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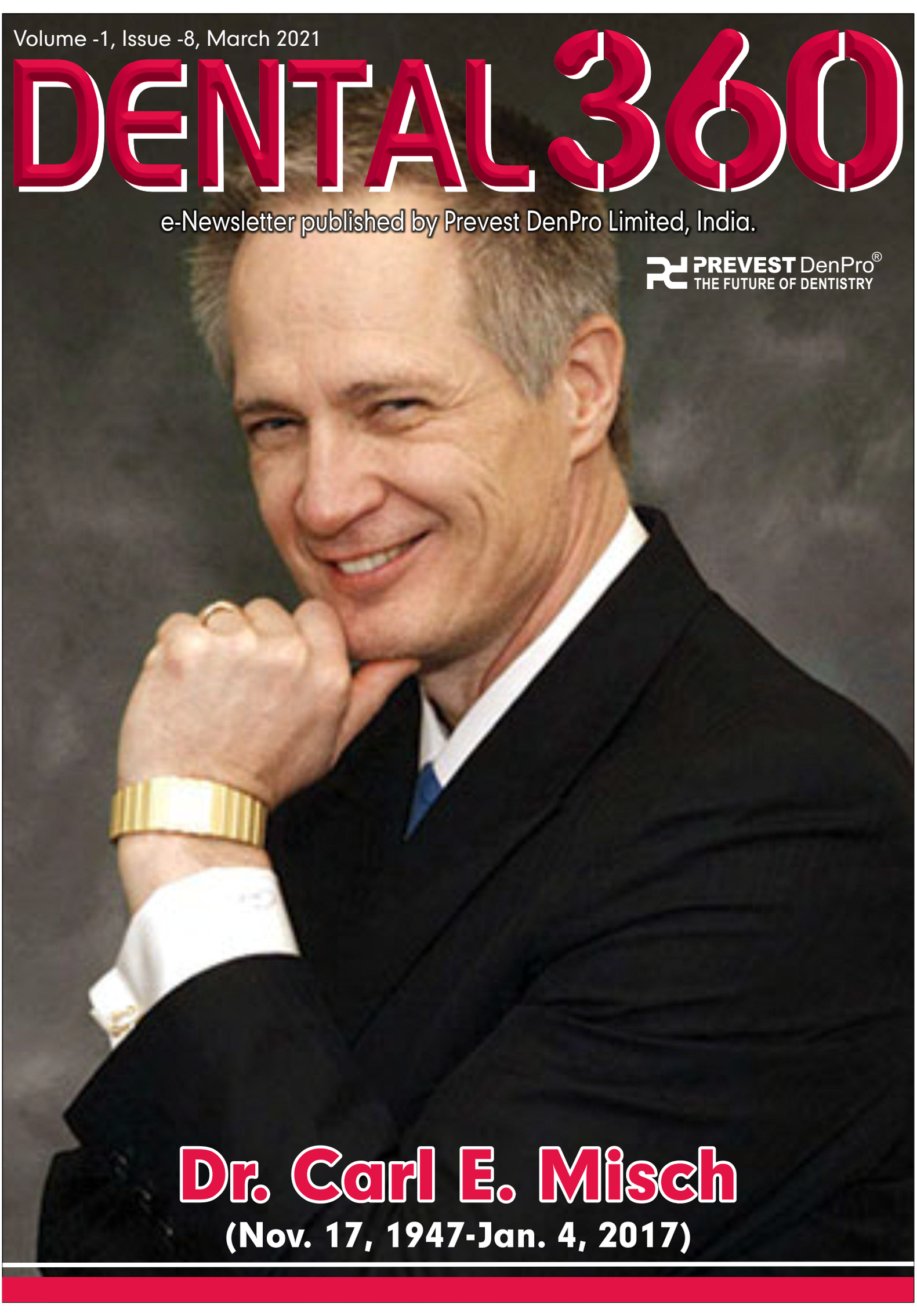
THE FUTURE OF DENTISTRY



Dr. Carl E. Misch

(Nov. 17, 1947-Jan. 4, 2017)

EDITORIAL

Tackling the second wave : The Way Ahead

The pandemic derailed India in the first quarter of 2020. The event exposed India's vulnerability and lack of preparedness for tackling pandemics. Government's commitment, the strict containment actions and development of healthcare infrastructure, resulted in effective control of the virus transmission.

The relaxation of the lockdown norms and the influx of tourists created a spike in the recent times. The detection of newer variants of the SARS-CoV2, futher worsened the issue. The new variants have been found to be more virulent than the earlier version and caused a steep spike in the number of cases, especially in Maharashtra, Punjab, Kerala, Tamilnadu and Karnataka. The festival season and attitude of the general public towards safety norms has indirectly contributed to the sudden raise in the number of cases. The vaccination drive has also rendered a false sense of security among the general public. The vaccinated individuals have to be sensitized & educated on the necessity of using masks and sanitizers during this period .

Monitoring of the senior citizens and people with co-morbidities should be given prime priority. The health and progress of these individuals must be monitored at regular intervals using remote monitoring technologies. Telemedicine must be used as a connecting tool to help people in far-flung areas. Awareness campaigns explaining the importance of using sanitizers and masks should be done at regular intervals to sensitize the people on personal protection.

Social gatherings, malls, theatres and restaurants should be avoided till the curve flattens out. Government initiatives alone cannot control the present spike. The citizens should take up the responsibility and adhere to the strict protocols and thereby prevent the need for yet another lockdown. Vaccination drives should be intensified so that we can control the spike in a shorter period . The citizens, health workers, medical professionals and the government should collaborate and work towards a common goal of containing this spike at the earliest.

