Title-Orthodontic Correction of Class II Division 2 Malocclusion in an adult With Single Missing Incisor: Case Report

Sarathya Muheswari and Saba Khan
Orthodontics and Dentofacial Orthopedics, Dr ZA Dental College, India
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A report describes the treatment of an adult with a skeletal Class II Division 2 malocclusion with crowbite. The patient had a lower central incisor resulting in the loss of anterior incisal guidance and a collapsed lower anterior region. The correction of this discrepancy was achieved by correction of the inclination of the maxillary incisors, opening of the bite and forward posture of the lower anterior region. The space in the lower anterior region was regained for replacement of the extracted incisor using a conventional Maryland bridge, and the anterior incisal guidance was restored. Improved smile and facial esthetics were achieved.

Class II Division 2: Incisal Guidance: Crowbite; Missing Single Incisor

Angle [1-7] described a lesser common form of Class II malocclusion as being characterized by distal inclination of the incisors. The Angle classification of Class II division 2 malocclusion as a triad of signs—deep bite, retruded maxillary incisors, and posteriorly positioned mandibular dental arch or the "w" [1].

In a more severe pattern of class II division 2 was described in Germany termed as Deckbiss or the "w" sign is simply recognized as a condition where the incisors are completely covered by excessive overbite of the maxillary incisors [2].

This pattern is also believed to have a strong genetic basis. Deep anterior overbite is seen to develop during the eruption period. The expression of this phenomenon in both the maxillary incisors erupting at the same time is more pronounced in an individual with a mandible where the center of rotation of the mandible is no longer on the midline. This is thereby resulting in the underdevelopment of the posterior facial height. Although the growth in these regions is restricted in the anterior region, due to the deep overjet, the mandibular basal region specifically the physical region continues to grow under independent growth [3-5].

Case Report

A 22 year old girl reported to the department of orthodontics with the chief complaint of an impinging bite, no smile and an extracted lower central incisor. As reported by the patient her mother also had a similar malocclusion (i.e., inheritance pattern of the malocclusion). On extraoral examination the patient had a symmetrical face with a competent lips and a strong chin. The upper lip protruded against the lower lip. Both the maxillary and mandibular were of the square type. Smile analysis showed a nonline with a non-consistent smile arc and a Morley's ratio line. Intraoral examination revealed Angle's class II molar relationship bilaterally. A complete overbite with retruded upper incisors including the canines was seen along with the upper incisors resting on the lower anterior gingival margin and causing the lower central incisor to be extracted at an age resulting in loss of incisal guidance and collapsed lower incisors.

Diagnosis and Treatment Objectives

The patient was diagnosed as Angle's Class II Division 2 malocclusion with a complete crowbite. End relationship on right side and Class II Molar relation on left side and Class II Canine relationship on left side and Class II Molar relationship on left side and Class II Canine relationship on left side and Class II Molar relationship on right side with hypodivergent growth pattern. The main treatment objectives were to reverse overjet, overbite and provide an incisal guidance to the patient.

https://www.researchgate.net/publication/331854701_Title-Orthodontic_Correction_of_Class_II_Division_2_Malocclusion_in_an_adult_With_Single_Incisor_Case_Report

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ORTHODONTICS AND GUMMY SMILE

Dental Science

Dr. Sarah Asif
Senior Resident, Department of Orthodontics and Dentofacial Orthopedics, Ziauddin Ahmad Dental College, Aligarh Muslim University, Aligarh *Corresponding Author

Dr. Sandhya Maheshwari
Professor, Department of Orthodontics and Dentofacial Orthopedics, Ziauddin Ahmad Dental College, Aligarh Muslim University, Aligarh

Dr. Mohd. Tariq
Professor and Chairman, Department of Orthodontics and Dentofacial Orthopedics, Ziauddin Ahmad Dental College, Aligarh Muslim University, Aligarh

ABSTRACT

One of the predominant objective of seeking orthodontic treatment is enhancement of dental esthetics. Smile comprises of the most essential factor of an individual's facial esthetics. When an excessive amount of gingiva is displayed superior to the maxillary anterior teeth upon smiling the smile is said to be "gummy". Based on the underlying etiology various methods can be employed for the correction of gummy smile orthodontically.

KEYWORDS

Orthodontics, Gummy Smile, Mini Implant Inrusion.

INTRODUCTION

According to Hasky "A smile is one of the most effective means by which people convey their emotions". With the increasing awareness regarding esthetics amongst the common population the challenge for an orthodontist to provide excellent occlusions along with outstanding and highly satisfying esthetics has also increased. Goggla Smile is known by a variety of names such as 'Gummy smile', high lip line, short upper lip or a full denture smile.1,2 Peck et al in 1992 found that the frequency of a person to project a gummy smile was related to anterior vertical maxillary excess, the muscular ability to raise the upper lip higher than average when smiling, greater overjet, greater interlabial gap at rest and greater width.3

Acceptable range of gingival exposure has long been debated; it is apparent that an excess of 4mm of gingival display on smiling is considered aesthetic and the majority of literature supports 0-6mm of gingival exposure as the ideal. Keus et al. first reported that 6mm of gingival display represents the threshold acceptability.

ETIOLOGY OF GUMMY SMILE

1. Soft tissue factor
A. Lip incompetence
B. Lip contour

2. Dental factors
A. Teeth position
B. Natural arch form

3. Leukogenetic factors
A. Gingival thickness
B. Type of gingival architecture

4. Skeletal factors
A. Maxillary exostosis
B. Mandibular exostosis

5. Orthodontic treatment induced-Extensive forces Unexpressed Vertical Growth, Anterior Position of the Mandible.

DIAGNOSIS OF GUMMY SMILE

It involves systematic recording of

1. Interlabial Distance at rest
When interlabial space at rest is normal (1-3mm), gummy smile is considered to have a predominantly muscular origin. Usually, the main cause of increased interlabial space is dimensionall discrepancy (vertical maxillary excess and/or premaxillary growth), which may or may not be associated with anatomical and/or functional changes in the upper lip.

2. Upper Incisor Exposure during rest and speech
At rest, the exposure of the upper incisors is 2-8mm in women and 1-3mm in men are considered to be within the normal range. Factors causing an increased exposure of the upper incisors at rest are: upper incisor extraction, orthodontic orthodontic treatment, skeletal pattern, vertical maxillary excess, short upper lip. Assessment of phonetics during clinical examination is also important.

3. Smile arc
Facies have a sharper curvature, whereas in males the curvature is flatter. Also brachycoucher facial patterns tend to have a flatter smile arc than individuals with mesocephalic or dolichocephalic pattern.

4. Width/length ratio of maxillary incisors
The gold standard ratio for the width of the maxillary incisors should be 8:10 of its length, whereas for upper lateral incisors that same ratio should be around 7:1. It is important to assess whether the crown of anterior teeth appear very short primarily for two reasons: a reduction in height of the incisal edges of upper teeth by incision and/or intrusion or gingival reduction.

5. Morphofunctional characteristics of the upper lip
Morphofunctional features of the lip such as: lip length, thickness and insertion, direction and contraction of various lips related muscle fibers, all affect the amount gingival exposure upon smile.

ORTHODONTIC TREATMENT MODALITIES FOR CORRECTION OF GUMMYSMILE

The appropriate treatment is determined by the etiology of the problem and the age of the patient. Treatment may include increasing the vertical height of the maxillary incisors so that they are not visible at rest. Surgical procedures such as: gingivectomy, crown lengthening, or reduction of the maxillary arch for correction of excess gingival display. Orthodontic treatment can be used to reduce excessive gingival exposure due to increased maxillary and skeletal relationships. Orthodontic intrusion, orthognathic surgery to move the maxilla upward and implant augmentation to introduce the maxillary anterior teeth.

Orthodontic Intraction
If the maxillary anterior teeth are excessively intruded in relation to the posterior teeth and the bite is deep, then the anterior teeth can be orthodontically intruded. According to Garber and Solow, the anterior teeth are maintained in the arch with a small elastic ligature, and the soft tissue moves together with the teeth, and therefore intrusion should improve a gummy smile. Cases with excessive vertical growth of upper anterior dentition will usually show extension and intrusion of upper incisors, deep overbite along with gummy smile.

Intraction arches such as: Ricketts Utility arch, Bunsen three piece intrusion arch, CAN intrusion arch by Nanda, Ovel's intrusion arch, can be successfully used for the correction of gummy smile in such cases; (Figure 1)
CASE REPORT

Preprosthetic Orthodontics in an Adult with Multiple Anterior Edentulous Spaces and Loss of Vertical Dimension

SANDHYA MAHESHWARI BDS, MDS
N.D. GUPTA BDS, MDS
SHRADDHA RATHI BDS, MDS
ADITI GAUR BDS, MDS

The authors show how a short phase of orthodontic therapy can prepare an adult with missing teeth for prosthetic rehabilitation. As this case illustrates, the treatment is aimed primarily at improving the patient's esthetics, oral hygiene, and masticatory function.

This is a preview of the article.

The full article will be available soon or on the current website: https://www.jco-online.com
MINISCREW IMPLANT SUPPORTED K-LOOP (MISK) SPRING FOR MOLAR DISTALIZATION

Prabhat Kumar Chaudhari¹, Sandhya Maheshwari², Saba Khan³, Om Prakash Kharbanda⁴

¹. Assistant Professor, Division of Orthodontics and Dentofacial Deformities, Centre for Dental Education and Research (CDER), All India Institute of Medical Sciences (AIIMS), New Delhi, 110029, India.

². Professor, Department of Orthodontics and Dentofacial Orthopedics, Aligarh Muslim University, Aligarh-202002, India.

³. Assistant Professor, Department of Orthodontics and Dentofacial Orthopedics, Aligarh Muslim University, Aligarh-202002, India.

⁴. Professor and Head, Division of Orthodontics and Dentofacial Deformities, Centre for Dental

This paper deals with the introduction of a treatment modality for maxillary molar distalization using Miniscrew implant Supported K-Loop (MISK) spring. The MISK spring consist of one active unit and one anchorage unit. The active unit uses K-loop spring attached bilaterally or unilaterally as needed between first molar tube and first premolar bracket. The premolar arm of the K-loop spring extended vertically for its attachment with anchorage unit to provide anchorage for molar distalization. The anchorage unit uses miniscrew implant, A hypodent model was prepared to evaluate the effectiveness of MISK spring. Subsequently, MISK spring was tested for efficacy in a case. It was found that the MISK spring is efficient in distalization of maxillary molars.

Key words: Molar distalization, K-loop spring, Miniscrew implant.

Introduction:

Non-extraction treatment with intra-oral maxillary molar distalization has been in practice with buccal or palatal approach. Recent systematic reviews¹ ² concluded that Pendulum appliance is most commonly used appliance among all appliances for intraoral molar distalization with Nance button and its variation for anchorage reinforcement, but it was not enough to neutralize the side effects of the anchorage loss and anterior anchorage loss are always critical with molar distalization appliances. Net amount of molar distalization utilizing conventional anchorage ranges from 40 to 80%³. Recent study by Kinzinger et al using miniscrew-supported periodontal anchorage of the skeletonized distal jet showed that skeletal anchorage allows greater molar distalization in the total movement as 86.5% to 91.7%³. This study signifies the efficacy of skeletal anchorage for intraoral molar distalization as an treatment alternatives to conventional anchorage. Palatal intraoral molar distalizing appliance apply distalization force closer to centre of resistance of molars, the molar experience therapeutically undesired mesio-palatal and disto-buccal rotation.

By changing the movement to force ratio with K-loop⁵ spring it is possible to achieve control tipping, uncontrolled tipping or bodily movement of maxillary molar depending upon the requirement of each case. But anterior anchorage was always critical with K-loop spring appliance. We have modified the premolar arm of the K-loop spring by extending it vertically for its attachment with miniscrew implant to make an innovative anchorage design to provide absolute anchorage for molar distalization. Through this paper we have tried to highlight a treatment modality for maxillary molar distalization using Miniscrew Implant Supported K-Loop (MISK) spring for nonextraction treatment of patients with a Class II malocclusion without proclination and mesial movement of the anterior teeth.

https://www.journaloforthodontics.org/critical-corner/miniscrew-implant-supported-k-loop-misk-spring-for-molar-distalization/
Mini Implant Assisted Correction of a Skeletal Class II Malocclusion with Deep Overbite - A Case Report

Sarah A.*, Sandhya M, Tariq M and Saba K
Department of Orthodontics and Dentofacial Orthopedics, Aligarh Muslim University, India

*Corresponding author: Sarah Asli, Department of Orthodontics and Dentofacial Orthopedics, Ziauddin Ahmad Dental College, Aligarh Muslim University, India, Email: sarahasli97@gmail.com

Abstract
Case report of a 19 year old male patient who presented with a skeletal Class II malocclusion associated with 100% deep overbite, vertical maxillary excess, incompetent lips and a hyperdivergent growth pattern. Fixed orthodontic mechanotherapy using preadjusted edgewise appliance along with segmented arch mechanics and mini implants, was used for the correction of the malocclusion and to achieve an optimum soft tissue balance. The treatment outcomes achieved were; correction of overjet and overbite, correction of class canine and molar relation and competency of lips resulting in improvement of facial esthetics.

Keywords: Skeletal Class II malocclusion; Incompetent Lips; Intrusion; Mini Implants; Vertical Maxillary Excess

Introduction
Deep bite is said to be one of the most challenging malocclusions for an orthodontist to treat and correct. A variety of treatment modalities and biomechanics have been outlined and employed by various researchers till date, that aid in achieving deep bite correction. Nonsurgical treatment modalities for correction of deep bite are usually directed towards relative mechanics; either by extrusion of posterior teeth or by intrusion of incisors or a combination of both [1-6].

Davidovitch & Rebellato delineated a variety of factors such as smile line, incisor display, and vertical dimension depending on which the choice of the most suitable treatment option for an individual is opted for [7]. The most routinely employed techniques for deep bite correction are: Cetlin’s appliance, RCS wires, Rickett’s utility arch, Burstone’s intrusion spring and arch, KSIR loop, Connecticut intrusion arch, PG retraction spring by Gjessing and the anterior bite plate [2,8].

Recently, mini-screw implants are increasingly being used by orthodontists as the most favorable treatment option for intrusion of teeth and correction of deep bite. Owing to their small dimensions, they provide the benefit of immediate loading, multiple placement sites, relatively simple placement and removal, placement in interdental areas where traditional implants cannot be placed, and minimal costs for patients as well [6].

Case Report
A 19 year old male reported to the department of orthodontics with the chief complaint of forwardsly placed upper front teeth and a non pleasing smile. On extra oral
Detection of Molecular Biomarkers as a Diagnostic Tool in the Planning and Progression of Orthodontic Treatment

Abstract
Orthodontic treatment focuses on providing patient care at the appropriate timing to utilize the growth potential for best results. It involves growth modification of the craniofacial region along with alveolar bone remodeling during tooth movement. The dynamic process of bone metabolism involves the release of biochemical mediators in the circulation. These molecules are indicative of the bone remodeling activity of osteoclastic deposition and osteoclastic resorption. Such biomarkers when detectable in the systemic circulation highlight the skeletal maturity of orthodontic patients and when detected locally as, in gingival crevicular fluid (GCF) and saliva, indicate the progression of orthodontically induced alveolar bone remodeling. Assessment of molecular biomarkers of bone remodeling in the body fluids would aid the clinicians in planning orthodontic treatment at the ideal timing and evaluating the advent of the treatment.

Keywords: Biomarkers, GCF, orthodontic tooth movement, saliva, serum

Introduction
Orthodontic treatment is a comprehensive treatment involving growth modification of the craniofacial region and alveolar bone remodeling affecting tooth movement. The underlying mechanism for bone remodeling involves an interaction between biochemical mediators which are released in the circulation. Detection of such molecules would aid the clinicians in assessing the growth status of the orthodontic patient and the efficacy of orthodontic care being rendered. Assaying these biomarkers would also help in evaluating the speed of treatment and local tissue reactions to the forces being applied. The present article aims at highlighting the molecular biomarkers for bone metabolism and their significance in orthodontic treatment.

Serum Biomarkers
Molecules detectable in serum indicate the general growth status of an individual and, thus, highlight the skeletal maturity level. Researchers have performed a number of studies providing an array of molecules indicating skeletal growth turnover.

Serum levels for osteocalcin, bone alkaline phosphatase (ALP), and serum carboxy-terminal telopeptide were recorded and correlated to bone mineral density by Silva et al., showing higher values in pubertal age group. Biomarker values were shown to be decreased with advancing bone age and sexual maturation and showed parallelism with peak height velocity. Insulin-like growth factor-I (IGF-I) working in parallel with the growth hormone has been shown to be a biomarker in the evaluation of skeletal maturity. Serum IGF-I concentrations have been found to increase slowly in pre-pubertal children with a further steep increase during puberty. After puberty, a subsequent continuous fall in circulating IGF-I levels suggests that there is an increase in IGF-I activity in period of increased skeletal growth.

Gupta et al. evaluated serum IGF-I levels in females of the age group 8–23 years. They showed that IGF-I can be correlated with the status of the cervical vertebral maturation and MP3 radiographs, thus, suggesting its use as a reliable marker for assessing the skeletal age.

In a recent study by Jain et al., it was suggested that IGF-1 and insulin like growth factor binding protein (IGFBP-3) serum levels can be used as biochemical markers for skeletal
A case of ortho-surgical management of palatal canine impaction using K-9 Spring

Aditi Gaur1, Sanihya Maheshwar1, Mohd. Tariq1, Sanjeet Kumar Verma1

1Senior Resident, 2Professor, 3Professor & HOD, Dept. of Orthodontics, Dr. Z.A. Dental College, Aligarh Muslim University, Aligarh, Uttar Pradesh

*Corresponding Author:
Email: aditigaur2239@gmail.com

Abstract
The present article describes a case report of a palatal canine impaction in a 14 year old male patient. The case was treated by surgical exposure of the impacted tooth followed by orthodontic traction. Sufficient space was created prior to the application of traction forces. The total treatment time was 22 months. The treatment duration in such cases depends on the age of the patient and the position of the impacted tooth with respect to the occlusal plane and mesiodistal position of the tooth.

Keywords: Impaction, Palatal, Canine, Impacted.

Introduction
Impaction is referred to a condition of unerupted tooth when its root formation is complete or when its contralateral tooth has been erupted for at least 6 months.1 The ectopic eruption and impaction of maxillary permanent canines is a frequently encountered clinical problem. The prevalence of maxillary canine impaction ranges from 0.8% to 5.2%.2,3 Approximately one-third of impacted maxillary canines are located labially and two-thirds are located palatally.4 It has been reported that palatal impactions account for 85% and labial impactions 15%.5,6 Management of impacted canines involves either a guided eruption of the impacted tooth or eruption by orthodontic traction. Highly positioned palatally impacted canines are often difficult to manage because of the presence of thick palatal bone. The present article describes the case of a palatal canine impaction which was managed by surgical exposure followed by orthodontic treatment.

Case Report
A 14 year old male patient had reported to the department of Orthodontics with the chief complaint of irregularly positioned teeth. On extra oral examination it was observed that the patient had symmetrical, mesoprosopic face with convex profile and competent lips. The smile analysis revealed a reduced incisor display with a non consonant smile and reduced lateral negative space(Fig. 1).

