



## Total Reconstruction of the Lower Lip with Modified Bilateral Cheek Advancement Flap. Surgical Technique and Clinical Cases

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Received: June 18, 2020

Published: October 16, 2020

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### Abstract

When we consider reconstructing the lower lip after an oncological ablation, “staggered reconstruction” begins with simpler procedures up to the most complex ones. Generally, these defects are previously planned in a regular way, since they need a precise design of the reconstruction technique. The local flaps are within the second reconstructive option, after the primary closures. They have the advantage of a good harmony with color, easy access, simplicity in the surgical technique and the use of an innervated muscle for its function. Among its disadvantages, it includes the need to make extra skin incisions on the face and the lack of enough tissue for very extensive defects. The objective of this article is to demonstrate the total reconstruction of the lower lip with modified bilateral cheek advancement flap.

**Keywords:** Lower Lip; Reconstruction; Local Flap; Cheek Advancement Flap

### Introduction

When we talk about reconstruction, we refer to oncological resections for primary neoplasms of the lip. Generally, these defects are previously planned in a regular way, since they need a precise design of the reconstruction technique. The lower lip is composed of 3 structured layers comprising skin, muscle and mucosa. The mandibular branch of the V pair and marginal branch of the VII cranial nerve are responsible for its sensory and motor innervation, respectively. The vascular supply is given by the labial arteries, branch of the facial artery. Among the functions of the lip are to maintain the oral sphincter and labial competence during swallowing; also, its role in speech, expression and orofacial cosmetics is also important. When we consider reconstructing the lower lip after an oncological ablation, “staggered reconstruction” begins with simpler procedures up to the most complex ones. The local flaps are within the second reconstructive option, after the primary closures. They have the advantage of a good harmony with color,

easy access, simplicity in the surgical technique and the use of an innervated muscle for its function. Among its disadvantages, it includes the need to perform extra skin incisions on the face and the lack of sufficient tissue for very extensive defects [1,2]. The objective of this article is to demonstrate the total reconstruction of the lower lip with a bilateral modified cheek advancement flap.

### Clinical Cases

#### Case #1

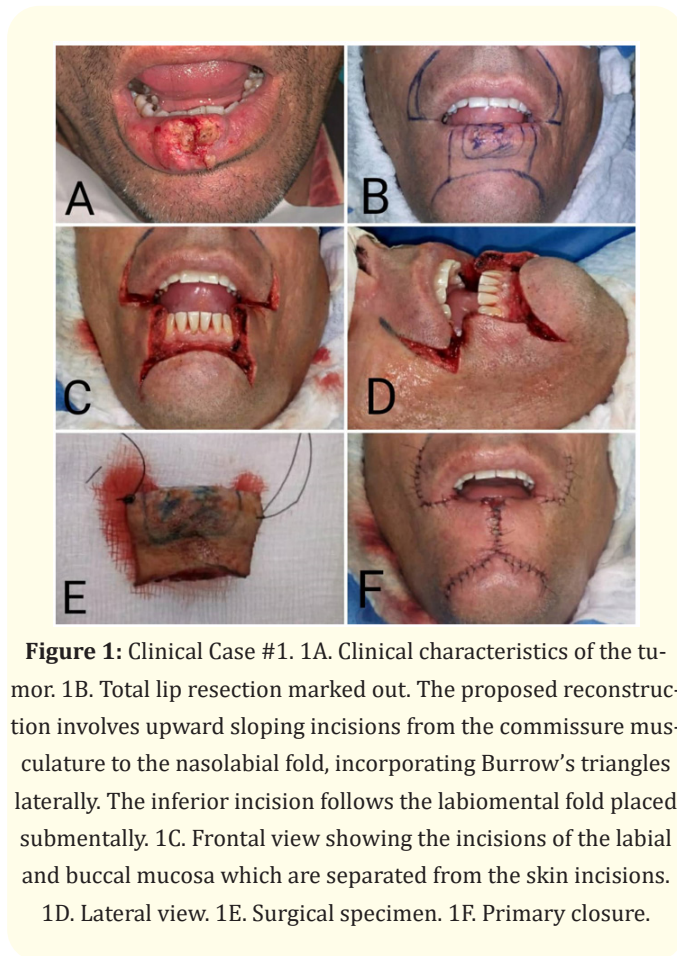
A 52-year-old male patient who attended the Oral and Maxillofacial Surgery Unit of our institution, with a chief complaint of a lesion in the lower lip with 6 months of evolution, asymptomatic, without previous treatment. Within his medical record, the patient reported a long-standing smoking tobacco habit. The extraoral clinical examination showed an ulcerated lesion in the lower lip, involving skin, muscle, and mucosa, indurated, bleeding, crusted and painless on palpation, with an irregular surface, without palpable

cervical adenopathies. Intraorally, no apparent lesions were evident. An incisional biopsy under local anesthesia was performed, which resulted in a well differentiated, infiltrating Squamous Cell Carcinoma.

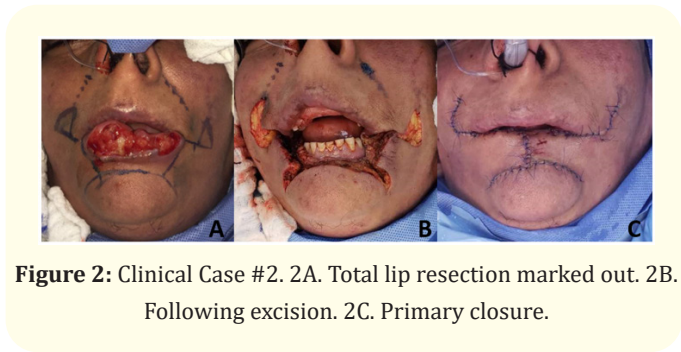
**Case #2**

A 44-year-old female patient with a chief complaint of a tumor in the lower lip, with 9 months of evolution, symptomatic, without previous treatment. Within her medical record, the patient reported systemic lupus erythematosus diagnosed 27 years ago treated with prednisone since then. The extraoral clinical examination showed an ulcerated lesion that occupied almost the entire lower lip, involving muscle, skin and mucosa, indurated, bleeding, painful on palpation, with an intense red color, without palpable cervical adenopathies. Intraorally, no apparent lesions were evident. An incisional biopsy under local anesthesia was performed, which resulted in Moderate Leucoplasiform Dysplasia associated with moderate to severe chronic inflammation at the level of the stroma.

