



Sliding and Splitting Quadrangular Flap for Reconstruction of Combined Upper Lip and Premaxillary Defect

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Abstract

Head and Neck Squamous Cell Carcinoma (HNSCC) is the sixth worldwide most common type of cancer, with about 200,000 newly diagnosed cases and approximately 128,000 deaths per year. Current treatment strategies for HNSCC include surgery, radiotherapy, chemotherapy, immunotherapy or combinatorial treatments. However, the overall 5-year survival rate of HNSCC patients is still about 50%.

We present a squamous cell carcinoma of the upper lip and premaxilla, treated with local excision and reconstruction with a sliding and splitting quadrangular flap to rebuild the deficit of the upper lip, palate and premaxilla simultaneously.

In a single step, we performed a reconstructive phase consists in two full thickness genial quadrangular flaps, close to the limits of the lateral removal.

Myo-mucous portion is rotated and sutured with 3/0 Vicryl to the counter-lateral flap to rebuild the palatal wall. Oral competence and the aesthetic-functional result was good at distance.

We consider this technique an excellent solution in patients with comorbidities affected by malignant neoplasms involving the premaxilla and lip nose region.

Introduction

Head and Neck Squamous Cell Carcinoma (HNSCC) is the sixth worldwide most common type of cancer, with about 200,000 newly diagnosed cases and approximately 128,000 deaths per year. Current treatment strategies for HNSCC include surgery, radiotherapy, chemotherapy, immunotherapy or combinatorial treatments. However, the overall 5-year survival rate of HNSCC patients is still about 50% [1].

Risk factors associated with oral cancer are represented by sun exposure, male sex, smoking, skin tone, presence of mobile prostheses, and positivity to HPV [2].

Oral SCC occurs in several intraoral sites, including the floor of mouth, tongue (most common), gingiva, lips, and buccal mucosa. It might also present bone involvement either in the maxilla or the mandible [3].

Localization in the premaxilla is rare, with higher degrees of drawbacks, related to both aesthetic and functional aspect, being the region seat of the entire incisive complex [4].

Moreover, if the premaxilla is involved and tumor reaches bigger volume, is difficult to define the origin: Palatal, nasal or labial tissue [5].

When tumor involves all these areas, we have several reconstructive techniques described for the upper lip, less for bone reconstruction.

Lip reconstruction depends on the location of the damage and the extent of it. From the less invasive approach to the more aggressive one, we have different options: In case of minor defects, closing by approximation of the remaining edges or rotation of local and locoregional flaps; in case of major defects, using of free flaps [6].

We present a squamous cell carcinoma of the upper lip and premaxilla, treated with local

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Received Date: 02 Nov 2021

Accepted Date: 11 Dec 2021

Published Date: 22 Dec 2021

Citation:

Carboni A, Agrillo A, Amodeo G, Cipriani O, Cerbelli E, Scopelliti D. Sliding and Splitting Quadrangular Flap for Reconstruction of Combined Upper Lip and Premaxillary Defect. *Ann Plast Reconstr Surg.* 2021; 5(3): 1082.

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excision and reconstruction with a sliding and splitting quadrangular flap to rebuild the deficit of the upper lip, palate and premaxilla simultaneously.

Case Presentation

An 80-year-old female patient came to our observation on 2012 complaining pain of the upper lip and premaxilla, since 4 months.

Her history indicated that patient was wearing a full denture due to a completed enthalia.

Clinical examination revealed a widespread ulceration of the upper lip and premaxilla, approximately 3.5 cm × 3 cm × 4 cm, involving lip, premaxilla, and nasal septum (Figure 1, 2).

Limits of the lesion were badly localized, and on palpation, lesion was consistent, painful and aching, with obvious bleeding.

CT scan with contrast agent confirmed the involvement of premaxilla, nasal floor, upper gingival fornix and upper lip.

An incisional biopsy performed in upper gingival fornix, showing G1 squamous cell carcinoma was also performed.

Our surgical protocol has been planned, to perform an accurate resection and a contextual reconstruction with new quadrangular rotational flap to replace surgical defect of the lip and the palate in the same surgical timing.

Patient underwent to general anesthesia, and infiltrated with carbo anesthetic with 1:100000 adrenaline for appropriate vasoconstriction.

