Upward Advancement of the Nasolabial Components at Unilateral Cleft Lip Repair Prevents Postoperative Long Lip


Objective: To prevent the occurrence of postoperative long lip, longitudinal postoperative changes in nasolabial forms of patients with unilateral cleft lip who underwent primary lip repair with or without upward advancement of the nasolabial components were compared.

Patients: Forty-three subjects (24 unilateral cleft lip and palate [UCLP] and 19 unilateral cleft lip solely, and cleft lip and alveolus [UCL/UCLA]) who underwent primary lip repair with upward advancement of the nasolabial components (NA group) and 30 subjects (16 UCLP and 14 UCL/UCLA) without upward advancement (LA group) were enrolled.

Outcome Measures: Postoperative photos taken at 1 and 6 months and at 1, 2, and 3 years were used for measuring the heights of the nasal alar base (NBH), the columellar base (CBH), Cupid’s peak (CPH), and the upper lip (ULH). The ratios of these measurements between the affected and unaffected sides were calculated in both groups.

Results: In the LA group, the 3-year postoperative all-items ratios of UCLP were significantly larger than those at 1 month postoperatively, demonstrating drooping of the nasolabial tissues in the affected side (all \( P < .01 \)). Furthermore, the 3-year postoperative CPH and ULH ratio of UCL/UCLA was significantly larger than that at 1 month postoperatively, demonstrating the long lip (\( P < .01 \)). In the NA group, the NBH, CBH, and CPH ratios of both UCLP and UCL/UCLA did not show significant differences between 1 month and 3 years postoperatively.

Conclusion: Upward advancement of the nasolabial components prevents postoperative long lip.

KEY WORDS: unilateral cleft lip, nasolabial drooping, long lip
the alar base of the lateral lip in the case of an incomplete cleft (Brauer, 1978; Nakakita et al., 1999). It is also recommended to undermine the surrounding tissues of the piriform margin and reposition the orbicular oris muscle in the case of a wide complete cleft (Sugihara et al., 1988). However, no reports have described objective results of successful prevention of postoperative long lip by adopting certain surgical procedures.

When considering the pathology of UCL, the facial skeleton on the cleft side is dislocated into the more inferior, distal, and posterior position than that on the noncleft side (Markus and Delaire, 1993). All nasolabial components including nasal cartilage, the nasalis and orbicularis oris muscles, subcutaneous tissue, skin, and lining mucosa also dislocate three-dimensionally by attaching to the dislocated skeletal framework. If cleft lip is repaired by advancing the labial components without repairing the nasal tissue location, soft tissues may accumulate around the junction between the nasal and labial tissue around the nasal base and may cause relapse into the original position of the affected side. Therefore, we thought that it was necessary to undermine the surrounding tissues of the piriform margin and advance the nasolabial tissue on the affected side simultaneously into the upward, medial, and anterior position, recovering the symmetry of the nasalis and the orbicular oris muscles to prevent postoperative long lip following primary UCL repair in all types of UCL.

In this study, postoperative changes in nasolabial forms were longitudinally measured between the subjects who underwent UCL repair with or without upward advancement of the nasolabial components. The usefulness of simultaneous advancement of the nasolabial components for prevention of postoperative long lip was analyzed in unilateral cleft lip and palate (UCLP) and unilateral cleft lip solely as well as cleft lip and alveolus (UCL/UCLA).

Patients and Methods

Patients

Data were obtained from the records of Kagoshima University Medical and Dental Hospital and Kyushu University Dental Hospital. The institutional review boards at Kagoshima University Medical and Dental Hospital and at Kyushu University Medical and Dental Hospital approved the protocol of this study.

In this study, 43 consecutive subjects who underwent primary UCL repair in Kagoshima University Medical and Dental Hospital between 2006 and 2008 were enrolled. The sample included 24 subjects with UCLP and 19 subjects with UCL/UCLA. These subjects underwent UCL repair at a body weight of about 6 kg using Cronin’s triangular-flap technique with simultaneous upward advancement of the nasolabial components by a single surgeon (nasolabial advancement [NA] group; Table 1).

