

Case Report

Correction of Class III Malocclusion in a Growing Child: A Case Report

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Received: February 03, 2020; Accepted: March 05, 2020; Published: March 12, 2020

Abstract

Class III malocclusion, either due to mandibular prognathism or maxillary retrognathism, can become severe if not treated at right time. Early treatment, in growing individuals, reduces the chances for orthognathic surgery. An 8 year old girl visited with a chief complaint of anterior cross bite. Patient's facial profile was concave with anterior facial divergence. Intra oral examination depicted reverse overjet along with mesial step molar relation. The patient was treated with RME along with Petit face mask therapy for six months period. After six months, significant improvement was recorded in patient's facial profile with correction of skeletal class III malocclusion.

Keywords: Class III malocclusion; RME; Petit facemask therapy

Introduction

Class III malocclusion most commonly occurs due to maxillary deficiency or excessive growth of mandible. Class III malocclusion is growth related problem and become more severe and difficult to treat if left untreated in the early ages [1]. Treatment modalities vary depending upon developing and developed class III malocclusion. Facemask therapy, Reverse twin block, Class III bionator and chin cup are used to intercept the developing class III malocclusion. Camouflage and Orthognathic surgery are treatment strategies for developed class III malocclusion. Prevalence rate of class III malocclusion is less as compared to class II and class I malocclusion [2]. Edge to edge bite, reverse or negative overjet, cross bite, flaring and protrusion of lower anteriors, mesial step molar relation, and class III molar relation are some important dental findings seen in class III malocclusion patients. In the mixed dentition period, especially in maxillary deficiency cases, facemask therapy is the treatment of choice for class III malocclusion. Rapid Maxillary Expansion (RME) along with facemask therapy provides more significant results in correction of class III malocclusion. The role of RME before facemask therapy is to disarticulate the maxillary sutures for more efficient maxillary protraction [3,4]. The present case report describes the early management of class III malocclusion using RME with facemask therapy in 8 year old female patient.

Case Report

A 8 year old healthy female patient reported with the chief complaint of forward placement of lower front teeth as compared to upper front teeth with large lower jaw. On extra oral examination (Figure 1), patient's facial profile was concave, anterior divergent face and obtuse nasolabial angle. Lower lip was positioned ahead of the upper lip.

On intraoral examination (Figure 2), occlusion relationship was mesial step molar relation bilaterally with reverse overjet of 3 mm and anterior cross bite in relation to 11, 53, 21, 22, 63. The patient was advised for orthopantomogram, and lateral cephalogram (Figure 3). Cephalometric analysis showed a Class III sagittal relationship (ANB



Figure 1: Extra oral profile.



Figure 2: Intra-oral view.

= -2, AO-BO = -4 mm) with a retrognathic maxilla (SNA = 79°, N perp to A = -2.1 mm), and mild prognathism of the mandible (SNB = 81°, N perp to Pog = +1.0 mm). Lower lip was positioned ahead of the upper lip with respect to Rickett's Esthetic plane (UL-E line = 6 mm, LL-E line = 5 mm). The patient had class III skeletal malocclusion with retrognathic maxilla. Correction of skeletal class III, overjet and overbite, molar relationship and obtaining ideal aesthetics were the treatment objectives. The patient was treated with bonded rapid maxillary expansion along with face mask therapy.

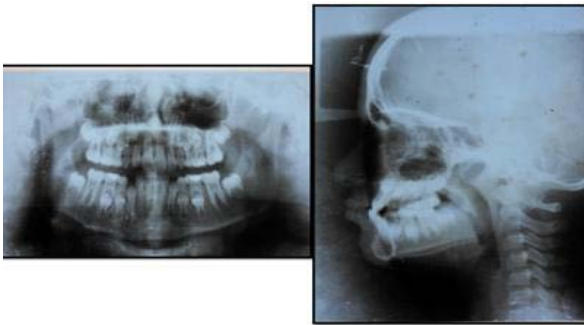


Figure 3: Orthopantomogram, and lateral cephalogram.



Figure 4: Bonded rapid maxillary expansion.



Figure 5: Dysjunction of maxilla.

Treatment was started with Bonded Rapid Maxillary Expansion device which consisted of a 13 mm HYRAX screw (Leone, Italy). HYRAX screw was soldered with wire framework adapted to study model (Figure 4) which had hooks incorporated on the buccal aspect of deciduous canines to engage the extra oral elastics for a facemask therapy. This appliance was cemented with Glass Ionomer Cement. The expansion screw was daily activated for 2 turn for the first week and then 1 turn for next week. The bonded RME should be activated for 10 days prior to facemask therapy.

