Osteochondritis Dissecans

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Introduction

Background

Osteochondritis dissecans (OCD) is a term for osteochondral fracture. An osteochondral fragment may be present in situ, incompletely detached, or completely detached. A completely detached fragment is a loose body (see Images 1-2).

Lateral radiograph of the knee reveals a calcified loose body (arrowhead) posterior to the knee and lucency (arrow) in the articular surface of the patella.
Anteroposterior radiograph of the knee demonstrates lucency (arrow) in the central and superior aspect of the patella.

Recent studies

Adachi et al evaluated the functional and radiographic outcome of retroarticular drilling without bone grafting in 12 patients with juvenile osteochondritis dissecans after 6 months of unsuccessful nonoperative treatment. The mean Lysholm score significantly improved postoperatively (from 72.3 to 95.8). All lesions except 1 healed after retroarticular drilling, and healing was achieved at a mean of 4.4 months on plain radiographs and 7.6 months on magnetic resonance imaging.[2]

Kijowski et al retrospectively compared the sensitivity and specificity of previously described magnetic resonance imaging criteria for the detection of instability in patients with juvenile or adult osteochondritis dissecans of the knee, with arthroscopic findings as the reference standard. Separately, previously described MR imaging criteria for detection of OCD instability were 0-88% sensitive and 21-100% specific for juvenile OCD lesions and 27-54% sensitive and 100% specific for adult OCD lesions. When used together, the criteria were 100% sensitive and 11% specific for instability in juvenile OCD lesions and 100% sensitive and 100% specific for instability in adult OCD lesions. The authors concluded from their findings that previously described MR imaging criteria for OCD instability have high specificity for adult but not juvenile lesions of the knee.[3]

Pathophysiology

Osteochondritis dissecans (OCD) is a form of osteochondrosis limited to the articular epiphysis. Articular epiphyses fail as a result of compression. Both trauma and ischemia probably are involved in the pathology. Trauma is most likely the primary insult, with ischemia as secondary injury.[4,5]
Trauma may be direct, such as impaction fracture, or repetitive microtrauma, such as excessive normal compressive stress. The pathology of OCD may be described in 3 stages.

1. In the first stage (acute injury), thickened and edematous intra-articular and periarticular soft tissues are observed. Often, the adjacent metaphysis reveals mild osteoporosis resulting from active hyperemia of the metaphysis.
2. In the second stage, the epiphysis reveals an irregular contour and a thinning of the subcortical zone of rarefaction. On radiography, the epiphysis may demonstrate fragmentation. Blood vessels within the epiphysis are incompetent because of thrombosis or microfractures of the trabeculae, which results in poor healing.
3. The third stage is the period of repair in which granulation tissue gradually replaces the necrotic tissue. Necrotic bone may lose its structural support, which results in compression and flattening of the articular surface.

Injury of the articular cartilage allows an influx of synovial fluid into the epiphysis, creating a subchondral cyst (see Images 3-8). The subchondral cyst and increased joint pressure may prevent healing.

Anteroposterior radiograph of the knee is unremarkable.
Anteroposterior radiograph of the knee 1 year after injury reveals an anterior cruciate ligament reconstruction (arrowheads) and lucency (arrow) in the lateral tibial plateau.
Sagittal T2-weighted image of the knee 2 weeks after injury demonstrates a kissing bone contusion in the lateral femoral condyle (arrowhead) and lateral tibial plateau (arrow).
Sagittal T2-weighted image 1 year after injury reveals a subchondral cyst (arrow), an articular defect in the lateral tibial plateau, and a large knee effusion (arrowhead).
Coronal T1-weighted image 2 weeks after injury is unremarkable.
Coronal T1-weighted image 1 year after injury demonstrates a subchondral cyst (arrowhead) in the lateral tibial plateau.

- Knee: In the knee joint, the medial femoral condyle is the most commonly involved site (see Images 9-10). Potential locations are the lateral aspect of the medial femoral condyle (75%), the weightbearing surface of the medial (10%) and lateral femoral condyles (10%), and the anterior intercondylar groove or patella (5%) (see Images 1-2, Images 11-13). Rarely, OCD occurs in the medial tibial plateau (see Images 14-15).[6,7,8,9,10,11,12,13,14,15,16]
Anteroposterior radiograph of the knee reveals osteochondritis dissecans in the lateral aspect (arrowhead) of the medial femoral condyle.
Axial CT of the knee demonstrates a completely detached osteochondral fracture (arrowhead) in the lateral aspect of the medial femoral condyle.

