Outcomes of Total Ankle Replacement are Worse in Patients with Ipsilateral Hindfoot Fusion

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INTRODUCTION: Hindfoot (subtalar and/or talonavicular) fusion is a commonly used procedure to treat arthritis and/or deformity. As a result, some patients with ankle arthritis who undergo total ankle replacement (TAR) have a history of prior hindfoot fusion or undergo concomitant hindfoot fusion at the time of TAR. Previous studies have demonstrated hindfoot fusion as a risk factor for failure of TAR and associated with worse clinical outcomes. This study seeks to determine if these findings are reproducible by evaluating clinical, radiographic, and patient-reported outcomes (PROs) of primary TAR with ipsilateral hindfoot fusion at a minimum 2-years follow-up from primary TAR. We hypothesized that TAR patients with ipsilateral hindfoot fusion would have worse PROs and clinical outcomes compared to controls.

METHODS: A retrospective review of prospectively collected data within an institutional registry was performed. Inclusion criteria for this study were patients undergoing primary TAR (Cadence, Inbone, Invision, Infinity, Salto, Vantage, or Zimmer) between October 2015 and January 2022, with or without prior/concomitant ipsilateral hindfoot fusion, with preoperative and 2-year postoperative PROMIS scores. 400 TARs met inclusion criteria for analysis. Demographic, clinical, patient-reported outcomes, and radiographs were collected. Radiographic complications (including cysts, lucency, subsidence) were recorded. Multivariate linear regression models were used to evaluate the associations of hindfoot fusion, implant type, reoperations, (defined as any surgical procedure following primary TAA, including retention of metal implants with polyethylene explant), revisions (defined as exchange of tibial and/or talar components), and demographics with 2-year postoperative PROMIS scores. Finally, proportions of patients meeting PROMIS thresholds for the patient-acceptable symptom state (PASS) at 2-years postoperative was compared between groups via Pearson Chi square tests.

RESULTS: Of 400 ankles included, 49 (12.3%) had ipsilateral hindfoot fusion. In multivariate analysis, hindfoot fusion patients had significantly worse 2-year postoperative PROMIS scores in all domains (except Depression) versus patients without hindfoot fusion (**Figure**). Preoperative PROMIS domains were predictive of 2-year postoperative PROMIS scores for each respective domain (except Pain Intensity). There was also a bimodal pattern of the impact of age on PROMIS scores: patients at the extremes of age (older and younger) had significantly worse postoperative PROMIS scores for Physical Function, Pain Interference, and Pain Intensity. Hindfoot fusion patients had a significantly higher rate of revision (10.2%) than those without hindfoot fusion (2.6%) (P=0.038). Hindfoot fusion patients had a higher rate of radiographic complications (38.1% versus 22.2%), but this did not meet statistical significance (P=0.075). Hindfoot fusion patients were equally as likely to meet PASS thresholds at 2-years postoperatively in all domains except Global Mental Health (P=0.015) and Depression (P=0.024).

DISCUSSION AND CONCLUSION: This study demonstrates that TAR patients with ipsilateral hindfoot fusion experience worse pain, function, and physical and mental health postoperatively compared to their counterparts without ipsilateral hindfoot fusion. Despite this, they may be equally as satisfied with their physical state and pain levels postoperatively compared to patients without hindfoot fusion, but experience mental challenges that are not acceptable. As indications for TAR continue to expand, it is imperative to understand the role of hindfoot fusion in the survivorship and function of TAR to guide clinical decision making and patient education for establishment of postoperative expectations.

Figure. Multivariate Analysis of Two-Year Postoperative PROMIS Scores.