# Category 6: Class II Division 1 malocclusion treated with extraction of permanent teeth

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## SUMMARY OF TREATMENT

**Case report category:** #6
**Candidate ID#:** 95137
**Date of birth:** 2-23-92
**Age:** 7 years 4 months

## PRETREATMENT RECORDS

**Date of Records:** 6-22-99

### Diagnosis

**Skeletal:** Mildly retrognathic (ANB = 4°). Moderately hyperdivergent (FMA = 29°).
**Dental:** Class II Division 1 in mixed dentition. Large overjet (6 mm). Moderately deep overbite (4 mm). Moderate maxillary and mandibular arch length shortage.
**Facial:** Convex. Lips apart at rest with mentalis strain to close. Acute nasolabial angle with moderate lip protrusion.

### Treatment Plan

Serial extraction of first premolars now to address maxillary and mandibular arch shortage. Allow additional eruption of teeth. Comprehensive orthodontics once the patient completes the loss of deciduous teeth. Close space with maximum maxillary anchorage and minimal mandibular anchorage.

### Treatment

**6-22-99:** Serial extraction of all first premolars.
**6-28-01:** Placement of upper and lower appliances to the first molars, delivery of a cervical pull headgear and bite place. Retract the maxillary canines completely using sliding mechanics and Class II elastics, followed by the anteriors. En masse space closure on the lower using sliding mechanics. Detail and retain.
**Initiated Treatment Date:** 7-26-01
**Appliance Removal Date:** 11-11-03
**Active Treatment Time Duration:** 28 months

## POSTTREATMENT RECORDS

**Date of Records:** 12/9/2003
**Retention:** Maxillary and mandibular trutain retainers.
**Retention Completed Date:** ongoing
**Retention Duration:** ongoing

## HISTORY AND ETIOLOGY

The patient presented for an orthodontic evaluation at the recommendation of her pediatric dentist. She was prepubertal and in good health. She had received routine dental care.

## DIAGNOSIS

**Skeletal:** Mildly retrognathic (ANB = 4°). Moderately hyperdivergent (FMA = 29°).
**Dental:** Class II Division 1 malocclusion in mixed dentition. Large overjet (6 mm). Deep overbite (4 mm). Moderate maxillary and mandibular arch length shortage.

## TREATMENT PLAN

Serial extraction of first premolars followed by comprehensive orthodontic treatment.

## SPECIFIC OBJECTIVES OF TREATMENT
### Maxilla

**A-P:** Retract A point.

### Mandible

**A-P:** Advance B point.
**Vertical:** Maintain.

**Table.** Cephalometric summary

| Area | Measurement | $A^1$ | $A^2$ (progress) | B | *Difference $A^1$ to B |
|---|---|---|---|---|---|
| Maxilla to cranial base | SNA | 80 | 82 | 77 | 3 |
| Mandible to cranial base | SNB | 76 | 78 | 75 | 1 |
| | SN-Go-Gn | 37 | 35 | 40 | 3 |
| | FMA | 29 | 29 | 32 | 3 |
| Maxillomandibular | ANB | 4 | 4 | 2 | 2 |
| Maxillary dentition | 1 to NA (mm) | 6 | 6 | 6 | 0 |
| | 1 to SN | 104 | 107 | 102 | 2 |
| | 6-6 (mm) (casts) | 42 | 41 | 43 | 1 |
| Mandibular dentition | 1 to NB (mm) | 5 | 6 | 6 | 1 |
| | 1 to Go-Gn | 93 | 94 | 93 | 0 |
| | 6-6 (mm) (casts) | 37 | 36 | 37 | 0 |
| | 3-3 (mm) (casts) | n/a | 25 | 28 | 3 |
| Soft tissue | Esthetic plane | 3 | 5 | 2 | 1 |

$A^1$, Pretreatment records.
$A^2$, Interim or progress records if indicated.
*B,* Posttreatment records.
*Note difference between $A^1$ and B. The board does not require that candidates use negative or positive signs to indicate this value. Show only the number difference between the 2 values.

