Acta Med. Okayama, 2005
Vol. 59, No. 2, pp. 67-71

Acta Medica Okayama
http://www.lib.okayama-u.ac.jp/www/acta/

Case Report

A Case of a Femoral Neck Tumor: Painless Osteoid Osteoma?

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We report herein a unique, previously unreported, successful outcome for a patient untreated for a tumor affecting a femoral neck considered as painless osteoid osteoma. The lesion was detected by chance at examination for groin injury. Diagnosis was based on the plain radiography, bone scan, and computed tomography. The results of the full blood examination were normal. Neither pharmacomedical nor surgical treatments were given. Two years later, radiological resolution of the lesion was revealed. The patient was observed between 1995 and 2002. We conclude that painless osteoid osteoma should be included in the differential diagnosis of asymptomatic femoral neck lesions. Our case suggests that osteoid osteoma has a tendency to regress over time and that conservative management appears to be a reliable option.

Key words: osteoid osteoma, painless, untreated, femoral neck

Osteoid osteoma is a benign neoplasm most often seen in young males. Most osteoid osteomas are found in the first 3 decades of life, but an occasional lesion in an older patient has been reported. Clinically the patients present with significant pain, which is characteristically worse at night and relieved by nonsteroidal anti-inflammatory drugs. On X-ray, the classic finding is a small radiolucent area surrounded by sclerotic bone in the cortex. The conventional paradigm holds that, once suspected on clinical and radiological grounds, surgical excision is necessary. If it were not for the pain, osteoid osteoma would rarely require surgical treatment [1]. Because the majority of osteoid osteomas are removed, the natural history of this lesion is not well understood. Therapeutic alternatives are percutaneous coagulation of the nidus by alcohol [2, 3] or laser [4, 5], thermocoagulation [6, 7], or high-frequency radioablation [8, 9].

Received March 24, 2004; accepted November 25, 2004.
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Basu *et al*. [10] have reported the first case of painless osteoid osteoma in a metacarpal. Several reports of osteoid osteoma indicate that "spontaneous regression" of the lesion eventually occurs [11-19]. There have been a few isolated case reports on the medical treatment of osteoid osteoma [20-22], but only 2 series of long-term experience [23, 24]. As the symptoms related to this tumor are likely to resolve spontaneously, more recent literature supports nonoperative management [1, 23]. The follow-up imaging appearance of osteoid osteoma in conservatively managed patients has not been clearly documented in the literature.

We report here the successful outcome of a patient untreated for a tumor affecting a femoral neck considered as painless osteoid osteoma. The lesion was detected by chance at examination for other reasons. Neither pharmacomedical nor surgical treatments were administered. Management of the lesion was by observation only. No long-term series has previously been reported in which no treatment was given. Our review of the literature identified this case as the only example of a completely untreated osteoid osteoma of the femoral neck.

The purpose of this report is to emphasize the possibility of using differential diagnosis to identify existing asymptomatic femoral neck tumors as painless osteoid osteoma, as well as to contribute to a better understanding of the natural history of osteoid osteoma.

Case Report

An 11-year-old boy was admitted to our hospital in January 1995 a day following injury to the right side of the groin sustained during skiing training. The boy had fallen down over the tip of the left, unreleased ski. The patient related no direct trauma to the area. His past medical history was unremarkable.

Physical examination revealed a right groin pain. The right hip showed moderate global restriction in the range of motion. The groin pain completely subsided a few days later. The range of motion of the right hip was painless and equal to that of the opposite side. Clinical inspection of other body systems, the patient's temperature, erythrocyte sedimentation rate, white blood cell count, C-reactive protein, protein electrophoresis, bone chemistry, rheumatoid factor status, serum electrolytes, and serum enzymes, including the alkaline phosphatase levels, were all normal. He did not use any medications. He was a keen sportsman, but could not recall any history of injury to the right hip apart from this case.

