Management of Angle's Class II Division 2 Malocclusion with Early Interceptive Orthodontics: A Case Report

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ABSTRACT

A case report to illustrate the early interceptive orthodontics for management of developing Class II Division 2 malocclusion is presented. A child with Angle's Class II Division 2 malocclusion was treated with prefunctional orthodontics, functional orthodontics followed by comprehensive orthodontics. Excellent results were achieved.

Keywords: Class II Division 2, Functional jaw orthopedics, Interceptive orthodontics.

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INTRODUCTION

Early orthodontic treatment refers to orthodontic intervention before the eruption of permanent dentition (except third molars) is complete.¹ The treatment of children presenting with a Class II Division 1 malocclusion involves one of two approaches. The first provides treatment in two phases; one of intervention during the mixed dentition (phase I) followed by a second definitive course of appliance treatment in early adolescence (phase II). The second approach involves providing a single course of comprehensive therapy during adolescence. Early interceptive treatment is always indicated if the overbite is severe. Thus, if patient shows up with a deep impinging overbite, there is no doubt that it is the best time to treat a Class II Division 2 (Class II Div 2) malocclusion.²

A case report to illustrate the early Interceptive orthodontics for management of developing Class II Div 2 malocclusion is presented. This case is unique example to describe the importance of incisor correction at growing stage and achievement of mandibular correction in familial Class II malocclusion which could otherwise can lead to surgical treatment plan. This case report will add evidence for timely Class II correction after incisor proclination in growing patients.

Clinical Findings

A 10-year-old male patient reported to Oral Health Sciences Centre with chief complaint of unpleasant smile and irregular upper front teeth. The patient had positive familial history as his mother presented with Angle's Class II Div 1, father was Angle's Class II Div 2, and younger brother was also in distal step molar relationship. Extraoral examination revealed euryprosopic face, decreased lower anterior face height, convex facial profile, lower lip trap, and deep mentolabial sulcus (Fig. 1). On intraoral examination, the patient had mixed dentition with Class II molar relation, complete deep bite, retroclined central, and proclined lateral incisors (Fig. 1).

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Cephalometric Findings

ANB angle 6 degrees, FMA 16 degrees, Upper Incisors to NA line 9 degrees, IMPA = 81 degrees.

Diagnosis: Skeletal Class II due to mandibular retrusion, hypo-divergent growth pattern, retroclined maxillary central incisors, and up-righted mandibular incisors (Fig. 2), (Table 1).

Treatment Objective

- Correction of inclination of anterior teeth,
- Correction of retrognathic mandible.

Treatment Plan

- Phase 1: Correction of inclination of central incisor and deep bite. Growth modulation for retro-positioned mandible.
- Phase 2: Fixed orthodontic treatment for final finishing and detailing, retention.

Treatment Progress

During phase 1 treatment, the inclination of retroclined maxillary incisors was corrected using double helical protraction wire³ (Fig. 3)

Fig. 1: Pretreatment extraoral and intraoral photographs

Fig. 2: Pretreatment radiographs

Table 1: Comparison of pre- and posttreatment cephalometric parameters

<i>Cephalometric parameters</i>	<i>Pretreatment</i>	<i>Postfunctional</i>	<i>Posttreatment</i>
SNA	82°	83°	75 mm
SNB	76°	80°	84°
ANB	6°	3°	82°
FMA	16°	20°	24°
U1 to NA	9°	23°	28°
L1 to NB	0°	24°	31°
IMPA	81°	97°	106°
Interincisal angle	180°	134°	119°
E-line to upper lip	−1.5 mm	−4 mm	−5.5 mm
E-lip to lower lip	1 mm	−2 mm	−2.5 mm

Fig. 3: Double helical protraction wire for correction of retroclined incisors

and mandibular advancement by functional (twin block appliance) (Fig. 4). Twin block appliance therapy was continued for 2.6 years followed by fixed orthodontic treatment. In phase 2 treatment, fixed multibracket therapy was used for final finishing and detailing in both upper and lower arches. The functional appliance correction of skeletal class II was retained using Class II elastics. Total treatment duration was 4 years 6 months. The stage and posttreatment extraoral photographs show marked improvement in profile (Fig. 5). The stage and posttreatment intraoral photographs show satisfactory occlusion with Class I molar relation and normal overjet and overbite (Fig. 6). Cephalometric findings show correction skeletal Class II to Class I malocclusion with improvement of ANB from 6–2 degrees. The inclination of maxillary incisors also improved to 28 degrees to NA line. IMPA increased to 106 degrees (Table 1). Lateral cephalograms and their superimpositions during treatment progress showed marked growth of mandible (Figs 7 to 9).

DISCUSSION

Main objective of early interceptive orthodontics is to correct upper incisor retroclination and to provide an oral environment that is favorable for normal mandibular growth. Double helical protraction wire was used to procline incisors as there was

sufficient space for the proclination of the central incisors. Early correction of central incisor inclination followed by functional appliance therapy to correct mandibular retrusion helped successful treatment of patient.^{5,6} Functional appliances reposition the mandible forward and help in management of mandibular retrusion in growing children.⁴ Normal profile, harmonious skeletal, and dental relations were achieved. IMPA was increased as expected after twin block therapy.

CONCLUSION

Treatment of Class II Div 2 malocclusion in growing patients requires a careful diagnosis and treatment planning and early interceptive orthodontics is very important for successful management of these cases. It is very important for the clinicians to see the signs of Div 2 malocclusion and refer them to appropriate centre for their early diagnosis and interception. Early interception provides opportunity of nonsurgical treatment for mandibular deficiency which could otherwise lead to an ortho-surgical treatment plan.

Primary take away from case report is that early diagnosis and timely management of retroclined incisors in Div 2 cases are main requisite in interventional orthodontics.

Fig. 4: Intraoral: Pre- and post-functional photographs

Fig. 5: Extraoral: Pretreatment, stage, and posttreatment photographs

Fig. 6: Intraoral: Pretreatment, stage, and posttreatment photographs

Fig. 7: Lateral cephalograms: Pretreatment, stage, and posttreatment

Fig. 8: Cephalometric superimposition: Mandibular: Pretreatment (black), stage 1.5 years blue), and posttreatment (red)

Fig. 9: Cephalometric superimposition: Pretreatment (black) and posttreatment (red)

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