

## CASE REPORT Correction of Anterior Crossbite with a Combination Technique

[RYOON KI HONG, DDS, PHD](#)

[JANG HOON AHN, DDS, MSD](#)

[BYUNG CHUN SOH, DDS](#)

The Multiloop Edgewise Archwire (MEAW) was developed by Kim for uprighting and distalizing posterior teeth.<sup>1</sup> This case report describes an esthetic and effective use of the MEAW, in conjunction with lingual appliances, to correct an adult anterior crossbite without extractions.

### Diagnosis and Treatment Plan

A 24-year-old female, presenting with the chief complaint of an anterior crossbite, wanted lingual orthodontic treatment for esthetic reasons. The patient exhibited a convex, prognathic profile and a Class III molar relationship, with an overjet of -1.5mm, an overbite of .8mm, and a midline discrepancy (Fig. 1). The mandibular left second molar was tipped lingually.

Cephalometric evaluation showed a Class I skeletal relationship and protrusive maxillary and mandibular incisors (Table 1). The anteroposterior maxillomandibular relationship was normal, but the mandibular denture base related anteriorly to the maxillary denture base. FMA was within normal limits.

The preferred treatment plan involved extraction of the maxillary second and mandibular first bicuspids, but the patient requested nonextraction treatment. Limitations of such treatment were explained to the patient, who elected to proceed with lingual appliances in the maxillary arch and labial appliances in the mandibular arch.

### Treatment Progress

Fujita lingual brackets were bonded indirectly in the maxillary arch,<sup>2</sup> and an .0155" Respond mushroom archwire was engaged (Fig. 2A). In the mandibular arch, .018" X .025" preadjusted edgewise appliances were banded and bonded, and an .0155" Respond archwire was placed. Conventional leveling and alignment were performed with progressive archwire changes.

The maxillary and mandibular right third molars were extracted prior to the use of the MEAW. After seven months of treatment, an .016" X .016" Blue Elgiloy mushroom archwire was engaged in the maxillary arch, and a MEAW with reverse curve of Spee in the mandibular arch (Fig. 2B).

Long Class III elastics (3/16", 4oz) and anterior diagonal elastics (5/16", 4oz) were utilized to move the mandibular dentition posteriorly and to correct the midline. After 19 months of treatment, the anterior crossbite and the midline discrepancy were corrected.

Vertical elastics (3/16", 6oz) were then used to extrude the anterior teeth and seat the anterior occlusion (Fig. 2C). Poor cooperation by the patient in wearing the elastics and keeping appointments prolonged treatment, so that appliances could be removed only after 26 months of treatment. Maxillary 3-3 fixed and mandibular wraparound removable retainers were placed.

## Treatment Results

The anterior crossbite was corrected, and a Class I canine and molar relationship was established with proper cuspal interdigitation and a coincident midline (Fig. 3).

Superimposition of pretreatment and post-treatment cephalometric tracings showed a downward and backward mandibular rotation (Fig. 4). This was probably due to maxillary molar extrusion during leveling of the occlusion and to the use of Class III intermaxillary elastics. The extrusion of the maxillary molars made the Class III occlusal relationship easier to correct as the mandible rotated down and back.

