

# Single-stage reconstruction of traumatic lower lip defects with chin island myocutaneous and labial mucosal flap

## ABSTRACT

In the present study of eight cases of traumatic lower lip defects, the reconstruction was achieved in a single stage by V-Y advancement island chin myocutaneous flap and labial mucosal advancement flap. There are many methods described for the reconstruction of small-to-large size of lower lip defects from straight-line closure of small defects to local flaps and free flaps for large defects. V-Y advanced chin flap has been reported previously also for the repair of lower lip defect with varying results. The vermilion reconstruction in others reported cases was done with the free mucosal grafts, V-Y labial mucosa advancement, or pedicled tongue flaps. Tongue flap is a two-stage procedure with esthetically unnatural look and an irregular surface of the vermilion. The free mucosa graft showed necrosis partial or complete resulting in irregular surface of vermilion and notching in the lip. V-Y labial mucosa advancement was done more for a small defect of the lip only. In the present series, we have repaired the vermilion of the lip by labial mucosal advancement flap, muscle by advancement of orbicularis oris from chin flap, and skin by V-Y advancement of island myocutaneous chin flap. Our results showed normal oral size with no evidence of microstoma or commissural distortion; oral competence was good with normal sphincteric function. The vermilion reconstructed had normal color and sensation. Lip seal was very good without notching defect in the vermilion. Drooling of saliva or speech defect was not noticed. The facial expressions and the look of the face were near normal. Hence, esthetically and functionally, the results were good without any irregularity or notching of the lip along with no incidence of drooling of saliva. We think that this technique may be considered as a procedure of choice for managing the moderate-to-large post traumatic defects of the lower lip. It is good esthetically and functionally besides being single stage for reconstructing moderate-to-large defects of the lower lip and is satisfying to the patient.

**Keywords:** Chin myocutaneous flap, labial mucosal flap, lip seal, moderate-to-large lower lip defect, normal oral opening, normal reconstructed vermilion in color and sensation, oral competence

## INTRODUCTION

Anatomically the lip consists of skin, subcutaneous tissue, muscle, submucosa, and mucosa from anterior to posterior side. The muscle in between the mucosa and skin is primarily orbicularis oris.<sup>[1-3]</sup> The vermilion of the lip is a mucosa which lies between white roll of the lip and intraoral moist mucosa<sup>[1,4]</sup> and the sling of orbicularis oris around the mouth forms the sphincter of the mouth. The orbicularis oris originates from the anterior surface of the maxilla and mandible and is inserted on the under surface of the skin and mucosa of both upper and lower lips and at the lateral corner of the mouth slightly above the angle with modiolus. At modiolus


besides orbicularis oris, other muscles of the face also meet, which are responsible for the movement of the mouth and facial expressions. They are the orbicularis oris, buccinator, levator anguli oris, depressor anguli oris, zygomaticus major,

### RAHUL SAHAI, SUDHIR SINGH<sup>1</sup>

Department of Plastic Surgery, SN Medical College, Agra,  
<sup>1</sup>Department of Plastic Surgery, Getwell Hospital, Varanasi, Uttar Pradesh, India

**Address for correspondence:** Dr. Sudhir Singh, Getwell Hospital, Varanasi, Uttar Pradesh, India.  
 E-mail: s.sulekha@gmail.com

**Received:** 24 July 2020, **Revised:** 31 July 2020, **Accepted:** 19 June 2021, **Published:** 20 August 2022

Access this article online	
<b>Website:</b> <a href="http://www.njms.in">www.njms.in</a>	<b>Quick Response Code</b> 
<b>DOI:</b> <a href="https://doi.org/10.4103/njms.NJMS_162_20">10.4103/njms.NJMS_162_20</a>	

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**For reprints contact:** WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Sahai R, Singh S. Single-stage reconstruction of traumatic lower lip defects with chin island myocutaneous and labial mucosal flap. *Natl J Maxillofac Surg* 2022;13:S113-20.

zygomaticus minor, and risorius muscles [Figures 1 and 2]. The function of orbicularis oris is to control the shape and movements of the lips. Blood supply of the orbicularis in lower lip is from facial artery through inferior labial artery and maxillary artery via mental branches. It is innervated by buccal branch of VII nerve.<sup>[2]</sup>

Functional and esthetic restoration is a challenge in the reconstruction of a traumatic loss of lip.<sup>[5,6]</sup> Most of the lip defects are repaired by local available lip tissue. Smaller vertical segmental losses can be repaired by advancement of remaining lip, but large defects and specially the vermilion defects need various local flaps for repair. After malignancy,<sup>[1,5]</sup> trauma<sup>[1]</sup> is the second most common cause of lower lip defects. It is more commonly seen in young adults due to human bite,<sup>[1]</sup> animal bite,<sup>[7]</sup> road side accidents,<sup>[8]</sup> burn injuries,<sup>[9]</sup> cancrum oris,<sup>[10]</sup> A-V malformations,<sup>[11]</sup> cracker blast injuries, burn injuries, and hemangiomas.

