

The Bite-Jumping Screw for Modified Twin-Block Treatment

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The original twin-block appliance was developed by Clark in 1982.¹ Various modifications have since been made, so that the appliance can be used in either Class II or Class III functional treatment.²⁻⁵

One of the drawbacks of the original design was the inconvenience of reactivating the appliance to achieve an edge-to-edge protrusive position for complete overjet reduction or overcorrection. De-Vincenzo and Winn have suggested a more gradual advancement of the bite,⁶ which theoretically produces a more orthopedic effect and better patient compliance by reducing tension in the craniomandibular musculature.⁶⁻⁹ Bass also suggested that gradual bite advancement would improve

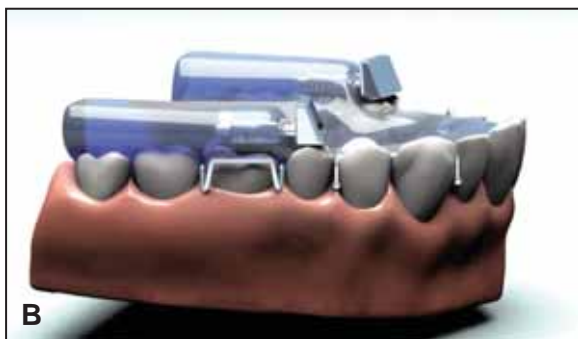
patient comfort at rest and during speech, and that it would be more likely to maintain the correct position of the appliance during sleep.¹⁰

We developed the bite-jumping screw* to simplify progressive bite advancement with the twin-block appliance. These screws are incorporated longitudinally in the upper bite blocks, with the screw heads at 70° angles to the lower bite blocks¹¹ (Fig. 1). The system allows a gradual, 6mm anteroposterior correction in either Class II (Fig. 2) or Class III cases.

*ForestadentUSA, 2301 Weldon Parkway, St. Louis, MO 63146; www.forestadentusa.com.



A



B

Fig. 1 A. Bite-jumping screw. B. Advancement screws incorporated in maxillary twin blocks.



Fig. 2 Gradual twin-block advancement with bite-jumping screws in Class II treatment.

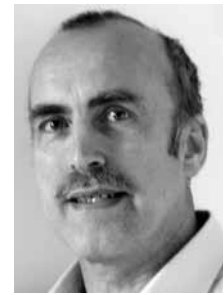
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Class II Treatment

A 9-year-old female was referred with a severe overjet (Fig. 3). She had a history of thumb-sucking, which she gave up before treatment.

Clinical examination showed an overjet of 13mm and an overbite of 5mm, with no contact between the lower incisors and the upper incisors or palate. The maxillary arch had anterior spacing

with flared incisors and was mildly constricted in the posterior region. Mandibular anterior crowding was combined with retroclined incisors. The molars and canines were in full-step Class II relationships.

The patient displayed lip incompetence at rest. Her convex profile was due to both a protrusive maxilla and a retrusive mandible, partially compensated for by a strong chin. The upper lip was

