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IDEAS AND INNOVATIONS

Reconstructive

A Novel Surgical Approach for the Reconstruction of a Large Partial-Thickness Defect of the Helical Rim

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Summary: The unique anatomy of the ear makes it difficult to reconstruct. In terms of restoring the natural curvature of this anatomic site, repair of large defects involving the helical rim after skin tumor removal presents a unique surgical challenge. We present a case of a patient with a partial-thickness surgical defect involving more than one-third of his right helical rim. The defect was reconstructed using a double transposition flap, with the flap taken from the surrounding skin. There was no need to interpose a cartilage graft, as there was no damage to the patient's own cartilage during the surgery. Both flaps survived with no complications. This single-staged surgical technique was performed under local anesthesia. The immediate and long-term outcomes were satisfactory, and cosmetic results were good. We describe the double transposition flap as an innovative technique for reconstructing specific ear defects. In particular, it is an excellent surgical option for the reconstruction of large surgical defects involving the helical rim. For defects such as the one outlined here, this flap may be considered as an alternative reconstructive option, provided the patient's medical condition allows. *(Plast Reconstr Surg Glob Open 2026;14:e7337; doi: 10.1097/GOX.0000000000007337; Published online 6 January 2026.)*

INTRODUCTION

Basal cell carcinoma is a common tumor of the ear, and surgical excision is generally the preferred treatment option. One of the most commonly affected areas is the helical rim. Mohs surgery can be an effective approach in such cases. As tumors in this location are often large, complex reconstruction techniques may be needed to close the defects after tumor removal. Here, we report the case of a patient who had a large tumor in this area and describe the flap we chose to use. This flap has not been described previously in the literature.

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METHODS

Case Description

An 88-year-old White man presented at our clinic for treatment of a primary basal cell carcinoma on his right ear. The tumor consisted of an erythematous, partially ulcerated, and poorly defined plaque of 3 × 1 cm, involving more than one-third of the right helical rim (Fig. 1). As optimal treatment to achieve complete removal of the tumor, we recommended Mohs surgery. We performed the surgery under local anesthesia. Three stages were needed for complete tumor removal. Bleeding was minimal, keeping the underlying cartilage undamaged. The resulting partial-thickness defect measured 5 × 1.5 cm and was primarily centered on the mid-third of the right helical rim (Fig. 2).

Technique

Several basic principles must be taken into consideration during this type of surgery. It is necessary to ensure complete tumor removal, to restore the anatomical and aesthetic curvature of the helical rim, to

Disclosure statements are at the end of this article, following the correspondence information.

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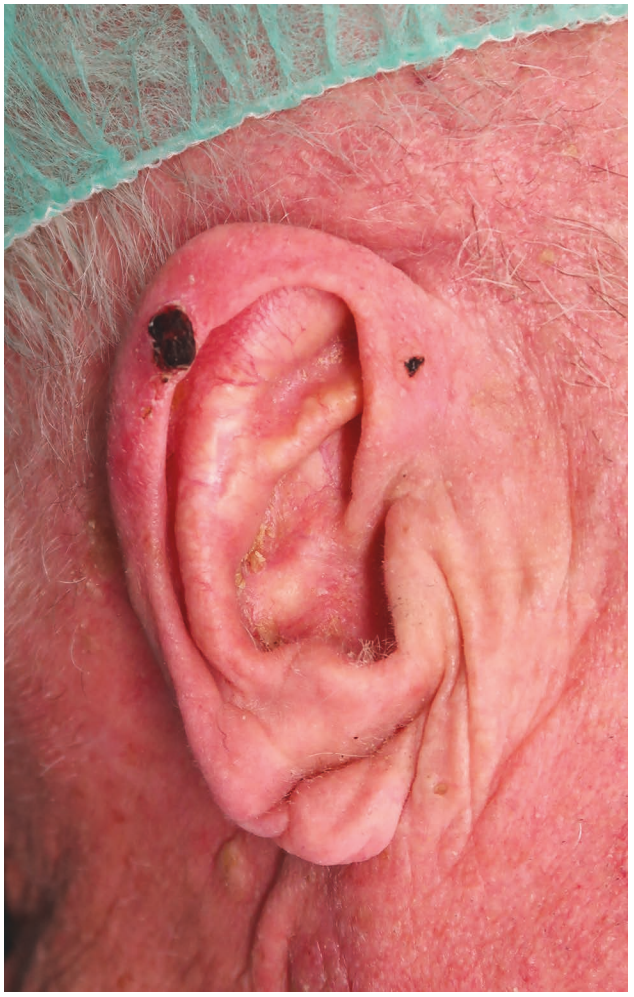

