

Unlocking the Malocclusion with a Semifixed Bite Plate

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Vertical control is one of orthodontists' top priorities during treatment. In cases with deficient lower facial height and a strong musculature, however, it is sometimes impossible to bond the mandibular arch early in treatment because it is too difficult to open the bite.

Over the past 30 years, the Hawley plate¹ has become more popular as a retainer than as a bite plate used in conjunction with fixed appliances, as advocated by Strang,^{2,3} to treat deep-bite Class II, division 2 malocclusions. Hawley devices are cumbersome when worn with brackets, and often cause problems with oral hygiene, speech, and chewing.

Some orthodontists use lingual brackets to open the bite. Others, such as Philippe, bond composite lingually to the maxillary incisors to help open the bite in Class II, division 2 cases.⁴ The disadvantage of these approaches is that when the maxillary incisors are advanced to unlock the malocclusion, the mandibular incisors lose contact with their antagonists.

For some years, we have used Ballester's

bite plate, which is a semifixed Hawley-type appliance inserted in the palatal tubes of the maxillary first molar bands. This auxiliary is an incomparable tool for unlocking the malocclusion in three dimensions.

Construction

The parts of the appliance include:

- An anterior acrylic plate with an incisal plane that can be flat, inclined, or meshed between the opposing incisors, according to clinical requirements (Fig. 1).
- Two GAC standard 21-601-60 molar bands with welded horizontal palatal tubes.*
- Two .032" occlusal rests at the maxillary first premolars, used as vertical supports, which can be modified by adding .045" tubes or elastic hooks.
- Two .032" posterior arms, which are inserted in the palatal tubes of the maxillary first molar

*GAC International, Inc., 185 Oval Drive, Central Islip, NY 11722.

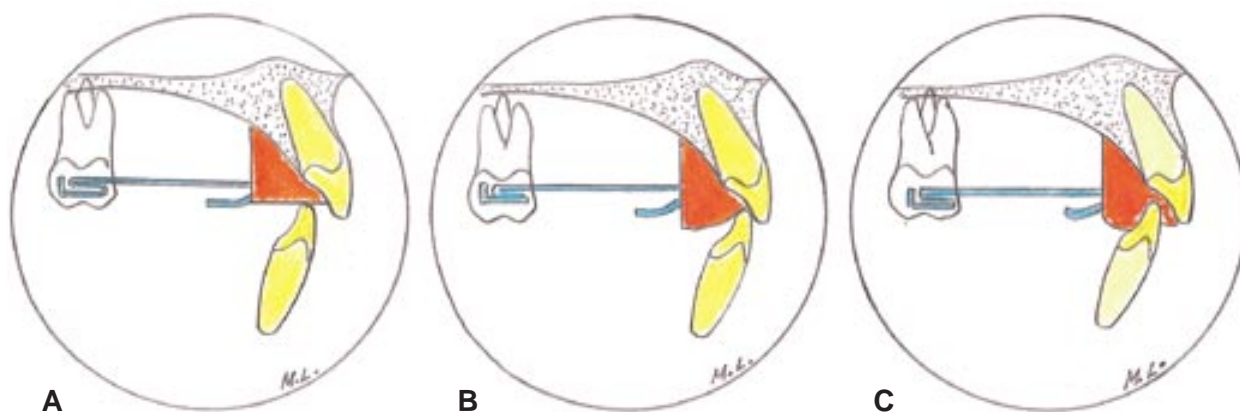


Fig. 1 Ballester's biteplane design depends on clinical needs. **A.** Flat plane used for incisor deprogramming and unlocking. **B.** Inclined plane used for disk capture. **C.** Meshed-incisor biteplane used to fixed CR and for tripodization or arch segmentation.

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bands.

