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CASE STUDY

MANAGEMENT OF CLASS II SUBDIVISION MALOCCLUSION WITH UNILATERAL MAXILLARY FIRST PREMOLAR EXTRACTION

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ABSTRACT

Extraction decisions are extremely important during diagnosis and treatment planning. Management of class II malocclusion in adult is most difficult in orthodontics. In this case report, we present the orthodontic treatment of 19 year old female patient with a Class II div I subdivision malocclusion, with class II incisor and canine relationship, class II molar on left side and class I on right side with overjet of 10 mm and overbite of 6 mm and shift of upper midline to left side by 3mm treated with extraction of upper right first premolar and distalisation of upper left first and second molar with K loop.

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INTRODUCTION

The main goal of orthodontic treatment is to obtain symmetry on both side and normal relationship of the teeth with facial structures. The decision of whether to extract or not to extract the teeth in patients with asymmetry requires thorough consideration of several factors. Like whether asymmetry is of dental or skeletal origin, it is in upper arch or lower arch, shift of the dental or skeletal midline. One of the main reason for dental asymmetry is early loss of deciduous teeth and congenitally missing tooth or teeth, in our case there was missing 25, 35, 45 as patient gives history of extraction with same teeth along with history of trauma to upper anterior teeth when she was one year old. In this case report, we present the orthodontic treatment of 19 year old female patient with a Class II div I subdivision malocclusion, with class II incisor and canine relationship, class II molar on left side and class I on right side with overjet of 10 mm and overbite of 6 mm and shift of upper midline to left side by 3mm.

Case Report

This 19 year old female patient presented with Class II div I subdivision malocclusion, with class II incisor and canine relationship, class II molar on left side and class I on right side with overjet of 10 mm and overbite of 6 mm and shift of upper midline to left side by 3mm.The patient requested treatment to improve her dental appearance. She had no relevant medical history and patient gave H/O trauma to upper anterior teeth 15 years back. Extraoral examination revealed convex profile, average mandibular plane angle and protruded lips. Intraoral examination revealed retroclined upper right central incisor, missing upper left second premolar and lower second premolar on both side. To achieve an ideal result, a treatment plan using MBT appliance was planned and decision was taken to extract single upper right first premolar and to gain lost anchorage with distalization of upper left posterior segment with 'K' Loop. (Kalra, 1995)

Treatment Objectives

- Correction of proclined anterior teeth
- Achieving normal overbite and overjet
- Achieving class I molar, incisor & canine relationship

Treatment plan:

- **Maxillary arch:** Extraction of upper single first premolar on right side and upper third molar on both side
- **Mandibular arch:** Non extraction in lower arch

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- Initial alignment and levelling of upper and lower arch with MBT 0.022 slot
- After alignment distalization of maxillary left posterior segment with 'K' Loop (Kalra V. 1995)
- Retraction of anterior teeth with absolute anchorage.
- Achieving class I molar, incisor & canine relationship
- Final finishing and detailing

side retraction of canine was started simultaneously. 'K' loop (Kalra, 1995) was made from 0.017×0.025 TMA wire and Used to distalize molars in a more bodily fashion as the special V-bend in the K-Loop moves both the crown and root distally. The K-Loop (Kalra, 1995) produces gentle continuous forces for efficient and effective tooth movement.

Pre-treatment records

Intraoral photographs showing class I molar& canine relationship on right side and class II (end on) on left side with overjet of 10 mm & overbite of 6 mm

Intraoral photographs showing retroclined upper right central incisor, missing upper left second premolar and lower second premolar on both side

Treatment progress

Full-arch .022" appliances were bonded, and levelling and alignment were carried out with continuous .014" nickel titanium archwire. After initial alignment of upper and lower arch, segment of 19×25 SS wire was made in upper arch by cutting it mesial to maxillary left canine & 'K' loop was placed on maxillary left posterior segment with one arm inserted in maxillary left canine and one arm in maxillary first molar as shown in fig. SH 7 implant was also placed between maxillary left first premolar and first molar and maxillary anterior segment was hold by ligating it to the implant for preventing anchorage loss of anterior segment as shown in fig. On right

Activation

Step 1: Insert K-Loop (Kalra, 1995) into first molar tube and canine bracket. Place a mark just mesial to the molar tube and distal to the canine bracket.

