Orthodontic Management of Crowding - case report

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ABSTRACT

Two female aged 13 and15 yrs presented with class-I malocclusion with crowding and lock bite on upper right and left lateral incisors. Treatment involved extraction of all first premolars. The alignment of teeth of booth arch was achieved by edgewise orthodontic therapy.

Key Words: Class I malocclusion, crowding, edgewise orthodontic therapy

INTRODUCTION

Class I malocclusion can present itself in a wide spectrum of conditions and multiple combinations of crowding, spacing, rotations, cross bites and bimaxillary protrusion. Class I malocclusion with significant crowding of more than 4mm are best managed with extractions of teeth, most commonly the first premolars. First premolars are the teeth of choice for extraction since they are usually located in close proximity to the problem i,e. crowding and /protrusion. Crowding of the teeth is the most common type of malocclusion at present. Undoubtedly it is related in part to the continuing reduction in jaw and tooth size in human evolutionary development. Jaw dimensions do seem to have a strong genetic control. Environmental factors must have played some role in the recent increase in crowding of the dental arches.[1-3]

CASE REPORT

HISTORY AND DIAGNOSIS

A 13 year old female came to the department of Orthodontics and Dentofacial Orthopedics, Dhaka Dental College and Hospital with the chief compliant of crowding on upper and lower jaw with rotation on lower right central incisors.

The patient was in the permanent dentition. She had no relevant dental, medical or family history and had no history of previous orthodontic treatment.

On extra oral examination (Fig: 1) she had a symmetric face with a slight convex profile. Lips are incompetent. Her TMJ was alright and had a normal path of closure.

Clinical examination (Fig.2) showed crowding in both upper and lower arch and rotation in lower central incisor. There was total of 9 mm crowding in maxilla and 10 mm crowding in the mandibular arch. She had Class I molar relationship with 4 mm overjet and 2 mm overbite. There was no premature contact or any other pathology.
Radiographic examination (Fig.3A) showed a full permanent dentition and a Class I skeletal pattern (Fig.4A).

TREATMENT OBJECTIVES

Considering the above findings the objectives of orthodontic treatment of this patient were to –

1. Eliminate the crowding present in the upper and lower arch.
2. Correction of rotation
3. Establish and maintain a Class I molar and canine relationship.
4. Establish normal overjet and overbite.
5. Establish and maintain occlusal harmony and interdigitation for improved aesthetics and proper function.

TREATMENT PLAN AND PROGRESS

Due to the severity of crowding, the first option of treatment plan was to extract all the first premolars to provide space for alignment. Standard edgewise 0.018-inch slot bracket was bonded, Anchorage was enforced with an anchorage plate, and initial leveling was done with the use of 0.014-inch stainless steel arch wire with multiloop over 3 months. Then upper canines are retracted by using segments of elastomeric chain on 0.016-inch stainless steel arch wires.

In the lower arch, canine retraction was done by using segments of elastomeric chain on 0.016-inch stainless steel arch wires. To correct rotation space was opened with open coil spring then aligned with box loop. Then leveling and alignment was done by 0.014 multiloop arch wires. The remaining extraction space on both arches was closed with tear drop contraction loops on 0.016x 0.022 inch rectangular stainless steel arch wires. Arch coordination and interdigitation was done by using elastics (Fig.5). After arch coordination and finishing, the appliance was removed, retention involved upper Hawley retainer and lower fixed retainer.

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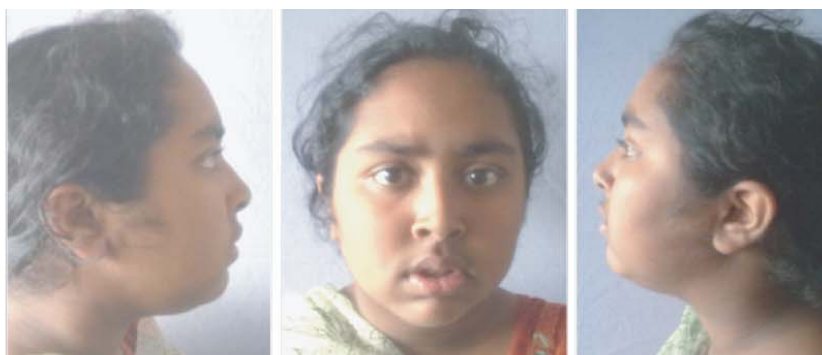
Fig.1: Pretreatment facial photographs

