



Correction of Severely Crowded Lower Anterior Teeth Using Self-Ligating Bracket System: A Case Report

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Abstract

Introduction: Crowding is one of the popular complaints for undergoing treatment so far. The individual who has crowded teeth not only suffers from the unaesthetic appearance, but also with the functional deficiencies in form improper cleaning and gum related problems. Orthodontics is a boon for such people and with the advent of technological break through the correction of crowding is possible within no time with less pain and more comfort.

Case Presentation: A 13-year-old male patient presented himself with the chief complaint of irregularly placed in the upper and lower front teeth. On examination, he had a convex profile with retrognathic mandible, posterior divergence. The intra oral examination revealed angle's class I malocclusion with 4mm overjet and 5 mm of over bite. The upper anteriors were moderately crowded and the lower anteriors were severely crowded with an in-standing left lateral incisor. Lower dental midline was shifted to the left by 3mm.

Discussion: The article shows the effective non extraction management of crowding case using self-ligating bracket system which otherwise with conventional bracket system would have been difficult to treat with the non-extraction treatment modality

Keywords: Self-Ligating Brackets, Crowded Teeth, Damon Brackets

1. Introduction

In the era of variable transformation temperature orthodontics, correction of crowding using extraction modality is not the only option available to orthodontist. Now with the advanced bracket systems like self-ligating brackets and the temperature activated wires, non-extraction treatment for the reliving of the crowding is the best choice. Even though the exception do exist for this but most of the cases can be handled with conservative mode of treatment. Self-ligating brackets have etched their name in the history of orthodontics because of their time saving ability during appointment times, (1, 2) very low friction (3, 4) and increased efficacy of treatment (5-7). With these advantages they are duty bound to stay here for long. The present article is report of one such case of sever crowding treated using self-ligating bracket system.

2. Case Presentation

A 13-year-old male patient presented himself with the chief complaint of irregularly placed upper and lower

front teeth. On examination he was having a convex profile with retrognathic mandible, posterior divergence (Figure 1A - 1C). The intra oral examination (Figure 2A - 2E) revealed angle's class I malocclusion with 4 mm overjet and 5 mm of over bite. The Upper anteriors were moderately crowded and the lower anteriors were severely crowded with an in-standing left lateral incisor. Lower dental midline was shifted to the left by 3 mm.

The radiographic examination (Figure 3) presented with skeletal class I jaw bases with horizontal growth pattern and mild proclination of upper and lower anterior teeth (Table 1). The Bolton's model analysis showed mandibular teeth excess in both the overall ratio and anterior tooth material ratio calculation.

2.1. Diagnosis

Angle's class I dental malocclusion with increased overjet and overbite with sever lower anterior crowding based on skeletal class I jaw bases with horizontal growth pattern with mild proclination of upper and lower anterior teeth.



Figure 1. A - C, Pre-Treatment Extra Oral Photographs

Table 1. Cephalometric Reading

Parameters	Pre-Treatment	Post Treatment
SNA	760	730
SNB	740	740
ANB	20	10
SN-MP	280	300
FMA	230	280
U1-SN	1080	1040
L1-MAN.PLANE	990	1010
U1-NA (ANGLE)	32.50	310
U1-NA (LINEAR), mm	7	10
L1-NB (ANGLE)	230	250
L1-NB (LINEAR)	5mm	6mm

2.2. Treatment Plan

It was decided to take up non extraction treatment modality using the Damon self-ligating bracket system as there was a scope for expansion in the lower posterior region.

Upper and lower teeth were banded and bonded according to the Damon’s bracket positioning recommendation. The initial leveling and aligning was carried out using Damon’s .016” Copper NiTi wire (Figure 4A - 4E). The open coil springs was placed between the Lower left central incisor and lower left canine in the lower anterior region. The crimpable tubes were crimped mesial to the crowded region as suggested by the Damon. In the posterior section

turbo bite was given on the lower first molars to relieve the lower anterior brackets from the occlusal interferences (Figure 4E). Lower second molars were not banded as they were partially erupted.

After the initial wire .016 × 022” copper NiTi followed by 019 × 25” copper NiTi (Figure 5A - 5E) were placed for the sequential leveling. A stainless steel wire of 019 × 025” in upper and lower arch along with the midline and the class II elastics was given for the lower midline correction and class II molar relation on the right side.