A cutaneous perpendicular incision was performed, from lip



Figure 1: Lesion of the upper lip and premaxilla, approximately 3.5 cm × 3 cm × 4 cm.

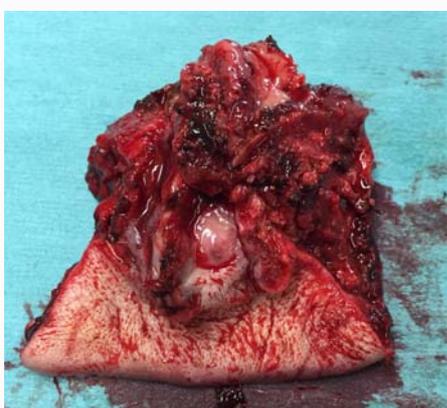


Figure 2: Lesion of the upper lip and premaxilla, approximately 3.5 cm × 3 cm × 4 cm.

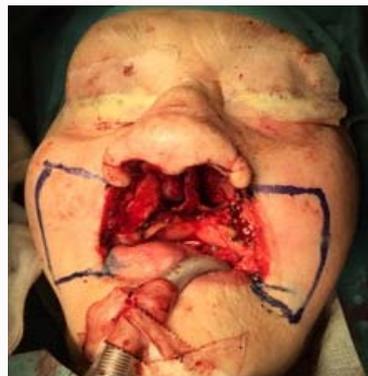


Figure 3: Surgical marking for sliding flap.



Figure 4: Splitted quadrangular flap.

commissure up to the height of the nasal wing bilaterally, continued medially, extended inside the nasal mucosa.

A central half-size columellar incision is then performed, posteriorly extended along mucous membrane of the septum, including mucous, cartilage, and reaching up to the vomerine portion.

These total thickness incisions were made in the anteroposterior direction, perpendicular to cutaneous incisions (Figure 3).

It was then performed a piezosurgery osteotomy, keeping safe palatine arteries, consisting in the incisor region removal extended to canine, with a portion of the upper lip and premaxilla.

Margins were sent to extemporaneous examination, resulting negative for neoplastic infiltration.

In a single step, reconstructive phase consists in two full thickness genial quadrangular flaps, next to the limits of the lateral removal (Figure 3).

Height of the flap will be the at least 2 cm longer than hemi-upper lip, in order to preserve vascular pedicle, and allowing flap rotation.

Width of the flap has to be greater than height of the lip, exceeding in order to overcome the physiologically flap contracture.

A full-thickness incision is made including also the muscular plane, with careful attention to preserve the vascular pedicle based on the facial artery.

Then, these two flaps are split in order to obtain a superficial layer



Figure 5: Splitted quadrangular flap.



Figure 6: Wound closure at the end of procedure.



Figure 7: 3 month postoperative result.

composed of skin and dermis, including vascular pedicle, and a lower muscular layer (Figure 4, 5).

Myo-mucous portion is rotated and sutured with 3/0 Vicryl to the counter-lateral flap to rebuild the palatal wall.

Upper dermal portion is then rotated medially for the reconstruction of the upper lip, suturing to the counter lateral with 3/0 Vicryl in the deep layer, and with 3/0 Nylon for the cutaneous portion (Figure 6).

Finally, gross was sent to EID, which confirmed the presence of squamous cell carcinoma, with no sign of perineural, perivascular, or lymphatic invasion.

Based on the clinical, radiographic and histopathological examination, tumor was classified T2N0M0 (Stage II).

Oral competence and the aesthetic-functional result was good at distance (Figure 7, 8).

Patient is in November 2019 free from disease.

Discussion

Oral Squamous Cell Carcinoma (SCC) represents 90% to 95% of all malignant neoplasms of the oral cavity, it occurs in several well-



Figure 8: 3 month postoperative result.

established intraoral sites, including floor of mouth, tongue (most common), gingiva, lips, and buccal mucosa. It might also present either in the maxilla or the mandible, with bone involvement [7].

Risk factors are associated with genetics, alcohol consumption, cigarette smoking, and HPV infection [8].

One of the most used was flap described by Webster: a crescentic perialar cheek excision for upper lip flap advancement [9]. This flap represents a modification of Burow flap, originally described in 1855, based on the excision of 4 triangles from the cheek, two above and two below the incision [10].

