



## Aetiopathological Study on Perianal Fistula

Md Mahinul Islam<sup>1\*</sup>, Md Minhaz Uddin Rajib<sup>2</sup>, Most. Masuda Afroz<sup>3</sup>, Karina Rahman<sup>4</sup>, Tania Ahmed<sup>5</sup>

- 1 Department of Surgery, Charghat Upazilla Health Complex, Rajshahi, Bangladesh
- 2 Department of Surgery, 250 Bed General Hospital, Nilphamari, Bangladesh
- 3 Department of Obstetrics & Gynaecology, 100 Bed Hospital, Saidpur, Nilphamari, Bangladesh
- 4 Department of Surgery, Enam Medical College & Hospital, Dhaka, Bangladesh
- 5 Department of Surgery, Ad-Din Medical College & Hospital, Dhaka, Bangladesh

**Abstract:** *Background:* Fistula-in-ano, a common surgical pathology, causes significant patient discomfort and disability, often receiving only temporary relief and casual attention in general medical practice. Fistula-in-ano is an abnormal communication between the anal canal or rectum and the perianal skin which is the chronic manifestation of the acute perianal process that forms an anal abscess. This study investigates the etiology of the perianal fistula. *Method:* The cross-sectional observational study was carried out in the Department of Rangpur Medical College Hospital, Rangpur, from July 2015 to December 2015. A total of 100 patients were selected as study subjects by simple random sampling technique. All data were collected using a pre-formed questionnaire. Collected data was classified, edited, coded, and entered into the computer for statistical analysis by using SPSS version 20. Collected data were analyzed using descriptive statistics. *Results:* Perianal fistulas predominantly affected males (86%), with a male-to-female ratio of 6.14:1. The most affected age group was 20-50 years, with no exemptions except for those below 10 years and over 80 years. A significant portion (76%) had a history of prolonged sitting at work. Most of the organisms were enteric in origin and constituted about 69.64%. *Conclusion:* This study reveals that perianal fistulas primarily affect individuals aged 20-50, with a higher incidence in males, in low socioeconomic group, and a significant portion is associated with prolonged sitting at work. Organisms isolated from a discharge of fistulas are mostly enteric origin and E. coli (50%) is the highest incidence.

### Original Research Article

#### \*Correspondence:

Dr. Md Mahinul Islam

Junior Consultant, Department of Surgery,  
Charghat Upazilla Health Complex,  
Rajshahi, Bangladesh  
Email: mahinulislamshuvro@gmail.com

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#### Article at a glance:

**Study Purpose:** To investigate the causes and factors associated with perianal fistulas.

**Key findings:** Perianal fistulas mostly affect males (86%) and those aged 20-50. Prolonged sitting at work was reported by 76% of patients. The most common organism found was Escherichia coli (50%).

**Newer findings:** The study links prolonged sitting at work to the development of perianal fistulas and highlights the prevalence of E. coli as a key pathogen.

**Abbreviations:** E. coli - Escherichia coli, DNA - Deoxyribonucleic Acid, MRI - Magnetic Resonance Imaging, ICU - Intensive Care Unit, UNICEF - United Nations International Children's Emergency Fund.



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## INTRODUCTION

Throughout the surgical history fistula-in-ano has been a troublesome pathology to both patient and physician. Perianal fistula is a pathologic disorder that generates significant patient discomfort and disability. Although this is frequently encountered in general medical practice,

it often receives only casual attention and temporary relief. Its prevalence in the general population is probably much higher than that seen in clinical practice since most patients do not seek medical attention.<sup>1</sup> Fistula-in-ano is an abnormal communication between the anal canal or rectum and the perianal skin which is the chronic

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manifestation of the acute perianal process that forms an anal abscess. When the abscess ruptures or is drained, an epithelialized track can form that connects the abscess in the anus or rectum with the perianal skin. Abscesses are thought to begin as an infection in the anal glands spreading into adjacent spaces and resulting in fistulas in ~40% of cases.<sup>2</sup> With a mean age of 40, most patients, commonly men, present between the ages of 20 to 60, and fistulas in children are infrequent, occurring in only 3% of cases.<sup>3</sup> The exact etiology of anorectal abscess and fistula is a matter of controversy. In 1880, French anatomists Herrmann and Desfosses initially described small glands in the internal sphincter ani and submucosa of the anal canal.

