Full-Cusp Class II Malocclusion with Bilateral Buccal Crossbite (Scissors-Bite) in an Adult

Abstract

Full-cusp Class II malocclusion with posterior buccal crossbite and an overjet exceeding 10mm, usually requires orthognathic surgery for an optimal correction. However, the use of extra-alveolar bone screws for anchorage has expanded the therapeutic envelope for conservative, nonextraction treatment. The dentoalveolar correction was facilitated by a 5-7mm retraction of the entire maxillary arch to achieve a Angle Class I molar relationship. Near ideal dental alignment was accomplished with passive self-ligating brackets, early light short elastics, posterior cross elastics, and bite turbos on lower molars. This challenging malocclusion with a discrepancy index (DI) of 22 was treated in 26 months to a Cast-Radiograph Evaluation (CRE) score of 22 and a Pink & White Esthetic Score of 3. (Int J Ortho Implantol 2015;37:60-79).

Key words:
excessive overjet, Angle Class II molar relationship, OrthoBoneScrew, extra-alveolar miniscrews, posterior buccal crossbite, Damon self-ligating brackets, early light short elastic, posterior criss-cross elastics, posterior bite turbos.

History and Etiology

A 25-year-old male patient presented for orthodontic consultation with two chief concerns: facial esthetics and crooked teeth (*Figs. 1-3*). There was no contributory medical or dental history. The etiology of the malocclusion was consistent with ectopic eruption of the permanent 1st molars into a buccal crossbite relationship, and a long-term lip trap, i. e. habitual posturing of the lower lip between the mandibular and maxillary incisors. Despite the severity of the malocclusion (*DI 22*), the patient was treated to an excellent result without orthognathic surgery (*Figs. 4-6*). Pre-treatment and post-treatment radiographic documentation is presented in Figs. 7 and 8, respectively. The pre-treatment cephalometric analysis (*Table 1*) revealed a modest Class II skeletal pattern (*ANB 5°*) with a mandibular plane angle (*SN-MP 30°*) that was within normal limits. Horizontally impacted mandibular 3rd molars were noted in pre-treatment panoramic radiograph (*Fig. 7*). Following extraction of all four third molars, 26 months of active treatment produced a well aligned (*CRE 22*) dentition with Class I buccal segments and a much improved esthetic appearance (*Figs. 4-9*). The details for diagnosis and treatment will be discussed below.

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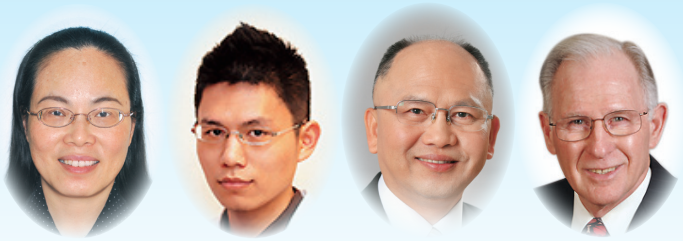


Fig. 1: Pre-treatment facial photographs

Fig. 4: Post-treatment facial photographs

Fig. 2: Pre-treatment intraoral photographs

Fig. 5: Post-treatment intraoral photographs

Fig. 3: Pre-treatment study models (casts)

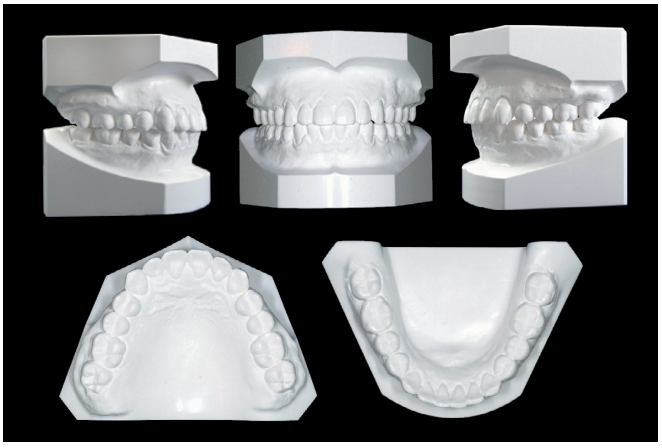
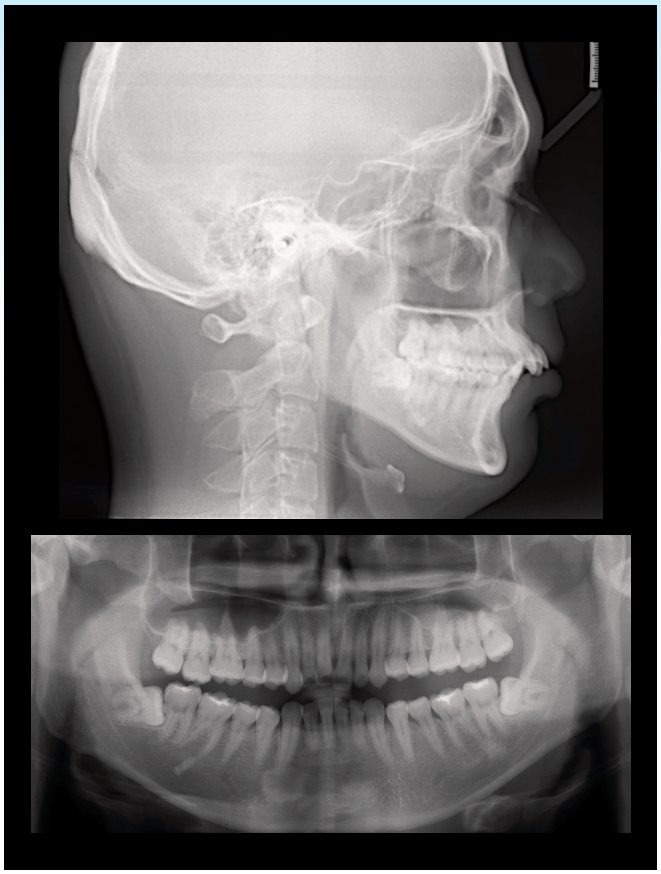
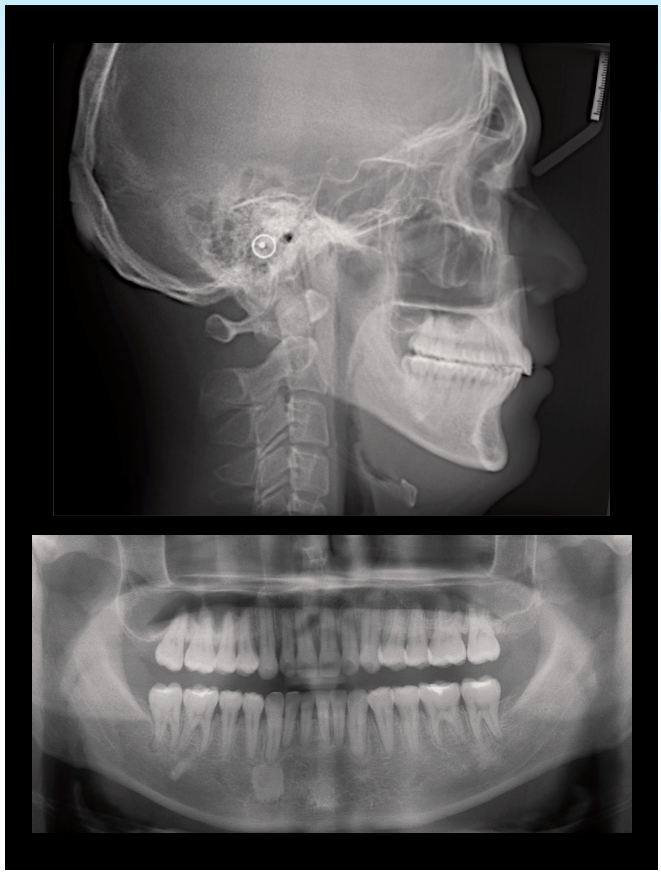


