

Impressions

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Attingal Branch



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Impressions

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Journal of Indian Dental Association Attingal Branch

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Office:

The Editor-In-Chief,
Impressions-Journal of IDA
Attingal Branch,
Prathyusha Dental Care
IIIrd Floor YCDC, Opp
Vydyuthi Bhavanam, Pattom,
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President's Message



Dear members,

First of all let me thank you all for reposing faith in me and electing me as the president of IDA Attingal branch. I with my Secretary Dr Anil Kumar and Treasurer Dr Arun S will stand up to your expectation and to our promise.

I believe with your support we can keep up the dignity of IDA Attingal branch as one of the most vibrant branch of IDA KERALA STATE.

As a member for many years, I have witnessed our branch's steady growth. Thanks for the efforts of all its previous leaders and our enthusiastic members. I would like to express my recognition for the excellent work and tireless efforts of our predecessors.

The IMPRESSIONS is aimed to spread knowledge and update the members with latest technology that is available. We would like to encourage our young dental surgeons to contribute and share their experiences. This form of educational activities will help to dissipate the knowledge of dentistry as effective evidence based treatments among ourselves.

We would like to increase our membership and would love to have suggestions from all of you. Your membership and interest in our branch is what makes IDA Attingal branch strong and vibrant branch in IDA KERALA STATE BRANCH. Welcome to be our member and contribute to the journal !

Jai IDA

Dr Deepak S Das

President

IDA Attingal Branch.

Secretary's Message



Dear colleagues,

Greetings from the office of the honorary Secretary, IDA Attingal branch, it's with great pleasure, we are releasing the 1st issue of the journal of IDA Attingal branch IMPRESSIONS of this year 2017.

This journal contains interesting articles and discussions on various subjects including case reports by our members. We are all professionals and it's our duty to keep our knowledge updated in the present scenario particularly. Publication of journal is a part of scientific activity which is the backbone of all organization. It's a great pride for all of us. This year we are planning to publish this journal quarterly.

Every year journal reaches new heights and the credit goes to the entire editorial team of our branch which has received recognition's of national awards in the past. My heartiest compliment to Dr Pradeep C. Dathan and his team. Without their sincere and committed efforts, this journal may not be possible. I believe his efforts would definitely bring again laurels to our branch very soon.

Wishing you all the very best and hope to meet you all through my next communication

Always with you,

Dr Anil Kumar
Honorary Secretary
IDA Attingal Branch.

ABOUT IDA ATTINGAL

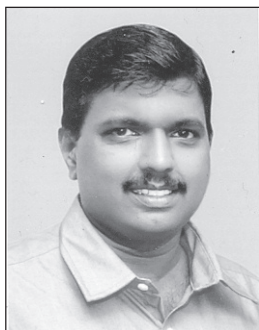
IDA Attingal, symbolizes & represents, updates & educates, promotes & supports the local dental community of erstwhile Attingal, in delivering, quality dental health care to the general public. Maintenance of proper standards & ethical manner in practice, better interpersonal relations, as well as willingness to share knowledge, among members, has provided a high degree of respectability to the organization. Effective follow up of organizational proceedings at the state & national level by the branch executive, ensures that the members are kept abreast of all IDA activities. Regular representation at IDA events & healthy interaction with other branch members, has made IDA Attingal quite popular & a force to reckon. Adding to this would be a plethora of eminent leaders from the branch, who have raised to higher echelons in IDA. Through various Scientific programmes, presentations, journals & newsletters, the branch creates awareness of the latest advancements in dentistry, among members.

Contents

OVERVIEW

- 7** **Some factors that affect dental implant treatment**
K. Chandrasekharan Nair, Pradeep C. Dathan,
Bheemalingeswara Rao
- 11** **Oral Health Care for the Elderly.**
Hari Pillai
- 14** **Anterior Esthetic Fixed Appliances for Children: Clinical Considerations and Parental Counseling**
Firoz Ashraf, Soumya Rajan, Suprasidh Suprakasam, Sreejith KR,
Sobha Kuriakose
- 17** **Nanoperiodontics**
Nita Syam, Vinod Mony, Arunima PR, Nima Syam
- 19** **TMD-Cutting the Gordian Knot - Part I**
T Mohan Kumar
- 22** **Effect of psychosomatic disorders in oral diseases**
Revathy V V, Ismail Sneha R, Rajendran Sruthy, M.S. Deepa
- 26** **Dry Socket –Revisited**
S. Sooraj
- CASE REPORT**
- 29** **Esthetic rehabilitation of periodontally compromised dentition using a combination of Gumfit and Cu-Sil Denture**
Nikhil S Rajan, Mintu M Kumar, Sarath C, Pradeep Dathan
- 32** **Gingival depigmentation: A split mouth comparative study between scalpel and diode laser**
Rhea Kiran R, Mintu M Kumar, Seema G, Sarath C.
- 35** **Branch Reports**

Editorial



Let us inform and transform

This is the first editorial with which I face you after you have reposed in me the most responsible job of our association – the Editor. Because of my predecessors, our journal has achieved a reputed standing in the state and in the country. Dental journals have no dearth in this country. Perhaps India publishes the maximum number of dental journals when compared to any other country in the world. However I am fully aware that quantity does not represent the advancement in the field of dentistry.

Through this journal, Dentists should be able to learn about new concepts, clinical developments, clinical opinions, treatments and the latest advancements in techniques and instrumentation that help them keep pace with rapid changes in dentistry. The journal would provide our members a knowledge transfer platform for rapid publication of reports and articles. This journal would encourage researches concerning improvement of dental health through the latest technologies like tissue engineering, nanotechnology, laser application and dental implantology.

There is a general feeling that articles are to be written by teaching faculty only. No doubt they are situated in a favorable atmosphere. But clinician should also take leadership in research on what they find in day today practice. It can be a clinical situation, your finding on a material and its usefulness, an article you have come across or any interesting anecdotes related to dentistry. I earnestly urge my fellow members to take up writing articles seriously and to send them to me without any hesitation. Your article will be a big learning experience to the junior professionals. Let us strive together to make our '**Impressions**' a great journal. Let it become a catalyst of transformation.

Dr. Pradeep C. Dathan
Editor, Impressions

Some factors that affect dental implant treatment

* K. Chandrasekharan Nair, ** Pradeep C. Dathan, *** Bheemalingeswara Rao

* Professor Emiritus, Dept. of Prosthodontics, Vishnu Dental College, A.P.

** Professor & HOD, Dept. of Prosthodontics, Sri Sankara Dental College, Akathumuri, Trivandrum;

*** Associate Professor of Prosthodontics, Vishnu Dental College, Bhimavaram, AP

Send correspondence: Dr. K. Chandrasekharan Nair, E-mail: chandrasekharannair.drk@gmail.com

Introduction of dental implants has fulfilled the long cherished dream of the dentist to have a replacement of missing teeth that is well anchored to the jawbone. Tooth loss has always been a concern of the patient because of the functional and aesthetic inadequacies it causes. The search for a good quality replacement is centuries old starting from the period of Mayans (600AD). Mayans have used shaped sea shells as dental implants. Perhaps the calcium carbonate in the shell might have favoured osseo-integration (Fig 1). Evolution of science has thrown new light in this search which has resulted in the removable and fixed dentures. The culmination happened through the introduction of dental implants. The only advancement which can be envisaged at present can be the genetically created dentition. Now dental implant is the first considered option for the replacement of the missing tooth. Some factors that dictate success in dental implants are described in this article.

Dental implants are considered in the following situations:

- ❖ restoration of dental aesthetics
- ❖ restoration of lost dental functions like chewing and speech
- ❖ maintenance of space and occlusal stability
- ❖ orthodontic anchorage
- ❖ preservation of bone and prevention of disuse atrophy after tooth loss

Osseointegration

The origins of Osseointegration go back to Per-Ingvar Branemark who first began experiments with titanium implant chambers to study blood flow in rabbit bone. He discovered that the bone had integrated with the implant that it could not be removed. Branemark called this osseointegration. Osseointegration was originally

defined as a direct structural and functional connection between ordered living bone and the surface of a load-carrying implant¹. An implant is regarded as osseointegrated when there is no progressive relative movement between the implant and the bone. In practice, this means that osseointegration is an anchorage mechanism whereby non vital components can be reliably and predictably incorporated into living bone and that this anchorage can persist under all normal conditions of loading². Scientists feel that osseointegration is not the result of an advantageous biological tissue response but rather the lack of a negative tissue response. In the mid 1960's, Branemark began his first successful experiments on humans. At first very few fellow scientists took Branemark very seriously and there was little acceptance of osseointegration as a viable treatment. Eventually an emerging breed of young academics started to notice the work being performed in Sweden and at a Toronto Conference in 1983 the worldwide scientific community finally began accepting Branemark's work. Today osseointegration is a highly predictable treatment. (Fig 2)

Titanium surface

On exposure to atmospheric conditions, a thin oxide layer covers the surface of pure titanium spontaneously. More extensive oxide growth occurs on titanium implants which are exposed to biological tissues. Inflammatory cells, especially macrophages, may contribute to the development of the oxide layer by excreting proteolytic enzymes, cytokines, superoxide and hydrogen peroxide. It is hypothesized that the actual interface of the titanium implant and the living tissue is a hydrated titanium peroxy matrix. The formation of such a matrix is unique to titanium³. (Fig.3)

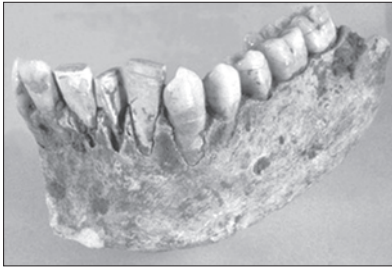


Fig. 1. Mayans used shaped sea shells as dental implants



Fig 2. Per-Ingvar Branemark (1929-2014)

