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EVALUATION OF TEMPOROMANDIBULAR JOINT CONDITION AFTER HARDWARE-SURGICAL TREATMENT OF DENTO-MANDIBULAR ANOMALIES IN YOUNG PATIENTS

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ABSTRACT. ***Introduction.*** Nowadays there is an increased attention to facial aesthetics. More and more often dento-mandibular anomalies, in which temporomandibular joint (TMJ) is affected, are treated by hardware-surgical method. At the same time, when eliminating dento-mandibular anomalies, the condition of the temporomandibular joint is often not evaluated in the long term. ***The purpose of the study*** was to assess the condition of the temporomandibular joint after orthodontic treatment and orthognathic operations in young people. ***Materials and methods.*** In this work we have carried out a clinical evaluation of the temporomandibular joint in 13 young people suffering from lower macrognathia after orthodontic treatment and orthognathic surgeries. ***Result.*** It was found that all the patients suffering from inferior macrognathia who took part in the study had pathological symptoms of the temporomandibular joint characteristic of its painful dysfunction before the complex hardware-surgical treatment. The orthodontic treatment performed in the patients practically did not change the clinical symptoms of the temporomandibular joint. Both before the orthodontic stage and after its completion, pathologic symptoms of the temporomandibular joint persisted. In the distant period after the completion of the surgical stage of treatment, the reliable effectiveness of complex therapy with regard to the TMJ condition was noted, which amounted to 10.64%. However, it should be taken into account that pathologic symptoms of the temporomandibular joint after the completion of hardware-surgical treatment remained in all the examined patients, despite the fact that in some of them their severity slightly decreased. In one patient, despite the good aesthetic effect of complex hardware-surgical therapy, the condition of the temporomandibular joint worsened from mild to moderate severity of pain dysfunction. ***Conclusion.*** Timely informing patients about the expected effectiveness of treatment and possible complications within the framework of the patient's signing an informed consent for treatment or intervention is an important factor of conflict prevention in dentistry and maxillofacial surgery.

KEYWORDS: *young people, dento-mandibular anomalies, temporomandibular joint, temporomandibular joint pain dysfunction, inferior macrognathia, hardware-surgical treatment, orthodontic treatment, orthognathic surgeries*

ОЦЕНКА СОСТОЯНИЯ ВИСОЧНО-НИЖНЕЧЕЛЮСТНОГО СУСТАВА ПОСЛЕ АППАРАТУРНО-ХИРУРГИЧЕСКОГО ЛЕЧЕНИЯ ЗУБОЧЕЛЮСТНЫХ АНОМАЛИЙ У МОЛОДЫХ ЛЮДЕЙ

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РЕЗЮМЕ. ***Введение.*** В настоящее время существует повышенное внимание к эстетике лица. Все чаще зубочелюстные аномалии, при которых страдает височно-нижнечелюстной сустав, лечат аппаратурно-хирургическим способом. В то же время при устранении зубочелюстных аномалий часто не оценивается в отдаленном периоде состояние височно-нижнечелюстного сустава (ВНЧС). ***Цель исследования*** — оценка состояния височно-нижнечелюстного сустава после ортодонтического лечения и ортогнатических операций у молодых людей. ***Материалы и методы.*** В работе проведена клиническая оценка состояния ВГЧС у 13 молодых людей, страдающих нижней макрогнатией, после ортодонтического лечения и ортогнатических операций. ***Результаты.*** Установлено, что все принявшие участие в исследовании пациенты, страдавшие нижней макрогнатией, имели до начала комплексного аппаратурно-хирургического лечения патологические симптомы со стороны ВНЧС, характерные для его болевой дисфункции. Проведенное ортодонтическое лечение у пациентов практически не изменило клинической картины со стороны ВНЧС. Как до ортодонтического этапа, так и по его завершению патологические симптомы со стороны ВНЧС сохранялись. В отдаленном периоде после завершения хирургического этапа лечения отмечена достоверная эффективность комплексной терапии в отношении состояния ВНЧС, которая составила 10,64%. Однако следует учитывать, что патологические симптомы со стороны ВНЧС после завершения аппаратурно-хирургического лечения сохранились у всех обследованных пациентов, несмотря на то что у некоторых больных их выраженность несколько уменьшилась. У одного пациента, несмотря на хороший эстетический эффект комплексной аппаратурно-хирургической терапии, состояние со стороны ВНЧС ухудшилось с легкой степени тяжести болевой дисфункции до средней тяжести. ***Заключение.*** Своевременное информирование пациентов о предполагаемой эффективности лечения и возможных осложнениях в рамках подписания пациентом информированного согласия на лечение или вмешательство является важным фактором профилактики конфликтов в стоматологии и челюстно-лицевой хирургии.

