CASE REPORT

Chondroblastoma of the Triquetrum

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Chondroblastoma is a relatively uncommon but benign bone tumor that is typically found in a long-bone epiphysis. Reports of this type of tumor in the carpals have been rare, and even fewer cases of such tumors in the triquetrum have been reported. Here, we present classical findings of a chondroblastoma at an unusual location, the triquetrum, in an adolescent. Fat-suppressed T2*-weighted imaging revealed a hyperintense tumor matrix replacing the bony trabecula of the triquetrum, which had not been addressed in previous literature. Radiography-based differential diagnosis of a bubbly lesion in the hand of an adolescent, even in the small carpal bones, should include chondroblastoma.

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1. Introduction

Chondroblastoma (CB) is a relatively uncommon, benign, cartilaginous bone tumor typically occurring in an epiphysis. It can appear in any center of ossification, although it is most often found in the epiphyses of major tubular bones.1-5 Reports of this type of tumor in the carpal bones have been rare, and only two cases of such tumors in the triquetrum have been reported.6,7 We present a rare occurrence of a CB in the triquetrum of an adolescent.

2. Case Report

A 14-year-old boy visited our orthopedic clinic because of left wrist pain associated with painful and limited range of motion. A falling episode had occurred 3 months prior to his visit, but no obvious fracture was noted on serial radiographs. Radiographs of the left wrist showed a radiolucent lesion almost completely occupying the triquetrum, with cortical thinning (Figure 1). No obvious calcification was noted within the lesion. Due to persistent pain, the patient underwent a noncontrast magnetic resonance imaging (MRI)
examination, which revealed that the lesion was hypo-
intense on T1-weighted images (WIs) and hyperintense on
fat-suppressed T2*-WIs, with edema in the adjacent soft
tissues, particularly on the ulnar side (Figure 2). Under the
suspicion of osteonecrosis, the patient underwent arthro-
scopic surgery for examination and treatment.

Arthroscopy with two dorsal portals revealed mild injury
of the scapholunate ligament, synovitis in left ulnar-side
wrist joint, and triangular fibrocartilage complex were intact. Thermal
ligament tightening, bony specimen collection, and
residual synovium shaving were performed. However, CB
was diagnosed by intraoperative pathologic examination.
The patient then underwent tumor excision of the left tri-
quetrum by intralesional curettage and local adjuvant
therapy with phenol. He had neither a sequel nor a recur-
rence of tumor in the follow-up clinic visits.

3. Discussion

CB is a rare, benign bone tumor that constitutes about
1.45% of all bone neoplasms.\(^6\) It can be distinguished from
a giant cell tumor on the basis of the chondroid matrix. CB
generally arises in the epiphysis or apophysis of a long bone
but, sometimes, may extend into the metaphyseal zone.
The knee region (34% of cases) and proximal humerus (20% of cases) are the most common sites. About 10% of CBs arise
in the hands and feet,\(^6\) and only 19 cases of CB in the
carpals have been reported\(^6\) (scaphoid, \(n = 6\); capitate,
\(n = 3\); lunate, \(n = 2\); triquetrum, \(n = 2\); trapezium, \(n = 2\);
hamate, \(n = 1\)). CB most frequently occurs in the second
and third decades of life. Males are affected more commonly than females, at a ratio of nearly 2:1. Nonspe-
cific symptoms and signs include local pain, swelling,
tenderness, and joint stiffness.

In serial radiographic studies, characteristic features
include an osteolytic, “bubbly” lesion located eccentrically
or centrically in the epiphysis or apophysis, which is usually
<5–6 cm in size, well defined, and spheroidal or ovoid in
shape. CBs mostly involve the medullary cavity and rarely
the cortex. Nearly half of these tumors are surrounded by
a thin sclerotic rim. Calcific foci within the lesion are noted
in about 30–50% of patients and are well detected on
computed tomography. MRI often shows a thin lobulated
rim. The tumor matrix is of low signal intensity on T1-WIs
and of variable signal intensity on T2-WIs.\(^9\) CBs are typically
associated with an inflammatory response with high signal
intensity on T2-weighted MRI.\(^10\) Peritumoral edema is
characteristically observed and should not be mistaken for
permeation. Benign CBs in small bones may mimic the
locally aggressive lesion. Our fat-suppressed T2*-WI
revealed a hyperintense tumor matrix replacing the bony
trabecula of the triquetrum, a finding that was not
addressed in previous literature.

Based on the patient’s age and imaging features,
differential diagnosis included infection, CB, eosinophilic
granuloma, chondrosarcoma, enchondroma, and osteo-
blastoma. Infection and granuloma often lead to meta-
physeal or diaphyseal abnormalities. Involvement of flat or
irregular bones is unusual in clear cell chondrosarcomas,
which also seldom show associated inflammation on MRI;
endosteal erosion, cortical violation, pathologic fracture,
and a soft-tissue mass may be additional findings in some
cases.\(^11\) Differentiating CB from enchondroma and osteo-
blastoma may be difficult. When radiographs reveal
a bubbly lesion in the hand of an adolescent, i.e., typical
imaging findings in a typical age distribution, even in the
small carpal bones, differential diagnosis should
include CB.
Most CBs are relatively nonaggressive and are readily curable with curettage and bone grafting. Metastases have been reported but are extremely rare. A diagnosis of CB-like osteosarcoma must be ruled out when this tumor occurs at an atypical site because some osteosarcomas have remarkably similar cytologic features. Hence, these rare tumors and clear cell chondrosarcomas must be considered when neoplasms behave aggressively. No study to date has reported the recurrence rate of CBs in the carpals. Overall, the prognosis is excellent after complete surgical removal.12–14

References