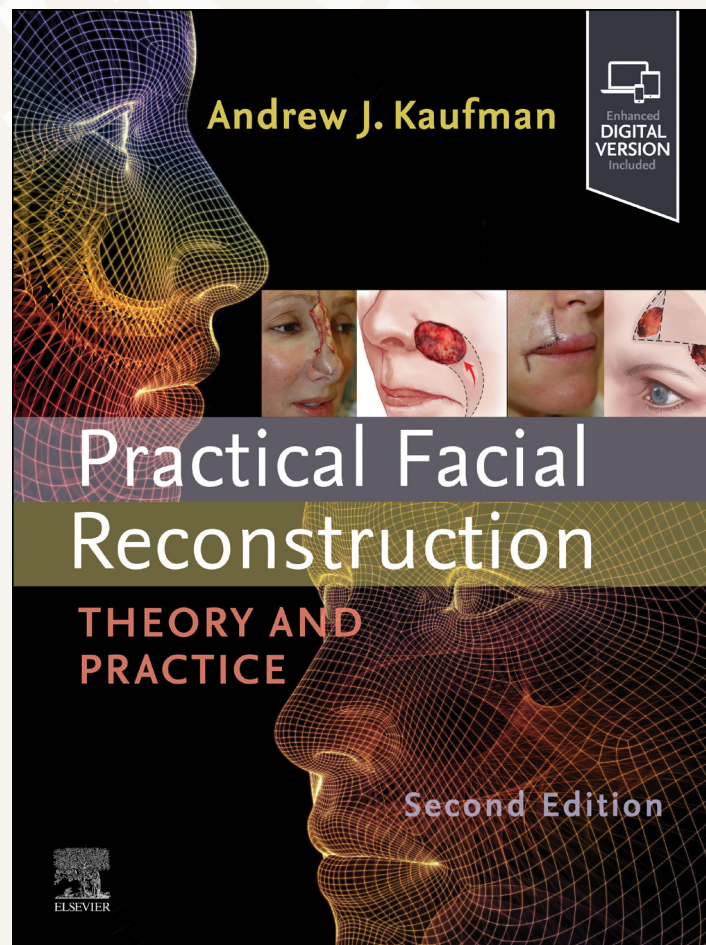


Exclusive preview: Ear Reconstruction



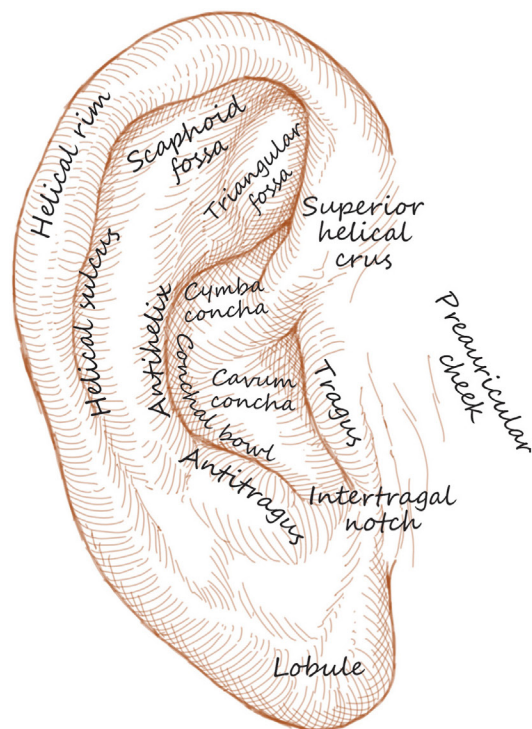
From *Practical Facial Reconstruction, 2nd Edition*



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Ear Reconstruction



The ear is a complex structure whose lateral surface provides minimal loose tissue for side-to-side or flap repair. The skin on this side is bound down to a convoluted cartilaginous structure with convex and concave surfaces. As such, repair on the lateral surface is usually limited to second-intention healing, skin graft, or a flap from the medial pinna or other nearby cosmetic units (i.e., preauricular cheek or postauricular scalp). The skin on the medial surface of the ear is a little looser and may provide adequate tissue for side-to-side or flap repair of small-to-medium-sized defects, although flap repair frequently recruits tissue from the postauricular sulcus area. The helical rim provides the characteristic shape of the pinna, and reconstruction is most successful if the shape, size, and appearance of this contiguous structure are maintained. Fortunately, for many defects on the helical rim, the inferior helical rim and lobule provide an adequate reservoir of loose tissue from which to fashion local flap repair.

