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Chapter 28

Haemorrhoids or piles

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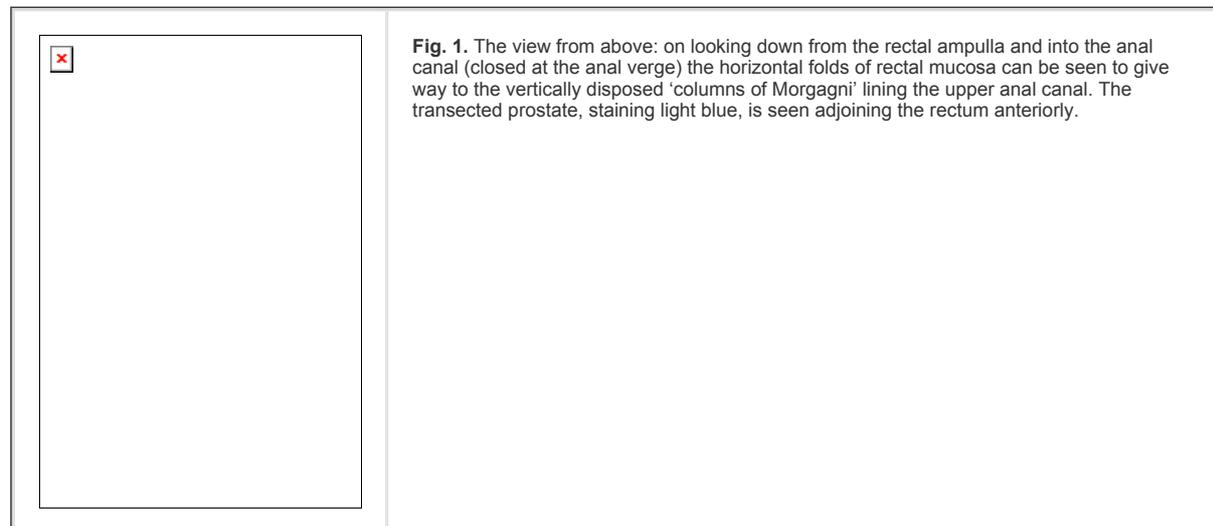
Introduction

Seldom can prevalence have been so paradoxically matched by incomprehension, or ignorance embarrassed by accessibility as in piles, for the disease is both common and easy to inspect, and yet unnecessary confusion exists. There are two reasons: a legacy of misleading terms related in turn to a misconceived pathological explanation, and an inadequacy of anatomic description. Thus disarmed by a stylized and simplistic image of anal anatomy and disabled by both erroneous terminology and time-honored myths, the qualifying doctor can be excused an inaccurate mental picture of what is in essence a simple complaint. Given a true picture of the morphology of the anal lining, however, with an understanding of its pertinent microscopic features one can readily perceive both what piles are, how they occur, and what they would look like, and be able to predict and envisage the complications to which they are prone.

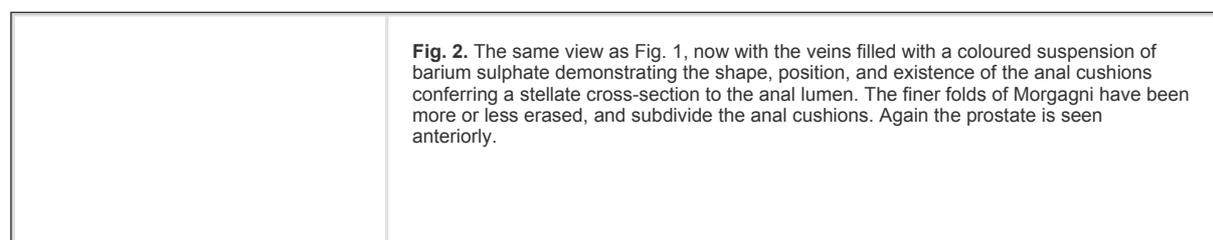
The names 'haemorrhoids' and 'piles' are essentially synonymous though differently derived from the two main—and only certain—symptoms, respectively bleeding and protrusion. The disease, though, is not the result of varicosity nor, as the reader will appreciate, are itching and pain its necessarily expected accompaniments. All this, and their logical management, will become clear from the anatomic account.

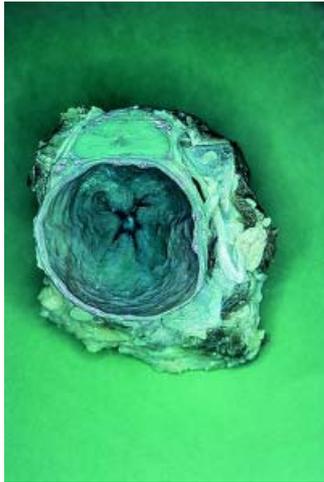
Anatomy of the anal lining

The anal canal is usually shown as a 4-cm long tube lined in its upper two-thirds by insensible mucosa and below by a hairless, glandless cuff of highly sensitive squamous epithelium, the anoderm. The mucosa is seen to be thrown into longitudinal folds (named after Morgagni) which are sometimes—incorrectly—depicted as containing vertically ascending columns of serpiginous veins. This oversimplified description derives from the usual method of preservation and dissection and provides no clue either to the intricacies of its infrastructure or the almost inevitable vagaries of its existence (Fig. 1).



If, instead, the vessels of a fresh anorectum are filled (retrogradely, from the superior rectal vein) prior to inflation and fixation, the interior of the anal canal is seen, on transection of the rectum above, to look quite different (Fig. 2). Now the anal lining bulges into the lumen as three (occasionally four) pads—each more or less impressed by the vertical mucosal folds—which have been called the anal cushions. Their presence and curious architecture are the key to piles.





The anal cushions

Nineteenth-century anatomists gave a more accurate and detailed description of the anal lining. One feature they recognized was the thickness and rich vascularity of the anal submucosa. It was in fact likened to cavernous tissue and reckoned to assist anal closure. The

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observation of its discontinuous grouping into three main and constantly sited masses, however, explained the nature of piles. We called them the anal cushions. There is often a fourth midline posterior one and their substance extends above and below the dentate line. When their component vasculature is filled they confer an appearance to the anal lining which belies the standard anodyne description (Fig. 3).



Fig. 3. An anal canal, prepared to demonstrate the anal cushions as in Fig. 2, slit open to show the interior. The anal cushions can be seen dark in their mucosal part with blood pushed down ahead of the barium sulphate suspension injected into the superior rectal vein.

Blood supply

The anal cushions receive a rich intercommunicating supply from the superior, middle, and inferior rectal (synonymously called haemorrhoidal) arteries. From five to eight branches of the superior rectal artery pass through muscular 'button holes' in the rectal ampullary wall to descend into the anal submucosa (Fig. 4(b)), there to anastomose freely with contributions from the middle and inferior vessels. Local mucosal excisional procedures will inevitably encounter substantial bleeding from any one or all three sources. Part of this supply is carried straight into the venous system by direct arteriovenous shunts and probably provides for the mechanical function (described below) without which the wealth of vasculature is not fully explained.

Fig. 4. (a) A dissection of the superior rectal artery (injected with red latex) branching within the mesorectum of an anteriorly opened anorectal specimen. (b) Branches of the superior and middle rectal arteries (injected with red latex) dissected as they emerge into the anal submucosa.



The veins of the anal submucosa are particularly notable, exhibiting one of the two entirely unique local morphological characteristics. They are distinguished by discrete dilations along their course, particularly subanodermally. These vein sacs, resemclove root, were once thought to be pathological, and in fact the underlying fault in piles. John Hunter (1728–1793) described them in a haemorrhoidectomy specimen (Spec. 1277, Hunterian Museum, Royal College of Surgeons of England) and noted the great curiosity of their being separated by segments of normal vein (Fig. 5). They are, however, normal. They occur in all adults (Fig. 6(a, b)) and are found at birth (Fig. 7). The subanodermal sacs look like petals of a blue daisy through the skin of a baby's distracted anal verge, and can also be demonstrated in the adult (Fig. 8). They drain mainly cephalad into the portal system but also through the sphincter and below it into the systemic circulation; a route, though, that dissections suggest becomes increasingly tenuous with age (Fig. 6(a, b)), which might explain the postdefaecatory anal verge engorgement and oedema that troubles some patients, and the oedema and discomfort of some prolapsed piles.



Fig. 5. A haemorrhoidectomy specimen clearly showing the vein sacs of the 'haemorrhoidal' venous plexus, here clotted.

Fig. 6. (a) Radiograph of an anorectal specimen prepared by filling the superior rectal vein with a warm barium/gelatin mixture which on cooling sets in the veins. The specimen has been slit open. The venous saccules are easily filled from above but drain poorly inferiorly into the subcutaneous perianal tributaries of the inferior rectal vein, a feature often noted in adult specimens. (b) Close-up of the slit open anal canal from an adolescent, viewed with transmitted light. The veins have been filled with latex and the tissues rendered translucent. Drainage into the inferior rectal tributaries is freer than in later life.

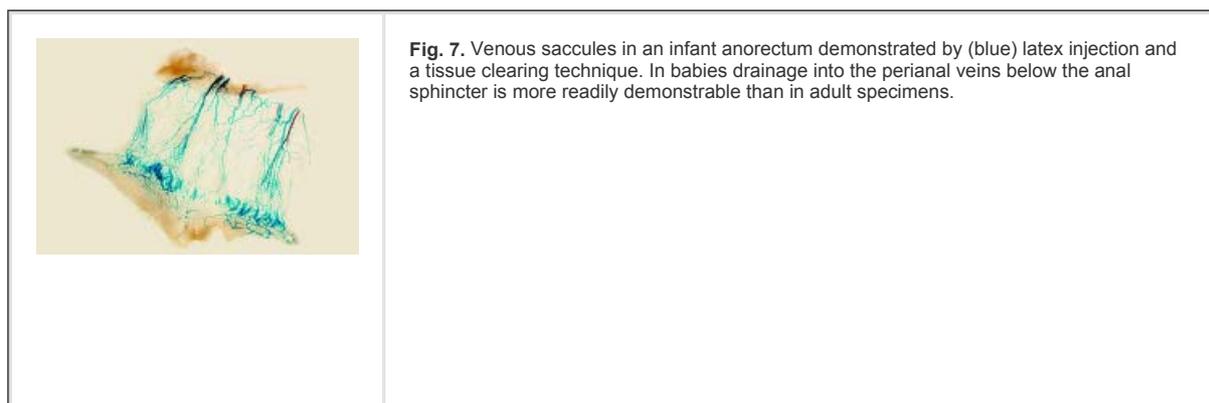


Fig. 7. Venous saccules in an infant anorectum demonstrated by (blue) latex injection and a tissue clearing technique. In babies drainage into the perianal veins below the anal sphincter is more readily demonstrable than in adult specimens.

