

CASE REPORT UPDATE



Original Article: [10.1016/j.ajodo.2016.09.031](https://doi.org/10.1016/j.ajodo.2016.09.031)

This article is a 7-year post-treatment follow-up from a patient with a skeletal Class II relationship who presented with a severe brachyfacial pattern, a narrow middle and lower pharyngeal airway space, severe deep overbite and overjet, and the presence of several old single metal-ceramic crowns in both arches. A multidisciplinary treatment care was developed, achieving a molar and canine Class I relationship and a good overbite and overjet. The total volume and area of the pharyngeal airway space increased, and the patient's snoring ceased. Photographic and radiographic records 7 years after the completion of treatment showed good facial esthetics, occlusion, and oral health. (Am J Orthod Dentofacial Orthop Clin Companion 2024;4:64-8)

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[10.1016/j.xaor.2023.11.001](https://doi.org/10.1016/j.xaor.2023.11.001)

Miniscrew-assisted multidisciplinary orthodontic treatment with surgical mandibular advancement and genioplasty in a patient with a brachyfacial Class II relationship with mandibular asymmetry: A 7-year posttreatment update

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This patient initially presented with skeletal and dental Class II occlusion with a severe brachyfacial pattern and a narrow middle and lower pharyngeal airway space.¹ A multidisciplinary treatment plan was developed. The initial phase involved preoperative orthodontic treatment. Nonsurgical periodontal treatment was performed. The mandibular third molars and the mandibular left first molar were extracted; the right first molar was maintained and kept under observation. The old distressed single metal ceramic crowns were replaced by provisional resin crowns. A 0.022 × 0.028-in slot preadjusted appliance (MBT prescription) was placed. One miniscrew was inserted at the second quadrant to correct occlusal plane canting, and two more were placed in the mandibular incisor area to prevent intrusion of the incisors.

The second phase consisted of a bilateral asymmetric sagittal split osteotomy for mandibular advancement with genioplasty.

Finally, postoperative orthodontic treatment was continued until optimal occlusion was obtained. The esthetic rehabilitation to replace the old crowns used the Digital Smile Design protocol. Mandibular first molar implants and maxillary ceramic crowns were placed at this time. Treatment finished with molar and canine Class I relationships and a good overbite and overjet. The chronic mild periodontitis



Fig 1. Seven-year postretention facial and intraoral photographs.

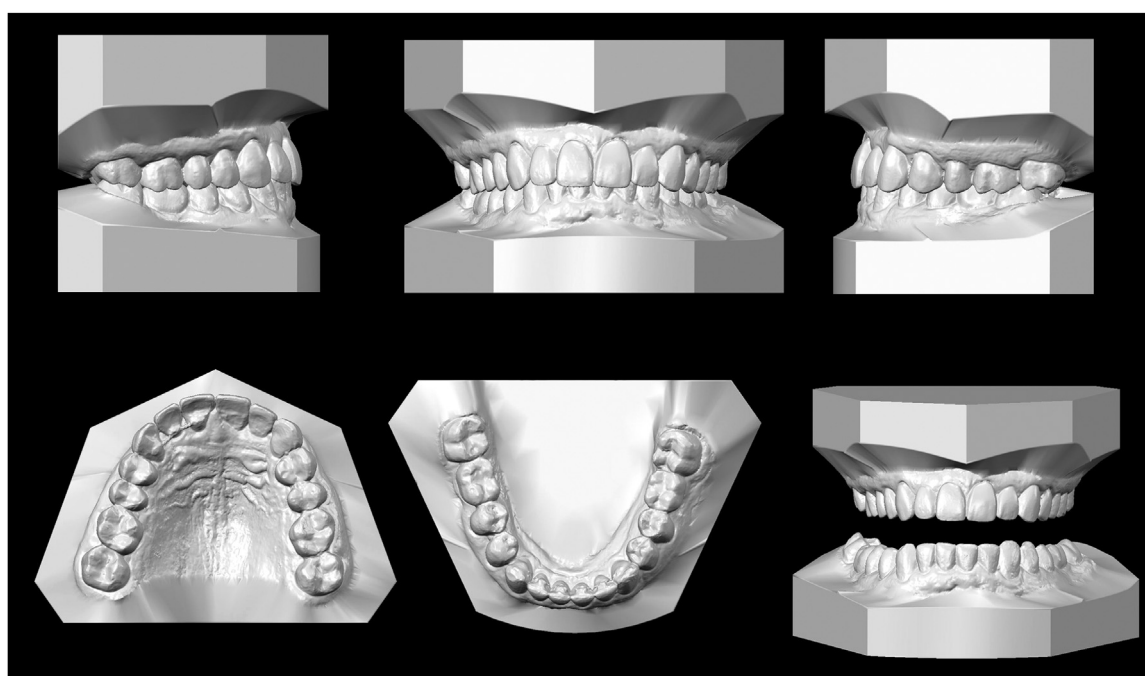


Fig 2. Seven-year postretention digital models.

