Concepts in Surgery of the Anus, Rectum, and Pilonidal Region

72

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Introduction

The anorectal area at the intersection of endoderm and ectoderm is one of the most complex body regions. Taken for granted by most, the intertwined complexity of anatomy, function, and a variety of diseases pose an unparalleled challenge. Anorectal surgery is one of the most distinct ways to recognize quality in a surgeon. From a patient perspective, all problems in the area are "hemorrhoids." It remains up to the educated surgeon to take a systematic yet sensible history and perform a thorough physical exam to replace simplifications with specific information. A knowledgeable differential diagnosis is the guide to an appropriate workup. With great opportunity for success, there are also traps and pitfalls that result in poor outcomes, pain, and functional impairment.

This chapter provides an overview from a surgical perspective of the anatomy, function, and diseases combined with the intellectual, technical, and decision-making challenges that characterize anorectal surgery. It defers comprehensive disease presentations and review of pathophysiological and epidemiological details to respective texts. The focus here is to emphasize specific aspects that are relevant for establishing safe practice patterns and allowing for a structured development of surgical strategies. Experience shows that optimized outcomes of anorectal surgeries are more often a matter of the whether, when, how much, and the type of surgical approach. Diligence and restriction are equally necessary to allow for continued nonsurgical management.

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Anatomy and Physiology

The anorectum transitions from the terminal portion of the gastrointestinal tract to the outside. Embedded in the osseous pelvis and surrounded by urogenital organs, there are important neuromuscular, lymphovascular, ligamentous, and connective tissue structures that are covered by a changing epithelial layer. The complex functional unit maintains fecal continence by providing both a stopper-equipped rectal reservoir and a controlled expulsion mechanism for feces.

The rectum represents the distal approximately 12–15 cm of the large intestine that forms the reservoir and extends from the sacral promontory to the anorectal ring. From the abdominal perspective, its proximal start is defined as the confluence of the taeniae coli. The anterior portion of the proximal two-thirds of the rectum is covered by peritoneum while the remaining rectum is extraperitoneal. The mesorectum lies posterior to the rectum and contains the blood, nervous, and lymphatic supply to the rectum.

Definitions of the anal canal vary between surgeons and anatomists. The surgical anal measures up to 4 cm from the anorectal junction to the anal verge. The physiological anal canal represents the high-pressure zone of 2–4 cm length. And last, the anatomical-histological definition is centered around the dentate line with a transition from columnar to transitional cuboidal above, and from modified squamous epithelium without appendages to regular skin with hair and glands distal to it.

The dentate line, as the embryologic fusion point between the endoderm and ectoderm, marks the border between visceral and somatic innervation, and a change in direction of the lymph drainage. Furthermore, it is the location where the cryptoglandular complex of 4-8 apocrine anal glands coming from the intersphincteric space enters the anal canal.

The anorectum receives its major blood supply from the superior, inferior, and, to a lesser degree, middle hemorrhoidal arteries that form a wide intramural network of collaterals and collect in arteriovenous plexus. The submucosal

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hemorrhoidal cushions above the dentate form the basis for internal hemorrhoids and communicate with the smaller external hemorrhoidal plexus. There are three primary positions: left lateral, right anterior, and right posterior.

The pelvic floor (pelvic diaphragm) is a funnel-shaped musculo-tendineous termination of the pelvic outlet and is formed by striated skeletal muscles that are innervated by S3-S4 nerve branches. At the hiatus for passage of the anorectal and urogenital viscera, it transitions to the voluntary U-sling of the puborectalis and the concentric ring of external anal sphincter (EAS) muscle. Both contribute to the resting tone and the voluntary incremental squeeze tone of the anal canal. The internal anal sphincter (IAS) is an involuntary smooth muscle in continuation of the muscularis propria of the rectum and is innervated by autonomic nerves; it contributes to the resting sphincter tone. The groove between internal and external sphincter is palpable within the anal canal, distal to the dentate line.

