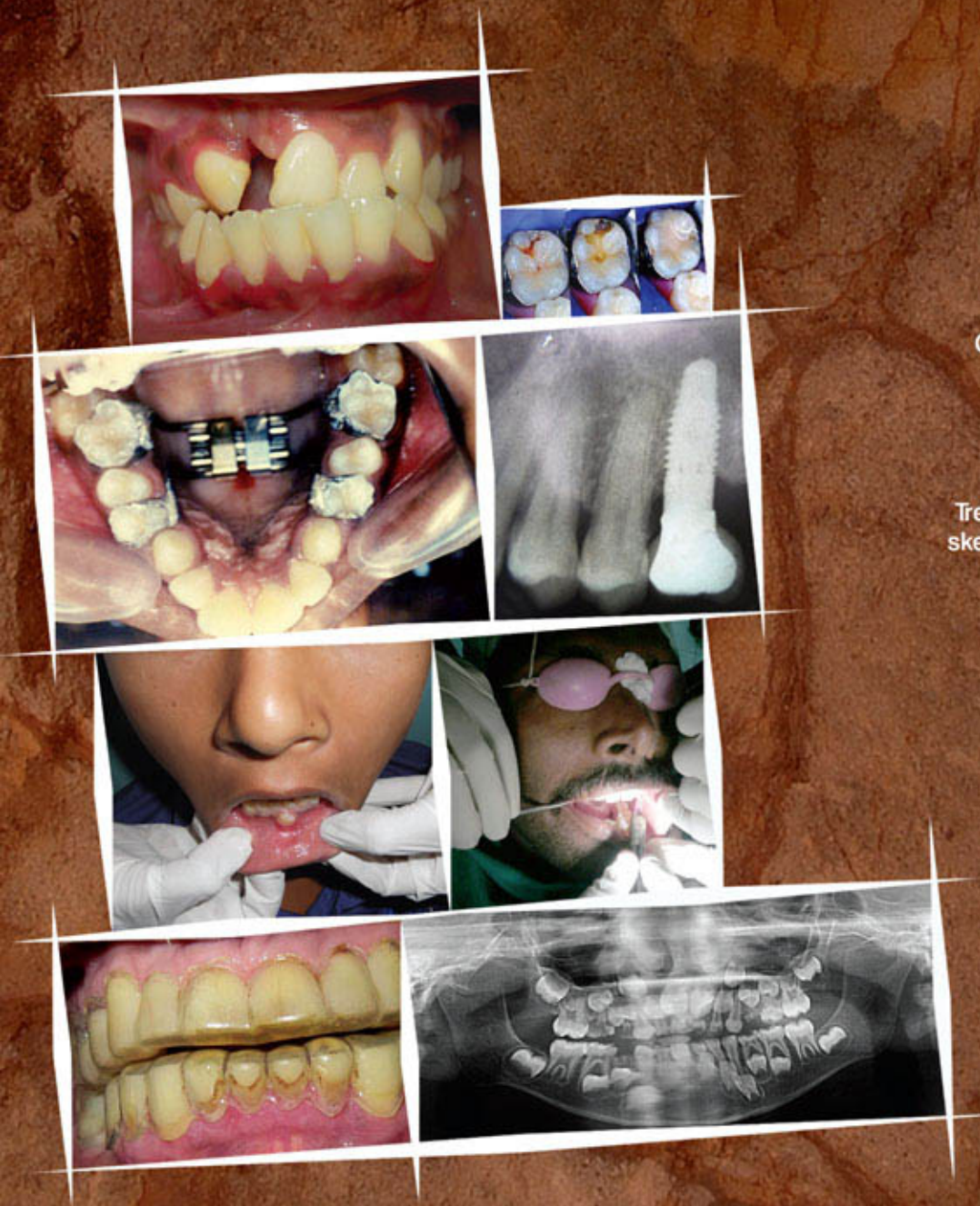
Index Copernicus ID 5385
ISSN No. 0972-396X

KDJ

Kerala Dental Journal

Quarterly Publication of Indian Dental Association, Kerala State Branch

Vol 35 | No. 2
April 2012



Special Issue

Orthodontics

Email: editorkdj@gmail.com | Web: www.idakerala.com

Contents

Kerala Dental Journal
Vol. 35 | No. 2 | April 2012

President's message

Dr. Raveendranath M.

Team KDJ especially the Editor Dr. K. Nandakumar is re asserting the word commitment and for any office bearer of IDA, his work is worth emulative. My heartiest wishes to KDJ.

Ombudsman in Dental practice is a concept out of sheer intellect or next level of thinking and the topic was shared to me by Dr. V. Viswanath our Past State President few year back when we worked together. But I was premature then to gauge the depth of it or the situation was not demanding for it. But few experiences in last few months brought the concept live into my thoughts and I feel ombudsman in Dental Practice is the answer to many queries and a check to many problems.

One responsible person at the top level in the hierarchy of bureaucracy approached me to ascertain the stand of IDA on certain issues related to practice, treatment and patients grievances. He had an unpleasant experience with some cosmetic Dental procedure and the treatment was commented badly by a foreign authority. The person doubts the dentist for collusion with some commercial interest. He started investigations, collected informations, shared dental experience with others, organized people etc, etc. Though on one side he accuses dentist, he really longs for professionalism and transparency in practice. He insists for case sheet, counseling, billing etc.

In almost another situation one parent denied ortho treatment to his child since the parent had a very horrible experience, as he put in, with ortho treatment. He argues that he had umpteen dental problems after orthodontic treatment. Here I understood the person had undergone "Matrimonial Orthodontics" than growth and development based orthodontics, and I tried to pacify him with their failures in knowing about the treatment which was their right.

In both cases the root causes are multi pronged and it starts with government failure in creating a Dental policy for the State. Till today government has not initiated any Dental awareness programme for the State. Physical and social constraints of private practice, lack of social security etc, the problems are many.

But my concern remains and is that in the run of practice many of us are forgetting the minimum essentials to be taken care of in practice and I am also not an exception to this reality. We are forgetting that now days our practice is being screened more and more not only by our community but also by International community. We are forgetting that we are accountable especially in this era of information and RTI. A segment of people around us, though they are minority, are very powerful and influential and they can spread the plus and minus of anything very swiftly across the globe.

My appeal is that we have to set practice with these concerns and an accountable mind.

Thanking You,

Dr. M. Raveendranath
President -IDA Kerala State

Dr. K. Nandakumar

Will the government start a medicity?

The general medical education in India was originally designed to prepare students for graduate training leading to careers as practicing physicians. It was also expected to stimulate them to consider careers as scientists and teachers. The curriculum aimed to develop in students the learning skills essential for independent study and continued learning in their life as physicians. We made medical colleges with this noble thought in the late 1950s. The circumstances have compelled them to assume the role of a speciality hospital. It was widely accepted that medical colleges provided the solutions for all the health care problems. Even now that perception has not vanished. But the medical care profile in our country has changed drastically keeping the western system as the role model. Presently corporate hospitals dictate the terms in advanced health care and an ordinary Indian is deprived of such facilities. Government Medical colleges have developed many advanced specialities and offered super speciality courses. The work culture in our country is such that government departments will not work properly on all the days and hence defeats the very purpose. All the government medical colleges of our country can neither claim to be good quality teaching institutions nor speciality hospitals with high standards. The political leadership never thinks that the primary objective of the medical college is to produce good quality doctors. Truly speaking, teaching suffers a lot in our medical colleges because the teaching faculty concentrates more on the clinical care rather than the student training. Private practice of the teaching faculty is theoretically banned after offering a high pay scale and now the government wants to revert back to the former system. The relevant questions to be raised are: Can we improve the teaching standards of our medical colleges while offering high quality clinical service? Can we bring in private practice without detriment to quality teaching? The old system which prevailed was a failed model. There is a solution for this. The Government should think of the medical city concept. The training component should be bifurcated and under and post graduate courses can be run in that. The faculty need not practice there. The super speciality subjects should be run in a speciality hospital (centre of excellence) and super speciality course should be run in that component. Faculty can have limited practice. Because it is a government system, specialized treatment can be heavily subsidized. Research can be developed as a specific component and it should be released from laboratories to find a place in the clinical science. Will government start medical cities? That is a question to be thought of seriously. The concept of a medical or health city stands unprecedented in India. Not surprisingly, it is often a misunderstood term. A cluster of hospitals, teaching facility for all specialities, a holistic healthcare centre, a large hospital sprawled across acres of land? Certainly it has all these. But it doesn't end here. In simpler terms, the difference between a medical college hospital and a medical city is as vast as the difference between a corner shop and a megastore. What you won't find at the shop, you will be certain to get at the store. The corporate sector would definitely capitalize on this idea. But the common man will be deprived of advanced health care facility. In the interest of the common man, will the government take the initiative to start a medicity?

Dr. K. Nandakumar
Editor, KDJ

Kerala Dental Journal
Vol. 35 | No. 2 | April 2012

EDITORIAL OFFICE
Neelambikam, Attukal, Manacaud
Trivandrum, Kerala - 695 009
Phone: 0471-2459235
Mobile: 09447066100
e-mail: editorkdj@gmail.com
web: www.idakerala.com

Interdisciplinary therapy

Dentists in the present world of dentistry are called upon to provide patient centric treatment requiring a vast array of treatment modalities. The dentist should select the best option for the patient, which best fits their particular situation. The finest application of the best treatment for the particular situation presented by the patient should be the obligation of each and every dentist.

Today's dental practice requires an interdisciplinary approach that integrates the knowledge, skills, and experience of all the disciplines of dentistry and its associated fields into comprehensive treatment to maximize results. Interdisciplinary Dentofacial Therapy presents, for the first time, the philosophy and methodology needed to blend a diverse group of professionals into a cohesive team. Complex and rapid scientific and technological advances have made it difficult for dental practitioners to stay current in one field, let alone more than one. An interdisciplinary approach is necessary for best utilizing new and existing techniques to decrease practitioner frustration and increase patient benefits. Interdisciplinary Dentofacial Therapy presents many cases in which an interdisciplinary approach provided the best possible solutions for both simple and complex dentofacial problems. Thus, it serves as a comprehensive reference for interdisciplinary team members. It shows how to set up and coordinate team therapy, using the latest advances in dental techniques and materials to greatest advantage, and how team members can communicate most effectively with each other. A true interdisciplinary approach to dentistry is arguably the best way to fully utilize current treatment options. Because of the inherent complexity and difficulties in developing and maintaining an interdisciplinary team, very few groups practice a comprehensive approach.

The keys to interdisciplinary dental facial therapy (IDT), are education and facilitation. These keys can be combined with the power of the internet and can enable a team to achieve levels of care that until now did not seem possible. Each doctor can have his/her own mailbox, and calendars integrated within the site and with other doctors, teams, or study groups. This allow for time management, communications, coordination, and confirmation of meetings and appointments.

Information technology is affecting every aspect of business today. Dentistry is just beginning to take advantage of its many offerings. The World Wide Web can simplify collaboration at local and global levels to provide a vast resource for treatment options, philosophies, and new technologies. By harnessing the power of the internet, interdisciplinary dentistry will become more predictable and efficient.

Edited by: **Dr. K. Nandakumar,** Hon. Editor • Published By: **Dr. Shibu Rajagopal,** Hon Secretary • **For IDA, Kerala State Branch** • Production: **Suman Graphics,** sumangfx@gmail.com

Recent advances in diagnosis and digital imaging

* Ajith R. Pillai, ** Sujith Alex Thomas

Computer utilization lagged behind in the typical orthodontic practice because of computers initial limitations and expense. The computer revolution has been vital to the paradigm shift that has occurred in orthodontics. The ability to store and retrieves information electronically has opened the door to knowledge transference never before possible to the practitioner. As computers became more dynamic and reliable, orthodontic practitioners started to use computers unique strengths mostly to help in diagnosis and treatment planning

Orthodontics, is the field which places a significant amount of emphasis on the accurate diagnosis for the optimum treatment results. Traditional radiographic technique have their limitation in the diagnosis of skeletal & dental mal-relation. With the advent of recent digital imaging technology there have been paradigm shift on orthodontic diagnosis treatment planing. Advantages of digital imaging are dose reduction, image prediction, reduced overall time, measurements (digital callipers), 3-D reconstruction, contrast enhancement, storage, teleradiology, environmentally friendly. Some of the disadvantages are cost, reduced sensor dimension, cross- infection control.

- 3D digital dental models using laser technology
- Video imaging and prediction
- Three dimensional image capturing system for facial profiles (c3d software)
- Digital imaging and smile analysis with the smile mesh programme
- Rapid prototyping (rpt)
- Stereolithography (sla)
- Teleradiology
- Cone beam computed tomography (newtom qr 9000 ct scanner)

3d digital dental models using laser technology

A new Laser scan based approach called e-models was developed to improve the accuracy and efficiency of orthodontic diagnosis, treatment planning, and bracket placement. The orthodontist sends the impression and bite registration to GeoDigm/ OrthoCAD. E-models are constructed through proprietary laser scanning process. Using the e-model software, the clinician can move, rotate, or zoom in on the model and make measurements in any plane or orientation.

Video imaging and prediction

The software superimposes the patients lateral photograph onto the lateral cephalogram to a proportionate scale. When the computerized predictions are made, the patient can now have an idea of his/her probable facial appearance after the planned treatment.

Three dimensional image capturing system for facial profiles (c3dsoftware)

The analog picture of a stereopair of video cameras are converted into a digital mode with a standard frame grabber. The software does the entire capture in 50 milliseconds 3D imaging of the face enables the orthodontist to evaluate the face from any direction.

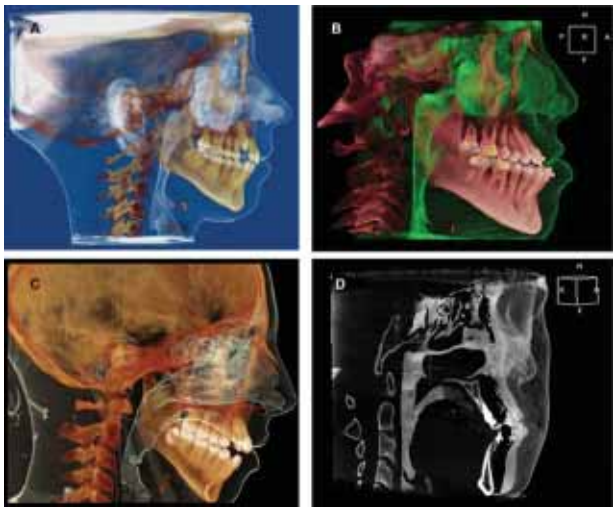
Digital imaging and smile analysis with the smile mesh programme

This methodology was first used manually by Hulsey and later modified and computerized by Ackerman. The frame that best represents the patient's socialsmile is selected and saved as a JPEG file. The smile image is then opened in a program called SmileMesh, which measures 15 attributes of the smile

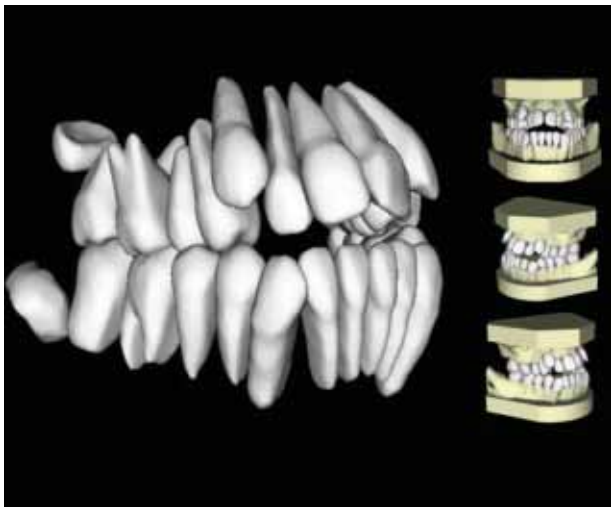
Rapid prototyping (rpt)

It is a group of manufacturing processes that enable the direct physical realization of 3D computer models. This technology converts the 3D computer data provided by a dedicated file (STL file) format

* Reader, ** Senior Lecturer, Azeezia College of Dental Sciences, Meeyannoor, Kollam



Volume-rendered CBCT images for the airway in either color enhanced form (A, B, and C) or shaded form (D) where the colors or the shadow are used to aid better visualization and assessment of the airway, as well as correlations with the surrounding head and neck structures. Images generated using the Dolphin software (A), 3dMD (B and D), and InVivoDental (C).



