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Management of patient with occlusal discrepancy and TMD: A case report of a comprehensive approach

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Abstract

Introduction: Temporomandibular disorders (TMDs) are a group of clinical issues that affect either one or both of the masticatory muscles, the temporomandibular joint, and related tissues. It is regarded as a subclass of musculoskeletal illnesses and is the most common source of nondental pain in the orofacial region. The dispute and controversy surrounding the causes of TMDs in dentistry are unlike any other areas due to the lack of scientifically verified proof of a cause-and-effect connection. Occlusion has been acknowledged as a significant etiological or perpetuating component, but the exact extent of its influence has not been determined.

Case Description: A 43 year old female patient complained of pain and clicks in the right temporomandibular joint (TMJ) while opening and closing of mouth, accompanied with pain in neck and episodes of headache. On examination patient had edge to edge bite. On palpation, all muscles of mastication bilaterally were tender including the trapezius and sternocleidomastoid muscle. Patient had occasional clicks in right TMJ. The patient was diagnosed with Myofascial pain and dysfunction syndrome due to occlusal discrepancy with disc de-arrangement of right TMJ. A comprehensive treatment to be conducted in 3 phases was proposed. The objective of treatment was resolution of pain, clicks and aesthetics.

Conclusion: Multidisciplinary approach performed by orofacial pain specialist, orthodontist, prosthodontist and physiotherapist yield in complete resolution of patient's complaint and improved quality of life, along with good corporation of patient has led to completion of treatment within a time span of 1 year.

Keywords: Temporomandibular disorder, comprehensive treatment, modified Hawleys's appliance, occlusion

Introduction

Temporomandibular disorders (TMDs) are a group of clinical issues that affect either one or both of the masticatory muscles, the temporomandibular joint, and related tissues. It is regarded as a subclass of musculoskeletal illnesses and is the most common source of nondental pain in the orofacial region. The dispute and controversy surrounding the causes of TMDs in dentistry are unlike any other areas due to the lack of scientifically verified proof of a cause-and-effect connection. Occlusion has been acknowledged as a significant etiological or perpetuating component, but the exact extent of its influence has not been determined. Certain occlusal characteristics, such as unilateral lingual crossbite or deep bite, were found by Pullinger and Seligman as possibly associated with TMDs. A unilateral posterior crossbite was thought to be a potential local risk factor for the emergence of TMDs by Magnusson et al. Extreme deep bite values have also been thought to be a required condition linked to TMDs, but not adequate to establish a causative link.

Case Report

A 43-year-old female patient with a 2 year history of pain, and clicks in the right temporomandibular joint (TMJ) while opening and closing of mouth, accompanied with pain in neck and episodes of headache, presented in the department of Oral medicine and Radiology.

She had no significant past medical records. In her past dental history she has undergone prosthesis in relation to 35, 36, 37 and 45, 46, 47 2 years ago.

She was previously advised a soft splint of 2mm for 6 months but had no relief and experienced occasional clicks in the right TMJ. No functional or parafunctional habits were recorded.

On examination patient had edge to edge bite (Fig.1 and 2). On palpation, all muscles of mastication bilaterally were tender including the trapezius and sternocleidomastoid muscle. Patient had occasional clicks in right TMJ.

During verbal history the patient gave a VAS score of 8 out of 10.

Further investigation included CBCT of the joints, T-scan for occlusal forces, electromyogram for the activity of the muscles and JVA (fig.5) for the intensity of clicks.

CBCT revealed reduced joint space with respect to the right TMJ.

The pre procedure digital analysis (Fig.6) reveals that the right side has 55.1% forces, and the left side has 44.9%. The bite seems to be balanced but when we carefully analysed, the maximum forces are on the right 2nd molar and premolars compared to left molars and premolars. The disclusion time is 0.20s and occlusion time is 0.00s.

Electromyogram revealed hyperactivity of all muscles of mastication including trapezius and sternocleidomastoid.

Joint vibration analysis revealed patient had right closing clicks and according to joint vibration analysis flow chart which is based on Pipers classification it was concluded that patient was suffering from chronic adapted disc displacement classified as 4b.

