

Case Report

Orthodontic diagnosis and management of TMJ – A case report

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ABSTRACT

Temporomandibular joint (TMJ) problems can be challenging and cause a myriad of complaints. The orthodontist can play a crucial role in identification and resolution of the same. The management through orthodontic treatment aims not merely at ideal positioning of the teeth but also ensuring synchrony between the condylar position and occlusion, often helping in re-establishing the lost equilibrium of the joint and muscles, often associated with malocclusion. This case report puts forth the diagnosis and orthodontic management of TMJ aberrations, wherein silent signs are manifested in the dentition. The case report, further, aims to provide insight on bridging the gap in treating minor TMJ aberrations by treating the probable root cause – malocclusion. A 20-year-old female patient presented with attrition of the lower incisors and deflection of the mandible on maximum mouth opening, suggestive of silent signs of temporomandibular disorder. Cone-beam computed tomography evaluation revealed erosion of the condylar head bilaterally.

Keywords: Temporomandibular disorder, Centric relation, Centric bite, Habitual occlusion, Orthodontics

INTRODUCTION

The uniqueness of the temporomandibular joint (TMJ) and its aberrations poses a challenge to the orthodontist both in terms of its differential diagnosis and treatment planning. A good understanding is required in diagnosing the reason behind the occlusal dysfunction and its resulting condylar displacement which is commonly manifested as a shift in the position of the mandible.^[1] In some cases, however, the reason is not apparent and this makes the functional examination of the TMJ crucial.^[2] In such patients, the orthodontist's role is paramount in identifying the silent yet significant indicators of TMJ dysfunction in the absence of any outward pathological conditions.^[2]

The management through orthodontic treatment aims at restoring the harmony between the condylar position and occlusion, thus helping in re-establishing the lost equilibrium of the joint and its associated muscles.^[3] This case report puts forth an interesting case involving TMJ abnormalities, its diagnosis, interventions, and the reasoning behind.

CASE REPORT

Pretreatment evaluation

A 20-year-old female patient presented with a complaint of forwardly placed upper front teeth.

Extraoral examination [Figure 1] revealed convex profile and asymmetry of the face present with the chin deviated toward the right.

Intraoral clinical examination [Figure 2] showed an increased overjet, reduced overbite, end on canine relationship bilaterally, and end on molar relationship on the left side and a class II molar relationship on the right side. The lower incisors showed attrition.

On functional examination [Figure 3], clicking of the joint during opening of the mandible was present on the right side. Muscle tenderness was elicited with the temporalis muscle. Upper and lower midlines were coinciding with each other at physiological rest position and at maximum intercuspation. However, during maximum mouth opening, deflection of the mandible toward the left was present.

Radiographic evaluation

The orthopantomogram showed flattening of condylar head on both sides, decreased ramal length on the right side, impacted lower third molars, buccoverted upper right third molar, and supernumerary teeth present between the lower premolars bilaterally. Cone-beam computed tomography evaluation revealed erosion of condylar head present bilaterally [Figure 4].

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Roth power centric bite

Before proceeding with fixed orthodontic appliance, to unravel the true centric position of the mandible in relation to the TMJ, a face-bow transfer was performed. Roth power centric bite registration was taken using DeLar bite registration wax and the unraveled position was mounted on a fully adjustable articulator.^[4-6]

The centric relation position of the mandible reflected a backwardly positioned mandible with an increase in overjet by 2 mm, decrease in overbite by 1 mm and molar relationship advancement by 1.5 mm as compared to the habitual occlusal position. This proved that there was a

centric relation-centric occlusion discrepancy (CR-CO discrepancy).

Since this was within the long centric range of 2 mm, the centric relation position of the mandible was used as the base to treat the malocclusion without any deprogramming of the mandible [Figure 5].^[6]

Treatment progress

Keeping the new position of teeth in mind, extraction of the upper premolars was done to correct the proclined upper incisors, which, on retraction, would also help in establishing the overbite.^[7] A class II buccal segment finish was accepted considering the profile of the patient. Overall, a well-intercusated and well-aligned Class I incisal occlusion was achieved with Class II molar relationships. The follow-up of the case after 1 year showed a stable occlusion with no further erosion of the condylar heads. No significant clicking sound was elicited on follow-up [Figure 6].

DISCUSSION

This case report aims to provide an insight on bridging the gap in treating minor TMJ aberrations by treating the probable root cause – malocclusion. The case report, further, puts forth the diagnosis and orthodontic management of TMJ aberrations, wherein silent signs are manifested in the dentition.

