



CHHATRAPATI SHAHU MAHARAJ SHIKSHAN SANSTHA'S  
**DENTAL COLLEGE & HOSPITAL,**  
KANCHANWADI, PAITHAN ROAD, AURANGABAD



# JOURNAL OF DENTOVISION 2021







## राजर्षी छत्रपती शाहू महाराज

धन्य धन्य तू शाहूराया, तुजसम राजा तुच एकला ।  
तूच शिवाजी, बुध्द देव तू, तूच हरी सावळा ॥

## OUR INSPIRATION



**Hon. Shri. Padmakarji H. Mulay,  
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## MESSAGE FROM THE PRESIDENT



Chhatrapati Shahu Maharaj Shikshan Sanstha is one of the leading educational institutes. Since it was established, this Sanstha is known for its massive academic development. This 'Dentovision' journal has always been an integral part of this development. This is the 3<sup>rd</sup> issue of 'Dentovision' journal of CSMSS Dental College. The publication of this journal is a sign of immense hardwork & consistent efforts, shown by each & every person involved in its formulation. This journal will keep inculcating new & innovative ideas as it serves as a platform for the expression of every student's skill and talent. The journal will really prove as a guiding path for the future generations.

I congratulate A.O Sanstha, Director, Acting Dean, Faculty members, Ph.D, PG , UG students & Non teaching staff of CSMSS Dental College & Hospital for taking initiatives and carrying this noble task ahead.

**Hon. Shri. Ranjeet P. Mulay**  
President, CSMS Sanstha  
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## MESSAGE FROM THE TRUSTEE



A journal reminds you of your goals & learnings in life. It offers a place where you can deliver a deliberate message & thoughtful ideas. I congratulate CSMSS Dental College & Hospital for their success in publishing this scientific journal 'Dentovision' for its 3<sup>rd</sup> issue.

I was very much gratified to see the previous issues of this publication. This journal truly is a combination of diligence, coherence & comprehensive ideas. The journal is formulated by the collective efforts of Dentovision team. I appreciate the immense hard work by everyone related to this journal and give my best wishes for its success.

**Hon. Shri. Sameer P. Mulay**  
Trustee, CSMS Sanstha  
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## MESSAGE FROM THE ADMINISTRATIVE OFFICER



From 1986, CSMS Sanstha has always nurtured the skills and talents of the students, providing an invaluable platform for betterment of their carriers. This college has always maintained top quality healthcare for patients under guidance of highly qualified staff in each faculty . We have always encouraged the youth in expression of their ideas in scientific activities, lectures and research oriented programmes. The publishing of scientific journals has been an integral part of this Sanstha.

I appreciate all the hardwork that has been put in the formulation of this journal under superior guidance that has made this issue a great success. I congratulate and give my best wishes to the Director, Acting Dean, Editorial board members, Teaching staff, Ph.D, PG & UG students of CSMSS Dental College & Hospital for this effort .

**Dr. Shrikant Deshmukh**  
A.O. CSMS Sanstha,  
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## **MESSAGE FROM THE DIRECTOR**



Being a part of CSMS Sanstha leading educational institution for academics in India, is really a proud feeling for me. Publication of journals is a vital part of academic development which promotes research activities, empowering youth in betterment of their skills & talents in dentistry. Dentovision journal entering its next issue is truly a sign of dynamic approach by all students both UG, PG, Ph.D Students and of our teaching staff.

I wish all the luck & success, and give my best wishes to the Dentovision journal team as well as to our teaching & non teaching staff & students for their enormous efforts in publishing this scientific journal.

**Dr. S. C. Bhoyar**  
Director,  
CSMSS Dental College & Hospital

## MESSAGE FROM ACTING DEAN



It's a great pride, enthusiasm to invite you to read the scientific journal 'DENTOVISION' third issue.

Our mission is to develop the students in all capacities, also to motivate the students to write the scientific article and be aware about the total process of publication.

Dentovision represents the collective thinking group of innovative individuals.

The success of Dentovision is totally due to all faculty members who encouraged the participants to pursue scientific activities, also students who participated and worked hard to give the journal its final shape.

I appreciate the hard work by the team of CSMSS for Dentovision.

Hope you will appreciate the efforts taken for Dentovision while going through it.

**BEST REGARDS!**

**Dr. Lata Kale**  
HOD, Prof. & Acting Dean  
Oral Medicine & Radiology

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# Editorial

## Periodontal Medicine : *A Fact or A Fallacy*

The future always lies in research, discovery & the development of new procedures & products. The lesson of periodontal medicine has taught us that there is a link between periodontitis and systemic diseases, is inflammation. The question for the future is how to control that inflammation, in other words “*Periodontics beyond plaque control*”.



Periodontal medicine is a term used to describe how periodontal infection or inflammation may have an impact on extraoral health. Periodontal medicine is a newly emerged branch in periodontology which explores a two- way relationship between periodontal disease and systemic disease.

Periodontal diseases may be a risk factor for cardiovascular diseases, diabetes mellitus, adverse pregnancy outcomes and pulmonary infections. Dental and medical practitioners should be aware of the clinical implications of these co-relation, & treat the affected patients in collaboration for better oral and general health.

Periodontist's in particular and dentist's in general to some extent, will have to become physicians of mouth. The realization that what we do or we don't do, as a practitioner we will have a far reaching effect on the systemic health of the patient or their health is a great responsibility.

The future of periodontists in India is bright, we need to expand dental and our diagnostic skills to provide health screening & surgical services. The need to provide these interventions in patients has become more important.

Dentovision Journal has successfully stepped-up in 3<sup>rd</sup> issue for its unique scientific publication.

I kindly appeal to all the members to enhance their support for the upcoming issue by contributing through their various scientific research activities.

I am grateful to our Management, Administrative officer, Director, Acting dean & all the teaching & non-teaching staff members for their immense support in publishing the 3<sup>rd</sup> issue of Dentovision Journal.

**Dr. Maya Mhaske**

Professor & Head of Department  
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- Authors : Maximum 6 authors for Original research and 5 authors for Case reports and Reviews.
- Font size : Title : 16 – Times New Roman Bold – 1.15 Spacing
- Text : 12 – Times New Roman
- Images : 3-4, Colored, Resolution 300dpi and 5 mb size with Arabic number.
- Keywords should be 3-4, mentioned in bold.
- Abstract should be 75-100 words.
- Tables should have proper legends.
- When a trade name is used for a product or material, the manufacture's name and details must appear in the article and references (if any).
- Article should not exceed 8 pages including the references, images and tables
- References should not exceed 40 in number, They should be mentioned in superscript in the article with font size 9 and font Times New Roman.
- Vancouver style should be followed for References.



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## Scope & Carrier Options After BDS / MDS In Dentistry

Dr. Subhash Bhoyar



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### **Golden Rule to follow in setting Professional carrier is “To take counsel but make your own Decision”**

Almighty God has given us enough wisdom and knowledge to choose the Right Professional carrier. Dentistry is very rapidly growing profession with vast scope in diverse direction.

**Choice is yours!**

### **ACADEMIC CARRIER**

Of course, first choice of most of the dental graduates may be above 80 % is to join post graduates MDS course in a reputed recognized institute. MDS is a 3 years full time course available in all 9 dental specialities. Total number of MDS seats available in our country is approximately 5000 and in our state we have about 500 seats which include govt. colleges, private unaided colleges and deemed universities.

Admission is through various entrance examinations like NEET, AIIMS etc. It's a very competitive and tough exam. If you succeed and get MDS seat its good.

If not then many other options are available like.

1. PG Diploma in all 9 specialities of Dentistry It's a 2-year course and

admissions are done directly at college level scope is in Teaching & Clinical job.

2. DNB in dentistry. It is affiliated to Central National health board and eligibility is MDS qualification. It is available in few centers all over the country.
3. Ph.D – Doctor of Philosophy. It is a 3 years course available in MUHS in all branches of dentistry. Eligibility is MDS with clearance of PET exam & after Registration you can do it at your own working center & as a external candidate at other institutes.
4. M.Sc PG degree courses are available in all basic medical subjects like Anatomy, Physiology etc. in many medical colleges. It's a

two year course and BDS graduates are eligible to get admission at college level. MUHS is also conducting Msc course in Pharmaceutical Medicine of two years duration for getting employment in academics and in pharmaceutical companies etc.

5. MPh – Master in Public Health It's a two years course available in some centres of medical colleges. Scope is to join as clinical research person in WHO related research, Clinical trials projects, in NGO's etc.
6. MBA in hospital management – Its two years course to become administrator in Multispecialty hospital.
7. Fellowship / Certificate courses of 1 year duration in Oral Implantology, Microdentistry and Esthetic Dentistry etc are conducted by MUHS. Also fellowship course are available in Oral oncology at Tata cancer hospital Mumbai, regular CDE workshop, scientific conference etc. can be attended to update the knowledge and skill for getting good jobs and for improving clinical practice.
8. You may pursue your higher education in developed countries like USA, UK, Canada, Australia, Germany, Newzealand etc. to do DDS, FDSRCS, DDM, BDM, MS etc. after clearing NBDE part I & II exam, GRE / TOFEL exam, license exam of ministry of health of that country etc.

## EMPLOYMENT

1. Approximately 80 % BDS / MDS students prefer to settle down either by opening their own dental clinic independently or become the part of multispecialty hospital mostly in Urban City areas. In rural areas for opening the clinical practice few advantages are there like initial settlement investment is less for opening dental clinic and also there is less professional competition. You can also practice there with the help of mobile dental van with all facilities. This way you can achieve two goals, one for you to get financial resource and second to serve rural population.
2. Remaining approximately 20 % dental graduate specially with postgraduate qualification can join academic jobs as teacher in either Govt./ Private Dental Institute. Person with MDS has got better chances for employment and promotion.
3. You can also join as Dental Surgeon or Specialist in Govt. hospital at Civil/Sub Civil Hospital centers, ESIC hospital, Dental chain corporate hospital, Railway hospitals etc.
4. You can join Indian Defense Services as Dental Surgeon in a Cadre of Lieutenant in Army, Navy or Airforce Sector with excellent honor and perks after clearing their entrance exam.

5. You can join WHO as a research person – Scientist, Consultant and also can join pharmaceutical companies specially producing dental products.
6. You can join Dental trade as Dealer, marketing manager in dental manufacturing company or you may become dental good manufactures.
7. You can join Civil services after Clearing MPSC/ UPSC exam to become IAS, IPS IFS officer.
8. You can setup independent Dental Lab to provide all technical help to practicing dental surgeons of your locality.

9. You may join as Dental surgeon or Specialist Consultant in foreign countries like USA, UK, Canada, Australia, or Gulf Countries like Saudi Arabia UAE, Kuwait etc.

After clearing their ministry of health exams or NBDE exam to practice in their country with excellent financial gain.

**So, there is a vast scope in diverse direction for dental graduates.**

**Sky is the limit.**

**Take a Decision and make Reality in your life.**

**REMEMBER .....**

**COURAGE IS LIFE AND FEAR IS DEATH .....**

**ALL THE BEST**

## Occupational Hazards in Dentistry-A Review

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### Abstract:

Dental professionals are susceptible to a number of occupational hazards. Continuous educating and appropriate intervention studies are needed to reduce the complication of these hazards. Relying on relevant literature, the present paper discusses selected occupational hazards.

