History of Medicine, 2022, 8(2): 203–213
DOI: 10.17720/2409-5834.v8.2.2022.025

Asymmetric Extractions for the Treatment of Class II Subdivision Malocclusion: CASE REPORT

Prachi Doneria, Karuna Singh Shawney, Sujit Panda, Darahnam Kharlyngdoh

Rama Dental College, Rama University, Mandhana Kanpur, U.P, India.

ABSTRACT

Orthodontic treatment is made more difficult by the resulting unbalanced occlusal relation. Class I features are present on one side and Class II on the other in patients with Class II subdivision malocclusions. In these situations, the extraction of four premolars is to create a bilateral Class I molar relation, which requires patient compliance with the usage of Class II elastics. One such Class II subdivision malocclusion case that was handled with asymmetric extractions is presented in the current case report. This method preserves one premolar without compromising dental occlusion or aesthetics and is not dependent on patient cooperation.

Keywords: Class II subdivision malocclusion, extraction of three premolars, midline shift

INTRODUCTION

Treatment of Class II malocclusions varies depending on the clinician's perspective and skill in achieving a good finish of occlusion.[1,2,3,4,5,6,7]. The reason for asymmetry whether purely dental, skeletal, or both has been a question in the clinician's mind. Alavi et al[2] observed that Class II subdivisions result mainly from the asymmetry of the mandibular first molars. Rose et al[8] confirmed that Class II subdivision occurred mainly due to distal positioning of the mandibular first molar on the Class II side. Janson et al[4] also concluded that the components that contributed to the asymmetric anteroposterior relationship in the Class II subdivision malocclusion were mainly dentoalveolar. The primary contributor to the differences between the Class II subdivision malocclusion and the normal occlusion was the distal positioning of the mandibular first molars on the Class II side in the mandibles without unusual skeletal or positional asymmetries[8]. However, the other factor was the mesial positioning of the maxillary first molar on the Class II side. In most of the situations, the decision is made on the midline shift. Predominantly, the maxillary midlines are co-incident to the midsagittal plane whereas the mandibular dental midline is deviated to the Class II side. The most followed treatment strategy is - all first premolar extractions and rarely asymmetric 3 premolar extractions. Janson et al[6] study concluded that treatment of Class II subdivisions with 3 premolar extractions showed a tendency to a better treatment success rate in correcting maxillo-mandibular dental midline deviation and consequently a tendency for a slightly better correction of anteroposterior discrepancy of posterior segments compared with 4 premolar extraction treatment. This case report describes a Class II subdivision malocclusion which was treated with asymmetric 3 premolar extractions. The advantages of this treatment plan are justified in this clinical situation. The molars were corrected to a functional Class I on the Class I side and functional Class II on the Class II side, the midlines were made coincident,

and normal overjet and overbite were reasonably achieved. The time consumed was much less than the time that would have taken to correct a Class II to a functional Class I when 4 premolars are extracted. The proposed 3 premolar extractions plan seemed to be an ideal choice of treatment plan.[1,2]

CASE REPORT- A 17-year-old female named Varnika Rajput came to the Department of Orthodontics and Dentofacial Orthopaedics of Rama Dental College Hospital and Research Centre and complained of forwardly placed upper front teeth. A convex profile with posterior divergence, incompetent lips, an average nasolabial angle, and a lower facial height without any obvious asymmetry were all revealed by an extraoral examination. Increased overjet, a lower midline shift to the right of the midfacial axis, and a missing right second mandibular molar during the intraoral examination. On the right side, the canine and molar relations were in Class II occlusion with a Class II division 1 incisor relation (figure 1 b) on the left side, they were in Class I occlusion.

