

CDABO CASE REPORT

Asymmetric extraction treatment of a Class II Division 1 subdivision left malocclusion with anterior and posterior crossbites

Mark Todd, DMD,^a Michael Hosier, DDS, MS,^b Tim Sheehan, DDS, MS,^b and David Kinser, DDS, MS^c

Iowa City, Iowa

This case was chosen by the CDABO student case selection committee for publication in the AJODO. (Am J Orthod Dentofacial Orthop 1999;115:410-7)

PATIENT HISTORY AND CAUSE

The patient was a 17-year 3-month-old white female (Figs 1 to 4). Her chief concern was "I want my teeth straightened and my tooth sticks out." Her medical history revealed no contraindications to orthodontic therapy. The cause of her malocclusion was a combination of genetic and environmental factors.

DIAGNOSIS

The patient demonstrated an Angle Class II Division 1, subdivision left malocclusion with anterior and posterior crossbites. She had a straight profile and normal vertical facial proportions. The maxillary incisor display at rest was 5.5 mm, the upper dental midline was 1 mm left of the face, and the lower dental midline was 5 mm left. Lateral cephalometric evaluation (Table I) showed a normal maxillary and mandibular anterior-posterior skeletal position, a flat mandibular plane, and mandibular dental retrusion. Radiographically, caries were noted on multiple teeth, and third molars were developing normally in their crypts. Models demonstrated a Class I molar and canine on the right and a Class II molar and canine on the left. The maxillary right canine was blocked out of the arch labially. The maxillary tooth size arch length discrepancy was -11 mm and the mandibular tooth size arch length discrepancy

was -7.9 mm. Overbite was 40%, overjet was 3 mm, and a 1 mm Bolton mandibular excess was noted. Centric relation and centric occlusion were coincident. Mild generalized marginal gingivitis was present.

TREATMENT OBJECTIVES AND INITIAL TREATMENT PLAN

The treatment objectives consisted of maintaining the maxillary, mandibular, and facial soft tissue relationships, correcting the midline discrepancy, attaining canine symmetry, bringing the blocked out maxillary right canine into the arch, correcting the anterior and posterior crossbites, finishing with Class I canines, a Class I molar relationship on the right, and a Class II molar relationship on the left, and achieving ideal overbite and overjet. The initial treatment plan included oral hygiene instructions, caries control, and extraction of the maxillary first premolars and mandibular right first premolar. Fixed edgewise appliances would be placed, and arch wires would be used to expand the maxillary dentition and correct the crossbites. Leveling and aligning of both arches would proceed. The mandibular right canine would be retracted until canine symmetry was obtained. The remaining space would be closed reciprocally. Light elastics and artistics will be used to attain final interdigitation. The final occlusion will be retained with maxillary and mandibular Hawley appliances.

TREATMENT PROGRESS

After caries control and oral hygiene instructions, the maxillary first premolars and the mandibular right first premolar were extracted. Edgewise appliances (0.022 × 0.028) were placed, and 0.016 sentaloy archwires were inserted. After 4 months with these arch-

^aOrthodontic resident at The University of Iowa, Iowa City.

^bIn private practice; formerly Orthodontic Resident at The University of Iowa, Iowa City.

^cIn private practice and Adjunct Associate Professor at The University of Iowa, Iowa City.

Reprint requests to: Thomas Southard, DDS, MS, Graduate Program Director, Department of Orthodontics, College of Dentistry, The University of Iowa, Iowa City, IA 52242

Copyright © 1999 by the American Association of Orthodontists.

