Case Report

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Treatment of Skeletal Class III With Extraction And Standard Edgewise: Case Report

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Abstract

Objective: This study was determining the skeletal, dental, and soft tissues changes is respons to camoflage Class III treatment.

Methods: A male patient 14 years, 10 months with malocclusion of dental Class I and skelettal Class III, included crowding and crossbite anterior, overbite 3 mm, overjet -1,5 mm, maxillary midline shift to the right 2 mm and mandibular midline shift 1 mm. Treatment was extraction of maxillary and mandibular first premolar with standard edgewise appliance and retention of hawley retainer. After of treatment, correction of the crowding, crossbite anterior and midline, with dental relation class I, normal overbite and overjet is 2 mm.

Results: This case is Angle's class I malocclusion where sagittal interarch relationship is normal, it is preferable to extract in both the arches in order to maintain the interarch relationship, so was that extraction of the right first premolar of maxilla and mandibular.

Conclusion: Careful management of the extraction space preserved normal lip support and facial profiles.

Keywords: Extraction, Skeletal Class III, Standard Edgewise.

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Introduction

Malocclusion can occur, at least in part, as a result of unfortunate pattern of facial growth. The translation and transformation of the components if the orofacial complex, however cannot be atributed solely to genetics. Bone responds to its environment as it grows. This fact does not mean that growth. The translation and transformation of the compenents of the orofacial complex, however, cannot be attributed solely to genetics. Bone responds to its environment as it grows. This fact does not mean that growth can be modified in a controlled and predictable way.[1]

Orthodontists seek treatment methods that can, in some measure, create an environment to ameliorate qualitative or quantitative growth deficiencies. Many orthodontists use a first phase of functional therapy, rather than rely solely on some form of fixed appliance treatment, largely because they assume that multibonded treatments can have no effect on growth. In contrast, some clinicians who use the edgewise technique have argued that their method of treatment controls the vertical dimension and thereby modifies the vector of mandibular growth. Clinical studies suggest that the amount or direction of mandibular growth can be altered by a variety of treatments, including, in the opinion of many, the edgewise appliance.[1]

Although each orthodontic patient presents unique circumstance and challenges, treatment options and outcomes are mitigated by the patient's age and sex, in addition to the malocclusion. Orthodontists often prefer to work "with growth" because more correction can be achieved by growth of the supporting bones than by tooth movement. This issue becomes apparent when treating essentially nongrowing adults, when almost all correction depends on tooth movement. Our objective in this study was determine the skeletal, dental, and soft tissues changes is respons to camoflage Class III treatment.[2]

An angle classification for malocclusion focuses on the occlusal relationship of the first molars, so it can be misleadng for many malocclusions. Likewise, anterior crossbite may be deceptive, particularly when associated with a prognathic skeletal pattern and concave face. This unusual case appears to be a modest problem based on the molar discrepancy. Anterior crossbites with a Class III skeletal pattern have a layer of complexity that is not readily diagnosed.[3]

Class III malocclusion are very difficult to treat. This is due to the dental and skeletal components associated with most Class III malocclusions. Nongrowing skeletal Class III malocclusions are even more difficult to treat the limited treatment options available. Young patient who are diagnosed early with this problem can be treated orthopedically with a chincap or protraction facemask to normalize the underlying skeletal discrepancy. Patients with no growth remaining must be camouflage by

orthodontic tooth movement or fixed appliance. Standard edgewise is appliance to treatment is the displacement of teeth relative to supporting bone and compensate for an underlying jaw discrepancy.[3]

The edgewise mechanism can be described as a full-banded technique, with bracket and the auxillary edgewise attachments applied individually to each of the teeth. Space closing procedures following extraction in malocclusions with a discrepancy between total tooth material and available supporting bone. It also provides efficient and stable anchorage when such resistance is required, and it is an effective means of moving posterior teeth distally with the aid of extraoral traction.[4]

The principal attachment of the edgewise appliance is the bracket, with buccal tubes on the most distally placed molars. The brackets vary from standard widht of 0.050 inch to doublewidht and twin brackets for use on molars. In themselves, the brackets are passive. Tooth movement is accomplished by means of traction delivered to the brackets by securely attached arch wires.[5]

