Osteochondral lesion of the elbow
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Section: Musculoskeletal system
Area of Interest: Bones Musculoskeletal joint
Procedure: Diagnostic procedure
Imaging Technique: Conventional radiography
Imaging Technique: MR
Special Focus: Athletic injuries Case Type: Clinical Cases
Authors: Dimitar Radev
Patient: 13 years, female

Clinical History:
13-year-old female patient complained of pain, discomfort and spontaneous locking of the left elbow. She does gymnastics. There was no history of acute trauma.

Imaging Findings:
X-ray examination of the left elbow: a lucent zone in the capitulum humeri demarcated by an osteosclerotic rim. MR findings: there is a lesion that involves both the cartilage and bone marrow of capitulum humeri. The osteochondral lesion is localized in the anterior and lateral part of capitulum humeri. On STIR images the lesion looks filled with fluid and there are underlying cysts. On the STIR images there are minimal bone marrow oedema changes around the osteochondral lesion as well as in the caput radii. The other structures, including caput radii, are intact. The osteochondral lesion can be classified as unstable. There is a joint effusion both anteriorly and posteriorly regarding the distal humerus. There are intraarticular fragments localized in the joint effusion – posterior to the distal humerus (olecranon fossa) (Figure 2c). These fragments are proven on subsequent arthroscopy.

Discussion:
Osteochondral lesion (OCL) of the elbow can affect different structures of the joint, but is most frequent in the anterolateral part of capitulum humeri [1]. Factors such as repetitive trauma and valgus stress in the elbow are believed to be a cause for OCL of the elbow, though the exact aetiology is not clear [2]. Immature athletes, older than 10 years, are usually affected [3, 4].

Osteochondrosis of capitulum humeri is another disorder that affects immature skeleton and is known as Panner disease [5], which may develop spontaneously or as a result of trauma or overuse injury [6]. Patients are usually younger than 10 years [5, 7].

X-ray imaging features that may be used in distinguishing the two conditions include:
• for OCL of capitulum humeri - lucent area, sometimes surrounded by osteosclerotic rim. The articular surface is irregular. With progressive disease loose bodies may appear [7, 8]. There is a classification based upon these X-ray changes: grade I – lucent zone, grade II – demarcated zone or detachment between the bone lesion and the humerus, grade III – loose bodies [8].
• for Panner disease - reduction in size, increased opacity and fissures in the capitulum humeri during follow-up [7, 6].

MRI can be used for grading of osteochondral lesions as well as for classifying them as stable and unstable lesions.
On T1-weighted images both stable and unstable lesions are characterized by a low or low-intermediate signal intensity [9]. The lack of fluid between the osteochondral fragment and the bone is a sign of stable lesion [10]. An OCL on MRI can be classified as unstable according to the following changes in T2 weighted sequences: hyperintense linear zone between the lesion and the adjacent bone, sublesional cyst, hyperintense linear zone that involves both the cartilage and the subchondral bone and focal articular surface defect [9]. These criteria are accepted for OCL of talar dome and femoral condyle and are used in OCL of capitulum humeri [8, 9].

Panner disease is a self-limiting disease and usually resolves spontaneously [5]. OCL can be treated conservatively or surgically, based upon clinical and radiological findings [8, 7].

Besides Panner’s disease, there are other conditions that should be taken into consideration in a more detailed differential diagnosis. Pseudodefet in capitulum humeri region is a normal variant and represents an anatomical sulcus located posteriorly [7]. Valgus impaction fracture, posterior dislocation of humerus and capitulum fracture can produce changes in capitulum humeri, but they can be distinguished by additional posttraumatic changes on the MRI [10].

**Differential Diagnosis List:** Osteochondral lesion of capitulum humeri, Osteochondral lesion of capitulum humeri, Osteochondrosis of capitulum humeri (Panner’s disease)

**Final Diagnosis:** Osteochondral lesion of capitulum humeri

**References:**


Figure 1

Description: Anterior posterior radiograph of the left elbow shows radiolucent lesions delineated by a peripheral rim of sclerosis.

Area of interest:
Capitulum humeri Origin: Radev D, Department of Radiology, Gentofte Hospital, Copenhagen, Denmark
Description: Coronal STIR image shows an osteochondral lesion (arrow) in the capitulum humeri and underlying cysts (arrowheads). There is an effusion.

Area of interest:
Capitulum numeri Origin: Radev D, Department of Radiology, Gentofte Hospital, Copenhagen, Denmark
**Description:** Coronal T1-weighted FSE shows a hypointense lesion in the capitulum humeri.

**Area of interest:**
Capitulum humeri. **Origin:** Radev D, Department of Radiology, Gentofte Hospital, Copenhagen, Denmark
Description: Sagittal PD – weighted with fat saturation image. There is a joint effusion (arrowheads) with intra-articular loose bodies posteriorly (arrows).

Area of interest:
Anterior and posterior to the distal humerus

Origin: Radev D, Department of Radiology, Gentofte Hospital, Copenhagen, Denmark