For precise fitting of the appliance, the maxillary impression should be taken with the molar bands in place. After waxing the molar areas and pouring the plaster, the laboratory construction is as follows:

1. Bend the occlusal rests on each side from round .032" wire (Fig. 2A).
2. Bend the two posterior arms from round .032" wire. Attach them to the molar tubes with Blanc's locking bolts⁵ to ensure that the appliance is removable only by the clinician.
3. Draw the acrylic contours on the cast.
4. Varnish the anterior part of the cast.
5. Fix the anterior and posterior arms in place with wax, 1.5mm from the gingival margins (Fig. 2B).
6. Pour the acrylic resin.

7. Build up the incisor plane as desired (Figs. 1,2C).
8. Polymerize the acrylic resin (Fig. 2D).
9. Polish the appliance (Fig. 2E,F).
10. Check the appliance in the mouth, and adjust as necessary.

The bite plate can be inserted or removed with a How plier, but for initial placement it is advisable to cement the molar bands with the appliance already inserted in the palatal tubes.

Clinical Indications

Indications of Ballester's bite plate include:

1. Severe deep bite, particularly collapsed Class II, division 2 cases in which it is difficult to open the bite and hence to bond the mandibular arch without lengthening treatment time. Reverse-

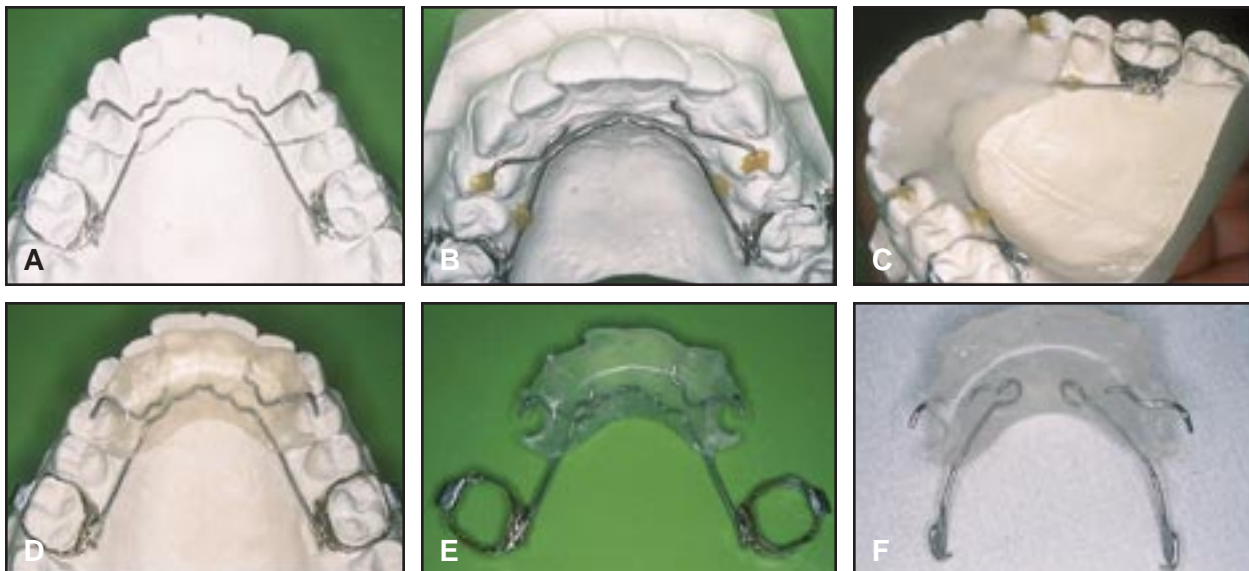


Fig. 2 Laboratory construction of Ballester's bite plate. A. .032" occlusal rests bent over maxillary first premolars; .032" posterior arms fixed to palatal tubes of molar bands. B. Anterior and posterior wires attached with wax, 1.5mm from gingival margins. C. Anterior biteplane built up with acrylic. D. After acrylic polymerization. E,F. Different versions of appliance after polishing.

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curve archwires, utility arches, and vertical anterior headgear are usually not as efficient as the bite plate, which allows immediate mandibular bonding and arch segmentation⁶ (Fig. 3).

