### 1.0 Introduction/General Considerations

Anorectal disorders include a diverse group of pathologic conditions that are the cause of significant patient discomfort and disability. Amongst the most common conditions requiring evaluation, hemorrhoids alone account for almost 2 million ambulatory care visits each year in the United States(1). Luckily, most anorectal disorders seen in practice can be managed in the office without any surgical treatment. Despite this, serious disorders like inflammatory bowel disease and malignancies always need to be kept in mind and considered in the differential diagnosis when evaluating the patient with an anal complaint. In addition, problems in these last few centimeters of the gastrointestinal tract have a major effect on overall quality of life. Serious associated morbidities, leading to diminished function, may occur secondary to both incorrect or delayed diagnosed or inappropriate treatment. Although non-operative management is often the initial treatment, surgical options always need to be a component of the armamentarium for dealing with these diverse processes. Thus surgeons need to be aware of all aspects of approaching the patient with anorectal pathology, as ultimate
recovery and function depend on accurate and proper evaluation and management.

2.0 General Anatomy of the Anorectal Region
The anal canal is approximately 5 cm in length. It begins a few centimeters above the dentate line and extends down to the anal verge. The histology of the anal canal at its proximal end is transitional epithelium. (Figure 1) It begins where the columnar epithelium of the rectum ends. The transitional epithelium extends down to the dentate line where the stratified squamous epithelium begins. Stratified squamous then extends to the anal verge where the true skin begins, complete with hair follicles and sebaceous glands. The dentate line is clearly visible 1 – 2 cm above the anal verge in the middle of the anal canal. It appears as a series of peaks and valleys highlighted by a purplish/blue appearance from the underlying blood vessels. Each valley has an opening or anal crypt that connects to an anal gland. These glands secrete mucous into the anus. A thorough understanding of the anatomy provides insight into the associated pathological processes that occur in this region. For example, cryptoglandular infections are the source of perirectal or perianal abscesses and fistulae. Innervation of the lower anal canal below the dentate line and perianal skin is via somatic nerves. Thus, lesions in this area such as abscesses, thrombosed external hemorrhoids and anal fissures can be extremely painful. Innervation of the upper anal canal is via autonomic nerves. Lesions in this area such as anal malignancies and internal hemorrhoids are not usually painful, allowing procedures such as band placement of internal hemorrhoids to be possible.

Just beneath the hemorrhoidal plexus lies the sphincter complex. Two muscle groups make up the anal sphincter mechanism. The internal sphincter is the innermost muscle. It is smooth, involuntary muscle and is primarily responsible for the resting tone of the anal canal and control of flatus. The external sphincter muscle is skeletal, voluntary muscle and is primarily responsible for control of feces. Division of the internal sphincter muscle for treatment of fissures or fistulae is usually well tolerated and does not lead to significant problems with incontinence. Division of the external sphincter muscle, however, can lead to debilitating incontinence to solid stool and is strongly discouraged (2,3).

3.0 Hemorrhoids
3.1 Introduction
Hemorrhoids, also called piles, is a term that refers to the normal circumferentially located submucosal vascular beds above and below the anal canal. As they are an essential part of a normal state, the presence of these hemorrhoids does not mean a pathologic change is present. In the normal state they act to maintain anal continence, especially when there is increased pressure in the anal canal during coughing, straining, or sneezing. To have hemorrhoidal disease, changes that lead to bleeding, thrombosis, prolapse and possible rectal pain need to be present. Hemorrhoidal disease occurs when the increased anal pressure is prolonged such as during pregnancy or with severe constipation. It can also occur with diarrhea, aging, or due to hereditary factors.

3.2 Etiology/ Epidemiology
The term “hemorrhoids” is often misused and therefore prevalence estimates are often not accurate. Estimates range from prevalence in the United States being as high as 80% (4) to estimates that over 50% of the population will have developed hemorrhoidal disease by the time they are 50 years of age (5). Both men and women are equally affected4. Symptoms increase with age, with peak incidence being between 45 and 65 years old (6). Other predisposing factors include pregnancy, chronic straining and increased abdominal pressure (7). Although an associated family history has been suggested, it may simply reflect an increased familial trend in seeking treatment.

3.3 Relevant Anatomy/Physiology
Hemorrhoids are classically located in three columns, including right anterior, right posterior, and left lateral. (Figure 2) More commonly, these three columns are obscured by edema, clot, and many times are not found in these exact locations. The more important discrimination is between internal and external disease. Internal hemorrhoids are located proximal to the dentate line, though often found protruding distal to it, and are covered with mucosa with an autonomic nerve innervation. External hemorrhoids originate distal to the dentate line, are covered with modified squamous epithelium and have somatic innervation. Because of this difference in innervation, external hemorrhoids are more often painful than their internal counterparts. Factors described above, including chronic straining, will disrupt the anal canal and vascular engorgement ensues. It is also important to make note that rectal varices associated with portal hypertension are not hemorrhoids, and are beyond the scope of this text.

