

Appendicular Base Perforation as a Rare Manifestation of Abdominal Tuberculosis in a Paediatric Patient: A Case Report

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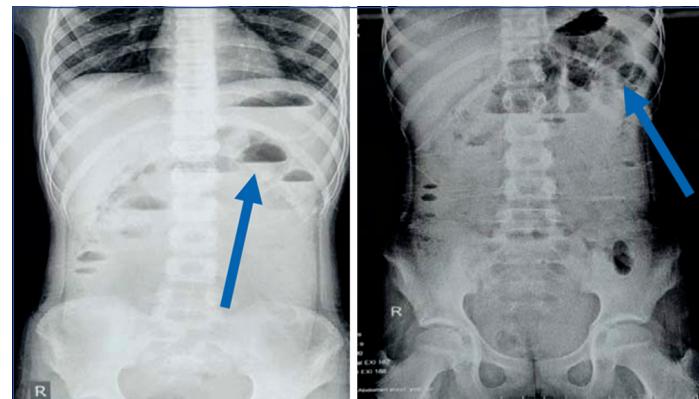
ABSTRACT

Pulmonary tuberculosis is the most commonly diagnosed site of tuberculosis infection in children and abdominal tuberculosis accounts for only 0.3-4% of all tuberculosis cases, especially in Indian children. Although India has made progress in reducing overall TB incidence in recent years, abdominal TB remains a rare and potentially life-threatening complication that presents diagnostic and therapeutic challenges. Here, in this case report, a 13-year-old female presented to the Department of Gastroenterology at a tertiary health-care centre. The patient presented with abdominal pain, fever and vomiting, with a history of abdominal distension. Imaging revealed inflammatory changes with perforation. During emergency laparoscopic appendectomy, perforation at the base of the appendix was identified along with multiple peritoneal granulomas. Histopathological examination and the Cartridge-Based Nucleic Acid Amplification Test (CBNAAT) were performed. After confirmation of the diagnosis, the patient was started on antitubercular therapy according to national guidelines and responded well to treatment. This case emphasises the importance of considering TB in atypical presentations of appendicitis, especially in children.

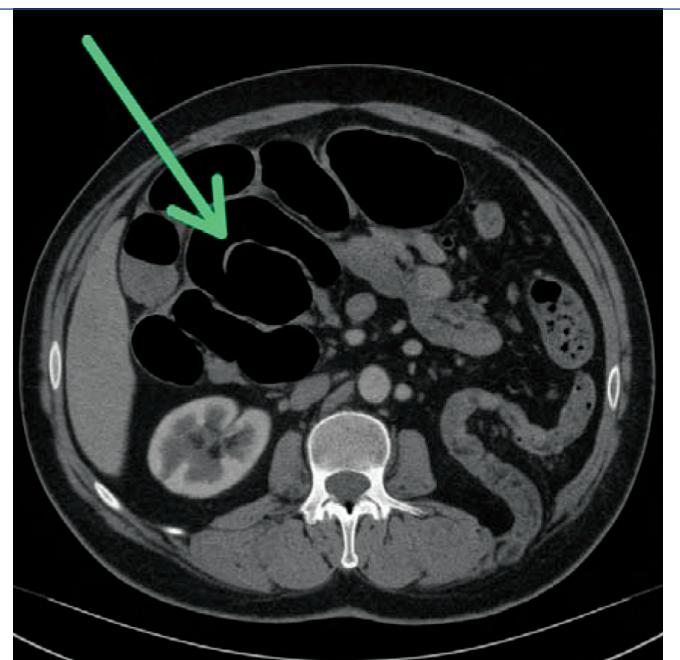
Keywords: Abdominal tuberculosis, Antitubercular therapy, Appendicitis, Laparoscopic appendectomy, Perforation