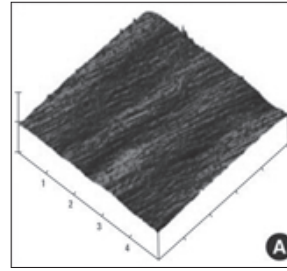


Fig 3. Machined titanium surface-atomic force microscopy



Fig 4. Different designs of implants

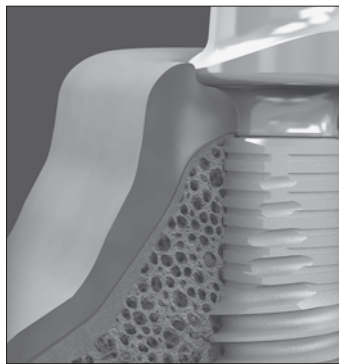


Fig 5. Implant bone and implant soft tissue contact

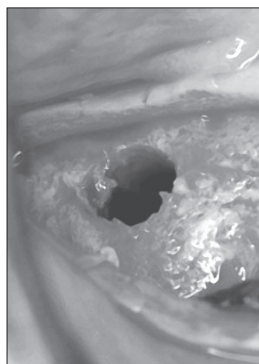


Fig 6. Osteotomy site

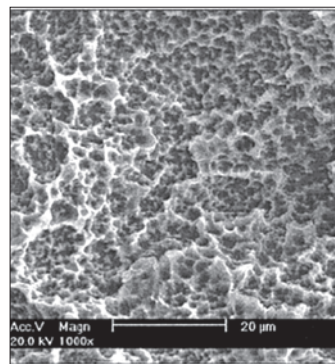


Fig 7. Blasted and acid etched surface

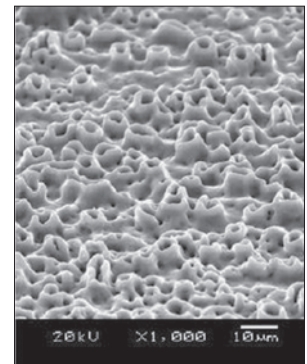


Fig 8. Anodised titanium surface

Factors that ensure success

Albrektsson et al. suggested six factors that are particularly important for the establishment of reliable osseointegration: implant material, implant design, surface conditions, status of the bone, surgical technique, and implant loading conditions⁴. The conventional clinical protocol for placement of dental implants involves two phases: 1. placement of the implant in a prepared surgical site and allowing a healing period of 3 to 6 months for tissue reorganization. 2. the phase of prosthesis placement. This protocol can be changed so that insertion of the implant and prosthesis placement can be integrated into a single step and it is called as immediately loading. Immediate loading necessitates a shorter healing time and that is achieved by altering the biocompatibility of titanium implant surfaces, modifying the surgical technique and changing the implant design. The implant design should favour primary stability and distribution of masticatory load otherwise there is no standardization of implant design. Screw threaded implants are the most commonly used. Tapered implants have a higher compression capacity than cylindrical ones. During insertion the tapered implant induces compression stresses

on the bone leading to better primary stability (Fig 4). Osteoblastic cells adhere more quickly to rough surfaces of titanium than to smooth surfaces. Implant surface changes include the morphology, topography, chemical composition, surface energy, surface composition, chemical potential, residual stress, the existence of impurities, thickness of titanium oxide film and the presence of metallic and nonmetallic compounds on the surface. Controlling the surface characteristics can reduce the healing time and the bone-implant interface can achieve adequate strength to withstand the forces in the oral environment^{5,6}.

Biocompatibility

Biocompatibility indicates compatibility of the material with the tissue and its ability to perform a specific function. In fact there is no material that is biocompatible for all applications.

Biocompatibility is dependent on the physical, chemical and mechanical properties of the material but also had to be defined by the situation in which the material is used (Williams, 2008). Other factors that influence the biocompatibility of biomaterials are electrical charge and surface features. The biocompatibility of materials used in dental

implants is evaluated by studying the reaction between the implant and the bone and implant and the soft tissue (Fig 5). The implant-soft tissue contact is responsible for establishing a seal that isolates implant and the bone from the oral environment. Metals that have corrosion passivation, i.e., high resistance to corrosion, do not trigger a negative response of tissues. This behavior is observed with Pt, Ta, Nb, Zr and Ti. It is possible to identify a correlation between biocompatibility, chemical stability and biological performance. The materials that ensure osseointegration are cp titanium, tantalum and niobium. Most manufacturers use cp titanium and alloy of Ti-6%Al-4%V. Implants are also categorised by biocompatibility based on the type of biological response they elicit in the long-term interaction with the host tissue. The three major types of biocompatibility of implants are:

- Biotolerant: the material is not necessarily rejected by host tissue but surrounded by a fibrous capsule
- Bioinert: materials allow close apposition of bone on their surface
- Bioactive: formation of new bone onto their surface takes place and ion exchange with host tissue leads to the formation of chemical bonds along the interface¹¹.

Temperature control

Preparation of implant bed or osteotomy site preparation is of critical importance to osseointegration. Drilling causes mechanical damage to the bone and increases the temperature.

Mechanical and thermal damage to the tissue surrounding the implant can have a destructive effect. Necrosis occurs when the temperature exceeds 47°C for 1 min. Therefore, care must be taken to avoid thermal bone injury during the procedure. External irrigation can provide sufficient cooling during drilling and keep the temperature below of 47°C. Lower temperature saline is effective in cooling the bone and irrigation of the site should be continued between the drilling steps. Other factors that cause heat generation during drilling are the drilling speed and the force^{7,8}. (Fig 6)

Initial stability and movement

Firm installation is an essential requisite for the success of the dental implant. Movement between an implant and the bone causes fibrous capsule formation around the implant. Fibrous encapsulation is prevalent with stainless steel, alumina and zirconia but rarely seen with Titanium implants without movement. Animal studies have reported that micromotion between 50 and 100 microns is tolerated but above which

resorption at the interface is resulted, leading to fibrous encapsulation that challenges the stability. Implant stability depends on direct mechanical connection between implant surface and the surrounding bone and can be divided into primary, secondary and tertiary stability. The stability obtained immediately after the placement of dental implant is called primary stability. The stability obtained after osseointegration is named secondary stability. The tertiary stability is related to the maintenance of osseointegration. Primary implant stability is essential to achieve successful osseointegration. It also depends on bone quality and quantity, implant geometry and the site preparation technique. Clinical observations indicate that when the dental implant insertion torque is higher than 40 N.cm, the success rate increases⁹.

Surface topography of the dental implant is important to ensure adequate bone implant contact, osseointegration and good prognosis. Surface roughness is one of the characteristic which is defined into three viz. 1. macro roughness (10 microns to millimeters) 2. micro roughness (1 to 10 microns) 3. nano roughness (1 nanometer is equal to 1/1000 of a micron. Nano implant surface will have 100 nanometer sized tubules). Macro roughness includes the geometry of the implant like the thread design. Micro roughness is created by pits of 4 micron diameter and 1.5 micron depth. There are different methods to create such topography.

Surface topography

Sand blasted and acid etched surface is created by sand blasting with aluminium oxide and by acid etching. The roughness will be 1 to 2 microns. Titanium oxide and calcium phosphate can also be used for blasting the surface (Fig 7). In plasma spraying method titanium particles are sprayed at high temperature on to the implant surface to a thickness of 30 to 50 microns and the roughness created is below 10 microns. Anodization procedure consists of alkaline cleaning, acid activation and electrolyte anodizing. Acid activation is done with a mixture of nitric acid and hydrofluoric acid to remove the natural titanium oxide layer and surface contaminants. The electrolyte anodization is carried out in an electrochemical cell, which usually has a three-electrode configuration (titanium anode, platinum cathode and Ag/AgCl reference electrode). When a constant voltage or current is applied between the anode and cathode, electrode reactions (oxidation and reduction) in combination of field-driven ion diffusion lead to the formation of an oxide layer on the anode surface (Fig 8).

Anodisation creates nano tubules and those have a key role in the interactions with proteins and cells. Newer designs are switching over to anodisation. HA coating was once very popular but it was found to affect long term prognosis.

Experimental studies have shown that for metallic implants with porous surfaces optimum bone growth requires a pore size between 50 and 400 μm^{10} . Bisphosphonates, Simvastatin, antibiotic coating and synthetic peptide coating are some of the surfaces that are tried on implants. Simvastatin reduces serum cholesterol concentration by decreasing cholesterol biosynthesis by the liver. In an animal study simvastatin increased cancellous bone intensity as well as its compressive intensity. Laboratory studies have reported that Simvastatin has a potential to improve osseointegration¹². Tetra-cycline eliminates microorganisms that contaminate implant surfaces. It increases cell proliferation and inhibits collagenase activity; thereby promoting enhanced attachment and bone healing.

Classic prosthodontic techniques are challenged by implants in the treatment of edentulism. It has been shown clinically that the bone loss after tooth extraction is reversed by the placement of dental implant, since the first human study reported by Brånemark. The mechanical loads exerted by occlusion are transferred to the jawbone through the dental implant, and can potentially affect the bone remodeling according to Wolff's law which states that bone grows and remodels in response to the forces that are placed upon it. After injury to bone, placing specific stress in specific directions to the bone can help it remodel and become normal healthy bone again.

Therefore, it is critical to develop a sound understanding of the load transfer mechanism from the implant to the bone. It is equally important, to supply a dental implant with critical chemical and contour features on its surface. If the ideal load transfer characteristics can be

identified, it may be possible to improve the osseointegration.

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Oral Health Care for the Elderly

* Hari Pillai

* Former Asst Professor, College of Dentistry, National Guard Health Affairs, Riyadh

Send Correspondence: Dr. Hari Pillai, E-mail: hari61pillai@gmail.com

Oral health is not separate from general health, but maintaining oral health is definitely difficult and different in old age. The design and implementation of comprehensive preventive dentistry protocols for elders presents the dental profession with many challenges. Although specific treatment protocols must be designed to meet the unique needs of the individual patient, there are certain factors common to the elderly segment of the population that may influence these protocols. Statistics released by the Union ministry of Health and Family welfare show that life expectancy in India has gone up by five years, from 62.3 years for males and 63.9 years for females in 2001-2005 to 67.3 years and 69.6 years respectively in 2011-2015. This jump in figures noticed in the present decade is attributed to better immunization and nutrition coupled with prevention and treatment of infectious diseases. But increased life expectancy has its own share of problems, like increased disease burden.

Oral Health and Overall Health

What happens in the mouth is often a reflection of what happens in the body. Oral Health as been linked to diabetes, heart disease, stroke, and pneumonia. Dental diseases are a significant public health menace having a substantial impact on the quality of life which in turn affects the daily performance and general life satisfaction.

In most of the developing countries including India, there is a limited access to oral health care services, as a result teeth are often left untreated or are extracted because of pain or discomfort. The growing incidence of some chronic diseases like diabetes can further have a negative impact on oral health. Extensive research in public health has shown that a number of individual, professional, and community preventive measures are effective in preventing most oral diseases.

Oral health problems in elderly people

Globally, poor oral health among older people has particularly been seen in a high level of tooth

loss, dental caries experience, high prevalence rates of periodontal disease, xerostomia, and oral precancer/cancer. The negative impact of poor oral conditions on daily life is particularly significant among edentulous people. Extensive tooth loss reduces chewing performance and affects food choice; for example, edentulous people tend to avoid dietary fibre and prefer foods rich in saturated fats and cholesterol. Edentulousness is also shown to be an independent risk factor for weight loss and, in addition to the problem with chewing, old-age people may have social handicaps related to communication.

Dentists who are engaged in geriatric dental care have noticed dramatic demographic changes like increased numbers of adults surviving into older age and increased numbers of older adults retaining natural teeth (Fig.1).

