

## CONSERVATIVE TREATMENT OF DISC DISPLACEMENT WITHOUT REDUCTION - CASE REPORT

Aurelia Magdalena Enache<sup>1</sup>, Andreea Gratiela Becheanu<sup>2</sup>, Dana Festila<sup>3</sup>

<sup>1</sup> Assistant Professor, Department of Orthodontics and Dentofacial Orthopedics, Faculty of Dental Medicine, "C.Davila" University of Medicine and Pharmacy, Bucharest, Romania;

<sup>2</sup> Private practice limited to Endodontics and Orofacial pain, Pitesti, Romania;

Associate Professor, Department of Orthodontics and Dentofacial Orthopedics, Faculty of Dental Medicine, "Iuliu Hatieganu" University of Medicine and Pharmacy, Cluj Napoca, Romania

\*Corresponding author email: gratiela.becheanu@yahoo.ro

### ABSTRACT

Disc displacement without reduction (DDwoR) with or without limited mouth opening is intracapsular biomechanical disorder characterized by anterior position of the disc relative to condyle, that does not reduce with mouth opening. Due to a multifactorial etiology, the treatment of DDwoR needs an interdisciplinary team to address the specific factor. The treatment modalities may include: patient and self-management, cognitive behavioral therapy (CBT), pharmacotherapy, physical therapy, orthopedic appliances, as conservative options and occlusal therapy and surgery, as aggressive, irreversible options. The aim of this article is to present a successfully treated case of DDwoR through conservative therapy.

**Key words** : disc displacement without reduction, stabilization appliance, pain, musculoskeletal stable position.

### INTRODUCTION

Temporomandibular joint disorders (TMDs) is a group of diseases including muscle and temporomandibular joint disorders with a multifactorial etiology: trauma, anatomical factors (skeletal and occlusal factors), emotional stress, deep source of pain, parafunctions and adaptability of the patient.[1,2]. Regarding the prevalence of the TMDs there is a large variability from study to study, because of different definitions, but only 3,6% to 7% of the individuals with TMDs are estimated to require treatment.[3,4,5,6,7]. The most common temporomandibular joint (TMJ)

disorder is articular disc displacement (DD), characterized by a misaligned disc-condyle structural relationship and a prevalence of 41% in TMDs patients.[8] The most frequent direction for displacement of the disc is anterior or anteromedial direction, but posterior or mediolateral displacement of the disc have also been described.[9-12] The DD etiology has not been established, but elongated and torn ligaments binding the disc to the condyle allow the disc to displace, in the majority of cases.[1,3]

Disc displacement is subdivided into (a) DD with reduction (DDwR), (b) DDwR with intermittent locking, (c) DD without

reduction (DDwoR) with limited opening and (d) DDwoR without limited opening based on the stage of condyle-disc misalignment and clinical dysfunction.[9] DDwoR is less frequent than DDwR (approximately 5% of DD) and affects more female than male.[10] DDwoR with or without limited mouth opening is an intracapsular biomechanical disorder characterized by anterior position of the disc relative to condyle, that does not reduce with mouth opening. The difference between them is that DDwoR with limited opening, also referred as *closed lock* is associated with limited mouth opening that does not reduce with clinician or patient manipulative maneuver, only if it's an acute phase and TMJ pain, which are at the same time the reasons that force the patient to seek medical treatment. [1] With time, mandibular movements improve up to total restoration and the pain also reduces and DDwoR with limited opening goes from acute to chronic stage of DDwoR, which corresponds to DDwoR without limited opening. Although sometimes asymptomatic, DDwoR is an important risk factor for degenerative joint disease.

Patients with symptomatic DDwoR look for medical help, due to psychological implications also, especially the consequences of the chronic pain. Management goals for patients with DD should be established in accordance with etiology and appropriate diagnosis so the treatment benefits of conservative, non-invasive, reversible modalities at the early stages or irreversible modalities (occlusal therapy, surgery). The aim of this article is to show the importance of the correct diagnosis for an individualized treatment of DDwoR.