Presurgical Treatment

Nasoalveolar molding (NAM) was combined from birth to lip repair in all UCLP subjects in two groups (the NA group and the LA group). With regard to UCL/UCLA, NAM was not used in two groups (the NA group and the LA group). Our NAM protocol consisted of the use of Hotz’s plate and a nasal stent at the anterior part of the plate (Grayson et al., 1999; Nakamura et al., 2009). The staff that managed Hotz’s plates and NAM differed between the two groups because the groups were treated at different times and institutions, but the alveolar arch growth was the same and in accordance with the original method reported by Hotz and Gnoiski (1976).

Surgical Procedures

NA Group

Details of the step-by-step surgical procedures for primary cleft and nose correction in the NA group were as follows (Figs. 1 and 2):

1. The skin incision was made according to Cronin’s triangular-flap technique, and a triangular skin flap was designed 1 mm above the peak of Cupid’s bow (Fig. 1a).
2. The intercartilaginous incision reached the top of the nasal dome, and the lateral crura of the lower lateral cartilage were freed (Figs. 1b and 2a). Through the oral and nasal vestibular incision, nasal undermining of the surroundings of the piriform margin and the lower border of the upper lateral cartilage on the cleft side was performed. These dissections achieved repositioning of the nasalis and the orbicular oris

### TABLE 1 The 173 Patients Who Underwent Nasolabiaplasty by Cronin’s Methods With or Without Upward Advancement of the Nasolabial Components

<table>
<thead>
<tr>
<th>Group</th>
<th>Surgical Method</th>
<th>Type of Cleft</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasolabial</td>
<td>With upward advancement of the nasolabial components</td>
<td>UCLP</td>
<td>24</td>
</tr>
<tr>
<td>LA</td>
<td>advancement of the nasolabial components</td>
<td>UCL/UCLA</td>
<td>19</td>
</tr>
<tr>
<td>(NA)</td>
<td>Total</td>
<td></td>
<td>43</td>
</tr>
<tr>
<td>Labial</td>
<td>Without upward advancement of the nasolabial components</td>
<td>UCLP</td>
<td>16</td>
</tr>
<tr>
<td>(LA)</td>
<td>advancement of the nasolabial components</td>
<td>UCL/UCLA</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

Thirty consecutive subjects who underwent primary UCL repair at Kyushu University Dental Hospital between 1993 and 1995 were used as a control group. This group included 16 UCLP and 14 UCL/UCLA subjects. These subjects underwent primary UCL repair by the same Cronin’s triangular-flap technique without upward advancement of the nasolabial component by a single surgeon (labial advancement [LA] group; Table 1).
FIGURE 1  Step-by-step procedure for simultaneous correction of primary unilateral cleft lip repair. a: Design of skin incision by Cronin's technique. b: The intercartilaginous incision. c: Three-dimensional upward advancement of the nasolabial component. d: Raw surface was covered with bilateral hinged cleft margin flaps. e: Postoperative frontal view. f: Frontal view at 3 months postoperatively.

FIGURE 2  Schematic demonstration of correction of primary unilateral cleft lip repair. a: The intercartilaginous incision. b: Three-dimensional upward advancement of the nasolabial component. c: Raw area is covered with bilateral hinged cleft margin flaps. d: Orbicular oris muscle was reconstructed by different techniques (overlapping, interdigitation, edge-to-edge suturing).
muscles and facilitated the three-dimensional upward (cephalad) advancement of the nasolabial components (Figs. 1c and 2b; Nakamura et al., 2009).

3. The stay suture to fix the highest point of the nasal alar groove was made by through-and-through suturing using absorbable thread after upward advancement of the nasolabial component. The defect of the lining of the nasal vestibule caused by upward advancement of the nasal component was covered using bilateral upper-based hinged-cleft margin flaps, depending on the extent of the raw area (Figs. 1d and 2c; Tajimi, 1983). For the incomplete cleft lip patients, a free cleft margin flap was used to reconstruct the raw area caused by upward advancement.

4. For reconstruction of the orbicular oris muscle, the pars peripheralis and the pars marginalis were connected individually in different manners: overlapping, interdigation, and edge-to-edge suturing, as shown in Figure 2d. The edge of the nasalis muscle was connected at the bottom of the nostril floor.

5. Subcutaneous and cutaneous suturing was carried out carefully, and the height of Cupid’s peak on the affected side was established as approximately 0.5 mm shorter than that on the unaffected side immediately after the operation (Fig. 1e). At 3 months postoperatively, the position of the nasal alar base and Cupid’s peak on the affected side was symmetric to that on the unaffected side (Fig. 1f).

