

# Surgical Treatment of Hemorrhoids

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Indru Khubchandani Nina Paonessa  
and Khawaja Azimuddin (Eds.)

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# **Surgical Treatment of Hemorrhoids**

Second Edition

 Springer

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*Dedicated to our patients, who have provided  
the inspiration for this work*

# Foreword

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It is a great honor to be asked to contribute a Foreword in recognition of a peer's contribution to the literature in the field of colon and rectal surgery, and a special privilege to be asked by someone who is inarguably as recognized an international authority as Indru Khubchandani—as well as his colleagues. I have known Dr. Khubchandani for more than thirty years. He was born in Bombay, India, and attended college and medical school in that city, achieving his M.D. degree in 1956. From there he traveled to Sunderland, England, where he became a House Officer, ultimately moving to Ryhope in order to complete his training as a senior registrar. He became a Fellow of the Royal College of Surgeons of England and Edinburgh in 1957. In 1961 he emigrated to the U. S. and became a resident in general surgery at the New England Medical Center in Boston. In the following year, he became a fellow and ultimately an instructor at Temple University Medical Center in Philadelphia, under the tutelage of Harry E. Bacon, one of the giants in the field, textbook author, and editor-in-chief of the journal, *Diseases of the Colon and Rectum*, for many years.

Dr. Khubchandani remained at Temple for three years, certifying in the specialty of colon and rectal surgery in 1963. Following his years at Temple he moved to Allentown, Pennsylvania, where he established one of the country's pre-eminent centers of colon and rectal surgery. It would require more time than I have been allotted for this space if I were to enumerate all of his accomplishments. Dr. Khubchandani is a member of numerous organizations throughout the world. He is a Professor of Surgery at Pennsylvania State University/Hershey Medical Center. He has served on virtually every committee in his hospitals, in the American Society of Colon and Rectal Surgeons, and has served as a reviewer for more than a dozen journals. He has been active in a host of community organizations in Allentown and in India. He has been honored as an Honorary Fellow of the Brazilian, Chilean, Venezuelan, Egyptian, Spanish, Cuban, and Italian Societies of Coloproctology, among many other named professorships, awards, and recognitions. An endowed chair of Colon and Rectal Surgery has been established in his name at Penn State University/Hershey Medical School, at the Lehigh Valley Hospital. He has been the driving force for the establishment and the remarkable growth and recognition of the International Society of University Colon and Rectal Surgeons, wherein he serves as Director General.

In this second edition, the authors have strived to address the needs of the surgeon in training, general surgeons, and colon and rectal surgeons. The concept has been to place into context the numerous recent innovations in the management of hemorrhoidal disease. Simply stated there has been a plethora of newer approaches that have been developed in the last decade, modifications and techniques which are often at considerable odds with oldest surgeons' understanding of the classical approach to the

management of this condition—that is, excisional surgery and its technical variations remove hemorrhoidal tissue.

The Contributors represent a who's who in the international community of colon and rectal surgeons. Forty-two surgeons are represented in this otherwise modest-sized book. Fully 13 are from American institutions, but the authors are well distributed internationally. Other countries and institutions include Italy, St. Marks Hospital, Harrow, England, Mexico City, Wycombe, The John Radcliffe Infirmary, Oxford, England, Sao Paulo, Brazil, Vienna, Austria, Singapore, Cairo, Egypt, and Stockholm, Sweden. Without doubt there is a conscientious effort to explore the opinions of numerous individuals with diverse interests in the management of this condition.

The monograph begins with the obligatory series of chapters on history, anatomy, physiology, examination, differential diagnosis, etc. There follows a series of chapters on various techniques which represent essentially historical or antiquated operations, such as the Lord Anal Dilatation, an operation that I believe has essentially fallen into disuse if not disrepute. The same made by said for the Parks Hemorrhoidectomy and Cryotherapy. A number of other chapters discuss more conventional operations. These include a discussion on Transanal Hemorrhoidal Dearterialization, and hemorrhoidectomy using the Ligasure<sup>TM</sup> vessel sealing system.

Marvin L. Corman, M.D.  
Stony Brook University, October 16, 2008

# Preface

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Much has happened in the management of hemorrhoidal disease since the First Edition was published under the able leadership of Dr. Charles Mann. Some procedures have been relegated as “historical” and have become obsolete by virtue of the data collected, particularly in the era of evidence-based medicine. Other innovations have developed with the help of sophisticated technology. The editors have made an attempt to put together a group of internationally renowned experts, each with personal published data to corroborate their expertise.