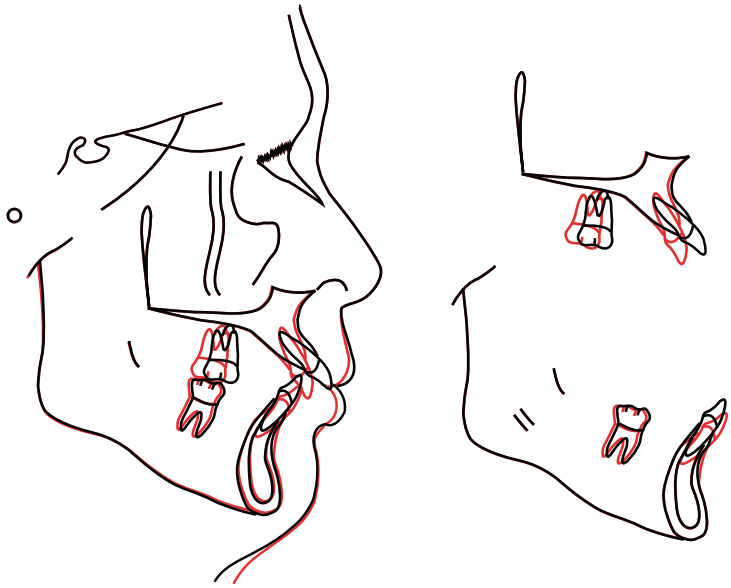
Fig. 6: Post-treatment study models (casts)



■ *Fig. 7:*
Pre-treatment panoramic and lateral cephalometric radiographs



■ *Fig. 8:*
Post-treatment panoramic and lateral cephalometric radiographs



■ *Fig. 9:*
Superimposed tracings of pre-treatment (black) and post-treatment (red) lateral cephalometric radiographs document the skeletal and dental treatment.

CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA°	89°	88°	1°
SNB°	84°	84°	0°
ANB°	5°	4°	1°
SN-MP°	30°	28°	2°
FMA°	23.5°	21.5°	2°
DENTAL ANALYSIS			
U1 TO NA mm	10 mm	4 mm	6 mm
U1 TO SN°	129°	108°	21°
L1 TO NB mm	6 mm	7 mm	1 mm
L1 TO MP°	96°	101°	5°
FACIAL ANALYSIS			
E-LINE UL	0 mm	-2 mm	2 mm
E-LINE LL	3 mm	-1 mm	4 mm

■ Table 1: Cephalometric summary

Diagnosis

Skeletal:

1. Skeletal Class I (*SNA 89°, SNB 84°, ANB 5°*)
2. Mandibular plane angle (*SN-MP 30°, FMA 23.5°*) was within normal limits (*WNL*)

Dental:

1. Bilateral Angle Class II malocclusion (*5mm*)
2. The overbite was 5 mm and overjet was 10 mm
3. Mild crowding: *2 mm in the upper, and 3 mm in the lower arch*
4. Bilateral maxillary 2nd and 3rd molars were in buccal cross bite
5. Maxillary 3rd molars were erupted, and the mandibular 3rd molars were horizontally impacted

Facial:

Acceptable profile and slightly protrusive lower lip

The ABO Discrepancy Index (*DI*) was 22[1] as shown in the subsequent worksheet.

Specific Objectives of Treatment

Maxilla (*all three planes*):

- A - P: *Retract*
- Vertical: *Maintain*
- Transverse: *Make coincident with the lower arch*

Mandible (*all three planes*):

- A - P: *Maintain*
- Vertical: *Maintain*
- Transverse: *Maintain*

Maxillary Dentition

- A - P: *Retract the entire arch to correct buccal interdigitation*
- Vertical: *Maintain*
- Inter-molar Width: *Constrict in the 2nd molar area*

Mandibular Dentition

- A - P: *Maintain*
- Vertical: *Maintain*
- Inter-molar / Inter-canine Width: *Maintain*

Facial Esthetics: Correct lip protrusion

Treatment Plan

Complying with the patient's desire to avoid orthognathic surgery and the extraction of any teeth expect the 3rd molars, a treatment plan was

proposed to place extra-alveolar (*E-A*) bone screws (*2x12mm OrthoBoneScrew®, Newton's A Ltd, Hsinchu, Taiwan*) into the infrazygomatic crests bilaterally, to retract the entire maxillary arch. Posterior bite turbos and bilateral posterior criss-cross elastics were applied to facilitate bite opening and correct the bilateral posterior buccal crossbite. Class II early light short elastics (*ELSE*) were used to retract the upper anterior teeth and reduce the overjet.

In the last phase of active treatment, section the maxillary archwire distal to the canines, and use vertical elastics to settle in the maxillary buccal segments to the finished the mandibular arch. Remove the fixed appliances and retain the corrected dentition with upper & lower clear retainers.

Appliances and Treatment Progress

Treatment was initiated after all the 3rd molars were extracted (*Fig. 10*). The bracket system was a Damon Q® .022" slot self-ligating appliance (*Ormco, Glendora, CA*). To counter the side effects of Class II elastics, the maxillary anterior teeth were bonded with high torque brackets. The initial archwire was .014" CuNiTi with resin "*pearls*" bonded on the ends to prevent mucosal irritation.

After one month of initial alignment and leveling in the upper arch, the lower arch was bonded, utilizing low torque brackets in the mandibular anterior region, and fitted with a .014" CuNiTi archwire (*Fig. 11*). Buttons were bonded on the lingual surfaces of both lower 2nd molars (*Fig. 12*) and cross elastic (*Chipmunk 1/8, 3.5oz*) were used in the second molar area bilaterally. At the same appointment, posterior bite turbos (*composite resin bonded on the occlusal surface*) were placed on both mandibular 1st molars to open the bite to facilitate correction of the bilateral buccal crossbite (*Fig. 13*). The first 5 months of treatment was dedicated to correcting the posterior crossbites.

Four months after the initiation of treatment, the maxillary archwire was replaced with a .016" NiTi wire. One month later, the posterior crossbites were corrected, the cross elastic were stopped, and drop in hooks were inserted into the brackets of the bilateral upper 1st premolars. The patient was

Fig. 10:
Prior to treatment there was an asymmetric excessive overjet that precluded placing lower anterior brackets without preliminary alignment of the upper arch and/or the use of posterior bite turbos.

Fig. 11:
To counter the effect of Class II elastics, the maxillary anterior teeth were bonded with high torque brackets and the low torque brackets were selected for the lower anterior teeth.

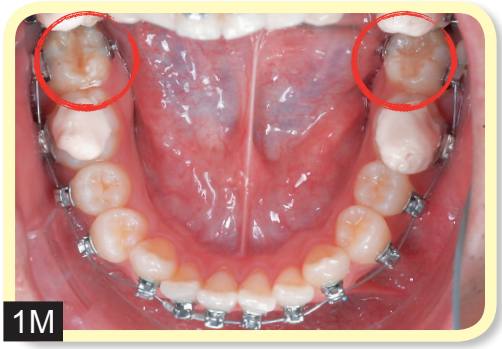
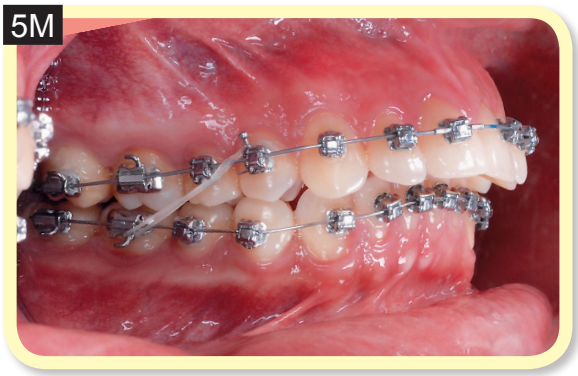


Fig. 12:
Buttons were bonded on the lingual surface of the lower 2nd molars bilaterally.

