

Interceptive Treatment for Class III Malocclusion: A Case Report

Dr. Deepti Garg

MDS Orthodontics, Assistant Professor in deptt of Orthodontics and dentofacial orthopaedics, Sri Bankey bihari Dental College and Research Centre, Ghaziabad

ABSTRACT

Orthodontic treatment for the class III malocclusion can be categorised as 1. Growth Modification either involving maxillary expansion and protraction or restraining mandibular growth 2. Waiting until growth has ceased, thereby, committing the patient to either dental camouflage, or orthognathic surgery. This case report describes the nonsurgical treatment of a skeletal Class III malocclusion that relied on simple treatment mechanics to effectively improve the patient's profile and esthetics.

INTRODUCTION

A Developing class III malocclusion is one of the most challenging problems confronting an Orthodontist. If left untreated the class III malocclusion may worsen, with the majority of these patients ultimately requiring Orthognathic surgery, as adults.

Class III malocclusion is one in which the lower first molar is mesially positioned relative to the upper first molar as described by Edward H Angle. A developing class III malocclusion can present with maxillary skeletal retrusion, mandibular skeletal protrusion, or a combination of the two. In addition to these sagittal problems there may also be posterior and anterior cross bites present. Dental Compensation, such as maxillary dentoalveolar protrusion and mandibular dentoalveolar retrusion tend to produce poor facial profiles with mandibular excess often apparent. Class III malocclusion patient usually have a concave facial profile, and the lower lip protrusive to the upper lip. Pseudo Class III malocclusion is caused by premature contact during the normal path of closure of the mandible and result in anterior displacement of the mandible. The etiologic factors of a Class III malocclusion are the influence of genetic, environmental factors, and oral function.

CASE REPORT

A male patient of age 9 came with a complaint of forwardly placed lower front teeth. On extraoral examination, the patient had dolicocephalic head form, leptoprosopic facial form, concave prolife, anterior divergence, and protruded lower lips (fig. 1). On intraoral examination, the patient had an anterior crossbite in relation to all incisors, and Class III molar and canine relationship, upper incisors are proclined, lower incisors are retroclined and forward path of closure, and reverse overjet of 2 mm and overbite of 4 mm was seen (fig. 2). On cephalometric evaluation, patient had a skeletal Class III base with normal maxilla and prognathic mandible and vertical growth pattern.

Treatment objectives:

- Correction of anterior crossbite
- Restraining the mandibular growth
- To obtain ideal overjet and overbite



Fig 1: Pre-treatment Extra oral photographs of the patient



Fig 2: Pre-treatment Intra oral photographs of the patient

TREATMENT

Treatment was started with bonding of 0.022" slot Roth brackets on both arches and simultaneously patient wore the chin cup (fig 3). Leveling and alignment was started with 0.016 nickel titanium (NiTi) followed by 0.016 stainless steel (SS) and sequence of rectangular NiTi archwires in the upper and lower arches.. Settling of occlusion was done with 0.019×0.025 " stainless steel wire in upper and lower anterior tooth and vertical settling elastics in posterior. Retention was given with a removable Hawley's retainer in the upper arch and canine-to canine bonded fixed retainer in the lower arch(fig 4).



Fig 3: Patient wearing Chin Cup



Fig 4: Post-treatment Extraoral and Intra oral photographs of the patient

DISCUSSION

Class III malocclusion treatment is one of the biggest challenges for the orthodontist in his daily clinical routine. Although mandibular growth being mainly under genetic control, the chin cup can change growth and morphology of the mandible itself. Studies have shown that the force of the chin cup can change the shape of the jaw, slow condylar growth, improve the position of the chin in the anteroposterior direction and inhibit some maxillary vertical development.

Results of previous studies have shown that the use of chin cups applying a force of 500 to 600 g, hours, on average, can lead to significant changes in mandibular growth patterns during puberty. However, the force duration can vary from 6 to 15 hours/day.

There is no consensus in the literature regarding the best time to start orthodontic/orthopedic treatment of Class III subjects, but all agree that this should involve pubertal growth spurt. There seems to be no difference between the final skeletal profiles of individuals who started treatment early, around 7 years old, and those who left to start treatment later in the early pubertal growth spurt. When planning such treatment, the clinician must take into account the likely duration of the growth spurt, to establish the time of use of orthopedic mechanics. In any event, the recommendation is that the use of chin cup should not be less than 12 months. However, after the end of the growth spurt, there seems to be no difference between the growth pattern of a patient with mandibular prognathism and a normal individual.

CONCLUSION

The choice of using the chin cup in the case reported in this work seemed the best option and, finally, the desired functional and esthetic objectives were achieved. Treatment of a Class III patient with chin cup was reported. The basis for this treatment approach was presented, and the final treatment result was obtained. The proposed treatment objectives were to obtain a stable dental articulation and good esthetics instead of the skeletal disharmony and dental Class III malocclusion was achieved.

REFERENCES

- [1]. Proffit WR, Fields HW Jr. Contemporary orthodontics. 3 rd ed. St Louis: Mosby; 2000 [Textbooks].
- [2]. Rabie AB, Gu Y. Diagnostic criteria for pseudo class III malocclusion. Am J Orthod Dentofacial Orthop 2000;117:1-9.
- [3]. Moreno Uribe LM, Vela KC, Kummert C, Dawson DV, Southard TE. Phenotypic diversity in white adults with mild/severe Class III malocclusal. Am J Orthod Dentofacial Orthop 2013;144:32-42.
- [4]. Costa Pinho TM, Ustrell Torrent JM, Correia Pinto JG. Orthodontic camouflage in the case of the skeletal Class III malocclusion. World J Orthod 2004;5:213-23.
- [5]. Lin J, Gu Y. Preliminary investigation of nonsurgical treatment of severe skeletal Class III malocclusion in the permanent dentition. Angle Orthod 2003;73:401-10.
- [6]. Hisano M, Chung CR, Soma K. Nonsurgical correction of skeletal class III malocclusion with lateral shift in an adult. Am J Orthod Dentofacial Orthop 2007;131:797-804.
- [7]. Graber TM, Vanarsdall RL. Orthodontics: Current principles and techniques. 3 th ed. St. Louis Mosby; 2000 [Textbooks].
- [8]. Grob DJ. Extraction of a mandibular incisor in a class I malocclusion. Am J Orthod Dentofacial Orthop 1995;108:533-41. [PUBMED]
- [9]. Proffit WR, Ackerman JL. A systematic approach to orthodontic diagnosis\ and treatment planning. In: Graber TM, Swain BF, editors. Current Orthodontic Concepts and Techniques. 3 rd ed. St Louis: C.V. Mosby 1985 [Textbooks].
- [10]. Kerr WJ, Miller S, Dawber JE. Class III malocclusion: Surgery or orthodontics? Br J Orthod 1992;19:21-4.
- [11]. Yang WS. Morphology of mandibular symphysis and positioning of lower incisors in the skeletal Class III malocclusion. Korean J Orthod 1985;15:149-53.
- [12]. Battagel JM, Orton HS. Class III malocclusion: A comparison of extraction and non-extraction techniques. Eur J Orthod 1991;13:212-22.