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"Analytical Study on Clinicopathological Findings of Fistula-In-Ano at a Tertiary Health Care Centre, Dhauj, Faridabad, India"

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ABSTRACT –

Background: Fistula-in-ano is a chronic abnormal communication commonly arising from cryptoglandular infection and represents a persistent surgical challenge due to its recurrent nature and risk of sphincter injury. The condition predominantly affects middle-aged males and often requires surgical intervention, such as fistulotomy or fistulectomy, for definitive management. Modern imaging and histopathological evaluation play crucial roles in diagnosis and etiological assessment.

Methods: This observational study enrolled 52 patients diagnosed with fistula-in-ano over a 12-month period at a tertiary care center. Patients underwent detailed clinical assessment, preoperative evaluation, and either fistulotomy or fistulectomy, depending on fistula complexity. Histopathological examination of excised tracts was routinely performed, and follow-up continued for at least six months to document outcomes and complications.

Results: The majority of patients were males (78.8%), with the highest incidence in the 40-49-year age group. Squamous epithelium lined 48% of tracts, columnar in 38.4%, and mixed in 13.4%. Histopathological findings included granulomatous inflammation (48%), polymorphonuclear dominance (28.8%), and fibrotic changes (17.3%). Fistulotomy offered shorter morbidity and hospital stay for low/simple fistulas, while fistulectomy reduced recurrence in complex cases. Complications were minor and manageable across both modalities.

Conclusion: Individualized surgical approach based on fistula type, aided by MRI and histopathology, optimizes patient outcomes. Fistulotomy is well-suited for simple fistulas, while fistulectomy provides better clearance in complex cases. Routine pathological examination aids in identifying specific etiologies, supporting targeted postoperative therapy for conditions such as tuberculosis or Crohn's disease.

Keywords: Fistula-in-ano, cryptoglandular origin, fistulectomy, fistulotomy, MRI fistulography, histopathology, anal abscess, postoperative outcomes

I. INTRODUCTION –

An anal fistula is a chronic abnormal communication, usually lined to some degree by granulation tissue, which extends outward from the anorectal lumen (the internal opening) to an external opening on the perineal or gluteal skin [1]. It is essentially a painless condition, although the discharge may cease temporarily, leading to pus accumulation and recurrent abscess formation [2]. The most common etiological factor is a previous anorectal abscess [3]. While the majority of fistulas are cryptoglandular in origin, other less frequent causes include trauma, Crohn's disease, malignancy, radiation exposure, and unusual infections such as tuberculosis, actinomycosis, and chlamydial infections [4].

Fistula-in-ano seldom heals spontaneously and typically necessitates surgical intervention for complete recovery. A range of surgical techniques—fistulotomy, fistulectomy, primary closure following tract excision, and various staged operations—have been developed and refined to achieve optimal outcomes. These procedures have markedly improved postoperative recovery, reduced recurrence rates, and enhanced the overall quality of life of affected individuals. A thorough preoperative evaluation, including delineation of the fistulous tract and assessment of sphincter involvement, is critical for successful management. Furthermore, detailed preoperative counselling plays a vital role, as patient awareness of the disease course, surgical options, and potential complications contributes to compliance and satisfaction [5].

Modern imaging modalities have revolutionized diagnostic accuracy. Magnetic Resonance Imaging (MRI) fistulography is considered the gold standard for evaluating fistula anatomy. It allows precise visualization of the tract in relation to the anal sphincter complex, identifies the internal opening and secondary extensions, and detects associated abscesses or collections. The sensitivity and specificity of MRI can be further enhanced by the use of gadolinium-based contrast media, which highlight the fistulous canal and its ramifications [6,7]. The integration of such imaging techniques into preoperative planning has significantly reduced the risk of recurrence and sphincter injury.

Ultimately, successful treatment of fistula-in-ano depends on meticulous surgical technique and comprehensive perioperative care. As emphasized by contemporary surgical literature, the surgeon who gains the first opportunity to treat the patient is often the one most likely to achieve complete cure, minimize morbidity, and prevent long-term disability [8]. Despite advances in both diagnosis and management, fistula-in-ano continues to challenge surgeons due to its tendency for recurrence and the delicate balance between eradication of disease and preservation of continence.

