

Case Series

Reconstruction Techniques for the Medial Canthus and Lateral Nasal Wall: A Case-Based Learning Approach

Andrea Malagón-Liceaga^{a, b} Alejandra Juárez-Flores^c
Ana Lilia Ruelas-Villavicencio^{a, b}

^aFaculty of Medicine, National Autonomous University of Mexico, Mexico City, Mexico;

^bDermatology Department, National Institute of Nutrition Salvador Zubirán, Mexico City, Mexico; ^cOphthalmology Department, National Institute of Nutrition Salvador Zubirán, Mexico City, Mexico

Keywords

Medial canthus · Lateral nasal wall · Skin cancer · Reconstruction · Dermatologic surgery

Abstract

Introduction: Reconstruction of the medial canthus and lateral nasal wall poses a significant challenge in dermatologic surgery due to the area's complex, concave, three-dimensional anatomy, and proximity to critical structures like the nasolacrimal system. **Case Presentation:** This case-based learning approach details three different techniques on the management of extensive defects involving the medial canthus and lateral nasal wall, focusing on three different surgical techniques: the Mustardé flap, a combination of flaps with a graft, and a supraclavicular skin graft. All three approaches achieved satisfactory clinical and cosmetic outcomes. **Conclusion:** Successful reconstruction in this region requires a multidisciplinary approach that carefully integrates facial esthetic units while preserving the functional integrity.

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Introduction

Reconstruction of the medial canthus and lateral nasal wall presents a significant challenge in dermatologic surgery, as it involves a three-dimensional concave structure, encompasses two anatomical subunits, and often affects structures like the nasolacrimal duct. The medial canthus is the second most common site for periocular skin cancer, accounting for 28%–47% of cases [1].

Correspondence to:
Ana Lilia Ruelas-Villavicencio, aruelas@facmed.unam.mx

Our objective was to present a case-based learning approach of three different techniques for addressing the reconstruction challenges of the medial canthus and lateral nasal wall, focusing on the challenges involved in each reconstruction, as performed by the Dermatologic and Oculoplastic Surgery Departments at a teaching hospital in Mexico City. Herein, we present three illustrative cases that highlight our reconstructive options for addressing defects involving the medial canthus and lateral nasal wall.

Cases

All the patients presented with large, complex post-resection defects following the excision of keratinocyte cancer.

Case 1: Mustardé Flap and Glabellar Flap

The first case (Fig. 1) involved a 57-year-old woman with a 5 cm defect following the resection of a basal cell carcinoma (BCC) affecting the eyelid, lateral nasal wall, and cheek. To address the complexity of the reconstruction, a two-flap approach was chosen. A cheek advancement-rotation flap, also known as the Mustardé flap, was used to restore most of the defect, while a glabellar advancement flap was used to cover the upper portion. Complications were minimal, consisting of eyelid edema that resolved 3 months later with intralesional steroids. Both flaps contributed to excellent cosmetic results. The total follow-up for this case was 33 months.

The advantages of a Mustardé flap include the mobilization of the entire anatomical unit, leading to outstanding cosmetic outcomes. However, it requires extensive mobilization and sufficient thickness to maintain proper blood supply.

Key considerations include ensuring adequate flap thickness for vascularization and maintaining vascular integrity, especially in patients with a history of smoking, previous surgeries, or radiation, as these factors increase the risk of necrosis. Facial hair growth may also limit the use of this technique. There is a notable risk of ectropion, so precise suturing is critical [2]. Securing the flap to the periosteum of the upper maxillary bone with a non-absorbable suture is essential to avoid this complication.

Case 2: Flap Combinations plus Graft

Figure 2 presents the case of a 66-year-old man with a 6 cm defect after resection of a BCC, multiple flaps and a graft were used to close the defect, including a glabellar transposition flap and two advancement flaps (cheek and eyelid). A graft was applied to cover the remaining defect; however, distal necrosis occurred. This area was left to heal by secondary intention, resulting in a satisfactory cosmetic outcome. Another complication was the development of ectropion, which required correction in a subsequent procedure using a lateral tarsal strip and placement of a full-thickness skin graft from the contralateral upper eyelid. The total follow-up duration was 28 months.

This approach has several advantages, such as the ability to close large defects with limited surgical alternatives. However, this technique also has some disadvantages. For the glabellar transposition flap, these include the risk of eyebrow fusion, extensive skin mobilization, increased risk of distal necrosis due to the concave wound bed, and heightened bleeding. Distal necrosis can often be attributed to decreased perfusion pressure in long flaps. Strategies to minimize this risk include optimizing flap design, maintaining appropriate length-to-width ratios, and ensuring adequate vascular supply. Additionally, the patient had a history of smoking, which increases the risk of necrosis, and underwent addiction-focused



Fig. 1. Mustardé flap or cheek advancement-rotation flap (red). Additionally, a glabellar advancement flap (blue) was performed to cover the remainder of the defect.

psychological intervention weeks prior to the procedure. Proper fixation to the periosteum of the maxillary bone using nonabsorbable sutures is also crucial to achieve stability and support.

