

A 30 YEAR EXPERIENCE IN THE MANAGEMENT OF ANAL FISTULA

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ABSTRACT

Anal fistula has been recognized for centuries, and yet, its treatment remains a challenge for surgeons till today. In this study, a 30 year experience of treating anal fistula is being reported and discussed in light of the various recognized management methods. A total of 320 patients were treated by fistulotomy, fistulectomy, fistula plugging or seton technique. Data showed that fistula plugging carried the highest failure rate (89%) seconded by fistulectomy (37%), seton procedure (24.5%) and fistulotomy (15.6%). High transsphincteric fistulas were more likely to predict failure compared to low transsphincteric, intersphincteric and subcutaneous fistulas (37.5% versus 9.5%, 7.3% and 0%, respectively). In conclusion, the scales seem to support fistulotomy. However, no standardized algorithm exists to guide the care of patients and the choice of operation is based on patient-related factors, the patient's surgical history, and the surgeon's experience and familiarity with the various techniques for treating anal fistula.

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1. Introduction

Anal fistula is one of the most benign anorectal disorders treated by the surgeons. It is mostly an age old problem involving the anorectal region. It has proven to be notorious for its chronicity, recurrences and frequent acute exacerbations. References to fistula in the anorectal region date to antiquity. Hippocrates (460 B.C) described the use of seton to cure fistula in anorectal region. In 1376, the English surgeon John Ardene wrote treatises of fistula in anorectal region, whereby he described fistulotomy and seton use (1). Of all patients who present with an initial perianal abscess, up to 65% will develop a chronic or recurrent anal fistula (2,3).

The true prevalence of fistula-in-ano is unknown. The incidence of a fistula-in-ano developing from anal abscess ranges from 26 to 38% (4). One study showed that the prevalence of fistula-in-ano is 8.6 cases per 100 000 population. The prevalence in men is 12.3 and in women 5.6 cases per 100 000 population. The male to female ratio is 2.1 and the

mean age is 38.3 years (5, 6). Surgery is the basic gold standard treatment of anal fistulas aiming mainly at healing the fistulous tracts, eradication of infection, and preservation of anal sphincter muscle. Various surgical treatments have been tried to cure fistula-in-ano including fistulectomy, fistulotomy, fistula plugging, and seton procedure. The aim of this article is to review our experience with patients treated for anal fistula secondary to cryptoglandular disease and to determine the factors that could influence postoperative outcome.

2. Methods

During the period between March 1986 and February 2015, three hundred and twenty patients underwent surgical intervention for anal fistula (214 males and 106 females; median age: 42 years; range: 20-71 year and follow-up: 6-18 months). Exclusion criteria were non-crypto-glandular fistula (i.e. fistula due to inflammatory bowel disease, HIV, malignant

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neoplasm, radiotherapy and obstetrical trauma), and rectovaginal or rectourethral fistula. Age, sex, history, type of fistula, number of fistula tracts, baseline continence and type of procedure performed were recorded (Table 1). Postoperative complications and recurrences in patients, stay and outcome were also recorded. Operative failure was defined as persistence or recurrence of symptoms within six months of intervention. Colonoscopy was performed when indicated to exclude any suspected disease, and preoperative endoanal ultrasonography was done in patients with persistent or recurrent anal fistula after prior interventions, and in patients with multiple external fistula openings.

Mean age (Range)	38 Years (21-71 years)	
Main duration of symptoms	28 weeks	
	Number of Patients	Percentage
Sex		
Male	214	(66.8%)
Female	106	(33.2%)
Previous Operation	260	(80%)
Baseline incontinence		
Stool	9	(2.8%)
Gas	19	(5.3%)
Fistula Type		
Subcutaneous	45	(14%)
Intersphincteric	85	(26.5%)
Low transsphincteric	165	(51.5%)
High transsphincteric	25	(7.8%)
Single vs multiple openings	270/50	(84.3%/15.7%)
Horseshoe	41	

Table 1 - Characteristics of Patients with Anal fistula

Preoperative preparation consisted of enema the night before surgery. All patients underwent the operation either under general or spinal anesthesia as indicated by the anesthesiologists according to the patient's general condition and concerns. All patients were reexamined under anesthesia in lithotomy position on the operative table to verify the preoperative anorectal findings and the type of fistula. Biopsy was taken from all patients and sent for histopathology to detect fistulas secondary to specific causes.