We present a retrospective study of eight patients of traumatic defects of lower lip treated by V-Y advancement of chin island myocutaneous and labial mucosa flaps done between 2008 and 2014. We have not included malignant lesions of the lower lip. The cases were of road side accidents, motor vehicle accidents, personal assaults injuries,<sup>[1]</sup> human bite,<sup>[1]</sup> and cracker blast injuries, without any other major facial injuries. In the present technique, we repaired the lower lip defect primarily in three steps: one by advancing mucosa from the labial side; two by advancing orbicularis oris from lower lip; and three by advancing skin in the form of V-Y advancement of island myocutaneous flap from lower lip and chin. In the present technique of lower lip reconstruction, the results were good both esthetically and functionally.

### SURGICAL TECHNIQUE

The patients were operated for the reconstruction of lower lip defects under general endotracheal anesthesia after all necessary required investigations [Figure 3]. The patient was laid in supine position with 15 degree neck extension. Local infiltration is done along the line of incision with 1:100000 dilution of injection epinephrine. Broad-spectrum antibiotics were given for 5 days after the operation, in which first 2 days parenterally and then after by oral route. Ryles tube feeding was given for 2 days after the operation and then after liquid oral diet for 7 days. Paracetamol was given for the symptomatic treatment for pain as and when required. External non absorbable stitches were removed on the 8<sup>th</sup> day and absorbable intraoral stitches were left as such. The photographic documentation was done pre- and postoperatively.

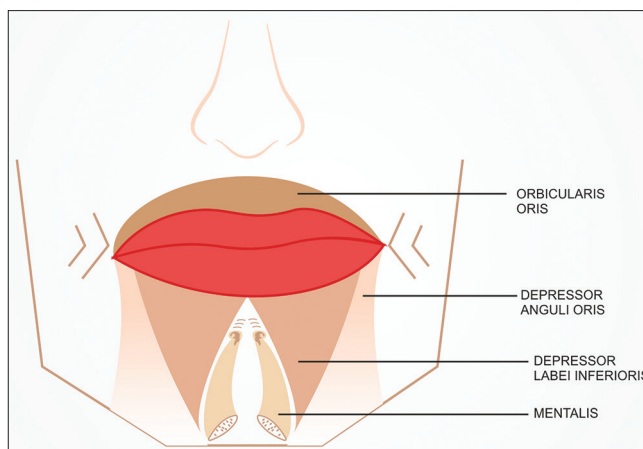


Figure 1: Anatomy of muscles around lip- front view

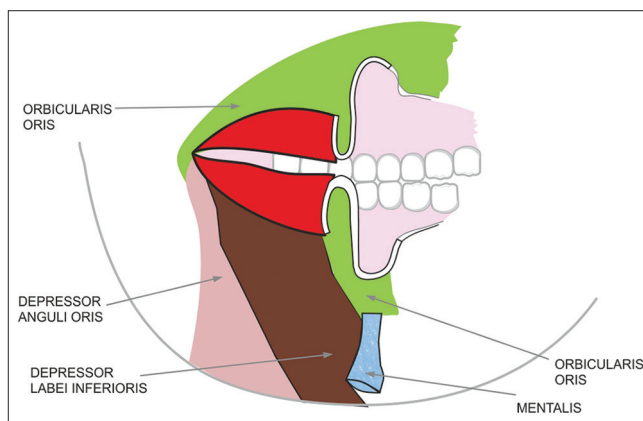


Figure 2: Cross sectional anatomy view of muscles around lip



Figure 3: Lip defect

In the presented method of the lower lip repair, we addressed the reconstruction under the following three heads [Figures 4 and 5]: (1) the labial mucosa/vermilion reconstruction, by advancement of lip mucosa from the oral side; (2) reconstruction of skin on outer side, by proximal advancement of island myocutaneous flap from chin; (3) reconstruction of orbicularis oris sling, by mobilization of

orbicularis oris from the advanced island myocutaneous flap.