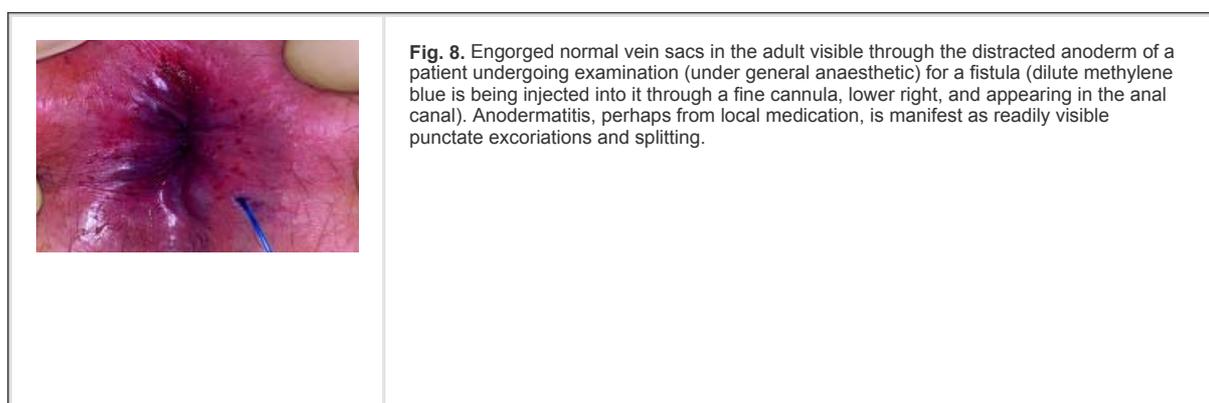
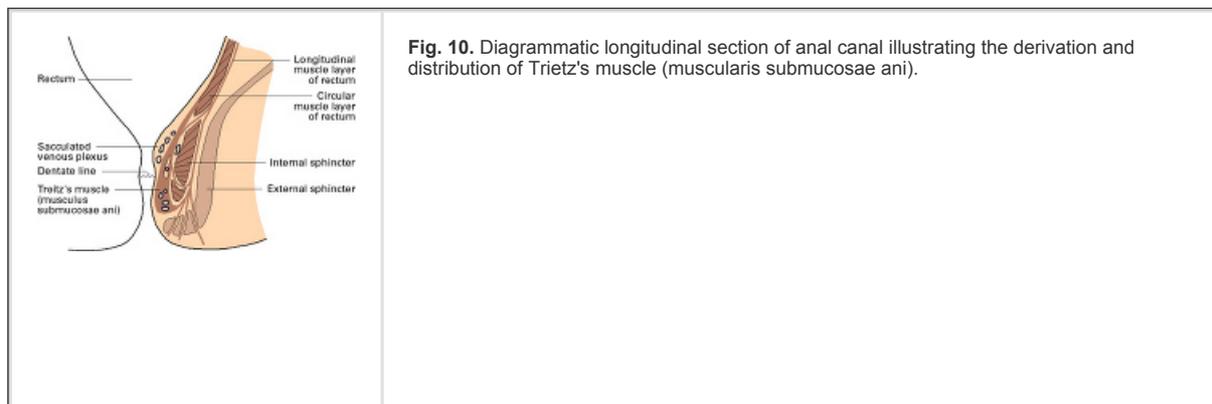
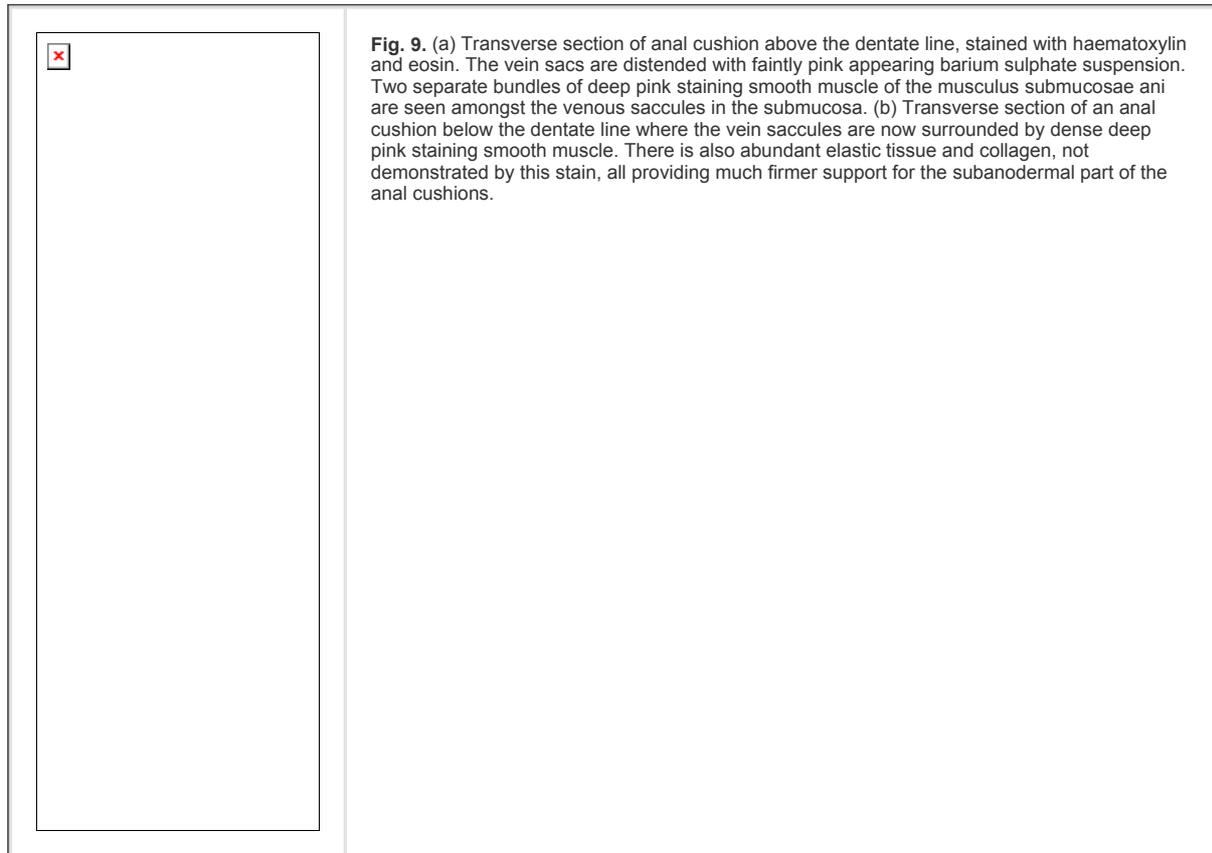


Fig. 8. Engorged normal vein sacs in the adult visible through the distracted anoderm of a patient undergoing examination (under general anaesthetic) for a fistula (dilute methylene blue is being injected into it through a fine cannula, lower right, and appearing in the anal canal). Anodermatitis, perhaps from local medication, is manifest as readily visible punctate excoriations and splitting.

Support

The cushions are held against the shearing, extruding force of defaecation by smooth muscle, the *musculus submucosae ani*, and by elastic tissue. This muscle, the second unique anatomic feature—nowhere else is muscle to be found in the submucosa—was discovered by Treitz (1853) and has been observed and drawn by others since. It descends from the internal sphincter in separate bundles (Fig. 9(a)) which coalesce subanodermally to form a dense

supporting stroma around the vein sacs (Fig. 9(b)). A longitudinal section (Fig. 10) shows its full extent and demonstrates how the looser upper part of the cushions is supported by the tough more strongly secured lower component, and how the muscle's contraction, which occurs during defaecation, both flattens the cushions and braces them against the internal sphincter.



Function

There can be no doubt that the anal cushions contribute to anal closure. The spongy substance and variable volume conferred by the vein sacs, with their direct arterial communications, imparts an appropriate texture—firm, too, below and floppy above—upon

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which the sphincter can 'squeeze' to complete closure. Of interest, an inner tube of an inflated tyre falls naturally into three parts if a band around its perimeter is tightened (David Tibbs, John Radcliffe Hospital—personal communication).

The nature of piles

The anal cushions can as we have seen be viewed from above in an appropriately prepared specimen (Fig. 2). They can also be seen anoscopically (Fig. 11), in transverse histological section (Fig. 12(a, b)), and by holding the dissected-free anal lining up to the light (Fig. 13). By whatever means of demonstration they are found constantly to occupy the left lateral (3 o'clock), right posterior (7 o'clock), and right anterior (11 o'clock) sectors of the anal circumference, and not infrequently the posterior midline, which of course is where piles present. It is logical to

conclude, therefore, that the condition we call piles or haemorrhoids results from the internal disruption and downward displacement of the anal cushions, a conclusion supported by both their macroscopic (Fig. 14) and microscopic appearance (Fig. 15(a, b)). Varicosity of the anal veins, when it (rarely) occurs (Fig. 16), looks quite different.

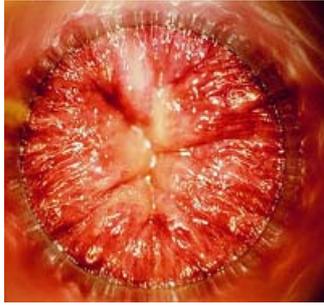


Fig. 11. The proctoscopic appearance of normal anal cushions.



Fig. 12. (a) Transverse section of the anal canal prepared to demonstrate the cushions above the dentate line. (b) Transverse section of the anal canal prepared to demonstrate the cushions below the dentate line.

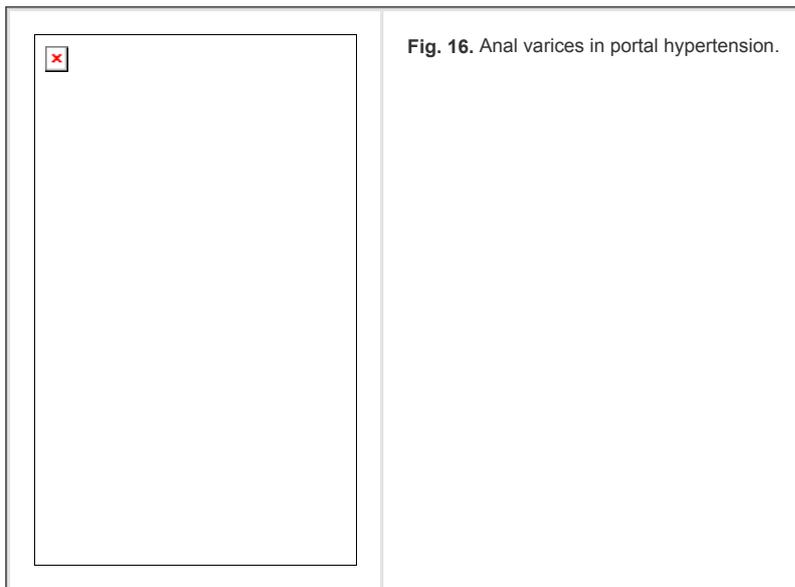


Fig. 13. The anal lining dissected from the internal sphincter and held up to the light.



Fig. 14. Prolapsed piles.