After the dysjunction of maxilla (Figure 5), HYRAX screw was sealed with resin and Petit facemask therapy was started. The patient was advised to wear the facemask daily for 14-15 hours. The direction

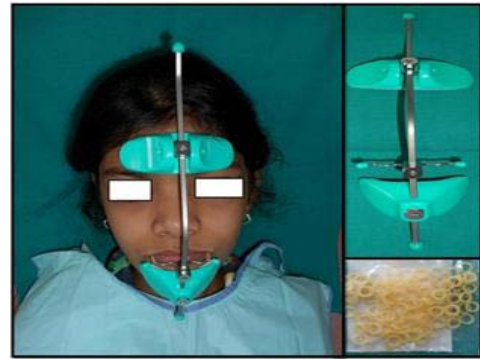


Figure 6: Facemask therapy.



Figure 7: Post-Operative view.

of pull was downward and forward and, directed 20° to the occlusal plane (Figure 6). In the first week of facemask therapy, force level was 150 gram on each side then it was increased to 300 gram in second week on each side and maintained for next 6 months.

Correction of anterior tooth cross bite, skeletal malrelationship was achieved with significant improvement of patient profile after 6 months of facemask therapy (Figure 7).

Discussion

Maxillary protraction appliance is indicated in case where retarded maxillary growth is a major component of class III malocclusion. Protraction appliance with expansion appliance has been used for early orthopaedic intervention of class III malocclusion. Early mixed dentition period is ideal for facemask therapy [5].

Petit facemask was used in the present case report. It consists of a forehead cap and chin cup with a stainless steel rod running into the midline connecting forehead cap to chin cup. A crossbar at the level of mouth is used to engage the extra oral elastics. Before the facemask therapy, a bonded RME appliance for expansion of maxilla was used in this patient. A 13 mm HYRAX (Hygienic Rapid Expander) screw was used in bonded RME appliance. The HYRAX screw has wire extensions that are adapted and follow the palatal contour.

In the present case, bonded RME was used along with facemask

therapy-

- a) It helps in disarticulating the maxillary sutures.
- b) Gives better response to protraction forces.
- c) Rate of expansion is 0.5 mm / day.
- d) Location of force application 15 mm above the occlusal plane.
- e) Direction of pull 15-20 degree inclined to occlusal plane.

Tanne K, et al. [6] reported that 45° to 30° downward pull in facemask therapy gave more translatory effect. Ngan PW, et al. [7] reported that 30° angulation pull was sufficient to give a more positive response.

Baccetti T, et al. [8] reported that early mixed dentition period is the correct age for facemask therapy. Kapust AJ, et al. [9] reported that 4-7 years and 7-10 years age group responded better to facemask treatment than 10-14 years age group. Kim JH, et al. [10] reported that before 10 years of age time is correct for facemask therapy. William Proffit [4] reported that correct time to treat growing class III malocclusion cases is when the incisors erupt.

Class III malocclusion is a growth related problem so long term monitoring of growth is still required in early correction using RME with facemask therapy. The patient is still being monitored for long term stability.

Conclusion

The case focuses on early management of class III malocclusion, thus providing normal skeletal, dental development along with psychological development, in later ages. Combination of maxillary expansion with the use of protraction appliance will increase the amount of skeletal effect.

References

1. Kharbanda OP. Orthodontics-Diagnosis and Management of Malocclusion and Dentofacial deformities Elsevier II edn. 2013: 786.
2. Halicioglu K, Yavuz I, Ceylanc I, Erdemd A. Effects of face mask treatment with and without rapid maxillary expansion in young adult subjects Angle Orthod. 2014; 84: 853-61.
3. Solano-Mendoza B, Iglesias-Linares A, Yañez-Vico RM, Mendoza-Mendoza A, Alió-Sanz JJ, Solano-Reina E. Maxillary protraction at early ages The revolution of new bone anchorage appliances J Clin Pediatr Dent. 2012; 37: 219-29.
4. Proffit W. Contemporary Orthodontics 4th edition Elsevier. 2007.
5. Turley PK. Managing the developing class III malocclusion with palatal expansion and facemask therapy Am J Orthod Dentofacial Orthop. 2002; 122: 349-52.
6. Tanne K, Hiraga J, Sakuda M. Effects of directions of maxillary protraction forces on biomechanical changes in craniofacial complex Eur J Orthod. 1989; 11: 382-91.
7. Ngan PW, Hagg U, Yiu C, Wei SH. Treatment response and long-term dentofacial adaptations to maxillary expansion and protraction Semin Orthod. 1997; 3: 255-64.
8. Baccetti T, McGill JS, Franchi L, McNamara JA Jr, Tollaro I. Skeletal effects of early treatment of class III malocclusion with maxillary expansion and face mask therapy Am J Orthod Dentofacial Orthop. 1998; 113: 333-343.
9. Kapust AJ, Sinclair PM, Turley PK. Cephalometric effects of face mask/ expansion therapy in Class III children: a comparison of three age groups Am J Orthod Dentofacial Orthop. 1998; 113: 204-212.
10. Kim JH, Viana MA, Graber TM, Omerza FF, BeGole EA. The effectiveness of protraction face mask therapy: A meta-analysis Am J Orthod Dentofac Orthop. 1999; 115: 675-685.