Important from a disease aspect are the perianal spaces that are defined by fascial compartmentation. The ischioanal space on either side of the anal canal is bounded by the levator ani muscles superiorly and the ischial tuberosities laterally; the two sides connect posteriorly through the superficial and the deep postanal spaces of Courtney between the anococcygeal ligament and the levator ani muscles. The supralevator space lies superior to the levator ani muscles and surrounds the rectum posteriorly; medial to the ischial spine, it can communicate with the ischioanal space via the fascia of the obturator internus and Alcock's canal.

Diagnostics

Anorectal Examination

Visual inspection, digital rectal examination, and anoscopy or proctoscopy are the key components of a complete anorectal examination. Equal attention should be paid to morphological and functional aspects. The physical exam can be performed with the patient in either a lateral decubitus or the prone jackknife position. The latter can be further optimized by using a hydraulic exam table that allows flexion at the hips and Trendelenburg positioning. Excellent lighting is crucial for a meaningful exam.

The perianal skin and anal area should first be inspected with the buttocks retracted laterally. The overall anatomy is assessed for gross abnormalities, asymmetries in shape, color and texture, defects (skin, perineal body, anal verge, etc.), prolapse (rectal, vaginal), or a visually evident lack of sphincter tone ("patulous anus"). The visual inspection and external palpation check for scars, erythema or other skin pathology, swelling and/or induration, thrombosis, hemorrhoidal enlargement, prolapse, fissures, fistulas, specific pain trigger points, or masses. Pain with retraction of the buttocks should also be noted. If patients experience significant pain on external exam, a digital exam or instrumentation should be avoided; if necessary, an examination under anesthesia or sedation should be arranged for in the operating room. If tolerated though, a gentle digital rectal examination (DRE) should then be performed which not only entails the insertion of typically the index finger into the rectum but counterpressure from the opposing thumb on the outside (bi-digital rectal exam) to compress the tissue and look for indurations. An educated DRE may allow for identification of multiple abnormalities such as masses, fistulas, abscesses, strictures, pain trigger points (levator spasm, coccydynia, prostatitis), integrity, strength/weakness, or discoordination of the sphincter complex. The anal sphincter tone should be assessed at rest and squeeze, as well as during a Valsalva maneuver.

Instrumentation aims at a visualization of the mucosa and either confirming or ruling out a specific pathology. Defining the extent (anoscopy vs. rigid/flexible sigmoidoscopy) should rely on previously documented evaluations as well as the immediate and future need for visualization of a specific pathology or the colon. An instrumentation beyond a simple anoscopy typically requires administering 1-2 enemas before the procedure. In many situations, and depending on the individual age and risk constellation, a complete colon clearance should be recommended prior to a nonurgent anorectal intervention.

Imaging

For most anorectal cases, imaging is not necessary to establish the diagnosis. Selectively on a case-by-case basis, a need for cross-sectional imaging (e.g., ultrasound, CT, MRI, PET scan) may be recognized depending on the circumstances and the expected or confirmed nature of the pathology.

For evaluation of the pelvic floor and sphincter integrity, the ultrasound is by far the best modality. For more extensive or intrapelvic conditions (tumors, suppurations/fistulas, etc.), a static MRI or CT scan may be superior. For dynamic assessment of any positional instability of the pelvic organs (pelvic organ prolapse) and the evacuation efforts, a dynamic pelvic MRI or a defecating proctogram is best situated to provide the link between morphology and function.

Functional Testing

For objective evaluation of the pelvic floor and sphincter function, a set of diagnostic modules can be utilized. Anal manometry includes the measurement of resting and squeeze pressures over the length of the anal canal, anorectal volume tolerance, and rectal compliance, and the presence or absence

of the recto-anal inhibitory reflex (RAIR). Additional tests may include measurement of the pudendal nerve terminal motor latency (PNTML), electromyography (EMG), or a balloon retention and expulsion test.

