

**A Cadaveric Study: Does Ankle Positioning Impact the Quality of Anatomic Syndesmosis Reduction?**

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**Purpose:** We sought to compare the quality of syndesmotic reduction with the ankle in maximal dorsiflexion versus neutral plantar flexion (normal resting position).

**Methods:** Baseline CT imaging of 10 cadaveric ankle specimens from 5 donors was obtained with the ankles placed in normal resting position. Two fellowship-trained orthopaedic surgeons disrupted the syndesmoses of each ankle specimen. All ankles were then placed in neutral plantar flexion and were subsequently reduced with thumb pressure under direct visualization via an anterolateral approach and stabilized with one 0.062-in K-wire placed from lateral to medial in a quadricortical fashion. Post-reduction CT scans were then obtained with the ankle in normal resting position. This process was repeated with the ankles placed in maximal dorsiflexion during reduction and stabilization. Post-reduction CT scans were then obtained with the ankles placed in normal resting position. All post-reduction CT scans were compared to baseline CT imaging. Mixed-effects linear regression was used to assess the difference of baseline scan compared to reduction in neutral plantar flexion and maximal dorsiflexion with significance set at  $P < 0.05$ .

**Results:** Syndesmotic reduction and stabilization in maximal dorsiflexion led to increased external rotation of the fibula compared to baseline scans ( $13.0^\circ \pm 5.4^\circ$  [mean  $\pm$  standard deviation] vs  $7.5^\circ \pm 2.4^\circ$ ,  $P = 0.002$ ). There was a tendency toward lateral translation of the fibula with the ankle reduced and stabilized in maximal dorsiflexion ( $3.3 \text{ mm} \pm 1.0 \text{ mm}$  vs  $2.7 \text{ mm} \pm 0.7 \text{ mm}$ ,  $P = 0.096$ ). No other statistically significant differences between measurements of reduction with the ankle placed in neutral plantar flexion or maximal dorsiflexion compared to baseline were present ( $P > 0.05$ ).

**Conclusion:** Reducing the syndesmosis with the ankle in maximal dorsiflexion may lead to malreduction with external rotation of the fibula. There was no statistically significant difference in reduction quality with the ankle placed in neutral plantar flexion compared to baseline. Future studies should assess the clinical implications of ankle positioning during syndesmotic fixation.