CASE REPORT

Colorenal fistulae: A rare but fatal presentation of renal tuberculosis in a paediatric patient

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Abstract

Genitourinary Tuberculosis (GUTB) primarily occurs due to haematogenous infection and represents the most prevalent form of extra-pulmonary tuberculosis. It typically presents with non-specific symptoms and is rare in children, making diagnosis challenging and, potentially, leading to complications such as renal failure, pyonephrosis, nephrocutaneous fistulae, and sepsis. We describe a unique case involving a four-year-old male child who developed renal tuberculosis secondary to a renal stone, resulting in pyonephrosis and colorenal fistulae.

Keywords: Colorenal fistulae; Extrapulmonary tuberculosis; Genitourinary tuberculosis; Nephrectomy; Renal tuberculosis.

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Introduction

Tuberculosis remains the primary cause of mortality after infectious diseases. According to the World Health Organisation (WHO), there was a significant surge in its prevalence between 2017 and 2019. However, there was subsequently an 18% decrease between 2019 and 2020, with the number of cases declining from 7.1 million to 5.8 million.[1]

Genitourinary Tuberculosis (GUTB) constitutes approximately 30-41% of all cases of Extrapulmonary Tuberculosis (EPTB) globally. The prevalence of GUTB varies by region, with the highest rates observed in Africa, Asia, Eastern Europe, and Russia, whereas developed nations such as Western Europe and the United States experience comparatively lower rates.[2]

Although it represents the primary site for extrapulmonary tuberculosis (EPTB), urogenital tuberculosis (UGTB) is infrequent in young children and frequently evades detection.[3,4]

A colorenal fistula is an uncommon occurrence in paediatric patients, and it can manifest in any segment affected by ischaemia, chronic inflammation, or necrosis. Interventional procedures, inflammatory disorders, colon tumours, xanthogranulomatous pyelonephritis, and other causative factors typically trigger an initial renal lesion that leads to colorenal fistula.[5]

The clinical presentation and signs of renal tuberculosis vary widely, and there is no specific diagnostic symptom or clinical sign that reliably indicates the presence of the condition. In younger children, symptoms may be absent for years until the disease progresses to complications.[6]

Tuberculosis occurring alongside stone disease is exceedingly uncommon, and it often presents with symptoms resembling those of stone disease. This similarity complicates the diagnosis of GUTB even further. Here, we describe an exceptionally rare case involving renal tuberculosis concurrent with renal stone disease, which manifested as pyonephrosis and colorenal fistula.

Case Report

A four-year-old boy presented to the emergency department at Sindh Institute of Urology and Transplantation (SIUT), Sukkur, in June 2023 complaining of generalised abdominal pain and intermittent fever. Upon examination, he exhibited fever and tachycardia, with a temperature of 100°F, a respiratory rate of 22 breaths per minute, and a pulse rate of 95 bpm, along with generalised pallor. There was no reported history of exposure to tuberculosis.

Laboratory investigations revealed a haemoglobin level of 8.8 gm/dL(12-14gm/dL), a total leukocyte count of 18,700/mm^3(4000-10,000/mm^3), and a platelet count of 102,000 (>150,000). Renal function tests were within normal limits. Urine analysis indicated turbid urine with no proteinuria, 10–12 white blood cells, and 4–5 red blood cells per high-power field. Urine culture showed no growth.

An abdominal ultrasound revealed a distorted right kidney with a renal pelvic calculus measuring 1.4cm. A perinephric collection of about 70 ml was also noted. It showed dense echoes in the pelvicalyceal system and grade 2 hydronephrosis (Figure 1).

Intravenous pyelography and a renal scan performed by

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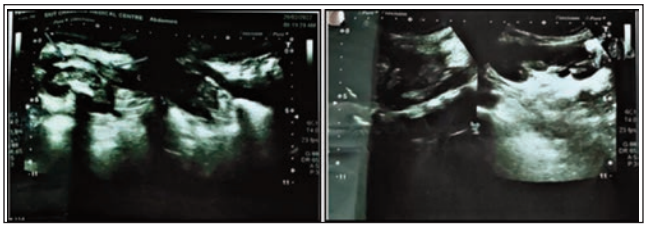

Figure-1: Ultrasound imaging of kidneys demonstrating distorted right kidney with thick echoes and perinephric collection.