Management

Nonsurgical Treatments

Management of patients with anorectal disorders almost always includes nonoperative measures. The most pressing goals are (a) to optimize the stool consistency and evacuation, (b) to address any acute pathology (wound, thrombosis, inflammation), and (c) to care for the surrounding skin. Specific complex diseases (cancer, inflammatory bowel disease) are beyond the scope of this chapter and require interdisciplinary attention.

Dietary changes and possible fiber supplementation are intended to identify and avoid unfavorable nutritional habits. Bowel and potentially behavioral habit training may be important to maintain regularity and minimize obsessive patterns. Sitz baths aim at cleaning the area from stool or—in case of a wound/inflammation—from debris, pus, and fibrine buildup. Supportive measures include application of barrier creams to protect the perianal skin.

Systemic antibiotics are not routinely needed but utilized selectively. More commonly, medications are introduced for pain control, to soften the stool (stool softeners, laxatives), to slow down the bowels (antidiarrheal medications), to bind bile acids (cholestyramine), or to reduce the reflectory sphincter relaxation (antidepressants such as amitriptyline). Patients with incontinence may benefit from reducing the stool load through scheduled rectal enemas.

While there are abundant over-the-counter topicals, the majority of them have no proven benefit and may in fact cause harm (e.g., steroids or topical anesthetics). Rational topical medications are limited and include sphincter tone reducing medications (nitroglycerine or calcium antagonists) or occasionally antibiotic creams (metronidazole).

Physical therapy and biofeedback training aim at optimizing the pelvic floor and sphincter function including retention or evacuation by either strengthening, coordination, or relaxation exercises.

Surgical Tools

The majority of anorectal conditions and surgeries can be managed and carried out in an outpatient setting. Minor interventions may be suited for the office/clinic when there is an appropriate setup of equipment, materials, and staff as well as a willing patient. Patients with severe anorectal pain or anxiety are better served with an examination and management in the operating room.

Success in either setting often does not require extravagant tools but comes easiest with standard instruments, adequate lighting, optimal positioning, and a trained team to provide a smooth and predictable process.

It should be noted though that even for anorectal and endoluminal cases, the armamentarium of surgical tools continues to rapidly expand. There is a wide range of new platforms aimed at facilitating the approach or allow for less invasive procedures. The booming growth unquestionably has expanded horizons, but the individual roles are yet to be defined in many instances. Where appropriate, these technologies are discussed in the respective chapters.

Anesthesia and Positioning

For surgical procedures, the choice of anesthesia and patient position is determined by surgeon preference. Conscious sedation and local anesthetic often work very well; however, spinal block anesthesia or general anesthesia can afford superior relaxation and paralysis for young muscular male patients. Prone jackknife positioning allows better exposure and decreases the venous congestion of the hemorrhoid plexus. The buttocks can be retracted laterally with tape in the prone jackknife position for better exposure. In superobese patients, however, any position may prove to be exceedingly difficult, and sometimes, a lateral position offers the best compromise.

Local anesthesia using a long-acting local anesthetic (e.g., bupivacaine) can be used for office procedures or in support of sedation/anesthesia in the operating room (preemptive analgesia). On either side, on a transverse line through the anus, a deep injection of 5 cc of the anesthetic targets the ischioanal fossa—lateral to the sphincter complex, that is, 1–1.5 cm away from the anal opening. A more superficial circumferential block is added around the anus. In case of a single quadrant office procedure, a few milliliters of local anesthetic may be injected just around and under the respective target lesion (thrombosed hemorrhoid, wart, skin biopsy, etc.).

Perioperative Management

Most anorectal procedures require only minimal preparation. One to two enemas just prior the surgery typically suffice, unless a full colonic evaluation is planned or specific reasons ask for a full bowel cleansing. Single dose of antibiotic may be administered but for many procedures do not seem to add any benefit. Due to the short nature of the surgeries, there is no indication for pharmacological thromboembolic prophy-

laxis. And as long as the intravenous fluid administration is kept at a minimum, there is also no routine need for a Foley catheter.