HELICAL RIM: HELICAL RIM ADVANCEMENT FLAP

7.7

Properly designed and executed, the helical rim advancement flap is a wonderful addition to a surgeon's repertoire for the reconstruction of helical rim defects (**Fig. 7.7A and I-U**).

From the author's experience, there are two aspects of the design that may vary among surgeons or literary sources. Unfortunately, some of these variations may make the flap more difficult to perform or jeopardize the viability of the flap. The first of these variations is having the flap extend only to the inferior aspect of the helical rim, i.e., stopping short of the lobule. The second design variation is making the flap a full-thickness incision, essentially advancing a tube of helical rim to fill the defect. Regarding the first aspect, the lion's share of loose or lax tissue from where to borrow is in the lobule of the ear. Ending the flap along the helical rim only stretches the helical rim. Extending the flap to the lobule and removing a tricone within the lobule allows one to advance the flap significantly. The second design variation involves a full-thickness incision through the helical sulcus to and through the medial or posterior aspect of the ear. The problem with this approach is that it significantly decreases the available blood supply to the flap. Rather than keeping the skin on the medial pinna intact and benefitting from the broad pedicle of the flap, the pedicle (and therefore the blood supply) of the flap is significantly reduced, jeopardizing the viability of the distal portion of the flap.

The properly designed and executed helical rim advancement flap should have an incision that extends to the lobule, where a tricone is excised (**Fig. 7.7B**). The flap should have a broad-based pedicle, essentially preserving all of the skin on the medial aspect of the pinna except for a tricone, which may be excised during the repair (**Fig. 7.7C**). To mobilize the flap, the skin on the medial pinna needs to be undermined completely to the postauricular sulcus, but maintaining a broad pedicle for the flap helps preserve a robust blood supply. After adequately undermining, the flap is advanced into the surgical defect, and the helical rim is sutured into place with one or two 4-0 absorbable, buried vertical mattress sutures. The wound edges over the helical rim are approximated and hypereverted by two or three 5-0 or 6-0 polypropylene vertical mattress sutures, and the remainder of the wound is closed with a running percutaneous polypropylene suture (**Fig. 7.7D**). A small tricone is excised on the medial aspect of the pinna and repaired. The final healed result shows a good cosmetic outcome (**Fig. 7.7E**) (see also **Video 7.4**).

