

Acute Hematogenous Osteomyelitis of the Rib

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Abstract. Two cases of acute hematogenous osteomyelitis of the rib are presented. In one case the etiologic agent was *Staphylococcus aureus* coagulase-positive and in the other it was *Bacteroides corrodens*. Although an uncommon disease, hematogenous osteomyelitis should be considered in the differential diagnosis of destructive lesions of the rib. Anaerobic and aerobic cultures should be obtained for bacteriologic analysis.

Key words: Osteomyelitis – Rib – Acute hematogenous osteomyelitis – Anaerobic and aerobic osteomyelitis

Acute hematogenous osteomyelitis of the rib is an uncommon entity. Most large studies of hematogenous osteomyelitis suggest an incidence of 1% [4, 6]. Recently, we examined two patients with acute hematogenous osteomyelitis of the rib. In one case the etiologic agent was *Bacteroides corrodens*, and the second case was *Staphylococcus aureus* coagulase-positive. Both cases were treated by local rib resection and systemic antibiotics. We are able to find one previously reported case where the etiologic agent was an anaerobic bacteria [3] and have been unable to find any reported of acute hematogenous osteomyelitis of the rib.

Case Report

Case I

A 19-year-old male college student who was well until four weeks prior to admission when pain began in the anterior aspect of the lower left rib cage. He recalled no history of trauma. The patient

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had, for the last 18 months, worn corrective dental braces which were adjusted monthly. They were last tightened one month prior to the onset of symptoms and no signs of a dental infection were present.

Two weeks prior to admission, radiographs of the left ribs were normal. A sedimentation rate of 22 and a white blood cell count of 10,100 with 61% polys was present. No antibiotics were prescribed. The pain persisted and slight local swelling occurred.

A technetium 99^m MDP bone scan revealed markedly increased uptake in the anterior aspect of the left seventh rib (Fig. 1A). A gallium scan was normal. Rib X-rays including tomograms were normal. Eleven days later the sedimentation rate had increased to 43 and a low-grade fever occurred. Repeat radiographs showed periosteal elevation of the anterior portion of the left seventh rib without evidence of bone destruction (Fig. 1B).

The patient was admitted to the hospital and aspiration of the area of maximum swelling and tenderness failed to reveal purulent material. Aerobic and anaerobic cultures of the aspirated material and blood cultures were normal. Excisional biopsy of the anterior seventh rib was performed (Fig. 1C). At surgery, several cubic centimeters of grayish purulent material was present and frozen sections revealed acute and chronic inflammatory cells with no evidence of malignancy.

The patient was started on Cefalozin and Gentomyocin immediately after cultures were obtained in the operating room. Four days after biopsy anaerobic cultures showed a gram negative bacillus subsequently identified as *Bacteroides corrodens*. Aerobic cultures were negative. Intravenous penicillin was continued for four weeks followed by two weeks of oral penicillin. The wound healed uneventfully and symptoms completely resolved. No evidence of recurrent disease was present in the 18 months of follow-up.

Case II

A 14-year-old boy developed left lateral chest pain six weeks prior to admission to the hospital. One week later the patient developed pain in his right buttock and became febrile to 102° F.

A smooth hard nontender mass was palpated in the left midaxillary line over the seventh rib. Palpation of the right sacroiliac joint was very painful. There was a white blood cell count of 23,800 with a left shift. A technetium 99^m MDP bone scan showed increased radionuclide activity in the lateral aspect of the left seventh rib and the right sacroiliac joint (Fig. 2A). Radiographs demonstrated a destructive process involving the lateral aspect of the left seventh rib (Fig. 2B). Thick periosteal reaction and a noncalcified soft tissue mass were present. An excisional biopsy of the left seventh rib was performed (Fig. 2C). Culture demonstrated *Staphylococcus aureus* coagulase-positive as did culture of an aspi-

