RESEARCH ARTICLE

Effect of Retention of Results on Patient Satisfaction with Orthodontic Treatment

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Abstract

Currently, the number of requests for orthodontic care has increased significantly. This is facilitated by a number of factors -the technical capabilities of orthodontists, which have grown many times due to technological progress and the ability to provide the necessary assistance at almost any age; the need for an aesthetic result, which is formed under the influence of the media. As a result, there are high requirements for both yourself and your appearance, as well as for the orthodontist. Thanks to new technologies, such as cortical support, it became possible to solve the treatment of dental anomalies, which previously could only be cured by surgery. But at the same time, such an important issue as the retention of the results achieved remains open. We studied the objective parameters that changed as a result of orthodontic treatment (teleradiography orthopantomography, analysis of control and diagnostic models), and compared them with the subjective assessment of patients. We have found that the patient's motivation, desire to cooperate with the doctor, a clear understanding of the treatment goals allows you to get a high-quality result and keep it for a long enough period of time.

Keywords: *dental anomalies, orthodontic treatment, bracket system, period of retention, treatment planning.*

Introduction

The quality of treatment of orthodontic patients is largely associated with the development of diagnostic methods [1]. However, the orthodontist is often confronted with high expectations [2, 3, 11, 12].It was found that patients at orthodontic appointments often have a reduced or normal level of situational anxiety and personal anxiety [4, 5, 13, 14].The stability of the result of orthodontic treatment is the most important aspect of the quality of the result and patient satisfaction with the activities carried out.

The question of how best to preserve what has been achieved for the longest possible period of time is still relevant. There are various opinions on this issue, but there is no single view on it. This applies both to the hardware used for retention and to the time required to achieve stability. It is necessary to note the goals that we consider the main ones when conducting orthodontic treatment. These are the fundamental points that make it possible to plan treatment correctly, as well as to evaluate the result from all points of view. So, what do we want to achieve?

- Dental aesthetics and facial harmony.

- Functional occlusion

- Healthy temporomandibular joint

- Meeting the patient's expectations

- A healthy periodontium

- Freedom of the airways

- Long period of stability

All goals are important, and if we achieve them, we can count on the patient's satisfaction with the results of treatment,

and on maximum stability during the retention period. Assessment of the quality of life of an orthodontic patient in the treatment of dental anomalies allows you to standardize the approach to choosing a treatment method, predict the success of the treatment, evaluate its adequacy and patient satisfaction with it, and is also one of the indicators of its effectiveness.

The patient's appearance, attractiveness, and socio-psychological assessment are of great importance for assessing the quality of life [6, 15, 16, 20, 21, 22].So how can we consolidate the results? It is absolutely true that the best retention device is a good occlusion. Naturally, the correct position of the jaws in the space of the skull, the correct fissure-tuberose contacts will support the achieved position of the teeth and bite.

But nevertheless, equipment is needed that will make it possible to reconstruct the bone and connective tissue that changed during the movement of teeth. Also very relevant is the question of the time during which the retention of the achieved result should occur. At the same time, often, despite the established retainers, there are certain recurrences of anomalies, but this does not always affect the patient's satisfaction with the orthodontic treatment and the quality of his life [7, 8, 17, 18, 19].Thus, the study of this issue is relevant for this research.

Materials and Methods

This work was done at Sechenov University with supported by the "Russian Academic Excellence Project 5-100". The study involved 190 people of both sexes who sought orthodontic care. Criteria for inclusion of patients in the study: age 18-29 years; anomalies of teeth, dentition, occlusions; absence of concomitant periodontal diseases; availability of informed consent to participate in the study. Criteria for non-inclusion of patients in the study: dental anomalies of skeletal shape; partial secondary absence of teeth; refusal to participate in the study.

All patients underwent the necessary diagnostics, including x-ray examination (teleradiography, orthopantomography, CT scan), analysis of control and diagnostic models, a photo protocol, and a treatment plan. At the end of treatment, each patient underwent a control teleradiography to identify the changes achieved during treatment. Teleradiography analysis was carried out according to the method Mc Laughlin. Roth-Jarabak, Swing [9, 23, 24, 25]. After the end of active orthodontic treatment, each patient was fitted with a retention device. In the retention period, follow-up was performed 1 month later, 6 months later, and 12 months after the end of treatment. During control visits, the state of the dental system was evaluated for the presence of relapses and patient satisfaction with the result obtained at the moment. Patient satisfaction was assessed using a specially designed questionnaire based on the OHIP-14 questionnaire [10, 26, 27, 28].

For statistical manipulations, mathematical and descriptive statistical methods were used, including the determination of arithmetic means and deviations, $M\pm s$; standard error of the mean, $M\pm m$; t-student's criterion, t. the calculation was performed in the office program Microsoft Office Excel-2010.

Results and Discussions

After the first stage, dental position abnormalities were diagnosed in 85 (44.7%) patients, distal occlusion -in 68 (35.8%), deep incisor occlusion -in 31 (16.4%), mesial occlusion -in 3 (1.6%), vertical incisor dysocclusion -in 1 (0.5%), cross occlusion-in 2 (1.0%) patients.