- Elbow: In the elbow joint, the most common site of OCD occurs in the anterolateral aspect of the capitellum. Singer and Roy proposed that repeated valgus stress and a tenuous blood supply within the capitellum explain the frequent occurrence of OCD in this location. In a cadaveric study of the articular surfaces of the radiocapitellar joint, Schenck et al demonstrated significant topographic differences in the mechanical properties and thickness of cartilage in the capitellum and radial head. Disparity in the mechanical properties of the central radial head and lateral capitellum probably is a factor in the initiation and localization of OCD of the capitellum (see Images 16-23).
Drawing of osteochondritis dissecans of the capitellum with localized subchondral bony flattening and a normal articular surface.
Drawing of osteochondritis dissecans of the capitellum with a nondisplaced osteochondral fragment.
Ankle: In the ankle joint, OCD occurs more frequently in the talus (see Images 24-32) than in the tibial plafond (see Images 33-36) and is 4-14 times more common.\textsuperscript{21,22} Disparity in frequency results from the biomechanical topography of the human ankle cartilage, since tibial cartilage is stiffer than talar cartilage. The usual sites of OCD of the talar dome are the posteromedial aspect (56%) and the anterolateral aspect (44%) of the talus. Occasionally, mirror-image osteochondral defects of the talus and distal tibia occur, suggesting trauma as a potential cause of both lesions.\textsuperscript{7,23,24,25,26,27,28}
Anteroposterior radiograph of the leg reveals osteochondritis dissecans in the medial talar dome (arrowhead).

Mortise view of the ankle reveals lucency in the central portion of the tibial plafond (arrowhead).

- Tarsal navicular: Occasionally, OCD of the tarsal navicular (see Images 37-40) is seen on ankle radiographs. Osteochondral fracture of the tarsal navicular is not as rare as previously reported in the radiologic literature. Radiographic findings can be subtle and, in some patients, may mimic Mueller-Weiss syndrome or stress fracture of the tarsal navicular. CT or MRI helps confirm the diagnosis. OCD of the tarsal navicular is limited to the proximal articular surface. Tarsal navicular OCD does not demonstrate the classic radiographic appearance of Mueller-Weiss syndrome, which includes comma-shaped deformity of the navicular resulting from collapse of the lateral portion of the bone, bipartite navicular resulting from fracture, or protrusion of portions of the bone or
the entire navicular bone, medially or dorsally. In addition, tarsal OCD does not demonstrate either partial or complete sagittal fracture line on CT or MRI.\textsuperscript{[29]}

Lateral radiograph of the ankle reveals a cortical depression and loss of the sharp cortical line in the proximal articular surface of the tarsal navicular (arrowhead).
Sagittal T1-weighted image of the ankle confirms osteochondritis dissecans of the tarsal navicular (arrowhead).

- **Hip joint:** In the hip joint, OCD occurs overwhelmingly in the femoral capital epiphysis. Only case reports exist of patients with OCD of the acetabulum. Many patients with OCD of the femoral capital epiphysis have a prior history of Legg-Calvé-Perthes Disease. OCD is observed in approximately 3% of adults who had Legg-Calvé-Perthes disease as children. However, this complication cannot be predicted during the early stages of the Legg-Calvé-Perthes process and may present years later. [25,30,31,32,33]

- **Shoulder joint:** OCD rarely occurs in the shoulder joint, where it involves either the humeral head or the glenoid. Only 7 patients with OCD of the humeral head have been reported. All of the patients were men, ranging from age 12-44 years. Five of the patients (71%) demonstrated lesions in the right shoulder, suggesting an association with right-handedness. Locations of involvement were the anterosuperior, posterosuperior, posteromedial, superior, and medio-inferior aspects of the humeral head. [34,35,36,37]

- **Glenoid:** OCD of the glenoid is best detected on MRI. A developmental defect of the glenoid is a normal variant that may be mistaken for OCD of the glenoid (see Images 41-42). Developmental defect of the glenoid is a small focal defect within the center of the glenoid and without associated subchondral bone marrow edema. OCD of the glenoid usually is a much larger and eccentrically located lesion (see Images 43-46).
Oblique, coronal T2-weighted image of the right shoulder demonstrates a developmental defect in the glenoid filled with fluid (arrowhead). Note the central location and absence of subchondral bone marrow edema. This is a normal variant.
Sagittal T2-weighted image of the right shoulder reveals a central depression within the glenoid (arrowhead) without associated subchondral bone marrow edema. This is a normal variant.

