MRI OF THE ANKLE

Bone and Cartilage

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Osteochondral Defect (OCD)
*AKA*
Osteochondral Lesion of the Talus (OLT)
*AKA*
“Osteochondritis Dissecans”

Osteochondral injury
Underlying bone necrosis, collapse, fragmentation

IT’S NOT A COINCIDENCE THAT OCD ALSO MEANS OBSESSIVE-COMPULSIVE DISORDER!!
Osteochondral Lesions of the Talus
Osteochondral Lesions of the Talus

428 OCLs: Mid-medial (zone 4) most common

Osteochondral Lesion of the Talus

Instability of osteochondral fragment is most important observation
Unstable OCD
-fluid surrounds fragment
Unstable OCD
- Fragment surrounded by fluid
- Underlying cysts, edema
35 month follow up

.interval detachment of fragment
Osteochondral Lesions

Unstable osteochondral fragment?

Direct arthrogram with contrast undercutting cartilage fragment
Anterior impingement: large spurs limiting motion on dorsiflexion - anteromedial especially
Impingement Syndromes

Anterior impingement with intraarticular body
Anterolateral Impingement

“meniscus syndrome”

- Following tear of lateral ligaments
- Scar tissue forms in recess
- Leads to impingement, pain
Anterolateral Impingement Syndrome

- Scar tissue in anterolateral gutter following inversion injury and ligamentous injury; Post-traumatic inversion
- Anterolateral pain, swelling, limited dorsiflexion
Posterior Impingement

“Os Trigonum Syndrome”

- Fluid at interval
- Cystic change
TARSAL COALITION

- painful pes planus, stiffness in adolescent
- fibrous, cartilaginous or osseous
- Secondary signs
  - Anteater sign
  - “C” sign
  - Talar beaking
- Conservative tx – immobilization
- Surgical tx – excision of coalition with placement of interposition material
"Anteater" sign
CALCANEONAVICULAR COALITION
Osseous Calcaneonavicular Coalition
"C" sign
SUBTALAR COALITION
Middle Subtalar Coalition
“Drunken Waiter” sign
Osseous middle subtalar coalition
Fibrous Navicular-cuboid Coalition
Marrow
OCCULT FRACTURE

Following acute trauma - radiographically normal

Marrow edema on T2 / STIR – may obscure fx line (look on T1)

Subacute: fx line dark
- identical to stress fx
Occult Talar Neck Fracture

Fx line
Persistent Lateral Ankle Pain Following Inversion Injury

- Fracture of the lateral talar process
- Intraarticular fracture: 50% missed on initial plain film study
Lateral talar process fracture - subacute
STRESS FRACTURE

Usually dx by radiography
Chronic repetitive injury not severe enough to cause acute fracture
Common sites: distal MT shafts, calcaneus, distal tibia
MR images - low signal line with surrounding edema; just edema = ‘stress response’
-pain at site, no acute trauma by history
Stress Fracture
BIOMECHANICAL STRESS

- Increased signal on T2 related to trabecular remodeling (probably not true edema)
  - Subcortical, subarticular, subenthesial
- Commonly seen on MRI after prolonged immobilization, altered weight-bearing
- Painless at site(s)
- Simulates true pathology
PITFALL:
HEMATOPOIETIC MARROW

RESIDUAL ISLANDS OF HEMATOPOIETIC MARROW: 11 YEAR OLD FEMALE
Ankle Pathology by MRI

- Large Effusion
- T1 and T2 hypointense
- Proliferative synovium
- Pressure erosion

**PVNS:**
- Monoarticular
- Young women
- Loves the ankle
Ankle Pathology by MRI

- Large complex effusion
- Subcortical edema (bare areas)
- Tenosynovitis
- Erosions

RA:
- Polyarticular
- Young women
Ankle Pathology by MRI

- Erosion with irregular margins
- Soft tissue mass
- No cartilage lesions

**Gout:**
- Polyarticular
- Older population
- Tophi and erosions
• “Articulation” in a strange location

**Bipartite cuneiform:**
• Many developmental variants in tarsal bones
• Instability can lead to degenerative changes and pain
Questions?