Fig. 13:
Cross elastics were attached bilaterally from the upper 2nd molars to the lower 2nd molars. Posterior bite turbos were placed on the mandibular 1st molars to open the bite for crossbite correction.

instructed to wear Class II early light short elastics (*Hummingbird 1/8, 2oz.*) bilaterally from the upper 1st premolars to the lower 1st molars to retract the upper anterior teeth and reduce the overjet (*Fig. 14*).

Six months into active treatment E-A bone screws (*2x12mm OrthoBoneScrew®, Newton's A Ltd, Hsinchu, Taiwan*) were implanted bilaterally in the infrazygomatic crests. Drop in hooks were inserted into the brackets of the upper canines, and elastometric chains were attached from the upper canines to the E-A screws to retract the maxillary anterior segment (*Fig. 15*). At the same appointment, the archwires were changed to .018" NiTi in the upper arch and .016" NiTi in the lower arch.



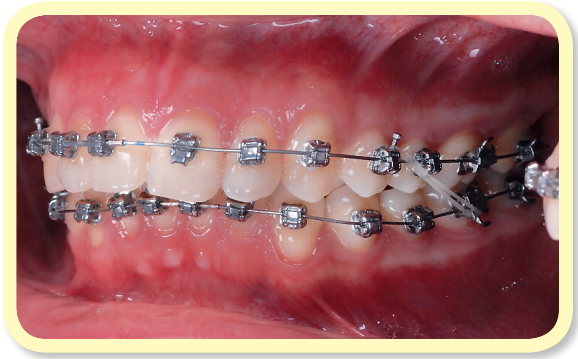


Fig. 14:
Class II early, light short elastics were worn bilaterally full time, from the upper 1st premolars to the lower 1st molars to retract the upper anterior teeth and reduce the overjet.

Fig. 15:
Extra-alveolar bone screws (2x12mm OrthoBoneScrew®, Newton's A Ltd.) were implanted bilaterally into the infrazygomatic crests. Drop in hooks were inserted into the brackets of the bilateral upper canines. Using elastometric chains attached from the upper canines to the screws to retract the maxillary anterior segment.

In the 8th month, archwire changes were .014x.025" CuNiTi in the upper and .018" NiTi in the lower. One month later, a .017x.025" low friction TMA archwire was used on the maxillary arch open coil springs were placed between the left central and lateral incisors to open a space for restoration of the mesial caries on the upper left lateral incisor (*Fig. 16*). A .014x.025" CuNiTi archwire was used on the mandibular arch.

In the 13th month, the archwire was changed to .016x.025" stainless steel (*SS*) in the upper arch, and .017x.025" low friction TMA in the lower arch. The bimaxillary anterior segments were ligated with a figure-eight tie using a .012" SS.

After 15 months of active treatment, a progress panoramic radiography was exposed to evaluate axial inclinations and reposition brackets on inadequately aligned teeth (*Fig. 17*). The interproximal contact of upper and lower incisors were stripped as needed to reduce the black triangles (*Fig. 18*). One month later, the archwire was changed to a .016x.025" SS in the lower arch. The excessive anterior overjet was improved from 10 mm to 3 mm.

Fig. 16:
An open coil spring was used to open space for the restoration of mesial caries on the upper left lateral incisor.

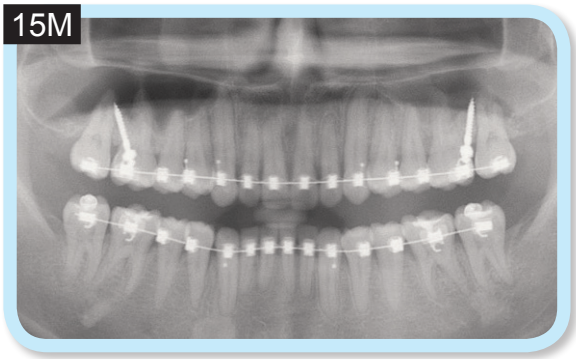


Fig. 17:
A progress panoramic radiography was taken to evaluate the relationship between axial inclination and bracket position of each tooth.

Fig. 18:
The interproximal contact of upper and lower incisors were stripped to reduce the black triangles. After interproximal enamel reduction, an elastomeric chain was applied to close the space. Reshaping the crowns and closing space produced a more harmonious tooth contours.

In the 18th month, all brackets were repositioned as needed to achieve a precise finished alignment, and a .014x.025" CuNiTi archwire was used in the upper arch. Two months later the buccal posterior crossbite on the right side was tending to relapse, so cross elastics (*Chipmunk 1/8, 3.5oz*) were used again on the right second molars. The upper archwire was changed to .016x.025" SS and full arch elastomeric chains were applied to close all residual spaces.

22nd month after the initial of treatment, the anterior overjet was reduced to 1.5 mm. Class II elastics (*Bear 1/4, 4.5oz.*) were worn bilaterally full time, from the upper canines to the lower 1st molars and cross elastics were stopped.

After 23 months of active treatment, outcome assessment was performed on prefinish records to evaluate treatment progress and plan the finishing sequence of treatment (*Figs. 19-22*).

Fig. 19:
Interim-treatment facial and intraoral photographs at 23 months of treatment

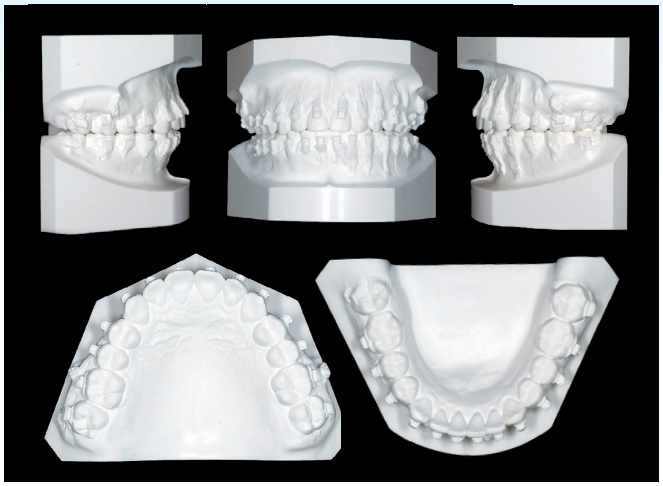


Fig. 20:
Interim-treatment study models at 23 months of treatment

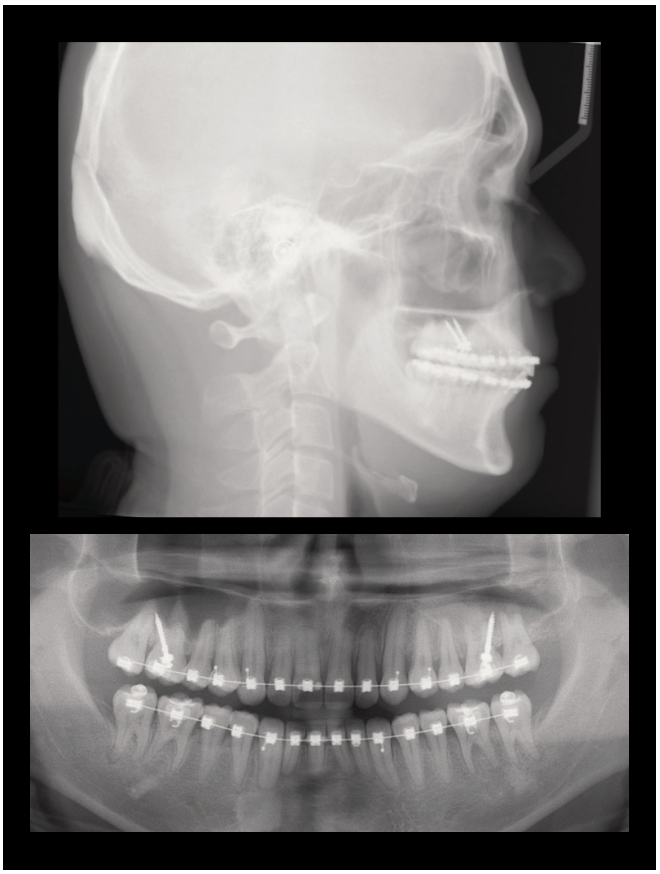


Fig. 21:
Interim-treatment pano and cephalometric radiographs at 23 months of treatment

