

CDABO CASE REPORT

Treatment of a Class III malocclusion with maxillary constriction and an anterior functional shift

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PATIENT HISTORY AND CAUSE

The patient was a 16-year 4-month-old white male (Figs 1-4). His chief concern was "I do not like the way my front teeth bite together, and my dentist said that an orthodontist may be able to correct it for me." The dental and medical histories were unremarkable. The cause of his malocclusion was a combination of genetic and environmental factors.

DIAGNOSIS

The patient had an Angle Class III malocclusion with an anterior and bilateral posterior crossbite. He appeared overclosed with a protrusive lower lip. Cephalometrically, the position of the maxilla and mandible, as well as the patient's vertical proportions, were considered within the normal range. Maxillary constriction was present, incisor inclinations were within the normal range, and the patient demonstrated a 5 mm functional anterior shift of the mandible from centric relation to maximum intercuspation. Dentally, he was seen to have a 90% underbite, 4.5 mm negative overjet, spacing in the maxillary and mandibular arches, and small maxillary lateral incisors. His upper dental midline was approximately 1 mm to the right. Radiographs revealed all four third molars developing normally.

TREATMENT OBJECTIVES AND INITIAL TREATMENT PLAN

The treatment plan and objectives were to expand the maxilla, eliminate the functional shift, close

mandibular spaces by retracting the canines and incisors, close maxillary spaces by protracting the posterior teeth but leaving appropriate space mesial and distal to the lateral incisors for cosmetic buildups, and attain a Class I canine and molar occlusion with ideal overbite and overjet.

TREATMENT PROGRESS

Treatment began with the placement of a fixed rapid maxillary expansion device (RME) banded to the first premolars and molars. The patient was told to turn the expander twice daily for the first 3 days and then one turn per day thereafter. After a period of 5 weeks, a total of 8 mm of expansion had been attained. With the RME appliance in place to passively retain the expansion, fixed edgewise appliances (0.022 inch slot) were placed to begin leveling and aligning the mandibular dentition. After 3 months, the RME appliance was removed, and fixed appliances were placed in the maxilla along with a transpalatal arch (TPA) soldered to the molar bands for continued retention of the expansion. Mandibular space closure was accomplished with a 0.018-inch stainless steel arch wire and elastomeric chain from molar to molar. Protraction of the maxillary posterior dentition was accomplished with stopped arch wire mechanics (0.018-inch stainless steel arch wire) and open coil springs. Springs were placed initially between the first and second premolars to protract the first premolars and then placed between the second premolars and molars. The case was finished with rectangular arch wires (0.018 × 0.022-inch stainless steel upper arch wire and 0.018 × 0.025-inch stainless steel lower arch wire), and Class III elastics were used for 6 months. After a total of 24 months of treatment the appliances were removed and maxillary and mandibular Hawley retainers were placed.

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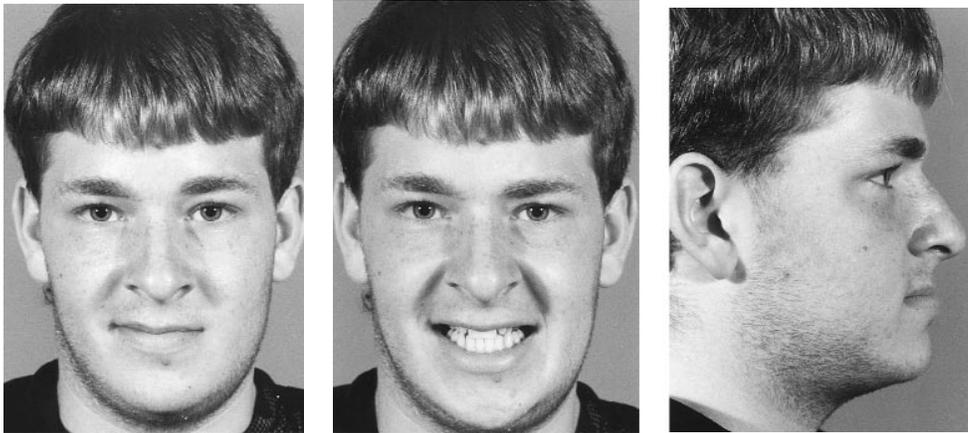


Fig 1. Pretreatment facial photographs.

