

Reminder of important clinical lesson

Follow-up bone scintigraphy images of a patient with osteoid osteoma during medical treatment

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Summary

Osteoid osteoma is a benign bone tumour which is usually seen in long bones. Although the eventual treatment of this tumour is surgery, medical treatment is another option. We present the 3 years follow-up bone scintigraphy images of a patient with osteoid osteoma which show improvement by medical treatment.

BACKGROUND

Osteoid osteoma is the third most common bone tumour.¹ Usual localisation of osteoid osteoma is at the metaphysodiaphyseal region of long bones of lower extremities in male adults.²⁻³ Treatment is either medical or surgical. It has been suggested by Ilyas *et al*⁴ that medical treatment is the method of choice, especially in those patients who respond. Follow-up of medical treatment is of great importance since the patient needs to be informed about the prognosis of the disease. Although relief of pain is an important clinical sign during follow-up, imaging methods are important in showing a clear improvement of the tumour. Our case report is about a 3-year scintigraphical follow-up of a patient with osteoid osteoma during medical treatment.

CASE PRESENTATION

Diagnostic bone scintigraphy was performed in a 42-year-old woman with pain in her thigh for 3 years, who had a sclerotic bone lesion in her anteroposterior thigh radiography (figure 1). Three-phase bone scintigraphy showed increased vascularity at the projection of the right tibial mid-region and a focal activity accumulation at the same localisation in the late phase. These findings were concordant with osteoid osteoma (figure 2). The nidus which is defined as the most active part of the lesion was determined by bone scintigraphy, and thus the diagnosis was certain. After medical treatment for 3 years, follow-up bone scintigraphy showed faint activity accumulation at the upper and lower regions of the lesion; moreover, the nidus activity disappeared (figure 2). These findings were in agreement with the clinical improvement and were considered as a response to treatment. Simultaneous MRI and CT images revealed sclerosis at the region corresponding to the lesion identified by bone scintigraphy (figures 3 and 4).

OUTCOME AND FOLLOW-UP

The patient was treated with naproxen (500 mg/day, PO) for 2 years and responded well to this treatment. Nine

years later, the patient was still asymptomatic and the direct radiography of the lesion was stable.

DISCUSSION

Plain radiography is the first-line imaging modality for the diagnosis of osteoid osteoma. Diagnostic features are lesions located at the cortex of long bones with a diameter of less than 2 cm.¹ Bone scintigraphy is the most effective method to show osteoid osteoma especially the nidus.⁵⁻⁶ Bone scintigraphy is the best second-line procedure in localisation and diagnosis of this tumour, especially when direct radiograms are negative due to localisation.¹ In this case report, we suggest the use of bone scintigraphy as a follow-up modality during medical treatment. Since bone scintigraphy clearly demonstrates the nidus formation, theoretically it might also show the disease activity. This case report suggests that bone scintigraphy might also show inactivation of an osteoid osteoma during therapy with anti-inflammatory drugs. This conclusion may encourage medical treatment of patients who do not prefer surgery.

CT is superior to MRI in the diagnosis of osteoid osteoma.⁷⁻⁹ The CT characteristics of osteoid osteoma are low attenuating nidus with focal central calcification surrounded by perinidal sclerosis.¹⁰ Although MRI can show bone marrow oedema and oedema of adjacent tissues, it is inadequate to reveal the nidus which is the main target of all therapeutic methods.¹¹ The main goal of the surgical methods is excision of the nidus with minimal damage to adjacent tissues.¹² Because of this, CT-guided or γ -probe-guided surgical interventions are preferred.¹³ Preoperative CT or bone scintigraphy together with γ -probe in surgery correctly localises and guides surgery. In this report, we showed that in addition to localising the nidus, bone scintigraphy may also determine the nidus activity during medical treatment. En bloc resection and nidus curettage are common surgical methods.¹⁴⁻¹⁵ In addition to this, radio-frequency ablation or laser ablation of osteoid osteoma are alternative methods in the treatment of osteoid osteoma.¹⁶⁻¹⁸ Fluorodeoxyglucose positron emission tomography (FDG PET)/CT has been performed before and after radio-frequency ablation of osteoid osteoma to demonstrate improvement.¹⁹



Figure 1 Diffuse sclerosis at the mid-portion of right tibia is seen in anteroposterior and lateral x-ray images.