Fig. 15. (a) Longitudinal section of a haemorrhoidectomy specimen showing smooth muscle, connective tissue, and vein sacs. (b) Longitudinal section of anal canal from an autopsy specimen showing a prolapsed pile. Hypertrophied Treitz's muscle bundles are clearly seen.



Pathology

The anal cushions are disrupted to produce piles by the forces of defaecation. For many sufferers defaecatory habits and stool consistency are probably to blame. The Valsava effect of excessive straining engorges the cushions, which have lost the support of the external sphincter as it relaxes. The shearing force of hard stools will increase the damage. In other patients who claim a lifetime of regular easy bowel actions, the anal cushions may be structurally deficient. Weakness arising from the influence of progesterone on smooth muscle and elastic tissue may explain the predisposition to haemorrhoids in pregnancy, though an increase in pelvic vascularity may contribute. Many women date their haemorrhoids not to actual pregnancy but to parturition, when the supporting tissues of the anal cushions may be stretched and torn.

Histological examination often shows larger vascular spaces than normal and more prominent connective tissues but no changes not accounted for by the effects of disruption.

Classification

It is customary to classify haemorrhoids by degree: first degree, only bleeding announces their presence; second degree, spontaneously reducing prolapse at defaecation; third degree, prolapse requiring manual replacement; fourth degree, permanent prolapse. However, while a classification is required for the purpose of comparing different treatment techniques scientifically, the degree of any particular patient's piles may in fact vary with time.

The terms 'internal' and 'external' piles add little.

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Symptoms

Although the underlying lesion in piles—disruption of the supporting and anchoring tissues of the cushions—means that prolapse is inherent in their nature, bleeding is more worrying and is the usual reason for seeing a doctor. Prolapse is, however, the other unequivocal symptom. Pain, itching, and anal dysfunctional effects are less reliable diagnostic criteria.

Bleeding

The capillaries of the lamina propria are only protected by a single layer of epithelial cells, and little trauma is required to breach them.

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Since it is the more lax-textured, upper part of the anal cushion which mainly prolapses, dragging the mucosa to the outside, trauma due to wiping or contact with clothes often occurs. Repeated trauma produces a chronic inflammatory response, making the damaged mucosa a brighter red, and granular (Fig. 17) and so more friable and likely to bleed.

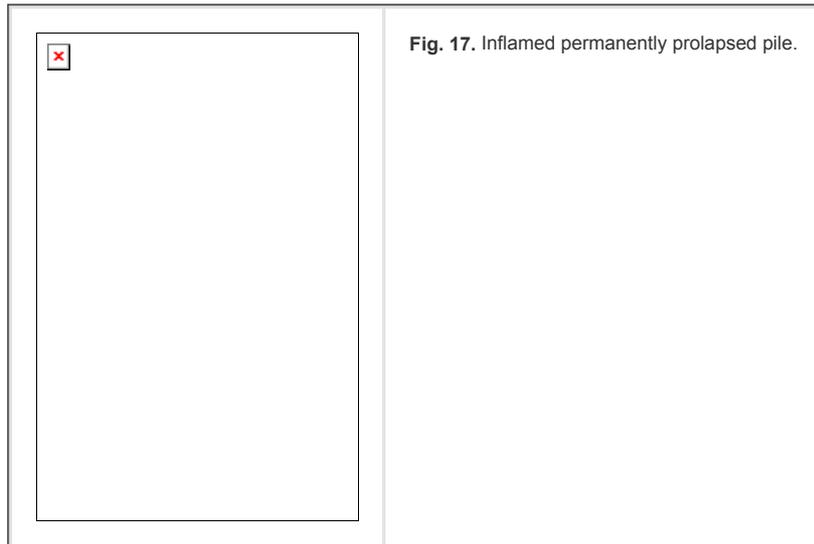


Fig. 17. Inflamed permanently prolapsed pile.

A great deal of unnecessary investigation, which is costly, inconvenient, uncomfortable, and occasionally even hazardous for the patient, can be avoided by time spent unravelling exactly what is meant by bleeding. Patient and courteous attention to detail in taking a history is always amply repaid, but never more so than here: haemorrhoids are very common, and yet bleeding may also indicate a more serious condition. First- and second-degree piles, which remain intra-anal except at defaecation, bleed with the bowel movement. Being capillary blood it is bright red. If enquiry reveals that it occasionally drips, an anal origin is certain, because the anus remains closed by tonic contraction of the sphincter except at the moment of defaecation. Blood that drips into the pan, after passage of the stool, must originate either from extruded anal mucosa, or from a fissure in the anoderm. The only other, and most uncommon, possibility is

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a rectal polyp on a long enough stalk. Similarly, bleeding into clothing is almost certainly of anal origin. Blood smeared on the stool in the pan is ominous and unlikely to be coming from piles, since freshly shed blood ought to disperse into the water. The fact that it

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remains on the stool suggests either that it has congealed there, or is mixed with mucus, indicating a higher lesion.

Passage of clotted blood also demands exculpation of a colorectal source, and a careful history may provide a useful clue. Piles may

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still be the explanation if questioning reveals that the clots were only seen on the paper; such clotting can have occurred in freshly shed blood lying at the anal verge. It is very rare for a large pile to bleed back into the rectum and

proclaim itself by passage of older clots at stool.

Prolapse

Many patients have not tried manual replacement of their piles after defaecation, having been 'afraid to', and therefore put up with more discomfort than they need. Others replace them promptly only to be demoralized and inconvenienced by their messy extrusion on exertion later.

Pain

Pain is a contentious issue in pile symptomatology. Although claimed to be a prominent and attributable problem, there seems to be no good reason why a disrupted anal cushion should actually be painful. When trapped outside the closed anus, distortion combined with oedema and congestion from lymphatic and venous impairment may well cause discomfort. In many cases pain on defaecation is due to an easily overlooked fissure. None the less, some patients do experience relief from what they had thought of as pain from successful treatment of their uncomplicated piles, and the wise clinician allows for some hyperbole, perhaps, in description.

Episodes of painful irreducible swelling which last a week or so can be most unpleasant. Often called 'strangulated' piles or an 'attack of the piles', they are usually due to greater or lesser degrees of infarction resulting from obstruction of venous drainage by thrombosis and consecutive clotting in the sacculated venous plexus. Infarction is used here in its proper sense, denoting an intravascular and interstitial 'stuffing with blood', and not in its common contemporary misusage implying necrosis. Although necrosis would supervene if circulatory impairment by venous blockage were sufficient, complete obstruction of venous return is in fact very rare and the usual outcome is spontaneous resolution as the clot shrinks and lyses and venous circulation is restored.

Itching

When the patient's main concern is itching, piles are seldom to blame. A local skin condition is usually responsible. Although treatment of coexisting piles may procure relief, it is unwise to encourage a patient greatly bothered by pruritus to believe that the answer is at hand. Mucus discharge from a prolapsed pile, however, causes an alleviable irritation in some patients.

Anorectal dysfunction

Defaecatory derangement can be excited by disrupted anal cushions causing a sensation of incomplete evacuation, particularly when further engorged by fruitless straining. Of course a feeling of unsatisfied defaecation—tenesmus—may have a more serious explanation.

Soiling

Blood and serum from the exposed inflamed mucosal part of a pile dries dark on underclothing and may be thought fecal. Only very rarely, however, do third- and fourth-degree haemorrhoids allow minor conduction of rectal contents to the surface. Mucus may also exude from the exteriorized mucosa of piles and can be the presenting symptom.

Examination

When a meticulous history suggests piles and the findings agree, examination can be confined to the anorectum. The only equipment then required is proctoscope (anoscope), rigid sigmoidoscope (rectoscope), light source, and biopsy forceps. Many, however, would disagree and argue for routine adjunctive fiber-optic inspection of the distal colon, at least in those over 40 years of age for rectal bleeding, however described and whatever the anoscopic findings. Some workers in this field indeed advocate full colonoscopy in patients aged 40 or over presenting with rectal bleeding even when bright red, on the basis of the frequency of finding right-sided pathology in those of middle age and older, but in the author's view theirs is more an argument—still unresolved—for screening.

Signs

There are several dynamic influences on a pile's presentation—the vigorous arterial supply, the presence and possibly changing diameter of the arteriovenous shunts, the variability of cushion bulk due to the capacity of the venous saccules, and the effects of cushion displacement and anal sphincter contraction on venous and lymphatic drainage. As a result, not only does the appearance change from time to time in the same patient, but the same symptom may have different causes. For instance, whereas most people complaining of prolapse have simple displacement of the anal cushion(s) (Figs 14, 17), a 'lump' felt by others may be due to engorgement of the subanodermal veins from, one presumes, impaired drainage (Figs 6, 18) or transient but most uncomfortable postdefaecatory anodermal oedema. (Fig. 19).

Fig. 18. Engorgement of the subanodermal veins masquerades as prolapse in some patients. Paucity of drainage of the venous saccules trapped outside by sphincteric closure



(Fig. 6(a)) may explain this phenomenon.



Fig. 19. Postdefaecation oedema also occasionally contributes greatly to the bulk of 'prolapse', and must result in some way from impairment of either venous or lymphatic drainage.

Piles that are transiently displaced suffer little trauma, but when the mucosal part is frequently exposed it becomes inflamed (Fig. 17). Thrombosis and clotting in the vein sacs also influence the appearance of the pile, but as an indication there will be associated discomfort or, depending on the extent of clotting and consequent infarction, frank pain. Clotting of a small part of the venous plexus causes an uncomfortable attack of swelling of the pile, with oedema but little infarction. Greater degrees of obliteration of venous drainage embarrass the circulation accordingly (Fig. 20). However, even the fully infarcted pile (Fig. 21) will, despite its appearance, resolve. Many patients who seek medical attention because of such an attack of saccular clotting, and who graphically describe the severity of the condition, have recovered by the time of specialist consultation. The term 'strangulated piles' may be misapplied to this condition, causing inappropriate and inevitably unsuccessful efforts at supposedly therapeutic replacement.

Fig. 20. Early venous clotting in an anal cushion. Individually clotted sacculles can be seen through the subanodermal oedema.

