

## Fistulotomy in the Management of Perineo-Scrotal Anterior Fistula-In-Ano

Dharma Reddy<sup>1</sup>, Vivaan Dutt<sup>2</sup>, Sahana N<sup>3</sup>, Gururaj Gundad<sup>4</sup>

<sup>1</sup>Associate Professor, Department of Surgical Gastroenterology, Vijayanagar Institute of Medical Sciences, Bellary

<sup>2</sup>Post-graduate, Department of General Surgery, Vijayanagar Institute of Medical Sciences, Bellary

<sup>3</sup>Post-graduate, Department of General Surgery, Vijayanagar Institute of Medical Sciences, Bellary

<sup>4</sup>Post-graduate, Department of General Surgery, Vijayanagar Institute of Medical Sciences, Bellary

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Corresponding author: Dr Gururaj Gundad

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### Abstract

**Introduction:** Anterior fistulas opening over the scrotum or perineum, have long represented a surgical challenge.

**Objectives:** To study the outcomes in 30 cases of anterior fistulas, treated with fistulotomy as a single stage procedure.

**Methods:** In a prospective study, 30 patients with anterior fistulas were selected. Workup was done to delineate the course and type of fistula. The selected cases underwent fistulotomy as a single stage procedure. Outcomes of surgery were measured in terms of recurrence of symptoms, incontinence as measured by the Wexner score, and complications.

**Results:** Over half the fistulae (53.3%) were found to be trans-sphincteric type according to Park's classification. Post fistulotomy, 22 patients (73.3%) recovered completely. Four patients had minor complication of wound infection. Recurrence was noted in one of the patients. Two patients were found to have incontinence post-operatively at 3 months, with Wexner scores >10. However, only 1 patient had a significant incontinence at the 6-month post-operative follow up visit.

**Conclusion:** Fistulotomy appears to be a simple and effective treatment modality for anterior fistulae. A comparative analysis with other surgical techniques is warranted.

**Keywords:** Fistula, Perineum, Scrotum, Treatment Outcome.

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### Introduction

Fistulas represent a common and debilitating chronic inflammatory disease prevalent since centuries. Patients present with complaints of chronic pain, discharge and even incontinence. Prevalence rates of fistulas range from 5 to 12 cases per 1,00,000 population, with male preponderance. [1,2]

Primary fistulas are the result of chronic progression of a local infective pathology. [3] Whereas, secondary fistulas are the result of other underlying disease or condition, such as inflammatory bowel disease, tuberculosis or trauma.

Examination by careful palpation reveals the anal fistulous tract between the

external opening, which is normally found in the perianal region, and the internal opening into the anal canal. Goodsall's Rule is used to guide the identification of the course of fistula. [4]

Management principles of fistulas centre largely on controlling of the anal sepsis with antibiotics, and reducing symptoms, followed by definitive measures to manage the fistula, with a goal of minimal morbidity in terms of preventing recurrence and maintaining continence.

Anterior fistulas with the external opening over the scrotum or perineum represent a surgical challenge owing to their site and long course. [5]

A range of surgical treatment modalities have been described since the time of ancient Indian medicine. [6][7] Fistulotomy is a commonly used modality of treatment, implying opening up of the fistulous tract, and allowing for healing of the tissue by secondary intention.

In this study, we report the outcomes of 30 cases of anterior fistulas opening over the scrotum or perineum, treated with fistulotomy in a single stage procedure.

## Methods

In this prospective study conducted at a tertiary care government hospital, Vijayanagar Institute of Medical Sciences, Bellary, India, 30 patients with fistula-in-ano who presented to the surgical gastroenterology OPD with external opening over the perineum or scrotum, between the period of 2016-2019, were considered.

Anterior fistula with the external opening either at the perineal body, base of scrotum, or distal to it was the criteria for inclusion in this study. [5]

A detailed clinical history was taken and secondary fistulas were excluded. Examination was done to identify the position of the external opening and course

of the tract. Classification of type of fistula was done using Parks' classification. [8]

MR fistulogram was ordered in all cases to accurately identify the course of fistula, and rule out possible urethral involvement. Written prior informed consent was taken. All patients were managed by fistulotomy as a single stage procedure, by a single operating surgeon.