Key Words -Fistula-in-ano, Cryptoglandular origin, Fistulectomy / Fistulotomy, MRI fistulography, Anal abscess, Postoperative outcomes

Objectives -

1. To study the various types and the clinical and pathological presentations of the fistula-in-ano.
2. To study the efficacy of two modalities of surgical approach (Fistulectomy and Fistulotomy) with reference to post-operative hospital stay and any complications.
3. To study the etiological factors and clinical presentations of fistula in ano.

Inclusion Criteria –

1. All patients above age of 10 years
2. Patients presenting with first episode fistula in ano or with recurrence after previous surgery during this one-year period.

Exclusion Criteria –

1.Patients unfit for surgery
2.Patients not willing for surgery
3.Patients with anal fistulas along with acute perianal abscess, known cases of ulcerative colitis, Crohn’s disease, Carcinoma of Rectum, Active Abdominal Tuberculosis, Congenital Fistulas, Serology Positive Cases (HIV) and Anal Fistulae due to Perianal Injuries and Radiation Therapy are excluded.
4. Patients above 80 years of age

II. MATERIALS AND METHODS -

This was an observational study conductedamongst 52 patients those who were admitted for the evaluation of Fistula in anoover a period of 12 months during January 2024 to December 2024. Purposive sampling method was used to select patients. In the present study, data collection was conducted as follows: a detailed history was obtained regarding the nature and duration of presenting complaints, prior treatments, family history, and personal history. Comprehensive, General and Systemic examinations were performed, along with a focused local examination to assess the external opening, discharge, excoriation, swelling, fissures, prolapsed haemorrhoids, skin tags, and granulation tissue.

Digital rectal examination and proctoscopic evaluation were carried out to locate and palpate the internal opening and to identify any associated conditions such as abscesses, secondary piles, external haemorrhoids, fissures, or skin tags. All essential pathological investigations were performed

Operative findings and postoperative progress were carefully documented. Patients were followed up in the outpatient department for a minimum period of six months, or longer, when necessary, to assess treatment outcomes and identify any late complications.

Postoperative pain was assessed using the Visual Analogue Scale (VAS) at 6 hours, 24 hours, and at the time of discharge.

Operative Procedure:

All patients were operated in the left lateral (Sims) position under general anaesthesia after thorough preoperative assessment. Preoperative preparation included a proctoclysis enema administered the night before and on the morning of surgery. At the time of induction, prophylactic antibiotics were administered—Inj. Ceftriaxone + Tazobactam 1.125 g IV and Inj. Metronidazole 500 mg IV.

Patients with a long palpable tract were selected for **fistulectomy**, while those with a simple linear low fistula or non-palpable tract were selected for **fistulotomy**.

Fistulotomy Technique:

This classical procedure involves the use of a fistula probe to delineate the primary fistulous tract and detect any high blind extensions. The course of the tract is defined by careful probing. The perianal skin and anal epithelium are then divided using diathermy. If the internal sphincter is involved, it is identified and divided accordingly. The surgical wound is left open to heal by secondary intention.

Fistulectomy:

In this technique an elliptical incision is made around the external opening and deepened, and tissue dissected in either side of the tract. The methylene blue dye which is injected through the external opening, acts as a guide that prevents the fistulous tract from accidental injury. If sphincter muscles come across during dissection, it is separated from the tract. Dissection is completed up to internal opening and finally mucosal defect closed with delayed absorbable suture materials if needed. Sometimes tract ends abruptly and without internal opening, in such cases dissection completed up to the level of methylene blue staining and tract excised.

Postoperative Care:

1. A second dose of **Inj. Ceftriaxone + Tazobactam (1.125 g IV)** was administered 6 hours after the initial dose.
2. **Inj. Metronidazole (500 mg IV)** was also repeated 6 hours following the first administration.
3. **Inj. Tramadol (100 mg IV)** was given as required for pain management.
4. Patients were allowed oral intake 6 hours after surgery. To further alleviate postoperative discomfort, a **per rectal diclofenac suppository** was administered.
5. Fistula tract or contents of tract are sent for histopathological examination.

Histopathological Diagnosis of Fistula in Ano:

The excised fistulous tract obtained during surgery (fistulectomy or fistulotomy) is sent for histopathological examination. The specimen is fixed in 10% neutral buffered formalin, processed, and embedded in paraffin. Thin sections (4–5 µm) are prepared and stained with haematoxylin and eosin (H&E) for microscopic evaluation.