On intra oral examination it was observed that the patient had Angle’s Class I molar relation bilaterally, missing canine and retained C in the first quadrant, crowding in mandibular anteriors, an overjet of 4mm with a deep bite. The maxillary arch was asymmetrical and symmetric mandibular arch with lingual blocked lateral incisors.(Fig. 1)

Oral pantomogram was recorded which showed an impacted maxillary canine. An occlusal radiograph of the patient was also recorded which showed a palatal canine impaction causing retroclination of maxillary
A systematic nutritional and dietary guideline for orthodontic and orthognathic surgery patients

Sanjukta Maheshwari1, Mehd. Tarig2, Aditi Gaur3, Jija N1

1Professor, 2Senior Resident, 3Junior Resident, Dept. of Orthodontics & Dentofacial Orthopedics, Dr. Z.A. Dental College, Agra, Uttar Pradesh

*Corresponding Author:
Email: jijanbj@gmail.com

Abstract
Nutritional considerations are most critical during growth and development of individuals because of increased dietary requirements during this period. These who seek orthodontic treatment avoid many types of foods, especially fruits, raw vegetables, and other hard and tough foods because of pressure sensitive. This review highlights the benefits of proteins and other key nutrients. Also, it is important to consider energy intake for proper growth and development of the body. Thus, surgery of these structures may result in impaired food intake and eventually in nutrient deficiencies. In both instances special dietary concerns and guidelines are mandatory for the success of treatment and overall well-being of the patient. This paper presents an overview of the relationship between diet and orthodontic treatment including orthognathic surgery.

Keywords: Nutrition, Orthodontics, Orthognathic surgery, Fruits, Vegetables

Introduction
In recent years, people have become more aware & concerned about maintaining good health & having a healthy lifestyle. A good diet plays an important role in maintaining good oral & overall health.[1]

A diet that contains adequate amounts of all the necessary nutrients required for healthy growth and activity is a balanced diet.[2] The importance of a balanced diet cannot be overstated. A balanced diet provides natural disease prevention, weight control, and proper growth without the use of sleeping pills. Balanced diet is also important because it enables to meet daily nutritional needs and enjoy a higher overall quality of life. With nutritional issues in the spotlight, it seems a good time to evaluate how orthodontic treatment affects a patient’s diet and their overall health.[3]

A review of basic principles of nutritional science indicates its applicability to the orthodontics to the many levels. Nutritional considerations are most critical during growth and development and environmental challenges. The literature suggests that the nutritional status of the orthodontic patients can affect the biological response of the periodontal ligaments and the bone to orthodontic bands and brackets. Adolescence is a period of profound physiological and psychological developmental change that is also associated with altered nutritional needs.[4]

Adolescents are vulnerable because of increased dietary requirements during this period when changes in lifestyle and food habits greatly affect nutrient intake.[5] In addition, adolescents are typically involved in orthodontic treatment, during which modified dietary needs are required. Poor dietary behaviour is likely.[6] It is accepted that orthodontic treatment causes pressure sensitivity to the teeth which leads to pain, discomfort and functional limitations.[7,8] The mastication of hard foods is therefore difficult for patients and there is a tendency for soft foods to be eaten. The avoidance of hard to chew natural foods usually involves the elimination of solid foods such as raw vegetables and fresh fruit,[9-11] starchy foods such as meat, and dry foods such as bread or bagels,[12-14] from the diet.

Orthodontic treatment brings physical, psychological, and emotional stresses that increase the nutritional mobilization and utilization, thus raising the nutritional requirements of the person. This along with the fact that the nutritional needs of adolescents are already stressed by growth and development as well as the emotional stress of puberty, maintaining a well balanced diet is of great importance.[15] Orthodontic treatment typically lasts for around 1½ to 3 years and during this duration certain dietary restrictions and modifications are advised. A previous examination of patient’s nutrient intake before and after orthodontic adjustment reported a decrease in the intake of copper and manganese, and a possible detrimental effect on the rate of tooth movement.[16] Orthodontists recommend that patients avoid hard foods that may cause appliance damage which, in turn, may affect nutrient intake. Moreover, occlusal changes during treatment may also impair mastication and patients may cope by altering their diet or by swallowing coarse food leading to digestive disorders. In both circumstances impaired dietary intake may increase nutrition-induced disease risks.[17] The mouth is the portal for entry food into the body. Thus, maxillofacial surgery includes the orthognathic surgery of these structures may result in impaired food intake both prior to & after surgery. Adequate nutritional support in such patients is mandatory. In this review article we discuss the nutritional consideration in orthodontic and orthognathic surgery.
Case Report

Nonsurgical Correction of Facial Asymmetry and Occlusal Plane Cant in a Nongrowing Female: A Case Report

Aditi Gaur1, Sandhya Maheshwari1, Sunjeev Kumar Verma2, Fehmi Mian1

1. Department of Orthodontics and Dentofacial Orthopedics, Dr. Z.A. Dental College, Aligarh Muslim University, Aligarh, India

Abstract

The present article describes a case report of a 19-year-old female with facial asymmetry and chin deviation towards the right. Sequential extraction of all four premolars was performed for midline correction and alignment of blocked out first premolars and canines. An orthopedic cant was achieved with the use of expansion and distal movement of the right first molar. Orthodontic treatment was successful in improving facial appearance in patients with initial facial asymmetry, thus eliminating the need for orthognathic surgery in such cases.

Keywords: Asymmetric elastics, facial asymmetry, nonsurgical treatment

Introduction

The phenomenon of facial asymmetry can be described as differences in size or relationship between right and left sides of the face. Minor facial asymmetry is common and can be observed in every individual. Facial asymmetry affects lower half of the face more than upper face. The appearance of facial asymmetry as abnormal depends on individual perception. Mild to moderate facial asymmetry can be managed by camouflage orthodontic treatment. Severe skeletal asymmetry must often require a surgical management protocol. Not all facial asymmetry patients are candidates for surgical correction; therefore, patient assessment and selection remain major issues in diagnosis and treatment planning.

This case report describes orthodontic management of an adult female with Class I skeletal profile, facial asymmetry, and mandibular deviation to the right. Orthodontic treatment was considered for the patient to correct the malocclusion and relieve the interferences being created by blocked out dentition.

Diagnosis and Etiology

A 19-year-old female patient reported to the Department of Orthodontics with the chief complaint of noticeable facial asymmetry and irregularly positioned teeth. On evaluating patient history, no medical disorder or dental history was inferred from the details provided by the patient and her parents. On external examination, it was observed that the patient had mesoatomic, asymmetrical face with convex profile, and competent lips (Figure 1). The patient had a mesofacial appearance and the facial height on right side was shorter compared to the left side, on frontal examination. The smile of the patient was asymmetric with a noncoronionsm smile arc and an increase in lateral negative space on right side.

Address for correspondence: 2. Department of Orthodontics and Dentofacial Orthopedics, Dr. Z. A. Dental College and Hospital, Aligarh Muslim University, Aligarh - 202 002, Uttar Pradesh, India
E-mail: aditi.gaur32@gmail.com

Case Report

Crouzon syndrome: A comprehensive review and case report

Aditi Gaur, Sandhya Maheshwari, Sanjeev Kumar Verma, Mohammad Tariq
Department of Orthodontics and Dental Anatomy, Dr. Ziauddin Ahmad Dental College, Aligarh Muslim University, Aligarh, Uttar Pradesh, India

ABSTRACT
Crouzon syndrome is an autosomal dominant disorder characterized by craniosynostosis of coronal and sagittal sutures. Crouzon syndrome is caused by mutation in the fibroblast growth factor receptor-2 (FGFR-2) gene. Other characteristic features of Crouzon syndrome include exophthalmos, midfacial hypoplasia, and mandibular prognathism. The present article describes a case report of a 13-year-old male patient with characteristic skeletal and dental features of Crouzon syndrome.

Key words: Craniosynostosis, Crouzon syndrome, prognathism

INTRODUCTION
The term “craniofacial anomalies” literally encompasses all congenital deformities of the cranium and the face. More specifically, however, the term has come to imply congenital deformities of the head that interfere with physical and mental well-being.[2] Most craniofacial anomalies and dentofacial deformities result from inherited mutations and aberrant environmental modulation of multiple genes. Craniosynostosis is the term used to describe premature fusion of one or more cranial sutures in utero. Crouzon syndrome is an autosomal dominant disorder with complete penetrance characterized by premature synostosis of coronal and sagittal sutures that begins in the first year of life.[3] It was first described by a French neurosurgeon Octave Crouzon in 1912.[4] Crouzon syndrome is caused by mutation in the fibroblast growth factor receptor-2 (FGFR-2) gene.[5] Once the sutures become closed, growth potential to those sutures is restricted. Intraoral manifestations include mandibular prognathism, reverse overjet, and V-shaped maxillary dental arch.[6] Narrow, high, or cleft palate and bidual uvula can be seen as well. Occasional oligodontia, macrodontia, peg-shaped, and widely spaced teeth have been reported.[7,8,9]

Crouzon syndrome has an incidence of approximately one in 25,000 births worldwide.[10] It constitutes 4.8% of all cases of craniosynostoses.[1] Crouzon syndrome does not have any sex predilection.[10]

CASE REPORT
A 13-year-old male patient reported with his parents to the Department of Orthodontics with the chief
Decision Making Factors for Surgical Exposures Impacted Canines: A Review

Dr. N. D. Gupta¹, Dr. Sandhya Maheshwari², Dr. Neha Agrawal³, Dr. Pramod Yadav⁴

¹(Periodontology & Community Dentistry, Dr. ZA Dental College/ AMU University, India)
²(Orthodontics & Dentofacial Orthopedics, Dr. ZA Dental College/ AMU University, India)
³(Pediatric Dentistry, Dr. ZA Dental College/ AMU University, India)
⁴(Pediatric Dentistry, Dr. ZA Dental College/ AMU University, India)

Abstract: This report describes the surgical and orthodontic management of a patient with an impacted canine, which is a frequently encountered clinical problem and the treatment usually requires an interdisciplinary approach. In the present article, an overview of the incidence and sequelae, as well as the surgical, periodontal, and orthodontic considerations in the management of impacted canines is presented.

Keywords: Diagnosis, etiology, impacted canines, orthodontic techniques, surgical techniques.

I. Introduction

Impaction refers to a failure of a tooth to emerge into the dental arch, either due to space deficiencies or the presence of the entity blocking its path of eruption.¹ Permanent canines are the second most frequently impacted teeth after third molars.² The incidence of canine impaction is 1.7% according to Ericson and Kvaron.³ Permanent canines (85%) have palatal impaction and remaining 15% have buccal impaction.⁴

II. Etiology

The exact etiology of tooth impaction is not known. However, two theories explain the mechanism i.e. guidance theory and genetic theory. According to the guidance theory of canine displacement, the impaction is due to local predisposing factors i.e. congenital missing teeth, odontomes, transposition of teeth and other factors which interfere the path of its eruption.¹ The second theory i.e. the genetic theory suggests that the impacted canines are often with other dental anomalies including the tooth size, shape number and structure.⁵

III. Factors Affecting The Surgical Exposure Of Impacted tooth

The decision regarding the surgical exposure of the impacted tooth depends upon the multiple factors that need to be assessed by clinical and radiographic evaluations.

A. Clinical Assessment:

1. Patient age: The most suitable age for tooth exposure and forced eruption is in childhood or adolescence because as the age increases, the impacted tooth develops ankylosis and the chances of orthodontic correction become difficult.
2. Elastica and function of impacted tooth: A severely malformed or short rooted impacted tooth is likely to be unyielding and nonfunctional and is not worth saving.
3. Alignment of the adjacent teeth: The prognosis is good when there is spacing in the incisors while in cases of well aligned incisors the space has to be created to accommodate the impacted cuspid. The prognosis is usually worse where there is crowding of incisors.
4. Rotation of tooth: The orthodontic eruption of rotated impacted tooth is difficult.
5. Patient Cooperation: Factors such as missed appointments and poor oral hygiene influence the treatment duration and results.
6. Amount of Keratinized Tissue: Lack of keratinized tissue over the impacted tooth renders the treatment more difficult.
7. Length and cost of the treatment: The length of the surgical and orthodontic treatment and treatment expenses are the other factors that should be considered. The length of the orthodontic treatment usually takes 1-3 years depending upon the patient age, bone density, amount of root formation and dilacerations, depth of the impaction, available arch space etc.
Effects of adhesion promoter on orthodontic bonding in fluorosed teeth: A scanning electron microscopy study

Aditi Gaur, Sandhya Maheshwari, Sanjeev Kumar Verma and Mohd. Tariq

ABSTRACT
Introduction: The objectives of the present study were to elucidate the effects of fluorosis in orthodontic bonding and to evaluate the efficiency of an adhesion promoter (Assure Universal Bonding Resin) in bonding to fluorosed teeth.

Materials and Methods: Extracted premolars were divided into two groups on the basis of Thylstrup and Fejerskov Index. Ten samples from each group were etched and evaluated for etching patterns using scanning electron microscope (SEM). The remaining samples were subdivided into four groups of 20 each on the basis of adhesives used: IA, IIA - Transbond XT and IB, IIB - Transbond XT plus Assure Universal Bonding Resin. Shear bond strength (SBS) was measured after 24 h using the universal testing machine. Adhesive remnant index (ARI) scores were recorded using SEM. Statistical analysis was conducted using a two-way analysis of variance, and Tukey’s post hoc test was performed on SBS and ARI scores.

Results: Similar etching patterns were observed in both fluorosed and nonfluorosed teeth. No significant differences were found in the SBS values observed in both groups (8.68 ± 3.10 vs. 9.53 ± 3.44, P = 1.000). Increase in SBS was observed when Assure Universal Bonding Resin was used. Higher ARI scores were observed when an adhesion promoter was used for bonding. Conclusions: Mild-moderately fluorosed teeth etch in a manner similar to the nonfluorosed teeth. Similar bond strengths were achieved in fluorosed and nonfluorosed teeth when conventional composite was used. Use of an adhesion promoter increases the bond strengths in both groups of teeth.

Key words: Bond strength, bonding, enamel damage, fluorosed, scanning electron microscopy

INTRODUCTION
Dental fluorosis is a developmental disturbance of enamel caused by exposure to high concentration of fluoride during the development of teeth, which results in pathological changes in the tooth structure.10 Orthodontists working in the endemic fluorosis regions may encounter difficulties in performing routine bonding procedures in cases affected by this condition. It is difficult to bond attachments to fluorosed enamel because of the inability to achieve a uniform etched surface.11 The reduction in acid solubility of enamel has been attributed to the incorporation of fluoride in the enamel crystals during the developmental stages of teeth resulting in larger apatite crystals.11

Rebonding of brackets is a time-consuming procedure causing a negative impact on successful orthodontic treatment. Over the years, numerous modalities have been introduced to improve the bond strengths of the attachments to the tooth surfaces.

Adhesion promoters were originally introduced as bi-functional monomers such as 4-methacryloyloxyethyl trimellitate anhydride with both hydrophobic and hydrophilic groups promoting infiltration of...
Hemifacial Microsomia: Need Of A Dentist Can’t Be Denied.

Prof. N. D. Gupta¹ Dr Himanshu Trivedi² Dr Vivek Kumar Sharma³ Prof. Sandhya Maheshwari⁴

¹ Professor, MDS Dept. Of Periodontics & Community Dentistry, Dr. Z. A. Dental College, A.M.U., Aligarh.
² Post Graduate student (MDS) Dept. of Periodontics & Community Dentistry, Dr. Z. A. Dental College, A.M.U., Aligarh.
³ Asso. Professor, Dept. Of Periodontics & Community Dentistry, Dr. Z. A. Dental College, A.M.U., Aligarh.
⁴ Prof. Sandhya Maheshwari, Dept of Orthodontics, Dr. Z. A. Dental College, A.M.U., Aligarh, 202001, UP, India.

Abstract: Hemifacial microsomia is a common craniofacial malformation resulting in oral, facial and ocular manifestations. The condition is relatively rare with important dental changes. The unclear aetiology with variable presentation makes it an interesting case study. This case report attempts to discuss the clinically relevant dental findings in hemifacial microsomia patients with management of the same.

Key words: Craniofacial, Goldenhar syndrome, Malformation, Microsomia.

I. Introduction

Hemifacial microsomia is the second most common craniofacial malformation following cleft lip and palate. The term Hemifacial microsomia was first described by Gorlin for conditions characterized by unilateral microtia, failure to form ramus and condyle of mandible and macrostomia. Owing to its diverse clinical presentation various names have been given to it such as Goldenhar syndrome, lateral facial dysplasia, oromandibular dysostosis and oculoauriculo-vertebral spectrum.

II. Case Report

A 17 year old girl reported to the OPD of Dr. Ziauddin Ahmed dental college, AMU with chief complaint of asymmetrical face. Patient also had a complaint of difficulty in chewing. Patient has once visited a plastic surgeon for treatment of defective ear. No treatment was rendered to her by plastic surgeon. Patient gave no history of any such disease in other family members. No antecedent drug history or history of trauma was found. History of a dental filling was given by patient. No other dental treatment history was found.

Upon extraoral examination asymmetrical face with deviation towards right side was found (Figure 1). Flattening of face towards right side and underdeveloped ear pinna was also noted (Figure 2). Incompetent lips, inclination of tips and fullness of face towards left side was noted (Figure 3). Upon palpation underdeveloped ramus and condyle on the right side was noted. Upon intraoral examination posterior open bite on the right side and inclination of canines of occlusion was noted (Figure 4). Absence of maxillary first molar and mandibular second molar on the right side was also noted.

Oral hygiene of the patient was not adequate with deposition of plaque and calculus on the hard tissue surfaces. There was also narrowing of palate and decreased palatal width on right side. A Panoramic radiograph revealed underdeveloped ramus of mandible and condyle (Figure 5).

Figure 1

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Acute gingival bleeding in Ehlers-Danlos syndrome

Neha Bansal a,*, Narinder D. Gupta a, Himanshu Trivedi a, Sarthika Maheshwar b

* Department of Periodontics & Implant Dentistry, Dr. Saraswati Dental College (JAMS), Aligarh 202002, U.P., India
b Department of Orthodontics & Dentofacial Orthopedics, Dr. Saraswati Dental College (JAMS), Aligarh 202002, U.P., India

ABSTRACT

Ehlers-Danlos syndrome (EDS) is an inherited syndrome in which there is a defect in collagen synthesis. Dental health professionals can play an important role in diagnosing such rare genetic syndromes by correlating oral manifestations with systemic signs and symptoms.

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1. Introduction

Ehlers-Danlos syndrome (EDS) is a heterogeneous group of inherited connective tissue disorders in which there is a defect in collagen synthesis. Other terms such as “rubber man” or “Indian rubber man” are also being used synonymously for this syndrome.

The occurrence of joint hypermobility with spontaneous hemorrhage is a common feature in Ehlers-Danlos syndrome. There is no report of this rare entity with the chief complaint of intra-oral bleeding. The reasons of acute gingival bleeding may be numerous but when it occurs in conjunction with other clinical features as in this particular case, the need of thorough examination and investigations cannot be disregarded. The cases of EDS with chief complaint of intra-oral bleeding are not reported yet and this makes this case worth reporting.

2. Case Report

An 8-year-old girl referred to the Department of Periodontics and Implant Dentistry, Dr. Saraswati Dental College with chief complaint of gingival bleeding since last 3 days. Initially, bleeding was intermittent in nature which was aggravated by oral prophylaxis by a local dentist. She gave a history of recurrent fall while walking and easy bruising all over the body since as long as she remembered. There was no history of any previous dental treatment or bleeding from any other site of body. There was no significant medical and drug history. Occurrence of similar manifestations was found in two out of three sisters of the patient.

On extra-oral examination of the patient, typical long face with prominent eyes, staring look due to loss of infraorbital adipose tissue, and pinched nose was noted (Fig. 1a). On intra-oral examination a haematoma (8 by 20 mm) was observed in relation to buccal gingiva of upper right primary second molar and permanent 1st molar (Fig. 1b). Periodontal status appeared to be normal. Patient's palate was deep and dome-shaped (Fig. 1c). OPG X-ray and panoramic radiograph revealed no significant abnormal finding.

