

Mandibular Incisor Extraction: A Case Report

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Abstract

A proper case selection and treatment planning for lower incisor extraction is gaining popularity with its numerous advantages in mandibular crowding cases. Lower incisor extraction has helped in avoiding expansion of intercanine width and in relieving crowding. It also helps to simplify the orthodontic treatment mechanics with improvement in occlusion and dental esthetics in reduced treatment time.

Key Words: Occlusal Harmony, Inter Canine Width, Alignment.

Introduction:

Extraction in orthodontics is a therapeutic method to gain space for relieving crowding. Extraction to create space for accommodation of the remaining teeth of crowded dental arches was written up in the dental literature as long as 1771. Extractions of first or second premolars were common alternatives to gain space considering the facial profile and space requirement. However, extraction of one or more lower incisor was considered as a controversial method as it was found to present with unwanted side effects as increase in overbite, overjet, space reopening, partly unsatisfactory posterior occlusion, recurrence of crowding in remaining three incisors and unesthetic loss of interdental gingival papilla in mandibular anterior region. These side effects can be minimized with a proper case selection and controlled use of simple treatment mechanics.^{1,2,3} This article presents a case of lower incisor extraction.

Case Report:

A female patient 16 years old reported with a chief complaint of crowding in lower anterior teeth and forwardly placed upper anterior teeth. She had a mild convex pleasing facial profile with competent lips [Figure 1]. Her intra-oral clinical examination

showed severe crowding with mandibular anteriors and mild crowding with maxillary anteriors and Angles Class I molar relation bilaterally. Due to lower anterior crowding, mandibular left canine was displaced buccally [Figure 2] Model analysis showed Boltons ratio, mandibular anterior and overall excess of 5.6 mm and 1.4 mm respectively.

The main objective of treatment plan was aimed at relieving lower and upper anterior crowding without much disturbing her facial profile. Extraction of mandibular left lateral incisor, to facilitate proper aligning of 33 was planned which would gain space enough to relieve lower anterior crowding. Prior to start of orthodontic treatment, periodontal maintenance in form of scaling and extraction of incisor was done.

The orthodontic treatment was started using PAE 0.022 slot brackets. 0.014 inch NiTi preformed arch wire was used as initial wire as to exert very light forces.⁴ Alignment and levelling was achieved with subsequent wire sequence (Table 1). After levelling, using 0.019 x 0.025 SS arch wire space closure was started with very light forces using tie backs. Anterior teeth were also placed together with continuous ligation when retracted, for distributing the force acting on the anterior teeth.



Figure 1.a: Pre Treatment Extra Oral Frontal View



Figure 1.b: Pre Treatment Extra Oral Frontal Smile View



Figure 1.c: Pre Treatment Extra Oral Lateral Profile View



Figure 2.a: Pre Treatment Intra Oral Frontal View



Figure 2.b: Pre Treatment Intra Oral Right Lateral View



Figure 2.c: Pre Treatment Intra Oral Left Lateral View



Figure 2.d: Pre Treatment Intra Oral Maxillary Occlusal View



Figure 2.e: Pre Treatment Intra Oral Mandibular Occlusal View

Table No. 1: Table Wire with Sequences

Table 1	Wire Sequence	Treatment
1	0.014” NiTi	Initial wire
2	0.016 NiTi	Aligning
3	0.018 NiTi	Aligning
4	0.016 x 0.022 NiTi	Aligning and Leveling
5	0.019 x 0.025 NiTi	Aligning and leveling
6	0.019 x 0.025 SS	Retraction

Note: NiTi- Nickel Titanium, SS- Stainless steel.

