

Pyogenic Osteomyelitis of the Rib in Children

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Abstract. Five children with pyogenic osteomyelitis of the rib are presented. A child with a chest wall abscess or discharging sinus should have a careful radiological assessment to exclude osteomyelitis in the underlying rib.

Key words: Osteomyelitis – Tuberculosis of bone – Hemoglobinopathy, bone changes

Osteomyelitis of the ribs is uncommon [3, 5]. We report five patients, all children, who had pyogenic rib osteomyelitis and who were encountered in a 4-year period at the University College Hospital, Ibadan, Nigeria.

Case Reports

Case 1

This 2½-year-old boy presented with a tender, fluctuant swelling below the left breast which discharged pus at incision. Bacterial culture yielded a profuse growth of *Staphylococcus aureus*. In spite of antibiotic therapy and a repeat drainage, the lesion did not resolve. A chest radiograph after 6 weeks showed osteomyelitis of the left 5th rib (Fig. 1). Rib resection was performed with a good result.

Case 2

This 2-year-old girl was seen with a 10-day history of a progressively enlarging swelling below the left axilla. A chest radiograph showed an underlying localised lytic process in the left 7th rib consistent with osteomyelitis (Fig. 2a).

Staphylococcus aureus was isolated from the pus. Due to poor response to drainage and antibiotic therapy (Fig. 2b), the patient is awaiting rib resection.

Case 3

This 3-year-old girl presented with pyrexia and a slightly tender left chest wall swelling of several weeks duration.

A chest radiograph revealed expansion and patchy sclerosis of very many ribs bilaterally (Fig. 3). Blood culture yielded moderate growth of *Salmonella* species, and haemoglobin electrophoresis revealed haemoglobin S and C. The patient was managed conservatively.



