

Treatment of Bimaxillary Protrusion, Blocked-Out Canine and Buccal Crossbite

History and Etiology

A 24-year-and-8-month-old female presented for orthodontic treatment (Figs. 1-3). Her chief complaints were protrusive profile and high (*blocked-out*) canine. There were no known history or habits contributing to the malocclusion. The clinical examination revealed a relatively long face with a steep mandibular plane angle and a tooth-size to arch-length discrepancy in both arches. This pattern suggests the malocclusion is primarily an environmental problem associated with relatively low biting strength associated with a history of less intensive masticatory loading.

However, the bilateral buccal crossbite of maxillary second molars suggests a contributing genetic component. To assess treatment progress, records were analyzed 13 months into treatment (Figs. 4-8). The final records documenting 26 months of fixed appliance treatment are shown in Figs. 9-11. The pretreatment (Fig. 12) and post-treatment (Fig. 13) radiographs are displayed in a comparative format. Superimpositions of pretreatment and post-treatment cephalometric tracings, document the treatment in the sagittal plane (Fig. 14). The details for diagnosis, treatment and outcomes assessment will be discussed in this case report.



Fig. 1: Pretreatment facial photographs



Fig. 2: Pretreatment intraoral photographs



Fig. 3: Pretreatment study models

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Fig. 4: Progress facial photographs



Fig. 5: Progress intraoral photographs



Fig. 6: Progress study models

Diagnosis

Date of the pretreatment photographic (Fig. 2) and radiographic (Fig. 12) records was 11-08-2010. The study models (*casts*) were taken shortly thereafter, following the removal of the lower left 3rd molar (Fig. 3). As previously mentioned, intermaxillary crowding, and irregular dental display (*blocked out maxillary canine*) are probably environmental manifestations of the malocclusion (Fig. 15), while the bilateral buccal crossbites reflects a genetic predisposition (Fig. 16). The upper second molars had large restorations which required repair so the tooth could assume a normal occlusal contacts once the buccal crossbite was corrected (Figs. 17). Since the upper right third molar had no restorations, it was preferable to extract the second molar and replace it by moving the third molar mesially. Pretreatment study models (*taken after the removal of the lower left 3rd molar*), cephalometric and panoramic radiographs (Figs. 3,12) were used to document the complexity of the malocclusion. There was obvious crowding and irregular dental and gingival display (Figs. 15) and the specific posterior buccal crossbite is well documented on the casts (Figs. 16). The upper second molars had restorations which required repair (Figs. 17). The ABO Discrepancy Index (DI) was 29 as shown in the subsequent worksheet.

1. Angle Classification: Bilateral Class I molar relationship
2. Tooth Size Arch Length Discrepancy:
 - Maxillary: -8 mm
 - Mandibular: -7 mm
3. Crossbites: Buccal crossbite of upper 2nd molars
4. Facial: Protrusive lip profile
5. Radiographic\Cephalometric:
 - Skeletal: Class I (SNA 80°, SNB 77°, ANB 3°), high mandibular plane angle (SN-MP 39°)
 - Dental: Increased axial inclination of the lower incisors (IMPA 110°)
6. Radiographic\Panoramic: Low sinus floor and upper midline deviated 2mm to left

Specific Objectives of Treatment

Maxilla (all three planes):

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

Mandible (all three planes):

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

Maxillary Dentition

- A - P: Retract the incisors
- Vertical: Intrude the molars
- Intermolar Width: Maintain
- Intercanine Width: Decrease

- Buccolingual Inclination: Correct bilateral buccal cross bite of 2nd molars

Mandibular Dentition

- A - P: Retract the incisors
- Vertical: Maintain
- Inter-molar Width: Maintain
- Inter-canine Width: Maintain
- Buccolingual Inclination: Maintain

Facial esthetics: Retract both lips

Treatment Plan

Extract all four 1st premolars along with the upper right 2nd molar. Use high torque brackets on the upper anterior teeth and standard torque brackets on the lower teeth. Bond both arches with an .022" slot Damon Q bracket system (*Ormco*). Place posterior bite turbos on both lower 1st molars in combination with cross elastics (3.5 oz) to correct the buccal cross bite.¹ Two miniscrews in the infrzygomatic crests may be needed to retract the upper dentition to resolve the maxillary protrusion. Apply light up & down elastics and detail the final occlusion. Retain the corrected dentition in the anterior mandibular segment with a fixed retainer. Use clear overlay retainers in both arches.

Appliances and Treatment Procedures

All four 1st premolars, the upper right second molar and the lower left third molar were extracted before treatment. A .022" slot Damon Q bracket system (*Ormco*) was used. High torque brackets were bonded on the upper dentition. The initial upper archwire was .014 CuNiTi fitted with two sectional protective sleeves between the canines and second premolars. Standard torque brackets were bonded on the lower dentition with a .014" CuNiTi archwire

and similar protective sleeves. To assist with the buccal crossbite correction of tooth #15, a lingual button was bonded on tooth #18 for cross elastics (*Chipmunk 1/8" 3.5oz*), and occlusal bite turbos were placed on the lower first molars to temporarily open the vertical dimension of occlusion (VDO). In the 3rd month, an .018" CuNiTi arch wire was placed and drop-in hooks were fitted in the vertical slot of the upper canines to secure class II elastics (*Parrot 5/16" 2oz*). One month later, when the buccal crossbite correction of #15 had been achieved, the lower bite turbos were removed. A rectangular lower .014" x.025" CuNiTi wire was engaged to achieve initial root torque. Two buttons were bonded on the palatal side of teeth #1 and 4 for the closure of the extraction spaces with sectional power chains. In the 7th month, both upper and lower arch wires were replaced by .017"x.025" TMA wires. Fig. 8 SS ligatures were tied to maintain the firm contacts of the anterior teeth. Drop-in hooks were fitted in the vertical slot of the lower canines to anchor power chains to complete closure of the extraction spaces.