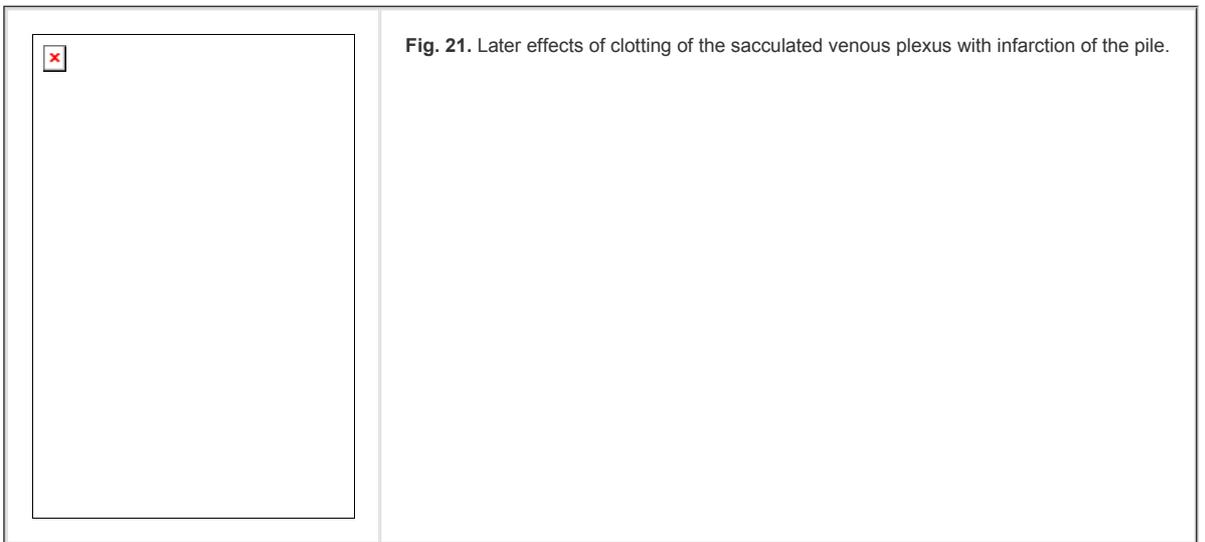


Fig. 21. Later effects of clotting of the sacculated venous plexus with infarction of the pile.

A disordered cushion may, therefore, present in one of several ways as a lump at the anal verge. Commonly, however, external inspection provides no clue to their presence, and nothing abnormal is found on anal digitation, since uncomplicated piles are impalpable. A nodular induration is felt if clotting has occurred. In most patients,

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the diagnosis is suggested by the history and confirmed with the anoscope. Interpretation of the appearance is not straightforward. Since anal cushions are normal structures (Fig. 11), their distinction from piles (Fig. 22) is only one of degree. Bright red granularity of the mucosal part of a cushion is certain evidence of its disruption, and the extent to which the cushions bulge into the instrument's end on straining and follow it out on withdrawal, provide a valuable guide. The beginner will often miss the anoscopic diagnosis of piles from failing to ask the patient to push down as if defaecating as the instrument is gradually withdrawn. A previously unimpressive anal cushion may then demonstrate its obvious disruption.

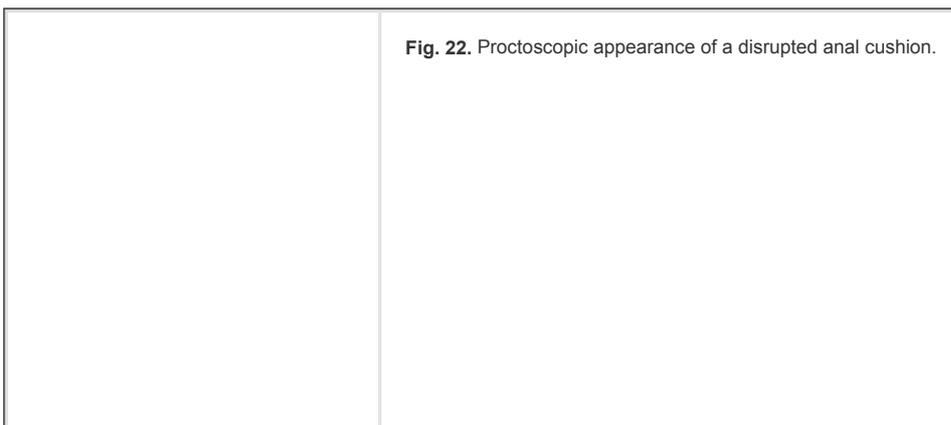


Fig. 22. Proctoscopic appearance of a disrupted anal cushion.



Rectoscopic (rigid 'sigmoidoscopic') exclusion of rectal disease is an essential part of the establishment of the diagnosis. Because piles are common, finding them does not rule out another condition higher in the rectum causing the symptoms. There is, however, no evidence for the claim still occasionally made that haemorrhoids can result from rectal carcinoma or pelvic masses.

Differential diagnosis

Anal tags

Many patients mistake anal tags for piles, and indeed the disrupted anodermal part of a cushion may have a similar appearance. Anal tags are cutaneous protruberances at the junction of the anoderm and perianal skin. They are of uncertain origin, but possibly result from local derangement of lymphatic drainage—as their occasional disarming partial reformation soon after excision suggests. They can be solitary and discrete, or form a circumferential irregular fringe (Fig. 23).

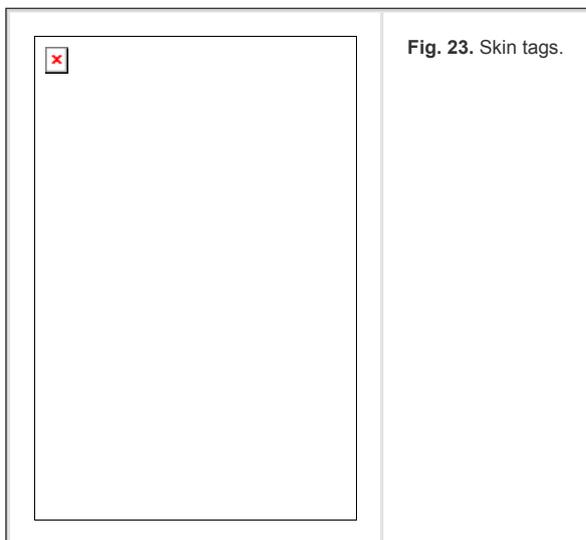


Fig. 23. Skin tags.

Fibroepithelial polyp

These are club-like protruberances from the dentate line and seem to be hypertrophied anal papillas, again possibly due to lymphatic obstruction (Fig. 24).

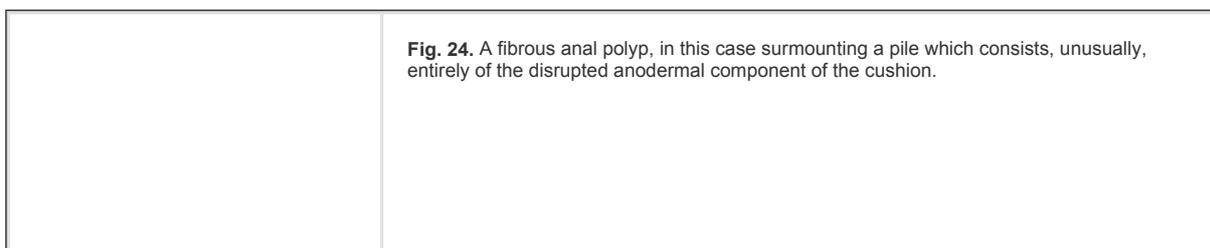


Fig. 24. A fibrous anal polyp, in this case surmounting a pile which consists, unusually, entirely of the disrupted anodermal component of the cushion.



Sentinel pile

This misnomer is given to a skin tag marking—and often containing within it—the distal end of an anal fissure, found usually in the posterior midline (Fig. 25).

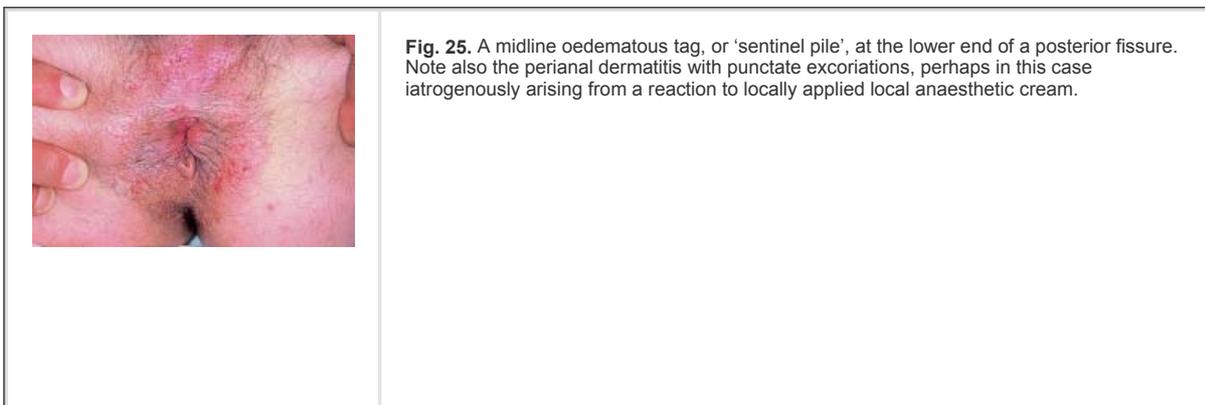


Fig. 25. A midline oedematous tag, or 'sentinel pile', at the lower end of a posterior fissure. Note also the perianal dermatitis with punctate excoriations, perhaps in this case iatrogenously arising from a reaction to locally applied local anaesthetic cream.

Fissure

A patient described as having 'painful itchy piles' may well be suffering from an anal fissure, particularly when associated with a sentinel tag masquerading as a pile. The deep burning pain of a fissure on and after defaecation and the associated itching are quite unlike the discomfort appropriate to a pile. Typically, too, the pain of a fissure will start some 30 min after defaecation and continue for 2 to several hours.

Dermatitis

Because of the widespread belief, both in the lay and the medical mind, that itching and soreness mean piles, in many patients referred for a surgical opinion the problem is in fact dermatological. Hyperkeratosis (seen as pale, slightly soggy or glazed skin), erythema, punctate

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excoriations, and multiple hairline radiating cracks—often more pronounced in the anterior or posterior midlines—will suggest the correct diagnosis (Figs 8, 25). While the occasional patient may have psoriasis and quite a few are prone to itchy rashes elsewhere, in most, in the author's experience, the problem is confined to the anus. The pain at defaecation of anodermatitis usually lasts only a matter of seconds.

