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Case Report

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SUDIPTA KAR'S MODIFICATION OF ORAL SCREEN

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ABSTRACT

The oral screen is a myofunctional appliance used in early interceptive treatment. It was first introduced by Newell in 1912. There are various modifications were fabricated by various researchers. Here another modification of oral screen is done for better clinical efficacy and patient comfort and safety by the author.

KEYWORDS: Oral screen, modification.

KEYMESSAGES: Comfortable design of oral screen is fabricated for early interceptive orthodontic treatment.

INTRODUCTION

The oral screen is a simple and versatile myofunctional appliance used in early interceptive treatment of dental arch deformities. It was first introduced by Newell in 1912. Oral screen was routinely used in England before Second World War.[1] Kraus[2] first differentiates the difference between oral screen and vestibular screen. Later oral screen has been advocated by Hotz[3] Nord[4][5] and Fingeroth.[6] Different variations of oral screen had been designed by different researchers to fulfill different treatment need. Rehak, more recently Goyal .S has introduced different modifications. Oral screen is specially used in malocclusions aggravated by faulty muscle function. The screen prevents the pressures from cheeks to act on the dentition helping the tongue to exert free force on constricted dental arch. This causes passive expansion of the arches.

CASE HISTORY

A boy of 9 years of age had attended to the department of Pedodontics & Preventive Dentistry, Guru Nanak Institute of Dental Sciences & Research with the chief complain of

malocclusion.(Figure – 1) On examination proclined upper anteriors with mouth breathing habit was observed. He was in mixed dentition stage. He had multiple carious teeth also with pulpectomy and stainless steel crown in 55 (Figure – 2). Patient was also having large overjet (approx 5 mm) (Figure – 3 and 4). Modified oral screen was fabricated and delivered subsequently to the patient (Figure – 5,6,7,8 and 9). Lip exercises also had been instructed (Figure – 10). Post operative follow up showed good lip competency (Figure – 11).

Post operative instruction and adjustment of the appliance.

Patient was instructed to wear the appliance every night and also during day time whenever possible. Lip seal exercises was demonstrated to the patient and asked to practice the same for about 30-45 minutes/day. Breathing holes should be gradually reduced in size. Wire component can also be adjusted according to treatment need. Regular check up should be also advised at an interval of 3-4 weeks.

Uses

1) Mild distoclusions, with premaxillary protrusion and open bite in the deciduous and mixed dentition.
2) Correction of habits like mouth breathing, thumb sucking, lip biting, lip sucking, tongue thrusting.
3) Correction of flaccid, hypotonic orofacial musculature.

Mechanism of Action :

- The screen prevents the oro-facial muscle pressures to act on developing dentition causing passive expansion of the dental arches by normal tongue pressure.
- The lip pressure is directed towards the incisors cause in lingual movement of the proclined teeth.
- The construction bite is taken directly in the patient's mouth by moving the mandible forward within 1-3 mm and the bite is opened 2 mm. So forward positioning of developing mandible is possible.
- Hypotonic lips are activated and thus improved by this specific appliance.

Construction of the appliance

Appliances are preferably made of clear acrylic and wire component. First working models placed in normal occlusion or protrusive bite is taken for class II division 1 malocclusion then wax up of the appliance is done. Proclined anterior segment may or may not be influenced directly by the oral screen so, incisal third of anterior teeth may or may not be covered with1-

2mm wax according to the need of treatment. Posterior segment is not influenced by the appliance directly. Then 2 loops were fabricated with 19 gauge stainless steel wire and the distal side of the loop were joined together with same wire soldered with each other taking the help of sliver solder, flux and blue flame .The loops were designed in such way that the outer loop were extended up to distal end of first permanent molars or the last erupted molars. A clearance of 2 – 4 mm was incorporated between loops and also buccal surfaces of the dental arches. These distally joined loops actually help to restrict the buccinator muscles in exerting inward muscle forces towards developing dental arches. A loop was also incorporated in the anterior portion of the appliance according to Holz modification. The distal loops were joined with each other with the help of soldering to prevent distortion and cheek injury by the free distal loops and acting as a firm barrier. This was the modification done in this appliance. Then acrylisation was performed with clear acrylic only in the anterior portion to incorporate the wire components in the appliance. Allowances were given for labial frenum. Appliance may be processed with either heat cure or self-cure acrylic. Breathing holes were incorporated into the acrylic potion. Then properly trimmed and polished appliance was delivered to the patient.