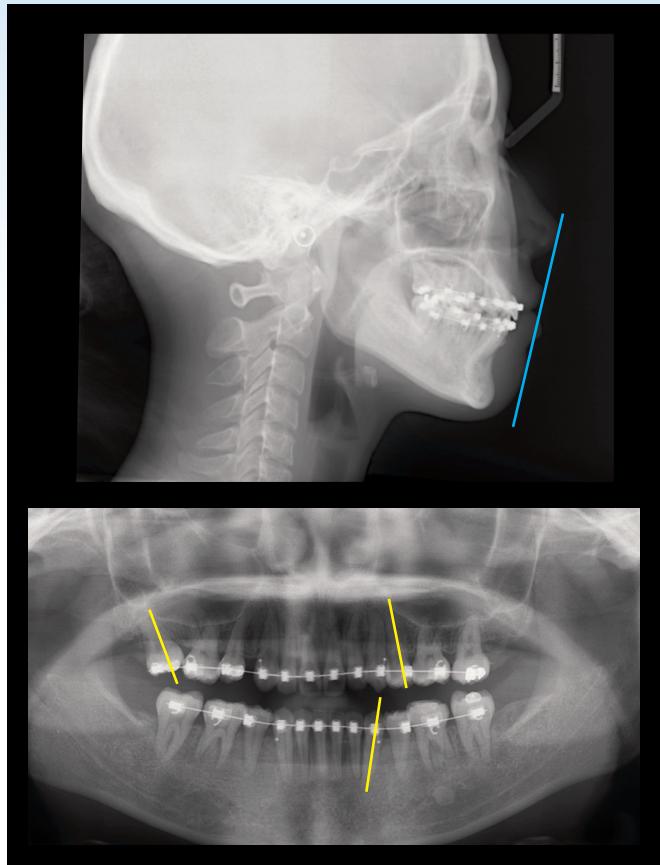


Fig. 7:

Progress cephalometric radiograph shows improvement in the profile and the panoramic radiograph showed the inadequate root angulation for teeth #1, 13 and 22.

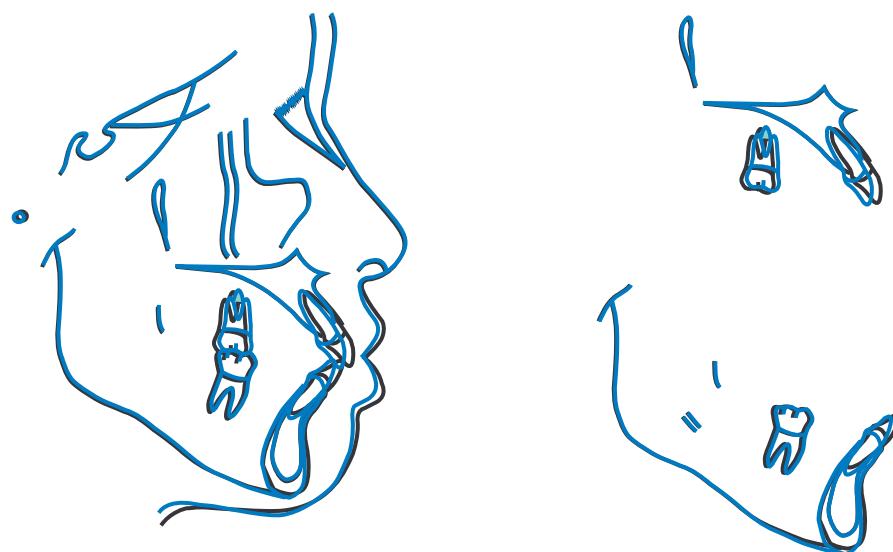


Fig. 8:

Superimposed tracings show the change in treatment progress. All anterior teeth were retracted and lip protrusion was corrected with minimal loss of anchorage.

One month later, a lower .016"x.025" stainless steel wire was placed with a reverse curve of Spee. In the 10th month, L-type elastics (*Bear 1/4" 4.5oz*) were applied from the upper canines to lower molars on the right side to detail the occlusion. The upper arch wire was replaced with a .017"x. 025" TMA wire. In the 13th month of active treatment, progress records were collected. The dental casts and radiographs

were assessed using the Cast Radiograph Evaluation (*formally the Objective Grading System*) established by the American Board of Orthodontics to help candidates determine if their met board standards (Figs. 18-22). The specifics of this treatment progress analysis and the treatment changes that were indicated will be discussed later in this report.



Fig. 9: Post-treatment facial photographs



Fig. 10: Post-treatment intraoral photographs



Fig. 11: Post-treatment study models

According to the deviations from the CRE ideal (*score 52 as detailed below*), the subsequent treatment plan was revised and discussed with the patient. A .019" x.025" stainless steel wire was placed on the upper arch. One month later, the lingual buttons were bonded on teeth #19, 20 & 30 and cross elastics (*Moose 5/16" 6oz*) were attached from the buttons to the upper canines. In the 18th month, the brackets on teeth #2, 13, 18 and 20 were repositioned and more flexible CuNiTi arch wires were engaged into the precisely positioned adjustments. Two months later, the brackets on teeth #2, 7-10, 19, 23-26 and 30 were repositioned. In the 21st month, a good dental alignment had been achieved, but unesthetic anterior interproximal contacts with V-shaped spaces were noted. From the occlusal view, the palatal contact of the proximal surfaces resulted in facial slits for food debris and stain. To eliminate the black triangles and inadequate crevices between the anterior teeth, interproximal enamel reduction was performed (Figs. 24-26). In the final stages of the treatment, subtle adjustments were made with the first and third order bends in the .017"x.025" TMA arch wires. To improve the posterior occlusion, the end of the maxillary arch wire was cut distal to the 2nd premolars and triangular elastics (*Moose 5/16" 6oz*) were applied (Fig. 28). Once optimal interdigitation and intermaxillary contacts were achieved, all fixed appliances were removed and retainers were delivered.