The paradigm of management of hemorrhoidal disease has shifted over the years. Surgical excision is relegated to very few advanced cases. The majority of hemorrhoidal diseases can be managed in the office with painless, simple care. When surgery is indicated, “day surgery” has become a standard around the world. The ambulatory hemorrhoidectomy is truly ambulatory, with most patients being discharged for recovery at home within hours of performing the procedure.

The chapters are short, concise, and written with precision. Few tables are utilized and only diagrams which add to the text are included.

It is the editors’ fervent desire that the book be palatable to surgical trainees, general surgeons, and colon and rectal surgeons. Where necessary, the description is detailed enough to impart knowledge beyond a cursory narrative.

We are grateful to the contributors, who have given of their time and shared their expertise without any monetary contribution.

*Indru Khubchandani, MD (Editor)*

*Nina Paonessa, DO (Editor)*

*Khawaja Azimuddin, MD (Editor)*

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# 1 Surgical History of Haemorrhoids

S. Ellesmore and A.C.J. Windsor

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For as long as man has been blessed with an anus, it is fair to assume that he has also been doubly blessed with haemorrhoids. The word “haemorrhoid” is derived from the Greek *haema* (blood) and *rhoos* (flowing), and it was probably Hippocrates (460 BC) who was the first to apply the name to the flow of blood from the veins of the anus. The term “piles” is derived from the Latin *pila* (a ball) and was widely used by the public at the time of John of Arderne (born AD 1307), and in his treatise of 1370 he remarks that the “common people call them piles, the aristocracy call them haemorrhoids, the French call them figs (*figer*, to clot), what does it matter so long as you can cure them”. If only it was that simple.

## The Egyptians

Although Egyptian writings left no specific reference to haemorrhoids, there are several descriptions which are unlikely to be any other condition. The *Edwin Smith Papyrus* (1700 BC) (Breasted, 1930) and the Ebers Papyrus (1500 BC) (Ebbel, 1937) both contain references to anal pathology and the *Edwin Smith Papyrus* reports, “if thou inspecteth a man in his anus, whether standing or sitting, suffering very greatly with seizures in both his legs. Thou shouldst give a recipe, an ointment

of great protection; Acacia leaves, ground, titrated and cooked together. Smear a strip of fine linen therewith and place in the anus, that he may recover immediately”.

## The Greeks

The Hippocratic Treatises (460 BC) (Adams, 1849) provide some of the earliest details of both clinical description and surgical treatment of haemorrhoids and in the following reference, Hippocrates is seen to favour an operation to simply ligate the pile: “And haemorrhoids in like manner you may treat by transfixing them with a needle and tying them with very thick and woollen thread; for thus the cure will be the more certain. When you have secured them, use a septic application, and do not foment until they drop off, and always leave one behind; and when the patient recovers let him be put on a course of Hellebore.” Further writings “On Haemorrhoids” (Adams, 1849) attributed to Hippocrates deal with haemorrhoidal excision and give mention to an expanding speculum akin to one found in the ruins of Pompeii, and remarkable similar to the Eisenhammer retractor of today. There also appears an interesting description of the aetiology of haemorrhoids: “The disease of the haemorrhoids is formed in this way: if bile or phlegm be determined to the veins of the rectum, it heats the

blood in the veins; and being gorged the inside of the gut swells outwardly, and the heads of the veins are raised up, and being at the same time bruised by the faeces passing out, and injured by the blood collected in them, they squirt out blood, most frequently along with the faeces". It is good to see that our understanding of the aetiology of haemorrhoids has improved, though some would question by how much.

## The Romans

A Roman contribution to the history of the haemorrhoid is provided by Celsus (25 BC–AD 14). In *De Medicina* (Celsus & Cornelius, 1938), he gives a description of the surgery, mentioning both the ligation and ligation-excision technique, and also mentions the postoperative complication of urinary retention. Galen (AD 131–201) also gives a good clinical description of haemorrhoidal disease, and advocates ligation of haemorrhoids for two hours when surgery is indicated. The intermittent occlusion of the vascular pedicle was also used in the nineteenth century to reduce pain and to avoid spreading gangrene.

## The Far East

The only reference of note from Indian medical history is in *The Susruta Samhita* (Bhishnagrata, 1907), the ancient Sanskrit text of Hindu medicine. Opinions are divided as to its date, from fourth century BC to fifth century AD. The work is the Aryan equivalent of the Hippocratic Treatise, but is more surgically advanced. Of note are its emphasis on wound cleanliness and advanced surgical technique.

