

# Activator reloaded – Myofunctional appliance at its best

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## Abstract

Orthodontics from time immemorial has always been considered as the first speciality of dentistry. Diagnosis and treatment planning from Dr. Tweed's time always required extraction of four vital and functional premolar teeth. However, many patients, parents and general dentists have failed to understand that orthodontic treatment at an early age can help save the extraction teeth to achieve a full functional and esthetic harmonious dentition. Our case demonstrates a non-extraction orthodontic treatment plan of a developing skeletal Class II malocclusion. The results of this case show a successful correction of Class II molar malocclusion with excellent form and function, which resulted in improvement of the patient's frontal and facial profile, which, thereby boosted her personality and self-confidence.

**Keywords:** Socio-economic background, soft tissue dysfunction, timing of treatment, two-phase treatment plan: phase 1 – myofunctional appliance: Andreasen's modified activator, phase 2 – finishing with non-extraction pre-adjusted fixed appliance treatment

## Introduction

This case is unique from the point of socio-economic background. Hence, the diagnosis arrived at was to treat it with very affordable Activator therapy followed by inexpensive fixed appliance brackets.

Habits play a significant role in improper development of dental as well as facial form, function and esthetics. Moreover, it is known from child psychology that habits are many a times correlated with stress or anxiety in a growing child. Of the very many common childhood habits, lip biting is one of the significant detrimental habit. It results in compromised dental and facial esthetics by posterior positioning of the mandible, protrusion of maxillary anterior teeth and deep bite.<sup>[1]</sup> Such children on reaching maturity get conscious of these profile problems leading to a loss of self-confidence, which could even hamper their social development.

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## Case Report

A 10 years 6 months-old girl, born on 06/02/1998, presented in the Department of Dentistry, Bhatia General Hospital, under parental guidance with a complaint of protruding upper front teeth. Her medical history was non-contributory. According to the history charting questionnaire, her mother revealed her daughter's lip biting habit while studying or reading. The habit had developed since childhood and, even after repeated counselling, efforts taken to quit the habit by her previous general practitioner proved in vain.<sup>[2]</sup>

Her extraoral examination [Figures 1, 2] revealed a shortened lower facial height with a convex profile. A clinically flat mandibular plane was also noted, signifying a horizontal growth pattern, favorable for Activator therapy. The face was symmetrical and the nasolabial angle was approximately 90°. On temporomandibular joint (TMJ) examination, all movements were found to be normal. Her Visual Treatment Objective (VTO) clinically showed a marked improvement in profile guaranteeing a successful result.

On intraoral examination [Figures 3-5], the molar/canine relation was end-on tending toward Angle's Class II relation with a partially impacted lower left canine. Clinically, the overjet measured 6 mm.

Cephalometric analysis showed the sella-nasion-point A angle (SNA) to be 82.4° and sella-nasion-point B angle (SNB) to be 76.1°. The resulting Point A-nasion-point B angle (ANB) of +6.3° suggested a posterior placement of the mandible. Upper incisor to the sella-nasion (SN) plane was 120° and lower incisor to mandibular plane (IMPA) was 110°, reconfirming upper and lower incisor proclination. The interincisal angle was 110°, confirming a convex profile. Frankfort's mandibular plane angle (FMA) of 17° suggested a

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**Figure 1:** Pre-treatment extraoral frontal view



**Figure 2:** Pre-treatment extraoral lateral profile view



**Figure 3:** Pre-treatment intraoral view at occlusion



**Figure 4:** Pre-treatment intraoral left lateral view at occlusion



**Figure 5:** Pre-treatment intraoral right lateral view at occlusion

horizontal growth pattern, which was very favorable for the use of a myofunctional appliance.

The Cervical Vertebrae Maturity Index showed a substantial growth potential of about 80%.

The orthopantomogram showed continuous posterior and lower borders, normally positioned condyle, a pre-requisite for myofunctional treatment, adequate alveolar bone height and good root parallelism with a partially impacted lower left canine.



**Figure 6:** Post-treatment extraoral frontal view

The Ashley Howe's Model Analysis turned out to be 44%, revealing a borderline case for an extraction decision.

Thus, the patient was diagnosed as a case of developing skeletal Class II malocclusion, exhibiting an end-on molar and canine relation.



**Figure 7:** Post-treatment extraoral lateral profile view



**Figure 8:** Post-treatment intraoral frontal view at occlusion



**Figure 9:** Post-treatment intraoral left lateral view at occlusion



**Figure 10:** Post-treatment intraoral right lateral view at occlusion



**Figure 11:** Midstream – Andreasen's activator placed intra-orally

The treatment approach was a two-phase treatment with periodic oral prophylaxis. Andreasen's modified Activator with a lower lip pad was the appliance of choice for treating the Class II skeletal base malocclusion.<sup>[3,4]</sup> This was finished with pre-adjusted fixed appliances using McLaughlin, Bennett and Trivisi's 0.022 slot prescription.<sup>[5,6]</sup>

On post-myofunctional therapy [Figures 6 and 7], the facial profile straightened and the lower one-third facial height increased significantly.

Intraorally [Figures 8-10], the molar/canine relation turned into Angle's Class I relation bilaterally.

Cephalometrically, SNA stayed constant whereas SNB increased to 79.6°, which resulted in an ANB of +2.8°, normal for our Indian population. Both upper incisor to SN plane and IMPA reduced dramatically, resulting in an interincisal angle of 128°, corroborating a decrease in the upper/lower incisor proclination. FMA increased to 22°, also adding to the near-normal vertical component of growth.<sup>[7,8]</sup>

Figure 11 shows the Andreasen's Activator placed intra-orally – the appliance which resulted in the above mentioned desired changes.

## Discussion

These skeletal/dentoalveolar changes could be attributed to (i) correction of the lower lip biting habit, (ii) remodelling at the TMJ, (iii) restriction of the maxillary growth and (iv) inherent increase in the natural mandibular bone mass. Dentoalveolar changes included Angle's Class I relation, which

was the end result of a correct bite registration procedure. Habit correction included keeping the lower lip away by means of the lower lip pad, which resulted in pacification of the hyperactive mentalis muscle activity.<sup>[9]</sup>

Registration of bite was an important feature as Angle's Class I occlusal relation, which was obtained after following the correct bite registration procedure. Although bite registration requires case-specific parameters, a posterior clearance of 3.5 mm, an anterior clearance of 2.5 mm and guidance into Angle's Class I occlusal relation were followed.<sup>[10]</sup>

## Conclusion

Developing skeletal Class II malocclusion can be most effectively treated by non-extraction means if diagnosed at an early age and with correct patient–parent motivation. As Witzig has rightly said, *“There are no bad patients or appliance that fail, it's we doctors who fail to motivate the patient for a correct patient-appliance combination.”*

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