

TOTAL AND SUBTOTAL LOWER LIP RECONSTRUCTION USING MODIFIED WEBSTER'S CHEEK ADVANCEMENT FLAPS AFTER CANCER RESECTION

Nikolay G. Uzunov,⁽¹⁾ Martin Trifonov,⁽¹⁾ Emil L. Sarachev,⁽²⁾

(1) Department of maxillofacial surgery, Faculty of Dental Medicine, University of Medicine - Plovdiv

(2) Department of oral surgery, Faculty of Dental Medicine, University of Medicine - Plovdiv

Corresponding author: Nikolay G. Uzunov

Department of maxillofacial surgery, Saint George University Hospital

66 Peshtersko Shosse Boulevard, Plovdiv 4000

Tel: +359 32 602922; +359 888 625145, E-mail: nouzoun@abv.bg

Abstract. Webster's modification of Bernard-Burrow's technique is popular for total lower lip reconstruction.

Purpose: to evaluate function and cosmetics after lower lip reconstruction with Webster's flaps.

Methods: Nine patients underwent lower lip resection with reconstruction for spinocellular carcinoma. The follow-up period varied 6-72 months.

Results: In five patients wounds healed uneventfully. In four patients minor dehiscencies developed. No recurrences were observed. Reconstructed lips were controlled drooling within 30-45 days after surgery. Lip sensation and function gradually improved during the first year.

Conclusions: Webster's technique is useful in total lower lip reconstruction. Lip sensation and functional rehabilitation improve after operation.

Key words: lower lip reconstruction, modified Webster's flaps, local flaps, lip cancer

INTRODUCTION

Defects of the lips and perioral region can result from a variety of causes. The most likely of them are trauma and malignancy. Cancer resections of the face destroy facial aesthetics and function and lead to psycho-emotional stress to the patient and social inferiority complex. That is why any lip ablations require restoration of lip function, cosmetics and emotional and sexual expression that resemble the premorbid situation. [1] Tobin and O'Daniel [5] emphasize that the essential goals of lip reconstruction are: (1) complete skin cover and oral lining; (2) semblance of the vermilion; (3) adequate stomal diameter, (4) sensation; and (5) competent oral sphincter. It is generally accepted that large subtotal involving more than 75% of lip length and total full-thickness labial defects are difficult to restore (Table 1). [1-5]. The situation is much more complicated when full-thickness perioral defects accompany the lip defect [1-7].

In 1838 Von Burrow advocated excising four full-thickness triangles of excess skin from the base of bilateral perioral cheek advancement flaps. He did not publish his idea until 1855, while Camille Bernard performed the same procedure in 1852 and reported his results in 1853. [6, 7] The original Bernard-Von Burrow operation involves transposition to the lateral lower lip of bilateral, full-thickness triangular flaps with their caudal bases at the level of the commissures. Early cheek advancement flaps restored surface lip anatomy, but ignored underlying deep neuromuscular anatomy as they transected the perioral muscles and/or their innervation. Accordingly, poor function and sensation resulted from these methods. Only in the mid-20th century did Freeman (1958) and Webster and associates (1960) modify Bernard-Burrow's technique to preserve the deep neuromuscular structures by limiting the triangular excisions to the skin only [6, 7]

PURPOSE

The purpose of this study to evaluate function and esthetics of the lower lip after total and subtotal tumor resection and primary lip reconstruction with Webster's cheek advancement flaps.

MATERIALS AND METHODS

Patients. Nine patients (2 females and 7 males) aging from 36 to 78 years presented with spinocellular carcinoma involving more than 2/3 of lower lip length. The character of the lesion was proved by histological examination