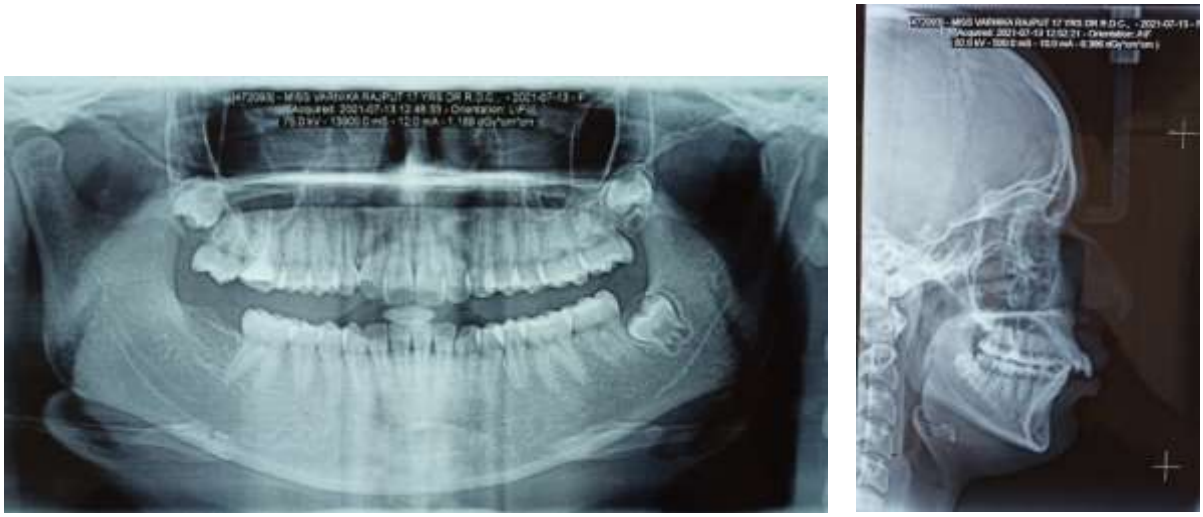
Clinical examination: The patient was mesomorphic and had a normal gait. The face was leptoprosopic with incompetent lips. Profile was convex with a normal chin and presented an average clinical FMA. Congenitally missing teeth in respect to 47. (figure 1 c) Overjet is 9.5mm with an overbite of 4.5mm. (figure 1 b) The midline shifted towards the right side. Proclined maxillary anteriors (figure 1 c) with rotated right maxillary lateral incisor. Maxillary and mandibular arch is U-shaped. Erupting concerning 18,28 and 38. (figure 1 c)

Pretreatment photographs:

I.Extraoral photographs:

Figure 1: a.Pretreatment Extraoral photographs

b.Intraoral Photographs



c.Pretreatment orthopantomogram and lateral cephalogram

TABLE 1:

Measurement	Ideal Value	Pre-Treatment Value
SNA	82 deg	82 deg
SNB	79 deg	77 deg
ANB	3 deg	5 deg
FMA	24 deg	29 deg
IMPA	95 deg	99 deg
Jaraback's Ratio	65 %	64%
Lower 1 to N-B (mm)	4 mm	7 mm
Upper 1 to N-A (mm)	4 mm	9 mm
Interincisal angle	131 deg	112 deg

Diagnostic Summary:

It's a case of skeletal Class II jaw base relationship with the normal maxilla and retrognathic mandible with vertical growth pattern and Angle's Class II Div 1 Subdivision malocclusion with proclined maxillary, mandibular anteriors, and rotated maxillary right lateral incisor.

Problem list:

- Skeletal Class II
- Increased Overjet
- Deep bite
- Midline shift towards the right side

Treatment objectives:

- To camouflage skeletal Class II relationship
- To align arches
- To establish a balanced occlusal relationship bilaterally
- To correct overjet and overbite
- To improve the profile
- To constitute a good aesthetic smile with the correct midline.

Treatment options/alternatives:

1. Lower molar protraction (Class II side) with alignment along with all four first premolar extractions

2. Lower molar protraction (Class II side) with alignment along with first premolar extractions in the upper arch, the first premolar extraction on the Class I side, and second premolar extraction on the Class II side in the lower arch
3. Extraction of two premolars in the upper arch to correct proclination and one premolar in the lower arch on the Class I side to correct midline.

Treatment Progress:

Anchorage reinforcement was needed to prevent mesial molar movement in the upper arch; this was achieved by cementing a nance palatal arch as the treatment involved the extraction of the first premolars in the upper arch and extraction of the mandibular first premolar of the left side. Treatment started with placing MBT prescription brackets and molar tubes till the first molar. Leveling and alignment were done using 0.012NiTi, 0.014 NiTi, 0.016 NiTi, 0.016 SS, 0.018 NiTi, 0.018 SS, 0.017x0.025 NiTi, 0.019X0.025 NiTi, and 0.019 x 0.025 SS archwires. The patient was monitored and recalled after every 4 weeks to check progress. Finally, 0.019 x 0.025" stainless steel archwires were placed in the upper arch and lower arch.