Some of the key factors that play a role in keeping natural teeth for longer periods in the oral cavity are education, nutrition, medicine, professional dental care, genetic predisposition and efficient home care. At the same time, the consequences of poor oral care can range from bad breath, loss of self esteem and social isolation to the more common dental caries, periodontal disease and their sequelae. The reasons cited for dependent elderly people not getting sufficient oral care includes major illnesses, medication that masks dental disease, cognitive and/or physical decline, fall in income or lack of insurance and inability to get to a dentist.

Some medications used by the elderly can have adverse impact on the awareness and progress of oral diseases. This can be in the form of reduction of pain/sensitivity, dry mouth, antibiotics that may mask origin of dental plaque disease and sedation etc.

A variety of systemic diseases can influence the progression of dental plaque disease, the most significant among them being aspiration pneumonia, sepsis, coronary artery disease, diabetes, stroke etc.

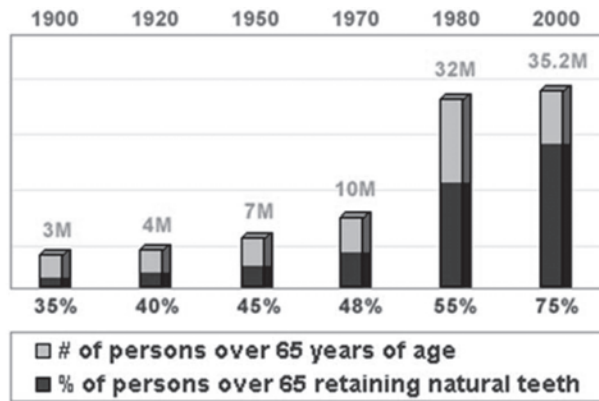


Fig 8. The “curve” of preventive dentistry

Tables 1 and 2 show a list of oral hygiene management programs customized for the elderly. Prescription products can also be made use of for effective implementation of the program.

Nutritional considerations should also be worked upon while charting out a plan to reduce tooth morbidity in the aged. Emphasis should be laid on consuming a sugar free and healthy diet and paying attention to regular dental visits.

Dry Mouth or Xerostomia

A common problem among elderly people and is typically associated with decreased salivary gland function. Common symptoms associated with dry mouth include a constant sore throat, burning sensation, problems speaking, difficulty swallowing, hoarseness or dry nasal passages.

Without the cleansing effects of saliva, tooth decay and other oral health problems become more common. Dry mouth is a potential side effect of many medications (prescribed and over-the-counter) to include, Antihistamines, decongestants, painkillers, hypertension medications, muscle relaxants, drugs for urinary incontinence, Parkinson’s disease medications, antidepressants and many others medications.

Patients using oral inhalers for asthma often develop an oral fungal infection and are encouraged to rinse their mouths with water after using the inhaler.

Some interesting disease associations

Gum Disease and Heart Disease

Cardiovascular disease is the leading killer of men and women in many countries. A study done by Arbes and colleagues, published in 1999, found that the odds of having a heart attack increased with the severity of periodontal disease. A study by Beck and colleagues (1996) Followed a group of men age 21-80 years old who were free of Cardio Vascular Disease for a baseline. When the research

was followed up after 18 years it was found that loss of the alveolar bone (jaw bone, which is a measure of periodontal disease) at the baseline, was a predictor of heart disease incidents and stroke.

Researchers have found that people with periodontal disease are almost twice as likely to suffer from coronary artery disease as those without periodontal disease.

Possible cause:

Oral bacteria via the blood attach to fatty plaque contributing to clot formation. Inflammation caused by periodontal disease increases plaque buildup, which may contribute to swelling of arteries.

Oral Health and Stroke

Patients with Periodontal disease are more likely to suffer from Artherosclerosis Disease – a narrowing of the arteries that can lead to stroke.

Again, possible cause: Oral bacteria via the blood attach to fatty plaque contributing to clot formation. Inflammation caused by periodontal disease increases plaque buildup, which may contribute to swelling of arteries.

Oral Health and Pneumonia

Pneumonia accounts for 1.2 million hospitalizations annually with over \$8 billion spent. When bacteria, viruses or, rarely, fungi living in the nose, mouth, sinuses, or the environment spread to the lungs, one can develop pneumonia or other infections. The infection can be transmitted from people who are already infected with the causative bacteria or virus irrespective of whether they are sick or not.

A Japanese research group studied the provision of oral care after each meal for elderly, frail adults in 11 NHs in Japan to those not receiving the oral care after each meal and demonstrated that death from pneumonia decreased significantly with oral care. Good oral care reduces the number of potential pathogenic bacteria that might colonize the mouth that may reach the lungs.

Oral Health Maintenance Elements
1.Mechanical Tooth brushing, flossing
2.Chemical Fluoride, anti-bacterial, peroxide
3.Nutritional Healthy diet, fiber
4.Regular dentist visits

Table 1 : Oral Health Maintenance elements

Oral Hygiene Management Program	
Mechanical devices	Prescription products
1. Manual toothbrushes	1. Floride gels * (Gel-Kam, Prevident)
2. Battery spin brushes	2. Chlorhexidine* (Peridex, Perioguard)
3. Cordless rechargeable tooth brushes	
4. Other interdental cleaning aids	

Table 2 : Oral Hygiene Management Program

The Link Between Gum Disease and Diabetes

Diabetes is a risk factor for periodontal disease and the converse ie, periodontal disease is a risk factor for Diabetes is also true. Studies indicate people with diabetes are 2 to 3 times more likely to develop periodontal disease than people without diabetes. (National Diabetes Education Program). The ADA advises people with diabetes to visit the dentist at least twice a year.

This is because people with diabetes are generally more susceptible to bacterial infection and have a decreased ability to fight periodontal disease. (American Diabetes Assoc.)

Oral Health Problems and Diabetes

Problems associated with diabetes are tooth decay, periodontal (gum) disease, salivary gland dysfunction, fungal (yeast) infections, inflammatory skin disease, infection and delayed healing taste impairment and elevated blood glucose etc. An 11-year study of Pima Indians with Type 2 Diabetes noted that Periodontal disease was a positive predictor of mortality from Ischemic heart disease, where the risk increases 3.2 times compared to non diabetics

Summary

The oral health of elderly people is generally poor, which has a negative impact on masticatory function and oral-health-related quality of life. Oral infections and biofilm also present general health risks, in particular aspiration pneumonia. The care concepts for dependent elderly people requires an interdisciplinary team composed of nursing personnel, facility managers, physicians, dentists and their dental assistants and hygienists. The major block in oral health care of elderly would be the underestimation of the oral health care need by them. The dental care of the residents is often limited to emergency care and is not aimed at retaining teeth. Conversely, with changing

attitudes the oral health goal should include: Keeping their teeth, keeping their teeth healthy and keeping their teeth pretty.

The best option to serve the residents would be "home dentistry or domiciliary dental care," however it is yet an infrequent practice in India. Surveys should be conducted in this sector very routinely to spot the residents in the need of oral care circumscribing nursing homes, old age homes, ashrams, secure units, and community households.

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OVERVIEW

Anterior esthetic fixed appliances for children: Clinical considerations and parental counseling

*Firoz Ashraf, *Soumya Rajan, *Suprasidh Suprakasam, **Sreejith KR, **Sobha Kuriakose

*Sr. Lecturer, **Professor, Department of Pedodontics and Preventive Dentistry, Sri Sankara Dental College, Akathumuri PO, Varkala, Thiruvananthapuram, Kerala - 695 318.

Send correspondence: Dr. Suprasidh Suprakasam, E-mail: suprus007@gmail.com

Abstract

Esthetic rehabilitation of a young toddler who has suffered multiple tooth loss due to early childhood caries or extensive dental trauma is one of the commonest restorative challenges a pediatric dentist faces. An anterior esthetic appliance may be used to replace lost teeth. The most decisive factor for placing an anterior esthetic appliance is parental desire. Other considerations include space maintenance, masticatory functions, speech development and tongue habits. However there is no strong evidence that early loss of maxillary incisors will have any significant long lasting effect on growth and development of the child. This paper deals with the clinical considerations and parental counseling regarding anterior esthetic fixed appliance.

ECC, known-previously as nursing bottle caries is the term that describes rampant dental caries in infants and toddlers¹. The condition, when associated with the bottle feeding habit, has been characterised as first affecting the primary maxillary anterior teeth, followed by involvement of the primary molars. The extent of decay is always more severe in the maxillary incisors and frequently, by the time the child is brought to the dentist, much of the anterior clinical crowns are decayed or lost.

When extraction of primary incisors is necessary, many parents will seek an esthetic solution to replace the lost teeth. For the clinician seeking to construct and place an esthetic appliance in a child, there is very little information in the dental literature which addresses the need or indications for these appliances. A few articles have been published which describe a particular appliance design,^{2,3,4} but there is scarcity of information regarding the clinical considerations and parental counselling.

Introduction:

Clinical considerations and Parental Counseling:

The strongest factor for placing an anterior esthetic appliance is parental desire. While space maintenance, speech development and tongue habits may be of some considerations, there is no strong evidence that early loss of maxillary incisors will have significant effect on the growth and development of the child.

Space maintenance:

While space maintenance in the posterior region is an important consideration, when there is early loss of primary molars, the anterior segment, canine to canine appears to be stable with no net loss of space. If one or more incisors are lost, there may be some rearrangement of space, but no space

maintenance is usually required if the loss occurs after the eruption of primary canines^{5,6}.

Masticatory function:

Children who have had all the four maxillary incisors extracted due to Early childhood caries (ECC) seem to function well without them. Parents may express concern about their child's ability to eat without four incisors. They need to be reassured that feeding is generally not a problem⁵. In a survey of parents whose children had all incisors extracted, parents reported that their child adapted to the lack of their anterior teeth and had no difficulty eating and chewing⁷.

Speech:

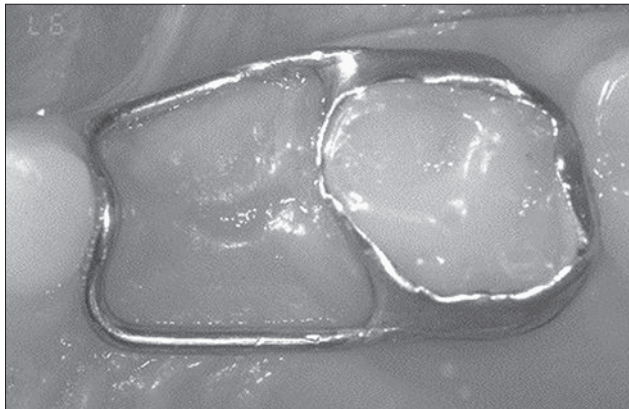
Many sounds are made with the tongue touching the lingual side of the maxillary incisors



Anterior edentulous area



Space maintainer which restores esthetics



Band and loop space maintainer

and inappropriate speech compensations can develop if the teeth are missing^{5,8}. One of the studies concluded that many patients who received prosthetic dental appliances develop better articulation skills¹⁰. Another study by Riekman and El Badrawy,¹¹ found that loss of all maxillary primary incisors resulted in some speech problem in children. Another better designed study by Gable et al¹² found that earl loss of incisors have no long term effect on speech. As the data is incomplete, it may be appropriate to consider appliances for children under three years of age who have not yet developed their speech skills. Children over four years will usually compensate for the tooth loss and not exhibit any long term speech disorders.

