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RESEARCH ARTICLE

MANDIBULAR INCISOR EXTRACTION – A CASE REPORT

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ABSTRACT

In planning orthodontic cases that include extractions as an alternative to solve the problem of negative space discrepancy, the critical decision is to determine which teeth will be extracted. Several aspects must be considered, such as periodontal health, orthodontic mechanics, functional and esthetic alterations, and treatment stability. Premolar extractions are the most common, but there are situations in which atypical extractions facilitate mechanics, preserve periodontal health and favor maintenance of the facial profile, which tends to unfavorably change due to facial changes with age. The extraction of a lower incisor in the most ectopic position and with compromised periodontium was the alternative of choice for this treatment, which restored function, providing improved periodontal health, maintained facial esthetics and allowed finishing with a stable and balanced occlusion.

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INTRODUCTION

The decision of whether or not to extract teeth is one of the most crucial choices that the orthodontist has to make when planning a case. The extraction versus non-extraction debate is perhaps the most lasting philosophic controversies in orthodontic practice with both biologic and mechanical ramifications. Traditionally, treatment planning in orthodontics has revolved around either a purely non-extraction approach or an approach involving the extraction of all four first premolars. However, an alternative orthodontic treatment modality involving the extraction of only a single mandibular incisor has gained popularity in the recent past. Even though this approach was traditionally reserved for cases with an ectopically placed incisor or one with poor prognosis, it is now believed that mandibular incisor extraction in cautiously selected cases may allow the clinician to use simple treatment mechanics and achieve optimum results (Kokich and Shapiro, 1984).

Specific criteria for mandibular incisor extraction include (Canut, 1996; Bahreman, 1977):

- Permanent dentition
- Minimal growth potential

- A Class I molar relationship
- A harmonious soft-tissue profile
- Minimal-to-moderate overbite
- Little or no crowding in the maxillary arch
- An existing Bolton discrepancy

Advantages of mandibular incisor extraction over premolar extractions

- It may reduce treatment time, especially if crowding is limited to the anterior segment (Kokich, 1984).
- Stable result is likely in the anterior region, because expansion is not necessary and intercanine width is minimally altered (Riedel *et al.*, 1992).
- Because little retraction is required compared with premolar extraction therapy, the anteroposterior position of the mandibular incisors is not changed, allowing maintenance of a harmonious profile (Bahreman, 1977).

Disadvantages of Mandibular incisor extraction: (Sheridan *et al.*, 1992; Faerovig *et al.*, 1999)

- If no Bolton discrepancy exists, closure of the incisor space will result in increased over jet.

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- The inter-proximal papillae may be sacrificed, which may lead to the development of open gingival embrasures or “black triangles”.

Which incisor to extract???

It depends on several considerations, including:

- Periodontal conditions
- The presence of gingival recession
- The location of any restorations, including endodontic treatment.
- In addition, the mesiodistal width of each incisor should be measured and the anticipated amount of tooth movement determined with the Bolton analysis, keeping in mind that in the mandible, the central incisors tend to be smaller than the lateral ones.
- Mandibular incisor extraction may also be considered when the patient has congenitally missing maxillary lateral incisors and significant mandibular anterior crowding (Miller *et al.*, 2002; Owen, 1993).
- Mandibular incisor extraction is generally contraindicated in a Class II patient, because it would result in a significant increase in over jet (Nanda and Uribe, 2009).

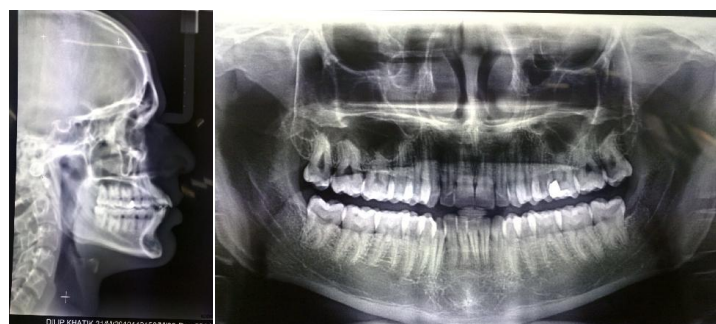
Case report

A 21-year-old male presented with a chief concern of “lower incisor crowding”. Clinical examination revealed competent lips, a straight profile. On smiling, he displayed 100% of her incisors. The molar and canine relationships were Class I. Model analysis revealed crowding of 6 mm in the lower arch. Patient has normal over jet and overbite. Although slight gingival recession was found in the areas of lower left central incisor region. Maxillary left first molar was previously restored due to caries.

