

CASE REPORT

Treatment of temporomandibular joint trauma following odontectomy

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ABSTRACT

Temporomandibular Joint Disorder (TMD) is a non-dental musculoskeletal disorder that has a complex and multifactorial etiology. The most frequent symptoms are pain in the masticatory muscles, in front of the ears, and in the temporomandibular joint (TMJ); this disorder can also be accompanied by clicking sounds and locking. This study aimed to present a case report of temporomandibular joint trauma following odontectomy. A 22-year-old patient came with some complaints, namely pain in the TMJ, a clicking sound when opening and closing the mouth, and limited mouth opening. The symptoms started when the patient underwent odontectomy on all the four third molars, causing tightness around the jaw, pain, and clicking. However, she did not seek any treatment for these conditions until the pain became worse and disturbed her activities. The patient had to deal with limited mouth opening and severe migraines up to twice a day. During an examination, the patient was able to open her mouth without pain only 25 mm in width, with a maximum mouth opening of 35 mm. The therapy was done by constructing a 4-mm stabilization splint and educating the patient on how to reduce the pain. In fact, 2 months after the treatment and the use of stabilization splints, her complaints of TMJ pain and clicking sounds decreased, her mouth opening increased, and the migraines never came back. In this case, non-invasive treatment as the first-line therapy in patients with disc displacement with reduction and arthralgia can reduce the joint pain symptoms, and some of the symptoms have even disappeared.

Keywords: arthralgia; disc displacement with reduction; odontectomy; temporomandibular disorder

INTRODUCTION

The temporomandibular joint (TMJ) is a joint that serves to connect the mandible to the temporal bone of the cranium, and it is responsible for jaw movement when talking, eating, and yawning. TMJ consists of hard tissues, soft tissues, muscles, nerves, and arteries. Hard tissues comprise the mandibular fossa, articular eminence, and condylar process. Soft tissues consist of the articular disc which is divided into three zones by thickness, i.e., the anterior zone, the intermediate zone (the thinnest region), and the posterior zone (the thickest region). In addition, the soft tissues also comprise the articular capsule, ligaments, and accessory ligaments.^{1,2}

Articular disc is one of the components in the soft tissues, that is located between the mandibular fossa and the condylar process, which serves as a flexible/elastic cushion and helps jaw movement during mouth opening

and closing. Disc displacement from its normal functional relationship with the condyle and the articular portion of the temporal bone is called “an internal temporomandibular joint disorder”.^{1,3} The most commonly found manifestation of internal temporomandibular joint disorder is anterior disc displacement in relation to the condyle. In this case, joint pain and a clicking sound when returning to a normal position after jaw opening are common symptoms. Other signs and symptoms may include pain around the TMJ or ears, stiffness and pain in the joints and muscles, limited mouth opening, muscle fatigue, and jaw movement disorders. These disorders may interfere with daily activities, thus lowering the patient’s quality of life.^{4,5,6}

Temporomandibular joint disorders caused by third molar extraction trauma have been reported and have become a source of concern for dentists and dental practitioners. Many researchers have found a very high prevalence of TMJ disorders

(50-63%). Around 60% of patients with this disorder experience pain, a clicking sound, and limited mouth opening after molar tooth extraction. This joint pain may become chronic unless well-treated.^{7,8,9,10}

Patients with temporomandibular joint disorders should receive treatment to reduce pain and damage, as well as restore normal daily functions and activities. The treatment for these disorders consists of non-invasive, minimally invasive, and invasive treatments. The first-line therapies can be in the form of pharmacotherapy, self-care techniques, physical therapy, psychological therapy, acupuncture, and intra-oral therapy.^{11,12,13,14}

METHODS

A 22-years-old woman, came to RSGM Prof. Soedomo to get her temporomandibular joint examined because it was painful and had a clicking sound. The patient complained of pain in the temporomandibular joint and around the ear. She once had jaw locking, and her pain was so bad that it disturbed her daily activities. These complaints started to emerge after she underwent a series of odontectomy procedures for the third molars on the upper and lower jaw. During the first procedure, the patient felt jaw strain, a clicking sound on the left side, and pain in the jaw joint immediately after the surgery was performed. As time went on, the pain and clicking sound became worse on both sides. When the pain was recurrent, the patient felt it from the region around the joint to the head (migraine), which occurred once to twice a day. In addition, the patient also complained of limited mouth opening, so she always tried not

to open her mouth widely when talking, eating, laughing, or yawning unless she felt pain on the left side. Since the pain on the left side emerged, she used the right side for chewing. The patient also experienced locked joints and ringing in the left ear several times.