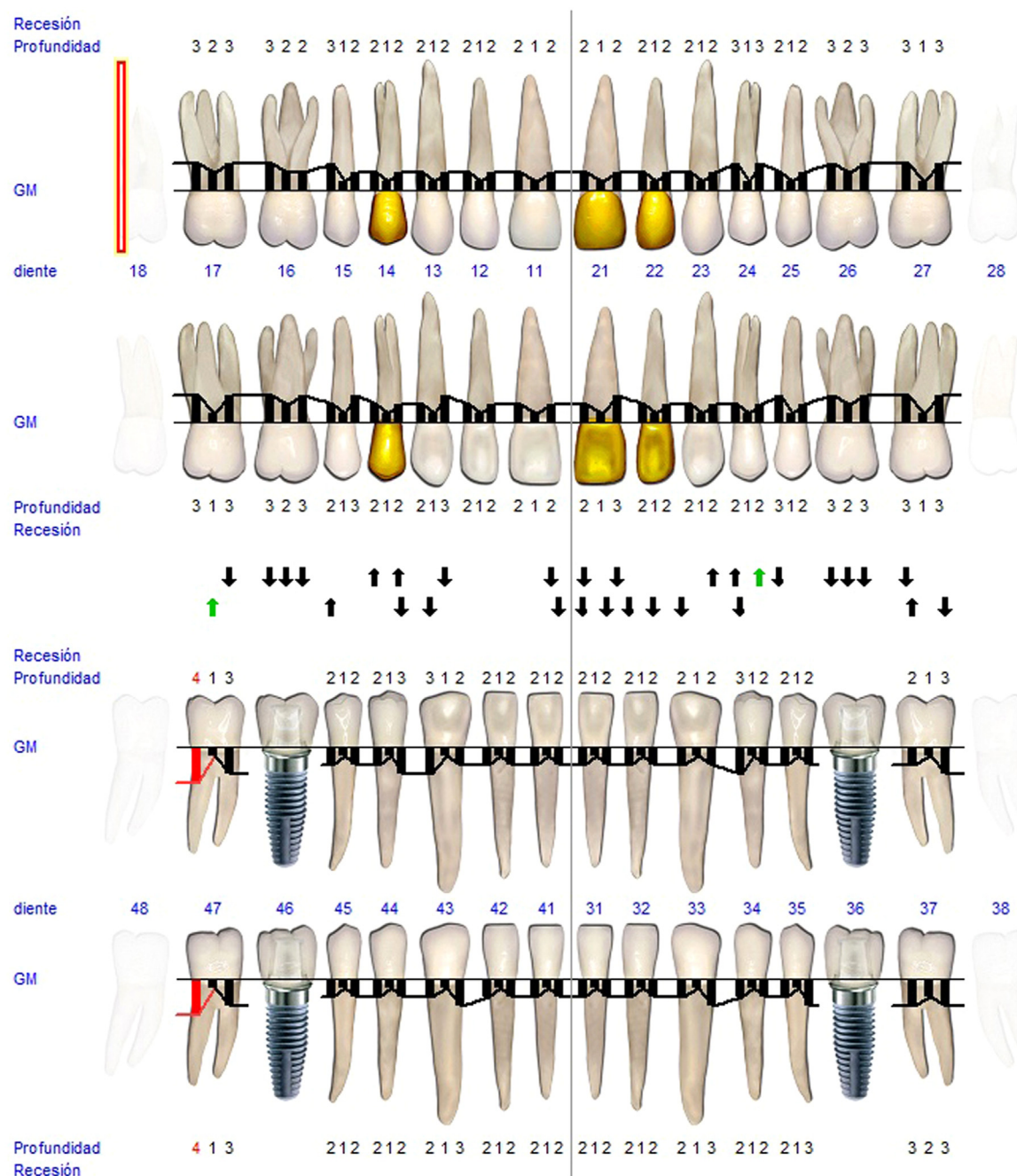


Fig 3. Seven-year postretention periodontogram.

improved, and all papillae recovered. After the mandibular advancement surgery, the total volume and area of the pharyngeal airway space increased, and the patient's snoring ceased. A satisfactory facial profile was obtained, showing a balanced and harmonious face.

