaginal fistula

C. Universal recurrence within one year

D. Loss of the rectoanal inhibitory reflex

Answer: B. Generally attributable to the staple line being placed too close to, or through, structures beyond the rectal wall. (Section 13.2)

Q4. Compared with PPH, THD (transanal haemorrhoidal dearterialisation) differs in that it:

A. Also involves circumferential stapled excision

B. Ligates the arterial supply to haemorrhoidal cushions via Doppler guidance, without excising any tissue

C. Requires general anaesthesia in all cases

D. Is reserved exclusively for external haemorrhoids

Answer: B. Originating with Morinaga's 1995 Doppler-guided technique using the "Moricorn" proctoscope. (Section 13.3)

Q5. THD is generally best suited to which category of haemorrhoidal disease?

A. The most advanced, bulky disease with extensive prolapse

B. Lower-grade disease without extensive prolapse

C. Thrombosed external haemorrhoids only

D. Haemorrhoidal disease in pregnancy exclusively

Answer: B. For advanced, bulky disease, Milligan-Morgan and Ferguson remain better equipped to treat definitively. (Section 13.3)

Q6. Longer-term follow-up and meta-analyses of PPH compared with conventional excisional haemorrhoidectomy have suggested:

A. Identical recurrence rates in all grades of disease

B. A somewhat higher recurrence rate after PPH, particularly for the most advanced grades of disease

C. PPH has a lower recurrence rate in every study published

D. No meta-analyses have ever been conducted comparing the two

Answer: B. A now-familiar pattern in this book of early enthusiasm followed by more qualified real-world evidence. (Section 13.2)

Q7. Modern THD protocols typically add which additional step to address prolapse alongside arterial ligation?

A. Circumferential stapling

B. Mucopexy — suturing redundant prolapsing mucosa back into position

C. Cryotherapy of the anal cushions

D. Botulinum toxin injection

Answer: B. (Section 13.3)

Q8. The UK's National Institute for Health and Care Excellence (NICE) has recognised Doppler-guided arterial ligation as:

A. Contraindicated in all circumstances

B. A legitimate alternative to conventional haemorrhoidectomy for appropriately selected patients

C. The mandatory first-line treatment for all haemorrhoidal disease

D. Experimental and not for clinical use

Answer: B. (Section 13.3)

MCQs — Chapter 14: Laparoscopic and Robotic Approaches

Q1. The global laparoscopic revolution is generally credited to have been ignited by which operation?

A. Mühe's 1985 laparoscopic cholecystectomy

B. Mouret's 1987 video-assisted laparoscopic cholecystectomy

C. Leahy's 1990 laparoscopic rectal resection

D. Pigazzi's 2006 robotic total mesorectal excision

Answer: B. Mühe performed the first laparoscopic cholecystectomy in 1985, but Mouret's witnessed, video-assisted 1987 version is credited with disseminating the technique globally. (Section 14.1)

Q2. The pelvis proved particularly resistant to conventional laparoscopy chiefly because:

A. The peritoneal cavity cannot be insufflated in the pelvis

B. Long, rigid, straight instruments through fixed ports, viewed in two dimensions, struggle with fine dissection in a narrow, bony, nerve-laden space

C. General anaesthesia cannot be used for pelvic procedures

D. The rectum lacks a peritoneal covering entirely

Answer: B. Particularly demanding in male patients, where autonomic nerves governing bladder and sexual function must be avoided. (Section 14.2)

Q3. Pigazzi's 2006 report of robotic-assisted total mesorectal excision demonstrated which specific technical advantages?

A. Lower equipment costs than laparoscopy

B. Wristed instruments, stable 3D visualisation, and tremor filtration addressing the pelvis's specific challenges

C. Elimination of the need for any minimally invasive port access

D. Compatibility with local anaesthesia alone

Answer: B. Associated with lower conversion rates to open surgery and, in some studies, reduced postoperative erectile dysfunction. (Section 14.3)

Q4. Robotic platforms have since been extended from rectal cancer surgery to which benign condition discussed elsewhere in this book?

A. Chronic anal fissure

B. Fistula-in-ano

C. Rectal prolapse (via ventral mesh rectopexy)

D. Internal haemorrhoids

Answer: C. Offering the same dexterity and visualisation advantages for the fine anterior dissection this operation demands. (Section 14.4)

Q5. Adoption of robotic surgery for benign anorectal disease has, so far, lagged behind its adoption for rectal cancer chiefly because:

A. Benign disease cannot technically be treated robotically

B. The additional cost and training burden is more readily justified where the stakes of nerve injury and incomplete resection are higher, as in cancer

C. Robotic platforms are incompatible with mesh

D. No robotic ventral mesh rectopexy has ever been reported

Answer: B. (Section 14.4)

Q6. Who performed the first laparoscopic rectal resection, in 1990?

