OSTEOCHONDRAL AND LIGAMENT INJURY PATTERNS IN ANKLE FRACTURES: A MULTI-CENTER STUDY

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Background: When treating ankle fractures, the presence of talar osteochondral lesions and the extent of ligamentous injury is associated with the severity of injury. The Danis-Weber classification system has been used to predict potential ligament damage.

Purpose: The purpose of this study is to validate the ligament injury patterns that have been proposed to occur with the Danis-Weber Classification and identify the cartilage injury pattern that occurs on the talus with each fracture type.

Study Design: Retrospective Cohort Study.

Methods: A prospective, multi-center foot and ankle arthroscopy registry was queried for patients who underwent arthroscopic treatment of ankle fractures from 2017 to 2020. Pre-operative and intra-operative findings were noted, including the Danis-Weber fracture classification, presence and location of osteochondral damage, and unstable deltoid, and/or syndesmotic ligaments. Kendall's tau-b, a nonparametric correlation coefficient for ordinal variables, was used to measure the strength and direction of association between Weber fracture type and the presence of a syndesmotic injury, deltoid ligament tear, medial malleolus fracture, or osteochondral lesion. The locations of osteochondral damage were compared as percentages.

Results: 73 subjects were prospectively collected as part of a multicenter ankle arthroscopy database. Average subject age was 43 years (SD = 17) with 59% female and 41% male. A significant association between the presence of a syndesmotic injury and fracture type was identified, with syndesmotic injuries more likely occurring with a Weber C fracture (73%, $r_T = 0.44$, $p < 0.0005$). A significant association was not identified between Weber classification and a deltoid tear(23%, $r_T = 0.74$, $p = 0.47$) or medial malleolus fracture(32%, $r_T = -0.001$, $p = 0.79$). Location of the talar osteochondral lesions were as follows: 22% medial-anterior, 22% lateral-anterior, 22% lateral-central, 17% central-anterior, 9% medial-central, 4% later-posterior, 4% central. There was no significant association identified between Weber classification and the location of the osteochondral injury ($p = 0.99$).

Discussion/Conclusion: Concurrent injuries with syndesmotic disruption, deltoid ligament tears, medial malleolus fractures, and osteochondral lesions have been proposed to be associated with Weber C ankle fractures. However, in this multicenter study, only syndesmotic injuries were associated with the Weber C classification. This study found similar rates of medial malleolus fractures and osteochondral lesions in Weber B and C type fractures.

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