Retention protocol included fixed canine-to-canine lingual retainers on both arches and a maxillary circumferential Hawley retainer to be worn at night. The patient returned 7 years after removing the orthodontic appliances. The patient strictly followed the instructions and reported 8-hour retainer wear at night. The facial esthetics and occlusion achieved at the

end of treatment have been maintained. Overbite increased by 1.5 mm after the end of treatment, and the maxillary fixed lingual retainer was broken (Figs 1 and 2). Furthermore, the chronic mild periodontitis was stable (Fig 3). The postretention radiographs showed no changes compared with the posttreatment analysis (Fig 4).

In this patient, the most important concerns are related to overbite relapse, the snoring problem and the narrow middle and lower pharyngeal airway space, the plate infection, and the stability of the mandibular advancement.

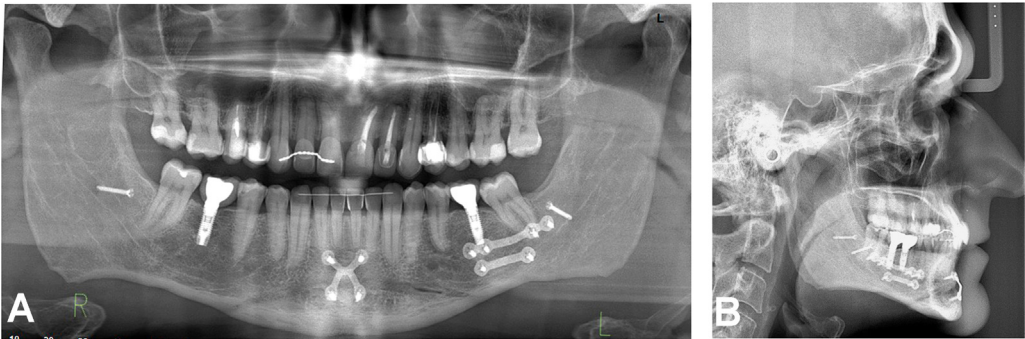
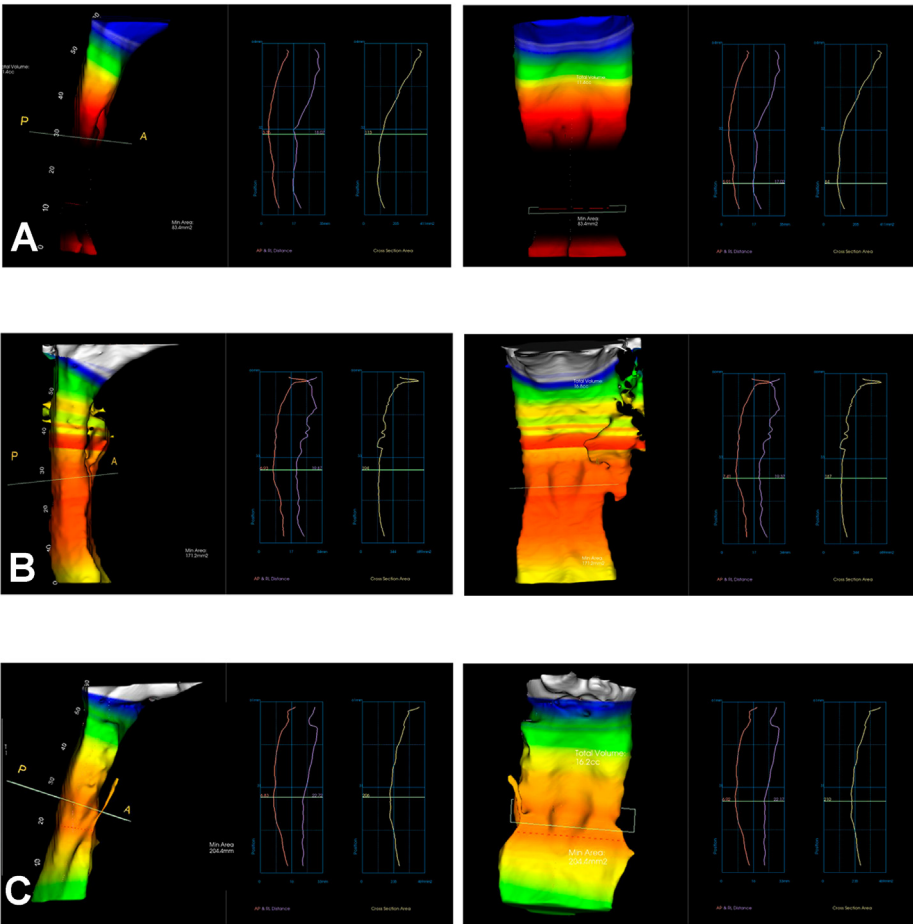


