

Nonsurgical Treatment of Anterior Open Bite Malocclusion

Abstract

This case report describes the nonsurgical treatment of a 31-years-old female presenting with a chief complaint of anterior open bite malocclusion. A clinical exam revealed that there were spaces between her lower anterior teeth. Orthodontics was indicated to align and level the maxillary dentition and close the mandibular spaces. Anterior early light short elastic (2 oz) was used to solve the open bite problem. Miniscrews in the infrazygomatic crests was applied to retract the upper and lower dentition and intrude the upper posterior segment. It improved her lip profile and reduced the mandibular angle. Class III elastics were used to correct the negative overjet and continuous intermaxillary elastics were prescribed to settle the final occlusion. A marked improvement in anterior open bite correction and occlusal function was achieved. (Int J Orthod Implantol;40:44-63)

Key words:

Anterior open bite malocclusion, early light short elastics, Angle Class I molar relationship, mandibular midline shifted, Damon self-ligating brackets, OrthoBoneScrew, extra-alveolar miniscrews, infrazygomatic crests (IZC), class III elastics, negative overjet, continuous intermaxillary elastics.

History and Etiology

A 31-years-old female was referred by her dentist for orthodontic consultation (Fig. 1). Her chief concern was the spaces between her lower teeth (Figs. 2-3). There were no contributory medical problems. A clinical exam revealed that the excess space in the mandibular region was associated with a mandibular midline deviation that was 1.5 mm to the right. The patient had a bilateral Class I molar relationship with a 1.5-2.0 mm open bite from the maxillary right lateral incisor to the left canine (Fig. 2). Her oral hygiene was excellent. A tongue thrust swallowing pattern was noted, which is a common compensation for patients with an anterior open bite. The primary etiology of her anterior open bite appears to be an interincisal posture of the tip of her tongue.

The patient was treated to a pleasing result as shown in Figures 4-9. The cephalometric and panoramic radiographs document the pre-treatment condition (Fig. 7) and the post-treatment results (Fig. 8). The superimposed cephalometric tracings before and after treatment are shown in Fig. 9. The correction of this difficult malocclusion was facilitated by assessing progress records, that were collected about 6 months prior to the anticipated finish.¹

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■ Fig. 1: Pre-treatment facial photographs



■ Fig. 4: Post-treatment facial photographs



■ Fig. 2: Pre-treatment intraoral photographs



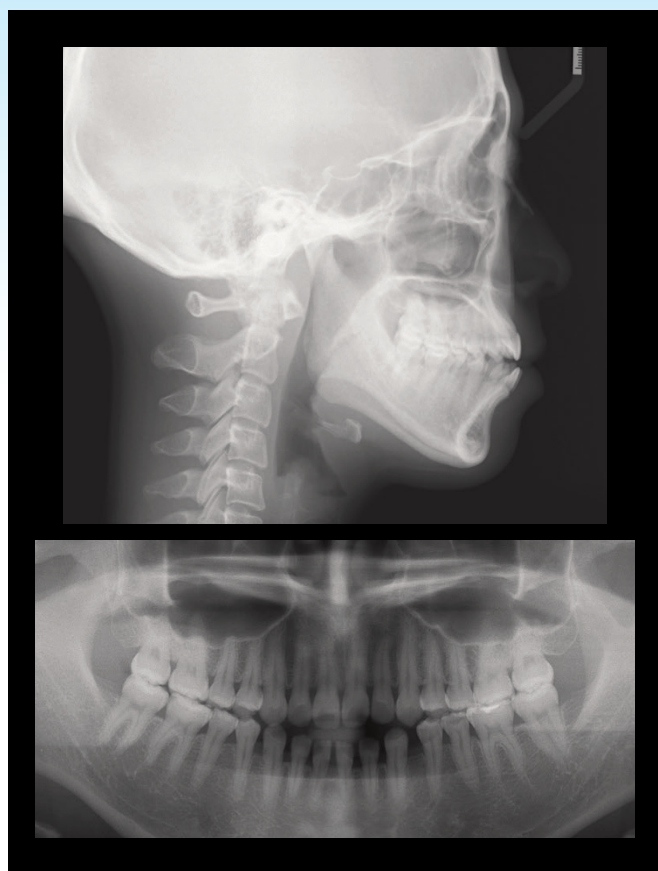
■ Fig. 5: Post-treatment intraoral photographs



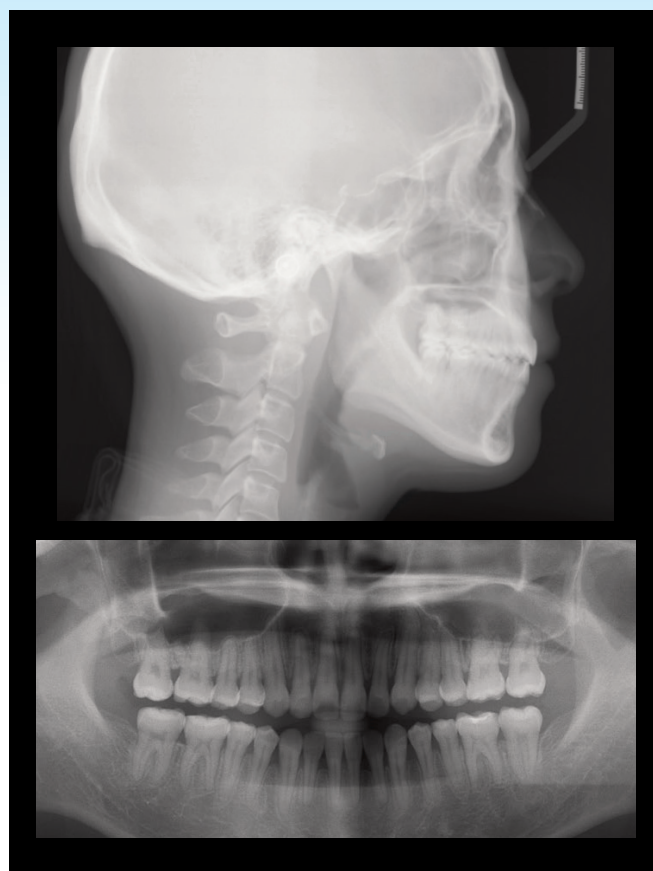
■ Fig. 3: Pre-treatment study models (casts)



