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customized impression coping : a case report

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Management of periodontal-endodontic lesion by regenerative approach: case reports



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As it is high time the practice of eco dentistry has been adopted by us dental practitioners and discussions on the same are happening everywhere, concerns and queries on products available to make this concept practical has been raised in different forums. One such concern is the plastic sterilization pouches. When searched for eco friendly sterilization pouches, this product popped up which would probably help us replace our plastic sterilization pouches.

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Editorial



Dr. Anjana G.

The need of the future: Eco Dentistry

Like all industries and practices Dentistry too is contributing considerably in polluting the earth. The detrimental effect of Dental practices on the environment is a major concern. The term “eco-friendly dentistry” was coined by Dr. Malden Kralj, the founder of Ora Dental Studio, America’s first green dental group. Eco-friendly dentistry is an approach that implements sustainable practices in the dental office by keeping resource consumption in line with nature's economy, by safeguarding the external environment by virtue of eliminating or reducing outgoing wastes and by promoting the well-being of all those in the clinical environment by conscious reduction of the chemicals in the breathable air.

Time has exceeded in converting our practices into an eco friendly work place. There are two main avenues for implementing eco-friendly dentistry: (1) appropriate policy development and implementation and (2) dentists taking responsibility/ ownership in the absence of policies and regulations. In the wake of plastic ban by the government in 2020 it is time for us to plan strategies. So far as Dentistry is concerned attention and detailing on the following areas are needed. Designing energy efficient dental offices, appropriate dental waste management and reduction of Plastic and Electronic waste, implementation of latest technologies for efficient time and resource management and recycling of possible dental materials should be our concern and we should collectively work towards it. The four R's of being eco-friendly include reduce, reuse, recycle, and rethink. The commitment of one single Dental office might not be able to save earth, but if we work together to develop and implement policies on practicing Eco Dentistry, we will be able to reduce our contribution to earth's destruction.

Dr Anjana G.
Editor, KDJ

Message from the President

My dear members,

We have concluded yet another organisational year. When I look back, I feel it was indeed a memorable year for me, because I was extremely lucky to have such a wonderful team to work with, and had exceptional leaders across the state, who conducted various activities which were greatly member friendly. I take this opportunity to congratulate all the branch leaders for their untiring effort to make their term a productive one.

The IDA has associated itself in policy matters concerning the profession and implemented projects such as Sraddha & Sanjeevani, the relevance of which is significant in the present scenario. IDA has an equally responsible role in the profession, as well as in the public as a professional organisation, and it is my belief that all the activities nowadays are carried out considering this fact.

The term end is always the occasion for an independent and objective assessment of performance. Last year, we bravely stepped into the implementation of privilege CDE's, and it was indeed a great success. We were able to conduct eight State CDE's, out of which five were privilege CDE's. Hearty congratulations to the CDE Team! CDH activities also kept up its high quality and concluded with the viral project SRADDHA, which was well appreciated by all branches. Kudos to CDH Team! Our projects, IDA Hope, IDA CAN & IDA Mark, rolled out extremely well last year, under the able leadership of its management team. The WDC team worked systematically and could conduct various programs, keeping high standards.

Introduction of a Newsletter was another remarkable step, considering the fact that the IDA and its activities should reach out to all its members. Congratulations to the Vice President, Dr. George Abraham, for the initiative.

We have concluded last year with the mega event - The historic IDC 2020. We have started the centenary celebration of Modern Indian Dentistry at IDC 2020 and the conference laid a new milestone with record number of scientific presentations. An approximate of 750 scientific presentations enlightened the delegates with plenty of knowledge and clinical experiences. I take this opportunity to congratulate each and every member of the organising committee for making the event a glorious success. IDA Trivandrum branch has added yet another feather on its crown, by making IDC 2020 a memorable one.

We believe we are able to provide through KDJ, a platform for meeting the ever growing knowledge needs of the Dental professionals, with its features on clinical experiences, scientific researches, and modern developments in Dental science. KDJ definitely serves as an aid to improving the range of applications in clinical practice. I extend my whole hearted best wishes to our beloved editor Dr. Anjana G, for her future endeavours, and congratulate her for her extraordinary performance as the Editor of KDJ.

I once again extend my sincere gratitude to all office bearers of my team, especially to the Honorary Secretary Dr. Suresh Kumar G, who took IDA to a whole new level, by contributing sincerely with true dedication.

I am grateful to each and every member of the IDA, for the tremendous support given to me and to my team, and I promise you, I shall be present for the betterment of the IDA till my very last breath. Thanking you.

Jai Hind, Jai IDA.

Yours in IDA

Dr. G S Abhilash
President, IDA Kerala state



Dr Abhilash G S

Message from the Secretary



Dr. Suresh Kumar G.

Dear Members,

Seasons wishes to all and wishing each one of you a very happy 2020.

IDA has always strived to gain recognition from the official bodies, be it in the National or State Level. We have managed to succeed at least partially on that aspect too. It would be wise on our part to realise that with recognition comes responsibility too.

It is very important for the association and its members to act in a manner that befits the role it has assumed. The strength of any association is in its unity and collective strength.

As the office completes the term it's a sincere request to all as members to be as one and act as one which would further enhance our position to be the organisation that we strive to be. Your trust in the office is certainly the driving force for any office bearer and sure they will deliver with the confidence that such support brings along with it.

Once again thanking each and every member of the association for extending their support to the activities of IDA. It is your cooperation and involvement that has always helped IDA Kerala State be the pioneering State Branch of IDA all over India and is truly a reflection of the commitment and trust that each one of you have shown.

As we get to the final issue of KDJ for the year and personally the final issue during my term as Secretary of IDA would be apt to reflect on the role KDJ has played in connecting with the members and thanking the editor Dr Anjana for the wonderful support she has lent to the office

Thanking you all and wishing a bright future for IDA

Dr. Suresh Kumar G.
Secretary, IDA Kerala State

Comparative evaluation of wear resistance of commercially available artificial denture teeth-an in vitro study

*Sreepriya S S, *Sharon Ann Jose, **Sudeep S., *** Sangeeth K Cherian

Abstract

During the past century, the replacement of lost natural teeth, caused by dental caries, periodontal diseases, oral and jaw pathologies, congenital missing, or accidents could be performed by many ways. The most two common means in replacing loss natural teeth were fixed and removable dental prosthesis. A conventional removable prosthesis comprises of two important components; artificial denture teeth and a denture base.

Physical properties are the main considerations when choosing the type

of artificial denture teeth in fabricating the prosthesis. The artificial denture teeth should mimic most of the anatomical and esthetical details. In addition, they should be non-toxic, non-reactive with oral soft tissues, user friendly, and inexpensive. Furthermore, among mechanical properties, wear resistance is an important property. Lack of sufficient wear resistance will result in excessive reduction in structure, resulting in loss of posterior tooth support, loss of vertical dimension of occlusion, loss of masticatory efficiency, alterations in the functional path of masticatory movement,

fatigue of masticatory muscles, faulty tooth relationship, and loss of esthetics. Currently there are various types of commercial artificial denture teeth available, such as porcelain teeth, conventional acrylic resin teeth, and improved acrylic resin teeth, including high cross-linked acrylic resin teeth and composite resin teeth. The acrylic resin teeth are more commonly used in removable dentures.

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► Introduction

The wear resistance of denture teeth considered as one of the most important requirements for oral rehabilitation of edentulous patients with removable dentures in order to maintain a stable occlusal support over time. Wear of occlusal surface may result in insufficient posterior tooth support, loss of vertical dimension of occlusion, which result in residual ridge resorption. Denture teeth currently in use are made of methacrylate-based resins, which has advantages such as cross-linked polymerisation, low susceptibility to fracture and decreased clicking sounds. However, the wear resistance questioned for being lower. The aim of this study was to evaluate the wear resistance of commercially available acrylic resin denture teeth and to compare the wear resistance of three commercially available denture teeth.

► Materials and methods

The materials used in this in vitro study are three brands of acrylic denture teeth (Acryrock, Premadent, Cavitax), DPI

self cure acrylic resin, electronic weighing machine, cylindrical grinding machine and pin on disc tribometer.

► Method of preparation of specimen

The artificial mandibular molar teeth were selected for the study. The DPI self-cure acrylic resin was used to hold the teeth. The acrylic resin was shaped into a cylinder form and the cross-linked surface of the teeth is attached to the one end of the cylinder. The cylinder was grinded into exact size of 40mm x 8 mm with a cylindrical grinding machine.

► Procedure

The weight of each specimen was measured using the electronic balance before the test. The specimen were attached to the wear testing machine (pin on disc tribometer). Each specimen was then subjected to the wear test, in which cylinder specimen of known weight was rubbed against the rotating stainless steel disc of known roughness. All test were performed under constant applied load of 64 n for 5.18 minutes by keeping the

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temperature constant for 27°C. Each specimen were subjected to 5000 cycles and the specimen were re weighted. The procedure is repeated for another 5000 cycles of total 10000 cycles and the change in the weight is analysed statically

► Result

Within the limitations of the study the following conclusions were. The obtained results was statistically analysed by using

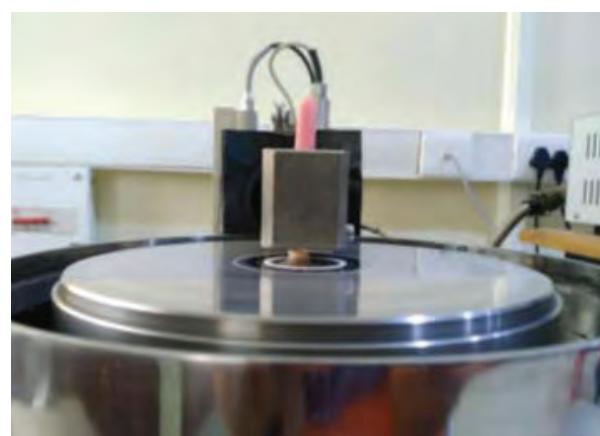
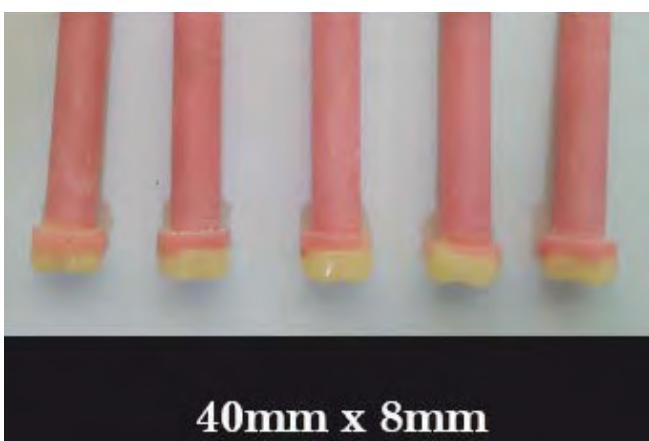
ANOVA and the result showed highly significant difference with a significant level $p < 0.001$

The comparison between each groups were done with Tukey- Kraer test.

Acryrock acrylic teeth showed the highest wear resistance amoung the three brands of the tested artificial teeth. Acryrock > Cavitax > Premadent

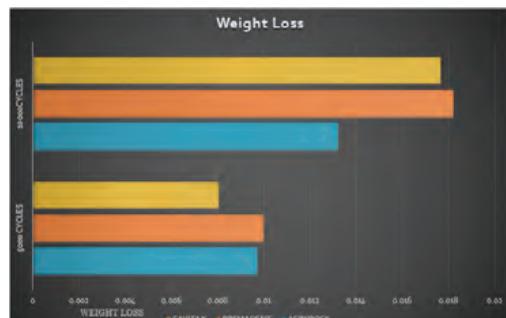
► Discussion

The result of the present study showed statistically significant differences in wear within each brand group and Acryrock acrylic resin teeth had the highest wear resistance amongst three group of tested samples. Khan et al conducted a similar study in which they compared different brands of artificial teeth and found no significant differences in wear resistance³. M Grando et al evaluated the microhardness, composition and wear resistance of different brands of artificial teeth and concluded that no significant difference between brands in either trial⁴. Mello P C et al evaluated the wear resistance of seven different brands of artificial teeth opposed to metal and composite antagonist. They concluded that the antagonist material is a factor of major importance to be considered in the choice of the artificial teeth to be used in the prosthesis⁵ Based



Result

CYCLES	ACRYROCK	PREMADENT	CAVITAX
5000	0.009740±0.003166	0.009980±0.001240	0.008060±0.002694
10000	0.01322±0.005019	0.01822±0.002342	0.01764±0.001773



on the findings of Ghazal, et al.⁵ (2008), the test performed in this study correspond to an approach of two body wear with direct contact between the artificial teeth tested and the antagonist, which produces a mixed wear of adhesion, attrition and fatigue. Some authors have stated that this condition is especially important when considering complete dentures with a bilaterally balanced occlusion. Additionally, in a 2-body wear test only direct interactions between surfaces of sample and antagonist cause a substance loss⁶.

