

Pediatrics

Genitourinary tuberculosis in 2-year-old Indonesian boy with malnutrition: A rare case

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ABSTRACT

Genitourinary tuberculosis is a primary target of hematogenous infections and is the most common site of extra-pulmonary tuberculosis. A 2-year-old Indonesian boy with genitourinary tuberculosis with family history of tuberculosis. Radiological work-ups show pulmonary miliary tuberculosis, complication of hydronephrosis and ureteral kinking. Centrifuge-urine smear shows acid-resistant bacillus. Anthropometric measured was similar a 1-years-2-months-old boy. The biological activity of tuberculosis can only be assessed by cultivating mycobacteria. The patient was treated with anti-tuberculosis regimens and shows improvement on clinical presentation. He received nutritional intake based on the WHO formula (F75, F100, F135). This patient should undergo reconstructive surgery but refuse.

Introduction

Tuberculosis is one of the most common causes of death due to infectious disease, with at least nine million new cases worldwide and two million deaths per year. Around 95% of these cases occur in developing countries. Genitourinary tuberculosis is reported 20%–70% from all cases of extra-pulmonary tuberculosis, but rarely found in children. This is the second most common form of extra-pulmonary tuberculosis after peripheral lymphadenopathy.¹ This study reported a rare case of genitourinary tuberculosis in 2-year-old Indonesia boy with malnutrition.

Case presentation

A 2-year-old Indonesian boy had acute febrile illness due to recurrent urinary tract infection. He experienced intermittent fever for two months, took antipyretic, and was circumcised but the fever did not resolved. His brother and aunt suffered from lung tuberculosis and were on treatment for 3 months. The boy had a history of bacille Calmette-Guerin vaccine. His development progress was according to age, but there was a delay in the personal-social aspect. The patient's anthropometric status included body weight (9 kg), height (78 cm), head circumference (47 cm) and upper arm circumference (12 cm). These conditions indicated malnutrition for children aged 2 year because it showed the growth of children aged 1-year-old and 2-months-old.

Laboratory analysis revealed hemoglobin (10.6 mg/dL), white blood cell (17.460/mm³) with monocytosis (7.6%), platelet (822,000), normal ureum and creatinine levels. Tuberculin test (2IU) was 15 mm of induration in diameter. Chest radiogram showed military tuberculosis (Fig. 1A). In Indonesia, diagnosis of pediatric tuberculosis is based on TB scoring ≥ 6 . The patient's score was 7, including severe malnutrition, positive tuberculin test, abnormal chest X-Ray, and history of fever >2 weeks. Abdominal ultrasonography (USG) revealed right hydronephrosis grade II, with chronic parenchymatous renal disease (Fig. 1B). USG Doppler showed discrepancy in flow velocity of right and left renal, suggesting renal artery stenosis or anatomical pathology (hydronephrosis and parenchymatous renal disease). Centrifuged-urine smear microscopy examination was positive for acid-resistant bacilli by using Ziehl-Neelsen method (Fig. 1C). Intravenous pyelography (IVP) showed moderate dilation of the right kidney (Fig. 2). USG and IVP were conducted at different times. Urinalysis revealed cloudy urine with proteinuria (+2), leukocytosis (+3, 2521/hpf), bacteriuria, hematuria (+3, 258/hpf) eumorphic. Voiding cystourethrogram revealed right vesicoureteral reflux grade III-IV (Fig. 3). All relative findings indicated genitourinary tuberculosis.

The initial therapy for patients included oral anti-tuberculosis to eradicate tuberculosis bacteria, symptomatic therapy for pain treatment, and nutrients for the management of severe malnutrition marasmus. Patients received children FDC (fixed drug combination), 2

