

Proper Principles and Practices in the Surgical Management of Hemorrhoids*

STEPHEN EISENHAMMER, M.B. (ED.), F.R.C.S. (ENG.)

Johannesburg, South Africa

THE TERM "HEMORRHOID" is derived from the Greek (haima = blood; rhoos = flowing) and was first used by Hippocrates in his treatises.^{1,2} The word "pile" (Latin *pila*, a ball) was used in the writings of John Arderne.³

Hemorrhoids, which are varicosities of the hemorrhoidal veins, may be internal or external. Internal hemorrhoids occupy the submucous space proximal to the dentate line. The lower portion is covered by cuboidal epithelium and the upper part by columnar epithelium. The veins form the internal hemorrhoidal plexus and are radicles of the superior hemorrhoidal vein (Fig. 1).

External hemorrhoids occupy the marginal space external to the crypt or dentate line, where the transitional epithelium is firmly attached to the internal sphincter muscle by fibroelastic fibers of the submucosae ani, called the mucosal suspensory ligament.²² This space occupies the distal portion of the anal canal, extending to the anal verge, where it is limited by a ring of terminal intermuscular fibers of the conjoined longitudinal muscle which proceed medially and upward to blend with the mucosal suspensory ligament at the dentate line. Shropshear²⁵ prefers the term "anal intermuscular septum" to designate the terminal fibers. The proximal surface of this space consists of transitional or modified squamous epithelium and that of the distal portion is true skin. The term "anoderm" aptly describes this structure. External hemorrhoids develop from branches of

the inferior hemorrhoidal veins and an equivalent arterial terminal. The two plexuses anastomose freely, deep to the crypts, and, in third-degree piles, they become joined together.

Internal hemorrhoids, being of visceral origin, are relatively insensitive, whereas external hemorrhoids are of somatic origin and are extremely sensitive.

Miles,¹⁷ in 1919, showed that the three primary piles are radicles of the superior rectal vein, which divide into left and right main branches, the latter subdividing into an anterior and a posterior terminal. Smaller secondary branches may develop between these sites, the commonest being situated on the left posterior and left anterior terminals (Fig. 2).

External piles cannot be separated from internal hemorrhoids. Surgically, the term "hemorrhoid" refers to the combined plexuses. In the early stages, while the dentate line is adherent to the muscle, either the internal or the external hemorrhoid may predominate. Usually hemorrhoids are classified into first, second, or third degrees, depending on the extent of protrusion or prolapse.

The freely-connecting external plexus varies in degree. In some instances (especially in large, heavy men) it is the dominant lesion. Occasionally the external varicosity may assume cystic proportions in the right posterior field and is called a cystic congestive external hemorrhoid. In other instances, it may be diffuse and almost encircle the anal verge. In young girls, one occasionally encounters a solitary right anterior external cystic congestive pile. It

* Received for publication June 10, 1968.

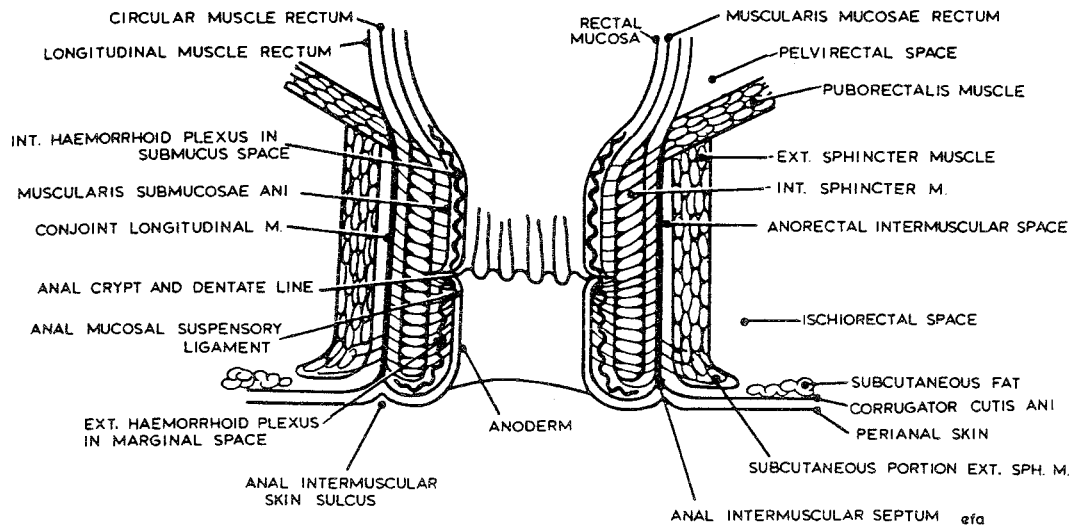


Fig. 1. Anorectal sphincter and associated anatomy.

prolapses on straining. Often, in the young male adult, an inherent instability of the external plexus may result in recurring attacks of acute hematomas.

It may be said that every person has some degree of piles. Apparently members of those races who habitually subsist on highly-spiced food have a greater incidence than undernourished people who subsist mainly on starch. Unless the patient has rare portal obstruction due to cirrhosis of the liver, thrombosis of the portal vein, or an abdominal tumor, hemorrhoids usually are caused by faulty bowel habits and abnormal straining while defecating, straining while at work, prolonged standing, sphincteric relaxation, and rectal congestion.

Internal hemorrhoids give rise to various degrees of bleeding, prolapse and discharge, whereas external hemorrhoids are responsible for painful edema, congestion and thrombosis. Rarely, profuse hemorrhage from a small perforation of an external hemorrhoidal varix may occur.

Complications of piles account for other secondary symptoms. Acute and chronic anal fissures are due to traction of a prolapsing pile or tension of posterior con-

gestive external piles. Fibrous degeneration of internal piles gives rise to polyps. Contracture of the internal sphincter, due to persistent congestive irritation of internal piles, leads to varying degrees of stenosis. The worst complication of piles is the so-called acute attack, which consists of thrombosis of prolapsed internal piles and edema. If strong sphincter spasm is associated,

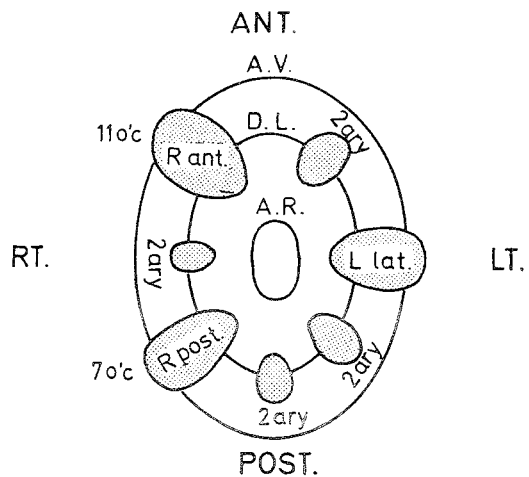


Fig. 2. The usual arrangement of primary and secondary internal hemorrhoids as viewed with the patient in the lithotomy position. AV = anal verge; DL = dentate line; AR = anorectal ring.

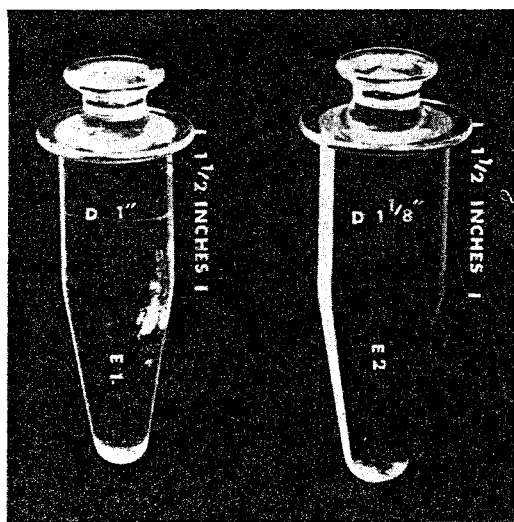


FIG. 3. The author's transparent dilators. E_1 and E_2 of 1" and $1\frac{1}{8}$ " diameter. E_2 replaces E_1 in the conservative treatment of acute anal fissure. (Manufactured by Vann Bros., Ltd., London, and Glaxo-Allenburys, Ltd., distributors, Johannesburg, South Africa.)

prolapsed internal piles may become strangulated and slough. Portal pyemia is the gravest complication but remains a theoretical danger.

