

Full Cusp Class II Malocclusion with a Deep Overbite

SUMMARY

A skeletal and dental Class II malocclusion in a adolescent male with incompetent lips was managed with non-extraction orthodontics treatment. The impinging deep overbite was resolved with an anterior bite turbo. The skeletal and dental Class II relationships were corrected with Class II elastics and miniscrews that were inserted as anchorage in the infrazygomatic crests bilaterally. A tooth positioner was used to finish the occlusion. Overall, this moderately difficult malocclusion (DI=20) was finished in an excellent result (CRE=24) in ~21 months, but there were some side effects associated with rapidly opening the bite. (Int J of Othod Implantol 2014;36:72-86)

Key word: Class II, deep overbite, miniscrews, tooth positioner.

History and Etiology

A 13-year-11-month-old boy was referred by his dentist for orthodontic consultation (Fig. 1). The chief concern was an impinging deep overbite (Figs. 2 and 3). A diastema was noted between the upper central incisors (Fig. 2). No known habits contributing to the malocclusion were reported. However, hypermentalalis activity associated with lip closure (Fig. 1) suggests the malocclusion is primarily environmental, secondary to a moderate lip trap



■ Fig. 2: Pre-treatment intraoral photographs show an impinging deep overbite that obscures the view of the lower anterior teeth.



■ Fig. 1: Pre-treatment facial photographs show strained lips on closure: flat chin contour in the profile view, dimpled chin pattern due to hypermentalalis activity in the frontal view. Note that the chin dimpling disappears when the lips are opened for the smiling view.



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

Dr. Sheau-Ling Lin,
Instructor, Beethoven Orthodontic Course (left)

Chris Chang, DDS, PhD.

Founder, Beethoven Orthodontic Center
Publisher, International Journal of Orthodontics & Implantology (Middle)

W. Eugene Roberts, Consultant,
International Journal of Orthodontics & Implantology (Right)



Fig. 4:
Post-treatment facial photographs show lip strain on closure.



Fig. 5:
Post-treatment intraoral photographs document that the deep overbite was successfully resolved.



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

when the lips are in repose. The patient was treated to an acceptable result as documented in Fig. 4-9.

Diagnosis

Skeletal:

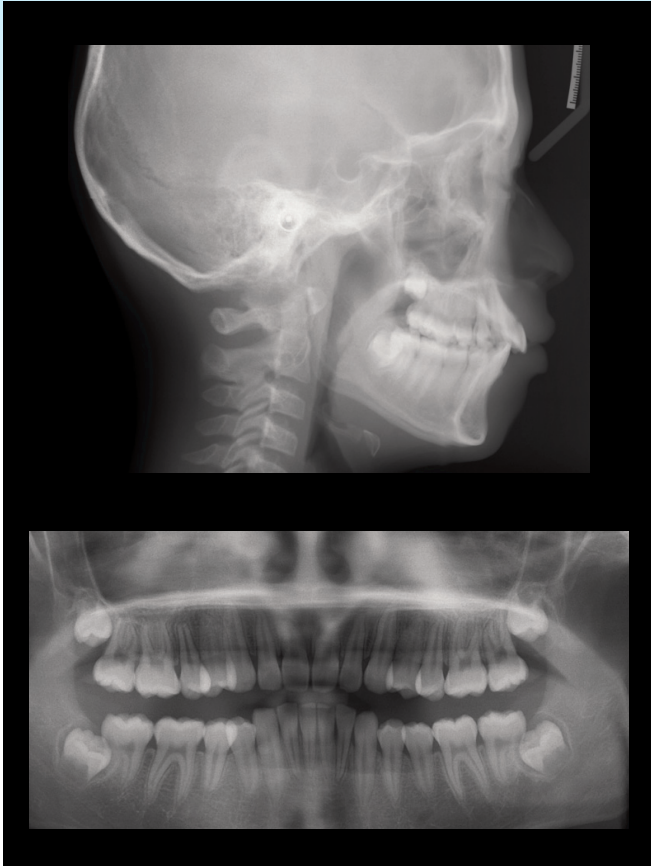
- Skeletal Class II (SNA 85°, SNB 79°, ANB 6°)
- Normal mandibular plane angle (SN-MP 29°, FMA 21°)