0889-5406/99/\$8.00 + 0 8/5/87997

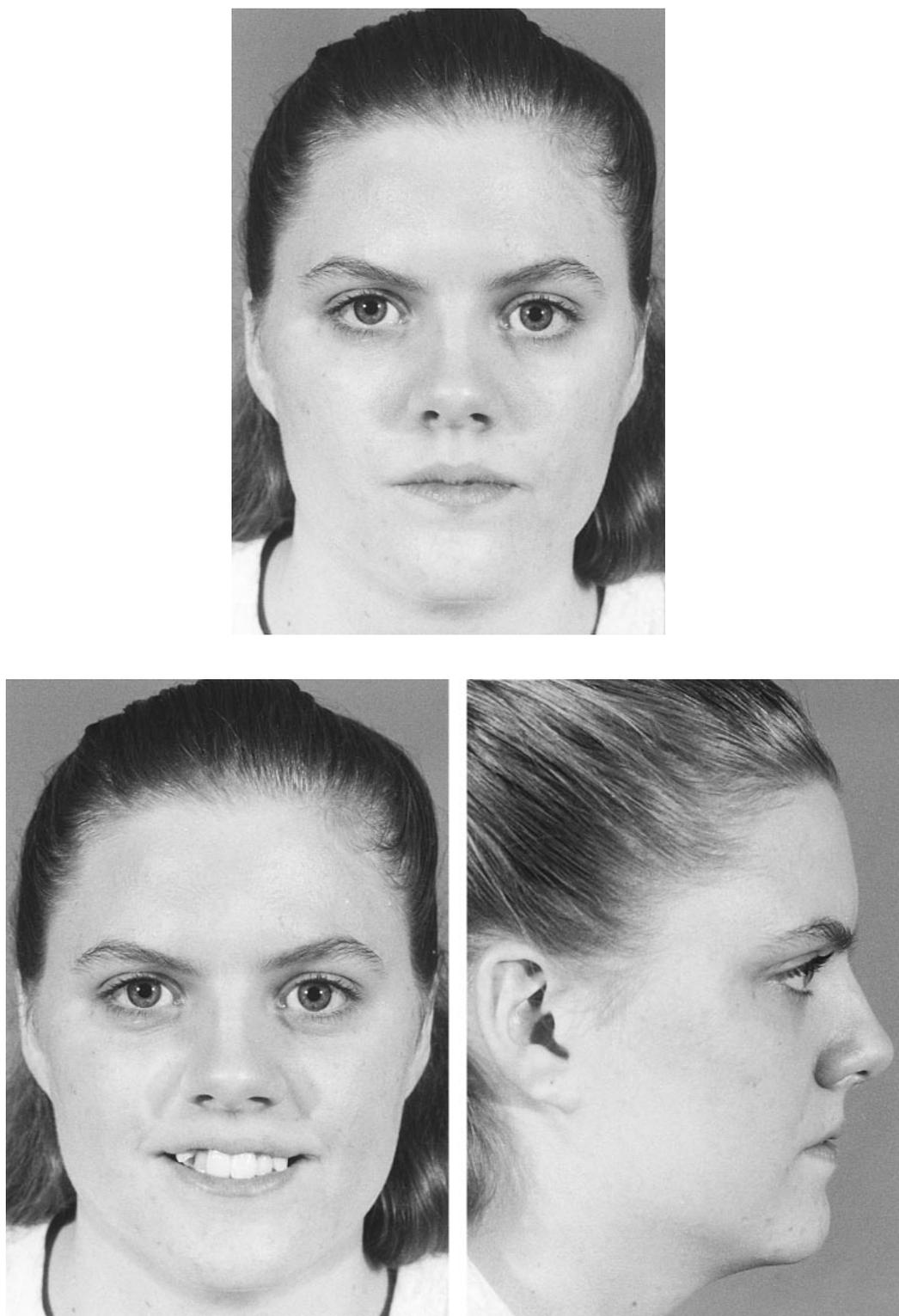


Fig 1. Pretreatment facial photographs.