### LABIAL MUCOSA

To raise the labial mucosa flap from the oral side of the lower lip, the orbicularis oris was dissected free from the mucosa by sharp dissection in submucosal plane with the help of scissors, from the wound margins above to labial sulcus below. To convert the mobilized mucosa into a rectangular flap, two vertical straight incisions were given on lateral and medial ends of defect above to labial sulcus below. A back cut in the lower end of the incisions further increased the upward advancement of the mucosal labial flap. This labial mucosal flap was later utilized to cover the reconstructed muscle sling of orbicularis oris and sutured with the skin of advanced chin island myocutaneous flap. The blood supply of mucosal flap was through its periosteal attachment in labial sulcus. Next, the blunt periosteal elevator is introduced, though the lip defect between the mucosal and muscular planes and orbicularis oris, depressor labii inferioris, depressor anguli oris, and mentalis is released from the anterior surface of mandible inferiorly up to lower border and laterally up to premolars on each side. This release of muscle from mandible helps in upward movement of chin myocutaneous flap.

### ORBICULARIS ORIS SLING

The orbicularis oris required in reconstruction of the lip defect was taken from the upper margin of advanced chin myocutaneous flap for this. About 5 mm to 10 mm wide strip of the skin was excised on the upper end of flap and the underlying muscle was made available for the lip defect. Further undermining the flap margin provides more availability of the muscle. The orbicularis oris is advanced proximally in the defect is sutured with orbicularis oris of the remaining uninvolved lips on lateral sides and thus the sphincteric muscular sling around the mouth is completed.

### CHIN MYOCUTANEOUS FLAP

In lower lip below the defect, two V-shaped skin deep incisions were placed in the labiomandibular groove from the lateral ends of defect above to the center of the mandible below. The underlying orbicularis oris, depressor labii inferioris, depressor anguli oris, mentalis, and platysma were freed from the under subcutaneous layer of skin along the margins of incision by the sharp dissection up to 0.5 cm to 1 cm on either sides of V incision. This provided the adequate movements of myocutaneous flap upward. Next, the previously mobilized labial mucosa is brought forward from the back of the lip and is sutured with the margins of the

chin island myocutaneous flap after roofing the reconstructed orbicularis oris muscle in the defect.

### RESULTS

Eight patients of traumatic lower lip defects were operated under general anesthesia. The transverse defect was more than  $2/3^{\text{rd}}$  of the lip length. All patients were young adults with an average of 38 years. Three patients reported within 8–10 h of injury and five patients after 3–4 days of the injury. Patients were operated after the necessary investigations done for fitness for general anesthesia. Average time of operation was between 90 and 120 min. Blood transfusion was not required in any case. Ryles tube feeding was given for 48–72 h and then after liquid oral diet for another 10 days. Reactionary local edema was noticed for 48–72 h after the operation in all patients which subsided itself. Head end elevation and tablet paracetamol helped in reducing edema and pain. Superficial necrosis of vermilion mucosa was seen in one case, which healed by itself in 10 days. Marginal necrosis of the skin flap was not seen in any of the case. Notching of the vermilion or drooling of saliva was not seen even after 3 months of the operation, and speech deglutination and facial expressions were normal. The results were good both esthetically and functionally and satisfying to the patient [Figures 6-20].

### DISCUSSION

There are many methods described for the reconstruction of small-to-large defects of the lower lip. For small defects, local closure is done in three layers in a straight line,<sup>[1]</sup> but it causes pulling down of vermilion border as it heals. Incorporating Z or W plasty or converting the oval defect into V shape prevents this. Defects up to  $1/3^{\text{rd}}$  can be repaired primarily in three layers, but if the defect is between  $1/3^{\text{rd}}$  to  $2/3^{\text{rd}}$ , the primary closure is not advisable and if done may lead to disruption of suture due to tension in suture line or result into microstomia. The Abbe's flap<sup>[12]</sup> is better for these type of defects. When Abbe's flap is used in defect near the oral commissure, it is known as Abbe–Estlander flap.<sup>[13,14]</sup> Isolated vermilion defects are repaired by V-Y advancement of vermilion,<sup>[15,16]</sup> by island vermilion flap,<sup>[17]</sup> or by advancement of myomucosal arterialized flap from single side or from both sides<sup>[4,16,18]</sup> of remaining vermilion. For the insufficient vermilion in uninvolved lower lip, the defect is reconstructed from the upper lip mucosa<sup>[19]</sup> by cross-lip transverse vermilion flap or from cheek by free mucosal graft, mucosal flap,<sup>[1,19-21]</sup> or facial artery cheek mucosal flap.<sup>[1,17,22,23]</sup> Tongue flap<sup>[5,24]</sup> is used for reconstruction of long transverse vermilion defects and in V-Y advanced chin flap to reconstruct the mucosal layer of the lip. The tongue flap is a two-stage procedure with esthetically less satisfying results, but it is a good



