

Demographic, Clinical and Diagnostic Profile of Patients with Anal Fistula: A Prospective Observational Study

¹Mobashir Nasim, Postgraduate student, Department of General Surgery, Era's Lucknow Medical College and Hospital, Lucknow, India

²Nisar Ahmad Ansari, Professor, Department of General Surgery, Era's Lucknow Medical College and Hospital, Lucknow, India

³C. S. Rawat, Professor, Department of General Surgery, Era's Lucknow Medical College and Hospital, Lucknow, India

⁴Sachin Khanduri, Professor and Head, Department of Radiodiagnosis, Era's Lucknow Medical College and Hospital, Lucknow, India

Corresponding Author: Mobashir Nasim, Postgraduate student, Department of General Surgery, Era's Lucknow Medical College and Hospital, Lucknow, India

How to citation this article: Mobashir Nasim, Nisar Ahmad Ansari, C. S. Rawat, Sachin Khanduri, “Demographic, Clinical and Diagnostic Profile of Patients with Anal Fistula: A Prospective Observational Study”, IJMACR– August – 2026, Volume – 9, Issue –4, P. No. 444 – 452.

Open Access Article: © 2026 Mobashir Nasim, et al. This is an open access journal and article distributed under the terms of the creative common's attribution license (<http://creativecommons.org/licenses/by/4.0>). Which allows others to remix, tweak, and build upon the work non- commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Introduction: characterized by an abnormal communication between the anal canal and perianal skin. Accurate clinical and radiological assessment is essential for appropriate management and prevention of recurrence.

Objectives: To evaluate the demographic, clinical, and diagnostic profile of patients with fistula-in-ano presenting to a tertiary care hospital.

Materials and Methods: This prospective observational study was conducted in the Department of General Surgery, Era's Lucknow Medical College and Hospital, Lucknow, over a period of two years. A total of 45 patients aged above 18 years with clinically diagnosed

fistula-in-ano were enrolled. Demographic details, clinical presentation, examination findings, and MRI characteristics were recorded. Fistulas were classified according to the St. James MRI classification system. Data were analyzed using SPSS version 26.0.

Results; The mean age of patients was 37.84 ± 12.81 years, with the majority belonging to the 21–40 years age group (53.4%). Males predominated (84.4%), with a male-to-female ratio of 5.43:1. Most patients belonged to rural areas (66.7%) and lower-middle socioeconomic status (44.4%). Discharge from the external opening was the most common presenting complaint (100%), followed by constipation (44.4%) and pain (24.4%). A single external opening was observed in 91.1% of

patients, and 84.4% of openings were located within 3 cm of the anal verge. Posterior openings were more common (64.4%). Internal openings were identified in 64.4% of cases. MRI revealed Grade 4 fistula as the most common type (40.0%), followed by Grade 3 (24.4%). No statistically significant association was found between the distance of the external opening from the anal verge and MRI grading ($p=0.065$).

Conclusion: Fistula-in-ano predominantly affects young and middle-aged males. Persistent discharge is the most common clinical presentation. MRI plays a crucial role in the accurate assessment and classification of fistulous tracts, with Grade 4 fistula being the most frequent type in the present study. Combined clinical and radiological evaluation is essential for optimal management.

Keywords: Fistula-in-ano, MRI, St. James classification, Anal fistula, Clinical profile, Prospective observational study.

Introduction

Fistula-in-ano is a chronic abnormal communication between the anal canal and the perianal skin, most commonly resulting from cryptoglandular infection of the anal glands. It represents one of the most frequently encountered anorectal disorders in surgical practice and is associated with significant morbidity due to persistent discharge, pain, recurrent abscess formation, and impairment of quality of life¹.

The pathogenesis of fistula-in-ano is explained by the cryptoglandular theory proposed by Parks, according to which infection of the anal glands leads to abscess formation and subsequent fistula development². Although cryptoglandular infection accounts for the majority of cases, fistulas may also occur secondary to Crohn's disease, tuberculosis, malignancy, radiation exposure, trauma, or previous anorectal surgery³.

