Staphylococcus aureus costal osteomyelitis with complicated by pleural effusion in a 7-month-old infant : a misleading clinical presentation

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ABSTRACT :

Osteomyelitis is an inflammation of the bone, generally of infectious origin. It often affects the long bones, but the clinical presentation can be misleading if the location is atypical. Costal osteomyelitis is very rare in children and can mimic other pathologies.
We report the case of a 7-month-old male infant with no previous medical history who was admitted for investigation of acute fever, incessant crying and a parietal chest mass. The biology showed an inflammatory syndrome. Chest X-ray showed left pleural effusion and the CT scan showed lesions compatible with the diagnosis of costal osteomyelitis complicated by a rupture of the subperiosteal abscess in the pleura. The evolution was favorable after chest drain insertion of the pleurisy and intravenous antibiotic therapy. Costal osteomyelitis is a very rare condition that can mislead the clinician. Early recognition and proper treatment can prevent complications.

RESUME :

L'ostéomyélite est une affection qui touche souvent les os longs. Les manifestations cliniques peuvent être trompeuses si la localisation est atypique. L'ostéomyélite costale est très rare chez l'enfant et peut imiter d'autres pathologies.
Nous rapportons le cas d'un nourrisson de sexe masculin âgé de 7 mois sans antécédents pathologiques notables admis pour une fièvre aiguë, des pleurs incessants et une masse thoracique pariétale. La biologie a montré un syndrome inflammatoire. La radiographie du thorax a montré un épanchement pleural gauche et la tomodensitométrie a montré des lésions d'ostéomyélite costale compliquée d'une rupture d'un abcès sous-périosté dans la plèvre. L'évolution était favorable sous antibiothérapie intraveineuse et drainage.
L'ostéomyélite costale est une affection très rare qui peut induire le clinicien en erreur. Un diagnostic précoce et un traitement approprié peuvent prévenir les complications.

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INTRODUCTION :

Acute osteomyelitis is a hematogenous infection of the bone. It is a frequent cause of admission that require prolonged hospitalization. In developed countries, the incidence of this condition in the pediatric population is 8/100,000 children. The most frequent location involves long bones, such as the femur or humerus (1, 2). Other locations are possible, such as short and flat bones. Costal involvement remains extremely rare, accounting for less than 1% of osteomyelitis (3, 4). We report a case of costal osteomyelitis in a 7-months old infant to highlight the diagnostic challenge of this rare condition.

CLINICAL CASE

A 7-month-old male infant with no specific medical history and complete vaccination for his age was transferred from the pediatric surgical ward for exploration of persistent fever. The onset of his symptoms dated back to one week prior to admission, when the infant presented with irritability and incessant crying. The diagnosis of acute intestinal intussusception was ruled out by abdominal ultrasound. The mother reported excessive crying especially when handling her child and a high fever appeared secondarily. On examination the temperature was 40 degrees, with a soft left basi-thoracic parietal mass of 4 cm long axis without local inflammatory signs and painful to palpation. Costal osteochondritis or infected costal hematoma were suspected. An ultrasound of the mass (figure 1)

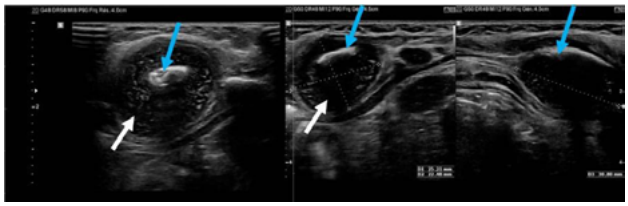

Figure 1 : : US images showing an intraosseous fluid collection (white arrow) around the rib which is presenting cortical irregularities (blue arrow)

was performed and showed a heterogeneous liquid collection of 3 cm surrounding the middle arch of the left 7th rib which presents an irregular lytic cortex of 3 cm. The biology revealed a significant inflammatory syndrome with CRP of 240 mg/l and hyperleukocytosis (WBC = 22 000/mm3) with neutrophilia at 15 000/mm3 a. The chest X-ray (figure 2) showed a mild soft tissu thickening of the lower left chest wall.

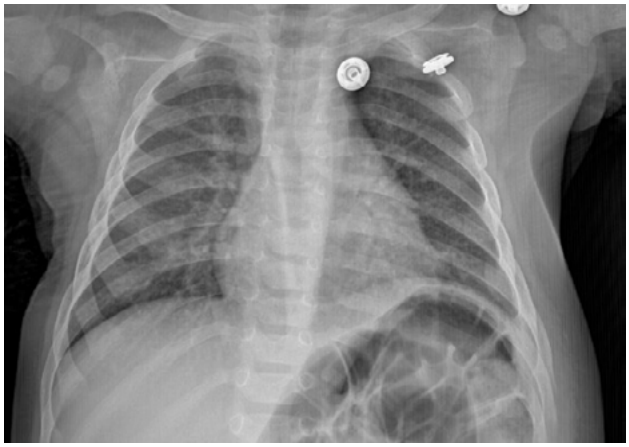

Figure 2 : : A chest radiograph showing a discreet soft parts thickening of the lower left chest wall (white arrow)

