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The comparative characteristics of the treatment of increased dental abrasion by orthopedic and direct restoration methods.

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ABSTRACT

The study involves a comparative analysis of the treatment of increased dental abrasion by various methods. According to some researchers, an increased dental abrasion occurs often and is characterized by its rapid development and a substantial loss of enamel and dentin. Increased dental abrasion affects the anatomical shape of the teeth: disappearance of tubercles, cutting edges of the cutters, decrease in crown height. A direct occlusion leads to abrasion of the cutting edges and chewing surfaces of all teeth, a deep occlusion causes abrasion of labial surfaces of the lower teeth and palatine surfaces of apron upper teeth. Once emerging, an increased abrasion has been steadily growing, deepening in the areas with the exposed dentin, and remaining for a while where the enamel is preserved. Using hitherto only orthopedic methods of treatment for increased abrasion is inefficient, primarily due to the duration of the treatment. It was found that in case of degree I-II increased abrasion the effective methods are both orthopedic treatment method and the method of direct restoration (reduced terms of treatment) and the treatment of grade III - IV abrasion must the restoration method must be combined with orthopedic treatment.

Keywords: increased dental abrasion, occlusion, direct abrasion restoration, increased dental abrasion treatment

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INTRODUCTION

An increased dental abrasion is characterized by intense diminution of hard tissue in one or several teeth. Currently, this type of pathology is observed in almost 12% of people, mostly in men [1].

Dental abrasion is characterized by diminution of enamel and dentin, which leads to the formation of sharp enamel edges, traumatic to mucosa of the lips and cheeks [2]. Increased abrasion of hard dental tissue (HDTIA) is caused by endogenous or exogenous reasons, or due to their combination [3]. Clinically, HDTIA evolves with different rates, has typical clinical signs and stages of pathological course [4]. Over time, if left untreated, the disease progresses, tooth crowns become lower, as well as the height of the lower third of the face, which is accompanied by the appearance of wrinkles in the corners of the mouth, a change in the ratio of components of the temporomandibular joint, the occurrence of phenomena of hypersensitivity, and impaired functions of visual and auditory analyzers [5]. The foregoing shows that the increased dental abrasion requires timely diagnosis and treatment [6].

Objective of the study is a comparative analysis of the methods of treatment for increased abrasion of hard dental tissue in various occlusion in the adults.

MATERIALS AND METHODS

To evaluate the effectiveness of treatment, 85 patients (49 men and 36 women) with varying degrees of dental abrasion and various occlusions were examined. Orthognathic occlusion was diagnosed in 36 patients (42.4%), direct occlusion - in 15 (17.6%), open occlusion - in 12 (14.1%), deep occlusion - in 12 (14.1%), progenesis occlusion - in 6 (7.1%), and prognathic occlusion - in 4 patients (4.7%) (Fig. 1). All 85 patients surveyed were divided into 3 groups according to the method of treatment. The first group underwent direct dental restoration, the second group received orthopedic treatment, and the third group had a combination of therapeutic and prosthetic treatment methods applied. Clinical examination included the survey of patients, determination of the history of life and the state of the overall status, the occupational features of the patients and their complaints of the condition of the teeth and the masticatory system in general. Abrasion of hard dental tissues was determined by Bracco classification. The prevalence of increased dental abrasion in patients was evaluated in percentage. Treatment and the preventive examinations were carried out during 2011-2015. The effectiveness of treatment was evaluated every 6 months during 5 years.

