

An Orthodontic Approach to the Veau Type IV Cleft Lip and Palate Problem in the Preschool Child

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Progress has been made toward solving the displaced premaxillary segment in the bilateral complete cleft lip and palate of the newborn, referred to as the Veau Type IV.¹ Acrylic retainers or activated acrylic appliances have been advocated by McNeil (4), Blair and Hardy (1), Harkins (3), and Rosenstein (5). In the past, most of the appliances have been expansion prostheses designed to reposition the premaxilla in conjunction with surgery involving the resection of the vomer and the repair of the lip.

In many cases the defect is so large that surgery is precluded or that unsatisfactory post-operative results are obtained. This is due to the wide alveolar defect and/or to the acute angle of the premaxilla in relation to the nasal floor. In many of the bilateral complete clefts, repair demands extreme stretching of the tissues and requires tremendous surgical dexterity in order to close the lip.

The literature does not contain sufficient information on repositioning of the premaxilla in this age group. The purpose of this study, then, was to determine whether orthodontic treatment prior to surgery would facilitate surgical closure of the cleft lip.

Method

An acrylic cap containing a contoured piece of .045" stainless steel orthodontic wire was fitted labially and lingually to the premaxilla. An occipital head cap was constructed for each patient and adjusted for comfort. Ortho-spec elastic traction bands numbers 5 and 6, delivering 120-150 gram loads (4 to 5 ounces), were worn bilaterally by the patient continuously until repositioning was satisfactorily accomplished (Figures 1 and 2).

Subjects for this study were three preschool Caucasian children with bilateral complete cleft palates and prepalates with vomers attached. The premaxillae were rotated moderately and protruded markedly. They ranged in age from 2 years, 6 months to 3 years, 4 months. The mesio-distal

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²Veau's Type IV classification of cleft lip and palate is an abbreviated classification for the ACPA classification of bilateral complete cleft palate and prepalate with vomer unattached: premaxilla rotated moderately — protrusion marked.

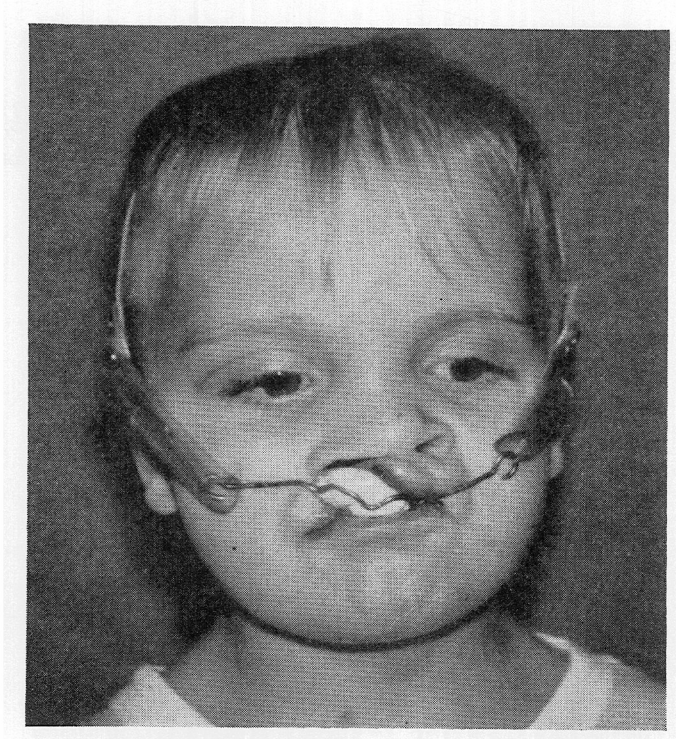


FIGURE 1. Headgear in place, frontal view.

widths of the premaxillae were equal to the cleft defect in two children, but not equal to each other. The premaxilla of the third patient was larger mesio-distally than the corresponding cleft defect. In all three cases, the premaxillae were positioned at an acute angle to the floor of the nose.

Measurement Techniques

Study casts, Kodachrome slides, and lateral cephalometric roentgenograms were taken before treatment and at three-week intervals during treatment.

The lateral roentgenograms were traced utilizing the following cephalometric landmarks which were easily visualized and highly reproducible: nasion (N), the naso-frontal suture; and sella (S), the center of sella turcica. Nasion and sella were then connected, forming the SN plane (Figure 3).

As in many clefts of the palate the outline of the nasal floor was difficult to visualize in its entirety. For this study, the SN-7° plane is used to represent a horizontal plane from which retraction of the premaxilla may be related. This plane, on the average, parallels the Frankfort Horizontal plane.

