Original

FACTORS INCREASING THE RISK OF RECURRENCE IN FISTULA IN ANO

Maryam Bibi[1], Nabeela Rauf[2], Gulmeena Khan[3]
[1]Resident second fellowship urogynae Ayub teaching hospital Abbotabad
[2]Resident second fellowship urogynae Ayub teaching hospital Abbotabad
[3]Resident gyn/obs Ayub teaching hospital Abbotabad
Corresponding Author:
Nabeela Rauf
Resident second fellowship urogynae Ayub teaching hospital
Email: raufnabeela@gmail.com

ABSTRACT:

BACKGROUND: Fistula in ano is a path that connects the anal canal or rectum to the epidermis surrounding the anus. Anorectal infection is the most common cause of anorectal fistula. Key aspects of anal fistula treatment include closing the internal opening of the fistula tract, draining infection or necrotic tissue, and excising the fistulous tract while preserving sphincter function.

OBJECTIVE: The aim of this study was to evaluate various aspects such as per operative complications, post-operative complications, and various factors associated with recurrence and management of fistula in ano including fistulotomy, fistulectomy, setons, and an anal advancement flap.

METHODOLOGY: A retrospective cohort study was conducted in Ayub teaching hospital abbotabad from 2018 till 2022. The sample size was calculated and a total of 130 people were included in this study. SPSS was used for data analysis which included quantitative and qualitative data.

RESULT: The mean age of presentation for fistula in ano was 38 years (SD ± 10.32) with age ranging from 18 to 60 years, showing a statistically significant recurrence rate with p value of 0.022. The study also included males greater than females with insignificant statistical association of p value 0.706. The type of surgical procedure performed and co morbidities presented were significantly associated with recurrence with a p value of 0.00 and 0.01 respectively.

CONCLUSION: Fistulotomy and fistulectomy demonstrated lower recurrence rates compared to setons. Additionally, comorbidities such as diabetes, hypertension, and age were found to be significantly associated to recurrence.

KEYWORDS: FACTORS; RISK; RECURRENCE; FISTULA

1.INTRODUCTION

An anal fistula is a hollow tract that connects an external opening in the perianal skin to an internal opening in the anal canal (1). The majority of adult anal fistulas are a sequel of cryptoglandular infection, which are initially present in the intersphincteric space and subsequently extends to involve the other surrounding areas as well (17). There are typically 6 (range, 3-10) anal glands spread reasonably uniformly and circumferentially at the level of the dentate line in a normal anal canal. They interact with the anal canal via crypts or channels, though up to half of all crypts do not have glands.

80% of anal glands are limited to the submucosa, with the remaining 20% having the ability to invade the internal sphincter but rarely the external sphincter. Herrmann and Desfosses proposed in 1880 that some instances of anal fistula could be caused by anal glands reaching deep from the lower rectal mucosal

membrane into perianal tissue. This hypothesis, now known as the cryptoglandular theory, is most firmly backed by Parks' work in 1961. (11)

According to Park's classification anal fistulas are classified as intersphincteric, transsphincteric, suprasphincteric, or extrasphincteric based on the location of the fistula tract. (1) Anal fistulas can be further classified into simple (low lying) and complex (high lying) fistula. (23)

Complex anal fistulas pose difficulty in treating because they involve a significant portion of the anal sphincters, making complete eradication of the fistulous tract associated with a significant risk of incontinence. Failure to excise the primary tract and its secondary extensions, as well as adequately drain sepsis, may, on the other hand, result in the persistence or recurrence of the anal fistula. Recurrent anal fistulas after previous fistula surgery present a unique challenge that typically necessitates more anal surgery expertise to treat the cause of recurrence and travel through the disturbed anatomy after previous surgery. (11) (23)

During wound healing extensive signaling between the cells and stimulation of a well-orchestrated cascade of cytokines, growth factors, and interleukins play a major role. In comparison, there is a disruption in this process in chronic wounds. When a patient with a complicated anal fistula fails to heal after sphincter-sparing surgery or develops repeated perianal infections, it is frequently assumed that there is an anatomical or technological issue.

