

Multiligament Ankle Instability following Rotational Ankle Injuries: A Prospective Cohort Study

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INTRODUCTION:

Rotational ankle injuries are frequent and mostly benign. However, chronic pain and residual instability following an index rotational trauma can happen. The diagnostic elucidation of the pain source is challenging, with ligamentous insufficiency, osteochondral injuries, and impingement/arthritis representing potential causes for symptoms. The prevalence and pattern of the residual isolated or combined ligamentous ankle instability following rotational injuries are not entirely elucidated in the literature. In this prospective cohort study, we aimed to assess the frequency of combined ligamentous instability (lateral, medial, and syndesmotic) in patients with chronic ankle pain (>6 months) following rotational ankle injuries that failed conservative treatment and underwent surgical treatment. We also aimed to assess improvement in patient-reported outcomes (PROs) following treatment of the diagnosed conditions.

METHODS:

This is an IRB-approved prospective cohort study. We included patients with history of chronic pain (>6 months) following a rotational ankle injury, with clinical signs of combined ligamentous instability of at least two ligamentous complexes (lateral, medial, and syndesmotic), and that failed conservative treatment (>3 months). All patients underwent surgical treatment. Diagnostic arthroscopic assessment was performed. Syndesmotic instability was considered positive if a metallic sphere of 3mm could be inserted in the anterior syndesmotic space. Deep deltoid instability was confirmed with a "pass-through sign" when a 4.0mm shaver could be introduced in the medial gutter. Lateral ankle instability was confirmed with a positive rotatory drawer test under fluoroscopic assessment. Presence of isolated or combined ligamentous instability was noted and patients received appropriate open surgical treatment for the confirmed ligamentous insufficiencies. Presence of associated osteochondral injuries, peroneal pathology, and anterior bony impingement were also recorded. PROs were collected preoperatively and at most recent follow up.

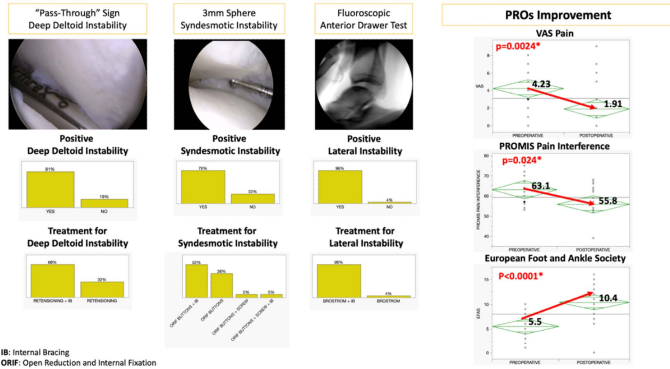
RESULTS:

A total of 27 patients were included (9 males/18 females), mean age 35.9 years (range, 18-68), and average BMI 31.3kg/m²(CI, 28.1-34.5). Eighty-nine percent had ankle sprains, and 11% rotational ankle fractures treated conservatively. Intraoperative assessment demonstrated positive lateral, medial, and syndesmotic instability in respectively 96%, 81%, and 78% of the patients. Most common combined instabilities were: 59% multidirectional (all three complexes), 19% rotational (medial+lateral), 15% anterolateral (lateral+syndesmotic), and 4% anteromedial (medial+syndesmotic). Isolated lateral instability was present in only one patient (4%). Peroneal tendon pathology, osteochondral injuries and anterior bony impingement were found in respectively 67%, 19%, and 26% of the patients. The average postoperative follow up was 22.2 months (3-39 months). Significant improvements in VAS (P=0.0024), PROMIS Pain Interference (p=0.024), and EFAS scores (p=0.022) were observed.

DISCUSSION AND CONCLUSION:

In this prospective cohort study, combined multiligament instability was extremely frequent in patients with chronic pain following rotational ankle injuries. Ninety-six percent of patients had confirmed intraoperative instability of at least two of the three ankle ligamentous complexes. Multidirectional (lateral, medial, and syndesmotic) (49%), rotational (lateral and medial) (19%), and anterolateral (syndesmotic and lateral) (15%) instabilities were the most frequent injury patterns. Following ligamentous repair/reconstruction, significant improvements in PROs were observed at an average follow up of 22-months. Our study highlights that the diagnosis of residual multiligament ankle instability should be considered in patients with chronic ankle pain following rotational injuries.

MULTILIGAMENT ANKLE INSTABILITY FOLLOWING ROTATIONAL ANKLE INJURIES: A PROSPECTIVE COHORT STUDY



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Diagnostic criteria for deltoid, syndesmotic, and lateral ankle instability. Frequencies of intraoperative confirmed deep deltoid, syndesmotic, and lateral ankle instability. Types and distributions of surgical techniques utilized to treat the confirmed ligamentous instabilities. Graphical plots demonstrating Improvements in patient-reported outcomes, with respective p-values comparing preoperative and postoperative Visual Analogue Score (VAS) for pain, PROMIS Pain Interference, and European Foot and Ankle Society (EFAS) scores, are also presented.