On microscopic examination, the following features are typically observed:

- The tract is lined by granulation tissue composed of proliferating fibroblasts, capillaries, and chronic inflammatory cells (mainly lymphocytes, plasma cells, and macrophages).
- Areas of ulceration and necrosis may be present along the lumen of the tract.
- In long-standing cases, the tract may show fibrosis and epithelialization at certain points.
- Secondary infection can lead to the presence of neutrophilic infiltration and pus pockets.
- In special cases, additional findings may suggest underlying etiology:
  - Tuberculosis: Presence of epithelioid granulomas with Langhans giant cells and caseous necrosis.
  - Crohn’s disease: Non-caseating granulomas, transmural inflammation.
  - Malignancy: Dysplastic or malignant epithelial cells indicating carcinoma arising in chronic fistula.

Special stains such as Ziehl-Neelsen stain (for acid-fast bacilli in tuberculosis) or PAS stain (for fungal elements) may be used when indicated.

Place of Study –Al Falah School of Medical Sciences and Research Centre, Dhauj, Faridabad (121004)

III. RESULTS –

The present study was conducted over a period of one year and included a total of **52 patients** diagnosed with fistula in ano. Among these, **41 patients (78.8%) were male** and **11 patients (21.2%) were female**, indicating a clear male predominance.

Age Distribution

The patients ranged in age from **10 to 79 years**, with the majority belonging to the **40–49 years** age group (**38.4%**), followed by **30–39 years** (**28.8%**) and **20–29 years** (**13.4%**). The distribution of cases across different age groups is presented in **Table 1.**

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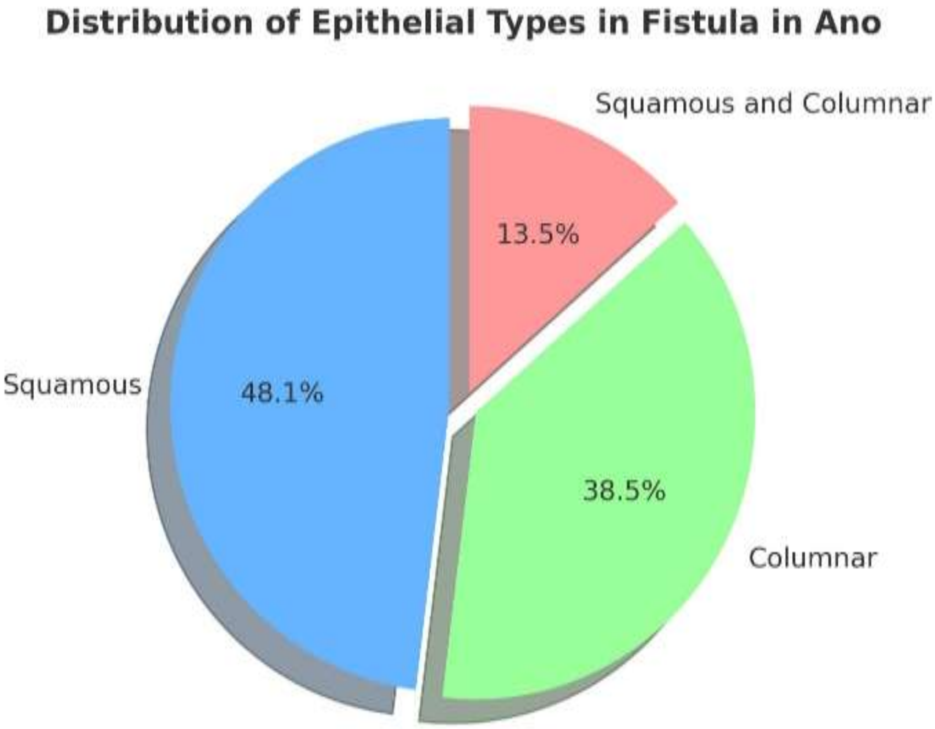
Table 1

Age Group (years)	Number of Patients	Percentage (%)
10 - 19	2	3.8
20 - 29	7	13.4
30 - 39	15	28.8
40 - 49	20	38.4
50 - 59	3	5.7
60 - 69	3	5.7
70 - 79	2	3.8

Histopathological Findings

Microscopic examination of the excised fistulous tracts revealed different epithelial linings and histological features.

- The **type of epithelium** lining the tract was **squamous** in **25 patients (48%)**, **columnar** in **20 patients (38.4%)**, and **both squamous and columnar** in **7 patients (13.4%),** depicted clearly in **Pie Chart 1**.