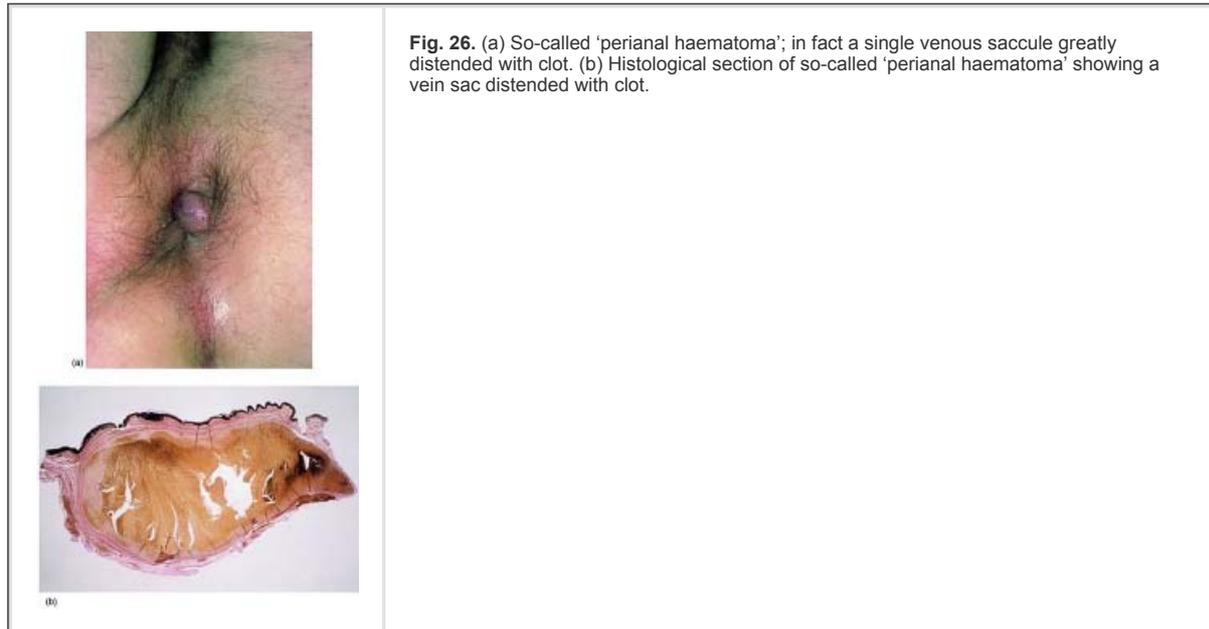
'Perianal haematoma'

The term 'pile' might easily have been inspired by this condition (Latin: *pila* = ball) so spherical and usually singular is it (Fig. 26(a, b)), and its other name, 'thrombosed external pile', is not entirely inappropriate. However, to keep our terminology exact we should use 'pile' to denote a disrupted anal cushion. These often painful lesions of sudden onset and, when not relieved by incision, of usually self-limiting nature (either by rupture or by absorption) are not in fact the ruptured blood vessel the term suggests (nor are they strictly

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speaking 'perianal', arising as they do subanodermally) but vein sacs distended by clot. The term 'clotted vein sac'

describes them accurately but though preferable is unlikely to supersede its time-honoured alternative.



Rectal prolapse

Early rectal prolapse may be confused with piles when the patient is unable to describe the size of the protrusion and is inhibited from straining sufficiently at the examination to produce it. Treatment for piles may then be instituted with later disappointment, but no substantial harm done.

Rectal tumour

Rectal tumour can easily be missed by impatient history taking and unreflective digital examination, for it is not so much the length of the finger which matters as the amount of thought behind it. Because of the rectum's curvature, even upper-third tumours may be palpable. Even when nothing is felt or seen, if the patient's symptoms do not accord with the findings further investigation is required. Ominous symptoms are old blood, particularly if slimy or clotted, tenesmus, altered bowel behaviour, deep discomfort, and 'wet'—messy—flatus.

Miscellaneous

It is a curious fact that almost any discomfort in or irregularity of the anorectum may be attributed to piles. Thus proctalgia fugax, proctitis, solitary rectal ulcer, fistula-in-ano, and warts may also all masquerade.

Treatment

Since piles may be blamed for almost any anal condition the first step is to decide whether they could be responsible for the symptoms. When itching is the main complaint piles are unlikely to be the cause, and actual pain—rather than the discomfort of protrusion or episodes attributable to attacks of thrombosis—is more likely to be due to a fissure. Chronic anal pain, of course, is never due to piles. With prolapse and bleeding, however, we are on firmer ground.

The management will be either conservative or interventional.

Conservative treatment

Although piles are by definition disrupted anal cushions, symptoms from them are partly determined by their size, which can alter greatly depending on the state of engorgement of their constituent vein sacs, which in turn is affected by straining and the state of tone of the surrounding anal sphincter. Simple avoidance of prolonged straining at stool may achieve sufficient symptomatic relief. An increase in dietary fiber, therefore, and desistance from reading in the lavatory, together with advice to ignore the false signal suggesting the need for a greater straining effort imparted sometimes by prolapsing piles may be enough.

Interventional treatment

Surgical measures work by reducing the bulk of the disrupted anal cushion (not only has its attachment loosened but its internal structure as well), and inducing adhesion of the remainder. Since the mucosal part causes most of the symptoms—all of the bleeding and mucus discharge, and most of the discomfort—its reduction will be sufficient for the majority of patients. Even a large cutaneous component may be pulled up and so be flattened and tidied by tissue

reduction above. It is therefore fortunate that the mucosa is insensitive and so allows quick and effective treatment in the outpatient clinic or office. Various techniques are available.

Rubber band ligation

In 'banding', as it is called, a 'polyp' of the pile centred sufficiently cephalad to prevent involvement of the sensitive anoderm is pulled into a ligating device passed down the anoscope and strangulated by displacing from the ring-mounting a small rubber O-ring previously rolled there from a cone loader. The incorporated tissue withers and falls away within 2 or 3 days leaving a small ulcer which is usually healed in a month.

The size of the 'polyp' banded will depend on the toughness of the tissue, the volume of redundant loose cushion, and the traction force applied by the operator. Previous intervention—banding, injection, and so on—may cause such dense scarring as to prevent the incorporation of sufficient tissue to help. Usually, however, with good grasping forceps a polyp the size of an average raspberry can be banded, and sometimes, gratifyingly, the size of a large one. Because the anatomy of the anal canal and the mechanics of banding make it impossible to ablate enough tissue to be damaging, the author takes the view that the greater the volume of the mucosal part of the pile which can be ensnared the better. The pile is therefore first carefully 'sized up' down the anoscope to choose the site to be seized by the graspers which will ensure the strangulation of the greatest part of the pile without involving the anoderm. If the amount of tissue obtained seems less than expected, a further application, this time firmly grasping and pulling on the previously banded polyp, will often achieve more (Fig. 27(a)). If on the other hand the band looks to have been placed too high or too low, a further adjoining application is worthwhile (Fig. 27(b)).

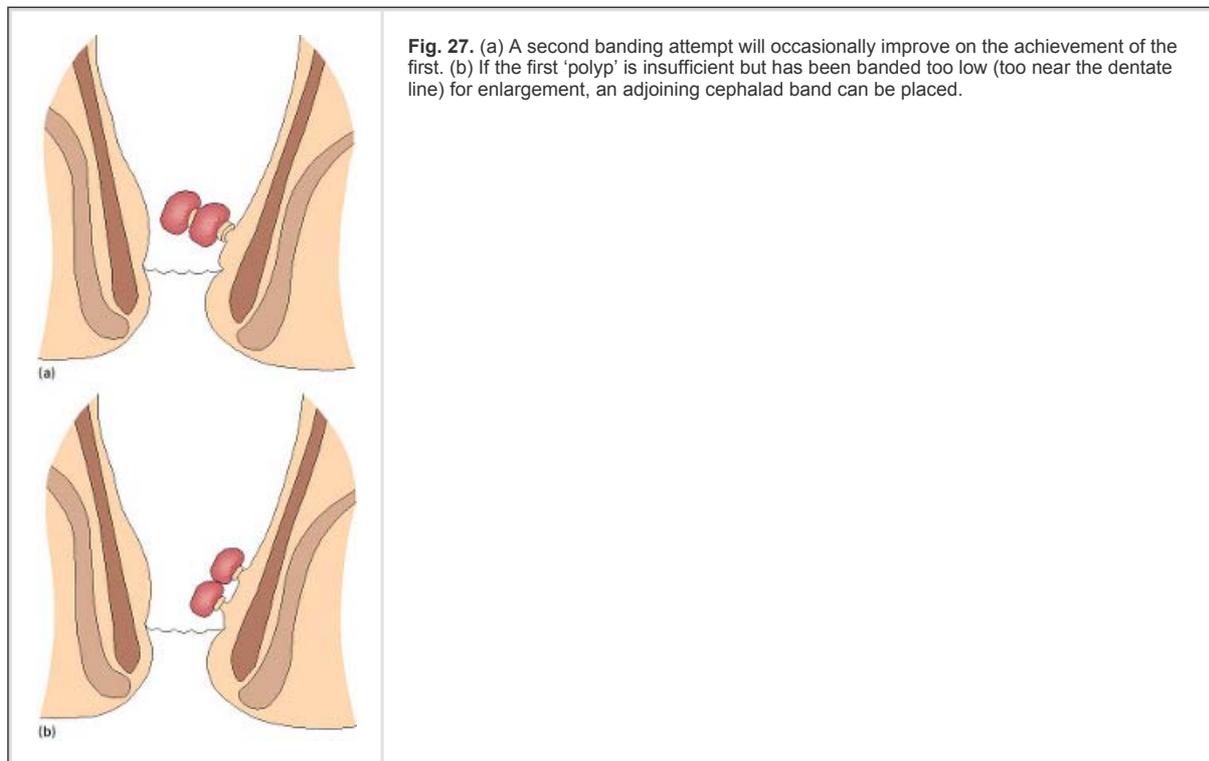


Fig. 27. (a) A second banding attempt will occasionally improve on the achievement of the first. (b) If the first 'polyp' is insufficient but has been banded too low (too near the dentate line) for enlargement, an adjoining cephalad band can be placed.

Even permanently prolapsed irreducible piles can be cured by banding. The band can be applied to the exposed mucosa outside the anal canal with complete symptomatic relief, even the cutaneous/anodermal element being improved, and anyway seldom much of a nuisance (Fig. 28).

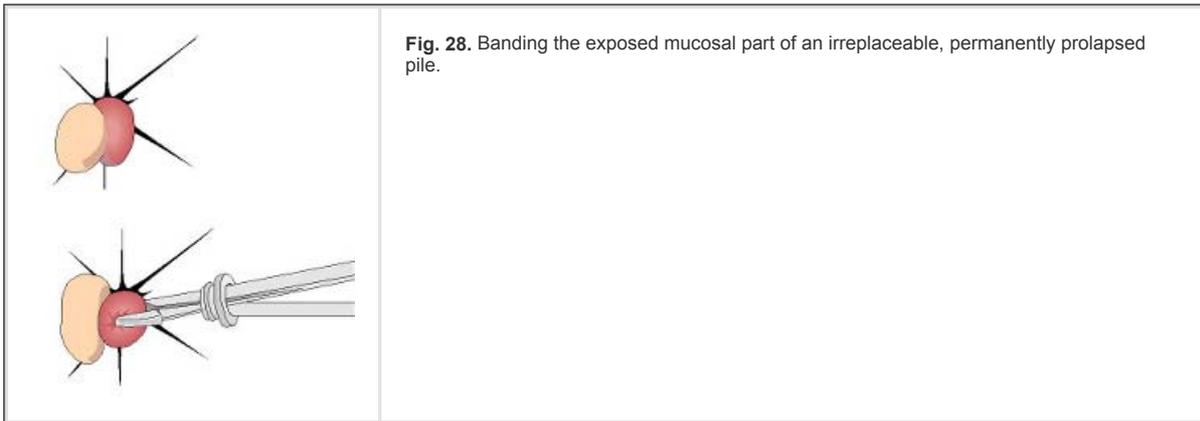


Fig. 28. Banding the exposed mucosal part of an irreplaceable, permanently prolapsed pile.

