Periosteal chondrosarcoma of metacarpal bone: Report of a rare entity

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CASE REPORT

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Abstract

Chondrosarcomas of the hand are very rare, constituting less than 0.5% of all chondrosarcomas. Metacarpal involvement and juxtacortical location are still rarer. We report a case of periosteal chondrosarcoma of metacarpal bone in a 38-year-old man, who presented with swelling of the left hand. He underwent extended ray amputation with removal of the entire left third metacarpal bone. Histopathological and radiological features of the tumour are described. Recognition of periosteal chondrosarcoma and its differentiation from other surface bone tumours is very important because the prognosis is excellent after adequate local surgery.

Key Words
Periosteal chondrosarcoma, juxtacortical, metacarpal.

Implications for Practice

1. Periosteal chondrosarcomas are very rare, constituting less than 0.2% of all bone tumours
2. MR image showing the tumour encasing the metacarpal bone and microscopy showing the grade 1 chondrosarcoma are described
3. Periosteal chondrosarcomas should be differentiated from other surface bone tumours because the prognosis is excellent after adequate local surgery.

Background

Periosteal (juxtacortical) chondrosarcoma is a rare low grade malignant cartilaginous neoplasm arising from external surface of bone. It constitutes less than 2% of all chondrosarcomas and 0.2% of all bone tumours.[1] Long bones are the common sites of this tumour, especially the femur. The hand is affected in less than 0.5% of all chondrosarcomas and among the hand bones, phalangeal bones are more commonly affected than the metacarpals. [2]

This tumour usually presents in the second and third decades of life and has a male predilection.[2,3] Patients complain of progressive swelling with or without associated pain. Often the tumour runs a long indolent course. [4]

In X-ray periosteal chondrosarcoma often appears as a rounded mass having the same radio-opacity as the soft tissue and they sometimes tend to show popcorn opacities.[3,4] MRI is superior to all other imaging techniques for detecting intramedullary abnormalities and soft tissue extensions.[2,4,5]

Grossly the tumour is seen as a lobulated mass with size ranging from 3-14cm, median 4cm. Histologically most of the periosteal chondrosarcomas are low grade (grade I and II).[1,4]

Figure 1: X-ray of the left hand. Tumour has the same radiodensity as the surrounding soft tissue

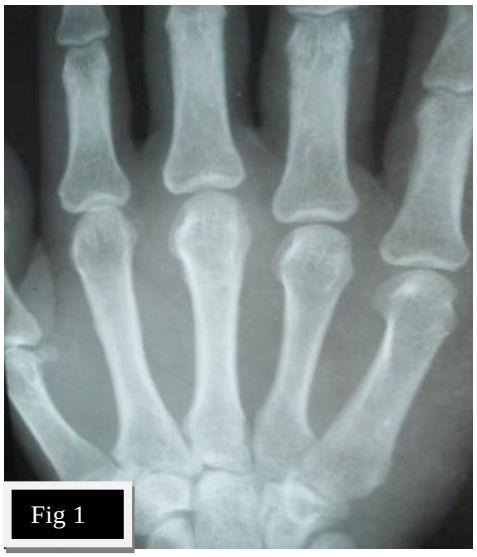


Figure 2: MR image showing the tumour of left third metacarpal bone

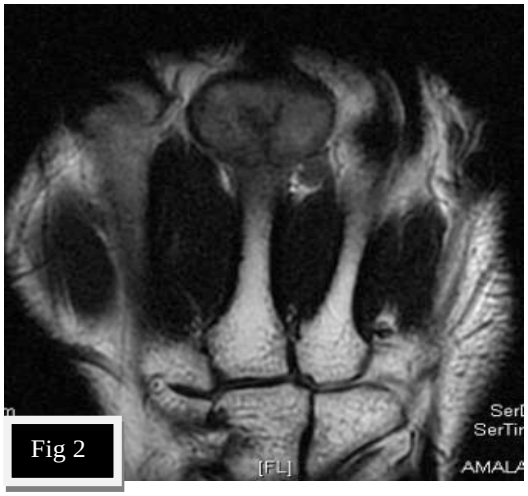
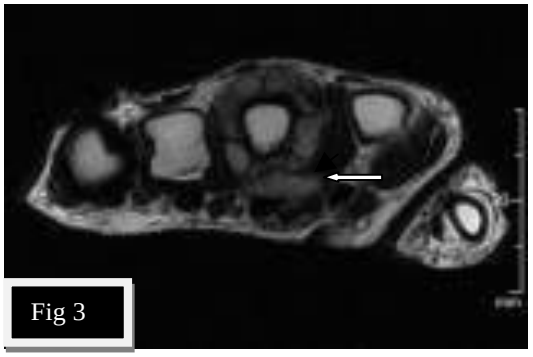


Figure 3: T1W1 MR image showing the tumour encasing the third metacarpal bone. Focal invasion of the tumour into the soft tissue is seen



Case details

A 38-year-old man presented to our hospital in July 2010, with a history of progressive painless swelling of the left middle finger of 12 years duration. X-ray showed radiolucent soft tissue mass over the third metacarpal bone of left hand (Figure 1). MRI revealed a tumour encircling the left third metacarpal towards the metacarpo-phalangeal joint (Figure 2). At one focus the tumour was seen to involve the adjacent soft tissues (Figure 3).