Esthetic appearance:

The most important reason for replacing missing incisors is to restore a natural and pleasing appearance and thus provide an opportunity for normal psychological development. However, body image alterations bear little significance in the very young¹³. Children under five are seldom affected socially to any great extent due to their limited exposure to peers, unlike school age children but it is possible

that children who regularly attend day care may become more aware of their image and lack of teeth and may be affected by their appearance.

If the parents do not indicate a desire to replace missing anterior teeth no treatment is usually required. But if the parents as well as the children do wish to replace missing teeth, they should not be discouraged from their decision. The possibilities of caries and growth interference are two other topics that should be discussed with the parents considering a maxillary esthetic appliance. Plaque and food debris accumulation may be increased with the fixed anterior appliance. A comprehensive caries prevention programme must be initiated with frequent recall schedule. Adequate measures of oral hygiene should be achieved before placing any such appliance.

There is no evidence that prosthetic appliance might restrict a child's oral growth⁸. The inter canine growth between the age of 2-4 years is minimal (less than 0.5mm) and is clinically insignificant¹⁴.

Discussion:

Placement of an anterior fixed appliance is an elective procedure and is based on the parental desires on their child's esthetics. Parents must be able to make an informed decision and the pediatric dentist should provide them with the accurate information regarding such a decision. As mentioned earlier space maintenance in this region is generally necessary; eating and function are also not affected. Speech problems in children over 4 years of age are not common and even if they occur, are usually compensated and reversible.

Timing of placement is somewhat controversial. Historically it was suggested to allow 2-3 weeks following tooth loss before fabrication. This delay was thought to allow better healing and gingival shrinkage to occur. However same day extraction and appliance placement can result in an excellent clinical outcome. Perhaps one reason to delay treatment is to ascertain when the

parents' concern of esthetic is a real one. Esthetically many parents' image of their child improves with in the delay period and their esthetic concern will dissipate.

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Nanoperiodontics

* Nita Syam, **Vinod Mony, ***Arunima PR, **** Nima Syam

*Senior Lecturer, Dept of Periodontics, Sri Sankara Dental College, Akathumuri, Varkala, Trivandrum; **Reader, Dept Oral and Maxillofacial Pathology, PMS Dental College, Vattapara, Trivandrum; *** Reader, Dept of Periodontics, PMS Dental College, Vattapara, Trivandrum; **** Post graduate student, Dept of Conservative Dentistry, Yenopoya Dental College, Mangalore

Send correspondence: Dr. Nita Syam, E-mail: nitadsyam@gmail.com

Abstract

Nanotechnology refers to the control and manipulation (10-9m) of matter at nanometer dimension. Although the nanoscale is small in size, its potential is vast. Nanodentistry will make possible the maintenance of comprehensive oral health by employing nanomaterials and ultimately, dental nanorobots. This article is a review, which describes about the potential use of nanotechnology in the field of periodontics.

Introduction

Nanotechnology is a term that is gaining importance and expertise in every area of medicine, by its extreme diverse, ranging from extensions of conventional device physics to completely new approaches based upon molecular self-assembly, from developing new materials with dimensions on nanoscale to investigating whether we can directly control matter on atomic scale¹. Nano is the Greek word which stands for 'dwarf'. Nanotechnology is the science of manipulating matter, measured in the billionths of meters or nanometer, roughly the size of two or three atoms². The vision of nanotechnology was introduced in 1959 by late Nobel Physicist Richard P Feynman who proposed employing machine tools to make smaller machine tools, which are to be used in turn to make still smaller machine tools, and so on all the way down to the atomic level. In his historical lecture in 1959, he said "this is a development which I think cannot be avoided"³

Feynman's idea was overlooked until the mid-1980s, when the MIT educated engineer K Eric Drexler introduced the term "nanotechnology, (Gribbin & Gribbin, 1997) which was later defined by Norio Taniguchi as follows: Nanotechnology mainly consists of the processing, separation, integration, and deformation of materials by one atom or one molecule.

Today, Nanotechnology is understood by the following 4 approaches⁴

I. The Bottom Up Approach: Seeks to arrange smaller components into more complex assemblies, the covalent bonds of which are extremely strong. (Das et al., 2007)

II. The Top Down Approach: Seeks to produce: smaller devices by using larger ones in achieving precision in structure and assembly. (Das et al., 2007) These solid state materials can also be used

to create devices known as NEM (Nanoelectromechanical systems) which are used in cancer diagnosis.

III. The Functional Approach: Seeks to develop components of a desired functionality without regard to how they might be assembled.

IV. The Biomimetic Approaches: Seeks to apply biomolecules for applications in nanotechnology. (Ghalarbor et al., 2005)

The subfields anticipate what inventions nanotechnology might yield, or attempt to propose an agenda. (Kubik et al., 2006)

The applications of nanotechnology are varied. They include medicine, environment, energy, information and technology, heavy industry and consumer goods. In the field of dentistry, the integration of nanotechnology has given rise to a new stream 'nanodentistry'. (Uysal et al., 2010)

The various nanoparticles are as follows⁵

- | | |
|-----------------|-------------------|
| 1. Nanopores | 2. Nanotubes |
| 3. Quantum dots | 4. Nanoshells |
| 5. Dendrimers | 6. Liposomes |
| 7. Fullerenes | 8. Nanospheres |
| 9. Nanowires | 10. Nanobelts |
| 11. Nanorings | 12. Nanocapsules. |

Nanorobotics : Nanorobotics is the technology of creating machines or robots at or close to the microscopic scale of nanometers⁶. According to nanorobotic theory, 'nanorobots are microscopic in size, it would probably be necessary for very large numbers of them to work together to perform microscopic and macroscopic tasks. Nanorobots are able to distinguish different cell types by checking their surface antigens. When the task of nanorobot is completed they can be retrieved by allowing them to exfuse themselves via the human excretory channels.^{7, 8}

Nanotechnology -Role in periodontics

Periodontal drug delivery : Recently, Pinon-Segundo et al⁹ produce d and characterized triclosan-loaded nanoparticles by the emulsification – diffusion process, in an attempt to obtain a novel delivery system adequate for the treatment of periodontal disease. The nanoparticles were prepared using poly (D, L-lactide-coglycolide), poly (D,L-lactide) and cellulose acetate phthalate. poly (vinyl alcohol) was used as stabilizer. These triclosan nanoparticles behave as a homogeneous polymer matrix-type delivery system, with the drug (triclosan) molecularly dispersed. Pinon-Segundo et al has concluded that triclosan nanoparticles were able to effect a reduction of the inflammation of the experimental sites. Timed release of drugs may occur from biodegradable nanospheres. A good example is Arestin in which tetracycline is incorporated into microspheres for drug delivery by local means to a periodontal pocket¹⁰.

Oral prophylaxis: Nanorobots incorporated in mouthwash could identify and destroy pathogenic bacteria leaving behind harmless oral flora to flourish in the oral ecosystem. It would also identify food particles, tar tar, plaque lift them from the teeth to be rinsed away. Being suspended in liquid and able to swim about, they reach surfaces beyond bristles of tooth brush or the fibres of floss. Continuous debridement of supra and sub gingival calculus would be done by nanorobots incorporated in dentifrices. They provide a continuous barrier to halitosis¹¹.

Periodontal tissue engineering: Nanotechnology has got the potential to produce nonbiologic self-assembling systems for tissue engineering purposes. Self-assembling systems are those which automatically undergo prespecified assemblies much in line with known biologic systems associated with cells and tissues. It is possible to create polymer scaffolds in the future for cell seeding, growth factor delivery and tissue engineering bules and diameter with twice as large as nonsensitive teeth. Reconstructive dental nanorobots, using native biological materials, could selectively and precisely occlude specific tubules within minutes, offering patients a quick and permanent cure¹².

Dental hypersensitivity

Natural hypersensitive teeth have eight times higher surface density of dentinal tubules and diameter with twice as large as nonsensitive teeth. Reconstructive dental nanorobots, using native biological materials, could selectively and precisely occlude specific tubules within minutes, offering patients a quick and permanent cure¹³.

Tooth repair

Chen et al¹⁴ made use of nanotechnology to simulate the natural biomineralisation process to create the hardest tissue in the body, the enamel by using highly organized microarchitectural

units of nano-rod like calcium hydroxapatite crystals arranged parallel to each other.

Role of nanotechnology in dental biofilm

Silver nanotechnology chemistry has proven to be effective against biofilms. Silver disrupts critical functions in a microorganism. It has high affinity towards negatively charged side groups on biological molecules such as sulfdryl, carboxyl, and phosphate groups distributed throughout microbial cells. Silver attacks multiple sites within the cell to inactivate critical physiological functions such as cell wall synthesis, membrane transport, nucleic acid synthesis (DNA and RNA) and translation, protein folding and function and electron transport.

Conclusion

The emergence of consensus concerning the direction, safety, desirability and funding of nanotechnology will depend upon how it is defined. Nanotechnology offers great potential in the field of dentistry ranging from dental restorative materials to implants to surgical procedures to bone replacement material etc. However, with every great good, comes great evil. While it is appropriate to examine carefully the risks and potential toxicity of nanoparticles and other products of nanoscale technology, the greatest risks are posed by malicious and unwise use of molecular manufacturing.

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TMD-cutting the gordian knot - Part I

* T. Mohan Kumar

* Prof & Head Dept of Prosthodontics, Mahe Institute of Dental Sciences, Mahe

Send correspondence: Dr. T. Mohan Kumar, E-mail: tmkumar59@gmail.com

The scene is all too familiar to almost all dental practitioners. The patient who walks into the clinic complaining of pain in the pre-auricular region and difficulty in opening the mouth. Some even complain of noises from the joint. The patient has already visited almost all the medical specialties but to no avail. The diagnosis is easy. It is a TMD or as some would put it MFPDS. The problem is what are you going to do next?

This series of 3 Articles will attempt to address this most vexing and often frustrating problem. The problem of TMDs

While the first part will introduce the topic along with a brief discussion on etiology the second and third will focus on diagnosis and management respectively

TMDs are defined as a group of conditions that affect the masticatory musculature, TMJ and ASSOCIATED STRUCTURES. This definition by Bell makes it clear that TMD has at least two components: a muscular component and a joint Component.