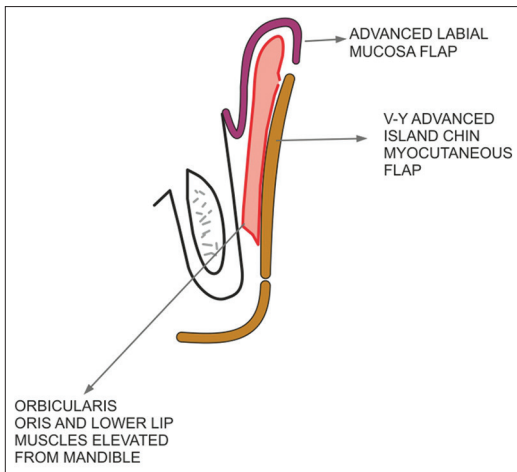


Figure 4: Flaps elevation



Figure 6: Case 1A: Central lip defect involving oral mucosa muscle and skin

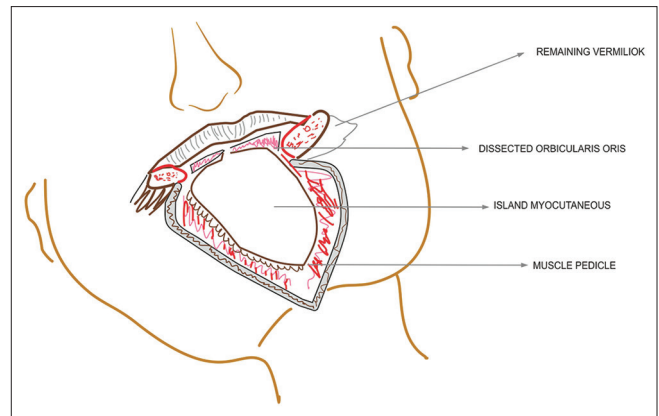


Figure 5: Island myocutaneous flap



Figure 7: Case 1B: Picture showing the marking of island chin flap



Figure 8: Case 1C: The picture showing the skin of flap being dissected out from the underlying muscles along incision margins



Figure 9: Case 1D: Showing the undermining of skin margins on both sides of V flap. The orbicularis muscle is preserved on both sides as pedicle of the flap

alternative to mucosal reconstruction of the lip in cases with extensive loss of labial mucosa in large transverse lower lip defects. Defects exceeding the anatomical boundaries of the lower lip are difficult to repair from lower lip alone. Flaps from cheek,<sup>[25]</sup> nasolabial,<sup>[11,19,26,27]</sup> and upper lip<sup>[19]</sup> may be required.<sup>[12,28]</sup> Common flaps used in the repair of

large lip defects after excision of the cancerous lesions are Karapandzic<sup>[29,30]</sup> flap (1974), Bernard Webster Flap (1852),<sup>[31]</sup> Gillies flap, nasolabial flap Ujimore's (1980) McGregor, and Gillies fan flap, Fujimora gate flap,<sup>[32]</sup> Bernard<sup>[31]</sup> Diffenbach.<sup>[33]</sup> If still insufficient then submental, deltopectoral or pectoralis





Figure 10: Case 1E: Final suturing of flap



Figure 11: Case 1F: Two weeks post op picture with good lip seal



Figure 12: Case 1G: Two weeks post op - open mouth



Figure 13: Case 2A: Near total loss of vermillion of lower lip



Figure 14: Case 2B: Lip defect mouth open



Figure 15: Case 2C: Perioperative

major flap are planned. Deltopectoral flap<sup>[34]</sup> is a pedicled flap with morbidity and inconvenience to the patient and is rarely used today. Microsurgical free flap<sup>[1,6,35]</sup> reconstructions are practiced for large defects and for post radiation necrosis of the skin around defect.

