

CASE REPORT

Management of TMD in patient with canted occlusal and asymmetry

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ABSTRACT

Keywords: Disc displacement, Facial asymmetry, TMJ internal derangement

Facial asymmetry can disturb not only appearance but also function. The most characteristic of the TMJ internal derangement (ID) is the disc displacement in patient with face asymmetry. To report the successful treatment of TMJ ID in class 2 malocclusion with canted occlusal plane and facial asymmetry. A 22-year-old male patient came refer by the Orthodontics Department with chief complaints of slanted jaw and bite, soreness, tension in front of right ear region. History of closed lock on his right jaw and had clicking on his left. He's a daytime bruxer. Clinical examination showed visible canting in the occlusal plane, reciprocal clicking in the left TMJ, limited movement and deviation when opening and closing the mouth. Based on panoramic x-ray, the left mandibular ramus was longer than the right. The DC-TMD diagnosis is disc displacement with reduction on the left and disc displacement without reduction without limited opening on the right TMJ. A stabilization appliance (SA) was fabricated for him. Patient was instructed to do jaw exercise, and physical-self regulation (PSR). Patient was also told that emotional stress, and bad habit should be reduced. After 4 months using the SA, and doing the jaw exercise and PSR, the patient showed significant improvement. Soreness and tension had disappeared, and facial asymmetry was getting better. Patient then was referring to Orthodontic Department to treat his malocclusion. SA, jaw exercise and PSR were a good treatment choice to manage the TMJ ID. (IJP 2024;5(2):152-156)

Introduction

Facial asymmetry can disturb not only appearance but also function. Temporomandibular disorder is a multifactorial condition with muscle hyperactivity as an important contributing factor, along with stress, arthrogenous factors, parafunctional habits and structural issues in the anatomy of the joint.¹ Temporomandibular joint disorders (TMD) were first introduced in an article written by James Costen in 1943.² Some of the hallmarks of TMD include Temporomandibular joint (TMJ) pain, limitation of mandibular movement, and TMJ sounds.³ Scientific findings at that time showed that occlusion conditions affected the function of the masticatory muscles.² In the 1950s, a hypothesis was proposed that malocclusion caused abnormalities in the masticatory muscles and played a role in the occurrence of TMD.² The division of TMD is divided into three categories, namely derangement of the condyle-disc complex (disc displacement with reduction, disc displacement without reduction, disc displacement with intermittent locking), structural incompatibilities of the articular surfaces (deviation, adherences/adhesion, subluxation, luxation), and inflammatory joint disorder (synovitis/capsulitis, retrodiscitis, osteoarthritis, osteoarthrosis, rheumatoid arthritis, hyperuricemia, traumatic arthritis).²

Temporomandibular joint internal derangement (TMJ-ID) is a common problem faced by dentist when treating patients with asymmetry. The most characteristic of the TMJ internal derangement is the disc displacement in patient with face asymmetry.^{4,7} Articular disc displacement has

known as possessing a cause-and-effect relationship with facial morphology and growth.^{4,8,9} Many studies investigate the mechanism of articular-disc displacement, where in general shown increase in friction has been claimed as a major causative factor in displacement of the articular disc. The side with symptoms is directly related to the amount of vertical asymmetry.^{4,10} The mandible appears to be shorter on the side with more advanced disc displacement.^{4,6}

Differences in bilateral TMJ morphology may represent an anatomic disorder that predispose this patient to TMJ problems.^{4,11,12} Biomechanically, vertical dental and skeletal asymmetries of the mandible, such as canting of occlusal and mandibular planes in the frontal dimension due to a difference in the height of the right left ramus, have been considered as important contributors to disturbances in TMJ loading that are related to TMJ ID.^{4,13,14}

Repetitive loading with unbalanced and inappropriate direction of stress may cause reactions of the lateral pterygoid muscle and the accessory ligament around the TMJ, tending to increase the stability of the joint. These mechanical strains may cause fatigue and spasm to the muscles and ligaments that finally induce disc displacement.^{4,15}

This case report aims to report the successful treatment of TMJ internal derangement in class 2 malocclusion with canted occlusal plane and facial asymmetry.

