

A Quick Fix for Pseudo-Class III Correction

S. JAY BOWMAN, DMD, MSD

Pseudo-Class III malocclusion is usually diagnosed in a patient with an anterior functional shift of the mandible resulting from lingually inclined maxillary incisors.^{1,2} When the mandible is manipulated into a terminal hinge-axis position, the incisors often come into edge-to-edge contact, requiring the patient to move the mandible forward to achieve posterior occlusion. Pseudo-Class III patients typically have deficient midfacial length and maxillary arch length, upper lip retrusion, excessive maxillomandibular anterior displacement, retroclined maxillary incisors, and normal vertical development.^{1,3}

A pseudo-Class III malocclusion may be treated early to reduce the functional shift of the mandible and increase maxillary arch length, thus permitting eruption of the permanent canines and premolars into a Class I relationship.⁴⁻⁷ Advancing or tipping the maxillary incisors labially can normalize the overjet and allow the mandible to close into a Class I without the anterior shift. Although the routine use of Phase I treatment to resolve Class II malocclusion or crowding is not supported by the literature,⁸⁻¹² early treatment of Class III malocclusion using protraction facemasks and expansion has been found helpful in 70-75% of such patients.¹³⁻¹⁷ Moreover, early correction of pseudo-Class III anterior crossbite was successful

in 100% of 25 consecutively treated cases.⁴ Only 25% of these patients required a second stage of treatment after eruption of the remaining permanent teeth.⁷ Johnson has recommended that to minimize overall treatment time, specific goals should be set for Phase I, and no procedures should be initiated early that could be performed “better” later.¹⁸ In cases of pseudo-Class III malocclusion, early intervention has a highly favorable cost-benefit ratio, and treatment usually takes less than nine months.

Various appliances and orthodontic mechanics have been used to correct anterior crossbite in the transitional dentition.^{13-17,19,20} A common technique is to use a simple edgewise appliance (molar tubes and incisor brackets) to advance the incisors into a normal overjet. Although the force can be produced by compressing a rectangular superelastic wire between the molar tube and incisor brackets, deflecting the additional arch length away from the line of action, this method offers limited control and may cause cheek impingement. Alternatively, an open-coil spring on a more rigid wire can be compressed against the molar tube to push the incisors labially. A problem with this technique, however, is that 4-5mm of wire will extend beyond the molar edgewise or headgear tube (the bimetric arch^{21,22}), which may cause soft-tissue discomfort.

Quick Fix Device

The Quick Fix* device was designed to facilitate advancement of the maxillary incisors when used with a traditional 2 × 4 edgewise appliance.²³ The device consists of a rectangular stainless steel archwire, open-coil springs, arch locks, and Side Swipe* auxiliaries (Fig. 1).

*Trademark of American Orthodontics, Inc., 1714 Cambridge Ave., Sheboygan, WI 53081; www.americanortho.com.

Dr. Bowman is a contributing editor of the *Journal of Clinical Orthodontics* and in the private practice of orthodontics at 1314 W. Milham Ave., Portage, MI 49024; e-mail: drjwyred@aol.com. He is an Adjunct Associate Professor at St. Louis University and a straight-wire instructor at the University of Michigan. Dr. Bowman has a financial interest in the Quick Fix Kit.



A Quick Fix for Pseudo-Class III Correction

The Side Swipe auxiliary (Fig. 2), originally developed in 2002, avoids the soft-tissue irritation caused by wire segments protruding past the molar tubes. The wire can be cut flush with the molar tube while still allowing a sufficient length of “traveling” archwire to track forward through the molar tubes as the incisors are advanced.²³

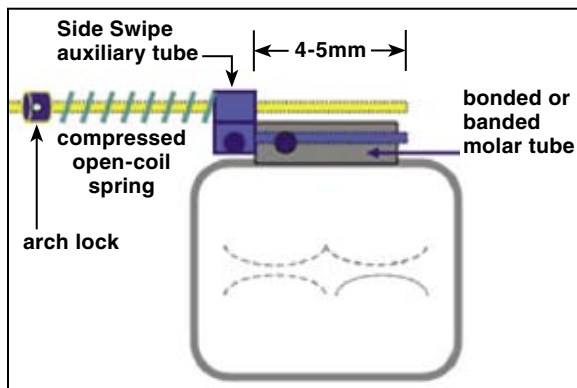


Fig. 1 Components of Quick Fix device.



