

CASE REPORT

Interdisciplinary Treatment of a Class II Deep-Bite Patient with Missing and Impacted Teeth

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This 14-year-old male presented with a bilateral dental and skeletal Class II relationship (with the mandible about 7mm retrognathic), a severe anterior deep bite, and a crossbite of the maxillary right first molar (Fig. 1). He had a slightly gummy smile, a round, wide face, and a good nasolabial angle and chin profile. The maxillary incisors were at 100° to the bispal plane, and the mandibular incisors at 97° to the mandibular plane.

The patient's maxillary lateral incisors and all four third molars were missing. The maxillary right canine was impacted, and the mandibular left canine was impacted in a nearly hori-

zontal position. The deciduous maxillary right lateral incisor and cuspid and left cuspid were still present, while the maxillary left canine was in the position of the lateral incisor.

The objectives of treatment were to obtain a dental and skeletal Class I relationship, a good archform without the deep bite, an esthetic smile displaying four maxillary incisors, a harmonious profile, and more space for the tongue (to reduce the likelihood of snoring).

Presurgical Orthodontics (1½ years)

Both arches were bonded, and a maxillary Quad Helix* and

mandibular lingual arch were placed (Fig. 2). A few days later, the horizontally impacted mandibular left canine was extracted, and a bracket was bonded to the impacted maxillary right canine under local anesthetic.

Alignment of both arches was carried out along with opening of the mandibular left canine space. Once the maxillary right canine had been brought into the arch, the maxillary lateral incisor spaces were opened, and the axes of the central incisors were corrected with open-coil springs. Just before surgery, the Quad Helix was replaced by a rapid palatal expander (Fig. 3).

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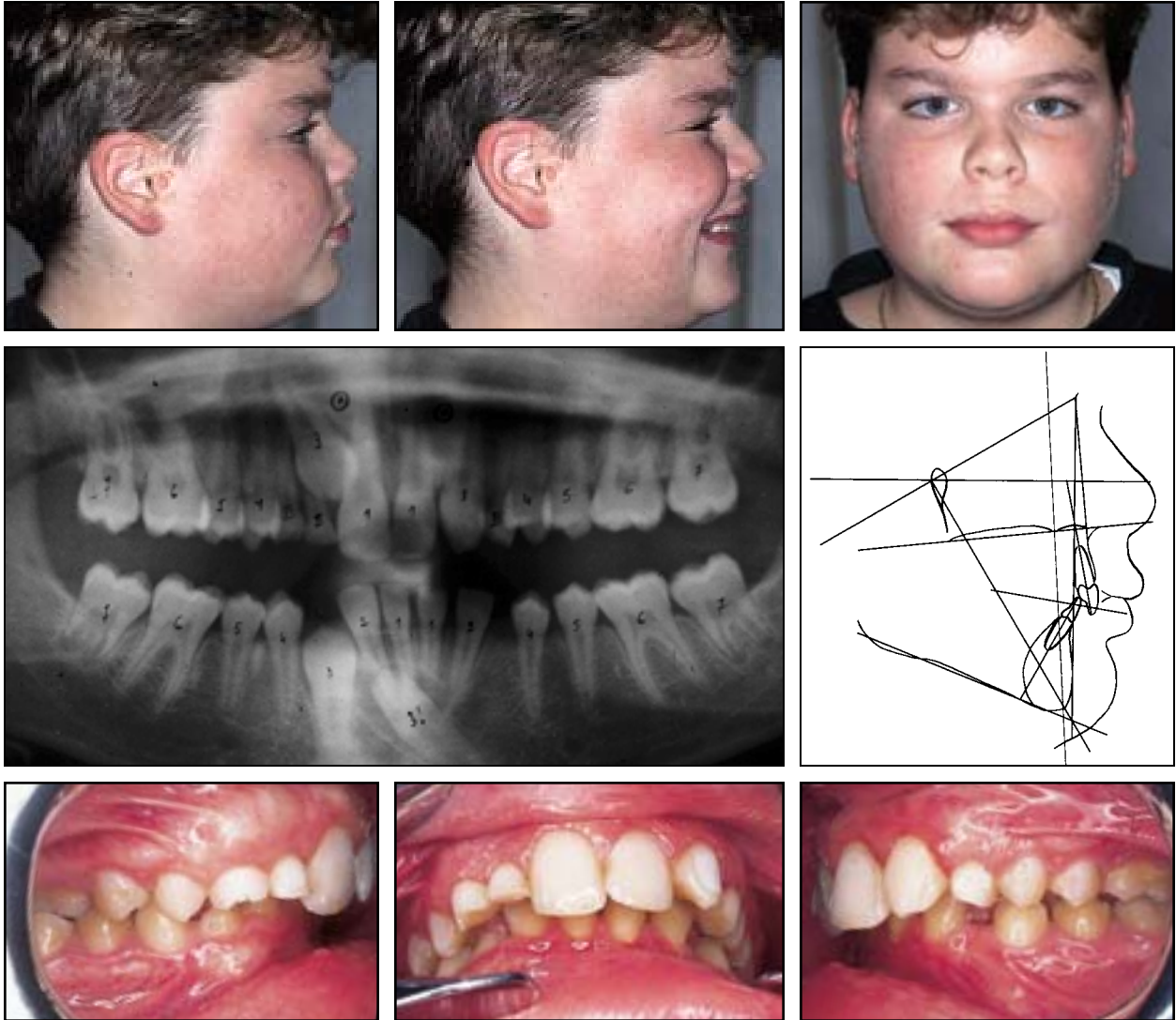


