

Case Report

Mandibular incisor extraction for management of class I malocclusion- A case report.

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Abstracts:

Extraction of premolar teeth to manage class I malocclusion is conventionally the management approach of choices. However class I malocclusion with tooth tissue discrepancy could be managed with the extraction of a lower incisor tooth with a more acceptable aesthetic outcome. This article describes a case of class I malocclusion managed with extracting a mandibular lower incisor tooth.

Introductions:

A class I malocclusion is a condition in which the tip of mesiobuccal cusp of first maxillary molar occludes in the anterior buccal groove of mandibular first molar tooth, however malocclusion presents on other teeth.¹Cephalometric specific classification also present to conclude the skeletal base as class I malocclusions.²One of the most critical decisions in treatment planning is whether to extract teeth. This extraction decision also influences the patient's treatment seeking behavior and co-operations.³To conclude this decision of extraction for orthodontic corrections could easily be made on the basis of Bolton's tooth tissue ratio analysis for a specific population with comparing its norm.⁴

Several approaches for crowded mandibular anterior teeth are currently employed: distal movement of posterior teeth, lateral movement of canines, labial movement of incisors, interproximal enamel reduction, removal of premolars, removal of one or two incisors, and various combinations of the above. Selecting the best treatment is often difficult, and all guidelines do not apply to every case.⁵

According to Owen,⁶ patients who are suitable for single lower incisor extractions usually fit the following diagnostic pattern: Class I molar relationship, moderately crowded lower incisors, mild or no crowding in the upper arch, acceptable soft tissue profile, minimal to moderate overbite and overjet, no or minimal growth potential, and missing lateral incisors or peg shaped laterals. The aim of this case report was to assess the treatment outcome and changes in dentofacial structures especially mandibular incisor position after extraction of one single lower incisor.

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Report of the cases:

A 22 years male from rangpur reported to a private dental practice office in Dhaka with the gradual discoloration and decay of incisal edge of that particular lower anterior teeth over last two years. He reported that a local dentist in rangpur prescribes him sealing and polishing of that tooth to correct the discoloration, however he could not remember any history of trauma to that tooth. With a routine intraoral periapical radiograph (IOPA) of that tooth shows so evidence of periapical lesion or widening of periapical membrane space of that tooth. Pulp vitality test with electric pulp tester shows response higher electric level on that tooth compare to neighboring teeth, which indicate that the tooth is going to be non-vital.

On extra oral examinations patients having normal straight profile, which clearly does not indicated for extraction of teeth to manage this case. Cause extraction of teeth in such case will depress the upper and lower anterior alveolar base resulting a plate dish shape profile on post treatment appearances. No history of trauma to the teeth or temporo-mandibular joint, known medical history was reported. On introral examinations class I molar and class I canine relationship were noticed, however incisor relationship was edge to edge to bight with reduced overjet and over bite. Crowding on lower anterior arch was noticed. On routine

chief complain of irregularities in his teeth (specially in the lower anterior region) and

radiographic examination with oral panoramic radiograph (OPG), and lateral cephalometric radiograph no sign of underlying bony pathology were noted with all periodontally healthy standing tooth, without any absence or missing tooth. On lateral cephalometric radiograph SNA, SNB, and ANB angle were recorded within its normal limit. This concluded this case a class I malocclusion with crowding on lower anterior segment. The treatment goal was set to correct the anterior crowding without changing the face profile, the SNA and SNB angle. To perform this clinically additional space is required to eliminate the crowding. Reproximation or disking of lower anterior teeth could be an option for that, however the arch perimeter and total anterior tooth material of lower jaw conclude that almost 3mm space is required. Extraction of any premolar in any side of the arch could affect the post treatment facial appearance; moreover unilateral premolar extraction could result the midline shift. So extraction of a mandibular incisor was plane for that. The challenge of extracting mandibular incisor is that it could reduce the SNB angle ultimately increasing the ANB angle that ultimately increases the chances of developing a deep bite.