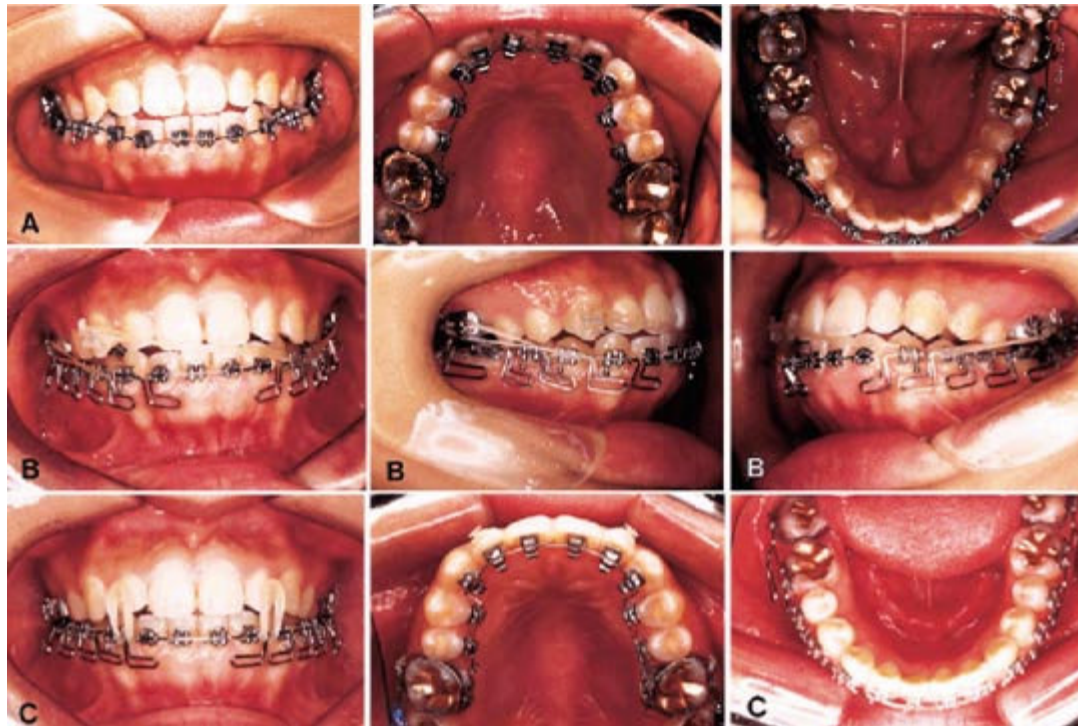
The increase in interincisal angle from  $108.1^{\circ}$  to  $114.2^{\circ}$  could be attributed to the uprighting of the mandibular incisors. The maxillary and mandibular incisors were slightly extruded, and the mandibular molars were uprighted distally (Fig. 5).

Records taken one year after treatment show the stability of the occlusion (Fig. 6). □

## FIGURES



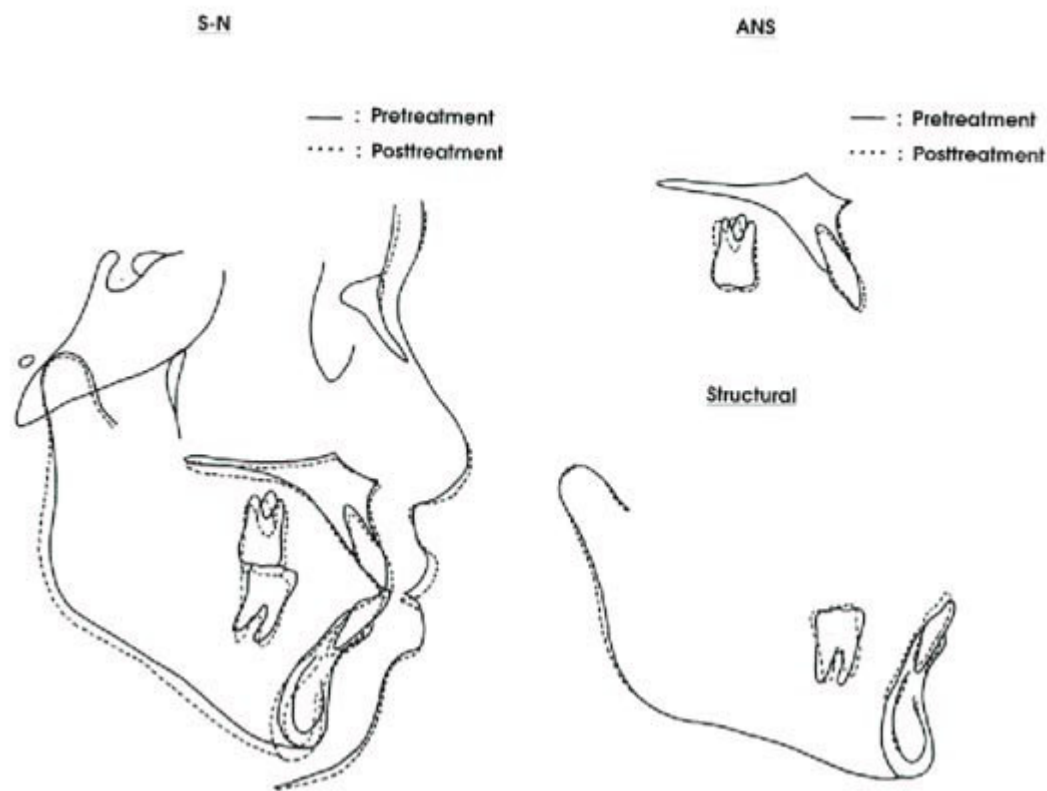
**Fig. 1** 24-year-old female before treatment.