On general examination, articular hypermobility was observed (Fig.1c). However, no episodes of joint dislocation have occurred in the past. Muscle bulk, tone and power were noticeably reduced. On the bright scale, a score of 7/10 was given to patient for joint hypermobility (Fig. 2). Trendelenburg sign and mild hyperelasticity of the skin could be elicited (Fig. 3a and b). Subdermal ecchymosis on shin of her right leg and bruises were observed on forearms (Fig. 3b and c).


* Corresponding author. Tel.: +91 98 973 17016.
E-mail address: nehabansal02@gmail.com (N. Bansal), ndguptaad@gmail.com (N.D. Gupta), trivedi.himanshu@gmail.com (H. Trivedi), m.sarthika@gmail.com (S. Maheshwar).
Tel.: +91 98 972 27723.
Tel.: +91 98 972 27769.
Tel.: +91 98 122 7329 (S. Maheshwar)
Correction of Class II malocclusion and soft tissue profile in an adult patient

Achti Ghazi, Sandhya Maheshwari, Sanjeev Kumar Verma

Abstract

Treatment of Class II malocclusion in non-growing individuals is a challenging situation for the clinician. Class II malocclusion with bialveolar protrusion often dictates premolar extractions with maximum anchorage. The present article describes the case of an adult female with skeletal Class II malocclusion, bimaxillary protrusion, increased overjet, deep bite, lip protrusion, everted lower lip, deep mentolabial sulcus, and lip incompetence. To correct the malocclusion, all four first premolars were extracted. Direct anchorage from mini-screws was used for retraction of the anterior segment. The mandibular buccal segment was protracted into the extraction space using Class II mechanics. Ideal Class I canine and molar relations were achieved in 24 months. There was a significant improvement in facial profile and smile esthetics of the patient.

Keywords: Absolute anchorage, bialveolar, Class II, mini-screw, skeletal anchorage

Introduction

Class II malocclusion is a frequently encountered problem in orthodontic patients. The presence of skeletal Class II malocclusion in adult patients is challenging, and patients often have high expectations regarding the results. Increased upper lip procumbency is commonly associated with protrusive maxillary dentition in Angle Class II Division 1 malocclusions and Class II malocclusions. The treatment plan often includes extraction of the maxillary premolars, followed by retraction of the anterior teeth with maximum anchorage. Mini-screws provide an efficient system of bony anchorage for anterior retraction without affecting the posterior dentition.

Class II elastics are effective in correcting Class II malocclusions; and the effect has been found to be primarily dento-alveolar. The present case report describes a case of an adult female with Class II malocclusion, bialveolar protrusion, and lip incompetence. The treatment involved en masse retraction of the anterior teeth using maximum anchorage and protraction of mandibular molars using moderate anchorage with Class II elastics.

Case Report

A 19-year-old female patient had reported to the Department of Orthodontics and Dentofacial Orthopedics with the chief complaint of forwardly positioned upper front teeth. On extra oral examination, it was observed that the patient had the symmetrical facial appearance, meso-protrusive face, convex profile, incompetent lips, short upper lip, everted lower lip, and deep mentolabial sulcus [Figure 1]. On intra oral examination, it was observed that the patient had Class II molar and canine relation bilaterally with mandibular midline shift toward left by 2 mm. The patient had an overjet of 7 mm and an overbite of 70% [Figure 1].

Cephalometric findings revealed a hypodivergent growth pattern, skeletal Class II malocclusion with protruded maxilla and reduced mandibular length [Figure 2]. Orthopantomogram findings showed erupting mandibular third molars [Figure 3].

Treatment objectives

- Alignment and leveling
- To achieve ideal overjet and overbite
- To achieve Class I canine and molar relation
- Anchorage considerations
- To achieve optimum lip competence

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Orthodontic management of a borderline case with ectopic maxillary canine by unilateral premolar extractions

ADITI GAUR, SANDHYA MAHAPATRA, SANDEEP KUMAR VERMA, MOHD. TARQ

Abstract
Management of orthodontic cases often requires extraction of permanent teeth. The decision making regarding extractions depends upon the size, shape, and functional influence of the teeth, the mesial roots, and the growth pattern. The present report describes a case with unilateral buccally bloomed out canine and bilateral posterior crossbite, for which unilateral premolar extractions were performed to achieve an optimum and functionally stable occlusion.

Keywords: Borderline, buccally, ectopic canine, unilateral extraction

Introduction
Extraction is done primarily to gain space, reposition, and correct sagittal interarch discrepancy. All other things are equal, it is better not to extract, but in some cases extraction provides the best treatment. The decision making regarding extraction of teeth depends upon the arch length, tooth material, discrepancy, facial profile, and skeletal pattern.1 Certain patients with unique orthodontic problems such as jaw size/tooth size discrepancies, maxillary/mandibular tooth size differences, and maxillary/mandibular tooth size discrepancies demand asymmetric extraction.2,3 Ectopic canines which are buccally displaced usually result from space deficiencies; thus, the management often dictates extraction as the treatment protocol.2,4

The present article describes a case of a patient with Class II subdivision malocclusion with unilateral buccally bloomed canine which was treated by unilateral first premolar extractions.

Departments of Orthodontics and Pediatric Dentistry, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, Uttar Pradesh, India

Correspondence: Dr. Aditi Gaur.
Department of Orthodontics and Pediatric Dentistry, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, Uttar Pradesh, India.
E-mail: aditigaure2289@gmail.com

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Case Report
A 15-year-old female patient had reported to the Department of Orthodontics with the chief complaint of a malpositioned upper left tooth. A clinical examination of the patient was done. It was observed that the patient had a symmetrical mesiodistal facies. The patient had a convex profile with a prominent nose. The smile arc of the patient was consonant [Figure 1]. On intraoral examination, it was observed that the maxillary midline was shifted toward the left and the mandibular midline was shifted toward the right. Canine relation was Class I on the right side and a buccally bloomed canine was present on the left side. Anomerally, the overbite was in an edentulous area. The patient had a Class II molar relation on the right side and Class I molar relation on the left side. The patient had bilateral posterior crossbite with respect to the first molars [Figure 1]. The maxillary arch was U-shaped and symmetric, and the mandibular arch was wide, symmetric, and U-shaped.

The cephalometric findings revealed a normodivergent growth pattern with a Class I skeletal base [Figure 2].

An orthopantomogram was also recorded which showed erupting third molars in all four quadrants [Figure 3].
Case Study

Miniscrew-Assisted Mandibular Molar Protraction: A Case Report


Abstract

The present article describes the case of a 12-year-old female patient in which mandibular second molar protraction was performed after the extraction of a grossly damaged first molar. A titanium miniscrew was placed in the buccal alveolar bone between the canine and premolar to provide direct anchorage for protraction forces. A balancing lingual force was applied. The treatment time was 22 months. Ideal overbite and overjet with good posterior occlusion was achieved.

Keywords: Molar protraction, Miniscrew, Uprighting.

Introduction

Mayers suggested that mandibular first permanent molar is the most common tooth to be lost due to caries.¹ Loss of permanent tooth results in undesirable consequences such as mesial tipping and rotation of adjacent teeth, eruption of opposing tooth into the extraction space.² Previously prosthetic replacement of the edentulous spaces was considered as a sole treatment option as molar protraction was seldom attempted by clinicians due to increased anchorage demands. Mandibular molar protraction is one of the most challenging tooth movements during orthodontic treatment. Anterior dental anchorage is often inadequate to protrude a molar without reciprocal retraction of the incisors or movement of the dental arch line.³ The introduction of temporary anchorage devices has enabled the orthodontists to perform difficult tooth movements like molar protraction. The present article describes a case report of a patient with a grossly damaged mandibular first molar which was extracted and replaced by protraction of mandibular second molar into the extraction space.

Case Report

A 12-year-old female patient had reported to the department of orthodontics with the chief complaint of irregularly placed front teeth. The clinical examination of the patient revealed a symmetric, mesoprosopic face with convex profile and competent lips. Intraorally, the patient had a flush terminal molar relationship with end-on canine relation bilaterally, and overjet of 3 mm. Overbite of 4 mm, retained deciduous second molars in all quadrants. The patient had a restoration with respect to 36 and a grossly damaged 46 which was previously root canal-treated (Fig. 1).

Cephalometric examination revealed a skeletal class I base with hypodivergent growth pattern with an ANB of 3° and an FMA of 21° (Fig. 2).

OPG findings revealed erupting premolars in all quadrants, erupting second molars in all quadrants, developing third molar in all four quadrants and root canal treated 36 (Fig. 3).

*Senior Resident, Department of Orthodontics and Dentofacial Orthopedics, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, India
**Professor and Head, Department of Orthodontics and Dentofacial Orthopedics, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, India
***Professor, Department of Orthodontics and Dentofacial Orthopedics, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, India
****Assistant Professor, Department of Orthodontics and Dentofacial Orthopedics, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, India
Correspondence to: Dr. Aditi Gaur, Department of Orthodontics and Dental Anatomy, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, India. E-mail: aditigaur2289@gmail.com

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Metal Hypersensitivity in Orthodontic Patients

Sowdhy Maheshwari, Sanjeev K Verma, Sushma Dhiman

Department of Orthodontics and Dental Anatomy, Aligarh Muslim University, Aligarh, India

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Abstract

Orthodontic treatment of individuals with metal hypersensitivity is a matter of concern for the orthodontist. Orthodontic appliances contain metals like Nickel, Cobalt and Chromium etc. Metals may cause allergic reactions and are known as allergens. Reaction to these metals is due to biodegradation of metals in the oral cavity. This may lead to the formation of corrosion products and their exposure to the patient. Nickel is the most common metal to cause hypersensitivity reaction. Chromium ranks second among the metals, known to trigger allergic reactions. The adverse biological reactions to these metals may include hypersensitivity, dermatitis and asthma. In addition, a significant carcinogenic and mutagenic potential has been demonstrated. The orthodontist must be familiar with the best possible alternative treatment modalities to provide the safest, most effective care possible in these cases. The present article focuses on the issue of metal hypersensitivity and its management in orthodontic patients.

Key words: Nickel-Titanium alloy; biological effects; biocompatibility; tissue reaction; orthodontics; corrosion

Introduction

Metals form an integral part of orthodontic practice. Orthodontic auxiliaries, made up of metal consist of bands, arch wires, ligature wire, hooks, tubes, brackets, and springs. Metals like stainless steel, cobalt chromium, nickel-titanium, and b Titanium, may be used singly or in combination to fabricate these appliances. Orthodontic treatment of individuals with metal hypersensitivity is a matter of concern for the orthodontist. Orthodontic treatment is a dynamic process that relies on the body's ability to adapt to the appliances utilized. Orthodontic treatment exposes alloys to a moist and corrosive environment, biodegrade them, thus increasing the chance of metal sensitization. An allergic reaction, or hypersensitization, is defined as an excessive immune reaction that occurs when coming into contact with a known antigen. Adverse hypersensitivity reactions are usually most often as allergic contact dermatitis of the skin and nose, but mucosal and gingival reactions, as well as a potential general dermal and systemic reaction can also occur. Nickel, in particular, is the most common contact allergen in women. Chromium ranks second among the metals, known to trigger allergic reactions. When hypersensitivity reaction occurs in a patient, treatment time and efficiency, treatment satisfaction, general health and quality of life are adversely affected.

Epidemiology

The incidence of adverse reactions in orthodontic patients has been estimated at 1:100, with 85% of these being contact dermatitis. Allergic and tissue reactions to orthodontic wires, as well as metal release from wires, have been reported by many workers. The amount of metal released from fixed orthodontic appliances in vitro varies depending upon the manipulation of the appliances and on different physical and chemical test conditions. Park and Shear (4) reported an average release of 40 µg nickel and 39 µg chromium per day from a simulated full-
BRACKET POSITIONING: WHAT IS IDEAL?

Abstract: In orthodontics, bracket positioning is the key to good results based on good diagnosis and treatment planning. All the advocates of different appliance systems hold stress on proper positioning of brackets. Accurate bracket placement is very important since it affects torque, tip, in/out, vertical positioning, and rotation. The purpose of this article is to review the work of notable orthodontists and their opinions regarding the ideal location for bracket placement.

Correct bracket positioning is one of the most important factors which can affect the treatment outcome. Even though it is routinely performed, the ideal location is debatable if not controversial. Landmarks reported in the literature show interesting dissimilarity. Tweed (1966) suggested the incisal edge as a guideline for linear measurement. Saltzman advocated the middle third of the crown as the ideal location. Holdaway (1952) stated the bite to be determinant for bracket positioning, at occlusal third of the crowns if there is an increased overbite and at cervical third in open bite cases. Jangnak used crown form as a predictor to locate the position for brackets. With the advent of preadjusted edgewise brackets, the importance of accurate bracket positioning has further amplified as it is necessary for proper expression of the intended prescription.

Tweed advocated placing brackets by linear measurements from bracket slot to the incisal edges of anterior teeth. In maxillary arch, the bracket was placed vertically at a distance of 3.5 mm for central incisors, canine and the premolars, while for lateral incisors, the distance was kept at 3 mm. Mesiodistally, for the anterior teeth, it should be at the middle of the tooth, and in the incisal edge. Whereas, in the mandibular arch, the incisal edge of bracket slot is placed at 3.5 mm to the incisal edges of incisors and cusp tips of canines and premolars. On the molars, brackets and molar sheaths are placed at the junction of upper and middle third of teeth occluding face. Mesiodistally, maxillary bracket should be in line with the mesiobuccal cusp 3.

P.R. Begg (1965) gave the light wire appliance, and advocated the differential force mechanisms. Begg brackets are modified ribbon arch brackets. According to him, the brackets are centered mesiodistally on the labial surfaces of teeth with the base of the arch wire slots 4 mm from the incisal edge or cusp tips. On maxillary laterals at 3.5 mm except when tooth is originally displaced linguually (dentally).

Molar tubes should be parallel with the occlusal surface when viewed from the buccal aspect. Parallel with a long axis of the occlusal surface of the tooth mesiodistally when viewed from occlusal. Tubes on mandibular molars are placed more gingivally to avoid occlusal interference.

Lawrence F. Andrews, who famously stated, "The six keys to normal occlusion" also developed the straight wire appliance (SWA). Andrews straight wire appliance (1976) gave the concept of an imaginary plane known as "The Andrews Plane." It is a plane that would pass through (Long Axis) LA points of the crowns of normally occluded teeth or, simply, the plane would separate the occlusal and gingival portions of the crown at the LA point.

Andrews advocated placing brackets at the mid-point of the long axis of the clinical crown, keeping vertical incisal wings parallel to the long axis of the clinical crown and then moving the bracket up or down until the middle of its slot base is at the same height as the mid-point of the clinical crown 6, 12. Ronald Roth developed the second generation of preprogrammed brackets. He modified the Andrews prescription to allow the teeth to be placed in an overcorrected position. Roth advocated the key to determining bracket height are the canines and premolars. The center of bracket should be placed at the maximum convexity of crowns of posterior teeth. Maxillary centrals should be bracketed equal in height to the maxillary laterals. The centrals will be 0.5 to 1 mm longer than the laterals after settling. Canine tip is kept 1 mm longer than the adjacent laterals. Position of anterior
RAPID ORTHODONTICS-A CRITICAL REVIEW

1Sandeep Maheshwari, 2Sanjiv Kumar Verma, 2Mohd. Tariq, 3Aditi Gaur
1Professor, 2Associate Professor, 3Junior Resident
Department of Orthodontics and Dentofacial Orthopedics,
Dr. Z. A. Dental College, Alligarh Muslim University, Alligarh, India.

Abstract - Due to increased demand of orthodontic treatment amongst adult patients there has been a rise in the development of methods to accelerate the orthodontic tooth movement and reduce the overall treatment time. Various methods have been introduced to enhance the rate of tooth movement which include the use of low-level laser therapy, pulsed electromagnetic fields, electrical currents, Surgical means like corticotomy, dentinovenous distraction, periodontal distraction, periodontal, prosthetic and molecular therapies. Amongst these methods the best results have been obtained through Surgical procedures. Most of these procedures are still in the experimental phase and greater number of clinical trials are required to refine these techniques in the clinical practice.

Introduction
In today's era there is an increased demand for orthodontic treatment especially among adult patients. The greatest concern amongst the patients undergoing orthodontic treatment is the increased treatment time. Fixed orthodontic treatment lasts up to 2 to 3 years which further increases the risk of complications associated with the treatment such as external root resorption, periodontal problems and patient compliance. Clinicians are constantly striving towards developing strategies to enhance the rate of orthodontic tooth movement. Recently, numerous methods have been proposed to enhance the rate of orthodontic tooth movement so that faster and better treatment options can be provided to the patients. The present article aims to review the different Surgical and non-Surgical techniques which have been proposed to fasten the rate of orthodontic tooth movement.

Surgical methods:
Over the years various Surgical procedures have been tested to enhance the rate of tooth movement. Amongst the numerous modalities Surgical techniques have been found to be highly effective in reducing the treatment time for orthodontic therapy. These Surgical procedures can be performed routinely, but have the limitations of increased discomfort to the patient and the risk for morbidity. The commonly used Surgical techniques have been enumerated.

Corticotomy:
Kole et al. in the year 1959 gave the concept of corticotomy combined with orthodontics as a means of reducing treatment time. Interproximal corticotomy cuts made extending through the cortex, connected with horizontal osteotomy cuts resulted in bony blocks which were considered by Kole to be responsible for quicker tooth movement. Similar attempts were made by Gante et al. in five adult patients in whom space closing was attempted with orthodontic forces following a vertical corticotomy. The mean treatment time for these patients was 10-8 months, compared with a conventional treatment time of 28.3 months.

Wilkodontoics - periodontally accelerated orthodontics
Wilkio et al introduced a corticotomy facilitated technique involving alveolar augmentation. The technique includes labial and lingual alveolar flaps accompanied with limited selective croticotomy. (Figure 1). According to Wilkio et al. the accelerated tooth movement in case of corticotomy is due to increased bone turnover and decreased bone density. When a tooth moves through a healing surgical site, the tensional stress on the tooth act in a synergistic manner with growth factors to reline local bone mass. This mechanism was explained by Harold Frost as Regional Acceleratory Phenomenon. The corticotomy surgery elicits a profound accelerated response in a limited area because of the demineralization. Sebanon et al. explained the histological mechanism following corticotomy using a microflask. He suggested that there was a rapid Scine in the catabolic and anabolic activity in the alveolar bone and periodontium three weeks after the corticotomy procedure. The induced increase in bone turnover and decrease in mineral content of the bone (demineralization) are conducive to accelerated tooth movement.
Interdisciplinary management for restoration of function and esthetics in a patient with hereditary amelogenesis imperfecta

Sushma Dhiman, Saba Khan, Sandhya Maheshwari, Jay S. Upadhyay

ABSTRACT

Amelogenesis imperfecta (AI) is a type of hereditary disorder which is expressed as a group of conditions causing developmental anomalies in the structure of enamel. It is associated with a reduction of oral health-related quality of life, has an impact on psychological well-being, and leads to various physiological problems. Children or adults with AI express varying degree of malocclusions either in the form of crowding, impacted teeth, spacing, retained teeth, reduced vertical height due to abnormal tooth structure or undue tooth loss. Orthodontic treatment should precede esthetic rehabilitation. Proper diagnosis of the case is quintessential to provide durable functional and esthetic result to these patients, improving the quality of their lives. We present a case of interdisciplinary management for restoring function and esthetics in a patient with hereditary AI of the hypoplastic type accompanied with tooth impaction and some other dental anomalies.

