

# DEGENERATIVE DISEASES OF TEMPOROMANDIBULAR JOINT: CASE REPORT

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## ABSTRACT

Temporomandibular disorders refer to a set of conditions that affect the chewing muscles and/ or the temporomandibular joint and are considered as a heterogeneous group of health problems related to chronic pain. Osteoarthritis is a chronic, non-inflammatory, focal degenerative disease that primarily affects the cartilage of synovial joints and is associated with processes of remodeling of the subchondral bone and involvement of the synovial tissue. Radiographically, there is flattening of the condyle and articular eminence, sclerosis and erosion of the cortical bone layer and changes in shape. The treatment and control of osteoarthritis is based on the clinical and functional recovery of normality. This is achieved through clinical, physiotherapeutic and pharmacological procedures. Methodology: This case study, descriptive and quantitative through a clinical case report. The purpose of this study was to report a clinical case of temporomandibular dysfunction of a 23-year-old female patient with limited mouth opening and mandibular locking. The presence of osteophytic formation and a discrete aspect of the antero-superior surface of both mandible heads were detected by radiographic examination. It is concluded that the detection and control of the degenerative processes of TMJ are still a great challenge for Dentistry and should be carefully diagnosed. Since this diagnosis must, unquestionably, undergo an anamnesis and detailed clinical evaluation, in the definition of the necessity or not of treatment.

**KEYWORDS:** Temporomandibular Joint Disorders; Osteoarthritis, Syndrome of Articulation Dysfunction of Temporomandibular Joint.

## 1. INTRODUCTION

Temporomandibular joints (TMJs) are part of the masticatory system, which are involved in complex functions such as chewing, swallowing and phonetic<sup>1,9,19,22</sup>, being an element of the stomatognathic system formed by several structures, systems capable of performing complex movements. Chewing, swallowing, phonation, and posture depend heavily on the function, health, and stability of it to function properly. Its etiology is multifactorial: changes in

occlusion, traumatic or degenerative TMJ injuries, skeletal problems, psychological factors and deleterious habits<sup>1-6,9,16,23</sup>. Temporomandibular disorders (TMD) refer to a set of conditions that affect the chewing muscles and / or the temporomandibular joint and are considered as a heterogeneous group of health diseases related to chronic pain. It has characteristic symptoms such as muscular and/ or articular pain, palpation pain, limited mandibular function and articular noises. May be prevalent, isolated or associated<sup>1-5,7,13,14,15,16,23</sup>.

TMD pain is musculoskeletal, ie: muscular, joint or mixed. The term TMD encompasses chronic pain conditions arising from masticatory muscles, temporomandibular joints and associated structures<sup>8</sup>.

The etiology of TMD is considered multifactorial. Clinical symptomatology gives a clear feeling that the etiology of this disease includes important functional elements (neuromuscular factors), anatomical (occlusal, articular) and psychosocial (stress, sex)<sup>10</sup>.

Degenerative joint (TMJ) processes are related to malfunctioning, and radiological examinations are often included in the diagnosis of mandibular cranial dysfunctions. The main degenerative changes of TMJs include facet, erosion, osteophyte, sclerosis, concavity and pseudocyst. The radiographic examination is fundamental in the clinical examination of TMJ, and is becoming more sophisticated every day. It is possible to cite arthrography, computed tomography, helical tomography, magnetic resonance imaging and computerized axio-sonomyography<sup>2,3,6,10,19</sup>.

Among the joint problems we find the inflammatory and non-inflammatory conditions. Most TMJ inflammation is part of mechanical overload and repetitive microtrauma, or part of a general inflammatory joint disease such as rheumatoid arthritis, juvenile rheumatoid arthritis, psoriatic arthritis, or ankylosing spondylitis. Synovitis usually accompanies other TMJ dysfunctions. Non-inflammatory conditions include uncommon acquired developmental/developmental dysfunctions such as aplasia, agenesis, hyperplasia, and neoplasms; deviations of the shape of the joint components as degenerative joint disease, also called osteoarthritis; mechanical dislocations like disk shifts with and without reduction; and joint adhesion<sup>11</sup>. The prevalence of TMJ symptoms such as pain and movement restriction varies between 5 and 15%, with

most cases occurring in young adults between the ages of 20 and 40, especially in the female gender<sup>1,3,4,5,7,8,9,11,14,18,19,22</sup>.