Figure 4: Tumour composed of lobules of chondrocytes, (hematoxylin and eosin 10x)

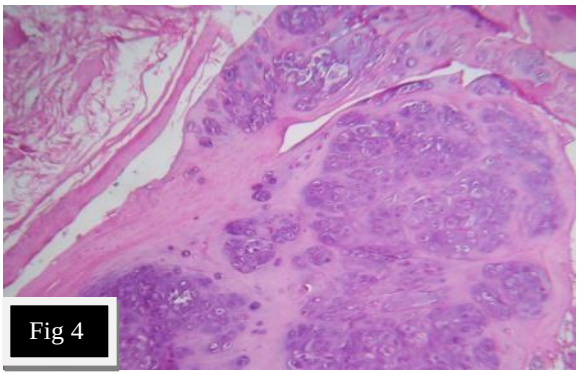
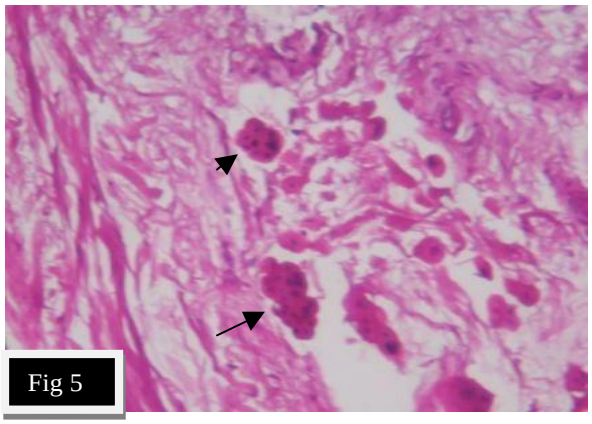


Figure 5: Neoplastic chondrocytes invading the soft tissue (hematoxylin and eosin 10x)

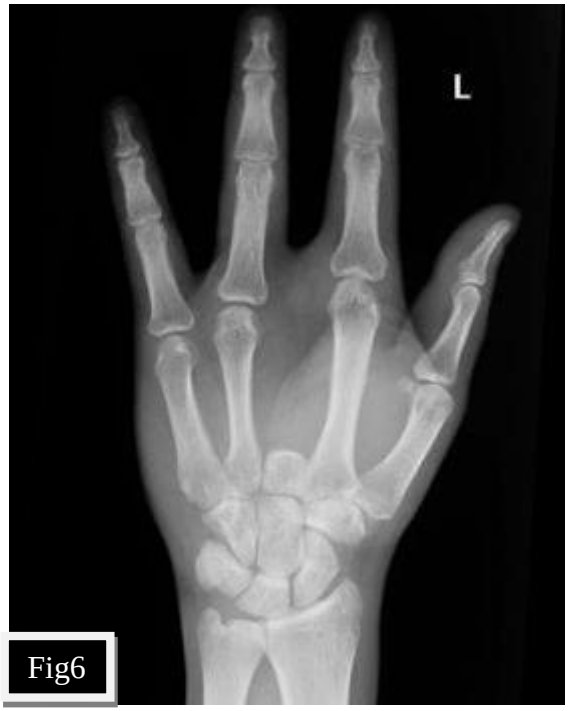


CT guided tru cut biopsy and imprint smears were sent to our department which showed features of a well differentiated chondroid neoplasm.

He underwent extended ray amputation with removal of the entire left third metacarpal. The gross specimen showed a lobulated mass encircling the metacarpal bone surface. Tumour measured 3.8cm along greatest dimension. Cut surface showed glistening appearance. Microscopy showed solid lobules of hyaline cartilage (Figure 4). The neoplastic chondrocytes exhibited atypia in focal areas. Tumour cells showed infiltration of the adjacent fibromuscular soft tissue (Figure 5). A final diagnosis of periosteal chondrosarcoma, grade 1 was made.

Patient is on regular follow-up and is disease free. Post-operative X-ray is also provided (Figure 6).

Figure 6: Post-operative X-ray



Discussion

Chondrosarcoma involving bones of the hand are very uncommon. Periosteal chondrosarcoma is a rare variant of chondrosarcoma arising in the periosteal layer of tubular bones, producing tumour mass on the bone surface. Recognising periosteal chondrosarcoma and differentiating it from other surface bone tumours is very important as the prognosis is excellent after adequate local surgery alone.[1,4] Periosteal chondroma and periosteal osteosarcoma are the close differential diagnoses and share some radiological and histologic features.

Periosteal chondroma may be the most difficult tumour to differentiate from periosteal chondrosarcoma.[1,5] According to Robinson et al, size of the tumour is the most reliable predictor to differentiate between the two.[5] However permeation into soft tissue is an important characteristic of chondrosarcoma that can be used to distinguish it from chondroma.[4,5] In our case, even though the tumour was low grade, definite invasion of the tumour cells into the surrounding soft tissue helped us to make the final diagnosis.

Periosteal chondrosarcomas usually affect metaphysis while periosteal osteosarcoma more often affects mid-diaphysis. Soft tissue margins are well demarcated in the former.[4] Histologically one can demonstrate tumoural osteoid formation.[1,4]

Prognosis is good for periosteal chondrosarcoma compared with central chondrosarcoma. The long-term survival rate is better and there are fewer recurrences. [4]

In conclusion we present a rare variant of chondrosarcoma, namely periosteal chondrosarcoma involving an extremely rare site, the metacarpal bone.

Various studies have shown that unlike the conventional chondrosarcoma, periosteal chondrosarcoma has a better prognosis.[1,3,4] Our patient is doing well with his regular follow-up.

We report this case to highlight this rare tumour in an uncommon site which requires adequate local surgery alone and has a better prognosis than central chondrosacomas. [3]

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PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests

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PATIENT CONSENT

The authors, K.P. Kavitha, M.C.Savithri, K.C. Ramani, Dominic Puthoor, declare that:

1. They have obtained written, informed consent for the publication of the details relating to the patient(s) in this report.
2. All possible steps have been taken to safeguard the identity of the patient(s).
3. This submission is compliant with the requirements of local research ethics committees.