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▶Page 2



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▶Page 6



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▶Page 10

Quick-fix device for pseudo-Class III

Resolving anterior crossbites with the quick-fix device

By S. Jay Bowman, DMD, MSD

The early resolution of a pseudo-Class III malocclusion appears to be one of the most successful and stable orthodontic procedures. The purpose of this article is to describe a simplified yet predictable mechanism for the correction of pseudo-Class III malocclusions and, with the addition of mini screws, treatment of some Class IIs.

Pseudo-Class III malocclusion

The differentiation of pseudo-Class III from a typical Class III malocclusion is a simple yet critical distinction in orthodontic diagnosis. The classic clinical presentation of pseudo-Class III is seen in a patient who exhibits an ante-



Illustrations of the quick-fix device. (Photos/Provided by Dr. S. Jay Bowman)

rior functional “shift” of the mandible, resulting from lingually inclined maxillary incisors (i.e., anterior crossbite).^{1,2}

When the pseudo-Class III mandible is manipulated into a terminal hinge axis position, often the incisors will contact edge-to-edge. Consequently, the patient must move his or her lower jaw forward in order to occlude on their posterior teeth. This type of shift is not indicative of a true skeletal Class III relationship.

Specifically, a decreased midface length, diminished upper-arch length, retrusive upper lip, increased maxil-

lary-mandibular anterior displacement, retroclined upper incisors and normal vertical development typically characterize pseudo-Class III patients.^{1,5}

Interestingly enough, Lin⁴ has reported the prevalence of Class III in a Chinese population involves one in 20 youngsters, but half of those may be characterized as pseudo-Class III. The incidence of all types of Class III malocclusions in Caucasian populations is far less frequent.

Correction of Pseudo-Class III

Hägg and co-workers⁵ have stated that

“interceptive orthodontics is intended to prevent a specific problem from getting worse.”

Consequently, the goals for early resolution of a pseudo-Class III malocclusion are to improve the functional shift of the mandible and to increase maxillary arch length to permit proper eruption of the permanent cuspids and premolars into a Class I relationship.⁶⁻⁸ Advancing and/or tipping the maxillary incisors labially can normalize the

→ 01 page 4

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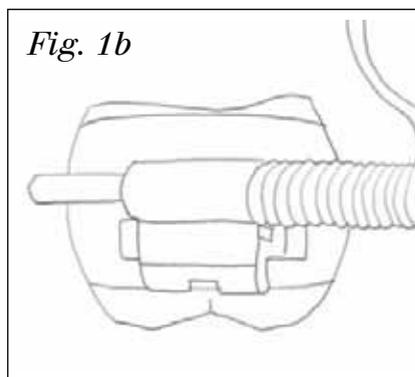
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Figs. 1a and 1b: Alternative methods for advancing upper incisors have included: a) compression of a rectangular super-elastic arch wire between the molars and incisors; b) so-called 'bimetric wire' with a compressed open-coil spring against a required headgear tube attachment. (Note: Excess wire distal to the tube required for advancement.)

← 01 page 1

overjet and permit the mandible to close into a Class I relationship without the anterior shift.

Phase I treatment is defined as early treatment with the intent to change skeletodental relationships and to limit or eliminate a second phase of treatment. Unfortunately, the routine use of early (Phase I) treatment to resolve Class II (by mandibular "advancement")^{9,10} or crowding (via bimaxillary expansion)^{11,12} has not been supported by the referred literature.¹³

In contrast, the early resolution of Class IIIs using protraction facemasks and expansion has been demonstrated to be helpful for 70 to 75 percent of patients.¹⁴⁻¹⁸ Workers at the University of Hong Kong have shown that early correction of pseudo-Class III anterior crossbites was successful for 100 percent of 25 consecutively treated patients.⁵

This was accomplished in a short, eight-month Phase I treatment using simple mechanics ("advancing loops") with a "2 x 4" bracketed appliance. In fact, only 25 percent of the patients required a second stage of treatment upon the eruption of the remaining permanent dentition.⁸

Johnson¹⁹ has recommended that in order to reduce treatment time in Phase I, specific goals must be set for early treatment and no procedures should be initiated in an early stage when they could be done "better" later.

