Value of Ultrasound for Stability Assessment of Isolated Lateral Malleolar Fractures Compared to Stress Radiography and Arthroscopy

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Introduction/Purpose: Isolated Lateral malleolus fracture, like any other fractures can be treated by operative or conservative treatment. Stability of ankle joint is the most important factor in deciding the type of treatment. Unstable ankle joints present superior clinical outcomes with surgical management. There are many methods to assess the stability of ankle joint such as plain x-ray films, stress radiographies and physical examination. Many studies have suggested the usage of ultrasound for diagnosis of ankle ligament injury. But, there are no reports about its use for stability assessment of isolated lateral malleolar ankle fracture. Therefore, the purpose of this study is to evaluate the value of ultrasound for stability assessment of isolated lateral malleolar fractures, compared to simple x-ray, stress radiography and arthroscopy.

Methods: We have conducted a prospective study which included 13 consecutive patients who underwent arthroscopic exam and subsequent open reduction and internal fixation for isolated lateral malleolar ankle fracture. Before operation simple x-ray, external rotation stress radiographs were done. Stress ultrasound was performed to assess the anterior inferior tibiofibular ligament (AITFL) and medial deltoid ligament prior to operation. The arthroscopic findings were used as the reference standard. A standardized physical examination (tenderness and ecchymosis, external rotation stress test), simple radiography, stress radiography and ultrasound images were compared to assess the stability.

Results: Deltoid ligament injury and or syndesmosis injury were verified arthroscopically in 12 cases with a clinical diagnosis (92.3%). There were 9 cases who showed unstable ankle fracture on the simple radiography, (69.2%). There were all cases who showed unstable ankle fracture on the external rotation stress radiography. (100%) In addition, for 12/13, there were acute tear of the deltoid ligament or AITFL injury on the ultrasound (92.3%).

Conclusion: The results suggest that ultrasound could be used for the assessment of the instability of isolated lateral malleolar fracture.

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