
THE ROENTGENOGRAPHIC FINDINGS OF ORTHOPEDIC MELIOIDOSIS

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Abstract

The purpose of our study was to describe roentgenographic appearance of Melioidosis in musculoskeletal system, discuss its differential diagnosis and its associated diseases.

We review the conventional radiographs of the 8 proven cases of Melioidosis involving bones and joints on the basis of the type of bony destruction, location and periosteal reaction.

The result of serological analysis, history of associated diseases were discussed.

5 patients with osteomyelitis involved large tubular bones. The types of bony destruction were geographic, permeative, punched-out and mixed permeative and punched-out osteolytic destruction. Most common location was metaphyses.

There are two cases of periosteal reaction, codman and solid buttress.

Of the 2 patients with septic arthritis, large joints were involved. Roentgenographic findings were joint effusion and bony erosion.

There were variable radiographic features of Melioidosis. Osteolytic destruction with or without periosteal reaction was shown. Lack of reactive sclerosis may not be differentiated from primary or secondary bone tumor and osteomyelitis from other organisms. The roentgen findings of arthritis could not be differentiated from Tbc.

DM was the most common associated disease. Indirect hemagglutinin titer over 1:160 was helpful in the diagnosis.

Key words: The Roentgenographic findings of Orthopedic Melioidosis, geographic, permeative, punched-out and mixed bone destruction. Metaphyses. Periosteal reaction. Effusion. Erosion.

Introduction

Melioidosis, an infectious disease caused by the gram negative bacillus, *Pseudomonas Pseudomallei*, was first reported in 1912 by Whitmor. (1) It is commonly found in soil and rice paddies of the Southeast Asia and other tropical areas. (1,2) In Thailand, the first case was reported by Chitti Chitavej in 1955. The highest incidence was in the Northeastern part.

There is wide spectrum of the clinical presentation of Melioidosis, range from subclinical to acute fulminating

septicemia. (4,5) Multiple organs involvement (6,7) is frequency encountered. The lungs are the site most commonly affected. Musculoskeletal system involvement is rare and usually found in association with infection in other organs. Several reports of the orthopedics Melioidosis has been presented (8,9) but no roentgenographic findings had been illustrated.

The purpose of this study is to describe the roentgenographic appearance of melioidosis in bones and joints and to emphasize the features which may help to differentiate it from other mimicking diseases.

Patients and Methods

Retrospective analysis of the proven cases of Melioidosis infection of bones and joints were performed during 1985-1989. The diagnosis was made by means of positive culture from pus, bone biopsy, joint effusion or positive serological test (titer ober 1:160).

The conventional radiographs of the involved bones or joints were reviewed, on the basis of the types of bony destruction, location, and periosteal reaction.

RESULT

The result (as in table 1) revealed 5 male and 3 female patients, the age-range was 28-75 years (mean 54.5 years). The majority of the patients lived in the

Northeastern part of Thailand. Duration of symptoms ranged from 2 months to 8 months.

Osteomyelitis was diagnosed in 5 cases, involving 2 humerus, 1 femur, 1 tibia and 1 radius. Septic arthritis was diagnosed in 2 cases, involving 2 knees and 2 ankles. Osteomyelitis with septic arthritis in 1 case involved right distal tibia and right femur.

An isolated musculoskeletal system involvement was found in 3 cases (case No.1,2,7) and those associated with systemic infection were seen in 5 cases. (case No. 4,5,6,8)

Diabetes millitus is the most common associated disease. (6 in 8 cases)

Positive Indirect Haemagglutinin (IHA) titer, more than 1:160 was seen in 6 cases (100%)

TABLE 1

No.	Sex/age	Occupation	Clinical presentation	Duration	Associated disease	Positive culture	IHA titer
1	M/43	Northeast	Fever,swelling	8 M	DM		1:160
2	M/28	North	Pain at Rt. hip weight loss	6 M	Asthma	Bone biopsy & culture	
3	M/75	Northeast	Fever, anemia and swelling & pain at Rt. knee & Rt. ankle	2 M		pus from urine & blood	
4	M/55	Northeast	Fever,swelling of Rt. and Lt. ankles, liver abscess, pneumonia,skin pustules	2 M	DM past history of pulm. Tbc.	joint eff. from Lt. ankle & blood	1:320
5	F/57	Northeast	Fever, Lt. ankle pain sepsis and pneumonia	2 M	DM		1:1280
6	M/66	Northeast	Pain chronic ulcer at Rt. forearm swelling Lt. ankle	3 M	pus from osteomyelitis at Rt. forearm		1:320
7	F/62	Northeast	Fever,pain & swelling at Rt. arm	3 M	DM	bone biopsy & C/S	
8	F/50	Northeast	Fever,pain at Rt. knee	3 M	DM	joint eff- usion & blood	1:640