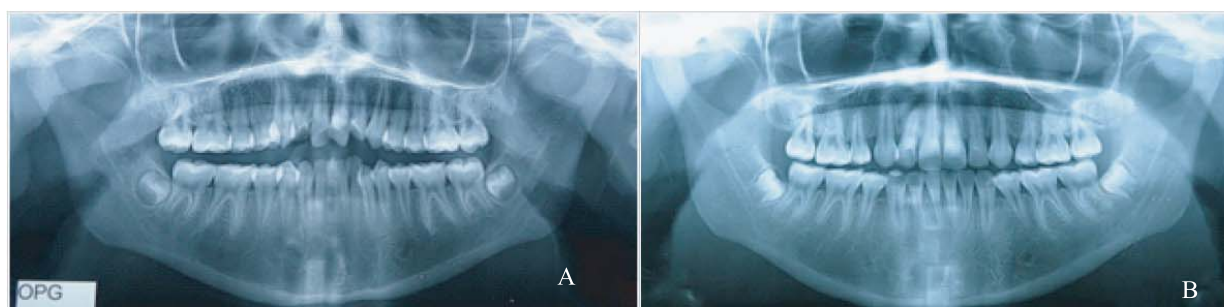Fig.2: Pretreatment intraoral photographs

Fig.3: Panoramic Radiograph before (A) and after treatment (B)

Fig.4: Cephalogram before (A) and after treatment (B)

26

Bangladesh Journal of Orthodontics and Dentofacial Orthopedics (BJO & DFO)
Vol. 4, No. 1 & 2, October 2013 & April 2014 [April 2014]

Fig.5: Class II elastic is used for arch coordination and interdigitation

Fig.6: Post-treatment intraoral photographs

Fig.7: Post-treatment facial photographs

RESULTS AND DISCUSSION

Total treatment time was 24 month, this is partly related to the long treatment time required to totally retract the canines. Post treatment records show that the treatment objectives were achieved. Facial photographs (Fig.7) show an improved profile. Class I canine and molar relationships were established with canine-protected occlusion. Ideal overjet and overbite were achieved. Proper alignment and nice gingival contour were attained (Fig.6).

Post treatment panoramic radiographs (Fig.3B) show good parallelism of roots and normal structure of the periodontium. No sign of root resorption was seen.

The post-treatment lateral cephalometric radiograph (Fig.4B) showed a balanced facial profile. Cephalometric analysis showed a Class I skeletal relationship, the ANB angle decreased slightly. Dental measurements did not change significantly. A functional and good-looking occlusal result was achieved. The patient was satisfied with her teeth and profile.

CASE REPORT-2

HISTORY AND DIAGNOSIS

A 15 year old female came to the department of Orthodontics and Dentofacial Orthopedics, Dhaka Dental College and Hospital with the chief compliant of crowding on upper and lower jaw with lock bite on upper right and left lateral incisors.

The patient was in the permanent dentition. She had no relevant dental, medical or family history and had no history of previous orthodontic treatment.

On extra oral examination (Fig: 7) she had a symmetric face with a straight profile. Lips are competent. Her TMJ was alright and had a normal path of closure.

Clinical examination (Fig.8) showed crowding in both upper and lower arch and upper right and left lateral incisors were

27

Bangladesh Journal of Orthodontics and Dentofacial Orthopedics (BJO & DFO)
Vol. 4, No. 1 & 2, October 2013 & April 2014 [April 2014]

in cross bite. There was total of 8 mm crowding in maxilla and 9 mm crowding in the mandibular arch. She had Class I on left side and on right side Class III molar relationship with 1 mm overjet and 1 mm overbite. There was no premature contact or any other pathology.

Radiographic examination (Fig.10 A) showed a full permanent dentition and a Class I skeletal pattern (Fig.11A).

TREATMENT OBJECTIVES

Considering the above findings the objectives of orthodontic treatment of this patient were to –

1. Eliminate the crowding present in the upper and lower arch.
2. Correct the cross bite.
3. Establish and maintain a Class I molar and canine relationship.
4. Establish normal overjet and overbite.
5. Establish and maintain occlusal harmony and interdigitation for improved aesthetics and proper function.

