Is One Screw Adequate to Secure the Medial Malleolus in an Unstable Ankle Fracture?

***Jessica Mandel, BA**; Rajkishen Narayanan, MD; Sanjit R. Konda, MD; Kenneth A. Egol, MD*
NYU Langone Orthopedic Hospital, New York, NY, United States

Purpose: Ankle fractures are among the most common orthopaedic injuries encountered. The purpose of this study is to analyze any differences in outcomes following fixation of a medial malleolar fracture with 1 versus 2 lag screws.

Methods: Between April 2013 and February 2017, 752 patients who presented at 2 hospitals within 1 academic institution with an unstable rotational ankle fracture and were treated operatively by a trained orthopaedic surgeon were identified. Data collected included patient demographics, injury information, and operative management. Inclusion criteria for analysis included patients who underwent open reduction and internal fixation of an ankle fracture that included fixation of the medial malleolus. Data regarding radiographic outcomes, pos-operative complications, and need for revision surgery were collected. Medial malleolus fragment size was assessed by 1 investigator (J.M.) on the AP and lateral views of the initial injury radiograph. Functional outcome was assessed using the Maryland Foot Score (MFS). Data were analyzed using Fisher's exact tests and Independent t-tests with SPSS version 23 (SPSS Inc).

Results: Out of the 201 patients who met inclusion criteria, 52 patients (25.9%) received 1 medial malleolar screw and 149 patients (74.1%) received 2 screws. Of the patients with 1 medial malleolar screw, 5 patients (9.6%) received additional fixation of the malleolus with 1 Kirschner wire. Our cohort was 62.1% male with an average age at initial injury of 48.0 + 17.8 years. At a mean of 3.8 + 2.6 months, all patients had united their fracture. The average malleolar fragment size on AP radiographic views for patients with 1 screw was smaller than those with 2 screws (14.7 mm + 3.9, 16.4 mm + 3.4, respectively, $P = 0.009$). Fragment size was also smaller for patients with 1 screw when measured on the lateral view of the radiograph (21.4 mm + 4.7, 26.2 mm + 2.9, respectively, $P = 0.001$). There was no difference between groups in ankle dorsiflexion or plantar flexion at 1 year postoperatively ($P = 0.451$, $P = 0.581$). Patients who received 1 screw did not differ from those who received 2 screws with respect to MFS ($P = 0.924$). Furthermore, time to healing, postoperative complication rate, and rate of revision surgery did not differ between groups.

Conclusion: The use of a single screw for medial malleolar fixation does not appear to be problematic. This information is especially important in situations when the fragment is too small to accommodate multiple fixation points. The decision of whether to utilize 1 or 2 screws in larger fragments is based upon the orthopaedic surgeon's discretion.