

Revision of Bilateral Cleft Lip Deformity Using Abbe Flap

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Background: Most primary repair of bilateral complete cleft lip does not show satisfying result due to several deformities caused by inappropriate use of the hypoplastic prolabial tissue, failure to advance the lateral lip elements to the midline for primary repair of the orbicularis, and scarring. The Abbe flap is the accepted procedure for the correction of severe secondary deformity of a bilateral cleft lip. By introducing an adequate amount of lip tissue, it relieves the tightness of the upper lip and also corrects the depressions of the tip of the nose. Symmetry between the two lip is also achieved

Patient and Method: Three patients with tight lip deformity underwent this procedure. The Abbe flap, which was taken from the central portion of the lower lip vermilion, was designed to repair the vermilion tubercle and the Cupid's bow. A tiny portion of skin was included to facilitate closure of the donor site. The pedicle was divided 3 weeks after operation.

Results: Each patients showed a more natural contour of the vermilion tubercle and the Cupid's bow. The scarring of the donor site was inconspicuous.

Summary: The Abbe flap can be considered as a choice for revision of bilateral cleft lip deformity. The disadvantages of this flap include patient's discomfort and the need for multiple procedures.

Keywords: *Abbe flap, bilateral cleft lip*

Latar Belakang: Sebagian besar operasi perbaikan bibir sumbing komplis bilateral belum menunjukkan hasil yang memuaskan karena adanya deformitas pasca operasi akibat penggunaan jaringan prolabial hipoplastik yang tidak sesuai, kegagalan untuk menyatukan elemen lateral bibir di garis tengah secara tepat sebagai perbaikan primer dari orbicularis, dan parut. Flap Abbe adalah prosedur yang dapat diterima untuk mengkoreksi deformitas sekunder dari bibir sumbing bilateral. Dengan menggunakan jaringan bibir yang cukup, ketegangan dari bibir atas dapat dikurangi serta depresi dari puncak hidung dapat diperbaiki serta tercapai simetrisitas antara dua bibir.

Pasien dan Metode: Tiga pasien dengan deformitas tight lip menjalani prosedur ini. Flap Abbe yang diambil dari porsi tengah vermilion bibir bawah didesain untuk memperbaiki tuberkel vermilion dan cupid's bow. Sebagian kecil dari kulit juga dipakai sebagai penutup untuk area donor. Tangkai dipotong 3 minggu setelah operasi.

Hasil: Setiap pasien menunjukkan kontur yang lebih natural dari tuberkel vermilion dan cupid's bow. Parut dari area donor tidak tampak mencolok.

Ringkasan: Flap Abbe dapat dipertimbangkan sebagai pilihan dalam revisi dari deformitas sumbing bibir bilateral. Kerugian dari flap ini mencakup ketidaknyamanan dari pasien dan perlunya prosedur berulang.

Kata kunci : *Abbe flap, bilateral cleft lip*

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Repair of a bilateral complete cleft lip and nasal deformity is the essence of plastic surgery². It has been said that a bilateral cleft lip is twice as hard to repair as a unilateral cleft but that the final result is only half as good. This may or may not be true, but it does reflect the frustration and discouragement commonly associated with the management of

this deformity. It is timely, therefore, to evaluate one's experience, to assess the logic in any changes and to justify present methods of management³.

The universal stigmata associated with secondary bilateral cleft lip deformity include the following: (1) increase columelo-labial angle and so called "whistle deformity" due to

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tissue deficiency of the central vermillion; (2) vermilion color mismatch when the vermilion of the hypoplastic prolabium is used; (3) wide, undimpled philtrum with straight lateral columns; and (4) absent or deformed Cupid's bow and philtral landmarks. Causes of these deformities can usually be traced to inappropriate use of the hypoplastic prolabial tissue (white roll and orbicularis), failure to appropriately advance the lateral lip elements to the midline for primary repair of the orbicularis, and scarring. When central lip elements are significantly short or scarred, revision requires the replacement of full-thickness lip elements and anatomical landmarks: skin, white roll, orbicularis oris, and vermilion.¹

The Abbe flap represents a method of addressing the secondary deformities associated with the bilateral cleft lip. Dr. Robert Abbe was the first to describe the procedure in English, and has received most of the credit for

the lip-switch procedure. The Abbe flap is a full-thickness composite flap, involving the transfer of the skin, muscle, and mucosa of the central part of the lower lip to the upper lip. The Abbe flap is the accepted procedure of choice for the correction of a severe secondary deformity of a bilateral cleft lip. By introducing an adequate amount of lip tissue it relieves the tightness of the upper lip and also corrects the depressions of the tip of the nose. Symmetry between the two lip is also achieved.⁴

PATIENT AND METHODS

Case 1

A 17-year-old female with an upper lip scar deformity underwent the abbe flap procedure. The pedicle of the Abbe was divided 18 days later. Natural contour of the vermilion tubercle and the cupid's bow was obtained and the profile of both lips improved. The patient still needs some revision regarding the philtral scar.