The incidence of anal fistula is estimated to range between 1.2 and 2.8 cases per 10,000 population annually, with a clear male predominance and peak occurrence in the third to fifth decades of life⁴. Clinical manifestations vary according to the complexity and anatomical course of the fistulous tract. Common symptoms include persistent purulent discharge, perianal pain, swelling, itching, recurrent abscesses, and occasionally bleeding per rectum⁵.

Accurate classification of fistula-in-ano is essential for selecting appropriate management strategies and minimizing recurrence and postoperative incontinence. Parks classified fistulas into intersphincteric, transsphincteric, suprasphincteric, and extrasphincteric types based on their relationship with the anal sphincter complex². In recent years, magnetic resonance imaging (MRI) has emerged as the gold standard for preoperative assessment because of its ability to delineate fistulous tracts, secondary extensions, abscesses, and their relationship to surrounding structures⁶. The St. James University Hospital MRI classification system has further improved diagnostic accuracy and surgical planning⁷.

Despite advances in diagnostic imaging and surgical techniques, fistula-in-ano remains a challenging condition because of its recurrent nature and varied clinical presentations. Understanding the demographic characteristics, clinical manifestations, and radiological patterns of patients with anal fistula is crucial for improving diagnostic accuracy and treatment outcomes. Therefore, the present study was undertaken to evaluate the demographic, clinical, and diagnostic profile of patients with fistula-in-ano attending a tertiary care teaching hospital.

Materials and Methods

Study Design and Setting

This prospective observational study was conducted in the Department of General Surgery, Era's Lucknow Medical College and Hospital, Lucknow, Uttar Pradesh, India, over a period of two years. The study aimed to evaluate the clinical and demographic profile, presentation patterns, and classification of fistula-in-ano among patients presenting to the surgical department.

Study Population

The study included all eligible patients diagnosed with fistula-in-ano who attended the Department of General Surgery during the study period. Patients were enrolled consecutively after obtaining informed written consent.

Sample Size Calculation

The sample size was calculated based on the maximum and minimum proportions of symptoms reported among patients with fistula-in-ano in a previous study conducted by Mahakalkar et al. The calculation was performed using the following assumptions:

- Maximum proportion of symptom (perianal discomfort), $p_1 = 1.00$ (100%)
- Minimum proportion of symptom (perianal itching), $p_2 = 0.38$ (38%)
- Clinically significant proportion difference (e) = 0.50
- Design effect (d) = 1.0
- Type I error (α) = 5%, corresponding to a 95% confidence level
- Type II error (β) = 10%, providing 90% study power

Based on these parameters, the minimum required sample size was calculated to be 45 patients. Therefore, a total of 45 patients were enrolled in the study.

Ethical Considerations

The study protocol was reviewed and approved by the Institutional Ethics Committee of Era's Lucknow Medical College and Hospital. Ethical clearance was obtained vide letter number ELMC&H/RCLELL/2024/220. Written informed consent was obtained from all participants before their inclusion in the study.

Inclusion Criteria

- Patients clinically diagnosed with fistula-in-ano.
- Patients aged more than 18 years.

Exclusion Criteria

- Anal fistulas resulting from perineal injuries.
- Congenital anal fistulas.

Data Collection and Clinical Assessment

Detailed demographic and clinical information was collected from all enrolled patients using a predesigned case record form. The following parameters were recorded:

- Age
- Gender
- Place of residence (urban/rural)
- Socioeconomic status
- Presenting symptoms and duration of symptoms
- History of previous anorectal surgery or recurrence

A comprehensive clinical evaluation was performed for each patient. This included:

General Examination

General physical examination was carried out to assess the overall health status of the patient and identify any associated comorbidities.

Local Examination

A detailed perianal examination was performed to identify:

- External opening of the fistula

- Number and location of openings
- Presence of discharge
- Induration or inflammation around the tract
- Associated abscesses or secondary tracts

Digital Rectal Examination

Digital rectal examination was conducted in all patients to evaluate:

- Internal opening of the fistula
- Sphincter tone
- Induration along the fistulous tract
- Presence of any associated anorectal pathology

Classification of Fistula-in-Ano

Based on clinical findings and operative assessment, fistulas were classified according to their anatomical relationship with the anal sphincter complex into:

- Intersphincteric fistula
- Transsphincteric fistula
- Suprasphincteric fistula
- Extrasphincteric fistula

Patients were further categorized as having simple or complex fistulas depending on the tract characteristics and involvement of the sphincter muscles.

