

Case Report

Challenge in reconstruction of facial defect using perialar crescentic advancement flap: Two case reports and single institution experience

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Abstract Reconstruction of defects located on the facial areas such as the upper lips can be challenging given the nearby important anatomical structures surrounding it and the limited availability of free margins between the lips and the nose. The use of crescentic advancement flap can therefore be useful as a reconstructive method where defects are located bordering certain anatomical sites with curved nature, making it an excellent surgical method for medium-sized defects such as located on the nasal ala. We report two cases of successful basal cell carcinoma (BCC) defect reconstruction in our institution utilizing the crescentic advancement flap. All patients achieved excellent results, both in cosmetical and functional aspects with minimal complications.

Key words

Basal cell carcinoma; Perialar crescentic; Skin flap; Skin surgery.

Introduction

Basal cell carcinoma (BCC) is a type of skin cancer that most often form of skin cancer with chronic and destructive nature that can lead to significant local tissue invasion resulting in high morbidity. The disease most often develops on areas of skin exposed to the sun, such as the face and neck.^{1,2} Due to the aggressive and infiltrative nature of BCC lesions, removal of BCC lesions may result in large-sized defects that may pose a challenge for physicians for subsequent reconstruction. The preferred therapeutic option has been Moh's micrographic surgery (MMS) or surgical excision with wide margins. To amend the defects, several surgical skin flap methods may be used based on the size and area of the defects. It should be taken into consideration

that these defects can negatively impact patient's functional and cosmetical appearance.¹

First discovered by Webster in 1955, the perialar crescentic advancement flap is a renowned method for reconstruction of perialar defects.³ As the name implies, the method takes use of tissue redundancy forming a crescentic shape to increase lateral mobility and cover defects.⁴ This is especially useful for medium-sized defect areas in which the defects border certain anatomical regions with curved borders, such as within the vicinity of the nasal ala.^{4,5}

In this paper, we report the use of the perialar crescentic flap as a reconstruction method for upper lip defects after BCC removal that resulted in excellent functional and cosmetical outcomes, highlighting the usefulness of this method for facial defect reconstruction.

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Case 1 A 65-year-old female presented with

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painless, gradually enlarging hyperpigmented plaque, ulceration and raised borders on the upper right vermillion measuring approximately 3cmX2cm, three years prior. Removal of the lesion through resection with a 5 mm margin was performed confirming the diagnosis of BCC (**Figure 1A**). The resulting defect measured approximately 4cmX3cm. To amend the defect, the perialar crescentic flap was chosen.

The procedure starts by administering tumescent anaesthesia into the upper lip, nasal ala, and nasolabial fold extending to the lower lip adjacent to the mandibular area. A curvilinear incision was made from the base of the defect downwards within the melolabial fold to lower lip around mandibular area. The length of incision measured 12cm or three times the diameter of the existing defect. Undermining of connective tissues underneath the lateral cheek was then ensured using blunt scissors prior to advancing the tissue, forming a crescentic shape along the melolabial fold to mandibular area.

Mostly, the length of the longer outer edge of

the flap (**Figure 1B**) should be balanced with the shorter inner defect (**Figure 1B**) along with the underlying of the primary defect that is being reconstructed.

In the present scenario, in order to preserve its form, the closure of the defect must commence from the broadest diameter, with the objective of directing point A towards point A1 and points B towards points B1 (**Figure 1B**) along the path of the force vector that generates minimal tension. Subsequently, a number of subcutaneous 4-0 polyglycolide sutures were in order to secure the flap. The flap was finalized by excising and eliminating the surplus tissue in the inferior crescentic region, as depicted in **Figure 1B**. Intraoperative visualization was facilitated and post-operative bleeding was prevented by maintaining haemostasis during the procedure. Supplementary profound sutures were inserted, succeeded by nylon 4.0 suture, as depicted in **Figure 1D**. The wound margins were approximated using a 4.0 nylon suture (**Figure 1D**).



Figure 1(A). Hyperpigmented nodules, plaque, and ulceration with raised borders on the upper lip of the right vermillion; (B) Surgical Markings (C) Tumour Removal and Tissue Excision Prior to Reconstruction (D) Immediate post-reconstruction; (E) Follow-up after four weeks showed excellent functional and cosmetic outcomes.

Case 2 A 61-year-old female presented with hyperpigmented nodules on the upper lip five years prior, measuring 1cmX1cm and confirmed to be BCC. Excision of the lesion was performed with a 5-mm margin. Resulting in a circular defect with a diameter of approximately 2 cm. Reconstruction of the defect was done using the perialar crescentic advancement flap.