Computer-generated models reconstructed from the digital imaging and communications in medicine (DICOM) data using the InVivoDental software showing not only the crowns of the teeth but also the roots.

directly to a physical model, layer by layer with a high degree of accuracy.

Stereolithography (SLA)

Stereolithography (SLA) is the most widely distributed process of RPT

Applications

1. Custom made brackets for individual patient anatomy of crowns. [lingual brackets]
2. Various mock surgery procedures can be practiced on the 3D Biomodels, allowing optimal input into the management decision, pre-operative planning and choice of surgical technique

Teleradiology

Teleradiology is the electronic transmission of radiological images from one location to another for the purposes of interpretation and/or consultation.

1. Teleradiology allows timely interpretation of radiological images
2. Gives greater access to secondary consultations and to improved continuing education.
3. Users in different locations may simultaneously view images.

These methods after potential to profoundly expand and deepen our understanding of growth and development and therapy, and overall benefit to our patients. The key element in orthodontic treatment remains a skilled orthodontic specialist with an understanding of the biological and biomechanical knowledge base.

Bibliography

1. Frank JL. Computer aided drafting. J Clin Orthod 1986; 20: 327-29.
2. Yehya AM, et al. Automated cephalometric soft tissue analysis. J Clin Orthod 1990;
3. Warradine N, et al. Holograms as substitutes for orthodonticstudy casts. Am J Orthod Dentofacial Orthop 1990; 98 :110-16.
4. Wenzel A, et al. Digital radiography for orthodontist. Am JOrthod Dentofacial Orthop 2002; 121: 231-35.
5. Saniz Kavacay, Niel Bulakbasi. Reliability of Cone BeamComputed Tomography for dental measurements. Am J Orthod Dentofacial Orthop 2006; 129: 24-28.

Comparison of the arch widths in cleft palate patients

* Suja Ani G., **Dhiraj Agrawal, ***Jayan James

Abstract

Maxillary arch widths and ratios of arch widths are computed for unilateral cleft patients. The maxillary dental arch dimensions in unilateral cleft are different from that of the normals.

KDJ 2012; Vol. 35, no.2: 214-219

Introduction

Cleft palate is the most common genetic defect seen in the orofacial region, for treatment of which the patients report to the department of orthodontics also. There are different types of clefts, and different classifications. The cleft may be unilateral or bilateral. The patients who reported to the dept: of orthodontics were divided into the different groups of classifications, and an attempt is made here to determine the arch width in unilateral cleft palate patients.

Background/Rationale

Studies were made to measure the arch widths in the normals of our population, in our state, in our country and in the world; but the arch dimensions of the cleft patients are not that widely studied. Hence this study is undertaken on the arch dimensions of the cleft patients, in the government dental college, Thiruvananthapuram.

Materials and methods

This study was carried out in the Department of Orthodontics, Government Dental College, Thiruvananthapuram, during the period from January 2012 to March 2012.

Twenty plaster study models, of unilateral cleft patients who reported for treatment in the department of Orthodontics, Dental College, Thiruvananthapuram, were taken up for analysis. The criteria for selection of the study casts included unilateral cleft palate with presence of most of the permanent teeth except 3rd molar. These were the study casts of patients who had undergone surgical repair of the cleft palate at the specified required age and who belonged to Kerala by birth and domicile. The arch dimensions were taken using digital vernier callipers, in millimeters. Standardisation of the readings were done. The dimensions taken for this study were inter canine width; inter premolar width, and inter molar widths. Maxillary inter canine width (MX33) was measured at the cervical margin, on the labial surface of maxillary canines; maxillary inter premolar width (MX44) was measured at the cervical margin, on the buccal surface of maxillary first premolars; and maxillary inter molar width (MX66) was measured at the cervical margin at the buccal surfaces of maxillary molars. No reading was taken when a tooth was missing or unerupted. No substitution was made for missing and/ or unerupted tooth as it may give false reading. Ratios were also computed. Ratios computed were maxillary inter canine width (MX33) divided by maxillary inter molar width (MX66); and maxillary inter premolar width (MX44) divided by maxillary inter molar width (MX66); and maxillary inter canine (MX33) divided by maxillary inter premolar width (MX44). The mean ages of the cleft patients were 16.5 years. There were 7 males and 13 females.

The data was analysed statistically using the SPSS software. The mean and the standard deviations for the arch dimensions were calculated. Whether there is any statistically significant difference between the mean values observed for males and females were also analysed. Comparison of the arch width values of the cleft with that of the normal population values obtained from an earlier study conducted in the department of orthodontics, Govt: Dental College, Thiruvananthapuram was done, the mean age of the normal sample being 19.4 for the sample designated as T1 sample and 34.4

* Professor, ** P.G. Student, *** Asst. Professor, Dept. of Orthodontics, Govt. Dental College, Trivandrum



Fig A, B, C Photographs of a Unilateral cleft patient

Fig A Frontal View Fig B Right lateral view Fig C Maxillary occlusal view

Table 1: *Mean and SD of arch dimensions for the cleft and the normals*

parameter	Category	N	mean	sd	t	p
maxillary inter canine width (MX33)	Cleft	15	33.15	5.50	-3.116	0.004
	Normal	15	37.88	2.08		
maxillary inter premolar width (MX44)	Cleft	20	38.75	5.40	-4.674	0.000
	Normal	15	45.71	2.29		
maxillary inter molar width (MX66)	Cleft	19	51.24	5.27	-4.609	0.000
	Normal	15	57.98	2.28		
mx33/mx44	Cleft	15	0.84	0.14	0.260	0.797
	Normal	15	0.83	0.02		
mx33/mx66	Cleft	14	0.67	0.14	0.415	0.682
	Normal	15	0.65	0.02		
mx44/mx66	Cleft	19	0.76	0.13	-0.721	0.476
	Normal	15	0.79	0.03		

Table 2: *Genderwise comparison among the cleft*

parameter	Category	N	mean	sd	t	p
maxillary inter canine width (MX33)	Male	5	33.07	4.13	-0.037	0.971
	Female	10	33.19	6.29		
maxillary inter premolar width (MX44)	Male	7	35.32	3.35	-2.310	0.033
	Female	13	40.60	5.48		
maxillary inter molar width (MX66)	Male	7	50.97	2.23	-0.162	0.873
	Female	12	51.39	6.54		
mx33/mx44	Male	5	0.93	0.13	2.100	0.056
	Female	10	0.79	0.12		
mx33/mx66	Male	5	0.64	0.08	-0.505	0.623
	Female	9	0.68	0.17		
mx44/mx66	Male	7	0.69	0.04	-2.031	0.058
	Female	12	0.81	0.14		

Table 3: *Comparison between cleft and normal among males*

parameter	Category	N	mean	sd	t	p
maxillary inter canine width (MX33)	Cleft	5	33.07	4.13	-3.465	0.004
	Normal	10	38.46	2.02		
maxillary inter premolar width (MX44)	Cleft	7	35.32	3.35	-7.438	0.000
	Normal	10	45.98	2.57		
maxillary inter molar width (MX66)	Cleft	7	50.97	2.23	-7.293	0.000
	Normal	10	58.73	2.11		
mx33/mx44	Cleft	5	0.93	0.13	2.280	0.040
	Normal	10	0.84	0.02		
mx33/mx66	Cleft	5	0.64	0.08	-0.478	0.641
	Normal	10	0.65	0.02		
mx44/mx66	Cleft	7	0.69	0.04	-5.794	0.000
	Normal	10	0.78	0.03		

Table 4: *Comparison between cleft and normals among Females*

parameter	Category	N	mean	sd	t	p
maxillary inter canine width (MX33)	Cleft	10	33.19	6.29	-1.211	0.248
	Normal	5	36.72	1.85		
maxillary inter premolar width (MX44)	Cleft	13	40.60	5.48	-1.807	0.090
	Normal	5	45.18	1.71		
maxillary inter molar width (MX66)	Cleft	12	51.39	6.54	-1.677	0.114
	Normal	5	56.47	2.00		
mx33/mx44	Cleft	10	0.79	0.12	-0.398	0.697
	Normal	5	0.81	0.02		
mx33/mx66	Cleft	9	0.68	0.17	0.423	0.680
	Normal	5	0.65	0.03		
mx44/mx66	Cleft	12	0.81	0.14	0.092	0.928
	Normal	5	0.80	0.02		

for the sample designated as T2 sample in that study; and the sample number being 15.

The average maxillary intercanine width (MX33) among cleft was 33.15±5.50 and that among the normals* was 37.88± 2.08. The observed difference was statistically significant ($p<.05$). MX33 value for the cleft was significantly less when compared with the normals. The average maxillary inter premolar width (MX44) among cleft was 38.75± 5.40, and that among the normals was 45.71±2.29. The observed difference was statistically significant ($p<.05$). MX44 value for the cleft was significantly less when compared with the normals. The average maxillary inter molar width (MX66) among cleft was 51.24± 5.27, and that among the normals was 57.98±2.28. The observed difference was statistically significant ($p<.05$). MX66 value for the cleft was significantly less when compared with the normals. The average mx33/mx44 ratios among cleft was 0.84± 0.14, and that among the normals was 0.83±0.02. The observed difference was statistically not significant ($p>.05$). The average mx33/mx66 ratios among cleft was 0.67±0.14, and that among the normals was 0.65±0.02. The observed difference was statistically not significant ($p>.05$).

The average mx44/mx66 ratios among cleft was 0.76± 0.13, and that among the normals was 0.79±0.03. The observed difference was statistically not significant (p>.05).

The average maxillary intercanine width (MX33) among the males in the cleft sample was 33.07±4.13, and that among the females was 33.19± 6.29. The observed difference was statistically not significant (p>.05). The average maxillary inter premolar width (MX44) among the males in the cleft sample was 35.32± 3.35, and that among the females was 40.60±5.48. The observed difference was statistically significant (p<.05). The average maxillary inter molar width (MX66) among the males in the cleft sample was 50.97± 2.23, and that among the females was 51.39±6.54. The observed difference was statistically not significant (p>.05). The average mx33/mx44, mx33/mx66 and mx44/mx66 ratios did not show statistically significant difference between the males and females in the cleft sample (p>.05).

The average maxillary inter canine width (MX33) among males of the cleft was 33.07±4.13, and that among the males of the normals was 38.46± 2.02. The observed difference was statistically significant (p<.05). The average maxillary inter premolar width (MX44) among males of the cleft was 35.32± 3.35, and that among the males of the normals was 45.98±2.57. The observed difference was statistically significant (p<.05). The average maxillary inter molar width (MX66) among males of the cleft was 50.97± 2.23, and that among the males of the normals was 58.73±2.11. The observed difference was statistically significant (p<.05). The average mx33/mx44 ratio among males of the cleft was 0.93± 0.13, and that among the males of the normals was 0.84±0.02. The observed difference was statistically significant (p<.05). The average mx44/mx66 ratio among males of the cleft was 0.69± 0.04, and that among the males of the normals was 0.78±0.03. The observed difference was statistically significant (p<.05). The average mx33/mx66 ratio among males of the cleft was 0.64± 0.08, and among the males of the normals was 0.65±0.02. The observed difference was statistically not significant (p>.05).

The average maxillary inter canine width (MX33) among females of the cleft was 33.19±6.29, and that among the females of the normals was 36.72± 1.85. The observed difference was statistically not significant (p>.05). The average maxillary inter premolar width (MX44) among females of the cleft was 40.60± 5.48, and that among the females of the normals was 45.18±1.71. The observed difference was statistically not significant (p>.05). The average maxillary inter molar width (MX66) among females of the cleft was 51.39± 6.54, and that among the females of the normals was 56.47±2. The observed difference was statistically not significant (p>.05). The average mx33/mx44 ratio among females of the cleft was 0.79± 0.12, and that among the females of the normals was 0.81±0.02. The observed difference was statistically not significant (p>.05). The average mx33/mx66 ratio among females of the cleft was 0.68± 0.17, and among the females of the normals was 0.65±0.03. The observed difference was statistically not significant (p>.05). The average mx44/mx66 ratio among females of the cleft was 0.81± 0.14, and that among the females of the normals was 0.80±0.02. The observed difference was statistically not significant (p>.05).

Discussion

Management of the cleft patients requires a multidisciplinary approach, and the treatment is a prolonged to, over years; study on the arch dimensions would be appreciated in this context.

Analysis of the arch widths showed that the arch widths in the inter canine, inter premolar and the inter molar regions (MX33, MX44 and MX66) showed significant changes between the cleft and the normals. This may be explained as per 'Literature has shown that, even with the conservative non traumatic surgical techniques, early repairing surgeries induce changes in the upper dental arch morphological characteristics in patients with cleft lip and palate' (as cited in ref 2), since the study sample included patients who had undergone surgical intervention. Genderwise comparison among the cleft showed significant changes in MX44 in males and females. Comparison between cleft and normal among males showed significant difference in the parameters studied, except in the mx33/mx66 ratio. Comparison between cleft and normal among females did not show any significant difference in any of the parameters studied.

Comparison between cleft and normal among males and also comparison between cleft and normal among females did not show any significant difference in the MX33/MX66 ratio. Of the parameters taken up for this study on cleft, MX33/MX66 ratio alone showed statistically significant difference in the T1 and T2 groups in the early adulthood in the study on normals*, (0.013mm in 15 years, averaging to 0.001mm/year).

Conclusion

1. The maxillary dental arch dimensions in unilateral cleft are different from that of the normals

2. In the cleft sample, The mean inter canine width, inter premolar width and the inter molar widths for the males was 33.07±4.13, 35.32±3.35, and 50.97± 2.23 respectively; for the females was 33.19±6.29, 40.60± 5.48, and 51.39±6.54 respectively; and for the total population was 33.15±5.50, 38.75±5.40, and 51.24± 5.27 respectively.

3. The mean maxillary inter premolar width (MX44) showed a statistically significant difference between the males and females of the cleft sample ($p<.05$); the values were 35.32±3.35 (males) 40.60±5.48 (females). The other parameters in the study did not show any statistically significant difference between the males and females.

