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Case Report

An effective surgical method to deepen the gingivolabial sulcus for unilateral complete cleft lip/palate during primary surgery: cases reports

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Abstract: Shallow gingivolabial sulcus usually appeared in patients with unilateral complete cleft lip after primary repair. The purpose of this study was to explore the effect of a surgical method that was developed for improving gingivolabial sulcus depth in patients with unilateral complete cleft lip during primary repair. Patients with unilateral complete cleft lip who received primary surgery were treated by this surgical technique. The labial mucosal flap from the unaffected side reversely sutured to the vestibularis, and the labial mucosal flap from the affected side sutured with the reversely sutured mucosal flap. Other wounds of the lip are closed with 5-0 absorbable sutures and 6-0 sutures respectively. Then the sutures will be removed one week after operation, and the clinical effect would be observed during followup. Lip repaired with this technique healed well and no major complications were observed, and the labial frenum could also be simultaneously corrected based on this method. The operative time also did not increase based on this method. Satisfied postoperative morphology of lip, and obviously improved depth of gingivolabial sulcus were observed for all patients during a followup from 6 months to 24 months. We presented a useful method, in which the labial mucosal flap from the unaffected side reversely sutured to the vestibularis, and the labial mucosal flap from the affected side sutured with the reversely sutured mucosal flap could effectively correct the shallow gingivolabial sulcus in patients with unilateral complete cleft lip/palate during primary repair.

Keywords: Surgical method, deepen the gingivolabial sulcus, unilateral complete cleft lip/palate, primary repair

Introduction

As one of the most common congenital development malformations on oral and maxillofacial region, Cleft lip/palate (CLP), characterized by a notch in the lip or a groove that runs into the roof of the mouth and nose, usually results in nasolabial deformity, oronasal fistula and speech disorders [1-3]. Labral muscle hypoplasia and lack of lip mucosa were main factors contribute to shallow gingivolabial sulcus, a common clinical feature of CLP related nasolabial deformity [4], which could lead to both aesthetic and functional problems [5]. Restoring the normal anatomical structure of nasolabial and palate such as the depth of gingivolabial sulcus should be carefully taken into consideration due to a normal gingivolabial sulcus depth could enhance the coordinated activity of lip and make preparation for future orthodontics or prosthodontic [6, 7]. Although there were some studies presented ways for gingivolabial sulcus extension on patients with unilateral cleft lip [8]. The purpose of this study was to present a useful surgical technique in which the labial mucosal flap from the unaffected lip reversely sutured to the vestibularis, and the labial mucosal flap from the affected lip sutured with the reverse sutured mucosal flap for improving gingivolabial sulcus depth in patients with unilateral complete cleft lip during our common primary surgery process.

Materials and methods

Patients

From January 2008 to August 2016, 10 patients with unilateral complete CLP who received primary surgery by our cleft lip and palate team using this surgical technique to deepen the gingivolabial sulcus at the Department of Oral and

Figure 1. Preoperative photography and surgical design for patient one with unilateral complete cleft lip/palate.

Figure 2. The intraoral photography of the incisions for patient two with unilateral complete cleft lip/palate.

Cranio-Maxillofacial Surgery in Shanghai Ninth People's Hospital, Shanghai Jiaotong University School of Medicine were included in this study. They met the following criteria: they had a non-syndromic unilateral complete CLP; they had abnormal nasolabial profile and shallow gingivolabial sulcus. This study was approved by the Ethics Committee of Shanghai Ninth People's Hospital, Shanghai Jiaotong University, School of Medicine.

Surgical procedure

The step-by-step surgical procedures for unilateral complete CLP and shallow gingivolabial sulcus correction were described in detail as follows. The skin incision was designed and incision line was marked using methlene blue to show the extraoral and intraoral incision line, respectively (**Figures 1**, **2**). After completing the skin and mucous incision in the unaffected lip followed the marked line, a transverse incision was performed above the frenulum of upper lip in the sulcus vestibularis, and a triangular mucous flap in the labial sulcus was prepared (**Figure 3**). Then the labial mucosal flap from the unaffected lip reversely sutured to the vestibularis mucosal (**Figure 4**). Subsequently, the skin and mucous incision in the affected lip followed the marked line was performed, and the labial mucosal flap from the affected lip was sutured with the reversely sutured triangular mucosal flap using 5-0 absorbable suture (**Figures 5** and **6**) to improve

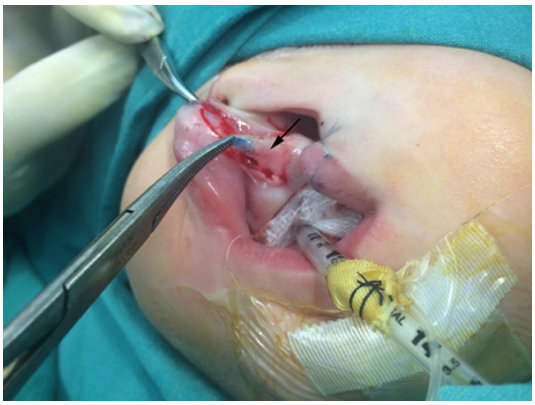

Figure 3. The labial mucosal flap from the unaffected side was prepared. Arrow indicates the triangular mucous flap.

