

Clinical Application of the Tongue Elevator

YOUNG-SUCK KIM, DMD, MSD
SOON-YONG KOWN, DMD, MSD, PHD
YOUNG-GUK PARK, DMD, MSD, PHD
KYU-RHIM CHUNG, DMD, MSD, PHD

Most Class III malocclusions are characterized by protrusive mandibles and low tongue posture. There is some disagreement among researchers whether the overgrowth of the mandible causes the low tongue posture or the tongue posture induces the protrusion of the mandible.¹

In any case, the dentofacial complex is certainly influenced by the size and shape of the tongue, its posture, and its mode of action. If habitual low tongue posture is not corrected in a growing Class III patient, the lower anterior teeth will eventually become proclined and spaced, the maxilla will be constricted, and the posterior teeth will overerupt. The skeletal effect will be a clockwise rotation of the mandible and a long facial appearance.

The duration of tongue force appears to be more critical than the magnitude of force; short-acting pressures during speaking and swallowing can be discounted because their total duration is only a few minutes per day.^{2,3} Orthodontic appliances such as tongue pearls⁴ and tongue spurs have been used to correct tongue-thrusting habits, but the main effect of these appliances is to normalize the activity of the tongue. They do not fundamentally alter the tongue position at rest, where it is located most of the time.

Dr. Chung has designed a Tongue Elevator to correct low tongue posture in the rest position, thus normalizing perioral muscle function and avoiding exacerbation of the malocclusion.

Appliance Design

The Tongue Elevator has a thick acrylic base with occlusal rests made of .032" stainless steel wire (Fig. 1). The acrylic should be as wide and thick as possible without limiting the movement of the frenum. The occlusal rests are placed in the lingual occlusal grooves of the lower pos-

terior teeth so as not to interfere with the occlusion. If necessary, a labial bow or ball clasps can be added for better retention.

The cross-section of the Tongue Elevator is half-pear-shaped so that the tongue will occupy

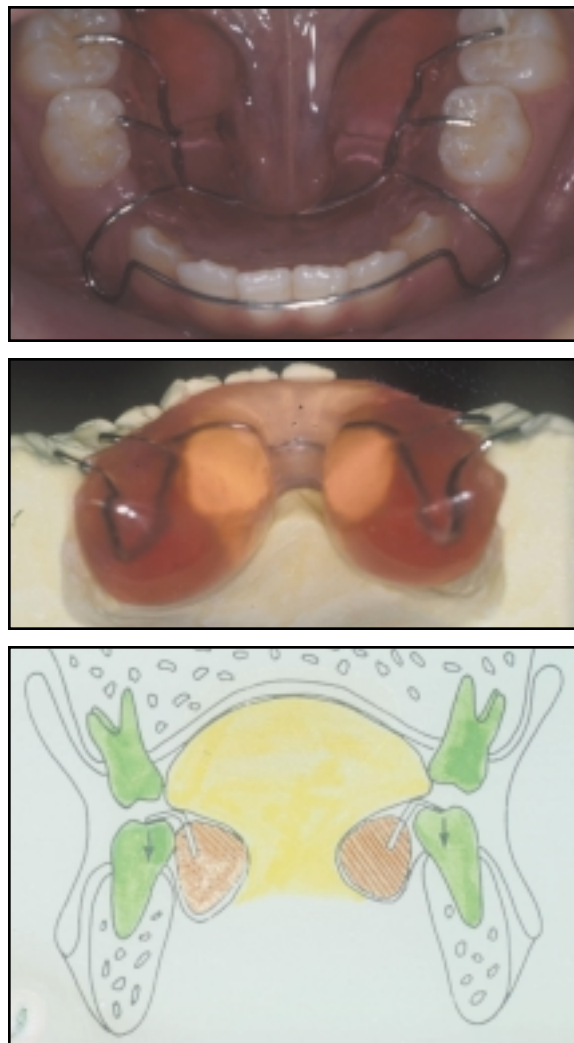


Fig. 1 Tongue Elevator.