Patient was placed in the lithotomy position under spinal anaesthesia, and the tract was delineated with local injection of methylene blue solution. A fistula probe was used to pass along the fistula tract. Entire fistula tract was then opened up between the internal and external openings, passing through the subcutaneous tissues as well as the perineal musculature in most of the patients. Where necessitated, the scrotum was also divided in order to expose the complete course of the fistula.

Post operatively patients were advised Sitz bath and stool softeners, and discharged on post-operative day 1 or 2. Patient was given instructions to continue Sitz bath 3 times daily, and also to wash the wound with antiseptic solution after passing stools and while bathing, to prevent contamination and soiling. Weekly follow up was done initially, and healing and closure of the wound was assessed. Long term follow-up was done for a period ranging from 1-3 years.

Outcomes were measured using several variables based on patient interview, including residual symptoms and postoperative incontinence, and physical examination of surgical site. The Wexner score [9] was used to further assess patients who reported incontinence. A score > 9 was taken to be significant for incontinence. Recurrence was excluded by patient interview for symptoms and physical examination to rule out any new external opening or perianal discharge. In case of suspicion for recurrence, a repeat MRI was done.

Statistical analysis of was done using SPSS-22 software, after tabulation of data on an MS Excel spreadsheet. Chi square test was applied as test of significance, with confidence value at 95%, and  $p < 0.01$  was considered as statistically significant.

### Demographic profile

**Table 1: Age and sex wise distribution of the patients**

Variable	Frequency	Percent
<b>Age group</b>		
20 - 30 yrs	10	33.3
31 - 40 yrs	6	20
41 - 50 yrs	9	30
> 50 yrs	5	16.7
Mean $\pm$ SD	39.37 $\pm$ 12.87	
<b>Sex</b>		
Female	4	13.3
Male	26	86.7

The mean age of the patients enrolled in this study was  $39.37 \pm 12.87$  years, with a majority of the patients in the age group of 20-30 years (33.3%)

Patients were predominantly male, with only 4 female patients (13.3%). All female patients selected presented with trans-sphincteric fistulas with external opening at perineum.

Patient profile with respect to age and sex were found to mirror with the general presentation of anterior fistulae reported elsewhere.

### Clinical Profile

**Table 2: Clinical profile of patients with fistula (n=30)**

Parameter	Frequency	Percent
<b>Duration of symptoms</b>		
2 - 6 months	21	70
7 - 12 months	6	20
> 12 months	3	10
Mean $\pm$ SD	7.60 $\pm$ 5.89	
<b>Comorbidities</b>		
Yes	10	33.3
No	20	66.7
<b>Side of scrotum</b>		
Right	16	53.3
Left	13	43.3
Midline	1	3.3
<b>Position</b>		
10'O clock-2'O clock	29	96.7
9'O clock-3'O clock	1	3.3
<b>Park's Classification</b>		
Trans	16	53.3
Inter	9	30
Supra	3	10

	Extra	2	6.7
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Patients presented with symptoms of pain and itching at the site of fistulous opening, seropurulent discharge from the fistula and faecal staining at fistula opening. The majority of patients (n = 18) complained of pain and discharge as the reason for seeking medical attention. However, the mean duration of symptoms following which patients reported to us was found to be  $7.60 \pm 5.89$  months, indicating a prolonged course in a majority of patients.

**Table 2: Co-morbid conditions among the patients with fistula (n=30)**

Co-morbidities	Frequency	Percent
Haemorrhoids	4	13.3
Perianal abscess	5	16.6
Type 2 DM	2	6.7
Hypertension	1	3.3

33.3% of patients were found to have comorbidities. 3 (10%) had systemic comorbidities, out of which 1 patient had both type 2 diabetes mellitus and hypertension, while 2 others had type 2 diabetes alone. 9 (30%) of the patients had loco-regional comorbidities, with 5 patients having co-existing perianal abscess and 4 patients having internal haemorrhoids.

Over half the fistulae (53.3%) were found to be trans-sphincteric type according to Park's classification. Inter-sphincteric was the next most common, occurring in 30% of the cases.

Variation was also found with respect to the position of the internal opening of the fistulae. However almost all cases (n = 29) were found to have an internal opening between the 10'O clock and 2'O clock positions, i.e., anteriorly.

Position of the external opening of the fistula was found to be on the right hemiscrotum in 53.3% of the cases, and in 1 case was found to open over the median raphe itself.