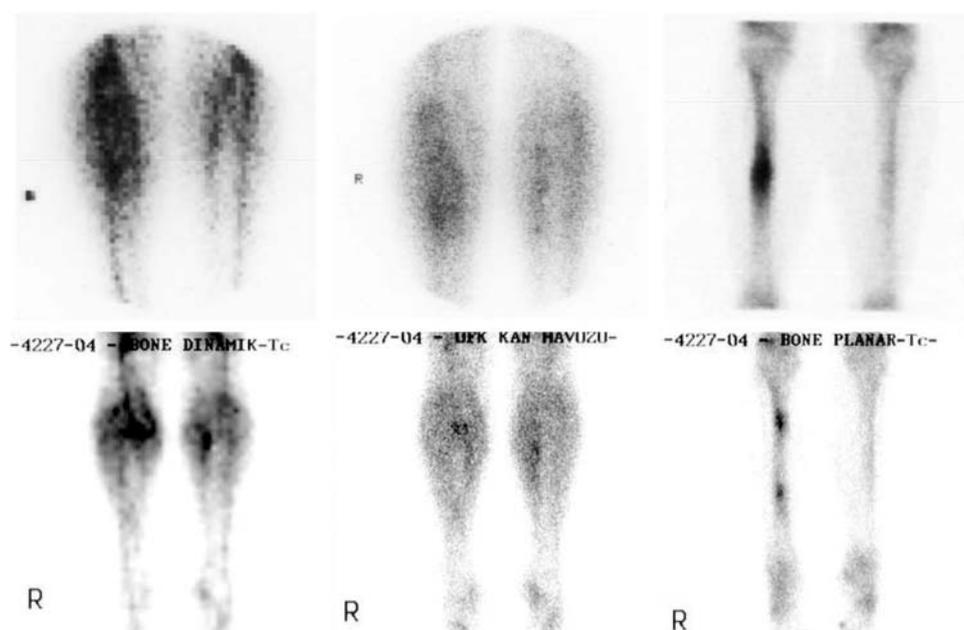


Figure 2 Three-phase bone scintigraphy images showing increased vascularity in flow and blood pool phase and focal increased activity accumulation at the mid-region of tibia in the late phase which corresponds to nidus (upper line). Three-phase follow-up bone scintigraphy of the patient showing faintly increased vascularity and increased uptake at the upper and lower regions of the previous lesion without nidus activity (lower line).



Figure 3 MRI showing sclerosis and bone marrow oedema around this sclerosis at the mid-portion of the right tibia.

Medical treatment with anti-inflammatory drugs is another treatment choice especially in patients who do not prefer surgical interventions.^{4 20 21} Long-term follow-up results of medical treatment of large series may be found in the literature.^{21 22}

This case report suggests that bone scintigraphy may be useful for determining the disease activity of patients with osteoid osteoma who are treated with anti-inflammatory drugs.

Learning points

- ▶ Osteoid osteoma is a benign bone tumour and eventual treatment of this tumour is surgery.
- ▶ Medical treatment is another option in the management of patients with osteoid osteoma.
- ▶ Bone scintigraphy may be valuable to show the response of patients with osteoid osteoma to medical treatment.

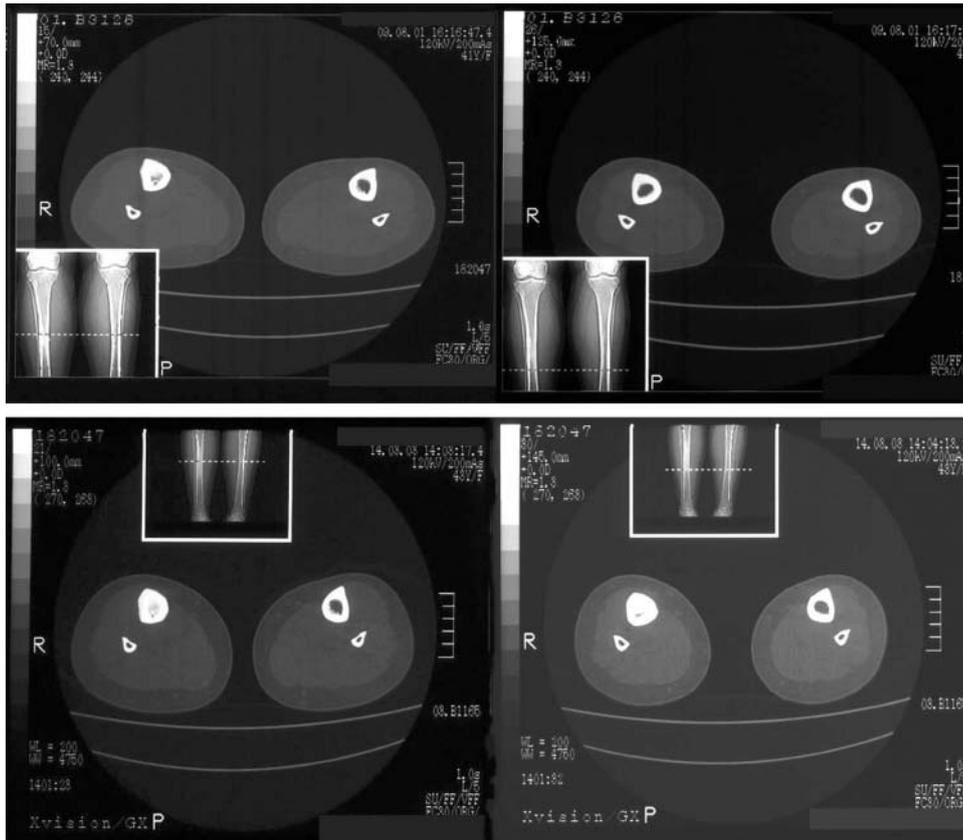


Figure 4 Transaxial CT images showing cortical thickening and a sclerosing lesion in the medullary region of the right tibia.

Competing interests None.

Patient consent Obtained.

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