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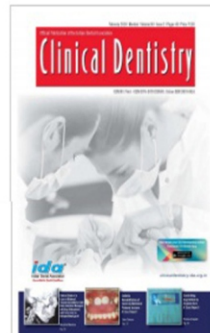
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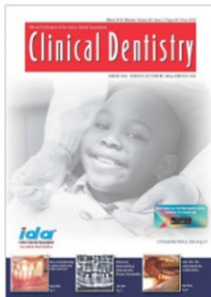
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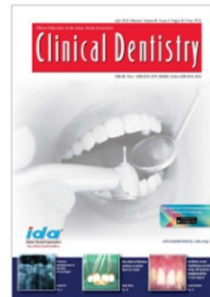
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Photographs of X-rays should be sent and not the original X-rays. Prints should be clear and glossy. On the back of each print in the upper right corner, write lightly the figure number and author's name indicate top of the photograph with an arrow of word Top Slides and X-ray photographs should be identified similarly.

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Dr. A.L. Meenakshi Sundaram

It's a great pleasure to meet everyone through the 3rd issue of JIDAT this year.

Almost 8 months of 2018 passed by and I'm thankful for your enormous support in this challenging year.

As all of you are aware, state office is trying its level best to get an representation in CEA in both district and state level.

We have met DMS, Health Secretary and Health Minister more than four times regarding this issue. Hope we will succeed by the time when you get this issue of JIDAT.

I kindly request your continuous support to help IDA flourish and hope our branch will be an inspiration to others

I thank Dr. Mustafa, editor in chief of JIDAT for his outstanding work and dedication.

Thank you

Yours sincerely,

Dr. A.L. Meenakshi Sundaram
Hon-State President
IDA-Tamilnadu State Branch



Dr. K.P. Senthamarai Kannan

Dear Members,

Warm Regards from IDA Tamilnadu State Branch.

Its great privilege to write my secretary message in prestigious Tamilnadu State Journal “JIDAT”. Jidat is an Scientific Journal on Original research articles exclusively designed for academicians & Clinical practitioners. It provides a platform for eminent dentists to publish their research and evidence based finding in different fields of dentistry. JIDAT mainly focus in research and latest updates in dentistry.

My best wishes for editor & his team.

With Regards,



Dr. K.P. Senthamarai Kannan

Hon-State Secretary

IDA-Tamilnadu State Branch



Dr. H. Mohammed Musthafa

Warm wishes,

Happy to meet you all through this Issue. For any Association, the Members are its strength. More the Members, Stronger the Association. My humble request to all the members is to take IDA's Message to all the Dentists' in the state. There may be questions what Association has done to me? You all be the Ambassadors of IDA in spreading the activities and keep in touch with all the fellow dentists. IDA Tamilnadu State Office is striving to its core to increase the Membership strength. Hereby I plead all the IDA Members to make use of our journal in exhibiting your clinical and academic talents. We at the office of JIDAT are here to support you in exhibiting the same. Jai IDA!!!

A handwritten signature in black ink, appearing to read 'Dr. H. Mohammed Musthafa'.

Dr.H.Mohammed Musthafa,
Editor in Chief,
JIDAT.

THOUGHTS ON PRACTICE MANAGEMENT

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The Practice of Dentistry has become more and more competitive if not a rat race in the present day scenario. The output of Dental graduates has increased 1000 times per year in Tamil Nadu from the mere 40 per year in the 1970s.

Practically the incidence and prevalence of oral /dental diseases have remained the same if not reduced due to availability of a very good awareness of Preventive practices and also interventional, curative and rehabilitative measures .

Thus the practice of Dentistry for the Graduates is more competitive and demanding and for the Specialists more selective or restrictive. Each practitioner has to give something more than the other to get new patients to the clinic and retain them.

The need for investment is primary concern if one has to offer the best if not better than the existing neighbour. The place, the establishment, recurring expenses of staff, waste disposal, consumable materials, laboratory charges wipe out a major chunk of the income. Added to this are the personal expenses, family commitments, transportation and that of educating the offspring. These put a very tight string on the available fund for investment for future or otherwise called saving.

Due to the stress in running the day to day practice successfully till establishing a regular clientele and later the need to maintain or elevate standards so as to retain what you

have achieved over the years; with great efforts and sacrifice, of course the next concern of every progressing year is the wear and tear of the practicing person in the form of occupational hazards like musculoskeletal restrictions and stress.

Thus the Practice of dentistry deprives one, of the social interactions with other than the fraternity. One tends to drift away by 20 years of practice, when the new practitioner breed makes you go for acquiring of new techniques and skills of course, at a cost and refurbishing and adding new equipment leading to the rising costs.

Apart from the intricacies of the above mentioned practice related challenges the need for security in social and health domains also exert a great demand to the practitioner; causing more stress to his character resources. The social pressure to be a part of the elite society is a drain to the exchequer and resources and the peer pressure to be on the top of the professionals becomes a arduous task

Thus it would be wise to follow a structured pattern to keep afloat our enthusiasm and interest in practice to fulfil the demands of the ever vigilant patient.

Maintenance of patient records to avoid litigations

Insurance in the form of professional indemnity ,equipment ,life

Health insurance for the family is a must ,which should not be forgotten

Allocations of funds for saving

Systematic investment plans started early in the career will become huge close to retirement, without any burden. It is a proven wonderful path to build big amount

Taking loans on deposit rather than mortgage reduce paperwork and also the interest paid to financial institutions.

Proper tax assessment/ payments and deriving benefits of all the available exemptions also is a way of saving and increase your credibility and credit worthiness which many do not utilise fully.

Planning and nurturing a successor for the practice from the offspring if possible Taking off periodically to spend time with family, on tours and refreshing the interest in practice

Regular physical activity, meditation, music will add to the charm of life.

Attending Conferences to keep up knowledge of equipment and techniques

Being part of Professional Associations like IDA to get to know the available specialists

Who can help you to increase quality of your practice

If possible develop parallel investment in other reliable business to compensate for vagaries in practices. Early Investments in the real estate will give huge benefits close to retirement by high returns.

Thus the present day practitioner has to carefully balance on several ropes at the same time so that he does not lose his relevance to the society and also be a successful service provider to the society.

This needs for proper pricing, providing

the best scientifically relevant treatment modalities, being ethical and truthful to the patient and profession will definitely go a long way in a happy, balanced career; getting the full benefits of your education and training in Dentistry.

All such factors are systematically given at the HO Website-which will be of good use to know.