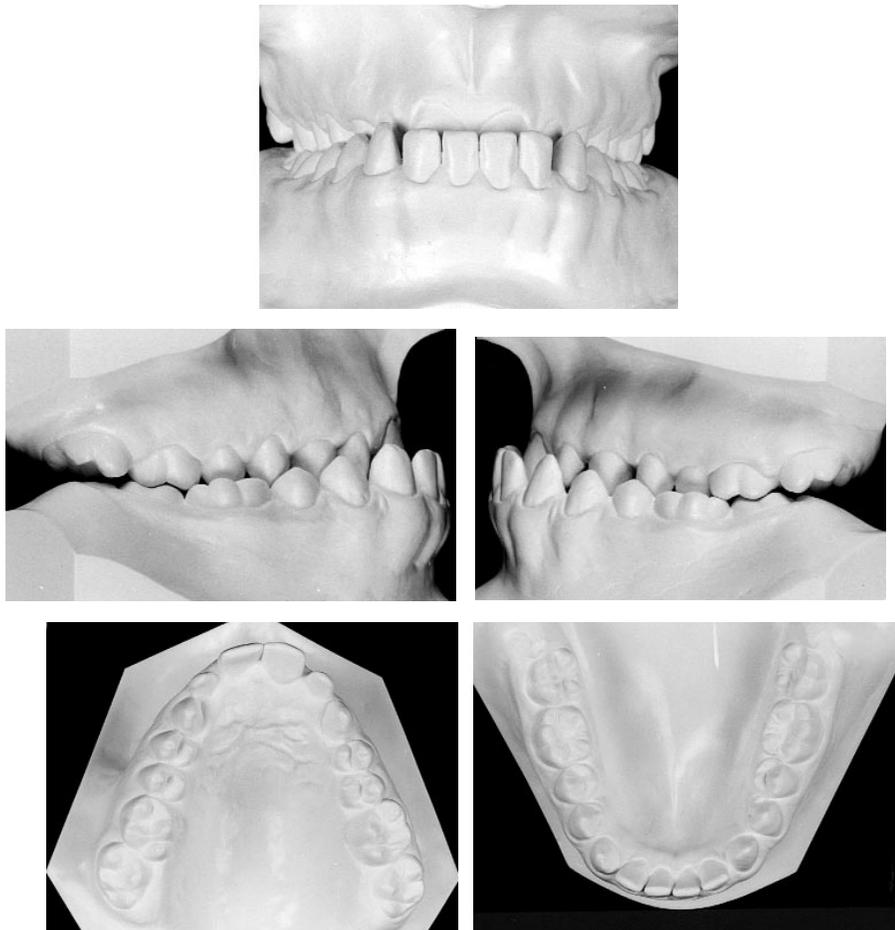


Fig 2. Pretreatment study casts.

RESULTS ACHIEVED

The patient's profile improved through a slight increase in lower facial height and reduced protrusion

of the lower lip and chin. The maxilla was successfully expanded and unchanged in anterior-posterior position. The mandible rotated down and back with treatment.

