

Case Report

Lower incisor extraction in Class III Malocclusion

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ABSTRACT

Introduction: Lower incisor extraction is one of the treatment option in borderline class III cases with mild to moderate crowding because it maintains the straight facial profile. Careful diagnosis and proper treatment planning is essential before planning lower incisor extraction. **Material & method:** This paper discussed few clinical cases of borderline skeletal class III with Bolton's tooth material discrepancy in which extraction of one lower incisor was planned. **Results:** Class I canine relationship was obtained with stable occlusion. **Conclusion:** It is effective and efficient treatment option in borderline class III cases with mild to moderate crowding.

Key words: class III malocclusion, extraction, soft tissue profile.

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INTRODUCTION:

In terms of function, aesthetics and stability, lower incisor extraction can be regarded as a valuable option in orthodontic treatment. According to Kokich and Shapiro (1984), the extraction of a lower incisor in some cases allows the orthodontist to improve occlusion and dental aesthetics with a minimum need of orthodontic treatment.¹⁻²

It is effective and efficient treatment option which requires careful diagnosis and proper treatment planning.

Class III malocclusions with harmonious soft tissue profile, presence of mild to moderate crowding with minimum overbite are best treated with lower incisor extraction.¹⁻⁴ The advantages of performing this modality reduces the treatment duration, stable result can be produced with minimum alteration of intercanine width and little retraction is required compared to premolar extraction therapy.^{2,3,5} Extraction of one incisor will lead to increase in overjet which would benefit in class III malocclusion cases.

CASES DESCRIPTION:

Case 1:

A 20 year old female patient with straight profile, ANB and Wits showing Class III skeletal bases with anterior crossbite, super class I molar relationship with lower anterior crowding, dental midline shift (lower shift by 2 mm towards right), Bolton's discrepancy of 2.2 mm mandibular excess in anterior. Correction achieved by extracting 32. Among lower incisors, 32 was extracted (Figure 1). Results showed a better contact between distal surface of central incisor and mesial surface of canine. An increase in tooth material was required in the upper arch in this case to achieve positive overjet. At the end of treatment normal overjet and overbite was achieved (Figure 2). Stable results were obtained. Figure 3 shows three years follow up post debonding. No changes in the position of lower incisor were observed.



Figure 1



Figure 2



Figure 3

Case 2:

A female patient of age 12 years came up with the chief complaint of lower anterior crowding. Cephalometric analysis revealed class I malocclusion with mild class III bases and mild vertical growth pattern. Treatment goal was to correct crowding without changing facial profile. Among lower incisors, 32 and 42 were extracted.(Figure 4). Patient after 2 years post retention. (Figure 5)



Figure 4



Figure 5

Case 3:

A 23 year old female patient with orthognathic profile. The intraoral evaluation revealed Angle Class I molar relationship with crossbite irt 31, gingival recession and grade 1 mobility in 31, satisfactory posterior occlusion. The model analysis disclosed Bolton's discrepancy in anterior was 1.9 mm mandibular excess and overall 3.9 mm. In this case (Figure 6) 31 was decided to extract as it was periodontally compromised and showed poor prognosis. Figure 7 shows post treatment crowding is relieved, normal overjet and overbite achieved with class I canine relationship. Figure 8 showing stable results two years follow up post debonding.



Figure 6



Figure 7



Figure 8

DISCUSSION AND CLINICAL CHALLENGES:

Many authors preferred extraction of mandibular incisor in borderline class III malocclusion^(1,5,12,13,14). In class III cases with camouflage therapy, it is generally preferred to increase the overjet at the end of orthodontic treatment. Extraction of lower incisor helps achieve this objective in selected class III cases. The cases described here are skeletal class III patient with good facial profile and mild crowding of the arches. The treatment plan was to extract one of the lower incisors. Lower incisor extraction in these cases were highly favorable because it maintained the straight facial profile and also helped in relieving mild to moderate crowding in lower arch. Proclining the upper anteriors slightly and expansion of the arch is an acceptable compromise in skeletal class III cases. Single incisor extraction can be planned even in maxillary tooth material excess in class III cases. Because this increases the overjet which helps to camouflage class III skeletal bases. The post treatment intraoral photographs showed

good alignment of upper and lower anteriors even after 3 years (Figure 3)

Selection of the incisor to be extracted:

It depends on a combination of the following factors: type of malocclusion, health of the supporting tissues, amount of Bolton's tooth size discrepancy and upper and lower dental midline shift.³ Type of malocclusion and periodontal tissue health determines the choice of the tooth to be extracted, the best option is to extract ankylosed tooth, severely rotated or malposed tooth. The advantage of extracting these teeth over other teeth prevent the unnecessary movement of many other teeth.¹ Bolton's tooth size discrepancy analysis help to choose the removal of the wider lateral incisor or the narrower central incisor. Some professionals prefer to remove the narrower central incisor, as it promotes stability in cases with mild crowding.^{9,10} Neff¹¹ found that the extraction of lateral incisor create better contact between the distal face of a central incisor with the mesial

surface of the canine while extraction of central incisor create contact between the mesial surface of the remaining central incisor and the mesial surface of the lateral incisor which develop undesirable black triangle.

Vincent O Kokich¹² extracted carious mandibular incisor to maintain straight profile and achieved satisfactory outcomes at the end of treatment. Prakash *et al.*¹³ treated a case with mandibular incisor extraction for the correction of lower anterior crowding and achieved better results in comparison to premolar extraction since maintenance of posterior occlusion was not a concern and it also decreases the treatment time.

Daniel J Grob¹⁴ also treated Class III case in which mandibular incisor extraction was done in order to maintain the acceptable facial profile and showed stable results.

Canut¹ and Reidel⁵ *et al* found better stability in patients treated with a single mandibular incisor extraction in comparison to premolar extraction.

The extraction of an incisor poses important limitations that must be taken into account, accentuated overjet, on removing an incisor, the canine displaces mesially, and canine functional protection is lost, a visible diastema thus results in an area of considerable aesthetic and periodontal importance., the loss of gingival tissue, appearance of black triangles.^{4,5,7,8} But with careful planning this could be controlled. Black triangles or open gingival embrasures can be corrected by bodily movement of incisors or by periodontal flap surgery procedures.

The disadvantages include the possibility of an increased overjet or class III occlusal relationship in cases with adequate overjet and midline discrepancy. The extraction site may reopen, development of open gingival embrasures or “black triangles”^{7,8}

Houston¹⁵ suggested that long axis of the lower incisor should not pass lingual to the centroid of upper incisors in pre-treatment radiographs of cases indicated for lower incisor extraction. The long axis of lateral incisor in class III bases does not pass lingual to the centroid of upper incisors. Thus, cases with over-uprighted or retroclined lower anteriors in the presence of sufficient overjet and minimal irregularity in lower anterior region are not indicated for lower incisor extraction.

In cases of class III, the mandibular proclination can either be corrected by using Class III elastics, which proclines the maxillary and retroclines the mandibular anterior teeth, by extraction of premolars, extraction of single incisor or interproximal stripping in cases of minimum discrepancy. Extraction of single incisor or interproximal stripping will lead to increase in maxillary

tooth material and a reduction of mandibular tooth material achieving normal overjet and overbite in class III conditions. Like the Steiner's compromise compensates for the increased ANB, similarly this Bolton's compromise will help to achieve normal ovejet and overbite.

CONCLUSION

Skeletal class III malocclusion with good facial profile and mild to moderate lower anterior crowding can be camouflaged successfully with lower incisor extraction. Minimal alteration of the mandibular arch form is the key for success and stable results.

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