Fig. 1. Basal cell carcinoma of 3×2 cm, involving more than one-third of the right helical rim.

prevent distortion, and to minimize potential postoperative complications, such as deformity and scar-related complications.

First, the skin was wiped with a 2% aqueous solution of chlorhexidine, and the visible tumor was outlined with surgical ink. Anesthesia consisted of local infiltration of a 2% solution of mepivacaine hydrochloride plus a 0.5% solution of bupivacaine hydrochloride. The presence of abundant remaining skin surrounding the defect led us to consider using this tissue for closure. The surgical technique involved the use of 2 cutaneous transposition flaps. We designed a transposition flap in the remaining skin above the defect to cover/close the upper half of the defect. Similarly, another transposition flap was harvested from the remaining skin below the defect to repair the lower half of the defect (Fig. 3). Each flap had a width of approximately half the length of the defect to ensure adequate vascular supply. These flaps depended on the rich subcutaneous arterial supply network provided by the superficial temporal artery anteriorly (toward the tragus) and the posterior auricular artery posteriorly (toward the lateral helix). Both flaps were the same size and were

Takeaways

Question: Our study evaluated how to best reconstruct large helical rim defects while maintaining ear symmetry and facial aesthetics by selecting the most appropriate surgical approach based on the defect's features and individual patient factors.

Findings: Our case study demonstrated that the double transposition flap is an effective surgical technique for reconstructing large, narrow, anterior partial-thickness helical rim defects. The procedure yielded optimal cosmetic results in the presented case.

Meaning: The double transposition flap is a reliable and cosmetically effective surgical option for reconstructing large partial-thickness helical rim defects when patient and defect conditions are appropriate.

undermined from the subcutaneous plane. (**See figure, Supplemental Digital Content 1**, which displays that the 2 flaps were undermined from the subcutaneous plane, **https://links.lww.com/PRSGO/E521**.) After undermining, the superior flap was transposed toward the upper

