

Further Studies in Class II Treatment*

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A PRELIMINARY report. The Cephalometric Appraisal of Orthodontic Management of Class II Malocclusions, was published in the *Angle Orthodontist* in October 1938. The cases reported at that time were all adult dentures which had undergone long continuous treatment. The changes recorded were, for the most part, made at the beginning and at the completion of treatment. No X-rays taken during the treatment interval were included. The changes reported in our original investigation seemed to indicate that Class II and Class III cases should be treated as early as possible. Our present report embraces cases in the deciduous and mixed dentitions and is consequently in the form of a preliminary report, since management in these early years can only be considered as a treatment stage with the possibility that other periods may have to be undertaken at a later age.

In appraising the data obtained we attempted to answer certain questions which in the main were the same as those used in our preliminary report. They were:

Do we move teeth bodily or by tipping?

Can we demonstrate mesial and distal movements of buccal teeth?

In overbite cases do we depress incisors, elevate molars or both?

Do we alter the angle of the occlusal plane with or without elastics? If so, is there any change subsequent to treatment?

Do changes accompanying orthodontic management take place in the alveolar process, in the mandibular and maxillary bases, or in both?

What relation, if any, exists between the movement and the age of the patient?

Is there any correlation between the inclination of incisors and subsequent growth and development of the maxilla and mandible?

Does axial inclination, disturbed by treatment, tend to correct itself or not?

Although data was collected on all these questions some will not lend themselves to an answer at this time owing to the short treatment period.

The first case shown deals with treatment in the complete deciduous denture. The method of treatment employed in this case involved a complete strap-up with the edgewise arch mechanism, and followed that described in the writings of Drs. Angle, Brodie, Wright and others. Briefly, this consists in tipping the maxillary teeth distally to a Class I relation with the lowers

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by means of second order bends and elastics. The mandibular arch is maintained as a unit of stationary anchorage.

Case J.G., Female Class II Division I

Age at beginning of treatment, 5 years, 5 months, 17 days.

Models of case before and after treatment are shown in Fig. 1.

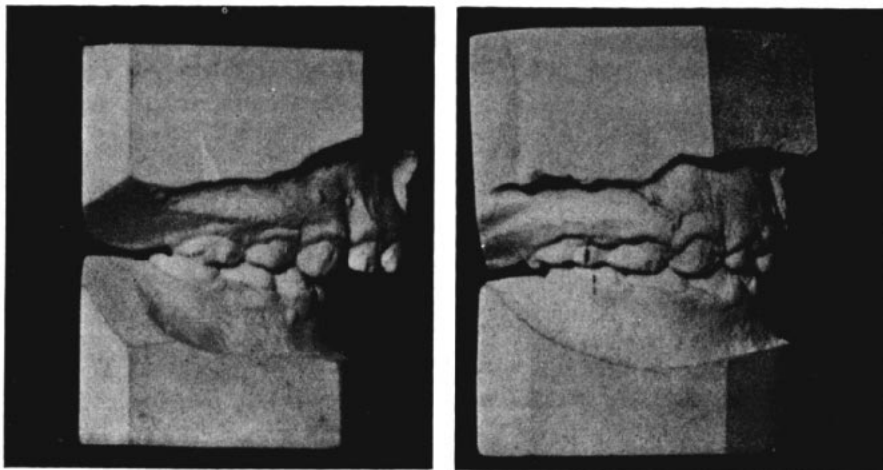


Fig. 1.—Models of case before and after treatment.

Tracings of X-rays of case before and after treatment appear in Fig. 2. Elapsed time between the two tracings is eight months and nine days.

A composite tracing of the case before and after treatment reveals the changes in the interval, Fig. 3.

This case reveals the following:

The upper second deciduous molar has moved distally and occlusally.

The lower second deciduous molar has moved considerably forward bodily, and slightly downward.