Her treatment resulted in good facial profile with alignment and levelling with no crowding in upper and lower arch [Figure 3, 4]. The total duration of orthodontic treatment was 17 months. After the appliance removal, bonded lingual retainers were given for permanent retention of the maxillary and mandibular arches.⁵

Discussion:

Extraction of lower incisor was advocated as early in 1904. Later, Reidel and co-workers and case reports by various authors have favoured removal of one or more incisors in severely crowded mandibular arches and considered one of the only logical alternatives.^{6,7} Arch length and tooth size discrepancy helps to evaluate the amount of space required for correction of crowding, levelling curve of spee and inclination of lower incisors. Anterior boltons discrepancy of more than 83 mm can be a definite case for lower incisor extraction.⁸ Extraction decision should be carried to produce harmony between the upper and lower arches without any deficient or excess space left.

This case presented with Boltons anterior mandibular excess and showed space requirement of 5.6 mm. Hence though proximal stripping an alternative to gain space, incisor extraction was planned to achieve more stable results. Simple mechanics with adequate torque control and axial inclinations of mandibular teeth was monitored to prevent lingual tilting of the mandibular canine crowns and unwanted narrowing of the inter-canine width. Care was taken to keep maxillary midline overlying the centre of three incisors.

On lower incisor extraction, the lower cuspids may be positioned mesially; as a result their cusp tips contact the distolingual marginal ridges of maxillary lateral incisors, instead of mesial fossa of maxillary cuspids. The interference should be compensated by equilibrating the non functioning portion of the lower cuspids or extruding lower incisors to maintain occlusal contact in centric occlusion.⁶

Extraction of one incisor in cases of moderate to severe crowding may even satisfy the requirement of maintaining the arch form and width without expansion of the inter-canine width.⁷



Figure 3.a: Post Treatment Extra Oral- Frontal View



Figure 3.b: Post Treatment Extra Oral Frontal Smile View



Figure 3.c: Post Treatment Extra Oral Lateral Profile View



Figure 4.a: Post Treatment Intra Oral Frontal View



Figure 4.b: Post Treatment Intra Oral Right Lateral View



Figure 4.c: Post Treatment Intra Oral Left Lateral View



Figure 4.d: Post Treatment Intra Oral Maxillary Occlusal View



Figure 4.e: Post Treatment Intra Oral Mandibular Occlusal View



Figure 5.a: Crowded Lower Anteriors With Lack of Space for One Incisor



Figure 5.b: Class III Cases Where Extraction of Lower Incisor Followed by Retrusion of Lower Anteriors Improves Occlusion

Lengthy retention to allow for periodontal adaptation is better for the post-retention stability; hence fixed bonded retainers were given in both the arches in this case.

However, as all cases may not favour this strategy, a proper case selection and careful planning is required prior to decision on lower anterior extraction. Cases that may favour lower incisor extraction are: Crowded lower anteriors with lack of space for one incisor [Figure 5.a], moderate crowding with lower anterior region with good normal maxillary dentition, perfect buccal interdigitation, in cases of lower incisor with bone loss, periodontitis & fracture, incisor tooth size anomaly, ectopic eruption of lower incisor, Class I cases with anterior dental cross bite due to lower anterior crowding and protrusion, severe anterior tooth size discrepancy due to small upper or large lower anteriors, in class III cases where retrusion of lower anteriors improves occlusion [Figure 5.b], acceptable soft tissue profile, minimal to moderate over bite & over jet, minimal growth potential, missing lateral incisor or peg laterals, mandibular tooth material excess.⁸⁻¹³

Cases with definite need for extractions of bicuspid while canines in class I relationship, cases with deep bite with horizontal growth pattern, bimaxillary crowding cases with no anterior Bolton's discrepancy and cases with anterior discrepancy due to either small lower anteriors and/or large maxillary

incisors, should not be selected as lower incisor extraction cases.⁸⁻¹³

Summary and Conclusion:

Selecting the best treatment option is often difficult and not all factors can be achieved, but a proper case selection and proper decision on which tooth to extract can prove extraction of mandibular incisor a therapeutic extraction option in severe lower anterior crowded cases. A systematic treatment approach with simple mechanics and torque control can aid in achieving a stable occlusion that is esthetic and in functional harmony.

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