

# A Jaw Exerciser Inspired by Nature: A Case Report

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## ABSTRACT

TMJ ankylosis and the subsequent restricted mouth opening leads to disfigurement of the face which in turns leads to number of psychological problems. Besides, the patient finds it difficult to swallow and masticate. The speech is unclear and difficult. Availability of various prosthodontic treatment options has brought much succour to these patients. One of these options is described in this case report of a young female patient with limited mouth opening due to muscle fibrosis of the right condyle, using a jaw exerciser which has been modelled on the natural contours of a concha. This treatment option was chosen keeping the basic philosophy of following the importance of nature in treating and maintaining our physical, mental and psychological well being.

**KEYWORDS:** Trismus, Temporomandibular joint, Fibrosis, Prosthetic appliance, Nature

## INTRODUCTION

Temporomandibular joint disorders (TMD) is the term used to refer to dysfunctions characterized by pain in the region of the temporomandibular joints, muscles of mastication, and periauricular area; limitations and deviations in the mandibular movements; joint noises; and an altered occlusal relation.<sup>1</sup> Ankylosis can be defined as “inability to open the mouth due to either a fibrous or bony union between the head of the condyles and the glenoid fossa”.<sup>2</sup> It is usually caused by infection and trauma. Increasing limitation of opening the jaw observed in a dental clinic is usually the first clinical sign. Morbidity can be avoided to a significant extent by diagnosing and treating the condition early.<sup>3</sup>

Maxilla and Mandible form the boundaries of the oral cavity. The maxilla being fixed, the opening of the oral cavity is dependent upon the up and down and forward and backward movement of the mandible. Normal ‘maximal interincisal opening’ (MIO) ranges between 40-45 mm. Less than 35 is indicative of less than 5 mm is defined as complete ankylosis.<sup>4</sup> Kazanjian<sup>5</sup>, has classified ankylosis of TMJ into 2 types, True and False. True ankylosis is due to pathology involving the joint while false ankylosis is due to extra-articular abnormalities. This type of false ankylosis is commonly termed as “trismus”.<sup>6</sup>

In today’s stressful life and times, it is extremely important to understand and acknowledge the benefits of integrating a positive relationship with nature into one’s life. Research has proven that treatment plans which use nature as their core improve the treatment outcome significantly.<sup>7</sup>

This case report highlights the use of a prosthetic

appliance which has been fabricated for the treatment of limited mouth opening, keeping the healing power of nature in mind, where a dentist fails.

## CASE REPORT

A 37 year old female patient reported to the Department of Prosthodontics and Crown and Bridge and Implantology, at Manav Rachna Dental College, Faridabad, Haryana, with a chief complaint of severely limited mouth opening and inability to chew food and brush her teeth properly, due to the same.

**History:** On recording the history of the present illness, it was found that the patient had been experiencing difficulty in opening her mouth since the past 4-5 years and the problem had increased in intensity since then. The patient gave a negative history for any kind of trauma to the TMJ due to a fall or accident, any parafunctional habits such as bruxism and clenching and any prolonged and painful dental treatment, in the past. However, she gave a positive history for third molar infection, in the fourth quadrant, 4-5 years back, for which she was advised extraction. However, she didn’t go through with the procedure and took antibiotic treatment for the same.

**Examination:** Physical examination showed limited maximum interincisal mouth opening (7mm), (Fig 1, 1a,1b,1c) a symmetric opening without pain or joint sounds, accompanied by reduced mandibular eccentric movements. Assisted (passive) mouth opening did not increase the interincisal distance.

