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A case report of osteoblastoma on the distal phalanx of the ring finger successfully treated with curettage and polymethylmethacrylate filling

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ABSTRACT

BACKGROUND: Osteoblastoma is an aggressive benign tumor whose presentation varies with location and size. This rare bone tumor is thus difficult to diagnose particularly when it occurs outside its most common location – the vertebral column and long bones.
CASE: We report a case of osteoblastoma of the fourth distal phalanx of the left hand in an 18-year-old male, presented with pain and swelling and treated with curettage and polymethylmethacrylate filling followed by immobilization by a cast, which was opened 10 days later to start physical therapy. Patient was pain-free, recovered full function of his finger, and remained without pain at one month post-surgery. The finger was monitored closely for two years; sequential films showed a radiopaque interface and no evidence of local recurrence.
CONCLUSION: This is the first report of osteoblastoma on the distal phalanx. The possibility of osteoblastoma should be considered in cases of pain and swelling of phalanx, and if diagnosed, curettage and polymethylmethacrylate filling may be the treatment of choice.

1. Introduction

Osteoblastoma is a rare primary neoplasm of the bone. Despite its benign nature, the tumor may sometimes exhibit aggressive behavior and is typically treated with curettage; then the resulting space is packed with bone or a bone substitute.

Osteoblastomas account for only 0.5–2% of all primary bone tumors and 3% of benign bone tumors [3]. While this tumor can occur in any part of the skeleton, the most common sites are the vertebral column and long bones. The tumor rarely presents in the hand; the phalanx is involved in less than 5% of cases [3,14]. Metaphyseal lesions are slightly more common than diaphyseal, with very few lesions in epiphyseal locations [6].

Osteoblastoma can occur at any age, and predominantly affects younger persons, with about 80% of these tumors occurring before 30 years of age. Osteoblastoma affects males more often than females, at a ratio of 2–3:1 [3].

Symptoms and signs are variable, but the characteristic symptom is a localized, dull pain that does not get worse at night and cannot be relieved by salicylates [14]. We present a case of osteoblastoma located at the rare site of the distal phalanx of the hand.

2. Case report

An 18-year-old male student was referred to our clinic for pain and swelling of the fourth distal phalanx of the left hand. He complained of progressive distal phalanx pain and swelling in the area for two months that was not activity-related and only partially relieved by non-steroidal anti-inflammatory medications. In contrast to characteristic pain pattern of osteoblastoma [14], which is not worse at night, the pain in the present case was more intense at night. There was no history of trauma.

Upon referral to a medical center, an X-ray revealed a lytic lesion containing some calcification in his distal phalanx (Fig. 1).

The rheumatologist referred him to an orthopedic surgeon. Physical examination identified a tender, firm swelling over the distal phalanx. Movements were slightly restricted by pain. Blood work data, including complete blood count, chemistry, coagulation analysis, erythrocyte sedimentation rate, and C-reactive protein were all normal.

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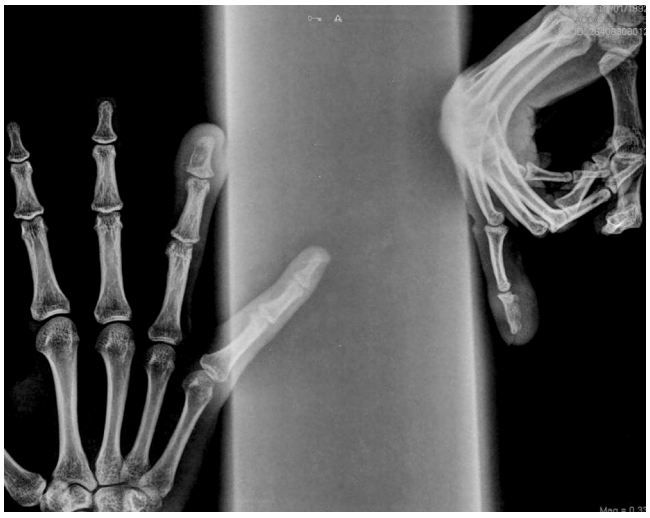

Fig. 1. Plain radiographs of the hand showed an osteolytic lesion in the distal phalanx. Some calcification could be seen within the lesion.

Based on clinical and radiological findings, the lesion was considered a benign primary tumor. An excisional biopsy was performed through a lateral approach and the resulting gap was filled with polymethylmethacrylate (PMMA). Macroscopic biopsy findings included a cavity containing spongy bone and reddish soft mesh. Histopathological appearance of the osteoblastoma consisted of a well-vascularized connective tissue stroma actively producing osteoid and primitive woven bone (Fig. 2).

Then the digit was immobilized by a cast, which was opened 10 days later to start physical therapy. At that time, the patient was pain-free; he recovered full function of his finger and remained without pain at one month post-surgery. The finger was monitored closely for two years; sequential films showed a radiopaque interface and no evidence of local recurrence (Fig. 3).