## Maxillary Dentition

**A-P:** Bodily distal movement of the incisors. Maintain incisor torque. Minimal advancement of the molars.
**Vertical:** Prevent incisor extrusion during space closure. Maintain molar position.
**Intermolar width:** Maintain

## Mandibular Dentition

**A-P:** Maintain incisor position and torque. Protract molars
**Vertical:** Level the lower arch with incisor intrusion.
**Intermolar/intercanine width:** Maintain molar position. Expand canine width.

## Facial Esthetics

Reduce lip protrusion. Improve facial balance and smile esthetics.

## APPLIANCES

Maxillary and mandibular bonded .022 Damon II brackets from second premolar to second premolar. Banded maxillary .022 first molar tubes with headgear tubes. Bonded lower molar tubes. Maxillary second molar buttons. Removable bite plate. Cervical pull headgear. Class II and vertical finishing elastics.

## TREATMENT PROGRESS

**6-14-00:** Request the extraction of all first premolars.
**7-26-01:** Placement of maxillary and mandibular appliances to the first molars. A removable bite plate and cervical pull headgear were delivered. Julianne was instructed to wear the bite plate 24 hours a day every day and the headgear 14 hours a day. Archwires progressed to 19 × 25-in stainless steel. The upper archwire was placed with flush molar stops, and the canines were retracted using sliding mechanics. The lower spaces were closed en masse using sliding mechanics. Class II elastics were started to assist the retraction of the canines and to help slip lower anchorage. Once the maxillary canines were retracted, a new 19 × 25-in wire with hooks distal to the laterals was placed, and the incisors were retracted using sliding mechanics with full coils. After the lower spaces were closed, lower second molars were bonded and leveled, and maxillary second molars received buttons to assist rotation. The archwires were detailed and elastics continued until a Class I molar and canine relationship was achieved. Her braces were removed after vertical finishing elastics and maxillary and mandibular trutain retainers were delivered for 24-hour daily wear. Her third molars will be reevaluated in 2 years.

## RESULTS ACHIEVED
### Maxilla

**A-P:** A point was retracted.

### Mandible

**A-P:** B point was maintained.
**Vertical:** The bite opened slightly.

### Maxillary Dentition

**A-P:** The incisors were largely unchanged. The molars moved anteriorly.

**Vertical:** The incisors slightly extruded following extractions, but were largely unchanged during orthodontics. The molars slightly extruded following extractions, but were largely unchanged during orthodontic treatment.

**Intermolar width:** Slightly increased.

### Mandibular Dentition

**A-P:** The incisors were slightly bodily retracted. The molars moved anteriorly.

**Vertical:** The incisors slightly extruded following extractions, but were largely unchanged during orthodontics. The molars extruded.

**Intermolar/Intercanine Width:** Intermolar width remained the same. Intercanine width increased.

### Facial Esthetics

Bimaxillary protrusion was corrected. Lip competence was improved. Smile esthetics were improved.

### RETENTION

After the removal of the braces, the patient received maxillary and mandibular trutain retainers for 24-hour daily wear. She will reduce her wear to nighttime at her next visit. Her third molars will be recommended for extraction in the future.

