CASE REPOSITORY

Parosteal Osteosarcoma of the Distal Radius Mimicking an Osteochondroma—A Diagnostic Misadventure

Sahil Sanghavi, MS, DNB,* Abhijeet Wahegaonkar, DNB, MCh,* Yogesh Panchwagh, MS,* Amit Kharat, DNB, PhD*

We present a case of a parosteal osteosarcoma mimicking an osteochondroma with atypical clinical features, radiographic findings, and histological examination. This report serves to exemplify the importance of recognizing the similarities between these 2 entities and other peculiar features that will help to differentiate between sessile osteochondromas and parosteal osteosarcomas, to prevent misdiagnosis. *(J Hand Surg Am. 2017;■(■):1.e1-e10.*

Key words Parosteal osteosarcoma, osteochondroma, distal radius.

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A VARIETY OF TUMOR AND TUMOR-LIKE conditions originating from the surface of bone have been described in literature. Surface osteosarcomas are a rare form of osteosarcoma accounting for around 3% to 6% of all osteosarcomas.[1] Parosteal osteosarcoma is a frequently misdiagnosed condition and is often difficult to distinguish from an osteochondroma because of similarities in presentation. We describe a case of a parosteal osteosarcoma of the distal radius mimicking an osteochondroma with unique radiological and histopathological features.

CASE REPORT

A 45-year-old, right hand—dominant schoolteacher presented to our institution with a 2-month history of painless swelling of insidious onset over the dorsum of the right wrist. The medical history was largely noncontributory except for a suspected nondisplaced fracture of the distal radius resulting from a minor blunt trauma to the right wrist about 2 years earlier, which resolved uneventfully with nonsurgical treatment in a short-arm cast. Clinical examination revealed a well-defined, 5 × 4-cm hard mass that was fixed to the underlying bone. The skin over the mass appeared normal. Flexion of the wrist was 30° and extension was 20°. Pronation of the right forearm was 50° and supination was 60°. Restriction in motion occurred because of the mass effect of the lesion. Radiographs of the right wrist joint revealed an osseous mass arising from the dorsal aspect of the distal end of the right radius (Fig. 1). Magnetic resonance imaging (MRI) showed a lesion measuring 25 × 31 × 28 mm with a hyperintense area along the ulnar aspect of the bony outgrowth representative of a thickened cartilage cap (Figs. 2–4). A diagnosis of an osteochondroma arising from the distal end of the right radius was made and the patient subsequently underwent a marginal excision of the tumor (Fig. 5). The specimen was sent for histopathological examination, which showed nodular neoplastic proliferation consisting of mature trabecular bone covered with a cap of proliferating cartilage containing chondrocytes arranged in lacunae showing a single nucleus. This cartilage did not show an increase in

*From the *Sancheti Institute for Orthopaedics and Rehabilitation, Pune, India.*

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Corresponding author: Sahil Sanghavi, MS, DNB, Sancheti Institute for Orthopaedics and Rehabilitation, 16 Shivajinagar, Pune 411005, India; e-mail: sahil.sanghavi@hotmail.com.

