CDABO CASE REPORT

Asymmetric extraction treatment of an Angle Class II Division 2 subdivision left malocclusion with anterior and posterior crossbites

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PATIENT INFORMATION

The patient presented as an 8-year 8-month old white male (Figs 1 to 4). His chief complaint was "I want my underbite corrected." His medical history revealed no contraindications to orthodontic therapy. The cause of the dentofacial deformity appeared to be early loss of the maxillary second primary molars and a combination of genetic and environmental factors.

DIAGNOSIS

The patient demonstrated an Angle Class II Division 2 subdivision left malocclusion with anterior and posterior crossbites. He had normal vertical facial proportions, a straight profile, and a protrusive lower lip due to a pseudoprognathic mandible. The maxillary incisor display at rest was 4 mm, the upper dental midline was 3 mm to the left of the facial midline, and the lower dental midline was 1 mm left. Lateral cephalometric evaluation showed a normal maxillary anteroposterior skeletal position, a normal mandibular plane angle, and slightly upright maxillary and mandibular incisors. Other radiographic findings were unremarkable. Models demonstrated an end-on molar relationship on the right and a Class II molar relationship on the left. A dental asymmetry was present in the maxillary arch with the left first molar ahead. The maxillary tooth size arch length discrepancy was –13.7 mm whereas arch length in the mandible was adequate. Underbite was 90% and underjet was 1.5 mm. A functional shift of the mandible 2 mm anteriorly and 3 mm laterally was noted. Mild generalized gingivitis was present.

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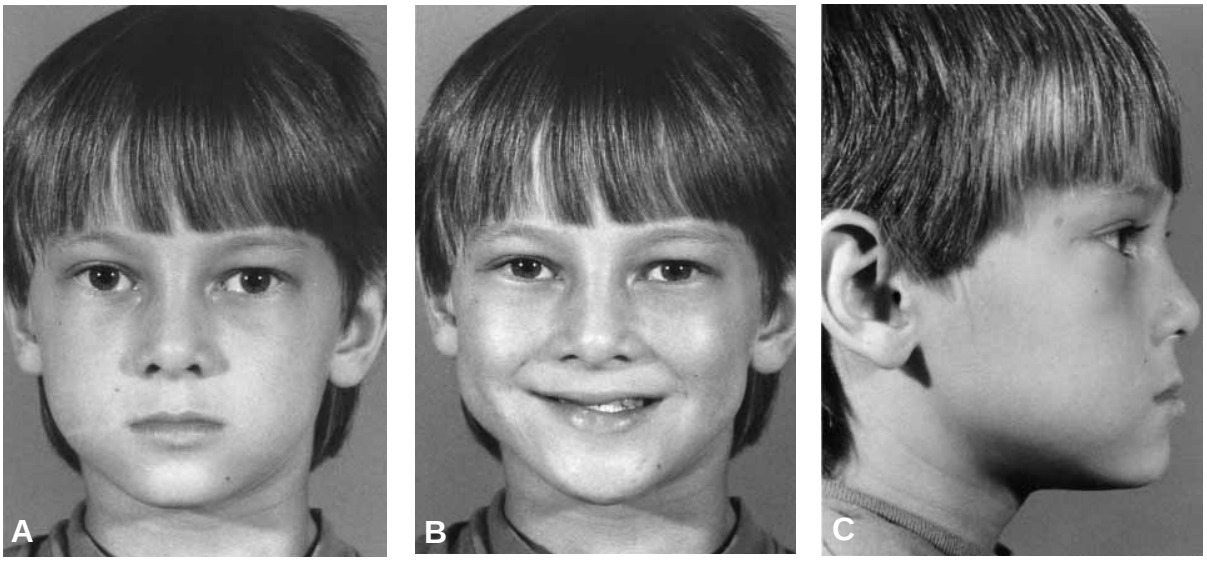

Fig 1. Pretreatment facial photographs. **A**, Repose; **B**, smile; **C**, lateral.