<https://www.ida.org.in/Membership/Details/Practice-Management>

GOOD LUCK TO YOU ALL



DR. Jayantha Padmanabhan. MDS

“COMPUTERIZED CEPHOLOMETRIC SURGICAL PREDICTION IN ORTHOGNATHIC SURGERY WITH FACAD 2 D SOFTWARE ”

*Dr. Vijjaykanth.M. M.D.S **, *Dr. Jayanthi.M.D. M.D.S ***, *Dr. Selvarani .R M.D.S ***, *Dr. Usha Rao.G M.D.S.**

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ABSTRACT

Malocclusion can be due to dentoalveolar and or with involvement of facial skeletal components especially maxilla and mandible. Majority of the skeletal cases are attempted correction nonsurgically with Functional Jaw Orthopaedics , but these ideal treatment plan requires the patient to be seen by an orthodontist before pubertal growth spurt is over. In cases where this growth timing are missed there are option of treating the case with orthodontic camouflage or orthognathic surgery [OGS]. Severe skeletal malocclusions are best corrected with OGS with emphasis on soft tissue esthetics, occlusion and stability of the corrected result. OGS procedure involves many phases of treatment planning. It is beneficial both for the surgeon and the patient if the results could be predicted to the maximum extent possible. Manual cephalometric prediction are traditionally done which is usually cumbersome and has the downside as photographic prediction is not possible , hence at present computerized cephalometric prediction is preferred over manual prediction.

This paper deals with the usage of FACAD 2D- Cephalometric software which predicts the surgical outcome . The biggest advantage being the visualization of patients profile photo with the planned OGS procedure. This helps the surgeon to try different surgical treatment approach and select the best possible outcome. Patient are benefitted by visualizing their possible facial changes with the selected OGS surgery . This also helps the surgeon to communicate more efficiently with the patient and in-turn patient can decide in a better state of mind regarding the proposed surgery.

Key words : Facadcephalometric software, surgical prediction, orthognathic surgery .

Introduction :

Orthognathic surgery (O G S) is a major faciomaxillary surgical procedure which deals with the surgical correction of facial deformity especially jaw deformity. Orthognathic surgery involves repositioning of maxilla, mandible or chin in adult moderate to severe skeletal malocclusion cases which are difficult to treat by orthodontic camouflage. [1]

Team approach involving various specialists might be required for successful outcome of OGS procedure, in which the OMF surgeon and the orthodontist will play the key role. Many adult orthodontic patients have compromised periodontal status which complicates the treatment planning. Good periodontal health is the starting point for any advanced dental procedure. Pre orthodontic periodontal procedures

might be required in adult patients requiring OGS.

History of Orthognathic surgery :

Mandibular osteotomies :

1846 - HULLIHAN was the first to perform the Anterior Subapical Osteotomy and setback of anterior mandible which is considered to be the first orthognathic surgery.

1906- Blair of St.Louis who was closely associated with Edward Hartley Angle [Father of Modern Orthodontics] performed mandibular body osteotomy

1927 - Wassmund - inverted "L" ramus osteotomy

1939 - Kazanjian - extraoral approach in beveled horizontal osteotomy of the ramus.

1955 - Obwegeser - sagittal split osteotomy

1970 - Herbst , Kent and Hinds - Intr-oral vertical

ramus osteotomy.

Maxillary osteotomy :

1927 - Wassmund - Le fort I osteotomy with the intact pterygomaxillary junction , elastic forces were used to bring the maxilla forward.

1942 - schuchard - staged Lefort I osteotomy followed by pterygo - maxillary separation

1949 - Moore and ward - Horizontal transection of the pterygoid plate

1965 - Obwegeser - fully mobilized the maxilla

TREATMENT PLANNING SEQUENCE FOR OGS CASES :

As of routine orthodontic case, clinical examination is carried out with importance to facial macro, mini and microesthetics Thorough history and Psychological evaluation with reference to patients expectation of the surgical outcome is mandatory . In adult orthodontics an important question to be explored is, Why the patient has approached for treatment?and why now ?. The answer to these questions should be explored to know about patient's expectations towards the treatment outcome. Any unnatural expectation should be identified and clearly clarified with the patient to avoid any future misunderstanding with the patient.

David.M.Sarver and James L. Ackerman insists about the re-emergence of the esthetic paradigm, they have given three basic requirements for assessing dentofacial esthetics .[2]

1 A dynamic and static 3 - dimensional evaluation of the face

- 2 Lip tooth relationship and anterior tooth display at rest and during smile.
- 3 Analysis of dental and skeletal volume of the face influencing the soft tissue facial mask.

Envelope of Discrepancy: Proffit has given the envelope of discrepancy which is useful in determining the limitation of orthodontic treatment in skeletal malocclusion cases. [3] This schematic diagram gives the maximum possible tooth movement in all three planes of space ie: antero-posterior, vertical and transverse .This can be used as a reference guide in judging the maximum possible tooth movement with orthodontics, functional jaw orthopaedics and orthognathic surgical procedures respectively, which helps the clinician to some extent to decide between the orthodontic camouflage and OGS in moderate skeletal malocclusion cases.

Records :

OPG, facial photographs both extra oral and intra-oral, upper & lower models constitute the essential orthodontic records required for any orthodontic case. Lateral cephalogram is only supplemental record not required for routine simple orthodontic cases but very much needed in skeletal malocclusion cases for confirming the provisional diagnosis of skeletal malocclusion. In case of transverse skeletal discrepancy and facial asymmetry PA/ Frontal cephalogram and or CBCT will be required. Additional x-rays viz. RVG are required in case of thorough evaluation of individual tooth problems.

Most of the skeletal malocclusion cases have occlusal interferences with

functional shift which might require an anterior deprogrammer splint, followed by centric relation record. Proper mounting of the models with face bow record in a semi adjustable articulator is a mandatory step in majority of cases.

Functional shift is the deviation of the mandible during closure of jaw from postural rest position to maximum intercuspation. In cases like these, the static occlusion seen in the patients mouth is the deviated or altered occlusion and not the original malocclusion. If these are not recognized and properly recorded the entire treatment planning and treatment outcome will be compromised.

Usually OGS cases has three phases,

PHASE 1 : PRESURGICAL ORTHODONTICS

In most skeletal malocclusion, the severity are masked/reduced by appropriate movement of teeth. This natural phenomenon is called dento alveolar compensation .These dentoalveolar movements if done orthodontically is called camouflage treatment for skeletal malocclusion. For example in skeletal class II malocclusion with prognathic maxilla and/or retrognathic mandible the maxillary anteriors are upright and the mandibular anterior teeth are proclined so as to reduce the increased overjet. The opposite of this happens in skeletal class III with retrognathic maxilla and/or prognathic mandible .In these malocclusions upper anteriors are proclined and lower anteriors are retroclined so as to avoid the anterior cross bite and to have either positive or edge to edge bite relationship.

