

Abstract

Introduction

Long-term durability of endovascular revascularization in patients with diabetes mellitus and chronic limb-threatening ischemia (CLTI) is historically poor.

While free tissue transfer provides soft-tissue coverage, its hemodynamic impact on upstream macrovascular patency is poorly understood. To evaluate whether microsurgical free tissue transfer affects long-term vascular patency and repeat intervention rates following endovascular revascularization in the ischemic diabetic lower extremity.

Materials and Methods

This retrospective comparative cohort study evaluated patients with diabetes mellitus who underwent endovascular lower extremity revascularization for CLTI with or without free tissue transfer for diabetic foot ulcers between 2010 and 2023. Patients were stratified into 2 cohorts: Group 1 received endovascular revascularization followed by free tissue transfer within 1 to 2 weeks; Group 2 received endovascular revascularization alone with conventional wound coverage. The primary end point was repeat target limb endovascular revascularization. Secondary end points included major lower-extremity amputation and overall survival.

Results

Of 299 patients included (Group 1, n = 100; Group 2, n = 199), Group 1 patients were younger than Group 2 (mean age, 65.0 vs 71.9 years; $P < .001$), though advanced tissue loss (Rutherford 5/6 or Fontaine IV) was more prevalent in Group 1. Repeat target limb revascularization rates were significantly lower in Group 1 than Group 2 (15.0% vs 45.2%; $P < .001$). After multivariable Cox regression adjusting for age, sex, and comorbidities, free tissue transfer remained an independent protector against repeat intervention (hazard ratio, 0.30; 95% CI, 0.16–0.53; $P < .001$). The patency rate was also significantly higher in Group 1 versus Group 2 ($P < .001$). No significant difference in reintervention rate was observed between free muscle and fasciocutaneous flaps ($P = .26$). There was also no significant difference in major amputation rate (7.0% vs 11.6%, $P = .22$).

Conclusion

Combining free tissue transfer with successful endovascular revascularization significantly decreases target vessel restenosis and repeat intervention rates in diabetic patients with chronic limb-threatening ischemia. While providing essential soft tissue coverage, free flap reconstruction may also play a supportive role in maintaining long-term vessel patency, offering a promising strategy for comprehensive diabetic limb salvage.