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Management of skeletal class II div 2 malocclusion with therapeutic lower incisor extraction : A case report

Dr Pinaki Roy[1], Dr Prasanta Kumar Das[2], Prof. (Dr) Amal Kr Chakrabarti[3], DrSampitaDhali[4]

[1]*Associate Professor, , Dept of orthodontics & dentofacial orthopaedics, Dr R Ahmed Dental College & Hospital,*
[2] *Pedodontist, Private Practitioner*
[3]*Professor & HOD, , Dept of orthodontics & dentofacial orthopaedics, Dr R Ahmed Dental College & Hospital.*
[4]*3rd year PGT, Dept of orthodontics & dentofacial orthopaedics, Dr R Ahmed Dental College & Hospital*
Corrosponding author: Dr Prasanta Kumar Das

Abstract:
Class II division 2 malocclusion is commonly associated with a mild Class II skeletal pattern, but may also occur in association with a Class I or even a Class III dental base relationship.This case describes management of class II div 2 with deep overbite with intrusion and protraction of maxillary anteriors using Ricketts utility arch in average growing child with early permanent dentition and . Extraction of Lower incisor was done to relieve ant crowding which is lingually locked. Excellent result was achieved.

Key Word*: Class II div 2 , Skeletal pattern, utility arch , incisor extraction*

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I. Introduction

Angle's Class II div 2 malocclusion has a marked horizontal growth pattern with decreased lower facial thirds, palatally inclined upper anteriors, and remarkably increased transverse maxillary arch dimensions[1].Lower incisor extraction in orthodontic treatment was very rare modality of orthodontic treatment because there are few patients who meet the standards for such treatment. a Class II dental relationship may be due to any combination of four major factors: (1) maxillary skeletal excess, (2) maxillary dental excess, (3) mandibular skeletal deficiency, and (4) mandibular dental deficiency. McNamara's method of cephalometric evaluation can be credited with making orthodontists aware of the fact that more Class II malocclusions result from mandibular deficiency than maxillary excess[2]. A patient can have Class I occlusion as the result of overclosure of the mandible with short lower face height and a dental deep bite. These individuals are said to have "masked" Class II skeletal patterns. Using Dr. Enlow's[3] terminology, these people have had compensatory counterpart alterations in the sagittal and vertical relationships of the teeth and jaws, masking the true nature of the problem. The treatment of children presenting with a Class II Division 2 malocclusion involves two approaches two phases; one of intervention to treat the retroclined incisors and make them proclined and second approach involves providing a single course of comprehensive therapy during early interceptive treatment is always indicated if the overbite is severe. Thus, if patient shows up with a deep impinging overbite, there is no doubt that it is the best time to treat a Class II Division 2 malocclusion[4].

II. Case Report

A 14-year-old male patient came to Department of Orthodontics and Dentofacial Orthopedics, Dr. R. Ahmed Dental College & Hospital complaining of malalignment of upper front tooth. On Extraoral examination she was found to have meso-prosopic facial form with straight profile with competent lips. (fig-1) Intraorally there is retroclined upper maxillary central incisors, collapsed upper arch, crowing in lower arch with complete deep and traumatic bite (Fig-1), interestingly he possesses a class I molar relationship and lingually locked left lateral incisor. Radiographically he was found to have skeletal class II pattern with ANB of 8^0 ,4 mm of wits appraisal. Cephalometrically he was found to have average growth patten.(Fig-4)

Fig -1

Diagnosis

A 14-year-old male growing patient with Angle's class I molar relation on class II skeletal base with class II div 2 and average growth pattern having deep traumatic bite.

Treatment objectives

1. Correction of inclination of incisors.
2. Correction of deepbite.
3. Relieving lower ant crowding

Treatment plan

After discussing the possible treatment alternatives, the patient was planned to be treated in 2 phases. In 1st phase simultaneous intrusion and protraction was done in retroclined upper anterior teeth using protraction utility arch and blocked lower lateral incisor was extracted as therapeutic approach to relieve lower incisor crowding. Anchorage was maintained through out the treatment.

