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Upper Lip Reconstructions in Acquired Defects Excluding Melanocytic Nevi and Vascular Tumors

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ABSTRACT

As one of the face's prominent features, the lips help to eat, drink, suck, speak, and kiss, and their functions show certain emotional expressions while communicating with people. Although the lips are without bone and very flexible, they have very close relationships with the upper jaw. Furthermore, the two lips together make the oral sphincter, and none of them has superiority over the other on behalf of the sphincteric functions.

A total of 36 cases of upper lip reconstruction were reviewed retrospectively. Melanocytic nevi and tumors in the vascular origin were excluded from the study. All cases were performed sequentially over 25 years by the author. Indications, techniques, postoperative care, complications, and patient characteristics were taken into consideration for each case.

Most of the defects resulted from malignant tumor excisions. The procedures used for the upper lip reconstruction included direct closure (n: 5), cheek bilobed flap (n: 4), perialar crescentic advancement flaps (n: 8), full-thickness skin grafting (n: 1), Estlander flap (n: 1), V-Y advancement flaps (n: 3), superiorly based nasolabial peninsular flap (n: 3), perforator-based island flap (n: 6), bilateral depressor anguli oris flaps (n: 1), and musculocutaneous flap combined with local skin flaps (n: 3). No hematomas, infections, or flap necrosis were reported. One patient died of myocardial infarction during early postoperative days.

Most of the defects located on the upper lip can be treated with certain type of perforator-based flaps or perialar crescentic advancement flaps. Since most of the tumors are small or medium sized, an adequate knowledge about these two flaps must be acquired.

Key words: upper lip defects, perforator-based flap, bilobed flap, moustache

INTRODUCTION

The upper lip position is affected by a number of factors, and the position of the maxilla and teeth are two important considerations. Although the upper lip does not contain any bone, it has a very close relationship with the upper jaw. Any deficits on the upper jaw will show itself with some problems on the upper lip. Two very well-known examples of this are protrusion of the upper lip with the premaxillary segment in the bilateral cleft lip and retrusion of the upper lip in class II malocclusion (Figures 1 and 2). For this reason, it is unreasonable to make some soft tissue surgery on the upper lip when there are some bony problems in the upper jaw. A very well-known motto "first the bone then the soft tissue surgery" is for nothing more than the upper lip and upper jaw relationships.

When the maxilla is devoid of any problems, surgical problems existing on the upper lip may be divided into two main categories: (1) injuries and its complications and (2) defects coming after the resections of benign or malignant tumors. In this study we excluded the melanocytic nevi and tumors in vascular origin.

The upper lip has many anatomical connections with the adjacent tissues; therefore, some of the upper lip problems may also have some effects on them. Some benign or malignant tumors may be located on both the nose and the upper lip or on both the cheek and the upper lip; more complicated surgical problems may exist on all of them together.

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FIGURE 1: Position of the upper lip strongly depends on the maxillary position. The picture shows its change only by LeFort-I osteotomy.

PATIENTS AND METHODS

From August of 1989 through November of 2014, 36 patients (21 female patients and 15 male patients) who had defects of the upper lip with or without coexisting defects of adjoining facial units were treated using direct closure (n: 5), cheek bilobed flap (n: 4), perialar crescentic advancement flaps (n: 8), full-thickness skin grafting (n: 1), Estlander flap (n:1), V-Y advancement flaps (n: 3), superiorly based nasolabial peninsular flap (n: 3), perforator-based island flap (n: 6), bilateral depressor anguli oris flaps (n: 1), and musculocutaneous flap combined with local skin flaps (n: 3). No hematomas, infections, or flap necrosis were reported. One patient with pectoralis major flap died of myocardial infarction during early postoperative days. Both general and local anesthetics were used. The main criteria for determining anesthetics were age and general conditions of the patients and types of defects (Tables 1, 2, and 3). The age of the patients ranged from 21 to 95 years. Defects had resulted from skin cancer extirpation (n: 31), benign tumors (n: 4), and metastatic tumors from kidneys (n: 1). No traumatic defect was observed in this series (Figures 1–29).

Perioperative antibiotics were used in all cases. In all flap cases, a Penrose drain was inserted for 1–2 days postoperatively. In the cases of the pectoralis major flap together with the bilobed flap, a suction drain was inserted. In primary closure and skin grafting cases, no drain was used.

FIGURE 2: Upper lip protrusion associated with cleft lip.

Table 1: Characteristics of the patients.