4. In the cleft sample, the mean inter canine width/ inter molar width; and inter premolar width/ inter molar width and inter canine/inter premolar width ratios for the males was 0.64± 0.08, 0.69± 0.04, and 0.93± 0.13; for the females was 0.68± 0.17, 0.81± 0.14, and 0.79± 0.12; and for the total population was 0.67± 0.14, 0.76± 0.13 and 0.84± 0.14.

5. On comparison between cleft and normal among males, there was significant difference between males of the cleft and the normal populations in MX33, MX44, MX66, MX33/MX44 ratio and MX44/MX66 ratio. The MX33/MX66 ratio showed no significant difference.

6. On comparison between cleft and normals among females, there was no significant difference between females of the cleft and the normal populations.

*Normals - refers to the sample for whom the values were obtained in ref. 1.

References

1. A fifteen year longitudinal study on the craniofacial and dental changes in Kerala population with normal occlusion. Dr Suja Ani G. Dissertation submitted in partial fulfilment of the requirements for the degree of Master of Dental Surgery in Orthodontics in the University of Kerala November 1997 (unpublished).

2. Omar Gabriel da Silva Filho, Fabricio Monteiro de Castro Machado, Adriana Coelho de Andrade, José Alberto de Souza Freitas, Samir E. Bishara (1998). Upper dental arch morphology of adult unoperated complete bilateral cleft lip and palate. American Journal of Orthodontics & Dentofacial Orthopedics Volume 114, Issue 2, Pages 154-161, August

Twin block

* Amal S Nair, ** Anil Kumar P, ** Rajashekar

Abstract

This case reports illustrate the effective treatment of Class II division 2 malocclusion with modifications to the Twin Block appliance. This approach may reduce the total treatment time and reduce the need for extra-oral anchorage. In The case presented treatment has been carried out on a non-extraction basis with full correction of the malocclusion.

KDJ 2012; Vol. 35, no.2: 220-221

Introduction

The Twin Block developed by Clark (1982), has proved a popular and clinically successful appliance. With improved patient co-operation and increased daily wear correction of a sagittal discrepancy is possible in many patients within a 6–9-month period.

Patients who may be considered for this modified Twin Block technique are those with a Class II division 2 incisor relationship on a moderate Class II skeletal base with an ANB of 6–9 degrees. The buccal segment relationship should ideally be at least half a unit Class II and the patient should have potential for further facial growth. Cephalometric analysis is carried out to confirm that the lower incisors can be proclined during treatment of the malocclusion. The axial inclination of the upper incisors is corrected initially by labial tipping and this corrected inclination is maintained during further correction of the malocclusion.

The bite registration is taken with the buccal segment relationship in an over corrected position, this may result in an edge-to-edge incisor position or a slight reversed overjet. However, by ensuring that there is 7–8 mm of separation in the buccal segments, there should be no incisal interference as the upper labial segment is proclined. It is also essential to have sufficient height of the blocks to ensure that the patient is more comfortable posturing forwards than closing in centric relation.

Pre-treatment

* Reader, ** Professor, Department of Orthodontics, Sree Mookambika Institute of dental sciences, Kulashekaram, Tamilnadu, India

Appliance in position **Post treatment**

Case presentation

A 13 year-old female was referred to the Department of orthodontics, Sree Mookambika Institute of dental sciences, Kulashekaram, Tamilnadu, India), She presented with a Class II division 2 incisal relationship on a moderate Class II skeletal base, with mandibular retrognathia. In occlusion the overbite was 6 mm and, the overjet was 8 mm. The buccal segment relationship was a full unit Class II bilaterally. The cephalometric tracing confirmed that the patient had a moderate Class II skeletal base relationship with an ANB value of 8•0 degrees.

Treatment involved correcting the Class II skeletal relationship with a Twin Block appliance. Twin Block appliances were fitted and instructions given to turn the anterior screw and mid-line screw both once a week, but not simultaneously. Antero-posterior correction of the buccal segments was achieved after 8 months full time wear. Following treatment the patient's facial appearance has improved with the mandible appearing less retrognathic and the lower anterior face height increased. The teeth have been aligned, the buccal segment relationship is now Class I and the inclination of the upper labial segment has been corrected.

Discussion

There are obvious advantages of treating Class II division 2 patients with one removable functional appliance prior to fixed appliance therapy. Treatment time may be significantly reduced by eliminating a pre-functional phase of treatment.

References

1. Clark, W. J. (1982) The Twin Block traction technique, European Journal of Orthodontics, 4, 129–138
2. Houston, W. (1989) Incisor edge-centroid relationship and overbite depth, European Journal of Orthodontics, 11, 139–143.
3. Houston, W. and Tulley, J. (1993)A Textbook of Orthodontics,Wright, Bristol.
4. Illing, H. M., Morris, D. O. and Lee, R. T. (1998) A prospective evaluation of Bass, Bionator and Twin Block appliances. Part 1—the hard tissues, European Journal of Orthodontics, 20, 501–516.
5. Lund, D. I. and Sandler, P. J. (1998) The effects of Twin Blocks: a prospective controlled study, American Journal of Orthodontics and Dentofacial Orthopaedics, 113, 104–110.
6. Mills, C. M. and McCulloch, K. J. (1998) Treatment effects of the Twin Block appliance: a cephalometric study, American Journal of Orthodontics and Dentofacial Orthopaedics, 114, 15–21.
7. Mills, J. R. E. (1973) The problem of overbite in Class II division 2 malocclusion, British Journal of Orthodontics, 1, 34–48.
8. Selwyn-Barnet, B. J. (1991) Rationale of treatment for Class II division 2 malocclusion, British Journal of Orthodontics, 18, 173–181.
9. Selwyn-Barnet, B. J. (1996) Class II division 2 malocclusion: a method of planning and treatment, British Journal of Orthodontics, 23, 29–36
10. Toth, L. R. and McNamara, J. A. (1999) Treatment effects by the Twin-block appliance and the FR-2 appliance of Frankel compared with an untreated Class II sample, American Journal of Orthodontics and Dentofacial Orthopaedics, 116, 597–609.
11. Trenmouth, M. J. (2000) Cephalometric evaluation of the Twin-block appliance in the treatment of Class II division 1 malocclusion with matched normative growth data, American Journal of Orthodontics and Dentofacial Orthopaedics, 117, 54–59.

Treatment of a growing patient with skeletal maxillary constriction using rapid palatal expansion

* Shino P. Mathew, ** P. Anil Kumar, * Amal S. Nair, *** Shinod Varghese

Introduction

Rapid Palatal expansion has been used for more than 100 years, to correct maxillary skeletal base constriction, first reported by E.H. Angell in the 1860's. Skeletal maxillary constriction, which is distinguished by a narrow palatal vault, usually produces a posterior cross bite, and posterior cross bite due to a narrow maxilla is an indication for treatment at the time it is discovered. It can be corrected by opening the Mid – Palatal suture, which widens the roof of the mouth and floor of the nose. And to obtain maximum skeletal effect, it is necessary to place force directly across the suture[1]. Timing is also very crucial in treating a patient with rapid palatal expansion as chances of successful opening of suture are nearly 100% before age 15 (before and during adolescence) but begins to decline thereafter because of increased inter-digitation[2].

Pre – Treatment Assessment

13 year old patient came to department of orthodontia at S.M.I.D.S, complaining of forwardly placed upper front teeth. The general health of the patient was good with no significant medical history and no history of any intra oral habits were reported.

Clinical examination – Extra oral

Patient had a leptoprosopic facial form with a straight soft tissue profile: Lips were incompetent at rest position, with a deep mentolabial sulcus.

Clinical examination – Intra oral

Her General oral and dental conditions were good.

a) Maxillary arch

Tapered asymmetrical constricted maxillary arch with crowding in relation to the anteriors.

b) Mandibular arch

Ovoid asymmetrical arch, Anterior teeth were retroclined with mild crowding.

c) Occlusal features

Patient had an overjet and overbite of 6 mm respectively. Both the left and right buccal segments were in a class I molar relationship and lingual cross bites with respect to 13,23,16.

Diagnosis

Angles Class I malocclusion with skeletal maxillary constriction and proclined upper anteriors.

Clinical Management

1st phase of treatment

The treatment plan consisted of 2 phases. A Non-extraction treatment approach using a Rapid Maxillary expansion screw (HYRAX) was initiated to correct the posterior transverse discrepancy between the dental arches. The HYRAX screw was soldered on the 1st molar as well as the 1st premolar. The expander was activated 1.5 mm (six turns) on the 1st day and 0.5 mm each successive day by a 1/4 turn in the morning and evening and this was done till the maxillary arch was over corrected by 2-3 mm and maxillary lingual cusp comes in contact with mandibular buccal cusp. Mandibular posterior bite blocks were used during the 1st phase of treatment to guarantee vertical control during expansion. The screw was then fixed and the appliance was left in situ for 3 months for retention.

2nd phase of treatment

After the required expansion was achieved, fixed appliance treatment was initiated using PEA .022 MBT prescription system and 0.016" Nitinol wire was placed in the upper and lower arch for alignment purpose. Intrusion and

* Reader, ** Professor, *** Senior Lecturer, Dept. of Orthodontics, Sree mookambika Institute of Dental Science, Kulasekharam, TamilNadu.

Pre-treatment

During treatment

with RME

Post treatment

retraction of the upper anteriors were done with a 3-piece intrusion arch on a 0.017 x 0.025" S.S. sectional wire. Patient co-operation was excellent and the treatment was completed in 20 months time. For retention purpose an upper and lower Begg Retainers were given.

Conclusion

Timing is a very crucial factor in treating a patient with skeletal maxillary constriction as it involves opening of the mid palatal suture and it should be done before or during the adolescence phase after which the inter maxillary suture ossifies.

References

1. Profitt.WR, Fields H.W. Contemporary Orthodontics (3rd ed), Mosby2001.
2. Melsen B. Palatal growth studied on human autopsy material, Am.J.Orthod 68:42-54,1975.

A modified approach using diode laser to reduce trismus in oral submucous fibrosis patients

* C. Murugavel, ** A. Gnanam, *** Roopesh

Abstract

Aim: To study the efficacy of diode laser in reducing trismus in oral sub-mucous fibrosis patients.

Materials & method: Eight patients reported to the Department Of Oral & Maxillofacial Surgery, SRM Dental College Ramapuram, Chennai, with limited mouth opening were included. Among the 8 patients, two patients declined the treatment protocol due to multiple outpatient visits and for 1 patient the entire treatment regimen and follow-up could not be completed due to poor patient compliance; hence they were excluded from the study. Thereby, 5 patients (3 male, 2 female) 25 – 39 years of age (mean: 32 years) were included. Histopathological study was done to confirm submucous fibrosis. Lysis of fibrous band was done with diode laser for all five patients.

Results: All the patients had a good improvement in mouth opening with an average increase in mouth opening of 20mm.

Conclusion: Various surgical methods have been tried to relieve trismus but the use of diode laser appears to be the easiest one for surgeons and the procedure has good results.

Key words: Oral sub mucous fibrosis, Diode Laser.

KDJ 2012; Vol. 35, no.2 : 224-228

Introduction

Oral submucous fibrosis is a chronic debilitating disease of the oral cavity characterized by inflammation and progressive fibrosis of the submucosal tissues (lamina propria and deeper connective tissues). Oral submucous fibrosis results in marked rigidity and an eventual inability to open the mouth. The condition is well recognized for its malignant potential and is particularly associated with areca nut chewing, the main component of betel quid.

The pathogenesis of the disease is not well established, but the cause of oral submucous fibrosis is believed to be multifactorial. A number of factors trigger the disease process by causing a juxtaepithelial inflammatory reaction in the oral mucosa. Factors include areca nut chewing, ingestion of chillies, genetic and immunologic processes, nutritional deficiencies, and other factors. In later stages, OSMF causes trismus leading to increased morbidity. WHO defined OSMF as a slowly progressing disease characterized by formation of fibrous bands which form a blanched oral mucosa resulting in severe restriction of movement of mouth.[10] The prevalence of submucous fibrosis in random samples of the population in India is up to 0.4%. This indicates that there may be millions of individuals suffering from submucous fibrosis in the country. Although hard data are not available, indications are that this disease is increasing rapidly in India, corresponding to the current upsurge in the popularity of various manufactured areca-nut preparations such as mawa and pan masala. Submucous fibrosis affects all parts of the oral mucosa and occurs in both sexes over a

* Reader, ** Professor, Department of Oral and Maxillofacial Surgery, S R M Dental College, Ramapuram, Chennai.
*** Senior Lecturer, Azeezia College of Dental Sciences, Meeyannoor, Kollam

wide age range. Nevertheless, there are significant and specific regional variations in this regard.

Materials and Methods

Eight patients reported to the Department of Oral & Maxillofacial Surgery, SRM Dental College Ramapuram, Chennai, with limited mouth opening (trismus), Patient also complained about pain and burning sensation. On clinical examination fibrosis of the mucosa was seen. These patients were initially included in the study. Among the 8 patients, two patients declined the treatment protocol due to multiple outpatient visits and for 1 patient the entire treatment regimen and follow-up could not be completed due to poor patient compliance; hence they were excluded from the study. Thereby, 5 patients (3 male, 2 female) 25 – 39 years of age (mean: 32years) were included. Histopathological study was done to confirm submucous fibrosis.

Inclusion criteria of patient:

1) Patient with restricted mouth opening due to oral submucous fibrosis randomly selected regardless of patient age, gender, caste and socio-economic status.
2) Patient having no underlying systemic diseases.
3) Patient who had been previously treated with local and medical treatment was also included.
4) Patient diagnosed as oral sub-mucous fibrosis without any dysplastic features.

Instrumentation:

CDHC denlase 980/7 Diode Laser Therapy System, a Class IV laser product, producing semi-conductive (diodic) gallium arsenide (gaas) laser (input: 5 V ~ 14 A, visible output: 1mw max @ 630-670 nm, invisible output: 7 W max @ 800-990 nm manufactured by China Daheng Group Inc.) was utilized in the study.

Surgical technique:

After an informed consent was obtained, all patients were examined by the first investigator. Maximal possible mouth opening noted. Patient was confirmed with the cessation of habit of betel nut chewing before starting the procedure.

Local anesthesia given using lignocaine containing adrenaline in 1:80,000 concentrations. The subjects and the clinician were required to wear protective glasses. Diode laser with a power setup of 1.6 – 1.8 w in intermittent mode was used. Lysis of fibrous band was started from retromolar area near pterygomandibular raphae. We had lysed the fibrous bands in scrapping motion instead of regular inverted 'y'shaped incision. The procedure is limited to mucosal and sub-mucosal layer and not extending to muscle layer. The procedure continued anteriorly till the angle of the mouth avoiding the parotid duct opening. The same procedure was done over the contralateral side. Circumoral bands were also lysed, if present. After the procedure is over, biostimulation is done over raw wound area with diode laser with a power setup of 0.3 w for 60 sec/cm^2. Biostimulation was done extraorally over all the tender points.

Subsequent visit was done on 1st, 3rd, 5, 7th, 15th and 30th post-operative day where biostimulation (0.3w continuous) was done with physiotherapy. The vertical inter-incisal distance between the midpoints of upper and lower central incisors was measured by a ruler and recorded in millimeters.

Pain and burning sensation was analysed with the help of visual analogue scale.

