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CASE REPORT
Reconstructive

A Modification of the Webster-Bernard Lip Reconstruction

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Summary: We report a modification of the Bernard-Webster lip reconstruction technique which uses the Burrows triangles as V-Y advancement flaps rather than excising them. A 44-year-old white, nonsmoking man presented with a 2-cm cutaneous squamous cell carcinoma of the right lower lip. Oncological resection required excision of 40% of the lower lip to the modiolus. A modified Bernard-Webster flap was used to reconstruct the full length of the lip with minimal donor morbidity.
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INTRODUCTION

Lip reconstruction is commonly required after surgical excision of cutaneous malignancy. Cutaneous squamous cell carcinoma (cSCC) is the most common malignancy of the lower lip.[1] Small lower lip lesions may be treated with wedge excision and closure, but reconstruction of large full-thickness defects of the lips continues to be a reconstructive challenge. Many techniques for lip reconstruction have been described.[2] Choice of reconstruction must take into account the defect size, anatomical sub-site, patient co-morbidities, and the treating surgeon's experience. Full-thickness defects can be described as less than one-third, between one-third and two-thirds, near total, and total.

Full-thickness defects constituting more than one-third of the lower lip require complex reconstruction. In 1845, Dieffenbach[3] reported reconstruction of the lower lip defect using a malar flap with bilateral medial advancement. Bernard[4] described employing bilateral full-thickness Burrows triangles resected along the nasolabial grooves to facilitating medial malar advancement. Webster et al.[5] further modified this approach by combining triangular incisions employed for partial-thickness defects and mucosal flaps to reconstruct the lip vermillion with advancement of the surrounding para-nasal skin. This modification provided major technical advance. By allowing innervated muscle to be brought into the new lip it provides a sensate, cosmetically and functionally superior lip. The Bernard-Webster flap is a useful technique for reconstruction of large lower lip defects.

However, this technique does not restore the orbicularis oris sphincter, although oral continence may be preserved. The reconstructed lower lip may be tight due to the reduction of the circumference of the soft tissues encircling the lower dentition. This relative tightness may lead to an apparently bulky upper lip which may overhang the lower lip. In addition, the technique discards a large section of healthy tissue in the nasolabial and mentolabial areas.

We present a modification of this flap which eliminates lower lip and commissure tightness. The technique uses bi-axial V-Y flaps from the previously discarded Burrows Triangles in the nasolabial and mentolabial areas.

CASE REPORT

A 44-year-old white man presented with a 6-month history of a fungating mass arising from the dry vermillion of his right lower lip. At presentation, the lesion was 2-cm in diameter. A biopsy revealed a moderately differentiated cSCC. There was no clinical or radiological evidence of regional lymphatic disease. The planned resection including one-centimeter margins resulted in a 40% defect of the right lower lip extending to the modiolus (Fig. 1). The patient underwent resection and reconstruction with a modified ipsilateral Bernard-Webster flap reconstruction. A lateral release of the cheek advancement flap created a cutaneously islanded myo-mucosal flap which advanced with minimal tension. However, this created a defect in the cheek immediately lateral to the nasolabial crease.

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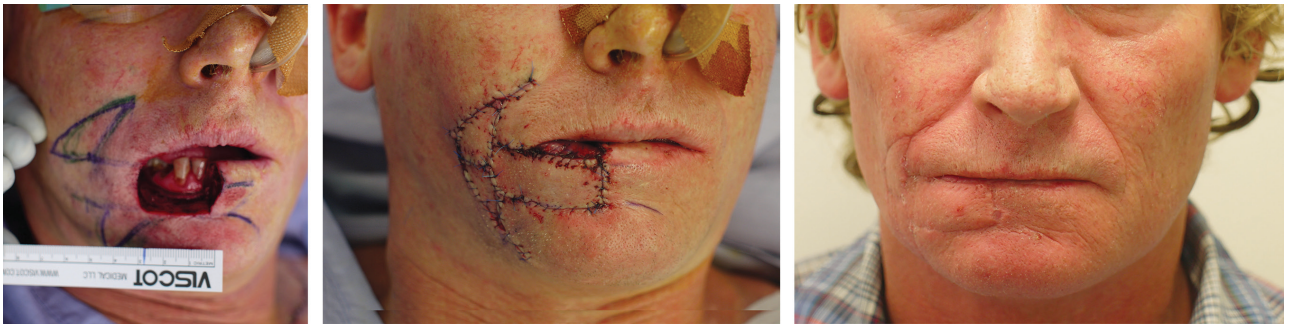

Fig. 1. Our modified Bernard-Webster flap: intraoperative post-lower lip resection of invasive cSCC; 1-week postoperative reconstruction; and 12-week follow-up (top to bottom).