Hemorrhoids are classified first in external and internal hemorrhoids. Internal ones are then classified as to the degree of prolapse during straining, which aid as a guide to appropriate treatment. First-degree do not descend below the dentate line; second-degree will protrude on straining, but have spontaneous reduction; third-degree internal hemorrhoids protrude and require manual reduction to return to the anal canal; and fourth-degree hemorrhoids protrude beyond the anal verge and are unable to be reduced.

3.4 Diagnosis
Symptoms of hemorrhoidal disease differ for internal and external hemorrhoids. Most patients with internal hemorrhoids will come in with the symptom of rectal bleeding. This bleeding is most commonly painless, bright red, and often noted when causing additional trauma to the tissues, including during a bowel movement or during the use of tissue paper. Bleeding is associated with internal hemorrhoids as they are covered with mucosa. External hemorrhoids do not bleed as often, as they are covered with anoderm, but can present when they become thrombosed: severe pain that is acute in onset and constant in nature. (Figure 3) This pain typical peaks after the third or fourth day and will then slowly subside. Another presenting symptom includes “feeling a small mass” around the anus. This represents a prolapse and can either be present intermittently or continuously. As many rectal diseases are associated with bleeding, a thorough history and physical exam is necessary with important factors being protrusion, bowel movement patterns, anti-coagulation
Management of Common Anorectal Disorders

Management of Common Anorectal Disorders http://www.ptolemy.ca/members/current/anorectal

3.5. Management

Treatment for external hemorrhoids is often only sought for pain associated with thrombosis. The treatment should be guided towards relieving this pain. As stated before, pain typically peaks after the third or fourth day and will then slowly subside and this should be considered in deciding upon treatment. Oral analgesics, sitz baths, bulking agents and/or stool softeners, cold cloths or ice applied directly to the hemorrhoid are initial treatments. Increasing the amount of roughage or fiber (approximately 30g/day) and fluid in the diet will help alleviate constipation and decrease the pressure in the anal canal, and is recommended for all patients with any type of hemorrhoidal disease. Surgical excision can shorten the length of recovery and is recommended when severe symptoms are present and the patient presents within the period of still increasing pain. Excision can be performed in the office with use of local anesthetics like xylocaine containing epinephrine. Excision should include removing the thrombus and leaving the skin open or closure of the overlying anoderm. Skin tags associated with external hemorrhoids are often asymptomatic, but if needed can be removed by simple excision using scissors or electrocautery with, again, local anesthetics. Other reasons for excision of external disease include large symptomatic piles that provide difficulty with hygiene or repeated flares.

Internal hemorrhoids can again initially be treated with conservative therapy and surgery should only be reserved for severe cases. Conservative therapy includes the therapies described above with addition of usage of hydrocortisone suppositories. Such therapy is most effective in grade I and II internal hemorrhoids. If these therapies do not work, use of rubber band ligation, sclerotherapy and photoagulation can be used. All three procedures can be performed in the office. Sclerotherapy involves injecting sclerosants (such as morrhuate sodium, 5% phenol in olive oil, and hypertonic saline) with a 30-gauge needle. This will then cause an intense inflammatory reaction that leads to destruction of redundant submucosal tissue. Although not performed as much as in the past, it may be effective when other therapies are not available or in the patient taking anticoagulation medication. Rubber-band ligation, originally described by Barron in 1936, is performed with a hemorrhoidal ligator, such as the McGivney dilator. A latex rubber ring is placed over the tip of the instrument. Typically, the drum is loaded with two latex bands for each hemorrhoid to ensure ligation of the hemorrhoid if a band breaks or slides off. The instrument tip and rubber band are placed over the hemorrhoid, and a grasping forceps is used to pull the hemorrhoidal tissue through the drum, positioning the rubber band at the base of the hemorrhoid. Prior to placement of the band, the patient should be asked if any discomfort is felt. This may indicate that the tissue is too close to the somatically innervated tissue near the dentate line. If extreme pain is felt after the band is applied, the ligature should be removed immediately by grasping the band with a crypt hook and cutting it. Band ligation causes the hemorrhoid to become ischemic and slough off within 7 days or so.

Although we recommend placement of a single band on the initial setting to ensure tolerance, multiple applications can be performed within a subsequent 2 to 4-week interval. Ligation of multiple hemorrhoids can be performed, but this will increase the overall discomfort. Complete relief of symptoms can be achieved in approximately 80% of patients. Rubber band ligation is not to be used for external hemorrhoids. Photoagulation, first described by Neiger in 1979, uses a Tungsten halogen lamp which generates heat and destroys the mucosa and submucosa at a depth of 3mm within the application site. This technique is not any more effective then the other two therapies, but adds cost.

