

Treatment of Class I malocclusion by single mandibular incisor extraction in patient with class III skeletal base – A case report

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Abstract

Over the long time, increasing numbers of patients have become aware of orthodontic treatment and are demanding high-quality treatment, in the shortest possible time with increased efficiency and reduced costs. Orthodontic treatment aims at normal functional occlusion balance with the supporting structures and environmental musculature. Class I malocclusions can be treated by several means, according to the characteristics associated with the problem, such as tooth material-arch length discrepancy, patient's profile, and dentition as a whole in relation to the cranial base determines teeth to be extracted as well as patient compliance.⁽¹⁾ Correction of Class I malocclusions in non-growing patients usually involves selective removal of permanent teeth, with subsequent dental camouflage.

Keywords: Class I malocclusion, Single mandibular incisor extraction, Class III skeletal base.

Introduction

Crowding of mandibular incisors is seen frequently with normal growth.⁽²⁾ Upper anterior teeth are 18-36% larger than the lower anterior teeth, so a compensation should be made to bring the segments in harmony.⁽³⁾ Crowding in mandibular anterior teeth has been treated by various non-extraction methods: moving posterior teeth distally, expanding the arches and increasing intercanine width, proclining the anteriors, interproximal enamel reduction, premolar extractions, extraction of one or two incisors, or combination of above treatment options.⁽⁴⁾ To determine the treatment plan: Arch length tooth substance discrepancy of the six lower anterior teeth measured according to the Bolton analysis.^(5,6) Class I cases with lower anterior crowding and normal maxillary dentition with good buccalinterdigitation, which show arch length deficiency in the lower anterior segments of over 4 to 5 mm. and an anterior ratio greater than 83% are the cases of first choice for extraction of one lower incisor.⁽¹⁾ In deciding which lower incisor to be extracted whether mandibular central or lateral, right or left. There are various deciding factors which determines the extraction of particular teeth, which includes; magnitude of anterior arch length deficiency, amount of anterior tooth ratio, periodontal and tooth health condition, upper and lower midline relationship.⁽²⁾ However, selecting best treatment for patient is not easy,

as similar treatment mechanisms may lead to different individual responses.

Indications for single mandibular incisor extraction includes, Class I malocclusions with lower anterior crowding having normal maxillary dentition, well settled buccal occlusion, and increased irregularity index. Malocclusions with anterior cross-bites due to crowding in lower anteriors and lower incisor protrusion and in Class I malocclusions with severe anterior tooth-size discrepancy. Contraindications includes the patients with horizontal growth pattern, Class I malocclusion cases requiring upper premolar extraction, bimaxillary crowding cases with no tooth-size discrepancy in the incisor area, and large maxillary incisors and small mandibular incisors.

Diagnosis and Etiology

A 14 year old female patient had reported to the Department of Orthodontics with the chief complaint of crowding in front teeth. On evaluating patient history no past medical disorder or dental history was given. While conducting functional examination no temporomandibular joint symptoms were detected. On extra oral examination it was observed that the patient had apparently symmetrical, leptoprosopic face, convex profile. Nasolabial angle was towards



Fig. 1: Pre-Treatment extra-oral and intra – oral photographs

Normal range, lips were competent, average smile index, with a non-consonant smile arc and smile was asymmetrical i.e. canting was seen during smiling, with an incisor display of 95%, and increased buccal corridor space. Intraoral examination revealed full cusp class I molar and Labially erupted upper right canine, Over retained deciduous canines in upper arch, Over retained deciduous 1st molars in lower arch, and an overjet of 3 mm and 70% overbite, maxillary midline shifted to right by 1.5 mm, non-coincident maxillomandibular midlines. Apparently symmetrical V shaped maxillary and

mandibular arch, Crowding in relation to mandibular anteriors, Boltons discrepancy anterior mandibular excess was 4mm.

Panoramic radiograph revealed no sign of root resorption. The mandibular third molars were in the formative stages, maxillary third molar buds were missing. No caries or periapical lesion was visible. Cephalometric findings showed that the patient had a hyperdivergent growth pattern and a Class III skeletal base. The maxillary and mandibular incisors were crowded.