TMDs are always associated with all or some of the following symptoms:

- Pain in and around the regions of the TMJ
- Difficulty in opening the mouth
- Sounds in the TMJ

This triumvirate of symptoms is pathognomonic of TMD. But the difficulty in diagnosing and managing TMDs is because these symptoms may have a origin in the muscles or in the joint.

Classification of TMD

There are many classifications for TMD but the one that is universally accepted is the RDC/TMD classification by Dworkin and Le Resche. (RDC – Research Diagnostic Criteria for TMD)

This classification divides TMD into two Axes.
Axis 1

Axis 2.

Axis 1 is further subdivided into

- (a) Muscular disorders
- (b) Disc displacement
- (c) Arthralgia

Axis 2 is subdivided into

- a) dysfunctional chronic pain
- (b) depression and non-specific physical symptoms
- (c) jaw disability.

However since it is the Axis 1 disorders that is commonly encountered by practitioners this discussion will focus on this Axis, Muscle disorders are further subdivided into two: Myofascial pain and myofascial pain with limited opening

Disc displacements are Disc disorders with reduction, disc disorders with limited opening and finally disc disorders with restricted opening (closed lock) Arthralgia or pain in the joint could be due to retrodiscitis, capsulitis, arthritis etc.

But before we go any further a quick overview of the TMJ would help us to understand the problem better. The TMJ is a diarthroidal synovial joint capable of both hinge movement as well as translatory movement. The TMJ system comprises of three components apart from the muscles, ligaments and the nerves and blood vessels. The three components of the joint include the condyles. The Articular disc and the glenoid fossa. The condyle and the fossa need little explanation as their anatomy etc are quite familiar to any student of dentistry however the structure of the articular disc needs to be elaborated.

First its function: the disc is a structure of dense fibrous connective tissue and is interposed between the condylar head and the fossa. It has two functions. It serves to smoothen out the incongruities between the fossa and the condyle thereby enabling the smooth functioning of the

joint. The second is to divide the fossa into two compartments. An inferior and superior compartment. The condyle can execute hinging movements in the lower one and translatory movement in the upper one. The disc is divided into three parts. A posterior thick band, a thin intermediate section and an anterior thickened part. The disc is attached to three structures. The condyle, the fossa and to the superior pterygoid muscle. Medially and distally the disc is attached to the condyles by the Medial discal and lateral discal ligaments respectively. Anteriorly it is attached both to the condyle and the superior pterygoid muscle. Postero-inferiorly the disc is attached to the condyle by a ligament and postero-superiorly to the glenoid fossa by an elastic band of tissue called the retrodiscal attachment. Posterior to the condyle within the fossa there is a space called the retrodiscal space filled with blood vessels and nerves.

The disc as mentioned earlier divides the fossa into two compartments. Hinging occurs in the lower while translation occurs in the upper. The hinging movement proceeds upto 20 mm (measured interincisally) while translation and hinging allows the mandible too be opened upto 55 mm (interincisally) in adults. The disc plays an important role in the initiating of TMDs.

Etiology of TMD

It was in the late 30's that an ENT surgeon by name Costen drew the attention of the medical and dental community to a group of conditions which later earned the moniker –Costen's Syndrome. It included pain in the pre-auricular area, tinnitus, dizziness and difficulty in opening the mouth. Surprisingly despite his medical background Costen attributed these symptoms to dental factors viz. overclosure of the jaws due to loss of posterior teeth with subsequent compression of the auriculo-temporal nerve by the condyle. Although later disproved by Sicher and others the name

continued to be used to describe the group of conditions. Following Costen's footsteps many others have christened the condition by various names for example Shore called it TMJ Dysfunction syndrome while Ash and Ramfjord called it functional TMJ disturbance. Laskin called it Myofascial Pain Dysfunction Syndrome (MFPDS). Today the term coined by Bell viz. TMD is widely accepted as the name for this group of conditions.

For decades Costen's thinking enjoyed popularity as the cause of TMJ problems. However by the 50's with new research results emerging to negate Costen's thinking the dental fraternity started attributing occlusal causes to TMD; specifically drawing attention to occlusal interferences as the cause of TMDs. Later a host of other factors were attributed to be causative for TMD. Some of them were stress, posture, social factors etc. This was a period of free fall for TMD. It even saw TMJ problems as idiopathic in nature! which ofcourse is not true entirely

Today the following paradigm is considered to be chief contender for explaining TMD.

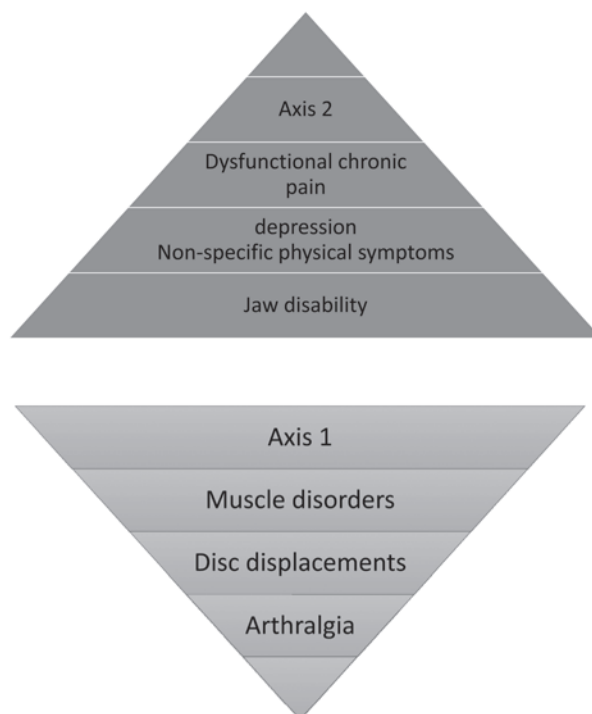
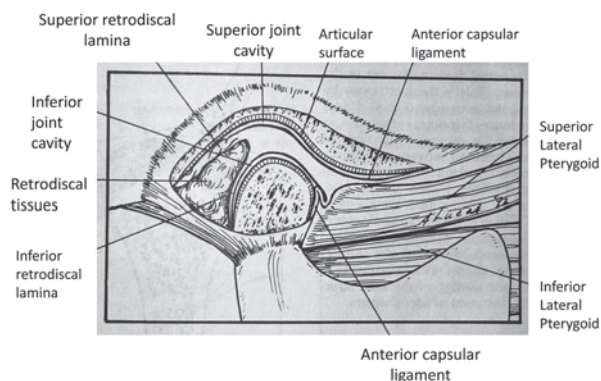
Normal physiological function + event > physiological limit = TMD.

Events that can cause the tipping over are :

Occlusal factors

Trauma

Emotional factors, deep pain input and parafunctional habits.



Occlusal factors: once considered the prime cause for TMDs this factor does not, today, enjoy scientific legitimacy vis-à-vis the etiology of TMD is concerned

Trauma: has been implicated, both varieties i.e macro trauma and micro trauma have been implicated and there is evidence for both

Emotional factors have been cited as a cause for TMD especially for Axis 1 group 2 conditions and there is evidence for this

Deep pain input refers to heterotopic pain i.e pain arising elsewhere but referred to the facial region.

Finally bruxism has been correlated with the onset of TMD although not too strongly.

All the above mentioned causes are for the Axis 1 group 2 disorders.

For Axis 1 group 2 disorders there are numerous candidates for the cause of TMD. they include

bacteriological, biomechanical, hormonal, traumatic, occlusal factors. and joint hypomobility.

Thus it is clear that TMD has multifactorial etiology which confuses the diagnosis. even while this is true management of TMD is still possible if the practitioner is astute enough to distinguish between Axis 1 group 1 conditions and Axis 1 group 2 conditions.

This can be possible if he/she follows the correct diagnostic protocols. These would be elaborated in the second part of this 3 part series of articles on TMD.

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Effect of psychosomatic disorders in oral diseases

*Revathy V V, *Ismail Sneha R, *Rajendran Sruthy, **M.S. Deepa

*Interns, **Head of Department of Oral Medicine and Radiology, Azeezia College of Dental Science & Research, Meeyannoor, Kollam.

Send Correspondence: Dr. Revathy V.V., Email: revathyvv1592@gmail.com

Abstract

"Mouth is the mirror of the body"; says Williams Osler as mouth reflects many systemic diseases. Oral mucosa shows the indirect result of an emotional problem. Most common ones are stress, anxiety and depression. Psychosomatic disorders are manifestations of physical imbalance in which emotional components have a strong influence. A wide spectrum of psychiatric disorders affects oral and para oral structures which have a definite psychosomatic cause, but unfortunately they remain unrecognised because of the common and limited nature of their presenting features. Emotional and psychological factors can disturb a wide variety of hormonal, vascular and ulcerations. Recent studies also pointed out to several potentially important risk indicators such as psychosocial factors : stress, depression and ineffective coping, state and trait anxiety. This article highlights the importance of psychological factors resulting in altered physiological responses causing diseases in orofacial region.

Keywords: Stress, anxiety, MPDS, oromucosal diseases

Introduction

Stress is defined as a physical, mental, emotional response to events that cause bodily or mental tension¹. In small doses, stress can be good for you because it makes you more alert and gives you a burst of energy. But feeling stressed for a long time can take a toll on your mental and physical health. Body and mind has a direct correlation which influence each other. Body response to stress by releasing stress hormones, which makes BP, heart rate, blood sugar levels go high².

Emotional as well as psychological factors may act as significant risk factors in the initiation and progression of oromucosal diseases. A decrease in cortisol level in traumatised or chronically stressed individuals may determine an increased vulnerability to bodily disorders, inflammation, chronic pain syndromes and allergies³.

Some of the symptoms of stress includes lack of energy and focus, poor self -esteem, short tempered, forgetfulness, headache, trouble sleeping, general aches and pain etc. stress happens when people feel like they don't have the tools to manage all of the demands in their lives. Even though it may seem hard to find ways to

de-stress, its important find those ways for your health.

Classification of psychosomatic disorders of oral cavity⁴

1. Pain related disorders
Myofascial pain dysfunction syndrome
Atypical facial pain
Atypical odontogenic pain
Phantom pain
2. Disorders related to altered oral sensation
Burning mouth syndrome
Idiopathic xerostomia
Idiopathic dysgeusia
Glossodynia
Glossopyrosis
3. Disorders induced by neurotic habits
Dental and periodontal diseases caused by bruxism
Biting of oral mucosa (self mutilation)
4. Autoimmune disorders
Oral lichen planus
Recurrent aphthous stomatitis
Psoriasis
Mucous membrane pemphigoid

Erythema multiforme
 5. Miscellaneous disorders
 Recurrent herpes labialis
 Necrotising ulcerative gingivostomatitis
 Chronic periodontal diseases
 Cancerophobia

Endocrine responses to stress⁵

Stress acts or potentiates the hypothalamic-pituitary-adrenal axis leading to increased serum corticosteroid levels which is thought to have antistress effects. In the face of stressors there is also a profound immune activation including the release of cytokines which cause further release of CRF which in turn serves to increase glucocorticoid effect and thereby self-limit immune activation. In long term stressed individuals, if there is decrease in cortisol availability, then they have increased chances of disorders with signs such as inflammation, pain and allergies.

