

Oncologic and Non-Oncologic Cutaneous Defects: Dermatologic Criteria and Reconstructive Strategies

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ABSTRACT

Oncologic and non-oncologic cutaneous defects represent a frequent challenge in clinical practice, particularly when they are located in facial regions of high aesthetic and functional relevance. Proper management of these lesions requires careful integration of dermatologic criteria that guide oncologic resection and reconstructive principles that allow restoration of anatomy and function. Basal cell carcinoma is the most common cutaneous malignant neoplasm and, although it has low metastatic potential, it may generate significant defects when it involves photoexposed areas such as the cheek. This article presents a narrative review of the management of oncologic and non-oncologic cutaneous defects, emphasizing dermatologic criteria and reconstructive strategies, accompanied by a clinical case report of a 38-year-old female patient with basal cell carcinoma located in the right malar region. The patient was treated with surgical excision using adequate oncologic margins and immediate reconstruction with a Mustardé cheek rotation flap, achieving satisfactory functional and aesthetic outcomes with no evidence of tumor recurrence during follow-up. Through the integration of the clinical case and the literature review, epidemiologic factors, dermatologic evaluation criteria, and reconstructive principles influencing decision-making are highlighted. This comprehensive approach underscores the importance of individualized planning and an interdisciplinary strategy to optimize clinical and aesthetic outcomes in the management of facial cutaneous defects.

KEYWORDS: Basal cell carcinoma; cutaneous defects; facial reconstruction; cutaneous flaps; Mustardé flap; dermatologic surgery; reconstructive surgery; cheek.

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INTRODUCTION

Cutaneous defects secondary to oncologic and non-oncologic pathology represent a frequent therapeutic challenge in daily clinical practice, particularly when they are located in exposed anatomical regions such as the face. Appropriate dermatologic evaluation and selection of the optimal reconstructive strategy are key determinants for achieving satisfactory oncologic, functional, and aesthetic

outcomes. In this context, collaboration between Dermatology and Plastic Surgery is essential, especially during the training of medical residents.^{1,2}

Skin cancer is the most common malignant neoplasm worldwide, with basal cell carcinoma and squamous cell carcinoma being the most prevalent variants. Initial management in most cases consists of surgical excision with adequate margins, defined according to dermatologic criteria

that include histologic subtype, tumor size, depth of invasion, degree of differentiation, and anatomical location. These variables influence not only oncologic prognosis but also the magnitude of the resulting cutaneous defect and, consequently, reconstructive complexity.²

Lesions located in the malar region, such as the right cheek, pose additional challenges due to the aesthetic importance of the facial unit, tissue mobility, proximity to critical anatomical structures, and the need to preserve facial symmetry. In such cases, reconstruction using local cutaneous flaps often offers significant advantages by providing adequate tissue coverage, respecting facial aesthetic units, and optimizing functional and cosmetic outcomes.^{3,4}

Modern management of cutaneous defects requires systematic integration of dermatologic and reconstructive criteria. From proper indication of surgical excision, oncologic risk assessment, and margin planning to the choice of closure method—whether by secondary intention, skin grafts, or local flaps—each decision must be individualized based on patient and defect characteristics.⁴

The aim of this article is to comprehensively review current principles in the management of oncologic and non-oncologic cutaneous defects, emphasizing dermatologic criteria guiding resection and available reconstructive strategies. Additionally, a clinical case of skin cancer located in the right malar region treated with surgical excision and cutaneous flap reconstruction is presented as a practical example of interdisciplinary decision-making in this type of pathology.^{5,6}

CLINICAL CASE REPORT

A 38-year-old female patient with no relevant past medical history and a history of intermittent chronic sun exposure since adolescence, mainly without regular photoprotection, presented for dermatologic consultation due to a cutaneous lesion located in the right malar region with approximately 14 months of evolution. The lesion exhibited slow and progressive growth, with occasional episodes of spontaneous bleeding and surface changes. Physical examination revealed an ulcerated nodular lesion with raised, well-defined borders, a pearly appearance, and superficial telangiectasias, measuring approximately 2.1×1.9 cm, located on the right cheek, with no clinical evidence of deep infiltration or involvement of adjacent structures. No regional lymphadenopathy was detected, and the remainder of the physical examination was unremarkable.