In the present retrospective study of reconstruction of traumatic defect of the lower lip, we have repaired the defect

primarily in three steps: one by advancing mucosa from the labial side; two by advancing orbicularis oris from island chin flap; and three by advancing skin of the chin in form of V-Y advancement of the chin island myocutaneous flap. In all cases, the defects were centrally located with remaining uninjured lip present on both sides. The size of the defects was more than 2/3<sup>rd</sup> of lip. All defects were repaired in single stage by V-Y advancement of chin island myocutaneous flap along with labial mucosal flap.





Figure 16: Case 2D: Perioperative



Figure 17: Case 2E: After three weeks of reconstruction

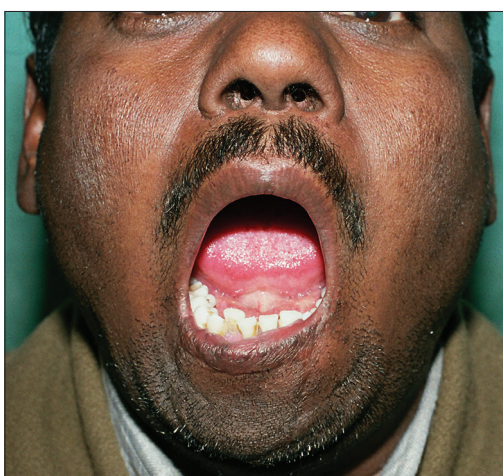


Figure 18: Case 2F: After three weeks of reconstruction



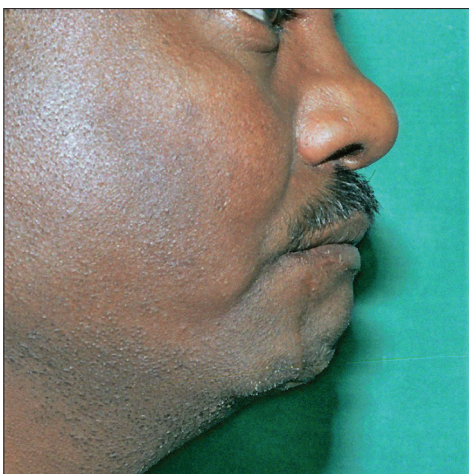
Figure 19: Case 2G: Reconstruction by V-Y advancement of chin final result after few months

Lip plays an important role in facial esthetics and in speech, deglutition, mastication, and facial expressions. In cases of lip defects, it is necessary to reconstruct the defect for the normal restoration of functions of the lip and appearance of the face. In the present technique of lip reconstruction, the mucosa was taken from the labial side of the lower lip in a form of rectangular flap and was advanced proximally to form the vermilion of the repaired lip. In two cases, back cut and Z plasty was required on the vertical incisions of the mucosal flaps to achieve the better upward advancement of the mucosal flap.

The orbicularis oris along its associated group of muscles was advanced proximally in the lip after they were released from the anterior surface of the mandible and from the under surface of chin skin.<sup>[5]</sup> To provide better muscle bulk in the lip defect, about 5 mm to 10 mm wide strip of the skin is excised from the upper margin of the myocutaneous flap. The lateral ends of the dissected muscle were sutured with the orbicularis oris of the remaining vermilion on either

side of the defect. The mobilized labial mucosa was brought over the orbicularis oris muscle and sutured with the upper margin of the island flap. The distal end of V incision was closed in Y form. All incisions were closed meticulously with 5/0, 6/0 monofilament ethilon on outer side and with Vicryl 4/0 on mucosal side. Orbicularis oris muscular sling<sup>[5]</sup> repair in the upper part of the lip defect is essential for the restoration of normal lip functions. Good muscular sling prevents drooling of saliva and gives normal smile, facial expressions, and adequate lip seal. It also provides fullness to the reconstructed lip.

