

RECONSTRUCTION OF LIP DEFECTS-a narrative review

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ABSTRACT

The reconstruction of the lower lip defects which may result from malignancy, trauma, and burn is necessary for mastication, oral competence, salivary retain, articulation, and aesthetic appearance of the face. While small (30% of the lower lip) and medium (30%–80% of the lower lip) size defects are reconstructed using primary repair and local flaps, reconstruction of the large defects including total and near-total of the lower lip is very challenging entity.

Keywords: lip, anatomical landmarks, fan flap; oral sphincter, etc.

INTRODUCTION.

Within the lower face, the lips constitute an essential and anatomically separate part of the face. Even very modest flaws might result in noticeable abnormalities if they are located in areas of the face that are prominent and that are situated inside the face's observational center [1–3].

When it comes to face aesthetics, for the idea of modern beauty, and the communication of feelings, the role that the lips play is essential. Because of the lips' function as an oral sphincter, they play an important part in the process of articulation as well as in the process of deglutition [4,5].

Therefore, reconstructing the lip may be a particularly difficult task for a facial reconstructive surgeon who is trying to bring

back both its form and its function [1,2].

LITERATURE REVIEW.

◆anatomy

The beginning stages of embryonic development are responsible for the formation of face features. The first pharyngeal arch gives rise to the mandible and the maxilla, both of which are parts of the jaw. The upper lip develops as a result of the merger of many embryologic elements, including the maxillary, the medial nasal prominence, and the intermaxillary segment. A similar process occurs during the development of the oral commissure, in which lateral embryologic components of the maxillary and mandibular processes fuse together to form the oral commissure [5,6].

It is the mandibular process that

gives rise to the lower lip as well as the jaw. The lip reaches from the subnasal region all the way to the mental crease, and it extends from one commissure to the contralateral commissure. The cutaneous lip and the vermillion are divided by a border of tissue that is known as the "white roll," and it is located on the pale side of the mouth. The "red line" delineates the boundary between the "dry vermillion" and the intraoral labial mucosa, also known as the "wet lip" [7,8].

Because it is devoid of adnexal structures, the vermillion is made up of keratinized stratified squamous epithelium that lies above a highly vascular plexus. This is what gives the lips their characteristic rosy red color [9]. The upper lip has a general shape that resembles an M, and the lowest extremity of the philtral columns are formed by the two apices of the top lip [10].

Cupid's bow is a term that refers to both the apices of the top lip as well as the center depression that sits in between them.

The tubercle is the name given to the protrusion that may be found in the exact middle of the upper lip. The philtral columns are extended superiorly to the columella, and they are separated from one another by the philtral grooves [11,12].

The aesthetic value of the upper lip may be broken down into three subunits: the central philtrum, the paired lateral units that stretch from the philtral columns to the melolabial folds, and the philtral columns themselves. It is essential to take into consideration the fact that relaxed tension lines have a radial orientation around the mouth [12-14].

These exquisite topographical characteristics present a difficulty to the surgeon when it comes to reconstructive work.

In comparison, the lower lip has surface architecture that is, for the most part, less complex. The mental crease is what defines the boundary between the lip and the chin in a human face. This correlates intraorally to the aspect of the gingival sulcus that is located at its deepest point.

Lip elevation, depression, and sphincteric action are all controlled by the

complicated musculature that lies beneath the skin of the lip. There are several pairs of muscles that work together to perform these functions [15,16].

The modiolus is a fibrous band that is located in the deep layer of soft tissue near the corner of the mouth. It is responsible for serving as both the insertion point and the origin point for the perioral muscles. The orbicularis oris muscle is the principal sphincteric muscle of the oral aperture. It is responsible for the majority of the lip's tissue and makes up the bulk of the lip.

Importantly, the orbicularis oris muscle has a resting tone, which may cause defects to look bigger due to the lateral force vectors pressing on wound margins. This can be a result of the draw that the muscle exerts on the wound edges [17].

When making plans for the repair, this aspect needs to be taken into account. In addition, the orbicularis needs to be reapproximated accurately in order to successfully reestablish the muscle activities described before.

The facial artery, which splits off into the superior and inferior labial branches, is the source of the blood supply for both the upper and lower lips. These arteries may be found at the level of the vermillion-cutaneous boundary, which is situated between the orbicularis oris muscle and the mucosal surface of the intraoral cavity [18].

◆reconstructive goals

When a full-thickness defect of the lower lip is caused by tumor resection or trauma, the goals for reconstruction (in order of priority) are to prevent drooling, allow a water-tight seal of the mouth to prevent flood or liquid expulsion during chewing, allow oral access for dentures, eating utensils, dental work, and airway access, preserve or recreate symmetric appearance at rest, preserve or recreate lip sensation, provide accurate articulation for speech, and permit pursing of the lips for sucking and whistling [19,20].

