Chondroblastoma With Secondary Aneurysmal Bone Cyst of the Hamate: Case Report

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Chondroblastoma of the carpals is rare, can mimic other benign bone tumors, and presents a diagnostic challenge. There have been few cases of benign tumors involving the hamate, with only one reported case of chondroblastoma, which was treated with complete hamate excision. We present a case of chondroblastoma with secondary aneurysmal bone cyst of the hamate treated with curettage, high-speed burring, phenol, and autogenous iliac crest bone grafting. At the time of the most recent radiographic follow-up, there was full graft incorporation, preserved hamate morphology, and no evidence of recurrence. *(J Hand Surg 2012;37A:538–542. Copyright © 2012 by the American Society for Surgery of the Hand. All rights reserved.)*

Key words Aneurysmal bone cyst, carpal tumor, chondroblastoma, hamate, phenolization.

Chondroblastoma is a benign tumor that accounts for 1% of all primary bone tumors and commonly involves the epiphyses and apophyses of long bones.[1,2] Carpal involvement is rare, with only 6 reported cases in 26,800 primary bone neoplasms from one institution, none of which involved the hamate.[3] There has been only one reported case of chondroblastoma within the hamate, which was treated with complete hamate excision.[4] We present a case of chondroblastoma with secondary aneurysmal bone cyst of the hamate, treated with curettage, high-speed burring, phenol, and autologous cancellous bone graft.

CASE REPORT

An 18-year-old, right-handed man presented with a complaint of worsening dorsal and ulnar left wrist pain for 1 year. The onset of pain was insidious, without antecedent trauma. His symptoms were exacerbated with ulnar deviation and lifting heavy objects. He did not exhibit any constitutional symptoms.

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He had tenderness over the dorsal and palmar aspects of the hamate, with mild edema over the dorsal surface but without any skin changes. Wrist motions were 75° of flexion, 60° of extension, 35° of radial deviation, and 30° of ulnar deviation. Grip strength was reduced in the affected extremity to 12 kg, secondary to pain, compared to 50 kg on the right. The neurovascular examination was normal, and there was no lymphadenopathy or other enlargements.

Anteroposterior radiographs of the left wrist showed a lytic lesion filling the entire hamate without cortical violation (Fig. 1). Magnetic resonance imaging revealed an expansile lytic lesion encompassing the entire hamate (Fig. 2). The lesion was heterogeneous on T1-weighted and T2-weighted images, without matrix deposition or fluid–fluid lines. Differential diagnosis was giant cell tumor, aneurysmal bone cyst, chondroblastoma, and enchondroma. Due to the benign imaging characteristics of the lesion, staging studies (imaging of the chest and abdomen) were not performed, and excisional biopsy with intralesional curettage was recommended.

The mass was approached through a dorsal, longitudinal incision in line with the middle finger metacarpal. This particular approach was performed in case a salvage procedure, such as a total wrist arthrodesis, would be necessary in the future. An ulnarly based extensor retinacular flap was created to expose the dorsal capsule. A T-shaped capsulotomy was created at the distal

FIGURE 1: Preoperative posteroanterior radiograph.

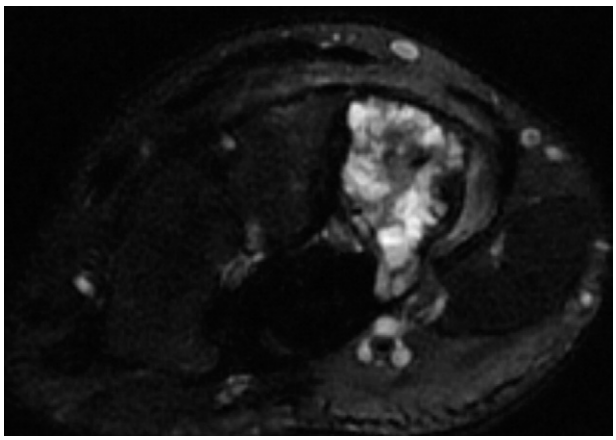

FIGURE 2: Preoperative T2-weighted axial magnetic resonance image.

margin of the dorsal intercarpal ligament over the hamate and capitate. The capitohamate joint was fully visualized and noted to have a fully intact articular surface. The periosteum was elevated off the hamate to reveal an expansile lesion with a bluish hue. An intraoperative frozen section was negative for malignant features and provided a preliminary diagnosis of aneurysmal bone cyst versus giant cell tumor.

A round burr was used to access the lesion, which consisted of blood and a lining characteristic of an aneurysmal bone cyst (Figs. 3A, 3B). The entire hamate was cleared of the lesion with curettes and a burr. Phenol (89% in concentration) was introduced into the hollowed-out hamate and then neutralized with acid alcohol (ethyl alcohol 95% and hydrochloric acid 10% in concentration). Another surgical team, with separate instruments, harvested autogenous, cancellous iliac crest bone graft, which was packed into the void within the hamate (Fig. 4).

The dorsal capsule was re-approximated with 2-0 Ethibond (Ethicon, Johnson and Johnson, Cornelia, GA) sutures. A layer of TenoGlide (Integra LifeSciences, Plainsboro, NJ) was placed over the repaired capsule before reconstruction of the extensor retinaculum. The extremity was placed into a volar splint.

Although the gross pathology appeared to be an aneurysmal bone cyst, histopathology confirmed the diagnosis of chondroblastoma with secondary aneurysmal bone cyst (Fig. 5). At 17 months after surgery, there was evidence of bone graft incorporation, no articular collapse, and no evidence of recurrence (Fig. 6).

DISCUSSION

Chondroblastoma is a rare, benign tumor accounting for approximately 1% to 2% of all primary bone tumors and almost 5% of benign tumors.[5–8] There is a male to female predilection of 2:1, and it is more common between the ages of 10 and 20 years (range, 2–83 y). Approximately 54% to 66% of chondroblastomas involve the tubular bones.[1,8,9] The proximal femur,[7,10] proximal humerus,[5,11] proximal tibia,[6,12] and tarsal bones[8] have all been reported as common sites of involvement.

Chondroblastoma involving the hand is rare, with few documented cases.[13–15] In a review of 26,800 primary bone neoplasms from one institution, Murray et al reported on 44 primary tumors of the carpals with chondroblastoma found in 6 patients (3 in the scaphoid, and 1 each in the capitate, lunate, and triquetrum).[3] In that series, there were no cases of chondroblastoma involving the hamate. There has been only one reported case of chondroblastoma within the hamate.[4] The most common symptoms are pain, localized tenderness, and limitation of movement that usually is present for several months before the time of diagnosis.[12] Our patient presented with 6 months of wrist pain aggravated by ulnar deviation.

The radiographic features of chondroblastomas are classic and consistent with long bone involvement.[5] The tumor most commonly is seen as a lucent defect located at the epiphysis. Lesions that extend to the cortex either expand the bone to maintain their round shape or are altered to conform to the contour of the host bone, with erosion and thinning of the involved cortex. Chondroblastomas tend to have a slow and indolent pattern of growth, and in at least half of the cases, there is a well-defined margin, marked by a thin sclerotic rim.[8] In the present case, the lesion was expansile and lucent, involving the