Case Report

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This malocclusion would undoubtedly be considered as Class III, but it is not typical of the classification. Usually in this class the deformity is characterized by the enlargement and altered form of the mandible, the maxilla being comparatively normal. In this instance the maxilla was underdeveloped and continued to be distinctly retarded in comparison with a comparatively normal mandible. The disturbance in the latter was limited to defective growth in length of the ramus. The problem is interesting, as well, because of the illustration it offers of the advantage, and in some cases the necessity, of using intervals of active treatment through the development period.

History of Patient: A boy, three years and three months of age at first observation, appeared slight, active and mentally alert. He was under height and underweight and his dentition about one year behind his chronological age. The second temporary molars were just erupting. The inadequate case history recalls the earlier orthodontic concept that if the normal mechanical relation of the teeth were established, both facial and dental development would proceed normally.

Radiographic Record: When treatment was started it did not seem wise to try full mouth intra-oral films. The upper and lower incisor regions were taken intra-orally and the molar region by extra-oral plates. X-ray records were made about once a year. Only the final set are reproduced (Figure 1). Note the absence of the lower left second and third molars. Also note the character and structure of the bone and the alveolar border. In 1932, 1933 and 1934 cephalometric head plates were made. Tracings of the first and last are superimposed and shown in Figure 2. Note the absence of any nasal spine. While the mandible shows about normal growth, little if any can be seen in the maxilla.

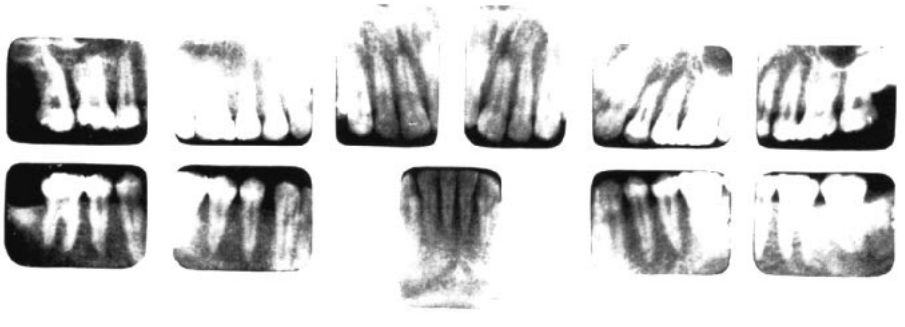

Fig. 1.—Radiograph August, 1939, seven years after treatment.

Family History: The child was of Scandinavian descent, at least on the father's side. Both parents were in good health. To casual observation the mother's denture was normal but the father's showed a marked prognathism. The detail of the occlusal relationship was not recorded for either parent. The mother, a very intelligent person, had been a trained nurse, understood professional language and was extremely cooperative.

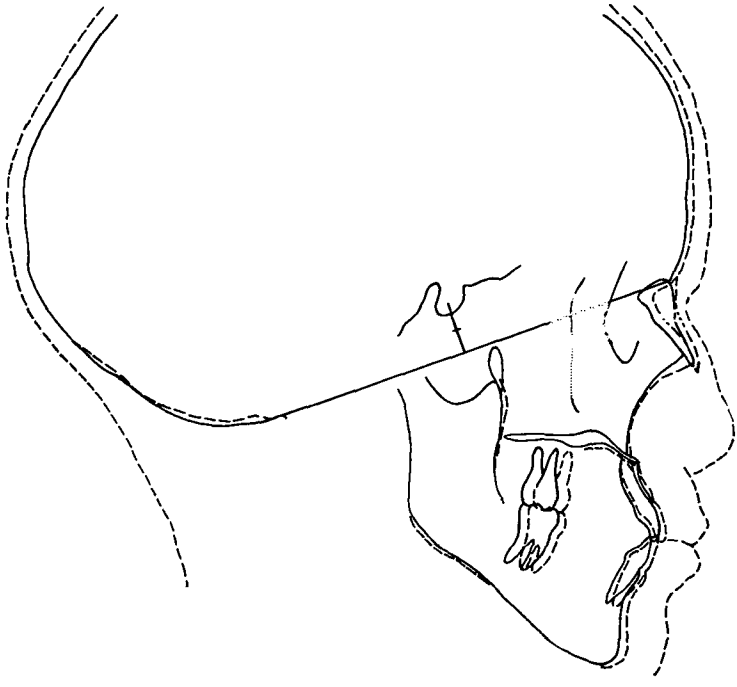

Fig. 2.—Tracing of head plates. Solid line 1932; broken line 1934. All bands were removed in 1932.

Dental and Orthodontic Examination: The head was of Nordic type and well formed. The face was oval but markedly lacking in anterior-posterior dimension in the maxillary region. The nose was distinctly flattened. This does not show in the original profile photographs (Figure 3) as the head was turned too much by the photographer, but it is very apparent in the photographs taken at the end of the first period of treatment. (Figure 4.) The lips were normal in function and muscle tone. There was a tendency to thrust the mandible forward when attention was concentrated on anything and in physical effort.