Analysis of TRG after orthodontic treatment showed that the main indicators for each pathology are close to optimal, even in cases of occlusion anomalies, it was possible to obtain sufficiently compensated values (Table 1). In all cases, a compromise treatment was performed without the use of orthosurgery, since none of the patients were ready for such interventions. Currently, thanks to the introduction of new technologies, such as cortical support, in cases where previously it was possible to cure only with the help of orthosurgery, it is now possible to achieve a good result by inserting or moving teeth with the support of orthodontic micro implants.

In each clinical case, a satisfactory result was achieved for dental signs, and facial aesthetics remained a compromise decision of the patient. Thus, we have achieved quite satisfactory results in cases of treatment of complex pathology of occlusion.

Table 1: Average change in angular and linear parameters of teleradiogramm after orthodontic treatment

Parametrs of teleradiogramm	Norm	Anomalies in the position of teeth	Distal occlusion	Deep occlusion	Mesial occlusion	Vertical tool disocclusion	Cross-bite occlusion
SNA	82,0±3.5°	81,5°	83,0°	85,3°	80,0°	84,6°	79,7°
SNB	80.0±3.0°	78,6	78,3°	81,8	81,2°	83,2°	78,2°
ANB	2.0±2.4°	2,9	4,5°	3,5°	1,1°	1,4°	1,5°
A/NP, mm	0.0±3.1	-0,6	0,3	2,3	5,2	-0,5	2,7
Pog/NP, mm	-4.0±5.3	-4,4	-5,1	0,2	15,8	-3,2	1,6
WITS, mm	0.0±1	1,7	2,5	1,1	-4,8	0,5	1,4
SN/MP	32.0±5°	33,7°	22,8°	31,2°	33,3°	29,2°	27,7°
FH/MP	26,0±5°	25,8°	19,5°	24,0°	18,9°	25,7°	17,9°
PP/MP	28,0±6°	25,9°	19,3°	24,4	17,8°	24,2°	23,1°
PP/OP	10,0±4°	6,0°	6,8°	6,8°	4,6°	7,0°	8,9°
MP/OP	17,4±5°	19,9°	11,4°	17,6°	13,2°	17,2°	14,2°
U1/APog, mm	6,2±2,2	6,2	5,5	5,7	1,6	7,7	4,1
L1/APog, mm	2,0±2,3	3,4	1,6	1,4	2,2	1,8	0,2
U1/PP	110,0±5°	110,6°	107,1°	109,2°	118,5°	114°	106
L1/MP	95,0±7°	96,6°	98,8°	99,5°	81,3°	97,4°	94,6°
U1/OP	57,5±7°	51°	63,1°	59,6°	61,3	52,7°	64,3
L1/OP	72,0±5°	75,9°	87,4°	67,3°	81,3°	71,7°	72,3°

According to the results of the patient survey, more than 95% of the patients in the study group were completely satisfied with the results of treatment. Immediately after the treatment was completed, only 4.74% were partially satisfied with the result, and 12 months later, after the complete restoration of the dental system aesthetics, only 1.58% was left. At the same time, 92.63% believe that all treatment goals were achieved and a year after the end of treatment, 97.37% of patients believes so. The resulting aesthetics do not satisfy patients in an average of 4% of cases, and this, unfortunately, persisted both 6 and 12 months after treatment. It is noteworthy that relapse occurred in 6.32% after six months and a year later in 11.05% of cases, but this did not affect overall satisfaction with aesthetics. In more than 85% of cases, there is an improvement in self-esteem, which means an increase in self-esteem (Table 2).

Table 2: Results of patient survey on satisfaction with the results of orthodontic treatment

Questionnaire	At the end of active orthodontic treatment (%)			12 months after treatment (%)		
	Yes	No	Partially	Yes	No	Partially
Are you satisfied with the results of your orthodontic treatment?	95,26 ±0,70		4,74 ±1,54	98,42 ±0,90		1,58 ±0,90
Do you think that all the treatment goals have been achieved?	92,63 ±1,65	7,37 ±1,89		97,37 ±1,16	2,11 ±1,04	0,53 ±0,53
Are you satisfied with the aesthetic result?	94,21 ±1,69	2,11 ±1,04	3,68 ±1,37	94,74 ±1,62	1,58 ±0,90	3,68 ±1,37
Are changes significant				7,37	3,68	

| for you in the event of a relapse? | | | | ±1,89 | ±1,37 | |
| Has the treatment changed your attitude to yourself? | 85,79 ±2,53 | 7,89 ±1,96 | 6,32 ±1,76 | 91,05 ±2,07 | 6,32 ±1,76 | 2,63 ±1,16 |

Given that satisfaction with treatment is at 95%, and a year after treatment aesthetic result was positive with 100%, we can talk about the high level of treatment and cooperation of patients and their interest in quality result

Conclusions

Stabilization and consolidation of the results of orthodontic treatment is not only the objective of the orthodontist, but also the issue of interaction with the patient. The importance of maintaining the result is very high, since patient satisfaction at the end of treatment may change if a relapse occurs. The patient's motivation, his desire to cooperate with the doctor, a clear understanding of the goals of treatment allows you to get a high-quality result and keep it for a long enough period of time. Thus, patient satisfaction with the results of treatment, and therefore improving the quality of his life, is a very complex, multi-factorial process consisting of such details as compliance of the patient's wishes and the doctor's capabilities, therapeutic goals, patient capabilities, duration of treatment, achieving good function and aesthetics of the dental system and long-term stability of the result.

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