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RESEARCH ARTICLE

TREATMENT OF MOUTH BREATHING AND MAXILLARY ANTERIOR PROCLINATION WITH MODIFIED ORAL SCREEN: A CASE REPORT

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ABSTRACT

Introduction: The habit of mouth breathing can affect the growth and development of dentofacial complex of child. The adverse effects are greatest during the period of growth. Clinical Findings: This case report focuses on the use of oral screen on a patient with mouth breathing and maxillary anterior proclination with incompetent lips. Outcome: The oral screen reduced the proclination and lips became competent within 5 months of usage. Conclusion: Oral screen proves to be a simple technique for interception of worsening of the effects due to habits.

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INTRODUCTION

Mouth breathing has a multifactorial aetiology[1].Sim and Finn classified mouth breathing into three categories included obstructive, mouth breathing habit, and anatomy, inability to maintain lips together, short upper lips which made it unable to be closed entirely.[2-4]Mouth breathing has been declared to have serious effects on the growth of the facial skeleton and occlusion of teeth on account of the displacement of normal lateral, buccal and lingual muscular forces.[5] The use of an oral screen resulted in the retroclination of proclined maxillary incisors simultaneously with a proclination of the lower incisors[6]. Nasal breathing enables adequate growth and development of the craniofacial morphology, which interacts with other functions such as chewing and swallowing[7]. Alterations in the soft tissues have been attributed to mouth breathing, more specifically modification in muscle functions, as well as in the hard tissue morphology, including facial bones and dental arches[8]. During the growth phase, the child with chronic mouth breathing, whether caused by nasal obstruction or not, develops several morphological alterations, that lead to an undesirable development of the dentofacial complex morphology[9.10]. The effects of mouth breathing on orofacial musculature is greatest during growth period. Overcoming bad habits of mouth breathing is done by using an oral screen. Oral screen is a functional tool applies the pressure from orofacial muscles and soft tissue on the cheeks and lips to prevent mouth breathing and lip posture deficiency[11].

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CASE

A 12 year old boy reported to the department of Pedodontics and preventive dentistry, KVG Dental College and Hospital, Sullia, with the chief complaint of forwardly placed upper front teeth. On eliciting parents revealed the history of mouth breathing habit.On extraoral clinical examination, mesoprosopic facial form, convex facial profile with incompetent lip, hypotonic upper lip and was noticed. Intraoral examination revealed mixed dentition stage. Assessment of occlusion revealed class I molar relation bilaterally, an overjet of 6mm. ENT referral and consultation was taken and Mouth breathing was classified to be anatomic as the lip morphology did not permit the boy to close his mouth completely.

Pre op and intraoral pictures showing the frontal and lateral view of the patient

Panoramic image showed a symmetrical condyle shape. The right condyle was lower than the left condyle (Figure 1.A). Cephalometric image showed a Cervical Vertebrae Maturation Stage (CVMS) with the results of CS 3 maturation stages (Figure 1.B). Steiner's analysis showed class I skeletal with orthognathic maxilla and mandible with forwardly placed upper and lower incisors.

OPG

Diagnosis of Angle class I malocclusion with proclined upper and lower incisors , 6 mm overjet, 3mm overbite, and bad habit of mouth breathing. Aetiologies of malocclusion were bad habits,persistence, imbalance in growth and development of the maxillary and the mandible, and also genetic factors.

LATERAL CEPHALOGRAM

TREATMENT PLAN

A custom - made acrylic oral screen was planned for interception of mouth breathing habit with a metal holding loop modification to aid in myofunctional exercises for correction of malocclusion. Parents were explained and educated about the treatment plan and consent taken.

APPLIANCE FABRICATION

Upper and lower alginate impressions were recorded giving special attention to accurate reproduction of the depths of vestibular sulcus and labial fold and poured with dental stone .Wax construction bite was chilled and replaced on casts and mounted on articulator.

