Reconstruction of the lip commissure with upper and lower lip full-thickness defects using submental and nasolabial flaps: a case report

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Abstract

Introduction
Lip carcinoma is considered the most common oral cavity malignancy, representing about 30% of all oral cavity malignancies. The treatment of lip carcinomas is mainly by surgical removal, and less frequently by radiotherapy or a combination of these two methods. Surgical excision of larger lesions of the lips and/or oral cavity usually creates a two dimensional or three dimensional defects. The reconstruction of such defects is technically challenging. Local flaps are often not sufficient and also regional flaps have the disadvantages of being too bulky, have a limited reach and may require a second session for refashioning and division of the pedicle. The only satisfactory method of reconstruction of such extensive defects is the use of free vascular flaps. In this case, we describe the results of reconstructing a commissure defect extending to adjoining parts of both lips and inner buccal mucosa using extended superiorly based nasolabial flap and submental flap.

Case report
A 49-year-old male patient presented in June 2011, with a large ulcerating painful mass involving the right lip commissure and right half of the upper lip and right one-third of the lower lip extending inwards involving the underlying part of the inner buccal mucosa, preoperative wedge biopsy revealed an invasive grade II squamous cell carcinoma. The lesion was surgically removed followed by a supraomohyoid neck dissection. This was followed by the neck dissection. Reconstruction of the resultant large full-thickness defect was done using two pedicled flaps, namely the nasolabial and submental island flaps. The histological examination of the specimen (paraffin sections) confirmed the initial biopsy, which had revealed invasive grade II squamous cell carcinoma. The excision margins were disease free as confirmed by the intraoperative frozen section examination, the right submandibular gland and all the right cervical lymph nodes dissected were free from tumour tissue except one submental lymph node.

Conclusion
The reconstruction of this extensive tissue defect with the use of combined nasolabial and submental island flap was secure, reliable and produced satisfactory aesthetic and functional results. In our study, we didn’t find much interference with neck dissection during harvest of the submental island flap. Moreover, it is a single stage procedure without the need for a second stage for flap division and without causing significant narrowing of the mouth and the need for further surgical intervention for rewidening it.

Introduction
Lips are special structures of the face and play an important role in food intake, communication, expression of feelings, moreover they are also an important part of an individual’s phenotypic traits.

The treatment of lip carcinomas is mainly by surgical removal, and less frequently by radiotherapy or a combination of these two methods.

Surgical excision of larger lesions of the lips and/or oral cavity usually creates two dimensional or three dimensional defects. The reconstruction of such defects is technically challenging and has a significant effect on the quality of life.

Local flaps such as Karapandzic flaps and Estandler flaps are often not sufficient and also regional flaps as pectorals major myocutaneous flap and deltopectoral flap have the disadvantages of being too bulky, have a limited reach and may require a second session for refashioning and division of the pedicle.

In recent years, the only satisfactory method of reconstruction of such extensive defects is the use of free vascular flaps such as radial forearm or anterolateral thigh flap, however, microvascular free flap techniques are technically complex.

In this case, we describe the results of reconstructing a commissure defect extending to adjoining parts of both lips and inner buccal mucosa using extended superiorly based nasolabial flap and submental flap.

Case report
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ulcerating painful mass involving the right lip commissure and right half of the upper lip and right one-third of the lower lip and extending inwards involving the underlying part of the inner buccal mucosa, preoperative wedge biopsy revealed an invasive grade II squamous cell carcinoma (Figure 1a and 1b).

There were clinically significant and radiologically (by ultrasound and computed tomography) suspicious right upper and middle cervical lymph nodes (LNs).

The lesion was surgically removed followed by a supraomohyoid neck dissection. The surgical planning and resection of the lesion was carried out with widely healthy margins (proved by intraoperative frozen section examination) and with the removal of soft tissues in full-thickness. The right lip commissure, right half of the upper lip, part of skin in the cheek along with underlying part of cheek musculature and inner buccal mucosa and right one-third of the lower lip were excised (Figure 2).

This was followed by the neck dissection (level I–IV) with extreme care to preserve the facial artery and its submental branch (the supplying vessel of the submental island flap) especially when dissecting level I cervical LNs (submental and submandibular LNs and submandibular gland). Dissection of the submandibular gland was done by safely ligating the submandibular branches of the facial artery to the gland preserving the whole facial artery along its course on the posterior aspect of the gland.

Reconstruction of the resultant large full-thickness defect was done using two pedicled flaps, namely the nasolabial and submental island flaps. A long superiorly based nasolabial flap was harvested extending down till the right lower mandibular margin (Figure 3) with the facial artery identified and with subsequent identification of the facial artery perforator that supplies the flap (Figure 4). The nasolabial flap was rotated medially for reconstruction of the upper lip and then folded upon itself to form the inner and outer aspects of the upper lip.

The submental island flap was harvested (Figure 5), based on the submental branch of the ipsilateral side and after completion of the neck dissection, starting from the contralateral side in the subplatysmal plane, incorporating the ipsilateral anterior belly of the digastric, as the submental artery courses beneath it in 70% of cases. The submental flap is then rotated upwards towards the remaining defect in the lower lip and cheek and its distal part was folded inwards to reconstruct the deficient part of the inner buccal

Figure 1a: Preoperative view showing the lesion.

