Anorectal fistulas are common maladies. The challenge in therapy of perianal fistulas balances between the best possible cure and the preservation of continence. Complex fistulous disease challenges even the most experienced surgical specialists. The management options in these groups of patients are inadequate, with treatment often requiring multiple procedures, causing a risk for continued symptoms and fecal incontinence. This has lead to a serious search for newer and safer treatment options. Use of different types of setons and advancement flaps have their own advantages and pitfalls. Invasive methods with high rates of incontinence have given way to sphincter-sparing methods that have a much lower associated morbidity. Treatment with fibrin glue is an attractive option whenever continence might be endangered by operative procedures. Initial results with fistula plugs are promising but need further critical observations. Recently, the ligation of fistula tract had shown few promising results though it will be too early to comment on its long-term efficacy.

Key words: anal fistula; continence; sphincter; suppuration

INTRODUCTION

A fistula-in-ano is a hollow tract lined with granulation tissue connecting a primary opening inside the anal canal to a secondary opening in the perianal skin. Secondary tracts may be multiple and from the same primary opening. The male-to-female ratio is 1.8:1. The mean age of patients is 38.3 years. Fistula-in-ano is nearly always caused by a previous anorectal abscess. Anal canal glands situated at the dentate line afford a path for infecting organisms to reach the intramuscular spaces. Other fistulae develop secondary to trauma, Crohn’s disease, anal fissures, carcinoma, radiation therapy, actinomycoses, tuberculosis, and chlamydial infections.

The cryptoglandular hypothesis states that an infection begins in the anal gland and progresses into the muscular wall of the anal sphincters to cause an anorectal abscess. Following surgical or spontaneous drainage in the perianal skin, occasionally a granulation tissue-lined tract is left behind, causing recurrent symptoms. Multiple series have shown that the formation of a fistula tract following anorectal abscess occurs in almost 40% of cases. A thorough understanding of the pelvic floor and sphincter anatomy is a prerequisite for clearly understanding the classification system for fistulous disease.

The external sphincter muscle is a striated muscle under voluntary control by 3 components. These are submucosal, superficial, and deep muscle. Its deep segment is continuous with the puborectalis muscle and forms the anorectal ring, which is palpable upon digital examination. The internal sphincter muscle is a smooth muscle under autonomic control and is an extension of the circular muscle of the rectum.

Patients often provide a reliable history of previous pain, swelling, and spontaneous or planned surgical drainage of an anorectal abscess. Perianal discharge, pain, swelling and external openings, which may be single or multiple, are the commonest features. In few cases, symptoms like bleeding, diarrhea and skin excoriation due to purulent and irritant discharge may be noticed.

Important points in the history that may suggest a complex fistula include inflammatory bowel disease, diverticulitis, previous radiation therapy for prostate or rectal cancer, tuberculosis, steroid therapy or HIV infection.

The patient may complain of abdominal pain, weight loss or change in bowel habits in such situations.
Physical examination findings remain the mainstay of diagnosis. The examiner should observe the entire perineum, looking for an external opening that appears as an open sinus or elevation of granulation tissue. Spontaneous discharge via the external opening may be apparent or expressible upon digital rectal examination.

Digital rectal examination may reveal a fibrous tract or cord beneath the skin. It also helps delineate any further acute inflammation that is not yet drained. Lateral or posterior induration suggests deep postanal or ischiorectal extension.

The examiner should determine the relationship between the anorectal ring and the position of the tract before the patient is relaxed by anesthesia. The sphincter tone and voluntary squeeze pressures should be assessed before any surgical intervention to delineate whether preoperative manometry is indicated. Anoscopy is usually required to identify the internal opening. To effect a cure for an anal fistula, one must first carefully identify the fistula tract and categorize its anatomic relationship to the sphincter complex. This begins what can be an occasionally difficult search for the source of the infection, the internal opening. Several techniques have been described to facilitate this search.

In 1900, Goodsall described a simple rule of thumb that uses the location of the external fistula opening to predict the location of the internal opening. Fistulas with external openings in the anterior half of the anus usually track in a radial fashion directly into the anal canal. Fistulas with an external opening in the posterior half of the anus usually track in a curvilinear fashion to originate from the posterior or midline. Palpation around the external opening can also help identify thickened tissues or a cord extending from the external opening in toward the internal opening.