Osteoarthritis is a chronic, non-inflammatory, focal degenerative disease that primarily affects the cartilage of synovial joints, being associated with remodeling of the subchondral bone and involvement of the synovial tissue. Osteoarthritis is the most common form of degenerative disease that affects the human skeleton and is usually related to increased mechanical load, tension and trauma to the joints, which can also be called osteoarthritis; and is considered, when reaching the temporomandibular joint (TMJ), the less symptomatic form of the disease. Its etiology is not clearly defined, it may be of local or systemic origin, its initial stages of development are, in most cases, subclinical, preventing the precise clinical and radiographic diagnosis. There are also other factors that contribute to the perpetuation of osteoarthritis, such as alterations in the extracellular matrix and metabolic activity of the chondrocytes<sup>2,7,9,12,17-20</sup>.

Temporomandibular arthralgia is characterized by spontaneous pre-auricular pain or pain caused by palpation and/ or function, with pain occasionally referred to the temporal region<sup>2,6,10,12</sup>.

Patients with osteoarthritis are more consistently characterized by long deviations from the centric relation position to the usual maximal intercuspal position (MIP), increased overhang and anterior bite tendency, with increased risk for these disorders being predominantly associated with extreme variations of these conditions<sup>1,4,8,11,13,15-17</sup>.

Patients with osteoarthritis are predominantly female, in the age group of 21 to 40 years and the main symptoms are: TMJ pain, headache, cracking, otalgia, joint pain, facial pain, functional limitation, cervical pain, tiredness, opening limitation of mouth, pain during chewing, tinnitus, pain in the jaw, among others<sup>20</sup>.

Despite the different types of arthritis, its treatment has the same objective, since it emphasizes the reduction or elimination of the inflammatory process, using systemic, local and intra-articular approaches. It is believed that joint degeneration results from a dysfunctional remodeling, due to a diminished adaptive ability of the joint surfaces and / or an excess of load that exceeds the normal adaptive capacity. It is believed that joint degeneration results from a dysfunctional remodeling, due to a diminished adaptive capacity of the joint surfaces and/ or an excess of load that exceeds the normal adaptive capacity<sup>2,5,9,20-21</sup>.

The various radiological examinations are frequently included in the diagnosis of mandibular cranial dysfunction<sup>1-5,8-10,13-16,20</sup>.

The treatment and control of osteoarthritis is based on the clinical and functional recovery of the normality, that is, obtained through clinical, physiotherapeutic and pharmacological procedures, with the purpose of reducing pain, improving mandibular movement and controlling the degenerative process<sup>5,7,9,11,15,16,20-23</sup>.

The presentation of the present Case Report has the objective to verify if it is possible to choose a

preferential therapeutic approach, as well as the therapeutic efficacy of associated strategies.

## 2. CASE REPORT

A 23-year-old female patient at the time of diagnosis and treatment sought a dental surgeon complaining that there was a mandibular locking limiting her mouth opening.

After careful anamnesis, intra-oral and radiographic examination, osteophytic formation was observed on the anterior aspect of both mandibular condyles and a discrete facet of the antero-superior surface of both.

A radiographic documentation was requested and topographic evaluation revealed a discrete decrease of the posterior articular space in the left joint, observed in the occlusion points (Figures 1 and 2), maintenance of articular spaces in the right joint (Figure 3), and normal excursion of both heads of the mandible observed in the intakes at maximum oral opening (Figures 4 and 5).

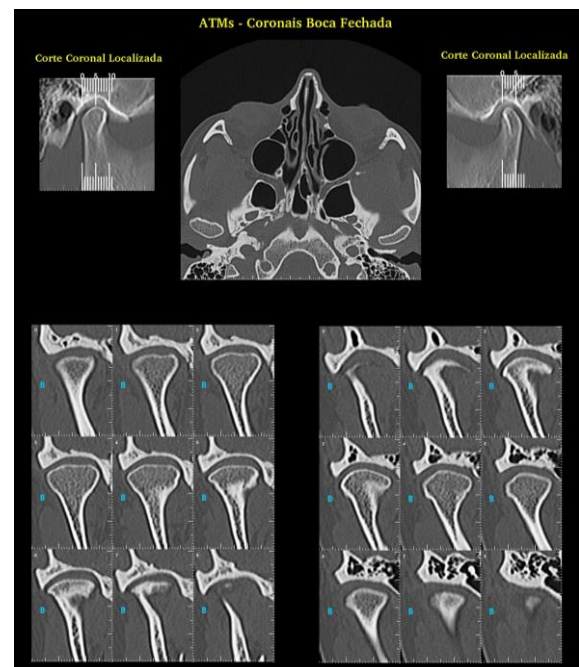


Figure 1. TC Cone Beam Mouth Closed.

