

External Ear Melanoma Treated with Auricular Reconstruction Using Four Different Tissues in a 16-Year-Old Patient

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Summary: The auricular region is a common site of cutaneous malignancies, most of which are nonmelanoma skin cancers, such as basal cell carcinoma and squamous cell carcinoma, in older patients. They are often treated with limited surgery that can be performed under local anesthesia. We report the case of a young patient with external ear melanoma who underwent reconstruction for defects of more than one-half of the helix and concha using four types of tissues: a rib cartilage graft, temporoparietal fascia flap, full-thickness skin graft, and retroauricular flap. Extending the retroauricular flap posteriorly to the entire hairless area allowed us to cover the anterior surface of the rib cartilage framework, which helped effectively achieve aesthetics. In auricle reconstruction, it is crucial to determine how well the anterior surface of the auricle is created. (*Plast Reconstr Surg Glob Open* 2023; 11:e5065; doi: [10.1097/GOX.0000000000005065](https://doi.org/10.1097/GOX.0000000000005065); Published online 14 June 2023.)

The auricular region is a common site of skin cancer, mostly basal cell carcinoma and squamous cell carcinoma in older patients, which are often treated by a minor surgery that can be performed under local anesthesia, such as wedge excision or local flap.^{1,2} We report the case of a young patient with malignant melanoma of the auricle, in whom both tumor curability and maintenance of cosmetic appearance are important. The patient underwent reconstruction using four types of tissues with excellent results.

CASE REPORT

The patient was a 16-year-old boy. He underwent an excisional biopsy in our dermatology department for a 10×7 mm black dome-shaped tumor at the center of the right helix that had been growing for several years. The pathology results confirmed a diagnosis of malignant melanoma, and he was referred to our department. Initial examination revealed a 10-mm-long suture scar in the center of the right helix. The tumor thickness was 8 mm,

and contrast-enhanced computed tomography showed no lymph node involvement or distant metastasis. Based on the diagnosis of cT4N0M0 according to the American Joint Committee on Cancer TNM staging system for melanoma, we planned sentinel node biopsy, extended resection, and reconstruction.

Surgical Procedure

Three sentinel nodes were identified using sentinel lymph node scintigraphy performed the day before the surgery. Two were found in the postauricular region and one in the neck. The lymph nodes in the postauricular region were approached through the incision of the retroauricular flap, as described below. A separate incision was made on the neck. The primary lesion was resected in the full layer with a 2-cm horizontal margin from the biopsy scar, extending to the concha, beyond the central half of the helix (Fig. 1). The helix and antihelix frameworks were reconstructed using the right sixth and seventh rib cartilage grafts (Fig. 2a). (See Video 1 [online], which shows the right sixth and seventh rib cartilage frameworks being fixed using 4-0 clear nylon.) The retroauricular flap, which extended to the entire posterior hairless area, was elevated using a subcutaneous pedicle (Fig. 2B). The retroauricular flap was moved anteriorly, the concha was reconstructed, and the rib cartilage of the antihelix was covered. (See

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Received for publication November 28, 2022; accepted April 19, 2023.

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DOI: [10.1097/GOX.0000000000005065](https://doi.org/10.1097/GOX.0000000000005065)

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

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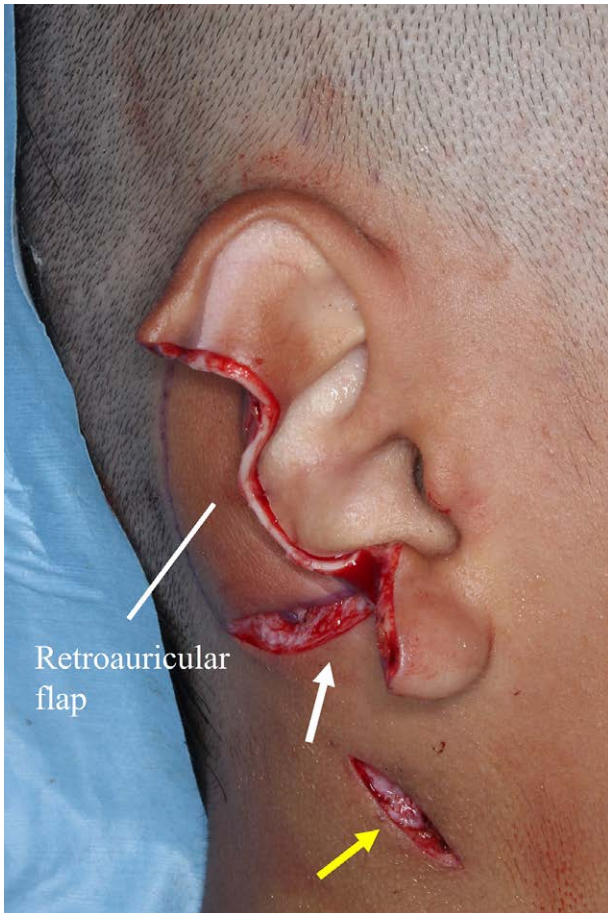


Fig. 1. Photographs after tumor resection. More than half of the defects in the helix extend to the concha. Sentinel lymph node biopsy was performed from the inferior margin of the retroauricular flap (white arrow), and another incision was made in the neck (yellow arrow).

