

CREATING SMILES: TREATMENT OF CLASS II MALOCCLUSION WITH D2 APPLIANCE

By Jose Turcios, DDS

In this case report, we will review the use of the D2 appliance by Ortho Arch to correct a Class II malocclusion in combination with using a fixed removable lower lingual holding arch to provide mandibular anchorage.

The D2 Sagittal Corrector can bring your patient to the occlusal goal of a Class I occlusion in three to five months. The D2 utilizes elastics at the start or early part of treatment. The appliance consists of two parts. The appliance has a posterior component that has a free-floating

metal bar attached and is first bonded to the six-year molar, and an anterior component. The posterior bar is cut to length and can be measured to fit any size span. The anterior component is bonded to an anterior tooth (in this case, the canine) after placement of the posterior bar into a reception hole in the anterior component. These components are universal and can fit both the right and left sides.

By using the D2 appliance, we can usually expect to see decreased treatment times in patients who

cooperate with elastic wear as this patient did during her treatment.

CASE REPORT DETAILS

Medical and Dental History

KD is a healthy 15-year-old and outgoing Caucasian female. Previous medical history reveals no significant findings. She does not present any previous dental restorations. She does not take any medications on a regular basis, no history of allergies or previous hospitalizations. Her chief complaint is that “I don’t like my smile. My teeth are crooked”.

Clinical Examination

She presents with unilateral left-side dental Class II molar malocclusion and moderate-to-severe crowding on maxillary and mandibular arches. Tooth #6 presents ectopic buccal eruption. She also presents a deep bite and an accentuated curve of Spee. Her upper arch is constricted. Her overjet is 4 mm, and overbite is 5 mm (80% overbite). She presents a straight profile. (Fig 1 and Fig 2)

TMJ Examination

Examination revealed no significant findings. She reports no pain upon opening or closing nor during lateral excursions. No deviations or joint noise can be appreciated.

Radiographic Analysis

The panoramic radiograph reveals that all permanent teeth are present. Third molars are present in different stages of early development. Bone density appears normal. Root sizes are normal. (Fig 3).

