

A Case of Squamous Cell Carcinoma of the Ear Helix Successfully Treated with Rhombic Transposition Flap

Hei Sung Kim, M.D., Gyoung Moon Kim, M.D., Si-Yong Kim, M.D.

Department of Dermatology, College of Medicine, The Catholic University of Korea, Seoul, Korea

Approximately 6% of all head and neck skin cancers arise from the external ear, of which squamous cell carcinoma (SCC) and basal cell carcinoma (BCC) are the most common. Acquired helical rim defects can be caused by injury or after excision of a tumor. Since many patients feel that the auricle has a functional and cosmetic importance, it is crucial to consider the esthetics. In cases where the defect exposes bare cartilage, second-intention healing is usually not achieved. Therefore, full-thickness skin grafts have been adopted, but the healing time is long and in many cases, mismatch of color between the grafted skin and the surrounding ear has been observed. Alternatively, reconstruction with flaps may provide optimal coverage. Among the many possible flap designs, the rhombic transposition flap has become widely utilized in dermatologic surgery, due to its simplicity and versatility. Herein, we report a case of SCC on the superior helical rim (of which the cartilage was spared) successfully managed with a rhombic transposition flap. The surgical procedure had been relatively simple and the resultant ear helix was free from deformity. In future, we recommend that defects of the ear helix, which have an intact cartilage, should be treated with a rhombic transposition flap to give a successful cosmetic and functional outcome.

(*Ann Dermatol (Seoul)* 18(1) 47~50, 2006)

Key Words: SCC, Ear helix, Intact cartilage, Rhombic transposition flap

INTRODUCTION

Malignant lesions of the external ear are quite common. In fact, nearly 6% of all head and neck cancers develop from the auricle, of which SCC & BCC predominate^{1,2}. Within the auricle, SCC most commonly arises from the helix. This has been supported by many studies, including one with 152 cases of SCC of the auricle where 95 (62%) arose from the helix³.

Even with hair coverage, acquired helical rim defects can be eye-catching and may cause depression. Such defects are mostly the result of an injury or local excision of a neoplasm⁴. It is well known that flaps provide an optimal coverage for defects exposing bare cartilage, compared to skin grafts, in terms of healing time and cosmetic outcome, and among them, the rhombic transposition flap has become widely utilized. The rhombic transposition flap, first describe by Limberg in 1946⁵, is currently popular in dermatologic surgery due to its relative simplicity and versatility.

Herein, we report a case of SCC on the superior ear helix of a 68-year-old man. After excision of the tumor, the skin-only defect of the superior helix was treated with a rhombic transposition flap, which resulted in rapid healing, continuity in skin color and an absence of disfigurement to the helical rim. The patient was very satisfied with the outcome, so from our experience, we recommend treatment with a rhombic transposition flap in cartilage-spared skin

Received April 22, 2005

Accepted for publication August 19, 2005

Reprint request to: Gyoung Moon Kim, Department of Dermatology, St. Vincent's Hospital, College of Medicine, The Catholic University of Korea, 93-6 Ji-dong, Paldal-gu, Suwon, Gyeonggi-do, Korea. Tel. 82-31-249-7465, Fax: 82-31-253-8927, E-mail. unehomme@freechal.com

Previous presentation: At the 2005 Korean Dermatologic Conference (spring), as a poster Funding sources: none

defects of the helical rim for optimal cosmetic and functional results.

CASE REPORT

A 68-year-old male patient visited our clinic complaining of an intermittently-painful, persistently growing lesion on the left ear, which had started to develop 3 years ago. On physical examination, a $1.1 \times 0.8 \times 0.4$ cm sized nodular mass, with a central crater filled with exudation and crusts, was observed on the superior helix (Fig. 1). The patient had no previous medical or family history of the condition, but as a farmer, he had been exposed to excessive sunlight and following a skin biopsy done at a local clinic, was diagnosed as having SCC.

We performed a total excision of the tumor with a 5 mm margin. Since there was no sign of invasion of the cartilage on gross inspection, we spared the

cartilage. The excised sample was sent off for a frozen histologic confirmation of a free margin. After margin control, we reconstructed the defect with a



Fig. 1. A $1.1 \times 0.8 \times 0.4$ cm sized nodular mass with a central crater filled with exudation and crusts on the superior helix.



Fig. 2. (A) A schematic drawing of the classic rhombic flap design on the ear helix. (B) After reconstruction using a rhombic transposition flap.



Fig. 3. At a follow-up visit 3 months after the operation, the defect was completely healed with minimal scarring.

classical rhombic transposition flap (Fig. 2A). Initially, the excision defect was converted to a rhombic-shaped wound. The flap was obtained from the postauricular tissue by making an incision medial to the defect. The width of the flap was designed to approximate the size of the defect. The flap, donor site, and the wound edges were then widely undermined in supramuscular and superficial subcutaneous planes to minimize the tension. After flap transposition, the wound was closed in a standard layer fashion (Fig. 2B).

Stitch-out was done 2 weeks after the operation and we instructed the patient to apply Aquacell[®] for one month. At a follow-up visit 3 months after the operation, the defect had completely healed with minimal scarring (Fig. 3). Furthermore there has been no sign of local recurrence or metastasis.