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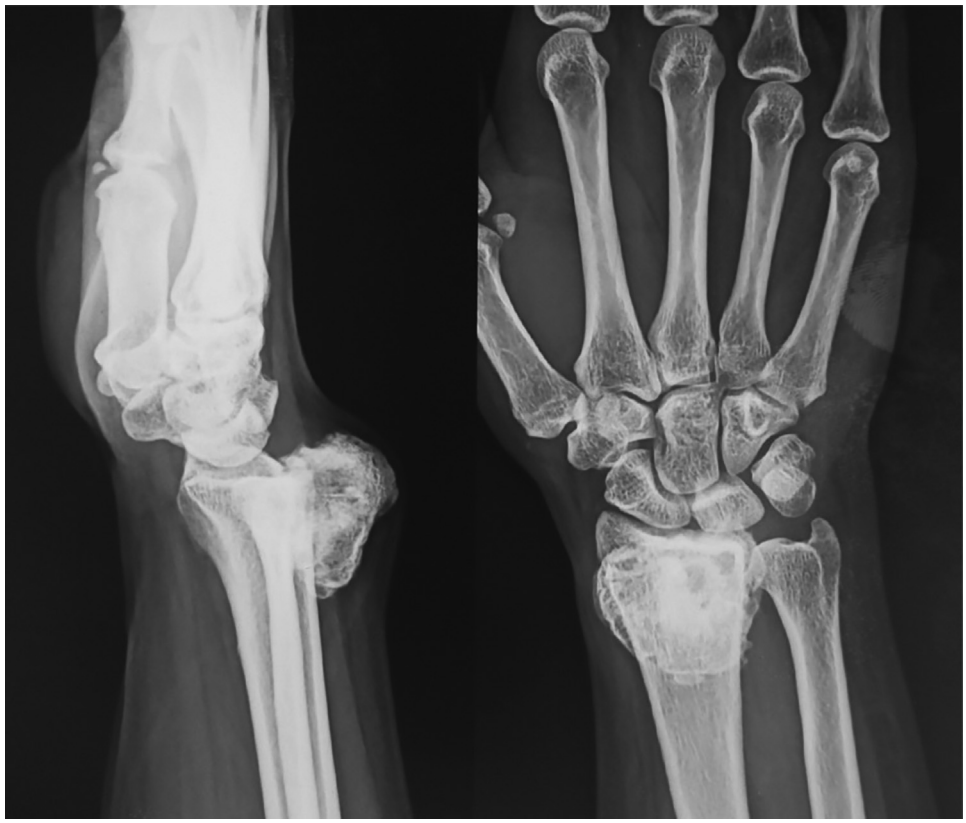

FIGURE 1: Bony mass arising from the dorsal aspect of the distal end of the right radius.

cellularity, mitotic activity, or necrosis. These findings were in accordance with our clinical diagnosis of an osteochondroma (Fig. 6).

Six weeks later, the patient presented to the clinic with recurrent swelling at the same site. Plain radiographs of the right wrist (Fig. 7), computed tomography (CT) images (Fig. 8), and MRI scans (Fig. 9) were obtained. The CT images and MRI scans showed a plaque-like osseous formation overlying the focal, scalloped postsurgical area on the dorsal aspect of the distal radius along with tenosynovitis of the extensor pollicis longus, extensor carpi radialis brevis, and extensor carpi radialis longus tendons. High-resolution CT of the chest and a technetium^{99} bone scan were performed. The high-resolution CT showed no obvious metastatic lesion and the bone scan report showed no distant skeletal involvement.

In view of the recurrence of the tumor within 6 weeks and more detailed radiological evaluation, we performed surgical intervention in the form of wide excision of the tumor along with the distal end radius. The distal ulna was used as bone graft to bridge the defect in the radius and we performed an arthrodesis of the radiocarpal joint using a dynamic compression plate (Fig. 10). Extensor tendon reconstruction was done simultaneously to restore finger extension.

Histopathological examination of the excised tumor specimen revealed a surface osteochondromatous nodule along with underlying infiltrative fibroblastic proliferation and a permeative spindle cell tumor component consistent with a diagnosis of parosteal osteosarcoma (Fig. 11). The excision margins and scar were free of tumor deposits. The distal ulna graft united (Fig. 12) with pronation of 45° and supination of 55°. At 3 years' follow-up, there was no clinical recurrence and the patient returned to her previous occupation as a school teacher.

DISCUSSION

Parosteal osteosarcoma is a rare, low-grade malignancy that arises on the surface of bone and invades the medullary cavity at a later stage. It is among the most frequently misdiagnosed entities in bone and soft tissue tumors.[2] The tumor is usually located on the posterior aspect of the distal femur in about 70% of cases, followed by the proximal tibia and proximal humerus, although rare locations such as the cranium, mandible, rib, clavicle, and tarsal bones have been reported.[3,4] Okada et al[5] described diagnostic criteria for labeling a surface osteosarcoma as a parosteal osteosarcoma. Radiographically the lesion should