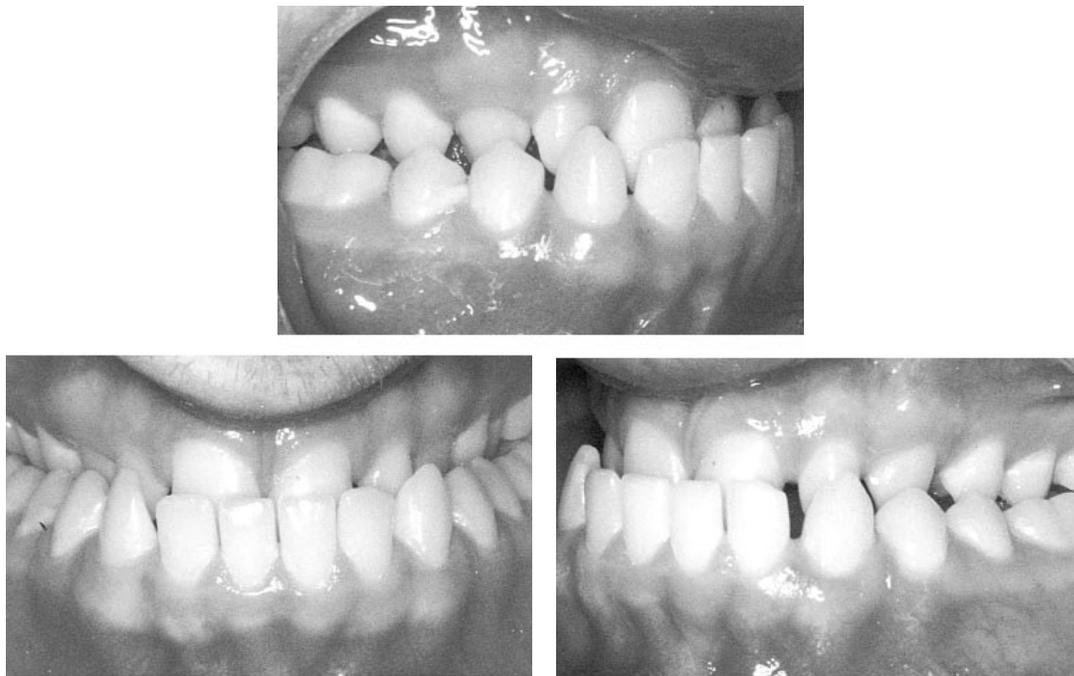


Fig 3. Pretreatment intraoral photographs.

Table I. Summary of cephalometric analysis

Measurement	Standard	Initial	Deband
SNA	82	83	84
FH-NA	90	95	93
SNB	80	85	84
FH-NPog	88	97	95
ANB	2	-2	0
SN-MP	32	23	22
FMA	25	12	12
LFH/TFH	55%	53%	55%
1:SN	104	105	112
1:NA	4 mm	4 mm	5 mm
1:FH	65	75	85
1:NB	4 mm	5 mm	2.5 mm
1:1	131	139	144
ILG	0 mm	0 mm	0 mm
Mx lip:1 at rest	2 mm	1 mm	1 mm

The maxillary molars were extruded and protracted bodily. Mandibular molars remained stable as the incisors were tipped lingually (Figs 5-9).

The patient completed his treatment with well-interdigitated Class I molars and canines with 40% overbite, 2 mm overjet, and coincident midlines. The anterior functional shift was eliminated making centric relation coincident with maximum intercuspation. Canine guidance was present with lateral excursive movements. Radiographically, good root parallelism existed with minimal resorption. The third molars were developing normally.

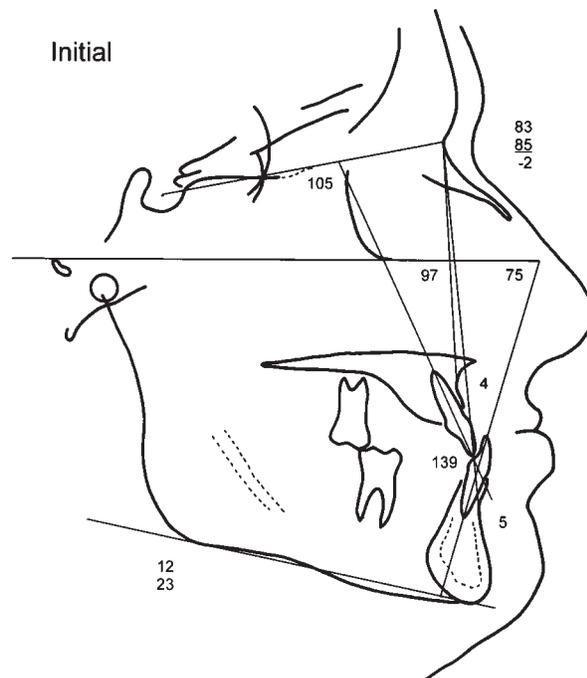


Fig 4. Pretreatment cephalometric tracing.

