

**Syndesmosis Reduction and Fixation Using Intraoperative 3D Imaging***Morad Mohamad, MD; Victor Dubois-Ferrière, MD**Hôpitaux Universitaires de Genève, Genève, SWITZERLAND*

**Background/Purpose:** Ankle syndesmotic injuries are common. They require anatomic reduction and fixation to restore the normal biomechanics of the ankle joint and prevent long-term complications. Intraoperative CT can provide accurate assessment of syndesmotic reduction. However, there is evidence that evaluating the tibiofibular relationship based on three-dimensional (3D) imaging of the injured side may not be sufficient. The purpose of this study is to assess the quality of reduction of tibiofibular syndesmosis using intraoperative CT scan, and using the uninjured ankle CT scan as a template to guide the reduction.

**Methods:** All patients underwent intraoperative or preoperative CT scan of their uninjured ankle. The injured ankle syndesmosis was reduced and temporarily fixed with a Kirschner wire. An axial slice, 1 cm proximal to the tibial plafond, was obtained with an intraoperative CT scan, and compared to the uninjured ankle CT at the same level. If the reduction did not match to the uninjured side, the reduction was revised and CT repeated. Finally the syndesmosis was fixed with 3.5-mm screws and a final intraoperative CT scan was obtained. A greater than 2-mm anterior-posterior or medial-lateral displacement compared with the untreated ankle was considered significant malreduction.

**Results:** Using the technique described, 17 patients have been treated. Ten patients had a fracture Weber C-type, 5 a Maisonneuve fracture, and 2 had a revision of syndesmosis malreduction. Position of the fibula in postreduction CT scans showed a mean anterior-posterior displacement of 0.88 ( $\pm 0.67$ ) mm as compared to the uninjured ankle. The medial-lateral position showed a mean displacement of 0.91 ( $\pm 0.55$ ) mm.

**Conclusions:** The results of this study indicate that fixation of syndesmosis using the contralateral side as a reference and under O-arm control provides a more accurate method. This appears to be a promising technique to have up to 100% of anatomic reduction. To the best of our knowledge, this is the first study using the uninjured ankle CT as template to guide syndesmosis reduction.