TABLE 2

Case No.	Bone or joint involved	Roentgen findings
1.	Rt.	Permeative and punched out bony destruction at superior medial aspect of humerus including its neck with Codman periosteal reaction. Normal glenoid cavity
2.	Rt. femur	Well-defined geographic bony destruction of the intertrochanteric region with sharp border.
3.	Rt. knee	Bony erosion of lateral femoral condyle and lateral tibial condyle.
	Rt. ankle	Degenerative change with effusion and small osteolytic lesion at distal fibula.
4.	Lt. ankle	Joint effusion, no bony destruction
5.	Lt. tibia	Permeative bony destruction of distal tibia. Normal joint space.
6.	Rt. distal radius	Punched out osteolytic lesion at radial side, no periosteal reaction. Periarticular osteoporosis.
7.	Rt. humerus	Muliple, punched-out osteolytic expansile destruction involved metaphyses and diaphyses. Solid, buttress periosteal reaction.

Roentgen findings

Osteomyelitis

Patterns of bony destruction

Geographic destruction (case 2 fig 1)

Punch-out osteolytic destruction (case 6 fig 2, case 7 fig 3)

Permeative destruction (case 5 fig 4, case 8 fig 5)

Mixed permeative and punch-out osteolytic destruction (case 1 fig 6)

Periosteal reaction

Codman (case 1 fig 6)

Solid-buttress (case 7 fig 3)

Septic arthritis

Bony erosion (case 3 fig 7)

Joint effusion (case 4 fig 8)

DISCUSSION

The clinical presentation, bacteriological, radiological and pathological findings of melioidosis may imitate many diseases. In respiratory system (10), radiographic findings of acute septicemic form may not be able to differentiated from staphylococcal infection and in chronic form may resemble chronic pulmonary tuberculosis (7)

Musculoskeletal system symptoms may also accompany either the primary infection or disseminated disease. Bone and joint involvement in melioidosis is rare. In this study, osseous lesions were single and involved long tubular bone, particularly metaphyseal location. Radiologically, the lesions consisted of geographic, permeative, punched-out osteolytic destruction with or without periosteal reaction. Lack of reactive bone sclerosis is possibly the characteristic of the disease.

The geographic osteolytic destruction has well defined border without sclerotic margin. This pattern of bony destruction may be difficult to differentiate from metastases (11), or primary bone tumor such as giant cell tumor, or Brown tumor. Clinical and chemical analysis were required. The epiphyseal or diaphyseal involvement may be helpful in the differential diagnosis.

The permeative destructive pattern may resemble osteomyelitis from other causes (12)

The punched-out osteolytic and mixed punched-out and permeative osteolytic destruction may resemble bony destruction from fungal infection, such as coccidiomycosis (12,13)

Septic arthritis in melioidosis is possibly less frequent than osteomyelitis, ankle and knee may be the most common site. Radiographs of the involved articulation

revealed effusion and marginal erosion. These findings could not be differentiated from arthritis caused by other pathogens such as tuberculosis. (12,13)

Our study confirmed previous reports that DM was the most common underlying disease. However there

is no remarkable influence on the severity of the isolated articular melioidosis. (8)

The history of living in endemic area should arouse the suspicious of the disease.

Indirect hemagglutinin titer over 1:160 is helpful in the diagnosis.