No diagnosis is complete without careful, bimanual, digital, rectal-pelvic-abdominal examination, sigmoidoscopy, and abdominal palpation.

About 80 per cent of patients who have piles do not require surgical treatment. Usually, conservative treatment suffices. In all cases, education regarding the bowel habit is extremely important.

Conservative Treatment

In uncomplicated first- and second-degree hemorrhoids, when bleeding is the only problem, injection therapy is indicated. The author uses phenol, 5 per cent in almond oil, with 2 grains of menthol added to an ounce of solution. These submucosal injections require 10 to 30 ml for each internal hemorrhoid per session. Thirty ml is the maximum amount permissible. This

treatment is contraindicated when hepatic disease exists.

Many complicating fissures may resolve after hemorrhoidal injection and dilatation. The author uses a dilator of $1\frac{1}{8}$ inch diameter (Fig. 3).

In second- and third-degree hemorrhoids with prolapse, with or without bleeding and with little or no involvement of the external plexus, the method of choice is internal ligation. This applies especially to the elderly patient, the ailing and the sick. A single large recurrence after a hemorrhoidal operation often lends itself to this method. The technics of Blaisdell⁵ and of Barron⁴ are well known. The author developed his own simple technic, with self-devised instruments. This method has been used for many years with gratifying results. When large areas require ligation, to ensure complete necrosis, a central injection of water or phenol in oil, sufficient to blanch the tissues, is recommended. If this is not done, a granular residual polyp may develop, which requires diathermic destruction after a lapse of about three weeks. Figure 4 shows the instruments and technic employed by the author.

Acute thrombosis of piles occurs commonly as a lesion of the external plexus. Usually it occurs either as a superficial unilocular type or as deeper diffuse clots. Less often, multiple involvement may occur. When it is subacute, small, and pain is moderate, a large, sclerosing injection into the adjacent internal pile may be given and Varidase[®] oral tablets, one, four times a day, should be administered for four days. An astringent hygroscopic lotion of glycerine acid tannicum may be applied on gauze, covered with cotton wool, and kept in place by well-fitting jockey shorts for men and nylon stretch panties for women. This dressing should be changed three to four times a day for two days. For multiple hematomas, this plan is followed. With the single, tense, large and very painful

hematoma, it is necessary to dissect out the involved plexus under local infiltration anesthesia. The skin edges occasionally need trimming and approximating with a silk stitch. Here, too, a phenol-in-oil injection of the internal hemorrhoid helps to retract the external deformity.

Less often, an extremely painful, tense thrombosis occurs internally at the papillary end of the external pile. Strong lidocaine ointment gives sufficient analgesia to introduce a sharp bistoury through a Hirschman anoscope into the hematoma, which collapses, producing immediate and complete relief.

Thrombosis of prolapsed internal hemorrhoids represents the true "attack" of piles, and may be single or multiple. The corresponding external pile is always edematous, the plexus is congested, and there are varying degrees of thrombosis. When the sphincter is acutely spastic, strangulation may occur. Pain is extreme. After liberal application of strong anesthetic ointment, the bowels should be cleaned by a large enema. Administration of meperidine hydrochloride intravenously may be necessary. The patient is placed in the left lateral position. Gradual and strongly-increasing pressure with a firm dressing is applied over the pile mass to disperse the edema. The internal piles are now reduced by pressing them inward with a small, moist, cotton wool pad, using a lubricated index finger. If there is a single external thrombosed pile, the thrombus should be removed. To maintain reduction, it is essential to inject the upper poles of the affected fields with the maximum amount of phenol-in-oil solution. An external-pressure dressing is applied and a four-day course of Varidase® oral tablets is begun immediately. The patient is confined to bed for a day and the bowels are encouraged to move gently after 48 hours.

Generally, surgery is not advocated for acute attacks. When the hemorrhoids are

chronic, conservative dissection is advised. A single strangulated pile may be excised in the office, with the patient under local anesthesia, using a small Eisenhammer-Fansler speculum.

In internal thrombosis, when the musculature is relaxed and there is no strangulation, symptoms are correspondingly mild. Here, injection therapy, oral Varidase® tablets and external glycerine acid tannicum dressings, as previously outlined, are advised.

Indications for Surgical Operation

Definitive surgery is required for severer types of hemorrhoids which are not suited to conservative methods. The most urgent are those complicated by a severe fissure situated, generally, at the right posterior. The other type of complicating fissure is situated midposteriorly between the two mounds of congested external hemorrhoids. When soiling and discharge of prolapsed piles disturb the patient, a surgical operation should be performed. In the heavy individual, the external plexus may assume large dimensions and cause great discomfort which necessitates surgery. In the younger patient, repeated attacks of external anal hematoma may require surgery. Recurring thromboses in internal piles, with or without strangulation, can be eliminated only by operative treatment, which should be performed when the acute stage has subsided. Excessive bleeding, which is not amenable to conservative therapy, necessitates surgery. Fibrous, polypoid, prolapsing hemorrhoids can be treated only by surgery. In chronic resistant pruritus ani, due to soiling of the anal skin from prolapse and tags, surgery is imperative.

History of Hemorrhoidal Surgery

Surgery of hemorrhoids goes back a long time and, fundamentally, has changed little. The treatment and description of piles appear in many ancient writings, but not

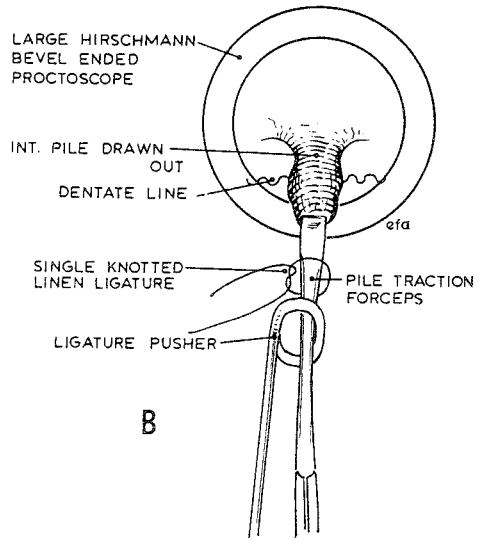
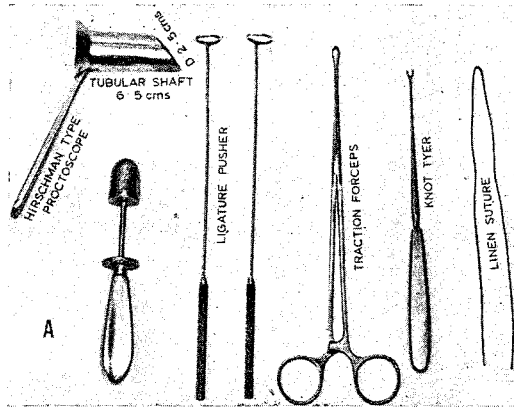
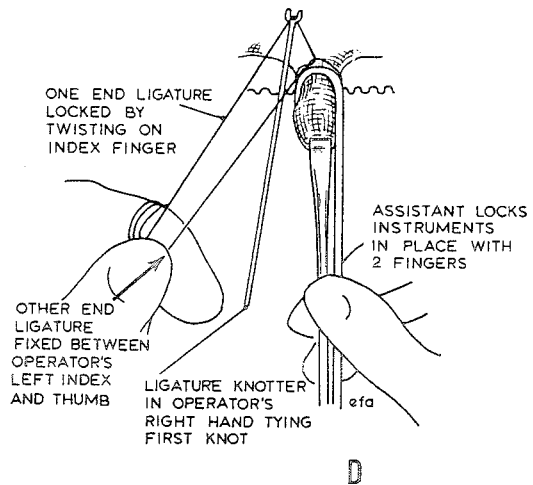
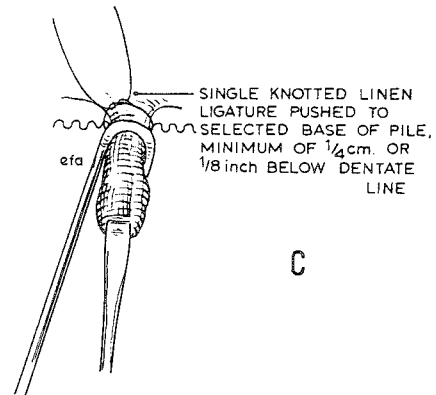


