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# Association between headache and temporomandibular disorder

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**Abstract** (J Korean Assoc Oral Maxillofac Surg 2017;43:363-367)

Headaches are one of the most common conditions associated with temporomandibular disorder (TMD). In the present paper, we evaluated the relationship between headache and TMD, determined whether headache influences the symptoms of TMD, and reported two cases of TMD accompanied by headache. Our practical experience and a review of the literature suggested that headache increases the frequency and intensity of pain parameters, thus complicating dysfunctional diseases in both diagnostic and treatment phases. Therefore, early and multidisciplinary treatment of TMD is necessary to avoid the overlap of painful events that could result in pain chronicity.

**Key words:** Headache, Temporomandibular joint disorders

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## I. Introduction

Temporomandibular disorder (TMD) is characterized by chronic, spontaneous, nonodontogenic pain that is referred to the masticatory muscles, periauricular region, teeth, and temporomandibular joint (TMJ)[1]. The pain is highly aggravated with mandibular movements and mastication and results in limited mandibular movements, TMJ clicking, and headache[2]. TMD has been previously known as Costen's syndrome, mandibular dysfunction, and craniomandibular disorder[3-5].

Between 2003 and 2005 in Korea, 0.15% patients who visited a hospital with TMD-related symptoms were diagnosed with TMD[6]. The number of diagnoses increased every year, with the average incidence in teenagers being high at 22.5%. In children, the signs of TMD can appear at a preschool age, although the symptoms are noticeably mild. However, studies on TMD in children are difficult and unreliable because of the inaccurate expression of pain stated by children[7].

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Regarding the association between sex and TMD, the prevalence in women is reportedly 2 to 5 times that in men[8]. Moreover, the manifestation of temporomandibular symptoms, including clicking, jaw fatigue, trismus, and pain during mastication, is higher in women than in men[9,10].

## II. Headache and TMD

Researchers have found high rates of medical comorbidities in patients with a wide range of chronic pain conditions, including fibromyalgia and headache[10,11]. Headache occurs more frequently in patients with TMD symptoms (27.4% vs 15.2%)[12] and can be divided into two main types: primary headache and secondary headache.

### 1. Primary headache

#### 1) Migraine

Migraine is a common, disabling primary headache disorder that is currently ranked by the World Health Organization as number 19 among all debilitating diseases worldwide. It is subdivided into migraine without aura and migraine with aura. The former (International Classification of Headache Disorders [ICHD] code 1.1) was initially known as common migraine or hemicrania simplex. It is diagnosed on the basis of at least five attacks per month that last for 4 to 72 hours and are characterized by unilateral, throbbing, moderate or severe pain accompanied by nausea, vomiting, photopho-

bia, and/or phonophobia. When there are >15 headaches per month for >3 months, the condition is known as chronic migraine (code 1.5.1). Triptan is considered effective for the management of acute attacks. Migraine with aura was initially known as classic or ophthalmic migraine (code 1.2 or 13.17) and is diagnosed on the basis of at least two attacks per month, with premonitory symptoms including fatigue, difficulty in concentration, neck stiffness, sensitivity to light or sound, nausea, blurred vision, yawning, and pallor[13-16].

2) Tension-type headache

Tension-type headache can be infrequent episodic or frequent episodic. Infrequent episodic tension-tension type headache (code 2.1) is diagnosed on the basis of ≤1 attack that lasts for 30 minutes to 7 days and is characterized by bilateral, nonpulsating, mild pain that is not aggravated by physical activity, with or without pericranial tenderness. The frequent episodic type (code 2.2) shows the same characteristics and is diagnosed on the basis of >1 but <15 attacks per month for ≥3 months[17-21].

### 2. Secondary headaches

Secondary headaches include acute and chronic headaches that occur after whiplash injury. Acute secondary headache (code 5.3) develops within 7 days after the injury and resolves within 3 months. Chronic secondary headache (code 5.4) also develops within 7 days after injury, although it persists for >3 months[22-24].

### 3. Masticatory myofascial pain and headache

According to the new diagnostic criteria for TMD (DC/TMD), masticatory myofascial pain and headache are correlated[25]. As defined in DC/TMD, the confirmation of a myofascial trigger point (MTrP), the palpation of which exaggerates the pain, suggests that headache originates from MTrP, and that myofascial pain does not originate from intracranial structures. Furthermore, the International Classification of Headache Disorders-3 (ICHD-3 beta) recommends that the temporal relationship between headache and TMD should be assessed with regard to onset, development, and improvement[26]. Involuntary tooth contact is one of the most typical parafunctions that is observed more frequently in patients with TMD than in healthy individuals[27]. If patients with TMD avoid parafunctional habits and assume a mandibular resting position keeping the maxillary and mandibular teeth separate, unnecessary masticatory muscle activity can be decreased, which results in pain relief[28]. Immobilization of fascia induces sensitization of free nerve endings, which are considered to be the cause of myofascial pain. Stretching of the fascia, including MTrP, through massage and passive stretching is believed to improve fascial mobility and relieve pain[29]. Decreased pain thresholds have been noted in the extremities of TMD patients[30]. Accordingly, exercise and massage increase the threshold of peripheral receptors in the affected muscles that generate nociceptive inputs, suppress pain processing, and modulate pain through the central nervous system[31].

## III. Management of Headache Associated with TMD

The signs and symptoms of headache attributed to TMD (HATMD) can be significantly improved by physical therapy, and these improvements are associated with improvements in TMD signs and symptoms. ICHD-3 beta defines HATMD as headache caused by a disorder involving structures in the temporomandibular region that is diagnosed by its devolvement in temporal relation to the onset of TMD. HATMD worsens in parallel with TMD progression and improves with TMD resolution. Unilateral headache occurs ipsilateral to the side of TMD, which is evidence of the pathological process affecting TMJ and the masticatory muscles[32]. Researchers have found that an improvement in TMD signs and symptoms or their treatment can ameliorate headaches. The different treatment approaches for this condition are described below.