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Figure 1. Extra oral photography



Figure 2. Visible canting



Figure 3. Intra oral examination show the clinical condition of remaining teeth

Case Report

A 22-year-old male patient came to the Prosthodontic clinic, Universitas Indonesia, Jakarta, refer by the Orthodontics department. His chief complaints were slanted bite, slanted jaw, soreness, and tension in front of right ear region after wearing orthodontic fixed braces for 1,5 years when he is in junior high school. Ten years ago, he experienced a closed lock on his right jaw, the dentist only prescribed him an analgetic. He had a limited mouth opening ever since. He had clicking on his left. Besides, he was also a daytime bruxer and history of trauma was denied. Clinical examination showed visible canting in the occlusal plane [figure 1](#) and [figure 2](#), reciprocal clicking in the left TMJ, limited movement and deviation when opening and closing the mouth.

Intraoral analysis showed the patient have a good oral hygiene, 14,24,34,44 missing due to the previous orthodontic treatment, occlusion class II, light occlusal wear, no occlusal interference and slide in centric [figure 3](#). Based on panoramic radiography, it was shown that the left mandibular ramus was longer than the right side [figure 4](#) and from posteroanterior radiography shown there is a midline deviation on the mandible to the right side [figure 5](#). Transcranial radiograph could be seen that the right TMJ is displaced posteriorly in biting position but displaced antero-inferiorly in rest position. Left TMJ showed that there was a condyle hypermobility [figure 6](#).

Result from the Index Temporomandibular Disorder of the patient with total score 2 are Non-Temporomandibular Disorder. Result of the Etiology of TMD showed the overall based on the gender, stress, bad habit, and freeway space examination with total score of 6 are high risk for TMD. According to the DC-TMD symptom and examination questionnaire, the diagnosis is disc displacement with reduction on the left and disc displacement without reduction without limited opening on the right TMJ [figure 7](#).

According to Okeson, the diagnostic algorithm for temporomandibular disorders, the treatment management for the patient are fabrication of stabilization appliance, jaw exercise, physical-self regulation (PSR), reducing emotional stress, reducing bad habit² and orthognathic surgical considerations for correcting different mandibular ramus heights.^{2,16}

Stabilization appliance (SA) is usually made for the maxilla with the aim of creating an optimal occlusal relationship for the patient. To eliminate orthopedic instability between occlusal and joint positions, thereby eliminating the etiologic factor of TMD (instability). SA can be used in maxilla and mandibula, but SA maxilla is more commonly used. Maxillary SA is more stable and covers more tissue, more retentive and less likely to break. In patients with class II and III jaw relationships, achieving proper anterior contact and guidance is often difficult with mandibular appliance, maxillary appliance is more stable as all mandibular tooth contacts are on a flat surface. SA can help to find the musculo skeletally stable relationship of the

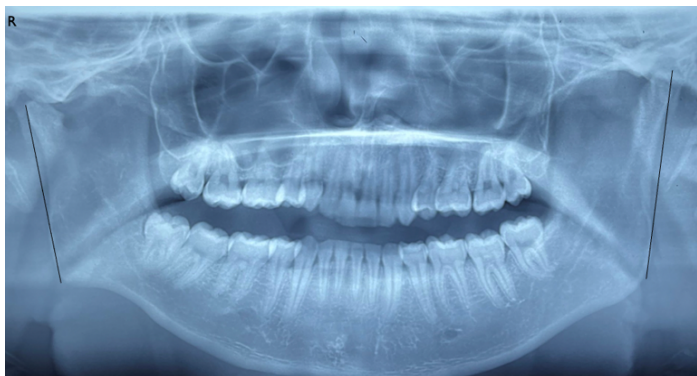


Figure 4. Panoramic radiography showed left mandibular ramus longer than the right side

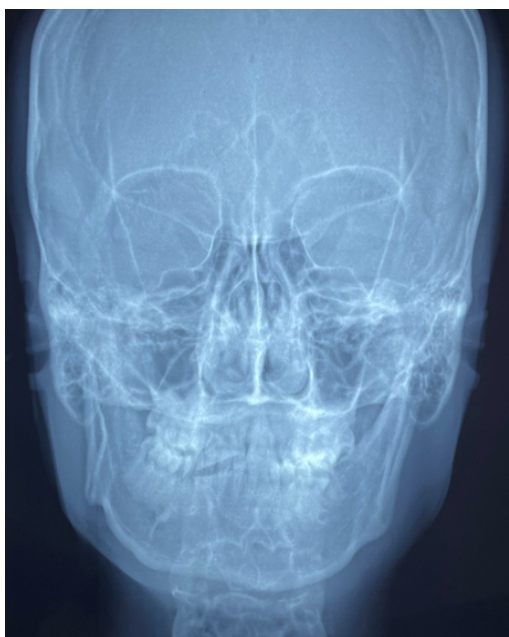


Figure 5. Posteroanterior radiography shown there is a midline deviation on the mandible