Video 2 [online], which shows the retroauricular flap being moved anteriorly through the cartilage defect in the concha region and sutured with 6-0 nylon.) The temporoparietal fascial flap was elevated and covered the rib cartilage of the helix through a subcutaneous tunnel on the cranial side of the auricle (Fig. 2C). (See **Video 3** [online], which shows the temporoparietal fascia flap being moved posteriorly through the subcutis on the cranial side of auricle and covering the rib cartilage framework. The skin grafts were implanted over the temporoparietal fascia flap and sutured with 6-0 nylon.) A full-thickness skin graft was placed over the temporoparietal fascia flap and donor site of the retroauricular flap (Figs. 2D and 3).

Microscopic metastasis was detected in one of the three sentinel nodes in the neck. The final diagnosis was Stage IIIc pT4bN1aM0. Postoperative adjuvant therapy with pembrolizumab was administered. Seven months after surgery, no local recurrence, lymph node metastasis, or distant metastasis was observed. The morphology of the auricle remains excellent (Fig. 4).

DISCUSSION

Basal cell carcinoma is a tumor located within the skin in many cases, and can be reconstructed with skin grafts.³ However, in malignant melanoma, cartilage resection is desirable, and reconstruction other than skin grafting is necessary.⁴ The conchal chondrocutaneous flap reportedly helps reconstruct defects at the central part of the helix. Although methods of elevation with a subcutaneous pedicle⁵ or skin pedicle⁶ have been reported, both are indicated for defects of up to one-third of the helix. Defects exceeding one-third of the helix require auricular frame reconstruction with rib cartilage grafts and coverage with a temporoparietal fascia flap and skin grafts, as in microtia.⁷

In this study, we reconstructed a full-layer defect of more than half of the helix, including the concha, using four tissues: rib cartilage graft, temporoparietal fascia flap, full-thickness skin graft, and retroauricular flap. A retroauricular flap was used to reconstruct an anterior auricular defect with a subcutaneous pedicle at the base of the auricle.⁸ Conchal cartilage removal allows for flap movement with little disturbance to the subcutaneous pedicle and is characterized by the ability to reproduce the depression of the conchal surface. In this study, the retroauricular flap was extended posteriorly to include the entire hairless area. This allowed us to cover the concha and the antihelix part of the rib cartilage framework with a retroauricular flap. The rib cartilage framework covering the temporoparietal fascia flap and skin grafts was limited to the helix margins. In other words, the anterior auricular surface was reconstructed with a retroauricular flap, and the posterior surface was reconstructed using a skin graft, effectively achieving aesthetic appeal. In auricle reconstruction, it is crucial to determine how well the anterior surface of the auricle is created. Yu et al covered the anterior surface of the rib cartilage framework with an expanded retroauricular flap using a tissue expander.⁹ Although their method allows for more extensive coverage than ours, it is a two-stage procedure. Second-stage reconstruction is a safer option for malignant tumors; on the other hand, auricular cartilage deformity caused by scar contracture during the waiting period, which are difficult to correct, should also be considered.

The disadvantage of our method is the deformity of the postauricular region due to the skin grafting on the donor site of retroauricular flap. The other limitation associated with a retroauricular flap is the presence of sentinel lymph nodes in the postauricular region in 15% of cases of external ear melanoma.¹⁰ Although the ability to perform a sentinel node biopsy through an incision in the retroauricular flap seems advantageous, the possibility of surgical tumor dissemination should be considered if micrometastases have developed in the lymph nodes. In our case, there was no postauricular lymph node metastasis, and the neck was positive; however, careful follow-up is needed in the future.

CONCLUSIONS

We report the case of a 16-year-old boy with auricular malignant melanoma. More than half of the helix was lost and reconstructed using four tissue types: a rib cartilage graft, a temporoparietal fascia flap, a full-thickness skin

