



## THE JAW-DROPPING SCOPE OF TMJ DISORDERS

By Jessica Heath and Neal Goulet

In 2007, competitive eater Takeru Kobayashi announced that he was suffering from an arthritic jaw. The one-time king of the Coney Island hot dog-eating contest could open his jaw only as wide as a fingertip.

The Japanese-born Kobayashi reportedly was diagnosed with temporomandibular joint (TMJ) disorder, joining more than 10 million Americans suffering from the same affliction, according to the National Institutes of Health (NIH).

The New York Times estimated that as many as three-fourths of Americans have one or more signs of a temporomandibular problem. Among patients with the most severe/chronic and painful disorders, the ratio of women to men is 9:1, according to the TMJ Association.

A temporomandibular joint, or TMJ, can be found on each side of our heads. These joints connect the lower jaw (mandible) to the temporal bone of the skull.

TMJ disorders, also known as TMD, generally describe pain and dysfunction in the muscles that move the jaw and the joints that connect the jaw to the skull. TMD can affect our ability to speak, chew, swallow, make facial expressions and even breathe, according to the



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TMJ Association.

The muscles that control the joints allow the jaw to move side to side, up and down, and forward and backward. The combination of hinge and sliding motions, the NIH noted, makes the TMJ among the body's most complicated joints.

Symptoms linked to TMJ disorders include:

- Radiating pain in the face, jaw and neck
- Jaw muscle stiffness
- Limited movement or locking of the jaw
- Painful clicking, popping or grating in the jaw joint when opening or closing the mouth

- A change in the way the upper and lower teeth fit together

But facial pain can be a symptom of many conditions, such as sinus or ear infections, headaches and nerve-related facial pain. For this reason, NIH suggested, ruling out these other problems helps in identifying TMJ disorders.

Most patients with TMD also experience painful conditions in other parts of their bodies, according to the TMJ Association.

These conditions "occur together more

often than chance can explain." They include chronic fatigue syndrome, chronic headache and fibromyalgia.

Other research, the association noted, "indicates that TMD is a complex disease like hypertension or diabetes involving genetic, environmental, behavioral, and sex-related factors."

"Complex cases, often marked by chronic and severe pain, jaw dysfunction, comorbid conditions, and diminished quality of life, will likely require a team of doctors from fields such as neurology, rheumatology, pain management, and other specialties for diagnosis and treatment."

### CAUSES

A 2011 study published in the National Journal of Maxillofacial Surgery described the causes as "complex and multifactorial."

Often the exact cause is unknown. However, several contributing factors, such as occlusal abnormalities (upper and lower teeth coming together), orthodontic treatments, poor health and nutrition, can lead to a TMJ disorder.

TMJ pain can result from:

- Inflammation of the articular disk or its moving out of place
- Damage to the joint cartilage or arthritis developing
- Microtrauma or macrotrauma that damages the joint



Scan for video of TMJ exercises.

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- Joint laxity
- Inflammation in the joint capsule, or what is known as synovitis or capsulitis
- Muscle conditions in which trigger points and pain cause restrictions
- Pain that starts in the cervical or thoracic spine regions
- Psychosocial factors such as chronic stress, tension, anxiety, depression or pain

### TREATMENT

The NIH recommended that patients look for a health care provider with expertise in musculoskeletal disorders (muscle, bone and joints) and training in how to treat pain conditions.

Because more studies are needed, according to the NIH, experts recommend a conservative course of treatment that is not invasive to the tissues of the face, jaw or joint, such as surgery.

Physical therapy can address many of the factors that play a role in the complexity of TMJ disorders.

Often, one of the first steps is making the patient aware of common stress-induced behaviors, such as clenching and grinding teeth, that often lead to pain because of increased tension surrounding the joint.

Relaxation techniques and self-management of chronic stress can relieve some of these symptoms. A dental device, such as a night guard, might be prescribed for short-term relief but should not be used long term as it will not correct the dysfunction.

Physical therapy can address limitations within the joint or muscle around the TMJ. When limitations exist, soft tissue mobilization and joint mobility techniques can

help increase range of motion in the joint.