They proposed that infections in these glands could lead to abscesses and fistula-in-ano.<sup>4</sup> Eisenhammer and Parks' widely accepted cryptoglandular theory suggests that an intramuscular anal gland infection occurs, with subsequent obstructive infection preventing spontaneous drainage into the anal canal, as proposed by Eisenhammer in 1958.<sup>5</sup> Parks discovered cystic dilatation of anal glands in 8 out of 30 consecutive cases of anal fistula, proposing that it could result from acquired duct dilatation or a congenital abnormality, and indicating its potential role as a precursor to infection within a cavity filled with mucin.<sup>6</sup> The gland penetrates the internal sphincter extending into longitudinal fiber but not into the external sphincter complex. The diameter of the duct is only 40 nm and 8-10 glands are usually found.<sup>7</sup> The anatomical structures of the duct and gland are changed. Cystic dilation up to 1 cm had occurred. They often contain pus and vegetative matter suggesting that fecal material had probably entered the duct. This infected cystic dilation is usually found deep in the internal sphincter muscle. Thus, the anal gland may be regarded as the diverticula of the anal canal, and like the diverticula of any other part of the alimentary tract are subjected to stasis and secondary infection<sup>8</sup>. The gland passing through the internal sphincter compresses the duct, leading to cystic dilation and

abscess formation, resulting in various types of fistulas.<sup>9</sup> In 10% of Crohn's disease cases, anorectal involvement may extend into the perirectal or perianal space, causing fistula formation. Fistulas can also occur due to perforation from foreign objects, trauma, rectal cancer, or infections like hydradenitis suppurativa, tuberculosis, or fungal infections.<sup>10</sup> The central aim of the study is to assess the etiology of perianal fistulas.

## METHODS

The cross-sectional observational study conducted at the Department of Rangpur Medical College Hospital from July to December 2015 focused on patients with perianal fistula from surgery wards as the study population. A total of 100 patients were chosen through simple random sampling, adhering to predetermined inclusion and exclusion criteria. Inclusion criteria comprised patients clinically diagnosed with perianal fistula who underwent relevant investigations and operative treatment, and expressed willingness to provide consent. Exclusion criteria involved patients with fistulas resulting from perianal injuries, congenital fistulas, and those unfit for or declining surgery. Comprehensive patient history was obtained from either the patient or accompanying attendants, followed by thorough physical examinations and collection of relevant investigation and operative notes. Data collection utilized a pre-designed questionnaire, with collected data subsequently classified, edited, coded, and entered into a computer for statistical analysis using SPSS version 20. Descriptive statistics were employed for data analysis, and findings were presented through tables and charts. Ethical clearance was obtained from the ethical committee of Rangpur Medical College, with informed written consent secured from all participants. Confidentiality of information was strictly maintained for study purposes.

## RESULTS

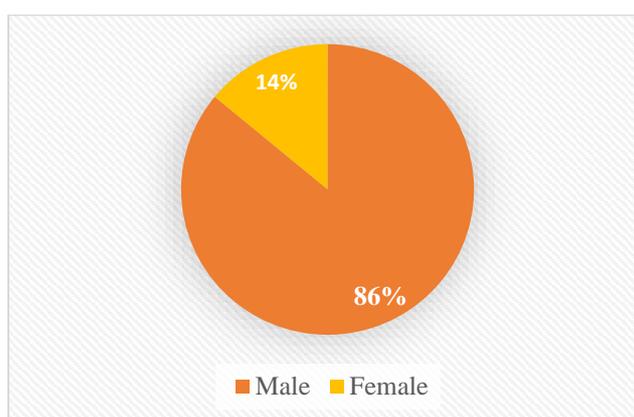
**Table 1: Age distribution of the patients (N=100)**

Age (years)	n	%
11-20	2	2.0
21-30	24	24.0
31-40	26	26.0

41-50	20	20.0
51-60	17	17.0
61-70	8	8.0
71-80	3	3.0

The majority of cases occurred in the 21 to 50 years age group, constituting approximately 70%. Notably, there were very few cases in extreme

age groups, indicating the infrequency of the disease at those ages [Table 1].