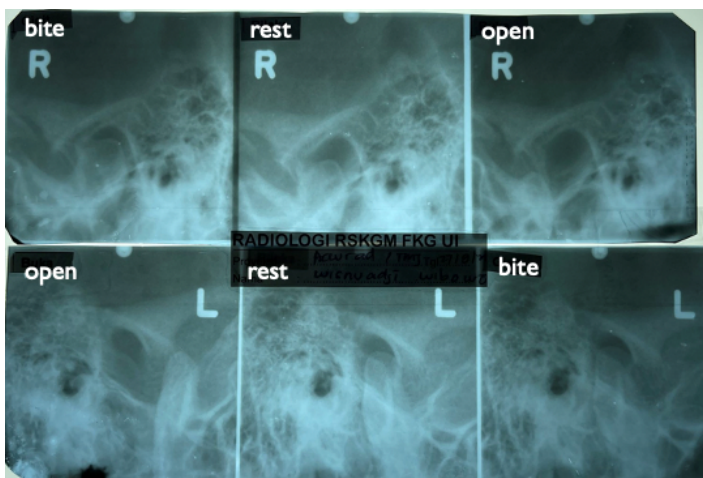


Figure 6. Transcranial radiography of the patient

condyles in the fossa.² According to Ooi K et al, horizontal occlusal instability strongly affected the prevalence of internal derangement of TMJ. A causal relationship has been reported between internal derangement of the TMJ and an abnormal facial skeleton, which is characterized primarily by a retrognathic mandible, mandibular asymmetry, and occlusal instability.^{1,2,17} fabricating SA for this patient is the right choice to correct the instability that occurred. A leaf gauge is used to assist locating the musculo skeletally stable position. The patient asked to close, and enough leaves are placed between the anterior teeth to separate the posterior teeth slightly. As the patient tries to seat the posterior teeth, the condyles will move to the centric relation position. Care should be taken to assure that the patient does not protrude while closing or that the leaf gauge does not exert a retruding force on the condyles.^{5,18} Figure 8. The patient is asked to use it every night for 8 hours a day figure 9.

Patients with dysfunctional jaw movements can often be trained to do passive exercise to avoid these movements by simply watching themselves in a mirror. The patient is encouraged to open on a straight opening pathway. In many instances, if this can be accomplished following a more rotational path, with less translation, disc derangement disorders will be avoided.² Repetitive loading with unbalanced and inappropriate direction of stress may cause reactions of the lateral pterygoid muscle and the accessory ligament around the TMJ, tending to increase the stability of the joint. These mechanical strains may cause fatigue and spasm to the muscles and ligaments that finally induce disc displacement.^{4,15,19} The patient is instructed to open the mouth slowly. Stop if there is pain. Then the patient is instructed to watch his mouth opening with a mirror until he can make a straight mouth opening path without deviation. Sometimes passive muscle stretching can be assisted with the use of vapocoolant sprays it helps in treating trigger points associated with myofascial pain.²

To complete the treatment management, we asked the patient to do the Physical Self-Regulation (PSR). Based on clinical trial by Drs. Bertrand and Carlson included randomization of 44 patients with an average age of 34.6 years and with pain lasting for 52 months into either a group receiving PSR or a group receiving standard dental care (SDC) that included a stabilization appliance. Both treatments resulted in significant decreases in pain intensity and life interference from the pains 6 weeks after treatment was initiated.² The PSR approach consists of eight areas of education and training.² PSR is a powerful tool in reducing many orofacial pain conditions. There are two issues, however, that must be overcome. The first is because these principles are so simple many patients will not believe they will work. In fact, many clinicians will likely feel the same until they see the success that can be achieved. The clinician needs to convince the patient that she or he can make major improvements in the pain condition if these treatment strategies are followed.

