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Clinical Paper
Cleft Lip and Palate

Septal anchoring suture: a key suture to improve the nasolabial symmetry in unilateral cheiloplasty☆

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Abstract. Since 2008, a septal anchoring suture has been used in unilateral cleft lip repair at Chang Gung Memorial Hospital in order to stabilize the lateral lip centrally. This study compared the symmetry of two groups of patients: those treated with and without an anchoring suture. Multiple standardized direct and photographic facial measurements were performed on the faces of all patients pre-cheiloplasty and at 5 years post-cheiloplasty. The degree of nasolabial symmetry was evaluated by comparing the ratios of measurements of the cleft vs. non-cleft sides. The ratio of change in these measurements was also compared postoperatively. The vertical lip length ratio approached 1 in the septal anchoring suture group, which differed significantly from the group without the suture (0.968 vs. 0.873, $P < 0.001$). As expected, the horizontal lip length and central lip height ratios showed no statistically significant change. The ratio of change from pre- to postoperative also showed a significant improvement ($P = 0.028$) in the vertical lip length of the group with the septal anchoring suture compared to the one without. The septal anchoring suture is a useful method to correct the tendency of the lip to shift to the cleft side.

Key words: cheiloplasty; septal anchoring suture; unilateral cheiloplasty; unilateral cleft lip; lip shifting.

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The ultimate goal of cleft lip surgery is to achieve a perfectly symmetrical lip and nose. It has been shown that for the general population, the more symmetrical the face, the more attractive the face is[1]. The appearance and symmetry of the nasolabial region is also seen as one of the most important characteristics when evaluating the results of any facial surgery[2–5]. Surgical results are usually analyzed in a relatively subjective, non-standardized fashion and there is little agreement when assessing the cosmetic outcomes of the surgery[6].

Tracing back through the history of cheiloplasty, the aim of all the many techniques has been to ensure that the cleft side looks like the non-cleft side, with, for example, a balanced and symmetrical

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lip. Millard's rotation advancement, and variants of this, is still the most popular technique worldwide[7].

At Chang Gung Memorial Hospital, a modified Millard rotation advancement cheiloplasty technique is used in combination with presurgical nasoalveolar moulding (NAM). As has been described by Samuel Noordhoff and Philip Chen[8,9], the rotation advancement technique has been modified and now includes (1) a Mohler incision on the rotational flap[10], (2) a limited upper horizontal relaxing incision of the advancement flap, (3) overlapping of the orbicularis oris muscle for philtral reconstruction[9], (4) vermilion reconstruction with a Noordhoff flap[9], and (5) primary nasal reconstruction[9].

In order to achieve improved and more consistent results at Chang Gung Memorial Hospital, an assessment of surgical outcomes was performed in 2007. The preliminary study involved direct measurement of the anthropometric points of the face to examine the degree of nasolabial symmetry in patients who had undergone a unilateral cheiloplasty in 2002. The results showed that the lip was generally shifted towards the cleft side. This tendency has been deemed inevitable due to the difference in lip lengths on the cleft side, which are generally shorter than the horizontal lip lengths on the non-cleft side[11]. It was therefore attempted to improve the nasolabial asymmetry.

As a result of these findings, a septal anchoring suture has been employed since 2008. This is used to secure the lateral lip orbicularis muscle centrally by anchoring it to the nasal septum. There has been no other change in the technique for the lateral lip muscle dissection. It was, however, theorized that the added strength of the suture may help to centralize the lateral lip and stop it shifting to the cleft side. It is possible that it may also have the added benefit of straightening the septum, which is always deviated to the non-cleft side.

In this study, patients with and without the septal anchoring suture were compared by direct measurement of specific distances on their faces. Direct measurements of this three-dimensional nasolabial region provide the most accurate, realistic result when compared to the analysis of two-dimensional and three-dimensional photographs[2]. Furthermore, an evaluation was performed to determine whether the lip was truly centralized on the face by assessing lip shifting against an imaginary facial midline based on horizontal and vertical lines at the midpoint between the medial canthi.

