DOI: https://doi.org/10.17816/uds516341
Research Article

Clinical experience of using occlusocorrectors as an operational positioner

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ABSTRACT

The article presents the clinical experience of using composite occlusorrectors for the purpose of surgical positioning of the mandible during its osteotomy, which minimizes inaccuracies in jaw closure, ensures proper closure of teeth, in some cases — to facilitate oral hygiene, as well as to prevent the syndrome of forced position of the mandible in the postoperative period, thereby reducing the prerequisites for recurrence of maxillary-facial anomalies.

Keywords: osteotomy; dentofacial anomalies; surgical splint; stabilizing composite occlusion correctors.

To cite this article
Fadeev RA, Lanina AN, Vishneva NV. Clinical experience of using occlusocorrectors as an operational positioner. *Acta Universitatis Dentistriae et Chirurgiae Maxillofacialis*. 2023;1(1):23–28. DOI: https://doi.org/10.17816/uds516341

Received: 27.06.2023 **Accepted:** 13.11.2023 **Published:** 05.02.2024

ECO•VECTOR

DOI: https://doi.org/10.17816/uds516341
Научная статья

Клинический опыт применения окклюзокорректоров в качестве операционного позиционера

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АННОТАЦИЯ

В статье представлен клинический опыт применения композитных окклюзокорректоров с целью операционного позиционирования нижней челюсти при ее остеотомии, что позволяет минимизировать неточности сопоставления челюстей, обеспечить правильное смыкание зубов, в ряде случаев — облегчить гигиену полости рта, а также профилактировать синдром вынужденного положения нижней челюсти в послеоперационном периоде, тем самым уменьшая предпосылки для рецидива зубочелюстно-лицевых аномалий.

Ключевые слова: остеотомия; зубочелюстно-лицевые аномалии; операционный сплинт; стабилизирующие композитные окклюзокорректоры.

Как цитировать

Фадеев Р.А., Ланина А.Н., Вишнёва Н.В. Клинический опыт применения окклюзокорректоров в качестве операционного позиционера // Университетская стоматология и челюстно-лицевая хирургия. 2023. Т. 1. № 1. С. 23–28. DOI: https://doi.org/10.17816/uds516341

Рукопись получена: 27.06.2023 **Рукопись одобрена:** 13.11.2023 **Опубликована:** 05.02.2024

INTRODUCTION

Accurate planning and prediction of hardware-surgical treatment results are essential for achieving optimal esthetic and functional outcomes in correcting dentomaxillofacial anomalies (DMFA) [1, 2]. The increasing use of computer-aided surgical planning in orthognathic surgery has advantages over traditional methods [3, 4]. However, treatment success depends on factors such as the surgical technique, the degree of DMFA decompensation in the preoperative period, and a proper comparison of control and diagnostic models of the jaws in constructive dentition [1, 5–7]. Postoperative recurrence of DMFA may result from unstable bone fragment fixation, mandibular head displacement, and inaccurate mandible positioning due to insufficiently tight occlusal contacts of teeth [5–7]. During surgery, plastic positioning splints are commonly used to stabilize occlusion. These splints are affixed to a jaw and have clear impressions of antagonist teeth. However, despite precise surgical jaw positioning, such devices have several disadvantages. To ensure sufficient rigidity, splints must have the minimum required thickness, which may contribute to overbite. Additionally, their removal from the oral cavity in some cases may lead to a syndrome associated with forced mandibular position, necessitating correction by an orthodontist. This increases the risk of extended treatment time [8]. In cases with multiple occlusal contacts during the postoperative period, such as insufficient DMFA decompensation before surgery or partial tooth loss, particularly in end-defect cases, using such devices can significantly worsen oral hygiene. Therefore, composite onlays — occlusal correctors — manufactured by laboratory methods and fixed on the patient's teeth with liquid-flow composite material or glass ionomer cement are optimal for surgical mandible positioning and postoperative stabilization.

PRACTICAL APPLICATIONS

A clinical example is presented to illustrate the application of occlusal correctors in facilitating surgical positioning of the mandible during osteotomy.

A 23-year-old patient (referred to as Kh.) undergoing orthodontic treatment for distal tooth row ratio, lower micrognathia, and retrognathia (Fig. 1) received a combined hardware-surgical plan to correct the DMFA through orthognathic surgery involving forward displacement of the mandible by oblique sagittal osteotomy (Fig. 2). Plaster models of the jaws aligned well in the constructive occlusion (Fig. 3), eliminating the need for an operative positioner, which would have required an overbite to ensure rigidity. Instead, the laboratory method was employed to fabricate and adhesively fix occlusal correctors with clear impressions of antagonist teeth on teeth 3.7, 3.6, 4.6, and 4.7 using a composite material, thereby preventing inaccuracies in positioning the mandible during surgery (Fig. 4). The use of occlusal correctors enabled precise positioning and stabilization of the mandible, followed by sequential grinding and the introduction of teeth in contact, resulting in optimal morphofunctional occlusion at the end of treatment (Figs. 5 and 6).