Conventional procedure is to

decompensate the dentoalveolar compensation by presurgical orthodontics [4]. The teeth in each jaw are aligned and arranged properly to its jaw base without considering the opposite jaw. It is even said to the extent that presurgical orthodontics should be performed in each jaw as though the upper and lower jaw belongs to two different individuals, but extreme importance should be given to transverse arch coordination of upper and lower arch. Proper explanation of this phase to the patient is important as facial esthetics usually worsen due to dentoalveolar decompensation .In general all intrusion mechanics are performed presurgically and all extrusion mechanics can be done post surgically.

PHASE II : SURGICAL PHASE

Cephalometric surgical prediction to determine the type of surgery and whether uni-jaw or bi-jaw surgery are planned.Face bow transfer and mounting of models in centric relation. If the arc of mandibular rotation is not going to be changed with the planned surgery,then simple three point articulation is sufficient. Face bow Mounting with semi-adjustable articulators is mandatory in all Lefort - I maxillary superior or inferior repositioning surgeries as it has implication in arc of mandibular rotation which is termed as auto-rotation. After mounting ,model surgery and surgical splint fabrication is done. This phase is followed by orthognathic surgery and a phase of consolidation for about 4 to 6 weeks.

PHASE III : POST SURGICAL ORTHODONTICS:

Typically postsurgical orthodontics is started in about 4 to 6 weeks and if proper

presurgical planning and orthodontics is done postsurgical orthodontics should not take more than 6 to 8 months. This phase consists of maintenance of achieved skeletal correction and settling of occlusion by using finishing arch wires / intraoral elastics.



SFOA : Surgery first Orthognathic approach : There is also an approach of doing orthognathic surgery first without presurgical orthodontics wherein post surgical orthodontics alone is done. This is patient friendly approach as the facial esthetic correction is immediately achieved by surgical correction, as it is usually the patients major concern. There is a limited indication for this approach [5] . Moderate cases with acceptable soft tissue esthetics and without major functional shift of mandible are indicated. Severe skeletal cases with transverse skeletal discrepancy are usually avoided. The essence of case selection for this technique is basically the teeth position of the presurgical malocclusion should not hinder proper surgical movement of the jaw bases by the OMF surgeon.

Surgical treatment planning requires a good understanding between the OMF surgeon and the orthodontist. Both should

be able to discuss the possibility and limitation of their speciality so that a best possible treatment outcome is given to the patient. The OMF surgeon and the orthodontist should have a general consenses regarding orthodontic extraction, presurgical orthodontic timing , required dentoalveolar decompensation(whether it's a bi-jaw or uni-jaw surgery), type of surgical procedures and post surgical orthodontics , so that these aspects can be clearly explained to the patient and a personalized treatment algorithm can be established prior to starting the treatment.

CEPHALOMETRIC SURGICAL PREDICTION :

This procedure is very useful to determine the required surgery and its possible outcome. Accuracy of the prediction depends on the experience of the operator, quality of records, method adopted. Manual prediction requires multiple cephalometric tracings simulating the jaw movements. This is usually done during the second phase of treatment along with the model surgery. The disadvantage of this method are time consuming ,cumbersome and totally dependent on the skill of the orthodontist. Another major disadvantage is the soft tissue prediction, where the visualization of the soft tissue surgical outcome is difficult .

Procedure involved in manual prediction :

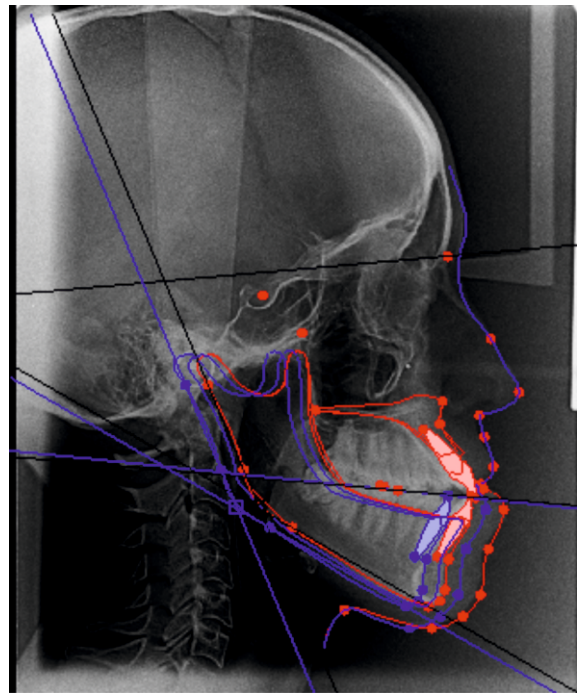
First routine cephalometric tracing is done in a lateral cephalogram taken after presurgical orthodontics. Usually COGS - cephalometric analysis for orthognathic surgen given by Charles Burstone is used [6] .This has a separate value for males and

females. There are usually differences in values for skeletal proportions between Caucasian population and Indian population due to different body build and stature. To overcome this ethnic and racial variation there are studies undertaken in Indian population and appropriate values based on our population sample are available. It is better to have these as reference values to have better compatability. Generally Caucasian values especially the linear cephalometric values are higher when compared to our population [7] . Next phase involves tracing of maxilla and mandible separately with a common reference plane to the previous tracing.

Appropriate surgical cuts are simulated in this and the proposed jaw surgery is mimicked by moving the part of the tracing of the proposed surgical jaw .once the required movement is achieved an overlay tracing is done by placing a new tracing sheet and the proposed new position is traced in the overlay sheet. Appropriate soft tissue movement are also simulated to predict the desired result.

COMPUTERIZED CEPHALOMETRIC PREDICTION (FACAD 2D SOFTWARE):

Various software are available both in 2 D and 3 D. Regular lateral cephalogram is adequate for a 2D prediction whereas special facial CBCT is required for 3 D prediction. The advantage of 3 D prediction is both the sagittal and the frontal predicted changes can be visualized unlike in 2 D where only sagittal changes can be predicted and visualized. The downside of 3 D software is they are more expensive when compared to the 2 D software. FACAD is a 2 D



software from Sweden [8]. Certain studies have showed minor differences in the measurement in few parameters between digital and manual cephalometric tracing [9].

Method for 2 D Cephalometric Surgical Prediction :

Lateral cephalogram and profile photo of the patient is first uploaded in the software after creating appropriate patient ID.

