



Reconstruction of upper third auricular defects



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The objective of this article is to summarize the current methodology for addressing upper third auricular defects based on comprehensive literature review and the senior author's experience. Partial-thickness defects may be addressed using secondary intent, primary closure, excision of exposed cartilage followed by primary closure, or use of skin grafting. This decision is often dictated by the status of the perichondrium. Small full-thickness defects (<1.5 cm) are sometimes amenable to primary closure and others may require conversion to a wedge excision to facilitate closure. Medium size defects (1.5–2.0 cm) are more likely to require local tissue rearrangement including chondrocutaneous advancement flaps for helical defects or composite grafts for defects beyond the helical rim. Reconstruction of larger defects (>2.0 cm) can often be facilitated by pedicled flaps that require detailed knowledge of the surrounding blood supply. There are a variety of solutions available for the reconstructive surgeon to effectively address this unique challenge.

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Introduction

The upper third of the auricle is generally defined as the portion of the ear superior to a line drawn parallel to the Frankfort horizontal line through the superior edge of the concha cymba (Figure 1). Similar to other regions of the ear, defects in this area primarily arise from either traumatic injuries or ablative procedures, like Mohs micrographic surgery, for cutaneous malignancies. When cancer is the culprit, squamous cell carcinoma is interestingly more common on the auricle than basal cell carcinoma.¹

When faced with a patient suffering from tissue loss in the superior pinna, the surgeon should consider both general and distinct circumstances before proceeding. Patient preferences and comorbidities must be taken into consideration. Nicotine use, diabetes mellitus, immunosuppression, and the need for

anticoagulation are but a few deleterious factors that may negatively affect the reconstructive outcome. One must also discern patient goals for the repair, help set realistic expectations, and discuss the risks, benefits, and alternatives for both single- and multi-stage repairs. In some instances, patients may be best served by conservative wound closure or wound healing by second intent followed by allowance of adjacent hair to provide some degree of coverage to camouflage the defect. Function may supersede form, though, especially for patients who rely on the pinna for anchoring eyeglasses or for correct fitting of a behind-the-ear hearing aid processor.²

Once decided to proceed with reconstruction, it is useful to categorize defects of the upper third first by depth and layer involved, and then by size.

Partial-thickness defects of the upper third

A defect involving only the cutaneous layer may be amenable to primary closure, especially on the medial (sometimes referred to as posterior) surface where relatively

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Figure 1 The upper third of the auricle defined by a line drawn parallel to the Frankfort horizontal line through the superior edge of concha cymba. (Color version of figure is available online.)

greater subcutaneous tissue lends to greater soft tissue laxity.² This is also an option along the free edge of the helix where simply suturing skin from the medial and lateral surfaces will close the wound. Helical cartilage may need to be trimmed to allow tension-free closure. On the contrary, lateral (sometimes referred to as anterior) cutaneous defects are difficult to close primarily because of the lack of subcutaneous tissue and tightly bound epithelium.^{1,2} A split- or full-thickness skin graft is often the treatment of choice in this circumstance (Figure 2). Postauricular, preauricular, and supraclavicular skin grafts are all viable donor options, though ipsilateral or contralateral postauricular skin will likely provide the closest match with respect to skin thickness and pliability. Grafts should be fenestrated to permit the egress of fluid, and secured with either full-thickness quilting sutures or a bolster dressing.

Another alternative for cutaneous defects of the upper third is healing by secondary intent. Concave surfaces

inherently heal more favorably than convex surfaces, making this a more viable option on the lateral surface of the auricle (Figure 3).¹ In contrast, a helical rim defect is at risk of unfavorable contouring and notching if allowed to heal by secondary intent.³

Defects that extend beyond the cutaneous layer to involve the perichondrium render the underlying cartilage unable to support a skin graft. Therefore, exposed cartilage void of perichondrium may require excision in certain instances. The cartilage of the concave concha cavum, concha cymba, fossa triangularis, and scapha can be partially removed without sacrificing the superstructure of the ear.⁴ However, this may result in a more complex, multidimensional wound, such as the wedge defect described later in this article.² Alternatively, fenestration of the exposed cartilage with a large bore needle or dermatologic punch can promote blood flow through the cartilage to aid in graft imbibition or propagation of granulation tissue and neoeptithelialization.

Full-thickness defects of the upper third by size

Using the metric of size, reconstructive surgeons are aided in determining the ideal reconstructive option for a given full-thickness defect (Table). Defects smaller than 1.5 cm may be modified into a simple, full-thickness wedge shape that can then be closed primarily in layers. This wedge can be extended into the concha with the apex pointed toward the root of the helix to reduce tension and minimize distortion.^{2,4} The cartilage is approximated with monofilament polydioxanone or poliglecaprone suture. Braided sutures tend to create cheese-wire cuts through cartilage. The skin envelope can then be closed with suture of the surgeon's choosing. At the free edge of the helix, care should be taken to entice wound edge eversion, preferably with interrupted vertical mattress sutures. In this way, as wound contraction and healing commence, a smooth free edge devoid of notching will result.

As wedge size increases subsequent closure will result in greater loss of auricular vertical height. Even so, the potential asymmetry is often inconsequential owing to the

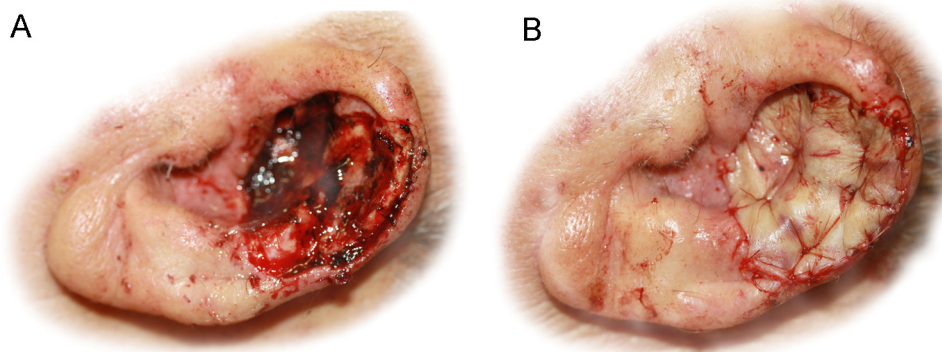


Figure 2 (A) Mohs skin-only defect of the lateral superior pinna. Perichondrium intact. (B) Wound closed with full-thickness skin graft and secured with quilting sutures. A bolster was then applied for 1 week. (Color version of figure is available online.)

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