



ISSN Print: 2394-7489  
ISSN Online: 2394-7497  
IJADS 2020; 6(3): 158-162  
© 2020 IJADS  
[www.oraljournal.com](http://www.oraljournal.com)  
Received: 07-05-2020  
Accepted: 09-06-2020

**Dr. Bhushan Jawale**  
Professor, Dept of Orthodontics  
and Dentofacial Orthopedics,  
Sinhgad Dental College and  
Hospital, Sinhgad, Pune,  
Maharashtra, India

**Dr. Lishoy Rodrigues**  
PG Student, Dept of  
Orthodontics and Dentofacial  
Orthopedics, Sinhgad Dental  
College and Hospital, Sinhgad,  
Pune, Maharashtra, India

**Dr. Vijay Naik**  
Professor and HOD, Dept of  
Orthodontics and Dentofacial  
Orthopedics, Maratha Mandal  
Dental College and Hospital,  
Belgaum

**Dr. Veerendra Kerudi**  
Professor and HOD, Dept of  
Orthodontics and Dentofacial  
Orthopedics, ACPM Dental  
College and Hospital, Dhule

**Dr. Amit Chaudhary**  
Associate Professor, Dept of  
Periodontology and  
Implantology, BVP Dental  
College and Hospital, Pune,  
Maharashtra, India

**Dr. Amit Nehete**  
Professor, Dept of Orthodontics  
and Dentofacial Orthopedics,  
MGV Dental College and  
Hospital, Nashik, Maharashtra,  
India

**Corresponding Author:**  
**Dr. Lishoy Rodrigues**  
PG Student, Dept of  
Orthodontics and Dentofacial  
Orthopedics, Sinhgad Dental  
College and Hospital, Sinhgad,  
Pune, Maharashtra, India

## **Management of a non growing adult borderline extraction case of a patient having a Class II Division 1 malocclusion by non extraction protocol for aesthetic improvement: A case report on adult orthodontics**

**Dr. Bhushan Jawale, Dr. Lishoy Rodrigues, Dr. Vijay Naik, Dr. Veerendra Kerudi, Dr. Amit Chaudhary and Dr. Amit Nehete**

### **Abstract**

Class II malocclusion is one of the most common problems around the globe affecting around one-third of the patients who come for orthodontic treatment. This case report evaluates the management of skeletal Class II division 1 malocclusion in a borderline non-growing adult patient without extraction of upper first premolars. Clinical and cephalometric evaluation revealed skeletal Class II division 1 malocclusion with severe maxillary incisor proclination, convex profile, average mandibular plane angle, incompetent lips, increased overjet and overbite. Following fixed orthodontic treatment marked improvement in patient's smile, facial profile and lip competence were achieved and there was a remarkable increase in the patient's confidence and quality of life. The profile changes and treatment results were demonstrated with proper case selection and good patient cooperation with Fixed appliance therapy.

**Keywords:** Fixed appliance therapy, Class II Div 1 malocclusion, borderline extraction, non extraction protocol, aesthetic improvement, adult orthodontics

### **Introduction**

Fixed Appliance treatment can significantly alter and improve facial appearance in addition to correcting irregularity of the teeth. Class II div 1 malocclusion is more prevalent than any type of malocclusion after Class I malocclusion<sup>[1-2]</sup>. Over the last few decades, there are increased number of adults who have become aware of orthodontic treatment and are demanding high quality treatment, in the shortest possible time with increased efficiency and reduced costs<sup>[3]</sup>. Class II div.1 malocclusions can be treated by several means, according to the characteristics associated with the problem, such as anteroposterior discrepancy, age, and patient compliance<sup>[4-5]</sup>. The indications for extractions in orthodontic practice have historically been controversial<sup>[6-8]</sup>. On the other hand, correction of Class II div.1 malocclusions in nongrowing patients, with subsequent dental camouflage to mask the skeletal discrepancy, can involve either retraction by non extraction means simply by utilizing the available spaces or by extractions of premolars<sup>[9-10]</sup>. The extraction of 2 premolars is generally indicated when there is no crowding or cephalometric discrepancy in the mandibular arch<sup>[11-12]</sup>. But fortunately some time with suitable mechanotherapy, satisfactory results with an amazing degree of correction can be achieved without extraction of permanent premolars. This case presents the correction of a Class II Div 1 Spaced malocclusion in a non growing adult male patient with increased overjet, overbite and a bimaxillary protrusion merely simply by executing a non extraction protocol. The Non Extraction protocol shown in this case is indicative of how a borderline extraction case can be converted into a non extraction case by routine Fixed Orthodontic treatment

### **Case Report**

#### **Extra-Oral Examination**

A 32 year old male patient presented with the chief complaint of forwardly placed upper front teeth and excessive show of upper front teeth.

