

Current perspectives on the pathogenesis and management of haemorrhoids

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ABSTRACT

Haemorrhoids are usually asymptomatic, and are considered a disease only if they become symptomatic. The commonest symptoms are rectal bleeding and mucosal prolapse. In the majority of patients, haemorrhoids can be managed conservatively by increasing dietary fibre and fluid intake along with lifestyle modifications. Those with more advanced disease may be managed by sclerotherapy or rubber band ligation. Surgery is reserved for patients with failed medical therapy and for those who have developed complications. This article would discuss the current concepts on the pathogenesis and management of haemorrhoids.

Keywords: *Haemorrhoids, rectal bleeding, treatment*

Introduction

Haemorrhoids are one of the commonest proctological conditions. They occur as a result of enlargement and distal displacement of the normal anal cushions. They are usually asymptomatic, and considered a disease only if they become symptomatic. Thus, the term ‘haemorrhoid disease’ instead of ‘haemorrhoids’ more correctly identifies the pathological condition characterised by rectal bleeding, mucosal prolapse, anal itching and sometimes thrombosis and pain.

Epidemiology

Haemorrhoids are the third most common gastrointestinal diagnosis in the United States with nearly 4 million hospital visits annually (1). Most patients with haemorrhoids remain asymptomatic.

The peak age of haemorrhoids ranges from 45 to 65 years. The presence of haemorrhoids in less than 20-year-olds is unlikely. Age distribution pattern is the same for both males and females. It is interesting to see that the age distribution pattern of haemorrhoids deviates from the age distribution pattern of constipation which peaks in childhood, declines in middle age and significantly increases after the age of 65 years (2).

It has been found that haemorrhoids are 1.8 times more common in higher socioeconomic class compared to lower socioeconomic class. Caucasians are more frequently affected than African Americans (3). There is no significant difference in prevalence of haemorrhoids between males and females although there are some studies state that it is more prevalent in females. Haemorrhoids have also been shown to be commoner in patients who are obese (4).

A study done in India showed a prevalence of 9.08 % among patients who visited the outpatient department over a year to National Institute of Unani Medicine, Bangalore, of which 72.8% were male and 27.2% are female (5). In another study from India, haemorrhoids accounted for nearly one third of patients presenting with lower gastrointestinal (LGI) bleeding and it was the commonest cause for lower gastrointestinal bleeding (6). The incidence of haemorrhoids in Sri Lanka has not been documented.

Classification

Haemorrhoids are classified as internal or external, based on their location in relation to the pectinate line (the dividing point between the upper 2/3 and lower 1/3 of the anal canal). Internal haemorrhoids are located above the dentate line and are covered with simple columnar epithelium, which is not innervated by somatic sensory nerves. They characteristically lie in the 3, 7 & 11 o'clock positions when the patient is in the lithotomy position. They often result in painless, bright red rectal bleeding during defecation. There are four grades according to the degree of prolapse: Grade 1 – no prolapse, with prominent blood vessels, Grade 2 – prolapses upon bearing down and reduces spontaneously, Grade 3 – prolapses upon bearing down and requires manual reduction and Grade 4 – prolapses and cannot be manually reduced (7). External haemorrhoids are located below the pectinate line and covered by the anoderm (stratified squamous epithelium), which is innervated with somatic pain fibers. Thus, they are sensitive to pain (3).

Pathogenesis and aetiology

There are three main anal cushions found at left lateral, right anterior and right posterior positions of the anal canal. Each cushion consists of loose connective tissue which surrounds the arteriovenous communications between superior, middle rectal arteries and superior, middle, inferior rectal veins, and the covering mucosa (8).

The exact pathogenesis of haemorrhoids is not well understood. Currently, the sliding anal canal theory is widely accepted. According to this theory, stretching of the supporting tissues of the anal cushions during defaecation causes abnormal

downward displacement of the anal cushions. Straining during defaecation causes the anal cushions to expand due to the increased venous pressure and protrude out of the anal canal. Repeated straining will cause the supporting connective tissue of the anal cushions to stretch further and fragment causing prolapse of the anal cushions leading to haemorrhoids (9). It was also found that there is a hyperdynamic arterial supply to the haemorrhoids which also cause an increase in venous pressure (10).