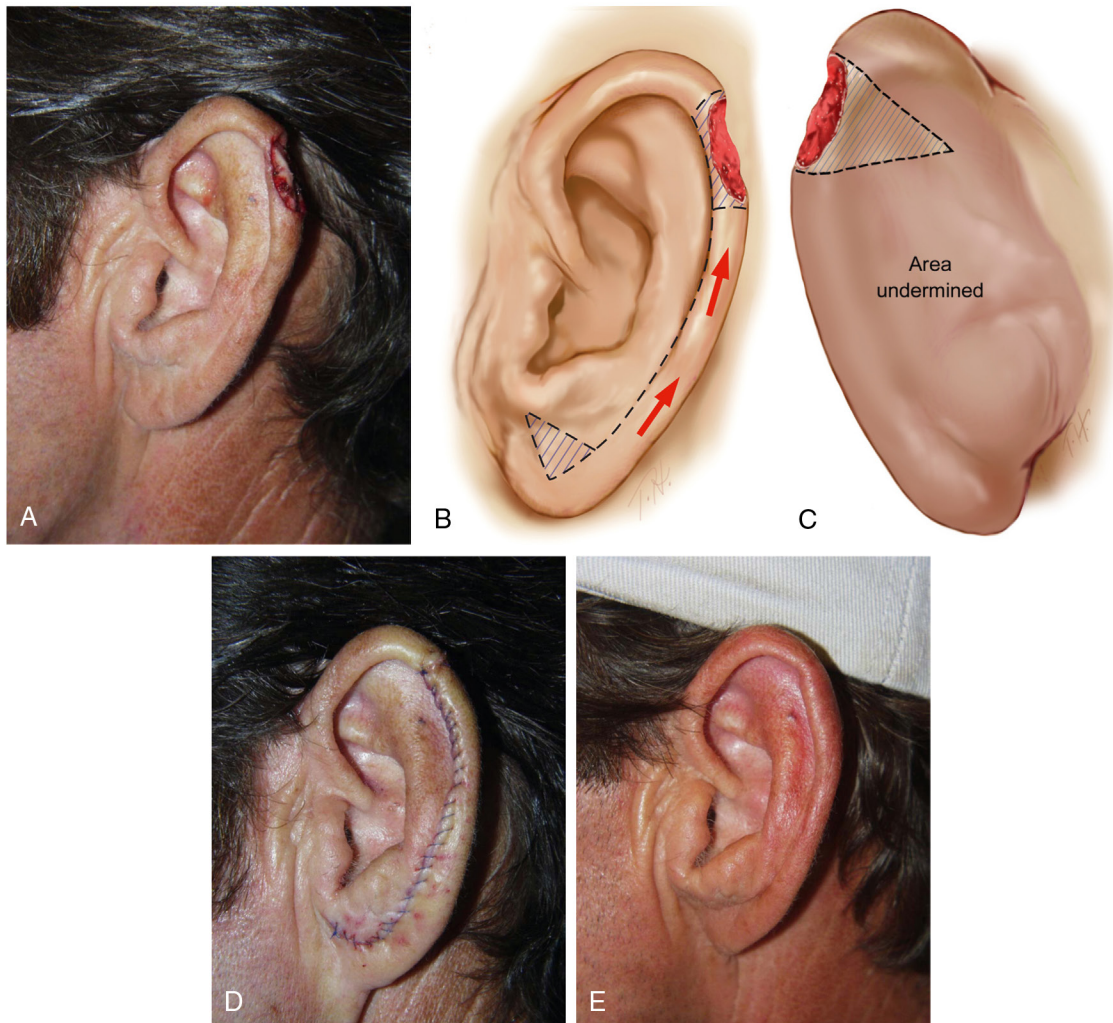


Figure 7.7 (A) This 50-year-old man was left with a 1.4×1.2 cm defect on the left helical rim following Mohs surgery for a squamous cell carcinoma. (B) Proper design of the helical rim advancement flap. The surgical defect is slightly enlarged so that the repair is completed at the junctions of cosmetic units (e.g., within helical sulcus) and so that the advancing flap and closure is perpendicular to the skin surface. The incision along the helical sulcus is carried to the lobule, where a tricone is excised to facilitate advancement of the flap after undermining on the medial pinna. Incisions through the helical sulcus and lobule are carried to the medial aspect of the pinna but do not incise the cutaneous surface on that side. (C) Medial aspect of the pinna. Undermining is completed over the medial pinna all the way to the postauricular sulcus, but except for excision of the tricone, the skin is not incised. Maintaining a broad pedicle preserves the vascular supply to the flap. (D) Helical rim advancement flap sutured into place. One or two buried vertical mattress sutures at the leading edge of the flap secure the flap in place. Over the helical rim incision, vertical mattress sutures are used to approximate and hyperevert the rim (to avoid notching after healing). A running suture is used along the helical sulcus and lobule and on the excision of the tricone on the medial aspect of the pinna. (E) Final healed result. Helical rim is well reconstructed. Lobule is slightly smaller in height.