Hematological investigations were done in which vitamin D was 13.1ng/mL, serum calcium was 8.50mg/dL and vitamin B12 was 150pg/mL.

Diagnosis

Myofascial pain and dysfunction syndrome due to occlusal discrepancy with disc de-arrangement of right TMJ.

Treatment plan

A comprehensive treatment to be conducted in 3 phases was proposed. In the phase 1 we concentrated on relieving the muscle tenderness by transcutaneous electric nerve stimulation therapy (Fig.7) for each session and ultrasound biweekly for 4 weeks. Along with this supportive medical treatment was prescribed for 2 months.

A deprogramming splint of 3mm thickness for 1 month to be used only in the night to reduce the acute pain of muscles. After a month patient gave a VAS score of 4. In phase 2 orthodontic treatment was commenced, a modified Hawley's appliance with a screw (fig.8,9 & 10) was fabricated and patient was asked to wear it in the daytime for 6 months. After 6 months the patient gave a VAS score of 2 and EMG revealed the muscle hyperactivity reduced. Follow up was done after 6 months.

After this the final phase was commenced, which consisted of prosthesis for upper anterior's 12, 11, 21 and 22.

In the end of the completion of treatment, the patient reported that she no longer felt pain and clicks in the TMJ. So, post treatment digital analysis (Fig.11) were recorded which had normal values. The post procedure analysis reveals that the right side has 49.2% forces and the left side had 50.8% forces. The bite seemed to be very well balanced and the excessive forces on the right 2nd molar and premolars are relieved. The disocclusion time is 0.00s and occlusion time is 0.45s.

The final records showed restoration of occlusal harmony (fig.12) and esthetics and elimination of clicks and the medical investigations were repeated in which vitamin D was 21.2 ng/mL, serum calcium was 9.3 mg/dL and vitamin B12 was 247 pg/mL.

Discussion

Patients with chronic MPDS have a non-resolving, hyperactive muscular condition that is defined by ongoing, regular supportive adjunctive therapy, chronic splint use, frequent ingestion of pain medication, and persistent facial pain and temporal migraines. One researcher's published occlusal adjustment studies have frequently demonstrated the therapeutic effectiveness of precision-measured occlusal modifications in lowering chronic symptomatology and the need for continued therapy^[1].

Multidisciplinary approach is an important aspect in providing comprehensive treatment for TMDs^[2]. In the case described here, the patient reported a history of symptoms lasting since 1 to 2 years, but they worsened in the last six months. This patient felt pain and had masticatory difficulties. These are the most typical symptoms that patients with temporomandibular joint disorders (TMDs) present with, according to published research. 3 Recent research has shown that many TMD patients exhibit an erratic pattern of masticatory movements with a preference for one side^[4, 5].

Chronic fatigue and psychiatric symptoms can occasionally result from TMD patient's ongoing discomfort^[6, 7]. The patient reported numerous physical and psychological changes during the case history recording.

The treatment objective was resolution of pain, clicks and aesthetics. After explaining the patient about her malocclusion, she was assured that the treatment will resolve her chief complaint of clicking and pain in her TMJs. With these clarifications, the patient decided to undergo orthodontic and prosthodontic treatment with was carried out in three phases.

During phase I of the treatment plan, maxillary and mandibular impressions were taken, and the casts were mounted on three-point articulator (Jabbar and co INDIA), freeway space was determined and a deprogramming mandibular acrylic hard splint of 3mm thickness was given for a period of one month along with pharmacotherapy.

During phase II of the treatment plan, which was conducted three months after the patient's first clinical visit. The comprehensive approach had led to resolution of patient's chief complaint. She claimed that because she was pain-free, and her chewing pattern was comfortable. She also observed better sleep quality, pain-free awakenings, and an increased desire for social activities.