The second issue that must be overcome is the patient must be willing to actively participate in the treatment

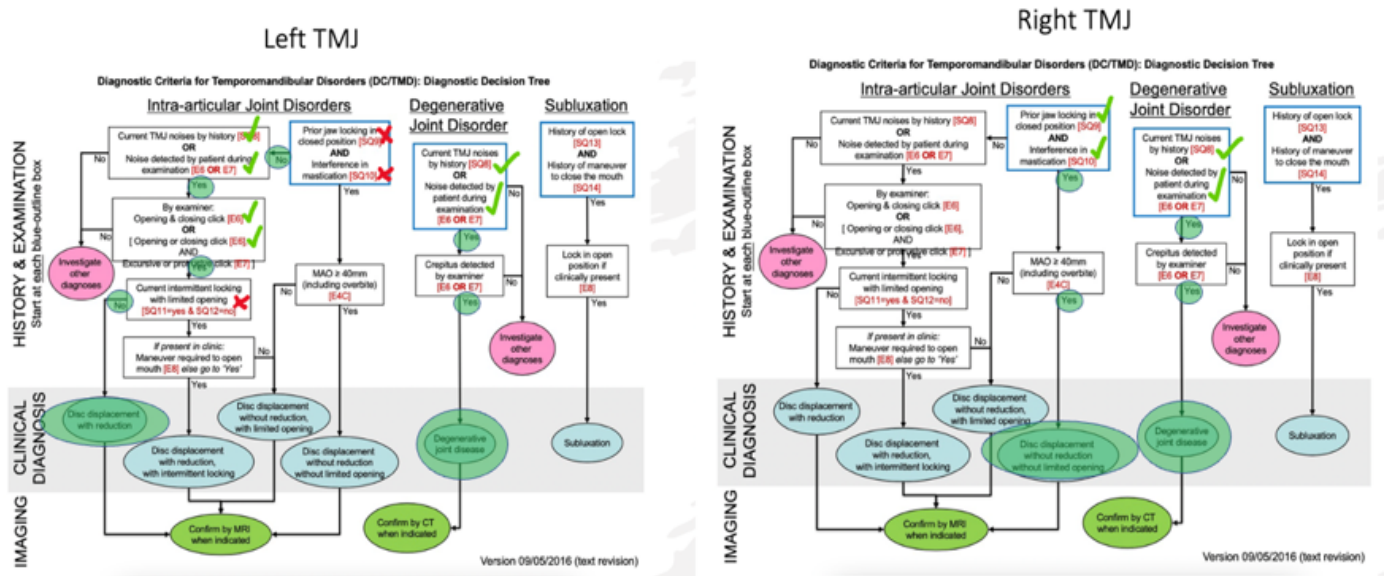


Figure 7. The DC-TMD result of the patient



Figure 8. A leaf gauge used to assist locating the musculo skeletal stable position



Figure 9. Stabilization appliance of the patient

strategies.² PSR works if the patient will actively participate and train.^{2,20}

The patient underwent monthly control where each control was carried out an examination of subjective and objective complaints, palpation of the masseter, temporal muscles and TMJ to check if there's any pain. Occlusion and articulation traces on the stabilization appliance were also checked with articulating paper at every control where thick traces which

meant heavy contact were reduced to get balanced occlusion pressure on all teeth figure 10. After 5 months using the SA, and doing the jaw exercise and PSR, the patient showed significant improvement. Soreness and tension disappeared, and facial asymmetry was getting better figure 11. Patient then was referring to orthodontic department to treat his malocclusion.

There is a difference in the height of the right and left ramus which can cause an imbalance in TMJ loading. This imbalance can cause increased friction on the articular disk. Unbalanced repetitive loading and incorrect direction cause a reaction to the lateral pterygoid musculus and accessory ligaments around the TMJ this causes soreness and tension which can lead to disc displacement.

By using a stabilization appliance with the help of a leaf gauge, it will position the condyle in a Musculo skeletal stable position (CR position) where the condyle head is in the supero-anterior position of the glenoid fossa. After being positioned in the MS position, it is expected that the muscles are relaxed so that the face does not look pulled to the right. According to Okeson, using SA will reduce pressure on the retrodiscal tissue. By adding passive exercise and PSR as treatment management completed the improvement in this patient where the mouth opening and closing movements that were previously deviated became more corrected and reducing bad habit.

Conclusion

The use of SA, jaw exercises and PSR are good treatment options for the management of TMJ internal derangement. Malocclusion patients with TMD symptoms should not be treated with orthodontics immediately. We must eliminate TMD first to prevent it from getting worse.