Clinical Conditions

Anorectal Pain

Pain may have a wide differential diagnosis, but the most common causes are (1) anal fissure (chronic, aggravated by defecation), (2) thrombosed external hemorrhoid (days to 1–2 weeks), or (3) a perirectal abscess (gradual increase). Other causes include functional, neoplastic, neurogenic/referred pain conditions, and others.

Hemorrhoids

Internal hemorrhoids are a common anorectal condition. They arise from the hemorrhoidal cushions above the dentate line, and hence they are covered by a mucosal epithelium and are devoid of somatosensory nerves. The anal cushions are a part of normal anorectal anatomy and contribute to continence. Symptoms develop when there is pathological engorgement of these cushions as a result of chronic constipation as well as an individual predisposition.

Symptoms of internal hemorrhoids are characteristically painless rectal bleeding or prolapse whereas itching is not considered a specific symptom. The bleeding is typically bright red and can be noted either on toilet paper or drip into the toilet bowel. Most bleeding episodes are self-limited. Internal hemorrhoids are not associated with pain except when there is an acute Grade IV (incarcerated internal hemorrhoids); presence of pain more likely suggests a fissure or an acutely thrombosed external hemorrhoid.

Internal hemorrhoids are classified according to the degree of mucosa-covered prolapse: Grade I is characterized by bleeding without prolapse, Grade II by prolapse with straining that spontaneously reduces, Grade III by prolapse that requires manual reduction, and Grade VI by prolapse that cannot be reduced. The Grade IV is acute and painful and represents an emergency if the sphincter tone is very tight, and the hemorrhoids become incarcerated, thrombosed, and eventually risk at developing tissue necrosis; the Grade IV is chronic when the sphincter tone is very lax, and while the hemorrhoids can be reduced, they immediately re-prolapse. The degree of prolapse is on one hand obtained by the patient's history, but otherwise can be evaluated by instructing the patient to perform a Valsalva maneuver either in the lateral decubitus position or on the toilet. Internal hemorrhoids may be associated with an external component (skin-covered), which is not graded and should not be mistaken as prolapse.

Treatment of internal hemorrhoids varies based on the severity of disease. The initial goal of therapy is to minimize straining and reduce constipation. This can be accomplished with dietary fiber supplementation, stool softeners, and sufficient fluid intake. Often no further treatment is necessary for Grade I internal hemorrhoids. If symptoms persist, additional therapy may be required. Grade I, II, and some Grade III internal hemorrhoids can be treated with a variety of office-based procedures, including rubber band ligation, sclerotherapy, and infrared coagulation. Persistent symptoms or larger grade III internal hemorrhoids require operative treatment with either an excisional or stapled hemorrhoidectomy or trans-anal Doppler-guided hemorrhoidal artery ligation. Incarcerated internal hemorrhoids require an excisional hemorrhoidectomy, particularly if there is tissue necrosis.

External hemorrhoids arise distal to the dentate line and are covered with squamous epithelium. They frequently are chronic and only rarely give cause to symptoms. Rarely, they are so redundant that the patients have difficulty with the local hygiene. Occasionally, there may be an acutely thrombosed external hemorrhoid with a sudden onset and a limited period of pain. There is no bleeding from external hemorrhoids, except if an acute thrombosis spontaneously ruptures and the clot evacuates. Bleeding and chronically "painful hemorrhoids" more often represent an anal fissure with sentinel skin tag.

External hemorrhoids should only be excised if the patient opts for an excisional hemorrhoidectomy for cosmetic/esthetic purposes or if they are diagnosed in the acute phase of thrombosis. In the latter situation, surgical treatment within 72 hours from the onset of pain may hasten recovery; after 72 hours, the thrombosis begins to be organized and absorbed and the palpable lump softens and becomes less painful. Conservative treatment with a high-fiber diet, stool softeners, sitz baths, pain control, and sufficient fluid intake is more appropriate beyond 72 hours.