A perpendicular was constructed from the SN-7° plane to the most an-

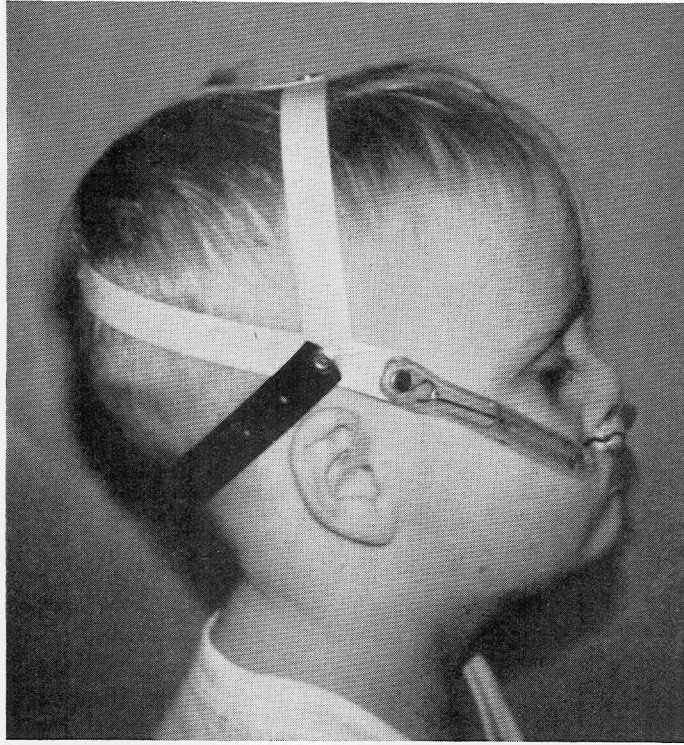


FIGURE 2. Headgear in place, lateral view.

terior aspect of the premaxilla, referred to as the anterior nasal spine (ANS). A line was drawn through the long axis of the most prominent incisor, and a perpendicular erected from SN-7° to the incisive tip.

Results

Case A required twelve weeks for retraction. The premaxilla was moved posteriorly 8 mm. The maxillary deciduous incisor was moved posteriorly 16 mm at its incisive edge. The plastic surgeons felt that with the premaxilla so positioned, surgical closure of the lip was easier (Figures 4, 5, and 6).

Case B required ten weeks for retraction, but a much smaller increment of movement was accomplished. The premaxilla moved posteriorly only 4 mm before resistance was met proximally by the maxillary halves. Tissue irritation and lack of patient cooperation prevented further orthodontic retraction. Even though there was less distal movement of the premaxilla than in case A, the plastic surgeons felt that closure of the lip was greatly facilitated by pre-orthodontic therapy.

Case C was a failure orthodontically. The premaxilla was larger than the anterior alveolar defect, and resistance from the maxillary surfaces was

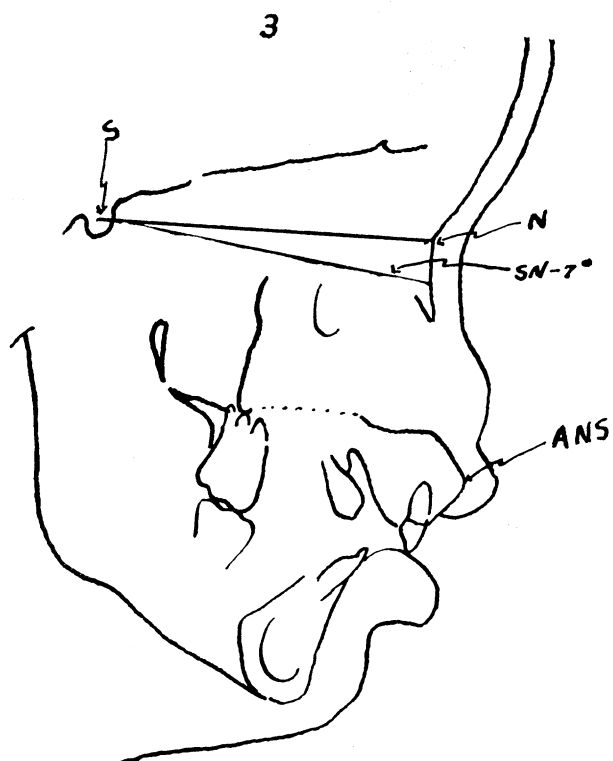


FIGURE 3. Cephalometric landmarks.

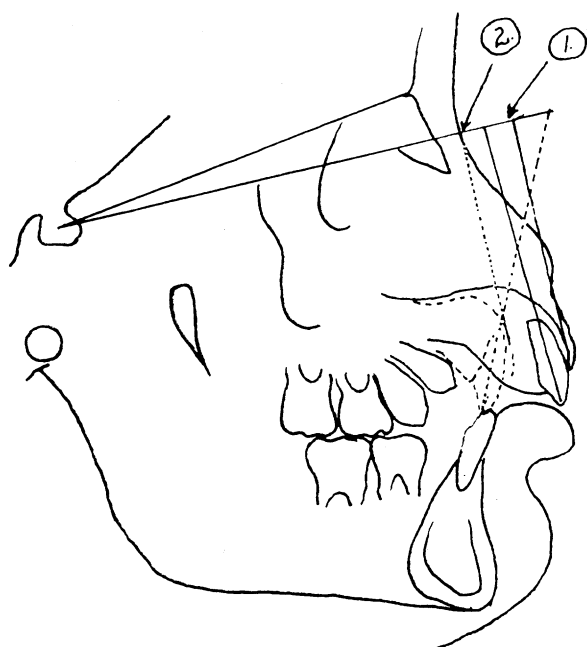


FIGURE 4. Cephalometric tracing showing retraction of premaxilla.

