Arthroscopic Treatment of Osteochondral Lesions of the Talus with Allograft Cartilage Matrix

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Our disclosures are in the Final AOFAS Mobile Application. We have no potential conflicts with this presentation.
Osteochondral Lesions of the Talus (OLTs)

- OLTs
  - Focal defect in the talar dome’s articular cartilage that involves subchondral bone

- Surgical treatment is size-dependent
- Primary OLTs < 1.5 cm²
  - Arthroscopic excision & micro-fracture
    » Over 80-90% successful
    » Fibro-cartilage formation through marrow stimulation
    » Several shortcomings
      - Micro-fRACTure site is left void or exposed
      - The fibro-cartilage that forms is less durable than articular cartilage
      - Risk of OLT recurrence
Alternative Treatments to Traditional OLT Micro-Fracture

• Autologous chondrocyte implantation?
  – 2-stage procedure

• Osteochondral transport/transplant?
  – Autograft vs. allograft
  – Often requires ankle arthrotomy
    + malleolar osteotomy

• Allograft cartilage matrix?
  – Fills in the micro-fracture site
  – Done arthroscopically
  – Without prior literature to support this
• To evaluate outcomes from using allograft cartilage extracellular matrix (ECM) as an adjuvant when arthroscopically treating OLTs

• Hypothesis
  – Adjuvant use of allograft cartilage ECM for OLTs reliably provides –
    » Return to function
    » Pain relief
    » Osteochondral healing
Methods

• 22 patients with OLTs < 1.5 cm²
  – Prospective enrollment from May 2012 – September 2014
  – Arthroscopic treatment by 1 treating surgeon

• Pre- & post-surgical clinical assessment
  – Foot & Ankle Ability Measures (FAAM)
  – Visual analog scale (VAS) for pain
  – Independent observer (K.J.)

• Pre- & post-surgical imaging
  – Preoperative radiographs & magnetic resonance imaging (MRI)
  – Postoperative radiographs
  – Postoperative computed tomography (CT) at 6 months
    » To assess osteochondral healing
Methods cont.

• Technique of ankle arthroscopy
  – Antero-medial & antero-lateral portals
  – Excision & micro-fracture of OLT
  – Defect in talar cartilage filled in with allograft cartilage ECM
    » Biocartilage, Arthrex, Naples, FL

• Post-operative protocol
  – Non-weightbearing (NWB) x 4 weeks
    » 1st 2 weeks in a splint
    » Next 2 weeks in a controlled Ankle Motion (CAM) boot
  – Progressive to full WB in CAM boot x 4-6 weeks
  – Wean from boot & return to normal activities at 10-20 weeks
Results

- All 22 patients that received allograft cartilage ECM presented for final follow-up
  - Mean of 20.2 months
  - Mean FAAM increased from 51.4/100 -> 87.3/100 ($P<0.05$)
  - Mean VAS decreased from 8.1/10 -> 1.9/10 ($P<0.05$)

- Chondral healing on CT
  - 91.1% (20/22) by 6 months after surgery

- Joint alignment
  - 95.5% (21/22) acceptable w/o arthrosis
Complications

• Incomplete chondral healing by 6 months after surgery
  – 2 patients (9.1%)
    » 1 achieved healing at 9 months after surgery with no further intervention
    » 1 achieved healing with receipt of osteochondral autograft plugs from the lateral distal femur

• Post-surgical ankle degenerative joint disease
  – 1 patient (4.5%)
    » Symptoms treated nonsurgically
      – Brace immobilization
      – Activity modification
      – Anti-inflammatory medication
Discussion

• Patients who received allograft cartilage ECM OLTs < 1.5 cm² had:
  – Improved functional scores (P < 0.05)
  – Improved pain scores (P < 0.05)
  – High rates of chondral healing

• Shortcomings with this study
  – Non-comparative
  – Limited number of patients
  – Limited follow-up
Conclusion

- For treating OLTs < 1.5 cm², allograft cartilage ECM fills the osteochondral defect after arthroscopic microfracture and can yield –
  - High rates of return to function
  - High rates of pain relief
  - High rates of chondral healing

- Considerations for further research
  - Comparative studies with/without using allograft cartilage ECM in patients with OLTs < 1.5 cm²
  - Larger patient populations
  - Longer follow-up
References