**Key Words:** Occupational Hazards, Intervention studies, complications.

### Introduction:

Occupational hazard can be defined as a risk to a person usually arising out of employment. It can also refer to a work, material, substance, process, or situation that predisposes or itself causes accidents or diseased a work place.

The practice of dentistry exposes dental professionals to a variety of work related hazards. This includes:

- Working in a sanitary state
- Working at a high level of concentration for long hours
- Working with anxious patients
- Exposure to microbial aerosols generated by high speed rotary hand pieces.

- Exposure to various chemicals used in clinical dental practice
- Other hazards.

Major occupational hazards the major occupational hazards are:

- Biological health hazards
- Physical hazards
- Chemical hazards
- Musculoskeletal disorders and diseases of the PNS
- Mechanical hazards
- Psychosocial hazards
- Stress



- Legal hazards

Babaji P et al stated that dentists during clinical practice exposed to variety of work related hazards. These occupational hazards can be classified into five types:

- 1) Physical
- 2) Chemical
- 3) Biological
- 4) Psychological
- 5) Musculoskeletal disorders<sup>1</sup>

### Biological Hazards

The dental environment is associated with a significant risk of exposure to various microorganisms. Many infectious agents may be present in blood or saliva as a consequence of bacteremia or verneil associated with systemic infections.

Dental patients and dental health care workers may be exposed to a variety of microorganisms via blood or oral or respiratory secretion. It includes cytomegalovirus, hepatitis B virus (HBV), hepatitis c virus, herpes simplex virus types 1 and 2, human immunodeficiency virus (HIV), mycobacterium tuberculosis, corona virus, staphylococci, streptococci, and other viruses and bacteria especially those that infect the upper respiratory tract.

There are many Oral manifestations of occupational diseases [table 1]<sup>2</sup>

Structure Affected	Etiologic Agent	Manifestation
Tooth enamel and dentin	Dust Pre-tension of instruments Acids Sugar	Staining Abrasion Decalcification Caries
Gingiva	Dust, mercury compounds Dust, heavy metals Variation in atmospheric pressure, benzene acid, mercurial compounds mercurial compounds Dust: flour	Gingivitis Pigmentation Hemorrhage Ulceration Periodontitis Calculus
Periodontal membrane	Mercurial compounds Dust, flour	Periodontitis Calculus
Alveolar bone and jaws	As, Cr, Hg, P, Ra Fluorine	Osteomyelitis and necrosis Sclerosis
Lips	Low humidity Dust Aniline carbon monoxide Tar	Dryness, fissure Cheilitis, leukoplakia Coloration of lips Carcinoma
Oral mucosa	Dust chemicals	Pigmentation stomatitis.
Tongue	Food tasting	Anesthesia, parasthesia
Salivary glands	Mercury compounds X-ray radium Increased intraoral pressure	Ulceration, ptyalism Xerostomia pneumatocele.

Table 1: Oral manifestations of occupational diseases

### Methods of Precautions

Identification of high-risk patient or proper diagnosis of patient from which he is infected.

- Adapt highest standard of hygiene.
- Use of universal protection kits like face shield, face mask, goggles, gloves etc.
- Use of disposable mask, gloves, syringes, needles,

Vaccination against TB, Hepatitis-B, COVID- 19.

### Physical Hazards

The dentist and the clinical staff are at risk of physical injuries during many dental procedures. Sources of physical injury can include debris from the oral cavity striking the eyes, cuts from sharp instruments, or puncture wounds from needles or other sharp instruments. Such injuries can result in the transmission of serious infectious disease to the dental worker. It comprises:

Heat and cold- The direct effect of heat exposure are burns, heat exhaustion, heat stroke and heat cramps. Important hazards are associated with cold work are chilblains, erythrocyanosis, immersion foot and frostbite as a result of cutaneous vasoconstriction.

Light- Exposure to excessive brightness is associated with discomfort, annoyance, and visual fatigue

Noise- Auditory effects which are consist of temporary or permanent hearing loss. Non auditory effects which are consist of nervousness, fatigue, interference with speech.

Vibration- After some months or years of exposure, the fine blood vessels of the fingers may be increasingly sensitive to spasm.

UV radiation- Occupational exposure to ultraviolet radiation occurs mainly in arc welding. Such radiation affects the eye, causing intense conjunctivitis and keratitis.

Ionizing radiation- The radiation hazards comprises of genetic changes, malformation, cancer, leukemia, ulceration and sterility and in extreme cases the death.

### **Methods of Precautions during radiation exposure-**

- Use standard radiographic machine as per AERB guidelines.
- Use of well collimated filtered beam.
- Use of lead barrier.
- Special conch shell design for the X-ray.
- The walls should be plastered with Barium.
- Use of lead aprons

- Use of fast films.
- Operator should use personal monitoring devices.

If there is no lead partition then use position and distance rule.

### **Chemical Hazards**

The chemical environment is one of the most rapidly expanding components of the work environment because new chemicals and solutions are being introduced regularly. Many biomaterials and auxiliary products used in dentistry are chemically reactive. Hazardous chemical agents used in clinical dentistry include mercury, powdered natural rubber latex (NRL), Disinfectants and nitrous oxide (N<sub>2</sub> O). By far the most important and most dangerous of these agents is mercury.

### **Precautions to Avoid Mercury toxicity-**

It is advisable to conduct regular mercury vapor assessments in clinical settings; receive episodic individual amalgam blood level tests; and use goggles, water spray, and suction during the removal of old amalgam restorations.

### **Latex Hypersensitivity-**

Gloves and mask form an integral part of dentist's protective equipment. Latex gloves dusted with com starch powder are most often used. The gloves and the mask form an efficient barrier against most pathogens; they also constitute a very good barrier against viruses, provided they are intact.

## Musculoskeletal Disorders and Diseases of PNS

At work, the dentist assumes a strained posture both while standing and sitting close to a patient, while providing care which causes an overstress of the spine and limbs and the peripheral nervous system (PNS). This includes varicose veins, carpal tunnel syndrome, mechanical hazards, psychosocial hazards, legal hazards and stress. Hand/wrist complaints among dentists and especially dental hygienists are highly prevalent<sup>3</sup>.

The dentist makes constant monotonous movements, which stress the wrist and elbow joints. Also of consequence are mechanical vibrations. A number of dental doctors suffer from a defect of the median nerve and of the cubital nerve. An early syndrome of a defected median nerve shows in acroparaesthesia. A consequence of the defected median nerve in the carpal canal is the so-called tunnel syndrome.

Its early phase is dominated by paroxysmal paresthesia of the thumb and index finger, which occur almost without exception at night and which are accompanied by sensomotor disorders of the thumb and index finger as well as by the atrophy of the thenar. The necessity of keeping the upper limbs extended upwards in a bent and abducted position, without the possibility of resting the hands on the elbows is conducive to a defect of the elbow nerve. While bending the forearm, the medial head of the triceps muscle goes into the sulcus of the elbow nerve, which facilitates a pressure on the nerve. Pains of the epicondylus, appearing at first during strain and special movements, gradually

intensifying and radiating along the forearm, point to an inflammation of the epicondylus of the humeral bone. Operations carried out during extractions stress not only the elbow joint and the wrist joint but may result in chronic tendon sheath inflammation. The long-term effect of all those adverse circumstances occurring in the work of the dental doctor may lead to diseases described as cumulative trauma disorders<sup>4</sup>.

## Stress-

Stress is the most common psychological condition that occurs in the dental profession. Many clinical situations are the source of stress to a dentist and these include, among others, procedures connected with anesthetization of patients, overcoming of pain and fear, unexpected emergency situations in which a patient's health or life is in danger, or procedures with uncertain prognosis. Stress situations form an inherent part of a dentist's everyday work. In most cases, the knowledge of psychology, good communication skills and establishment of a proper relation between dentist and patient are crucial for the treatment to be successful. High patient loads or uncooperative patients, especially those of extremes of age were major causes for increased stress at work in the present study.<sup>5</sup>

Such dentists may develop adverse habits of tobacco, gutkha, alcohol, smoking etc.

This stress can be avoided by developing good habits such as reading, gardening sports, listening music in between appointments.

- Compulsory Sunday off.
- Meeting friends.

The necessity to cope with cancelled visits or late arrivals by patients.

### Psychological hazards –

- Mental illness as a response to excessive workplace stressors.
- Substance abuse as a response to excessive workplace stressors.
- Stressed related to work-life conflict.
- Abuse by clients or members of the public.
- Abuse by co-workers.
- Hazards related to working alone.
- “Technostress” related to the introduction of new technology.
- Hazards related to impacts of aging on workers<sup>6</sup>

### Medico - legal problems-

In every country there are relevant statutes and regulations which apply to the practice of dentistry. The contravention of any of these may warrant that legal actions be brought against a dental practitioner particularly in developed countries where the citizens appear more aware of their rights to help assure a safe work environment in dental treatment, the hazard awareness and prevention of legal risks should be made known to all clinical workers of the dental hospital<sup>7</sup>.

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Dental practice comes under consumer protection act. According to this:

Fault of commission- If wrong or unnecessary treatment is given.

Eg- If patient is diabetic and extraction is done without checking for serum glucose level. Such conditions are considered as fault of commission.

Fault of omission- The act of withholding treatment.

Eg. If patient has anaphylactic attack – then not giving adrenaline followed by steroid.

This may be fatal. Such condition comes under act of commission.

### Precautions to avoid problems

- Maintain proper dental records.
- Obtaining informed consent from patient and parents.
- Attending CDE programs.
- Keep your knowledge updated with all new technologies and treatment plans in dentistry.<sup>8</sup>

### Conclusion

The main aim is to make all the new dentists aware about the hazards of occupation. If the proper precautions are taken then there will not be any stress and you will enjoy the work in dentistry.

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## COVID- 19 And Oral Health: A Brief Review

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### Abstract :

There has been an exponential spread of COVID 19 across the world recently, due to human to human transmission of Novel Corona Virus. The mucocutaneous manifestations of this viral infection, particularly those of the oral cavity, appear to be less recognized. This article is a brief attempt to increase the awareness of major and minor oral manifestations of COVID 19.

