

CASE REPORT

Surgical-Orthodontic Treatment of Class II Malocclusion with Maxillary Vertical Excess

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Adult patients with skeletal Class II malocclusion usually require a combination of orthodontic and orthognathic surgical treatment.¹⁻⁷ Surgery can sometimes be avoided with dental compensation or orthodontic camouflage by means of extractions, but the results are generally not as satisfactory.⁸ This article describes surgical-orthodontic treatment of an adult patient with a Class II malocclusion caused by excessive maxillary vertical growth.

Diagnosis

A 31-year-old female pre-

sented with the chief complaints of protruding maxillary anterior teeth and a gummy smile (Fig. 1). Initial examination revealed moderate crowding with a maxillo-mandibular tooth-size discrepancy of -3mm, a bilateral Class II molar relationship, a severe overbite, and a 12mm overjet. Both arches were constricted, but there was no crossbite. The maxillary and mandibular midlines were both deviated to the left, the former by 1mm and the latter by 4mm. The incisors of both arches were protrusive relative to the basal bone.

Facial analysis confirmed a maxillomandibular skeletal discrepancy due to excessive vertical growth. The consequences were a pronounced gummy smile, lip incompetence with muscular hypotonia, and a convex profile with mandibular retrusion. The initial cephalometric tracing confirmed the skeletal problems (ANB = 10°; MPA = 45°). The panoramic radiograph showed that all permanent teeth except the mandibular right third molar were present and that the mandibular right first molar had undergone endodontic treatment.



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Treatment Planning

The primary treatment objectives were to improve the positioning of the maxillary arch, with a reduction in dental and gingival exposure; to achieve Class I molar and canine relationships; and to correct the overjet and overbite.

One possible treatment approach was to extract the max-

illary first premolars, followed by leveling and alignment of the maxillary arch to improve the basal-bone positioning of the incisors and reduce the overjet. In the mandibular arch, the incisor protrusion would remain the same, and the tooth-size discrepancy would be addressed through anterior interproximal reduction. The result would be a camouflaged Class II molar relationship.

Another alternative was to extract all four first premolars and perform orthognathic surgery involving maxillary impaction and retrusion. Because both of these options would have produced limited esthetic improvement, they were rejected.

The chosen alternative involved extraction of all four first premolars and presurgical orthodontic treatment to improve



Fig. 1 31-year-old female patient with severe maxillary protrusion, maxillary vertical excess, and pronounced gummy smile before treatment (continued on next page).

the incisor inclination, level and align the arches, and achieve ideal archforms. This would be followed by maxillary impaction with Le Fort I surgery, mandibular advancement from a sagittal ramus osteotomy, and chin advancement by mentoplasty.

Treatment Progress

Edgewise .022" appliances were placed in both arches, with

bands on the first and second molars and brackets on the canines and second premolars. All four first premolars were then extracted. A mandibular lingual arch and maxillary transpalatal bar were used for anchorage to distalize the upper and lower canines on .019" x .025" segmental archwires, thus gaining space for incisor alignment.

After seven months of treatment, brackets were bonded to all

the incisors, and .015" coaxial archwires were used for leveling and alignment. The incisors were uprighted using .019" x .025" retraction archwires. After two years of treatment, presurgical upper and lower archwires were inserted for leveling and alignment to achieve parabolic archforms and proper incisor inclinations. Presurgical treatment took 30 months, longer than expected because of many missed

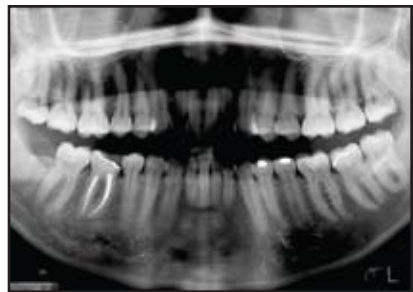
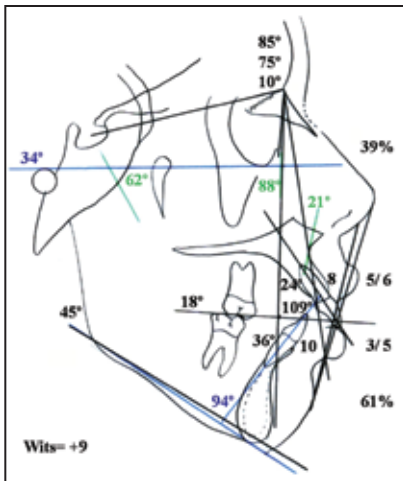


Fig. 1 (cont.) 31-year-old female patient with severe maxillary protrusion, maxillary vertical excess, and pronounced gummy smile before treatment.

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appointments and bracket failures (Fig. 2).

Orthognathic surgery was then performed, resulting in 5mm of mandibular advancement, 3mm of chin advancement, and 7mm of maxillary impaction (Fig. 3). Postsurgical treatment lasted 18 months—again, longer than

expected because of continuing poor cooperation and frequent bracket replacement. Class II elastics were used in the late post-surgical phase.