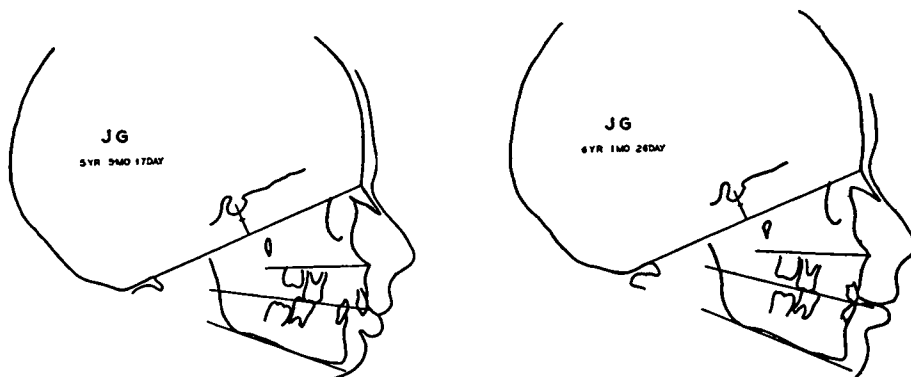


Fig. 2.—Tracings of X-rays of case before and after treatment.

The lower incisor has moved downward and forward considerably, and has tipped slightly.

The upper incisor has moved downward and lingually.

The occlusal plane has opened in front and in back and the bite has opened.

The angle of the nasal floor to the cranium has opened slightly.

The mandible has increased in height and is slightly forward, but the lower border has maintained a nearly parallel position.

The vertical dimension of the face has been considerably increased.

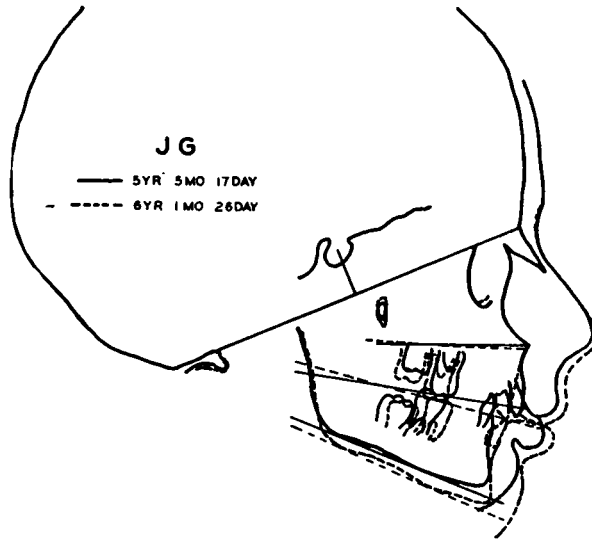


Fig. 3.—A composite tracing of the case before and after treatment.

The next group is of the mixed denture age, ranging from 6 years, 6 months, to 10 years, 9 months. Treatment methods employed here varied from the previous group.

Before going further it must be clearly understood that treatment in this group is only a preliminary stage. In all probability further treatment will be necessary at the completion of the adult denture. Mixed dentures cannot be completed in a single period of treatment since it is impossible to have control of the cuspids and bicuspid, especially the uppers. To attempt to move the entire maxillary arch distally introduces the possibility of crowding or impacting the canines. This in itself may add a new malocclusion. Consequently it was deemed advisable primarily to attempt to establish a Class I relation of the 6 year molars.

The method employed was as follows:

The mandibular arch was used chiefly for anchorage, and was either strapped up completely with the edgewise arch mechanism, or only the six anteriors and the 6 year molars were used. In the maxillary arch the method was identical with that used by Dr. Angle when he first began to tip the

maxillary molars distally, using the E arch. The maxillary 6 year molars were banded and straight sheaths to receive the round nickel-silver E arch .051" dia. were soldered on the buccal surface. No other bands were used. The arch wire, which had threaded ends and carried friction-sleeve nuts, was shaped to conform to the general arch form. It was then adjusted to lie opposite the gingival margins of the upper incisors when passive. Intermaxillary hooks were soldered opposite the deciduous cuspid areas. The arch was then placed in the tubes and advanced by turning the nuts at the 6 year molars, until it was labial to the incisors at least $\frac{1}{16}$ ". The lower arch wire was then tied in, and Class II intermaxillary elastics were worn.