MPDS (Myofascial Pain Dysfunction Syndrome)

MPDS is a pain disorder, in which unilateral pain is referred from the trigger points in myofascial structures, to the muscles of the head and neck⁶. Patient reports psychological symptoms such as frustrations, anxiety, depression, hypochondriasis and anger. MPDS is associated with maladaptive behaviour such as pain, verbalization, poor sleep, dietary habits, lack of hear words, lack of sleep eating behaviour⁷. Traumatic occlusion due hyper occlusive fillings, prosthesis, improper orthodontic treatment, habits like bruxism, joint problems, and improper masticatory habits can also result in MPDS.

Atypical facial pain

Atypical facial pain is a painful condition not satisfying certain typical manifestation of well-known condition⁸. Typically manifests in middle aged women. Underlying stress and psychiatric disturbances will be associated with severe and continuous pain. There will be vague, intractable, burning type of pain affecting one side of the face⁹.

BMS (Burning Mouth Syndrome)

BMS is a chronic intraoral painful condition that is not characteristically associated with any clinical lesions. Local, systemic and psychological factors have been the broadly suggested causes¹⁰. There is strong predilection for females. Hormonal changes during menopause have greater association. Clinical features include burning sensation of the tongue, lips, gums, palate. Effective management of the stress along with symptomatic management is necessary¹¹.

Idiopathic xerostomia

Saliva plays a significant role in the maintenance of oral and general health. Xerostomia is the abnormal reduction of reduction of saliva. Stress and the drugs for psychologic disorders such as Antipsychotics, Tricyclic antidepressants, Benzodiazepines can cause xerostomia. Xerostomia can in turn leads to other diseases like oral thrush¹². Artificial saliva can reduce the severity to some extent¹³.

Lichen planus

Lichen planus is a mucocutaneous disorder that varies in appearance from keratotic to erythematous and ulcerative.(fig 1)¹⁴. There will be immunologically induced degeneration of the basal cell layer of the oral mucosa¹⁵. It can undergo remission and exacerbation during stressful situation. Oral lesions can present as reticular, erosive or bullous type. Reticular lichen planus is common and it involves the buccal mucosa, lateral and dorsal tongue, gingiva, palate and vermillion border. Typical radiating white striae and erythematous atrophic mucosa are present at the periphery of well demarcated ulcerations. Treatment includes stress management, diet modification, pharmacotherapy with antioxidants and steroids.

Recurrent aphthous stomatitis

Multiple round or ovoid ulcers with well-defined borders and erythematous halo surrounding the periphery of ulcer (fig. 2)¹⁶. Autoimmune antibody dependent cellular cytotoxicity is seemed to be pathology. Ulceration is preceded by burning sensation. Recurrence of aphthous ulcers coincide with period of stressful situations¹⁷. Topical anaesthetics, analgesics and antimicrobials will be useful. Systemic medication includes Levamisole.

Recurrent herpes labialis

Herpes infection often leads to oral lesions. Highly occurs on keratinized mucosa like hard palate and gingiva. Recurrences usually occurs due to either physical or emotional stress. Lesions are mainly seen on skin and labial mucosa (fig 3). Associated with fever, pain pharyngitis. Menstruation can be a triggering factor. Systemic medication includes Acyclovir 400 mg twice daily for 2 wks.

Pemphigoid

Bullous pemphigus and benign mucous membrane pemphigoid are the two variants of pemphigoid (fig 4)¹⁸. In that bullous pemphigus is commonly seen in women of 6th and 7th decades of life. Bullae over the skin and mucous membrane which ruptures to give rise to erosive areas which

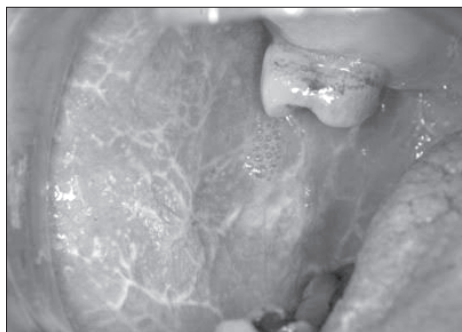


Fig 1 Oral lichen planus



Fig 2 Recurrent aphthous stomatitis



Fig 3 Recurrent herpes labialis



Fig 4 Pemphigoid



Fig 5 Erythema multiforme



Fig 6 Necrotising ulcerative gingivitis

heal spontaneously. Stress can trigger newer lesions. It commonly affects gingiva and buccal mucosa. Cicatricial pemphigoid shows sub epidermal blistering. Symptomatic treatment which includes topical steroids and intra lesional steroids and systematic steroids like azathioprine and also antioxidants are also given.

Erythema multiforme

Erythema multiforme is an acute reactive self limiting and recurring mucocutaneous disorder that causes blistering and ulceration of skin and mucous membrane (fig 5)¹⁹. It is commonly found among people with stress and anxiety. It appears as macule, papule, bullae. It is triggered by HSV1&2 infections. Symptomatic management includes steroids, antioxidants and antibiotics and antiviral drugs if herpes infection present²⁰.

Necrotising ulcerative gingivitis

It is a fusospirochaetal infection caused by local and systemic predisposing factors.(fig 6). Stress and other psychomatic factors have detect anti-inflammatory and anti-immune effects²¹. It can cause behavioural mediated effects on body's defences. Stress increases cortisol level which suppress neutrophil activity and decrease IgG & IgA production causes periodontal pathogens to cause more destruction. Management includes oral

prophylaxis, stress reduction, topical analgesics, anaesthetics and systemic medications.

Desquamative gingivitis & chronic periodontal diseases (CPD)

Desquamative gingivitis is an erythematous, desquamated and ulcerated appearance of the gums. It is associated with stress and anxiety. Emotional factors also probably play a significant role in the CPD, in which the gingival and underlying periodontal tissue cannot respond adequately to the local irritation of bacterial plaque and calculus. The loss of tissue resistance has been attributed to variety of systemic factors including emotional stress.

Glossopyrosis

Glossopyrosis is the burning sensation of tongue. It is the common complaint of highly stressed individuals²². They are invariably neurotic symptoms and indicative of underlying psychologic problems, which are often severe and require appropriate psychiatric management.

Dysgeusia

Dysgeusia is an altered taste perception. It is a common complaint of severely neurotic subjects and also present in patients suffering from depression. Apart from altered sensation, burning

mucosa can also be seen in this type of patients. Psychiatrist consultation may be indicated in these cases.

Management of stress

There are steps you can take to help you handle stress in a positive way and keep it from making you sick. Some of the following ways to reduce the stress level are social activity, autogenic training, cognitive therapy, meditation, enough sleeping, mind fullness, time management, music as a coping strategy, deep breathing, yoga, prayer, reading novels, physical exercise, natural medicine, humour, biofeedback, desensitisation, positive thinking, distraction techniques etc.

Pharmacotherapy includes antianxiety drugs like benzodiazepines (diazepam), antidepressants like monoamine oxidase inhibitors (phenelzine), tricyclic antidepressants (Amitriptyline), sedatives like barbiturates.

Conclusion

Stress is a conscious or unconscious psychological feeling or physical situation which comes as a result of physical or mental, positive or negative pressure to overwhelm adaptive capacities. Changing lifestyles makes people vulnerable to stress related diseases. Dentist in their daily practice frequently come across patients with psychosomatic disorders, patients who are emotionally disturbed frequently presents with oral symptoms and recognition of such emotional disturbance benefits both the patient and the clinician. Effective management of stress can reduce the incidence of oral diseases.

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OVERVIEW

Dry Socket –Revisited

*S. Sooraj

* Professor and Head, Department of Oral and Maxillofacial Surgery, Sri Sankara Dental College, Akathumuri, Varkala, Trivandrum

Send Correspondence: Dr. Sooraj; email: soorajsdr@yahoo.com

Introduction

Dry socket also known as localized alveolar osteitis or alveolitis sicca dolorosa is one of the most frequent complications after extractions.¹⁻⁵ It was first described by Crawford⁶ in 1876. The incidence of dry socket ranges from 1% to 4% and may rise to as high as 45% in cases of lower third molar extractions.^{1, 7}

Symptomatology

Dry socket was first described as a complication of disintegration of the intra-alveolar blood clot, with an onset 2 to 4 days after extraction¹⁻⁶. According to Fazakerlev and Field⁷, the alveolus empties, the osseous surroundings are denuded and covered by a yellow-gray necrotic tissue layer, and the surrounding mucosa usually becomes erythematous. It is clinically characterized by a putrid odor and intense pain that radiates to the ear and neck⁸. Pain is considered the most important symptom of dry socket. It can vary in frequency and intensity, and other symptoms, such as headache, insomnia, and dizziness, can be present. Recently, investigators have suggested the following definition for dry socket: postoperative pain surrounding the alveolus that increases in severity for some period from 1 and 3 days after extraction, followed by partial or total clot loss in the interior of the alveolus, with or without halitosis^{1,9}.

Microscopically, dry socket is characterized by the presence of inflammatory cellular infiltrate, including numerous phagocytes and giant cells in the remaining blood clot, associated with the presence of bacteria and necrosis of the lamina dura¹⁰

In 1973, Birn¹¹ reported that the inflammatory process can extend to the medullary spaces and sometimes the periosteum, resulting in connective

tissue inflammation of the contiguous mucosa, with microscopic features typical of osteomyelitis. Degradation of the blood clot in association with dissolution of erythrocytes and fibrinolysis, deposits of hemosiderin, and the absence of organized granulation tissue have also been described in histopathologic investigation of dry socket.¹²

Etiology

The exact etiology of dry socket has not been clearly understood. Birn¹¹ hypothesized that dry sockets had greater amount of plasminogen activity than normal extraction sockets. The plasminogen is converted to plasmin by direct or indirect activators which in turn is responsible for disintegration of clot and formation of kinin which causes intense pain.

In 1989, Catellani¹³ stated that the pyrogens secreted by the bacteria are indirect activators of fibrinolysis in vivo. Catellani¹³ studied the effectiveness of those pyrogens on the treatment of thromboembolic disease, injecting the products intravenously. An interesting fact is that dry socket does not occur until after the first postoperative day. The explanation is that the blood clot contains antiplasmin, which must be consumed by the plasmin before disorganization of the clot.