Patients and methods

This study was designed to investigate the long-term results of the septal anchoring suture used in unilateral cheiloplasty and was approved by the Institutional Review Board of Chang Gung Memorial Hospital. Two groups of unilateral complete cleft lip and palate patients were compared: those with and those without the septal anchoring suture. The first group comprised 19 patients who underwent a unilateral cheiloplasty in 2002 without the septal anchoring suture. The second group comprised 22 patients who underwent the same unilateral cheiloplasty in 2008, however with the addition of the septal anchoring suture.

All of the patients underwent the same Chang Gung Memorial Hospital modified rotation advancement cheiloplasty at 3 months of age and this was performed solely by the senior surgeon (P.K.T.C.). Presurgical nasoalveolar moulding (NAM) and postoperative 3M taping and a nasal stent were applied to all of the patients. Except for the septal anchoring suture, the operative procedures were the same in the two groups. Patients with other craniofacial anomalies were excluded from the study and so all patients had isolated unilateral complete cleft lip and palate only.

Measurements

The measurements were based on the anthropometric points described in 1995 by Noordhoff et al.[8] (Fig. 1). All measurements were taken directly on the child's face using a Vernier caliper (precision to 0.01 mm) at the time of cheiloplasty (3 months of age) and at the 5-year clinic follow-up. The preoperative measurements were always performed by the senior surgeon. Postoperative measurements were performed by the same person (T.C. L.). To ensure accuracy and inter-rater

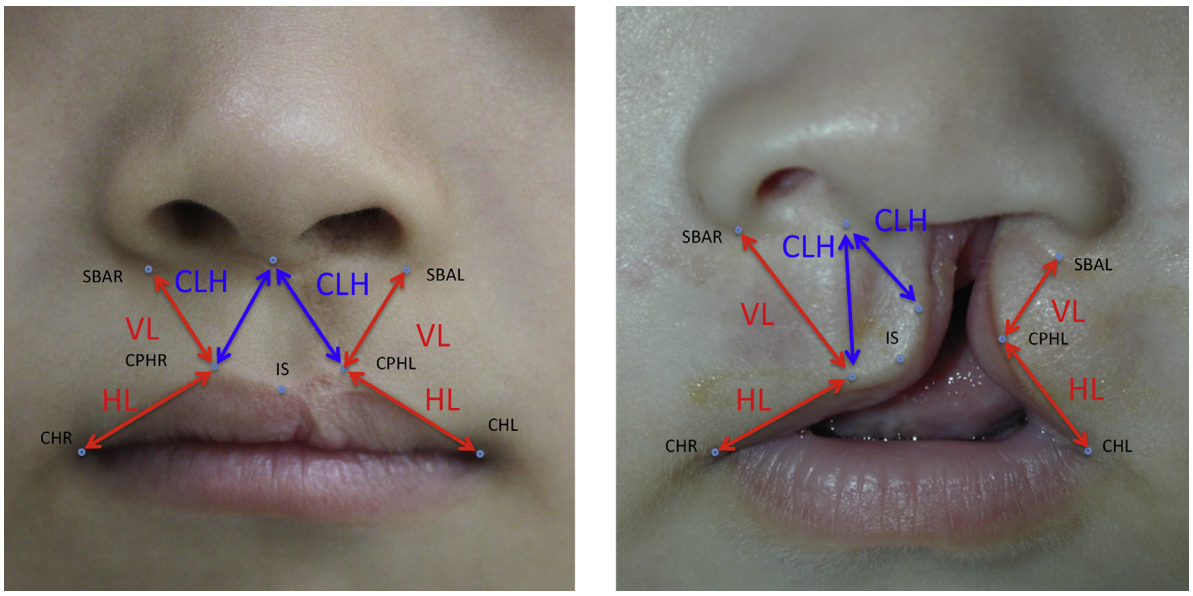

Fig. 1. Measurements according to anthropometric points: (a) postoperative; (b) preoperative. VL, vertical length; HL, horizontal length; CLH central lip height; CHR, CHL, right and left commissure; CPHR, Cupid's bow non-cleft side; CPHL, Cupid's bow cleft side; IS, central Cupid's bow; SBAR, SBAL, right and left alar base.

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