Fistulas were classified according to anal sphincter involvement as subcutaneous, intersphincteric, low transsphincteric, and high transsphincteric.

The continence level was assessed and documented preoperatively and postoperatively in all patients. If present, it was classified as gas or stool incontinence. Patients who had both symptoms were listed under the more severe of the two symptoms (stool incontinence).

180 patients underwent fistulotomy which consisted of laying open the fistula with curettage of the tract, fifty patients underwent fistulectomy where the fistulous tract was removed en masse, and thirty five patients were treated with anal fistula plugging (Surgisis AFP) where collagen tissue was used to plug the fistula and acted as scaffold to promote healing, and lastly, 55 patients underwent seton technique where we used rubber for this procedure. It consisted of passing the rubber through the fistula tract around the deep external sphincter after opening the skin, the subcutaneous tissue and exposing the internal sphincter muscles. The rubber was tightened down and secured with a separate silk suture. With time, fibrosis occurred above the rubber as it gradually cut through the sphincter muscles and essentially exteriorized the tract. The rubber was tightened on subsequent office visits, twice weekly, until it is pulled over in six to eight weeks.

3. Results

Fistulotomy was performed in 180 patients and in 28 patients (15.6%), the operative intervention failed (Table 2). Of these 28 patients, disease persistence was apparent in 15 patients within one month of the intervention and in 13 patients within one to six months.

Postoperative recurrence was noted mainly following anal plugging (87% of patients) while fistulotomy, fistulectomy and seton procedure had similar recurrence rate. However, fistulectomy had the highest postoperative incontinence rate (28%), followed by seton procedure (15%), fistulotomy (8.5%) and finally anal plugging (2%) (Table 2).

From the 320 patients, 41 had horseshoe fistulas and underwent either fistulotomy (n=15), anal plugging (n=16) or seton procedure (n=10). These patients had the highest percentage of operative failure (44.5%) (Table 3).

After combining the postoperative recurrence and incontinence rates, it was evident that anal fistula plugging carried the highest failure rate (89%) compared with fistulotomy (15.6%), fistulectomy (37%) and seton procedure (24.5%). It was also noted that the presence of multiple external anal openings increased the risk of recurrence as depicted in Table 3. Moreover, we found that older patients had a higher postoperative complication rate (18%) compared with the younger group (12.5%).

Finally, high transsphincteric fistulas were more likely to predict failure compared with low transsphincteric, intersphincteric and subcutaneous fistulas (37.5% versus 9.5%, 7.3% and 0%, respectively) (Table 3).

Method of Treatment	Number of patients	Healing duration in weeks	Recurrence rate %	Incontinence rate %
Fistulotomy	180	3-5	7.1	8.5
Fistulectomy	50	7-15	9	28
Anal fistula Plugging	35	2-4	87	2
Seton Procedure (Rubber)	55	6-8	9.5	15

Table 2 - Operative Intervention and Overall Outcome

Age	
≤ 42 years	12.5 %
>42 years	18 %
Sex	
Male	14.5 %
Female	17.3 %
Fistula Type	
Subcutaneous	0 %
Intersphincteric	7.3 %
Low Transsphincteric	9.5 %
High transsphincteric	37.5 %
Number of Fistulous tracts	
Single	14 %
Multiple	19.5 %
Procedure	
Fistulotomy	15.6 %
Fistulectomy	37 %
Anal Plug	89 %
Seton Procedure	24.5 %

Table 3 - Percentage of Operative Failure in Patients with anal fistula

4. Discussion

Management of anal fistula remains a challenge for surgeons (coloproctologists) because of the anatomical location of the disease and the potential risks of postoperative recurrence and incontinence complications. Although the primary objective of operative intervention is to cure the fistula, equally important is the morbidity associated with each procedure.

