Case Report

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THIS CASE, a Class II, Division I (Angle), was selected to report because it presents a rather severe collapse of the lower arch.

HISTORY OF PATIENT

This girl, of Swedish extraction, was nine years, eleven and one half months of age when she presented for treatment. She was quite large and stocky, and showed a physical and dental development ahead of the average for her age. Her mental development appeared to be good. She was making very satisfactory progress in school, was co-operative, unafraid and easy to handle.

FAMILY HISTORY

The father and mother are both above the average in physical stature, and about forty-five years of age. The other child, a brother three years older, is of good physique. The mother has a rather severe Class II, Division II malocclusion; the father a Class I of slight disturbance, and excellent facial development. The brother has a Class I malocclusion with considerable lingual collapse.

DISEASE HISTORY

The patient's health record revealed no serious illness and no consecutive series of disturbances. Tonsils and adenoids had been removed. Previous to this she had been a mild mouth breather. This habit is not present now.

The dental record indicates considerable caries of the deciduous teeth and some premature loss of teeth. At the time of examination there were small fissure cavities in all first molars. The oral tissues were healthy, but did show some inflammation in the areas of the recently erupted teeth.

DENTAL AND ORTHODONTIC EXAMINATION

The head is brachiocephalic and the face a modified square type. Vertical height of face may be slightly deficient for her developmental age, but certainly not markedly so. The profile would indicate some protrusion of the upper lip, a marked retrusion below the lower lip and a good chin point. (This is not due to soft tissue.)

Musculature was normal in tonus and function with the exception that she was using the lower lip too much in lip closure. This was due to tooth position, but did not appear to have reached the point of producing the typical mentalis picture. The tongue was normal in size, position and function.

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Fig. 1.—Photographs at beginning and end of active treatment.

Type of Malocclusion

Class II, Division I, complicated with a collapse of the lower arch.

Case Analysis

The major etiological factor of the Class II malocclusion is uncertain. It probably is a morphogenetic pattern, associated with growth and development of the facial components. The arrangement of the teeth in the arches has been influenced by the play of musculature over malrelated arches. Premature loss of deciduous tooth material is a primary factor in starting the collapse of the lower arch.

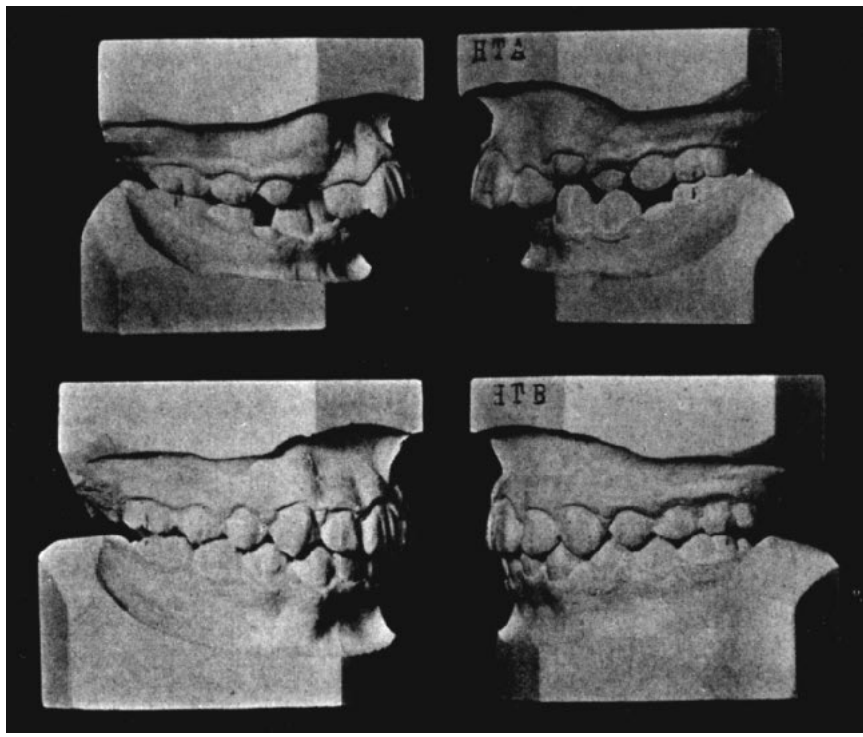

Fig. 2.—Models at beginning and end of active treatment.

The nature of the tooth movement in the developing malocclusion was analyzed as follows:

Lower Arch

The premature loss of deciduous teeth permitted an accelerated mesial drift of both first molars on their denture base. A rather atypical anterior collapse has occurred, the incisors having collapsed until they have a distinct lingual inclination. The right cuspid has tipped distally into the first bicuspid space and the mid-line has shifted to the right. Both the models and photographs would indicate that the anterior segment of the arch had

collapsed to a lingual relationship with its denture base or ridge. There is a marked increase in the curve of Spee, due probably to some supra-eruption of the incisors and lack of posterior alveolar height. The arch form is quite narrow.

Upper Arch

This arch presents the usual Class II, Division I problem.

