

# Correction of skeletal Class II—anterior deep bite and prominent chin by forced surgical rotation of the mandible

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## Abstract

The purpose of this paper is to describe a technique of forced surgical rotation of the mandible used in skeletal Class II patients with deep bite and prominent chin. Posterior occlusal composite onlays combined with preoperative orthodontic treatment without anterior intrusion increase the posterior rotational component of the surgical mandibular advancement, when removed during operation. This manoeuvre allows for the surgical closure of the posterior open bite, while anteriorly the deep bite is opened. This technique avoids bimaxillary rotation surgery with dorsal impaction in mild to moderate cases. In any case, a chin setback osteotomy with compromised aesthetics can be avoided.

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The correction of Class II deep bite can be achieved by isolated orthodontic treatment (one or more of maxillary incisor intrusion; mandibular incisor intrusion; mandibular incisor proclination; maxillary posterior teeth extrusion; or mandibular posterior teeth extrusion) or a combination of orthodontic treatment and orthognathic surgery.<sup>1</sup> The latter is indicated when the dental discrepancy cannot be corrected by the isolated use of orthodontic mechanics or when facial aesthetics are compromised. The problem case is the patient with a prominent chin. Mandibular advancement and chin setback surgery; as well as a subapical mandibular advancement osteotomy may be detrimental to facial aesthetics.<sup>2</sup>

## Technical protocol

In those cases, at the beginning of the orthodontic preparation for operation, an increase in posterior occlusal height is achieved on the molar teeth that will occlude during and after



Fig. 1. Occlusal augmentation with composite on the first mandibular molar. Inset: removal with a bony rongeur.

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Fig. 2. Three-quarter profile views of the patient. (A) Preoperative picture. Skeletal Class II configuration with a prominent chin and gonial hypertrophy on a hypoplastic mandible. (B) Picture taken 1 year postoperatively. A bilateral sagittal split osteotomy has corrected the dental Class II relationship. Intraoperative removal of the composite onlays with closure of the resulting posterior open bite and reduction of the anterior deep bite have resulted in an increase in facial height and harmony, and has relatively reduced the prominent chin. Gonial contouring was also done.

mandibular rotation. This is done by acid etching, applying bonding (such as Transbond™ Light Cure Adhesive, 3M, Minneapolis, USA) and a composite resin (such as Herculite XRV® Ultra, Kerrhawe, Bioggio, Switzerland). The surface of an amalgam or composite filling is roughened with a diamond drill bit and treated similarly further on. To increase the augmentation at a later session, the surface is roughened

and the bonding-composite procedure repeated. The composite resin is usually applied on the mandibular molar teeth (Fig. 1), but occasionally maxillary molars and premolars may be used. No attempt is done to level the curve of Spee.

The effect of the rotation can be simulated on a profile cephalogram in the orthodontic clinic, as soft pogonion follows hard pogonion in a 1:1 ratio.<sup>3</sup>