Factors that cause straining during defaecation will predispose to haemorrhoids. This includes a low fibre diet and chronic constipation. Increased intra-abdominal pressure (chronic cough, ascites, intra-abdominal masses or pregnancy) also predisposes to haemorrhoids (3). Prolonged time spent in lavatory was found to be a risk factor because it results in sitting with a relaxed perineum and unsupported anal cushions (11). Haemorrhoid disease also has genetic component that predispose to epithelial and smooth muscle dysfunction; thus, family history of haemorrhoids is also a risk factor (12).

External haemorrhoids are due to dilated veins just beneath skin around the anus. They often give rise to severe pain due to thrombosis (13).

Diagnosis and treatment

Haemorrhoids are diagnosed by clinical assessment and proctoscopy. Internal haemorrhoids cause painless bleeding, prolapse, mucous discharge and feeling of incomplete evacuation. Bleeding is bright red in color and usually coated on the outer surface of stools but not mixed with stools (8). Visual examination of the anus and surrounding area may aid diagnosis of prolapsed haemorrhoids. A digital rectal examination (DRE) will detect masses, prostate enlargement but internal haemorrhoids are less likely to be palpable unless they are thrombosed. Internal haemorrhoids will look like purplish buds through the proctoscope (14). Individuals less than 40 years of age need a proctoscopy or a flexible sigmoidoscopy and for individuals more than 40 years of age a colonoscopy would be needed to exclude colorectal cancer and inflammatory bowel disease which will present with similar symptoms (15).

There is a wide array of treatment modalities available for haemorrhoids. The choice of treatment modality will depend of the grade of haemorrhoids, their symptoms and complications. They can be categorized into life style modifications, medical management, ambulatory procedures and surgical procedures.

External haemorrhoids are best managed conservatively with analgesics when they present with thrombosis as they get absorbed and resolve spontaneously within few days. Excision under local anaesthesia could be done if the pain does not settle with analgesics (13, 16).

Life style modifications and medical management

The goal of treatment is to achieve the passage of soft bulky stools without the need of straining at the time of defecation. Life style modifications are first line of treatment for grade 1 and 2 haemorrhoids. However, lifestyle modifications are mandatory when other treatment modalities are used to prevent recurrence. Life style modifications include a high fibre diet (such as fruits, vegetables and whole grains), which can be supplemented with fibre supplements (psyllium, methyl cellulose). Recommended intake of dietary fibre is 25 - 38 g per day (17). It is important have an adequate fluid intake, which adds moisture to stools(8). The recommended daily water intake is 3.7L for men and 2.7L for women (18). Change in toilet habits such as reduced time spent on the toilet (3 – 5 minutes is recommended) and not straining during defaecation are essential behavioural modifications (17). Life style modifications have shown a risk reduction of 0.47 (7).

Topical steroids, analgesics and emollients are frequently used but there is no scientific evidence to support their use. Oral intake of flavonoids is another method that is successfully used to treat haemorrhoids. Although mechanism of action is not properly understood flavonoids are associated with strengthening of blood vessel walls and increasing lymphatic drainage of haemorrhoid tissue (19). Sitz baths, a popular home remedy is known to soothe the irritation of haemorrhoids by reducing tissue oedema and sphincter spasm (8). This is done by submerging the buttocks in a basin filled with lukewarm water for 15-20 mins for a day.

Adding Epsom salt to water is also practised. Although there is no strong scientific evidence to support effectiveness on sitz baths, a study done in Sri Lanka evaluating Ayurvedic modified sitz baths were shown to be effective (20).

Ambulatory procedures

Patients with grade 1 and 2 haemorrhoids who fail medical treatment and those who have grade 3 haemorrhoids can be effectively treated with ambulatory procedures such as sclerotherapy, rubber band ligation, infrared coagulation and cryotherapy (7).