Dental:

- Bilateral Class II molar relationship, full cusp discrepancy on the left side (Fig. 3)
- 100% impinging deep overbite with lingual recession of the gingiva on the Mx central incisors (Figs. 2 & 3)
- Overjet (OJ) 5 mm (Fig. 10)
- Mild crowding of about 2 mm in upper arch, and 1 mm in the lower arch
- Diastema <1.0 mm between maxillary central incisors (Fig. 11)
- Maxillary dental midline 1 mm to the right of the facial midline
- Deep Curve of Spee (Fig. 12)

Facial:

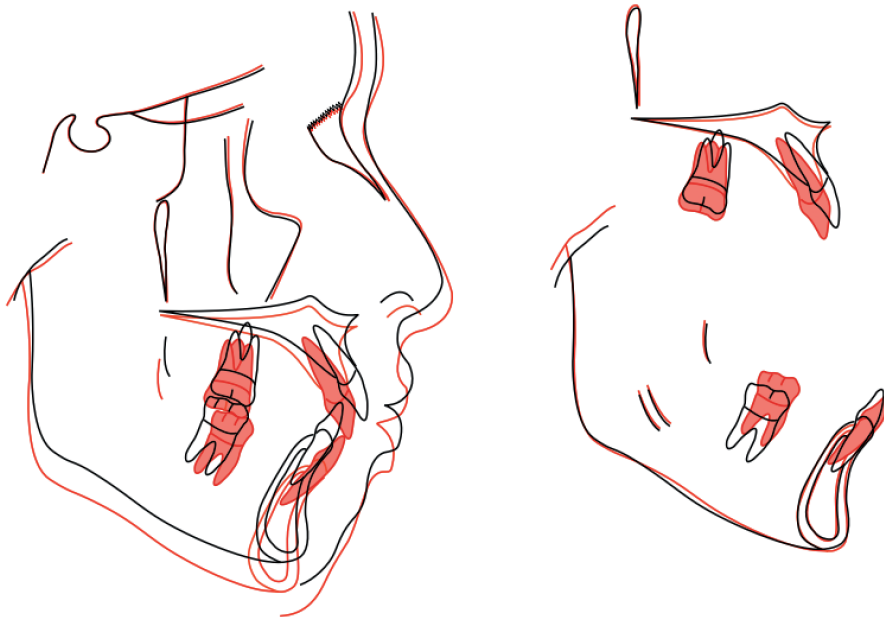
- Mild convex profile with protrusive lips Lip strain on closing, as evidenced by a dimple pattern on the chin due to hypermentalis activity



■ **Fig. 7:**
Pre-treatment cephalometric and panoramic radiographs reveal a deep overbite and increased curve of Spee.



■ **Fig. 8:**
Post-treatment cephalometric and panoramic radiographs document the correction of the deep overbite the excessive curve of Spee



■ **Fig. 9:**
Superimposed tracings document retraction of maxillary anterior teeth and posterior rotation of the mandible. The mandibular molars were extruded and the lower incisors were slightly flared.



Fig. 10: Pre-treatment a 100% deep impinging overbite is associated with distal out rotation of the maxillary central incisors.



Fig. 11: Pre-treatment and intra-oral frontal photographs reveals a maxillary midline diastema.



Fig. 12: An open-mouth frontal view of the dentition shows the deep curve of Spee.

The ABO Discrepancy Index (DI) was 20 as shown in the subsequent worksheet.

