

Fistula in ano: where are we placed?

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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 but are usually from the same primary opening. Fistula-in-ano is nearly always caused by a previous anorectal abscess (1). Anal canal glands situated at the dentate line provide 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 (2).

Patients often provide a reliable history of previous pain, swelling, and spontaneous or surgical drainage of an anorectal abscess. Perianal discharge, pain, swelling and external openings that may be single or multiple are the commonest features (Fig. 1). 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 (3).

The Parks classification system defines four types of fistula-in-ano that result from cryptoglandular infections which includes intersphincteric, transsphincteric, suprasphincteric and extrasphincteric fistula. However, for better expression in clinical terms, the fistula is termed as subcutaneous, submuscular (intersphincteric, low trans-sphincteric), and complex or recurrent (high trans-sphincteric, supra-sphincteric and extra-sphincteric, multiple tracts, recurrent) (Fig. 2).

Unlike the current procedural terminology coding, the Park's 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.

Differential diagnosis includes hidradenitis suppurativa, infected inclusion cysts, pilonidal disease or Bartholin gland abscess in females. None of these, however, communicate with the anal canal.



Fig. 1 - A horseshoe fistula with multiple openings.



Fig. 2 - A tubercular fistula with scarring and multiple openings.

No specific laboratory studies are required; the routine preoperative studies are performed based on age and co-morbidities if any. Radiological studies are not performed for routine fistula evaluation. They can be helpful when the internal opening is difficult to identify or in the case of recurrent or multiple fistulae to identify secondary tracts or missed primary openings. More information can be gathered with a specialized imaging technique called as fistulography. The accuracy rate however is less than 50%.

Endoanal ultrasound involves passage of a 7- or 10-MHz transducer into anal canal to help define muscular anatomy differentiating intersphincteric from transsphincteric lesions. Studies

show that the addition of hydrogen peroxide via the external opening can help outline the fistula tract course. MRI is becoming the study of choice when evaluating complex fistulae. It has been shown to improve recurrence rates by providing information on otherwise unknown extensions. Computerized tomography is more helpful in detecting perirectal inflammatory disease than for diagnosis of low fistulae because scan can detect the exact location of the fluid pockets that require drainage than detecting small fistulae (4). A barium enema/small bowel series may prove useful for patients with multiple fistulae or recurrent disease to help rule out inflammatory bowel disease. Anal manometry or examination under anesthesia may be needed before subjecting the patient to surgery for anal fistula especially if a reduced sphincter tone is found. Rigid sigmoidoscopy can be performed at the initial evaluation to help rule out any associated disease process in the rectum.

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. 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.

The gold standard surgical therapy is the laying-open technique (fistulotomy), which is useful for primary fistulae like the submucosal, intersphincteric and low trans-sphincteric. Here, a probe is passed into the tract through the external opening to bring it out from the internal opening. The overlying skin, subcutaneous tissue, and internal sphincter muscle are divided with a knife or electrocautry, thereby opening the entire fibrous tract (Fig. 3). Curettage is performed to remove granulation tissue in the tract base. In contrast, complete fistulectomy creates larger wounds that take longer to heal and offers no recurrence advantage over fistulotomy. Biopsy from the tract tissue is mandatory to rule out any granulomatous lesion as a cause of anal fistula, like tuberculosis.

If the fistula tract courses higher into the sphincter mechanism, seton placement should be performed. A seton can be placed alone, combined with fistulotomy, or in a staged fashion. This technique is useful in patients with complex fistulae like high transsphincteric, suprasphincteric, extrasphincteric or multiple fistulae. Seton treatment is more successful in recurrent fistulae after previous fistulotomy, anterior fistulae in female patients, and in patients with poor preoperative sphincter pressures. Patients with Crohn's disease or patients who are immunosuppressed should also be treated with seton placement (5). Setons have two purposes beyond giving a visual identification of the amount of sphincter muscle involved. Setons can be made from large silk suture, silastic vessel markers, or rubber bands (Fig. 4) that are threaded through the fistula tract.

Setons are of two types (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. 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 few weeks. A cutting seton can also be used without associated fistulotomy (6). Two-stage seton is also called as



Fig. 3 - Anal fistulotomy wound with visible tract.