A. Erich Mühe

B. Philippe Mouret

C. Patrick Leahy

D. Alessio Pigazzi

Answer: C. Colorectal surgery answered the call for minimally invasive technique relatively early, though the pelvis itself remained technically resistant for years afterward. (Section 14.1)

Q7. The surgical platform used in Pigazzi's landmark 2006 report was:

A. The ZEUS system

B. The da Vinci surgical system

C. The AESOP system

D. A conventional 2D laparoscopic tower

Answer: B. (Section 14.3)

Q8. This chapter's central argument is that lasting surgical innovation in the pelvis has been driven chiefly by:

A. Patient demand for shorter hospital stays

B. Technology directly compensating for a specific anatomical challenge (the narrow, fixed, nerve-laden pelvic space)

C. Regulatory mandates requiring minimally invasive approaches

D. Cost reduction pressures alone

Answer: B. The same pattern seen with PPH and THD exploiting the dentate line's sensory boundary in Chapter 13. (Section 14.5)

MCQs — Chapter 15: Modern Understanding of Sphincter Physiology

Q1. Endoanal ultrasound, developed by Clive Bartram, was made possible by which specific technical modification?

A. Replacing the rotating transducer's soft rubber balloon with a rigid plastic cone

B. Adding Doppler capability to a standard proctoscope

C. Combining ultrasound with MRI in a single probe

D. Using a flexible fibre-optic bundle instead of a rigid probe

Answer: A. Published with Peter Law in 1989, this was the first technique to resolve the internal and external anal sphincters as distinct, individually visible structures. (Section 15.1)

Q2. Pudendal nerve terminal motor latency (PNTML) testing, described by Kiff and Swash in 1984, measures:

A. Resting anal canal pressure

B. The time taken for the external sphincter to respond to pudendal nerve stimulation near the ischial spine

C. Rectal compliance

D. The rectoanal inhibitory reflex threshold

Answer: B. Building on an electro-ejaculation stimulation technique originally described by Brindley in 1981. (Section 15.2)

Q3. Later, larger studies of PNTML found that:

A. Its correlation with continence outcomes was stronger than originally believed

B. Its correlation with continence outcomes was considerably weaker and less consistent than early enthusiasm suggested

C. It had no further clinical relevance whatsoever and was immediately abandoned

D. It replaced endoanal ultrasound as the primary investigation of choice

Answer: B. It remains a historically important proof of concept even as its everyday clinical utility has been increasingly questioned. (Section 15.2)

Q4. Sacral nerve stimulation (SNS) improves faecal continence chiefly by:

A. Directly repairing a disrupted external sphincter

B. Modulating nerve signals governing the pelvic floor and rectal sensation, without repairing damaged muscle

C. Increasing resting IAS tone pharmacologically

D. Bypassing the rectum entirely via a colostomy

Answer: B. This allows benefit even in some patients with substantial sphincter defects who would not be candidates for conventional repair. (Section 15.3)

Q5. Sacral nerve stimulation was first applied to which condition before being adapted for faecal incontinence?

A. Chronic anal fissure

B. Urinary incontinence

C. Rectal prolapse

D. Anal fistula

Answer: B. Adapted for faecal incontinence by Klaus Matzel and colleagues, who published the first case series in 1995. (Section 15.3)

Q6. The FDA approved sacral nerve stimulation specifically for faecal incontinence in which year?

A. 1995

B. 2004

C. 2011

D. 2016

Answer: C. (Section 15.3)

Q7. Which institution is the shared origin of endoanal ultrasound and PNTML testing, reflecting sustained institutional focus on this field?

A. Massachusetts General Hospital

B. St Mark's Hospital

C. Wayne State University

D. Banaras Hindu University

Answer: B. Already responsible for the Milligan-Morgan operation and Parks's fistula classification described in earlier chapters. (Section 15.5)

Q8. Taken together, this chapter's three technologies primarily transformed continence preservation by:

A. Replacing all clinical judgement with automated diagnosis

B. Moving continence assessment from purely clinical judgement toward genuine, though still imperfect, objective measurement

C. Eliminating the need for any further surgical technique development

D. Making sphincter-preserving surgery obsolete

Answer: B. (Section 15.4)

MCQs — Chapter 16: MOLIS

Q1. MOLIS (Modified Open Lateral Internal Sphincterotomy) was developed specifically to address which limitation of conventional lateral internal sphincterotomy?

A. Its use of a posterior midline incision

B. Division of the internal anal sphincter by positional judgement in a relatively obscured surgical field

C. Its dependence on general anaesthesia

D. Its high recurrence rate compared with Lord's anal dilatation

Answer: B. MOLIS instead delivers the IAS to the wound surface, allowing the lower one-third to be divided under direct vision. (Section 16.1)

Q2. During the MOLIS manoeuvre, fibres of which structure are commonly encountered at the wound edge and must be recognised rather than mistaken for the external sphincter?