Case 3: Graft

A skin graft is often the preferred option when large flaps are impractical due to factors such as age or anticoagulation therapy. In our third case, a 71-year-old man with a 4.5 cm defect following BCC resection in the medial canthus was treated with a supraclavicular skin graft. The main challenge with this approach is the potential for discrepancies in color and texture between the graft and the surrounding tissue (Fig. 3). The total follow-up duration was 15 months.

This technique is particularly suitable for patients with multiple comorbidities or limited surgical alternatives. It is also ideal when there is limited experience with other reconstruction techniques. Grafts can be harvested from the contralateral upper eyelid or other areas like the preauricular, postauricular, or clavicular regions. Slightly overestimating the tissue needed is advisable, as reconstructed areas may retract during healing [3].

A crucial factor for graft success is applying firm, consistent compression (a “tie-over”) to ensure stable contact between the graft and the underlying wound bed. This technique helps maintain proper adhesion, reduces the risk of graft failure, and increases the likelihood of a successful outcome.

In all three cases, the nasolacrimal duct and caruncle were sectioned during surgery. However, this only resulted in mild epiphora with minimal complaints from the patients. All patients were satisfied with the outcomes. The CARE Checklist has been completed by the authors for this report, attached as online supplementary material (for all online suppl. material, see <https://doi.org/10.1159/000543603>).

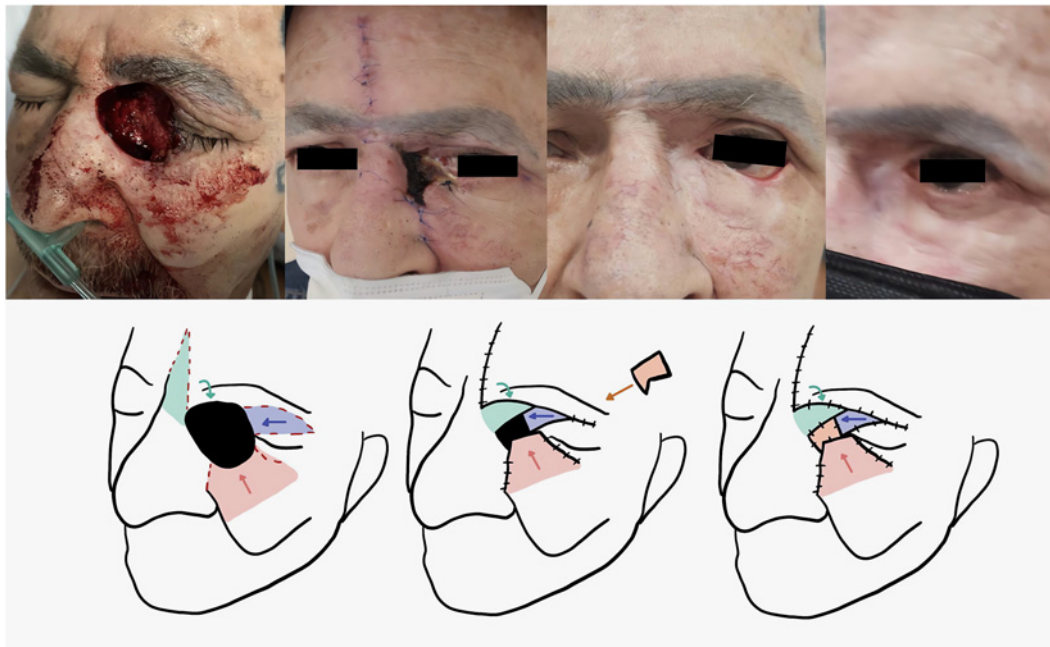


Fig. 2. A large defect involving the nasolacrimal system. A glabellar transposition flap (green) covered the superior defect, while upper eyelid (purple) and cheek (red) advancement flaps closed the rest. A graft (orange) was applied to the medial canthus but developed distal necrosis, healing by secondary intention. Ectropion developed postoperatively, corrected with a lateral tarsal strip and full-thickness skin graft from the contralateral upper eyelid, resulting in a good cosmetic outcome, as shown in the final image.

