

Case Report

A Successful Reconstruction of the Upper Antihelix Defect via Postauricular Pull-Through Pedicle Flap

T Maciulaitis, R Venciute-Stankevice¹, N Jakutis²

Faculty of Medicine,
Vilnius University,
²Clinic of Rheumatology,
Orthopedics, Traumatology
and Reconstructive Surgery,
Vilnius University, Vilnius,
¹Centre of Plastic and
Reconstructive Surgery,
Vilnius University Santaros
Klinikos, Vilnius, Lithuania

Received:
20-Jun-2022;
Revision:
09-Sep-2022;
Accepted:
16-Sep-2022;
Published:
20-Dec-2022

ABSTRACT

The auricle is a complex anatomic structure with a three-dimensional configuration proper reinstating that poses a substantial reconstructive challenge. The postauricular pull-through flap is perfectly suitable method for the reconstruction of helical and antihelical auricle defects; however, due to its difficult harvest technique, it is not commonly used in a practice. Here we describe a case of a patient with an antihelix defect following basal cell carcinoma (BCC). In our case, the reconstruction was performed via postauricular pull-through pedicle flap, and a satisfactory result was achieved.

KEYWORDS: *Antihelical defect, ear reconstruction, postauricular pull-through flap*

INTRODUCTION

Malignancies of the external ear are frequent due to its protruding position and sequent actinic exposure. Basal cell carcinoma (BCC) makes up to 90% of all malignant cutaneous lesions in the head and neck region and is the most common type of skin cancer of the external ear.^[1] Skin cancers mostly occur in helical and antihelical regions.^[2] Wide excision and prompt reconstruction are needed to reduce the risk of recurrence and infection. Furthermore, due to psychological benefits, when possible, auricular defects should be treated in a way that results in the best aesthetic outcome for the patient.^[3] However, patients' aesthetic desires must be considered when choosing a reconstructive method. With this in mind, various available surgical techniques may be reviewed: primary closure, secondary intention, split- or full-thickness grafts, and local or regional flaps.

In this case, we describe a patient with an antihelix defect following BCC resulting in distortion of anatomical

integrity. The method we chose for the reconstruction was a postauricular pull-through pedicle flap.

CASE REPORT

A 70-year-old female was referred to our center's dermatology clinic due to the ulceration of the right antihelix, exhibiting symptoms for more than a year. The patient denied having any concomitant diseases, recent traumas, or infection and emphasized slow enlargement of the lesion. Local examination revealed a yellow bean-sized nodule on the right antihelix. Pathology reports of punch biopsy tissue showed irregular basal-like cell mass proliferation in the dermis. In accordance with clinical features and histopathology, the patient was clinically diagnosed with BCC.

Address for correspondence: Mr. T Maciulaitis,
Faculty of Medicine, Vilnius University, M.K. Čiurlionio St. 21,
Vilnius 03101, Lithuania.
E-mail: tomas.maciulaitis@mf.stud.vu.lt

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Maciulaitis T, Venciute-Stankevice R, Jakutis N. A successful reconstruction of the upper antihelix defect via postauricular pull-through pedicle flap. *Niger J Clin Pract* 2022;25:2073-6.

Access this article online	
Quick Response Code:	Website: www.njcponline.com
	DOI: 10.4103/njcp.njcp_416_22

Objectively, a plaque of 1,2 cm × 1,5 cm was seen on the right antihelix [Figure 1] with an ulcerated surface, dark-crusts, exuded ridges, and exposed cartilage [Figure 2].

The patient preferred a one-stage treatment plan and was mainly concerned about the aesthetic outcome of the surgery. Therefore, based on the antihelical location and scale of the defect, the surgical team decided to perform a reconstruction surgery using a local flap.

Reconstruction was performed via a postauricular pull-through pedicle flap, for which we planned a 20% overlay in the medial direction. The flap was grafted in the superior medial auricular area. First, total excision of the primary defect was performed followed by incisions made on the donor site peripheral markings, to the postauricular sulcus [Figure 3].

A cartilage window was then made, by excising cartilage proximally to the defect, intended to connect the donor site with the defect. The excision itself was

prepared wide enough to fit the pedicle of the flap without compression, which could lead to vascular insufficiency. Then, the flap was passed through a cartilage opening and was positioned on the site of the defect. Excess areas of the flap were resected and consolidated precisely to the edges of the defect. For both donor site closure [Figure 4] and consolidation of the flap [Figure 5], nonabsorbable synthetic sutures were used.

Our visualization presented might help understand the mechanics of the pull-through flap technique [Figure 6].

We prepared a three-dimensional animation, allowing to visualize a mechanics of this flap as well [Figure 7].

Postoperatively, the vascularization of the flap was active, and the gauzes were dry. Regular dressings were continued for the wound once a day.

A suture removal follow-up visit 2 weeks later revealed satisfactory aesthetic results on both donor and flap



Figure 1: Right antihelix defect



Figure 2: Defect edges

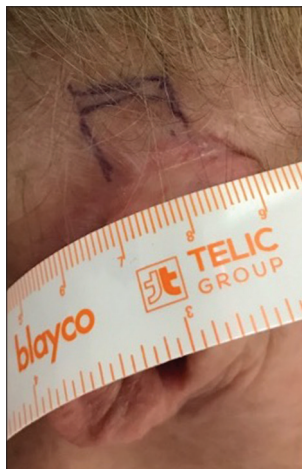


Figure 3: Preoperative markings of a donor site



Figure 4: Primary closure of the donor site



Figure 5: Sutured flap in the defect zone

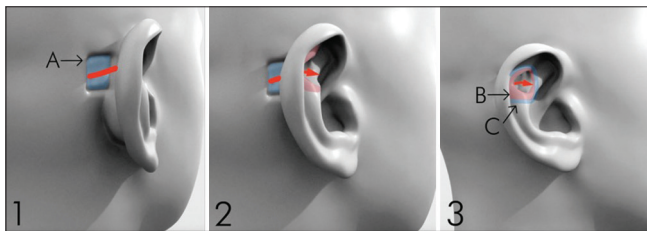


Figure 7: 1A—postauricular flap marking; 2—Cartilage tunnel; 3B—defect site; 3C—Flap overlay site

sites [Figure 8]. Furthermore, the flap site maintained a slight degree of sensation.