Several studies have found that males are twice as prone as women to acquire perianal abscess and fistulas. The reasons for this are unknown. There are no variations in anal gland histology or location between females. At the cellular level, there is proof that testosterone increases proinflammatory cytokines while oestrogen decreases them. (11)

Several studies have shown that chronic cryptoglandular anal fistulas produce high amounts of certain proinflammatory cytokines. Anal fistulas are variably epithelialized and surrounded by thick collagen tissue with pockets of inflammatory cells, according to histological investigations. Their growth and survival are most likely the result of a complex combination of histological, microbiological, and molecular variables (21). Following are the most frequently performed procedures which are mentioned below:

FISTULOTOMY:

Fistulotomy is a successful procedure for treating simple low lying anal fistulas with a healing rate of more than 90%.(11). Fistulotomy refers to the opening or deroofing of the fistulous tract. After retracting the anal canal, a blunt-ended probe is inserted through the exterior and internal openings. The tissue covering the probe is dissected. The fistulous tract's epithelial lining is then curetted. Overhanging skin edges are excised. (1)

FISTULECTOMY:

An elliptical incision is given and deepened around the external opening, and tissue is dissected on each side of the tract. Dye is injected such as methylene blue into the tract, it functions as a guide. If sphincter muscles are found during dissection, they are detached from the tract. Dissection was performed up to the interior orifice, and the mucosal defect was eventually repaired with delayed absorbable suture material. When a tract stops abruptly and without an internal opening, dissection is performed up to the level of methylene blue staining and the tract is removed. (1)

SETON: Three types of setons are most commonly used including Cutting, draining, and Medicated seton. It is beneficial in the treatment of high anal fistula. Nonabsorbable thin silastic tubing/monofilament material used. Internal and exterior openings are found using a blunt probe while the patient was in the

lithotomy position. The seton was then introduced via the exterior aperture into the internal opening through the fistulous tract, and the end was taken out via the anal canal. The two ends were then tied parallel with silk to minimise causing discomfort to the patient. In the case of seton cutting, the seton is gradually tightened after two weeks to cut through the anal sphincter progressively. Draining setons are retained for two to three months to drain collecting and infection control. (1) In the case of complicated anal fistulas, initial seton is used to manage sepsis which is usually followed by a subsequent, definitive treatment to treat the fistula. Depending on the type of secondary treatment, healing rates have ranged from 62% to 100%. (23)

ENDO ANAL ADVANCEMENT FLAP:

Endoanal advancement flap is a sphincter-saving technique that involves curettage of the fistula tract, closure of the internal opening, and mobilization of a proximal segment of healthy anorectal mucosa, submucosa, and muscle to cover the location. According to reports, 66% to 87% of crypto glandular fistulas heal following the first endoanal advancement flap. (23)

The goal of this study is to identify and evaluate the various factors associated with the recurrence of fistula in ano in order to provide insights into the creation of effective prevention and treatment strategies. The impact of co-morbidities on recurrence such as diabetes mellitus (DM), hypertension, and cardiovascular illness was also studied, including gender, age and the different treatment modalities available.

DEFINITION OF RECCURRENCE:

Anal fistula surgery success is usually described as full epithelization of the anal wound with no residual tract, external or internal openings, or perianal discharge. Failure of fistula treatment is classified into three categories: persistence, recurrence and de-novo fistula. Persistence of anal fistula is described as the inability of the anal fistula that fails to completely heal for more than six months after treatment. Recurrence is described as the clinical recurrence of the fistula within one year of the operation after full healing of the surgical wound. De-novo fistula is the clinical development of a fistula after full healing of the surgical incision that occurs more than one year after the initial procedure. (1), (2). Several risk factors have been identified with the risk of recurrence which can be divided into three categories: preoperative, intraoperative, and postoperative risk factors. Recent studies also suggests that histological, microbiological, and molecular factors probably play a role (11). The position of the primary fistulous tract with the location of its internal opening and its identification is crucial as high transphincteric, supra sphincteric and extrasphincteric fistulaes are more prone for recurrence and difficult to completely excise and remove the entire tract. (2)