Treatment Progress:

Phase 1: Transforming Class II div 2 into a Class II div 1 case:

Patient was treated with fixed mechanotherapy using Pre-Adjusted Edgewise MBT 022 Slot Brackets, to achieve proper alignment and levelling of the maxillary arch by segmented approach . Once 2 sides of the maxillary arch was aligned, a relatively rigid stabilizing (0.020 SS) stainless steel continuous wire is placed in a 0.022-in slot and a niti open coil spring was placed to create adequate space for incisors to be proclined . A protraction utility arch with helix was made and directly engaged into the incisor bracket (two couple system). One end of the utility arch is placed auxiliary tube of the molar band and whole system is stabilized by a transpalatal arch to take anchorage.(Fig-2)

Phase 2 : lower left lateral incisor was extracted and lower arch alignment was done.

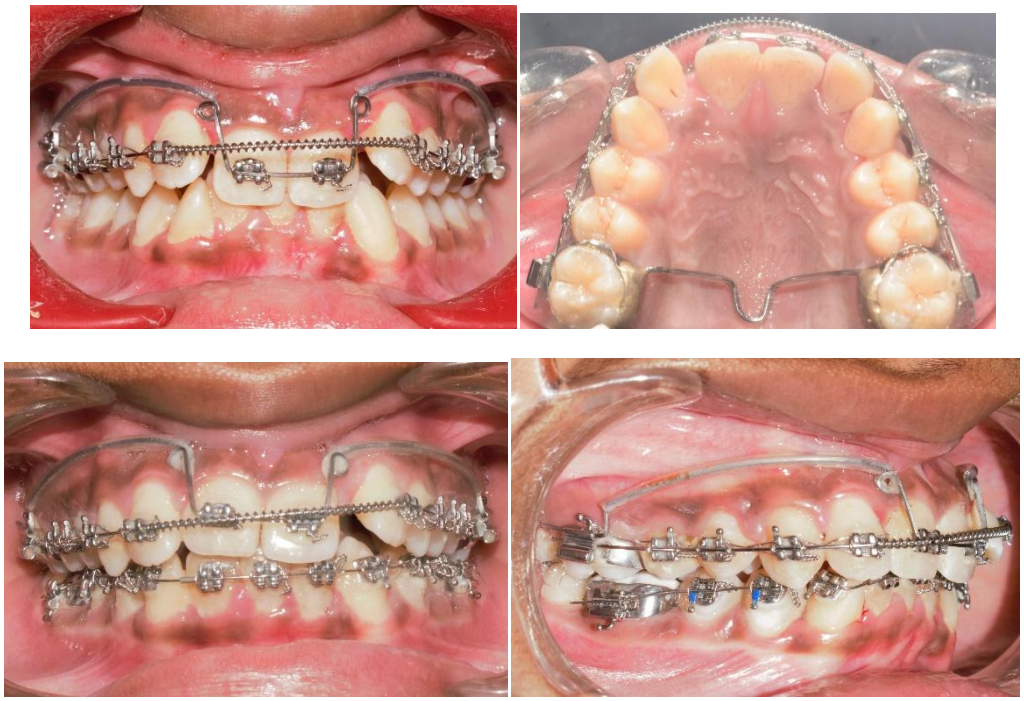


Fig- 2

Treatment results

The upper and lower arch brought into proper alignment with the adjacent teeth. Bilateral Class I molar, canine and incisal relationships were achieved with ideal overjet and overbite. The final radiographs indicated intact roots, proper root alignment, and no root disease. The crowding in the lower arch has been relieved.For retention anterior bite plate was given with lower fixed spiral retainer. 6 months follow up after the orthodontic treatment(Fig-3)

