

The Bi-Helix Opening Spring for Lingual Orthodontics

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Unlike treatment with conventional labial brackets, lingual orthodontics relies on constriction mechanics, since the brackets are placed behind the center of resistance of the teeth. This makes space opening for the alignment of blocked-out anterior teeth one of the major challenges of lingual treatment. Insertion and compression of an open-coil spring are difficult and technique-sensitive due to the narrow interbracket distances, even if a labially blocked-out tooth is not tied in to the archwire. A compressed archwire can produce unwanted side effects and will also have to bypass the blocked-out tooth, thereby increasing treatment time.

An alternative to these methods, the bi-helix opening spring, is an inexpensive, custom-made auxiliary that is easily “clipped” into place after bonding and engagement of the blocked-out tooth, without removal of the archwire. Because alignment and space opening are performed simultaneously, treatment time is reduced. The spring can be attached to single or multiple teeth in either arch, and it has shown virtually no side effects.

Fabrication and Activation

1. Bend a small helix of approximately 1mm diameter in a straight .016" stainless steel wire with a small bird-beak or Jarabak plier.

2. After measuring the space needed between the first and second helices, mark the position of the second helix in the appropriate location on the wire (Fig. 1) and bend a second helix similar to the first.

3. Mark the legs of the spring with the locations of bends that will place the spring at the appropriate height, usually the gingival margin (Fig. 2).

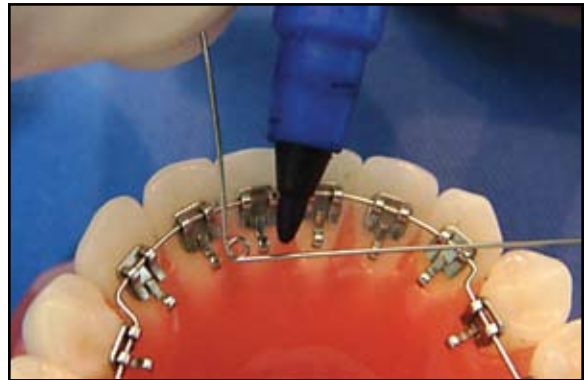


Fig. 1 Wire with first helix measured for placement of second helix.

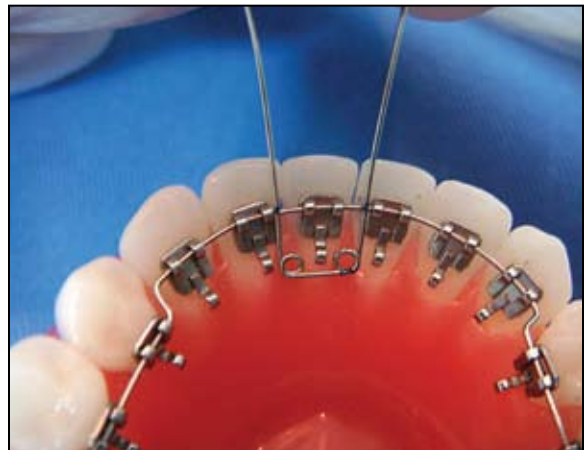


Fig. 2 Second helix formed and legs of spring marked for appropriate height of bends.



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Fig. 3 Legs of spring bent into J-hooks and excess wire cut off.



Fig. 4 Placement and activation of bi-helix opening spring.

4. Bend the legs into J-hooks and cut off the excess wire ends (Fig. 3).

5. Hook one leg of the spring over the archwire, compress the spring slightly to place the second leg, then close the hooks with a Weingart plier to activate the spring (Fig. 4).

6. Further activation can be added intraorally by bending the horizontal section between the helices with a three-prong or Tweed loop-forming plier.

Case Reports

Three cases show typical results using variations of the bi-helix opening spring in different situations.

Case 1 was a 45-year-old male with lower anterior crowding and a displaced lower left central incisor (Fig. 5A). Lingual brackets* were bonded from lower first premolar to first premolar, and an .012" nickel titanium archwire was placed (Fig. 5B). Four weeks later, a bi-helix opening spring was inserted. Figure 5C-F shows the patient's progress at four, eight, 12, and 16 weeks after spring placement.

Case 2, a 29-year-old female, presented with 4mm of lower anterior crowding, a lingually displaced lower left lateral incisor, and a labially displaced lower left central incisor (Fig. 6A). Lingual brackets* were bonded from lower second premolar to second premolar, and an .012" nickel titanium archwire was inserted (Fig. 6B). A bi-helix opening spring was added, spanning both of the displaced incisors (Fig. 6C). After eight weeks of treatment, alignment was nearly complete (Fig. 6D).

Case 3 shows a 54-year-old male with 4mm of upper anterior crowding and a lingually blocked-out upper right lateral incisor (Fig. 7A). Lingual brackets** were bonded from upper left second premolar to right first premolar, and an .012" nickel titanium archwire was tied in. A bi-helix opening spring was placed during the bonding

*2D Lingual Bracket, Forestadent, 2315 Weldon Parkway, St. Louis, MO 63146; www.forestadent.com.