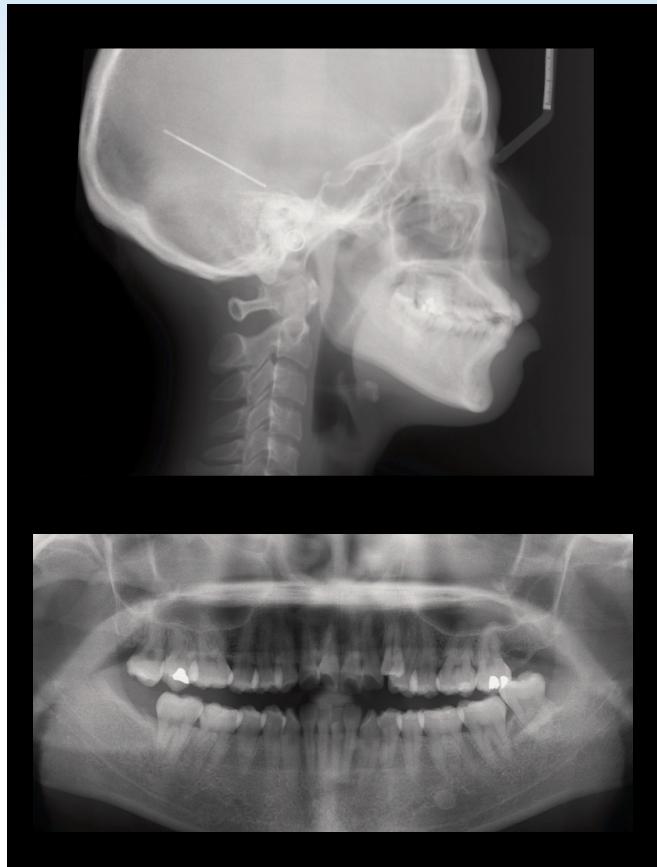


Fig. 12:
Pretreatment panoramic and cephalometric radiographs

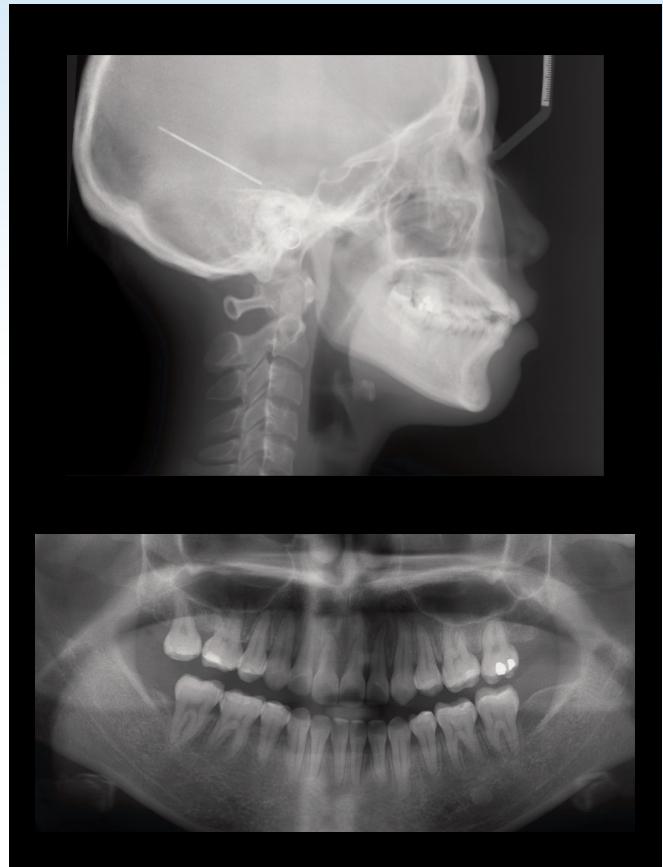


Fig. 13:
Post-treatment panoramic and cephalometric radiographs

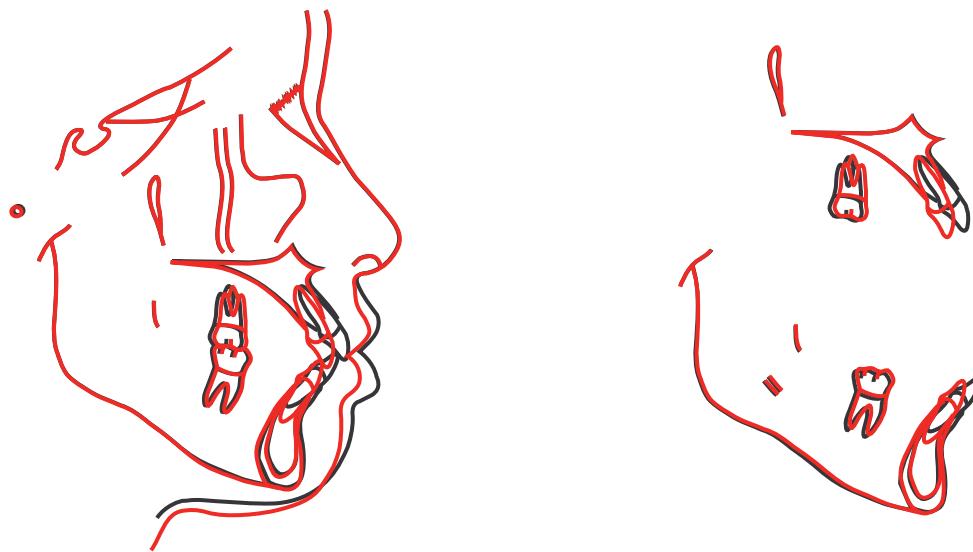


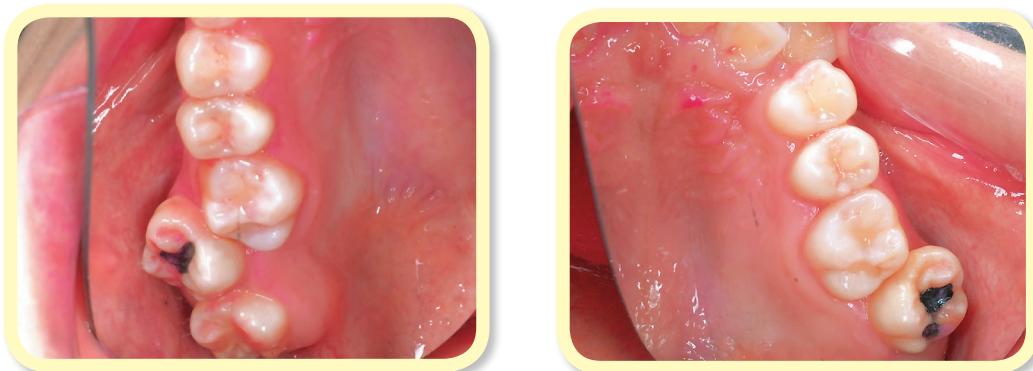
Fig. 14:
Superimposed tracings show all incisors are retracted and the lower incisors are intruded. Despite the anchorage drain for space closure and incisor retraction, the molars showed minimal mesial movement and maintained a class I relationship. The profile was markedly improved relative to the E-line.



■ Fig. 15: Pretreatment presentation of severely crowded anterior teeth with a blocked out maxillary left canine.



■ Fig. 16: The occlusal discrepancy involves buccal cross bite of teeth #2,17 and 18, and an irregular overjet of the anterior teeth.



■ Fig. 17:

Both maxillary second molars deteriorated occlusal restorations and are in buccal crossbite, but the upper right third molar has adequate occlusal anatomy to substitute for a second molar.

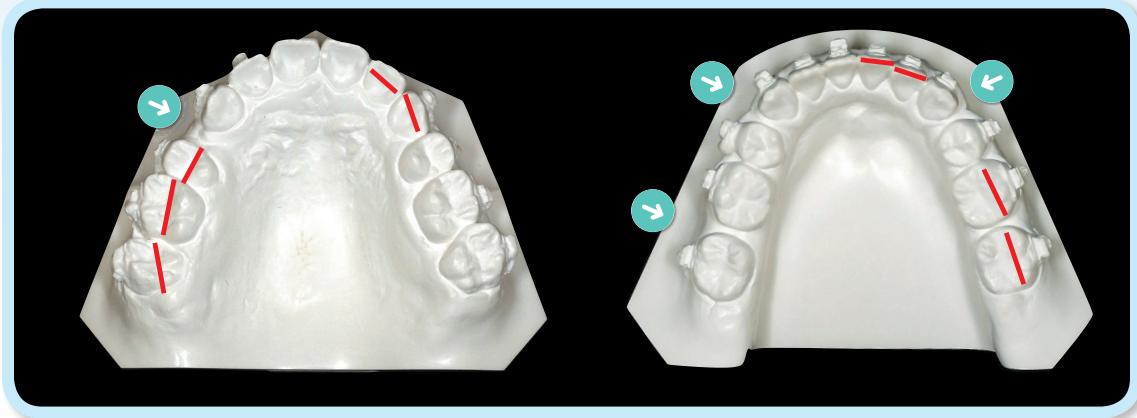


Fig. 18:

Progress Casts: occlusal views of the progress casts has red lines to demonstrate alignment and rotation discrepancies and interproximal contact problems are marked by arrows.