Painvas Scale

1	3	5	7	10
No pain	mild	moderate	severe	very severe

Results

All the patients had a good improvement in mouth opening with an average increase in mouth opening of 20 mm.

Pain was increased after the fibrotomy but later it was reduced and there was no pain at the end of the 5th visit for the entire patient.

Burning sensation was also increased after fibrotomy but it was also reduced to no burning sensation at the end of 5th visit.

Statistical analysis of the parameters obtained was conducted using SPSS for Windows. Differences were analyzed by paired samples T test and listed below in table.

The interincisal opening pre-operative and post-operative after the treatment is listed below in table.

On statistical analysis in burning sensation there was differences when comparing Pre-Operative value with 2nd, 3rd, 4th Visit, but no difference was seen in when comparing pre-operative with 5th visit and comparing 1st and 2nd visit with 5th visit. P value was significant.

Table 1

Sl.No	Patient Name	Pre-Operative Interincisal Opening	Post-Operative Interincisal Opening
1	Case-1	17 mm	35 mm
2	Case-2	11 mm	35 mm
3	Case-3	16 mm	37 mm
4	Case-4	20 mm	35 mm
5	Case-5	24 mm	46 mm

Chart 1

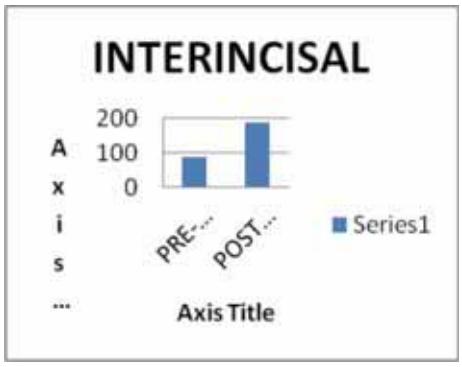


Fig. 1 preoperativve mouth opening

Fig. 2 Fibrotomy

Fig. 3 Immediate post operative

On statistical analysis in pain intensity there was differences when comparing Pre-Operative value with 2nd, 3rd, Visit, but no difference was seen in when comparing pre-operative with 4th and 5th Visit and comparing 2nd Visit with 4th and 5th Visit. P value was significant.

On statistical analysis in inter incisal. P value was highly significant, which showed the success of treatment.

Discussion

Oral submucous fibrosis is a high risk precancerous condition that predominantly occurs amongst Indians, Indians settled outside India, to a lesser extent in other Asiatics, and sporadically in Europeans.

Ajit Auluck et al[1]stated that habit of chewing betel quid containing areca nut causes chronic irritation of oral mucosa, eliciting chronic inflammatory response. This inflammatory response activates the T-cells and macrophages at the site which inturn increases cytokines like IL-6, IF-alpha and growth factor TGF-alpha. The cytokines and growth factor later forms insoluble forms of collagen in two ways. One way is by activating procollagen gene that forms soluble collagen which is converted into insoluble collagen by the action of copper stimulated lysyl oxidase and flavonoids in areca nut. The other way is by activating tissue inhibitor of matrix metalloproteinase (TIMP) and plasminogen activator inhibitor gene which inhibits activated collagenase and conversion of procollagenase to collagenase leading insoluble collagen. This insoluble collagen is the cause for oral submucous fibrosis.

Guari Mishra et al[5] has stated that oral submucous fibrosis is a form of pathologic fibrosis affecting oral mucosa. There is compelling evidence to implicate the habitual chewing of areca nut with the development of oral submucous fibrosis. Arecoline stimulates fibroblasts to increase the production of collagen by 150%..

M.Y.P. kuo et al[8] reported that fibroblasts from oral submucous fibrosis tissues were isolated and established. In comparison with normal fibroblasts,

Fig. 4 post op healing

Fig. 5 post op mouthopening

some oral submucous fibrosis fibroblasts synthesized larger amounts of collagen; they have higher procollagen levels; and they produce type I collagen trimer, which is resistant to degradation. These properties might contribute to the accumulation of collagen in oral submucous fibrosis lesions.

Pao-Hsin Liao[9] found frequency of mutations in the *APC* gene and low expression of the wild-type *TP53* tumor suppressor gene product in patients with oral submucous fibrosis, providing some explanation for the increased risk of oral squamous cell carcinoma development in patients with oral submucous fibrosis.

Lidiane Isabel fillipin et al[7] reported that laser reduces histological abnormalities, collagen concentration, and oxidative stress in an experimental model of Achilles tendon injury. Reduction of fibrosis could be mediated by the beneficial effects on the oxidant/antioxidant balance.

Ribeiro et al[11] stated that the primary biologic effect of the laser on connective tissue is the rapid generation of myofibroblasts from fibroblasts and concluded that the induction of a phenotype with contractile properties may have clinical significance in the acceleration of the wound-healing process. It facilitates myofibroblastic differentiation during the early stages of the cicatricial repair process. Laser therapy also appears to modulate the inflammatory response by downregulating lymphocytic proliferation during the wound healing process.

Sushma Lagdive et al[12] stated that Diode laser basically does not interact with dental hard tissue it is a excellent soft tissue surgical laser, indicated for cutting and coagulating gingiva and oral mucosa and also soft tissue curettage. Laser has a photothermal, chemical and plasma mediated effects. The absorption of light by organic molecule leads to stimulation of π electrons and n electrons, causing photochemical reaction causing break up of chemical compounds.

Yogesh Doshi et al[15] Lasers have potential advantage of a bactericidal and detoxifying effect as well as removal of epithelial lining and granulation tissue.

Anisha Maria et al[3] has studied use of nasolabial "islanded" flaps after the resection of fibrous bands in oral submucous fibrosis patients and found that inferiorly based nasolabial "islanded" flaps provide reliable coverage of defects of the buccal mucosa and improves mouth opening. Author also tells that Tongue flaps are bulky and when used bilaterally cause disarticulation, dysphagia and increased chances of aspiration. Harvesting of buccal pad fat is easy but the anterior reach of the flap is often inadequate and cannot be used for larger defects. Complications of the nasolabial flap include loss of the nasomaxillary crease and the creation of an edematous and bulky flap.

D. R. Nayak et al[4] had used KTP-532 laser in management of oral submucous fibrosis and found that adequate release of oral submucous fibrosis could be achieved by using a KTP-532 laser procedure with satisfactory results.

Tanveer Alam et al[13] reports the use of carbondioxide laser in treating benign soft tissue like lesion in oral cavity. Author found that laser provided bloodless field and also allow histological examination without distortion, resulting in painless post-operative period and no collateral damage to adjacent tissue with no post-operative complication like, pain and swelling. Author then concluded that laser can be considered as a revolutionary modality for surgical excision of oral exophytic growth.

Viral Chhaya et al[14] had studied the use of carbon dioxide laser in release of trismus in oral submucous fibrosis. In severe cases, fibrous bands from the palate fixate and reduce the mobility of the mandible. In these cases, CO_2 laser excision or lysis of the bands followed by mouth opening exercises has been found to be an effective palliative treatment in oral submucous fibrosis.

Anil Shah et al [2] had carried out the study using an Opus 5 diode laser to relieve trismus caused by oral submucous fibrosis, evaluated the efficacy of surgical excision with laser without any graft to cover wounds and to maintain mouth opening postoperatively by physiotherapy.

Conclusion

Various surgical methods have been tried to relieve trismus but the use of diode laser appears to be the

easiest one for surgeons and the procedure has good results. Diode laser emits through fiber-optic cable and has reasonable cutting efficacy.

Of the numerous properties, penetration and absorption of rays are the two most relevant parameter for selection of diode laser, Diode laser is a portable device which delivers rays through a fiber-optic cable. Its cutting depth is less than 0.01 mm, and thus preserves tissues beyond this depth[6]. It gives a precise line of controlled cutting without damaging the muscles and deeper structures.

Laser therapy eliminates the use of grafts, to close defect in spite of extensive lysis of fibrous bands. It yields excellent cosmetic and functional results.

Our entire patient had increased mouth opening with an average of 20 mm. Pain and burning sensation was reduced and absent at the end of the treatment. On statistical analysis P value was highly significant.

It is also better accepted by the patient as the whole treatment is done in local anaesthesia in outpatient department and there is no need of hospital stay.

References

1. Ajit Auluck, MDS; Miriam P. Rosin, PhD; Lewei Zhang, Bds, Phd, Frcd(c); Sumanth Kn,) Oral Submucous Fibrosis, a Clinically Benign but Potentially Malignant Disease:Report of 3 Cases and Review of the Literature. *JCDA, October 2008, Vol. 74, No. 8.*
2. Anil Shah, Sunanda Raj, Viral Rasaniya, Shirish Patel, Mohan Vakade. Surgical Management Of Oral Submucous Fibrosis With Opus – 5 Diode Laser. *Journal of oral laser application 2005, 5, 37-43*
3. Anisha Maria, Yogesh Sharma, Preeti Kaur. Use of Nasolabial Flap in the Management of Oral Submucous Fibrosis – A Clinical Study *People's Journal of Scientific Research 29 Vol. 4(1), Jan. 2011.*
4. D.R Nayak, S. G. Mahesh, P Pavithran, K Pujary, S Pillai. Role of Ktp –532 Laser In Management Of Oral Submucous Fibrosis. *The journal of laryngology and otology. 2009, 123, 418 – 421.*
5. Gauri mishra, Ranganathan Matrix metalloproteinase-1 expression in oral submucous fibrosis: An immunohistochemical study. *Indian J Dent Res 2010; 21:320-5.*
6. Jawahar. R Talsania, Umakant B Shah. Use of Diode Laser In Oral Submucous Fibrosis With Trismus: Prospective Clinic Study. *Indian journal otolaryngology head and neck surgery 61: 22-25(2009).*
7. Lidiane Isabel Fillipin Msc, José Luis Mauriz PhD, Kelem Vedovelli Msc, Andréa Janz Moreira MSC. Low-level laser therapy (LLLT) prevents oxidative stress and reduces fibrosis in rat traumatized Achilles tendon. *Lasers in Surgery and Medicine volume 37, issue 4, pages 293–300, october 2005.*
8. M.Y.P. Kuo, H.M. Chen, L.J. Hahn, C.C. Hsieh and C.P. Chiang. Collagen Biosynthesis in Human Oral Submucous Fibrosis Fibroblast Cultures. *J Dent Res 1995 74: 1783.*
9. Pao-hsin Lia, Tien-linglee, Li-chiu Yang, Shyh-hwang Yang, Shiow-ling Chen, Ming-yung Chou. Adenomatous polyposis coli gene mutation and decreased wild type-p53 protein expression in oral submucous fibrosis: A preliminary investigation.*OOOOE,2001;92:202-207.*
10. Rajiv S. Desai A, G.S. Mamatha A, Musarrat J. Khatri A, Subraj J. Shetty B.Immunohistochemical Expression of Cd34 For Characterization And Quantification Of Mucosal Vasculature And Its Probable Role In Malignant Transformation Of Atrophic Epithelium In Oral Submucous Fibrosis. *Oral Oncology 46 (2010) 553–558.*
11. Ribeiro MA, Albuquerque RL, Ramalho LM, Pinheiro AL. Immunohistochemical Assessment Of Myofibroblast And Lymphoid Cells During Wound Healing in Rats Subjected to Laser Photobiomodulation At 660nm. *Photomed Laser Surgery.(2009)*
12. Sushma, Yogesh Doshi, P.P Marawar.Management of gingival hyperpigmentation using surgical blade and diode laser therapy : A Comparetive Study. Sushma lagdive. *Journal oral laser application 2009, 9, 41-47.*
13. Tanveer Alam, Daya K Jangam. CO_2 laser : A treatment modality for benign soft tissue tumor – like lession of the oral cavity – a case report and literature review. *Journal oral laser application 2010, 10,45-51.*
14. Viral A Chhaya, Vikas Sinha, Rajendrasinh Rathor. Oral Submucous Fibrosis – Surgical Treatment With Co_2 Laser. *World Articles in Ear, Nose and Throat 2010 vol.3-2.*
15. Yogesh Doshi. Diode – laser management of puberty – induced gingivitis and grade ll gingival enlargement in a female patient: a case report. *Journal oral laser application 2010, 10, 135-138.*

Role of selective laser sintering technology in dentistry

* Shibu A., ** Anuroopa A., *** Lovely M., **** Arun R.

Abstract

Lasers have a wide application in various clinical as well as laboratory procedures. Among laboratory procedure, the most common applications are in digitalization of impression, welding procedures and in fabrication of crowns. This paper deals with the dental application of metal laser sintering technology for the fabrication of fixed partial denture prosthesis.

Key words: Laser sintering, metal laser sintered crowns, rapid prototyping.

KDJ 2012; Vol. 35, no.2: 229-230

Selective laser sintering technology is an advanced rapid prototyping technology which is used to manufacture ceramic and metal devices directly from the 3D data. It is a layer manufacturing technology which requires less time thereby making it cost effective with less fabrication time. In this technology a three-dimensional object is created layer-by-layer (from bottom to top) from a heat fusible powdered material and fused using the heat generated from a laser device. This additive metal technology is also termed as selective laser melting technology (SLM)[1].

Procedure

There are two type of laser sintering technology namely the direct laser sintering (DLS) and indirect laser sintering technology. In direct laser sintering technology metal powders are used directly without any binder while indirect laser sintering technology uses a binder, hence forth require a post-processing procedure. Direct laser sintering technology is more frequently used in dentistry than the indirect technology. In direct laser sintering procedure a 3D CAD model is fabricated from an STL file using software data in the computer. Now using this a technician builds the model and the super structure required on the computer screen. After "build file" is completed, it is "sliced" into the layer thickness and downloaded to the direct metal laser sintering machine (Fig 1).

The direct metal laser sintering machine has a build chamber area, a material dispensing platform which provides the metal powder for the procedure and a build platform along with a recoater blade or a roller, which moves new powder over the build platform. It also has a Erbium-fiber optic laser which fuses metal powder into a solid part by sintering or melting it locally using the focused laser beam according to the instruction of the CAD file. Once a layer is sintered, the platform lowers slightly so that a thin fresh layer of powder is delivered and further this is also processed. Thus this layer by layer process continues till the structure is complete using layers of 20 micrometer thickness in an hour.(Fig 2).

Since this technique is utilizing rapid prototyping procedure it is also called as "rapid prototyping and rapid manufacturing using direct metal laser sintering technology[2]."

Advantages

Direct metal laser sintering system can use most alloys and the procedure is less time consuming.

Disadvantages

It requires use of Electrical Discharge Machining (EDM) and/

* Reader, ** Senior Lecturer, *** Professor, **** P.G. Student, Department of Prosthodontics, SreeMookambika Institute of Dental Sciences Kulasekharam, Tamilnadu.

Fig – 1 Metal laser sintering machine

Fig – 2 Metal laser sintered crowns

or grinding machines having the same level of accuracy provided by the rapid prototyping machine.

Material used

Currently available alloys used in the process include 17-4 and 15-5 stainless steel, maraging steel, cobalt chromium, inconel 625 and 718 and titanium Ti6Al4V.

General and dental applications

Applications include the manufacturing of parts of aerospace devices, dental and medical implants, working prototype, ergonomic models and medical tools. In dentistry it is used in the manufacture of fixed partial denture, implant fixture and in custom made titanium cast mesh for prosthetic guided bone regeneration of atrophic maxilla.