Outcome Measures

Table 1. Demographic Profile of the Study Population (N=45)

Variable	Category	Frequency (n)	Percentage (%)
Age Group	≤20 years	3	6.7
	21–30 years	12	26.7
	31–40 years	12	26.7
	41–50 years	11	24.4
	51–60 years	4	8.9
	≥61 years	3	6.7
Gender	Male	38	84.4
	Female	7	15.6

Mean age: 37.84 ± 12.81 years (Range: 18–68 years)

Male-to-Female Ratio: 5.43:1

The primary outcomes assessed included:

- Clinical presentation of fistula-in-ano
- Distribution of fistula types
- Demographic characteristics of affected patients

Secondary outcomes included the relationship between demographic variables and fistula characteristics.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) software version 26.0. Continuous variables were expressed as mean ± standard deviation (SD), while categorical variables were presented as frequencies and percentages. Statistical significance was assessed using appropriate tests such as the Chi-square test or Fisher's exact test for categorical variables and Student's t-test for continuous variables. A p-value of less than 0.05 was considered statistically significant.

Results and Observations

A total of 45 patients diagnosed with fistula-in-ano were enrolled in this prospective observational study. The demographic, clinical, and radiological characteristics of the study population are summarized below.

Table 2. Socioeconomic Status and Domicile of the Study Population (N=45)

Variable	Category	Frequency (n)	Percentage (%)
Socioeconomic Status	Upper	2	4.4
	Upper Middle	5	11.1
	Lower Middle	20	44.4
	Upper Lower	12	26.7
	Lower	6	13.3
Domicile	Rural	30	66.7
	Urban	15	33.3

Table 3. Clinical Presentation and Duration of Symptoms (N=45)

Variable	Frequency (n)	Percentage (%)
Discharge from Opening	45	100.0
Constipation	20	44.4
Pain	11	24.4
Itching	5	11.1
Perineal Abscess	2	4.4
Bleeding per Rectum	1	2.2
Duration ≤6 Months	20	44.4
Duration >6 Months	25	55.6

Mean duration of symptoms: 8.09 ± 5.34 months (Range: 1–23 months)

Table 4. Characteristics of External Opening (N=45)

Variable	Category	Frequency (n)	Percentage (%)
Number of Openings	Single	41	91.1
	Multiple	4	8.9
Distance from Anal Verge	<3 cm	38	84.4
	≥3 cm	7	15.6
Position of External Opening	Posterior	29	64.4
	Anterior	16	35.6

Table 5. Per Rectal Examination and Proctoscopy Findings (N=45)

Finding	Frequency (n)	Percentage (%)
External Opening Identified	45	100.0
Internal Opening Identified	29	64.4

Table 6. Distribution of Comorbidities (N=45)

Comorbidity	Frequency (n)	Percentage (%)
Hypertension	6	13.3
Diabetes Mellitus	5	11.1
History of Pulmonary Tuberculosis	2	4.4

Table 7. MRI Grading According to St. James Classification (N=45)