Figure 1 : Pre operative extra oral photograph

Figure 2 : Intra oral photograph

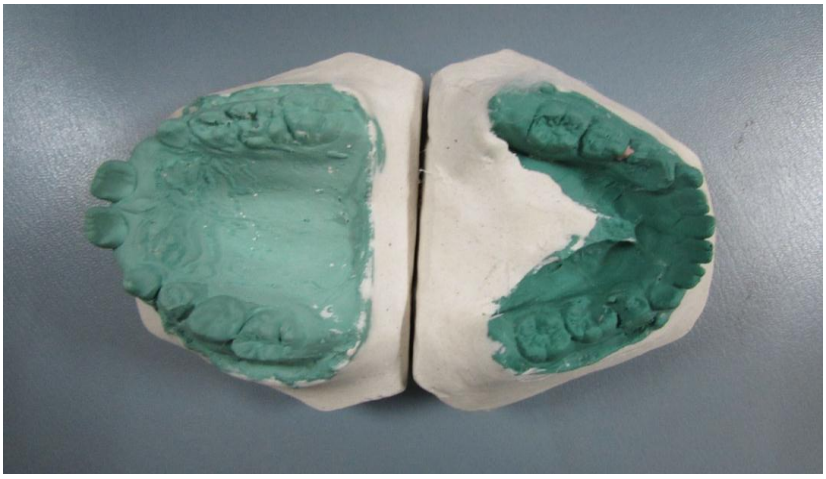

Figure 3 : Upper and lower model of dentition

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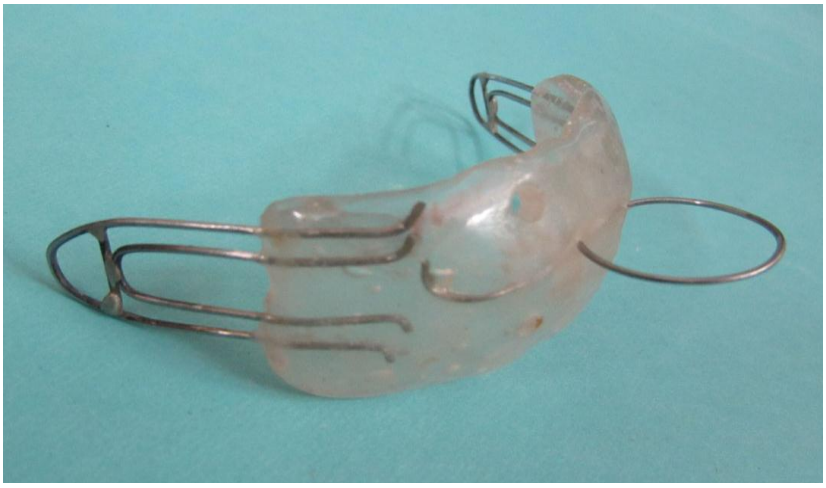

