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REVIEW ARTICLE

Treatment Approaches for the Effective Management of Anal Fistula in the Modern Era

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ABSTRACT
A complication of incision drainage or abscess ulceration around the anus and rectum is anal fistula which manifests as the creation of irregular channels linking the rectum and anal canal with the skin circumambient to the anus. It mostly affects the male population having a yearly frequency of two cases per ten thousand individuals. Histologically in anal fistula chronic inflammatory cells and fibrous tissues are surrounded by epithelialization of variable degree, which are categorized as squamous, columnar, or transitional zone epithelium. Anal fistula influences the psychological condition of the patients, which leads to depression or anxiety symptoms, in addition to severely impacting their standards of living. In general, anal fistula cannot be treated without medical intervention and the most efficient treatment for anal fistula is surgery. The optimal treatment in the modern era includes the elimination of the infected lesion, adequate drainage, and fistula closure while minimizing injury to the anal sphincter which includes treatment with fibrin glue, fistula plug, LIFT, etc.

Keywords:
Anal fistula, Treatment, sphincter-sparing, Fistulotomy, Ligation of Inter-sphincteric Fistula Tract.

Introduction

A complication of incision drainage or abscess ulceration around the anus and rectum is anal fistula which manifests as the creation of irregular channels linking the rectum and anal canal with the skin circumambient to the anus. The disease has a greater impact on men than on women, having a yearly frequency of two cases per ten thousand individuals [1-5]. A fistula can form on its own, but approximately 30–50% of the instances, are a consequence of an anorectal abscess, which anticipates the development of primary and secondary tracks in about 25% of cases [6].

Anal fistula influences the psychical condition of patients, who frequently undergo depression or anxiety symptoms, in addition to severely impacting their life. In general, anal fistula cannot be treated without medical intervention and anal fistula surgery is the frequent alternative. The ideal treatment includes elimination of the infected lesion, adequate drainage, and fistula closure while minimizing the damage to the anal sphincter.

An anal fistula is classified into four distinct forms, supra-sphincteric, inter-sphincteric, trans-sphincteric, and extra-sphincteric[7].

The Fistula of the Inter-sphincteric region invades through the internal sphincter but does not pass via the outer sphincter. Trans-sphincteric form of the fistula is breached via both the inner and outer sphincter. Supra-sphincteric form of fistula enters the body via the inner sphincter and after that expands anterior to the sphincters between the plane, passing over an outer sphincter until reaching in perineum. Horseshoe fall under this abscesses category.

Extra-sphincteric form of fistula is extremely uncommon. It connects the rectum and perineum, extending crabwise to the inner and outer sphincters[7]. It can be grouped as simple or complex fistula. Horseshoe fistulas trans-sphincteric fistulas, extra-sphincteric fistulas, supra-sphincteric fistulas, and chronic multiple tracks fistulas in the inner tracks in female patients are all examples of complex fistulas, linked to inflammatory bowel disease, radiotherapy, and a history of incontinence, or a history of chronic diarrhea [8]. Histologically in anal fistula, chronic inflammatory cells and fibrous tissue in the track are surrounded by epithelialization of variable degree, which is categorized as squamous, transitional zone epithelium, or columnar[9-11].

Many forms of fistulas can be efficaciously treated using fistulotomy which has offered satisfactory outcomes, but more complicated fistulas are troublesome to treat as the possibility of intermittence and continence failure is high. Several sphincter-sparing treatments have been suggested over the years, but the right surgical solution is yet to be found. Despite the broad diversity of surgical methods available, a basic explanation of surgical operation efficacy, failure, and recurrence is still insufficient.

Pathophysiology of Anal Fistula

Anorectal abscess frequently leads to fistula-in-ano. When an anal gland is blocked, an abscess forms, and an infection spread, which is known as an anorectal abscess. The sphincter complex is in close proximity to the infection, allowing the fistula to pass through it.

