Principles and Practice of Reconstructive Surgery for Head and Neck Cancer

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KEYWORDS

• Head and neck reconstruction • Tongue reconstruction • Pharyngeal reconstruction
• Mandible reconstruction • Oral cavity reconstruction • Free flap • Microsurgery

KEY POINTS

- Goals for head and neck reconstruction include optimal functional and aesthetic outcomes.
- Free flaps are often the first choice of reconstructive options in head and neck reconstruction.
- Appropriate flap selection optimizes functional outcomes.
- When possible, replace tissue with similar tissue.
- Early referral to physical therapy, occupational therapy, and speech and swallow therapy helps to optimize outcomes.

PATIENT EVALUATION OVERVIEW

Evaluation of the patient needing reconstructive surgery is multifaceted but can be simplified based on the anatomic site of the cancer and the anticipated defect, evaluation of the potential donor sites for reconstruction, and whether adjuvant therapies are required. Attention to these domains during patient evaluation helps produce the best reconstructive result for each patient. Replacing like with like is an important principle in reconstructive surgery.

SOFT TISSUE RECONSTRUCTION

Soft tissue reconstruction of the head and neck stems largely from the extirpation of cutaneous malignancies, including basal cell carcinoma, squamous cell carcinoma, and melanoma. Based on the size of the residual defect after wide local excision of the malignancies with clear margins, reconstruction can pose a formidable challenge (**Table 1**).[1] This observation is especially true in sites where full-thickness defects

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Table 1
Surgical margins of resection for skin malignancies

Type of Cancer	Recommended Margins of Resection
Basal cell carcinoma	1–2 mm
Squamous cell carcinoma	2–4 mm
Melanoma	
Melanoma in situ	5 mm
<1 mm	5 mm
1–2 mm	1 cm
>2 mm	2 cm

involve components such as cartilage or mucosa in addition to the overlying skin. With the advent of Mohs micrographic surgery, the size of these defects can be decreased to facilitate closure and reconstruction. Healing by second intention, primary closure for small defects, or skin grafts for larger defects are the simplest options. They may produce inferior cosmetic outcomes. Here, the principal techniques for soft tissue reconstruction are presented by anatomic site.[2]

Eye

Reconstruction of the periorbital region can usually be achieved with skin grafts for partial-thickness defects or local tissue rearrangement for full-thickness defects. Large, full-thickness defects of the eyelids require lid switch procedures such as Fricke or Tripier flaps.[3,4] If an orbital exenteration is necessary, reconstruction with cervicofacial flaps or free tissue transfer (such as a radial forearm flap) may be needed.[5,6] If a prosthesis is planned, reconstruction with less bulky soft tissue is preferable. A bulkier flap is necessary to fill the cavity if prostheses are not used.[7]

Ear

Because the ear is composed of cartilage as well as overlying soft tissue, reconstruction largely depends on whether a full-thickness or partial-thickness defect is created. If the perichondrium has been preserved, skin grafting or primary closure is the best option. However, if the defect encompasses the perichondrium or cartilage, conversion to a full-thickness wedge resection and primary closure or Antia-Buch helical advancement may be preferable.[8] Another option is to use a cartilage graft from the contralateral ear or rib, which requires flap coverage with retroauricular skin or temporoparietal fascia. This approach requires a second stage to divide and inset the flap as well as additional skin grafting.[9,10]

Mouth

The lips are composed of mucosa as well as the wet and dry vermilion overlying the orbicularis oris muscles. The upper lip has several distinct anatomic subunits, including the philtral columns, the Cupid bow, the white roll, and the tubercle.[2] Lip reconstruction depends strongly on the amount of vermilion remaining. Partial-thickness defects may be reconstructed with vermilion switch procedures or vermilion and mucosal advancement flaps. Reconstruction of full-thickness defects also depends on the amount of residual lip tissue (**Table 2**).[11–14]