The Radiologic Change of Distal Tibiofibular Joint Following the Removal of the Transfixing Screw After Syndesmotic Injury
Bi O Jeong, MD, PhD, Jong Hun Baek, MD, Wookjae Song, MD

Category: Ankle, Trauma

Keywords: Syndesmosis, Syndesmosis malreduction, Transfixing screw, Removal

Introduction/Purpose: Transfixing screw fixation is required after anatomic reduction of syndesmosis disruption. An accurate anatomic reduction is related to good functional outcome. However, there is a dispute over whether the transfixing screw should be removed, and little is known about the change of syndesmosis integrity after screw removal. This study aimed to evaluate the effect of transfixing screw removal on syndesmosis integrity with computed tomography (CT) scans.

Methods: The study was done prospectively on 28 cases (28 patients) who had transfixing screw fixation for syndesmosis injury from September 2010 to August 2016. Mean age was 31.9 years (range, 17 to 55 years). There were 20 male patients and 8 female patients. Transfixing screws were removed after 3 months, and CT scans were done just before and 3 months after transfixing screw removal. Anterior and posterior measurement ratio (A/P ratio) of the syndesmosis was measured on axial CT images for radiological analysis of changes in syndesmosis integrity between before and after screw removal.

Results: Malreduction was observed in 7 cases (25%) before transfixing screw removal. All 7 cases were anterior malreductions. Syndesmosis was spontaneously reduced after screw removal in 5 out of the 7 malreduction cases (71.4%). The A/P ratio in the 7 cases decreased from average 1.37 (range, 1.25 to 1.61) before screw removal to average 1.12 (range, 0.96 to 1.25) after screw removal. The decrease was statistically significant (p = 0.016). Syndesmosis malreduction rate decreased from 25% before screw removal to 7.1% after screw removal. All patients with adequate reduction of their syndesmosis continued to have a reduced syndesmosis after transfixing screw removal. However, this difference in malreduction rate was statistically insignificant (p=0.063).

Conclusion: Although the malreduction rate is relatively high after transfixing screw fixation in disrupted syndesmosis, the malreduced syndesmosis was spontaneously reduced in 71% of cases after screw removal. Therefore, it is beneficial to remove the transfixing screw a certain period of time after transfixing screw fixation to achieve anatomic reduction of the syndesmosis.