### 1. Patient education

TMD is a self-limiting disorder that primarily resolves within an average of 7 years. Explanations and assurances are helpful to eliminate fear and ameliorate symptoms in patients who should be advised to rest their masticatory system and avoid precipitating factors such as hard, chewy foods or chewing gum and parafunctional habits such as clenching and grinding[33,34].

### 2. Physical therapy

Physical therapy is a common first-line treatment for TMD-associated pain and dysfunction because it is simple, noninvasive, and inexpensive; can be easily implemented at home; and offers the opportunity for communication between

doctors and patients. For example, a home physical therapy program involving the application of heat or ice to the painful areas, massage, and range of motion exercises have been shown to decrease pain and improve function. Furthermore, physical therapy measures such as active relaxation exercises, ethyl chloride spray, and passive stretching, acupressure, ultrasound, deep massage, moist heat application, laser therapy, electrical stimulation, and transcutaneous electrical nerve stimulation can be used to manage precipitating factors while enhancing central inhibition[35].

### 3. Splint therapy

Benefits of occlusal appliances include a stable temporary occlusal relationship, habit management assistance, alterations in TMJ structural relationships, prevention of dental and periodontal damage, and a possible decrease in masticatory muscle activity during sleep[36].

### 4. Psychological interventions

In a previous study, patients who received psychological intervention exhibited significantly lower levels of self-reported pain and depression and were less likely to seek care for TMD-related issues. Compared with patients who received psychological intervention, those who did not receive psychological intervention were 12.5 times more likely to exhibit a somatoform disorder, 7 times more likely to exhibit an anxiety disorder, and 2.7 times more likely to exhibit an affective disorder at 1 year. Moreover, cognitive-behavioral therapy resulted in decreased pain levels, improved coping abilities, and decreased emotional distress associated with chronic pain in other parts of the body[37].

### 5. Medications

Oral medications indicated for TMJ disorders include analgesics, nonsteroidal anti-inflammatory drugs (NSAIDs), oral steroids, muscle relaxants, antiepileptic drugs, and antidepressants. Injectable medications include local anesthetics, corticosteroids, and botulinum toxin. Although analgesics and corticosteroids are indicated for the treatment of acute pain, NSAIDs, local anesthetics, and muscle relaxants can be used for both acute and chronic disorders. Tricyclic antidepressants are generally used for chronic TMD-related pain associated with tension-type headaches[37].

## IV. Cases Report

### 1. Case 1

A 24-year-old man presented with a chief complaint of headache and bilateral TMJ discomfort. He had suddenly developed severe pain accompanied by trismus 2.5 years ago. Orthopedic medications were ineffective. His mouth opening was spontaneously restored, although pain was persistent. In addition, a crepitus sound was heard on the right side. The level of discomfort was highest after waking in the morning, and his headaches were severe and getting worse. He also reported a history of closed jaw locking. The left masseter and temporalis and both superior cervical muscles were tender on palpation. The patient felt a difference in his occlusion. He was initially diagnosed with TMD class 1, 3 (1: muscular pain, 3: disc dislocation, perforation, and sclerosis). Treatment was initiated, and at the first visit, impressions were recorded for the fabrication of casts to evaluate bruxism. Subsequently, single-photon emission computed tomography (SPECT) was performed, which revealed increased uptake on the right side, indicating the presence of inflammation. There were no signs of bruxism, and his diagnosis changed to TMD class 4 (bone changes around TMJ). Impressions were recorded for the fabrication of a splint, and medications were prescribed including avocado soya unsaponifiables (Imotun; Chong-Kun Dang Co., Seoul, Korea) for disc lubrication and naproxen (Naxen; Chong-Kun Dang Co.) for inflammation relief. Finally, the splint was delivered, and the patient was followed up. All symptoms, including headache, resolved completely 2 months after the initial examination.

### 2. Case 2

A 60-year-old man presented with a chief complaint of right-sided headache and facial pain during mastication. His headaches began 20 years ago, with no spontaneous pain or TMJ noise. There was no pain in the morning, and it generally started during mastication and became severe in the evenings. Furthermore, he experienced an abnormal sensation on the right side of the face, with right-sided shoulder pain that increased in the afternoon. His past medical history included depression, and he had been referred by his neurologist to the dental department. He was diagnosed with TMD type 1, 5 (1: muscular pain, 5: psychological pain). He was prescribed Ultracet (325 mg acetaminophen and 37.5 mg tramadol; Ortho-McNeil, Raritan, NJ, USA), a very strong pain relief medi-

cation, for a total of 4 weeks. However, although his pain was controlled after taking the drug, it increased after the effects wore off. Accordingly, we recorded impressions for splint fabrication. Following delivery of the splint, his pain decreased by 80%, with occasional pain in the right temporalis muscle. Two months later, the patient lost his splint and requested a new one. At 2 months after delivery of the new splint, his pain had completely disappeared. The patient was advised to wear the splint through the night and was recalled after 3 months. He complained of occasional pain, and we provided instructions for self-managing the splint and asked him to visit the clinic if he experienced further pain.

## V. Conclusion

In conclusion, the findings from this review and the two reported cases suggest that TMD encompasses a collection of clinical entities that are often very painful and disabling, with a major contribution of headache to patient symptoms. However, they are self-limiting and generally respond to conservative therapy. Basic management strategies for pain control and restoration of the range of motion can decrease the level of disability and often contribute to relief from primary headaches.

## Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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