Consolidating the upper and lower incisors and retraction of canines using active tie back on 0.019 x 0.025 SS. Consolidating the upper and lower incisors as a unit and placing a hook distal to the lateral incisor and retraction using active tieback on 0.019x0.025 SS. Final space closure was done using a power chain, and then 0.014” NiTi (settling wire) was ligated. Once the occlusion settled, the appliance was debonded. Retention was achieved with Begg’s retainers in both arches.

RESULT:

The time taken for leveling and aligning was 9 months and 10 months for space closure and settling. On the left side, the Class I molar relation was maintained, whereas on the right side, the Class II molar relation showed better intercuspation. At the end of treatment, a proper overjet and overbite were maintained with coincident midlines and a slight improvement of the profile was seen.

POST-TREATMENT PHOTOGRAPHS:

I.Extraoral photographs:

Figure 2: a. Post Treatment Photographs Extraoral

II. Intraoral photographs:

Figure 2: b.Post-treatment Intraoral photographs

III.X-Rays:

Figure 2: c.Post-treatment Orthopantomogram d.Post-treatment Lateral cephalogram

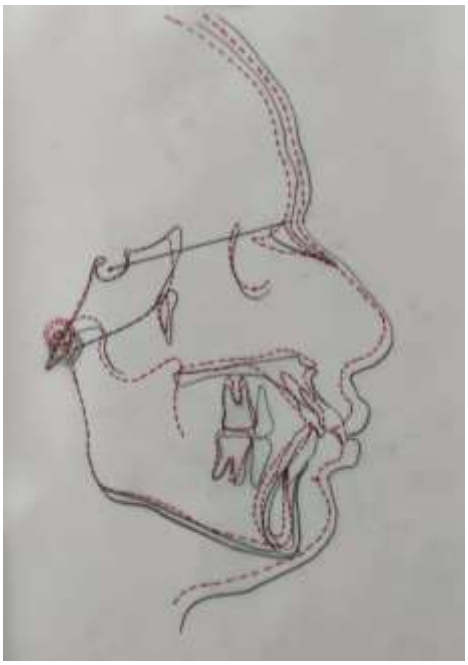


Figure 2:e. Superimposition of the pre and post-treatment cephalogram

TABLE 2

Measurement	Pre Treatment	Post Treatment
SNA	82 deg	80 deg
SNB	77 deg	75deg
ANB	5 deg	7 deg
FMA	29 deg	30 deg
IMPA	99 deg	97 deg
Jaraback's Ratio	64 %	65.4%
Lower 1 to N-B (mm)	7 mm	7 mm
Upper 1 to N-A (mm)	9 mm	3 mm
Interincisal angle	112 deg	118 deg
Upper 1 to N-A (degree)	34^{o}	26^{o}
Lower 1 to N-B (degree)	29^{o}	30^{0}

DISCUSSION

Clinical features of Class I on one side and Class II on the other are seen in patients with Class II subdivision malocclusions. Orthodontic therapy is made more difficult by the ensuing unbalanced occlusal relation. Class II subdivision malocclusion individuals typically have a mandibular dental midline that is displaced toward the Class II side, whereas the maxillary dental midline is either coincident with the midsagittal plane or exhibits a slight deviation.[1,2,3,9] To address the patient's primary complaint, the choice was taken to extract the upper first premolar in this instance to reduce the proclination. Both a single and two premolar extractions were possible for the lower arch. The treatment of the extraction of two premolars required the anterior cross elastics for midline correction, Class II elastics necessary for the mesial movement of the lower molar to a Class I relation[10], and these procedures will take more time,[11] thus these treatment plans were avoided.