Early advancement of the permanent maxillary incisors for a patient with a pseudo-Class III malocclusion can: correct the anterior crossbite and/or reduce traumatic occlusion, produce a positive overjet and improve coupling of the anterior teeth, permit proper posterior occlusion without an anterior functional shift, may reduce the risk of development of a skeletal Class III and provide some additional arch length for erupting premolars and canines. In other words, the cost/benefit ratio is



Fig. 2a



Fig. 2b



Fig. 2c

Fig. 2a-2c: Nine-year-old female with anterior crossbite and associated functional shift. Upper and lower 2 x 4 appliances were placed for leveling and alignment. Patient was noncompliant with Class III elastics. Quick Fix appliance advanced the upper incisors into favorable overjet in three months without dependence upon patient cooperation.

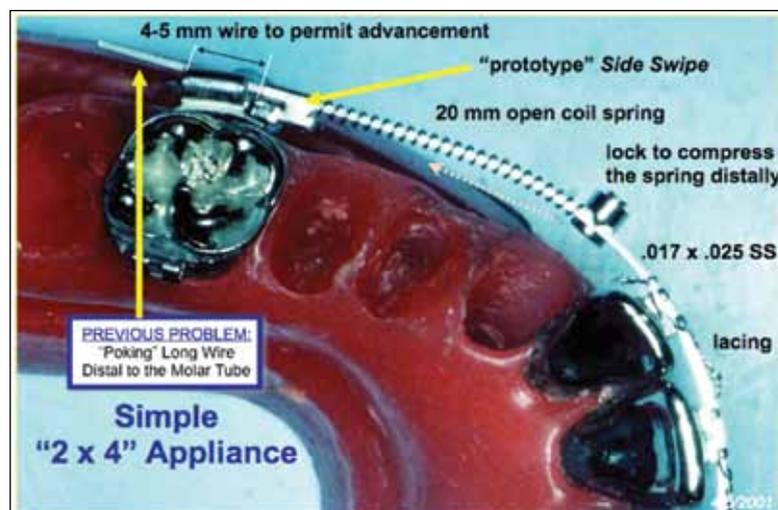


Fig. 3a

Quick Fix Device

The Quick Fix* device is based on a typical 2 x 4 edgewise appliance and was designed for effective and efficient advancement of the maxillary incisors.²⁴

The appliance consists of a rectangular stainless-steel arch wire, open coil springs, arch locks and Side Swipe auxiliaries.

Look for Part II of this article to appear in an upcoming edition of Ortho Tribune.

highly favorable for early intervention for these types of patients and the treatment time is usually less than nine months.

Previous advancement methods

In the past, a variety of appliances and orthodontic mechanics have been used to correct anterior crossbites in the transitional dentition.

This has included the use of inclined planes (both fixed and removable), chin-cups²⁰, Smart Wire fixed reverse labial bow²¹, protraction facemasks¹⁴⁻¹⁸, removable appliances with advancement springs and functional appliances.

One of the most common techniques is to use a simple edgewise appliance (tubes on the molars and brackets on the incisors) to advance the incisors into a normal overjet. The force to advance these teeth can be produced by bending "advancing"²⁵⁻⁸ or bulbous loops.

Another method involves compressing a rectangular super-elastic wire between the molar tube and incisor brackets (permitting the additional arch length to deflect away from the line of action), but this mechanism limits some control and may result in impingement of cheek mucosal tissues (Fig. 1a).

As an alternative, an open coil spring on a more rigid wire can be compressed against the molar tube to

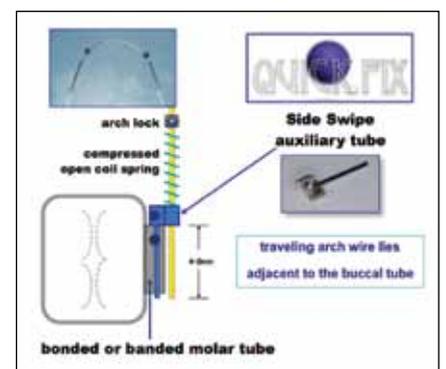


Fig. 3b

Figs. 3a, 3b: a) Sliding arch wire advancement of the incisors typically requires four to five millimeters of additional arch wire length extending distal to the molar or headgear tube that will 'poke' a patient's cheeks. b) Resolution of this problem was achieved by the development of the Side Swipe Auxiliary that permitted cutting the wire 'flush' to the molar tube while still providing the necessary 'travel' length for adequate incisor advancement.