### FINAL EVALUATION OF TREATMENT

The dental functional and esthetic goals were met. The patient's cooperation during treatment was initially excellent and then declined to fair after the first 20 months. I credit her headgear wear with her successful maxillary retraction as well the nice final incisor torque. My criticism of this case is that I am disappointed that the vertical increased as much as it did; however, accomplishing the Class II correction without some extrusion of the molars was probably unlikely. Also, the position of the maxillary left second molar could have been better. The gingival recession on the facial of the mandibular left central will be monitored and referred for a graft if this gets worse.
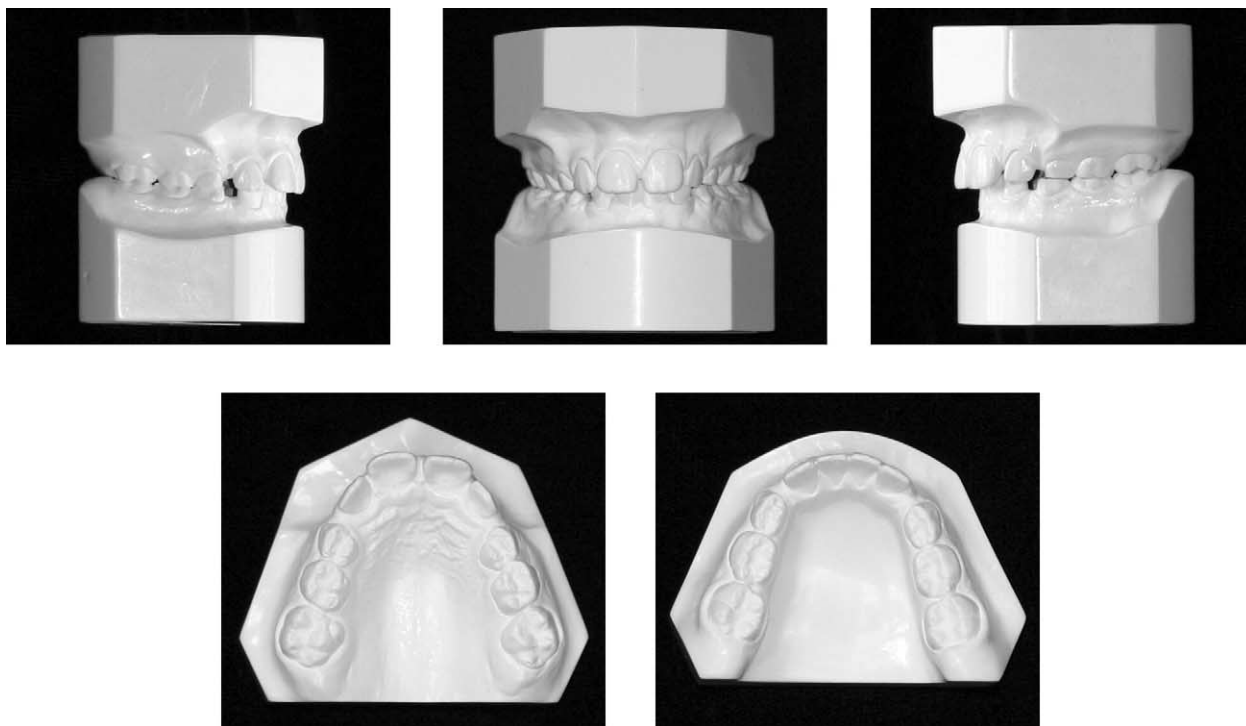
**Fig 1.** Pretreatment photographs.



