

CASE REPORT

Early Management of an Edge-to-Edge Incisor Occlusion

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An edge-to-edge incisor relationship can be a clinical manifestation of other anomalies, including a Class III malocclusion caused by forward sagittal displacement of the mandible, or a Class I pseudo-infraclusion induced by sagittal proclination of the incisors.¹⁻³ This multifactorial anomaly is more common in the mixed dentition, with a prevalence of 17-18%, and is primarily found in children between the ages of 7 and 9, when it is associated with incomplete eruption of the incisors.⁵



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Lack of anterior guidance is one of the principal causes of occlusal instability and TMD.^{6,7} Moreover, the absence of overjet and overbite can allow uninhibited mandibular growth, resulting in a true skeletal Class III relationship.² Early interception is therefore crucial to achieving satisfactory esthetic and functional results.^{4,8-10}

The following case demonstrates interceptive treatment of an edge-to-edge bite in the mixed dentition.

Diagnosis and Treatment Planning

An 8-year-old male presented with the chief complaint of an edge-to-edge incisor occlusion (Fig. 1). Clinical examination found an oval and symmetrical face with normal length, a marked labiomental furrow, and an 85° nasolabial angle. The lips closed without contraction of the perioral muscles, and a timid and unesthetic smile revealed only a portion of the upper incisors. The patient had 1mm Class III molar and canine relationships, a thin periodontium, an anterior edge-to-edge occlusion, and coincident midlines.

The panoramic radiograph confirmed that the patient was in the mixed dentition with good dental and periodontal health. Cephalometric analysis indicated a skeletal Class III relationship and alveolar incisor protrusion (Table 1). Total space analysis showed mild anterior crowding with a shallow curve of Spee (1mm), while a cephalometric correction value of 8 evidenced proclination of the lower incisors (Table 2). The craniofacial and total space analysis resulted in a mean total difficulty of 39 (Table 3).¹¹

Treatment goals were to restore a normal overjet and overbite and thus reorient the growth of basal bones, guide dental eruption in the buccal regions to rebuild the occlusion from front to back, restore a stable and functional Class I occlusion, correct the lower-incisor proclination, and maintain harmonious interarch relationships in the transverse dimension.

Treatment Progress

After the patient received oral-hygiene in-

struction, the lower deciduous canines were extracted. This space allowed the lower incisors to move distally and establish a normal overjet and overbite (Fig. 2A). Regular appointments were scheduled to monitor the development of the permanent teeth.

After dental alignment and arch coordination were achieved (Fig. 2B), the finishing stage involved refinement of the anterior and buccal occlusion, correction of the canine and molar relationships, and normalization of the overjet and overbite (Fig. 2C).

Treatment Results

Total treatment time was two years (Fig. 3). The patient's soft-tissue harmony was preserved (Z angle = 70°), and he exhibited a symmetrical face and a pleasant smile. He had Class I molar and canine relationships, a normal overjet and overbite, coincident midlines, and a maxillary arch circumscribing the mandibular arch.

Cephalometric analysis confirmed a satisfactory lower-incisor angulation, with the teeth well centered in the symphysis (Table 1). The interincisal angle therefore increased from 118° to 121°. Counterclockwise rotation of the mandible enabled correction of the open bite. The skeletal Class III was considerably improved, as evidenced by an increase in the Wits appraisal from -6mm to -3mm. The facial pattern, although slightly altered, remained normodivergent (GoGn/SN = 35°).

Seven years later, the treatment results and growth remodeling were stable (Fig. 4). The overjet and overbite helped maintain the normodivergent pattern, the corrected position of the lower incisors, and the Class I occlusal relationship, despite the mandibular growth pattern. The profile was balanced, ensuring a good labiomental relationship, but the upper lip was more supported than it was before treatment.