LA Group

The surgical design and reconstruction method for the orbicular oris muscle in the LA group were the same as those in the NA group. Although the orbicular oris muscle was thoroughly detached from the oral vestibular incision to perform LA, the nasalis muscle and lateral cartilage remained intact in the LA group. The height of Cupid’s peak on the affected side was established as approximately 0.5 mm shorter than that on the unaffected side immediately after the operation, as in the NA group.

Surgeons

Two surgeons were selected to be in charge of the NA and LA groups. Two surgeons were affiliated with Kyushu University, where surgery for the LA group was performed at the same time, and they performed treatment for patients in the LA group together between 1993 and 1995. One of them was transferred to Kagoshima University in 2005 and has been in charge of NA group patients since 2006. Therefore, they used the same method of orbicular oris muscle reconstruction.

FIGURE 3 Assessment of the position of nose and lip using color photos (available online). The height of the nasal alar base, the distance between the baseline, the line containing both medial angles, and the nasal alar base were measured on the affected side (A’) and nonaffected side (A). The height of the columella base was measured on the affected side (B’) and nonaffected side (B). The height of Cupid’s peak was measured on the affected side (C’) and nonaffected side (C). The nasal alar base height ratio (A’/A × 100), the columellar base height ratio (B’/B × 100), and Cupid’s peak height ratio (C’/C × 100) were calculated.

Longitudinal Assessment of the Lip and Nose Forms Using Serial Color Photos

All patients were followed for more than 3 years postoperatively. Digital data of photos of the frontal view taken serially at 1 month, 6 months, 1 year, 2 years, and 3 years postoperatively were used for two-dimensional analyses of the lip and nose forms. Color photos of the front view of the patients were taken by experienced staff of the Cleft Lip and Palate Team at both Kagoshima University Hospital and Kyushu University Hospital from the center of the face as well as possible. The digital data of the color photos were stored on a personal computer and measured using 3D Rugle V software (Medic Engineering Co., Kyoto, Japan).

Measurement

Nasal Alar Base Height Ratio

The vertical height of the nasal alar base, the distance between the line containing both medial ocular angles and the nasal alar base, was measured on the affected side (A’) and the nonaffected side (A; Fig. 3). The nasal alar base height (NBH) ratio (A’: affected side/A: nonaffected side ×100) was calculated. A value of 100 indicates symmetry, and a value of more than 100
indicates drooping of the nasal alar base on the affected side.

**Columellar Base Height Ratio**

The vertical height of the columellar base, the distance between the line containing both medial ocular angles and the columellar base, was measured on the affected side (B) and the unaffected side (B; Fig. 3). The columellar base height (CBH) ratio (B: affected side/B: unaffected side ×100) was calculated. A value of 100 indicates symmetry, and a value of more than 100 indicates drooping of the columellar base on the affected side.

**Cupid’s Peak Height Ratio**

The vertical height of Cupid’s peak, the distance between the line containing both medial ocular angles and Cupid’s peak, was measured on the affected side (C) and the unaffected side (C; Fig. 3). The Cupid’s peak height (CPH) ratio (C: affected side/C: unaffected side ×100) was calculated. A value of 100 indicates symmetry, and a value of more than 100 indicates the descent of Cupid’s peak and a long lip on the affected side.

**Upper Lip Height Ratio**

The distance between the point of the columellar base and the point of Cupid’s peak was measured on the affected side (D) and the unaffected side (D; Fig. 3). The upper lip height (ULH) ratio (D: affected side/D: unaffected side ×100) was calculated. A value of 100 indicates symmetry, and a value of more than 100 indicates overextension of upper lip length and a long lip on the affected side.

**Statistical Analyses**

For statistical analyses, the Mann-Whitney U test was used to compare mean values of the measurements of NBH, CBH, and CPH ratios between 1 month postoperatively and each of the other postoperative stages in each group. These mean values were also compared between the NA and LA groups at 3 years postoperatively. The significance of differences was accepted when the P value was <.01.

