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Case Report

Osteoid osteoma in a metacarpal bone: literature review and case report

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ABSTRACT

Osteoid osteomas are benign skeletal tumors; more than half of the lesions occur in lower extremity long bones, with very few cases reported in metacarpal bones. We presented the case of a patient at the plastic surgery department of a regional hospital, who presented with a tender tumor in the left hand over the past 2 years.

Keywords: Osteoid osteoma, Bone tumor, Hand surgery, Bone graft

INTRODUCTION

Osteoid osteoma was first described by Bergstrand in 1930 and characterized by Jaffe as an entity in 1935.[1] Osteoid osteoma is the third most common (after osteochondromas and no ossifying fibromas) and corresponds to 11% of the benign bone tumors. With only 6 to 13% of osteoid osteomas affecting the hand and wrist region.[2-5] It is most commonly seen in the second and third decades of life, although patients as young as three years old have been reported. There is a male to female preponderance of 3 to 1.[6] It may present with various clinical presentations; although small, it can produce significant pain and discomfort for prolonged periods that usually worsens at night and is relieved by salicylates. Radiography and computed tomography scans are the mainstays of imaging diagnosis.

Osteoid osteomas are small, distinctive, no progressive, benign osteoblastic lesions consisting of a nidus surrounding sclerotic bone. Differential diagnosis covers an extensive range of conditions due to its variety of presentations. The natural history is for regression within 6 to 15 years with no treatment; however, this can be reduced to 2 to 3 years using aspirin and non-steroidal anti-inflammatory drugs. Computed tomography-guided percutaneous techniques including trephine excision, cryoablation, radiofrequency ablation and laser thermocoagulation.[6] Its pathology and pathogenesis have not been clearly defined, its radiological features can imitate other etiologies and surgical treatment is not always successful.[6] A literature review reveals that very few cases of metacarpal osteoid osteoma have been reported. Here we presented a rare case of osteoid osteoma of a metacarpal bone that presented with an extensive tumor lesion.

CASE REPORT

A seventeen year old female presented to the plastic surgery department, referring no allergies or any associated disease, with a history of two years of dull pain associated with a volume augmentation in the left hand, without any trauma history. On examination, the overlying skin was healthy with minor local swelling of the fifth metacarpal bone of the left hand. There was tenderness over a palpable mass of approximately 4×3 cm, of hard consistency, nonmobile, no limitations in movement or any sensitivity alteration were noticed (Figure 1). Radiographs revealed an expansible, eccentric

lesion seen in the proximal diaphysis and base of the fifth metacarpal (Figure 2a). Laboratory findings were normal; radiographically, we observed bone hypertrophy in the fifth metacarpal bone at the base level. MRI showed a focal lesion and the bone had a high-intensity area (Figure 2b). After complete workup, the patient was posted for surgical exploration. We found a bone tumor on the diaphysis and base of the proximal fifth left metacarpal bone (Figure 3 a and b). We proceeded to complete the tumor resection and harvested an iliac crest corticocancellous bone graft; miniplate fixation was made with a 10-hole 2.0 system (Figure 3 c-e). The patient showed a good outcome, with good rehabilitation, presented with a small hypertrophic scar (Figure 4 a-b).

Figure 1: Painful swelling of the proximal segment of the fifth metacarpal.

