OLD IS GOLD: CONVENTIONAL METHOD FOR THE TREATMENT OF CLASS II MALOCCLUSION – A CASE REPORT

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Abstract

Background: One of the most prevalent type of malocclusion is class II, div I malocclusion. Common features of this type of malocclusion include a mild to severe class II skeletal base with an Angles class II molar and canine relations, proclined maxillary incisors and an increased overjet and itnormally has a convex profile with incompetent lips.Planned extraction of some teeth will help us to achieve favourable dental occlusion. In this case report, the patient was treated with upper first and lower second premolars extraction and the case was finished in class I molar relationship.

Results: The patient's profile not improved significantly, but there was a significant reduction in the soft tissue facial convexity with downward and forward mandibular growth. Class I dental occlusion was achieved bilaterally with optimal overbite and overjet.

Conclusions: Correction of class II malocclusion by camouflage treatment is challenging and high quality individualized technique is required.

Premolars extraction can lead to significant profile changes and satisfactory facial aesthetics, if undertaken after a proper diagnosis.

Key words: Class II malocclusion, camouflage, upper and lower premolar extraction

Introduction

One of the most prevalent type of malocclusion is class II, div I malocclusion. Common features of this type of malocclusion include a mild to severe class II skeletal base with an Angles class II molar and canine relations, proclined maxillary incisors and an increased overjet and itnormally has a convex profile with incompetent lips.[1]

Now a days, patients have become more conscious about their esthetics and orthodontic treatment and want quality treatment with high efficiency and low costs, in minimum possible duration.[1] Every treatment plan has its own pros and cons. Orthognathic surgery is one of the best method to deal with skeletal discrepancy in non-growing patients, but it has some disadvantages like patient compliance, treatment cost etc. While in growing patients, myofuntional or fixed functional appliances are best options.

Fixed functional appliances or myofunctional appliances are used for growth modification, the patient should be in growing stage if modification of growth is required and must be done before the growth ends. [2]

But what if the patient denied both the treatment options i.e, orthognathic surgery as well as fixed functional appliance therapy, then dental camouflage is the treatment of choice.

In this case report, the patient that was treated neither gone for surgery nor for fixed functional appliance therapy. She was treated with the conventional method i.e, dental camouflage.

Case report

A female patient 12 years old came to our department with chief complaint of forward placement of upper front tooth region.

Clinical examination

- Revealed no facial asymmetry,convex facial profile, posterior facial divergence, steep mandibular plane, acute nasolabial angle, dolicocephalic, leptoprosopic, incompetent lips, convex arc smile, increased interlabial gap, hypotonic upper lip.**(Fig-1)**

Intraoral examnation:

- Patient had end-on on right side and class I on left side molar relationship and end on canine relationship bilaterally.
- Rotation irt 11,13,21,32,35 and crowding irt 11,12,13,21,22,31,32,41,42 with increased overjet (7mm) and overbite (6mm). **(Fig-1)**

Fig 1. Pre treatment photographs

Treatment objectives

• Leveling and alignment of the upper and lower teeth
• Achieve Class I canine and molar relationship bilaterally
• Achieve ideal overjet and overbite
• Control of vertical dimension
• To achieve an esthetic profile

Treatment alternatives

The first treatment option was extraction of maxillary and mandibular first premolars and a camouflage line of treatment. However, this treatment option would not improve the patient's profile features.

The second treatment option was extraction of maxillary and mandibular first premolars with fixed functional appliance to correct skeletal class II discripancy.

First treatment option was opted and advantages and disadvantages of both were explained to the patient.

Cephalometric assessment

On the basis of cephalometric values, the patient was diagnosed as a case of skeletal Class II malocclusion with vertical growth pattern, prognathic maxilla, retrognathic mandible with unpleasent soft tissue facial profile**.(Fig-2)**

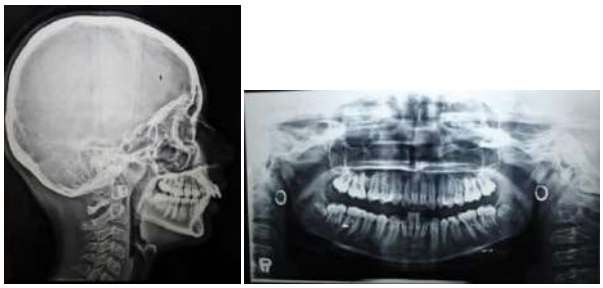


Fig 2. Pre Treatment Lateral Ceph and OPG

Model Analysis

Fig-3 Pre Treatment models

According to Bolton's analysis-

Mandibular anterior tooth material excess 1.6mm and overall mandibular tooth material excess – 1.04 mm.

According to Ashley Howe's analysis-

It was a borderline case while according to carey's analysis there was a discrepancy of -4mm in both upper and lower arch**.(Fig-3)**

Treatment plan

- Maxillary first premolars and mandibular second premolars extraction due to grossly decayed mandibular left second premolar.