Interim-Treatment Progress

Date of Records: 23 months after initial treatment

Maxilla:

- A - P: *Retract*
- Vertical: *Maintain*
- Transverse: *Reduced to coincide with the lower arch*

Mandible:

- A - P: *Anteriorly positioned*
- Vertical: *Maintain*
- Transverse: *Maintain*

Maxillary Dentition:

- A - P : *Molars and incisors retracted*
- Vertical: *Molars and incisors maintained*
- Inter-molar Width: *Constricted*
- Inter-canine Width: *Expanded*
- Buccolingual Inclination: *Excessive*

Mandibular Dentition:

- A - P: *Molars maintained, incisors intruded with increased axial inclination*
- Vertical: *Molars and incisors maintained*
- Inter-molar Width: *Decreased*
- Inter-canine Width: *Expanded*
- Buccolingual Inclination: *Maintained*

Anticipated Future Treatment

The interim-treatment (*prefinish*) revealed substantial improvement in the overjet, bilateral posterior

buccal crossbite and lower lip protrusion (*Fig. 19*). Axial inclination of the upper incisors had been reduced from 129° to 109.5°, U1-SN (*mm*) was reduced from 10 to 6 mm, but the L1-MP angle was increased from 96° to 101° (*Fig. 23*).

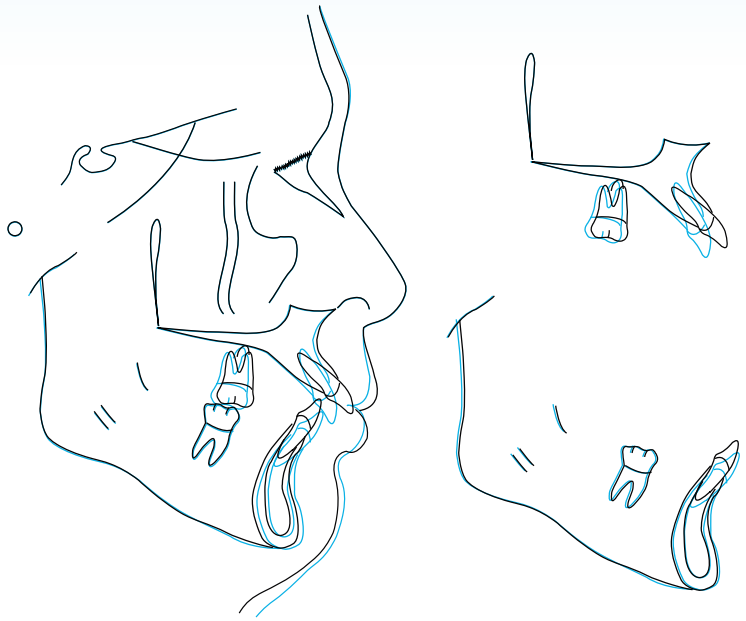


Fig. 22: Interim-treatment superimposed tracings at 23 months of treatment

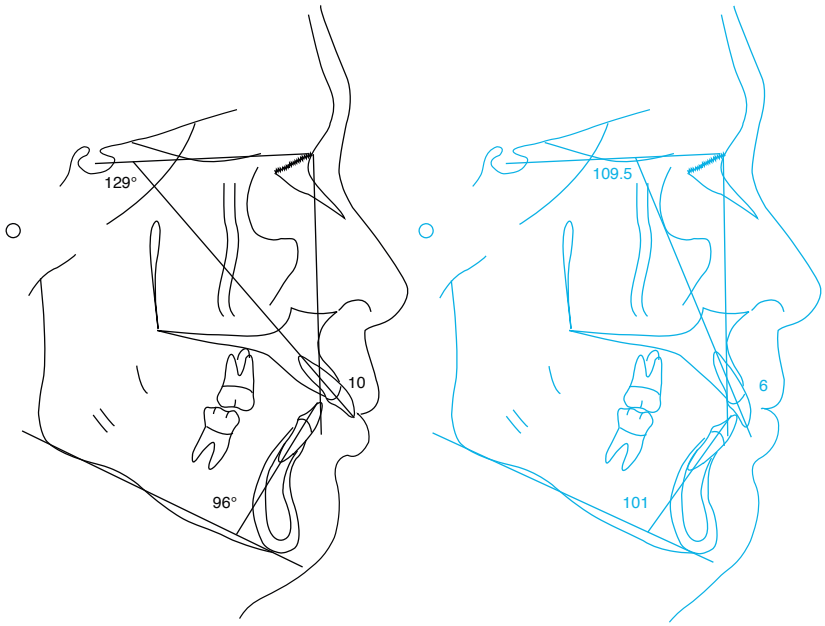


Fig. 23:
Interim-treatment cephalometric tracings revealed that flaring of the upper incisors had been reduced from 129° to 109.5°. U1-SN (mm) was reduced from 10 mm to 6 mm, and the L1-MP was increased from 96° to 101°.

The CRE (*Cast-Radiograph Evaluation*) progress score is routinely used about six months before debonding to check for remaining discrepancies. Panoramic radiography was used to check the angulation of dentition in order to reposition brackets.

The aim of the prefinish evaluation was to reduce the CRE score from 40 to no more than 26 points.

The following to do list is based on progress CRE score of 40 was expected to be accomplished in about 3 months:

1. Detailed bending to correct multiple rotations (*Fig. 24*).
2. Retract the upper anterior segment to reduce the overjet (*Fig. 25*).
3. Arch coordination to improve the occlusal relationship and dental contacts (*Fig. 26*).

During the last 3 months of treatment, finishing bends and vertical elastics were used to efficiently finish the occlusion. One month prior to the completion of active treatment, the upper archwire was sectioned distal to the cuspids, and the lower archwire was cut distal to the 1st molars. Up and down (*vertical*) elastics (*Chipmunk 1/8, 3.5oz*) were used to improve the the intermaxillary contacts of the posterior teeth (*Fig. 26*).[2] After 26 months of active treatment, all appliances were removed, and clear overlay retainers were delivered for both arches.