The question of controversial debate is the interaction between the occlusion and its influence on the TMJ. According to McNamara and Okeson, a stable occlusion is a reasonable orthodontic treatment goal, not achieving



Figure 1: Extraoral views taken using DSLR camera at a standardized light setting: (a) frontal view and (b) profile view.



Figure 2: Intraoral views of the habitual occlusion taken using DSLR camera: (a) right view, (b) frontal view, and (c) left view.

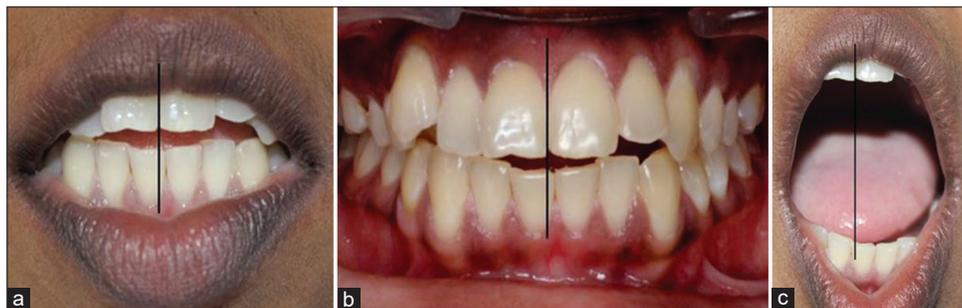


Figure 3: Functional positions of the mandible taken using DSLR camera: (a) postural rest, (b) maximum intercuspation, and (c) maximum mouth opening.

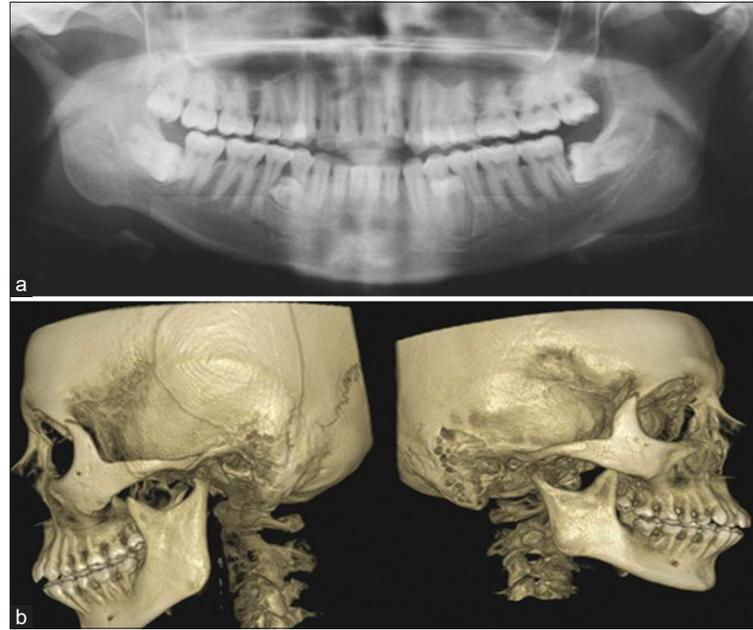


Figure 4: Radiographs (a) orthopantomogram and (b) cone-beam computed tomography.



Figure 5: Centric relation – centric occlusion evaluation articulated over a fully adjustable articulator (a) bite registration, (b) habitual occlusion, and (c) unraveled malocclusion.



Figure 6: Post-treatment – intraoral: (a) right molars in occlusion, (b) anteriors in occlusion, and (c) left molars in occlusion.

a specific gnathologically ideal occlusion does not result in temporomandibular disorder (TMD) signs and symptoms.^[3] However, the Roth William Philosophy believes that, functionally, it is important that the intercuspation is achieved with the condyles seated in the fossae.^[6] Any lack

of harmony will have adverse effects on the teeth, tooth-supporting tissues, TMJs, muscles, and post-orthodontic stability.^[8]

The pertinent question is does the dental occlusion have anything to do with TMDs? Can orthodontic treatment be

beneficial in the management of TMDs? In this case, the establishment of a stable occlusion resulted in reduced pain on muscle palpation and the clicking sound decreased. Further, erosion of the condylar head was mitigated.

CONCLUSION

- Orthodontists play a crucial role in the diagnosis and treatment of TMDs caused due to malocclusion of teeth
- Orthodontic correction is beneficial in correcting simple TMJ aberrations.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

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