Extraction of teeth impairs the forward development of dental arches and the alveolar process. Thus, extraction of teeth improves sagittal relationship not only by tooth movement, but also by selective forward growth impairment of the alveolar bone.[6]

The strategy to camouflage of Class III malocclusion usually involves proclination of the maxillary incisors and retroclination of the mandibular incisors to improve the dentalocclusion, but it might not correct the underlying skeletal problem or facial profile. Studies have shown an increase in the ANB angle, little or no change in the vertical dimension, and decreased concavity of the facial profile with Class III camouflage treatment. However little information is available on possible tooth movements to camouflage this type of skeletal malocclusion.[7]

Case Report

A man, 14 years and 10 months with the main complaint that his mandibular teeth were covering her maxillary teeth and crowded in anterior. He had asymmetrical face and smile line with a straight profile.

Intra oral examination Figure 1 showed his maxillary arch showed severe crowding, whereas his mandibular arch showed mild crowding with normal curve of spee. He had full-step Class I molars and canines Class III relation in the right, with a negative overjet of -1.5 mm and overbite 3 mm. Compared with his facial midline, the maxillary dental midline was deviated 2 mm to the right and maxillary dental midline was deviated 1mm to the left.

The lateral chepalometric analysis indicated a skeletal Class III pattern (ANB, -2; wits appraisal, -3 mm) panoramic radiograph showed that her mandibular third molars were missing. His right and left condylar heads were in shape. In a temporomandibular joint (TMJ) evaluation, there were no TMJ symptoms, such as pain, restricted jaw movement, or joint noise, or other symptoms Figure 2. He also had familial skeletal Class III malocclusion appeared to be a combination of heredity, persistence, premature lost and envir-onmetal factors.

Evaluation of the handwrist radiograph showed that the epiphysis of the middle phalanx of the middle finger was the same width as the diaphysis Figure 3, indicating that the patient was approaching the peak of the growth spurt according to Bjork, Grave and Brown.[6]

Diagnosis in this case is skeletal Class III and dental Class I malocclusion, maxillary and mandible crowding, crossbite anterior. Facially, the patient appeare summetrical with normal lip competence and no display of gingiva on full smile Figure 1. She had a class I malocclusion with dental crowding. The photograph intraoral showed a normally developing dentition and no dental restoration Figure 2. Cephalometric analysis showed skeletal Class III Table 1.

The following treatment objectives were established: (1) to correcct crowding anterior maxillary and mandibular, (2) to correct anterior crossbite, (3) to establish Class 1 dental relationship, (4) to obtain normal overjet and overbite, (5) to correct the dental midline, (6) to improve facial and dental esthetics by establishing an esthetic smile.

Orthodontic treatment used the usual skeletal Class III malocclusion treatment mechanism, starting with the extraction of the right first premolar of maxilla and mandibular, treatment began with bonding complete fixed bracket (standard edgewise, 0.022x0.028 inc) with leveling and aligning by using SS wire 0.014 inch with multiple loops and stopper to the mesial tube, then the treatment continued by respectively 0.014 inc, then 0.016 to 0.018 inc plane arch for 7 months to correct crowding in the upper and lower jaw.

After that, performed tooth retraction right maxillary canines teeth, then enmasse retraction was performed using T-loop distal to the teeth brackets 12 and 22 with 0.016x0.022 inch rectangular wire until all spaces were closed.

Until now, the patient's crowding and crossbite anterior has been corrected, the -1,5mm overjet