KEY WORDS: Amelogenesis imperfecta, occlusal rehabilitation, porcelain crown

Introduction

Amelogenesis imperfecta (AI) is a group of inherited abnormalities of the enamel (1-4). It may be classified into hypoplastic, hypocalcified, and hypomaturation, depending on the clinical presentation of the defects and the likely stage of enamel formation that is primarily affected (5-8). Usually, both deciduous and permanent dentitions are involved. The defects in the enamel, the dentin, and root form are usually normal. Although these teeth are subjected to more wear and tear, they are more resistant to decay. The disease may be autosomal dominant, autosomal recessive or X-linked, it is genetically and clinically heterogeneous.

Esthetics, loss of vertical dimension due to occlusal wear resulting in masticatory dysfunction and tooth sensitivity are major clinical concerns in a patient of AI. It is important to restore these enamel defects as early for esthetic and functionally stable outcome, and also for psychological well-being of the patient (9). A tentative treatment plan for such patients must be chalked out according to age and socioeconomic status of the patient as well as type and severity of the disorder and the intraoral findings. It is critical to evaluate, diagnose, and address concerns. The aim of this paper was to outline the management of esthetics and function with a multidisciplinary approach in a patient with AI of the hypoplastic type accompanied with tooth impaction and some other dental anomalies in 22-year-old female patient.

Case Report

Diagnosis and etiology

A 22-year-old female patient presented with a chief complaint of discolored and irregular teeth as shown in Figure 1. Tooth shades varied from light to dark yellow. Severe attrition of buccal segments in both the arches was present, but the patient had no problem of sensitivity. History revealed that her primary dentition had a similar appearance. The patient’s oral hygiene was satisfactory, along with some hypoplastic carious lesions. Vitality tests were done and teeth 24, 25, 45 were found to be nonvital. Rest of the teeth were vital and tender on
INTERDISCIPLINARY MANAGEMENT OF COMPOUND ODONTOMA: A CASE STUDY

ABSTRACT: Odontomas are the most common of the tumors arising from the odontogenic tissues. Odontomas are frequently responsible for preventing tooth eruption, and are seen associated with retained primary teeth. Here we describe a case of a 12 yr old child with retained left mandibular primary anterior and their unerupted counterpart due to the presence of a compound odontoma, and the subsequent management of the patient's condition.

Introduction: A delay in time between the exfoliation of a deciduous tooth and the eruption of its permanent successor is known as dental retention. This occurs when tooth eruption does not occur within a normal time frame. Cahill and Marks established that although a viable dental follicle is required for tooth eruption, tough eruption is a series of metabolic events in alveolar bone characterized by bone resorption and formation on opposite sides of the dental follicle and the tooth does not contribute to this process. In other words even after a viable tooth bud progresses to form a perfectly formed tooth, eruption might still not take place i.e. absence or mal formation of the tooth bud, malposition of the teeth, failure of growth signals, paucity of hormones, chronic diseases (genetic or acquired), compromised liver function or impairment in the path of eruption are the main causes of non-eruption of permanent teeth and consequent retention of the primary teeth. Impedance in the path of eruption itself may be due to a myriad of reasons one of the rare one being the presence of an odontoma. The term Odontoma was first included in literature by Paul Broca as far back as 1886. The term is used for describing the growth in which functional odontogenic tissues (both the epithelial and mesenchymal components) co-differentiate simultaneously. The odontoma is often defined as a hamartoma rather than a true neoplasm. Hamartomas are tumor-like lesions composed of an overzealous growth of mature cells and tissues which are native to that area. Of the odontogenic tumors these represent the largest group with around 2%-6% of odontogenic tumors turning out to be odontomas.8,13 These may occur as a result of trauma, infection, Endodermal factors, and even may be idiopathic but whatever is the initiating factor, mostly odontomas result from extraneous buds of odontogenic epithelial cells.14,15 Odontomas are mostly associated with unerupted impacted teeth and appear as solitary and asymptomatic lesions unless secondarily associated with cysts or infection and are diagnosed on routine radiographic examination.6,16 Radiographically they present as a mixed radiolucent-radiopaque lesion surrounded by a radio-opaque halo rather than a solid radio-opaque mass as in odontoma or other calcifying/sclerotic lesions.6

Case Report A 12 yr old boy presented to the clinic of Department of Pedodontics, Dental College, A.M.U, Aligarh, accompanied by his father. They had been advised to seek orthodontic treatment by the boys' sister, a BDS1st year student who had noticed her brothers' teeth were malaligned and of unequal size. [Fig: 1]

Upon clinical examination it was found that he had retained both upper deciduous central and lateral incisors as well as deciduous canine [Fig: 1]. There was a mild, painless, bony hard swelling with diffuse borders in relation to the left upper three anterior teeth. This swelling had reportedly been there...
An interdisciplinary management of severely resorbed maxillary anterior ridge complicated by traumatic bite using a ridge splitting technique

Narender Dev Gupta, Sandhya Maheshwari, Prabhat Kumar Chaudhari, Shraddha Rath

Abstract:
Injury to the teeth and alveolar ridge of the maxillary anterior region due to trauma can cause severe alveolar ridge deficiency. Ridge augmentation is a reliable periodontal plastic surgical method for the correction of ridge defects for esthetic purpose. Although ridge augmentation can help to restore the ridge volume, the grafting procedures can significantly increase the patient morbidity, treatment time, and cost. Among the ridge augmentation techniques, the ridge split procedure demonstrates many benefits such as no need for donor site, the rare risk of damage to underlying anatomical structure, less pain, and swelling. This case report presents a vertical split technique for increasing the bone volume. There was a remarkable healing and significant increase in bone volume. We have followed the case for 4 months.

Key words:
Deficient maxillary bone, ridge augmentation, ridge splitting, maxillary anterior, traumatic deep bite

INTRODUCTION
A severe bone loss can occur after tooth extraction or trauma. Furthermore, it can be complicated by the traumatic deep bite which leads to severe alveolar ridge resorption. Atrophy of the alveolar bone may also be seen in congenitally missing teeth, failed implants and advance periodontal disease. These ridge defects are common in conjunction with single or multiple tooth loss. The Prosthodontic treatment with fixed partial denture of surgically uncorrected ridge defects is challenging and leads to several aesthetic and functional problems. Numerous techniques have been used to modify the width of a deficient alveolar ridge. These techniques range from guided bone regeneration (GBR), block bone grafting, distraction osteogenesis, ridge splitting etc. For a deficient edentulous maxillary ridge, the localized ridge expansion is a useful technique to provide an increase in ridge width so as to achieve an adequate alveolar crest. The augmented ridge split procedure (SRSP) was originally developed by Sironen et al and Stoppiani et al and later discussed by Neves and Reis. The indication for ridge augmentation using ridge expansion procedure include an edentulous space with minimal loss of vertical bone height accompanied by an inadequate alveolar bone thickness (4 mm) in the buccal/palatal direction. The case described an interdisciplinary management of severely resorbed maxillary anterior ridge using a ridge splitting technique.

CASE REPORT
A 19-year-old female patient presented to our University Dental Center with the chief complaint of deficient maxillary anterior edentulous ridge. The patient wanted the esthetic rehabilitation of missing upper front teeth. On clinical examination, there was deficient maxillary anterior edentulous ridge complicated by the traumatic deep bite. After taking initial records (Figure 1), the case was discussed among prosthodontist, periodontist, and orthodontist. After the oral prophylaxis and hygiene maintenance instructions patient was referred to the orthodontist for bite opening. It took 12 months to open the bite (Figure 2). The patient was then referred to the periodontist for the management of deficient maxillary anterior edentulous ridge. A consultation with prosthodontist involving patient was made before ridge splitting procedure regarding the rehabilitation of edentulous maxillary anterior segment using dental implants or fixed prosthetic bridge. Due to economic conditions patient opted for a fixed bridge in place of dental implants. For achieving an emergence profile of the prosthesis, improvement in the bone height and width was...
Assessment of maturity in orthodontics: A review
Sushma Dhiman, Sandhya Maheshwari, Sanjeev K. Verma

Department of Orthodontics and Dental Anatomy, Aligarh Muslim University, Aligarh, Uttar Pradesh, India

Keywords
Promarkers, cervical vertebral maturation/analysis, dental maturation, hand-wrist radiographs, skeletal maturation

Abstract
Precise evaluation of maturation stage should be an integral part of both diagnosis and treatment. Different authors have reported different methods in an attempt to determine the best indicator of maturity. These include body height, body-weight, sexual maturation; frontal sinus, chronological age, biological age or physiological age, hand-wrist maturation, cervical vertebrae, dental eruption, dental calcification stages and biomarkers. Ever the method has its own advantages, disadvantages and over the other method. However, still researchers are being done to explore best method to assess the maturity of an individual. This article reviews the methods of assessment of skeletal maturation.

Introduction
Every individual matures according to his or her own biological clock. Different authors have reported different methods in an attempt to determine the best indicator of maturity. These include height, weight; chronological age, sexual maturation; frontal sinus, biological age or physiological age; hand-wrist maturation; cervical vertebral maturation; dental maturation; and dental calcification stages and recently biomarkers.

Chronological age
Both date by calendar determines chronological age. Each individual variation lies in timing of pubertal growth spurt with respect to chronological age. Therefore, thus, chronological age cannot be considered as a reliable indicator for the evaluation of maturity status of a child. This has led to the concept of biological age or physiological age.

Biological age or physiological age
The physiological age of a person is determined by the degree of maturation of the different tissue systems. Physiological age can be estimated by maturation status of somatic, sexual, skeletal, and dental system.

Somatic maturity
Annual growth increments in height or weight determines the somatic maturity. Measurement of height represents general growth of the skeleton. Average age of onset of stature growth for females and males of approximately 10 and 12 years, respectively, with the peak coming later in both sexes. Height, therefore, might represent a skeletal measure that can be used to predict the timing of the facial growth spurt and needs further exploration.

Sexual maturation
Sexual maturation involves using secondary sex characteristics to predict the individual maturational status. Tanner had given separate sexual maturity ratings for boys and girls which consist of five stages of sexual maturity with stage 1 being the least mature (preadolescent) and stage 5 being the most mature (adult). In boys, Tanner Sexual Maturity Ratings assesses pubic hair (amount, coarseness, color and location), penile length and breadth, scrotal development and testicular size. In girls, Tanner Sexual maturation rating assesses breast development (size and morphology) and pubic hair (location, color, morphology, quantity). Prediction of sexual maturity requires a physical examination, and hence use of sexual maturity as maturation marker is limited in the orthodontic set up. Serial recording of voice change in boys can be used as a measure of maturity.
A dilemma in orthodontics: Extractions in borderline cases
Sushma Dhiman, Sandhya Maheshwari
Department of Orthodontics and Dental Anatomy, Aligarh Muslim University, Aligarh, Uttar Pradesh, India

Keywords: Borderline, extraction, non-extraction

Correspondence: Dr. Sushma Dhiman, Department of Orthodontics and Dental Anatomy, Aligarh Muslim University, Aligarh, Uttar Pradesh, India. Phone: +91-5327214157, Email: sushma.dhiman.mu@gmail.com

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Abstract
Patient with good facial esthetics require extractions to reach a stable and functional occlusion can be categorized as a borderline case. It may also be defined as a case caught in between the conflict of extraction and nonextraction. Empirical evidence of uncertainty exists with these patients. Borderline cases also have an absence of dental or craniofacial anomalies, permanent dentition, healthy periodontium and normal anteroposterior relationship between maxilla and mandible. Therefore, the aim of this paper is to describe criteria, which should be kept in mind before deciding to go for extraction or nonextraction treatment in borderline cases.

Introduction
A case is borderline when extraction of permanent teeth is required to reach a stable and functional occlusion, but when the patient has good facial esthetics that could be disturbed by extractions.2 Borderline case may also be defined as the case caught in between the conflict of extraction and nonextraction. Empirical evidence of uncertainty exists with these patients.2 Borderline cases also have an absence of dental or craniofacial anomalies, permanent dentition, healthy periodontium and normal anteroposterior relationship between maxilla and mandible.

Table 1 summarises the factors to be considered when planning for the extraction plan for a borderline case.

Dental variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tooth-size-arch length deficiency (TSALD)</td>
<td>TSALD is the most common form of malocclusion treated by orthodontists.20 Indices which may be used to find out TSALD. Currey basin 2.5-3.5 mm TSALD as a borderline case.20 McNamara set arbitrary borderline of 3.6 mm.21 Guin, concluded amount of maxillary arch length discrepancy may range from 6 to 8.11 mm for borderline cases.22 Roughly 1 mm of crowding in either arch to constitute definitive nonextraction, while definitive extraction therapy in the maxillary and mandibular arches was 5.8 and 7.3 mm, respectively.22</td>
</tr>
</tbody>
</table>

Table 2: Factors affecting extraction decision

<table>
<thead>
<tr>
<th>Factor</th>
<th>Dental parameters</th>
<th>Skeletal parameters</th>
<th>Soft tissue factors</th>
<th>Other factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSALD</td>
<td>FMA</td>
<td>FMU</td>
<td>Position of upper and lower lip</td>
<td>Growth status</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1-2-Pog line</td>
<td>Midline deviation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Upper lip morphology</td>
<td>Patients’ preference</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

Table 3: Curve of Spee

<table>
<thead>
<tr>
<th>Angle</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curve of Spee</td>
<td>1-A-Pog line</td>
</tr>
<tr>
<td>Bolton analysis</td>
<td>Upper and lower central incisors to N-A and N-B line</td>
</tr>
</tbody>
</table>

Table 4: Irregularity index

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMA</td>
<td>Frankfort maxillary nasal angle</td>
</tr>
<tr>
<td>IMDW</td>
<td>Incisor mandibular plate angle</td>
</tr>
<tr>
<td>SN-MP</td>
<td>Sella-Nasion and mandibular plate</td>
</tr>
<tr>
<td>TSALD</td>
<td>Tooth-size arch length deficiency</td>
</tr>
<tr>
<td>FMA-Pog</td>
<td>A-Pog A to Pogionom</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>From</th>
<th>To</th>
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</table>
Diagnosis and management of facial asymmetries

Sandeep Maheshwari, Sanjeev Kumar Verma, Aditi Gaur, Sushma Dharman
Department of Orthodontics and Dental Anatomy, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, Uttar Pradesh, India

ABSTRACT
Facial asymmetry is a common clinical observation in orthodontics. Modern orthodontics is a multidisciplinary field and is considered a diagnostic tool for various occlusal and facial anomalies. This review is intended to provide an overview of the definition and classification of facial asymmetry. Due to the nature of the face, it is important to understand the patient's facial symmetry in terms of the midsagittal plane. Symmetry is an important aspect of orthodontic treatment and can be evaluated and measured using various methods. The article also highlights the importance of facial asymmetry in identifying the cause of asymmetry.

Introduction
Symmetry is defined as "equality or correspondence in terms of parts distributed around a center or an axis at the two extremes or poles or on the two opposite sides of the body."

The word symmetry refers to balance between structures on the other hand asymmetry can be explained as an imbalance or disproportionation.

The phenomenon of facial asymmetry can be described as differences in size or relationship of two sides of the face. According to Sewert and Poroft, frequencies of facial laterality are 5%, 36% and 74% in the upper, middle, and lower thirds of the face. Minor facial asymmetry can be observed even in the most normal appearing individuals, in most of the cases left side of the face being larger than the right side. Although the opposite has also been suggested in the literature. There is a variation in the distribution of asymmetry on various parts of the craniofacial region.

Peck et al. observed that orbital region exhibited the least asymmetry (0.87 mm), mandibular region the most (3.34 mm) and the zygomatic region exhibiting a moderate asymmetry of 2.25 mm. It was suggested that as the facial structures farther from the cranium are observed there was an increase in asymmetry. Similar findings were seen by Maeda et al. who said that asymmetry most frequently in mandibular body only about 6.1% of the patients examined demonstrated a mild degree of maxillary asymmetry. Chew et al. reported asymmetry in 35.8% of 212 patients with dentofacial deformities, with the majority of cases in patients with class III occlusal deformity. Among patients reporting for orthodontic treatment the most common asymmetry trait observed is mandibular midline deviation from the facial midline occurring in 62% of patients, followed by lack of dental midline coincidence (46%), maxillary midline deviation from the facial midline (39%), molar classification asymmetry (22%), maxillary occlusal asymmetry (20%), mandibular occlusal asymmetry (18%), facial asymmetry (5%), chin deviation (4%), and nose deviation (3%).

Etiology of Facial Asymmetry
Harguchi et al. suggested that the etiology of facial asymmetry can be divided between those with genetic origins and those with environmental origins.
Original Article

Soft tissue airway dimensions and craniocervical posture in subjects with different growth patterns

Juhi Ansar*; Sandhya Maheshwari; Sanjeev K. Verma; Raj Kumar Singh; Deepak K. Agarwal; Preeti Bhattacharya

ABSTRACT

Objective: To compare the dimensions of the nasopharynx and oropharynx of subjects with different growth patterns and to determine whether any correlation exists with their craniocervical posture.

Materials and Methods: Cephalometric radiograph of 60 subjects (16–25 years old), taken in natural head position, were divided into three groups according to the mandibular plane angle: hypodivergent (SN/MP <26°), normodivergent (SN/MP 26–38°), and hyperdivergent (SN/MP >38°). Correlations were calculated between nasopharyngeal area, oropharyngeal area, and craniocervical posture. Continuous variables were compared by one-way analysis of variance, and the significance of mean difference between the groups was done by the Tukey post hoc test. A value of P < .05 was considered statistically significant.

Results: Patients in the hyperdivergent group were found to have significantly smaller nasopharyngeal and oropharyngeal areas than the other groups (P < .001 and P < .05, respectively). Similarly, the oropharyngeal area in the normodivergent group was significantly smaller than that in the hypodivergent group (P < .05). However, no significant differences were found in the nasopharyngeal areas between the hypodivergent and normodivergent groups and between the hyperdivergent and normodivergent groups (P > .05). Reduced pharyngeal airways were typically seen in patients with a large craniocervical angle and a large mandibular inclination.

Conclusions: Smaller nasopharyngeal and oropharyngeal airways were seen in connection with a large craniocervical angle and large mandibular inclination. Therefore, we suggest that the vertical skeletal pattern may be one of the factors that contribute to nasopharyngeal and oropharyngeal obstruction. (Angle Orthod. 2015;85:604–610.)

KEY WORDS: Nasopharyngeal and oropharyngeal airway; Craniocervical posture; Cephalometry; Growth pattern

INTRODUCTION

The past two decades have witnessed a renewed interest in the interaction between form and function in the craniofacial region. Two physiologic factors have received particular attention with regard to their possible relation to craniofacial development: adequacy of the pharyngeal airway and the vertical relations of the head and the cervical column. A normal airway is considered one of the important factors for the balanced growth of the craniofacial structures. To breathe through the mouth, one must maintain an oral airway, and to accomplish this, the mandible and the tongue are displaced downward and backward and the head is tilted back. If this happens during growth it alters the forces affecting the facial skeleton. The mandible may not contact the maxilla during swallowing, permitting unrestrained vertical

*Senior lecturer, Department of Orthodontics, Institute of Dental sciences, Bareilly, India.
†Professor and Chairman, Department of Orthodontics and Dental Anatomy, Aligarh Muslim University, Aligarh, India.
‡Professor, Department of Orthodontics and Dental Anatomy, Aligarh Muslim University, Aligarh, India.
§Senior Lecturer, Department of Orthodontics, Sucha Pancholi Dental College, Funtawas, India.
¶Professor and Chairman, Department of Orthodontics, Institute of Dental sciences, Bareilly, India.
Professor, Department of Orthodontics, Institute of Dental Sciences, Bareilly, India.
Corresponding author: Dr Juhi Ansar, Department Of Orthodontics and Dental Facial Orthopedics, Institute of Dental Sciences, Bareilly 243005, India.