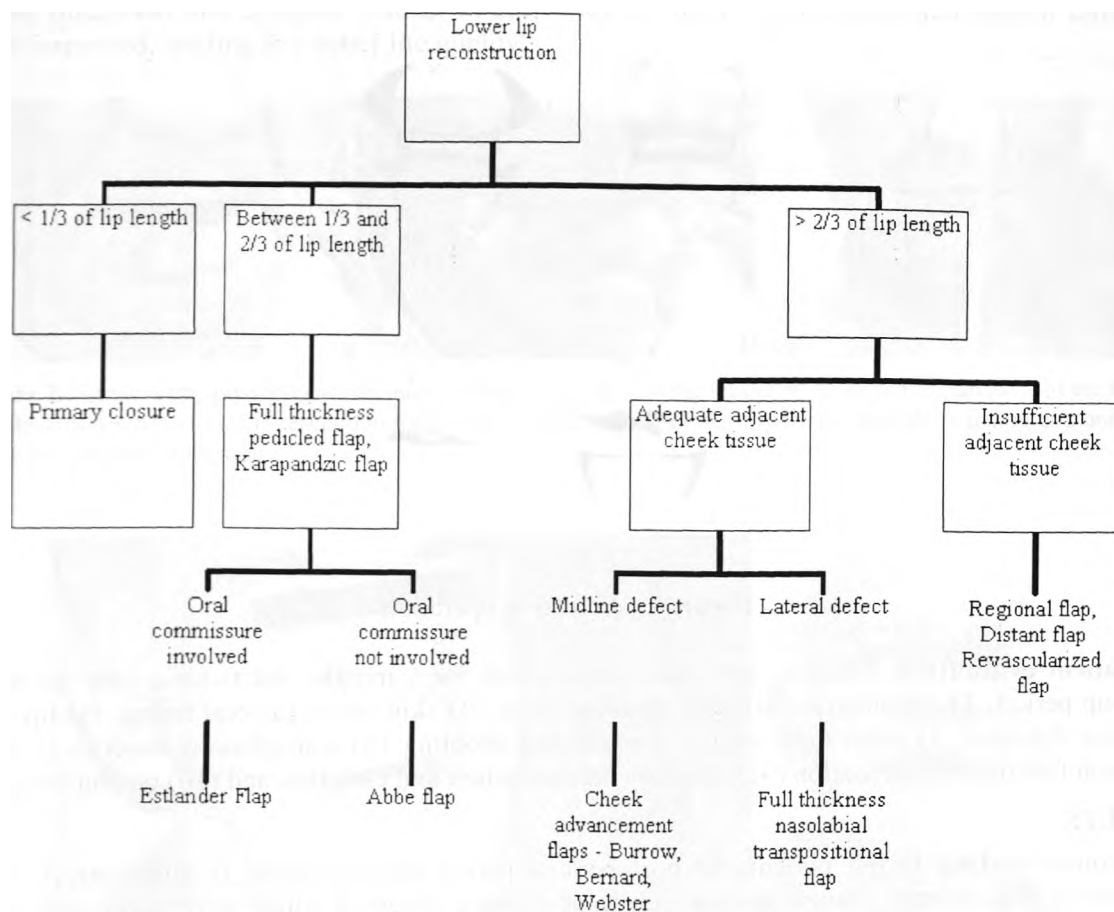


Table 1. Lip reconstruction algorithm

Three patients had suffered the same lesion before and had had radiological treatment with good result. In two patients the lesion reappeared (10 and 12 years after radiotherapy respectively) in the same location of the lip as previously detected; in one patient (8 years after radiotherapy) the new lesion occupied the opposite half of the lip. The rest 6 carcinomas were primary lesions. Multidisciplinary oncological consultations were made to choose the treatment method. In all cases surgical resection with neck dissection was chosen as treatment modality.

Surgical technique. The patients were operated on under general anaesthesia with nasotracheal intubation. Neck dissection was made first, then the tumour was resected and bleeding was controlled. After confirmation that the boundaries of the resected specimen were clear from malignancy, we proceeded with the reconstruction of the lip. Von Burrow's triangles were outlined. The lower tips of the two paramental triangles extended beyond the inferior border of the mandible, and their base was located below the mental foramen levels. The two nasolabial triangles were placed in the upper medial cheek, preserving labial and facial arteries. Thus, cheek advancement flaps were planned which included facial, superior and inferior labial and mental arteries and the main trunk of the mental nerve. The oral mucous membrane was dissected near bucco-gingival junction. The lower mucous membrane incision was made 0.5 mm above the inferior vestibular fornix while the upper mucous incision was situated approximately 1 cm above the level of the labial commissure and below the parotid papillae. After excision of the triangles down to the muscle layer and mucous incisions the mobility of the flaps is checked. In most cases with lower lip reconstruction, if necessary, muscles are incised below the level of the mental neurovascular bundle.

After satisfactory mobilisation of the flaps is achieved, the latter are advanced and muscles are sutured at the midline first. The whole muscle layer is then repositioned anteriorly towards the midline and fixed in its new position with mattress sutures. Then the intraoral mucous flaps are closed in a water tight fashion and skin sutures are placed. The advanced excess mucous membrane is designed, flipped over and sutured to recreate the lacking vermilion. The whole wound is drained and compressive dressing is applied for two-three days. Antibiotics are administered perioperatively and 24-48 hours after the operation. Sutures are removed 8-10 days after surgery.

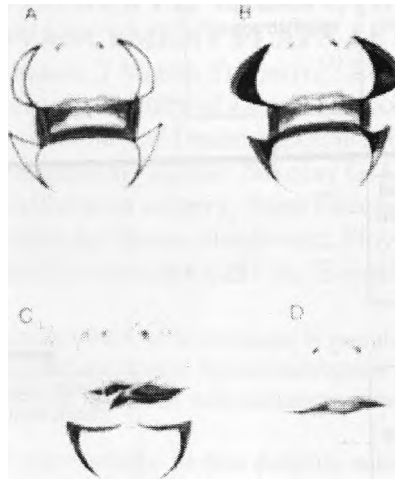


Figure 1. Webster's operation

Patient evaluation. Patients were seen every month for 6 months and twice-a-year for the whole follow-up period. The biometric variables observed were: (1) skin cover, (2) oral lining; (3) lip mobility ; (4) stomal diameter, 5) water tight closure in preventing drooling; (6) oral sphincter function in digestion: (7) speech function; (8) sensation (9) vermilion reconstruction and esthetics; and (10) patient satisfaction.