A study of V-Y advancement of triangular full thickness flap based on mental neurovascular<sup>[36]</sup> bundle was done for the reconstruction of defects in lower lip. After deepithelizing, the base of the triangular V-Y flap free buccal mucosa graft was used to reconstruct the vermilion. In our series, instead of deepithelizing the base of the flap, we excised the 5 mm strip of the base of island V-Y advanced flap and covered it with labial mucosal flap instead of free mucosal graft. Partial



**Figure 20: Case 2H: Reconstruction by V-Y advancement of chin final result after few months**

or complete necrosis of mucosal graft is more common in free mucosal grafts and less in mucosal flaps as they are more vascular due to the blood supply through periosteal attachments. Vermilion reconstructed with mucosal flap looks natural, with no surface irregularities and with normal sensations. The muscle repaired done in our series showed adequate sphincteric action with normal good lip seal. Reconstruction of transverse defect by V-Y was reported in which the base of flap was deepithelialized and sutured with pedicled tongue flap.<sup>[37]</sup> The tongue was released in second operation. Vermilion reconstructed with tongue flap has its own drawbacks such as irregular surface, unnatural look, altered sensations, and it is a multistage procedure with difficulty in eating or taking meals till the tongue flap is detached in second stage after 2–3 weeks.

## CONCLUSION

The defects of the lower lip reconstructed by this single-stage method is good and satisfactory to the patient. There was normal oral size with no evidence of microstoma or commissural distortion; oral competence was adequate with normal orbicularis oris sphincteric function. The vermilion reconstructed had normal color and sensation. Lip seal was very good without notching in the vermilion. Drooling of saliva or speech defect was not noticed. The facial expressions and the look of face were near normal. We think that this procedure may be considered as a procedure of choice for managing the moderate-to-large posttraumatic defects of the lower lip.

## Declaration of patient consent

The authors declare that they have obtained consent from patients. Patients have given their consent for their images and other clinical information to be reported in the journal.

Patients understand that their names will not be published and due efforts will be made to conceal their identity but anonymity cannot be guaranteed.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

- Pribaz JJ, Meara JG, Wright S, Smith JD, Stephens W, Breuing KH. Lip and vermilion reconstruction with the facial artery musculomucosal flap. *Plast Reconstr Surg* 2000;105:864-72.
- Craig E. Vigliante, Anatomy and Functions of the Muscles of Facial Expression; *Oral and Maxillofacial Surgery Clinics: Review article*. 2005;17:1-15. DOI: <https://doi.org/10.1016/j.coms.2004.09.005>.
- Riccardo F. Mazzola, Graziella Lupo; *Evolving Concepts in Lip Reconstruction; Clinics In Plastic Surgery: Full length article*. 1984;11: 583-617. DOI:[https://doi.org/10.1016/S0094-1298\(20\)31737-5](https://doi.org/10.1016/S0094-1298(20)31737-5).
- Kolhe PS, Leonard AG. Reconstruction of the vermilion after "lip-shave". *Br J Plast Surg* 1988;41:68-73.
- Kakudo N, Kuro A, Morimoto N, Hihara M, Kusumoto K. Combined tongue flap and deepithelialized advancement flap for thick lower lip reconstruction. *Plast Reconstr Surg Glob Open* 2017;5:e1513.
- Bai S, Li RW, Xu ZF, Duan WY, Liu FY, Sun CF. Total and near-total lower lip reconstruction: 20 years experience. *J Craniomaxillofac Surg* 2015;43:367-72.
- Siberchicot F, Zwetyenga N, Majoufre-Lefebvre C, Ammar-Khodja M. Etiology of lip defects. *Ann Chir Plast Esthet* 2002;47:371-9.
- Arif Z, Rajanikanth BR, Prasad K. Soft tissue injuries of the maxillofacial region occurring from motorcycle accidents. *J Maxillofac Oral Surg* 2019;18:432-9.
- Martins WD, Westphalen FH, Westphalen VPD. Microstomia Caused by Swallowing of Caustic Soda: Report of a Case. *J Contemp Dent Pract* 2003;4:091-099.
- Reddy BP, Reddy B S, Kiran G, Chembolu N. Cancrum oris: A devastating orofacial gangrene. *NTR Univ Health Sci* 2012;1:192-4.
- Peter S, Rahman ZAA. Excision of arteriovenous malformation of lower lip without embolisation. *Int J Oral Maxillofac Surg* 2017;46:248.
- Abbe R. A new plastic operation for the relief of deformity due to double harelip. *Plast Reconstr Surg* 1968;42:481-3. PMID: 4880838.
- Jong-Min L, Jung-Hwan O. Reconstruction of lower lip defect using the Abbe-Estlander flap: A case report; *Maxillofacial Plastic and Reconstructive Surgery*. 2007;29:361-365. 2288-8101(pISSN)/2288-8586(eISSN).
- Estlander JA. A method of reconstructing loss of substance in one lip from other lip. *Plast Reconstr Surg* 1968;42:361-6.
- Spira M, Stal S. V-Y advancement of a subcutaneous pedicle in vermilion lip reconstruction. *Plast Reconstr Surg* 1983;72:562.
- Kolhe PS, Leonard AG. Reconstruction of the vermilion after "lip-shave". *Br J Plast Surg* 1988;41:68-73. doi: 10.1016/0007-1226(88)90147-6. PMID: 3345410.
- Sakai S, Soeda S, Terayama I. Bilateral island vermilion flaps for vermilion border reconstruction. *Ann Plast Surg* 1988;20:459.
- Watson AC. An innervated muco-muscular flap for the correction of defects of the vermilion border of the lip. *Br J Plast Surg* 1973;26:355.
- Gupta S, Chattopadhyay D, Murmu MB, Gupta S, Singh HS. A new technique for one-stage total lower lip reconstruction: Achieving the perfect balance. *Can J Plast Surg* 2013;21:57-61.

