ELSEVIER

European Journal of Radiology Extra 66 (2008) e47–e50

EUROPEAN JOURNAL OF RADIOLOGY EXTRA

http://intl.elsevierhealth.com/journals/ejrex

Bizarre parosteal osteochondromatous proliferation of the ulna

Eric J. Heffernan [a,*], Cheng H. Lee [b], Fahad O. Alkubaidan [a], Paul W. Clarkson [c], Bassam A. Masri [c], Peter L. Munk [a]

[a] *Department of Radiology, Vancouver General Hospital and University of British Columbia, Vancouver, BC, Canada*
[b] *Department of Pathology, Vancouver General Hospital and University of British Columbia, Vancouver, BC, Canada*
[c] *Department of Surgery, Radiation Oncology and Developmental Radiotherapeutics, BC Cancer Agency, BC, Canada*

Received 14 December 2007; received in revised form 30 January 2008; accepted 1 February 2008

Abstract

Bizarre parosteal osteochondromatous proliferation of bone (BPOP) is a rare, benign lesion consisting of bone, cartilage and fibrous tissue, which most commonly arises in the hands and feet of young adults. When arising in atypical locations such as long bones, this entity can present a diagnostic challenge to radiologists. We report a case of BPOP arising from the ulna that mimicked an osteochondroma radiologically, and describe the radiographic, CT and MR appearances of this lesion.

Keywords: Bizarre parosteal osteochondromatous proliferation; Radiography; Tomography, X-ray computed; Magnetic resonance imaging

1. Introduction

Bizarre parosteal osteochondromatous proliferation of bone (BPOP), also known as Nora's lesion, is a rare, ossifying lesion, which arises exophytically from the surface of cortical bone [1]. It occurs most commonly in the hands and feet; while occurrence in long bones has been well described in the pathology literature [2], this entity often presents a diagnostic challenge to radiologists when it arises in atypical locations [3]. We describe the radiological appearances of a case of BPOP arising from the distal ulna in a patient with no history of direct or penetrating trauma to this region.

2. Case report

A 41-year-old left hand dominant female who works in the insurance industry presented to the musculoskeletal oncology clinic complaining of an increasing mass on the distal ulnar aspect of her left forearm. She had first noticed this 8 months prior, soon after moving a load of wood. She did not note any direct trauma or penetrating injury at that or any other time in the recent past. The lump was not interfering with her wrist or hand function. She had no history of similar masses or other illnesses. There was no significant family history; in particular there was no history of bone tumors such as osteochondromata.

Examination revealed a firm bony mass attached to ulnar aspect of the distal ulna. There were no overlying skin changes and the range of movement and neurovascular examination were normal. Systemically she had no other palpable masses or skin changes and was otherwise normal.

Plain radiographs showed a 2 cm, well-defined, ossified lesion arising from the distal metaphysis of the ulna (Fig. 1). There was no associated periosteal reaction, and no reactive sclerosis in the underlying bone. Computed tomography (CT) better delineated the relationship between the lesion and the ulna (Fig. 2); the CT findings were interpreted as showing both cortical and medullary continuity suggesting the diagnosis of osteochondroma. However, on T1-weighted imaging a definite thin bridge of residual cortex was identified separating the medullary space of the lesion from that of the ulna (Fig. 3a). The mass demonstrated central high signal intensity on the T1-weighted sequence, which became intermediate in signal intensity on fat-saturated T2-weighted imaging (Fig. 3b). The periphery of the ossified component of the lesion was high signal on STIR imaging, with a well-defined, higher signal cartilaginous cap. Following the administration of intravenous

* Corresponding author at: Department of Radiology, Vancouver General Hospital, Jim Patisson Pavilion South, 899 West 12th Avenue, Vancouver, BC V5Z1M9, Canada. Tel.: +1 604 875 4111; fax: +1 604 875 4723.
E-mail address: ejheffernan@eircom.net (E.J. Heffernan).

1571-4675/$ – see front matter © 2008 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.ejrex.2008.02.003

Fig. 1. AP radiograph of the left wrist shows a well-defined ossified lesion (arrow) arising from the medial aspect of the distal ulnar metaphysis. The underlying bone appears normal, with no periostitis and no reactive sclerosis.

gadolinium, enhancement of the periphery was demonstrated, in addition to enhancement around the cartilaginous cap.