Fig. 2 Side Swipe auxiliary inserts into standard molar tube, providing 4-5mm of additional archwire length without excess wire extending distally.

Treatment Procedure

Before the Quick Fix device is installed, the incisors are leveled and aligned using superelastic round wire in a maxillary 2×4 appliance (two banded or bonded first molar tubes and preadjusted brackets on the central and lateral incisors). This phase typically takes two to five months.

The Side Swipe auxiliaries are inserted into the molar tubes after leveling and alignment. The wire segment of the Side Swipe is inserted into the molar tube mesially, with the edgewise tube of the auxiliary oriented buccally (Fig. 3). The Side Swipe is secured to the molar tube with a stainless steel or elastic ligature from the hook on the auxiliary to a hook on the molar tube.

Universal arch locks are placed about 16-17mm from the midline mark on the right and left sides of an $.0175" \times .025"$ stainless steel arch, which will allow seating of the archwire into the incisor brackets with the arch locks distal to the lateral incisors (Fig. 4). Two 20mm lengths of $.009" \times .030"$ open-coil spring are slid onto the wire up to the arch locks. The Quick Fix archwire is inserted into the edgewise tubes of the Side Swipes, rather than into the molar or headgear tubes, so that the excess wire lies adjacent to the molar tubes.

The archwire is then seated into the incisor bracket slots, and a stainless steel ligature is laced across in a figure-8 to consolidate the incisors and prevent spaces from opening (Fig. 5). The arch locks are loosened with a wrench and slid distally along the wire to compress the open-coil springs; compression is usually sufficient when the locks are positioned between the first and second deciduous molars (Fig. 6). The locks are then tightened. A distal-end cutter is used to cut the archwire flush



Fig. 3 Side Swipe auxiliary inserted from mesial into first molar tube and secured with elastic ligature.



Fig. 4 Universal arch locks placed 36mm apart on .0175" x .025" stainless steel arch; 20mm lengths of .009" x .030" open-coil spring slid onto arch-wire up to locks.



Fig. 5 Rectangular archwire seated into incisor brackets and "laced" with figure-8 ligatures to prevent unwanted space opening.

with the end of the molar tube, leaving 4-5mm of wire distal to the Side Swipe and adjacent to the molar tube (Fig. 7). The Quick Fix is self-limiting, because the wire will slip out of the Side Swipe tube after 4-5mm of advancement. Incisor movement generally takes two to three months.

Clinical Examples

Figures 8 through 11 demonstrate correction of typical pseudo-Class III anterior crossbites using the Quick Fix device. The Quick Fix can be used in combination with other appliances including 2 x 4 systems, palatal expanders, reverse-pull facemasks, and Class III elastics.

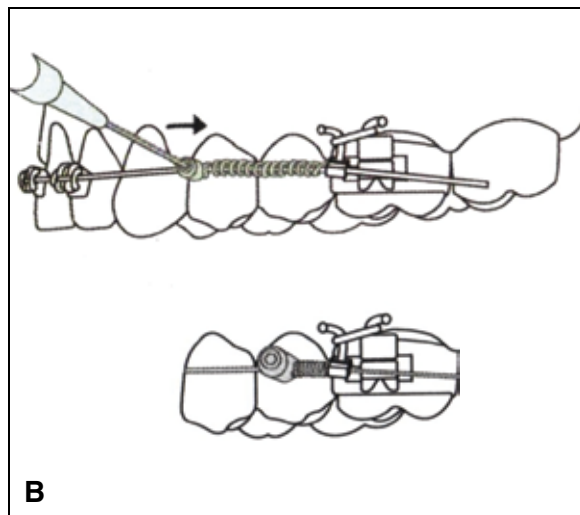


Fig. 6 A. Arch lock slid distally to compress open-coil spring, then tightened between first and second deciduous molars. B. Distal extension of archwire inserted into Side Swipe tube, with remaining portion lying adjacent to molar tube.