Figure 1. Preoperative clinical appearance



Figure 2. Above : Intraoperative design and result. Below : Four months postoperative

Case 2

A 24-year-old female with an upper lip scar deformity underwent the abbe flap procedure and nasal repair using diced cartilage costa graft. This patient had palatoplasty when she

was 22 years old so she has no maxillary growth disturbance. The pedicle of the Abbe was divided 21 days later. The patient remains unsatisfied with the result and planned to do further repair.



Figure 4. Preoperative Clinical Appearance

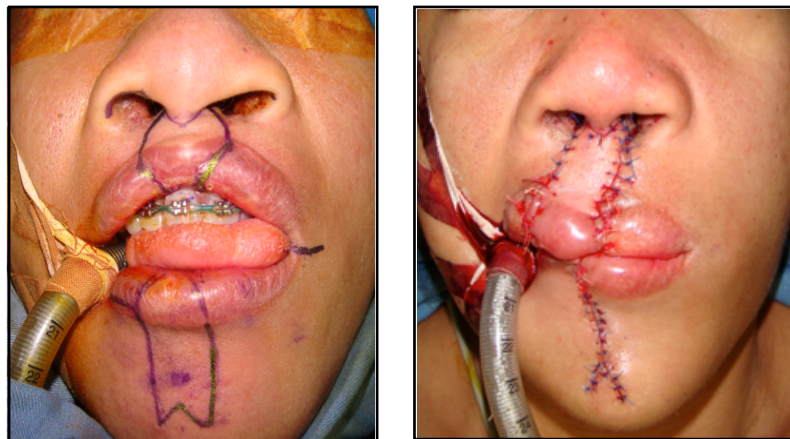


Figure 5. Intraoperative design and result



Figure 6. Four Months postoperative

Case 3

A 25-year-old male with an upper lip scar deformity underwent the abbe flap procedure. This patient also underwent rhinoplasty using conchal cartilage from his left ear. The pedicle of the Abbe was divided in the following 18

days. Natural contour of the vermillion tubercle and the cupid's bow was not successfully obtained but the patient lives outside Java island and have not reconsider revision. This patient had palatoplasty when he was 2 years old so he had a maxillary disturbance.



Figure 7. Preoperative clinical appearance



Figure 8. Intraoperative result



Figure 9. One year postoperative

Operative Techniques

The Abbe flap operation is generally performed under local anesthesia. However, when combined with rhinoplasty, general anesthesia is used.⁵ The Abbe flap is centered in the middle of the lower lip, and the flap is designed so that the length of the flap approximates the length of the defect, replacing the entire philtral aesthetic unit with healthy new tissue. In cases where the central upper lip is short, the length of the flap can be designed from the base of the columella to the central junction of the wet and dry vermilion of the lower lip. The width of flap is designed to be smaller than the upper lip defect, and often ends up being between 1.2 and 1.5 cm. The measurement of the width of the flap should take into consideration the subsequent defect in the donor lip and tissue stretch that will occur over time with the reconstructed central aesthetic unit. The triangular or shield-shaped flap is outlined centrally on the lower lip 10 to 15mm wide, with enough length to reach the base of the columella. On one side all layers are divided, while on the other, a pedicle with the inferior labial vessels is preserved. The scarred central portion of the upper lip is excised. The lower lip defect is closed and the flap is rotated on its pedicle and sutured into position. The division of the pedicle was performed 2 to 3 weeks later.⁹

Nasal Repair

Open rhinoplasty performed and the flap was elevated at the supraperichondrial level. A pocket was made and filled with diced cartilage graft taken from eighth ribs.¹

DISCUSSION

Much progress has been made in the field of cleft lip repair (Nakajima et al., 1991). However, in bilateral cleft lip repair, numerous problems still remain. Millard published his forked flap technique in 1958 and Converse et al (1970) reported a combined nose lip repair in bilateral cleft lip deformity.⁶

For the correction of short columella skin, we can adopt bilateral reverse-U incision (Tajima et al., 1997) when the skin shortage was slight or mild, and the nostril rim skin rotation

flap was combined when the columella was extremely short. V-Y elongation of the fibrous tissue in the columella base was also combined because its tension often restricted nasal tip projection. These procedures were a combination of well-known techniques for the correction of bilateral cleft lip and nose deformities.