FIG. 4A (above). Instruments used in the author's method of office ligation of prolapsing internal hemorrhoids. Right: B, Drawn-out pile with single knotted ligature lying loosely above ligature pusher; C, Ligature pushed down to base of pile; D, Instruments locked in required position. Operator now uses both hands to tie the first knot strongly. Pile traction forceps and ligature pusher are removed and two more knots are tied to complete strangulation of pile at least 1/8" from dentate line.



until the era of early Greek culture did Hippocrates, in his medical treatises,^{1, 2} provide a true clinical picture and sound surgical methods consisting of a ligation operation¹ and cauterization.²

Parks²¹ states that Amida of the Byzantine era gave a good description of ligation and excision of piles, as did Paul of Aegina. Hindu medicine of Susruta Samhita, of about the fifth century A.D., gives a very good description of this operation. Arab medicine then gained the ascendancy, and the classical operation of ligation and excision persisted until the eleventh century, when intellectual leadership returned to Europe. During the next six centuries, nothing new was added. Ligation and excision and cauterization persisted until the 18th century, when much writing on the subject by eminent British surgeons appeared. However, no change came about.

The first surgeon to attempt improvement on ligation and excision of the large hemorrhoidal deformities was Jean Louis Petit.²³ He described the first dissection of the varicose plexus submucosally.

Samuel Cooper,⁷ in 1809, also developed a submucous method for excision of hemorrhoids. Unfortunately, the more difficult technic and poor instruments discouraged its practice.

In 1835, Salmon,²⁴ the founder of St. Mark's Hospital, was the first to isolate the hemorrhoidal vascular pedicle by dissection.

Whitehead,²⁷ in 1882, devised a method of circular excision of prolapsed internal hemorrhoids at the anal verge and suturing the mucosa to the skin margins. This operation disrupted the normal anatomy and physiology of the anal canal. An immediate wet anus resulted, and ectropion followed.

Mitchell,¹⁹ in 1903, introduced his clamp excision and oversewing method. This simple excision with closure was very attractive, but its unsound principles accounted for the breakdown of all wounds.

Miles,¹⁷ in 1919, described his method of excision and ligation. This was a low ligation operation and presented no advantages over the existing Salmon operation at St. Mark's, except that he introduced "pectinotomy" when contracture coexisted, and this was a brilliant contribution to anorectal surgery. Later, in 1953, this was shown by the author⁹ to be a low internal sphincterotomy.

Milligan and associates,¹⁸ in 1937, described their modification of the Salmon operation, which is the standard ligation and excision of St. Mark's Hospital. It is also known, throughout the world, as the Gabriel operation.¹⁶

In England, the Salmon operation with its improvements is truly an excision-and-ligation procedure, in contrast to that employed in the United States of America, where the vascular pedicle is ligated first and then dissected free. Basically this is a ligation-and-excision operation. The method used in the United States has always been dissection and some degree of suturing.

Fansler,¹² in 1931, described his anatomic, conservative operation and, in 1933, with Anderson,¹³ he described a plastic operation for inflamed thrombosed hemorrhoids. These operations are performed with the Fansler operating speculum. The term "anatomic" is correct, because his instrument is the only one that restores the anal canal to its correct position.

In 1941, Calman⁶ described, once again, a submucous dissection technic with conservation of the epithelial surface.

Ferguson and Heaton,¹⁵ in 1959, described their closed plastic hemorrhoidectomy, in which a modified Sims speculum was used.

Parks,²² in 1956, presented his classic paper on the surgical treatment of hemorrhoids. His submucous dissection requires the use of his ingenious self-retaining retractor. It was the first modern challenge to the excision-and-ligation procedure used in England.

Watts and associates,²⁶ in 1964, carried out an investigation to determine the best operation for piles. Degrees of healing and pain were their criteria. Their series of 104 operations consisted of the excision operation of Salmon with high and low ligation, methods of Miles and St. Mark's, excision with primary suture of Mitchell, the operation of Ferguson and Heaton, submucous excision of Parks, and excision by clamp and cautery.¹⁴ Ten days after all these types of hemorrhoidectomy, except submucous excision, extensive wounds were found in the anal canal up to the level of the anorectal ring. Breakdown of mucosal bridges between the intra-anal wounds was common and resulted in coalescence of adjacent granulating wounds; sometimes there were complete or almost complete circumferential wounds. The clamp and cautery operation caused the most extensive destruction. Mucosal healing was complete in five to six weeks. In four patients, strictures developed, and eight had excessive

fibrosis. Preliminary dilating lessened the pain, but there was little difference in the various types except that those with primary suture were more painful. At six months, four of 28 submucous excisions recurred, in contrast to one of 72 in other types.

Discussion

From the foregoing résumé of the main types of hemorrhoidal surgery, the fact emerges that the present-day operative procedure of choice is still the so-called ligation-and-excision type. Hippocrates,¹ in his treatises, described a method of transfixing the hemorrhoid with a needle and tying it with a stout thread. He also described the method² of cauterizing the hemorrhoid with red-hot irons. His cautery operation has gradually disappeared, but his method of tying off piles by transfixion suture differs little from that used in modern surgery.

One may well ask why it is that in over 2,000 years there has been little real advancement in hemorrhoidal surgery. Strict surgical principles are utilized in every part of the body, with the exception of surgery of hemorrhoids. Proctologists have striven to improve existing technics, but there has been no unanimity concerning the best procedure. The vast majority of hemorrhoidal surgery is undertaken by the general surgeon, who devotes so much time to major procedures that little time is left for the problems of the anorectum. Therefore, the surgeon utilizes the simplest and quickest technic. Thus the hemorrhoids are literally "lopped off" in the shortest time. It reminds one of the days when tonsils were guillotined in droves. There is no denying that a well-executed ligation-and-excision operation, in spite of its primitiveness, gives a good end result. It is a crude procedure, but as practiced by all and sundry there is a fairly high proportion of poor results which, unfortunately, is strongly inherent in the method.

When anesthesia was nonexistent and instruments were primitive, speed and simplicity were essential, and this was accomplished by an external traction-eversion amputative technic of ligation and excision. If there were a number of varicose masses encircling the elbow, would a surgeon perform a ligation and excision operation? Certainly not; a planned reconstructive dissection with normal anatomic restoration would be performed. However, when the highly sensitive and important anal canal has similar prolapsing masses, a crude five-minute operation, consisting of ligation and excision, thereby denuding most of the anal canal of its epithelial lining, is the accepted procedure.

The stenosis that occurs when excessive hemorrhoidal areas are removed is always situated in the midpart of the anal canal, at the dentate line, because compensation takes place from the abundant mucosa above and the abundant skin below. There are instances where excision is performed for large, acutely inflamed and thrombosed, prolapsed, internal piles, in which epithelial loss is excessive and stenosis involves the entire anal canal.

Surgeons do not realize that large, prolapsed, combined piles represent the displaced true lining of the corresponding part of the anal canal extending from the anal verge to the anorectal ring. This can be illustrated by introducing a large Sims speculum which retracts the pile mass two-thirds into the anal canal. A more somber demonstration is revealed by introduction of a large Sims speculum, after excision of this prolapsed externo-internal pile mass, when it will be seen that a large area of the anal canal is denuded of epithelium.