The crypto glandular epithelium bordering the anal canal is where the infection begins. A barrier preventing infection from entering deep perirectal tissue is the internal anal sphincter. Anal gland ducts pass through the internal sphincter and into the intersphincteric region. Once an infection takes hold in the intersphincteric location, it can spread further. Abscess develops in the intersphincteric region at first, then spreads to nearby prospective spaces. Common causative organisms include E. coli, several Enterococcus species, and different Bacteroides species.[12]

Current Strategies for the Amelioration of Anal Fistula

The type of treatment therapy is determined by the position of the fistula along with the cascading causes. Most fistulas are handled surgically with a range of treatments depending on the presence of the outer and inner sphincters. Complex forms of fistula, occurring due to Crohn's disease, are therapeutically treated. Draining pus from the abscess cavity or putting a draining seton in the fistula are two treatment options. This is not a novel idea but it has been promoted for quite some time [13,14]. An ongoing contamination results in a lower rate of recovery.

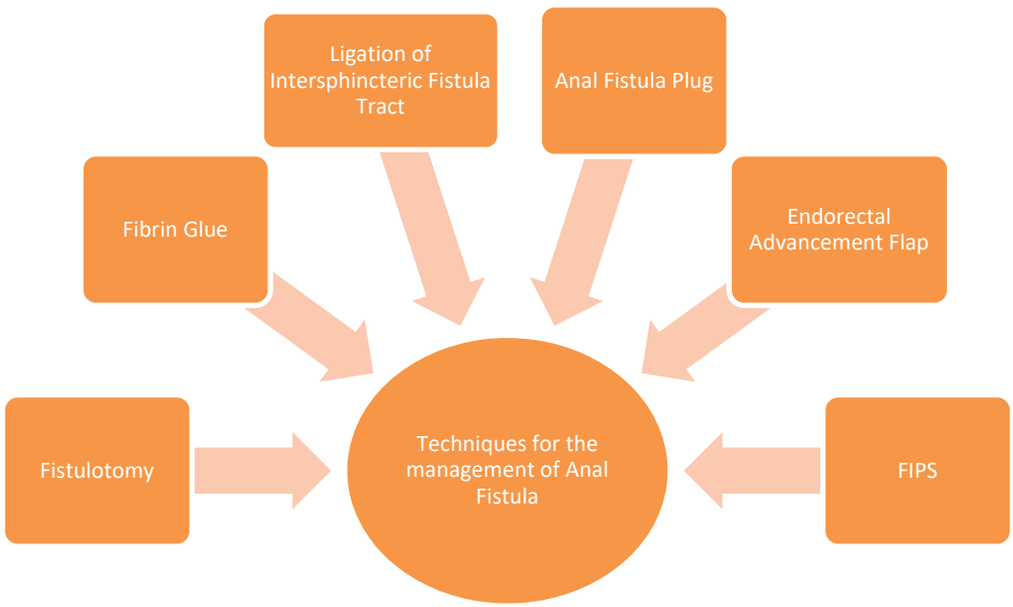

Fig. 1. Treatment Approaches for the management of Anal Fistula.

Fistulotomy

The sphincter muscle is separated and the fistula tract is opened during fistulotomy. For treating basic anal fistulas primary fistulotomy has been used as the standard, and it is still effective for inter-sphincteric and low trans-sphincteric fistulas. For simple fistulas with limited sphincter intervention, this surgical procedure is very successful, with 90 % recovery [15]. Higher fistulas may be a very different challenge, but there is not much research to back this up. According to research findings, severe complicated, and chronic fistulas show a 4% recurrence risk and 36% continence problems with flatus or mild fecal staining being the most common cause [16]. A study looked at 50 patients and found that 7% of them had recurrences, with 40% of them having mild control issues [17].

Another research examined anal manometry in 35 sufferers after and before the operation. Patients who had previously suffered incontinence improved their manometric characteristics and anal continence. Incontinence did not escalate in patients who had never had it before. In this analysis, the recurrence rate was 5.7 %. One more research found similar results following 81 months of follow-up with 70 patients, with enhanced fecal continence after fistulotomy and an 8.6% reappearance rate [19]. According to these studies in complex fistulas, sphincter recovery in the context of fistulotomy appears to be a feasible option. It must be noted that fistulotomy is a very complex method utilized in just a few areas throughout the world [18].

