Radiologic Diagnosis / *Radyolojik Tanı*

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What is Your Radiologic Diagnosis?

Radyolojik Tanınız Nedir?

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A nine-year-old female patient presented to our hospital with prolonged fever. Infectious, inflammatory, and neoplastic processes were primarily considered as the etiology of the fever. Chest X-ray at the time of admission was within normal limits. A chest computed tomography (CT) scan obtained at an external center also showed no mediastinal/hilar lymphadenopathy, parenchymal nodule/infiltration, or pleural effusion.

Initially, an abdominal ultrasound (US) and a comprehensive laboratory panel were planned for the patient. Abdominal US showed enlarged intra-abdominal lymph nodes, particularly in the para-aortic region, appearing hypoechoic with a central necrotic appearance. No leukocytosis was detected in the blood count; sedimentation and C-reaktive protein were elevated. Cytomegalovirus and Epstein-Barr virus tests were negative. The Quantiferon test was positive. No blasts were observed in the peripheral smear and bone marrow aspiration.

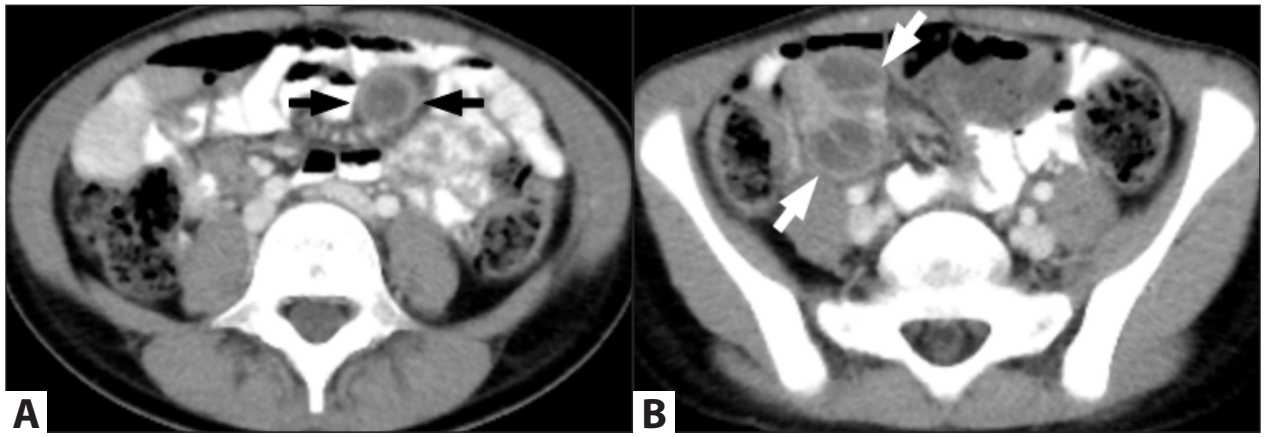

Figure 1. A. On an axial abdominal CT slice passing through the midline of the abdomen; a 17 mm lymph node with a hypodense, necrotic center is observed in the mesenteric region (arrows). **B.** Axial abdominal CT slice at the level of the pelvic inlet; in the right paracolic region, there are conglomerate necrotic lymphadenopathies extending into the pelvis, with contrast-enhancing walls and a hypodense center, approximately 25 mm in diameter (arrows).

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Abdominal CT showed multiple necrotizing lymphadenopathies in the mesentery along the midline and in the right lower quadrant, in the right parailiac area of the pelvis, measuring up to 25 x 23 mm in size, with a central hypodense area and peripheral rim-like contrast enhancement (Figure 1). Additionally, smaller, non-necrotic lymph nodes were present in the portal hilum and paraaortic regions, and minimal free fluid was present in the pelvis.

Based on the evaluation of imaging and clinical findings, childhood tuberculosis lymphadenitis was considered the most likely diagnosis. Differential diagnoses included viral infections, leukemia, lymphoma, or metastatic lymphadenopathies. Nodal involvement with peripheral contrast enhancement in the mesenteric/retroperitoneal region was considered a strong clue favoring tuberculosis in pediatric cases, even if lung findings were normal. A percutaneous biopsy was planned for microbiological confirmation and tissue culture to support the diagnosis and guide treatment. Sampling was performed using US-guided tru-cut biopsy.

Considering the patient's clinical findings and radiological investigations together, what is your diagnosis?