According to Anusavice, acrylic-resin artificial teeth are composed essentially of carbon (C), oxygen (O), and hydrogen (H). The finding of the present study can be attributed to the chemical and structural properties of the artificial teeth. Some in vitro studies reported no significant difference in wear resistance between improved acrylic resin teeth and conventional acrylic resin teeth⁷. There are many factors affecting the wear resistance such as wear testing mechanism, force, antagonist, chemical and abrasive medium⁸. The other important factor is specimen characteristics, artificial denture teeth are manufactured in varieties of compositions and layer. Artificial denture teeth were previously divided into two different layers, enamel and dentin layer⁹. This classification did not fit the newly developed artificial denture teeth designs. Each layer of artificial denture teeth has different properties, such as hardness and monomer diffusion¹⁰. Wear evaluation is theoretically difficult, because wear depends on a number of parameters other than the mechanical and physical properties of the material. These parameters include temperature, sliding speed, normal pressure, counterface roughness, and transfer film.

► Conclusion

This is clinically significant for the practitioners to decide the appropriate teeth selection for prosthetic rehabilitation of missing teeth. Since it is difficult to simulate clinical scenario in laboratory environment further research has to be conducted for wear behaviour studies of artificial teeth with improved technology.

► Acknowledgement

The authors would like to acknowledge to Mr Sujith Kumar KV, Instructor grade II, Mechanical Engineering Department, College of Engineering and Technology, Trivandrum for his technical support throughout the study.

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Saliva as a forensic tool in personal identification

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Abstract

Forensic odontology is the branch of forensic science which deals with collecting, preserving, recording and interpretation of dental evidence at the interest of court of law for law enforcement. The identification of traces of biological fluid from crime scene can provide crucial probative information

and further corroborates the DNA evidence. Currently, saliva a complex biological fluid is emerging as a primary investigative tool in forensics which helps in detecting crime, cases of sexual assaults, human and animal bite mark analysis, alcohol and drug abuse, hormone identification and poisoning. The

current review emphasizes the application of saliva in forensics and describes its method of detection and collection.

Keywords: saliva, forensics, personal identification

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► Introduction

Forensic odontology is one of the specialty that involves human identification beyond recognition through oral and paraoral structures namely teeth, jaw bones, saliva and skull structures and also involves identification of dental records. The term Forensic is derived from a Latin word *Forensis* meaning Forum or court of law. Recovery of traces of biological fluid from crime scene is one of the prime forensic evidence in identifying a suspect or a victim¹. In recent years, saliva is emerging as a forensic tool that aids in personal identification, crime detection, age and gender determination, drug monitoring and bite mark analysis².

The use of saliva has many advantages over blood including (a) ease of access, (b) low cost, (c) safety in handling when compared to blood which has higher potential risks of contamination and (d) noninvasive collection methods². The salivary analysis for serological testing and cellular analysis has been proved to be of wide application in criminology like rape and paternity cases, drug and alcohol abuse, hormone identification, cases of poisoning. The current review article

highlights the use of saliva and various methods of detection and isolation of saliva stains encountered in forensics.

Saliva as a forensic tool

Saliva is often detected in crime scene or sexual assaults along with bite marks or lip prints. Any trace of saliva left in bite marks and lip prints can be used for biologic profiling to determine age, gender, personal characteristics and health status of an individual. Dried saliva stains deposited on the skin, clothing or other inanimate objects is an important source of DNA. The detection of saliva present a unique challenge as it is undetectable to human eye. Advanced method have been developed for the identification and recovery³.

Methods of detection of saliva

Chemicals: Various chemicals such as enzymes and salts have been tried out to detect the biological stains. Saliva deposited in envelopes and stamps are identified using chemical which acts on reducing sugars and give a red insoluble precipitate. Alkaline phosphatase and Amylase are the most commonly used enzymes. But all these test possesses certain limitations

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and variable sensitivity upon age and quantity of saliva stain⁴. Alkaline phosphatase test gives a false positive result hence is not very specific. Iodine test for detecting salivary amylase has been used for many years, but it gives a negative reaction which leads false positive result when excess starch is present. Salts like nitrites and thiocyanates has also been used for detection. But they can be used for samples only up to 2 days and thiocyanates are not commonly found in saliva⁵.

Salivary α amylase and saliva detection: α amylase test has been used as a screening tool for detection of presence of salivary sample. RSIDTM –saliva (Rapid Stain Identification Test) is a lateral flow immunochromatographic strip test for human saliva detection designed to detect the presence of human α amylase which confirms the presence of saliva in a sample⁶. It uses two anti- salivary amylase monoclonal antibodies specific for human salivary α amylase. Due to limited production, Abacus Diagnostics has developed an alternative, SALIgAE® saliva test, a colorimetric test for human saliva detection. It is a solution in a tube that changes color with addition of extract containing saliva. Unlike the old spotty paper test, a new screening test SALIgAE spray by abacus diagnostics for location of saliva stains at crime scenes which requires no incubation or additional equipments. Polilight® is a versatile light source suitable for detecting traces of saliva that are not apparent to naked eye⁷. It produces intense narrow bands of light, at wavelengths between 310 and 650nm. It has application in latent fingerprinting and alternative to other saliva detection screening tests. Lasers, UV light, quartz arch tubes are employed for identification of saliva stains.

Fluorescent spectroscopy: A rapid and noninvasive method to detect dried saliva stains from human skin. Fluorescence spectroscopy is a technique which is widely used for the analysis of the structure, dynamics and functional interactions of proteins. It is based on the principle that when a fluorescent material is excited at a particular wavelength, it emits radiation of longer wavelength. α salivary amylase contains an aromatic amino acid tryptophan. It gives a characteristic emission spectrum at 345-355nm when excited at 282nm by fluorescent spectroscopy. Thus possess a good sensitivity in detecting dried saliva stains on human skin³.

A recent study done by researchers is concerned with the use of fluorescent spectroscopic data as a preliminary forensic evidence for the detection of dried saliva stains by fluorescent emission spectra from the surface of drinking glass and comparing it with the undiluted liquid saliva⁸.

Recovery of saliva

The retrieval of traces of saliva stains from human skin is essential as it useful for identity testing. The following techniques are employed.

Single swab technique: Classical method in which single wet cotton swab or wet filter paper is laid passively on skin surface to recover the saliva stains.

Double swab technique: The technique was studied by sweet et al⁹. It is similar to single swab technique followed by the application of dry cotton swab. The moisture from the first swab will rehydrate and loosen the dried epithelial cells within the saliva which will then adhere to the fibers in the cotton swab. This technique provides better yield of saliva from the skin surface¹. DNA from the saliva samples are extracted by phenol- chloroform method. It is a liquid –liquid extraction technique used to separate DNA molecule from proteins and lipids on the basis of their solubility in immiscible solutions.

DNA profiling for personal identification

DNA analysis has provided a significant advance in identification and is routinely used in criminal investigations and mass disasters. Identification of foreign biological material by DNA profiling is widely used in forensic DNA analysis in different cases of sexual abuse or harassment. Foreign DNA persist in the victim's mouth for a restricted period of time, can be extracted from saliva. The samples undergo processes like extraction, quantification, amplification, separation, and analysis and interpretation.

DNA profiling techniques are either Restriction Fragment Length Polymorphisms (RFLPs) on Variable Number Tandem Repeats (VNTRs) or PCR analysis¹⁰. In RFLP analysis, DNA is collected from cells and cut into small segments using restriction enzymes and are separated using gel electrophoresis. The repeat sequences vary in length among different individuals and are called variable number of tandem repeats or VNTR's. Currently DNA profiling is based on PCR and uses simple sequences or Short Tandem Repeats (STR). It uses highly polymorphic regions that have short repeated sequences of DNA which can be used to discriminate between unrelated individuals. DNA typing using STR is done by matching 13-17 of nuclear STR markers of a victim's profile to an antemortem sample of a victim or to family members. A system of 13 STR markers constitutes the Combined DNA Index System (CODIS) which is used in USA and Canada.

When DNA is highly degraded, mitochondrial DNA (mt DNA) can be used for human identification⁴. There are hundreds to thousands of copies of mtDNA for every copy of nuclear DNA. Genomic DNA is maternally and paternally inherited whereas mtDNA is maternally inherited.

Salivary microbiome

Salivary microbiome describes all the individual microbiota present in the saliva potentially useful for personal identification. Salivary microbiome comprises of eight genera which constitutes

about more than 70% of total bacterial population. Out of which at least 700 bacterial species are found in mouth. It includes Streptococci, Neisseria, Hemophilus, Prevotella, Veillonella, Porphyromonas, Rothia and Fusobacterium¹¹. The composition and function of salivary microbiome varies with individual's age, lifestyle, their cohabitants, habits, health status, geographical location and time of collection¹².

Different stages of analysis of salivary sample for oral microbiome include: (1) Salivary sample collection from the skin of the victim. (2) 16SrRNA sequencing is done to identify the taxonomy of bacterial species. (3) Analysis of 16SrRNA sequences is made to match with the published database of salivary microbiome.¹²

The composition of oral micro flora changes with age. At birth the oral cavity is sterile however, after six hours bacterial colonization starts with species mostly Streptococcus. The most commonly found species in infants is Streptococcus salivarius which mainly colonizes the tongue. Gradually as teeth starts to erupt, leads to the colonization of Actinomyces and diverse Streptococci species.

Metagenomics is a new molecular approach in genomic analysis used to detect DNA acquired from environmental samples, in order to study the microbial community. The analysis of microbial fingerprints in saliva left on the bite marks in a sexual assault case allows the adaptation of shotgun sequencing also known as Whole metagenome Shotgun Sequencing (WGS)¹¹.

Gender Determination

The potential use of cytological examinations of exfoliated buccal epithelial cells in saliva on bite- marks are used for sex determination of the perpetrator. Based on the successful efforts on blood stains, two parameters have been proposed (1) the presence and detection of sex chromatin. Barr bodies in females and F bodies in males. (2) Determination of sex hormone levels based on detectable quantities and ratios of testosterone and 17B estradiol by radioimmunoassay (RIA)⁴.

Amelogenin is an enamel matrix protein which regulate growth and maturation of hydroxyapatite crystals. Amelogenin gene is present on X (AMLE X) and Y (AMEL Y) chromosome. When Primers specific for intron 1 of the amelogenin gene are used, the X chromosome gives a 106 base pairs amplification product and the Y chromosome gives a 112 base pairs. Therefore, samples from male sources (XY) will show two bands on an agarose gel, while females (XX) will show only one band¹³.

Bite mark analysis

Saliva deposited on bite marks are analyzed for identification of suspect or victim. Due to elastic and distortable nature of human skin and lack of good impression medium, saliva left

in bite- marks are used as an alternative for bitemark analysis. Swabbing (single swab or double swab technique) are done to extract DNA present in salivary trace evidence. Recovery of biter's exfoliated epithelial cells in dried saliva stains can also be used in bite mark analysis.

Fletcher et al in 1984 described the use of ELISA technique with monoclonal antibody in detecting the presence of salivary immunoglobulin A up to 16 months old salivary stains for species identification¹⁴.

If the monoclonal Antibody results are poor, crossover electrophoresis and double gel diffusion technique can be used for the analysis of bite marks from non-humans where the biting animal is unknown.

Drug monitoring

The use of saliva in drug detection has been explored, especially in monitoring therapeutic drug concentrations and detection of impaired drivers. Peel et al in 1984 found measurable quantities of drugs in saliva extracted with methanol and analyzed by enzyme multiple immunoassay technique and gas chromatography¹⁵.

Salivary drug concentration can be correlated to free fraction of drug in blood. The drug enters the saliva by simple passive diffusion.

Drug wipe technique: The technique was introduced by Securetec (ottobrun, Germany) which monitor the presence of drug in saliva. Drug wipe is a pen sized immunochemical based test strip, wiping surfaces for recovering traces of drug. It detects drugs like cannabis, cocaine, heroin, morphine and benzodiazepines.

Drugs like amphetamine, phenobarbital and morphine can be detected in saliva by radioimmunoassay. Levels of Steroid hormone such as cortisol, cortisone and testosterone can be measured using saliva².

Salivary biomarkers

Salivary biomarkers may be used in forensics in general identification of people and in situations of mass disasters. By tracking the history of a particular disease of the victim from the hospital records and matching with the salivary biomarkers of those diseases and hence arriving at a positive identification. These biomarkers may be used to identify DNA that are not on any existing database¹.

Conclusion

Saliva has served as a primary diagnostic tool in forensics. Being an easily available bio fluid and noninvasive collection method its use over other biofluids are exceptional. It is a new

research area which needs to be further explored for its optimal utilization as an adjunct and confirmatory source of personnel proof and identification in forensic field.