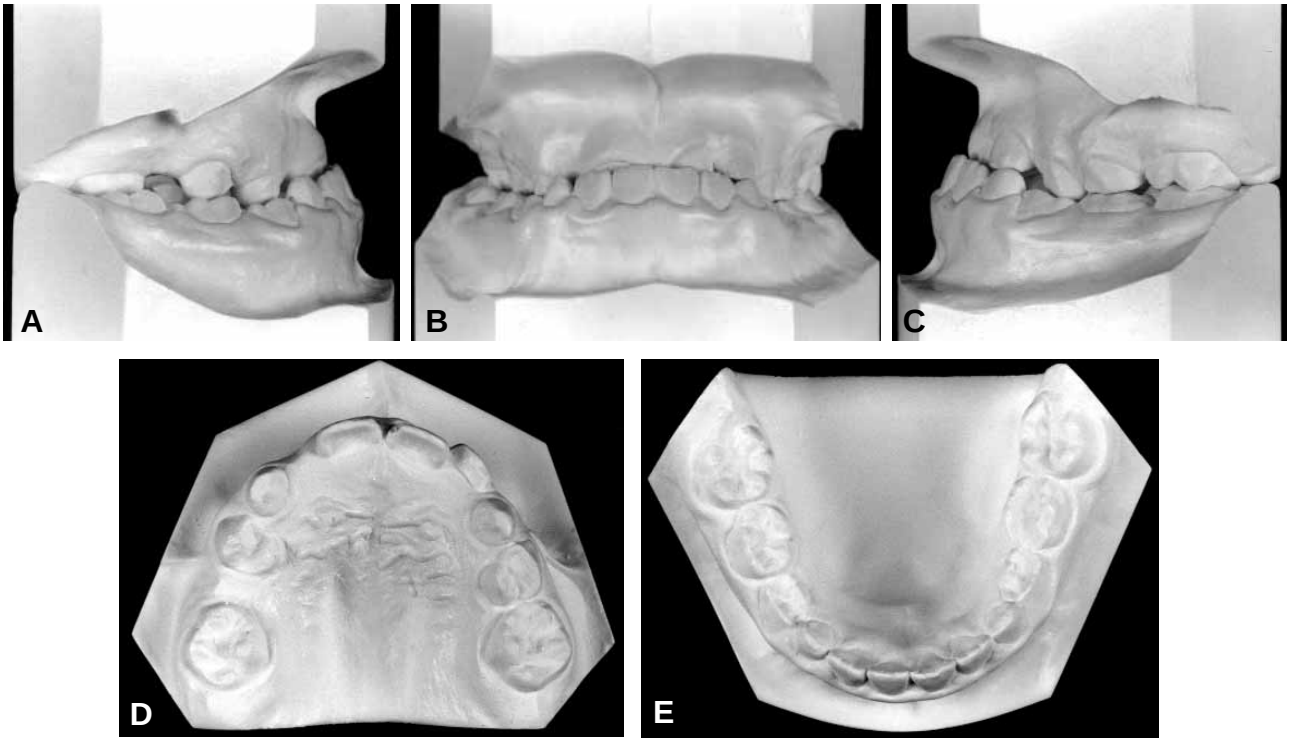

Fig 2. Pretreatment study casts. **A**, Right lateral; **B**, frontal; **C**, left lateral; **D**, maxillary; **E**, mandibular.

Fig 3. Pretreatment intraoral photographs. **A**, Right lateral; **B**, frontal; **C**, left lateral.

TREATMENT OBJECTIVES AND INITIAL TREATMENT PLAN

The treatment objectives consisted of obtaining an improved profile by eliminating the functional shift and resulting pseudoprognathic appearance of the lower lip, correcting the anterior and posterior crossbites, correcting the midline discrepancy, and finishing with a Class I occlusion with ideal overbite and overjet. The initial treatment plan consisted of the placement of a mandibular posterior biteplate, banding of the maxillary first molars, and bonding of the maxillary incisors. The appliances would be used to procline the maxillary incisors to correct the anterior crossbite and functional shift. The patient's growth would be monitored with the use of cephalometric radiographs, and a chincup would be used if necessary to modify undesirable forward mandibular growth. Tooth eruption would be monitored, and the treatment plan reevaluated on eruption of the permanent dentition. The patient's orthodontic treatment would be finished with the use of fixed edgewise appliances followed by the placement of Hawley retainers for retention.

