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CASE REPORT

Conservative Management of Temporomandibular Disorders in Children

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ABSTRACT

Removable appliances with posterior bite plates are largely advised to be worn for duration of 6-12 weeks. If worn beyond this duration it may lead to undesirable changes in the patients biting pattern and Tempromandibular disorders (TMD). This article aims at shedding light on the conservative management of a case of TMD due to prolonged wear of a removable orthodontic appliance, which was used for crossbite correction in a patient with a Cleft lip cleft palate (CLCP). The conservative management of TMD is recommended when in children with TMD to reduce the problems posted by surgical method of management.

Keywords: Orthotic appliance; Conservative management; TMJ exercise

1 INTRODUCTION

Temporomandibular disorders (TMD) are a type of masticatory disorders, which manifests as pain in musculoskeletal system of the masticatory complex and associated region in the head, neck and shoulders[(1)]. Tempromandibular disorders presents either with restricted or asymmetric mandibular movements. Aberrant sounds are observed with deviated mandibular movements.[(2)]

TMD affects approximately 5 - 15 % of the population with an increased predilection towards women[(1)] and increases with age[(2)]. The prevalence in children and adolescents vary from 16% to 68%.[(3)] It is expected that 34% of children with primary dentition may have at least one sign or symptom of TMD. It's prevalence in mixed dentition period change to 5 - 10%.[(2)]

Multiple factors play a role either alone or in combination in the etiopathogenesis of TMJ disorders[(4)]. The etiological factors vary from birth to adulthood, that is forceps delivery at birth (leading to retarded growth of mandible and Tempromandibular joint (TMJ)), to para-functional oral habits, trauma and/or psychosocial elements[(2)]. Another factor, not considered frequently by the dental professionals is the prolonged use of removable appliances with bite opening used for minor orthodontic tooth movement could lead to TMJ problems.

Removable appliances, such as posterior bite plates with opening of bite used for minor tooth movement are largely advised to be worn for a duration of 6-12 weeks with regular follow-ups.[(3,5)] If worn beyond this duration and even if correction has not occurred it is to be discontinued as it may lead to undesirable changes in the patients biting pattern. Such changes may further lead to derangement of occlusion

and cause TMJ problems. The responsibility of avoiding such consequences lies with the practitioner and is expected to guide the parent and patient.

This case report aims at shedding light on the conservative management of a case of TMD due to prolonged wear of a removable appliance with posterior bite plate, which was used for crossbite correction in a patient with Cleft lip Cleft palate (CLCP).

2 CASE REPORT

A 9-year-old male child patient reported to the department with complaint of ill-fitting removable appliance with posterior bite plate and 'Z' spring. History of presenting illness revealed that the child was undergoing treatment for the correction of anterior crossbite since 4 months.

Clinical examination revealed that the child had undergone surgery of cleft palate closure. The child was in the mixed dentition period (with erupted permanent molars and central incisors in both upper and lower arch) with a stainless steel crown placed in relation to tooth no. 55 and 65. The occlusion review revealed end-on molar relation bilaterally and anterior crossbite along with gingival recession in relation to tooth no. 11, 21, 22 due to traumatic bite (Figure 1).

Fig. 1: Showing crossbite in relation to 11, 21, 22 with gingival recession

TMJ examination revealed a gross deviation on opening and closing, following which PA Cephalogram was advised for radiographic examination of occlusion and TMJ. Cephalometric assessment revealed a deviated chin to the left, an unilateral left sided posterior cross bite and hypoplastic Maxilla and Zygoma on the left, with no effect seen on the condyle or the TMJ (Figure 2).

3 MANAGEMENT

The decision of conservative management of the deviated mandibular movement was made, after consulting the Oral and Maxillofacial surgeon. The treatment strategy followed were:

1. Discontinuation of the Z spring appliance used for the correction of crossbite

Fig. 2: PA cephalogram showing unilateral left sided crossbite with deviation to the left and normal condyle

2. Training in form of coordination exercises was given, that is to close in the normal path of mandibular closure. (Opening and closing of mouth 20 times a day). The child was able to close in the accepted path of closure with pain in the joint while exercising. So was unable to follow recommended coordination exercise.
3. Thus, 3M orthodontic trainers with coordination exercises were advised to aid in path of closure during coordination exercise. The trainer was advised to be worn during coordination exercise and for night wear. The patient reported after 3 months with relief of pain, without much improvement in the deviated path of mandibular closure and a torn 3M trainer.
4. The decision of fabricating Custom made Orthotic TMJ appliance was made. The occlusal splint was fabricated using an Erkoloc pro 3mm sheet (Erkodent Germany). This sheet has a special property of being two layered, with an inner soft layer of polyurethane that rests on the tooth surface, thereby providing more comfort to the patient. The appliance was fabricated on a vacuum forming machine (Erkoform 3D) and was advised to be used for a duration of 1 hour in a day for a week, later increase it to 2 hours a day for a week, then to 3 hours in a day for a week followed by the 3 hour daytime and night wear (Figure 3).