Image calibration : Lateral cephalogram need to be calibrated for proper measurement. Either a standard calibration or customized calibration is done. If the x-ray is taken from a known source the magnification given by the manufacturer can be taken as reference . If this is not possible there are two methods available. Many machines has got metallic inbuilt ruler ,so in the x-ray image these are visible which can be used for the calibration. In the second method two known anatomic landmarks are connected to obtain a linear cephalometric measurement which can be extrapolated in

the software for proper calibration.

Following the calibration of the xray the required cephalometric analysis is selected from the software (usually COGS by Burstone) . Many analysis are already preloaded , and it's the operators choice to choose depending on the need. Anatomic landmarks are identified and marked in the x-ray. The cephalometric points are accurately and automatically selected one by one if calibration is proper. If the selected landmark is not satisfactory then the operator has the choice of editing and changing the selected landmark to the desired location. Once all the landmarks are marked , the software automatically gives the measured values on the left side table. Values in normal range are coloured black where as values marked in red and blue are in the higher and lower range respectively. Next the profile photo should be attached to the ceph and both should be matched . Matching of the lateral cephalogram and profile photo is important as it is the prerequisite for the predicted outcome in the patient photographic image. Following this the outline of maxilla and mandible is drawn in the xray ,then the required anatomic structure is selected and by using the direction keys the structure is moved in any direction superior ,inferior , anterior or posterior mimicking the surgery. Left side tab will depict the values in mm in the moved direction. Once the desired movement is made,then the predicted profile photo is displayed as per the selected movements. In general in 2D software like FACAD , the antero-posterior movement prediction results are good when compared to the vertical surgical predictions. The major advantage in computerized prediction

is visualizing the patients profile photo after the planned surgical movement in the x-ray. If the predicted outcome is not satisfactory either the skeletal movements can be altered or totally a different surgical approach can be considered. This is the major advantage in computerized cephalometric prediction.

The profile photo and the predicted surgical profile photo can be arranged side to side and compared, the photos along with the cephalometric values and tracing can be exported.

A word of caution to be discussed with the patient regarding the surgical software prediction and the surgical outcome is that it might be similar but not the same. The prediction is only to give an overall view of the planned surgical procedure. In our experience the prediction has been very useful and the surgical outcome has closely matched with our prediction.

Never the less it is our opinion not to share these computerized surgical predicted records/predicted photos with the patient for avoiding any medico-legal complications or a comprehensive consent should be obtained explaining the limitation of the prediction software.

Conclusion :

There are many advantages in using computerized cephalometric surgical prediction. To highlight few are

1. Many cephalometric analysis can be done with ease and speed as the cephalometric values are calculated and given automatically by the software
2. Predicted surgical movement can be visualized in the profile photo.

- Both profile photo and surgical photo can be placed side to side for comparison and to communicate with the patient.
- Easy maintenance and communication with digital records.
The cephalometric values, cephalometric tracings, predicted surgical profile photo all can be digitally maintained and exported via mail.
- Simultaneously many surgery can be planned and the predicted outcome can be assessed immediately which makes the selection of surgical procedure and in which jaw to be simpler for both the OMF surgeon and the orthodontist.
- Patients are better convinced by seeing the predicted simulated surgical outcome in their profile photo.

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INTERNALLY WEIGHTED MANDIBULAR DENTURE FOR THE MANAGEMENT OF ATROPHIC MANDIBULAR RIDGE – A CASE REPORT

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ABSTRACT

Prosthodontic Rehabilitation of severely resorbed mandibular foundation using complete denture prosthesis pose a great challenge. Retention, stability and support of the complete denture prosthesis is affected by the extreme residual ridge resorption. There are various treatment options for the management of atrophic mandibular ridge. The concept of internally weighted denture suggested that gravity and the additional weight added to the mandibular complete denture aids in retention of the prosthesis. This article reports a case of atrophied mandibular ridge for which an internally weighted mandibular complete denture was fabricated with a customized weighted metal framework.

Keywords: Atrophic mandibular ridge, internally weighted mandibular denture, retention, reinforcement.

Introduction :

Most mandibular dentures weigh less than half as much as the supporting tissues and teeth which has been lost. The reduction of the weight might contribute to the reduction in normal vertical dimension at rest and improper muscle function.. This is considered to be an important factor in the adequate extension and retention of the mandibular dentures, especially atrophied residual ridges. The use of cast lower denture base and adequate extension of the denture base overcomes these deficiencies¹.

Metal framework and cast metal base had been used for reinforcing the mandibular denture base in the management of resorbed residual ridges. They improve the dimensional stability, fracture resistance, weight, accuracy and retention of the mandibular denture bases.

Use of gold framework

for the compensation of the weight lost after extraction and severe resorption in mandibular arch ridges was first introduced by Grunewald¹. Belfiglio² advocated the use of metal bases for reinforcing the complete dentures in conditions where an increase in strength is needed or a higher degree of dimensional change is expected during the denture processing. Use of chrome-cobalt alloy as a retentive denture base material for the maxillary complete dentures was described by DeFurio and Gehl³.

The metal base dentures helps in the reinforcement of the prosthesis, but they often irritate the underlying residual alveolar ridge and the adjustments post-delivery in the tissue surface of the prosthesis were difficult⁴. Various authors have described different techniques to position and fabricate the metal denture

bases during the processing to overcome these disadvantages. Wormley and Brunton⁵ described a technique by molding softened sticks of wax into a triangular cross-section shape directly over the definitive cast to fabricate a metal bar. Hurtado⁶, suggested a technique in which 4 cast metal tissue stops were used for the fabrication of metal bases. Kim et al⁷ described a method in which a plaster index of the preliminary tooth arrangement and processed denture base were used. The most recent technique described by Balch et al⁴ advocated the usage of vertical posts extending from the framework into the definitive cast to maintain the space beneath the framework during denture processing with acrylic resin.

Internally weighted mandibular denture fabrication requires accurate impressions, additional laboratory procedures and also the cost of the prosthesis increases. This article describes a case report wherein an internally weighted mandibular complete denture was fabricated with customized design and position of the metal base for an optimal esthetic and functional outcome and also allowed for conventional relined procedures.

CASE REPORT:

A 53 year old female reported to the Department of Prosthodontics, CSICDSR, Madurai with a chief complaint of missing teeth in upper and lower arches. History revealed that she was a complete denture wearer for the past 5 years and had her mandibular complete denture prosthesis fractured recently. Intraoral examination revealed completely edentulous maxillary and mandibular arches. Mandibular arch was atrophied severely in the anterior region than the posterior region (Figure :1). The patient wanted a denture with high strength.

