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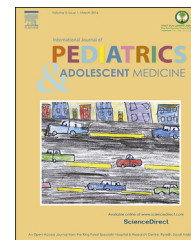


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INSTRUCTIVE CASE

A child with complicated *Mycobacterium tuberculosis*



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Abstract Tuberculosis (TB) is one of the leading causes of morbidity and mortality worldwide, with ever increasing resistance to commonly used antituberculous drugs. Drug-resistant TB was recognized shortly after the introduction of an effective therapy in the late 1940s, the use of streptomycin, which was the first widely used antituberculosis drug. Patients who received this drug usually had marked and rapid clinical improvement, but treatment failures were common after the first three months of therapy. Most children are infected by household contacts who have TB, particularly parents or other caretakers. Common symptoms of pulmonary TB in children include cough (chronic, without improvement for more than three weeks), fever (higher than 38 °C for more than two weeks), and weight loss or failure to thrive. Findings on a physical exam may suggest the presence of a lower respiratory infection, whereas the clinical presentation of extra pulmonary TB depends on the site of disease. The most common forms of extra pulmonary disease in children are TB of the lymph nodes and of the central nervous system. The role of inadequate treatment and poor compliance in the emergence of resistance highlights the importance of the DOT (Direct Observation Therapy) method in improving treatment outcomes and to control the spread of resistance. Copyright © 2016, King Faisal Specialist Hospital & Research Centre (General Organization), Saudi Arabia. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

TB is a disease that is caused by the bacterium *Mycobacterium tuberculosis*. The bacteria usually attack the lungs, but TB bacteria can attack any part of the body, such as the kidney, spine, or brain. If not treated properly, TB can be fatal. TB was once the leading cause of death.

2. Case presentation

A 7-year-old Saudi girl presented to the emergency department at this tertiary care hospital with a worsening course of fever, cough, weight loss, and abdominal pain over 3 weeks. She was admitted to a local hospital earlier and was suspected of having lymphoma. There was a history

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of recent contact with an aunt who was diagnosed as having pulmonary TB 6 months earlier and who was started on treatment with 4 drugs. The results of culture and susceptibility testing are not available. The child's place of residence in AL-Jouf was crowded, with many extended family members, and was poorly ventilated. Her father was 45 years old, and her mother was 35 years old. Both were healthy, but of poor socioeconomic status.

On examination, the child looked acutely ill, pale, tachypneic, and tachycardic, with a temperature of 39.6 °C, WT 11.7 < 5th centile, and HT 106 cm > 50th centile. There were multiple cautery marks over the chest wall and upper abdomen, and on chest auscultation, there was a marked decrease of air entry on the right side, with bronchial breathing and basal crepitations.

2.1. Laboratory data (Table 1)

The chest X-ray (Fig. 1) demonstrated an airspace disease involving the right lower lobe and a cystic change involving the right upper lobe with blunted cardiopulmonary angles. A CT scan of the chest (Fig. 2) demonstrated large airspace consolidation involving the right middle and lower lobes, with a large cavity in the right upper lobe, and bilateral miliary nodules that had a tree-in-bud appearance. There were multiple mediastinal necrotic lymph nodes suggestive of acute on top of chronic TB. The abdominal CT showed small hypo-dense splenic lesions.

Based on these findings, the patient was diagnosed as having pulmonary TB, iron deficiency anemia, and failure to thrive. Air borne isolation was initiated, and she was admitted to a negative air pressure room and started on INH, Rifampicin, pyrazinamide streptomycin, pyridoxine, and iron therapy. Four days after treatment, her platelet count decreased to 25 x 10⁹/L.

Rifampicin-induced thrombocytopenia was suspected, and the drug was therefore discontinued and replaced with ethambutol. Subsequently, the platelet count rebounded to a normal level.

Table 1 Clinical investigation upon diagnosis and during treatment of DOT.

Laboratory data	On diagnosis	On DOT	Normal range
CBC and differential			
WBC, 10 ⁹ /L	19.17	5.86	4.30–11.30
RBC, 10 ¹² /L	3.49	4.34	4.30–5.50
hemoglobin, g/L	67	113	110–150
Hematocrit, L/L	0.294	0.339	0.350–0.450
MCVfL	73.7	78.1	75–95
MCHCpg	22.5	26	24–30
RDW, %	19	12.9	11–15
Platelet, 10 ⁹ /L	25	231	155–435
Neutrophil absolute, 10 ⁹ /L	6.20	1.71	1.35–7.50
Lymphocyte absolute, 10 ⁹ /L	1.21	2.88	1.90–4.90
ESR, mm/h	140	9	0–15
CRP, mg/L	103	0.4	≤3 mg/L
Albumin, g/L	17	42.9	32–48
AST, U/L	373	33.5	10–45
ALT, U/L	114	24.9	10–35
Bilirubin, total, umol/L	6.3	4.9	0–21
Alkaline phosphate, u/L	269.5	246	100–300
HIV 1–2 antibody screening	Non reactive		

The Mantoux test was positive. Sputum for the AFB stain was positive, and the rapid DNA amplification test was positive for the *M. tuberculosis* complex. The culture was later reported to be positive for mycobacterium TB. The isolate was susceptible to streptomycin, isoniazid, rifampin, ethambutol, and pyrazinamide.

The general condition of the patient improved on treatment, with a normalizing respiratory rate and other vital signs, but she experienced persistent episodes of low-grade fever. Her appetite improved, with good oral intake and

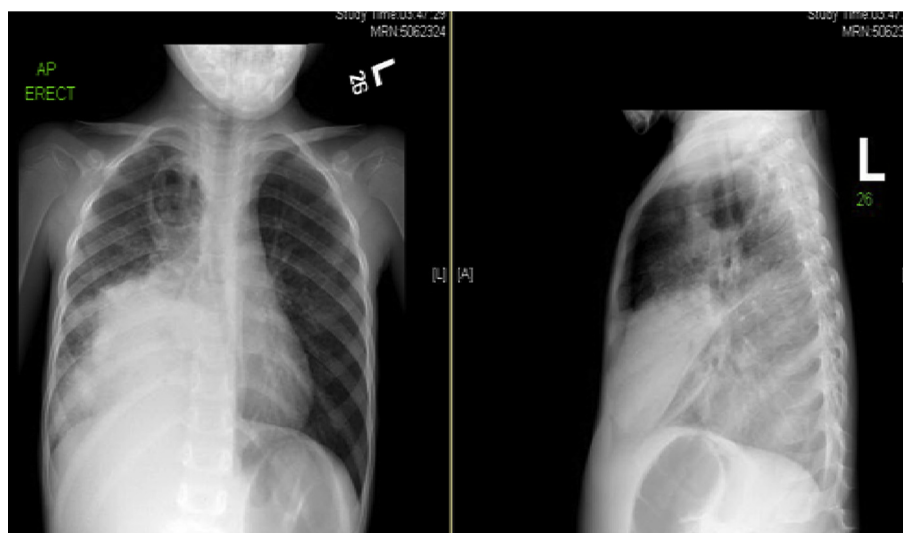


Figure 1 Airspace disease involving the right middle and lower lobe with a cystic change involving the right upper lobe.

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