Step 2: Place 2.0 mm high step bend 2.0mm distal to the molar mark and 2.0mm mesial to the canine mark.

Step 3: Insert K-Loop (Kalra, 1995) in place and ligate into canine bracket. Place a cinch back bend mesial to the canine bracket as shown.

Complete distalization was achieved in 7-8 months with bodily movement of molar & minimum anchorage loss of anterior

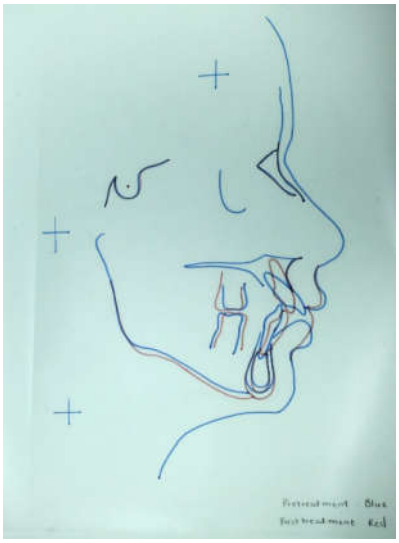
segment after distalization maxillary left canine & premolar was retracted separately and lastly anterior segment was retracted with friction mechanics.

Mid treatment Photographs


Insertion of 'K' loop (Kalra, 1995) on maxillary left posterior segment between canine and molar along with SH 7 implant for holding anterior segment



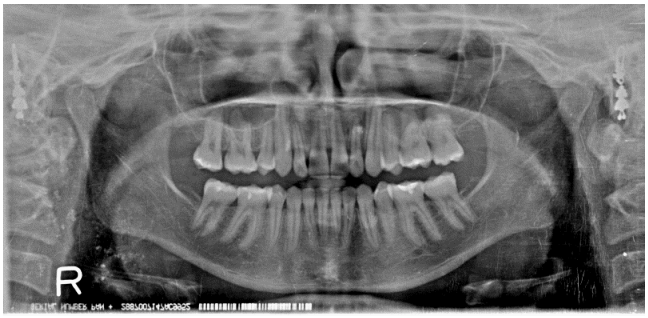
Maxillary arch showing space distal to premolar indicating distalised 2mm of molar after 2 months along with segmental canine retraction on right side



Superimposition Tracing

Pre-treatment Cephalogrph

Post-treatment cephalograph



Post-treatment OPG showing root parallelism of all teeth

Post treatment photographs

Post treatment Extraoral photographs

DISCUSSION

Asymmetrical malocclusions can be either of skeletal, dental or of soft-tissue origin. If the etiology is mainly dental, the asymmetry may have developed from abnormal dental eruption, premature loss of deciduous teeth, or loss of permanent teeth. If the aetiology is primarily skeletal, the patient may have a developmental or acquired asymmetry in either or both arches. In our case it is of mainly dental origin and because of premature loss of deciduous and permanent teeth. Asymmetrical malocclusions, although commonly seen in orthodontic practices, are among the most difficult cases to treat. In this patient as maxillary left premolar was missing maxillary molar got mesialised and we basically regained that space by distalising maxillary molar by 'K' loop. (Kalra, 1995)

Superimposition tracing showing 4mm distalization of upper molar along with 5-6 mm retraction of upper anterior teeth with good soft tissue profile.

Measurement	Pre treatment	Post treatment
SNA	82^0	82^0
SNB	78^0	78^0
U1 to NA angle	40^0	20^0
U1 to NA mm	8 mm	2 mm
L1 to NB angle	20^0	24^0
L1 to NB mm	3 mm	4 mm
FMA	29^0	29^0
IMPA	86^0	90^0
L1 to A-pog	1 mm	2 mm
U1 to pt. A	8 mm	3 mm
U1 to SN angle	124^0	105^0
U6 to ptv	24 mm	20 mm

Conclusion

Asymmetrical malocclusions although commonly seen in orthodontic practices, are among the most difficult cases to treat. As this case shows, an ideal result can be achieved with proper diagnosis and treatment planning with proper way to distalise maxillary posterior segment using K loop. (Kalra, 1995)

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