## CASE REPORT

The patient S.A., 19 year-old female presented with left TMJ area pain as the chief complaint, in February 2017. She had a limited mouth opening and she was also wearing a splint, on a full-time basis. Two and the half years ago when she was eating her left TMJ locked, she felt a terrible pain and couldn't open her mouth. Progressively she managed to open the mouth wider, but the pain persisted and after 2-3 months of pain she decided to see a dentist. The treatment plan combined the splint she came with and osteopathic treatment. The splint, covering all the mandibular teeth, for occlusal therapy was made in accordance with the data obtained from the condilography, in a therapeutic mandibular position. After 3-4 month of continuous use of the splint she had no pain and she could open her mouth wider, but not as wide as before the mandible locking. At almost one year from the beginning of the treatment with splint, the pain started again, the left joint was clicking during mouth opening, yawning, eating, laughing. She has never stopped wearing the splint (as she had been recommended), because the next step of the treatment, orthodontic treatment, would have had to stabilize the mandible in the new acquired position through a new built occlusion.

As medical history, during her childhood she underwent orthodontic treatment with fixed appliance in the upper arch to correct the unilateral crossbite, on the right side.

The patient presented with continuous aching, sharp, strobing pain in the left TMJ area, masseter and mandibular angle left area. On a visual analogue scale (VAS) the pain was 7. It was aggravated by

function(chewing, biting on the right side, yawning and mandibular movements) and it could be relieved only by sleep. The pain is chronic because it has been lasting for a long period of time, so she presented mild signs of anxiety.

The patient also had bad habits like nail and lip biting, clenching, sleeping on her stomach with her head rotated to the left and speech pathology - lisping (lateral). During speech (including "s") there was a

significant deviation of the mandible to the right. Her sister and father have also lisping and mandible deviation during speech. It can also be noted the history of left unilateral clicking.

Clinical examination (fig.1) showed a facial asymmetry due to mandible deviation and head rotation to the right, limited mouth opening (27 mm) and restricted mandibular lateral movement to the right.



Fig.1-Facial aspect – mandibular deviation to the right and limited mouth opening

At intraoral examination (fig.2) it can be noted a permanent dentition with class III molar and canine relationship on the left side, class II canine and class I molar relationship on the right side, lower midline deviation to the right and edge to edge

relationship on the right side, in transversal plane, associated with a lateral open bite on the right side. That new therapeutic occlusal relationship was determined by the split, as the patient mentioned



Fig.2 – Intraoral aspect of occlusal relationship

Taking into consideration all those symptoms- history of clicking, limited mouth opening with deflection on the left side, restricted lateral movement to the right and normal lateral function on the left side -

the clinical diagnosis was DDwoR with limited opening and chronic pain, which was confirmed by MRI investigation (fig.3), the gold standard for DDwoR. [15,16]



Fig.3 MRI- left TMJ a)start of the treatment;b)one year follow-up

Our treatment plan for this case of DDwoR was appliance therapy with stabilization appliance (SA) in order to leave the retrodiscal tissue to adapt along with patient education about the condition : decrease jaws use, emotional stress awareness and to encourage reduction of non-functional teeth contact (parafunctions). So the patient was advised to stop nail and lip biting habit, control clenching, speech evaluation and



Fig.4 Stabilization appliance

At the first appointment, after one week of using the SA she could open the mouth wider and the pain was 3 on VAS and occasionally. Afterwards she continued to wear the SA, but on a night-time basis. She stopped nail biting habit and tried to control clenching and lip biting habit, but she didn't see a speech therapist. SA was adjusted periodically, because its contacts with the lower teeth changed continuously. The symptoms improved gradually in such a way that after four months of treatment she had no pain, no restricted mandibular movements and mouth opening. ***"I can eat ALL I want, including beef, that I couldn't eat before***



Fig.5 Intraoral occlusal relationship after SA therapy

The result of the treatment had also a positive psychological effect on the patient. Due to chronic pain, limited movements of the mandible, discomfort created by the wearing of the splint on a full-time basis and

therapy. The appliance, a full-arch hard acrylic stabilization appliance (fig.4) was made for the upper arch in accordance with Okeson technique and for the first week it was worn on a full-time basis [1]. The treatment goal of the stabilization appliance was to eliminate the orthopedic instability between the occlusal position and joint position, being fabricated in musculoskeletal stable position, optimal position for the patient.

***starting this new treatment"*** (patient said). Intraoral examination at that moment showed an important change in occlusal relationship. It could be noted that the lateral open bite disappeared, the teeth contacts improved especially on the left side, but the mandibular shifting to the right accentuated (fig.5). Probably this was the original occlusion before wearing the first splint, that tried to build a new occlusal relationship. The reevaluation revealed an orthopedic and occlusal stability, so the mandible was in a musculoskeletal stable position and the treatment with SA was discontinued.

no improvements after more than one year of treatment with splint the patient had a mild anxiety, which also aggravated the symptoms. Although she realized that she could return to a normal life she was afraid

of stopping wearing SA, but after some more months she was very happy and gave using SA.