Fibrin Glue

In the early stages of the procedure, anal fistula treatment accompanied by fibrin glue injection received a lot of attraction because it appeared to be a straightforward and well-tolerated solution to a complicated problem. The procedure entails lining the fistula tract with glue and, in some cases, it involves debridement of the tract and closing of the inner opening with suture. The glue enables the formation of a provisional matrix during reoccurrence. Fibrin glue serves as a fecal infection stopple as well as a supporting structure for the development of native tissue [20]. Following that, a few minor case studies came into light, which depicted a primary healing rate of 30-60%. Healing rates were found to be lower in bigger series with longer follow-up durations [21-24].

Long-term healing rates in patients suffering from anal fistula were studied after 16 months of injection treatment and it was reported that only 14% of sufferers had permanent relief from fistula[25]. Fibrin glue's poor performance is due to the shortcomings of the glue clot which has liquid consistency [26]. The development of abscesses leads to long-term intermittence. Synthetic glue e.g., cyanoacrylate glue, obstructs the fistula which can form several abscesses around the glue remnants. In other operations, such as video-assisted anal fistula treatment (VAAFT), it also plays a part in strengthening the suture closing of the inner opening [27].

Lift (Ligation of Intersphincteric Fistula Tract)

LIFT is an economical, successful sphincter-sparing method that was first developed by Rojanasakul [28], with a 94.4 % effectiveness rate and no continence failures. The LIFT method ligates and slices the fistula in sphincters, scrapes the damaged tissue of the fistula wall, and ligates the fistula tract, essentially preventing recurring infections caused by fecal particles. It is suitable for trans-sphincteric fistulas with well-formed fistulas, and the majority of complex anal fistulas. Other fistulas, such as rectovaginal fistula, can be treated using LIFT [29-30].

The LIFT technique comes in a variety of forms. Some practitioners advise regular seton positioning prior to LIFT [31], while some of them use setons only whenever required. Suturing in the interior of the anal canal is not a part of the classic treatment method, but some cases involve the closing of the inner aperture inside the anal canal [32]. Over the last nine years, there have been over 30 publications on LIFT, with healing rates ranging from 40 to 95 % [33-37.]

A bioprosthetic mesh is placed into the inter-sphincteric groove[38], which can perform LIFT and an endorectal advancement flap simultaneously[39], a fistula implant that moves from the inter-sphincteric groove to the external orifice (LIFT-Plug) [40], All have been proposed as improvements to the LIFT technique. The findings of these approaches seem to be positive.

FIPS

A fistulotomy is still the recommended therapy for basic anal fistula care, the conventional fistulotomy has two major drawbacks, high incontinence incidence, and keyhole deformity. While the sphincter-sparing procedure has gained widespread acceptance in recent decades, colorectal surgeons also face a significant recurrence rate.

Parkash et al. [41] suggested FIPS, an urgent sphincter repair procedure, to strengthen fistulotomy in 1985. FIPS decreases the risk of postoperative keyhole deformity and fecal incontinence as compared to traditional fistulotomies. Furthermore, when compared to most sphincter preservation techniques, FIPS lowers the post-surgery recurrence rate.

De Hous et al. [42] used a retrospective clinical trial to show that FIPS might help patients with clear anal fistula to avoid keyhole deformity, and the incidence of keyhole deformity was linked to the presence of posterior

fistula. Furthermore, the FIPS postoperative recurrence rate was within a reasonable range (4.2 %).

In a retrospective study, Seyfried et al. [43] discovered that primary sphincter repair was not only successful for distal fistula, but even for intermediate fistula, and proximal fistula therapy. However, as the complexity of the anal fistula increased, the medicinal effect of this procedure diminished.