A. The puborectalis

B. The corrugator cutis ani

C. The pudendal nerve

D. The conjoint longitudinal muscle's deep component

Answer: B. Gently displaced with a cotton gauze pledget to expose the IAS cleanly. (Section 16.2)

Q3. In the author's prospective 333-case MOLIS series (January 2016–December 2025), continence was assessed using:

A. Pudendal nerve terminal motor latency

B. The Wexner Incontinence Score

C. Endoanal ultrasound alone

D. Manometry exclusively

Answer: B. No case of postoperative incontinence was recorded at any Wexner Score timepoint across the series. (Section 16.3)

Q4. Multi-site MOLIS for severe anal canal stenosis is performed at which four clock positions?

A. 12, 3, 6, 9 o'clock

B. 10, 2, 8, 4 o'clock

C. 1, 5, 7, 11 o'clock

D. 2, 4, 8, 10 o'clock

Answer: B. Deliberately avoiding both the 6 o'clock posterior midline (site of Eisenhammer's keyhole deformity) and the 12 o'clock anterior midline. (Section 16.4.1)

Q5. For surgeons still developing the judgement to gauge division depth precisely by feel, the multi-site MOLIS protocol recommends restricting each site's division to:

A. The full thickness of the IAS

B. The lower one-quarter of the IAS, with adequacy checked intraoperatively using calibrated dilators

C. The upper one-half of the IAS

D. No division at all until formal fellowship training is complete

Answer: B. Providing a wider margin of safety than the standard lower one-third depth. (Section 16.4.1)

Q6. Contralateral MOLIS is the author's approach for managing which clinical scenario?

A. Bilateral synchronous fissures

B. Fissure recurrence following an initial lateral sphincterotomy or MOLIS

C. Fissure occurring in a patient with prior haemorrhoidectomy

D. Anal stenosis following radiotherapy

Answer: B. Operating at a fresh site on the opposite side rather than re-entering the previously operated, less predictably healing field. (Section 16.4.2)

Q7. The core manoeuvre distinguishing MOLIS from conventional closed lateral internal sphincterotomy is:

A. Use of a Doppler probe to locate the sphincter

B. Deliberate delivery of the internal anal sphincter to the wound surface before controlled division under direct vision

C. Division of the external, rather than internal, sphincter

D. Routine use of a defunctioning stoma

Answer: B. (Section 16.2)

Q8. As presented in this book, the author's 333-case MOLIS series is best characterised as:

A. A multicentre, blinded randomised controlled trial

B. A single-surgeon, prospectively collected series, offered transparently pending external, multicentre validation

C. A retrospective case-control study with matched controls

D. A meta-analysis of previously published series

Answer: B. Explicitly not presented as a claim of definitive, universally reproducible superiority over conventional lateral sphincterotomy. (Section 16.3)

MCQs — Chapter 17: Anorectal Malignancy

Q1. William Ernest Miles's key insight, published in 1908, was that rectal cancer recurrence after perineal resection alone resulted from:

A. Inadequate anaesthesia during the original operation

B. Tumour spread not only downward but upward and laterally through the pelvic lymphatics

C. Failure to use antiseptic technique

D. Incomplete removal of the anal sphincter alone

Answer: B. Requiring removal of the rectum, anal canal, and surrounding lymphatic field together via a combined abdominal and perineal approach (APR). (Section 17.1)

Q2. Heald's total mesorectal excision (TME), described in 1982, achieved its effect by:

A. Wide local excision of the tumour alone, sparing the mesorectum

B. Removing the rectum together with its surrounding mesorectal fat and lymph nodes as a single intact package along a defined embryological plane

C. Combining chemoradiation with a defunctioning colostomy

D. Circumferential stapled resection above the dentate line

Answer: B. Dramatically reducing local recurrence and, importantly, enabling sphincter-preserving anterior resection for many more patients than before. (Section 17.2)

Q3. Following the widespread adoption of TME, Miles's original abdominoperineal resection (APR) is now:

A. Performed in the great majority of rectal cancer cases

B. Reserved for a comparatively small minority of low rectal tumours where sphincter preservation is not oncologically safe

C. Entirely obsolete and no longer performed

D. Used exclusively for anal squamous cell carcinoma

Answer: B. (Section 17.2)

Q4. The great majority of anal canal cancers are which histological type, distinct from rectal adenocarcinoma?

A. Adenocarcinoma

B. Squamous cell carcinoma

C. Neuroendocrine carcinoma

D. Gastrointestinal stromal tumour

Answer: B. Reflecting the anatomical divide in tissue type at the dentate line described in Chapter 0. (Section 17.3)

Q5. The Nigro protocol, first published in 1974, established which treatment as standard first-line therapy for most anal squamous cell carcinoma?