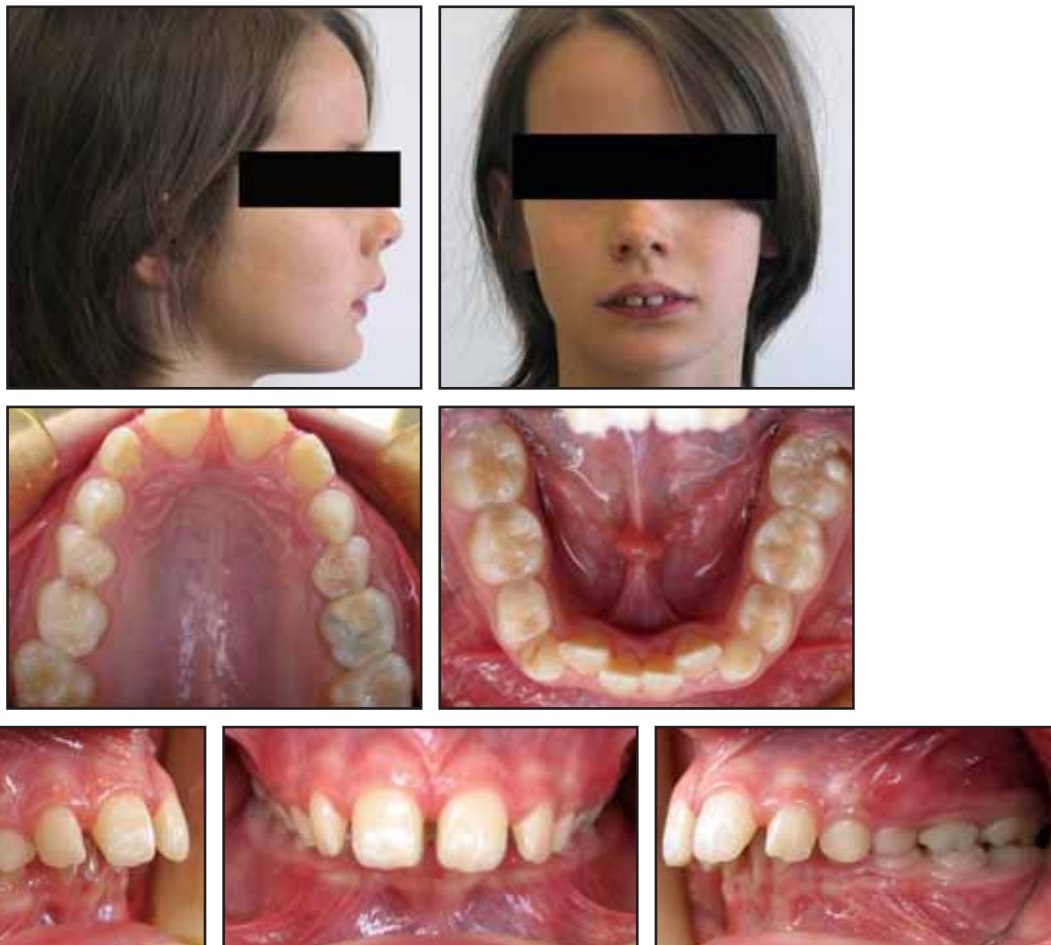


Fig. 3 9-year-old female patient with severe overbite and Class II malocclusion before treatment.



Fig. 4 Placement of twin-block appliance with bite-jumping screws.



Fig. 5 Immediate improvement in soft-tissue profile.

long, with a normal nasiolabial angle and a pronounced labiomental fold.

This patient was a good candidate for twin-block treatment with bite-jumping screws (Fig. 4). Her soft-tissue profile showed an immediate improvement after appliance placement (Fig. 5).

For optimal patient comfort, we recommend that the screw be activated 2mm after eight weeks of twin-block wear and 2mm after another eight weeks. If further correction is needed, there is still 2mm of advancement left in the system. With this

regime, the functional appliance can be worn 24 hours a day if necessary¹¹; we recommend a minimum of 14 hours a day.

Class III Treatment

Conventional twin blocks are especially difficult to reactivate in Class III cases. Bite-jumping screws built into the anterior acrylic plate of the maxillary Class III bite blocks allow easy gradual advancement (Fig. 6).

