CHAPTER V

DISCUSSION

The study subjects were recruited retrospectively in chronological order from the Maharaj Nakorn Chiang Mai Hospital, and Orthodontic and Pediatrics Department, Faculty of Dentistry, Chiang Mai University. Although this ensured that a complete population sample was gathered, it also meant that there would not be an equal gender split because the incidence of unilateral cleft lip and palate is not the same in both sexes.[19] In the study sample, there were thirteen male and ten female subjects, for a male:female ratio of 1.3:1, whereas the left and right cleft ratio was 2.29:1. At first glance, these ratios may seem at odds with those previously published.[19, 53] This apparent difference can be explained by the relatively small sample sizes used in this study compared with the large number of participants who were involved in the previously mentioned epidemiological studies.

To be sufficient to show any true difference in size between the two groups, there should be at least 1,060 subjects. The size of the study groups used in this investigation was statistically determined, by utilizing an independent t-test with p = 0.05 determined after the start of a pilot study. In this study, there were 12 study subjects in the one-stage group and 11 study subjects in the two-stage group. Previous research has been carried out on a varying number of participants.[16, 38, 54] The number of patients included in this study is small but can be explained by the strict application of inclusion criteria and the lack of completeness of patient records

for many potential subjects. For example, the hometowns of many of the subjects were located more than 100 kilometers from Maharaj Nakorn Chiang Mai Hospital, and many had not made repeated trips to the hospital for consecutive visits. Therefore, patients were excluded from the study if their records were not complete.

To discriminate the classification categories, the scoring system of Huddart and Bodenham[52] was preferred, as was the case in another reports.[55] This scoring system was chosen because its reliability and consistency is greater than that of a descriptive classification.[56] The severity of crossbite is taken into account in this system and it is easier than descriptive statistics for assessing the relevant data.[52]

Simultaneous repair of cleft lip and palate is not a new procedure and has been the subject of debate during the past four decades. Although the surgical combination studied here has been described before, the available scientific evidence on how it affects the outcome of treatment is sparse. Even though some studies[10-11] have not revealed comprehensive results and there has not been sufficient follow-up time to follow treatment outcomes to adylthood, enough knowledge has been accrued to compare this procedure with other approaches to cleft lip and cleft palate repair. The findings of this study indicate that one-stage (simultaneous) closure together with definite lip and palate repair showed no difference when compared to the two-stage group in terms of dento-alveolar and occlusal development at the mixed dentition stage in patients with unilateral cleft lip and palate. The results of this study agree with those of Fudalej *et al.*[57] Furthermore, they demonstrated that the dental arch relationships in patients with unilateral cleft lip and palate with a mean age 11.2 years following one-stage repair (Warsaw protocol) and two-stage repair (Oslo Cleft Team's protocol) were comparable. However, the dental arch relationships in their

study were rated using the GOSLON Yardstick, which represents the European population. Because all subjects in the current study were Thais, and because racial difference may be a factor in development, dental models were compared instead of using the GOSLON Yardstick.

Sagittal growth and sagittal arch relationship

There were no significant differences in the measurement of anterior overjet and the anterior crossbite evaluation in both groups. Although there was no statistical difference in the features of model analysis between both groups, some clinical differences were observed. The overjet and anterior crossbite scores in the one-stage group (-2.03±1.50 mm, 75%) were slightly less than those in the two-stage group (-3.57±2.69 mm, 92.9%). All central incisors in the one-stage group were in crossbite. However, 85.7% were in crossbite and 14.3% were edge-to-edge in the two-stage group. Both one-stage and two-stage repair of the upper lip caused the restriction of anterior growth and reduced upper incisor inclination. These findings agree with those of other studies that evaluated maxillofacial morphology in pre-adolescent children. Savaci et al.[5] reported that both one-stage simultaneous repair and conventional two-stage repair affected SNA and SNB angles in patients with complete unilateral cleft lip and palate to the same degree. De Mey et al.[12] found no significant difference in anterioposterior midfacial morphology between patients treated by one-stage or two-stage closure. Fudalej et al.[15] suggested that a simultaneous one-stage closure of the unilateral cleft lip and palate results in a good maxillo-mandibular relationship, with 81% of subjects having adequate overjet