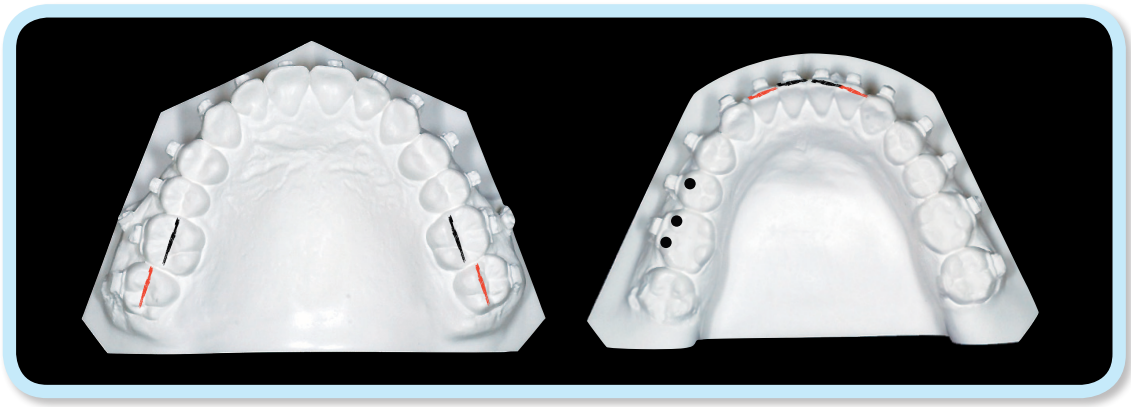


Fig. 24: Detailed bending were used to correct rotations in the upper 2nd molars and the lower anterior region.

Fig. 25: The upper anterior segment was retracted with Class II elastics to reduce the overjet.

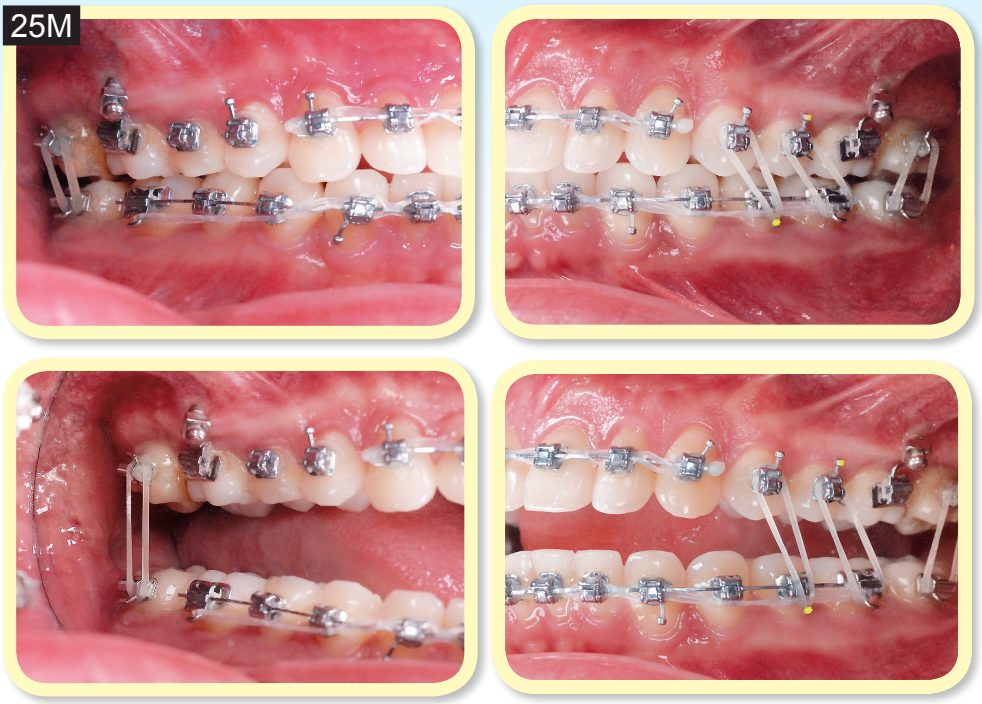


Fig. 26:
Arch coordination was used to improve occlusal relationship and contacts. The upper archwire was sectioned distal to the cuspids, and the lower archwire was cut distal to the 1st molars. Up and down (vertical) elastics (Chipmunk 1/8, 3.5oz) were used to improve the the intermaxillary contacts of the posterior teeth.

Results Achieved

Maxilla (*all three planes*):

- A - P: *Retracted*
- Vertical: *Maintained*
- Transverse: *Coincident with lower arch*

Mandible (*all three planes*):

- A - P: *Maintained*
- Vertical: *Maintained*
- Transverse: *Maintained*

Maxillary Dentition

- A - P: *Retraction of the entire maxillary arch*
- Vertical: *Maintain*
- Inter-molar Width: *Coincident with lower arch*

Mandibular Dentition

- A - P: *Maintain*
- Vertical: *Intrude incisors*
- Inter-molar / Inter-canine Width: *Maintain*

Facial Esthetics: Retraction of both lips

Retention

Upper and lower clear overlays were delivered, with the instructions for full time wear for the first 6 months and nights only thereafter. The patient was instructed in home care as well as in maintenance of the retainers.

Final Evaluation of Treatment

The final ABO CRE score[1] was 22 points. The major residual discrepancies were: alignment / rotation 5 points, marginal ridges 5 points, buccal overjet 5 points, and occlusal contact 4 points. Most of the CRE problems involved the maxillary 2nd molars (*Figs. 27 and 28*).

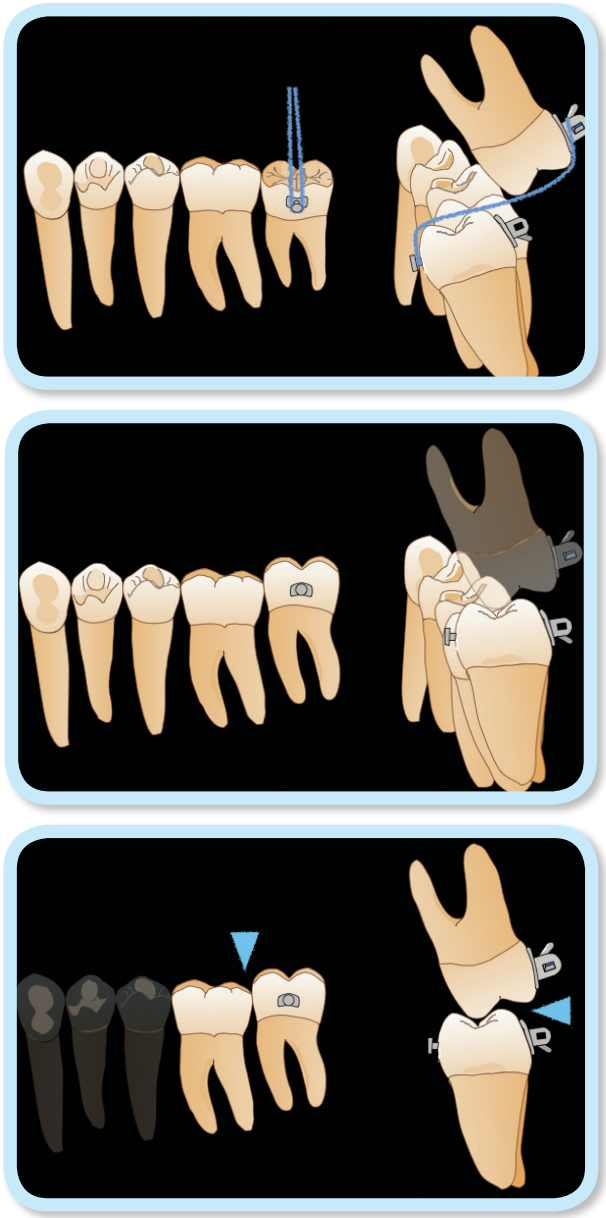


Fig. 27:
A side effect of the cross elastics was extrusion of the 2nd molars producing marginal ridge discrepanacies.