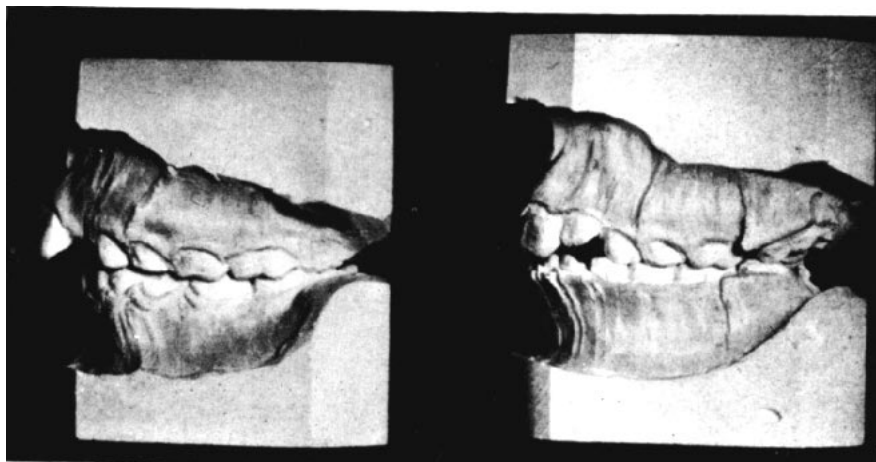


Fig. 4.—Models of case before treatment and at end of first treatment stage.

Adjustments were made at three week intervals, and consisted of re-establishing the original position of the maxillary arch wire, to increase the curve of Spee until it again came to lie opposite the gingival of the upper incisors, and to advance the arch wire $\frac{1}{16}$ " from the incisors.

A few suggestions in the handling of the upper "E" arch may be in order at this time. The arch of choice appears to be the heavy Angle E arch .051" in diameter and of nickel silver. Extreme care must be exercised in the soldering of intermaxillary hooks in order that undue heat should not be used which will destroy the temper of the arch wire and subject it to breakage. Sheath hooks which can be fastened with soft solder are more advantageous. In order for the arch wire to lie opposite the gingival of the upper incisors a bend is usually made anterior to the buccal tube when the tube is soldered parallel to the occlusal surface of the tooth. To avoid making such a sharp bend, the buccal tube may be soldered somewhat diagonally across the buccal surface so as to lie from mesio-gingival to disto-occlusal. Then an exaggerated Curve of Spee is made in the upper arch wire, beginning at the very distal end. This serves to: (1) produce a definite lever acting on the molar; (2) facilitate easier manipulation of the arch wire; (3) prevent undue breakage just in front of the tube caused by a sharp bend; (4) afford greater frictional retention of arch wire in tube.

The principle involved in the aforementioned treatment seems to be the operation of a definite lever across each 6 year molar. As the tooth moves it is tipped distally, while the mesial half goes occlusally, thereby opening



Fig. 5.—Tracings of X-rays of case before treatment and at end of first treatment stage.

the bite. The tipping back of the molars seems to carry the entire maxillary denture distally, not only resulting in a correction of the mesio-distal relationship, but a marked improvement in the arrangement of the incisors.

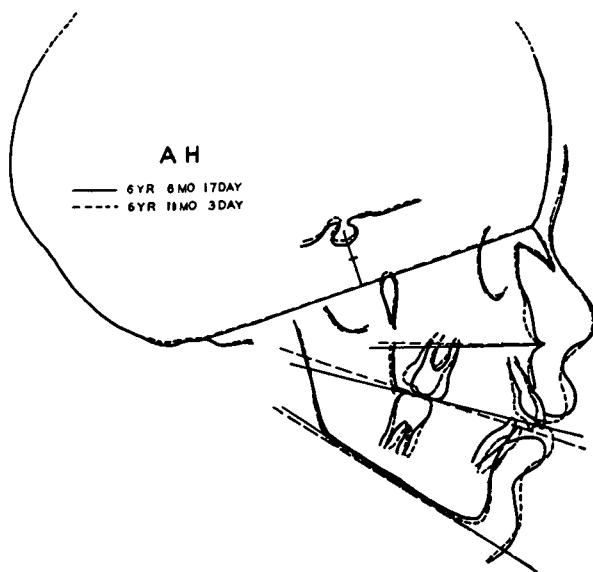


Fig. 6.—A composite of the two previous tracings.

