

Vol. 7. Issue 2

Impressions

JUNE 2017

Journal of Indian Dental Association
Attingal Branch



e-mail : journalidaatl@gmail.com
www.idaatingalbranch.org



Best Journal State Award for 2013 and 2014

Best Journal National Award - Runner up 2013 & Winner 2014

Impressions

June 2017

❖ Vol. 7 ❖ Issue No. 2

Journal of Indian Dental Association Attingal Branch

Editor-In-Chief

Dr. Pradeep C. Dathan

Associate Editor

Dr. Rahul R.

Editorial Board

Dr. Prakash P., Dr. Sudeep S., Dr. Ganesh C, Dr. Dinesh N., Dr. Afzal A., Dr. Sherin A. Khalam, Dr. Sarath C, Dr. Suprasidh, Dr. Nithin, Dr. Biju A Nair, Dr. Ashok Gopan, Dr. Saji Mathew



Indian Dental Association
Attingal Branch

Office:

The Editor-In-Chief,
Impressions-Journal of IDA
Attingal Branch,
Prathyusha Dental Care
IIIrd Floor YCDC, Opp
Vydyuthi Bhavanam, Pattom,
Thiruvananthapuram-695004.

Mobile : 9447060374

e-mail: journalidaatl@gmail.com

Executive Committee Members

IMM. PAST PRESIDENT

Dr. Hari Kumar R
Mob : 7736430522

PRESIDENT ELECT

Dr. Ramesh S
Mob : 9847087969

VICE PRESIDENTS

Dr. Afzal A
Mob : 9495626349

Dr. Arshad B H
Mob : 9447903616

JOINT SECRETARY

Dr. Sudeep Saratchandran
Mob : 9847122768

ASSI: SECRETARY

Dr. Sherin. A. Khalam
Mob : 9947584673

TREASURER

Dr. Arun S
Mob : 9895162606

CONVENOR CDE

Dr. Biju A. Nair
Mob : 9400067000

CONVENOR CDH

Dr. Subash R. Kurup
Mob : 9895140523

EDITOR JOURNAL

Dr. Pradeep C. Dathan
Mob : 9447060374

Rep. to HOPE

Dr. Arun Roy
Mob : 9846037096

President

Dr. Deepak S Das
Deepak Villa, Near Telephone
Exchange, Kadakal P O,
Kollam - 691 536
Mob: 9497456020
E-mail: drdeepaksdas@gmail.com

Rep. to IMAGE

Dr. Ashok Gopan
Mob : 9447064346

ASAP Coordinator

Dr. Rahul R. Pillai
Mob : 8111834448

Ex. Com. MEMBERS

Dr. Niaz Yousuf
Mob : 9495596998

Dr. Arun B.S.
Mob : 9961171516

Dr. Prasanth S.P.
Mob : 9809034235

Dr. Athul Asok
Mob : 8089962048

Dr. Roshith S. Nath
Mob : 9567156769

REP. TO STATE EXECUTIVE

Dr. Premjith S.
Mob : 9847240328

Dr. Alex Philip
Mob : 9447252120

Dr. Abhilash G.S
Mob : 9447086137

Dr. Ashok Gopan
Dr. Biju A. Nair
Dr. Arun Roy S.
Dr. Anil Kumar D.

WOMENS DENTAL COUNCIL

Dr. Fazeela Ayub
Mob : 8547494627
Dr. Deepa G.
Mob : 9495309679

Hon. Secretary

Dr. Anil Kumar D
Lekhmi Dental Clinic
Near B R Auditorium,
Vizhinjam, Kerala - 695 521
Mob: 9447725674
E-mail: dranilkumard@gmail.com

President's Message



Dear members,

Welcome to the second issue of the journal of Ida Attingal branch.

As we look at "impressions", It is important to keep an impression in mind that it represents the collective thinking of a group of innovative individuals working on cutting edge technology with whom I am privileged to work with.

Congratulations to Dr pradeep dettan and the editorial team for a job well done.

Though our journal, has gone a long way from its inception, many challenges remain. We are fully aware of the fact that establishing a viable scholarly journal takes time and effort. We certainly cannot succeed without the understanding and support of all our beloved members.

We are delighted that you are joining us as readers and hope you will also join us as contributors. We look forward to welcome your submissions to have many more issues.

Thank you

Jai IDA

Dr Deepak S Das

President

IDA Attingal Branch.

Secretary's Message



Dear colleagues,

Warm greetings to one and all.

I am glad to be your Secretary of IDA Attingal branch with a membership strength of 331 members.

Over the period of six months of this year, we could comfortably conduct four CDEs, many Dental camps and an awesome program on "The World No Tobacco day 31st May" at Varkala Railway station. I am thankful to all our members, Interns, staff and management of Sree Sankara Dental College and Southern Railway for their active participation in an exemplary manner.

We were fortunate to have the presence of the Honourable Secretary General Dr Ashok Doble, IDA Kerala State President, Secretary, CDE convener Dr Sabu Kurian, Dr Suresh and Dr Rajesh respectively to grace the function.

I am extremely happy to quote that our journal "impressions" has improved leaps and bounds, especially with regards to submissions, its presentations and the quality of the content of the articles.

Thanks to the untiring effort of Dr Pradeep Dathan and his editorial team, authors, and all well wishers, who are promoting this journal.

With regards

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

- 43** **Sequelae of wearing complete denture**
Arya H M, Sudeep S, Dinesh Nair
- 47** **Occupational stress in dental profession**
Lekshmy Gupthan
- 49** **Autologous Blood Injection therapy for chronic temporomandibular displacement; Is it worth the resonance? – A Review**
Radhika S Chandran, Rammohan R.S
- 52** **Interleukin-6 in oral health and diseases**
Anil Arya, Jayasree Aswathy, Mohan Aswathy K, John Anna Chinchu, M. S. Deepa.
- 54** **LANAP – A ray of hope in periodontal therapy**
Nita Syam, Nima Syam
- 57** **Local anaesthetic resistance. An update of a rare phenomenon**
Manoj S. Nair, Arun G. Pillai, Tharun V. Jacob, Megha K.
- CASE REPORT**
- 60** **Endodontic retreatment of radix entomolaris – A case report**
Satheesh SL, Shefali Jain, Noora, Deepak Dinesh
- 63** **Direct Bonded FPD**
Karthik S, Shahin Ismail, Nimmy KJ, Raahee Kiran, Smitha Raveendran, Pradeep C Dathan
- 66** **CPD in transition - a clinical technique**
Shyam Mohan A., Yeshaswini
- 69** **A protean approach for rehabilitation of partially edentulous patient - Case report**
Shahin Ismail, Karthik S, Nimmy KJ, Rahee Kiran, Chandrathara, Nikhil S Rajan, Pradeep C Dathan
- 72** **Clinical discussion of odontogenic keratocystic tumour presenting as a mandibular swelling: A case report**
Ramesh S, Sunila Thomas, Vivek V, Jincy Thomas
- 75** **Branch Reports**



Ethical advertising

In the past, dental organizations have raised concerns that advertising commercializes the practice of dentistry and does not respect the dignity of the profession. Dentists have been expected to generate referrals from other medical and dental professionals and from satisfied patients by providing good care to their patients. In 1982, the United States Supreme Court affirmed a ruling in favor of the Federal Trade Commission (FTC) in its determination that the prohibition on advertising contained in the American Medical Association's code of ethics was an unlawful restraint of competition. The FTC argued that all businesses and professionals have the right to inform the public of the services they provide and that all consumers have the right to make informed choices based on truthful advertising. It is ethical for dentists to market their practices. There are certain precautions to be observed. Advertisements must be truthful and not deceptive, misleading and conveying discriminatory attitudes. Advertising that seeks to denigrate the competence of other individual professionals or group practices is always unethical. All paid advertising must be clearly identified as such. Dentists should consider not just the intent of any advertisement but also its the effect on the public's view of the profession.

Advertising in any format may be ethical but still reflect poorly on the profession and undermine the public impressions of the profession. For example, use of a large billboard or television infomercials to advertise services is not unethical but still might be considered by many to be unprofessional. The location in which an advertisement is placed also may contribute to deception. Technically it may not be wrong to place a big flex board, advertising a group practice in front of a small dental clinic, but professional self-restraint should prevent such an occurrence.

All information provided in the advertisement must be accurate and must not create false or unjustified expectations. Images and graphics can be as deceptive or misleading as text.

Advertisements may include non-deceptive information, such as address, phone numbers, web site address, office hours, languages spoken, publications, teaching positions, hospital affiliations, and methods of payment accepted. Terms such as "top," "world-famous," "world-class," "painless" or even "pioneer," usually are misleading and designed to attract vulnerable patients.

Fee structures and costs may be advertised with caution as it can mislead or encourage inaccurate assumptions. For example, promises of a money-back guarantee are frequently misleading. Producing fair and accurate advertising of dental practices and services can be challenging, even with the best intentions. It often is difficult to include detailed information because of the cost and size restrictions or the limitations of the media form that has been selected. If the specific advertising form does not lend itself to a clear and accurate description, an alternative media format should be selected.

In India advertisements are controlled by Advertising Standards Council of India (ASCI) which is a self-regulatory voluntary organization of the advertising industry. ASCI and its Consumer Complaints Council (CCC) deal with complaints received from consumers and industry against advertisements which are considered as false, misleading, indecent, illegal, leading to unsafe practices, in contravention of the ASCI Code for Self-Regulation in Advertising. Under its National Ad Monitoring Service (NAMS) started in May 2012. ASCI now proactively monitors over 80% the new print and TV ads released in the country every month, for contravention of its Code. (Phone number of Secretary General, ASCI 9821162785/ 23512371).

In the modern world, advertising is justified for professionals but it must be guided by great restraint.

Dr. Pradeep C. Dathan
Editor, Impressions

Sequelae of wearing complete denture

*Arya H M, **Sudeep S, ***Dinesh Nair

*PG student, **Prof & Head, ***Reader, Dept. of Prosthodontics,
PMS College of Dental Science and Research, Vattappara, Trivandrum

Send correspondence: Dr. Arya HM, E-mail: aryahari4490@gmail.com

Abstract

Wearing complete dentures may have adverse effects on the health of both the oral and the denture supporting tissues. This article is a review of selected literature on the sequelae of treatment with complete dentures in the specific areas of residual ridge resorption, mucosal reactions, burning mouth syndrome and temporomandibular disorders. Residual ridge resorption is an inevitable consequence of tooth loss and denture wearing, with no dominant causative factor have been found. Mucosal reactions have a multifactorial cause, most of which can be easily treated. Most patients are satisfied with their complete dentures. Correlations between anatomic conditions and denture quality and patient satisfaction are weak. Psychologic factors seem to be extremely important in the acceptance of and adaptation to removable dentures. There are still no reliable methods to predict the outcome of complete denture treatment and there are many problems related to treatment with complete dentures. Complete denture prosthodontics will remain an important part of dental education and practice. In addition to clinical and technical skills, insight into patient behavior, psychology and communication techniques are also necessary

Introduction

Placement of removable prosthesis in the oral cavity produces profound changes of the oral environment that may have an adverse effect on the integrity of oral tissues. These effects can be divided into direct and indirect sequelae. To the first group belong residual ridge resorption and mucosal reactions, such as denture stomatitis, denture irritation hyperplasia, traumatic ulcers, oral cancer in denture wearers and "flabby ridges. Other conditions related to the wearing of complete dentures include altered taste perception, burning mouth syndrome, gagging, periodontal disease (abutment) and caries (abutment). Indirect sequelae are related to the great changes in masticatory function in complete denture wearers compared with dentate subjects. Bite force is reduced with risk for atrophy of the masticatory muscles. The reduced masticatory ability may lead to changes in dietary selection with risks for an impaired nutritional status, especially in the elderly complete denture wearer.

Denture stomatitis

Many denture wearers develop an inflammatory reaction in the denture-bearing mucosa, most

frequently in the palate. It is usually a benign disorder and most patients are unaware of their denture stomatitis. The lesions may be local or general in nature, and the surface may show small or more extended areas of erythema of a smooth or granular type

According to Newton denture stomatitis can be classified as

Type I: localized simple inflammation or pinpoint hyperemia

Type II: An erythematous or generalized simple type seen as more diffuse erythema involving a part or entire denture covered mucosa

Type III: granular type involving central part of hard palate and alveolar ridges

Type I is trauma induced whereas types II & III are caused by presence of microbial plaque accumulation (bacteria or yeast) on the fitting denture surface & the underlying mucosa. In addition trauma could stimulate turnover of palatal epithelial cells thereby reducing the degree of keratinization and barrier function of epithelium thus the penetration of fungal and bacterial antigens takes place more easily

Diagnosis

The presence of candida associated denture stomatitis is confirmed by finding of mycelia or pseudohyphae in a direct smear. It can also be diagnosed by the isolation of more than 50 candidal species from the lesion.

Management and preventive measures

Because of the diverse possible origins of denture stomatitis, several treatment procedures could be used, including antifungal therapy, correction of ill-fitting dentures, and efficient plaque control. The patient should be instructed to remove the dentures after the meal and scrub them vigorously with soap before reinserting them. The mucosa in contact with the denture should be kept clean and massaged with a soft toothbrush.

Patients with recurrent infections should be persuaded not to use their dentures at night but rather leave them exposed to air, which seems to be a safe and efficient means of preventing microbial colonization. Rough areas on the fitting surface should be smoothed or relined with a soft tissue conditioner. About 1 mm of the internal surface being penetrated by microorganisms should be removed and relined frequently. A new denture should be provided only when the mucosa has healed and the patient is able to achieve good denture hygiene.

Local therapy with nystatin, amphotericin B, miconazole, or clotrimazole should be preferred to systemic therapy with ketoconazole or fluconazole because resistance of *Candida* species to the latter drugs occurs regularly.

For a reduction in the risk of relapse, the following precautions should be taken

1. Treatment with antifungals should continue for 4 weeks
2. When lozenges are prescribed, the patient should be instructed to take out the denture during sucking
3. The patient should be instructed in meticulous oral and denture hygiene; the patient should be told to wear the dentures as seldom as possible and to keep them dry or in a disinfectant solution of 0.2% to 2.0% chlorhexidine during nights

Denture irritation hyperplasia

Common sequelae of wearing ill-fitting dentures is occurrence of tissue hyperplasia of mucosa in contact with denture border. Lesions are a result of chronic injury by unstable dentures or by thin and overextended denture flanges. Lesions may be single or quite numerous and are composed of flaps of hyperplastic connective tissue. When this

situation occurs the patient should be instructed to rest the tissue by not wearing the denture. Proper oral hygiene and tissue massage will also improve the condition. The existing denture should be refitted with a tissue or temporary relining material. If marked improvement does not occur surgical correction will be needed.