Sclerotherapy

Sclerotherapy is used to treat grade 1 and 2 haemorrhoids. It works by fixation of the anal cushions to the underlying muscle by inducing fibrosis. The most commonly injected solution is 5% phenol in olive oil. This is injected to the submucosa at the base of the haemorrhoid. Misplacement of the injection results in mucosal ulceration and rarely prostatic abscess or sepsis (11).

Rubber band ligation (RBL)

Rubber band ligation is recommended for the treatment of grade 1, 2 and 3 haemorrhoids. It is superior to sclerotherapy and infrared coagulation and has a success rate of 75-97% (7, 21). Ligation of the base of the haemorrhoid tissue results in ischemic necrosis of the haemorrhoid mass followed by scar fixation to the rectal wall (7). Most commercially available band ligators are easy to use suction devices and draw the haemorrhoid tissue into the applicator before ligation (22). Common adverse effects of RBL include perianal pain or discomfort, which is usually relieved by analgesics, sitz baths and laxatives. Pelvic sepsis is a rare but devastating complication (15).

Infrared coagulation (IRC)

This acts by coagulating tissue and evaporating water from cells, leading to shrinkage of the haemorrhoidal mass. It is achieved by applying a probe to the base of the haemorrhoid for a few

seconds. IRC is less operator-dependent than sclerotherapy and results in fewer complications. However, several treatment sessions may be needed for a better outcome. It is not suitable for large prolapsing haemorrhoids (23).

Cryotherapy

In cryotherapy, a freezing cryoprobe is used to ablate the haemorrhoid tissue. It is not commonly used, as studies found it to be associated with prolonged pain, foul-smelling discharge and a high failure rate (24).

Surgical procedures

Surgical treatment of haemorrhoids remains an effective approach for patients who have failed or cannot tolerate ambulatory procedures, grade 3 and 4 haemorrhoids and haemorrhoids with complications. Surgical procedures include surgical haemorrhoidectomy, doppler guided haemorrhoid artery ligation and stapled haemorrhoidopexy. Radiofrequency ablation and laser haemorrhoidectomy are newer alternatives.

Surgical haemorrhoidectomy

Surgical excision is the most effective treatment for grade 3 and 4 haemorrhoids (21). It has the lowest recurrence ((1% at 1 year) compared to other treatment modalities (25). It can be performed using scissors, a diathermy or vascular-sealing devices (26-28). The commonest post-operative complaint is perianal pain. The use of vascular sealing devices reduces post-operative pain and has shorter hospital stays and faster wound healing compared to haemorrhoidectomy with diathermy or scissors (29-31). Other complications include: acute urinary retention, postoperative bleeding, portal pyemia, delayed wound healing, mucosal prolapse, anal stricture, and fecal incontinence (32).

Doppler-guided haemorrhoidal artery ligation

Identification and doppler ligation of the hyperdynamic arteries that supply the haemorrhoids results in symptom improvement. This procedure causes less pain due to the lack of tissue excision (7).

In patients with prolapse of haemorrhoidal masses, Doppler guided ligation is combined with plication of the haemorrhoidal masses. This modality of treatment is becoming increasingly popular, as it is not associated with serious complications. Short-term outcomes at one year are comparable with surgical haemorrhoidectomy (33). More studies with longer follow up are needed in view of the possibility of revascularization and recurrence (34).

Stapled haemorrhoidopexy

Stapled haemorrhoidopexy is used to treat grade 1, 2 and 3 haemorrhoids. In this procedure a circular stapling device is used to excise a ring of redundant rectal mucosa just proximal to the haemorrhoidal mass. This results cephalad relocation of the anal cushions and interruption of the feeding arteries (7). Serious complications include rectal stricture and rectovaginal fistula (35). It is preferable to perform this procedure in circumferential prolapsing haemorrhoids. It is associated with less pain and faster recovery compared to excisional Haemorrhoidectomy (7).

Radiofrequency ablation (RFA)

In radiofrequency ablation, a ball electrode connected to a radiofrequency generator is applied to the haemorrhoid tissue resulting in coagulation and evaporation of the tissue (36). It is a less invasive alternative for haemorrhoidectomy which is easy to perform and has an early recovery (37). It is frequently associated with bleeding and prolapse. Other complications include: infection, acute urinary retention and perianal thrombosis (38).