The case was discussed at our multidisciplinary tumor conference. Although the imaging was felt to be suggestive of an osteochondroma, the clinical history of rapid appearance of a mass in a 41-year-old made this unlikely. We considered parosteal and periosteal osteosarcoma to be in the differential. It was felt that biopsy would be unhelpful in differentiating these lesions and make repeat resection difficult. BPOP was not considered due to the lack of a directly traumatic injury. Our recommendation was that she should undergo an excisional

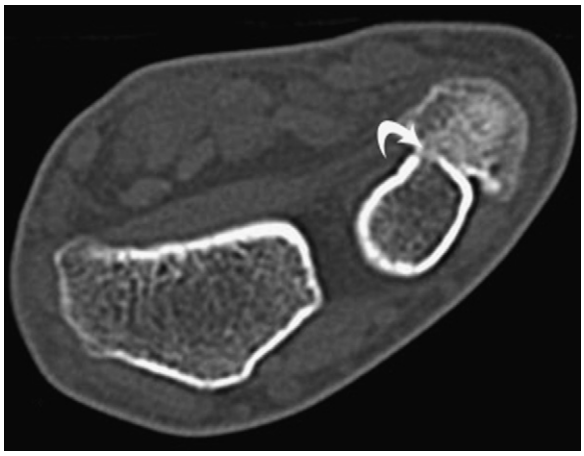

Fig. 2. Transverse CT image (bone window settings) of the distal left radius and ulna show what appears to be a cortical breach with medullary continuity between the lesion and the underlying ulna, however close inspection reveals that there is some residual high density cortex at this site (curved arrow).

biopsy as resection of this small lesion would be associated with fairly low morbidity and provide definitive management in the event that a low-grade malignancy was diagnosed. This was discussed with the patient and she gave informed consent.

Postoperatively she had some restrictions with supination and pronation initially but eventually regained this with physiotherapy and returned to normal function. Radiographs at 12 weeks postoperatively showed the graft was incorporating and the fixation stable. She will be followed for function and local recurrence.

The gross appearance of the lesion, at low magnification, was that of an osteochondroma-like outgrowth arising from the surface of the distal ulna (Fig. 4a). It was confined by a layer of periosteum that was contiguous with the periosteum covering the adjacent cortical bone. A cartilage cap measuring up to 1.5 mm in thickness was present covering the outer aspect of the lesion, and the cartilage plate appeared to have undergone enchondral ossification, giving rise to the mature bony trabeculae at the center and the base of the lesion. There was no marrow space continuity between the lesion and the under-

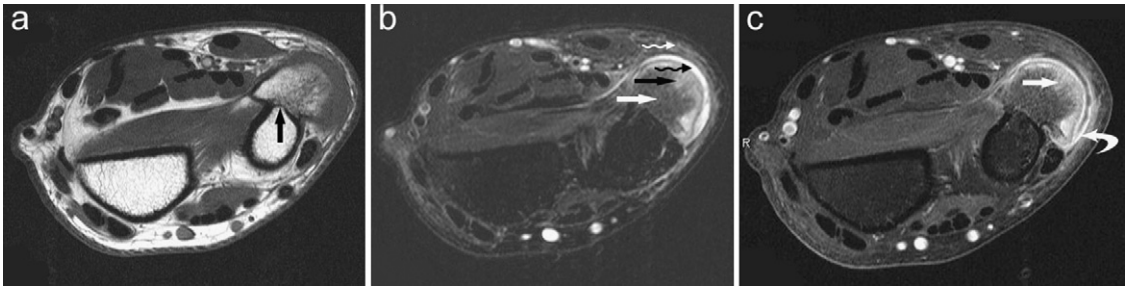

Fig. 3. Transverse T1-weighted (TR 550.0 ms, TE 17.0 ms) image, (a), shows that the signal intensity of the centre of the lesion is slightly lower than that of the ulnar marrow, and that there is a thin, low-signal bridge of intact cortex separating the medullary spaces (arrow). On T2-weighted, fat-saturated imaging (TR 3370.0 ms, TE 77.0 ms, ET 9), (b), the centre of the lesion is intermediate in signal intensity (white arrow), while its periphery returns high signal (black arrow). A higher-signal cartilaginous cap covers the mass (wavy black arrow). There is some oedema in the overlying soft tissues (wavy white arrow) however no soft-tissue mass is present. The post-gadolinium T1-weighted fat-saturated (TR 458.0 ms, TE 17.0 ms) image, (c), shows some enhancement of the periphery (arrow), with additional rim enhancement of the cartilaginous cap (curved arrow).