Discussion

An edge-to-edge incisor occlusion in a young child can be resolved by orthodontic camouflage treatment and by growth reorientation, based on

differential growth of the maxilla compared to the mandible. Early intervention can ameliorate or even eliminate many dental and skeletal abnormalities. For optimal results to be achieved, however, the patient should meet certain criteria, including a normodivergent or hypodivergent vertical pattern, a mild to moderate sagittal discrepancy, an absence of transverse deficiency, and a relatively normal esthetic appearance.¹²

The patient shown here benefited from a short treatment that avoided surgery and preserved the entire permanent dentition. Normal overjet and overbite were restored by relocation of the lower incisors. Counterclockwise mandibular rotation and the corrected overjet and overbite helped inhibit excessive mandibular growth, maintain a harmonious vertical pattern, and prevent relapse.

**TABLE 1
CEPHALOMETRIC ANALYSIS**

	Norm	Pretreatment	Post-Treatment	Seven Years after Treatment
SNA	82° ± 2°	78°	78°	80°
SNB	80° ± 2°	79°	81°	83°
ANB	2° ± 2°	1°	3°	3°
Wits appraisal	0mm ± 2mm	-6mm	-3mm	-6mm
U1-NA	22°	30°	34°	32°
U1-NA	4mm	8mm	8mm	7mm
L1-NB	25°	32°	26°	25°
L1-NB	4mm	7mm	4mm	5mm
U1-L1	131°	118°	121°	122°
GoGn/SN	32° ± 5°	36°	35°	33°
FMA	25° ± 3°	24°	27°	25°
FMIA	67° ± 3°	58°	63°	68°
IMPA	88° ± 3°	98°	90°	87°
Z angle	73°	72°	70°	74°
Upper lip		10mm	10mm	15mm
Total chin		10mm	10mm	15mm
Anterior facial height		51mm	45mm	68mm
Posterior facial height		35mm	31mm	47mm
Facial index	0.69	0.68	0.68	0.69

**TABLE 2
TOTAL SPACE ANALYSIS (MM)**

		Coefficient	Differential
Anterior zone			
Crowding	-1.00	1.50	1.50
Cephalometric correction	8.00	1.00	8.00
Soft tissues	0.00	0.05	0.00
Total			9.50
Middle zone			
Crowding	+2.00	1.00	2.00
Curve of Spee	1.00	1.00	1.00
Total			3.00
Posterior zone			
Class II	1.00	2.00	2.00
Crowding	1.00		0.50
Growth	6.00	0.50	3.00
Total			5.50
Total difference:			18.00

**TABLE 3
CRANIOFACIAL ANALYSIS**

	Average	Ceph	Gap	Coefficient	Differential
FMA	22°-28°	0.24	0.00	5.00	0.00
ANB	1°-5°	0.10	0.00	15.00	0.00
Z angle	70°-80°	0.72	0.00	2.00	0.00
Occipital plane	8°-12°	0.19	7.00	3.00	21.00
SNB	78°-82°	0.79	0.00	5.00	0.00
HFP/HFA	0.65-0.75	0.68	0.00	300.00	0.00
Craniofacial difference:					21.00