Prosthetic applications

1) Implant fixtures- Titanium alloys (Ti 6Al 4V) alloy powder of particle size 1-10 microns were prepared using laser sintering technology. Implants with gradient of porosity from inner core to outer surface can be fabricated which results in functionally graded implant material with elastic property similar to bone leading to minimum stress shielding effect and improved long term performance.[3] The implant surface treated by laser sintering technology had better osteoconductive behaviour compared to conventional implants.[4]

2) Fixed partial denture – Cobalt chromium alloy crowns and bridges can be fabricated using this technology. It exhibits mixed failure mode with a prominent adhesive failure on porcelain. But there was no significant difference in bond strength between the cast cobalt chromium alloys and laser sintered cobalt chromium metals.[5,6]

3) Custom made cast titanium mesh- A customized titanium mesh can be fabricated using CAD-CAM procedure and rapid prototyping to augment maxillary bone and minimize surgery.[7,8,9]

Summary and conclusion

The application of laser technology permits fabrication of predictable and precise restoration with accurate fit and marginal integrity. With use of laser energy directed to a small area, it is possible to melt the metal powder resulting in a superior restoration. Hence laser sintering technology is considered as an upcoming science which will improve the clinical outcome in dentistry.

References

1. www.wikipedia.com through google.
2. Montasser M.Dewidar, Jae-Kyoo and K.W.Dalgarn A Comparison between Direct and Indirect Laser Sintering of Metals. J. Mater. Sci. Technol., Vol.24 No.2, 2008 227.
3. Traini T, Mangano C, Sammons RL, Mangano F, Macchi A, Piattelli A. Direct laser metal sintering as a new approach to fabrication of an isoelastic functionally graded material for manufacture of porous titanium dental implants. Dent Mater. 2008 Nov;24(11):1525-33.
4. Mangano C, Piattelli A, Raspanti M, Mangano F, Cassoni A, Iezzi G, Shibli JA. Scanning electron microscopy (SEM) and X-ray dispersive spectrometry evaluation of direct laser metal sintering surface and human bone interface: a case series. Lasers Med Sci. 2011 Jan;26(1):133-8.
5. Tara MA, Eschbach S, Bohlsen F, Kern M Clinical outcome of metal-ceramic crowns fabricated with laser-sinteringtechnology. Int J Prosthodont. 2011 Jan-Feb;24(1):46-8.
6. Akova T, Ucar Y, Tukay A, Balkaya MC, Brantley WA. Comparison of the bond strength of laser-sintered and cast base metal dental alloys to porcelain. Dent Mater. 2008 Oct;24(10):1400-4.
7. Ciocca L, Fantini M, De Crescenzio F, Corinaldesi G, Scotti R.. Direct metal laser sintering (DMLS) of a customized titanium mesh for prosthetically guided bone regeneration of atrophic maxillary arches. Med Biol Eng Comput. 2011 Nov;49(11):1347-52.
8. Oyagüe RC, Sánchez-Turrión A, López-Lozano JF, Montero J, Albaladejo A, Suárez-García MJ. Evaluation of fit of cement-retained implant-supported 3-unit structures fabricated with direct metal laser sintering and vacuum casting techniques. Odontology. 2011 Nov 11.
9. Williams JV, Revington PJ. Novel use of an aerospace selective laser sintering machine for rapid prototyping of an orbital blowout fracture. Int J Oral Maxillofac Surg. 2010 Feb;39(2):182-4.
10. Jaeme Pieree,Vandn Broch,Ignace Naert."Rapid Manufacture of dental prosthesis by mean of selective nature sintering/ melting."Journal of Dental Technology. April 2007.

Osteotome mediated sinus floor elevation with immediate implant placement

* C.S. Nithya

Abstract

Implant placement in the posterior maxilla is usually complicated due to inadequate bone. Various techniques are being followed to lift the sinus floor and augment the available bone. Osteotome technique is a less invasive altranative to the commonly performed lateral window osteotomy. The material of choice to augment bone would be autogenous cancellous bone and the same is used in the present case. This article describes the placement of an implant in the maxilla by localised elevation of the sinus floor by osteotome technique and augmentation of available bone with autogenous bone. Implant was loaded in five months. Followed up for three years.

KDJ 2012; Vol. 35, no. 2: 231-233

Introduction

Replacing the natural teeth has remained a field of interest for the practitioners of dentistry for centuries. Fixed partial denture has almost completely replaced removable partial denture as it is more convenient for the patient. The best available option for a reasonably lasting and "maintainable" solution is implant when compared to the other available means of replacement of teeth. However the quantity and quality of bone available is a major concern. Autogenous bone of sufficient quantity through a small surgery would be most comfortable for the patient.

Due to the close proximity of maxillary sinus and lack of density of bone in the maxillary posterior region, practitioners avoided endosseous implants in this area for a long time[1]. Sinus floor elevation with bone grafting has solved this problem to a great extent. Various techniques have been reported for sinus augmentation and bone grafting with delayed or simultaneous implant placement[2]. A less invasive alternate technique is the osteotome mediated localised elevation of sinus floor through a crestal approach.

Case report

A 42 year old male patient presented with the complaint of difficulty to chew properly due to missing teeth. On clinical examination maxillary left first and second molars were found missing and third molar mesially inclined. Mandibular second molar was also missing. Patient was educated about various methods of replacing the missing teeth. He opted to replacing the maxillary first molar by implant and was not keen on replacing second molar. Necessary blood investigations, IOPA radiograph and OPG helped in planning the implant placement surgery.

The height of bone available at the floor of the maxillary sinus was 6 mm (Fig. 1).

Under local anaesthesia, mid crestal, crevicular and vertical release incisions were made to elevate the mucoperiosteal flap. Mid crestal incision was continued along the buccal crevicular margin of the third molar upto the distal surface of the tooth. The point of insertion of the implant was marked with the pilot drill through the guiding stent. Osteotomy started with pilot drill (Fig. 2), deepened with sequential preparation upto one mm short of the estimated bone height and 5 mm diameter. Sinus floor was fractured with the osteotome and surgical mallet (Fig.3). The third molar was extracted from the same quadrant; small amount of cancellous bone was harvested through the socket and condensed into the osteotomy site. A 5×10 tapered screw type

* Associate Professor, St John's Medical College Hospital, Bangalore

Fig. 1 pre-operative radiograph

Fig. 2 Pilot drill

Fig. 3 Osteotome positioned for sinus floor fracture

Fig. 4 Implant placed

Fig. 5 Immediate post operative radiograph

Fig. 6 Three years

endosteal implant (Fig.4) and cover screw was placed and wound closed.

Crown was delivered after five months. Radiographs were taken immediate post-op (Fig. 5), after prosthesis placement, at one year and two and three year follow-up (Fig. 6).

Discussion

The primary determinant in implant survival is the quantity and quality of available bone. Maxillary posterior region is the most challenging area when it comes to replacing teeth by implant as the bone in this area is Misch's D4 bone which is the softest bone in the jaw. The quality of recipient bone directly influences the amount of trauma generated during osteotomy. This in turn affects the load bearing ability and long time survival. Pathological over load can cause bone loss or microfracture leading to implant mobility.[3,4,5] The challenge is compensated by using larger diameter HA coated threaded implants.

The residual sub sinus alveolar bone height is 6 mm which is sufficient for immediate implant placement with sinus floor elevation and bone graft[6,7,8]. When bone height is less than 5 mm lateral window osteotomy will be preferable[6,7]. Osteotome mediated sinus floor elevation is the ideal technique for a single tooth replacement. Through the osteotomy preparation the osteotome is introduced to compress the bone against the floor of the sinus, ultimately leading to a controlled "inward fracture" of the sinus floor bone along with the schneiderian membrane which should remain intact within the fractured bone. Published reports demonstrate increase in bone height of 2-7mm [avg 4mm][4,5]

Points to be considered:

(1) When sinus floor has an acute anterior slope the osteotome can get deflected.

(2) Septae along the floor may make it impossible to fracture the sinus floor in the desired manner.

Autogenous bone is often considered the gold standard for bone augmentation because of its osteoconductive, osteoinductive, and osteogenic properties[9].

Simultaneous implant placement may not be advisable when the bone height is less than 4mm[7].

Conclusion

The widely accepted option of tooth replacement is fixed partial denture due to the convenience in maintenance when compared to removable partial denture. Implant has the advantage of conservation of adjacent teeth over fixed partial denture. Lack of bone is not a major hurdle in implant surgery these days. Innovations in the implant technology and surgical techniques have evolved to such an extent that success is predictable. The osteotome mediated sinus floor elevation technique has the advantage of being a very simple procedure and hence has good patient acceptance. As this procedure is planned in cases where available bone height is more than 5mm immediate implant placement is possible, thereby reducing the treatment time. Sufficient cancellous bone could be harvested as the third molar was in a non functional position and a candidate for extraction. The implant was loaded in 5 months and has functioned very well till date.

References

1. Esposito M, Hirsh JM, Lekholm U et al.Biological factors contributing to failures of osseointegrated oral implants[I] success criteria and epidemiology. Eur J Oral Sci 1998;106:527-551
2. Misch CE. Contemporary implant dentistry St Louis Mosby 1999,22, 317-327
3. Misch CE. Endosteal implants for posterior single tooth replacement: altranatives, indications, contraindications and limitations. J oral implantol 1999;25:80-94
4. Zarb GA Schmitt A. The longitudinal clinical effectiveness of osseointegrated dental implants in posterior partially edentulous patients. Int j Prosthodont 1993;6:189-196
5. Fugazzotto PA, Wheeler SL. Lindsay JA. Success and failure rates of cylinder implants in type IV bone. J Periodontol 1993;64:1085-1087
6. Toffler M; Osteotome mediated sinus floor elevation: a clinical report, Int J Oral Maxillofac implants 19:266-73,2004
7. Peleg M, Mazor Z, chaushu et al: Sinus floor augmentation with simultaneous implant placement in the severely atrophic maxilla, J Periodontol 69:1397, 1998
8. Bruschi GB Scipioni A, Calesini G, et al : Localised management of sinus floor with simultaneous implant placement : a clinical report, Int J of OMFimplants 13 : 219, 1998
9. Boyne PJ, Janus RA : Grafting of the maxillary sinus floor with autogenous marrow and bone, j Oral Surg 38:613, 1980

INFORMATION FOR AUTHORS **Kerala Dental Journal**

GUIDELINES

Manuscripts: Articles should be type written on one side of A4 size (21x28cm) White paper in double spacing with a sufficient margin. One Original and two high quality photocopies copies should be submitted. The author's name is to be written only on the original copy and not on the two photocopies copies. **In addition to the printed version, a CD containing the article file also should be submitted compulsorily.** Use a clear and concise reporting style. KDJ reserves the right to edit, manuscript, to accommodate space and style requirements. Authors are advised to retain a copy for the reference.

Title Page: Title page should include the title of the article and the name, degrees, positions, professional affiliations of each author. The corresponding authors, telephone, e-mail address, fax and complete mailing address must be given.

Abstract: An abstract of the article not exceeding 200 words should be included with abbreviated title for the page head use. Abstract should state the purpose of the study, investigations, basic procedures and the main findings.

Tables: Tables should be self explanatory, numbered in roman numbers, according to the order in the text and type on separate sheets of paper like legends for illustrations.

Illustrations: Illustrations should be clearly numbered and legends should be typed on a separate sheet of paper, while each figure should be referred to the text. Good black and white glossy photographs or drawings drawn in black Indian ink on drawing paper should be provided. **Colour photographs will be published as per availability of funds. It will incur printing cost. Otherwise the cost of printing will be at the expense of authors and charges will be advanced by KDJ at the time of receipt of accepted manuscripts.** Photographs of X-rays should be sent and not the original X-rays. Prints should be clear and glossy. On the back of each print in the upper right corner, write lightly the figure number and author's name; indicate top of the photograph with an arrow of word Top' Slides and X-ray photographs should be identified similarly.

Photographs:- Author's photograph - Stamp size, Black and White, glossy photographs should be sent along with the article.

Reference: Reference should be selective and keyed in numerical order to the text in Vancouver Style (not alphabetical). Type them double spaced on a separate sheet of paper. Journal references must include author's names, article title, journal name, volume number, page number and year. Book reference must include author's or editor's names, chapter title, book title, edition number, publisher, year and page numbers.

Copy right: Submission of manuscripts implied that the work described has and not been published before (except in the form of on abstract or as part of published lectures, review or thesis) and it is not under consideration for publication else where, and if accepted, it will not be published else where in the same form, in either the same or another language without the comment of copyright holders. The copyright covers the exclusive rights of reproduction and distribution, photographic reprints, video cassettes and such other similar things. The views/opinions expressed by the authors are their own. The journal bears no responsibility what so ever.

The editors and publishers can accept no legal responsibility for any errors, omissions or opinions expressed by authors. The publisher makes no warranty, for expression implied with respect to the material contained therein. The journal is edited and published under the directions of the editorial board who reserve the right to reject any material without giving explanations. All communications should be addressed to the Editor. No responsibility will be taken for undelivered issues due to circumstances beyond the control of the publishers.

Books for review: Books and monographs will be reviewed based on their relevance to KDJ readers. Books should be sent to the Editor and will become property of KDJ.

Return of articles: Unaccepted articles will be returned to the authors only if sufficient postage is enclosed with the manuscripts.

Subscription Rates: Free distribution for all the members of the Indian Dental Association Kerala State.

Inland Subscription: Rs. 400 per issue, Rs. 1500 for 1 Year, Rs. 2500 for 2 years, Rs. 3500 for 3 years.

For on-line Submission of articles: visit www.idakerala.com

All correspondence may please be send to the following address :
Dr. K. Nandakumar,
Hon. Editor, Kerala Dental Journal
Neelambikam, Attukal, Manacaud, Trivandrum - 695 009
Phone: 0471-2459235 / Cell: 09447066100
e-mail: editorkdj@gmail.com

Creating an ovate pontic recipient site using the immediate pontic technique

* Smita Sara Manoj, ** Vidya Chitre, *** Meena Aras

Abstract

The ovate pontic design allows for a natural emergence profile. To sculpt the tissue beneath the pontics, provisional restorations with ovate pontic designs should be provided for tissue guidance and stabilization. This clinical report describes the rehabilitation of a young female patient with a fractured and unrestorable maxillary second premolar using a cantilevered fixed partial denture with an ovate pontic. The step by step method of fabricating an acceptable ovate pontic using an immediate fixed provisional restoration as a template has also been described.

KDJ 2012; Vol. 35, no. 2: 234-236

Conventional fixed partial dentures (FPD) represent the most popularly used treatment modality. The pontic used must fulfil the complex criteria of replacing the function of the lost tooth, provide an esthetic and cleanable prosthesis, prevent tissue irritation and ensure mechanical stability of the restoration.

Over the years, there have been many designs that attempt to create pontics that are both hygienic and natural in appearance. The designs range from conical pontics placed directly in the extraction socket to pontics that require large or very small receptor sites to hygienic (sanitary) pontics which do not come in contact with soft tissues at all.