Objectives of Treatment

1. To reposition the teeth and the alveolar process of each arch so that they bear a satisfactory relationship to the supporting bases, the maxilla and mandible.
2. To relate the arches to each other, at the same time maintaining (1).
3. To improve facial harmony.
4. To restore to a normal dynamic balance all of the forces acting upon the denture so that the result may remain stable.

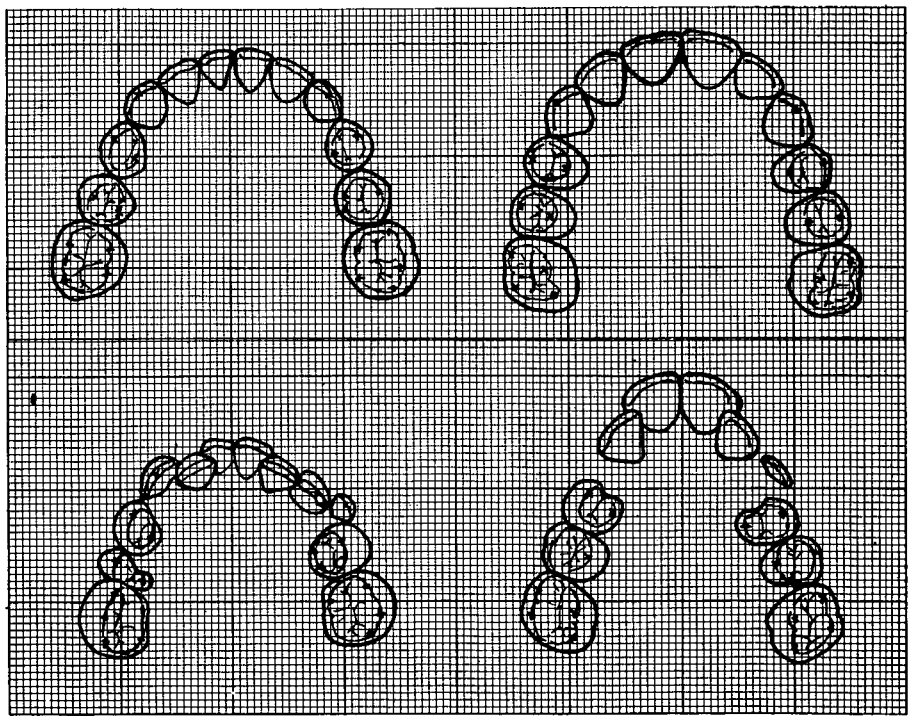

Fig. 3.—Occlusal tracings of the models oriented with the Grunberg Symetroskop.

Tooth Movements Desired

It was felt that lower arch length could be obtained by—(1) Uprighting and pushing the first molars distally to open a 2 mm. space between them and the bicuspids, then distal movement of the bicuspids. (2) Uprighting the incisors, at the same time increasing arch width and tipping the molars

and bicuspids distally to gain necessary additional arch length. (3) Changing the upper arch form to keep pace with the lower, and distal tipping of maxillary teeth.

Outline of Means of Obtaining Tooth Movement

The lower appliance was set first, the first molars carrying .022 x .028 buccal tubes. The remaining teeth with the exception of right first bicuspid and left second bicuspid were fitted with edgewise bracket bands. On the

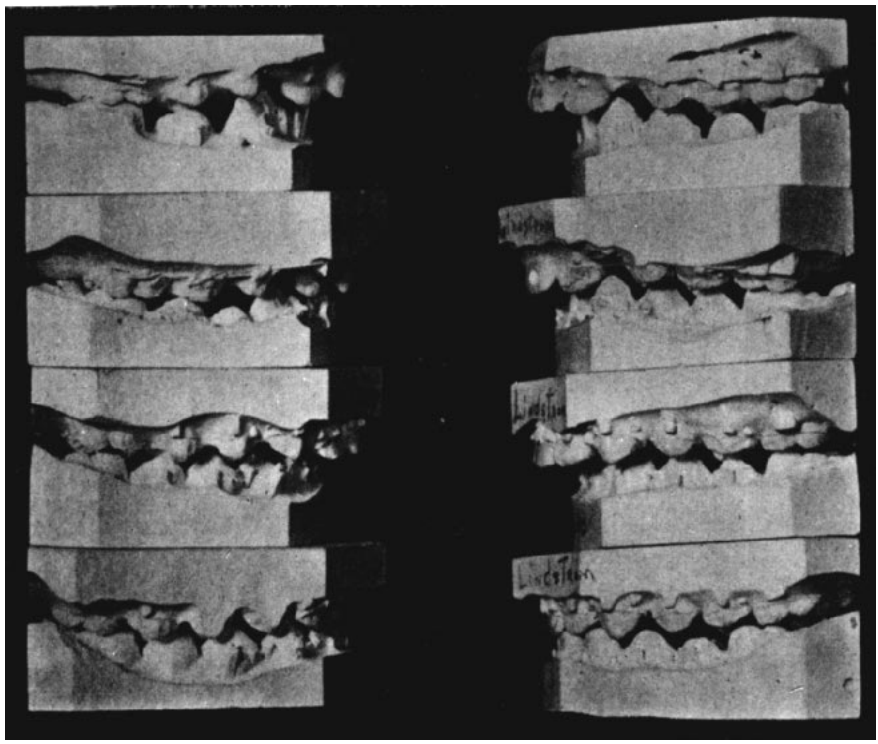

Fig. 4.—Serial study bites. Description under Outline of Means of Obtaining Tooth Movement.