Achieving a Class I molar relationship on the initial Class II side and, as a result, the coincidence of the maxillary and mandibular dental midlines in the four premolar extraction technique is primarily dependent on patient cooperation.[2,12,13] Conversely, asymmetric extraction of three premolars (one mandibular and two maxillary on the Class I side) will result in the coincidence of the maxillary and mandibular dental midlines, as well as Class I canine and molar relationships on the Class I side and Class II molar and Class II canine relationships on the Class II side.[1,2,14,15,16,17] This therapy makes it easier to correct the dental midline deviation because it closes the extraction space in the mandibular arch at the same time. Numerous studies have found that Class II subdivision malocclusion treatments involving three or four premolar extractions have comparable long-term occlusal stability.[18]

CONCLUSION

The asymmetric extraction approach appears to need less compliance overall than the alternative requirement of Class II elastics. Patients find that the extraction of three premolars is more acceptable than the extraction of four. In this instance, the objectives of improving the profile and achieving occlusion that is both functionally and clinically acceptable were met. To attain the best possible therapy outcomes, a careful case selection and treatment plan are essential.

REFERENCES

1. Alavi DG, BeGole EA, Schneider BJ. Facial and dental arch asymmetries in class II subdivision malocclusion. Am J Orthod Dentofacial Orthop 1988;93:38-46.

2. Janson GR, Metaxas A, Woodside DG, de Freitas MR, Pinzan A. Three-dimensional evaluation of skeletal and dental asymmetries in class II subdivision malocclusions. Am J Orthod Dentofacial Orthop 2001;119:406-18.

3. Janson G, Woodside D, Metaxas A, Henriques J, Freitas M. Orthodontic treatment of subdivision cases. World J Orthod 2003;4:36-46.

4. Janson G, Cruz KS, Woodside DG, Metaxas A, de Freitas MR, Henriques JF. Dentoskeletal treatment changes in class II subdivision malocclusions in submentovertex and posteroanterior radiographs. Am J Orthod Dentofacial Orthop2004;126:451-63.

5. Janson G, de Lima KJ, Woodside DG, Metaxas A, de Freitas MR, Henriques JF. class II subdivision malocclusion types and evaluation of their asymmetries. Am J Orthod Dentofacial Orthop2007;131:57-66.

6. Janson G, Carvalho PE, Cançado RH, de Freitas MR, Henriques JF. Cephalometric evaluation of symmetric and asymmetric extraction treatment for patients with class II subdivision malocclusions. Am J Orthod Dentofacial Orthop2007;132:28-35.

7. Janson G, Cruz KS, Barros SE, Woodside DG, Metaxas A, de Freitas MR, *et al.* Third molar availability in class II subdivision malocclusion. Am J Orthod Dentofacial Orthop2007;132:279.e15-21.

8. Rose JM, Sadowsky C, BeGole EA, Moles R. Mandibular skeletal and dental asymmetry in class II subdivision malocclusions. Am J Orthod Dentofacial Orthop1994;105:489-95.

9. Mohammad HA, Abu Hassan MI, Hussain SF. Cephalometric evaluation for Malaysian Malay by Steiner analysis. Sci Res Essays2011;6:627-34.

10. Steyn CL, du Preez RJ, Harris AM. Differential premolar extractions. Am J Orthod Dentofacial Orthop 1997;112:480-6.

11. Fink DF, Smith RJ. The duration of orthodontic treatment. Am J Orthod Dentofacial Orthop 1992;102:45-51.

12. Burstone CJ. Diagnosis and treatment planning of patients with asymmetries. Semin Orthod 1998;4:153-64.

13. Lewis PD. The deviated midline. Am J Orthod 1976;70:601-16.

14. Cheney EA. The influence of asymmetries upon treatment procedures. Am J Orthod. 1952;38:934-45.

15. Cheney EA. Dentofacial asymmetries and their clinical significance. Am J Orthod 1961;47:814-29.

16. Todd M, Hosier M, Sheehan T, Kinser D. Asymmetric extraction treatment of a class II division 1 subdivision left malocclusion with anterior and posterior crossbites. Am J Orthod Dentofacial Orthop 1999;115:410-7.

17. Wertz RA. Diagnosis and treatment planning of unilateral class II malocclusions. Angle Orthod 1975;45:85-94.

18. Janson G, Araki J, Estelita S, Camardella LT. Stability of class II subdivision malocclusion treatment with 3 and 4 premolar extractions. Prog Orthod 2014;15:67.