Anal Fissure

An anal fissure is a short longitudinal tear between the dentate line and the anal verge associated with high internal anal sphincter tone. Anal fissures are most commonly located in the midline, usually posteriorly and less commonly anteriorly. Eccentric or long anal fissures are concerning for other pathophysiology including Crohn's disease, HIV, tuberculosis, or immunocompromised status. Risk factors for anal fissures include chronic diarrhea and constipation, but anal fissures may develop in the setting of normal bowel movements. Patients usually present with pain with defecation. Sometimes acute fissures can be associated with bright red

blood per rectum, but traces of blood on toilet paper are more characteristic. Anal fissures can be defined as acute or chronic. Acute fissures have new onset related to an episode of diarrhea or constipation. Chronic fissures are characterized by greater than 3 months of symptoms or morphologic signs of chronicity such as a sentinel skin tag, exposed sphincter muscle, or hypertrophic anal papilla. The majority of acute anal fissures will heal with conservative management. Some acute anal fissures will develop into chronic anal fissures associated with a vicious cycle of increased internal anal sphincter tone, increased pain, and increased constipation.

The goal of treatment is to decrease the sphincter tone and improve stool regularity. Patients should be placed on fiber supplements, stool softeners, and increase their fluid intake. Reduction of the sphincter tone can be achieved by topical medications (nitroglycerin or calcium antagonists), a Botox injection into the internal anal sphincter muscle (chemical sphincterotomy), or most effectively but irreversibly by a lateral internal sphincterotomy (with or without a fissurectomy).

Anorectal Suppurative Diseases

Anorectal abscesses are common and usually present with anal or perianal pain, erythema, and tenderness. Signs of systemic sepsis may also be present.

Anorectal abscesses arise from the anal glands and crypts along the dentate line. Historically, they were invariably caused by enteric bacteria, but recently other strains (including methicillin-resistant *Staphylococcus aureus*) have been isolated.

The location and depth of the abscess determines the clinical findings on physical exam. Perianal abscesses are usually located close to the anus. Ischiorectal abscesses can be larger and deeper, and they may be more difficult to recognize and hence can result in more severe infection. Intersphincteric abscesses present with anal pain and fluctuance in the anal canal but often lack external signs of an infection. Supralevator abscesses characteristically originate from an intraabdominal/pelvic disease process that finds its way to the deep postanal and ischioanal spaces.

In general, anorectal abscesses can be diagnosed on physical exam alone (external palpation or bi-digital rectal exam). Blood work or imaging is not routinely needed but may be useful if there is a suspicion for complex disease or if an abscess is suspected without external physical exam findings.

Treatment of anorectal abscess is invariably surgical and consists of incision and drainage with the goal of relieving pressure and pain and allowing pus to drain freely. This can often be performed with local anesthesia at the bedside or in the office. Larger ischiorectal abscesses, horseshoe abscesses, supralevator abscesses, or patients with significant pain on exam may be more comfortably treated under anesthesia in the operating room (if there is no undue delay). Drainage is performed by incising the skin over the abscess as close to the anus as possible to ensure that the resulting fistula is short. Intersphincteric abscesses are drained by incising the internal sphincter over the area of fluctuance. Treatment of supralevator abscesses depends on the source of the infection and may require intraabdominal source control of the infection. Antibiotics are only required in the treatment of anorectal abscess if there is associated cellulitis or systemic sepsis or if the patient is immunocompromised.

Anorectal fistula is the chronic sibling disease of the abscess and may persist in roughly 50% after spontaneous rupture or surgical drainage of an abscess. A substantial portion of patients do not recollect having an abscess and simply present with a draining opening. Patients with anorectal fistula usually present with cyclic anorectal pain and drainage. The course of the fistula can be evaluated with thin silver probes or hydrogen peroxide injection into the fistula tract and assessment for bubbles at the internal opening. The internal opening is most commonly found at the dentate line along the cryptoglandular complex.