Patients with complex or trans-sphincteric anal fistulas had poorer postoperative satisfaction with FIPS, according to Litta et al. [44] FIPS is an effective, safe, and low-reappearance anal fistula therapy, particularly for simple anal fistulas, but patients must be knowing about the risk of incontinence and keyhole deformity after surgery.

Anal Fistula Plug

The anal fistula plug method was originally discovered in the year 2004 and in 2006 the first case was published [45]. The technique quickly acquired popularity due to its simplicity, convenience of use, absence of any injury to the underlying tissue, and higher patient tolerance.

Lyophilized porcine-derived small intestinal sub-mucosa (Cook Biotech Incorporated, United States) is used to make an anal fistula plug (APF). It is a solid, pliable tissue that is stripped of its cells and facilitates tissue repair and restoration by acting as a framework for host fibroblasts [45]. This material was created with the intention of repairing severe tissue abnormalities in the abdomen and chest walls.

The initial recovery rates for AFP were found to be to be between 85 and 87 % [45-46]. These rates, however, did not hold up under more stringent scrutiny, and further case studies were not able to replicate the high success rates. Most studies were long enough to reveal that the curative rate was found to be less than 50%, and some cases reported as low as 24% [47-51].

There is additional evidence to suggest that repeating the plug location after an initial failure is not a good idea [52]. Complex fistula success rates ranged between 35% to 87 %. This demonstrates that such a technique is very unlikely to succeed. But because of its good tolerance and fewer side effects, AFP is a felicitous alternative in treating intricate anal fistulas. However, due to higher rates of failure of APF, the patient must be advised accordingly.

Endorectal Advancement Flap

It is a sectional-thickness flap made up of sub mucosa, rectal mucosa, and muscle fibers that are mobilized. The foundation should be larger than the tip by at least a 2:1 ratio to ensure enough blood supply. Debris and epithelial lining can be cored and curated to remove from the anal fistula track, followed by the closure of the inner hole and induction of the advancement flap above the defect for avoiding strain. According to a study of 1,654 patients, full-thickness flaps are comparatively less safe than partial-thickness flaps [53].

The reported success rates varied widely because of a small sample and different modalities. Initial recovery rates usually vary from 65 to 93 %. [54-56]. It is still uncertain whether a draining seton is necessary or not before the anorectal flap [57-59]. This is a difficult question to address because many trials are biased, not randomized, and cannot exist in series that use setons selectively, which serve as an additional step for the more complicated fistulas. The investigators believe that preoperative drainage with the help of seton is helpful if there is any sign of continuing inflammation or sepsis. Mitalas et al. [60] published their experience with second-generation advancement flaps in 26 patients, with a 69 % recovery rate in the first attempt. Healing rates were >90% when combined with those that were safely administered during the second attempt. According to the same research advancement flap appears to have no influence on continence. Initially, fibrin glue injection was recommended as a method to be used along with an advancement flap. It has been reported that a combination of these two methods provides higher recurrence than flap alone [61-62].

Crohn's disease can be treated using advancement flaps, but they are less successful. It should not be done if there is active mucosal disease present [63-64].

Conclusion

With the increased focus on anorectal disorders and the growth of science and technology, a plethora of innovative therapies have developed to address the issue of complicated anal fistula. Because of the features of many inducements and kinds of complicated anal fistula, there is a lack of consistent criteria for evaluating the success of various anal fistula treatment approaches, and no consensus on the optimum therapy has been formed. Currently, we demonstrate that a range of techniques may be utilized to treat fistula, demonstrating the varying intricacy of anal fistula and the unexpected and non-reproducible effects associated with the disease. Before attempting repair, it is critical to identify secondary expansions and tracts of the fistula from the anal canal. In general, anal fistula cannot be treated without medical intervention and the most feasible treatment option is surgery. The optimal treatment of anal fistula in the modern era includes the elimination of the infected lesion, adequate drainage, and fistula closure while minimizing injury to the anal sphincter which includes treatment with fibrin glue, LIFT, FIPS, and fistula plug.

Conflict of Interest

The authors declare no conflict of interest.

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