The ovate pontic initially described in 1933, has been suggested to accurately duplicate the emergence profile of natural teeth[1,2]. Ovate pontics are normally indicated for teeth fractured at the tissue crest with intact buccal plate. One of the most challenging issues in a dental treatment plan is to preserve interproximal tissue after the removal of a tooth. This article presents a case report that illustrates the clinical steps involved in the creation of an ovate pontic recipient site by preserving the interproximal papilla and alveolar bone and the accurate transfer of this site to a laboratory model.

Case report

A twenty six year old female patient reported to the Department Of Prosthodontics, Government Dental College, Goa for restoration of a fractured maxillary left first premolar. On examination it was observed that the tooth was endodontically treated with a vertical fracture extending much below the gingival margin (figure 1). The patient had a high smile line exposing the labial surfaces of teeth, interdental papilla, free marginal gingiva and buccal mucosa.

Treatment plan

As the tooth could not be restored with a full crown restoration, extraction of the same followed by a fixed partial denture was advised. However, the patient objected to any tooth preparation on canine. Finally it was decided to rehabilitate the patient with a cantilever FPD using the second premolar and first molar as abutments. Due to the high smile line, it was decided to fabricate an ovate pontic using an immediate fixed provisional restoration as a template, a technique described by Dylina TJ[1].

Treatment procedure

Tooth preparation was done on the maxillary right second premolar and first molar for a full metal ceramic cantilever FPD. An impression was made. The tooth

* Reader, Dept. of Prosthodontics, Azeezia College of Dental Science and Research, Meeyyanoor, Kollam; ** Asst. Professor, *** Professor and Head, Dept. of Prosthodontics, Goa Dental College and Hospital, Goa.

Fig. 1 Endodontically treated maxillary left second premolar with a vertical fracture extending much below the gingival margin

Fig. 2 Pontic site following tooth preparation and extraction

Fig. 3 Provisional FPD

Fig. 4 Provisional FPD relined and luted in position

Fig. 5 Pontic site after four months of healing

Fig. 6 Provisional restoration used to form the silicone matrix

Fig. 7 Silicone matrix

to be extracted was scrapped off from the cast and a provisional FPD with an ovate pontic was fabricated.

The maxillary left second premolar was then extracted protecting the interdental papillae, buccal and lingual cortical plates. The provisional FPD was relined and luted in position with an interim luting cement (figures 2, 3, 4).

The patient was reviewed after every two-three weeks to check the pontic site for proper healing. The tissue surface of the pontic was periodically relined to ensure marginal fit and contour of the provisional FPD. After four months of healing, the pontic site was examined for any trauma and ulcerations (figure 5). The provisional restoration was removed and final impression for the FPD was immediately made to prevent rebound of tissues.

The provisional restoration was then cleaned of all debris. Silicone putty material was mixed and formed into a rectangular shape. Simultaneously, light body material was injected into the internal surface of the FPD and tissue surface of the pontic. Gingival surface of the provisional restoration was then embedded in the putty material to three quarter the depth of the entire pontic (figure 6). Excess material was trimmed away to ensure proper seating of the abutments. The matrix so formed was then used as an index for fabrication of the final prosthesis (figure 7, 8, 9, 10).

Discussion

This article presents a method of creating an ovate pontic recipient site using an immediately fabricated provisional restoration as a template and also the method of transferring the details of the pontic form to the laboratory technician.

Ovate pontics have been recommended as a means of accurately duplicating the emergence profile for natural teeth to fulfill the esthetic and functional requirements[1,3,4,5,6]. The convex design of this pontic was intended to form a concave soft tissue outline in the site of the alveolar ridge mucosa. In contrast to the requirements for pontics which suggest the importance of pressure-free contact over a small area, the ovate pontic contacts a larger area of the underlying soft tissue and applies very light pressure[2,3]. Even though several authors have reported that soft-tissue contacting pontics were associated with clinical signs of inflammation[3], a histologic observation in humans by Zitzmann et al[4] reported that an ovate pontic design supported by adequate oral hygiene procedures was not associated with overt clinical signs of inflammation.

The various techniques of creating an ovate pontic site varies from controlled regeneration directly after tooth extraction (immediate pontic technique) to plastic surgery (gingival grafting) accompanied by tissue

Fig. 8 Silicone matrix used as an index for fabrication of the final prosthesis

Fig. 9 FPD with the ovate pontic

Fig. 10 Emergence profile created by the ovate pontic

conditioning during the course of subsequent prosthodontic treatment.

In this case, due to the high smile line and the patient's desire for an immediate prosthesis it was decided to fabricate an FPD with an ovate pontic using the immediate pontic technique. The immediate pontic technique helps in creating an emergence profile by retaining the gingival form and limiting the loss of tissues that would cause the appearance of dark interdental areas (black triangles).

Conclusion

Immediate replacement of an extracted tooth with a fixed partial denture is an aesthetic challenge. Use of an ovate pontic design would help in creating a natural emergence profile. An ovate pontic recipient site following atraumatic tooth extraction can be created by using an immediate pontic technique that would help in supporting the extraction socket. Use of ovate pontics requires that the patient exercise special care with oral hygiene procedures.

References

1. Dylina TJ. Contour determination for ovate pontics. J Prosthet Dent 1999;82:136-142.
2. Edelhoff D, Spiekermann H, Yildirim M. A review of esthetic pontic options. Quintessence Int 2002;33:736-746.
3. Liu CS. Use of a Modified Ovate Pontic in Areas of Ridge Defects: A Report of Two Cases. J Esthet Restor Dent 2004;16:273-283.
4. Zitzmann NU, Marinello CP. The ovate pontic design: A histologic observation in humans. J Prosthet Dent 2002; 88:375-380.
5. Vasconcellos DK, Volpato CAM, Zani IM, Bottino MA. Impression technique for ovate pontics. J Prosthet Dent 2010;105:59-61.
6. Pettman PH. Immediate Tooth Replacement with Ovate Pontic on Fixed Bridge. Journal of the Canadian Dental Association 2004;70:564-566.

Sublingual epidermoid cyst

* Rasheena P.M, ** Girija K. L., *** Valsa Thomas

Abstract

Epidermoid and dermoid cysts are extremely rare developmental cysts of a benign nature, usually presenting as painless slow growing swellings which may occur anywhere in the body, although about 7% are found in the head and neck. They represent 0.01% of all oral cavity cysts and are located mostly in the submental region. A case report of a nine year old child with pain and swelling in the middle anterior floor of the mouth histopathologically reported as epidermoid cyst is presented here. Patient was followed up for over a year with no reported recurrence.

Keywords: Developmental cyst in floor of mouth, sublingual cyst, epidermoid cyst

KDJ 2012; Vol. 35, no. 2: 237-239

Introduction

Oral diagnosis is the dental discipline that is specifically concerned with the assessment of patient's general and dental health status. It usually demands, in depth knowledge and diagnostic skills. In dental practice we encounter different types of oral swellings with diagnostic dilemma.

Epidermoid and dermoid cysts are non odontogenic inclusion cysts lined by ectoderm.[1] They occur anywhere in the body, predominantly in areas where embryonic elements fuse together. Epidermoid cysts of the neck are much less common than dermoid cysts of the head and neck. Most often they are located in the sub mental region.[2] Most epidermoid cysts in the oral cavity are derived from epithelial debris or rests enclave during midline closure of the bilateral first and second brachial arches. Here we describe a rare case report of sublingual epidermoid cyst in a child.

Case report

A male child, nine years old, reported to the OPD, Department of Oral Medicine Dental College, Thiruvananthapuram, with complaints of pain and swelling of six months duration, in the floor of the mouth. There was history of interference with speaking and swallowing as reported by his parents. There was no history of discharge or increase in swelling size during meals and associated fever or breathing difficulties.

The child was moderately built and nourished and without regional lymphadenopathy (Fig 1). On intraoral examination, a swelling was noted in anterior floor of the mouth which was not translucent, bidigitally palpable and not associated with swallowing or tongue movements. On palpation, solitary, 2.5 x 2 cm sized, fluctuant, mild tender, mobile, well encapsulated cystic swelling with doughy consistency and yellowish discolouration was confirmed in the midline of anterior floor of the mouth (Fig 2). Overlying mucosa was intact.

Clinical differential diagnosis of a possible odontogenic infection or cysts was ruled out radio graphically. The other common swellings in the floor of the mouth such as lympho epithelial cysts, lipoma, haemangioma, ranula, salivary gland tumors were ruled out, considering their lateral location and typical clinical characteristics. The mass did not favor diagnosis of a thyroglossal cyst; for lack of movement with swallowing or extension of tongue.[5] Thus the final clinical impression was congenital cyst in anterior floor of mouth.

* Post Graduate Student, ** Assistant Professor, ** Professor & Head, Department of Oral Medicine & Radiology, Govt. Dental College, Thiruvananthapuram.

Fig. 1 Extra oral view with no significant swelling

Fig. 2 Intraoral view with cystic swelling in the floor of the mouth

Routine blood and urine examination was within normal limits. Ultrasonography of the mass reported a well defined, thick walled cyst with echogenic debris within. Multiple well defined, dependent, echogenic nodules were also noted. FNAC revealed a thick, cheesy material from the swelling which was consistent with dermoid cyst. Surgical removal of the cyst was done under local anesthesia in the department of Pedodontics (Fig 3). Histopathology examination revealed uniformly thin stratified squamous orthokeratinised epithelium without any identifiable adnexal structures. Supporting connective tissue was moderately collagenous with focal areas of inflammatory infiltrate. The lumen of the cyst was filled with large amount of keratin suggestive of epidermoid cyst (Fig 4). Patient is being followed up for over one year and there was no recurrence till date.

Discussion

Among non odontogenic cystic swellings in the floor of the mouth, thyroglossal duct cysts as midline swellings contribute the most, followed by cystic hygromas (cystic lymphangioma) and brachial cysts. The dermoid and epidermoid cysts occur in the range of 3-7% only. [1]. Mayer in 1955 has described three subclasses of congenital mouth cysts: Epidermoid cysts (simple), dermoid cysts (complex) and teratoid cysts (complex). Epidermoid cysts have a lining composed only of epithelial cells, dermoid cysts contain skin adnexa (hair follicles, sebaceous glands, and sweat glands), and teratoid cysts contain both epithelial and non-epithelial components.[2]

The occurrence of the epidermoid cysts in the oral cavity is extremely rare.[3] Epidermal inclusion cysts are the result of implantation of epidermal elements and its subsequent cystic transformation.[3, 4] The causes are, sequestration and implantation of epidermal rest during embryonic period, occlusion of the pilosebaceous unit, or iatrogenic or surgical implantation of epithelium in to the jaw mesenchyme.[5,6] They usually present as midline slow growing masses which gradually increase in size over the years, due to the accumulation of cutaneous products. The lesions are usually soft and mobile and do not move with the protrusion of tongue or swallowing movements. The size of the cysts varies from few millimeters to 12.0 cms.[7, 8]

Most of these lesions occur in individuals aged 10-30 years. They generally present slow, progressive growth and often asymptomatic unless secondarily infected.[9, 10] The occurrence of secondary malignancies such as basal cell carcinoma, Bowen's disease, squamous cell carcinoma and mycosis fungoids have been reported rarely, which manifest as rapid growth with friability and bleeding.[11] Hereditary syndromes like Gardener syndrome, basal cell nevus syndrome and pachonychia congenita, have epidermoid cyst as a part of their clinical features.

Histopathologically, epidermoid cyst usually has a cystic lining of stratified squamous epithelium with glandular differentiation and is filled with desquamated keratin disposed in a laminar pattern. In contrast to epidermoid cysts, dermoid cysts are lined by epidermis that possesses various epidermal appendages. Heterotropic oral gastro intestinal cyst is usually lined partly by stratified squamous epithelium and partly by gastric mucosa.

In this case, site and features are consistent with that of review findings [1,3,5,7] except for age, below ten years. Mild pain was due to secondary infection. After surgical excision, patient recovered without functional disturbance or recurrence. The child had no cutaneous or bony lesions, suggestive of associated syndromes. Clinically and histopathologically, there was no evidence of malignancy in the mass.

Fig. 3 Excised specimen

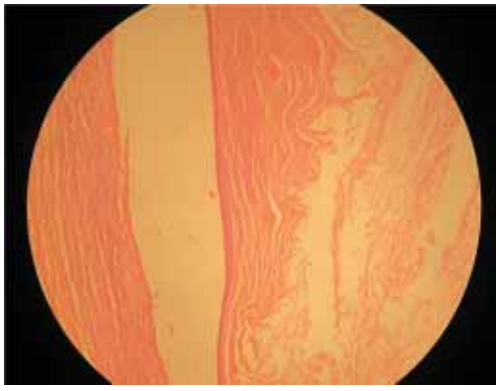


Fig. 4 Histopathological picture with keratin in laminar pattern

Conclusion

Epidermoid cyst is a congenital abnormality that rarely arises in the floor of the mouth. A painless sublingual swelling may be the only clinical manifestation, which can pose a diagnostic dilemma to the general practitioner. Although epidermoid cysts are usually benign, surgical removal and histological evaluation are warranted to prevent complications like impingement on adjacent structures, deformities of head and neck and any probable malignancy.

Acknowledgements

Departments of Pedodontics, Oral and Maxillofacial Pathology, Government Dental College, Thiruvananthapuram

References

1 Tolga K, Murat K, Enver V, Elif S, Ozlem S. Sublingual epidermoid cyst: A case report: J Med Case Report. 2007; 1: 87.

2 Larissa Santana Arantes Elias Angélica Ferreira Oton-Leite Clóvis Martins Silva Rejane Faria Ribeiro-Rotta Aline Carvalho Batista Elismauro Francisco de Mendonça Epidermoid cyst: highlights on diagnosis and magnetic resonance imaging features Rev. Odontociênc. (Online) 2010; 25: 2 http://dx.doi.org/10.1590/S1980-65232010000200019

3. De Ponte FS, Brunelli A, Marchetti E, Bottini DJ. Sublingual epidermoid cyst. J Craniofac Surg 2002; 13: 308-10.

4. Bataineh AB, Mansour MJ. Extra oral epidermoid cysts. Br J Oral Maxillofac Surg 1997;35:49-51.

5. Kandogan T, Koç M, Vardar E, Selek E, Sezgin O. Sublingual epidermoid cyst: a case report. J Med Case Reports 2007; 1: 1-4.

6. Anavi Y, Kaplan I, Calderon S. Lateral neck mass. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2002; 94:536-39.

7 Jha AK, Sahoo NK. An unusual case of submental epidermoid cyst in a ten years old child: A case report. International Journal of Case Reports and Images 2011; 2(10):10-13.

8 Koca H, Seckin T, Sipahi A, Kaznae A. Epidermoid cyst in the floor of the mouth: Report of a case. Quintessence Int 2007 Jun; 38(6):473-7.

9 Ozan F, Polat H B, Ay S, Goza F. Epidermoid cyst of the buccal mucosa: A case report. J Contemp, Dent Pract 2007 Mar 1; 8(3):90-6

10 Hemaraju N, Nanda S K, Mediker S B: Sublingual epidermoid cyst. Indian Journal of Otolaryngology and Head and Neck surgery 2004; 3:218-220.

11 Koeller K K, Alamol, Adair C F and Smirniotopoulos J G. Congenital cystic masses of the neck: Radiologic Pathologic correlation. Radio graphics 1999 Jan-Feb; 19(1):121-46.