Specific Objectives of Treatment

Maxilla (all three planes):

- A - P: Retract
- Vertical: Allow for normal expression of growth
- Transverse: Maintain

Mandible (all three planes):

- A - P: Allow for normal expression of growth
- Vertical: Allow for normal expression of growth
- Transverse: Maintain

Maxillary Dentition

- A - P: Retract the entire maxillary arch
- Vertical: Maintain the molars and intrude the incisors

CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA°	85°	83°	2°
SNB°	79°	78°	1°
ANB°	6°	5°	1°
SN-MP°	29°	30°	1°
FMA°	21°	22°	1°
DENTAL ANALYSIS			
U1 TO NA mm	6 mm	3 mm	3 mm
U1 TO SN°	110°	108°	2°
L1 TO NB mm	7 mm	9 mm	2 mm
L1 TO MP°	98°	102°	4°
FACIAL ANALYSIS			
E-LINE UL	2 mm	-0.5 mm	2.5 mm
E-LINE LL	5 mm	3 mm	2 mm

■ Table 1: Cephalometric summary

- Inter-molar Width: *Increase*
- Inter-canine Width: *Maintain*
- Buccolingual Inclination: *Maintain*

Mandibular Dentition

- A - P: *Maintain the molars and intrude the incisors*
- Vertical: *Maintain the molars and intrude the incisors*
- Inter-molar Width: *Increase*
- Inter-canine Width: *Maintain*
- Buccolingual Inclination: *Maintain*

Facial Esthetics: Correct incompetent

Other: Correct Curve of Spee by intruding the lower incisors

Treatment Plan

A non-extraction treatment plan included correcting the deep overbite, leveling the Curve of Spee, coordinating the arches, and normalizing the soft tissue profile. Both arches will be bonded with a full fixed orthodontic appliance, with bite turbos placed on the lingual surface of both central incisors to correct the deep bite and curve of Spee. Class II molar relationship was to be corrected with early-light-short elastics (2 oz). Miniscrews were planned bilaterally in the infrazygomatic crests for retracting the maxillary arch to correct the Class II relationship. Up & down elastics (2 oz) were prescribed to detail the occlusion before removing the fixed appliances, and then the final occlusion was to be achieved with a positioner. An upper clear retainer and both upper and lower fixed retainers were planned to retain the

corrected dentition. Removal of the four 3rd molars at the age of 18 is recommended.

A 0.022" slot Damon Q bracket system (*Ormco*) was used. The maxillary arch was bonded with high torque brackets on the anteriors, and low torque brackets for the mandibular arch (*Fig. 13*). The archwire sequences for both arches was .014 CuNiTi, .016 CuNiTi, .014 x .025 CuNiTi, and .017 x .025 TMA. Class II elastics (*early-short-light*) were used to correct the A-P discrepancy during the .014 CuNiTi archwire stage.



■ **Fig. 13:** High torque brackets were bonded on the maxillary incisors, and low torque brackets were used for the mandibular incisors.

In the 5th month of treatment, the composite resin bite turbos were placed on the palatal surface of the upper central incisors to open the bite and allow the molars to erupt in order to correct the impinging deep bite situation1 (*Fig. 14*). In the 11th month of active treatment, reshaping the contour of all the mandibular central and the lateral incisors was carried out so the irregular surface of the teeth that would not disturb the alignment (*Figs. 15-*



■ Fig. 14:
Composite resin bite turbos were bonded on the lingual surface of the maxillary central incisors.



■ Fig. 15:
At 10 months of treatment, the lower incisors required reshaping.



■ Fig. 16:
The lower incisors were reshaped, and the spaces were subsequently closed with elastomeric chains.

16). One month later, two miniscrews (2x12 mm, OrthoBoneScrew®, Newton's A, Inc.) were inserted bilaterally in the infrazygomatic crests^{1,2} to serve as anchorage to retract the entire maxillary dentition (Fig. 17 A & B). When both arches were in the .017 x .025 TMA archwire stage, elastometric chains were attached from the upper canines to the miniscrews, and class III elastics were used from the lower canines to the miniscrews.



■ Fig. 17-A:
Miniscrews, inserted bilaterally in the infrazygomatic crests, were subsequently used to anchor Class III elastics, extending to drop-in hooks on the lower cuspids.



■ Fig. 17-B:
A lateral view shows the Class III elastics between the lower canines and the upper posterior miniscrews.

Bracket repositioning was performed as indicated by sequential panoramic films during several appointments, and wire bending was performed for detailing the occlusion during the final stages of the treatment. In the 19th month of treatment, up and down elastics were applied on the 2nd molars to settle the tip-back side effect, which had been caused by retraction of the maxillary arch using miniscrews for anchorage.