A. Abdominoperineal resection alone

B. Combined radiotherapy, 5-fluorouracil, and mitomycin C (chemoradiation)

C. Wide local excision without adjuvant therapy

D. Total mesorectal excision

Answer: B. Achieving cure in Nigro's original three patients without the operation ever needing to remove the sphincter; APR is now reserved for salvage in persistent or recurrent disease. (Section 17.3)

Q6. Before the 1970s, anal squamous cell carcinoma was primarily managed by:

A. Chemoradiation alone

B. Abdominoperineal resection, at the cost of a permanent stoma

C. Local excision with sphincter preservation

D. Observation alone, given its indolent course

Answer: B. With five-year survival in the range of 50–70%. (Section 17.3)

Q7. The Nigro protocol is described in this book as a "genuinely different kind of victory for sphincter preservation" because:

A. It represents a more precise surgical dissection plane

B. It achieved cure not through a more precise operation, but through the discovery that, for this cancer, no operation at all was often the better cure

C. It eliminated the need for any imaging before treatment

D. It was the first technique developed specifically in India

Answer: B. (Section 17.3)

Q8. William Ernest Miles is referenced in which other chapters of this book, in addition to Chapter 17?

A. Chapters 9 and 11 (Goodsall's rule co-publication; perineal rectosigmoidectomy)

B. Chapters 2 and 3 only

C. Chapter 16 only

D. He is not referenced elsewhere in the book

Answer: A. His 1900 collaboration with Goodsall and 1933 description of perineal rectosigmoidectomy are discussed in Chapters 9 and 11 respectively. (Section 17.1)

MCQs — Chapter 18: Reflections

Q1. The three recurring patterns identified in this closing chapter across the book's history are:

A. Convergent discovery, honest reassessment, and the role of institutions

B. Anaesthesia, antisepsis, and anatomy

C. Ligation, cautery, and excision

D. Egypt, Greece, and Rome

Answer: A. Observed respectively in the independent arrival at the seton principle across cultures, the pattern of early enthusiasm followed by more sober evidence (Whitehead, Goodsall, PNTML,

PPH), and the sustained institutional role of bodies like St Mark's Hospital and the American Proctologic Society. (Section 18.1)

Q2. The central question this book argues has remained essentially unchanged from antiquity to the present is:

A. How to eliminate all anorectal disease through prevention

B. How much tissue must be divided to cure the disease, and how much must be spared to preserve the patient

C. How to reduce the cost of anorectal surgery

D. How to train more colorectal surgeons

Answer: B. A question the book traces from the Hippocratic thread through to the author's own MOLIS technique. (Section 18.2)

Q3. Which institution is credited in this chapter with producing a concentration of achievement — including the Milligan-Morgan operation, Parks's classification, and Bartram's endoanal ultrasound — across nearly two centuries?

A. Banaras Hindu University

B. St Mark's Hospital

C. Wayne State University

D. Massachusetts General Hospital

Answer: B. Illustrating the book's "institutional" pattern of durable progress. (Section 18.1)

Q4. Examples of techniques whose early enthusiasm was later narrowed by more sober evidence, as traced across this book, include:

A. Whitehead's operation, Goodsall's rule, PNTML, and stapled haemorrhoidopexy (PPH)

B. The dentate line and the puborectalis sling

C. Vesalius's anatomical texts

D. The founding of national colorectal societies

Answer: A. (Section 18.1)

Q5. The author frames MOLIS, in this closing chapter, as:

A. The final, definitive solution to chronic anal fissure

B. This book's most recent entry in an ongoing lineage, not its conclusion

C. A technique that supersedes and replaces the need for further research

D. Unrelated to the historical principles traced earlier in the book

Answer: B. Readers are explicitly invited to view it as one more chapter in a still-unfinished history. (Section 18.2, cross-referenced with Chapter 16)

Q6. Which ongoing institutional story does this chapter identify as still unresolved as the book goes to print?

A. The renaming of the American Board of Colon and Rectal Surgery

B. India's path toward formal MCh recognition of Colorectal Surgery as a distinct sub-speciality

C. The founding of St Mark's Hospital

D. The dissolution of the Company of Barber-Surgeons

Answer: B. Expected to conclude, one way or another, within the careers of this book's own readers. (Section 18.3)

Q7. The convergent-discovery pattern is best illustrated by which specific example from earlier chapters?