Therefore, to excise boldly the large pile masses and the epithelial covering, in order to cure a patient of prolapsed varicosities, is outside the bounds of modern surgical principles and is a sad reflection on present-day practices.

Reorientation of the entire approach to hemorrhoidal surgery is needed to evolve an appropriate technic, based on sound surgical principles.

General Principles of Correct Hemorrhoidal Surgery

The ideal hemorrhoid operation should aim at restoring the anal canal to its normal anatomic state and physiologic function.

This implies that a normal adequately-lined anal canal will remain at the conclusion of the operation. The external half of the anal canal must be lined by skin or anoderm, extending to the reconstituted dentate line, and the internal part must have a full mucosal lining.

The skin of the anal canal normally possesses great elasticity and distensibility and allows maximum dilatation of little more than $1\frac{1}{4}$ inches, or about 3.5 cm. This fact necessitates maximum conservatism in sacrificing the anoderm. As stated repeatedly by the author,^{10, 11} this should apply equally to all surgery of the anal canal.

The next most important requirement is correction of the prolapse. This necessitates excision of the redundant rectal mucosa, the degree of which is gauged prior to closure of the wound. All subtegumentary, submucosal, vascular and interstitial tissue must be dissected upward carefully until the internal sphincter is cleanly exposed. In some cases the longitudinal fibers covering the internal sphincter may be preserved if dissection can be accomplished cleanly.

The first step in removal of a hemorrhoid is deep introduction of a high hemostatic suture to ligate the vascular pedicle. This ligature is placed as high as possible and usually is situated just below the anorectal ring. The internal hemorrhoid is always drawn externally with a clamp when the ligature is placed, to ensure that no prolapse remains. The left anterior basal ligature is placed about $\frac{1}{4}$ inch above the internal hemorrhoid to avoid hemorrhage when dissection is carried higher.

The hemorrhoidal operation is undertaken for two distinct types. The first is not prolapsed and the dentate line is fixed. In this instance, the main lesion involves the external plexus, which causes repeated painful episodes of edema, congestion or thrombosis. Bleeding may be a feature. In the second type, prolapse is associated. In this group, the suspensory ligament is stretched and causes the interhemorrhoidal groove at the anal verge. Here, the reasons for operating are prolapse, discharge, bleeding and thrombosis. Complications of these two main groups are fissure, hypertrophied papillae, fibrous polyps, skin tags and various degrees of contracture.

Correction of the abnormalities generally requires raising wide skin and mucosal flaps. Free suturing of these flaps, in a field teeming with intestinal flora, is surgically sound because absolute or near-absolute autoimmunity exists in the tissues.

These principles have not been observed in our present-day surgery because we have failed to appreciate why, as Watts and associates²⁶ point out, conservative methods of today are surgically unsound and the ligation-and-excision method is still more commendable. All the conservative operations used in tests by Watts and associates²⁶ have definite shortcomings, either anatomically or technically.

The submucous hemorrhoid operation of Parks²² is the most widely debated method of today. It re-introduces the submucous method, using a special retractor which allows wide dissection. The first point stressed is the relative painlessness of the operation, attributed to the greatly lessened epithelial denudation of the anal wall. The postoperative painlessness of a hemorrhoidal operation is due to elimination of postoperative internal anal sphincter spasm which the author⁸ postulated in 1951 when he recommended a posterior partial internal sphincterotomy in the ligation-and-excision operation for piles. In 1955, the author

underwent a standard ligation-and-excision operation for piles at St. Mark's Hospital, together with a posterior distal-half internal anal sphincterotomy. The freedom from postoperative pain, at all stages, was remarkable. The same day, another doctor, at the same institution, also underwent a ligation-and-excision operation with no muscular interference. The pain was such, he later confided to me, that this operation should not be permitted in a human being. The relatively small amount of anal-wall exposure in the Parks operation, as compared with the vast exposure of a full ligation-and-excision procedure, has nothing to do with the diminished pain of this operation, and is best demonstrated by the fact that in a case of a small, acute fissure, where epithelial loss is nil and the lesion is minimal, the pain may be excruciating if the sphincter spasm is severe. It is thus conclusive that the relative painlessness of the Parks operation is due to the divulsive and paralyzing effect of his retractor on the internal anal sphincter, plus the unavoidable severing of numerous superficial internal sphincter fibers during the course of the dissection. After utilizing this technic, the tendency of surgeons is to include the external tag in the dissection, thus causing almost as much loss of anoderm as in the ligature operation. Saving mucosa prevents stenosis and hemorrhage and promotes quicker healing, but it fails to correct the mucosal prolapse, which is the second most important feature of the operation for prolapsed hemorrhoids. Actually, the internal self-retaining blades of the retractor, when fully separated, obscure the mucosal prolapse and interfere with its adequate removal. On the other hand, dissection of the hemorrhoidal plexus is simplified by using this instrument, which shortens the anal canal to almost $\frac{3}{4}$ of an inch (the width of the blades).

The adult healthy anal canal possesses sufficient elasticity to permit a maximum

dilatation of about 3.5 cm. This anoderm stretch takes place in parallel to the internal sphincter to which it is ultimately attached by the terminal fibers of the conjoined longitudinal tendon. The dentate line is the most adherent part, due to the fixation of the mucosal suspensory ligament and penetration of the internal sphincter by the anal crypts. In contrast, the mucosa above is relatively free and mobile. It is the lack of appreciation of these anatomic facts that accounts for failure of the closed-suture excision methods.

Mitchell¹⁹ clamped off the drawn-down everted piles, excised and oversewed them. Thus, a quantitative excision was performed, causing total epithelial loss similar to that of the ligation-and-excision operation. The suture line was thus fixed to the internal sphincter and, on dilatation, it became disrupted. The inevitable breakdown converts the operation to the open ligation-and-excision procedure.

Ferguson and Heaton¹⁵ describe a "closed hemorrhoidectomy" developed from the technic of Lynn Ferguson. Using a modified Sims speculum, the partially-prolapsed hemorrhoids are removed generously down to the muscle through a long elliptical incision, extending well beyond the external hemorrhoidal border. The edges are undercut and the sutures draw the mucosa well up. A neat funnel-shaped, fully-sutured anal canal is the result. Here again, an over-generous amount of mucous membrane is removed. The suture lines have only a small degree of lateral undercutting and freeing from the internal sphincter. Here, also, the epithelial loss is excessive and wound separation must follow dilatation. The funnel shape is due to shortening and broadening of the exit of the anal canal, caused by incising the lower prominent edges of the internal sphincter.

Fansler,¹² in 1931, described his anatomic method of hemorrhoidectomy, using gen-

eral surgical principles. His tubular operating speculum, 6 cm long and 3.5 cm in diameter, with a 2-cm slot, reduces the prolapse completely and restores the anal canal to its true anatomic position. The anal canal is excessively drawn up and is actually lengthened to more than $2\frac{1}{2}$ inches, in contrast to Parks' retractor which lessens its length to less than one inch. The rectal mucosal prolapse remains. Fansler first inserted a deep muscle-engaging ligature above the pile; the pile mass was excised through a long wedge incision, with care to ensure easy approximation of the epithelial edges. The muscle bed was cleanly exposed at the completion of dissection, as in Ferguson and Heaton's method.¹⁵ Here, too, a shortened, funnel-shaped canal results, due to division of the prominent free outer border of the internal anal sphincter, which is inadvertently incised while dissecting free the external plexus. Fansler claimed that this operation removes all abnormal tissue and reconstructs a normal terminal rectum and anal canal. When difficulty arose in inserting the instrument, he advocated a small, posterior, midline, sphincter-cutting incision. His operation approaches the closest to attaining an anatomic reconstruction because his operating speculum is the only type that restores the anal canal to its true anatomic position. The wedge-shaped excision of the hemorrhoids, although carried out in an anal canal that is stretched to a diameter of 3.5 cm, is still a quantitative excision. There is a minimum of dissection beyond the excised edges and, after resuture, a definite degree of instability is left. The anoderm is only loosely approximated. Thus, Fansler's technic ensures that the prolapse is completely removed, but the anoderm loss is excessive and stenosis may result.