Repositioning of the bracket was done in relation to lower right lateral and the lower right canine for the root up righting and 019 × 25” copper NiTi was placed in the lower arch. It took one and half years to complete the case.

The post treatment extra oral photographs show the pleasing appearance of face (Figure 6A-6C).The post treatment photographs show class I molar and canine relationship with ideal overjet and over bite (Figure 7A - 7E). After finishing the case upper and lower bonded retainers were placed from canine to canine (Figure 7A - 7E and Figure 8).

2.3. Superimposition Results

The overall superimposition (Figure 9A) showed that the face has grown in downward and backward direction and lower molars are mesialized. The regional superimposition of maxilla (Figure 9B) showed forward movement of maxillary base along with the dentition, whereas in mandible dentoalveolar portion had moved back and the mandible itself has grown downward (Figure 9C). The comparison of the pre and the post lateral cephalometric read-



Figure 2. A - E, Pre-Treatment Intra Oral Photographs

ing suggests lower incisor proclination and overall growth of face in class III skeletal pattern ([Table 1](#))

Five year post treatment results show the retention of the results achieved with good intercuspation ([Figures 10A - 10C](#) and [11C - 11E](#)).

3. Discussion

The aim of the article is to show the effective management of crowding using self-ligating bracket system and the retention of the same over a long period. Though the reported case looks like the regular, orthodontically treated case, but its uniqueness is in the treatment plan. The case which otherwise would have been treated with all first premolar extraction with the con-

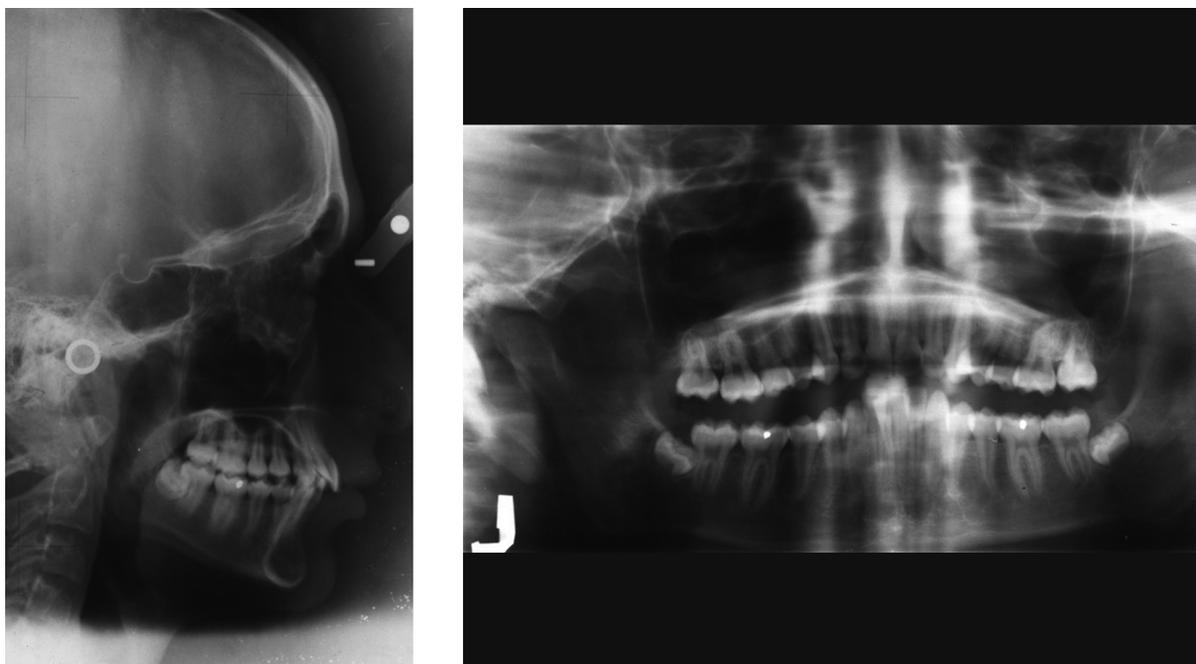


Figure 3. A - B, Pre-Treatment Radiographs

ventional pre-adjusted edgewise appliance was treated by non-extraction protocol using the self-ligating bracket system. This was made possible because of the biocompatibility of the particular appliance; it produced the passive expansion like effect by the arch wire configuration as well as the bracket profile (8). Typically the pioneers of self-ligating bracket suggest the use of copper NiTi wire during all the stages of the treatment, which produces a physiological sound force system for the teeth alignment (8).