Experimental and clinical studies have suggested lip surgery as a possible factor in the inhibition of anteroposterior maxillary growth seen in patients with cleft

lip and palate.[34, 58] Suri *et al.*[58] reported a sagittal deficiency in the prominence of the maxilla on the cleft side. The effects after lip repair consisted of reduction of the premaxillary anterior projection and lingual tipping of the upper incisors.[46] Garrahy *et al.*[59] also reported a prevalence of 31.3% in Class III incisor relationships (British Standards Institute classification)[60] in children with unilateral cleft lip and palate. Fudalej *et al.*[54] reported that upper incisors were retroclined by 10.7 degrees in pre-adolescent children who underwent one-stage closure. The decreased overjet and the incidence of anterior crossbite found in both groups in the current study support the findings in these studies.[46, 54, 58-59]

The transverse growth and transverse arch relationship

There was no significant difference in the evaluation of posterior crossbite in both groups. Posterior crossbite in the one-stage group was slightly less than that in the two-stage group, 75% and 78.6%, respectively. Posterior crossbites in the small lateral jaw segment in both groups occurred more frequently than they did in the large segment. The most striking observation was that the largest crossbite score was in maxillary central incisors of cleft side in both groups, and that the crossbite scores decreased by tooth type from anterior to posterior. The numbers of teeth in crossbite were slightly higher in the two-stage group for canines, first premolars or first deciduous molars and first molars than in the one-stage group. However, the numbers of teeth in crossbite were higher in the one stage group for central incisors and second premolars or second deciduous molars than in the two-stage group. Also, the findings of Smahel *et al.*[61], who evaluated the three-dimensional morphology of the palate at the permanent dentition stage of development, agree with those of this study. Smahel *et al.*[61] found that the palate in patients with unilateral cleft lip and palate was

narrower throughout its whole extent, more anteriorly than posteriorly. The reduction in arch width reached 45% between the premolars and 39% between the first molars. Moreover, the anterior and posterior arch widths were similar in both groups. It indicated that separation of lip and palate repair, or combination of those two structures had no effect on transverse maxillary development. However, the effect of surgical repair of lip and palate in patients with clefts was constriction of arch dimensions. This generally agrees with the findings of Derijctoke et al.[62] that cheiloplasty affected anterior arch width, whereas palatoplasty had adverse effects of varying severity on the transverse and antero-posterior arch growth. Honda et al.[63] reported, that palatoplasty performed on 4-year-old Japanese children with clefts seemed to exert an adverse effect on transverse palatal growth.[63]

The difference in timing of lip repair affected the growth of the maxilla to the same degree in both groups. In this study, the mean age of lip repair in the one-stage group was 5 months, whereas mean age in the two-stage was 15 months. The results showed that surgeons could delay the lip repair operation until 15 months of age.

There was 0.82 mm greater overbite in the one-stage group, than in the two-stage group with means of 4.29 mm. (SD=1.73) and 3.47 mm. (SD=2.59) respectively. However, the difference was not significant. The effect of surgical closure in both groups was similar. One-stage lip and palate closure had been performed in this study at 15 months of age on average. Two-stage lip and palate closure, cheiloplasty had been performed at 4 months of age, and palatoplasty had been performed at 14 months of age. This current study shows that there was no statistically difference in dental model analysis between two groups. From this result, the maxilla and surrounding structures can be waiting until 12 to 18 months of age.

Savaci *et al.*,[5] have claimed that this one-stage procedure offers several important advantages, such as less psychological trauma, low cost, and possibly an improvement in speech because of less scarred palatal fields and the low rate of occurrence of palatal fistulae. However, parents should be permitted to weigh the advantages and disadvantages of both one-stage and two-stage procedures before making their decision.

The vertical growth and vertical arch relationship

There was no significant difference in the evaluation of anterior overbite in both groups. Although there was no statistical difference in the features of model analysis between both groups, some clinical differences were observed. The anterior overbite in the one-stage group (4.29±1.73) was slightly more than those in the two-stage group (3.47±2.59 mm). In this study, the anterior overbite in both group were in normal range (3-4 mm). Casal et al.[64] reported that in unilateral complete cleft lip and palate patients, there was a decrease in molar relation and incisor overbite, an increase in facial convexity, and lower facial height. Their findings were different when compared to this study. Lesson and Trankmann[65] demonstrated that the maxilla in cleft patients showed clockwise rotation and the anterior height of mandible was increased.