Case number	Nature of the pathology	Location of the pathology	Selected anesthesia	Age and gender	Type of the reconstruction	Comment on end result
1	Oral sphincter incompetence following surgery (SCC)	Right oral commisure	Local	80-M	Estlander flap	Good
2	BCC	Right infranasolabial	Local	62-M	Perforator-based island flap	Good
3	BCC	Right infranasolabial	Local	63-F	Superiorly based nasolabial peninsular flap	Good
4	BCC	Right infranasolabial	Local	60-F	Perforator-based island flap	Late result unkonown
5	BCC	Philtrum	Local	40-F	Vertically oriented excision and primary repair	Good
6	Adnexal tumor	Between the frenulum and tubercle	Local	47-F	Submucous resection and primary repair	Good
7	SCC	Philtrum	General	45-M	Unilateral Burrow resection and midline primary closure	Complicated with microstomia
8	BCC	Whole right upper lip	General	63-F	Perforator-based large nasolabial island flap	Hemifacial edema during early postoperative period
9	BCC	Left upper lip	General	70-F	Bilobed Skin Flap	Excellent
10	BCC	Right upper lip	Local	65-M	Bilobed Skin Flap	Excellent
11	Neurogenic tumor	Left upper lip	Local	23-F	Vertically oriented excision and primary repair	Good
12	BCC	Columella and philtrum	General	57-M	Upper lip rotation flap including back-cut (lazy V-Y design)	Columellar loss
13	BCC	Right vermiliocutaneous border	Local	65-F	Crescent flap	Excellent
14	BCC	Left upper lip	Local	55-M	Crescent flap	Good with alopecia
15	BCC	Right upper lip	Local	55-F	Crescent flap	Good
16	BCC	Left philtral	Local	40-F	Primary repair	Good
17	BCC	Right upper lip	Local	38-F	Primary repair	Good
18	BCC	Right philtral	Local	40-F	Primary repair	Good
19	BCC	Right nasolabial sulcus and upper lip	Local	75-M	Nasolabial V-Y advancement flap	Excellent
20	Metastatic renal carcinoma	philtral	Local	35-M	Primary repair	Good
21	BCC	Columella and upper lip	General	78-M	FTSG	Alopecia on beard and depressive scar
22	BCC	philtral	Local	70-F	Primary repair	Good
23	BCC	Left upper lip	Local	67-F	Primary repair	Good
24	BCC	Left upper lip	Local	47-F	Crescent flap	Excellent
25	BCC	Right upper lip	Local	80-F	Crescent flap	Excellent
26	BCC (already operated)	Left upper lip and commisure defect	General	73-F	Pectoralis major musculocutaneous flap + bilobed flap	Good
27	BCC	Right upper lip	Local	45-M	Perforator-based island skin flap	Good
28	BCC	Right upper lip including vermilion	Local	95-F	Crescentic flap	Excellent
29	SCC	Left commisure	Did not accept surgery	84-M	Nothing done	Sphincteric insufficiency
30	SCC	Left mucosal	General	55-M	DAOF-NLF	Sphincteric insufficiency
31	BCC	Left upper lip	Local	51-M	Crescentic flap	Good
32	BCC	Left upper lip	Local	78-M	Crescentic flap	Good
33	Neurogenic tumor	Right upper lip	Local	55-F	Excision and primary repair	Good
34	BCC	Left upper lip, commisure and left lower lip	General	65-M	Full thickness bilobed flap of the cheek	Sphincteric insufficiency
35	SCC	Whole upper lip	General	53-F	Bilateral DAOF	Sphincteric insufficiency
36	Angiolymphoid hyperplasia	Right upper lip and alar base		44-F	V-Y adavancement nasolabial flap	Good

Table 2: Reconstructive methods used in this series.

Technique used	***Number***
Bilobed flap	4
Perforator based flap	6
Superiorly based nasolabial flap	3
Skin grafting	1
Primary closure	5
Estlander flap	1
Burow's triangle resection	1
Crescentic flap	8
V-Y advancement flap	3
Bilateral depressor anguli oris flaps	1
Pectoralis major flap for lining (bilobed flaps done together with it in 2 cases)	3
TOTAL	35

Table 3: Etiological characteristics of the cases.

Etiological features of the patients	Number
Malignant tumor excision	26
Animal bite	1
Metastatic tumor	2
Benign tumors	4
TOTAL	33

DISCUSSION

The entire upper lip is not a uniform body part. It includes some smaller parts that can be called as subunits such as philtrum, philtral columns, vermilion, vermiliocutaneous border, median lip tubercle, and cubid bow. Each subunit may be understated or exaggerated, but its general shape is constant from lip to lip (1).