CASE REPORT

A 13-year-old female presented with acute onset of moderate-intensity, continuous, non radiating pain in the right iliac fossa, persisting for two days. These symptoms were associated with low-grade fever and multiple episodes of non bilious vomiting. There was no history suggestive of tuberculosis, constitutional symptoms, or chronic gastrointestinal complaints. On clinical examination, the patient exhibited localised tenderness, rebound tenderness and guarding in the right lower quadrant, without signs of generalised peritonitis. Bowel sounds were hypoactive. Routine laboratory investigations were performed and revealed leukocytosis and elevated CRP levels [Table/Fig-1]. A plain erect abdominal radiograph revealed subacute obstruction [Table/Fig-2]. Ultrasonography of the abdomen demonstrated a non compressible, blind-ended tubular structure in the right iliac fossa measuring approximately 11 mm in diameter, with adjacent echogenic mesenteric fat, mild pelvic ascites and multiple enlarged mesenteric lymph nodes. Furthermore, a contrast-enhanced CT (CECT) of the abdomen and pelvis was performed [Table/Fig-3], which revealed an inflamed appendix with focal discontinuity at its base suggestive of perforation, periappendiceal fat stranding, loculated pelvic fluid and mesenteric lymphadenopathy. The constellation of findings raised suspicion for an atypical infectious aetiology, including tuberculous appendicitis. In this case report, written informed consent was obtained from the patient's guardians prior to the operative procedure. The patient presented to the emergency department on day 2 of symptoms and underwent emergency laparoscopic appendectomy within 12



[Table/Fig-2]: X-ray findings showing multiple air fluid levels showing subacute obstruction.



[Table/Fig-3]: CECT showing dilated bowel loops indicating obstruction.

Investigation	Results	Normal values
Total White Blood Cells (WBC) count (/mm ³)	15,600 (Neutrophilic predominance)	4,000-11,000 / mm ³
C-Reactive Protein (CRP) (mg/L)	64	<5 mg/L
Erythrocyte Sedimentation Rate (ESR) (mm/hr)	50	0-20 mm/hr
Human Immunodeficiency Virus (HIV)	Negative	-
Hepatitis B surface Antigen (HbsAg)	Negative	-
Hepatitis C Virus (HCV)	Negative	-

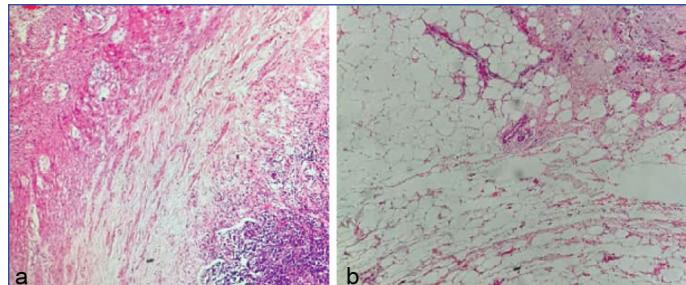
[Table/Fig-1]: Laboratory investigations.

hours of admission, after stabilisation and imaging. Intraoperatively, multiple granulations were noted over the peritoneal surfaces, bowel loops and omentum, suggestive of tuberculous peritonitis [Table/ Fig-4]. The small bowel loops appeared thickened with evidence of granulomatous inflammation. A perforation was identified at the base of the appendix with surrounding inflammatory adhesions. Both ovaries appeared grossly normal and clear peritoneal fluid was present without evidence of purulence. The procedure was completed laparoscopically with resection of the appendix, peritoneal lavage and tissue sampling for histopathological and microbiological evaluation.

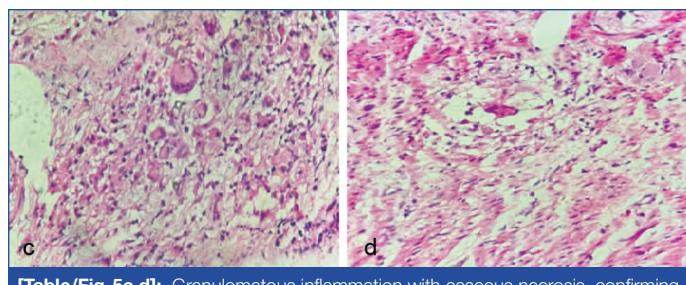


[Table/Fig-4]: Multiple enlarged mesenteric granulations suggestive of TB.

The specimen was sent for histopathological examination and intraoperative tissue was submitted for CBNAAT, which was positive for *Mycobacterium tuberculosis*. Histopathological analysis revealed granulomatous inflammation with caseous necrosis, confirming a diagnosis of tuberculous appendicitis, as presented in [Table/Fig-5a-d].



[Table/Fig-5a,b]: Granulomatous inflammation with caseous necrosis, confirming a diagnosis of tubercular appendicitis (H&E,10x).



