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Orbital Tumor Exenteration and Reconstruction with Temporal Flap: Retrospective Analysis

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Abstract | **Original Research Article**

Orbital exenteration is a radical surgical procedure indicated for locally advanced palpebro-orbital malignancies, particularly basal cell carcinoma. Although it provides effective oncologic control, it results in significant functional and aesthetic morbidity, making reconstruction of the orbital cavity a major challenge. We conducted a retrospective monocentric study at the Maxillofacial Surgery Department of Mohammed VI University Hospital in Marrakech, including six patients treated between January 2023 and August 2025 for palpebro-orbital basal cell carcinoma. All patients underwent total orbital exenteration followed by delayed reconstruction using a temporalis muscle flap. Clinical, radiological, histopathological data, postoperative outcomes, complications, and aesthetic results were analyzed. The mean age was 68.7 years, with equal sex distribution. Tumors were located in the eyelid or medial canthus in all cases, with multifocal naso-jugal extension in 33.3%. Histologically, all lesions were basal cell carcinomas, predominantly infiltrative forms (50%). Reconstruction was achieved using a temporalis muscle flap, followed by skin grafting in 83.3% of cases. Favorable postoperative evolution was observed in 83.3% of patients. One case (16.7%) of flap necrosis occurred, associated with tumor recurrence at one year. Aesthetic outcomes were considered satisfactory in most patients. Orbital exenteration remains an effective treatment for advanced palpebro-orbital basal cell carcinoma. Reconstruction using the temporalis muscle flap is a reliable and reproducible technique, offering a favorable balance between oncologic safety and aesthetic outcome, particularly in resource-limited settings. Larger prospective studies are needed to validate these findings.

Keywords: Exenteration, Temporalis muscle flap.

INTRODUCTION

The orbit is a main cavity located in the upper part of the facial skeleton; it contains the globe and its annexes communicate with the endocranium and certain parts of the facial skeleton through numerous orifices. Orbital exenteration is a major surgical procedure indicated in the management of eyelid-orbital tumors, primarily malignant, such as basal cell carcinoma (BCC), which accounts for 80 to 90% of cases [1]. It consists of the removal of the eyeball and its adnexa [2]. Exenteration can be classified into three types: subtotal, which corresponds to enucleation extensive, total which includes the eyelids and all orbital contents with the periosteum and exenteration extended to the surrounding structures and the orbital bone [3]. Although this procedure provides excellent cancer control, it remains a highly mutilating and disfiguring intervention, posing significant aesthetic and functional challenges. Rehabilitation of the orbital cavity is a major issue. Reconstruction of the residual orbital cavity varies from case to case, ranging from spontaneous epithelialization following directed healing to advanced microsurgical techniques such as free flaps [4,5]. Among the various reconstructive options, the temporal flap is particularly valued for its reliability, versatility, and ease of harvesting. [3] In this article, we report our experience in the reconstruction of exenteration cavities following infiltrating palpebro-jugal basal cell carcinoma type tumors, highlighting the importance of a delicate balance between the requirement of oncological safety and the search for an optimal aesthetic and functional result. Achieving this balance requires a multidisciplinary approach involving maxillofacial or plastic surgeons, anesthesiologists, and radiotherapists.

PATIENTS AND METHODS

This retrospective single-center study was carried out in the maxillofacial surgery department at the Mohammed VI University Hospital in Marrakech. We reviewed the records of 6 patients treated from January 2023 to August 2025 for palpebro-orbital BCCs with a cutaneous origin, who underwent total exenteration first, with delayed reconstruction using a temporal muscle flap.

Four patients were admitted through the consultation, two were referred to us by ophthalmologists, and one patient was referred by dermatologists.

The following data were collected: patient characteristics, tumor location, BCC histological subtypes, tumor size and radioclinical profile, time to healing for skin grafting, postoperative complications and the occurrence of tumor recurrence after exenteration.

The aesthetic results were evaluated directly through a patient satisfaction survey.

