CASE REPORT

Karapandzic Flap in Reconstruction of Post-traumatic Lower Lip Defects: Report of Two Cases

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Abstract Reconstruction of lower lip is a challenge to the surgeon who seeks excellence in restoration of both aesthetics and functions. The defects may arise either due to trauma, developmental anomaly or post-excision of malignant conditions. The reconstruction of rectangular shaped full thickness defects of lip may be achieved with bilateral advancements of the remaining lip segments. We report two cases with post-traumatic full thickness avulsion of central two third of lower lip, reconstructed with Karapandzic flap.

Keywords Karapandzic flap · Lower lip reconstruction · Lip repair · Lip avulsion

Introduction

Lower lip being the most integral part of lower third of face has important role in functions and aesthetics. The reconstruction of large sized full thickness lower lip defect is a challenging task for surgeons. The goals of lip reconstruction include maintenance of oral competence, sufficient oral access, adequate tissue match in terms of colour and texture, proper symmetry as well as preservation of the apparent

commissure and preservation of sensation [1]. Various reconstruction techniques have been discussed in literature, but the advantages of Karapandzic flap are unique in its characteristics. This technique was first described in 1974 and it readily got popularized because it maximizes vascular supply and preserves optimal motor and sensory function to the reconstructed lip minimizing the need for re-innervation [2].

Case Report

Case 1

A 52 year old male patient reported to our emergency department with severe injury to his lower portion of face due to fall in the drain channel under the influence of alcohol. His general medical condition was stable. On clinical examination, the central two-third portion of lower lip was found missing (Fig. 1). The wound was bleeding from all around. Initial hemostatic measures were performed. Due to the large size of defect an elective procedure for lip repair with Karapandzic flap was planned. Under local anesthesia, the debridement of was wound done and a full thickness defect involving the middle two-thirds of the lower lip, measuring about 4×3 cm in size was seen. The reconstruction was done with bilateral flaps from adjacent tissue by an incision along the course of the mental crease as far as possible and was then carried around the oral commissure and into the nasolabial crease (Figs. 2, 3). The neurovascular structures were carefully dissected and preserved. The flaps were mobilized equidistantly and advanced towards each other (Fig. 4). The mucosa, orbicularis oris muscle and skin were sutured to each other in three layers (Fig. 5). The cosmetic and functional results were satisfactory as sutures

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Fig. 1 Pre-operative photograph of the patient with avulsed central two third of lower lip (Case-1)

Fig. 2 The planned circumoral incision along the mental and nasolabial crease was marked (Case-1)

followed the natural crease; the oral function was preserved as well as the sensibility and mobility of the lips. However, there was a slight microstomy, without any functional impact. He was discharged on the second postoperative day and advised to review after 1 week. He did not report back for further management and follow up.

Case 2

A 26 year old male patient reported to us with injury to the lower face due to a fall to the ground (Fig. 6). The patient was drowsy and irritable. On clinical examination, the

Fig. 3 Bilateral elevation of circumoral flaps with proper dissection of neurovascular structures (Case-1)

Fig. 4 The two circumoral flaps were mobilized equidistantly towards each other and approximated (Case-1)

central two third of lip was found missing. Initial measures were taken to stabilize the patient. There was sufficient gap between the two remaining portions of lip measuring about 4.5×3.5 cm. The defect was large enough, so we planned Karapandzic flap for its reconstruction. All biochemical investigations were within normal limits. His medical history was not suggestive of any systemic abnormality.

Under local anaesthesia with bilateral mental and infraorbital nerve blocks, wound debridement was done initially. Incision was placed over the bilateral mental crease and advanced along the nasolabial crease just above the level of angle of mouth. Proper dissection of orbicularis oris muscle was done and both the pedicled circumoral flaps were rotated and advanced to the middle portion.

Fig. 5 Meticulous closure done in three layers—mucosa, orbicularis oris muscle and skin (Case-1)

Fig. 6 Pre-operative photograph of patient with avulsed central two-third of lower lip (Case-2)

Primary closure was done in three layers i.e. mucosa, muscle and skin, separately. Satisfactory functional and cosmetic results were obtained. After 1 month, the patient was very much satisfied with the results but the microstomia and scar was noticeable (Fig. 7). As the patient was satisfied with the results, no further surgery was carried out to correct microstomia.