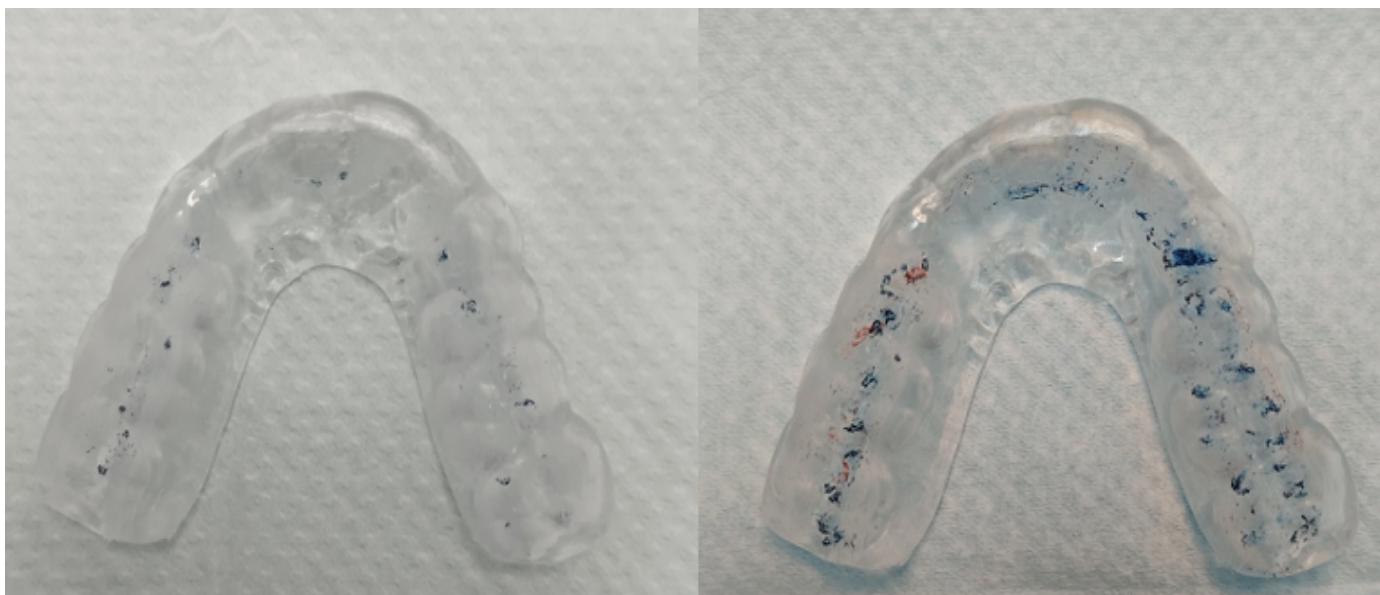


Figure 10. Occlusion and articulation traces on SA

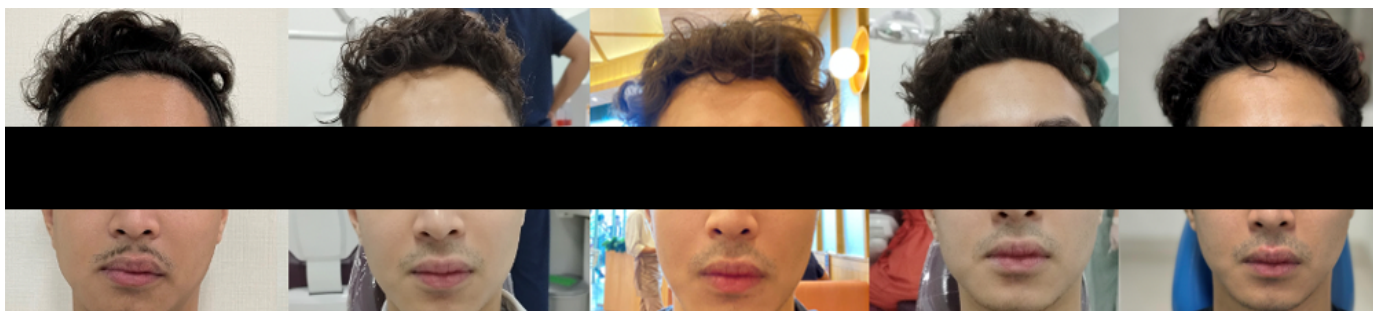


Figure 11. Patient progression after 5 months treatment

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