RESULTS

Wound healing. In five patients the postoperative period was uneventful. In three patients (one with preoperative radiotherapy) minor surface dehiscencies were observed which were controlled with local antiseptics and healed under secondary intention within 21 days. One patient developed moderate dehiscence of submental skin flap portion which required closure under local anesthesia. Scars became hardly discoverable within 6-9 months. No cancer recurrences were observed during the follow-up period.

Lip function and sensation. Reconstructed lips were able to control drooling within 30-45 days after surgery. Lip function and sensation gradually improved during the first year after together with patient satisfaction. Three months postoperatively patients were able to drink adequately from a cup.

Patient satisfaction. Patient satisfaction increased together with the improvement in lip competence, scar fading and facial appearance.

DISCUSSION

The importance of the lips in relation to the rest of the body is well illustrated by their large representation in the sensory and motor cortex. They are the portal to the gastrointestinal system. Having this capacity they act as a sphincter and retain food, fluids and saliva in the oral cavity during mastication. Other very important lip functions are articulation, aesthetics, emotional expression and sexual sensation and stimulation. [1, 3, 4] Several techniques are proposed for lip reconstruction (cheek advancement flap, cross-lip flap, nasolabial flap, oral circumference advancement flaps, innervated composite flaps, distant flaps). Most of them restore lip continuity but either function, or stomal diameter and/or facial aesthetics remain poor [3, 5-7].

From all local flaps cheek advancement flaps are most popular. In 1960 Webster, Coffey, and Kelleher published their modification of Bernard-Burrow cheiloplasty procedure. [6, 7] The three important refinements they made to the original operation are: (1) excise skin and subcutaneous tissue only in the Burrow's triangles to maintain innervated muscle-bearing flaps; (2) locate the triangular excisions farther laterally in the nasolabial fold instead of next to the commissures; and (3) paramental Burrow's triangles to ease inferior advancement of the cheek tissue. Other refinements of the original technique include Freeman's myoplastic introduced, [1-4] philtral replacement with cross-lip flap recommended by Williams and colleagues, [1,3, 4], Fries's "universal procedure" (1,4), recreation of the nasolabial fold with buried dermal flap suggested by Clodius, [1,4], Tobin's depressor agulu oris faps [5], and the advocated by Meyer and co-workers location of the excision sites at the upper lip-vermillion edge. [1, 3, 4] Webster's modified cheek advancement flaps gives the opportunity to reconstruct lower lip with

acceptable functional and cosmetic results. In our series lip function, aesthetics and patient satisfaction gradually improved, leading to a better life quality.

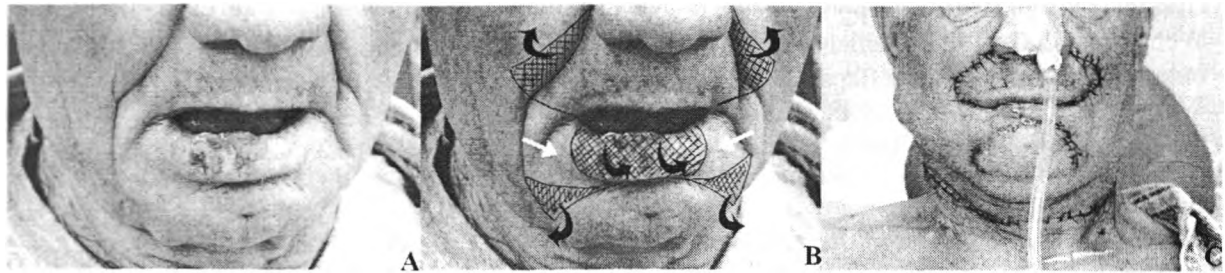


Figure 2. A case with spinocellular carcinoma of the lower lip. (A) the lesion involves more than 80% of the lip. (B) Boundaries of tumor. Lip resection must involve at least 1 cm of healthy tissue. Webster's triangles planned. (C) A day after the operation



Figure 4. Six months after operation. (A) the patient is singing; (B) The patient is whistling



Figure 3. The same case. (A) Two months after the operation. Mouth opening is normal. (B) Oral mucosal lining. (C) No drooling

CONCLUSIONS

Bernard-Von Burrow procedure together with its modifications now is probably the most popular of all cheek advancement methods for total full-thickness lip reconstruction. Within the limitations of this study it can be concluded that Webster's technique is useful in total and subtotal lower lip reconstruction. Lip sensation and functional rehabilitation seem to be improved with muscle transposition and mental nerve preservation. Further investigation and technique refinements must be made.

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