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Tissue engineering in orthodontics

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Abstract

Tissue engineering provides a new era for therapeutic medicine; it is progressing very rapidly and extends to involve all tissues in our body. This article provides an introduction to the field of tissue engineering and its relevance in orthodontics and highlighting the challenges and opportunities at the crossroads of both fields. Tissue engineering strategies involve the application of a biomaterial scaffold to conduct tissue

formation, cells to effect tissue formation and biologically active factors to direct and promote tissue regeneration. Application of tissue engineering in orthodontics are in management of external root resorption, accelerated orthodontic tooth movement, tooth movement into intra bony defects, extending the envelope of discrepancy. Application in dentofacial orthopaedics are in management of dentofacial anomalies like cleft lip and palate and

hemifacial microsomia, temporomandibular disorders, newer approaches in distraction osteogenesis, rapid maxillary expansion. More intensive research is necessary and clinical randomized controlled trials with long durations should be performed to offer long term benefits to patients.

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► Introduction

The field of orthodontics and dentofacial orthopedics has always worked in synergy with technological innovations to improve diagnostic and therapeutic techniques for more precise outcomes. Orthodontic treatment of malocclusions is not without certain shortcomings like prolonged treatment time, apical root resorption, tooth movement limited within alveolar bone and difficulties to overcome periodontal defects.

Tissue engineering involves “the application of principles and methods of engineering and life sciences towards the fundamental understanding of structure-function relationships in normal and pathological mammalian tissues and the development of biological substitutes to restore, maintain, or improve tissue functions.”¹ This article provides an introduction to the field of tissue engineering and its relevance in orthodontics and highlighting challenges and opportunities at the intersection of both fields.

Tissue Engineering Complex

Tissue engineering strategies involve the application of a biomaterial scaffold to conduct tissue formation, cells to effect

tissue formation and biologically active factors to direct and promote tissue regeneration. Emerging applications of tissue engineering in dental and craniofacial tissues present increasing potential to impact orthodontic treatment.¹

Regenerative periodontal/bone therapies are broadly categorized as

a) Material based therapies

1. First generation- Biomaterial scaffold based approach: GTR membranes, calcium phosphate based materials
2. Second generation- Growth factor based approach: platelet- rich plasma, emdogain, BMP-2, PDGF, FGF-2

b) Stem-cell based therapies

1. Third generation- Mesenchymal Stem Cell (MSC) / osteoprogenitor cell-based approach
2. Fourth generation- Stem cell construction based approach: 3D cell construct
3. Fifth generation- Physiologically analogous tissue/ organ replacement approach: iPS cells, genetically modified MSCs³

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Biomaterial is defined as “a material intended to interface with biological systems to evaluate, treat, augment, or replace any tissue, organ or function of the body.”⁴ Biomaterials in tissue engineering has applications as scaffolds to support tissue formation within a defined volume. Other requirements of biomaterials for tissue engineering scaffolds are mechanical properties suitable for the application, the capacity to be easily processed into the required shapes and the ability to be sterilized with clinically acceptable techniques.

Bone tissue engineering employs degradable scaffolds, in which the scaffold provides initial mechanical support and facilitates tissue growth and then degrades as the bone tissue forms. Therefore no surgery is required to remove the scaffold and the developing bone tissue gets exposure to mechanical load as the scaffold degrades¹. Techniques of fabrication of scaffolds for tissue engineering are electrospinning, particulate leaching, emulsion templating, and additive manufacturing/three-dimensional printing. Examples of biomaterials used are metals, ceramics, and polymers.¹ Composite and hybrid materials can be used in tissue engineering scaffolds to get advantages of the constituent materials.

Tissue engineering can introduce cells to promote tissue repair through transplantation with a scaffold material or direct injection at the target site. Stem cells (SCs) are self-renewal cells that can differentiate towards various cells under suitable conditions. Various sources for harvesting SCs are muscles, dermis, bone marrow, adipose tissue, periosteum, blood, umbilical cord, synovial membranes and teeth. As extraction of primary teeth, premolar or third molar is common intervention in orthodontic treatment of malocclusions, sources of SCs from the teeth can be gained easily. Some studies have revealed

differentiation and proliferation potential of mesenchymal stem cells (MSCs) derived from dental pulp, periodontal ligament or human exfoliated primary teeth.

In bone tissue engineering, Mesenchymal Stem Cells (MSCs) are carried by an osteoconductive scaffold and differentiated to osteogenic cells using osteoinductive growth factors. They can be isolated from bone marrow and adipose tissue aspirates, and can be applied for regeneration or repair of craniofacial and musculoskeletal tissues.^{5,6} Genetic manipulation of adult somatic cells like fibroblasts is used to produce cells known as induced pluripotent stem cells (iPSCs), which are capable of developing into cell types from all three germinal layers. Due to this unique combination of pluripotency from an adult-derived cell source, iPSCs are considered as a potential cell source for tissue engineering.^{7,8}

Growth factors can be chemically tethered to a scaffold surface or can be incorporated into a scaffold and released in a controlled fashion. The biological activity of growth factors depends upon maintenance of a complex three dimensional structure which can rapidly denature upon release from a scaffold. Nucleic acid delivery is an alternative to protein delivery to inform tissue formation in tissue engineering. Nucleic acids encoding proteins can be developed and released from tissue engineering scaffolds.

APPLICATIONS OF TISSUE ENGINEERING

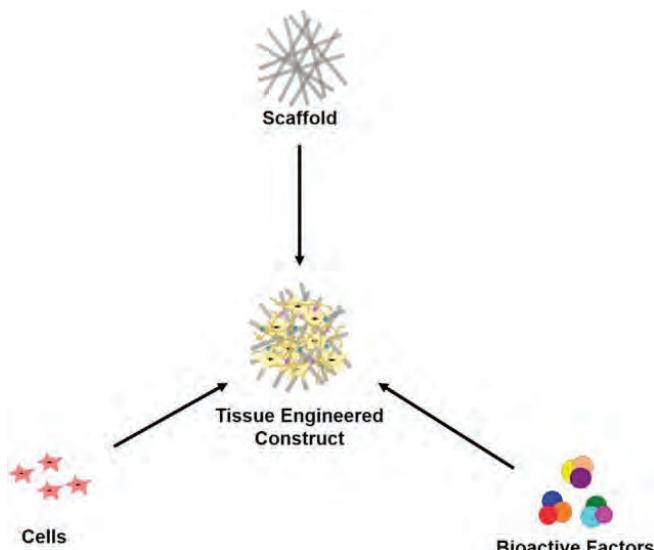
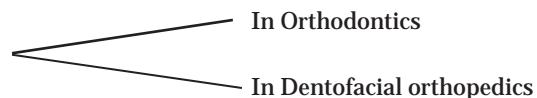
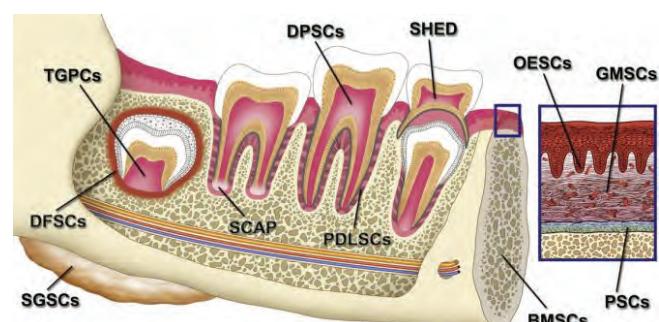


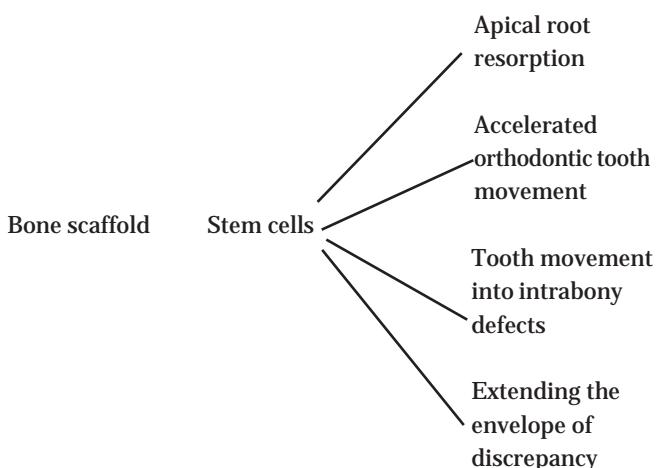
Fig. 1



Intra oral sources of Stem cells

Fig. 2: Sources of adult stem cells in the oral and maxillofacial region. BMSCs: bone marrow-derived MSCs from orofacial bone. DPSCs: dental pulp stem cells; SHED: stem cells from human exfoliated deciduous teeth; PDLSCs: periodontal ligament stem cells; DFSCs: dental follicle stem cells; TGPCs: tooth germ progenitor cells; SCAP: stem cells from the apical papilla. OESCs: oral epithelial progenitor/stem cells; GMSCs: gingiva-derived MSCs. PSCs: periosteum-derived stem cells. SGSCs: salivary gland-derived stem cells.

APPLICATIONS IN ORTHODONTICS



Apical Root Resorption

Apical root resorption is a common and unfavorable side effect of orthodontic treatment in which factors involved are genetics, individual biological variability, age, sex, orthodontic forces and duration of treatment. It may lead to loss of tooth structure such as cementum and dentin and even tooth loss. One possible treatment modality can be regeneration of resorbed roots by the application of SCs and tissue engineering.

It increases the longevity of tooth and has an important role in facilitating the treatment. MSCs derived from periodontal ligament (PDL) in *in vivo* transplantation produced cellular cementum-like hard tissue with embedded osteocalcin-positive cells².

Accelerated Orthodontic Tooth Movement by Tissue Engineering

Orthodontic tooth movement (OTM) is achieved by the remodeling of PDL and alveolar bone in response to mechanical loading. The initial inflammatory event at compression sites is caused by the constriction of PDL microvasculature which results in a focal necrosis, followed by the recruitment of osteoclasts from the adjacent marrow spaces. These osteoclasts are derived from hematopoietic SCs results in accelerated OTM by providing progenitor cells.

The development of newer methods to accelerate OTM has decreased treatment times, reduced adverse effects such as pain, discomfort, dental caries, and periodontal diseases, and minimized iatrogenic damages like root resorption and subsequent development of non-vital teeth. Increased PDL progenitor cells with decreased expression of type-I collagen (Col-I) were observed during application of orthodontic force, while after force withdrawal there was increase in Col-I expression suggesting that PDLSCs are able to respond to orthodontic forces with suppressed collagen expression. This

ability of SCs could be used to accelerate OTM in response to orthodontic forces.²

Periodontal regeneration through Tissue Engineering

Periodontal complications are one of the most important side effects of orthodontics which includes gingivitis to periodontitis, dehiscence, fenestrations, interdental fold, gingival recession or overgrowth, black triangles. Periodontal regeneration is defined as the formation of new cementum, alveolar bone, and a functional periodontal ligament on a previously diseased root surface. The recent treatment approaches include the use of surgery, guided tissue regeneration (GTR), bone fillers, growth factors and application of bioactive molecules to induce regeneration. Based on the differential potential capability and ability of renewal via mitosis, SCs have the quality to regenerate damaged tissues, so they can be used for regeneration of periodontium and for correction of infra bony defects.

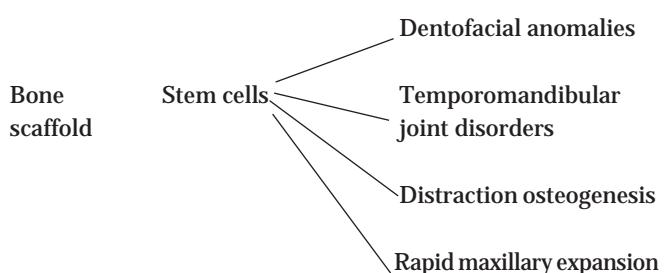
iPSCs implanted into a mouse periodontal fenestration defect model with a silk fibroin scaffold along with enamel matrix derivative gel, resulted in higher rate of cementum and alveolar bone formation¹⁰. Also, the bone marrow derived mesenchymal stem cells (BM-MSC)-treated wounds exhibited accelerated wound closure, increased re-epithelialization, cellularity, and angiogenesis.

Extending the envelope of discrepancy

The extent of OTM is limited by certain factors including the anatomy of alveolar bone, pressures exerted by the soft tissues, attachment levels of periodontal tissues, neuromuscular forces and lip-tooth relationships. The anteroposterior, vertical, and transverse millimetric range of treatment possibilities in orthodontics can be expressed as an “envelope of discrepancy.” Gingival recession occurs secondarily to alveolar bone dehiscence, if overlying tissues are stressed beyond this envelope during OTM.