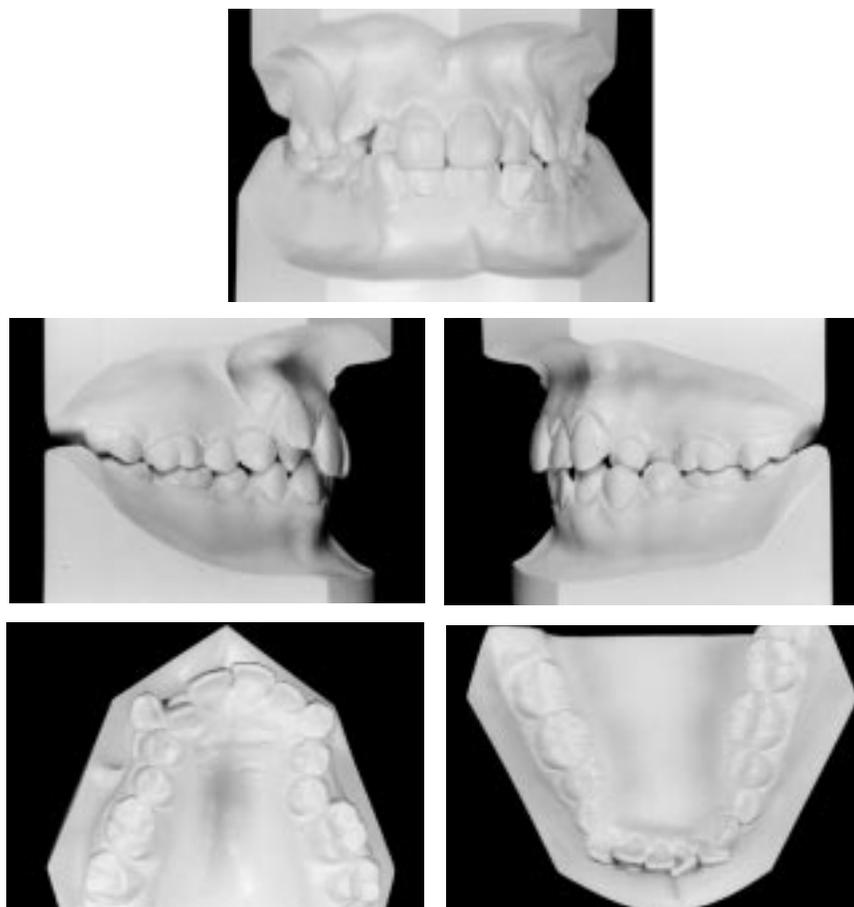


Fig 2. Pretreatment study casts.

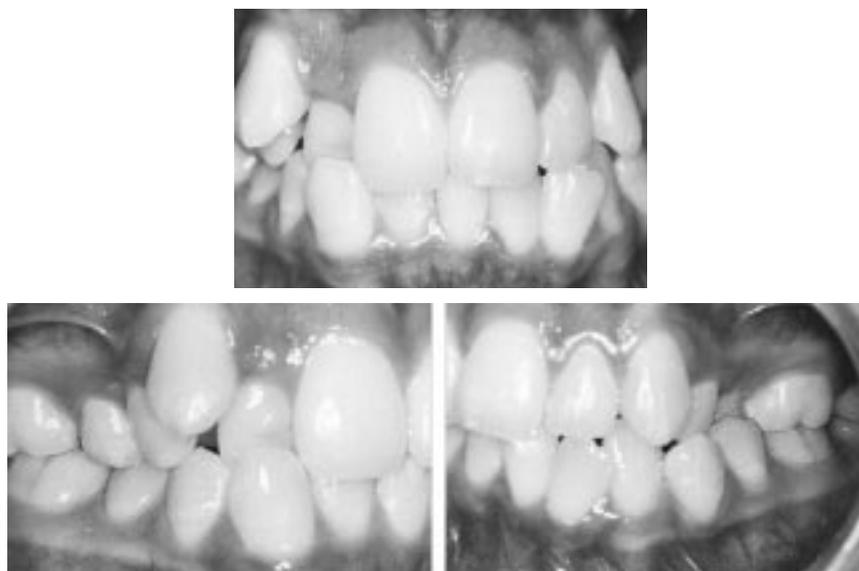


Fig 3. Pretreatment intraoral photographs.