A. The independent arrival at the seton/thread principle in Greco-Roman, Ayurvedic, and Islamic Golden Age traditions

B. The simultaneous founding of the American and Indian colorectal societies

C. The identical wording used in Sushruta Samhita and Kitab al-Tasrif

D. The shared authorship of Goodsall's rule and the Parks classification

Answer: A. Separated by centuries and, in several cases, complete absence of contact between the traditions involved. (Section 18.1)

Q8. This closing chapter's overall purpose, as stated explicitly, is to:

A. Introduce new clinical technique not covered elsewhere in the book

B. Step back and ask what pattern connects Hippocrates to MOLIS, and what it suggests about the field's future

C. Provide a comprehensive index of all instruments described in the book

D. Present unpublished data from a new clinical trial

Answer: B. (Chapter 18 introduction)

Appendix D

Clinical Vignette MCQs — Current Examination Pattern

Supplementary to Appendix C. These questions follow the longer, scenario-based single-best-answer format now common in postgraduate surgical entrance examinations. Offered as exam-preparation practice only, to be reviewed by the author and validated against current curricula before formal inclusion.

MCQs — Chapter 0: Anorectal Anatomy and Physiology

Q1 (Vignette). A 34-year-old woman presents with a sensation of incomplete evacuation and straining at stool for eight months. Colonoscopy and barium studies are unremarkable. On bimanual examination with the patient straining in the left lateral position, the rectum is felt to be compressed anteriorly against the sacral hollow by a firm pelvic mass. What is the most likely underlying mechanism?

A. Solitary rectal ulcer syndrome

B. Extraluminal compression of the rectum by a retroverted uterus

C. A rectocele secondary to pudendal neuropathy

D. Anismus (paradoxical puborectalis contraction)

Answer: B. A purely extraluminal, endoscopy-negative obstruction, diagnosed only by bimanual examination under straining — as illustrated by the case vignette earlier in this book. (Section 0.3.1)

Q2 (Vignette). A 3-week-old neonate presents with abdominal distension, bilious vomiting, and delayed passage of meconium beyond 48 hours of life. Anorectal manometry is performed. Which specific finding would most support a diagnosis of Hirschsprung's disease?

A. Elevated resting anal pressure

B. Absence of the rectoanal inhibitory reflex (RAIR)

C. Reduced squeeze pressure

D. Prolonged pudendal nerve terminal motor latency

Answer: B. Absence of RAIR on manometry is a key diagnostic feature in suspected Hirschsprung's disease, reflecting failure of the internal anal sphincter to relax on rectal distension. (Section 0.4)

MCQs — Chapter 2: The Ayurvedic Tradition

Q1 (Vignette). A 45-year-old manual labourer with a low transsphincteric fistula-in-ano is counselled on treatment options. His livelihood depends on preserved continence, and he is willing to accept a longer overall healing time and repeated outpatient visits in exchange for the lowest possible risk of sphincter injury. Which treatment principle best fits his priorities?

A. Fistulotomy under general anaesthesia

B. Kshara Sutra therapy

C. Immediate wide local excision

D. Abdominoperineal resection

Answer: B. Kshara Sutra offers cure rates comparable to surgery with reliable sphincter preservation, at the cost of healing measured in weeks rather than days — an appropriate trade-off for a patient prioritising continence over speed. (Section 2.4)

MCQs — Chapter 7: Early Haemorrhoidectomy Techniques and the First Surgical Societies

Q1 (Vignette). A 50-year-old man with a sedentary desk job reports intermittent bright red bleeding per rectum and a soft, non-tender mass that prolapses during defecation but reduces spontaneously afterward, without pain. What grade of internal haemorrhoids does this represent, and which factor in the author's Gravitational Theory is most directly implicated?

A. Grade I; acute straining-related pressure spikes only

B. Grade II; chronic postural venous load from prolonged sitting

C. Grade III; internal anal sphincter hypertonia

D. Grade IV; irreducible prolapse

Answer: B. Spontaneous reduction after prolapse defines Grade II disease; prolonged sitting reflects the chronic postural component of the Gravitational Theory, distinct from the acute straining-pressure and IAS-hypertonia components. (Section 7.2)

MCQs — Chapter 9: Fistula Surgery

Q1 (Vignette). A 40-year-old man reports intermittent perianal discharge and mild pain for six months, with episodes of localised swelling that resolve after spontaneous discharge of pus. On examination, a small, indurated external opening is seen 3 cm from the anal verge in the posterior midline, with a palpable cord-like tract on digital rectal examination. What is the most likely diagnosis?

A. Pilonidal sinus

B. Fistula-in-ano

C. Perianal Crohn's fissure

D. Hidradenitis suppurativa

Answer: B. A history of recurrent perianal abscess with intermittent discharge, a visible external opening, and a palpable indurated tract is characteristic of fistula-in-ano, arising per the cryptoglandular hypothesis; pilonidal sinus instead points to the natal cleft rather than the perianal verge. (Section 9.1)

Q2 (Vignette). A 36-year-old woman has a fistula external opening located 2 cm anterior to the anal verge, at the 1 o'clock position. Using Goodsall's rule, where would the internal opening be predicted to lie, and how reliable is this prediction in her case?