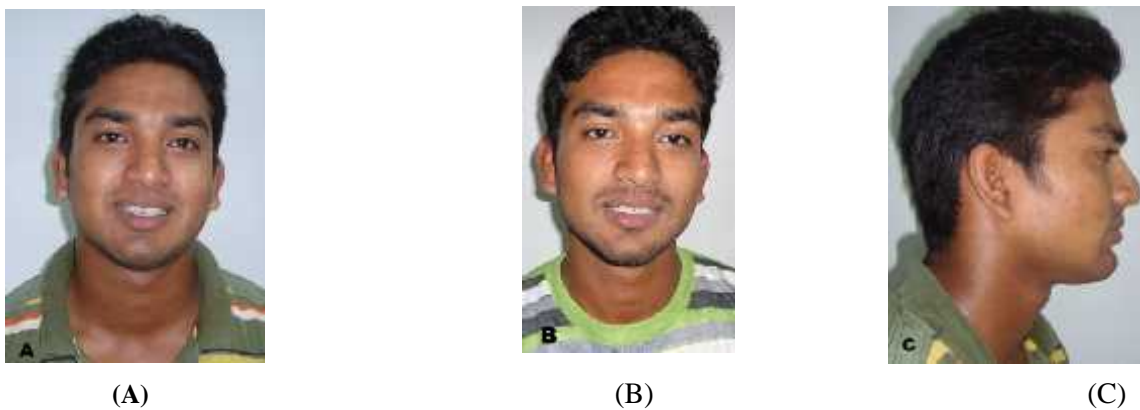


Figure 1: Extra-oral photograph shows pretreatment smile of the patients(A), post treatment smile (B), pre-treatment profile of the patients. The inter incisal gap showing in the pretreatment photograph (A) is eliminate after treatment (B).

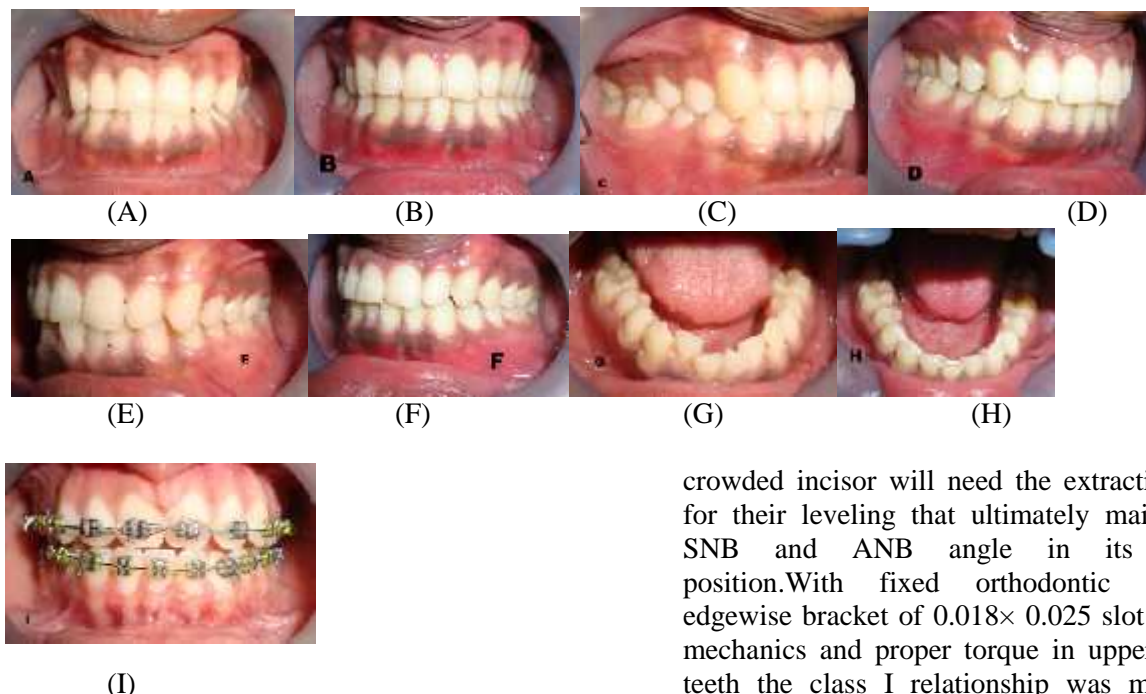


Figure 2: Intra oral photograph of the patients in pre-treatment front view (A), right lateral view (C), left lateral view (E), lower occlusal view (H) with crowded lower incisor, post treatment front view (B), right lateral view (D), left lateral view (F), lower occlusal view (H) eliminating incisor crowding. After the space closure of extracted incisor (I).