**Fig 2.** Pretreatment dental casts.
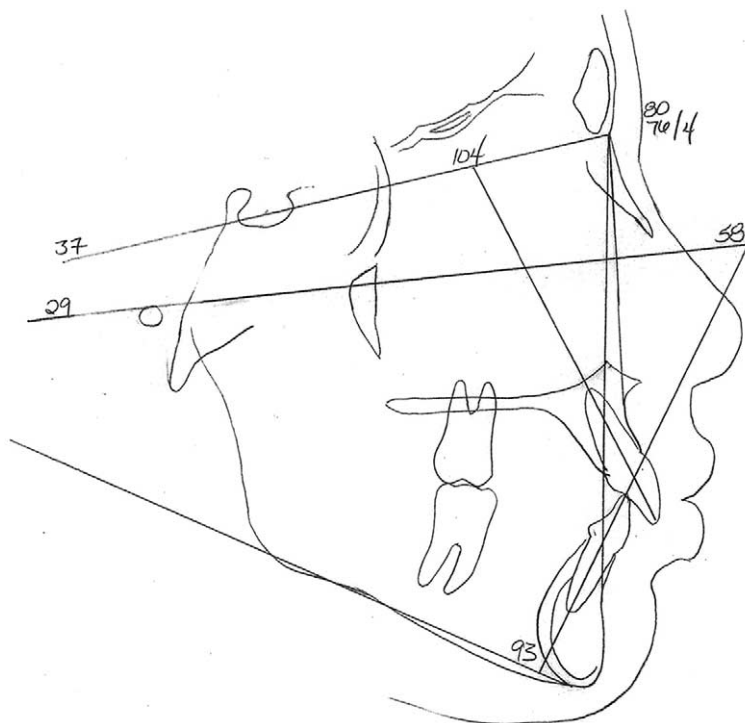
**Fig 3.** Pretreatment tracing.



**Fig 4.** Pretreatment cephalometric radiograph.