### Outcomes

Outcomes of surgery were measured in terms of recurrence of symptoms, incontinence as measured by the Wexner score, and complications, including wound infection. Parameters were recorded at time of discharge, after 3 and 6 months.

22 patients (73.3%) recovered completely with uneventful intra and post-op course. 4 patients had post-op wound infection which subsided with regular Sitz bath and short course oral antibiotic cover. Recurrence was noted in one of the patients enrolled in our study. A recurrence of previous symptoms, with a perianal abscess, occurred by the 6-month follow up visit. A repeat MR fistulogram was ordered, and a branched fistula was noted, indicating that an unidentified branched tract probably existed at the time of initial surgery.

Two patients were found to have incontinence post-operatively at 3 months, with Wexner scores >10. However, only 1 patient had a significant incontinence at the 6-month post-operative follow up visit, i.e., a Wexner score >10. This patient had a trans-sphincteric type of fistula.

The mean duration to full healing of the fistulotomy was 3 weeks ( $21 \pm 2$  days)

**Table 3: Surgical outcome of the patients with fistula (n=30)**

Parameter	Frequency	Percent
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<b>Incontinence (at 3 months)</b>		
Yes (Wexner >10)	2	6.67
No (Wexner <10)	28	93.3

**Table 3: Surgical outcome of the patients with fistula (n=30)**

Parameter	Frequency	Percent
<b>Incontinence (at 6 months)</b>		
Yes (Wexner >10)	1	3.3
No (Wexner <10)	29	96.7

## Discussion

Patients with ano-rectal sepsis are at risk for fistula formation, with 30-40% of those with acute ano-rectal sepsis progressing with chronicity to perianal fistula. Formation of fistulae has been well explained by the cryptoglandular theory which describes that the initiating event is obstruction of the glands of the anal crypt, leading to infection of the accumulation of inspissated debris. As this suppuration continues, an abscess forms and it spreads along the path of least resistance through the anal complex and into the perineal region inferiorly, to the ischiorectal fossae laterally, and supra-levator space superiorly. From here it can extend further into the scrotum in males or vulva in females. [10][11]

Goodsall's rule states that if the external opening of an anal fistula is anterior to a transverse line across the anus will open radially into the anterior wall of the anal canal provided it is less than 3 cm from the anal verge, else it will open in the midline posteriorly.[10] In rare cases, extension of the fistula with external opening away from the immediate perianal region, into the perineum or scrotum is noted, and represents a surgical challenge. [12]

Exception to the Goodsall's Rule is the long-tract anterior fistula [13], which include fistulas with scrotal extension. Such fistulae often have long, curved courses which may not be fully delineated on clinical examination and PR examination. There is no standard protocol for investigative procedures to identify the fistula tract, however, MR fistulogram [14]

is often accepted as the most informative, and indicated in cases with long course of fistula. On axial and coronal MR-images the different layers of the anal sphincter and the surrounding structures can be well visualised.

The layers of the scrotum, from the surface to the testes, consist of the epidermis, dartos fascia, Colles' fascia, and external spermatic fascia. The Colles' fascia spreads over the anterior part of the superficial external sphincter muscle, the deep perineal fascia and the external spermatic fascia.[15] It is hypothesised that a low trans-sphincteric fistula with an anterior internal opening (as seen in a majority of our cases), penetrates the superficial external sphincter and directly enters the Colles' fascia. The fistula proceeds through the Colles' fascia or through the potential space between the Colles' fascia and deep perineal fascia to the scrotum and finally opens at the scrotal epidermis. [16][17]

This explains the reason why fistulotomy represents a safe surgical technique for long anterior fistula. A fistulotomy lays open the fistulous tract, thus leaving smaller unepithelized wounds, which hastens the wound healing. Marsupialization of the fistulotomy wounds can reduce the healing time further. The structures through which the fistula tracks, is devoid of vital structures, and has good blood supply. This allows for good healing, and maintenance of strength of the perineal body muscles, despite them being divided intra-operatively.

There is a paucity of studies addressing the successful management of long fistulas

with scrotal or perineal extension. A study in Japan by Araki et al. [16] studied 56 patients with anal fistulas with scrotal extension. Median age of patients was 38 (range 13-80) years. The mean duration of anal fistulas was 54 months. The left side of the scrotum was most commonly involved. Within each subgroup of Parks' classification, 38 patients had low trans-sphincteric fistulas and 6 had inter-sphincteric fistulas. Patients were treated using drainage setons, and many required multiple setons for successful treatment, although all patients were eventually cured.