The patient was treated with amoxicillin-clavulanic acid. As the fever persisted, a needle aspiration was performed which brought back 3 ml of pus.
On the third day of admission the patient developed a left pleural effusion. Pleural tapping yielded 100 ml of purulent fluid. Direct examination showed 4000 white cells per mm3 with 60% PNN and the presence of gram-positive cocci. Treatment was based on intravenous antibiotic therapy with amoxicillin/clavulanic acid at a dose of 150 mg/kg/day combined with gentamycin. A chest CT scan (figure 3) showed osteolysis of the middle arch of the left 7th rib, with the presence of a collection all around and an infiltration of the soft tissues with moderate septate left pleural effusion.

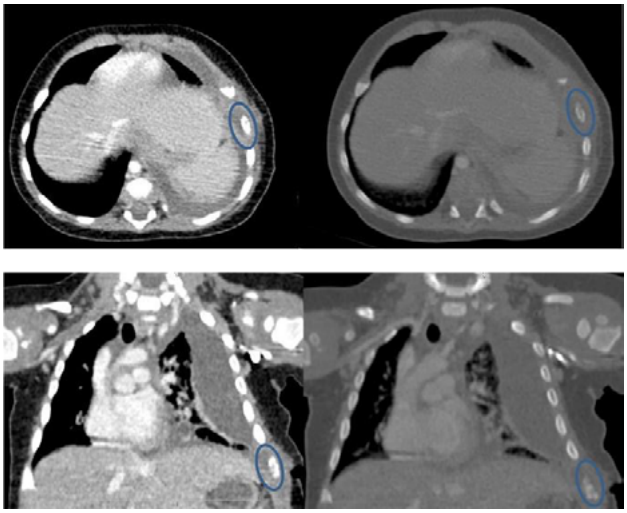

Figure 3 : : CT images: (a) axial Mediastinal window shows an abscess englobing the middle arch of the 7th left rib and in (b) axiale Bone window image showing cortical erosions of the same left rib (circle).CT frontal view (c and d) showing a left pleural loculated effusion.

The diagnosis of left costal osteomyelitis complicated with pleural effusion was done. The pluerlal fluid culture was positive for methicillin-susceptible staphylococcus aureus and the blood cultures were negative.

The outcome was favorable with apyrexia and improvement of the general condition after 5 days of treatment.

DISCUSSION :

Acute osteomyelitis is a hematogenous infection of the bone that has been evolving for less than 15 days (5). It often affects long bones such as the femur or humerus (1, 2). Costal involvement is a very rare location of osteomyelitis and represents less than 1% of all cases of hematogenous osteomyelitis (6). To date, 63 cases of pediatric costal osteomyelitis have been described in the literature in the last century (3, 7-11).

The source of the bacteremia responsible for acute osteomyelitis is usually not clinically evident. Therefore, the skin or mucous membranes of the colonized respiratory tract would be the most likely source of infection. Staphylococcus aureus is found in 50% of cases and is the most frequently incriminated germ regardless of age. The other bacteria are streptococcus B and Escherichia coli in infants under 3 months of age as well as streptococcus A and pneumococcus (12).

Kingella kingae has a particularly high colonization rate (12%) in infants, which gradually decreases (6%) in older children (13). Dissemination may result from three mechanisms: local involvement by contiguity of adjacent sites or inoculation secondary to trauma or surgery, vascular insufficiency, or hematogenous involvement, which is most common in children (2, 3, 14, 15). Our patient had no history of trauma, surgery or recurrent infections prior to hospitalization.

The costal locations described in the literature were, in the majority of cases, anterior near the chondrocostal junction as in our patient and posterior at the costovertebral angle (3, 15).

An early diagnosis is not always obvious in the face of a misleading clinical presentation. The child may present with fever and a thoracic mass, but sometimes the signs may be moderate and mislead the examiner, such as the absence of inflammatory signs (2, 15)

Standard X-rays have a low sensitivity and specificity for the detection of osteomyelitis. In the other hand, ultrasound can guide the diagnosis and show signs suggestive of bone involvement (16)

Early initiation of empirical antibiotic therapy, later adapted according to the results of the antibiogram, can prevent complications. Locoregional complications reported in the literature are subperiosteal abscesses, thrombophlebitis and arthritis (2, 17). In our patient, moderate pleural effusion appeared later and required drainage would be secondary to ineffective antibiotic therapy.

CONCLUSION :

Our case illustrates the challenges of the diagnosis of osteomyelitis in unusual location case. The starting point of the costal osteomyelitis in this case was unclear and may have been the result of hematogenous spread, although no primary site of infection was evident. Early diagnosis and antibiotic therapy can prevent complications.

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