

Original Articles

# Repair of Nasolabial Deformities Secondary to Bilateral Cleft Lip with Upper Lip Philtrum Skin Flap and Lower Lip Abbe Flap

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## ABSTRACT

**Objective** To explore an ideal method for the correction of the secondary nasolabial deformities of bilateral cleft lip.

**Methods** From January 2013 to December 2018 ,repairing nose and lip in median of the median upper lip flap and lower lip Abbe flap in 13 patients with secondary nasolabial deformity of cleft lip, implanting artificial nose prosthesis when necessary.

**Results** All the flaps were survived and nose appearance was greatly improved. The shape of the upper lip turned more similar to normal. Coordination between upper lip and lower lip was appropriate.

**Conclusion** The median upper lip flap combined with lower lip Abbe flap to repair the secondary nasolabial deformities of bilateral cleft lip is effective . Good cosmetic results can be obtained.

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## KEY WORDS

Bilateral cleft lip; Nasolabial deformity; The median upper lip flap ; Abbe flap.

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## INTRODUCTION

As a difficult and final part of the sequence repair of cleft lip and palate, how good nasolabial deformities secondary to bilateral cleft lip are repaired is of significant importance. It is mainly manifested as short front lip, lack of vermilion tissues on upper lip, no obvious vermilion tubercle, too tight upper lip, too short nasal columella, flat nose tip, no obvious nasolabial angle, nostril deformation and so on. Due to the existence of various complex deformities, there is not enough tissue to achieve good repair effect, so it brings great challenges to clinical practice<sup>[1-2]</sup>. From January 2013 to December 2018, 13 patients with nasolabial deformities secondary to bilateral cleft lip were treated with upper lip philtrum skin flap and lower lip Abbe flap in our hospital. When necessary, artificial nasal bridge was implanted to repair the nasolabial deformities to achieve ideal results.

## MATERIALS AND METHODS

### General Materials

There were 13 patients in this group, 7 males and 6 females, aged 16-23 years old, all with nasolabial deformities secondary to bilateral cleft lip. The clinical manifestations were too short and tight upper lip, thin vermilion tubercle, distorted lip arch, different height of lip peak on both sides, obvious scar on upper lip, irregular shape in philtrum area, flat nose tip, too short nasal columella, collapsed ala, wide nostril, etc.

### Surgery Methodologies

**Surgery Design:** The nasal columella was extended and nose tip improved by philtrum skin flap of front lip. The upper lip appearance was reconstructed with Abbe flap

of lower lip according to the amount of skin muscle and vermilion tissues of upper lip defect.

**Phase I Surgery:** It was performed under intubation and general anesthesia. The incision line was designed along the original incision scar of the upper lip and extended upward to the lateral margin of the nasal columella and the bilateral alar margin. The upper lip philtrum area skin flap was designed with the nasal tip as the pedicle. The skin flap included the full length of the anterior lip and the skin of the nasal columella. The depth of the skin was up to submucosa, the skin flap was turned up, the scar was fully released, the base of the anterior lip and the nasal columellar was fully separated, the cartilage of the bilateral alar was separated, and bilateral medial alar cartilage was drawn, sewed, hanged and fixed; depending on the shape of nose and patient's needs, if necessary, the willow leaf artificial nose bridge was implanted, and the upper lip skin flap of the philtrum area was pushed upward to raise the tip of the nose and remodel the nasal columella. After repairing the distal skin of the flap, adjusting the width of the upper lip and nasal alar, confirming the defect of the upper lip skin muscle and vermilion tissues, a M-shaped or shield-shaped Abbe flap pedicled with the lower lip artery was designed to carry the whole layer of vermilion, skin, muscle and mucosa. After the formation of the tissue flap, it was rotated 180 degrees and transferred to the upper lip receiving area. After local adjustment, the mucosa, muscle and skin were sutured layer by layer. The donor site was sutured layer by layer.

**Phase II Surgery:** it was done under local anesthesia. Two to three weeks after Phase I operation, Abbe's pedicle was broken, local details of upper lip were trimmed and lower lip was counterposed.