Tooth or bone remnants in the socket can also result in the development of dry socket¹¹.

Poor oral hygiene and consequent alveolar contamination is also an important factor for the onset of dry socket. This relationship was supported by reports of this complication in patients with poor oral hygiene and/or pre-existing local infection, such as pericoronitis and severe periodontal disease.¹⁴ Vasoconstrictors, which are present in local anesthetics, have also been

considered contributing factors for the etiopathogeny of dry socket. This affirmation was contested, however, because patients undergoing extraction with local anesthesia without local infiltration have also developed dry socket. 1978, Nitzan et al¹⁵ demonstrated a possible relationship between the presence of aerobic micro-organisms and the etiology of dry socket. They also reported high fibrinolytic activity in the cultures of an anaerobic *Treponema denticola*, which is found in periodontal disease.¹⁵

In 2002, Blum¹ suggested that factors inherent to the patient must also be considered as risk factors for dry socket. These included a history of dry socket, deep osseous impaction of mandibular third molars, poor oral hygiene, a recent history of pericoronitis, ulcerative gingivitis or active illness associated with the tooth to be extracted, smoking (in particular >20 cigarettes daily), oral contraceptive use, and immunocompromised patients.¹

Treatment of dry socket

Because of complex aetiopathophysiology, a universally accepted effective treatment has not been presented. Although local treatment with antibiotics has been described as clinically significant in preventing dry socket,^{16,17} the efficacy of such drugs in the treatment of dry socket has also been extensively investigated.¹⁸⁻²¹ The regular bacterial microflora of the mouth comprises specially anaerobic bacteria; thus, a greater prevalence of these micro-organisms, such as *Streptococcus facultative*, *Porphyromonas*, *Prevotella*, *Peptostreptococcus*, and *Fusobacterium*, are present in odontogenic infections.²²

Mitchell²³ defined the properties of the ideal dressing for dry socket as one that promotes fast and effective release of pain; does not irritate the surrounding tissues; is easily absorbed or incorporated; allows close contact with the osseous tissue; is antiseptic; is stable to mouth fluids; does not alter in volume in contact with blood and saliva; and is easily applied. In addition, the treatment should be made at a unique appointment and preferably be of low cost.

In 1988, Mitchell²³ suggested the use of nitroimidazoles for the treatment and prevention of dry socket, because of the evident participation of anaerobic bacteria in the etiology of dry socket.

Poi et al,²⁴ in 2000, studied a paste mainly composed of metronidazole, 2% lidocaine, carboxymethylcellulose, and mint with 5% ascorbysilane C (ascorbyl methylsilanolpectinate). They found that it reduced free radicals, protected

the cellular membrane, and regenerated cutaneous tissues, in addition to helping the synthesis of collagen and elastin. From these outcomes, they concluded that the paste was effective in the treatment of infection and did not interfere with the normal chronology of the healing process, in an experimental dental model of an infected alveolus in the rat.²⁴

Cardoso et al²⁵ believe that aggressive curettage could cause greater trauma to the osseous alveolar tissues and bacteremia. In addition to local procedures, they prescribed 0.12% chlorhexidine as a mouthwash, 3 times daily for 14 days. If clinical signs of infection, such as fever, suppuration, and pain were present, they prescribed amoxicillin 1,500 mg/day; for patients allergic to amoxicillin, clindamycin 1,200 mg/day was given. Analgesics were prescribed for the pain. Daily follow-up examinations were done until the symptoms resolved completely.

Conclusion

Dry socket is a common clinical complication after extraction which results in excruciating pain and delayed healing of the socket. Although various aetiopathophysiologic mechanisms have been described, a completely acceptable explanation for causation has not been forthcoming. Consequently treatment modalities have also varied with no consensus as to which modality is the most effective. Aggressive curettage is now considered to increase socket damage and induce bactremia and hence has to be discouraged. Palliative socket dressings with or without antibiotics and maintenance of local antisepsis seems to hold the key to successful outcome.

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Esthetic rehabilitation of periodontally compromised dentition using a combination of Gumfit and Cu-Sil Denture

* Nikhil S. Rajan, *Mintu M. Kumar, *Sarath C., **Pradeep C. Dathan

*Senior Lecturer, * Professor and Head of Department in Prosthodontics, Sri Sankara Dental College, Akathumuri, Varkala, Trivandrum

Send correspondence: Dr. Pradeep C. Dathan Email: pdathan70@gmail.com

Abstract

Esthetics along with function is the two most common concerns of patients. Expectations of patients are at times unrealistic and our job becomes cumbersome to attain treatment result to their expectations. The present prime concern in dentistry is on preservation of remaining natural teeth. Presence of few teeth in oral cavity help in preserving alveolar ridge integrity, maintain the proprioception, and gives psychological benefit to the patient. A complete periodontal evaluation prior to any prosthetic rehabilitation can greatly enhance the success rate of these prosthesis. This case report presents with a middle aged lady patient with multiple loss of tooth due to periodontitis rehabilitated with upper gum fit and lower Cu-Sil dentures.

Introduction

Edentulous patients in middle or late middle age group have lot of expectations regarding their smile and esthetics. Transitional denture provides an alternative treatment plan for the patients willing to replace their missing teeth while retaining their very few remaining teeth. A relatively newer type of transitional denture is Cu-sil denture. A Cu-sil denture is a denture with vents, lined by a gasket of silicone rubber; the vents provide space for remaining natural teeth to emerge into the oral cavity through the denture. Cu-sil denture is the simplest removable partial denture, but its fabrication requires special armamentarium and materials. Gum fit dentures are another variety of dentures provided to patients who has high smile line along with prominent maxillary or Mandibular arches. These patients usually has a past or current periodontal disease progression, This must be investigated both clinically and radiographically and treated if needed. In many occasions, non-surgical periodontal management by full mouth disinfection is adequate to maintain the healthy

condition of the remaining teeth. In case of extensive and progressive disease, surgical procedures involving bone grafts may be necessary.

Case Report

A female patient aged 42 years reported to the Department of Prosthodontics at Sri Sankara Dental College for the replacement of missing teeth. Clinical examination revealed a completely edentulous maxillary arch, partially edentulous mandibular arch. Past dental history revealed that the tooth loss was attributed to periodontal disease. She had 43,44,45,33 and 34 remaining which on clinical and radiographic evaluation showed fair prognosis. The patient was referred to the Department of Periodontics. Clinical examination showed generalized gingival inflammation, recession and periodontal pocket depth of 4mm in all the teeth. A thorough oral prophylaxis was done on the first day followed by full mouth disinfection procedure including subgingival scaling and root planing along with subgingival irrigation of chlorhexidine. Antibiotics (Tab Doxy 100mg, BD X 1day followed



Pre-Operative View



Fabricated Prosthesis



Prosthesis Inserted



Post-Operative View

by OD X 6days), analgesic (Tab Zerodol P SOS) and mouth wash (Hexidine) was prescribed. The patient was reviewed after two week and the periodontal status was determined to be satisfactory and was referred to Department of Prosthodontics for further treatment.

Patient had facial profile of Angle's class II, vertical maxillary excess with high smile line. Diagnostic impression and cast was made and tentative relationship was recorded to visualize inter arch space to access the space available for lower tooth. After 1 week, secondary impression of the maxillary edentulous arch was taken. Special impression procedure was planned for lower region to get the edentulous area of the mandibular region in functional state and hard tissue in an anatomic state. A custom tray was designed relieving existing tooth and border molding was done followed by a pickup impression. Secondary cast was again surveyed

to verify parallelism of existing tooth to correct path of invention for the Cu-Sil denture. Jaw relation was recorded with gum fit maxillary denture base. Acrylisation of the prosthesis was done and the prosthesis trimmed and polished to sheen. Insertion of the prosthesis in the patients mouth was carried out and further trimming and adjustment was done until the patient was comfortable. Post insertion instructions were given to the patient and was stressed on the importance of maintains oral hygiene. She was asked to review in the following week at Department of Prosthodontics and also asked to report to Department of Periodontics every three months for review and management if necessary.

Discussion

Our goal was "perpetual preservation of what remains rather than meticulous replacement". There has been a radical difference stated in many of the dental literatures states that the presence of

teeth preserves the alveolar ridge. Thus, the prime target of present-day dentistry is on preservation of teeth and periodontium. Several studies have shown that removal of all natural teeth and rehabilitation with complete dentures generally results in alveolar bone loss and leads to psychological trauma due to reduced stability, and retention. Maintaining a good lip support along with providing a good smile in maxillary excess cases has also been reviewed in literatures.

In practice, we come across patients with compromised occlusion including multiple missing teeth accompanied by tilted, abraded, periodontally weak or extruded tooth. In regular scenario, extractions of these teeth are carried out and minimal effort is placed in preservation of these valuable structures due to the fear of failure. In such cases after thorough clinical and radiographic examination, followed by periodontal management, Cu-Sil dentures are the choice of removable prosthetic replacement. They are the simplest form of retaining existing tooth with good periodontal support which helps for hassle free placement and support for the prosthesis. Advantages of Cu-Sil dentures when compared to over dentures are that they do not require major procedures on the existing tooth other than minor alterations to attain parallelism. Existing dentition remains vital and proprioception remains same as normal dentition. Gum fit dentures in maxillary excess patients can be delivered only if retention and stability of the denture can be achieved from the remaining areas excluding labial maxillary vestibular region from canine to canine region. These complex procedures require much patient cooperation and can be carried out only after

educating the patient along with his or her peer relatives about the procedure and treatment outcome.

Conclusion

Gum fit and Cu-Sil dentures are advanced options available in prosthetic restoration phase. They provide stable and predictable outcome when compared to traditional replacement option like over dentures or conventional complete or partial dentures. A sound periodontal support is essential for the success of any prosthesis. Case selection is of vital importance in a combination of Cu-Sil denture, gumfit prosthesis as providing a difference to attain maximum esthetics involves ideal edentulous and partially edentulous arches. Patients should be educated on its merits and demerits along with maintenance of their prosthesis.

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Gingival depigmentation: A split mouth comparative study between scalpel and diode laser

* Rhea Kiran R, **Mintu M Kumar, ***Seema G, ****Sarath C.

* * PG Student, ** Senior Lecturer, *** Professor & Head of Department in Periodontics, ****Senior Lecturer, Sri Sankara Dental College, Akathumuri, Varkala, Trivandrum

Send correspondence: Dr. Sarath C., E-mail: dr.c.sarath@gmail.com

Abstract

Gingival hyperpigmentation represent a major aesthetic challenge to many patients. A natural occurrence of excessive melanin secreting cells are not pathogenic *per se* but often warrants corrections due to patients demands. This case report describes a young male patient with such a complaint and two widely used techniques in depigmentation and a post operative follow up of three months.

