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Original Research Article

Tuberculosis in anal fistula: incidence, clinical insights, and diagnostic challenges

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ABSTRACT

Background: Tuberculosis (TB) is a rare but significant cause of anal fistula, often leading to diagnostic delays and suboptimal treatment. This study aimed to assess the incidence, clinical characteristics, and diagnostic challenges of TB in anal fistula cases.
Methods: A prospective observational study was conducted from July 2023 to December 2024 at six hospitals in Bangladesh. A total of 85 patients with anal fistula underwent clinical evaluation, histopathological examination, and microbiological testing for TB. Fistulas were classified using the Parks and American gastroenterological association (AGA) systems. Demographic, clinical, and diagnostic data were analyzed using SPSS Version 25.
Results: Among 85 patients, the mean age was 38.6 years, with a male predominance (80.0%). Inter sphincteric (48.2%) and low trans sphincteric (24.7%) fistulas were the most common types. Histopathology confirmed TB in 3.5% (3/85) of cases. All TB-positive cases presented with chronic non-healing fistulas, unhealthy granulation tissue, and were initially misdiagnosed. Simple fistulas accounted for 64.7% of cases, yet TB was identified in both simple and complex fistulas.
Conclusions: TB should be considered in chronic or recurrent anal fistulas, especially in endemic regions. Routine histopathological examination is crucial for timely diagnosis. A combination of surgical intervention and anti-tubercular therapy (ATT) leads to favorable outcomes. Increased awareness among clinicians can help reduce diagnostic delays and improve patient management.

Keywords: Tuberculosis, Anal fistula, Perianal tuberculosis, Fistula-in-ano, Histopathology, Diagnostic challenges

INTRODUCTION

Anal fistula is the most common anorectal condition resulting from chronic infections of the anal glands.[1,2] It consists of an abnormal communication between the anal canal and perianal skin, often manifested by persistent discharge, pain, and recurrent infection.[2] Most cases of anal fistulas are cryptoglandular in origin; they arise from obstruction and subsequent infection of the anal glands.[3] However, a subset of these cases is due to underlying conditions including Crohn's disease, malignancies, and infections such as TB. Determining these less common causes is important since they impact both the mode of management and prognosis.[4]

TB of anal fistula is an uncommon yet clinically important condition.[1] Although the lungs are the most common site for TB infection, extrapulmonary TB accounts for a significant percentage, especially in endemic areas.[5] Among extrapulmonary manifestations, anorectal TB is very rare, amounting to less than 1% of all TB cases.[6] The clinical appearance of TB may be an anal fistula, chronic ulceration, abscess formation, or even a mass-like lesion, with most manifestations often simulating other diseases in the anorectum. Because the clinical presentation of the disease is quite nonspecific, TB-related anal fistula is often mistaken for a simple cryptoglandular fistula, often delaying proper treatment.[7]

The incidence of TB -associated anal fistula is not the same worldwide; thus, it is higher in regions where TB is endemic.[8] In Bangladesh, where TB is still a significant public health burden, the association with TB should be checked for in chronic anal fistulas. Previous studies have documented that TB-related fistulas tend to present with chronic non-healing tracts, a higher recurrence rate after surgical intervention, and a need for ATT alongside surgical management.[9,10] True burden of TB in anal fistulas remains underreported because of challenges in diagnosis.

Diagnosis of TB in anal fistula requires a high index of suspicion. Routine histopathological examination of excised fistula specimens is not always carried out except if clinically indicated.[11] Besides, most of the traditional diagnostic methods of fistula specimen such as AFB and mycobacterial culture do not have satisfactory sensitivity. Caseating granulomas and Langhan's type of giant cell on histopathology constitute a hallmark feature of diagnosis; however, for better detection rates, more modern molecular techniques should be employed such as polymerase chain reaction for *M. tuberculosis*.[12] Absence of routine TB screening among fistula surgery patients may lead to missed diagnosis, probably resulting in inappropriate management and recurrence.[13]