◆techniques

The Sanskrit literature of Sushruta

contain descriptions of lip repair that extend all the way back to the year 3000 BC. On the other hand, the majority of the procedures that are used today are drawn from practices that were established in the early 19th century [3,4].

The horizontal extent of the lip deficiency serves as the primary focal point of the paradigm for lip repair. In accordance with their severity, flaws are ranked as either

The cross-lip flap was initially reported by Sabattini in the year 1837. It required transferring a triangular full-thickness piece of the lower lip to the upper lip in order to rebuild a defect in the top lip [8].

A number of other adaptations of his method quickly followed, the most of them were made by Abbé and Estlander. 6 Abbé created the flap in 1898 to be roughly one-half the breadth of the defect and based it on the labial artery of the opposite lip. The flap was intended to be narrower in proportion to the width of the defect [3,4].

After the repair is complete, the top and lower lips will have the same width thanks to this method. Although the first technique outlined repair of the top lip, because to the higher incidence of malignancy, it is more common to require to rebuild a defect of the lower lip [18].

This is because the upper lip is less likely to be affected by cancer. As was previously stated, this interpolated flap derives its pedicle from the labial artery that runs along the opposite lip [4-6].

Small venous veins that run parallel to the arterial pedicle are responsible for providing venous drainage. The triangular flap is then put inside the opposing lip defect after being rotated through 180 degrees about its pedicle. Following the completion of the procedure, the donor site is first closed, and roughly three weeks later, the pedicle is separated and the flap is repositioned [7,8].

► A small semicircular defect is the typical aftereffect of the straightforward removal of a tiny lip malignancy together with sufficient margins. The puckering of the tissue that comes with direct primary

minor, moderate, or major. Defects that are considered to be small include less than or equal to one-third of the breadth of either the upper or lower lip [11,17].

Defects that are considered medium, also known as intermediate, involve one-third to two-thirds of the lip. Defects that are deemed to be large are those that take up more than two-thirds of the horizontal lip.

closure of such a defect, while functionally restoring, is aesthetically undesirable. For this reason, extra normal tissue is typically removed to ease closure. In the same way that a circle skin defect in another location is extended into an ellipse for more appealing closure, a circular skin defect here is extended into an ellipse [16,18].

The term "V" refers to the most straightforward further excision of tissue located below a lip defect. Meticulous closure is necessary in order to get a successful outcome for the main closure of this defect. In order to restore the integrity of the orbicularis oris ring, the orbicularis oris muscle on both sides of the lesion needs to be securely sutured together.

Following the completion of the muscle suturing, the vermilion cutaneous borders on both sides are next meticulously corrected and then stitched. The precision of this stitch will decide whether the lip heals with a step-off or a lip notch, or whether it heals as a smooth curve. When the imperfection is located in the exact middle of the lip, the vermilion on both sides of the defect has a width that is an exact match [12].

When dealing with a bigger primary defect, particularly one that extends more inferiorly on the lip, a pure "V" shape might occasionally result in the removal of sufficient tissue to make primary closure impossible. In situations like these, a shield or pentagon-shaped cut can be made to reduce the amount of total tissue removed and make primary closure possible [21,22].

It's possible that lip flaws will have a rectangular outline. An appealing closure can be created using advancement flaps if

the excision can be planned or prolonged so that the base of the rectangle rests along the mental crease.

The vermilion can be reconstructed in one of two ways: either by advancing the mucosa of the lower lip forward to the vermilion cutaneous border, or (if it is more important to preserve a natural lip pout and fullness), by using a bipediced mucosal flap taken from the upper lip or the anterior tongue.

The Hagedorn rectangular flap is an additional method that may be used to prevent the central notching while doing primary excision and vermilionectomy. This method employs the development of a single rectangular flap at one side of the primary excision site [11,23].

This flap is turned ninety degrees and inserted into a notch that was created by an incision that was made almost vertically on the other side of a primary excision site.

. It is possible to utilize the flap to repair primary abnormalities affecting up to 40–45 percent of the lower lip.

► Defects that fall into the medium category affect between 30 and 75 percent of the lower lip. After removing this volume of tissue, anywhere from 85.5 percent to 63.5 percent of the original ring of the two lips will still be visible. The majority of these flaws are amenable to satisfactory repair by the rearrangement of existing lip tissue; there is no requirement for the use of cheek tissue that is not part of the lip, which is necessary for vermilion reconstruction [12,24].

► *The Abbé flap* is generally a triangular flap that is created from the opposite lip, pedicled on the labial artery, and is one-half to one-third the breadth of the initial lesion. This flap is used to repair defects in the lip.