КЛЮЧЕВЫЕ СЛОВА: *люди молодого возраста, зубочелюстные аномалии, височно-нижнечелюстной сустав, болевая дисфункция височно-нижнечелюстного сустава, нижняя макрогнатия, аппаратурно-хирургическое лечение, ортодонтическое лечение, ортогнатические операции*

INTRODUCTION

There is an increased attention to facial aesthetics nowadays. Dento-mandibular anomalies (DMA) and facial asymmetries are treated not only by orthodontic methods, but also by orthognathic surgeries [1, 2]. In this case, the position of the mandibular heads in relation to the temporal bone articular fossae is often changed. In other words, certain changes in the spatial position of the temporomandibular joint (TMJ) elements occur [3]. At the same time, temporomandibular arthralgia often occurs during orthodontic treatment or soon after it. Temporomandibular arthralgia is distressing for patients, is poorly treatable and is often causes complaints, claims and lawsuits against medical organizations by patients who believe that they have been treated incorrectly [4, 5]. It is believed that the elimination of DMA and facial asymmetries will have a positive effect on the functional status of the TMJ [6, 7]. However, no research has been conducted.

AIM

The aim of the study was to evaluate the condition of the temporomandibular joint after orthodontic treatment and orthognathic surgeries in young adults.

MATERIALS AND METHODS

The research included 13 males aged 22 to 28 years who suffered from lower macrognathia and underwent consecutive orthodontic treatment with bracket systems and surgical treatment with orthognathic interventions. The patients underwent bilateral oblique sliding osteotomy of the mandible as orthognathic surgery. All patients were clinically evaluated for TMJ condition before the complex treatment had been started, after the active stage of orthodontic treatment, and 12–18 months after surgical treatment according to the previously proposed methodology. It involves assessment of the state of mouth opening, the presence of mandibular deviation when opening and closing the mouth, the presence of sound phenomena in the TMJ area during mandibular movement, as well as the presence of joint pain in the state of physiological rest of the mandible and during its movement [8]. Based on these parameters, the severity of TMJ pathology was determined, as well as the effectiveness of treatment during the specified periods of patient follow-up.

The study complies with ethical standards of the Committee on Human Experiments of the Helsinki Declaration issued in 1975 and revised in 2000.

The digital material obtained was processed on a personal computer using a specialized statistical analysis package Statistica for Windows v. 6.0. Differences between the compared groups were considered reliable at $p \leq 0.05$. Instances with p-value in the range from 0.05 to 0.10 were regarded as a tendency.

RESULTS AND DISCUSSION

Clinical study revealed that 11 (84.62%) out of 13 young patients suffering from inferior macrognathia had TMJ pathology in the form of mild TMJ pain dysfunction (ICD-10 code — K07.60), and 2 (15.38%) patients were diagnosed with similar pathology of moderate severity. The examined patients were most often diagnosed with symptoms associated with sounds (crepitation, crunching, clicking), as well as deviation of the lower jaw when opening and closing the mouth from 2 to 5 mm, less often it was determined by limitation of mouth opening. Orthodontic treatment with vestibular bracket systems lasted from 11 to 15 months. After its completion, the TMJ condition was also evaluated. Although the clinical condition in this group of patients improved, the effectiveness of treatment at this stage was extremely low and amounted to 2.13% ($p > 0.05$). However, there were no changes in terms of the severity among the examined patients. Mild degree of TMJ pathology was revealed in 11 patients, and 2 patients had moderate pathology ($p > 0,05$). A positive dynamics was associated with a decrease in pathological symptoms of TMJ (Fig. 1, 2).

Orthognathic surgeries successfully performed on all patients changed patients' appearance, improved their mental state and internal picture of the disease. At the same time, speaking about the TMJ condition, it is necessary to emphasize that 1 (7.69%) patient,

who suffered from a mild degree of severity of TMJ pathology before the complex treatment, had a worsening to a medium degree of severity of the disease, namely painful TMJ dysfunction. 2 (15.38%) patients with moderate TMJ pathology showed improvement of their condition and changed it over to a mild degree. However, pathological symptoms of TMJ did not disappear at all, similarly to all the examined patients (Fig. 1). Although effectiveness of the treatment was reliable ($p < 0.05$) in terms of the intensity of the clinical picture in the remote period after the surgical stage of treatment ($p < 0.05$) and amounted to 10.64% (Fig. 2).

Thus, it should be noted that, despite the comprehensive hardware and surgical treatment of inferior macrognathia, the pathological symptoms persisted, although in some cases their intensity was slightly reduced, as evidenced by the obtained treatment efficacy indicators. One patient showed a worsened TMJ condition one year after the complex treatment was completed, as he was diagnosed with a mild degree of severity of TMJ pathology before the treatment and after the orthodontic stage. Unfortunately, the remote period demonstrated that the TMJ pathology switched to medium severity. This data should be taken into account when planning hardware and surgical treatment, especially when drawing up the patient's informed consent for orthodontic treatment and subsequent orthognathic care. Competent and timely awareness of a patient about possible results of treatment and its effectiveness, as well as complications, can reduce the number of complaints, claims and lawsuits in relation to complex treatment of DMA. It can also prevent forensic conclusions