The outcome of alveolar bone regeneration using SCs exhibited a tendency to enhance bone formation which might provide an approach for expanding limitations of envelope of discrepancy by increasing the extent of tooth movement¹¹.

APPLICATIONS IN DENTOFACIAL ORTHOPEDICS



Dentofacial anomalies

Stem cell-based tissue regeneration is an advanced and reliable therapeutic strategy for craniofacial tissue reconstruction¹². Cleft lip and palate is one of the most prevalent congenital anomalies which occurs from fusion failure of nasal process and oro palatal shelves.

SCs have the potential for bone regeneration in oral and maxillofacial region and reduces the alveolar bone defect size by bone formation and have less postoperative morbidity compared to autogenous bone grafting and they help the teeth in the defect area to erupt in their proper position¹⁵.

Hemi Facial Microsomia (HFM) is a rare, multi-systemic congenital disease resulting from the unilateral abnormal morphogenesis of the first and second pharyngeal arches. The typical features of HFM include unilateral hypoplasia of the craniofacial skeleton and its overlying soft tissue. Use of adipose derived stromal cells (ASCs) for soft tissue reconstruction enhances angiogenesis, improves the survival of grafts and thus reduces atrophy¹³.

Temporomandibular joint disorders (TMD)

The temporomandibular joint (TMJ) is comprised of both osseous and cartilaginous structures enclosed in a capsule that is lubricated with synovial fluid. It is an important growth site during postnatal development with two articular surfaces which can adapt to changing environmental conditions. The mandibular condyle grows by proliferation of the progenitor/SCs that differentiate into chondrocytes leading to formation and increase of cartilaginous matrix, which may be replaced with lamellar trabecular bone¹⁶. SCs can be used for maintenance of mandible in new position and repair of TMJ lesions.

TMJ is prone to injuries, osteoarthritis, rheumatoid arthritis, tumors and congenital anomalies. TMD manifests as pain, myalgia, headache and structural destruction together known as degenerative joint disease¹⁷.

The culture of human umbilical cord matrix (HUCM) SCs in growth medium containing chondrogenic factors demonstrated they can outperform the TMJ condylar cartilage cells¹⁸. Combination of polylactide acid discs with adipose tissue stem cell revealed the potential to develop a tissue engineered TMJ disc¹⁹.

Distraction osteogenesis(DO)

DO which is regarded as “endogenous bone tissue engineering” is done by creating a corticotomy, placing a rigid distractor across the cut bone and gradually activating the device. The mechanism of osteogenesis and gap repair initiated by an immediate inflammatory response leading to the recruitment

of MSCs and further differentiation into chondrocytes that produce cartilage and osteoblasts that produce bone. Long treatment periods and fibrous union or nonunion of bone are major draw backs. The injection of MSCs transfected with Bone Morphogenic Protein (BMP) demonstrated greater bone formation and earlier mineralization in the distracted callus, more mature medullary cavity, better bone quality and higher trabecular parameters at the second and fourth weeks of the consolidation period and acceleration of osteogenesis²¹.

Rapid maxillary expansion

Maxillary constriction can be associated with certain problems including occlusal disharmony, esthetics, functional difficulties such as narrowing of the pharyngeal airway, increased nasal resistance, alterations in tongue posture resulting in retroglossal airway narrowing and mouth breathing. RME is indicated in patients below 12 years, with lateral discrepancies involving several teeth, whether the constriction is skeletal, dental or a combination of both²². It is an effective orthopedic procedure to open up the midpalatal suture, providing adequate and stable increase in maxillary width and establish balance between the width of the jaws.

During RME, a gap in the midpalatal suture is created which is filled with blood and granulated tissue and followed by active bone formation. Study by Ekizer et al showed that locally applied MCSs to the expanded maxilla is a useful and practical treatment method to accelerate new bone formation in midpalatal suture and to shorten the duration of treatment and retention for patients undergoing orthopedic maxillary expansion²³.

► Conclusion

Tissue engineering offers new strategies in providing treatment alternatives to numerous orthodontic problems. The capacity of tissue engineering technology may increase with the complexity of the approach, the complexity of the regulatory pathway, the costs, and the timeline for clinical translation. More intensive research is necessary and clinical randomized controlled trials with long durations should be performed to offer long term benefits to patients. Bioengineered tooth itself may soon become a reality given the pace of current research and advancement in tissue engineering.

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Oral lichen planus – A case report

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Abstract

Lichen planus (LP) is a common chronic inflammatory muco-cutaneous condition, which was first described by Eramus Wilson in 1869. Although oral lichen planus in childhood is rare, this diagnosis should be considered in children presenting with oral white lesion. The purpose of this study is to report an unusual case of oral

LP involving the lip, gingiva, palate and buccal mucosa in a 9 year old female child. On clinical evaluation, multiple white lesions in buccal mucosa were observed with no cutaneous lesions. The patient is currently under medication and regular evaluation. Although a rare occurrence, early recognition and management of this

condition by dental practitioners can have a significant impact on the general health of affected patients.

Keywords: Juvenile Oral Lichen Planus, striations, basal cell degeneration, steroid

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► Introduction

Lichen planus (LP) is a common chronic mucocutaneous inflammatory disorder of unknown etiology which frequently affects the oral mucosa.¹ It was first described in 1869 by Erasmus Wilson as “lichen planus,” because the clinical appearance of these lesions is similar to lichens (i.e. symbiotic algae and fungi growing on rocks).² The disease occurs more commonly in women than in men with a female/male ratio of approximately 2 : 1. The reported prevalence of LP is up to 5%, while the prevalence of oral LP (OLP) is 0.1% to 2.2%.³ It is estimated that 50% to 70% of adult LP patients have both skin and oral lesions and approximately 25% of patients present with oral lesions alone.⁴

Andreasen (1968) divided oral lichen planus into six types: reticular, papular, plaque-like, erosive, atrophic, and bullous. The reticular, papular, and plaque-like forms are usually painless and appear clinically as white keratotic lesions. The erosive, atrophic, and bullous forms are often associated with

a burning sensation and in many cases can cause severe pain. The oral lesions are more pleomorphic than those of their cutaneous counterparts. The histopathology of LP shows variable hyperkeratosis, irregular rete ridge elongation, basal cell degeneration, and a band-like predominantly lymphocytic infiltrate in close proximity to surface epithelium.

Although a common disease, LP's exact cause remains unknown. An autoimmune basis has been proposed, as LP often occurs in association with other autoimmune diseases, such as lupus erythematosus, pemphigus, Sjogren's syndrome, autoimmune liver disease, rheumatoid arthritis and dermatomyositis. There is evidence suggesting, however, that LP is not a true autoimmune disease but rather a chronic, cell-mediated immune disorder involving activated lymphocytes and up regulated cytokine production. Both CD4 and CD8 cells are present but increasing numbers and activation of CD8 cells is thought to contribute to characteristic damage to the basal epithelium. Roles for genetic predisposition, stress, and

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environmental factors, such as infectious agents and systemic illnesses, also have been proposed.

While LP is widely recognized in adults, its occurrence in children is uncommon. In a study of 420 Iranian patients with histopathologically confirmed OLP, less than 1% had developed OLP before the age of 13.5. Several retrospective reviews, however, have estimated that only 1%-16% of LP patients are younger than 15 years old. Proposed factors responsible for this paucity of reports include a lack of patient and parent awareness of lesions, and misdiagnosis or lack of recognition by practitioners.

This paper reports a case of oral lichen planus in childhood and indicates the importance of considering lichen planus in

the differential diagnosis of hyperkeratotic lesions affecting the oral mucosa of children.

► Case Report

A 9 year old girl reported to the department of Pedodontics, Govt dental college, Trivandrum, with a chief complaint of pigmented lesion on lower lip, gingival and inner aspect of her cheeks (figs 1-4). Patient is hypothyroidic and is under treatment. Her twin sister is also under treatment for hypothyroidism but not having any similar intraoral lesions. A family history also failed to reveal the presence of any similar lesion in the immediate relation. On examination, she appeared healthy without any skin rashes. On intraoral examination, bilateral symmetric striations in the posterior buccal sulcus extending into the buccal mucosa were noted. Classic white, lacy



Fig 1



Fig 2



Fig 3



Fig 4

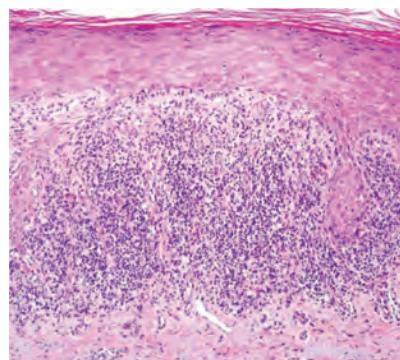


Fig 5



Fig 6



Fig 7



Fig 8



Fig 9

striations were noted on lower lip, hard palate and gingival. On palpation, lesion was non-tender and flat. There were no adjacent dental restorations and routine blood examination was normal. Microscopic image of lesion shows band-like lichenoid lymphocytic infiltrate with irregular saw tooth rete ridge, hypergranulosis and hyperkeratosis suggestive of juvenile oral lichen planus (fig 5).

Oral prophylaxis was done and oral hygiene maintenance reinforced. Patient was instructed to use topical application of Triamcinolone acetonide and candid cream. After one month, patient was reviewed and lesions has been subsiding to a great extend. (Fig 6-9). Patient is kept under regular follow-up.

► Discussion

Lichen planus (LP) is predominately described as a disease of the middle aged or older. Its occurrence in children has been increasingly observed. The global prevalence of LP is lower than 1% in overall population and the frequency in children can vary from 0.56% to 13% of the general lichen planus. In addition, the largest reported series of lichen planus in childhood (LPC) reported originates from India.⁶

Juvenile OLP occurred slightly more frequently in male patients (60%), particularly those 11 and 15 years old (60%). The buccal mucosa was the most commonly affected site (55%), although synchronous involvement of 2 or more sites (usually the buccal mucosa and tongue) was frequently observed.⁷ Most patients were affected by reticular OLP (64%), although it was not unusual to see 2 or more types occurring in a single patient. OLP is considered a premalignant lesion. The risk of malignancy has been estimated to be 0.4%–3.7%, which often develops after 10 years.⁸

There is a spectrum of oral lichenoid lesions (OLL) that can determine a differential diagnosis of OLP. OLL encompass several clinical settings: 1) Oral lichenoid contact lesions as a result of allergic contact stomatitis. The lesions are seen in close contact to dental restorative materials, most commonly amalgam, or other contacted agents; 2) Oral lichenoid drug reaction, wherein oral and/or skin lesions arise in temporal association with taking of certain medications, such as oral hypoglycemic agents, angiotensin-converting enzyme inhibitors, and nonsteroidal anti-inflammatory agents; 3) Oral lichenoid lesions of graft-versus-host disease, a common complication of allogeneic hematopoietic stem-cell or bone marrow transplantation

Important factors in the development of juvenile OLP include: (1) previous hepatitis B vaccination; (2) liver disease, including chronic active hepatitis and (3) genetic predisposition, such as familial LP.⁹ Milligan and Graham-Brown reported a

family history of LP in 1% to 2% of their juvenile OLP patients, whereas Cottoni et al found 1 of 5 (20%) of their juvenile OLP cases had a positive family history.¹⁰ Singal documented OLP in 1 family over 3 successive generations: an 11-year-old Indian boy, his father, and his grandmother. Based on this report, the author suggested an autosomal dominant basis for familial LP. Interestingly, reticular OLP is the most common form overall, while erosive and ulcerative OLP tend to predominate in familial cases. A number of human leukocyte antigen types also have been associated with familial LP. Regarding OLP, it appears that the erosive form is relatively rare in children as opposed to the adult population, in which erosive OLP is estimated to affect 39% of patients. The rarity of this form likely explains why most juvenile OLP patients are asymptomatic.

Pharmacologic treatment is often unnecessary in asymptomatic patients. In symptomatic patients, good oral hygiene should be encouraged as a means of reducing irritating factors such as plaque and calculus. Corticosteroids have been the mainstay of management of OLP; yet, other modalities like calcineurin inhibitors, retinoids, dapsone, hydroxychloroquine, mycophenolate mofetil and enoxaparin have contributed significantly toward treatment of the disease. Analysis of current data on pathogenesis of the disease suggests that blocking IL-12, IFN- γ , TNF- α , RANTES, or MMP-9 activity or upregulating TGF- β 1 activity in OLP may be of therapeutic value in the future.¹¹ The rationale behind usage of corticosteroid is their ability to modulate inflammation and immune response. They act by reducing the lymphocytic exudate and stabilizing the lysosomal membrane.¹² Topical midpotency corticosteroids such as triamcinolone acetonide, high-potent fluorinated corticosteroids such as fluocinonide acetonide, disodium betamethasone phosphate, and more recently, superpotent halogenated corticosteroids such as clobetasol are used based on the severity of the lesion.¹³ The patient and parents should be informed; however, that chronic use of topical steroids can lead to oral candidiasis. Systemic steroid therapy and dapsone are typically reserved for refractory and recurrent cases. Tacrolimus ointment, topical tretinoin, and topical cyclosporine also have been used with success in some cases.

