Treatment Options for Cystic Lesions of the Talus

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OCL of the Talus

- Numerous types/locations
  - Classification can be based on xray/MRI/scope
- ***What defines a "cyst"***
  - Subchondral defect vs. "blowout"
  - Large cystic lesion with Type I-IV = Loomer lesion (Type V)
    - Valve theory of Van Diyk

Beware of Imaging/Classification/Staging

- MRI/CT and arthroscopic staging systems have been advocated, yet unproven clinically
- MRI and arthroscopic correlation reported 81-83% (Mintz '03, Lee '08)
- ***CT scan useful for determining true size of lesion/cyst – edema on MRI overestimates***

McGahan, Pinney: Current Concepts Review; FAI Jan '10

Treatment of Cystic Lesion

- MRI/CT and arthroscopic findings are necessary in determining best treatment option
- Arthroscopic vs open intervention?

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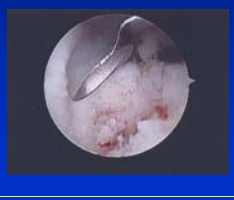
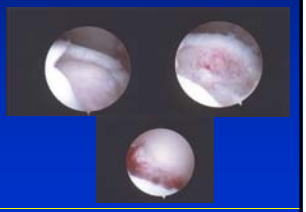
"Virgin" Lesions in Athletes

- My preference = debride (chondroplasty) and obtain stable cartilage edge; curette/microfracture





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Painful Recurrent Lesions

Never trust the findings or results of a "prior" scope unless you did the one "prior"… or have a video

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Painful Recurrent Lesions

- Assuming no other cause for pain than OCL
  - Obtain/repeat MRI/CT
  - If no "major" cyst (<1cm): redo arthroscopy
    - Often unstable cartilage rim
    - Frayed fibrocartilage - microfracture
    - Anterior impingement

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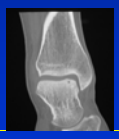
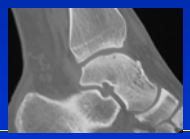
Case Example

- Recurrent pain and suspected symptomatic OCD
  - NFL player 2 years s/p microfracture
  - No "major" cyst: redo arthroscopy





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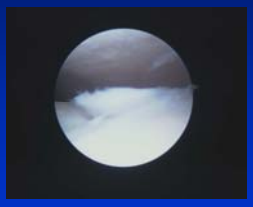
Redo Arthroscopy



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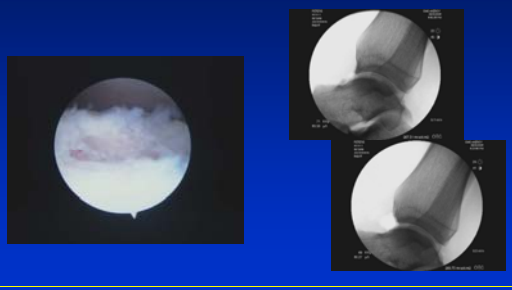
Redo Arthroscopy



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Results of Redo

- Repeat scopes don't do as well as primary but…
  - 75% G/E compared to 86% (Schuman et al, JBJS-B, '02)
  - Sawa et al; FAI '07: reasonable to repeat scope

If > 1 year of relief achieved with simple debridement, I will re-do

Open treatment in career athletes are a major blemish

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What to do with *"painful"* Recurrent/Persistent/Progressive Cystic Lesion and Failed Repeat Microfracture?

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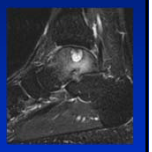
Beware of the Large Cystic Lesion

(aka Loomer lesion, Type V)

- Lesions with subchondral cyst formation have less favorable results with standard arthroscopic techniques (Kumai '99; Robinson '03; Kolker '04)
- Zengerink et al FA Clininc '06: Lesions >1 cm require open treatment



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Beware of the Large Cystic Lesion

(aka Loomer lesion, Type V)

- Choi et al AJSM '09: defects >150mm^2 on MRI do worse
- Multiple alternatives developed to fill defect but often require a malleolar osteotomy