A tooth positioner was prescribed to establish an optimal functional occlusion. At the appointment prior to removing the fixed appliances, impressions and a wax bite registration were taken and sent to a commercial orthodontic laboratory to fabricate the tooth positioner. The patient was informed that the braces would be removed at the next appointment and a positioner would be used to finish the occlusion.

After 21 months of active treatment, all the appliances were removed and a mouthguard-type tooth positioner was delivered (Fig. 18). The patient was instructed to wear it four hours a day for the first two weeks, during which the patient was asked to repeatedly clench into the positioner and then release. The patient was instructed to perform this "exercise" for 15 minutes every hour while wearing the appliance. After two weeks of the tooth positioner application, the treatment was finished and the retainers were delivered (Fig. 19). Post-treatment cephalometric and panoramic radiographs (Fig. 8), as well as superimpositions of cephalometric tracings (Fig. 9) document the final result.



■ Fig. 18:

At 21 months, a mouthguard-type tooth positioner was delivered to finish the occlusion.



■ Fig. 19:

Post-treatment photograph of the frontal view of the maxilla shows the final alignment.

Results Achieved

Maxilla (all three planes):

- A - P: Retracted
- Vertical: Increased
- Transverse: Expanded

Mandible (all three planes):

- A - P: Retracted
- Vertical: Increased
- Transverse: Expanded

Maxillary Dentition

- A - P: *Retracted maxillary arch*
- Vertical: *Maintained*
- Inter-molar Width: *Increased*
- Inter-canine Width: *Maintained*

Mandibular Dentition

- A - P: *Maintained*
- Vertical: *Increased*
- Inter-molar Width: *Increased*
- Inter-canine Width: *Decreased*

Facial Esthetics:

- Lower lip profile was improved but the lips were still incompetent. Chin dimples were still noted in the frontal photograph of the face (Fig. 4) because of mentalis muscle contraction when the lips are closed.

Superimpositions:

- As the maxilla extruded, it was retracted, but the mandible was rotated posteriorly.

Upper incisors were retracted bodily and slightly extruded, but the lower incisors were flared. Extrusion of the lower molars was attributed to the extensive use of Class II elastics.

Retention

After two weeks of tooth positioner application, a fixed retainer was bonded on the lingual surface of the two maxillary central incisors to prevent the

teeth from returning to pre-treatment positions (*rotation & spacing*). The 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. In addition, the patient was instructed in the proper home hygiene care and maintenance of the retainers.

Final Evaluation of Treatment

Critical assessment of this case with the ABO Cast-Radiograph Evaluation and IBOI Pink & White score resulted in scores of 24 and 2 respectively, as documented on the forms appearing later in this report. The major discrepancies were in the occlusal relationships (8 *points*), marginal ridges (5 *points*), alignment/rotations (3 *points*), and occlusal contacts (2 *points*). The patient's chief concern (*deep impinging overbite*) was successfully treatment, and his lip profile has been improved but the lip incompetence remained. The patient was satisfied with the treatment outcome (Fig. 20).



■ **Fig. 20:**
Post-treatment photograph shows the patient with Dr. Chris Chang.

Discussion

Angle Class II Division 1 malocclusions represents a large proportion of the average orthodontist's caseload.³ There are multiple approaches for managing Class II Division 1 malocclusion. The diagnosis and treatment plan should carefully consider facial profile, skeletal pattern, growth potential, and severity of the malocclusion. The treatment protocol as well as the malocclusion severity can influence the efficiency of orthodontic treatment.⁴ Therapeutic options include removable functional appliances, fixed functional appliances, headgear, intermaxillary elastics and/or tooth extractions. Removable functional appliances are usually best suited to patients in the late mixed dentition, while fixed functional appliances are best in the early permanent dentition.⁵ However, the effectiveness of functional appliances on enhancing mandibular growth in the short term remains controversial.⁶ Since the current patient had a major Class II discrepancy and his growth potential was questionable, a dentoalveolar correction was indicated to achieve the most efficient treatment for a full cusp Class II malocclusion as rapidly as possible. Extractions were not a good option due to mild crowding and convex profile. Excessive retraction of the anterior teeth may increase the nasolabial angle and decrease incisal inclination, which could increase the severity of the deep bite. Therefore, a non-extraction treatment protocol was chosen, utilizing a full fixed appliance, Class II elastics and maxillary posterior miniscrews.