The second example is a relatively larger surgical defect, but by following the same principles and continuing the incision to the lobule, an adequate amount of tissue was recruited for repair (**Fig. 7.7F–H**). How large a surgical defect can be repaired in this manner is based on several factors. Older patients with larger ear lobules provide a larger resource for reconstruction, but even in younger patients, a defect measuring up to 1.5 or even 2.0 cm can be repaired with a helical rim advancement flap.

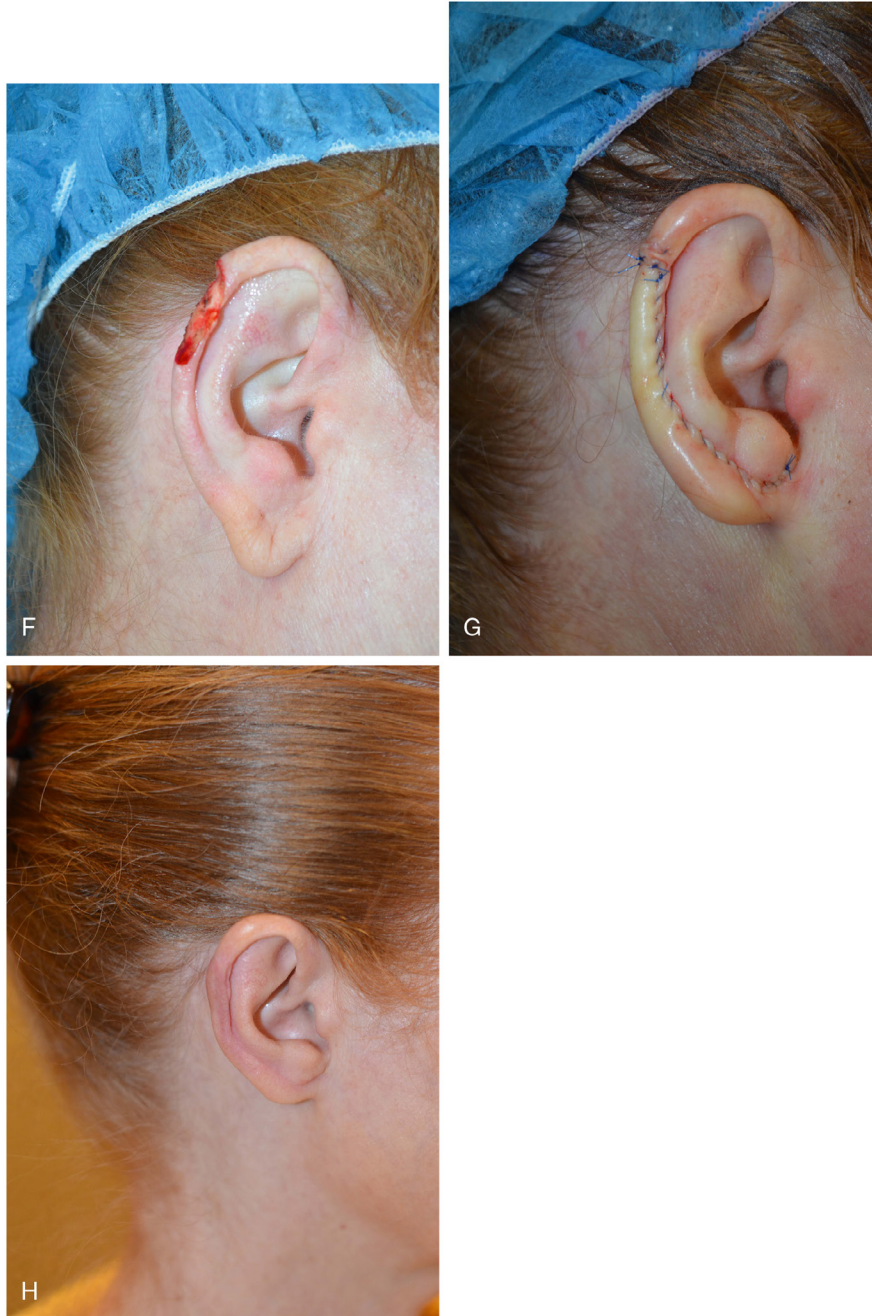


Figure 7.7, cont'd (F) This 56-year-old woman was left with a 2.3×1.2 cm defect along the helical rim following Mohs surgery for a basal cell carcinoma. (G) A helical rim advancement flap reconstructed the surgical defect. The incision over the helical rim was closed with 4-0 absorbable, buried vertical mattress sutures and 5-0 polypropylene vertical mattress sutures to approximate and hyperevert the wound edges. (H) Final healed result. Lobule slightly smaller in height but with a good shape and unbroken helical rim. Lobule can be pierced after 3 months.