Fig. 1 14-year-old Class II patient with deep bite and missing and impacted teeth before treatment.



Fig. 2 Placement of Quad Helix and alignment of maxillary arch.



Fig. 3 Placement of rapid palatal expander after initial opening of maxillary lateral incisor spaces.

**Surgical Phase
(Dr. Lejuste)**

Oral surgery consisted of:

- A sagittal osteotomy of the mandible (skeletal and dental bilateral Class I) and correction of the deep bite (advancement of 5mm), fixed by bicortical screws on both sides (Fig. 4).
- A mucoperiosteal flap at the gingival margins to allow surgically assisted maxillary expansion without osteosynthesis, and a floating Le Fort I osteotomy, in which the maxilla, in two parts,

is held only by the intersinusnasal wall and the expander, without a plate or screws.

- Placement of an implant** in the space of the mandibular left canine.

**Post-Surgical Orthodontics
(1 year)**

Vertical elastics were worn between the buccal segments 24 hours a day to help settle the occlusion. Rapid palatal expansion

**Steri-oss 2916 TPS, diameter 3.8mm, length 16mm.

produced a space of about 4mm between the maxillary central incisors (Fig. 5). The maxillary archwire was cut mesial to the canines, and a sectional .016" archwire was placed between the second premolars for two months.

An elastomeric chain between the central incisors gradually closed the anterior space. As soon as possible, pontics with bonded brackets were tied on the .016" × .022" main archwire to improve esthetics and speech (Fig. 6).



Fig. 4 A. After one and a half years of presurgical orthodontic treatment. B. Simulation of forward repositioning of mandible.



Fig. 5 Opening of 4mm space between maxillary central incisors after surgery and maxillary expansion.



Fig. 6 After space closure with elastomeric chain between maxillary central incisors, placement of two pontics on .016" × .022" wire in reopened spaces of maxillary lateral incisors.



Fig. 7 A. Laser CO₂ surgery used to eliminate excess gingiva between maxillary central incisors. **B.** Healing after 10 days.

Further surgery using laser CO₂ (Dr. Genin) was needed to eliminate the frenum and the interdental gingival excess (Fig. 7). This technique has the advantages of almost no bleeding and no sutures.

The most difficult problem was to upright the axes of the maxillary central incisors and canines. Implants were scheduled later, but are not recommended in the maxillary anterior area of a male patient before age 18. Therefore, new brackets with high hooks were bonded for attachment of elastics between the two central incisors and from the molars to the canines (Fig. 8).

