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Bimodal Presentation of Septic Shoulder as Shoulder Dislocation in Children

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Abstract

Introduction: The presence of a largely cartilaginous humeral head in children makes it difficult to diagnose septic arthritis of the shoulder.

Materials and Methods: We conducted a case note review of five patients who presented with septic arthritis of shoulder joint.

Results: The age of the affected children ranged from 6 months to 10 years. Patients presented on average after 22 days from onset of symptoms. Staphylococcus aureus and Pseudomonas aeruginosa were obtained on pus culture. All cases were treated operatively by arthrotomy and drainage along with appropriate antibiotic administration for a period of 6 weeks.

Conclusion: Successful treatment of septic arthritis of the shoulder was achieved in all cases. At an average follow-up of 6 months, good outcome was noted with restoration of full range of shoulder movements.

Keywords: Septic shoulder, Children, Shoulder dislocation

Introduction

Acute septic arthritis is a condition with the potential for joint destruction, osteomyelitis, osteonecrosis, physeal damage, systemic illness and even death, which warrants urgent diagnosis and treatment [1-3]. Staphylococcus aureus is the most isolated organism, followed by Kingella and Group A Streptococci. Metaphyseal capillaries have sluggish blood flow which makes the growing skeleton in children susceptible to osteomyelitis. Septic arthritis occurs through contiguous spread from the metaphysis, in locations where the metaphyseal end of a long bone is intra-articular [4,10].

Though septic arthritis is a disease of infancy, involvement of the shoulder joint is rare with reports citing a prevalence of 3–5% of all septic joints [1]. There is little data available regarding its clinical presentation, clinical course, and treatment. It is usually associated with osteomyelitis of the adjacent bone [1-3]. The capsule of the shoulder joint envelopes the metaphysis which facilitates contiguous spread between the bone and joint space [2]. Treatment recommendations include antibiotic therapy only, percutaneous aspiration and arthrotomy.

Material and Methods

We reviewed the records of 5 patients who presented with features of septic arthritis of the shoulder. All patients in the series were treated with ultrasonography-guided (USG) arthrotomy and joint drainage under general anesthesia. The surgical wounds were left open initially and secondary closure was performed based on patient improvement.

Patients were treated initially with intravenous antibiotics and changed to oral medication for a total duration of 6 weeks. Empirical treatment with vancomycin was initiated in all cases. Once the pus culture results were available, antibiotic choice was dictated by the sensitivity of the organism.

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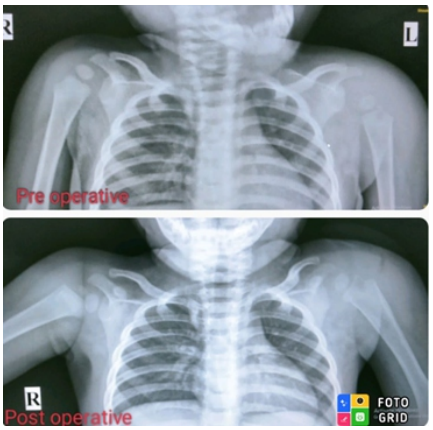

Figure 1: Preoperative x-ray showing dislocation of left shoulder joint and post-operative x-ray showing dislocation was corrected after incision and drainage.

Figure 2: Incision given over front of shoulder joint and recheck the collection of joint by sonographic probe.

Figure 3: USG findings of septic shoulder-effusion of joint

Results

Of the 5 children, three were girls. The average age at presentation was 5 years (6 months to 10 years). The average time until diagnosis was 22 days (4 to 40 days). The children presented with decreased use of the affected shoulder and 4 patients had a history of antecedent trauma.

Prior to their presentation to our institution, all children had an initial diagnosis as "shoulder dislocation" based on history and radiographs at outside centres. Previous treatments included cuff and collar sling and an attempted relocation of the joint by a "traditional bone setter."