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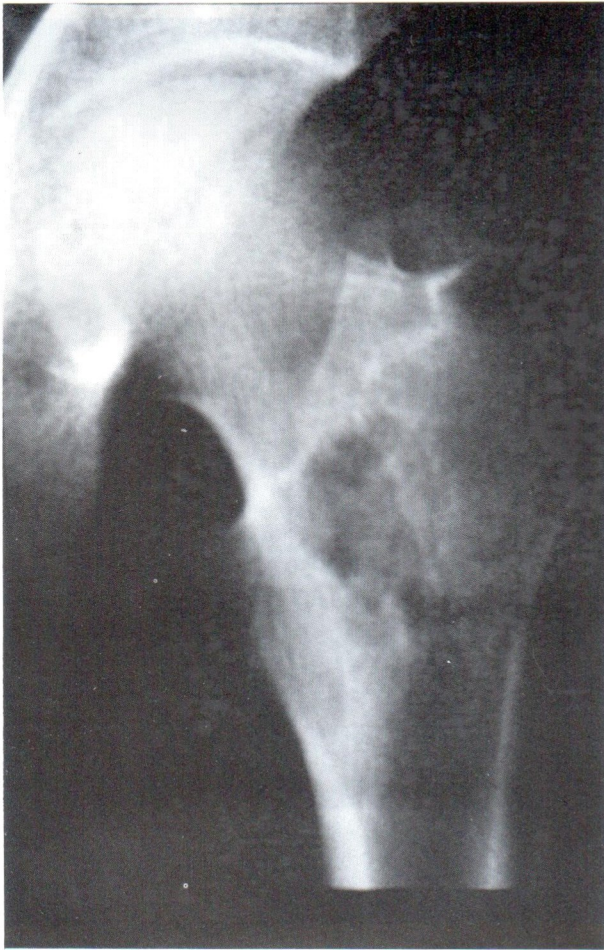


Fig.1 Case 2. 28 yr-old male with rt. hip pain and weight loss. Conventional radiograph of the pelvis shows well defined geographic osteolytic destruction of the intertrochanteric region of rt femur with sharp border



Fig.2 Case 6. 66 yrs-old male with chronic ulcer at rt. forearm. Conventional radiograph of Rt. forearm shows punched-out osteolytic destruction at radial side of Rt. distal radius without periosteal reaction. Periarticular osteoporosis is also noted.

Fig.3 Case 7. 62-yr-old female with pain and swelling of Rt.arm. Conventional radiograph of Rt. humerus shows multiple punched-out osteolytic expansile lesions involving metaphysis and diaphyses. Solid buttress periosteal reaction is seen.

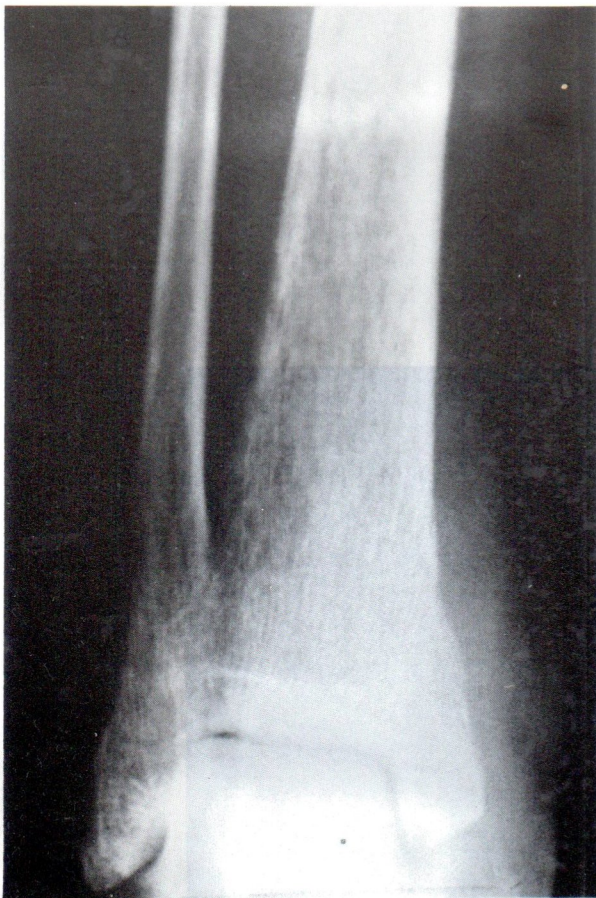
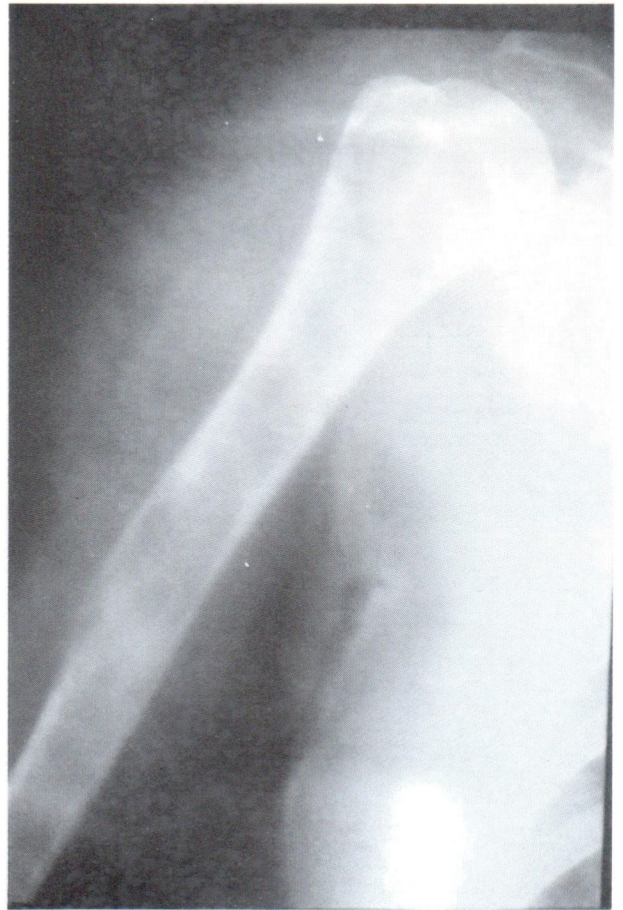