**RESULTS**

**Longitudinal Changes in the NBH, CBH, CPH, and ULH Ratios Between the NA and LA Groups**

Tables 2, 3, 4, and 5 show the results of comparisons of the NBH, CBH, CPH, and ULH ratios at the five postoperative stages in the NA and LA groups. Figures 4 and 5 depict the changes in the NBH, CBH, CPH, and ULH ratios at the five postoperative stages of both UCLP and UCL/UCLA.

**NBH Ratio**

In UCLP, the NBH ratio in the NA group did not demonstrate significant differences between 1 month and each of the four other postoperative stages (Table 2; Fig. 4a). The NBH ratio in the LA group was significantly greater at 6 months postoperatively (103.0 ± 1.35) than at 1 month postoperatively (101.1 ± 1.39), demonstrating the drooping of the nasal alar base.

### Table 2: Result of the Nasal Alar Base Height Ratio (NBH Ratio) Between the NA Group and LA Group

<table>
<thead>
<tr>
<th></th>
<th>NA Group</th>
<th></th>
<th>LA Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 mo Postop</td>
<td>6 mo Postop</td>
<td>1 y Postop</td>
<td>2 y Postop</td>
</tr>
<tr>
<td>UCLP</td>
<td>98.8 ± 3.24</td>
<td>100.0 ± 2.70</td>
<td>99.7 ± 2.65</td>
<td>99.8 ± 1.76</td>
</tr>
<tr>
<td>UCL/UCLA</td>
<td>100.5 ± 3.65</td>
<td>100.6 ± 2.69</td>
<td>100.5 ± 2.06</td>
<td>99.6 ± 1.70</td>
</tr>
</tbody>
</table>

* Comparison between 1 month postoperation and each postoperative stage in the same group, P < .01.  
† Comparison between the NA group and LA group at 3 years postoperation in the same cleft type, P < .01.

### Table 3: Result of the Columellar Base Height Ratio (CBH Ratio) Between the NA Group and LA Group

<table>
<thead>
<tr>
<th></th>
<th>NA Group</th>
<th></th>
<th>LA Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 mo Postop</td>
<td>6 mo Postop</td>
<td>1 y Postop</td>
<td>2 y Postop</td>
</tr>
<tr>
<td>UCLP</td>
<td>101.0 ± 1.87</td>
<td>101.7 ± 1.52</td>
<td>100.9 ± 1.41</td>
<td>100.7 ± 1.51</td>
</tr>
<tr>
<td>UCL/UCLA</td>
<td>100.4 ± 1.54</td>
<td>100.7 ± 1.22</td>
<td>100.7 ± 0.85</td>
<td>100.4 ± 0.69</td>
</tr>
</tbody>
</table>

* Comparison between 1 month postoperation and each postoperative stage in the same group, P < .01.  
† Comparison between the NA group and LA group at 3 years postoperation in the same cleft type, P < .01.
**TABLE 4** Result of the Cupid’s Peak Height Ratio (CPH Ratio) Between the NA and LA Group

<table>
<thead>
<tr>
<th></th>
<th>NA Group</th>
<th></th>
<th>LA Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 mo Postop</td>
<td>6 mo Postop</td>
<td>1 y Postop</td>
</tr>
<tr>
<td>UCLP</td>
<td>97.6 ± 1.64</td>
<td>99.9 ± 1.14</td>
<td>100.1 ± 1.08</td>
</tr>
<tr>
<td>UCLP/UCLA</td>
<td>98.4 ± 2.00</td>
<td>100.2 ± 1.51</td>
<td>100.6 ± 1.49</td>
</tr>
</tbody>
</table>

* Comparison between 1 month postoperation and each postoperative stage in the same group, \( P < .01 \).
† Comparison between the NA group and LA group at 3 years postoperation in the same cleft type, \( P < .01 \).

In UCLP, the CPH ratio in the NA group did not demonstrate significant differences between 1 month and each of the four other postoperative stages (Table 4; Fig. 4c); these differences were maintained 3 years postoperatively. When the CPH ratio in UCLP was compared between the NA and LA groups at 3 years postoperatively, the LA group (103.5 ± 0.51) was significantly greater than the NA group (100.0 ± 0.82; \( P < .01 \); Table 4; Fig. 5c).