Traumatic ulcers

Traumatic ulcers or sore spots most commonly develop within 1 to 2 days after placement of new dentures. The ulcers are small and painful lesions, covered by a gray necrotic membrane and surrounded by an inflammatory halo with fine, elevated borders. The direct cause is usually overextended denture flanges or unbalanced occlusion. Conditions that suppress resistance of the mucosa to mechanical irritation are predisposing (e.g., diabetes mellitus, nutritional deficiencies, radiation therapy, or xerostomia). In the systemically noncompromised host, sore spots will heal a few days after correction of the dentures. When left untreated, it subsequently develops into a denture irritation hyperplasia

Oral cancer in denture wearers

An association between oral carcinoma and chronic irritation of the mucosa by the dentures has often been claimed, but no definite proof seems to exist. Case reports have detailed the development of oral carcinomas in patients who wear ill-fitting dentures. However, most oral cancers do develop in partially or totally edentulous patients. The reasons appear to include an association with more heavy alcohol and tobacco use, less education, and lower socioeconomic status, which predispose to oral cancer as well as to poor dental health, including tooth extraction and denture wearing.

This underlines the necessity of strict and regular recall visits at 6-month to 1-year intervals for comprehensive oral examinations. The opinion is still valid that if a sore spot does not heal after correction of the denture, malignancy should be suspected.

Flabby ridge

It is due to replacement of bone by fibrous tissue. It is seen most commonly in the anterior part of the maxilla, particularly when there are remaining anterior teeth in the mandible, and is probably a sequelae of excessive load of the residual ridge and unstable occlusal conditions. Results of histological and histochemical studies have shown marked fibrosis, inflammation, and resorption of the underlying bone. However in a situation with extreme atrophy of the maxillary alveolar ridge, flabby ridges should not be totally removed because

the vestibular area would be eliminated. Indeed the resilient ridge may provide some retention for the denture.

Burning mouth syndrome

BMS could be a sequelae of denture wearing and is characterized by a burning sensation in one or several oral structures in contact with the dentures. It is relevant to differentiate between burning mouth sensations and BMS. In the former group, the patient's oral mucosae are often inflamed because of mechanical irritation, infection, or an allergic reaction. In patients with BMS, the oral mucosa usually appears clinically healthy. The vast majority of those patients affected by BMS is older than 50 years of age, is female, and wears complete dentures.

A vague burning sensation or pain under an apparently well-fitting denture with the complete absence of any detectable lesions is a common complaint of the geriatric patient. A burning tongue is also frequently brought to the attention of the dentist. These symptoms may be associated with complete or partial dentures but are sometimes experienced when no prosthetic replacements are in use. If dentures are used, simply requesting the patient to leave them out for a period of time to see if the sensation disappears will determine whether they are at fault.

Management

In denture wearers in whom no organic basis for the complaints is identified, the approach of the prosthodontist should be very careful. The situation may be further complicated by the fact that the patients often claim that their psychiatric disorders are due to the poor dentures and the inadequate prosthetic treatment they have received. The patient's symptoms should always be taken seriously, but any comprehensive prosthetic treatment, including treatment with implant-supported overdentures, should be carried out only as a collaborative effort of psychiatrist and prosthodontist

Gagging

The gag reflex is a normal, healthy defense mechanism. Its function is to prevent foreign bodies from entering the trachea. Gagging can be triggered by tactile stimulation of the soft palate, the posterior part of the tongue, and the fauces. In sensitive patients, the gag reflex is easily released after placement of new dentures, but it usually disappears in a few days as the patient adapts to the dentures. Persistent complaints of gagging may be due to overextended borders (especially the posterior part of the maxillary denture and the distolingual part of the mandibular denture) or poor retention of the maxillary denture. However, the condition is often due to unstable occlusal conditions or increased vertical dimension of occlusion because the unbalanced or frequent occlusal contacts may prevent adaptation and trigger gagging reflex

Residual ridge reduction

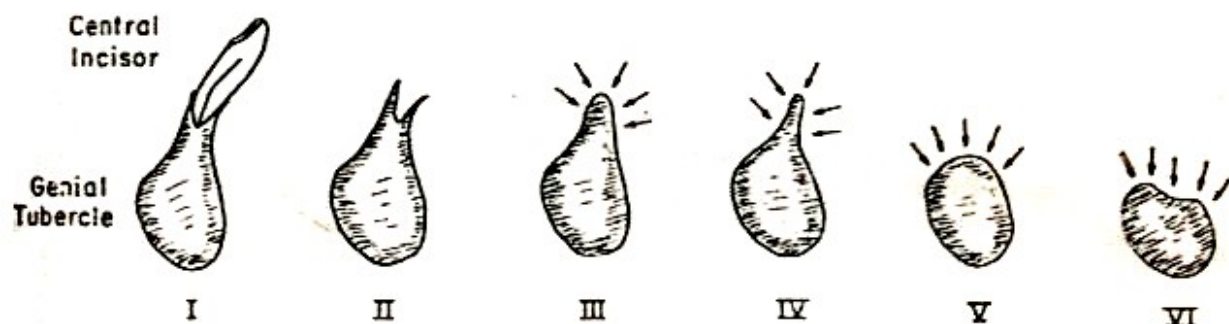
A term used for the diminishing quantity and quality of the residual ridge after teeth are removed (GPT 7). Continuous bone loss after tooth extraction and placement of complete denture is seen. Reduction is a sequel of alveolar remodeling due to altered functional stimulus of bone tissue. It is a progressive and irreversible course that results in impairment of prosthesis and oral function

Atwood's classification:

- Order I - Pre-extraction
- Order II - Post-extraction
- Order III - High, well rounded
- Order IV - Knife edge
- Order V - Low, well rounded
- Order VI - Depressed

Consequences

The consequences include apparent loss of sulcus width and depth, displacement of muscle attachment closer to the crest of residual ridge, loss of vertical dimension of occlusion reduction of



lower facial height, anterior rotation of mandible, increase in relative prognathia, changes in interalveolar ridge relationship after progression of residual ridge reduction, morphological changes of alveolar bone such as sharp, spiny, uneven residual ridges and location of mental foramen to the top of residual ridge.

Treatment

Pre-prosthetic surgery includes ridge preservation procedures, corrective or recontouring procedures of the defects and abnormalities. Ridge extension procedures (sulcus extension, ridge augmentation) and reconstruction methods like correction of abnormal ridge relationship. Provision of accessory undercuts like creating favorable undercuts, dental implants, and onlay denture and modified denture construction procedure Eg. Immediate denture

The prosthetic factors to be considered include broad area coverage, decreased buccolingual width of teeth, and improved tooth form, avoidance of inclined planes, centralization of occlusal contacts, provision of adequate tongue room and adequate inter-occlusal distance during rest jaw relation.

Overdenture abutments: caries and periodontal disease

Wearing of overdentures is often associated with a high risk of caries and progression of periodontal disease of abutment teeth. This is due to bacterial colonization beneath a close fitting denture is enhanced, and good plaque control of fitting denture surface is difficult to obtain. Predominant micro organisms are streptococcus, lactobacilli and actinomyces.

Management

Abstain from wearing dentures in the night. Application of flouride-chlorhexidine gel and mechanical & chemical plaque control. Placement of copings that cover the exposed dentin and root surface is indicated where caries is more deeply penetrating and this is to reduce risk of new or recurrent caries. Periodontal pockets greater than 4-5 mm should be surgically eliminated

Indirect sequelae

Atrophy of masticatory muscles

Masticatory function depends on the skeletal muscular force and the facility with which the patient is able to coordinate oral functional movements during mastication. In complete denture wearers, particularly in women atrophy of masseter and medial pterygoid muscle is seen. The decrease in bite force and chewing efficiency results in impaired masticatory function. Retention

of a smaller number of teeth used as overdenture abutments helps in maintenance of oral functions. In completely edentulous patients, placement of implants is usually followed by an improvement of masticatory function & an increase of maximal occlusal forces.

Nutritional status and masticatory functions

The factors related to dietary selection and nutritional status of wearers of complete dentures are masticatory function, oral and general health, socio-economic status and dietary habits. Re-education of elderly denture wearers regarding dietary habits and replacement of ill-fitting dentures. Mechanical preparation of food before eating will help mastication and reduce its influence on food selection

Conclusion

The important consequences of wearing complete dentures are reduction of residual ridges and pathological changes of oral mucosae. This results in poor patient comfort, destabilization of occlusion, insufficient masticatory function and esthetic problems. Effort should be made to retain some teeth in strategically good positions to serve as overdenture abutments and the maintenance of tooth roots in mandible is important. The patient should be motivated to practice proper denture wearing habits and maintenance of oral hygiene and follow a regular follow-up schedule at yearly interval for continuous monitoring of dentures and oral tissues so that an acceptable fit and stable occlusion can be maintained.

References

1. Gunnar A Carlsson: Clinical morbidity and sequelae of treatment with complete dentures, J Prosthet Dent 1997;79:17-23
2. MAA Khan, MS Jahan, A Yousuf, S Praveen: Bangladesh journal of dental research and education, July 2013; vol.3; 51-56
3. Zarb -Bolender: Prosthodontic treatment for edentulous patients, 12th edition.
4. Arthur. Rahn. O, Charles. Heartwell. M, Jr: Textbook of complete dentures, 5th edition.
5. Sheldon Winkler: Essentials of complete denture prosthodontics, 2nd edition.
6. Basker RM & Davenport JC: Prosthetic treatment of edentulous patient, 4th edition.
7. Tallegren A: The continuing reduction of the residual alveolar ridges in complete denture wearers: mixed longitudinal study covering 25 yrs, J Prosthet Dent 27:120-132, 1972.
8. Budtz-Jorgensen E: Oral mucosal lesions associated with wearing of removable dentures, J Oral Path 10:65-80, 1981.
9. Conny DJ, Tedesco LA: The gagging problem in prosthodontic treatment, Part I: description & causes, J Prosthet Dent 49:601-606, 1983.
10. Hillerup S: Preprosthetic surgery in the elderly, J Prosthet Dent 72:551-558, 1994.

Occupational stress in dental profession

***Lekshmy Gupthan**

*Assistant Professor, Department of Psychiatry, Govt Medical College, Thrissur

Send correspondence: Dr. Lekshmy Gupthan, E-mail: lekshmysiju@gmail.com

Abstract

Dentistry is regarded as a stressful profession that can have a negative impact on the personal and professional lives of the dentists. This often begins from the training period. Management of stress starts with identifying the stressors and assessing the varying responses among dentists to the same. There is a need to rearrange the working pattern and use both person and situation centered strategies to cope with the stress.

Introduction

Dentistry is a career that is both rewarding and demanding. A survey among dental students identified the reasons for choosing dentistry as an ease of being self-employed, ability to work regular hours and have a good income and also the direct opportunity to help people in need¹. But on entering the clinical practice they often find varying and increasing number of stressors. There are issues related to work place, management of practice and financial pressures. According to Moore and Brodsgaard in 2001 dentists' perceptions of the most intense stressors were running behind schedule, causing pain, heavy work load, late patients and anxious patients². These issues can lead to work stress and burn out which are serious professional risks in dentistry. In order to avoid becoming occupationally dissatisfied, dentists must be aware of these stressors and attempt to manage them as well.

Stress and burn out

Both working atmosphere and personality factors contribute to the stress level in dentists³. Isolated working atmosphere which also requires utmost care and precision with a limited chance to move around can be taxing. Dentists with an obsessive personality who expect higher standards of performance are also at risk.

When facing with stressful situations people can have varying physiological as well as emotional responses³. Strength and duration of stressors can determine the responses. Low or weak demands keep the person bored and lethargic whereas

moderate demands for short term make them aroused and lively; excessive demands for short term can cause high arousal and excitement. If low demands persist long term it can lead to dismay and sense of failure. Moderate or challenging demands long term lead to feeling of adequacy and high self esteem, but long term excessive demands lead to exhaustion and loss of self confidence.

Stress can manifest with symptoms of backache, breathing difficulties, palpitation, feeling tense and depressed, panic attacks, lack of concentration at home and work, impaired sleep and appetite, overeating and excessive worrying etc.

Chronic occupational stress can lead to a state described as burnout⁴. Occupational burn out is characterized by emotional exhaustion, lack of enthusiasm and motivation, feelings of ineffectiveness, indifferent attitude towards clients and co workers and as a result reduced efficacy within the workplace.

Prevention and management of stress

Stress management should be structured and focused on the individual needs of the practitioner.

Care should be taken to improve the working environment in the surgery. One should avoid isolation and share problems with fellow practitioners. It is also necessary to work only sensible hours and make time each day for a break. Allow oneself to take time off whenever the pressures of practice start to build. Along with this it is essential to learn how to better handle patient anxiety and hostility.⁵

Attending courses on stress management will be helpful. Stress management programs help in the development of assertiveness skills and positive communication skills. This also helps in learning methods of problem solving, decision making, the art of saying no and methods of relaxation. Time management include establishing things that must be done and things that one would like to do; setting priorities and allotting time to each with taking breaks between activities.⁶

If the major source of stress is work / family conflict, care must be taken to spend sufficient time with one's family. A healthy life style with sufficient sleep, healthy meals, exercise, hobbies and giving up addictions are also important. One should also maintain appropriate social support and relations of friendship.⁶

Awareness of personal limits and setting realistic goals is essential. Be kind to yourself and less critical and demanding of your efforts.

One should not hesitate to seek professional help in case of over whelming stress. Anxiety disorders and depressive disorders are also observed frequently in dentists. Combined treatment with medication and psychotherapy is usually beneficial.

Conclusion

Dentistry is often considered as stressful due to the work environment and personality types of people choosing the profession. Chronic stress can lead to burn out. There is a need to learn coping strategies to minimize the effects of stress. Stress management workshops will be beneficial. Professional help may be sought in case of overwhelming stress.