**Key Words:** Oral Manifestations, COVID-19, Oral Lesions

### Introduction :

Recently a global pandemic burden has emerged by the human to human transmission of Novel Corona Virus disease. Since the outbreak in December 2019, COVID 19 has affected more than 11,301,800 people (WHO). The most common symptoms are fever and dry cough and in some cases shortness of breath, dysosmia and dysgeusia. 5% may become critically ill and develop pneumonia and acute respiratory distress syndrome.<sup>1</sup> The mucocutaneous manifestations, particularly those of the oral cavity of this viral infection appear to be recognized.<sup>2</sup>

### Covid 19 and oral manifestations:

According to current research, corona virus invades human cells via the receptor angiotensin converting enzyme 2 (ACE 2) through scRNA-seq data analyses. COVID 19 acute infection shows oral signs and symptoms. For examples taste disorders, unspecific oral ulcerations, desquamative gingivitis, patchae and candidiasis, inflammation of the papillae of tongue etc. Herpetiform eruption comprising vesicles and erosions were also noted on the lips, anterior tongue and buccal mucosa along with mild fever, myalgia and throat pain. Aphthous ulcer on lips along with pain, burning sensation of the tongue and inflammation and purulent areas on the

pharyngeal wall are also noted. Along with oral symptoms, severe body pain, headaches, dizziness, loss of appetite, nausea were also noted. Aphthous like lesions, herpetiform lesions, candidiasis and oral lesions of Kawasaki- like disease are the most common oral manifestations of COVID-19 disease.<sup>3,4</sup>

At the beginning of COVID 19 pandemic it was assumed that lack of oral involvement is a differentiating feature of covid-19 exanthema, relative to other viral exanthema. Recently SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) has been detected from saliva of the patients and RT-PCR from saliva can be a more sensitive test compared to nasopharyngeal test. Furthermore ACE2 has been found in oral mucosa, especially with more density on dorsum of tongue and salivary glands.<sup>3,4</sup>

According to studies, oral manifestations included ulcer, erosions, bulla, vesicles, pustule, fissured or depapillated tongue, macule, papule, plaque, pigmentation, halitosis, haemorrhagic crust, necrosis, patch, swelling, erythema, spontaneous bleeding. The most common site of involvement in descending order are tongue (38%), labial mucosa (26%), palate (22%)<sup>1</sup>, gingival (8%), buccal mucosa (5%), oropharynx (4%), and tonsil (1%). Suggestive diagnosis of the lesions were aphthous stomatitis, herpetiform lesion, candidiasis, vasculitis, mucositis, drug eruption, necrotizing periodontal disease, angular cheilitis, and Melkerson-Rosenthal syndrome.<sup>3,4</sup>

In 68% patient, oral lesions are symptomatic (painful, burning sensation). Oral lesions were nearly equal in both genders (49% female; 51% male). Mostly oral lesions were seen between 4 days upto 12 weeks after onset of systemic symptoms.

Oral lesions heal between 3 to 28 days after appearance.

Different types of therapies depending on type of lesion, for oral manifestations of COVID19 include chlorhexidine mouthwash, nystatin, oral flucanazole, topical or systemic corticosteroids, systemic antibiotics, systemic acyclovir, artificial saliva and photobiomodulation therapy (PBMT).<sup>3,4</sup>

### Conclusion :

Older age and severity of covid-19 disease seem to be the most common factors that predict severity of oral lesions in these patients. Lack of oral hygiene, opportunistic infections, stress, underlying disease (diabetes mellitus, immunosuppression), trauma (secondary intubation), vascular compromise and hyper inflammatory response secondary to COVID 19 might be the most important predisposing factors for development of oral lesions in COVID 19. Dentist should consider exhaustive intraoral examination along with salivary gland and saliva flow to check whether oral cavity is affected by the virus.

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## Diagnosis And Treatment Planning in Conservative Dentistry and Endodontics

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### Abstract:

The success of treatment depends upon careful history taking coupled with a logical progression to diagnosis of the problem that has been presented. Each stage follows on from the preceding one. A proper treatment plan should be formulated and should involve a holistic approach to what is required.

**Key Words** - Diagnosis, symptoms, restorative, treatment plan

### Introduction :

Diagnosis is the correct **determination, discriminative estimation** and **logical appraisal** of conditions found during examination as evidenced by distinctive signs, marks and symptoms. It is also defined as the art of distinguishing one disease from another.

Diagnosis is made by the following steps: taking personal information of the patient, medical history, recording the chief complaint and its history, examining the patient, establishing a provisional diagnosis

on the basis of history and examination, conducting the necessary investigation, to reach to the final diagnosis. After the final diagnosis and evaluation a proper treatment plan has to be made a plan of treatment and medical risk assessment for dental patient.<sup>1</sup> Chief Complaint is the patient's response to the dentist's questions. It is the reason for which the patient has come to doctor or the reason for seeking the treatment. It should be recorded in **patient's own words** and in chronological order, if complaints start simultaneously record them in the order of severity. Chief complaint is a significant step



in recording a case as it aids in the diagnosis and treatment planning.<sup>2</sup>

**Symptom** can be defined as phenomena or sign of a departure from the normal state and are indicative of illness.<sup>3</sup> It can be divided into subjective and objective symptoms. Symptoms which are experienced and reported to the clinician by the patient are called as subjective symptoms. The most common chief complain experienced by the patient is pain. Other being cavitation which may be due to cariogenic pathology or by degenerative changes like attrition, abrasion, erosion or abfraction.<sup>3</sup> Objective symptoms are seen by the clinician through various tests. During this stage, extraoral and intraoral tissues are examined, tested, and compared bilaterally for the presence or absence of pathosis. In extraoral examination the patient is examined for asymmetries, localized swelling, changes in colour or bruises, abrasions, cuts or scars, and similar signs of disease, trauma, or previous treatment.

Intraoral examination consists of examination of soft tissue and the dentition. This examination involves a thorough visual and digital examination of the lips, cheeks, oral mucosa, tongue, palate and muscles are evaluated and abnormalities are noted. Alveolar mucosa and attached gingiva are examined for the presence of discoloration, inflammation, ulceration, and sinus tract formation. Teeth are examined for discolorations, fractures, abrasions, erosions, caries, large restorations, occlusion or other abnormalities. Visual changes like chalkiness or brown grey discoloration of pit and fissures or smooth surfaces may indicate the presence of caries, frank cavitation confirms the diagnosis of caries. A discolored tooth is often pathognomonic of

pulpal pathosis or is the sequel of earlier root canal treatment.<sup>4</sup>

Restoration must be checked for its structural integrity, margins, anatomic form, occlusal and interproximal contacts, esthetics and effects on the periodontium. A restoration may be diagnosed as defective if it shows any of the following changes: marginal breakdown or fracture, improper contour and contacts, recurrent caries or esthetically displeasing dark stains.

Dynamic relationship of the teeth during movements of the mandible should be examined. In occlusion, plunger cusps, tilted teeth, occlusal relationship in anterior and posterior teeth should be examined.<sup>5</sup> This is often relevant in deciding how to restore a tooth. Occlusion of a new restoration is provided in a such a way that the occlusal contacts of the other teeth remain unaltered.

Aids that may be employed while examining caries are separation of teeth using wedges, fiberoptic transillumination, dye penetration method, electric conductance, quantitative laser fluorescence and pulsed laser caries detector.<sup>6</sup>

**Treatment planning** in operative dentistry is a complex process and the dentist must consider several factors before selecting the optimum treatment for a given patient which includes: patients general and oral health, patients' compliance, functional needs, choice of restoration, and esthetics.<sup>7</sup>

Traditional operative dentistry was based on the extension for prevention using silver amalgam and cast metal restorations. New concept is based on prevention and treatment using the least invasive approaches, known as **minimal intervention dentistry**.<sup>8</sup> Newer restorative materials containing adhesive property like glass ionomer cements, composites helped to preserved tooth

structure<sup>9</sup> and while bioactive materials like MTA, Biodentine helped in maintaining the integrity of the pulp tissue by pulp capping procedures.<sup>8</sup>

When the dental caries is not treated at the primitive stage, it progresses in pulpal direction (fig 1) resulting in pulpal (fig 2) and periodontal pathologies (fig 3) which is represented by the patient as pain.

Based on the symptoms presented by the patient the diagnosis of pathology is made (fig 4) and the treatment is planned.

There are various treatments modalities and the commonly done treatment.

### **Consideration before starting root canal treatment<sup>10</sup>**

#### **Tooth related factors**

- Extremely dilacerated roots
- Calcified pulp chambers and root canals
- Extensive internal and external resorption
- Subgingival caries or post endodontic restoration is not possible
- Teeth with difficult visualization or instrumentation
- Tooth fractures
- Strategic value of tooth; first molar, tooth adjacent to edentulous space

#### **Restorative consideration**

- Badly broken-down vital tooth where complex restorations are needed like deep inlay or onlays or pin retained restorations. Hence intention root canal should be advised

#### **Prosthetic consideration**

- In excessively tipped, rotated or supraerupted which have to be used as an abutment where chances of pulpal exposure are high

### **Periodontal consideration**

- Planning hemisection, perioendo lesions
- It appears that, clinically, the pulp is usually not affected by periodontal disease until the defect has exposed a pathway of communication between the root canal and the oral environment.

### **Systemic considerations**

- Where risk of bacteraemia is more with extraction, endodontic treatment is advice

### **Patient factor**

- Cooperation
- Availability
- Financial commitment
- Microstomia

**Treatment sequencing** consists of organizing the different treatments into an orderly sequence and is performed within a given time period. The phases of treatment plan are: **Urgent phase, Control phase, Re-evaluation phase, Definitive care phase and Maintenance phase.**<sup>11</sup>

In urgent phase, treatment mainly aims at providing the relief from symptoms, for example, incision and drainage of an abscess with severe pain and swelling, endodontic treatment of a case of acute irreversible pulpitis, etc. In control phase, the treatment involves halting the progress of primary disease, i.e., caries or periodontal problem by removing etiological factors. Finally, the patient is made to understand the disease and its treatment which further increases his/her compliance to the treatment. This approach is beneficial for the long-term prevention of the dental caries and periodontal disease. Re-evaluation phase

comes between control phase and the definitive phase. Thus, holding phase is a time between control phase and definitive phase that allows time for healing and analysis of inflammation. During this phase, patient is advised home care habits and motivated for further treatment. The initial treatment is re-evaluated before the definitive treatment begins. The definitive phase may involve many procedures that enhance function and esthetics such as operative procedures endodontic, orthodontic, periodontic and oral surgical prior to further treatment. In maintenance phase, regular recall and examination of patient is done. This helps in prevention of the recurrence of the disease and maintenance of the previous treatment results. Recall visits for patients can vary from patient-to-patient, for example, patients who are at high-risk for dental caries should be examined more frequently than the patients at low risk for dental caries.<sup>11</sup>

**Conclusion:**

Hence, the acquisition of knowledge is one of man’s greatest accomplishments. The procedure of accepting a patient, recognizing that he/she has a problem, determining the cause of problem and developing a treatment plan which would solve the problem.