Unicystic ameloblastoma of mandible

* Rathy Ravindran, * Joseph Edward, ** Jacob John, *** Deepa M G

Abstract

Unicystic Ameloblastoma shows clinical, radiographic, gross features of a jaw cyst but on histological examination show a typical ameloblastomatous epithelium lining the cyst cavity, with or without luminal and/or mural tumour proliferation. It is reported to have a less aggressive biologic behaviour, responds more favourably to conservative surgery and have lower reccurence rate when compared to classic solid or multicystic ameloblastoma. Recurrence may be long delayed and hence a long term follow up is essential for proper management of the patient. Here we present a case of Unicystic Ameloblastoma of mandible in a 26 year old male histologically showing mural proliferation with review of literature.

Keywords: Unicystic Ameloblastoma, Mandible, Mural

KDJ 2012; Vol. 35, no.2: 240-242

Introduction

The term ameloblastoma was suggested by Churchill in 1934. A thorough description of ameloblastoma was given by Falkson in 1879.[1] More than 80 % of ameloblastoma are solid or multicystic variant. Unicystic ameloblastoma account for 10-15% of intraosseous ameloblastoma. More than 90 % showed predilection for mandible. The concept of Unicystic ameloblastoma was introduced in 1977 by Robinson and Martinez.[1] It refers to those cystic lesions that show clinical radiographic or gross features of jaw cyst, but on histologic examination show typical ameloblastomatous epithelium, lining part of the cystic cavity with or without luminal and/or mural tumour growth[3]. The literature indicates that unicystic ameloblastoma is biologically less aggressive than solid ameloblastoma. The overall recurrence rate was 15% with mural subtype having greater recurrence

Here we report a case of Unicystic Ameloblastoma of the mandible with review of literature.

Case Report

A 26 yr old male patient reported to our out patient department with a swelling of the right lower back tooth region of 6 months duration (fig. 1). There was a history of pain in relation to lower right second molar. Clinical examination revealed an oval swelling of size 4 x 5 cm on the right mandibular region. Swelling was coral pink in color and was firm on palpation, extending from distal of second molar to retromolar region. Well defined radiolucent area extending from the lateral aspects of the roots of right mandibular first molar to ramus area, with displacement of impacted 48 and resorption of roots of 47, lower border of mandible was intact.

Computed Tomography sections confirmed the presence of a well corticated unilocular cystic lesion in right mandible and extending into the lower ascending ramus (fig 2). The lingual and buccal cortices were eroded with minimal intra oral extension. The alveolar margin was destroyed with erosion of the roots of second molar tooth.

Sections from biopsied specimen stained with hematoxylin and eosin revealed a connective tissue capsule lined by odontogenic epithelium (fig 3). Ameloblastic proliferation is noticed in the connective tissue wall (fig 4,5). In a few area odontogenic follicle with cystic degeneration is also noticed. And a diagnosis of Unicystic ameloblastoma was made.

Treatment undertaken was curettage and chemical cauterization using carnoy's solution.

* Professor & HOD, ** Reader, *** P.G. Student, Dept of Oral & Maxillofacial Pathology, Azeezia College of Dental Science & Research, Meeyannoor, Kerala State

Fig. 1 Swelling of size 4x5cm extending from distal of mandibular right second molar to retromolar region

Fig. 2 CT shows a well corticated unilocular cystic lesion in right mandible and extending into lower ascending ramus.

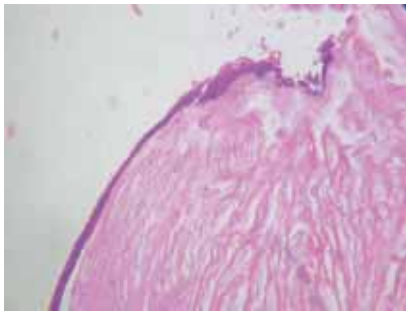


Fig. 3 Odontogenic epithelium lining the connective tissue capsule(H&E 10x).

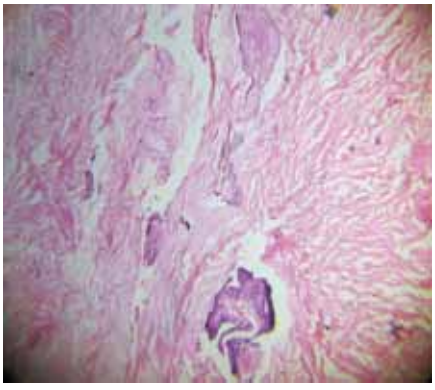


Fig. 4 Odontogenic epithelial islands in connective tissue capsule(H&E 10x).

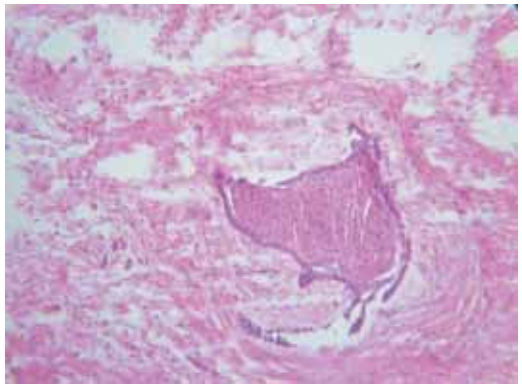


Fig. 5 Ameloblastic follicle, cytoplasm of stellate reticulum like cells takes on a granular eosinophilic appearance(H&E 10x).

Discussion

Unicystic Ameloblastoma, a variant of ameloblastoma was first described by Robinson and Martinez in 1977. Prior to the report by Robinson and Martinez this variant has been referred to as mural or intraluminal ameloblastoma. It is reported have a less aggressive biologic behaviour and lower reccurence rate when compared to classic solid or multicystic ameloblastoma. The Unicystic Ameloblastoma appears cystic on gross examination but on subsequent microscopic examination shows the presence of ameloblastoma in the cyst wall.[4] In the series studied by Li TJ *et al* the mean age was 25.3 years with 70% of cases show peak incidence at 2nd or 3rd decades. More than 90% occurred in mandible, usually in the posterior region. Almost all tumours demonstrate monocystic growth pattern.[7]

There have been many debates regarding whether Unicystic Ameloblastoma develop de novo or arises in a existing cyst. Leider *et al*, proposed three pathologic mechanisms for evaluation of Unicystic Ameloblastoma.[8]

a) Reduced enamel epithelium

b) Ameloblastomas arise in dentigerous cyst

c) A solid ameloblastoma undergoes cystic degeneration of ameloblastic islands with subsequent fusion of multiple microcysts and develop into a unicystic lesion.

Between 50% and 80% of cases are associated with tooth impaction, the mandibular third molar being most often involved. The dentigerous type arise 8 years earlier on average than the nondentigerous variant.

It often involves impacted tooth and the focal areas of cystic tumour lining is often composed of nonspecific thin epithelium that mimics the dentigerous cyst lining.[2,7] The present case was associated with an impacted tooth supporting the second hypothesis ie arising from dentigerous cyst.

Ackerman *et al* classified the Unicystic Ameloblastoma into three histological groups.[9]

Group I: Luminal Unicystic Ameloblastoma (tumour confined to luminal surface of the cyst)

Group II: Intraluminal /Plexiform Unicystic Ameloblastoma (nodular proliferation into the lumen without infiltration of tumour cells into cyst wall.

Group III: Mural unicystic ameloblastoma(invasive islands of ameloblastomatous epithelium in the cyst wall not involving the entire epithelium)

The above classification was modified by Philipsen and Reichart[8] as

Subgroup 1- luminal unicystic ameloblastoma

Subgroup 1.1-luminal and intraluminal

Subgroup 1.2.3-luminal, intraluminal and intramural

Subgroup 1.3-luminal and intramural

Subgroup 1, 1.2 were non aggressive and could be treated by enucleation whereas subgroups 1.2.3, 1.3 should be treated aggressively similar to solid/ multicystic ameloblastoma as there can be infiltration of tumour site surrounding cancellous bone.[3]

Differential Diagnosis

Dentigerous cysts, Odontogenic keratocysts, adenomatoid odontogenic tumour, giant cell lesions and sometimes solid ameloblastoma can be the possible differential diagnoses for a unilocular lesion with or without a dentigerous relationship occurring within the jaws.

Ki-67 and PCNA(Proliferating Cell Nuclear Antigenen) are used to check the proliferative index of the Unicystic Ameloblastoma.[7] However, Eversole contends that currently unaided histologic assessment for Unicystic Ameloblastoma remains the gold standard for diagnosis, because of a variable response of Unicystic Ameloblastoma to tissue markers.

Treatment

The treatment is decided by the clinical behaviour and which in turn is dictated by the histological pattern of ameloblastoma. Though an ideal treatment in the form of simple enucleation with or without curettage for the intralumenal or luminal types or a resection type of treatment for the mural type is difficultto determine preoperatively; it is only the postoperative careful histological typing that actually clarifies whether the tumor is wholly limited within the cyst wall or it is growing into the outer connectine tissue wall. The whole specimen needs to be actively screened for mural invasion in every case.[1]

Features of intramural type of Unicystic ameloblastoma was evident in our case. The patient is being followed regularly and no recurrence has been reported until now. The average interval to recurrence was approximately 7 years. Recurrence related to histologic subtypes of Unicystic Ameloblastoma, with those invading fibrous wall having recurrence rate of 35.7%, other types 6.7%.[7] Recurrence may be long delayed and hence long term follow up advised.

Conclusion

The diagnosis of Unicystic Ameloblastoma was based on clinical and histological features. The pathologist should exercise thorough histological examination of entire lesion to determine whether ameloblastoma has penetrated the wall of cyst or not, as the recurrence rate is higher for the mural type of Ameloblastoma. The recurrence following conservative surgery is more likely to occur in the mural type. Therefore they should be treated in the same manner as solid ameloblastoma. A long term follow up is mandatory as recurrence of unicystic ameloblastoma may be long delayed.

References

1. Radhika MB, Thambiah LJ, Paremala K, Sudhakaran M. Clear Cell Unicystic Ameloblastoma. JOMFP 2011;15:109-112.
2. Gupta N, Saxena S, Rathod VC, Aggarwal P. Unicystic ameloblastoma of the mandible. JOMFP 2011;15:228-231.
3. Kokila G, Laxmidevi BL, Mahadesh J. Unicystic and solid type of ameloblastoma occurring in same person. IMAGE 2009-2010;10.
4. Yavagal C, Anegundi R, Shetty S. Unicystic plexiform ameloblastoma: An insight for pediatric dentists. Journal of Indian Society of Pedodontics and Preventive Dentistry 2009;27:70-74.
5. Thangaswamy VS. Unicystic ameloblastoma of mandible- A Case Report. Journal of Indian Academy of Dental Specialists 2011;2:71-73.
6. Sivapathasundharam B, Einstein A. Unicystic ameloblastoma with the presence of dentin. Indian Journal of Dental Research 2007;18:128-130.
7. Li TJ, Wu YT, Yu SF, Yu GY. Unicystic ameloblastoma:A clinicopathologic study of 33 chinese patients. American Journal of Surgical Pathology 2000;24:1385-92.
8. Philipsen HP, Reichart PA. Unicystic ameloblastoma-A review of 193 cases from literature. Oral Oncology 1998;34:319-325.
9. Ackerman GL, Altini M, Sheer M. The unicystic ameloblastoma: a clinicopathological study of 57 cases. Journal of Oral Pathology 1988;17:541-546.
10. Robinson L, Martinez MG. Unicystic ameloblastoma: a prognostically distinct entity. Cancer 1977;40:2278-2285.
11. Lee PK, Samman N, NgIO. Unicystic ameloblastoma- Use of carnoy's solution after enucleation. International Journal of Oral and Maxillofacial Surgery 2004;33:263-67.

Goldenhar syndrome

* Jeeva P.P., ** Padmakumari B., *** Nityasri V.

Abstract

Goldenhar syndrome or oculo auriculo vertebral syndrome was first reported by Dr.Maurice Goldenhar in 1952. It is a rare disease entity characterized by hemifacial microsomia along with eye, ear and vertebral involvement. The etiology of this condition is still unclear; most cases reported are primarily sporadic. This report presents a case of a 9 year old girl with features of Goldenhar syndrome.

Keywords : Goldenhar, microsomia, hypoplasia

KDJ 2012; Vol. 35, no.2: 243-245

Introduction

Goldenhar syndrome is a highly complex combination of malformations which leaves the afflicted infant with an underdeveloped face. It is also known as oculo auriculo vertebral syndrome (OAV syndrome) which involves congenital defects characterized by a heterogeneous constellation of malformations classically involving face, eyes and ears. It affects the first and second brachial arches of the first pharyngeal pouch, the first brachial cleft and the primodia of the temporal bone. This condition was first described by Dr.Maurice Goldenhar in 1952.[1] Later in 1963; Gorlin *et al* named this syndrome as oculo auriculo vertebral syndrome due to the presence of additional vertebral anomalies. The incidence varies from 1 in 3500 to 1 in 5600 live births with a male to female ratio of 3:2.[2]

In Goldenhar syndrome, the individual prominently presents with hemifacial microsomia. They also exhibit a wide range of anomalies including the eye (micropthalos, coloboma of the upper eyelid, epibulbar dermoids) and the ear (microtia, anotia, preauricular skin tags or ear appendies and fistula). The striking features may be minor facial asymmetry to severe underdevelopment of one half of the face. Other anomalies of the vertebrae, congenital heart anomalies, renal failure, mental retardation, developmental dental disturbances have also been reported.[3,4] Dental problems are common due to the difference in development patterns between both sides of the face and jaw bones. Dentofacial anomalies may include cleft lip and palate, a crease over the lateral commissure of the mouth, a highly arched palate, hypoplasia of the maxillary and mandibular arches, micrognathia, gingival hypertrophy, supernumerary teeth, enamel and dentin malformations, and delayed tooth development. Malocclusion and macrostomia due to the presence of an underdeveloped lower jaw have also been observed. Moreover, patients often show asymmetric development of the muscles of the masticatory system and agenesis of salivary glands. [2, 3, 4]

Case report

A 9 year old girl was referred to the Department of Pedodontics, Govt. Dental College, Kottayam for extraction of root stumps. She was a diagnosed case of Goldenhar syndrome by birth. Her parents were non-consanguinous. She was born at full term after a normal delivery and there was no history of any maternal illness during pregnancy. She has an elder sibling who had no signs of congenital anomalies. The remaining family history was unremarkable. Her milestones of developments were delayed. She had a cervical defect with a left sided scoliosis. She had chronic asthma and frequent attacks of bronchopneumonia. She showed features of mental retardation, renal problems (prominence of renal pelvis) and cardiac anomalies (Ventricular Septal Defect, post subclavian coarctation).

Extra oral examination showed occipital prominence, depressed nasal bridge, low set ears, right sided hemifacial microsomia with

*Asst. Professor, ** Asso. Professor, Dept. of Pedodontics, ***Lecturer in Community Dentistry, Government Dental College, Kottayam

Fig. 1 Extraoral view showing microsomia of the right side of the face.

