A Combination Preadjusted Edgewise Approach Treatment of Class I Bimaxillary Proclination with Upper and Lower First Premolars Extraction

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Angle Class I bimaxillary proclination case with midline discrepancy and crowding in upper and lower anterior teeth was treated with upper and lower first premolars extraction using 0.018" Roth prescription. To simplify the treatment combination technology of Roth, Alexander and MBT was used.

Key words: Soldered transpalatal arch, laceback, canine retraction module, friction and frictionless mechanics, lateral excursions.

Introduction:

Many treatment methods are being used in India. Most of the clinicians are switching from Begg's to Tip-Edge Technology or Pre-adjusted Technology for their three dimensional control during the treatment.

Our experience of last 29 years in Begg's technique and last 7 years in Pre-adjusted technology has revolutionized the orthodontic concept in our mind.

This is a presentation using our experience of light arch wire technology and combination of different Pre-adjusted Technologies.

(It is a format, required for Indian Board of Orthodontics, which also includes pre and post treatment models.)

Case History:

A female patient (M.U.) (fig.1,2), age 21 years, reported to us on 6th March, 2000 with chief complaint of prominent and malaligned front teeth.

Family history:

There was no obvious history of similar malocclusion, any major illness or allergies in her family.

Medical history:

No obvious prenatal or postnatal history.

Dental History:

Patient was not having any teething problems or any type of habit.

Intraoral examination:

Patient was having fair oral hygiene, normal mucosa, gingiva and frenum.

There were no supernumerary teeth.

Class I molar relationship with crowding in upper and lower anterior teeth (fig.3,5).

Orthopantomogram examination revealed that all permanent teeth were present & no pathology was observed (fig. 49).

The upper central incisors were prominent (fig. 4).

Diagnosis:

Skeletal relationship: Class I with Bimaxillary proclination (fig.47)

Dental relationship: Canines and First Molars were in Angles' Class I relationship.

The case was diagnosed from:

Model analysis: Upper and lower arch length discrepancy shows excess tooth material.
Ashley Howe's index is more than 37% indicates non-extraction.
Carey's index discrepancy is between 0 to 2.5 mm indicates proximal reduction.
Bolton's analysis: Over all ratio and anterior cephalometric analysis (Table – 2): Angulation of lower central incisor to NB 34° and IMPA 105° were significantly on higher side.
Esthetic line shows significant 3 mm prominence of upper and lower lips.
Orthopantomogram: All teeth up to third molars are present having normal root pattern (fig. 49).
Overall diagnosis: Looking to the patient's facial profile and above findings indicates Extraction Case.

Treatment plan:
- Extraction of upper and lower first premolars.
- Roth Preadjusted Edgewise Appliance with 0.018" slot was given (fig.6,7,8,23,26).
- Soldered Transpalatal arch of 0.036" S.S. wire was given during treatment to hold the maxillary first permanent molars (Fig. 23).

Treatment progress:
- Upper standard Roth appliance was given from first molar to first molar. (fig.6,7,8)
- Lace backs from upper molar to canine on right and left side with 0.009" S.S. wire were given. (fig. 6,8)
- Upper 0.016" Nitinol wire was given for alignment of teeth (fig.6,7,8,23).
- After alignment of upper teeth, lower standard Roth appliance was given from first molar to first molar. Lower second premolars and upper right second premolar were banded. (fig. 26)
- Lace backs was given from lower molar to canine followed by 0.016" Nitinol wire for alignment of lower teeth.
- Upper 0.016" × 0.022" S.S. wire with mild curve of Spee and lower 0.016" × 0.022" S.S. wire with mild reverse curve of Spee were given for bite opening (fig. 9,10,11).
- For upper and lower arches standard arch format was strictly observed.
- Consolidation of centrals and laterals in upper and lower arches were done to prevent opening of spaces due to stretch of transseptal group of periodontal membrane fibers during canine retraction. Consolidation of second premolars and molars were done to increase anchorage during retraction.
- Retraction module was prepared by cutting single module of power chain ligated with 2 inch long 0.009" ligature wire to produce friction mechanics.
- Total retraction of canine was achieved with 2x stretched retraction module which was changed every month.
- While retraction of upper and lower canines, Class I canine relation was strictly observed. (Fig. 9,11,12,14)
- After total retraction of upper and lower canines upper and lower 0.016" × 0.022" S.S. wire with tear drop loops distal to lateral incisors were given which had to be activated 1 mm at each month till closure of the space between lateral incisor and canine using friction less mechanics. (fig. 12,14)
- Teardrop loop wires were given approximately 10° alpha bend and 20°-beta bend observing standard arch format.
- Flat upper and lower 0.017" × 0.025" S.S. flat wires were given for proper interdigitiation observing standard arch format. (fig. 15,16,17)
- Canine and incisal guidance was checked before removal of appliance for proper atraumatic occlusion.

