Autologous Osteochondral Transplantation for Osteochondral Lesions of the Talus: Functional and T2 MRI Outcomes at Mid to Long-term follow-up

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Disclosure

Primary author has no personal disclosures

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Osteochondral lesions (OCL) are a common consequence of ankle sprains and fractures\(^1\)

Autologous Osteochondral Transplantation (AOT) attempts to restore native architecture for patients with;

- Large lesions
- Cystic lesions
- Previous unsuccessful microfracture treatment\(^2\)

- Scranton et al\(^3\)/Hangody et al\(^4\): 90-92% good to excellent outcomes
- Kennedy et al\(^5\): 72 patients FAOS scores mean improvement 52.67 to 86.19 @ 28 months

Previous, smaller series have shown good clinical outcomes and variable MRI findings\(^6\)

- T2 mapping MRI allows quantitative assessment of the graft site tissue
- No published data on T2 mapping outcomes in AOT patients
Objectives of the Study

• Assess the functional and MRI outcomes after AOT

• Establish any correlations between patient demographic variables, lesion characteristics, and outcomes

• Investigate any links between clinical and imaging outcome data
Methods

• All AOT procedures carried out by senior author between 2006 and 2013.
• 87 procedures, 85 patients

Functional Outcomes
  ➢ Foot and Ankle Outcome Score (FAOS)
  ➢ Short Form (SF-12) questionnaire

Imaging Outcomes
  ➢ Magnetic Resonance Observation of cartilage Repair Tissue (MOCART)
  ➢ T2 relaxation values of graft and adjacent control tissues
Methods – Surgical Technique

- Lesion location defined pre-operatively by MRI and confirmed intraoperatively
- Location determines surgical approach and exposure required
- Cylindrical grafts harvested from non-weightbearing portion of ipsilateral femoral condyle
- Number/Size of grafts determined intra-operatively
Results – Patient Demographics

• 85 patients
• 35% Female
• Mean age: 37 years
• Mean clinical follow up: 47 months
• 60% OCLs had traumatic etiology
• 26% patients had prior microfracture
Results – OCL data

- 48% preoperative cystic OCLs
- Mean lesion area = 104mm²
- 47% centromedial (No. 4)
- 71% required medial osteotomy approach
- 15% double plug graft
Results – Clinical Outcomes

• Mean FAOS improvement = 31 (p = 0.001)
  • Pre-op 50 to Post-op 81

• Mean SF-12 improvement = 21 (p =0.01)
  • Pre-op 33 to Post-op 54

• Males have significantly better improvement in FAOS (p=0.03)

• Other patient variables were not significantly correlated with functional outcomes
Results – Imaging Outcomes

• **Mean MOCART score = 86**
  - 83% integration to border zone
  - 74% non-intact subchondral bone (edema or cysts)

• **Significant difference in T2 relaxation times in superficial graft compared to normal control tissue (p<0.0001)**

• **Slight negative correlation between post-op FAOS and deep zone relaxation value (r=-0.381, p=0.002)**
Conclusions

• **AOT is a safe and effective procedure**

• **At a mean follow up of 4 years AOT leads to good functional and MRI outcomes**

• **Further investigation of the use of quantitative imaging analysis in those with poor postoperative clinical scores is warranted**

• **More follow-up is required to assess the significance of those with prolongation of T2 relaxation values in superficial tissues**


