



## ASYMMETRIC EXTRACTIONS FOR TREATMENT OF CLASS II SUBDIVISION MALOCCLUSION - REVIEW AND CASE STUDY

**Dr. Santosh Kumar**

Professor, Department of Orthodontics and Dentofacial Orthopaedics, Faculty of Dental Sciences, SGT University, Budhera, Gurugram-122505, Haryana, India.

**Chand Sawhney**

Consultant, Dr Sawhney Super speciality Dental Clinic and Orthodontic Centre, Agra, Uttar Pradesh

### ABSTRACT

Class II subdivision malocclusion is characterized by Class II molar relation on one side and Class I on another side with a deviated lower dental midline, which makes its treatment complex. The conventional treatment protocol employed in such cases is the extraction of four premolars. However, midline correction and attainment of stable molar relationship is difficult with conventional four premolar extraction protocol. It is time consuming and depends upon the patient compliance. The three premolars extraction protocol allows correction of lower dental midline and establishment of stable molar relationship with great ease in less duration of time alleviating patient compliance. This article reviews the effectiveness and advantages associated with three premolars extraction protocol in treatment of Class II subdivision malocclusion supported by case study.

### KEYWORDS :

### INTRODUCTION

The Class II subdivision malocclusion is characterized by presence of Class II molar relation on one side and Class I on the other side. The other important features include shifted mandibular midline towards Class II side, deep bite and increased overjet<sup>1,2</sup>. The class II subdivision malocclusions have been reported to account for 50% of all Class II malocclusions. The major cause of asymmetric anteroposterior relationship in Class II subdivision malocclusions is the dentoalveolar asymmetry which is because of

1. Distal positioning of the mandibular first molar on the Class II side.
2. Mesial positioning of maxillary molars on Class II side.
3. Combination of above two causes.

Among these, distal positioning of mandibular first molar is the main causative factor in majority of cases. The mandibular canine is also positioned distally on Class II side in such cases<sup>3</sup>. The orthodontic correction of Class II subdivision malocclusion is complex due presence of asymmetric molar relationship. In such patients, the displaced lower midline toward the Class II side with normal maxillary dental midline add to complexity of the treatment<sup>1,2</sup>. The treatment approaches for correction of such cases includes symmetric extraction of four premolars and asymmetric extraction of three premolars<sup>4,5</sup>. The four-premolars extraction approach (two maxillary first premolars and two mandibular first premolars) will produce bilateral Class I molar and canine relationships at the end of treatment. Asymmetric extractions which involve extraction of three premolars (two maxillary first premolars and one mandibular first premolar on the Class I side) will produce bilateral Class I canine relationship and Class I molar relationships on the Class I side and Class II molar relationships on the Class II side, along with coincidence of the maxillary and mandibular dental midlines to each other and to the midsagittal plane<sup>1,5</sup>.

Advantages of three premolars extraction protocol-

1. The interdental midline correction with little or without use of intermaxillary and anterior diagonal elastics. Thus, it eliminates the need for patient compliance<sup>2,6</sup>.
2. The treatment time is reduced as treatment time is directly related to the number of extracted premolars. The asymmetric extraction protocol offers interdental midline deviation correction and closure of the extraction space in the mandibular arch simultaneously<sup>3,5</sup>. Thus, three premolars extraction protocol is less time consuming than the conventional four premolars extraction protocol<sup>7</sup>.
3. The correction of midline is easier unlike four premolars

extraction protocol. The midline does not tend to shift towards the Class II side as there is no extraction space for closure on Class II side<sup>8</sup>.

There is greater difficulty in controlling the overbite when four first premolars are extracted. The three premolar extractions approach shows better tendency for correction of vertical irregularity in deep bite cases

### Alternative Treatment Option

In patient with subdivision malocclusion, the four premolars extractions with second premolar extracted on class II side in lower arch is an treatment option as this establishes a difference in anchorage between two sides canines to obtain Class I relationship<sup>4</sup>. However, second premolar extraction on Class II side also requires greater use of intermaxillary elastics to achieve Class I molar relationship on original Class II side. The correction of lower midline is also difficult as it tends to shift more towards Class I side during premolar extraction space closure. To avoid this, along with Class II elastics on Class II side, diagonal elastics must be used anteriorly<sup>8</sup>. This creates need for greater patient cooperation, and thus increases the risk of failure in case of poor patient compliance. Because of the advantages associated with three premolars extraction protocol, many author had advocated three premolars extraction protocols when patient profile allows upper and lower incisors retraction<sup>2,3,4,9</sup>. Thus in cases where treatment plan does not involve change in the anteroposterior relationship of posterior segment, the prognosis is better for correction malocclusion with three premolar extractions<sup>10,14</sup>.

