



Fixation of medial malleolar fractures with magnesium bioabsorbable headless compression screws: short-term clinical and radiological outcomes in eleven patients

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Abstract

Objective The purpose of this retrospective study was to evaluate the outcome of medial malleolar fractures treated with magnesium (MgYREZr) bioabsorbable compression screw fixation.

Materials and methods Eleven patients with a medial malleolar fracture (either isolated or accompanied by bimalleolar or trimalleolar ankle fractures) who were treated with magnesium bioabsorbable compression screws between 2015 and 2016 in our hospital were retrospectively evaluated. Patients were monitored with a mean follow-up of 17.3 ± 4.1 months (range 12–24 months). The mechanism of injury was ground level falls in all patients. All fractures were classified as closed fractures. American Orthopedic Foot and Ankle Society's (AOFAS) scale and the visual analog scale (VAS) were used to evaluate the clinical results during the final follow-up. Bone union and a possible loss of reduction were assessed with serial radiographs. Potential complications including revision surgery and infection were recorded and reported.

Results There were 11 patients (4 female, 7 male) with a mean age of 41 ± 21.9 years (range 20–78 years). Six patients had Herscovici type C and five patients had type B fractures. At the final follow-up the mean AOFAS score was 94.9 ± 5.7 points (range 85–100 points) and the mean VAS score was 0.4 ± 1.2 points (range 0–4 points). Radiographic solid union was achieved in all cases. No complications were seen during the follow-up. No patients required implant removal or revision surgery.

Conclusions This is the first study that investigates the use of bioabsorbable magnesium compression screws in medial malleolar fractures. The results of this study revealed that fixation of medial malleolar fractures with bioabsorbable magnesium compression screws provides adequate fixation with good functional results.

Level of evidence Level IV, therapeutic, retrospective case series.

Keywords Biodegradable implants · Magnesium screws · Ankle fractures · Functional outcome · Bioabsorbable implants

Introduction

Ankle fractures are most common and frequent injuries that constitute around 9% of all fractures [1]. Medial malleolar (MM) fractures appear either isolated or accompanied by lateral or posterior malleolar fractures. It has been shown that failure of anatomic reduction of the talar mortise results

in ankle instability and secondarily in post-traumatic osteoarthritis of the ankle joint. Therefore, if medial malleolar fracture is a component of an instable ankle fracture such as bimalleolar or trimalleolar fracture, surgical fixation of all fractures is generally recommended. On the other hand, stable or minimally displaced (< 2 mm) isolated MM fractures can be treated conservatively with high rate of union and good functional results [2]. However, in biomechanical studies, it has been demonstrated that even 1 mm of bone displacement or step-off increases the contact pressure of the ankle joint that may eventually lead to post-traumatic osteoarthritis [3]. In a recent study comparing conservative versus operative treatment of isolated MM fractures ($n = 137$), fracture displacement of more than 2 mm was found to be an independent risk factor for inferior results in either treatment

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