**TABLE 5** Result of the Upper Lip Height Ratio (ULH Ratio) Between the NA and LA Group

<table>
<thead>
<tr>
<th></th>
<th>NA Group</th>
<th></th>
<th>LA Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 mo Postop</td>
<td>6 mo Postop</td>
<td>1 y Postop</td>
</tr>
<tr>
<td>UCLP</td>
<td>96.7 ± 3.30</td>
<td>99.3 ± 2.26</td>
<td>100.4 ± 2.22</td>
</tr>
<tr>
<td>UCLP/UCLA</td>
<td>97.0 ± 4.36</td>
<td>99.8 ± 2.44</td>
<td>100.8 ± 1.80</td>
</tr>
</tbody>
</table>

* Comparison between 1 month postoperation and each postoperative stage in the same group, \( P < .01 \).
† Comparison between the NA group and LA group at 3 years postoperation in the same cleft type, \( P < .01 \).
In UCLP, the ULH ratio in the NA group at 1 year postoperatively (100.4 ± 2.22) was significantly greater than that at 1 month postoperatively (96.7 ± 3.30), changing from a short lip on the affected side to almost symmetrical upper lip heights \( (P < .01; \text{Table 5; Fig. 4d}) \); these differences were maintained 3 years postoperatively. The ULH ratio in the LA group at 2 years postoperatively (100.5 ± 0.72) was significantly greater than that at 1 month postoperatively (98.8 ± 0.98), demonstrating a change from a short lip on the affected side to almost symmetrical upper lip heights \( (P < .01; \text{Table 5; Fig. 4d}) \); these differences were maintained 3 years postoperatively. The ULH ratio in UCLP at 3 years postoperatively did not show any significant differences between the NA group (100.5 ± 2.38) and the LA group (100.8 ± 0.67; Table 5; Fig. 4d).

In UCLA/UCL, the ULH ratio in the NA group at 1 year postoperatively (100.8 ± 1.80) was significantly greater than that at 1 month postoperatively (97.0 ± 4.36), changing from a short lip on the affected side to almost symmetrical upper lip heights \( (P < .01; \text{Table 5; Fig. 4d}) \); these differences were maintained 3 years postoperatively. The ULH ratio in the LA group at 1 year postoperatively (103.1 ± 0.78) was significantly greater than that at 1 month postoperatively (100.2 ± 0.58), changing from almost symmetrical upper lip heights to a long lip on the affected side \( (P < .01; \text{Table 5; Fig. 5d}) \); these differences were maintained 3 years postoperatively. When the ULH ratio in UCL/UCLA was compared between the NA and LA groups at 3 years postoperatively, that of the LA group (103.3 ± 0.68) was significantly greater than that of the NA group (100.9 ± 1.42; \( P < .01; \text{Table 5; Fig. 5d}) \).

**DISCUSSION**

There are several reasons for postoperative long lip following primary UCL repair, such as (1) the lateral lip length of the affected side tends to be longer than that of the nonaffected side in the preoperative stage (Brauer, 1978; Nakakita et al., 1999), (2) the intraoperative design sometimes involves a triangular flap that is too wide (Sugihara et al., 1988, 1993), (3) there is postoperative overgrowth of the lip on the affected side (Kaplan, 1978),
and (4) there is postoperative nasolabial drooping on the affected side (Sawhney, 1972; Sugihara et al., 1988; Nakakita et al., 1999). However, as far as we know, there are no reports describing the objective results of successful prevention of postoperative long lip by adopting certain surgical procedures.

When considering the pathology of UCLP, the facial skeleton on the cleft side is dislocated to a more inferior, distal, and posterior position than that on the noncleft side. All nasolabial components including nasal cartilage and the nasalis and orbicularis oris muscles dislocate three-dimensionally (Fig. 6; Markus and Delaire, 1993). Figure 7 shows images of incomplete UCL and UCLA. Attachment of the nasal alar base to the upper edge of the nasalis muscle on the cleft side was sagged compared with the noncleft side for both incomplete UCL (Fig. 7a) and UCLA (Fig. 7b). Therefore, we thought that postoperative long lip following primary UCL repair could not be prevented if nasolabial components including nasal cartilage and the nasalis and orbicularis oris muscles on the cleft side were not recovered to the same position as on the noncleft side in all cleft types. In fact, in this study, the LA group demonstrated postoperative long lip in both UCL/UCLA and UCLP.