References

1. Bernabe E, Icaza JL, Delgado Angulo. Reasons for choosing dentistry as a career: a study involving male and female first-year students in Peru. *European Journal of dental education*. 2006 Nov; 10(4): 236-41.
2. Moore and Brodsgaard. Dentists' perceived stress and its relation to perceptions about anxious patients. *Community dentistry and oral epidemiology*. 2001 February; 29(1):73-80.
3. Robert E Rada, Charmaine Johnson. Stress, burn out, anxiety and depression among dentists. *Journal of the American Dental Association*. 2004 June; 135(6):788-794
4. Shivam Kapoor, Manjnath P Puranik, Uma SR. Burn out in Dentistry: an overview. *International Journal of advanced health sciences*. 2014 December; 1(8):17-22
5. S Naidoo. Managing Stress in Dental Environment. *South African Dental Journal*. 2015 October; 70(9):388-389
6. Mihaela Stoica, Florin Buicu. Occupational Stress Management. *Management in Health*. 2014; 15(2):7-9

Guidelines to the Authors

- ◆ Article will be evaluated for publication on the understanding that the work submitted has not been published elsewhere, that it has not and will not be submitted to another journal until the editor has made a decision on its acceptability for this journal, and that, if accepted, its contents will not be published elsewhere without the editor's permission. Accepted papers become the copyright of the Impressions-Journal of IDA Attingal branch and permission must be sought from the publishers before they can be reprinted elsewhere.
- ◆ Each page must be numbered in consecutive order from the title page, through the abstract, text, references.
- ◆ Manuscript must contain a structured abstract of a maximum of 200 words, with the headings, purpose of the study, materials and methods, results, and conclusions.
- ◆ Use standard headings: introduction, materials and methods, results, discussion, conclusions.
- ◆ References shall be given according to the Vancouver style: the author's surname and initials (if there are more than five authors, additional authors are designated as et al.); full title; journal title (in standard abbreviated form); year; volume number; and page numbers from start to finish.
- ◆ A version of the manuscript must be submitted on CD as well.
- ◆ Correspondence may be sent to the following address:

The Editor-In-Chief, Impressions-Journal of IDA Attingal Branch,
Prathyusha Dental Care IIIrd Floor YCDC, Opp Vydyuthi Bhavanam, Pattom,
Thiruvananthapuram - 695004
Mobile: 9447060374, e-mail: journalidaatl@gmail.com

Autologous blood injection therapy for chronic temporomandibular displacement; Is it worth the resonance? – A Review

* Radhika S Chandran, ** Rammohan R.S.

* Professor, Department of Oral and Maxillofacial Surgery, Noorul Islam College of Dental Sciences, NIMS Medicity, Aralumoodu, Trivandrum - 695 123; **Reader, Department of Oral and Maxillofacial Surgery, Sri Sankara Dental College, Varkala, Kerala

Send correspondence: Dr. Radhika S Chandran, E-mail: radhika.s.chandran@gmail.com

Abstract

Autologous blood injection into the TMJ for the treatment of chronic dislocation is a relatively novel and increasingly popular method. The evolution of this treatment modality and controversies in theories of mechanisms of action is discussed in detail. The subtle variations in methods by which different authors carried out this procedure is also reviewed. Finally the article provides insight into why some cases are more successful than others and the essentials of case selection

Chronic TMJ dislocation, a recurrent condition in which the condyle gets trapped anterior to the articular eminence on mouth opening, and does not self reduce is a distressing as well as embarrassing situation to the patient. The pathogenesis involves bony (abnormal size of eminence or shallow glenoid fossa) or soft tissue (weakness of ligaments or laxity of capsule) factors. Certain systemic diseases like Parkinson's disease, epilepsy, Ehler Danlos syndrome and antipsychotic drugs which may cause extra pyramidal reactions, have also been attributed as predisposing factors.

Bony abnormalities are best treated surgically either by creating an obstacle or removing it. On the other hand soft tissue etiologies could be treated conservatively before resorting to extensive treatments like capsular tightening procedures. These include restricted range of motion, muscle relaxants, sclerosing agents, Botox etc.

Autologous blood infusion (ABI), a newer concept which involves introduction of the patient's own blood into the superior joint space (SJS) and peri capsular tissue (PC) has been reported to be largely successful. It is based on the principle to restrict mandibular movements by inducing fibrosis in the upper joint space, the pericapsular tissues, or both¹. The article aims to review this treatment a modality and tries to give details about its clinical application.

History

Autologous blood infusion for chronic TMJ dislocation was first reported in 1964 by Brachman in German literature by treating 60 patients¹. Schultz² in 1973 and Jacobi Hermans³ in 1981 used ABI along with intermaxillary fixation. In 2001, Hasson et al⁴ reintroduced ABI with detailed reports of the technique and recommended it as safe alternative for chronic TMJ dislocation.

Single cases with positive outcome were subsequently reported by Kato et al⁵, Gupta et al⁶, Pinto et al⁷. Machon et al⁸ modified the technique and reported success rates as high as 80%. Similar high results were also reported by Candirili et al⁹, Daif et al¹¹ etc. ABI is found to be a simple, rapid, minimally invasive technique, with a low possibility of complications and is a feasible alternative before surgical intervention.¹²

Methods

The basic technique described by Hasson et al⁴ involves drawing 5 cc of autologous blood from cubital fossa and injecting 4 cc in the superior compartment and 1 cc in the pericapsular tissue using a 19 gauge needle. The entry into the superior joint space is through the articular fossa point, identified 10 mm anteriorly to tragus and 2 mm below trago-canthal line. After the injection, an elastic bandage was used for the first 24 hours with restriction of mandibular motion and a soft

diet. Active physiotherapy commenced after a week. The same technique was followed effectively by Kato et al⁵, Candirili et al¹³, Yoshioko et al¹⁴ etc.

Machon et al⁸ in their classic article, described a new technique with improved results. They advise flushing of the joint cavity with Ringers Lactate (5ml) according to the established norms of arthrocentesis with same entry at articular fossa point and an additional exit needle (20mm anterior to tragus and 5 mm inferior to trago-canthal line), also in SJS. After removing the second needle, autologous blood is injected through the articular fossa point, but in reduced amount i.e 2ml into SJS and 1ml into pc tissue. Head bandage time is extended by 2 weeks during which movement restriction and soft diet is followed. Physiotherapy commences after 2 weeks with gradual tapering of head bandage time and diet restrictions. Gupta et al⁶, Bayomi et al¹⁵ tried this technique with good results as well.

Pinto et al⁷ tried using a facelift bandage after ABI therapy instead of normal elastic bandage with favorable result. Also the role of intermaxillary fixation in ABI therapy was experimented by Hegab et al¹⁶, who recommended, using IMF for 4 weeks after ABI produced better results than ABI therapy alone which is better than intermaxillary fixation alone.

Candirili et al⁹ tried ABI in different severities of chronic TMJ dislocation, and noted that it is more suitable for less frequent dislocations. The site of blood injection was tested by Daif et al¹¹ in 30 patients. Their trial of SJS injection alone did not produce better results than the established norm of SJS and PC injection.

One important side effect of ABI therapy was noted by Daif¹¹ et al. he originally tried to vary the sites of injection by comparing the established protocol of SJS and PC injection with SJS injection alone. SJS and PC injection showed better clinical and radiographic results than its injection only to the SJS but produced a reduction in inter incisal mouth opening. This disadvantage was not seen in the SJS alone group.

Triantafillidou¹⁷ also found statistically significant reduction in mouth opening in ABI treated group compared to joint physiotherapy in his trial of 40 habitual TMJ luxation patient. So it is important that patient must undergo a controlled physical therapy schedule to re establish a functional range of motion. Machon et al⁸ advocated that the patient should start jaw rehabilitation by gradual and controlled range of motion exercises after 2 weeks of the autologous blood injection therapy.

Mechanism of action

The mechanism of action is still unclear. Most authors believe it to be bleeding induced fibrosis which causes limitation of motion⁴. Initially, the joint capsule and the periarticular tissues are distended by the injected blood. During the next few hours or days, an inflammatory reaction takes place and mediators released by platelets and the dead and injured cells cause blood vessels to dilate and leak plasma, which results in swelling of adjacent tissues. The joint becomes physically more difficult to move. Next, a combination of an organized blood clot and loose fibrous tissue forms, which maintains the joint stiffness. Last, this tissue matures and causes a permanent limitation of movement of the joint. An animal study comparing ABI and saline injection to TMJ, revealed fibrotic changes only in ABI cases¹⁹

But studies have demonstrated that even a single exposure of cartilage to blood can cause permanent cartilage destruction¹⁸. This paradox is addressed by a 2013 animal study which states that cartilage destruction is seen with acute/continuous joint bleeding. Micro bleeds (similar to ABI therapy) do not cause direct cartilage damage but add to joint degeneration by inflammation in the long term²².

This fibrosis theory was disputed by Candirili et al⁹. They could not find any evidence of ABI therapy induced fibrosis in their 2 independent studies. First a histopathologic study in rabbits failed to demonstrate any fibrous change even after one month post ABI treatment²⁰. Secondly an MRI study in 14 patients also showed no structural change in TMJ at the end of one year, even though their dislocation were corrected¹³.

Hence Candirili et al⁹ suggests that pain resulting from traumatic effects of ABI causes patients to be reluctant in mouth opening to the critical size necessary for dislocation, which allowed the joint to become more stable.

Steimbirek²¹ in his month long, independent animal study using 12 pigs, noted no histological or morphological change in TMJ after ABI. He did not favor any theory, concluding some other mechanism might be involved²². In spite of the high success obtained with ABI therapy in chronic TMJ dislocation, the mechanism still remains inconclusive.

Case selection

Even though many authors have reported extreme positive results with ABI therapy, they have not discussed about why it is not effective in

the remaining cases. The question of case selection have not been properly addressed therefore.

Candirili et al tried to test the effect of ABI therapy in varying severity/ frequency of TMJ dislocation. They found that ABI is better clinically suited when the dislocation is not very severe i.e less than 2 dislocations/week. For daily dislocations or those caused by normal activity, the ABI induced joint fibrosis is not enough⁹.

They also suggested that cases fail when there is history of other TMJ disorders like arthritis or disc displacements along with dislocation⁹. These cases are best avoided. One particular indication for ABI therapy is its use in medically compromised patients due to its minimally invasive nature.⁶

Conclusion

This review notes that ABI is found to be a simple, effective procedure with minimal complications and should be tried in patients with chronic TMJ dislocation before resorting to any surgical intervention. However there is lack of long term follow up studies to demonstrate its clinical effects concretely. Also the rationale of using ABI therapy is not established because of the unclear mechanism involved.

References

- Brachmann F: Eigenblutinjektionen bei rezidivierenden, nicht- fixierten Kiefergelenkluxationen. Zahnarzt 15:97, 1964
- Schulz S: [Evaluation of periarticular autotransfusion for therapy of recurrent dislocations of the temporomandibular joint]. Dtsch Stomatol 23:94, 1973
- Jacobi-Hermanns E, Tetsch P: [Pericapsular autologous blood injection as therapy for habitual temporomandibular joint luxation]. Deutsche zahnärztliche Zeitschrift 36:187, 1981
- Hasson O, Nahlieli O: Autologous blood injection for treatment of recurrent temporomandibular joint dislocation. Oral Surg Oral med Oral pathol Oral radiol Endod 92:390, 2001
- Kato T, Shimoyama T, Nasu D, et al: Autologous blood injection into the articular cavity for the treatment of recurrent temporo- mandibular joint dislocation: A case report. J Oral Science 49:237, 2007
- Gupta D, Rana AS, Verma VK. Treatment of recurrent TMJ dislocation in geriatric patient by autologous blood - A technique revisited. J Oral Biol Craniofac Res. 2013 Jan-Apr;3(1):39-41.
- Pinto AS, McVeigh KP, Bainton R. The use of autologous blood and adjunctive 'face lift' bandage in the management of recurrent TMJ dislocation. Br J Oral Maxillofac Surg. 2009 Jun;47(4):323-4.
- Machon V, Abramowicz S, Paska J, Dolwick MF. Autologous blood injection for the treatment of chronic recurrent temporomandibular joint dislocation. J Oral Maxillofac Surg. 2009 Jan;67(1):114-9.
- Candirli C, Korkmaz YT, Yuce S, Dayisoğlu EH, Taskesen F. The effect of chronic temporomandibular joint dislocation: frequency on the success of autologous blood injection. J Maxillofac Oral Surg. 2013 Dec;12(4):414-7.
- Oshiro N, Yoshida H, Uemura M, Suwa F, Morita S. Analysis of MRI findings in minimum invasive treatment for habitual temporomandibular joint dislocation by autologous blood injection around the temporomandibular joint capsule. J Craniomaxillofac Surg. 2014 Oct;42(7):1486-90.
- Daif ET. Autologous blood injection as a new treatment modality for chronic recurrent temporomandibular joint dislocation. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2010 Jan;109(1):31-6.
- Coser R, da Silveira H, Medeiros P, Ritto FG. Autologous blood injection for the treatment of recurrent mandibular dislocation. Int J Oral Maxillofac Surg. 2015 Aug;44(8):1034-7.
- Candirli C, Yüce S, Cavus UY, Akin K, Cakir B. magnetic resonance imaging findings. Imaging Sci Dent. 2012 Mar;42(1):13-8.
- Yoshioka N, Shimo T, Ibaragi S, Sasaki A. Autologous Blood Injection for the Treatment of Recurrent Temporomandibular Joint Dislocation. Acta Med Okayama. 2016 Aug;70(4):291-4.
- Bayoumi AM, Al-Sebaei MO, Mohamed KM, Al-Yamani AO, Makrami AM. Arthrocentesis followed by intra-articular autologous blood injection for the treatment of recurrent temporomandibular joint dislocation. Int J Oral Maxillofac Surg. 2014 Oct;43(10):1224-8.
- Hegab AF. Treatment of chronic recurrent dislocation of the temporomandibular joint with injection of autologous blood alone, intermaxillary fixation alone, or both together: a prospective, randomised, controlled clinical trial. Br J Oral Maxillofac Surg. 2013 Dec;51(8):813-7.
- Triantafyllidou K, Venetis G, Markos A. Short-term results of autologous blood injection for treatment of habitual TMJ luxation. J Craniofac Surg. 2012 May;23(3):689-92.
- Hooiveld M, Roosendaal G, Wenting M, et al: Short-term exposure of cartilage to blood results in chondrocyte apoptosis. Am J Pathol 162:943, 2003
- Gulsas A, Bayar GR, Aydıntug YS, Sencimen M, Erdogan E, Agaoglu R. Histological evaluation of the changes in temporomandibular joint capsule and retrodiscal ligaments following autologous blood injection. J Craniomaxillofac Surg. 2013 Jun;41(4):316-20.
- Candirli C, Yüce S, Yildrm S, Sert H. Histopathologic evaluation of autologous blood injection to the temporomandibular joint. J Craniofac Surg. 2011 Nov;22(6):2202-4.
- Stembirek J, Matalova E, Buchtova M, Machon V, Misek I. investigation of an autologous blood treatment strategy for temporomandibular joint hypermobility in a pig model. Int J Oral Maxillofac Surg. 2013 Mar;42(3):369-75.
- Van Meergeren MER, Roosendaal G, Jansen NWD, Lafeber FPJG, Mastbergen SC. Blood-Induced Joint Damage: The Devastating Effects of Acute Joint Bleeds versus Micro-Bleeds. Cartilage. 2013;4(4):313-320.

