CASE REPORT

Coordinated Logopedic and Lingual-Orthodontic Treatment of an Open-Bite Case

ENRICO ALBERTINI, DDS
GIANLUCA FORNI
LUCA LOMBARDO, DDS
GIUSEPPE SICILIANI, DDS

Speech therapy, as performed by a qualified logopedist, can be an important adjunct to orthodontic treatment of patients with oral habits. This report shows a patient who was retreated with lingual appliances in conjunction with logopedic therapy.

Diagnosis and Treatment Planning

A 14-year-old female presented with the request of aligning her teeth by means of an esthetic appliance. Her previous orthodontic treatment, performed by a general dentist with a labial technique and terminated one year previously, had relapsed.

From a frontal view, her face appeared well proportioned, with a slight deviation of the mandibular symphysis to the left (Fig. 1). The profile was normal,


Dr. Albertini


Mr. Forni


Dr. Lombardo


Dr. Siciliani

Dr. Albertini is in the private practice of orthodontics at Via Pansa 55/i, 42124 Reggio Emilia, Italy; e-mail: info@dralbertini.com. Mr. Forni is an Orthodontic Technician and Dr. Lombardo is an Adjunct Professor, Postgraduate School of Orthodontics, and Dr. Siciliani is the Chairman, Department of Orthodontics, University of Ferrara, Ferrara, Italy.

Fig. 1 14-year-old female patient with open bite and skeletal Class II malocclusion before orthodontic re-treatment.

TABLE 1
CEPHALOMETRIC DATA

	Norm	Pre-treatment	Post-Treatment
Horizontal skeletal			
SNA	82.0°	74.1°	74.4°
SNB	80.0°	71.8°	72.4°
ANB	2.0°	2.3°	2.0°
Maxillary skeletal (A-NA perp.)	0.0mm	–1.8mm	–3.3mm
Mandibular skeletal (Pg-NA perp.)	–4.0mm	–4.4mm	–5.9mm
Wits appraisal	0.0mm	+0.8mm	+1.0mm
Vertical skeletal			
FMA (MP-FH)	26.0°	26.9°	25.8°
MP-SN	33.0°	41.0°	38.0°
Palatal-mandibular angle	28.0°	30.9°	28.7°
Palatal-occlusal plane (PP-OP)	10.0°	10.8°	10.0°
Mandibular-occlusal plane	11.4°	20.1°	18.7°
Anterior dental			
U1 protrusion (U1-APo)	6.0mm	5.0mm	5.6mm
L1 protrusion (L1-APo)	2.0mm	0.1mm	1.8mm
U1-Palatal plane	110.0°	112.3°	111.3°
U1-Occlusal plane	54.0°	56.9°	58.7°
L1-Occlusal plane	72.0°	69.7°	66.0°
IMPA	95.0°	90.2°	95.3°

Fig. 2 Manual setup for indirect bonding with KommonBase system.[2]

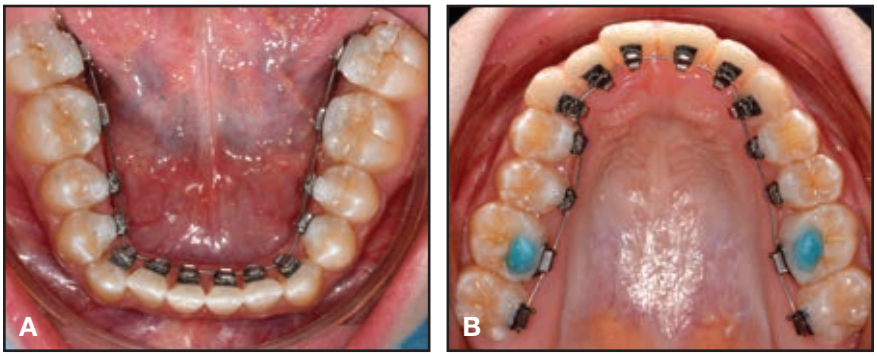

Fig. 3 A. Initial placement of lower Ormco STb* Light Lingual System brackets and .013" Copper Ni-Ti* archwire. B. Two weeks later, initial placement of upper Ormco STb brackets and .013" Copper Ni-Ti archwire, with occlusal build-ups bonded to upper first molars.