Fistulotomy remains one of the most commonly performed operations for anal fistula with a reported success rate ranging from 87% to 94% (7), which is similar to our findings (84.4%). As mentioned before, fistulotomy entails the division to various degrees of anal sphincter muscle, which may affect the patient's incontinence and adversely affecting the patient's quality of life.

In our series, postoperative incontinence has been noted between 8.5% and 28% of patients who underwent fistulotomy and fistulectomy. This conforms to incontinence rates reported in literature that range between 6 and 40 percent (6, 8-10). So, this finding has prompted surgeons to identify the subgroups of patients who are at an increased risk of developing post fistulotomy and post fistulectomy incontinence and to offer such patients sphincter preserving techniques. Patients who are predisposed to incontinence include patients with baseline incontinence, those with a history of anal operations, women with anterior based fistulas, and patients with high tracts or horseshoe fistulas involving a significant amount of sphincter muscle (11, 12).

Although, early results with anal fistula plugging appeared promising, several large studies showed a low success rate 14% (13) which is consistent with our results. However, more recent studies reported better success rates from 20% to 34% (14, 15).

During the study period, all patients were treated with fistulotomy, fistulectomy and 2 other sphincter preserving techniques (the anal fistula plugging and seton procedure). However, the highest operative success was achieved with fistulotomy and seton procedure. The anal fistula plug was associated with the lowest success rate (13%). Postoperative fecal incontinence developed in 8.5%, 28%, 2% and 15%, respectively, in patients who did not have prior baseline incontinence (Table 2). Patients older than 42 years and having high transsphincteric fistulas had higher rates of fecal incontinence as depicted in Table 3. These findings can be explained physiologically as loss of muscle tone due to aging or loss of muscle tissue due to surgical intervention, both entities would affect the continence level (16).

On assessment of the risk factors for recurrence, incontinence and delayed wound healing in our series, it was found that the presence of multiple external openings was associated with increasing risk of recurrence, and this conforms to what was reported in St. Mark's Hospital series (17). Our results support the commonly held idea that fistula recurrences increase with the complexity of the fistula (18). The high postoperative recurrence rate seen in horseshoe fistulas suggests that uncertainty about the relationship of the fistula with anatomic structures of the anal region can preclude effective treatment. A thorough knowledge of the anatomy of the region is strongly recommended. Actually, the appropriate type of surgery is dictated by the course of the fistula tract. Significant potential morbidity, such as incontinence and recurrence, contributes to the surgeon's reluctance to perform aggressive and invasive procedures resulting in the non-eradication of infection and hence recurrence (19). On reviewing literature, it was noted that improper identification of internal opening was reported to be the most common cause of recurrence.

In our study, there was no significant difference between fistulotomy (7.1%) and seton (9.5%) regarding recurrence rate; however, previous reports showed that seton has a higher recurrence rate (0-25%) compared to fistulotomy (1-9.7%) (20). This difference could be attributed to the smaller number of patients treated by seton technique, higher selection of cases, and the shorter follow-up period in our study.

The other major concern in fistula surgery is the possibility of various degrees of incontinence. In this series, complaints about disorders of continence have been reported in 53.5% of patients without a major degree of postoperative incontinence. This result is within the normal range of incontinence, up to 56%, as reported in different series (21-23).

Data in this study depicted that there was a significant correlation between the development of anal incontinence and old age, female sex, and the presence of multiple external openings. In line with the literature, the association of incontinence with the complexity of fistula is statistically significant (18, 24).