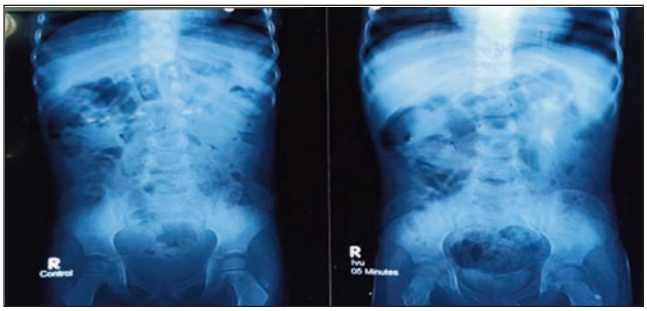

Figure-2: Intravenous Pyelogram (IVP) demonstrating absence of contrast excretion or uptake on the right side, accompanied by a radiopaque shadow in the renal pelvic area, in contrast to normal contrast excretion observed on the left side.

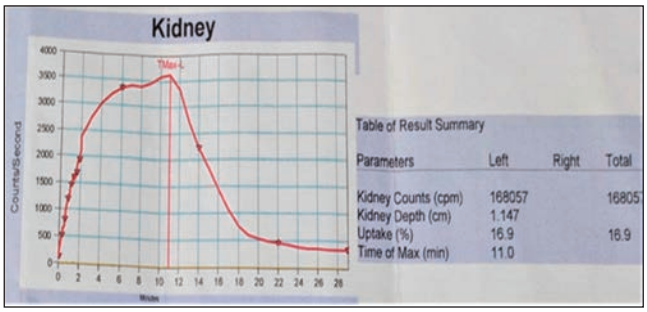

Figure-3: MAG-3 scan illustrating lack of contrast excretion or uptake on the right side, indicative of a non-functioning right kidney, contrasted with normal excretion of contrast on the left side, suggesting normal kidney function.

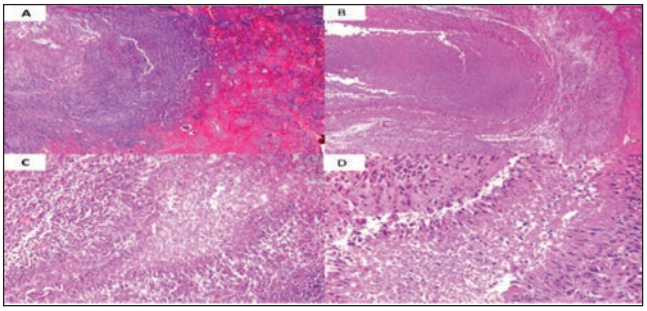

Figure-4: Histopathology of nephrectomy specimen. A) Low-power view showing advanced changes of chronic pyelonephritis on the right side. On the left side, there is intense inflammation (H&E, ×40). B) Medium-power view showing a large area of caseation necrosis surrounded by a rim of epithelioid cells (H&E, ×100). C) Medium-power view showing central caseation necrosis surrounded by palisading epithelioid cells (H&E, ×200). D) High-power view showing central caseation necrosis surrounded by palisading epithelioid cells (H&E, ×400).

the patient's physician before referring to us were presented. The intravenous pyelography revealed a radiopaque shadow in the right renal area, indicating no contrast uptake in the right kidney, while the left kidney showed normal uptake and excretion (Figure 2). The radioisotope scan (MAG-3 scan) indicated a non-functioning right kidney and a normal functioning left kidney (Figure 3).

Following optimisation, a right nephrectomy was performed. Intraoperatively, the kidney was densely adherent to surrounding structures, and pus was observed in the iliac fossa. Subsequently, a subcapsular nephrectomy was conducted to prevent inadvertent injury to adjacent organs. Further dissection revealed a fistulous communication between the right colon and the lower pole of the right kidney. The right colon was dissected, separated from the kidney, and the fistulous tract was excised. Vicryl 3/0 was used to close the colonic defect in two layers and a loop ileostomy was created.