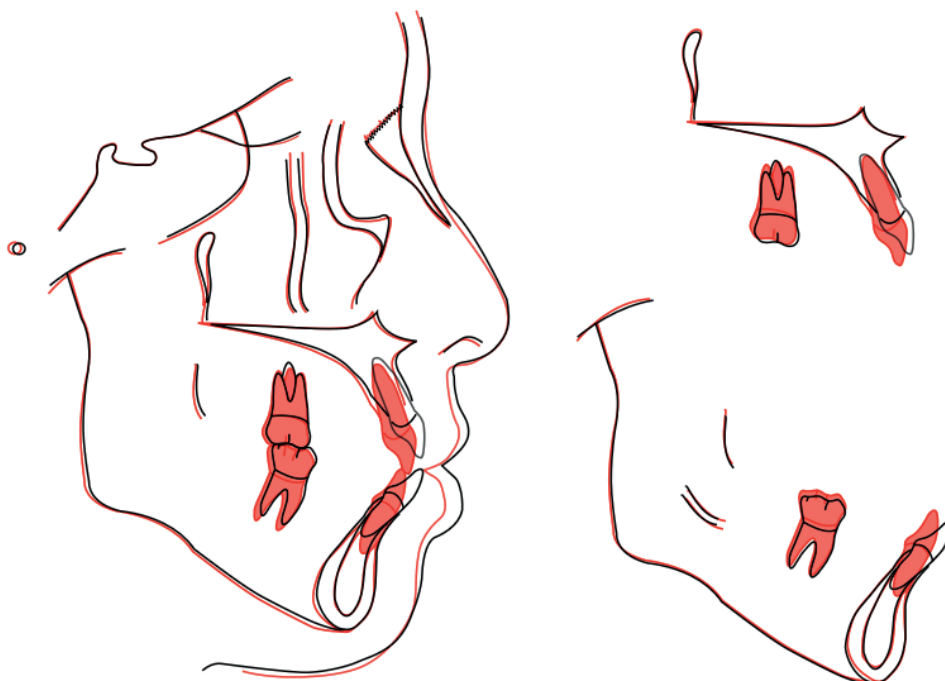
■ Fig. 6: Post-treatment study models (casts)



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



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



■ Fig. 9:
 Superimposed tracings: Upper and lower incisors were retracted. The upper molars were distalized by miniscrews which were inserted into the infrazygomatic crests (IZC). Significant lip retraction was achieved due to the whole arch distalization. Very little growth was found.

Diagnosis

Facial:

- Bimaxillary lip protrusion
- Chin deviates 3mm to the right side

Skeletal:

- Skeletal Class I (SNA 79°, SNB 77°, ANB 2°)
- High mandibular plane angle (SN-MP 36°, FMA 29°)

Dental:

- Angle Classification: *bilateral Class I molar relationship*
- Incisal relationships: *overjet -2 mm, openbite of ~2 mm, and proclined lower incisors (IMPA=106°) (Fig. 10).*



■ **Fig. 10:**
-2 mm overjet and 2 mm open bite, proclined lower incisors (IMPA=106°)

- Tooth Size Arch Length Discrepancy: *maxillary arch 0 mm, mandibular arch -11 mm*
- Crossbite right canines and first premolars

Radiographic\Panoramic:

- Asymmetric mandible (Fig. 7)

Radiographic\Other:

- Low alveolar bone height in mandibular anterior region

The ABO Discrepancy Index (DI) was 34 as shown in the subsequent worksheet.

Specific Objectives of Treatment

Maxilla:

- A - P: *Maintain*
- Vertical: *Maintain*
- Transverse: *Expand to correct posterior crossbite*

Mandible:

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

Maxillary Dentition:

- A - P: *Molars: Retract incisors*
- Vertical: *Extrude incisors*
- Inter-molar Width: *Maintain*
- Inter-canine Width: *Maintain*
- Buccolingual Inclination: *Maintain*

Mandibular Dentition:

- A - P: *Maintain molars and retract incisors*

- Vertical: *Maintain*
- Inter-molar Width: *Maintain*
- Inter-canine Width: *Decrease to correct crossbite*
- Buccolingual Inclination: *Maintain*

Facial Esthetics:

- Correct the lip protrusion.

Other:

- Retract the entire upper and lower dentition to correct the protrusive profile.

Treatment Plan

A non-extraction treatment with a full fixed orthodontic appliance was indicated to align and level the maxillary dentition and close the mandibular anterior spaces. Anterior early light short elastics (2 oz) were planned to resolve the anterior open bite.

Two maxillary extra-alveolar miniscrews will be used to retract the upper and lower dentition to improve the lip profile, as well as to control the upper posterior segment extrusion due to use of Class III elastics. The final occlusion will be detailed with bracket repositioning, archwire adjustment and intermaxillary elastics as needed.

The corrected dentition will be retained with lower anterior fixed retainer as well as clear overlay retainers for both arches. Tongue and muscle training will be reinforced during treatment as well as during the retention period.

Appliances and Treatment Progress

A .022" slot Damon Q® bracket system (Ormco) was used with standard torque brackets on all incisors. The maxillary arch was bonded and .014" CuNiTi archwire was fitted. Open coil springs were placed bilaterally between the central and lateral incisors, to open spaces for restoration of carious lesions on the distal surfaces of both central incisors (Fig. 11).

After one month of initial alignment and leveling in



■ Fig. 11:

The maxillary arch was bonded with standard torque brackets in the anterior segment and open coil springs were placed bilaterally between the central incisors and lateral incisors to open spaces for restoration of the distal caries on the two central incisors. A .014 CuNiTi archwire was inserted.



■ Fig. 12:

The mandibular arch was bonded with standard torque brackets and fitted with a .014 CuNiTi archwire.

the maxillary arch, the mandibular arch was bonded with standard torque brackets and fitted with a .014" CuNiTi archwire (Fig. 12). The patient was instructed to wear Class III elastics (*Parrot 5/16, 2oz.*) bilaterally full time, from the lower canine to the upper 1st molar to correct the negative overjet.

Four months after the initiation of treatment, a rectangular .014x.025" CuNiTi wire was placed in the maxillary arch. Drop in hooks were inserted into the brackets of the upper central incisors and lower canines. Early light elastics (*Ostrich 3/4, 2oz.*) were used from the lower canines to the upper central incisors to correct the anterior open bite.

One month later, a .017x.025" low friction TMA archwire, expanded in the posterior, was used on the maxillary arch, and the anterior segment was ligated with a figure-eight tie with a .012" stainless steel ligature. A .014x.025" CuNiTi archwire was fitted for the mandibular arch (Fig. 13). The lower archwire was replaced with a .016x.025" SS.

Eight months after the initiation of treatment, a .019x.025" SS archwire was used on the maxillary arch. After the negative overjet was corrected,

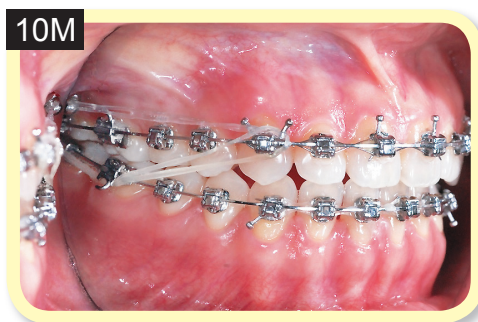
Class II elastics (*Fox 1/4, 3.5oz.*) were worn bilaterally from the upper canine to the lower 1st molar. The following month, the 1.5 mm maxillary midline deviation to the right was addressed by increasing the force of the Class II elastics (*Bear 1/4, 4.5oz.*) and extending the range of action to the lower 2nd molar on the right side.

