Free Flap for Limb Salvage Following Oncologic Resection: 12-Year Experience

Edward I. Chang MD[1], Alexander T. Nguyen MD[1], Melissa A. Crosby MD[1], Hong Zhang PhD[1], Jennifer K. Hughes OTR[2], Julie Moeller[2], Roman J. Skoracki MD[1], Valerae O. Lewis MD[1], David W. Chang MD[3], Matthew M. Hanasono MD[1]

[1] Department of Plastic Surgery, The University of Texas, MD Anderson Cancer Center, Houston TX, USA
[2] Department of Rehabilitation Medicine, The University of Texas, MD Anderson Cancer Center, Houston, TX, USA
[3] Department of Surgery, Section of Plastic Surgery, University of Chicago, Chicago, IL, USA

Introduction: While a number of studies have examined free flap salvage for lower extremity trauma, a knowledge gap exists regarding the optimal flap choice for limb reconstruction following oncologic resection, given surgical resection, chemotherapy and radiation. In particular, whether muscle, myocutaneous, or fasciocutaneous flaps have superior outcomes remains unknown.

Methods: Retrospective review of all free flaps performed for upper and lower extremity salvage from 2000-2012.

Results: Overall 220 patients (mean age 51.7 years, mean BMI 27.7 kg/m^2) underwent free flap reconstruction for limb salvage (64 upper extremity, 156 lower extremity). Flaps were classified as muscle-only (n=77), myocutaneous (n=67), or fasciocutaneous (n=76). Comorbidities including smoking, diabetes, peripheral vascular disease, and prior chemotherapy or radiation had no impact on complications. However, the presence of osteomyelitis was significantly associated with post-operative infection (OR: 19.5, CI: 3.77-100.64; p=0.0004), wound healing complications (OR: 7.51, CI: 2.21-25.49; p=0.001), and amputation (OR: 4.63, CI: 1.41-15.19; p=0.01). Placement of hardware did not increase complications, although it was associated with nearly 5-times the risk for total flap loss (OR: 4.92, CI: 1.33-18.23; p=0.017).

Fasciocutaneous and myocutaneous flaps were associated with significantly increased risks for hematoma requiring operative evacuation (p=0.02) and an unplanned return to the operating room for microvascular complications (p=0.005). However, they were at lower risk for infection (OR: 0.14, CI: 0.02-0.87; p=0.03) compared to muscle-only flaps. Performing an end-to-side anastomosis was also strongly associated with an unplanned return to the operating room (p=0.009). There were 7 total flap losses (3.2%) with fasciocutaneous and myocutaneous flaps at significantly increased risk for flap loss (OR: 2.58, CI: 1.06-6.26; p=0.03). Pre-existing osteomyelitis and a prior deep vein thrombosis were associated with higher incidence of progression to amputation (p=0.01 and p=0.04 respectively). Overall, 190 patients were successfully reconstructed while 30 patients (13.6%) ultimately required amputation.

Conclusions: Free flaps can be performed reliably for limb salvage (86.4%) following tumor extirpation with high success rates (96.8%). While fasciocutaneous and myocutaneous flaps were less likely to develop infections, they were at significantly higher risk for take-backs and total flap loss.

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