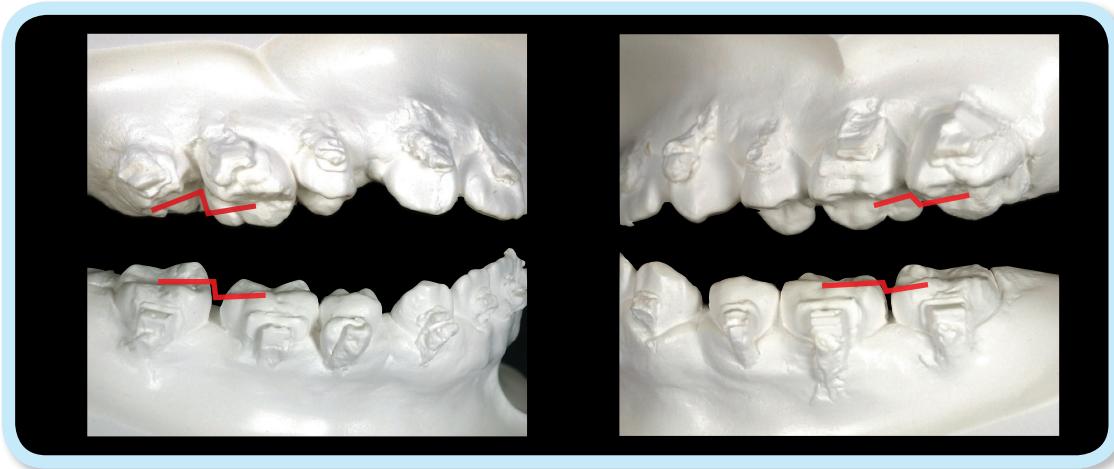


Fig. 19: Progress casts: to correct the marginal ridge discrepancies shown by red lines, brackets had to be repositioned.



Fig. 20:

Progress casts: the ABO step gauge was used to assess the buccolingual inclination of premolar and molars. Tooth #20 was buccally flared due to the pulling force of the cross elastics.



Fig. 21: Progress casts: 15 points were scored for overjet, which was the largest discrepancy in dental alignment.



Fig. 22: Progress casts: Occlusal contacts and alignment relationship showed many discrepancies in the 13th month.

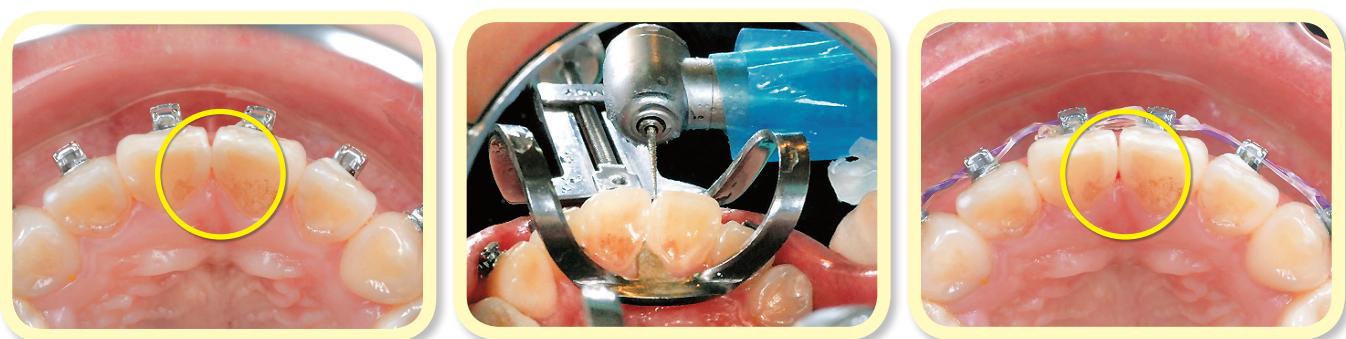


Fig. 23: The V-shaped spaces from the occlusal view were corrected with an interproximal contact reduction procedure.



Fig. 24: Black triangles were eliminated using a selective enamel procedure in the interproximal areas.



Fig. 25:

The irregular palatal marginal ridges were reduced with a green stone in a low speed handpiece to help eliminate V-shaped space and allow for a complete reduction of incisal overjet.



Fig. 26:

The adjusted surfaces were polished with separating strips.



Fig. 27:

Power chains were applied to consolidate the residual interproximal spaces.

CEPHALOMETRIC				
SKELETAL ANALYSIS				
	PRE-Tx	Tx-Progress	POST-Tx	DIFF. (pre-post)
SNA°	80°	79°	79°	1°
SNB°	77°	76°	76°	1°
ANB°	3°	3°	3°	0°
SN-MP°	39°	39°	39°	0°
FMA°	32°	32°	32°	0°
DENTAL ANALYSIS				
U1 TO NA mm	10 mm	7 mm	5 mm	5 mm
U1 TO SN°	107°	103°	98°	9°
L1 TO NB mm	12 mm	9 mm	6 mm	6 mm
L1 TO MP°	111°		105°	6°
FACIAL ANALYSIS				
E-LINE UL	0 mm	-1 mm	-1.5 mm	1.5 mm
E-LINE LL	5 mm	3 mm	0 mm	5 mm

Table. 1: Cephalometric summary

Treatment Progress

Date of Records was 12-03-2011 (Figs. 4-8). All treatment goals were reevaluated and the following revisions were made:

Maxillary Dentition

- Intermolar Width: Increase

Mandibular Dentition

- Inter-molar Width: Increase
- Inter-canine Width: Increase

Treatment Needs For An Optimal Finish

To-do list based on the progress cast radiograph evaluation (CRE) score of 52:

1. Detailing bends to correct rotations

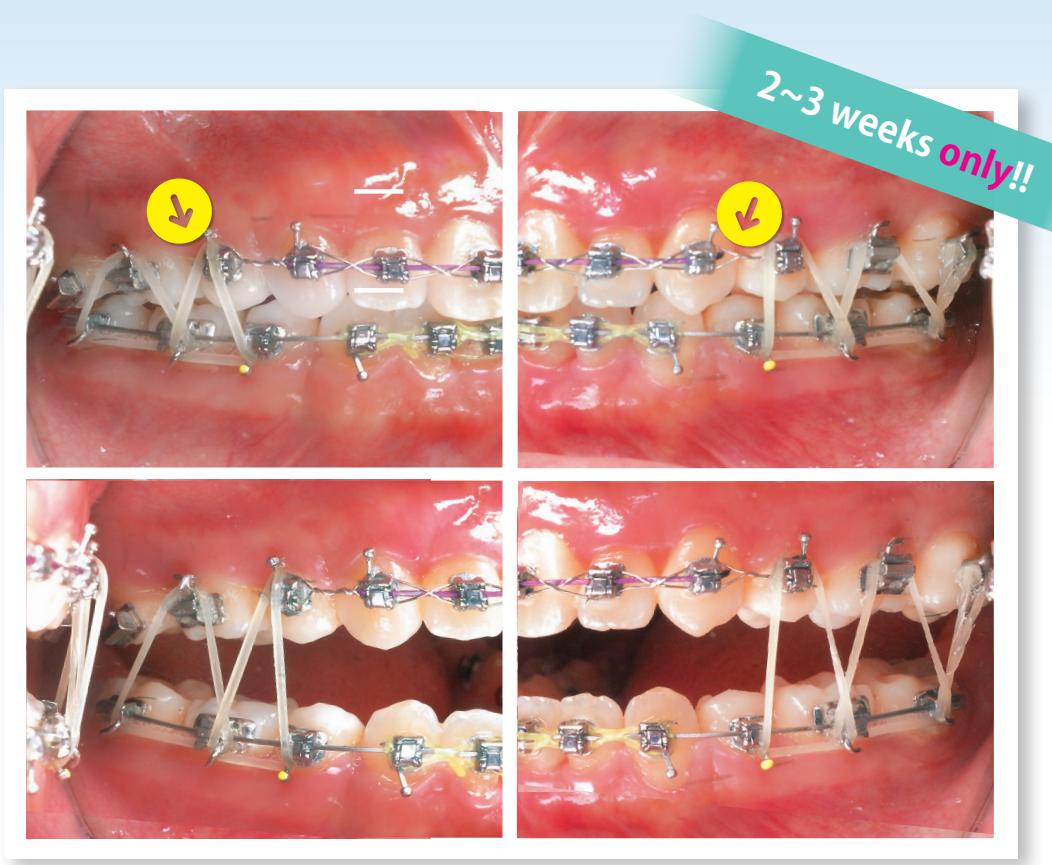


Fig. 28:

To detail the occlusion, the upper posterior archwire was cut distal to the premolars, and vertical elastics were used to seat the maxillary teeth on the mandibular dentition that was stabilized with an archwire..

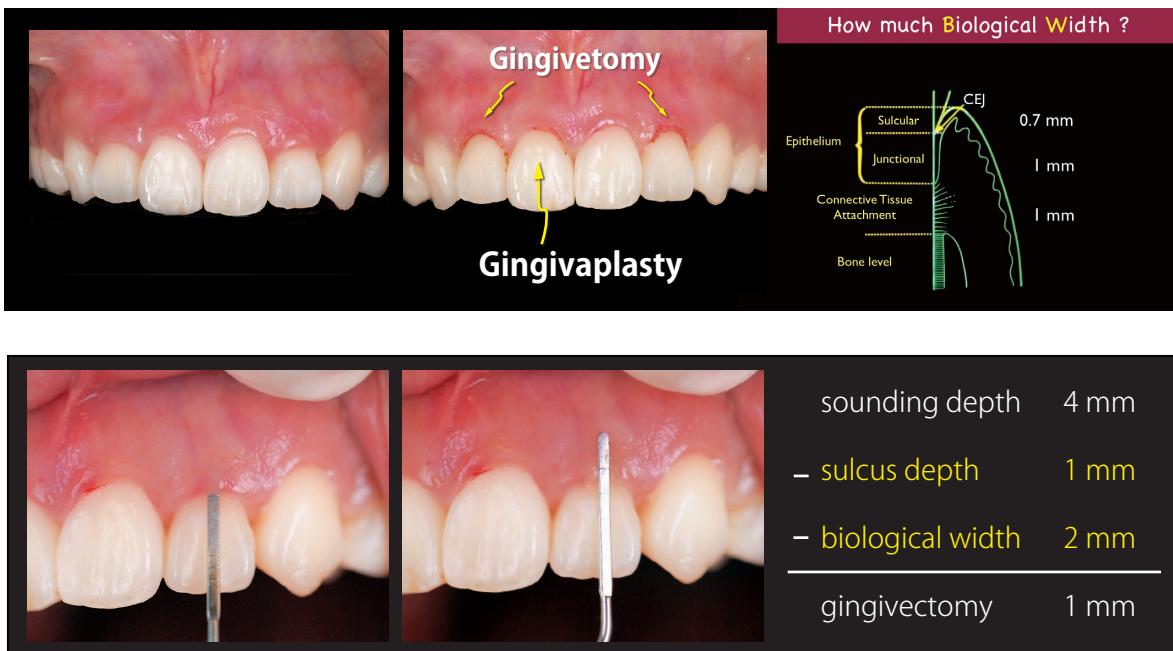
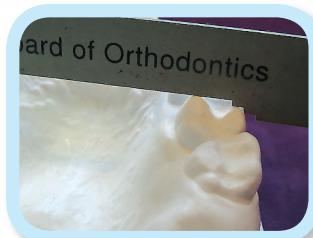


Fig. 29:

Gingivoplasty and gingivectomy is limited to the sounded depth minus 3mm to preserve the biologic width of the periodontium..



■ Fig. 30: Tooth #2 (original the 3rd molar) shows distal in rotation and #27 exhibits a mesial-in rotation.

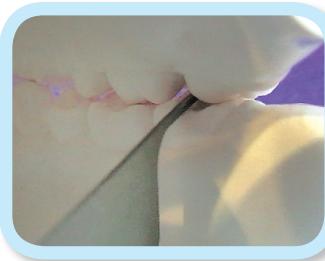


■ Fig. 31:
Marginal ridge discrepancies are evident between the upper premolars and first molars.

■ Fig. 32: The buccolingual inclination is measured for tooth #14.



■ Fig. 33: Excessive overjet was observed for teeth #2, 8 and 15.



■ Fig. 34: Tooth contacts are evaluated on the finish casts.



Fig. 35:

The upper right third molar was protracted with simultaneous force application on the buccal and palatal surfaces.