Interleukin-6 in oral health and diseases

*Anil Arya, *Jayasree Aswathy, *Mohan Aswathy K, *John Anna Chinchu, ** M.S. Deepa

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

Send Correspondence: Dr. Anil Arya, Email: arya.nithin007@gmail.com

Abstract

Interleukin 6 is a multifunctional cytokine involved in a number of physiologic and pathologic processes including responses to trauma, infection and development and progression of malignancies. IL- 6 is synthesized in response to stimuli by a variety of cells such as macrophages, neutrophils, keratinocytes, fibroblasts and endothelial cells. A number of common oral diseases including oral cancer, lichen planus and periodontal diseases have been reported to be associated with dysregulation of IL-6. The paper highlights the role of IL-6 in oral health and diseases.

Keywords: Interleukin 6, Recurrent Aphthous Stomatitis, Oral Lichen Planus, Oral Submucous Fibrosis

Introduction

Interleukins are a group of cytokines (secreted proteins and signal molecules) that were first seen to be expressed by WBC (leucocytes).¹ Majority of interleukins are synthesized by helper CD4T lymphocytes, monocytes, macrophages and endothelial cells. They promote the development and differentiation of T and B lymphocytes and hematopoietic cells. The functional pleiotropy and redundancy are the characteristic feature of cytokines which includes interleukins, interferons, CSFs and many growth factors. ILs are assigned to each family based on sequence technology and receptor chain similarities or functional properties which includes² IL-1 to IL-35 and IL-39.

Interleukin 6 (IL-6)

It is a pleuripotent cytokine produced by several cells including macrophages, neutrophils, keratinocytes, fibroblasts, activated T cells and endothelial cells in response to stimuli such as infection and trauma³. IL-6 plays a role in pathophysiology of severe infections, in immune regulations, bone metabolism, hematopoiesis, inflammation, oncogenesis and acute phase reactions (fig:1).

IL-6 also plays a pivotal role during the transition from innate to acquired immunity. Acute inflammation is characterized by initial infiltration of neutrophils which is then replaced by monocytes and T cells to prevent increased tissue damage. Along with various chemokines IL-6 attracts neutrophils in the initial phase. IL-6 also

promotes B and T cell differentiation⁴

IL-6 in oral health

IL-6 has important effects in response to microbial insults acting not only as an anti-inflammatory agent but also as a proinflammatory agent when the inflammatory process becomes chronic.

IL-6 in periodontal tissues

Periodontitis is a bacterially driven inflammatory disease characterized by an inflammatory lesion starting from the gingival crevice and proliferating towards the periodontal ligament. In periodontitis, the presence of microbes trigger an inflammatory immune response mediated through alteration in vascular network and exudation of gingival crevicular fluid (GCF), carrying inflammatory cells, plasma cells that eventually leads to tissue destruction⁵. This inflammatory response is mediated by cytokines such as IL-1, IL-6 and TNF – alpha⁶. High levels of IL-6 have been detected in GCF and saliva of patients with gingivitis and periodontitis compared to healthy subjects⁷.

IL-6 in pulpitis

In pulpitis, peptidoglycans from gram positive bacteria such as *Lactobacillus casei* are responsible for caries and have been shown to enhance IL-6 production from human pulp cells in time and dose dependent manner. High levels of IL-6 have been identified in inflamed pulp and periapicallesion compared to healthy pulp,

suggesting that IL-6 is released locally in endodontic lesion. Presence of IL-6 have also been showed in dental granulomas.⁸

IL-6 in oral lichen planus

Lichen planus is a chronic inflammatory disease that affects skin and mucous membrane of squamous cell origin. IL-6 concentrations have been shown to be increased in patients with oral lichen planus compared with healthy controls, especially in severe ulcerative forms of oral lichen planus. The subepithelial inflammatory cell infiltrate consisting primarily of T cells and macrophages which can lead to increase in the expression of other proinflammatory cytokines, including IL-6⁹. IL-6 reflected in part the trend of malignant transformation of OLP¹⁰

IL-6 in recurrent aphthous stomatitis

Recurrent aphthous ulcer is a common disorder characterized by recurrent ulceration in the oral mucosa typically first in childhood or adolescence. Patients with recurrent aphthous stomatitis exhibit periodic increase in serum IL-6¹¹

IL-6 in oral cancer

IL-6 may also act as a signal transducer, activator of transcription and as a growth factor for human keratinocytes and cancer cells. IL-6 levels in serum and saliva of patients with oral cancer were higher than those of control subjects¹². IL-6 can stimulate oral squamous cell carcinoma to increase secretion of matrix metalloproteinases 1 and 9, which play a major role in infiltrative growth, metastasis and treatment of cancer¹³. IL-6 can also promote tumor growth by causing DNA methylation changes, which can lead to changes in the gene expression of oral cancer cells

IL-6 in oral submucous fibrosis

Cytokines play an important role in regulating fibroblast function and is likely to play a key role

in regulating the initiation and progression of scarring in any fibrotic disease. IL-6 has been implicated in the development of a variety of fibrotic disease. IL-6 expression is significantly upregulated in OSF fibroblasts in areca quid chewers and arecoline may be responsible for the enhanced IL-6 expression. IL-6 may be a contributing molecular factor in the pathologic features noted in OSF.

Conclusion

IL-6 together with other cytokines and active phase reactants, modulate the response to oral bacteria. An excessive IL-6 response may contribute to the development of chronic inflammatory lesion resulting in loss of periodontal ligament, alveolar bone. This might happen through IL-6 tissue degradation effects on connective tissue and bone. The role that IL-6 plays as a growth factor in oral cancers is becoming increasingly clear. IL-6 modulation strategy could become available in future that may significantly improve the efficacy of oral tissue management.

References

- 1) Brocker C, Thompson D, Matsumoto A, Weibert D W, Vasiliou V. Oct 2010. Evolutionary divergence and functions of the human interleukins (IL) gene family. *Human genomics*; 5(1):30-55.
- 2) Thomas Eiwegger, AmaSchaffartzik, Claudio Rhyner. Interleukins from 1 to 37 and interferon gamma: receptors functions and roles in disease. May 2011;127(3):704-708.
- 3) Kishimoto. T, Akira S, Narasaki. M, Taga. T. IL-6 family of cytokines and gp130. *Blood*.1995;86:1243-1254.
- 4) P. Chomarat, J. Banchereau, J. Davoust, A.K. Palucka. IL6 switches the differentiation of monocytes from dendritic cells to macrophage.2000;510-514.
- 5) Page. R.C, Schroder. H.E. Pathogenesis of inflammatory periodontal diseases, a summary of current work.1976;34:235-239.
- 6) Howells. G.L. Cytokine networks in destructive periodontal diseases.1995;1:266-270.
- 7) Johansen A., Bjurshammar. N, Gustafsson. A. The influence of academic stress on gingival inflammation. 2010;8:22-27.
- 8) Prso. I.B, Kocjan. W, Simic. H, et al. Tumor necrosis factor alpha and IL6 in human periapical lesions.2007;38210.
- 9) Lodi. G, Scully. C, Carrozzo. M, Griffiths. M, Sugerman. P.B, Thongprasom. K. Current controversies in oral lichen planus.2005;100:164-178.
- 10) Carrozzo M, de CapeiMU, Dametto E. Tumornecrosis factor alpha and interferon gamma polymorphism contribute to susceptibility of OLP.2004;114:278-283.
- 11) De Sa AR, Pimenta FJGS, Dutra WO, Gomez RS. Immunolocalization of IL-4, IL-6 and lymphotoxin alpha in dental granulomas.2003;96:356-360.
- 12) Chen S, MalhotraPS, Thomas GR, et al. Expression of proinflammatory and proangiogenic cytokines in patients with head and neck cancer.1999;5:136
- 13) Sundelin K, Roberg K, Grenman R, Hakansson L. Effects of cytokines on MMP expression in oral SCC patients.2005;125:765-773.

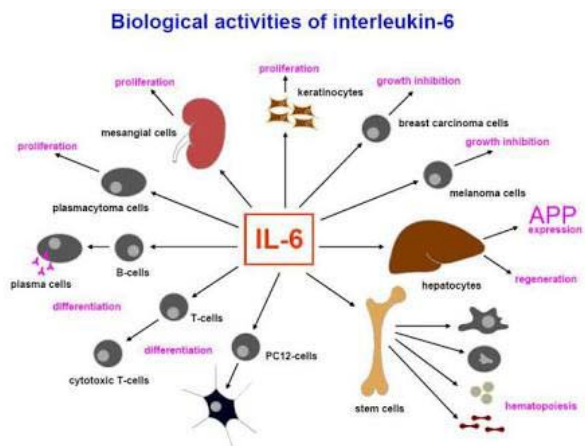


Fig. 1: Biological activities of interleukin -6

OVERVIEW

LANAP – A ray of hope in periodontal therapy

*Nita Syam, **Nima Syam

*Senior Lecturer, Dept of Periodontics, Sri Sankara Dental College, Akathumuri Varkala, Trivandrum;

**Post graduate student, Dept of Conservative Dentistry, Yenepoya Dental College, Mangalore

Send Correspondence: Dr. Nita Syam; email: nitadsyam@gmail.com

Abstract

Lasers were introduced into the field of clinical dentistry with the hope of overcoming some of the drawbacks posed by the conventional methods of dental procedures. Since its first experiment for dental application in the 1960s, the use of laser has increased rapidly in the last couple of decades. Because of their many advantages different types of lasers are available for clinical and specific use.

Introduction

Dentistry has changed tremendously over the past decade to the benefit of both the clinician and the patient. One technology that has become increasingly utilized in clinical dentistry is that of the laser. Laser is an acronym for Light Amplification by Stimulated Emission of Radiation¹. Laser is a device that utilizes the natural oscillations of atoms or molecules between energy levels for generating coherent electromagnetic radiation usually in the ultraviolet, visible, or infrared regions of the spectrum. It is a device that produces high intensity of a single wavelength and can be focused into a small spot. Initially introduced as an alternative to the traditional halogen curing light, the laser now has become the instrument of choice, in many applications, for both periodontal and restorative care. Because of their many advantages, lasers are indicated for a wide variety of procedures.²

Laser therapy remains controversial in the field of periodontics³. Lasers of varying wavelengths (635 to 10600 nm) used for non surgical and surgical periodontal and peri implant therapy include: diode, neodymium: yttrium- aluminium- gar, net (Nd:YAG) Carbon dioxide, Erbium: yttrium-aluminium- garnet (Er:YAG)⁴. It is important to note that lasers of varying wavelengths have different levels of tissue penetration depending on reflection, scatter and absorption. Therefore each therapy must be

individually investigated with a specific laser. Periodontal therapy utilizing a laser has been reported as a monotherapy, as an adjunct to scaling and root planning, for root debridement combined with surgical or non-surgical therapy, to perform surgical laser – assisted new attachment procedure (LANAP).⁵

LANAP

Laser Assisted New Attachment Procedure (LANAP) is an FDA approved patented protocol for the treatment of gum Disease. LANAP is an effective, proven treatment of periodontitis through regeneration rather than resection (surgery). In 2004, the U.S. Food and Drug Administration cleared the LANAP protocol for the treatment of periodontal disease⁶. The formal definition developed for LANAP is “cementum mediated new attachment to the root surface in the absence of long junctional epithelium”. Patterned after the Excisional New Attachment Procedure (ENAP), LANAP is designed to remove diseased and necrotic tissue selectively from within the periodontal sulcus. However LANAP utilizes a free running (10-6 secs) pulsed Nd: YAG laser in place of a scalpel. Originally referred to as Laser-ENAP, LANAP has involved to provide a minimally invasive alternative to flap surgeries.⁷

How does lanap work?