Treatment progress

The maxillary first premolars and mandibular second premolars were extracted and the patient had undergone a fixed orthodontic mechanotherapy with a preadjusted edgewise appliance (0.022-inch slot). An initial arch wire 0.014, 0.016 NiTi was used for the leveling and aligning in upper arch. In the upper arch Trans-palatal arch was given for anchorage preservation. After two months, lower bonding was done and 0.014 NiTi arch wire was given and in upper arch wire changed to 0.016 NiTi.

In upper arch, extraction space was utilised to correct crowding, rotations and in retraction of anteriors. The patient was progressively shifted to heavier arch wires and 0.019″ × 0.025″ stainless steel wires with crimpable retraction hooks used to close the spaces.After the space closure, short settling elastics (class II pattern) was used for settling of occlusion**.(Fig-4)**

Fig- 4 Settling elastics in class II pattern

Treatment result

The patient's profile not improved significantly, but there was a significant reduction in the soft tissue facial convexity with downward and forward mandibular growth. Class I dental occlusion was achieved bilaterally with optimal overbite and overjet. Some amount of settling still required irt 23 and 25 due to early debonding as she had to pursue for her higher studies**.(Fig-5)**

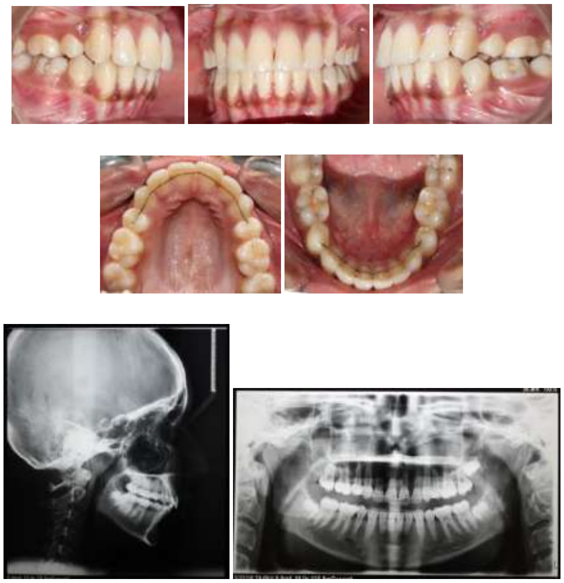


Fig-5: Post Treatment records

Post treatment cephalometric

Tracing revealed improvement in the skeletal discrepancy (SNB pretreatment: 74° and post treatment 75°), while SNA remained same. Maxillary and mandibular incisors inclination (upper incisors to NA angle, pre treatment: 33° and post treatment: 19°; IMPA pre treatment: 102° and post treatment 94°).

Table 1- Pre and Post Cephalometric values

PAR SCORING SHEET

Name

CASE NUMBER		Pre-Treatment		Date							
PAR COMPONENTS	RIGHT								LEFT	UN-WEIGHTED TOTAL	WEIGHTED TOTAL
Upper anterior segments	3-2		2-1		1-1	0	1-2	1	2-3	0	2	X1
Lower anterior segments	3-2	0	2-1	0	1-1	0	1-2	1	2-3	1	2	X1
Buccal occlusion	Antero-posterior		Right	0	Left	1					1	X1
	Transverse		Right	0	Left	1					1	X1
	Vertical		Right	0	Left	0					0	X1
Overjet	Positive	3	Negative								3	X6
Overbite	Overbite	2	Openbite								2	X2
Centre line		0									0	X4
										TOTAL	11	

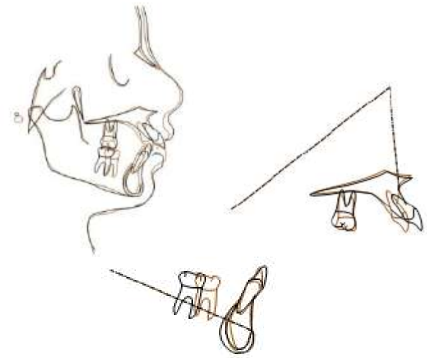
CASE NUMBER		Post-Treatment		Date							
PAR COMPONENTS	RIGHT								LEFT	UN-WEIGHTED TOTAL	WEIGHTED TOTAL
Upper anterior segments	3-2	0	2-1	0	1-1	0	1-2	0	2-3	0	0	X1
Lower anterior segments	3-2	0	2-1	0	1-1	0	1-2	0	2-3	0	0	X1
Buccal occlusion	Antero-posterior		Right	0	Left	0					0	X1
	Transverse		Right	0	Left	0					0	X1
	Vertical		Right	0	Left	1					1	X1
Overjet	Positive	0	Negative								0	X6
Overbite	Overbite	0	Openbite								0	X2
Centre line		0									0	X4
										TOTAL	1	