Implant supported prosthesis was suggested for the patient. But, as the patient was not willing for the surgical interventions internally weighted complete denture was planned for mandibular arch and a conventional complete denture prosthesis in maxillary arch.

Maxillary and mandibular arch primary impressions were made with impression compound (Aslate, Asian Acrylates, Mumbai) in the stock trays (Figure: 2 a) and the primary casts were fabricated. Custom tray was fabricated and sectional border molding was done using greenstick compound (DPI Pinnacle, Mumbai) and the secondary impression was made using monophase (addition silicone impression material (DMG Honigum ,Germany) in the maxillary arch (Figure: 2 b). As the mandibular arch was atrophied, close fitting tray was fabricated and sectional border molding was done using green stick compound (DPI Pinnacle, Mumbai) followed by the secondary wash impression with light body addition silicone material (DMG Honigum , Germany) (Figure: 2 b). The master casts were fabricated using dental stone (Asian chemicals, Gujarat).

In the mandibular master cast modelling wax was adapted over the crest of the residual ridge to provide relief (Figure: 3 a). The mandibular cast was duplicated using reversible hydrocolloid, agar and the refractory cast was fabricated .Wax pattern was adapted over the crest of the ridge not extending to the sulcus depth and the sprue was attached to the wax pattern with tissue stops for aiding in the positioning of the metal frame work during processing (Figure: 3 b). Conventional casting procedure was done following which metal framework was finished and polished (Figure: 3 c). Metal frame work trial was done intraorally (Figure:

3 d). Following which the occlusal rim was fabricated over the metal framework in the mandibular arch using modelling wax. Tentative jaw relation was recorded and facebow transfer was done (Figure: 4 a). The casts were mounted in semi-adjustable articulator (Figure: 4 b). Teeth arrangement was done and try-in verification of jaw relation was done (Figure: 4 c). Followed by which processing of the denture was done in the conventional manner. Care was taken in positioning the metal framework in the correct position. The metal framework was sandwiched between the heat cure acrylic resin layers (external and internal) (DPI, Mumbai). The denture was trimmed and polished (Figure: 5 a & b). The prosthesis was inserted (Figure: 5 c & d).

DISCUSSION

Severe residual ridge resorption of the mandibular arch requires the construction of a denture which is strong, functional and stable. These requirements can be fulfilled by a denture reinforced with a metal framework. The inherent strength of the internally weighted mandibular denture prevents fracture and meets patient's special needs.

The fact that the fracture of mandibular complete denture decreased following the internal metal reinforcement and as long as adequate bulk of acrylic resin was present was demonstrated in a study¹⁰. The internally suspended framework is also indicated when edentulous ridge contours are irregular or significantly compromised, because all denture base adjustments remain in acrylic resin rather than metal. The major disadvantage is the added expense of the prosthesis for the patient⁴.

CONCLUSION

An optimal treatment alternative for the cases of atrophic mandibular ridge is the use of customized metal framework well adapted to

the ridge and also aiding in the reinforcement of the prosthesis which resists fracture of the prosthesis. The fabrication technique described in this article helps in achieving appropriate contour of the denture base with minimal metal display.

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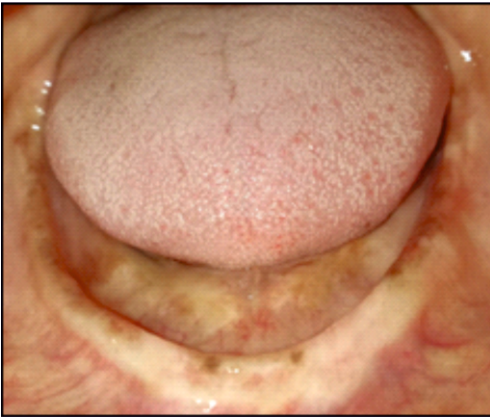


Figure : 1: Intra oral view

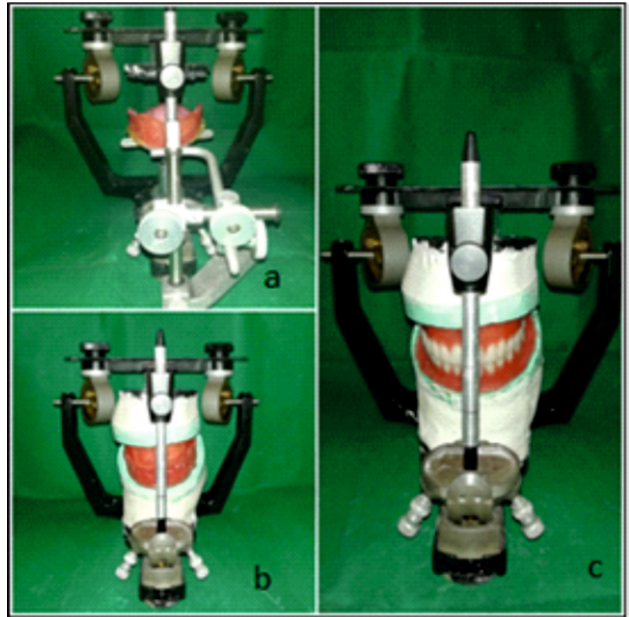


Figure 4a : Face bow transfer
4b : Mounted in semi-adjustable articulator
4c : Try-in verification of jaw relation



Figure : 2a : Primary impressions
2b : Secondary impressions



Figure 5 a: Intaligo surface of the prosthesis
5 b: Cameo surface of the prosthesis
5 c & d: Post-insertion intraoral & extraoral view.



Figure 3a : Relief wax adapted over master cast
3b : Wax pattern and sprue attached
3c : Metal framework in the master cast
3d : Framework trial done intraorally

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IVF- A PRELUDE TO GINGIVAL ENLARGMENT ?

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ABSTRACT

Gingival hyperplasia or Gingival enlargement is a typical increase in the number of healthy cells in normal arrangement in a tissue. Gingival hyperplasia can be a result of unusual tissue response to the inflammation caused by local irritants, such as plaque, calculus, systemic disturbances such as hormonal changes or medications. A 35-year-old female patient reported to the outpatient department of Periodontology & Oral Implantology, Madha Dental College & Hospital, with a chief complaint of swelling in gums which has gradually increased in size with progressive increase in bleeding while brushing and discomfort. Medical history revealed that she was undergoing treatment for infertility for the past 1 year. A diagnosis of drug-influenced gingival enlargement and chronic periodontitis was given. Thorough scaling and root planing were carried out in multiple sittings. The patient showed a remarkable improvement within a month and at the 6th-month follow-up visits. Even though we expected the need for gingivectomy/gingivoplasty procedure, we observed that the enlargement regressed completely obviating the need for future management.