**Fig 5.** Pretreatment panoramic radiograph.

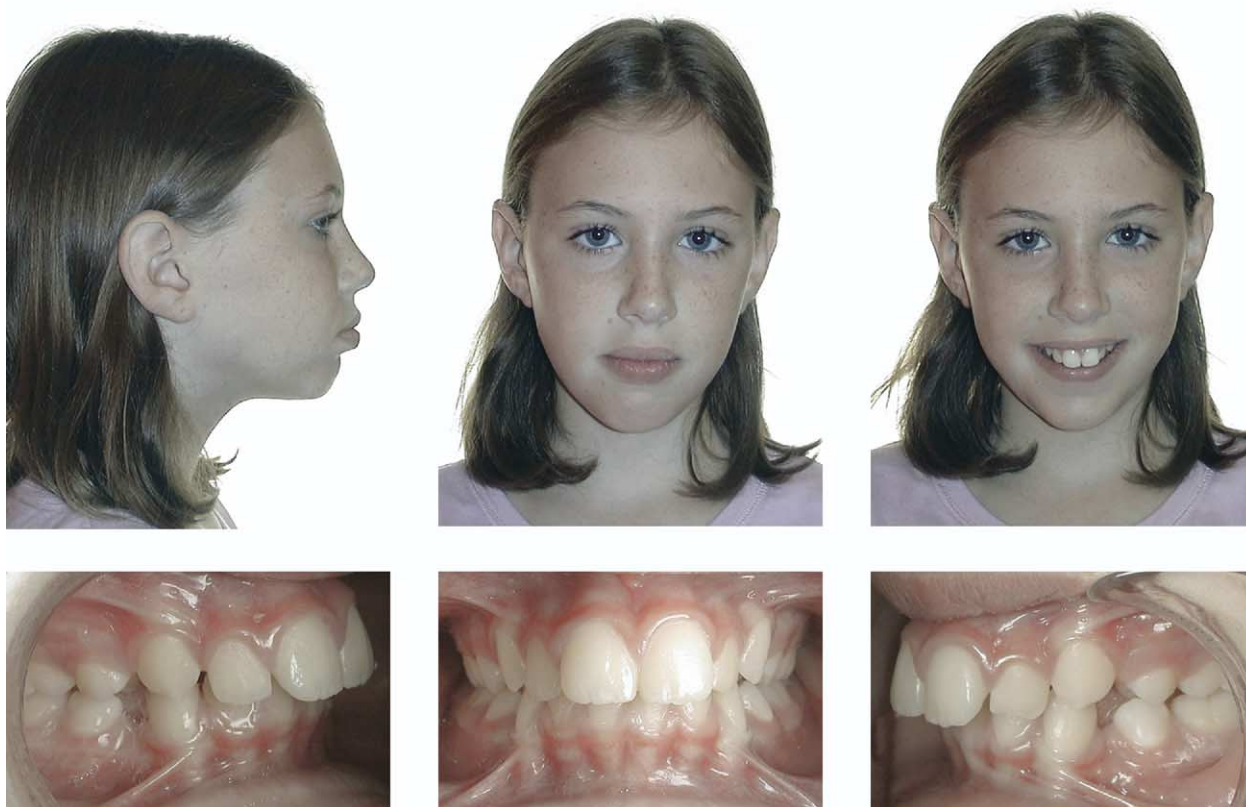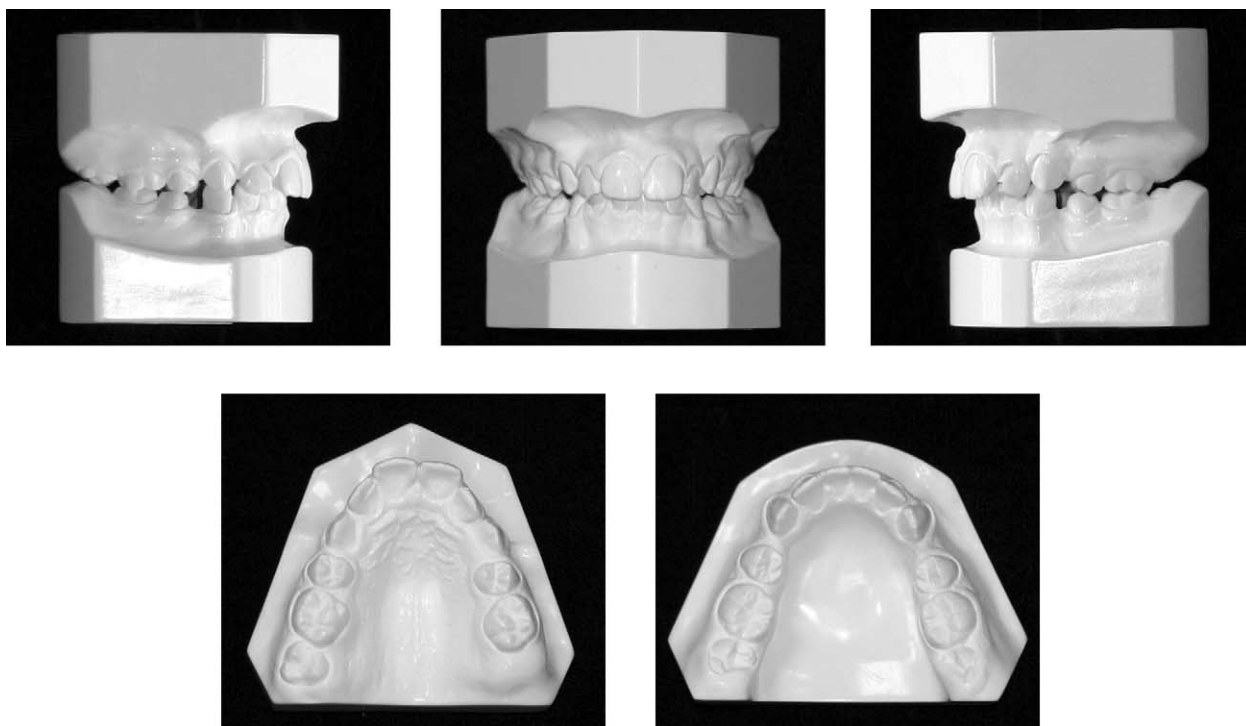**Fig 6.** Progress photographs.