The treatment goal was set to correct the anterior crowding without changing the face profile, the SNA and SNB angle. To perform this clinically additional space is required to eliminate the crowding. Re-proximation or disking of lower anterior teeth could be an option for that, however the arch perimeter and total anterior tooth material of lower jaw conclude that almost 3mm space is required. Extraction of any premolar in any side of the arch could affect the post treatment facial appearance; moreover unilateral premolar extraction could result the midline shift. So extraction of a mandibular incisor was plane for that. The challenge of extracting mandibular incisor is that it could reduce the SNB angle ultimately increasing the ANB angle that ultimately increases the chances of developing a deep bite. In our cases the

crowded incisor will need the extraction space for their leveling that ultimately maintain the SNB and ANB angle in its original position. With fixed orthodontic slanted edgewise bracket of 0.018×0.025 slot and loop mechanics and proper torque in upper anterior teeth the class I relationship was maintained after finishing. Extraction of mandibular left central incisor tooth was done on to gain space for leveling the other incisor in a arch shape. That ultimately maintain the Class I incisor relationship with opposite arch teeth while retracting the upper anterior teeth. After retention phase bonded lingual retainer was placed with 'flexible spiral wire' of 0.012 millimeter (by OROMCO) that was placed by 'Super Bond C&B' (by Sun Medical Con. Japan). Over a two year post treatment patient found satisfied with his smile and occlusion and reveal good periodontal condition on the radiological follow-up in 2012.

Discussions:

The Class I molar and canine relationship were established with satisfactory interdigitation of posterior teeth. The negative overjet was transformed into a positive overjet, and the overbite was improved. The upper and lower arch length deficiencies was eliminated and the tooth size discrepancy was managed successfully. The mandibular dental midline was become the center of the remaining lower central incisor. The dentition and the periodontal tissues remained healthy during treatment. Unaesthetic loss of the

interdental papillae between the lower central incisors was occurred as an unwanted side-effect. Post-treatment radiographs showed that minimal root resorption had occurred during treatment and that root parallelism was satisfactory. Cephalometric evaluation revealed that no significant changes were occurred except the increasing of the overbite. The lower and the upper incisors were retroclined slightly, and the interincisal angle was decreased. Lower cast analysis showed that there was no change in the arch length, the intercanine width was decreased, and interpremolar and intermolar widths were increased. A class I malocclusion with a significant mandibular tooth-size excess can frequently be treated by extracting one mandibular incisor in the literature.⁵ A mandibular tooth-size excess greater than 1.6 mm, as determined by the Bolton analysis,⁴ is considered significant and can typically be handled in 1 of 3 ways: interproximal reduction, extraction, or restoration. Extraction of one mandibular incisor is generally done in patients with Bolton discrepancies greater than 2.0 mm. The decision to extract should be supported by initial records, diagnostic wax set-up, and clinical experience. Additional information, such as Bolton analysis, shape of maxillary incisor crowns, and amount of interproximal enamel is also important.⁷ Reidel⁸ has suggested that in patients with severely crowded mandibular arches, the removal of one or more mandibular incisor(s) is the only logical alternative which may allow for increased stability of the mandibular anterior region without continuous retention.⁹ In this case, we believed that treatment results would be stable because of the fact that inter-canine width was decreased, and the lower incisors were not protruded.

Conclusions:

One single mandibular incisor extraction can be an effective treatment choice for the appropriate malocclusion with a Bolton discrepancy. However, several factors must be considered before making the final treatment decision. In addition, evaluation of a diagnostic wax set-up will allow the orthodontist to predict the success of the proposed treatment plan.

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