# Treatment Methods of Class II Division I

## Using Round Labial Arch Wire with Attachments and Removable Lingual Appliance with Attachments*

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IN the 7th edition of "Malocclusion of the Teeth" Dr. Angle says, "Class II Division I is characterized by distal occlusion of the teeth of both lateral halves of the lower dental arches, the lower molars having taken this position on their eruption and locking; a narrowed upper arch, lengthened and protruding upper incisors, short and practically functionless upper lip, lengthened lower incisors, and thickened lower lip which rests cushion-like between the upper and lower incisors, increasing the protrusion of the former and the retrusion of the latter."

He continues with the description of a typical case wherein he says, ". . . not only are all the lower teeth effectively locked in distal occlusion in these cases, but the mandible is also distal in its relation to the maxilla and usually smaller than normal. It is quite normal in form, although the compensating curve of occlusion is greater than normal, due principally to the elevation of the lower incisors from lack of function, while in some instances the lower molars occupy a plane lower than normal in the line of occlusion."

The foregoing description of Class II Division I malocclusion was undoubtedly intended for the adult dentition only. Today we look farther than this and find a similar condition existing in the deciduous dentition, and also in the mixed dentitions.

The recognition of such conditions in early childhood has forced us as orthodontists to develop a new philosophy of treatment. By instituting corrective measures early we can prevent an exaggerated manifestation of the malocclusion in later years. Treatment of malocclusions during early childhood has been termed by many orthodontists as "Preventive Orthodontia."

The first case for consideration is that of a child from two and a half to five years of age.

### *Appliance*

The upper appliance would consist of a round labial arch fitted into round horizontal buccal tubes on the second deciduous molar bands. Spring loop ends would be used to lengthen or shorten the arch wire, and intermaxillary hooks would be attached to the arch wire in the deciduous cuspid region. Lingual extensions, soldered to the molar bands extending anteriorly to include the deciduous cuspid, would complete the upper appliance.

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The lower arch may be fitted with a removable lingual appliance, attached by vertical half-round tube and post with spring locking device to bands on second deciduous molar teeth. Intermaxillary hooks are soldered to the molar bands at mesiobuccogingival angle. Finger springs are added to the lateral aspects of the lingual arch wire to complete the lower appliance.

*Outline of Treatment*

The loop ends on the upper labial arch are adjusted away from the anterior end of the buccal tubes to permit free passage of the arch wire through the tube. To reduce the labioversion of the upper anterior teeth intermaxillary elastics are used, and during this phase of treatment the lower arch is utilized as a complete anchorage unit. During this process the lateral expansion which is required may be accomplished by widening the labial and lingual arch wires through the second deciduous molar region. As the upper second deciduous molars move buccally the first deciduous molars and cuspids are carried along with them through the medium of the lingual extensions. The lower first deciduous molars and cuspids are moved buccally by the action of finger springs attached to the lingual arch wire. This process is continued until the labioversion of the upper anteriors is reduced and proper arch form is accomplished in both arches. At this juncture the loop ends on the upper labial arch are adjusted so they rest passively against the anterior end of the buccal tubes. Intermaxillary force is now employed to move the mandible forward to its proper position and occlusion with the upper denture.

The child is now instructed in the usual routine of exercises outlined for the purpose, and periodic check-ups are made during the retention period. Parents are cautioned that some treatment of the permanent dentition might be necessary. This advice applies to all cases of children eleven years of age or younger.

The period from five to seven years, or when the exchange of the upper central incisors takes place, is one in which no attempt should be made to reduce labioversion of the upper anterior teeth. However, all other phases of treatment may be carried out as previously outlined, using the same appliances and the same general treatment plan. Later, when the permanent incisors erupt, they may be treated for labioversion by the same method as outlined or, if the operator deems it advisable, he can band them, using McCoy tube attachment or the Johnson Twin Wire mechanism, or any other combination of choice.

From seven to eleven years of age, or rather from the dictates of the x-ray analysis, the appliances used would be essentially the same as outlined previously, with a few possible exceptions. The first permanent molar may be banded and utilized as anchorage instead of the second deciduous molar, and lighter or finer gauge wires could be used with attachments for the upper labial arch. The simple incisal hook may be employed to reduce any supraversion of the anteriors in conjunction with the labial and lingual arches; in fact there are any number of combinations which may be used in this connection.