The post-operative period was uneventful, and the patient was discharged on the seventh post-operative day after drain removal and parental training for ileostomy management. Histopathological examination confirmed renal tuberculosis (Figure 4), prompting a follow-up appointment in the outpatient department for consultation with infectious disease specialists. Anti-tuberculosis therapy (ATT) was initiated in accordance with WHO protocol[7] ensuring rigorous follow-up.

After five months of ATT, an ileostomy reversal was performed. Currently, the child is thriving well, with normal renal function and haematological parameters.

Discussion

Genitourinary tuberculosis represents the predominant site for extra-pulmonary tuberculous lesions. Initially, it was believed that genitourinary involvement was a consequence of dissemination of the Tubercle Bacilli from the lungs. However, the recognition of renal tuberculosis and tuberculosis epididymitis as manifestations of the same infection led to the introduction of the term GUTB.[7] Tuberculosis foci within the urinary tract can remain latent and may take anywhere from two to 20 years to reactivate.[8] This prolonged period of dormancy often leads to the misconception that paediatric renal TB has essentially disappeared.

In cases of GUTB, isolating Mycobacterium tuberculosis poses a challenge. The formation of sealed-off cavities in the kidney can prevent the detection of bacteria in urine cultures, despite the disease progressing. The sensitivity of the GeneXpert/RIF assay has been reported to range

between 63% to 94%.[8,9] Similarly, in the present case, multiple previous urine cultures yielded negative results for tuberculosis until histopathological examination of the specimen confirmed its presence.

The symptomatology of renal TB is characterised by vague, non-specific manifestations, with flank pain and dysuria being the most common symptoms, and there are no diagnostic physical signs to raise suspicion.[9]

Additionally, associated pathologies, such as stone disease and secondary infections, can sometimes obscure the clinical presentation, further complicating the diagnosis.[7] In our study, the primary symptoms were flank pain and fever, initially attributed to renal stones.

Obstructive uropathy leading to pyonephrosis and declining renal function is a common consequence of untreated renal TB. Prompt drainage and initiation of anti-tuberculosis therapy (ATT) typically yield favourable outcomes.[6] However, to the best of our knowledge, the development of colorenal fistulae, as observed in this patient, has not been previously reported.

Anti-tuberculosis therapy is the cornerstone of treatment for the majority of patients with GUTB. Both the World Health Organisation (WHO) and the Centre for Disease Control and Prevention (CDC) recommend a two-phase therapy regimen. The initial phase (the intensive phase), lasting two months, involves the administration of four drugs (Rifampicin, Isoniazid, Pyrazinamide, and Ethambutol) once daily, and the continuation phase, which lasts for four months, involves the administration of only two drugs, typically Rifampicin and Isoniazid, twice weekly.[10] This patient also received anti-tuberculosis therapy according to the WHO protocol for the duration of six months before the commencement of ileostomy reversal.

Medical treatment with anti-tuberculosis therapy (ATT) is the primary treatment approach. If diagnosed before surgery, it is advisable to commence ATT at least four weeks prior to the procedure, particularly when lower tract reconstructive surgery is scheduled.[10] Maintaining a high index of suspicion among patients from endemic regions can facilitate early diagnosis and help prevent the catastrophic complications associated with GUTB.

Conclusion

Genitourinary tuberculosis presents as a rare occurrence in children and poses a considerable challenge in diagnosis, especially in the presence of renal stones. Prompt evaluation for GUTB is warranted in children residing in endemic regions who exhibit resistant or recurrent urinary tract infections without delay.

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Author Contribution:
NAM: Concept, data acquisition, interpretation, literature review, drafting and critical review.
NM: Concept, data acquisition, literature search and drafting.
RM: Data review, literature search and literature review.
MAC: Literature search, literature review and critical analysis.
MH: Critical review of draft and final approval.