

## Conservative Orthodontic Management of a Periodontally Compromised Case with Severe Malocclusion

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### ABSTRACT

We present a case who reported to us with severe malocclusion complicated by periodontally compromised status of dentition. This case showcases how a severely hypodivergent case can be managed conservatively despite the extreme crowding. Recognition and management of trauma from occlusion due to such hypo divergence is vital to provide a healthy periodontium. The case portrays management approach in adult orthodontic cases.

### **KEYWORDS**

Peridontium; Periodontium; Hypodivergent

### INTRODUCTION

Proper mechanical cleaning of teeth is an uphill task for adult patients presenting with severe crowding, failure to achieve optimum hygiene amounts to a compromised periodontium. Combined periodontal and orthodontic treatment is of paramount importance to re-establish a healthy, esthetic and well-functioning occlusion. Pathologic migration clinically manifests as progressive spacing, crowding, rotations and elongation of the anteriors in 30% to 50% of patients reporting with periodontal disease [1,2]. Other adverse effects on marginal periodontium include; pathologic changes in gingival contour and facial-lingual alveolar margin, as well as interdental bone [3]. Patients with periodontal disease associated with severe inflammation presents as a challenge to the orthodontist. Presence of deep bite further

accentuates the problem with morpho-functional and masticator implications, which are commonly associated with a hypodivergent growth pattern. A careful treatment plan and low orthodontic forces are of paramount importance in the management of such cases. We present this case of a female patient who presented with severe mal-alignment; and was treated non-extraction with fixed orthodontic mechanotherapy.

### CASE REPORT

#### *History and Diagnosis*

A 23-year-old female patient reported to our OPD with the chief complaint of irregular teeth. The patient also complained of bleeding gums and increasing irregularity in her upper and lower dentition. Her medical revealed no significant systemic problems. On extra-oral examination it was seen that she had an apparently symmetrical,

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mesoprosopic face with straight profile, a prominent chin and deep mento-labial sulcus. Only 20% incisal display was present during smiling. Occlusal evaluation showed class I molar and canine relation bilaterally, upper lateral incisors were in cross-bite, scissor bite was present on the right side, and over jet was 2mm with a 100% overbite. The case was diagnosed Ackerly Class III traumatic overlap with stripping of lower anterior gingival [3]. A retained deciduous lateral incisor was present in the fourth quadrant. There was generalized gingival inflammation. Periodontal examination was done, probing depths, clinical attachment levels; gingival bleeding and plaque scores were charted. It was observed that there were generalized pocket depths up to 4 mm and gingival recession over 2 mm, throughout a major part of the dentition (Figure 1).



**Figure 1:** Pre-treatment malocclusion.



**Figure 2:** Pre-treatment lateral cephalogram.

Model analysis revealed minor tooth size-arch length discrepancy in both arches with Bolton's discrepancy in the anterior region. Radiographic examination showed mild bone loss on panoramic radiograph. Severe hypodivergence, with skeletal deep bite on a skeletal class I base was observed on cephalometric analysis. Also, there was retroclination of upper and lower anterior (Figure 2).

### ***Treatment Progress***

Initially palliative periodontal treatment was done to resolve acute symptoms of gingival inflammation. An acrylic posterior bite plate was given to disocclude the anterior teeth and scaling and root planning was done.



**Figure 3:** Post-treatment intra-oral images.

Orthodontic treatment was done using MBT readjusted edgewise appliance (3 M Unitek) 0.022 × 0.025 inch slot. Upper alignment was initiated using lighter thermally activated NiTi. Bonding was performed later in lower anterior teeth with an acrylic posterior bite plate. Scissor bite was corrected using intra-maxillary cross elastics between the maxillary premolars. Oral prophylaxis was performed every 6 weeks to control gingival inflammation. Total duration of treatment was 22 months. At end of treatment, well-aligned, coordinated arches were achieved. To manage the Bolton's discrepancy, upper

lateral incisors were built up with composite. Patient had a 60% incisal show on smiling. A healthy periodontium was achieved with no signs of inflammation and there were no pockets (Figure 2). Gingivoplasty was done to achieve physiologic gingival contour. Patient was given removable upper wrap-around retainer and lower fixed retainer. Meticulous oral hygiene regime was advised and reinforced with regular recall visits (Figure 3).

## **DISCUSSION**

Recent times have seen an upsurge in the number of adult populations reporting for orthodontic treatment in order to enhance their esthetic appearance [4]. Many of the adult orthodontic patients present a co-existing periodontal pathology with the malocclusion, which in turn leads to pathologic migration, malocclusion and trauma from occlusion (TFO). Such cases require an interdisciplinary approach with the combined efforts of periodontist and orthodontist. A comprehensive oral prophylaxis protocol prior to, during and after completion of orthodontic treatment is essential for long-term stability and success of orthodontic treatment in patients with compromised periodontium [5]. In such patients; 3 months - 6 months before commencing the orthodontic treatment, active periodontal treatment should be done, for the resolution of inflammation and proper healing [6].

In this case scissor bite was present, with lateral incisors being in cross-bite, correction of cross-bite is imperative to relieve TFO [7] and also; aids in long term stability [8]. Another reason for TFO was a skeletal deep bite associated with a hypodivergent skeletal base. Bite

opening in such cases with molar extrusion is unstable due to the presence of strong musculature [9]. In our case, bite opening largely resulted due to proclination of retroclined anteriors. Normal axial inclination of anterior is the key to stability and successful retention [10]. Expansion and proclination of incisors were done, to maintain a fulcrum at the incisors, this also prevents the overbite from deepening. Extractions must be avoided in short lower facial height patients. Extraction decision must not be based solely on crowding. Efforts were made to maintain low orthodontic forces throughout the treatment especially during alignment. Rapid labial tipping may lead inadvertent root resorption or bone dehiscence. Thick symphysis, which is a characteristic of hypodivergent base, allows for proclination of lower anteriors. Proper arch coordination was achieved using coordinated arch wires and cross-elastics.

Smile improvement was largely due to better incisor show and proper inclination of the anterior. Lip profile also improved. Good aesthetical and functional results were obtained.

## **CONCLUSION**

Cases with extreme forms of malocclusion with concomitantly occurring periodontal disease must be evaluated and treated with caution. Dramatic results can be achieved if the case is diagnosed well and appropriate therapeutic procedures are used.

Long term follows up and meticulous oral hygiene maintenance is the keys to a stable and functionally balanced result.

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