



## TREATMENT OF CLASS I MALOCCLUSION WITH LOWER INCISOR EXTRACTION- A CASE REPORT

### Orthodontics

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### ABSTRACT

Distal movement of posterior teeth, labial movement of incisors, interproximal enamel reduction, junking of premolars, junking of one or two incisors, and colourful combinations of the forenamed are presently used procedures for crowded mandibular anterior teeth. It might be gruelling to choose the right course of action, and not every situation will fit under every rule. Single mandibular incisor extraction isn't a common orthodontic treatment. A 16- time-old girl with a Class I malocclusion is the subject of a case study that details her mandibular incisor extraction procedure, which revealed a substantial mandibular low length insufficiency and mandibular tooth- size excess. The degree of mandibular anterior dental crowding in this case, the mandibular tooth- size that's presently present, and the dental midline distinction were indicated the extraction of one mandibular incisor

### KEYWORDS

Incisor Extraction, Mandibular Incisor, Crowding, Lower Incisor

### INTRODUCTION

Establishing a natural relationship between the teeth and facial structures is the primary objective of orthodontic treatment. Angle underlined that achieving facial harmony, balance, and aesthetics required the preservation of all dental units. Nevertheless, later research on the durability of the findings indicated that tooth extractions were required to rectify specific malocclusions. When it comes to orthodontic diagnosis and treatment planning, the lower incisor inclination is quite significant. Orthodontists understand that it is not always feasible to retain all dental units in order to rectify malocclusions.<sup>1-3</sup> In cases of extreme crowding, the extraction of a specific permanent tooth is required. The use of extraction versus non-extraction therapy protocols is hotly debated.

The orthodontic paradigm changed primarily from an extraction-oriented regimen in the middle of the 20th century to a non-extraction philosophy in the early 1900s, then back to the former again.<sup>4</sup> Currently, a number of methods are used to treat crowded mandibular anterior teeth, including the removal of premolars, the removal of one or two incisors, the distal movement of posterior teeth, the lateral movement of canines, the labial movement of incisors, and various combinations of the above mentioned. It might be challenging to choose the right course of action, and not every situation will fit under every rule.<sup>5</sup> A follower of Pierre Fauchard, Bourdet suggested extracting premolars in 1757 to alleviate congestion. Similarly, in cases of posterior protrusion, Hunter<sup>6</sup> removed the first premolars to permit incisor retrusion. Hahn<sup>7</sup> recommended the extraction of a mandibular incisor to bridge the gap and lessen anterior proclination over two centuries later.

One of the most important considerations when selecting one of the treatment plans is arch length shortage.<sup>8</sup> The disparity between the mandibular and maxillary dentitions is revealed by Bolton analysis. A mandibular incisor extraction may be an additional extraction option if there is a deficiency in the mesiodistal breadth of the maxillary anterior teeth. In orthodontic practice, extraction of a single mandibular incisor is not a common course of treatment. Mandibular incisor extraction indications, benefits, and restrictions have been discussed in previous works by Valinoti,<sup>9</sup> Shapiro,<sup>9</sup> and Riedel,<sup>10</sup>. The process of selecting patients and administering treatment with lower incisor extraction was elucidated by Uribe and Nanda<sup>11</sup>.

Owen<sup>4</sup> states that patients who meet the following criteria typically have a Class I molar relationship, moderately crowded lower incisors, mild to no crowding in the upper arch, an acceptable soft tissue profile, minimal to moderate overbite and overjet, no or minimal growth potential, and missing lateral incisors or peg-shaped laterals. These patients are therefore candidates for single lower incisor extraction. Unwanted side effects include space reopening, partially unsatisfactory posterior occlusion, recurrence of crowding in the remaining incisors, unaesthetic loss of interdental papillae in the mandibular anterior area, and increased overbite and overjet beyond acceptable limits.<sup>5,6,10,12</sup>

### Case report

#### Extra-oral Examination

A 16 year old female patient presented with the chief complaint of irregular teeth in upper and lower front region and excessive show of front teeth. On Extra oral examination, the patient had a Orthognathic facial profile, grossly symmetrical face on both sides, competent lips, normal mentolabial sulcus and normal Nasolabial Angle, a Mesoprosopic facial form, Dolichocephalic head form, average width of nose and mouth, minimal buccal corridor space, a consonant smile arc. The patient had no relevant prenatal, natal, postnatal history, history of habits or a family history. On Smiling, there was normal display show of maxillary anterior teeth. The patient had a toothy smile. On smiling he also showed the presence of mildly crowded anterior dentition and an unaesthetic facial profile and smile. The patient was very dissatisfied with his smile.



Pretreatment Extra Oral Photos

### Intra-oral Examination

Intraoral examination on frontal view shows presence of an increased overjet and an average overbite with the lower dental midline is not coincident with the upper dental midline. On lateral view the patient shows the presence of Class I Division 1 incisor relationship, class I Canine relationship unilaterally and class I molar relationship bilaterally. There is mild crowding in the upper and lower anterior region with proclined and forwardly placed upper and lower anterior teeth. The upper and lower arch shows the presence of a "U" shaped arch form.