Dr. Sai Kalyan

Crown Lengthening Revisited

ABSTRACT :

With the increasing popularity of aesthetic dentistry, an understanding of the therapeutic modalities brought about by an interdisciplinary approach has developed. As a result, crown lengthening procedures have become an integral component of the aesthetic armamentarium and are utilized with increasing frequency to enhance the appearance and retention of restorations placed within the aesthetic zone. In this article, crown lengthening procedure is discussed as a way in which the dentist can address both functional and aesthetic demands.

INTRODUCTION :

Clinical crown of the tooth is the distance from gingival margin to incisal edge or occlusal surface of the tooth. A short clinical crown is defined as any tooth with less than 2 mm of sound, opposing parallel walls remaining after occlusal and axial reduction which might be because of subgingival caries, subgingival crown fractures, too short tooth crown for restoration retention, excess of gingiva and partially opened anatomical tooth crown.[1]

The concept of crown lengthening was first introduced by D.W. Cohen (1962). [2] Clinical crown lengthening refers to procedures designed to increase the extent of supragingival tooth structure for restorative or aesthetic purposes. It is a procedure that often employs combination of tissue reduction or removal, osseous surgery, and or orthodontics for tooth exposure. The procedure is based on two principles: biologic width (BW) establishment and maintenance of adequate keratinized gingiva (KG) around the tooth.

CONCEPT OF BIOLOGICAL WIDTH :

The biological width is defined as the dimension of the soft tissue that is attached to the portion of the tooth coronal to the crest of the alveolar bone. This term was based on the work of Gargiulo et al,[3] who described the dimensions and relationship of the dentogingival junction in humans. In periodontal health, the biologic width was reported to be an average of 2.04 mm, where approximately 0.97 is occupied by the junctional epithelium and 1.07 mm is occupied by connective tissue attachment to the root surface. The physiologic location of the biologic width can vary with age, tooth migration due to loss of arch or occlusal integrity, or orthodontic treatment. ***(Figure 1)***

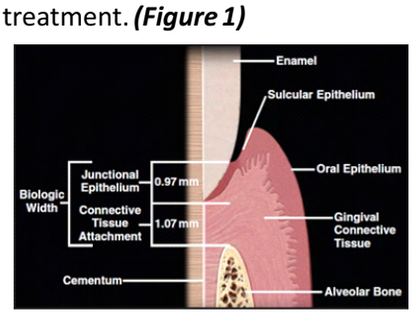


Figure 1: Concept of Biologic Width

Violation of the biologic width is a common occurrence in the practice of restorative dentistry. A familiar clinical situation in which the biologic width can be violated is by the placement of a deep sub gingival restoration. The need to establish a subgingival restorative margin can be dictated by caries, tooth fracture, external root resorption, or the need to increase axial height of a tooth preparation for retention purposes. If the apical margin of the restorative preparation is placed within the biologic width (i.e., too close to the bone), a zone of chronic inflammation is likely to develop.[4] One of the theories proposed is that there is insufficient space for a "normal" length of junctional epithelium to develop; the junctional epithelium is short, weak, and does not exert an effective sealing effect of the dentogingival unit. Moreover, the area is easily damaged by mechanical oral hygiene practices, and chronic inflammation persists or is easily induced. Others believe a deeply placed subgingival restorative margin, close to the alveolar bone crest, impairs proper plaque control promoting inflammatory changes not conductive to a healthy periodontal environment.[5]

FUNCTIONAL OR RESTORATIVE CROWN LENGTHENING[6]

Crown lengthening for restorative reasons include increasing retention and to expose subgingival caries, fracture, or restorative margins by increasing the amount of sound tooth structure above the alveolar crest. ***(Figure 2)***

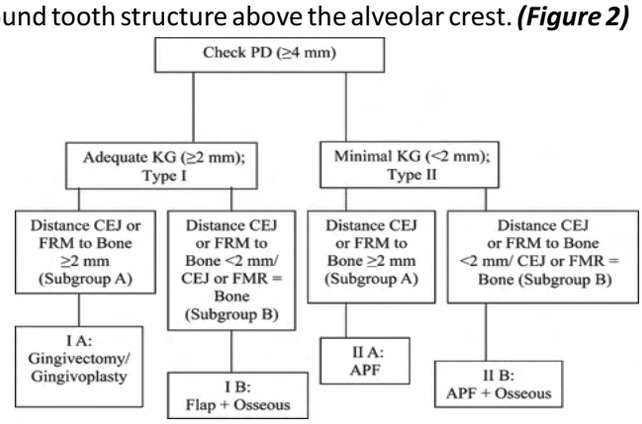


Figure 2: Protocol for Surgical Crown Lengthening. (*PD = Probing Depth, KG = Keratinized Gingiva, FRM = Finished restorative margin)

AESTHETIC CROWN LENGTHENING[7]

Crown lengthening for aesthetic reasons aims to correct either gummy smile or gingival overgrowth. The periodontal status of the involved teeth is first assessed. ***(Figure 3)***

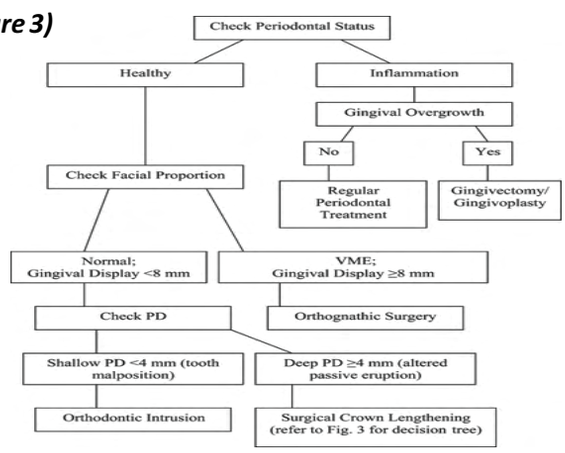


Figure 3: Management of Gummy Smile. (*PD = Probing Depth)

Crown Lengthening Revisited

Vertical maxillary excess (VME) is a dentofacial condition associated with excessive vertical growth of maxilla.