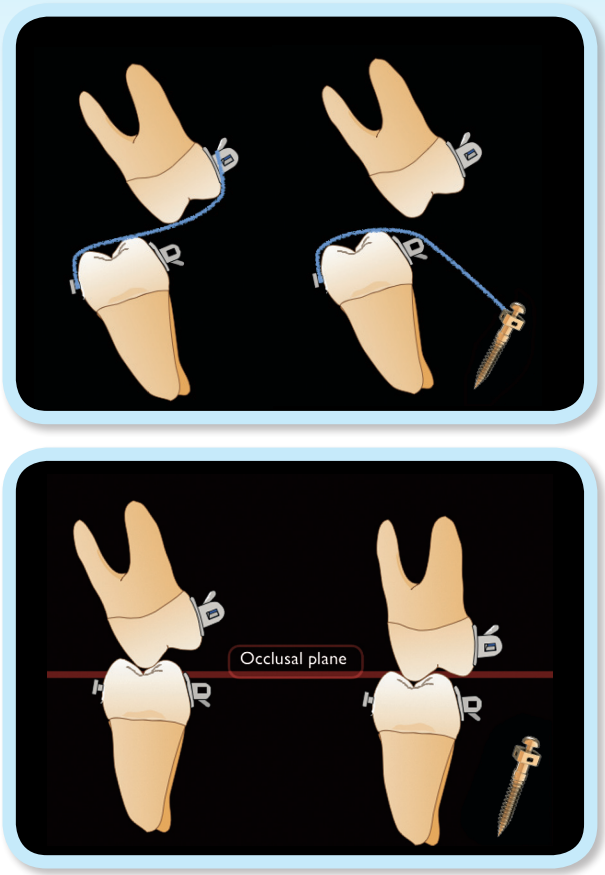


Fig. 28:
The extrusive nature of cross elastics (left) is compared to the intrusive and uprighting force delivered via the extra-alveolar bone screws (right). Thus, the pre-mature contact between the maxillary 2nd molar palatal cusps and the central fossae of the mandibular 2nd molars is a side effect of the cross elastics.

The major esthetic concerns, severe overjet and protrusive lips, were well corrected and a solid Class I molar relationship was achieved. The bilateral buccal crossbites (*scissors-bite*) were well corrected.

Discussion

Excessive overjet may have an extrinsic etiology due to habits such as thumb sucking or overuse of pacifiers at a young age. Probably the most common cause of overjet is a lower lip trap which may be

secondary to oral habits. An excessive overjet greatly increases the risk of injuring the protruded upper front teeth. Malaligned teeth can render the biting of food difficult or impossible, and excessive overjet may result in speech impediments. Incompetent lips due to excessive overjet may present an unattractive appearance, subjecting a child to teasing and poor psychosocial development.

Excessive overjet (*>10mm*) in an adult usually requires orthognathic surgery,[3] but no treatment should be rendered without a through evaluation of the dental and facial patterns. The first impression for the present patient may be an underlying skeletal discrepancy that is associated with flared incisors and soft tissue protrusion.[4] Although the ANB angle was 5°, the severe flaring of the maxillary incisors is more directly related to a long-term lower lip trap. The lack of a severe skeletal discrepancy favors conservative management of the Class II malocclusion rather than resorting to orthognathic surgery.

In an adult, correcting a full unit Class II molar relationship is a challenging task. Extracting maxillary first premolars and finishing in a Class II molar relationship is a typical approach, but that would be difficult to achieve for the present patient because his buccal segments were already in a full cusp Class II occlusion. Furthermore, the patient wanted to avoid extractions and orthognathic surgery, so the viable option was extra-alveolar bone screws in the infrazygomatic crests (*IZC*) to retract the entire maxillary arch.[5-6] With a combination of precise diagnosis and reliable mechanics, the present severe malocclusion was resolved in 26 months without extractions or orthognathic surgery.

At the beginning of treatment, the bilateral buccal crossbite was the first priority.[7] Posterior bite turbos with cross elastics were used for the early correction of the crossbite. These straight forward mechanics successfully corrected the buccal crossbite within 5 months, but side effect of the cross elastics compromised the result with regard to alignment of maxillary second molars. The CRE score documented multiple problems with 2nd molar alignment, including steps between mandibular molars (*Fig. 27*), and pre-mature contact between the maxillary 2nd molar palatal cusps and the central fossa of the mandibular 2nd molars (*Fig. 28*). There were multiple 2nd molar alignment problems: 1. excessive buccal overjet, 2. marginal ridge discrepancy, and 3. occlusal contact discrepancies. Second molar intrusion with E-A bone screws helped to offset some of the molar alignment problems by delivering an intrusive force (*Figs. 27 and 28*).[8]

Extra-alveolar bone screws in the IZCs were used for anchorage at about 6 months into treatment when a .014"x.025" CuNiTi upper archwire was in place. Low-friction self-ligating brackets enhance alignment of malposed teeth,[9] but the relatively small archwire does not fill the slot, so retraction forces may rotate teeth and create marginal ridge discrepancies. Carefully monitoring of changes in occlusion and tooth angulation is important for well-controlled early retraction of the buccal segments.

Torque selection is very important for full arch retraction. High torque brackets on maxillary incisors and low torque braces on mandibular incisors counters the changes in axial inclination that are expected with E-A retraction forces and Class II

elastics.[10] The entire maxillary dentition was retracted about 6mm (*Table 1*), and a 1mm proclination of the lower incisors was necessary to resolved the 10mm overjet. Torque control and finishing bends in the archwires were required during finishing. Additional finishing bends and/or bracket repositioning for the maxillary 2nd molars would have improved the CRE score. However, it is difficult to perceive 2nd molar alignment problems intraorally, so a set of pre-finish casts about 3-6 months before the end of active treatment is very helpful. In retrospect, the second molar problems could have been corrected when the largest archwire (*.017x.025" TMA*) was in place.

Precise diagnosis is a key to successful treatment. The dental relationship for the present case appeared to be a skeletal Class II div.1 malocclusion; however, the skeletal relationship was only an ANB of 5° (*Table 1*) so the malocclusion was primarily a dentoalveolar problem. If Class II div.1 cases have reduced lower facial height and a low FMA angle,[11] excessive masseter muscle force is probable.[12] The etiology of the current Class II div 1 malocclusion appears to be the result of a poor oral habit: lower lip trap. Myofunctional therapy (*MFT*) is important for long term success following active orthodontic treatment to correct habit-induced malocclusions. Tongue and lip posture training are important adjuncts during the retention phase.[13]

The post-treatment cephalometric radiograph suggests a reduced pharyngeal airway (*Fig. 8*) so possible respiratory problems should be monitored during retention. If the patient develops obstructive sleep apnea (*OSA*) symptoms, additional treatment may be indicated.[14]

Conclusion

Correction of a full cusp Class II malocclusion with a 10mm overjet in an adult usual requires extractions and/or orthognathic surgery. Improved diagnostic methods and the development of extra-alveolar bone screws anchorage has introduced a new paradigm for correction of severe dentoalveolar malocclusions without extractions or extensive surgery. Furthermore, the method is highly efficient because up to 6 mm of maxillary retraction was achieved in 26 months of active treatment time.[15]

Careful diagnosis and simplified mechanics are important for soliciting patient compliance. The rapid progression of treatment and the simplified mechanics facilitated oral hygiene and provided a positive experience for the patient. The patient's oral habits should be managed with MFT and his potential for OSA should be monitored.

Acknowledgment

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Discrepancy Index Worksheet

TOTAL D.I. SCORE 22

OVERJET

0 mm. (edge-to-edge)	=	
1 – 3 mm.	=	0 pts.
3.1 – 5 mm.	=	2 pts.
5.1 – 7 mm.	=	3 pts.
7.1 – 9 mm.	=	4 pts.
> 9 mm. 10	=	5 pts.