Two lip surfaces can be differentiated: the skin and the mucosa. Between the two surfaces, there are very small subcutaneous tissues and a thin muscular layer: mostly musculus orbicularis oris, which is connected with many facial expression muscles (1).

The lips are very sensitive when compared to other areas of the skin on the body, and this may be attributable to the fact that the brain cortex devotes a very large part of its surface area to lips like fingertips. Sensation in the upper lip is courtesy of the infraorbital nerve and branches of the trigeminal nerve (1). The blood supply for the lips comes from the superior and inferior labial branches of the facial artery (2).

Defects, deformities, wounds, or their combinations may exist on the upper lip (3). Wounds may be caused by human and animal bites or because of falling down. Deformities may exist with the cleft lip surgery. Defects generally result from tumor resections. Surgical problems existing on the upper lip are so common

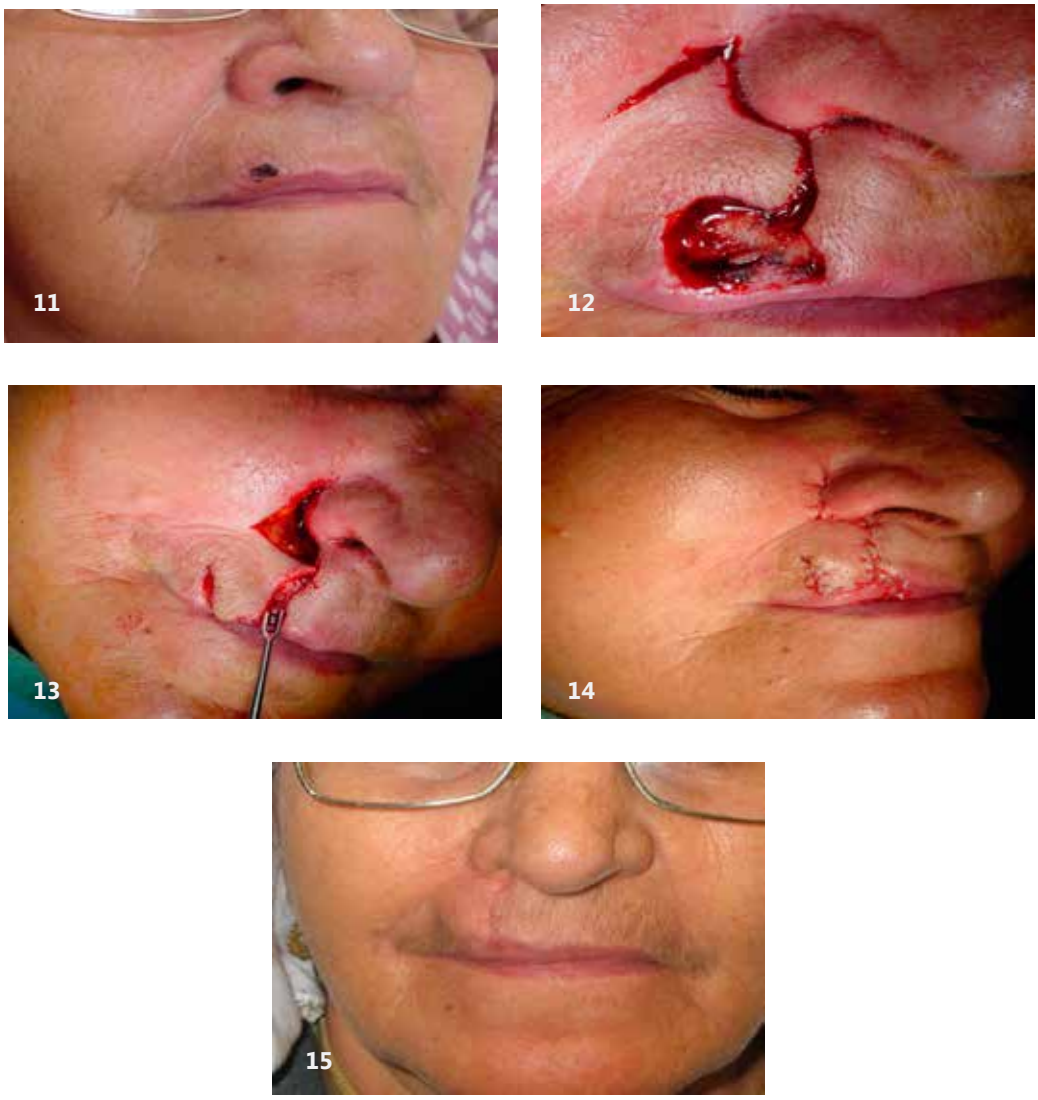
Figures 3, 4 and 5: A case of BCC and superiorly based nasolabial flap planning for defect reconstruction. Early and late postoperative results.