INDICATIONS[8]

- Inadequate clinical crown for retention due to extensive caries, subgingival caries or tooth fracture, root perforation, or root resorption within the cervical 1/3rd of the root in teeth with adequate periodontal attachment.
- Short clinical crowns.
- Placement of sub gingival restorative margins.
- Unequal, excessive or unaesthetic gingival levels for aesthetics.
- Planning veneers or crowns on teeth with the gingival margin coronal to the cemeto enamel junction (delayed passive eruption).
- Teeth with excessive occlusal wear or incisal wear.
- Teeth with inadequate interocclusal space for proper restorative procedures due to supraeruption.
- Restorations which violate the biologic width.
- Gummy smile.
- In conjunction with tooth requiring hemi-section or root resection.
- Assist with impression accuracy by placing crown margins more supragingivally.

CONTRA INDICATIONS[9]

- Deep caries or fracture requiring excessive bone removal.
- Post-surgery creating unaesthetic outcomes.
- Tooth with inadequate crown root ratio (ideally 2:1 ratio is preferred).
- Non restorable teeth.
- Tooth with increased risk of furcation involvement.
- Unreasonable compromise of esthetics.
- Tooth arch relationship inadequacy.
- Unreasonable compromise on adjacent alveolar bone support.

DISCUSSION :

The goal of surgical crown lengthening is to provide the restorative dentist with sufficient clinical crown to permit optimum restoration of a tooth. The indications of surgical crown lengthening are subgingival caries, subgingival fracture, teeth shortened by extensive caries or fracture, naturally short clinical crown due to non-exposure of anatomic crown. The techniques of surgical crown lengthening are :

a) External Bevel Gingivectomy.
b) Internal Bevel Gingivectomy with or without bone reduction.
c) Apically positioned flap with or without bone reduction.
d) Combined technique (Surgical and orthodontic).

To perform these techniques various criteria are first required to set and then one should choose for an optimal technique which would best suit the situation. All the hard tissue and soft tissue parameters should be recorded first to evaluate the requirement of the case. There are also various means of performing CLS. For example, Scalpels, Cautery and lasers. It has been seen that healing with lasers is faster than scalpels. Also post-operative discomfort is lesser with lasers as compared with scalpels.[10]

CONCLUSION :

Crown lengthening is as a viable procedure that enables to restore teeth having a short clinical crown, extensive subgingival caries, subgingival tooth fractures at dentogingival junction, when performed in ideal clinical conditions, crown lengthening gives satisfactory results both from a functional as well as aesthetic point of view.

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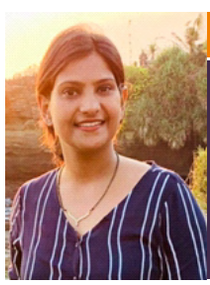

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A Clinical Guide For Endodontic Success

The scope of Endodontics includes diagnosis, treatment of pulpal and peri radicular origin as well as prevention of pulpal disease. To excel in this particular field, a clinician needs to improve his/her diagnostic skills. Root Canal treatment is carried out with the purpose to maintain asepsis of canal system and disinfect it adequately. To avoid certain complications, dentist needs to improve their knowledge and skills regarding advancement in treatment modalities. Therefore, this is clinical guide is distributed into different topics and subtopics which are stated important for understanding of those fundamental endodontic principles.

❖ Local Anesthesia :

Local anesthesia reports to commonly fail in endodontic practice with inflamed tissue i.e., hot tooth. Several factors may be responsible such as sensitization of tetrodotoxin resistant (TTX-R) sodium channels, therefore, rapid acting non-steroidal anti-inflammatory drugs (NSAIDS) may be useful in pretreatment to increase efficiency of anesthetics in patients with odontogenic pain.

➢ Management of *hot tooth* :

- ✓ Short morning appointments to the patients.
- ✓ Premedication with lorazepam 1mg night before sleep followed by 90min. before procedure (check medical history for any interaction with drugs).
- ✓ Electric pulp testing or Test cavity to ensure anesthesia before commencement of any root canal procedure.
- ✓ Intraosseous and Intraligamentary injections to ensure success.
- ✓ Anesthetic agent like bupivacaine reports to be strongly effective in hot tooth.

❖ Access opening :

The objective is to conserve tooth structure and gain access into the canal system of the tooth in order to maintain it's integrity and functioning.

- ✓ Use no. 4 round bur with light strokes against wall to remove roof overhangings.
- ✓ Explore for palatal canal in maxillary molars and distal canal in mandibular molars first to increase work efficiency as wider canals are easier to locate.
- ✓ Follow radiographs to have an idea about the depth and anatomy of pulpal floor from cuspal/incisal edge to avoid any endodontic mishaps like perforations.
- ✓ Pulp stones are discrete calcifications found in the pulp chamber of the tooth. Therefore, use ultrasonic tips BUC1and BUC1A (Obtura Spartan) for further refinement of access cavity walls, also to dissect and displacement of the calcified mass (pulp stone).
- ✓ To locate extra canals (MB_2, mid mesial), use DG 16 probe to explore. Also Ultrasonic tips can be used for scouting of extra canals.