TREATMENT PLAN AND PROGRESS

Due to the severity of crowding, the first option of treatment plan was to extract all the first premolars to provide space for alignment. Standard edgewise 0.018-inch slot bracket was bonded; initial leveling was done with the use of 0.014-inch stainless steel arch wire with multiloop over 3 months. Then upper and lower canines were retracted by using segments of elastomeric chain on 0.016-inch stainless steel arch wires simultaneously. After closing the extraction space, 0.014 inch stainless steel with 'L' loops was placed to correct the cross bite of upper lateral incisors. In this stage bite opened by using posterior bite plane to free the lock.

In the lower arch, leveling and alignment was done by 0.014 multiloop arch wires. The remaining extraction space on both arches was closed with tear drop contraction loops on 0.016x 0.022 inch rectangular stainless steel arch wires.

After arch coordination and finishing, the appliance was removed, retention involved upper and lower removable begs retainer.
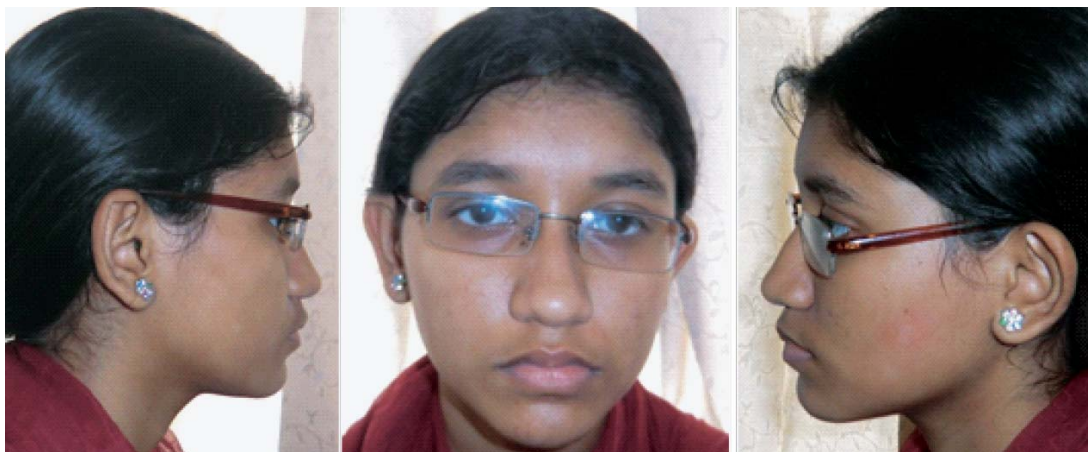

Fig.7 : Pretreatment facial photographs

Fig.8: Pretreatment intraoral photographs

Fig.9: Post-treatment intraoral photographs

28

Bangladesh Journal of Orthodontics and Dentofacial Orthopedics (BJO & DFO)
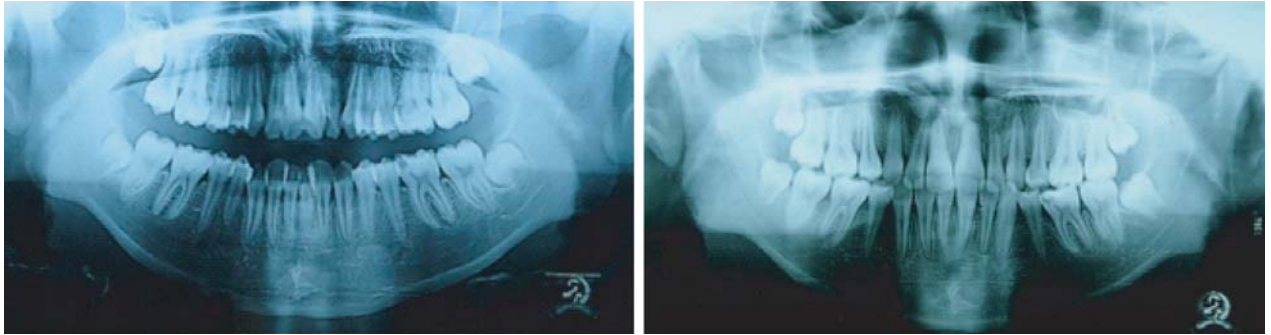*Vol. 4, No. 1 & 2, October 2013 & April 2014 [April 2014]*