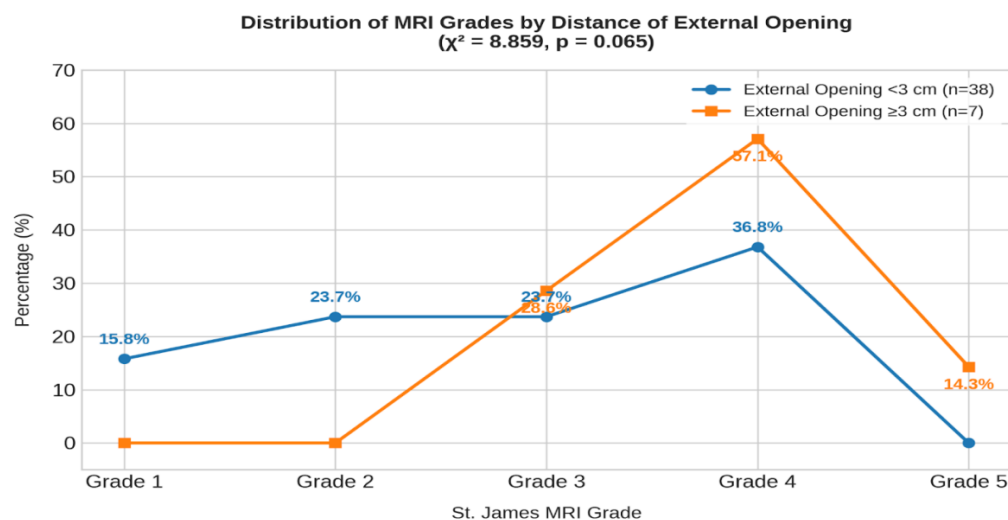
MRI Grade	Description	Frequency (n)	Percentage (%)
Grade 1	Simple Linear Intersphincteric	6	13.3
Grade 2	Intersphincteric with Abscess/Secondary Tract	9	20.0
Grade 3	Transsphincteric	11	24.4
Grade 4	Transsphincteric with Abscess or Secondary Tract within Ischiorectal Fossa	18	40.0
Grade 5	Supralelevator/Translevator	1	2.2

Table 8. Association Between Distance of External Opening and MRI Grading

MRI Grade	External Opening <3 cm (n=38)	External Opening ≥3 cm (n=7)
Grade 1	6 (15.8%)	0 (0.0%)
Grade 2	9 (23.7%)	0 (0.0%)
Grade 3	9 (23.7%)	2 (28.6%)
Grade 4	14 (36.8%)	4 (57.1%)
Grade 5	0 (0.0%)	1 (14.3%)

Chi-square (χ^2) = 8.859

p-value = 0.065



Discussion

The present prospective observational study evaluated the demographic, clinical, and diagnostic characteristics of 45 patients with fistula-in-ano presenting to a tertiary care centre. The findings provide valuable insights into the epidemiological and clinical profile of this common anorectal disorder.

In the present study, the mean age of patients was 37.84 ± 12.81 years, with the majority belonging to the 21–40 years age group (53.4%). These findings are consistent with previous studies, which reported that fistula-in-ano predominantly affects young and middle-aged adults during their economically productive years^{8,9}. Mahakalkar et al. reported a similar age distribution with the highest prevalence occurring in the third and fourth decades of life¹⁰.

A marked male predominance was observed in our study, with males accounting for 84.4% of cases and a male-to-female ratio of 5.43:1. Similar male predominance has been reported by numerous investigators^{8,10,11}. The higher incidence among males has been attributed to hormonal influences, anatomical differences, and greater exposure to risk factors associated with anorectal sepsis.

The majority of patients belonged to rural areas (66.7%) and lower-middle socioeconomic status (44.4%). Similar observations have been reported in studies conducted in developing countries where poor hygiene, delayed healthcare access, and lower awareness levels contribute to the burden of anorectal diseases¹². These findings highlight the importance of public health interventions and early diagnosis in rural populations.

Discharge from the external opening was the most common presenting complaint, reported by all patients (100%). Constipation (44.4%), pain (24.4%), and itching

(11.1%) were other frequently observed symptoms. Similar symptom profiles have been reported by Sainio and Mahakalkar et al., who identified persistent discharge as the hallmark clinical feature of fistula-in-ano^{4,10}. The chronicity of symptoms observed in our study is reflected by the mean symptom duration of 8.09 ± 5.34 months, with more than half of patients experiencing symptoms for over six months before seeking medical attention.

Clinical examination remains an important component of diagnosis. In the present study, a single external opening was observed in 91.1% of patients, and the external opening was located within 3 cm of the anal verge in 84.4% of cases. Posteriorly located external openings were more common (64.4%) than anterior openings (35.6%). These findings are in agreement with Goodsall's rule, which states that posterior external openings are more frequently associated with curved fistulous tracts and are generally more common than anterior openings¹³.

Internal openings were identified in 64.4% of patients during digital rectal examination and proctoscopy. The inability to identify internal openings clinically in all patients emphasizes the limitations of physical examination and the need for radiological imaging, particularly in complex fistulas.

