



UNILATERAL VICIOUS MASTICATION – THE IMPORTANCE AND RESOLUTION: A CASE REPORT

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ABSTRACT

Introduction: Patients presenting Temporomandibular Disorders (TMD) are common in our daily clinical practice. One of the possible conditions that lead to TMD is the habitual chewing side syndrome.

Methods: In this case report a clinical approach is presented to manage the TMD related to unilateral vicious mastication. A 42 years old woman presented reporting headaches, difficulty to open mouth, presence of sensitivity in the left ear and TMJ region, soreness on the left side temporal region and sensitivity in the anterior inferior teeth. It was noted that the patient habitually clenched and ground teeth. Patient mentioned chew more on the left side.

Results: After confirming the unilateral mastication, a modified therapy based on the Neuro occlusal Rehabilitation was applied through the use of a splint. After 60 days the patient described absence of the previous symptoms and pain relief.

Conclusion: The evaluation of the masticatory pattern is often neglected; however, it is of great importance since it can lead to several conditions such as condyle wear, pain, alteration of the occlusal plane, deviation of the medial line, deviation of the mandible at mouth opening, bone alterations, Temporomandibular joint (TMJ) hypofunction, headache, among others.

KEYWORDS: Unilateral mastication. Habitual chewing side syndrome. Temporomandibular disorder. Oral facial pain. Splint.

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INTRODUCTION

Temporomandibular disorders (TMD) are important to be diagnosed and treated due to its prevalence^{1,2,3}, relation to quality of life⁴⁻⁶ and clinical signs and symptoms.⁷⁻⁹ A previous study evaluating 17,051 children and

adolescents concluded that 16% of the subjects showed clinical signs of TMD.¹ In adults, the prevalence of TMD is not precisely defined, different authors claim it to be between 10% and 70% of general population.^{11,12,13,14} The most common signs and symptoms are popping¹⁵, clicking^{3,11}, limited mouth opening^{5,11,14},

headaches^{11,14}, mandibular deviation on opening and closing¹¹, earaches^{5,11}, dental wear¹⁷, joint dysfunction and pain,^{3,6} muscle alterations and pain^{10,16}. Therefore, there is an association showing a decrease in quality of life (OHRQoL) in patients with TMD^{4,14}.

The pattern of mastication has been reported to be related to TMD with focus on habitual chewing side syndrome, also known as unilateral chewing pattern or unilateral vicious mastication.¹⁸ Unilateral mastication is defined as the preferred side of mastication predominantly used by the patient.⁷ A study showed that more than 45% of the population have one side of preferable chewing.¹⁸ This could bring consequences such as: uneven occlusal wear, alteration of the occlusal plane, deviation of the medial line, deviation of the mandible in the mouth opening, bone alterations, Temporomandibular joint (TMJ) hypofunction, headache, among others.^{11,17} Ved et al claim that preference of chewing side, bruxism, wear facets, unstable occlusion, and partial edentulous arches have been reported to have a positive association with TMD.¹⁹ Several factors could influence this habitual unilateral mastication pattern, leading the subject to use only one side for mastication.^{7,8,17} Among the dental factors are caries, plaque accumulation, pain, periodontitis, occlusal discrepancies, premature contact have been related to unilateral mastication.^{18,20} The prevalence of unilateral chewing ranges from 20% to 55% according to previous publications.¹⁸

Neuro occlusal rehabilitation treats the malfunctions that results in morphological alterations to the stomatognathic system.²¹ This malfunction leads to an inappropriate fostering of the neuromuscular system.²¹ Planas observed that all patients who had unilateral vicious chewing, had a difference in the vertical dimension between the right and left sides, observed in laterality movements, which he called "Law of minimum vertical dimension"²²; according to this rule, the subject chews more on the side in which the Functional

Masticatory Angle is smaller.^{21,22} The interocclusal distance observed in the lateral movements is called Functional Masticatory Angle. Radiographically, evidence shows reshaped condyle, eminence and articular cavity on the functional side affecting these patients with unilateral chewing.^{11,17}

The objective of this case report is to present a patient with habitual unilateral mastication, reporting its relationship with TMD. The therapeutic methodology assigned for this patient is presented based on the Neuro-Occlusal Rehabilitation²².