Negative OJ (x-bite) 1 pt. per mm. per tooth =

Total = 5

OVERBITE

0 – 3 mm.	=	0 pts.
3.1 – 5 mm.	=	2 pts.
5.1 – 7 mm. 6.5	=	3 pts.
Impinging (100%)	=	5 pts.

Total = 3

ANTERIOR OPEN BITE

0 mm. (edge-to-edge), 1 pt. per tooth
then 1 pt. per additional full mm. per tooth

Total = 0

LATERAL OPEN BITE

2 pts. per mm. per tooth

Total = 0

CROWDING (only one arch)

1 – 3 mm.	=	1 pt.
3.1 – 5 mm. 4	=	2 pts.
5.1 – 7 mm.	=	4 pts.
> 7 mm.	=	7 pts.

Total = 2

OCCLUSION

Class I to end on	=	0 pts.
End on Class II or III	=	2 pts. per side ____ pts.
Full Class II or III	=	4 pts. per side 8 pts.
Beyond Class II or III	=	1 pt. per mm. additional ____ pts.

Total = 8

LINGUAL POSTERIOR X-BITE

1 pt. per tooth Total = 0

BUCCAL POSTERIOR X-BITE

2 pts. per tooth Total = 4

CEPHALOMETRICS (See Instructions)

ANB ≥ 6° or ≤ -2° = 4 pts.

Each degree < -2° _____ x 1 pt. = _____

Each degree > 6° _____ x 1 pt. = _____

SN-MP

≥ 38° = 2 pts.

Each degree > 38° _____ x 2 pts. = _____

≤ 26° = 1 pt.

Each degree < 26° _____ x 1 pt. = _____

1 to MP ≥ 99° = 1 pt.

Each degree > 99° _____ x 1 pt. = _____

Total = 0

OTHER (See Instructions)

Supernumerary teeth	x 1 pt. =	
Ankylosis of perm. teeth	x 2 pts. =	
Anomalous morphology	x 2 pts. =	
Impaction (except 3rd molars)	x 2 pts. =	
Midline discrepancy (≥3mm)	@ 2 pts. =	
Missing teeth (except 3rd molars)	x 1 pts. =	
Missing teeth, congenital	x 2 pts. =	
Spacing (4 or more, per arch)	x 2 pts. =	
Spacing (Mx cent. diastema ≥ 2mm)	@ 2 pts. =	
Tooth transposition	x 2 pts. =	
Skeletal asymmetry (nonsurgical tx)	@ 3 pts. =	
Addl. treatment complexities	x 2 pts. =	

Identify:

Total = 0

IMPLANT SITE

Lip line : Low (0 pt), Medium (1 pt), High (2 pts) =_____

Gingival biotype : Low-scalloped, thick (0 pt), Medium-scalloped, medium-thick (1 pt), High-scalloped, thin (2 pts) =_____

Shape of tooth crowns : Rectangular (0 pt), Triangular (2 pts) =_____

Bone level at adjacent teeth : ≤ 5 mm to contact point (0 pt), 5.5 to 6.5 mm to contact point (1 pt), ≥ 7mm to contact point (2 pts) =_____

Bone anatomy of alveolar crest : H&V sufficient (0 pt), Deficient H, allow simultaneous augment (1 pt), Deficient H, require prior grafting (2 pts), Deficient V or Both H&V (3 pts) =_____