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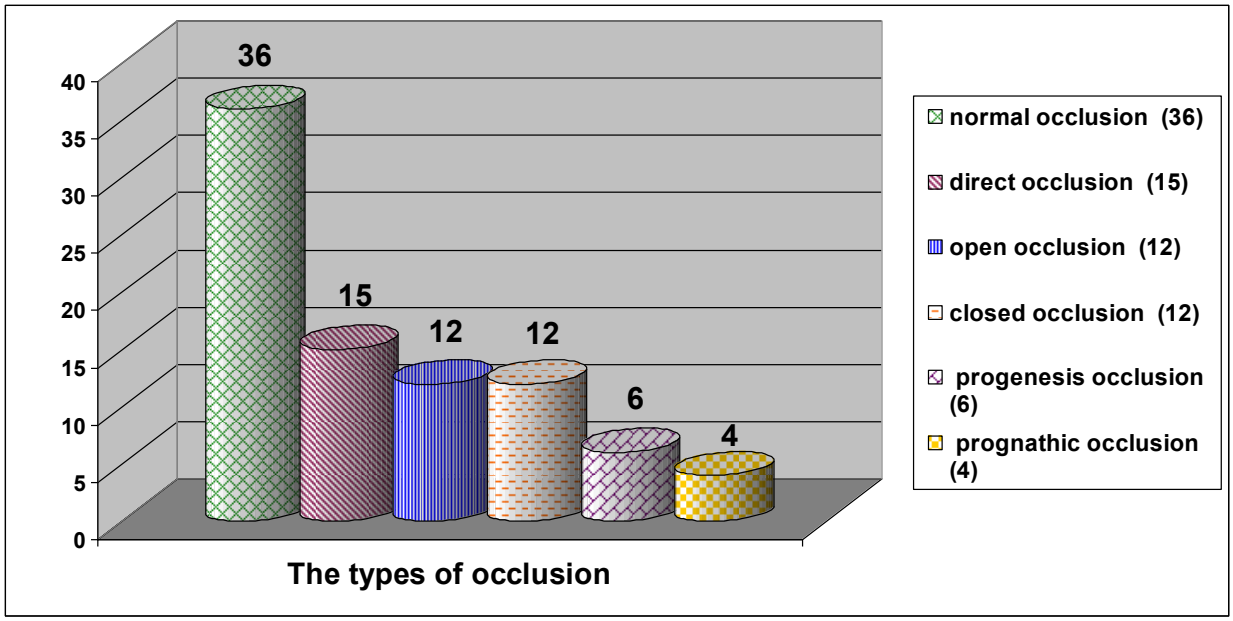

Fig. 1. Distribution of patients by type of occlusion

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RESULTS AND DISCUSSION

All patients were divided into 3 groups according to their treatment method:

Patients of group 1 (n=45) underwent direct restoration. They had grade I-II increased abrasion developing on the background of orthognathic, direct, open, deep, progenesis and prognathic occlusions. Total 175 restorations of individual teeth was carried out: 52 restorations with microhybrid FiltekZ-250 (localization of grade I dental abrasion in the frontal part of the oral cavity), 50 restorations with nanocomposite FiltekSupreme (localization of grade I-II dental abrasion in the frontal part of the oral cavity) and 73 restorations with microhybrid packable Filtek P-60 (localization of grade I-II dental abrasion in the distal part of the oral cavity).Follow-up clinical examinations revealed: after 6 months - the maintained aesthetic appearance of the teeth, absence of any defects restored for 2 years; after 2.5 years - 2 patients (4.4%) had chips in their restoration, and 1 patient (2.2%) had repeated abrasion; after 5 years - 4 patients (8.9%) had chips in their restoration, and 3 patients (6.7%) had signs of abrasion (Figure 2). Thus, the treatment of hard dental tissues abrasion by direct restoration is effective, because the single cases of repeated abrasion and the restoration defects occur only in 2.5-5 years.

Twenty-nine patients of the second group with orthognathic, direct, open, deep, progenesis and prognathic occlusions with grade I-II dental abrasion underwent treatment with the help of orthopedic techniques. At the same time, 17 patients received dental bridgeworks installed, 10 patients - clasp prostheses, and 2 patients - single crowns. Follow-up clinical examinations revealed: after 6 months - the maintained aesthetic appearance of teeth, no defects in the structures observed during 1.5 year; after 2.5 years - 2 patients (6.9%) required correction of their prostheses, and 2 patients (6.9%) had repeated abrasion; after 5 years - 4 patients (13.8%) had correction of their prostheses, and 4 patients (13.8%) had repeated abrasion observed, which required the complete restoration (Fig. 2). A high rate of complications is due to the fact that these patients had during treatment the adjustment of their occlusion height, resulting in an increased load on the structure. Moldovanov A.G. [7] came to the same conclusion. Thus, treatment of hard dental tissue abrasion by orthopedic methods is also effective, however, requires replacement of the entire prosthesis in case of damaging only a part of the structure.