In severe cases or if other more conservative therapies fail, surgical excision is necessary. Hemorrhoidectomy is performed with the intent to remove the pathologic tissue and restore the anal canal to normal function. These procedures can be performed under a general, spinal, or caudal anesthetic. The addition of local anesthetics such as lidocaine and marcaine with epinephrine promotes hemostasis and decreases immediate post-operative pain, and can, in most patients, be used as the sole agent. Several different techniques have been described and no gold standard is present. One of the most common techniques used is the Ferguson technique which closes the defect after removal of the tissue. First a clear identification of the internal sphincter muscle is necessary. The hemorrhoid should then be lifted off this muscle to ensure that the muscle is not injured and the entire hemorrhoidal complex is removed. An incision is made with a dissecting scissors or electrocautery in a ‘V’ shape in the anoderm and is carried proximally to the apex of the hemorrhoidal plexus. The plane just above the sphincter muscle is relatively bloodless. If a significant amount of bleeding is encountered, this usually means the hemorrhoidal vessels are being divided rather than being elevated off the muscles. Once at the apex, a clamp is placed across the hemorrhoidal vessel pedicle and suture ligated. This suture is tied in place and then used to close the defect in a running, interlocking fashion to achieve adequate hemostasis. It is safe to remove up to three columns of hemorrhoidal tissue at a single operation. Yet removing all three columns requires thorough knowledge of both the anatomy and excellent technique, as it increases the risk for fecal incontinence and anal strictureing. Care should be made to leave at least 1 cm of anoderm between the removed columns to avoid resultant strictureing of the anal canal.

Newer technologies include the use of a neodymium laser and tissue dissectors/sealants such as the Ligasure®, Harmonic Scalpel®, and Enseal® device. Another technique used for prolapsed hemorrhoids is the circular stapler. This device is transanally placed with a circular purse-string suture located 3-4 cm above the dentate line. A 33-mm stapling device is also placed transanally, facilitating circumferential excision of the distal rectal mucosa and a “pexy” of the sub-luxated tissues back to their native location. Overall
Management of Common Anorectal Disorders

Many types of patients will be seen with this condition, including patients with immunosuppression or human immunodeficiency virus (HIV). Besides the use of universal precautions, no differences in wound healing is seen, except in the patient with end-stage AIDS, although efforts should be placed on optimizing initial non-operative management.

3.6 Complications
Although post-operative pain is not really a complication, it is the most frequent problem encountered after surgery. The most effective method of management is the use of frequent nonsteroidal anti-inflammatory drugs (NSAIDs), sitz baths for spasm, and attempt to minimize narcotic medications. Other early complications include bleeding, itching, urinary retention and fecal impaction, and itching. All these complications are minor and can be corrected with conservative management. Late complications include fecal impaction, secondary bleeding, wound infection, anal fissure, and incontinence. These late complications are very uncommon and should be treated accordingly. The most feared complication is fecal incontinence, but even when present, 50% of the patients will report resolution of soiling by six weeks.

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4.0 Anorectal Abscess and Anal Fistula

4.1 Introduction
An anorectal abscess is essentially a “boil” of the perianal/perirectal region, with the purulent collection developing as the acute manifestation, and the anal fistula resulting as a consequence of this initial infection. A fistula is defined as an abnormal communication between any two epithelial-lined surfaces, with an anorectal fistula specifically being a communication with the rectum or anal canal and the perianal skin. These two entities are then similar disease processes along a continual timeline, with the fistula being the chronic state.

4.2 Etiology/Epidemiology
The etiology of these abscesses is thought to be cryptoglandular in approximately 80% with the remaining 20% being from trauma, HIV, cancer, or inflammatory bowel disease. These very common infectious processes develop when there is an obstruction of an anal crypt at the dentate line in the anal canal. The anal gland emptying into that crypt then becomes infected and, depending on the exact location of the infection, a perianal or perirectal abscess arises. Such an abscess is either drained surgically or drains spontaneously. If the opening to the anal crypt does not heal completely, this becomes the internal opening of a fistulous tract that drains through the external opening on the anus or buttock where the abscess originally drained. The incidence of fistula formation ranges from 25% to 50% if all four types of abscesses are included. Patients of all ages can be affected by this disease with the peak incidence being around 20 to 40 years old. Men are more commonly affected than women.

