

Osteoid Osteoma after a Stress Fracture of the Tibia: A Case Report

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Abstract

A 24-year-old man presented with a stress fracture over his left tibia following an infantry training 6 years ago. X-rays of his left tibia revealed a stress fracture and bone scan showed marked tracer uptake at the fracture. He was treated conservatively but his pain persisted since then. Five years later, X-rays and histological examination confirmed the diagnosis of osteoid osteoma. The stress fracture may act as a trigger for the formation of osteoid osteoma and caused a delay in diagnosis.

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Case Report

A 24-year-old man complained of left leg pain following 3 months of infantry training 6 years ago. There was no previous complaint of pain over his left leg and there was no trauma. On examination, the left distal tibia had a moderate swelling over the medial cortex that was hard and slightly tender to palpation. There were no overlying signs of inflammation. Initial radiographic examination revealed thickening over the cortical margin in the lower shaft of left tibia, with organised periosteal new bone formation, consistent with a healed stress fracture (Fig. 1). A bone scan revealed marked tracer uptake over the left distal tibia, consistent with a healing stress fracture. Total white counts and erythrocyte sedimentation rate were normal. He was treated conservatively.

However, his pain had persisted. It was deep, aching and occasionally intense pain, not related to exertion, nor did it become worse at night. It was relieved to a much greater extent with anti-inflammatory medications than aspirin. Radiographs at yearly interval revealed sclerotic callus over the fracture site.

Five years after the patient first presented with left tibia pain, check radiographs (Fig. 2) revealed for the first time a radiolucent nidus within a thickened cortex in the left tibia. Computerised tomographic (CT) scan showed a classic osteoid osteoma nidus with a central sclerotic focus within a thickened cortex.

At surgery, the lesion was localised with intraoperative radiographs at the postero-lateral cortex of the tibia. The

nidus consisted of a 1.5 cm cavity filled with granulation tissue and surrounded by hard sclerotic bone. An en bloc excision was performed and the defect was packed with bone graft. Histology confirmed osteoid osteoma.

Following excision of the osteoid osteoma, the patient's symptoms were totally relieved. He was pain free at 1 year follow up.

Discussion

Osteoid osteomas are the third most common primary benign tumours of the bone (1 1%), being surpassed only by osteblastoma and non-ossifying fibroma.¹ They account for 21% of all benign bone tumours in young people. They can occur anywhere in the body, but usually occurs in the lower extremities, with 50% or more occurring in the femur or tibia,^{2,3} and occurring more commonly in males than females with a ratio of 2:1.

Pain is the main and often the only symptom, classically described as mild and intermittent at first, then more severe and constant later, and worse at night,⁴ usually with exertional component.² A rapid and dramatic relief of pain upon administration of aspirin is a good indication of the diagnosis^{1,2,5} which has a diagnostic significance.

They elicit a profound osteoblastic response in the surrounding bone, accounting for its characteristic picture of sclerosis around a lucent nidus. Sometimes the sclerosis can be so extensive that it may obscure all other details.³ Symptoms may appear before radiological changes are apparent.⁶

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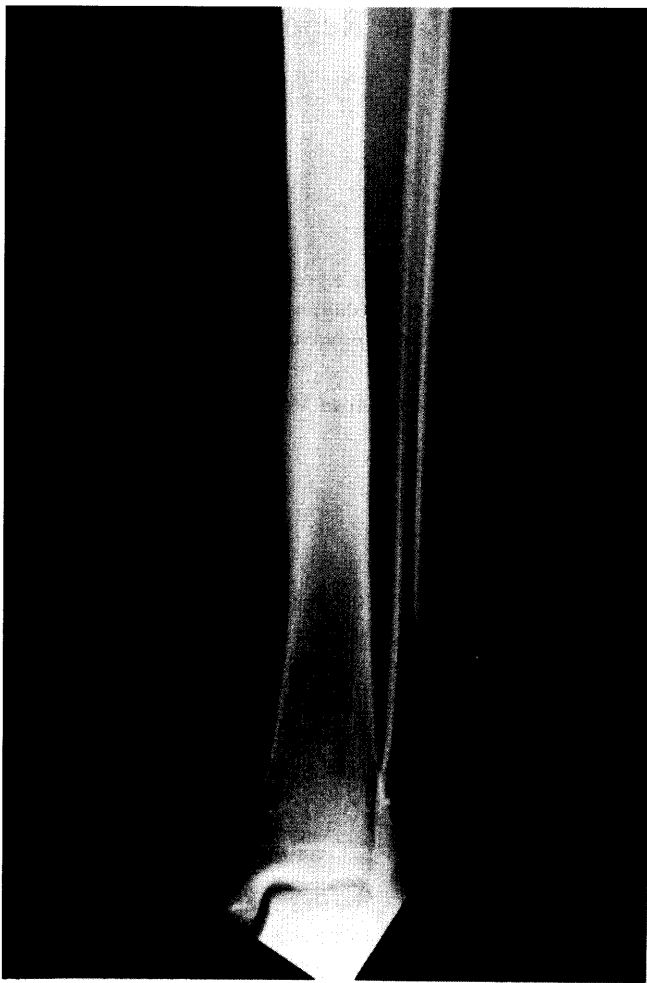


Fig. 1. Radiographs revealed thickening over the cortical margin in the lower shaft of left tibia, with organised periosteal new bone formation, consistent with a healed stress fracture.