In the third group of patients, the direct restorations were combined with orthopedic treatments. Eleven patients were under supervision with direct and open occlusion of grade II-III of dental abrasion. Follow-up clinical examinations revealed: after 6 months - the maintained aesthetic appearance of the teeth, no functional defects were observed during 2.5 years; after 5 years - one patient (9.1%) required remodeling of the work due to the repeated dental abrasion (Fig. 2).

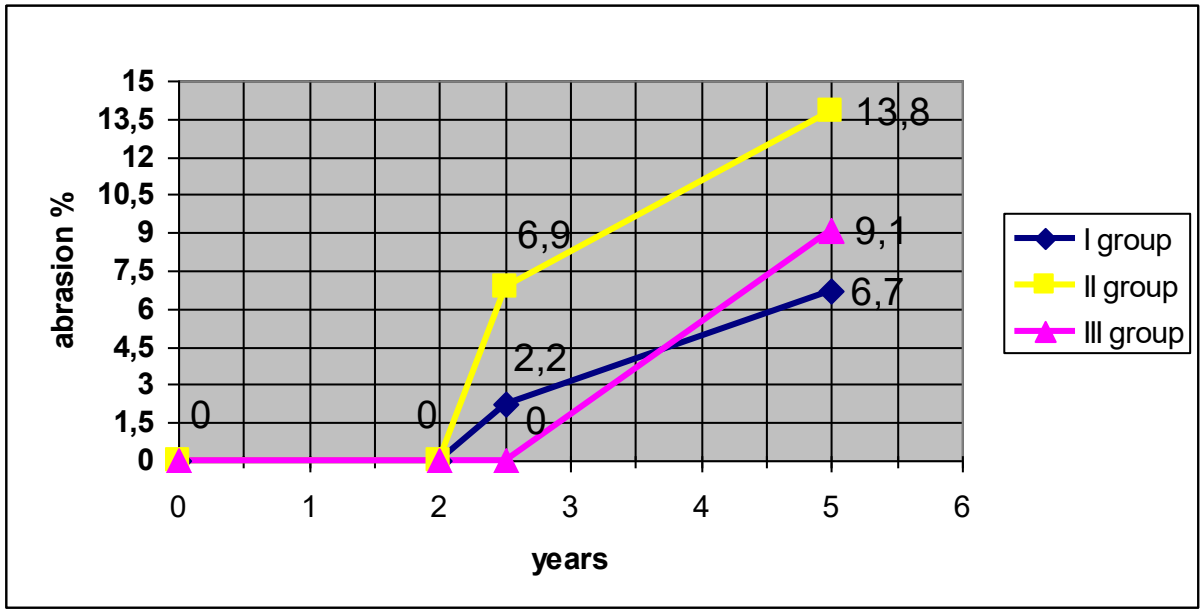

Fig. 2. Dynamics of the repeated increased dental abrasion in the age aspect in patients of groups 1, 2, and 3.

Thus, the analysis of the results of treatment of the increased dental abrasion shows that a quite effective method for grade I-II abrasion is a combination of orthopedic treatment and direct restorations (the benefits are a one-time replenishment of the lost dental tissue, the lack of their bulk preparation, high functional efficiency and aesthetic appearance), which is supported by studies by other authors [8,9,10]. The treatment of grade III-IV dental abrasion requires to combine direct restoration with orthopedic treatments, due to the need to adjust the occlusion height. These combinations allow not only restoring the lost tooth shape and function, but also its aesthetic characteristics (color and transparency), and preventing further dental abrasion. Repeated clinical examinations conducted every 6 months during 5 years provide evidence of the high effectiveness of all three methods of treatment.

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