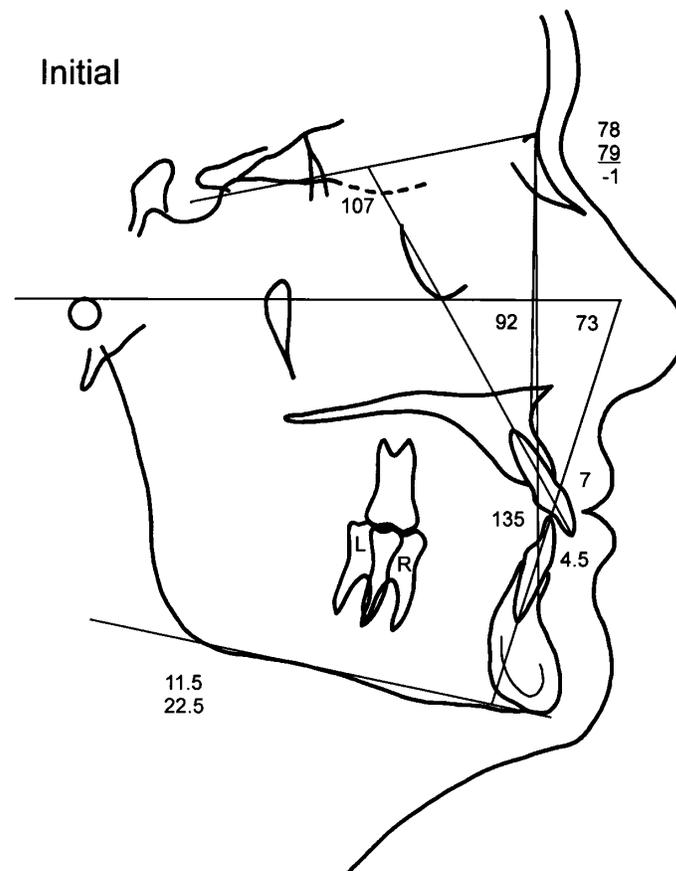


Fig 4. Pretreatment cephalometric tracing.

Table I Summary of cephalometric analysis

Measurements	Standard	Initial	Deband
SNA	82	78	79
FH-NA	90	90	90
SNB	80	79	78.5
FH-NPog	88	92	91
ANB	2	-1	0.5
SN-MP	32	22.5	24
FMA	25	11.5	13
LFH/TFH	55%	56.8%	57.8%
I:SN	104	107	104
I:NA	4 mm	7 mm	5 mm
FMIA	65	73	66
1:NB	4 mm	4.5 mm	5.5 mm
I:1	131	135	131
ILG	0 mm	0 mm	0 mm
1:Mx lip at rest	2 mm	5.5 mm	5 mm

wires for initial leveling and aligning, a 0.018 inch stainless steel maxillary archwire with expansion on the left side was placed along with a 0.016 inch stainless steel mandibular archwire with reverse curve of

Spee. For 3 months, maxillary and mandibular archwires were progressively increased to 0.020 inch stainless steel. The mandibular right canine was retracted reciprocally with elastic chain on 0.020 inch stainless steel archwire to obtain symmetric mandibular canines. Class II elastics were used for 2 months to retract maxillary canines to obtain Class I canines. Stainless steel rectangular archwires (0.018 × 0.025) were placed while artistic bends and triangle elastics at the canines were used to obtain proper interdigitation. Total treatment time with active appliances was 17 months. The appliances were removed, and maxillary and mandibular Hawley retainers were placed.

RESULTS ACHIEVED

The patient's facial soft tissue esthetics displayed little change (Fig 5). Cephalometric superimpositions showed a slight decrease in chin projection as the result of mandibular molar extrusion and a slight downward and backward rotation of the mandible (Figs 8 and 9, Table I). The maxillary position was maintained. The maxillary incisors were retracted and extruded slightly,