Following the collapse of the Roman and Greek civilisations, medical knowledge was nurtured by the Arab Empire; Rhazes (AD 860–932), Ali Abbas (AD c.994) and Avicenna (AD 980–1036) (Adams, 1844) all describe the classical operations

for piles. However, the Arab scholars held the baton of medical knowledge for only a short time before returning it to Europe.

## The Master Surgeons

At this time Europe was to see one of its finest periods of surgical advancement in the hands of the Master Surgeons. Theodoric (AD 1205–1296) trained at the University of Salerno, discarded Galenical doctrine and advocated healing by primary intention. Lanfrank (died AD 1315) of Milan migrated to Paris in 1295 and became the first great teacher of French surgery. Henri de Mondeville, Guy de Chauliac and John of Arderne (one of the most celebrated early colorectal surgeons), all educated at Montpellier, greatly advanced surgery in a pre-Renaissance revival. Interestingly, master surgeons wrote little during this period, and even less about the management of haemorrhoids. Henri de Mondeville (1260–1320) mentioned haemorrhoids only to warn against operating on them. Unfortunately, the era of the Master Surgeon came to an end with the practise of surgery by the barber and not the scholar; a situation that would remain until the middle of the eighteenth century.

## The Barber Surgeons

The era of the barber surgeon lasted for nearly 350 years, and what writings there were from true surgeons were sadly very traditional. The notable surgeons of the time, Ambrose Pare (1510–1590), Master Peter Lowe (1612), Dr Read (1650) and Richard Wiseman (1622–1676), added little to the medical knowledge of haemorrhoids. In polite society at this time, the condition was known as "le mal de St Phiacre", an attempt to confer respectability by the possession of a patron saint; however, there seems to be some doubt about the appropriateness of the chosen patron who was the patron saint of gardeners!

## The Renaissance

The eighteenth century saw the end of the barber surgeon and a return of science to medicine. Lorenz Heister (1739) published a work on *Chirurgie*, one of the first textbooks to contain detailed illustrations. He states on haemorrhoids, “but the moderns judging the methods of the ancients too cruel, and often pernicious, generally leave the case to nature, except when the discharge is profuse...”. He described ligation with excision, “he is then to tie up the bleeding tunercles with a needle and thread, cutting off those parts which are distended beyond the ligation, taking care at the same time to leave a few of the smallest veins open as before observed”.

In the same period, Morgagni (1749) (Morgagni, 1769) published his theory on the aetiology of haemorrhoids, differing from the Hippocratic dogma held by the ancient and mediaeval writers. Morgagni stated, “without doubt, it was not very easy for the blood to pass through a liver of that kind [cirrhotic]. But why, then, you will say, did it not stagnate equally in the other veins which go to the trunk of the vena portarum? And for this very reason it was that I said you would immediately understand it, or at least in part. Add therefore, to omit other things, the very great length, which is peculiar to this one vein [the superior haemorrhoidal] among the others, so that it is much more difficult for the blood to be carried upwards, from this vein, than from the others, especially as the situation of the human body requires it, which without doubt is one of the reasons why other animals are not subject to piles. And if you ask why, in those bodies in which there is any impediment to the quick motion of the blood upwards, the veins of the legs in particular are dilated into varices, you will find the same thing to be the cause of them chiefly which we assign for the piles.”

## The Nineteenth Century

At the end of the eighteenth century and the beginning of the nineteenth century, men such as Per-civall Pott, William Cheselden and John

Hunter created an environment in which writing was encouraged, although interestingly none of these men wrote about haemorrhoids themselves. There was great debate about the relative values of ligation and of excision of haemorrhoids, neither without mortality, and ligation with the added morbidity of intense pain. It would appear that the surgeons of the time had not differentiated between the sensitive anal skin and the insensitive rectal mucosa.

Jean Louis Petit, who wrote a three-volume book on surgery in 1774 (Petit, 1774), rejected excision due to potentially fatal haemorrhage and anal stenosis, and ligation due to pain and gangrene. He noted that the skin of the anus was sensitive and therefore recommended excision ligation, and in 1835, Brodie (Brodie, 1836), in writing about the problems of ligation alone, stated: “The application of the ligation to internal piles in general causes but little pain, and only a slight degree of inflammation follows, for the mucous membrane has nothing like the sensibility of the skin, and does not resent an injury in like manner”. In a *Dictionary of Practical Surgery*, Samuel Cooper (1809) both quoted and supported Petit’s favour of excision/ligation and, although the technique was not universally accepted, one has to remember that this was before the advent of general anaesthesia and this technique took longer to perform than both excision and ligation alone. Sir Astley Cooper (1836) supported ligation, following the death of three of his patients on whom he had performed an excision – two from bleeding, one from peritonitis – and Copeland described many complications from the excision/ligation technique, including pain, retention of urine, stricture and tetanus. He recommended rectal bouginage, popular with the French schools, thought to treat the increased anal tone which was the cause of haemorrhoids.