In order to completely delineate the entire anatomy of fistulous tract. MRI is the most widely diagnostic tool of investigation used. (2) The role of imaging is signifiancamt because it is useful in identifying any secondary extensions of the fistula tract or any abscess cavity present simultaneously. (2)

2.METHODOLOGY:

A Retrospective Cohort study was conducted in Ayub teaching hospital Abbotabad. Data was collected from June 2018 till June 2022. Sample size for this study is calculated using the WHO calculator .A Pakistani study was searched and used for the sample size estimation with 90% confidence level. The total sample size of 130 patients were included in this study. Ghani F, Khan KH, Shahzad M, Ahmad K. Effectiveness of seton in anal fistula. J Surg Pakistan. 2019;24(1):8-12. Doi:10.21699/jsp.24.1.3.

All the Patients aged between 18-60 years were included in this study with fistula in ano undergoing for surgical management. Patients with inflammatory bowel diseases such as Crohn's disease and Ulcerative

colitis, patients who had prior preoperative anal incontinence and patients who had a history of recurrent anal fistulas were excluded from this study .Data was collected retrospectively via patients medical records through their EMR who had fistula in ano diagnosed clinically and on Magnetic Resonance Imaging of Pelvis .

They underwent the surgical procedure details were filled according to the pre constructed questionnaire. Patients were asked for any post operative recurrence and its associated symptoms. Patients were tracked for up to six months and more via telephonic contact and their record of Opd follow up visits after surgery for the above mentioned symptoms.

3.DATA ANALYSIS:

Data was analyzed using Microsoft Excel 2016 and SPSS v. 21.0. Qualitative (gender, residential/socio-economic status, certain co morbid conditions present, type of anal fistula, type of surgical procedure performed ,outcome and recurrence encountered data was expressed as number and percentage (No & %). Quantitative data including age was expressed as mean and standard deviation (N ± SD). Frequency, mean, percentage and standard deviation were calculated for qualitative and quantitative data respectively. Pearson's coefficient was used to assess presence of association between type of procedure performed for different types of anal fistula and its surgical outcome including recurrence.

Chi square test was applied to assess strength of association. A P value of less than or equal to 0.05 was taken as significant.

4.RESULTS:

According to this sample data 107 males (82%) and 17 females (17.7%) were included in this study. The mean age of presentation of this disease was 38 years with standard deviation of 10.32 ranging from 20 to 60 years.

Following were the most commonly procedures performed in our setup. Fistulotomy was the most commonly performed procedure in 49 (45.38 %) of patients.

Fistulectomy in 42 (32.31%), Seton in 25 (19.2%) and an advancement flap in 4 (3%) of individuals included in this study.

The recurrence rate for fistula in ano was seen in 30 (23%) of patients. Among the following procedures recurrence was most commonly seen in patients who were treated with seton in 13 (43.3%) of patients followed by fistulectomy in 16 (36.7%) and 11 (33%) patients had recurrence who had fistulotomy done. No recurrence was seen in advancement flap group. We also wanted to see if the type of surgical procedure performed had anything to do with the risk of recurrence of anal fistula. P value of 0.000 was calculated and was found to be statistically significant.

Patients who experienced recurrence of this disease post operatively, their recurrence were co related with co morbidities.

It was found that patients who were Diabetic had a higher recurrence rate and it was seen in 9 individuals and in 3 who were hypertensive. Chi square test was applied and p value of 0.01 was calculated with significant statistical difference.

Furthermore, on comparative statistical analysis for recurrence of anal fistula with different parameters we found that age has significant statistical association having the p-value of 0.022 and gender has no any significant statistical association having p value of 0.706.

