

Minimally Invasive PIP Joint Fusion Of The Second Toe With Hallux Valgus Correction: A Prospective Case Series

Mohamed Sayed Yousef, Ayla Newton, **Lilanthi Wickramarachchi**, Peter Lam, Thomas Lewis, Robbie Ray
King's College NHS Foundation Trust, London, United Kingdom

Objectives

This study aimed to evaluate the clinical and radiological outcomes of minimally invasive proximal interphalangeal (PIP) joint fusion of the second toe using a 2.4 mm intramedullary screw. All patients underwent the procedure in combination with hallux valgus correction, with a minimum follow-up of 12 months.

Material and Methods

Fifty-three patients (53 toes) underwent second toe PIP joint fusion using a percutaneous technique and a 2.4 mm intramedullary screw. The procedure was performed in the setting of forefoot reconstruction that included hallux valgus correction. Patients were reviewed clinically and radiographically at regular intervals. Primary outcomes included radiographic union, complications, and patient-reported outcome measures (PROMs) using the Manchester-Oxford Foot Questionnaire (MOxFAQ) and EQ-5D. The minimum follow-up duration was 12 months.



Pre-op



Intra-op



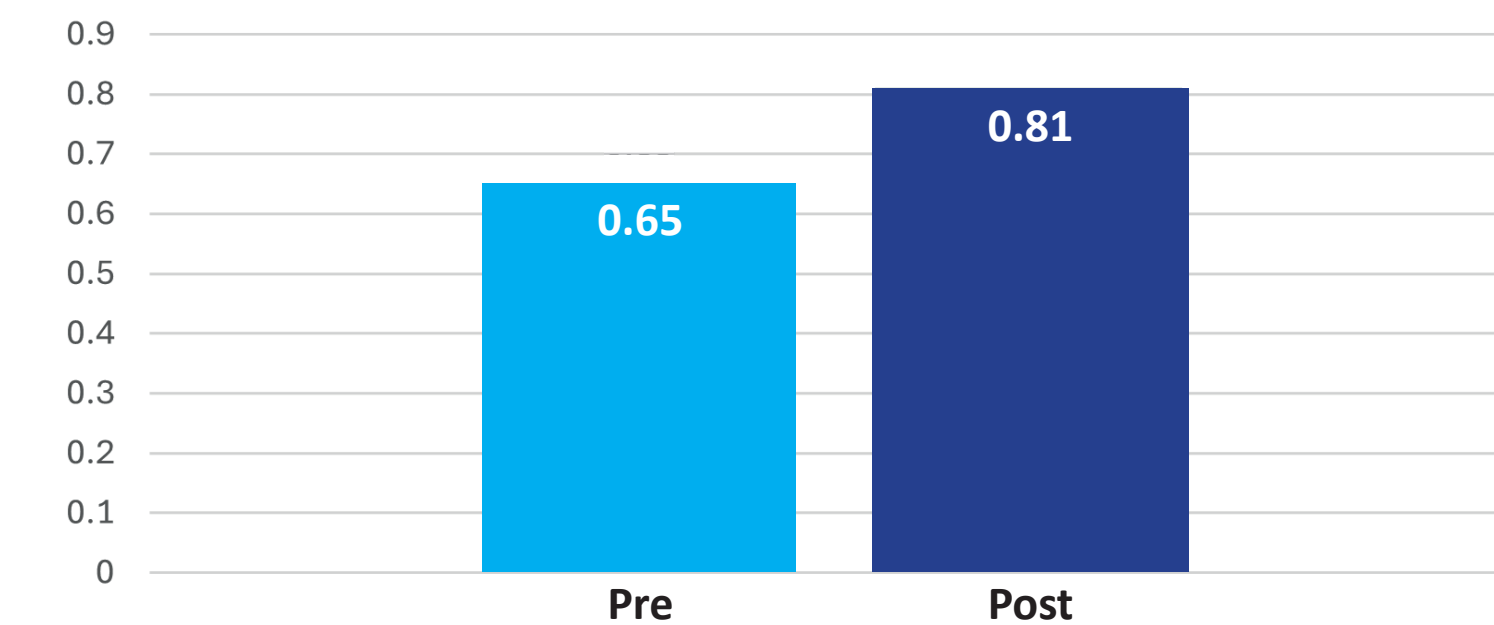
Post-op

Results

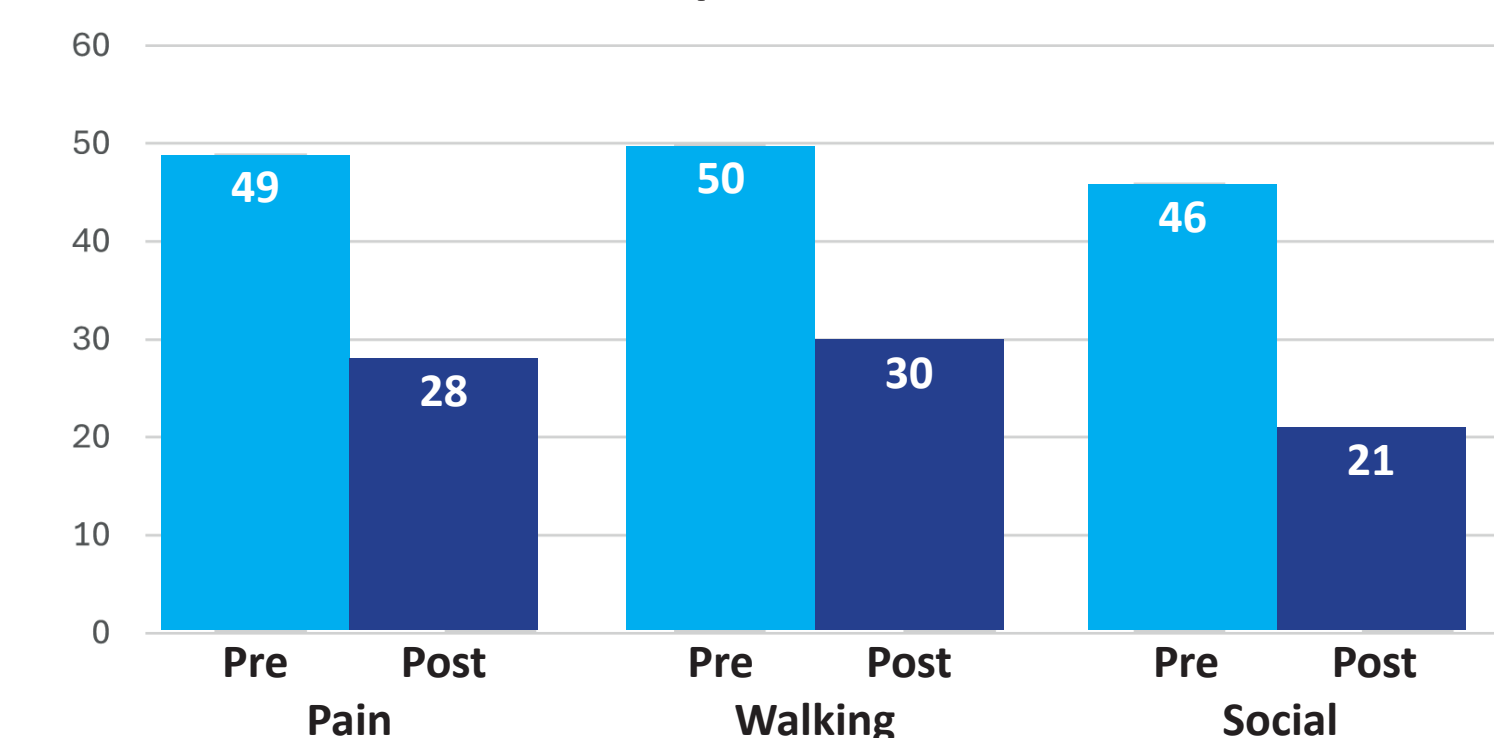
The mean radiographic follow up was 14.6 ± 8.0 months and PROMs follow up of 15.0 ± 4.6 months. Radiographic union was achieved in 47 out of 53 cases (88.7%). The 6 non-unions were asymptomatic and did not require revision. There were no cases of hardware failure or neurovascular injuries, 3 cases of screw removal due to migration (5.7%), 1 case of infection (1.9%) that was treated with antibiotics with an overall complication rate of 7.5%. All patients reported improved function and pain relief.

MOxFAQ and EQ-5D scores showed statistically significant improvement across all domains from pre-operative to 12 month post-operative scores (MOxFAQ Pain improvement 21.3 ± 13.1 , Walking improvement 14.8 ± 26.4 , Social Interaction improvement 29.5 ± 16.3).

Pre and Post Operative EQ-5D Scores



Pre and Post Operative MOxFAQ Scores



Conclusions

Minimally invasive PIP joint fusion of the second toe using a 2.4 mm intramedullary screw is a safe and effective procedure when performed alongside hallux valgus correction. It provides high union rates, excellent patient-reported outcomes, and a low risk of complications, including hardware-related issues.

This technique represents a reliable option in the setting of forefoot percutaneous surgery.