Figure 1 **Pretreatment Facial and Intraoral Photograph.**

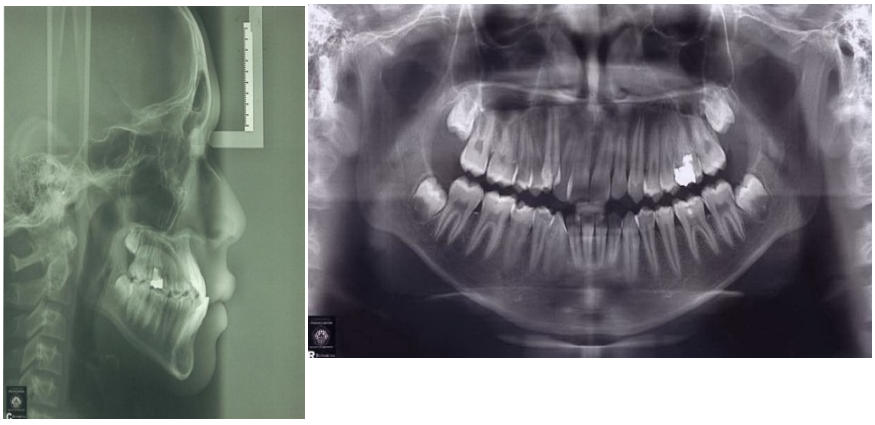

Figure 2 **Pretreatment lateral cephalometric and panoramic radiograph, showing a protruded lower incisivus and crowding of the maxillary and mandibular arch.**

Figure 3 **Hand - Wrist Film.**

has become 2mm, the openbite is 3mm to 2mm, and now the patient's dental treatment is still being carried out to get a normal bite Class I relationships were completely established. The patient was finished with 0.019x0.025 inc stainless steel archwire with ideal shape and torque in the the hawley retainer.

A posttreatment lateral chepalometric analysis showed skeletal base (SNA: pre and post treatment stay in number 83^0) and backward movement of the mandible (SNB: from 85^0 to 83^0). The ANB from -2^0 to 0^0 changes may be explained by the downward and backward rotation of the mandible. To correct his anterior crossbite, his maxillary incisors were proclined compared with treatment. The panoramic image revealed no signs of significant root or bone resorption, and good root parallelism was observed.

The superimposition found on lateral cephalometric radiographs Figure 4, a point moved forward slightly, and her maxillary and mandible first molars were extruded, allowing for the unlocking of his bite.

Discussion

This case is Angle's class I malocclusion where sagittal interarch relationship is normal, it is preferable to extract in both the arches in order to maintain the interarch relationship, so was that extraction of the right first premolar of maxilla and mandibular. [6]

In skeletal Class III patients, severe crowding in the maxilla from constriction of the dental arch is not rare. Yet, the decision of whether to extract the teeth is difficult. Although the feasibility of camouflage treatment, which can be carried out by various extraction combinations, has been proved by numerous studies that demonstrated successful masking of skeletal discrepancies instead of correcting them, more attention should be paid to extractions.

The treatment of developing skeletal Class III malocclusion is a challenging task for an orthodontist, particularly since, independent of the treatment changes, the potential Class III growth pattern remains. As a rule, camouflaging might be prescribed for patients only if there are clearly defined indications the residual growth will not worsen the deformity after treatment; mean while, tooth repositioning will have a favorable effect, or at least be less damaging to the facial esthetics. Although our patient was close to her pubertal growth spurt, we could not deny the possibility that the longterm stability can remain compromised if there is any residual growth. On the other hand, for a retrognathic maxilla, the extraction choice might only affect facial harmony. [8]

Figure 4 **Posttreatment facial and intraoral photographs.**

Figure 5 **Posttreatment lateral cephalometric and panorami radiograph, showing the improved profile and the parallel alignment of all tooth roots.**

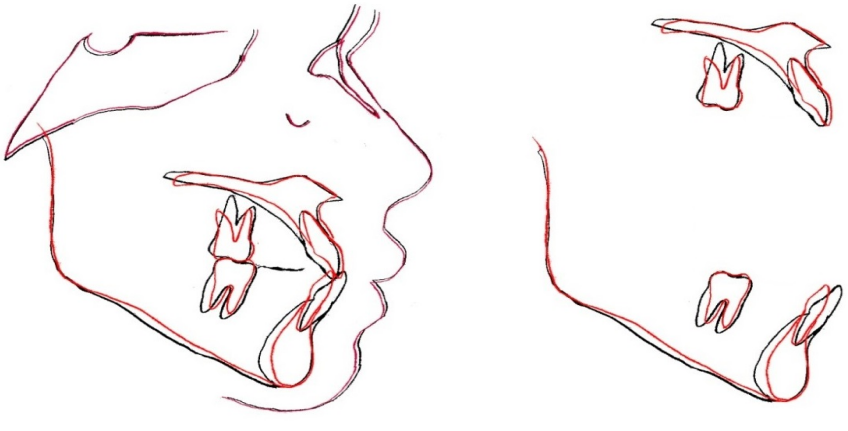

Figure 6 **Initial (black) and final (red) cephalometric tracings are superimposed on the anterior cranial base (left), and on the stable skeletal structures of the maxilla (upper right), and the mandible (lower right).**