### Pre- and Postoperative Nursing

Before Phase I surgery, effective communication with patients should be emphasized to inform them of the importance of upper and lower lip braking after operation, help to build confidence and determination, ensure stable anaesthesia recovery, immediately remind them after resuscitation, strictly limit mouth opening, guide suction tube liquid or semi-liquid diet, remove incision callus and secretions in time, keep incision clean, and closely observe lip blood circulation. Attention should be paid to eliminating patients' anxiety and tension before Phase II surgery, and routine nursing after the surgery.

### Evaluation of Treatment

**1.4.1 Subjective evaluation:** The patients' satisfaction with the operation results was surveyed, including whether they were satisfied with the change of the appearance after operation, and their acceptance of the operation.

**1.4.2 Objective evaluation:** Positive and lateral photographs were taken before and after operation to analyze the aesthetic improvement of lip and nose. Quantitative evaluation of three anatomical landmarks in the labial and nasal region should be done before the surgery and 3 months after the surgery.

## RESULTS

### Surgery Effects

After repair of nasolabial deformities secondary to bilateral cleft lip with upper lip philtrum skin flap and lower lip Abbe flap, all flaps survived and grew well. The patients were satisfied with the improvement of their appearance after operation, and felt surgical treatment process acceptable. The length of the three anatomical landmarks was measured, which indicated obvious improvement. The distance between the ipsilateral alar and lip peak was extended by more than 3 mm on average, the length of philtrum by more than 4 mm on average, and the height of the nasal tip by more than 3 mm on average. After comparing photos of 3 months to 3 years, it was found that the appearance of the nose was significantly improved, the columella of the nose was prolonged, the shape of the nostril basically returned to normal, the height and width of upper lip were moderate, the vermilion tubercle was prominent, and the ratio of the upper and lower lips was better.

### Case

A 20-year-old man with too tight upper lip, no vermilion tubercle, and obvious imbalance of upper and lower lips ratio, flat tip of nose, collapsed ala and short columella after bilateral cleft lip repair. After repair with upper lip philtrum skin flap and lower lip Abbe flap, the results were satisfactory (Fig. 1).

## DISCUSSION

The nose and upper lip, located in the mid-facial region,



Fig. 1

are significant. The repair of deformity is of great significance and challenges. Although there are many factors affecting the degree of secondary nasolabial deformity caused by cleft lip, the core problem is the insufficient amount of tissues [3]. Reasonable correction of secondary deformities of cleft lip requires a comprehensive understanding of the changes in the anatomical structure of bone, cartilage and soft tissues caused by the initial deformities, iatrogenic and growth changes [4]. In surgical practice, we should first have personalized evaluation of the characteristics of nasal and upper lip deformities, understand the relationship between the local and the whole, define the reconstruction objectives, identify the source of tissues, and formulate a perfect repair plan.

### Repair of Nose

Flat nasal tip and short nasal columella are one of the most prominent secondary deformities of bilateral cleft lip [5]. The aim of secondary nasolabial deformity repair is to achieve natural balance of nasal appearance, adjust nasal tip appropriately, lengthen the length of nasal columella, and strengthen the symmetry of nasal alar and nostril [6]. In the early repair stage of bilateral cleft lip, we can deeply feel that the amount of skin tissues of the front lip is not large, which is between the nasal columella and the upper lip. It is hard to find balance between the two, and often

neither of them can get enough skin tissues. Therefore, in the repair of nasolabial deformities secondary to bilateral cleft lip, we must make a final choice. In the application of this method, the upper lip skin of philtrum, i.e. the original anterior lip skin, is completely supplied to the nasal columella and nasal apex. With the advancement of the percutaneous flap, the nasal tip can be fully released and the nasal tip and nasal columella can be raised. In the process of skin flap dissection, incision scars corresponding to the position of bilateral middle crest were removed at the same time, nasolabial angle was adjusted, width and height of upper lip were adjusted, and defects were fully exposed by aesthetic standards.

### Repair of Upper Lip

Lip plays an important role in facial aesthetics, nutrition and language function [7]. In patients with secondary deformities of cleft lip, the insufficiency of upper lip complex tissues leads to the loss of vermillion tubercle, short and tight upper lip, and imbalance of upper and lower lip ratio. The lower lip is the natural donor site for repairing upper lip tissue defect [8]. Full tissue transfer of Abbe flap provides the amount of tissues for upper lip skin and mucosa, restores the continuity of orbicularis oris muscle and reconstructs the structure of vermillion tubercle. The incision connecting the recipient area is just on the straight track of the philtrum ridge on both sides, with natural shape and no scar. The width of the lower lip was shortened and the ratio of the lower lip to the upper lip was more coordinated after Abbe flap removal.