Postural adaptations are among the common causes of TMJ disorders because of changes in the alignment of the cervical and thoracic spine regions. A physical therapist will be able to treat these spinal changes, muscle flexibility and strength, and postural muscle endurance. ▀

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## ILLUSTRATION

# TMJ ANATOMY

The temporomandibular joint, or TMJ, actually is two (right and left) joints, comprising the round mandibular condyle that sits in the concave portion of the temporal bone of the skull.

The articular disc separates the mandible (lower jawbone) from the temporal portion of the skull and is biconcave, or shaped like a peanut. The disc is flexible and elastic cartilage that cushions the two bones where they meet, similar to how the meniscus functions in our knees.

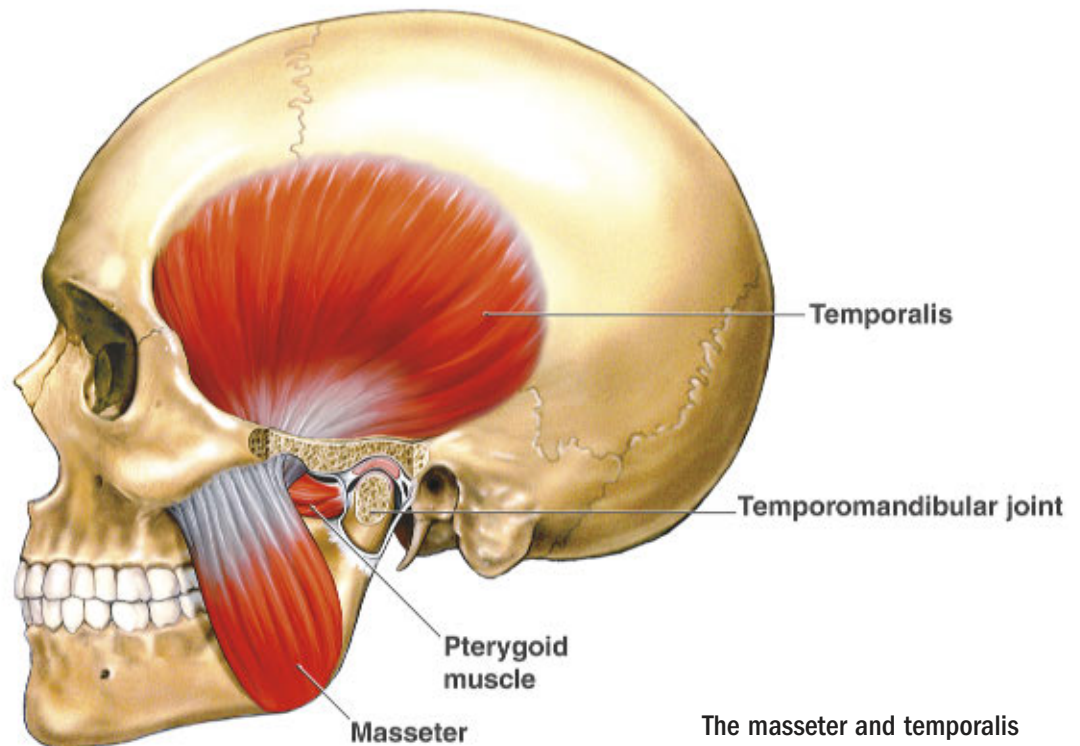
The disc has nerve endings and assists with movement of the mouth. Excessive movement of the disc causes the click commonly associated with TMJ problems.

Several ligaments contribute to controlling movement.

The major muscles are the masseter, medial pterygoid, and temporalis, which help close the mouth, and the pterygoids and hyoids, which open the mouth.

### NORMAL TMJ FUNCTION

- Opening, the first 25 millimeters (mm) are a rotation in the joint followed by a forward glide of the condyle. This is accompanied by forward movement of the articular disc for a maximum opening of greater than 40 mm.
- Closing should be full to 0 mm.
- The lower jaw can protrude to 6 mm.
- Lateral excursion is 12 mm in either direction.
- Resting position of the jaw is with the neck in a neutral position (head directly above the neck) and the mouth closed fully with tongue placement near the roofline of the mouth. ▀



The masseter and temporalis muscles help close the mouth.

