

## Aesthetic Correction of Class II Bimaxillary Protrusion

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### Abstract

Bimaxillary protrusion is a commonly seen deformity in Asian populations. This condition is characterized by protrusive and proclined upper and lower incisors and incompetence of lips, gummy smile, mentalis muscle strain and anterior open bite [1]. This condition poses a serious threat to the aesthetic concern of the patient which is intertwined with psychological trauma and social inter-relation disturbances. A Successful treatment depends on the thorough evaluation of the condition, understanding the need and the concern of the patient and providing an appropriate treatment plan. This case report describes correcting a bimaxillary protrusion by treating the upper anteriors with Root Canal Treatment, placing a post and core with change in the angle of inclination and restoring them with a crown & bridge prosthesis.

### Introduction

Bimaxillary protrusion is characterized by a class II molar relation where the distobuccal cusp of the upper first molar occludes in the buccal groove of the lower first permanent molar. Class II Div 1 is characterized by proclined upper incisors with a resultant increase in the overjet. A deep incisor overbite can occur in the anterior region. A characteristic feature of this malocclusion is the presence of abnormal muscle activity. The upper lip is usually hypotonic, short and fails to form a lip seal. The lower lip cushions the palatal aspect of the upper teeth referred to as 'lip trap'. The tongue occupies a lower posture thereby failing to counteract the buccinator muscle activity. The unrestrained buccinator activity results in narrowing of the upper arch at premolar and canine regions thereby producing V-shaped upper arch. Hyperactivity of mentalis muscle is seen. The imbalance of muscular activities accentuates the narrowing of the upper dental arch.

This dentofacial anomaly can be divided into two different categories based on the involved arch to maxillary excess or mandibular deficiency [7, 8]. The resulting anomaly may demonstrate various severities of class II malocclusion in different ages, which dictates the preferred approach to clinical management.

Etiology of class II malocclusion can be attributed by hereditary defects & also habits like tongue thrusting, thumb sucking or mouth breathing habits.

Class II malocclusion could be identified based on precise clinical evaluation (extra- and intra-oral features), diagnostic aids (history, photographic analysis, radiographic analysis, and cast analysis), and functional analysis (examination of postural rest position and maximum intercuspation, examination of the temporomandibular joint and orofacial dysfunction) of the patients [9-11].

First Treatment of choice for a class 2 bimaxillary protrusion should be Orthodontic correction of the facial esthetics and the functional rehabilitation by extraction of first premolars followed by retraction and retroclination of maxillary and mandibular incisors [1]; ( The best treatment modalities for class II malocclusion in growing patients include using functional appliances either removable like Activator, Bionator, Frankel, and Twin-block or fixed appliances like MARA, cemented Twin-block, or Herbst appliance that mostly enhance further mandibular growth via mandibular advancement and also headgear like Cervical, Highpull, and combination type, which provides extra oral force to restrict further maxillary growth [12-14]) this line of treatment could afford the vitality of the teeth thus, giving this treatment modality an advantageous position.

Other treatment modalities include segmental maxillary osteotomy to treat with the exaggerated curve of spee and vertical maxillary excess [1]. With proper execution in accordance with the surgical planning and post op care can, it can provide satisfactory results within a short period of time.

Another line of treatment includes Root canal Treatment of the upper anteriors followed by placing post with a change in the angle of inclination of the core, reducing the length of the teeth and restoring them with crown & bridge prosthesis. This treatment option commits satisfactory results within a short span of time and within a limited expenditure.

Last option of treatment is extraction the affected maxillary anteriors and restoration with crown and bridge using the upper adjacent teeth. This treatment would cost sacrifice of vital teeth and also the crown preparation of adjacent vital teeth henceforth, not putting it in the conventional line of treatment for a class 2 bimaxillary protrusive case.

## Case Report

A 28years male patient, presented with a complaint of proclined upper front teeth since an early age. He wished to have an aesthetic correction for the same.