Appliance was designed to contact only upper incisors and shield lower lip away by blocking lower anterior region with wax. Oral screen was outlined on the casts and fabricated from self-cure acrylic resin with metal ring incorporated; it was then finished and polished.

INSTRUCTIONS TO PATIENT

The patient was instructed to wear the appliance night time along with daily half an hour of myofunctional exercises. Child was instructed to improve lip competence and tonicity by pulling on the holding ring and closing lips against the pull, trying to retain the appliance within mouth.

RESULT ACHIEVED

The patient has used an oral screen for five months with a control period of 2 weeks - 4 weeks. Aftercontrol, the hole was closed gradually.

During the use of the appliance, the lips were instructed to be closed, and the appliance should be used for 1 hour during the day, night, and sleep. After five months of treatment, the lips wereimproving and were able to be closed, with 3 mm overbite, and 3 mm overjet.

LATERAL CEPHALOGRAM

DISCUSSION

Children with mouth breathing habit will have a craniofacial growth which follows their breathing habit. Changes in the facial muscles affect the arch and position of the teeth associated with disorders of the lips, tongue, palate, and mandible which are then associated with facial deformities. Mouth breathing decreases masticatory activity and giving a negative vertical effect on posterior teeth which can cause malocclusion.[12] The oral screen is a myofunctional orthodontic appliance that is indicated to restore nasal breathing, to intercept premaxillary protrusion, and to prevent habits such as finger-sucking and tongue-thrusting. We decided to use the oral screen because it lay comfortably in the vestibular space between the lip and teeth and did not impinge on the alveolar mucosa. The patient tolerated the appliance well.[13]The appliance is effective and useful as long as the patients cooperate on using it for 3 to 6 months and train their lips for 30 minutes every day and use it at night or during sleep.[14]

The treatment with an oral screen resulted in decrease of the overjet and the upper dental arch length. This is in line with the results obtained in the previous study of the immediate effect of treatment with an oral screen[15] The changes in the dental arch widths found during the period of observation probably result from normal growth and development and cannot be ascribed to the treatment[16]. The same is true of the changes in mandibular prognathism and inclination. The increase in overbite during the treatment may partly be ascribed to normal development but is also due to the retraction of the maxillary incisors by the treatment. Due to habitual mouth breathing, both the anterior and posterior seals are not closed, the tongue lies low and flat, without maintaining contact with upper posterior teeth and palatal tissue.[17] By treating this nonphysiologic reflex pattern, by substituting screen for anterior lip seal, added benefit of an improved posterior oral seal is also obtained. There is a negative air pressure within the mouth; that is, a pressure below that of the atmosphere. The tongue is held back, so that its full bulk is available for spreading the dental arches, and for increasing the height of the bite, If this perfectly normal function is present throughout the entire period of the growth of the framework of the face, the whole face will exhibit harmony of size and form in its relation to the cranium, with larger dental arches and a flatter palate.[18] Another advantage of this treatment approach is that it is not likely to produce iatrogenic damage. There is some evidence that OS (oral screen) effects on incisor position may be due to only mechanical pressure on the upper incisors[19] Mouthbreathing can be intercepted by use of an oral screen. It is a functional appliance by virtue of the fact that it produces its effects redirecting the pressures of the muscular and soft tissue curtain of the cheeks and lips. It works on the principle of the force appliances and force elimination. Effective education and reinforcement of children and parents help in gaining compliance.[20]

CONCLUSION

This study showed that the oral screen effectively reduced the upper anterior protrusion as well as the mouth breathing. The oral screen is not a “universal appliance” but is a very useful device which can be used effectively, especially during the mixed dentition period. The appliance is easy to use and simple to fabricate and helps to intercept mouth breathing and correction of overjet. The results obtained in the case discussed about are well acceptable . It was possible because of the co-operation of the patient and the awareness that the parent had regarding the treatment. Such interceptive procedures with proper diagnosis and treatment planning can reduce the adverse effects of oral habits such as mouth breathing.

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