The height of the harvested flap will be established according to the height of the defect. The contralateral opposite-lip labial artery serves as the basis for the vascular pedicle's foundation. Therefore, an Abbé flap is pedicled upon the right superior labial artery and is located on the lower left side of the lip. However, the flap design and the

side of the pedicle may both be implemented in a number of different ways.

A reconstruction using an Abbé flap is carried out in defects that are located medially to the oral commissure, whereas an Estlander flap is carried out in defects that include the oral commissure.

In order to provide a greater amount of blood flow to the proximal pedicle, the point of rotation should be located as near to the commissure as possible while demarcating the base of the flap[25,26].

After making incisions through the skin, the lip, and the mucosa, the connection to the lip is left laterally and pedicled on the matching labial artery. It is necessary to execute a careful dissection of the orbicularis oris muscle at the level of the vermilion border in order to maintain the vascular pedicle that is located deep inside the muscle.

The labial arteries are located at this level. Because of the contribution it makes to the venous vascular supply, approximately 5 millimeters of vermilion mucosa need to be retained if at all feasible.

After surgery, the patient will get instructions on how to prevent themselves from opening their mouth too wide. A diet consisting primarily of soft foods or liquids is recommended for the patient in order to reduce the amount of strain that is being put on the pedicle. After a sufficient amount of time has passed for vascularization, usually about three weeks, a surgery to split and inset the pedicle is carried out as part of the second step.

► *The stair-step flap* is a complex advancement flap. The lip deficiency is filled with tissue that has been moved medially from the side of the chin and the lip region.

When dealing with bigger deformities (those measuring more than 2 centimeters) or when seeking the greatest degree of symmetry, bilateral flaps are the method of choice.

The defect is squared off, and depending on whether a unilateral or bilateral flap is going to be employed, a line is stretched from the defect's inferior border

horizontally in either one or both directions.

This one-stage procedure has the highest rate of success when applied to abnormalities affecting between 30 and 50 % of the A lower lip. By advancing the flap or flaps, the ring of the orbicularis oris may be reconstituted, which ensures that acceptable functional outcomes will be achieved. The blood and nerve supply to the flap (or flaps) is not interrupted, which contributes to excellent healing and early function after the procedure.

The linear progression of the scar from the vermilion cutaneous boundary are where the incisions in the skin are made. These incisions go parallel to the outside border of the orbicularis oris muscle. At first, the incisions are merely made through the surface layer of the skin and the subcutaneous tissue.

A blunt dissection is performed in order to discover the neurovascular pedicle, which is then meticulously conserved when it has been located. Following this, the muscle and mucosa around the pedicle are split as required for adequate flap mobility. After being rotated, pulled together, and closed in layers, the flap(s) are then removed [27].

Due to the fact that the Karapandzic flap does not add any new tissue to the mouth cavity, microstomia may become an issue. If this method is utilized to repair a defect that affects seventy-five percent of the lower lip, the closure will result in an oral circumference that is five eighths, which is about sixty-three percent of the

helps to eliminate the risk of major scar contracture issues. Because this flap does not require incisions to be made on the opposing lip, it is a great alternative for correcting problems in the lower lip. Additionally, it leaves the top lip, which is more cosmetically conspicuous, unharmed.

►The fan flap serves as the inspiration for the *Karapandzic flap*. It retains the same fundamental structure and pattern of movement as its predecessor, but it transports its own blood supply and brain supply with it. About 2.5 centimeters in circumference that was originally there.

►The *Gillies fan flap* is similar to the Estlander lip-switch flap in that it repositions tissue around the corner of the mouth to restore a lateral defect in the lower lip. This flap uses tissue from the upper lip and cheek. Because of the increased quantity of cheek tissue that is moved with the fan flap and because of the fan-shaped form of the flap, it is possible for the flap to close in one continuous line.

The genuine commissure has been turned medially, which has resulted in a rounded and unclear "corner" of the mouth. This detracts from the overall aesthetic appearance. When compared to other reconstructive methods, the cosmetic outcomes produced by these alternatives are far superior.

In most cases, primary closure of defects affecting up to one third of the lower lip can be accomplished by selecting one of the excision forms mentioned above. A stair-step or lip-switch flap can be used to fix defects in the lower lip that range from 30 to 50 percent of the lip's surface area. In the majority of cases, stair-step restoration achieves satisfactory function more rapidly than the lip switch flap and has a superior cosmetic appearance. This is because the steps are built one on top of the other

CONCLUSIONS

Lip reconstruction poses a difficult challenge for the facial surgeon. The lips are prominent aesthetic facial units and serve an important functional purpose as well. Reconstruction should be tailored to the location and size of the defect. Reconstructive efforts should also aim to optimize the sphincteric function of the lips for both deglutition and speech.

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