

EP-100

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(Serial Progressive Approximation Suturing for
Definitive Closure after Partial Loss of a Radial Forearm
Free Flap in a Post-craniotomy Scalp Defect)



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Purpose: Extensive post-craniotomy scalp necrosis is frequently reconstructed with free tissue transfer; however, partial flap loss remains a challenging complication with limited salvage options. We report NPWT-assisted progressive direct closure after partial loss of a radial forearm free flap (RFFF), highlighting the role of a residual viable flap layer as a biologic dressing.

Methods: A 51-year-old man underwent aneurysm clipping followed by craniectomy for subarachnoid hemorrhage and developed a right temporoparietal scalp necrosis (15 × 5 cm). After aggressive debridement, RFFF was inset and anastomosed end-to-end to the superficial temporal artery and vein. Postoperatively, partial flap loss occurred; although the superficial component became necrotic, viability was preserved in a portion of the deep fat layer. Nonviable tissue was excised in a staged manner. Salvage consisted of NPWT-assisted progressive direct closure using serial, traction-assisted approximation sutures with deep anchoring to incrementally advance wound edges. Approximation and NPWT changes were performed at weekly intervals over 3 months until tension-balanced direct closure was achieved.

Results: Progressive direct closure was successfully completed without repeat microsurgery, tissue expansion, or additional donor-site morbidity. During the closure period, the remaining viable RFFF layer provided effective temporary coverage consistent with a biologic dressing, facilitating wound bed protection and gradual approximation. Follow-up demonstrated complete epithelialization, durable healing, and acceptable scalp contour.

Conclusion: In partial flap loss after scalp free flap reconstruction, NPWT-assisted progressive direct closure is a pragmatic salvage strategy. Residual viable flap tissue may function as a biologic dressing during staged closure, reducing the need for secondary free tissue transfer.



Fig. 1. Pre-reconstruction presentation. Right temporoparietal post-craniotomy scalp necrosis after aneurysm clipping and decompressive craniectomy, demonstrating a full-thickness soft-tissue defect (~15 × 5 cm) prior to definitive coverage.



Fig. 2. Index reconstruction with free tissue transfer. Immediate postoperative appearance after RFFF inset with end-to-end microvascular anastomosis to the superficial temporal artery and vein.



Fig. 3. Partial flap loss with residual viability. Postoperative partial loss of the RFFF: superficial necrosis with preservation of viability in a portion of the deep fat layer, followed by staged excision of nonviable tissue and initiation of NPWT-assisted salvage.



Fig. 4. Final outcome after NPWT-assisted progressive direct closure. Healed scalp at follow-up after ~3 months of progressive direct closure using serial approximation suturing with weekly NPWT dressing changes; the remaining viable deep flap layer served as temporary biologic coverage during staged closure, culminating in complete epithelialization and durable wound healing.