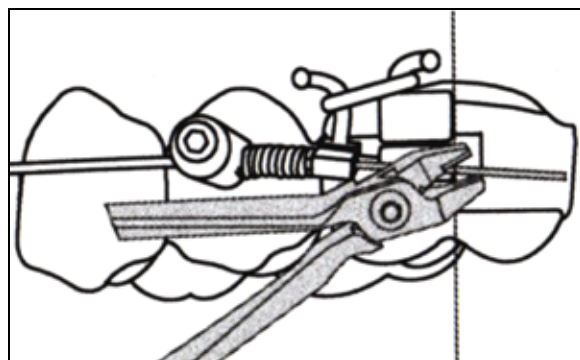


Fig. 7 Distal extension of archwire cut flush with end of molar tube.

A Quick Fix for Pseudo-Class III Correction

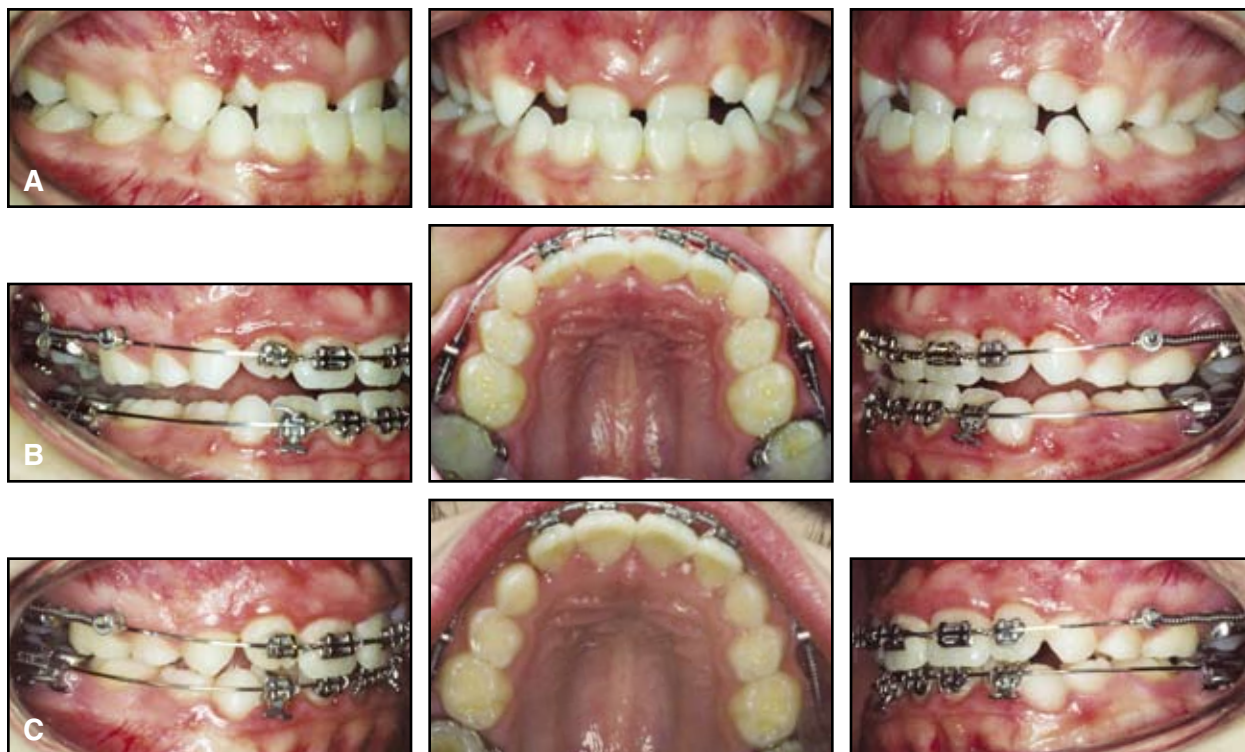


Fig. 8 A. 9-year-old female patient with anterior crossbite and associated functional shift. B. Upper and lower 2 × 4 appliances used for leveling and alignment. C. Quick Fix device used to advance maxillary incisors into desired overjet in three months, without dependence on patient cooperation.



Fig. 9 A. 11-year-old male patient with anterior crossbite and functional shift. B. After leveling and alignment, crossbite corrected in five months with Quick Fix device.



Fig. 10 A. 9-year-old male patient with anterior crossbite. B. After leveling and alignment with upper and lower 2 × 4 appliances. C. After two months of maxillary incisor advancement with Quick Fix device. D. Patient after seven months of Phase I treatment; increase in upper incisor inclination resulted in same overbite, but normalized overjet. E. Patient at age 14; second-stage treatment was planned to address crowding and overbite. F. Superimposition of pretreatment and pre-Phase II cephalometric tracings.