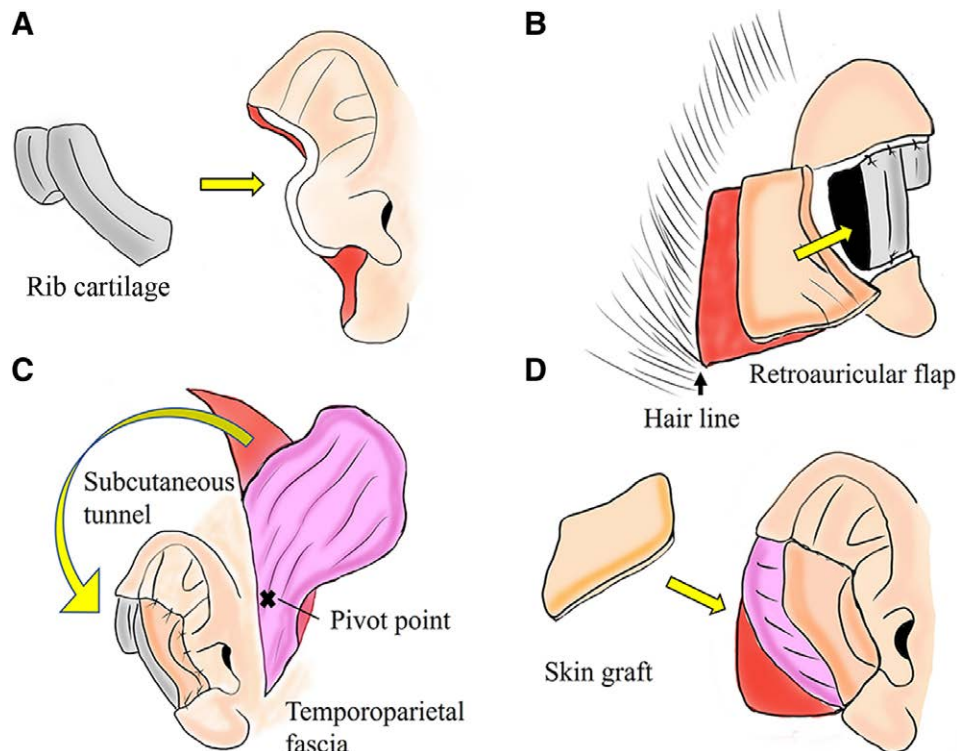


Fig. 2. Schema of surgical procedure. A, The framework was reconstructed with right sixth and seventh rib cartilage graft for defects beyond the central half of the helix and antihelix. The smaller posterior portion was the sixth costal cartilage, and the larger anterior portion was the seventh. Their attachments to each other were left connected. B, The retroauricular flap extended to the entire posterior hairless area. The flap was moved anteriorly through the conchal cartilage defect. C, The temporoparietal fascial flap was elevated through an arc-shaped temporal incision and covered the rib cartilage of the helix, which was not covered by the retroauricular flap, through a subcutaneous tunnel on the cranial side of the auricle. D, A full-thickness skin graft was taken from the rib cartilage donor site, and the postauricular region on the unaffected side was placed over the temporoparietal fascia flap and donor site of the retroauricular flap.

graft, and a retroauricular flap. Extending the retroauricular flap posteriorly to the entire hairless area covered the anterior surface of the rib cartilage framework, effectively achieving aesthetic appeal. In auricle reconstruction, it is crucial to determine how well the anterior surface of the auricle is created.

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DISCLOSURE

The authors have no financial interests to declare in relation to the content of this article.

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Fig. 3. Photograph taken at the end of reconstructive procedure. The retroauricular flap covered the concha and the rib cartilage framework of the antihelix. Full-thickness skin grafts on the temporoparietal fascia flap covered the framework of the helix.

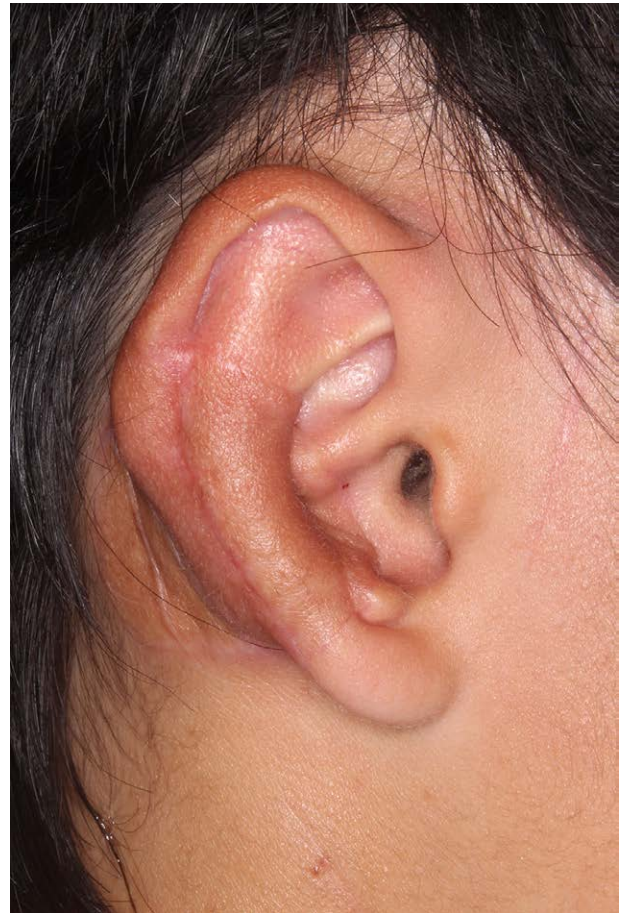


Fig. 4. Postoperative view seven months after reconstruction. The reconstructed ear was slightly pigmented; however, the morphology was good.