Tumescent anaesthesia was administered to the upper lip, nasal ala, melolabial fold, and lower lip in the mandibular region. Superior and inferior Burow's triangles were excised adjacent to the defect. Subsequently, a crescent-shaped incision was performed along the superior and inferior margins of the defect, encompassing the alar fold, nasolabial fold, and the lower lip around the mandibular region, as depicted in **Figure 2B**. Following the excision procedure, the adjacent tissue located laterally to the incision site was undermined up to the melolabial fold in order to promote medial displacement of the tissue. The subcutaneous tissue was mobilized and progressed, resulting in the formation of an organic curvilinear

configuration spanning from the nasolabial fold to the mandibular region. Typically, the extended length of the outer edge of the flap ought to be commensurate with the shorter inner segment (**Figure 2B**) in addition to the foundation of the principal defect that is being reconstructed.

The closure process of the defect was initiated at its maximum diameter, with the objective of connecting point A to point A1 and point B to point B1 (**Figure 2B**) along the force vector path that generates minimal tension. The lesion's periphery was excised and subsequently secured on both flanks with 4.0 non-absorbable sutures, as illustrated in **Figure 2D**.

In both cases, compression dressings were applied to prevent formation of hematoma beneath the flaps. We evaluated patients for potential post-operative complications such as partial or complete flap loss, wound dehiscence, hematoma, seroma, and wound infection. A follow-up of 10 weeks on both patients showed satisfying results.



Figure 2 (A-B) Initial defect after BCC lesion removal; (C-D) Surgical Markings Prior to Reconstruction (E) Immediate post-operative result; (F) Follow-up after ten weeks showed excellent functional and cosmetic results.

Discussion

The perialar area consists of the labial tissue located below the alar sill, the buccal and maxillary tissue that includes the melolabial fold next to the lateral alar crease, and the nasal sidewall skin above the nasolabial alar creases line. Scars and facial asymmetry in this area are prominent as they are located in the center of the face. Reconstructing defects on the upper cutaneous lip can be a difficult task due to the proximity of the free margins of the lip and the nose. Furthermore, surgical procedures performed in this location may intersect the junction line of the melolabial fold, which could potentially result in the removal of the upper cutaneous lip, the retraction of the upper vermilion margin, or the development of asymmetry along the insertion of the melolabial fold.³

The reconstruction of facial defects following the excision of malignant tumours has been described using a variety of techniques. Although there is currently no clear consensus, selection of a technique depends on several factors, mainly the size and location of the defect, as well as the capability of the surgeon.³ Primary closure is only preferable in cases of small defects.⁶ However, for larger defects, more complex reconstruction methods such as skin flaps or skin grafts maybe needed.^{7,8}

A local skin flap is used to cover the defect. Skin flap refers to the transplantation skin and subcutaneous tissue that is harvested from a site nearby the primary defect while maintaining its intrinsic blood supply vascularization that remains involved to the donor site.

An advancement flap is a surgical technique that involves sliding tissue over a defect in one dimension. The incisions are made only a slight or indirect connection to the defect to free

neighboring tissue, and the wound edge acts as the free surgical margin of the flap.⁹ Local flaps are preferable as it provide better cosmetic and functional outcomes. This is achieved through superior matching of skin qualities such as colour and texture with surrounding tissue and vascularization which allow better healing process and less scarring in comparison to skin grafts.^{7,8}

In addition, this technique can also provide tissue replacement for defects while simultaneously placing incision lines in more favorable hidden locations.⁴ The crescentic advancement flap, is a closure techniques of advancement flap which utilizes crescentic-shaped incisions suitable for reconstruction of defects located on difficult sites such as the upper lip vermilion and is an excellent technique for both patients in our paper.

This techniques are preferable for medium-sized defects measuring 1-1.2cm in diameter based on the tissue laxity and adjacency of the defect to the ala, as well as for areas where defects border anatomical regions with curved borders. In addition, the more laxity provided by the skin in elderly patients such as in these cases also helped in causing less tension that would potentially cause necrosis and failure.³⁻⁵

The defects were altered to achieve parallel lateral edges that extended both superior and inferior. This was done to position the final suture lines along the vermilion, base of the nose, and alar-facial sulcus. Next, the flap's lateral aspect was lifted to the subcutaneous plane, and any excess tissue along the alar-facial sulcus was eliminated. Differential suturing can accommodate the difference in length of the wound margins.^{5,10} Achieving precise realignment of the melolabial fold insertion is crucial for minimizing complications and achieving optimal aesthetic results. In addition,

making the right incision lines may aid in hiding all suture lines after the healing process.³

Conclusion

The perialar crescentic advancement flap is a relatively simple and practical technique for reconstruction of surgical defects located on the upper lip that provides excellent functional and cosmetic results.

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