

## **Patient-Reported Functional Outcomes Following Charcot Foot Reconstruction**

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### **INTRODUCTION:**

Charcot foot reconstruction has been shown to improve quality of life in patients with diabetes-associated arthropathy. However, patient-reported outcomes following surgical reconstruction remain underreported. This study aimed to quantify functional recovery using validated patient-reported outcome measures (PROMs), including the PROMIS Global Health, Physical Function, and Pain Interference domains, as well as the Foot and Ankle Disability Index (FADI), which have not been previously reported in this population.

### **METHODS:**

This was a retrospective study of patients with diabetes-associated Charcot foot arthropathy who underwent surgical reconstruction between 2022 and 2023 at a single academic institution. PROMs collected were the Foot and Ankle Disability Index (FADI), PROMIS Global Health (Physical and Mental), PROMIS Pain Interference, and PROMIS Physical Function. Surveys were administered preoperatively and at 6- and 12-months postoperatively; patients were included if they completed all surveys at all three timepoints. Generalized estimating equations (GEE) were used to estimate mean changes in PROM scores over time; multivariable models were used to assess the impact of clinical variables including fixation type (internal versus external), infection, and location of deformity. Statistical significance was set at  $p < 0.05$ .

### **RESULTS:**

Twenty-seven patients met inclusion criteria with complete PROM data at baseline, 6 months, and 12 months postoperatively. Median age was 59 years and median BMI was 36. Compared to baseline, patients demonstrated a statistically significant decrease in PROMIS Pain Interference scores at 6 months ( $\Delta -3.93$ ,  $p=0.025$ ), but this improvement was not sustained at 12 months. No significant differences were observed in other PROMs across timepoints, although mean scores for PROMIS Global Health Physical, PROMIS Physical Function, and FADI all trended in a positive direction. Notably, PROMIS Global Health Mental scores trended negatively, although these findings did not meet statistical significance.

Subgroup analysis revealed that presence of infection negatively impacted all PROMIS domains, with significantly lower Global Health Physical ( $\Delta -9.6$  at 6 months,  $-8.0$  at 12 months), Global Health Mental ( $\Delta -9.2$  at 6 months,  $-7.8$  at 12 months), and FADI scores ( $\Delta -27.0$  at 6 months,  $-25.4$  at 12 months; all  $p < 0.05$ ). In contrast, patients who underwent external fixation showed improved outcomes, including significantly higher Global Health Physical ( $+3.5$  at 12 months), Global Health Mental ( $+8.6$  at 6 months), and FADI ( $+14.5$  at 12 months) scores, as well as lower Pain Interference scores at 6 and 12 months ( $\Delta -5.7$  and  $-4.5$ , respectively; all  $p < 0.05$ ) compared to patients with internal fixation. Location of Charcot deformity was also found to influence outcomes. Patients with midfoot deformity had higher Pain Interference scores at 6 months ( $+5.0$ ,  $p=0.036$ ), while those with tibiotalar reported worse Physical Function scores ( $-6.0$ ,  $p=0.034$ ) than the remaining cohort. On item-level analysis of the FADI survey, patients reported significant improvement at 6 months in domains including "Sleeping," "Home responsibilities," "Activities of daily living," and "Personal care," as well as pain-related items such as "Pain at rest" and "Pain during activity" (all  $p < 0.05$ ). Improvements in general pain metrics persisted at 12 months.

### **DISCUSSION AND CONCLUSION:**

Charcot foot reconstruction can lead to meaningful improvements in pain and function, with early gains notable by 6 months postoperatively. Overall PROM trends were favorable and trended in a positive direction except for the PROMIS Global Health Mental, which slightly declined. Presence of infection was a strong predictor of worse outcomes, highlighting the importance of counseling patients with suspected infection preoperatively about their elevated risk and potential for limited functional recovery. These results underscore the challenging nature of treating Charcot arthropathy, and reinforce the need for individualized, multidisciplinary management in this vulnerable patient population.