Furthermore, our results support the commonly held belief that cutting of the tissue encircled by a fistulous tract carries a risk of incontinence that is proportional to the amount of muscle divided (25). Clearly, one should be more conservative in women and particularly in those with anterior-based fistula, as the anal canal tends to be shorter. In addition, there is the added problem of occult sphincteric injury secondary to child birth (30% after regular delivery and 80% after forceps assisted delivery) (25).

This study has several limitations, in particular, the patients were not randomized to the various operative interventions and the choice of operation was driven by the surgeon's judgment, based on the patient's surgical history, fistula anatomy, and baseline continence level. Most of the patients, perceived to be at a higher risk of incontinence, underwent fistulotomy and a sphincter preserving operation. On the other hand, the anal fistula plugging and seton (rubber) technique were used in a smaller number of patients. Therefore, the results of our study need to be interpreted within the context of these limitations.

It is also important to note that other procedures are implicated in the treatment of anal fistula such as endorectal advancement flap, anocutaneous flap (25, 26), video-assisted anal fistula treatment (VAAFT) (27), which is a minimally invasive and sphincter saving procedure for treating complex fistulas. The main feature of the VAAFT technique is the ability to view the fistula from the inside of the tract so that it can be eradicated under direct vision using fistuloscope. In our institutions this equipment is not available and consequently we are not acquainted with this procedure, not to mention that the cases of complicated fistulas are limited in Lebanon. Furthermore, recent reports from Chulalongkorn University described a novel technique called Ligation of the intersphincteric fistula tract (LIFT) (28, 29). It is based on detection of the internal opening by injection of H₂O. A curvilinear incision at the intersphincteric tract is made, followed by identification of the intersphincteric tract and its ligation close to the internal opening and then removal of the intersphincteric tract. Finally, there all granulation tissue in the rest of the fistulous tract will be removed with suturing of the defect at the external sphincter muscle.

Muhammed Sh et al. reported that primary healing was achieved in 82% of 45 patients (30), while Tozer et al. reported a lesser success in such a procedure reaching 57% of the 37 patients (31). This procedure leads to preservation of anal sphincter, with minimal tissue injury and a shorter healing time (Anaraki et al.2016) (32).

On the other hand, the LIFT procedure started in our institutions since April 2012.

So far, the cases are limited and there is a need for a close follow-up to analyze the results before any reporting.

Furthermore, there is another new technique, the radical emitting laser probe that showed very promising preliminary results (33, 34, 35), however, it is still too early to report on.

Moreover, adipose derived adult stem cell administration to treat complex perianal fistula proved to be safe without any incontinence risk but it seems that healing is lower than other sphincter-preserving procedure (36, 37).

5. Conclusions

The Surgical treatment of anal fistula is a balancing act aimed at eradicating the disease, preserving continence, and limiting the morbidity of the interventions.

In this study, the scales seem to support fistulotomy compared with the other operations. Anal fistula plugging was associated with the highest operative failure and persistence of the disease when compared with fistulotomy, fistulectomy, and seton technique. Patients with high transsphincteric fistula and those older than 42 years were at higher risk of developing postoperative incontinence. It is recommended that some understanding of the anatomy of the fistulous tract and its relation to anal sphincter, in addition to factors affecting outcome, is a must for proper planning for surgical management of anal fistula.

In brief, the management of anal fistula remains a challenging condition to the colorectal surgeons despite the best technological advances. No standardized algorithm exists to guide the care of patients with anal fistula, and the choice of operation is based on patient-related factors, the patient's surgical history, and the surgeon's experience and familiarity with the various new techniques for treating anal fistula.