![FIGURE 5](image1.png) Result of comparing the height ratio between the NA group and LA group in UCL/UCLA. a: The nasal alar base height ratio (NBH ratio). b: The columellar base height ratio (CBH ratio). c: The Cupid’s peak height ratio (CPH ratio). d: The upper lip height ratio (ULH ratio). *Comparison between 1 month postoperation and each postoperative stage in the same group, \( P < .01 \). *Comparison between the NA group and LA group at 3 years postoperation in the same cleft type, \( P < .01 \).

Although UCL/UCLA in the LA group did not exhibit drooping of the nasal alar base and columna base on the affected side, the descent of Cupid’s peak and overextension of upper lip length on the affected side were shown postoperatively. Accordingly, the drooping of the excessive orbicular oris muscle on the affected side might have brought about postoperative long lip in the LA group.

On the other hand, UCLP in the LA group indicated the drooping of both the nasal alar base and the descent of Cupid’s peak on the affected side postoperatively. This is

FIGURE 7  Preoperative basal view in incomplete UCL and UCLA patients. a: Incomplete UCL patient. b: Incomplete UCLA patient.

FIGURE 8  Pre- and postoperative patients who underwent upward advancement of the nasolabial component. a: Preoperative basal view in incomplete UCL. b: Postoperative basal view 3 years postoperatively in incomplete UCL. c: Preoperative basal view in complete UCLP. d: Postoperative basal view at 3 years postoperatively in complete UCLP.
because the lower lateral cartilage and the nasalis muscle on the affected side did not undergo reconstruction at the correct position; as a result, drooping of the nasolabial tissues on the affected side caused postoperative long lip.

In this study, we performed three-dimensional upward (cephalad) advancement of the nasolabial components using bilateral upper-based hinged cleft margin flaps to cover the defect of the lining of the nasal vestibule (Nakamura et al., 2009; Fuchigami et al., 2014). Figure 8 shows pre- and postoperative basal views of a male patient with incomplete UCL (Fig. 8a and 8b) and complete UCLP (Fig. 8c and 8d) who underwent primary UCL repair with advancement of the nasolabial components. The positions of the nasal alar base, the columellar base, and Cupid’s peak remained symmetrical 3 years after surgery. As such, in subjects in whom upward advancement of the nasolabial components has been undertaken, postoperative long lip could be prevented on the affected side in UCL/UCLA, and postoperative drooping of the nasal alar base and the columellar base and postoperative long lip could be prevented on the affected side in UCLP. Furthermore, in our recent study, upward advancement of the nasolabial components for UCLP facilitated the forward molding of the maxilla, resulting in a more symmetrical alveolar arch form (Fuchigami et al., 2014).

Although there are several limitations to this study, it is the first reported study to have achieved successful prevention of long lip following primary UCL repair. The major limitations of this study are that the subjects of the NA and LA group were from the different institutions and the surgeons differed between the two groups. Both of the surgeons were affiliated with Kyushu University between 1993 and 1995, when surgeries for the LA group were performed, and they conducted the surgeries together. The LA group showed postoperative long lip in all cleft types, as shown in the results. To prevent postoperative long lip, the surgeon transferred to Kagoshima University in 2005 performed surgery to add upward advancement in the NA group. There was a long surgical interval between the two groups. However, the surgical procedures, including surgical design and muscle reconstruction, of the two surgeons were the same, excluding whether or not upward advancement of the nasolabial components was performed. Therefore, it is reasonable to compare these two groups. Another limitation is that the postoperative 3-year follow-up in this study was not long, since facial growth gradually continues until the end of adolescence. However, it has been reported that drooping of the lip was demonstrated from 6 months until 1 year postoperatively, and it is rare for drooping of the lip to be demonstrated more than 1 year postoperatively (Sawhney et al., 1972; Kaplan, 1978; Saunders et al., 1986). Actually, in this study, drooping of the nasal alar base and the columellar base in the LA group appeared at about 6 months postoperatively, and drooping of Cupid’s peak in the NA and LA groups appeared at 6 months and 1 year after operation, respectively; these situations were maintained at 3 years postoperatively. Therefore, it is thought that the postoperative 3-year follow-up in this study is significant and useful.

**CONCLUSIONS**

Upward advancement of the nasolabial components at UCL repair prevents postoperative nasolabial drooping and long lip in all unilateral cleft types.

**REFERENCES**