Soft tissue anatomy : Intact (0 pt), Defective (2 pts) =_____

Infection at implant site : None (0 pt), Chronic (1 pt), Acute(2 pts) =_____

Total = 0

Cast-Radiograph Evaluation

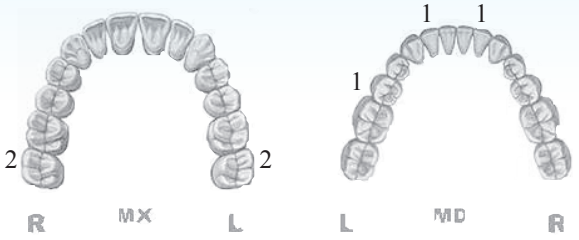
Interim-Treatment Progress

Case # 1 **Patient**

Total Score: 40

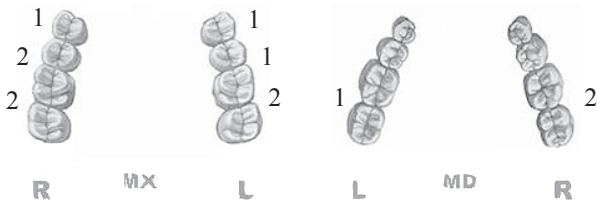
Alignment/Rotations

7



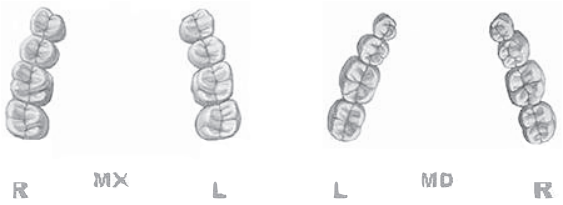
Marginal Ridges

12



Buccolingual Inclination

0

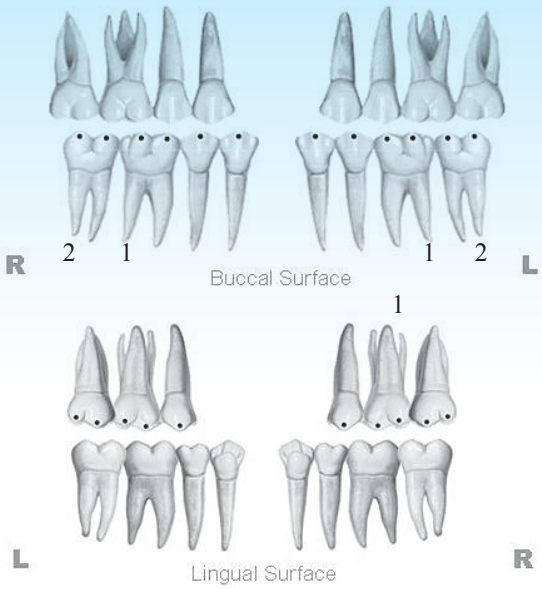


Overjet

9

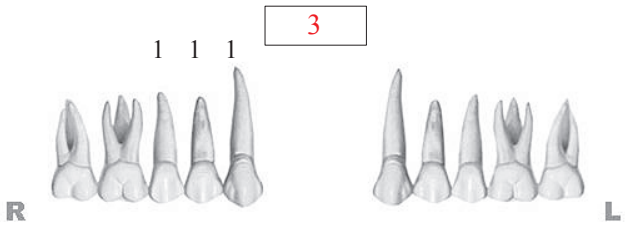
Occlusal Contacts

7



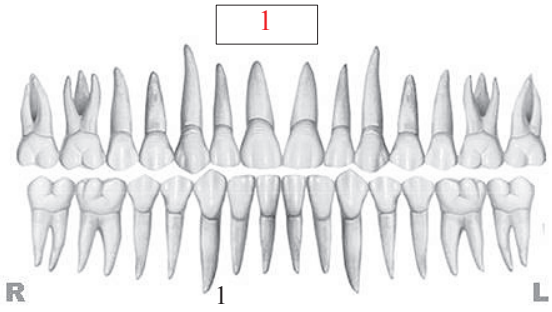
Occlusal Relationships

3



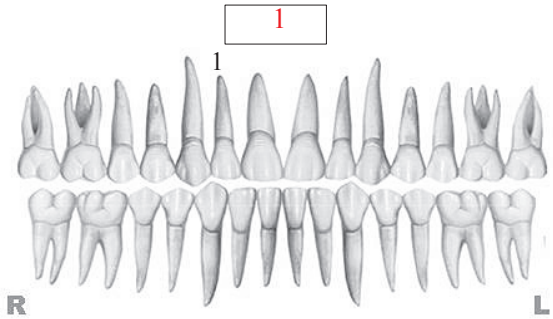
Interproximal Contacts

1



Root Angulation

1



INSTRUCTIONS: Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

Cast-Radiograph Evaluation

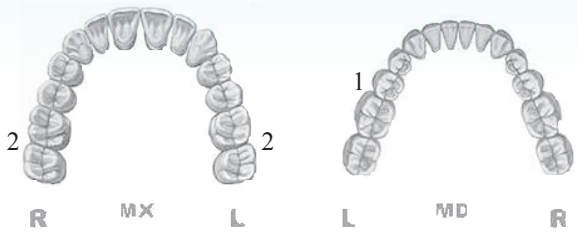
Interim-Treatment Progress

Case # 1 **Patient**

Total Score: 22

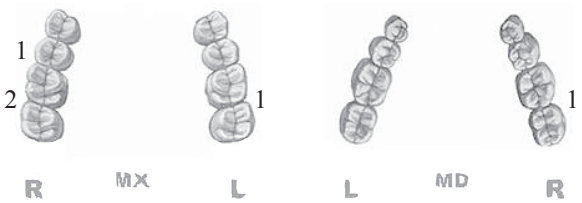
Alignment/Rotations

5



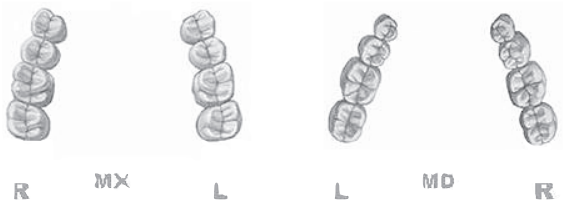
Marginal Ridges

5



Buccolingual Inclination

0

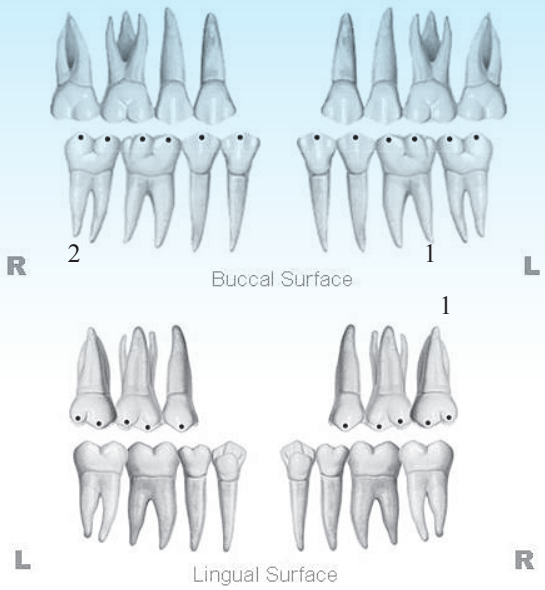


Overjet

5

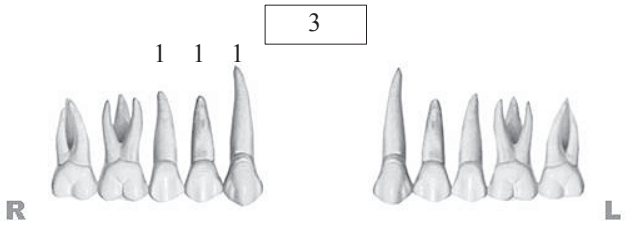
Occlusal Contacts

4



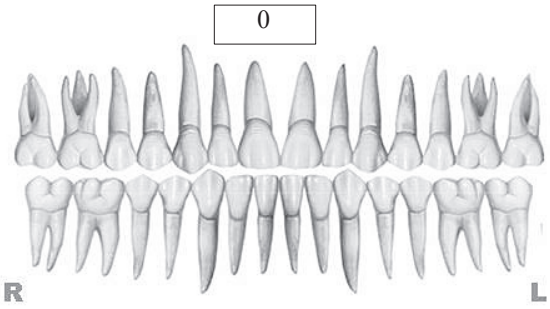
Occlusal Relationships

3



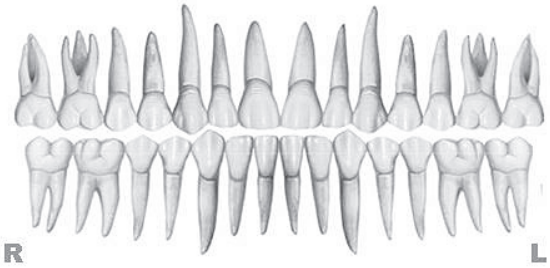
Interproximal Contacts

0



Root Angulation

0



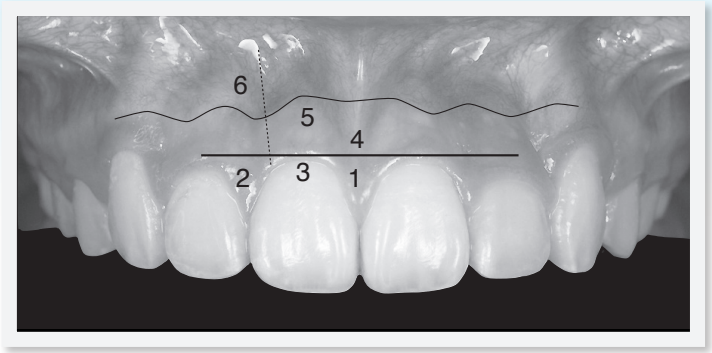
INSTRUCTIONS: Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

IBOI Pink & White Esthetic Score

Total Score: = 3

1. Pink Esthetic Score

Total = 1

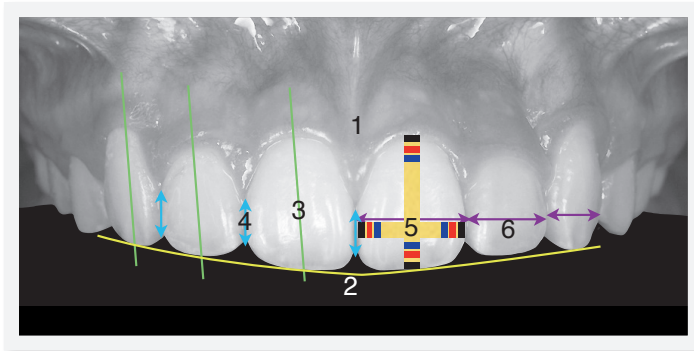


1. Mesial Papilla	0	1	2
2. Distal Papilla	0	1	2
3. Curvature of Gingival Margin	0	1	2
4. Level of Gingival Margin	0	1	2
5. Root Convexity (Torque)	0	1	2
6. Scar Formation	0	1	2

1. M & D Papillae	(0)	1	2
2. Keratinized Gingiva	(0)	1	2
3. Curvature of Gingival Margin	0	(1)	2
4. Level of Gingival Margin	(0)	1	2
5. Root Convexity (Torque)	(0)	1	2
6. Scar Formation	(0)	1	2

2. White Esthetic Score (for Micro-esthetics)

Total = 2



1. Tooth Form	0	1	2
2. Mesial & Distal Outline	0	1	2
3. Crown Margin	0	1	2
4. Translucency (Incisal thrid)	0	1	2
5. Hue & Value (Middle third)	0	1	2
6. Tooth Proportion	0	1	2

1. Midline	0	(1)	2
2. Incisor Curve	(0)	1	2
3. Axial Inclination (5°, 8°, 10°)	0	(1)	2
4. Contact Area (50%, 40%, 30%)	(0)	1	2
5. Tooth Proportion (1:0.8)	(0)	1	2
6. Tooth to Tooth Proportion	(0)	1	2