The following cases, although treated identically, show somewhat varying results for approximately the same treatment period. However, the younger the patient, the more rapid were the changes during the same interval.

Case A.H., Female Class II Division I

Age at beginning of treatment, 6 years, 6 months, 17 days.

Models of case before treatment and at end of first treatment stage are shown in Fig. 4.

Tracings of X-rays of case before treatment and at end of first treatment stage are given in Fig. 5. Elapsed time between the two tracings is about five months.

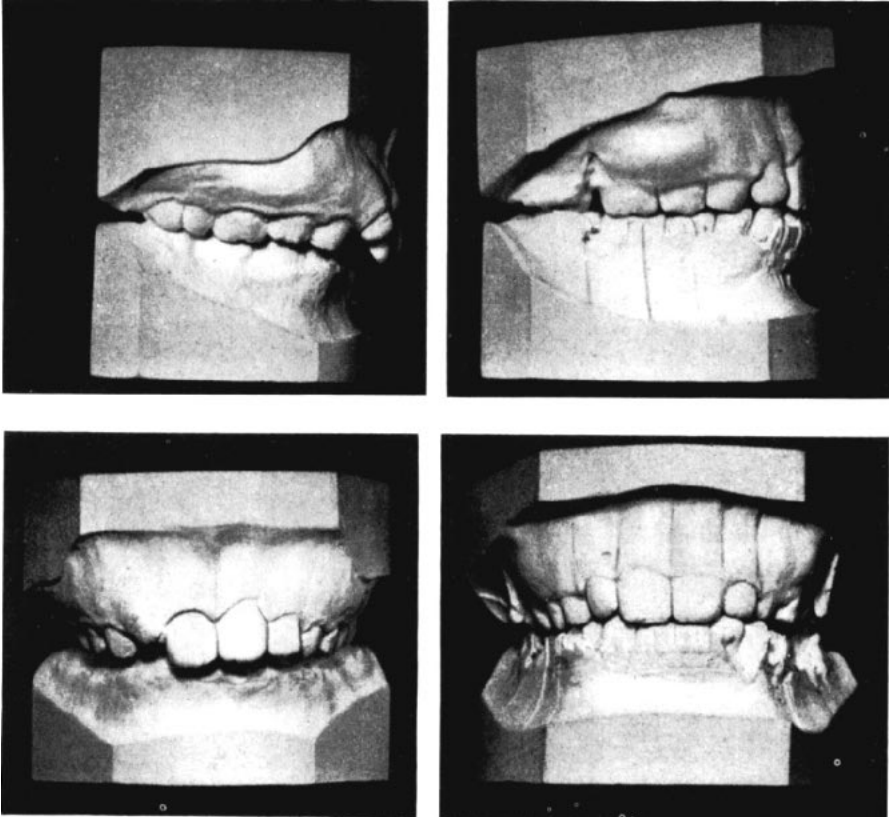


Fig. 7.—Models of case before treatment and the end of first treatment stage.

A composite of the two previous tracings are represented in Fig. 6.

The case Fig. 6 reveals the following:

The upper molar has been tipped considerably distally but has not moved occlusally.

The lower molar has remained nearly stationary except for a slight mesial movement of the roots.

The lower incisor has moved downward and forward bodily.

The upper incisor has tipped downward and forward bodily.

The upper incisor has tipped downward and lingually.

The nasal floor angle has opened in back.

The occlusal plane has opened in front and in back but has remained parallel.