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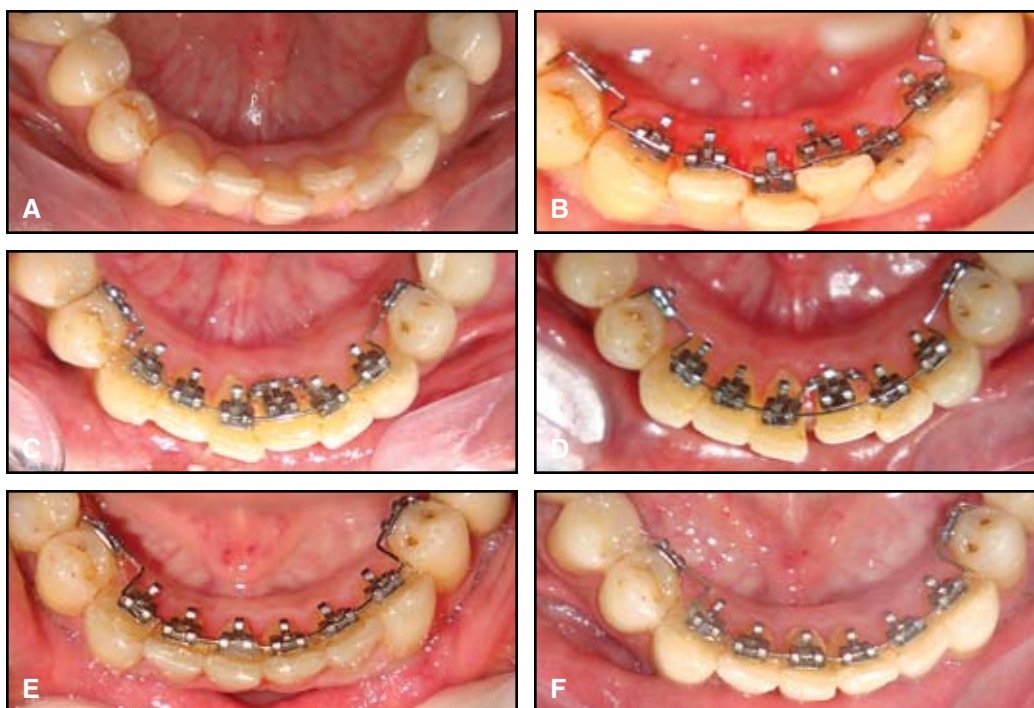


Fig. 5 Case 1. A. 45-year-old male patient with 4mm of lower anterior crowding and lingually displaced lower left central incisor. B. Lingual brackets* and .012" nickel titanium archwire in place. C. Space opening and alignment four weeks after placement of bi-helix opening spring. D. Spring reactivated eight weeks after correction. E. Spring removed 12 weeks after placement. F. Alignment and spontaneous closure of over-correction four weeks after spring removal.

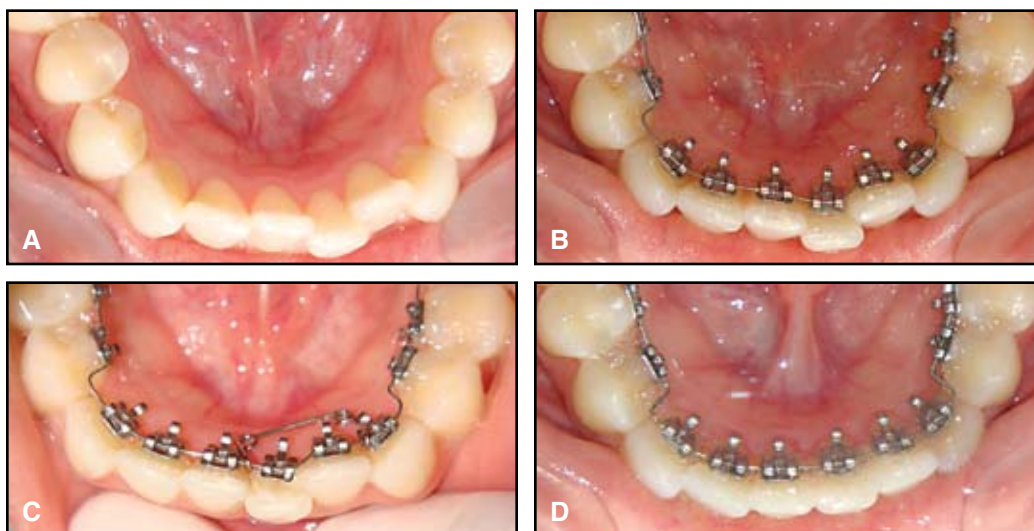


Fig. 6 Case 2. A. 29-year-old female patient with 4mm of lower anterior crowding, lingually displaced lower left lateral incisor, and labially displaced lower left central incisor. B. Lingual brackets* and .012" nickel titanium archwire in place. C. Bi-helix opening spring spanning both displaced incisors. D. Eight weeks later, alignment nearly complete.