Pretreatment extra-oral and intra-oral photographs and radiographs

Treatment Objectives

- Relieving of lower anterior crowding
- Good and stable dentoalveolar changes
- Maintenance of class I canine and molar relation
- To achieve ideal over jet and overbite
- Maintenance of good profile



Pretreatment extra-oral and intra-oral photographs and radiographs



After initial alignment and leveling

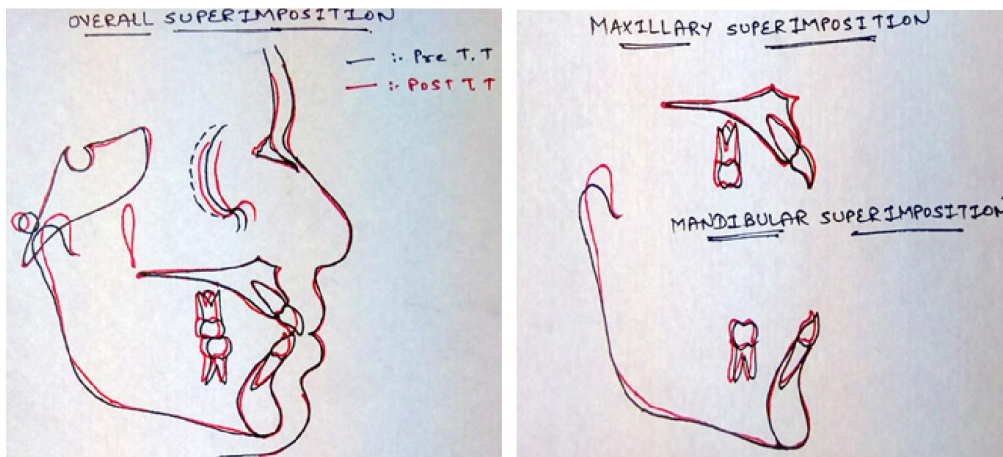


Settling (0.014" s.s upper and lower with triangular settling elastics)





Post treatment photographs



Cephalometric superimposition

Cephalometric measures	Pretreatment	Post treatment
SNA	90°	90°
SNB	88°	87°
ANB	3°	2°
N-A-POG	3°	3°
SN-GO-GN	15°	17°
FACIAL AXIS	78°	80°
U1-SN	120°	122°
I1-MP	114°	105°
U1-NA	40°	40°
U1-NA	6MM	6MM
I1-NB	35°	32°
I1-NB	5MM	4MM

Treatment plan

Lower incisor extraction was planned because of good profile, minimal space requirement. Most labial placed lower incisor (mild gingival recession irt 31) extraction will help in correction in lower arch.

Treatment Progress

The patient was referred to have the lower lateral incisor (31) extracted. Initial alignment and leveling was done with 0.016" NiTi followed by 0.018" stainless steel. After alignment, leveling was done with 0.019"×0.025" NiTi. After initial alignment & leveling, 0.019"×0.025" stainless steel was placed in the upper and lower arch for torque expression and closure of spaces. Settling of occlusion was done with 0.014" stainless steel wire and triangular elastics.

DISCUSSION

Extraction of lower incisor was advocated as early in 1904. Later, Reidel and co-workers and case reports by various authors have favored removal of one or more incisors in severely crowded mandibular arches and considered one of the only logical alternatives (Kokich and Shapiro, 1984; Riedel et al., 1992). 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. 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 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 center of three incisors. 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. 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 (Riedel et al., 1992). 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 boltons discrepancy and cases with anterior discrepancy due to either small lower anterior and/or large maxillary incisors, should not be selected as lower incisor extraction cases (Ali-akbar Bahreman, 1977; Canut, 1996; Richardson, 1963).

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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