



Outcomes of Hallux Amputation Versus Partial First Ray Resection in People with Non-Healing Diabetic Foot Ulcers: A Pragmatic Observational Cohort Study

The International Journal of Lower
Extremity Wounds
2025, Vol. 24(1) 225–234
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DOI: 10.1177/15347346221122859
journals.sagepub.com/home/ijl



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Abstract

There are few data comparing outcomes after hallux amputation or partial first ray resection after diabetic foot ulcer (DFU). In a similar context, the choice to perform one of these two surgeries is attributable to clinician preference based on experience and characteristics of the patient and the DFU. Therefore, the purpose of this study was to determine the more definitive surgery between hallux amputation and partial first ray resection. We abstracted data from a cohort of 70 patients followed for a 1-year postoperative period to support clinical practice. We also attempted to identify patient characteristics leading to these outcomes. Our results suggested no statistical difference between the type of surgery and outcomes such as recurrence of DFU and amputation at 3, 6, and 12 months or death. However, there was a statistically significantly increased likelihood of re-ulceration for patients with CAD who underwent hallux amputation ($p = 0.02$). There was also a significantly increased likelihood of re-ulceration for people with depression or a history when the partial ray resection was performed ($p = 0.02$). Patients with prior amputation showed a higher probability of undergoing another re-amputation with partial ray resection ($p = 0.01$). Although the trends that emerge from this project are limited to what is observed in this statistical context, where the number of patients included and the number of total observations per outcome were limited, it highlights interesting data for future research to inform clinical decisions to support best practices for the benefit of patients.

Keywords

diabetes, lower extremity, foot diseases, orthopedic procedures, reoperation, infection

Diabetes mellitus (DM) is one of the most common chronic diseases worldwide. DM-related foot complications such as peripheral arterial disease, diabetic foot infection (DFI), diabetic foot ulcer (DFU) and minor or major lower extremity amputation (LEA) reduce the quality of life and lead to premature death.^{1,2} Personal, societal and economic burdens of DFUs highlight the importance to support prevention strategies for the at-risk population as well as effective treatments that will prevent DFU recurrence, re-amputation or other complications such as DFI and death.^{3,4} Indeed, DFI is involved in 58% of DFU and approximately 50% of these infected patients are affected with PAD. PAD is highly predictive of LEA.^{5–8} Approximately 17% to 30% of people with a DFU will ultimately require a LEA and patients with DFI have 155 times greater risk of LEA than patients without associated infection.^{3,7,9,10} It is estimated that 85% of all DM-related LEA are preceded by a DFU but sometime, LEAs are an inevitable treatment.¹¹

The key components of successful limb salvage are to achieve a DFU-free, plantigrade foot that is functional with

treatments that have minimum impact on a patient's global health. A successful LEA is i) the complete eradication of non-viable tissue to optimize the patient healing potential, ii) reduce

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