Figure 4. The inferior margin of labial mucosal flap from the unaffected side reverse sutured to the vestibularis using a 5-0 absorbable sutures. Arrow indicates the triangular mucous flap reversely sutured to the vestibularis mucosal.

Figure 5. The released labial mucosal flap (arrow) from the affected side transferred to the unaffected side.

Figure 6. The labial mucosal flap (arrow) from the affected side sutured with the reversely sutured mucosal flap.

the gingivolabial sulcus depth in patients with unilateral complete cleft lip. Finally, others wounds were regularly sutured using 5-0 absorbable sutures and 6-0 sutures. The sutures will be removed one week after surgery. All the operations were done by the same senior surgeon.

Follow-up and clinical effect observation

All patients received a follow-up period ranged from 6 months to 24 months, and the depth of vestibular sulcus in the anterior region of maxilla was observed based on clinical examination.

Results

Patients with unilateral complete cleft lip were receiving primary surgery using this reported technique. Patients' age ranged between 3 months to 9 months. All patients obtained an increase in the depth of gingivolabial sulcus after surgery, and **Figure 7** showed the satisfied postoperative depth of gingivolabial sulcus at 6 months after surgery in one patient. All patients healed well and no major complications, such as flap infection, necrosis, were observed, and the labial frenum could also be simultaneously corrected based on this method. In addition, the operative time has not been increased obviously, and satisfactory appearance also has been obtained in these patients.

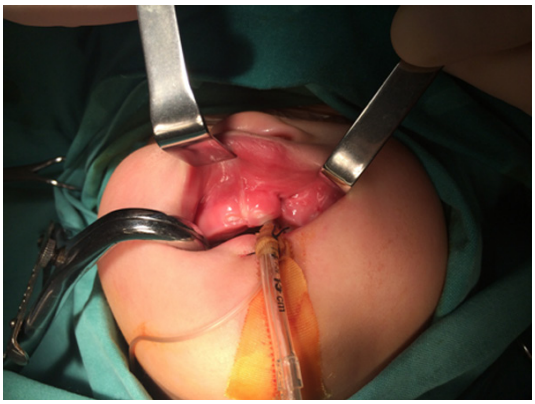

Figure 7. Photography of a patient at 6 month after operation showed a satisfied postoperative depth of gingivolabial sulcus.

Discussion

Cleft lip/palate, one of the most common congenital malformations, dose cause considerable psychological and financial burden to both affected family and society, and often requires multidisciplinary management from different teams [9-11] that may involves multistage treatment interventions, including radiology, cleft lip/palate repair, genetics and genetic counseling, speech therapy, psychotherapy, dental prosthodontics, orthodontics and orthognathic surgery [12, 13]. Considering these factors, it's hard to ignore the fact that restoring the depth of shallow gingivolabial sulcus, which usually brings some trouble when they receive the orthodontic or prosthodontics treatment, is significant to patients with unilateral complete cleft lip/palate. Effectively resolving this problem in primary surgery would produce a beneficial effect on patients' prognosis and subsequent therapy. Although there are

great developments for CLP primary surgery, previous techniques to treat the shallow gingivolabial sulcus usually exhibited different varying degrees of contraction or followed loss of sulcus depth [7]. Thus, a surgical technique focus on correction of gingivolabial sulcus is still urgently necessary and the important role of the correction needs to be emphasized in primary surgery. In this study, the deepened gingivolabial sulcus is harvested in patients. Meanwhile, the inferior margin incision can reach a satisfied effect on fully releasing the abnormal upper labial frenum, which may limit the lip movement and affect esthetics of smile line, to avoid excessive amounts of contraction [14]. Furthermore, we transferred the labial mucosal flap from the affected side to the unaffected side, which is also useful to maintain the central position of the labial frenum.

In summary, we presented a useful method, in which the labial mucosal flap from the unaffected side reversely sutured to the vestibularis, and the labial mucosal flap from the affected side sutured with the reversely sutured mucosal flap could effectively correct the shallow gingivolabial sulcus in patients with unilateral complete cleft lip/palate during primary repair. Of course, further prospective, randomized, and quantitative studies to obtain definite conclusion is necessary.

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Disclosure of conflict of interest

None.

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