



Early treatment mechanics of the Class II Division 2 malocclusion

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Abstract

A most common type of early malocclusion that the pediatric dentist comes in contact with daily is the developing Class II Division 2 malocclusion (Fig 1-a,b). It is the malocclusion that the parents of the children we serve bring to our attention. Parental concern is the early crowding that develops in the anterior of the lower arch with risk of periodontal involvement. This malocclusion is readily amenable to interception at age 7 or 8 and can proceed with a protocol of defined objectives and predictable outcomes (Fig 2). With efficient and effective utility arch wire (UAW) mechanics a state of normalcy can be achieved within six to eight months of treatment.¹ (Pediatr Dent 22:68-70, 2000)

Characteristics

The Class II Division 2 malocclusion can be generally described (Fig 3). The clinical characteristics of this early problem are typically presented as a one-half Class II Angle molar relationship (3.5 mm Class II discrepancy) with mesiolingual rotation of the molars. The large interincisal angle characterizes as a deep bite with retroclined upper central incisors and retruded crowded lower incisors.

Strategy and protocol

The use of preformed utility arch wires (Ortho Organizers, Inc., 1619 S. Rancho Santa Fe Road, San Marcos, CA, USA 92069) in a fully programmed (.022x.028 slot size) 2x4 bracket sys-

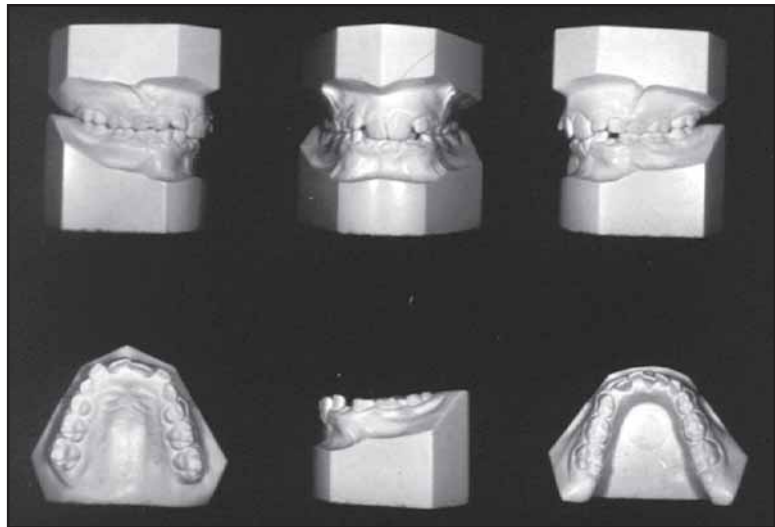


Fig 1a. J.M., 8y-0m. Casts showing pretreatment Class II Division 2 malocclusion.



Fig 1b. J.M., 8y-0m. Intra-oral photo showing Class II Division 2 dental characteristics plus periodontal risk.

tem is the suggested mode of operandum for early Class II Division 2 correction.

Step 1

Begin UAW mechanics by advancing the upper centrals to align and level with the laterals by using an .016 UAW. After the upper teeth are aligned, additional advancement may be required. Continue next with .016 x .016 square UAW (Fig 4). When the upper incisors are in normal cephalometric position as they relate to the maxilla, proceed to advance, level, align, and rotate the lower incisors to a normal cephalometric position as they relate to the mandible (Fig 5). The resultant effect is a decrease in overbite and an increase in overjet. When the upper/lower anterior teeth advance, the bite opens, thus creating more room for the tongue, which will cause an increase in tongue pressure allowing for buccal expansion. With the exfoliation of primary teeth and serial guidance, rapid expansion of the buccal segments will occur if defined objectives have been met.

Early Treatment Objectives

- Overbite
- Overjet
- Molar relationship
- Jaw relationship
- Lip seal

Fig 2. Proper early treatment objectives in sequence of treatment.

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Early Class II Division 2: Characteristics
• Normal to small LFH
• Flat mandibular plane
• Recessed lips
• Retroclined central incisors
• Laterals in natural arch form
• Lower anterior crowding
• Strong musculature
• Generally good airway
• 100% overbite
• Zero overjet
• Non-extraction cases

Fig 3. General early Class II Division characteristics.

increases posterior overjet and distalizes molars approximately 2mm per side. Potentially, this action will distalize anterior teeth, which is the reason for over-correcting the anteriors 2mm before initiating these mechanics. The mechanics will also increase posterior vertical forces from UAW because it rotates the molar around its lingual root. The effect on the anterior re-

Step 2

Prior to Class II correction, the maxillary incisors are advanced 2mm more than the predicted cephalometric goal (Fig 6).

Step 3

Select a new maxillary preformed .016x.016 UAW, toe-in the molar section 90 degrees, and flatten the anterior section before inserting the wire. Upon insertion this will expand the molar area 5 to 10 mm (Fig 7). This activation of the wire has the following effects: in the posterior region, it will distalize, rotate, and expand the upper permanent first molars, which

gion of the dental arch causes the incisors to intrude, as well as labialize slightly with anterior torque or a rotational effect of incisors. A corollary benefit of these mechanics is the orthopedic action of the mandible “unlocking” and advancing potentially 2-3mm. A normalcy of defined early treatment objectives is achieved within six to eight months (Fig 8).