Fig 1 Progression of dental caries

Pulpal State	Symptom	Vitality	Response to Cold
Normal pulp	Asymptomatic	Vital	Within normal limits
Reversible pulpitis	Sensitive to pressure or temperature <sup>1</sup>	Vital	Hypersensitive to cold
Symptomatic irreversible pulpitis <sup>2</sup>	Spontaneous, throbbing pain	Vital	Hypersensitive to cold and lingering response
Asymptomatic irreversible pulpitis <sup>3</sup>	None	Vital	Within normal limits
Pulp necrosis <sup>4</sup>	Asymptomatic <sup>1</sup>	Nonvital	No response
Previously treated	Variable	Nonvital	No Response
Previously initiated therapy	Variable	Variable	Variable

Fig 2 Pulpal Pathologies

	Clinical signs	Radiological Signs
Symptomatic Apical Periodontitis	Spontaneous Pain *** Pain to percussion *** Lack of pulpal sensitivity *** Pain on palpation apical ***	Thickening periodontal ligament *** Radiolucency, image of bone lysis +
Acute Apical Abscess	Swelling *** Pain to percussion + Lack of pulpal sensitivity *** Pain to apical palpation +	Radiolucency, image of bone lysis *** Thickening periodontal ligament **
Chronic Apical Abscess	Presence of fistula *** Lack of sensitivity therefore *** Pain to apical palpation **	Radiolucency, image of bone lysis *** Thickening periodontal ligament ***

Fig 3 Periapical Pathologies

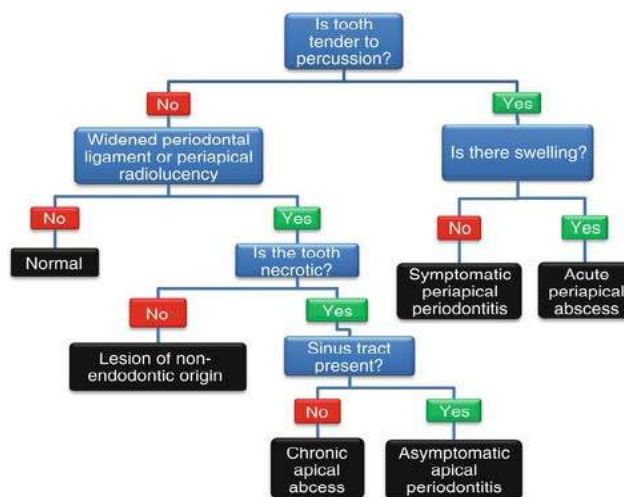


Fig 4 Diagnosis of the pathologies depending upon the symptoms and signs

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## Early Treatment Of Vertical Skeletal Dysplasia With Different Types Of Spring Loaded Bite Blocks

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### Abstract :

Open bite malocclusion has long held great fascination in orthodontics. It is difficult to treat and relapse tendencies are strong. The early treatment strategy of skeletal open bite is based on the inhibition of the vertical development or intrusion of the buccal dentoalveolar structures by means of bite-blocks or extra oral appliances, thus producing an upward and forward rotation of the mandible into a more horizontal growth direction, rather than vertical. Use of spring loaded bite blocks gives additional advantage of increased muscular strength, which could be crucial in terms of long term stability of open bite correction. This article highlights various innovative modalities which essentially incorporates posterior bite block with some form of active intruding springs.

**Key Words :** Spring, Bite-blocks, Open bite

### Introduction :

The cause of anterior open-bite is multifactorial and can be attributed to a combination of skeletal, dental and soft tissue effects<sup>1,2</sup>.

The treatment of dental open bite is relatively easy but the treatment of vertical skeletal dysplasia i.e. skeletal open bite is quite complex and undoubtedly one of the most relapse prone malocclusions.

The early treatment strategy of skeletal open bite is based on the inhibition of the vertical development or intrusion of the buccal dentoalveolar structures by means of bite-blocks or extra oral appliances, thus

producing an upward and forward rotation of the mandible into a more horizontal growth direction, rather than vertical. Early interception offers psychological benefit and potential for condylar growth.

Various treatment modalities have been proposed for the early correction of skeletal anterior open bite<sup>3-19</sup>. These include the use of high pull headgear, vertical-pull chin cup, functional appliances, posterior bite-blocks and it's modifications.

Out of these, only posterior bite blocks proved to be effective in producing condylar growth and forward rotation of mandible. To actively intrude the buccal segments there is always a need of some active component.

These were tried by, Iscan et al<sup>20</sup> and Akkaya and Haydar<sup>21</sup>, where some spring were added in the blocks. But there were some inherent deficiencies in the designs, e.g. there was no scope for lower posterior segment intrusion, good laboratory support needed, force measurement was not possible etc.

To overcome these deficiencies and to take maximum advantage of growth, present article describes basic spring loaded block appliance design with some additional types based on needs of the individual patients.

**Design I:  
Modified Woodside Spring loaded bite blocks (Fig.1)**

The construction bite is taken by hinging the mandible open about 3-4 mm beyond the rest position in centric relation. This results in 6–8 mm of vertical opening in the second premolar region.

Appliance is constructed as described by *Linder-Aronson* and *Woodside*<sup>22</sup> with two modifications.

It has two parts. First, a mandibular removable plate with occlusal coverage and the second is an acrylic bite block, occlusal to the mandibular plate.

These parts are connected by two helical springs (buccal and lingual) made from 0.9 mm stainless steel wire. The springs are positioned with helix facing towards the premolars. Lower end of the buccal spring is soldered to the Adam's clasp (0.8mm stainless steel) and the occlusal end is embedded completely into the occlusal bite block. The lingual spring has its lower end embedded in lower plate and the upper end embedded into the occlusal bite block.

A hook is made from 0.9 mm stainless steel wire, embedded into the occlusal bite block in the molar region on buccal side, to

measure the amount of activation. This is done using a Dontrix gauge.

During every appointment (4 weeks) appliance is activated to apply constant intrusive force of 250 – 300 gms.

Original appliance is modified in two ways,

1. Occlusal coverage is added on mandibular posterior teeth.
2. Hook placed in upper block for measurement of the amount of activation.



Fig 1: Design I (SLBB I)

**Indication:**

For skeletal open bite cases in mixed dentition, where there is over eruption of most distal buccal segment.

**Case report:**

A male patient, age 9 years, 4 months was treated with this design (Fig 2,3). Open bite of 7 mm was corrected in the span of 8 months and was retained further for 1 year using passive posterior bite blocks.

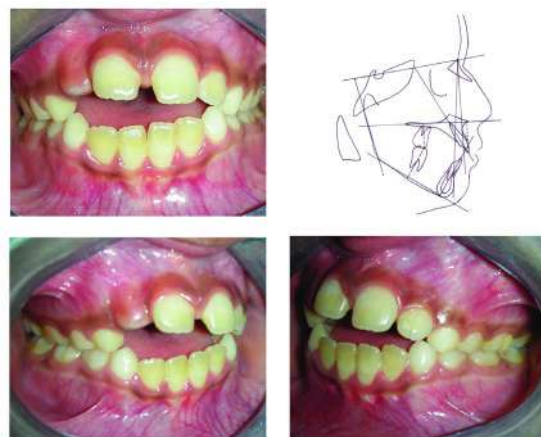


Fig 2: Pre-treatment

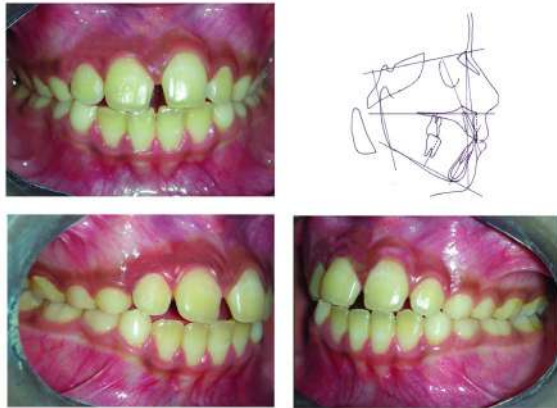


Fig 3: Post treatment

### Design II

#### Z spring loaded bite blocks (Fig 4)

In this design upper and lower parts are connected by a single spring on right and left side. The configuration of spring is like a Z spring, with its lower end embedded in mandibular block and one in maxillary block on buccal side. It is made up of high strength 0.9 mm stainless steel wire. Appliance is retained by Adams clasps on Molars.

To prevent slippage of the maxillary block lingually, during closure a lingual shield is constructed on mandibular block.

The activation is done by opening the two arms of the 'Z', such that the maxillary lock remains parallel to mandibular block.

#### Indication:

For skeletal open bite cases in mid and late mixed dentition, where there is need of intrusion and/or holding of whole buccal segment

#### Advantage

Distributes the intrusive forces over whole buccal segment uniformly.



Fig 4: Design II (SLBB II)

### Design III

#### Plate free Spring loaded bite blocks (Fig 5)

In this modification maxillary and mandibular components are joined by buccal and lingual springs on each side. They are made from 0.8 mm SS or 0.8 mm TMA round wires. The springs are positioned with helix facing towards the premolars. Lower and occlusal ends are embedded in mandibular and maxillary occlusal bite blocks respectively. The activation is done by opening the two springs of each side.

To measure the amount of activation, a measuring hook can also be added in maxillary block.



Fig 5: Design III (SLBB III)

#### Indications

1. For active intrusion of maxillary and mandibular buccal segments.
2. Especially given in late mixed and early permanent dentition period, since appliance is self retaining and depends on good occlusal adaptation for retention.
3. Can also be used as an active retention appliance in pubertal and adolescent age group after orthodontic correction using TADS and/or orthognathic correction of skeletal open bite.
4. For active muscle exercise in skeletal open bite patients.

**Advantages over earlier design:**

1. More patient friendly.
2. Easy to prepare and no need of special lab support.
3. Use of TMA wire reduces chances of fatigue fracture of springs

**Conclusions:**

1. Design I is useful for skeletal open bite cases in mixed dentition, where there is over eruption of most distal buccal segment.
2. Design II is useful for skeletal open bite cases in mid and late mixed dentition, where there is need of intrusion and/or holding of whole buccal segment
3. Design III for active intrusion of maxillary and mandibular buccal segments. Especially given in late mixed and early permanent dentition period, since appliance is self retaining and depends on good occlusal adaptation for retention.
4. These designs can also be tried in cases of TMJ compression pathology.
5. Effectiveness of these appliances as a habit braking appliance based on their 'oral gymnastic effect' is also under consideration.

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## A Hidden Monster: Third Hand Smoke

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### Abstract:

Oral cancer is one of the most fatal health problems confronted by the mankind today. In India , because of cultural, ethnic, geographic influences and the popularity of addictive habits, the incidence of oral cancer is high. It ranks number one in terms of its occurrence among men and third among women. Cigarette smoking is one of the chief causes of head and neck cancer worldwide. Second hand smoke is a type of smoking mixture of side stream smoke and main stream smoke exhaled from the lungs of smokers. A recent model of involuntary smoking has surfaced , the concept of 'third hand smoke' (THS). Evidence supports widespread presence of third hand smoke in indoor environments. THS is hidden and underestimated public health hazard. Our focus is to highlight the concept of THS smoke.

