11:30 – 11:35 am
Use of Collagen Matrix Autologous Chondrocyte Implantation for Talus OCD
Martin R. Sullivan, MD
Sydney, Australia

Osteochondral Lesions of the Talus
Chronic sprains of acute injury can lead to damage of the articular surface of the talus. Sprains are the most common injury to the ankle in sport, and it is estimated that injuries to the talus occur in 6.5% of all ankle sprains.

Patients with cartilage damage to the talus will complain of swelling and medial or lateral ankle pain associated with activity. Report of an ankle sprain that has failed to completely heal by 8 weeks should raise suspicion of a talus cartilage injury. The patient may have a normal exam without evidence of instability; however, direct pressure over the talus with the ankle in plantarflexion will elicit tenderness. Plain radiographs of the ankle can only identify 50-66% of lesions, and the only evidence may be an inconsistency in the trabecular bone of the talus. MRI is superior to radiographs to determine the location and size of the lesion. Bone edema and potential stability of the fragment can be determined on MRI which is useful for operative planning.

The cartilage of the talus differs in composition and thickness than that of the knee. Robinson et al. demonstrated that traumatic lesions occur on both the lateral and medial aspects of the talar dome. At arthroscopy, 20 of 65 patients had lateral dome injuries. The lateral injuries were more often delamination type injuries and the average time to presentation was 1.5 years. Medial lesions occurred in 45 of 65 patients, 35 of the 45 were associated with a single traumatic event, and the average time to presentation was 3 years.

Ankle arthroscopy is recommended for cases failing conservative measures and is an effective means for diagnosis and treatment of lesions of the talus, with up to 85% of patients improving after arthroscopic drilling or curettage. Takao et al. have shown improved outcomes if the damaged cartilage is removed and microfracture is performed compared to indirect, subchondral drilling. Larger lesions that fail to improve four months after arthroscopy should be considered for osteochondral grafting or autologous chondrocyte implantation (ACI). Osteochondral grafting of defects have yielded 91-94% good to excellent results; however, limited incision or arthroscopic ACI procedures will likely become the standard of care for these lesions. Recently, Baums and colleagues reported encouraging results in 12 patients at a mean of 63 months follow up. Whittaker also described excellent results in 10 patients at an average of 23 months. We report excellent results of a 2 year, prospective study of ACI for talar dome lesions using a type I/III collagen membrane.

Discussion Outline
Talus Cartilage Treatment Options
- Large >1cm delaminating lesions may not respond well to microfracture and outcome less reliable
MACI Technology
- Current technology is MACI (Genzyme/Verigen)
- Porcine type I/III collagen membrane is seeded with chondrocytes
- Harvesting is arthroscopic from the lesion in the ankle
  “The Use of Talus Osteochondral Defect Cartilage for Chondrocyte Harvesting: Results of 151 Consecutive Patients”
International Sports Medicine Fellows Conference Post Fellowship Award 2012
MACI Investigation
- 2 year, prospective, independently funded study
- Total of 10 patients with isolated talar dome lesions and failed attempt at curettage/microfracture
- Pre-op Scoring AOFAS Hindfoot Score, SF-36, MRI with ICRS Scoring
- Intra-op Grading and lesion size
- Post-op Scoring at 1 year & 2 years

Sydney 2 Year MACI Results (FAI 2010 Sep;(9):747-53)
- Results for 10 patients available at 2 years
- Average 1.7 prior procedures
- Average time of injury or symptom onset to MACI – 4.6 years
- Lesion size $1.34 \pm 0.34 \text{cm}$ in length, $1.02 \pm 0.35 \text{cm}$ in width
- Average surface area of $1.39 \pm 0.66 \text{cm}^2$
- AOFAS hindfoot scores (1 year)
  - Preoperative – $67.5 \pm 13.8$ (range 42-76)
  - Postoperative – $77.0 \pm 11.4$ (range 46-87)
  - Significant improvement ($p<0.05$)
- SF36 Results (2 years): Significant improvement in:
  - Bodily Pain ($p=0.011$)
  - Physical Functioning ($p=0.011$)
  - No significant difference in results between 1 and 2 years
- SF36 Data Question (1 year)
  - Compared to one year ago, how would you rate your health now?
    - Significant difference ($P=0.007$)
- 10 of 10 would have procedure again

MACI Summary
- Represents the ‘second generation of ACI’
- Good alternative for patients who fail microfracture and/or curettage
- A medial malleolar osteotomy is not necessary
- It is not a first line treatment option but rather a ‘salvage’ procedure
- Cells are derived from the ankle joint and cartilage removed at time of arthroscopic surgery can be utilized as source of chondrocytes
- Encouraging clinical results with two year data particularly in terms of pain relief and function
- Long term data (currently looking at 7 year data) needed to elucidate quality of repair tissue for MACI