4.3 Relevant Anatomy/Physiology
Pelvic floor anatomy is essential to comprehend this disease. The pelvic floor muscles and surrounding musculature create 4 potential spaces, including the perianal, the ischiorectal, the intersphincteric, and the supraleaver space. The abscesses are classified by their location in the potential anorectal spaces in the pelvis: perianal (most common), ischiorectal, intersphincteric, and supraleaver (least common). With the intersphincteric, ischiorectal, or supraleaver spaces a horseshoe abscess should be considered. This abscess starts in the midline posterior crypt, extends through the deep post-anal space and bilaterally to both ischiorectal fossae. It should be thought of especially when initial drainage fails to heal symptoms or when patients complain of a deep-seated pain. Fistulas are classified according to their involvement of the sphincter muscles. An intersphincteric fistula lies superficially, coursing between the internal and external sphincter muscles. The external opening is very close to the anal opening and usually very little of the internal sphincter muscle is involved in the tract. Both a transphincteric fistula and a suprasphincteric fistula traverse both the internal and external sphincter muscles. The opening for these fistulas is lateral on the buttock and farther away from the anus than an intersphincteric fistula. Whereas the transphincteric fistula often crosses both sphincter muscles at the same level, the suprasphincteric fistula starts out at the dentate line and then travels superiorly in the intersphincteric space before going above the sphincter complex and out to the skin through the ischiorectal fossae. Extraspincteric fistulas pass above the levator ani, outside the sphincter complex, and are often a result of trauma or other diseases like diverticulitis, cancer, trauma, or inflammatory bowel disease. A prediction of the fistula course can be made by considering Goodsall’s rule, which is based on an imaginary transverse line drawn across the anal verge. It states that a fistula with an external opening posterior to this line has an origin in the posterior midline crypt. A fistula with an external opening anterior to this plain will have a radially oriented fistula tract. Also, if the secondary (external) opening is more than 3 cm from the anal verge, a more complicated cephalad extension, or inflammatory bowel disease origin is possible.

4.4 Diagnosis
Common presenting symptoms for abscesses include pain, swelling and other general signs of an infection, including fever, especially in ischiorectal and supraleaver abscesses. The pain is classically severe in the perianal or perirectal region, and mostly gradual in onset (over the course of 2 to 3 days). Pain is not often associated with fistulas, where drainage and occasional bleeding is more common. On examination, a tender fluctuant mass can be seen if a perianal abscess is present. Less dramatic cutaneous findings are noted with abscesses located at the other above mentioned planes. If the patient can tolerate it, a digital rectal and vaginal exam should be

operative time, length of hospital stay and outcomes including recurrence and complication rates have been equivalent to the standard hemorrhoidectomy. Although difficult to quantify the “total cost” which encompasses hospital stay, medication usage, complication rate and return to function, the peri-operative cost for usage of such stapler is 30% higher. The use of the circular stapler is contraindicated in patients with a fixed external hemorrhoid or anal stenosis, although there are reports of its use in isolated thrombosed disease.

4.4 Diagnosis
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performed to evaluate for internal anal canal or lower rectal involvement. Unfortunately, patients with intersphincteric, supralevalvator and deep post-anal space abscesses may have a paucity of findings other than tenderness with digital rectal examination. Careful examination for any type of ischemic changes of either skin or underlying tissues should be done as life-threatening necrotizing infections, although rare, may be present. Examination for a fistula opening should be performed by looking for a small area of heaped up granulation tissue with pus in the punctuate opening. The fistula can often be felt as a cord like structure leading to the anal sphincter. If anoscopy can be performed, one can try to find the internal opening, which would be at the dentate line and have granulation tissue as well; however, this is rarely possible outside of the operating room. Further consideration needs to be taken in patients with a history of such abscesses or fistulas and in patients with inflammatory bowel disease, as more extensive disease than preliminary evaluation deems may be present. In such cases, endorectal ultrasound, CT or MRI, if available might provide additional information.