Anoscopy allows direct inspection of the dentate line and usually reveals an internal opening or a focus of purulent drainage implicating an occult internal opening. Passage of a lacrimal duct or fistula probe through the external opening may also track through the fistula and into the internal opening. Probes should be passed gently and not be forced into creating false passage.

Traction placed on the external opening may also produce dimpling at the level of the dentate line, suggesting the location of the offending crypt. If these measures are unsuccessful in identifying the internal opening, the external opening can be injected with dilute hydrogen peroxide. The resulting effervescence often opens up a stenotic tract and demonstrates drainage of bubbles through an internal opening into the anal canal. A similar technique using methylene blue injection has also been described. However, excessive staining of the anal canal may hamper efforts to identify the internal opening uniquely.

The differential diagnosis includes, hidradenitis suppurativa, infected inclusion cysts, pilonidal disease or Bartholin gland abscess in females. Any of these however, do not communicate with the anal canal.

Therapeutic intervention is indicated for symptomatic patients. Symptoms usually involve recurrent episodes of anorectal sepsis. An abscess develops easily if the external opening on the perianal skin seals itself.

If patients are without symptoms and a fistula is found during a routine examination, no therapy is required.

**CURRENT ANAL FISTULA TERMINOLOGY**

Subcutaneous

- Submuscular (intersphincteric, low trans-sphincteric)
- Complex, recurrent (high trans-sphincteric, supra-sphincteric and extra-sphincteric, multiple tracts, recurrent)

However, unlike the current procedural terminology coding, the Parks classification system does not include the subcutaneous fistula. These fistulae are not of cryptoglandular origin but are usually caused by unhealed anal fissures or anorectal procedures, such as hemorrhoidectomy or sphincterotomy.

No specific laboratory studies are required; the normal preoperative studies are performed based on age and comorbidities. Radiologic studies are not performed for routine fistula evaluation. They can be helpful when the primary opening is difficult to identify or in the case of recurrent or multiple fistulae to identify secondary tracts or missed primary openings.

Fistulography involves injection of contrast via the internal opening, which is followed by anteroposterior, lateral, and oblique x-ray images to outline the course of the fistula tract. The accuracy rate is 16-48%. The procedure is well tolerated but requires the ability to visualize the internal opening. Except in the case of recurrent disease, fistulography may be slightly more useful than a careful examination under anesthesia.

Endoanal ultrasonography involves passage of a 7- or 10-MHz transducer into anal canal to help define muscular anatomy differentiating intersphincteric from transsphincteric lesions. A standard water-filled balloon transducer can help evaluate the rectal wall for any suprasphincteric extension. Studies show that the addition of hydrogen peroxide via the external opening can help outline the fistula tract course. This may be useful to help delineate missed internal openings. These studies are reported to be 50% better than physical examination alone to help find an internal opening that is difficult to localize. However, this modality has not been used widely for routine clinical fistula evaluation.

MRI findings show 80-90% concordance with operative findings when observing a primary tract course and secondary extensions. MRI is becoming the study of choice when evaluating complex fistulae. It has been shown to decrease recurrence rates by providing information on otherwise unknown extensions.

A CT scan is more helpful in the setting of perirectal inflammatory disease than in the setting of small fistulae because it is better for delineating fluid pockets that require drainage than for small fistulae. CT scan requires administration of oral and rectal contrast. Muscular anatomy is not delineated well.
A barium enema/small bowel series is useful for patients with multiple fistulae or recurrent disease to help rule out inflammatory bowel disease.

Pressure evaluation of the sphincter mechanism is helpful in certain patients.

If decreased tone is observed with manometry, surgical division of any portion of the sphincter mechanism should be avoided. Situations like previous fistulotomy, obstetric trauma, high trans-sphincteric or supra-sphincteric fistula and very elderly patients may have decreased anal tone.