According to the clinical and radiographic exams, left-sided temporomandibular dysfunction and the presence of subchondral bone sclerosis were diagnosed on the upper faces of both jaw heads.

After the diagnosis and due to continuous blockages, she always returned to the dental surgeon in order to perform the jaw unlocking maneuver.

It was then necessary to start treatment with a protrusive plaque. At the beginning of the treatment the patient used the protrusive plaque (Figures 6 and 7) for 24 hours a day until stabilization of the locking. After the mandibular unlocking, it was proposed to the patient to make Viscosupplementation of TMJ with a derivative of hyaluronic acid that would have the purpose of lubricating the joint.

This treatment was started with applications of 1ml of Sodium Hyaluronate in TMJ.

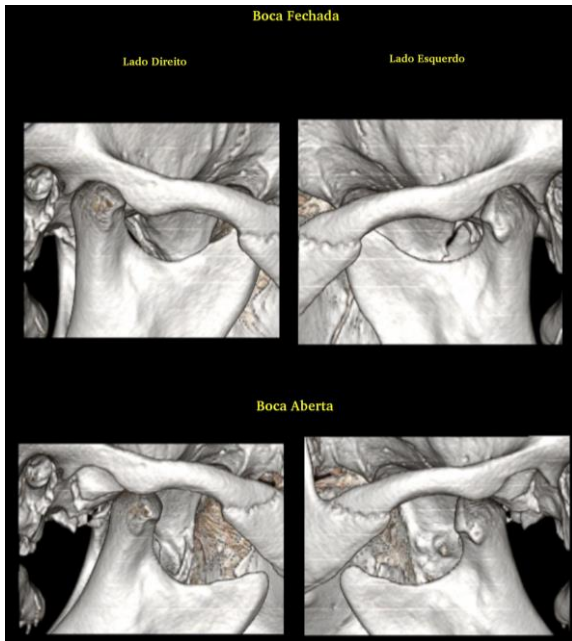


Figure 2. TC Cone Beam Mouth Closed.

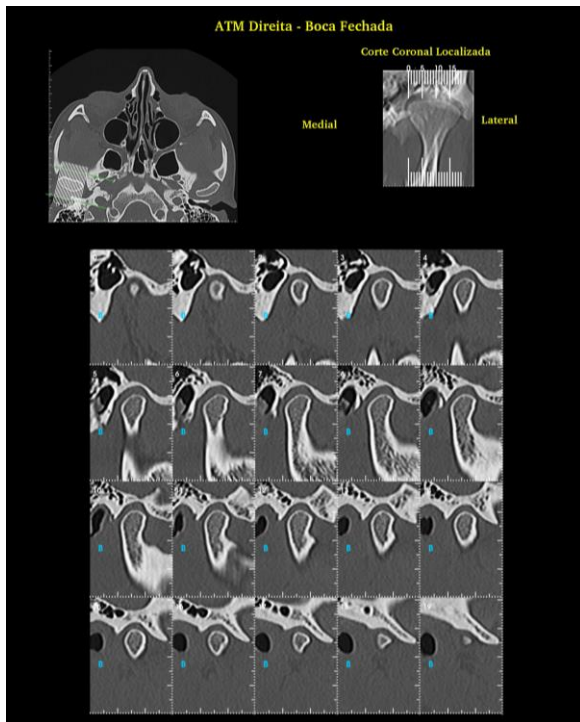


Figure 3. TC Cone Beam Mouth Closed - Right Side.

After two applications without many results the patient decided to interrupt the applications and return to use the plate; also starting physical therapy once a week for 2 months, which also obtained few results. Given this, the patient underwent physiotherapy and continued the treatment with only the use of the plaque. The protruding plaque was where the patient got the best results.

### 3. DISCUSSION

In order to evaluate the possible etiology, it is necessary for the dental surgeon to evaluate and diagnose the causes of TMD with a view to

extinguishing the causative factors before restoring the definitive lesion. It is always interesting to return the functional conditions to the patient, either through interocclusal plaques, prosthetic rehabilitations, orthodontic treatments, occlusal adjustments or the combination of all of them depending on the need of the case<sup>1,2,11,17,21,22,23</sup>.