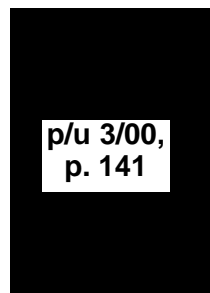
Dr. Kim is a Director and Dr. Kwon is President, Central Orthodontic Mechanic Foundation, 601 Seowon B/D, Seocho 4-dong, Seocho-Gu, Seoul 137-042, Korea. Dr. Park is a Professor and Dr. Chung is Professor and Chairman, Department of Orthodontics, Kyung Hee University, Seoul. E-mail Dr. Kim at sky@orthodontic.co.kr.



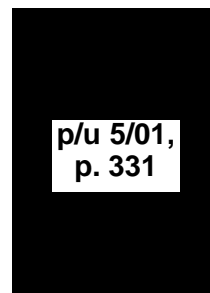
Dr. Kim



Dr. Kwon



Dr. Park



Dr. Chung

the palatal space and help expand the constricted maxillary arch. The force of the tongue is transmitted to the lower teeth by the occlusal rests. Because this force can block alveolar growth, we occasionally grind away anterior portions of the acrylic to allow lingual movement of selected lower anterior teeth.

Case Report

A 7-year-old female patient presented with an anterior open bite (Fig. 2). A Tongue Elevator was placed, and the anterior open bite was corrected after nine months (Fig. 3). The mandibular plane to SN angle decreased by 2° and the mandibular plane to Frankfort horizontal angle by 3°, indicating counterclockwise growth of the mandible.

Discussion

This counterclockwise rotation of the mandible could be attributed to the restriction of growth in the posterior alveolar area relative to the anterior region. Such modifications in alveolar bone growth and the occlusal plane angle strongly indicate a therapeutic effect of the Tongue Elevator.

In a Class III patient with a protrusive mandible and a relatively low hyoid bone, the tongue is literally dragged to a lower position.

This not only overexpands the mandibular arch, but robs the maxillary arch of the tongue support it normally enjoys.⁵ If the Tongue Elevator is kept in place to maintain an upward movement of the hyoid bone, it can serve as a muscular retainer.

The Tongue Elevator can also be used with conventional retainers and functional appliances, or combined with a transpalatal arch to intrude the upper molars.

Conclusion

Whether improper tongue posture and



Fig. 2 7-year-old female patient with anterior open bite.