The management of TB-associated anal fistula is quite different from the management of a standard cryptoglandular fistula.[5] Whereas conventional fistulas are usually treated with surgery alone, TB-related fistulas require ATT in addition to surgery.[11] Delays in healing, recurrence, or complications such as extensive perianal tissue destruction may be seen if the underlying TB is not identified and properly treated. Thus, the identification and treatment of this rare but important cause are essential for the optimization of patient outcomes.[8,12]

The present study has been designed to determine the incidence of TB in cases of anal fistula, describe the clinical characteristics, and point out the diagnostic challenges associated with its identification. This study will be based on the analysis of histopathological findings, specimen distribution, and clinical features for enhancing awareness and early detection of TB in anal fistula cases. Our findings will provide valuable clinical insight into the prevalence and management of TB-associated anal fistulas, given the limited data available on this subject in Bangladesh, thus helping improve diagnostic strategies and patient care.

METHODS

This is a prospective observational study conducted over a period of 1.5 years, starting from July 2023 and ending in December 2024, and involving 85 patients with a diagnosis of anal fistula. The study was conducted at six hospitals in Bangladesh: five in Dhaka, including Shaheed Suhrawardy medical college hospital, Mugda medical college hospital, super specialized hospital, Impulse hospital, and Labaid cancer and super specialty hospital, and one in Jhenaidah district, Rabeya hospital.

Patients who underwent surgery for anal fistula were enrolled, and all operative details were recorded in a proforma based on the St. Mark's hospital fistula operation note format to ensure uniformity in reporting. Exclusion criteria included those with inflammatory bowel disease, incomplete medical records, or lost to follow-up. Demographic data, clinical features, and post-operative results were noted on a structured data sheet. In the postoperative period, patients were followed up in the first week and then every two to four weeks until complete healing. Presence of TB in fistula specimens was confirmed by histopathological examination.

All the data collected were entered systematically and analyzed using SPSS version 25.0. Descriptive statistics summarize the data on patient demographics, fistula classification, specimen distribution, and clinical findings. Incidence of TB in anal fistula was based on histopathological diagnosis. Informed consent was obtained from all participants, and ethical approval was granted by the institutional ethics committee.

RESULTS

Table 1 presents the demographic characteristics of our study participants, highlighting a male predominance (80.0% male, 20.0% female) among 85 patients. Majority (62.4%) were aged 19-40 years, followed by 22.4% in the

41-60 years group. Pediatric cases (0-18 years) accounted for 5.9%, while 9.4% were over 60 years.

Table 2 presents the distribution of fistula types based on Parks classification among 85 patients. The inter sphincteric type was the most common (48.2%), followed by low trans sphincteric fistulas (24.7%). High trans sphincteric fistulas accounted for 12.9%, while superficial (8.2%), supra sphincteric (4.7%), and extra sphincteric (1.2%) fistulas were less frequent.

Table 3 categorizes the fistulas based on the AGA classification, showing that the majority were simple fistulas (64.7%), while 35.3% were classified as complex.

Table 1: Demographic characteristics of our study participants (n=85).

Characteristics	N	Percentages (%)
Sex		
Male	68	80.0
Female	17	20.0
Age groups (in years)		
0-18	5	5.9
19-40	53	62.4
41-60	19	22.4
>60	8	9.4

Table 2: Total fistula parks classification, (n=85).

Tract type	N	Percentages (%)
Superficial	7	8.2
Inter sphincteric	41	48.2
Trans sphincteric (Low)	21	24.7
Trans sphincteric (High)	11	12.9
Supra sphincteric	4	4.7
Extra sphincteric	1	1.2
Total	85	100

Table 3: Total fistula AGA classification, (n=85).

Type	N	Percentages (%)
Simple	55	64.7
Complex	30	35.3
Total	85	100

Table 4: Specimen type distribution, (n=85).