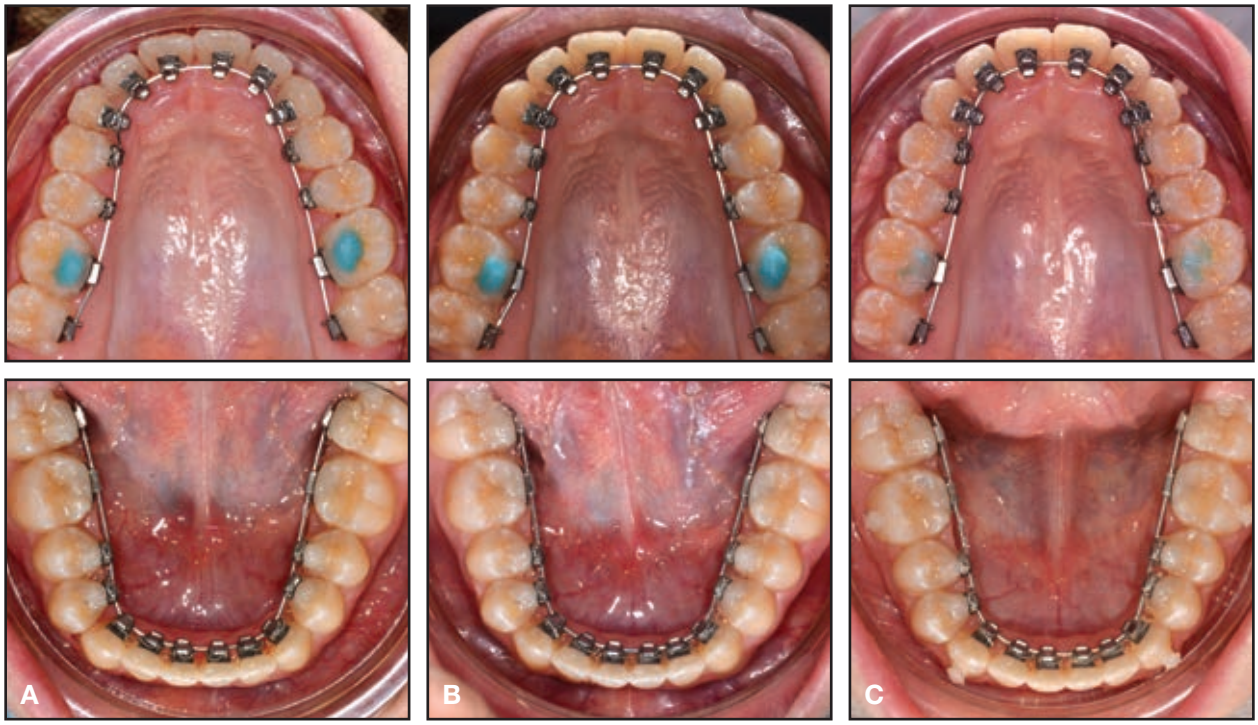

Fig. 4 A. Insertion of .016" × .016" Copper Ni-Ti archwires after two months of treatment. B. Insertion of .018" × .018" Copper Ni-Ti archwires after four months of treatment. C. Labial composite esthetic buttons bonded to upper canines and lower first premolars and first molars, for attachment to 3⁄16", 6oz Class II and intercuspation elastics.**

*Ormco Corporation, Orange, CA; www.ormco.com. STb is a trademark and Copper Ni-Ti is a registered trademark.
**Impala elastics, Ormco Corporation, Orange, CA; www.ormco.com.

Fig. 5 Upper arch debonded after eight months of treatment.

Fig. 6 Anterior settling after two months of wearing removable acrylic plate.

exhibiting a correct nasolabial angle, a marked labiomental sulcus, and a prominent chin. All teeth were present, including the third molars. The lower midline was slightly deviated to the left, and there was a substantial anterior open bite, mainly on the right side, with an excessive overjet. The patient had a Class I molar relationship on the right and a mild Class II canine and molar relationship on the left. Both arches were slightly crowded. The upper arch was also slightly deficient in the transverse dimension, and the lower curve of Wilson was pronounced.

Cephalometric analysis indicated a skeletal Class II, with both the maxilla and the mandible in retrusive positions (Table 1). The skeletal pattern tended toward hyperdivergence, while the occlusal plane was oriented counterclockwise. The upper incisors appeared normally inclined, but the lower incisors were retroclined (even in the presence of an "active retainer"). The retainer was removed one month after our initial examination.