Among associated comorbidities, hypertension (13.3%) and diabetes mellitus (11.1%) were the most common. Diabetes mellitus has been recognized as a risk factor for chronic infections and delayed wound healing, which may contribute to fistula persistence and recurrence¹⁴. A history of pulmonary tuberculosis was present in 4.4% of patients, reflecting the need to consider secondary causes of anal fistula in endemic regions.

MRI has become indispensable in the evaluation of fistula-in-ano. In the present study, Grade 4 fistulas according to the St. James classification were the most common type, accounting for 40% of cases, followed by Grade 3 fistulas (24.4%). These findings suggest that a substantial proportion of patients present with advanced or complex disease requiring detailed preoperative assessment. Similar observations have been reported by Morris et al., who demonstrated the utility of MRI in detecting secondary tracts and abscesses that may not be evident on clinical examination⁷.

The association between the distance of the external opening from the anal verge and MRI grading was not statistically significant ($p=0.065$). Although higher MRI grades appeared more frequent among fistulas with openings beyond 3 cm, the limited sample size may have reduced the statistical power to detect a significant association. Larger multicentric studies are required to further evaluate this relationship.

Overall, the findings of the present study reinforce the importance of detailed clinical assessment combined with MRI evaluation for accurate diagnosis and classification of fistula-in-ano. Early diagnosis and appropriate classification are essential for selecting optimal surgical management and reducing recurrence rates.

Conclusion

Fistula-in-ano predominantly affected young and middle-aged males in the present study, with most patients belonging to rural areas and lower-middle socioeconomic status. Persistent discharge was the most common presenting complaint. The majority of patients had a single posterior external opening located within 3 cm of the anal verge. MRI revealed Grade 4 fistula as the most common type according to the St. James

classification. Clinical examination combined with MRI provided accurate assessment of fistulous tracts and aided in proper classification. Early diagnosis and detailed preoperative evaluation are essential for appropriate management and improved patient outcomes.

References

1. Williams JG, Farrands PA, Williams AB, Taylor BA, Lunniss PJ, Sagar PM, et al. The treatment of anal fistula: ACPGBI position statement. *Colorectal Dis.* 2007;9(Suppl 4):18–50.
2. Parks AG, Gordon PH, Hardcastle JD. A classification of fistula-in-ano. *Br J Surg.* 1976;63(1):1–12.
3. Abcarian H. Anorectal infection: abscess-fistula. *Clin Colon Rectal Surg.* 2011;24(1):14–21.
4. Sainio P. Fistula-in-ano in a defined population. Incidence and epidemiological aspects. *Ann Chir Gynaecol.* 1984;73(4):219–224.
5. Nelson RL. Anorectal abscess fistula: what do we know? *Surg Clin North Am.* 2002;82(6):1139–1151.
6. Buchanan GN, Halligan S, Williams AB, Cohen CR, Tarroni D, Phillips RK. Magnetic resonance imaging of fistula-in-ano. *Br J Surg.* 2003;90(7):877–881.
7. Morris J, Spencer JA, Ambrose NS. MR imaging classification of perianal fistulas and its implications for patient management. *Radiographics.* 2000;20(3):623–635.
8. Malik AI, Nelson RL. Surgical management of anal fistulae: a systematic review. *Colorectal Dis.* 2008;10(5):420–430.
9. Vasilevsky CA, Gordon PH. Benign anorectal disorders. *World J Surg.* 1982;6(3):322–338.

10. Mahakalkar CC, et al. Clinical profile and management of fistula-in-ano: a prospective study. *Int Surg J.* 2021;8(5):1450–1455.
11. Zanutti C, Martinez-Puente C, Pascual I, Pascual M, Herreros D, García-Olmo D. An assessment of incidence of fistula-in-ano. *Colorectal Dis.* 2007;9(3):278–282.
12. Gupta PJ. Clinical profile and management of fistula-in-ano in rural population. *Trop Gastroenterol.* 2004;25(2):72–74.
13. Goodsall DH, Miles WE. Diseases of the anus and rectum. London: Longmans Green & Co.; 1900.
14. American Diabetes Association. Standards of Medical Care in Diabetes. *Diabetes Care.* 2024;47(Suppl 1)–S350.