4.5. Management
A simple abscess without a fistula can be incised, drained and the wound left open for continued drainage. (Figure 7) An elliptical or cruciate incision is often preferred. Packing of the wound is not necessary although most physicians will pack initially, for hemostatic purposes. Perianal and ischiorectal abscesses can be drained in the office with the aid of local anesthetics. If the abscess is large, the patient is febrile, or other types of abscesses are suspected (i.e., supralevalvator, deep postanal space, horseshoe abscesses) it is best performed, if possible, in the operating room under regional or general anesthetics. A proper incision and drainage is performed with the buttocks spread apart and secured by taping to the operating table. We prefer the prone position for optimal visualization. The area is prepared with betadine and draped. Local anesthetic is occasionally ineffective due to the presence of pus, and the patient, if awake, should be tested prior to incision. An incision is made in a cruciate fashion over the point of maximal fluctuance. One or two corners of the skin flaps may be excised to keep the cavity open for drainage. The abscess cavity is probed with a hemostat and all septations are divided. The cavity may be irrigated with betadine and normal saline and packed loosely with gauze. The most common error in performing an incision and drainage is to make the opening too small, causing inadequate drainage and persistent infection. In addition, for large abscesses, the incision should be placed closer to the anal verge if possible to keep any resultant fistula tract as short as possible. In the case of a horseshoe abscess, drainage of the offending crypt, as well as lateral incisions over the abscess cavity in the ischiorectal fossae should be made and tracts should be curetted. These incisions and tracts can be kept open with a Penrose drain. Intersphincteric abscesses should be drained through the rectum, which involves opening and blunt separation of the internal anal sphincter muscle. Ischiorectal abscesses should be drained though the ischiorectal fossa. Any packing can be removed by the patient the following morning. Wound care at home should be with twice daily washings with clean water. If possible, the patient should soak in a warm bath once or twice a day. This will relieve discomfort and hasten healing. Antibiotics are not needed following drainage, unless marked cellulitis, immunosuppression, valvular heart disease, signs of systemic infection, or diabetes exist (16). Those patients with supralevalvator abscesses commonly have from a pelvic source and may need drainage from the abdominal route. Those patients with a cryptoglandular source arising from an intersphincteric abscess extension should be drained into the rectum; while those with a cryptoglandular source arising from an ischiorectal extension should be drained to the perineal skin. This is to avoid, as much as possible, a complex fistula tract. A fistula is best treated in the operating room with light sedation and local anesthesia. Positioning is as described above for incision and drainage of an abscess. The internal opening is identified by placing a probe through the external opening. If the fistula is intersphincteric and very little of the internal sphincter muscle is involved, the skin and muscle overlying the tract can be divided safely with minimal risk of fecal incontinence. (Figure 8) The edges of the fistula are sutured in a marsupialization fashion with a running stitch of chronic or vicryl consistency. If, however, the fistula is found to be trans- or suprasphincteric, division of the external sphincter muscle is discouraged if it involves more than one-third of the thickness of the sphincter complex, as it will likely cause fecal incontinence. The fistulous tract should then be cleaned out with a curette and a loose string (suture, vessel loop) placed through the tract and secured in place. This is called a Seton and will allow persistent drainage of pus until the fistulous tract can epithelialize and heal. (Figure 9) Cutting Setons that are tightened repeatedly over the course of many weeks are discouraged as they are extremely painful and do not decrease the risk of incontinence. Long-term outcomes for trans- and suprasphincteric fistulae are not as good as for intersphincteric fistulae. The former often persist for many months and require repeat examinations in the operating room with repeated cleaning of the fistulous tract. Newer treatments include injection of a fibrin glue substance or placement of a collagen plug in attempts to close the internal opening. The long-term success rate of these modalities is often less than 50% (17). Further surgical therapy may involve closure of the internal opening through the use of mucosally-based advancement flaps, diversion stoma, or in severe cases, proctectomy.

4.6 Complications
Post-operative complications include recurrence of the abscess or fistula. This occurs in about 37% to 50% of patients (18). Performing a fistulotomy at the time of abscess drainage may decrease the rate of recurrent abscess and fistula to 1.8% (19), but increases the risk of incontinence. Recurrence often occurs from failure to identify the offending crypt or tract. In patients with abscesses, the physician should always consider diagnoses such as perianal hidradenitis suppurativa, inflammatory bowel disease, or HIV infection. Fecal incontinence is an uncommon but feared complication. The use of a Seton in complicated fistulas decreases this complication.

5.0 Anal Fissure
5.1 Introduction
Anal fissures are common problems that cause severe patient discomfort. A fissure is basically a linear tear in the anal mucosa which extends distally from the dentate line to the anal verge. Analogous to a “split lip” of the anus, every time a patient has a bowel
movement, the anal mucosa will be stretched and the fissure reopened. A fissure can sometimes heal by itself, but due to recurrent injury by the mechanism described above, and often the associated increased contraction of the internal anal sphincter, it becomes a chronic problem.

5.2 Etiology/Epidemiology
The etiology for anal fissures is not completely understood. Some type of initial trauma is necessary with subsequent failure of healing. This initial insult is often a hard bowel movement and history of constipation, although severe diarrhea can also be an associated condition as well. Other diseases like Crohn’s disease, HIV or previous surgery should also be considered. Failure of healing is thought to be secondary to internal anal sphincter hypertonicity and subsequent relative decreased blood supply (20). These lesions are often encountered in patients between 30 to 50 years old, with the incidence the same in both sexes (21). They are most commonly found in the posterior, with the next most prevalent site being the anterior midline, where it is more common in women (10-20%) than in men (1-10%) (22). When fissures are found laterally, syphilis, tuberculosis, occult abscesses, carcinoma, acquired immunodeficiency syndrome (AIDS) or inflammatory bowel disease should be considered as causes. Chronic fissures can be also associated with findings of hypertrophied anal papillae, sentinel tags, visible sphincter muscle fibers. (Figure 10) Finally, polyps, hemorrhoids and other concomitant disease are often present.