Given the clinical suspicion of cutaneous malignancy, an incisional biopsy was performed, and histopathologic analysis confirmed the diagnosis of basal cell carcinoma. According to dermatologic risk criteria—including facial location, tumor size, and potential aesthetic impact—surgical management with complete excision and adequate oncologic margins was indicated. The procedure was performed under local anesthesia with sedation, achieving resection of the lesion with safety margins, including skin and subcutaneous tissue down to the superficial muscular plane. Following excision, a cutaneous defect measuring approximately 3.5×3.2 cm was created in the right malar region, with partial exposure of the underlying muscle.



Figure 1. Preoperative image.

Definitive histopathologic analysis confirmed completely excised basal cell carcinoma with tumor-free surgical margins. Due to the size of the defect, its location in a highly visible facial aesthetic unit, and the need to preserve facial symmetry, primary closure and healing by secondary intention were ruled out. Immediate reconstruction was performed using a local cutaneous flap, selecting a Mustardé cheek rotation flap, a technique that allows adequate tissue mobilization, excellent vascular supply, and favorable aesthetic outcomes in the malar region.

Flap design consisted of a wide curvilinear incision starting at the lateral border of the defect, extending inferolaterally along the nasolabial fold and continuing toward the

preauricular region, respecting relaxed skin tension lines. Careful dissection was performed in the subcutaneous plane with extensive tissue release to allow adequate rotation without tension while preserving flap vascularity. Once mobilized, the flap was rotated into the malar defect, achieving complete coverage and proper adaptation to the surgical edges. Deep fixation sutures with absorbable material were placed to redistribute tension, minimize the risk of ectropion, and preserve facial anatomy. Closure was completed in layers using absorbable sutures in the deep plane and non-absorbable cutaneous sutures for the skin.



Figure 2. Immediate postoperative image.



Figure 3. Immediate postoperative image.

Postoperative evolution was uneventful. At the 7-day follow-up, adequate flap viability was observed with no signs of infection, necrosis, or dehiscence, and cutaneous sutures were removed. Subsequent follow-ups at 1, 3, and 6 months demonstrated proper healing with satisfactory aesthetic and functional outcomes, good integration of the flap with surrounding tissues, and preservation of facial symmetry. No clinical evidence of tumor recurrence was identified during the follow-up period.

DISCUSSION

This case highlights the importance of appropriate dermatologic evaluation for selecting oncologic treatment, as well as individualized reconstructive planning. Reconstruction using a Mustardé cheek rotation flap proved to be a safe and effective option for managing facial cutaneous defects secondary to basal cell carcinoma, particularly in young patients, where aesthetic outcomes are of special relevance.⁷

Management of oncologic and non-oncologic cutaneous defects represents an ongoing challenge in clinical practice, particularly when involving the face, where oncologic, functional, and aesthetic considerations converge. Facial

skin plays a central role in personal identity and expression; therefore, tumor resection must be accompanied by careful reconstructive planning that restores anatomy without compromising complete disease eradication. In this context, collaboration between Dermatology and Plastic Surgery is indispensable, as it allows integration of diagnostic, therapeutic, and reconstructive criteria from a comprehensive perspective.⁷

Basal cell carcinoma is the most frequent cutaneous malignant neoplasm worldwide and constitutes the leading cause of oncologic cutaneous defects requiring reconstruction. Its incidence has steadily increased in recent decades, not only among older populations but also in younger patients, particularly women, as a result of intermittent sun exposure patterns, tanning bed use, and inadequate photoprotection. Although its metastatic potential is low, its locally invasive behavior can produce significant defects, especially when located in photoexposed areas such as the malar region. The epidemiologic magnitude of this entity and its clinical impact are summarized in Table 1.^{8,9}