Retention:
After removal of appliance upper and lower Hawley's retainers were given for retention.

Evaluation of Result (Table – 1):
- Angle's Class I canine & molar relations were maintained. (fig. 37, 39, 40, 42)
- Proper midline was established (fig. 38, 41).
- Perfect coincided arch shape was established (fig. 43, 44, 45, 46).
- Perfect harmony of the facial profile was gained. (fig. 33, 34, 35, 36).
- Cranial base superimposition, maxillary & mandibular superimpositions show significant reduction in bimaxillary proclination. (fig. 47, 48, 51, 52)
- Orthopantomogram shows perfect root paralleling (fig.49,50).
- Active treatment duration was 14 months.
BEFORE TREATMENT
<table>
<thead>
<tr>
<th>Area</th>
<th>Measurement</th>
<th>Normal</th>
<th>Pre-treatment</th>
<th>Post-treatment</th>
<th>Difference Pre &amp; post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxilla to Cranial base</td>
<td>SNA</td>
<td>82°</td>
<td>81°</td>
<td>79°</td>
<td>2°</td>
</tr>
<tr>
<td>Mandible to Cranial base</td>
<td>SNB, SN-GoGn, FMA</td>
<td>80°, 32°, 25°</td>
<td>81°, 26°, 25°</td>
<td>80°, 28°, 26°</td>
<td>1°, 1°</td>
</tr>
<tr>
<td>Maxillo-Mandibular</td>
<td>ANB, Wits, Interincisal (Angle)</td>
<td>2° - 1 mm, 131°</td>
<td>0° - 6 mm, 117°</td>
<td>1° - 4 mm, 130°</td>
<td>1°, 2 mm, 13°</td>
</tr>
<tr>
<td>Maxillary Dentition</td>
<td>1 to NA, 1 to SN</td>
<td>22° 4 mm, 102°</td>
<td>29° 11 mm, 110°</td>
<td>26° 8 mm, 105°</td>
<td>3°, 3 mm, 5°</td>
</tr>
<tr>
<td>Mandibular Dentition</td>
<td>1 to NB, IMPA</td>
<td>25° 4 mm, 90°</td>
<td>34° 10 mm, 105°</td>
<td>23° 4 mm, 95°</td>
<td>11°, 6 mm, 10°</td>
</tr>
<tr>
<td>Soft Tissue</td>
<td>Esthetic Plane</td>
<td>-4 mm -2 mm, 3 mm</td>
<td>-1 mm 1 mm, 2 mm</td>
<td>-4 mm 1 mm, 3 mm</td>
<td>3 mm, 2 mm</td>
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</tbody>
</table>
Conclusion:
A class I Bimaxillary proclination case was treated with extraction of upper and lower first premolars using the combination approach as follows:
- MBT technology for canine retraction.
- Alexander ideology for Driftodontics.
- Roth 0.018" slot approach for retraction of anterior teeth and finishing.

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