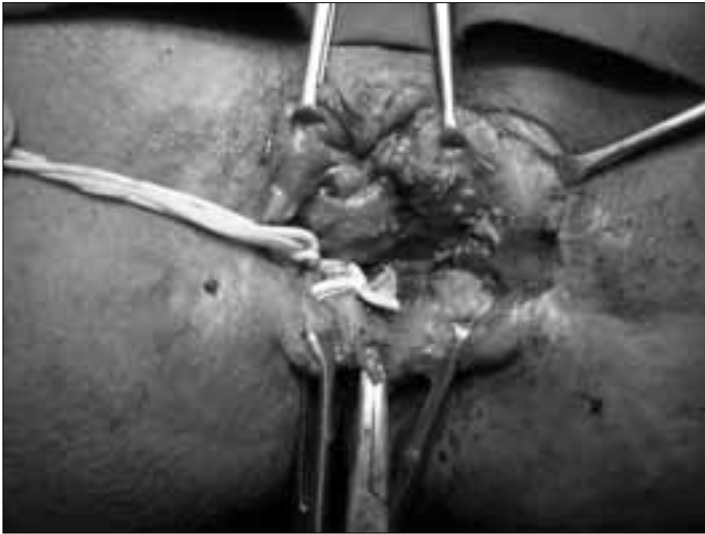


Fig. 4 - Cutting rubber seton in tract.

draining or fibrosing seton. 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 (7).

Mucosal advancement flap is reserved for use in patients with chronic high fistula but is also indicated for all the above complex situations where use of seton is indicated. This procedure involves total fistulectomy, with removal of the primary and secondary tracts and complete excision of the internal opening. A rectal mucomuscular flap with a wide proximal base is raised (8). 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.

Recent advances in biotechnology have led to the development of many new tissue-adhesive and biomaterials. Now the anal fistula can be closed by the injection of fibrin glue, a solution of the clotting factors fibrinogen and thrombin. This glue results in the formation of a clot within the fistula, which helps promote healing of the tract. By its less invasive nature, this therapy leads to decreased postoperative morbidity. While the success rates of fibrin glue ranges between 0-100%, addition of adipose-derived stem cells obtained from a liposuction procedure and a subsequent expansion process has been demonstrated to have a higher success rate when compared with fibrin glue alone.

The anal fistula plug has also proven successful in direct clinical trials. The anal fistula plug is a conical device made of a suturable bioprosthetic material that supports tissue healing. The plug is placed by drawing it through the fistula tract and suturing it in place. Long-term success rates vary with methodology but with minimal morbidity it can be repeated in case of recurrence. However, the recent reports concluded that the success rate with this plug is less than 15% (9). 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 (10). Importantly, ensure that the internal wound does not close prematurely, causing a recurrent fistula. Digital examination findings can help distinguish early fibrosis. Early postoperative complications include urinary retention, bleeding, fecal impaction and occasionally thrombosis in the hemorrhoids. Delayed postoperative complications include recurrence, incontinence, anal stenosis and delayed wound healing.

References

1. Rickard MJ. Anal abscesses and fistulas. *ANZ J Surg.* 2005; 75:64-72.
 2. Williams JG, Farrands PA, Williams AB, Taylor BA, Lunniss PJ, Sagar PM, Varma JS, George BD. The treatment of anal fistula: ACPGBI position statement. *Colorectal Dis.* 2007; 9 Suppl 4:18-50.
 3. Joy HA, Williams JG. The outcome of surgery for complex anal fistula. *Colorectal Dis.* 2002; 4:254-261.
 4. Sun MR, Smith MP, Kane RA. Current techniques in imaging of fistula in ano: three-dimensional endoanal ultrasound and magnetic resonance imaging. *Semin Ultrasound CT MR.* 2008; 29:454-71.
 5. Buchanan GN, Owen HA, Torkington J, Lunniss PJ, Nicholls RJ, Cohen CR. Long-term outcome following loose-seton technique for external sphincter preservation in complex anal fistula. *Br J Surg.* 2004; 91:476-80.
 6. Iwadare J. Sphincter-preserving techniques for anal fistulas in Japan. *Dis Colon Rectum.* 2000; 43:S69-77.
 7. Hammond TM, Knowles CH, Porrett T, Lunniss PJ. The Snug Seton: short and medium term results of slow fistulotomy for idiopathic anal fistulae. *Colorectal Dis.* 2006; 8:328-37.
 8. Alver O, Ersoy YE, Aydemir I, Erguney S, Teksoz S, Apaydin B, Ertem M. Use of "house" advancement flap in anorectal diseases. *World J Surg.* 2008; 32:2281-6.
 9. Safar B, Jobanputra S, Sands D, Weiss EG, Noguera JJ, Wexner SD. Anal fistula plug: initial experience and outcomes. *Dis Colon Rectum.* 2009; 52:248-52.
 10. Whiteford MH, Kilkenny J 3rd, Hyman N, Buie WD, Cohen J, Orsay C, et.al. The Standards Practice Task Force; The American Society of Colon and Rectal Surgeons. Practice parameters for the treatment of perianal abscess and fistula-in-ano (revised). *Dis Colon Rectum.* 2005; 48:1337-42.
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