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Rehabilitation in dysfunctions of temporomandibular joints

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Abstract

The treatment of the temporomandibular joints dysfunctions shall be complex due to several possible causes that trigger the disorders. Rehabilitation is based on adopting the techniques that originate from manual therapy, applying physiotherapy, classical and transverse massage, as well as autotherapy. Moreover, in the course of the therapy, Kinesio taping, post-isometric relaxation,

positional release, release and rolling of the skin are also applied. Cooperating with an orthodontist, a stomatologist, a physiotherapist and a psychologist, as well as the commitment to the treatment on the part of the patient shall allow the cure to take effect in the joint itself and the muscles surrounding it.

Key words: Temporomandibular joint, biomechanics, manual therapy

Introduction

The temporomandibular joint is built of the head of the mandible and the anterior part of the mandibular fossa – the dimple and the joint lump of the temporal bone [1]. There is a disc located in the joint, which divides the joint into two halves. The role of the disc is to reduce the friction forces and to decrease the stresses. The joint is stabilized by the ligaments: the lateral, the sphenomandibular and the stylomandibular. It is possible to make the following movements in the joint: ejecting and reversing, lowering and lifting, as well as lateral movements [2]. The temporal muscle, the masseter muscle, and the medial pterygoid muscle are responsible for clenching the jaws. The lateral pterygoid muscle ejects the mandible forward and slightly opens the jaws [4]. Its mass, the muscle of the floor of the mouth, the digastric muscle, and the mylohyoid muscle are responsible for opening the jaw [2, 3].

The strength of the masseter muscles is significant. Despite clenching the jaws, the muscles may still contract, which makes it possible to chew. Once the clench of the jaws has been reached, muscle work results in excessive pressure on the joint, which causes periosteum soreness [4].

The movements in the temporomandibular joint depend on both rows of teeth, the cooperation of the muscles and the joint structure. Both joints cooperate with each other at every movement, making thus the movement in only one of the joints impossible. In the case of missing teeth, due to compensation, we may expect a joint conversion [2]. The rows of teeth, the mandible, the jaw, and the masseter muscles create a coherent system, referred to as the stomatognathic system [4].

During sleep, in physiological conditions, a slight opening of the mandible takes place [2]. In a pathologic situation, we witness an excessive masseter muscle tension during sleep, often coupled

with grinding the teeth. The external grounds for bruxism (the aetiology whereof has not been entirely elucidated) include a high level of stress and depression. Whereas malocclusion, pathologies of the temporomandibular joint, dysfunctions of neurotransmitter secretion - mainly dopamine [5] – constitute the internal grounds. Dysfunctions in formations of the joint and - mostly masseter and temporal – muscles have been observed in patients. Moreover, patients display teeth grinding, soreness and limited movability. If left untreated, bruxism gives rise to further disorders. They include headaches, neck pains, earaches, hearing and sleep disorders, excessive tension in the shoulder and backaches [6]. Present dysfunctions induce further ones. The treatment of bruxism is a complex process. It involves the application of relief braces, malocclusion is corrected, physical exercise, physiotherapy, therapeutic massage, psychotherapy, pharmacotherapy, manual therapy and autotherapy are adopted into the treatment [5, 7, 8].

Aim of the dissertation

A literature review has been conducted and the types of modern therapy employed in the treatment of temporomandibular joints dysfunctions have been identified.

Temporomandibular joints disorders

A diagnosis of temporomandibular joints disorders consists of conducting examinations and running functional tests. The inquired patients report pain in the joint area, a “clicking” noise while opening the mandible, a toothache after waking up – caused by clenching them tightly in sleep. Headaches, pains in the neck, shoulders, and saliva secretion disorders and gingivitis while brushing the teeth may also be present. Some patients also report they wake up because of grinding their teeth [5, 7, 9]. In the course of visual examination, wearing the tooth surface, biting down on a cheek on the inside – usually to a greater extent on one side – and gum line recession are visible in the oral cavity. Hypertrophies of the masseter muscle and the temporal muscle are visible from the outside. In the course of palpation examination, there are tissue texture abnormalities or trigger points located on the masseter muscle and the temporal muscle. During the examination, the muscles are evidently painful and excessively tightened. The next stage in the diagnosis of temporomandibular joints is an examination of active and passive movability. A therapist assesses and compares the range and the physiological track of the movements in both joints checks the present deviations or the popping audible during the movement. All the movements possible to make, as well as the working of the

joint itself, are subject to examination. The examination may be performed in either a sitting or lying position [6].