References

1. Abbas MA, Jackson CH, Haigh PI: Predictors of outcome of anal fistula surgery. *Arch Surg*. 2011; 146(9):1011-1016..
2. Atkin GK, Martins J, Tozer P, Ranchod P, Phillips RK: For many high anal fistulas, lay open is still a good option. *Tech Coloproctol* 2011; 15(2):143-150.
3. Bleier JI, Moloo H, Goldberg SM: Ligation of intersphincteric fistula tract: an effective new technique for complex fistula. *Dis colon Rectum* 2010; 53(1):43-46.
4. Blerir JI, Moloo H, Goldberg SM: Ligation of the intersphincteric fistula tract: an effective new technique for complex fistulas. *Dis Colon Rectum* 2010; 53:43-46.
5. Blumetti J, Abcarian A, Quinteros F, Chaudhry V, Prasad L, Abcarian H: Evolution of treatment of fistula in ano. *World J Surg* 2012; 36(5):1162-1167.
6. Cavanaugh M, Hyman N, Osler T: Fecal incontinence severity index after fistulotomy: a predictor of quality of life. *Dis colon rectum* 2002; 45(3):348-353
7. Champagne BJ, O'Connor LM, Ferguson M, Orangio GR, Schertzer ME, Armstrong DN: Efficacy of anal fistula plug in closure of cryptoglandular fistulas: long-term follow-up. *Dis colon Rectum* 2006; 49(12):1817-1821.
8. Christoforidis D, Pieh MC, Madoff RD, Mellgren AF: Treatment of transsphincteric anal fistulas by endorectal advancement flap or collagen fistula plug: a comparative study. *Dis Colon Rectum* 2009; 52(1):18-22..
9. Davies M, Harris D, Lohana P, Chandra Sekaran TV, Morgan AR, Beynon J, Carr ND: The surgical management of fistula-in-ano in a specialist colorectal unit. *Int J Colorectal Dis* 2008; 23(9):833-838.
10. Deeba S, Aziz O, Sains PS, Darzi A: Fistula-in-ano: advances in treatment. *Am J Surg* 2008; 196: 95-99.
11. El Maksoud WA, Osman MM, Gaweesh Y: Management of deep post anal space suppuration associated with horseshoe fistula: Conventional lay open method versus posterior midline approach. *EJS* 2012; 4:155-160.
12. Garcia-Anguilar J, Belmonte C, Wrong WD, Goldberg SM, Madoff RD: Anal fistula surgery: factors associated with recurrence and incontinence. *Dis colon Rectum* 1996; 39:723-729.
13. Hamadani A, Haigh PI, Liu II, Abbas MA: Who is at risk for developing chronic anal fistula or recurrent anal sepsis after initial perianal abscess? *Dis colon Rectum* 2009; 52(2):217-221.
14. Hidaka H, Kuroki M, Hirokuni T, Toyama Y, Nagata Y, Takano M, Tsuji Y: Follow-up studies of sphincter-preserving operations for anal fistulas. *Dis colon Rectum* 1997; 40:107-111.
15. Hongo Y, Kurokawa A, Nishi Y: Open coring-out (function-preserving) technique for low fistulas. *Dis Colon Rectum* 1997; 40:S104-106.
16. Hyman N, O'Brien S, Osler T: Outcomes after fistulotomy: results of a prospective, multicenter regional study. *Dis Colon Rectum* 2009; 52(12):2011-23024.
17. Koehler A, Risse-Schaaf A, Athanasiadis S: Treatment for horseshoe fistulas-in-ano with primary closure of the internal fistula opening: a clinical and manometric study. *Dis Colon Rectum* 2004; 47(11):1874-1882.
18. Loungnarath R, Dietz DW, Mutch MG, Birnbaum EH, Kodner JJ, Fleshman JW: Fibrin glue treatment of complex anal fistulas has low success rate. *Dis Colon Rectum* 2004; 47(4):432-436.
19. Lupinacci RM, Vallet C, Parc Y, Chafai N, Tiret E: Treatment of fistula-in-ano with the Surgisis® AFP(TM) anal fistula plug. *Gastroenterol Clin Biol* 2010; 34 (10):549-53.
20. Malouf AJ, Buchanan GN, Carcapeti E, Rao S, Guy RJ, Westcott E, Thomson JP, Cohen CR: A prospective audit of fistula-in-ano at St. Mark's hospital. *Colorectal Dis* 2002; 4:13-19.
21. Osman MM, El Maksoud W, Zaki Y, Moaz A: Complex anal fistula: clinic-pathological variables affecting cure. *EJS* 2013; 32(2):121-125.
22. Perrin WS: President's address: some landmarks in the history of rectal surgery. *Proc. Roy. Soc. Med* 1932; 25:338-346.
23. Pezim ME: Successful treatment of horseshoe fistula requires deroofting of deep postanal space *Am J Surg* 1994; 167(5):513-515.
24. Roig JV, Jordan J, Garcia-Armengol, Esclapez P, Solana A: Changes in anorectal morphologic and functional parameters after fistula-in-ano surgery. *Dis colon Rectum* 2009; 52(8):1462-1469.
25. Rosa G, Lolli P, Piccinelli D, Mazzola F, Bonomo S: Fistula in ano: anatomoclinical aspects, surgical therapy and results in 884 patients. *Tech Coloproctol* 2006; 10(3):215-221.

