OPEN

PRS GLOBAL OPEN

CASE REPORT
Reconstructive

Combined Tongue Flap and Deepithelialized Advancement Flap for Thick Lower Lip Reconstruction

Natsuko Kakudo, MD, PhD
Atsuyuki Kuro, MD
Naoki Morimoto, MD, PhD
Masakatsu Hihara, MD
Kenji Kusumoto, MD, PhD

Summary: We repaired a long horizontal defect in the lower lip caused by the resection of squamous cell carcinoma by reconstructing the white lip with a V-Y advancement flap and vermilion with a tongue flap. During this procedure, we deepithelialized the V-Y flap, lifted the upper margin of the flap and sutured it to the remaining upper margin of the lip, and then covered it with the tongue flap, resulting in the successful reconstruction of a thick lip. There were no postoperative complications in articulation or swallowing. This novel procedure is a simple method to aesthetically and functionally reconstruct a thick lower lip. *(Plast Reconstr Surg Glob Open 2017;5:e1513; doi: 10.1097/GOX.0000000000001513; Published online 24 October 2017.)*

The lower lip is a common site for malignant neoplasms of the skin. Treatment typically involves surgical resection; however, difficulties are associated with the functional and aesthetic reconstruction of the lip. Therefore, various surgical procedures have been devised.[1–3]

To reconstruct long horizontal defects after the resection of malignant neoplasms of the lower lip, Yano et al.[4] reported a method to reconstruct the white lip with a V-Y advancement flap and vermilion with a tongue flap. In the reconstruction of the lip using a V-Y advancement flap and tongue flap, we deepithelialized the V-Y flap, lifted its upper margin and sutured it to the upper margin of the remaining lip, and then covered it with the tongue flap, thereby successfully reconstructing a thick lip. This new procedure is described as follows.

CASE

A 61-year-old man was admitted with biopsy-proven well-differentiated squamous cell carcinoma on the lower lip. The lower lip from the white lip to the vermilion with normal tissue margins of 10 mm was excised. The height of the white lip defect was approximately 1 cm. An isosceles triangular flap is designed with the incision line in the white lip as the base and the lower end of the mentum as the vertex. After tumor resection, an incision is made in the flap. At the beginning, only the skin and subcutaneous tissue are incised, the orbicular muscle of the mouth is left intact. An area of approximately 2 cm around the flap is detached over the orbicular muscle of the mouth, the caudal side of the orbicular muscle is split, and the flap is detached upward to facilitate its upper advancement. The orbicular muscle may be severed approximately 1 cm from the upper margin of the flap to permit smooth lifting of the flap. The flap is advanced upward with the orbicular muscle, the upper margin of the lip flap is lifted to the remaining upper margin of the lip, to which it is temporarily sutured (Figs. 1, 2).

The V-Y flap was advanced upward with the orbicular muscle, and the flap was deepithelialized, and the upper margin of the flap was lifted to the upper margin of the remaining lip and sutured (Fig. 3). A tongue flap with a superior pedicle is designed on the reverse side of the tip of the tongue. Then the tongue flap is applied over the deepithelialized flap and sutured. Two weeks later, the tongue flap was divided and the donor site sutured. The follow-up period was 2 years with no recurrence. Lip function was excellent, and dentures were used without any issues (Fig. 4; **see Supplemental Digital Contents 1 and 2,** http://links.lww.com/PRSGO/A554.)

From the Department of Plastic and Reconstructive Surgery, Kansai Medical University, Osaka, Japan.
Received for publication April 4, 2017; accepted July 21, 2017.

DOI: 10.1097/GOX.0000000000001513

Disclosure: *The authors have no financial interest to declare in relation to the content of this article. The Article Processing Charge was paid for by the authors.*

Supplemental digital content is available for this article. Clickable URL citations appear in the text.

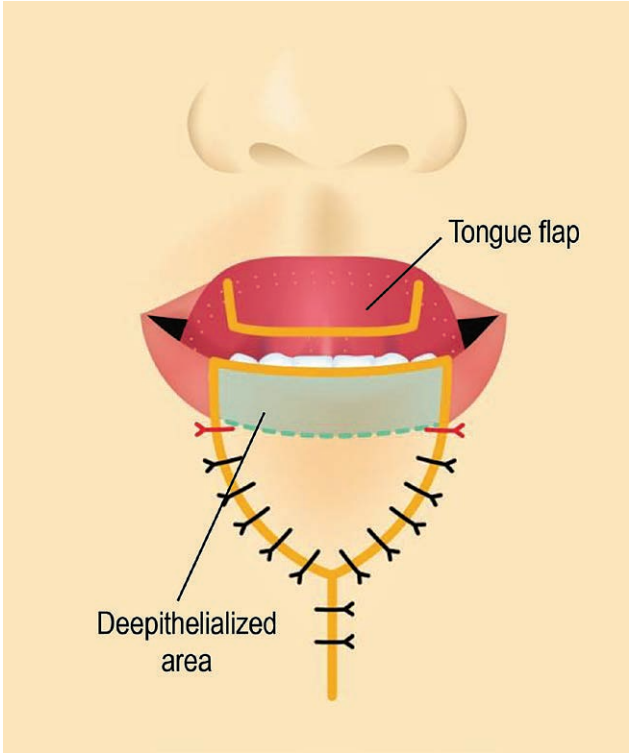

Fig. 1. Operative technique using a deepithelialized V-Y flap and tongue flap. The V-Y flap is deepithelialized and advanced, its upper margin is lifted to the upper margin of the remaining lip, and then sutured.

