

Case Report

An unusual case of chest pain

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ABSTRACT

Osteomyelitis is an infection of the bones caused by pyogenic organisms. The ribs are an extremely uncommon site for osteomyelitis, occurring in less than 1% cases. The main causative organisms are Gram-positive bacteria, such as *Staphylococcus aureus* and *Hemophilus influenzae*. Gram-negative bacteria like *E. coli* have been rarely reported. Authors hereby present a case of an immune-competent patient who presented with an osteomyelitis of the ribs caused by the latter. In developing countries, tuberculosis is considered as the primary cause of osteomyelitis and pleural effusions. However, other organisms should also be considered in patients who present with fulminant infections.

Keywords: *Escherichia coli*, Immune-competent, Osteomyelitis, Ribs

INTRODUCTION

Osteomyelitis is an infection of the bones caused by pyogenic organisms. The ribs are an extremely uncommon site for osteomyelitis, occurring in less than 1% cases.¹ The main causative organisms are Gram-positive bacteria, such as *Staphylococcus aureus*, *Hemophilus influenzae* and *Actinomyces spp.* *Mycobacterium tuberculosis* has also been reported in developing countries. Gram-negative bacteria have been rarely reported.

Authors hereby present a case of an immune-competent patient who presented with a fulminant osteomyelitis of the ribs caused by the latter.

CASE REPORT

A 45-year-old male presented with complaints of high-grade fever, pleuritic pain in left lower chest since 1 month and dry cough since 15 days. There was no history of diabetes or hypertension. On examination, there was a tender, localised swelling in left lower chest wall. Initial

investigations revealed a raised total count and ESR. The haemoglobin was 6.9 g/dl. The patient was started on antibiotics based on the above reports. HbA1c was 5.7.

The chest x-ray was suggestive of a left sided pleural effusion (Figure 1). Pleural aspiration was done under sonography guidance; the biochemical reports were inconclusive.

CECT thorax (Figure 2, 3) showed enhancing collections bilaterally with multiple rib erosions and pathological fractures with mild pleural effusion and pericardial effusion.

CECT abdomen revealed mild hepato-splenomegaly. Serum electrophoresis was negative for M-band and bone marrow biopsy showed normal plasma cells with no evidence of granuloma or malignancy.

Pleural fluid culture grew *E. coli* and antibiotics were changed according to sensitivity reports. The patient's symptoms and chest X-ray showed subsequent improvement (Figure 4).



Figure 1: Left sides pleural effusion and multile encysted collections on right side.

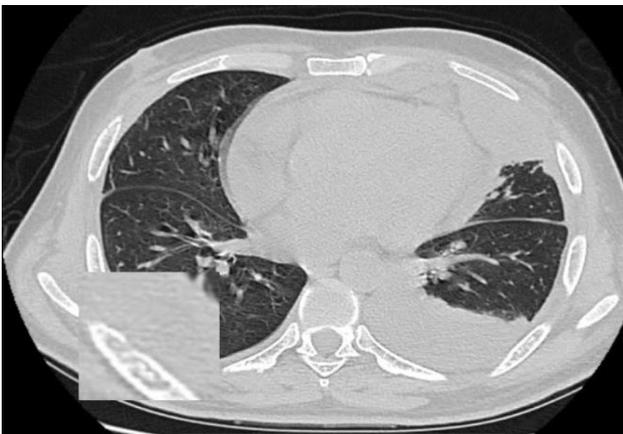


Figure 2: Collections bilaterally with rib erosions of right side (magnified).

