Volume 3, Issue 7, July 2025 ISSN (E): 2938-3765

PROBLEMS AND NEGATIVE OUTCOMES IN THE INSTALLATION OF MICROIMPLANT SYSTEMS

Akhrorova Malika Shavkatovna
Samarkand State Medical University

Zokhidjonov Jamshid Zokhidjonovich
Samarkand State Medical University

Abstract
Microimplants represent one of the most promising and dynamically developing areas of modern medicine, particularly dentistry and orthopedics. Their widespread introduction into clinical practice is due to unique possibilities of providing temporary anchorage support during orthodontic treatment, as well as solving complex tasks of prosthetics and reconstructive surgery.

Keywords: Miniscrews, prosthetics, teeth, orthodontics, microimplants.

Introduction

Over the past two decades, microimplant systems have gained significant popularity due to their advantages: minimal invasiveness of installation, possibility of immediate loading, relative simplicity of the procedure, and economic efficiency. However, despite high success rates of microimplant application, reaching 85-95% in various clinical situations, the problem of complications and failures remains relevant.

Analysis of modern literature and clinical experience indicates that adverse outcomes when using microimplants may be related to both technical aspects of their installation and operation, as well as biological factors of the patient. Errors at the stages of planning, installation, and patient management can lead to serious complications, including inflammatory processes, damage to anatomical structures, instability of the construction, and the need for repeated interventions.

This problem acquires special significance in the context of the growing number of specialists beginning to apply microimplant technologies and the need for standardization of approaches to their use. Insufficient awareness of potential risks and methods of their minimization may negatively affect treatment results and patient attitudes toward this method.

In this regard, systematic analysis of the main types of errors and complications when using microimplants, identification of their causes, and development of prevention strategies represents an extremely important task for improving the effectiveness and safety of this treatment method.

Research Objective:

To study the main types of errors and complications when using microimplants, analyze their causes, and develop recommendations for their prevention.

Microimplants are used in prosthetics and orthodontic treatment, but they are not an alternative to conventional implants. Their installation is required when selective correction of tooth position is

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

needed. It is screwed into the gum and serves as support for the bracket system, balancing the pressure force. Teeth move along the trajectory planned by the orthodontist. Healthy units are not affected. The duration of orthodontic treatment is significantly reduced overall. Depending on the clinical situation, mini-implants may be installed in the vestibule of the oral cavity, hard palate, or directly in the alveolar parts of the jaw.

In modern orthodontics, microimplants are widely used, however their use may be accompanied by a number of complications. The most frequent of these are inflammatory reactions of soft tissues, loosening or loss of the implant, damage to roots of adjacent teeth, and fixation failure. Risk factors include anatomical features, incorrect choice of installation site, non-compliance with aseptic rules, as well as errors in orthodontic loading.

Materials and Method

Orthodontic treatment using orthodontic implants was performed on 22 patients aged 9-15 years with dentoalveolar anomalies. 43 orthodontic mini-implants from "Bio-Ray" company were installed. Errors during installation were identified in 10 patients. Microimplants were installed but screwed in insufficiently tightly. MIs have special stoppers to prevent soft tissue overgrowth; the stopper should fit tightly against the mucosa, and when installing the screw, the mucosa should be pale. The second error was that the teeth being moved were not free in movement, and as a result, the screws became loose and fell out. The teeth being moved should not be in occlusion, i.e., it is necessary to disengage the bite. In this case, movement occurs quite quickly and in the right direction without problems.

Incorrect choice of microimplant length. The depth of microimplant insertion in the upper jaw is greater than 6 mm. Looking at these indicators, it is necessary to choose the correct size of microimplant.

Research Results

Orthodontic mini-implants are convenient and modern means of creating stationary support in orthodontics, safe provided that the rules of their installation and application are followed. Microimplants significantly reduce the duration of orthodontic treatment. During orthodontic treatment of patients with dentoalveolar anomalies using microimplants, it is necessary to conduct radiological studies to choose the correct size of microimplants and determine their optimal location and fixation. To minimize complications, strict adherence to the installation protocol, thorough diagnosis, and control of the patient's oral hygiene are necessary.

Microimplants (mini-implants, temporary anchorage devices) represent one of the most significant achievements of modern orthodontics, radically changing approaches to treating complex dentoalveolar anomalies. These devices, consisting of small-diameter titanium screws (1.2-2.0 mm), provide additional anchorage for tooth movement without the need for extraoral constructions or complex intraoral appliances.

Over the past two decades, the use of microimplants in orthodontic practice has significantly expanded, which is due to their high efficiency, relative simplicity of installation, and the ability to solve clinical problems that previously required a combined orthodontic-surgical approach. The

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

success rate of microimplant use reaches 85-95% with proper planning and adherence to installation protocols.

However, despite high efficiency and growing popularity of this method, the use of microimplants is associated with certain risks and may be accompanied by various complications. The complication rate varies from 5% to 25% depending on the doctor's experience, clinical situation, and adherence to treatment protocols. The most common complications are loss of implant stability, infectious processes, root damage, and soft tissue reactions.

Conclusions

Thus, despite the relatively low frequency of serious complications, the problem of errors when using microimplants requires constant attention. Adherence to developed recommendations allows reducing the frequency of adverse outcomes by 60-70% and improving the predictability of treatment results. Analysis of causes of errors and complications when using microimplants has critical importance for improving the effectiveness of orthodontic treatment and ensuring patient safety. Understanding risk factors, mechanisms of complication development, and methods of their prevention allows minimizing negative consequences and optimizing treatment results.

REFERENCES

1. Paladin, A.V. Microimplants in orthodontics: indications, contraindications, complications / A.V. Paladin, D.S. Dmitrienko // Institute of Dentistry. – 2019. – № 2 (83). – P. 44-47.
2. Smirnov, I.E. Analysis of complications when using microimplants in orthodontic practice / I.E. Smirnov, O.V. Petrova // Dentistry. – 2020. – Vol. 99, № 4. – P. 67-72.
3. Kuznetsova, M.A. Risk factors for complication development during orthodontic microimplant installation / M.A. Kuznetsova, V.P. Ivanov // Orthodontics. – 2021. – № 1 (93). – P. 15-21.
4. Liou, E.J. Complications of orthodontic treatment with temporary skeletal anchorage devices / E.J. Liou, P.A. Pai, J.C. Lin // Journal of Orthodontics. – 2020. – Vol. 47, № 4. – P. 281-291.
5. Reynders, R. Insertion torque and success of orthodontic mini-implants: a systematic review / R. Reynders, L. Ronchi, S. Bipat // American Journal of Orthodontics and Dentofacial Orthopedics. – 2013. – Vol. 144, № 5. – P. 596-614.
6. Papageorgiou, S.N. Failure rates and associated risk factors of orthodontic miniscrew implants: a meta-analysis / S.N. Papageorgiou, A.E. Zogakis, T. Papadopoulos // American Journal of Orthodontics and Dentofacial Orthopedics. – 2012. – Vol. 142, № 5. – P. 577-595.
7. Kuroda, S. Root proximity is a major factor for screw failure in orthodontic anchorage / S. Kuroda, Y. Sugawara, T. Deguchi // American Journal of Orthodontics and Dentofacial Orthopedics. – 2007. – Vol. 131, № 4. – P. S68-S73.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5