Fig. 1. 2½-year-old-boy. Osteomyelitis involving the entire left 5th rib

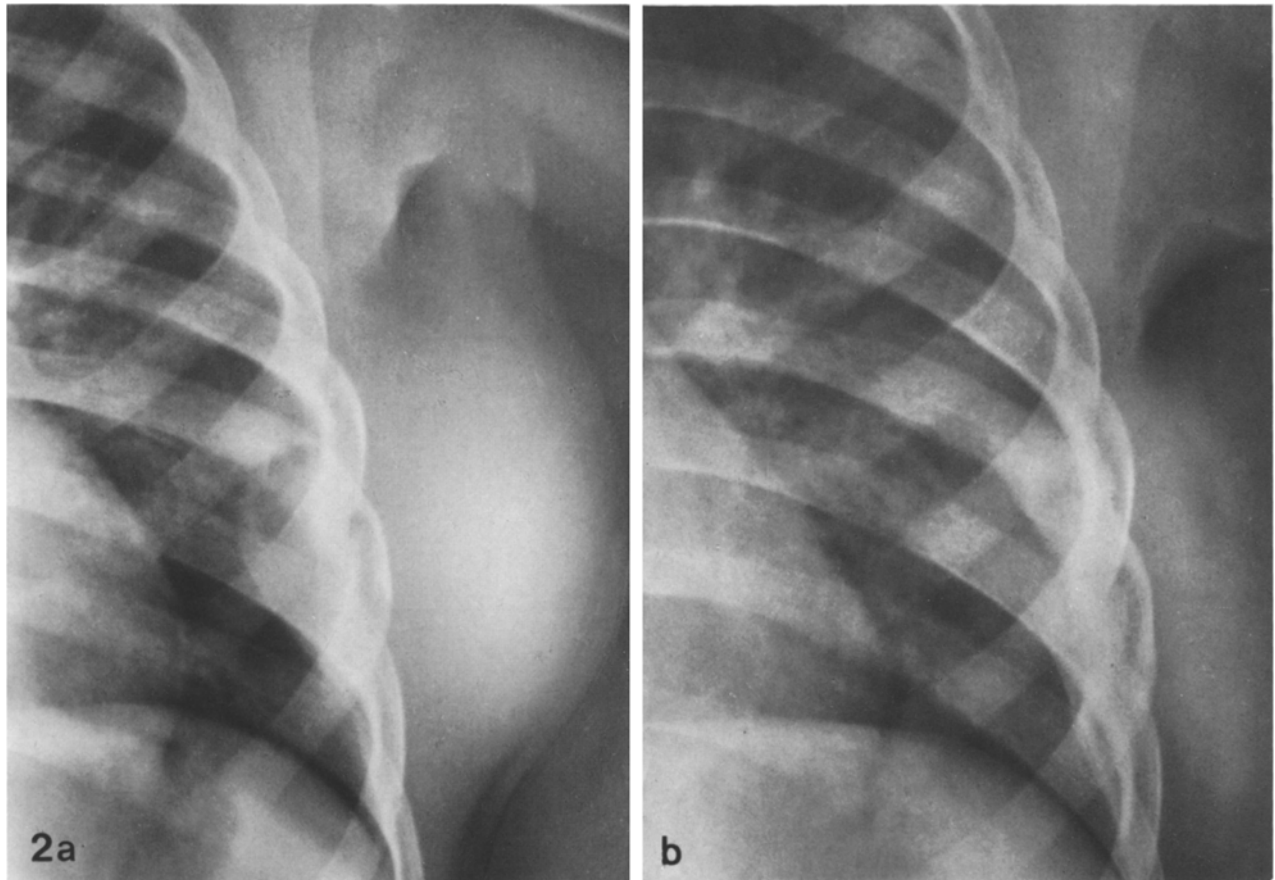


Fig. 2. a 2-year-old-girl. Localised lytic destruction in the left 7th rib with massive overlying soft tissue shadow (abscess). Note also the extrapleural collection. b Same patient 4 months later after incision, drainage and antibiotic therapy. Osteomyelitic process essentially unchanged

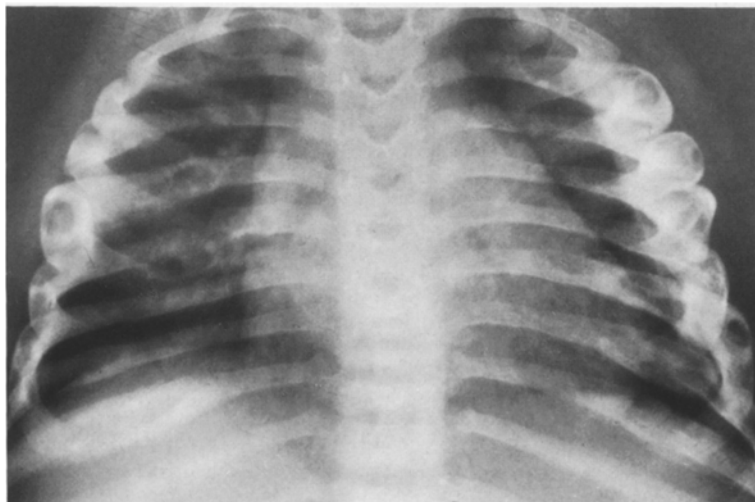


Fig. 3. Bilateral multiple rib osteomyelitis in a 3 year old girl with haemoglobin SC. Blood culture yielded *Salmonella* species