**Key Word :** Third hand smoker, Residual smoke, Second hand smoke

### Introduction

It is well known fact that smoking is injurious to health. Many health problems like cancer, cardiovascular diseases and chronic obstructive pulmonary diseases are associated with cigarette smoking. There are evidences to support the fact that not only active smoking, but involuntary exposure to environmental tobacco smoke is also harmful to health <sup>1</sup>. Mainstream smoke is the one which is directly inhaled by the smoker through mouth. Second hand or passive smoking or side stream smoke,

also at times referred to as environmental tobacco smoke, is the one which comes from the burning tip of cigarette and which is mixed with surrounding air. Second hand smoke is a combination of smoke exhaled by the smoker and also the smoke which comes from the burning end of cigarette. Non-smokers have health issues due to this passive smoking. <sup>2,3</sup>

### Third Hand Smoke:

Third hand smoke is also known as residual or aged tobacco smoke.<sup>2</sup> Third-hand smoke

is a relatively new phenomenon in public health field. This notation was coined in 2009 but was not brought to light until the New York Times published an article on this topic.<sup>4,5</sup>

A smoker exhales various nicotine –like contaminants when he/she smokes, which settles down on various household objects and surfaces and remains there for various weeks or months together.<sup>6</sup> This third hand smoke can be detected on variety of surfaces and objects like floor, furniture , clothings , curtains , bedding and couches for several months after smoking.<sup>7</sup>

A complex physiochemical reaction takes place between the environmental pollutants and emitted tobacco compounds. Nicotine adsorbed onto the surfaces reacts with nitrous acid (which is formed by indoor activities like unvented combustions using various appliances) forming tobacco specific-N-nitrosoamine (TSNA) which is combination of of 1-(N-methyl-N-nitrosamino)-1-(2-pyridinyl)-4-butanal (NNA),4-(methylnitrosamino)-1-(3-pyridinyl)-1-butanone(NNK), and N-nitroso nornicotine (NNN).<sup>6</sup>

### **Is third hand smoke harmful??**

Inhalation, ingestion and dermal absorption are the 3 pathways of third hand smoke exposure that has been identified.<sup>7</sup> Three ‘Rs’ describe the third hand smoke, it remains on the surfaces, it is re-emitted back into gas phase and it reacts with oxidants and other compounds from the environment.<sup>6</sup>

TSNA is a major toxic product formed in third hand smoke and long term effect of TSNA is responsible for cancer in human cells. TSNA consists of NNK, NNA and

NNN. NNA has a higher ability to cause oxidative DNA damage and break in the DNA strands and has an ability to induce concentration-dependent increase in mutant fractions.<sup>8</sup> NNK by methylation and pyridyloxobutyl adduct process, can causes mutation in DNA. Also, NNK forms nitrous oxide when exposed to ultraviolet A along with alkylating and oxidative intermediates which leads to formation of 8-oxodG and O6meG in DNA. This can lead to DNA strand breaks, oxidative and alkylative DNA base damage and mutation. Nonsmokers are continuously in contact with carcinogens in third hand smoke. When nonsmokers touch polluted surfaces in smoking environments TSNAs could be contacted by hands. Also is has been confirmed that person who is exposed to THS exhibits elevated levels of TSNA in the body fluids. THS is insidious and is difficult to remove with commonly used cleaning appliances (like vacuum cleaner).<sup>6</sup>

### **Can THS cause Oral Cancer??**

Third hand smoke is comparatively a new concept and not much research and studies are done on it. To prove the cause and effect relationship of third hand smoke and oral cancer more research is to be required.

### **Future Direction:**

There is a need for pursuing a programmatic research agenda so as to fill gaps in our current knowledge and understanding of the chemistry, adverse effect, clinical significance and policy implications of third hand smoke.<sup>2</sup> More studies are invited to study the long term and short term effect of third hand smoke (especially in children). Such studies will certainly contribute to better prevention of third hand smoke exposure induced health

effects in human and this will provide scientific basis for policy decision making in National Tobacco Control Programs.

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## Interdisciplinary approach of Perio-Endo Lesion – A Case Report

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### Abstract:

Anatomically the pulp and periodontium are connected through apical foramen, & lateral, accessory, and furcal canals. Diseases of one tissue may affect the other. In the present case report a primary endodontic lesion with secondary periodontal involvement is described. In this case, root canal treatment was done followed by periodontal therapy with the use of platelet-rich fibrin (PRF) as the regenerative material of choice. PRF has been a breakthrough in the stimulation & acceleration of tissue healing. Absence of pain, swelling along with tooth stability & adequate radiographic bone fill at 3 months of follow-up indicated a successful outcome.

**Key Word :** Endo-perio lesion, intrabony defect, platelet-rich fibrin, regeneration

### Introduction :

The tooth, the pulp tissue within it, and its supporting structures should be viewed as one biologic unit. The interrelationship between periodontal and endodontic diseases has aroused much speculation, confusion, and controversy. The relationship between the periodontium and the pulp was first discovered by Simring and Goldberg in 1964<sup>[1]</sup>

The endo-perio lesion is a condition characterized by the association of periodontal and pulpal disease in the same

dental element. The term “perio-endo lesion” is used to describe lesions formed due to inflammatory products found in varying degrees in both periodontium and pulpal tissues<sup>[2]</sup>

The possible pathways for the ingress of bacteria and their products into these tissues can broadly be divided into: Anatomic and physiological pathways<sup>[3]</sup> The causative agents of periodontal disease are found in the sulcus and are continually challenged by host defenses. An immunologic or inflammatory response is elicited in response to this microbiologic challenge.

When periodontal disease extends from the gingival sulcus toward the apex, the inflammatory products attack the elements of the periodontal ligament and the surrounding alveolar bone.<sup>[4]</sup>

Periodontal therapy is performed to remove the local factors, which leads to resolution of inflammation in the supporting structures of the tooth. It predominantly involves scaling and root planing as a main therapy, combined with hard and soft tissue surgery. With proper postoperative maintenance care, resolution of inflammation occurs, leading to arrest of disease progression.<sup>[5]</sup>

### Classification

According to Simon, Glick and Frank in 1972 classified as<sup>[6]</sup>

- Primary endodontic lesion
- Primary periodontal lesion
- Primary endodontic lesion with secondary periodontal involvement
- Primary periodontal lesion with secondary endodontic involvement
- True combined lesion

### Case Report

#### Primary endodontic lesion with secondary periodontal involvement

A 36-year-old patient came to the department with chief complaint of pain with 46 and 47. The patient's medical status was non contributory. The patient complained of periodic pus discharge, grade I tooth mobility, and intermittent pain. Radiographs displayed a bony defect in the furcal and periapical area of 46 and 47. Endodontic treatment was performed and treatment results were evaluated 3 months later which showed that the furcation lesion still remained intact. Therefore, periodontal regenerative surgery

was planned for the treatment of the furcation defect.

After administering of local anesthesia, a mucoperiosteal flap was raised. After reflection thorough degranulation and debridement was done at the defect area. Also thorough scaling and root planing was carried out on the exposed root surface area of the defect. After instrumentation, the root surfaces were washed with saline solution to attempt to remove any remaining detached fragments from the defect and surgical field. After that, PRF was stabilized in the furcation area defect. Primary soft tissue closure of the flap was done with nonresorbable black silk [3-0] suture, using interrupted suturing technique. The patient was advised proper plaque control, and prescribed 0.12% chlorhexidine mouthwash for rinsing twice daily, for a week. The sutures were removed 7 days after surgery. 3 month recall radiograph showed considerable bone repair in the furcation defect with 46 and 47 [Figure 1].

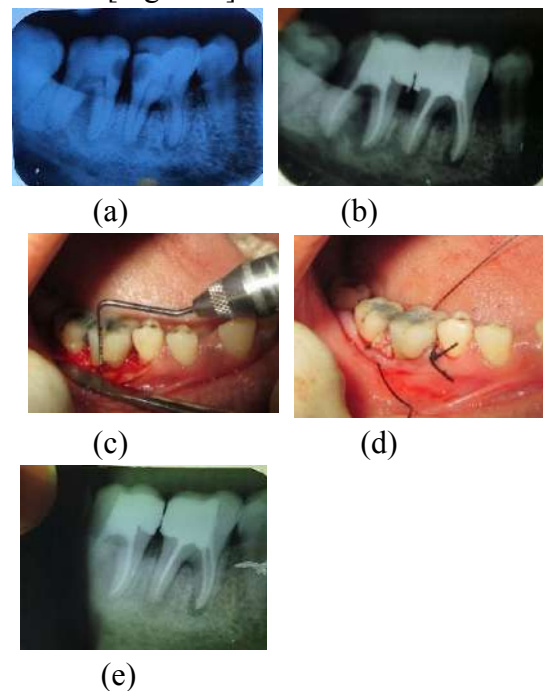


Fig.1 a) Pre-op radiograph b) Three month recall after RCT showing radiolucency in furcation area c) Flap refection d) PRF placement e) 3 month recall after regenerative flap surgery showing considerable bone fill in the furcation defect.

## DISCUSSION

Perio-endo lesions develop by either periodontal destruction combining apically with an existing periapical lesion or an endodontic lesion combining with an existing periodontal lesion.<sup>[2]</sup> Seltzer *et al.*<sup>[7]</sup> concluded that an established endodontic lesion could progress through the main or accessory canals to produce periodontal breakdown. A more controversial hypothesis has also been suggested, which is the spread of infection from a periodontal pocket into the root canal system itself.<sup>[8]</sup> True-combined lesions are treated initially as for primary endodontic lesions with secondary periodontal involvement. Periodontal surgical procedures are almost always called for. The prognosis of a true-combined perio-endo lesion is often poor or even hopeless, especially when periodontal lesions are chronic with extensive loss of attachment.<sup>[9]</sup>

El-sharkawy *et al.*<sup>[10]</sup> studied the regenerative potential of PRF and suggested that the administration of growth factors may be combined with tissue regeneration techniques in the repair of intrabony defects, furcations, and cyst cavities.

PRF is a regenerative material that was first developed by Choukroun *et al.* in France in 2001.<sup>[11]</sup> It belongs to the new generation of platelet concentrates which is in the form of a platelet gel. It is made from autologous blood and is used to deliver growth factors in high concentration to the site of a bone defect, offering several advantages includ-

ing promoting wound healing, bone growth, maturation, graft stabilization, wound sealing, and hemostasis.<sup>[11]</sup>

PRF has been shown to be superior over traditionally prepared platelet-rich plasma (PRP). Its advantages include ease of preparation and lack of biochemical handling of blood which makes this preparation strictly autologous. The step in which bovine-derived thrombin is added to promote conversion of fibrinogen to fibrin in PRF is eliminated. The elimination of this step considerably reduces the risk associated with the use of bovine-derived thrombin.

The conversion of fibrinogen into fibrin takes place slowly with small quantities of physiologically available thrombin present in the blood sample itself. Thus, the physiological architecture that is very favorable to the healing process is obtained due to this slow polymerization process.<sup>[11]</sup> It consists of a fibrin matrix polymerized in a tetramolecular structure with incorporation of platelets, leukocytes, cytokines, and circulating stem cells.<sup>[12]</sup> The intrinsic incorporation of cytokines within the fibrin mesh allows for their progressive release over time (7-10 days) as the network of fibrin disintegrates.<sup>[12]</sup> According to Simonpiera *et al.*,<sup>[11]</sup> the use of this platelet and immune concentrate offers the following four advantages. First, the fibrin clot plays an important mechanical role, with the PRF membrane maintaining and protecting the grafted biomaterials and PRF fragments serving as biological connectors between bone particles. Second, the integration of this fibrin network into the regenerative site facilitates cellular migration, particularly for the endothelial cells necessary for neoangiogenesis, vascularization, and survival of the graft.

Third, the platelet cytokines [platelet-derived growth factor (PDGF), transforming growth factor (TGF), and insulin-like growth factor-1 (IGF-1)] are released gradually as the fibrin matrix gets resorbed, thus creating a perpetual process of healing. Lastly, the presence of leukocytes and cytokines in the fibrin network can play a significant role in the self-regulation of inflammatory and infectious phenomenon within the grafted material.<sup>[13]</sup>

The case presented here was planned to regenerative therapy as after 3 months of endodontic therapy there was resolution in endodontic component only and periodontal lesion was still intact. Periodontal therapy deals with many aspects of the supporting structures, including the prevention and repair of lesions of the gingival sulcus. Endodontic therapy deals primarily with diseases of the pulp and periapical tissues. The success of both periodontal and endodontic therapy depends on the elimination of both disease processes, whether they exist separately or as a combined lesion. The relationship between periodontal and endodontic disease has been a subject of speculation for many years.