Figure 2: The defect after tumour resection.

Figure 3: Extended superiorly based nasolabial flap.

Figure 4: Identification of facial artery perforator.

Figure 5: Submental island flap harvested.
mucosa. Interestingly, that the submental flap is not needed to be tunnelled with subsequent fear of compression on the pedicle and venous congestion of the flap, as the part of the lower check that is proposed to be undermined to create the tunnel was used to extend the length of the nasolabial flap paving out the way for the submental flap to be inset in the defect directly without tunnelling (Figure 6).

The histological examination of the specimen (paraffin sections) confirmed the initial biopsy, which had revealed invasive grade II squamous cell carcinoma. Its dimensions were 6 × 4 × 4 cm. The excision margins were disease free as confirmed by the intraoperative frozen section examination, the right submandibular gland and all the right cervical LNs dissected were free from tumour tissue except one submental LN.

**Discussion**

The surgical treatment of lip cancer varies from patient to patient, depending on the size, location and type of the lesion, the degree of cell differentiation, the presence or absence of infiltrated LNs and the patient’s general health condition. In the case presented above, the size and nature of the lesion indicated its full-thickness resection with wide clear margins, which resulted in an extensive soft tissue defect. So far, in most similar cases local flaps such as Karapandzic, Estandler, Abbe and Fan flaps or mobilisation of cervical flaps, have been used and are recommended to reconstruct the resulting defect, depending on its size. These local flaps are limited by significant microstomia and by limited oral access and the necessity of a second stage. Other local random flaps mobilised from the neck or nearby areas of the cheek are either unreliable or of limited versatility in terms of coverage of such extensive defects involving both lips and commissure.

In the last two decades, microvascular free flaps such as the radial forearm or the anterolateral thigh flaps have become the first choice and are still currently used with great success in reconstructing extensive perioral and intraoral defects. However, these reconstruction techniques have advantages and disadvantages, the main ones being increased difficulty, they need trained personnel, microsurgical setup and are usually associated with an increased operative time and a longer hospital stay as well as functional and aesthetic problems in extensive defects.

Radiotherapy is an alternative option for the treatment of malignant tumours in the head and neck area, while it is claimed that radiotherapy as a single treatment can have results comparable to those of surgical treatment, in small tumours mainly but also in larger ones. Definitive radiation therapy, concurrent chemoradiation and induction therapy are alternative options for patients who are not candidates for surgery. Surgery should be considered for locally advanced oral cavity cancer, including lip.

In this study, the flaps used for reconstruction of defects are axial flaps with secure blood supply unlike any proposed local random flap and harvested from nearby areas in head and neck so provide better colour and tissue texture match unlike any other regional or distant flap transfer.

The nasolabial flap is a cutaneous axial flap based on angular artery perforators if superiorly based or facial artery perforator if inferiorly based, the tissues that compose the nasolabial flap lies over the facial and angular artery, lateral to the nasolabial fold and extends from the mid cheek above ala down to the mandibular line. The nasolabial flap provides good colour and texture-matched tissue to the upper and lower lips and an excellent blood supply based on the facial arteries and a natural-appearing scar at the donor site reinforces this flap as a useful adjunct in lip reconstruction. Motor function is not quite as automatic as in the neurovascular Karapandzic flap, but donor tissue is more abundant.

The submental artery flap was first described by Martinet et al. in 1993. The earliest reported use of this flap for reconstruction in oral carcinoma was by Sterne and Hall in 1996. Since it was described, the flap has been extensively used for reconstruction of small to moderate size oral cavity soft tissue defects. However, its role in lip, commissure defects reconstruction has not been clearly described. In addition, controversy exists about its interference with neck dissection.

Moreover, in this study, the curative oncologic resection of such tumour helped to make the harvest of the flaps used (nasolabial and submental flaps) easier; that wide surgical resection of the tumour primary site helped good identification and preservation of the facial artery and the angular artery perforator that supplies the superiorly based nasolabial flap and it was possible in such a situation to harvest the nasolabial flap as pedicled perforator (propeller) flap if needed, also the required supraomohyoid neck dissection.

**Figure 6:** Final inset of the two flaps.
helped good identification and preservation of facial vessels and their submental branches.

In summary, the reconstruction of the extensive tissue defect in the present case with the use of combined nasolabial and submental island flap was secure, reliable and produced satisfactory aesthetic and functional results (Figures 7 and 8).

**Conclusion**

The treatment of a large squamous cell carcinoma of the lip commissure with both lip and cheek propagation has been presented in this study. The surgical removal of the lesion was extensive due to its size and nature, and was followed by neck dissection.

In the present case, the reconstruction of the extensive tissue defect produced satisfactory aesthetic and functional results. We didn’t find much interference with neck dissection during harvest of the submental island flap. Moreover, it is a single stage procedure without the need for a second stage for flap division and without causing significant narrowing of the mouth and the need for further surgical intervention for widening it.

**Consent**

Written informed consent was obtained from the patient for publication of this case report and accompanying images. All the procedures of this work were done following the approval of the ethical committee of Mansoura University.

**References**

Case Report

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