Gingival melanin pigmentation occurs in all races.¹ Melanin, a brown pigment, is the most common natural pigment contributing to endogenous pigmentation of gingiva and also the gingiva is the most predominant site of pigmentation on the mucosa. Melanin pigmentation is the result of melanin granules produced by melanoblasts intertwined between epithelial cells at the basal layer of gingival epithelium.² When gingival hyperpigmentation occurs as a genetic trait in some population, irrespective of age and gender, it is termed as racial or physiologic pigmentation.^{1,3}

Gingival depigmentation is a periodontal plastic surgical procedure whereby the hyperpigmentation is removed or reduced by various techniques. The patient's demand for improved esthetics is the first and foremost indication for depigmentation. Various depigmentation techniques have been employed. Selection of the technique should be based on clinical experiences and individual preferences.⁴

A. Methods aimed at removing the pigment layer:

I. Surgical method of de pigmentation.

- Scalpel surgical technique
- Cryosurgery
- Electrosurgery

II. Rotary method

- Using rotary burs

III. Lasers.

- Neodymium; aluminum Yttrium Garnet (Nd YAG) laser
- Erbium YAG lasers
- Carbon di oxide (CO2) laser.
- DIODE laser

IV. Chemical methods of de pigmentation.

B. Methods aimed at masking the pigmented gingiva with grafts from less pigmented area:

- Free gingival graft
- Acellular dermal matrix allograft.⁵

This article demonstrates a comparative evaluation of managing gingival pigmentation using scalpel and Laser techniques with 3 month follow up.

Case Report:

A 27 year old male patient visited the Department of Periodontology of Sri Sankara Dental College, Akathumuri, complaining of dark gums and broken restoration of upper right front tooth. History revealed that pigmentation was present since childhood suggestive of physiological melanin pigmentation (Fig. 1). Patient was systemically healthy without any habits. Patient's oral hygiene was good. Patient was explained about the treatment options of depigmentation procedures available and the possibility of repigmentation after certain period.

Oral prophylaxis was carried out during the initial visit. A split mouth approach comparing



Fig. 1 Pre- operative view

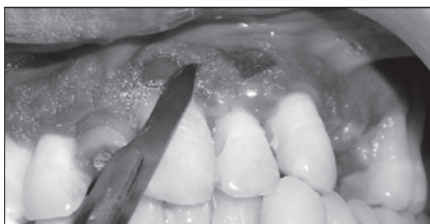


Fig. 2 Application of Scalpel

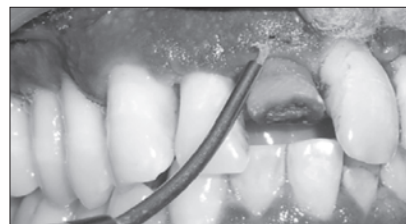


Fig. 3 Application of LASER



Fig. 4 Immediate post-operative view of scalpel therapy



Fig. 5 Immediate post-operative view of laser therapy



Fig. 6 Coe-pak given

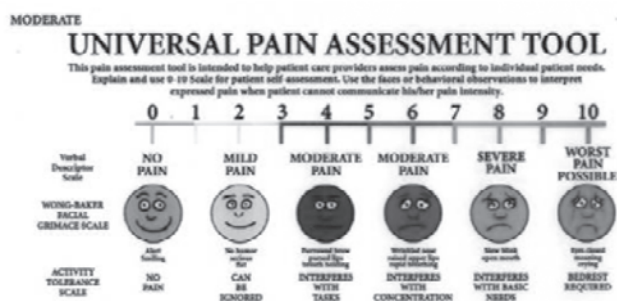


Fig. 7 Wong- Baker Facial Grimace Scale of pain perception



Fig. 8 Post- operative view after 3 months

scalpel technique with that of laser was planned for depigmentation procedure followed by permanent restoration of fractured tooth. Local infiltration of lignocaine was administered prior to depigmentation in the upper anterior zone including the distal side of right and left canines. At the maxillary left anterior region from central incisor to canine (anterior esthetic segment), a conventional/traditional technique was used, wherein a #15 blade is used for depigmentation (Fig. 2). At the right counterpart, laser technique was used for depigmentation (Fig. 3). Diode laser with 940nm was used for the procedure. Depigmentation was performed with short light paint brush strokes in a horizontal direction to remove epithelial lining. There was absolutely no bleeding. Coe-Pak was given on both the surgical sites (Fig. 6). Postoperative instructions were given to the patient, nonsteroidal anti

inflammatory in the form of Ibugesic plus was given thrice daily for 3 days. As the patient was co-operative and willing, he was requested to fill up a feedback form based on Wong- Baker Facial Grimace Scale which is considered to be the Universal pain assessment tool of pain perception each day after the procedure for one week.⁶ (Fig.7)

Result:

Patient was recalled after 1 week for re evaluation. The pack was removed, and the surgical area was examined. Wound healed uneventfully on both the sides. As per the filled feedback form of pain perception scale, the patient marked (3-4) on the pain perception scale, which reveals pain of moderate intensity and dull aching type on both treated sites for 2 days postoperatively. On the third day, he marked (1-2) on the scale which signifies pain that can be

ignored. After the third day, pain was rarely noticeable on both sites, (0) on the scale. On 1 month postoperative follow-up, the healing was uneventful without any post-surgical complications. After 3 months of review, the gingiva appeared light pink in colour, healthy, and firm giving a normal appearance (Fig. 8). The patient was very impressed with such a pleasing esthetic outcome. Depigmentation was not carried out for mandibular anterior region because they were of no esthetic concern for the patient.

In the above mentioned case, no hemorrhage, infection or scarring occurred in any of the site on the first and subsequent visits. The healing was uneventful. But the patient experienced post-operative pain which was of dull aching type and moderate intensity on both sites till the 2nd day, which subsided thereafter. The patient's acceptance of the procedure was good, and the results were excellent, as perceived by the patient. The follow-up period showed no repigmentation.

Discussion

Scalpel surgical technique essentially involves surgical removal of gingival epithelium along with a layer of the underlying connective tissue and allowing the denuded connective tissue to heal by secondary intention. The new epithelium that forms is devoid of melanin pigmentation.⁵ The scalpel method of depigmentation gave satisfactory results from both clinical and patient's perspective. However, this technique caused unpleasant bleeding during and after the operation, and it was necessary to cover the surgical site with periodontal dressing for 7-10 days. The area healed completely in 10 days with normal appearance of gingiva. We found that the scalpel technique was relatively simple and versatile and that it required minimum time and effort.

Lasers are of two types: hard and soft tissue lasers. Soft tissue lasers are used for procedures like gingivectomy, frenectomy, gingivoplasty, de-epithelialization, periculectomy, crown lengthening procedures etc. Hard tissue lasers can cut both hard and soft tissues. In this case we used soft tissue diode laser for depigmentation. The main advantage was that there was no intraoperative bleeding which maintained a clear field of operation, one of the main principles of instrumentation. This technique also ensured a more safe, fastest, esthetic and effective control.

Conclusion:

The results of this case report showed that both scalpel and laser are of equal effectiveness in giving esthetic results by depigmentation. Post-operative pain was also comparable in both technique, no added advantage of controlling post-operative pain in lasers. But it created a clear bloodless field of surgery. Thus we conclude that the choice of instrumentation for depigmentation should be based on the cost-effectiveness, severity of pigmentation, time duration of treatment and most importantly, patients' preferences and not on post-operative symptoms.

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IDA Attingal Branch

Reports & Activities

Installation ceremony of new office bearers under the presidentialship of Dr Deepak S Das was held at Hotel Lake Palace, Kadinamkulam on 11th Dec 2016. 98 members along with their family members attended the installation program. The President elect of IDA Kerala state branch Dr Sabu Kurian was the chief guest. Dr Sreejith N Kumar Past President of IMA Kerala State was Our Guest of Honour. The program was followed with cultural events and dinner.

First executive meeting of IDA Attingal branch was held on 20/12/2016 at Lions club, Attingal at 7.30pm. All executive members attended the program.

President proposed a financial committee, CDE committee, CDH committee, web site committee and journal committee for the smooth functioning of the branch.

To reduce expenditure we decided to try e - brochure. As per the request from the members the committee decided to conduct a 2 hr class for account keeping and using swiping machine in clinics. The meeting unanimously decided to support Dr Arun Roy who is contesting for the post of State Vice President.

IDA Attingal branch observed National Dentist Day 24/ 12/2016 at Lions club.

Dr Deepak S Das, President IDA Attingal branch inaugurated the program. He gave a small introduction of Dr Ahmed. Former Honorary Secretary Dr Alex Philip gave a good speech about Dr Ahmed.

Charter secretary Dr Biju A Nair cut the cake and distributed among the members.



The New Office Bearers 2017



Dr Deepak S Das taking charge as the new president of IDA Attingal



National dentist day celebration

A free CDE was conducted on 08/01/2017 at IMA hall, Mamom at 2.30 pm. Mr Radhakrishnan (Rtd income tax officer) delivered a lecture on Account keeping in our clinics. He gave the list of documents needed for account keeping and highlighted the need for IT filing for practitioners.

Ms Resmi (Manager) of Federal Bank, Attingal demonstrate how to use Lotza app.

The programme concluded at 6.00pm. Around 50 of our members benefitted from it.

In 49th state conference held in Kottayam our candidate Dr Arun Roy won the election and became second Vice President of Kerala state branch. Dr Alex Philip received a special appreciation award for observing the world cancer day along with IMA.

An inter branch CDE in Orthodontics was conducted by IDA Attingal branch on 19th Feb:2017. Faculty was Dr Vineeth V Thundukattil MDS. Around 100 participants from the host and neighboring branches attended the program.

As part of the state dentist day celebrations, IDA Attingal branch members visited Karunalayam (an asylum for mentally challenged and an old age home) on March 5th afternoon. Groceries for one month and clothes as per their requirement were provided. On seeing their miserable life we decided to provide more help in future also. The entire dental treatment for the inmates will be provided free of cost from the branch. Dentist Day poster designed by our member

Dr Subash Kurup was issued to all our members. Thanks to Dr Subash for his tremendous effort for the skit and poster.

Women's wing of IDA Attingal branch conducted oral check camp in a tribal community near Vithura in connection with world women's day on 5th March. Around 90 persons make use of this opportunity. We provide them tooth pastes, brushes, medicines etc.

This year Kerala state Branch decided to give excellence award to most promising male and female dentist from each branch. From our branch Dr Arun S and Dr Rakhee Rakesh was selected to receive the honors.



Poster for dentist day



Camp by women's dental council



First inter branch CDE programme



CDE on Accounts Keeping



Visit to Karunalayam



Distributing groceries at Karunalayam