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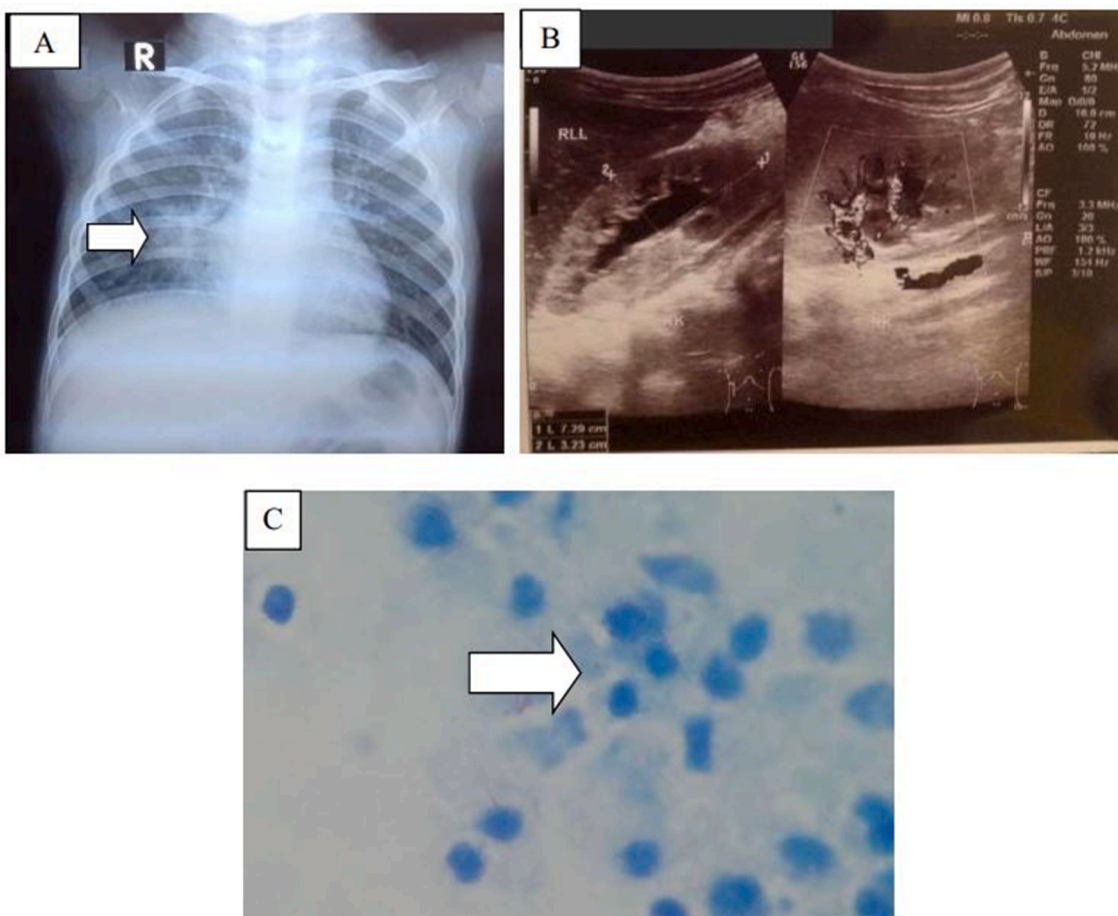


Fig. 1. Chest radiogram of miliary tuberculosis: miliary infiltrate in right pericardial side (A); abdominal ultrasonography: Right kidney Moderate Hydronephrosis, Chronic Parenchymatous renal disease in right kidney (B); Centrifuge Urine: Red staining in urine Ziehl Nielsen staining (C). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

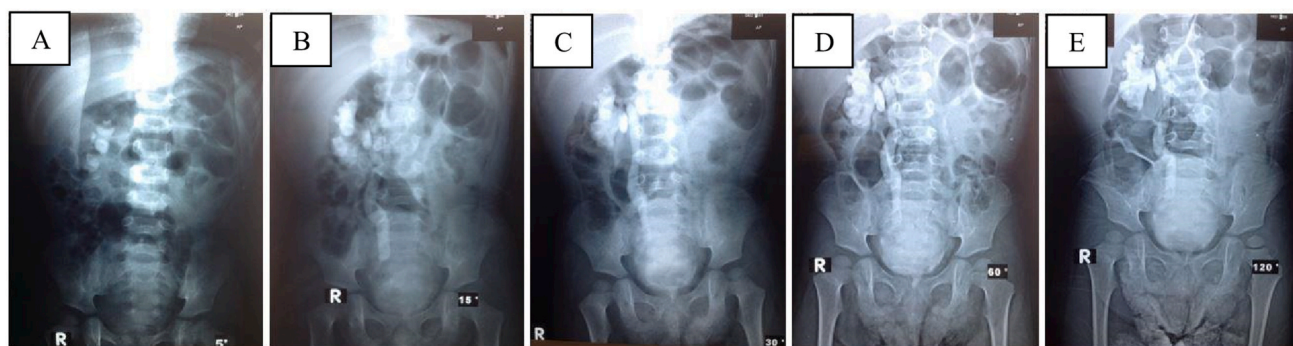


Fig. 2. Intravenous pyelography: nephrogram appears normal at 5 minutes (A), 15 minutes (B) 30 minutes (C), and 60 minutes (D). In the 120th minute (E) the pelvicalyceal system of the dextra widens with the clubbing-shaped calyx tip. Ureter dextra: appears dilated so that the UVJ with ureteral kinking is at 1/3 proximal. Vesica urinaria: regular mucosa, no visible indentation, filling defect (-), additional shadow (-).