The cephalometric radiograph was traced using the Gerety analy-

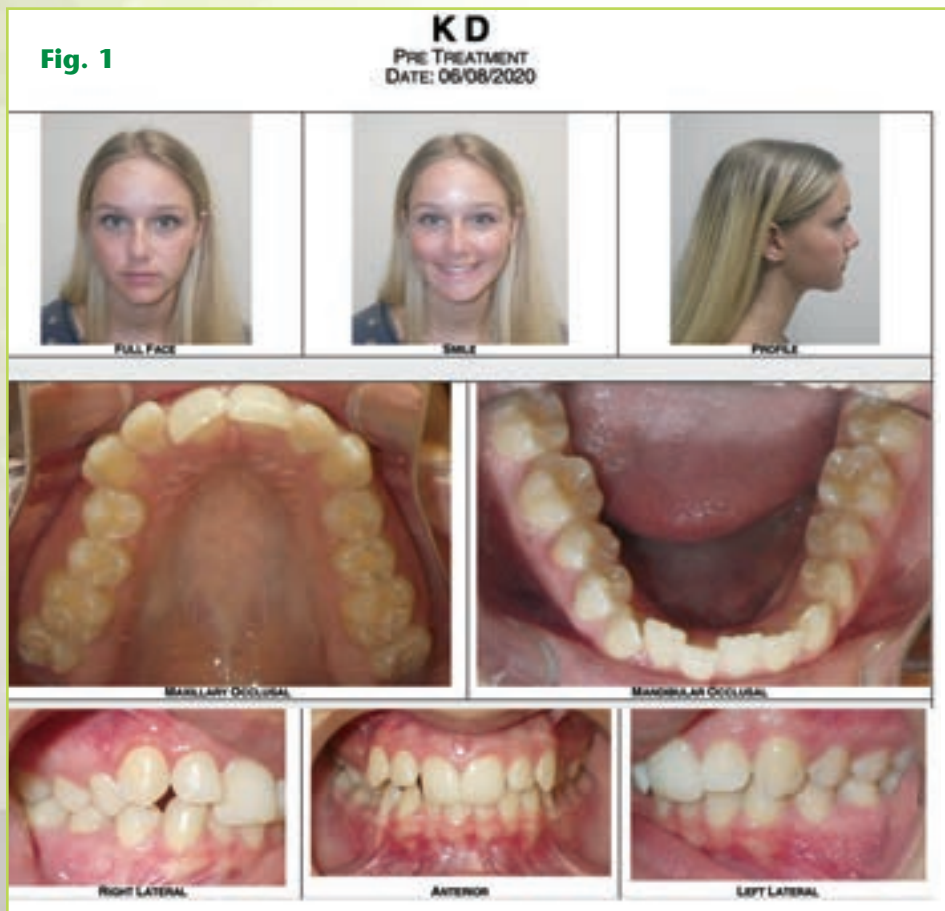




Fig. 2

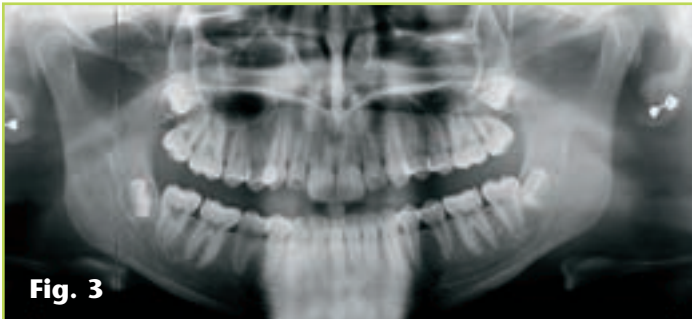


Fig. 3



Fig. 4

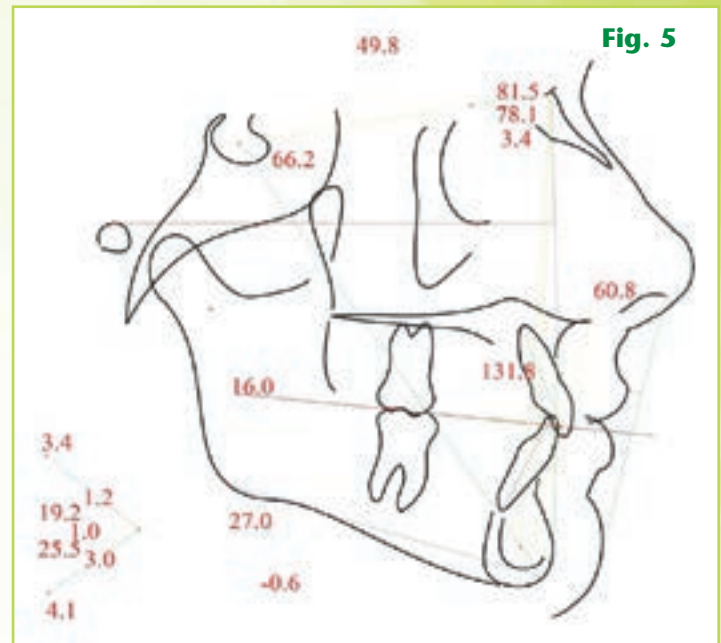


Fig. 5

ORTHODONTIC EXAM FORM

Genety Analysis
 Patient Name: KD PRE-OP
 Patient Age (YY MM): 15.5
 Patient Gender (1=M/2=F): 2
 Date: 6/8/2020

Measurements	Patient	Norm	Difference	Standard Deviation	Signif	Interpretation
Skull						
SNA (deg)	81.5	82.0	-0.5	2.0		within normal limits
SNB (deg)	78.1	80.0	-1.9	2.0		within normal limits
ANB (deg)	3.4	2.0	1.4	1.6		Class I
Sr. Line (mm)	49.9	51.0	-1.2	3.0		within normal limits
Wits (mm)	1.6	0.0	1.6	2.0		Class I relationship
LF height (mm)	60.8	66.7	-5.9	4.1		lower face height is slightly deficient
Go-GonSN (deg)	27.0	32.0	-5.0	4.0		slight counterclockwise growth
Y Axis (SN) (deg)	66.2	67.0	-0.8	4.0		within normal limits
OPSN (deg)	16.0	14.5	1.5	1.0		slight clockwise growth
SNi (deg)	27.0	26.0	0.9	2.0		within normal limits
Chin Button (Pg to NB) (mm)	4.1	4.0	0.1	2.0		within normal limits
Chin Button (Maturity) (mm)	4.1					
Dental						
SNi IANA (mm)	1.2	4.0	-2.8	2.0		upper incisor is in a slight posterior position
SNi IAN (deg)	19.2	22.0	-2.8	2.0		upper incisor is slightly retroclined
SNi IANB (mm)	3.0	4.0	-1.0	2.0		within normal limits
SNi IANB (deg)	25.5	25.0	0.5	3.0		within normal limits
I-N (deg)	131.8	130.0	1.8	6.0		within normal limits
SNi IANP (mm)	-0.8	2.7	-3.3	1.7		lower incisor is slightly posterior of Williams Line
Soft Tissue						
Upper Lip to E-Plane (mm)	-0.2	0.0	-0.2	2.0		maxillary lip is slightly flat
Lower Lip to E-Plane (mm)	-2.8	0.0	-2.8	2.0		mandibular lip is slightly flat