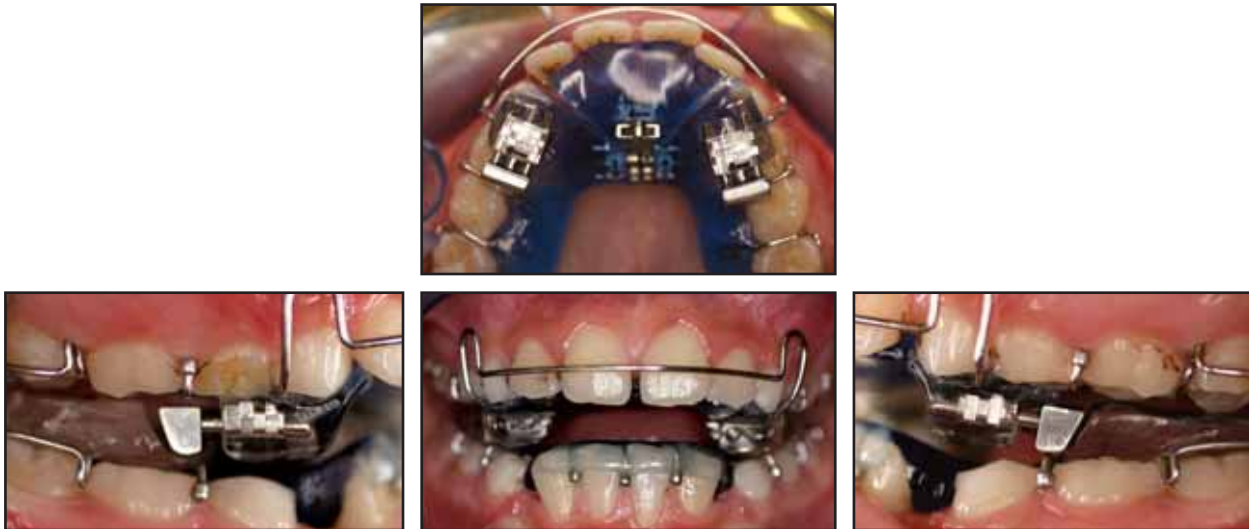


Fig. 6 Bite-jumping screws built into anterior acrylic plate of maxillary Class III bite blocks.

Conclusion

These bite-jumping screws are simple to manufacture in the lab and to handle at chairside. About 100 of the appliances are currently in use, and various clinical trials are in progress.

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REFERENCES

1. Clark, W.J.: The twin block traction technique, *Eur. J. Orthod.* 4:129-138, 1982.
2. Banks, P. and Carmichael, G.: Stepwise overjet reduction with a modified twin-block appliance, *J. Clin. Orthod.* 33:620-623, 1999.
3. Dyer, F.M.; McKeown, H.F.; and Sandler, P.J.: The modified twin block appliance in the treatment of Class II division 2 malocclusions, *J. Orthod.* 28:271-280, 2001.
4. Jena, A.K.; Duggal, R.; and Parkash, H.: Orthopedic and orthodontic effects of twin-block appliance, *J. Clin. Pediat. Dent.* 29:225-230, 2005.
5. Kidner, G.; DiBiase, A.; and DiBiase, D.: Class III twin blocks: A case series, *J. Orthod.* 30:197-201, 2003.
6. DeVincenzo, J.P. and Winn, M.W.: Orthopedic and orthodontic effects resulting from the use of a functional appliance with different amounts of protrusive activation, *Am. J. Orthod.* 96:181-290, 1989.
7. Banks, P.; Wright, J.; and O'Brien, K.: Incremental versus maximum bite advancement during twin-block therapy: A randomized controlled clinical trial, *Am. J. Orthod.* 126:583-588, 2004.
8. Chintakanon, K.; Turker, K.S.; Sampson, W.; Wilkinson, T.; and Townsend, G.: Effects of twin-block therapy on protrusive muscle functions, *Am. J. Orthod.* 118:392-396, 2000.
9. Falck, F. and Frankel, R.: Clinical relevance of step-by-step mandibular advancement in the treatment of mandibular retrusion using the Frankel appliance, *Am. J. Orthod.* 96:333-342, 1989.
10. Bass, N.M.: *Interceptive orthodontics*, European Orthodontic Society Congress, Brighton, England, 1996.
11. Clark, W.J.: *Twin Block Functional Therapy: Applications in Dentofacial Orthopaedics*, Mosby-Wolfe, London, 1995.