In 1974 Karapandzic and in 1990 Gillies modified the original incision, using locoregional advancement flaps to provide sensory and motor innervations [11].

In case of a filter deficiency up than 1 cm, Abbe flap is recommended, which restores upper lip aesthetically and functionally [12], then modified by Kreit in 1995, with an extended flap to repair defects of the upper lip [13].

In 2006 Spinelli et al. [14] used the crescent advancement flap for the correction of 19 cases of upper lip cancer, with satisfactory functional aesthetic results. In all patients, there was no recurrence.

In case of lip, superior gingival fornix and premaxilla involvement, radical resection of these areas becomes mandatory.

Other kinds of flaps that are instead used for the reconstruction of the posterior maxilla (temporal, dorsal, pectoral, or sternocleidomastoids) are unsuitable in the premaxilla, due to its advanced position.

Therefore, in association with the reconstruction of the upper lip, reconstruction of premaxilla is usually managed with obturators, with discomfort of the patient and a greater effort to keep it in the proper hygienic conditions [15].

A valid reconstructive option was described by Torroni et al. [16], managing it with an osteomyocutaneous free flap, able to provide bone support and prosthetic implant rehabilitation.

About the reconstruction of the upper lip, width of the removed tissue is fundamental, and leads the reconstructive technique. In case of deficit less than 1 cm, it is possible to perform a resection and a closure with local flaps, with particular attention to avoid a vertical elongation of the lip. In case of a filter deficiency up than 1 cm, Abbè flap is recommended, which restores upper lip aesthetically and functionally [13].

Among all of them, Karapandzic [11] flap, for the first time described in 1974, with the advantage of respecting the orbicular

muscle and motor nerves of the lips, is used. This technique can be used both for the upper lip and for the lower lip.

According to Malard et al. [17] this type of flap can be used more correctly for defects of at least two thirds of the volume of the upper lip.

Unfortunately, in our cases, the reconstructive aim concerned central portion of the upper lip, fornix and premaxilla up to the anterior portion of the palate.

The aforementioned flaps were therefore not suitable for the complete reconstruction of the surgical deficiency.

Other reconstructive possibilities were represented by microvascular flaps with osteomyocutaneous component, giving the possibility to perform a correct bone reconstruction of the premaxilla for a fixed prosthetic rehabilitation [18], although elderly patients with comorbidity have higher chance of intraoperative and postoperative complications, with major risk of free flap failure [19].

For combined defects involving premaxilla and upper lip, no single-stage procedure able to reconstruct surgical defect has been documented, except for George et al. [20], which, with a modified crescent flap, rebuilds palate with cutaneous portion, resulting good functional and aesthetic outcome.

Our new technique, through a single stage surgical procedure, sets up a rotating and splitting flap to obtain both to reconstruct palatal wall between the nasal pits and the oral cavity, achieving total reconstruction of the upper lip including gingival fornix, which in these cases can be maintained in the following days by the application of prosthesis with modeled prosthetic flange to avoid the collapse of the newly reconstructed fornix. That was possible with the flange constantly lowered and re-modeled with soft resin.

No evidence of microstomy or oronasal fistula was evident, as sometimes happens with the use of crescent perialar flap [21,22].

Conclusion

Reconstruction of the premaxilla still represents a challenge for the maxillofacial surgeon. Contextual reconstruction of lip, palate and premaxilla in a single stage procedure is not yet fully described in international literature.

Revascularized free flap reconstruction may not always be indicated in elderly patients with comorbidity, due to the major intraoperative and postoperative difficulties.

Our new technique is a good solution in case of involvement of lip and premaxilla in elderly patients and with comorbidity, ensuring palate reconstruction with muscle portion of the flap, and lip with the cutaneous one.

It is not in fact essential, for proper implant rehabilitation, bone support in the premaxillary area, allowing a prosthetic rehabilitation both in patients with the presence of distal dental elements at the resection, and in edentulous patients; in the latter case, with implant in the posterior and/or zygomatic sectors.

We consider this technique an excellent solution in patients with comorbidities affected by malignant neoplasms involving the premaxilla and lip nose region.

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