STEP-BY-STEP HELICAL RIM ADVANCEMENT FLAP

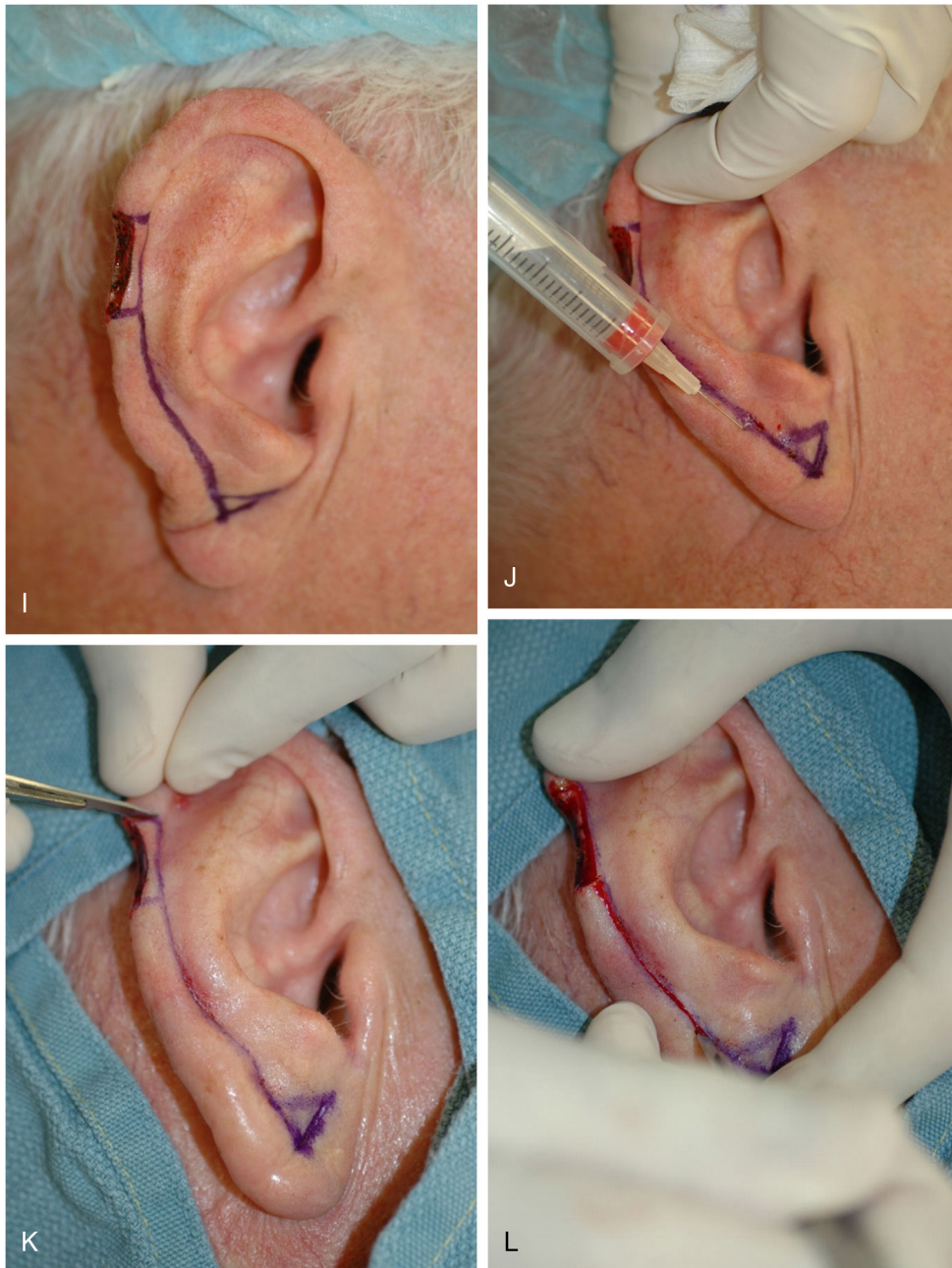


Figure 7.7, cont'd (I) Surgical defect on the helical rim to be repaired by helical rim advancement flap. The edges of the defect will be made perpendicular to the skin surface. The flap is marked out with a long incision following the helical sulcus to the lobule, where a tricone will be excised to facilitate advancement of the flap into the defect. (J) Local anesthesia is infiltrated along the helical sulcus to the lobule and also along the helical rim and over the medial (i.e., posterior) aspect of the pinna to the postauricular sulcus. (K) Edges of the surgical wound are made perpendicular to the skin surface to better approximate wound edges when the flap is advanced into the surgical wound. (L) Incision is made along the helical sulcus but keeps the skin on the medial aspect of the pinna intact.