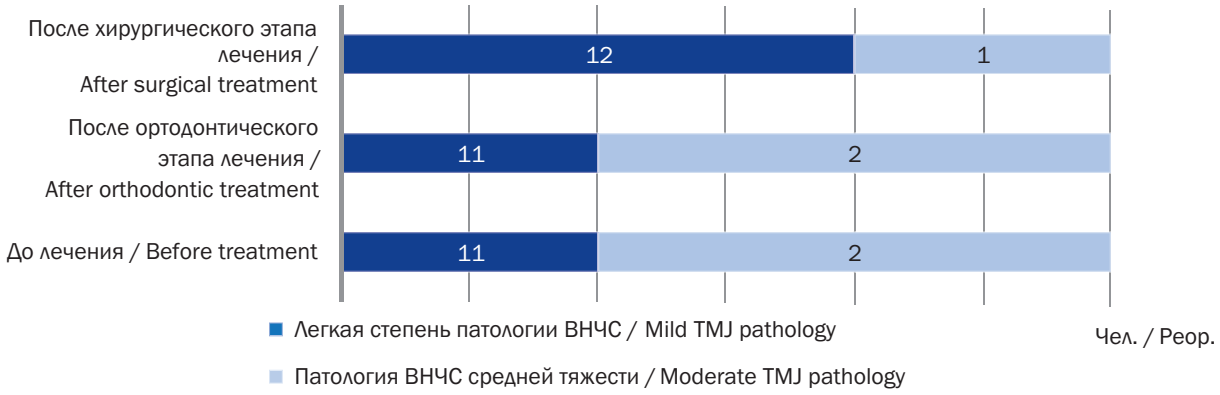

Fig. 1. Characteristics of the severity of temporomandibular joint (TMJ) pathology in the examined patients at the stages of complex treatment, people

Рис. 1. Характеристика степени тяжести течения патологии височно-нижнечелюстного сустава (ВНЧС) у обследуемых пациентов на этапах комплексного лечения, человек

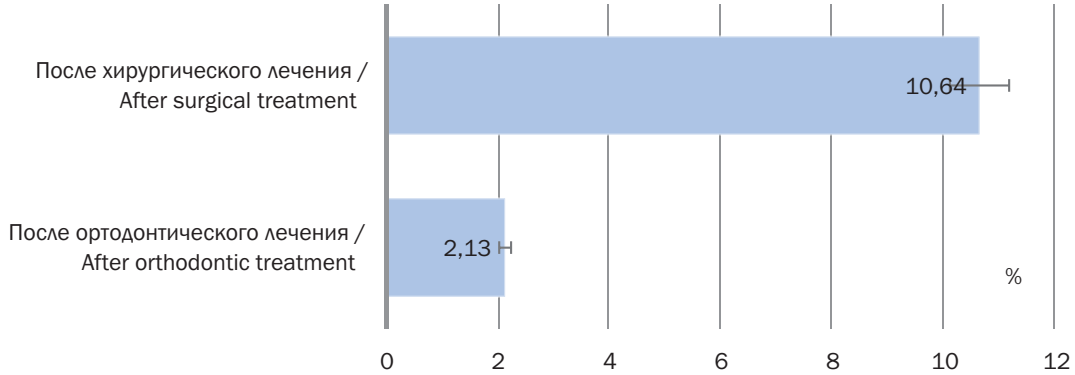

Fig. 2. The effectiveness of treatment of the examined patients after the stages of hardware-surgical treatment, %

Рис. 2. Эффективность лечения обследованных пациентов после этапов аппаратурно-хирургического лечения, %

about causal relationship between treatment and complications.

CONCLUSION

The conducted clinical research has shown that all the patients who took part in the study, suffering from TMJ, had pathological symptoms of TMJ before the complex appliance-surgical treatment. The orthodontic treatment performed in the patients practically did not change the clinical picture of TMJ. Pathological TMJ symptoms persisted both before the orthodontic stage and after its completion. Reliable effectiveness of TMJ complex therapy was noted in the remote period after the completion of the surgical stage of treatment, which amounted to 10.64%. However, it should be taken into account that TMJ pathological symptoms remained in all examined patients even after the hardware-surgical treatment had been completed, despite the fact that some patients noted that the severity slightly decreased. In addition, one patient showed a worsening of TMJ condition from mild to moderate TMJ pain dysfunction despite the good esthetic effect of complex orthodontic and surgical therapy. This indicates possible adverse effects of complex orthodontic and surgical treatment of TMJ, which take place in everyday practice and may become a reason for patients' claims to medical organizations. Timely informing patients about the expected effectiveness of treatment and possible complications as part of the patient's signing an informed consent for treatment or intervention is an important factor in conflict prevention in dentistry and maxillary and facial surgery.

ADDITIONAL INFORMATION

The author read and approved the final version before publication.

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