

Free Tissue Transfer to the Traumatized Upper Extremity: Risk Factors for Postoperative Complications in 282 Cases

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Abstract

Purpose: To evaluate risk factors that contribute to postoperative complications and flap loss in complex upper extremity reconstruction.

Methods: Retrospective chart review was performed for all patients undergoing free tissue transfer for upper extremity reconstruction. Data were analyzed using Chi-Square and Fischer's exact tests.

Results: Two hundred eighty-two cases met inclusion criteria. Reconstruction occurred within 24 hours (25.9%), days 2-7 (12.2%), or >7 days (61.9%). Forty-seven (16.7%) of injuries were located proximally. Over half of the cases had an open (25.9%) or closed (34.4%) fracture. Gustilo fracture grade was IIIA (0.1%), IIIB (17.4%), or IIIC (7.8%). Superficial infection, deep infection, and osteomyelitis occurred in seventeen (6%), twenty-four (8.5%), and fifteen (5.3%) cases, respectively. Total or partial flap loss occurred in twelve (4.3%) and five (1.8%) cases, respectively. An interpositional vein graft was used in 41 (14.5%) and anastomotic revision was performed in 53 (18.8%). Mean follow-up was 37.5 ± 49.5 months. Timing of reconstruction did not significantly affect postoperative outcomes. Proximal location of injury was significantly associated with superficial (RR=6.5, $p<0.01$) and deep infection (RR=5.3, $p<0.01$), and osteomyelitis (RR=4.0, $p<0.01$), although not with flap failure ($p=0.3$). Presence of open fracture was significantly associated with developing superficial (RR=3.1, $p=0.013$) and deep infection (RR=1.9, $p<0.01$), as well as osteomyelitis (RR=1.6, $p<0.01$). Closed fractures did not negatively influence postoperative outcomes. Gustilo IIIC fractures were associated with a higher risk of flap loss (RR=3.5, $p=0.03$). Interpositional vein graft use was associated with a higher risk of flap loss (RR=3.2, $p=0.01$), as was anastomotic (RR=7.9, $p<0.01$).

Conclusions: Injuries proximal to the elbow and presence of open fracture were associated with a significantly higher infection rate. Gustilo IIIC fractures, need for interpositional vein grafts, and anastomotic revision resulted in significantly higher risk of flap loss. Fracture fixation and injury location were not predictors of flap loss.

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