In certain situations, examination under anesthesia may be needed before subjecting the patient to surgery for anal fistula. This examination is necessary before surgical intervention, especially if outpatient evaluation causes discomfort or has not helped delineate the course of the fistulous process. Several techniques have been described to help locate the course of the fistula and, more importantly, identify the internal opening. Inject hydrogen peroxide, milk, or dilute methylene blue into the external opening to look for emergence of these liquids from the internal opening. Traction (pulling or pushing) on the external opening may also cause a dimpling or protrusion of the involved crypt.

Insertion of a blunt-tipped crypt probe via the external opening may help outline the direction of the tract. If it approaches the dentate line within a few millimeters, a direct extension likely existed. Care should be taken to not use excessive force and create false passages.

Rigid sigmoidoscopy can be performed at the initial evaluation to help rule out any associated disease process in the rectum. Further colonic evaluation is performed only as indicated.

Medical Therapy

No definitive medical therapy is available; long-term antibiotic prophylaxis and infliximab may have a role in recurrent fistulae in patients with Crohn’s disease.

Surgical Therapy

The ideal treatment of anal fistulas should aim at obliteration of the internal opening and all associated tracts without the need to divide any of the sphincter. However, this situation is difficult to achieve in majority of cases where some amount of sphincter fibers are required to be severed.

Simple anal fistulas may be treated by lay-open fistulotomy or fistulotomy.

The laying-open technique is useful for 85-95% of primary fistulae like the submucosal, intersphincteric and low trans-sphincteric. In this procedure, a probe is passed into the tract through the external and internal openings and the overlying skin, subcutaneous tissue, and internal sphincter muscle are divided with a knife or electrocautery, thereby opening the entire fibrous tract.

At low levels in the anus, the internal sphincter and subcutaneous external sphincter can be divided at right angles to the underlying fibers without affecting continence. This is not the case if the fistulotomy is performed anteriorly in female patients. Curettage is performed to remove granulation tissue in the tract base.

Complete fistulectomy creates larger wounds that take longer to heal and offers no recurrence advantage over fistulotomy.

Opening the wound out on the perianal skin for 1-2 cm adjacent to the external opening with local excision of skin promotes internal healing before external closure.

Some advocate marsupialization of the edges to improve healing times.

Biopsy from the tract tissue is mandatory to rule out any granulomatous lesion as a cause of anal fistula, like tuberculosis.

These incisions heal in a matter of weeks, and derangements in fecal continence are uncommon. Published outcomes following fistulotomy are variable as a result of heterogeneity of the techniques used, the type of fistulas treated, and length of follow-up, etiology, and the definitions of incontinence. In general, the recurrence rate for treatment of simple anal fistulas with fistulotomy is 2 to 8% with functional impairment generally between 0 and 17%.

This derangement tends to improve for up to 2 years after surgery.

Seton placement

Complex anal fistulas may also be treated by use of setons or staged fistulotomy, or both. A seton is a flexible piece of permanent material inserted through the fistula tract. Silastic vessel loops and silk sutures are common materials used as setons. Setons are useful when fistulotomies are undesirable and likely to result in significant incontinence or poor healing. This technique is useful in patients with complex fistulae like high transsphincteric, suprasphincteric, extrasphincteric or multiple fistulae. It is also used in recurrent fistulae after previous fistulotomy, anterior fistulae in female patients, and poor preoperative sphincter pressures. Patients with Crohn’s disease or patients who are immunosuppressed should also be treated with seton placement.

Setons are of two types- Single-stage seton (cutting)- The seton is passed through the fistula tract around the deep external sphincter after opening the skin, subcutaneous tissue, internal sphincter muscle, and subcutaneous external sphincter muscle. It is then tightened down and secured with a separate silk tie. With time, fibrosis occurs above the seton as it gradually cuts through the sphincter muscles and essentially exteriorizes the tract. The seton is tightened on subsequent office visits until it is pulled through over 6-8 weeks. A cutting seton can also be used without associated fistulotomy.

Because cutting setons require frequent tightening and are uncomfortable, they are less tolerated by patients and are a less appealing therapy than other options for complex fistulas. They are also associated with minor incontinence rates ranging from 34 to 63%.