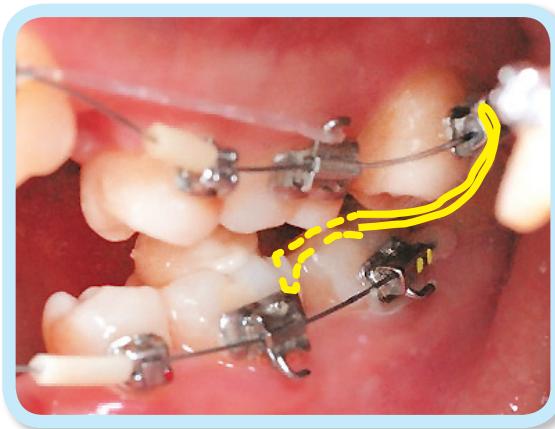


Fig. 36:

Bite turbos opened the occlusion so that cross elastics can efficiently correct the buccal crossbite.

2. Reposition the brackets on teeth #1, 4, 10, 12, 18, 19 and 31 to correct marginal ridge discrepancies.
3. Complete the closure of extraction spaces with sliding mechanics.
4. Constrict the upper arch to correct the buccal overjet.
5. Use miniscrews in the infrzygomatic crests bilaterally to correct the midline discrepancy and lip protrusion.
6. Arch coordination to improve the occlusal relationship and contacts.

Progress Concerns and Summary

Buccal cross bite, crowding and protrusion were improved, and axial inclination of all incisors was reduced. However, there were many bonding errors leading to alignment irregularities. Bracket repositioning will be performed after closing the extraction spaces. Miniscrews in the infrzygomatic crests will be proposed to further correct the midline off and maxillary protrusion. **To-do list** aims to reduce the CRE score from 52 down to <20. Estimated treatment time is 9 more months.



Fig. 37:

Different appearances are noted for a protracted right maxillary third molar compared to a natural left second molar after cross bite correction.

Results Achieved

Date of Records: 01-04-2013 (Figs. 9-14), Age: 27-00,

Tx Time: 26 months

Maxilla (all three planes):

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

Mandible (all three planes):

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

Maxillary Dentition

- Alignment: #2 rotated distal side out
- Anchorage: Maintained
- Incisor Control: Uprighted (*decreased axial inclination*)
- A.P.: Retracted
- Vertical: Maintained
- Intermolar Width: Increased
- Intercanine Width: Decreased
- Marginal Ridges: discrepancy on #3-4, 13-14
- Buccolingual flaring of #14



Fig. 38: A good profile and a pleasing smile were achieved.

Mandibular Dentition

- Alignment: #27 rotated mesial side in
- Anchorage: Maintained
- Incisor Control: Uprighted
- A.P.: Retracted
- Vertical: Maintained
- Inter-molar Width: Maintained
- Inter-canine Width: Increased
- Buccolingual Inclination: Acceptable

Facial esthetics:

- Lip profile improved, especially the lower lip.

Superimposition: Both the maxillary and mandibular dentoalveolar processes were retracted slightly. Both upper and lower incisors were retracted and their inclination was improved. A slight loss of anchorage was found in both arches due to the use of intermaxillary elastics, but it was well controlled. Although extensive Class II elastics were used, no extrusion of mandibular posterior teeth was noted, probably due to the intrusive vector of the posterior bite turbos. No mandibular growth was observed. Class I molar relationship was maintained. Overjet and overbite were ideal. The protrusive lip was retracted to a straight and balanced profile (Figs. 12-14).

Retention

A lower fixed retainer was bonded from teeth #20-29. 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. Instructions were provided for routine home care and maintenance of the retainers.

Final Evaluation of Treatment

The major discrepancies in the anterior teeth were corrected, resulting in normal overjet and overbite (Fig. 17). All extraction spaces were closed. The upper dental midline was shifted 2mm to the right to correspond with the facial midline. Blocked-out canines were well aligned, and the gingival texture was healthy. The ABO Cast-Radiograph Evaluation score was 16 points, as documented on the form that appears later in this report. The score is an excellent result which is well within the limit of 30 for this series of ABO case reports. The following deviations from ideal were noted:²

- The upper left third molar, moved into the second molar position, was rotated distal in, and the lower right canine was rotated mesial in (Fig. 30).
- Marginal ridge discrepancies were noted between the maxillary premolars and molars bilaterally (Fig. 31).
- Buccolingual inclination was evident in the upper left first molar (Fig. 32).
- Excessive buccal overjet was observed for the upper right second molar, left second molar and right central incisor (Fig. 33).
- Occlusal contacts were absent for five occlusal

stops in the buccal segments, most of which were associated with 2nd molar alignment (Figs. 34).

- Root angulation problems were observed for the upper right premolar and second molar, as well as for the lower left second incisor (Fig. 13).

Discussion

The major problems in this case were the buccal crossbite and the bimaxillary protrusion. The Discrepancy Index (DI) was 29.^{3,4} There were two treatment options to resolve the protruded profile. One was non-extraction with extra-alveolar miniscrews to retract both dental arches,⁵ but the patient's long face and high mandible plane angle complicates that approach. Bimaxillary protrusion and crowding, in a patient with increased VDO, respond more positively to extracting all four 1st premolars.⁶ Bilateral buccal crossbite of the second molars was solved by using different approaches (Figs. 35-37). On the left side, the occlusal bite turbos were bonded on the first molars to create intermaxillary space for cross elastics (3.5 oz, 1/8" Chipmunk)(Fig. 36). On the right side, the large restoration in the second molar favored extraction and third molar protraction to close the space (Figs. 35 and 37). Because of dental anatomical variations, achieving root parallelism was more challenging than anticipated. Analyzing progress records (Figs. 5-7) was very helpful in identifying and correcting the bracket bonding errors (Fig. 13).⁷

After closing the spaces, the patient was very

pleased with the improvement in her facial profile. It was not necessary to use extra-alveolar OBSs, which was the patient's preference. The Class II molar relationship and midline deviation were solved using unilateral Class II elastics. In retrospect, an OBS in the left infrzygomatic crest would have expedited the treatment, enhanced the midline correction, and easily achieved a solid Class I occlusion. It would have been wise to propose the use OBS prospectively. Patients tend to be less receptive to this option if they were not expecting it.