5.3 Relevant Anatomy/Physiology
Fissures are often sharply demarcated and granulation tissue can be noted. As stated, chronic fissures can be fibrotic and can form a sentinel pile. As the posterior midline is the most poorly perfused area of the anal canal, most occur in this area in both sexes. Increased internal sphincter pressure can decrease blood flow even further and is thought to contribute to a chronic fissure. In a person with an anal fissure, the internal anal sphincter goes into spasm, and this hypertonicity of the muscle results in pain. The external sphincter is under voluntary control. However, it differs from all other voluntary skeletal muscles in that it maintains a constant tonic contraction at rest (approximately 15% of the resting pressure), but is not thought to contribute to the chronicity of the fissure.

5.4 Diagnosis
A thorough history is not only essential, but can often make the diagnosis alone in this disease. Patients will describe a sharp pain that is initiated by a bowel movement. The pain will last for a few minutes to several hours. Other complaints will be bright red bleeding after a bowel movement that is most commonly described as streaking the stool or on the toilet paper with wiping, although it can occur throughout the day. If a sentinel pile is present, some tenderness to palpation can be present. On examination spreading of the buttocks is often enough to see the fissure and no anoscopy exam is necessary in the acute setting. Digital rectal examination can often palpate these fissures, although local anesthetics are recommended due to the severe pain associated with such an exam. It is the authors’ preference to diagnose and begin treatment (often without digital examination or anoscopy) and bring the patient back in 2-4 weeks for a more thorough examination when the patient is less symptomatic.

5.5. Management
Again conservative management is the first option in treatment. Medical management includes oral analgesics, sitz baths, bulking agents and/or stool softeners, increased hydration and topical anesthetics. Other topical therapies include the use of nitrate creams like 0.2% glyceryl trinitrate cream bid or tid to reduce internal sphincter tonicity (23). They also have a vasodilatory effect and cause increased perfusion. Side effects of these preparations include burning and headaches in 25-50%. Calcium channel blockers like diltiazem either topically or orally can also be used by the same type of mechanism (24). A more invasive treatment is the injection of Botulinum toxin A (20-40IU) into the internal sphincter muscle. Similar results have been obtained with only mild complications of hematoma, thrombosis and infection at the injection site (25).

If the fissure fails to heal after medical treatment, surgical intervention is often necessary. Although many procedures have been reported, the lateral internal sphincterotomy (LIS) is the most commonly performed. This procedure involves division of the internal anal sphincter muscle to the level of the proximal extent of the fissure or the dentate line through either a closed or open procedure. (Figure 11) This relieves the symptoms in over 98% of patients and has very low recurrence rate (26). The procedure can be performed under local anesthetics in the operating room with very minimal complication risk. Fecal incontinence has been reported in 1-40%, although the majority of these are transient and often to flatus alone. Other surgical approaches include posterior internal sphincterotomy and manual anal dilation which are each associated with higher complication rates of a keyhole defect and fecal incontinence (>50%), respectively (27).

5.6 Complications
Post-operative complications from a LIS include bleeding, fistula, infection and abscess formation. These are very uncommon and occur in less than 1% of the cases. Fecal incontinence again is a feared complication, but again occurs in 1-40% of the cases (28), with the vast majority of these patients improving within 6 weeks.

6.0 Sexually Transmitted Diseases
6.1 Introduction
Common sexually transmitted diseases causing anorectal problems include Human Papilloma Virus (HPV), Human Immunodeficiency Virus (HIV), and Chlamydia trachomatis (Lymphogranuloma Venereum).

6.2 Etiology/Epidemiology
The Human Papilloma Virus is transmitted via sexual contact with infected persons. HPV types 6, 11, 16, and 18 are most commonly associated with perianal condylomata. Types 16 and 18 have been associated with anal dysplasia, intraepithelial neoplasia, and invasive squamous cell carcinoma (29). It can be asymptomatic with no visible lesions so an infected individual may not know he or she has the virus. In a sexually active population, the prevalence of DNA of the HPV is around 50 percent. The virus can cause anal symptoms and lesions even in those individuals who do not practice anal receptive intercourse. Infection occurs when there is trauma to the epithelium. The virus then enters the basal cell layer and proliferates. Mature virus particles then move to the superficial epithelial layers. Papillomas or warts develop when there is hyperplasia of these epithelial cells as well as hyperplasia of the stroma supporting the epithelium. These lesions are then called condylomata acuminata.

Co-infection with HIV may alter the severity and manifestations of other sexually transmitted diseases. Patients infected with the HIV can have common anorectal problems such as hemorrhoids, abscesses and fistulae. Patients who have progressed to have the Acquired Immunodeficiency Syndrome (AIDS) are prone to getting idiopathic AIDS-related anal ulcers. Anal fissures secondary to HIV tend to be off the midline, deeper involvement of the muscle, and extend higher in the anal canal. HPV infection in HIV patients is more aggressive with a greater propensity for dysplastic and neoplastic changes (30). Other anorectal manifestations of HIV include opportunistic infections resulting in diarrheal disease. Nonspecific proctitis with no identifiable pathogenic agent has been noted in up to 26% of patients infected with HIV.