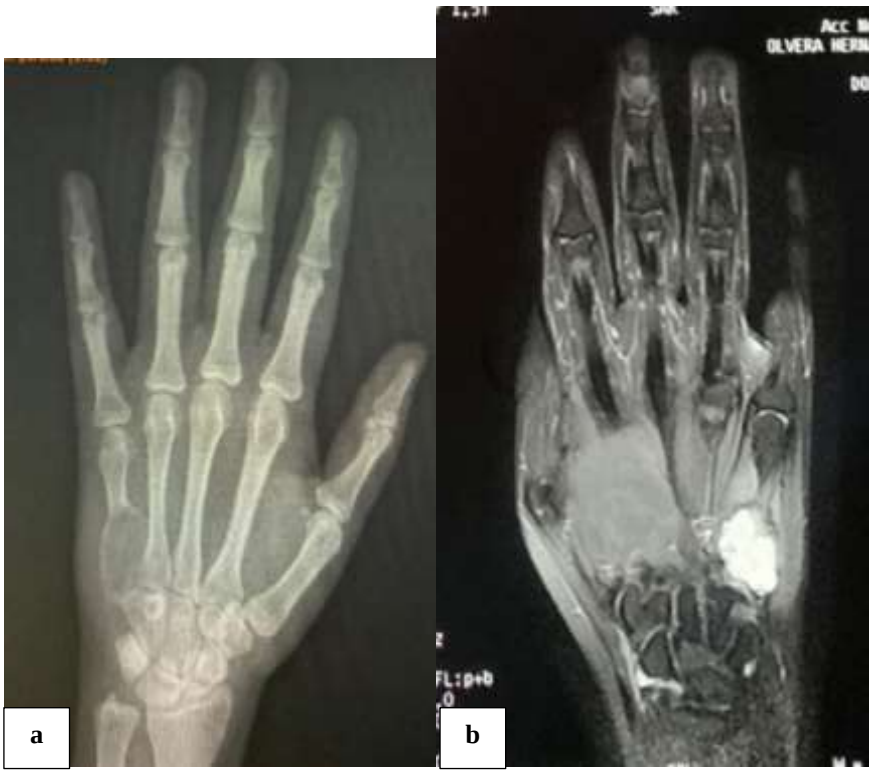

Figure 2: (a) Anteroposterior plain radiograph of hand showing lesion with cortical sclerosis in the base and proximal half of the fifth metacarpal; (b) MRI image showing well-defined eccentric lesion in the base of fifth metacarpal showing a hyperintense signal on T2 image.

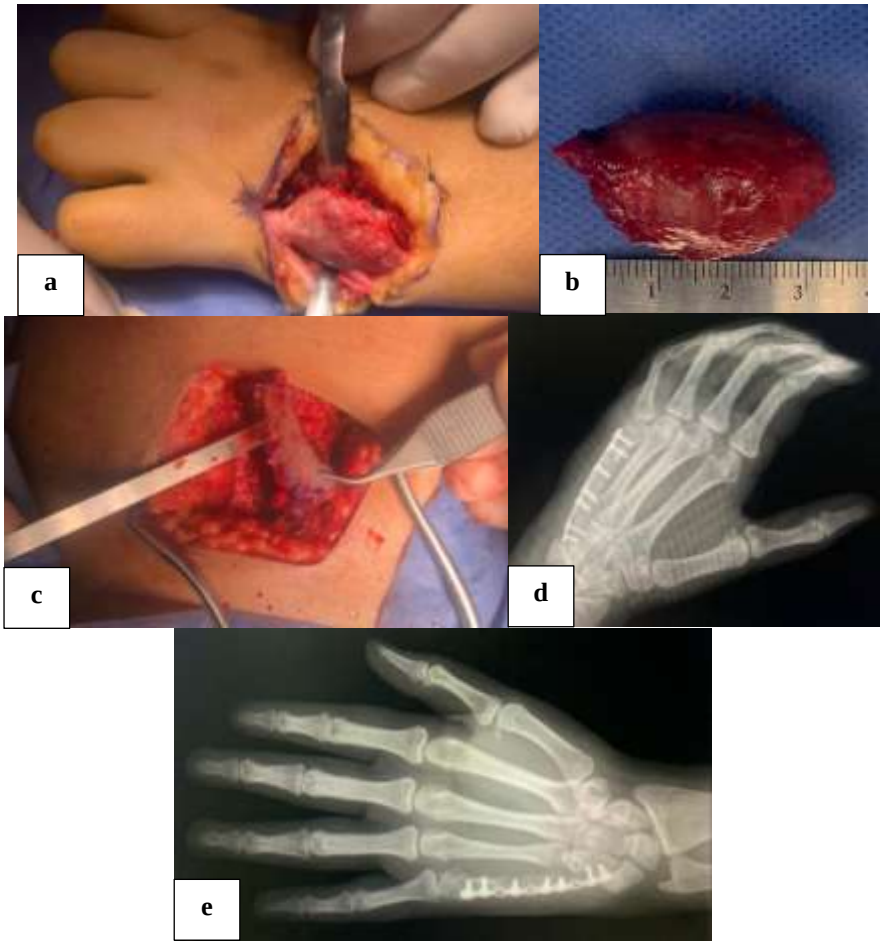

Figure 3: (a) The dorsal approach of the fifth metacarpal with exposure of the lesion; (b) resection of the proximal fifth metacarpal bone, 35×21 mm; (c) a iliac crest bone graft of 35×12 mm; (d and e) postoperative radiographs showing a ten-hole 2.0 system miniplate reducing the iliac bone graft with the distal fifth metacarpal and the Hamate.