A Quick Fix for Pseudo-Class III Correction

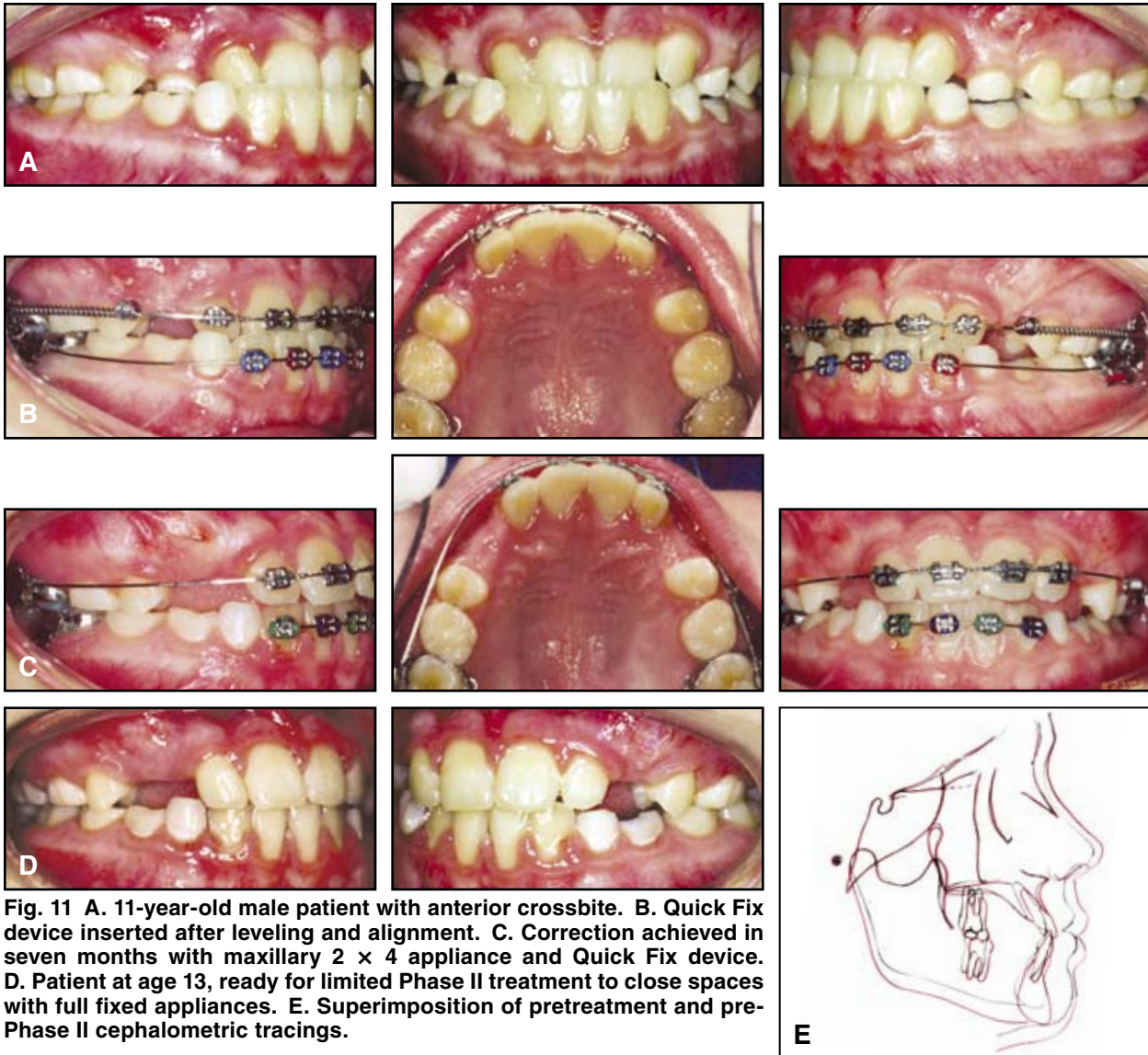


Fig. 11 A. 11-year-old male patient with anterior crossbite. B. Quick Fix device inserted after leveling and alignment. C. Correction achieved in seven months with maxillary 2 × 4 appliance and Quick Fix device. D. Patient at age 13, ready for limited Phase II treatment to close spaces with full fixed appliances. E. Superimposition of pretreatment and pre-Phase II cephalometric tracings.

Conclusion

Early correction of pseudo-Class III malocclusion provides simple, rapid, reliable, and stable resolution of anterior crossbite and associated functional shift. Such treatment reduces the risk of developing a skeletal Class III malocclusion and

may facilitate or even eliminate the need for Phase II therapy. The Quick Fix device is a simple, predictable, and effective mechanism for correcting a pseudo-Class III.²⁴ It can also be adapted for molar distalization in Class II patients, using Class II elastics or miniscrew anchorage to prevent flaring of the incisors.^{25,26}