Because a tongue-thrust habit was diagnosed, the patient was sent for a logopedic evaluation. The logopedist suggested

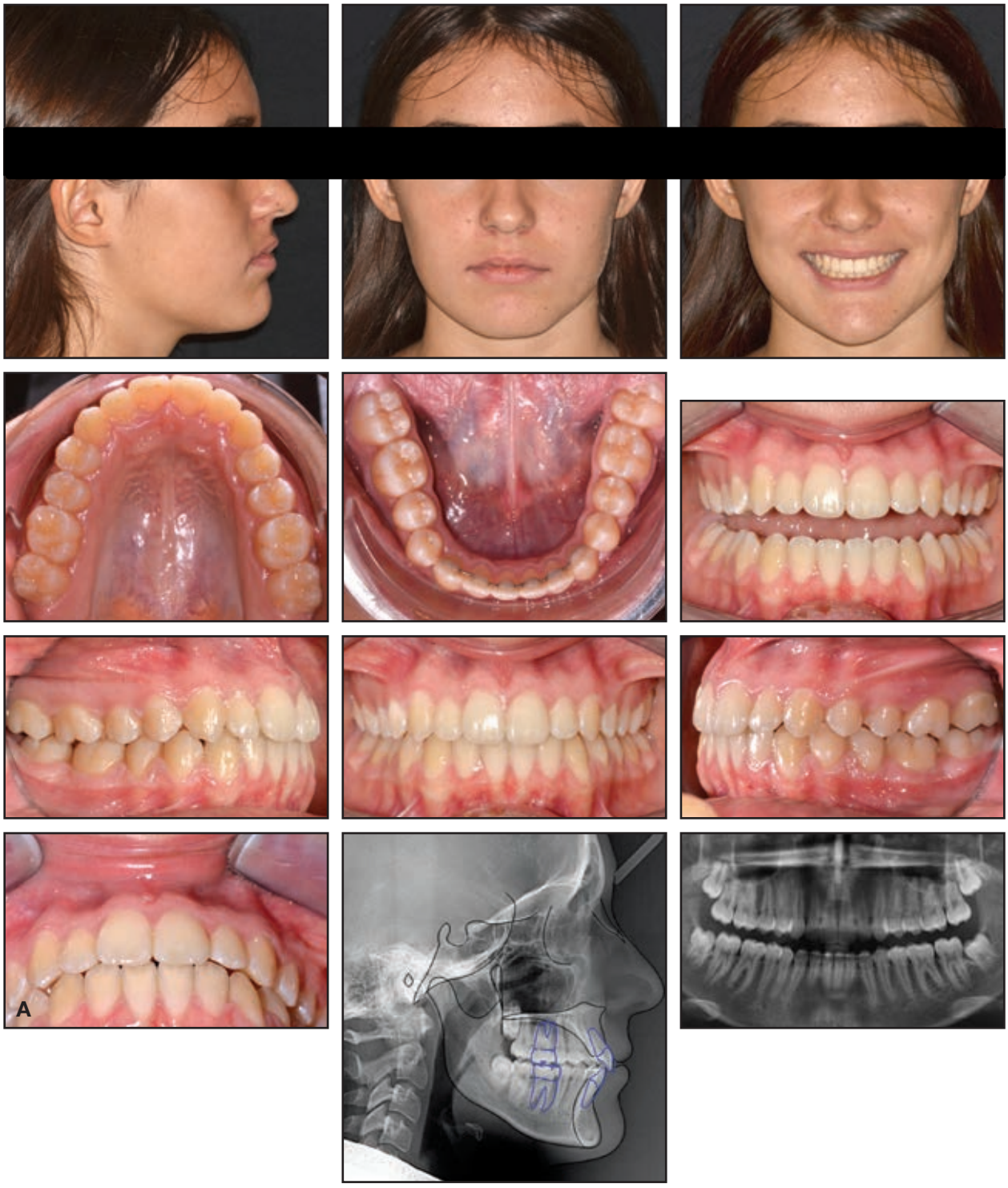

Fig. 7 A. Patient after 16 months of treatment (continued on next page).

