

Case report of relapsed all first premolar extraction case

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Abstract

This case describes orthodontic treatment in a relapse of the all first premolar extraction case. The case describes how the twin block which is made using the thermoplastic sheet to get more compliance in the adult patient is used. Post treatment photos show the better lower lip support and forward placement of mandible improving the lateral profile. This case report opens the new avenues to treat the Class II adult cases.

Introduction

Retention and relapse is an important aspect of orthodontics. Stable occlusion which is well harmonized with soft tissues is paramount objective in treatment planning. Achieving the ideal overjet and overbite mitigates the chances of relapse ¹. The rise in the cases of relapse is often the combination of attitude of patient towards retainers and unstable occlusion. The patients are often found non-compliant towards retainers especially

Hawleys retainers.²The retreatment of relapse cases are a challenge since they narrow down the treatment options.

Diagnosis

A 18 year old female patient presented with the chief complain of proclination of teeth. She had undergone the unsuccessful orthodontic treatment with all first premolar and maxillary third molar extraction. She had history of trauma in relation to left central incisor which show Ellis Class II fracture with negative finding on the panoramic radiographs (figure 2) and vitality. Clinical examination showed convex profile with prominent nose, deep mento labial sulcus and obtuse nasolabial angle. Intraorally, Class II molar and Class II canine relation on both sides can be seen with U shaped symmetrical upper and lower arches. Maxillary molars were mesiopalatally rotated and distopalatally tipped. Overjet of 7mm and overbite of 5mm is present with accentuated curve of spee. (figure 1)



Figure 1

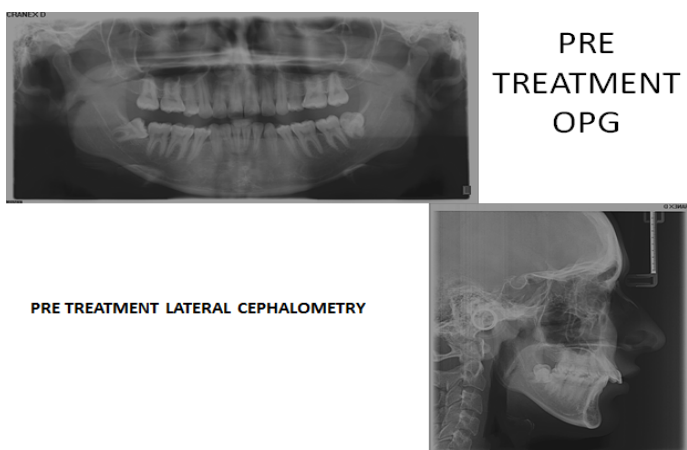


Figure 2

Cephalometric Analysis- Steiners, Tweed, Downs and Rakosi Jarabak Analysis are performed which shows skeletal Class II relation with orthognathic maxilla and retrognathic mandible with average growth pattern. Mesial tipping of maxillary incisors can be seen hence

requires uprighting. Mandibular plane in relation to nasion perpendicular and lower incisors is normal. Occlusal and palatal plane tilted upwards.

Parameter	Normal	Pre treatment	Inference	Post functional	Post Treatment
Sna	82°	83°	Orthognathic maxilla	83°	83°
Snb	80°	78°	Retrognathic mandible	80°	80°
Anb	2°	5°	Class ii	3°	3°
Upper I to sn	4 mm	5mm	Mesial tipping	5mm	4mm
Lower I to sn	4mm	5mm	Mesial tipping	5mm	5mm
Impa	90°	87°	Retrognathic lower incisors	94°	94°
Y axis	56° - 66°	65°	Average growth pattern	66°	66°
Fma	25°	28°	Average growth pattern	29°	29°
Saddle angle	123° ± 5°	129°	Posterior position in the glenoid fossa	131°	131°

Treatment Objectives

1. Achieving Class I skeletal relation as far as possible
2. Achieving Class I molar relation
3. Achieving Class I canine relation
4. To achieve ideal overjet and overbite
5. To correct rotations of teeth
6. To correct mesial tipping of teeth
7. To achieve ideal inclination of teeth
8. To achieve a balanced soft tissues

Treatment Alternatives

1. Two phase treatment: First phase Fixed twin block¹² was considered to correct the skeletal discrepancy i.e. treatment of skeletal class II^{13,14,15} followed by second phase of fixed mechanotherapy.
2. Distalization of maxillary first molars followed by retraction of anteriors.

The first treatment plan was considered since patient is skeletally Class II. Moreover, distalization and retraction of anteriors would have led to concave profile. Since she has prominent nose with retrognathic mandible distalization of the molars wasn't a good option.