RETENTION

Immediately after removal of the fixed appliances the patient was placed in maxillary and mandibular temporary retainers and instructed to wear them 24

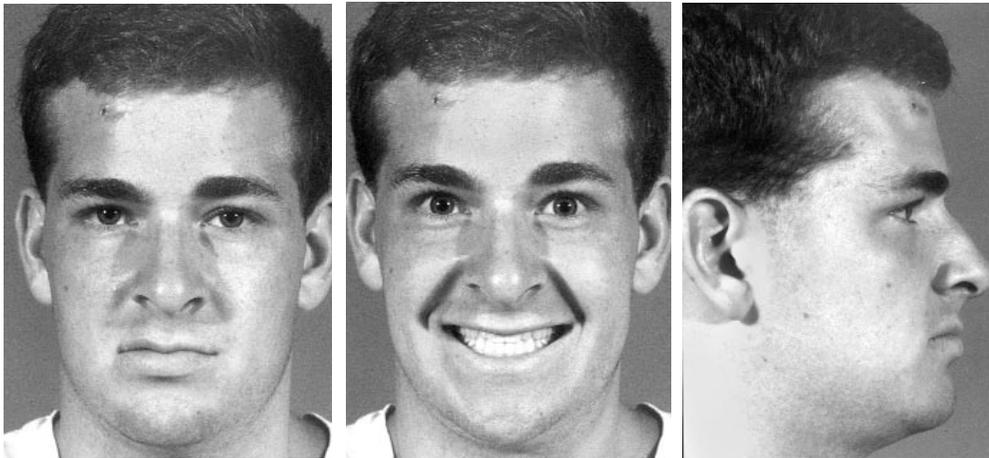


Fig 5. Posttreatment facial photographs.

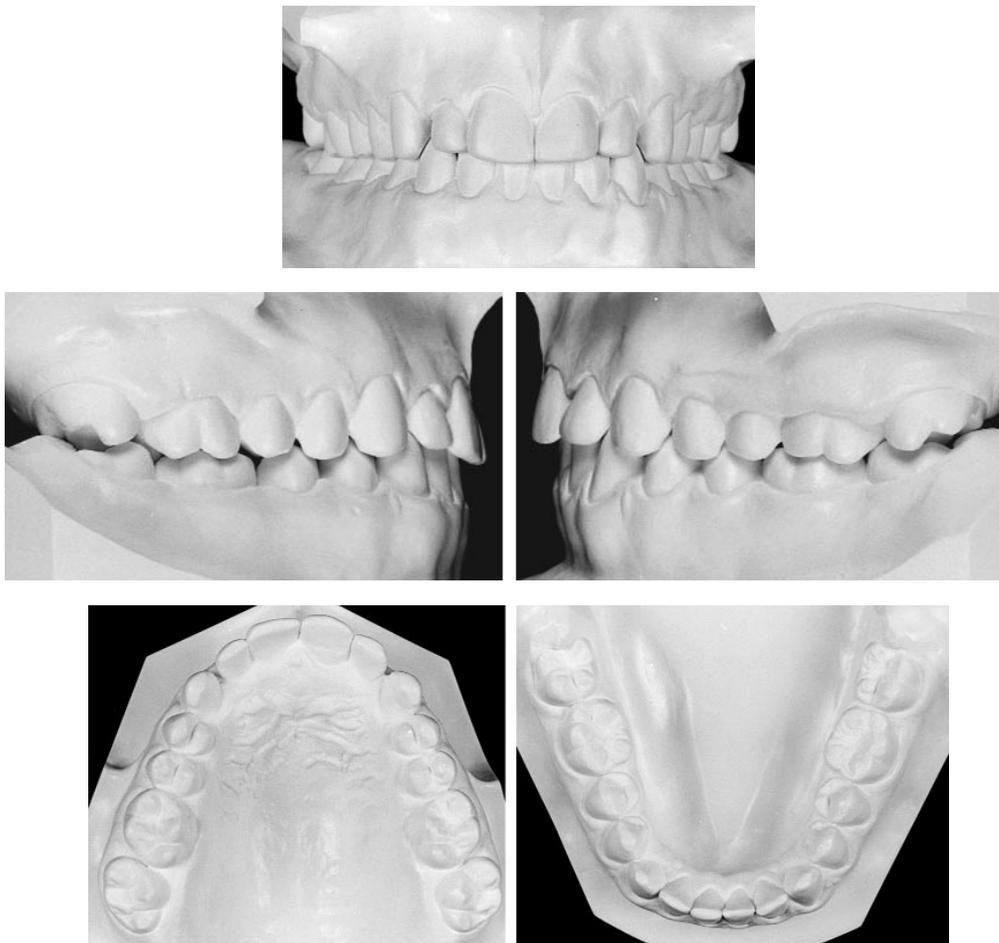


Fig 6. Posttreatment study casts.