Introduction

Gingival enlargement is defined as an abnormal growth of gingival tissue. Other terminology for the condition is gingival overgrowth, gingival hyperplasia and hypertrophic gingivitis¹. The etiology of gingival enlargement is poorly understood but can be attributed to factors like plaque accumulation, systemic hormonal stimulation, blood dyscrasias, drugs or idiopathic².

In vitro fertilization popularly referred to as IVF has captured the attention of the public since its sensational introduction in 1978. Today, assisted reproductive technology is available throughout most of the civilized world and the practice is largely different from that used during the early days³. The variation in the level of female sex hormones estrogen and progesterone are responsible for various physiological changes in females at specific phases of their life. The main sex hormone exerting influence on

the periodontium are estrogen and progesterone. Estrogen is mainly responsible for alteration in blood vessels and progesterone stimulates the production of inflammatory mediators. In women during puberty, pregnancy and ovulation, there is an increase in the production of sex steroid hormones which results in increased gingival inflammation, characterized by gingival enlargement, increased gingival bleeding and crevicular fluid⁴.

Effects of Estrogen on the periodontal tissue^{5,6,7}

- Increase cellular proliferation in blood vessels.
 - Stimulates the proliferation of the gingival fibroblast.
 - Increase the amount of gingival inflammation with no increase of plaque
- Effects of progesterone on the periodontal tissue^{8,9},
- Increase vascular dilatation, thus increasing permeability.
 - Increase the production of prostaglandin
 - Inhibits proliferation of

human gingival fibroblast proliferation.

CASE REPORT

A 35 year old female patient reported to the outpatient department of Periodontology & Oral Implantology, Madha Dental College & Hospital Chennai, with a chief complaint of swollen gums gradually increase size since past 6 months with progressive increase in bleeding while brushing and discomfort. Medical history revealed that she was undergoing IVF treatment for infertility for past one year.

Intra oral examination revealed generalized reddish inflamed gingiva and gingival enlargement covering roughly 1/3rd of the teeth in both upper and lower arches. (Figs: 1&2). Periodontal probing revealed that there were moderate pockets (true + pseudo) with bleeding on probing. Taking in to account the fact that the degree of enlargement observed was not commensurate with the amount of local factors, diagnosis of drug influenced gingival enlargement superimposed on chronic periodontitis was given, the drugs being the hormonal therapy the patient was receiving. Patient was advised for complete blood count which was found to be normal except the ESR, which was at 45. OPG revealed mild-moderate generalized horizontal bone loss interdental.



Fig:2 Pre-op

TREATMENT DONE:

After due clearance from the patient's gynecologist, periodontal treatment was instituted which included thorough supra and sub gingival scaling which was done in two settings considering the amount of inflammation. Patient was asked to rinse with 0.2% chlorhexidine® mouth wash twice a day for 1 minute and to apply gum astringent (Stolin® gum paint) twice a day followed by warm saline rinses and to maintain strict oral hygiene.

Patient was recalled after 2 weeks where considerable improvement in gingival consistency was noted (Figs:3&4). During this visit thorough root surface debridement (Root planing) was done with Gracey and Universal Curettes (Hu Friedy®) and irrigation was done with normal saline. Patient was again asked to maintain strict oral hygiene. Even though we expected the gingival enlargement to reduce considerably, necessitating the need for gingivectomy/ gingivoplasty procedure, it was observed that the enlargement regressed completely obviating the need for any respective management. The patient was recalled after 2 months where in there was no sign of gingival enlargement and oral hygiene was found to be satisfactory. The pocket depth had reduced to satisfactory levels, leaving a



Fig:1 Pre-op

reduced, but healthy periodontium (Figs:5,6,&7)



DISCUSSION

In our study we observed that gingival enlargement was in-commensurate with the local factors leading to a diagnosis of drug influenced gingival enlargement. This was in agreement with studies conducted by Pavlatou et al¹⁰, who concluded that periodontal clinical parameters worsened in women undergoing IVF treatment. Conversely they also studied the preexisting periodontal status and found that poor status appeared to be associated with poorer outcomes of IVF treatment. Lalasa et al¹¹ also reported that infertility treatment exacerbates the gingival inflammation and periodontal disease process by reporting significantly higher gingival

inflammation and sulcus bleeding index (SBI) in IVF-treated women when compared to untreated women. According to Lapp A et al¹² and Gordon M et al¹³, progesterone has been shown to down regulate IL-6 production by human gingival fibroblast to 50% of that of control values. Similarly Miyangi M et al¹⁴ has concluded that progesterone has also been found to enhance the chemotaxis of Polymoneuclear leukocytes, while low concentration of estradiol have been demonstrated to reduce Polymorphonuclear leukocytes Chemotaxis. The production of sex hormones (estrogen and progesterone) increase to a level that remains relatively constant throughout the normal female reproductive phase. Jonsson¹⁵ in this study concluded that human PDL cells possessed immune reactivity for estrogen receptors more specifically estrogenic effects in PDL cells are mediated via estrogen receptors beta (ER beta), whereas no immune reactivity was expressed in these cells for progesterone receptors, which implies that progesterone does not have a direct effect on PDL cell function. Haytac et al.¹⁶ demonstrated in their study that effect of combining gonadotropin injection therapy with other ovulation therapy is strongly associated with gingival inflammation.

CONCLUSION

Patients with gingival enlargement should be carefully examined and a thorough case history must be taken to arrive at an accurate diagnosis. Female sex hormones influence the gingival response to plaque to a great extent. Gingival inflammation is exacerbated during puberty, pregnancy, menopause and during any hormonal therapies the female patient may be undergoing. The present case highlights the need to spread awareness both among dental and medical community so that the patients undergoing hormonal therapies may be educated regarding maintenance of meticulous oral hygiene in order to prevent any

deleterious periodontal manifestations.

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ORTHODONTIC CONSIDERATIONS IN PATIENTS WITH ASTHMA

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ABSTRACT

Asthma is a leading cause of chronic illness in childhood. Advances in the treatment of medical conditions have resulted in long-term disease-free survival. Consequently, many of these patients are now seeking orthodontic therapy. Understanding the condition and planning the treatment is necessary to perform successful completion of orthodontic therapy. This article will discuss Asthma, its effect on orthodontic treatment and the recommended methods to avoid the potential problems that may arise.