push the incisors labially (Fig. 2). Most often, four to five millimeters of wire must travel through the molar edge-wise or headgear tube (e.g., bimetric arch^{22,23}; Fig. 1b) and that additional length of “traveling” wire may also create significant soft-tissue trauma and discomfort. An alternative was sorely needed.

Development of the Side Swipe Auxiliary

The intent of the so-called Side Swipe* Auxiliary was to eliminate painful “cheek poking” from the four to five millimeter extension of wire distal to the molar tubes (mentioned previously), yet still provide a sufficient length of “traveling” arch wire to track forward through molar tubes as the incisors are advanced (Fig. 5).²⁴

The original construction of the Side Swipe involved a segment of .0175” x .025” stainless-steel wire inserted through the shorter of the two tubes in a dual-tube rectangular auxiliary (a modification of the “auxiliary attachment”²⁵). Next, a tube with a soldered hook was placed onto the wire and was either “crimped” or spot-welded in place (Fig. 4a). This concept was later simplified and miniaturized into its current state (Fig. 4b; American Orthodontics, Sheboygan, Wis.). Application of the Quick Fix device will be described in Part 2 in our next issue. **OT**

(Editor’s notes: Bowman has a financial interest in the Quick Fix Kit. A complete list of references will appear with Part 2 of this article.)



Fig. 4a and 4b: a) Development of the Side Swipe began with a segment of .017” x .025” stainless-steel wire inserted into a dual tube auxiliary and followed by a crimpable hook. b) This evolved into the current pre-formed auxiliary tube.

OT About the author



Dr. Bowman is a diplomate of the American Board of Orthodontics, a member of the Edward H. Angle Society of Orthodontists, a fellow of both the American and International College of Dentists and the Pierre Fauchard Academy International Honor Organization, a charter member of the World Federation of Orthodontists and is a regent of the American Association of Orthodontists Foundation. He developed and teaches the Straightwire course at the University of Michigan, is an adjunct associate professor at Saint Louis University and is a clinical assistant professor at Case Western Reserve University. He received the Angle Research Award in 2000 and the Alumni Merit Award from Saint Louis University in 2005.

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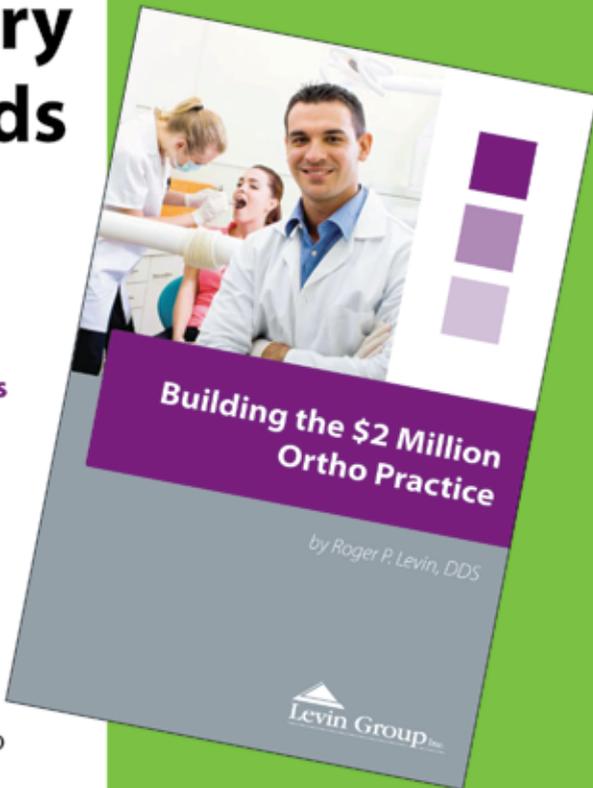
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