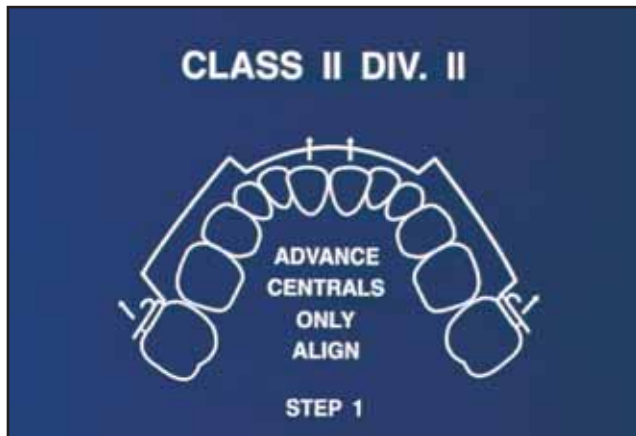


Fig 4. Place maxillary anterior teeth normal to maxilla.

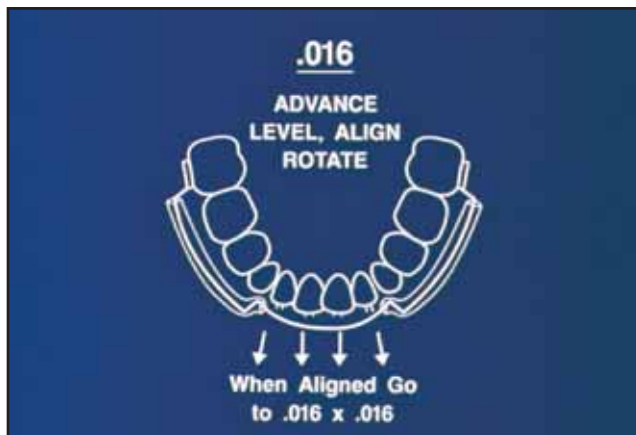


Fig 5. Place mandibular anterior teeth normal to mandible.

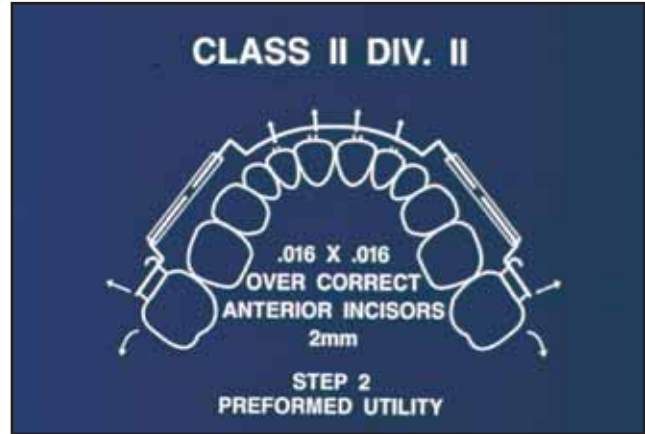


Fig 6. Overcorrect maxillary anterior teeth by 2mm to cephalometric goal prior to molar correction.

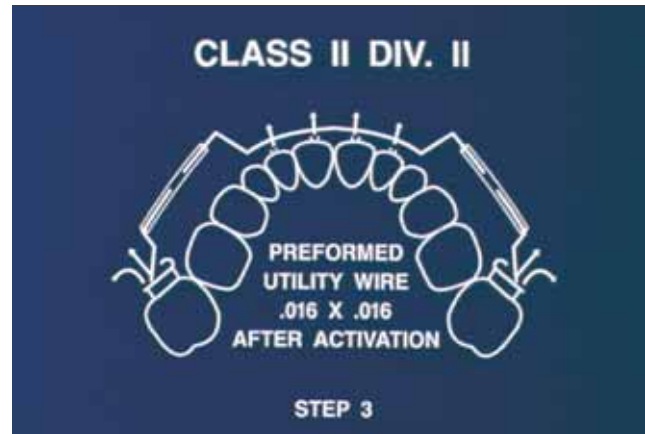


Fig 7. Distal rotation and expansion of maxillary permanent first molars.

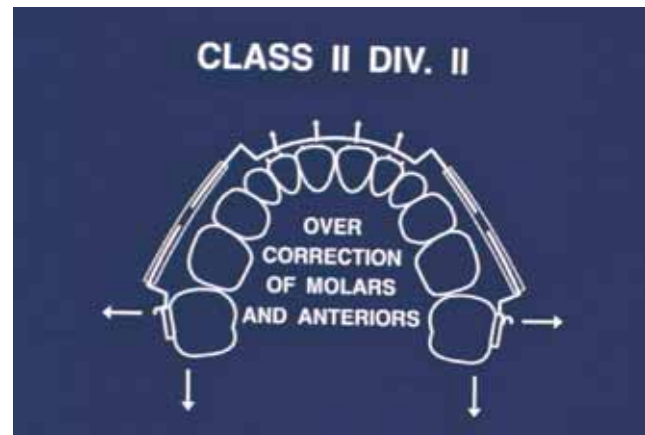


Fig 8. Overcorrection of maxillary first permanent molars and maxillary incisors-causing an orthopedic forward movement of the mandible.