Anchorage is considered the most critical factor when correcting a Class II Division 1 malocclusion. To reinforce anchorage, various auxiliaries can be used, including headgear, lingual arch, transpalatal arch, Nance holding arch and intermaxillary elastics. However, anchorage control that requires patient compliance may be problematic. Dental implants, miniscrews, and miniplates are increasingly popular for skeletal anchorage that does not depend on compliance. These devices can provide stationary anchorage for various types of tooth movement⁷ without active patient cooperation. According to the retrospective study by Yao et al.,⁸ skeletal anchorage has achieved better control than other options in both the anteroposterior and vertical directions during treatment of maxillary dentoalveolar protrusion. Correction of Class II malocclusion is facilitated by greater retraction of the maxillary incisors, less posterior anchorage loss, and counterclockwise mandibular rotation, especially for patients with a hyperdivergent face.⁸ Among the devices available, miniscrews as temporary anchorage devices (TADs) are commonly used because of the following advantages:⁴

1. Easy placement and removal
2. A variety of maxillary and mandibular locations are available for placement
3. Minimal operation and postoperative discomfort⁹

4. No need for complicated clinical and laboratory procedures to facilitate precise implant placement
5. Can be immediately loaded Correction of deep overbite can be accomplished in different ways depending on the treatment goals chosen for individual patients.^{10,11} There are four general treatment options to consider:¹²

1. Extrude the posterior segment

2. Intrude the maxillary incisors

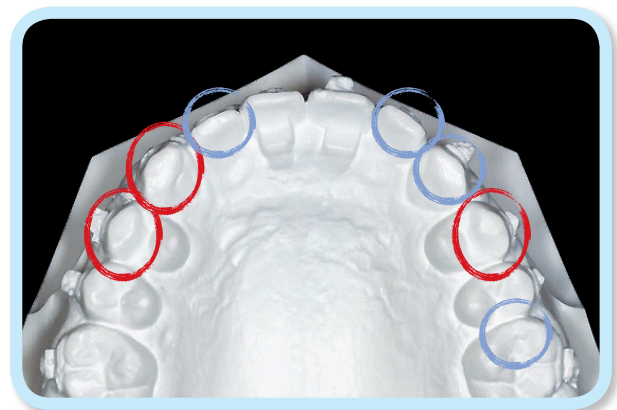
3. Intrude the mandibular incisors

4. Flare the maxillary and/or mandibular incisors

For the present patient, anterior bite turbos were placed to allow posterior teeth to extrude. This method is advantageous for correcting the deep bite, creating interocclusal space and eliminating the intercusp locking. All of these effects facilitate the correction of the Class II relationship.^{13,14} Bite turbos and Class II elastics are a good combination to solve Class II deep bite problem, but there are risks if the patient does not have good growth potential for forward rotation of the mandible. These mechanics rotate the mandible posteriorly (*clockwise*), extrude the mandibular molars, and increase the axial inclination of the lower incisors. Taking the side effects on the anterior teeth into consideration, high torque brackets were chosen for the upper incisors

and low torque brackets for the lower incisors. Despite this precaution, lower incisor angulation to the mandibular plane increased from 98° to 102°. In retrospect, it may have been better to treat this case with miniscrews and a lower base arch to intrude the mandibular incisors.¹⁰ However, miniscrews can also produce unwanted side effects, such as tip-back of the molars and a posterior open bite. However these side effects can be at least partially controlled by using a lighter force and extending the treatment time.