The initial plain radiograph obtained upon admission revealed an oval radiolucent area surrounded by sclerotic bone in the right femoral neck (Fig. 1). A bone scan revealed a diffuse increase in scintillations in the proximal femur extending beyond the limits of the nidus, with no uptake elsewhere (Fig. 2). There was no double density sign. A computed tomography (CT) scan demonstrated a posteriorly located calcified nidus with surrounding sclerosis within the cortex of the right femoral neck (Fig. 3). This represented the typical appearance of an osteoid osteoma.

The patient remained pain-free, and no treatment was

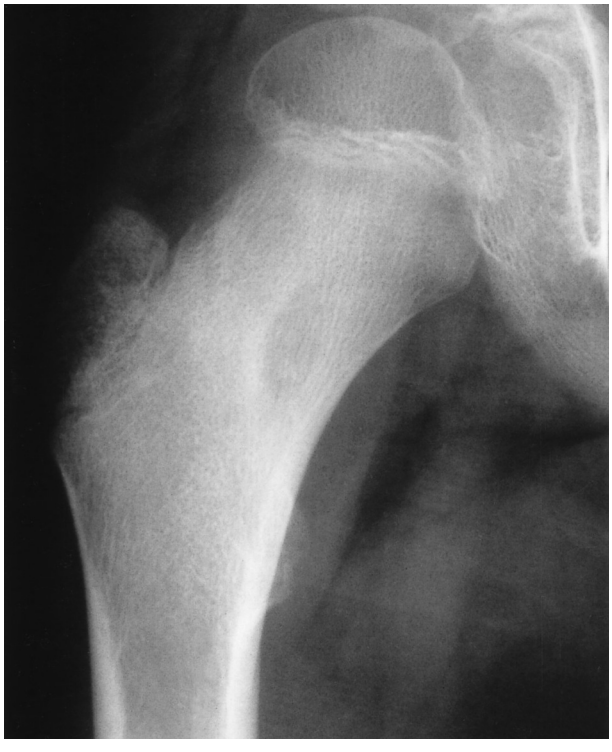

Fig. 1 X-ray of the right hip on admission. An oval radiolucent zone surrounded by sclerotic bone is seen in the medial basi-cervical region of the right femur.

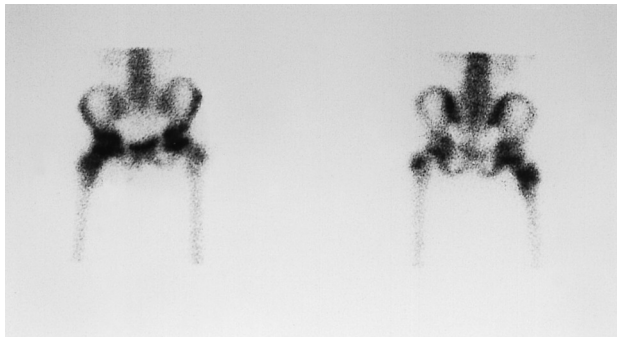

Fig. 2 Bone scintigraphy. A diffuse increase of intense activity was detected in the right proximal femur.

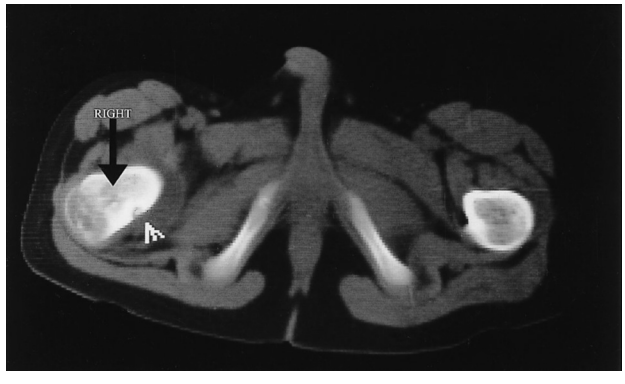

Fig. 3 A computerized tomography scan of an osteoid osteoma. The white arrowhead points to the calcified nidus of the lesion, which is located in the posterior aspect of the right femoral neck.

