Osteochondral Lesions of the Talus: A 10-year prospective clinical experience

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Abstract

Introduction:

Osteochondral lesions of the talus (OLTs) are a heterogenous group of injuries involving the talar cartilaginous surface and/or subchondral bone. Primary OLTs, which represent a small proportion of all OLTs, were previously referred to as osteochondritis dissecans (OCD) lesions and involve chronic diseases of the subchondral bone arising from deficient vascular supply. The vast majority of OLTs are secondarily related to a history of trauma, although other factors may be involved including ankle instability or mechanical malalignment (Giannini, cite others). They are most common in the young, athletically active population, with the average age of patients being 20-30 years and a male preponderance of over 70% (O’Loughlin, others). Although the exact incidence is unknown (Gobbi), OLTs are being increasingly recognized due to improved imaging modalities and a heightened index of suspicion (Schacter, others).

Berndt and Hardy published their landmark description of talar osteochondral injuries in 1959 (cite), and numerous classification systems and treatment algorithms have expanded on their work since then. Unfortunately, no general consensus on treatment recommendations has been reached, largely due to the heterogeneity inherent to these lesions. Ferkel et al reported (from Easley) that staging results following arthroscopic debridement did not correlate with radiographic, CT or MRI staging. In conjunction with this, there are few high level studies in the literature to guide decision-making, as only one prospective, randomized study on surgical treatment of OLTs has been reported (Gobbi et al).

Surgical management has traditionally been the treatment of choice for symptomatic lesions as it has been well documented in the literature that non-operative management of symptomatic lesions has a high failure rate (cite). Several surgical techniques have been described, including marrow-stimulation procedures (abrasion arthroplasty, microfracture, antegrade and retrograde drilling), osteochondral autografting (OAT, mosaicplasty), allograft transplantation and autologous chondrocyte implantation (ACI). For defects less than 1.5cm2 with intact subchondral bone, microfracture is a popular treatment choice (cite several). For lesions larger than this, outcomes are much less predictable (Choi et al), and no surgical technique has been proven to be superior. Revision surgery for failed treatment presents another management challenge (cite).

We have been prospectively following our patients treated with microfracture and osteochondral autografting since the start of 2000. The purpose of our study is to compare outcomes of OLTs treated with either microfracture or osteochondral autografting, depending on the International Cartilage Research Society (ICRS) grade at time of arthroscopic debridement. We tested the null hypothesis: No difference in treatment outcomes will be seen.Materials and Methods

This prospective analysis included skeletally mature patients with International Cartilage Research Society (ICRS) grade III and IV lesions (See Table 1) treated with microfracture or OAT by the senior author (S.A.L.) over a ten-year period from 2000-2009. All patients had symptomatic (pain and/or limitation of function) lesions despite a minimum of 3 months of nonsurgical management, or had already failed previous marrow stimulation procedures. All lesions were evaluated with radiography as well as MRI and classified at time of arthroscopy. Excluded were patients with ICRS grade I and II lesions, uncontained ICRS grade IV lesions (peripheral lesions without an intact bony perimeter), bipolar lesions, those associated with an ankle fracture and those with diffuse arthritic changes of the ankle.

*Surgical technique*

All patients initially underwent a diagnostic ankle arthroscopy. The patient was placed in a supine position, and a general anesthetic was administered. A non-invasive ankle distractor strap connected to a sterile bar and attached to the operating table was used to dial in appropriate tension to the ankle (GUHL DISTRACTOR, Acufex , USA). Standard ankle arthroscopic portals (anterolateral, anteromedial and posterolateral) were utilized for diagnosis, debridement and appropriate treatment. Initial debridement was performed using a shaver and following adequate debridement, the size of the lesion was measured by the senior author (SAL) with use of a marked probe. The size and depth of bony involvement was measured and noted as well.

For patients undergoing osteochondral transplantation, a medial malleolar osteotomy was required to allow exposure of posteromedial or central lesions. Anterolateral lesions were approached via a mini-arthrotomy with ATFL release. Fibular or Chaput’s osteotomies were done when necessary [33].

Arthroscopic debridement with marrow stimulation via the microfracture technique was performed for patients with ICRS grade III lesions (full thickness cartilage loss with no bony involvement). After standard arthroscopic debridement, the calcified zone of cartilage was scraped off with a curette and then multiple holes were created in the subchondral bone spaced 3mm apart to allow vascular channels to form [34]. These microfractures were achieved by using a pointed awl and mallet. The tourniquet was then taken down to ensure bleeding from the holes [9,10].

Those patients with ICRS grade IV lesions (full thickness cartilage loss with a bony defect) had a single plug osteochondral autograft (OATS) or mosaicplasty from the ipsilateral knee, depending upon the size and morphology of the lesion. Ideally, up to a 10-mm diameter focal osteochondral plug is inserted perpendicularly to fill the defect.[8, 35]. Mosaicplasty instruments (Arthrex, USA) were used to measure the diameter of the grafts to be obtained, to carve out the base of the lesion and measure the depth of the recipient holes. The grafts were obtained with double-edged tubular cutting chisels that ensure the precise diameter and length of the grafts. The tubular drill holes on the recipient site were made through a tubular drill guide, which also served as the delivery tube. This was repeated until all the grafts were seated flush on the recipient bed [9-12]. Our mosaicplasty technique is similar to that described by Hangody et al. (F&A Intl 03). (SHOULD WE INCLUDE PICTURES OF THE TECHNIQUES?)

Results

The major outcome measures utilized in this study were the pre and post-operative American Orthopedic Foot and Ankle Society Hindfoot Score (AOFAS) and Visual Analog Scale (VAS) pain and function scores. Other variables collected included age, sex, body-mass index (BMI), length of follow-up, location of lesion, duration of symptoms prior to procedure, history of trauma, history of prior surgeries, subsequent procedures, complications, and overall satisfaction.

*Microfracture Group*

*Osteochondral Autografting Group*

Discussion

The aim of our study was to report on the prospective outcomes of patients with OLTs treated with two surgical techniques. Our results show that BLAH BLAH BLAH

Conclusion

The results of our study show that microfracturing of ICRS stage III lesions leads to high patient satisfaction and function over mid-term follow-up. Our results also show that osteochondral autografting can lead to good/excellent results over mid-term follow-up but the results are inferior to those seen in the microfracture group. Further studies need to delineate the ideal first-line treatment for these troubling injuries.

References