Instead of excising the Burrows triangles, these were raised as superiorly and inferiorly based myo-cutaneous V-Y flaps (**See Video 1** [online], which displays an illustration of cSCC excision and AROW flap reconstruction; and additional case showing a bilateral version of our modified Bernard-Webster flap; at intraoperative planning lower lip cSCC resection; at 1-week postoperative reconstruction; and 12-week follow-up). These were advanced to fill the cheek defect (Fig. 1). The effect was that the primary lip defect was wholly reconstructed by the creation of a secondary cheek defect, which in turn is reconstructed by the tertiary defect of the V-Y flaps. This facilitated even distribution of tissues along the nasolabial crease (Fig. 1), and eliminating tightness at the reconstructed modiolus.

Excision margins were found to be clear with no evidence of recurrence at 6 months. Cosmetic and functional outcomes have been satisfactory (Fig. 1), with normal speech, eating, drinking, and oral continence. A second case using the technique for bilateral advancement has been performed (**see Video 1 [online]**).

DISCUSSION

To date, no surgical technique provides all of the requirements for an ideal lip reconstruction of defects involving greater than one-third.[2,6] These include delivering a sensate area with adequate sulcus depth, oral competence, a wide oral commissure, and preservation of adjacent aesthetic landmarks. The Bernard-Webster[5] and Karapandzic[7] flaps are commonly used for reconstruction of defects larger than one-third of the lower lip. However, the Karapandzic flap has potential risk of microstomia and blunting of the oral commissure. In comparison, the standard Bernard-Webster flap shortens the cheek which may distort the encircling muscles of the lower lip muscles, and create disproportion to the upper lip. Preservation of the nasolabial Burrows triangles and using these to prevent cheek narrowing may be an advantage. By advancing a cutaneous islanded myo-mucosal flap into the primary lip defect a full-length lip is reconstructed without tension. The secondary cheek defect is reconstructed with the Burrows triangle V-Y advancement flaps to prevent cheek tightness and the tertiary defect from the V-Y flaps is closed directly with tension spread across the whole length of the nasolabial and labio-mental creases. The tradeoff is that there is additional incision at the lateral margin of the V-Y flaps.

The case demonstrates the potential utility of this modification where healthy tissue is preserved rather than discarded. The principles of this newly described technique may reduce morbidity of a common lip reconstruction technique.

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REFERENCES

1. Zitsch RP III, Park CW, Renner GJ, et al. Outcome analysis for lip carcinoma. *Otolaryngol Head Neck Surg.* 1995;113:589–596.
2. Seo HJ, Bae SH, Nam SB, et al. Lower lip reconstruction after wide excision of a malignancy with barrel-shaped excision or the webster modification of the Bernard operation. *Arch Plast Surg.* 2013;40:36–43.
3. Dieffenbach JF. Chirurgische Erfahrungen besonders uber die Wiederherstellung zerstorter Teile des menschlichen Korpers nach neuen Methoden. *Bedim TCF Enslin.* 1845:34–38.
4. Bernard C. Cancer de la levre infericure, restauration a l'aide de lambeaux quadrilataires lateraux. *Scalpel.* 1852;3:357–360.
5. Webster RC, CoffeY RJ, Kelleher RE. Total and partial reconstruction of the lower lip with innervated musclebearing flaps. *Plast Reconstr Surg Transplant Bull.* 1960;25:360–371.
6. Eskiizmir G, Baker S, Cingi C. Nonmelanoma skin cancer of the head and neck: reconstruction. *Facial Plast Surg Clin North Am.* 2012;20:493–513.
7. Karapandzic M. Reconstruction of lip defects by local arterial flaps. *Br J Plast Surg.* 1974;27:93–97.