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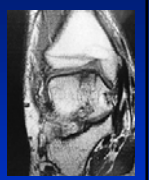
Treatment of Type V Lesions

- Retrograde drilling/filling
- Mosaicplasty
- Osteochondral Autograft Transplantation System (OATS)
- ACI (Carticel)- staged surgical procedure
  - MACI, FMACI
- Bulk Allograft Transplantation



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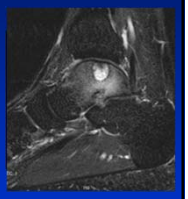
Chronic Cystic Lesions – Treatment Decision

- Depends on size of cyst
  - If less than 1 cm = debride/curette
  - If > 1 cm = fill void
- Status of articular surface
  - If cartilage cap intact and medially based = retrograde drilling and grafting



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Chronic Cystic Lesions

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Chronic Cystic Lesions

- Depends on status of articular surface
  - Retrograde drilling and grafting

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Large Chronic Cystic Lesions with Articular Defect

- Osteochondral Autograft Transplantation System (OATS)
  - If < 11 mm – knee autograft
  - If >11 mm – talar allograft
- Mosaicplasty
- ACI

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Results of OATS

- Gross et al: Allograft OATS. FAI 2001
  - 6/9 did "okay, three went on to fusion
- OATS for type V cystic OLTs (Scranton, Frey, Fedor; JBJS-Br, 2006)
  - 50 patients
    - 90% G/E results with autogenous OATS
    - 26/50 had malleolar osteotomy
    - No malleolar non-unions
    - 1 donor site pain – arthroscopic scar release
    - 15 minor reoperations

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I have not been happy with OATS

- Knee pain with autografts
- Poor incorporation with allografts
- Cartilage viability with allografts
- Need for malleolar osteotomy

- ***What other options are there?***
  - ***Have to consider expense, 2-stage surgeries***

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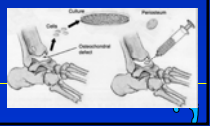
Other Options

- ACI
  - Implantation of in vitro cultured autologous chondrocytes using a periosteal tissue cover or membrane
    - 2 stages – requires harvest
    - Often requires an osteotomy
    - What to do with the defect?
    - Costly…



Other Options

- ACI
  - Ferkel (AJSM '09)
    - 32 patients - first 11 pts reported; avg age = 35; average follow-up = 36 months (24-58)
    - 9 medial and 2 lateral lesions
    - All patients failed previous surgery
    - ***6 patients had "sandwich" procedure with bone grafting of large cystic underlying defect*** and use of two periosteal grafts back to back
    - 2nd look arthroscopy on 10/11 (91%) patients; all lesions were covered by "cartilage-like" surface
    - 82% G-E, 18% fair; AOFAS preop 47, postop 84

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Very Large Lesions?

- Bulk allograft (level IV studies)
  - Rankin JBJS '09
    - 15 pts – 11 G/E, 2 fusions
  - Hahn et al: FAI '10
    - 13 pts in f.u.
  - Gortz et al: FAI '10
    - 12 ankles – 5 G/E, one fusion

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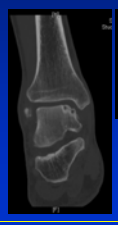
Bulk Allograft

- 24 y/o man – runner; failed 3 surgeries

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Bulk Allograft

- Last resort….




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What else???
Cartilage Allografts

- *DeNovo* (Zimmer)
  - Living juvenile cartilage particles
  - Arthrotomy
  - Debride/drill OCL



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Cartilage Allografts

- *DeNovo*
  - "sandwich" technique for cysts = bone graft the defect first

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Cartilage Allografts

- *DeNovo*
  - Calcaneal bone graft impacted into cyst
  - Use obturator as delivery vehicle

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Cartilage Allografts

- *DeNovo*
  - Lay cartilage material over the bone with use of fibrin glue

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Cartilage Allografts

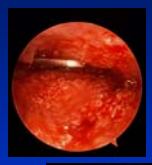
- *DeNovo*
  - Avoid over-filling

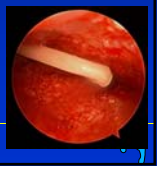
Cartilage Allografts

- *DeNovo*
  - Test ROM
  - Postop: NWB 6 weeks, no running for 6 months
  - No results thus far
  - Difficult approval process

Cartilage Allografts

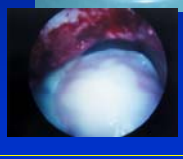
- *Biocartilage* (Arthrex)
  - "dead" cartilage allograft
  - On the shelf – much less expensive
  - Will it work???