► Conclusion

There is very little dermatology literature on the subject of Juvenile lichen planus, and even fewer reports in the dental literature. Although oral lichen planus in childhood is rare, this diagnosis should be considered in children presenting with oral white lesion. Periodic follow-up is required in all OLP patients, typically every 6 months to every year. This is especially important in the pediatric population as malignant transformation has been described in a small percentage of adult OLP cases in follow-up studies.

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Optimizing implant esthetics in maxillary anterior region using a customized impression coping: a case report

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Abstract

Restoration of a single implant in the anterior aesthetic zone is a challenging case for not only the clinician, but also for the lab technician as well. Immediate implant placement and immediate loading of a single tooth implant provides significant benefits compared with traditional delayed protocols. The correct three-dimensional positioning of the implant and proper management of the peri-implant soft tissues

is required to achieve and maintain the desired emergence profile. A technique is presented by customizing the impression coping to prevent soft tissue collapse or distension during the impression procedure, and accurately transferring the clinical situation to the master cast. This clinical report involves the extraction of a mobile anterior tooth, immediate implant placement and provisionalisation, and the

use of a customized transfer impression coping throughout impression making, to restore the tooth in an aesthetic manner. The purpose of this case report is to replace a single implant both functionally and aesthetically, thus satisfying the needs of the patient.

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► Introduction

A successful esthetic implant restoration should have an emergence profile that mimics the natural tooth¹. Today's world of implantology is not only concerned about prosthetic restorative options but also aesthetics that are identical to the contralateral natural healthy teeth. Replacing missing teeth especially restoring teeth in the anterior esthetic zone with implant supported restorations is a technique sensitive task and poses challenges for clinicians. So various guidelines have been put in place with regards to the planning, surgical execution and restorative phases of implant treatments in order to optimize the clinical results.

In the aesthetic zone, implants are placed 3 to 4 mm apical to the facial free gingival margin of adjacent teeth. This provides the space necessary to profile the prosthesis from a round implant platform to the three-dimensional shape of a tooth as it emerges from the soft tissue. Most healing abutments and impression copings are cylindrical in shape and do not mimic the contours of the natural teeth. The use of such components to make the final impression results in a master cast in which the soft tissue configuration around the implant platform is circular².

Several techniques have been reported for the accurate transfer of the intraoral peri-implant soft tissue developed by a provisional restoration which include use of provisional restoration as an impression coping^{6–9} and injection of impression material around a provisional restoration seated on a master cast¹⁰. The purpose of this report is to present a method for the precise transfer of the peri-implant soft tissue developed by customizing the impression coping during the impression procedure. Customized impression coping helps to minimize gingival distention or collapse during the impression process and results in more accurate information being transferred to the master cast.

► Case report

A 25 year old male patient presented with the chief complaint of mobility of upper front tooth (fig.1). He has observed tooth mobility 2 years ago and noticed frequent swelling of the gums with white discharge. The patient had no relevant medical history. He had undergone a traumatic injury involving this tooth 7 years back followed which orthodontic fixed appliance therapy was done 3 years before. Clinical and radiographic examination shows grade II mobility with respect to 11 along with periapical abscess. In the emergency phase the incision and

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drainage of the abscess followed by antibiotics was indicated. Periodic rechecking of the infected tooth was carried out and once the active infection subsided, various treatment options were discussed with the patient in details and the patient opted for the suggested implant placement. A CBCT scan (fig.2) was obtained in order to plan the implant placement protocol. Due to the absence of sufficient buccal bone, it was decided to go for immediate implant placement with simultaneous bone augmentation in the extraction socket. The complete treatment procedure was discussed with the patient and obtained consent to continue with the procedure.

Implant placement procedure

The surgery was performed under local anaesthesia. The tooth was extracted atraumatically using periotome (fig. 3) and the socket is thoroughly curetted and rinsed with sterile saline solution in order to remove any granulation tissues present. The osteotomy was created in a step-wise manner using burs of increasing diameters under copious external irrigation using saline. Care was taken to avoid the anatomic structures including the incisive canal by slightly distalizing the implant's placement. A 4.0 mm diameter and 16mm long endosteal root form implant (champions implant) was placed in the fresh extraction socket with a 40Ncm final torque (fig. 4). Radiographic investigation was performed during and after implant placement. The 16 mm dental implant guaranteed the primary stability, extending the preparation 4 mm further from the apex level of the extracted

tooth. The jumping distance or gap distance i.e the distance between the implant body and extraction socket wall was found to be greater than 1.5mm, which was filled with particulate graft and covered with collagen membrane (fig. 5) (fig.6).

Adequate primary stability of the implant was achieved (Insertion torque 40N/cm) for immediate loading. A screw retained provisional crown was fabricated using tooth coloured acrylic resin and was hand tightened onto the implant to a torque of 15 N/cm and the screw channels filled with cotton and Teflon tape and sealed with temporary cement (fig.7). An ideal emergence profile was developed in the provisional screw-retained restorations which were placed in the patient to finalize the surrounding soft tissue healing and adjustments were made to ensure the prosthesis was out of occlusion. Centric and lateral occlusal contacts were eliminated to minimize non-axial loading. Postoperative antibiotics and analgesia were prescribed for 5 days and Oral hygiene instructions were given to the patient. The patient was placed on a soft diet and followed up at 2 weeks, 4 weeks and 8 weeks. The healing was uneventful (fig.8).

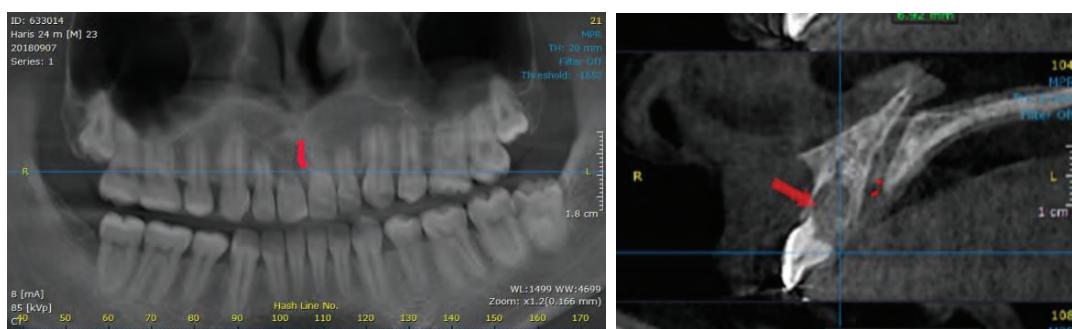
Fabrication Of Customized Impression Coping

Upon removal of the provisional crown, the peri-implant soft tissue collapses immediately and support of the peri-implant soft tissue is needed in order to prevent this collapse to ensure the transfer of correct information to the lab technician. The



Fig. 1 Pre-operative photographs of the patient

RADIOGRAPHIC EVALUATION



- CBCT shows:**
- Labio - palatal bone between 4.45 to 6.30mm
 - Superio - inferior height upto 16mm (2mm short of anatomical landmarks)

Fig. 2 Radiographic evaluation with CBCT

temporary crown is removed from the patient's implant and fixed to an implant replica or lab analog. The soft tissue along the provisional crown is marked with a pencil and a lab putty material is used to take an impression of the emergence profile of the crown. Once the material is set, remove the provisional crown and the impression coping is then inserted in the place of the temporary crown on the lab analog and the temporary crown returned to the oral cavity in order to prevent peri-implant soft tissue collapse during the preparation of the customized impression coping. The space between the impression coping and putty material is filled with pattern resin to capture the emergence profile of the temporary crown (fig. 9). The customized impression coping now supports the surrounding tissues identically to the provisional for the final impression. An open-tray impression was taken with impression materials and once the impression is removed, an analog is attached to the impression coping thus a soft-tissue model is made and

sent to the lab for the fabrication of full ceramic crown (fig. 10).

Jig trial or verification jig was tried to ensure the final screw-retained framework for the optimum passive seat as well as to verify that the master model is accurate prior to manufacturing the framework (fig. 11). The final restoration was delivered within a few days. The definitive restorations were torqued and the screw channels were filled with Teflon tape and composite resin (fig. 12). Radiographs were taken to confirm the seating and occlusion was re-checked. The patient was recalled in a week for a follow-up to evaluate the shape of the peri-implant soft tissues. The final result met all the criteria and was seen as a successful outcome. The patient was placed on an implant maintenance program in order to closely monitor the implant stability, occlusion, peri-implant soft tissues and general oral health.



Fig 3 Extracted tooth(11).



Fig 4 Implant placement done.



Fig 5 Collagen membrane placement.



Fig 6 Gap distance covered with particulate graft.



Fig 7 Immediate loading done with screw-retained provisional crown.



Fig 8 Healing after 6 months.



Fig 9 Customization of impression coping using pattern resin.

► Discussion

The emergence profile of an implant-supported restoration has a significant effect on the hygiene, peri-implant health, and esthetics of the prosthesis¹¹. This article has described an alternative impression technique for implant restorations in the aesthetic zone. Conventional approaches for making impressions of implants use impression copings at either the fixture or the abutment level. Because impression copings are cylindrical in shape, they cannot replicate the soft tissue around an implant accurately. Therefore, it is difficult for the dental technologist to create an ideal emergence profile which may compromise the final esthetics of the definitive restoration. A properly contoured provisional prosthesis is the best approach to sculpting the periimplant soft tissue and the final prosthetic reconstruction must follow soft tissue modifications established with the provisional restoration. This article has illustrated the customization of impression coping for obtaining an emergence

profile cast. It aids the laboratory technician in developing the emergence profile from the implant platform to the cervical third of the clinical crown, whereas the master cast is used for the accurate implant position, contact point, occlusion, and final crown contour.

Several techniques for transferring the peri-implant soft-tissue emergence profile from a provisional to a final prosthesis have been reported.

Jansen⁶ et al fabricated two identical provisional restorations and used one of them as a transfer impression coping. This technique does not account for chairside modifications to the provisional restoration to accomplish the optimum emergence profile.

Attard and Barzilay⁹ described a method in which the



Fig. 10 Customized impression coping were re-inserted and impression made using elastomeric impression material.

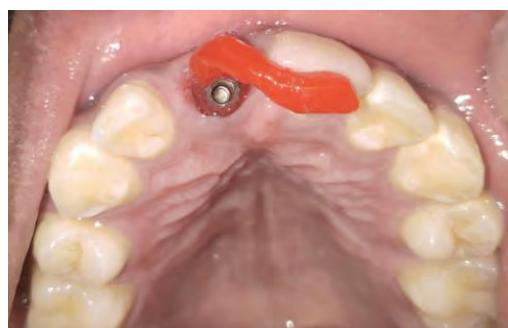


Fig 11 Jig trial verification.



Fig 12 Final definitive prosthesis.

provisional restoration is used as an impression coping for the final impression. However, this technique requires that the patient be without the provisional restoration for approximately 1 hour, the time needed for the pouring of the impression and hardening of the dental stone. In addition, the provisional restoration is modified (acrylic dimples) to confirm the proper seating and stability necessary during vibration pouring of the master cast. This is because of the need to obtain an accurate transfer of the implant antirotation feature in the master cast.

Hinds³ et al also approached a similar method of customizing the impression coping for an exact registration of the healed tissue. In this approach, the patient has to be without the prosthesis as the customized impression coping is made in the laboratory. Inaccuracies are incorporated in this indirect technique because of the volumetric changes in all the materials used. Additionally, the patient soft-tissue profile may collapse during the waiting period, resulting in discomfort when the provisional restoration is reinserted.

Elian¹⁴ et al also illustrated a method for the precise transfer of the peri-implant soft-tissue developed by a customized provisional restoration to an emergence profile cast. A simple technique for obtaining an emergence profile cast. All the studies mentioned above obtained in conclusive results.

In the technique described in the present article, it only requires approximately 5 to 6 minutes to fabricate this custom impression coping. Thus, in just a few minutes an accurate coping can be made that will ultimately save the clinician chair time when the permanent restoration is delivered. This will allow the laboratory technician to fabricate a restoration that fits precisely with proper contour, function, and esthetics.