❖ Measuring Working Length :

It limits the depth for placement of filling into the canals and has deemed role in determining success of treatment.

- ✓ Pre-curving of the tip of a small file is important to negotiate the apical end. Once the file is curved and placed into the canal, it is gently worked with a circumferential watch-winding motion until is able to reach the apex.
- ✓ Use of reliable Apex locators along with radiographs, aids in determining the working length correctly.
- ✓ One must take three different radiographic interpretations from 20° mesial or distal angulation to confirm root anatomy and canal configurations as it may differ for each tooth.

❖ Biomechanical preparation (BMP) :

- ✓ Avoid instrumentation in dry canal, instead use lubrication such as sodium hypochlorite or EDTA (RC Prep) for the same.
- ✓ Use rotary files for BMP after maintaining patency and pathway upto #20 hand file to avoid instrument/file breakage.
- ✓ Continuous recapitulation would help maintain patency of working length.
- ✓ Wipe off the files with an alcohol-soaked gauze to remove the debris stuck in the flutes for better cutting efficiency along the dentin.

- **Irrigation :**
- ✓ Use side vent needles to avoid extrusion of irrigating solution beyond apex which may otherwise cause accidental extrusion like NaOCl injury.
- ✓ One can use Manual Digital Activation (MDA) technique to agitate irrigants inside the root canal system with 2 mm in-and-out movement inside the irrigating solution used with the master cone grasped 1 mm set back from the working length.

- **Intra canal Medicament :** can be placed in the canal by rotating a file in a counter clockwise motion.
- ✓ Remember that the default clockwise rotation of a rotary file removes debris up and out of the canal.

- **Obturation :**
- ✓ Small amount of sealer could be placed on 3-4mm tip of the gutta percha cone, placed in the canal and use the master GP in perking motions to evenly make the sealer flow along the canal walls as well as into inaccessible areas.
- ✓ Master gutta percha cone could be sterilized by immersing in 2% CHX (Chlohexidine) or NaOCl.
- ✓ Excess GP can be seared off using ultrasonic tips without water flow, as the heat generated softens gutta percha and helps in removing the excess.

- Endodontic Management in **patients with limited mouth opening** :
- ✓ Use small hand mouth mirrors such as size 3 mouth mirror and small head handpieces for tooth preparation.
- ✓ The EndoHandle (Venta Endo) provides an easier grip of a file that can also be pre-curved or bent to facilitate access.
- ✓ One should hold the hand file at approximately 90° to the direction of his or her fingers. Use of NiTi files with controlled memory are recommended for use. Examples include EndoSequence Reciprocating (ESR) Files

A Clinical Guide For Endodontic Success

(Brasseler USA) and WaveOne Gold (Dentsply Sirona Endodontics).

Properly treating endodontic emergency patients requires the dentist to have a good understanding of diagnosis, local anesthesia, conventional endodontic treatment, and clinical pharmacology. Additionally, the application of these modalities for treatment may reduce chair side time compared to conventional approach. With increasing demand for precise treatment in difficult cases like calcified canal, developmental anomalies where access is difficult, normal access cavity preparation to minimize the loss of pre cervical dentin to increase the strength and better prognosis ,the guided endodontics gained popularity.

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AESTHETIC DENTISTRY : OVERVIEW

'A smile is the prettiest thing you can wear'. Since time immemorial man has tried different ways to improve his smile. The science of dentistry has always focused on the final aesthetic outcome of the treatment after the primary goal of pain relief and function has been achieved. Over the years aesthetic dentistry has been recognised asa highly specialized multidisciplinary branch as it requires a sound knowledge of all streams of dentistry as well as artistic skills.

Aesthetic dentistry is a branch of dentistry that involves skills and techniques to improve ones smile's appearance ,improvement of shape, colour, alignment , size of teeth as well as improvement in overall health and function. Though used interchangeably with cosmetic dentistry, aesthetic dentistry focusses on more natural looking seamless smile transformation.

Some of the common issues which lead to patients seeking aesthetic dental treatment are :

1. Broken or chipped off teeth
2. Intrinsic or extrinsic stains on teeth or discoloured teeth
3. Malaligned teeth which includes protrusion, crowding, rotated teeth.
4. Severe worn out teeth.
5. Too much gums showing leading to gummy smile appearance or hyperpigmentation of gums.

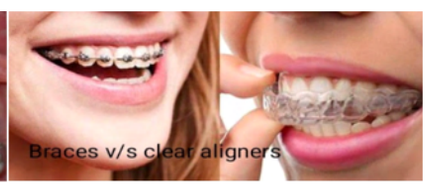
PEDIATRIC ASPECTS OF AESTHETIC DENTISTRY :

It is very important to take good care of milk teeth or deciduous teeth as they play a very important role in future oral health. They are important for proper chewing of food, for speech development as missing teeth may lead to delayed speech or pronunciation issues in children. Parents must wipe baby gum pads with a clean cotton cloth to remove milk residues. Brushing must commence after teeth have erupted and fluoride toothpaste must be used for optimal utilization of fluoride for tooth development.