**Figure 1: Demographic Characteristics According to Gender**

The study revealed a lower incidence of perianal fistula in females (14.0%) compared to males (86.0%). [Figure 1]

**Table 2: Distribution of perianal fistula among different socioeconomic group (N=100)**

Socioeconomic group	n	%
Low-income group	55	55.0
Average income group	35	35.0
High income group	10	10.0

This study shows that perianal fistula is common in low- and average-income groups of people and constitutes about 90% of total cases. Of

course, people with high income group do not exempt. [Table 2]

**Table 3: History of previous perianal diseases (N=100)**

Previous perianal disease	n	%
Perianal disease	25	25.0
Perianal fistula	10	10.0
Total	35	35.0

Out of 100 cases 35 cases had history of previous anorectal suppurative condition among

which 25 cases had history of perianal abscess and 10 cases had perianal fistula. [Table 3]

**Table 4: Distribution of patients according to previous perianal treatment (N=100)**

Previous perianal disease	Surgical treatment		Conservative treatment	
	n	%	n	%
Perianal abscess (n=25)	10	40.0	15	60.0
Perianal fistula (n=10)	3	30.0	7	70.0

Among perianal abscess 40% had history of surgical management and 60% received conservative treatment. Among perianal fistula 30% had history of surgical management and 70% received conservative treatment. [Table 4]

**Table 5: Distribution of patients according to bowel habit (N=100)**

Bowel habit	n	%
Constipated	58	58.0
Normal	42	42.0

In case of bowel habit 58% patients were found to be constipated and rest 42% patients had normal bowel habit. [Table 5]

**Table 6: Personal habit of the respondents (N=100)**

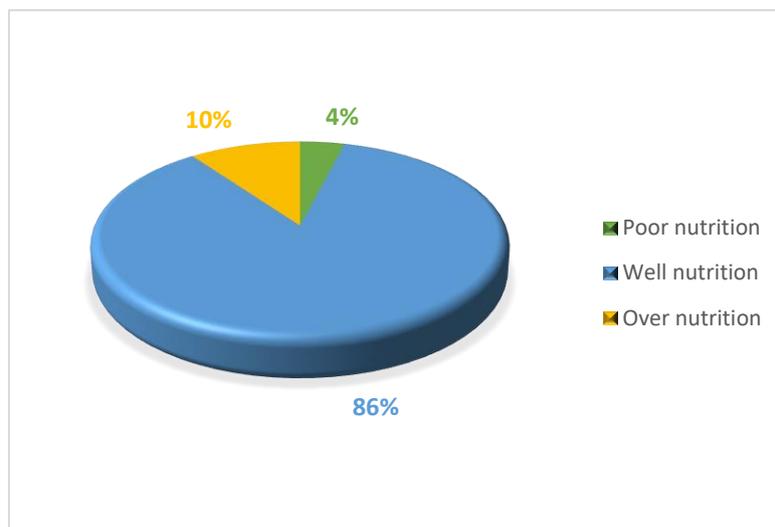
Personal habit	n	%
Smoking	50	50.0
Betel nut chewing	20	20.0
Wine consumption	1	1.0
Total	71	71.0

About 50% patients were habituated in smoking, 20% in betel nut chewer with tobacco leaf and 1% in wine consumption. [Table 6]

**Table 7: Distribution of perianal fistula among different occupation groups (N=100)**

Occupation	n	%
Rickshaw puller	23	23.0
Clerk	16	16.0
Student	14	14.0
Driver	13	13.0
Shop keeper	10	10.0
Day Labour	08	08.0
Teachers	08	08.0
Housewife	04	04.0
High officials	04	04.0
Businessman	03	03.0

In this series, the majority of the patients (23.0%) were rickshaw pullers, followed by clerks (16.0%), and students (14.0%). [Table 7]



**Figure 2: Distribution of perianal fistula among different nutritional groups (N=100)**

This study shows that most of the patients (86%) with perianal fistula were well nourished. Only 4%

of patients were poorly nourished and 10% were overnourished. [Figure 2]

**Table 8: Other anorectal diseases associated with perianal fistula (N=100)**

Disease	n	%
Hemorrhoid	4	4.0
Anal fissure	8	8.0
Perianal abscess	6	6.0
Total	18	18.0

It has been observed that 18% cases were associated with the other anorectal condition. In this study hemorrhoid, anal fissure and perianal

abscess were encountered with incidence of 4%, 8% and 6% respectively. [Table 8]

**Table 9: Distribution of concerned organism (N=100)**

Type of organism	Name of organism	n	%
Enteric	Escherichia coli	28	50.0
	Bacteroids	7	12.5
	Proteus	4	7.14
Cutaneous	Staphylococcus aureus	11	19.64
	Streptococcus	3	5.36
Sterile		3	5.36