► Conclusion

Successful and predictable maxillary single tooth replacement can be achieved with proper case selection and attention to both surgical and prosthetic technique. Extraction followed by immediate implant placement and loading of provisional crown can allow for the preservation and maintenance of hard and soft tissues. The custom made impression coping technique described is easy to implement and is an accurate method of recording the soft tissue contours achieved during the temporization stages. This technique easily transfers important three dimensional information to the laboratory in order to fabricate final restorations whose contours duplicate those developed in the provisional restorations.

► Summary

The case reported here described the extraction of a fractured central incisor, and simultaneous implant placement and

immediate loading. The use of a customized impression coping was employed. An aesthetic final result was achieved, satisfying both the patient and clinician.

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Esthetic root coverage procedure with coronally advancing flap and barrier membrane: A case report

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Abstract

Gingival recession is defined as the apical migration of the gingival margin beyond the cementoenamel junction (CEJ), which results in the exposure of tooth roots which is aesthetically displeasing and can also result in tooth hypersensitivity. A number of surgical procedures have been used to obtain root coverage. Several surgical techniques including pedicle flaps and free

soft-tissue grafts have been indicated for the treatment of gingival recession defects with different success rates. Localized gingival recessions can be managed with various root coverage procedures, more specifically, using the coronally advanced flap with distinct designs. The aim of the present article was to evaluate the coverage of labial gingival recession defects with coronally

advanced flap procedure using barrier membrane.

Key words: Coronally advanced flap, gingival recession, root coverage

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► Introduction

Over the past few decades, a myriad of surgical techniques that include pedicle and free soft-tissue grafting techniques have been introduced to correct recession defects. These techniques have exhibited varying degrees of success owing to the selection of the appropriate technique. Coronally advanced flap (CAF) is a suitable technique that produces good results in treating gingival recession with adequate apical keratinized tissue. Some of the pioneers who have proposed different CAF techniques are Allen, Miller, Zucchelli, and De Sanctis.¹

There are number of etiological factors leading to gingival recession such as inflammatory periodontal disease, trauma from faulty tooth brushing, occlusal trauma, high frenal attachment, tooth malposition or root prominence leading to the thinning of bony plate, orthodontic tooth movement in unusual direction, underlying alveolar bone dehiscence, thin gingival biotype etc.²

The present case report shows a successful root coverage achieved by CAF with barrier membrane (collagen membrane)

in Miller's class I recession defects in maxillary central incisors. To avoid second surgical wound site and soft tissue harvesting, biological factors or biomaterials are being developed and used, such as enamel matrix proteins, guided tissue regeneration, acellular dermal matrices, platelet-rich plasma and fibrin, and human fibroblast dermal derivative cells. Collagen membrane type 1 and 111 derived from porcine and bovine, are most commonly used barrier membrane.³

► Case report

A 40-year-old male patient with no relevant medical history reported to the Department of Periodontology KMCT Dental college, Mukkam, Kozhikode with a chief complaint of sensitivity in upper front tooth region for the past 2 months. On clinical examination, reveals Miller's class I recession in 11 and 21 (Fig. 1). A thorough case history was taken, and the periodontal parameters such as probing depth, recession depth, clinical attachment level, and height of keratinized gingiva were recorded. An informed consent and routine blood investigation reports were obtained from the patient.

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Scaling and root planing was performed 1-week before the surgical procedure.

► Surgical procedure

Local anaesthetic, 2% lignocaine hydrochloride containing adrenaline at a concentration of 1:80,000 was used. An intra-sulcular incision made on 11 and 21 (Fig. 2). vertical releasing incision placed at the line angle of 12 and 22 (fig.2)

till mucogingival junction and a full thickness mucoperiosteal flap was elevated using periosteal elevator till the mucogingival junction (fig. 3), to get a passive coronal positioning of the flap. The root surface was instrumented with curettes and irrigated with sterile normal saline solution. Barrier membrane was reshaped and trimmed to accommodate until at least 2mm apical to bony margin (Fig. 4). Overlying flap was advanced coronally and completely cover the membrane (Fig. 5). The flap held in



Fig. 1 Pre-operative view



Fig. 2 Incisions placed



Fig. 3 Flap reflected



Fig. 4 Barrier membrane



Fig. 5 Sutures given



Fig. 6 Periodontal pack



Fig. 7 Post operative view

position with interrupted sutures and holding sutures (Fig. 5). Periodontal pack (Coe-pak) was applied over the site (Fig. 6).

The patient was instructed to avoid any mechanical trauma at the wound site. Antibiotics and analgesic prescribed for 5 days and suture removal done after 10 days (Fig. 7)

► Discussion

Root exposure as sequelae of isolated recession presents as an esthetic concern to the patient. In addition, along with these defects, dentin hypersensitivity, persisting gingival inflammation, and root caries are commonly observed. Periodontal plastic surgery is indicated in such situations for better clinical outcome and appearance. At present, there are many techniques available for root coverage such as free gingival autografts, coronally repositioned flaps, CTG, and lateral pedicle flaps.

These surgical approaches were performed to attain a reduction in recession depth and gain in clinical attachment level and also to enhance the width of keratinized tissue.^{4,5} Free gingival graft has, however, shown unpredictable long-term success for root coverage in terms of color match and texture.⁶ Excessive tissue thickness as a result of CTG is considered as a post-operative complication,. limitations of this technique are bleeding from the donor site and pain sensations in the palate.^{7,8}. Due to these restraints, like donor site morbidity and second surgical site, many biological membranes have been used within the past decades. Clinically relevant root coverage has been obtained by these membranes.^{9,10}

In the present case, collagen membrane was used to treat the isolated gingival recession. The membrane was found to have integrated well into the recipient tissues without complications or any allergic reactions observed.

► Conclusion

The technique of coronally advanced flap is reliable for the treatment of gingival recession as root coverage was observed in both the cases. The advantage of using this technique for

root coverage was no post-operative discomfort, good blood supply, good color matching, stable result and resolution of dentinal hypersensitivity. This case report indicates that teeth with multiple gingival recessions, associated with toothbrush trauma can be successfully treated by the coronally advanced flap. Membrane was observed to be integrated well within the recipient's connective tissue and yielded good results. Gingival thickness and the keratinized gingival width were also increased with enhanced esthetic outcome. Overall patient's comfort and acceptance were satisfactory

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Management of periodontal-endodontic lesion by regenerative approach: Case reports

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Abstract

Endo perio lesion has been one of the most common problems associated with the tooth. The simultaneous involvement of pulpal problems and inflammatory periodontal disease can complicate diagnosis and treatment planning. An endo-perio lesion can have a varied pathogenesis which ranges from quite simple to relatively complex one. When a periapical lesion communicates with

a deep periodontal pocket, the etiology can be either endodontic or periodontal. Successful therapy will only result from the establishment of an accurate diagnosis and forming such a diagnosis requires a methodical multi-staged approach. The present case reports describes localized primary periodontal lesion with secondary endodontic involvement in maxillary molars. Its management was done by root

canal therapy followed by periodontal regenerative procedure using Guided tissue regeneration technique.

Keywords: Endodontic-periodontal lesion, guided tissue regeneration, root canal therapy

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► Introduction

Pulp-periodontal interrelationship is one in which “there are so many pathways of communication that one is tempted to put aside the notion of two distinct anatomical structures and consider them as a single continuous system.”¹ Pulpal infection may cause a tissue destructive process that proceeds from the apical region of a tooth toward the gingival margin. The relationship between periodontal and pulpal disease was first described by Simring and Goldberg in 1964 as Pulpodontic-periodontic syndrome.² This syndrome can be initiated by either pulpal or periodontal disease and may manifest pulpal and periodontal symptoms.³

The vast majority of pulpal and periodontal diseases are caused by bacterial infection. It has been suggested that cross-infection between the root canal and the periodontal ligament can occur via the anatomical (apical foramen, lateral and accessory canals, dentinal tubules and palato-gingival grooves) and non-physiological pathways (iatrogenic root canal perforations and vertical root fractures).⁴ These pathways determine the spread of infection. Periodontal disease causes destruction of bone in a coronal-to-apical direction while direction of the endodontic lesions is from apex to coronal. When the pulp is

infected, it elicits an inflammatory response of periodontal ligament. However, the effect of periodontal inflammation on the pulpal tissue remains controversial.⁵ Clinically, the pulp is not affected by periodontal disease until accessory canals are exposed to the oral environment or microvasculature of the apical foramen is damaged.⁶

► Classification

The most commonly used classification was given by Simon, Glick and Frank in 1972, which includes⁷:

1. Primary endodontic lesion
2. Primary periodontal lesion
3. Primary endodontic lesion with secondary periodontal involvement
4. Primary periodontal lesion with secondary endodontic involvement
5. True combined lesion

Protocol for management of periodontic-endodontic lesions are:

1. Preliminary phase
2. Phase I therapy with scaling and root planning, root

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canal therapy followed by antimicrobial therapy and occlusal correction by selective grinding.

3. Re-evaluation phase

4. Phase II surgical therapy- Invasive regenerative and periodontal plastic surgical procedures.

5. Restorative phase

6. Maintenance phase

Present cases according to Simon's classification manifested as primary periodontal with secondary endodontic lesions. These cases are treated with the above protocol.

► Case reports

Case I

A female patient aged 40 years complained of pain and pus discharge from right maxillary second molar since 3 months. She was systemically healthy and medical history was non – contributory. On clinical examination, there was generalized

plaque and calculus. Grade II mobility with draining pus through gingival sulcus in relation to 17. Probing pocket depth of 11mm, 12mm, 10mm and 4mm was recorded respectively on mesial, buccal, distal and palatal aspects of the maxillary second molar.(Fig 1) Tooth was non carious and non-vital as it didn't respond to thermal or electric pulp tester. Intra-operative periapical radiograph (IOPAR) showed a deep bony defect on mesial and distal aspect of tooth 17 extending till root apex (Fig.2). Based on clinical, and radiographic examination, a diagnosis of periodontal lesion with secondary endodontic involvement was made for tooth 17.

► Management

Emergency treatment was done, which included abscess drainage with administration of antibiotic regimen and analgesics for 5 days. On next appointment, phase I therapy with full mouth scaling and root planing was done followed by

Case I



Fig. 1 Pre operative assessment



Fig. 2 IOPA shows periapical radiolucency



Fig. 3 Full thickness mucoperiosteal flap –Defect extending till root apex



Fig. 4 Root biomodification with tetracycline done



Fig. 5 Placement of Demineralized bovine bone matrix (Osseograft)



Fig. 6&7 Placement of PRF and collagen membrane placement



Fig. 8 Sutured with 3-0 silk suture suture



Fig. 9 Post op -6 months



Fig. 10 Post op IOPA

occlusal reduction and root canal treatment in relation to 17.

Re-evaluation of patient after 1 week showed decrease in swelling and inflammation. Phase II surgical therapy was done in relation to 17. 2% local anaesthesia with 1:200000 adrenaline as administered. Vertical releasing incision was given at distal line angle of 15 and sulcular incisions from 15 to 18. A full thickness mucoperiosteal flap was raised. Circumferential bone defect extending till apex with root dehiscence was observed in relation to tooth 17 (Fig.3). Degranulation done and thorough root planing was done with Hu-Friedy Gracey curettes. Root biomodification done in relation to 15-18 (fig 4). Demineralized bovine bone matrix derived type I collagen (Osseograft) (fig.5) and platelet concentrate PRF were placed (fig 6) and root dehiscence was covered by resorbable collagen membrane (Periocol). (fig 7) Flap was sutured with 3-0 silk suture and Coe-Pack was placed (Fig.8). Post operative instruction with medication were given. After 1 week Coe pack and sutures were removed and soft tissue healing was satisfactory. At 3 months, it was observed that mobility of tooth was reduced from Grade II to Grade I. At 6 months (Fig.9) Probing pocket depth was reduced to 5mm, 7mm, 5mm and 2mm respectively on distal,

buccal, mesial and palatal side. Radiograph shows bone fill in relation to 17. (Fig:10)

► Case II

A 56-year-old female patient complaint of bleeding and receding gums throughout the mouth and recurrent pain with root exposure in relation to upper right first molar since 8–9 months. (Fig 1) History revealed vigorous horizontal scrubbing brushing method, progressive apical migration of the marginal gingiva in relation to 16. On clinical examination Miller class 4 recession with probing pocket depths (7–6 mm) could be appreciated. There exhibited complete exposure of the disto buccal root, loss of vitality (upon electric pulp test), Grade III furcation involvement with Grade I mobility in relation to 16

► Management

Endo-perio inter-disciplinary treatment approach was planned. Phase I therapy with scaling and root planning, roll method of brushing, and occlusal corrections, followed by endodontic treatment. Patient were recalled after 2 weeks. There observed reduction in gingival inflammation, with no marked reduction in probing depth. Patient were planned for phase II

Case II



Fig. 1 Pre Operative Assessment



Fig. 2a Initial Probing Depth- 7mm



Fig. 2b Pre IOPA



Fig. 3 Full thickness mucoperiosteal flap elevated –Defect extending till apex



Fig. 4 Distobuccal Root Resected



Fig. 5 Placement of Hydroxyapatite graft (Symbograft)



Fig. 6 PRF membrane placed



Fig. 7 Flap displaced laterally and Sutured



Fig. 8 Post Op 1 week



Fig. 9 Post op 3 months



Fig. 10 Post IOPA

surgical therapy with resection of distobuccal root and periodontal surgery for coverage of partially visible mesiobuccal root.