Anal fistulas are classified and treated according to their relationship to the external sphincter. There are five main types of fistulas: superficial, intersphincteric, transsphincteric, suprasphincteric, and extrasphincteric. Superficial fistulas travel from the primary to the secondary opening without interfering with any of the muscle structures. Intersphincteric fistulas course through the intersphincteric plane but not the external sphincter muscle. Transsphincteric fistulas pass from the intersphincteric plan through at least a portion of the external sphincter muscle. Suprasphincteric fistulas extend cephalad within the intersphincteric plan to above the level of the external sphincter muscle and pass around the external sphincter muscle to enter the ischioanal fossa. Extrasphincteric fistulas pass from the skin of the perineum through the ischiorectal fossa and levator muscles before penetrating the rectal wall.

Numerous techniques have been described for anal fistulas. Superficial fistulas and intersphincteric fistulas can be safely treated with fistulotomy. For transsphincteric fistulas, however, a balance between cure of the fistula and preservation of the sphincter strength must be found. Techniques include from least to most successful: fibrine glue injection, insertion of a collagen fistula plug, ligation of the intersphincteric fistula tract (LIFT), endorectal advancement flap (ERAF), or a cutting seton. Sometimes, a fistula may be controlled or matured but not eliminated by placement of a draining seton. That option is relevant for Crohn disease, immunocompromised patients, patients on chemotherapy,

and others in whom a definitive treatment is not immediately advisable.

Supralevator fistulas are frequently associated with an underlying abdominal pathology; they are usually not amenable to standard local anorectal procedures and require addressing the underlying disease.

Pilonidal Disease

Pilonidal disease is a common condition that is included with other anorectal diseases because of its proximity to the area. It has features and some overlap with hidradenitis suppurativa and/or with perirectal fistulas. Pilonidal disease most commonly occurs in young adults. It usually presents with pain, erythema, swelling, and drainage from pits in the sacrococcygeal region. It is thought to develop as a foreign body reaction and infection secondary to hair nests beneath the skin surface, which may be the result of secondary penetration and primary development. Acute abscesses should primarily be drained utilizing local anesthesia. Further, elective surgery is indicated if there is a persistent activity (sinus, fistula, induration) or if there are recurrent episodes of acute infections. In the short course, the disease management solely focuses on symptom control. In the long run, however, there emanates a risk of squamous cell cancer if smoldering and fistulizing disease persists over 20–30 years.

A wide range of surgical options of variable extent have been described, none of which combines all goals in one (recurrence-free recovery, fast recovery, limited impact on activity, pain-free, etc.). The details are described in the respective chapter.

Hidradenitis Suppurativa

Hidradenitis suppurativa is a fistulizing inflammatory process that typically arises in the buttock, perianal and perineal, groin, and suprapubic areas as well as the underarm pits. The disease appears to originate from the apocrine sweat glands. It represents a chronic smoldering infection with superimposed acute exacerbations with multifocal suppuration and abscess formation. Over time, there may be a significant fibroplastic reaction with occasionally grotesque scarring and tissue deformation.

Mild forms may respond to medical management, whereas more extensive disease requires surgical interventions to unroof the fistula tracts. Due to the chronically recurrent nature of the disease, there is on occasion a need to perform several sequential debridements until an area comes to complete quiescence.

Rectal Prolapse

Rectal prolapse is full-thickness protrusion of the rectum below the anal verge. This is distinguished from partial rectal mucosal prolapse, which can occur with hemorrhoidal disease. Full-thickness rectal prolapse is identified by the external appearance of concentric rectal folds, whereas partial rectal mucosal prolapse has a radial pattern. Rectal prolapse may develop as isolated pathology or in the context of multicompartmental pelvic organ prolapse. There is often a primary or secondary weakness or lack of the pelvic suspension structures such as a low peritoneal reflection, underdeveloped mesorectum, lack of lateral attachments, or pelvic diaphragm dysfunction. A rectal tumor, polyp, or ulcer can sometimes act as a lead point and cause the prolapse.