Pie Chart 1

- The **histological features** observed in the tracts included **granulomatous inflammation** in **25 patients (48%)**, **predominance of polymorphonuclear cells** in **15 patients (28.8%)**, **fibrotic scar tissue** in **9 patients (17.3%)**, and **granuloma formation** in **3 patients (5.7%)**

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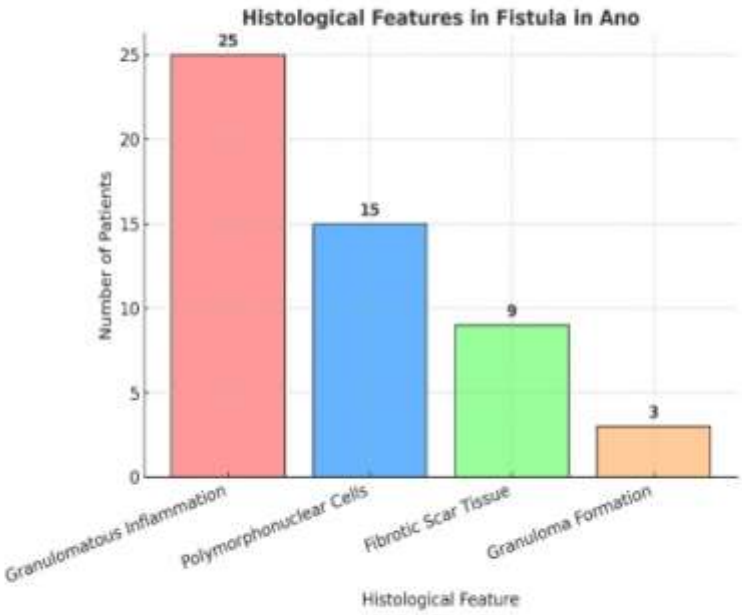


For simple low fistulas, fistulotomy is an effective, sphincter-sparing option with shorter operative morbidity and similar short-term healing rates.

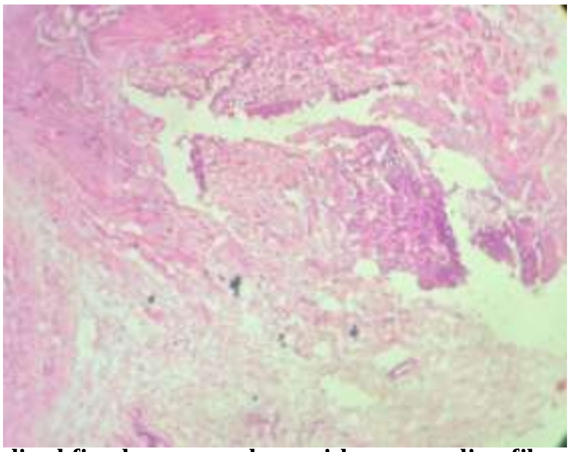
For long, palpable, or complex tracts, fistulectomy may better eradicate disease and reduce early recurrence risk, at the expense of slightly increased immediate postoperative pain and longer hospital stay; complications are generally minor and manageable.

Clinical decision-making should be individualized, based on preoperative mapping (e.g., MRI when indicated), fistula classification (intersphincteric/transsphincteric/suprasphincteric), and patient priorities (e.g., risk tolerance for recurrence vs short-term morbidity).

Routine histopathological examination of excised fistula tracts is recommended because it identifies treatable specific causes (e.g., tuberculosis, Crohn's disease) that alter postoperative management.

Preoperative assessment should include detailed clinical examination and selective imaging (MRI fistulography) for complex fistulas to plan sphincter-preserving surgery.

In TB-endemic regions, maintain a high index of suspicion for tuberculous etiology in granulomatous tracts; treatment with antitubercular therapy may be required instead of—or in addition to—further surgical intervention.



Above section shows epithelized fistulous tract along with surrounding fibroconnective tissue showing acute and chronic inflammatory cells {H&E Stain}

IV. DISCUSSION –

The findings of this study highlight the predominance of fistula-in-ano among middle-aged males, aligning with global and regional epidemiological trends that associate the condition primarily with males in the fourth and fifth decades of life. The majority of cases demonstrated a cryptoglandular origin, consistent with literature emphasizing this as the most frequent etiopathogenic mechanism. The preponderance of granulomatous inflammation and squamous or columnar epithelial lining in the excised tracts reinforces the chronic nature of the disease and its recurrent inflammatory pathology.