Fig. 6



Fig. 7

sis. KD presented a Class I skeletal relation, with an ANB angle measurement of 3.4 degrees. SNA is 81.5 degrees and SNB angle is 78.1, denoting a Class I relationship. OP/SN angle is 16 degrees, which indicates slight clockwise growth. Maxillary incisors are in a slight posterior and retroclined position. At her age, little growth is expected. Lower incisors are in a slight retroclined position as well. (Fig 5 and Fig 6.)

Treatment Objectives

- Improve overjet and improve overbite
- Level, align and rotate (chief complaint)
- Obtain Class I molar and canine dental occlusion
- Improve esthetics

Treatment Plan

- Orthodontic bands on 1st and 2nd lower molars and straight wire brackets on lower premolars, canines and incisors
- Straight wire brackets on upper incisors only

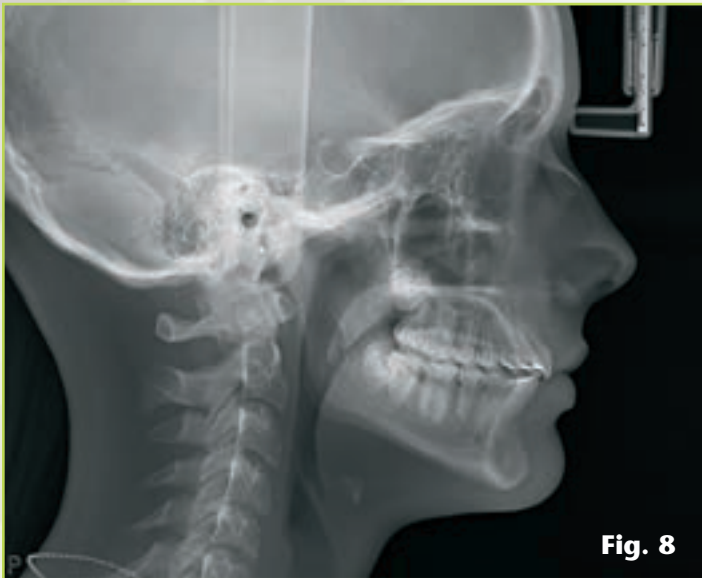


Fig. 8

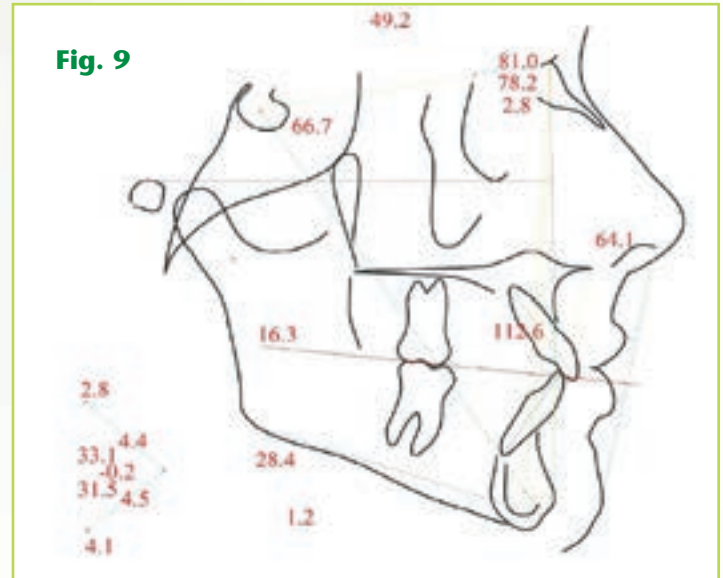


Fig. 9

- Start archwire sequence on lower arch.
- Place D2 appliance bilaterally on maxillary arch and place LLHA on mandibular arch for anchorage
- Correct Class II with elastics
- Remove D2 appliance and place rest of upper brackets and molar bands
- Finish archwire sequence
- Maxillary and mandibular bonded fixed retainers 3 – 3
- Estimated treatment time: 18 months.

Schuamburg, Illinois).