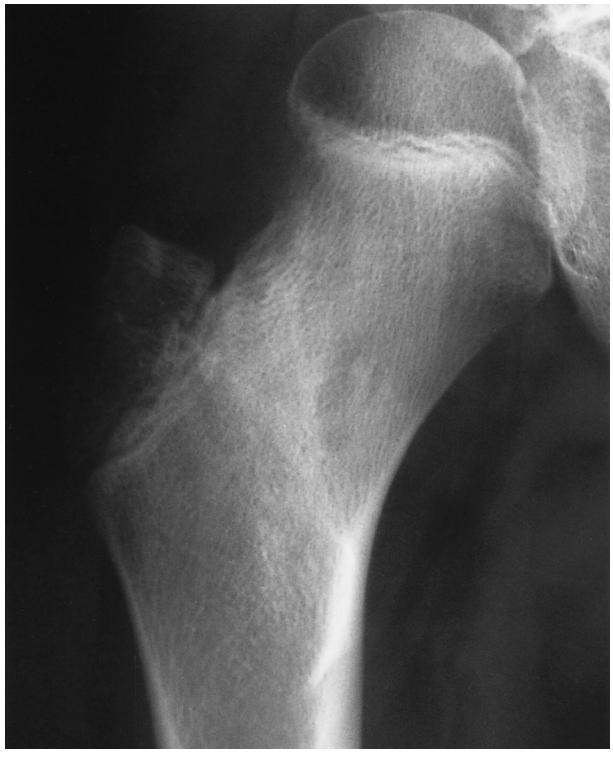

Fig. 4 X-ray taken 10 months later. Decrease in the size of the radiolucent area.

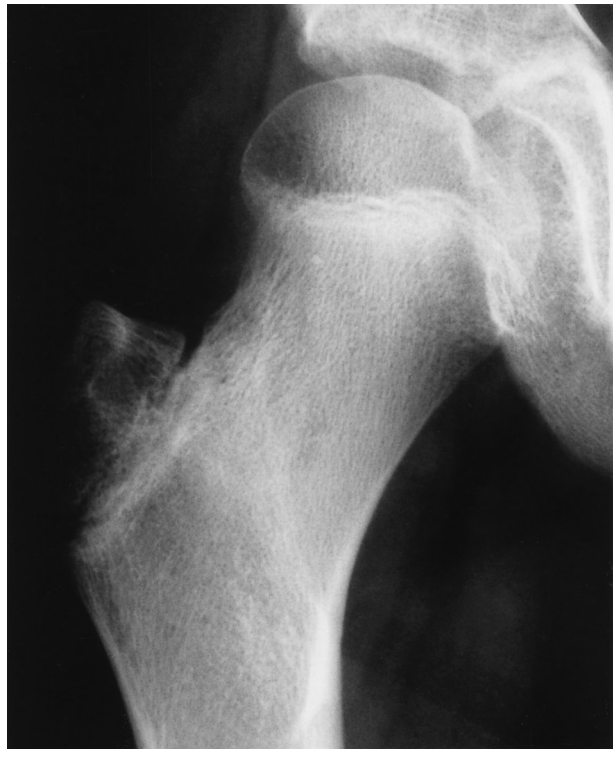

Fig. 5 At 2 years. Radiological resolution of the lesion.

administered. Management was by observation only. An X-ray taken 3 months later showed minimal change compared with the initial plain radiograph. At 10 months, a decrease in size of the radiolucent area was noticed (Fig. 4). Fifteen months later, radiological resolution of the lesion was revealed (Fig. 5). The patient was observed between 1995 and 2002, after which time he was discharged from the orthopedic oncologist's care. The patient returned to sport activities and remained asymptomatic for a 5-year follow-up period. At the time of the last survey, at age 16, he was a competitive skier.

Discussion

Osteoid osteoma presents fairly consistently with bone pain, worsening at night. It rarely exceeds 1.5 cm in diameter, and the radiographic appearance is characteristic. In general, lesions closer to the cortex produce more osteosclerosis than those arising in cancellous bone, as in the femoral neck [2, 25–31]. In the reported case there was no pain, the lesion was larger than 1 cm, and progressive sclerosis was not visible on radiograph. However, the patient underwent blood work, standard radiography, bone scanning, and CT.