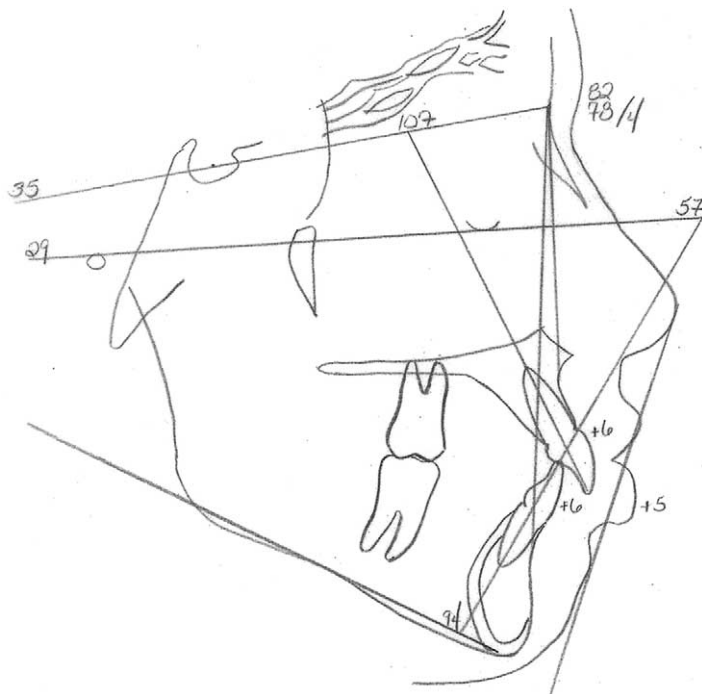
**Fig 7.** Progress dental casts.