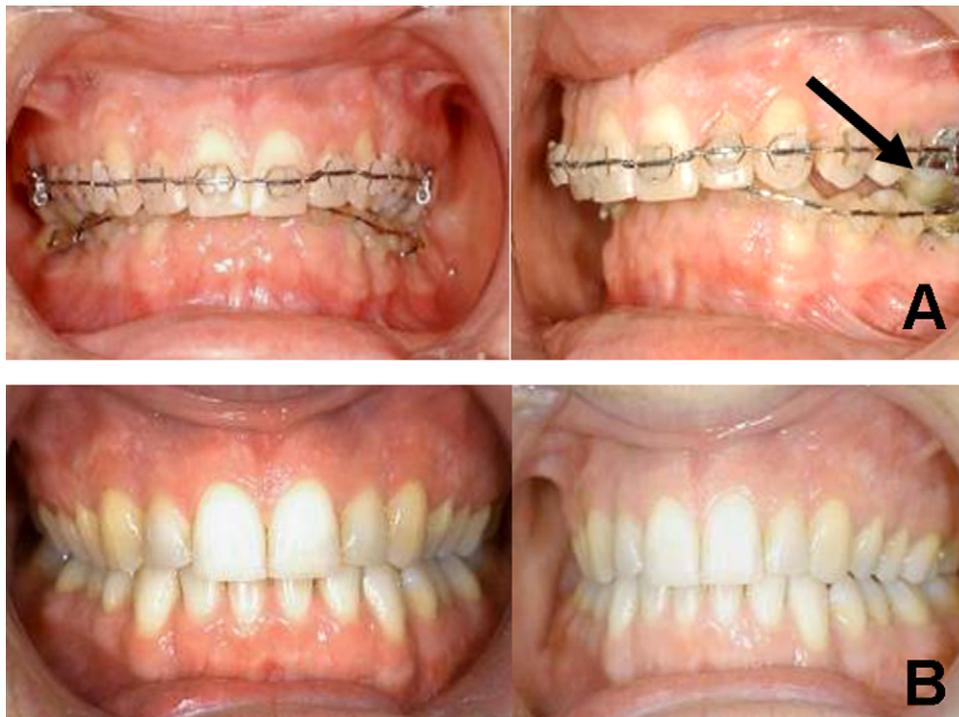


Fig. 3. Occlusal views, frontal and three-quarter left profile (Orthodontist: B. Van den Eynde, Halle-Brussels, Belgium). (A) Preoperatively: the arrow points at the occlusal augmentation of the maxillary molars. (B) One year postoperatively.

The composite onlay is efficiently removed during operation with a bony rongeur (Fig. 1), occasionally finished with a green stone bur. The posterior open bite so created is closed, and the frontal deep bite is opened, all surgically (not gradually postoperatively as advocated for cases of anterior open bite).

The technique becomes hazardous when the augmented molar stands alone. The augmentation may increase the tendency for lingual rotation.

### Case report

The patient had the problems of a skeletal Class II deep bite with palatal lacerations, bruxism, and muscular pain. She also had asymmetrical gonial hypertrophy (Fig. 2). The objectives of treatment were to achieve proper sagittal and vertical occlusions, and to soften and create symmetry in the jaw angles. Preoperative orthodontics aimed for posterior rotation of the mandible with correction of the mandibular plane angle and of the chin prominence. Occlusal composite augmentation onlays on the maxillary molars created a posterior open bite (Figs. 3 and 4). No attempt was made to level the curve of Spee. The anterior deep bite was maintained before operation.

The composite onlays were removed during the sagittal split osteotomy, and the mandible rotated posteriorly, while the sagittal malocclusion was corrected (Figs. 2 and 3). The right jaw angle was reduced in the transverse direction and the left side in the vertical, so a maxillary osteotomy (for more rotation) and a chin osteotomy (to reduce its prominence) could be avoided.

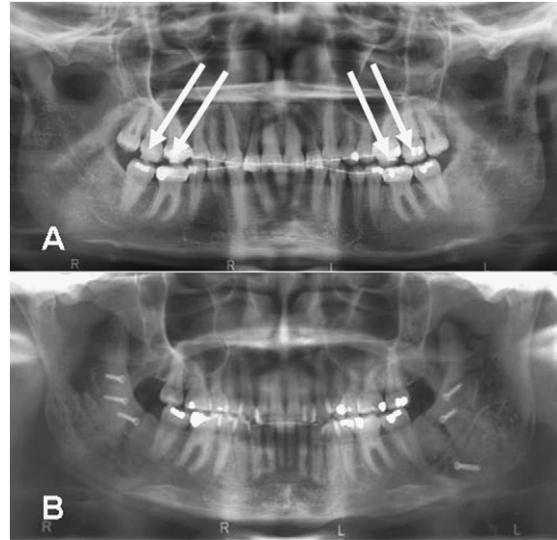


Fig. 4. Panorex views. (A) Preoperatively: the arrows point at the augmentations. (B) Postoperatively.

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