Lymphogranuloma Venereum (LGV) is caused by the intracellular bacterium Chlamydia trachomatis, serovars L1-L3. (Non-LGV serovars D – K are less virulent). Chlamydial infections are transmitted to the anorectum via anorectal or oral-anal intercourse. LGV is characterized by aggressive ulceration of the perianal, anal and rectal areas. It can also present as perianal abscesses, fistulae or stricturing. Rectal involvement causes proctitis with associated severe rectal pain and discharge. Lymphadenopathy can occur in the iliac, inguinal, femoral and perirectal nodal basins and are often the hallmark of the diagnosis.

6.3 Relevant Anatomy/Physiology
Lesion will be noted around the anal area, but certain diseases can be seen higher in the lower rectum, approximately 10 to 15 cm from the anal verge. Besides knowing the general anatomy of the anorectal area as described previously, an anatomical understanding of the inguinal and perineal area is helpful. No such anatomy will be specified here, but an understanding of inguinal lymph nodes and external sexual organs is essential in managing sexually transmitted diseases. A thorough oral exam is also recommended, as concomitant infection may be present.

6.4 Diagnosis
Symptoms with HPV include pruritus, growths, drainage, difficulty keeping the area clean, bleeding, and pain. Physical examination reveals fleshy papilliform lesions of varying sizes that can occur individually or as a carpet of lesions. (Figure 12) In 10% of patients, only intra-anal lesions are present. Anoscopy can be performed to assess for lesions in the anal canal, but is generally not performed until the external lesions have completely resolved or while in the operating room. There is always concern that the virus may be introduced into new and proximal areas by instrumentation. However some say that anoscopy is mandatory because treatment of perianal lesions will be unsuccessful if intra-anal lesions are not treated concomitantly (30). AIDS is associated with a number of diseases as it decreases the host immunity. One of the most common anorectal diseases is AIDS related anal ulcers. They are extremely painful lesions, proximal in the anal canal, often above the dentate line. They are broad-based, deep ulcers with destruction of sphincter planes, leaving mucosal bridges.

Up to 15% of individuals affected with LGV are asymptomatic. If symptomatic they may present with rectal pain, tenesmus, and fever. Occasionally mucosal ulcerations are seen. Inguinal lymphadenopathy may be present. Diagnosis of LGV is dependent on proper specimen collection, namely using a cotton swab, and transporting to the lab on a special medium kept refrigerated until inoculation onto culture plates. Gram stain showing polymorphonuclear leukocytes but no gonococci can be presumed to be chlamydia.

6.5. Management
Treatment for HPV involves destruction of the warty lesions. If the lesions are few and not internal, this is best accomplished in the clinic setting. There are several different topical treatments. Podofilox 0.5 % gel can be applied twice daily for three days, then no treatment for four days. This cycle is repeated for up to one month, but care should be noted as this should not be applied in the anal canal. Cryotherapy with liquid nitrogen can be used as a single application on a cotton swab with care being taken to avoid touching normal skin. Patients are advised to return in three weeks time for repeat treatment if necessary. Trichloroacetic acid can also be used in a similar fashion, and unlike podofilox, can be used in the anal canal. For lesions that are large, in a carpet on the anus, or in the internal anal canal, electrodessication with cautery or laser in the operating room is optimal if available. The patient is positioned as described previously for treatment of anal abscesses. Local anesthetic is injected. The cautery pen is used to desiccate the warts. The eschar is removed after this is done. Postoperative pain from this procedure can be severe and patients should be advised to soak in a warm bath, if available, several times a day.

Recurrence is high for anal warts, particularly in immunocompromised patients such as those with HIV. Frequent examinations (every three to six months) should be performed until the warts are cleared. As stated before, HPV serotypes 16 and 18 can cause dysplastic transformation of the epithelium, which is a precursor lesion to anal squamous cell carcinoma. The risk of anal squamous cell carcinoma in the HIV positive individual with HPV is several times that of the non-HIV positive individual. Therefore, HIV positive patients should be monitored even more closely (every three months) for wart persistence or recurrence.

Anal ulcer associated with AIDS can be treated with intralesional injection of steroids (methylprednisolone 80 – 160 mg in 1 cc of
Management of Common Anorectal Disorders

Pinworm infestation may be treated with pyrantel pamoate (Antiminth), 1 g as a single oral dose and a repeat dose in two weeks, or mebendazole (Vermox), 100 mg as a single oral dose, with a repeat dose in two weeks if necessary. Pinworms are identified by applying clear tape to the perianal area in the early morning before the patient has washed or wiped the area and then applying it to a microscope slide. Using a microscope pinworm eggs can be identified.

