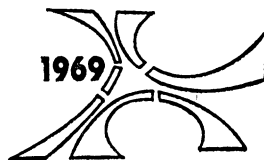


Maxillary Segmental Stability in Cleft Lip and Palate Subjects



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The value of early orthopedic treatment of cleft lip and palate, as McNeil originally described in 1954 (1), has been doubted by several authors. To ascertain the advantage, if any, of this kind of treatment, all our patients with cleft lip and palate who have been treated since 1958 were examined. For this study, only those patients treated by the same surgeon and the same orthodontist were examined in order to avoid differences in results due to variations in operative procedures by different surgeons.

The investigation should tell us about the postoperative *stability* of the cleft maxillae after presurgical orthopedic treatment, in comparison to when it is not done. We were specifically interested in the period between surgical closure of the cleft hard and soft palate at 2½ years of age and the eruption of the permanent incisors in the maxilla at 6 to 8 years. The eruption of the permanent incisors was chosen as the terminal point for this investigation, because most incisors which erupt near the cleft are in a rotated position and need orthodontic treatment.

What do we mean by stability? We chose the following criteria to judge it in a cleft palate case: a) the two or three segments must remain in correct alignment during the growth period in which we are interested, and b) the maxilla must retain its normal occlusion with the mandible. Any deviation from these two criteria was considered a sign of instability.

Material

Forty-eight cases were used in the present study and these were divided into the following 2 groups. *Group A* was comprised of 18 patients who had had no early orthopedic treatment. 15 had complete unilateral and 3 had complete bilateral clefts. In *Group B* were 30 patients who had been treated by early orthopedic means. 17 had unilateral and 13 had bilateral clefts.

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The treatment of these two groups differed considerably. The treatment of Group A was simple and schematic. a) The lip closure was done at three months of age. In bilateral clefts, the operation was done in two stages within 6 or 8 weeks of each other to avoid too much tension on the freshly operated lip. b) Closure of the hard and soft palates was provided at 2½ years. c) A full reassessment of the case was made at 5 or 6 years.

The patients of Group B were given more individual and complicated procedures. a) Early orthopedic treatment was provided to form a regular upper alveolar arch and a normal relationship between maxilla and mandible. b) Lip surgery was at 6 to 8 months. In bilateral clefts, this was done in one operation, because of the absence of tension due to good alignment of the premaxilla. c) Maintaining the form and position of the alveolar arch was accomplished by orthopedic appliances. d) Repair of the hard and soft palates was done at 2½ years. e) After palate repair, the patient was routinely observed. f) A full reassessment of the case was made at 4½ to 6 years.

Results

It was considered that instability could be assessed by examining the degree of crossbite present. The results concerning complete unilateral clefts are shown in Table 1. The comparison of Group B with Group A shows an appreciable diminution in the "crossbite on the side of the cleft" in the former group but there is also an increase in the frequency of "normal occlusion" on that side. This could possibly be due to the displacement of the two segments which also may be responsible for the small increase of "anterior crossbite" (Figure 1). The smaller segment (that is, the segment of the cleft side) is moved buccally; this prevents the later development of a crossbite of the cleft side. On the other hand, the larger segment is moved inwards, and this may cause the development of a crossbite anteriorly if the cleft is very wide. To avoid this, we now stop the inwards movement of the greater segment, when it is in a good position relative to the mandible (Figure 2). The gap remaining between the

TABLE 1. Results for complete unilateral clefts.

<i>Conditions of occlusion at age 6 to 8 years</i>	<i>group A no presurgical treatment</i>	<i>group B orthopedic presurgical treatment</i>
crossbite		
anterior.....	1	3
side of the cleft.....	9	2
side of the cleft and anterior.....	2	1
complete.....	1	2
normal occlusion.....	2	9
total.....	15	17

Orthopedic movement of segments.

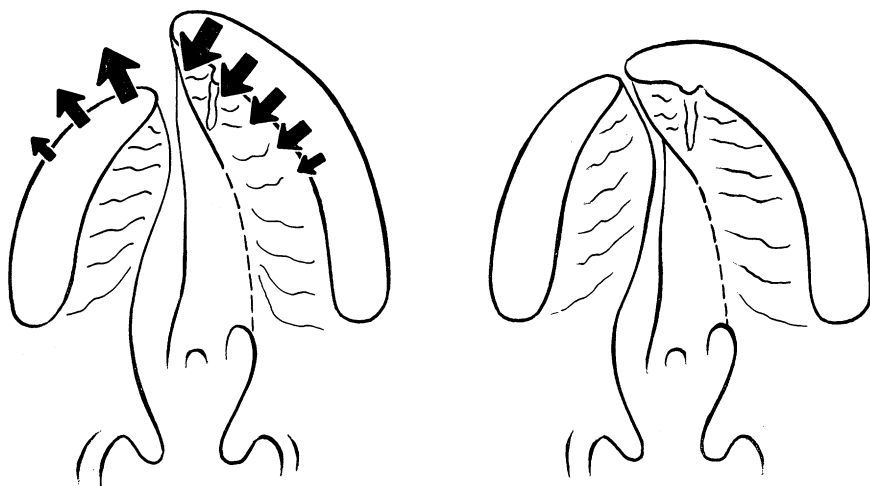


FIGURE 1. Orthopedic movement of segments in unilateral cleft lip and palate.