- Wrist joint: OCD of the wrist joint is rare and primarily occurs in the scaphoid. It may occur in either the distal or proximal pole and in either the distal or proximal articular surface of the scaphoid and may be bilateral. OCD of the scaphoid has been observed in bakers, boxers, pelota players, acrobats, and pneumatic drill workers, all of whom are subjected to repeated minor trauma of the wrist. One report of OCD of the distal radioulnar joint exists.[38,39,40,41]

**Frequency**

**United States**

Overall prevalence of osteochondritis dissecans is unknown; however, the prevalence of OCD in specific joints has been reported. In femoral condyles, OCD has been estimated to occur in 6 per 10,000 men and in 3 per 10,000 women younger than 50 years. OCD of the ankle occurs in 0.002 per 1000, regardless of age and sex. Nielsen reported a frequency of 4.1% for OCD of the elbow.[42] In general, OCD occurs more commonly in the convex surface than in the concave surface of a joint.

Overall, the knee is most frequently involved in OCD.[18] In a large series of patients with OCD, OCD of the elbow, ankle, and hip comprising approximately 6%, 4%, and 2% of OCD patients, respectively, was reported. Since the advent of cross-sectional imaging (CT and MRI), OCD of the talus has been diagnosed more frequently and, in future series, may represent the most frequent site of OCD.

**Mortality/Morbidity**

Pain is the primary symptom in osteochondritis dissecans. Osteoarthritis is a common long-term complication.
Race
No racial predilection is recognized in osteochondritis dissecans.

Sex
No sex predilection is reported in osteochondritis dissecans.

Age
Osteochondritis dissecans tends to affect young patients. In OCD of the elbow, patient age averages 23 years and ranges from 4-47 years. In OCD of the ankle, patient age averages 20 years and ranges from 8-50 years. In OCD of the hip, patient age averages 24 years and ranges from 14-39 years.[43]

Presentation
Patients with osteochondritis dissecans usually report pain at the extremes of motion range. Periarticular edema is often present with slight warmth to the touch. When a lower extremity is involved, patients often limp. Symptoms usually improve with protected immobilization of the joint.

Preferred Examination
Staging classifications of osteochondral lesions have been described best in the talus. Arthroscopic classifications of osteochondral lesions are the criterion standard. Two arthroscopic classifications of osteochondral lesions of the talus are reported. Both surgical classifications are based on the appearance of the overlying articular cartilage as seen on arthroscopy.

The Pritsch arthroscopic staging of osteochondral lesions of the talus is as follows[44]:

- Grade I - Intact, firm, shiny articular cartilage
- Grade II - Intact but soft articular cartilage
- Grade III - Frayed articular cartilage

The Cheng arthroscopic staging of osteochondral lesions of the talus is as follows[45]:

- Grade A - Articular cartilage is smooth and intact but may be soft or ballottable
- Grade B - Articular cartilage has a rough surface
- Grade C - Articular cartilage has fibrillations or fissures
- Grade D - Articular cartilage with a flap or exposed bone
- Grade E - Loose, nondisplaced osteochondral fragment
- Grade F - Displaced osteochondral fragment

Radiographic findings correspond with arthroscopic staging in 56% of patients, because fibrosis may provide stability in osseous separation. MRI correlates best with surgical staging.

Differential Diagnoses
Avascular Necrosis, Femoral Head
Osteoarthritis, Primary
Stress Fracture

Radiography
Lateral radiograph of the knee reveals a calcified loose body (arrowhead) posterior to the knee and lucency (arrow) in the articular surface of the patella.
Anteroposterior radiograph of the knee is unremarkable.
Anteroposterior radiograph of the knee 1 year after injury reveals an anterior cruciate ligament reconstruction (arrowheads) and lucency (arrow) in the lateral tibial plateau.

Anteroposterior radiograph of the knee reveals osteochondritis dissecans in the lateral aspect (arrowhead) of the medial femoral condyle.
Anteroposterior radiograph of the leg reveals osteochondritis dissecans in the medial talar dome (arrowhead).

Lateral view of the ankle reveals loss of the sharp cortical line (arrowhead) in the posterior aspect of the tibial plafond.
Lateral radiograph of the ankle reveals a cortical depression and loss of the sharp cortical line in the proximal articular surface of the tarsal navicular (arrowhead).