With the knowledge of these various surgical procedures utilized to correct hemorrhoids, and the understanding of the

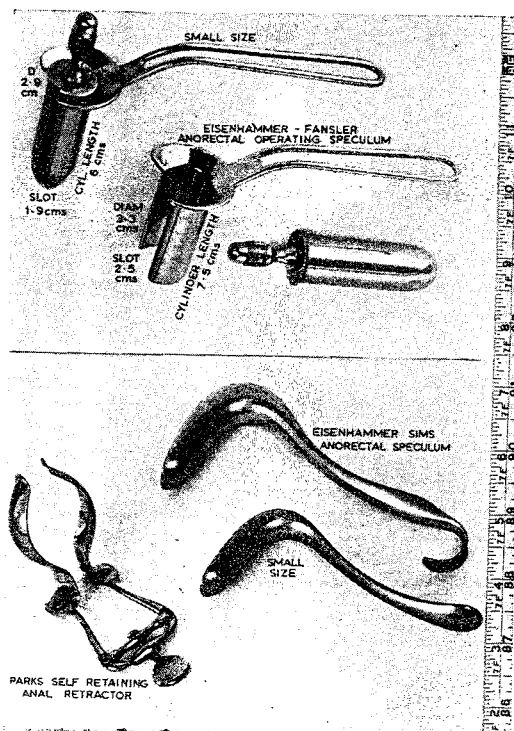


FIG. 5. Instruments necessary for conservative surgical removal of hemorrhoids. (Allen and Hansburys, Ltd., London.)

reasons for their shortcomings, it is possible to provide a technic based on sound surgical principles.

The operative steps in surgery of hemorrhoids are all carried out within the confines of the anal canal; therefore, its performance is entirely dependent on the use of a combination of instruments.

At the beginning of the procedure, the large-sized, true-angled, Eisenhammer-Sims speculum is used for assessment. The first step of the operation in each operative field is insertion of the basal hemostatic suture. The instrument causes partial prolapse and exteriorizes the hemorrhoidal field, permitting high ligation.

The Parks self-retaining retractor simplifies dissection of the plexus by compressing the field in its long axis and stretching it out transversely in a taut, fixed position.

Final restoration of the dissected anal wall flaps to their true anatomic position can be achieved only by using a large-diameter, tubular, slotted speculum of the Fansler type. The measurements of this speculum have been changed to allow wide suturing and freer dissection. The Eisenhammer-Fansler anorectal operating speculum is 7.5 cm long and 3.3 cm in diameter; the width of the slot is 2.5 cm. It has a blunt, cone-shaped obturator (Fig. 5).

Surgical Principles

The operative procedures utilized for hemorrhoidectomy vary according to the type of hemorrhoid. It is only by this means that uniformly good results can be guaranteed. No two hemorrhoids are alike, and therefore no two operations should be identical.

In general, dissection of the hemorrhoidal plexus through radial incisions is utilized. Maximum preservation of the epithelial lining of the anal canal is practiced throughout the operation. Wide flaps are created and plastic principles are used in reconstructing the anal canal.

Occasionally there is a large prolapse posteriorly, shown by an intervening scar or partially-healed area. To restore it to its anatomic position, a transverse incision

should be utilized, with excision of scar and resuture to its former position. This technic is equally applicable to a hemorrhoidal area when circumstances demand it. The method was described by Fansler and Anderson,¹³ in 1933, as a radical cure for acute, thrombosed, prolapsed hemorrhoids. Neumeister,²⁰ a pupil of Fansler's, described this operation again in 1959 (Fig. 6).

Lesser or secondary hemorrhoids require simpler surgery. Using the author's speculum, after applying a basal hemostatic ligature, the hemorrhoid is incised longitudinally and centrally. The plexus is undercut freely on both sides and finally the area is resutured, utilizing the basal ligature for the continuous closure. A small internal hemorrhoid may be destroyed by oversewing it strongly.

In the elderly patient with atonic musculature, no expanding retractor, such as that of Parks, is permissible. It is in these cases that the simple traction methods of ligature and excision have their only true application. When there is poor control, postoperative stenosis would be welcomed.

When extensive vagotomy has been performed, the type of operation should be determined by careful sphincter analysis. When postural tone is faulty, avoid stretch-

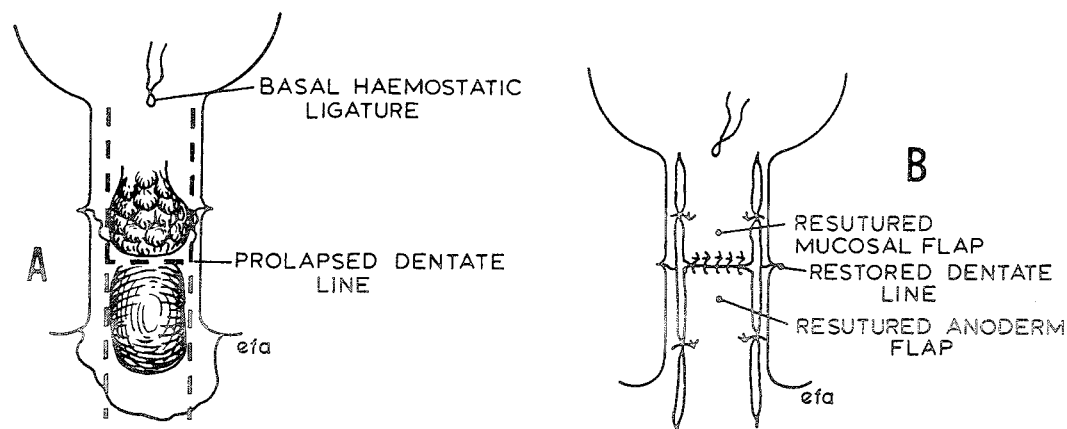


FIG. 6. Fansler-Anderson plastic operation for a prolapsed thrombosed hemorrhoid. A. Broken lines represent incision of exposure for dissection of two flaps. B. Wound closure after removal of hemorrhoid.

ing and dissecting. The simple ligation and excision operation is preferable.

Plan of Operation

The inpatient is admitted the night before operation. Bowel preparation consists of administering large soap-and-water enemas at 9:00 PM and 5:00 AM. Eight phthalylsulfathiazole tablets are given orally before each enema, and tincture of opium, 25 minims, is given orally after the second enema. Pyrilamine maleate, 50 mg, is injected half an hour before operation. A "T" bandage and two pairs of well-fitting jockey-type shorts are provided for men; nylon stretch panties are used for women.

Office-ambulant patients may have a light breakfast. The bowels are carefully cleaned with soap-and-water enemas immediately prior to operation. Here, too, pyrilamine maleate, 50 mg, is injected preoperatively.

The Standard Type of Operation

Local infiltration anesthesia is used for ambulant office patients and when general anesthesia is contraindicated. The patient is placed in a modified Sims left lateral position, with elastoplast separation of the buttocks.

With general anesthesia, the lithotomy position is used and local anesthesia is used to lessen bleeding and the amount of general anesthesia needed, and to control immediate postoperative pain.

The hair is shaved and antiseptic preparation is the preliminary step. Savlon®, in full strength, is the favorite cleansing medium—it is a mixture of chlorhexidine and cetrimide.

