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THE INFLUENCE OF PARTIAL ABSENCE OF TEETH ON CHANGES IN THE TEMPOROMANDIBULAR JOINT.

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Abstract

The purpose of this article is to analyze the clinical and pathogenetic mechanisms and forms of changes in the TMJ associated with partial tooth loss, their relationship with occlusal changes, and functional disorders of the masticatory system.
Partial tooth loss (hypodontia and adentia) remains one of the most common dental problems, significantly impacting not only chewing function and aesthetics but also the condition of the temporomandibular joint (TMJ). Despite the widespread development of prosthetic methods for restoring lost teeth, the impact of prolonged tooth loss on the morphofunctional characteristics of the TMJ continues to generate interest among clinicians and researchers.

Keywords

Temporomandibular joint, articular disc, missing teeth.

General principles of anatomy and function of the TMJ

The temporomandibular joint is one of the most complex joints in the human body, enabling movements of the mandible—opening and closing the mouth, retraction, protraction , and lateral displacement. The joint is formed by the glenoid fossa of the temporal bone and the head of the condylar process of the mandible, separated by a biplanar articular disc, which performs shock-absorbing and stabilizing functions.
The functional load on the TMJ depends on chewing activity, the nature of occlusion, the condition of the dental arches, and muscle tone. Violation of these conditions can lead to compensatory and pathological changes, manifested by pain, joint dysfunction, and occlusion disorders.

Partial absence of teeth: etiology and classification

Partial edentulousness is a condition in which some teeth are missing from one or both jaws. Causes include:

- chronic periodontal diseases;
- complicated caries;
- injuries;
- congenital developmental anomalies;
- endocrine and systemic diseases.

Classification of partial edentia can be based on the number of missing teeth, location (lateral, anterior), consequences for the chewing arch and the Kennedy and Applegate classification .

The influence of missing teeth on the occlusal scheme

Tooth loss causes serious changes in occlusion:

1. Displacement of dental arches

- Mesial inclination of the antagonist teeth;
- Advancement of adjacent teeth;
- Decreased interalveolar height.

Such changes lead to disharmony in the relationship of the dental arches, disrupt the central function of the arch and increase the risk of temporary occlusion.

2. Violation of the bite height

Tooth loss is often accompanied by a decrease in bite height, which causes:

- Increased load on the articular surfaces;
- Change in the position of the lower jaw;
- Compensatory changes in the muscles of the masticatory apparatus.

Pathogenetic mechanisms of influence on the TMJ

Biomechanical restructuring

Partial absence of teeth leads to changes in the distribution of chewing forces. This is reflected in:

- Increased loads on individual antagonist teeth;
- Increased influence of the masticatory muscles on the joint.

Such changes can initiate remodeling of the articular surfaces, abrasion of the articular disc and disruption of its shock-absorbing properties.

Change in the position of the lower jaw

Decreased dental support causes a retroclinal position of the mandible, which:

- Increases pressure on the anterior -inferior parts of the joint capsule;
- Promotes redistribution of joint load;
- Stimulates adaptive (or pathological) bone changes.

Muscle dysfunction

Violation of the harmony of dental contacts leads to compensatory activity of the masticatory muscles, the occurrence of spasms, increased fatigue and disruption of the kinematics of the lower jaw.

Clinical manifestations of TMJ changes in partial edentia

Symptoms

- Pain in the TMJ area;
- Clicking and crepitation when moving;
- Limited or excessive amplitude of mouth opening;
- Headaches, distant pain in the neck and shoulders.

Functional disorders

- Disco- descapsicular disorders;
- Articular disc distortion;
- Decreased chewing efficiency;
- Dyspeptic phenomena in chronic masticatory dysfunction.

Diagnosis of TMJ changes

Diagnostics includes:

- **Clinical examination** : assessment of the TMJ by palpation, percussion, dynamics of movement;
- **Occlusal analysis** : registration of contacts, assessment of bite height;
- **Instrumental methods** : orthopantomography , CT/MRI of the TMJ, if necessary - articulation registration.

Treatment and prevention

Prosthetic restoration

The main method of correction is the restoration of missing teeth using:

- Removable dentures;
- Fixed bridge prostheses;
- Implants.

Occlusion correction restores the biomechanics of the masticatory system, reduces TMJ overload and normalizes the function of the masticatory muscles.

Occlusal correction

- Therapeutic polishing of dental surfaces;
- Occlusal liners (splints);
- Using an articulator to model contacts.

Physiotherapy and muscle rehabilitation

- Thermal procedures;
- Massage;
- Physical therapy for chewing muscles;
- Biofeedback .

Prevention

- Timely restoration of lost teeth;
- Regular orthodontic and dental checkups;
- Teaching patients about hygiene and proper chewing function.

Conclusions.

Partial absence of teeth has a multi-level impact on the TMJ, expressed in changes in occlusion, redistribution of the chewing load, disruption of the position of the lower jaw and subsequent involvement of the articular structures in the pathological process.

A comprehensive approach to diagnosis and treatment, including timely dental restoration, occlusion correction, and functional rehabilitation, can significantly reduce the risk of developing TMJ dysfunction and improve functional treatment outcomes.

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