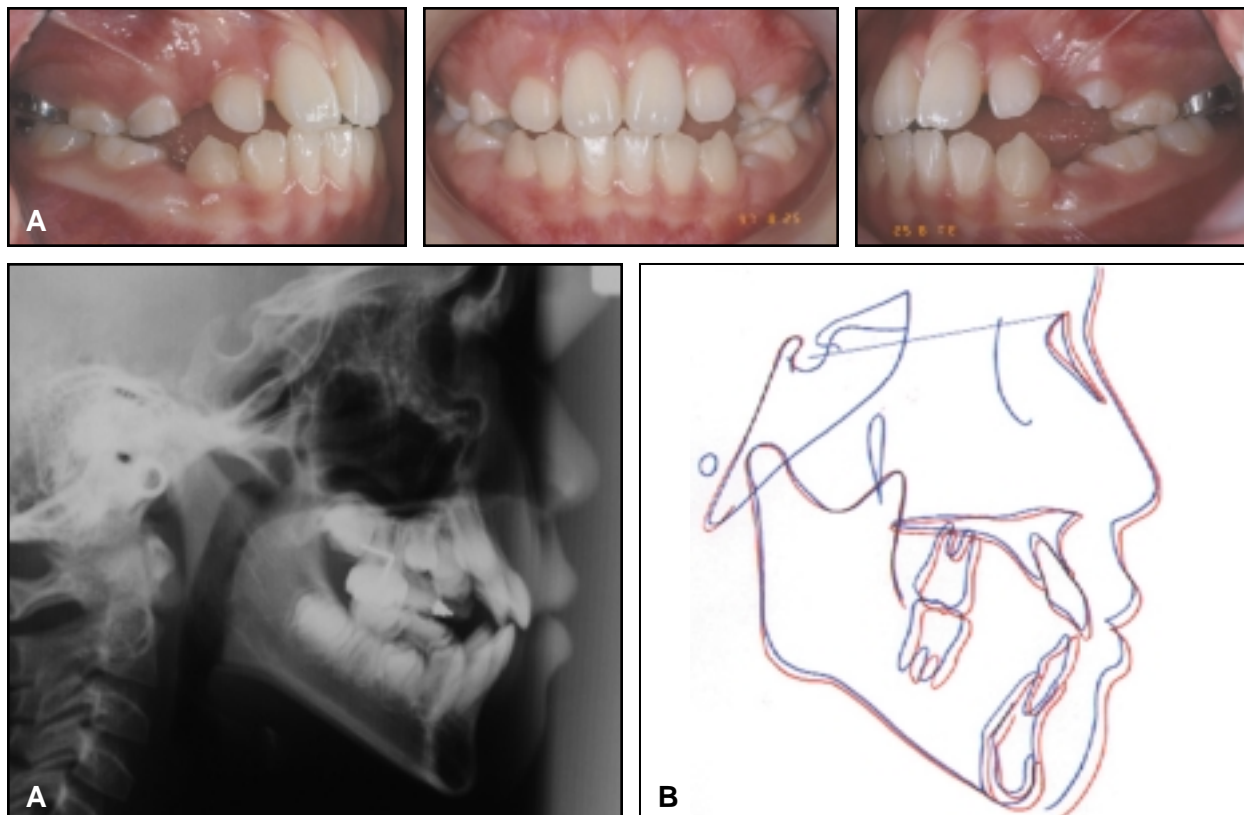


Fig. 3 A. Open bite correction after nine months of treatment. B. Superimposition of cephalometric tracings.

function is a cause or a contributing factor in a Class III malocclusion, it is difficult to achieve stable results without correcting it. The Tongue Elevator appears to be a reliable means of obtaining a long-term musculoskeletal correction.

REFERENCES

1. Graber, T.M.: *Orthodontics: Principles and Practice*, 3rd ed., W.B. Saunders, Philadelphia, 1972.
2. Proffit, W.R.: Equilibrium theory revisited: Factors influencing position of the teeth, *Angle Orthod.* 48:175-186, 1978.
3. Proffit, W.R. and Brandt, S.: JCO Interviews Dr. William R. Proffit on the proper role of myofunctional therapy, *J. Clin. Orthod.* 11:101-115, 1977.
4. Clark, J.R.: Pearls: Initialed habit breaker, *J. Clin. Orthod.* 17:169-169, 1983.
5. Brodie, A.G.: Anatomy and physiology of head and neck musculature, *Am. J. Orthod.* 36:831-844, 1950.
6. Lowe, A.A.: Tongue movements: Brainstem mechanisms and clinical postulates, *Brain Behav. Evol.* 25:128-137, 1984.
7. Moss, J.P.: The soft tissue environment of teeth and jaws: An experimental and clinical study: Part 1, *Br. J. Orthod.* 7:127-137, 1980.
8. Moyers, R.E.: *Handbook of Orthodontics*, 4th ed., Year Book Medical Publishers, Inc., Chicago, 1988.
9. Eskew, H.A. and Shepard, E.: Congenital aglossia, *Am. J. Orthod.* 35:116-119, 1949.
10. Huang, G.J.; Justus, R.; Kennedy, D.B.; and Kokich, V.G.: Stability of anterior openbite treated with crib therapy, *Angle Orthod.* 60:17-24, 1990.