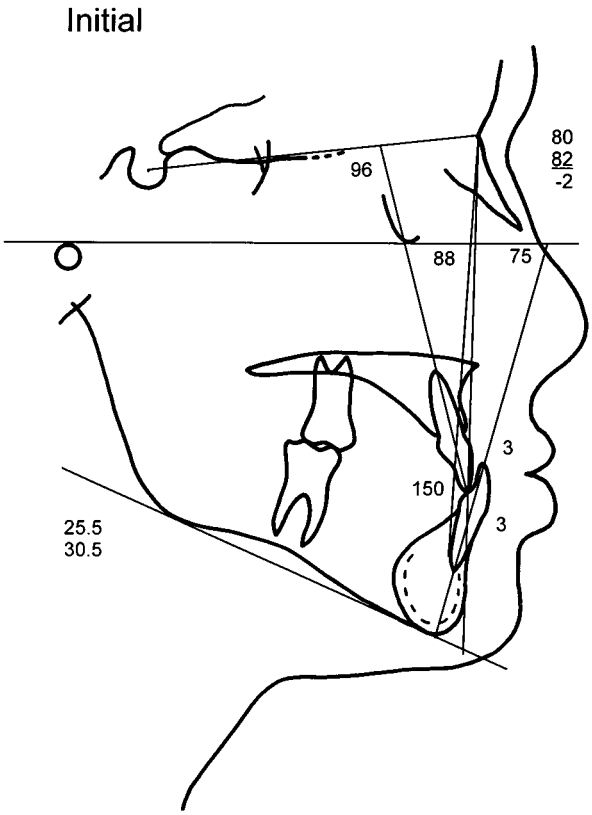

Fig 4. Pretreatment cephalometric tracing

TREATMENT PROGRESS

Treatment began with the placement of a mandibular posterior biteplate, banding of the maxillary first molars, and bonding of the maxillary incisors. A 0.018 inch stainless steel archwire with opening loops was used to procline the maxillary incisors. After 3 months of treatment, the crossbite was corrected, the biteplate was discontinued, and a stopped 0.018 inch stainless steel archwire was placed. One year after treatment began, progess records were made. The decision was made to place a lower lingual holding arch, deband the maxillary arch and place the patient in a Hawley retainer, and extract the maxillary left first premolar because of an insufficient arch length. The patient's growth and eruption of the permanent dentition was monitored for 1 year after which the patient was fitted with a chincup. Six months after placing the chincup, fixed edgewise appliances were again placed. Throughout this treatment time a 0.018 inch stainless steel archwire was primarily used until the final 4 months of finishing in which 0.019×0.025 inch maxillary and mandibular archwires were used. Vertical elastics were worn throughout the finishing stags. The chincup was continued throughout treatment until deband with fair cooperation. Oral hygiene was noted throughout treatment as being poor. On debanding, the patient was given a tooth positioner that was worn approximately 2½ months with fairly good compliance.

Table I. Summary of cephalometric analysis

Measurement	*Standard*	*Initial*	*Deband*
SNA	82	80	83
FH-NA	90	86	86.5
SNB	80	82	82
FH-Npog	88	88	86
ANB	2	–2	1
SN-MP	32	30.5	29
FMA	25	25.5	25.5
LFH/TFH	55%	55%	57%
1:SN	104	96	111
1:NA	4 mm	3 mm	7 mm
FMIA	65	75	57
1:NB	4 mm	3 mm	6 mm
1:1	131	150	124
ILG	0 mm	0 mm	0 mm
Mx lip: 1 at rest	2 mm	4 mm	2.5 mm

RESULTS ACHIEVED

The prognathic-appearing lower lip was corrected resulting in a slightly convex profile (Fig 5). The maxilla grew downward and forward, and the mandible grew downward. The maxillary incisors were tipped labially, and the molars were extruded and translated slightly anteriorly. The mandibular incisors were extruded, and their roots were torqued lingually. The mandibular molars were extruded and protracted slightly (Figs 6 and 7, Table I).

The patient completed his treatment with well-interdigitated Class I canines and right molar and a Class II left molar (Figs 8 and 9). Overbite of 20% was obtained with minimal overjet. The upper dental midline was 1 mm left of the lower dental midline and slightly to the left of the face. There was bilateral canine guidance during lateral excursions. Temporomandibular joint function was asymptomatic, and the centric relation was coincident with centric occlusion. Radiographically, good root parallelism was achieved, with slight root resorption of the mandibular incisors. Unfortunately, poor oral hygiene during treatment caused significant decalcification.

