

DENTAL 360

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Dr. Stephen Cohen

EDITORIAL

Amidst rising concerns about the Omicron variant of the corona virus, the need for a global pandemic accord today is greater than ever. South Africa displayed great alacrity in detecting and passing on information about the mutant, giving the government precious time to take safeguards. Countries around the world have begun taking precautionary measures against this variant. Responses have been far swifter compared to earlier this year when the Delta variant began to make its presence felt. There are indications that the world has learnt valuable lessons in preparedness from the nearly two-year-long standing corona virus.

Even then, the surge of corona virus is bad: the longer the virus spreads, the greater are its chances to become more transmissible or more deadly. Also, based on preliminary analysis of Omicron infections in South Africa and elsewhere, experts suggest that it has 6 times higher potential to spread than the Delta, which has created havoc in India.

Talking about dentistry, COVID-19 pandemic has shown a major impact on dental practice. The COVID-19 risk mitigation strategies include strict adherence to infection control practices (use of hand sanitizers, facemask and maintaining social distancing), reducing the amount of aerosol production in the dental setting, and managing the quality of air in the dental treatment rooms by reducing the use of air conditioners and improving air exchange. Dental professionals are trying to adapt to the new norms, while the long-term impact of COVID-19 on dentistry needs further investigation.

No one can be safe unless everyone else is safe. The international community must put its shoulder to the wheel to actualise a pandemic treaty with legal obligations for all countries. The fate of humanity depends on it.

Dr. Shiva Gupta

Guest Editorial ►



PALLIATIVE CARE

Dr. Sourav Malhotra

WHAT IS PALLIATIVE CARE?

Palliative care is a care given to improve the quality of life of patients having serious or life-threatening disease, such as cancer. The goal of palliative care is to prevent or treat, as early as possible, the symptoms and side effect of the disease and its treatment, in addition to the related psychological, social, and spiritual problems. Since no two patients are alike, palliative care treatments are tailored to the individual based on his or her medical needs and his or her wishes for how they want to be treated physically, psychologically, and spiritually. It should begin at diagnosis and continue through treatment, follow-up care, and the end of life.

PALLIATIVE CARE ADDS LIFE TO DAYS RATHER THAN DAYS TO LIFE.

The goals of palliative care include:

- Treating symptoms including pain, nausea, breathlessness, insomnia, and other physical issues caused by cancer or its treatment.
- Managing emotional and social needs, including anxiety, depression, and relationship issues.
- Addressing practical needs, such as transportation and financial concerns.
- Providing support for family, friends, and care givers.
- Addressing spiritual needs or concerns.

WHO GIVES PALLIATIVE CARE ?

Often, palliative care specialists work as part of a multi disciplinary team to coordinate care. This palliative care team may consist of doctors, nurses, registered dietitians, pharmacists, and social workers. Many teams include psychologists or a hospital chaplain as well. Palliative care specialists may also make recommendations to primary care physicians about the management of pain and other symptoms.

ROLE OF DENTAL SURGEON IN PALLIATIVE CARE TEAM

The palliative care team consists of specialists in various fields

of medicine who provides care and treatment to the patients. A dental surgeon can help to improve the quality of life of the patients. Mouth is the most important organ of expression and it is most often affected in later stages of diseases. Oral cavity is home for a great number of micro organisms which aggravates the disease process. The patients need the help of a dentist to alleviate his/her discomfort and to live a better life. He can help the patient right from the initial diagnosis of the condition up to the relief of pain in the terminal stages of the diseases.

COMPREHENSIVE PALLIATIVE CARE WILL TAKE THE FOLLOWING ISSUES INTO ACCOUNT FOR EACH PATIENT:

Physical: Common physical symptoms include pain, fatigue, loss of appetite, nausea, vomiting, shortness of breath, and insomnia. Many of these can be relieved with medicines or by using other methods, such as nutrition therapy, physical therapy, or deep breathing techniques.

Emotional and Coping: Palliative care specialists can provide resources to help patients and families deal with the emotions that come with a cancer diagnosis and cancer treatment. Depression, anxiety, and fear are only a few of the concerns that can be addressed through palliative care. Experts may provide counselling, recommend support groups, hold family meetings, or make referrals to mental health professionals.