Keywords: Guidelines, interdisciplinary management, Asthma, orthodontic considerations, orthodontic treatment

INTRODUCTION

Respiratory disorders are common among patients. Understanding the condition and planning the treatment is necessary to perform successful completion of orthodontic therapy. The use of intravenous (IV) sedation and general anesthesia (GA) for elective procedures may be contraindicated for asthmatic patients. Drugs can also induce adverse effects in orthodontic treatment among these patients. Respiratory diseases are of two types- Upper airway diseases like adenotonsillar hypertrophy, pharyngitis, tonsillitis and Lower airway diseases like Asthma. Asthma is a diffuse chronic inflammatory obstructive lung disease with episodes of chest tightness that causes breathlessness, coughing,

and wheezing all of which are related to bronchiole inflammation¹¹. It is associated with hyper reactivity of the airways to a variety of stimuli and a high degree of reversibility of the obstructive process. Pediatric asthma is also common. Asthma is a leading cause of chronic illness in childhood. The strongest identified risk factor for the development of asthma is atopy, an inherited tendency to exhibit allergic reactions. Acute episodes of coughing and wheezing are often precipitated by exposure to allergens and irritants, such as cold air or noxious fumes and emotional stress. Asthma is of Intrinsic and Extrinsic types. Intrinsic is non-atopic, originally thought to be non-IgE mediated, may be due to local production of IgE with in

airways. The trigger is unknown but it is assumed to develop from seasonal allergy, may be due to imbalance of physiological control of smooth muscle tone. Extrinsic type develop due to hereditary factors, prenatal effects like high cord blood IgE levels, prenatal exposure to allergens, postnatal factors like high IgE serum level, early exposure to dietary factors like eggs, wheat and bovine products and low serum IgA level at 3 months of age.

ORAL HEALTH CONDITIONS IN ASTHMA:

Anti-asthmatic drugs-induced xerostomia increases the risk for caries development in patients with asthma. Chronic use of inhalers, especially those containing steroids, may result in a predilection for the development of oral candidiasis. The use of nebulized corticosteroids can result in throat irritation, dysphonia and dryness of mouth and rarely, tongue enlargement. In an asthmatic patient, the common habits like mouth breathing and immunological factors can cause gingival inflammation. The maintenance of oral hygiene is strongly recommended for these patients. Fluoride supplements should be instituted for all asthmatics, particular those taking 2 agonists. The patient should be instructed to rinse his or her mouth with water each time after using inhalers. Oral hygiene maintenance methods should be reinforced to reduce the incidence of periodontal diseases. If noted, candidiasis can be treated with topical antifungal agents such as nystatin.

External root resorption and asthma: Alveolar bone resorption is a basic mechanism in orthodontic tooth movement. However, the development of excessive root resorption during orthodontic treatment is considered an adverse side effect of the mechanical force induced movement of teeth. Inflammation is an integral part of the tissue response to orthodontic force. In this process, immune cells migrate out of the capillaries in the periodontal ligament (PDL) and interact with locally residing cells by elaborating a large array of signal molecules. The presence of primed leucocytes in the peripheral blood, which originate in diseased organs such as lungs and joints, supports the notion of a possible association between excessive orthodontic root resorption and pathological conditions that affect or involve the immune system.

There has been a tentative link between orthodontic therapy induced external root resorption and patients with asthma.¹⁰ This increased prevalence of resorption was confined to mild root blunting and the researchers concluded that longevity or function of posterior teeth would not be adversely affected. The patients must be informed of this risk prior to treatment. Davidovitch⁴ et al hypothesized those individuals who have medical conditions that affect the immune system may be at a high level of risk for developing excessive root resorption during the course of orthodontic treatment.

In reviewing orthodontic patient records at the University of Oklahoma, they discovered that the incidence of asthma, allergies, and signs indicative of psychological stress were significantly higher in patients who had experienced excessive root resorption during orthodontic treatment as compared with the group of orthodontic patients who had completed their course of treatment without suffering this unfortunate outcome.

McNab¹⁰ et al reported that the incidence of external apical root resorption was elevated in an asthma group. However, both asthmatics and healthy patients exhibited similar amounts of moderate and severe resorption. Moreover, in healthy patients, the incidence of external apical root resorption was 2.30 times higher for Begg appliances compared with edgewise, and it was 3.72 times higher for patients for whom extractions were performed compared with those for whom no extractions were performed.

External apical root resorption is undesirable sequelae of orthodontic treatment resulting in loss of tooth structure from the root apex. It has been proposed that factors, such as the inflammatory mediators produced in asthma, may enter the periodontal ligament and act synergistically to enhance root resorption. Eosinophils are bone-marrow-derived granulocytes that are involved in both allergic and non-allergic inflammation. Eosinophils release

preformed cytotoxic granule proteins and produce superoxide and cytokines. Each of these functional capabilities is linked to the production of tissue damage and physiologic derangements that are characteristic of human diseases associated with eosinophil-dominated inflammation, such as asthma. McNab and colleagues¹⁰ compared the incidence and severity of external root resorption following fixed orthodontic therapy among patients with and without asthma. It was found that while the incidence of external apical root resorption was more in the asthmatic population, the severity of resorption was the same between groups. Using a cellular biology approach, Davidovitch⁴ et al questioned whether mediators generated outside of the PDL influenced cellular interactions involved in root resorption, by attracting and/or activating cementoclast (osteoclast) progenitors. Conditions that were implicated in contributing to the production of such mediators were gingivitis, asthma, and alcoholism. Davidovitch⁴ et al induced allergic asthma in guinea pigs and applied an orthodontic force against the maxillary molars. Although root resorption was not observed among these cementum free and continuously erupting teeth, the number of alveolar bone osteoclasts in areas of compressed PDL increased over the controls, suggesting that chemical mediators produced in the asthmatic state may influence cell populations and

subsequently the resorption process . Among the elderly population, resorption of the mandibular canal wall is more prevalent in subjects with asthma, and these patients are in the high-risk group for severe resorption of the residual mandibular ridge after tooth loss. The increased incidence of EARR for the upper first molars in asthmatics may result from local sinus inflammation, which itself is the result of a systemic inflammatory condition. Masato Nishioka⁹ et al did a study to determine the association between excessive root resorption and immune system factors in a sample of Japanese orthodontic patients. They found that the incidence of asthma tended to be higher in the root resorption group. From the results, it was concluded that allergy, root morphology abnormality, and asthma may be high risk factors for the development of excessive root resorption during orthodontic tooth movement in Japanese patients.

Inflammation is an integral part of tissue response to orthodontic force in the early stage of tooth movement. In this process, immune cells migrate out of the capillaries into the periodontal ligament and interact with locally residing cells by elaborating a large array of signal molecules. The presence of primed leucocytes in the peripheral blood which originate in diseased organs supports the possible association between root resorption and pathologic conditions, including allergic conditions and asthma, which involve the immune system⁶.