The patient was found to have an unconscious bruxism habit that was evidenced by generalized wear facets on multiple teeth (*Fig. 21*). The etiology appeared to be a predisposition to nocturnal bruxism that was manifest after the deep impinging overbite was relieved. Attrition can occur with



■ **Fig. 21:**

Following the opening of the occlusion with bite turbos, generalized wear facets were noted on multiple teeth in the maxillary arch (circles). The facets were distinguished as less (blue circles) or more (red circles) severe.

normal masticatory function but it is usually a manifestation of parafunctional habits such as nocturnal bruxism.¹⁵ Parafunction is thought to have a multifactorial etiology: occlusal, psychological or originating within the central nervous system.¹⁶ However, Caroline et al.¹⁵ found no relationship between bruxism and orthodontics; neither the need for nor the provision of orthodontic treatment contributes to increased tooth wear. Parafunction can lead to mobility of the dentition, severe occlusal wear, displacement of the aligned arches and sometimes pain. Recommended treatment includes the medication Klonopin® (*clonazepam*) 1mg one hour prior bedtime, reduction of acidity in the diet which softens tooth structure, fabrication of an occlusal nightguard to protect the teeth, and restoration of the damaged tooth structure as necessary.¹⁵

The purpose of the tooth positioner for the present patient was to establish an optimal functional occlusion. Using a tooth positioner, rather than final finishing with archwires, is purported to have 3 advantages :

1. It allows the fixed appliances to be removed sooner.
2. It improves articulation of the teeth and massages the gingiva, which is usually swollen after comprehensive orthodontic treatment.
3. It helps develop lip competence and facial muscle tone.

According to Yongjong et al.,¹⁸ wearing a tooth positioner improves alignment and rotation, overjet, occlusal relationship, inter-proximal contact, and root angulation. For the present patient, improved occlusal relationships, closure of inter-proximal contacts, proper overbite and optimal overjet were all achieved. However, good patient compliance is needed and that is the most important consideration in determining the efficacy of the method.¹⁸

In addition to a successful outcome, a treatment protocol must also provide good long-term stability of the dental relationships. Long-term changes in tooth alignment can occur, so Niall et al.¹⁹ suggest that it is not appropriate to evaluate final treatment results at the end of active treatment. Long-term follow-up evaluation is an important consideration for all patient treatment outcomes.

Conclusion

Class II Division 1 with a deep bite is a common malocclusion. The choice of treatment should consider the patient's facial profile, skeletal pattern, growth potential, and severity of the malocclusion. Bite turbos and Class II elastics are a good combination for rapidly resolving a severe Class II deep bite malocclusion. This method may be advantageous for patients who have competent lips, but limited growth potential; however, opening the bite may also lead to unintended consequences such as flaring of the lower incisors, lingual tipping of the upper incisors, and incompetent lips. Overall,

extra-alveolar skeletal anchorage, miniscrews buccal to the maxillary molars, may achieve better control of Class II correction in three dimensions, particularly for patients with incompetent lips.

Acknowledgment

Thanks to Teacher Paul Head, Dr. Hsin Yin Yeh and Ben Lin for proofreading this article.