A laser fiber probe about the width of two human hairs is gently inserted between your tooth and gum tissue. As the laser light energy is

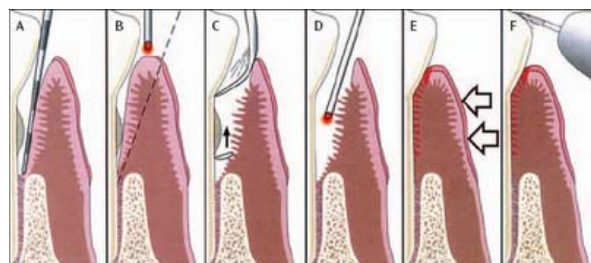
transmitted through the fiber probe harmful bacteria causing gum disease are eliminated. Once the bacteria is selectively removed using the laser light energy, your gum can successfully reattach to your tooth root thereby protecting the bone beneath and permitting the bone to regenerate.⁸

Clinical advantages

- ♦ Precision
- ♦ Deeper penetration–kills bacteria beyond the tip up to 1.5mm into dentin tubules
- ♦ Selective photo-thermal ablation of red inflamed tissue
- ♦ Bactericidal especially to black pigmented bacteria
- ♦ Effects calculus so it's easier to remove
- ♦ Neutralizes endotoxins in root and tissue
- ♦ Biostimulation of stem cells in the periodontal ligament to pro-mote regeneration
- ♦ Hemostasis
- ♦ Less recession
- ♦ Much less sensitivity
- ♦ Quicker healing overall Minimal postoperative discom-fort by reducing prostaglandins
- ♦ Reduced stress for doctor, staff, and patient

Limitations

- ♦ Specialized training and safety precautions required, and equip-ment is relatively expensive
- ♦ An initial delay in soft tissue healing
- ♦ Cannot be used to remove bone or on amalgam
- ♦ Somewhat slower than conventional modalities
- ♦ Not appropriate for crown lengthening with osseous con-touring, gingival grafting, or procedures to expose fractures, etc.
- ♦ Not every tooth can be saved and double-digit pockets may need double treatment
- ♦ Not every pocket responds well– i.e: smokers. About 90 percent of pockets will get approximately 50 percent reduction (10mm to 5mm, 8mm to 4mm, etc.)
- ♦ As with flap surgery, Class II and Class III furcations will usually still be a problem⁹



The LANAP protocol¹⁰

- A. Perio probe indicates excessive pocket depth
- B. Laser radiation vaporizes bacteria, diseased tissue, pathologic proteins and alerts the practitioner to the presence of tartar
- C. Ultrasonic scaler and special hand instruments are used to remove root surface accretions
- D. Laser is used to form a gel-clot containing stem cells from bone and PDL
- E. Reattachment of rete ridges to clean root surface, with a stable fibrin clot at the gingival crest to create a “closed system”
- F. New attachment is regenerated

Patient Acceptance of the LANAP Protocol

Even patients who have traditionally avoided dental treatment or have experienced traditional surgery in the past accept LANAP treatment. They are seeking an alternative to traditional surgery and are familiar and comfortable with the use of lasers for LASIK treatment for their eyes. Thus, they consider laser treatment for periodontal disease a viable alternative. Clinically, what immediately becomes apparent is that post operatively there is minimal discomfort, shrinkage of swollen, puffy gums and reduction of bleeding. After the procedure, the patient can see that the tissues feel and look healthier. Since LANAP treatment is not a cut-and-sew procedure, no native tissues are injured; the recession associated with traditional surgery is not present. Consequently, the patients do not have the root sensitivity or longer-appearing teeth.¹¹

Recent Advances

Water lase system is a revolutionary dental device that uses laser energized water to cut or ablate soft and hard tissue. Periowave, a photodynamic disinfection system utilizes nontoxic dye (photosensitizer) in combination with low intensity lasers enabling singlet oxygen molecules to destroy bacteria.¹²

Conclusion

Laser treatment is expected to serve as an alternative or adjunctive to conventional mechanical periodontal treatment. Currently, among the different types of lasers available, NdYAG, Er:YAG and Er, Cr:YSGG laser possess characteristics suitable for dental treatment, due to its dual ability to ablate soft and hard tissues with minimal damage. In addition, its bactericidal effect with elimination of lipopolysaccharide, ability to remove bacterial plaque and calculus,

irradiation effect limited to an ultra-thin layer of tissue, faster bone and soft tissue repair, make it a promising tool for periodontal treatment including scaling and root surface debridement.

Finally, in order to have a successful periodontal treatment in long term, patients need to be motivated. It is not so much the technology but the motivation and psychology that matter when it comes to practice of oral hygiene before, during and after the periodontal treatment to maintain a good and stable periodontal condition.

References

1. Dederich DN, Bushick RD. Lasers in dentistry: Separating science from hype. JADA. 2004 February; 135:204-212.
2. Yukna RA, Scott JB, Aichelmann-Reidy ME, LeBlanc DM, Mayer ET. Clinical evaluation of the speed and effectiveness of subgingival calculus removal on single rooted teeth with diamond-coated ultrasonic tips. J Periodontol 1997;68:436-42.
3. Cobb CM, Low SB, Coluzzi DJ. Laser and the treatment of chronic periodontics. Dent Clin North Am 2010;54:35-53
4. Niemz, Markoff H. Laser-tissue interaction, fundamentals and application, 3ed. New York. Springer, 2007:65
5. Gregg RH, McCarthy DK. Laser ENAP for periodontal ligament regeneration. Dent Today 1998;17(5):88-91
6. US Food and Drug Administration. 510(k)s Final Decisions Rendered for July 2004 (Periolas MVP-7, 510(k) number K030290). PDF. Accessed: August 16, 2012
7. Yukna RA, Carr RL, Evans GH. Histologic evaluation of an Nd:YAG laser- assisted new attachment procedure in humans. Int J Periodontics Restorative Dent 2007; 27: 577-87.
8. LANAP Procedure- AVALON DENTISTRY
9. Stephen Brown, D.D.S. • "Excellence in Non-Surgical Periodontics, Implants & Laser Treatment"- PERIO DONTA LETTER
10. Stephen Brown D.D.S. A new breakthrough in periodontal therapy: LANAP. PERIO DONTA LETTER
11. Harris DM, Gregg RH, McCarthy DK, Colby LE, and Tilt, LV. Laser-assisted new attachment procedure in private practice. General Dentistry, 2004;52(5):396-403
12. Walsh LJ. The current status of laser applications in dentistry. Aust Dent J 2003; 48:146-55.

Local anaesthetic resistance. An update of a rare phenomenon

*Manoj S. Nair, **Arun G. Pillai, **Tharun V. Jacob, ***Megha K.

*Prof & Head, Principal, **Reader, ***Senior Lecturer, Department of Oral Pathology, Sri Sankara Dental College, Akathumuri, Varkala, Trivandrum

Send correspondence: Dr. Manoj S. Nair., E-mail: manoj.nair68@gmail.com

Abstract

Local anaesthetic failure is unavoidable in dental practice. Local anaesthetic resistance is an extremely rare and not yet clearly understood phenomenon. Anaesthetic drugs act by blocking the sodium channel. Mutation of the gene SCN54A, which codes for the highly specialized protein Nav 1.5 has been found. Patients who have undergone scorpion bite have been noticed to have either delayed onset, incomplete anaesthesia or complete failure of local anaesthesia. Women with MC1R mutations has also been reported to have defective response to local anaesthetic drugs. Although a rare phenomenon appreciating the existence of local anaesthetic resistance will help the profession in devising alternative drugs or mechanisms to achieve local anaesthesia

Introduction

The drug, local anaesthetic can be regarded as the backbone in the practice of dentistry. There would be no other branch in medical science other than dentistry, which uses local anaesthetics to such a great extent. It is indeed the most essential drug in dentistry. The success of many dental treatments depends on achieving excellent local anaesthesia. Failure of local anaesthesia can adversely affect both the patient and the dentist. Available search of literature gives a success rate for inferior alveolar nerve block as ranging from 53% to 96%¹⁻³.

Local anaesthetic failure is attributed to causes such as poor technique, anatomic variation, inexperience of the operator, inflammation, inappropriate dosage and composition of the local anaesthetic solution. Local anaesthetics work through sodium channel, which is a highly specialized protein. Therefore, it is theoretically possible that mutations affecting the proteins within the sodium channel can lead to local anaesthetic resistance. This article makes an attempt to review the mechanism of action of local anaesthesia and the rare phenomenon of local anaesthetic resistance, at a molecular level.

Sodium channel

Voltage gated sodium channels (Nav) are responsible for the initiation and propagation of

action potentials in both nerves and muscles. Sodium channel has three subunits. Alpha, beta-1 and beta-2 subunits. The alpha subunit has further four homologous domains (I-IV). Each of these domains is made up of six transmembrane segments (S1-S6). (Fig 1). The local anaesthetic drug acts by interacting with the 6th segment of the domain four of alpha subunit (IV-S6)⁴. Resistance to the local anaesthetics may be related to alpha subunit of sodium channel and more specifically to 6th segment of domain four of this subunit⁵.

Voltage gated sodium channel, which differ in alpha subunits, are responsible for Na⁺ flow. The difference in subunits of these channels has permitted their organization into isoforms. These isoforms have all been classified as members of a single gene family, with nine members. These channels are found in the central nervous system (Nav1.1-1.3 and Nav1.6), in the peripheral nervous system (Nav1.7-1.9), in skeletal muscles (Nav 1.4) and in myocardial muscle (Nav 1.5)⁶.

The sodium channel is a highly specialized protein. Mutations of the genes that code for the proteins in the sodium channel are responsible for certain myopathies and neuropathies such as periodic paralysis, cardiac arrhythmias, epilepsy, migraine, peripheral neuropathy etc⁷

Impressions - Journal of IDA Attingal Branch - June 2017, Vol. 7, No. 2

done by Arendt – Nielsen et al¹², it has been noticed that patients with EDS III gained analgesia but for much shorter duration. Many of patients with joint hypermobility syndrome report failure of local anaesthetics¹³.

SCN5A belongs to a family of gene that codes for the proteins of the voltage gated sodium channel, Nav 1.5. The chromosomal location of this gene is 3p22.2

Clenden. N et al in a study done on a three member family, who were resistant to local anaesthesia, identified a genetic variant associated with local anaesthetic resistance¹⁴. Mutation for SCN5A gene coding for Nav 1.5 was noticed. The same study demonstrated Nav 1.5 present in human peripheral nerves, to support the plausibility that an abnormal form of Nav 1.5 could be responsible for the local anaesthetic resistance.

Scorpions are found in all continents except Antarctica and are known to cause problems in tropical and subtropical regions. Scorpion bite can cause lethal envenomation in humans especially children¹⁵. The scorpion venom contains neurotoxins that block the sodium channels¹⁶. In a study done by Kosam D et al spinal anaesthesia failure and delayed effect was documented in significant number of patients with past history of scorpion stings¹⁷. In patients with history of scorpion bite significant difference has been found in time required for onset of anaesthesia and time required to reach peak of anaesthesia⁵. A delayed onset and more time was required to reach peak in case of patients who have experienced scorpion bite.⁵

Scorpion venom contains multiple toxins. The binding site of these toxins in the sodium channel

Diagram illustrating the mechanism of a voltage-gated sodium channel. The diagram shows three states of the channel (A, B, and C) in response to an electrical signal (downward arrow).

- State A:** The channel is closed, and no Na^+ ions pass through.
- State B:** An electrical signal causes the channel to open slightly, allowing Na^+ ions to enter.
- State C:** The channel is fully open, and Na^+ ions flow through.

The chemical structure of the channel protein is shown below, with a red dot indicating the site of the electrical signal binding.

$\text{S} = \text{Sodium channel}$
(this is a protein)

Chemical structure of the channel protein (S):

CC1=CC(=C(C)C(=C1)NC(=O)CCN(CC)CC)C

The structure shows a benzene ring with methyl groups (CH_3) at the 3 and 5 positions, and a side chain containing an amide group (NH), a carbonyl group (C=O), and a tertiary amine group ($\text{N}(\text{C}_2\text{H}_5)_2$).

Fig. 2

is same as that of local anaesthetics, 6th segment of domain four of alpha subunit (IV-6)⁴. The scorpion venom elicits a strong immune response producing antibodies against the binding site in the sodium channel. Later in life when these patients are exposed to LA, the drug is not able to bind to the site in sodium channel (1V-S6) as a result of competitive antagonism with scorpion venom antibodies⁵.

Melanocortin 1 receptor gene mutation and local anaesthetic resistances

Melanocortin 1 receptor (MC1R) gene mutation results in individuals with red hair, seen in Caucasian population. Anaesthetic requirement for red hair women has been found to be more than dark hair women¹⁸. Liem EB et al in their study has found that subcutaneous lidocaine was significantly less effective in redheads than in subjects with dark hair¹⁹. MC1R is not known to be expressed in peripheral nerves²⁰. Hence there is no association between MC1R function and local anaesthetic action. MC1R is expressed in brain glial cells and neurons periaqueductal gray²¹, a brain area that critically modulates nociception. The plausible explanation regarding involvement of MC1R in analgesia is that it could be mediated through brain glial cells¹⁹.

Conclusion

The successes of many dental treatments depend on successful local anaesthetic administration. Although failure of local anaesthetic administration is not an uncommon feature in dental practice, the problem is rectified by repeating the injection, or by slightly changing the position of the needle, or, as in case of infection, by controlling the infection. There are very rare instances where none of these methods succeed. The discovery of mutations for the gene that code for proteins in the sodium channel has thrown open the possibility of genetically mediated local anaesthetic resistance. Antibodies involved in competitive antagonism, as possibly in the case of scorpion bite, is an area that will need further investigation. Although an extremely rare phenomenon, when it occurs, the local anaesthetic resistance would result in adverse outcome for the dentist and the patient. Hence, further studies into this area is required to understand the phenomenon of local anaesthetic resistance and to devise alternative drugs.

Reference

1. Chaney MA, Kerby R, Reader A, Beck FM, Meyers WJ, Weaver J, An evaluation of lidocaine hydrocarbonate compared with lidocaine hydrochloride for inferior alveolar nerve block, *Anesth Prog*, 1991, 38:212 – 216.

2. Meecham JG, How to overcome failed local anaesthesia, *BDJ*, 1999, Vol 186, No. 1
3. Potonlk I, Bajrovic F, Failure of inferior alveolar nerve block in endodontics, *Endod Dent Traumatol*, 1999, 15, 247 -251.
4. Ragsdale DS, McPhee JC, Schever T, Catterall WA, Molecular determinants of state dependent block of Na⁺ channels by local anaesthetics, *Science*, 1994, 265(5179); 1724 – 1728
5. Panditrao MM, Panditrao, MM, Panditrao, AM, Development of resistance to the effect of local anaesthetic agents administered via various routes due to single or multiple, previous scorpion bites. A proposed hypothesis and reporting a yet unrecognized phenomenon, *J Anaesth, Crit Care Open Access*, 2015, 3(5), DOI:10.15406/jaccoa
6. Goldin AL, Evolution of voltage gated Na⁺ channels, *J Exp Biol* 2002, 205: 575 – 84
7. Catterall WA, Dib Haj S, Meisler MH, Pietrobon D, Inherited neuronal channelopathies: new windows on complex neurological disease, *J Neurosci*, 2008, 28(46), 11768 – 77.
8. Ritchie JM, Ritchie B, Greengard P, Active structure of local anaesthetics, *J. Pharmacol Exp Ther*, 1965, 150:152 -159.
9. Andrea M, Trescot MD, *Pain Physician*, 2003;6: 291 – 293.
10. Regezi, Sciubba and Jordan. *Oral Pathology, Clinical Pathology Correlation*, 2009 5e.
11. Kaaland S, Hagsaa B, Grevy C, Oxlund H, Reduced strength of skin in Ehler Danlos syndrome type III, *Scand J Rheumat Dis*, 1990;19:67 – 70
12. Arendt – Nielsen L, Kaalund S, Bjerring P, Hogsaa B, Insufficient effect of local analgesics in Ehler Danlos type III patients(connective tissue disorder) *Acta Anaesth Scand* 1990: 80: 188 -91.
13. Hakim AJ, Graham R, A simple questionnaire to detect hypermobility an adjunct to the assessment of patients with diffuse musculoskeletal pain, *Int J clinic Practice* 2003: 57: 163 -166
14. Clendenen N, Cannon AD, Porter S, Robards CB, Parker AS, Clendenen SR, Whole-exome sequencing of a family with local anesthetic resistance, *Minerva Anesthesiol*. 2016 Oct; 82(10):1089-1097
15. M. Ismail, "The scorpion envenoming syndrome," *Toxicon*, vol. 33, no. 7, pp. 825-858, 1995.
16. S. Cestele and W. A. Catterall, "Molecular mechanisms of neurotoxin action on voltage-gated sodium channels," *Biochimie*, vol. 82, no. 9-10, pp. 883-892, 2000
17. Kosam D, Nigam R, Murthy M, Debbarma M, Chatterjee S. Effect of previous scorpion sting on the efficacy of spinal anesthesia - A case control study. *Int J Med Res Rev* 2015;3(8):826-831.
18. Liem EB, Lin C-M, Suleman M-I, Doufas AG, Gregg RG, Veauthier JM, Loyd G, Sessler DI. Increased anesthetic requirement in redheads. *Anesthesiology* 2004;101:279-283
19. Liem EB, Joiner VT, Tsueda K, Sessler DI, Increased Sensitivity to thermal pain and subcutaneous lidocaine efficiency in redheads, *Anaesthesiology*, 2005; 102(3):509-514
20. Abdel-Malek Z. Melanocortin receptors: their functions and regulation by physiological agonists and antagonists. *Cell Mol Life Sci* 2001;58:434-41
21. Xia Y, Wikberg J, Chhajlani V. Expression of melanocortin 1 receptor in periaqueductal gray matter. *Neuroreport* 1995;6:2193-2196.