The local anesthetic solution consists of lidocaine, 1 per cent, with epinephrine 1:200,000 (marketed as Xylotox®). Ten ml is introduced into the intermuscular space in the posterior midline from the anorectal ring to the anal verge, using a # 18 hypodermic needle, $\frac{3}{4}$ inch long; the hub ini-

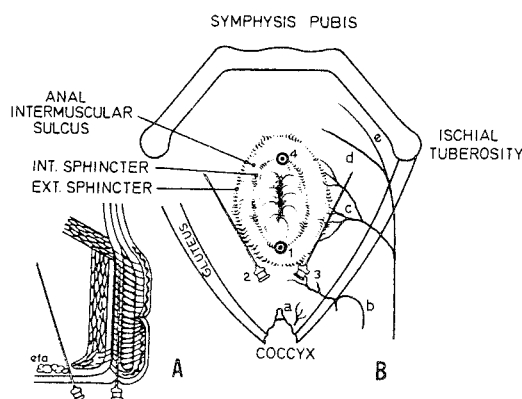


FIG. 7. Author's technic of anorectal local infiltration anesthesia. A. Coronal sectional view showing needles in intermuscular and ischioanal spaces. B. External direct view. a = anococcygeal nerve; b = fourth sacral nerve; c = inferior hemorrhoidal branch of pudendal nerve; d = perineal nerve; e = dorsal nerve, terminals of pudendal nerve. Order and positions of injections are shown by numerals 1 through 4.

tially is pressed well into the skin to reach the full space depth. Next, 10 ml of the solution is injected laterally by passing a #16 hypodermic needle, one inch in length, from posterior and just lateral to the anal verge toward Alcock's canal, a finger on the ischial tuberosity acting as a guide and infiltrating evenly along this line. The opposite side is similarly injected. Last, 5 ml is injected into the midanterior intermuscular space (Fig. 7).

After completion of the local infiltration anesthesia, a proctoscope is introduced to ensure a clean rectum. For minor soiling, simple swabbing suffices, but when conditions are bad, a 12-ounce rubber bulb with vulcanite nozzle is used to inject water and clear the bowel. Finally, cotton or gauze is inserted high, to close off the field.

The Eisenhammer modification of the Sims speculum is now inserted and the hemorrhoidal fields are examined. The right posterior or left lateral pile is dealt with first, depending on which is larger. Skin markings are made half an inch external to the outer central border of the three main piles, to indicate the outer end

of the incisions. The skin is now grasped just beyond the markings by triangular forceps, and firm, outward traction is exerted. A small artery forceps grasps the center of the internal pile and maximum prolapse is accomplished by traction with one hand while the basal ligature of 0 chromic catgut, on a #6 round Mayo needle, is introduced about half an inch above the base of the internal pile, including a bite of the internal sphincter. This is treble knotted, the short end being left about six inches long. Rarely, bleeding occurs from the puncture, necessitating a religature. If bleeding persists, a ligature should be inserted above, using the same suture and tying it off a second time. Occasionally, large hematomas have formed above the basal ligature, but they have caused no trouble.

The artery forceps is now removed, the suture is freed from the needle, wound around gauze and pushed above the basal ligature. A straight mucocutaneous incision is made radially with a small knife from just below the basal ligature over the center of the internal and external pile areas to the perianal space, half an inch beyond the outer border of the external pile at the marker point. This incision is technically difficult because the tissues are very movable and, to facilitate it, one may utilize the author's or the Parks speculum. Park's method of blowing up the tissues with a solution of saline and very weak epinephrine jeopardizes the viability of the flaps and obscures the finer details of the dissection. The outer skin edges and anoderm are raised to permit attachment of one or two artery forceps to the outermost part of the external plexus and subcutaneous tissue. When the plexus is large, a good grasp is easily obtained, but when the varicosity is small, it is difficult to get a good bite. Traction on the forceps helps to free the skin and anoderm on each side. The skin beyond the external pile is firmly

adherent to the corrugator fibers and less fixed from the point where it covers the external plexus to the dentate line, where it is attached by the suspensory ligament to the internal sphincter and also by the anal crypts, which are the greatest source of buttonholing of the flaps. The mucosa above can be dissected easily from the internal plexus (Fig. 8).

To free the flaps more widely, the Parks retractor is preferable to the Sims speculum. Attention is now directed to dissection of the plexus. The skin edges are held apart by an assistant and forceps are used to draw the external plexus inward, bringing into relief the long corrugator cutis ani fibers which pass inward to the intermuscular groove, over the subcutaneous external sphincter, and join the main termination of the conjoined longitudinal tendon. This has been referred to previously as the anal intermuscular septum. These fibers are dissected laterally with scissors and freed inward to join the forceps that grasp the main intermuscular bundle of the septum and the external plexus. This exposes the subcutaneous fat and subcutaneous external sphincter. Next, with a scalpel, the anal intermuscular septum is cut through to the lower rolled border of internal sphincter, thus freeing upward the external plexus in its anatomic marginal space. The external plexus must be freed as far laterally as possible before proceeding proximally with the superior plexus. As traction is made on the forceps attached to the freed corrugator fibers, the termination of the anal intermuscular septum and the external plexus, the lower border of the internal sphincter becomes the proximal part of the dissection. To free the plexus upward, the longitudinal fibers, with their interdigitating septa passing into the internal sphincter, must be incised carefully to avoid injury to the internal sphincter fibers. To prevent dragging the internal sphincter fibers into the plexus bundle which is

being dissected upward, blunt dissection is preferable.

Owing to shortening of the anal canal by the Parks retractor, dissection reaches the hemostatic pedicle suture quickly. The base of the freed plexus may require narrowing prior to ligation. The cotton or gauze insert and the ligature are now recovered, the Parks retractor is removed, the freed plexus is ligated at its base with the retrieved suture, and the tissue is cut away.

The author's operating speculum is now introduced, and it will be observed that the loose abundant semiprolapsed flaps are elongated and drawn far upward. This reveals the feasibility of a true anatomic reconstruction technic. Rarely, at this stage, is it necessary to introduce a suture to control a bleeding point.

The longitudinal incision of exposure mentioned in the foregoing description is more useful for moderate piles.

The flaps are now carefully assessed, and must lie comfortably apposed. The mucosa must always be inspected carefully for redundancy. An excellent instrument to be used in this connection is the Graeme Anderson hemorrhoidal forceps, with its locking device which permits shaving off the