Root resorption index according to Levander⁸, 1999

1. Irregular root contour
2. Root resorption apically, less than 2mm (Minor)
3. Root resorption apically, from 2mm- 1/3 of the root's length (Severe)
4. Root resorption exceeding 1/3 of the root's original length (Extreme)

ORTHODONTIC CONSIDERATIONS IN MANAGEMENT OF ASTHMATIC PATIENTS

Since asthma cases are common, it is probable that the orthodontist may encounter patients with this condition frequently. As the primary management consideration, patients at risk needs to be identified to prevent an episode of attack. The medical history should include specific query for the condition. Among patients who are aware of the severity of the disease, medications they use to take and factors that precipitate an attack is crucial. Communication with the patient's physician can also help in risk assessment³. Orthodontic treatment should probably be deferred in patients who report symptomatic disease. For patients at low or moderate risk, since anxiety and stress are often associated with acute attacks, morning appointments can be scheduled. Treatments can be provided with short waiting times, and visits of limited duration are most desirable. The orthodontist should make sure that the

patient has had their medication and, if possible, have their inhaler with them if in case needed during the appointment. Patients with asthma may be sensitive to several specific medications including the erythromycins, aspirin, antihistamines, and local anesthesia containing epinephrine. Management in orthodontic care can be divided into three stages- before orthodontic treatment, during treatment and after treatment.

Before treatment

- When an asthmatic dental patient seeks care, the clinician must assess his or her risk level by taking an oral history of the illness: ascertaining the frequency and severity of acute episodes, reviewing the patient's medications thoroughly (as they provide an indication of disease severity) and determining the patient's specific triggering agents. Preventing a sudden episode of airway obstruction is essential when treating an asthmatic patient⁷.
- As a general rule, elective orthodontics should be performed only on asthmatic patients who are asymptomatic or whose symptoms are well controlled. To minimize the risk of an attack, the patient's appointment should be in the late morning or the late afternoon.
- Orthodontist needs to be aware of the potential for dental materials and products to exacerbate asthma¹. These items include dentifrices, fissure sealants, tooth enamel dust (during interproximal slicing)

and methyl methacrylate. Therefore fixed appliances and bonded retainers without acrylic are preferable.

- Anxiety is a known 'asthma trigger'. For most patients, asking for a simple confirmation that they have taken their most recent scheduled dose of medication can prevent stress. Oxygen and bronchodilator should be available during treatment.
- Before sending patient to any invasive work to another specialist, he should be informed about the medical history. Dental local anesthetics with vasoconstrictors should be used with caution in asthmatic patients, as many vasoconstrictors contain sodium metabisulfite, a preservative that is highly allergenic².

During treatment

- It has been found that improper positioning of suction tips, fluoride trays or cotton rolls could trigger a hyperactive airway response in sensitive subjects' Eliciting a coughing reflex should be avoided.
- Prolonged supine positioning, bacteria-laden aerosols from plaque or carious lesions and ultrasonically nebulized water can provoke asthma triggers in the dental setting⁵.
- In case of acute attack following steps should be taken.
- Discontinue the procedure and allow the patient to assume a comfortable position.

- Maintain a patent airway and administer bronchodilator via inhaler/nebulizer.
- Administer oxygen via face-mask.
- Alert emergency medical services. Maintain a good oxygen level until the patient stops wheezing and/or medical assistance arrives.
- Owing to chances of allergy, offending NSAIDs include ketorolac, ibuprofen and naproxen sodium should be avoided after banding and bonding. Analgesic of choice is acetaminophen.

Guidelines for emergency:

During an acute asthmatic attack, discontinue the dental procedure, remove all intraoral devices, place the patient in a comfortable position, make is opened, and administer a 2-agonist and oxygen. If no improvement is noted, administer epinephrine (1:1,000 concentrations, 0.01 mg/ kg body weight, up to a maximum of 0.3 mg) and alert emergency medical assistance.

After treatment

- The maintenance of oral hygiene is strongly recommended.
- Fluoride supplements should be administered.
- The patient should be instructed to rinse mouth with water each time after using inhalers.
- Oral hygiene maintenance methods should be reinforced.

CONCLUSION

Asthma, the lower respiratory airway disease is common among patients who seek orthodontic care. Anti-asthmatic drugs-induced xerostomia, oral candidiasis, gingival inflammation and root resorption are oral pathologies usually present among asthmatic patients. Thorough medical history and triggering agents should be known by the orthodontist. Morning appointments, short waiting time, lesser duration of treatment time and proper positioning while providing dental care are all factors that can make management of asthmatic patients easier. The maintenance of oral hygiene is also necessary among them. Orthodontist should also be aware of the emergency management measures. Understanding the disease condition and providing dental care accordingly is a necessary requisition to perform successful completion of orthodontic therapy.

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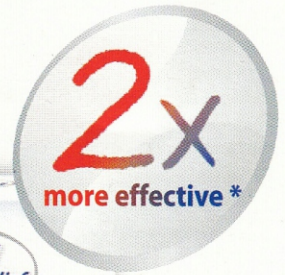
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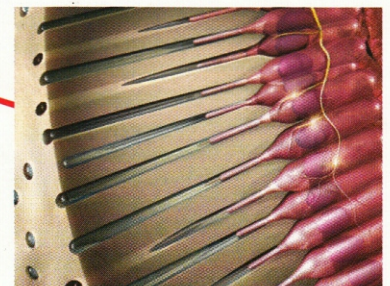
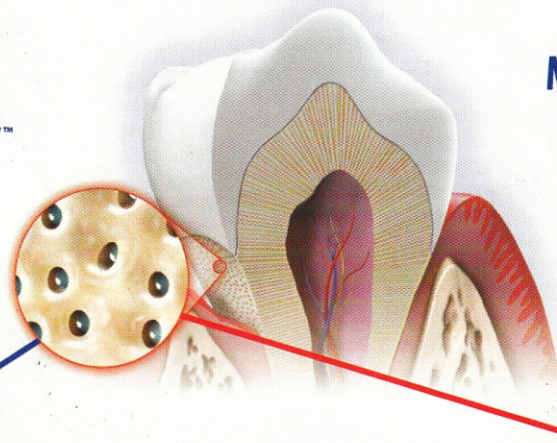
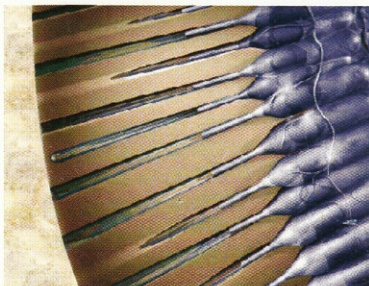
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