The founder of St Marks Hospital, Frederick Salmon, in his short book of rectal surgery (1828), advised bouginage. But we learn later from Allingham (1888) that Salmon modified the excision/ligation operation, incising the perianal skin, dissecting between the haemorrhoidal plexus and the anal musculature as high as the rectal mucosa, then ligating the pedicle.

Little has been added to the operation of haemorrhoidectomy since then, the exception being Whitehead's (1882) operation which involved removing the pile-bearing area of the anal canal and restoring mucosal continuity by the suturing of rectal mucosa to anal skin. It was not adopted in the UK due to the side-effects of stricture, incontinence due to loss of sensation, and soiling due to the presence of rectal mucosa in the anal canal, although it enjoyed greater popularity in America.

## The Twentieth Century

The success and safety of Salmon's operation sounded the death knell of the ligation alone technique. Many surgeons have modified this operation since, but none has altered the technique to any great extent. Those worthy of mention are Smith (1876), Alfred Cooper (1887), Quain (1854), Bryant (1861), Goodsall (Goodsall & Miles, 1900), Wallis (1907), Cripps (1884), Ball (1908), Miles (1919), Lockhart-Mummery (1923), Gabriel (1948), Devine (Devine & Devine, 1948), and, of course, the modification described by Milligan, Morgan, et al. (Milligan et al., 1937).

The end of the twentieth century saw two further developments; the diathermy haemorrhoidectomy, as described by Alexander-Williams (Sharif et al., 1991), and the stapled haemorrhoidectomy, using either a linear or a circular stapling device (Longo, 1998). All the various techniques are presently practised and supported by different surgeons, and, as yet, no one technique has proved superior to the others or been universally adopted. The debate as to the aetiology of haemorrhoids continues, with currently accepted theories including varicosity of the anal submucosal veins, vascular hyperplasia and downward displacement of the anal canal lining. It seems logical that a better understanding of aetiology may allow a more appropriate and effective surgical approach.

## Conservative Management

The history of haemorrhoids would not be complete without mention of the more conservative treatments we all practise on a daily basis. In 1657, Riverius (Riviere, 1657) was supposed to have used the topical application of nitric acid, a technique reintroduced by Houston (1843). In 1860, quacks were injecting phenol solution into piles, a technique later adopted by the medical profession, after Andrews (1879) thought it to be too dangerous to be used by the quacks.

Cauterisation was revised by Cusack, using a special clamp. This clamp was later modified by Smith, Allingham and von Langenbeck, among others.

Banding was introduced by Barron (1963), and, in many outpatient departments, has found favour over injection.

That the haemorrhoid should be featured in the medical literature of the past four thousand years, that patients in the past were prepared to risk death as a complication of surgery, and that present treatments are still far from perfect, implies that there is more to the humble pile than one first imagines.

The authors would like to acknowledge the late Sir Alan Parks, whose seminal article on the surgical history of haemorrhoids has formed the core research material for this chapter (Parks, 1955).

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# 2 Surgical Anatomy of Hemorrhoids

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## Introduction

It is surprising that, in this era of advanced medical achievements, the etiology of one of the commonest human afflictions is not exactly known. Many theories have been advanced regarding the pathogenesis of hemorrhoids, but none is entirely satisfactory. The result of studies on the surgical anatomy of the anal canal is presented with the object of obtaining a clearer understanding of its function in the light of its anatomic structure. A knowledge of such a structural-functional relationship seems necessary for understanding anal pathologies, including hemorrhoids.

