

Modified Chondrocutaneous Flaps for Middle Helical Rim Defects

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Summary: This article describes a unique approach for reconstruction of large helical rim defects. By raising bilateral chondrocutaneous flaps of the helical rim while including a semicircular chondrocutaneous excision of the adjacent scapha and antihelix, large defects can be repaired with minimal loss to the overall external ear circumference. This is a technically simple and reliable method that has resulted in excellent cosmetic outcomes and minimal morbidity in our practice. (*Plast Reconstr Surg Glob Open* 2021;9:e3592; doi: [10.1097/GOX.0000000000003592](https://doi.org/10.1097/GOX.0000000000003592); Published online 21 May 2021.)

INTRODUCTION

Acquired middle helical rim defects of the ear have numerous etiologies, the most common of which is malignancy. These lesions require excision followed by partial rim reconstruction, with the goal of preserving ear architecture, size, and overall symmetry with the contralateral ear. Achieving excellent cosmesis when reconstructing middle helical rim defects is challenging, given the auricle's complex architecture and vascularity.¹

For defects < 1.5 cm in length, wedge excision with direct closure is the most commonly employed reconstruction modality. When used in larger defects, wedge excision with primary closure risks altering the ear's overall size and shape, including increasing the risk of helical notching.²

Helical rim advancement flaps have been described for middle rim defects up to 2 cm.³ For larger middle rim defects, other reconstruction techniques that have been described include posterior auricular flap, Banner flap, mastoid tube flap, contralateral chondrocutaneous graft, Dieffenbach flap, and the converse tunnel technique. All of these techniques have the disadvantages of requiring multiple surgeries in addition to a cartilage graft from the contralateral ear or the ribs.⁴

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The Antia-Buch flap has proved to be a reliable option for superior helical rim defects.⁵ Several modifications to this flap have been described in the literature to allow for single-stage reconstruction of large superior rim defects.⁶⁻⁸ To our knowledge, there is only one article describing a modified Antia-Buch flap specifically for middle third helical defects.⁹ We describe a unique, modified approach for single-stage middle rim defects.

TECHNIQUE

The lesion, with proper margins, is marked for excision. At this time, the flap design is also drawn (Fig. 1A). The area marked for incision is excised through and through to include removal of the anterior skin, cartilage, and posterior skin (Fig. 1B). Next, the helical rim chondrocutaneous flaps are raised by incising the helical sulcus through the anterior skin and cartilage while leaving the posterior perichondrium and skin intact. An incision is then made from the straight line drawn over the scapha/antihelix from the most medial portion of the superior chondrocutaneous flap to the most medial point of the inferior flap. The tissue between the line and the flaps/defect is then amputated down to the posterior perichondrium and skin (Fig. 1C).

The helical rim flaps are then advanced/rolled into the defect; so the exposed dermal portions of the flaps are in contact with the exposed dermal portions of the scapha and antihelix segments (Fig. 1D). The procedure concludes with the helical flaps and scapha/antihelix being closed in this same configuration.

CONCLUSIONS

Much like the original Antia-Buch flap, leaving the posterior skin intact provides blood supply to the flaps via posterior auricular perforator vessels. Additionally, incising and advancing the chondrocutaneous flaps in a VY manner allows for these flaps to cover significantly