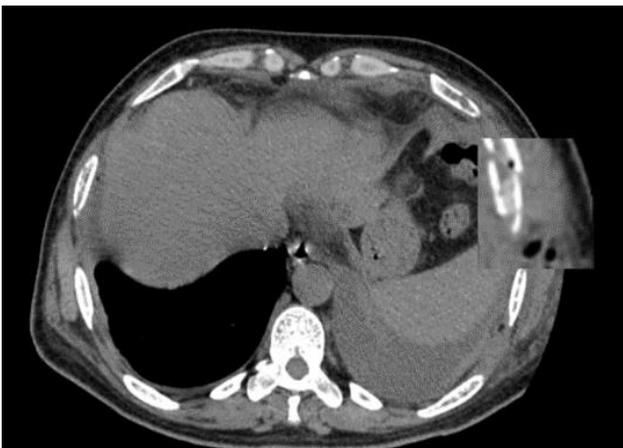


Figure 3: Rib erosions.

DISCUSSION

Osteomyelitis is an infection of the bones caused by pyogenic organisms. It may be acute or chronic. Acute osteomyelitis may be primary (due to hematogenous spread of infection) or secondary (due to an open fracture or surgery). Primary osteomyelitis is the commonest form

of the disease and generally occurs in children. The metaphysis of long bones is the most common site of disease owing to the hair-pin arrangement of vessels. *Staphylococcus aureus* is the most frequently reported causative organism.



Figure 4: Subsequent CXR in same patient improvement.

Osteomyelitis of the rib is a rare condition and may occur due to (a) penetrating trauma, (b) spread of infection like empyema or pneumonia to the adjacent bone and (c) via hematogenous seeding from a distant focus of infection. The commonest sites for rib osteomyelitis are the costochondral junction anteriorly and the costo-vertebral junction posteriorly. Similar to other sites, the most common infecting pathogen is *Staphylococcus aureus*. Mycobacterial infection accounts for 7% cases of osteomyelitis of the rib. Fungal osteomyelitis has been reported in immunocompromised individuals and occurs as a part of disseminated disease.

Several large series studies in patients with osteomyelitis have revealed an uncommon rib involvement.¹⁻³ Bishara et al analysed all cases of rib osteomyelitis between 1950 and 1998. The total reported cases were 104 out of which 89% were equally distributed between bacterial and mycobacterial infection (47 cases each). The 4th to 8th ribs were frequently involved in bacterial (63%) and mycobacterial (57%) infection, while in fungal rib osteomyelitis, the 1st to 3rd ribs were more commonly affected (56%). An associated pulmonary and/or pleural infection was described in 23.4% (11 cases) of mycobacterial, 25.5% (12 cases) of bacterial and 45% (5 cases) of fungal infection. In most of these cases, pneumonia and/or empyema were the proposed source of contiguous spread.⁴

Osteomyelitis involving the rib is generally unifocal, although multifocal involvement has been reported in infants.⁵ The earliest signs and symptoms of the osteomyelitis of the rib are usually nonspecific, which result in delay in diagnosis. Fever, pain and an abscess or sinus that fails to heal are the commonest presentations.^{6,7}

The early change of rib osteomyelitis that appears 1-2 weeks later, is pericostal edema demonstrated by soft tissue swelling of the thoracic wall accompanied by an adjacent inward pleural displacement.⁸

Pericostal edema can be readily diagnosed by ultrasound. A CT scan can be useful, but magnetic resonance imaging is the key for diagnosis in acute hematogenous osteomyelitis. It especially identifies marrow edema that is apparent in the early phases of metaphyseal infection before other imaging modalities.⁹ However the definitive diagnosis of rib osteomyelitis requires a culture of the aspirated metaphysis or subperiosteal pus or blood cultures.⁶

Treatment is usually with intravenous antibiotic or antitubercular therapy depending on the organism grown. Surgical debridement and / or rib resection is done for cases of chronic osteomyelitis.

CONCLUSION

Osteomyelitis of ribs is a rare clinical entity, but may be suspected in patients with a history of trauma who present with fever, pain and an abscess or sinus. Hematogenous dissemination or spread from adjacent sites in immunocompetent patients is very rare. In the case we present, there was no significant history of trauma. However, it could not be clearly established whether the empyema was a result of the rib infection or vice versa.

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Ethical approval: Not required

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