METHODS

Patient X presented to the private practice in 2017-05-17, female, 42 years old, her chief complaints were: headaches, limited mouth opening (29mm) (Figure 1), sensitivity near to the left ear and TMD region, soreness on the



Figure 1. Limited open mouth in beginning of treatment – 29mm

left side temporal region and sensitivity in the anterior inferior teeth. It was noted the patient habitually clenched and ground teeth. Patient mentioned that she chewed more on the left side. To investigate if the patient had a habitual side of chewing, it was asked to patient to slide the jaw to the right and left by contacting the teeth, starting from Centric occlusion. As one side had a smallest rise of the lower third of the face, according to the Law of minimum

vertical dimension and Functional masticatory angle, this side was the



Figure 2. Functional side- small height among upper and lower teeth



Figure 3. Non-functional side – bigger height among upper and lower teeth

chewing side.^{8,22} (Figure 2 and 3). Even though panoramic is not the gold standard for TMJ visualization, a panoramic radiograph was taken in 2017-05-17 aiming a first assessment of the oral condition (Figure 4). Radiographically it is possible to suppose the condylar head and articular fossa are reshaped on the left side in addition to a diminished space to the disc, suggesting the possibility of disc displacement. The signs and symptoms detected clinically by applying part of the Research diagnostic criteria for temporomandibular disorders questionnaire (RDC/TMD), supported the TMD diagnose and the prompt treatment needed.

The treatment goal was to obtain pain relief, to prevent more damages to TMJ and muscles and to restore the well function of the masticatory system, reprogramming the neuromuscular activity. As the patient had one side of habitual chewing, it was decided to employ the treatment with a



Figure 4. Panoramic radiograph in the beginning of treatment

modified splint as described below. The patient was submitted to impressions of the upper and lower arches with alginate (Hydrogum-Zhermack-Italy) for the preparation of the flat myorelaxant splint with canine disocclusion. The maxilla and mandible plaster models were assembled in a semi-adjustable articulator and an acrylic splint was manufactured. The hard-acrylic resin occlusal splint was installed in the upper arch for facilitating subsequent adjustments. In the splint, a small and important modification in the disocclusion was performed, based on the Law of the minimal vertical dimension, increasing the height in the left canine region to increase the height of the jaw dislocation on the functional side (in this case left side) because this was the side the patient chewed for



Figure 5. Splint canine disocclusion left side

longer (Figures 5). This modification also made possible to compensate and correct the different disocclusion heights in the teeth after the splint therapy ends.

The patient was instructed, during the use of the splint, to practice physical therapy exercises²³ with consecutive voluntary movements, sliding the jaw with touch through the

canine to the non-functional side to the lateral border of the plaque. These exercises should be practiced in 3-daily cycles of 5 minutes, leaving rest periods during each cycle. The use of a towel moistened in hot water was also indicated in the region of the balance joint to relieve discomfort. The patient was instructed to practice voluntary chewing on the non-functional side, in search of a muscular and joint physiotherapeutic recovery. After splint installation, the sequence of periodic adjustments was applied within 7 to 10 days as the recommended the therapeutic standard.¹⁴

RESULTS

The patient reported improvement, showing absence of symptoms in the following 60 days of



Figure 6. Open mouth after treatment – 40mm
treatment. Mouth opening increased 11mm, achieving 40mm after treatment. (Figure 6). This phase was followed by the

selective occlusal wear adjustment of VIPS cusps (vestibular inferior, palatal superior) in centric and BULL cusps (buccal upper posterior, lingual lower posterior) in lateral movements. After the occlusal adjustment in Centric occlusion, the Functional Masticatory Equilibrium was applied, intended to minimize or even resolve the differences in heights of left and right side during lateral movements - Functional masticatory angle²² (figure 7).

A modification of the conventional technique was used in lateral movements, adding acrylic resin



Figure 7. Lateral movements after treatment with equal heights in lateral movements

height in left canine to change the disocclusion. This later, lower the disocclusion on the non-functional side because of often observed interference on the balance side. In the conventional technique it is recommended proportional wear of the palatal cusp of the superior and vestibular of the inferior ones. In this case, the recommendation was to wear out as much as necessary the vestibular cusp of the lower molar, since the palatal of the superior teeth, being larger and bulky, can maintain the contact in the centric closure. As the

patient used myo-relaxing apparatus initially for neuromuscular treatment but the emotional impairment persists, the patient was asked to use the splint again (after relines) with the new occlusion and the recommendation was to use it just at night. The patient was then instructed to make periodic returns every six months for follow up and maintenance of the treatment. The orientation of chewing to the previous non-functional side (now adjusted and balanced) was maintained, in the expectation of strengthening and recovering the actual muscular and articular functional balance that for many years suffered from hypofunction. Follow up bi-weekly until September 2017, the patient has had absence of all the symptoms. Until the submission of this paper on March 2018 the patient reported no relapse of signs and symptoms associated with TMD.

