

Lip Repair after Mohs Surgery for Squamous Cell Carcinoma by Bilateral Tissue Expanding Vermilion Myocutaneous Flap (Goldstein Technique Modified by Sawada)

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Abstract

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Squamous cell carcinoma is the most common malignancy of the lower lip. Environmental factors such as ultraviolet light exposure, arsenic and smoking are contributing factors to the increasing incidence. Mohs surgery is the treatment of choice ensuring the lowest recurrence rates. The closure of the surgical defects, however, can be a challenge. Multiple and versatile methods of reconstructing vermilion defects have been described. Among these options, Goldstein developed the adjacent ipsilateral vermilion flap based on an arterialized myocutaneous flap. The original technique was modified by Sawada based on bilateral adjacent vermilion advancement flap for closure of central vermilion defects. We report the use of bilateral flaps - Sawada's technique (instead of unilateral as suggested by Goldstein) in medium (2 cm of extension) to large defects (> 2 cm) to achieve an effective and functional reconstruction of vermilion defects after Mohs surgery for lip cancer.

Introduction

The vermilion and cutaneous mucosa line of the lips represents an important role regarding esthetics and functionality of the face. The Vermilion has a unique anatomic structure with proper texture, colour, movement and function. This anatomical region also works as an important structure in interpersonal relationship and as strong sphincter [1].

The lips have a high incidence of skin tumours. The majority of lower lip tumours are squamous cell carcinomas (SCCs), in contrast to the upper lip where basal cell carcinomas (BCCs)

dominate. The precursor of lip SCC is chronic actinic cheilitis. Exposure to ultraviolet radiation, smoking, and arsenic are the major environmental factors contributing to its carcinogenesis [2][3][4]. Lip SCC has an intermediate risk of metastatic spread, higher than cutaneous SCC and lower than oral mucosa SCC [5]. Mohs surgery is the procedure with highest cure rates [6], but proper lip reconstruction can represent a challenge. Oncologic, functional and esthetic aspect must be ideally considered to choose the appropriate treatment [7].

Multiple and versatile methods of reconstructing vermilion defects have been described. Among these options, Goldstein developed the adjacent ipsilateral vermilion flap based on an

arterialized myocutaneous flap. This composite flap is stretched to span the deficient area [8]. The original technique was modified by Sawada based on bilateral adjacent vermilion advancement flap for closure of central vermilion defects [9].

We suggest the use of bilateral flaps - Sawada's technique (instead of unilateral as suggested by Goldstein) in medium (2 cm of extension) to large defects to achieve an effective and functional reconstruction of vermilion defects.

Case report

A 71-year-old female patient with a chronic lesion of her the lower lip presented to us (Fig. 1). The lesion appeared approximately four months ago. She had a history of sun exposure (non-professional), diabetes mellitus type II, hypertension and previous tumour surgeries for lung cancer and pharynx carcinoma eight years ago.



Figure 1: Squamous cell carcinoma of the lower vermilion

Under local anaesthesia and sedation, the lesion was removed in one single piece including Vermillion, skin, muscle and mucosa with a longitudinal dimension of 2 cm. Frozen section evaluation by the pathologist demonstrated tumour-free surgical margins. The final pathology report described an SCC of the lower lip, invasion to Clark level II. There was no vascular or perineural infiltration. The tumour was staged T1.

Bilateral vermilion flap (Goldstein's technique) was prepared for defect closure. Special attention was paid to avoid damage to the vascular plexus. The flaps were advanced medially. Mucosa, muscle and cutaneous mucosa line were sutured (Fig. 2). There were no complications in the post-operative period.



Figure 2: Surgery. (a) Surgical plan is observing a good margin limit resection. Bilateral expanding vermilion-myocutaneous flap was designed; (b) large defect after complete tumour excision; (c) Bilateral flaps were dissected; (d) the flaps were advanced medially. Note that two Burrow's triangles of compensation had been removed

The last follow-up four years after the surgery demonstrated no relapse. The esthetic aspect was very nice and the scars well dissimulated. There was no interference in the functionality of the mouth or lips especially no lip incontinence. Muscular activity was fully preserved (Fig. 3).

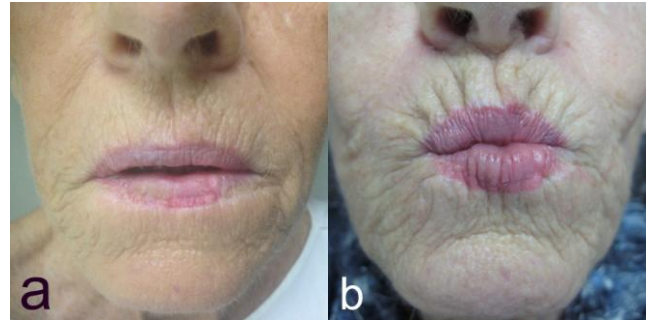


Figure 3: Four years post reconstruction without tumour relapse. (a) Good functionality and satisfactory esthetic result; (b) Functionality was maintained, and the lips and mouth as sphincter were preserved

Discussion

Lower lip defects after cancer removal are a challenge for reconstruction. A loss of labial continence increases the risk of dysphagia and sialorrhea, with negative effects on esthetics, function and health-related quality of life [10][11][12].

Various techniques have been developed over time to improve functionality and esthetics [8][9][10][11][12][13][14][15][16][17]. Although multiple-step procedures such as the Abbé - Estlander flap can yield good results [13], single step

procedures are favoured by patients. The Karapandzic flap [14] and the Bernard–Burrow–Webster procedure [15][16] are two long-established surgical techniques for lower lip reconstruction. While the Karapandzic flap preserves the sensibility, microstomia is a common outcome. The Bernard–Burrow–Webster flap allows a larger site mobilisation but may result in some degree of lip incontinence. The staircase technique is an option for closure of medium-sized defects with or without muscular involvement [17].

The bilateral tissue-expanding vermilion myocutaneous technique was used in the present case with good functional and esthetic outcome. If it is necessary, small Burow's triangle of compensation can help the reconstructive approach. The expanded flap has different anatomic structures which allow an effective stretching (advancement) towards the ipsilateral border defect. In general, bilateral flaps generate less tension in the distal portion of the flaps. They can be created smaller than a singular flap. Smaller flaps have more viability and are safer than bigger flaps. The muscular activity of the musculus orbicularis or is maintained since preparation of the flaps does not cut the muscular fibres. Last but not least, this one-stage procedure can be done under local anaesthesia as an outpatient procedure.

To avoid tumour recurrence, a three-dimensional surgical margin examination (Mohs technique in our case) is warranted [6]. The surgical technique for defect closure must be individualized depending on tumour stage, patients' needs, and availability of resources.

In conclusion, bilateral tissue-expanding vermilion myocutaneous flap for lip repair demonstrated to be a safe, useful and versatile technique in the reconstruction of vermilion defects. Adequate esthetic outcome and functionality of the region can be achieved as long as oncological and anatomic characteristics are properly considered.

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