References

1. Cozza P, Baccetti T, Franchi L, De Toffol, McNamara JA Jr. mandibular changes produced by functional appliances in Class II malocclusion: a systematic review. *Am J Orthod Dentofacial Orthop* 2006;129:599.e1-12.
2. Marsico E, Gatto E, Burrascano M, Matarese G, Cordasco G. Effectiveness of orthodontic treatment with functional appliances on mandibular growth in the short term. *Am J Orthod Dentofacial Orthop*. 2011;139:24-36.
3. Chang CH. Basic Damon Course No. 3: Danom + OrthoBoneScrew I, Beethoven Podcast Encyclopedia in Orthodontics 2011, Newton's A Ltd, Taiwan.
4. Lin JJ. A new method of placing orthodontic bone screws in IZC. *New & Trends in Orthodontics* 2009;vol 13:4-7.
5. Zhang N, Bai Y, and Li S. Treatment of a Class II Division 1 malocclusion with miniscrew anchorage. *Am J Orthod Dentofacial Orthop* 2012;141:e85-e93.
6. Moschos AP. Orthodontic treatment of Class II malocclusion with miniscrew implants. *Am J Orthod Dentofacial Orthop* 2008;134:604.e1-604.e16.
7. Shingo K et al. Class II malocclusion treated with miniscrew anchorage: Comparison with traditional orthodontic mechanics outcomes. *Am J Orthod Dentofacial Orthop* 2009;135:302-309.
8. Yao CC, Jane et al. Comparison of treatment outcomes between skeletal anchorage and extraoral anchorage in adults with maxillary dentoalveolar protrusion. *Am J Orthod Dentofacial Orthop* 2008;134:615-624.
9. Shingo K et al. Clinical use of miniscrew implants as orthodontic anchorage: Success rates and postoperative discomfort. *Am J Orthod Dentofacial Orthop* 2007;131:9-15.
10. Charles JB. Biomechanics of deep overbite correction. *Semin Orthod* 2001;7:26-33.
11. Hsu YL et al. ABO case report: A Class II deep bite case. *New & Trends in Orthodontics* 2009;vol 15:56-63.
12. David MS. Soft-tissue-based diagnosis and treatment planning. *Clinical Impression* 2005;14:1:21-26.
13. Samir EB. Class II malocclusion: Diagnostic and clinical considerations with and without treatment. *Semin Orthod* 2006; 12:11-24.
14. Jeff K. Honing Damon system mechanics for the ultimate in efficiency and excellence. *Clinical Impression* 2008;16:1:23-28.
15. Harpenau LA et al. Diagnosis and management of dental wear. *J Calif Dent Assoc*. 2001Apr;39(4):225-231
16. Nissani M. A bibliographical survey of bruxism with special emphasis on non-traditional treatment modalities. *J Oral Sci* 2011 Jun;43(2):73-83.
17. Caroline WM et al. Relationship between malocclusion, orthodontic treatment, and tooth wear. *Am J Orthod Dentofacial Orthop* 2009;136:529-535.
18. Yongjong P et al. Tooth positioner effects on occlusal contacts and treatment outcomes. *Angle Orthod* 2008;78:1050-1056.
19. Niall JP, McG et al. Long-term occlusal and soft-tissue profile outcomes after treatment of Class II Division 1 malocclusion with fixed appliances. *Am J Orthod Dentofacial Orthop* 2011;139:362-368.