3. Discussion

Osteoblastoma is an uncommon primary bone tumor with clinical and histological manifestations similar to those of osteoid osteoma. The most helpful single imaging technique for diagnosing osteoblastoma is radiography, on which the tumor appears as an expansile radiolucent lesion with an intact surrounding shell of bone and may contain varying degrees of calcification [13,14]. Osteoblastoma may have features similar to those of malignancy, such as cortical destruction and extra-osseous soft tissue expansion [13,19].

Other relevant imaging methods for this tumor type include computed tomography (CT), bone scan, and magnetic resonance imaging (MRI). CT can detect small mineralization in the tumor, which can help with diagnosis. CT also provides information about the size and extent of the lesion in the cortical bone, and aids preoperative evaluation and planning for surgery. Bone scans are also useful for localizing lesions, which appear as increased activity areas, but the scintigraphic appearance of the tumors is nonspecific. MRI findings of osteoblastoma are not specific, with a low signal in T1-weighted images and a high signal in T2-weighted images. However, MRI can reveal the extent of intra-osseous and soft tissue extension more accurately than other methods [4,13].

Although typical for an osteoblastoma, cortical attenuation may also be seen in other benign lesions such as fibrous dysplasia, aneurysmal bone cysts, and giant cell tumors [19].

The pathological features of osteoblastoma are similar to osteoid osteoma; both are bone-producing lesions arising from osteoblasts. Usually, the lesion is reddish-brown, even pinkish; friable with a gritty consistency; and hemorrhagic in appearance [9].

Osteoblastoma can be aggressive if associated with large epithelioid osteoblasts, and carries risk of local recurrence or malignant transformation into osteosarcoma [5]. These “aggres-

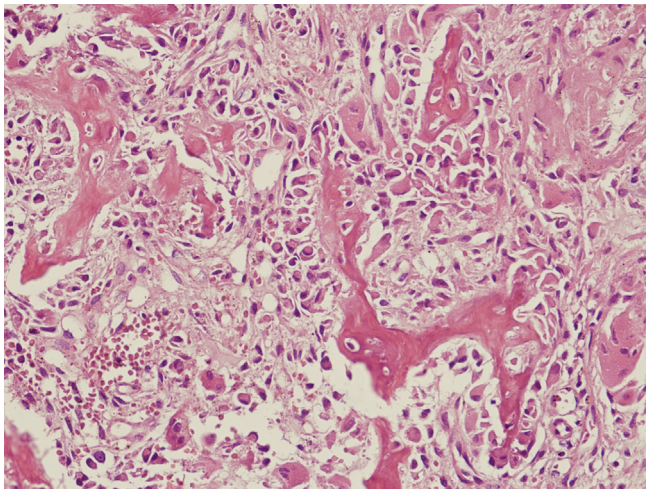

Fig. 2. The hematoxylin eosin (H-E) stained histological sample of osteoblastoma (with 40× magnification) consists of a well-vascularized connective tissue stroma in which there is active production of osteoid and primitive woven bone.

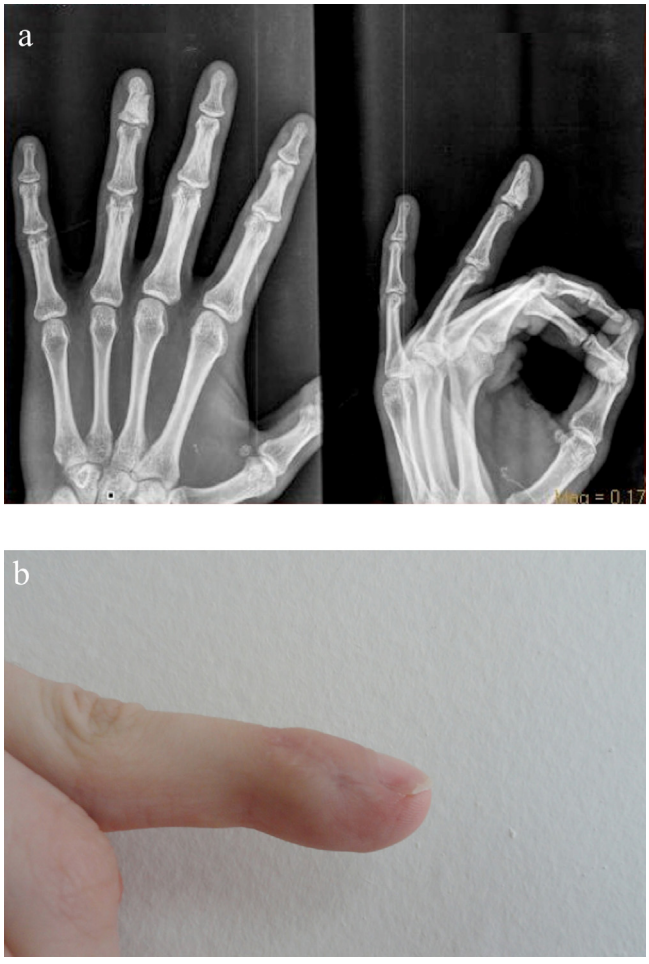

Fig. 3. Follow-up radiographs (a) and physical examination (b) at two years after surgery. Radiographs showed radiopaque interface and no evidence of local recurrence.