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# Reconstructive options for the neck after resection of cutaneous malignancies

Neerav Goyal, MD, MPH, Fred G. Fedok, MD, FACS

*From the Division of Otolaryngology-Head and Neck Surgery, Department of Surgery, The Pennsylvania State University, Milton S. Hershey Medical Center, Hershey, Pennsylvania.*

## KEYWORDS

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 Pectoral flap;  
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 Latissimus dorsi flap;  
 Reconstruction

Cutaneous defects of the neck require a different algorithm for reconstruction as compared to facial defects. Depending on the location and size of the defect, a variety of reconstructive techniques can be used, from secondary healing to pedicled or free flaps. Additionally, patient co-morbidities can negatively affect the outcomes of certain reconstructive options. We will describe a variety of techniques that are available to the head and neck or facial plastic surgeon for reconstruction of neck defects.

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Head and neck surgeons and facial plastic surgeons are often responsible for reconstructing defects secondary to Mohs surgery (chemosurgery) or wide local excisions of cutaneous malignancies of the neck. Approaching neck reconstruction requires a different algorithm compared with that used in reconstructing the face to yield the best functional and cosmetic outcome. This chapter will focus on the variety of techniques available to the surgeon in reconstructing defects of the neck, with specific focus on skin grafts, local flaps, and regional flaps.

Although there is a well-established literature defining the aesthetic units of the face, a similar consensus does not exist regarding the neck. In his 1994 report, Angrigiani<sup>1</sup> considered the neck as the anterior and posterior neck regions, with the separation between these 2 regions demarcated by an imaginary line from the earlobe to the middle of the clavicle. He defined the anterior neck as going from the lower border of the mandible to the sternal notch. Zhang et al<sup>2</sup> defined aesthetic units of the neck, as it related to patients who suffered burns to the neck, and chose to subdivide the anterior neck unit into the

suprahyoid and infrahyoid aesthetic units by defining the hyoid as a “pivot point of the neck”.

## Patient evaluation

### Location/size

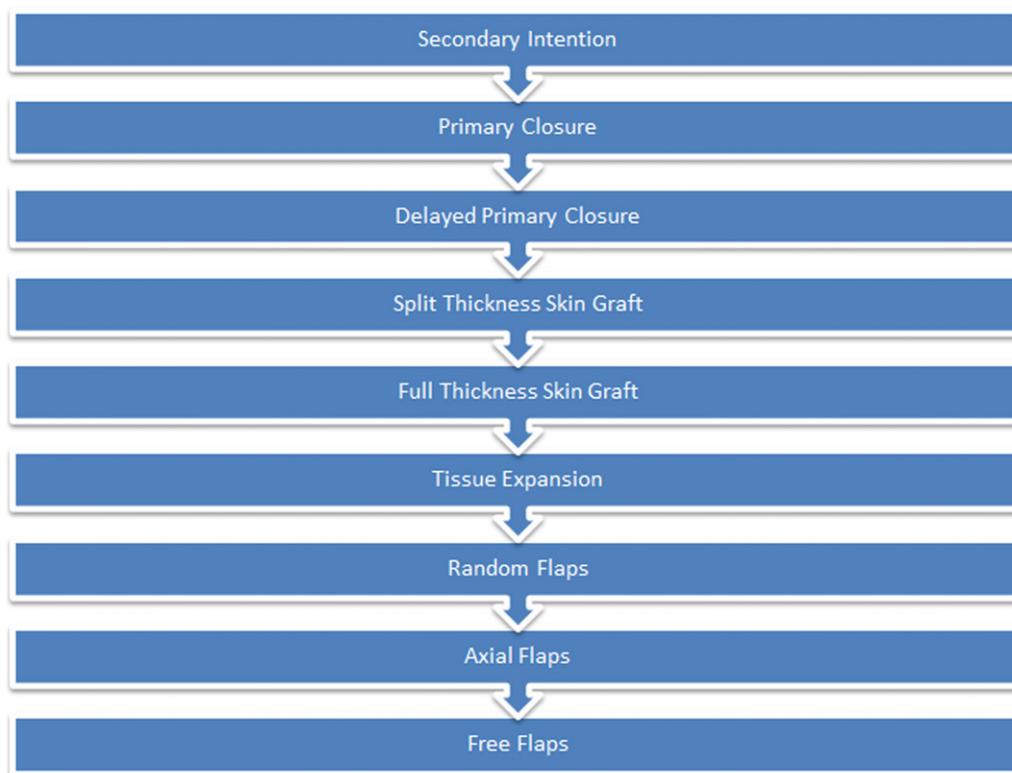
In evaluating a defect and developing a reconstructive plan, the location, depth, and size of the defect all play a significant role. Larger defects may not be amenable to closure with a skin graft or local flap and will likely require a regional flap. Similarly, defects that involve exposure of the great vessels will need a vascular flap of significant bulk (usually a regional flap) to ensure adequate coverage of the great vessels. The location of the defect will dictate reconstructive options on the basis of proximity to certain regional or local flaps, as well as in determining color and texture match of a graft.