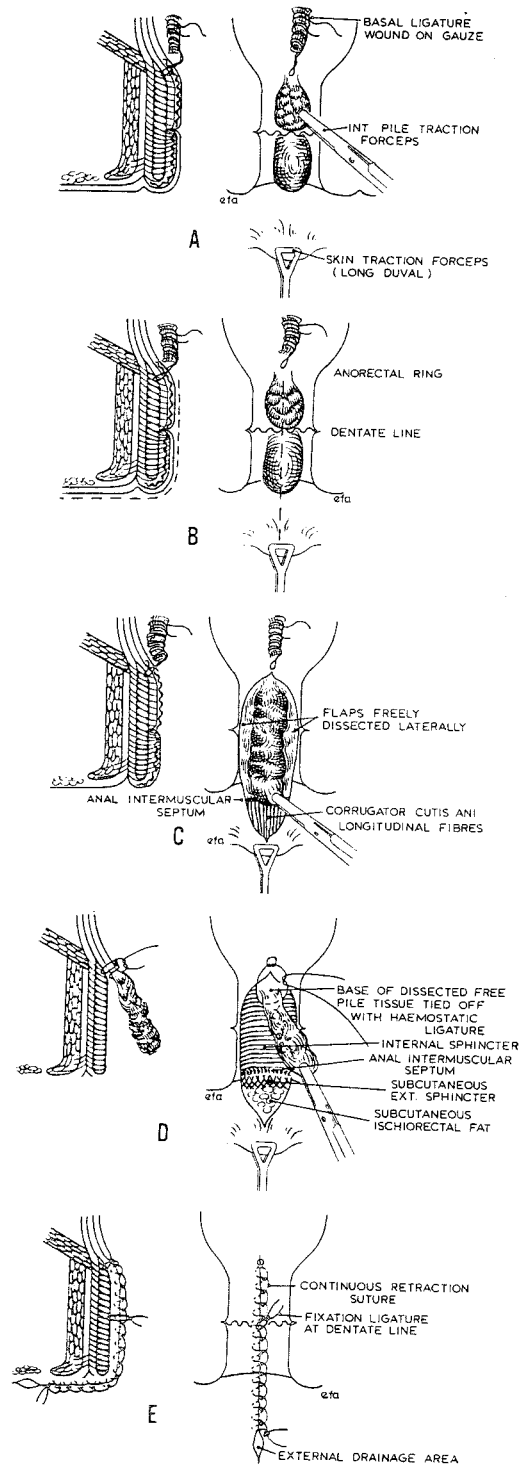


FIG. 8. Standard conservative operation for hemorrhoids. Diagrammatic representation of direct view with adjacent coronal view (half section of Fig. 1). A. Author's Sims speculum exposure. Traction forceps applied to internal pile and external skin. Insertion of deep basal hemostatic hemorrhoid ligature, which is then wound on gauze and pushed proximally. B. Long-exposure incision (broken line) shown extending $\frac{1}{2}$ inch beyond external hemorrhoid margin. C. Parks retractor exposure. Dissection of epithelial flaps, anoderm and mucosa completed. Outer angle of wound floor shows longitudinal corrugator fibers extending to intermuscular septum, outer border of external pile plexus, which continues to dentate line in marginal space. Upper floor space is occupied by internal plexus tissue. D. Same exposure. Dissection of hemorrhoidal tissue complete. Tissue mass is tied off at its base by freed basal ligature, prior to its division. E. Eisenhammer-Fansler speculum for exposure. Retraction closure suture illustrated is lying loose. Tightening of each loop retracts and markedly accordion-pleats suture line proximally to half its length.

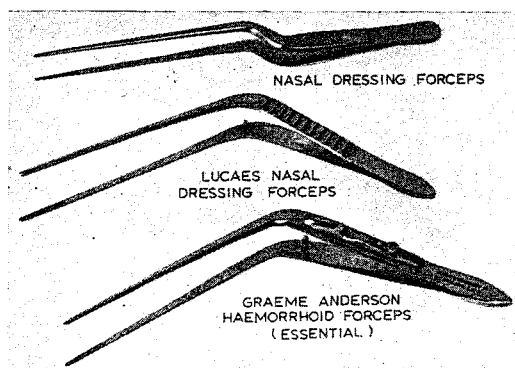


FIG. 9. Accessory dissection forceps. Graeme Anderson forceps, ideal for gauging and removal of redundant mucosa and for mapping out elliptical exposure incision where gross hypertrophy exists. Light nasal forceps are used for trimming off excess anoderm edges of flaps.

redundant portion from the upper surface of the closed blades. The author uses three different angled-type forceps (Fig. 9).

The long part of the ligature is then re-threaded onto a #6 Mayo cutting needle. Closure of the mucosa and anoderm is accomplished with a continuous through-and-through suture, tying singly each complete suture to the short end of the ligature. This is the "retraction suture" which draws the flaps well upward. To provide for drainage the suture is discontinued just short of the outer end. Finally, a single deep suture, which picks up the muscle, is placed at the dentate level.

The left lateral or posterior pile is dealt with next. Last, when dealing with the redundant portion from the upper surface anterior hemorrhoid, the basal hemostatic ligature must be placed closer to the upper pole, because if dissection is carried high it may cause bleeding which is difficult to control. Dissection here must be done with great care and not carried out too widely. Often it is preferable to leave behind the longitudinal fibers to cover the internal sphincter, thereby avoiding surface bleeding points.

This procedure suffices for moderate hemorrhoids and in cases where maximum conservation of epithelial lining is indicated.

Modifications of the Standard Operation

When the hemorrhoidal mass is greatly hypertrophied and a well-developed prolapse exists, the exposure incision is made as a wedge, about 0.5 cm wide just below the ligature and narrowing to half this width at the dentate line. This thin ellipse is continued to end half an inch beyond the external pile border. Small artery forceps are attached to the thin skin ellipse, which facilitates greatly the raising of the flaps.

It is preferable, also, to form a very thin skin ellipse in early hemorrhoids to permit small forceps to grasp the tissues. This simplifies the dissection.

The final assessment of the amount of mucosa and anoderm to be removed is made when the flaps are reduced inside and ready for suture.

Often, exposure of the three primary hemorrhoids is insufficient for complete reduction of the prolapse of the anal verge. Generally there is a large sag posteriorly, which includes a secondary pile. Here the author's speculum is used and a basal ligature is introduced above the hemorrhoid or centrally above the prolapse. A straight incision is made with a small scalpel from the ligature through the pile to prolapsed skin and 1 cm beyond. The incision is carried down to the muscle. The hemorrhoidal tissue is undercut freely.

The tip of the index finger presses the submucosal tissue into the jaws of small, fine, blunt-ended, angled scissors. The flaps are freed and drawn upward by the retraction suture. Some trimming may be necessary.

When posterior anal protrusion is large and associated with an old healed fissure, it may be necessary to dissect it free from its scar base. The scar is excised and the mucosa is freed to provide for resuturing transversely. Again, excesses are trimmed away.

If a left anterior hemorrhoid is present, it is dealt with by using the author's speculum the same as in the case of the left posterior pile. It is destroyed through a straight incision and resutured.

When there is a pronounced chronic contracture, with or without a fissure, a partial lower internal anal sphincterotomy may be performed. It must be remembered that the Parks retractor has already performed a satisfactory divulsion of the sphincter, and the dissection processes always divide an appreciable number of the superficial fibers of the internal sphincter.

An incipient hematoma may develop in the intervening fields at the anal verge. It should be opened by an external radial incision and evacuated.

When it is unnecessary to perform wide dissection of a hemorrhoid, the complete operation can be performed with the author's operating speculum. A minimum wedge incision is made, ending half an inch beyond the outer border of the external plexus. A preliminary basal hemostatic ligature is introduced, as in the other procedures. The dissection then proceeds along the same lines, but is less extensive, simpler, and can be performed much more quickly.

A speculum of small size is preferable when a single hemorrhoid is treated in an ambulant patient.

Postoperative Care

On completion of the operation, the operative fields are examined, using the Sims speculum to ensure that there is no bleeding.

Next, a digital examination is made to remove cotton or gauze pledgets. Those that are situated high are removed through a Kelly sigmoidoscope six inches long. For lighting, the author prefers a standard Winchester five-cell headlamp.

Next, a clean swab is inserted through a proctoscope above the operative field,

and two swabs soaked in 45 per cent aqueous tannic acid solution are inserted and left in the anal canal, extending outward to cover the external margins of the wounds where the dressings are firmly applied. After a moment the dressings are drawn out gently, a proctoscope is introduced to remove the protective swab, and the wound edges are swabbed with 10 per cent aqueous mercurochrome.

A five-inch, soft, amber, latex tube, with an internal diameter of $\frac{7}{32}$ " and a $\frac{3}{64}$ " wall, its inner end cut at an angle and two side holes cut in its inner two inches, is introduced into the rectum. A small safety pin transfixes its outer end.

It is fashionable to say that the tube is outmoded, because of the old idea of inserting a thick, short, firm tube (especially in England); this, in men, pressed unpleasantly against the prostate and increased the likelihood of bladder retention and pain. Bladder retention and pain were less noticeable in women.

The long, thin, soft tube used by the author obviates all these unpleasant sequelae and rectal ileus, which often persists for 48 to 72 hours, causing retention of gas and great discomfort. Equally important, it maintains the operative site at rest and keeps the anal canal and anal verge free of discharge, which passes onto the gauze saturated with glycerine acid tannicum surrounding the tube. Immediately after the tube is inserted and before the encircling gauze dressing is applied, one ounce of soft, white vaseline is introduced into the rectum. This is a practice learned from Gabriel of St. Mark's Hospital. It lubricates and keeps the tube patent.