26. Meinero P, Mori L: Video-assisted anal fistula treatment (VAAFT): a novel sphincter-saving procedure for treating complex anal fistulas. *Tech coloproctol* 2011; 15(4):417-422.
27. Ortiz H, Marzo J, Ciga MA, Oteiza F, Armendáriz P, de Miguel M: Randomized clinical trial of anal fistula plug versus endorectal advancement flap for the treatment of high cryptoglandular fistula in ano. *Br J surg* 2009; 96(6):608-612.
28. Shanwani A, Nor AM, Amri N: Ligation of the intersphincteric fistula tract (LIFT): a sphincter-saving technique for fistula-in-ano. *Dis Colon Rectu.* 2010, 53:39-42.
29. Younes HE: Ligation of the intersphincteric fistula tract technique in the treatment of anal fistula. *International Surgery Journal* 2017; 4(5):1536-40.
30. Shahid M, Ahmed Z, Malik S: Management of low anal fistula: Fistulectomy alone versus fistulectomy with primary closure. *Pakistan Armed Forces Medical Journal* 2017; 1:67.
31. Tozer P, Sala S, Cianci V, Kalmar K, Atkin GK, Rahbour G, Ranchod P, Hart A, Phillips RK: Fistulotomy in the tertiary setting can achieve high rate of fistula cure with an acceptable risk of deterioration in continence. *J Gastrointest Surg* 2013; 17(11):1960-1965.
32. Anaraki F, Bagherzade G, Behboo R, Etemad O: Long-term results of ligation of intersphincteric fistula tract (LIFT) for management of anal fistula. *Journal of Coloproctology (Rio de Janeiro)* 2016; 36(4):227-30.
33. Giamundo P, Geraci M, Tibaldi L, Valente M: Closure of fistula-in-ano with laser-FiLaC™: an effective novel sphincter-saving procedure for complex disease. *Colorectal Dis* 2014; 16(2):110-5.
34. Oztürk E, Gülcü B: Laser ablation of fistula tract: a sphincter-preserving method for treating fistula-in-ano. *Dis Colon Rectum* 2014; 57(3):360-4.
35. Arroyo A, Moya P, Rodríguez-Prieto MA, Alcaide MJ, Aguilar MM, Bellón M, Pérez-Vázquez MT, Candela F, Calpena R: Photodynamic therapy for the treatment of complex anal fistula. *Techniques in coloproctology* 2017; 21(2):149-53.
36. Guadalajara H, Herreros D, De-La-Quintana P, Trebol J, Garcia-Arranz M, Garcia-Olmo D: Long-term follow-up of patients undergoing adipose-derived adult stem cell administration to treat complex perianal fistulas. *Int J Colorectal Dis* 2012; 27(5):595-600.
37. Limura E, Giordano P: Modern management of anal fistula. *World J Gastroenterol* 2015; 21(1):12-20.