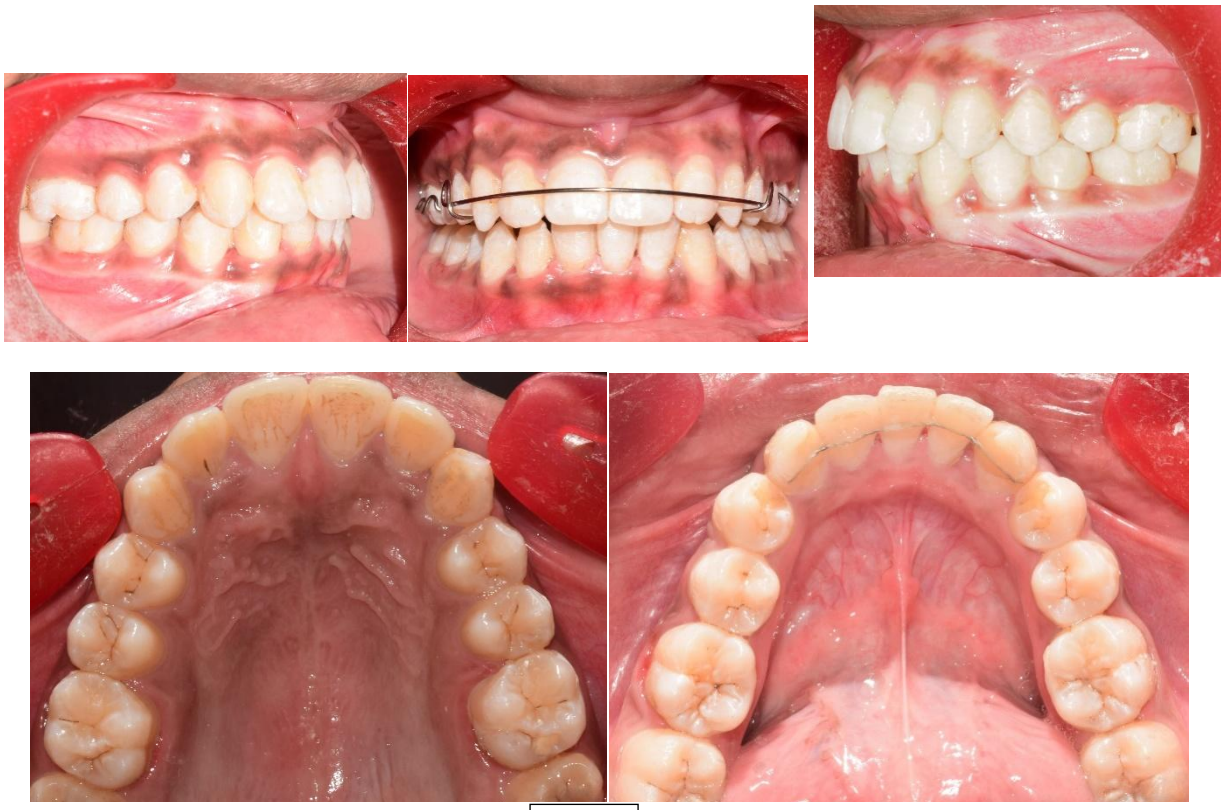
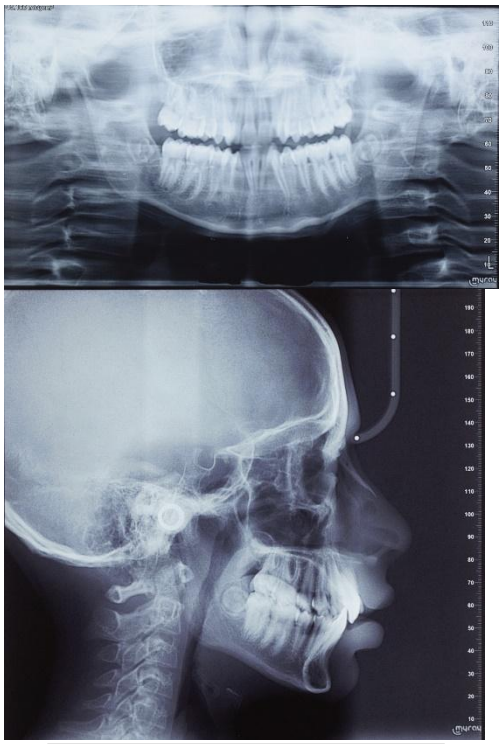