2. Cases with deficient lower facial height and missing posterior teeth. Ballester's appliance opens the bite so the mutilated occlusion can be reconstructed.

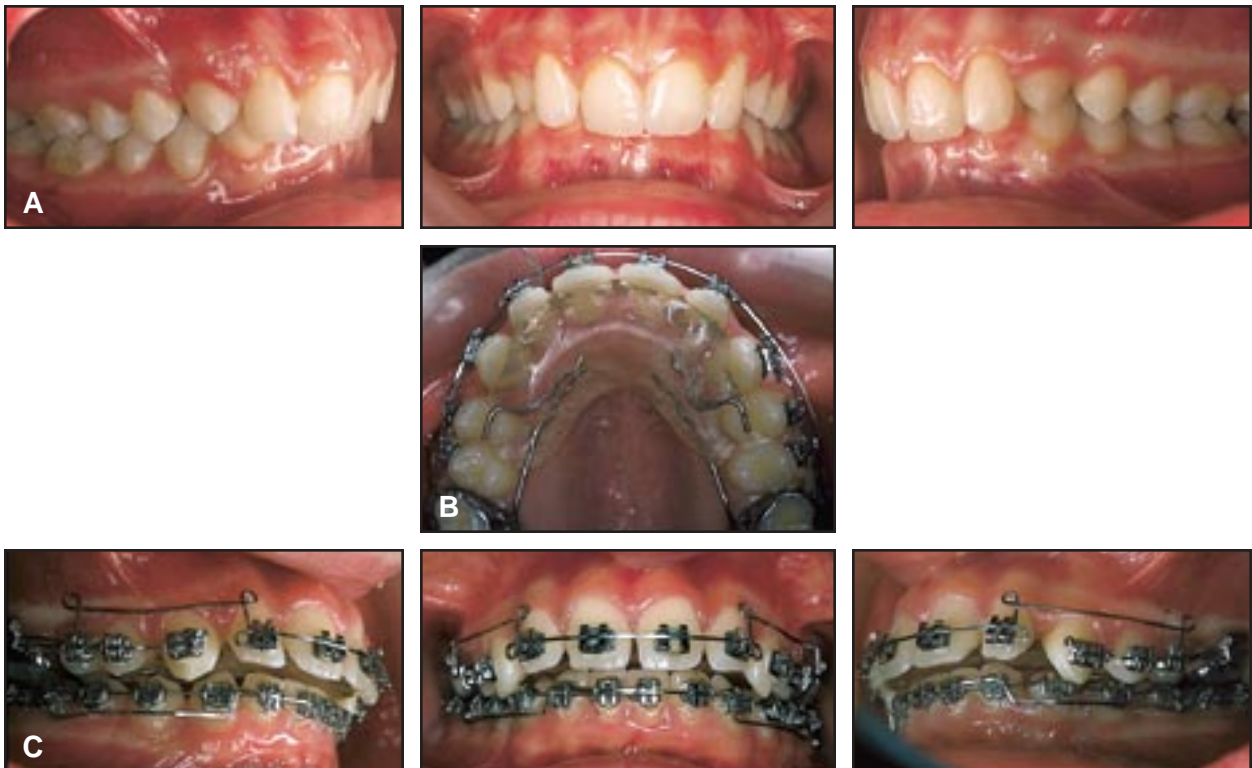


Fig. 3 A. Class II, division 2 patient with strong musculature and severe deep bite before treatment. B. Ballester's bite plate. C. Bite opened and Class II canine relationship corrected after three months of treatment.

3. Mandibular unlocking:

- Vertically, as described above.
- Transversely, to allow expansion of locked-in mandibular teeth.
- Sagittally, to allow mandibular protraction. In these cases, the bite plate is modified by welding .045" tubes to the occlusal rests to allow night-time insertion of a Langlade Reciprocal Mini-Chin Cup⁷ (Fig. 4). The appliance is used simultaneously with Class II and anteroposterior elastics, increasing the protraction effect on the mandibular arch.