Vertical incision along the distal line angle of the second premolar was taken, so that the width of reflected flap was one and a half times wider than that of the recession. Full thickness flap was raised up to mucogingival junction, to achieve coverage by flap without tension (Fig. 3). Affected tooth had a completely denuded and prominent distobuccal root, which could hinder the treatment outcome. Hence, the distobuccal root was resected using a tapered fissure bur (Fig. 4). The mesiobuccal root and palatal aspect were still embedded within bone and probably this was the reason for Grade-I mobility despite extensive bone-loss. Subsequently, lateral pedicle flap from the adjacent premolar, along with bone graft, was planned.

Synthetic alloplastic hydroxyapatite bone graft and platelet concentrate PRF was placed, to fill the depression after root resection (Fig 5,6). Flap was then displaced laterally and carefully stabilized with interrupted suture. (Fig 7)

Periodontal dressing was given over aluminium-foil on the site. The patient was given postoperative instructions and medications (Amoxicillin 500 mg t.d.s for 5 days and paracetamol 625 mg b.d. for 3 days after the consultation with his treating physician), and chlorhexidine mouth-wash twice daily for 10 days. The patient was recalled after 10 days for suture removal and check-up (Fig 8). There was no postoperative complication and healing was satisfactory. The defect created at the donor site was healing by secondary intention. The patient was instructed to use a soft toothbrush. He was monitored on a weekly schedule postoperatively, to ensure good oral hygiene of the surgical area. The re-evaluation of this area at 3-month follow-up showed no relapse. (Fig 9). The healing was uneventful. The cervical abrasion on the buccal surface was restored with light cure composite resin.

► Discussion

The diagnosis and prognosis of the tooth having endo-perio lesions presents a challenge to the clinicians. Correct diagnosis is important to determine the treatment and long term prognosis. The simultaneous existence of both endodontic and periodontal tissue destruction can complicate the diagnosis and subsequently affect the prognosis of the involved teeth 8. This highlights the importance of following a critical diagnostic strategy to ensure a correct treatment plan. It also requires thorough understanding of wound healing process involving both complex tissues.

Treatment of endo-perio lesion requires both endodontic treatment and periodontal regenerative treatment. The treatment strategy is to first focus on debridement and disinfection of the

root canal system followed by an observation period. The goal of periodontal surgery is to remove all necrotic tissues from the surgical site and facilitate the regeneration of hard and soft tissue along with the formation of new attachment apparatus 9.

In first case, there was no carious lesion in relation to 17; however tooth was associated with deep periodontal pockets and was non vital. Radiographic examination showed advanced periodontal bone loss in relation to 17 suggestive of periodontal lesion with secondary endodontic involvement according to Simons Classification. Three main pathways have been implicated in the development of periodontal-endodontic lesions: apical foramen, lateral and accessory canals and dentinal tubules.^{10,11} Main cause of the periodontal lesions is the presence of bacterial plaque formed by aerobic and anaerobic microorganisms. Lindhe et al¹² reported that bacterial components of the inflammatory process may reach the pulp when there is accessory canal exposure or through apical foramen. Rubach and Mitchell¹³ also suggested the possible role of accessory canals in the pathways of periodontal lesion with secondary endodontic involvement. In this case a possible source of pulpal necrosis in absence of carious lesion could be ingrowth of periopathogens from periodontal pocket into pulp via lateral or accessory canals.

In the second case vigorous brushing technique, assumed to be the main etiology for recession, was corrected first. The loss of the proximal interdental tissue and prominence of root are important factors, which affect the successful outcome of the treatment. Furcation further aids in progression of the disease. Prominent distobuccal root was completely resected and the prominence of the root-trunk was also reduced. The tooth was having Grade I mobility only, because of sound bone around palatal root. Hence, almost complete recovery could be achieved.

The advantages of pedicle graft are that predictable correction of gingival recession is possible as the graft has an uninterrupted blood supply from its base, and that postoperative discomfort is usually minor because no second surgery or another surgical site is involved. Also, the color of the graft matches the adjacent gingiva so, this technique provides good esthetics. Shrinkage of the displaced flap has been observed which has been compensated by taking one and a half times wider flap design and placement of margin almost 2 mm coronal to cemento-enamel-junction (CEJ). Bone graft was placed in order to provide scaffold and compensate the depression in the ridge due to root-resection.

Treatment of combined endodontic periodontal lesion requires a root canal treatment for healing endodontic component followed by periodontal regeneration. In this case

similar treatment plan was followed. Guided tissue regeneration (GTR) therapeutic protocol involves surgical placement of cell occlusive membrane facing the bone surface to physiologically seal off the site and create secluded space. It provides with an environment for the osteoprogenitor cells and expression of the osteogenic activity. In the first case we have used bioresorbable collagen membrane which have several desirable properties like cell adhesion, chemotactic and adhesive properties for a regenerative procedure. Previously mentioned reports in the literature have found clinical advantage of using bone graft in combination with collagen membrane.^{14,15} In present cases we used Xenogenic demineralized bovine bone matrix derived Type I collagen which have osteoconductive and osteoinductive properties and Alloplastic Hydroxyapatite crystals shows osteoconductive properties, which act as a scaffold for the in-growth and subsequent deposition of the new bone. Similar to our case, Verma et al¹¹ and Agarwal et al¹⁶ also illustrated successful treatment of endo-perio lesion by root canal treatment, following which periodontal surgery using collagen membrane and bone grafting.

► Conclusion

Endodontic periodontal lesions presents a diagnostic and treatment challenge. It can be successfully managed by root canal therapy followed by periodontal therapy. Guided tissue regeneration techniques using alloplastic membrane and resorbable collagen membrane can be effectively used in its treatment.

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Conflicts of interest

There are no conflicts of interest

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Association News

► CDH REPORT



Dr Subash K. Madhavan
Chairman CDH

World Geriatric Day

IDA Kerala State conducted World Geriatric day on 01-10-2019 was hosted by IDA Malanadu at Divya rakshayam, mylacobambu, Thodupuzha.

Dr Litto Manual, president IDA Malanadu welcomed the gathering.

Dr Jino Mathew Vaidhyan, Vice President IDS KSB, presided over the function.

World Geriatric day message was conveyed to the audience by Dr Subash Madhavan, CDH chairman IDA KSB.

Dr Alias Thomas handed over a cheque to the institute as charity.

Dr Ciju A Poulose, IPP IDA KSB, handed over medical aids, 2 wheel chairs to the institute.

Dr Muralikrishna R proposed the vote of thanks.

After the inauguration ceremony, dental camp was organised, around 200 inmates were screened at the dental camp and treatment

was given to the inmates in free dental clinic run by IDA Malanadu at the institute.

Mouth cancer awareness day

IDA Kerala state conducted Mouth cancer awareness day on 19/09/19 was hosted by IDA CMB at Cheemeni Open prison. The program and Free dental clinic with 2 dental chair was inaugurated by cheemeni Panchayath President Smt K Shakunthala. Dr Abhilash GS presided the function. Dr Subhash Madhavan spoke on the relevance of the day. Posters and pamphlets regarding oral cancer awareness was released by Sri. P ajaykumar superintendent of cheemeni open prison. Awareness vehicle was flagged off by Dr Anil Thunoli 2nd VP IDA KSB. Dr Subhash Madhavan delivered Antitobacco pledge. Oral cancer awareness talk was carried out by Dr varum Nambiar. Oral cancer screening was conducted among the inmates of cheemeni open prison. The program was felicitated by Smt MV Geetha, Subhash arukara, Ratheeshan K, K Shivaprasad, Mr Hassan. Dr Prabhath proposed the vote of thanks



► Attingal Branch

WOMENS WING 4th TRI MONTHLY REPORT (From 1st Oct – 15th Dec)

As a part of CHILAMBOLI cultural fest 2019, WDC Attingal branch members made a very enthusiastic participation in various competitions and had won prizes. Program was held at IMA house, Kaloor, Kochi on October 20th of 2019. Our branch did a skit named "CHILAMBOLI EXPRESS". On Stage events participated were Song solo, Dance Group, Monoact, Mimicry, Fashion show.

Off Stage Events participated were for Adults BottlePainting, Miniature Arts and for kids in painting. Participants were Dr. Jessi, Dr. Anjana, Dr. Pratheeksha, Dr. Arya Raj, Dr. Arya Chand, Dr. Rakhee, Dr. Dhrishya, Dr. Monila Mohan, Dr. Adheena and Ridhika R.R.

Monoact 2nd Prize

Mimicry 2nd Prize

Fashion Show 2nd Prize

Group Dance 3rd Prize

Bottle Painting Adults 2nd Prize

Painting Kids 2nd Prize



► Coastal Malabar Branch

CDE PROGRAMS

IDA Coastal Malabar Branch conducted TENTH CDE PROGRAM at K K Residency Payannur on October 27th. The topic was BASICS OF CBCT FOR GENERAL PRACTITIONERS. The faculty of the program was Dr. Junaid Ahamed & Dr Nandita Shenoy. It was an inter branch CDE. The eleventh CDE program of IDA coastal Malabar branch was a two day inter Branch CDE with live Demo and Hands On, held on 16th and 17th November 2019 at Hotel K.K Residency Payanur. Topic of the CDE was TIPS AND TRICKS OD DAILY ENDODONTICS AND CLASS II COMPOSITE RESTORATIONS. Faculty was Dr. Rajeeve S Pillai.

CDH ACTIVITIES

IDACoastal Malabar Branch conducted CDH activities like dental checkup and treatment camps, awareness classes at Peelikode on 13/10

/07/19, at GMUPSPerumba on 16/10/19 and on 03/12/19 at St Marys special school Pariyaram.

OTHER PROGRAMS

IDA Coastal Malabar branch conducted a branch tour to Goa on 12th and 13th October. Third and fourth issue of our Journal MIRROR has been released on October 21st and November 27th respectively. In addition to that ninth and tenth issue of monthly News Letter of IDACoastal Malabar Branch about the activities of branch has been released. IDA CMB participate in the zonal and state cricket tournament held at Kannur and Perinthalmanna respectively. An EOQM was held on October 21st for head office election. Sixth Executive Committee meeting was held on 18th November at K K Residency Payannur. AGM was held on November 27th at Nalanda resorts, Nileshwaram.



► Malanadu Branch

Executive meeting: 21-11-2019: 7th executive meeting was held at hotel kabani, muvattupuzha

05-12-2019: 8th executive meeting (Emergency executive meeting, condolences meeting of late Dr Anoop Varghese) was held at the residence of Dr Ciju A poulose (Arackal House).

CDE Activities: 08-12-2019 & 09-12-2019: Two day CDE and Hands on program "STOMA 2019" surgery training in oral & Maxillofacial advances was organised in association with Mar Baselius dental college, kothamangalam.

CDH Activities: 01-10-2019: World geriatric day was observed in association with IDA kerala state at Divyarakshayam, Mylakolombu, Thodupuzha. As part of the event wheel chair, toilet stools were donated to the institute. Breakfast was arranged for all the inmates of the institute.

11-10-2019: Dental camp was arranged in association with Junior Red cross at Government GHSS, Perumbavoor. Dental screening, awareness classes for students, awareness classes for teachers and dental kit distribution was done as part of the camp. 200 students were screened during the dental camp.

PUBLICATIONS: 21-11-2019: 4th issue of Malanadu dental journal was released Dr Marilyn Alias during the executive committee meeting

06-12-2019: 2nd issue of bulletin "Reflections" was released by Dr Alias Thomas

Sports Activity: 24-11-2019:

IDA Malanadu participated in Ida kerala state sports event "VEGA" held at irinjalakuda hosted by chalakudy branch/

Cultural Activities: 20-10-2019: IDA Malanadu participated in IDA kerala state cultural fest "chilamboli" hosted by IDA Kochi.



► Kollam Branch

IDA WDC conducted its fifteenth activity In relevance to "International Day For The Elimination of Violence Against Women" on 25th November 2019 at St. Mary's EM Public School from 10 am-12pm in collaboration with Kollam City Police. The programme –an Awareness Class with Demonstration on Self Defence was conducted by Kollam City Vanitha Cell Senior Police officers - Sri Regina & Sri. Rosy Xaviour followed by an interactive session.