Prior to treatment, the patient received information about the treatment procedure and signed informed consent for treatment and publication. The treatment began with a subjective examination, revealing that the patient was physically and mentally healthy, she had no systemic disorders, and neither she nor her parents had any medical history. An extra-oral examination showed no muscle disorders of the mouth, cheek, and lymph nodes, but the patient felt pain in the left jaw joint when making masticatory movements. The patient had an oval face shape, a normal convex profile, and medium-sized and symmetrical lips. In addition, the intra-oral examination also found no abnormalities in the oral cavity, U-shaped upper and lower arches with a moderate size. She had complete teeth, except third molar with a classification of Angle Class I malocclusion. On a TMJ examination, there were sounds on the left and right joints. The patient



Figure 1. Patient's extra oral image



Figure 2. Upper left: mouth opening without pain of 25 mm. Upper right: maximum mouth with pain of 35 mm pain. Bottom left: lateral movement. Bottom right: protrusion movement

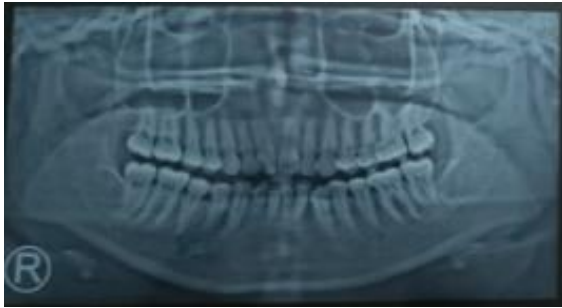


Figure 3. Panoramic X-ray photo. All the four third molars had undergone odontectomy. The left condyle was rounded and the left and right were symmetrical, the angle of mandible was large, the teeth arrangement was good and normal

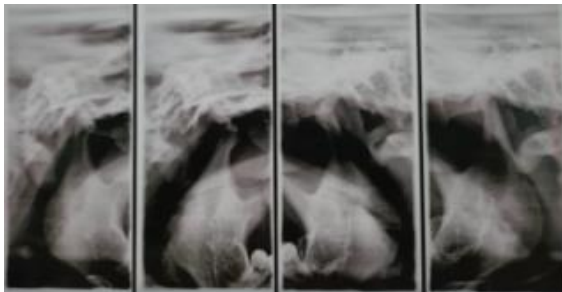


Figure 4. MRI photo. Rounded right and left condyles. The left condyle was in the glenoid fossa during mouth closing, and the right condyle was in the inferior region of the articular eminence. The left condyle was in the inferior region of the articular eminence during mouth opening, and the right condyle was in the antero-inferior region of the articular eminence



Figure 5. Maxillary stabilization splint

was able to open her mouth without pain with a maximum mouth opening of 25 mm, with pain with a maximum opening of 28 mm, with a non-assisted mouth opening of 35 mm, and with an

assisted mouth opening of 36 mm. The left lateral movement reached 6 mm, the right one reached 5 mm, the protrusive movement was 5 mm with 2 mm overjet and 2 mm overbite.

Panoramic and transcranial radiographs were also taken. The panoramic radiograph showed that the left condyle was rounded, the left and right ones were symmetrical, and the tooth arrangement was good and normal. The transcranial radiograph showed that both the right and left condyles were rounded. The left condyle was in the glenoid fossa during mouth closing, and the right condyle was in the inferior region of the articular eminence. On the other hand, the left condyle was in the inferior region of the articular eminence during mouth opening, and the right one was in the antero-inferior region of the articular eminence. Based on these findings, the diagnosis was disc displacement without reduction accompanied by arthralgia.

The treatment strategy included both preventive and therapeutic measures. The preventive action was performed by educating the patient by asking her to avoid hard foods or foods that are difficult to chew, avoid any activities that put strain on the jaw, avoid excessive caffeine, drink enough water, and improve posture by meditation. Therapeutic actions were in the form of medication to relieve pain, physical therapy, such as jaw exercises or massage, warm compresses, and stabilization splints.

During the first visit, subjective and objective examinations were performed in addition to filling out the complete diagnostic criteria and performing a bite registration using putty material. The impressions of the upper and lower jaws were made during the second visit as a preparation for the first stage of the treatment plan, i.e., a 4 mm stabilization splint. During the third visit, the patient came for the construction of the stabilization splint and she was given information on the use of the splint.