In the case discussed here, endodontic therapy was performed first, followed by periodontal therapy after 3 months. This sequence of treatment allows sufficient time for initial tissue healing and better assessment of the periodontal condition. It also reduces the potential risk of infection with bacteria and their by-products in the initial healing phase.<sup>[13]</sup> Here, PRF is used as both a graft material as well as a membrane. The postoperative radiograph taken at the 3 months follow-up examination showed complete resolution of

the periapical lesion and bone fill of the furcation defect. Endodontic therapy resulted in resolution of the endodontic lesion, but had little effect on the periodontal lesion. Therefore, it is essential that the periodontal problem is also treated to obtain the optimal therapeutic outcome.

## CONCLUSION

The healing of an endodontic lesion is highly predictable, but the repair or regeneration of periodontal tissues is questionable if associated with it. Endodontic therapy mostly should precede periodontal pocket elimination procedures in the case of a primary endo and secondary periodontal involvement; however, endodontic therapy would result only in resolution of the endodontic component of involvement and would have a little effect on the periodontal lesion. Therefore a thorough diagnostic examination usually will indicate the primary etiology and, thereby, direct the proper course of treatment plan as presented in this case. Results of the case presented here show that the combined treatment approach with PRF was effective in treating the combined perio-endo lesions.

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## INFLAMMATORY FIBROUS HYPERPLASIA – A CASE REPORT

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### Abstract:

Gingival enlargement, the currently accepted terminology for an increase in the size of the gingiva, is a common feature of gingival disease. Local and systemic factors influence the gingival conditions of the patient. These factors result in a spectrum of diseases that can be developmental, reactive and inflammatory to neoplastic. In this article, the history, aetiology, clinical and histopathological features, treatment strategies and preventive protocol of inflammatory hyperplasia are discussed.

**Key Words:** Inflammatory Hyperplasia, Gingival Enlargement, Gingival Hyperplasia, Fibrous Hyperplasia.

### Introduction:

The term inflammatory hyperplasia is used to describe a large range of commonly occurring nodular growth of oral mucosa that histologically resembles inflammatory granulation tissue. This resemblance may be greater or lesser depending on the degree to which one or more of the components of the inflammatory reactions and healing response are exaggerated in the particular lesion.<sup>[1]</sup> Reactive hyperplastic lesions represent the most frequently encountered oral mucosal lesions in humans.<sup>[2]</sup> These lesions represent a reaction to some kind of

irritation or low-grade injury like chewing, trapped food, calculus, fractured teeth and iatrogenic factors, including overextended flanges of dentures and overhanging dental restorations.<sup>[3]</sup> Diagnosis of each lesion from the groups is aided by their clinical and radiographic features, but histopathology is the key for final diagnosis.<sup>[4]</sup>

Gingival enlargement may be caused by a multitude of causes. The most common is chronic inflammatory gingival enlargement, when the gingiva presents clinically as soft and discoloured.<sup>[5]</sup> This is caused by

tissue oedema and infective cellular infiltration, caused by prolonged exposure to bacterial plaque, and is treated with conventional periodontal treatment, such as scaling and root planing. Situations in which the chronic inflammatory gingival enlargements include significant fibrotic components that do not respond to and undergo shrinkage when exposed to scaling and root planing are treated with surgical removal of the excess tissue.<sup>[6]</sup> The accumulation and retention of plaque is the chief cause of inflammatory gingival enlargement.

#### **CASE REPORT:**

A male patient aged 50 years reported to the outpatient department of C.S.M.S.S Dental college, with a chief complaint of loose teeth and pain in upper front region of jaw since 4 months. Patient was all right 4 months back, later he experience discomfort in upper front region of jaw. He also developed swelling in the same region. The swelling has gradually increased to the present size. Patient did not give any history of systemic illness on physical examination. He had habit of chewing tobacco since last 10 years.

On extraoral examination face was bilaterally symmetrical, (Fig 1) Lips were Competent & TMJ shows Bilateral synchronous movements with no tenderness and clicking sound, Lymph nodes are non-palpable. Intraoral examination revealed generalized periodontal pocket and gingival inflammation seen in relation with 11.

On Inspection the lesion was single, well-defined swelling present labially in the region of 11 & 21 and was oval in shape and approximately, 2 x 2 cm in size. The surface texture is smooth. The extent of the swelling is from mesial aspect of 12 to mesial aspect of 21. Color is red to pale

pink, borders of swelling are smooth. Overlying skin appears normal with normal surrounding tissue. The lesion involved the marginal and interdental gingiva on the facial surface. Local factors plaque and calculus were present. On palpation Swelling was afebrile, tender on gentle manipulation. Soft in consistency. Non fluctuant non compressible swelling. Swelling is movable in all possible direction. (Fig.2)

Other hard tissue findings revealed Grade 3 mobility with 11, 21. Pathological migration of teeth with 11, root caries with 11, 12. Root piece with 13, Sinus opening with 15 16, stains+++calculus++.

Provisional diagnosis made based on clinical findings was Inflammatory Hyperplasia with maxillary anterior region. On radiographic examination, IOPA with 11 and 21 shows root caries with 11 and 21 on . PDL space ceases to exists on generalised aspect of 11 with loss of lamina dura. A well-defined non corticated radiolucency of approximate size 1.0 x 0.8 cm seen at apical 1/3 of 11. Generalised PDL widening seen with 21, Suggestive of: Infected periapical abscess with 11. There is also interdental bone loss seen at coronal 1/3 op 11 and 21, suggestive of moderate periodontitis. (Fig.3)

The patient was sent to Oral Surgery Department where the lesion was surgically excised. (Fig.4) Patient was recalled after 15 days and follow up examination revealed eventful healing. (Fig.6) The excised lesion was sent to the Department of Oral Pathology for histopathological examination. Microscopic examination revealed H & E-stained tissue showing proliferated epithelium. Underlined fibrous connective tissue are fibrosed. Consists of haphazardly arranged bundles of collagen

fibers along with chronic inflammatory infiltrate mainly composed of plasma cells and lymphocytes. The features were suggestive of inflammatory fibrous hyperplasia.(fig.5)

Final diagnosis made based on clinical and histopathological examination was **INFLAMMATORY FIBROUS HYPERPLASIA** with maxillary anterior region.

**DISCUSSION:**

An oral inflammatory hyperplastic lesion is a common entity and may be defined as “an increase in the size of an organ or tissue due to an increase in the number of its constituent cells, as a local response of tissue to injury”. [1]

Traumatic irritants includes calculi, overhanging margin of restoration , foreign bodies, chronic biting, margins of caries, sharp spicules of bones, and overextended borders of appliances. Also clinically named as fibroma, squamous papilloma, epulis fissuratum. Inflammatory fibrous hyperplasia may occur on any surface of oral mucous membrane but generally occurs on gingiva. Inflammatory fibrous hyperplasia is the healed end product of an Inflammatory hyperplastic lesion and is not a true neoplasm. [7] It is an aggregate of scar tissue covered with a smooth layer of stratified squamous epithelium. [8]

**CONCLUSION:**

In short the case report concludes that inflammatory fibrous hyperplasia is a benign soft tissue response to a local irritant. It can be due to calculus, a sharp tooth, a broken filling, excessive plaque and other irritating factors. Inflammatory fibrous hyperplasia clinically presents as a well-demarcated exophytic mass. Conservative surgical excision is the preferred treatment of choice with removal of local irritants to prevent

recurrence. Follow-up of the patient is needed as it exhibits a tendency to recur.



Fig.1 Profile photo



Fig.2 Intraoral prior excision



Fig.3 IOPA of 11&21



Fig.4 Excised tissue

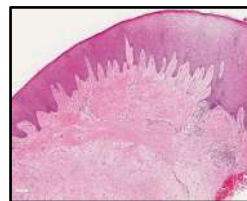


Fig.5 Histological image of fibrous hyperplasia of gingiva



Fig.6 After surgery

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## Current Status On Lithium Disilicate : A Review Article

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### Abstract:

The introduction of new generation of particle-filled and high strength ceramics, hybrid composites and techno polymers in the last decade has offered an extensive palette of dental materials broadening the clinical indications in fixed prosthodontics, in the light of minimally invasive dentistry. Moreover, last years have seen a dramatic increase in the patients' demand for non-metallic materials, sometimes induced by metal-phobia or alleged allergies. Therefore, the attention of scientific research has been progressively focusing on such materials, particularly on lithium disilicate in order to shed light on properties, indications and limitations of the new protagonists of the prosthetic scene.

**Key Words :** Lithium disilicate, IPS e.max , IPS empress2

### Introduction :

Lithium disilicate material had been widely marketed, because of adhesive properties of this material and its preservation of tooth structure. Lithium disilicate restorations are manufactured by heat press-lost wax technique (IPS e.max Press) or by CAD/CAM technique (IPS e.max CAD). The former has a high survival rate based on short and long term survival evidence for each single crown restoration and 3-unit FDP. The latter (IPS e.max {figure.1}CAD) techniques, which

produce diferent crystal characterization, lack enough clinical evaluations and trials thus are still not indicated for multiple units FDP . The manufacturer (Ivoclar Vivadent) starting use lithium disilicate as a frame work to increase the strength of veneer as IPS Empress2, where veneer material was fluorapatite-based porcelain<sup>[1]</sup>.

### **Abrasiveness And Wear :**

As to wear and abrasiveness, LS2 shows quite favourable properties, that are highly depending on the surface characteristics of the restoration. When accurately polished at its surface, the material exhibits convenient tribological behaviour in vitro, in terms of friction and wear of restorations, being its abrasiveness quite close to enamel, although more aggressive when compared to type III gold or to polished monolithic zirconia in in vitro simulations. Such favourable wear behaviour and durability have been also confirmed by some in vivo evidence<sup>[1]</sup>.

### **Surface Treatment And Cementation :**

In addition to excellent biocompatibility and high mechanical properties, LS2 exhibits very good esthetic features, especially as regards translucency, that is about 30% higher than conventional zirconia<sup>[2]</sup>. For the glass-ceramic class, to date hydrofluoric acid (HF) etching is best established procedure, to be performed according to validated protocols taking into account both acid concentration and etching time. Another system to create surface microirregularities is sandblasting LS2 with aluminum oxide particles. Nevertheless, it has been shown that this procedure, as well laser etching, can determine excessive loss of material, with surface modifications that are less uniformly distributed than after HF etching and that can significantly reduce flexural strength<sup>[3]</sup>. Recently, it has been shown that the use of silane combined to a phosphate functional monomer, the 10- Methacryloyloxydecyl-Dihydrogen-Phosphate (10-MDP), creating acidic environment further improves the bond strength of resin-based luting cement to lithium disilicate ceramics<sup>[4]</sup>.