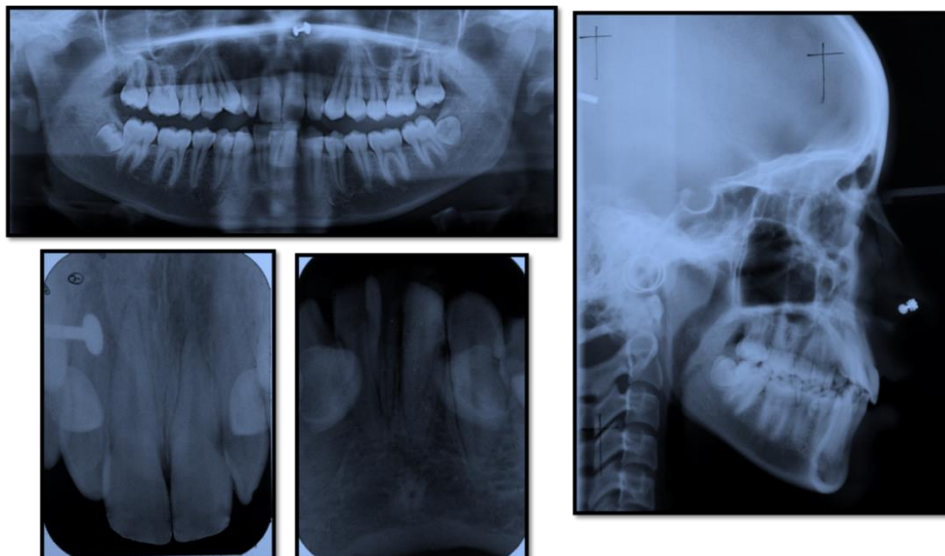


Fig. 2: Pre-treatment radiographs

Treatment objectives: Leveling and alignment in both arches, Extraction of over retained teeth, To attain proper overjet and overbite, To correct curve of spee, To achieve consonant smile, To achieve symmetrical smile, Long term retention.

Treatment planning: Fixed appliance therapy with pre-adjusted edgewise technique by extraction of one lower central incisor.

Treatment progress: Extraction of retained deciduous canine 53, 63 was advised. Bonding was done in maxillary arch with 0.022 x .028 inch slot MBT appliance. 0.012 inch NiTi wire was placed in maxillary arch and box loop in 0.017 x 0.025 TMA wire was placed to bring buccally placed 13 in line of arch. Patient

was advised extraction of retained deciduous first molars 74, 84. Mandibular arch was bonded and 0.014 inch NITI was placed in mandibular arch. Patient was advised extraction of 32. Wire was progressed to 0.018 NITI with reverse curve of spee in mandibular arch. On progressing to 0.017 x 0.025 S/S wire space closure was started with e-chain in maxillary arch. Anterior bite plate was given for correcting deep bite. 0.019 x 0.025 S/S wire was placed in maxillary arch and .019x .025 S/S wire with RCS was placed in mandibular arch. Lingual root torque was given in mandibular anteriors. Esthetic restoration was advised wrt 12, 22. Final finishing and detailing was done on 0.014 S/S wire.



Fig. 3: Mid-treatment extra-oral and intra – oral photographs, radiographs

Treatment results: Maxillary and mandibular arches were aligned very well. Maxillary midline was corrected. Overbite was decreased. Curve of spee was corrected. Mandibular incisors proclined due to correction of curve of spee.