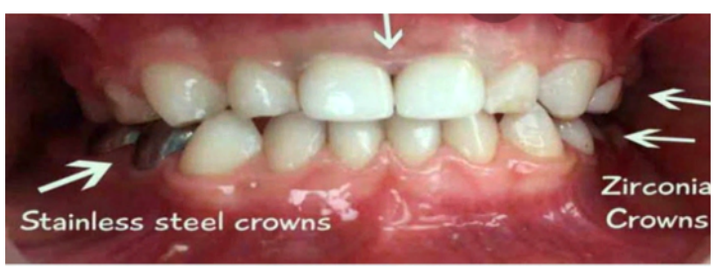
One of the most devastating effect of improper brushing and indiscriminate bottle feeding is nursing bottle caries which can lead to severe decay or loss of teeth affecting mastication and aesthetics. Fortunately new advancement has led to use of all white zirconia crowns in place of metal crowns to replace the damaged teeth.

Another aspect during childhood is improper oral habits such as thumb sucking, tongue thrusting, mouth breathing, lip biting which has an adverse affect on newly erupting permanent dentition leading to protruded front teeth, gaps or crowding between teeth. This requires timely intervention and use of habit breaking appliance to reverse the damage or in later stage corrective orthodontic treatment to align the teeth and improve the function and aesthetics. The field of orthodontics has come a long way from traditional metal braces to more aesthetic ceramic braces and clear aligners for those who don't want to put braces for aesthetic reasons.

Habit breaking appliance



Braces v/s clear aligners

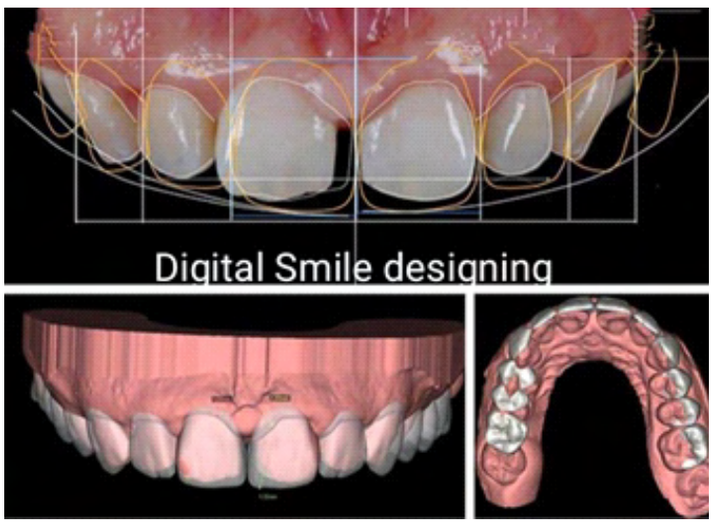


AESTHETIC DENTISTRY IN ADULTS :

As mentioned earlier it involves treatment aimed to improve the existing smile of the patient. Most often it is an elective treatment which means the patient willingly wants to improve his or her smile. In such cases treatment planning plays a major role. It involves detailed discussion with the patient to judge the main issue and expectation of the patient, pre-operative photographs from specific angles to assess the existing teeth as well as soft tissues such as gums,

AESTHETIC DENTISTRY : OVERVIEW

lips. Then plaster models are made before commencing actual treatment. Once the mockup is approved and consent taken from the patient the actual procedures start intraorally. Digital Smile designing is a major breakthrough in this field as the results now can be shown digitally to the patient which can give a clear idea about the outcome of the treatment and improve confidence and treatment acceptance.



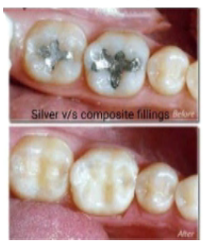
Here are few most common aesthetic treatments done worldwide:

TEETH WHITENING :

Teeth whitening refers to procedures done to make the teeth whiter. Teeth may stain due to various factors such as smoking, too much consumption of tea or coffee or coloured food in diet. These are usually extrinsic stains and require simpler procedures such as ultrasonic scaling and polishing to bring back the original colour of teeth. However sometimes intrinsic stains develop on teeth due to trauma, fluorosis or use of certain antibiotics such as tetracycline. Also ageing causes teeth to look more yellowish opaque due to enamel wear. Sometimes patients are unhappy with their original teeth colour and wish for a more whiter colour. In such cases bleaching is the preferred method of treatment. It includes use of wide array of chemicals most commonly hydrogen peroxide gel to get the desired effect. This treatment is either done in dental office or may involve use of customized trays for the application of whitening gels. Dentists can also prescribe specific toothpaste for the desired results.

Use of composites to repair chipped off teeth, close spaces between teeth or improve shape of teeth.

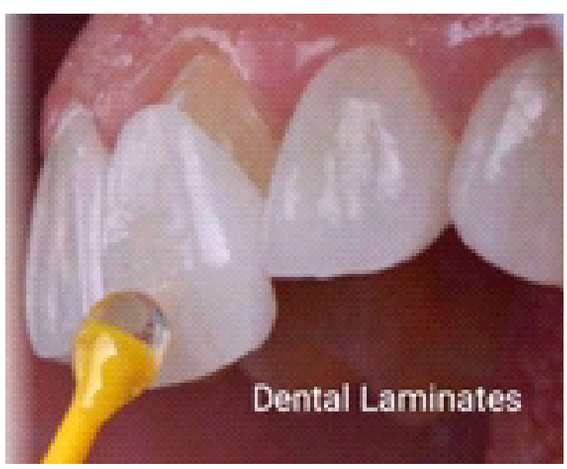
Dental composite is one of the most widely used cement for its high aesthetic value. It has virtually replaced old silver amalgam fillings or zinc phosphate cements due to its high strength, precision and high aesthetic values. It is used mainly for tooth restoration after dental caries, to repair minor chipped teeth, to improve shape of teeth as well as close minor gaps in between teeth.