In the 10th month, two extra-alveolar bone screws (*2x12 mm OrthoBoneScrew®*, *Newton's A, Ltd., Hsinchu, Taiwan*) were inserted bilaterally into the infrazygomatic crest (IZC). Elastometric chains were attached from the upper right and left canines to the screws (Fig. 14) to retract the maxillary anterior



■ Fig. 13:

A .017x.025" TMA archwire was used on the maxillary arch; the maxillary anterior segment was ligated with a figure-eight tie of an .012" stainless steel ligature. A .014x.025" CuNiTi archwire was used on the mandibular arch.



■ Fig. 14:

In the 10th month, two miniscrews (*2x12 mm OrthoBoneScrew®*, *Newton's A, Ltd., Hsinchu, Taiwan*) were inserted into both infrazygomatic crests. The elastometric chains were attached from the upper right and left canines to the screws.



Fig. 15:
The lower midline shift 1mm to right side was noticed. The Class II elastics were kept on the right side only to correct the midline shift.

segment. One month later, a 1mm lower midline shift to the right side was still evident, therefore Class II elastics were maintained on the right side only, for correction of the midline (Fig. 15).

After 13 months of active treatment, interim-treatment records were collected to evaluate the treatment progress and to plan the future treatment (Figs. 16-19).

Interim-Treatment Progress

Maxilla:

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

Mandible:

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

Maxillary Dentition:

- A - P :
 - a. Molars: *Maintained*
 - b. Incisors: *Extruded*
- Vertical:



Fig. 16: Interim-treatment facial and intraoral photographs.



Fig. 17: Interim-treatment study models.

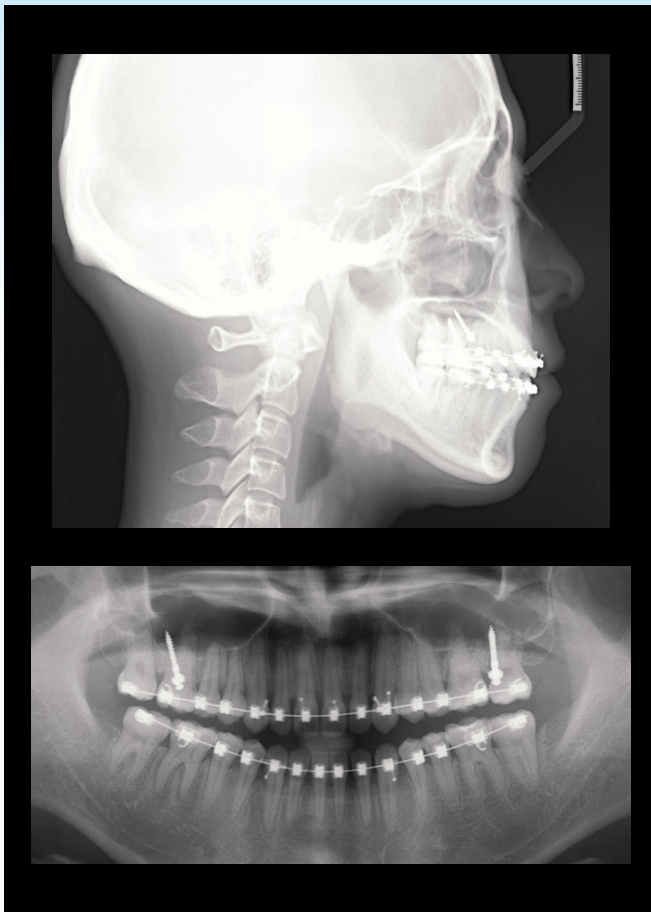
a. Molars: *Maintained*

b. Incisors: *Extruded*

- Inter-molar Width: *Expanded*
- Inter-canine Width: *Constricted*
- Buccolingual Inclination: *Maintained*

Mandibular Dentition:

- A - P:
 - a. Molars: *Maintained*
 - b. Incisors: *Extruded*

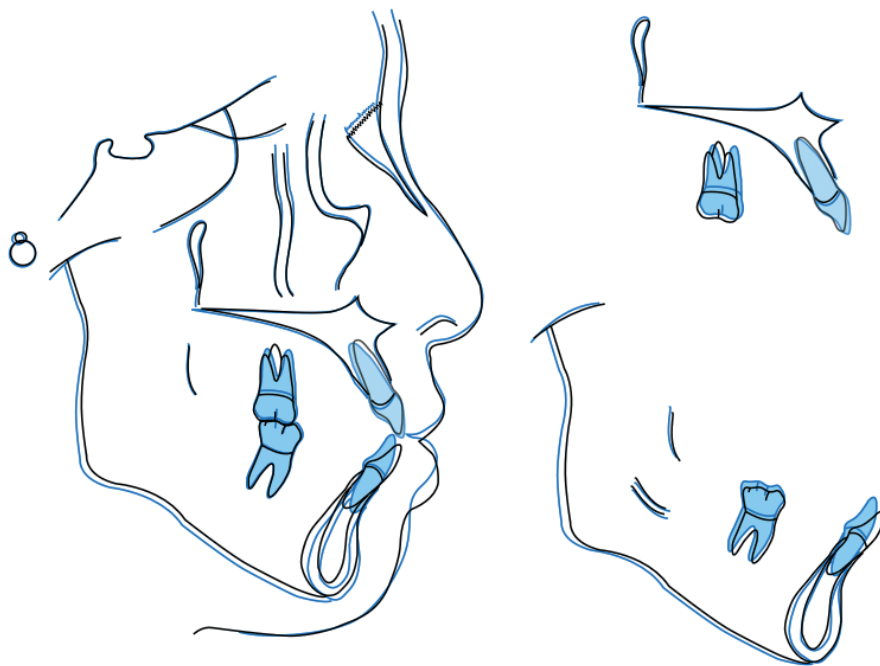


■ Fig. 18: Interim-treatment cephalometric and panoramic radiographs

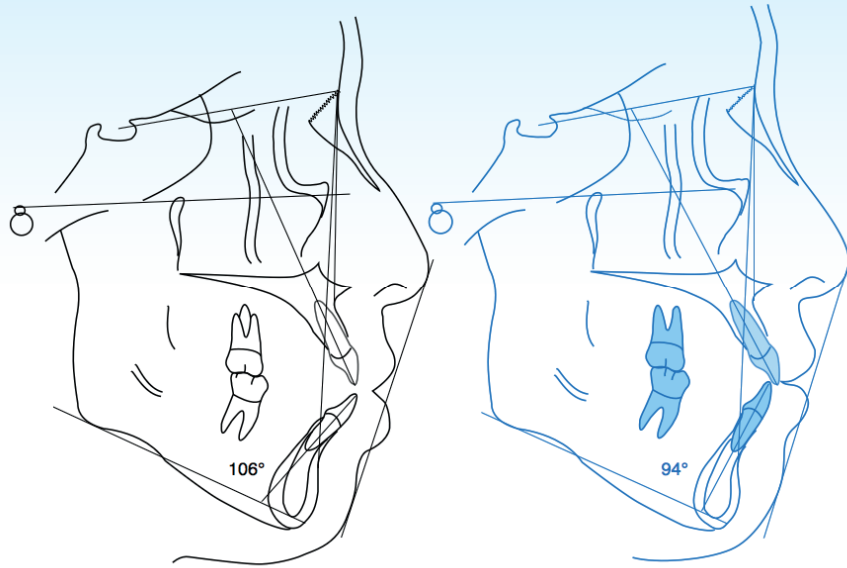
- Vertical:
Molars: *Extruded*
Incisors: *Extruded*
- Inter-molar Width: *Expanded*
- Inter-canine Width: *Constricted*
- Buccolingual Inclination: *Lingual Tipping*

Anticipated Future Treatment

The interim-treatment assessment revealed that the open bite, spacing and protrusive lower lip had all been improved (Fig. 16). The axial inclination of the lower incisors had been reduced from 106° to 94° (Fig. 20). IZC Miniscrews will be used to further correct the deviated midline and lip protrusion. A progress Cast-Radiograph Evaluation (CRE) score is routinely used about six months before debonding to check for alignment discrepancies (Figs. 21-24). This is a proven method for improving treatment quality.¹ A detailed correction plan was generated based on this CRE score.



■ Fig. 19: Superimposed tracings: Flaring of the lower incisors had been reduced from 106° to 94° .



■ Fig. 20: Flaring of the lower incisors had been reduced from 106° to 94°.

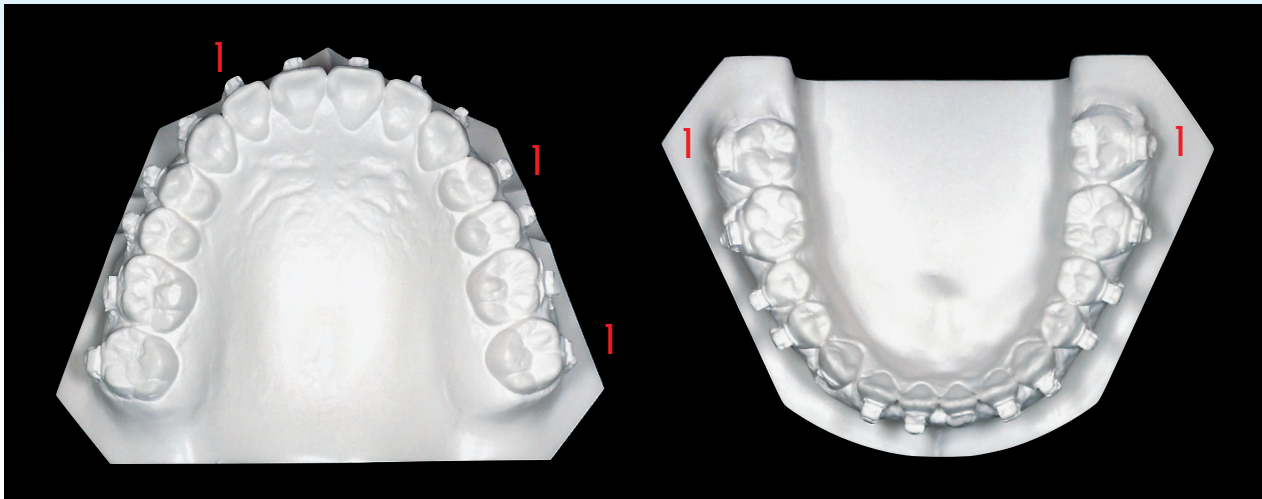
Panoramic radiography was used to check the angulation of the dentition in order to reposition brackets (Fig. 25). Then, the precise “to do list” was formulated to achieve an optimal finish with about 6 more months of treatment. The to do list was based on a progress CRE score of 40:

1. Detailed bending to correct rotations (Fig. 21).
2. Bond lingual buttons on lower 2nd molars and apply criss-cross elastics to correct lingual tipping of the lower 2nd molars and buccal flaring of the upper right 2nd molar (Fig. 22).
3. Retract the upper anterior segment with Class II elastics to reduce the overjet (Fig. 23).
4. IZC miniscrews to be utilized for correction of the deviated midline.
5. Interproximal reduction of lower anterior segment is indicated to reduce black triangles.
6. Arch coordination is needed to improve occlusal relationships and contacts (Fig. 24).

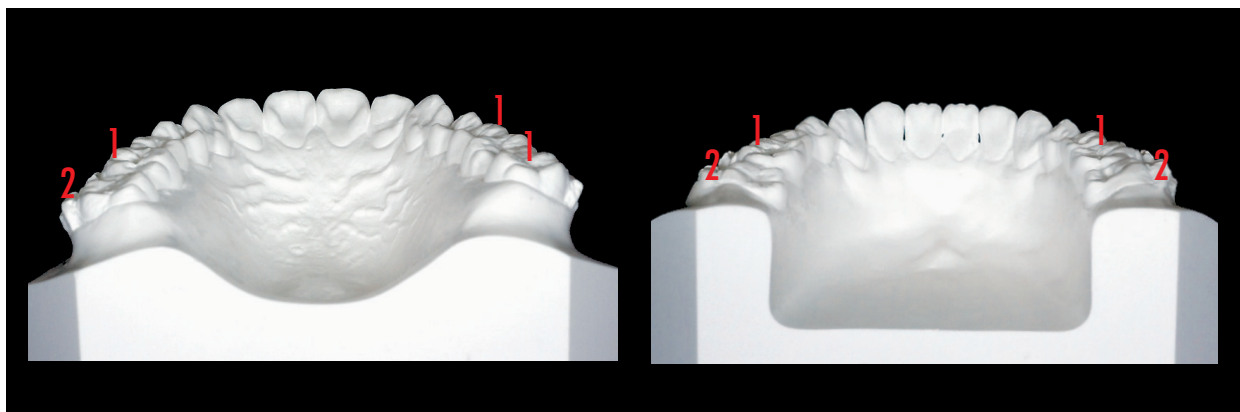
The interproximal contact of lower anterior teeth were stripped to reduce the black triangles (Fig. 26). The midline shift was closely monitored throughout treatment and in the 16th month of progress, the dental midline was corrected to an acceptable position (Fig. 27) and the bone screws were removed one month later. The elastics force to correct the anterior openbite was decreased (*Giraffe 3/4, 3.5oz.*) and Class II elastics (*Fox 1/4, 3.5oz.*) were maintained bilaterally to retract the upper anterior segment to reduce the overjet.