Fig 4. Seven-year postretention radiographs. **A**, Seven-year postretention panoramic radiograph; **B**, Seven-year postretention lateral cephalogram.



	PRETREATMENT	POSTTREATMENT	POSTRETENTION (7y)
Total Volume (cm ³)	11.4	16.8	16.2
MSP (mm)	3.4	6.9	6.8
MCP (mm)	17.0	19.4	22.2
MCA (mm ²)	83.4	171.2	204.4

MSP, Minimum sagittal plane; MCP, Minimum coronal plane; MCA, Minimum cross-sectional area

Fig 5. Airway evaluation chart. **A**, Pretreatment; **B**, Posttreatment; **C**, 7-year follow-up.

A severe brachyfacial pattern with a deep overbite and increased curve of Spee presents complex orthodontic problems, especially in a skeletal Class II. Therefore, intrusion of the mandibular incisors with miniscrews was considered to be a very good option for improving the excessive overbite because it has proven to be a stable treatment.² Nevertheless, overbite has relapsed 1.5 mm partially because of a severe brachyfacial pattern.

The snoring problem ceased afterward and has not reappeared. This may be due to the increase in the total volume and area of the pharyngeal airway space after the mandibular advancement that has remained stable (Fig 5). This increase is considered stable after mandibular advancement surgery in patients with skeletal Class II malocclusion.³

Because the patient had an infection of the plate on the right side, another concern was that the other plate would become infected. According to the literature, 13.4% of the patients who had undergone orthognathic surgery required the removal of at least one titanium plate, infection being the main reason.⁴ After the retention period, there was no infection, probably because the mandibular left first molar with the periapical lesion was extracted at the beginning of the treatment, unlike the molar on the right side.

Mandibular advancement was found to be very stable in this patient. Although long-term skeletal relapse cannot be avoided entirely, understanding the independent risk factors and their contributions will optimize treatment planning and long-term stability.⁵

AUTHOR CREDIT STATEMENT

Vanessa Paredes-Gallardo contributed to treatment and manuscript review and editing; Verónica García-Sanz

contributed to manuscript review and editing; and Carlos Bellot-Arcís contributed to supervision and manuscript review and editing.

CONFLICTS OF INTEREST

All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest, and none were reported.

STATEMENT OF INFORMED CONSENT

Informed consent was obtained by the patient.

References

1. Paredes-Gallardo V, García-Sanz V, Bellot-Arcís C. Miniscrew-assisted multidisciplinary orthodontic treatment with surgical mandibular advancement and genioplasty in a brachyfacial Class II patient with mandibular asymmetry. *Am J Orthod Dentofacial Orthop* 2017;152:679-92.
2. Paredes-Gallardo V, Bellot-Arcís C, García-Sanz V. Miniscrew mechanics for molar distalization and incisor intrusion in a patient with a Class II brachyfacial pattern and gummy smile. *Am J Orthod Dentofacial Orthop* 2020;158:273-85.
3. Pereira PKN, de Castro Rocha VÁ, Degan VV, Garib DG, Vedovello SAS, de Menezes CC. Upper airways after mandibular advancement orthognathic surgery: a 4-year follow-up. *Am J Orthod Dentofacial Orthop* 2021;159:743-9.
4. Gómez-Barrachina R, Montiel-Company JM, García-Sanz V, Almerich-Silla JM, Paredes-Gallardo V, Bellot-Arcís C. Titanium plate removal in orthognathic surgery: prevalence, causes, and risk factors. A systematic literature review and meta-analysis. *Int J Oral Maxillofac Surg* 2020;49:770-8.
5. Chen Y, Zhang J, Rao N, Han Y, Ferraro N, August M. Independent risk factors for long-term skeletal relapse after mandibular advancement with bilateral sagittal split osteotomy. *Int J Oral Maxillofac Surg* 2020;49:779-86.