

# ORBITAL RECONSTRUCTION AFTER EXENTERATION FOR MALIGNANT TUMOURS USING LOCAL FLAPS

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**Keywords:**  
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**Abstract:** Malignant orbital tumours represent 7% (113) out of the total number of malignant tumours surgically treated in the Oro-Maxillo-Facial Department of the “Lucian Blaga” University of Sibiu, as it is presented in a retrospective study developed over 10 years (2002-2012). The standard treatment in these cases is exenteration or extended exenteration in the more advanced forms. The resulting defects can be treated with local or locoregional flaps, as well as with distant flaps through microsurgery. Taking into consideration old age, frequency being higher with patients older than 50 years and often associated with other general comorbidities we have preferred local reconstructions. We will present these sliding, translating, rotational or pedicled flaps, with correlation to each study case characteristics, showing the advantages of the local flaps regarding the good results with minor complications as well as diminishing hospitalization and fast recovery.

**Cuvinte cheie:**  
exenterație,  
reconstrucția orbitei,  
lambouri loco-regionale

**Rezumat:** Tumorile maligne orbitare reprezintă 7% (113) din totalul tumorilor maligne operate în Clinica de Chirurgie OMF a Universității „Lucian Blaga” din Sibiu, așa cum rezultă dintr-un studiu retrospectiv efectuat pe 10 ani (2002-2012). Operația standard în aceste cazuri o reprezintă exenterația sau exenterația lărgită în formele avansate. Plastia defectelor rezultate se poate face atât cu lambouri locale sau loco-regionale, cât și cu lambouri de la distanță prin tehnici microchirurgicale. Având în vedere vârsta înaintată a pacienților, frecvența fiind mai mare după 50 de ani, asociată de multe ori și cu alte afecțiuni generale, așa cum rezultă din studiul nostru am preferat reconstrucțiile locale. Vom înfățișa în funcție de particularitățile fiecărui caz aceste lambouri de alunecare, translare, rotație sau pediculate, arătând avantajele plastiilor locale, atât în ceea ce privește rezultatele bune, cu complicații minore, cât și în ceea ce privește scurtarea timpului de spitalizare și reintegrarea rapidă a acestor pacienți.

## INTRODUCTION

In recent years, there has been an increase in the number of oncological patients. In a retrospective study developed over 10 years (2002-2012), malignant orbital tumours represented 5% out of the total number of malignant tumours surgically treated in the Oro-Maxillo-Facial Department of the “Lucian Blaga” University of Sibiu, showing also a growing tendency both in primary and secondary tumours. The elective surgical procedure is represented by the exenteration described by George Bartisch in 1586, which implies the removal of all the orbital content: eyeball, surrounding fat tissue, muscles, lachrymal gland, nerves, vessels, eyelids (1) etc. Often, because of the local invasion due to an incomplete exenteration or inadequate treatment, it is required an extended exenteration that also implies the resection of the surrounding structures, including facial sinuses, the upper maxilla, skull base till the anterior cranial fossa.(2)

For the reconstruction of these extremely extended and mutilating post-op defects, a series of local, loco-regional and distant flaps using microsurgery (3) have been described. Essentially, it is a fast recovery that seals the communicating channels with the nasal cavity, surrounding sinuses and the neurocranium, which allows the reintegration of the patient in society and continuing with adjuvant therapies.

## METHODS

Our study involved 113 patients who underwent surgery for malignant orbital tumours in the last 10 years in the Oro-Maxillo-Facial Department of the “Lucian Blaga” University of Sibiu, which represents 5% of the total number of the malignant tumours surgically treated. These have been both primary tumours (34 patients) that started in the eyeball, conjunctiva, lachrymal gland, optic nerve, as well as secondary tumours (79 patients) that started in the surrounding regions: eyelids, maxillary sinus, malar region, etmoidal sinus etc. This study has been made on men and women aged 8-91, showing an increased incidence for males (80%) and the 65-70 years group.

Histologically, the primary tumours (34 cases) have been: Melanoma (10); Adenoid cystic carcinoma (7); Malignant lymphoma (7); Adenocarcinoma (4); Rhabdomyosarcoma (3); Hemangiopericytoma (3)

The secondary tumours have been: Squamous carcinoma (45); Basal cell carcinoma (29); Malignant meningioma (3); Malignant inverted papilloma (2).