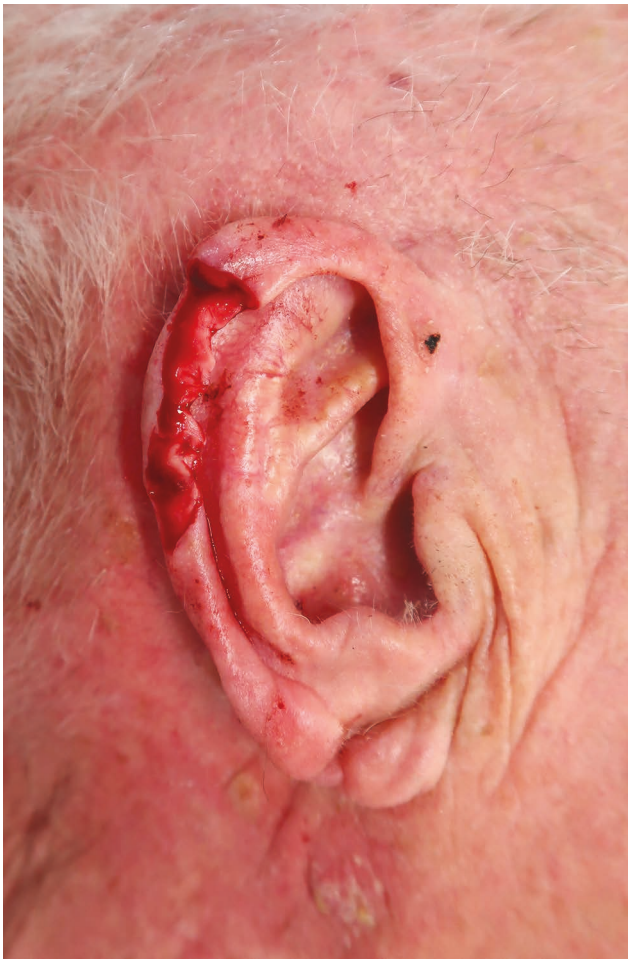

Fig. 2. Partial-thickness defect measured 5×1.5 cm and centered primarily on the mid-third of the right helical rim.

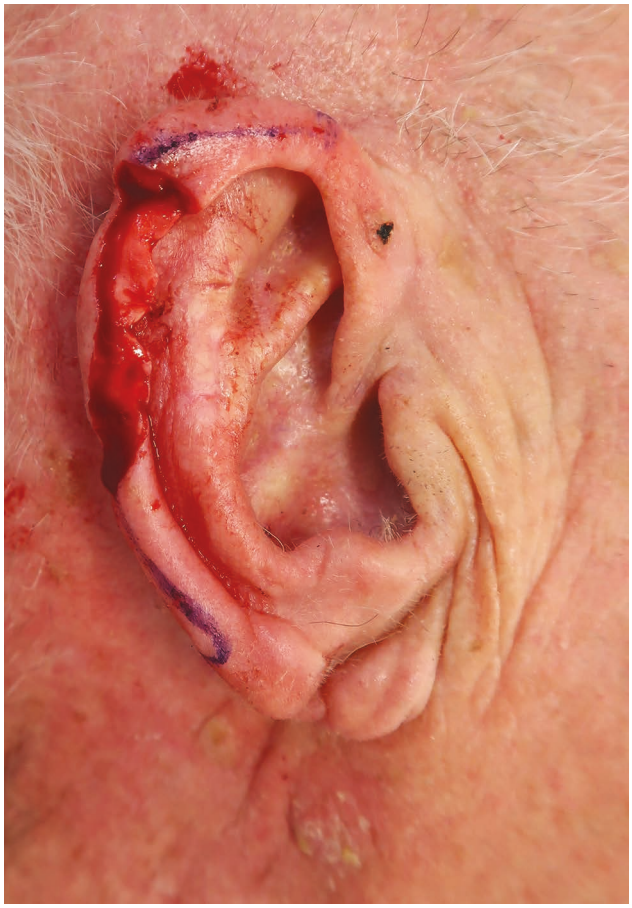

Fig. 3. Design of 2 transposition flaps in the skin surrounding the defect.

half of the defect, and the inferior flap was advanced toward the lower half, as shown in Supplemental Digital Content 2. (**See figure, Supplemental Digital Content 2**, which displays how the superior flap was advanced toward the upper half of the defect and the inferior flap was advanced toward the lower half, **https://links.lww.com/PRSGO/E522**.) We first repaired the 2 secondary defects as a linear closure using 5/0 silk, allowing better mobilization of both flaps. The flaps were then sutured and adapted to cover the defect using 4/0 and 5/0 silk. We then applied an antibiotic ointment of 2% mupirocin and a petroleum-based gauze dressing. The dressing was covered with a sterile bandage and kept in place until the first postoperative checkup 1 week later. At this time of follow-up, we confirmed that both flaps had survived with no loss. The sutures were removed 15 days after the surgery.

Results

No local complications were observed. Figure 4 shows the outcome 3 months after the surgery. The scar lines respected the local anatomical integrity with good cosmetic results. In this case, the treatment was successful in preventing the tumor from returning, as no tumor recurrence was observed at 1-year follow-up.