Laser haemorrhoid surgery

Two techniques are practiced namely, laser haemorrhoid coagulation and laser haemorrhoid dearterialization. In haemorrhoid coagulation haemorrhoid tissue is photocoagulated using Co₂ or Nd:YAG laser techniques leading fibrosis of mucosa and submucosa layers. CO₂ lasers give more precise cutting of tissue but cause more bleeding whereas Nd : YAG laser give better coagulation leading to less bleeding. In laser haemorrhoid dearterialization a 980-nm diode

LASER is used to cause shrinkage of the terminal branches of the superior rectal artery. Studies have shown that it is a safe procedure with minimal postoperative pain which is most effective for second- and third-degree with minimal mucosal prolapse (39).

Comparison of the treatment options

Comparing the outcomes of sclerotherapy, RBL and infrared coagulation, RBL has the lowest recurrence rate (7). A survey carried out by the British general and colorectal surgeons found RBL to be the most commonly performed procedure for haemorrhoidal disease (940). A meta-analysis (that included 27 randomized controlled trials) compared stapled haemorrhoidopexy (SH) with Haemorrhoidectomy and found SH to be associated with lesser pain, earlier return of bowel function, shorter hospital stays, earlier return to normal activities, better wound healing and a higher degree of patient satisfaction. However, SH was associated with a higher recurrence rate during long-term follow-up (41). A retrospective study of 18-month outcomes of Doppler guided ligation (DGL) and SH for grade 3 haemorrhoids found both procedures to be safe and effective. DGL had less pain, shorter hospital stays, and faster functional recovery but was associated with higher recurrence rate and lower patient satisfaction (42).

Haemorrhoids in pregnancy

Pregnancy and vaginal delivery predispose to haemorrhoids because of hormonal changes and increased intra-abdominal pressure. It has been estimated that 25% to 35% of pregnant women are affected by haemorrhoids (43).

Treatment is mainly symptomatic for the majority of patients. It can be treated by increasing fiber content in the diet, administering stool softeners (docusate sodium, psyllium) and increasing liquid intake. Topical creams provide symptomatic relief. Although none of the topical anti-haemorrhoidal agents commonly used have been assessed for safety in pregnancy, the constituents (local anesthetic, corticosteroids, and anti-inflammatory agents) are unlikely to harm the third-trimester infant (44). Symptoms usually resolve

spontaneously after delivery. Surgery should only be offered to those who are having complications of haemorrhoids such as severe bleeding, infection and extensive thrombosis (16).

Haemorrhoids in patients with portal hypertension

In patients with portal hypertension, it is important to distinguish haemorrhoids from rectal varices as the treatment options for the two conditions are different. Conservative management with correction of coagulopathy is the preferred initial treatment as bleeding from haemorrhoids in patients with portal hypertension is usually not life threatening. Sclerotherapy is preferred to rubber band ligation in patients who continue to bleed as the latter could result in torrential secondary hemorrhage. In refractory cases, suture ligation of the bleeding vessel is recommended. Haemorrhoidectomy is performed, as a last resort in these patients when other treatment options have failed (16).

Haemorrhoids in HIV and other immunocompromised patients

Conservative management is the mainstay of treatment of haemorrhoids in immunocompromised patients. Interventions or operations should be avoided, or performed with a careful consideration, due to the risk of infection which can lead to portal pyemia (16). In haemorrhoids with significant bleeding sclerotherapy appears to be safer than banding or haemorrhoidectomy (45). Antibiotic prophylaxis is essential before performing any intervention in these patients due to the risk of infection.

Conclusions

In conclusion, haemorrhoids are one of the most common proctologic conditions and can cause different levels of distress among patients. A wide range of treatment options is available including life style modification and medical management, ambulatory methods and surgical options. A personalized treatment approach is advisable taking into consideration the patients symptoms, grade of haemorrhoids and other comorbidities.

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