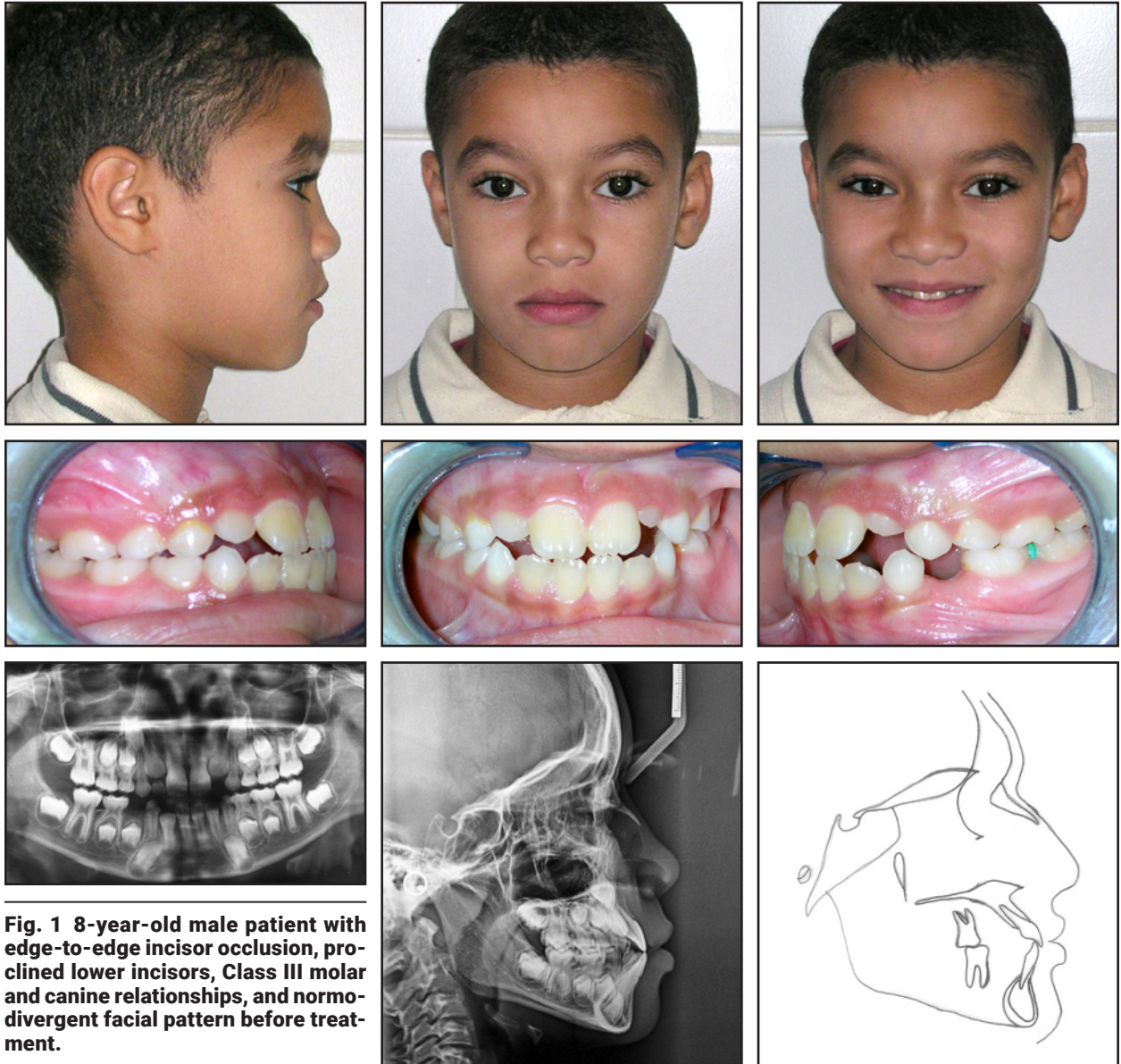
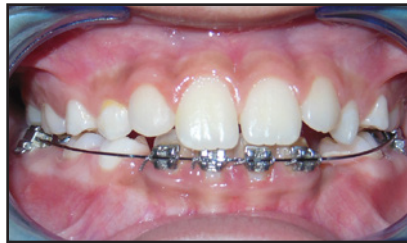


Fig. 1 8-year-old male patient with edge-to-edge incisor occlusion, proclined lower incisors, Class III molar and canine relationships, and normodivergent facial pattern before treatment.



Fig. 2 A. After extraction of lower deciduous canines, lower arch bonded with 2 × 4 appliance to move incisors into created spaces. **B.** Dental alignment and arch coordination after six months of treatment. **C.** After 12 months of finishing and intercuspation with preadjusted brackets and full-size, rigid stainless steel archwires.