Discussion

Lips are the most prominent soft tissue structures adding to the aesthetics of the face. These are associated with various other functions such as articulation of sound and speech,

Fig. 7 One month postoperative photograph showing the reconstructed lip with visible circumoral scar and microstomia (Case-2)

opening for food intake and also have erogenous values. Lips are often viewed as a symbol of sensuality and sexuality. Since these are vulnerable to various insults such as trauma, malignancy and sometimes developmental anomalies like clefts, etc. It becomes a prime concern for reconstructive surgeons to maintain proper form and function of the same.

Early descriptions of lip reconstruction are reported in Sanskrit writings of Susruta from India in 1,000 BC. The first descriptions of the classic V-shaped excision of the lip and primary repair have been credited to Louis in 1768 [3]. In the early nineteenth century, various methods have been practiced in the development of lip repair, but the full thickness circumoral flaps in the form of Karapandzic flap was most ideal for reconstruction of large, centrally located full-thickness defects of the lower lip and, to a lesser degree, the upper lip [4].

Karapandzic's technique for large defects of the lower lip involves unilateral or bilateral full-thickness circumoral advancement-rotation flaps [2]. The key feature of this reconstruction technique is preserving the neural and vascular structures that are encountered in the plane of dissection, so that optimal oral competence and sensory functions are preserved. The main arterial supply is from the inferior labial artery, which is a branch of the facial artery. The artery lies just deep to the orbicularis oris muscle and can be found in cross-section approximately at the wet-dry line. It provides numerous perforators through the orbicularis muscle to the overlying skin. The venous drainage of the lips does not follow the arterial supply. A dense venous network coalesces in the area of the major arteries to form the larger veins. The sensory innervations of the lower lip is provided by the mental nerve which is a terminal branch of inferior alveolar nerve which is in turn a branch of mandibular division of the trigeminal nerve (V3)

[5]. The releasing incisions of this orbicularis oris musculocutaneous flap are placed around the periphery of the anatomic lip unit and should be masked within the labio-mental and melolabial creases. Separation of the subcutaneous tissue and muscle of the flaps from the adjacent facial tissues is performed bluntly in order to avoid cutting through any neural or vascular structures, unless necessary. Care is taken to reattach the various muscles of facial expression to the orbicularis muscle in anatomically appropriate orientation and location, although to a large extent this occurs naturally as the wound margins heal. Meticulous layered wound closure is warranted to obscure as much as possible the extensive incisions. Failure to this can result in a scar that has a “clown-like” appearance as it encircles the lips [4].

There is a certain tendency for blunting of the oral commissures, though this is not usually a major problem. Moreover microstomia may occur as the defect is reconstructed with remaining lip tissues. Secondary correction of the mouth opening, however, is seldom needed, since there is some ability to widen the mouth opening over time [6]. However, the oral aperture can be made larger over time with persistent stretching of the lips, using either repeated manual manipulation or insertion of an adjustable lip-stretching mouth appliance [4].

Among the other reconstruction techniques described for the lower lip, the primary closures most often are the “Y”, “W”, “M”, or Z plasties for defects affecting less than one-third of the lip. In addition, the Abbe, Estlander, Gillies Bernard-Burow flaps or combinations thereof can deal with more extensive defects [7, 8]. For larger defects, the Webster–Bernard operation has stood the test of time. It involves medial advancement of the cheek tissue to create a new lower lip. It can give good results, although it does result in significant facial scarring [5].

Total lower lip defects require reconstruction with some form of distant flap (such as flaps from the scalp and forehead, the submandibular, deltopectoral, and pectoralis

major flap) or with a microvascular free radial forearm flap [6, 9].

Conclusion

The reconstructive surgeon has many options, but a thorough evaluation and pre-operative treatment planning is mandatory in making the choice of correct technique. Karapandzic flap technique is very successful in getting “like” tissue for reconstruction and maintaining the original neuro-vascular integrity of the lip. So, this flap may be considered as “Work-Horse” in reconstructing central two-third defects of the lower lip.

Conflict of interest None.

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