Fig.4 Case 5. 57 yr-old female with fever, Lt ankle pain, sepsis and pneumonia. Conventional radiograph of Lt. ankle shows permeative osteolytic destruction of distal tibia. The joint space is normal.



Fig.5 Case 8. 50-yr-old female with fever and pain at Rt. knee.
Conventional radiography of Rt knee shows permeative osteolytic destruction of distal femur with joint effusion

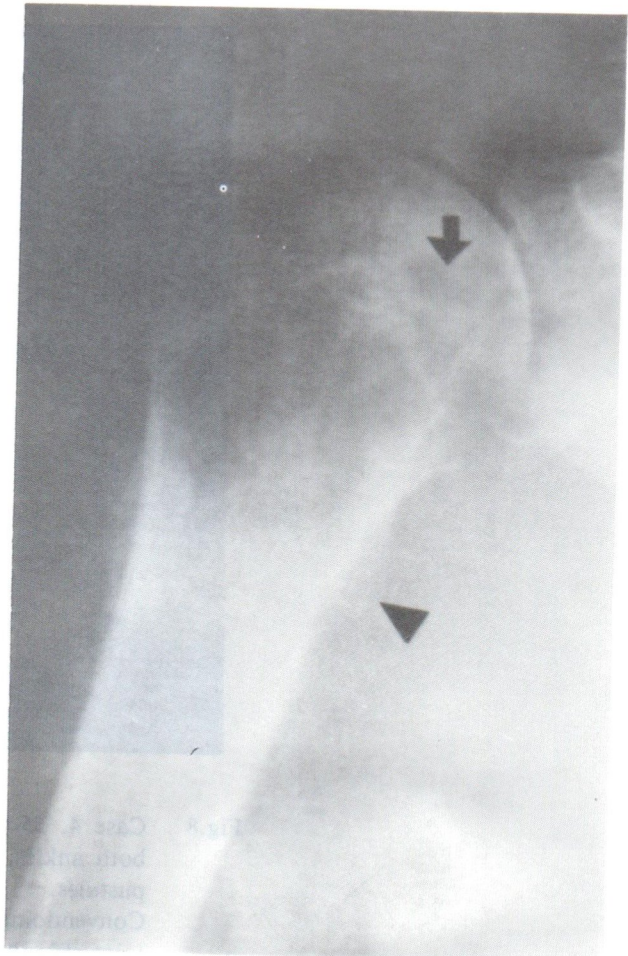


Fig.6 Case 1. 43-yr-old male with fever, pain and swelling of Rt. arm.
Conventional radiograph of Rt humerus shows permeative and punched-out osteolytic destruction at superomedial aspect with Codman periosteal reaction (arrowhead). The glenoid cavity is normal. The bony destruction involved metaphyses and epiphyses (arrow)



Fig.7 Case 3. 75-yr-old male with fever, anemia, pain and swelling of Rt knee and Rt ankle. Conventional radiograph of Rt knee shows bony erosion (arrowhead) at lateral femoral condyle and lateral tibial condyle



Fig.8 Case 4. 55-yr-old male with fever, swelling of both ankles, liver abscess, pneumonia and skin pustules. Conventional radiograph of Lt. ankle shows joint effusion (arrowhead). No bony destruction is evident