Two-stage seton is also called as draining or fibrosing seton. A draining seton, as the name implies, facilitates long-term drainage of the abscess cavity and fistula tract.
and thereby reduces the number of subsequent septic events, shrinks down the cavity, and promotes fibrosis of the tract. Draining setons are indicated for perianal Crohn’s disease or other fistulas with large abscess cavities or multiple tracts.

The seton is passed around the deep portion of the external sphincter after opening the skin, subcutaneous tissue, internal sphincter muscle, and subcutaneous external sphincter muscle. Unlike the cutting seton, the seton is left loose to drain the intersphincteric space and to promote fibrosis in the deep sphincter muscle. Once the superficial wound is healed completely, the seton-bound sphincter muscle is divided.

Once wound healing is complete, the seton is removed without division of the remaining encircled deep external sphincter muscle. The reported eradication of the fistula tract with this technique is in 60-78% of cases. Recurrence rates following staged fistulectomy and repair are low (2 to 9%) but do not come without significant risk of minor (54 to 66%) and major (4 to 26%) incontinence.11

Mucosal advancement flap

Mucosal advancement flap is reserved for use in patients with chronic high fistula but is also indicated for the same disease process as seton use. Advantages include a one-stage procedure with no additional sphincter damage. A disadvantage is poor success in patients with Crohn’s disease or acute infection.

This procedure involves total fistulectomy, with removal of the primary and secondary tracts and complete excision of the internal opening. A rectal mucosal flap with a wide proximal base (2 times the apex width) is raised.12 The internal muscle defect is closed with an absorbable suture, and the flap is sewn down over the internal opening so that its suture line does not overlap the muscular repair.

Endorectal advancement flap

This technique obliterates the internal fistula opening, requires no sphincter division, and results in no external wound. Preparation for the procedure involves a full bowel preparation with intravenous antibiotics.

An examination under anesthesia is performed to identify the fistula and its internal opening. Following curettage and debridement of the chronic tracts, a superiorly based endorectal advancement flap is mobilized in a submucosal plane with or without inclusion of a small portion of the internal sphincter.

Mobilization continues proximally in a trapezoidal shape, increasing its width with a more cephalad progression. The mobilization continues until completion of a tensionless repair of the rectal mucosa beyond the level of the trimmed internal opening.13

The success rates for endorectal advancement flaps are between 55 and 98%. Repeated endorectal advancement flaps have been described; however, these can be more challenging in a scarred, reoperative field.

Newer treatment

One of the great fears of fistula surgery is the potential for derangements in fecal continence resulting from the need to divide a portion of the anal sphincter to obliterate the source of the ongoing sepsis. Recent advances in biotechnology have led to the development of many new tissue-adhesive and biomaterials.14 This includes the fibrin glue and the anal fistula plug. Both techniques involve filling the fistula tract with a flexible bioresorbable substance that obliterates the tract and then becomes incorporated by autologous scar with the hope of permanently scarring off the fistula tract, obviating the need for sphincter division.15

Fibrin glue is a very appealing concept in that it is very simple to apply, is essentially painless and repeatable, and, because it does not require division of the sphincter complex, carries almost zero risk of fecal incontinence.

The technique for fibrin glue repair of an anal fistula involves a formal bowel preparation and perioperative intravenous antibiotics. An examination under anesthesia is performed, the fistula tracts are identified, and the primary opening is located using conventional techniques. The tract is mechanically deepithelialized using curettes or some form of debridement technique. The internal opening is closed with an absorbable suture. The fibrin glue components are mixed and assembled in the provided dual injection syringe. The plastic catheter is inserted into the external opening and fed down through the fistula to the internal opening. As the fibrin glue is injected, the two components admix at the tip of the syringe and coagulate rapidly into the consistency of rubber cement. During the injection, the plastic catheter is withdrawn to ensure even application across the entire fistula tract. Excess fibrin glue that overflows from the fistula openings is trimmed flush. Patients are instructed to avoid heavy lifting and strenuous activities for 1 to 2 weeks postoperatively.

The average success rate for fibrin glue repair is about 50%.16 Fibrin glue repair is more successful for cryptoglandular fistulas and less successful for rectovaginal and Crohn’s fistulas. Most recurrences are immediate and are noticeable within 2 to 3 weeks. One of the benefits of this procedure is that it is repeatable, and some studies show subsequent success with reaplication.