A longitudinal study with Chinese subjects indicated that there are no significant differences in the intermaxillary sagital relationships among the high and low angle subjects with Class III malocclusion from ages 8 to 14 years; however, there are significant changes in the vertical relationships during this period.[8]

For Asian (or rarely, other) late adolescent Class III patients with major protrusion of the lower incisors, using skeletal anchorage to move the whole lower arch posteriorly can be quite helpful in correcting the problem.[2]

As a mechanism of intrinsic craniofacial compensations, Enlow et al pointed out that rotation of the mandibular dental arch can be independent of the mandible itself. Thus, regardless of any downward-inclined ramus and corpus position, the flattening of the functional occlusal plane can reduce the overall extent of downward occlusal plane angulation caused by the downward rotation of the mandible. Due to the orthopedic uncontrollability of mandibular growth, establishment of the natural dentoalveolar compensation orthodontically so as to make an appropriate dentition for the patient's skeletal pattern was an important treatment objective in this case.[7]

In this patient, the changes contributing most to the correction of the initial dental and skeletal AP discrepancy were forward maxillary growth, maxillary incisor proclination, and distal en-masse movement of the mandibular dentition with concurrent alveolar remodeling. These changes produced a counterclockwise rotation of the occlusal plane as expected and improved the soft tissue profile, with protrusion of the upper lip.[7]

Skeletal change also had an impact on tooth movement. Apparently, as a result of dentoalveolar compensation, the mesial movement of the maxillary buccal segments in the controls was almost identical to apical base charge; this relationship also was seen in the edgewise patients during the posttreatment period.[8]

Conclusion

Ideal occlusion was achieved in a crowded Class I malocclusion with excellent patient cooperation, spontaneous resolution of crowding and crossbite anterior. Careful management of the extraction space preserved normal lip support and facial profile.

Class III therapy with extraction and standard edgewise is a comprehensive nonsurgical treatment strategy designed for developing skeletal Class III malocclusions by orthodontic treatment to improve the patient's occlusion and profile.

Tabel 1. Cephalometric Measurement

Downs

	-	Mean	+	Pretreatment	Posttreatment
<Facial °	82	87.8	95	87	84
<Conv °	10	0	-8.5	-1	-1
A-B °	-9	-4.6	0	-2	-2
Mandibula plane angle °	28	21.9	17	32	36
Y axis °	66	59.4	53	64	68
Occlusal plane angle °	14	9.3	1.5	10	9
I - I °	130	135.4	150.5	120	125
I - occlusal plane °	20	14.5	-3.5	23	9
I - Mandibula plane°	7	1.4	-2.5	4	-4
I - APg	5	2.7	-1	6	8

Steiner

	-	Mean	+	Pretreatment	Posttreatment
<SNA°	78	82	86	83	83
<SNB°	76	80	84	85	83
<ANB°	0	2	4	-2	0
I to NA mm	2	4	6	11	9 mm
<I to NA°	15	22	32	27	30
I to NB mm	2	4	6	8	6 mm
<I to NB°	15	25	32	30	25
<Pg to NB	-	2	-	0.5	1 mm
<I to I°	150	131	120	120	125
<Ocl to SN°	5	14	30	13	13
<GoGn to SN°	20	32	40	31	32

Wits

	K1 III	Mean	K1 II	Pretreatment	Posttreatment
AO-BO mm	<-3	1	>3	-3	-1

Wendel - Wylie

	Normal	Pretreatment	Posttreatment
N-ANS : ANS-Me	45% : 55%	44.8% : 55.2%	45.5% : 54.5%

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Conflict of Interest

The authors affirm no conflict of interest in this study.

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