tablets per day with ethambutol 200 mg per day during the intensive phase for two months, followed by 10-month maintenance phase. Patient also received prednisone 5 mg three times a day for 4 months then tapering off. Nutritional therapy complied with the recommended dietary allowance of age-appropriate for the calorie and protein, and Halliday Segar's formula for fluid needs. Patients received WHO formula (F75, F100, F135) to meet the needs of macronutrients, which were equipped with micronutrients such as vitamin A, vitamin B complex, Vitamin C, Vitamin D, Vitamin E, Folic Acid and Zinc.

Serial urinalysis during hospital treatment showed no significant

improvement in hematuria, leucocyturia and bacteriuria during the first month. Preparation of direct smear staining of urine with acid-resistant bacteria obtained a decrease in the number of acid-resistant bacteria within one week of treatment. The patient was planned for ureteric stenting but refused.

Discussion

Genitourinary tuberculosis is rare in children. There is often a long latent period (5–40 years) between the original pulmonary infection and



Fig. 3. VCUG: Right vesicoureteral reflux grade III-IV

the appearance of clinical renal disease, which causes rare renal improvement before the age of 20. Another reported case of urinary tract tuberculosis in children was 2 year old.²

Mycobacterium can reach the kidneys hematogenously. These bacteria can also be found in the urine in miliary tuberculosis and in some cases of pulmonary tuberculosis with no lesions in the renal parenchyma. Especially in urinary tuberculosis, voiding problems and chronic urgency non-responding to antibacterial drug regimens, are indicative of genitourinary tuberculosis.³

A combination of positive culture or histological analysis of biopsy specimens with polymerase chain reaction is still required in most patients for a definite diagnosis. Detection of acid-fast bacilli from urine samples by microscopy (Ziehl-Neelsen acid fast stain) is not reliable due to possible presence of mycobacterium smegmatis, which are acid-fast bacilli. The biological activity of tuberculosis can only be assessed by cultivating mycobacteria. The most common laboratory abnormalities are pyuria, albuminuria and hematuria in kidney disease cases. Renal tuberculosis is accompanied by manifestation of the urinary syndrome in 70.4% of cases and the presence of Mycobacteria tuberculosis in 100% of cases.⁴

According to the WHO, anti-tuberculous drug treatment is based on an initial 2-month intensive phase of treatment, and followed by a 4-month continuation phase. In the continuation phase, the drug may be given twice or thrice weekly. Reconstructive surgery, mainly repairing strictures at the lower end of the ureter, and bladder augmentation for a small fibrotic bladder is frequently required. Both radical and reconstructive surgery should be carried out in the first 2 months of intensive chemotherapy. Early ureteric stenting or PCN in patients with

tuberculous ureteral strictures may increase the opportunity for later reconstructive surgery and decrease the likelihood of renal loss.⁵

The child's bladder does not appear to be much contracted because of short duration of disease. Bladder contraction is usually caused by slow progressive infection without proper treatment that is clinically inapparent for decades.

Conclusions

A 2-year-old Indonesian boy with genitourinary tuberculosis confirmed by history of recurrent urinary tract infection, marasmic presentation, family history of tuberculosis. Radiological work-ups showed pulmonary miliary tuberculosis, also complication hydro-nephrosis and ureteral kinking. Centrifuge-urine smear showed acid-resistant bacillus. He was treated with anti-tuberculosis regimens and showed improvement on clinical presentation. This patient should undergo reconstructive surgery but refuse.

Statement of ethics

The parent or legal guardian were fully informed about the purpose of the study and provided written informed consent. The present case report adhered to the Declaration of Helsinki.

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Author's contribution

All authors contributed toward data analysis, drafting and revising the paper, gave final approval of the version to be published and agree to be accountable for all aspects of the work.

Declaration of competing interest

Astrid Kristina Kardani and Krisni Subandiyah declare that they have no conflict of interest this publication.

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