Fig 1: Pre-Treatment



Fig 2: Pre-Treatment

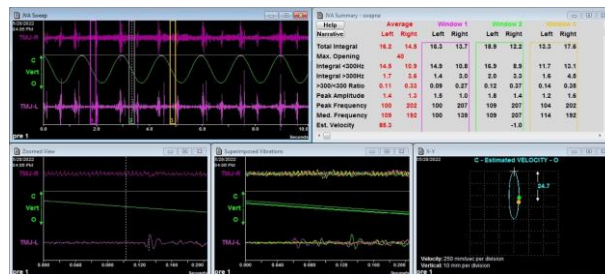


Fig 5: Pre Joint Vibration Analysis



Fig 3: Mounted Diagnostic casts

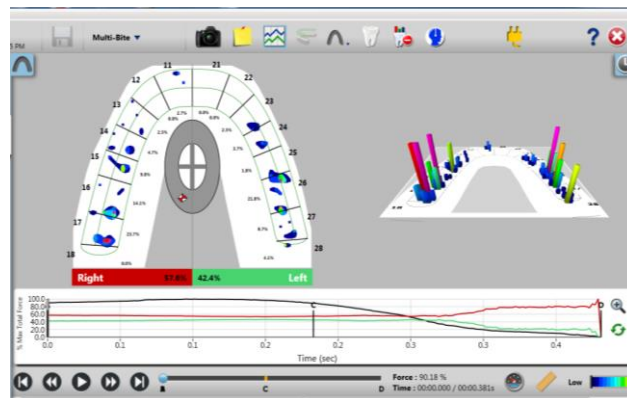


Fig 6: Pre Digital Analysis using T- Scan



Fig 7: TENS Application



Fig 4: Mounted Diagnostic casts



Fig 8: Modified Hawley's Appliance with Jack Screw and Anterior bite plane

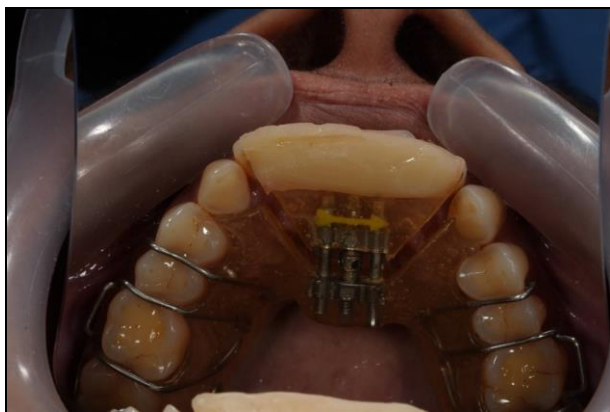


Fig 9: Modified Hawley's appliance with jack screw and anterior bite plane



Fig 10: Modified hawley's appliance with jack screw and anterior bite plane

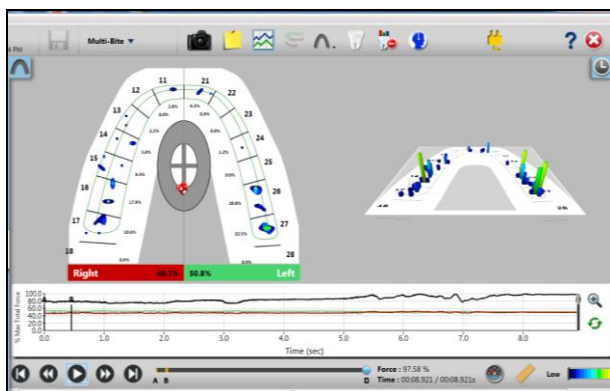


Fig 11: Post digital analysis using t-scan



Fig 12: Post-Treatment

Conclusion

TMD is often presented with edge on edge bite malocclusions. Despite the growing number of studies on TMD treatments, there is still no consensus regarding the best therapeutic technique and the real benefits of each one. Priority in prosthodontic therapy and orthodontic therapy in patients with TMD is to correct occlusion furthermore to decrease the pain and limited movement of mandible. Due to splint therapy as well as pharmacotherapy functional improvement was noticed in the orofacial myofunctional system as whole. Multidisciplinary approach performed by oro - facial pain specialist, orthodontist, prosthodontist and physiotherapist yield in complete resolution of patient's complaint and improved quality of life, along with good corporation of patient has led to completion of treatment within a time span of 1 year.

Conflict of Interest

Not available

Financial Support

Not available

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