With these diagnoses, in both cases we proceeded to perform a total resection of the lesion with oncological margins plus total reconstruction of the lower lip using a bilateral modified cheek advancement flap (Figure 1 and 2).



**Figure 1:** Clinical Case #1. 1A. Clinical characteristics of the tumor. 1B. Total lip resection marked out. The proposed reconstruction involves upward sloping incisions from the commissure musculature to the nasolabial fold, incorporating Burrow’s triangles laterally. The inferior incision follows the labiomental fold placed submentally. 1C. Frontal view showing the incisions of the labial and buccal mucosa which are separated from the skin incisions. 1D. Lateral view. 1E. Surgical specimen. 1F. Primary closure.



**Figure 2:** Clinical Case #2. 2A. Total lip resection marked out. 2B. Following excision. 2C. Primary closure.

**Surgical technique**

The incisions are made through the skin and the subcutaneous tissue layer. The incisions of the labial and buccal mucosa are separated from the skin incisions. The mucosal incisions are made at the same level as the skin incisions, but usually do not require extending as far laterally, although they can be compensated at a slightly higher or lower level depending on the lip to be reconstructed. The compensation provides more mucosa, which can be advanced with the flap. This extra mucosa is used to create the mucosal flaps, which are covered through the free margins of the flaps to restore the vermilion on the lateral portions of the reconstructed lip. What remains of the orbicularis muscle is released sufficiently to allow the advancement of the flap. The violation of the facial mimetic muscles is minimized by the blunt separation of the tissue to allow adequate stretching without separating the muscle attachments from the cheek flaps.

**Postoperative care**

As post-operative recommendations, we indicated wound massage from 1 to 6 months combined with pressure therapy by applying adhesives with micropore bands and application of sunscreen indefinitely, thereby minimizing risks of dehiscence and pigmentation of the wound, hypertrophy and/or keloids and thus, favoring the healing process.

The patients are currently free of disease after 2 years, with a favorable functional and aesthetic result, maintaining the oral sphincter and labial competence during swallowing (Figure 3).



**Figure 3:** Result at 6 months post-op. 3A Lips closed. 3B. Lips opened.

## Discussion

Many flaps have been described for lip reconstruction. These flaps work very well in those patients with defects ranging from one to two thirds of the lip. Although they can be used to reconstruct the entire lip, they often do not provide enough tissue for this purpose, resulting in a taut lower lip that tends to corrugate under the upper lip [3-5]. In other cases, it is necessary to recruit tissue from the adjacent cheek during reconstruction to prevent microstomy. Von Burow (1853 and 1855) [6] and Bernard (1852) [7], presented the concept of using cheek tissue to restore major defects or total loss of the upper or lower lips. The tissue is advanced horizontally from the medial part of one or, more commonly, from both cheeks in the form of bilateral opposing advancement flaps of the cheek. This method of repairing the lip has been referred to as Bernard's cheiloplasty. Permanent skin deformities are formed on each side of the base of each advancing flap and are called Burow triangles. An important feature of Bernard's cheiloplasty is the resection of Burow's skin triangles resulting from the advancement of the cheek flaps. The excision of the triangles facilitates the advance of the tissues. When Bernard's cheiloplasty is used to reconstruct total thickness defects of the lower lip, reconstruction requires the excision of three skin triangles. The triangles are bilaterally removed superior to the oral commissures. A larger cutaneous triangle which extends inferiorly from the defect of the lip in the chin is cut in the midline according to each case's need [5-7].

The modifications of the Bernard-Von Burow flaps have been described later by various authors. In 1960, Webster proposed a modified design for the reconstruction of the lower lip using a more linear horizontal advance of the cheek tissue compared to the Bernard-Von Burow techniques. This modification places the scars on the natural skin folds of the face and prevents the violation of the esthetic region of the chin, as it has been designed in our case. Webster's design also minimizes the tendency for vertical deficiency in the midline of the reconstructed lower lip. The reconstruction of the defects of total thickness of the lip using opposite advancement flaps of the cheek is technically difficult and the oral functioning is quite good in the best of cases. The lack of a functional sphincter muscle is compensated in part by the tension that is inherent to the reconstructed lip with the use of this surgical approach. While the opening and closing of the mouth may be acceptable, the more specialized functions of the lip, such as whistling or

kissing, tend to be significantly deficient [8-10]. The postoperative results described in the literature after this modification of the bilateral cheek advance technique are comparable to ours.

## Conclusion

The modified bilateral cheek advancement flap is still a very good alternative in the reconstruction of the lower lip, offering good aesthetic results by locating the scars in the natural skin folds, avoiding the violation of the chin region, thus minimizing the tendency for the vertical deficiency in the midline of the reconstructed lower lip. From the functional point of view, despite the fact that more specialized functions get diminished, maintaining the oral sphincter and labial competence during swallowing can be achieved satisfactorily.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

## Ethics Statement

This study was approved by the University Hospital of Maracaibo IRB and all participants signed an informed consent agreement.

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