DENTAL LAMINATES AND VENEERS :

Veneers are tooth coloured shells placed on the surface of the teeth to improve its appearance.

They are also used to close gaps between teeth, improve shape of teeth or in severe cases of teeth discolouration due to tetracycline stains or fluorosis where teeth whitening procedure was not satisfactory. Putting laminates or veneers is a minimally invasive procedure in which the outer (facial) tooth surface is reduced by 0.2 to 0.5mm and impression is taken and laminates are then fabricated in dental laboratory and later cemented on the tooth surface. It is a widely done procedure and popular amongst patients as it is less invasive and cost effective compared to full surface crowns.



Full coverage crowns :

These are typically indicated in following cases :

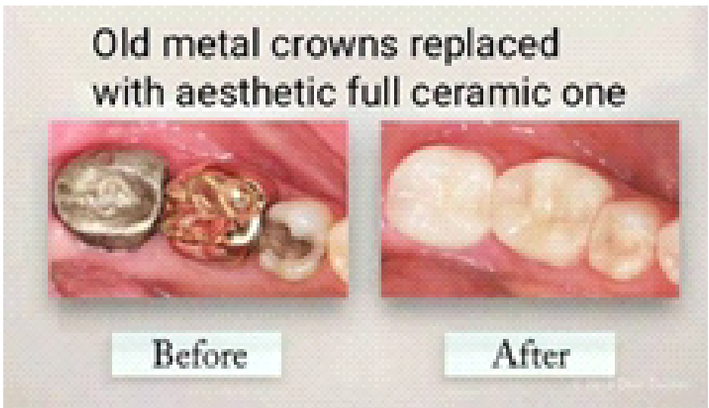
*Post root canal treatment when there is lot of damage to existing tooth structure due to caries. The tooth needs to be protected from strong biting forces with a full coverage dental crown.

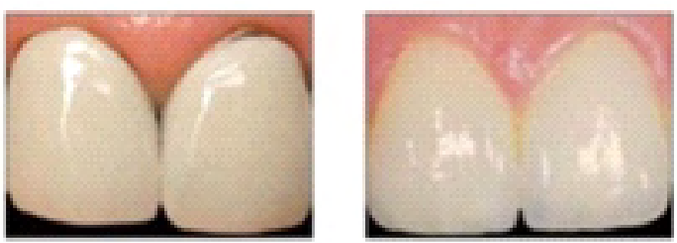
*Missing teeth needing replacement using dental bridge.

Attention to aesthetics has lead to preference for full ceramic crowns as they look much natural than a traditional PFM (porcelain fused to metal crown) or metal crown. They are made of high strength lithium disilicate material which is closest in shade to natural enamel. Absence of metal leads to

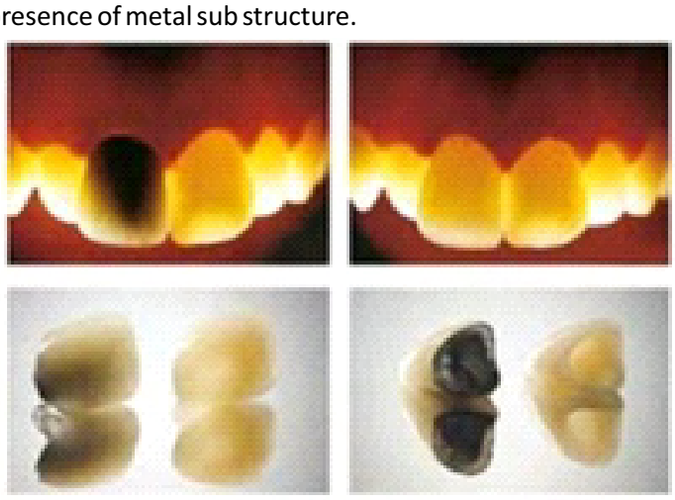
AESTHETIC DENTISTRY : OVERVIEW

highly translucent surface which greatly mimics the natural tooth.





PFM crown showing metal margin in comparison with Zirconia crown. Zirconia crowns have high strength and an attractive translucent appearance (as they transmit light in wavelength similar to that of natural teeth) giving them a high aesthetic value resembling that of the natural dentation whereas pfm crowns produce a blackish hue due to the presence of metal sub structure.



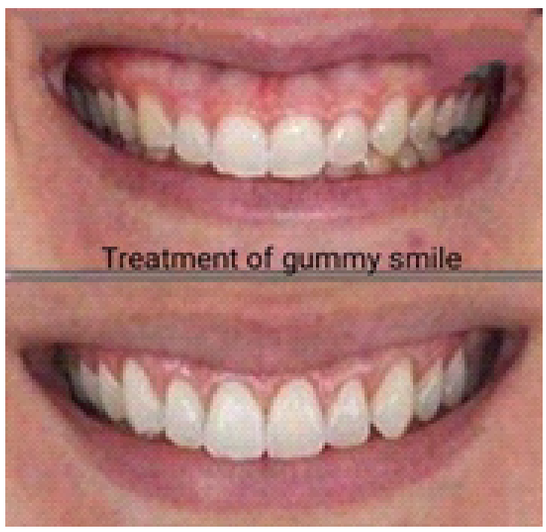
PFM on the left which is opaque not allowing light to pass through Zirconia on the right side, translucent almost like natural tooth.