In the finishing stage of the treatment, V-shaped interproximal spaces were spotted in the occlusal view of the upper incisors. Such anatomical contours create a false illusion of incomplete space closure, despite contact of the lingual marginal ridges. This morphological variation of incisors is a common Asian, particularly among Chinese. The restorative solution for this problem is to separate the teeth, reduce the lingual marginal ridges and smooth the lingual line angles to taper the interproximal surface to the lingual. After the reshaping procedure, the residual spaces are closed. At the same appointment, the black triangles between the lower incisors were corrected by progressive enamel stripping toward the incisal edge (Figs. 23-27).⁸

When the fixed appliances were removed, a discrepancy in the incisal gingival display was noted. The maxillary incisors had inadequate crown exposure relative to adjacent teeth. The clinical management for this problem is illustrated in Fig. 29. Under local anesthesia, gingival sounding was performed by probing, from the free gingival

margin to the alveolar bone crest. The sounding depth on the labial surface for both upper lateral incisors was 4 mm, which exceeds the 3mm minimum for adequate biologic width of healthy gingiva.⁹⁻¹¹ A diode laser was used to perform a 1mm gingivectomy on the labial surface of both lateral incisors. This minor surgical procedure dramatically improved the "pink and white" esthetics, as scored in the form appearing at the end of this case report.^{12,13}

The final alignment was evaluated with the ABO cast radiograph evaluation (CRE), and the score was 16 points, which is an excellent finish for a difficult malocclusion ($DI = 29$). The major finishing discrepancy was occlusal contacts (*5 points*); all other discrepancies were 3 points or less. Most of the finishing problems (*9 points out of 16*) related to alignment of teeth in the maxillary second molar positions. These problems related to lack of natural wear facets, unusual dental anatomy and the difficulty of achieving precise mechanics with adjustment at the end of the archwire. At the last appointment before debonding, the maxillary arch wire was sectioned distal to the second premolars to accommodate vertical elastics for final detailing after the method of Steffen¹⁴ (Fig. 28). Overall, the patient was well satisfied with the treatment.¹⁵

Conclusion

The patient's chief complaints of protrusive lips and a blocked-out (*high*) maxillary canine were addressed to her satisfaction. Outcomes assessment demonstrated that facial and dental esthetics were excellent. Analysis of progress records, to fine tune

the finishing mechanics, was an important step in achieving near ideal dental occlusion and functional alignment of the dentition with no lip strain. Two methods for correcting buccal crossbite of maxillary molars were utilized, and both were successful except for some limitations in achieving ideal intermaxillary occlusal contacts. In retrospect, the use of infrzygomatic miniscrews early in treatment probably would have simplified the mechanics and shortened the treatment time. It is important to discuss that option prospectively with the patient.

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Edward H. Angle Society

Patient YAO-CHUN CHUANG

CEPHALOMETRIC SUMMARY

Area	Measurement	A ¹	A ² (progress)	B	Difference A ¹ - B
Maxilla to Cranial Base	SNA	80	79	79	1
Mandible to Cranial Base	SNB	77	76	76	1
	SN-Go-Gn	39	39	39	0
	FMA	32	32	32	0
Maxillo-Mandibular	ANB	3	3	3	0
Maxillary Dentition	1 to NA (mm)	10 mm	7 mm	5 mm	5
	1 to SN	107	103	98	9
	6-6 (mm)(casts)	43 mm	48 mm	45.5 mm	2.5
Mandibular Dentition	1 to NB (mm)	12 mm	9 mm	6 mm	6
	1 to Go-Gn	110	103	98	12
	6-6 (mm)(casts)	39 mm	40 mm	39.5 mm	0.5
	3-3 (mm)(casts)	27 mm	28 mm	28 mm	1
Soft Tissue	Esthetic Plane	U: 0 mm L: 5 mm	U: -1 mm L: 3 mm	U: -1.5 mm L: 0 mm	1.5 5

A¹ Pretreatment records

A² Interim or progress records if indicated

B Posttreatment records

***NOTE: Difference between A1 and B.** It is not required for Affiliates to use negative or positive signs to indicate this value. Show only the number difference between the two values.

Note, additional measurements may be used for evaluation. Please place these on additional sheet.

Discrepancy Index Worksheet

Total DI Score 29

OVERJET

0 mm. (edge-to-edge)	=	1 pt.
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 = 2

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 = 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.	=	2 pts.
5.1 – 7 mm.	=	4 pts.
> 7 mm.	=	7 pts.

Total = 7

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 _____ pts.
Beyond Class II or I II	=	1 pt. per mm. _____ pts. additional

Total = 0

EXAM YEAR 2011
AO ID# CHRIS CHANG

LINGUAL POSTERIOR X-BITE

1 pt. per tooth Total = 0

BUCCAL POSTERIOR X-BITE

2 pts. per tooth Total = 4

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

$\geq 38^\circ$ 39° = 2 pts.

Each degree $> 38^\circ$ 1 x 2 pts. = 2

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

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

1 to MP $\geq 99^\circ$ 110° = 1 pt.

Each degree $> 99^\circ$ x 1 pt. = 11

Total = 16

OTHER (See Instructions)

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

Identify:

Total = 0

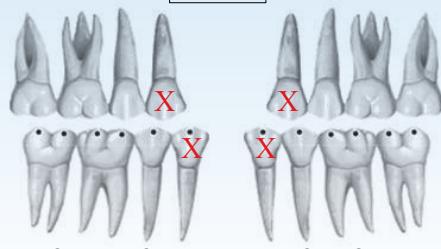
Cast-Radiograph Evaluation

Total CRE Score (Mid-Tx)

52

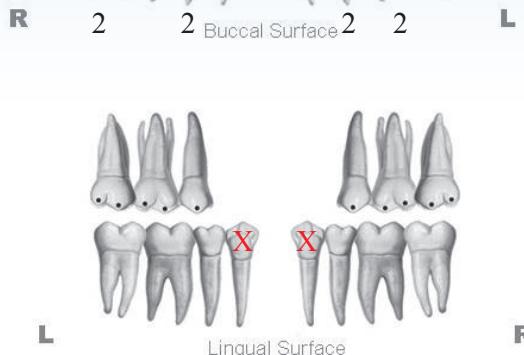
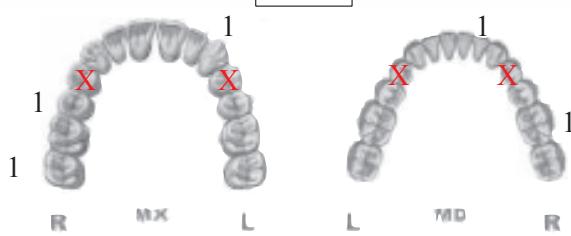
Occlusal Contacts