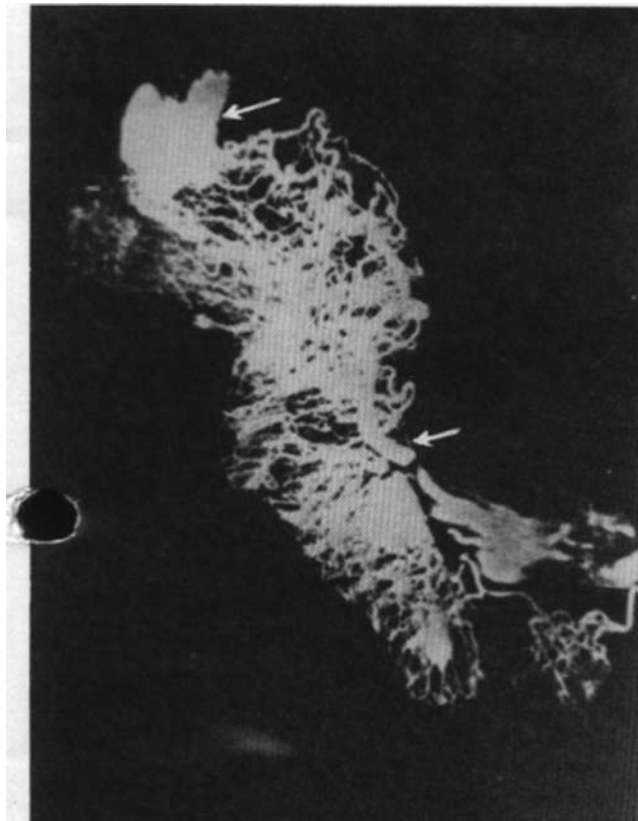
## Surgical Anatomy

In a previous study, two hemorrhoidal venous plexuses could be identified: submucosal plexus and adventitial plexus. They are connected by communicating veins.

1. **Submucosal plexus:** The veins in the rectal submucosa were arranged in transverse rings along the whole of the rectum including its neck (Figs. 2.1 and 2.2). However, this configuration faded in the pectinate area to appear as a radiological blush (Fig. 2.1); the plexus in this area seemed to be interrupted by the

attachment of the rectal neck (anal canal) cutaneous lining to the medial septum of the central tendon. Small side branches came out of the venous rings and penetrated the rectal muscle coat into the adventitia where they collected into multiple oblique veins to form the adventitial plexus. The submucosal plexus consisted of the three hemorrhoidal veins: superior, middle, and inferior; the sites of intercommunication of these veins could not be identified in the submucosa.

2. **Adventitial plexus:** This comprises oblique and vertically lying veins which intercommunicated, forming a plexus in the adventitia of the rectum and its neck (Figs. 2.3 and 2.4). The veins were larger than those of the submucosal plexus. The plexus was drained by the three hemorrhoidal veins; the sites of their communication could be identified. It was formed in the upper half of the rectum by branches of the superior hemorrhoidal vein, and in the lower half by both the superior and middle hemorrhoidal veins; whereas in the rectal neck it was formed by all three of the hemorrhoidal veins. Around the middle of the rectal neck, 3–6 oblique and sizeable “collecting veins” could be identified in the rectal adventitia. They collected into two veins which ascended on the sides to the back of the rectum and united to form the superior hemorrhoidal vein (Figs. 2.4 and 2.5).
3. **Communicating veins:** Two types of communicating veins were recognized: interhemorrhoidal and hemorrhoidogenital.



**Figure 2.1.** Cadaveric specimen showing the barium sulphate solution injected into the inferior mesenteric vein. It demonstrates that the rectal submucosal plexus extends along the whole of the rectum including its neck and is arranged in transverse venous rings. The upper arrow points to the superior hemorrhoidal vein.

- (a) **Interhemorrhoidal veins:** The three hemorrhoidal veins intercommunicated in the submucosa at the capillary level, and in the adventitia of the rectum and its neck. Yet the exact communication site between the superior and middle hemorrhoidal veins in the submucosa could not be recognized, because the submucosal plexus extended uniformly down to the pectinate line (Fig. 2.1). The blush area below this line seemed to point to the inferior hemorrhoidal plexus (Fig. 2.4). However, in the rectal adventitia the communication sites were easily identified at the rectal neck between the three veins, and around the lower third of the rectum between the superior and middle hemorrhoidal veins.
- (b) **Hemorrhoidogenital veins:** This is the name we gave to small veins which connected the adventitial hemorrhoidal with the prostatic or vaginal plexus. They varied in number from one to three veins on either side of the upper rectal neck. They lay in the rectal neck adventitia, and passed forward to reach the prostatic base and join the prostatic venous plexus (Figs. 2.2–2.5). In females, the veins proceeded to the side wall of the upper half of the vagina and joined the vaginal plexus. When the inferior mesenteric vein was injected with barium sulphate, the bladder wall in males (Figs. 2.2–2.4) and the vagina, uterus, and bladder in females were opacified through the hemorrhoidogenital