Endodontic retreatment of radix entomolaris – A case report

*Satheesh SL, **Shefali Jain, ***Noora, ***Deepak Dinesh

*Senior Lecturer, Department of Conservative Dentistry and Endodontics, Sri Sankara Dental College, Kerala, India; **Private Dental Practitioner, New Delhi, India; ***Post Graduate Student, Department of Conservative Dentistry and Endodontics, Sri Sankara Dental College, Varkala, Kerala, India

Send correspondence: Dr. Satheesh SL, Email: drsatheeshsl@yahoo.com

Abstract

A thorough knowledge of root canal anatomy and its variations are an essential prerequisite for successful endodontic diagnosis and treatment. In radix entomolaris, an additional root is located distolingually whereas in radix paramolaris, the additional root is located mesiobuccally. Failure to locate this additional canal will result in posttreatment disease. This case report provide insight into the endodontic retreatment of mandibular molar with an accessory lingual root.

Key words: mandibular second molar, retreatment, radix entomolaris.

Introduction

The clinical success of root canal treatment depends upon thorough debridement, disinfection and three dimensional obturation of the entire root canal system. The complexity of root canal system plays an important role in determining success and failure of endodontic treatment. Persistent apical periodontitis occurs as a result of missed canals, restoration failures, coronal leakage, separated instruments, inadequate chemo mechanical preparation, fractures and inadequate obturation. Erroneous root canal preparation will result in iatrogenic events like ledges, blocks, transportation and perforations¹. Alternative treatment plan includes non-surgical endodontic retreatment, endodontic surgery or extraction.

Nonsurgical retreatment includes chemo mechanical preparation and three dimensional obturation of previously treated root canals. To achieve success in retreatment all intracoronary obstructions preventing access to the root canal orifices should be removed. These include defective restorations and dentin overhangs, because of under extended access cavity preparation. After achieving access to root canal orifices, canal patency should be regained by removal of intra canal filling materials. After establishing canal

patency retreatment can be successfully completed by routine endodontic procedures².

Mandibular first molar is the most frequently restored and root canal treated tooth. The anatomical aberration in mandibular molars, especially additional roots have been extensively investigated as it varies according to ethnicity and gender. Study by Skidmore and Bjorndal reported the incidence of three root canals in 64.4% and four root canals in 28.9%³. Generally mandibular molars have two roots and three canals. When a third root is present, it usually occurs as two distal and one mesial⁴. An additional third root, first mentioned in the literature by Carabelli, is called the radix entomolaris⁵. The frequency of occurrence of radix entomolaris is less than 5% in white Caucasian and Indian populations. In Mongoloid traits the frequency varies between 5 to more than 30%⁶⁻⁸. The purpose of the article is to report successful orthograde retreatment of radix entomolaris.

Case report

A 23 year old female patient was referred to the department of endodontics for retreatment of left mandibular first molar (36). The patients chief complaint was pain on biting in relation to root canal treated left mandibular first molar. The

medical history was noncontributory. Clinical examination revealed a defective coronal composite restoration and the tooth was tender on percussion. Pre-operative radiograph revealed deficient root canal treatment of mandibular first molar with under filled mesial and distal canals (Fig. 1). An additional root outline could be traced in the preoperative radiograph. A diagnosis of persistent apical periodontitis was made. The definitive treatment plan was orthograde endodontic retreatment.

After administration of local anesthesia using 2% lignocaine with epinephrine (1:100000) the tooth no 36 was isolated with rubber dam. The defective coronal restoration was removed and the access cavity was refined using endo access bur. Access cavity was thoroughly rinsed with 5% sodium hypochlorite, it was observed that silver cone was used for obturation of distal canal and gutta percha for mesial canals. On exploration using DG 16 explorer, an undetected distolingual canal was found. Silver cone was removed using file braiding technique. Gutta percha cones were removed from the canal system using a combination of H files and protaper universal rotary retreatment files (Dentsply-Maillefer, Ballaigues, Switzerland). Protaper retreatment files were used in a sequential crown down manner using light apical pressure. Patency was established in all the four canals using a size 10 stainless steel K file. Working length was determined using electronic apex locator (Root ZX, J Morita, USA) and confirmed using radiograph (Fig. 2). The canals were then enlarged till working length using pre curved stainless steel hand files followed by protaper rotary files sequentially to F2. During preparation RC-Prep (Premier Dental Products, USA) was used as lubricant and 5.25% sodium hypochlorite (Novo dental products pvt ltd, India) was used alternatively to irrigate the canals. After instrumentation, canals were

irrigated with 17% edta solution (Canalarge, Ammdent, Chandigarh, India) to remove the smear layer. After completion of cleaning and shaping, final irrigation was done with sodium hypochlorite and saline. The canals were dried with paper points. A calcium hydroxide based intracanal medicament (RC Cal, Prime dental products pvt ltd, India) was placed and temporized with Cavit (3M ESPE Dental, India) for two weeks.

After two weeks, when the acute symptoms had resolved, canals were irrigated with 5.25% sodium hypochlorite (Novo dental products pvt ltd, India) and dried with paper points. Master cone radiograph (Fig. 3) was taken and the root canals were obturated with corresponding protaper gutta-percha cones adjusted to fit and AH plus sealer (Dentsply, maillefer, USA) [Fig. 4]. Access preparation was restored with amalgam restoration.

Discussion

Success of root canal treatment depends on a thorough knowledge of root canal anatomy, variations in canal morphology and careful clinical and radiographic examination. Atleast two diagnostic radiographs from mesial and distal angulation should be taken to locate additional roots^{9, 10}. Radix entomolaris can be classified into different types according to the location of cervical part^{5, 11}. Careful examination of crown and cervical morphology can facilitate identification of an extra root. In case of an additional root, an extra cusp (tuberculum paramolarae) or a more pronounced distolingual lobe will be present

Type A: Distally located cervical part of RE with two normal root components.

Type B: Distally located cervical part of RE with one normal distal root component

Type C: Mesially located RE

Type D: RE is located lingually between mesial and distal root complexes.



Fig. 1 Preoperative radiograph



Fig. 2 Working length radiograph



Fig. 3 Master cone radiograph



Fig. 4 Post obturation radiograph

De Moor et al classified RE based on curvature in buccolingual direction. Type I is straight root canal, type II refers to an initially curved canal which continues as a straight canal and type III refers to initial coronal curvature and a second curve extending from the middle third to the apical third¹³. The radix paramolaris is located mesiobuccally. Radix paramolaris can be classified into two types. In type A, cervical part is located on mesial root complex and in type B, cervical part is located centrally between the mesial and distal root¹⁴. Canal patency should be achieved for successful retreatment. Indiscriminate use of rotary files and excess apical pressure during reinstrumentation will result in ledge formation.

Failure of endodontic treatment most commonly occurs because of missed and untreated canals. The incidence of missed root and root canals in endodontically treated teeth have been reported as high as 42%¹⁵. In this case persistent endodontic disease occurred because of improper root canal treatment. The location of an additional canal is aided by the use of various instruments like DG 16 endodontic explorer, path finder, micro-opener and visual aids such as a loupe or dental operating microscope. Cone beam computed tomography is highly recommended when conventional periapical radiographs provide insufficient information. CBCT significantly increase canal detection when compared to conventional radiography¹⁶.

Conclusion

Awareness of root canal anatomy and anatomical variations can contribute to successful outcome of root canal treatment. Preoperative radiographs exposed at two different horizontal angulations, loupes and dental operating microscopes facilitate the endodontic procedure. Every effort should be made to locate and treat all

canals for long term success of root canal treatment.

References

1. Padmaja K, Shah A, Malpani S, Kakkar M, Thakkar R. Retreatment in Endodontics: A Review. *J Adv Med Dent Scie Res* 2015;3(1):205-208.
2. Endodontic Retreatment: A Rational Approach to Root Canal Reinstrumentation Ely Mandel and Shimon Friedman Vol. 18, No. 11, November 1992
3. Skidmore AE, Bjorndal AM. Root canal morphology of the human mandibular first molar. *Oral Surg*, 32: 778-784, 1971
4. P. Carrotte Endodontics: Part 4 Morphology of the root canal system *BRITISH DENTAL JOURNAL VOLUME 197 NO. 7 OCTOBER 9 2004*
5. Akilan Balasubramanian et al Endodontic Management of a Tooth with Radix Entomolaris and Five Root Canals *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) Volume 10, Issue 6 (Sep.- Oct. 2013), PP 62-65*
6. Curzon ME, Curzon JA. Three-rooted mandibular molars in the Keewatin Eskimo. *J Can Dent Assoc (Tor)* 1971 Feb;37(2):71-2.
7. Turner CG, 2nd. Three-rooted mandibular first permanent molars and the question of American Indian origins. *Am J Phys Anthropol* 1971 Mar;34(2):229-41.
8. Yew SC, Chan K. A retrospective study of endodontically treated mandibular first molars in a Chinese population. *J Endod* 1993 Sep;19(9):471-3.
9. Slowely RR. Radiographic aids in the detection of extra canals. *Oral Surg, Oral Med Oral Pathol.* 1974;37:762-72.
10. Walton RE. Endodontic radiographic techniques. *Dent radio Photo radio.* 1973;46:51-59
11. Carlsen O, Alexandersen V. Radix entomolaris: identification and morphology. *Scan J Dent Res* 1990;98:363-73.
12. Filip L, Calberson et al The Radix Entomolaris and Paramolaris: Clinical Approach in Endodontics *JOE—Volume 33, Number 1, January 2007*
13. De Moor RJ, Deroose CA, Calberson FL. The radix entomolaris in mandibular first molars: an endodontic challenge. *Int Endod J* 2004;37:789 -99.
14. Carlsen O, Alexandersen V. Radix paramolaris in permanent mandibular molars: identification and morphology. *Scan J Dent Res* 1991;99:189 -95.
15. Hoen MM, PinkFE Contemporary endodontic retreatments an analysis based on clinical treatment findings. *J Endodond* 2002 28: 834-836.
16. Nance R, Tyndall D, Levin LG, Trope M. Identification of root canals in molars by tuned-aperture computed tomography. *Int Endod J* 2000 Jul;33(4):392-6.

Direct Bonded FPD

*Karthik S, *Shahin Ismail, *Nimmy KJ, *Raahee Kiran, **Smitha Raveendran, ***Pradeep C. Dathan

*P.G. Student, **Senior Lecturer, ***Professor and Head, Dept of Prosthodontics,
Sri Sankara Dental College, Akathumuri, Varkala, Kerala

Send correspondence: Dr. Karthik S., E-mail: chlkarthiks@gmail.com

Introduction

Different treatment options can be considered for the replacement of missing teeth especially in the anterior or aesthetic zones¹. Removable partial dentures, Fixed Partial Dentures (FPD) are the conventional replacement methods. Resin – bonded fixed partial dentures can be recommended for young permanent teeth. Dental implants can be a good option, but its use is not recommended before the end of growth period i.e. around the age of 18 years². FPD is the most invasive treatment in terms of tooth reduction, Removable prosthesis is not convenient to the patient.

The Fiber reinforced composite (FRC) bridges represents an interesting alternative to conventional metal ceramic FPD³. Fiber-reinforced composite (FRC) can be described as composite materials formed from laminae, which are layers containing both fiber and matrix that are placed one on top of the other⁴. It can be created from a variety of both composite and fiber materials. Composite resin is a brittle material, incapable of withstanding prolonged occlusal forces, especially as an unsupported pontic. The addition of fiber to the composite matrix decreases the chance for failure and increases the overall strength and toughness of the composite. Fiber reinforced composite FPD s can be fabricated directly at chairside or indirectly in the laboratory⁵. Adding fibers creates layer, which could act as an impediment to crack formation and debonding. When possible, a FRC bridge should be fabricated extraorally to achieve better polish, polymerization conversion rate, and adaptation.

Studies states that reinforcement of composite resin by fibers increase the fracture toughness and resistance, and this combination provides a new option for short term composite bridge fabrication

This article describes three clinical case in which FRC bridge is fabricated according to direct and indirect technique.

Case report 1

A 28-year old male patient reported to the Department with a chief complaint of missing lower front teeth. the patient lost his lower central incisors in an accident 2 years back (Fig. 1), both the mandibular lateral incisors shows Grade 1 mobility. Patient had a removable prosthesis for the last two years, and he wish to replace it with a fixed prosthesis. Radiographic examination revealed that there is 2mm bone loss around both the mandibular lateral incisors. All the therapeutic options were described to the patient. It had been decided to place fiber reinforce composite bridge to replace missing 31,41.