Practical: Cancer patients may have financial and legal worries, insurance questions, employment concerns, and concerns about completing advance directives. For many patients and families, the technical language and specific details of laws and forms are hard to understand. To ease the burden, the palliative care team may assist in coordinating the appropriate services. For example, the team may direct patients and families to resources that can help with financial counselling, understanding medical forms or legal advice, or identifying local and national resources, such as transportation or housing agencies.

Spiritual: With a cancer diagnosis, patients and families often look more deeply for meaning in their lives. Some find the disease brings them more faith, whereas others question their faith as they struggle to understand why cancer happened to them. An expert in palliative care can help people explore their beliefs and values so that they can find a sense of peace or reach a point of acceptance that is appropriate for their situation.

ORAL CARE IN PALLIATIVE CARE:

The basic principle of oral care in palliative care (OCPC) is focused primarily on the principle that good oral hygiene is the fundamental for oral integrity. Early clinical diagnosis of the oral lesions or conditions in the palliative patients should be done and appropriate actions must be instituted to minimize

pain and suffering by giving the symptomatic relief. The causes of oral lesions may be fungal, viral, bacterial, ulcerative, immunosuppression, radiation, lack of oral hygiene, and so on. The common oral problems in palliative patients includes, xerostomia (dry mouth), sore mouth, oral thrush, swallowing problems, sore lips, bad taste/odor, soreness under dentures, heavy mucous, difficulty in speaking and pain from one or more of these problems.

WHO PAYS FOR PALLIATIVE CARE?

Palliative care is often covered by individual health insurance plans. If patients do not have health insurance or are unsure about their coverage, they should check with a social worker or their hospital's financial counselor. If you have been referred to a palliative care specialist, your palliative care team can help you and your care givers understand your diagnosis, treatment plan, and prognosis, which is the chance of recovery. These may change throughout the course of your illness, so continue to have honest discussions with both your oncologist and your palliative care team. Dental professionals are the important

members of extended palliative team and they have a number of key roles, including

- (a) Training of palliative care professionals,
- (b) Management of complex oral problems, and
- (c) Management of specific oral problems. Increased awareness by all health care professionals about palliative oral care would go a long way in providing relief, comfort, and consolation to terminally ill patients and their families.



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THE UPRISING OF MOUTH CANCER

Dr. Aditi Nagpal

INTRODUCTION

Mouth Cancer

- Cancer is one of the most common causes of morbidity and mortality today. Mouth cancer when diagnosed at an early stage can be treated with preventive measures such as quitting of tobacco habit, smoking bidi etc. According to the statistics, in 2012 the incidence of oral cancer in India is 53842 in males and 23161 in females. Mouth cancer is considered to be a disease which occurs in elderly people.
- Most of the mouth cancer cases occur between the ages of 50 to 70 years, but it could also affect children as early as 10 years. Incidence of oral cancer increases by age. The commonest age is the fifth decade of life. Considering the gender in all the age groups, men are more affected than women. In India, men are two to four times more affected than women due to the changes in the behavioral and lifestyle patterns.



ORAL CANCER: RISK FACTORS AND PREVENTION

Tobacco: (Smokeless and Smoking Tobacco)

Tobacco use of any kind, including cigarette smoking, puts you at risk. Heavy alcohol use also increases your chances of developing the disease. Smokeless tobacco in the form of betel quid, oral snuff, and betel quid substitutes such as guktha, nass, naswar, khaini, mawa increases the risk of oral precancerous lesions and oral cancer two- to fifteen times more. Risk increases substantially with duration and frequency of tobacco use.

Areca Nut Chewing: (Supari)

Cheap, prepackaged areca nut products, such as pan masala, are of recent concern, especially among youth. The inclusion of tobacco in the betel quid i.e (Pan) adds considerable risk towards mouth cancer.

Alcohol use:

Using tobacco plus alcohol poses a much greater risk than using either substance alone.

Chronic Trauma:

It now seems clear that chronic trauma, from sharp teeth, restorations, or dentures, contributes to oral cancer risk, although this higher risk commonly occurs only in the presence of the other local risk factors.

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HOW TO DETECT IF THERE IS INITIATION OF MOUTH CANCER ?

All patients with mouth lesions of unknown origin and more than 2-4 weeks duration should immediately be referred to a specialist (Oral Medicine and Maxillofacial Radiologist) to get proper diagnosis and treatment planning.