Aesthetic dentistry with respect to gums :

Gums play a very important role in overall oral aesthetics. There should be a harmonious blend between the gums and teeth so as to complete the whole aesthetic picture. Most common issues which need to be addressed by the aesthetic dentist are:

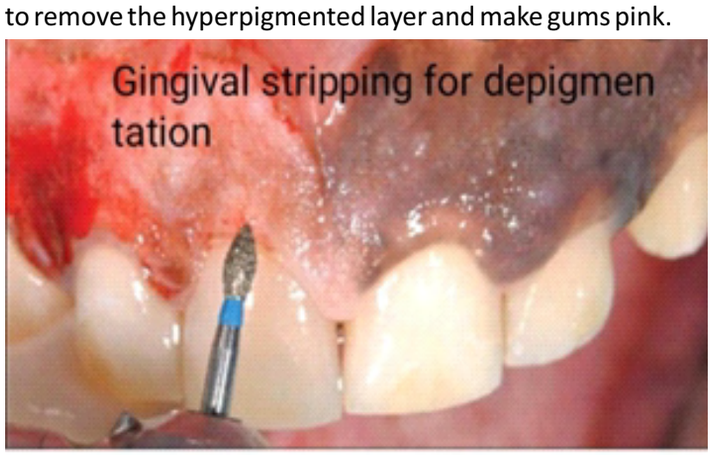
Gummy smile :

It is a common condition in which too much of gums are at display when the person smiles. It leads to shorter teeth appearance. It is treated by a procedure called as periodontal plastic surgery in which excess gum tissues and underlying bone are reshaped to expose the full length of teeth.



Gingival depigmentation :

Sometimes gums are darker in colour either uniformly or can have localised dark patches. Most commonly it is due to excess melanin production. In such cases various techniques such as surgical stripping, gingival abrasion or lasers are used to remove the hyperpigmented layer and make gums pink.



Full mouth rehabilitation :

As the name suggests it implies to rebuilding and/or replacing all teeth in patient's mouth. Full mouth reconstructions is a multi-disciplinary branch which combines aesthetics with the science of restorative dentistry to improve the health, function and beauty of the mouth.

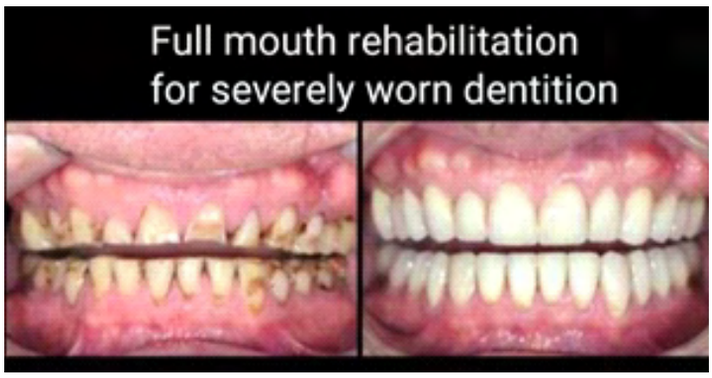
Few cases which require full mouth rehabilitation are:

*Severe worn out teeth due to bruxism (teeth grinding habit) leading to decreased height of teeth and subsequent problems with biting and jaw pain (temporomandibular joint issues).

*Years of neglect causing loss of multiple teeth due to caries or periodontal (gums) issues.

Here customized treatment plan has to be formulated taking into consideration the main causative factor. After that the aesthetic considerations are met to achieve the ultimate goal of a full reconstructed dentition which meets the functional and aesthetic demands.

AESTHETIC DENTISTRY : OVERVIEW

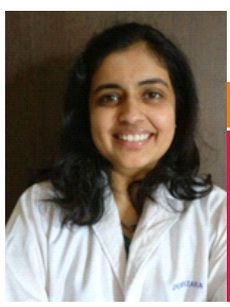


Use of BOTOX and dermal fillers in aesthetic dentistry :

This is a recent but a fast growing branch which merges the science of aesthetic dentistry and cosmetology. Aesthetic dentistry cannot just be tooth centric but take into consideration perioral areas and lips for the best possible results. So a combined approach is used in cases such as high lip line or deep nasolabial fold.

Conclusion :

Aesthetic dentistry is one of the fastest growing branches in dentistry today as people have become quite conscious about their smile. Not limiting to just celebrities and public figures every patient today expects a good aesthetic result for their treatment. Also the ultimate satisfaction for every dental practitioner is to give back that lost glowing smile as the patients leaves from the clinic with a heart full of joy and a smiling face to light up the world.



Dr. Nirzara Chaubal

Private practice Since 2011
Owner of Dr. Nirzara's Dental Care and Implant Center.
College: BDS from MGM Dental College, Navi Mumbai.

New Product Launch

Product Profile :

Fluorotop APF

Topical Fluoride Acidulated Phosphate Fluoride 1.23% Fluoride Ion

Description : A topical APF anti-caries preparation containing 1.23 % fluoride ion from sodium fluoride. The improved thixotropic properties ensure closer adherence to enamel and interproximal areas. It contains xylitol-a proven anti-caries ingredient. The gel is offered in flavours for patient satisfaction and there's no bitter taste.