Specimen type	N	Percentages (%)
Fistula tract	71	83.5
Skin around fistulous tract	4	4.7
Rectal/anal tissue	6	7.1
Abscess wall	3	3.5
Other (Caecum/ sigmoid colon, etc.)	1	1.2
Total	85	100

Table 4 presents the distribution of specimen types analyzed in the study, with the majority being fistula tract samples (83.5%), followed by rectal/anal tissue (7.1%) and skin around the fistulous tract (4.7%). A smaller proportion of specimens included abscess wall (3.5%) and other tissues such as from the caecum or sigmoid colon (1.2%), reflecting the diverse sampling approach used for diagnosis.

Table 5: TB diagnosis in anal fistula, (n=85).

Clinical feature	N	Percentages (%)
Chronic non-healing fistula	72	84.7
Unhealthy granulation tissue	30	35.3
Foreign body reaction	1	1.2
Associated abscess formation	3	3.5
TB in fistula	3	3.5

Table 5 presents the clinical features and associated findings in 85 cases of anal fistula. Chronic non-healing fistula was the most prevalent feature, observed in 84.7% (n=72) of cases. Unhealthy granulation tissue was found in 35.3% (n=30), while associated abscess formation was noted in 3.5% (n=3). Foreign body reaction was rare, occurring in 1.2% (n=1), and TB within the fistula was detected in 3.5% (n=3), reinforcing the need for thorough evaluation in persistent cases.

Table 6: Clinical features and associated findings (n=85).

Diagnosis	N	Percentages (%)
TB positive	3	3.5
TB negative	82	96.5
Total	85	100

Table 6 summarizes the TB diagnostic findings among the study participants, indicating that 3.5% (n=3) were TB positive, while the majority, 96.5% (n=82), tested negative.

DISCUSSION

Our study is important in ascertaining the incidence, clinical characteristics, and diagnostic challenges of TB in cases of anal fistula. These findings underscore the need to consider TB in chronic or non-healing anal fistulas, especially in endemic regions. We detected a 3.5% prevalence of TB in fistula-in-ano, consistent with previous studies in Bangladesh and other high-burden countries where the rates have generally ranged between 3 and 6%. Haque et al also gave a similar prevalence in their prospective study, strengthening the need to undertake routine histopathological and microbiological assessment of fistulous tracts in order to catch the disease in its early stages.[14]

TB is one of the major health problems in Bangladesh. Both pulmonary and extra pulmonary TB cases were reported in Bangladesh. Sarker et al stated that although perianal TB is considered a rare manifestation, there are increasing reports recently.[9] Al-Zanbagi et al in a systematic review, showed that gastrointestinal TB, including perianal TB, is often underdiagnosed because of its nonspecific presentation.[10] In our series, the majority of the TB patients were young to middle-aged males, which agrees with this demographic pattern in cases presented by Lazarus et al. This male preponderance can be explained by occupational exposure, lifestyle issues, and differences in health care-seeking behavior, as already identified by García-Rodríguez et al in their epidemiological analysis.[8,15]

Another important observation from our series was that the majority of fistula patients 84.7% had presented with a chronic nonhealing fistula, with unhealthy granulation tissue seen in 35.3% of them. These features are typical for cryptoglandular fistulas and do not necessarily suggest TB. However, Gupta et al have previously underlined that anal fistulas related to TB may present some atypical features such as multiple external openings, associated abscesses, or peculiar granulation tissue.[7] In fact, other features such as foreign body reaction were noted in our TB-positive cases that made the diagnosis difficult.

