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Case Report

Chondrosarcoma of metacarpal – A rare presentation

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ARTICLE INFO

Article history:

Received 8 September 2012

Accepted 9 October 2012

Available online 17 October 2012

Keywords:

Chondrosarcoma

Metacarpal

Fibular strut

1. Introduction

Chondrosarcoma, a malignant bone tumour constitutes about 9% of primary bone malignancies. Common in locations like proximal femur, proximal humerus, and pelvis, rarely it can occur in hand.¹ We describe a patient with chondrosarcoma of the fourth metacarpal, a rare presentation of this tumour. To the best of our knowledge, only 13 cases (primary & secondary) are reported in literature so far.^{2–6}

2. Case report

A 50-year-old male presented to our clinic with complaints of a swelling over the fourth metacarpal of his right hand associated with pain. The swelling was spontaneous, insidious in onset, gradually progressive over a span of 8 years, with pain for the last 12 months. There were no constitutional symptoms. The patient has never consulted an orthopaedic surgeon before. Clinically the patient had a swelling involving the entire fourth metacarpal measuring 6.5 cm × 4.5 cm, hard

in consistency and immobile. The metacarpal could not be palpated separately off the swelling. Skin over the swelling was shiny with dilated veins. Movements of fourth metacarpophalangeal joint were restricted.

Radiograph of the hand showed an expansile lesion of the entire fourth metacarpal with cortical destruction and soft tissue shadow. The lesion was abutting the third metacarpal producing scalloping of its shaft (Fig. 1). MRI scan confirmed the findings of cortical break and soft tissue mass (Figs. 2–4). The proximal phalanx of the fourth finger and the hamate were essentially uninvolved.

Investigations revealed no metastasis and no other similar lesions elsewhere in the body. We proceeded with an open biopsy, which showed low-grade chondrosarcoma. Based on the clinical, radiological and histopathological findings, we made a diagnosis of chondrosarcoma.

The patient was educated about the tumour and explained about the treatment plan and the recurrence rates. After an informed consent from the patient, we decided to do a radical resection of the tumour. The entire fourth metacarpal was removed with the surrounding muscles and the biopsy track.

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<http://dx.doi.org/10.1016/j.jcot.2012.10.002>

Fig. 1 – Radiograph of the right hand anteroposterior and oblique views showing expansile lesion involving the entire fourth metacarpal with cortical erosions and soft tissue shadows. [R] Denotes right side.

Patient's ipsilateral fibula of the size equal to the resected metacarpal was harvested and fixed with the proximal phalanx and hamate after abrading their cartilage using AO mini plates (Fig. 5). The resected specimen was examined histopathologically. It showed bony trabeculae entrapped by lobules of chondrocytes with chondroid matrix exhibiting pleomorphism, hyperchromasia, mitosis, areas of myxoid change and necrosis consistent with grade 2 chondrosarcoma (Fig. 6). The margins of the tumour with the surrounding soft tissues were clear. At 5 months post-operatively, patient had no evidence of local recurrence or distant metastases.

The patient was informed that data concerning the case would be submitted for publication, and he consented.

3. Discussion

Primary chondrosarcomas are rare in the hand, with a frequency of only 1.5–3.2% of all chondrosarcomas.^{2,7} Phalangeal bones are affected in 60% of these cases, the metacarpals in about 40%.⁸ Chondrosarcomas are slow growing, and symptoms can be present for years before patient

Fig. 2 – MRI showing intramedullary expansile lesion involving the entire fourth metacarpal with cortical break and soft tissue mass. The hamate is uninvolved.

Fig. 3 – MRI showing intramedullary expansile lesion involving the entire fourth metacarpal abutting the third metacarpal.

seeks medical attention. Pain in the absence of a pathological fracture can be an important feature differentiating an enchondroma from a low-grade chondrosarcoma.⁷ Similar to enchondroma, it is a lesion arising in the medullary cavity with irregular matrix calcification, but chondrosarcomas have a more aggressive appearance with bone destruction, cortical erosions, periosteal reaction, and rarely a soft tissue mass.¹ Histologically, chondrosarcomas are composed of malignant cells with abundant cartilaginous matrix, hypercellularity, plump nuclei, binucleate cells, a permeative pattern, and entrapment of bony trabeculae.⁹ Chondrosarcoma is often separated into three histological grades: low (grade 1), medium

(grade 2), and high (grade 3). The higher the grade, the more likely it is that the tumour will metastasize.⁹

The treatment of low-grade chondrosarcoma is controversial with good results after extended curettage and the use of intraoperative adjuvant treatments. Resection is the treatment of choice for the rest. For resection, a wide operative margin is suggested, as it will reduce the prevalence of local recurrence. Generally chondrosarcoma does not infiltrate the surrounding extraosseous tissues, and by resecting the involved bone with a small cuff of the surrounding soft tissues that originate from the involved bone, an adequate margin is obtained. Chemotherapy has no role in the treatment of

Fig. 4 – MRI showing the expansile lesion of the entire fourth metacarpal. The proximal phalanx is uninvolved.

Fig. 5 – Post-operative radiograph showing the fibular strut used to reconstruct the metacarpal. The graft was fixed to hamate and proximal phalanx with AO mini plates.

conventional chondrosarcoma. Radiotherapy likewise has a limited role in treating surgically inaccessible areas.^{1,9}

In our patient, the tumour was involving the entire metacarpal with surrounding muscles, precluding curettage and salvation of the metacarpal, hence wide resection was done with reconstruction using ipsilateral fibular strut graft. Because chondrosarcomas are slow growing, long-term follow-up with regular radiographs of the operative site and the chest is imperative so that treatment can be initiated promptly in the event of a recurrence. The patient was informed and he agreed to undergo close follow-up evaluation with use of magnetic resonance imaging and chest CT and in the case of local recurrence, a wide surgical excision shall be performed. The purpose of this study was not to give a description of chondrosarcoma and its clinicopathologic

Fig. 6 – Photomicrograph of the resected specimen. The cartilage tumour has surrounded the normal trabeculae, producing a cartilage matrix with increased cellularity and enlarged nuclei, typical of chondrosarcoma.

presentation, but to present the rarity of this tumour in the metacarpal and the use of autologous fibula to reconstruct it after wide excision.

Conflicts of interest

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

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