DISCUSSION

Among the patients with TMD and functional masticatory imbalance seen during the last 20 years in this practice, we found that the most common symptoms reported were localized headache (temporal region, ears, nape, trapezoidal region, retroorbital) and discomfort in mastication. The most frequent clinical signs were mandibular deviation at the mouth opening, inferior midline deviation, occlusal plane alteration, articular noises, facial asymmetry, increase in occlusal attrition on the functional side, rise chances of dental movement on the functional side, more dental plaque on the non-functional side. Although panoramic radiograph is not the gold standard for TMJ assessment, in the radiographic examination, several discrepancies of condyle, eminence and articular cavity were observed on the

functional side, as well as augment thickness of the mandibular cortical bone. In the maxilla, the maxillary sinus volume on the functional side and the advancement of the hemi-maxilla on the same side (class II) were observed. As a differential diagnose it was observed the elongated styloid process (ossification of the stylohyoid ligament) on both sides that can also lead to limited jaw mobility and pain. However, in this case the pain was limited to the left side, the evaluation showed that the patient had a habitual side of chewing, and radiographically the left condyle was reshaped. Moreover, the treatment chosen had a complete response demonstrating certainty of the right diagnosis and treatment.

Over the years, theories about the functional normality of the masticatory system went through several stages, such as bilateral balanced occlusion, unilateral balanced occlusion, canine disocclusion in the functional and para-functional movements in laterality, and a centric closure where the posterior teeth would protect the anterior ones and in the excursive movements the anterior ones would protect the posterior ones (Mutually Protected Occlusion - Gnatological Concept).¹⁷

Studies have reported that unilateral chewing may contribute to Temporal Mandibular Dysfunction (TMD),^{7,18} and described a correlation between loss of posterior teeth, occlusal imbalance and adaptation to pain with TMD.^{7,9} In this case, it was clear that the TMD was caused by the unilateral chewing pattern, although this patient has no loss of posterior teeth, as shown in her panoramic X-Ray. Ramfjord and Ash²⁴, described alternating bilateral chewing as essential for the correct development of support structures, occlusion stability and dental hygiene, which we can conclude through this case

with the occlusion stability matter and many others seen in our clinic daily. Marques and Lenci⁸ pointed out that the lack of effective bilateral mastication could interfere on the stomatognathic system's development, in the view of Neuro Occlusal Rehabilitation, affects the masticatory system due to lack of neural excitation. A study conducted by the University of Vienna reported that patients having one side of mastication described several signs such as unilateral pain in TMJ, unilateral clicking on TMJ, unilateral pain on palpation of TMJ or muscle, loss of support zone, asymmetric loss of contact with antagonist.¹⁸ We could observe in this case left side pain in TMJ, left side pain on palpation of TMJ and temporal and masseter muscle. Reinhardt et al. identified in their research that individuals who had unilateral mastication showed more signs and symptoms of TMD than patient with bilateral mastication.²⁵ Comparing with other patients in our clinic we also can say that patients with unilateral chewing pattern have serious signs and symptoms related to TMD, however there are a few more etiologic factors that could cause TMD and we have no data comparing the prevalence between the etiologic factors. Jeon et al.⁷ pointed out that unilateral mastication could lead to a change in the neuromuscular pattern in the mandibular activity resulting in changes in TMJ due to poor distribution of loads. In the same study, they showed an association between structural changes of TMJ with increasing in pain caused by arthralgia and osteoarthritis or osteoarthrosis in individuals with unilateral chewing due to chronic periodontitis and the functional imbalance caused by unilateral mastication.⁷ The changes in the TMJ can be found in this case seeing through panoramic X-Ray with condylar and

fossa reshaped. Unilateral mastication could also induce improper activity of masseter muscle and reduction of TMJ mobility on the side of unilateral mastication.⁷ The muscle pain is likely related to overload as shown in a study which demonstrated an increased electromyographic activity in masseter and temporal muscles on the preferential side of mastication.²⁶ The higher hyperactivity observed in elevator muscles may influence the disc-condylar relationship, which in turn could be an adjunct or predisposing factor to TMD.²⁶

Through this study, we emphasize the great clinical importance in the identification and treatment of patients with unilateral masticatory function, since several morphological and functional changes were observed and recorded during treatment. The correct orientation of the patient on this fact, followed by its correction, could decrease future TMD. The importance of this view is relevant since many professionals do not consider the analysis of mastication when performing dental treatment.

CONCLUSION

Unilateral mastication can lead to several problems; therefore, it may be screened, evaluated and treated by the dentists. The patients should be instructed to avoid this habit; this is an essential procedure that needs to be added to dentist's daily routine. In this present case, the signs and symptoms declined after the treatment, the patient reported no TMJ pain, improvement mouth opening in 11mm and absence of headaches. The treatment prevented other consequences of unilateral chewing such as occlusal wear, dental misalignment, premature contact and extrusions.

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