Fig.10: Panoramic Radiograph before (A) and after treatment (B)
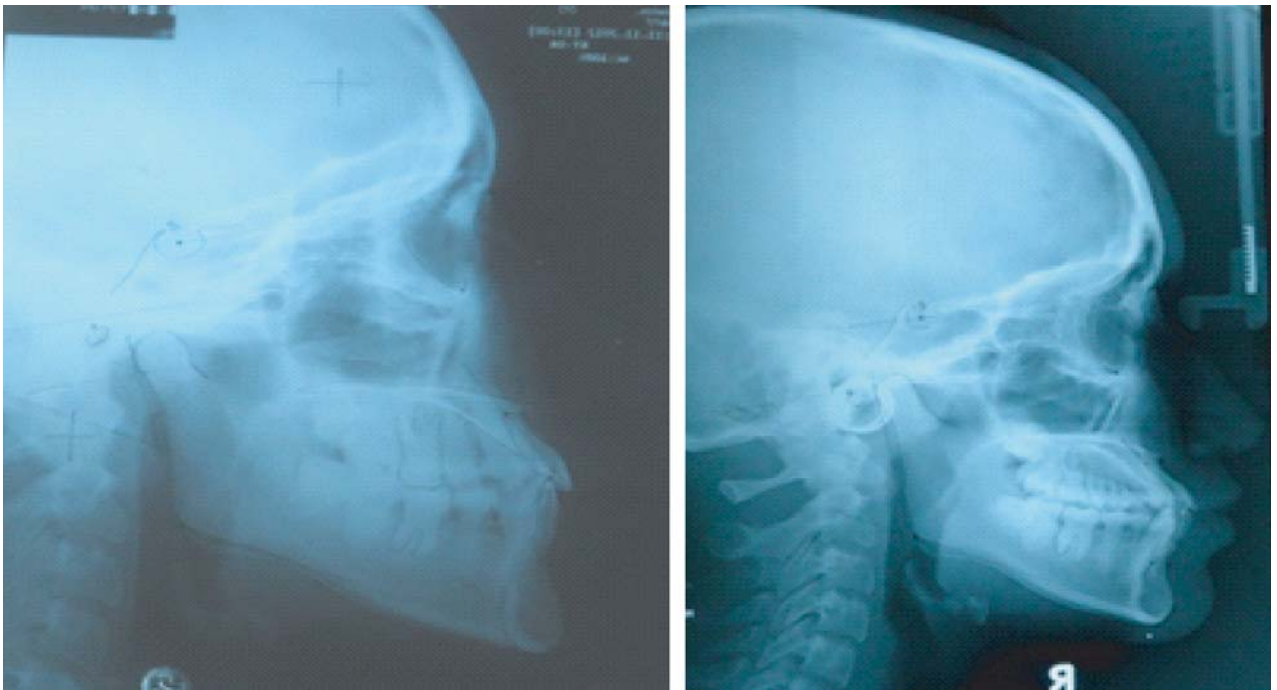
Fig.11: Cephalogram before (A) and after treatment (B)

Fig.12: Post-treatment intraoral photographs

29

Bangladesh Journal of Orthodontics and Dentofacial Orthopedics (BJO & DFO)
Vol. 4, No. 1 & 2, October 2013 & April 2014 [April 2014]

RESULTS AND DISCUSSION:

Total treatment time was 18 month, this is partly related to the long treatment time required to totally retract the canines. Post treatment records show that the treatment objectives were achieved. Facial photographs (Fig.12) show an improved profile and an attractive smile. Class I canine and molar relationships were established with canine-protected occlusion. Ideal overjet and overbite were achieved. Proper alignment and nice gingival contour were attained (Fig.9).

Post treatment panoramic radiographs (Fig.10B) show good parallelism of roots and normal structure of the periodontium. No sign of root resorption was seen.

The post-treatment lateral cephalometric radiograph (fig.11 B) showed a balanced facial profile. Cephalometric analysis showed a Class I skeletal relationship, the ANB angle was unchanged. Dental measurements did not change significantly. A functional and good-looking occlusal result was achieved. The patient was satisfied with her teeth and profile.

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30

Bangladesh Journal of Orthodontics and Dentofacial Orthopedics (BJO & DFO)
Vol. 4, No. 1 & 2, October 2013 & April 2014 [April 2014]