Treatment Progress

The bite of the patient is taken with overjet of 6mm. The bite is articulated on the articulator (figure 3). Using the replicated cast Twin block is fabricated from the Biostar unit (Biostar® VI with Scan Technology, Great Lakes Tonawanda, NY). Biocryl sheet (Clear Splint Biocryl 1 mm round, Great Lakes Tonawanda, NY)³ is used to fabricate the base which covers the teeth but is palate free. Since the biocryl sheet is clear it is esthetic. The blocks are made over the biocryl sheets by clear acrylic. The upper block extends from premolar to second molar while the lower block from canine to the premolar. The blocks are placed in patients mouth and adjustments are made to have good sliding of blocks at 70 degrees. The blocks are then cemented. (Figure4).

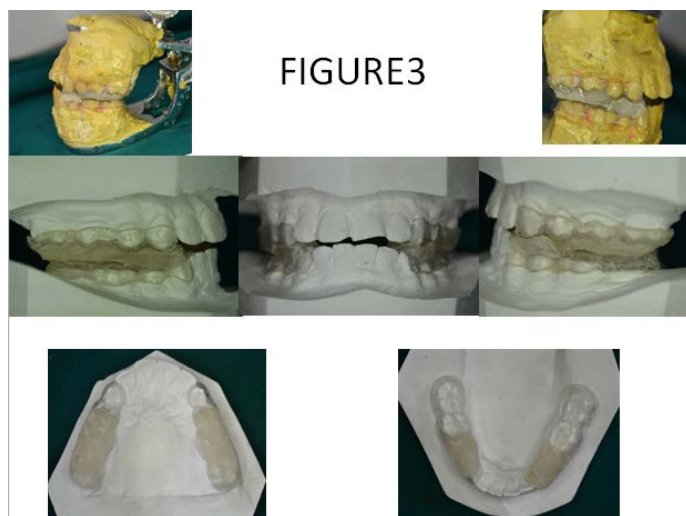


FIGURE3



FIGURE4

The blocks were kept for 10 months and selective trimming was carried out after 5 months. Class I molar relation was achieved after the functional phase.(figure5)



Figure 5



FIGURE 6

Phase II treatment with fixed mechanotherapy was started. Upper and lower arches are bonded and all molars are banded. The wire sequence was followed starting from 0.012 niti, 0.014 niti, 0.016 niti, 0.016X0.016 niti, 0.017X0.025 niti and 0.019X0.025 SS.

TPA was given for derotation of maxillary molars^{4,16} TPA was constructed from 0.032 inch stainless steel wire which allows to give symmetrical forces at both sides of the end of arch.¹⁷(FIGURE 6). Settling of occlusion is carried out. The final occlusion is achieved.(figure 7) . Comparison in lateral cephalometry (figure8) Retention protocol for lingual retainer and Hawley retainer is given.



POST TREATMENT



Figure 7



Figure 8

Discussion

Retreatment cases are always a challenge due to limited amount of treatment options especially when it is treated with all first premolar extractions previously. We not just have to heed to dental and soft tissues problems but also skeletal problems and retention. Functional appliances bring about both skeletal and dentoalveolar changes depending upon the force vector.¹⁸ In the case report the attempt is made to correct the skeletal class II relation using the fixed twin block which would act hybrid of myofunctional and fixed functional appliances.

Twin block compared to fixed functional appliances leads to more mandibular ramus growth and better control over the vertical height.^{5,11,19} Moreover, the first molars remain free to derotate which is not possible when fixed functional appliances are given. Twin block main area of action is mandible. Twin block helps to place the mandible forward and increase the condylar remodelling.⁶

The soft tissue changes are better in twin block compared to fixed functional appliances. The fixed functional appliances act by retrusion of upper incisors and maxillary molar distalization. Henceforth, the Labrale Superious and upper lip moving backwards rather than improvement in the lower lip and soft tissue menton.⁷

The changes seen in the the case report are amalgamation of skeletal and dental changes. Proclination of the lower

incisors which is evident both on twin block and fixed functional appliances are seen.⁸ The lower incisor proclination in twin block is less compared to fixed functional appliances.⁹ The increase in mandibular length and the posterior rotation of mandible due to additional growth in a superoposterior direction, with increased bone apposition at the posterior aspects of the condylar head and of the ramus is evident.¹⁰ Moreover, condylar growth, coronoid process remodeling, and osteogenesis in corpus and dentoalveolar regions reflects the skeletal correction.²⁰

Conclusion

Relapse brings perplexity in orthodontic branch. The cases which are priorly treated with extractions increases the patient expectation and narrows down the treatment options. The case here has shown positive results in all the three domain of skeletal, dental and soft tissue. The patient is cheerful smile and satisfaction brings utmost happiness to us.

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