The patient was clinically examined and observed to have generalized moderate gingivitis with moderate tobacco stains. grade-I mobility in 11 & no tenderness on percussion on any of the maxillary anteriors. Radiographic evaluation was done to check for the periodontal status, bone support and the crown: root ratio.

The patient was diagnosed with chronic localized periodontitis.

The treatment plan included extraction of 11, Root canal treatment of 12, 21, 22 followed by cast post and core placement and a Porcelain Fused Metal Crown & bridge for 15 14 13 12 11 21 22 23 24 25.

On the 1<sup>st</sup> appointment, extraction of 11 was being done under local anesthesia and access opening was being done for 12, 21, 22 under rubber dam isolation. Working length of all the three teeth were 23 mm.

On the 2<sup>nd</sup> appointment; under rubber dam isolation, Biomechanical preparation was being done using protaper rotary system upto F3 file in crown down technique. Irrigated with 5.25% NAOCL and final irrigation was done with 2% chlorehexidine. Obturated with F3 GP in lateral compaction technique using apex it plus sealer.

Once the RCT was healed & the teeth are ready for more work, On the 3<sup>rd</sup> appointment; using the GG drill upto no-5 size, Some of the fillings used in the obturation were being cleared out to make room for the post, upto the length of 18mm. (about 2/3<sup>rd</sup> of the GP is advised to be removed and at least 4mm of apical remaining GP is recommended for post placement) then the canal was being irrigated with saline and dried with paper points. Once the post space is created, the crown preparation was done. Reducing the height of the crown to a bare minimum and a ferrule being placed per gingivally on the palatal side for providing a proper seat for the core and preventing any fracture line. Followed by taking impression using type-II inlay wax & the wax pattern of the core was being inclined palatally, changing the angle of the core w.r.t the post. Wax pattern prepared were then individually cast in a base metal alloy (Nikel-chromium) & they were finished and polished using regular lab procedures.

On the fourth appointment, angulation and the fit of the cast post was evaluated and luted with type - I Glass Ionomer cement. Vital-Crown preparations were also done for 15, 14, 13, 23, 24 & 25. Followed by placement of gingival retraction cord, impression was made using addition polysilicone and light body impression material in putty-wash impression technique under rubber dam isolation. And bite registration was done using bite registration wax.

On the fifth appointment, the metal trial was taken. The buccal retroclination was checked & the lip competence was observed to have restored.

On the 6<sup>th</sup> appointment, the PFM bridge fit was evaluated and luted with type-I GIC. Canine supported occlusion was given to free the maxillary anterior teeth of bearing any stress while in function. The occlusion, phonetics and the lip support were checked and observed to have restored.

Periodic follow up is being done after 1 week and 1 month.

### Discussion

A great deal of Dental crown stability depends on the amount of the tooth structure that extends into its interior. If very little tooth structure occupies this space, the crown will be easily dislodged, especially by the force directed at its sides. The core is rebuilding the tooth so it is closer to its original dimensions. Hence, the crown's stability will greatly increase thereby maximising long term success. If more than half of a tooth's original crown portion is being lost, a post is needed to assist in anchoring the core to the tooth.

A custom made post is made according to the specific root anatomy hence, aided in conservation of the root structure as excess dentin need not have been cut. Also, this allowed to give a change in the angle of the core from the post in order to give the palatal inclination thereby, achieving the buccal retroclination. Also, as the post and core is made in a single unit, it possesses high strength and high post retention.

Though, there are a few drawbacks of placing a post, as it can stress the tooth from the sides and can make it vulnerable to fracture. However, a post placement is not a wrong therapeutic approach.

Post and core are considered as an alternative to tooth extraction and implant placement which entails a higher cost.

In this case, Weighing the endodontic treatment of the teeth with post and core placement over the other treatment modalities like orthodontic treatment or implant placement, gave a highly satisfactory result within a short span of time and cost without sacrificing the periodontally healthy teeth.

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