## CASE STUDY

# SELF-MANAGEMENT OF TMJ DISORDERS

By Misty Seidenberg

## PATIENT HISTORY

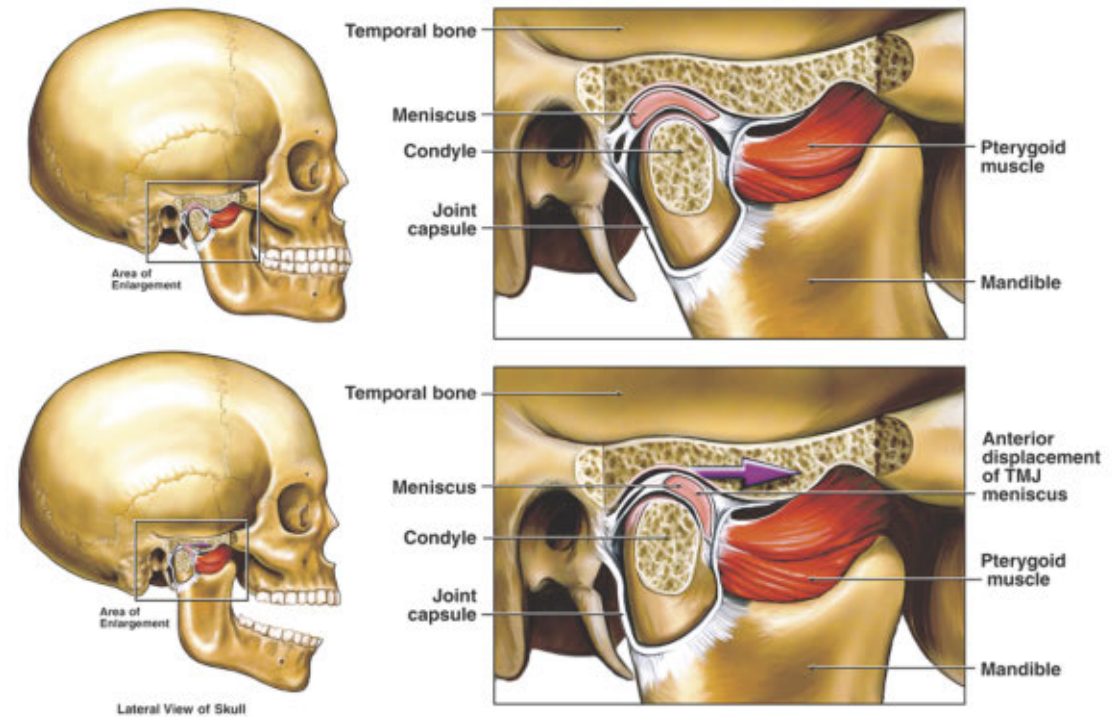
A 23-year-old female was referred to physical therapy for temporomandibular disorders (TMD) with complaints of closed locking. She reported a long-standing history of clicking in her temporomandibular joint (TMJ) and episodes of pain that had worsened and resulted in her jaw locking in the past three months.

She was on a pureed diet because chewing was too painful. She was unable to yawn and could not talk for more than five minutes without pain. She noted that her husband reported her clenching/grinding at night. She feared a recurrence of an episode in which her jaw locked: She was unable to unlock it herself and felt as though she were choking.

Because of these occurrences, she was seeing her dentist at least twice per week. She required sedation with Ativan and injections of lidocaine with manipulation to restore her jaw to opening and closing normally. Further questioning also revealed an association between stress and these episodes of pain and locking.

## ASSESSMENT

Upon assessment the patient could open her mouth 10 millimeters with pain throughout and with minimal side-to-side movement. She had poor posture: Her head was too far forward, increasing tension on the cervical and TMJ muscles at rest. An initial hypothesis suggested anterior disc displacement, which



created a locking-closed position with muscle spasms.

## TREATMENT

Initial treatment was directed at self-management strategies to unlock her jaw. This allowed range of motion gains to 25 millimeters. Cervical retractions were used to improve cervical and TMJ alignment, which caused an immediate gain of mobility to 35 millimeters.