### **Clinical Indications :**

As regards clinical indications of LS2, it has to be pointed out that this is one of the most

versatile metalfree materials for its high esthetic potential, good mechanical properties and favourable bonding strength to dental tissues, thanks to its silica content. Lithium disilicate ceramics can be utilized both for tooth- and implant-supported restorations, ranging from SCs to FDPs, from anterior veneers to posterior inlays, onlays and overlays<sup>[5]</sup>. As regards chairside procedures, monolithic LS2 crowns revealed a survival rate of 83.5% after 10 years of follow-up; the main complications were loss of retention, secondary caries and hypersensitivity<sup>[6]</sup>. The utilization of LS2 for FDPs is controversial topic: literature data is quite scant and not homogeneous, with high variability of reported survival and success rates, ranging from rather poor clinical results to acceptable long-term serviceability both in anterior and posterior sites, similar to metal-ceramics. In opinion of the authors, from strictly clinical point of view, taking into account the cost/benefit ratio in terms of esthetic needs and structural resistance, the material of choice for 3- or 4-unit FDPs is still zirconia, in all of its different typologies<sup>[7]</sup>.

### **Marginal Accuracy And Internal Fit:**

According to most recent literature, there is no significant difference in terms of marginal accuracy between conventional and full-digital procedures for the fabrication of monolithic lithium disilicate crowns. Moreover, some authors reported that hotpressed LS2 crowns made from conventional impressions with polyvinylsiloxanes exhibit better fit than CAD/CAM digitally produced ones<sup>[8]</sup>. Furthermore, centralized milling production has been reported to result in better fit compared to chairside system; in the same study, occlusal internal adaptation was better in the conventionally manufactured crowns than in the digitally fabricated

ones<sup>[9]</sup>. To date, drawing univocal conclusions about adaptation accuracy of lithium disilicate restorations is not easy, due to the high number of variables involved in the final prosthetic fit, like digital impression system and technique, used material and fabrication procedure, so there is still a noticeable amount of controversial debate<sup>[10]</sup>.

### Discussion :

Lithium disilicate (LS2) is classified as a glass-ceramic, in the class of particle-filled glass materials. Introduced on the market in the 90s with the commercial formulation named “IPS Empress 2”, it was composed of 65 vol% lithium disilicate, small needle-shaped crystals ( $3\text{--}6\ \mu\text{m} \times 0.8\ \mu\text{m}$ ) embedded in a glass matrix, with a 1 vol% porosity<sup>[11]</sup>. The high mechanical performance of this material is due, on one side, to a layered, tightly interlocked distribution of the elongated disilicate crystals, hindering crack propagation across the planes and, on the other side, to a mismatch between the thermal expansion coefficients of LS2 crystals and the glassy matrix, so that the latter induces a tangential, compressive stress around the crystals<sup>[12]</sup>.

As regards mechanical resistance, it has been clearly demonstrated that, in vitro, veneered LS2 crowns exhibit significantly lower fracture load values ( $1431.1 \pm 404.3\ \text{N}$ ) compared to monolithic ones, the main failure mechanism being bulk fracture initiating from the occlusal surface<sup>[13]</sup>.



IPS E MAX {fig.1}

### Conclusion :

The growing of materials and technologies does not mean the well-established traditional techniques are not working anymore. It does present the ease of retrieving and providing an accurate and precise prosthesis that was previously difficult to obtain. The evolution of lithium disilicate dental restorations give many advantages for veneering, inlay, onlay and single crown restorations. For implant supported prosthesis, lithium disilicate is still infrequently applied. As discussed in this review; In-vitro studies conclude that the lithium disilicate with different manufacture process present differential mechanical properties; and in clinical studies, lithium disilicate also showed perfect performance with no fracture, chipping or sensitivity. These results give a lot of advantages for natural teeth restorations.

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## Sclerotherapy In Oral Recurrent Buccal Fat Hemangioma : A Case Report

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### Abstract:

Hemangiomas are benign neoplasms that are common in the head and neck, but relatively rare in the oral cavity. They can cause esthetic and functional impairment, depending on location. The most common site is the upper lip, but they can occur in other areas, such as the tongue, buccal mucosa and palate. Treatment is primarily dependent on correct diagnosis of the lesion and on its anatomic location. The purpose of this paper is to provide a description of a case of a hemangioma on the left buccal area, treated by therapeutic sclerosis with sodium tetradecyl sulfate, covering clinical characteristics and methods for diagnosing these lesions. Precise diagnosis and appropriate therapeutic management resulted in satisfactory aesthetic and functional results, with total regression of the lesion and no signs of relapse at 6 months of follow-up.

**Key Word :** Hemangioma, Buccal mucosa, Sclerosis.

### Introduction :

Hemangiomas are often present at birth but may become more apparent during later life. They appear as a flat or raised reddish blue lesion and are generally solitary. Hemangiomas invariably involute however at least 10–20% cases need active intervention because of their tendency to bleed and become ulcerated. Hemangiomas of the oral cavity are not common but

amongst them, the head and neck is the common site.

Incidence of Hemangioma ranges from 1–12% depending on age and population studied. Injection of sclerosing agents into few hemangiomas can serve as a therapy. The present case of preoperated recurrent buccal hemangioma of oral cavity was treated by using 3% sodium tetradecyl sulfate (STDS) intralesionally<sup>1</sup>.

**Case Report:** A 23-year-old boy in good health reported to the department of oral medicine and radiology in July 2021 with complaint of painless swelling in left lower back region of the cheek that first presented 3 years back and went on increasing slowly. He underwent laser treatment for the same 2 years back after which it regressed. The swelling reappeared at the same site before 6 months and increased to the present size.

On extraoral examination, asymmetric face showing single oval mild swelling on the left side ramus area. (Fig.1) extending from 3 cm behind corner of mouth and 2.5 cm anterior to the ramus. Superiorly, it extended 2 cm below the zygomatic arch and inferiorly 3 cm above lower border of mandible. Skin over the swelling was normal. The mass was firm, non fluctuant, non compressible, non tender on palpation. There were no bruits, or lymphadenopathies associated with it.

Intraoral examination revealed that the lesion was bulging under the buccal mucosa at the region opposite to left mandibular posterior teeth. The colour of the buccal mucosa appeared reddish-blue, and several lobulated nodules looked acineiform. (Fig. 2) size of 1 cm -2 cm, raised and irregularly placed. The mass was solitary, soft, non tender, diffused. The high frequency soft tissue USG was done for the same, that revealed well defined oval heterogenous to hypoechoic vascular lesion seen in left buccal region, superior medial to ramus of mandible, extending deep from subcutaneous plane, measures approx. 16 x 16 mm. The lesion shows arterial and venous vessels within. Few cystic areas and fatty striations within lesion were also noted. Gives the impression of lesion to be recurrence of operated buccal hemangioma. The hemangioma was treated with the intralesional sclerosing agent injections of

3% sodium tetradecyl sulfate by the interval of 2 weeks. Follow-ups were taken by the end of two months ( fig 3) and after six months ( fig 4) of the treatment. During the third visit, around six months later, intraoral examination revealed complete disappearance of the lesion, so the sclerotherapy was terminated and after almost six months, by a phone call, the patient notified us that the lesion had completely disappeared without any sign of recurrence. Hemangioma regressed in this case with considerable relief of symptoms with minimal complications.



Fig 1. Extraoral appearance



Fig 2 . Intraoral appearance



Fig 3 Followup after 2 months



Fig 4 Followup after 6 months

**Discussion:** Hemangioma a tumor-like malformation, is composed of seemingly disorganized masses of endothelial lined vessels that are filled with blood and connected to the main blood vascular system. They may occur as isolated lesions in oral cavity or as multiple lesions affecting different parts of the body and associated with other developmental anomalies. They are of two types: cavernous and capillary, the former consisting of relatively large blood filled lakes, the latter of masses of proliferating vessels of capillary dimension. Such lesions characteristically bleed profusely when traumatized. The diagnoses of hemangioma are straightforward from the history and clinical examination. The differential diagnoses are limited<sup>2</sup>. Selection of Imaging Modalities Multiple imaging modalities should be used to evaluate

characteristics of the lesion, such as size, flow velocity, flow direction, relation to the surrounding structures (vessels, muscle, nerve, bone, skin), and lesion contents. Imaging modalities like Ultrasonography, CT, MRI, Phlebography and Angiography can be used<sup>3</sup>. In a superficial, localized lesion such as one in the tongue, imaging study is usually not indicated<sup>4</sup>.

If the lesion is accessible surgically, surgical excision is the gold standard treatment.

However there are several obstacles when considering surgery

1. Complete excision may not be possible.
2. Dissection is often complicated by excessive bleeding.
3. Recurrence.
4. Functional impairment of vital functions like swallowing.
5. Morbidity of surgical procedure.

These issues have led people to seek alternative treatment of these malformations like cauterization, cryotherapy, radiotherapy, sclerosing agents.

Use of laser therapy for the treatment of hemangioma has gained popularity. Laser leads to selective photothermolysis rather than nonselective tissue destruction. Oral mucosa can be amenable to yellow light laser (578–585 nm) as these are selectively absorbed by hemoglobin. The tunable dye laser can ablate superficial ectatic blood vessels without significant epidermal damage or scarring.

Nd:YAG laser has less selectivity for any particular chromophore and use on nonmucosal surface is reported to result in more scarring. Argon laser has limited depth of penetration so it can be used for superficial bleeding<sup>4</sup>.

Cryotherapy has been used in the treatment of keratotic, hyperplastic, granulomatous, vascular, pigmented and salivary gland lesions. Generally, histological examination is required to confirm lesion diagnosis but biopsy prior to cryotherapy may compromise the final result for clinically diagnosable lesions such as mucocele and haemangiomas<sup>5</sup>.

Sclerosing agent causes marked tissue irritation and/or thrombosis with subsequent local inflammation and tissue necrosis. The inflammation and tissue necrosis result in fibrosis with tissue contracture.

Various sclerosing agents that can be used are- absolute ethanol, boiling polidocanol, sodium morrhuate, sodium tetradecyl sulfate and bleomycin. Absolute ethanol causes strong endothelial damage. Response rate is high. It is less expensive and easy to obtain but the injection is painful and has high complication rate. Penetrative effect on deep vascular layer is also high. Polidocanol leads to overhydration of endothelial cells and is almost painless but it may induce irreversible cardiac arrest.

Sodium tetradecyl sulfate (sotradecol) is the sclerosing agent which has been used for years in the treatment of varicose vein, hemorrhoids and hemangioma. Intravenous injection causes intima inflammation and thrombus formation. Although sclerotherapy is a simple technique that is apparently free from complications, special precautions must be taken. The sclerosing agent should be administered using an insulin needle, injecting the solution into the middle of the lesion, to avoid necrosis of surrounding tissues<sup>6</sup>. This usually occludes the injected vein and subsequent formation of fibrous tissue results in partial or complete vein obliteration that may or may not be permanent. Disadvantages of sclerotherapy

include postoperative pain and burning sensation, potential anaphylactic reaction, tissue necrosis, and airway compromise<sup>7</sup>

Minkow used a technique of intralesional injection of 0.1–0.5 ml of 3% STS in intraoral hemangioma at the interval of 2–4 weeks. Satisfactory results were reported in all patients with minimum side effects and disappearance of the lesions without scarring. The number of injections varied according to the size of lesion. The interval between the injections was usually 2–4 weeks. It allows the induration and inflammatory reaction to subside.

#### **Conclusion:**

Oral Hemangiomas are rare benign neoplasms composed of capillary malformations. Diagnosis is usually made on clinical and radiological grounds. Surgery remains standard of care for resectable lesions. Sclerotherapy and laser therapy provide alternative options for inaccessible or unresectable hemangiomas; at the same time they can overcome limitations of surgery. Sclerosing agent 3% sodium tetradecyl sulfate is an effective agent for treatment of oral hemangioma.