On Extraoral examination, the patient had a convex profile, grossly symmetrical face on both sides with a slightly retruded chin, potentially incompetent lips, moderately deep mentolabial sulcus and a decreased Nasolabial Angle, a Leptoprosopic facial form, Dolicocephalic head form, Average width of nose and mouth, minimal buccal corridor space, a consonant smile arc and slightly posterior divergence

of face . The patient had no relevant prenatal, natal, postnatal history, history of habits or a family history. On Smiling, there was 100 percent shgow of maxillary anterior teeth. However, mandibular teeth were not visible on smile. The patient had a toothy smile. Also due to the spaced dentition, the patient was checked for tongue thrusting, however on examination the patient had no Tongue thrust habit.



Pre-Treatment Extraoral Photographs

**Intra-Oral Examination**

Intraoral examination on frontal view shows presence of a deep overbite with almost coinciding upper and lower dental midlines. On lateral view the patient shows the presence of Class II div 1 incisor relationship, a Class |I Canine relationship on both sides and a Class I molar relationship Bilaterally. Patient has an overjet of 6 mm and an overbite of 5 mm. There is spacing in upper anterior region between the lateral incisor and canines bilaterall, however the lower arch is moderately well aligned. A Bilateral single tooth scissor

bite with the 1<sup>st</sup> premolar is seen in the upper arch in both quadrants. The upper and lower arch shows the presence of a U shaped arch form and both upper and lower anterior region show flared out anterior teeth indicative of a bimaillary dentoalveolar protrusion. OPG of the patient shows presence of all four 3rd molars in a developing stage and a spaced anterior dentition. Lateral cephalogram is clearly indicative of proclined upper and lower anterior dentition again indicative of a Bimaxillary protrusion.



Pre-Treatment Intraoral Photographs

Pre-Treatment Cephalometric Readings

Parameters	Pre- Treatment
SNA	85°
SNB	82°
ANB	3°
WITS	2mm
Max. Length	79mm
Man. Length	99mm
Impa	110°
Nasolabial Angle	85°
U1 To Na Degrees	42°
U1 TO NA mm	9mm
L1 TO NB Degrees	38°
L1 TO NB mm	8mm
U1/L1 ANGLE	102°
Saddle Angle	131°
Articular Angle	156°
Gonial Angle	144°
Fma	25°
Y Axis	68°

1. Steiners analysis shows a prognathic maxilla and mandible, Class II Skeletal pattern, an Average to Horizontal growth pattern, proclined maxillary and mandibular anteriors, forwardly placed maxillary and mandibular anteriors and protrusive upper and lower lips
2. Tweeds analysis shows a Horizontal growth pattern and proclined mandibular incisors
3. Wits appraisal shows AO ahead of BO by 2 mm indicating Skeletal Class II pattern
4. Ricketts analysis shows an average mandible, average positioned condyles and proclined mandibular anteriors
5. McNamara analysis shows a prognathic maxilla, prognathic mandible, a horizontal growth pattern, decreased lower anterior facial height and proclined mandibular incisors
6. Rakosi Jaraback analysis shows a Horizontal growth pattern and proclined maxillary and mandibular incisors
7. Holdaway soft tissue analysis shows increased maxillary and mandibular sulcus depth and increased strain of lips
8. Downs analysis shows a Class II Skeletal pattern, a horizontal growth pattern and proclined maxillary and mandibular anterior teeth

**Diagnosis**

This 32 years old Adult male patient was diagnosed with Angle's Class II div 1 malocclusion with a prognathic maxilla and mandible and a horizontal growth pattern, increased overjet and overbite, proclined upper and lower incisors, moderately deep mentolabial sulcus, potentially incompetent and protrusive upper and lower lips