Orthopedic movement and bone grafting

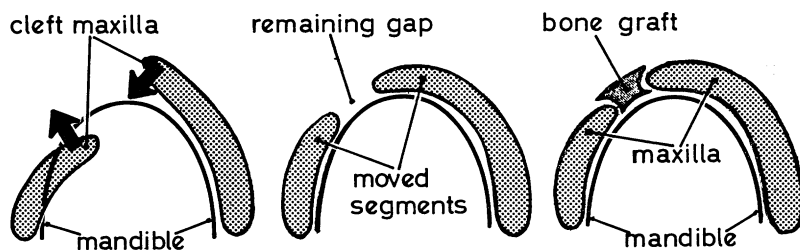


FIGURE 2. Orthopedic movement of segments and bone grafting.

two segments is actively kept open by an appropriate appliance which is introduced immediately after lip closure. Eight weeks after lip operation, a bone graft is inserted into the alveolar gap. By this combined treatment, we hope to avoid all "crossbites anteriorly" later.

We should also point out that, in many patients with minimal overbite, this treatment caused the normal occlusion to remain stable without any appliance after operation. In our opinion, this result provides good evidence that early orthopedic treatment not only brings displaced segments into good alignment, but also helps normal growth of the maxilla. On the other hand, our surgeon creates a deep upper labial sulcus during the first operation (Figure 3) to avoid pressure on the incisors and the

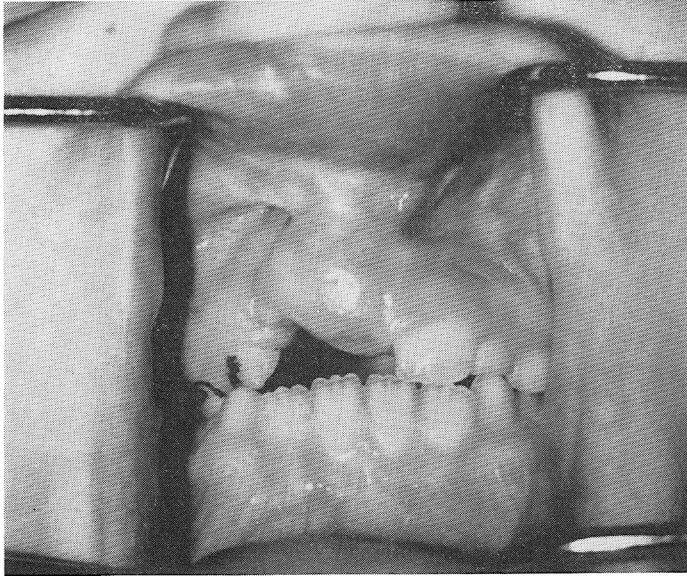


FIGURE 3. Deep upper labial sulcus, created during the first operation.

alveolar bone by the scar tissue possibly forming in the lip and fusing with the gingiva.

Table 2 shows the results obtained on bilateral clefts: out of 13 children treated by early orthopedic means, six showed a stable maxilla and therefore normal occlusion. Because there were only 3 patients in group A, however, a comparison is obviously not valid.

Summary

On the whole we think early orthopedic treatment to be successful in stabilizing the upper jaw and in preventing crossbites, even if the excessive requirements of time and costs are considered. About 55% of our cleft lip and palate patients between 8 and 10 years that have been treated by presurgical orthopedic means can subsequently be treated like children without a cleft. The only irregularities they show in their upper jaw, re-

TABLE 2. Results for bilateral clefts.

<i>condition of crossbite at 6 to 8 years</i>	<i>group A no presurgical treatment</i>	<i>group B orthopedic presurgical treatment</i>
transversal crossbite bilateral.....	2	6
crossbite front.....	—	1
normal occlusion.....	1	6
total.....	3	13

lated to their malformation, are missing or rotated incisors next to the cleft. Children without presurgical treatment always need long, complicated, and very expensive orthodontic treatment of their mixed or permanent dentition. In addition, our surgeon appreciates it because the two halves of the lip can be united without too much tension being produced by protruding alveolar segments. The cosmetic result is hence much better.

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Reference

1. McNEIL, C. K., *Oral and Facial Deformity*. London: Pitman, 1954.