**Fig 8.** Progress cephalometric tracing.



**Fig 9.** Progress cephalometric radiograph.
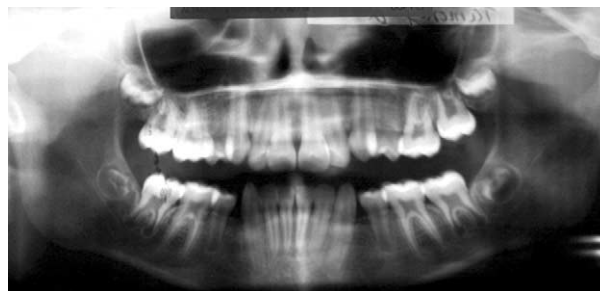


**Fig 10.** Progress panoramic radiograph.
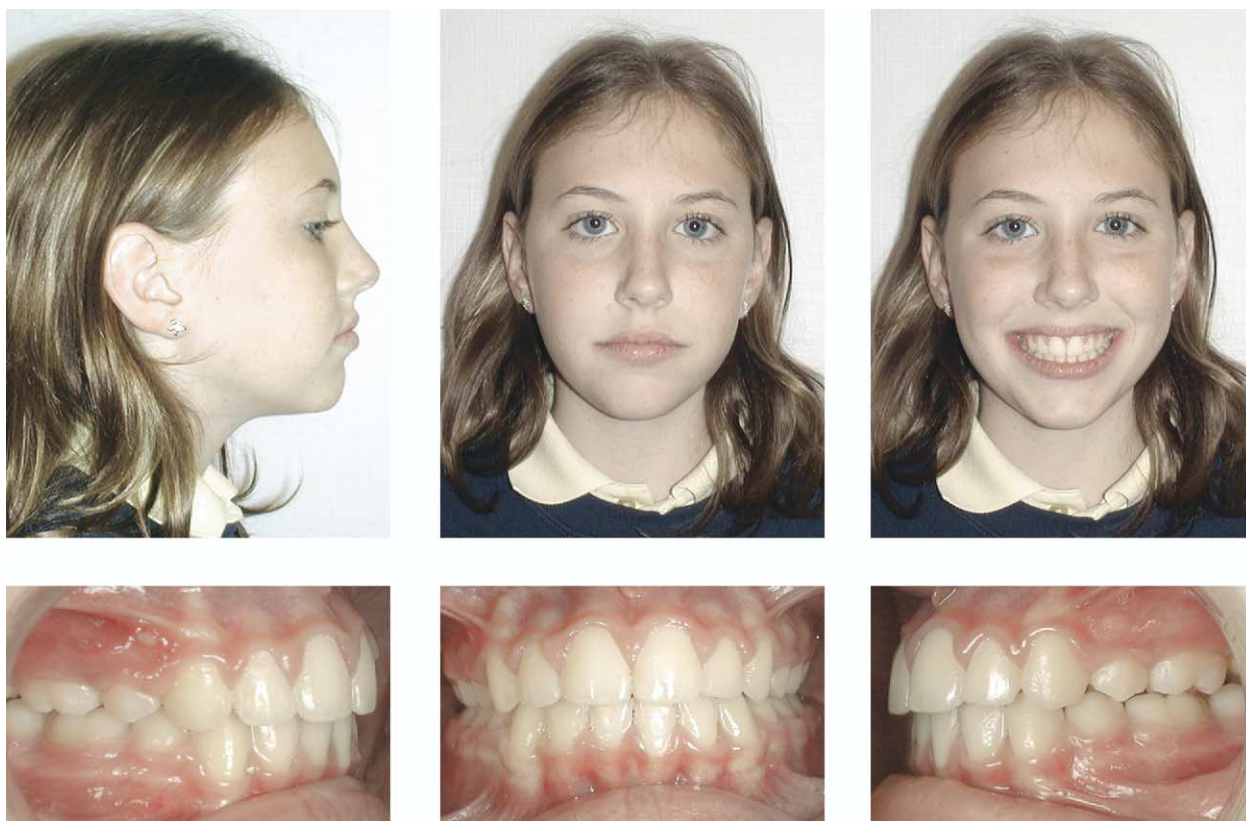
**Fig 11.** Posttreatment photographs.
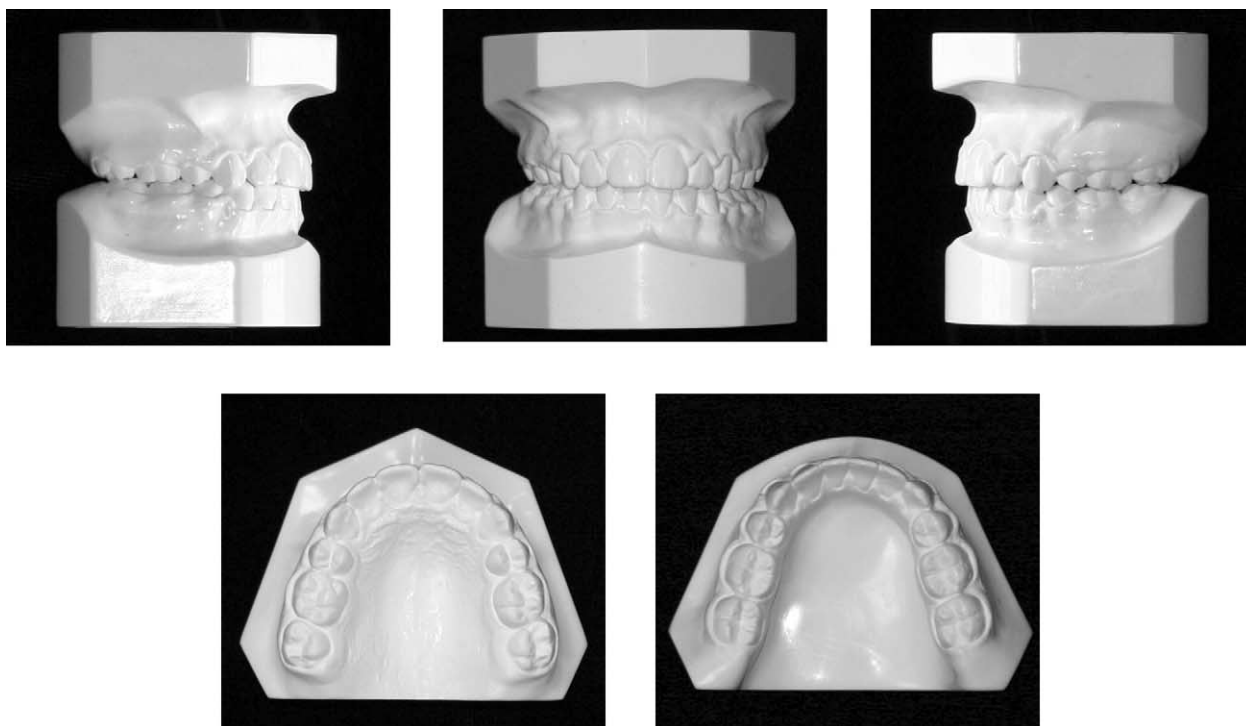