In our case, the bone scintigram revealed a diffuse accumulation of the radiopharmaceutical agent extending beyond the limits of the nidus seen in plain radiography because bone scintigraphy is more sensitive to osteoblastic activity than X-ray images, as in the latter the osteoblastic activity is identified only if calcium salts are deposited [32–35].

Our patient had no histological documentation of the diagnosis, as the successful natural course of the lesion does not allow this and biopsy itself would be curative [13, 36]. Thus, it is reasonable to question the certainty of the diagnosis in our case because of the lack of histological proof. Our patient had a nidus that was visible on computed axial tomography. In addition, he had a bone scintiscan showing accumulation of the radiopharmaceutical agent. Our patient was followed with sequential radiographs every 3 months. The only observed radiographic changes were healing (ossification) of the nidus. We regarded this tumor as osteoid osteoma because advanced radiological techniques now allow us to evaluate pathology more confidently, sometimes eliminat-

ing the need for histological confirmation [11, 27, 31]. CT is a very sensitive method in discovering the nidus, but the radiologist must be very careful because tube collimation of 5 mm or more will not be able to disclose the nidus in some instances [31]. Investigation of lesions by CT scanning with 2-mm fine cuts offers high definition. Occasionally, the examination may be performed with slices just 1 mm thick in order to locate a small nidus [27]. In the present case, little doubt remained as to the nature of the lesion.

Several reports have been presented in the orthopedic literature that provide proof that the symptoms associated with osteoid osteoma may spontaneously regress when the lesion remains *in situ* [11–17, 19]. It is unknown what factor(s) contribute to growth arrest or cell death in the regressed osteoid osteoma-like lesions. Huvos [37] contradicts some of this evidence and denies that osteoid osteoma may spontaneously regress. However, our patient could not recall any history of osteoid osteoma-related symptoms. It was detected by chance. In the present case, radiographically rapid onset of regression started 10 months after discovery. Fifteen months later it regressed completely.

Infection is probably the condition most commonly confused with an osteoid osteoma. A Brodie's abscess, where there is a focal collection of inflammation or pus, may look rather similar, but the osteolytic area is usually larger and more irregular than that associated with an osteoid osteoma [29]. Clinical inspection of other body systems in our patient and the results of the full blood examination were all normal. An osteoblastoma is virtually indistinguishable pathologically, but is larger (2–10 cm) and tends to expand the affected bone [29]. Asymptomatic femoral neck uptake on bone scintigraphy has been characterized as a finding of uncertain significance [38]. The differential diagnosis–in addition to stress fracture, herniation pit, bone island, skeletal metastases and Brodie's abscess–should include osteoid osteoma, as in our case [28, 39–42]. It is known that some bone tumors and tumor-like lesions may regress spontaneously. Examples include fibrous cortical defect, nonossifying fibroma, exostosis [43–45], bone island [46], eosinophilic granuloma [47], and osteoid osteoma [15, 48, 49], as in our case. CT is the best modality for identifying the nidus and narrowing the differential diagnosis of osteoid osteoma [50]. From a clinical perspective, it is important to consider plain radiographic follow-up [13].

The present case is unusual due to the painless lesion considered as osteoid osteoma, as with the case reported by Basu *et al.* [10], but also because this patient was successfully managed without surgical and pharmacomedical treatment. Invasive procedures necessitate periods of immobility as well as significant morbidity [51]. There is an increasing trend toward conservative management of osteoid osteoma, a therapeutic option that has received little recognition in the literature [23]. It is known that the use of salicylates or nonsteroidal antiinflammatory drugs in patients who have osteoid-osteoma can accelerate healing and thus resolution of pain [20, 23, 52]. These reports indicate that excision or *in situ* thermal ablation of the lesion is often unnecessary. In our case, neither pharmacomedical nor surgical treatments were given. To the best of our knowledge, this is the only example of a painless and untreated osteoid osteoma in this location. Management of the lesion was by observation only.

In conclusion, this report adds to the accruing evidence that (painless) osteoid osteoma has an often underappreciated tendency to regress over time. We propose that painless osteoid osteoma should be included in the differential diagnosis of asymptomatic femoral neck lesions. Conservative management appears to be a reliable option in treatment, as was true in our case.

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