FIGURES 6, 7, 8, 9 AND 10: A noduloulcerative case of BCC disturbing the moustache area: the appearance of exact tumor localization after moustache shaving. The defect following tumor excision was closetd with a perforator-based island flap transposition

everywhere in the world (4) that one may even find out articles indexed but labeled as written by undetermined language (9); yet it is limited when compared with the lower lips (5). Skin cancers are common on the lips, and it is also well known that upper lip tumors are predominantly basal cell carcinomas (BCCs), and patients with BCCs are predominantly female (6).

The use of nasolabial flaps as traditional transposition flaps for repair of defects of the nose and cheek is well known, yet its use for upper lip defects is not well documented. Although it has been advised to use either inferiorly based or superiorly based nasolabial flap for upper lip defects, it is better to use the superiorly based one in my opinion. Contrary to my opinion, there is a case report including an inferiorly based nasolabial flap for reconstructing upper lip BCC defect in a 74-year-old female patient (8).

Since the nasolabial flap area does not contain hairy skin, it will give better results especially on the upper lips of women. Change of hair direction may be a problem with nasolabial and cheek flaps. Change of facial hair location can especially occur in male patients. There are both hairy and hairless areas around mouth of the men, and it causes certain difficulties in reconstruction. Sometimes a hairless part of a flap is transferred to a hairy area; sometimes a hairy part of a flap is transferred to a hairless area (Figure 10).



Figures 11, 12, 13, 14, and 15: Another BCC case very close to vermilion. Following excision, the defect was closed with a crescentic flap.

By dividing the upper lip into 3 aesthetic subunits, a total of 59 patients were treated with a flap from the lower lip including musculomucosal pedicle. In their article the authors have described defects as medial subunit, lateral subunit, and cross-subunit (7). Among the subunits, the lateral and medial subunits have a potential to be connected with the cheek or nose. Cross-subunit defects will not include any adjacent tissue unless it would be a huge defect including nearly all upper lip.

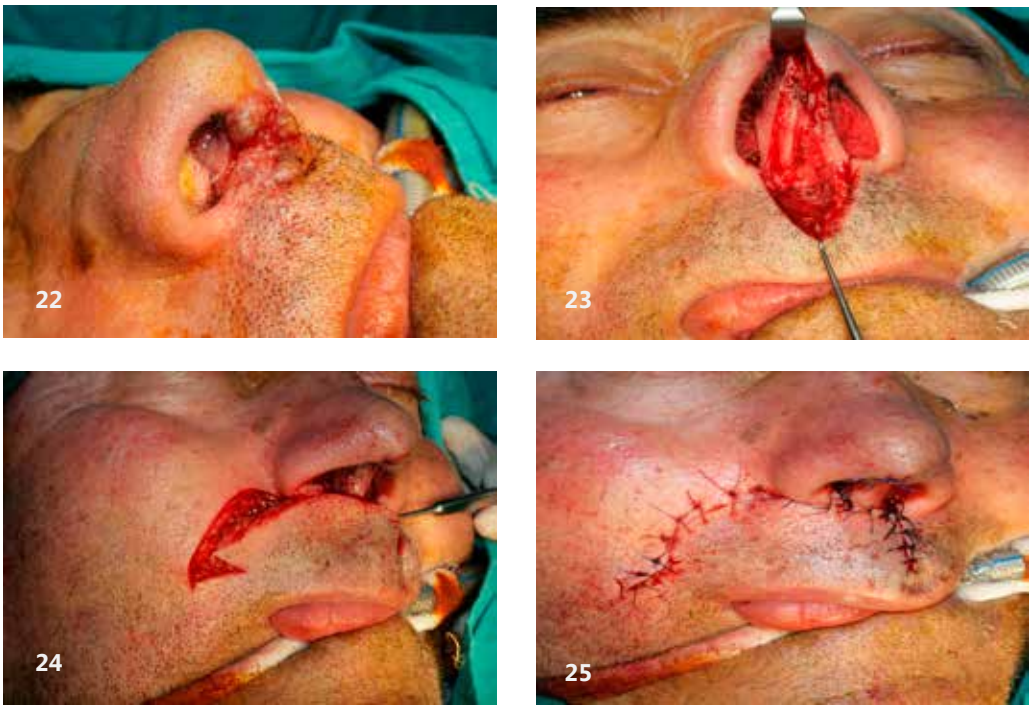
Surgical techniques used to correct the upper lip must be tailored with respect to the thickness of the defect and the vermilion involved. The defect thickness may consist of two different types: (1) full thickness defects and (2) split thickness defects. Full thickness defects including less than one-third of the upper lip can be repaired by suture in layers without any tissue transfers. However, to close a split thickness defect for less than one-third of the upper lip skin would be difficult to repair by direct suturing without any distortions. Any amount of horizontal excision of skin lesions near the free borders of the lips may cause distortion by eversion. To solve such a problem, it may be helpful to remove the lesion vertically, but even this may cause some gross deformities on the skin vermilion junction. Skin grafts cannot be used to correct full thickness defects and should be avoided in small- and medium-sized partial thickness defects.