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Early treatment of Class III malocclusion by RME and modified Tandem appliance

Juhi Ansar, Sandhya Maheshwari, Sanjeev Kumar Verma, Raj Kumar Singh

Department of Orthodontics and Dentofacial Orthopedics, Institute of Dental Sciences Bareilly, Bareilly, Department of Orthodontics and Dental Anatomy, Aligarh Muslim University, Aligarh, Uttar Pradesh, Department of Orthodontics and Dentofacial Orthopedics, Sada Rastogi Dental College, Faridabad, Haryana, India

ABSTRACT

Patients with a skeletal Class III malocclusion and maxillary deficiency can be treated successfully using a combined protraction facemask and alternate rapid maxillary expansions and contractions (AllRAMEC). However, due to poor patient compliance during facemask therapy there has been growing interest in introral appliances for correcting Class III malocclusion. The tandem traction bow appliance (TTBA) is an introral appliance which has been used successfully for the treatment of growing Class III patients. This case report describes the management of a 10-year-old boy with a Class III malocclusion and maxillary deficiency treated with modified TTBA appliance.

KEYWORDS: Class III skeletal pattern, maxillary expansion, orthopedic appliances

Introduction

Class III malocclusion is characterized by deviation in the sagittal relationship of the maxilla and the mandible caused by a deficiency and/or a backward position of the maxilla, or by prognathism and/or forward position of the mandible. In Asian societies, the frequency of Class III malocclusion is higher due to a large percentage of patients with maxillary deficiency. The incidence of Class III malocclusion in Asian populations can be as high as 14%. Different treatment modalities have been advocated for treatment of Class III malocclusion. They include early orthopedic treatment using protraction facemask or chin cup therapy, orthodontic camouflage or combined surgical/orthodontic approach for patients with severe skeletal discrepancies. Early treatment of Class III malocclusion has been advocated to avoid complications like gingival recession with relation to lower incisors, compromised dental and facial esthetics, eliminating an anterior functional shift of the mandible, and decreasing the chances of later orthognathic surgery. Orthopedic treatment is usually carried out in children with active growth, with a goal of obtaining maximum skeletal and minimum dental change.

Protraction facemask therapy has been advocated in the treatment of Class III patients with maxillary deficiency. Protraction devices for the maxilla are used to promote the growth of a deficient maxilla by applying extraoral force to actively growing patients. Various authors have reported the forward movement of the maxilla with protraction devices in animals, and the formation of new bone by sutural apposition. However, the major problem with extraoral anchorage has been patient's compliance, due to the physical appearance of the extraoral appliance. This article presents an introral modified tandem appliance for maxillary protraction in the mixed dentition that has been used clinically to achieve successful results without relying on unusual patient cooperation.

Diagnosis and Etiology

A 10-year-old boy came to the Department of Orthodontics and Dentofacial orthopedics with
Non-Surgical Non-Extraction Orthodontic Treatment Of An Adult With Facial Asymmetry

Raj kumar singh, Anil kumar Jangid, Santhia Maheshwari, Sanjeev kumar Verma, Varun goyal, Gurjeet singh

Reader, Sudha Rautagi College of Dental Sciences and Research, Faridabad, Haryana

Private practitioner, E.J. Junior Resident, Z.A.D.C., A.M.U, Aligarh

Reader, Sudha Rautagi College of Dental Sciences and Research, Faridabad, Haryana

Professor and Head, Sudha Rautagi College of Dental Sciences and Research, Faridabad, Haryana

ABSTRACT

An 18 year male patient presented with mandibular asymmetry with asymmetric mandibular and maxillary arches with midline shift and unilateral interior crossbite. There were dental compensations in association with skewed mandibular arch. The patient was treated nonsurgically without any extractions and asymmetric orthodontic mechanics. Posttreatment and post-treatment records are shown and the treatment strategy was discussed.

Key words: Asymmetry, Condylar hypoplasia, Crossbite.

INTRODUCTION

An ideal face is characterized by equal dimensions on one side compared to the structures on the opposite side. Any difference in the size or shape of the sides of the face is termed as facial asymmetry. Asymmetry of the face and dentition is a natural phenomenon as even beautiful faces exhibit mild degrees of asymmetry. Severe forms of asymmetry can cause both functional and esthetic impairment which require treatment necessary to correct asymmetry.

Although the etiology of facial asymmetries and their mechanisms have not been completely understood, it is well established that facial asymmetries often worsen with growth. The management of such asymmetry usually requires a combined surgical and orthodontic approach in adults.

Although these procedures improve both the aesthetic and functional problems, they are associated with many disadvantages namely high medical costs, long surgeries, and severe postoperative discomfort for patients. Besides this all adult facial asymmetry patients do not benefit from surgical correction. Therefore, patient assessment and selection remains a major issue in diagnosis and treatment planning.

This case report presents the nonsurgical, nonextraction orthodontic treatment of a patient with heterognathia, facial asymmetry and dentofacial deformity. This article attempts to deal with essentials like the camera controls, equipment and accessories required for clinical photography, procedure for acquiring the right photographs, common errors and editing guidelines. "Hot Tips" too are suggested to allow the best possible results to be consistently achieved.

DIAGNOSIS AND ETIOLOGY

An 18-year-old male patient was referred to the department with the chief complaint of deviated chin and facial asymmetry which was consistently increasing since early childhood (Fig 1). There was no history of any trauma to the facial structures.

Extraoral examination revealed significant facial asymmetry with chin deviated to right and mandibular skeletal lateral deviation to the right side. He had mesioangular incisors, concave profile, competent lips, canted smile, and without any incisor visibility and midline growth deficiency, however, there were no limitations of movements during jaw opening (Fig 2).

There was 5 mm mandibular midline deviation to the right side in relation to facial midline. Maxillary arch was symmetric with narrowing on left half and Mandibular arch with narrowing on right half. No discrepancy in occlusal relation was evident. There was crossbite on the right side extending from the right central incisor till the premolars. The molar and canine relationships were Class I on the right and Class III on the left side (Fig 3).

The cephalometric analysis (Table 1) presented a skeletal Class III pattern, with protruded maxillary anterior teeth. Dental compensations in the form of angulated (left side) mandibular anterior teeth were evident in panoramic radiograph along with enlarged left condylar neck (Fig 5). The pre-treatment posteroanterior radiograph confirmed the skeletal mandibular asymmetry with deviation of the mandible to the right by 30° (Fig 1A).

The etiology of the patient’s malocclusion was probably a
Nonsurgical Treatment of a Case with Skeletal Class III Malocclusion and Impacted Premolars: A Case Report

Sanjeev Kumar Verma, Yumna Qamar, Sarah Asif, Deepika RS Bais

ABSTRACT

This case report describes the nonsurgical, nonextraction therapy of a 16-year-old girl with a skeletal Class III malocclusion, and a reverse overjet and impacted mandibular premolars. The Class III malocclusion was corrected with alignment of impacted premolar and retraction of lower anterior with fixed appliances, combined with short Class III and vertical elastics in the anterior area. The Class I molar and canine relationships were achieved, and the facial profile improved substantially.

Keywords: Class III malocclusion, Impacted, reverse overjet

INTRODUCTION

Nonsurgical camouflage treatment in mild Class III malocclusion is achieved by backward movement of the lower dentition and forward movement of the upper dentition. Many camouflage treatment modalities have been used for distal tipping and distal movement of mandibular posterior teeth. The amount of distal movement is crucial.

Class III malocclusion is a challenging problem and requires a good diagnosis and treatment planning according to age, amount, and direction of growth.

It is easier to treat the developing class III patients with modification of the growth with appliances like functional regulator-III, reverse twin block, chin-cup and reverse pull headgear. However, patients in which the growth is completed the class III malocclusion is either treated with camouflage of teeth or through surgery.

Camouflage treatment is the orthodontic tooth movement relative to the supporting basal bone to compensate for any jaw discrepancy. The class III camouflage involves proclination of the maxillary incisors and retroclination of the mandibular incisors to correct reverse/negative overjet.

An impacted tooth is one that is embedded in the alveolus so that its eruption is prevented as the tooth is locked in position by bone or the adjacent teeth. The prevalence of impacted premolars has been found to vary according to age. The overall prevalence in adults has been reported to be 0.5%. Premolar impactions may be due to over retained or infraocclusal unerupted primary molars, mesial drift of teeth arising from premature loss of primary molars; ectopic positioning of the developing premolar tooth buds; or pathology such as inflammatory or dentigerous cysts.

Conservative management involves surgical extraction of the crown portion of the tooth, however, subsequent premolar eruption is unpredictable. In some cases orthodontic traction and repositioning or even extraction of the tooth may be indicated.

In the case report described here, we present a nonsurgical treatment approach of an adult skeletal class III patient with impacted mandibular premolars along with reverse overjet.
Abstract
Control of vertical dimension is recognised as an important as well as often difficult part of orthodontic treatment. Ineffective vertical control causes downward and backward rotation of mandible, prolonged treatment times, and compromised treatment results. Vertical control is often difficult, as most methods used to exert vertical control are highly patient-dependent. Controlling vertical dentoskeletal development is often difficult, because most orthodontic mechanotherapy tends to produce vertical movement of teeth. Vertical movement of teeth are least resisted therefore immediate effect is seen. Vertical control is difficult also because most methods depend on patient compliance.

Keywords: Vertical control, Hyperdivergent.

Many terms have been used to describe the excessive vertical facial height, including hyperdivergency, dolichofacial pattern, and hypoplastic pattern. The adequate control of the vertical dimension is crucial for a successful anteroposterior correction. Extreme clockwise rotation, high angle type, hyperdivergency, dolichofacial pattern, adentulous faces, idiopathic long face, total maxillary alveolar hyperplasia, and vertical maxillary excess all have excessive vertical growth of the maxilla as their common denominator. Thus it is difficult to classify this vertical maxillary dysplasia in traditional anteroposterior classification. Maxillary molars are considered to be the primary "bite openers" and mandibular incisors, the primary "bite closers" (Schudy, 1964). Increase in the vertical facial dimension cause more vertical displacement and rotation of maxilla and mandible, resulting in prolonged treatment times, compromised treatment objectives, and, often, poor esthetic results. The treatment objective in a patient having sufficient potential for growth should be to restrain and control maxillary descent and prevent eruption of anterior teeth. When the severity of vertical deformity is so great that reasonable correction cannot be obtained by growth modification or camouflage, the combination of orthodontics and orthognathic surgery may provide the only viable treatment. The following article provides a review on the control of vertical growth during the active fixed orthodontic treatment.

Predictors of Vertical Growth
The various morphological features associated with hyperdivergent growth include the increased lower anterior facial height, increased gonial angle, short mandibular rami, decreased posterior facial height. Skulth et al found that mandibular morphology may be used to anticipate the direction of residual growth based on the type of previous development. The morphological descriptors suggested by Bjork in his study by imprints include inclination of the mandibular symphysis, the shape of the lower border of the mandible, the curvature of the mandibular canal, the inclination of condylar head, and the thickness of the cortical bone below the symphysis.

Why it is Necessary
Controlling vertical dentoskeletal development is often difficult, because most orthodontic mechanotherapy tends to produce vertical movement of teeth. Vertical movement of teeth are least resisted therefore immediate effect is seen. Mechanics allow a large effect on vertical control at the weaker muscular actions allow less resistance to increase in lower facial height during the treatment. Profil stated that there are three indicators that can be used to predict the tendency toward overbite. These are:
1. The cranial base flexure angle (saddle angle): an increased saddle angle predisposes to dental and skeletal openbite.
2. The orientation of the maxilla: being up anteriorly and down posteriorly.
3. A short rams height and obtuse gonial angle.

Various treatment mechanics that extrude posterior teeth will hinge the mandible back, open the bite, and lengthen the anterior vertical dimension. In the adult patient, extraction of teeth in the posterior segment will lead to an opening of the bite through backward rotation of the mandible, i.e., an increase in facial height and in overjet. Space closure can involve translation of the posterior teeth, which can have the effect of extrusion, especially when significant tipping of molars is involved. One frequently used method of space closure and interocclusal correction is the use of Class II elastics. The side effects of the elastics are lower molar and upper anterior extrusion, with a steepening of the occlusal plane.
Orthosurgical Management of Odontome-Associated Maxillary Central Incisor Impaction

Case Report

Introduction

The term "Odontoma" was coined by Paul Leriche in 1867, to denote tumors formed in dental hamartomas of odontogenic origin [1], who defined this lesion as "a malformation in which all the dental tissues are represented, individual tissues being mainly formed but occurring in more or less disorderly patterns." Odontoma is probably the most common type of odontogenic tumor or hamartoma [2] which histologically comprises of a complex picture of differentiated epithelial, mesenchymal cells which may be derived from ameloblasts or odontogenic epithelium [3-5]. Hence, an odontoma is a benign mixed tumor and differs from a true neoplasm [6].

The etiology behind odontomas remains unclear, local trauma or infection has been implicated as a source of odontogenic hyperplasia. Alterations in genetic components, which may be associated with syndromes like Hermann's syndrome and Gardner's syndrome, also leads to odontoma formation [7]. Usually odontomas are asymptomatic [8-9] and are usually discovered during routine radiographs. Clinically, it presents with a delay in eruption of primary teeth or delayed eruption of the successor teeth.

Developmentally, odontoma can be of epithelial or connective tissue origin, it may also present as a composite mass comprising of both epithelial and mesenchymal derivatives [10]. They are clinically classified as complex or compound odontoma. A compound odontoma presents as a rudimentary tooth, with differentiated tissues arranged in layers of enamel, dentin, and pulp [11]. Contrastingly, a complex odontoma is its haphazard arrangement of dental tissues, with no morphologic similarity between the odontome and actual tooth structure. Commonly, compound variety of odontome is observed [12]. Compound odontome have a propensity for anterior region of the jaw while complex odontome are usually seen in the posterior region. We present a case of maxillary central incisor impaction associated with a compound odontome, its radiographic features and orthosurgical management.

Case Presentation

A 20 year old young adult came to the Department of Orthodontics and Orthopedic Orthopedics complaining of spacing with respect to the upper right incisor. On general examination and medical history evaluation, it was found that the patient was apparently healthy. Patient indicated history of prolonged retention of 51 which was extracted by a dental practitioner five years back in an anticipation of eruption of 11. Patient gave a history of root canal treatment with respect to 12, performed six months back as it the tooth was non-vital.

Clinical presentation

The patient had apparently symmetrical, mesodontic face and balanced facial pattern. On intraoral examination it was found that the patient had Class I canine and molar relation bilaterally, accompanied by an edentulous span in relation to right maxillary central incisor region (Figure 1). The overlying mucosa was apparently normal with no associated pain or inflammation. Cast analysis was done, which revealed no arch length-tooth size discrepancy in upper arch and mild crowding in the lower arch. Radiographic examination (Intraoral periapical radiograph, Maxillary Occlusal radiographs, panoramic radiograph) revealed deep impaction of 11 in the alveolar bone. Tooth size was present inferior to the impacted 11 (Figure 2). It was apparent that the mass was hindering the eruption of 11. A provisional diagnosis of compound odontoma was made based on clinical and radiographic picture.

Treatment objectives:

1. Alignment and leveling of arches.
Effect of acid etching on bond strength of nanoionomer as an orthodontic bonding adhesive

Saba Khan, Sanjeev K. Verma and Sandhya Maheshwari

ABSTRACT

Aims: A new Resin Modified Glass Ionomer Cement known as nanoionomer containing nano-fillers of fluororutilum-silicate glass and nanofiller clays and glass has been introduced. An in-vitro study aimed at evaluating shear bond strength (SBS) and adhesive remnant index (ARI) of nanoionomer under etching/unetched condition for use as an orthodontic bonding agent.

Material and Methods: A total of 75 extracted premolars were used, which were divided into three equal groups of 25 each. 1- Conventional adhesive (Enlight Light Cure, SDS, Omaha, CA, USA) was used after etching with 37% phosphoric acid for 30 s. 2- Nano-ionomer (Ketac N100, 3M, ESPE, St. Paul, MN, USA) was used after etching with 37% phosphoric acid for 30 s. 3- Nano-ionomer was used without etching. The SBS testing was performed using a digital universal testing machine (UTM-G-410B, Shenzi Engineering). Evaluation of ARI was done using scanning electron microscopy. The SBS were compared, using ANOVA with post-hoc Tukey test for intergroup comparisons and ARI scores were compared with Chi-square test.

Results: ANOVA (SBS, F = 104.75) and Chi-square (ARI, Chi-square = 30.71) tests revealed significant differences between groups (P < 0.01). The mean (SD) SBS achieved with conventional light cure adhesive was significantly higher (P < 0.05) (10.59 ± 2.03 Mpa, 95% CI, 9.74-11.41) than the nano-ionomer group (unetched 4.13 ± 0.88 Mpa, 95% CI, 3.79-4.47 and etched 9.32 ± 1.87 Mpa, 95% CI, 8.58-10.06). However, nano-ionomer with etching registered SBS in the clinically acceptable range of 5.9-7.8 Mpa, as suggested by Reynolds (1975). The nano-ionomer groups gave significantly lower ARI values than the conventional adhesive group.

Conclusion: Based on this in-vitro study, nano-ionomer with etching can be successfully used as an orthodontic bonding agent leaving less adhesive remnant on enamel surface, making cleaning easier. However, in-vivo studies are needed to confirm the validity of present findings.

Key words: Adhesive remnant index, etching, nanoionomer, orthodontics, shear bond strength

INTRODUCTION

Acid etching being used conventionally has certain disadvantages such as localized enamel decarboxylation and fracture of enamel. Approximately 96% patients undergoing fixed appliance therapy show signs of enamel demineralization. Fluoride releasing property of resin modified glass ionomer cement (RMGIC) has potential for prevention of white spot lesions. RMGIC demonstrates weaker bond as compared to conventional composites. Nanotechnology has been used to modify orthodontic bonding adhesives to improve their physical properties. Nanoparticles of Titanium dioxide, silicon dioxide and silver have been added to composites to induct anti-bacterial activities. Nanoionomer is a type of RMGIC composed of fluororutilum-silicate (FAS) glass, nanofillers, and...
Case Report: Orthodontic Management of Case with Skeletal Class II Malocclusion and Anterior Crossbite

Dr. Jiju Mohan1, Dr. Arbab Anjum2, Prof. Mohd. Tariq3, Dr. Irum Uzma Siddiquie4
1(Department of orthodontics and dentofacial orthopaedics, Dr. Ziauddin Ahmad Dental College/ Aligarh Muslim University, India)
2(Department of orthodontics and dentofacial orthopaedics, Dr. Ziauddin Ahmad Dental College/ Aligarh Muslim University, India)
3(Department of orthodontics and dentofacial orthopaedics, Dr. Ziauddin Ahmad Dental College/ Aligarh Muslim University, India)
4(Department of orthodontics and dentofacial orthopaedics, Dr. Ziauddin Ahmad Dental College/ Aligarh Muslim University, India)

Corresponding author: Dr. Jiju Mohan

Abstract: Class III malocclusion is among the most difficult malocclusion to be corrected, especially using orthodontic means alone. This is a case report of a 23-year-old male patient with a chief complaint of irregularly placed teeth and difficulty in mastication, having skeletal class III base and anterior crossbite treated successfully by orthodontic camouflage and non-extraction treatment approach.

