Modification of the radial forearm fasciocutaneous flap in partial pharyngolaryngeal reconstruction to minimize fistula formation

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INTRODUCTION: Reconstruction of pharyngo-laryngo-esophageal (PLE) defects secondary to cancer extirpation is a challenging problem, especially with a prior history of radiation therapy.[1] Circumferential defects or those involving >50% of the PLE require flap reconstruction.[2] We describe a modified RFF harvesting and insetting technique that results in an additional layer of dermal layer closure to reinforce the neo-pharyngeal suture line for partial PLE defects, reducing the risk of salivary leak and fistula.

MATERIALS AND METHODS: A trapezoidal RFF is marked with appropriate dimensions to reconstruct the defined defect. The flap is modified by adding an additional 1 cm margin at the edges. This portion is de-epithelialized to provide a second well-vascularized reinforcement layer to the construct. On flap inset, the skin edges are first sutured to the mucosal defect edges, followed by suturing of the de-epithelialized portion of the flap as a second, water-tight layer to the surrounding fascia. Microvascular anastomosis is then completed.

RESULTS: We performed the modified RFF for 3 patients who underwent salvage surgery to the larynx after receiving prior high-dose radiation therapy. There was one post-operative complication of neck hematoma that required evacuation in 1 patient. All flaps survived, and at 3 weeks post-operatively swallow studies showed no evidence of leak, stricture or fistula. All patients were taking soft diet at 3 months after the operation.

CONCLUSION: The holy grail of reconstruction for the defects in the PLE region are no salivary leaks, the ability to swallow and adequate voice rehabilitation. We report the successful use of a modified RFF in 3 patients with partial PLE defects, history of prior radiation and confounding co-morbidities leading to unfavorable wound healing factors. We utilized the skin portion of the RFF to fill the mucosal defect, with a second layer of robust well-vascularized dermis to further seal the construct and prevent leakage. Our patients achieved satisfactory healing, with successful per oral feeding after a period of swallowing rehabilitation.

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