20. Rayner CR. Oral mucosal flaps in midfacial reconstruction. *Br J Plast Surg* 1984;37:43-7.
21. Carstens MH, Stofman GM, Hurwitz DJ, Futrell JW, Patterson GT, Sotereanos GC. The buccinator myomucosal island pedicle flap: Anatomic study and case report. *Plast Reconstr Surg* 1991;88:39.
22. Pribaz J, Stephens W, Crespo L, Gifford G. A new intraoral flap: Facial artery musculomucosal (FAMM) flap. *Plast Reconstr Surg* 1992;90:421-9.
23. Kawamoto HK. Correction of major defects of the vermilion with a cross-lip vermilion flap. *Plast Reconstr Surg* 1979;64:325.
24. McGregor IA. The tongue trap in lip surgery. *Br J Plast Surg* 1966;19:253.
25. Chowchuen B. Modified bilateral neurovascular cheek flap: Functional reconstruction of extensive lower lip defects. *Plast Reconstr Surg Glob Open* 2016;4:e721.
26. Rahpeyma A, Khajehahmadi S. Unilateral one stage nasolabial flap for reconstruction of the lips. *J Maxillofac Oral Surg* 2015;14:234-9.
27. Rudkin GH, Carlsen BT, Miller TA. Nasolabial flap reconstruction of large defects of the lower lip. *Plast Reconstr Surg* 2003;111:810-7.
28. Standoli L. Cross lip flap in vermilion reconstruction. *Ann Plast Surg* 1994;32:214-7.
29. Webster RC, Coifey RJ, Kelleber RE. Total and partial reconstruction of the lower lip with inner- vated muscle bearing flaps. *Plast Reconstr Surg* 1960;25:360-71.
30. Hanasono MM, Langstein HN. Extended karapandzic flaps for near-total and total lower lip defects. *Plast Reconstr Surg* 2011;127:1199-205.
31. Denadai R, Raposo-Amaral CE, Buzzo CL, Raposo-Amaral CA. Functional lower lip reconstruction with the modified Bernard-Webster flap. *J Plast Reconstr Aesthet Surg* 2015;68:1522-8. doi: 10.1016/j.bjps.2015.07.019. Epub 2015 Jul 26. PMID: 26243196.
32. Karapandzic M. Reconstruction of lip defects by local arterial flaps. *Br J Plast Surg* 1974;27:93-7.
33. Tellioglu AT, Akyiiz M. Functional reconstruction o (total lower lip defects with a radial forearm free flap combined with a depressor anguli muscle transfer. *Ann Plast Surg* 1998;40:310-1.
34. Olawoye OA, Fatungase OM. Complete lower lip reconstruction with in-folded extended pedicled deltopectoral flap: Case report and review of the literature. *Nigerian Journal Of Plastic Surgery* 2017;13:24-7. [doi: 10.4103/njps.njps\_1\_17 Year].
35. Fujimori R. "Gate flap" for the total reconstruc- tion of the lower lip. *Br J Plast Surg* 1980;33:340-7.
36. Bayramicli M, Numanoglu A. The mental V-Y island advancement flap in functional lower lip reconstruction. *Plast Reconstr Surg* 1997;100:1682-90.
37. Yano K, Hosokawa K, Kubo T. Combined tongue flap and V-Y advancement flap for lower lip defects. *Br J Plast Surg* 2005;58:258-62.