Complications
Complications with sexually transmitted diseases, in general, involve transmittal to other individuals. A speedy diagnosis is therefore essential. Even though patients might not have any visible lesions with these types of diseases, they still need to be aware of high potential for transmission. After treatment of the lesions mentioned above, the area may swell significantly. Skin may be sloughed off following treatment, but scarring is uncommon. Untreated sexually transmitted diseases may result in rectovaginal or rectovesical fistulae, abscesses, and rectal strictures. As many of these diseases are treated with prescribed antibiotics, anti-virals and anti-fungals, side effects and possible allergies need to be kept in mind. Finally, as stated, dysplastic changes associated with HPV infection may ultimately lead to a higher risk of anal cancer.

7.0 Pruritus Ani
7.1 Introduction
Pruritus ani or anal itching is an extremely common problem and is associated with a wide range of mechanical, dermatologic, infectious, systemic and other conditions. Regardless of the etiology, the itch/scratch cycle is an important contributor to the problem. This cycle becomes self-propagating and results in chronic pathologic changes that persist even if the initiating factor is removed.

7.2 Etiology/Epidemiology
Pruritus ani has many etiologies. It can indicate the presence of an infection, including pinworms and fungal, poor hygiene or the presence of a fissure. In children, it is most often associated with pinworm, which can be acquired from either fecal-oral route or by sexual contact. However, in adults, a multitude of conditions can lead to the development of pruritis ani. Medications (i.e. colchicine, prolonged steroids), dermatological conditions (psoriasis), infection (candida, cornymbacterium), anorectal conditions (fissures, fistulas), diabetes, blood dyscrasias, caffeine and other methylxanthine use are common inciting conditions. Unfortunately, in many cases, no identifiable source is discovered. Overall, pruritis ani is more common in males than females.

7.3 Relevant Anatomy/Physiology
Pruritus ani is the itching and irritation of the skin at the anal verge and surrounding anal margin skin. Due to the irritation and subsequent scratching, erythema and swelling will be noted at this area.

7.4 Diagnosis
Patients will present with extreme anal itching and continued scratching to this area. Examination often demonstrates excoriation and irritation due to repeated scratching with small linear “tears” in the perianal skin extending radially from the anal verge. When pruritis ani becomes chronic, the perianal area becomes thickened, lichenified and appears white with fine fissures. (Figure 13) Pinworms are diagnosed by applying clear tape to the perianal area in the early morning before the patient has washed or wiped the area and then applying it to a microscope slide. Using a microscope pinworm eggs can be identified. Patients should undergo a thorough examination to exclude other anorectal conditions which could be contributing to the symptoms. In addition, examination with a Wood’s lamp, fungal scrapes, culture, stool studies and even biopsy of the perianal skin can all provide valuable information into the underlying etiology.

7.5. Management
The most important step in treatment is recognizing the underlying cause and treating the source of the itching. Hygiene and taking sitz baths after every bowel movement helps cleanse this area, but care should be to thoroughly dry the area. We often instruct our patients to use a hair dryer instead of causing extensive abrasions with a towel. Placing a cotton ball at the outside of the anal verge to collect any sweat or seepage, and using dusting powders other than corn starch can also be used to keep the area dry and decrease itching. Dietary adjustment such as avoiding or even limiting caffeine can be effective. Avoidance of detergent soaps should be a first step. General antihistamines can be used to decrease itching, but long term treatment with these should be avoided. In addition, topical steroids may be necessary to decrease the erythema and swelling, but should be used with caution, for a limited time, once other sources have been excluded (31).

Pinworm infestation may be treated with pyrantel pamoate (Antiminth), 1 g as a single oral dose and a repeat dose in two weeks, or mebendazole (Vermox), 100 mg as a single oral dose, with a repeat dose in two weeks if necessary. Mycotic infections with dermatophytes Trichophyton rubrum, Trichophyton mentagrophytes or Epidermophyton floccosum, or Candida species can cause perianal itching and treatment with topical imidazole derivatives, such as miconazole (Monistat) or clotrimazole (Lotrimin), is usually effective.

7.6 Complications
Complications occur due to excessive cleaning, especially with brushes. Such cleaning aggravates the skin and exacerbates the condition with eventually excoriating the skin. This area is also very sensitive to soaps and perfumes and cause an increased itching with increased local trauma as a consequence. Again as treatment includes prescribed antifungals, side effects and allergies need to be kept
8.0 Conclusion

Anorectal disorders are a common group of diseases seen in the office practice. Advances have been made in understanding the pathogenesis of these diseases. Each of the disorders described can be distinguished by a thorough history and performing a complete exam. By following the symptoms discussed and checking for exams findings stated, an effective treatment should be able to be found, whether it is medical or surgical.

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References


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