The prolapse can usually be reproduced on exam by asking the patient to perform a Valsalva maneuver in left lateral position or on the toilet. The clinical evaluation should at least include a sigmoidoscopy to evaluate for a lead point.

Most commonly, a rectal prolapse represent a chronic condition. Occasionally, it becomes an acute event if the prolapse cannot be reduced. An incarcerated prolapse without tissue necrosis should be reduced with application of table sugar to reduce edema or a perianal/pudendal nerve block for sphincter relaxation. If there is impaired tissue viability, a perineal proctectomy will be necessary.

Rectal prolapse can be treated with a variety of procedures which can broadly be grouped into perineal or abdominal surgical techniques. The choice of procedure depends on the patient's health (frailty), history, and preference of the patient. Perineal surgeries are less invasive and better tolerated but have a higher recurrence rate. For patients with a reasonable risk, abdominal procedures are more effective. Abdominal procedures come in various forms, through different types of access (open or minimally invasive modalities), with or without bowel resection, with or without implants (synthetic or biological), and with variable location of the implant (ventral vs posterior rectopexy). In pancompartmental pelvic organ prolapse, the rectopexy can be combined with a sacrocolpo- and cystopexy.

For patients who are not surgical candidates, banding, improvement in stool regularity, or sclerosing agents can be used and occasionally is quite effective.

Anorectal Stricture

Anorectal stricture/stenosis is a pathologic narrowing of the anal canal or distal rectum. The cause may be a malignancy or a series of benign conditions. The most common etiologies for the latter include prior anorectal surgery, complications from pervious rectal surgeries (leak), external beam

radiation therapy, Crohn's disease, or a functional outlet obstruction. Patients with an anorectal stricture often complain of constipation, ribbonlike stools, painful defecation, and the inability to perform enemas.

The management of an anorectal stricture depends on the etiology, the severity, the stricture length and configuration, and the patients' ability to compensation by means of coping mechanisms.

For mild anal stenosis, a bowel regimen including laxatives may suffice. The next level of intervention would entail and manual anal dilatation. For more severe forms of stenosis, a first dilation may require an exam under anesthesia. Ideally, subsequent dilations are done by the patient on a frequent basis by means of a dilator or a candle (as a cheaper version of a dilator).

A surgical correction is indicated for the most severe forms or when previous dilations do not result in a durable improvement. The choice of treatment depends on the length of the stricture and the surrounding tissue quality. Patients with fecal impaction or large bowel obstruction may require a proximal fecal diversion prior to other interventions for the stenosis. For patients with Crohn's disease and neoplasm, the underlying condition should be the focus of initial management.

The mainstay of surgical treatment for an anorectal stricture is an anoplasty, during which a vascularized skin flap from the perianal and buttock region is advanced into the anal canal after dividing the anal constriction. The skin flap is then secured in the anal canal with sutures. Following healing of the flap, anal dilatation is often performed to maintain long-term patency. If there is a long-segment stricture (e.g., as a result of radiation), a complete resection with either permanent stoma or a pull-through procedure may be necessary.

Functional Disorders

There are numerous functional disorders which range from fecal incontinence, to constipation, fecal outlet obstruction (obstructed defecation syndrome), pelvic floor dysfunction, functional anorectal pain (anismus, levator ani spasm), and others.

These conditions are complex and should be carefully managed and worked up. Defining the role of surgery versus medical management requires a skilled analysis of the various pros and cons.

Anorectal Skin Pathology

The anoderm can develop an unbelievable variety of primary and secondary dermatopathologies. Some are limited to that area; others occur in the context of a disseminated disease (e.g., psoriasis) or a specific infection (HPV, fungus, sexually transmitted infections, tuberculosis, etc.). There are benign or premalignant conditions with or without a potential for malignant transformation (e.g., dysplasia), as well as malignant conditions (squamous cell cancer, basal cell cancer, melanoma, and others).

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