Cystic Lesions

- The Future?
  - MACI?
    - Giza et al
    - Also avoids osteotomy
  - Cost may still be an issue



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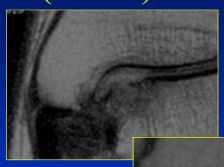
ACI (MACI)

- Early results encouraging
  - M Sullivan, Sydney



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Is the transfer of cartilage really necessary?

- What is the origin of pain?
  - Studies have shown that cartilage does not elicit pain
  - Rather due to pressure phenomenon in cyst

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If transfer of cartilage not necessary

- Fill the hole!
  - Iliac crest plug
  - I avoid biologic fillers
    - Ca Sulfate with PLA
      - Did not incorporate well

Promote growth of overlying pseudo-cartilage?

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Biologic or Bony Filler

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Biologic or Bony Filler

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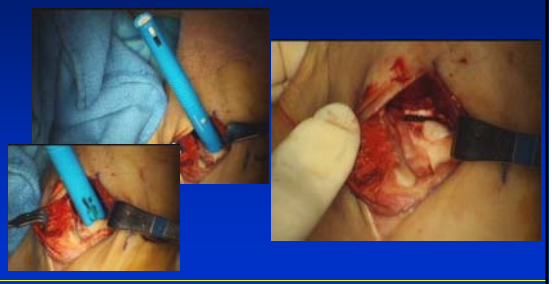
Biologic or Bony Filler



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Example: Biologic Filler

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Cystic Lesions of the Talus

- Questions remain!!!
  - What is the natural history?
  - What creates the symptoms?
  - What is the best treatment?

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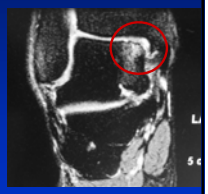
Cystic Lesions of the Talus

- Summary
  - Get CT and MRI
  - Repeat scope burns no bridges – try to avoid osteotomy
    - Try the sandwich technique
  - Need a good prospective studies with new cartilage allografts!



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Thank You!

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Generic Postop Recommendations after Scope Debridement

- NWB for 2-4 weeks if lesion <1.5cm
  - 6-8 weeks if >1.5cm
  - Boot to WB
- Begin ROM as soon as portals sealed over (7-10 days) – unless ligaments stabilized
- Pool therapy helpful

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Talar OCL - Etiology

Still no clearly defined and universally accepted etiology

- Trauma remains most commonly accepted
  - Based on Berndt and Hardy work of 1959

But do we really know?

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Talar OCL - Etiology

- Posteromedial: possible overuse, recurrent injury from instability
- Anterolateral: acute trauma

But are we sure?

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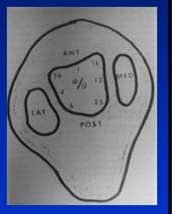
Talar OCL - Location

- Highly variable
  - Loomer et al, AJSM 1993
- Medial > Lateral but in central portion, not truly posteromedial or anterolateral
  - Raikin et al, FAI 2/07



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Talar OCL - Incidence

- Completely unknown
  - Coincidental finding or associated with ankle injuries?
  - Increased awareness due to # of MRIs now obtained?

