Reconstruction of the Medial Canthus of the Eyelid with a Paramedian Forehead Flap: Case Report

Reconstrução do canto medial da pálpebra com um retalho paramediano frontal: Relato de caso

Leandro Ricardo de Aquino Santos[1] David Alejandro Villafañe Sarmiento[1]
Rafaela Xavier de Almeida Amaral[1] Andre Villani Correa Mafra[1]

[1] Plastic Surgery Specialty, Rede Mater Dei de Saúde, Belo Horizonte, MG, Brazil

Address for correspondence Leandro Ricardo de Aquino Santos, , Rede Mater Dei de Saúde, Especialidade de Cirurgia Plástica, Belo Horizonte, MG, Brazil (e-mail: leandroras@yahoo.com.br).

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Abstract

Reconstruction of the medial corner of the eyelid is considered a highly complex surgical procedure, and there are different techniques described that are used depending on the type of injury, location, depth and extension of the resulting defect. A valuable reconstructive option for defects in the medial corner of the eyelid is the frontal paramedian flap, due to the proximity of the forehead to the orbit and the security of its supratrochlear vascular pedicle. The objective of the present case report is to share the satisfactory result obtained in the reconstruction of a defect in the medial corner of the eyelid after the excision of a recurrent tumor lesion, through the use of a frontal paramedian flap associated with canthopexy and canthoplasty at different surgical times.

Keywords
- carcinoma, basal cell
- ear cartilage
- ectropion
- orbit
- orbital neoplasms
- perforator flap

Resumo

A reconstrução do canto medial da pálpebra é considerada um procedimento cirúrgico de alta complexidade, e existem diferentes técnicas descritas que são utilizadas a depender do tipo de lesão, da localização, da profundidade e da extensão do defeito resultante. Uma opção reconstrutiva de grande valia para defeitos do canto medial da pálpebra é o retalho paramediano frontal, devido à proximidade da fronte com a órbita e à segurança de seu pedículo vascular supratroclear. O objetivo deste relato de caso é compartilhar o resultado satisfatório obtido na reconstrução de um defeito do canto medial da pálpebra após exérese de lesão tumoral recidivada, por meio da utilização de retalho paramediano frontal associado a cantopexia e cantoplastia em diferentes tempos cirúrgicos.

Palavras-chave
- carcinoma basocelular
- cartilagem da orelha
- ectrópio
- neoplasias orbitárias
- órbita
- retalho perfurante

Introduction

The reconstruction of the medial corner of the eyelid is a highly complex surgical procedure due to the fragile anatomical structures of great significance in orbital functionality, which requires technical skills, detailed anatomical knowledge, and great expertise by the plastic surgeon. The reconstruction options vary according to a few aspects, including injury type, location, depth, size, the extension of the resulting defect, and associated factors.[1] The reconstruction mostly aims to

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preserve or restore the adequate functioning of this noble region, with no aesthetic loss because of its importance in facial harmony.

Traditional surgical reconstruction methods include primary synthesis, local, remote, and free flaps, as well as skin grafts. Each option has advantages and disadvantages, depending on lesion severity.[2] The paramedian forehead flap is one of the most widely used techniques for extensive defects. In addition to being useful in nasal reconstruction, this flap is an excellent alternative for periocular alterations due to the proximity of the forehead to the orbit, the fact that it is an interpolation flap with easy pedicle rotation, and the proper blood supply from the supratrochlear artery. Moreover, it is a safe flap, and the donor area morbidity is low, with potential healing by second intention. Disadvantages include the need for a new surgical procedure for autonomization and the excess volume of adipose tissue in the flap.[1,3,4]

This article describes a complex clinical case of excision of a neoplasm in the medial canthus of the eyelid and reconstruction with a paramedian forehead flap. Further technical refinements were required to improve ectropion, including lateral canthopexy and medial canthoplasty with a scapha chondroperichondral graft.

Objective

The goal of the current study was to report a clinical case using a paramedian forehead flap to cover a defect in the medial corner of the eyelid after excision of a recurrent local neoplasia.

Materials and Methods

The present study is a case report with due authorization from the Research Ethics Committee of Hospital Mater Dei via Plataforma Brasil (CAAE: 78263424.3.0000.5128). We obtained information through access to the patient's medical records, medical interview with the patient, follow-up throughout treatment, and review of the literature in the PubMed, SciELO, and Cochrane databases, searching for the keywords eyelid, reconstruction, tumor, paramedian frontal flap, canthopexy, canthoplasty, diagnosis, treatment and complications, and lacrimal duct catheterization.