A. Curving posteriorly to the midline; highly reliable for anterior openings in women

B. Along a straight radial line to the nearest point on the dentate line; Goodsall's rule is notably less reliable for anterior fistulas in women

C. At the 6 o'clock position regardless of the external opening site

D. Unpredictable; Goodsall's rule applies only to posterior fistulas

Answer: B. Anterior openings are predicted to track radially inward, but published accuracy falls well below its overall 60–77%, and is weakest of all for anterior fistulas in female patients — the specific limitation the “Midline Rule” was proposed to address. (Section 9.2)

Q3 (Vignette). A 38-year-old man has a low transsphincteric fistula-in-ano confirmed on MRI, with no prior fistula surgery. He wishes to preserve continence and avoid the prolonged staged course of a cutting seton. Which procedure dissects the tract within the intersphincteric plane without dividing any sphincter muscle?

A. Fistulotomy

B. LIFT (Ligation of Intersphincteric Fistula Tract)

C. Cutting seton

D. Transanal endoscopic microsurgery

Answer: B. LIFT approaches and divides the tract within the intersphincteric plane — the same space in which the infected gland originates — without dividing sphincter muscle, though healing rates in wider-adoption series are more modest than in the original report. (Section 9.5)

MCQs — Chapter 10: Lateral Internal Sphincterotomy for Fissure

Q1 (Vignette). A 27-year-old woman presents with severe, tearing pain during defecation followed by a dull ache lasting an hour, with occasional streaks of bright red blood on the toilet paper. On gentle separation of the buttocks, a longitudinal ulcer is seen at the posterior midline of the anal verge, with a small skin tag at its distal margin. What does this skin tag most likely represent?

A. A perianal wart

B. A sentinel pile

C. A thrombosed external haemorrhoid

D. An anal polyp

Answer: B. A sentinel pile is a skin tag of chronic oedema and fibrosis at the distal margin of a chronic anal fissure, one of the classic triad findings alongside the fissure itself and a hypertrophied anal papilla. (Section 10.1)

Q2 (Vignette). A 22-year-old man with intermittent bloody diarrhoea and weight loss is found to have a broad, indolent, relatively painless ulcer at the lateral aspect of the anal canal, away from the midline. What should this atypical location and presentation prompt the clinician to consider?

A. Reassurance that this is a typical chronic fissure requiring only sphincterotomy

B. Further evaluation for an underlying cause such as Crohn's disease, tuberculosis, or malignancy

C. Immediate lateral internal sphincterotomy without further work-up

D. A diagnosis of haemorrhoidal thrombosis

Answer: B. A midline location is characteristic of the common, idiopathic chronic fissure described in this chapter; a lateral, atypical, or unusually painless ulcer — especially with systemic symptoms — should prompt evaluation for a secondary cause before proceeding to sphincterotomy. (Section 10.1)

MCQs — Chapter 11: Rectal Prolapse Surgery

Q1 (Vignette). An 82-year-old woman with poorly controlled heart failure and dementia presents with a full-thickness rectal prolapse protruding 6 cm outside the anal verge. Her family wishes to avoid general anaesthesia and a major abdominal operation given her comorbidities. Which procedure is most appropriate?

A. Laparoscopic ventral mesh rectopexy

B. Frykman's resection rectopexy

C. Altemeier's procedure (perineal rectosigmoidectomy)

D. Conservative management alone, deferred indefinitely

Answer: C. A perineal approach avoids an abdominal incision and does not strictly require general anaesthesia, at the cost of a recurrence rate higher than abdominal approaches — an appropriate trade-off in a frail, high-risk patient. (Section 11.2)

Q2 (Vignette). A fit and active 45-year-old man presents with a full-thickness rectal prolapse. He is keen to minimise the chance of recurrence and is fit for a longer operation under general anaesthesia. Which approach would most appropriately be offered, and why?

A. Altemeier's perineal rectosigmoidectomy, for its shorter recovery

B. Delorme's mucosal procedure, given its long track record

C. An abdominal rectopexy approach, accepting a larger operation in exchange for the lowest recurrence rate

D. Observation alone, since prolapse in fit patients resolves spontaneously

Answer: C. Current guidance favours a tailored approach: abdominal rectopexy for fitter patients able to accept a larger operation in return for greater durability, reserving perineal procedures for frailer patients. (Section 11.5)

MCQs — Chapter 13: Minimally Invasive and Stapled Techniques

Q1 (Vignette). A 55-year-old woman has Grade II internal haemorrhoids with persistent bleeding despite dietary and fibre measures, without significant prolapse. She wishes to avoid an excisional procedure and its associated postoperative pain. Which technique is best suited to her grade of disease?