In the 21st month, lingual buttons were bonded on the lower left canine and 1st premolar (Fig. 28) to help close a 1mm space between them. Additionally, triangle elastics (*Chipmunk 1/8, 3.5oz.*) were attached from the upper left canine to the two lingual buttons to improve the occlusal contact (Fig. 29).

Twenty-six months after the initiation of treatment, two torquing springs were placed on each upper



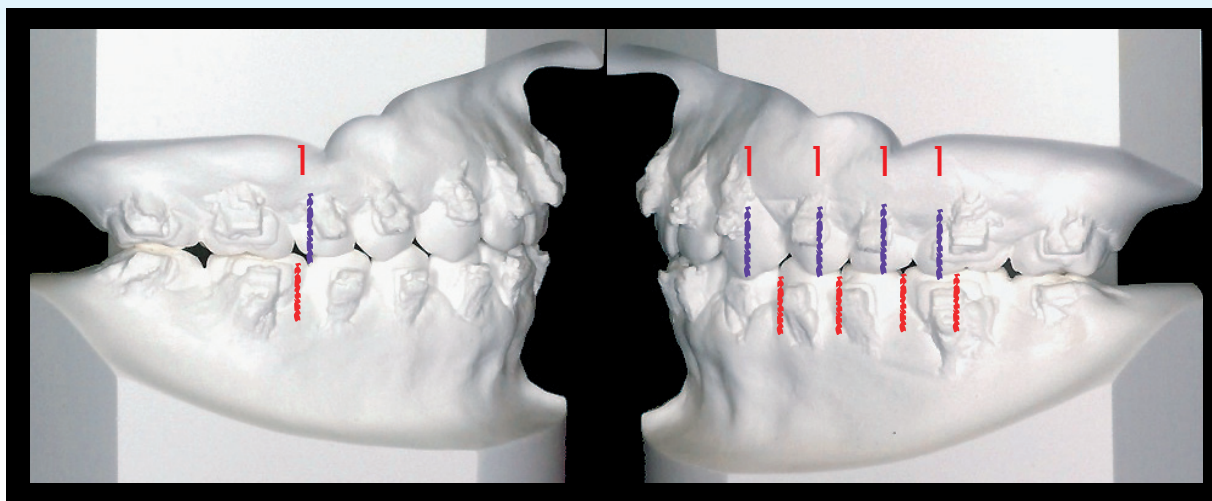
■ Fig. 21: The interim-treatment CRE: Alignment/Rotations was 5.



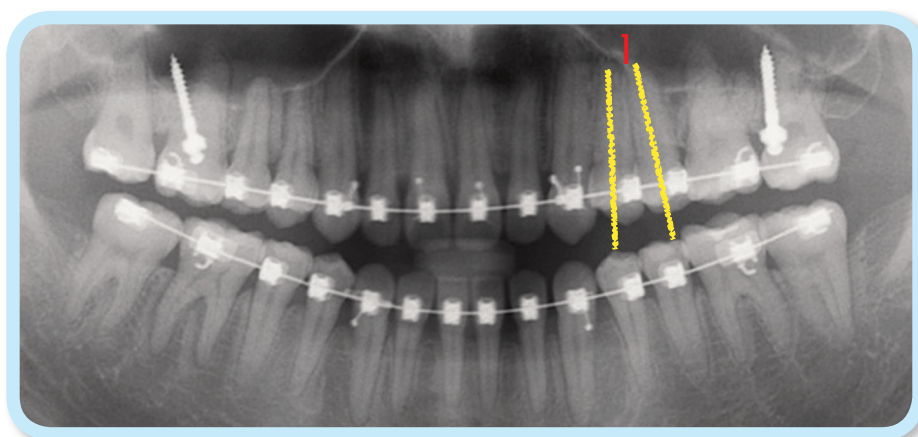
■ Fig. 22: The interim-treatment CRE: Buccolingual inclination was 11.



■ Fig. 23: The interim-treatment CRE: Overjet was 8.



■ Fig. 24: The interim-treatment CRE: Occlusal relationships was 5.



■ Fig. 25: The interim-treatment CRE: Root angulation was 1.



■ Fig. 26:
The interproximal contact of lower anterior teeth were stripped to reduce the black triangles.



■ Fig. 27:
In the 16th month of treatment, the dental midline was set to an acceptable position.



■ **Fig. 28:**
Two lingual buttons were bonded on the lower left canine and 1st premolar.



■ **Fig. 29:**
The triangle elastics (Chipmunk 1/8, 3.5oz.) were attached from the upper left canine to these two lingual buttons to improve the occlusal contact.



■ **Fig. 30:**
Two torquing springs were placed bilaterally on the upper lateral incisors to move the crown palatally.

lateral incisor to move the crowns palatally, as the maxillary arch was leveled (Fig. 30). The archwire was sectioned distally to the bilateral upper 2nd premolar. The posterior segments were removed and continuous intermaxillary elastics (*Giraffe, Chipmunk, Kangaroo*) were prescribed to settle the occlusion (Fig. 31).

After 27 months of active treatment, all appliances were removed.

Results Achieved

Maxilla:

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

Mandible:

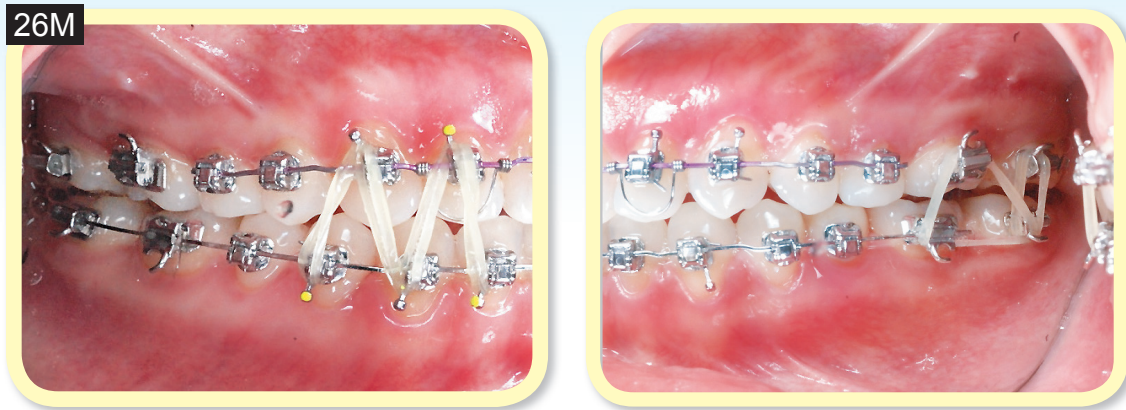
- A - P: *Maintained*
- Vertical: *Maintained*
- Transverse: *Maintained*

Maxillary Dentition:

- A - P: *Incisors retracted, slight retraction of the molars*
- Vertical: *Incisors extruded*
- Transverse:
Inter-molar Width: *Increased*
Inter-canine Width: *Maintained*

Mandibular Dentition:

- A - P: *Incisors retracted*
- Vertical: *Molars and incisors extruded*



■ Fig. 31:

The archwire was sectioned distally to the upper 2nd premolar on both sides. The posterior segments were removed. Continuous intermaxillary elastics were prescribed to settle the occlusion.