Informed consent was obtained from all patients for the creation and use of their medical records for scientific purposes.

⇨ **Surgical technique**

The surgical technique employed consisted of a total orbital exenteration. The primary objective of this procedure was to obtain tumor-free excision margins while preserving as much healthy periocular soft tissue as possible for reconstruction. The excision margin was 1 cm from the lower eyelid and nasal infiltration boundaries. Electrocoagulation of the severed pedicles was necessary to prevent hemorrhagic complications.

Our technique used for orbital cavity reconstruction was rotation filling of the temporal flap, in a secondary stage.

The incision is made in a sickle shape in the temporal region, beginning at the supraauricular level and circumventing the insertion of the temporalis muscle. Transposition and rotation of the muscle are performed using a transorbital approach. After dissection and release of the face-and-face flap, the muscle flap is elevated subperiosteally. It is tunneled into the orbital cavity through a large opening created by removing the outer orbital wall. It is then fixed around the perimeter of the tissue defect without tension.

In a tertiary stage, a full-thickness skin graft is used to cover the temporal flap (Figure1,2)

Figure 1: Exenteration in a patient with an infiltrating lower eyelid basal cell carcinoma

Figure2: Surgical technique: transfer of the temporalis muscle flap

RESULTS

A total of six patients were treated in our department during the study period. The mean age was 68.7 years, with a range from 53 to 76 years. The series had an equal distribution by sex (50% men and 50% women). The clinicopathological characteristics, including tumor location, histological type, pTNM classification, postoperative course, cosmetic results, and follow-up, are detailed in (Table 1).

Table 1: Clinical, histopathological, therapeutic and evolutionary characteristics of patients who underwent orbital exenteration with reconstruction (case series)

Patient Name	Age	Sex	Tumor Location	histological type	Imaging	pTNM classification	Waiting time for skin graft	Post-operative care	Aesthetic Result	Follow-up (Month)
Patient 1	66	F	inner canthal/right lower eyelid	Nodular basal cell carcinoma	Facial CT scan	pT4aNxMx	1 month after reconstruction	Good healing	Good	5 months
Patient 2	74	H	Right lower eyelid	Basal Cell Carcinoma infiltrating	Facial CT scan	pT3NxMx	1 month after reconstruction	Good healing	Good	9 months
Patient 3	53	H	inner canthal/ left lower eyelid	Follicular basal cell carcinoma	Facial MRI	pT3NxMx	1 month after reconstruction	Good healing	Good	17 months
Patient 4	76	F	Right palpebral-nasal (Multiple locations)	Nodular and infiltrating basal cell carcinoma	Facial CT scan	pT3NxMx	One and a half months after reconstruction	Good healing	Acceptable	18 months
Patient 5	72	H	inner canthal / two eyelids and globe	Nodular basal cell carcinoma	Facial MRI	T4aNxMx	1 month after reconstruction	Good healing	Good	30 months
Patient 6	71	F	Right palpebral-nasal / nasolabial	Infiltrating basal cell carcinoma	Facial CT scan	T4bNxMx	-	Flap necrosis	bad	25 months (Recidivism)

Four patients (66.7%) came from a rural area. In all cases (100%), the primary tumor was located on the eyelid or at the inner canthus, with multifocal naso-buccal involvement in two patients (33.3%). All lesions were basal cell carcinomas (BCCs) (100%), distributed as infiltrative (50%), nodular (33.3%), and follicular (16.7%) forms. Radiological evaluation was based primarily on cervicofacial computed tomography (CT scans) (66.7%), supplemented by MRI in two cases (33.3%) to determine locoregional extension, particularly to the orbital muscles, intra- and extraconal fat, and ocular structures. Involvement of the intraorbital fat and/or lysis of the orbital floor or medial wall were the main indications for exenteration. No lymph node dissection was performed.