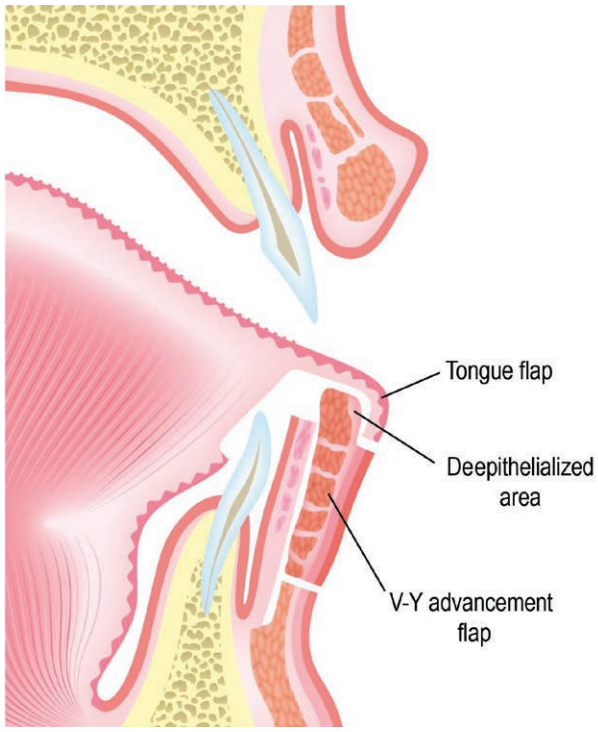

Fig. 2. The paramedian sagittal section of the lips in Fig. 1 was indicated.

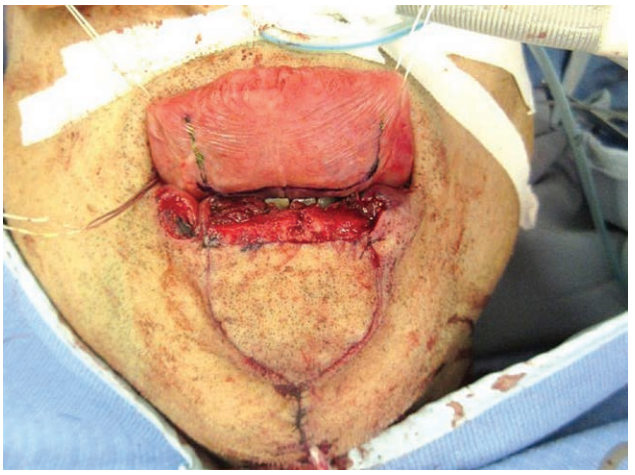

Fig. 3. Deepithelialization of the flap in case 1, and the tongue flap was designed.

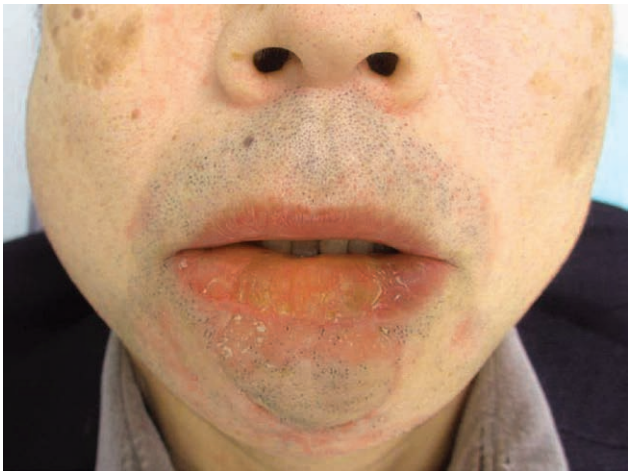

Fig. 4. Frontal view 2 years after surgery.