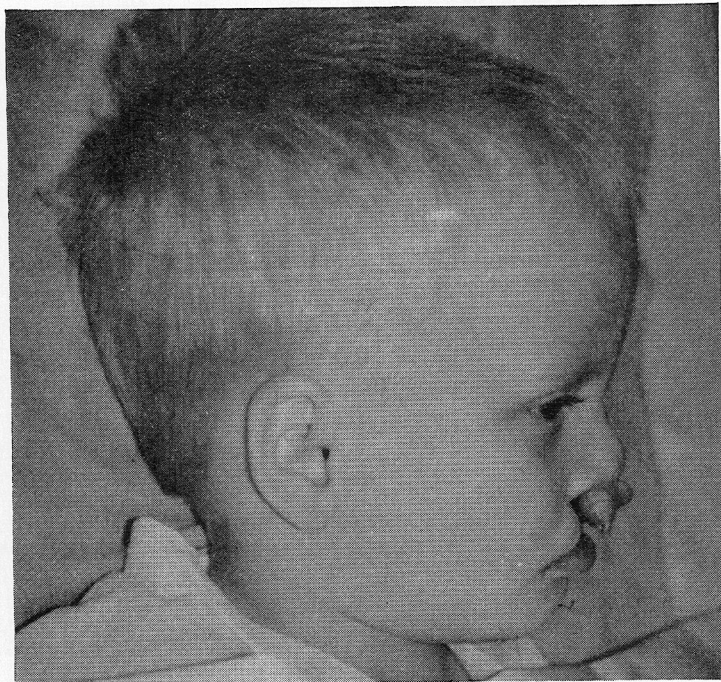


FIGURE 5. Before lip closure.

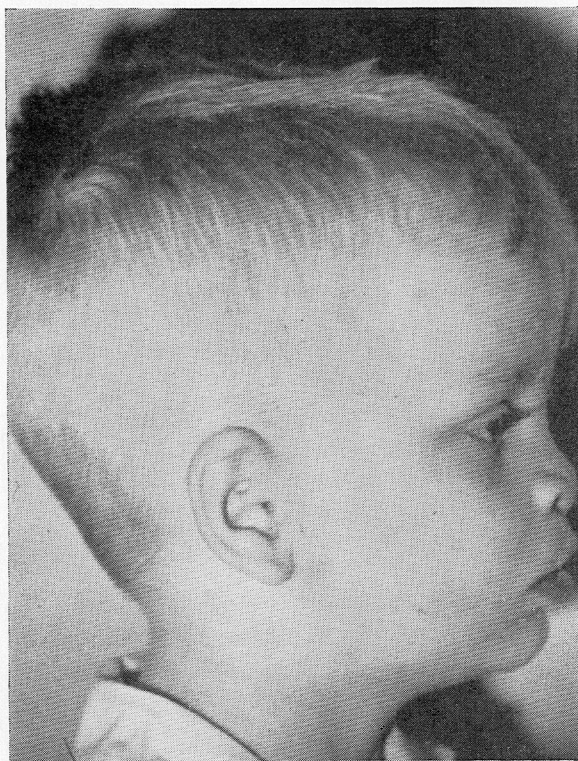


FIGURE 6. After lip closure.

too great to overcome. Closure of the lip in this case was done without orthodontic intervention. A degree of difficulty was noted by the surgeons during the operation. Clinically, the esthetic results to case A were superior to case C.

Discussion

The results do not provide an adequate basis for describing criteria which must be met to facilitate maximum success in distal movement of the premaxilla in all bilateral complete clefts of the lip and palate. It is felt that in certain cases which present premaxillae which are larger mesio-distally than the alveolar cleft defects, presurgical orthodontic therapy will fail to be of sufficient aid to the plastic surgeon prior to lip closure to justify use of the technique. The use of presurgical orthodontic therapy seems to have its best results in patients with alveolar cleft defects which are larger than, or equal to, the premaxilla's mesio-distal width. Data about the age range, type of headgear appliances, and clinical evaluation of the defect by roentgenograms and intraoral measurements must be collected and evaluated. The criteria to be used in determining clinically whether a patient with bilateral complete cleft palates and prepalates with unattached vomers will respond favorably to presurgical orthodontic therapy in retraction of the premaxilla have not yet been defined.

Summary

Three Caucasian children who had bilateral complete cleft palates and prepalates with unattached vomers were treated presurgically by orthodontic therapy. The premaxillae were retracted with the use of external Orthoband head caps and elastic traction bands. In two cases, the premaxillae were successfully repositioned making surgical closure of the lip less complicated. The third case was a failure orthodontically and surgical closure of the lip was done with difficulty. In special instances, then, presurgical orthodontic repositioning of the premaxilla greatly enhance the results of surgery of the lip.

References

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