The first control was scheduled four weeks after the stabilization splint was constructed. The patient said that her jaw condition and the joint pain improved, but the clicking sound could still

be heard during mouth opening. She still had headaches with the same intensity, but with fewer recurrences. Four weeks after the first control, the patient felt the symptoms improved, her headache also improved in terms of frequency and intensity, and the clicking sound was rarely heard. The mouth opening without pain increased to 33 mm from 25 mm. The third control was scheduled for the following 10 days. Her joint pain had significantly improved, and within these 10 days, she had no headache at all. The clicking sound was still occasionally heard, but she increased her mouth opening by 1 mm.

DISCUSSION

Jaw disorders are part of TMJ disorders and are characterized by painful and limited jaw movement, which is commonly exacerbated by jaw movement during activities. Women have greater susceptibility (up to twice) to develop jaw disorders, including arthralgia, arthritis, and arthrosis, compared to men.^{1,11}

The patient in this case report was a 22-year-old woman who complained of pain in her jaw joint and a clicking sound during mouth opening and closing. The patient also complained of limited mouth opening, which caused her to try to not open her mouth wide when talking, eating, laughing, and yawning. When she tried to open her mouth wide, she felt pain in the left joint. The patient only chewed food with her right side since then. The patient also experienced ringing in the left ear and jaw locking. Based on the patient's complaints, she was diagnosed with disc displacement with reduction and arthralgia. The reduction in disc displacement with reduction causes a painless clicking sound during mouth opening. However, pain can emerge when chewing hard food. The disc displacement with reduction can be diagnosed by making an observation during jaw/mouth opening. During jaw opening, there is a clicking sound, i.e., when the disc returns to the condyle. In general, reciprocal clicks are heard during mouth closing because the condyle shifts to the posterior region of the disc as the disc moves forward.

The patient also faced limited mouth opening, with a pain-free opening of 25 mm. The limited mouth opening was suspected to be because the patient tried not to open her mouth wide to avoid pain in the joints. She also tried to control her jaw movement when talking, eating, laughing, and yawning. Thus, it can be concluded that the limited jaw movement was due to pain instead of a structural dysfunction.

Sharp pain localized in the joint is a symptom of TMD, which is caused by from intra-articular disorders due to capsular trauma or inflammation. In this case, the patient experienced trauma in the form of a wide and prolonged mouth opening when an odontectomy was performed on her third molars. At that time, the patient felt joint strain and heard a clicking sound; the post-odontectomy pain persisted. The pain caused by movement and use of the jaw, which was also felt during a TMJ examination, was a symptom of arthralgia. Arthralgia is characterized by sharp and sudden pain in the jaw, ear, and in front of the ear, as well as pain during jaw movement. The pain was confirmed by palpation of the TMJ's lateral aspect.^{15,16}

Disc displacement with reduction does not require treatment if the patient can open the jaw wide without pain. However, in this case report, the patient complained of sharp pain that occurred 1-2 times per day and was treated with NSAIDs medication, warm compresses, soft food consumption, and physical therapy. Some patients reported that doing jaw exercises helped them make good progress. In addition, an occlusal splint can be used to promote neuromuscular harmony in the facial muscles and protect the splint from parafunctional habits.^{1,12,11,17,18,19}

Occlusal appliances have several functions, one of which is to provide a temporary occlusal condition that allows for orthopedic TMJ stability.¹ There are many types of occlusal appliances for the treatment of TMD. The most used occlusal appliances are stabilization appliance and anterior positioning appliance. Stabilization appliances are also known as a muscle relaxation appliances

because they are generally used to reduce joint muscle pain.^{1,8,20}

In this case report, a stabilization appliance was made in the maxilla to provide an optimal occlusal relationship for the patient. When this appliance is used, the condyle will be in a stable musculoskeletal position when the teeth make simultaneous contact. Treatment using a stabilization appliance aims to eliminate orthopedic instability between the occlusal position and the joint position, thus minimizing TMD symptoms.

Various studies have reported that the use of a stabilization appliance can reduce parafunctional activity that often co-occurs with periods of stress. A stabilization appliance can also benefit patients with retrodiscitis that comes after trauma, allowing for faster healing. The length of time of its use depends on the patient's level, type, chronicity, general health, and age.^{1,7,8,9}

CONCLUSION

In this case, the non-invasive treatment as the first-line therapy in a patient with disc displacement with reduction and arthralgia could improve the symptoms of joint pain, even totally alleviate some of the symptoms.

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