### Other Issues

(1) Normally, convexity of upper lip should slightly exceed that of lower lip. Therefore, the length and width of Abbe flap should be fully considered in the design to avoid improper ratio after transplantation. (2) The nasal tip is elevated by the philtrum skin flap, which can generally achieve better morphological improvement. According to the aesthetic needs of the patients, the nasal tip can be elevated by artificial nose bridge when necessary to improve the appearance. (3) Guarantee the blood supply of tissue flaps: the injury of labial artery of Abbe pedicle should be avoided; the labial artery need not be separated too much to avoid vascular distortion [9]; and the excessive tissue tension should be avoided. (4) Because the Abbe flap and the recipient area are sutured in a straight line, the suture of the vermillion incision is prone to linear depression. If necessary, Z-shaped repair can be done later.

In conclusion, the repair of nasolabial deformities secondary to bilateral cleft lip with upper lip philtrum skin flap and lower lip Abbe flap is an ideal repair method, as long as attention is paid to the details from the aesthetic point of view to improve the repair effect<sup>[10]</sup>.

## REFERENCES

- [1] SONG Qinggao, SHI Bing, ZHENG Qian, et al. Study on repair approach of bilateral cleft lips and nose deformity[J]. Chinese Journal of Reparative and Reconstructive Surgery, 2006, 20(9):899-901.
- [2] JI Yingchang, LI Yu, LI Hongsheng, et al. Management of secondary labionasal deformities after bilateral cleft lip repair[J]. Chinese Journal of Aesthetic Medicine, 2006, 15 (1) :43. DOI: 10.15909/j.cnki.cn61-1347/r.2006.01.019
- [3] FANG Shaowei, ZHENG Qian. The research progress in repair of the bilateral cleft lip with Abbe flap[J]. Chinese Journal of Aesthetic Medicine, 2008, 17 (12) :1819-1821. DOI: 10.15909/j.cnki.cn61-1347/r.2008.12.053
- [4] Alexander C. Allori, M.D., M.P.H., John B. Mulliken, M.D., et al. Evidence-based medicine: secondary correction of cleft lip nasal deformity[J]. Plastic and reconstructive surgery 2017 Jul; 140(1):166e-176e. DOI:10.1097/PRS.00000000000003475.
- [5] Jinguang He, Hua Xu, Tao Wang, et al. Simultaneous reconstruction of columella and philtrum using prolabial flap combined with Abbe flap in secondary bilateral cleft lip and nasal deformity[J]. Journal of Cranio-Maxillofacial Surgery (2017), DOI: 10.1016/j.jcms.2017.10.014.
- [6] Nakamura N, Okawachi T, Nozoe E, et al. Three-dimensional analyses of nasal forms after secondary treatment of bilateral cleft lip-nose deformity in comparison to those of healthy young adults[J]. Journal of oral and maxillofacial surgery. 2011 Nov;69(11):e469-81. DOI: 10.1016/j.joms.2011.03.041.
- [7] Husein Husein-ElAhmed, Rafael Armijo-Lozano. Lower lip reconstruction using a skin-mucosa Abbe-Estlander flap after squamous cell carcinoma excision[J]. An Bras Dermatol. 2017;92(2):260-2. DOI: http://dx.doi.org/10.1590/abd1806-4841.20175269.
- [8] Wilflingseder P, Ioannovich I. [Principles of plastic surgery]. [J]. Der Chirurg; Zeitschrift für alle Gebiete der operativen Medizin, 1971.
- [9] Cutting CB, Warren SM. Extended Abbe flap for secondary correction of the bilateral cleft lip[J]. J Craniofac Surg. 2013;24(1):75-78. DOI: 10.1097/SCS.0b013e3182781fdc.
- [10] CHENG Xu, SHI Bing. Technique development, postoperative assessment methods, and influencing factors of Abbe flap[J]. International Journal of Stomatology, 2015, 42 (1) :44-47. DOI: 10.7518/gjkq.2015.01.013.