Osteonecrosis of the os centrale carpi

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Section: Musculoskeletal system
Area of Interest: Bones
Procedure: Diagnostic procedure
Procedure: Computer Applications-Detection, diagnosis
Imaging Technique: Conventional radiography
Imaging Technique: CT
Imaging Technique: MR
Special Focus: Athletic injuries Calcifications / Calculi
Congenital Case Type: Clinical Cases

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Patient: 40 years, male

Clinical History:

A 40-year-old man boxer, presented with 1-year history of progressive pain at the dorsal aspect of the right wrist. On physical examination there was swelling on the dorsoradial aspect of his midcarpal joint.

Imaging Findings:

Radiographs in the anteroposterior and oblique views shows the existence of a bone fragment of 6 mm in maximum diameter, located between the scaphoid, trapezoid and capitate bones (Figure 1). Multidetector computed tomography (CT) with multiplanar reformation demonstrated a bipartite marked sclerotic smooth triangular ossicle in the dorsal aspect of the joint between the scaphoid, capitate, and trapezoid, indicative of accessory ossicle at this level (os centrale carpi) (Figure 2). Magnetic resonance (MR) images on T1, T2 and STIR sequences depicts low signal intensity of the ossicle on all pulse sequences (Figure 3).

Discussion:

Most accessory bones of the carpus lack clinical relevance and appear as asymptomatic anatomic variants. The os centrale carpi is a relatively rare finding, and bilateral occurrence is even more uncommon. It is located at the dorsal aspect of carpus between the scaphoid, trapezoid and capitate bones. Phylogenetically it is a remnant of the central row of carpals which are present in more primitive animals. With the exception of humans and some African apes, the os centrale carpi is a normal bone in primates. In the human embryo a cartilaginous os centrale carpi with its center of ossification appears at about 6 weeks, fusing with the scaphoid at 8 weeks, forming part of its distal ulnar portion. In some instances, the os centrale may form a projection from the scaphoid or may rarely fuse with the capitate or trapezoid [1, 2, 4, 5].

This entity should be differentiated from dystrophic soft tissue calcifications as hydroxyapatite deposition disease, CREST syndrome, post-traumatic heterotopic ossification and from other abnormalities involving the scaphoid bone. An avulsion fracture shows noncorticated or irregular margins. Dysplasia epiphysealis hemimelica is rare in the wrist, but when it appears it generates large osteochondromatous-like masses in the carpus. Congenital hypothyroidism causes abnormal ossification of the scaphoid, with multiple ossification centers on its proximal and
distal aspects [1, 7].
In some cases the os centrale carpi may cause symptoms due to its mobility within the wrist, causing interference with movements of the other carpal bones. Moreover, the symptoms may be due to osteonecrosis of the ossicle and secondary degenerative changes. In the latter case, radiography and CT usually show an os centrale carpi with a sclerotic and fragmented appearance and articular irregularity and narrowing, while MR images depicts low signal intensity of the ossicle on all pulse sequences. The administration of intravenous paramagnetic contrast agent (gadolinium) may confirm the diagnosis of osteonecrosis because an absence of enhancement implies lack of blood perfusion consistent with severe ischemia and necrosis [1, 2, 3, 6].

**Differential Diagnosis List:** Osteonecrosis of the os centrale carpi, Dystrophic soft tissue calcification, Congenital hypothyroidism, Dysplasia epiphysealis hemimelica

**Final Diagnosis:** Osteonecrosis of the os centrale carpi

**References:**


Description: Figure 2. Multidetector CT with multiplanar reformation (A,B,C) shows bipartite and marked sclerotic ossicle in the dorsal aspect of the joint between the scaphoid and capitate (arrows), suggestive of a bipartite os centrale carpi. Origin: Department of Musculoskeletal Radiology, Diagnostico por Imagenes Adrogue, Buenos Aires, Argentina 2012
**Description:** Figure 3. Magnetic resonance images in T2 axial (A), T1 coronal (B), STIR sagittal (C) and coronal (D) depicts low signal intensity of the os centrale carpi on all pulse sequences (arrows), suspicious of osteonecrosis. **Origin:** Department of Musculoskeletal Radiology, Diagnostico por Imagenes Adrogué, Buenos Aires, Argentina 2012
Description: Figure 1. Radiographs in the anteroposterior (A) and oblique (B,C) views depict a bone fragment (arrows) located between the trapezoid, scaphoid and capitate bones. Origin: Department of Musculoskeletal Radiology, Diagnostico por Imagenes Adrogue, Buenos Aires, Argentina 2012