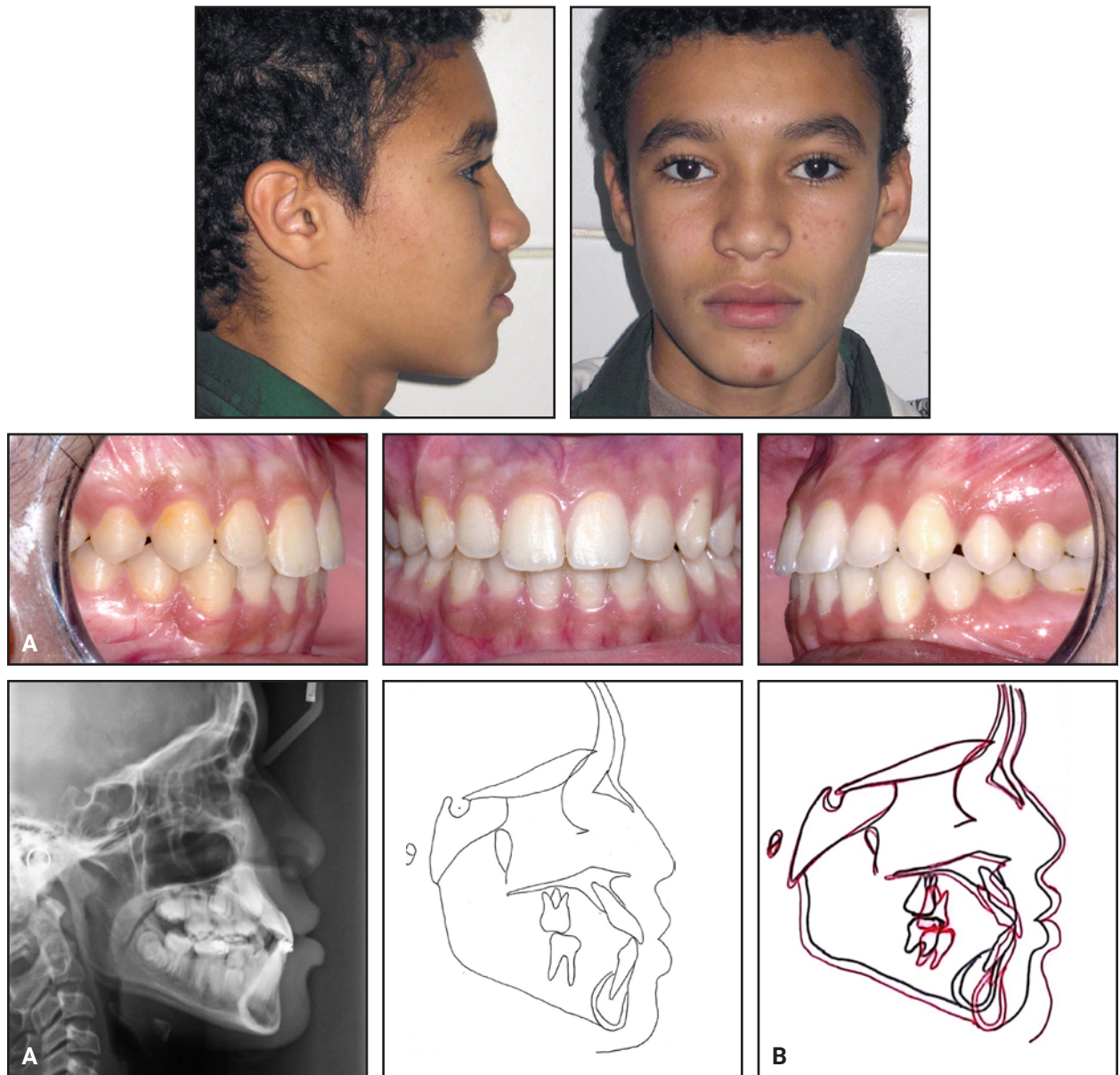


Fig. 3 A. Patient after two years of treatment. **B.** Superimposition of pre- and post-treatment cephalometric tracings.

