

## Syndesmotic Instability After Total Ankle Replacement: A Neglected Problem?

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**Category:** Ankle Arthritis

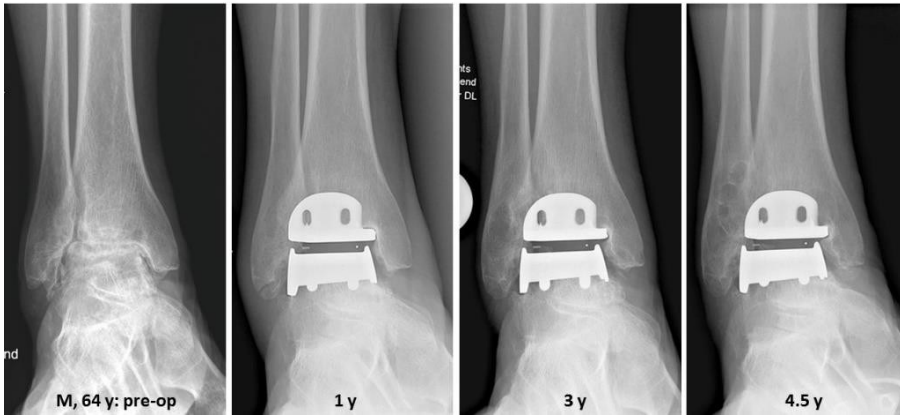
**Keywords:** total ankle replacement, three-component ankle, syndesmotic instability, failure of polyethylene insert, cyst formation

**Introduction/Purpose:** Total ankle replacement (TAR) evolved over the last decades and has been shown to be an effective concept in the treatment of ankle osteoarthritis (OA). In three-component designs, the second interface between polyethylene insert (PI) and tibial component allows the PI to find its position according to the individual physiological properties. This was believed to decrease shear forces within the ankle joint. However, it is not clarified to which extent such an additional degree of freedom may overload the ligamentous structures of the ankle joint over time. This may in particular be the case for the syndesmotic ligaments. Therefore, the purpose of this study was to analyze all ankles after TAR that showed a symptomatic overload of the syndesmotic ligaments and to determine the potential consequences.

**Methods:** Between 2003 and 2017, 31 ankles (females, 17; males 14; mean age 60 [40-79] years) were treated with a tibio-fibular fusion for a symptomatic instability of the syndesmosis. The indication for TAR was posttraumatic OA in 27 (87%), primary OA in 3 (10%), and hemochromatosis in one ankle (3%). The 31 ankles included 23 primary TAR (74%), 6 revision TAR (19%), and two take-down of a fusion and conversion to TAR (7%). Criteria for fusion were the presence of at least two of the followings: (1) tenderness over the syndesmosis, (2) pain while compressing the fibula against the tibia (squeeze test), (3) pain while rotating the foot externally (external rotation test), (4) widening of the syndesmosis on an anteroposterior view. Alignment of TAR (tibial articular surface [TAS] angle) and hindfoot alignment were measured on standard radiographs. Intraoperatively, the syndesmotic instability was confirmed before fusion. The wear of PI was documented.

**Results:** After a mean of 63 (range, 4 – 152) months after TAR, all patients evidenced pain at the level of the syndesmosis of at least 3 months. 25 ankles (81%; 24 after posttraumatic OA) showed a widening of the syndesmotic space and 22 ankles (71%) of the medial clear space with lateral translation of the talus. The PI was seen to overlap the tibial component in 15 ankles (48%). Nine ankles (29%) evidenced cyst formation, and eight ankles (26%) showed a decrease in height of the PI; whereas, in 3 ankles (10%) a fracture of the PI was found. A valgus misalignment of the heel was found in 25 ankles (81%), a valgus TAS in 16 (52%) and a varus TAS in 11 ankles (36%).

**Conclusion:** A syndesmotic instability after a three-component TAR apparently occurred mostly after posttraumatic OA, in particular if the heel was left in valgus. If the talus starts to move lateralward, the PI seems to be at risk for increased wear and finally mechanical failure (Figure 1). Therefore, a valgus misaligned heel should always be corrected during TAR implantation. If there is any sign of syndesmotic instability, a fusion should be considered. Further studies must prove whether in cases with a syndesmotic instability the use of a two-component design will be superior, as it stabilizes the talus in the coronal plane.



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