hours per day except when eating. One week later the patient was given maxillary and mandibular Hawley retainers with the same instructions for wear. Composite resin build-ups were completed for the maxillary lateral incisors 3 months after debanding.

FINAL EVALUATION

All treatment objectives were successfully achieved. The expansion of the maxilla and retraction of the anterior mandibular teeth allowed for the correction of the



Fig 7. Posttreatment intraoral photographs.

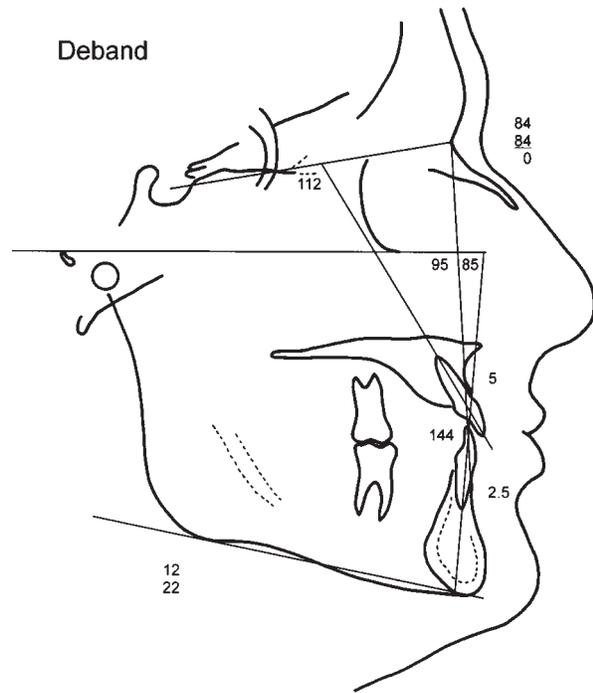


Fig 8. Posttreatment cephalometric tracing.

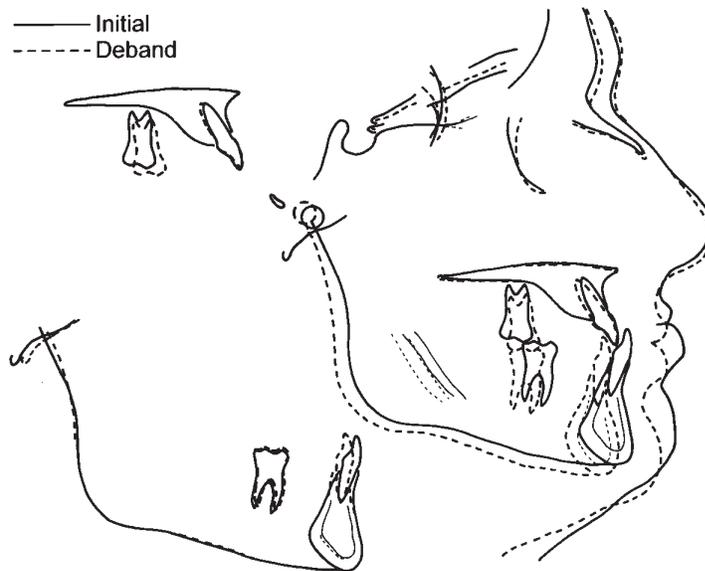


Fig 9. Pretreatment and posttreatment superimposed cephalometric tracings.

functional shift resulting in a Class I occlusion and improved facial esthetics. Temporomandibular joint function was normal. Spaces distal to the maxillary lateral incisors were left for complete build-ups. Stability prognosis is favorable because of the patient's age and

initial malocclusion. Third molar evaluation will continue throughout development.

We thank Dr Laurel Leslie, a former resident, for her care of this patient.