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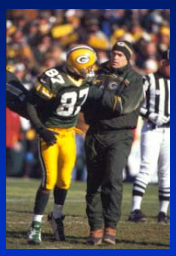
Diagnostic Findings "*Soft*"

- Vague symptoms of "giving way", catching, stiffness
- Physical findings nonspecific
  - Rarely tenderness or effusion
  - Possible ligamentous laxity
    - Medial and/or lateral



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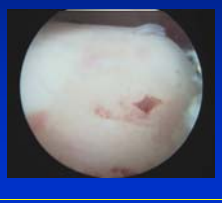
"Virgin" Chronic Lesions

- Vast majority - debride (chondroplasty) and obtain stable cartilage edge; drill or microfracture



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"Virgin" Chronic Lesions

- Type III and IV- depends on lesion
  - Vast majority = debride/curette
  - If large detached lesion with viable bone = repair with absorbable pins or screws

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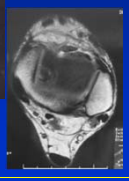
"Virgin" Chronic Lesions

- Example: 27 y/o DE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OCL + Ligament Instability

- Correct instability at time of scope (do not stage)
- Postop: protection of ligament repair more important than early motion

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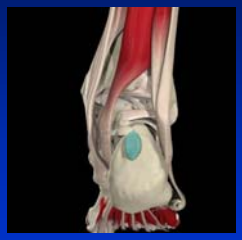
Posterior Talar OCDs or Loose Bodies

- Posterior Arthroscopy – Prone Position
  - Logistical issues if anterior pathology present



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Prone Ankle Scope

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Is the transfer of cartilage really necessary?

- What is the origin of pain?
  - Is it the bone/cyst itself?
    - Pressure phenomenon

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Is the transfer of cartilage really necessary?

- What happens to transferred cartilage plugs?
  - Zone of cartilage death from the harvest alone
  - Impaction death

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Case Presentation #2 Allograft Talar OATS

- 23yo athletic male with medial talar OCL
- Failed conservative treatment and prior scope
- Lesion >11mm therefore multiple grafts needed and allograft felt to be better option

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Results

- Allograft OATs
  - Gross et al: FAI '01
    - 9 pts: 6 survived at 11 yrs
    - 3 fusions due to resorption

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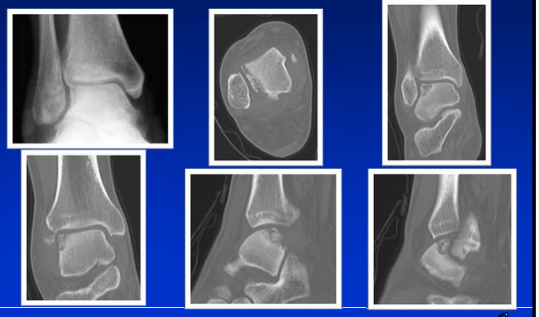
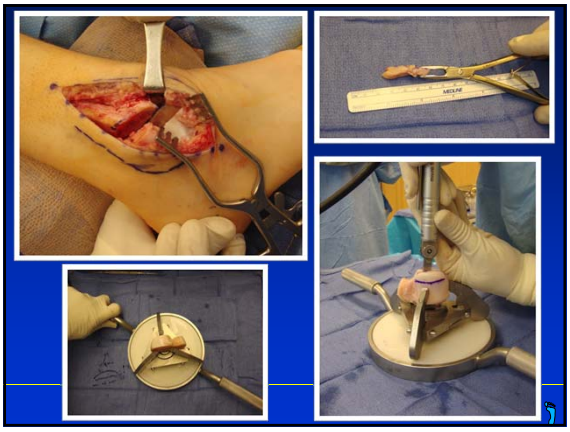
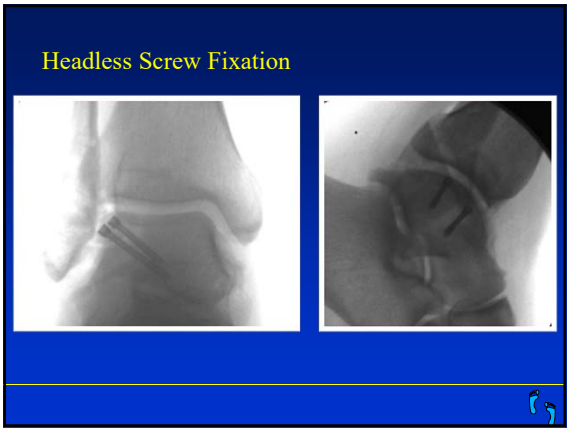
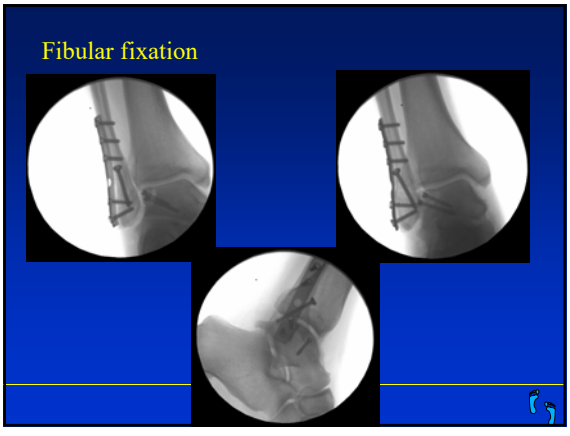
Bulk Allograft - Lateral