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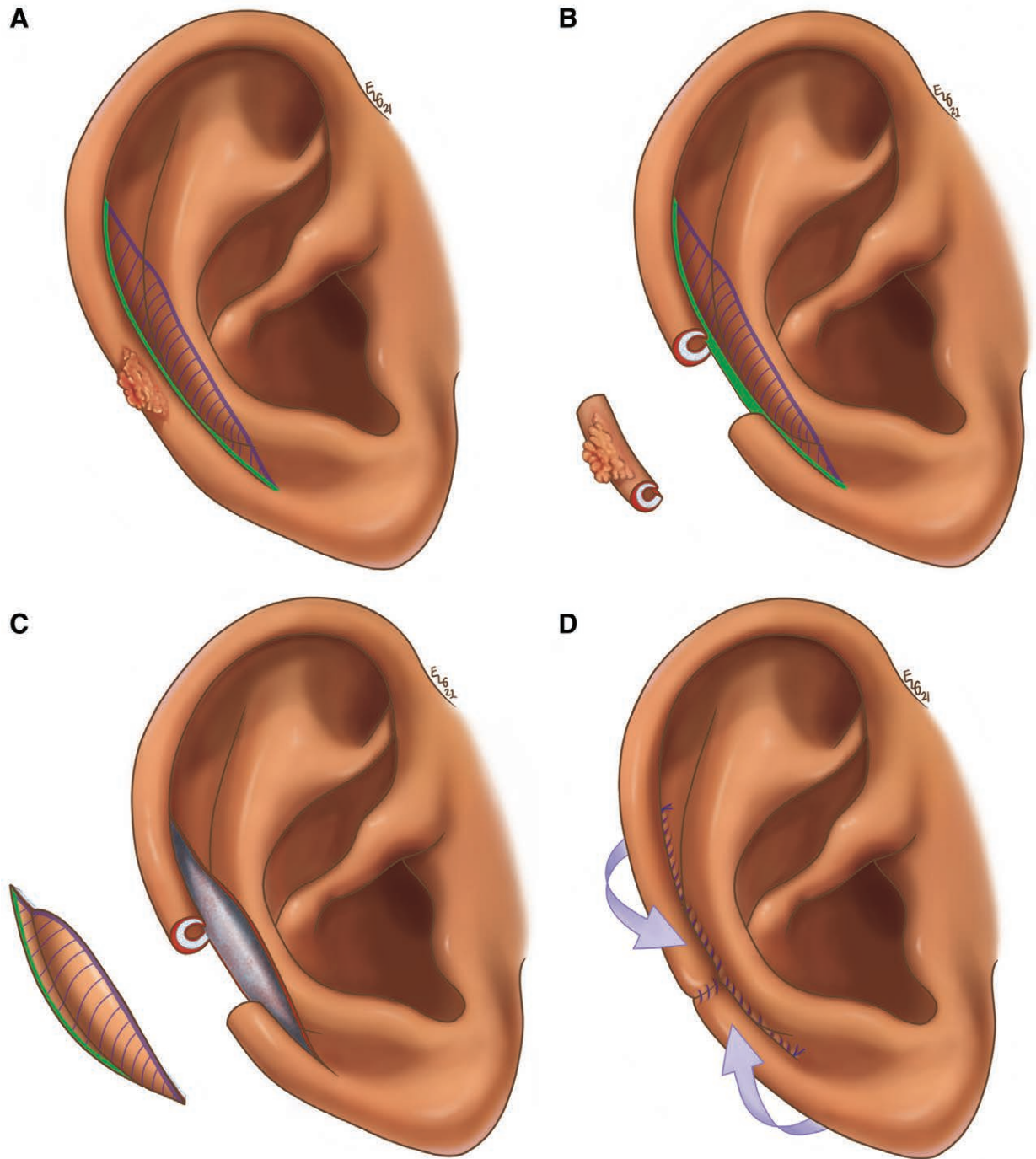


Fig. 1. Steps of the technique for modified chondrocutaneous advancement flaps. A, The technique broken down by area: green represents helical/sulcus incisions, and the blue-striped area notes the chondrocutaneous excision down to the posterior perichondrium/skin. B, Excision of the lesion and the subsequent defect. C, Excision of the anterior skin and cartilage in the scapha/antihelix inset area. D, Rotation-advancement of the chondrocutaneous helical flaps into the scapha/antihelix portion that underwent chondrocutaneous excision.

larger defects than would be possible with primary closure. What makes this flap unique is the chondrocutaneous scapha/antihelix excision. This excision is different from other modifications to the Antia-Buch, particularly other chondrocutaneous excisions such as the star and crescent excisions, in that it allows for a much more subtle circumference change. This is achieved by having the

excision continuous with the helical sulcus incisions and performed in a semicircular manner. This allows the helical chondrocutaneous flaps to essentially “roll” into the excision when they are rotated and advanced. Again, this allows for a mitigation of overall circumference and vertical height loss, which is what allows it to yield excellent cosmetic outcomes in middle helical rim defects.

Additional benefits include mitigation of the length of incisions that need to be made in the helical sulcus in the standard Antia-Buch technique. Other chondrocutaneous advancement flaps frequently employ Burow's triangles to assist with closure. In the only other modified Anti-Buch flap for middle helical rim defect, helical rim Z-plasty and Burow's triangles may be necessary to aid with tension-free closure.⁹ Additionally, if cupping occurs in this other method, additional wedge excision of the anterior skin and cartilage may be necessary. Our technique requires no other modifications to assist with closure.

SUMMARY

This technique has become the standard for middle helical rim defects in our practice. Our patients have been extremely happy with the cosmetic outcome and, to date, we have had no major complications with this technique. Although there is a mild decrease in overall external ear circumference relative to the contralateral auricle, our patients have been very satisfied with their outcomes and we believe this is much more preferable than the 2-stage approach. The key to this procedure is that the "rolling" of the opposing helical rim chondrocutaneous flap inset at the site of partial scaphoid/anti-helix resection allows for minimal overall deformation of the ear.

We conclude that this technique is a simple and reliable method of reconstruction for middle helical rim defects.

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