Treatment of temporomandibular joints dysfunction

It is possible to treat temporomandibular joints dysfunction in several ways. Dental and orthodontic-prosthetic treatment is the first step in the therapy. After the working order inside of the mouth has been restored, physiotherapeutic treatment begins [10]. Untreated stomatognathic system disorders with time shall affect disorders and pains in other parts of the body [11]. The selection of the appropriate therapeutic conduct should allow for an individual approach to all the existing dysfunctions. For the cause of these disorders may be compound [4, 10]. One method to rehabilitate temporomandibular joints is relaxing the skin by stretching and rolling it. The therapist locates the irregularities in skin tension above the joint, subsequently stretches it to the limits of elasticity and upholds this stretch without increasing force for about 10 to 15 seconds, until the place being worked on relaxes. Then the therapist searches for another dysfunction works on it and proceeds to do so until all the irregularities in skin elasticity have been removed. The tissue prepared in this way may be subsequently subject to rolling [6]. In the course of the therapy, grips like those applied to test joint play are used.

Further components that are worth taking advantage of in the treatment include classical massage and deep massage of transverse muscles affected by dystrophies. Physiological inflammation that is induced in the massaged tissues causes the tissues to come apart, thereby enabling them to regenerate properly [6]. The patient needs to be taught self-massage. The therapy is performed in a rest position of the mandible for about 3 to 5 minutes. All the masseter muscles undergo massaging.

The therapy of the temporomandibular joints also includes removing trigger points in all the muscles located in the joint area, as well as the in the neck muscles [4].

Availing oneself of muscle energy technique, e.g., post-isometric relaxation of excessively tense muscles represents another therapeutic alternative. It is worth ordering the technique to patients in the form of autotherapy. Relaxation exercises of excessively tense muscles shall be done several times during the day [12]. The joint hypermobility is corrected, among others, by applying Kinesio taping. The plasters are also used to reduce excessive muscle tension [13]. In order to achieve a permanent improvement of the patient's condition, it is important that the therapist teaches the muscle relaxation techniques to them. They may also benefit from ischemic compression. It is essential to develop a habit of conscious muscle relaxation. Some simple exercises shall be helpful in

order to do it: upholding the tip of the tongue in the front part of the palate, right behind the front upper teeth, holding the tongue between the teeth – with the mouth shut, holding the tip of the tongue on the palate, attempting to yawn with one's mouth shut. It is also essential that the patient develops a habit of constantly controlling the level of the masseter muscles tension [12, 13].

Another element useful in the treatment of bruxism is the application of dry needling techniques. Pricking muscle-slings trigger points is used the most often. The best result of the therapy is attributable to evoking a local muscle twitch as a result of the prick [14, 15].

It is worth including physiotherapy in the therapy of the temporomandibular joints. Among others, the ultrasounds, laser therapy, electrotherapy, magnetic field, infrared light exposure are utilized in the treatment. Electrotherapy is used in order to alleviate pain and reduce muscular tension, usually, TENS currents and interference currents are applied. Ultrasounds have pain-relief, anti-inflammatory, and relaxing effect. It is worth combining point-based laser therapy with a low-power and a high-power laser with developing trigger points on the masseter and the temporal muscle. A magnetic field is deployed to improve exacerbating symptoms and in chronic conditions. It is worth applying infrared lamps as a form of preparation preceding relaxation [16, 17].

There are several different methods and ways applied in rehabilitation of the temporomandibular joints. An individual approach, appropriately selected and integrated therapy, autotherapy, developing new habits and patient re-education shall influence the effectiveness of the therapy.

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