- Transverse:

Inter-molar Width: *Increased*

Inter-canine Width: *Decreased*

Facial Esthetics:

- Upper and lower lips were retracted, consistent with an optimal facial form.

Retention

An anterior mandibular fixed retainer was bonded on all teeth from canine to canine. Upper and lower clear overlay retainers were delivered. The patient was instructed to wear them full time for the first 6 months and nights only thereafter. The patient was instructed on home care and maintenance of the retainers as well as muscle exercises.

Final Evaluation of Treatment

The ABO Cast-Radiograph Evaluation score was 20 points. There are major discrepancies in two categories: alignment/rotation (4 points) and occlusal contacts (8 points).

Alignment and restorative recontouring of the upper anterior incisors, and closure of lower spaces helped to resolve the patient's chief complaints. The excessive spaces of the lower dentition were eliminated, but long-term retention will be necessary to prevent relapse.

Overall, there was significant improvement in both dental esthetics and occlusion. The profile was treated to an appropriate result with no esthetic problems.

Discussion

Anterior open bite has a multifactorial etiology comprising of genetically inherited skeletal pattern, soft tissue posture and inter-incisal habits, such as digit-sucking. To formulate an appropriate treatment plan, an accurate diagnosis is essential. Developmental open bites may resolve completely during the transition from mixed to permanent dentition, if the etiology is corrected, i. e. digit-

sucking habit and/or inter-incisal lip posture. More severe open bites, sometimes extending back to the terminal molars, rarely resolve spontaneously, so they often require complex orthodontic treatment, involving active molar intrusion or orthognathic surgery. However, major surgery has associated risks such as pain, swelling, bruising, altered nerve sensation which may be manifest as permanent anesthesia. In addition, there are significant costs, as well as the additional risk of general anesthesia.²

Wearing the elastics as instructed, and spontaneous correction of aberrant lip posture, were the keys to correcting the patient's anterior open bite. Using light elastics where applicable early in the treatment for correcting A/P, vertical and transverse problems is an important tool for improving treatment quality and enhancing the efficiency of the appliance system.³ Anterior early elastics with light force are optimal because there is a reduced tendency for excessive distal tipping of the incisors. Since there is no evidence of a contributing habit, the etiology of the anterior openbite is probably interincisal tongue posture. The use of light early elastics provides vertical force and serves as a reminder for the patient to retract the tongue gradually as the incisors extrude. However, it is important for the patient to understand their responsibility for correcting the tongue posture and maintaining. Achieving longterm success depends on correction of the etiology.

Stepovich⁴ concluded that spaces of 10 mm or more can be closed in adults, but retaining the closed spaces was difficult. For the present patient, an

anterior mandibular fixed retainer was bonded on all teeth from canine to canine to prevent the space from reopening.

Orthodontists strive to achieve a good functional occlusion. However, a tooth's position in the arch is determined by a combination of eruptive force, functional contact, and anatomy. Cusps and inclined planes aid in mastication and are guides for achieving optimal occlusal contact. Therefore, controlled settling accomplishes the same natural purpose as when teeth initially erupt.⁵

Anterior segment retraction with miniscrew anchorage is a noncompliant mechanism for improving the facial profile that exceeds the potential for all other approaches such as headgear combined with a transpalatal arch.⁶⁻⁷ Miniscrews have a high success rate of approximately 90% and they provided sufficient anchorage immediately after placement surgery for any orthodontic tooth movement. In addition, miniscrews placed without a mucoperiosteal incision or flap surgery significantly reduce the patient's pain and discomfort after implantation.⁶⁻⁸

It is very important for the orthodontist to educate the patient regarding the correct use of elastics because treatment results are dependent on patient cooperation. Latex elastics fail to maintain a continuous force and are therefore inferior to Niti springs in that regard.⁹

The maxillary and mandibular posterior teeth were retracted with extra-alveolar miniscrew implants

(2 mm in diameter and 12 mm long). En masse movement of the entire dentition after anterior tooth alignment reduced the treatment time and maximized the overall efficiency of the correction. The miniscrew implants were maintained firmly throughout the treatment and were able to provide excellent anchorage for retraction of the entire dentition.

The Pink & White esthetic score worksheet list below provides a broad array of clinical parameters for evaluation of patients with esthetics concerns.¹⁰

Conclusion

Overall, extra-alveolar miniscrews outperform all other forms of traditional mechanics for treating patients with severe malocclusions. Wearing the elastics as instructed was the key to correcting the patient’s anterior open bite. The discrepancies in occlusal contacts could have been improved by using more up and down elastics, but the additional mechanics would have increased treatment time.

Muscle exercises (*myofunctional therapy*) played an important role in the open bite correction. The dental protrusion was corrected with extra-alveolar miniscrew anchorage to retract the entire dentition. The long-term stability for this corrected malocclusion may be challenging, so the patient will be closely monitored with respect to soft tissue posture and recurrence of the open bite.

CEPHALOMETRIC				
SKELETAL ANALYSIS				
	PRE-Tx	Progress	POST-Tx	DIFF.
SNA°	79°	79°	78°	1°
SNB°	77°	77°	76°	1°
ANB°	2°	2°	2°	0°
SN-MP°	36°	36°	36.5°	0.5°
FMA°	29°	29°	29.5°	0.5°
DENTAL ANALYSIS				
U1 TO NA mm	6 mm	6 mm	4.5 mm	1.5 mm
U1 TO SN°	106°	108°	104°	4°
L1 TO NB mm	10 mm	8 mm	6.5 mm	3.5 mm
L1 TO MP°	106°	94°	90°	16°
FACIAL ANALYSIS				
E-LINE UL	-1 mm	-1.5 mm	-2.5 mm	1.5 mm
E-LINE LL	3 mm	1 mm	-0.5 mm	3.5 mm

Table 1: Cephalometric summary

In conclusion, this case demonstrates that open bite correction can be achieved with simple mechanics and muscle exercises to control the etiology. This difficult malocclusion (*DI=34*) was treated to an acceptable result (*CRE=20*). The patient and the clinician were pleased with the treatment result.

