Clinical Monograph

Secondary Treatment of Osteochondral Defects of the Talus
HemiCAP® Contoured Articular Resurfacing

Introduction
• Focal defects of the talar dome are not uncommon, are characterized by being deep and often cup-shaped and can lead to subchondral cysts¹ or joint degeneration.²

• Systemic review of talar dome procedures such as Osteochondral Autograft Transplantation (OATS), Autologous Chondrocyte Implantation (ACI) and Bone Marrow Stimulation (BMS) showed 76-87% success rate. Retrograde drilling and fixation showed success rates of 88 and 89%.³

• A subset of patients fails their primary procedure. These patients may be suitable candidates for the HemiCAP® Resurfacing Prosthetic as a secondary treatment option.

• Perpendicular access to the talar dome is crucial for the treatment of these lesions.⁴

• The implant is placed 0.5 mm recessed to the surrounding healthy cartilage.¹²

• Advantages of Focal Inlay Resurfacing System:
  • A family of implant convexities to address all 3 surfaces: Dome, ridge and wall
  • 3D mapping for a patient specific defect fill
  • Reproducible surgical technique
  • Strong, beadblasted screw fixation with taperlock
  • Joint preserving with exit into arthroplasty or fusion

Surgical Steps⁴,⁵
• Correct technique avoids articular step-off while maintaining perpendicular access.
• Re-fixation screws are pre-drilled at 60° in relation to the tibial axis, the osteotomy is made at 30° in relation to the tibial axis. Minimal bone is sacrificed when performing the osteotomy by using a thin saw blade. The articular cartilage is separated by osteotome to avoid cartilage loss.
• Introduction of the compression screws through the predrilled bone tunnels will result in a smooth joint surface during re-fixation.

Figure 1: 15mm Articular Inlay Resurfacing Component (CoCr) connected to high pitched screw fixation (Ti).

Figure 2 a,b: Joint access and osteotomy

Figure 3A: The talar lesion (arrow) is exposed through an oblique medial malleolar osteotomy and the necrotic fragment is excised.

Figure 3B: After the insertion of the fixation screw, the implant bed is reamed, the appropriate offset sizes are determined and a sizing trial is used to confirm a precise fit.

Figure 3C: The final articular component (A) is oriented in the correct plane and placed in the implant bed.

Figure 3D: The articular component is impacted and engaged in the morse taper interlock. The implant margins are slightly recessed to the surrounding surface.
Preliminary Clinical Results

- 10 patients with a secondary medial talar defect treated with HemiCAP® resurfacing.
- Non-weight-bearing for 6 weeks.
- Follow-up 3, 6, 12 months post-operative.
- Outcomes:
  - Numeric Rating Scale for Pain (NRS 0-10 worst)
  - AOFAS Ankle-Hindfoot score (0-100 best)
  - FAOS (0-100 best)

Radiographic Results

- There were no progressive degenerative changes of the ankle joint, as compared to preoperatively.
- There were no implant-related complications.
- The medial malleolar osteotomy was fully healed.

<table>
<thead>
<tr>
<th>NRS Pain and AOFAS Scores</th>
<th>Pre-operative</th>
<th>6 months postoperative</th>
<th>12 months postoperative</th>
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<tbody>
<tr>
<td><strong>NRS at Rest</strong></td>
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<tr>
<td>median (range) 0=best, 10=worst</td>
<td>3.0 (0-7)</td>
<td>1.0 (0-5)</td>
<td>0.5 (0-4)</td>
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<tr>
<td><strong>NRS Walking</strong></td>
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<td></td>
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<tr>
<td>median (range) 0=best, 10=worst</td>
<td>6.5 (4-8)</td>
<td>3.0 (0-9)</td>
<td>1.5* (0-5)</td>
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<tr>
<td><strong>AOFAS</strong></td>
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<tr>
<td>median (range) 0=worst, 100=best</td>
<td>69.5 (47-75)</td>
<td>72.5 (43-90)</td>
<td>85.5* (69-100)</td>
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</tbody>
</table>

*NRS at walking and AOFAS improved significantly (*) at final follow-up (p-value adjusted for multiple testing < 0.016) in comparison to the preoperative scores.

Conclusion

- Short-term results of the HemiCAP® metallic inlay resurfacing procedure showed very encouraging results for the treatment of secondary osteochondral defects of the talus.
- A larger cohort and longer follow-up is underway and will be needed to confirm the stability of the results and implant construct.

References