The first permanent molars would be my choice as anchorage units instead of the second deciduous molars, and the upper central incisors, or the

central and lateral incisors, would be banded for the reception of the McCoy tubes. The balance of the appliances would be the same as previously outlined. The treatment plan would be the same as outlined, except as noted before where x-ray findings would alter the course. The upper lateral incisors should be handled carefully because of the close proximity of the permanent cuspid crowns and the lateral incisor roots in the bone, and if any doubt exists it is best to let the lateral incisors drift until the cuspid crowns assume a more favorable position. Occasionally the dentition is in advance of the chronological age of the patient. When this is determined by the x-ray, it is best to defer lateral expansion lest the exfoliation of many deciduous teeth be hastened. All other phases of treatment may be carried out and later, if necessary, expansion of the bicuspid and cuspid teeth can be effected.

Treatment of Class II Division I malocclusion for the permanent dentition may be carried out in the following manner. There are many appliance combinations that may be employed for this purpose but for the sake of clarity only one will be considered here.

The maxillary appliance would consist of a round labial arch wire fitted into round horizontal buccal tubes on the first permanent molar bands; spring loop ends would be attached to the arch wire anterior to the buccal tubes, and intermaxillary hooks would be soldered to the arch wire in the cuspid region. Attachment bands fitted to the anterior teeth and bearing McCoy open tube attachments would receive the round arch wire in its labial aspect. Lingual extensions soldered to the molar bands, extending anteriorly to include the cuspid teeth, would complete the upper appliance.

The lower appliance would be a removable lingual arch wire attached to the molar bands through the medium of vertical half round tube and post with a spring locking device. Buccal tubes attached to the molar bands would serve as intermaxillary attachment and also for the reception of a round labial arch wire which is to be used later in treatment. Recurved finger springs are now added to the lingual arch wire in its lateral aspects to complete the lower appliance.

The first step in treatment is to reduce the labioversion of the upper anterior teeth, and at the same time carry out the necessary lateral expansion in both maxillary and mandibular arches. Supraversion of the upper anteriors may also be corrected during this initial stage of treatment. To effect this the appliance adjustments are as follows:

1. Adjust loop end on upper arch anteriorly to buccal tube to permit arch wire to pass distally through the buccal tubes.
2. Widen labial arch wire for upper molar and bicuspid expansion.
3. Widen lingual arch wire for lower molar expansion.
4. Activate finger springs for lower bicuspid and cuspid expansion.
5. Adjust upper labial arch wire gingivally for reduction of supraversion of upper anterior teeth.
6. Apply intermaxillary force, using entire lower jaw as anchorage, to reduce labioversion of upper anterior teeth.
7. Continue treatment until proper arch form is accomplished.

After the initial phase of treatment is completed, the lower lingual appliance is removed, accurately refitted and replaced. The second phase of treat-

ment, which consists of reduction of supraversion of lower anterior teeth, the elevation of the lower bicuspid teeth (if necessary) and the anterior movement of the mandible, is begun.

The appliance adjustments for the above are as follows:

1. Adjust spring loops on upper labial arch against anterior end of the buccal tubes. By so doing the entire maxillary arch is utilized as an anchorage unit against the movable lower jaw.

2. Apply intermaxillary force to move the mandible forward. During the process a lower labial arch is added for the purpose of stabilizing the lower buccal segments. If the lingual arch is used alone and if improperly adapted and manipulated and not carefully checked, the buccal segments of teeth in the lower arch will move anteriorly, causing the lower arch to buckle in the cuspid region.

To obviate this the lower labial arch is added and ligated to all six anterior teeth. If supraversion of the lower anterior teeth still exists at this point in treatment, the lower labial arch is adjusted gingivally and ligated to position for this purpose.

3. After the mandible has reached its destination, all necessary rotations are effected through the medium of attachment bands fitted with hooks and silk ligatures tied to the labial arch wires.

Occasionally a case will go through treatment where no labial arch wire is required on the lower arch. In these cases the necessary rotations may be accomplished by using attachment bands with suitable attachments for reception of finger springs or silk ligatures.

4. The axial alignment of the upper cuspids and bicuspids may be corrected, if necessary, by placing attachment bands fitted with McCoy tubes and finger springs attached to the labial arch wire.

5. Exercises are now advised, and the case is placed on retention.

Throughout the entire treatment process it may be observed that the mechanics of the above combination of appliances tends to tip distally and elongate the upper first permanent molars; it is merely a manifestation of the reactionary forces being exerted upon them. A similar observation may be made regarding the lower first permanent molars; by similar reactionary forces they, too, are elongated and tipped distally. As this takes place the lower bicuspids frequently elongate, although no attempt was made to have them do so. Supraversion of the lower anterior teeth is often corrected by the natural reactionary forces created by the above combination of appliances.

After observing the above manifestations of the reactionary forces, it is advisable in some cases to wait until the end of treatment to reduce the supraversion of the upper and lower anterior teeth and also the infraversion of the lower bicuspid teeth; otherwise an anterior open bite may result.

By careful manipulation of the above combination of appliances excellent results may be obtained in the treatment of Class II Division I malocclusions.

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