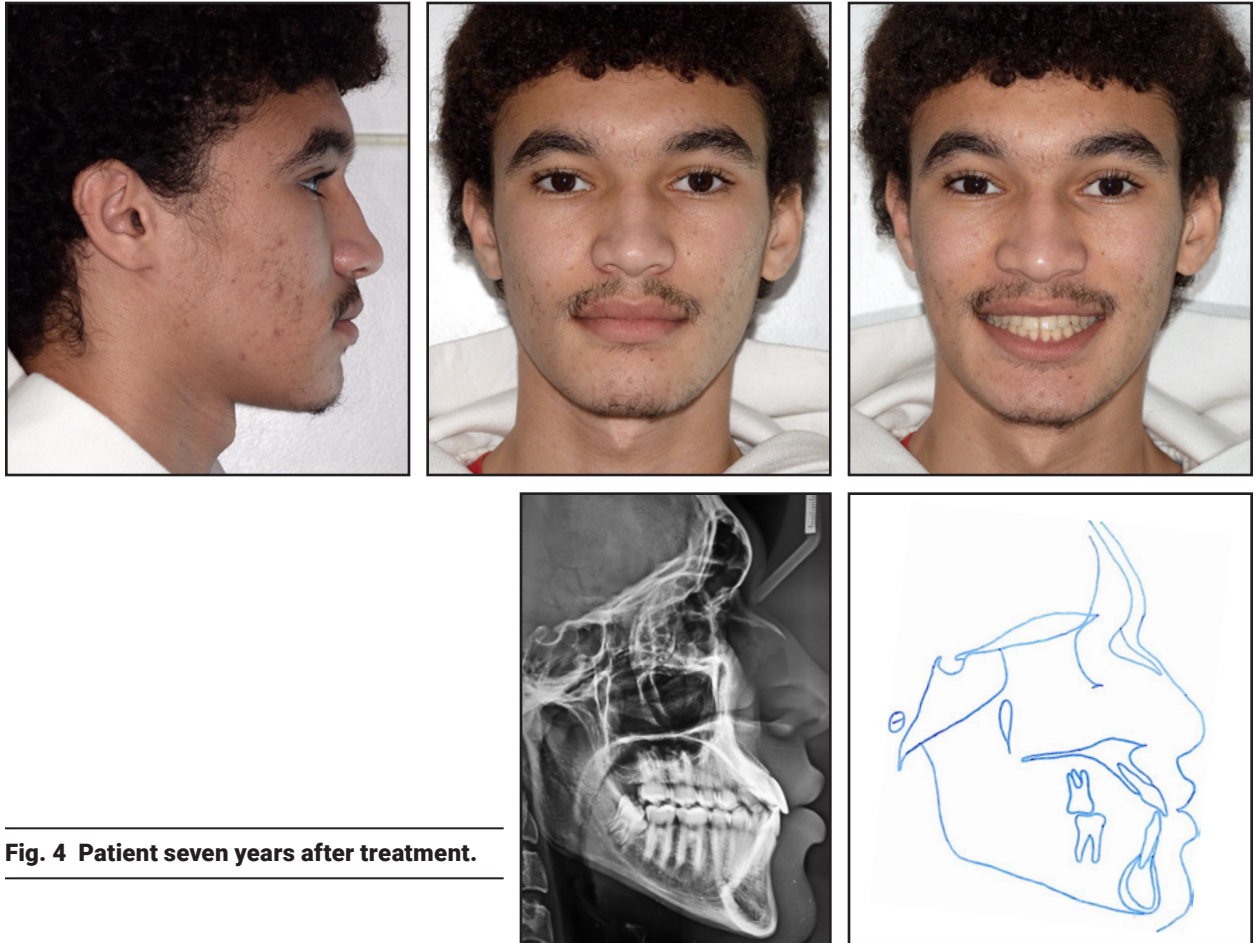


Fig. 4 Patient seven years after treatment.

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