The teeth were well formed with no gross evidence of caries. The upper dental arch was flattened from cuspid to cuspid. All of the upper anterior teeth fell to the lingual of the lowers and were entirely concealed by them when the jaws were closed. (Figure 5.) Because of the inclination to thrust the lower jaw and the prognathous character of the father's mandible it was rashly assumed that the boy's prognathism was acquired by imitation and that the upper anterior teeth had erupted to the lingual of the lowers in consequence.

Fig. 3.—Photographs at the beginning of the first period of treatment.

Fig. 4.—Photographs at end of first period of treatment.

Treatment: As normal development was impossible under these conditions immediate treatment was advised and instituted on March 23, 1922, the objective being to establish normal relation of the temporary teeth as soon as possible. A full lower vulcanite splint was made which altered the occlusion so that the incisal edges of the upper incisors were on a level with the lowers. The appliance was used during mastication as well as at other times. Bands were placed on the first temporary molars and cuspids, .022 round arches were used. Gradually during treatment the vulcanite was cut away posteriorly until the temporary molars were in occlusion, the edges of the incisors being in a common plane. June 1st the splint was removed when the incisors were above the line of occlusion. The upper temporary incisors were then banded and the arch advanced at intervals of two weeks. No inter-maxillary elastics were used. Bands were removed on the 17th of July when the temporary teeth were in normal relation as shown in the second models. (Figure 6.)

In October of the same year it was noticed that while the upper incisors were still well overlapping the lowers they were showing a tendency to tip

Fig. 5.—Photographs at the time all retaining appliances were removed.

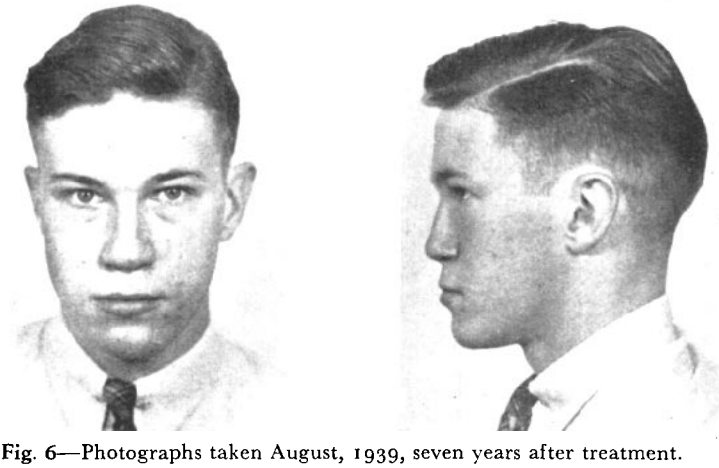

Fig. 6—Photographs taken August, 1939, seven years after treatment.

lingually and to cause the lower incisors to incline also. The maxilla continued to fall behind in development until March 12, 1924 when appliances were replaced. In a month the maxillary incisors were again brought forward and appliances were removed.

The patient was not seen again until August 27 of that year at which time the upper incisors had returned to their lingual position. On September 2nd the appliances were replaced with the clamp bands on the second temporary molars and .022 arches were used. This time Class III inter-maxillary rubbers were started at once. The bands were kept on continuously until October 21, 1926. The upper arch was stimulated intermittently, the object being to keep the upper temporary incisors developing downward and forward at an approximately normal rate. The lower arch remained continuously to prevent the under development of the maxilla from tipping the lower incisors lingually and buckling the lower incisor arc during the periods when the upper arch was not worn. In this way the integrity of the lower arch was maintained and used to stimulate the upper.

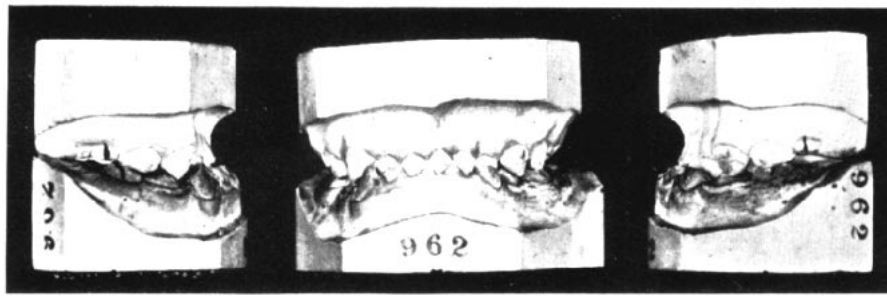

Fig. 7.—Cast at beginning of treatment.