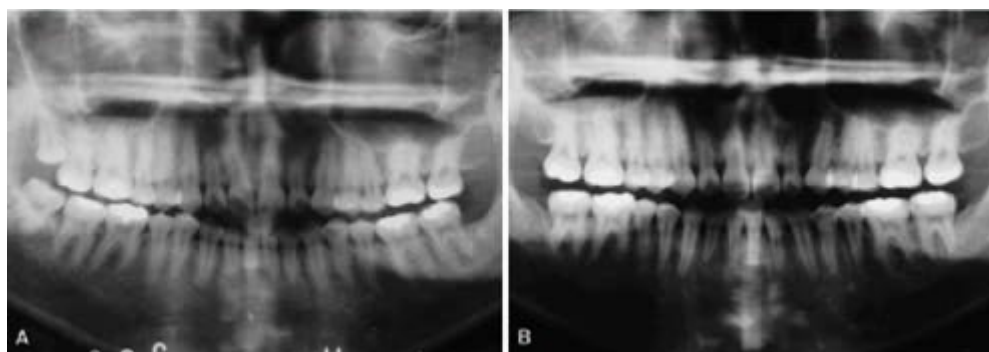
**Fig. 2** A. Initial .0155" Respond archwires in both arches. B. After seven months, .016" × .016" Blue Elgiloy mushroom archwire placed in maxillary arch and .016" × .022" stainless steel Multiloop Edgewise Archwire with reverse curve of Spee in mandibular arch. Long Class III and anterior diagonal elastics used to upright and distalize mandibular teeth and correct midline discrepancy. C. Vertical elastics used to extrude anterior teeth and seat anterior occlusion.



**Fig. 3** Patient after treatment.



**Fig. 4** Superimpositions of pre- and post-treatment cephalometric tracings on SN (left) and ANS (right).



**Fig. 5** Pre- and post-treatment panoramic radiographs show uprighting of mandibular buccal segments.





**Fig. 6** One year after treatment.

## TABLES

**TABLE 1**  
**CEPHALOMETRIC SUMMARY**

	Normal	Pretreatment	Post-Treatment
<i>Skeletal</i>			
SNA	81.6°	85.2°	84.6°
SNB	79.2°	82.3°	80.9°
ANB	2.5°	2.9°	3.7°
FMA	24.3°	27.7°	28.1°
NPo-FH	89.1°	87.4°	87.0°
<i>Dental</i>			
Overbite	1.8mm	0.8mm	1.3mm
Overjet	3.5mm	-1.5mm	2.0mm
1-SN	106.9°	115.3°	113.1°
IMPA	95.9°	103.1°	97.9°
Interincisal angle	123.8°	108.1°	114.2°
<i>Soft Tissue</i>			
Upper lip to E-line	-0.9mm	-0.6mm	0.8mm
Lower lip to E-line	0.6mm	4.7mm	3.5mm

**Table. 1**

## REFERENCES

1 Kim, Y.H.: Anterior openbite and its treatment with multiloop edgewise archwire, Angle Orthod. 57:290-321, 1987.

2 Hong, R.K. and Soh, B.C.: Customized indirect bonding method for lingual orthodontics, J. Clin. Orthod. 30:650-652, 1996.

## FOOTNOTES

1 Respond: Registered trademark of Ormco/"A" Company, 1717 W. Collins Ave., Orange, CA 92667.

2 Blue Elgilo: Registered trademark of RMO, Inc., P.O. Box 17085, Denver, CO 80217.