8



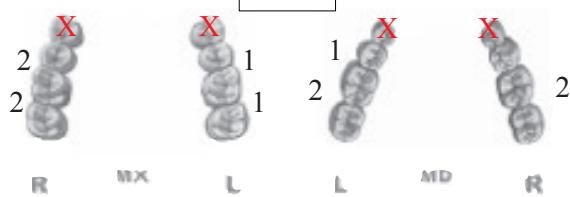
Alignment/Rotations

5



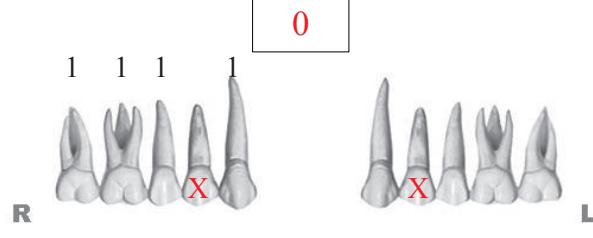
Marginal Ridges

9



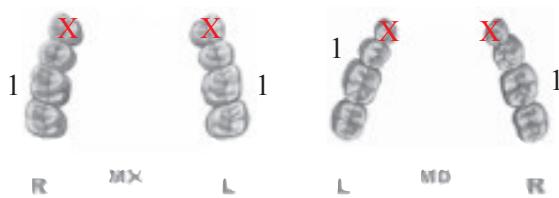
Occlusal Relationships

0



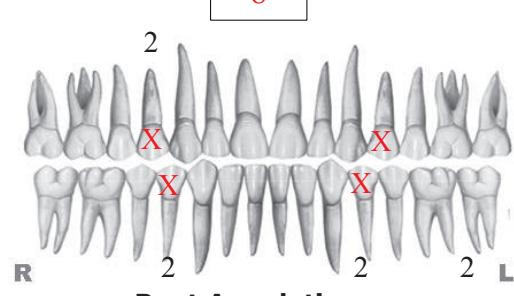
Buccolingual Inclination

4



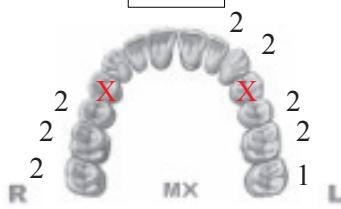
Interproximal Contacts

8



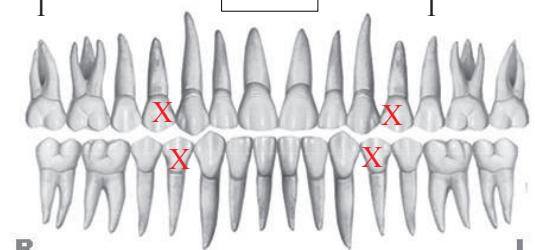
Overjet

15



Root Angulation

3



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.

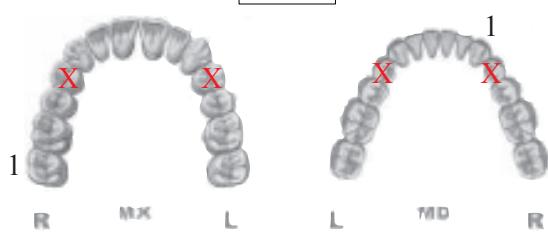
Cast-Radiograph Evaluation

Total CRE Score (Final Result)

20

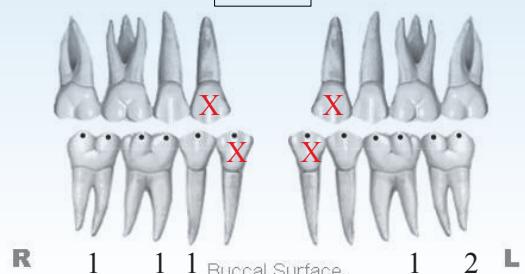
Alignment/Rotations

2



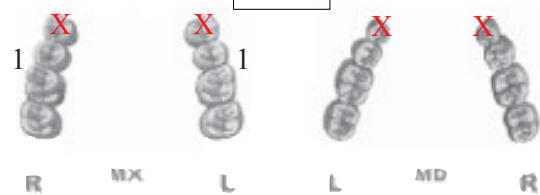
Occlusal Contacts

9



Marginal Ridges

2



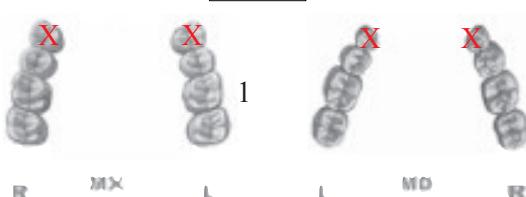
Occlusal Relationships

0



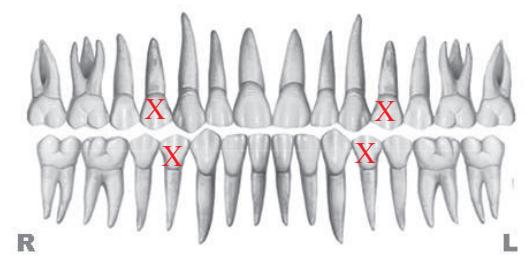
Buccolingual Inclination

1



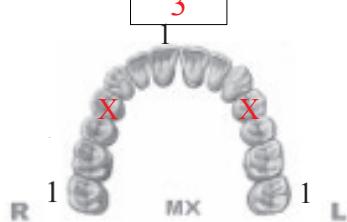
Interproximal Contacts

0



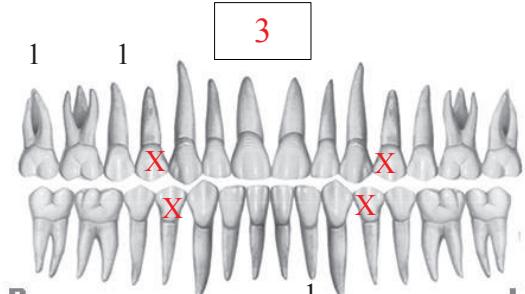
Overjet

3



Root Angulation

3



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

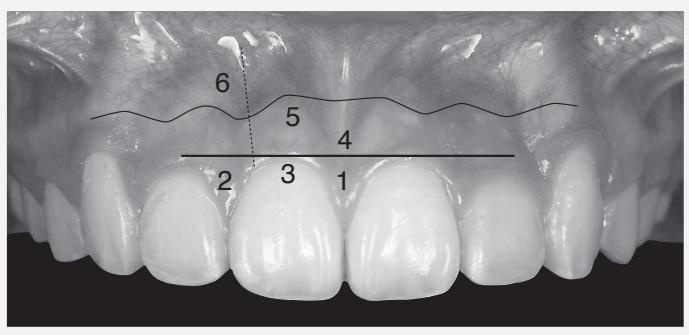
Total Score: =

3

1. Pink Esthetic Score

Total =

0



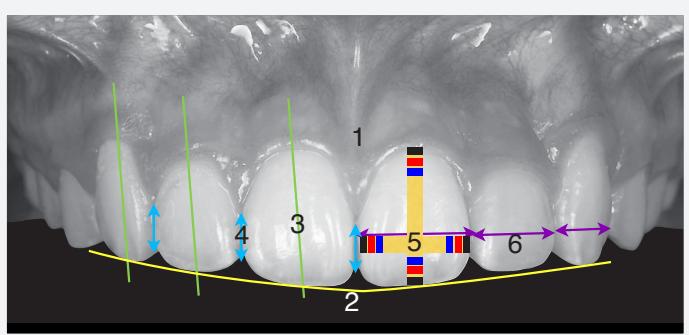
1. Mesial Papilla	0	1	2
2. Distal Papilla	0	1	2
3. Curvature of Gingival Margin	0	1	2
4. Level of Gingival Margin	0	1	2
5. Root Convexity (Torque)	0	1	2
6. Scar Formation	0	1	2

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 =

3



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