The length of the fiber (ever Stick C&B – GC America) was determined by adapting a thin aluminum foil on the tooth up till the middle thirds of each abutment crossing the pontic area. Since lateral incisors had grade I mobility canines were included as abutments, this provides splinting. the foil was flattened and used as a template, exact length of the fiber needed was measured and cut using a scissors. Clean the Tooth surfaces to be bonded with a slurry of pumice, rinse it. Enamel surfaces were etched with 37% phosphoric acid (GC Etchant) for 30 seconds (Fig. 2). After rinsing, all surfaces were air dried, and apply bonding agent (G-BOND – one component self etching) on lingal aspect of abutments and light cured for 10 seconds. A thin layer of a microhybrid restorative material was placed on the lingual side of the abutment teeth. Using instruments, the fiber was pushed through the uncured composite layer until it touched the surface of the tooth. The fiber crossed the pontic area under the incisal edge, going from

the labial, lingual and midline of each abutment. The thickness of the composite between the teeth and fiber was kept as thin as possible. The fiber on abutment teeth and pontic area was light cured for 40 seconds to form a strong framework for the FRC bridge fabrication. A second piece of the fiber was placed perpendicular to the first one in the

pontic region this forms the frame for the pontic. The fiber on the abutment was covered with composite resin. The pontic was built using composite on the framework. To obtain a good natural esthetic result, a composite restorative system containing different enamel and dentin shades was used. Dentin shades, responsible for



Fig. 1 – Intraoral view showing missing lower central incisors



Fig. 2 – Enamel surface etched with 37% phosphoric acid



Fig. 3 – Intraoral view of completed prosthesis (Labial)



Fig. 4 – Intraoral view of completed prosthesis (Lingual)



Fig. 5 - Intraoral view showing missing lower left central incisor



Fig. 6 – silicone mould for the fabrication of composite pontic



Fig. 7 – Silicone mould and completed composite pontic.



Fig. 8 – intraoral view of completed prosthesis (Labial)



Fig. 9 – Intraoral view of completed prosthesis (Lingual)



Fig. 10 – Intraoral view showing missing upper right second premolar



Fig. 11 – FRC Framework fabricated on working cast



Fig. 12 - Completed prosthesis (Buccal)



Fig. 13 - Completed prosthesis (Palatal)

the opacity, hue, and chroma, were placed internally and then covered by enamel shades. The bridge was finished and polished with appropriate instruments. (Fig 3, Fig 4) The entire prosthesis was kept out of occlusion in both centric and eccentric movements in order to reduce stress on the restoration.

The patient was placed on prophylactic regimen. At a review appointment 6 months later, the FRC bridge was examined and appeared to be functioning properly, maintaining its structural integrity and esthetics.

Case report 2

A 30 year old male patient reported to the Department with missing lower right central incisors (Fig. 5). A conservative management with fiber reinforced composite was planned.

An acrylic tooth of same mesio distal width of the edentulous area was selected

Mould was prepared by embedding it in the Addition silicone impression material (Fig. 6). Shade was selected, enamel composite and dentine composite was incrementally packed into the mould and cured to get a pontic with same mesiodistal dimension and shade. The composite pontic was then bonded to the fiber. (Fig. 7) Finishing and polishing was carried out. In order to reduce stress on the restoration the entire prosthesis was relieved from occlusion in both centric and eccentric movements. (Fig 8 & 9)

Case report 3

In this a missing maxillary right first premolar was replaced using indirect technique (Fig. 10). Other treatment options were not acceptable to the patient because of financial constraints.

A working cast was made from an alginate impression. The frame work and the composite pontic were fabricated on the working model. This was then attached intraorally using composite resin attachment was on to the palatal aspect of the abutment teeth.

Discussion

Prosthetic rehabilitation with FRC bridges are noninvasive with minimum or no tooth

reduction. The other advantages are reparability, ease of fabrication, and relative longevity. Hybrid composites are used for building up of pontics incrementally^{6, 7}. The composite resin is added incrementally to reduce overall polymerization shrinkage. Hybrid composites have good wear resistance this provides longevity to direct composite FPDs. Compared to direct technique, the indirect technique described in this article provides a better result in terms of adaptation, rate of polymerization, and final smoothness of the prosthesis. In direct technique, it is very difficult to control and avoid the composite excess in embrasures and undercuts. After curing, the composite can only be removed by rotary instruments⁸. The survival rate resin bonded FPDs depended upon location, type and length of FPD⁹. Long term clinical evaluation of this new technique has to be carried out further.

References

- 1) Marinello CP, Meyenberg KH, Zitzmann N, Luthy H, Soom U, Imoberdorf M. Single-tooth replacement: Some clinical aspects. *J Esthet Dent*. 1997;9:169-178.
- 2) Nixon RL, Weinstock A. An immediate extraction anterior single tooth replacement utilising a fiber reinforced dual component bridge. *Pract Perio aesthet Dent* 1998;10:17-26
- 3) Vallittu PK. Survival rates of resin-bonded, glass fiber-reinforced composite fixed partial dentures with a mean follow-up of 42 months: A pilot study. *J Prosthet Dent*. 2004;3:241-246
- 4) Ahlstrand WM, Finger WJ. Direct and indirect fiber reinforced fixed partial dentures: Case Report. *Quintessence Int* 2002;33:359-65.
- 5) Tezvergil A, Lassila LV, Vallittu PK. Strength of adhesive – bonded fiber reinforced composites to enamel and dentin substrate. *J Adhes Dent* 2003;5:301-11.
- 6) Ramos V Jr, Runyan DA. The effect of plasma treated polyethylene fiber on the fracture strength of Polymethyl methacrylate. *J Prosthet Dent* 1996;76:94
- 7) Vanini L. Light and colour in anterior composite restorations. *Pract Periodontics Esthet Dent*. 1996;8:673-682.
- 8) Bayne SC, Thompson JY, Swift EJ, Wilkerson M. A characterization of first generation flowable composites. *J am Dent Assoc* 1998;129:567-77.
- 9) Amir Chafaie, Richard portier. Anterior fiber reinforced composite resin bridge: A case report. *Pediatric Dentistry* – 26:6,2004.

CPD in transition - a clinical technique

*Shyam Mohan A, **Yeshaswini

*Prof & Head, Department of Prosthodontics, **Professor, Department of Oral Surgery, Rajas Dental College, Thirunelveli Dist, Tamil Nadu

Send Correspondence: Dr. Shyam Mohan A, E-mail: a_shyammohan@rediffmail.com

Introduction

Complete edentulism is a challenging phenomenon both functionally and esthetically. The problem doubles when it comes to the transition from a functioning removable partial denture to a full denture due to imminent clinical problems.¹ The patient might find it difficult to adapt to the drastic changes that comes with the same especially when the social standing is compromised.² Transitional dentures offer a soothing change-over in this stage saving the patient mainly from an esthetic handicap.

Several techniques are enumerated in the literature on transitional prostheses involving both removable and fixed dentures.^{3,4,5} Many of them discuss the conversion of an interim or acrylic RPD to a complete denture. The situation becomes more complex when the transition of a cast partial denture (CPD) to an acrylic complete denture (CD) is planned due to the incompatibility of both in terms of material and design. This case report delineates a similar situation wherein a novel technique is explained to convert a distal extension maxillary cast partial denture to a provisional CD.

Case report

A female patient of age 72 reported with a complaint of ill fitting upper removable cast partial denture (CPD), replacing all her posteriors and right canine. The periodontal status of the remaining upper natural teeth was bad while the lower arch was fully edentulous and rehabilitated with a single full denture (FD) with satisfactory results. The patient wished to convert the upper prosthesis too to FD due to esthetic and functional problems. She was not willing to remain edentulous at any course of the treatment period.

The CPD was of base metal alloy with antero-posterior palatal strap design for the major connector with intact denture teeth replacing 14,15,16,17,24,25 and 26. The major connector was well adapting to the palate with the retention jeopardized due to compromised/failed abutments. The open design and the weight of the prosthesis compounded the retention problem. The patient still managed to chew with the prostheses with the use of denture adhesive. The interarch occlusal relation and the vertical dimension of occlusion were found adequate.

The remaining upper two central, and one lateral, incisors were Grade III mobile with minimal apical bone attachment coupled with severe attrition. The removal of the same was thus planned and executed, followed by the conversion of CPD to provisional FD in a single day catering to her demands. The medical and drug history of the patient was favourable for the same.

Technique

Labial contouring of the anterior part of the CPD was done initially with base plate wax (DPI, Mumbai) ensuring adequate lip support and visibility (fig.1). Once confirmed this position was copied in addition silicon putty material (Aquasil, Dentsply) by digitally packing the material in the palatal aspect of the CPD, as a substitute for gypsum cast material to act as a scaffold (fig.2a, b). Tentative anterior teeth setting was done against this putty cast and the trial insertion done to patient's satisfaction. Intentional diastemata were incorporated to manage the excess space and also to simulate patient's natural setting, with her permission (fig. 3). The centric and intercusp relations were also confirmed with the existing lower FD.

The cameo part of the palatal strap was then covered and contoured with base plate wax (DPI, Mumbai) conforming to the existing contours and limiting it to a thickness of 2mm (fig.4a). The intaglio part was also made to follow the natural contours and the CPD was checked intraorally for supra contacts and complete seating. 1mm holes were put in the open part of the design to aid material retention (fig.4b). A further 10mm extension of the wax (DPI, Mumbai) was needed to cover the posterior areas and the hamular notches. The borders were adequately short of the functional sulci to accommodate the border

moulding material. Compatible tray adhesive (VPS, 3M ESPE) was applied on the intaglio and allowed to dry prior loading the modified tray with monophase polyether material (Impregum, Pentasoft, 3M). The thixotropic nature of this material allowed border moulding of the borders and at the same time to obtain a wash- impression of the maxillary arch (fig.5).

The impression along with the anterior set-up was poured in Type 3 gypsum (Labstone dental stone, Dentsply) for obtaining the working cast. The entire complex was then invested in denture flask for processing after wax carving, finishing



Fig 1 Labial contouring of the CPD



Fig 2 a and 2 b Packing the putty material in the palatal aspect of the CPD



Fig 3 Intentional diastemata incorporated



Fig 4a The cameo part contoured with base plate wax



Fig 4b 1mm holes to aid material retention



Fig 5 Wash- impression with polyether material



Fig 6 The resultant prosthesis after finishing and polishing



Fig 7 Finished prosthesis delivered

and polishing. Following dewaxing the cast frame work was retrieved carefully from the mold and multiple holes of 2mm diameter were put to aid in mechanical locking to PMMA. A META based adhesive (Metabond, Japan) was then applied on the cast framework for added adhesion between the alloy and acrylic. Heat cure PMMA (DPI, Mumbai) was pressure packed against the same and cured. The resultant prosthesis after finishing and polishing was inserted following routine post insertion adjustments (fig.6). The prosthesis catered both to patient's esthetic and interim demands until a permanent prosthesis is fabricated (fig.7).

Conclusion

An interim transitional denture helps the patient both functionally and esthetically. It also aids in a smooth transition from partial edentulism to complete edentulism. The technique

elaborates a convenient method to convert a distal extension CPD to an interim CD without much compromise. The framework also helps in enhancing the strength of the prosthesis. In due course the same can be replaced with a permanent one.

References

1. June Sisson, Kenneth Boberick, Sheldon Winkler. Conversion of a removable partial denture to a transitional complete denture: A clinical report. J Prosthet Dent 2005;93:416-8.
2. A. Mersel, I. Babayof, D. Berkey, J. Mann. Variables affecting denture satisfaction in Israeli elderly: a one year follow-up. Gerodontoloty 1995;12:89-94.
3. Abbott FB, Wongthai P. Converting a removable partial denture to a complete interim denture. J Prosthet Dent 1983;49:852-5.
4. Sisson J, Boberick K, Winkler S. Conversion of a removable partial denture to a transitional complete denture: A clinical report. J Prosthet Dent 2005;93: 416-8.
5. Lonsbrough RL. Conversion of a fixed partial denture to an interim removable partial denture: a clinical report. J Prosth Dent 1993;70:383-5.

A protean approach for rehabilitation of partially edentulous patient - Case report

*Shahin Ismail, *Karthik S, *Nimmy KJ, *Rahee Kiran,
Chandrarathara, **Nikhil S Rajan, *Pradeep C Dathan

*Post Graduate Student, **Reader, ***Prof & Head, Department of Prosthodontics,
Sri Sankara Dental College, Akathumuri, Varkala, Trivandrum, Kerala.

Send correspondence: Dr. Shahin Ismail, Email: shahin3872@gmail.com

Abstract

Complete or partial edentulism can be rehabilitated by conventional methods, In certain circumstances due to anatomic variations or due to the position of remaining dentition rehabilitation needs a versatile approach that include an interdisciplinary strategy to achieve best results. This article intends to highlight clinically relevant modifications of removable prosthesis that can be adapted for successful rehabilitation of compromised situations.

Key words: over denture, cusil denture, Partially edentulous arch, attrited anterior teeth.

Introduction

"The perpetual preservation of that which remains, and not the meticulous replacement of that which has been lost"- De Van.¹ In routine clinical practice we come across numerous patients who are reluctant to under go extraction even if these teeth challenges our treatment planning. In these cases a protean/versatile treatment options such as Cusil dentures, over dentures, telescopic dentures are considered.^{2,3} A case where such versatile approach was used for successful rehabilitation is reported here.