Discrepancy Index Worksheet

TOTAL D.I. SCORE = 20

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 = 2

OVERBITE

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

Total = 5

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 = 1

OCCCLUSION

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

Total = 6

LINGUAL POSTERIOR X-BITE

1 pt. per tooth Total = 0

BUCCAL POSTERIOR X-BITE

2 pts. per tooth Total = 0

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. = _____

I to MP ≥ 99° = 1 pt.
 Each degree > 99° _____ x 1 pt. = _____

Total = 4

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. = 2

Identify: Lip Incompetence

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) = _____

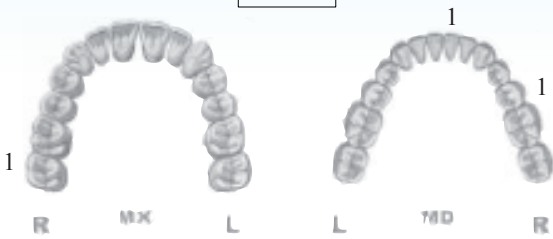
Total = 0

Cast-Radiograph Evaluation

Total Score: **24**

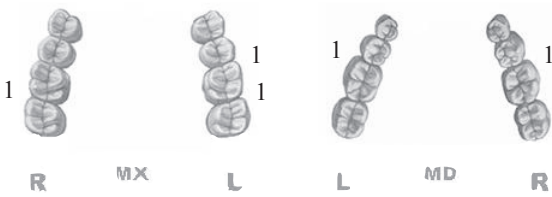
Alignment/Rotations

3



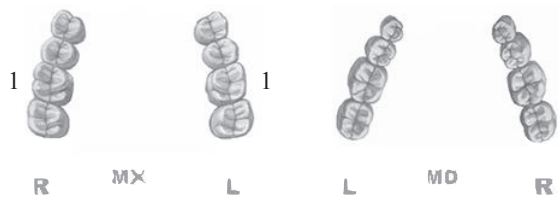
Marginal Ridges

5



Buccolingual Inclination

2



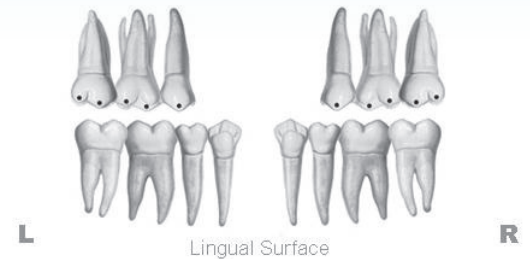
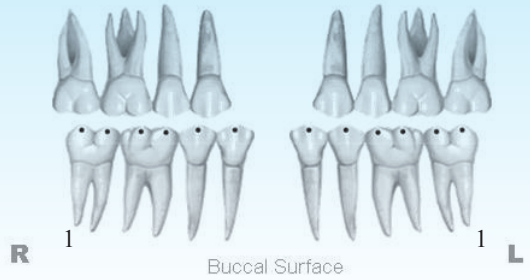
Overjet

1



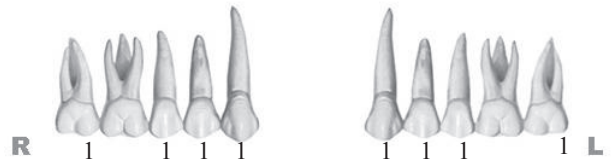
Occlusal Contacts

2



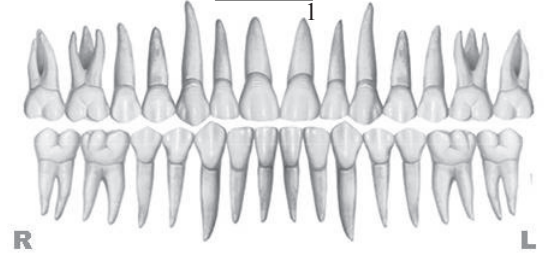
Occlusal Relationships

8



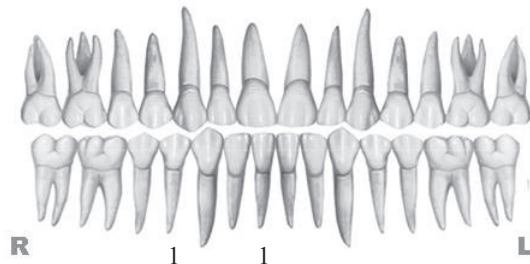
Interproximal Contacts

1



Root Angulation

2

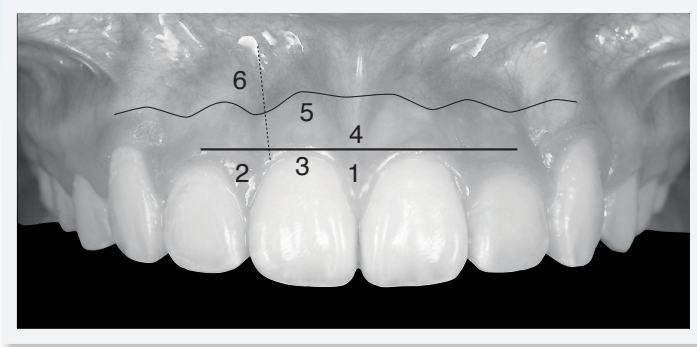


INSTRUCTIONS: Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

IBOI Pink & White Esthetic Score

Total Score: = 2

1. Pink Esthetic Score

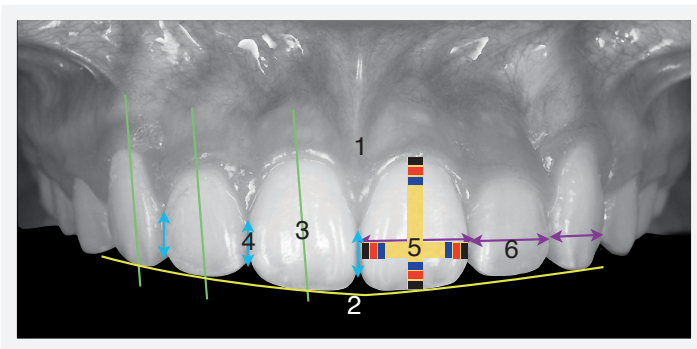


Total = 1

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 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 = 1

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