Pretreatment Intra oral photos



Pretreatment x-rays

### Pretreatment cephalometric values

| Parameter           | Pre-treatment |
|---------------------|---------------|
| SNA                 | 800           |
| SNB                 | 780           |
| ANB                 | 20            |
| U1-NA angle         | 300           |
| U1-NA mm            | 8mm           |
| L1-NB angle         | 250           |
| L1-NB mm            | 4mm           |
| IMPA                | 910           |
| Inter-incisal angle | 1200          |
| FMA                 | 280           |
| Y-axis              | 630           |
| Nasolabial angle    | 930           |

### Diagnosis

This 16 year old female patient was diagnosed with a I malocclusion with a Class I skeletal pattern and an average to vertical growth pattern, increased overjet and overbite, proclined upper and lower incisors, mild crowding in the upper and lower anterior region, protruded upper and lower lips, normal mentolabial sulcus, competent lips with increased lip strain and Orthognathic face.

### List of problems

1. Proclined maxillary and mandibular anterior teeth
2. Mild crowding in maxillary and mandibular anterior region
3. Increased overjet and overbite
4. Increased lip strain

### Treatment objective

1. To correct proclined maxillary and mandibular anterior teeth
2. To correct crowding in the maxillary and mandibular anterior teeth
3. To correct increased overjet and overbite
4. To decrease the lip strain
5. To achieve a pleasing smile and a pleasing profile

### Treatment Plan

### Extraction of 32

Fixed appliance therapy with MBT 0.022 inch bracket slot  
Initial leveling and alignment with 0.012", 0.014", 0.016", 0.018", 0.020" NiTi archwires following sequence A of MBT  
Retraction and closure of spaces by use of 0.019" x 0.025" rectangular NiTi followed by 0.019" x 0.025" rectangular stainless steel wires.  
Final finishing and detailing with 0.014" round stainless steel wires  
Retention by means of essix retainers along with lingual bonded retainers in the upper and lower arch.

### Treatment Progress

Complete bonding & banding in both maxillary and mandibular arch done, using MBT-0.022X0.028" slot. Initially a 0.012" NiTi wire was used which was followed by 0.014 , 0.016", 0.018", 0.020" NiTi archwires following sequence A of MBT. After 6 months of alignment and leveling NiTi round wires were discontinued. Then 0.019" x 0.025" rectangular NiTi followed by 0.019" x 0.025" rectangular stainless steel wires were used Reverse curve of spee in the lower arch and exaggerated curve of spee in the upper arch was incorporated in the heavy archwires to prevent the excessive bite deepening during retraction process and also to maintain the now achieved normal overjet and overbite. Light retraction forces were applied from molar hook to canine hook. Retraction and closure of spaces was done with the help of Elastomeric chains delivering light continuous forces and replaced after every 4 weeks due to force decay and reduction in its activity. Finally light settling elastics were given with rectangular steel wires in lower arch and 0.012" light NiTi wire in upper arch for settling , finishing, detailing and proper intercuspation. The increased overjet and overbite was corrected with an ideal occlusion at the end of the fixed appliance therapy. Also the profile of the patient improved significantly with a pleasant and consonant smile arc on smiling. Also, the Nasolabial angle improved significantly at the end of treatment.

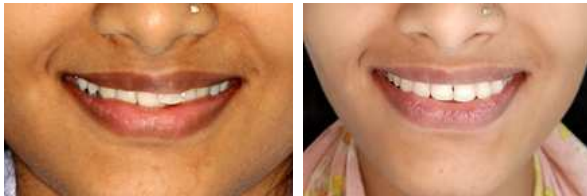
### Post Treatment Records

#### Post treatment extra oral photos



### Post-treatment cephalometric values

| Parameter           | Post-treatment |
|---------------------|----------------|
| SNA                 | 800            |
| SNB                 | 780            |
| ANB                 | 20             |
| U1-NA angle         | 220            |
| U1-NA mm            | 4mm            |
| L1-NB angle         | 250            |
| L1-NB mm            | 4mm            |
| IMPA                | 900            |
| Inter-incisal angle | 1330           |
| FMA                 | 250            |
| Y-axis              | 600            |
| Nasolabial angle    | 1000           |

**Pre-treatment smile****Post-treatment smile****DISCUSSION**

Treatment results with one mandibular incisor extraction have been supported by case reports of Owen,<sup>4</sup> Valinoti,<sup>5</sup> Kokich.<sup>9</sup> However, studies by Riedel<sup>10</sup> suggested treatment with lower incisor extraction in certain malocclusions only. Single incisor extraction enable the clinician to produce enhanced functional and cosmetic results with minimal orthodontic manipulation.<sup>9</sup> Stability of the results with mandibular incisor extraction seemed to be better than the treatment with premolar extraction.<sup>10</sup> Mandibular incisor extraction has some advantages such as permitting maintenance of a harmonious profile by keeping anteroposterior position of lower incisor<sup>11,12</sup> and reducing treatment time.<sup>9</sup> In patients with mandibular incisor crowding, both extraction and non-extraction can result in the increase of intercanine width. Extraction of a mandibular incisor reduces dental crowding without expanding the intercanine width and improves mandibular anterior root parallelism with the reduction in root proximity. It also increases the thickness of interdental bone. With this approach, posterior occlusion is not affected where interdigitation is good.

**Conflict of interest statement -**

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**Ethical statement –**

Patient consent was taken before starting the treatment as it was a clinical study

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