After histological confirmation and surgical indication, all patients (100%) underwent total orbital exenteration. Reconstruction with a temporalis muscle flap was performed later, after histological verification of clear resection margins, respecting a 1 cm safety margin. A split-thickness skin graft was subsequently performed in five patients (83.3%), within a period of 20 days to one month.

Postoperative recovery was favorable in five patients (83.3%), with satisfactory wound healing. One patient (16.7%) experienced flap necrosis requiring debridement followed by directed wound healing, complicated by tumor recurrence one year later. Aesthetically, the results were considered good to acceptable in the majority of cases, correlating with good wound healing (Figure 3).

Figure 3: Final result after skin grafting

DISCUSSION

In our series, the population is characterized by a high mean age (68.7 years), which is consistent with epidemiological data describing basal cell carcinoma (BCC) as a pathology of the elderly, linked to chronic UV exposure [6]. The predominance of eyelid and inner canthus locations observed in our series is also classic, these areas being particularly exposed and anatomically favorable to early orbital extension via the lacrimal pathways and deep tissues [7,8].

The indication for exenteration in our series was based on criteria of orbital invasion (intraorbital fat involvement, bone lysis), in accordance with current recommendations which reserve this surgery for locally advanced forms not totally resectable by conservative techniques [9]

In our series, exenteration with 1 cm safety margins allowed for good local control, with only one recurrence (16.7%). This rate is comparable to data in the literature, where recurrences after exenteration vary between 10 and 30% depending on the series, particularly in cases of infiltrative forms or borderline margins [10].

The recurrence observed in our study was associated with a local complication (flap necrosis), suggesting that the quality of reconstruction can indirectly influence local control by affecting monitoring and healing.

Reconstruction of the orbital cavity after exenteration presents a major surgical challenge. Its primary objective is to ensure a watertight separation between the orbit and intracranial structures, while also achieving an acceptable aesthetic result. Several options are described, such as directed healing and skin grafts [2], free and microsurgical flaps [11], and local flaps such as the frontal, nasolabial, temporalis fascia, temporalis muscle, and Converse scalping flaps for large tissue defects [12].

In our setting, the temporalis muscle flap is a reliable and convenient reconstruction option, offering ample tissue with robust vascularization primarily provided by the deep temporal arteries. Functionally, it allows for effective filling of the orbital cavity, minimizing the risk of fistulas and providing an adequate base for a secondary skin graft, while also reducing donor site morbidity. Several authors have shown that the temporalis muscle flap remains one of the best choices for a secondary skin graft, with satisfactory epithelialization rates [2].

The aesthetic results were judged satisfactory in the majority of cases, which is consistent with the literature. Temporalis muscle flaps offer good facial symmetry, a discreet scar, and acceptable rehabilitation for patients [12] (Figure3)

In our protocol, reconstruction was performed after confirmation of clear margins. This strategy allows for increased oncological safety and consequently a reduction in the risk of recurrence.

Some teams favor immediate reconstruction, particularly in cases of planned radiotherapy, to improve healing [13]. However, no clear efficacy has been demonstrated, and the choice remains dependent on the clinical context.

In our series, postoperative complications were limited, with only one case of partial flap necrosis (16.7%). This outcome is generally comparable to data in the literature. The low complication rate observed in our study thus reinforces the reliability and safety of reconstruction using the temporal flap technique.

However, the interpretation of these results must take into account the retrospective nature of the study and the small sample size (n = 6), which limits the statistical power and generalizability of the conclusions. Despite these limitations, our results remain consistent with those of published single-center series, confirming the role of the temporal flap as a reliable reconstructive option in the context of exenteration.

CONCLUSION

Orbital exenteration remains a radical but effective treatment for locally advanced eyelid-orbital basal cell carcinomas, allowing for satisfactory oncological control. Reconstruction using a temporalis muscle flap appears to be a reliable option, offering a good compromise between oncological safety, technical simplicity, and acceptable cosmetic results. Our experience confirms its relevance, particularly in resource-limited settings. Despite a low complication rate, the occurrence of necrosis remains possible and can impact the outcome. Larger-scale prospective studies are needed to confirm these results and standardize the indications.