### Host factors/recipient site factors

The method of reconstruction is dependent not only on the defect itself but also on the patient’s ability to heal and incorporate the reconstruction. The deleterious effects of

**Address reprint requests and correspondence:** Fred G. Fedok, MD, FACS, Division Chief of the Division of Otolaryngology-Head and Neck Surgery, Penn State Hershey Medical Center, Hershey, PA.

E-mail address: [ffedok@hmc.psu.edu](mailto:ffedok@hmc.psu.edu)



**Figure 1** Reconstructive ladder. Figure of options for reconstruction from least to most invasive. (Color version of figure is available online.)

radiation on local tissue diminish the vascularity, induce fibrosis, and reduce the ability of the skin to repair and heal.

Additionally, nutritional factors and other comorbidities as well as patient lifestyle can adversely affect the success of a reconstructive surgery. Patients with hypoalbuminemia or general malnutrition will have delayed wound healing and an increased likelihood of wound breakdown. Moreover, comorbidities such as hypercholesterolemia, peripheral vascular disease and coronary arterial disease can affect the patency, compliance, and resilience of pedicled flaps and decrease the success of grafts and free flaps. Additionally, research shows that diabetics have significant intracellular metabolic defects that lead to delays in signaling to limit tissue destruction and to initiate the reparative processes within the body.<sup>3</sup> Patients undergoing free-flap reconstruction with a diagnosis of diabetes have been found to be more likely to have a negative outcome.<sup>4</sup> Smokers are also associated with greater flap and healing complications secondary to the vasoconstrictive effect of nicotine and the higher likelihood of small-vessel disease, although these changes are thought to be reversible.<sup>5</sup>

## Reconstructive options

When considering options for reconstruction, we can use the reconstructive ladder to guide our options to manage a soft-tissue defect. The ladder consists of closure by secondary intention, primary closure, delayed primary closure, split-thickness skin graft, full-thickness skin graft, tissue expansion, random flaps, axial flaps, and, finally, free flaps

(as shown in [Figure 1](#)). When there is exposure of the great vessels, the wound may need to be closed immediately.

### Delayed reconstruction

Delayed reconstruction can be of significant utility in cases where there is concern for recurrence or positive margins from the initial resection. In these cases, a temporary split-thickness skin graft or other biological dressing can be used. As noted previously, delayed reconstruction usually cannot be entertained when there is exposure of the great vessels.

### Closure by secondary intention

Closing by secondary intention can be a reliable method of closing, especially along defects that lie over well-vascularized tissues and without exposure of the great vessels of other critical structures. Additionally, convex structures and areas with lax skin are more amenable to closure by secondary intention. This can yield healing that is cosmetically and functionally acceptable in many circumstances. It is not universally used and is of generally limited application. This method of closure might be used in patients who prefer not to have another surgery, when there are comorbidities or contraindications to other methods of closure. To aid with healing by secondary intention, Dhir et al<sup>6</sup> describe the use of vacuum-assisted closure (VAC) systems for neck wounds. In their case series, the VAC dressings were used mostly in patients who experienced a wound dehiscence of a neck dissection incision.

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