Acknowledgment

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Discrepancy Index Worksheet

TOTAL D.I. SCORE 34

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.	=	5 pts.

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

Total = 12

OVERBITE

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

Total = 0

ANTERIOR OPEN BITE

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

Total = 11

LATERAL OPEN BITE

2 pts. per mm. per tooth

Total = 0

CROWDING (only one arch)

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

Total = 0

OCCCLUSION

Class I to end on	=	0 pts.
End on Class II or III	=	2 pts. per side <u> </u> pts.
Full Class II or III	=	4 pts. per side <u> </u> pts.
Beyond Class II or III	=	1 pt. per mm. <u> </u> pts. additional

Total = 0

LINGUAL POSTERIOR X-BITE

1 pt. per tooth Total = 1

BUCCAL POSTERIOR X-BITE

2 pts. per tooth Total = 0

CEPHALOMETRICS (See Instructions)

ANB $\geq 6^\circ$ or $\leq -2^\circ$ = 4 pts.

Each degree $< -2^\circ$ x 1 pt. =

Each degree $> 6^\circ$ x 1 pt. =

SN-MP

$\geq 38^\circ$ = 2 pts.

Each degree $> 38^\circ$ x 2 pts. =

$\leq 26^\circ$ = 1 pt.

Each degree $< 26^\circ$ x 1 pt. =

I to MP $\geq 99^\circ$ **106⁰** = **1** pt.

Each degree $> 99^\circ$ **7** x 1 pt. = **7**

Total = 8

OTHER (See Instructions)

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

Identify:

Total = 2

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), ≥ 7 mm 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

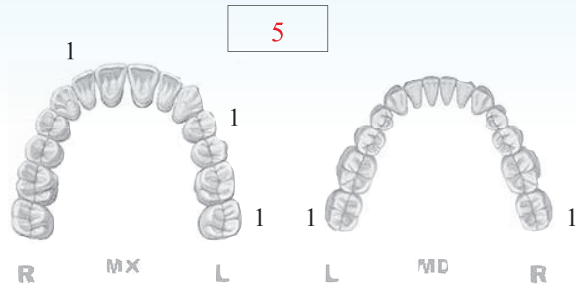
Cast-Radiograph Evaluation

Interim-Treatment Progress

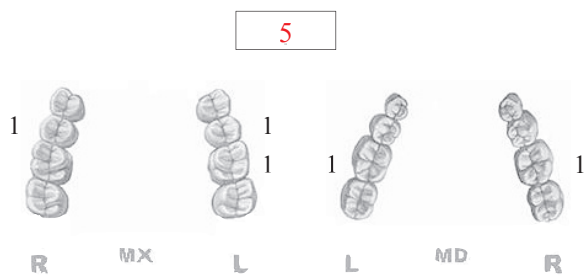
Case # 1 Patient

Total Score: **40**

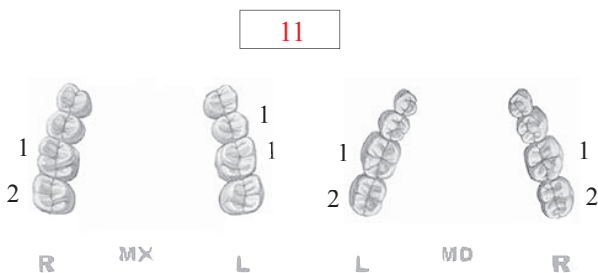
Alignment/Rotations



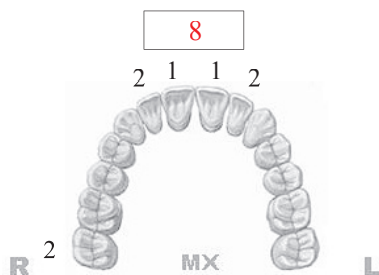
Marginal Ridges



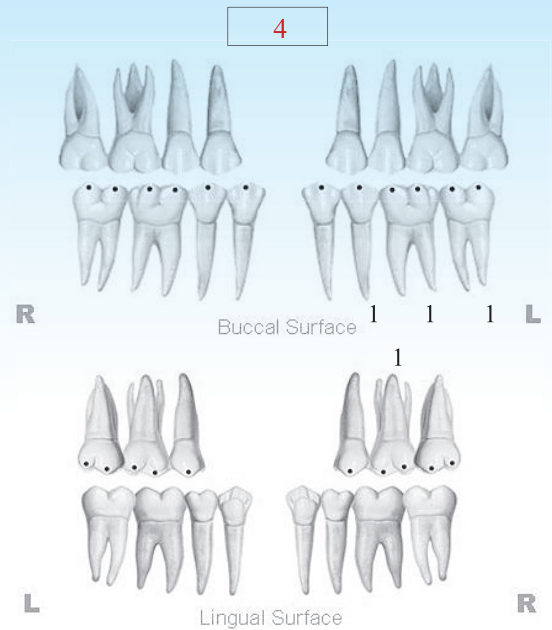
Buccolingual Inclination



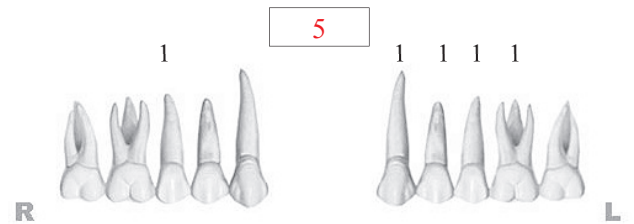
Overjet



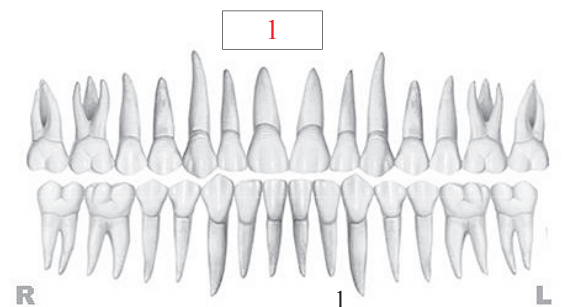
Occlusal Contacts



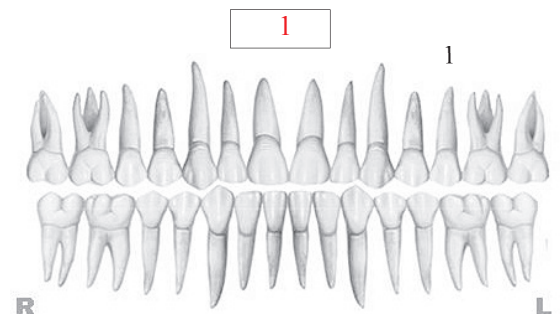
Occlusal Relationships



Interproximal Contacts



Root Angulation



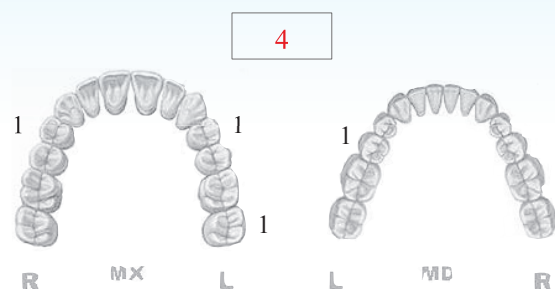
INSTRUCTIONS: Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