DISCUSSION

Various surgical options may be considered for the reconstruction of defects left after malignancy excision. According to a retrospective study by Bittner *et al.*^[4] analyzing 101 auricular reconstruction cases the most common repair method was primary closure, followed by full-thickness skin graft.

In this case, due to the scale of the defect, we were not able to close the post-excision wound primarily without disrupting symmetry and causing anatomical deformity to the antihelical region. Although it is known that the occurrence of wound infection depends on the wound's closure time, a wound with exposed cartilage can still be healed by secondary intention healing.^[5] To diminish the risk of complications and to accommodate our patient's preference for the shortest possible healing method, we did not consider secondary healing as a plan. The two-stage postauricular mastoid flap reconstructive option was an alternative method as well, however, this method is more suitable for larger, full-thickness defects, and requires one more operative stage.^[6]

Ultimately, the postauricular pull-through pedicle flap was chosen for reconstruction in this case. Masson was the

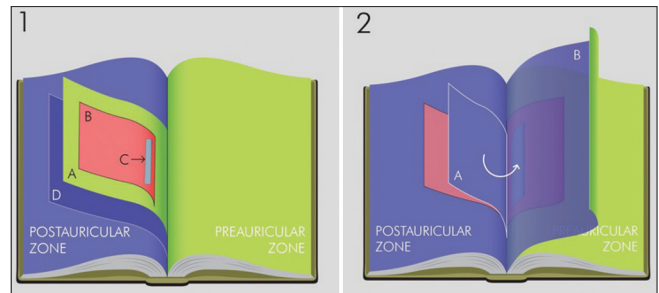


Figure 6: A perfect way to understand the mechanics of a pull-through flap is to visualize the ear as a bookmark. 1A—anterior surface of the ear; 1B—site of excision; 1C—cartilage tunnel; 1D—flap markings. 2A—Pulling through a flap; 2B—posterior surface of the ear



Figure 8: Two-week follow-up visit

first to describe this flap in 1972.^[7] It is well recognized in the literature as a “revolving door”^[8] or “flip-flop”^[9] flap. The color of the flap and its general appearance perfectly matches auricular skin. Donor site scars remain barely visible in the postauricular sulcus, as shown in Figure 7. The flap is well perfused by the auricular branch of the postauricular artery, for which it provides a sufficient amount of movement. Postauricular pull-through flap is associated with minimal morbidity, according to the case series study published by Yotsuyanagi *et al.*^[10] Necrosis and infection are theoretical and pose low to minimal risk for complications. Furthermore, it is considered to be a single-stage surgery and can be performed under local anesthesia.

CONCLUSION

The choice of reconstructive method for an anterior auricular defect depends on individual factors as well as on the experience and expertise of the surgical team. A pedicled pull-through flap is an elegant procedure for upper antihelix reconstruction, especially after tumor excisions, that provides reliable defect coverage, resulting in satisfactory aesthetic outcomes.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their

images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Informed consent

Written informed consent was obtained from a legally authorized representative(s) for anonymized patient information to be published in this article.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Sand M, Sand D, Brors D, Altmeyer P, Mann B, Bechara FG. Cutaneous lesions of the external ear. *Head Face Med* 2008;4:2. doi: 10.1186/1746-160X-4-2.
2. Vuyk H., Cook T. Auricular reconstruction after Mohs' surgery: A review. *FACE* 1997;5:9-21.
3. Gault D. Post traumatic ear reconstruction. *J Plast Reconstr Aesthet Surg* 2008;61(Suppl 1):S5-12.
4. Bittner GC, Kubo EM, Fantini BC, Cerci FB. Auricular reconstruction after Mohs micrographic surgery: Analysis of 101 cases. *An Bras Dermatol* 2021;96:408-15.
5. Levin BC, Adams LA, Becker GD. Healing by secondary intention of auricular defects after Mohs surgery. *Arch Otolaryngol Head Neck Surg* 1996;122:59-67.
6. Adler N, Ad-El D, Azaria R. Reconstruction of nonhelical auricular defects with local flaps. *Dermatol Surg* 2008;34:501-7.
7. Masson JK. A simple island flap for reconstruction of concha-helix defects. *Br J Plast Surg* 1972;25:399-403.
8. Dessy LA, Figus A, Fioramonti P, Mazzocchi M, Scuderi N. Reconstruction of anterior auricular conchal defect after malignancy excision: Revolving-door flap versus full-thickness skin graft. *J Plast Reconstr Aesthet Surg* 2010;63:746-52.
9. Oh MJ, Kang SJ, Sun H. A simple modified flip-flop flap for the reconstruction of antihelix and triangular fossa defects. *Arch Plast Surg* 2016;43:122-4.
10. Yotsuyanagi T, Watanabe Y, Yamashita K, Urushidate S, Yokoi K, Sawada Y. Retroauricular flap: Its clinical applications and safety. *Br J Plast Surg* 2001;54:12-9.