PROCEDURE * RECURRENCE				
Count				
		RECURRENCE		Total
		none	yes	
PROCEDURE	advancement flap	4	0	4
	fistulectomy	31	11	42
	fistulotomy	53	6	59
	seton	12	13	25
Total		100	30	130

GENDER					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	23	17.7	17.7	17.7
	Male	107	82.3	82.3	100.0
	Total	130	100.0	100.0	

		COMORBIDS					Total
		dm	htn	ihd	multiple	Nkcm	
RECURRENCE	none	5	6	1	4	84	100
	yes	9	3	0	3	15	30
Total		14	9	1	7	99	130

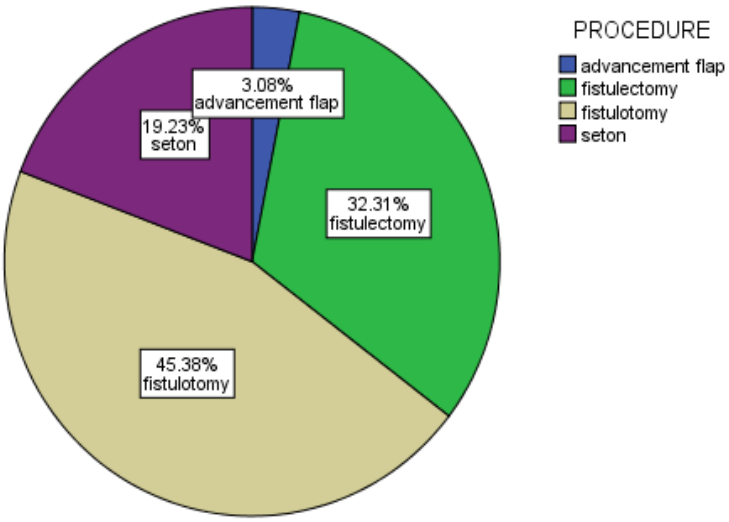
RECURRENCE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	none	100	76.9	76.9	76.9
	yes	30	23.1	23.1	100.0
	Total	130	100.0	100.0	

DESCRIPTIVE STATISTICS SUMMARY OF STUDY SUBJECTS:

VARIABLE		**STATISTICS N (%)**	**P VALUE**	**RECURRENCE N (%)**
AGE GROUP	18- 28 YEARS	21 (16.1%)	0.022	
	29-38 YEARS	49 (37.6%)		
	39-48 YEARS	31 (23.8%)		
	49-60 YEARS	29 (17.7%)		

GENDER	MALE	107 (82.3%)	0.706	24 (18.4%)
	FEMALE	23 (17.7%)		06 (4.6%)
PROCEDURE	FISTULOTOMY	49 (45.3%)	0.000	06 (20%)
	FISTULECTOMY	42 (32.31%)		11 (36.7%)
	SETON	25 (19.2%)		13 (43.3%)
	ADVANCEMENT FLAP	04 (3%)		--
RECURRENCE	YES	30 (23.1%)	-	
	NO	100 (76.9%)		
COMORBIDS	DM	14 (10.8%)	0.001	09 (6.9%)
	HTN	09 (6.9%)		03(2.3%)
	IHD	01 (0.7%)		--
	MULTIPLE	07 (5.4%)		03 (2.3%)



5.DISCUSSION:

Fistula in ano is a frequent surgical benign colorectal disease with significant risk of morbidity and recurrence that presents a significant therapeutic difficulty. Anal fistulas most commonly presents with complains of peri anal discharge and discomfort. Fistulectomy, Fistulotomy, Seton, advancement flap, etc and other therapies are now available. Fistulotomy is the most widely used procedure with a success rate of 87 to 94% (4). Because each operation has its own set of difficulties, this study compared the outcomes

of various procedures and the risk factors associated with recurrence. (1). It is imperative to localize the internal opening of anal fistula at the start of the procedure. Failure to do so may increase the incidence of recurrence substantially EAUS or MRI are used to locate the internal opening prior to surgery. MRI has a sensitivity and specificity of 96% and 90% for identifying interior openings, respectively. Preoperative MRI may aid in the localization of the internal opening and should be used in all complex fistulas (2), (16).