Several banding instrument models are available and although they work on the same broad principle there are two main categories, single-operator and assistant-required. As well as their self-evident attraction, single-operator banders confer the advantage that in holding the proctoscope throughout the surgeon can keep it exactly on the selected target. There are three types. One, a suction device (which can be driven by the Venturi effect of a running tap), uses a metal sucker tube—with the banding rubber ring mounted at its end and displaceable by a trigger—to suck the pile to which it is applied (under vision down any proctoscope) into it. Although straightforward to use, the need for suction may create practical difficulties, and the impossibility of knowing how much tissue has been sucked into the end for banding and how much suction can safely be applied

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without causing avulsion are deterring factors. Another consists simply of a small-diameter proctoscope with the rubber O-ring, again displaceable by a releasing mechanism, mounted at the operating end. A theoretical disadvantage to its use may be the problem of inadequacy of view. The 'One-man bander' seems to overcome both these disadvantages (Figs 29, 30). Several loaded ones are kept ready so that even multiple banding can be the work of a moment. It is designed for use down the Naunton-Morgan 'rectal speculum', a proctoscope, in fact, whose wide diameter allows a more certain diagnosis of piles than those of smaller bore (which may prevent their appreciation through providing too narrow a view). It is certainly the author's experience that piles can easily be missed down narrow anosopes.

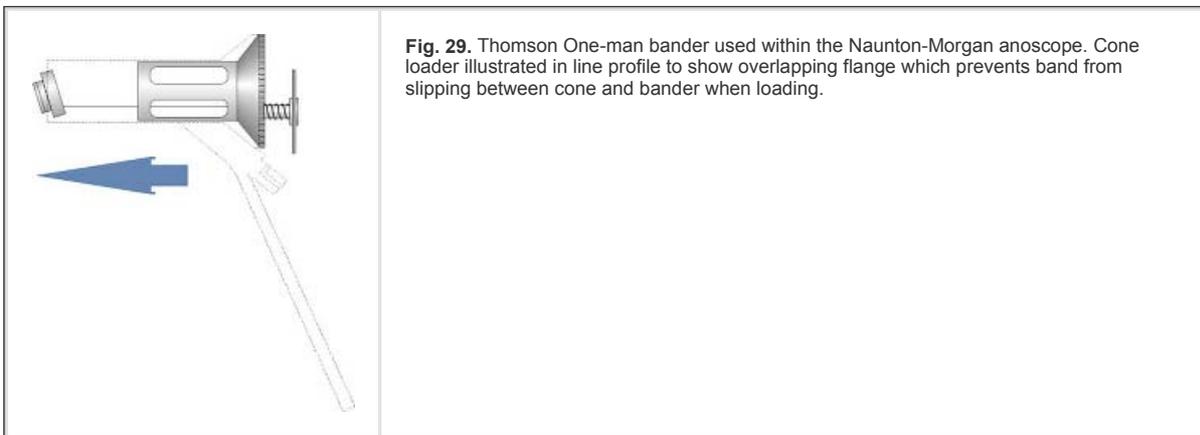


Fig. 29. Thomson One-man bander used within the Naunton-Morgan anoscope. Cone loader illustrated in line profile to show overlapping flange which prevents band from slipping between cone and bander when loading.

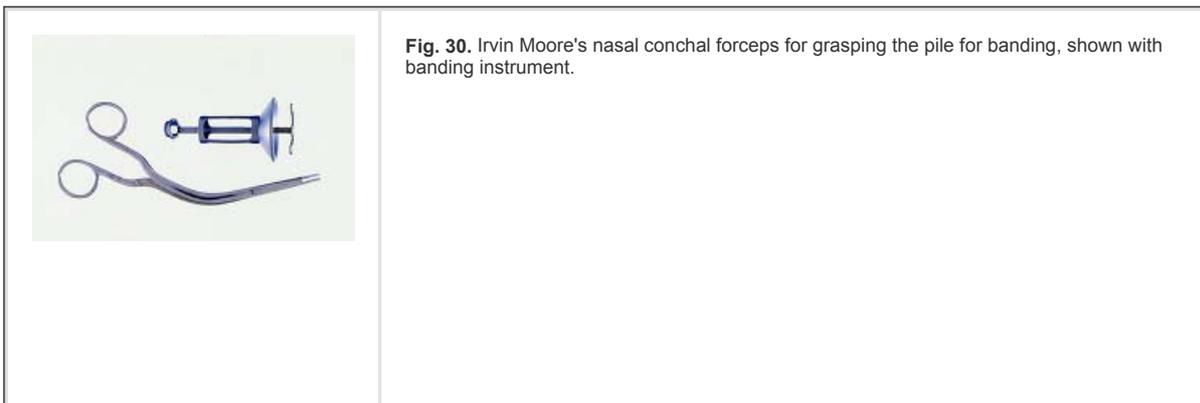


Fig. 30. Irvin Moore's nasal conchal forceps for grasping the pile for banding, shown with banding instrument.

For grasping the pile, Irvin-Moore's nasal conchal forceps seem ideally suited. They open more widely within the ring of the ligator than at least one purpose-designed model, and grip the tissue with less danger of tearing (Fig. 30).

On a note of caution, it has been the author's experience that combining pile banding with an anal stretch procedure may precipitate clotting in the residual sacculated venous plexus and so cause

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severe anal cushion infarction with its associated pain and swelling.

An empty rectum making banding easier and certainly more agreeable if not safer, it is best to have the patient self-administer a mini-enema or glycerin suppository prior to the banding. In addition, in case any pain afterwards would otherwise inhibit defaecation, it is sensible to advise patients to start a week's course of ispaghula husk or similar the day before. Finally, to make the procedure and its immediate aftermath as comfortable as possible the patients are also given analgesic tablets to take an hour before, and a supply to use afterwards.

Infrared photocoagulation and bipolar diathermy

Both of these cause tissue destruction by heat. The instruments are applied through an anoscope to coagulate a predictable volume of adjoining tissue. The mucosal part is treated so no anaesthesia is required.

In bipolar diathermy the mucosa is simply grasped by the instrument and the intervening tissue destroyed by an electric current passed across from one electrode to the other.

Sclerotherapy

An irritant chemical solution, usually 3 ml of 5 per cent phenol in arachis oil, is injected into the submucosa of the mucosal part of each pile. When the varicose vein theory of piles prevailed it was thought to act by inducing fibrosis which constricted the superior rectal venous drainage, so, it was thought, deterring the causative—as they thought (from the human's erect posture)—transmission of the supposed high pressures from the portal system. In fact it probably causes shrinkage of tissue by necrosis, and adhesion as a result of the ensuing inflammatory reaction.

Cryotherapy

A liquid nitrogen probe is placed against the pile for 3 min, and causes cold necrosis. Local anaesthesia, at least, is said to be needed.

Laser treatment

Laser evaporation has also been used for pile excision, with good initial reports. Its theoretical attraction lies in the reduction to the minimum of damage to residual tissue. However, it is an elaborate way of performing a simple task and uses expensive and fallible equipment in a forgiving area of great blood supply and margin for error in which excellent results can be obtained by simpler means. Were it to prove significantly less painful than scissor excision, and perhaps to allow more rapid healing, neither of which has so far been shown, then it might find widespread use.

Haemorrhoidectomy

When the troublesome cutaneous part of a pile is too large or immobile for patient relief simply from addressing the mucosal moiety above, scissor excision—haemorrhoidectomy—is required. However, although not 'ambulant', it is therapy that can often be done under local anaesthetic and seldom requires much more than an overnight stay. The excessively painful and prolonged experience of folk memory resulted mainly from the well intentioned use of wide-bore rubber drains or packs inserted in theater against the risk of haemorrhage. Mistaken, too, was the much encouraged belief that three-sector excision was always required ('the operation's over when it looks like a clover'), a practice unfounded in either trial or systematic experience. It arose with little doubt from the appearance of even normal anal cushions after anal manipulation in the lithotomy position, particularly when a patient is 'light' and strains under the anaesthetic. In fact the surgeon should be guided by the disease and will therefore sometimes excise in only one place, although in other cases in four. Always, however, adequate bridges of healthy tissue must be left between excision sites because not only is the anoderm of great functional importance in continence—'sampling' the rectal contents before release—but its excessive removal will result in a stricture, an avoidable tragedy. The other half of the mnemonic is certainly true, 'if it looks like a dahlia it'll end up a failure'.

The patient's rectum should be emptied prior to surgery by means of an enema administered about 2 h before. Whereas in the United Kingdom the patient is usually put 'in lithotomy' for the procedure, the prone jack-knife position is probably preferable for reasons both of access and local conditions, the anal canal's axis then being in a line with the surgeon's eye rather than, as in the lithotomy position, at an angle to it, and the vasculature not being unnaturally suffused with blood. However, the lithotomy position and the lateral position with buttocks taped apart, also useful, are easier to arrange.

Haemorrhoidectomy can be performed either open or closed and is done with scissors or diathermy (or for that matter, laser). Either way, the essential principle, emphasized by the reminder that surgery is the replacement of one lesion by another, is to keep the damage to the minimum required for symptomatic relief. Remember, too, that piles are just overlarge, floppy, and displaced parts of a structure which almost certainly contributes to anal control, so excision should leave sufficient behind. Above all, ample 'bridges' should be left. Finally, the midline anoderm, particularly

posteriorly, being so unstable and prone to fissure, it is as well to stay away from it. Therefore, a symptomatic midline posterior pile, as can occur, may be better treated by band ligation—so above the dentate line—with acceptance of any residual cutaneous irregularity there.

Open—excision/ligation—haemorrhoidectomy was popularized by Milligan and his colleagues at St Marks Hospital, London. Forceps are applied to the cutaneous part of the pile at the anal verge to reveal the mucosal moiety. A second pair then grasps the main pile

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mass which is thereby lifted from its surroundings. It is then snipped from the adjoining skin in a racket-shaped cut whose wide handle, directed cephalad above the dentate line, contains the superior rectal contribution to its blood supply (Fig. 31(a)). The elliptical part of the cut overlying the intersphincteric groove passes through the subanodermal part of the haemorrhoidal venous plexus to reveal the discrete vein sacs within. It is deepened to reveal the lower border of the internal sphincter. The pile is then dissected from the internal sphincter for a few millimetres (emerging fibres of Treitz's muscle will be encountered and divided)—both by identifying to safeguard it and to allow ligation above the dentate line (so of insensitive tissue)—so creating a thick pedicle which is transfixed and ligated (Fig. 31 (b)). The ligated remnant—most is excised—falls away in a few days to allow the open wound to heal by secondary intention. Despite that much diathermy coagulation may be required at the edges to achieve haemostasis, the wound usually contracts rapidly and will be found almost closed in as little as 10 days.

