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TITLE Effectiveness of Flexor Tenotomy in Patients with Toe Ulcers in Inter-Disciplinary High Risk Foot Service

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ABSTRACT (maximum 450 words. Please use the following or similar headings: Background/Methods/Results/Conclusions)

Background

Diabetic foot ulcers (DFUs) affect up to 34% of people with diabetes, with toe ulcers comprising approximately 15-20% of cases. Apical toe ulcers are particularly challenging, associated with high recurrence, delayed healing, and increased risks of osteomyelitis, hospitalisation, and amputation. Peripheral motor neuropathy contributes to deformities such as claw, hammer, and mallet toes by weakening intrinsic foot muscles, leading to increased plantar pressure and ulceration. International working group on the diabetic foot (IWGDF) guidelines recommend considering flexor tenotomy to manage and prevent toe ulcerations. The aim of this clinical audit is to assess the short term and long-term clinical outcomes of patients undergoing flexor tenotomy within the interdisciplinary High risk foot service (HRFS). The primary objectives included (1) evaluate ulcer healing rates, (2) assess ulcer recurrence at 1-month, 3-month,6-month and 12-month period, (3) monitor complication rates.

Methods

This is an ongoing prospective audit that commenced in November 2022 at Royal Perth Hospital podiatry. The inclusion criteria were: (1) reducible or semi-reducible toe deformities (2) active toe ulcer or were classified as "at-risk" due to pre-ulcerative lesions or abundant callus (3) toe pressures > 50 mmHg indicating adequate perfusion. Procedures were performed by Vascular consultants, with referrals accepted from East Metropolitan Health Service sites and Northam Hospital. Follow-up occurred at 1-week, 1-month, 3-months, 6-months, and 12-months- mainly to capture the short term and long-term outcomes of the procedure. All clinical data were systematically collected using a standardized flexor tenotomy data collection form to ensure consistency and facilitate longitudinal analysis

Results

As of April 2025, 52 tenotomies were performed in 39 patients (median age 67 years, range 40-86 years). Of these, 38.5% (20/52) were performed on toes with active ulcers, while 61.5% (32/52) were on toes at-risk of developing ulcers. Among the active ulcers, 95% (19/20) achieved healing by 3-months. In toes at-risk of developing an ulcer, significant reduction in callus was noted in all toes (100%), with no ulcer development observed at any time point. The recurrence rate was low at 5.8% (3/52). The reported complications included bruising (21.2%), transfer lesion (9.6%), toe hyperextension (11.5%), pain (3.8%), swelling (1.9%).

Conclusion

This audit demonstrates that flexor tenotomy is a safe and effective procedure for healing and preventing diabetic toe ulcers in appropriately selected patients. Consistent with the IWGDF guidelines and recent literatures, the high healing rate (95% within 3 months) with low recurrence support its therapeutic value. In the at-risk group, no ulcers developed post-tenotomy, highlighting its preventative value. Reported complications including bruising, transfer lesions, and toe hyperextension were comparatively low. This audit is among the few studies to explore the long-term outcomes of flexor tenotomy. Given the high burden of diabetic foot disease, these findings support the consideration of flexor tenotomy as part of multidisciplinary care to reduce morbidity and healthcare burden.