A. Milligan-Morgan haemorrhoidectomy

B. Transanal haemorrhoidal dearterialisation (THD)

C. Altemeier's procedure

D. Abdominoperineal resection

Answer: B. THD ligates the arterial supply to the haemorrhoidal cushions via Doppler guidance without excising tissue, and is best suited to lower-grade disease without extensive prolapse; more advanced, bulky disease is still better served by Milligan-Morgan or Ferguson haemorrhoidectomy. (Section 13.3)

MCQs — Chapter 16: MOLIS

Q1 (Vignette). A 30-year-old man who underwent lateral internal sphincterotomy eight months ago for chronic anal fissure now presents with a new fissure at the same lateral site, with a well-healed previous surgical scar visible alongside it. Per the approach described in this book, how should the surgeon proceed?

A. Re-explore and widen the same lateral site

B. Perform a posterior midline sphincterotomy instead

C. Operate at a fresh site on the contralateral side (contralateral MOLIS)

D. Proceed directly to Lord's anal dilatation

Answer: C. The author's approach to recurrence after an initial lateral sphincterotomy or MOLIS is to operate at a fresh site on the opposite side, rather than re-entering the previously operated, less predictably healing field. (Section 16.4.2)

MCQs — Chapter 17: Anorectal Malignancy

Q1 (Vignette). A 52-year-old man with a history of receptive anal intercourse presents with perianal pain, a palpable indurated mass at the anal verge, and intermittent bleeding for two months. Biopsy confirms squamous cell carcinoma of the anal canal, with no evidence of distant metastasis. What is the standard first-line treatment, sparing the sphincter in most cases?

A. Immediate abdominoperineal resection

B. Wide local excision alone

C. Combined chemoradiation (5-fluorouracil, mitomycin C, and radiotherapy) per the Nigro protocol

D. Total mesorectal excision

Answer: C. The Nigro protocol established combined chemoradiation as standard first-line therapy for most anal squamous cell carcinoma, achieving cure without an operation that removes the sphincter; APR is now reserved for salvage in persistent or recurrent disease. (Section 17.3)

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GLOSSARY

Glossary of Abbreviations

An Alphabetic Index of Abbreviations Used in This Book

This glossary collects, in alphabetic order, every abbreviation and acronym used in this book, together with its full form and a one-line note of what it refers to. It is provided as a quick-reference companion for postgraduate students, colorectal fellows, and specialists from other fields who may not encounter every term in daily practice.

ACRSI — *Association of Colon & Rectal Surgeons of India*

India's national professional body for colorectal surgery; established 1977, growing out of the ASI's Colo-Rectal Section.

APR — *Abdominoperineal Resection*

Miles's 1908 combined abdominal-and-perineal operation removing the rectum, anal canal, and surrounding lymphatic field, historically the standard curative operation for low rectal cancer.

ASCRS — *American Society of Colon and Rectal Surgeons*

The United States' professional society for colorectal surgery; founded 1899 as the American Proctologic Society, renamed ASCRS in 1973.

ASI — *Association of Surgeons of India*

India's national professional body for general surgery, out of which the colorectal (ACRSI) section eventually emerged.

BC / AD — *Before Christ / Anno Domini*

Conventional era markers used for historical dating throughout the early chapters of this book.

EAS — *External Anal Sphincter*

Striated muscle under voluntary control (via the pudendal nerve) that generates squeeze pressure and allows deferral of defecation.

FACRSI — *Fellowship of the Association of Colon & Rectal Surgeons of India*

India's postgraduate fellowship qualification in colorectal surgery, instituted by ACRSI in 1999.

FAIS — *Fellow of the Association of Surgeons of India*

A professional fellowship of the ASI (see above).

FDA — *Food and Drug Administration (United States)*

The US federal regulatory body; referenced here for its 2011 approval of sacral nerve stimulation for faecal incontinence.

IAS — *Internal Anal Sphincter*

Involuntary smooth muscle, a distal continuation of the rectal wall, responsible for the greater part of resting anal canal tone.

ICMR — *Indian Council of Medical Research*

India's apex body for coordinating and funding biomedical research; referenced here in connection with validation of Kshara Sutra therapy.

LIFT — *Ligation of the Intersphincteric Fistula Tract*

A sphincter-preserving fistula operation, approaching the tract through the intersphincteric plane without dividing muscle; described by Arun Rojanasakul, 2007.

LIS — *Lateral Internal Sphincterotomy*

The conventional operation for chronic anal fissure, dividing part of the internal anal sphincter; referred to throughout this book in its full form, and the base procedure from which Dr. Om Prakash Bhandari's own MOLIS technique (see below) is modified.

MBBS — *Bachelor of Medicine, Bachelor of Surgery*

The primary undergraduate medical degree in India and the UK.