Verma et al. said that most of the symptoms of perianal TB closely resemble cryptoglandular fistulas, Crohn's disease, or even malignancy; thus, diagnosis is often not correctly made.[12] Oliveira et al pointed out that late diagnoses of perianal TB occur because systemic TB symptoms such as fever and weight loss are lacking in many instances.[13] Corrêa et al have reported that multiple surgical procedures for various complaints were performed on several patients before a diagnosis of TB was entertained.[16] Our findings emphasize the need for confirmation through histopathology since culture and PCR tests are not always possible in resource-poor settings, as highlighted by Belhaj et al.[17]

In our study, total fistulas were classified according to both the Parks and AGA classification systems. The distribution was as follows: inter sphincteric, 48.2%, and low trans sphincteric, 24.7%. Garg et al in their study on perianal TB, demonstrated a similar distribution.[18] Although complex fistulas are normally associated with TB, we diagnosed the disease in even some of the simple ones. This implies the need to incorporate routine investigations into all chronic fistulas as part of examination and diagnosis. Sahu et al described the fact that apparently simple fistulas may contain tuberculous lesions, reinforcing the importance of histopathology examination.[19]

Our study highlights the necessity of histopathological examination in all chronic anal fistulas, regardless of their classification. Among the three TB-positive cases, according to AGA classification one was complex and two were simple fistulas, while Parks classification categorized them as one high trans sphincteric, one inter sphincteric, and one superficial fistula. None of these three were recurrent. This finding reinforces that TB can occur even in simple fistulas, contradicting the traditional belief that TB is primarily associated with complex or recurrent fistulas. Histopathological analysis revealed Langhans giant cells in one case, caseous necrosis in another, and foreign body giant cells in the third, demonstrating the diverse histological presentation of perianal TB.[6] Given that simple fistulas accounted for a significant portion of TB-positive cases, routine histopathological evaluation is essential, even when the fistula appears uncomplicated, to ensure timely diagnosis and appropriate management.[14]

Histopathology has remained the gold standard in the diagnosis of TB of the anal fistula. In our series, all cases of TB were confirmed by histopathology, which agreed with the observation made by Mathew et al that histopathological examination yielded better results than culture or PCR alone.[20] Garg et al recommended that though PCR is highly sensitive, its unavailability in most developing regions makes histopathology a more practical way of diagnosis.[21]

Most series confirm that the management of TB fistula-in-ano is different from that of routine cryptoglandular fistulas. Surgery is rarely effective for such fistulae and may frequently lead to recurrence if not treated with ATT. Takahashi et al underscored the fact that the combination of surgical drainage with ATT results in an optimal outcome, with a healing rate of more than 90%.[22] Indeed, our experience agrees with his view, and all TB positive cases treated by ATT showed the effective healing.

However, late diagnosis remains a major concern. Most of the patients in resource-poor settings undergo several surgeries before the suspicion of TB. Lip et al pointed out that delayed diagnosis prolongs morbidity, often leads to unnecessary procedures, and raises healthcare costs.[23] Pandit et al reported a case in which a TB-related perianal fistula was mistaken for a chronic rectal mass; this further leads the authors to acknowledge the diagnostic challenges associated with this condition.2[4]

Our findings also correspond to that from other parts of the world where TB is endemic. Sarker et al also presented a similar incidence of TB anal fistulas in Bangladesh, bringing again awareness amongst surgeons.[9] Garg et al studied perianal TB in India presenting 3-5% of all fistula-in-ano cases tubercular, close approximation to our findings.[25]

One notable discrepancy in our series was the percentage of complex fistulas amongst TB-positive cases. Whereas Oliveira et al had suggested a strong correlation between TB and complex fistulas, we found TB even in simple

fistulas.[13] This wider spectrum of disease requires further elucidation of the pathophysiology of perianal TB.

Limitations

Despite its strengths, our study has some limitations. The sample size of 85 patients, while providing valuable insights, is relatively small for drawing definitive epidemiological conclusions. Additionally, our study was conducted in tertiary care hospitals, which may introduce selection bias, as more complicated or refractory cases are likely to be referred.

CONCLUSION

Our study highlights the importance of considering TB in patients with all anal fistulas, especially in endemic regions. While perianal TB remains rare, its diagnosis is often delayed due to non-specific clinical presentation. Routine histopathological examination of fistula specimens, combined with a high index of suspicion, is crucial for timely diagnosis and management. Future research should focus on improving diagnostic accuracy and optimizing treatment strategies to reduce morbidity associated with this condition.

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