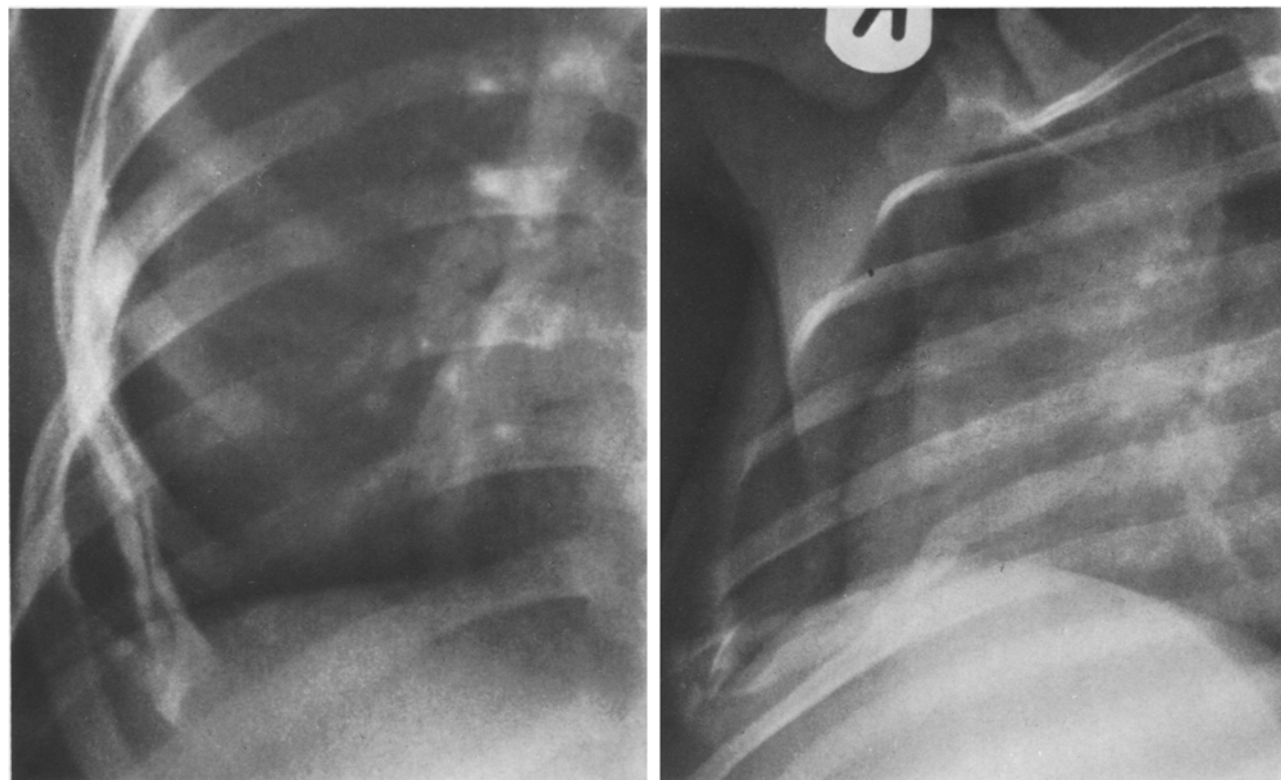


Fig. 4. 6-year-old-boy with chronic discharging sinus. Note osteomyelitis with pathological fracture and sequestrum in the right 6th rib

Case 4

This 6-year-old boy presented with a discharging sinus over the right chest wall. This started three years earlier as a tender swelling which broke down spontaneously, discharging thick purulent material. The lesion had healed and broken down repeatedly since then. There was no history of trauma. The chest radiograph showed osteomyelitis of the right 6th rib with pathological fracture and a sequestrum (Figs. 4a and b). Culture of wound swab yielded *Proteus rettgeri* and *Klebsiella* species. Complete cure was achieved by rib resection.

Case 5

This 13-year-old boy presented with multiple discharging sinuses on the left chest wall anteriorly and in the left mid-axillary line. His symptoms began 1 year earlier as a tender swelling lateral to the left breast. It ruptured spontaneously 2 months later, discharging pus, and had failed to heal. A chest film showed osteomyelitis of the entire left third rib. Culture of the swab from the site of discharge yielded *Staphylococcus aureus*, and the patient began the first of several courses of broad spectrum antibiotics which were continued until healing was achieved, six months later.

A summary of the clinical and radiological findings is provided in Tables 1 and 2.

Discussion

In a review of 93 cases of acute osteomyelitis in children Mollan et al. [5] found no rib involvement,

and in a similar review of 163 cases by Dich et al. [3] only one case of rib osteomyelitis was encountered.

The common clinical presentation of rib osteomyelitis is as a chest wall abscess or discharging sinus which is reluctant to heal [2, 4], a feature demonstrated by most of the patients in the present report. An unusual case presenting with painful torticollis was reported by Steinberg [6].