In this study it is seen that most of the organisms were enteric origin and constitute about 69.64% among which Escherichia coli 50% (28 cases), Bacteroids 12.5% (7 cases), and Proteus 7.14% (4 cases). About 25% of cases the infection was due to a cutaneous organism among which Staphylococcus aureus 19.64% (11 cases) and Streptococcus 5.36% (3 cases). Only 5.36% (3 cases) cases showed sterile culture. [Table 9]

## DISCUSSION

The result of the investigation showed that females are affected less commonly and constitute only 14% (14 of all cases) whereas male constitutes 86% (86 of all cases). Three different studies by Abcarian H. Sainio P. and Ramanujam P.S showed an M: F ratio of 2:1 whereas my study showed an M: F ratio is 6.14:1.<sup>2,11,12</sup> The incidence among the females is expected to be higher since many of them do not appear before surgeon for shyness. In this study most frequently 21-50 age group was seen to be affected. Hill JR. showed most patients present between the ages of 20 to 60 with a mean age of 40 in both sexes.<sup>13</sup> So, this study almost matches with other studies. However, examples of extreme age i.e. children of 2 months and old person show that no age is exempted.<sup>14</sup> Additionally, 76% of cases were associated with

prolonged sitting, including occupations such as rickshaw puller, student, clerk, shopkeeper, and driver.<sup>15</sup> About 18% cases of this clinical study were associated with other anorectal disease. Out of 100 cases 8(8%) had anal fissure, 4(4%) had hemorrhoid and 6(6%) were associated with perianal abscess.

A study by Saino P. among the inhabitants of Helsinki showed that perianal fistula occurred in 3.3% anal fissure cases and Bui reported an incidence of 5% anal fistula in those with anorectal abscess seen at Mayo clinic<sup>13, 16</sup> 35% (35 cases) patients had previous perianal suppurative condition. Ramanujam P.S and Vasilevsky<sup>12,17</sup> showed that the incidence of a fistula-in-ano developing from an anal abscess ranges from 26-38% and some multiple series of study had shown that the formation of a fistula tract following anorectal abscess occurs in 7-40% of cases<sup>18,19</sup>. 10 (10%) patients had history of previous fistula among which 30% (3 cases) cases were previously managed surgically by fistulotomy or fistulectomy and 70% (7 cases) cases were conservatively. Late complication in the form of recurrence of fistula is frequent and is estimated by various authors as developing in 0 to 26.5% of cases<sup>12, 20-22</sup>. So previous surgery in anorectum may be a causative factor for

developing perianal fistula. Bevans *et al.*<sup>23</sup> believe that patients who have undergone previous anorectal surgery and those who have had prior pathology in the area are more prone to develop suppurative problems since the natural barrier to infection are destroyed.

Personal enquiry shows that about 58% of cases had constipation, 64% were smoker and 35% were habituated in taking betel nut. Constipation, smoking and betel nut chewing separately found in association with various ano-rectal diseases and may serve as a predisposing factors. Though In most published series of anorectal fistula in adults, diarrhoea and constipation are infrequent symptoms.<sup>20</sup> It was seen that most of the organisms were enteric origin and constituted about 69.64% among which *Escherichia coli* was common (50%). In about 25% of cases, the organisms were cutaneous group among which *Staphylococcus aureus* (19.64%) was found most common. Only in 5.36% of cases sterile culture was found. A study by Seow-Choen F.<sup>24</sup> showed the predominant organisms were *Escherichia coli* (22%), *Enterococcus spp.* (16%) and *Bacteroides fragilis* (20%). Another study by Kumara and Jayratne<sup>25-30</sup> showed 74% of organisms were enteric origin among which *Bacteroids spp* (50%) and *E. coli* (26%) were predominant and 26 % organism was a cutaneous group among which *Staphylococcus aureus* (30%) was predominant.

### Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community. This was a single-center study but parasitic diseases are endemic in different parts of this country. So, the study may limit the ability to reflect the generalized population and other ethnic groups. Also, the small sample size was a drawback. A modest attempt may be made to a multi-center study of different parasitic diseases in Bangladesh.

### CONCLUSION

This study reveals that perianal fistulas primarily affect individuals aged 20-50, with a higher incidence in males, in low socioeconomic group, and a significant portion is associated with prolonged sitting at work. Organisms isolated from

a discharge of fistulas are mostly enteric origin and *E. coli* (50%) is the highest incidence.

### Funding

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### Conflict of interest

None declared.

### Ethical approval

The study was approved by the Institutional Ethics Committee

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