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Figure 4. A - E, Levelling and Aligning Photographs



Figure 5. A - E, Mid-Treatment Photographs



Figure 6. A - C, Post Treatment Extra Oral Photographs



Figure 7. A - E, Post Treatment Intra Oral Photographs

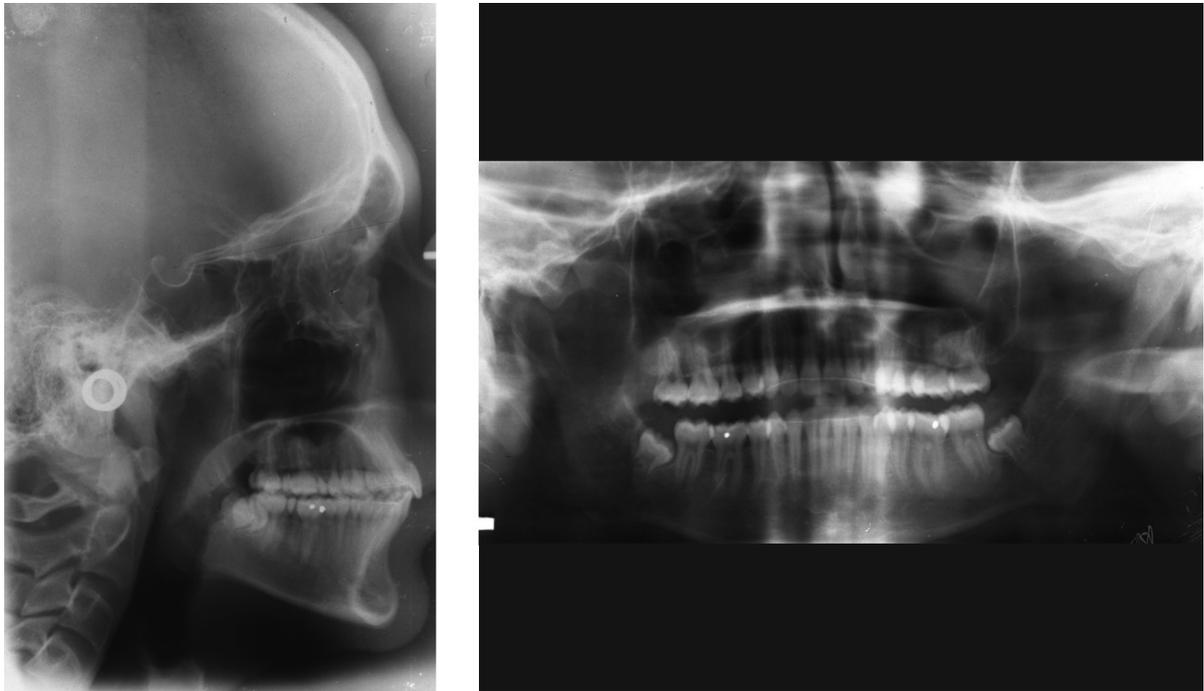