Fig-3

III. Discussion :

Class II division 2 malocclusion is commonly associated with a mild Class II skeletal pattern, but may also occur in association with a Class I or even a Class III dental base relationship. Where the skeletal pattern is more markedly Class II the upper incisors usually lie outside the control of the lower lip, resulting in a Class II division 1 relationship, but where the lower lip line is high relative to the upper incisors a Class II division 2 malocclusion can result.The vertical dimension is also important in the aetiology of Class II division 2 malocclusions, and typically is reduced. A reduced lower face height occurring in conjunction with a Class II jaw relationship often results in the absence of an occlusal stop to the lower incisors, which then continue to erupt leading to an increased overbite.In this particular case interestingly, patient was having average growth pattern and vertical anchorage control was maintained through out the treatment. Increase in lower facia hight is only due to normal growth of the patient.(Table-1)



Pre-treatment radiograph

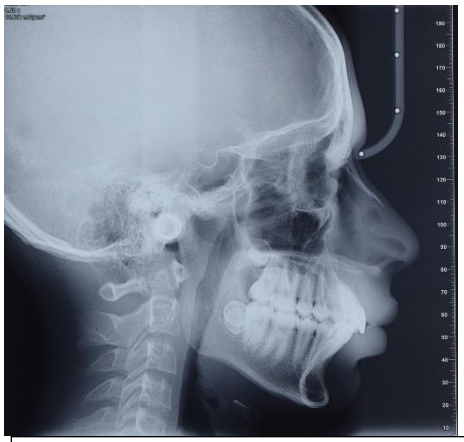
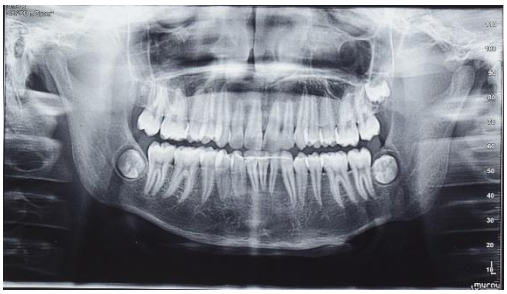


Fig – 4, Post treatment radiograph



Cephalometric values	pre	post
SNA	84˚	82˚
SNB	76˚	78˚
ANB	8˚	4˚
FMA	24˚	24˚
WITS APPRAISAL	+4mm	+2mm
Na per –pt A	6mm	3mm
Na per-pog	-2mm	0mm
UI-NA	-3mm/7˚	5mm/25˚
Interincisal angle	145˚	120˚
LI-NB	4mm/22˚	5mm/29˚
IMPA	90˚	97˚
LAFH	57mm	60mm
Nasolabial angle	110˚	105˚

Table - 1

Mandibular incisor extraction for orthodontic treatment is considered an unusual treatment option because of the limited number of patients that meet the criteria for such treatment. Traditionally, lower incisor extraction was usually used for an ectopically placed incisor or an incisor having poor prognosis. However, in today's spectrum of treatment options available, single incisor extraction when done on carefully selected cases, will help to obtain optimum results with usage of simple treatment mechanics [(5-8)]. Cases generally considered for lower single incisor extraction treatment modality include:

- mild to moderate overjet & overbite,
- pleasant soft tissue profile
- a Boltons discrepancy with mandibular tooth material excess
- Minimum amount of growth remaining.[9,10]
- Class III cases with anterior cross bite or an edgeto-edge incisor relationship[11,12].

This treatment option decreases treatment time & also provide stable results as arch expansion is not required and inter-canine width is minimally changed[13].

This case particularly having blocked out lower incisor that necessitate extraction of lingually locked teeth and dental camouflaging achieved with increase in IMPA. Normal profile, harmonious skeletal, and dental relations were achieved. (Table-1)

IV. Conclusion

There may be a short-term aesthetic inconvenience of the extraction space which should be informed & discussed to the patient before treatment. Post treatment, the maxillary midline occludes with the centre of the remaining mandibular central incisor, but this is does not hamper esthetics or function. A common side effect of this incisor extraction is formation of black triangles or open gingival embrasures.

Consent – Taken from the patient.

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