A new orthodontic treatment and speech therapy were recommended, but the patient refused any other treatment, because she got tired of treatments and nothing bothered her, nor the facial aspect neither the alignment of the teeth.

Everything had been well till October 2019, when she returned with left TMJ area pain, clicking and some episodes of mandible locking, which were managed by herself through lateral and anterior mandibular movements. The symptoms began on September 2019, after third molar extraction. She also had a stressful period. Due to the pain increased by biting on left side along with the rest of the symptoms support the diagnosis of muscular pain. The treatment was SA with self-regulated program for emotional stress for one month, because there were no more symptoms very soon after the treatment had begun. She also started speech therapy, because she found by chance that she had an accentuated mandibular deviation to the right during speech and she didn't like it. It was used the same SA and it didn't need any adjustments, that support the idea of stable malocclusion concept, a dental malocclusion that is orthopedically stable.

## DISCUSSION

Treatment of DD (wR or woR) is very challenging and the important principle that should be taken into consideration is that the etiology of TMDs is multifactorial, one of them being the adaptability of the patients which can override the other etiologic factors, reducing the severity of the TMD or

achieving good symptoms relief with conservative, noninvasive treatment modalities. The studies have demonstrated that even DDwoR is a very adaptive disorder [17-20]. It is also known that many patients with DD may have painless mandibular movements [21-23]. It is recommended that patients with DDwoR should be initially treated by the simplest and less invasive modalities. [24] But if the condition is chronic, there is a need of multidisciplinary team to address the specific etiologic factor. An important factor is the psychological factor, because TMDs patient are more anxious and depressed than other groups of dental patient [25]. Pain associated with a worse course of pain can be related with anxiety and depression [26-28] The treatment modalities may include: patient education and self-management, cognitive behavioral therapy (CBT), pharmacotherapy, physical therapy, orthopedic appliances, as conservative options and occlusal therapy and surgery, as aggressive, irreversible options.

Regarding appliance therapy for TMDs patients the most recent studies stated that there is a moderate effect for reduction of pain. [29,30]. One type of these appliances is a stabilization appliance (SA) that cover all maxillary or mandibular teeth. It is advisable to be used only during sleep whereas other conservative modalities, like CBT, in order to eliminate the parafunctions while awake. If the condition is acute, the appliance may be used on a full-time basis till the improvement of the symptoms. When there is no positive response after 3-4 weeks of treatment with SA, the patient should be reevaluated for a proper diagnosis. The SA can be fabricated by hard acrylic or soft

resilient material, but studies have shown that the last ones were no more effective than self-management treatment without appliance therapy [3]. The occlusal surface of the appliance should be as flat as possible, but during closure the posterior lower teeth should contact the appliance slightly more heavily than anterior teeth, in order to determine a stable mandibular posture. SA needs periodic adjustments of the occlusal surface in order to compensate for changes in mandibular position. [1]

Occlusal therapy is related with the role of occlusion in the treatment of DD, establishing a new mandibular position with a correct disc-condyle relationship and rearticulation of the teeth in a new position through occlusal adjustments, restorative and prosthodontics therapy, orthodontic-orthognathic therapy, named by Okeson "rebuilding". Although the occlusal-related dental treatment may be necessary for DD patients, there is a lack of evidence that occlusal therapy for an ideal dental occlusion is mandatory for routine TMDs treatment. [31-33].

TMJ surgery (arthrocentesis, arthroscopy, arthrotomy), in accordance with guidelines of American Association of Oral and Maxillofacial Surgery is only indicated when nonsurgical

therapy has been ineffective, including moderate to severe pain or dysfunction that is disabling [34].

In this case report, our treatment of DDwoR followed guidelines of the scientific literature, starting with conservative therapy. The treatment combined SA fabricated in musculoskeletal stable position and patient education and self-management, CBT in order to reduce non-functional teeth contact and control the chronic pain and speech therapy in accordance with etiologic identified factors. Although the occlusal relationship (right lateral crossbite, orthodontically treated in the childhood only with a fixed upper appliance) might have been a risk factor for DDwoR in this case, the previous occlusal therapy treatment the patient had had didn't show positive result. Accordingly, the clinician should not proceed to correct DD in a stable malocclusion with an occlusal therapy before a conservative, noninvasive treatment.

## CONCLUSION

This case report increases the evidence that the best management of DDwoR should start with a noninvasive, conservative treatment and the adaptability of the TMJ structures is an important factor for a positive result.

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