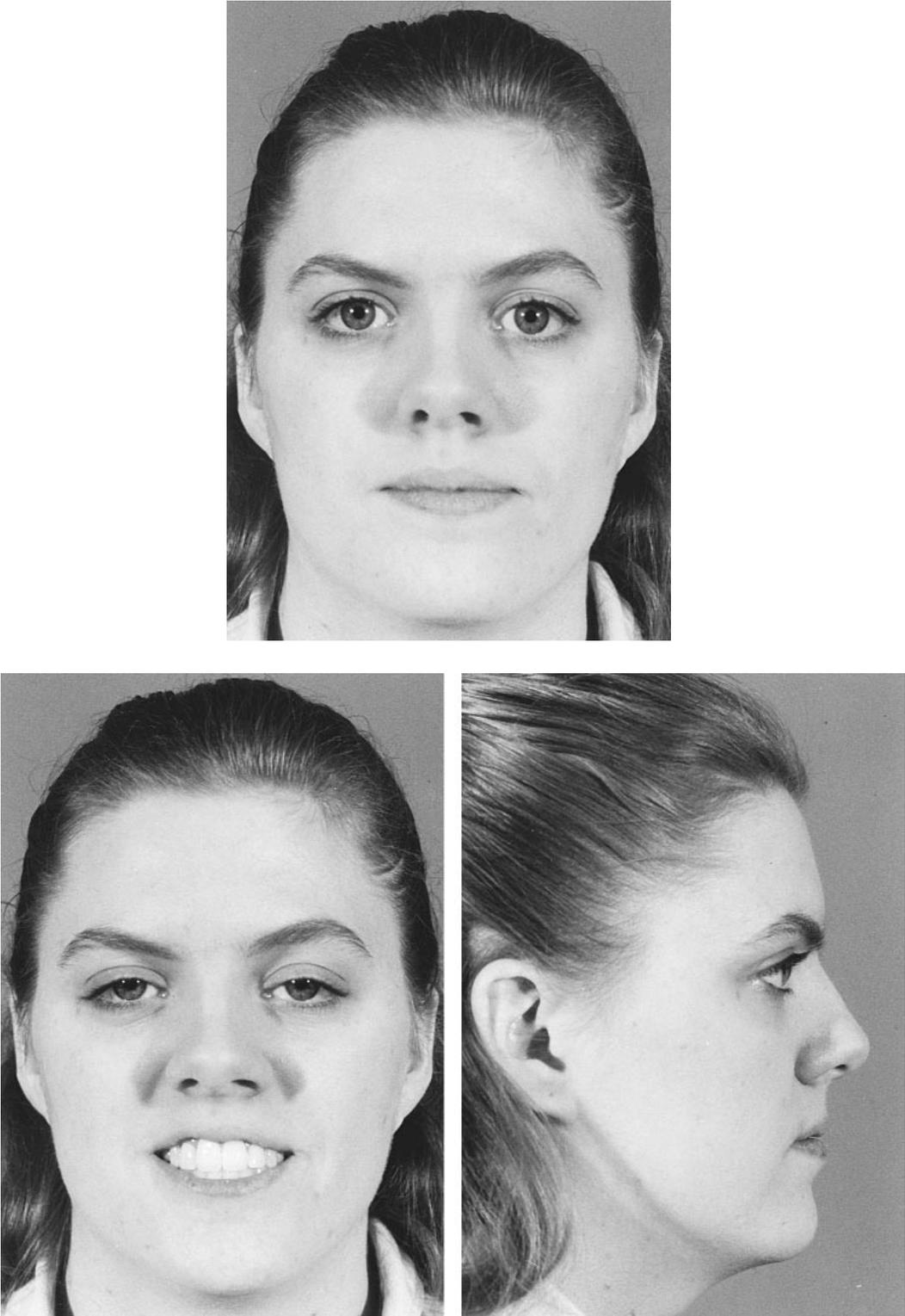


Fig 5. Posttreatment facial photographs.