Elevated erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) levels were present in 4 children. The average temperature at presentation was 39.0°C. A positive culture from pus was seen in 4 patients including Staphylococcus aureus and Pseudomonas aeruginosa.

The average follow-up of these patients was 6 months, with a range of 2 months to 12 months. There was no recurrence of the infection and full range of motion in the shoulder was restored.

Discussion

Septic arthritis of the glenohumeral joint is typically a disease of infancy [5, 6, 7, 8]. In this study, only 3 patients were under 12 months of age.

The initial diagnosis of septic arthritis requires absolute clinical judgment. Literature regarding the initial evaluation of children with joint pain or differentials for septic arthritis recommends always obtaining a complete blood count with ESR, CRP, synovial fluid analysis, and synovial fluid culture [8, 9, 10, 11].

In addition to laboratory evaluation, imaging modalities are also mandatory in the evaluation of septic arthritis [5, 6, 12]. Plain radiographs are required to differentiate septic arthritis from osteomyelitis, fractures and neoplasia. An increase in joint space (Fig. 1) may suggest an effusion [13].

Ultrasonography remains the most sensitive tool for detecting an effusion (Fig. 3) in the joint [14]. However, there is a false-negative result in approximately 5% of cases [15]. USG-guided aspiration of the joint evacuates pus, reduces destruction to the articular surfaces, confirms the diagnosis and is an essential step prior to antibiotic administration [16].

Magnetic resonance imaging (MRI) is extremely sensitive and specific for septic arthritis, thereby differentiating it from osteomyelitis and non-infective causes of joint pain in children [17]. However, MRI in an infant requires general anesthesia, which limits its applicability. We did not employ MR imaging in this series.

Bone scintigraphy is useful in identifying multifocal musculoskeletal infections, but lacks specificity and sensitivity in distinguishing septic arthritis from adjacent skeletal or soft-tissue involvement [23-24].

There is a lack of consensus regarding the optimum management of septic arthritis in children. Some authors recommend that repeated aspirations of the joint are sufficient, while others feel that arthrotomy, with or without the placement of an irrigation tube, is the treatment of choice [18-22]. We prefer arthrotomy, once the diagnosis of septic shoulder is established.

The synovial sheath surrounding the biceps tendon is essentially a blind pouch in which pus or organism may become loculated. In addition to incision of the glenohumeral joint, we recommend exploration of the biceps synovial sheath. This allows for a thorough debridement of the joint. We utilize USG during the arthrotomy because this help in achieving adequate drainage of pus while avoiding iatrogenic biceps tendon injury (Fig. 2).

A large portion of the proximal metaphysis of the humerus is intracapsular and a septic shoulder may coexist with humeral osteomyelitis. In infants below 12 months of age, perforating vessels cross the epiphyseal plate from the metaphysis to the epiphysis [16]. Thus, an osteomyelitis of the metaphysis can be associated with involvement of the epiphysis. We did not encounter any case of metaphyseal or epiphyseal involvement. Where osteomyelitis of the metaphysis is suspected, decompression of the bone is recommended [6, 16].

Aspiration is an alternative to surgical drainage. The advantages of being minimally invasive and quicker return to normal activity must be weighed against the potentially higher risk of ineffective drainage of the joint, especially if the pus has a viscous consistency.

Arthroscopy provides good visualization of the joint with the possibility of a more extensive washout. With an arthrotomy there is better visualization of the joint and sufficient irrigation can be performed, but it associated with prolonged recovery, a higher risk of avascular necrosis, and stiffness of the joint [27].

Once septic arthritis of the shoulder is diagnosed, treatment should be started promptly because greater delay results in the need for additional procedures [25, 26].

Conclusion

Septic arthritis of the shoulder is a rare condition. Although generally associated with infants, septic arthritis of the shoulder must be considered when evaluating any patient with shoulder pain and signs of systemic inflammation. We report five cases successfully treated with surgical drainage and antibiotic therapy. Prompt diagnosis and management should be undertaken to reduce the severity of possible complications.

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Declaration of patient consent : The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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