Cast-Radiograph Evaluation

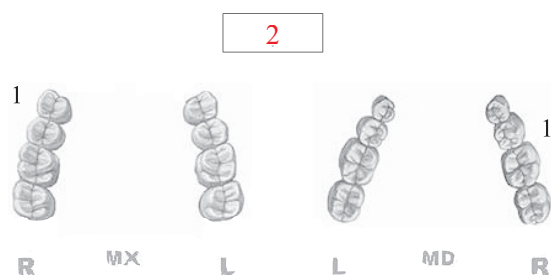
Case # 1 Patient

Total Score: **20**

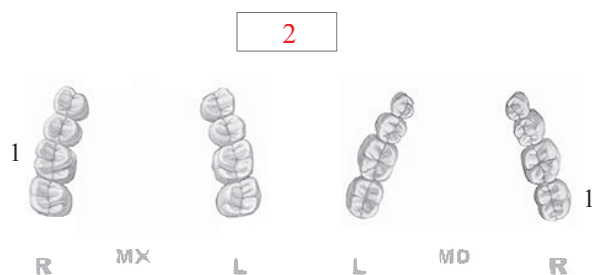
Alignment/Rotations



Marginal Ridges



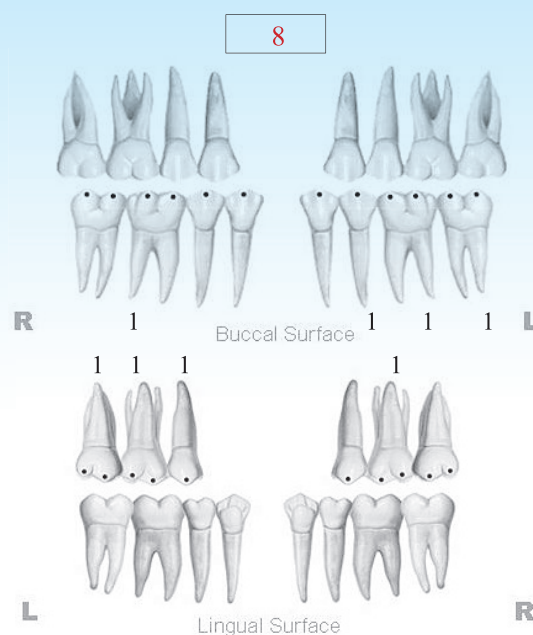
Buccolingual Inclination



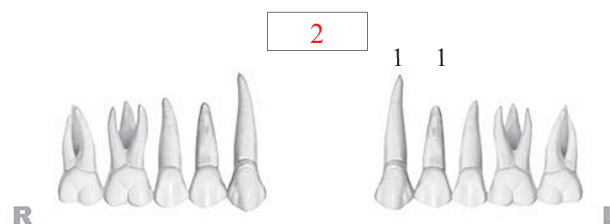
Overjet



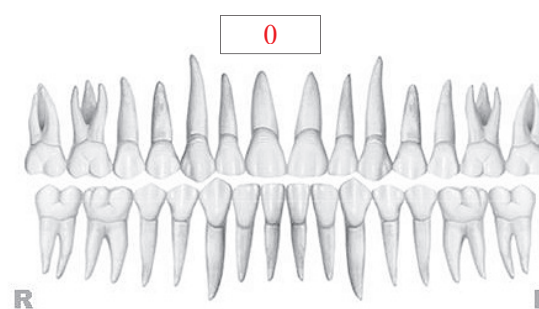
Occlusal Contacts



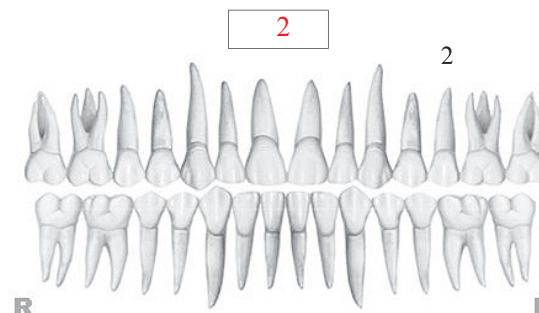
Occlusal Relationships



Interproximal Contacts



Root Angulation

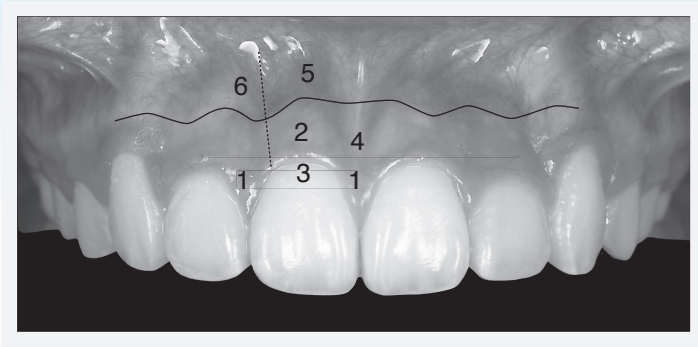


INSTRUCTIONS: Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

IBOI Pink & White Esthetic Score (Before Surgical Crown Lengthening)

Total Score: = **2**

1. Pink Esthetic Score

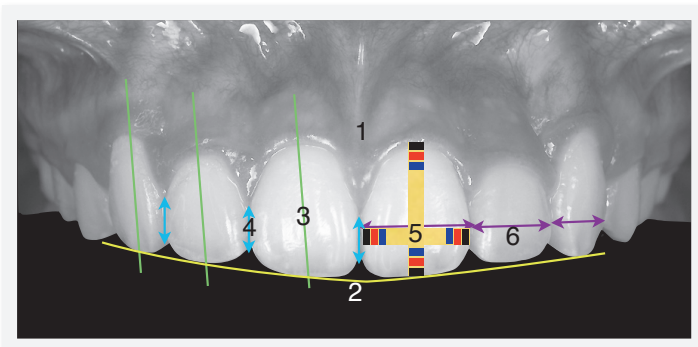


1. M & D Papillae	0	1	2
2. Keratinized Gingiva	0	1	2
3. Curvature of Gingival Margin	0	1	2
4. Level of Gingival Margin	0	1	2
5. Root Convexity (Torque)	0	1	2
6. Scar Formation	0	1	2

1. M & D Papilla	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

Total = **0**

2. White Esthetic Score (for Micro-esthetics)



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

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

Total = **2**