The other immediate concern was to address her stress levels to reduce clenching/grinding. She was taught visualization relaxation techniques, such as resting on a beach, to use before bed and during stressful parts of her day.

In the next two weeks, the patient reported an improvement in symptoms and reduced stress as she could independently control her locking

episodes. Extremely motivated, she purchased relaxation CDs to use during her work commute, which she felt reduced clenching during the day.

Thoracic spine mobilization, scapular stabilization and pectoralis stretching were performed to address postural deficits.

The final phase of her program was to address muscular stability of the TMJ. These exercises included tooth tapping (touching top and bottom teeth), pencil rolling (rolling a pencil back and forth between top and bottom teeth), and controlled opening (tongue on roof of mouth opening as far as possible without pain).

Upon discharge, the patient had not experienced any episodes of locking since the first week of treatment. She had returned to a normal diet, but she was instructed to continue to avoid hard foods such as raw

carrots and pretzels as well as “gummy” foods such as chewing gum and gummy bears. She was able to complete her tasks at work and home without symptoms and was able to manage her stress levels on her own.

## SUMMARY

This case is an example of an uncommon but serious TMJ disorder. Not only was it critical to find a self-management technique for her locking episodes, but it was necessary to address the underlying postural impairments for full restoration of function.

Medical literature is lacking when it comes to effective treatments for TMJ disorders. Because physical therapy is the least invasive option, it should be the first one considered for these patients. ■

## RESEARCH ABSTRACT

## TMD SYMPTOMS AND REHABILITATION OUTCOMES

By Katherine Myos

## INTRODUCTION

Twenty to 85 percent of the U.S. population is affected by temporomandibular disorders, or TMD, which are a collection of medical and dental conditions affecting the temporomandibular joint (TMJ), masticatory muscles, and associated soft-tissue components.

The three most common TMDs are myofascial pain and dysfunction, internal disc derangement, and osteoarthritis. Symptoms include orofacial pain, joint noise, and restricted jaw movement. Functional activities often are affected, including talking, eating, sleeping, working and participating in recreational activities. Common treatments include physical therapy, relaxation training, counseling, orthodontia, mouth splints, and surgical intervention.

The purpose of this study was to assess the affect of symptom longevity on functional outcomes, pain and patient perception of recovery after a rehabilitation program for TMD.

## METHODS

This study was a retrospective medial review of 48 patients seen with a primary diagnosis of TMD. Patients were classified into one of three groups based on the duration of their symptoms: acute (symptoms lasting fewer than 60 days); sub-acute

(60-180 days); and chronic (more than 180 days).

All patients received TMD rehabilitation, including passive range of motion, active range of motion, neuromuscular re-education techniques, joint and soft-tissue mobilization, relaxation and pain management, posture training, and strengthening exercises.

Maximal opening, deviation with opening, lateral excursion, and palpation of the masticatory and orofacial muscles were assessed and documented at the initial visit and at discharge. Perceived pain and improvement were assessed using the visual analogue scale. Functional improvement was determined

as the difference between the functional score at the initial visit and at discharge.

## RESULTS

- Within each group, the average functional improvement score and pain score improved significantly from pre-treatment to post-treatment: a 68 percent decrease in pain for acute and sub-acute groups and a 50.6 percent decrease in the chronic group.
- There was not a significant difference in functional outcome scores among the three groups.
- Vertical mouth opening and side-to-side movement improved significantly for all three groups, on average by 4.5 centimeters and 1.7 centimeters, respectively.
- 79 percent of patients with tenderness of the masticatory muscles showed improvement at discharge.

- 83 percent of patients with tenderness to the orofacial muscles showed improvement at discharge.

## DISCUSSION

Patients with TMD showed improvements in function and pain after a customized rehabilitation program. Even patients with chronic pain still had good outcomes with treatment interventions. Conservative methods including physical therapy should be considered to reduce pain and return to prior functional activities. 📌

## REFERENCE

Badke, M., Dussault L., Boissonnault, W. "Influence of symptom longevity on outcomes following a customized rehabilitation program for painful temporomandibular disorders." *Physiotherapy Canada*. 2010; 59:10-22.

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With temporomandibular disorders, functional activities often are affected, including talking, eating, sleeping, working and participating in recreational activities.