Free Tissue Transfer to Head and Neck

Lessons Learned from Unfavorable Results—Experience per Subsite

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KEYWORDS

• Free tissue transfer • Microsurgical head and neck recosntruction • Unfavorable results • Complications

KEY POINTS

- Unfavorable microsurgical head and neck reconstruction refers to complicated wound healing and suboptimal form and function despite free flap survival.
- The unique characteristics of some of the anatomic subsites and the unavailability of optimal techniques contribute to the unfavorable result.
- Knowing when to offer a priority reconstruction and when to do total reconstruction per site can reduce unfavorable outcomes.
- The reconstructive surgeon should foresee the effect of surgical scar contracture, radiotherapy, and the extent of tissue atrophy on the reconstruction and take necessary countermeasures.

INTRODUCTION

Free tissue transfer after ablation of head and neck cancer has become the gold standard of reconstruction.[1] In order for the microsurgical reconstruction to achieve its ultimate goal of good patient quality of life, successfully transferred free flaps should aim at restoring optimal form and function.

Good quality of life after head and neck reconstruction depends on uncomplicated wound healing to allow timely administration of chemotherapy and radiotherapy; adequate mouth opening, good deglutition, and intelligible speech; minimal donor site morbidity; minimal revision surgeries; and good cosmesis.[2,3] Fulfilling these goals demands thorough planning, wise and proper selection of techniques, and flawless execution of the surgery to ensure successful reconstruction beyond free flap survival.

Failure in achieving one or more of these goals despite successful free flap transfer results in unfavorable reconstruction marked with downgraded quality of life. Avoidance and treatment of the unfavorable results thus should be at the core of contemporary head and neck surgery.

The authors of this article, based on their extensive experience, identify potential challenges and pitfalls by region or anatomic structure in the head and neck and share their refined approach in a lesson-learned manner.

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UNFAVORABLE RESULTS AFTER MICROSURGICAL RECONSTRUCTION OF TONGUE AND MOUTH FLOOR DEFECTS

Unfavorable Results

Untoward outcomes after microsurgical reconstruction of the tongue and mouth floor involve inadequate volume reconstruction of the neotongue; strictures and tethering of the tongue; orocutaneous fistula; and/or suboptimal management of associating bony and/or soft tissue defect involving the mandible, palate, and lateral pharyngeal wall.[4]

Radiotherapy negatively affects the reconstruction, and the effect of radiotherapy on the flap and surrounding tissue is unpredictable and hard to control. Therefore, it seems logical to foresee the aftermath of radiotherapy to minimize related shortcomings and complications.

Classification of Tongue Defects

To avoid confusion, the authors refer to 50% loss of the tongue in anterior-to-posterior direction as hemiglossectomy and to more than 90% loss of the tongue with preservation of less than 10% of tongue base as near-total glossectomy. Total tongue defect refers to total resection of the tongue with/without the hyoid bone.

Other forms of tongue defects or defects not limited to the tongue, extending to mouth floor and adjacent structures, represent a largely diverse group that lacks uniformity and is better addressed individually.

Revisited Approach

On hemiglossectomy

Tethering-free reconstruction and water-tight closure at mouth floor are the goals.[5] The authors prefer thin anterolateral thigh cutaneous flap[6] to ensure pliable, soft neohemitongue. The flap is harvested above the deep fascia or the scarpa fascia depending on patient's thigh thickness.[7,8] During inset, the flap is sutured from posterior to anterior starting with the lateral side of the lower gum, then the tongue side leaving the anterior ventral tongue and anterior side of the lower gum toward the end. This allows the redundant part of the flap to be de-epithelialized to augment the neotongue with tension-free closure. Before closure and with care not to injure skin vessels, the inner side of the flap is sutured to the intrinsic muscles of the tongue to separate between mouth floor and oral tongue creating oral gutter (**Fig. 1**).

On near-total and total glossectomies

The key goals are to achieve long-lasting bulky neotongue with protective sensation, allow decanulation of the tracheostomy, and reasonable swallowing. The flap of choice is the combined anterolateral thigh flap with vastus lateralis muscle. Any flap with similar characteristics and tissue component can also be used.

Fig. 1. Adequate gutter between tongue and lower gum after reconstruction of hemiglossectomy defect with thin anterolateral thigh flap.

The anterolateral thigh flap allows stocky neotongue given that the flap is not stretched too thin to reconstruct every soft tissue defect in the oral cavity, such as the palatine tonsillar fossa or the soft palate. The vastus lateralis muscle is designed along the distal runoff of the descending branch to allow versatile obliteration of the dead space between the mandible and the hyoid bone.

Flap inset starts with the epiglottis all the way up along the lateral pharyngeal wall, then the flap is folded on itself anteriorly to create bulky tongue and finally sutured to the mandible/plate to seal the mouth floor. The next important step is hyoid bone suspension to the mandible/reconstruction plate, which opens up the epiglottis and lifts up the hyoid bone and the bottom of the flap minimizing sagging and flap sinking caused by gravity and bottoming out. The lateral cutaneous femoral nerve is coapted to the lingual nerve to provide protective sensation.

The presence of associating segmental mandibulectomy further complicates the reconstruction.[9] The authors recommend another free flap to address these defects.[10] This is discussed further in the section on mandible reconstruction (**Fig. 2**).

UNFAVORABLE RESULTS AFTER MICROSURGICAL RECONSTRUCTION OF THE MANDIBLE

Unfavorable Results

The untoward outcomes are soft tissue–related and bone- and hardware-related. In the first category, sunken appearance and orocutaneous fistula are