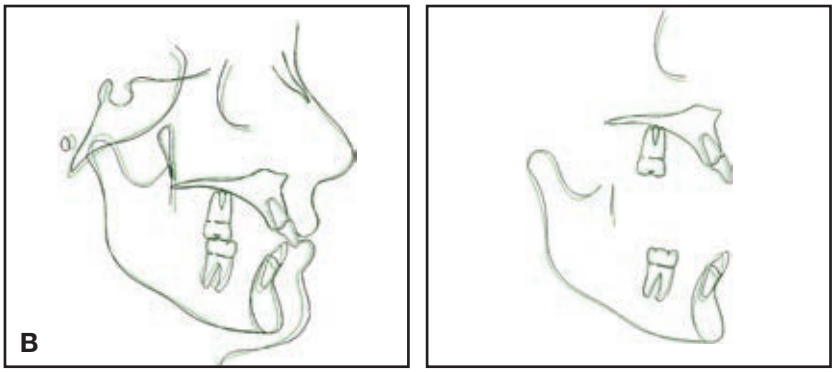

Fig. 7 (cont.) B. Superimposition of pre- and post-treatment cephalometric tracings.

an immediate course of therapy, and several months passed before orthodontic treatment was initiated.

Although the patient could have been treated successfully with the Invisalign*** system, she was unwilling to cooperate with aligner wear and requested a completely invisible appliance. We decided to use a lingual straightwire technique[1] with Ormco STb* Light Lingual System brackets.

Treatment Progress

Brackets were bonded indirectly, using a manual setup and single jigs, according to the KommonBase system[2] (Fig. 2). The lower arch was bonded first (Fig. 3A) and the upper arch two weeks later (Fig. 3B), with an .013" Copper Ni-Ti* wire inserted in each arch. Occlusal build-ups were bonded to the upper first molars for intrusion and vertical control during the leveling, alignment, and working phases.

Two months later, .016" × .016" Copper Ni-Ti archwires were inserted (Fig. 4A). Another two months later, the sequence progressed to .018" × .018" Copper Ni-Ti archwires (Fig. 4B).

The occlusal build-ups were progressively reduced; after five months of treatment, full-time 3⁄16", 6oz Class II elastics** were attached to esthetic labial composite buttons on the upper canines and the lower first premolars and first molars (Fig. 4C). A month later, composite buttons were bonded to the lower canines, and intercuspation elastics** were prescribed for nighttime wear.

The patient continued her logopedic appointments throughout treatment. After only eight months, the upper arch was debonded (Fig. 5). To help settle the anterior occlusion, a removable acrylic plate was prescribed to be worn 22 hours per day. This palatal plate, which incorporated a cutout at the retroincisal papilla to assist in lingual retraining, was progressively relieved by removing acrylic from the upper anterior segment.

Two months later, the removable plate was slightly reactivated (Fig. 6). The lower arch was debonded another three months later; a lower 3-3 lingual retainer was bonded, and a passive lower Essix† retainer was delivered to be worn 22 hours per day. Total treatment time was 16 months.

Treatment Results

Solid Class I canine and molar relationships were obtained on both sides; the crowding was resolved, and the open bite was corrected in both the anterior and buccal segments (Fig. 7A). The resulting light occlusal contact was ideal. The patient displayed a pleasant smile arc and a harmonious profile.

*Ormco Corporation, Orange, CA; www.ormco.com. STb is a trademark and Copper Ni-Ti is a registered trademark.
**Impala elastics, Ormco Corporation, Orange, CA; www.ormco.com.
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Fig. 8 Patient 13 months after treatment.

A final panoramic radiograph confirmed root parallelism. Cephalometric analysis showed a skeletal Class I with a properly oriented occlusal plane and normally inclined incisors (Fig. 7B, Table 1). The Ricketts E-line[3] and Merrifield Z-angle[4] were harmonious, supporting the nonextraction decision.

Three months after debonding, an upper 3-3 lingual retainer was bonded and an upper Essix retainer was delivered. Follow-up records taken 13 months after debonding demonstrated the stability of orthodontic treatment (Fig. 8).

Conclusion

As this case shows, a coordinated logopedic and lingual-orthodontic treatment can produce a reliable open-bite correction, even when previous treatment has been unsuccessful. Patient cooperation with both forms of therapy is required to achieve optimal results.

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