In women, elastoplast secures the tube and dressings to the buttock and prevents its loss during urination. Generous cotton wool or gamgee cover dressings are held in place by a T bandage and, over this, two pairs of well-fitting jockey shorts or stretch nylon panties are fitted. In ambulant pa-

tients, the T bandage is omitted and Scotch tape is used to hold the dressings in place.

If urinary retention occurs, a Foley catheter, #14 or smaller, is introduced and left in place until the bowels begin to move.

Twenty-four hours later, the first change of glycerine acid tannic dressing is made. The T bandage is discarded. The tight pants alone now suffice. The dressings are changed morning and evening, until the fourth night, when an aperient is administered. The tube is removed and simple vaseline-and-gauze, self-applied dressings are continued.

After operation, triptopen, a long-acting compound of penicillin, is injected intramuscularly (unless contraindicated) and prochlorperazine, an antiemetic, is given.

Beginning the next morning, four capsules of Colace®, 100 mg each, are given each morning and each evening for four days (32 capsules in all) to ensure a soft stool. This is a valuable therapeutic agent in anal surgery, especially when sphincter repair is performed, and for three weeks only, liquid feces are permitted. On the fourth night, two ounces of liquid paraffin and milk of magnesia, plus half an ounce to an ounce of plain cascara, are given half an hour before bedtime, followed 15 minutes later by administration of a strong sleeping tablet, plus compound codeine tablets. If the bowels fail to act on the next morning, a large water enema is given.

The patient is permitted to go home the day his bowels move. A full week is spent in bed. Sitting is avoided for a week.

Hot baths are permitted after the tube is removed, and the diet unrestricted, except for avoidance of gas-producing food. Liquid paraffin, plus milk of magnesia, is recommended nightly in doses that provide one easy motion per day.

The patient returns for examination on the fourteenth and twenty-first days, when the method for anal sphincter exercises, to be done each night for at least three months, is explained.

A special plea for the installation of bidets in all toilet systems is made. After surgery of the anal canal, perfect hygiene is not possible without this apparatus. Surely, in this age when a gadget exists for cleaning nearly every conceivable thing in a household, is it necessary for civilized people to fiddle with paper and feces when the forlorn bidet sits in every plumber's establishment? There should be a public health law, making it a compulsory installation in every toilet system.

Conclusion

The object of this paper is to encourage the introduction of sound surgical principles in the treatment of hemorrhoids. This type of surgery, being executed in a confined space, must, of necessity, be difficult. The technic is arduous and requires much practice before proficiency is acquired.

It is unfortunate that the external traction methods of ligation and excision of the Hippocratic era have become a fixation complex of the general surgeon. In all other fields he excels, but when dealing with piles, he reverts to the method of the Middle Ages. The temptation to perform the five-minute operation will always exist because, when well done, the end results may be good. Unfortunately, the over-all results are ominously poor. Its apparent false simplicity is its greatest drawback and, because of this fact, every unskilled surgeon is performing many hemorrhoidal operations.

True anatomic restoration of the anal canal, after elimination of pathologic factors, using accepted and sound surgical principles, is the ideal to be sought.

Fulfillment of the correct operative technic is dependent on using the correct instruments—a combination of three—a large Eisenhammer-Sims speculum, the Parks retractor, and the author's operating tubular speculum. Each fulfills a certain mechanical principle, permitting true anatomic

reconstruction of the anal canal after wide removal of all pathologic changes. The term "plastic reconstruction of the anal canal" is justified.

A good operation can be undertaken with absolute confidence that all pathologic aspects of hemorrhoids can be cured. Proper postoperative care is relatively simple, and it removes all unpleasant sequelae and complications.

The surgical procedures described in this paper are the outcome of more than 20 years of steady and persistent progression in the management of hemorrhoids, utilizing the methods of English and American colleagues.

This technic has been used routinely for five years, and it can be concluded that there is no longer justification for the simple, quick, traction-amputation operation of ligation and excision of hemorrhoids.

References

- Adams, F.: *The Genuine Works of Hippocrates*. London, printed for The Sydenham Society, 1849, vol. 1, p. 507.
- Adams, F.: *The Genuine Works of Hippocrates*. London, printed for The Sydenham Society, 1849, vol. 2, p. 825.
- Alderne, J. C.: *Treatises of Fistula in Ano, Haemorrhoids, and Clysters*. (Edited by D'Arcy Power.) London, K. Paul, Trench, Trüber & Co., Ltd., 1910, p. 66.
- Barron, J.: Office ligation of internal hemorrhoids. *Am. J. Surg.* 105:563, 1963.
- Blaisdell, P. C.: Prevention of massive hemorrhage secondary to hemorrhoidectomy. *Surg. Gynec. Obstet.* 106:485, 1958.
- Calman, A. S.: The submucous method in the treatment of anorectal diseases. *Am. J. Surg.* 53:428, 1941.
- Cooper, S.: *A Dictionary of Practical Surgery*. London, Longmans, 1809, p. 367.
- Eisenhammer, S.: The surgical correction of chronic internal anal (sphincteric) contraction. *S. Afr. Med. J.* 25:487, 1951.
- Eisenhammer, S.: The internal anal sphincter: Its surgical importance. *S. Afr. Med. J.* 27:266, 1953.
- Eisenhammer, S.: The evaluation of the internal anal sphincterotomy operation with special reference to anal fissure. *Surg. Gynec. Obstet.* 109:590, 1959.
- Eisenhammer, S.: The anorectal fistulous abscess and fistula. *Dis. Colon & Rectum* 9:106, 1966.
- Fansler, W. A.: Hemorrhoidectomy—an anatomical method. *Lancet* 51:529, 1931.
- Fansler, W. A., and J. K. Anderson: A plastic operation for certain types of hemorrhoids. *J.A.M.A.* 101:1064, 1933.
- Farquharson, E. L.: *Textbook of Operative Surgery*. Ed. 2, Edinburgh, E. & S. Livingstone, 1962, p. 725.
- Ferguson, J. A., and J. R. Heaton: Closed hemorrhoidectomy. *Dis. Colon & Rectum* 2:176, 1959.
- Gabriel, W. B.: *Principles and Practice of Rectal Surgery*. Ed. 1 and 5, London, H. K. Lewis & Co. Ltd., 1932, 248 pp.; 1963, 739 pp.
- Miles, W. E.: Observations upon internal piles. *Surg. Gynec. Obstet.* 29:497, 1919.
- Milligan, E. T. C., C. N. Morgan, L. E. Jones, and R. Officer: Surgical anatomy of the anal canal, and the operative treatment of haemorrhoids. *Lancet* 2:1119, 1937.
- Mitchell, A. B.: A simple method of operating on piles. *Brit. Med. J.* 1:482, 1903.
- Neumeister, C. A.: Early surgical treatment of completely thrombosed prolapsed hemorrhoids. *Med. Rec. & Ann.* 52:294, 1959.
- Parks, A. G.: De Haemorrhoids (a study in surgical history). *Guy Hosp. Rep.* 104:135, 1955.
- Parks, A. G.: The surgical treatment of haemorrhoids. *Brit. J. Surg.* 43:337, 1956.
- Petit, J. L.: *Traité des maladies Chirurgicales et des Opérations qui leur Conviennent*. Paris, T. F. Didot, 1774, vol. 2, p. 137.
- Salmon, F.: Quoted by Allingham, W.: *Diagnosis and Treatment of Diseases of the Rectum*. Ed. 5, London, J. and A. Churchill, 1888, p. 143.
- Shropshire, G.: Anatomic basis for anorectal diseases. *Dis. Colon & Rectum* 7:399, 1964.
- Watts, J. M., R. C. Bennett, H. L. Duthie, and J. C. Goligher: Healing and pain after haemorrhoidectomy. *Brit. J. Surg.* 51:808, 1964.
- Whitehead, W.: The surgical treatment of haemorrhoids. *Brit. Med. J.* 1:148, 1882.