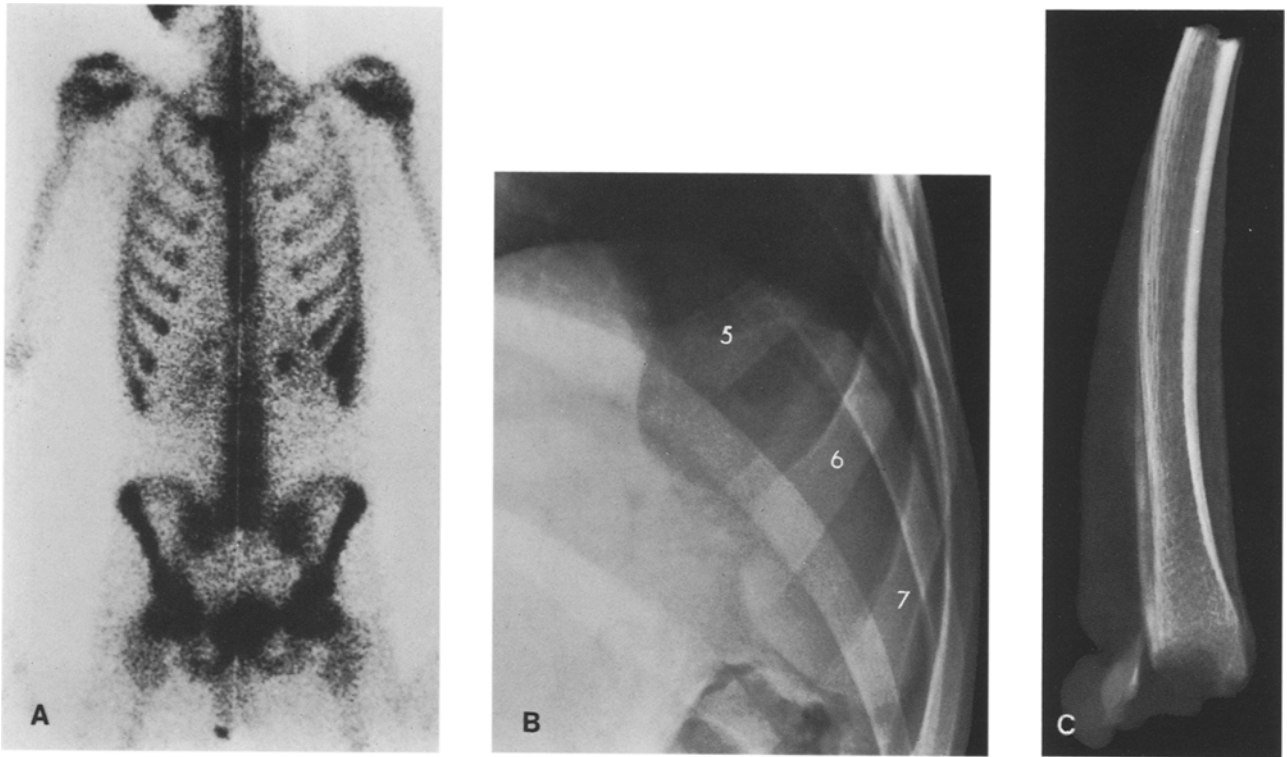


Fig. 1A-C. Case I. **A** Technitium 99m MDP bone scan shows increased radionuclide activity involving the anterior aspect of the left seventh rib. **B** Oblique projection of the left ribs shows a thick periosteal reaction without evident bony destruction. **C** Operative specimen shows diffuse periosteal thickening and normal underlying bone