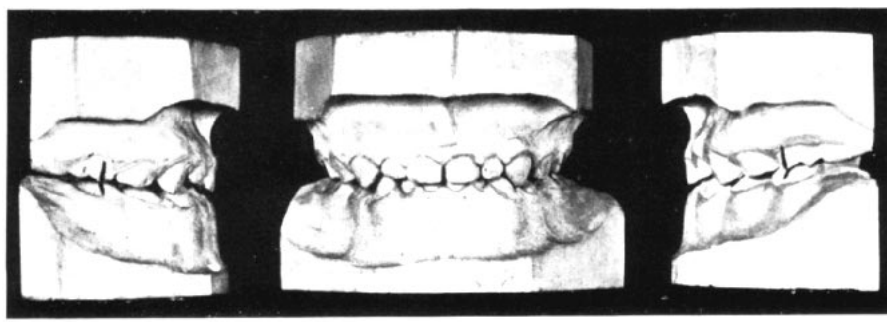

Fig. 8.—Cast at end of first period of treatment.

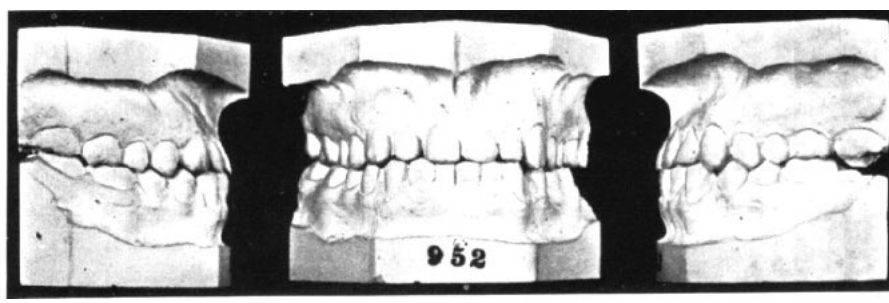

Fig. 9.—Cast in August, 1939, seven years after completion.

During this two-year period it became more and more evident that the essential factor in the case was the retarded development of the maxilla and an attempt was made to discover a cause. The possibility of pillowing habits was investigated. The mother made an accurate record of the boy's position several times each evening and in the morning for a sufficient interval to demonstrate that sleeping position was not a factor in the case.

Auxiliary History: In January, 1926 I asked that the child be taken to a pediatric clinic where a very thorough study of the case was made by the doctor in charge. I quote from his report:

The history shows that he has developed slowly in all ways except mentally. He was apparently handicapped at birth by a very difficult delivery and had a good deal of respiratory difficulty when an infant. He had nutritional disturbances even

while being breast fed, and at present is not gaining weight as rapidly as he should. A few months ago he developed a cough which at times is quite severe.

Eyes: Negative including fundus examination.

Ears: Negative.

Nose: Greatly flattened. The septum is deflected high up. The inferior turbinates are very large.

Mouth: The development of his mouth and maxilla you are familiar with.

Chest: No evidence of present or past rickets.

Percussion note is normal throughout. There is a musical murmur heard substernally which is almost humming-top type and which is accentuated on inspiration, disappears in recumbent position. There are no valvular murmurs. The blood pressure was 88 systolic and 70 diastolic in both arms. Lungs, abdomen and nervous system negative. Laboratory examination of blood, urine, X-ray of chest and sinuses were negative. The basal metabolism was normal.

The mother supplemented these findings by saying that the baby's face was terribly crushed by the forceps during delivery, especially the nose and maxilla. It is evident that if a satisfactory case history had been obtained at the beginning it would have been of considerable advantage. The findings as recorded in this examination suggest at least that the maxilla and bones of the face had never fully recovered from the birth injury and that consequently their rate of growth was less than the mandible and other bones of the head and face. The problem was now clearly defined as an attempt to stimulate the development of the bone of the maxilla, and especially the pre-maxillary portion, to assist this area in keeping up with the rate of growth of the mandible.

Management: October 26, 1926 all appliances were again removed and the case given three months of rest. During this time the upper first molars erupted in lingual occlusion. December 30, 1926 appliances were replaced with bands on the first permanent molars. By means of expansion and buccal torque these were brought into normal occlusal relation with the lower. April 21, 1927 all appliances were again removed.

A fifth period of treatment extended from May 12, 1928 to April 16, 1929 and was followed by the final use of appliances from March 30, 1932 to December 29, 1932. In these last treatment intervals the objective was to obtain as perfect interdigitation of all molars and bicuspids as possible, hoping that the adolescent growth period and the endocrine readjustment would transpire without further retardation. When all bands were removed in 1932 a vulcanite palate was used for a short time. The face is shown in Figure 7. The occlusion in August, 1939, nearly seven years after the removal of all bands, is shown in Figure 8 and Figure 9 is a photograph of the face at the same time.

Conclusions:

1. The importance of taking adequate and complete case histories is a lesson to be learned from this history.

2. Correct mechanical relation of the teeth will not always overcome the handicaps and insults to the normal developmental progress of the supporting dental framework.

3. Orthodontic treatment is a problem in development and sometimes requires mechanical therapy at repeated intervals through the period of development.

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