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Posterior mandibular widening secondary to advancement sagittal split osteotomy: A retrospective study

Élargissement mandibulaire postérieur après ostéotomie sagittale d'avancée : une étude rétrospective

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Summary

Introduction. Patients sometimes spontaneously report a modification of the width of their lower face after an advancement bilateral sagittal split osteotomy (ABSSO). The main goal of our study was to assess the variation of the bigonial distance (BGD) before and after ABSSO in a group of patients. The second goal was to look for a possible relation between the variation of BGD and the amount of mandibular advancement.

Materials and methods. We conducted a retrospective radiological study on patients who underwent an isolated ABSSO (Obwegeser-Dal Pont II type osteotomy) for a class II malocclusion in our department over a 26 months period. The measures were made on standardized frontal and lateral telerradiographies taken before, one day and one year postoperatively.

Results. Fifty patients (36 females, 14 males; mean age: 24) could be included. BGD was significantly increased one day (+ 9.8 mm, $P < 10^{-3}$) and one year after surgery (+ 4 mm, $P < 10^{-3}$). There was no relation between the amount of mandibular advancement and the increase of BGD.

Discussion. Our results suggest that ABSSO is responsible for posterior mandibular enlargement which must be taken into account during the aesthetic preoperative assessment. Further studies are mandatory to identify the risk factors for this phenomenon.

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Keywords: Orthognathic surgery, Mandibular advancement

Résumé

Introduction. Certains patients décrivent spontanément une modification de la largeur de l'étage inférieur de la face dans les suites d'une ostéotomie sagittale d'avancée mandibulaire (OSAM). Le but principal de notre travail a été de mesurer les variations de la distance bigoniaque (DBG) avant et après OSAM chez un groupe de patients. Le but secondaire a été de chercher une éventuelle relation entre la variation de la DBG et l'importance de l'avancement mandibulaire.

Matériel et méthode. Nous avons mené une étude radiologique rétrospective auprès de patients opérés dans notre service d'une classe II dento-squelettique par ostéotomie mandibulaire d'avancée isolée selon la technique d'Obwegeser-Dal Pont II sur une période de 26 mois. Les mesures ont été réalisées sur des télerradiographies standardisées de face et de profil effectuées en préopératoire, à 1 jour et à 1 an postopératoires.

Résultats. Cinquante patients (36 femmes, 14 hommes ; âge moyen : 24 ans) ont pu être inclus. La DBG a été significativement augmentée à un jour (+ 9,8 mm, $p < 10^{-3}$) et à un an postopératoires (+ 4 mm, $p < 10^{-3}$). Il n'a pas été trouvé de relation entre la valeur de l'avancement mandibulaire et l'importance d'augmentation de la DBG.

Discussion. Les résultats de notre étude suggèrent que l'OSAM entraîne un élargissement mandibulaire postérieur qui doit être pris en compte lors de l'analyse esthétique préopératoire. Des études complémentaires sont nécessaires pour identifier les facteurs de risque de ce phénomène.

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Mots clés : Chirurgie orthognathique, Avancement mandibulaire

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Introduction

Mandibular advancement by bilateral sagittal split osteotomy (ABSSO) is indicated to treat or to prevent functional disorders secondary to Class II malocclusion.

Aesthetic outcomes in profile are well known and expected, but some patients spontaneously report a feeling of posterior enlargement of the lower third of their face in front view (*fig. 1*).

The bigonial distance (BGD), separating the gonions, reflects the posterior mandibular width in the frontal plan.

The first goal of our study was to assess the impact of ABSSO on the BGD, one day and one year after surgery.

The second objective was to look for a possible relation between the variation of BGD and the amount of mandibular advancement.

Materials and methods

All consecutive patients operated between August 2011 and October 2013 in our department for a class II malocclusion by

mean of an isolated ABSSO were retrospectively included in the study. Concomitant wisdom tooth extraction was allowed. Patients operated with a combination of orthognathic procedures (ABSSO and mandibular contraction, and/or genioplasty, and/or Le Fort I maxillary osteotomy) and patients with incomplete records were excluded.

We routinely used the Obwegeser-Dal Pont II technique [1]. Fixation was achieved by one 4-hole-plate on each side. Patients were all operated on by the same surgeon. Local ethical approval was obtained and study design respected Helsinki Declaration.

For each patient, postoperative mandibular advancement was measured by comparison between pre- and postoperative lateral teleradiographies made in centric occlusal position and taken one day and one year postoperatively. In order to be reproducible, measures were made between the anterior face of incisors or orthodontic brackets and projected on a horizontal axis (*fig. 2*).

The amount of posterior mandibular widening was assessed by measuring the variations of the BGD on frontal teleradiographies using the same chronology. Gonions were spotted as the most lateral points located on each mandibular angle (*fig. 3*).

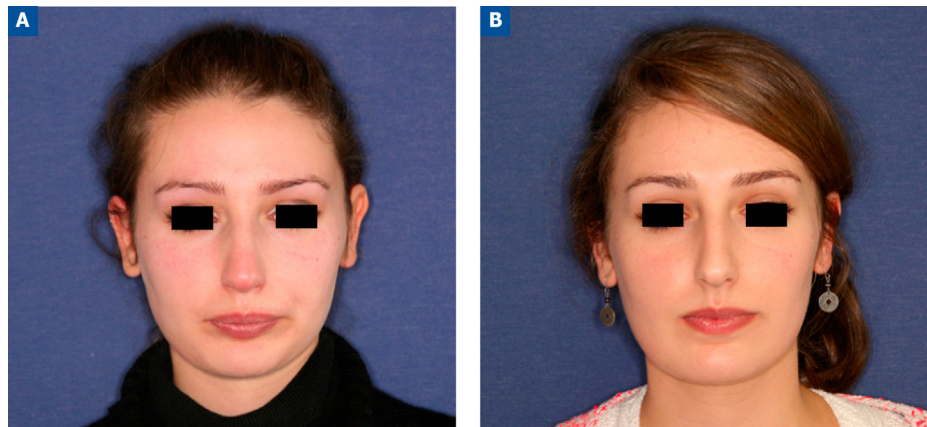


Figure 1. Clinical aspect of lower face widening secondary to mandibular advancement. **A.** Before surgery. **B.** One year after surgery.

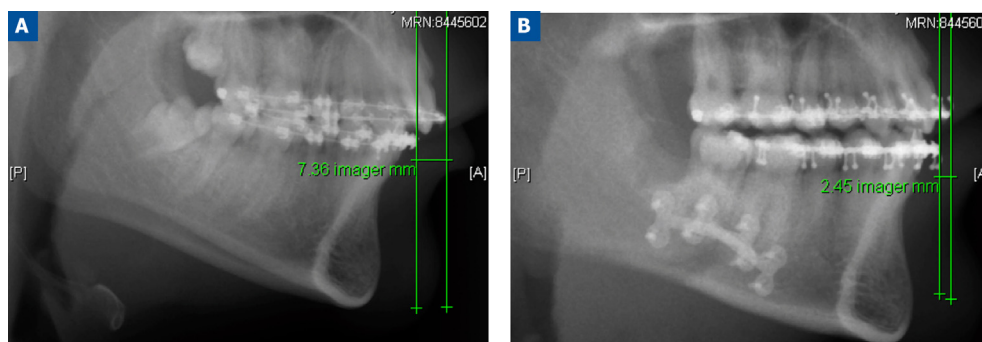


Figure 2. Example of measures on lateral teleradiographies in centric occlusal position. **A.** Before surgery. **B.** Postoperative day 1 (radiological advancement here is $7.36 - 2.45 = 4.91$ mm).

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