This could be a case of missed diagnosis of osteoid osteoma or a case of osteoid osteoma arising from a stress fracture. A missed diagnosis is possible given that the extensive sclerosis stimulated by the osteoid osteoma may have masked the nidus. However, the points against this are that serial X-rays did not reveal any nidus and the patient's symptoms are atypical of osteoid osteoma.

Adil et al⁷ speculated that trauma was a contributing factor to the cause of osteoid osteoma and several cases were described of post-traumatic osteoid osteoma, with interval of several months between trauma and appearance of pain, with fractures treated with internal fixation. Adil also speculated that invagination of periosteum at time of reduction and fixation caused the lesion. In this case, the stress fracture may result in soft tissue being caught in the callus and acts as a nidus for the formation of osteoid osteoma. The extensive callus would have masked the nidus on radiological examination and hence delayed the diagnosis.

Persistent bone pain following a fracture, accompa-

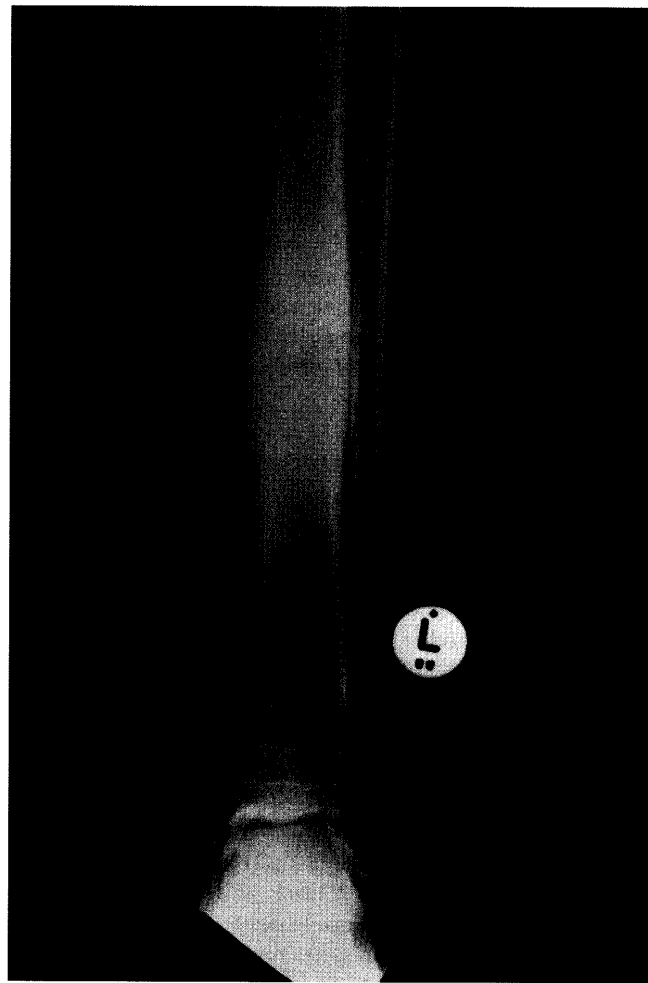


Fig. 2. Radiographs revealed a radiolucent nidus within a thickened cortex in the left tibia.

nied by non-specific radiographic and bone scan findings should raise a suspicion of osteoid osteoma. Further efforts to reach a diagnosis should be attempted with a CT scan or magnetic resonance imaging (MRI).

REFERENCES

1. Kaweblum M, Lehman W B, Bash J, Strongwater A, Grant A D. Osteoid osteoma under the age of five years: The difficulty of diagnosis. *Clin Orthop* 1993; 296:218-24.
2. Healy J H, Ghelman B. Osteoid osteoma and osteoblastoma: Current concepts and recent advances. *Clin Orthop* 1986; 204:76-85.
3. Gonzalez G, Abril J C, Mediero I G, Epeldigui T. Osteoid osteoma with a multicentric nidus. *Int Orthop* 1996; 20:61-3.
4. Hartmann T, Preis C, Gabriel A, Rath T, Ilias W. An osteoid osteoma as an undiagnosed cause of three years of severe pain. *Anesth Analg* 1997; 85:1344-5.
5. Marcove R C, Heelan R T, Huvos A G, Healey J, Lindeque B G. Osteoid osteoma: Diagnosis, localisation and treatment. *Clin Orthop* 1991; 267:197-201.
6. Adler R H, Gerber N, Weber M. A small and painful puzzle. *Pain* 1997; 69:211-2.
7. Adil A, Hoeffel C, Fikry T. Osteoid osteoma after a fracture of the distal radius. *Am J Roentgenol* 1996; 167:145-6.