An OPG was advised as part of the radiographic examination (Fig 2). Condylar fibrosis was observed in the right temporomandibular joint. Impacted third molars

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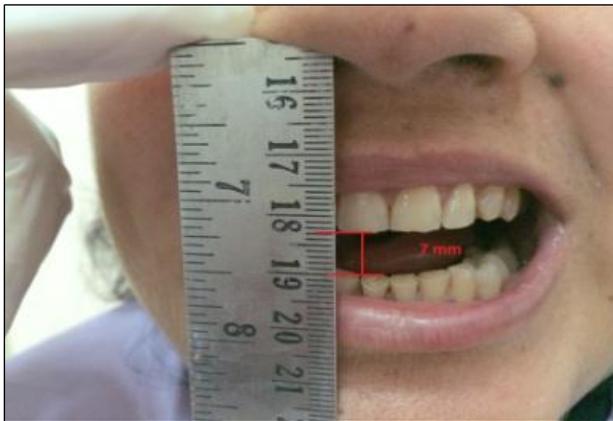


Fig 1 a



Fig 1b,c

were seen in the third and fourth quadrants.

**Diagnosis:** After careful history taking and examination, the final diagnosis was determined to be muscular fibrosis of the right condylar region of the TMJ due to a long standing, untreated infection in the impacted third molar region, of the fourth quadrant, which slowly progressed to muscle spasm and then muscular fibrosis of the joint, over the years, severely affecting and limiting the mouth opening of the patient.

**Treatment Planning:** Since the condition involved only muscular fibrosis and no bony union of the joint was seen, surgery as a treatment option was ruled out. The treatment plan included physiotherapy exercises using a threaded tapered screw jaw exerciser modelled on the natural contours of a concha, (Fig 3) along with supportive therapy. The threaded tapered screw was made of clear autopolymerizing resin. Firstly, an impression of the natural concha, (which is inexpensive and easily available) was made in irreversible hydrocolloid. The impression was carefully separated into two halves, filled with clear resin, put back together again, and held in place till the time the material set (Fig4). The replica of the concha, thus produced, was finished and polished and the threads were deepened to get a satisfactory threaded tapered screw appearance.(Fig5)

The appliance was evaluated in the patient's mouth and necessary adjustments were made. Patient was instructed about the use and importance of wearing the appliance. (Fig 6,7) In addition, the patient was also advised supportive therapy which included heat therapy, analgesics, soft diet and muscle relaxants. She was recalled after a week of regular use for evaluating the results. The mouth opening was found to have increased from initial 7 mm to 18mm after a week of regular use of the shell shaped jaw exerciser ( Fig 8,9).



Fig 2



Fig 3



Fig 4



Fig 5



Fig 6



Fig 7



Fig 8



Fig 9

## DISCUSSION

The word Trismus is a latin term derived from the Greek word “*Trismos*” which means grinding/rasping. It is a condition that impairs eating, interferes with oral hygiene, restricts access for dental procedures and in severe conditions, may adversely affect speech and facial appearance. The success of treatment depends on recognition of the cause and initiation of appropriate management. Ideally, trismus appliances are used in conjunction with physical therapy and are most effective when the condition is the result of muscle fibrosis or scar tissue that has not yet matured.<sup>8</sup>

Trismus appliances act either externally or internally, and the forces they impart can be continuous or intermittent, light or heavy, and elastic or inelastic. Current methods of increasing mouth opening include unassisted and finger-assisted stretching exercises, stacked depressors of the tongue and ferguson mouth gag. Use of bite plane, occlusal splint is a common practice along with physiotherapy.<sup>9</sup>

The threaded tapered screw appliance is constructed of acrylic resin, and is placed by the patient between the posterior teeth. With gradual turns of the screw, the mandible is depressed and the maxillary and mandibular teeth are forced apart. The appliance provides a force (continuous or intermittent) controllable by the patient, although the force is not generally sustained for lengthy periods of time. The force imparted is not elastic, and its direction is limited by the mechanical pressure available between the posterior teeth. Use of this appliance is restricted to dentate or partially edentulous patients.

Significant force can be generated, and anterior teeth in particular can become loosened if excessive force is applied. As this appliance is made with hard acrylic resin so deformation by clenching and unilateral movement of teeth is avoided.<sup>10</sup>

## CONCLUSION

This clinical report describes the characteristics and prosthodontic management of a young female patient with limited mouth opening due to muscle fibrosis of the right condyle. It is important to determine not only the type of therapy but also the treatment sequence for each patient on the basis of his or her needs. With proper care and prosthodontic treatment the patient can enjoy a relatively normal life.

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