**Treatment Objectives**

1. To correct maxillary and mandibular prognathism
2. To correct spacing in upper anterior region
3. To correct proclination of upper and lower anteriors
4. To correct overjet and overbite
5. To correct the acute Nasolabial Angle
6. To correct a deep mentolabial sulcus
7. To achieve a pleasing smile and a pleasing profile

**Treatment Plan**

- Fixed appliance Therapy with MBT 0.022 inch bracket slot
- Initial leveling and alignment with 0.012", 0.014", 0.016", 0.018", 0.020" Niti archwires following sequence A of MBT
- Retraction and closure of spaces by use of 0.019" x 0.025" rectangular NiTi followed by 0.019" x 0.025"

rectangular stainless steel wires

- Final finishing and detailing with 0.014" round stainless steel wires
- Retention by means of vacuum formed clear invisible retainers

**Treatment Progress**

Complete bonding & banding in both maxillary and mandibular arch done, using MBT-0.022X0.028" slot. Initially a 0.012" NiTi wire was used which was followed by 0.014, 0.016", 0.018", 0.020" Niti archwires following sequence A of MBT. After 6 months of alignment and leveling NiTi round wires were discontinued. Retraction and closure of spaces was then started by use of 0.019" x 0.025" rectangular NiTi with accentuated Anchor sweeps in the upper and lower stiff archwires for opening of bite to correct the increased overbite followed by 0.019" x 0.025" rectangular stainless steel wires. Anchorage was conserved by light retraction forces constantly monitoring the already well settled molar relation. This is the most important step in a borderline extraction case wherein anchorage conservation is of utmost importance. Finally light settling elastics were given with rectangular steel wires in lower arch and 0.012" light NiTi wire in upper arch for settling, finishing, detailing and proper intercuspation



MID Treatment Intraoral of Fixed Appliance Therapy

**Post Treatment Cephalometric Readings**

Parameters	Post-Treatment
SNA	82°
SNB	80°
ANB	2°
WITS	1mm
Max. Length	76mm
Man. Length	98mm
Impa	97°
Nasolabial Angle	99°
U1 To Na Degrees	28°
U1 TO NA Mm	3mm
L1 To Nb Degrees	26°
L1 TO NB Mm	2mm
U1/L1 Angle	134°
Saddle Angle	133°
Articular Angle	157°
Gonial Angle	146°
FMA	24°
Y AXIS	70°



Post Treatment Extraoral Photographs



Post-Treatment Intraoral Photographs

**Discussion**

Treatment of Class II malocclusion in adults without extractions of premolars is challenging. A well chosen individualized treatment plan, undertaken with sound biomechanical principles and appropriate control of orthodontic mechanics to execute the plan is the surest way to achieve predictable results with minimal side effects. Class II malocclusion might have any number of a combination of the skeletal and dental component. Hence, identifying and understanding the etiology and expression of Class II malocclusion and identifying differential diagnosis is helpful for its correction. The patient's chief complaint was forwardly placed and excessive show of upper front teeth .The selection of orthodontic fixed appliances is dependent upon several factors which can be categorized into patient factors, such as age and compliance, and clinical factors, such as preference/familiarity and laboratory facilities. The execution of only Fixed appliance therapy appropriately resulted in an

improvement in the patient's profile in this case. The SNA value showed a significant decrease from 85 to 82 degrees, the SNB value changed from 82 to 80 degrees thus addressing the major problem of maxillary and mandibular bidental protrusion. The mandibular incisor proclination reduced from 110 to 97 degrees, the nasolabial angle changed from 85 degrees to 99 degrees thus improving the patients profile drastically and the Frankfurts mandibular plane angle showed changes from being average to more horizontal growth pattern of patient due to the counter clockwise rotation of the mandibular plane. Successful results were obtained after the fixed MBT appliance therapy within a stipulated period of time.The overall treatment time was 14 months. After this active treatment phase, the profile of this 32 year old non growing adult male patient improved significantly as seen in the post treatment Extra oral photographs. Removable Vacuum formed clear retainers were then delivered to the patient.