Figures 16, 17, 18, 19, 20 and 21: Already operated on commissural squamous-cell carcinoma (SCC) case with positive tumoral margins showing the incompetence of the oral sphincter. Following re-resection of the already operated area, an Estlander flap was elevated and transferred. Postoperative result with shaving of beard and moustache.

If less than a third of the upper lip is lost, direct closure in three layers can be done without significant functional or aesthetic consequences. For this reason, a partial thickness loss of less than a third of the width of the lip can be converted into a full thickness defect and then can be repaired again with direct closure.

When it comes to the defects including vermilion, reconstruction becomes more intricate because the vermilion is not like the skin on the outside, and also is not like the mucosa on the inner side. The best way of vermilion reconstruction should be its replacement with another vermilion, but it is limited. Replacing it with either the inner-side mucosa or the outer-side skin is easier but unnatural. Advancement, rotation, or transposition of flaps from adjacent tissues other than vermilion will preserve their nature as skin or mucosa, and these will be visible clearly at the recontruction site.

The upper lip tissue itself can also be used in reconstructing small defects in the upper lip (10). In our series, there was only one case in which an inferiorly based V-Y advancement flap was used to close a midline defect on the upper lip including a columellar defect at the same time. The columellar defect was closed with a septal mucochondrial flap by expecting morbidity in columella (Figures 23 and 25). A philtral reconstruction with a unilateral



FIGURES 22, 23, 24, AND 25: BCC located on philtrum and columella was resected with 5 mm healthy margins. Mobilization of a horizontal V-Y flap from the right upper lip together with the septal mucochondrial flap to cover the caudal septum.

superiorly based nasolabial island flap has been reported in the literature (16).

As the upper and lower lips are joined laterally at the commissures, some defects in the corner of the mouth opening may involve both the lips. If the angle of the mouth is lost and both upper and lower lips are involved, the best way for repair is to use an Estlander flap. As an improper technique, primary closure had been used in one case and the patient consulted us complaining drooling from the right side of his mouth. Following re-resection of the corner, we elevated an Estlander flap and reconstructed without any insufficiency of sphincteric functions. Contrary to the Abbe flap, no pedicle division was necessary after the operation, and no secondary procedure was needed (Figures 16–21). Again, in only one case, we used Burow's triangles excision unilaterally and performed a primary closure in the midline.

With a complete or near-complete loss of the upper lip, a distant flap may be the only solution. One-stage reconstruction of the upper lip using a free radial forearm flap including the vascularized and innervated brachioradialis muscle has been presented claiming excellent functional and cosmetic results (13).

In this series, there was no case reconstructed with microvascular tissue transfer. However, in certain cases, we used regional flaps, such as pectoralis major musculocutaneous flap, to repair the inner side of the lip and cheek. To close the outer surface, the bilobed flap was used (Figures 26–27). The bilobed flap has been frequently used in facial defects (12). It can also be used in the upper lip reconstruction; however, it is not necessarily used for reconstructing small defects.

It has already been written 30 years ago that there was little that can be defined as original after that time and in fact, most of the so-called new methods for labial reconstruction were a modification of old ideas (11). Therefore, I have nothing in this study to claim as new, but since I have gained some experience, I would like to share my results. As conclusion, small-and medium-sized upper lip defects can be closed properly with local flaps such as perforator-based flap, crescentic flap, nasolabial flap, and bilobed flap. To reconstruct more complicated defects, the pectoralis major musculocutaneous flap should be added to one of these. Full-thickness skin grafting may give an easy solution to close the defect, but the end result may not be as good as the result obtained with local flaps (Figures 30–32).

FIGURES 26, 27, 28, AND 29: A left upper lip full-thickness defect. The inner surface was reconstructed with a pectoralis major flap and the outer surface was covered with a bilobed skin flap including depressor anguli oris muscle.

FIGURES 30, 31 AND 32: Full-thickness skin grafting may give an easy solution to close any upper lip defects including columella, but the end result may not be as good as the result obtained with local flaps.

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