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Postoperative medial gutter impingement following primary total ankle arthroplasty: A retrospective case-control study

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Introduction: Medial impingement is a common cause of reoperation after total ankle arthroplasty, but evidence regarding its risk factors is limited. Proposed causes include varus malalignment, oversized implants, talar internal rotation or medial translation, and joint line elevation. This case-control study evaluated factors associated with post-arthroplasty medial impingement and the effect of talar component downsizing. We hypothesized that joint line elevation and talar medial translation or internal rotation would increase risk, while downsizing would be protective.

Methods: We reviewed 1,133 primary ankle arthroplasties performed between 2013 and 2022. Revision cases and arthrodesis takedowns were excluded. Thirty-four patients who underwent revision for medial impingement were identified and matched to 115 controls. Radiographic analysis included pre- and postoperative coronal alignment, talar center migration ratio as a measure of medial talar displacement, joint line height ratio as a measure of joint line elevation, and component rotation on WBCT. Logistic regression was used to assess associations between medial impingement and postoperative alignment, talar downsizing, talar center migration ratio, and joint line height ratio.

Results: A total of 3% of arthroplasties required revision for medial impingement. Mean postoperative joint line height ratio was significantly higher in cases, indicating greater joint line elevation. Talar center migration ratio was also higher in cases, consistent with increased medial talar displacement. Talar internal rotation was greater in the impingement cohort. Regression analysis showed that joint line elevation was a significant risk factor, with each 0.2-unit increase associated with a 60% increase in odds. Talar component downsizing reduced the odds of medial impingement by 48%.

Conclusion: Joint line elevation and talar malposition increase the risk of medial impingement, whereas talar downsizing appears protective.

Keywords: Arthroplasty, replacement, ankle; Ankle joint; Arthritis.

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