Keywords: Skeletal class III, Camouflage, Non-extraction, Anterior crossbite

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I. Introduction

Class III malocclusion is far more prevalent in Asian countries than in the West.1 The incidence of anterior crossbite is 2.3–13 per cent among Japanese, 9.4–19 per cent among Koreans and 12.8 per cent among Chinese2 and 14.5 per cent in southern Chinese.3 Accordingly, class III malocclusions account for a large proportion of orthodontic patients in these countries—for example, 33 per cent of orthodontic patients in Japan and 20 per cent in China.2 In contrast, the prevalence of class III malocclusion in the United States is only about 1.0 per cent of the total population, and only 5 per cent of orthodontic patients.4

There are three main treatment options for skeletal class III malocclusion: growth modification, dentofacial compensation (orthodontic camouflage), and orthognathic surgery. Growth modification should be commenced before the pubertal growth spurt, after this spurt, only the latter two options are possible. Kerr et al.4 tried to establish cephalometric landmarks to objectify treatment decisions. The most important factors that differentiated the surgery and orthodontic patients in their study were size of the anteroposterior discrepancy, inclination of the mandibular incisors, and appearance of the soft-tissue profile.

Successful camouflage treatment for class III malocclusion can be achieved by proclination of maxillary incisors, retraction of mandibular incisors, and downward and backward rotation of mandible. Surgical correction of class III malocclusion can be achieved by mandibular setback, maxillary advancement, or a combination of both procedures.3

II. Case Report

This is a case report of a 23-year-old male patient with a chief complaint of irregularly placed teeth and difficulty in mastication.

History: His medical and dental history are non-contributory while his family history reveals brother having similar malocclusion.

Extra-Ocular Examination (Fig. 1): Shows an apparently symmetrical, mesoprotrusive face-concealed profile with competent lips.

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Management of Deep bite: Review

Authors
Dr Irum Uzma1, Prof. (Dr) Mohd. Tariq2, Dr Saba Khan2, Dr Grateful4

Abstract
Deep bite is a frequently encountered malocclusion in children as well as in adults and is challenging to treat with significant success rates. Adverse sequel of this malocclusion predisposes a patient to periodontal problems, functional impairment, and temporomandibular joint disturbance. This article will elaborate various appliances, their indications and contraindications along with the various biomechanics involved.

Keywords: Deep overbite, Deep bite, orthodontic management

1. Introduction
Deep bite is one of the most commonly occurring malocclusion seen next to crowding13 and its management is considered to be quite challenging to the clinician. It is classically defined as the increased vertical overlap of the upper anterior teeth onto the labial surface of lower anterior teeth in centric occlusion 1-2 mm of vertical overlap is considered to be normal1234. The crown length of the upper and lower incisors however may vary significantly in individuals. Therefore describing overbite in terms of "percentage" would be more descriptive, appropriate and useful. Upadhyay & Nanda66 had defined overbite as the amount and percentage of overlap of the lower incisors by the upper incisors. An ideal overbite ranges from 5-25% overlap.

1.1 Etiology of Deepbite
Skeletal or dental overbite may be caused by genetic or environmental factors (acquired) or a combination of both.

1.1.1 Skeletal deep bites are characterized by
1) Horizontal pattern of growth
2) Growth discrepancy of the jawbones

Dr Irum Uzma et al JMSCR Volume 07 Issue 03 March 2019
Unusual Finding of Molar Tube Embedded in the Labial Vestibule: A Rare Case of Negligence

Rahil Ahmed, Abdul Ahad, Ali Asgar Khan, Mird Tutu
Department of Plastic Surgery, King George Medical University, Lucknow; Departments of Periodontics & Orthodontics, Dr. A. M. A. B. Dental College and Hospital, Allahabad Medical University, Allahabad, Uttar Pradesh, India

Abstract

Cases of negligence in orthodontics are not as frequent as in other dental or medical specialties. However, sometimes we come across a case of negligence that cannot be ignored. Here, we present a very uncommon finding of a major tube embedded in the labial vestibule, between mandibular central and lateral incisors, for more than a month. The uniqueness of this finding is that a molar tube, as the name signifies, is supposed to be bonded on molars and if it gets dislodged due to any reason, it should have been embedded near the respective molar. With this dilemma in mind, this case offers many things to learn from errors.

Keywords: Orthodontic appliance; patient nonadherence; professional negligence

INTRODUCTION

Regular follow-up of orthodontic patients should not be a missed at just activating the appliances or placing the next sequence of wires. It should serve a wider perspective of keenly observing the patient for any adverse treatment effects, compliance with oral hygiene instructions, and very importantly, any left gaps in the oral cavity. Commonly, the extended archwire, cut by dental end cutter, may be left in the oral cavity which may subsequently cause the epithelium or the tissue, causing the patient to land up in the emergency. If any orthodontic materials such as elastic separators, clastics module, bracket, band, molar tube, etc., are left during the treatment, the same should be considered as an iatrogenic damage caused by the treating clinician.

Microbial plaque accumulation in the oral cavity is enhanced by various anatomic as well as etiologic factors. Foreign body partially embedded in the gingiva or alveolar mucosa is a common cause of gingival hyperplasia, causing inflammation in surrounding area. Although clinical signs in such cases may mimic the features of gingivitis, it is less likely to resolve by conventional periodontal therapy. Elastic separators and bands are most commonly left embedded interdentally thus causing severe inflammation and bone loss in that area.

To avoid this case, due to elastic separators clinicians often use bendable molar tube instead of stainless steel (SS) bands. However, since the bond strength of bendable molar tube is much lesser as compared to spot welded molar tube on SS bands, it becomes more frequently detached. For a longer time. To date, there are no published reports of such a case in the literature. We are reporting a case of an embedded bendable molar tube in the labial vestibule of the mandibular arch. Even after extensive search on various scientific databases, we could not find any report of such a case so far.

CASE REPORT

A 22-year-old systemically healthy female, reported with a chief complaint of dull pain in the lower anterior teeth region for 1 week. Pain used to get relieved on analgesic use but reappeared after a few hours. She reported having been undergoing fixed orthodontic treatment for 1 year in a dental clinic. She also informed about...
Conservative Management of Severe Class II Division 1 malocclusion in an adolescent female patient - A case report

Dr. Sarah Asif, Dr. Mohd. Tariq, Dr. Saba Khan

Abstract: Case report of a 15-year-old female patient who presented with class II div 1 malocclusion with protrusion and proclination of upper and lower incisors, skeletal class II base, normal/over divergent growth pattern and incompetent lips. She also presented an overjet of 10mm and a 80% overbite. The objectives was correction of the proclination and protrusion of maxillary incisors and enhancement of facial profile. Treatment consisted in extraction of the mandibular first bicuspids and fixed orthodontic appliance with panoramic edgewise appliance. The result showed correction of overjet and overbite, with class I canine relation and maintenance of facial aesthetics.

Keywords: Orthodontic camouflage, Class II div 1 malocclusion, Incompetent Lips, K-SIR Loop.

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I. Introduction

The class II division 1 malocclusion is considered as one of the most prevalent malocclusion. Enright et al, has reported a 14% frequency in children aged between 12-14yr old. The growth status of the individual at the treatment timing are essential aspects to be considered while attempting correction of Class II malocclusion. In case of adults, the camouflage treatment is the most frequently performed treatment modality for its correction; which invariably involves extractions of all four first premolars or the upper first premolars and lower second premolars or only the upper maxillary premolars.

Only upper first maxillary premolar extraction protocol is often resorted to in cases wherein there is minimal crowding or discrepancy in the lower arch. In a long term follow up by Milahik et al, they conclude that the level of patient satisfaction reported with a camouflage treatment versus orthognathic surgery; such as surgical mandibular advancement, were seen to be comparable. Junson et al performed a study to analyze the post treatment occlusal stability in premolar extraction cases, wherein they concluded that the two maxillary premolar extraction treatment protocol gave a better occlusal result versus the treatment results obtained with four premolar extractions.

II. Case Report

A 15-year-old female reported to the department of orthodontics, with the complaint of forwardly placed upper front teeth and a non-pleasing smile. On extraoral examination, the patient had a symmetrical mesoprosopid face with convex profile and incompetent lips and a curled lower lip. Smile analysis showed a normal smile line with a non-consonant smile arc and a morley's ratio of 100%. Upon intraoral examination the patient had class II molar and class II canine relationship bilaterally, scissors bite in relation to upper and lower first premolars on the left side, an overjet of 10mm, overbite of 80%, square shaped maxillary arch and an ovoid shaped mandibular arch with spacing in lower anterior region. (Figure 1) The periodontal tissues were found to be healthy. The functional findings revealed no signs or symptoms of a temporomandibular disorder.

Cephalometric findings presented a forwardly placed maxilla with an orthognathic endurable condition in.

https://www.academia.edu/37467770/Conservative_Management_of_Severe_Class_II_Division_1_malocclusion_in_an_adolescent_female_patient_A...
Effect of Twin Block Appliance on a Growing Patient – A Case Report

Mohammad Tariq, Sandhya Maheshwari, Sarah Asi*, Yumna Qamar and Shubhra Pathik

Department of Orthodontics and Dentofacial Orthopedics, Aligarh Muslim University, India.

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*Corresponding author: Sarah Asi, Department of Orthodontics and Dentofacial Orthopedics, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, Uttar Pradesh, India, Email: jni799@gmail.com

Abstract

Twin block appliance is very effective in a growing patient. The successful use of this appliance in the treatment of skeletal Class II malocclusion is based upon factors such as age of patient, compliance of the patient and other case selection criteria. This case report includes a 14-year-old boy who was treated with twin block appliance. If treated timely, growth modification and orthopedic effects with this appliance can be achieved in a growing individual. This appliance is very successful in a patient with retruded mandible and well aligned incisors in whom VTO is positive. This brings the mandible forward and improves the profile immediately.

Keywords: Twin block appliance; Growth modification; Myofunctional appliance; bite jumping

Abbreviations: VTO—Visual Treatment Objective

Introduction

Class II malocclusion is one of the most common problems around the globe affecting around one-third of the patients who come for orthodontic treatment [1-4]. According to McNamara, mandibular retrusion is the most common characteristic of this malocclusion [1-5]. Functional appliances are the appliances which bring about skeletal and dental corrections in these Class II patients with retruded mandible by utilizing force from the surrounding musculature. They were introduced long back and are now popularly used to correct Class II malocclusions in growing patients. In 1992, Clark [6] described the twin block appliance in United Kingdom, since then it has been continuously used in clinical practice [7]. A lot of evidences have proved that it is one of the most successful appliance used for the correction of skeletal class II patients which can be used in any kind of patient i.e. either hypo divergent, normodivergent or hyper divergent pattern with slight modifications to the appliance design.

The amount of mandibular advancement in twin block construction varies from patient to patient. In case of limited overjet, bite can be registered by placing incisors in an edge to edge relation while in case of large overjet bite is usually registered 2-3 times by advancing the mandible gradually, which according to many authors brings about greater orthopedic change. Following is a case report of a 14 year old boy with normodivergent growth pattern, treated with twin block appliance for correction in both sagittal and vertical planes.

Case Report

Figure 1: Pretreatment facial Photographs.

A 14 year old boy reported to the department with the chief complaint of forwardly placed upper front teeth and a non pleasing smile. Extra oral examination revealed that the patient had an apparently symmetrical face with a convex profile, competent lips, deep mento-labial sulcus with receded chin (Figure 1). Introral features showed a Class II Molar relation on left side and End-on molar relation on right side with Class II Canine relationship bilaterally, over jet of 9 mm, overbite of 0% and mandibular mid
Obstructive Sleep Apnea and Role of Orthodontics – A Brief Overview

Jiju M.1,2, Mohd. Tariq1, Sandhya Maheshwari3, Aditi Gaur4, Yumna Qamar5

1Junior Resident, 2Professor, 3Senior Resident, Dept. of Orthodontics, Aligarh Muslim University, Aligarh
4Corresponding Author: Email: umjijumu@gmail.com

Abstract
Obstructive sleep apnea is a medical condition that can affect an individual’s life quality. Obstructive sleep apnea, at times, can cause both physical and mental trauma to the patients. Proper treatment has to be provided since it can be a fatal medical condition if left ignored. OSA is characterized by upper airway obstruction, temporary cessation of breathing (apnea) or shallow breathing (hypopnea), associated with disturbed sleep. Snoring can be a regular symptom. A proper diagnosis and management is very much essential in such individuals to provide them a better life quality. The main aim of this article is to provide an overview of Obstructive sleep apnea - its clinical features, diagnosis and clinical management. Also, emphasis has been given to explain the role of orthodontists in Obstructive sleep apnea.

Keywords: Obstructive sleep apnea, Sleep apnea, Snoring, Sleep disorder, Breathing disorders.

Introduction
The prime purpose of any medical treatment, in one or the other sense, is improving the quality of an individual’s life. Obstructive sleep apnea is a medical condition that can affect an individual’s life quality. Obstructive sleep apnea, at times, can cause both physical and mental trauma to the patients. Treatment has to be provided since it can be a fatal medical condition if left ignored. OSA was first described by Charles Dickens in 1837. However, it was only in 1956 that Sidney Barwell carefully documented a case of an OSA patient. The first description of this disorder was recorded in 1965.

The major symptoms of OSA include upper airway obstruction, temporary cessation of breathing (apnea) or shallow breathing (hypopnea), associated with disturbed sleep. The upper airway obstruction causes snoring sound, produced by the vibration of soft palate or other oropharyngeal tissues. If cessation of breathing occurs for 10 seconds or more, it is termed as apnea [Greek word meaning without breath]. When a person is experiencing 30 or more apneic episodes during the course of a seven hours sleep, resulting in excessive sleepiness during the day time, he/she can be considered as an obstructive sleep apnea patient. This condition can occur at any age with increased incidence rate in adults.

This article emphasizes to give a simple and brief description of OSA, and to highlight the role of an orthodontist in the overall diagnosis and treatment planning of the condition.

Pathophysiology
The underlying pathophysiology of OSA is considered multifactorial. It may vary considerably between individuals. Several predisposing risk factors are identified and include obesity, male sex, age, micrognathia, retrognathia, macroglossia, alcohol consumption, enlarged tonsils, adenoids etc. Improved understanding of the underlying pathophysiology is important for the novel treatment strategies of OSA. OSA is characterized by recurrent collapse of the pharyngeal airway during sleep, resulting in substantially reduced (hypopnea) or complete cessation (apnea) of airflow inspite of ongoing breathing efforts. These disruptions to breathing eventually lead to intermittent blood gas disturbances (hypocapnia & hypoxygenia) and surges the sympathetic activation. Obesity is considered as the main epidemiologic risk factor along with increase in body mass index, central accumulation of adipose tissue.

As explained earlier pathophysiological causes of OSA is likely to vary between individuals. Important components include upper airway anatomy, ability of the upper airway dilator muscles to respond to respiratory challenge during sleep and the stability of the respiratory control system.

Literature suggests that the pathophysiology of OSA is mainly genioglossal, supported by the fact that the individuals with OSA have impaired genioglossal function. Also, the current studies suggest that the generalized hypotonia of the dilating muscles of the upper airway can lead to the total collapse of the upper airway. Even though the posterior pharyngeal airway contributes much in the occurrence of the OSA, nasal airway can also play an important role in total airway occlusion. Any occurrence of nasal obstruction increases the air flow resistance which results in increased inspiratory effort and greater negative pressure in the pharyngeal airway, which eventually leads to the collapse of airway.

Symptoms
Obstructive sleep apnea causes many symptoms which affects the quality of life. These includes
• Snoring (Common finding)
• Apneic episodes (Choking, Gasping, etc.)
Review Article

An Overview of the Andrews Preadjusted Edgewise Appliance

Mohammad Tariq*, Sarah Asif*

*Associate Professor, Junior Resident, Dept. of Orthodontics, Dr. Z.A. Dental College, AMU, Aligarh

*Corresponding author
E-mail: md786@gmail.com

Abstract

Edgewise appliance were non-programmed appliance. There were two basic short comings. First was bracket design problem and the second was heavy force requirement for the bodily tooth movement of the teeth. To overcome bracket design shortcomings one has to do extensive wire bending. For that an orthodontist should be skilled enough to do required wire bending for getting good results. The second problem of heavy forces for moving the tooth bodily, require greater anchorage preparation. Heavy force also compromises the health of the surrounding tissues. In 1970 Dr. Lawrence F. Andrews introduced straight wire appliance also known as Andrews appliance, in which he tried to overcome the shortcomings of edgewise appliance.

Key words: Andrews prescription, Edgewise appliance, Straight wire appliance.

Introduction

Bracket design shortcomings in the edgewise appliance are bracket base perpendicular to bracket slots, bracket bases not contoured, slots not angulated, bracket stem were of equal facial-lingual thickness, and maxillary molar offset is built in. Andrews’s concept was to develop a bracket in which tip, torque, and in/out was in built therefore the wire bending was not required to produce desired tooth movement. Saving treatment time and chairtime, and improving consistency in end results. He also introduced features to resolve the gingival hygiene, patient comfort and bracket interference. Gingival tie wings of the posterior brackets are placed farther laterally.

Generation Preadjusted edgewise appliance (PEA) of Andrews

Bracket features: Built-in guidance (tip, torque and in/out) minimizes arch wire manipulation.

In-out: First order bends were eliminated by variable bracket tube thickness.

Tip: Second order bends were eliminated by built in angulation of the bracket slot.

Table 1: Andrews’s prescription for maxillary arch

<table>
<thead>
<tr>
<th>Andrews</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIP</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>TORQUE</td>
<td>0</td>
<td>0</td>
<td>-0</td>
<td>0</td>
<td>-7</td>
<td>-9</td>
<td>-9</td>
</tr>
<tr>
<td>Crown prominence</td>
<td>2.1mm</td>
<td>1.65mm</td>
<td>2.5mm</td>
<td>2.4mm</td>
<td>2.5mm</td>
<td>2.9mm</td>
<td>2.9mm</td>
</tr>
</tbody>
</table>

Torque: Third order bends were eliminated by placing the control mesio-distal crown angulation. Labially traditional heavy edgewise forces continued to be used. Dots on the distogingival wing of the maxillary brackets.

Inclination of the base: Base has the same inclination as that of facial surface of crown.

Identification features: Dash on the distogingival wing of the maxillary brackets for identification.
BORDERLINE CASES IN ORTHODONTICS – DECIDING FACTORS:

Mohammad Tarig
Professor, Dept. of Orthodontics, Dr. Z. A. Dental College,
Aligarh Muslim University, Aligarh.

ABSTRACT: In orthodontic treatment extraction of teeth are required for correction of crowding and protrusion. Borderline cases are those patients in which the tooth size arch length discrepancy lies between extraction and non extraction range, therefore there is always an uncertainty of taking the decision of extraction. The orthodontist always wonder throughout the treatment whether he should have extracted or not and if he has extracted then he has extracted the right tooth? Because such cases more often have balanced face and pleasant profile. The problem remains in the arch length tooth size discrepancy. The aim of this article is to review the literature and find out various factors or variables so that decision of extraction or non extraction may become easy. We searched the MEDLINE, EMBASE, EBM reviews and scopus. The review of the literature says that in borderline cases various factors or variables should be considered before starting the treatment for the successful results because selecting the best treatment is often difficult and one guideline do not apply to every case.

INTRODUCTION:
Borderline cases have mild to moderate tooth size arch length discrepancy. The discrepancy is not much so that one can easily opt for extraction, and it is also not very less so that one can start the case without extraction. Because non extraction treatment can protrude the incisors and extraction can land up in dished in face. Therefore there is great divergence of opinion in the treatment of such patient. Carey's1 says the tooth size arch length discrepancy for borderline cases ranges from 2.5mm to 5mm, McNamara2 says it should be between 3mm to 6mm, and Proffrit3 view is that the tooth size arch length discrepancy should be 3-6mm and up to 9mm. This dilemma of extraction or non extraction always troubles the orthodontist and requires a careful diagnosis.

DIAGNOSIS:
Diagnosis is made on the basis of clinical examination, cast analysis and cephalometric analysis. The important factors which one should notice are the age of the patient whether the patient is growing or nongrowing. Profile of the patient, incisor proclination, buccal corridor, arch width, nose prominence, molar and canine rotation, lip prominence, facial form, whether patient is Brachiocephalic or dolichocephalic. Third molars present or absent. Curve of spee, midline deviations and various combinations of the above written factors.