RETENTION

Immediately after discontinuing treatment with the tooth positioner, the patient was placed in maxillary

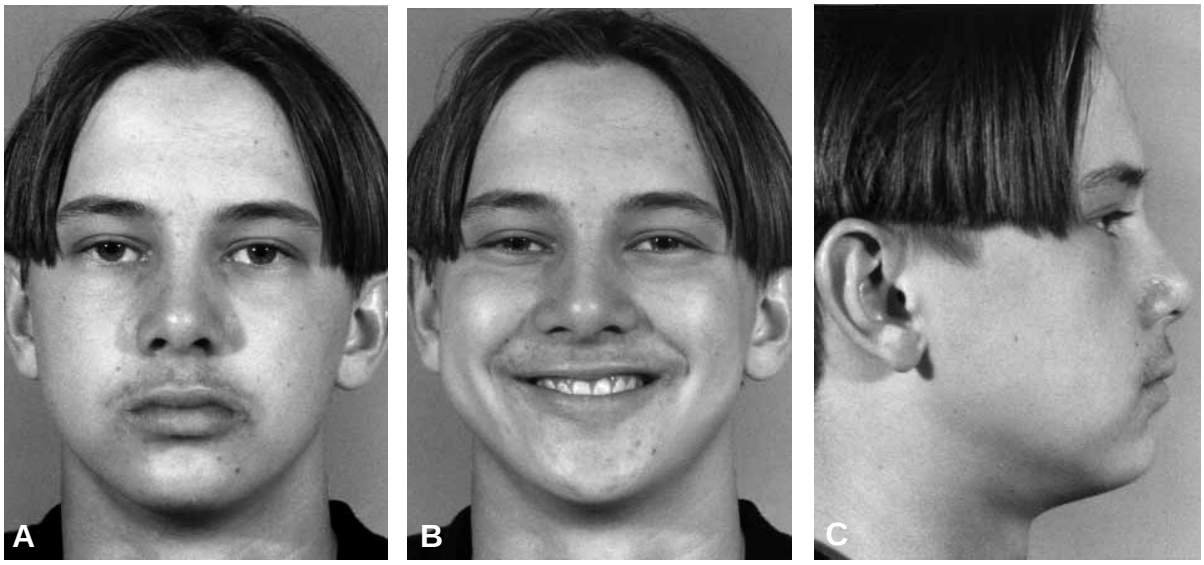

Fig 5. Posttreatment facial photographs. **A**, Repose; **B**, smile; **C**, lateral.

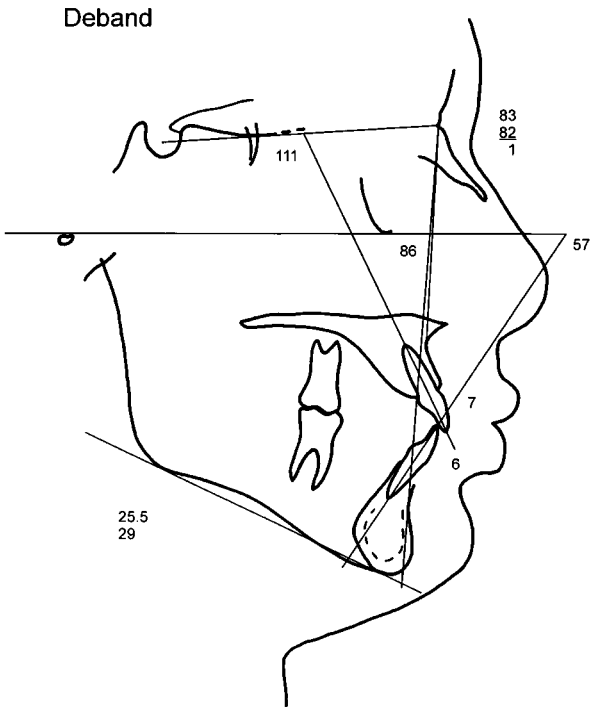

Fig 6. Posttreatment cephalometric tracing.

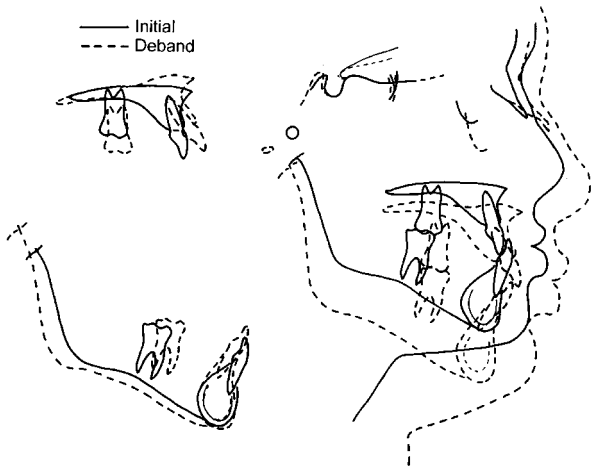

Fig 7. Pretreatment and posttreatment superimposed cephalometric tracings.

and mandibular Hawley retainers. He was instructed to wear the retainers full time for a period of 6 months followed by indefinite nighttime wear. Compliance has been good, and the occlusion has remained stable since the time of debanding.