Competing Interests

Authors declared they have no conflicts of interes.

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All authors have read and approved the final version of the manuscript.

REFERENCES

1. Ko S. Kourdjee, J.L. Perrot, A. Fakhi, E. Ravni, C. Bourgea, C. Dorado Cortez. (2023). *Épidémiologie des tumeurs palpébrales: "étude TorKcas" à propos de 4674 sujets.* Dermatologie, CHU Nord Saint-Étienne, Saint-Priest-en-Jarez, France. Doi: 10.1016/j.fander.2023.09.428
2. Kesting MR, Koerdt S, Rommel N, Mücke T, Wolff KD, Nobis CP et al. *Classification of orbital exenteration and reconstruction.* J Craniomaxillofac Surg. 2017;45(04):467-473. PubMed | Google Schola.
3. R. Patrick Yeatts, MD. *The esthetics of orbital exenteration.* American Journal of Ophthalmology. 2005;139:152–3.
4. Baum SH, Schmeling C, Eckstein A, et al. *Orbital exenteration: Symptoms, indications, tumour localizations, pathologies, reconstruction, complications and survival.* J Cranio-Maxillo-Fac Surg 2021;49(8):659e69.
5. Badhey A, Haidar Y, Genden E. *Soft tissue microvascular reconstruction of orbital exenteration defects*. Séminaires en chirurgie plastique 2019; 33(2):125e31.
6. A Lomas 1, J Leonardi-Bee, F Bath-Hextall. *A systematic review of worldwide incidence of nonmelanoma skin cancer.* British Journal of Dermatology. 2012
7. Ze Zhang, Son Ho, Vivian Yin, Gonzalo Varas, Saul Rajak, Peter J Dolman, Alan McNab, J Godfrey Heathcote, Alejandra Valenzuela. *Multicentred international review of orbital exenteration and reconstruction in oculoplastic and orbit practice*. .J Ophthalmol 2018; 102:654– 658. Doi : 10.1136/bjophthalmol-2017-310681.
8. Igal Leibovitch, Alan McNab, Timothy Sullivan, Garry Davis, Dinesh Selva. Avril 2005;112(4):717-23. *Orbital invasion by periocular basal cell carcinoma.* Ophthalmology. 2005. Doi: 10.1016/j.ophtha.2004.11.036.
9. Gary Russell Hoffman, Niall David Jefferson, Colin Bruce A Reid, Robert Leonard Eisenberg . *Orbital Exenteration to Manage Infiltrative Sinonasal, Orbital Adnexal, and Cutaneous Malignancies Provides Acceptable Survival.* American Association of Oral and Maxillofacial Surgeons. J Oral Maxillofac Surg 74:631-643, 2016. Doi : 10.1016/j.joms.2015.09.019.
10. I Rahman 1, A E Cook, B Leatherbarrow. *Orbital exenteration: a 13 year Manchester experience.* Br J Ophthalmol. 2005 Oct;89(10):1335-40. doi: 10.1136/bjo.2004.062471.
11. Jessica Yesensky, Nicole Lebo. *Reconstructive options following orbital exenteration.* Curr Opin Otolaryngol Head Neck Surg. 2020 Oct;28(5):352-354. doi: 10.1097/MOO.0000000000000662.
12. Tara Brennan, Tristan M Tham, Peter Costantino. *The Temporalis Muscle Flap for Palate Reconstruction: Case Series and Review of the Literature.* Int Arch Otorhinolaryngol. 2017 Feb 17;21(3):259–264. doi: 10.1055/s-0037-1598653.
13. Stéphanie Lemaître, Frederick Green, Rémi Dendale, Anne Vincent-Salomon, Laurence Desjardins, Nathalie Cassoux, Benoît Couturaud, Christine Lévy-Gabriel. *Total orbital exenteration with single stage repair using temporalis muscle transfer and secondary healing: a series of 29 cases.* 2021 published by Elsevier.