Outcomes of Bone Peg Fixation for Osteochondral Lesion of the Talus

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INTRODUCTION:

The available methods of fixation for an osteochondral fragment include a metal screw, a bioabsorbable screw, and fibrin sealant. However, these methods have weak points, such as the need to remove the screw, their relatively weak strength, and a foreign body reaction of biomaterials. In order to overcome these problems, fixation can be undertaken using autogenous cortical bone pegs.

The aim of this study was to describe the use of this technique in patients with osteochondritis of the talus, with persistent symptoms after conservative treatment, including postoperative radiological evaluation using CT or MRI. The hypothesis was that this form of fixation would show satisfactory results without complications.

METHODS:

Between September 2014 and July 2017, 25 patients with symptomatic osteochondritis of the talus and an osteochondral fragment, who were treated using bone peg fixation, were analyzed retrospectively. All were available for complete follow up at a mean 22 of months (12 to 35). There were 15 males and ten females with a mean age of 19.6 years (11 to 34). The demographics of the patients are shown in Table 1.

The indications for surgery were: deep ankle pain corresponding to the location of the lesion, bone oedema or increased uptake around the lesion on T2-weighted MRI images or single-photon emission CT (SPECT-CT), and failed conservative treatment, such as cast immobilization and insole, for at least three months.

The clinical results were evaluated using a visual analogue scale (VAS) and the American Orthopaedic Foot and Ankle Society (AOFAS) score preoperatively and at the final follow up. The radiological results were evaluated using classification described by Hepple et al. based on the MRI findings, the location of the lesion, the size of the osteochondral fragment, and the postoperative healing of the lesion.

RESULTS: The mean VAS and AOFAS score improved significantly from 6.3 (4 to 8) and 70.6 (44 to 78) preoperatively to 1.6 (0 to 5; $p < 0.001$) and 91.1 (77 to 100; $p < 0.001$, paired t-test) after surgery, respectively. Of the 15 patients who engaged in sporting activities before surgery, 14 had resumed these at the time of the final follow up. Table 2 shows the radiological results, including the classification and location of the lesion, the size of the fragment, and the postoperative healing of the lesion. In all cases, the screws and plates used for fixation were removed after union was obtained. One patient had medial pain due to synovitis at the osteotomy site; arthroscopic synovectomy was performed when the screws were removed and the symptoms resolved. No patients had nonunion or malunion of the osteotomy.

DISCUSSION AND CONCLUSION:

Bone peg fixation has several advantages over other methods of fixation.[25] First, no special implants such as metal or bioabsorbable screws, and fibrin sealants are needed. Pegs can be harvested easily from the distal tibia without another incision. Secondly, removal of the implant is not required after union as the pegs are absorbed. This could reduce the risk of damage to the normal cartilage when fixation fails. Lastly, the pegs can enhance union between the osteochondral fragment and the talar bed because they are autogenous. Finally, there is no risk of a foreign body reaction.

In conclusion, bone peg fixation for osteochondral lesions of the talus showed satisfactory clinical and radiographic results, without complications. This technique could be a good form of treatment for patients with this condition who have an osteochondral fragment.

Table 1. Demographics and Baseline Data

	n (%)	Mean (range)
Gender (M / F)		
Male	15 (60)	
Female	10 (40)	
Mean age (years)		19.6 (11-34)
BMI (kg/m^2)		23.8 (17.9-43.4)
Follow-up periods (months)		22 (12-35)
Duration of symptom (months)		27 (3-108)
History of traumatic events	21 (84)	
History of recent trauma (within 3 months)	15 (60)	

BMI, body mass index

Table 2. Radiographic results of all subjects

	n (%)	Mean (range)
Classification by Hepple et al.		
1	0	
2a	9 (36)	
2b	0	
3	14 (56)	
4	2 (8)	
5	0	
Location of OLT		
Posteromedial	19 (76)	
Anterolateral	5 (20)	
Centrolateral	1 (4)	
Size of fragments (mm)		
Anteroposterior		11.2 (5-20)
Mediolateral		10.4 (7-18)
Depth		5.2 (3-10)
Postoperative healing state of OLT		
Good (complete union)	19 (76)	
Fair (partial union)	6 (24)	
Poor (no change)	0	

OLT, osteochondral lesion