Treatment Results

Final records taken after

four years of treatment demonstrated facial symmetry with proportional facial thirds, a balanced maxillomandibular sagittal relationship, an esthetic smile line, and good lip positioning (Fig. 4A). Treatment produced Class I canine and molar relationships, coincident midlines, a 1mm over-



Fig. 2 Changes in archform after 30 months of presurgical orthodontic treatment.

jet, an overbite of one-third of the incisors, and parabolic, well-aligned archforms. The final panoramic radiograph confirmed root parallelism and proper interproximal contacts.

Superimposition of pre- and post-treatment cephalometric tracings indicated the amount of retraction of the incisors, showing them well positioned over the basal bone (Fig. 4B). Skeletally, the maxillary anterior and posterior regions were equally impacted by the surgery, and the mandible evidenced counter-clockwise rotation.

The retention regimen consisted of a bonded 3-3 lingual bar

in the lower arch and a Begg-type retainer in the upper arch.

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Fig. 3 Patient after orthognathic surgery.

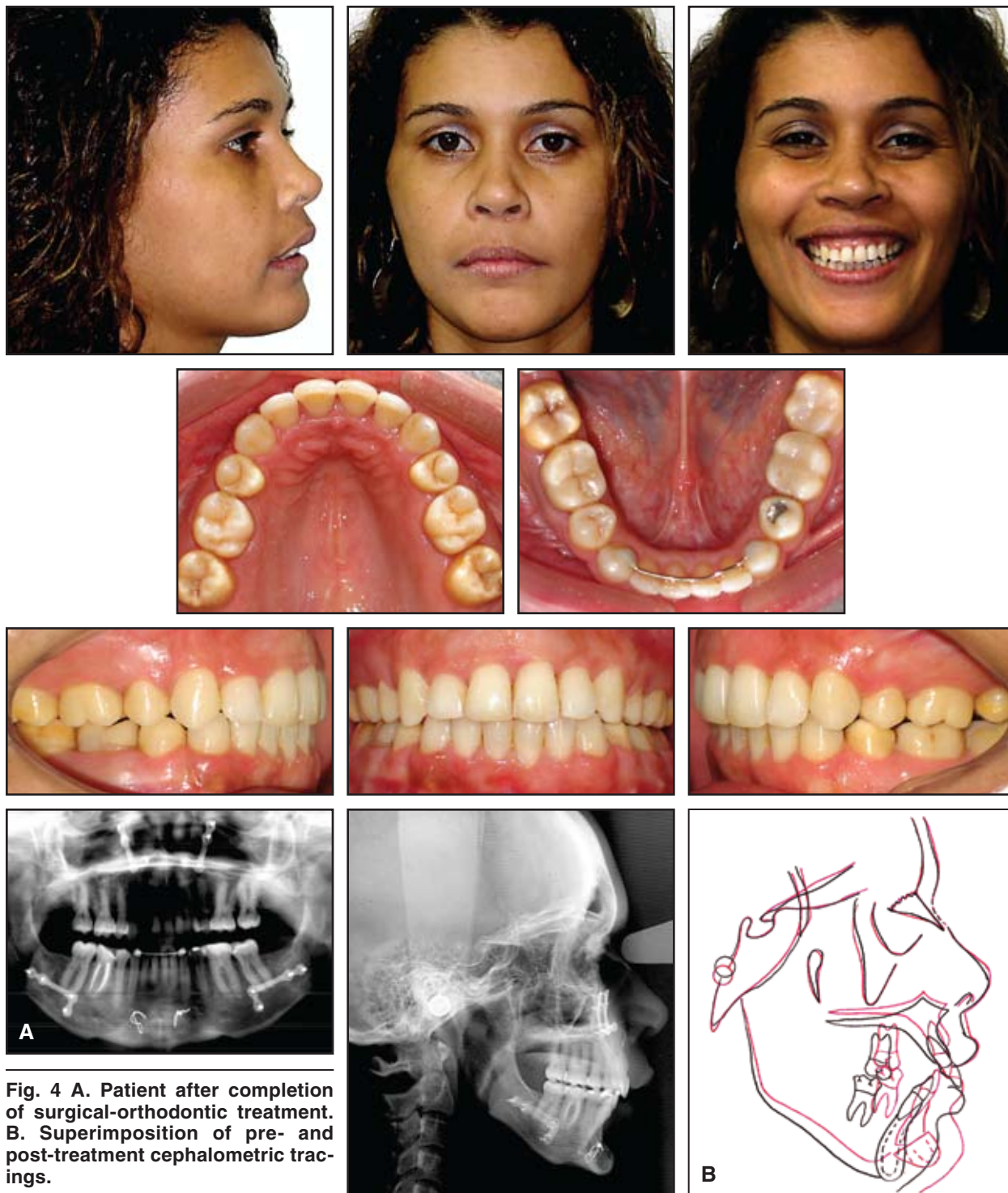


Fig. 4 A. Patient after completion of surgical-orthodontic treatment. **B.** Superimposition of pre- and post-treatment cephalometric tracings.