Figure 8. A - B, Post Treatment Radiographs

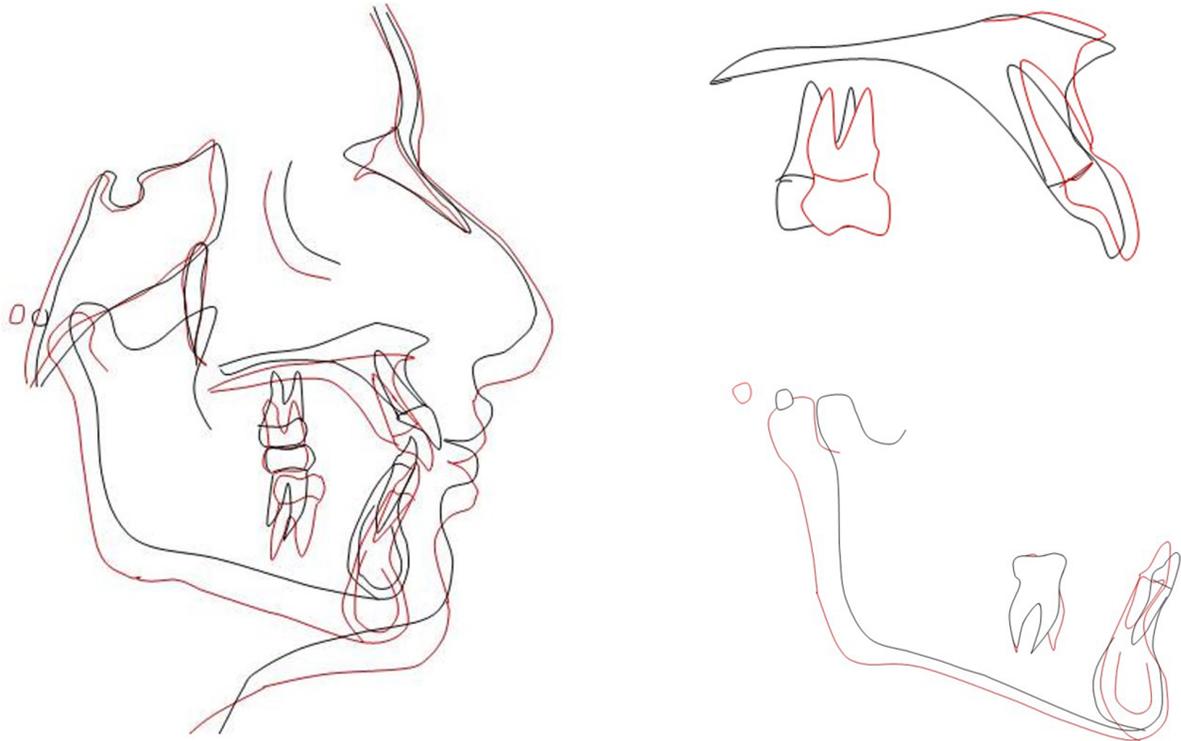


Figure 9. A - C, Superimposition

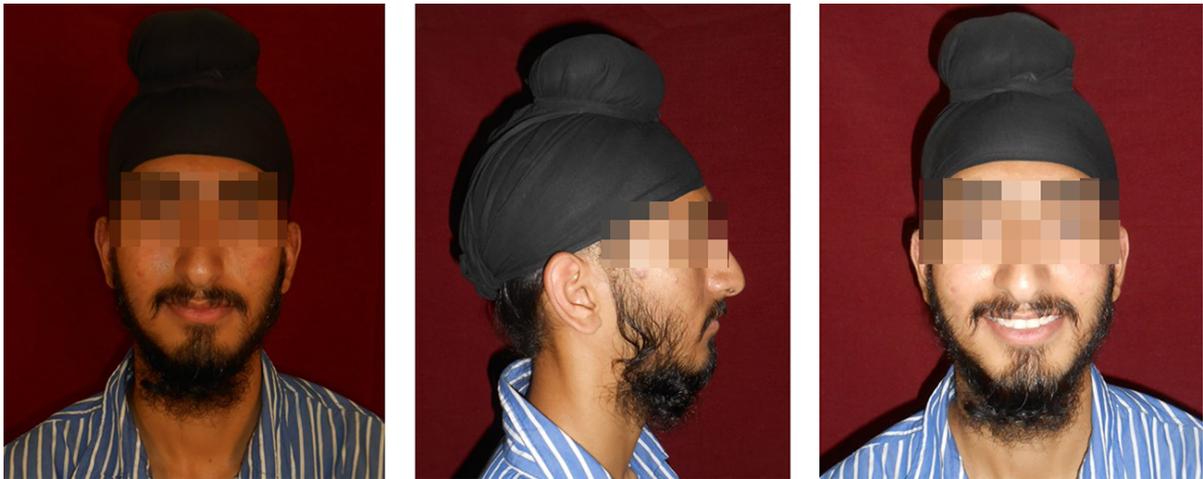


Figure 10. A - C, Five Year Post Retention Extra Oral Photographs



Figure 11. A - E, Five Year Post Retention Intra Oral Photographs