Seven months after surgery, the implant was loaded with a temporary crown. Four months later, all the brackets were debonded (Fig. 9), and a positioner was delivered. Another month later, an .015" twisted mandibular lingual retainer was bonded.

Prosthetic Finishing (Dr. Devreux)

Finally, two and a half years after the beginning of treatment and one year after surgery, Maryland bridges were bonded to the left and right maxillary anterior segments, and a permanent crown was cemented to the implant, to achieve proper esthetics and stabilize the bite (Fig. 10).



Fig. 8 Elastic hooks used to correct axes of maxillary central incisors and canines; temporary crown on mandibular left canine implant.

Treatment Results

The orthodontist often acts as coordinator when interdisciplinary treatment is required. In this case, orthodontics, surgery, prosthetics, and periodontology all combined to achieve the treatment goals: a bilateral Class I relationship, correction of the anterior deep bite, an esthetic smile displaying four incisors, and a harmonious profile.

During the final weeks of treatment, the patient lost more than 40 pounds—perhaps because of the improvement in his facial appearance (Fig. 9).

REFERENCES

1. Andrews, L.A.: JCO Interviews on the Straight-Wire Appliance, *J. Clin. Orthod.* 24:493-508, 1990.
2. Bert, M.; Picard, B.; and Toubol, J.P.: *Abrégé Implantologie*, Masson, Paris, 1992, pp. 493-508.
3. Brancart, A.: L'orthodontiste, élément coordinateur dans un traitement pluridisciplinaire, *Rev. Orthop. Dentofac.* 31:249-255, 1997.
4. Brancart, A.: Synergie orthodontie-implantologie, *Dentist News*, November 1992, pp. 5-7.
5. Bränemark, P.I.; Zabre, G.A.; and Albrektsson, T.: *Prothèses Ostéo-*

Intégrées: L'ostéointégration en Pratique Clinique, CdP, Paris, 1988.

6. Cunningham, S.J.; Hunt, N.P.; and Feinmann, C.: Psychological aspects of orthognathic surgery: A review of the literature, *Int. J. Adult Orthod. Orthog. Surg.* 10:159-172, 1995.
7. Epker, B.N.: Modification in the sagittal osteotomy of the mandible, *J. Oral Surg.* 35:157, 1977.
8. Jacobs, J.D. and Sinclair, P.M.: Principles of orthodontic mechanics in orthognathic surgery cases, *Am. J. Orthod.* 84:399-407, 1983.
9. Kirkpatrick, T.B.; Woods, M.G.; Swift, J.Q.; and Markowitz, N.R.: Skeletal stability following mandibular advancement with rigid fixation, *J. Oral Maxillofac. Surg.* 45:572-576, 1987.
10. Klein, J.C.: Nasal respiratory function and craniofacial growth, *Arch. Otolaryngol. Head Neck Surg.* 12:843-849, 1986.
11. Tompach, P.; Wheeler, J.; and Fridrich, K.: Orthodontic considerations in orthognathic surgery, *Int. J. Orthod. Orthog. Surg.* 10:97-107, 1995.
12. Sabri, R.: Objectifs orthodontiques en chirurgie orthognathique, *Rev. Orthop. Dentofac.* 29:319-335, 1995.
13. Woods, M.G.: Re: A retrospective study of relapse in rigidly-fixated sagittal split osteotomies: Contributing factors, *Am. J. Orthod.* 94:446-447, 1988.
14. Woods, M.G.; Wiesenfeld, D.; and Probert, T.C.S.: Surgically-assisted maxillary expansion, *Austral. Dent. J.* 42:38-42, 1997.
15. Zachrisson, B.U.: JCO Interviews on Excellence in Finishing, Part 2, *J. Clin. Orthod.* 20:536-556, 1986.

