

20-year-old male baseball catcher, increased activity, right knee pain. MRI 25/02/2020 OCD LFC. Healing stable or unstable?



Fig.1. Sagittal PD SPAIR high signal cleft undermines articular cartilage & subchondral bone fragment of the anterior lateral femoral condyle with high signal cysts deep to lesion.

Fig.2. Axial PD SPAIR non displaced unstable osteochondral fragment inferior lateral trochlea.



Fig.3 & 4. Sagittal and coronal PD images demonstrate trabecular condensations beneath the non-displaced fragment

#### **MRI Findings:**

- T1: variable signal, intermediate to low adjacent to fragment and variable fragment signal
- T2: high signal cleft demarcating fragment from bone indicates unstable lesion
  - low signal loose bodies, outlined by high fluid signal
  - donor site defect demonstrates high fluid signal
- MRI clues of instability
  - high signal cleft between fragment & adjacent bone on T2
  - fluid-filled cysts deep to lesion
  - high signal intensity line extending through the articular cartilage overlying the lesion
  - focal osteochondral defect full of joint fluid resulting from complete detachment of fragment

## Discussion:

- **Overview**
  - result from aseptic separation of osteochondral fragment with gradual fragmentation, articular surface and osteochondral defect. Often associated with intraarticular loose bodies.
- **Epidemiology**
  - demographics
    - juvenile form: age 10-15 while the physis is still open
    - adult form (skeletal maturity)
    - approximately a 2:1 male to female ratio
  - location
    - knee: posterolateral aspect of medial femoral condyle (70% in knee)
    - capitellum of humerus
    - talus
- **Classification:**

Clanton Classification of Osteochondritis (Clanton and DeLee)	
Type I	Depressed osteochondral fracture
Type II	Fragment attached by osseous bridge
Type III	Detached non-displaced fragment
Type IV	Displaced fragment

- **Aetiology:**
  - Uncertain, majority of cases thought to result for trauma. 40% have history of trauma.
  - Other postulated causes include:
    - avascular necrosis (AVN), fat emboli, microtrauma, familial dysplasia
  - Pathoanatomic cascade
    - softening overlying articular cartilage with intact articular surface
    - early articular cartilage separation
    - partial detachment of lesion
    - osteochondral separation with loose bodies
- **Clinical**
  - Variable, from asymptomatic to pain, locking (loose body), joint effusions & synovitis.
- **Differential diagnosis**
  - normal irregular distal femoral epiphyseal ossification, AVN, osteochondral impaction or stress/insufficiency fracture
- **Management**
  - Nonoperative
    - Restricted weight bearing & bracing: stable lesions in children, asymptomatic adults
    - Outcomes: 50-75% will heal without fragmentation
  - Operative
    - diagnostic arthroscopy: impending physeal closure
      - signs of instability, expanding lesions, failed non-operative management
    - subchondral drilling with K-wire or drill: stable lesion seen on arthroscopy
    - fixation of unstable lesion: unstable on arthroscopy/MRI >2cm: 85% heal peads OCD
    - chondral resurfacing: large lesions, >2cm x 2cm
    - knee arthroplasty: patients > 60 years

### Reference & Further reading:

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