CLINICAL EXAMINATION:
Few important diagnostic parameters which should be checked before deciding extraction or non extraction plan are given below.
Profile – in borderline cases profile or facial aesthetics of the patient is mostly acceptable and not a problem (Fig – 1).
Major change in the profile of the patient is not required because all the cephalometric findings will be within normal range.
Orthodontic management of a borderline case with ectopic maxillary canine by unilateral premolar extractions

ADITI GAUR, SANTHAN MAHESHWARI, SANDEEP KUMAR VERMA, MANSI TAKU

Abstract
Management of orthodontic cases often requires extraction of permanent teeth. The decision-making regarding extractions depends upon the arch length-tooth material discrepancies, the growth pattern, general profile, and arch asymmetries. Unique orthodontic problems may command special treatment plans to be taken. This present report describes a case with unilateral buccally blocked out canine and bilateral posterior crossbite, for which unilateral premolar extractions were performed to achieve aesthetic and functionally stable occlusion.

Keywords: Borderline, buccally, ectopic canine, unilateral extraction

Introduction
Extraction is done primarily to gain space, retract, and correct sagittal interarch discrepancy. All other things are equal, it is better not to extracts; but in some cases extraction provides the best treatment. The decision making regarding extraction of teeth depends upon the arch length-tooth material discrepancy, facial profile, and skeletal pattern.23 Certain patients with unique orthodontic problems such as jaw size/tooth size discrepancies, contra lateral tooth size differences, and maxillary or mandibular tooth size disarrangements demand asymmetric extraction.24 Ectopic canines which are buccally displaced usually result from space deficiencies, thus, the management often dictates extraction as the treatment protocol.25

The present article describes a case of a patient with Class II subdivision malocclusion with unilateral buccally blocked canine which was treated by unilateral first premolar extraction.

Department of Orthodontics and Dental Anatomy, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, Uttar Pradesh, India

Correspondence: Dr. Aditi Gaur, Department of Orthodontics and Dental Anatomy, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, Uttar Pradesh, India
E-mail: aditigaur22@gmail.com

Case Report
A 15-year-old female patient had reported to the Department of Orthodontics with the chief complaint of a malpositioned upper left tooth. A clinical examination of the patient was done. It was observed that the patient had a symmetrical macroscopic face. The patient had a convex profile and a prominent nose. The smile arc of the patient was unsatisfactory (Figure 1).

On intraoral examination, it was observed that the maxillary canine was shifted toward the left and the mandibular canine was shifted toward the right; canine relation was Class II on the right side and a buccally blocked canine was present on the left side. Anteriorly, the overbite was in an edge-to-edge relation. The patient had a Class I molar relation on the right side and Class II molar relation on the left side. The patient had bilateral posterior crossbite with respect to the first molars (Figure 1).

The maxillary arch was U-shaped and symmetric, and the mandibular arch was wide, symmetric, and U-shaped.

The cephalometric findings revealed a normodivergent growth pattern with a Class I skeletal base (Figure 2).

An orthopantomogram was also recorded which showed erupting third molars in all four quadrants (Figure 3).

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Methods of cephalometric superimposition - A review

Sara A1, Mohammad Tarifq

E1 – III, Professor department of orthodontics Dr. Z. A. Dental College AMU, Aligarh

Corresponding Author:
Email: joct786@gmail.com

Abstract

In 1951, Broadbent1(11) and Hoffst1(12) introduced the technique of radiographic cephalometry. Since then, clinicians and researchers have adopted and routinely used this valuable tool on orthodontic patients in order to analyse underlying dentofacial relationships. Cephalometric Superimposition is used to gain a better understanding of the facial changes that accompany growth and/or orthodontic treatment.

Keywords: Cephalometrics, Superimposition.

Introduction

A cephalometric superimposition is an analysis of lateral cephalograms of the same patient taken at different times. It is used to evaluate a patient's growth pattern between different ages and to evaluate changes in the dentolveolar and basal relationships after a course of orthodontic or surgical treatment. Cephalometric procedures and evaluations are considered in the light of: pretreatment objectives, orthodontic treatment modalities used, long-term follow-up of the treatment results and during the retention and post-retention periods.

Over the time various methods of superimposition have been developed. The aim of this article is to provide an overview of the various cephalometric techniques.

Methods of superimposition of cranial base structures

- Decoster method: According to Decoster, the bony anatomy of the anterior contour of the cranial base i.e. the anterior half of the sella turcica to the foramen caecum and the internal outline of the frontal bone are stable support for superimposition. Later Richardson found that Decoster's cribiform plane was only moderately successful as far as reproducibility was concerned. Its applicability did not favor the usage of this line.1(12)

- Broadbent triangle: The Broadbent triangle (Na-S-Bb) and its registration point R were among the first structures used for superimpositions to determine overall changes. With this method, the two tracings are oriented so that the R points are registered and the Bolton planes (Bo-Na) are parallel.1(12)

- Sella - nasion line: Orient the two tracings on the Sella-nasion line with registration at Sella. Provides composite view of the amount of growth change. It is accurate as long as the growth change at nasion

Fig. 1

Basion horizontal by Coben: Basion is used as the point of reference. The line from Basion drawn parallel to the original FH, of the several radiographs, establishes the constant SN-FH relationship and the Basion Horizontal plane of the series. Each subsequent coordinate tracing film may be superimposed by simply aligning the co-ordinate grids that have been especially designed for this purpose.0(18)

Ricketts’ proposed the Basion-Nasion plane as an area of registration for overall evaluation of the dentofacial changes. The superimposition area as the Ba-Na line with registration at CC point helps to evaluate changes in facial axes, direction of chin growth, and upper molar position.1(12)
Case Report

Treatment of Class I malocclusion by single mandibular incisor extraction in patient with class III skeletal base – A case report

Samita1, Rapash2, Mohammad Fairoj1,*

1Jr.III, Orthodontist, Professor, Dept. of Orthodontics, Z.A. Dental College (AMU), Aligarh
2Corresponding Author:
Email: jriii91@gmail.com

Abstract

Over the long time, increasing numbers of patients have become aware of orthodontic treatment and are demanding high-quality treatment, in the shortest possible time with increased efficiency and reduced costs. Orthodontic treatment aims at normal functional occlusion balance with the supporting structures and environmental maximisation. Class I malocclusions can be treated by several means, according to the characteristics associated with the problem, such as teeth material-arch length discrepancy, patient’s profile, and dentition as a whole in relation to the cranial base determines teeth to be extracted as well as patient with subsequent dental camouflage.

Keywords: Class I malocclusion, Single mandibular incisor extraction, Class III skeletal base.

Introduction

Crowding of mandibular incisors is seen frequently with normal growth.10 Upper anterior teeth are 18-30% larger than the lower anterior teeth, so a compensation should be made to bring the segments in harmony.10 Crowding in mandibular anterior teeth has been treated by various non-extraction methods: moving posterior teeth distally, expanding the arches and increasing intercanine width, proclining the anterior, interproximal enamel reduction, premolar extractions, extraction of one or two incisors, or combination of above treatment options.10 To determine the treatment plan, Arch length tooth substance discrepancy of the six lower anterior teeth measured according to the Bolton analysis.10 Class I cases with lower anterior crowding and normal maxillary dentition with good buccal interdigitation, which show arch length discrepancy in the lower anterior segments of 4 to 5 mm, and an anterior ratio greater than 83% are the cases of first choice for extraction of one lower incisor.10 In deciding which lower incisor to be extracted whether mandibular central or lateral, right or left. There are various deciding factors which determines the extraction of particular teeth, which includes: magnitude of anterior arch length discrepancy, amount of anterior tooth ratio, periodontal and tooth health condition, upper and lower midline relationship.10 However, selecting best treatment for patient is not easy, as similar treatment mechanisms may lead to different individual responses.

Indications for single mandibular incisor extraction include, Class I malocclusions with lower anterior crowding having normal maxillary dentition, well aligned lateral and posterior occlusion, and increased irregularity index. Malocclusions with anterior cross-bite due to crowding in lower anterior and lower incisor extrusion and in Class I malocclusions with severe anterior tooth size discrepancy. Contraindications includes the patients with horizontal growth pattern, Class I malocclusion cases requiring upper premolar extraction, bimaxillary crowding cases with no tooth-size discrepancy in the incisor area, and large maxillary incisors and small mandibular incisors.

Diagnosis and Etiology

A 14 year old female patient had reported to the Department of Orthodontics with the chief complaint of crowding in front teeth. On evaluating patient history no past medical disorder or dental history was given. While conducting functional examination no temporomandibular joint symptoms were detected. On extra oral examination it was observed that the patient had apparently symmetrical, leptoprosopic face, convex profile. Nasal skeletal angle was towards
Assessment of Tooth Proportions in an Aesthetically Acceptable Smile

ABSTRACT

Introduction: Aesthetic facial animation is mostly reported to be due to a close relationship between soft and hard tissue. A dynamic smile with appropriate tooth proportions. But variations in tooth size have been seen among various ethnic populations globally.

Aim: To evaluate the size and morphology of maxillary anterior teeth, the tooth with maximum variation both mesiodistally and cervicoincisally. Also, the tooth-to-tooth ratio in percentage of the mean tooth sizes in both genders in patients with aesthetically acceptable smile defined by a panel in North Indian population.

Materials and Methods: A total of 100 subjects (50 males and 50 females) were taken and a video clip of their dynamic smile was captured. The smiles were analyzed by a panel and the tooth proportions of the selected attractive smiles were evaluated in both males and females separately.

INTRODUCTION

A smile plays an important role in self-perception of an individual and is an important element of facial expression and physical attractiveness. A bright smiled associated with intelligence, empathy, extraversion and creates its own perception towards facial attractiveness [1]. There has been a paradigm shift in analysis of smile from static to dynamic. Ackerman et al. [2] and Tarantilis et al. [3] advocated the use of video recording due to its distinct advantage over clinically posed photographs for accurately capturing a true representation of the smile.

Nowadays, treatment methodology has shifted the focus on soft tissue-soft tissue relationships. So, the relationship between smile and tooth proportions is important, as the anterior teeth display during dynamic facial animation has entered clinical evaluation [4]. Tooth size variations have been reported among various ethnic populations, like North American Caucasians [5], Negros [6], etc. So, the knowledge of racial norms of tooth proportion may help to specify certain aesthetic modifications to the treatment for that particular population [7]. Therefore, owing to human variability and gender differences in tooth size proportions, a study was taken up on North Indian population with the aim of selecting a sample with aesthetically acceptable smile and evaluating its width-length ratio, tooth to tooth ratio in percentage and the tooth with maximum variation in maxillary anterior tooth region for both genders.

MATERIALS AND METHODS

A sample of 100 subjects (50 males and 50 females) from dental college in Meerut, Uttar Pradesh, India, were selected by a written consent as prescribed and approved by ethical committee of University, Meerut. Uttar Pradesh to participate in the study. The inclusion criteria were (1) Age group between 18 to 25 y (2) No previous history of orthodontic treatment (3) No significant skeletal dolical asymmetry (4) No missing or malformed teeth causing a tooth-size discrepancy (5) No interlabial spacing and crowding. (6) No retained primary or supernumerary teeth. (7) All subjects presented a complete permanent dentition with the exception of third molars. (8) No gingival irritation like gingival inflammation, hyperplasia and pericoronal surgery. (9) There should be no incisal cingulum and tooth abatination in the form of restoration, fracture, caries and attrition. The only exclusion Criteria was, poor video clip quality (out of focus, not rewatchable).

Each sample was positioned in the customised-equipment in natural head position to stabilise the head and to avoid excess motion (Figure 1). The digital video camera (Sony BX-7V) was mounted on the adjustable tripod stand and was set at a fixed distance of 30 inches from the subject. The lens was positioned parallel to the true perpendicular of the face in natural head position, and the camera was raised to the level of the patient's lower facial third. Then, the patient was made to smile (9).

While capturing the dynamic smile, 5 sec video clip was recorded with video camera capturing at 30 frames/sec. The raw video clip was downloaded to a computer and imported to video editing software (Free studio video to JPEG converter, V5.0.29 build 965) for converting streaming video into individual 150 photographic frames. It was seen that every 16th frame showed a change in smile, so every 16th frame out of 150 frames were selected. Out of the selected 10...
Lasers in Dentistry—Double Edged Sword

Sushma D1, Saba K2, Sadaf G3 and Zainab M4

1Private Practitioner, India
2Department of Orthodontics and Dentofacial Orthopaedics, Aligarh Muslim University, India
3Department of Paediatric and Preventive Dentistry, Aligarh Muslim University, India
4Private Practitioner, Qatar

*Corresponding author: Saba Khan, Assistant Professor, Department of Orthodontics and Dentofacial Orthopaedics, Dr. Z.A. Dental College, Aligarh Muslim University, Aligarh, UP, India, E-mail: apple.saba@gmail.com

Abstract

There has been a recent uprise in the use of lasers in the field of dentistry. This article serves to examine the risks involved with laser use in dentistry, the regulations governing safe use and the responsibilities of personnel involved in providing treatment to patients to prevent incidence of Laser injuries.

Keywords: Laser injuries; Laser classification; Dentistry

Introduction

The word "laser" is an acronym for Light Amplification by Stimulated Emission of Radiation. Laser in dentistry can be a precise and effective way to perform many dental procedures. Lasers can be used to detect caries, prepare cavities, seal dental tubules to reduce sensitivity, etching, curing teeth and sterilization of root canal system. There are also soft-tissue applications as the beam can be adjusted to enable it to cut, vaporize, or coagulate tissue. One of the main benefits of using dental lasers is the ability to selectively and precisely interact with diseased tissues. Lasers also allow the clinician to reduce the amount of bacteria and other pathogens in the surgical field, [1,2] and, in the case of soft-tissue procedures, achieve good hemostasis with the reduced need for sutures [4,5], minimize postoperative swelling and scarring with minimal post operative pain [6].

With widespread increase in the scope of Lasers in dentistry, additional risks to nontarget oral tissue, skin, and eyes are also increasing. Such damage may be the result of direct exposure to the laser beam or through the combustion of chemicals, gases, and materials used in dentistry. Damage can be instantaneous and permanent [7]. The majority of Laser injuries are due to poor adherence to established safety protocols. In order to use Lasers most effectively and safely, all clinicians undertaking laser dentistry should observe safe practice. This article serves to examine the risks involved with Laser use in dentistry, the regulations governing safe use and the responsibilities of personnel involved in providing treatment to patients to prevent incidence of Laser injuries.

Laser Classification—According To Potential of Causing Biological Hazard

International Electrotechnical Commission (IEC) is a global organization that prepares and publishes international standards for all electrical, electronic and related technologies. The IEC document 60825-1 is the primary standard that outlines the safety of laser products [8] (Table 1). Safety thresholds for lasers are...
Effect of Low-level laser therapy (LLLT) on Orthodontic Tooth Movement - Cellular Level

Sudhanshu Dhamnus and Saba Khan
Orthodontics and Dentofacial Orthopedics, Aligarh Muslim University, India
Submission: February 8, 2018; Published: February 19, 2018
Corresponding author: Sudhanshu Dhamnus, Orthodontics and Dentofacial Orthopedics, Aligarh Muslim University, India, Tel: 05272145521;
Email: dhamnusss@gmail.com

Abstract
Low-level laser therapy has been used to stimulate the orthodontic tooth movements (OTM). Low level laser therapy has biostimulatory effects. In the last decade, researchers have attempted to determine the effect of Low level laser therapy on the pathways and cells directly associated with orthodontic tooth movement. The results of studies on the rate of tooth movement are controversial. While the majority of published research outcomes indicate an increase in the rate of tooth movement after laser therapy compared to controls, but others reported no difference or even indicated the inhibitory effect of laser therapy on the rate of tooth movement. Most of the studies reported the effect of the LLLT on rate of orthodontic tooth movement but only few have dealt with the underlying mechanism of action of low-level laser therapy on cells involved in orthodontic tooth movement. The present paper discusses the effect of low level laser therapy on orthodontic tooth movement at cellular level.

Introduction
Orthodontic tooth movement occurs in the presence of a mechanical stimulus will cause changes in the microenvironment around the PIU, due to alterations of blood flow, leading to the secretion of different inflammatory mediators such as cytokines, growth factors, neurotransmitters, colony-stimulating factors, and mitochon- drial acid metabolites. As a result of these secretions, remodeling of the bone occurs [1-2]. Bone remodeling involves resorption of bone on the pressure site and bone formation on the tension site [3]. Low level laser therapy has biostimulatory effects [4]. It stimulates the on-going biological processes in tissue and has been found to be effective in modulating cell activity and production of endogenous molecules, which are also involved in orthodontic tooth movement [5-7].

In the last decade, researchers have attempted to determine the effect of LLLT on the pathways and cells directly associated with orthodontic tooth movement. The results of studies on the rate of tooth movement are controversial. While the majority of published research outcomes indicate an increase in the rate of tooth movement after laser therapy compared to controls [8-15], but others reported no difference [16-18] or even indicated the inhibitory effect of laser therapy on the rate of tooth movement [19]. Most of the studies reported the effect of the LLLT on rate of orthodontic tooth movement but only few have dealt with the underlying mechanism of action of LLLT on cells involved in orthodontic tooth movement.

How does LLLT work?
Effect of LLLT is photobiological not thermal. Exposure of a cell to LLLT occurs by absorption of light by photosensitive molecule also termed as chromophores [20,21]. Cytochrome c oxidase is a key photosensitizer of light in the far-red to near-IR spectral range [22]. Cytochrome c oxidase is an integral membrane protein of mitochondria that contains four redox-active metal centers. The excitation of this molecule with light energy accelerates the rate of electron transfer [23] and in turn increases the capacity of mitochondria to generate ATP [24]. Increased ATP results in increased energy available for the cell's metabolic processes.

Low level laser therapy's effect on main cellular components involved in orthodontic tooth movement: In the last few decades, researchers have attempted to determine the effect of LLLT on the biophysical pathways involved in orthodontic tooth movement. Some authors believe that LLLT induces osteoblasts proliferation (in vivo studies, [27-28]) and in vitro studies [29-30]. Which is responsible for the accelerated tooth movement. However, according to other researchers, bone resorption is the rate-limiting step in tooth movement [31]. Therefore, any procedure which has the potential to increase osteoclastic activity may increase the rate of orthodontic tooth movement. Recent studies highlight enhanced osteoclastic activity after low level laser therapy in vivo [39-44] and in vitro [45].
Conservative Management of Severe Class II Division 1 malocclusion in an adolescent female patient- A case report

Dr. Sarah Asif, Dr. Mohd Tariq, Dr. Saba Khan

1Senior Resident, Department of Orthodontics and Dentofacial Orthopedics, Ziauddin Ahmad Dental College, Aligarh Muslim University, Aligarh
2Professor, Department of Orthodontics and Dentofacial Orthopedics, Ziauddin Ahmad Dental College, Aligarh Muslim University, Aligarh
3Assistant Professor, Department of Orthodontics and Dentofacial Orthopedics, Ziauddin Ahmad Dental College, Aligarh Muslim University, Aligarh

Corresponding Author: Dr. Sarah Asif

Abstract: Case report of a 15-year-old female patient who presented with class II div I malocclusion with protrusion and proclination of upper and lower incisors, skeletal class II base, normodivergent growth pattern and incompetent lips. She also presented an overjet of 10 mm and a 80% overbite. The objectives was correction of the proclination and protruded maxillary incisors and enhancement of facial profile. Treatment consisted in extraction of the maxillary first bicuspids and fixed orthodontic appliances with preadjusted edgewise appliance. The result showed correction of overjet and overbite, with class I canine relation and maintenance of class II molar relation and marked improvement of facial esthetics.