Lateral malleolar approach

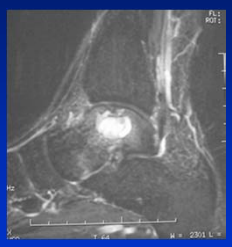



Headless Screw Fixation


Fibular fixation

Management of Bone Cysts

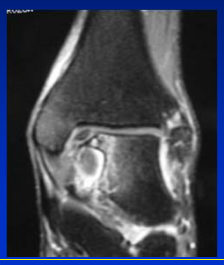
- Tibial/Talar/Calcaneal Cysts
  - Etiology?
  - Size?
  - Contained or non-contained?
  - Accessible?

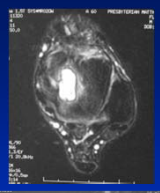


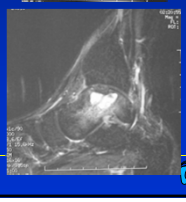
D.F.

- 34 y/o man with ankle pain
- Twisting injury 9 months prior

D.F.







D.F.

- Arthroscopic debridement
  - Removal of loose body
- Anteromedial arthrotomy
  - Inject of MIIG

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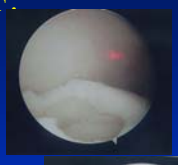

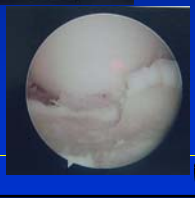

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D.F.

D.N.

- 31 y/o woman with recurrent ankle injuries
- Failed prior arthroscopy

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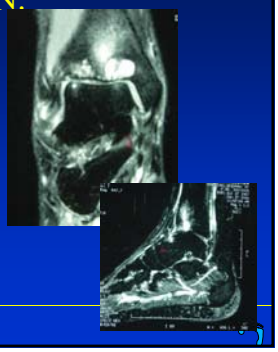
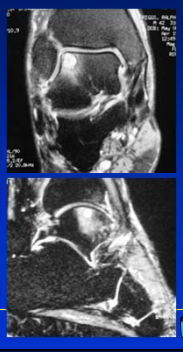


D.N.

- Arthroscopic debridement
- Percutaneous curettage and injection of MIIG

R.B.

- 36 y/o man with history of gout and ankle injury



Persistent/Recurrent Cyst and Pain after Scope

Just because there's an OCL doesn't mean it's the cause…

- Impingement syndrome (soft tissue or bone)
- Osteoarthritis
- Occult fracture
- Lateral instability
- Tarsal coalition
- Peroneal tendon pathology
- Subtalar pathology

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Results of Scope Debridement

- Tol, FAI February 2000
  - Metaanalysis (381 pts, 18 studies)
    - Non-op: 45%
    - Excision: 38%
    - Excision and curettage: 78%
    - Excision, curettage, drilling: 88%

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Results of Scope Debridement

- Ferkel et al: Arthroscopic treatment of chronic osteochondral lesions of the talus. Am J Sports Med 36:1750-1762, 2008.
  - 50 cases treated arthroscopically
  - 65-75% G/E
  - F/u 71 months

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Disclosures

Wright Medical, Arthrex: royalties, consultant, research

DJO: royalties