In the current study Males affected with anal fistula were in majority who were admitted as compared to females with a mean age of 38 years, same findings were consistent with a prospective study conducted by Ramachandra ML et al and his colleagues with reported mean age of presentation 31-40 years of age and male to female ratio of 2.1:1. (1). These findings were also consistent with a retrospective study conducted by Abbas et al with mean age of 45 years and a predominance of Males over Females. (4)

The literature favors a varied range of recurrence rate. The recurrence rate of anal fistula was 23.1% which was reported according to our study which is also consistent with other study Ramachandra et al reported a recurrence rate of 25%. (1) Furthermore, one more study concluded the recurrence rate after fistulotomy and fistulectomy as 9.4% and 12.3 % respectively. (08). Ghani et al also concluded a recurrence rate of 20% treated by seton. (3)

The association of recurrence of this disease was compared and studied in relation to co morbid conditions present. However, it showed a statistical significant relation with a p value of 0.001. which is in line with other studies. A case control study showed association of certain medical conditions including Diabetes, Hypertension and Hyperlipidemias in the development of anal fistulas. (14). Another study conducted by Ho et al reported that in diabetic patients healing rate is slower (p=0.00). Similar was the observation in hypertensive patients (24).

A meta-analysis was done which signifies no statistically significant difference in the recurrence rate between the fistulectomy and fistulotomy procedures. There are many factors that affect the postoperative results. (7).

Besides from the physical variables that cause recurrence a number of additional comorbidities raise the likelihood of anal fistula recurrence. Anal cancer, Crohn's disease, diabetes, smoking, obesity and an immunocompromised condition such as HIV are among these risk factors. (06) , (13). Anal fistulas are variably epithelialized and surrounded by thick collagen tissue with pockets of inflammatory cells, according to histological investigations .Their growth and survival are most likely the result of a complex combination of histological, microbiological, and molecular variables. (21)

Novel strategies for treating this complicated disease are developing. Intersphincteric Fistula Tract Ligation LIFT stands for intersphincteric fistula tract ligation. Rectal Sleeve Advancement Flap , Anal fistula Plug, Mesenchymal stem cells, Anal fistula endoscopic therapy VAAFT and fistula laser closure, which have success rates of 86% and 69% respectively are emerging as a potential method for difficult anal fistula therapy, including recurring fistulas (2,19).

6.CONCLUSION:

We determined in the current study that different risk variables for recurrence were statistically significant, including the surgical methods done. Fistulectomy and Fistulotomy have a lower recurrence rate than setons, which have the greatest recurrence rate. However, comorbidities such as diabetes and hypertension, as well as age, were substantially linked with the recurrence of fistula in ano.

7.LIMITATIONS:

However, the limitation of our study is that patients were followed for a shorter period of time of 6 months and non-randomization of the study.

8.REFERENCES:

1. Ramachandra ML, Garg M. A comparative study in the management of fistula in ANO using various modalities. Int Surg J 2018; 5:2223-7.
2. Emile SH. Recurrent anal fistulas: When, why, and how to manage? World J Clin Cases. 2020 May 6;8(9):1586-1591. doi: 10.12998/wjcc. v8.i9.1586. PMID: 32432136; PMCID: PMC7211523.
3. Ghani F, Khan KH, Shahzad M, Ahmad K. Effectiveness of seton in anal fistula. J Surg Pakistan. 2019;24(1):8-12. Doi:10.21699/jsp.24.1.3.
4. Abbas MA, Jackson CH, Haigh PI. Predictors of outcome for anal fistula surgery. Arch Surg. 2011 Sep;146(9):1011-6. doi: 10.1001/archsurg.2011.197. PMID: 21930996.
5. Hamadani A, Haigh PI, Liu IL, Abbas MA. Who is at risk for developing chronic anal fistula or recurrent anal sepsis after initial perianal abscess? Dis Colon Rectum. 2009 Feb;52(2):217-21. doi: 10.1007/DCR.0b013e31819a5c52. PMID: 19279415.
6. Bakhtawar N, Usman M (March 07, 2019) Factors Increasing the Risk of Recurrence in Fistula-in-ano. Cureus 11(3): e4200. doi:10.7759/cureus.4200
7. Xu Y, Liang S, Tang W. Meta-analysis of randomized clinical trials comparing fistulectomy versus fistulotomy for low anal fistula. Springerplus. 2016 Oct 6;5(1):1722. doi: 10.1186/s40064-016-3406-8. PMID: 27777858; PMCID: PMC5052239.
8. Kanchwala Q, Jain D, Phalgune D. Recurrence rates and fecal incontinence after fistulotomy or fistulectomy. Indian J Colo-Rectal Surg 2018; 1:43-7
9. Jordán J, Roig JV, García-Armengol J, García-Granero E, Solana A, Lledó S. Risk factors for recurrence and incontinence after anal fistula surgery. Colorectal Dis. 2010 Mar;12(3):254-60. doi: 10.1111/j.1463-1318.2009.01806. x. Epub 2009 Feb 7. PMID: 19220375.
10. Toyonaga T, Matsushima M, Kiriu T, Sogawa N, Kanyama H, Matsumura N, Shimojima Y, Hatakeyama T, Tanaka Y, Suzuki K, Tanaka M. Factors affecting continence after fistulotomy for intersphincteric fistula-in-ano. Int J Colorectal Dis. 2007 Sep;22(9):1071-5. doi: 10.1007/s00384-007-0277-z. Epub 2007 Jan 30. PMID: 17262199.
11. Sugrue J, Nordenstam J, Abcarian H, Bartholomew A, Schwartz JL, Mellgren A, Tozer PJ. Pathogenesis and persistence of cryptoglandular anal fistula: a systematic review. Tech Coloproctol. 2017 Jun;21(6):425-432. doi: 10.1007/s10151-017-1645-5. Epub 2017 Jun 15. PMID: 28620877.
12. Dudukgian H, Abcarian H. Why do we have so much trouble treating anal fistula? World J Gastroenterol 2011; 17(28): 3292-3296 [PMID: 21876616 DOI: 10.3748/wjg.v17.i28.3292]
13. Schwandner O. Obesity is a negative predictor of success after surgery for complex anal fistula. BMC Gastroenterol. 2011 May 23; 11:61. doi: 10.1186/1471-230X-11-61. PMID: 21605391; PMCID: PMC3120794.
14. Wang D, Yang G, Qiu J, Song Y, Wang L, Gao J, Wang C. Risk factors for anal fistula: a case-control study. Tech Coloproctol. 2014 Jul;18(7):635-9. doi: 10.1007/s10151-013-1111-y. Epub 2014 Jan 23. PMID: 24452294.

15. Buchanan GN, Halligan S, Williams AB, et al. Magnetic resonance imaging for primary fistula in ano. Br J Surg 2003; 90: 877-881.
16. Chi-Ming P, Chung-Kei ND, Ho-Yin C, Shiu-Ki L, Heng-Tat L. Recurrence Pattern of Fistula-in-Ano in a Chinese Population. JGLD [Internet]. 1Mar.2008
17. Poggio J. Fistula-in-Ano: Background, Anatomy, Etiology. 2019 Nov 18 [cited 2020 Feb 22]
18. Torkzad MR, Karlbom U. MRI for assessment of anal fistula. *Insights Imaging.* 2010; 1:62–71.
19. Akiba RT, Rodrigues FG, da Silva G. Management of Complex Perineal Fistula Disease. *Clin Colon Rectal Surg.* 2016; 29:92–100.
20. Cavanaugh M, Hyman N, Osler T. Fecal incontinence severity index after fistulotomy: a pr.
21. Pathogenesis and persistence of cryptoglandular anal fistula: a systematic review. Sugrue J, Nordenstam J, Abcarian H, Bartholomew A, Schwartz JL, Mellgren A, Tozer PJ. *Tech Coloproctol.* 2017; 6:425–432.
22. How the location of the internal opening of anal fistulas affect the treatment results of primary transsphincteric fistulas. Sygut A, Mik M, Trzcinski R. *Langenbecks Arch Surg.* 2010;395:1055–1059.
23. Vogel JD, Johnson EK, Morris AM, Paquette IM, Saclarides TJ, Feingold DL, Steele SR. Clinical practice guideline for the management of anorectal abscess, fistula-in-ano, and rectovaginal fistula. Diseases of the Colon & Rectum. 2016 Dec 1;59(12):1117-33.
24. Ho KS, Tsang C, Seow-Choen F, Ho YH,Tang CL, Heah SM, et al Prospectiverandomised trial comparing ayurvedic cuttingseton and fistulotomy for low fistula-in-ano.Tech Coloproctol.2015;5:137-41.