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SEARCH

## Closed Tibial Fracture Complicated by Acute Hematogenous Osteomyelitis

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*Abstract:*

*Osteomyelitis that followed a closed fracture is very rare. Although it has been reported that trivial trauma may be associated with the subsequent development of acute hematogenous osteomyelitis. This case report describes a condition of acute hematogenous osteomyelitis at the site of lower shaft tibial fracture in 58-year-old diabetic woman. The causative microorganism was E. coli.*



*Introduction*

Acute hematogenous osteomyelitis was found to affect children in the majority of cases. Trauma without fracture was the most common predisposing factor(1). Hematogenous osteomyelitis in the adult is relatively rare but may complicate injury or debilitating disease. It tends to involve the diaphysis of the bone rather than the metaphysis or epiphysis(2). Waldvogel et al. (1970) found no evidence that fractures were involved in the etiology of osteomyelitis(3). However, some cases of hematogenous osteomyelitis, that followed closed fractures, were reported(4, 5, 6). Even though osteomyelitis might develop at the site of a healed fracture after a few years of the accident(7).



*Materials and Methods:*

Syringe-aspirated specimen was obtained directly from the infected bone during surgery under general anesthesia. The collected material was inoculated immediately on culture media (by bedside). Aerobic, anaerobic and fungal cultures were done.

To identify appropriate published articles for inclusion, MEDLINE, PubMed and Biomedical Reference Collection were searched from January 1960 through January 2002. The following search terms were used: "closed fracture and osteomyelitis" and "closed fracture associated with osteomyelitis".



*Case Report:*

58-year-old woman complained of increasing pain at left lower shaft tibial fracture for two days

duration. The condition was associated with fever. The fracture had happened two weeks earlier where Plaster of Paris (P.O.P.) was applied. The patient was a known case of diabetes mellitus. The other clinical examinations revealed no remarkable signs. The patient was admitted at Basrah University Teaching Hospital where the following investigations were performed: ESR 80 mm/h, WBC 10200 /mm<sup>3</sup>, Hb 10 gm/dl and PCV 30%. X-Ray revealed the previous fracture and signs of bone infection.

The oral hypoglycemic medicine was replaced by parenteral insulin. The patient was operated on and the infected material was removed. Syringe-aspirated material was collected during the surgery. Direct microscopical examination of the pus revealed Gram-negative bacilli. Aerobic culture showed growth of *Escherichia coli*. While anaerobic and fungal cultures yielded negative growth. The causative organism was sensitive to cefotaxime and gentamicin whereas resistant to ampicillin, trimethoprim-sulfamethaxazol and doxycycline. The patient was given gentamicin (80 mg 8-hourly i.v.) and cefalexin (500 mg 6-hourly orally). The signs of bone infection resolved after the treatment and the patient discharged from the hospital without complications.

### Discussion:



All forms of treatment for tibial shaft fractures are associated with complications. The incidence of each complication is depending to a large extent on the method of treatment. In a review study(8) involving 895 tibial shaft fractures, which obtained from 13 prospective studies, revealed no single case of osteomyelitis that followed primary closed treatment. On the contrary, the incidence of osteomyelitis was 0.4% with plate fixation, 1% with reamed nailing and 1.5% with unreamed nailing. The incidence of delayed and nonunion was lower with operative treatment (2.6% with plate fixation, 8% with reamed nailing and 16.7% with unreamed nailing) than with closed treatment (17.2%). The incidence of malunion was also lower with operative treatment (0% with plate fixation, 3.2% with reamed nailing and 11.8% with unreamed nailing) than with closed treatment (31.7%). Therefore closed treatment has an advantage of less incidence of bone infection and disadvantage of more incidences of delayed union, nonunion and malunion.

Hematogenous osteomyelitis should also be suspected at the site of closed fracture of the spine as a few cases were reported (9,10). Mycobacteria and brucella might also settle at the location of closed fractures of spine and other bones(11,12,13).

Pathological fracture as a result of osteomyelitis should also be considered in preliminary diagnosis in which bone infection has happened before the fracture.

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