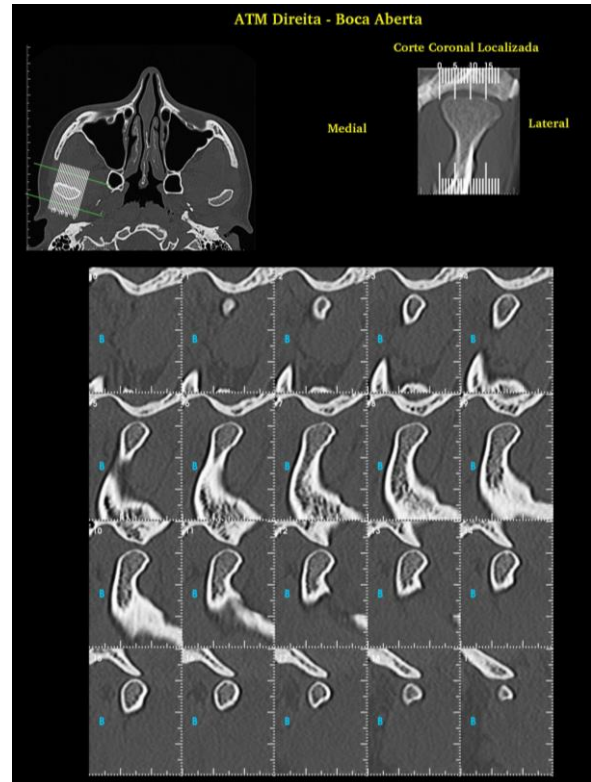


Figure 4. TC Cone Beam Mouth Closed - Right Side.

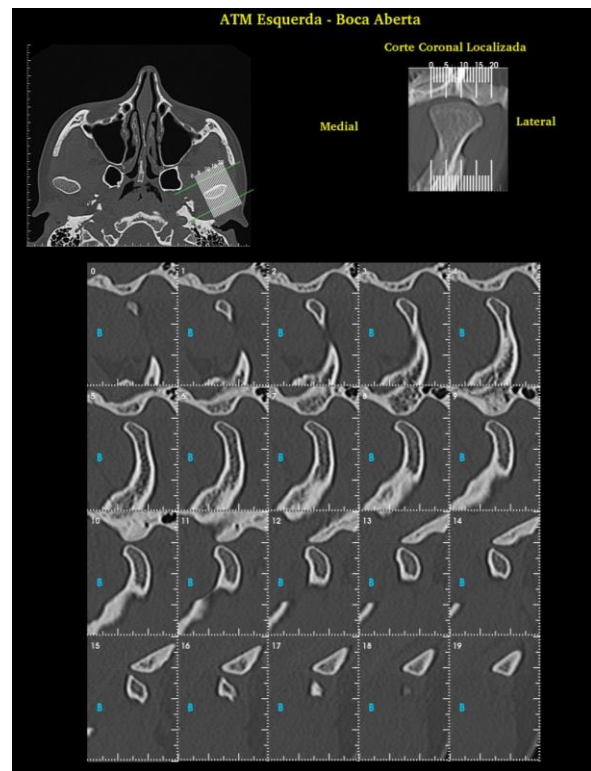


Figure 5. TC Cone Beam Mouth Closed - Left Side.



Figures 6 e 7. Protrusive Plate Treatment Start.

The main symptoms of TMD are: TMJ pain, headache, cracking, ear pain, joint pain, facial pain, functional limitation, cervical pain, tiredness, mouth opening, pain during chewing, tinnitus, pain in the jaw, among others. As treatment and control are all procedures that restore the quality of life of patients, returning them a normality or, mainly, of tissue remodeling and asymptomatic adaptation to degeneration<sup>1,3,4,5,7,8,9,11,18,19,22</sup>. The case study presented evidenced the aforementioned characteristics.

The main symptoms of TMD are: TMJ pain, headache, cracking, otalgia, joint pain, facial pain, functional limitation, cervical pain, tiredness, limitation of mouth opening, pain during chewing, tinnitus, pain in the jaw, among others<sup>1-7,12-18</sup>. The studies disagree of literature, because the patient did not attend these symptoms. Concerning auditory symptoms, it was observed that in patients with temporomandibular dysfunction there is a prevalence of tinnitus, perception of joint sounds, pain in the retroauricular region, dizziness, pressure in the ear, earache, autophony, vertigo, diplacusis, hearing loss and otorrhea<sup>2,5,9,20-21</sup>.

