

**PAIN DYSFUNCTION OF THE TEMPOROMANDIBULAR JOINT: PATHOGENESIS,
CLINICAL AND DIAGNOSTIC CRITERIA, AND MODERN TREATMENT
APPROACHES**

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Annotation. Pain dysfunction of the temporomandibular joint (TMJ) belongs to the group of temporomandibular disorders and is a multifactorial disease characterized by a combination of articular and myofascial pain, impaired function of the masticatory muscles and changes in the biomechanics of the mandible. The high prevalence of the pathology, its chronic course and its tendency to relapse determine its importance in clinical dentistry. The purpose of this work is to summarize current data on the pathogenesis, clinical picture, diagnostic criteria and principles of complex treatment of TMJ pain dysfunction. The article discusses occlusive, muscular, neurogenic, and psychoemotional factors that determine the development of the disease. Modern diagnostic algorithms based on DC/TMD criteria and evidence-based methods of conservative therapy are presented. The need for an interdisciplinary approach to achieve a sustainable clinical outcome is emphasized.

Keywords: TMJ, pain dysfunction, temporomandibular disorders, myofascial pain syndrome, occlusion, bruxism, splint therapy, central sensitization, arthralgia.

Introduction. Pain dysfunction of the temporomandibular joint (TMJ) is one of the most common causes of chronic orofacial pain. According to modern epidemiological data, signs of temporomandibular disorders are detected in more than half of the adult population, however, clinically significant pain syndrome is diagnosed in 10-15% of patients. The disease is most common in young and middle-aged people, with a predominance among women.

The TMJ is a complex anatomical and functional formation that provides movement of the lower jaw in three planes. His work is closely related to the condition of the maxillary system, chewing muscles and central nervous regulation. The imbalance between these components leads to the formation of functional overload, inflammatory and degenerative changes and chronic pain syndrome.

The relevance of studying TMJ pain dysfunction is due not only to its prevalence, but also to its significant impact on the quality of life of patients, reduced ability to work, and the need for long-term comprehensive treatment.

TMJ pain dysfunction is considered as a polyetiological disease with a multilevel pathogenesis. The modern concept is based on a biopsychosocial model, according to which the formation of pain syndrome is determined by the interaction of somatic, neurophysiological and psychoemotional factors.

1. Occlusive disorders.

The mismatch of the inter-jaw relationships, premature contacts, secondary adentia, and a decrease in the height of the bite can lead to a redistribution of the chewing load and the formation of a functional overload of the joint. However, modern research shows that occlusive factors are not the only cause of the disease, but act as a predisposing or supportive mechanism.

2. The muscle component.

Chronic hypertonia of the masticatory muscles, parafunctions (bruxism, teeth clenching), stress-induced muscle activity cause tissue ischemia, accumulation of metabolites, and the

formation of trigger points. Myofascial pain syndrome is often the leading manifestation of dysfunction.

3. Articular component.

Intraarticular changes include disc displacement, inflammatory reactions of the synovial membrane, and degenerative changes in articular surfaces. Increased intraarticular pressure and microtraumatization contribute to the chronic pain.

4. Neurogenic mechanisms.

Of particular importance is the phenomenon of central sensitization — an increase in the excitability of neurons of the central nervous system, which leads to increased perception of pain impulses and the formation of a chronic pain condition. At the same time, even minimal peripheral stimuli can maintain the pain syndrome.

5. Psychoemotional factors.

Anxiety, depression, and chronic stress increase muscle tension and alter pain perception. It has been proven that patients with severe psychoemotional disorders have a more severe course of the disease.

The clinical picture

The main symptom is pain in the TMJ and masticatory muscles, which increases with functional stress. The pain may be aching, dull, or less often acute, radiating to the ear, temple, and occipital region.

Additional symptoms include:

- restriction of mouth opening;
- deviation of the lower jaw when opening;
- clicks or crunches in the joint;
- feeling of fatigue of the chewing muscles;
- tension headaches;
- increased sensitivity of teeth in bruxism.

The clinical course may be acute or chronic. In the chronic form, combined musculoskeletal and articular manifestations are often observed.

Diagnostics.

The diagnostic algorithm includes:

1. Collecting anamnesis — clarifying the nature of pain, duration, provoking factors, the presence of stress and parafunctions.

2. Clinical examination — assessment of the range of movements, palpation of the masticatory muscles and joint, identification of pain points.

3. Occlusal analysis — detection of premature contacts and violations of inter-oral relationships.

4. Instrumental methods:

- o orthopantomography;
- o Computed tomography;
- o magnetic resonance imaging (to assess the position of the disc);
- o electromyography.

The current diagnostic standard is the DC/TMD criteria, which make it possible to differentiate between muscle and joint forms of the disease and take into account psychosocial factors.

Treatment.

Treatment of TMJ pain dysfunction should be phased and mostly conservative.

1. Educational activities.

They explain the nature of the disease to the patient, recommend limiting the load on the joint, avoiding harsh foods, and controlling parafunctions.

2. Drug therapy.

Nonsteroidal anti-inflammatory drugs, muscle relaxants, and, if necessary, anxiolytics or antidepressants are prescribed. With severe muscle hypertension, the use of botulinum toxin is possible.

3. Splint therapy.

Occlusal splints (stabilizing mouthguards) help to relieve the joint, reduce muscle tension and normalize the position of the lower jaw. This method is one of the most effective for the musculoskeletal and articular form of the disease.

4. Physical therapy.

Laser therapy, ultrasound, magnetic therapy, and therapeutic gymnastics are used to normalize muscle function.

5. Minimally invasive interventions

With pronounced intraarticular changes, arthrocentesis, intraarticular administration of hyaluronic acid or corticosteroids are possible.

Surgical treatment is rarely indicated and is used for severe structural disorders.

Discussion.

Modern research confirms that TMJ pain dysfunction cannot be considered solely as a consequence of occlusive disorders. The leading role is played by muscular and neuropsychological mechanisms. Isolated bite correction without taking into account central sensitization and the psychoemotional status of the patient does not provide a stable result.

An interdisciplinary approach involving an orthopedic dentist, neurologist, physiotherapist, and psychologist significantly improves the effectiveness of treatment and reduces the risk of chronic pain.

Conclusions.

1. TMJ pain dysfunction is a multifactorial disease with a leading role of muscle-neurogenic mechanisms.

2. Central sensitization plays a key role in the formation of chronic pain syndrome.

3. Diagnosis should be based on standardized criteria and comprehensive clinical and instrumental examination.

4. The treatment is based on conservative complex therapy, including splint therapy, drug support and correction of psychoemotional factors.

5. An interdisciplinary approach ensures the most favorable prognosis and the sustainability of the clinical effect.

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