DIAGNOSIS: Necrotizing mesenteric and pelvic lymphadenitis consistent with abdominal tuberculosis

Histopathology revealed necrotizing lymphadenitis and granulomatous inflammation (epithelioid histiocyte clusters, multinucleated giant cells). No microorganisms were detected in Epstein-Barr encoded RNA test and Auramine-Rhodamine staining/Periodic acid-Schiff stain/Grocott's-Methenamine Silver staining. Microbiological examination revealed the growth of *Mycobacterium tuberculosis* complex in culture, which was found to be sensitive to isoniazid, rifampicin, ethambutol, and streptomycin. No growth was observed in blood and tissue aerobic cultures.

Based on the combined evaluation of radiological, pathological, and microbiological findings, the diagnosis of pediatric abdominal tuberculosis was confirmed, and antituberculosis treatment was initiated. Follow-up abdominal ultrasound imaging showed marked regression of the lymph nodes.

Brief discussion

Due to nonspecific clinical findings and a broad differential diagnosis spectrum, abdominal tuberculosis in childhood is a disease prone to diagnostic delays. In this context, cross-sectional imaging plays a critical role in evaluating possible diagnoses and determining the appropriate target for biopsy. Multicenter series and recent reviews emphasize that clinical findings alone are insufficient in childhood abdominal tuberculosis; radiological findings must be combined with pathological and microbiological confirmation for diagnosis. The fact that the disease remains a significant cause of morbidity and mortality in endemic regions highlights the importance of early and accurate diagnosis (1-3).

In the nodal form of abdominal tuberculosis, CT is characterized by conglomerate lymph nodes showing central low attenuation due to caseous necrosis and peripheral ring-like contrast enhancement. Nodal involvement is usually seen along the mesenteric, porta hepatis, and paraaortic chains; this may be accompanied by high-protein ascites, omento-peritoneal thickening, and ileocecal wall thickening.

Differential diagnosis with lymphoma is not always straightforward. Lymphoma is characterized more by homogeneous attenuation and large, symmetrical masses, while specific clues favoring tuberculosis are peripheral ring-like enhancement and central necrosis. However, the etiology of mesenteric lymph nodes is diverse (neoplastic, infectious, inflammatory), and clinical correlation is important in incidental cases. Furthermore, the morphological features detected on imaging alone are not diagnostic; percutaneous biopsy should be considered in appropriate cases for a definitive diagnosis (2,4,5).

Thoracic involvement in childhood abdominal tuberculosis is variable, and chest X-rays and chest CT scans may be normal in a significant proportion of cases. Therefore, when peripheral contrasted, centrally hypodense lymph nodes are detected in the mesenteric or retroperitoneal chain, the possibility of abdominal tuberculosis should not be ruled out even if thoracic imaging is normal (2, 6).

Tru-cut lymph node biopsy with ultrasound guidance is a rational and safe approach for confirming the diagnosis in children. It has higher diagnostic success than fine needle aspiration. The indications for biopsy can be summarized as nodal involvement suggestive of TB but where lymphoma cannot be ruled out, persistent or ≥2-3 cm conglomerate/necrotic lymph nodes, systemic signs and symptoms, and the need for pathological/microbiological confirmation before treatment. In practice, ultrasound guidance is preferred for percutaneously accessible mesenteric/pelvic nodes; CT guidance should be preferred for deep or difficult locations. A coaxial system and at least 2-3 samples using a thick needle (usually 16-18G) are recommended, and the material should be sent separately and under sterile conditions for both histopathology and mycobacterial culture. Necrotizing granulomatous lymphadenitis on histopathology is a strong finding in favor of tuberculosis; since direct ARB stains are often negative, culture provides the "gold standard" for species identification and drug susceptibility testing; additionally, rapid confirmation and early resistance testing can be performed using nucleic acid amplification tests. Sedation/analgesia and Doppler-guided avoidance of vascular structures increase procedural safety in pediatric cases; the decision-making process should be based

on multidisciplinary evaluation of clinical and imaging findings (7-9).

According to WHO guidelines for childhood and adolescent tuberculosis, treatment is administered with all-oral, short-course regimens (usually 4-6 months) in drug-sensitive and clinically uncomplicated cases. If resistance is detected, appropriate combinations are preferred (10). Post-treatment, considering that the imaging response may lag behind the clinical response and paradoxical nodal growth may be observed, radiological follow-up with US, which does not involve radiation, and low-dose CT when necessary is recommended (2).

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