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International Journal of Pediatrics and Adolescent Medicine

journal homepage: <http://www.elsevier.com/locate/ijpam>

Images in pediatrics

Septic arthritis

Hatem Abbod, Lefian Al-Otaibi, Kamal Alshamiri*

Department of Pediatric Radiology, King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia

ARTICLE INFO

Article history:

Available online 18 December 2018

ABSTRACT

Septic arthritis is truly an emergency condition that needs an early diagnosis by appropriate clinical examination/judgment and using fast, available, and accurate radiological imaging and laboratory septic workup. Early diagnosis may prevent complications that may otherwise lead to the patient's disability.

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1. Case summary of images in a pediatric patient

A 4-month-old female patient presented to the emergency department with a history of right hip swelling, redness, and limited range of motion, which started 2 days before admission, preceded by upper respiratory tract infection and intermittent fever for which the last reading documented at home was 39 °C for 2 days, with no history of trauma.

The emergency physician requested an urgent hip ultrasound (US) to rule out effusion and pelvic X-ray to evaluate the hip joints. Hip US examination was performed, which showed right joint discrepant effusion as compared to the normal left side, with surrounding hyperemia and internal turbid fluid (Fig. 1). Pelvic x-ray was performed, which showed widened right medial femur neck to tear drop distance as compared to the normal left side, which is suggestive of moderate lateral subluxation of the right upper femur (Fig. 2).

Laboratory septic workup was positive, all of which were suggestive of septic arthritis. The patient received a single dose of vancomycin, and then she underwent right hip decompression, reduction, lavage together with arthrogram with right hip spica cast application. Then, an AP view of the right hemipelvis, hip joint, and femur in the abduction position was obtained during the postoperative follow-up, and the results revealed normal alignment of the small ossified right femur head with the right triradiate cartilage, central location within mild to moderately shallow right acetabulum (Fig. 3).

2. Discussion

The reported annual incidence of septic arthritis is between 4 and 12 per 100,000 children, which may occur in isolation or as a secondary process related to underlying osteomyelitis. There is often an overlap in the clinical presentations of septic arthritis and osteomyelitis [1].

3. Imaging

The imaging workup for suspected septic arthritis includes radiography or US before surgical intervention. The main purpose of early imaging in septic arthritis is to detect the effusion and to see whether there is an associated osteomyelitis. Effusion in superficial joints such as the knee joints can be detected clinically but sometimes can be occult clinically as in hip joints. Pyogenic septic arthritis may present with a small amount of fluid in the joint.

3.1. Pelvic plain film

Conventional radiograph is the initial screening imaging modality for the detection of septic arthritis, although it has low sensitivity and specificity for acute infection. In the early stage, the simple radiograph can appear normal, and this does not rule out infection. Conventional radiographic findings of septic arthritis may include soft tissue swelling/edema, capsular distension, or displacement of the articular structures, which may suggest the presence of joint effusion [2].

3.2. Hip US

US is the cornerstone modality for the detection of hip joint effusion because it is fast and accurate. Elevation of the joint

* Corresponding author.

E-mail address: Alshamirikamal@gmail.com (K. Alshamiri).

Peer review under responsibility of King Faisal Specialist Hospital & Research Centre (General Organization), Saudi Arabia.



Fig. 1. Ultrasonography examination of bilateral hip joints. There is a right joint discrepant effusion as compared to the normal left side, with surrounding hyperemia and internal turbid fluid.



Fig. 2. AP view of the pelvis and bilateral hip joints, which show moderate lateral subluxation of the right upper femur with widened right medial femur neck to tear drop distance as compared to the normal left side as seen; differentials may include a moderate right hip effusion.

capsule with anechoic or complex fluid effusion can be detected. Other important findings are the presence of synovial thickening and hyperemia. A difference of 2 mm between both hip joints is considered abnormal [3].

4. MRI

The overlap in the clinical presentations of septic arthritis and osteomyelitis permits the use of MRI for better evaluation of the location and extent of disease and to plan surgical interventions [4]. According to a study, the imaging workup of either septic arthritis or osteomyelitis should include MRI, and the use of US alone should be avoided [1].

5. Differential diagnosis

Our differential diagnosis focuses on the presentations as a perspective that includes the following pathologies:

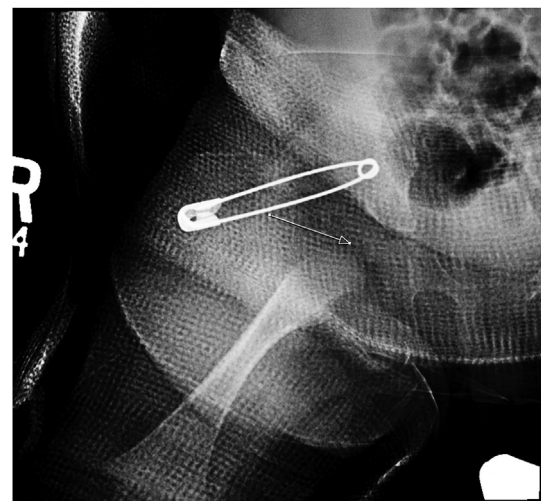


Fig. 3. Status post spica cast application. AP view of the pelvis and hip joints in the abduction position.

1. Osteomyelitis may mimic septic arthritis in its presentation. Ultrasonography is necessary to exclude the presence of joint effusion, thus suggesting contiguous septic arthritis. The diagnosis may be confirmed on a bone scan.
2. Transient synovitis is a benign synovial inflammation with subsequent effusion formation. Transient synovitis is more common than septic arthritis; however, the latter should be considered as primary pathology until proven otherwise because of its catastrophic outcomes as compared to transient synovitis, which is a self-limiting condition [5].

6. TTT of septic arthritis

6.1. Management

- Antibiotics adjusted on the basis of culture and sensitivity results
- Adequate drainage of the joint:

- o Needle aspiration
- o Arthroscopic drainage
- o Open drainage in difficult and deep joints.
- Monitoring of synovial fluid leukocyte counts and cultures
- Acute phase of the disease—patient's rest and optimal joint position
- Following the acute phase—early physical therapy and aggressive mobilization [6].

7. Complications

1. Relapses or reinfections.
2. Avascular necrosis of the femoral head.
3. Osteoarthritis in an affected joint [7].

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