The comparative evaluation between fistulotomy and fistulectomy revealed that while fistulotomy ensures a shorter postoperative stay and less discomfort, fistulectomy provides more extensive tract eradication and potentially lowers the rate of recurrence in complex or long tracts. This observation is supported by prior studies, such as those by Bhatti et al. and Garcia-Aguilar et al., who noted that fistulectomy, although technically demanding, offers more complete disease clearance at the cost of a longer healing period. However, neither technique showed major long-term complications when appropriate patient selection and preoperative assessment were followed, particularly when aided by MRI fistulography for tract delineation.

Routine histopathological evaluation of all excised fistula tracts in this study was critical for identifying coexisting pathologies, including tuberculosis and Crohn’s disease, which clinically mimic cryptoglandular fistulas. This underlines the necessity of pathological confirmation, especially in endemic areas where infectious causes are prevalent. The presence of significant granulomatous histology without a primary cryptoglandular component warrants further microbiological evaluation. The study findings also reinforce the relevance of integrating both clinical and histopathological perspectives in surgical decision-making for fistula management.

Overall, the data affirm that fistulotomy remains effective for simple and low fistulas with minimal involvement of the sphincter complex, whereas fistulectomy is preferable for complex or recurrent tracts, emphasizing the importance of case-based operative planning. The low complication rate and satisfactory postoperative healing outcomes of both techniques, as observed in this series, reflect the value of meticulous perioperative care, standardized antibiotic prophylaxis, and effective patientcounselling.

V. CONCLUSION –

Fistula-in-ano continues to be a surgically challenging condition due to its recurrent and chronic nature. This analytical study establishes that individualized surgical planning, based on fistula complexity and sphincter involvement, is essential for optimal outcomes. Fistulectomy offers better disease clearance for complex tracts, while fistulotomy ensures quicker recovery for low-lying, simple fistulas with minimal functional risk.

Routine histopathological examination of excised tracts remains indispensable to identify specific etiologies requiring adjunct medical therapy, thereby reducing recurrence, and guiding targeted management. Preoperative MRI fistulography and comprehensive clinical assessment enhance diagnostic precision and surgical outcomes. Consequently, a multidisciplinary, pathology-informed approach that balances disease eradication with sphincter preservation provides the best long-term prognosis and improves the quality of life of patients afflicted with fistula-in-ano.

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Conflicts of Interest –
There are no conflicts of interest.

REFERENCES -

[1]. Luniss PJ. The anus and anal canal. In: P. Ronan O'Connell, Norman S. Williams, and Christoper JK. Bustrode, editors. Bailey and Love’s short practice of surgery. 25th ed. London: Hodder Arnold; 2008. p. 1262-1263.
[2]. Goligher JC, Duthie HL and Nixon HH. Fistula-in-ano. In: Surgery of the anus, rectum and colon. 4th ed. London: Bailliere Tindall; 1980. p. 163-19
[3]. Russel TR. Anorectum. In: Lawrence W, editor. Current surgical diagnosis and treatment. 10th ed. 1994.
[4]. David L. Dunn, Colon, rectum and anus. In: Brunicardi, F. C., Andersen, D. K., & Dunn, D. L, editors. Schwartz’s principles of surgery. 10th ed. New York: McGraw-Hill Education: 2015. p. 1229- 1230.
[5]. Schuster MM, Ratych RE. Ano rectal disease. In: Hanbrich WS, Schaffner F, eds. Bockus Gastroenterology. Philadelphia: W. B. Saunders Company; 1995:1773-89.
[6]. Hussain SM, Stoker J, Schouten WR, Hop WCJ, Lameris JS. Fistula-in-ano:

endoanalsonography versus endoanal MR imaging in classification. Radiol. 1996;200:475-81.

[7]. Barker PG, Lunniss PJ, Armstrong P, Reznek RH, Cottam K, Phillips RK. Magnetic resonance imaging of fistula-in-ano: technique, interpretation and accuracy. Clinical Radiol. 1994;49:7-13.

[8]. Garcia-Aguilar J, Belmonte C, Wong WD, Goldberg SM, Madoff RD. Anal fistula surgery. Factors associated with recurrence and incontinence. Dis Colon Rectum. 1996;39:723-9.

[9]. Bhatti Y, Fatima S, Shaikh GS, Shaikh S. Fistulotomy versus fistulectomy in the treatment of low fistula in ano. Raw Medi J. 2011; 36:1-8.