Several surgical methods for columella elongation by using alar rim web skin have been described. They included V-Y advancement of the nasal tip (Brauer, 1971) and alar rim transportation (Straith et al., 1954). However, Millard (1976) warned that these techniques could cause visible scarring to the nasal tip. Ohishi et al. (1996) described a technique using columella lengthening using an inferiorly based small pedicle flap from rim skin rotating into the columella base, but the results of this technique have not been reported in the literature. This technique had several advantages: (1) the flap utilized the web skin below the incision of the nostril rim, (2) no tissue supply was needed and no additional scar on the upper lip resulted, (3) good color matching was possible and no conspicuous scar on the columella base was observed. Furthermore, this surgical procedure for columella lengthening was an addition to the bilateral reverse-U incision, using a combination of nostril rim skin flap depending on the severity of the shortage of the columella skin. Disadvantages of this technique included the fragility and relatively small size of the nostril skin flap. The postoperative scar contraction of the flap tends to make an uneven columella contour on the side of surgery.

For correcting the under projected nasal tip, there are several surgical techniques including septal cartilage graft (Nishimura and Ogino, 1978; Shin and Sykes, 2002; Trenite, 2002), L-shaped iliac bone graft (Takato et al., 1996), cantilever iliac bone graft (Takato et al., 1996; Yonehara et al., 2008), and a shield graft of free cartilage (Trenite, 2002). We also use conchal cartilage graft for tip support to obtain a symmetrical and solid columella strut and managed the subcutaneous fibrous tissue by the V-Y method at the columella base and molding up at the nasal tip area. With these procedures, the typical deformity of the bilateral cleft nose

such as seriously diminished nose projection, downward tip rotation, and the pseudo hump of the dorsum were corrected satisfactorily.⁷

An Abbe flap is used to repair upper-lip defects or deformities caused by congenital anomalies, trauma, or tumor resection. An Abbe flap is particularly useful for bilateral cleft lip deformities characterized by a poorly defined philtrum and Cupid's bow in association with abnormal skin texture. Abbe flap increases the volume of the central portion of the vermilion, improves definition of Cupid's bow, and creates normal skin texture of the upper lip. An Abbe flap is a full-thickness tissue graft from the lower lip. This flap is useful to repair upper-lip defects after advancement of the prolabium into the columella for lengthening. An Abbe flap also helps to reduce the discrepancy between the upper and lower lips and to correct a shallow buccal mucosal sulcus. This flap combined with simultaneous open rhinoplasty is an effective reconstructive procedure for patients with secondary bilateral cleft lip and nasal deformity.⁸

Some other modifications of conventional Abbe flap that have been described include the sandwich flap, the free flap, and the island flap. The sandwich flap is indicated when the upper lip is bulky and the lower lip thin. The island flap increases the flexibility of the flap without reducing its viability. Division of the island flap is easier than the conventional Abbe flap, and is usually performed between the second and third postoperative weeks. The pedicle of the sandwich flap can be divided earlier, usually 5 to 7 days.⁶ The free Abbe flap requires only one operation, but the likelihood of flap loss and the limited amount of tissue are major disadvantages.

The width, length, and shape of the Abbe flap are important considerations in flap design, as this will affect not only the reconstruction of the defect but the donor site. According to Millard, a 1- to 1.5-cm Abbe flap width is optimal for reconstruction of the philtrum. Holmstrom prefers the 9- to 10-mm width in reconstructions using the island flap. According to Millard, the flap must be long

enough to extend throughout the height of the lip with 1-mm insertion into the columellar base. Jackson and Soutar do not extend the flap more than two thirds of the lip. We agree that the flap must extend to the base of the columella. Millard prefers the shield shape for flap design. In contrast, Jackson and Soutar prefer the triangular shape. We agree with Jackson and Soutar that the square and bifid flaps are contraindicated for the base in the majority of cleft lip problems, as are the M- and W-shaped flaps. Our experience shows that the width of the flap may be 1 to 1.5 cm, and that triangular or shield forms give similar results. As the pedicled Abbe flap immobilizes the lip, resulting in discomfort for patients, the time of its division is important. In conventional flaps the detachment of the pedicle usually is carried out between 10 days and the third week after the surgery, but we think that the division at the end of the third week provides better safety for the flap.⁹

SUMMARY

The Abbe flap procedure gives satisfactory results in the secondary reconstruction of deficient upper lips in persons with bilateral cleft lip. The width of the flap must be 1 to 1.5 cm, the length should be sufficient to reach the base of the columella, the shape triangular or shield-shaped, and the position medial. The tissue transfer from the lower lip creates philtral dimple and philtral ridges. Disadvantages of the Abbe flap include patient discomfort and the need for multiple procedures. Rhinoplasty performed at the same time of the abbe flap would give a more esthetically appealing result

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