Four weeks later, first molar bands with lingual sheath were placed with a 0.016 Ni Ti wire on the lower arch and a sectional from #7 to #10 was placed on the upper arch. During this appointment, a fixed/removable lower lingual arch was also placed. We also placed bilateral D2 appliances from maxillary canines to maxillary first molars.

The patient was instructed on the wear of Force 2 Class II elastics (Carriere Motion elastics. 3/16" 8 oz. Henry Schein, Carlsbad, CA). (Fig 13 A, B and 14). She was told to wear the elastics all the time, except when she was eating. The objectives of the elastics, as well as proper care of appliances were also discussed with patient and her mother. In addition, we started with an archwire sequence focused on the lower arch.

At five months of treatment, it was observed that the Class II molar relationship had improved. During her regular ortho checks every four weeks, it was obvious

Fig. 10

ORTHODONTIC EXAM FORM						
Genity Analysis		Patient Name: KD POSS CP		Date: 12/13/2021		
Patient Age (YY-MM): 16.11						
Patient Gender (F/M/O): F						
Measurements	Patient	Male	Female	Percent Deviation	Graph	Interpretation
Skull						
SNA (deg)	81.0	82.0	-1.0	2.0		within normal limits
SNB (deg)	76.7	80.0	-3.3	2.0		within normal limits
ANB (deg)	2.8	2.0	0.8	1.0		Class I
SI Line (mm)	42.2	51.0	-8.8	5.0		within normal limits
Wits (mm)	-0.2	0.0	-0.2	2.0		Class I relationship
LI Height (mm)	64.1	66.7	-2.6	4.1		within normal limits
Go-Gonion (deg)	28.4	33.0	-4.6	4.0		within normal limits
Y-Axis (SI) (deg)	66.7	67.0	-0.3	4.0		within normal limits
OPSN (deg)	16.3	14.8	1.5	1.0		slight skeletal growth
SNO (deg)	76.7	76.0	0.7	2.0		within normal limits
Chin Button (Pg to M) (mm)	4.1	4.0	0.1	2.0		within normal limits
Chin Button (Maturity) (mm)	4.1					
Dental						
U1 U1A (mm)	4.4	4.0	0.4	2.0		within normal limits
U1 U1B (deg)	33.1	23.0	10.1	2.0		upper incisor is severely proclined
U1 U1C (mm)	4.0	4.0	0.0	2.0		within normal limits
U1 U1D (deg)	31.8	25.0	6.8	3.0		lower incisor is moderately proclined
I1 I1 (deg)	112.6	120.0	-7.4	6.0		interincisal angle is moderately concave
U1 U1P (mm)	1.2	2.7	-1.5	1.7		within normal limits
Soft Tissue						
Upper Lip to E-Plane (mm)	-2.5	0.0	-2.5	2.0		maxillary lip is slightly flat
Lower Lip to E-Plane (mm)	-2.1	0.0	-2.1	2.0		mandibular lip is slightly flat

CASE SUMMARY

KD's treatment began in June 2020. On the initial appointment, 0.022 slot brackets were placed on upper incisors only, as well as on the entire lower arch including premolars, canines and incisors. This is the typical protocol we use in our practice for Class II correction using the D2 appliance.