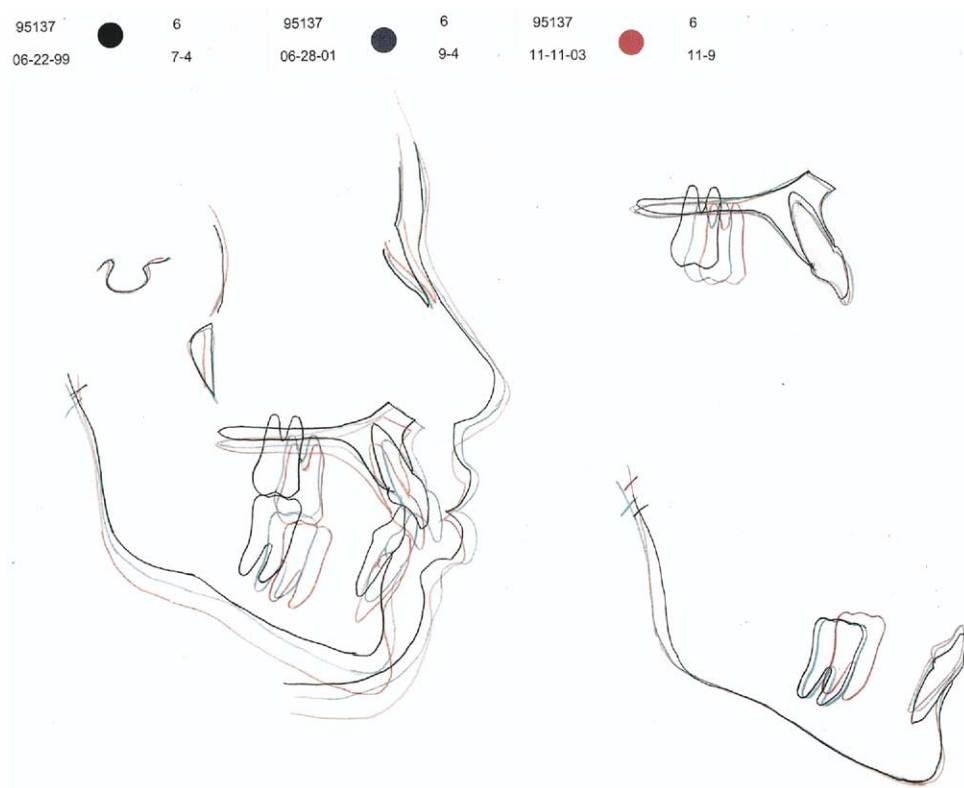**Fig 12.** Posttreatment dental casts.

**Fig 13.** Superimposed cephalometric tracings.



**Fig 14.** Posttreatment cephalometric radiograph.



**Fig 15.** Posttreatment panoramic radiograph.

**THE AMERICAN BOARD OF ORTHODONTICS**

# DISCREPANCY INDEX

Case Category _____ 6 _____
Total D.I. Score _____ 12 _____
CAST EVAL. SCORE _____ 17 _____

**(PLACE LABEL HERE)**

DATE _____

CANDIDATE # _____

EXAMINERS _____

Total      =      2

Pg. 1 of 3

### 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      =      2

### ANTERIOR OPENBITE

0 mm. (edge to edge)    =    1 pt.
then 2 pts. per mm. per tooth

       Total      =      _____

### LATERAL OPENBITE

2 pts. per mm. per tooth
       Total      =      _____

### CROWDING

| | | |
|---|---|---|
| 1 – 3 mm. | = | 1 pt. |
| 3.1 – 5 mm. | = | (2 pts.) |
| 5.1 – 7 mm. | = | 4 pts. |
| > 7 mm. | = | 7 pts. |

### OCCLUSION

| | | |
|---|---|---|
| Class I to end on | = | 0 pts. |
| End on Class II or III | = | (2 pts. per side) |
| Full Class II or III | = | (4 pts. per side) |
| Beyond Class II or III | = | 1 pt. per mm. Additional |

       Total      =      6

### LINGUAL POSTERIOR X-BITE

1 pt. per tooth      Total      =      _____

### BUCCAL POSTERIOR X-BITE

2 pts. per tooth      Total      =      _____

### CEPHALOMETRICS

| | | |
|---|---|---|
| ANB > 5.5 or < -1.5 | = | 4 pts. |
| Each Additional Degree | = | 1 pt. |
| SN-GO-GN 27 deg. – 37 deg. | = | 0 pts. |
| SN-GO-GN > 37 deg. | = | 2 pts. per degree |
| SN-GO-GN < 27 deg. | = | 1 pt. per degree |
| IMPA     > 98 deg. | = | 1 pt. per degree |

       Total      =      _____

**OTHER**     2 Points      =      _____
(See instructions)

**INDICATE PROBLEM** Class II division I malocclusion

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**Fig 16.** Discrepancy index worksheet.