FINDINGS

1. When implementing the hardware-surgical plan to correct dental midline facial esthetics using orthognathic surgery, the greatest impact is achieved when significant decompensation occurs in the preoperative period.

a *b* *c*

Fig. 1. Dental rows of patient H. before treatment in lateral (*a*, *b*), straight (*c*) projections
Рис. 1. Зубные ряды пациентки Х. до лечения в боковых (*a*, *b*), прямой (*c*), проекциях

a *b* *c*

Fig. 2. Dental rows of patient H. in lateral (*a*, *b*), straight (*c*) projections at the stage of decompensation of the maxillary anomaly in order to prepare for osteotomy of the mandible
Рис. 2. Зубные ряды пациентки Х. в боковых (*a*, *b*), прямой (*c*) проекциях на этапе декомпенсация ЗЧЛА с целью подготовки к остеотомии нижней челюсти

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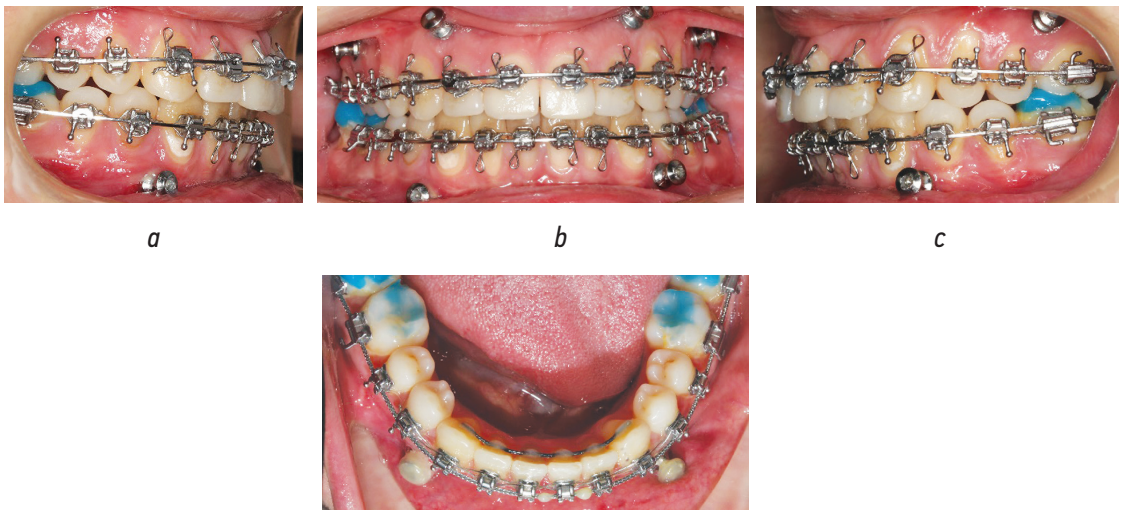
a *b* *c*

Fig. 3. Plaster models of the jaws of patient H. in the constructive bite in the lateral (*a*, *b*), straight (*c*) projections
Рис. 3. Гипсовые модели челюстей пациентки Х. в конструктивном прикусе в боковых (*a*, *b*), прямой (*c*) проекциях



a *b* *c*

d

Fig. 4. Dental rows of patient H. with occlusal correctors fixed on teeth 3.7, 3.6, 4.6, 4.7, in the postoperative period in lateral (*a*, *b*), direct (*c*), occlusal (*d*) projections
Рис. 4. Зубные ряды пациентки Х. с фиксированными на зубы 3.7, 3.6, 4.6, 4.7 окклюзокорректорами, в послеоперационном периоде в боковых (*a*, *b*), прямой (*c*), окклюзионной (*d*) проекциях

a *b* *c*

Fig. 5. Dental rows of patient H. in the postoperative period in the lateral (*a*, *b*), direct (*c*) projections: the stage of creating multiple occlusal contacts by grinding the overlays and using interdigital elastic ligature rings
Рис. 5. Зубные ряды пациентки Х. в послеоперационном периоде в боковых (*a*, *b*), прямой (*c*) проекциях: этап создания множественных окклюзионных контактов путем сошлифовывания накладок и применения межчелюстных эластических лигатурных колец

a *b* *c*

Fig. 6. Dental rows of patient H. at the end of orthodontic treatment in lateral (*a*, *b*), straight (*c*) projections
Рис. 6. Зубные ряды пациентки Х. по окончании ортодонтического лечения в боковых (*a*, *b*), прямой (*c*), проекциях

2. The alignment of plaster models of the jaws in constructive dentition before surgery is a crucial factor in minimizing the recurrence of DMFA.

3. Composite occlusal correctors can serve to stabilize and position the jaw accurately during osteotomy surgery, thereby preventing inaccuracies.

CONCLUSIONS

The utilization of composite occlusal correctors as surgical positioners can stabilize the mandibular position, preserve oral hygiene, and prevent the occurrence of forced mandibular position syndrome.

ADDITIONAL INFORMATION

Authors' contribution. All the authors made a significant contribution to the preparation of the article, read and approved the final version before publication. Personal contribution of each author: R.A. Fadeev — collecting material, writing and editing the text of the manuscript; A.N. Lanina — collecting material, analyzing the data obtained, writing the text of the manuscript; N.V. Vishneva — collecting material, analyzing the data obtained, writing the text of the manuscript.

Funding source. The authors claim that there is no external funding when writing the article. Competing interests. The authors declare the absence of obvious and potential conflicts of interest related to the publication of this article.

Ethics approval. The material of the article demonstrates the results of clinical observation, does not contain research materials.

Informed consent to publication. All participants voluntarily signed an informed consent form prior to the publication of the article.

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