MCh — *Magister Chirurgiae (Master of Surgery)*

India's postgraduate super-specialty surgical degree; referenced here in relation to the newly instituted MCh programme in Colorectal Surgery.

MOLIS — *Modified Open Lateral Internal Sphincterotomy*

Dr. Om Prakash Bhandari's own modification of LIS (see above) for chronic anal fissure, delivering the internal anal sphincter to the wound surface under direct vision before controlled division (Chapter 16).

MRI — *Magnetic Resonance Imaging*

Cross-sectional imaging modality referenced alongside endoanal ultrasound for sphincter assessment.

MRSH — *Member of the Royal Society for the Promotion of Health, London*

A professional membership (today under the Royal Society for Public Health); one of Dr. Om Prakash Bhandari's qualifications.

MS — *Master of Surgery*

Postgraduate surgical degree; one of Dr. Om Prakash Bhandari's qualifications (RNT Medical College, Udaipur, 1980).

PIMS — *Pacific Institute of Medical Sciences, Udaipur*

Medical college where Dr. Om Prakash Bhandari served as Professor of Surgery.

PNTML — *Pudendal Nerve Terminal Motor Latency*

A neurophysiological test of pudendal nerve function, measuring the time taken for the external sphincter to respond to nerve stimulation; devised by Kiff and Swash, 1984.

PPH — *Procedure for Prolapse and Haemorrhoids*

Longo's stapled haemorrhoidopexy, using a circular stapler to excise a ring of rectal mucosa and reposition prolapsing haemorrhoidal tissue.

PROSPER — *PROlapse Surgery: PErineal or Rectopexy (trial)*

A UK randomised trial, begun 2004, comparing abdominal and perineal approaches to rectal prolapse surgery across four principal techniques.

QR (code) — *Quick Response code*

The scannable square barcode used in this book to link the reader directly to Dr. Om Prakash Bhandari's operative MOLIS videos.

RAIR — *Rectoanal Inhibitory Reflex*

Reflex relaxation of the internal anal sphincter triggered by rectal distension, permitting the sampling reflex.

RNT — *Rabindranath Tagore (Medical College, Udaipur)*

Dr. Om Prakash Bhandari's medical school, named after the Nobel-laureate poet; commonly referred to by its initials.

S2–S4 — *Sacral nerve roots 2 to 4*

Standard anatomical shorthand for the spinal nerve levels of origin; used in this book when describing the pudendal nerve supply to the external anal sphincter.

SNS — *Sacral Nerve Stimulation*

An implanted-electrode technique that modulates sacral nerve signals to improve continence without directly repairing the sphincter; adapted for faecal incontinence by Matzel et al., 1995, and FDA-approved in 2011.

THD — *Transanal Haemorrhoidal Dearterialisation*

A Doppler-guided technique for locating and ligating the haemorrhoidal arteries, described by Morinaga, without excising tissue.

TME — *Total Mesorectal Excision*

Richard Heald's 1982 technique of removing the rectum together with an intact mesorectal package along an embryologically defined plane, which sharply reduced local recurrence in rectal cancer surgery.

UK — *United Kingdom*

US — *United States*

ABOUT THE AUTHOR



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Dr. Om Prakash Bhandari is a consultant surgeon and medical educator with over forty-five years of clinical and academic experience in general and anorectal surgery. He completed his MBBS in 1976 and his MS in General Surgery in 1980, both at R.N.T. Medical College, Udaipur, and was elected a Member of the Royal Society of Health, London (MRSH) in 1984.

He began his career in the Government of Rajasthan's medical service, before moving into academic surgery as Assistant Professor at NIMS Medical College, Jaipur, Associate Professor at Pacific Medical College, Udaipur, and Professor of Surgery at the Pacific Institute of Medical Sciences (PIMS), Udaipur. He is currently Consultant Surgeon and Director of Dr. Bhandari Piles Hospital (Manish Nursing Home), Chittorgarh, and Honorary Consultant Surgeon at M.P. Birla Hospital and Research Centre.

He is a Founder Life Member of the Association of Colo-Rectal Surgeons of India (ACRSI No. 37) and a Life Member of the Association of Surgeons of India (ASI No. 4020). His principal research contribution is the OPB-MOLIS (Modified Open Lateral Internal Sphincterotomy) technique for chronic fissure-in-ano, developed and refined over a single-surgeon case series of more than 350 patients, with no recorded incontinence. He is also the founding Editor-in-Chief of the Global Science Portal for Surgical, Procedural and Clinical Innovations (GSP-SPCI).

Over a career spanning more than four decades and thousands of patients treated, Dr. Bhandari has combined a surgeon's restlessness to improve technique with a historian's curiosity about how anorectal surgery arrived at its present understanding — the same curiosity that shaped this book.