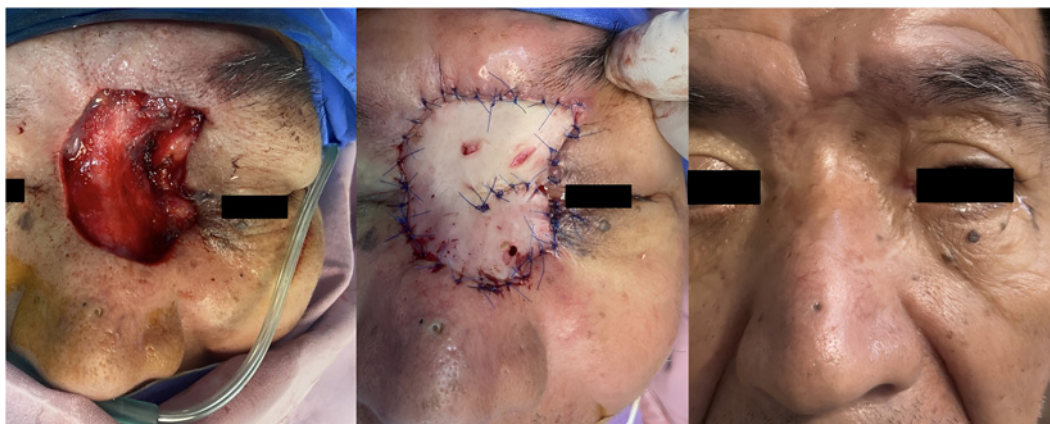


Fig. 3. Supraclavicular skin graft.

Discussion

Anatomically, the medial canthus is essential for eyelid alignment, anchored by the medial canthal ligament, which divides into three arms that attach to the maxillary bone, posterior lacrimal crest, and orbital process of the frontal bone. The pretarsal portion of the orbicularis oculi muscle originates from the medial canthal ligament. The angular artery, a branch of the facial artery, supplies blood to the medial canthus, while the facial

vein drains blood from the eyelids [4]. The lacrimal system consists of the punctum, canaliculi, common canaliculus, lacrimal sac, and nasolacrimal duct [3]. During medial canthus reconstruction, a 2 mm Bowman probe is used to assess the integrity of the nasolacrimal system. Canalicular defects are repaired with a stent, which is typically removed 3–6 months after surgery [5].

A baseline ophthalmologic exam, including visual acuity, is essential before surgery. Conditions such as ectropion or entropion should be corrected either during the initial surgery or in a subsequent procedure. Surgical success relies on adhering to facial esthetic unit principles and placing scars carefully. Incisions should follow skin tension lines to minimize scarring, and reducing vertical tension on the eyelids is crucial to prevent post-operative retraction [5].

Three cases are analyzed, each employing different strategies for reconstructing defects in the medial canthus and lateral nasal wall. The principle of esthetic subunits is crucial for these techniques, along with meticulous consideration of the skin characteristics and adjacent bony structures near the defect. We emphasize a personalized approach, as both flaps and grafts can yield acceptable cosmetic results with low associated morbidity. The complexity of reconstruction in this area underscores the need for multidisciplinary surgical approaches involving dermatologic, ophthalmologic, and plastic surgery.

Statement of Ethics

Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images. Ethical approval is not required for this study in accordance with local or national guidelines.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

A.M.-L.: data collection, writing, drafting, and editing of the manuscript. A.J.-F.: conceptualization and supervision. A.L.R.-V.: conceptualization, supervision, and final review and editing.

Data Availability Statement

All data generated or analyzed during this study are included in this article and its online supplementary material files. Further inquiries can be directed to the corresponding author.

References

- 1 Hooper J, Shao K, Feng PW, Falcone M, Feng H. Periocular and ocular surface nonmelanoma skin cancer. Clin Dermatol. 2024;42(1):71–7. <https://doi.org/10.1016/j.clindermatol.2023.10.011>
- 2 Patel SB, Buttars BR, Roy DB. Mustardé flap for primary nasal sidewall defect post-Mohs micrographic surgery. JAAD Case Rep. 2022;23:151–4. <https://doi.org/10.1016/j.jdc.2022.03.014>
- 3 Czyz CN, Cahill KV, Foster JA, Michels KS, Clark CM, Rich NE. Reconstructive options for the medial canthus and eyelids following tumor excision. Saudi J Ophthalmol. 2011;25(1):67–74. <https://doi.org/10.1016/j.sjopt.2010.10.009>
- 4 Neves JC, Arancibia-Tagle D, Medel-Jiménez R, Vásquez LM. Periorbital surgical anatomy. Facial Plast Surg. 2020;36(3):317–28. <https://doi.org/10.1055/s-0040-1712473>
- 5 Segal KL, Nelson CC. Periocular reconstruction. Facial Plast Surg Clin North Am. 2019;27(1):105–18. <https://doi.org/10.1016/j.fsc.2018.08.011>