Significant changes were noticed in the occlusion and a correction in the deviation of mandible after 6 months. The patient was followed up and recorded at 6 months, 12 months and 18 months. At the end of 18 months the crossbite got corrected (posterior, anterior) and the deviation was corrected (Figure 4).

4 DISCUSSION

TMD are classified based on its: Anatomical structure involved and Underlying pathology. In anatomical structure

Fig. 3: Occlusal Splint (Erkoform 3D)

Fig. 4: Follow up at end of 18 months

involved and its effect on TMJ it is classified as TMJ articular disorders, masticatory muscle disorders, headache disorders and associated structures[2]. Underlying pathology as Specific & Non-specific.

Specific TMD is when it is due to an underlying pathology like neoplasm, inflammation, growth disturbance or underlying systemic disease. Non-specific TMD is regarded as a musculoskeletal disorder[6] without a definite underlying pathology. The case reported was diagnosed as TMD with deviated mandibular movement and myalgia resulting in anterior cross-bite. The clinical and radiographical examination was suggestive of Non-Specific, that is with no underlying pathology, rather being induced due to prolonged duration of wear of posterior bite opening appliance with Z spring used for crossbite correction.

TMD is managed either by preventive, conservative or surgical method. Specific conditions are usually managed by surgical correction and this post with many risks as internal derangements, altered mandibular function that may further worsen the condition, including the healing of the surgical site, cost and psychological impact on the child and parents

Nonspecific TMD are managed by preventive or conservative approach[4] with following ways:

1. Patient education, home care plan and behavioral therapy
2. Physical therapy
3. Orthotics jaw appliance therapy
4. Pharmacotherapy.

Myalgia leads to tenderness if left unattended and also shift in the mandibular actions to avoid pain. This in turn would lead to deviation from its normal mandibular closure, resulting in TMJ movement disorder. Thus, the management option considered in this case was conservative approach.

1. Elimination of predisposing factors

The removable appliance with posterior bite plate and Z spring used over a prolonged duration for correction of crossbite was discontinued.

2. Patient education, home care plan

Parent was educated about the importance of reporting for the follow up on recommended time[3,5] and its consequences if not reported within the recommended time.

3. Physical Therapy

Physical therapy in form of coordination exercise was recommended to the patient. Patient was asked to perform this exercise by opening and closing the mouth 20 times a day with index finger on the lateral pole of TMJ to help in controlling the mandibular movements and to maintain the lower dental midline parallel to a vertical line traced on a small mirror[6]. This aided in reducing myalgia and helped the child in mandibular positioning, but this required parental monitoring.

4. Orthotic Jaw appliance therapy

To increase the duration of controlled mandibular movements and wean from parental monitoring, prefabricated commercially available 3M trainer was used. This appliance could help the patient in guiding the mandible and hold it in the desired position, the main disadvantage was discomfort in wearing as this was a monobloc appliance. It could not withstand the biting forces of the patient, resulting in tearing of the appliance.

This led to the decision of custom made orthotics appliance to help and to motivate the child to hold the mandible in the normal occlusion. The orthotic appliance fabricated using Erkoloc pro 3 mm sheet had a special property of being two layered, i.e. an inner soft layer of polyurethane that rests on the tooth surface and provide comfort to the patient. In fabricating orthotic appliance bite registration recorded from the patient was transferred on vacuum forming machine fitted with semi adjustable articulator. This included the occlusion of opposing arch in the orthotic appliance simultaneously while fabricating. The inclusion of opposing arch occlusion in the orthotic appliance aided in holding the mandible in normal occlusion.

5. Pharmacotherapy

Pharmacotherapy was not advised as the patient had pain while redirecting mandibular movement to its normal path of closure.

Re-direction of the mandible to its normal path of closure was achieved by eliminating pre-disposing factors and timely intervention with conservative management, including coordination exercises and orthotic appliance. Thus, preventing serious consequences and its effect on growth.

5 CONCLUSION

- The conservative management of TMD is recommended when in non-specific TMD in growing children to reduce the problems posted by surgical method of management.
- If the TMD is observed in growing stage it is imperative for early diagnosis and intervention with conservative management.

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