Table 1. Epidemiology of non-melanoma skin cancer

VARIABLE	DATA
Most frequent cutaneous neoplasm	Basal cell carcinoma
Proportion of total cases	70–80%
Predominant location	Face and neck
Typical age	>50 years
Current trend	Increase in younger patients
Metastatic potential	<0.1%
Clinical impact	High rate of resection and reconstruction

Proper dermatologic evaluation represents the first step in therapeutic decision-making. Selection of surgical treatment and determination of resection margins are based on a combination of clinical and histopathologic factors that allow tumor risk stratification. Variables such as histologic subtype, lesion size, depth of invasion, and anatomical

location directly influence both oncologic prognosis and reconstructive complexity. In facial lesions, even moderately sized tumors may be considered high-risk due to the functional and aesthetic impact of resection. The main dermatologic criteria guiding these decisions are presented in Table 2.¹⁰

Table 2. Relevant dermatologic criteria in skin cancer

Criterion	Clinical implication
Histologic subtype	Determines aggressiveness and recurrence
Tumor size	Defines surgical margins
Facial location	Classifies lesion as higher risk
Depth of invasion	Determines resection plane
Clinical borders	Influence surgical extent
Previous recurrence	Increases therapeutic complexity

Once oncologic resection is achieved, the resulting cutaneous defect must be analyzed from a reconstructive standpoint. Facial reconstruction should follow well-established principles, including replacement of like tissue, respect for relaxed skin tension lines, and preservation of facial aesthetic units. Selection of the appropriate

reconstructive technique depends on multiple factors related to both the defect and the patient. These reconstructive criteria help systematize decision-making and reduce the risk of functional or aesthetic complications such as facial distortion, unsightly scars, or eyelid malposition. The main reconstructive criteria are summarized in Table 3.^{11,12}

Table 3. Reconstructive criteria in facial cutaneous defects

Criterion	Considerations
Defect size	Small, medium, or large
Depth	Skin, subcutaneous tissue, muscle
Aesthetic unit involved	Cheek, eyelid, nose
Tissue laxity	Feasibility of local flaps
Patient age	Aesthetic expectations
Functional risk	Distortion of structures

In the malar region, medium-to-large cutaneous defects represent a particular challenge due to tissue mobility and proximity to critical anatomical structures such as the lower eyelid. In these cases, local cutaneous flaps are often preferable to skin grafts, as they provide better color, texture, and thickness match, as well as superior anatomical

integration. Flap selection should be individualized according to defect location and characteristics, always prioritizing preservation of facial symmetry. The main cutaneous flap options and their indications are shown in Table 4.¹³

Table 4. Selection of cutaneous flaps according to defect location

Location	Defect type	Recommended flap	Advantages
Malar region	Medium–large	Mustardé	Wide rotation, good aesthetics
Lower eyelid	Medium	Mustardé / advancement	Prevents ectropion

Nasal region	Small–medium	Bilobed	Excellent vascularity
Nasolabial fold	Small	Nasolabial	Camouflaged scar
Circular defects	Small–medium	Rhomboid (Limberg)	Versatile design

CONCLUSION

The Mustardé cheek rotation flap is one of the most widely used reconstructive techniques for malar and periorbital defects. Its broad design allows redistribution of tension toward areas of greater laxity, reducing the risk of lower eyelid distortion and preserving facial symmetry. In addition, its robust vascular supply promotes flap viability and optimal healing. In young patients, such as the case presented, this technique provides superior and durable aesthetic results, which is particularly relevant given the psychological impact associated with facial scars.^{14,15}

Integration of the clinical case with the reviewed principles illustrates the practical importance of interdisciplinary planning. The patient benefited from appropriate dermatologic evaluation that enabled complete oncologic resection, followed by carefully planned immediate reconstruction. Selection of the Mustardé flap was based on well-established anatomical, dermatologic, and reconstructive criteria, resulting in favorable postoperative evolution, adequate healing, and absence of tumor recurrence during follow-up.^{16,17}

Overall, this comprehensive approach reinforces the need for residents in Dermatology and Plastic Surgery to develop a shared understanding of the criteria guiding both oncologic resection and facial reconstruction, enabling more precise decision-making and outcomes oriented toward optimal functional and aesthetic results.¹⁸

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