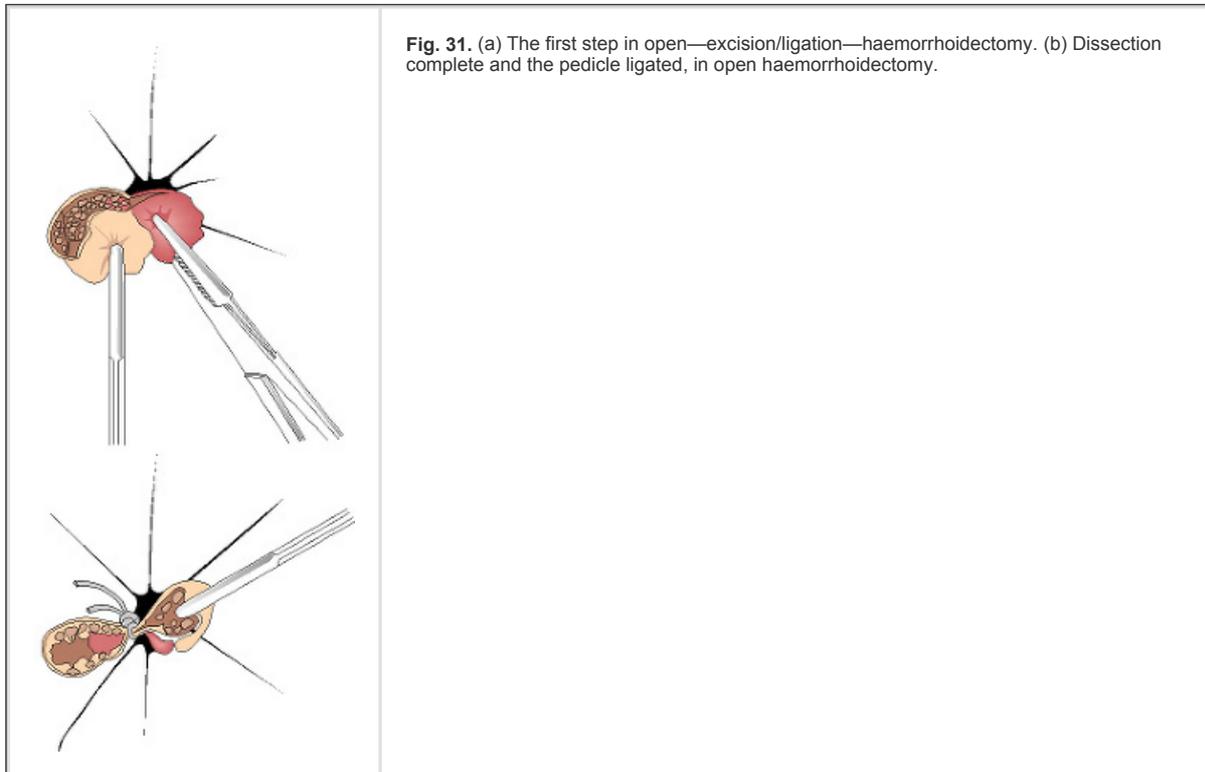


Fig. 31. (a) The first step in open—excision/ligation—haemorrhoidectomy. (b) Dissection complete and the pedicle ligated, in open haemorrhoidectomy.

The closed method, with or without submucosal excision of adjoining 'haemorrhoidal' tissue, was designed for faster healing and less pain. (The term 'haemorrhoidal' here illustrates the confusion which misleading terminology engenders. The spongy cavernous-like submucosa of the anal canal serves a valuable function in continence. Calling it 'haemorrhoidal' suggests disease and so encourages excision). It has not, however, been shown to achieve either aim, neither pain relief nor healing being improved. (Confoundingly, haemorrhoidectomy was also no more comfortable after a smooth muscle relaxant or internal sphincter division (lateral sphincterotomy)).

By operating down a wide-diameter slotted speculum the pile can be excised in its anatomic position without distortion, a technique which recommends itself from first principles alone. The pile exposed in the slot is excised within an ellipse, exposing the internal sphincter in its base, narrow enough to allow closure without tension (Fig. 32(a, b)). It is a technique which has been found most satisfactory.

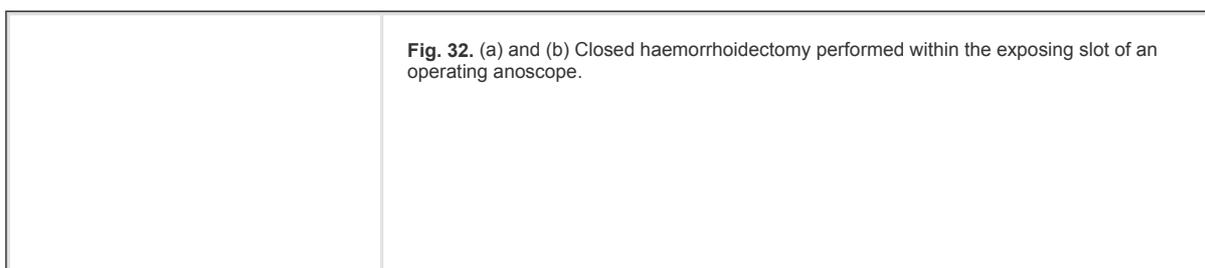


Fig. 32. (a) and (b) Closed haemorrhoidectomy performed within the exposing slot of an operating anoscope.



After haemorrhoidectomy by whichever method, light dressings are placed over the anus, perhaps kept in place by elasticated pants for easy changing. If general anaesthesia has been used the anal wounds should be thoroughly infiltrated with a long-acting local anaesthetic. The anus should not be packed. Warm baths are comforting, with or without salt, and measures are taken to keep the stools soft and regular. There is no need for the patient to stay in hospital until the bowels have moved but if they have not by the third day the patient should report back for an enema. Antibiotic cover is not required unless there is a particular predisposition to sepsis.

Manual anal dilation

This was widely practised as a treatment for piles in the last century. The nineteenth-century French surgeon, Verneuil, again reconciling its effect with the varicose vein theory, thought it improved venous drainage by stretching the rectal muscular button holes which convey the anal tributaries of the superior rectal vein. When reintroduced some years ago, it transiently displaced the surgical standby of the time, haemorrhoidectomy, but was later shown to have limited application. It probably helps patients who have discomfort and difficulty in defaecation by easing the effort of evacuation, so reducing the congestion of the cushions from excessive straining.

Pile stitching

This has been advocated. Absorbable sutures are placed above the dentate line to attach the cushion back to the internal sphincter. Obliteration of its blood supply also reduces bulk. It has a place when large piles demand amelioration yet there is a substantial risk from haemorrhage—in the presence of a cavernous haemangiomatic deformity, for instance, or when a patient must not discontinue anticoagulants.

Complications

Ephemeral

Vasovagal

A few people—mainly young males in the author's experience—faint after banding of piles, and even injection. It is therefore sensible to warn all patients to arrange to be driven home.

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Pain

Some discomfort follows all the tissue ablative procedures but amounts in some patients to severe pain lasting as long as a week. Again, prior knowledge will prevent much needless worry and also allow the patient to plan in advance.

Haemorrhage

Tissue destructive or excisional techniques will also leave a well vascularized, raw wet surface and so carry the irreducible risk of secondary haemorrhage. It is rare, but when it occurs, alarming, but once more if the patient is told of the possibility beforehand there will be less anxiety and disruption. In the author's experience only once in 20 years has continued bleeding required suture for haemostasis. In the other dozen or so instances the bleeding stopped spontaneously and without resort even to attempted tamponade with a balloon catheter. A micronized flavonoid fraction of diosmin and hesperidin (Daflon) significantly reduced secondary haemorrhage in one trial, and in an experience of 12 patients with secondary haemorrhage after haemorrhoidectomy a submucosal injection of 1:10 000 epinephrine through a proctoscope under sedation secured haemostasis each time.

Infection

Sepsis is an uncommon complication and will be treated on its merits. Fatal sepsis even after simple banding has been reported in immunocompromised patients. Stories are handed down of portal pyemia following haemorrhoidectomy, and

of necrotizing fasciitis complicating it. Both no doubt have occurred and will again but must be excessively rare. Neat surgery with the least trauma will surely reduce the possibility as will patient selection and judicious drainage rather than skin closure when the tissues have been compromised.

Urinary

Haemorrhoidectomy is notorious for causing transient difficulty in voiding in men. Banding may also induce curious bladder symptoms. Inadvertent intra- or periprostatic injection of sclerosant may have serious sequelae, even impotence being reported.

Anal cushion thrombosis

Occasionally, excessive pain seems to be attributable to thrombosis/clotting in the residual anal cushion after pile banding, the complication

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being detectable by the digital discovery of knobbly induration within the anal canal.

Permanent

Impairment of continence

A thorough study of 172 patients who had undergone haemorrhoidectomy at least 3 years previously (at a time when three sector excision was standard) found that 26 per cent had experienced a consequent impairment of control. Given the function of the anal cushions and the fact that haemorrhoidectomy may have been relegated to the end of the operating list to be performed by an unsupervised trainee, this outcome is not greatly surprising. However, if the surgeon confines tissue removal to the clearly redundant and leaves what Waldeyer called the 'corpus cavernosum recti' substantially intact, no functional impairment need be feared.

Oedema and tags

Occasionally, however careful the excision, the intervening skin bridges may swell uncomfortably with oedema to remain afterwards as tags. Though lymphatic impairment, perhaps from diathermy damage, is presumably responsible, the aetiology of anal tags is obscure; furthermore, when the entire anal lining has dislocated to form a circular curtain at the anus, the intervening bridges will of necessity remain as tags. They can be improved later under local anaesthesia if required.

Stricture

The anal lining is extraordinarily forgiving; elastic, robust, and quick healing. Only inexcusably excessive excision will result in stenosis, or some other extraordinary circumstance.

Which treatment?

A generation ago the choice was limited; for bleeding there was injection, and for prolapse haemorrhoidectomy. Nowadays open surgery is seldom necessary. The invention of outpatient tissue-reducing techniques has not only increased the possibilities but improved the prospect. At the same time the introduction of prospective randomized clinical trials has for the first time enabled scientific evaluation.

Conservative treatment has been compared with band ligation; bulk purgatives or high fibre diet with sclerotherapy, stretching, sphincterotomy, band ligation, and freezing. Banding has also been compared with sclerotherapy, haemorrhoidectomy, stretching, and infrared photocoagulation. Photocoagulation has been compared with bipolar diathermy, and one type of haemorrhoidectomy has been judged against another. Excellent and praiseworthy though such trials are they suggest a 'rivalry', when in fact no one treatment is best for all patients. Their greater merit is in showing prospectively and with careful control and monitoring that benefit can be derived from each measure, so allowing us an informed choice of the possible treatments.

However, while infrared- and electrocoagulation achieve the same objective with less pain and time off work, band ligation requires significantly fewer treatment sessions, and the instrument used is both cheaper and more robust. Multiple banding having been shown to be no more painful than a single application per visit, in the author's experience the great majority of patients are put right at one attendance. A recent overview, in fact, concluded that rubber-band ligation was the most effective 'ambulant' measure available.