[Table/Fig-5c,d]: Granulomatous inflammation with caseous necrosis, confirming a diagnosis of tubercular appendicitis (H&E,40x).

In view of the microbiological and histopathological confirmation, standard antitubercular therapy was initiated according to national guidelines: an intensive phase of two months comprising rifampicin (10 mg/kg/day), isoniazid (5 mg/kg/day), pyrazinamide (30 mg/kg/day), and ethambutol (20 mg/kg/day), followed by a continuation phase of seven months with isoniazid and rifampicin (2HRZE/7HR), administered daily. The postoperative period was uneventful. On follow-up, the patient demonstrated progressive clinical improvement. The surgical incision healed without complication. Abdominal symptoms resolved within two months and ultrasonographic evaluation confirmed resolution of ascites. Furthermore, the patient tolerated the antitubercular therapy well and experienced an uneventful postoperative recovery. Subsequently, the patient was discharged on a standard HRZE regimen, along with analgesics and probiotics.

DISCUSSION

Abdominal tuberculosis presents diagnostic challenges, especially in the paediatric population, where the clinical presentation often mimics more common gastrointestinal pathologies. According to a recent systematic review by Willis M et al., around 1.5 million children are reported to have TB annually, representing 11% of the total global burden and 16% of global TB-related deaths in children [1]. India alone accounts for 28% of the global childhood TB burden [2,3]. These statistics indicate that TB has become a major public health concern globally; this scenario is even worse in high-burden countries such as India, where extrapulmonary TB (EPTB) accounted for 1.95% of cases and contributed to up to 39.7% of all pediatric TB patients, according to Shah C et al., [4]. Among the various abdominal manifestations, tuberculous appendicitis is very rare and is often misdiagnosed due to its non specific signs and symptoms.

In the present case report, the patient presented with typical signs and symptoms of acute right iliac fossa pain, fever and vomiting, necessitating prompt and effective surgical evaluation. Intraoperative findings of a perforated appendiceal base, mesenteric lymphadenopathy and ascitic fluid raised suspicion for an atypical underlying aetiology. Histopathological examination revealed caseating granulomatous inflammation and a confirmatory diagnosis was established through CBNAAT, which detected the presence of *Mycobacterium tuberculosis*, confirming tuberculous appendicitis. The clinical presentation in this case aligns with a recent report by Haddad F et al., who described a similar presentation in a 26-year-old Moroccan female [5]. Hubbard G and Chlysta W, reported that tuberculous appendicitis is an uncommon clinical entity, accounting for approximately 1.5-3.0% of all TB cases [6]. Similarly, Malhotra P et al., described a 26-year-old female with tubercular appendicitis and emphasised the importance of considering this rare diagnosis in atypical abdominal presentations, particularly in TB-endemic regions [7].

Differential diagnosis of granulomatous appendicitis includes Crohn's disease, *Yersinia* infection, actinomycosis and foreign-body reactions. However, the presence of caseating granulomas and positive molecular testing confirm the tuberculous aetiology in this case report. Therefore, the present case report suggests that it is important for healthcare professionals to consider TB in the differential diagnosis of granulomatous inflammation, especially in endemic regions or when intraoperative findings are atypical. This is supported by Ionescu S et al., [8].

In this case, USG and CECT played important roles in identifying atypical features, thereby aiding early diagnosis and improving the patient's prognosis. However, in resource-limited settings, access to high-resolution imaging such as CECT remains limited, which presents significant diagnostic challenges.

This case report highlighted that surgical and medical approaches are the cornerstone in the management of tuberculous appendicitis. The surgical procedure, i.e., laparoscopic appendectomy, serves as a definitive treatment for localised disease, while ATT is important to eradicate systemic infection and prevent recurrence. The management employed in this case was supported by Di Buono G et al., Liu G et al., and Hong W et al., [9-11]. In this case, the patient showed a favourable outcome by following the standard antitubercular therapy with resolution of symptoms and no significant treatment-related complications.

CONCLUSION(S)

Appendicular perforation due to abdominal tuberculosis is rare, especially in children and often mimics acute appendicitis. In TB-endemic areas, clinicians should suspect TB in atypical intraoperative findings like lymphadenopathy or ascites. Present case report highlighted that early imaging, surgical intervention and confirmation by histopathology or CBNAAT are essential. Additionally, early

initiation of antitubercular therapy helps improve patients' outcomes and prevent further complications.

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