Figure 4 : Upper and lower models are in occlusion

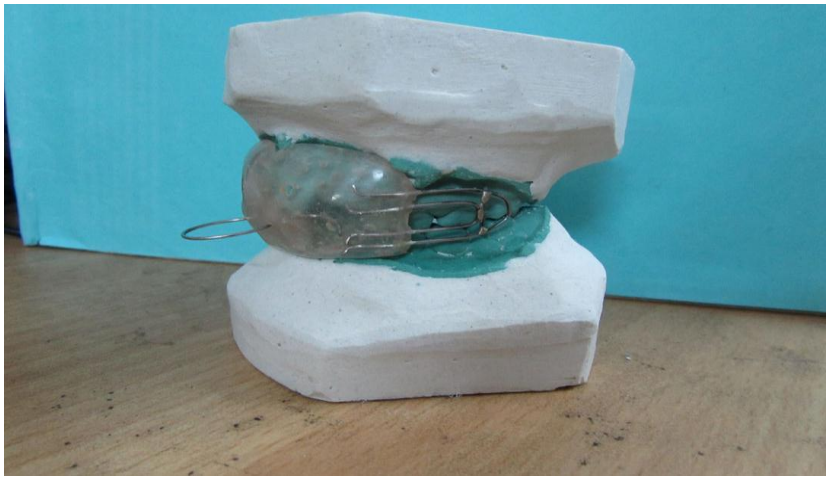

Figure 5 : Fabricated modified oral screen

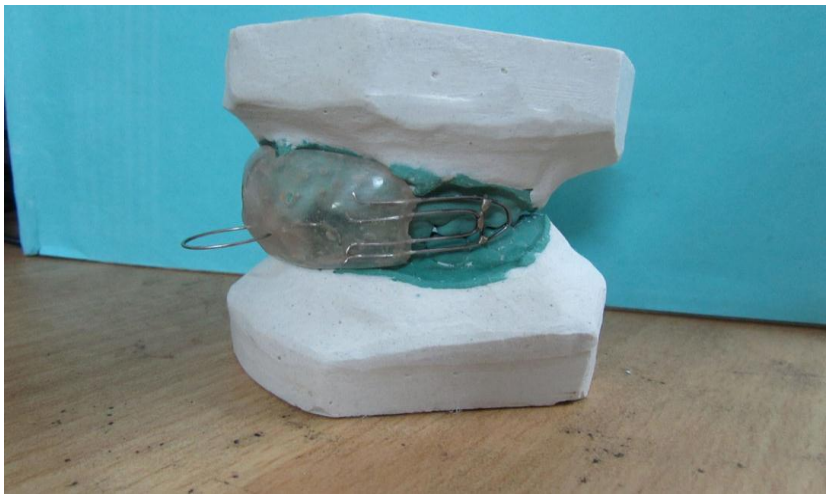

Figure 6 : Modified oral screen on cast

Figure 7 : Modified oral screen in patient's mouth (front view)

Figure 8 : Modified oral screen in patient's mouth (lateral view)

Figure 9 : Modified oral screen with elastic band

Figure 10 : Active lip Exercises

Figure 11: Post operative photograph

DISCUSSION

According to literature the best time for treatment with oral screen is 31/2 years to 4 years of age. 3 months to 6 months of intensive use of the oral screen may be may be useful.[2][4][5] Fingeroth, Kraus, and others place "breathing holes" in the labial aspect of the oral screen.[1][2][6] The appliance contributes to the development of a proper functioning occlusion. It is also effective in reducing or eliminating hyperactive mentalis activity. It also corrects the faulty relationships of upper and lower lips and near normal lip seals become evident. 30 minutes daily lip exercises give beneficial results.[7] Use of oral screen may accelerate the establishment of normal perioral environment[8] maxillary labioincisal contact of the screen is more effective in reducing excessive overjet.[5][9] Kraus invented 'double oral screen'.[2] It is useful in abnormal tongue portion, tongue thrust and open bite cases. It is also used in the elimination of mouth breathing habit. Selmer-Olsen also supported his view.[10] so oral screen and their modification can be utilized with abnormal tongue and lip activity by restoring lip tone and proper lip and tongue posture. Present modification aims to reduce the acrylic bulk of the appliance as well as increase the safety measure so that it helps the little kid to wear the appliance in a more positive and convenient manner.

Modifications

1. Hotz modification-Holz added a loop made of stain less steel in the anterior aspect of the screen. Patient pulls the loop and resists the displacement of the appliance with lips simultaneously.

2. Screen with breathing holes - multiple small holes are created in the anterior acrylic aspect of the oral screen to facilitate some amount of mouth breathing. Holes may be gradually reduced in size when nasal breathing is improved.
3. Double oral screen- A separate screen is fabricated lingual to oral screen with 0.9 mm wire bilaterally that passing through the bite in lateral incisor area or distal to the last molar area . It is helpful in the prevention of tongue thrusting.
4. Oral screen used in open bite cases-in this appliance an acrylic projection is fabricated to keep the tongue away from the dentition.
5. Rehak's modification- In this modification a pacifier is attached with the screen which projects out from the outer part of the oral screen. The pacifier has to be retained by the lips, therefore improve the hypotonic lips.
6. Modification of Goyal S **:** Incorporation of wire component by reducing acrylic part.
7. Present modification**:** With indigenous design of reducing the acrylic bulk with ovoid and criss cross wire.

Advantages

1. Light weight
2. Easy construction
3. Easily adjustable buccal loops
4. criss cross wires causing minimum or no distortion of extended loops.
5. Needs less chair side time for adjustment.
6. Less soft tissue ulceration in vestibules
7. Easy to clean.
8. More comfortable.
9. Low maintenance

Disadvantages

- Complete mechanotherapy is not possible with this appliance
- It is only an initial assault or phase 1 correction of orthodontic problem.
- Regular checkup is needed.
- Co-operation of patient is most essential
- Oral screen is also contraindicated for habitual mouth breathers due to specified nasal obstruction. ENT surgeon consultation is needed before treatment plan.

CONCLUSION

Oral screen helps to establish a better muscle balance between the tongue and buccinators mechanism. So the appliance is best suited to work with abnormal lip and tongue activity It is more comfortable than conventional oral screen due to less acrylic part with more safety future.

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