The anal fistula plug (Surgisis AFP) was developed as a modality to obliterate the fistula tract using an absorbable material. Surgisis is a bioresorbable extracellular matrix made from small intestinal submucosa that had been used clinically in other applications for years.17 It was redesigned into a conical shape specifically for anal fistula surgery. The plug is theoretically more advantageous than fibrin glue because it is inherently resistant to infection, is able to hold the suture, and can be implanted into nonsterile surgical fields.18 It can also be fashioned into a conical shape allowing the plug to be inserted in a high-pressure area and allowing inherent mechanical stability to avoid extrusion.

The technique for this procedure also requires the same preparations as for insertion of fibrin glue. The tract is irrigated with hydrogen peroxide but not debrided. A fistula...
probe or hemostat is passed through the fistula tract from an external opening to come out through the internal opening. A suture is then passed and tied to the apex of the anal fistula plug cone. This is used to pull the anal fistula plug into the fistula until resistance is encountered. The plug is sutured to the internal opening and anal sphincter muscle using a figure-of-eight 2-0 absorbable braided suture. Excess plug is trimmed, and the plug is buried into the primary opening. At the external opening of the fistula, the excess portion of the plug is trimmed off and the opening left open to prevent a closed space infection. Anal fistula plug repair is undergoing several technical modifications to obtain more consistent results.19

LIFT - LIFT (Ligation of Intersphincteric Fistula Tract) procedure is based on secure closure of the internal opening and removal of infected cryptoglandular tissue through the intersphincteric approach. Essential steps of the procedure include, incision at the intersphincteric groove, identification of the intersphincteric tract, ligation of intersphincteric tract close to the internal opening and removal of intersphincteric tract, scraping out all granulation tissue in the rest of the fistulous tract, and suturing of the defect at the external sphincter muscle. The success rate is reported between 50 and 80%.19 However, being a newer procedure, more randomized and control trials are required to establish the efficacy of this technique.

VIDEO ASSISTED ANAL FISTULA TREATMENT

The procedure is performed entirely under direct endoluminal vision. Visualization of the fistula tract is done using the fistuloscope, followed by localization of the internal fistula opening. Following this diagnostic fistuloscopy under irrigation, fulguration of the fistula tract is performed after closing the internal opening by suture reinforcement with cyanoacrylate. The internal opening can also be closed using staplers or mucocutaneous flap.20 However, the procedure has higher rates of failure due to non location of internal opening, multiple or secondary tracts and has yet to prove its efficacy in the long term.

Follow-up

Sitz baths, analgesics, and stool bulking agents are used in follow-up care.

Frequent office visits within the first few weeks help ensure proper healing and wound care. Importantly, ensure that the internal wound does not close prematurely; causing a recurrent fistula.21 Digital examination findings can help distinguish early fibrosis.

CONCLUSIONS

Several techniques have been described for the management of fistula-in-ano, but all carry their own risks of recurrence and incontinence. Technology has evolved over the past two decades that may enable surgeons to deal with this troublesome issue with greater success. Conventional fistula surgery techniques have their place, but new technologies such as fibrin glues and the anal fistula plugs offer an alternative approach, with initial studies reporting good success rates. The author believes that the treatment should be tailored with the individual patient taking into account the type of fistula, implication of surgical procedure on the quality of patient’s life, the cost of treatment using plugs and glues and balancing between possible recurrence and preservation of continence.

SUMMARY

KOJI JE TRETMAN ANALNIH FISTULA? SEĆI I PREKRIVATI REŽNJEM, ĆEP (PLUG) ILI PASTA.

Anorectal fistulae are a common condition in surgical practice and one of the most frequent causes of referral and treatment in colorectal surgery. The treatment of fistula-in-ano is challenging and varies in difficulty according to the type of fistula, implication of surgical procedure and the patient's quality of life. The success rate of fistula-in-ano surgery is moderate, ranging from 50 to 80%. However, there are newer and more effective techniques that have been developed in recent years, such as fibrin glue and anal fistula plugs.

REFERENCES