It should be noted that while osteoarthritis is a prevalent joint disease affecting several joints of the body, with increasing its prevalence in old age, TMJ osteoarthritis is a rare occurrence disorder according to epidemiological studies<sup>2,6,23</sup>.

At the maximum opening of the mouth, the interarticular disc interposes between the condyle and the articular eminence. When it exceeds this limit, the condyle is dislocated and the patient is open-mouthed, unable to close it. Manual reduction or surgery must be done. However, in 35% of the general population, normal dislocation occurs with spontaneous reduction, without being noticed. Depending on whether the capsule is more or less loose and of greater or lesser prominence of the joint eminence, the disc in this passage may or may not be traumatized, resulting in pain<sup>12,18</sup>. Our case study corroborates with what was said above because he attended with these symptoms.

Stress, sleep disorders, anxiety and depression are related to TMD and are the causes of orofacial pain, so these factors can aggravate the dysfunction. Psychic status may cause pain or increase pain, so people with TMD may have a poorer quality of life due to pain, and stress has also been associated with the etiology of TMD<sup>1,2,3,4,5,8,11,16,19</sup>. The case study disagreed with the statement because the patient did not present any of the triggering factors presented.

Magnetic resonance imaging (MRI) has been the exam of choice for the diagnosis of TMJ changes, allowing to assess, mainly, soft tissue alterations, joint

disc position (partial or total displacement of the disc with or without reduction), morphology and disc structure, bone condition of the condyle, adhesions and osteoarthroses.

Radiographically, there is flattening of the condyle and articular eminence, sclerosis and erosion of the cortical bone layer and changes in shape. Shortening of the ascending branch and "neck" of the condyle may be present in more advanced cases<sup>6,10,14</sup>.

Depending on the severity of the dysfunction, the treatment can be palliative, conservative, invasive and surgical, orienting the patient from the etiology, and care with the diet (soft diet), parafunctional habits (nail gnawing, chewing gum, biting pen cap and bruxism), use of physical therapies (exercises, hot water bottle), occlusal appliances (myorelaxant plates), intra-articular injections (hyaluronic acid, steroids)<sup>1,2,17</sup>.

Physiotherapy has been integrated into the interdisciplinary approach in the treatment of pain and dysfunctions associated with temporomandibular disorder and other conditions of orofacial pain. It aims to avoid surgery, repositioning the jaw in relation to the skull to improve function, minimize muscle pain, improve range of motion, improve posture, re-educate the patient regarding correct positioning of the jaw, reduce inflammation, reduce the load on the temporomandibular joint and strengthen the musculoskeletal system<sup>1,2,17,22,23</sup>.

Viscosupplementation is an alternative treatment modality that aims to restore the normal environment of synovial fluid and synovial tissue, restoring protection, lubrication, and straining. Synovial fluid, derived from synovial cells, has a viscous consistency, responsible for lubricating the joint surfaces, increasing efficiency, reducing erosion and carrying nutrients to avascular components<sup>2,8,12</sup>. Our case study disagrees with what was cited above once the inefficiency of the procedure was verified.

The occlusal plaque is the most conventional method of TMD treatment. It acts by promoting a balanced joint function, protecting the teeth from wear and mobility, relaxing muscles of mastication, redistributing the applied jaw forces, improving the function of TMJ thus reducing bruxism, and treating dysfunctions and pain in the joints and muscles of mastication<sup>15,24</sup>.

The stabilizing occlusal plaque, also referred to as the conventional or Michigan myorelaxant plaque, is the most used because it causes a lower risk of irreversible occlusal alterations to the patient: anterior opening bite, dental extrusions pathological migrations. There are TMDs that do not respond to plaque therapy, and other treatment modalities are necessary<sup>11,15,18,21,24</sup>. In the clinical case reported, the myorelaxant plaque was the only one that showed effectiveness.

The treatment of TMDs often requires the participation of several health professionals, such as dentist, physiotherapist, speech therapist, psychologist, neurologist, rheumatologist, bucco-maxillofacial surgeon, among others.<sup>1,2,11,17,21,22,23</sup>

## 4. CONCLUSION

It was concluded with this case study that none of the treatments reported is the one of choice. The temporomandibular disorders an accurate diagnosis and a multidisciplinary treatment. Among the modalities of the traction used, the occlusal plaque was the most effective. It has also been found that adjuvant treatments promote a very great benefit to the patient and whenever possible we must use them. In view of this exposure, it was verified that the treatment of choice depends fundamentally on the diagnosis and that the association of the treatments brings an important benefit to the patients.

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