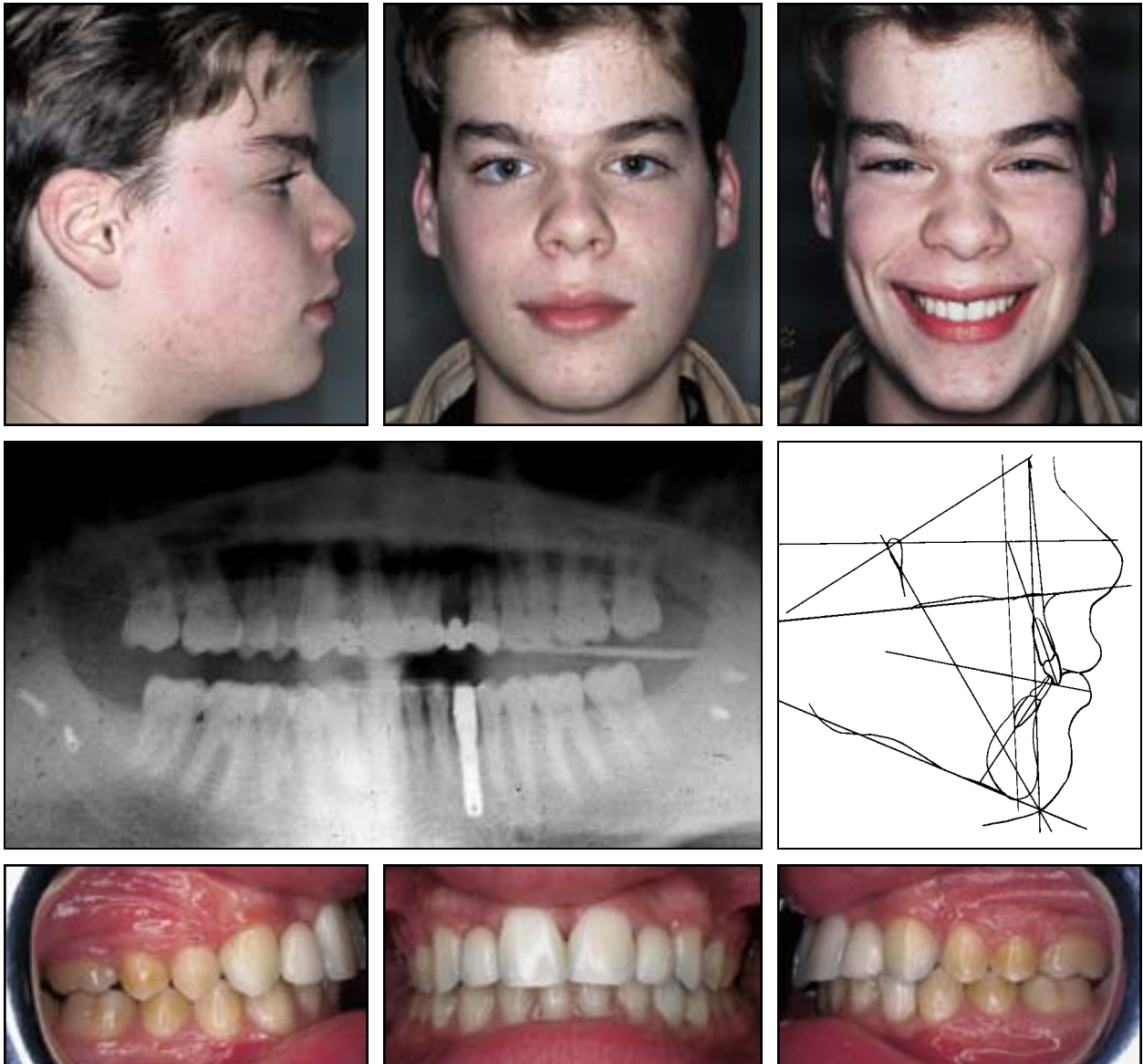


Fig. 9 After one year of post-surgical orthodontic treatment, Class I occlusion achieved without deep bite. Notice loss of weight and improved facial appearance.



Fig. 10 Maryland bonded bridges in maxillary anterior segments; permanent crown on mandibular left canine implant.