This includes:

- White or red spots anywhere in the oral mucosa
- A mucosal defect or ulceration
- Swelling anywhere in the mouth
- Loosening of one or more teeth for no known reason, not connected with periodontal disease
- Difficulty or pain in swallowing
- Reduced mouth opening
- Reduced movement of the tongue
- Numbness of the tongue, teeth, or lips

STEPS CAN BE TAKEN FOR PREVENTION OF MOUTH CANCER :

Oral cancer can be prevented by action against risk factors, especially tobacco which is the key factor:

- The enforcement of laws on youth access to tobacco and alcohol.
- The prohibition of all advertising and promotional activities by the tobacco industry.
- The prominent inclusion of strong pictorial warnings in existing written warnings on the labels of tobacco and alcohol

products.

- Campaigns are needed to raise public awareness about oral cancer and its links with tobacco and alcohol consumption.
- Facilities for accurate staging, including advanced imaging, and experienced multidisciplinary teams can improve long-term survival and quality of life.



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LIGAPLANTS

PERIODONTIO-INTEGRATED IMPLANTS

Dr. Shiva Gupta

ABSTRACT

Dental implants have proven to be a gold standard for replacement of missing tooth in the past decade. The most widely used implants in the current scenario are the osseointegrated implants with various shortcomings and the most prominent one is the lack of the periodontal ligament. To overcome this, implants with periodontal ligaments can be procured and this can be possible by the application of the tissue engineering concept along with suitable implant material. Tissue engineering has become an integral part of the periodontal therapy and its use has opened various gates in the field of dentistry. A tissue engineered periodontal ligament around the dental implant has been introduced in the past few years and is called as **ligaplant**. These ligaplants have become a promising option that can provide good biological performance leading to an increased life of the prosthesis. This article reviews new dimensions in the field of implant dentistry, Ligaplants.

Keywords:- Dental Implants, Periodontal Ligament, Ligaplants, Tissue Engineering.

INTRODUCTION

In today's era, replacement of missing teeth or tooth is done by dental implants. For implants to be successful, sufficient jaw bone height and width, patient health, pattern of selected implant, and dental surgeon expertise are very crucial.[1] However, problems still exist with dental implants as they lack periodontal ligament (PDL) attachment. As osseointegrated implants are "ankylosed" and do not have the same mobility as natural teeth with a PDL, efforts have been made for years to compensate for this obvious difference by "shock absorbing systems" built into the implant or its supra structure.[2] In 1990, **Buser et al**[3] showed that titanium dental implants when placed in contact with retained root tips, the PDL of these roots served as a source for cells which could cover the implant surface during healing. However, today, tissue engineering has opened a new vista in periodontal regeneration and more so in

the treatment of dental implants. From various scaffolds to matrices, all have proved their ability to regenerate the entire periodontium. Till now, osseointegrated implants are considered to be the most acceptable implants because of their high long-term clinical survival rate. These problems could be resolved only if implants with PDL could be developed and this is achieved by new generation periodontio-integrated tissue engineered **ligaplants**, which is nothing but the combination of the PDL cells with implant biomaterial.

RATIONALE

As ligaplant is an amalgamation of the periodontal ligament cells and implant biomaterial, thus periodontal ligaments formed facilitates the micro movements and shock absorption contrary to the conventional implants and have a positive impact on the quality of the distribution of forces among the teeth abutments and prosthesis supported by the implants. Their use may overcome the shortcoming of the conventional implants and may provide better physiological results that can lead to increased lifeline of the prosthesis as these implants mimic the form and function similar to that of natural teeth.

CHARACTERISTICS OF LIGAPLANTS [4,5]

- Helps in distribution of occlusal and masticatory forces.
- Acts like a shock absorber, giving the tooth some movement in the socket.
- Induces proprioception.
- Provides osteoconductive properties to the implants as it contains many vital cells such as osteoblasts, osteoclasts, fibroblasts, cementoblasts, cementoclasts and undifferentiated mesenchymal stem cells.
- Provides anchoring similar to natural dentition, facilitating tooth movements while the orthodontic therapy.
- Provide suitable anchoring for development and growth of alveolar bone housing.