STEP-BY-STEP HELICAL RIM ADVANCEMENT FLAP

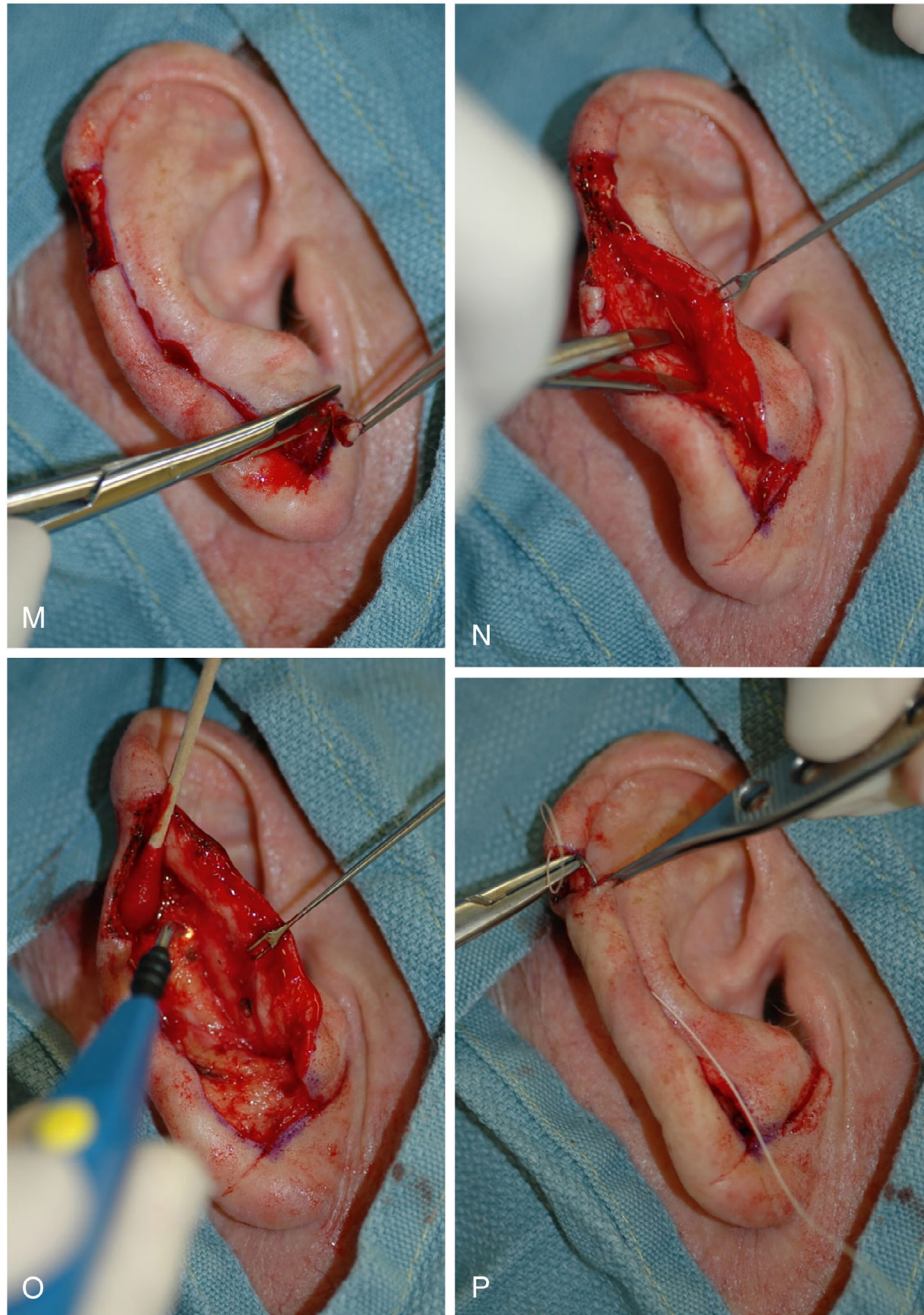


Figure 7.7, cont'd (M) Tricone is excised at the distal aspect of the incision within the lobule, which will allow the flap to advance more easily. (N) Skin hook is used to reflect the pinna outward, and the broad pedicle of the flap on the medial aspect of the pinna is undermined widely by blunt dissection, freeing the skin completely from the medial pinna. Undermining is carried to the postauricular sulcus. (O) Light spot electrocautery is used for hemostasis. (P) Flap is advanced into the surgical wound and sutured into place with 4-0 polyglactin 910 buried vertical mattress sutures. Additional buried, absorbable sutures may be used along the helical sulcus and lobule to secure the flap in place.