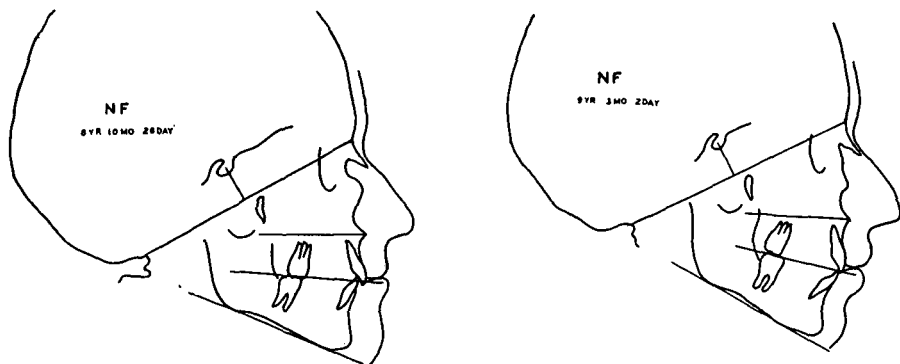


Fig. 8.—Tracings of X-rays of case before treatment and at the end of first treatment stage.

There has been only a very slight downward growth of the lower border of the mandible.

Case N.F., Male Class II Division II

Age at beginning of treatment 8 years, 10 months, 26 days.

Models of case before treatment and the end of first treatment stage are shown in Fig. 7.

Tracings of X-rays of case before treatment and at the end of first treatment stage are given in Fig. 8. The elapsed time between the two tracings is 5 months, 7 days.

A composite of the two previous tracings, Fig. 9, reveals the following:

The upper molar has been tipped quite considerably distally, but has moved occlusally only slightly.

The lower molar has moved bodily very slightly in a mesial direction.

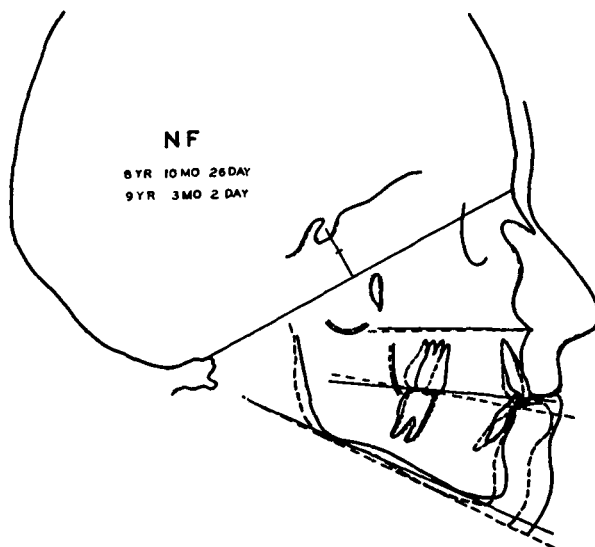


Fig. 9.—A composite of the two previous tracings.

The lower incisor has been tipped mesially and has moved downward considerably.

The upper incisor has tipped downward lingually.

The nasal floor has tipped downward slightly in back.

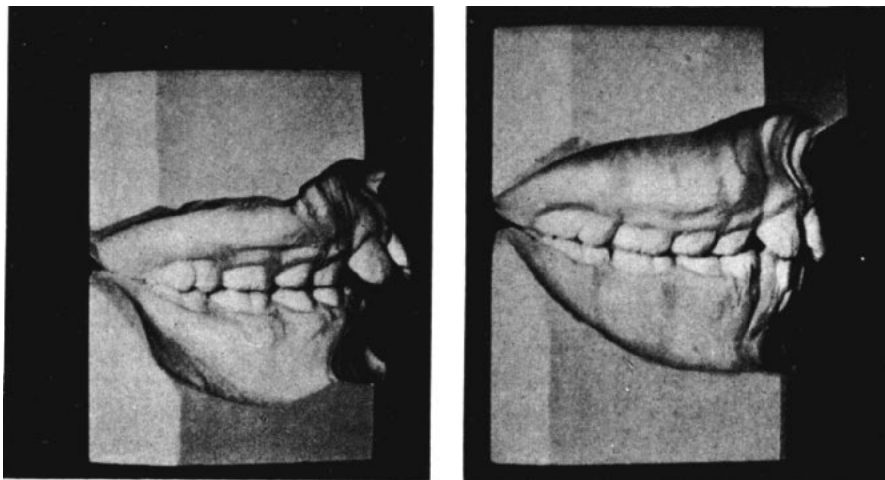


Fig. 10.—Models of case before treatment, and at the end of the first treatment stage.