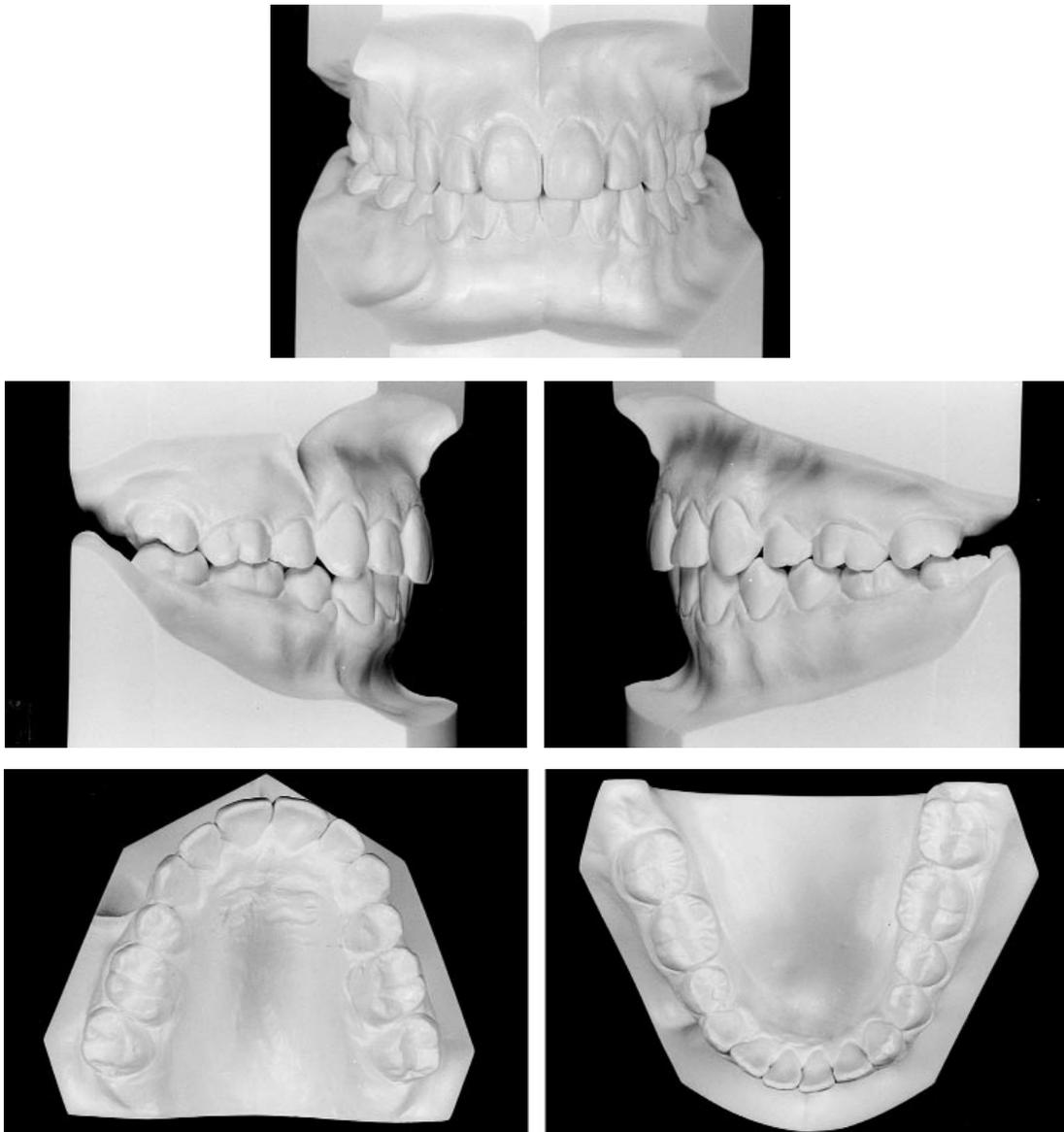


Fig 6. Posttreatment study casts.

and the molars were extruded and translated anteriorly. The mandibular incisors were tipped labially, and the molars were protracted and extruded. The mandibular right canine was retracted.

The patient completed her treatment with well-interdigitated Class I canines and right molar and a Class II left molar (Figs 6 and 7). Overbite of 20% was obtained with minimal overjet. Dental midlines were coincident and centered to the face. There was bilateral canine guidance during lateral excursions. Tempo-

mandibular joint function was asymptomatic, and the centric relation was coincident with centric occlusion. Radiographically, good root parallelism was achieved, and no root resorption was noted.