DISCUSSION

Skin cancer of the external ear is not rare and it commonly occurs in older men with a history of excessive sun exposure. The auricle is especially prone to actinic injury due to its projection and exposure to sunlight. Our patient had worked as a farmer for over 50 years and had probably been exposed to the sun for prolonged periods. The most common malignancies of the auricle are basal cell cancer, squamous cell cancers, and rarely, melanoma^{1,2}.

BCC and SCC are the major non-melanoma skin cancers. Although BCC is more common than SCC⁶, SCC has a higher morbidity rate due to its greater metastatic potential. For this reason, prompt diagnosis and treatment is crucial with SCC. In the head and neck area, SCC is almost equally distributed between the most exposed (face, forehead and nose) and least exposed (scalp and pinna) areas, unlike BCC, where lesions are mostly sited on the face, forehead and nose^{7,8}. The lower occurrence of BCC to SCC in the pinna (1.3:1) compared to other parts of the head and neck (4:1) implies that the risk of SCC is higher in a suspicious lesion of the pinna⁸⁻¹⁰. Our patient was referred from a local clinic with a mass on the left superior ear helix. The lesion was a $1.1 \times 0.8 \times 0.4$ cm sized, slowly-growing, intermittently-painful, solitary nodule with a central crater filled with exudative material and crust. From the central pit and its adjacent rolled-up border, the

lesion looked more like BCC or keratoacanthoma, but was proven to be SCC from skin biopsy.

Early diagnosis, meticulous removal of the tumor mass and systemic evaluation is important to minimize the morbidity associated with SCC, but it is also important to consider the esthetics, especially with defects of the pinna. Helical rim defects are eye-catching and can be cosmetically unacceptable to the patient. They are usually the result of injury, or as in our case, due to local excision of a neoplasm⁴.

Options for reconstructing defects involving the upper third of the ear include full-thickness skin grafts, wedge resection with primary wound closure, helical advancement flaps, multistage pre- or postauricular tubed flaps and one-stage pre- or postauricular transposition flaps¹¹. Since the defect in our patient was not small enough for a primary closure, we elected to do a one-stage postauricular rhombic transposition flap, which is now popular in dermatologic surgery, due to its simplicity and versatility. Unlike grafts, flaps produce excellent cosmetic results by allowing an optimal match in skin color and texture and in general, less healing time is required.

The classic rhombic flap is constructed around a defect, which is converted into a geometric 4-sided defect (rhombus) with equal side length and tip angles equal to 60° and 120° ⁵. It is classically designed by extending the short diameter of the defect beyond the flap, for a length equivalent to one of the sides⁵. The flap is then created by drawing a line from the free end of the extended short diameter, parallel to one of the sides of the existing rhombus⁵. When designed in this manner, the tip angle will be 60° . The flap is typically designed off the short axis of the defect to keep the flap as small as possible. Complications of rhombic flaps may be wound dehiscence, flap necrosis and scarring, but these are extremely rare¹². Prevention is possible by designing a tension-free flap and by careful undermining of the base of the flap¹². We did not experience any adverse effects after our patient's operation.

We report a case of SCC on the superior helix of a 68-year old farmer, who did not want any disfigurement of the ear helix but who also lacked the time and patience for prolonged healing. From our experience, the classic rhombic transposition flap provides a satisfactory cosmetic result, with almost no interruption within the continuity of the helical

rim and gives a perfect color match. We recommend this procedure for future ear helical defects, which have an intact cartilage. It is relatively easy to perform the surgery, results in rapid healing and has an excellent cosmetic outcome.

REFERENCES

1. Bailin PL, Levine HL, Wood BG, Tucker HM. Cutaneous carcinoma of the auricular and preauricular region. *Arch Otolaryngol* 1980;106:692-696.
2. Byers R, Kesler K, Redmon B, Medina J, Schwarz B. Squamous carcinoma of the external ear. *Am J Surg* 1983;146:447-450.
3. Freedlander E, Chung FF. Squamous cell carcinoma of the pinna. *Br J Plast Surg* 1983;36:171-175.
4. Orton C. Lesions of the pinna. In Rob C, Smith R (series eds): *Operative Surgery*, 3rd edn. Part I (Wilson JSP, ed) Head and neck. Butterworth: London, 1981:383-390.
5. Limberg AA. Design of the local flaps. In Gibson T, editor: *Modern trends in plastic surgery*. Butterworth: Washington DC, 1966:38-61.
6. Scotto J, Frears TR. Skin cancer epidemiology: research needs. *Natl Cancer Inst Monogr* 1978;50:169-177.
7. Raasch B, Maclennan R, Wronski I, Robertson I. Body site specific incidence of basal and squamous cell carcinoma in an exposed population. Townsville, Australia. *Mutat Res* 1998;422:101-106.
8. Ahmad I, Das Gupta AR. Epidemiology of basal cell carcinoma and squamous cell carcinoma of the pinna. *J Laryngol Otol* 2001;115:85-86.
9. Giles GG, Marks R, Foley P. The incidence of non-melanocytic skin cancer treated in Australia. *Br Med J* 1988;296:13-17.
10. Pierard-Franchimont C, Uhoda I, Pierard GE. Cutaneous cancers in the Mosan region and Ardennes of Belgium. *Dermatology* 1999;198:187-191.
11. Fortier-Riberdy G, Gloster HM Jr. Reconstruction of the superior helical rim with a postauricular transposition flap. *Dermatol Surg* 2005;31:99-101.
12. McNay AT, Ostad A, Moy RL. Surgical pearl: modified rhombic flap. *J Am Acad Dermatol* 1997;37:256-258.