Fig 9a. J.M. Early treatment to state of normalcy of defined objectives.



Fig 10b. J.M. The Andrews 6 Keys plus a mutually protected functional scheme of occlusion.

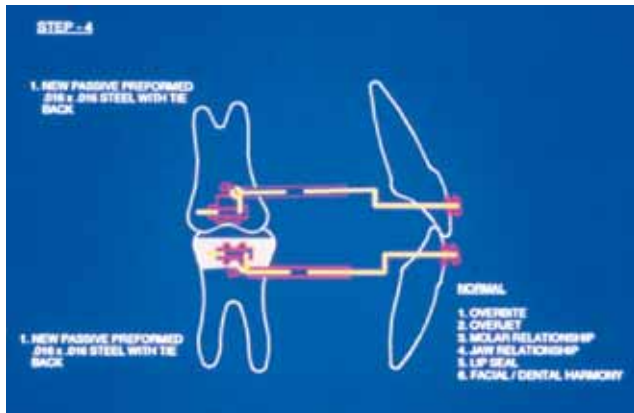


Fig 9b. Utility Arch Passive. 1. Maintain arch length. 2. Maintain alignment. 3. Maintain overbite. 4. Maintain overjet.

Step 4

Passive maxillary and mandibular .016 x .016 UAW's are placed during serial guidance and remain in place until the start of the second phase of active treatment (Fig 9-a,b). A continuation of a preprogrammed appliance² is used to achieve an advanced static occlusion scheme (the Andrews six keys)³ and

a mutually protected functional scheme of occlusion as endorsed by Roth⁴ (Fig 10-a,b).

Objective

The objective of these mechanics is to treat to a state of normalcy in the developing dentition. The pediatric dentist should be able to achieve early arch alignment by getting the proper overbite, overjet, molar relationship, jaw relationship, lip seal, and serial guidance. As a result of these procedures, the dentition is placed in a compatible position with the face and fosters a potentially healthy developing temporomandibular joint.

Observations

Early developing Class II Division 2 occlusions are one-half Class II's (3.5 mm) with mesio-lingual rotation of the molars. A rotated molar takes up space (approximately 2mm). Molar distal rotation and expansion mechanics corrects 2mm of the 3.5mm Class II problem. In the mixed dentition, or deep bite cases, the mandible will advance approximately 2mm (average). Clinical experience evidences 0-3mm with proper treatment. This type of treatment eliminates most headgears, elastics, and functionals for the early treatment of the Class II Div. 2 mal-occlusion.

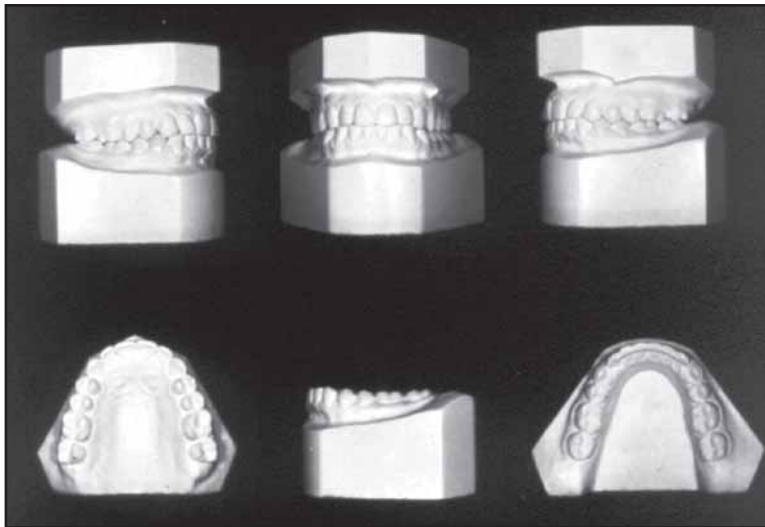


Fig 10a. J.M. Casts showing 10 years post treatment Straight-Wire Appliance Class II Division 2 optimal correction.

References

1. Carapezza, LJ: The use of the utility archwire appliance. *J Pedod* 11:201-29, 1987.
2. Andrews, LF: The straight-wire appliance. *J Clin Orthod* 10:Feb-Aug 1976.
3. Andrews, LF: The six keys to normal occlusion. *Am J Orthod* 62:296-309, 1972.
4. Roth, R: Five-year clinical evaluation of the Andrews straight-wire appliance. *J Clin Orthod* 10:836-50, 1976.