RETENTION

Immediately after fixed appliance removal, the patient was placed in maxillary and mandibular temporary retainers. After 1 month, the patient was given maxillary and mandibular Hawley retainers. Due to

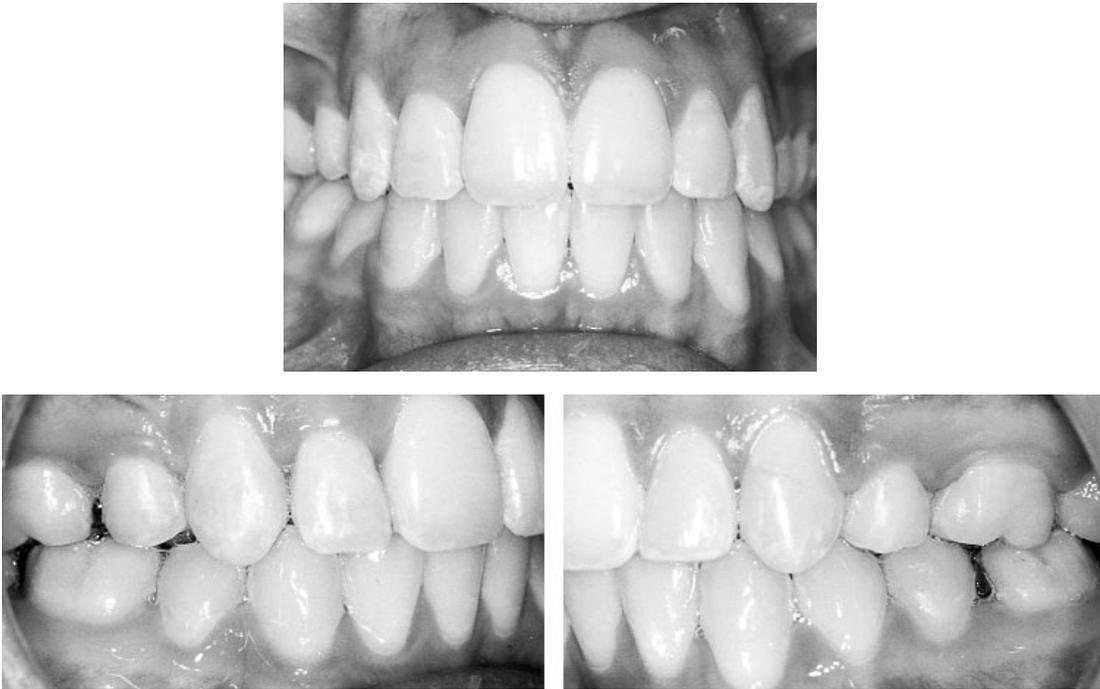


Fig 7. Posttreatment intraoral photographs.

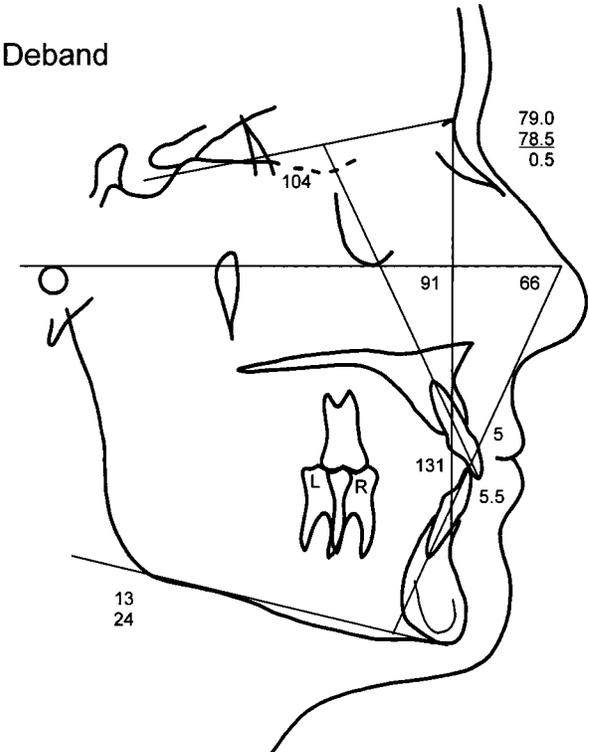


Fig 8. Posttreatment cephalometric tracing.