### Case 1

14 year old female patient presented with chief complain of forwardly placed upper anteriors. On examination, her malocclusion was diagnosed as Class II subdivision right side. The upper midline was coinciding with facial midline while lower midline was shifted towards Class-II side by 2.5mm (Figure 1a, 1b and 1c).



**Figure 1a, 1b and 1c :** Pre treatment Case 1 showing Class II subdivision right malocclusion

The cephalometric evaluation showed Class II skeletal base with proclined and forwardly placed upper and lower incisors. The overjet and overbite were 5.5 mm and 5mm respectively. The profile of the patient was convex. Asymmetric extractions of three premolars were planned in this patient. The pre adjusted edgewise appliance (Roth prescription) was used.

The total treatment time was 13 months and at the end of the treatment bilateral Class I canine relationship, Class II molar relationship on right side and Class I molar relationship on left side were present. The normal anterior inclinations, overbite and overjet were achieved. (Figure 2a, 2b and 2c)



**Figure 2 a, 2b and 2c :** Post treatment case 1 with retainers showing final finished occlusion after 13 months of active treatment.

### Case 2

A 13 year old female patient was reported with chief complain of forwardly placed upper anteriors and buccally placed upper left canine. On examination, a Class II malocclusion subdivision left side was seen. The upper midline was coincident with facial midline while lower midline was shifted towards Class-II side by 3mm (Figure 3a, 3b and 3c).



**Figure 3a, 3b and 3c:** Pre treatment Case 2 showing Class II subdivision left malocclusion.

The patient gave a history of early loss of upper deciduous left canine. The overjet and overbite were 5 mm and 4mm respectively. The profile of patient was convex. Asymmetric three premolars extractions were planned in this patient. The pre adjusted edgewise appliance with Roth prescription was used.

The total treatment time was 14 months and at the end of the treatment bilateral Class I canine relationship, Class II molar relationship on left side and Class I molar relationship on right side were present. The normal anterior inclinations, overbite and overjet were achieved. (Figure 4a, 4b and 4c)



**Figure 4a, 4b and 4c:** Post treatment case 2 with retainers showing final finished occlusion after 14 months of active treatment.

### DISCUSSION

There are two primary categories of class II subdivision malocclusions. In a frontal clinical perspective, type 1 class II subdivision malocclusions are distinguished by the mandibular first molar's distal placing on the class II side, the maxillary dental midline's coincidence with the midfacial plane, and the mandibular dental midline's deviation to the class II side. The maxillary first molar's mesial placing on the class II side, the maxillary dental midline's deviation to the class I side, and the mandibular dental midline's concurrence with the midfacial plane are the characteristics of type 2 class II subdivision malocclusions<sup>9-11</sup>. Two maxillary premolar

extractions and one mandibular extraction are two possible treatments for type 1 class II subdivision malocclusions.

Both the patients presented here were of almost same age group having Class II subdivision malocclusion. Both patients had an asymmetric molar relationship and deviated lower midline towards Class II side, characteristic to type 1 Class II subdivision malocclusion. The three premolar extractions was planned in both cases sparing the second premolar on Class II side in lower arch as it allowed easy attainment of stable molar relationship and correction of lower midline, with less chance of bite deepening and without compromising on retraction. The less treatment time and elimination of patient compliance adds to the simplicity of this treatment protocol.

### CONCLUSION

The treatment of Class-II subdivision malocclusion with three premolars extractions gives easier and better treatment option for correction of mandibular midline deviation resulting in better correction of anteroposterior discrepancy in posterior segment in reasonably shorter time when compared to four premolar extraction treatment protocol.

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