Ankle fracture – correlation of Lauge-Hansen classification and patient reported fracture mechanism

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Introduction/Purpose: The genetic Lauge-Hansen classification is considered to provide a link between mechanism of ankle injury and resulting fracture morphology. In this study, we addressed the question of agreement between the mechanism of the fracture as postulated by the Lauge-Hansen classification and mechanism reported by the patient in rotational ankle fractures. Understanding of the actual mechanisms of ankle fracture may guide treatment decisions.

Methods: Of 110 screened patients with acute malleolar fractures, 78 were able to provide information on their fracture mechanism and were included in the study. The study group consisted of 43 women and 35 men with a mean age of 47.8 (range 19.5-88.4) years. Patients were asked to describe the direction of deformation with primary question being pronation and supination as demonstrated by the examiner. As hyperplantarflexion and hyperdorsiflexion has been spontaneously reported by the patients, these directions were added to the analysis. Radiographs were analyzed according to Lauge-Hansen classification and compared with fracture mechanisms reported by the patients.

Results: The majority (35/78 = 44.8%) of patients reported pronation as their fracture mechanism, 27 (34.6%) patients reported supination, 15 (19.2%) patients reported hyperplantarflexion (3 pure, one combined with pronation and 11 combined with supination), and 1 patient reported hyperdorsiflexion combined with pronation.
Radiographs revealed 61 supination-external rotation (79%), 1 supination-adduction (1.3%), 14 pronation-external rotation (18%), 1 pronation-abduction (1.3%) fractures. One x-ray was unclassifiable with the Lauge-Hansen classification.
The patient reported mechanisms were in concordance with the mechanism deducted from the x-rays in 49% of cases. Only 17% of patients who recalled a pronation trauma actually had radiographs classified as pronation fractures while 76% of patients who recalled a supination trauma were also radiographically classified as having sustained supination type fractures.

Conclusion: The Lauge-Hansen classification should be used with caution for determining the actual mechanism of injury as it was able to predict the patient reported fracture mechanism in less than 50% of cases. A substantial percentage of fractures appearing radiographically as supination type injuries may have been actually produced by a pronation fracture mechanism.

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