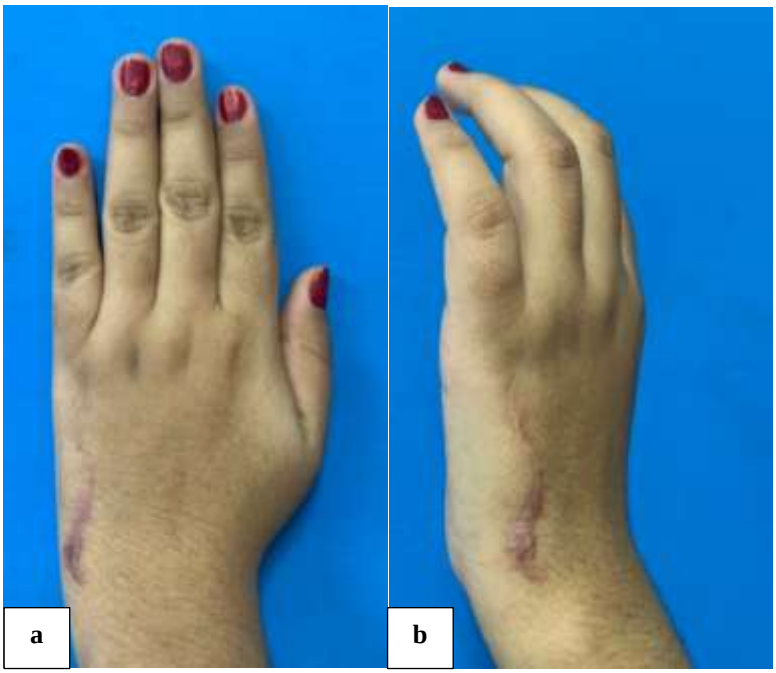

Figure 4: Surgical scar in the three-months follow up consult; (a) dorsal view; (b) oblique view.

DISCUSSION

The pathogenesis of osteoma osteoid remains controversial. Jaffe et al believed in a neoplastic origin, others on an inflammatory basis, and some suggested it to be an unusual healing and reparative process. However, its growth was not typical and, in some cases, spontaneous regression and healing occurred.[6-10]

Osteoid osteomas were benign skeletal tumors characterized by an intracortical nidus with variable amounts of calcification, sclerosis and bone marrow edema.[11,12] More than half of the lesions occurred in long bones of the lower extremity, with the proximal femur being the most common location. In the spine, osteoid osteomas almost exclusively occurred in the posterior vertebral elements.[13] Currently, the precise nature of the lesion remained undetermined. Imaging played a significant role in the detection of these lesions and it rarely localized in the carpal or metacarpal bones.[13,14]

The most frequent presentation sites in hand were the phalanges and carpal bones and the least commonly found in the metacarpal bones.[15-17] So, when a metacarpal presentation was found, the differential diagnosis should include syphilitic dactylitis, tuberculosis, other infection, brodies abscess, enchondroma, post-traumatic change, osteochondroma, soft tissue tumor, among others.[18]

Many surgical techniques have been described. However, since this tumor usually presented with pain, an early diagnosis was usually encountered. Findings usually presented with small tumors (commonly did not exceed 1 cm in diameter), so cortical peeling or burr-down with curettage was sufficient.[19] However, in cases like the one presented, *en bloc* resection was required, leaving a bone gap that must be reconstructed with a bone graft. Other techniques have been described, like percutaneous curettage, aldolization, laser coagulation, thermoregulation or radiofrequency ablation.[20] These lesions in the hand region were usually too narrow for the percutaneous treatments.[21]

CONCLUSION

This case is a rare presentation of a large osteoid osteoma in a metacarpal bone. Usually, an unroofing and curettage method is sufficient for a complete exercise. However, a complete tumor exercise should be done with a bone graft and miniplate reconstruction in a presentation like in this case, where a complete cortical degeneration is presented.

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