Haemorrhoidectomy though requiring admission, anaesthesia, and a longer recovery, still retains its place when the cutaneous part of the pile is causing the problem. Careful and targeted surgery will be rewarded by an excellent result and a most satisfied, relieved patient.

Cryodestruction is an anatomically less accurate means of tissue ablation and leaves a smelly, weeping wound slow to heal. Laser surgery offers attractive qualities but, given the rapidity of both doing and recovering from simple scissor

excision and the cost of the equipment required, it seems unlikely to be preferred.

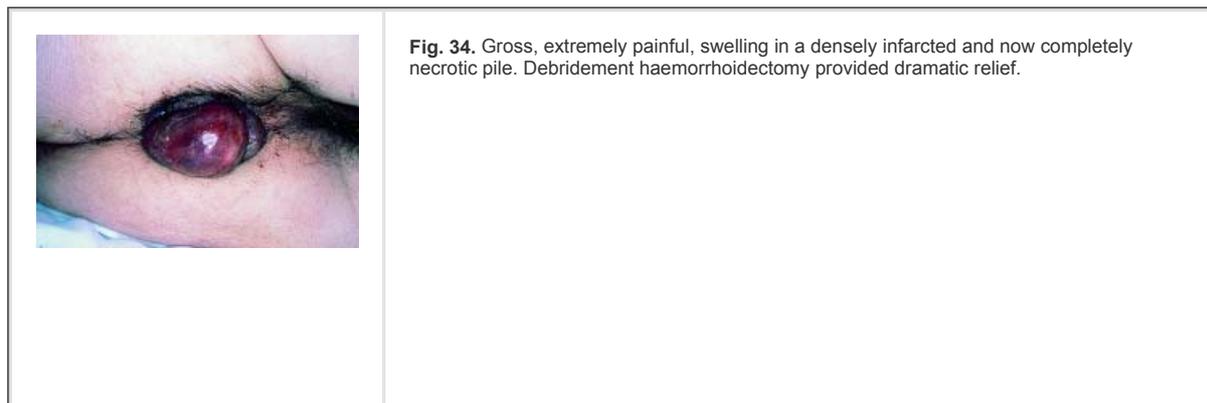
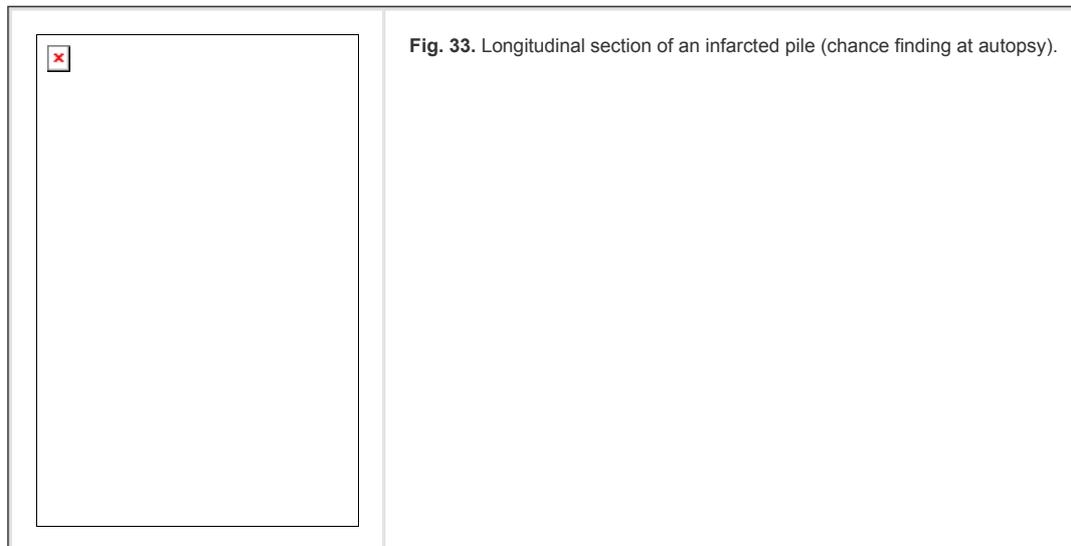
Manual anal dilation may have the occasional adjunctive place in the management of piles but would no longer be advocated as primary treatment.

Management of infarcted ('strangulated') piles

When one reflects on the necessarily turbulent flow in the sacculated venous plexus it seems odd how seldom thrombosis and clotting occurs. Afflicting a pile it causes considerable swelling and discomfort, and invites attempts at immediate amelioration. However, there have not been, and are unlikely ever to be, randomized trials of conservative and surgical treatment. In the author's experience the infarction is only rarely so dense as to cause insupportable pain and lead to necrosis, so most patients can be reassured that natural thrombolysis will restore the circulation and result in resolution in about 10 days (Fig. 21), (Fig. 33). Nitroglycerin ointment is reported to provide dramatic relief from the pain. In severe cases, however,

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there is no doubt that debridement haemorrhoidectomy, excising the worse afflicted tissue, is rewarded by rapid deliverance from misery (Fig. 34).



For the majority sufficient relief will be obtained by rest, analgesics, and hot baths, and by the medical attendant's confident prediction that the worst will be over in a week or at the most 10 days. Meanwhile they will be best advised to ensure soft regular stools by the daily consumption of ispaghula husk or its alternatives.

Conclusion

Once one understands the detailed anatomy of haemorrhoids and their pathological possibilities, their management is straightforward, and the treatment effective, acceptable, and reasonably trouble free. The important part is diagnosis. The patient's preconception that piles are responsible for their symptoms must not cloud the clinician's mind, for it does not take long experience in a busy anorectal disorder practice to realize that many patients sailing under the pennant of piles have something functional, dermatological, or otherwise idiopathic causing their symptoms. Uppermost must be the question whether reducing the bulk of the anal cushions and mooring them more firmly will logically address the presenting problem. If not, then in a nineteenth-century surgeon's words, 'in such cases prudence equally forbids the rash interposition of unavailing art, and the useless indulgence of delusive hope'.

Further reading

Bennett RE, Freidman MHW, Goligher JC. Late results of haemorrhoidectomy by ligature and excision. *British Medical Journal* 1963; **ii**: 216–19. [A functional study of 172 patients who had undergone haemorrhoidectomy 3 or more years previously. Some 26 per cent had experienced consequent impairment of control.]

Bullock N. Impotence after sclerotherapy of haemorrhoids: case reports. *British Medical Journal* 1997; **314**: 419. [A report of three men who became impotent after sclerotherapy for haemorrhoids. It is suggested that the mechanism is paraprostatic autonomic nerve plexus damage from misplaced injection.]

Gorfine SR. Treatment of benign anal disease with topical nitroglycerin. *Diseases of the Colon and Rectum* 1995; **38**: 453–6. [Five patients with thrombosed piles enjoyed 'dramatic relief of pain' from 0.5 per cent nitroglycerine ointment.]

Ho YH, Foo CL, Seow-Choen F, Goh HS. Prospective randomized controlled trial of a micronized flavonoid fraction to reduce bleeding after haemorrhoidectomy. *British Journal of Surgery* 1995; **82**: 1034–5. [A prospective randomized controlled trial in 228 patients of the effect of daflon after haemorrhoidectomy found a significant reduction in the rate of secondary haemorrhage.]

Ho YH, Seow-Choen F, Low JY, Tan M, Leong AP. Randomized controlled trial of trimebutine (anal sphincter relaxant) for pain after haemorrhoidectomy. *British Journal of Surgery* 1997; **84**: 377–9. [A prospective randomized controlled trial in 160 patients of the anal muscle relaxant trimebutine after standard haemorrhoidectomy found no reduction in pain despite a lowered mean resting anal pressure.]

Ho YH, Seow-Choen F, Tan M, Leong AFPK. Randomized controlled trial of open and closed haemorrhoidectomy. *British Journal of Surgery* 1997; **84**: 1729–30. [A prospective randomized comparison of open and closed haemorrhoidectomy in 67 patients showed faster healing after the open method but no difference in pain or complications.]

MacRae HM, McLeod RS. Comparison of hemorrhoidal treatment modalities. A meta-analysis. *Diseases of the Colon and Rectum* 1995; **38**: 687–94. [A meta-analysis of all randomized controlled comparisons of treatment modalities found that rubber band ligation was best for first to third degree piles.]

Mathai V, Ong BC, Ho YH. Randomized controlled trial of lateral internal sphincterotomy with haemorrhoidectomy. *British Journal of Surgery* 1996; **83**: 380–2. [A randomized controlled trial in 33 patients found not only no significant reduction in postoperative pain by adding lateral internal sphincterotomy to haemorrhoidectomy but an increased risk of incontinence.]

Milligan ETC, Morgan CN, Jones LE, Officer R. Surgical anatomy of the anal canal and the operative treatment of haemorrhoids. *Lancet* 1937; **ii**: 1119–24. [The first description of excision/ligation ('open') haemorrhoidectomy, which had been originated by Salmon at St Mark's Hospital, London, in the nineteenth century.]

Nivatvongs S. Hemorrhoids. In: Gordon PH, Nivatvongs S, eds. *Colon, rectum, and anus*. Quality Medical Publishing Inc., Missouri, 1992. [A well-illustrated description of Fansler's intra-anal 'anatomic' haemorrhoidectomy.]

Nyam DC, Seow-Choen F, Ho YH. Submucosal adrenaline injection for posthemorrhoidectomy hemorrhage. *Diseases of the Colon and Rectum* 1995; **38**: 776–7. [Complete haemostasis was obtained by submucosal 1:10 000 epinephrine injection under sedation in 12 of 12 patients suffering secondary haemorrhage after haemorrhoidectomy.]

Perez-Miranda M, Gomez-Cedenilla A, Leon-Colombo T, Pajares J, Mate-Jimenez J. Effect of fiber supplements on internal bleeding hemorrhoids. *Hepato-Gastroenterology* 1996; **43**: 1504–7. [A prospective randomized controlled study in 50 patients with bleeding internal haemorrhoids found the addition of fibre to the diet (compared with placebo) to result in both an objective and a subjective improvement.]

Pfenninger JL. Modern treatment for internal haemorrhoids. *British Medical Journal* 1997; **314**: 1211–12. [A leading article concludes from an overview of published data that 'scalpel surgery is now rarely needed'.]

Thomson WHF. The nature of haemorrhoids. *British Journal of Surgery* 1975; **62**: 542–52. [A detailed anatomical study of the structure and blood supply of the anorectum in 95 cadaveric specimens, 10 them from infants.]

Thomson WHF. The one-man Bander: a new instrument for the elastic ligation of piles. *Lancet* 1980; **ii**: 1006–7. [A new device is presented.]

Thomson WHF. The real nature of 'perianal haematoma'. *Lancet* 1982; **ii**: 467–8. [A pathological study of so-called 'peri-anal haematoma'.]