**Findings**

On conventional radiographs, osteochondral lesions may appear normal. When detectable, osteochondral lesions appear as lucencies in the articular epiphysis. Osteochondritis dissecans is suggested by a loss of the sharp cortical line of the articular surface.\[^{7,20,46}\]

The Berndt and Harty radiographic classification of osteochondral lesions of the talus is as follows\[^{47}\]:

- Stage I - Normal radiograph (subchondral compression fracture of the talus with no ligamentous sprain)
- Stage II - Partially detached osteochondral fragment
- Stage III - Complete, nondisplaced fracture remaining within the bony crater
- Stage IV - Detached, loose osteochondral fragment

**Computed Tomography**
Axial CT of the knee demonstrates a completely detached osteochondral fracture (arrowhead) in the lateral aspect of the medial femoral condyle.
Axial CT of the ankle reveals osteochondritis dissecans in the posteromedial aspect of the talar dome.
Coronal CT of the ankle demonstrates a nondisplaced osteochondral fragment.

Axial CT at the level of the ankle joint demonstrates lytic defect in the central and posterior portions of the tibial plafond.
Coronal CT of the ankle demonstrates a cortical depression in the tibial plafond.

Findings

In the ankle joint, helical CT has multiplanar capability. CT is obtained in the direct axial and coronal planes at 1.5-mm slice thickness with sagittal reformations. Cystic lesion of the talar dome, cortical depression, or a loose bony fragment within the osteochondral defect may be demonstrated.

The Ferkel and Sgaglione CT classification of osteochondral lesions of the talus is as follows:

- Stage I - Cystic lesion of the talar dome with an intact roof
- Stage IIa - Cystic lesion with communication to the talar dome surface
- Stage IIb - Open articular surface lesion with an overlying, nondisplaced fragment
- Stage III - Nondisplaced lesion with lucency
- Stage IV - Displaced osteochondral fragment

Magnetic Resonance Imaging
Sagittal T2-weighted image of the knee 2 weeks after injury demonstrates a kissing bone contusion in the lateral femoral condyle (arrowhead) and lateral tibial plateau (arrow).
Sagittal T2-weighted image 1 year after injury reveals a subchondral cyst (arrow), an articular defect in the lateral tibial plateau, and a large knee effusion (arrowhead).
Coronal T1-weighted image 2 weeks after injury is unremarkable.
Coronal T1-weighted image 1 year after injury demonstrates a subchondral cyst (arrowhead) in the lateral tibial plateau.
Axial T1-weighted image at the level of the ankle joint demonstrates abnormal low-signal intensity in the anterolateral aspect of the talus (arrowhead).
Coronal T2-weighted image demonstrates an articular defect and abnormal high-signal intensity in the lateral talar dome consistent with osteochondritis dissecans.
Oblique, coronal T2-weighted image of the right shoulder demonstrates a developmental defect in the glenoid filled with fluid (arrowhead). Note the central location and absence of subchondral bone marrow edema. This is a normal variant.
Sagittal T2-weighted image of the right shoulder reveals a central depression within the glenoid (arrowhead) without associated subchondral bone marrow edema. This is a normal variant.
Oblique coronal T2-weighted fat-suppression image demonstrates a hyperintense osteochondral lesion in the inferior half of the glenoid. Note the fluid in the subacromial/subdeltoid bursa and the supraspinatus tendon tear.
Axial-gradient recall image reveals an osteochondral lesion in the anterior half of the glenoid.

Findings

MRI detects radiographically occult lesions that also may not be evident on CT. A short tau-inversion recovery sequence is the most sensitive.[7,19,43]

The Anderson MRI classification of osteochondral lesions of the talus is as follows[48]:

- Stage I - Bone marrow edema (subchondral trabecular compression; radiograph results are negative with positive bone-scan findings)
- Stage IIa - Subchondral cyst
- Stage IIb - Incomplete separation of the osteochondral fragment
- Stage III - Fluid around an undetached, undisplaced osteochondral fragment
- Stage IV - Displaced osteochondral fragment

Ultrasonography
Anterior longitudinal sonogram reveals a stable lesion with localized subchondral bony flattening (arrows) and a normal outline of the articular cartilage (corresponding to Picture 16 in Multimedia; courtesy of Dr Masatoshi Takahara).