The diagnostic has been easily made using specific clinical signs such as: the presence of the tumoural mass, exoftalmy, diplopia, reduced obility of the eyeball, chemosis, palpebral edema.

The paraclinic exams have consisted in bioptic Rx,

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## CLINICAL ASPECTS

ultrasounds, CT and MRI, useful in establishing a correct diagnosis but more importantly evaluating the tumoral spread. All the patients have benefitted from exenteration or extended exenteration for periosteal or osseous invasion. Often, it has been required the total ablation of some orbital walls, of the upper hemimaxilla, of paranasal sinuses, partial of nasal pyramid till the anterior cranial fossa.

The reconstruction has been made in the same surgical step, using a large variety of local and locoregional flaps, such as sliding, translating, rotational or pedicled flaps, often combined with free tissue transfer. Rarely have we used free vascularised distant flaps, because of some patients' age contraindications (most of the patients are between 50-70 years old), and of the existence of specific age related comorbidities.

### RESULTS

Postoperatory, the evolution was very good, requiring no more than 7 days of hospitalization. The healing and social integration processes were very fast, allowing further treatment (radiochemotherapy).

There was some suppuration due to the unsatisfactory drainage and infection of the hematoma, but they were solved by specific treatments (drainage, antibiotics).

Also, in one of the patients with orbito-naso-frontal tumour, after performing a large flap exceeding the midline to cover the defect, appeared a partial necrosis of the flap, allowing healing by epithelialisation after an appropriate treatment.

At some of the patients who needed free skin grafts from their thighs, occurred peripheral graft necrosis, therefore the healing process was slower.

**Figure nr 1. A. Malignant orbital tumour; B. Surgical piece; C. Flap rotated in the defect**



**Figure no 2. A. Malignant orbital tumour; B. MRI showing the orbital extension of the neoplastic process; C. Flap-plasty with temporal muscle; D. Skin graft applied in the defect**



### DISCUSSIONS

Malignant tumours of the orbit have an increased rate in the context of the cephalic extremity malignancies. Our 10-year statistics show that 5% of all malignant tumours operated are of the orbit.

We observe the predominance of secondary tumours

with the starting point from the neighbouring regions and the extensive tumours as a result of inappropriate ophthalmic, dermatologic and radiochemotherapeutic treatments.

Exenteration surgeries have good results showing a 5 year survival rate, except the malignant melanoma in which the average survival was 18 months.

Large and mutilating defects, resulting from surgical extirpation required immediate plastic surgery for both functional and aesthetic purposes and closure of the communication with the nasal cavity, the paranasal sinuses and the anterior cerebral fossa.(5) Fast healing is needed in order to allow the other oncology treatments. Using local and locoregional flaps gave us satisfaction obtaining these goals. They were imposed by the advanced age of our patients as well as the general condition.

Depending on the specifics of each case we used in descending order: Rotation advancement flap-frontal-temporo-parietal; Temporo-frontal flap pedicle + free split skin graft from the thigh; Myofascial pedicle flap of temporal muscle + free split skin graft from the thigh; Inferior pedicle flap from glabella; Flap pedicled occipito-parieto-temporo-frontal + free split skin graft on thighs; Facio-cervico-thoracic flap allowed and control latero-cervical lymph node stations; Functional supraomohoidian or latero-cervical neck dissection were performed during the second stage in patients with squamous cell carcinomas that had their lymphatic nodules removed. In rare cases in which we opted for microsurgical reconstruction, we used the latissimus dorsi free flap.

### CONCLUSIONS

We note an increase of the malignant tumours of the orbit, often extensive forms, predominantly as a result of secondary tumours which grow because of inadequate treatment.

The treatment of choice is exenteration or extended exenteration if the periosteum and bone are invaded. The required immediate reconstruction can be performed with good results if we resort to a number of local plastic surgery depending on the particularities of each case. If these plastic surgeries are followed by prosthetic rehabilitation, the social reintegration of patients can be ensured.

Advanced stages of invasion to the anterior cerebral fossa require interdisciplinary collaboration with neurosurgeons.

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