CLINICAL AND FUNCTIONAL EVALUATION OF BRIDGE PROSTHETICS USING INTRA-OSSEOUS IMPLANTS

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Abstract. The aim of the article is a clinical evaluation of the use of bioplant in the complex treatment of chronic generalized periodontitis of mild degree with closed curettage of periodontal pockets.
Keywords: generalized periodontitis, bioplant, osteoregeneration, collagen.

INTRODUCTION

An analysis of literature data showed that almost 26% of patients with partial absence of teeth who require orthopedic treatment, for various reasons, refuse the production of removable dentures [1]. Dental implantation in combination with improved methods of manufacturing fixed dentures is widely used today for the rehabilitation of such patients [2]. One of the main problems of dental implantology is the prevention of inflammatory complications, the frequency of which in the postoperative period can reach 50% [3].

MATERIALS AND METHODS

The study included 40 patients with terminal defects of dental arches after bridge prosthetics using intraosseous implants. Electromyographic studies were performed by us in the area of the proper masticatory and temporal muscles using the Neurotech device (Russia) at rest and under maximum compression. All patients were divided into 3 groups. Group 1 consisted of 12 patients with unilateral and bilateral terminal defects of dental arches, group 2 included 14 patients after intraosseous implantation surgery, group 3 included 14 patients who received bridge prostheses with distal support on dental implants.

RESULTS AND DISCUSSION

When comparing the functional activity of the temporal and masticatory muscles before orthopedic treatment in patients of the 1st group, the following pattern was revealed. On the intact side, the bioelectrical activity (BEA) of the masticatory muscles was 1.5 times higher, and that of the temporal muscles was 2.3 times higher than on the side of the defect.

Electrophysiological indices of muscle activity in patients with bilateral terminal defects varied within a fairly wide range and depended on the type of chewing. It should be noted that 80% of patients in this group showed predominantly unilateral, namely right-sided, chewing, and 20% of patients had uniform bilateral chewing.

With a unilateral type of chewing, the average BEA values on the working side were 1.8 times higher for the masticatory muscles and 2.1 times higher for the temporal muscles. In patients with a uniform type of chewing, the BEA was approximately the same on the right and left. During electromyographic studies in patients of the 2nd group, the following dynamics of bioelectrical activity of the masticatory muscles were revealed. When clenching the jaws, the maximum amplitude of the BEA was 440±120 μV in m. masseter on the healthy side; 180±70 μV in m. masseter on the edentulous side; 392±110 μV in m. temporalis; 728±191 μV in m. temporalis on the healthy side. The coordination coefficient for the masticatory muscles during chewing averaged 2.4±0.13, for the temporal muscles – 0.5±0.13; at rest, for the masticatory muscles – 0.4±0.13, for the temporal muscles – 2.1±0.13, which indicated a lack of coordination in the work of the masticatory muscles. Three months after the implantation with early functional loading of the implant, some decrease in the BEA of the muscles at rest was observed. On average, for the masticatory muscles proper, the difference was 20% (m. masseter on the healthy side 280±81 μV, m. masseter on the

edentulous side − in the area of the inserted implant − 190±5.0 μV). In the temporal muscles, the BEA at rest decreased by an average of 25% and was: m. temp. on the edentulous side 450±11 μV; m. temp. on the healthy side – 210±4 μV. When clenching the jaws, the BEA of m. masseter h. – 460±98, on the edentulous side – 397±143 μV; m. temp. h. – 650±200 μV; m. temp. hell. – 610±200 μV.

The coordination coefficient for the masticatory muscles proper during compression was 1.2±0.08; for the temporal muscles 1.07±0.06. The coordination coefficient for m. masseter at rest was 0.72±0.05; for m. temporalis – 0.5±0.03. This occurred due to changes in the BEA of the masticatory and temporal muscles proper, which indicates the alignment of the coordination relationships of the masticatory muscles. After 12 months, the patients of the 3rd group after early functional loads maintained the dynamics towards normalization of the coordination work of the masticatory muscles. According to EMG data, an increase in the activity of the masticatory muscles is noted during early functional loads. Electromyographic examination of patients in the 2nd group demonstrated the same picture, but this occurred more slowly than in patients in the 3rd group - by the 12th month, which indicated the process of adaptation of the masticatory muscles to orthopedic structures and the coordination restructuring of the BEA.

The results of the electromyographic study showed that initially, most patients had weak bioelectrical activity of the masticatory muscles at rest. After early functional loads, the coordinated work of the muscles was restored, and their functional activity increased.

Analysis of electromyographic indices in patients of the 3rd group revealed visible changes in the functional state of the studied masticatory muscles depending on the period of implantation and subsequent prosthetics.

CONCLUSION

Thus, the results of electromyographic studies confirmed the restoration of the functional state of the masticatory muscles during orthopedic treatment of patients with various defects of the dentition using dental implants. The data we obtained are objective evidence of the restructuring of the reflex mechanisms of the muscular apparatus at different observation periods.

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