The School was adopted for oral health care

The programme commenced with a meeting. The self defence session concluded with feedback from a student followed by vote of thanks by the Principal of the School. Mementos had been presented to both the officers.

Dr Sherly Abraham, Rep WDC IDA Quilon & Dr Anney George, Hon. Secretary IDA Quilon had actively participated in the programme.

The news was well covered in almost all leading dailies like the Malayala Manorama Newspaper

IDA WDC Quilon branch conducted its fourteenth activity in relevance to "Breast Cancer Awareness Month" (1st October-31st October) at the Seminar Hall of TKM College of Arts & Science, Karicode, Quilon on 1st October 2019 from 11 am - 12 pm.

The programme commenced with a meeting inaugurated by Dr Manoj Varghese –respected President IDA Quilon Branch.

Welcome address was delivered by Prof. Aseeb AK (Health Club Convenor-TKMCAS) & Felicitations by Dr Jasin Rahman (HOD-Dept Of Zoology) & Dr Nehas H. Vote of thanks was proposed by Dr Anney George-Hon.Sec IDA Quilon

An awareness session with Ppt. on " Breast Cancer & Oral Health" was conducted by Dr Anney George, Hon.Sec. IDA Quilon for the students & staff of TKMCAS.

6 doctors had participated in the session.

The News was well covered in leading dailies like the Malayala Manorama Newspaper



► Kunnamkulam Branch

Onam Celebrations: The program started by the President Dr Babitha welcoming the gathering. Dr Deepak conducted games for kids and Doctors. This was followed by grand Music Gala by Cosmos and team. All the members participated thoroughly enjoyed the programs. After the celebrations, the gathering was served dinner and Dr Deepak gave the Vote of Thanks to the gathering.

4th Executive Meeting: The meeting started with the President Dr Babitha calling the meeting to order which was followed by a silent prayer. Dr Babitha summarized the years CDH and CDE activities and appreciated the branch members who actively participated and helped in making all the events for the year a success. Dr Deepak explained details regarding the Clinical Establishment Bill and the instructions received by the State IDA regarding the way forward. Dr Babitha requested the members to actively participate in the coming National conference which was to be held at Kovalam. Dr Deepak informed the executive that no nominations for any posts reached the secretary's office and therefore called for nominations for the various posts for the next Executive Committee.

CDE Activities: IDA Kunnamkulam conducted Full Day INTER BRANCH CDE on 27th October 2019 at Hotel K R Residency, Kunnamkulam from 9.45 AM to 4.30 PM on Topics: Sterilization & Infection Control and Dental Jurisprudence & Ethics. Hon. Secretary Dr. Deepak Mohan delivered welcome speech and President Dr. BabithaHariprasad presided over the meeting. The Classes was conducted by Dr. Bilahari N. MDS (HOD, Dept. of Oral Medicine & Radiology, St. Gregorios Dental College, Chelad) and Adv. M.K Moosakutty M.A LLB (Former President & Senior Advocate Tirur Bar Association). CDE Convenor Dr. Jeffy Cherry delivered vote of thanks. The Programme was informative and interesting.

12th CDE PROGRAMME (Inter Branch): IDA Kunnamkulam conducted 12th CDE Full Day Inter Branch CDE on 17th November 2019 at Hotel K R Residency, Kunnamkulam from 9.30 AM to 5.00 PM. The Class was conducted by Dr. Sunil Mohammed MDS (ABCD Square, Edappal) On Topic "ABCD OF CONCIOUS SEDATION". Hon. Secretary Dr. Deepak Mohan delivered welcome speech and President Dr. BabithaHariprasad presided over the meeting. Class was very useful to clear doubts regarding implementation of concious sedation in Dental Practice. HANDS ON Programme on "EXPERIENCE NOIS" was also held under leadership of Dr. Vijesh R Dev, Dr. FaseelAbdul Rahman, Dr. SajidAhamed and Dr. VaishnaSudhakaran. CDE Covenor Dr. Jeffy

Cherry delivered vote of thanks. The Programme was informative and interesting.

CDH Activities: EYE CARE AND DENTAL CAMP AT ANNAIKAL

Indian Dental Association – Kunnamkulam branch in association with Simons Eye Hospital and Red and Reds CLUB Annaikal conducted a free eye check up and Dental screening and awareness camp along with distribution of oral health kits on 10th November 2019 at CMS L.P School.

The camp was inaugurated at 10am by Mr. Tejas, Secretary, Red and Reds Club. The respective members of the associations expressed their good wishes to the success of the event. Dr. Babitha Hariprasad and Dr. Aazam Ahammed spoke at the event. The program began with an awareness talk by Dr. Aazam Ahammed in which he gave a quick review of important oral health problems and methods to prevent them, followed by an elaborate interaction session that witnessed participation of several enthusiastic patients.

The screening camp began at 10:00 am and went on till at 2:30 pm witnessing a total number of 80 registrations. The camp concluded with a promising note on serving the public with similar enthusiasm in the future.

IDA – KUNNAMKULAM CONDUCTED A CAMP AT CHAVAKKAD POLICE STATION

Indian Dental Association-Kunnamkulam branch organized and conducted Free Oral and Dental Health Check up along with Awareness class on November 15th 2019 at Chavakkad Police Station.

The inaugural function commenced at 8:30 am. The welcome speech was delivered by Circle Inspector, Shri. G. Gopakumar followed by inaugural speech by Dr. Sapna, IDA KKM. This was followed by a brief description of the camp agenda by Dr. Aazam Ahammed C.D.H Chairman. Mr. Jiji M.A delivered the vote of thanks.

The program started over with an oral and dental health awareness session along with tips on using Forensic Dentistry in their identification procedures by Dr. Aazam Ahammed which included active participation by the in house officers following which an elaborate oral health check up program was carried out for the officers. Oral health kits were distributed. The camp went on till 11pm with 32 registrations. Wind up ceremony got over by 11:30am with a promise that IDA-Kunnamkulam would serve with similar enthusiasm towards the betterment of oral and dental health in future.



► Malabar Branch

1. CDE activity- No.11 –Legal matters in dental practice & The dynamics of legal cell of IDA HOPE- What does the the legal cell do? 10th cde programme of IDA Malabar “Legal matters in dental practice” by Adv. Shyam Padman and “The dynamics of legal cell of IDA HOPE- What does the the legal cell do? Safe gurads in avoiding legal tangles” by Dr Deepu Jacob Mathew held on 12. 10.19 At IDA hall, Ashokapuram, Kozhikode.

2. CDE 12 – Two Days & Inter branch Mega CDE Programme with Hands on IDA Malabar conducted 12th CDE as “2 day & Inter branch Mega CDE programme with Hands on” 23.11.19 & 24.11.19 at Hotel Raviz and Hotel Malabar Palace. First day the topics covered were – “Suturing –The finishing tool” By Dr Saju N S, “Implant Simplified” by Dr Sabish Sivadas & “All about Clinical Establishment Bill” By Dr Antony Thomas. Session followed by Grand Gala dinner with Live Music. Second day lecture and Demo & Hands on lead By Dr Aravind Shenoy. The Topic was on “Mastering Laminates ‘N’ Veneer”.

3. CDH Activity- No.15 (Dental checkup camp- 7) On 14th October 2019 CDH wing of IDA Malabar conducted Dental check-up camp, awareness class and distribution of oral hygiene kits. The programme was held at JANATHA A.U.P School, Palath, Kozhikode. Dr. Denipa A.K led the awareness classes and the Dental Camp.

4. CDH Activity- No.16 (Cancer Awareness Programme) On 15.10.11 Under CDH wing, IDA Malabar conducted a full Day Awareness programme for public on Tobacco related health issues and promotion of Tobacco cessation activities. The day started with awareness of Migrant labours located at premises of Kozhikode city with announcement and pamphlet distribution prepared in Hindi. Official Inauguration held at Govt Dental College, Kozhikode. CDH Chairman, Dr Ikram Bin Ismail short listed the awareness programs by IDA Malabar. President, Dr Susha done Flag off for the announcement vehicle which would be roaming through suburbs of Kozhikode. An education session By Dr Sudha for Kudumbashree and Anganvadi teachers conducted at Cherappa, Primary Health Centre. Various Public awareness programs arranged at KSRTC and Private bus stand and Beach Area.

5. CDH Activity- No.17 (Dental checkup camp- 8) On 5th & 6th of November 2019 CDH wing of IDA Malabar conducted another Dental check-up camp, awareness class and distribution of oral hygiene kits. The programme was held at Silver Hills Public school, Paropadi, Kozhikode. Dr. Navajeeraj M.N, Dr Joel G Varghese, Dr Arun George Mathew, Dr Reshma Jose led the awareness classes and the Dental Camp.

6. CDH Activity- No.18 (Dental checkup camp- 9) On 8th of November 2019 IDA Malabar conducted Dental check-up camp, awareness class and distribution of oral hygiene kits. The programme was held at AM GUP school, Kallai, Kozhikode. Dr. Susha C N, Dr Dinesh K R & Dr Sethu Sivasankar, Dr Pravish, Dr Saleel, Dr Athira, Dr Aiswarya, Dr Vinny, Dr Hridaya led the awareness classes and the Dental Camp.

7. Sports activity 6. - IDA kerala D4 Subzonal cricket tournament IDA Malabar becomes the Zonal winner in Interbranch subzonal Cricket tournament conducted at Mahe. IDA Malabar won both matches by big margins and qualified for the statefinals

8. Sports activity 7 - Kerala State IDA Sports MEET – VEGA 2019 IDA Malabar showed up an outstanding sports performance for VEGA 2019 at Iringalakuda. We were the Winners in Men 400m Relay, Javelin throw men, Arm Wrestling, Badminton women single & Table Tennis

Women. Bagged Runners up in Tug of war, 100 m & 200 m men, Short put, badminton single, double women & Doubles men. Also we scored third prizes in 100 m men below 40 and above 50 categories.

9. Sports activity 8. Champions - DCL 2019 (IDA Kerala State Cricket Tournament) IDA Malabar become the Champions of IDA Kerala State Cricket Tournament – DCL 2019 held at CUSAT Ground, Kochi on Dec 1st. IDA Malabar Won the Cup with Man of the Final (Dr Ikram), Best Bowler of the Tournament (Dr Salim), Fair Player of The Tournament (Dr Arun Jose), Man of the Semi Final (Dr Muneer).

10. Cultural activity No.2. Chilamboli Performance Chilamboli 2019 – IDA Kerala's prestigious cultural event held at IMA House, Kochi on 20.10.19. IDA Malabar with outstanding performances bagged many prizes including Best singer, best duet performance, best solo dancer, best special item performance, best group dance, clay modeling 1st prize, 2nd prize for fashion show and audience report for outstanding skit performance.

11. Student activity.2 – Mamanagam19 IDA Malabar conducted an intercollegiate sports event - Mamangam 2019 as student activity at Medical College Ground on 11, 12 & 13 of November 2019. Fifteen Dental Colleges all over kerala participated in many of the sports events organized at outdoor and indoor. Govt. Dental college become the overall champions. GDC, Alapey became the Runners Up.

12. 5th family Get together and Branch tour The 5th family Get together IDA Malabar and Branch tour arranged on 7th & 8th December. It was a two day programme and 40 members with family joined with full of enthusiasm and enjoyed the most memorable trip to Vythiri, Wayanad. Families stayed at cottages and the everyone enjoyed pool side barbeque, buffet dinner and live music and fun games.

13. 5th Executive meeting IDA Malabar's this year's 5th executive meeting conducted on 28.10.19 at Hotel Hyson Heritage, Kozhikode. Members actively participated in decision making and the meeting concluded with dinner and fellowship. 14. Extra Ordinary General Body Meeting (EOGM) IDA Malabar conducted an Extra Ordinary General Body Meeting (EOGM) of our branch conducted at 4:pm IDA Hall, Ashokapuram, Kozhikode on 27.10.19. The single agenda for the meeting was IDA Council office Bearers Election for president elect and vice presidents.

15. Other meeting – Literary Club Our literary club conducted a meeting at wayanad. The idea was to introduce the book 'To kill a mocking bird'. The audience had healthy discussion on many other books too.

16. Reach to mass media - Press meeting We had conducted a press meeting at Kozhikode Press club on 12.10.19 in association with Oral Cancer awareness and cancer detection programme. A mass coverage received for the programme including visual media. Feedback from the public was tremendous.

17. Journal release. Official release of Malabar Dentist (4th Issue of 2019) 4th edition of Our Official journal Malabar Dentist formally released by Past President Dr Ravindran Nair.

18. Branch's News bulletin - Malabar Times (2nd edn. Jul-Dec 2019) Our official News Bulletin Malabar Times, 2nd edition of 2019 released by Dr Pramod Kumar A V, Professor & Head, GDC Kozhikode. This is aimed for circulating among the members to report the activities of branch from July to December 2019