first of February, 1939, an arch of .022 x .028 gold was adapted passively to all brackets. Two weeks later the arch was removed and arch stops placed distal to the brackets on right cuspid, second bicuspid and left first bicuspid to tie this segment up as a unit. Tip-back bends were placed for the first molars and the distal movement started with coil springs slipped over the arch between the molars and the banded bicuspids. The upper appliance was now set and a .022 round steel arch used to begin change in arch form.

At intervals of three weeks the molar tip-back bends and the tension of the coil springs were increased. By April, sufficient space was opened mesial to the molars; the lower molars having been moved from a Class I to a Class II relationship with the upper molars (A. Fig. 4). At this point,

arch stops were placed mesial to the molar tubes and pull coil springs used to move the bicuspids and left cuspid distally. When this was accomplished an ideal lower arch, .022 square steel, was placed with molar stops and tip-back bends for the bicuspids and molars to begin modification of arch form and gain slight additional length by correction of axial inclinations as the arch was advanced (B. Fig. 4).

Two months later, in October, an ideal gold arch .022 x .028 was placed in the lower, still with active tip-back bends, for the correction of axial inclinations, rotations and arch form.

At the same time a .022 x .028 upper arch was placed. The upper anterior bands were removed and occipital anchorage with a head-cap was used for five months to effect space for the cuspids as arch width was gained.

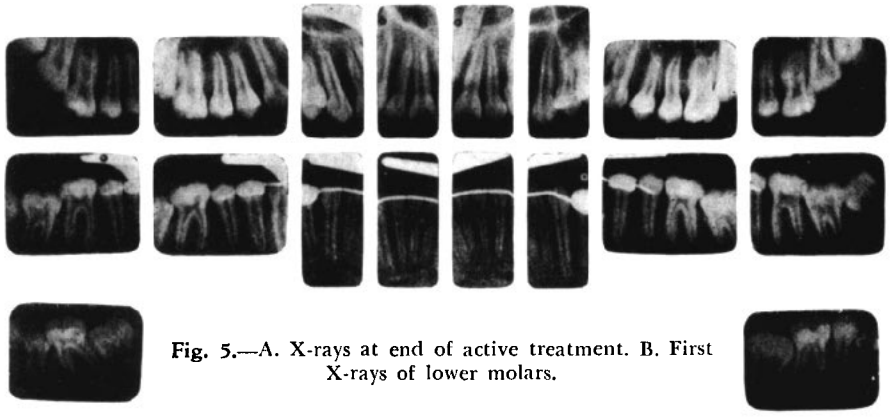

Fig. 5.—A. X-rays at end of active treatment. B. First X-rays of lower molars.

In February the lower arch was in condition for Class II mechanics. Upper and lower bands were checked and repositioned where indicated, and the patient was dismissed supposedly for ten days without the lower arch, as a new one was to be made. The patient contracted scarlet fever, and did not return for six weeks. Unfortunately I did not go to her home to replace the lower arch, for when she returned there had been considerable collapse in the lower arch. The loss of time and recovery of the collapse cost about five months in treatment time.

Intermaxillary elastics were worn for three months (C to D. Fig. 4) after which they were worn intermittently for three and one half months until the details of occlusion were corrected. The upper molars were retained with an excessive distal tipping and they settled within two months after retention.

Length of treatment—26 months.

Retention

An acrylic palate retainer was placed in the upper arch with .025 steel labial wire from cuspid to cuspid. The lower arch was retained with a G wire from first bicuspid to first bicuspid. The difficulty in closing the lips disappeared as the teeth approached normal occlusal relationships. The

occlusion was adjusted in treatment to permit lateral function, and the importance of normal masticatory function was stressed, the patient being told to practise this until it became a habit.

Summary and Criticism

This case is not reported because it is thought to represent a perfect treatment, rather it is presented as a method of analyzing and treating a difficult situation in the mandibular arch. The case was handled as it was on the premise that the mesial drift of the molars could be corrected; that the incisors were tipped lingually on their base in such a manner that uprighting them and modifying arch form would gain adequate arch length without producing a protrusion. By some standards this has been accomplished, by others it probably has not been successful. More distal movement of the dentures could probably have been effected by the use of Dr. Tweed's technic employing occipital anchorage and Class III elastics and more expansion of the arches. The x-rays at the end of treatment show unerupted, and at this time impacted lower second molars, with third molars present. The patient is only thirteen years of age. Will future facial development be sufficient to support a full denture? Has a balance been obtained which will assure a stable result?

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