Posterior longitudinal sonogram demonstrates a stable lesion with a nondisplaced bone fragment (asterisk), intact articular surface (arrowheads), and a narrow gap formation (arrow; corresponding to Picture 17 in Multimedia; courtesy of Dr Masatoshi Takahara).
Posterior longitudinal sonogram reveals an unstable lesion with a slightly displaced fragment (asterisk) and a wide gap formation (arrows; corresponding to Picture 18 in Multimedia; courtesy of Dr Masatoshi Takahara).

Anterior longitudinal sonogram demonstrates an unstable lesion with a capitellar defect (arrow; corresponding to Picture 19 in Multimedia; courtesy of Dr Masatoshi Takahara).

Findings
Sonography has been used to evaluate osteochondritis dissecans of the knee and humeral capitellum. The advantage of sonography is dynamic scanning with motion of the evaluated joint. In one study, sonographic assessment of OCD of the humeral capitellum agreed
with radiographic assessment in 23 of 27 patients (85%), MRI assessment in 9 of 10 (90%), and surgical findings in 14 of 15 (93%).

The sonographic appearance of OCD of the capitellum is as follows:

- **Stable - Localized, subchondral bony flattening and normal articular surface**
- **Stable - Lesion with nondisplaced osteochondral fragment**
- **Unstable - Capitellar osteochondral defect with loose intra-articular fragment**
- **Unstable - Lesion with slightly displaced osteochondral fragment**

**Nuclear Imaging**

**Findings**

Scintigraphic findings are nonspecific, demonstrating a mild-to-marked increase in focal uptake in the involved bone, depending on the age of the osteochondritis dissecans. Dynamic bone scintigraphy is twice as sensitive as static scintigraphy in the detection of OCD of the femoral condyles. The scintigraphic appearance is probably a result of the slow repair process around an OCD, involving only the bone tissue surrounding the lesion, and is not a result of the OCD itself.[9,49]

**Intervention**

Treatment consists of discontinuation of the injurious activity, protected immobilization of the joint, and administration of nonsteroidal anti-inflammatory medications. Surgery may be required to remove the intra-articular loose body and/or correct the resulting degenerative changes.[14,26,30,40,44]
Media file 1: Lateral radiograph of the knee reveals a calcified loose body (arrowhead) posterior to the knee and lucency (arrow) in the articular surface of the patella.
Media file 2: Anteroposterior radiograph of the knee demonstrates lucency (arrow) in the central and superior aspect of the patella.
Media file 3: Anteroposterior radiograph of the knee is unremarkable.

Media file 4: Anteroposterior radiograph of the knee 1 year after injury reveals an anterior cruciate ligament reconstruction (arrowheads) and lucency (arrow) in the lateral tibial plateau.
Media file 5: Sagittal T2-weighted image of the knee 2 weeks after injury demonstrates a kissing bone contusion in the lateral femoral condyle (arrowhead) and lateral tibial plateau (arrow).
Media file 6: Sagittal T2-weighted image 1 year after injury reveals a subchondral cyst (arrow), an articular defect in the lateral tibial plateau, and a large knee effusion (arrowhead).
Media file 7: Coronal T1-weighted image 2 weeks after injury is unremarkable.

Media file 8: Coronal T1-weighted image 1 year after injury demonstrates a subchondral cyst (arrowhead) in the
lateral tibial plateau.

Media file 9: Anteroposterior radiograph of the knee reveals osteochondritis dissecans in the lateral aspect (arrowhead) of the medial femoral condyle.
Media file 10: Axial CT of the knee demonstrates a completely detached osteochondral fracture (arrowhead) in the lateral aspect of the medial femoral condyle.

Media file 11: Lateral radiograph of the knee reveals a calcified loose body (white arrowhead) in the infrapatellar
fat pad and lucency in the articular surface of the patella (black arrowhead).

Media file 12: Sagittal T2-weighted image of the knee demonstrates a calcified loose body (white arrowhead) in the infrapatellar fat pad.
Media file 13: Sagittal T2-weighted image of the knee (adjacent to the image in Picture 12) reveals subchondral bone marrow edema (white arrowhead) and an articular cartilage defect in the patella.
Media file 14: Coronal T1-weighted image of the knee demonstrates subchondral bone marrow edema (arrowhead) in the medial tibial plateau.

Media file 15: Sagittal T2-weighted image of the knee reveals an articular defect (arrow) and subchondral bone marrow edema (arrowhead) in the medial tibial plateau.
Media file 16: Drawing of osteochondritis dissecans of the capitellum with localized subchondral bony flattening and a normal articular surface.
Media file 17: Drawing of osteochondritis dissecans of the capitellum with a nondisplaced osteochondral fragment.
Media file 18: Drawing of osteochondritis dissecans of the capitellum with a slightly displaced fragment.