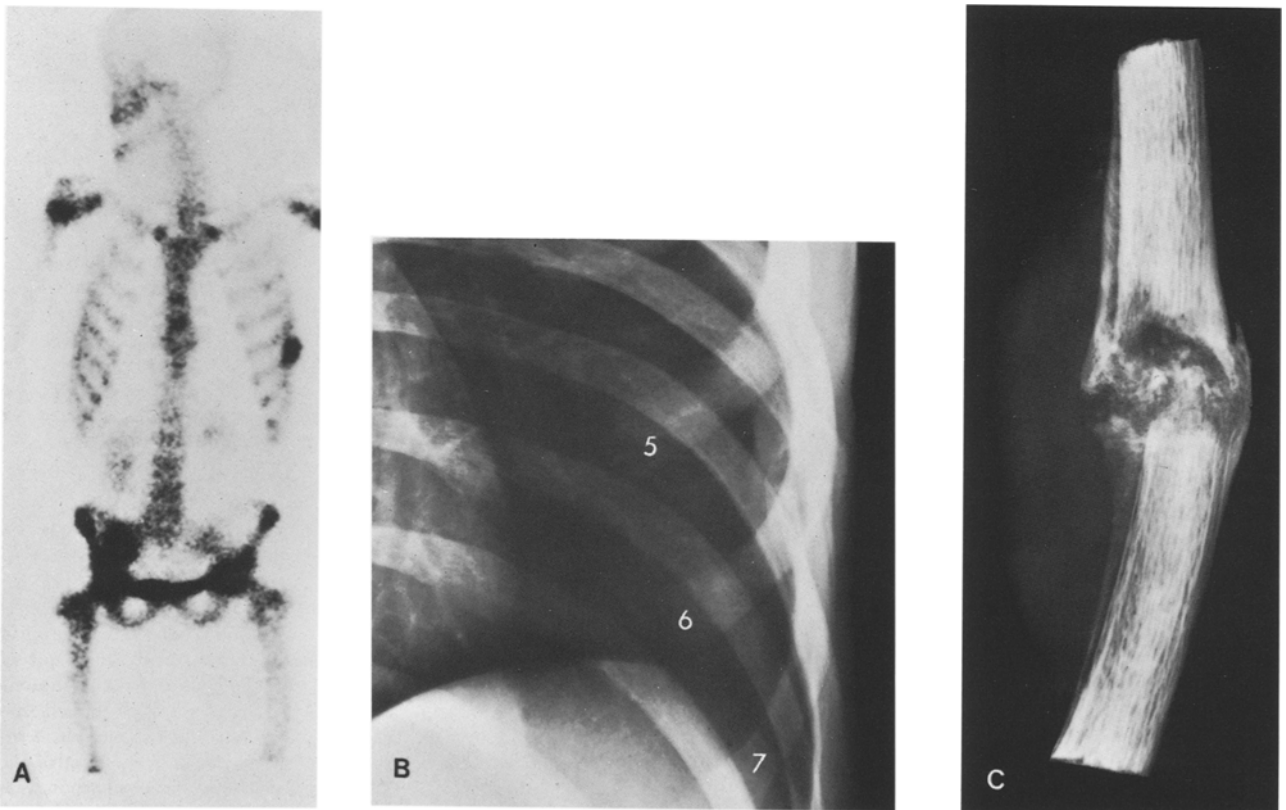


Fig. 2A-C. Case II. **A** Technitium 99m MDP bone scan shows increased radionuclide activity involving the midportion of the left seventh rib. There is also increased activity in the right SI joint. **B** Oblique projection of the left ribs shows bony destruction with periosteal reaction and pathologic fracture in the midportion of the left seventh rib. **C** Surgical specimen shows bony destruction with possible sequestrum and a thick periosteal reaction

ration of pus from the right SI joint. Appropriate antibiotics were instituted and the patient recovered uneventfully.

Discussion

Acute hematogenous osteomyelitis, except in the vertebral column, is unusual in adults and is rare in the ribs with a reported incidence of less than 1% [4, 6]. A report of 247 cases of acute hematogenous osteomyelitis at the Massachusetts General Hospital between 1963 and 1966 found no involvement of the ribs [10]. A series of 99 pediatric patients admitted to Grace New Haven Community Hospital found only six instances of acute hematogenous osteomyelitis of the rib out of 154 total bones affected [2]. The largest series of cases of acute hematogenous osteomyelitis of the ribs in the English literature was published by Brock in 1957 [1]. He reported 15 such cases, 10 of which were anterior in location, the remaining five being posterior. Brock attributed this distribution to the ossification pattern and vascular anatomy of the ribs with the anterior and posterior portions being metabolically analogous to the metaphyses of long bones, the most frequent site for a development of hematogenous osteomyelitis [3, 9].

Our first case involved the anterior portion of a rib due to an anaerobic bacteria. Two reviews of anaerobic osteomyelitis [5, 7] document only one case that involved the ribs [5]. The source of our patients' bacteremia almost certainly was dental manipulation since *Bacteroides corrodens* is a normal oral inhabitant.

In the second case the lateral portion of a rib was infected. This is not the usual site of involvement and, in fact, there has been no report at this site.

Both of our cases were treated successfully with local resection and systemic antibiotics in a manner similar to that suggested by Seashore et al. [8].

Although unusual, acute hematogenous osteomyelitis should be included in the differential diagnosis of a destructive rib lesion along with other entities, such as metastatic disease, Ewing's sarcoma, and eosinophilic granuloma. The two cases presented serve to emphasize the similarities of clinical presentation of Ewing's sarcoma and osteomyelitis. Osteomyelitis is a "great imitator" and because of its varying presentation should be considered in the differential diagnosis of a wide variety of bony lesions.

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