REFERENCES

1. Rabie, A.B. and Gu, Y.: Diagnostic criteria for pseudo-Class III malocclusion, *Am. J. Orthod.* 117:1-9, 2000.
2. Proffit, W.R.; Fields, H.W. Jr.; and Sarver, D.M.: *Contemporary Orthodontics*, 4th ed., Mosby Elsevier, St. Louis, 2007, pp. 175-176.
3. Gu, Y.: The characteristics of pseudo Class III malocclusion in mixed dentition, *Zhonghua Kou Qiang Yi Xue Za Zhi* 37:377-380, 2002.
4. Hägg, U.; Tse, A.; Bendeus, M.; and Rabie, A.B.: A follow-up study of early treatment of pseudo Class III malocclusion, *Angle Orthod.* 74:465-472, 2004.
5. Gu, Y. and Rabie, A.B.: Dental changes and space gained as a result of early treatment of pseudo-Class III malocclusion, *Aust. Orthod. J.* 16:40-52, 2000.
6. Rabie, A.B. and Gu, Y.: Management of pseudo Class III malocclusion in southern Chinese children, *Br. Dent. J.* 186:183-187, 1999.
7. Gu, Y.; Rabie, A.B.; and Hägg, U.: Treatment effects of simple fixed appliance and reverse headgear in correction of anterior crossbites, *Am. J. Orthod.* 117:691-699, 2000.
8. Vig, K.W.L.; O'Brien, K.; and Harrison, J.: Early orthodontic and orthopedic treatment: The search for evidence: Will it influence clinical practice? in *Early Orthodontic Treatment: Is the Benefit Worth the Burden?* ed. J.A. McNamara, Jr., Craniofacial Growth Series, vol. 44, Needham Press, Ann Arbor, 2007, pp. 13-38.
9. Johnston, L.E. Jr.: If wishes were horses, in *Early Orthodontic Treatment: Is the Benefit Worth the Burden?* ed. J.A. McNamara, Jr., Craniofacial Growth Series, vol. 44, Needham Press, Ann Arbor, 2007, pp. 39-51.
10. Little, R.M.; Riedel, R.A.; and Stein, A.: Mandibular arch length increase during the mixed dentition: Postretention evaluation of stability and relapse, *Am. J. Orthod.* 97:393-404, 1990.
11. O'Grady, P.W.; McNamara, J.A. Jr.; Baccetti, T.; and Franchi, L.: A long-term evaluation of the mandibular Schwarz appliance and the acrylic splint expander in early mixed dentition patients, *Am. J. Orthod.* 130:202-213, 2006.
12. Bowman, S.J.: One-stage versus two-stage treatment: Are two really necessary? *Am. J. Orthod.* 113:111-116, 1998.