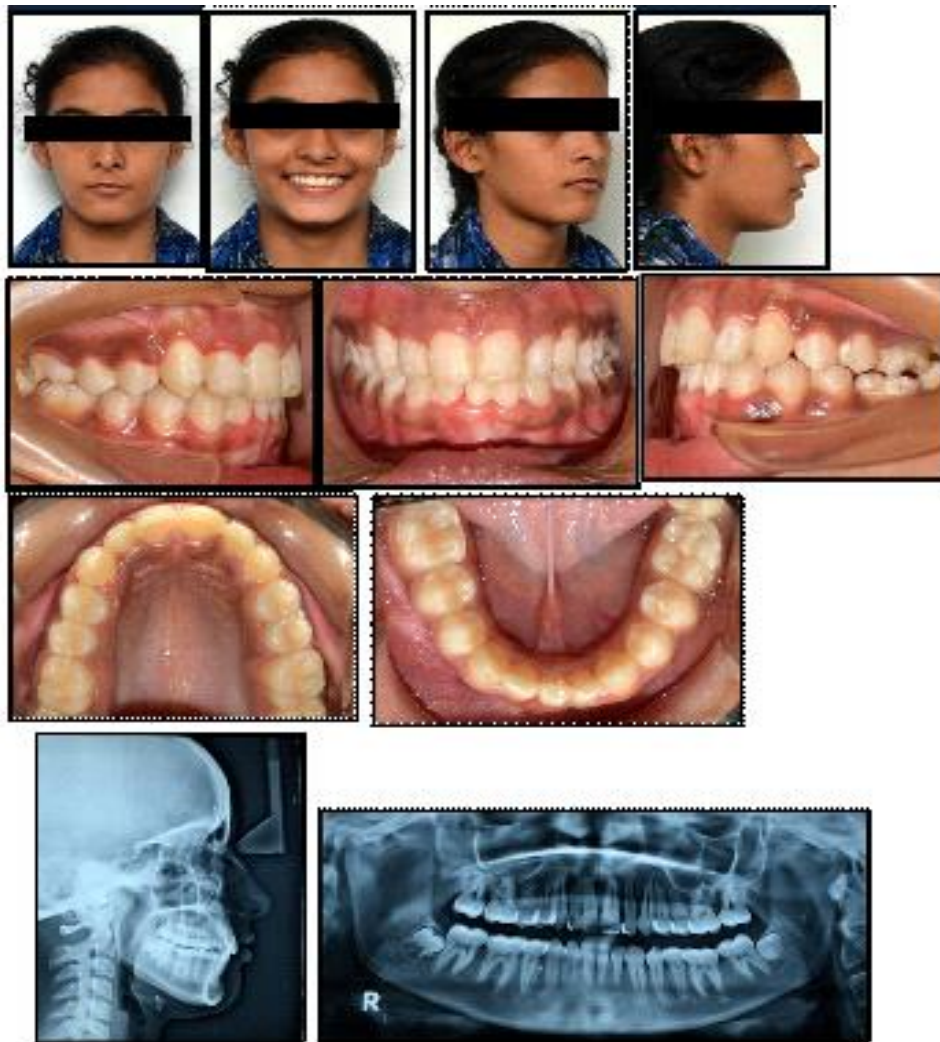


Fig. 3: Post-treatment extra-oral and intra – oral photographs, radiographs

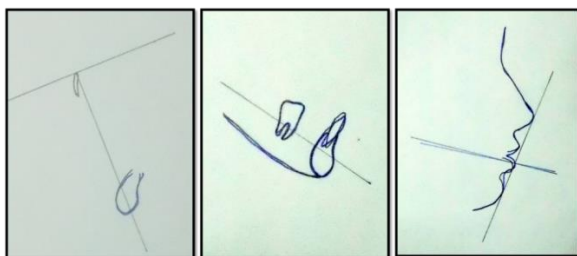


Fig. 4: Comparison of lateral cephalometric tracing

Table 1: Cephalometric Comparison

Variables	Pre treatment	Mid treatment	Post treatment
ANB	-1°	0°	0°
FMA	30°	30.5°	30.5°
MX1 – NA	7 mm	5mm	4mm
MX 1 – NB	3.5mm	4.5mm	5.5mm
IMPA	82°	88°	95°
Interincisal angle	134°	130°	125°
Upper lip to e- line	-1mm	-1.5mm	-2
Lower lip to e- line	-1mm	0mm	0mm
Nasolabial angle	97°	97°	98°

Discussion

The Class I molar and canine relationship were maintained with satisfactory interdigitation of posterior teeth. The overjet and the overbite was improved. The upper and lower arch length deficiencies was eliminated and the tooth size discrepancy was managed successfully. The maxillary dental midline was corrected. The dentition and the periodontal tissues remained healthy during treatment. Post-treatment radiographs showed that the root parallelism was satisfactory. Cephalometric evaluation revealed that no significant changes were occurred except the decreasing of the overbite. The maxillary and mandibular incisors were well aligned, and the interincisal angle was decreased. Mandibular cast analysis showed that there was no change in the arch length, the intercanine width was decreased, and interpremolar and intermolar widths were increased.

Conclusion

Remarkable improvement in facial and smile esthetics was accomplished. Patient had competent lips

and Smile was broader; smile arc was consonant with 1 mm gingival exposure on lateral incisors.

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