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## RATIONALE OF ELASTOMERS : A REVIEW

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### Abstract:

For accurate fit of indirect restoration a precise impression is important. Since last decade there are major advances in impression materials and their application with more importance on rubber impression materials than rigid materials. Polyvinyl siloxane shows the feature of polyether and vinyl siloxane. This involves accuracy, elastic recovery, dimensional stability, flow, flexibility, workability, hydrophilicity, a long shelf-life, patient comfort, and economy. Impression materials vary considerably in relation to ideal properties such as accuracy, elastic recovery, dimensional stability, flow, flexibility, workability, hydrophilicity, a long shelf-life, patient comfort, and economy. An accurate impression is an important step for accurate restoration.

**Key Word :** Polyvinyl siloxane, Elastomers, Flexibility, Polysulfide, Vinyl polyether siloxane

### Introduction :

Impression is the negative likeness or copy in reverse of the surface of an object (GPT 9)<sup>1</sup>It is made by placing an appropriate material in a stock or custom dental impression tray which is designed to roughly fit over the dental arches. An accurate impression is the most important step in the procedure of obtaining a perfect restoration. The recording of tissues in oral cavity is

difficult due to factors, such as salivation, blood flow and sulcular fluid. This becomes critical especially in recording finish lines for fixed restorations, especially where margins lay intrasulcularly. Hence, most dental surveys conducted correctly rate hydrophilicity as the most important criteria to choose an impression material where more can these materials improve. This has

led to the dawn of a new elastomeric impression material, i.e. vinyl polyether siloxane. Elastomers refer to a group of rubbery polymers, which are either chemically or physically cross-linked. There are four kinds of Elastomers used as impression materials viz., polysulfide, condensation silicone, addition silicone and polyether. Of these, addition silicone and polyether are most commonly used<sup>2</sup>. Traditional additional silicones were hydrophobic; due to which accuracy of impressions was questionable. The newer ones have added surfactants to counteract this. Polyether, on the other hand, is hydrophilic and records good detail, but it is the stiffest among all Elastomers. This newer elastomers that has been developed is called as vinyl polyether siloxane (VPES) combining features of both addition silicone and polyether. This new Elastomers boasts of immediate hydrophilicity

### **PROPERTIES OF ELASTOMERS:**

#### **Accuracy:**

According to American Dental Association specification number 19, to create exact castings, elastomeric impression materials must be able to reproduce fine detail of 25  $\mu\text{m}$  or less. PVS impression materials can make details of even 1 to 2 $\mu\text{m}$ <sup>3</sup>. Viscosity is also an important property of a material for the precise impression in a cast. It is found that to record fine detail viscosity should be lower. Putty materials fail to produce fine detail at the 25  $\mu\text{m}$  level and are required only to record details of 75 $\mu\text{m}$ . Dimensional accuracy is another aspect of the accuracy of an impression material. It is evaluated by measuring tooth-to-tooth distances within the same quadrant and cross arch. Although

PVS materials are likely to be more exact than other materials.

#### **Rheological properties:**

The ability of a material to flow into small areas and reproduce minute details defines wettability or flowability of an impression material. This type of material provides more accurate impression as this material produce impression with fewer voids and less entrapment of oral fluids. A light-body material, tends to flow off the preparation and possesses excellent flow characteristics. The ability of an impression material to reproduce minute detail in the area of 20 to 70 mm is necessary in the area of fixed partial dentures. When the heavier body tray materials are placed over the top of them most of the newer PVS products and polyether are thixotropic and stay where they are syringed but flow readily<sup>4</sup>

#### **Tear Strength:**

Resistance of particular material to tearing after setting is the tear strength of an impression material. Polyethers are considered to have the highest tear strengths, whereas hydrocolloids have relatively low tear strengths. PVS and polyethers are considered to have the highest tear strength.<sup>5</sup>

#### **Hydrophilic Behavior:**

About the Polyethers, it was found that they have produced the best details under moist conditions. Moisture control remains a significant factor for the expected achievement of the clinical impression with using polyvinylsiloxanes.<sup>6</sup> So it is concluded that there are uneven results among the



investigators. But for the practical purpose, the increasing hydrophilicity for elastomeric impression materials is the desired characteristics; polyethers have highest hydrophilicity than polysulphide than silicone.

### **Dimensional Changes:**

In the dental practice, for pouring most of the dental practitioner sent impression to the commercial lab which causes delay. For pouring impressions, practitioners may delay up to 72 h.<sup>7</sup> But the material may display great dimensional accuracy soon after its polymerization is complete as the dimensional accuracy is usually time dependent. Hydrogen gas released after setting from early generations of VPS. So to avoid bubbles we have to delay the pouring of casts. Then by adding platinum or palladium which scavenge the gas, this problem has been resolved. The materials like polyether and polyvinylsiloxane remain dimensionally accurate for a prolonged period of time (up to 1 week). And about VPS impression materials, have excellent accuracy and the fewest dimensional changes after multiple pours. When compared with the polysulfides and the condensation-curing silicones the polysiloxane materials shows small dimensional changes with time. If polysulfide impression materials poured instantaneously have sufficient dimensional accuracy<sup>8</sup>

### **DISCUSSION:**

In FPD, diagnostic impression is important as diagnostic cast gives idea about occlusocervical dimension of edentulous spaces, relative alignment and angulations of proposed abutment teeth, occlusal plane and oc-

clusion's detailed analysis. Due to low cost and easy to use as compare to other material, alginate is most commonly used in diagnostic impression. Polysulphides have a long working time, tear strength is good, before setting flow is good, surface detailed shows good reproduction, easier removal around undercuts is due to high flexibility and as compare to silicon and polyether it is with lower cost and drawback is that cannot be repoured. Polyvinyl siloxane also known as addition siloxane is dimensionally stable and record fine detail and can be poured at the comfort of the operator. PVS has excellent physical properties and handling characteristic and has the best elastic recovery of all available impression materials. This material can be poured 1 week after impression taken and can do multiple pour. Disadvantage of PVS are that the material is more rigid and to much costly practitioner use irreversible hydrocolloid mostly. Irreversible hydrocolloids have limitation that it tears easily and must be poured immediately after removal from mouth. Accuracy and acceptable stability of polyether and addition silicon material after disinfection protocol are unaffected. Whenever impression are made by polyvinyl siloxane. The use of vinyl glove is recommended whenever impression are made by vinyl polysiloxane as latex gloves results in inhibition of polymerization.<sup>9</sup>

### **SUMMARY:**

This review shows that vast variety of impression material is available for impression making. A good impression is an exact negative replica of each prepared tooth and must include all of the prepared surfaces and an adequate amount of unprepared tooth structure adjacent to the margin. The use of vinyl glove is recommended whenever impression are made by vinyl polysiloxane. Polyvinyl

siloxane has good physical properties and this material can be poured by multiple times. But this material is too expensive so most of the practitioner, make impressions by using irreversible hydrocolloid. Alginate is most commonly used among irreversible hydrocolloids as it is easy to used and less expensive.

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1<sup>st</sup> August CDE Programme by Dept. of Perio



5<sup>th</sup> March Conservative & Endodontics Day Celebrated



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12<sup>th</sup> Jan 2021 Oral Health Day celebrated by PHD Dept.



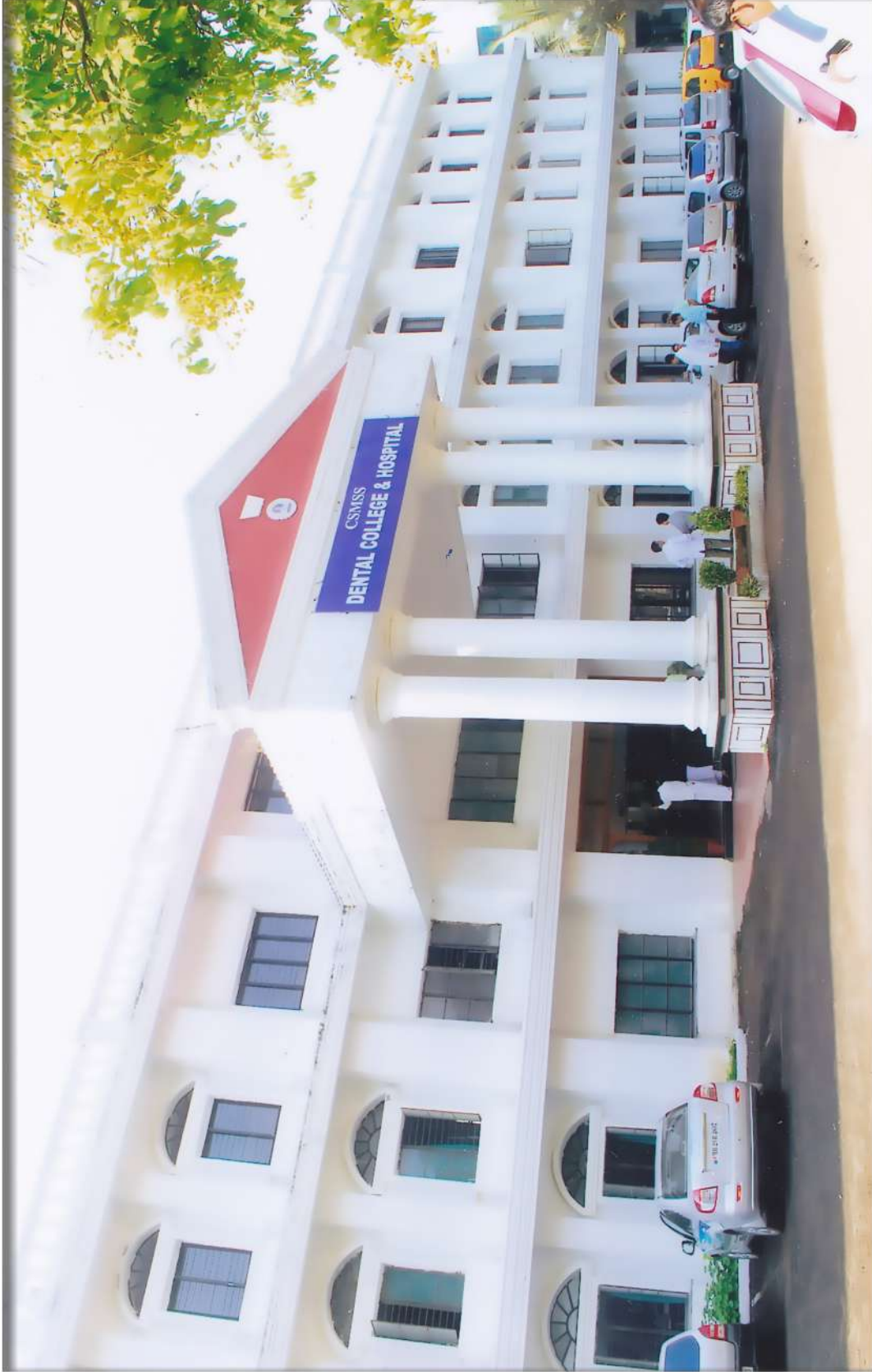
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