Case Report

We herein report the case of a 56-year-old Caucasian male patient referred to the craniomaxillofacial surgery team at Hospital Mater Dei, in the city of Belo Horizonte (state of Minas Gerais, Brazil), due to a recurrent tumor in the medial canthus of the right eyelid (►**Fig. 1**). Previous pathological examinations of the lesion initially revealed superficial and multicentric basal cell carcinoma (BCC), and a second biopsy diagnosed a nodular and infiltrative carcinoma. Reconstruction with a Mustardé flap occurred 5 years earlier.

The patient denied comorbidities and had a history of multiple skin cancer resections.

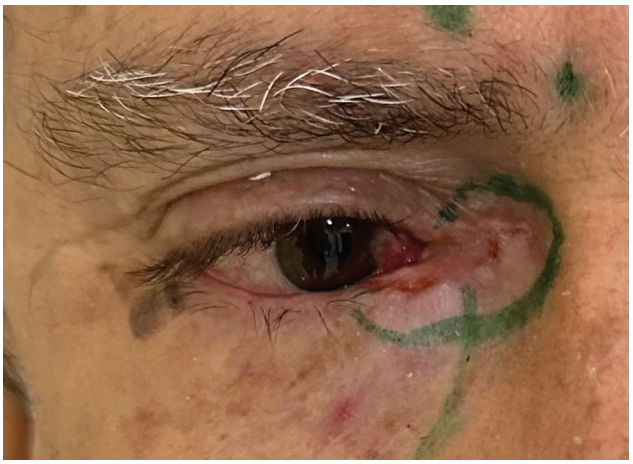

Fig. 1 Recurrent tumor (sclerodermiform basal cell carcinoma) in the medial corner of the right orbit.

After surgical risk assessments, the patient underwent tumor excision in the medial canthus of the right eyelid under general anesthesia. The peripheral safety margins were 6 mm, and the patient required resection of the anterior and posterior lamellae of the affected segment of the upper and lower eyelids (►**Fig. 2**). Defect reconstruction occurred in the same surgical procedure using an ipsilateral paramedian forehead flap without the need for a pedicle graft. Closure of the donor area of the flap was primary (►**Fig. 3**).

There were no complications in the peri- or postoperative period, and suture removal occurred in the usual manner within 1 week. The anatomopathological report revealed sclerodermiform BCC involving the caudal margin.

After a month, the patient (►**Fig. 4**) underwent a new surgery for margin enlargement (6 mm) and autonomization of the pedicle of the paramedian forehead flap (►**Fig. 5**). The new anatomopathological report showed neoplasm-free margins.

The progression to loss of lower eyelid support and continuous tearing (►**Fig. 6**) led us to propose a 3rd surgical

Fig. 2 Defect resulting from resection with oncological margins of a tumor lesion (sclerodermiform basal cell carcinoma) in the medial corner of the right orbit.

Fig. 3 Transposition of a paramedian forehead flap to reconstruct a defect in the medial corner of the right orbit.

procedure 5 months after the last approach. We decreased the thickness of the paramedian flap of the autonomized forehead, and the dissection highlighted the patency of the upper lacrimal duct (►**Fig. 7**). Lateral canthopexy and medial canthoplasty were associated with a chondroperichondral scapha graft fixated at the remaining tarsus of the lower eyelid and the medial canthal ligament (►**Fig. 8**).

The patient showed symptomatic improvement and an aesthetically favorable reconstruction (►**Fig. 9**), allowing good adaptation to social life. He will remain under continuous monitoring for early detection of new skin lesions.

Discussion

Around 5 to 10% of all skin cancers occur in the periorbital area.[5] Basal cell carcinoma, the most common type of skin

Fig. 4 Eyelid appearance one month after the first surgical procedure, consisting of tumor (sclerodermiform basal cell carcinoma) resection from the medial corner of the right orbit and paramedian forehead flap transposition.

Fig. 5 Reconstructive appearance after margin widening and pedicle autonomization of the paramedian forehead flap.

Fig. 6 Loss of lower eyelid support resulting from a tumor (sclerodermiform basal cell carcinoma) resection in the medial corner of the right orbit.