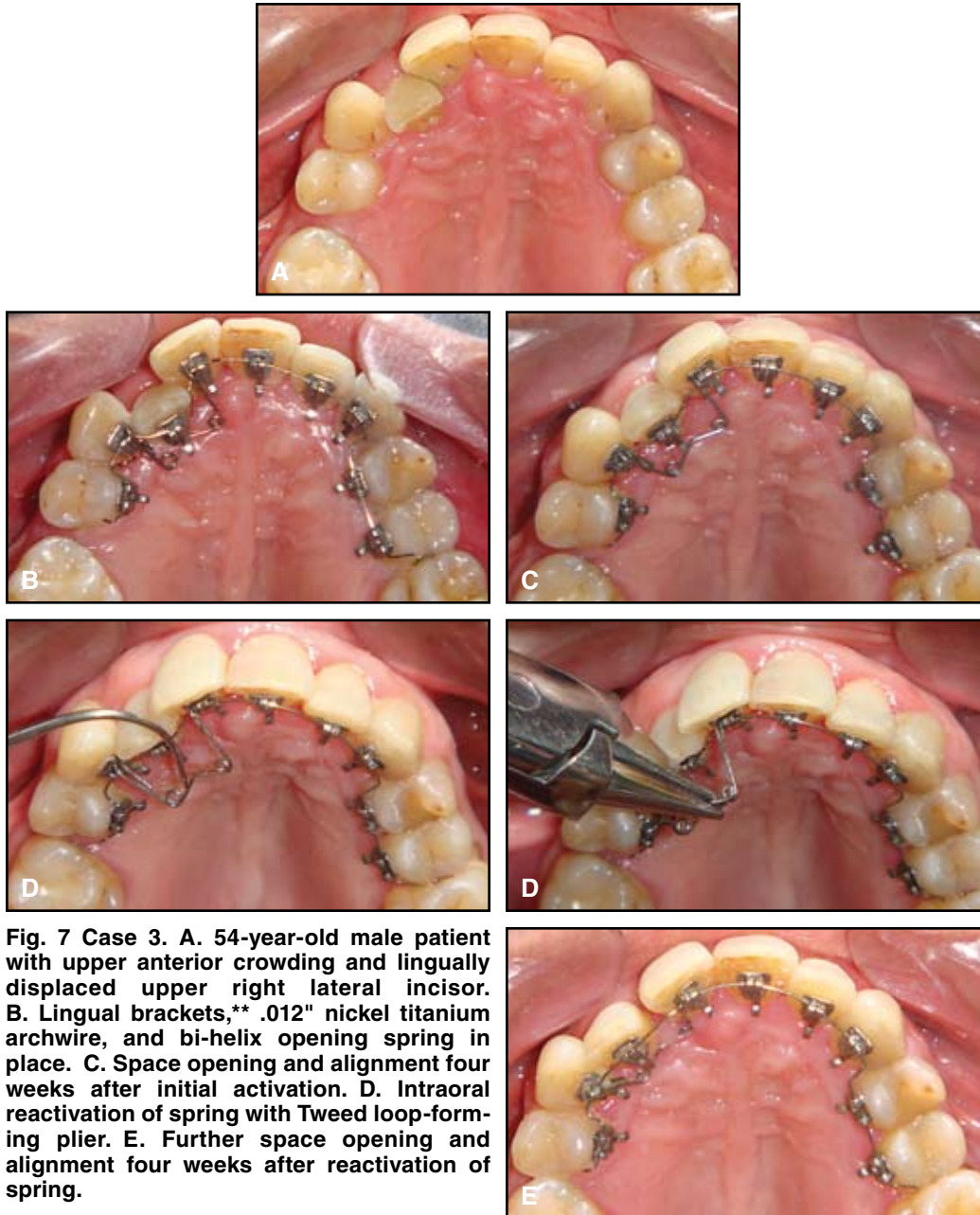


Fig. 7 Case 3. A. 54-year-old male patient with upper anterior crowding and lingually displaced upper right lateral incisor. **B.** Lingual brackets,** .012" nickel titanium archwire, and bi-helix opening spring in place. **C.** Space opening and alignment four weeks after initial activation. **D.** Intraoral reactivation of spring with Tweed loop-forming plier. **E.** Further space opening and alignment four weeks after reactivation of spring.

appointment and activated immediately (Fig. 7B). Four weeks later, significant space opening and alignment could be seen (Fig. 7C). An additional

**MiniAnts 2D Lingual Bracket, Forestadent, 2315 Weldon Parkway, St. Louis, MO 63146; www.forestadent.com.

activation was made intraorally using a Tweed loop-forming plier (Fig. 7D). Four weeks later, space opening was near completion, and alignment of the blocked-out lateral incisor had made good progress (Fig. 7E). □