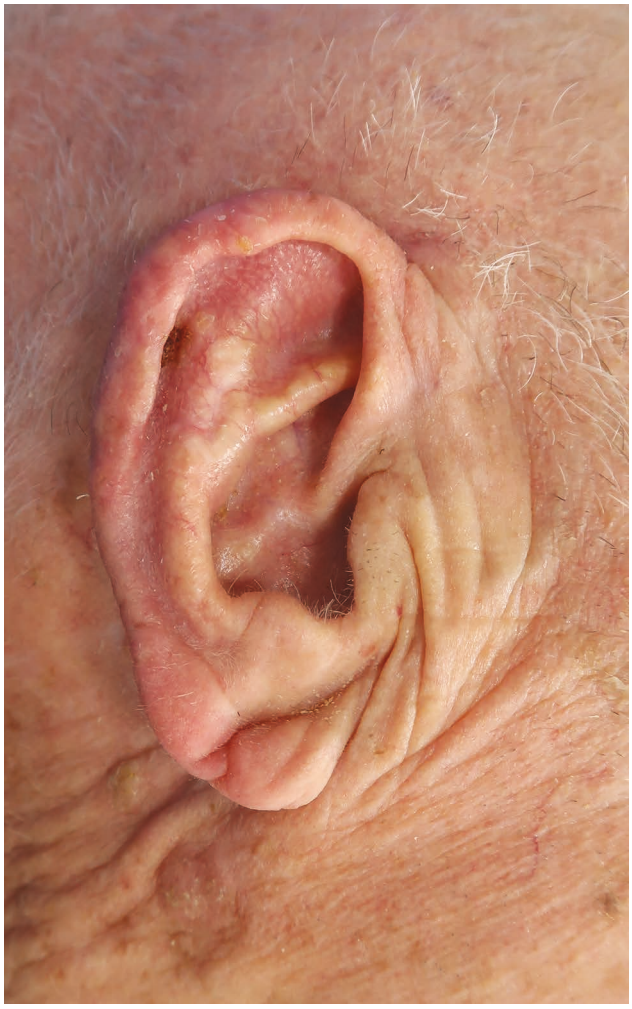

Fig. 4. Outcome 3 months after the surgery.

DISCUSSION

Large helical rim surgical defects can be difficult to reconstruct because changes to the ear's symmetry or structure might affect the overall appearance of the face. We need to consider several factors when selecting the most appropriate surgical approach for the defects outlined here. First, we need to assess the defect's size and identify whether it is a partial- or full-thickness defect. We must also consider the patient's general medical status and the tissue available for reconstruction. Restoring the helical rim curvature and achieving an optimal cosmetic outcome are the primary objectives of helical rim repair. Several techniques have been described to reconstruct this kind of surgical defect, but each case requires a unique understanding of the context and the patient's demands to be effective.

In the case presented here, primary closure,[1] grafts,[2] and secondary intention healing[3] were not the ideal options for reconstruction of this defect. Primary closure would have resulted in a significant reduction in the size of the ear. The use of grafts or secondary intention healing would have significantly affected the curvature of the helix, resulting in helical rim distortion, and the cosmetic result

would not have been optimal. Another feasible reconstructive technique for such auricular margin defects is the postauricular flap.[4] However, this flap is a 2-staged surgical technique, which implies greater surgical complexity and at least 2 days of surgery. Given that our patient was older and had limited mobility, we considered that the postauricular flap was not the most appropriate surgical approach. The Antia-Buch technique was considered; however, due to the vertical extent of the defect, it would have required wider dissection and a more invasive approach, which we sought to avoid in this patient.[5]

CONCLUSIONS

Here, we presented a novel surgical technique for the reconstruction of a large helical rim defect. The cosmetic results were optimal. Our results show that the double transposition flap was a good surgical option for repairing the large and narrow anterior partial-thickness helical rim defect described here. However, we emphasize the case-specific nature of our approach, acknowledging the limitations and potential challenges that may arise in a larger series.

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DISCLOSURE

The author has no financial interest to declare in relation to the content of this article.

PATIENT CONSENT

Informed and written consent was obtained from the patients before the surgery. Informed consent involved the collection of their clinical data and biological material for use in biomedical research and further medical publishing.

ETHICAL APPROVAL

All procedures involving human participants were conducted in accordance with the Declaration of Helsinki and its later amendments or with comparable ethical standards.

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