

## CASE REPORT

# Mandibular Single-incisor Extraction: An Efficient Treatment Approach

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## ABSTRACT

Removal of the mandibular single incisor is an alternative approach to treat some malocclusion. Many treatment strategies are presently used for crowded mandibular anterior dentition that include distalization of posterior teeth, slenderization, extraction of bicuspid, and extraction of mandibular incisors. This report presents the case of a boy aged 17 years with class I type III malocclusion, and the case is treated with lower single-incisor extraction due to the presence of crowding in mandibular anterior teeth, Bolton discrepancy in lower anterior by more than 4 mm, anterior cross bite, and the periodontally compromised single incisor. These all indicated the extraction of mandibular single incisor.

**Keywords:** Anterior cross bite, Bolton discrepancy, Mandibular incisor extraction, Periodontally compromised incisor.

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## INTRODUCTION

In orthodontics, it is always advisable to remove one or two teeth so as to achieve a normal functional occlusion. Many studies show that the extraction of mandibular single incisor is also an alternative therapeutic approach to achieve long-term stability.<sup>1,2</sup>

Indications for mandibular single-incisor extraction<sup>1,3</sup> are as follows:

- Tendency toward class III malocclusion
- A class I molar relationships with anterior cross bite
- A harmonious soft-tissue profile
- Anterior mandibular excess >4 mm

- Lower incisor placed out of the arch or block out lower incisor

- Good occlusion of the posterior segment  
The Kesling setup is mandatory in this approach.<sup>2,4</sup>

The benefits of lower single incisor eradication are as follows:

- Reduced the treatment duration, if crowding is only in the anterior region and maintains the posterior occlusion<sup>2</sup>
- Achieved adequate overjet<sup>3</sup>
- Maintenance of facial profile as small amount of retraction is required<sup>3</sup>

Some drawbacks of lower single incisor eradication are as follows:

- Overjet increased in case where very less amount of Bolton discrepancy exists, and the result will be a class III molar relationship, if used class II elastics to overcome the overjet
- Midline of upper and lower dentition remains mismatched and the space may be reopen after a long time<sup>4,5</sup>
- The "black triangles"<sup>6,7</sup>

Determination criteria of incisor extraction:

- Presence of periodontal pathology including bone loss
- Root canal-treated teeth
- Existing Bolton's discrepancy more than 4 mm, due to some conditions like presence of upper lateral incisor agenesis<sup>8,9</sup>

This case report presents the management of a 17-year-old patient having Angle's class I type III malocclusion, with mandibular anterior crowding, Ellis class I fractured maxillary right central incisor, and periodontally compromised mandibular left central incisor.

## CASE REPORT

### Diagnosis

This report presents the case of a boy aged 17 years, referred to the Department of Orthodontics and Dentofacial Orthopedics, Mahatma Gandhi Dental College and Hospital, Jaipur, India, with a chief complaint of irregularly placed upper and lower front teeth. He had a pleasing, straight profile, normal nasolabial and mentolabial sulci, and competent lips (Fig. 1).

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**Figs 1A to C:** Pretreatment extraoral photographs. (A) Frontal; (B) lateral oblique; and (C) right lateral

On examination, class I molar relationship and anterior cross bite in relation to right lateral incisor with respect to right lower canine was revealed (Fig. 2).

Lateral cephalogram evaluation revealed a class I skeletal and average growth pattern (Fig. 3). Arch perimeter and Carey's analysis revealed spacing of 2 mm in maxillary arch and crowding of 6 mm in mandibular arch and existing Bolton's discrepancy of 4.2 mm lower anterior region (Fig. 4).

The objectives of this treatment plan included:

- To relieve crowding in the lower arches
- To correct cross bite in relation to upper right lateral incisor with respect to right lower canine
- To maintain the adequate overjet and overbite and class I molar relationship
- To achieve class I canine relationship on both sides

### Treatment Plan

The lower central incisor extraction was planned as:

- The Bolton's discrepancy of lower anteriors was 4.2 mm, i.e., more than 4 mm.
- The lower left central incisor was periodontally compromised.
- The patient's profile was straight and there was a space requirement of 6 mm in the lower arch, which is equivalent to single incisor width.

So, the lower incisor (mandibular left central incisor) extraction was planned to correct mandibular crowding.

### Treatment Progress

In this case McLaughlin, Bennett, Trevisi 0.022" slot prescription along with lower left central incisor removal was planned. To disocclude the anteriors and to allow the correction of cross bite in the canine region, posterior bite blocks were placed. Wire sequence included 0.016

nickel–titanium (NiTi) in both arches followed by 0.016 × 0.022 NiTi and 0.017 × 0.025 stainless steel (SS) and 0.019 × 0.025 SS arch wires.

In lower arch, the space gained by removal of left central incisor was closed by the tight consolidation in the lower anteriors with ligature wire, during alignment of the remaining teeth.

After stage 1 correction, for full torque expression, 0.019" × 0.025" SS wire was placed in the upper and lower arches, and to close the spaces, E-chain was placed in lower arch over SS wire. In finishing stage, 0.016" premium plus Australian wire was inserted and settling elastics were used for settling of occlusion. The treatment runs for about 1½ years.

### Treatment Outcome

The pleasing straight profile was maintained (Fig. 5).

On both sides, class I molar and canine relationship were maintained and stable buccal occlusion was achieved. Anterior cross bite and crowding were resolved (Fig. 6).

Posttreatment lateral cephalogram (Fig. 7) shows well-settled skeletal class I occlusion and posttreatment OPG (Fig. 8) shows root parallelism.

### DISCUSSION

In orthodontics treatment, extraction of one single mandibular incisor is an uncommon approach over four bicuspid extractions. This approach is beneficial in terms where minor anterior cross bite is present with well-settled posterior occlusion as well as where we want to correct only the lower anterior crowding without changes in any facial esthetics.<sup>10</sup> The advantages are seen with this approach that both facial harmony and buccal occlusion remain balanced.



**Figs 2A to E:** Pretreatment intraoral photographs. (A) Right lateral; (B) left lateral; (C) frontal; (D) upper occlusal; and (E) lower occlusal



**Fig. 3:** Pretreatment lateral cephalogram



**Fig. 4:** Pretreatment orthopantomogram

#### Case Selection Criteria<sup>7,11-14</sup>

- Bolton's discrepancy more than 4 mm and anterior cross bite.
- Presence of peg lateralis or lateral incisor agenesis in upper arch.



**Figs 5A to C:** Posttreatment extraoral photographs. (A) Frontal; (B) lateral oblique; and (C) left lateral oblique



**Figs 6A to E:** Posttreatment intraoral photograph. (A) Right lateral oblique; (B) left lateral oblique; (C) frontal; (D) upper occlusal; and (E) lower occlusal



Fig. 7: Posttreatment lateral cephalogram

- Balanced facial harmony with class I molar relationship.
- Cervical vertebral maturation indicator stage VI in lateral cephalogram and fully erupted permanent teeth.
- Mild-to-moderate class III malocclusion with anterior cross bite.
- Malocclusions with one single incisor blocked in or blocked out from the arch.

## CONCLUSION

Mandibular single-incisor extraction is a convenient technique, both for orthodontist and patient rather than extracting four bicuspid that can be used as a therapeutic treatment alternative for correction of many malocclusion, including lower anterior crowding and anterior cross bite with well-settled buccal occlusion.

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Fig. 8: Posttreatment orthopantomogram

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