4. Deprogramming of the occlusion in adult TMD cases. Ballester's bite plate is helpful because it's worn 24 hours a day. Once centric relation can be easily found and verified without pain, acrylic resin can be added to the bite plate

to fix CR.

5. Mandibular tripodization, as advocated by Grummons.⁸ This is done with the meshed-incisor biteplane design. After CR is secured, segmented archwires can be used to build a good lateral canine relationship.

6. Disc capture, according to Farrar's concept.^{9,10} The acrylic plane is extended from canine to canine and inclined forward to slightly protrude the mandible. Mandibular protrusion should be registered with a Moyco wax bite** just before the "closing click". In these cases, the appliance wear time is usually longer, depending on the patient age and clinical situation.

**Moyco Union Broach, 589 Davies Drive, York, PA 17402.

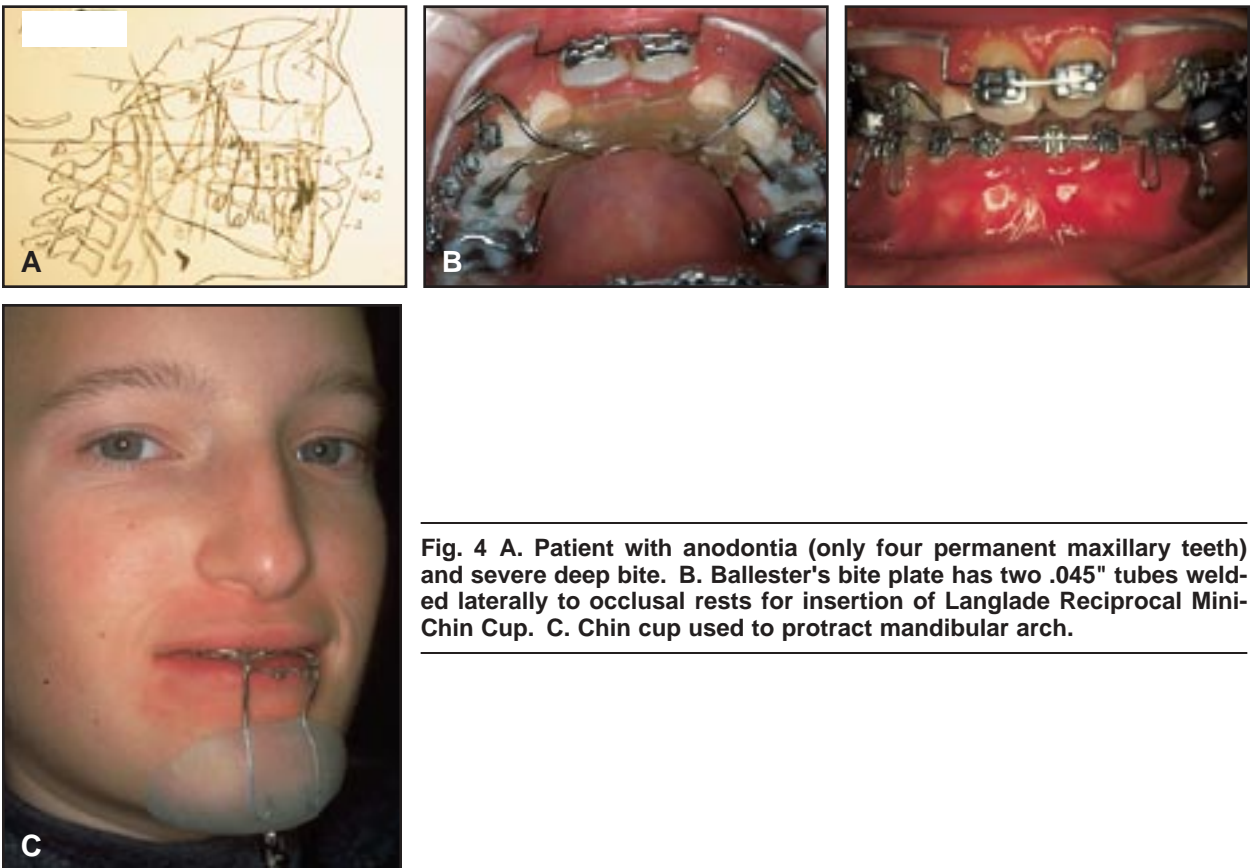


Fig. 4 A. Patient with anodontia (only four permanent maxillary teeth) and severe deep bite. B. Ballester's bite plate has two .045" tubes welded laterally to occlusal rests for insertion of Langlade Reciprocal Mini-Chin Cup. C. Chin cup used to protract mandibular arch.

Conclusion

Advantages of Ballester's bite plate include:

- Easily inserted and removed by the clinician.
- Not as cumbersome as a full palatal bite plate.
- Well accepted by both children and adults.
- Worn 24 hours a day, with the patient unable to remove it.
- Efficient at unlocking the mandible in three dimensions.
- Normal wear time of only two to three months in deep-bite cases with lower facial height less than three standard deviations below average.
- In growing patients, vertical unlocking of the TMJ allows sagittal mandibular growth, particularly in deep-bite Class II cases.
- In adult TMD patients, can be used for deprogramming, tripodization, or disc capture.