Fig. 7 Upper lacrimal duct patency.

Fig. 8 Fixation of chondroperichondral scapha graft to the remaining tarsus of the lower eyelid and the medial canthal ligament.

Fig. 9 Final appearance of orbitopalpebral reconstruction after three surgical procedures.

neoplasm, accounts for approximately 90% of malignant eyelid tumors. Squamous cell carcinoma is the second most common type of skin cancer, accounting for 5 to 10% of periorbital tumors, followed by sebaceous carcinoma and melanoma, both relatively uncommon.[6]

Excision of malignant skin tumors in the periorbital area can become a more demanding facial reconstruction procedure since tumor resection may result in combined defects of the medial canthus and eyelids, lacrimal duct involvement, and deep defects with enucleation. Eyelid retraction is a frequent complication from facial and periorbital reconstruction. The etiologies of eyelid retraction include anterior lamellar shortening, vertical flap tension, and medial ectropion. Common errors leading to these outcomes include poor fixation of the lateral canthal ligament to Whitnall's tubercle, inadequate fixation or lack of fixation of the posterior portion of the medial canthal ligament, undersizing of a skin graft or flap, and/or inadequate deep anchorage.

The paramedian forehead flap is a reconstructive option for defects of the medial canthus of the eyelid, especially for lesions affecting its inner extremities. The surgical schedule consists of at least 2 stages, the first for flap transposition and the second, after 3 or 4 weeks, for its autonomization. Functional and/or cosmetic improvement may require sequential refinements.[4]

In this case, we chose not to perform any canthopexy or canthoplasty procedures in the first and second surgical stages due to the oncological nature and the compromise of the caudal margin in our first approach. Despite the transposition of the paramedian frontal flap, the surgical margins could undergo effective widening. Only after determining the absence of neoplasia did we focus on procedures to improve the apparent sclera and ectropion, warranted by the extensive resection of all the lamellae of the lower eyelid.

Canthopexy with medial canthoplasty with a scapha chondroperichondral graft satisfactorily improved eyelid support. Consequently, thinning the volume of the paramedian flap was also essential for the more natural appearance of the periorbital region of our patient.

As for the lacrimal ducts, their catheterization is a common procedure to avoid epiphora in reconstructions of the medial canthus of the eyelid. However, this procedure has risks, like the potential formation of a false pathway, pyogenic granuloma, inflammation and infection of the canaliculus, internal or external tube migration, chronic nasal irritation, corneal abrasion, and silicone extrusion.[7] We preferred not to catheterize the inferior lacrimal duct because we kept the patency of the superior lacrimal duct and considered the possible complications of surgical manipulation of the lacrimal ducts. This approach did not result in functional impairment for the patient, whose initial excessive tearing showed favorable evolution with surgical treatment of ectropion.

It is also worth noting that Mohs micrographic surgery and sectioning and freezing could have been used on the first two surgical approaches as they could compromise the margins. In addition, the patient did not have the financial resources to obtain the necessary private supplementation for performing the Mohs procedure, and sectioning and freezing are not routine in skin neoplasm treatment in our service.

Finally, the main lessons from this case are: 1) aggressive BCCs in the medial canthus of the eyelid have a high potential for involving critical structures by tumor growth or resection with the required safety margins and benefit from repair of all affected eyelid lamellae; 2) the paramedian forehead flap is an interesting reconstructive option, especially when other flaps, such as Esser or Mustardé, have already been used.

Conclusion

In patients with defects in the medial canthus of the eyelid, reconstruction with a paramedian frontalis flap is a safe and reliable method, with satisfactory functional and aesthetic outcomes. The flap can be refined as many times as necessary, and reapproaches can adopt new reconstructive procedures.

Authors' Contributions

LRAS: data analysis and/or interpretation, statistical analysis, final manuscript approval, data collection, conceptualization, study conception and design, project management, investigation, methodology, performance of operations and/or experiments, writing – original draft, writing – review & editing, supervision, validation, visualization; DAVS: data analysis and/or interpretation, statistical analysis, final manuscript approval, data collection, investigation, writing – original draft, writing – review & editing, validation, visualization; RXAA: data collection, writing – review & editing, visualization; AVCM: final manuscript approval, project management, supervision.

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Clinical Trials

None.

Conflict of Interests

The authors have no conflict of interests to declare.

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