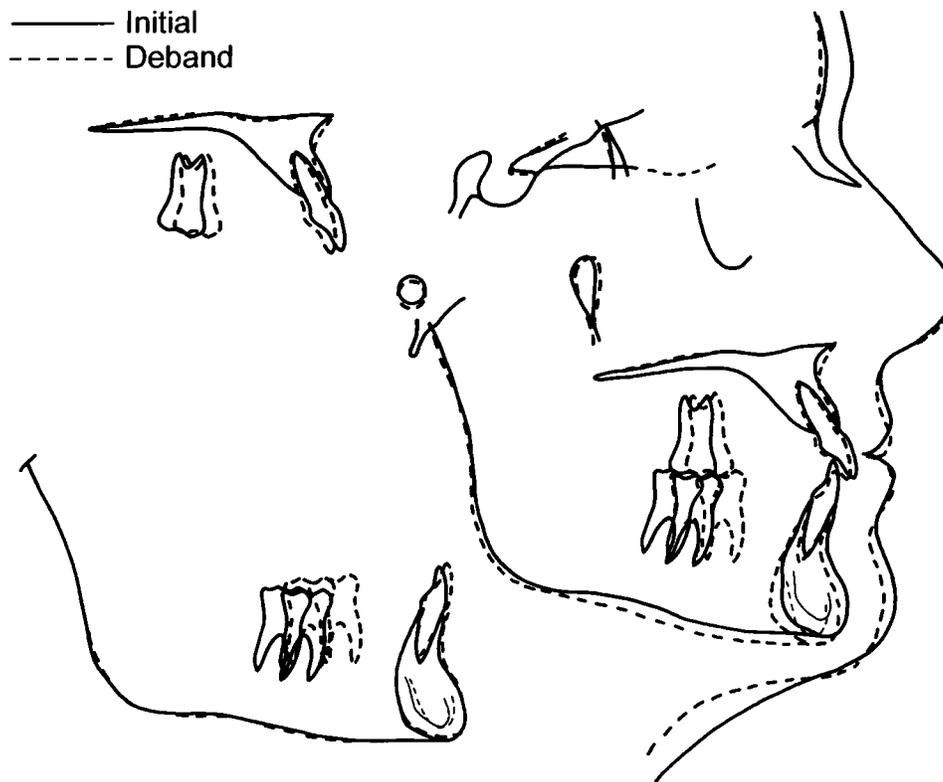


Fig 9. Pretreatment and posttreatment superimposed cephalometric tracings.

noncompliance with the retainers initially, a slight rotation of the mandibular left central incisor was noted before final models were obtained. Third molars were extracted during the retention phase of treatment. Occlusion has remained stable since the time of debanding.

FINAL EVALUATION

All treatment objectives were achieved. Coincident dental midlines that were centered to the face were obtained by gaining mandibular canine symmetry as a result of retraction of the mandibular right canine. Stability prognosis is favorable because of minimal future growth of the patient and good cooperation with retainer wear.

DISCUSSION

This case demonstrates the importance of identifying the specific area of arch asymmetry when initial canine or molar classifications differ as they do in subdivision classifications. Because the dental asymmetry for this patient was in the mandibular arch, it was appropriate to unilaterally extract in the mandibular arch to achieve canine symmetry. If the mandibular arch had been treated with nonextraction or with bilateral extractions, it is unlikely that the mandibular arch asymmetry would have been corrected thereby resulting in a failure to center the dental midlines facially. If the dental asymmetry causing the subdivision relationship had been in the maxillary arch, it would have been appropriate to unilaterally or asymmetrically extract in this arch.