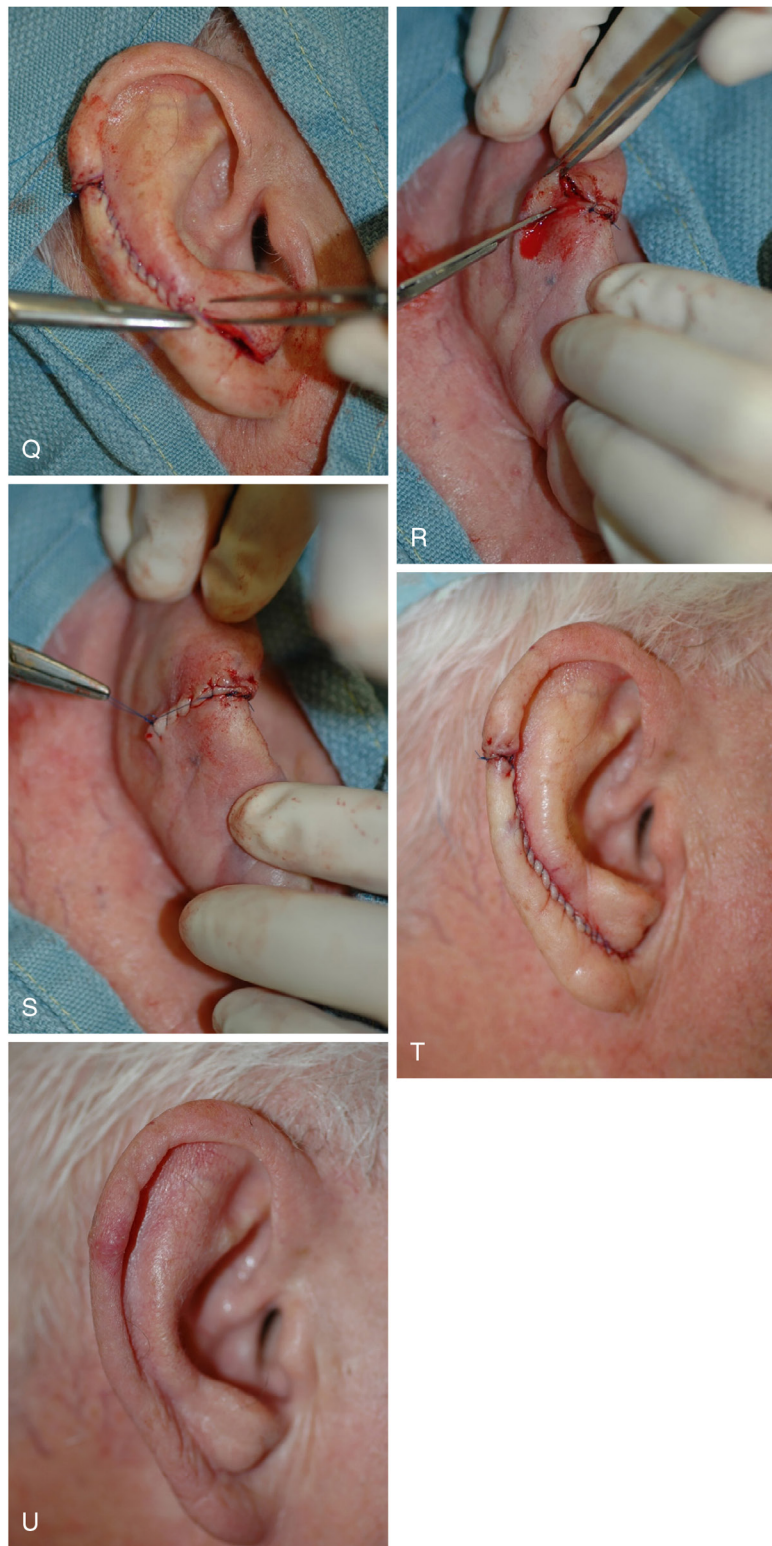


Figure 7.7, cont'd (Q) Vertical mattress (e.g., 5-0 polypropylene) sutures are used across the helical rim to hyperevert the helical rim and decrease chance of contracture and notching at the helical rim. Along the helical sulcus and lobule, a running percutaneous suture is used to approximate the skin edges. (R) Advancing the flap creates a standing cone or tricone on the medial surface of the pinna. This tricone is excised. (S) After excision of the tricone, the wound is closed with a running percutaneous suture. (T) Immediate postoperative appearance. Pressure bandage is applied for 24 hours to decrease swelling, pain, and risk of bleeding. Sutures are removed at 7–10 days. (U) Short-term healed appearance. Helical rim is well approximated without notching. Incision along helical sulcus and lobule is well hidden, and shape and continuity of pinna and helical rim are excellent.

Key Points

- Helical rim advancement flaps are a useful repair for small-to-medium-sized defects of the helical rim.
- Incision within the helical sulcus should be carried to the lobule, but the incision should keep the skin on the medial pinna intact (i.e., a broad flap pedicle should be maintained on the medial pinna).
- A tricone excision in the lobule facilitates the advancement of the flap.
- As with other closures crossing the helical rim (e.g., wedge excision repair or staged postauricular repair), closure of the epidermis over the helical rim should be with vertical mattress sutures to hyperevert the skin edges and avoid notching of the rim.



Watch Helical Rim Advancement Flap from *Practical Facial Reconstruction, 2nd edition* at <https://youtu.be/Qq7ym9ZefBQ>