Comparison of Pre and Post Treatment Cephalometric Readings

Parameters	PRE- Treatment	post-Treatment
Sna	85°	82°
Snb	82°	80°
Anb	3°	2°
Wits	2mm	1mm
Max. Length	79mm	76mm
Man. Length	99mm	98mm
Impa	110°	97°
Nasolabial Angle	85°	99°
U1 To Na Degrees	42°	28°
U1 To Na Mm	9mm	3mm
L1 To Nb Degrees	38°	26°
L1 To Nb Mm	8mm	2mm
U1/L1 Angle	102°	134°
Saddle Angle	131°	133°
Articular Angle	156°	157°
Gonial Angle	144°	146°
Fma	25°	24°
Y Axis	68°	70°



Retention with Vacuum Formed Clear Retainers



Comparison of Pre and Post Treatment Profiles

### Conclusion

This case report shows how a borderline extraction case can be managed with a Non Extraction Protocol by means of properly conserving Anchorage. The planned goals set in the pretreatment plan were successfully attained. Good intercuspation of the teeth was maintained with class I molar relationship. Treatment of bimaxillary protrusion and localized spacing included the retraction and retroclination of maxillary and mandibular incisors with a resultant decrease in soft tissue procumbency and convexity. The maxillary and mandibular teeth were found to be esthetically satisfactory in the line of occlusion. The overjet become near ideal and normal overbite was found. Patient had improved smile and Profile without the need for extractions The correction of the malocclusion was achieved, with a significant improvement in the patient aesthetics and self-esteem. The patient was very satisfied with the result of the treatment.

### References

- Hossain MZ *et al.*, Prevalence of malocclusion and treatment facilities at Dhaka Dental College and Hospital. *Journal of Oral Health*, 1994, 1(1),
- Ahmed N *et al.*, Prevalence of malocclusion and its aetiological factors. *Journal of Oral Health*, 1996, 2(2).
- Khan RS, Horrocks EN. A study of adult orthodontic patients and their treatment. *Br J Orthod*. 1991; 18(3):183-194.
- Salzmann JA. *Practice of orthodontics*. Philadelphia: J. B. Lippincott Company, 1966, 701-24.
- McNamara JA. Components of Class II malocclusion in children 8 10 years of age, *Angle Orthod*, 1981; 51:177-202.
- Case CS. The question of extraction in orthodontia. *American Journal of Orthodontics*. 1964; 50:660-691.
- Case CS. The extraction debate of 1911 by Case, Dewey, and Cryer. Discussion of Case: the question of extraction in orthodontia. *American Journal of Orthodontics*, 50: 1964, 900-912.
- Tweed C. Indications for the extraction of teeth in orthodontic procedure. *American Journal of Orthodontics*. 1944; 30:405-428.
- Cleall JF, Begole EA. Diagnosis and treatment of Class II Division 2 malocclusion. *Angle Orthod*. 1982; 52:38-60.
- Strang RHW. *Tratado de ortodoncia*. Buenos Aires: Editorial Bibliografica Argentina. 1957; 560-70:657-71.
- Bishara SE, Cummins DM, Jakobsen JR, Zaher AR. Dentofacial and soft tissue changes in Class II, Division 1 cases treated with and without extractions. *Am J Orthod Dentofacial Orthop*. 1995; 107:28-37. Rock WP.
- Treatment of Class II malocclusions with removable appliances. Part 4. Class II Division 2 treatment. *Br Dent J*. 1990; 168:298-302.
- Naragond A, Kenganal S, Sagarkar R, Sugaradday. Orthodontic Camouflage Treatment in an Adult Patient with a Class II, Division 1 Malocclusion – A Case Report, *J Clin Diagn Res*. 2013; 7(2):395-400.
- Kuhlberg A, Glynn E. Treatment planning considerations for adult patients, *Dent. Clin. N. Am*. 1997; 41:17-28;
- Tweed C. Indications for the extraction of teeth in orthodontic procedure. *American Journal of Orthodontics*. 1944; 30:405-428.
- Bishara S, Hession T, Peterson L. Longitudinal soft-tissue profile changes: a study of three analyses. *Am J Orthod*. 1985; 88:209-23.
- Alexander RG, Sinclair PM, Goates LJ. Differential diagnosis and treatment planning for adult nonsurgical orthodontic patient. *Am Jrthod*. 1986; 89:95-112.