FINAL EVALUATION

Successful skeletal, dental, and profile outcomes were achieved. Skeletally, the patient demonstrated a desirable growth pattern without excessive forward mandibular growth. Forward growth of the maxilla aided in achieving an improved skeletal relationship. Dentally, Class I canines were attained along with ideal overbite and overjet. An improved profile was obtained.

This case demonstrates the treatment difficulties that can be encountered as a result of the premature

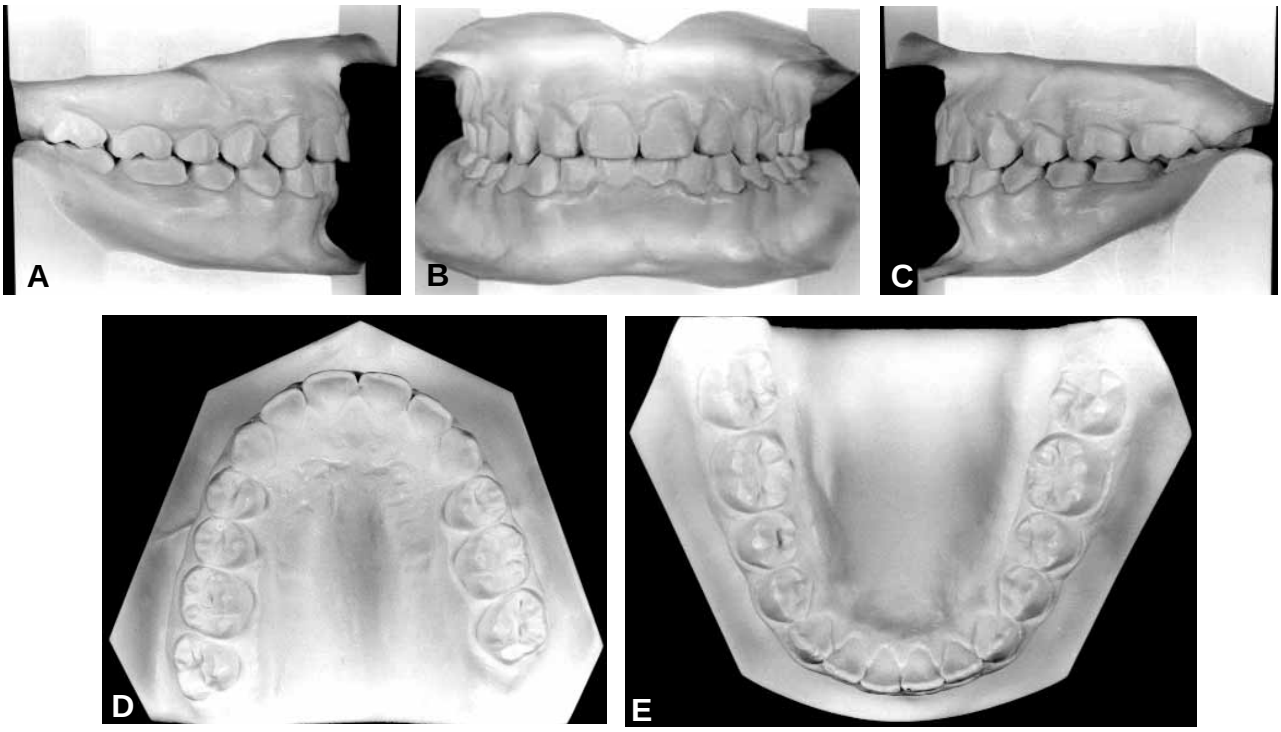

Fig 8. Posttreatment study casts. **A**, Right lateral; **B**, frontal; **C**, left lateral; **D**, maxillary; **E**; mandibular.

Fig 9. Posttreatment intraoral photographs. **A**, Right lateral; **B**, frontal; **C**, left lateral.

loss of primary molars. In this case, the maxillary left first molar drifted further mesial than the right first molar, causing a maxillary arch symmetry. If appropriate space-maintaining measures would have been taken after the loss of the maxillary primary second molars, the case may have been treated without extraction.