- In mutilated occlusions with severe deep bites and collapsed lower facial height, can sometimes avoid surgery.

REFERENCES

1. Hawley, C.A: Removable retainer, *Int. J. Orthod.* 5:291, 1919.
2. Strang, R.H.: *Textbook of Orthodontia*, 4th ed., Lea and Febiger, Philadelphia, 1958.
3. Korn, M.: Postural orthodontics, in *Orthodontics for the TMJ/TMD Patient*, ed. D. Grummons, Wright and Co., Arizona, 1994, pp. 249-280.
4. Philippe, J.: *La Récidive et la Contention Post-Orthodontiques*, SID, Paris, 2000.
5. Langlade, M.: *Optimisation Transversale*, Maloine, Paris, 1998.
6. Ricketts, R.M.: *Perception in Craniofacial Orthopedics*, vols. 1 and 2, Rocky Mountain Orthodontics, Denver, 1989.
7. Langlade, M.: Reciprocal Mini-Chin Cup for selected Class II malocclusions, *J. Clin. Orthod.* 31:787-798, 1997.
8. Grummons, D.: *Orthodontics for the TMJ/TMD Patient*, Wright and Co., Arizona, 1994, chapters 6, 7.
9. Farrar, W.B. and McCarty, W.L.: *A Clinical Outline of Temporomandibular Joint Diagnosis and Treatment*, Normandie Publications, Montgomery, AL, 1983.
10. Fricton, J.R.; Kroenig, R.J.; and Hathaway, K.: *TMJ and Craniofacial Pain: Diagnosis and Management*, Ishiyaku EuroAmerica Publishers, Pacific, MO, 1988.
11. Berliner, A.: *Ligatures, Splints, Bite Planes and Pyramids*, Lippincott Co., Philadelphia, 1964, pp. 122-173.
12. Gelb, H.: *TMJ Procedure Manual*, Masel, Bristol, PA, 1986.
13. Farha, K.F.: Sved appliance in intra oral orthodontics, *Cranio. Clin. Int.* 1:122-141, 1991.
14. Zarb, G.A.; Bergman, N.B.; Clayton, J.; and McKay, H.: *Prosthodontic Treatment for Partially Edentulous Patients*, C.V. Mosby Co., St. Louis, 1978, chapter 8.
15. Okeson, J.P.: *Management of Temporomandibular Disorders and Occlusion*, C.V. Mosby Co., St. Louis, 1989, chapter 16.
16. Ramfjord, S.P. and Ash, M.: *Occlusion*, 2nd ed., W.B. Saunders, Philadelphia, 1971, pp. 231-256, 313-344.
17. Langlade, M.: *Optimization of Orthodontic Elastics*, GAC International, Central Islip, NY, 2000.