Media file 19: Drawing of osteochondritis dissecans of the capitellum with a capitellar defect.
Media file 20: Anterior longitudinal sonogram reveals a stable lesion with localized subchondral bony flattening (arrows) and a normal outline of the articular cartilage (corresponding to Picture 16 in Multimedia; courtesy of Dr Masatoshi Takahara).

Media file 21: Posterior longitudinal sonogram demonstrates a stable lesion with a nondisplaced bone fragment (asterisk), intact articular surface (arrowheads), and a narrow gap formation (arrow; corresponding to Picture 17 in Multimedia; courtesy of Dr Masatoshi Takahara).
Media file 22: Posterior longitudinal sonogram reveals an unstable lesion with a slightly displaced fragment (asterisk) and a wide gap formation (arrows; corresponding to Picture 18 in Multimedia; courtesy of Dr Masatoshi Takahara).

Media file 23: Anterior longitudinal sonogram demonstrates an unstable lesion with a capitellar defect (arrow; corresponding to Picture 19 in Multimedia; courtesy of Dr Masatoshi Takahara).
Media file 24: Anteroposterior radiograph of the leg reveals osteochondritis dissecans in the medial talar dome (arrowhead).

Media file 25: Lateral radiograph of the leg demonstrates osteochondritis dissecans in the posterior aspect of the talar dome (arrowhead).
Media file 26: Axial CT of the ankle reveals osteochondritis dissecans in the posteromedial aspect of the talar dome.

Media file 27: Coronal CT of the ankle demonstrates a nondisplaced osteochondral fragment.
Media file 28: Sagittal reformatted image of the ankle reveals a nondisplaced osteochondral fragment.

Media file 29: Mortise view of the ankle demonstrates a linear calcified loose body (arrowhead) in the talofibular joint and lucency in the lateral talar dome (arrow).
Media file 30: Lateral view of the ankle reveals a linear calcified loose body (arrowhead).
Media file 31: Axial T1-weighted image at the level of the ankle joint demonstrates abnormal low-signal intensity in the anterolateral aspect of the talus (arrowhead).
Media file 32: Coronal T2-weighted image demonstrates an articular defect and abnormal high-signal intensity in the lateral talar dome consistent with osteochondritis dissecans.
Media file 33: Mortise view of the ankle reveals lucency in the central portion of the tibial plafond (arrowhead).

Media file 34: Lateral view of the ankle reveals loss of the sharp cortical line (arrowhead) in the posterior aspect of the tibial plafond.
Media file 35: Axial CT at the level of the ankle joint demonstrates lytic defect in the central and posterior portions of the tibial plafond.
Media file 36: Coronal CT of the ankle demonstrates a cortical depression in the tibial plafond.

Media file 37: Lateral radiograph of the ankle reveals a cortical depression and loss of the sharp cortical line in the proximal articular surface of the tarsal navicular (arrowhead).
Media file 38: Sagittal T1-weighted image of the ankle confirms osteochondritis dissecans of the tarsal navicular (arrowhead).
Media file 39: Coronal T2-weighted image of the ankle reveals a central depression in the tarsal navicular (arrowhead) consistent with osteochondritis dissecans.
Media file 40: Axial T2-weighted image of the ankle demonstrates subchondral bone marrow edema (arrowhead) in the proximal aspect of the tarsal navicular.
Oblique, coronal T2-weighted image of the right shoulder demonstrates a developmental defect in the glenoid filled with fluid (arrowhead). Note the central location and absence of subchondral bone marrow edema. This is a normal variant.
Media file 42: Sagittal T2-weighted image of the right shoulder reveals a central depression within the glenoid (arrowhead) without associated subchondral bone marrow edema. This is a normal variant.
Media file 43: Oblique sagittal T2-weighted fat-suppression image reveals a large lesion in the anterior and inferior aspects of glenoid.

Media file 44: Oblique coronal T1-weighted image demonstrates a hypointense lesion in the inferior half of the glenoid.
Oblique coronal T2-weighted fat-suppression image demonstrates a hyperintense osteochondral lesion in the inferior half of the glenoid. Note the fluid in the subacromial/subdeltoid bursa and the supraspinatus tendon tear.
Media file 46: Axial-gradient recall image reveals an osteochondral lesion in the anterior half of the glenoid.

References


**Keywords**

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