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Reduced nasal growth after primary nasal repair combined with cleft lip surgery



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KEYWORDS

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Summary Nasal growth after cleft lip surgery with or without primary nasal repair was evaluated using lateral cephalograms. In 14 patients who underwent simultaneous nasal repair with primary cleft lip repair and 12 patients without simultaneous nasal repair, lateral cephalograms were obtained at 5 and 10 years of age. Lateral cephalograms of normal Japanese children were used as a control. At 5 years of age, there were significant differences in the nasal height and columellar angle among the three groups. Children without simultaneous nasal repair had shorter noses with more upward tilt of the columella compared with the controls, while children with simultaneous nasal repair had much shorter noses and more upward tilt than those without repair. At 10 years of age, the children without simultaneous nasal repair showed no differences from the control group, while those with simultaneous repair still had shorter noses and more upward tilt of the columella. These findings suggest that performing nasal repair at the same time as primary cleft lip surgery has an adverse influence on the subsequent growth of the nose.

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Introduction

In 1993, Nakajima and Yoshimura (one of the present authors) reported a method for the primary repair of unilateral cleft lip combined with the primary correction of the

nasal deformity.¹ The procedure was designed to create an almost straight suture line in order to avoid a transverse scar running along the nasal floor. To bury the suture, the needle was run out and in through the same site on the alar skin. Long-term postoperative observation revealed that the noses of patients undergoing this combined repair procedure did not grow normally, and the tip of the nose moved upward as they became older.

When we compared nasal growth at 5 years of age between children undergoing this procedure and a normal control group of the same age, the two groups showed a significant difference in the vertical growth of the nose on

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Table 1 Distribution of evaluated cases. All cleft cases are unilateral. C = Complete cleft, IC = Incomplete cleft, L = lip, A = alveolus, P = palate.

cleft types		Male 8	Female 6	Total 14
NR+	CLAP	3	2	5
	ICLAP	0	1	1
	CLA	2	1	3
	ICLA	2	2	4
	CLA + soft palate cleft	1	0	1
	ICL + complete cleft palate	0	0	0
cleft types		Male 8	Female 4	Total 12
NR-	CLAP	5	2	7
	ICLAP	1	0	1
	CLA	1	2	3
	ICLA	0	0	0
	CLA + soft palate cleft	0	0	0
	ICL + complete cleft palate	1	0	1
		Male	Female	Total
normal control	5 years old	36	34	70
	10 years old	5	7	12

lateral cephalograms.² Accordingly, we stopped performing primary nasal repair at the time of initial cleft lip surgery in 1999.

Since then, some of the patients who underwent primary cleft lip repair without primary nasal repair have become >10 years old. In the present study, we conducted an analysis of nasal growth from the ages of 5–10 years in cleft lip children with and without primary nasal repair, and we compared the findings with those obtained in normal children.

Patients and methods

Patients

This study enrolled patients born between February 1993 and September 2000 who underwent primary cleft lip repair at our hospital, and they were followed up until 10 years of age. All the patients were Japanese. The cleft types are shown in Table 1. Patients with syndromes and those with severe complications were excluded. This study was

performed according to the tenets of the Declaration of Helsinki, and it received approval from our institutional ethics committee. Because it was difficult to take an adequate standard profile photograph of young children in our outpatient department, we used lateral cephalograms for analysis, which were taken at 5 and 10 years of age during routine outpatient visits.

Cephalograms of the following three groups were analyzed retrospectively: cleft lip patients with primary nasal repair (NR+), cleft lip patients without primary nasal repair (NR-), and normal control children. Only patients who underwent nasal repair by the “inverted trapezoid suture” method described by Nakajima³ (Figure 1) were selected for the NR+ group, while the cephalograms of normal Japanese children were kindly provided by an orthodontist (Dr. K. Sabashi, Private Practitioner). All measurements were made manually by one examiner (Y.I.) using a standard ruler and a protractor.

In addition to changing our nasal repair procedure in 1999, we altered the method of lip repair because of the lack of a nostril sill, but both methods of lip repair were considered to have no influence on nasal growth.

Methods

To represent nasal proportions in the frontal view, the soft-tissue outline of the face was traced on the lateral cephalogram, and projections of five points were marked on a vertical line drawn perpendicular to the Frankfort horizontal plane (Figure 2).

Point A was the point where a line passing through the basion and nasion crossed the soft-tissue margin, representing the highest point of the middle face. Point B was the most posterior point of the nasal root, indicating the highest point of the root. Point C was the most anterior point of the tip of the nose, and Point D was the base of the columella. Point E was the lower border of the upper lip, corresponding to the lowest point of the middle face.

The distances AB, BC, and CD were measured manually with a ruler to a precision of 0.5 mm, and two ratios were evaluated as follows: (1) the ratio of BC to AB (BC/AB ratio) was assessed as the ratio of the nasal length to the height of the middle face (a smaller value means a shorter nose); and (2) the ratio of CD to BC (CD/BC ratio) was also determined as the ratio of the height of the columella to the nasal dorsum from the front (a larger value means a more cranial position of the tip of the nose).

The columellar angle (α) was also measured (Figure 3). This was defined as the angle between a line drawn from



Figure 1 Schematic drawings of the method used for nasal repair. (Left) Alar skin is undermined subcutaneously through a rim incision on the healthy nostril and a reverse-U incision on the affected side. (Center) One needle pulling a nylon thread passes the bilateral lower lateral cartilages, and it goes out and back through a same needle hole to pick the upper lateral cartilage. (Right) The thread is tied beneath the nasal tip, making an inverted trapezoid.

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