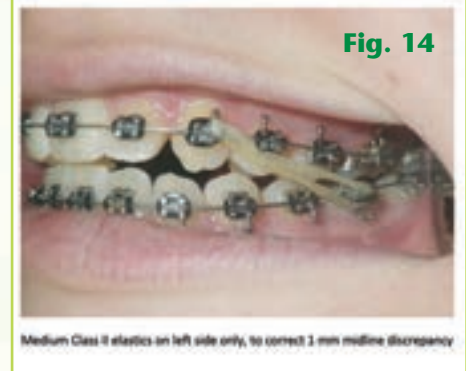
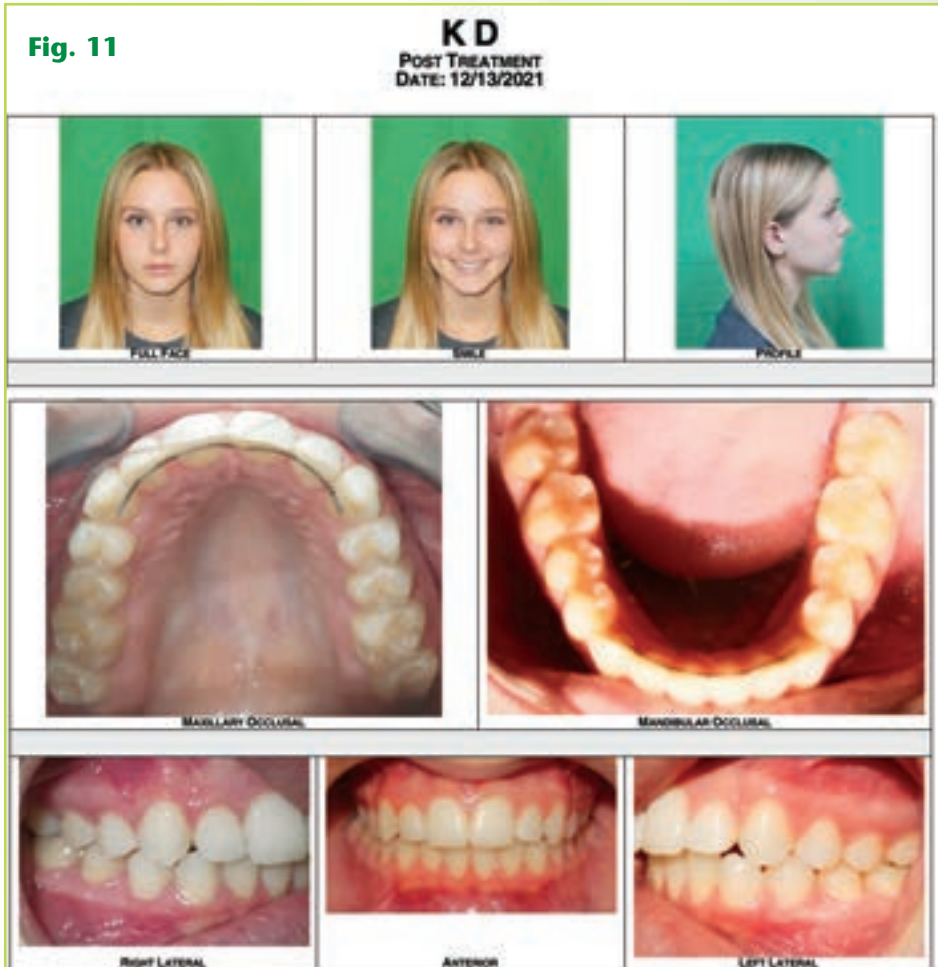
The first wire used was a 0,014 Ni Ti wire (upper sectional). 3 mm incisal stops were also placed on lingual of teeth #8 and #9 on the first appointment, in order to prevent brackets from being knocked off by the occlusion, due to the presence of deep bite.

To place the incisal stops, we use Minimolds (Ortho Arch,

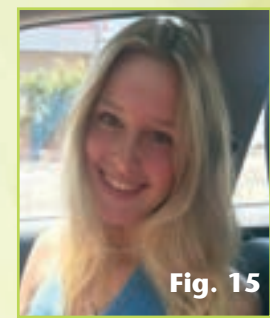
that K D was compliant with elastic wear involving her D2 appliance. The left and right side were in a good Class I molar relationship when she bit down. The crowding present on the lower arch was starting to improve due to the archwire sequence we had followed. The position of tooth #6 had also improved due to D2 elastic wear. She was instructed to wear the elastics at nighttime only to "hold the bite" the way it was. She was reappointed the next month to remove the D2 appliances.

At six months of treatment, all teeth were bracketed, and upper first and second molar bands were placed and the lower lingual holding arch was removed. We continued with regular archwire

Fig. 11



lower fixed retainers were placed. Post-op records were taken six months after appliances were removed.



(Figs. 7 -10)
Post-op photos and models show the outstanding result achieved with this treatment. (Figs. 11-14) K. D. told us that before treatment, she did not smile for pictures because she was ashamed of her teeth. Now, after orthodontic treatment, she cannot stop showing off her new smile, in person and on social media. (Fig. 15)

Fig. 12



sequences on both the upper and lower arches. After approximately three more months, and as the upper and lower archwire sequences progressed, we noticed that the upper midline was slightly shifted to the right (about 1 mm). At this point, we instructed the patient to wear Class II elastics (5/16" 3 oz. Henry Schein) on her left side only, to correct and align her upper and

lower midlines. She was told to wear this elastic all the time, except when eating. The purpose was explained.

After 12 months, all teeth were in proper position. The midlines were aligned. All the treatment objectives had been achieved. Even KD's profile had improved. Both the patient and her parents were very happy with results, and the patient was debanded. Upper and