The occlusal plane has opened considerably in front and slightly in back.

The mandible seems to have tipped downward and backward and growth changes seem to be in a backward direction.



Fig. 11.—Tracings of X-rays of case before treatment and at the end of the first treatment stage.

Case D.K., Male Class II Division I

Age at beginning of treatment 10 years, 9 months, 4 days.

Models of case before treatment and at the end of the first treatment stage are shown in Fig. 10.

Tracings of X-rays, Fig. 11, show case before treatment and at the end of

the first treatment stage. The elapsed time between the two tracings is 6 months, 8 days.

A composite of the two previous tracings is given in Fig. 12. This case reveals the following:

The upper molar has moved distally, bodily.

The lower molar has remained practically stationary.

The lower incisor has moved downward and tipped slightly mesially.

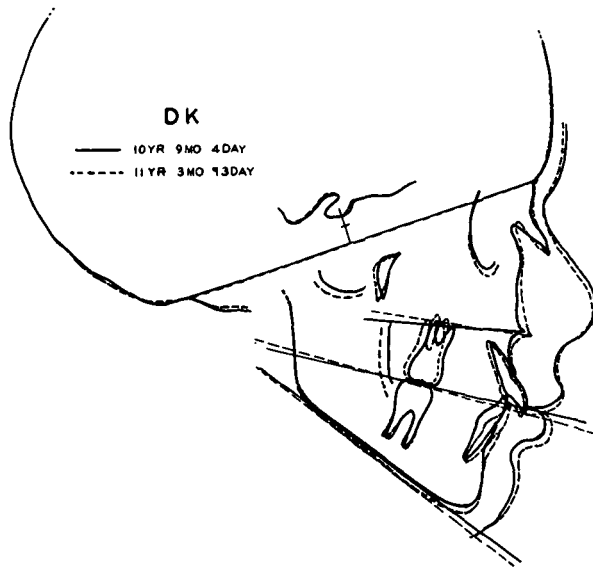


Fig. 12.—A composite of the two previous tracings.

The upper incisor has moved slightly lingually, bodily.

The nasal floor has tipped up, and opened considerably in back.

The occlusal plane has opened slightly in front and in back.

The mandible shows a very slight growth increase downward and forward at gnathion.

Summary

The small sample of material and the brevity of the treatment period, does not permit of any definite claims or dogmatic statements. However, the evidence presented here, brief as it may be, is self-evident and suggests the following:

1. In the complete deciduous denture, the changes seem to follow closely those observed in adult dentures treated similarly. Changes revealed cannot be attributed entirely to orthodontic treatment, since they occurred during a growth period.
2. In all cases the occlusal plane is disturbed with the posterior end going up and the anterior end going down. It appears as if there is a complete repositioning of the mandible.
3. In each case that could be demonstrated, a distal movement of the

maxillary six year molars was seen, which was of a tipping nature.

4. The downward tipping of the anterior end of the occlusal plane seems to be associated with the distal tipping of the maxillary molar resulting in the opening of the bite.

5. The use of elastics seems to be directly responsible for the change in the occlusal plane.

6. The fact that the upper arch operates solely on the 6 year molar and does not even come in contact with other teeth indicates that the tipping back of the six year molars and the establishing of their Class I relation seems to carry the entire maxillary denture distally. It not only establishes a Class I relation of the deciduous buccal teeth, but produces a definitely improved alignment of the upper incisors and a reduction in their overbite and overjet.

7. The lower molars due to growth, eruption and the pull of the elastics go upward and forward, while the resultant of forces on the lower incisor causes them to be tipped downward and forward.

These cases will be studied further with the object of noting changes that occur subsequent to treatment.

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