Although abnormal hemoglobins are a major factor predisposing black children to osteomyelitis [1], it is remarkable that, except for Case 3 who had hemoglobin-SC, all the other children had hemoglobin-A (Table 1). Furthermore, whereas *Salmonella* species are the major causative organisms of osteomyelitis in hemoglobinopathies [1], *Staphylococcus aureus* is the one most common cause of osteomyelitis in general [3, 5, 6].

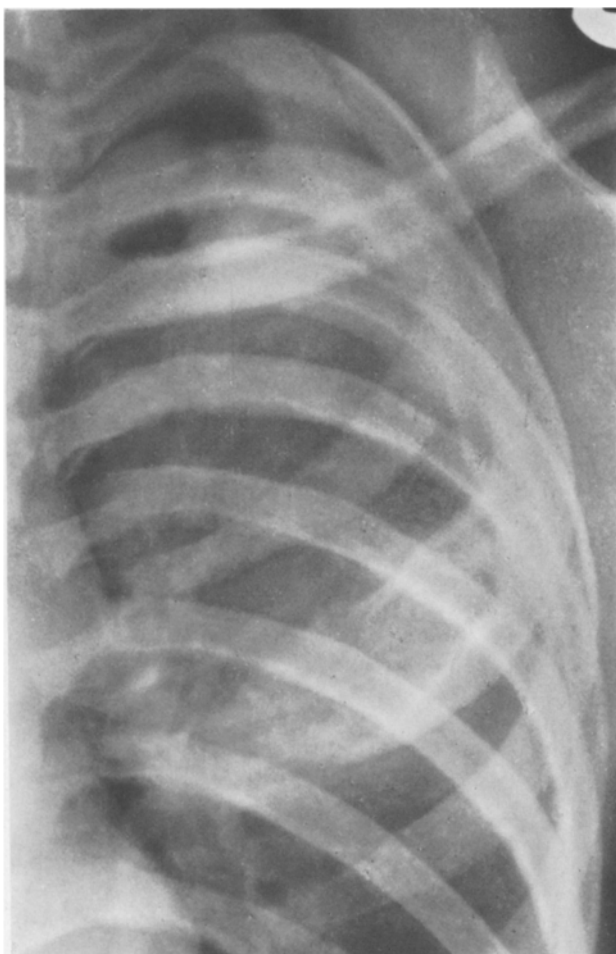
The radiological features of infective rib changes, extrapleural soft-tissue opacity, with an associated fluctuant chest wall swelling were reported by Brown [2] as being characteristic of tuberculous osteomyelitis. However, these features are not specific, at least in children (Fig. 2a).

Treatment of pyogenic osteomyelitis is preferably by surgical excision, which obviates the need for prolonged antibiotic therapy [4].

Table 1. Clinical data in 5 children with pyogenic osteomyelitis of the rib

Case no.	Sex	Age at onset (years)	Presenting feature	Isolated organism	Haemoglobin
1.	M	2½	Chest wall abscess	<i>Staph. aureus</i>	A
2.	F	2	Chest wall abscess	<i>Staph. aureus</i>	A
3.	F	3	Chest wall swelling	Salmonella species	SC
4.	M	3	Discharging sinus	<i>Proteus rettgeri</i>	A
5.	M	12	Discharging sinus	<i>Staph. aureus</i>	A

M = Male, F = Female

**Table 2.** Radiological findings in 5 children with pyogenic osteomyelitis of the rib

Case no.	Rib affected		Chest wall swelling	Extra pleural opacity	Other
	Side	Number			
1.	L	5th	+	+	Extensive rib expansion and sclerosis
2.	L	7th	+	+	Localised rib expansion and sclerosis
3.	Bilateral	3rd to 10th	+	+	Patchy sclerosis and expansion maximal in mid-axillary lines
4.	R	6th	-	-	Pathological fracture with sequestrum
5.	L	3rd	-	+	Sclerosis of entire rib with expansion anteriorly

L = Left, R = Right, + = Present, - = Absent

◀ **Fig. 5.** 13-year-old-boy with discharging sinuses. There is deformity and sclerosis of the entire left 3rd rib. Note also the associated extrapleural shadow

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