While our study shows similar clinical profile of patients, treatment outcomes were comparable or superior to seton technique. Moreover, it is accomplished as

a single stage procedure, with minimal recurrence.

### Conclusion

Thus, we consider fistulotomy to be a simple and effective treatment modality for long anterior fistulae, and has results comparable to any other complex surgical procedure, following proper pre-operative assessment of the course of the fistula tract.

A comparative analysis with other surgical techniques may throw better light on the optimal management strategy for such challenging fistulae.

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### References

1. Nelson R.L., Abcarian H. (2014) Epidemiology, Incidence and Prevalence of Fistula in Ano. In: Abcarian H. (eds) Anal Fistula. Springer, New York, NY
2. Sainio P. Fistula-in-ano in a defined population. Incidence and epidemiological aspects. Ann Chir Gynaecol. 1984. 73(4):219-24.
3. Yeo, C. J. (2019). Shackelford's surgery of the alimentary tract, 2019; 160; 1871-1887
4. Burgess BE. Chapter 88. Anorectal Disorders. In: Tintinalli JE, Stapczynski JS, Cline DM, Ma OJ, Cydulka RK, Meckler GD, eds. Tintinalli's Emergency Medicine: A Comprehensive Study Guide. 7th ed. New York: McGraw-Hill; 2011
5. McGee, M. F., Champagne, B. J., Stulberg, J. J., Reynolds, H., Marderstein, E., & Delaney, C. P. (2010). Tract Length Predicts Successful Closure with Anal Fistula Plug in Cryptoglandular Fistulas. Diseases of the Colon & Rectum, 53(8), 1116–1120.
6. Shindhe PS. Management of rare, low anal anterior fistula exception to Goodsall's rule with Kṣārasūtra. Anc Sci Life. 2014;33(3):182–185. doi:10.4103/0257-7941.144624
7. Kim DS. Comparison of a fistulectomy and a fistulotomy with marsupialization in the management of a simple anal fistula: a randomized, controlled pilot trial. J Korean Soc Coloproctol. 2012;28(2):67–68.
8. Parks, A. G., Gordon, P. H. and Hardcastle, J. D. (1976), A classification of fistula-in-ano. Br J Surg, 63: 1-12
9. Jorge JM, Wexner SD. Etiology and management of fecal incontinence. Dis Colon Rectum. 1993; 36:77–97.
10. Corman ML, Bergamaschi RCM, Nicholls RJ, Fazio VW; Anal fistula; Corman's Colon and Rectal Surgery. 6th ed. Philadelphia: Lippincott Williams & Wilkins; 2013. 384-427.
11. Samdani T, Nash GM. Anal cancer. In: Steele SR, Hull TL, Read TE, Saclarides TJ, Senagore AJ, Whielow CB, editors. The ASCRS textbook of colon and rectal surgery. 3rd ed. Heidelberg: Springer; 2016.

12. Abou-Zeid AA. Anal fistula: intraoperative difficulties and unexpected findings. *World J Gastroenterol.* 2011;17(28):3272–3276.
13. Muralidhar V, R G S, Krishnamurthy A. Long anterior anal fistula with an external opening in the medial raphe of the scrotum is likely to open radially inside the anal canal: an addition to the Goodsall's rule. *BMJ Case Reports.* 2018 Oct;2018
14. Barker PG, Lunniss PJ, Armstrong P, et al. Magnetic resonance imaging of fistula-in-ano: technique, interpretation and accuracy. *Clin Radiol.* 1994 Jan;49(1):7-13.
15. Netter FH. Atlas of human anatomy. 6th ed. Philadelphia, PA: Saunder/Elsevier; c2014. 329-97 p.
16. Araki Y, Kagawa R, Yasui H, et al., Rules for anal fistulas with scrotal extension. *J Anus Rectum Colon* 2017; 1:22–8.
17. Kurihara H, Kanai T, Ishikawa T, et al. A new concept for the surgical anatomy of posterior deep complex fistulas: the posterior deep space and the septum of the ischiorectal fossa. *Dis Colon Rectum.* 2006 Oct;49(10 suppl): s37-44.