Case report

A 63 year old female patient reported to the Department for replacement of her missing teeth (Fig 1). The patient had been partially edentulous since 3 years. Intraoral examination reveals Kennedy's Class I in maxillary arch the teeth remaining are 13,12,21,22,23, which were attrited and the mandibular arch showed a Kennedy's Class I with 32 and 34 as remaining teeth (Fig 3). Cusil denture was planned for the maxillary arch and tooth supported overdenture for the mandibular arch. Intentional root canal procedure was done on 32 and 34 and in 32 root caries was removed

and sealed with GIC cement was retained as submerged root stump. After intentional root canal of 34, it was prepared to receive a dome shaped cast coping with post extending up to the apical third of the root canal. The copings were finally cemented with glass ionomer cement (Fig 4). Impression was made with putty and light body elastomer. Master casts were made. Centric relation registered and mounted on articulator. Teeth were arranged and trial completed (Fig 5). Maxillary and mandibular dentures were fabricated with heat cured acrylic. The maxillary denture had windows in the region of abutment teeth which was lined by softliner (Fig 7, 8). The attrited maxillary anteriors were build up using composite (Fig 6) to match the occlusal plane of denture. The mandibular denture was relined using chairside reline material "UFI GEL P SOFT LINER" after application of the primer at coping region to have a snug fit for the over denture. The patient was comfortable at the time of insertion and during follow up after a week and after one month

Discussion

The case report describes a treatment modality for partially edentulous patient with few

remaining teeth. The prospect of losing all his teeth can be very disturbing for a patient. It also brings down patient's morale as it is an indirect reminder for being dependent on others and losing senescence. In such conditions, versatile approach such as overdenture, cusildenture and telescopic dentures can act as preventive prosthodontic treatment modality in our dental. Rissin et al. in 1978 compared masticatory performance in patients with natural dentition, complete denture and over denture. They found that the natural dentition has the maximum efficiency while over-denture patients had a chewing efficiency one third higher than the complete denture patients.⁴ In case of overdenture prosthesis, proprioception

is maintained, there is the presence of directional sensitivity; dimensional discrimination; canine response and tactile sensitivity.⁵ The average threshold of sensitivity to a load was found to be 10 times as great in denture wearers as in dentulous patients.

CuSil dentures are designed to preserve the remaining natural teeth and thus the alveolar bone. They have effect on retention and stability of dentures. In addition to this it gives the patient psychologic satisfaction of retaining the natural teeth as they were. Vertical dimension and proprioception is maintained by retained natural teeth. Attachment devices are avoided entirely. This treatment modality does not require any



Fig. 1 Pre-op profile



Fig. 2 Post-op profile



Fig. 3 Pre-op intraoral



Fig. 4 Mandibular metal coping



Fig. 5 Wax trial



Fig. 6 Incisal build up of anterior abutment with composite



Fig. 7 Ufi Gel P Soft Liner (Base and Catalyst Paste)

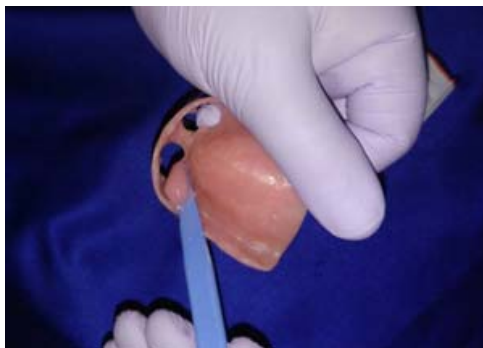


Fig. 8 Lining With Ufi Gel P Soft Liner



Fig. 9 Intaglio Surface of maxillary prosthesis



Fig. 10 Cameo Surface of maxillary prosthesis

tooth preparation and extra patient visit. It does not require any special armamentarium and material. If a tooth is lost in future, existing denture can be modified to occupy its place. They serve as a solution for single standing or isolated teeth present in dental arch

Conclusion

The success of the tooth-supported denture treatment depends upon the proper case selection. Various factors for selection include available tooth support and inter arch space, the amount of bone support, opposing dentition, clinical experience, personal preferences, maintenance problems, cost and most important being patient's motivation. Careful selection of the strategic abutment teeth is important. The attitude of the patient to the treatment should be assessed. Only those who

understand the limitations and benefits of tooth supported dentures should be treated. Hence, patient selection is critical to the success of the treatment.

Reference

1. DeVan M.M. Transition from natural to artificial teeth. J Prosthet Dent 1961;11:677-88.
2. Zarb-Bolender: Prosthodontic treatment for edentulous patients, 12th ed. Mosby.6-23,160-176,190-208
3. Sheldon Winkler: Essentials of complete denture prosthodontics, 2nd ed. IshiyakuEuroAmericaInc. U.S.A. 22-34,384-402
4. Rissin L, House JE, Manly RS, Kapur KK. Clinical comparison of masticatory performance and electromyographic activity of patients with complete dentures, overdentures, and natural teeth. J Prosthet Dent 1978;39:508-11.
5. Schwartz IS, Morrow RM. Overdentures. Principles and procedures. Dent Clin North Am 1996;40:169-94.

Clinical discussion of odontogenic keratocystic tumour presenting as a mandibular swelling: A case report

*Ramesh S, **Sunila Thomas, ***Vivek V, ****Jincy Thomas

*Senior Lecturer, ** Professor, ***Professor & HOD, ****Reader, Department of Oral Medicine & Radiology, PMS College of Dental Science & Research, Vattappara, Thiruvananthapuram.

Send correspondence: Dr. Ramesh S, E-mail: drrameshellite@gmail.com

Introduction

Mandibular swellings often cause diagnostic dilemma in clinical practice. The common mandibular swellings are odontogenic cysts - dentigerous cysts, radicular cysts, odontogenic keratocysts (OKC) & odontogenic tumours - ameloblastoma, calcifying epithelial odontogenic tumour.

OKC is one of the most common cause of mandibular swelling in the clinical scenario. The term OKC was introduced by Philipsen (1956).¹ It is a cyst derived from the remnants of dental lamina with a biologic behaviour similar to a benign cystic neoplasm.² The frequency of occurrence of OKC is 4.9%.³ Odontogenic keratocyst is now renamed as the Keratocystic Odontogenic Tumor (KCOT).⁴

Case report

A male patient of age 22 years reported to the Department of Oral Medicine and Radiology with a chief complaint of pain and swelling on the right side of face since two days. Since last 4 years he had several episodes of swelling which appeared for a week and had disappeared without taking any medication. Initially the swelling was small in size, gradually it increased and attained the present size.

Patient had undergone a surgery for parotid abscess on the right side of the face 3 years back.

Extra oral examination

The face was apparently asymmetrical. A diffuse swelling of size 4X5 cm extends superiorly from the level of the tragus of right ear and inferiorly

upto the lower border of the mandible, anteriorly behind the right corner of the mouth and extending posteriorly to the level of tragus of right ear without lifting the ear lobule.

On palpation the swelling was firm, warm and tender. A surgical scar was present just below the lobe of right ear. Right side TMJ was slightly tender on palpation. No clicking or deviation was present. Right side submandibular lymph nodes were palpable and tender.

Intraoral examination

There was a swelling in the buccal vestibule extending from the mesial aspect of lower right second premolar to the distal aspect of lower right second molar.

It was firm and tender to palpation. Slight expansion of the buccal cortical plate was present and no expansion was on the lingual cortical plate. Deep enamel caries were present on upper right first molar. Upper left first molar was missing and lower right third molar was unerupted.

Clinical diagnosis was inclined towards Odontogenic cysts or tumours or parotid abscess.

Investigations

1. Occlusal Cross sectional

Mandibular Occlusal Cross sectional view showed slight expansion of the right side buccal cortical plate.

2. Panoramic view

Panaromic view showed impacted lower right third molar. There were multilocular radiolucencies involving the body and angle of

the mandible, extending to ramus, condyle & coronoid process. The radiolucency was found to extend upto lower right mandibular first premolar.

3. CT showed displacement of the lower right third molar.

CT also revealed buccal cortical plate expansion of the right side mandible

Multilocular radiolucencies in the region of body, angle, coronoid process & condylar process of the right side mandible

Differential diagnosis

1. Dentigerous cyst-as third molar was missing dentigerous cyst was considered.

2. Muralameloblastoma-As one tooth was missing and also due to the multilocular appearance of the lesion, displacement of the impacted tooth, buccal cortical plate expansion mural ameloblastoma which develops from the linings of dentigerous cyst was considered.

3. Keratocystic Odontogenic tumour-Due to the multilocular appearance of the lesion and minimal cortical plate expansion, KCOT was considered.

Histopathology

Incisional biopsy was taken and histopathology report suggestive of Keratocystic odontogenic tumour.

1. A parakeratinised surface which is typically corrugated or wrinkled.

2. A prominent palisaded, polarised basal cell layer described as having picket fence or tomb stone appearance

Discussion

The present lesion clinically and radiographically produces a diagnostic dilemma to the examiner. KCOT occur over a wide age range & cases have been recorded as early as the first decade and as late as the ninth decade.⁵ The male & female ratio for the occurrence of the disease

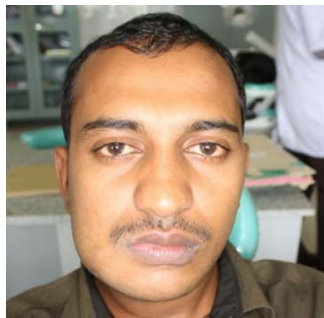


Fig. 1 Facial profile



Fig. 2 Intra oral view



Fig. 3 Occlusal Cross sectional view



Fig. 4 Panoramic view



Fig. 5 CT



Fig. 6 CT



Fig. 7 CT



Fig. 8 Histopath slide

is 1.27:1.⁶ Pinborg et al (1963) was the first to point out the peculiar aggressive behaviour of KCOT.⁷ The recurrence rate for KCOT is almost 5.2%. Due to the recurrent episodes of swelling on this region and the history of surgery in parotid region along with the presence of a surgical scar, parotid abscess was also considered initially. However, the location of the swelling more towards the lower third of mandible without raising the ear lobule was a negative finding.

Malignant lesions were also ruled out as the borders of the lesion were distinct in radiographic examination.⁸

As the lower right third molar was missing, the first differential diagnosis was Dentigerous cyst, but the multilocular appearance of the lesion ruled out the possibility of Dentigerous cyst. As one tooth was missing, and also due to the multilocular appearance of the lesion, displacement of the impacted tooth, buccal cortical plate expansion mural ameloblastoma which develops from the linings of dentigerous cyst was the next differential diagnosis.⁹ Bony expansion evident in cases of KCOT involving angle or ramus of mandible and in this case there was slight expansion of the lower right buccal cortical plate.

Conclusion

Based on the clinical evaluation, radiographic analysis and histopathological reports the present case was identified as KCOT. This stresses the importance of careful clinical and radiographic evaluation to formulate a differential diagnosis before histopathological confirmation.

Acknowledgement

Department of Oral and Maxillofacial Pathology, Department of Oral and Maxillofacial Surgery, PMS College of Dental Science and Research, Vattappara.

References

1. Philipsen HP Om keratocyst (kolestreatom) I kaeberne. T and laegebladet 1956; 60:963-981.
2. Rajendran R, Sivaprathasundaram. Shafers textbook of oral pathology 2006; 5th edition:363
3. Daley TD, Wysocki G.P and Pringle GA The relative incidence of odontogenic tumours. Oral & jaw cysts in a Canadian population. Oral surgery, oral medicine, oral pathology, oral radiology and endodontics 1994;77:276-280.
4. Barnes L, Eveson JW, Reichart P, Sidransky D Pathology and genetics of head and neck tumours. Lyon: IARC Press; WHO classification of tumors series. J Maxillofac Oral Surg 2005;8(2):127-131.
5. Meara J.G, Li K.K, Shan S.S and Cunningham M.J. Odontogenic keratocyst in the pediatric population. Archives of otolaryngology Head & neck surgery 1996; 122:725-728.
6. Jones A.V, Craig G.T and Franklin C.D. Range and demographic of odontogenic cysts diagnosed in a UK population over a 30 year old. Journal of oral pathology & medicine 2006;35:500-567.
7. Pinborg JJ and Hansen J. Studies on odontogenic cyst epithelium. clinical & roentgenographic aspects of odontogenic keratocysts. Acta pathologica et microbiologica Scandinavica 1963; 58:283-2947.
8. Hansen J. Keratocysts in jaws. In Husted E and Hjorting Hansen E. eds, Oral surgery 2 (transactions of the second international conference on oral surgery) Copenhagen 1967;128-134.
9. Smith I and Shear M. Radiological features of mandibular primordial cysts (keratocysts). Journal of maxillofacial surgery 1978;8:862-865.



IDA Attingal Branch

Reports & Activities

EXECUTIVE COMMITTEE MEETINGS

Fourth executive meeting at Lions club, Attingal on April 25 th. 18 executive members attended.

Fifth executive meeting at Lake Palace, Kadinamkulam on May 28 th. 15 executive members attended. An Iftar was arranged.

CDE

An interbranch CDE on 7th May at Parkcentre.

Topic: Prepare and Restore

Faculty: Dr K. Chandrasekharan Nair

113 members attended the programme.

WORLD NO TOBACCO DAY

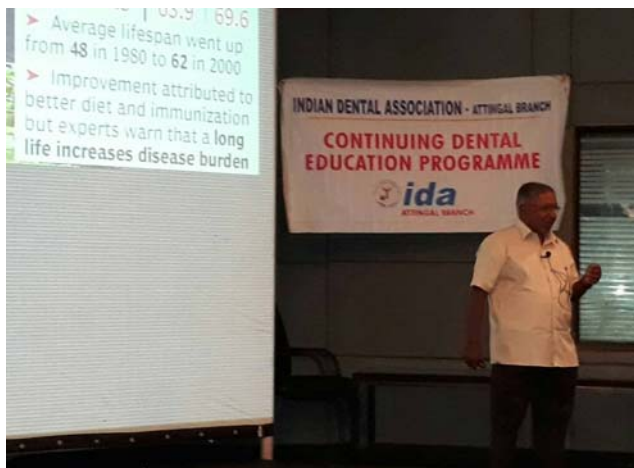
IDA Attingal branch observes World No Tobacco Day on 31st May in association with Southern Railway

at Varkala Railway Station. After the welcome speech by Station Manager Mr Sam Kutty, President of IDA Attingal branch Dr Deepak S Das inaugurated the programme. Special train from Trivandrum reached at Varkala railway station at 12.30pm and left at 1.10 pm.

Dr Ashok Dhoble our Hon: Secretary General, Dr Shobha Kuriakose, Dean of Sri Sankara Dental College, Dr Sabu Kurien, President KSB, Dr Suresh Kumar, Hon: Secretary KSB, Dr Rajesh CDH convenor has felicitated.

Dr Ansar PP, Consultant Clinical Oncologist Sree Gokulam Medical College, took an awareness class on ill effects of tobacco.

Students of Sri Sankara Dental College conducted a flash mob, mime, skit for the public



CDE programme by Dr. K. Chandrasekharan Nair



Flash mob and mime by students of Sri Sankara Dental College at Varkala railway station on World No Tobacco day



IDA Attingal branch Executive members along with IDA Hon Secretary General, Dr. Ashok Dhoble



Inauguration of World No Tobacco day programmes at Varkala railway station