PREPARATION OF LIGAPLANTS [6]

After the extraction of the donor tooth, it is immediately replanted into its native alveolus 14 days prior to its transplantation. There is cell proliferation and differentiation due to the activation of the process of healing within the periodontal ligament, caused by the intentional trauma. Tooth can be transplanted after 14 days, at the time, when the cell culture reaches its peak with various cells at the root surface attached by freshly formed Sharpey's fibers. An identical cell culture, by utilizing tissue engineering around an artificial root is a new concept that has been introduced to produce ligaplant by the following three steps:

Step I- Preparation of temperature responsive culture dishes

N-isopropylacrylamide monomer in the solution of 2-propanol was expanded onto polystyrene culture dishes. By using an Area Beam electron processing system, irradiation of the electron beam was put through these dishes. For the removal of the ungrafted monomer, rinsing of these dishes is done and are sterilized with ethylene oxide.

Step II- Cells and the cell culture Human periodontal ligament cells are then taken by scraping the middle third of the root periodontal tissues from an extracted tooth, by using a scalpel blade. Then these tissues are planted into the culture dishes having Dulbecco's modified Eagle's minimal essential medium augmented with 100 units/ml of penicillin-streptomycin and 10% serum of fetal bovine. These out-growth cell are then cultured by providing a humidified atmosphere of 5% carbon dioxide at a temperature of 37 degrees for 48 hours to facilitate the attachment of cells to the dishes. The medium needs to be changed at least three times in a week and the debris are removed by washing these dishes. At 37°C along with ascorbic acid 2-phosphate (50mg/mL), 10nM β glycerophosphate and 10nM dexamethasone and a cell density of 1×10^5 the human periodontal ligament cells are kept on a temperature-responsive culture dishes that are 35 mm in diameter. It acts as a medium for osseous differentiation for procuring the cell sheets.

Step III- Culturing of the cells of periodontal ligament in a bioreactor Titanium pin that is glazed with hydroxyapatite is kept in a hollow cylinder made up of plastic and also around 3mm of gap is kept around the pin. By this 3mm gap, the culture medium is constantly pushed. For around 18 days, single cells suspension procured from humans is implanted into the vessels made up of plastic under the flow of growth medium.

ADVANTAGES

- It resembles natural tooth insertion.
- These get firmly co-ordinated with no bone contacts and with no interlocking, in spite of the existing loose fitting for sparing the periodontal ligament cushion of the cells.
- Problems such as gingival recession and bone defects of the missing tooth are diminished.
- Induces formation of the bone and also an intimate tissue communication along the surface of the implants and bone is seen.

DISADVANTAGES

- Technique sensitive procedure as the success depends on optimal temperature, time and cells utilized for culturing purpose.
- High cost
- Other non-periodontal cells can grow instead of the desired one

in case of any complications in the process of culturing.

- The factors affecting the host to accept the implant or the growth of PDL in the socket is unpredictable, which may result in failure of implant.

CONCLUSION

As with all emerging technologies, a successful future for ligaplast will only be achieved through research finding and testing. Current research in ligaplast is focusing on extending this initial observation to clarify and to further pursue the implications of this type of healing around dental implants with titanium surfaces evaluation of whether this phenomenon occurs around implants with other surfaces. Further research on humans with long-term follow-up could only validate the feasibility and success of ligaplasts.

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PROFILE OF THE MONTH



Dr. Stephen Cohen

Dr. Stephen Cohen is an accomplished person, being both a practitioner and an active educator, whose beam of experience is heaved up by passionate focus on detail and clarity.

Dr. Cohen completed his education in Endodontic Postgraduate Program at University of Pennsylvania in 1969. From 1970 to 1988, he served as a Chairman of Department of Endodontics at Arthur A. Dugoni School of Dentistry, University of Pacific and extended his commitment to education as Adjunct Clinical Professor of Endodontics in University of Pacific and University of California, San Francisco.

Dr. Cohen is a pioneer who transformed the field of Endodontics. He served to be the Director of Endodontic Postgraduate Program at Riyadh

School of Dentistry and Pharmacy in Saudi Arabia. He was the senior editor of all 9 editions and coeditor of 10th, 11th, 12th editions of Endodontic Textbook, Pathways of Pulp and textbook of “A Clinical Guide to Dental Traumatology” and also has many publications authored in reputed Journals.

He is a Diplomate of the American Board of Endodontics and defined by his unquestionable ethics and pursuit of perfections, Dr. Cohen has been awarded by The Ralph Sommer Award (AAE) in 2015 and Louis I. Grossman Award (Société Française d'Endodontie). He is a renaissance man and has held leadership positions in many of the major professional and academic organizations in Endodontics.