ASSESSMENT OF OUTCOME

PAR SCORE		IMPROVEMENT	
Change in PAR score		Greatly improved	
% change in PAR score		Improved	
		Worse or no different	

Table 2- PAR scoring sheet

Peer assessment rating (PAR) index was assessed under the headings of anterior segments (upper and lower),buccal occlusion,overjet,overbite and centreline for pre-treatment and post-treatment intra-oral records .There was a significant improvement in the PAR scoring changing from 11 pre-treatment to 1 post treatment suggesting the malocclusion was greatly improved. **(Table-2)**



Basion –nasion at nasion **Xi –pm at xi**

Fig -6: pre-treatment (black), post-treatment (red)

	NORM	PRE-TREATMENT	POST-TREATMENT
SNA	82°	80°	80°
SNB	80°	74°	75°
ANB	2°	6°	5°
WIT'S Appraisal	0 mm	-4.6 mm	-3.8 mm
MPA	32°	33°	34°
U1-NA	22°	33°	19°
U1/NA	4.0mm	8.5mm	4.5mm
L1- NB	25°	30°	23°
L1/NB	4.0mm	5.5mm	5mm
IMPA	90°	102°	94°
1/1	131°	111°	122°

Discussion

The success of orthodontic treatment depends upon the skill of orthodontist as well as on favourable pattern of facial growth. During treatment, lack of sufficient and favourable growth will complicate the correction of skeletal discrepancy.[4]

For the correction of class II malocclusion, it is important to understand and identify the etiology and expression of a class II malocclusion.[2]Earlier studies regarding skeletal class II malocclusion characteristics showed

various and contradicting opinions. But it is believed that the combination of mandibular deficiency and maxillary excess cause skeletal class II malocclusion.[2]

The goal of camouflage treatment (dental) is to correct the skeletal relationships by reposition the teeth in the jaws orthodontically, so that there is an acceptable occlusion of dentition and a pleasing facial profile.The objective of the treatment in this patient was to displace the teeth and to compensate the underlying jaw discrepancy. Patient rejected the FFA therapy and extraction of maxillary premolars and retraction of the anterior teeth was decided to compensate the skeletal discrepancy and to improve the profile of the patient but lower anteriors were also proclined and had mild crowding so mandibular premolars were also extracted to obtain a proper dental occlusion. This resulted in dental changes and also soft tissue profile changes but there was no significant change skeletally.

The aim of orthodontic treatment includes obtaining a good facial balance, static and functional occlusion and stability of the treatment outcomes.[5-6] In proper class II malocclusion, extraction of four premolars would be the most appropriate treatment option to achieve an optimal facial profile. But because of the patients' poor compliance, extraction of two premolars can also provide good results and thus it can be selected. Few studies indicate that the extraction of premolars, can lead to positive profile changes if they are undertaken after a thorough diagnosis. [7-10].

Conclusion

Correction of class II malocclusion by camouflage treatment is challenging and high quality individualized technique is required.

Premolars extraction can lead to significant profile changes and satisfactory facial aesthetics, if undertaken after a proper diagnosis.

References

1) Naragond A, Kenganal S, Sagarkar R, Sugaradday. Orthodontic Camouflage Treatment in an Adult Patient with a Class II, Division 1 Malocclusion – A Case Report :Journal of Clinical and Diagnostic Research. 2013 February, Vol-7(2): 395-400

2) Sharma NS. Management of a growing Skeletal Class II Patient: A Case Report. Int J Clin Pediatr Dent 2013;6(1):48-54

3) Singh G, Goyal V, Rastogi S, Menon AG, Aziz SB, Sokhi RK. Management of class II division 1 malocclusion using fixed functional appliances: A case series. J Indian Orthod Soc 2018;52:60-5.

4) Bishara S, Zaher AR ,Cummins DM, Jakobsen JR. Effect of orthodontic treatment on the growth of individual with class II div I malocclusion: the Angle Orthodontist vol. 64, no. 3, 1994

5) Bishara S, Hession T, Peterson L. Longitudinal soft-tissue profile changes: a study of three analyses. Am J Orthod. 1985; 88:209-23.

6) Alexander RG, Sinclair PM, Goates LJ. Differetial diagnosis and treatment planning for adult nonsurgical orthodontic patient. Am J Orthod. 1986; 89:95-112.

7) Moseling K, Woods MG. Lip curve changes in females with premolar extraction or non-extraction treatment. Angle Orthod. 2004;74:51-62.

8) Ramos AL, Sakima MT, Pinto AS, Bowman SJ. Upper lip changes correlated to maxillary incisor retraction – a metallic implant study. Angle Orthod. 2005;75:499-505.

9) Conley SR, Jernigan C. Soft tissue changes after upper premolar extraction in Class II camouflage therapy. Angle Orthod. 2006;76:59-65

10) Tadic N, Woods MG. Incisal and soft tissue effects of maxillary premolar extraction in Class II treatment. Angle Orthod. 2007;77:808-16.

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