13. Wells, A.P.; Sarver, D.M.; and Proffit, W.R.: Long-term efficacy of reverse pull headgear therapy, *Angle Orthod.* 76:915-922, 2006.
14. Hägg, U.; Tse, A.; Bendeus, M.; and Rabie, A.B.: Long-term follow-up of early treatment with reverse headgear, *Eur. J. Orthod.* 25:95-102, 2003.
15. Kim, J.H.; Viana, M.A.; Graber, T.M.; Omerza, F.F.; and BeGole, E.A.: The effectiveness of protraction face mask therapy: A meta-analysis, *Am. J. Orthod.* 115:675-685, 1999.
16. Baccetti, T.; McGill, J.S.; Franchi, L.; McNamara, J.A. Jr.; and Tollaro, I.: Skeletal effects of early treatment of Class III malocclusion with maxillary expansion and face-mask therapy, *Am. J. Orthod.* 113:333-343, 1998.
17. McDonald, T.: Interview with Dr. Patrick Turley, *Pac. Coast Soc. Orthod. Bull.* 79:14-15, 2007.
18. Johnson, E.S.: Shortening orthodontic treatment time, *Orthod. Select.* 20:3, 2007.
19. Arman, A.; Toygar, T.U.; and Abuhijleh, E.: Profile changes associated with different orthopedic treatment approaches in Class III malocclusions, *Angle Orthod.* 74:733-740, 2004.
20. Carano, A.; Bowman, S.J.; and Valle, M.: A fixed reverse labial bow for moderate Class III interceptive treatment, *J. Clin. Orthod.* 37:42-46, 2003.
21. Wilson, W.L. and Wilson, R.C.: *Modular Orthodontics*, Rocky Mountain Orthodontics, Denver, 1981.
22. Harnick, D.J.: Case report: Class II correction using a modified Wilson bimetric distalizing arch and maxillary second molar extraction, *Angle Orthod.* 68:275-280, 1998.
23. Bowman, S.J.: Trouble-shooting trilogy, AAO annual session, San Francisco, May 23, 2005.
24. Bowman, S.J.: Concepts and controversies in contemporary clinical orthodontics, presentation, Oral Health and Science Seminar Series, Prince Philip Dental Hospital, University of Hong Kong, June 7, 2006.
25. Bowman, S.J.: Thinking outside the box with mini-screws, in *Microimplants as Temporary Orthodontic Anchorage*, ed. J.A. McNamara, Jr., Craniofacial Growth Series, vol. 45, Needham Press, Ann Arbor, 2008, pp. 327-390.
26. Ludwig, B.; Baumgaertel, S.; and Bowman, S.J.: *Mini-Implants in Orthodontics: Innovative Anchorage Concepts*, Quintessence, Berlin, 2008.