DISCUSSION

Important points in the selection of the method for lip reconstruction are that it is mildly invasive, does not cause impairment of mouth opening due to lip hypertonia, and the outcome is satisfactory in color and texture. Bai et al.[5] reported total and near-total lower lip reconstruction over 20 years and concluded bilateral local techniques, such as Yu's flap and V-Y flap or free flap, were useful. However, the vermilion cannot be reconstructed using these methods, which is disadvantageous.[5] Rahpeyma and Khajehahmadi[6] also reported the submental transposition flap and anteriorly based ventral rectangular myomucosal tongue flap for lower lip reconstruction. However, the limitations of these methods are as follows: first, they are not functional reconstructions and the sphincter function of the lower lip does not return; second, they are not innervated flaps (motor and sensory).[6]

Recently, Yano et al.[4] reported a method for reconstruction of a long horizontal defect after resection of a malignant tumor of the lower lip, consisting of reconstruction of the white lip with a V-Y advancement flap and vermilion

with a tongue.[4] A wide defect extending along 1/2 or more of the vermilion is a good indication for a tongue flap for the lower lip. Since the report by Yano et al.[4], reconstruction using a V-Y advancement flap and a tongue flap has also been reported by Urushidate et al.[7] and Chen et al.,[8] and a wide horizontal defect of the vermilion is considered a good indication for the procedure. The tongue flap was first used for vermilion reconstruction by Lexer[9] in 1909. Reconstruction using a tongue flap has the following advantages: rich blood flow and a high flap survival rate, usability of a relatively wide area of mucosa, procedural simplicity, excellence in color and texture, and greater strength and flexibility compared with other areas of the oral mucosa. However, it has the following disadvantages: the necessity of 2 operations for tongue flap suturing and separation,[10] and, when lifting a large tongue flap, marked postoperative tongue deformation, possibly causing impairment of tongue movements, taste disorder, and dysarthria. In this case, the patient was managed with nasal liquid diets in the hospital for 2 weeks after suture of the tongue flap to the V-Y flap to maintain rest and cleanliness of the local region.

In the reconstruction of a thick vermilion, a tongue flap including the lingual muscle bodies in addition to the lingual mucosa and aponeurosis must be lifted, but this is considered to increase the risk of the above postoperative complications. The deepithelialized advancement flap prepared by us was moved to a site above the defect together with the conserved residual lower orbicularis oris muscle. In addition, the tumor had long morphology in the horizontal direction in this patient, and the lengths of resection and movement of the orbicularis oris muscle were approximately 1 cm, respectively. The orbicularis oris muscle could be moved without transection within this range of defect, through which the lip function may have been retained, enabling eating and talking with no problem after surgery.

We, therefore, reconstructed a thick vermilion by deepithelializing a V-Y flap, pulling up its upper margin and suturing it to the remaining upper margin of the lip, and covering the deepithelialized V-Y flap with a tongue flap. By this simple method, we could functionally and aesthetically reconstruct a thick vermilion by preserving the function of the orbicular muscle of the mouth without excessively sacrificing the lingual muscle in tongue flap reconstruction. This method is recommendable for the reconstruction of wide horizontal defects of a thick vermilion.

CONCLUSIONS

To reconstruct long horizontal defects after the resection of malignant neoplasms of the lower lip, we deepithelialized the V-Y flap, lifted its upper margin and sutured it to the upper margin of the remaining lip, and then covered it with the tongue flap, thereby successfully reconstructing a thick lip.

Natsuko Kakudo, MD, PhD
Department of Plastic and Reconstructive Surgery
Kansai Medical University
2-5-1 Shin-machi
Hirakata, Osaka 573–1010
Japan
E-mail: kakudon@hirakata.kmu.ac.jp

PATIENT CONSENT

The patient provided written consent for the use of the images.

REFERENCES

1. Abbe R. A new plastic operation for the relief of deformity due to double harelip. *Plast Reconstr Surg.* 1968;42:481–483.
2. Estlander JA. A method of reconstructing loss of substance in one lip from other lip. *Plast Reconstr Sug.* 1968;42:361–366.
3. Karapandzic M. Reconstruction of lip defects by local arterial flaps. *Br J Plast Surg.* 1974;27:93–97.
4. Yano K, Hosokawa K, Kubo T. Combined tongue flap and V-Y advancement flap for lower lip defects. *Br J Plast Surg.* 2005;58:258–262.
5. Bai S, Li RW, Xu ZF, et al. Total and near-total lower lip reconstruction: 20 years experience. *J Craniomaxillofac Surg (Scotland).* 2015;43:p367–72.
6. Rahpeyma A, Khajehahmadi S. Combined submental-tongue flap for reconstruction of subtotal traumatic avulsion of lower lip: a technical note. *Plast Reconstr Surg Glob Open.* 2015;3:e302.
7. Urushidate S, Yokoi K, Higuma Y, et al. New way to raise the V-Y advancement flap for reconstruction of the lower lip: bipedicled orbicularis oris musculocutaneous flap technique. *J Plast Surg Hand Surg.* 2011;45:66–71.
8. Chen WL, Wang YY, Zhou M, et al. Double mental neurovascular V-Y island advancement flaps combined with tongue flaps for functionally reconstructing total lower-lip defects. *J Craniofac Surg.* 2012;23:181–183.
9. Lexer E. Wangenplastik. *Dtsch Z Chir.* 1909;100:206.
10. Tezel E, Guerrerosantos J, Trabanino C. Reconstruction of the lower lip with a tongue flap. *Plast Reconstr Surg.* 2002;110:1603–1604; author reply 1604.