Key words: Orthodontic camouflage, Class II div I malocclusion, Incompetent Lips, K-SIR Loop.

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1. Introduction

The Class II division 1 malocclusion is considered as one of the most prevalent malocclusions. Enrich et al., have reported a 14% frequency in children aged between 12-14 yr of age. The growth status of the individual and the treatment timing are essential aspects to be considered while attempting correction of Class II malocclusion. In case of adults, the camouflage treatment is the most frequently performed treatment modality for its correction, which invariably involves extractions of all four first premolars or the upper first premolars and lower second premolars as only the upper maxillary premolars may only be treated with a maxillary premolar extraction protocol. In a long term follow up by Meshik et al. they concluded that the level of patient satisfaction reported with a camouflage treatment versus orthognathic surgery, such as a surgical mandibular advancement, were seen to be comparable. Janson et al performed a study to analyze the post treatment occluded stability in premolar extraction cases, wherein they concluded that the two maxillary premolar extraction treatment gave a better occlusal result, vs the treatment results obtained with four premolar extractions.

2. Case Report

A 15year old female reported to the department of orthodontics, with the complaint of forwardly placed upper incisor due to a non pleasing smile. On external examination, the patient had a symmetrical mesogoniasic face with convex profile, incompetent lips and a curved lower lip. Smile analysis showed a normal smile line with a non-consonant smile arc and a molar’s ratio of 100%. Upon intraoral examination the patient had class II molars and II canine relationships bilaterally, excessive bite in relation to upper and lower first premolars on the left side, an overjet of 10 mm, overbite of 80%, square shaped maxillary arch and an avoid shaped mandibular arch with spacing in lower anterior region. (Figure 1) The periodontal tissues were found to be healthy. The functional findings revealed no signs or symptoms of a temporomandibular disorder.

Cephalometric findings presented a forwardly placed maxilla with an orthognathic mandible resulting in skeletal class II relation (ANB=7°, Wits=0mm, APP=0mm, VM=1mm). The patient had a normodivergent growth pattern (PMA=24°) along with proclined and protruded upper and lower incisors (Max 1-AF=14mm, Max 1-NA=8mm, Mid 1-AF=9mm, Mid 1-NA=10mm). (Figure 3)

S. 1: Isocophalometric analysis revealed proclined upper and lower lip w.r.t S and E line, increased interlabial gap; 4mm and lip strain of 3mm.

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Conservative Management of Severe Class II Division 1 malocclusion...
Quizzing as an innovative Teaching-Learning technique for undergraduate dental students

Saba Khan1, *, Sandhya Maheshwari2, Sadaf Ghanizadeh3, Seema Hashim4, Aditi Gaur5

1, 2 Assistant Professor, 3, 4 Senior Resident, 5 Dept. of Orthodontics, AMR Cherif Dental College, Aligarh, India

Abstract
Quiz is a modality, which requires analytical skills to assess and apply information to crack the code of questions. The topic chosen for this quiz was Cephalometrics, which is a clinical topic. It answers the diagnostic dilemma and is a must in "know-how" syllabus of BDS final year students. For a better understanding of the topic, we need an interactive teaching session. It was observed that the Teaching-Learning (T-L) session assisted students in remembering important concepts that were targeted by the quiz.

Keywords: Quiz, Cephalometrics, Teaching-Learning techniques, Curricula

Introduction
Teaching and learning are two sides of a coin. Innovation in Teaching-Learning (T-L) methods has gained popularity in recent times. Educators are adopting newer methods, as the teaching tools to deliver information have been found to be strongly correlated with grasping and processing of knowledge among students. Conventional didactic lectures focus on "Surface learning", where the main focus is on comprehension and reproducing information. However, now there has been a paradigm shift, where the primary goal is emphasized on "Deep learning" which relies on acquiring cognitive skills, balancing analysis and synthesis to form strong reasoning.

It has been well demonstrated that quizzing assists in "Deep learning", and can be a robust T-L tool for small group teaching. Quizzing on clinical topics helps students widen their horizon to clinical interface from purely didactic information as it is delivered routine-lecture format. Quizzing promotes and encourages students to use the facts flexibly, and amalgamate concepts and findings. Research on psychological aspect of quizzing have also concluded that "questioning" reduces the forgetting curve by retrieval practice and helps assimilate information in an effective way.

Cephalometrics is an important diagnostic tool in orthodontics. Dental Council of India (DCI) has included cephalometrics in the proposed curriculum for BDS students. Cephalometrics is taught in a series of lectures and practical classes. Clinical application of cephalometrics can be taught through interactive teaching-learning (T-L) methods only. To understand cephalometrics, students need to acquire critical thinking in terms of correlation of dental and skeletal components, and to hone problem-solving skills to clean a diagnosis and probable prognosis.

We hypothesized that quizzing will provide us as an innovative T-L method to infuse thorough understanding of cephalometrics in BDS students, to enhance their knowledge and help them develop relevant skills at diagnosing and assessing orthodontic problems.

Interactive techniques, which can be derived at, through quizzing include: breaking the class in to small groups, questioning the audience, using audience responses and use of clinical cases.

Aims of the study were:
1. To evaluate quizzing as a T-L technique
2. To assist students in understanding the clinical applicability of the topic

Material and Methods
This was a cross sectional, comparative and interventional study. The quiz was designed to be used as an instrument to enhance participation and interest for students studying in BDS final year in Dr. Z. A. Dental College, A. M. U. We have 24 students in BDS final year, out of which 20 students attended the quiz. The BDS final year batch was informed that, a Lecture-Quiz session would be undertaken on cephalometrics, two weeks in advance, so that the students came prepared for both lecture and the quiz.

1. Didactic lecture was taken on the topic in a two hour session divided into two- one hour session/ week
2. A pre-test questionnaire in the form of MCQ test was taken prior to the quiz.
3. Quiz was conducted after dividing the batch into four teams.
4. Post-test questionnaire was taken in the form of MCQ test.
Accelerating tooth movement: what options we have?

Abstract

With an understanding of the molecular and cellular basis of orthodontic tooth movement, new focus is on surgically assisted rapid tooth movement. This requires the orchestration of intrinsic factors. Clinically, efficiency and maintenance have been desired for orthodontic tooth movement (OTM). Besides these, it is often highlighted various newer methods of enhancing the rate of tooth movement, like, new forces, force therapy, use of electric currents, periodontal membrane vibration by vibrotactile, phononotactile force fields etc. Recent research has shown that these methods effectively increase the rate of OTM.

Introduction

Duration of treatment is one of the main concerns of patients undergoing orthodontic treatment. Fixed orthodontic treatment lasts up to 2 to 3 years increasing the risk of external root resorption, periodontal problems and patient compliance. Clinicians are constantly striving towards developing strategies to enhance the rate of orthodontic tooth movement. An increase in in-depth knowledge of the orthodontic tooth movement (OTM) has been a major aid in accelerating tooth movement. Corticotomy and multiple tooth osteotomies have been a major step in surgically assisted rapid tooth movement. Corticotomy was first described in 1992. The concept of using a “positive system” for active canine retraction using a screw was proposed by Pernu. Distraction osteogenesis in tooth movement was given by Liu et al. and Huang. Wölcck and Fugazotto demonstrated that minimal stress on a moving tooth through a surgically healing site led to faster tooth movement periodically accelerated orthodontic osteotomies or Wilckodontics. In a systematic review by Hu Long, it was concluded that corticotomy is a safe and effective means of increasing the rate of tooth movement. Following corticotomy, there is alveolar osteopenia, followed by new bone deposition and external formation, which can be supplemented using a bone graft. Frouz called it regional acceleratory phenomenon whereby, regional healing response led to accelerated tooth movement. Several newer techniques like low level laser therapy, use of electric currents, periodontal tissue activation by vibration, photoirradiation have been discussed in this article.

Corticotomy

Kale et al. gave the concept of corticotomy combined with orthodontics to accelerate tooth movement in order to decrease the treatment duration. He advocated the use of interproximal corticotomy cuts extending through the cortex, which were further connected with horizontal osteotomy cuts, thereby forming bony blocks which lead to quicker tooth movement and better stability.

Wilckodontics-periodontally accelerated osteogenetic orthodontics

Wölcck et al.9 introduced a corticotomy facilitated technique which involved alveolar augmentation. The surgical technique included reflection of labial and lingual alveolar flaps which was accompanied with limited selective corticotomy. Bone grafting leads to two advantages, firstly, it lead to lateral bone augmentation and expansion, secondly, it helped in tooth movement by providing biomechanical factors needed for tooth movement.10 Accelerated tooth movement in case of corticotomy is due to increased bone turnover and decreased bone density.12

Corticision

Park et al.11 introduced a modified version of corticotomy, a technique named corticision in which, scalped and malet were used to cut the bone through the gingiva without the reflection of a surgical flap, i.e. a trans-gingival approach was used. The trauma to the bone induced local acceleratory phenomena leading to accelerated tooth movement. This method had several shortcomings including poor precision and it was associated with dizziness in the patients due to repeated loading. However, Kim et al.12 reported that corticision can be used safely for rapid tooth movement based on histology and histomorphology of periodontal tissues.

Periodontal distraction

Liu et al.13 suggested that rapid orthodontic tooth movement is a form of distraction consequences of the periodontal ligament. Liu conducted a clinical experiment in 1998 and demonstrated faster mobilization of twenty-six canine teeth in humans by distraction of the periodontal ligament. This technique was referred to as dental distraction. A dental distractor is placed which has a distraction screw and a sliding rod. New bone trabeculae are formed parallel to the direction of force being applied and rapid alveolar remodeling takes place.14 A disadvantage from biomechanical perspective is the dental mobilization of the canine being retracted.15

Dentoalveolar distraction

Dentoalveolar distraction utilizes the principle of distraction osteogenesis. Corticotomy is performed only on the alveolar side sparing the palatal side to maintain adequate blood flow and to maintain bone support. The teeth move in the alveolar bone without any damage to the periodontal ligament.15,16

Peizocision

Peizocision was introduced by Dibarti et al.17 It involves piezoelectric microvibrations with concomitant tunneling for
CORRECTION OF ANTERIOR CROSSBITE IN A FEMALE ADULT PATIENT- A CASE REPORT

Dr. Muhammad Tariq1, Dr. Sarah Asif1
1Professor, Chairman, Department of Orthodontics and Dentofacial Orthopedics, Ziauddin Ahmad Dental College, Aligarh Muslim University, Aligarh
2Senior Resident, Department of Orthodontics and Dentofacial Orthopedics, Ziauddin Ahmad Dental College, Aligarh Muslim University, Aligarh

ABSTRACT: The following case report is of a 19 year-old female patient who presented with Angle’s Class III malocclusion and anterior crossbite on a skeletal class III base with a hypodivergent growth pattern. There was gingival recession with respect to her lower right central incisor which was severe for her age and in spite, caused by the crossbite malocclusion. No CO-CR discrepancy was noted. The objective of the orthodontic treatment was correction of the Class III malocclusion, correction of the anterior crossbite, restoration of the periodontal health of compromised central incisor and improvement of facial esthetics. Treatment consisted of fixed orthodontic mechanotherapy using preadjusted edgewise appliance. Results showed a marked improvement in the occlusal harmony and facial esthetics.

INTRODUCTION: Moyers’ defined anterior tooth crossbite as a dental malocclusion resulting from the abnormal axial inclination of maxillary anterior teeth.[1] Correction of crossbite is recommended when it is seen for the first time because it eliminates functional shifts and wear on the erupted permanent teeth, and possibly dentoskeletal asymmetry which eventually increases arch circumference providing sufficient space for the permanent teeth to erupt. An early correction of developing or a frankly developed crossbite also makes future treatment more comprehensible by eliminating at least that problem from the list.[3,5,9]

Though lack of an adequate space for the maxillary incisors to erupt is considered to be one of the most common cause of anterior crossbite, it is also seen to develop due to a labially positioned supernumerary tooth causing lingual deflection of the permanent tooth or any trauma causing displacement of the developing permanent tooth germ or an arch-length deficiency causing a lingual deflection of permanent anterior teeth during eruption or any habit of biting lip or in case of repaired cleft lip.[4,5,9]

Anterior crossbites require an immediate and effective treatment to prevent anterior teeth mobility and fracture and also to obviate any future periodontal and temporomandibular joint disturbances.[6-8]

Depending upon the etiology of the anterior crossbite, skeletal or dental, and the stage of dentition; mixed or permanent, a variety of treatment approaches can be used to prevent, intercept or correct it. A meticulous diagnosis must be performed by the orthodontist before beginning with the treatment mechanics.[9]

Treatment modalities for correction of anterior crossbite include tongue blade therapy, inclined plane, removable appliance with finger spring, maxillary 2x4 appliance, bonded resin-composite slings, fixed orthodontic mechanotherapy or orthognathic surgical procedures.[9-10]
An Overview of the Andrews Preadjusted Edgewise Appliance

Mohammad Tariq*, Sarah Asif

*Associate Professor, **Junior Resident, Dept. of Orthodontics,
Dr. Z.A. Dental College, AMU, Aligarh

Abstract

Edgewise appliance were non-programmed appliance. There were two basic shortcomings. First was bracket design problem and the second was heavy force requirement for the bodily tooth movement of the teeth. To overcome bracket design shortcomings one has to do extensive wire bending. For that an orthodontist should be skilled enough to do required wire bending for getting good results. The second problem of heavy forces for moving the tooth bodily, require greater anchorage preparation. Heavy force also compromises the health of the surrounding tissues. In 1970 Dr. Lawrence F. Andrews introduced straight wire appliance also known as preadjusted appliance, in which he tried to overcome the shortcomings of edgewise appliance.

Key words: Andrews prescription, Edgewise appliance, Straight wire appliance

Introduction

Bracket design shortcomings in the edgewise appliance are bracket base perpendicular to bracket stem, bracket base not contoured, slots not angulated, bracket stem were of equal faciolingual thickness, and maxillary molar offset is not built in. Andrew's concept was to develop a bracket in which tip, torque, and in/out was in built therefore the wire bending was not required to produce desired tooth movement. Saving treatment time and chair time, and improving consistency in end results. He also introduced features to resolve the gingival hygiene, patient comfort and bracket interference. Gingival tie wings of the posterior brackets are placed farther laterally.

Generation Preadjusted edgewise appliance (PEA) of Andrews

Bracket features: Built-in guidance (tip, torque and in/out) minimizes arch wire manipulation.

In-out: First order bends were eliminated by variable bracket/tube thickness.

Tip: Second order bends were eliminated by built in angulation of the bracket slot.

Torque: Third order bends were eliminated by placing the control medio-distal crown angulation. Labiolingually traditional heavy edgewise forces continued to be used. Dots on the distogingival wing of the maxillary brackets.

Torque in base: The center of the slot and the center of the base are always on the same plane for consistent and easy bracket placement. The bases of the brackets are inclined for each tooth type, to achieve proper tooth "torque"-the center of each slot at the same height as the middle of the clinical crown.

Inclination of the base: Base has the same inclination as that of facial surface of crown.

(+): sign refers to palatal root torque (labial crown torque) values.

(−): sign refers to labial root torque (palatal crown torque) values.

Rotation: Present only in maxillary molars not in any other maxillary or mandibular teeth. 10º molar off set relative to embrasure line. Middle and mesiobuccal cusp are equally prominent in mandibular molars.

Identification Features: Dots on the distogingival wing of the mandibular brackets for identification.

Table 1: Andrews's prescription for maxillary arch

<table>
<thead>
<tr>
<th>Andrews</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIP</td>
<td>5º</td>
<td>9º</td>
<td>11º</td>
<td>2º</td>
<td>2º</td>
<td>5º</td>
<td>5º</td>
</tr>
<tr>
<td>TORQUE</td>
<td>7º</td>
<td>3º</td>
<td>-7º</td>
<td>-7º</td>
<td>-7º</td>
<td>-9º</td>
<td>-9º</td>
</tr>
<tr>
<td>Crown prominence</td>
<td>2.1mm</td>
<td>1.65mm</td>
<td>2.5mm</td>
<td>2.4mm</td>
<td>2.5mm</td>
<td>2.9mm</td>
<td>2.9mm</td>
</tr>
</tbody>
</table>
Accelerating Tooth Movement: What Options We Have?

Introduction

Duration of treatment is one of the main concerns of patients undergoing orthodontic treatment. Fixed orthodontic treatment lasts up to 2 to 3 years increasing the risk of external root resorption, periodontal problems and patient compliance [1]. Clinicians are constantly striving towards developing strategies to enhance the rate of orthodontic tooth movement. An increase in in-depth knowledge of the alveolar topography [2] has been a major aid in accelerating tooth movement. Corticotomy and multiple tooth osteotomies have been the mainstay of surgically assisted rapid tooth movement. Corticotomy was first described in 1982 [3]. The concept of using a "positive system" for active canine retraction using a screw was prepared by Farrar [4]. Distraction osteogenesis in tooth movement was given by Liu and Huang [5]. Wilcko and Ferguson [6] demonstrated that intermaxillary stress on a moving tooth through a surgically healing site led to faster tooth movement. Periodontally accelerated osteogenic orthodontics by Wilcko et al. In a systematic review by Lin Long [7], it was concluded that corticotomy is a safe and effective means of increasing the rate of tooth movement. Following corticotomy, there is alveolar osteopении, followed by bone deposition and remodeling, which can be supplemented using a bone graft [8]. Frost [9] called it regional acceleratory phenomenon whereby, regional healing response led to accelerated tooth movement. Several newer techniques like low level laser therapy, use of electric current, periodontal tissue activation by vibration, photobiomodulation have been discussed in this article.

Corticotomy

Eide et al. [9] gave the concept of corticotomy combined with orthodontics to accelerate tooth movement in order to decrease the treatment duration. He advocated the use of interproximal corticotomy cuts extending through the bone, which were further connected with horizontal osteotomy cuts, thereby forming bone blocks which lead to quicker tooth movement and better stability.

Corticotomy-periodontally accelerated osteogenic orthodontics

Wilde et al. [10] introduced a corticotomy facilitated technique which involved alveolar augmentation. The surgical technique included reflection of labial and lingual alveolar flaps which was accompanied with limited selective corticotomy. Bone grafting leads to two advantages. Firstly, it leads to lateral bone augmentation and regeneration, secondly, it helped in tooth movement by providing biomechanical factors needed for tooth movement [11]. Accelerated tooth movement in case of corticotomy is due to increased bone turnover and decreased bone density [12].

Corticision

Park et al. [13] introduced a modified version of corticotomy, a technique named corticision in which, surgical mallet was used to cut the bone through the gingiva within the reflection of a surgical flap, i.e., a trans-gingival approach was used. The trauma to the bone induced regional acceleratory phenomenon leading to accelerated tooth movement. This method had several shortcomings including poor precision and it was associated with discomfort in the patients due to repeated malleting. However, Kim et al. [14] reported that corticision can be used safely for rapid tooth movement based on histology and histomorphometry of periodontal tissues.

Periodontal distraction

Liao et al. [5] suggested that rapid orthodontic tooth movement is a form of distraction osteogenesis of the periodontal ligament. Liao conducted a clinical experiment in 1998 and demonstrated faster distalization of twenty-six canine teeth in humans by distraction of the periodontal ligament. This technique was referred to as dental distraction. A dental distractor is placed which has a distraction screw and a sliding rod. New bone trabeculae are formed parallel to the direction of force being applied and rapid alveolar remodeling takes place [15]. A disadvantage from biomechanical perspective is the distal rotation of the canine being extracted [16].

Dentoalveolar distraction

Dentoalveolar distraction utilizes the principle of distraction osteogenesis. Corticotomy is performed only on the alveolar side...