Indications : Topical application of fluoride to aid in the protection against dental caries

Product Benefits :

- Inhibits plaque build-up
- Prevents demineralization of tooth
- Promotes re-mineralization for caries protection and prevention
- Economical
- High fluidity for easy and quick application

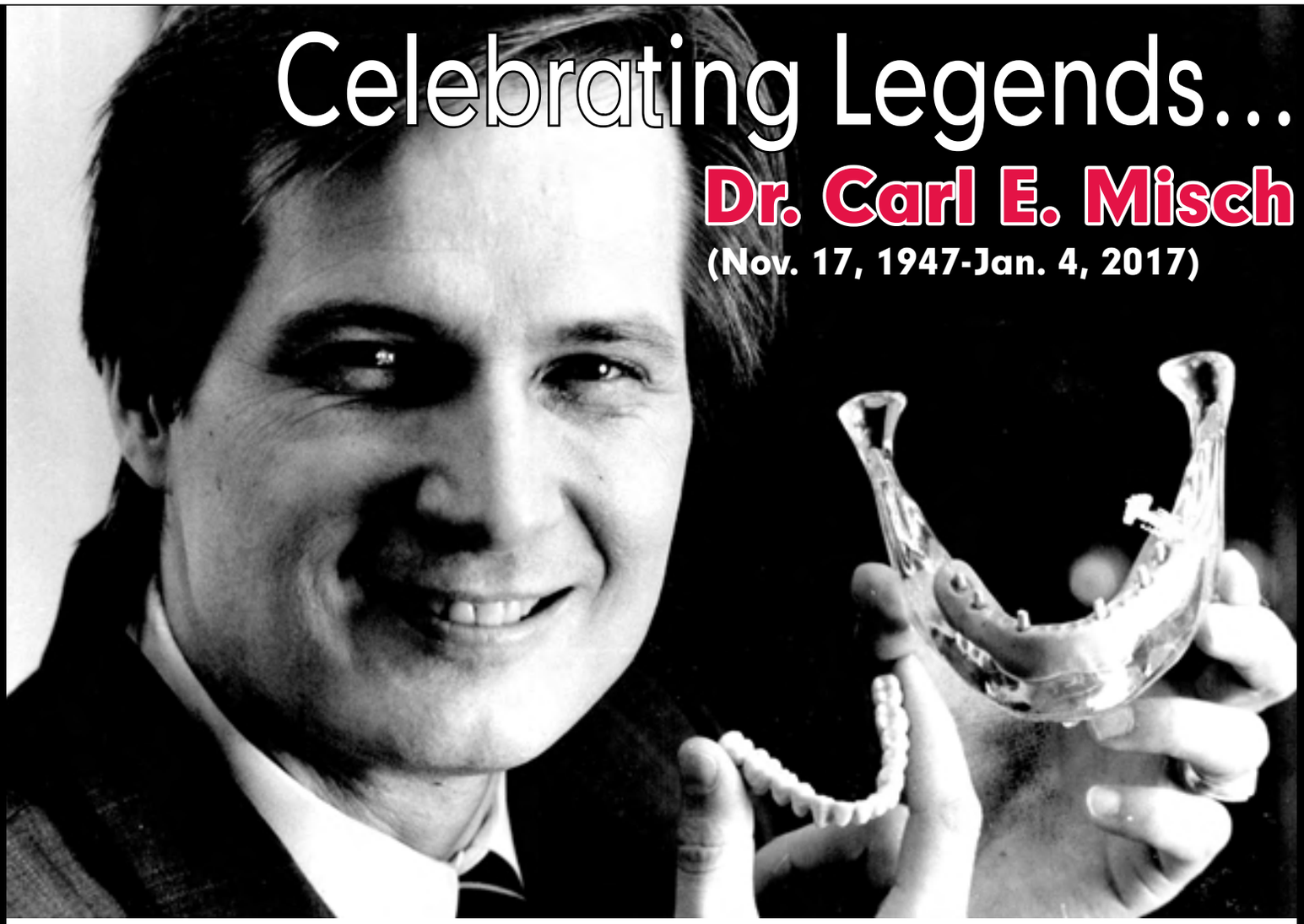
Packing :

REF: 80005: 500gm Plastic Bottle
REF: 80004: 200gm Plastic Bottle

Celebrating Legends...

Dr. Carl E. Misch

(Nov. 17, 1947-Jan. 4, 2017)



PROFILE OF THE MONTH

Carl E. Misch (November 17, 1947 – January 4, 2017) was an **American prosthodontist** recognized internationally for his clinical and academic contributions to the field of **implant dentistry**. Misch graduated magna cum laude in 1973 from the **University of Detroit Dental School**. He received his prosthodontic certificate, implantology certificate and **Masters degree** from the **University of Pittsburgh School of Dental Medicine**. The University of Yeditepe in Istanbul, Turkey and Carol Davila University of Medicine and Pharmacy in Bucharest, Romania each awarded Dr. Misch a Ph.D. (honoris causa). He holds several other post-graduate honors including twelve fellowships in dentistry, including the American College of Dentists, International College of Dentists, Royal Society of Medicine, American Association of Hospital Dentistry and the International Academy of Dentistry

Misch was Clinical Professor in the Department of Periodontology and Oral Implantology, and Director of Oral Implantology (hon) in the School of Dentistry, **Temple University** Philadelphia, PA, USA. Misch served on the Board of Trustees at the University of Detroit Mercy where he was also an Adjunct Professor in the Department of Prosthodontics. Misch had maintained a private practice restricted to implant surgery (bone grafting and implant placement) and related prosthetics for more than 30 years.

In 1999, he authored the text, Contemporary Implant Dentistry, and Misch has written three editions of Contemporary Implant Dentistry (Elsevier), which has become a very popular textbook that has been translated into 9 languages, including, Japanese, Spanish, Portuguese, Turkish, Italian and Korean. He has also written Dental Implant Prosthetics (Elsevier). He had published over 250 articles and has repeatedly lectured in every state in the United States as well as in 47 countries throughout the world.