Fig. 2 Profile view of the face showing periauricular tag and epibulbar dermoids

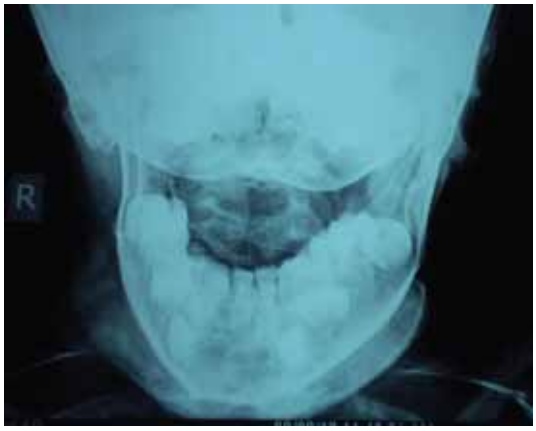


Fig. 3 PA mandible showing reduced size of the right side of the mandible

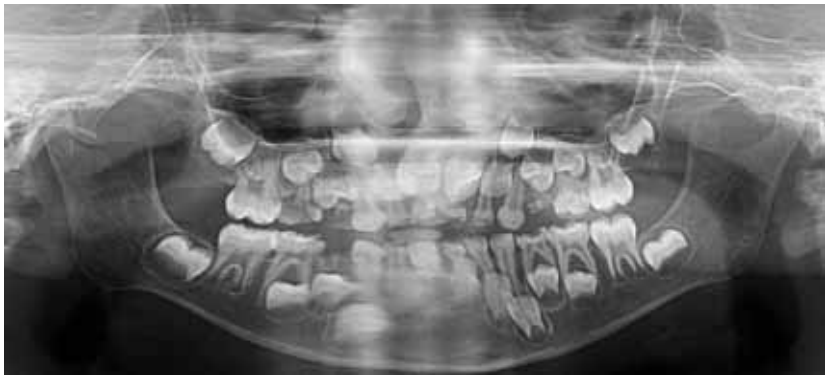


Fig. 4 Panoramic view showing reduced mandibular height of the right side with a pronounced antegonial notch.

Fig. 5 Anterior Open Bite

chin deviated to right side. Her right ear showed periauricular tag, pre auricular sinus. Audiometric tests revealed a hearing loss of the right ear. Her right eye showed presence of epibulbar dermoid. Her trunk radiographs revealed cervical hemivertebrae, hypoplasia of ribs with bifid spine.

Intraoral examination revealed a V shaped high arched palate. A mixed dentition stage of dentition was seen with asymmetric occlusion and an anterior open bite. The teeth showed dentinal caries and most of them were completely decayed. There was delay in eruption of deciduous and permanent teeth. The tongue was large and showed hyperpigmented areas. The level of attachment of maxillary and mandibular frenum appeared normal.

Panoramic view showing reduced mandibular height of the right side due to hypoplasia of the ramus and body of the mandible. An accentuated right antegonial notch was seen. Hypoplasia of the right side condyle and coronoid processes was also noted. Antero Posterior view of the thoraco lumbar spine showed left sided scoliosis, hypoplasia of ribs and bifid spine.

The child's parents were informed about the need for a multidisciplinary treatment and the risks associated with the same due to cardiac anomalies. Extraction of grossly decayed teeth was carried out after consultation with the cardiologist. Topical fluoride application was done for teeth at risk. Proper home care instructions and diet counselling was given to the parents.

Discussion

Goldenhar syndrome or OAV syndrome referred to three rare disorders that many clinicians believe to be intimately related to one another and which represent the range of severity of the same disorder. As the name suggests, this involves malformations of eyes, ear and spine. The disorder is characterized by a wide spectrum of symptoms and physical features that may vary greatly in range and severity from case to case.

Fig. 6 Trunk photograph showing the apparent curvature of the body to the left.

Fig. 7 AP view of the thoraco lumbar spine showing left sided scoliosis, hypoplasia of ribs and bifid spine.

The exact etiology of this condition is not known. Solten and Holmer suggested a link between genetic cause and vascular disruption in Goldenhar syndrome.[5] This anomaly may also result from fetal hemorrhage in the region of first and second brachial arch at the time when blood supply of these arches switches from the stapedial artery to the external carotid artery. Kallen et al related the pathologic mechanism of OAV to disturbance in the neural crest development.[6] Ingestion of drugs such as thalidomide, retinoic acid, tamoxifen and cocain by the pregnant mother may be related to this syndrome. Maternal diabetes, rubella and influenza have also been suggested as possible etiologic features. It is also suggested that multifactorial inheritance are caused by the interaction of many genes possibly in combination with environmental factors.[6,7,8]

The characteristic combination of external ear anomaly and ipsilateral facial underdevelopment is the hallmark of Goldenhar syndrome. Anomalies are unilateral in 85% of cases and bilateral in 10-33%, and the right side is more frequently affected.[2,9,10] The present case showed features like facial asymmetry and hypoplasia of mandible along with ear, eye, and vertebral problems. Neck problems may be due to fusion or bony bridge between the bones of the neck. Multi organ involvement is also seen in the case discussed.

Taken together, findings of this entity indicate that multiple organ involvement can limit surgical correction of deformities and affect the management of patients with Goldenhar syndrome. Structural anomalies of eye and ear can be corrected by reconstructive surgery. Jaw bone hypoplasia can be corrected by distraction osteogenesis and reconstruction with bone graft as the child grows.[2] Treatment of deformities requires multiple procedures performed by a multidisciplinary team, and long-term regular follow-up is important to monitor the growth and development of patients.

References

1. Goldenhar M. Associations malformatives de l'oeil et de l'oreille, in particulier le syndrome dermoide epibulbaire-appendices auriculairesfistule auris congenita et ses relations avec la dysostose mandibulofaciale. J Genet Hum 1952; 1: 243-282. (in French)
2. Gorlin R J. Bronchial arch and oroacral disorders. In: Gorlin RJ, cohen MM Jr, Levis Ls syndrome of the head and neck 3rd ed. Oxford university press; 1990. 641-9.
3. Bielicka B, Necka A, Andrych M. Interdisciplinary treatment of patients with Goldenhar syndrome – clinical reports. Dent Med Probl 2006; 43:458-462
4. Vinay C, Reddy RS, Uloopi KS, Madhuri V, Sekhar RC Craniofacial features in Goldenhar syndrome. J Indian Soc Pedod Prev Dent 2009; 27:121-124.
5. Solten HC,Holmes LB. Familial occurence of malformations possibly attributable to vascular abnormalities.J Pediatr 1986;108:112-4.
6. Kallen K,Robert E,Castella EE,Mastroiacovo P,Kallen B. Relation between OAV dysplasia and three other non random associations of malformations. Am J Med Genet 2004;127 A:26-34.
7. Das A, Ray B, Das D, Das S. A case of Goldenhar-Gorlin syndrome with unusual association of hypoplastic thumb. Indian J Ophthalmol 2008; 56:150-152.
8. Jena AK, Duggal R. A typical goldenhar syndrome: a case report. J Clin Pediatr Dent. 2006;31:118-122
9. Pinheiro AL, Araújo LC, Oliveira SB, Sampaio MC, Freitas AC. Goldenhar's syndrome – case report. Braz Dent J. 2003; 14:67-70.
10. Kulkarni VV, Shah MD, Parikh AA (1985) Goldenhar syndrome: a case report. J Postgrad Med 31, 177-179.

Speech and functional rehabilitation with a definitive hollow bulb obturator

* Hasti Anurag, ** Hasti Kalpana, *** H.G. Jagadeesh, **** Gupta Nidhi

Abstract

In general, an opening in oral cavity into nasopharyngeal space results either due to congenital or acquired defects. Disturbances in speech and swallowing are the major concerns for the patients with maxillary defect. The size, shape and location of the defect, characteristics of treatment considerations for maxillary defects present an unlimited variety of possible configuration. However a design of definitive prosthesis that is the obturator have been simplified by Aramany classification and designs.

The present article details the clinical and laboratory procedure of speech and occlusion of obturator prosthesis with cast removable partial denture with hollow bulb.

Key Words: Speech, hollow bulb, Cast removable partial denture

KDJ 2012; Vol. 35, no.2: 246-248

Introduction

Tumors of the hard palate, maxillary sinus and sometimes of buccal mucosa or nasal cavity require surgery called a maxillectomy or maxillary resection. Depending on the extent of the tumor, maxillary resections can be performed that may not violate the integrity of hard palate. Maintaining the hard palate, however, is an exception rather than the rule. However successful rehabilitation usually becomes more predictable if remaining natural teeth are preserved.[1]

Prosthodontic treatment, with a maxillary obturator prosthesis, is necessary to restore the occlusal harmony, contours of the resected palate and recreate the functional separation of the oral cavity.[2]

In the present case report, Aramany Class 2 maxillectomy defect was treated with a definitive hollow bulb obturator attached to cast removable partial denture.[3]

Case report

A 46 year old female patient teacher by profession was referred to the department of prosthodontics with the chief complaint of difficulty in speech and loose maxillary prosthesis which needs to be changed. Past medical history revealed that she underwent maxillectomy for mucoepidermoid carcinoma of maxillary tuberosity 9 years back. Patient also complained of pain in 25 and 27. Intraoral periapical radiograph revealed carious involvement of 25 and 27 with periapical lesion.

The defect was classified as Aramany Class 2 with the defect in right region. The missing teeth included were 13, 14,15,16,17,26.

Treatment plan included

Root canal treatment of 25 and 27 and cast full veneer crown followed by Prosthodontic rehabilitation in form of definitive hollow bulb obturator with artificial teeth, replacing 13, 14, 15, 16, 17,26.

Procedure

The defect undercuts were blocked with gauze and maxillary and mandibular impressions with

* Reader, Dept of Prosthodontics, School of Dental Sciences, Greater Noida U. P.; ** Reader, Dept of Prosthodontics, Jaipur Dental College,Jaipur Rajasthan; ***Principal and Head, Dept of Prosthodontics, School of Dental Sciences, Greater Noida U. P.; **** Senior Lecturer, Dept of Pedodontics and Preventive Dentistry, Santosh Dental College,Ghaziabad U.P.

Fig.1 After root canal treatment

Fig.2 All Metal Crown Cementation

Fig. 3 Wax Framework on Refractory Cast

Fig. 4 Metal Framework

Fig. 5 Prosthesis insertion

irreversible hydrocolloid were made.

After root canal treatment and post obturation amalgam restoration, tooth 25 and 27 were prepared to receive full metal crowns with internal rests. Disto occlusal rest seat was prepared on 24 [Fig 1].

A rubber base double mix single impression was made using putty and light body.

All metal crown wax patterns were fabricated, with rest seats were carved on mesio occlusal on 25 and mesio occlusal as well as disto occlusal of 27.

Working cast was surveyed and parallel guide planes on proximal as well as palatally surfaces of wax patterns were carved with wax carver surveying tool. On buccal surfaces favorable retentive undercut area were identified on 24, 25 and 27 and the cast was tripoded.

The patterns were sprued, invested and casting was done for all metal crowns.

After finishing and polishing, the crowns were cemented with glass ionomer cement (Fig.2). Then the irreversible hydrocolloid impression was made for fabrication of special tray, covering the defect and the remaining teeth was fabricated using autopolymerizing resin. The defect site was border molded and a final impression was made with regular body addition silicon impression material.

The final master cast was surveyed and then subjected to parallel block out in predetermined path of insertion, duplication was done using reversible hydrocolloid and a refractory cast was obtained.

A framework was waxed onto the refractory cast (Fig.3). The pattern was cast in base metal Co-Cr alloy and the framework was obtained (Fig.4). Finishing and polishing was done and metal tryin was done for the framework. Autopolymerizing resin was used to fabricate a temporary denture base on cast partial framework, occlusal rim was fabricated on it.

A jaw relation record was made and master cast mounted on articulator. Teeth arrangement and verification of jaw relation record and occlusal harmony was verified. Uniformly thick hollow bulb was fabricated on final master cast using auto polymerizing resin in the defect area.

Bulb was removed from the cast and the open margins were made 2mm short. Trial denture was seated onto the cast, after sealing and flasking, dewaxing was carried out. The hollow bulb was put into the defect and was sealed with superglue at the opening of the defect.

Table salt was filled into the defect, surface was coated with petroleum jelly, after applying separating medium, packing was completed then finishing and polishing was done. Hot water was injected to flush out salt from the bulb area. A definite hollow bulb prosthesis insertion was carried out [Fig 5].

At time of insertion vents/holes were made on anterior and posterior walls. To start with the size was kept 1mm and was kept increasing till nasal tone decreased considerably of the anterior hole. Clarity of speech was checked by asking the patient to count from 60-69.

Nasal oral resonance was checked by naries in occluded and unoccluded states. The speech is evaluated for hypernasality, hyponasality or mixture of both. Patient is asked to pronounce prolonged single vowels and consonants and by repitation of nasal consonants like m,n ang ng for hyponasality.[4,5]

At first post insertion recall visit minor occlusal were made on embrasure rest between 24, 25.

Soreness in corresponding to distobuccal border was reduced. Palatal cusps of maxillary artificial teeth kept in contact with the central fossa of mandibular lower teeth in centric position. Weekly recall sittings of duration of 25-45 mins are needed to evaluate and correct speech overtime. Patient was trained for insertion and removal of prosthesis, maintenance of hygience and periodic recalls were carried out.

Discussion

The obturator prosthesis is device for occluding a cavity serving the function of occlusion, speech and deglutition. Temporary all acrylic obturator plates though help in deglutition and healing contracture of tissues, its prolonged use results in resorption and contracture of scar tissue, obliterating vestibule. Definitive prosthesis with artificial teeth help not only in mastication but also prevent supraeruption of teeth in opposing arch while maintaining the health of remaining teeth.[6] In Armany class 2 situation the cast removal partial denture with typical class 2 modification I (P) provided a stable well retained mostly supported by principal abutment teeth adjacent to the modification area. Full palatal coverage extended on to the cingula of anterior teeth prevented tissueward movement. The anterior posterior running channels on superior surface helps in drainage of nasolacrimal secretions. The holes in front (AP) reduce the high nasal tone and impart approximately proper resonance. A definitive obturator is prepared at the completion of active treatment when the tissue have stabilized. Aramany Class2 defect generally provides a favourable situation of prosthesis construction when sound remaining teeth were present.[2] The defect is unilateral and anterior teeth are intact except 13. Esthetics is generally not compromised. The recommended design is similar to design of a class 2 Kennedy removable partial denture, in which indirect retention minimizes the possibility of dislogement of prosthesis under gravity.

Hollow bulb obturator was the choice for the bulb of the obturator. It helped to aid speech resonance, to lighten the weight on the unsupported side.[4]

Conclusion

There are many individual presentations and varying challenges in supplying patients with prosthesis for acquired palatal deficiency. As for any other successful treatment it demands understanding and application of basic fundamentals and in the final analysis good clinical judgement for the prosthesis to be a success.

References

1. Taylor T.D., Clinical Maxillofacial Prosthetics. Quintessence Publishing Co. Inc., Illinois, 2000.
2. Walter J.D., Obturators for acquired palatal defects. Dent Update 2005;32:277-85.
3. Aramany A. Mohamed, Basic principles of obturator design for partially edentulous patients, Part I: Classification. J Prosthet Dent 1978;40:554-7.
4. Kumner A.W,Resonance disorders &velopharyngeal dysfunction:simple low-tech and no tech procedures for evaluation and treatment.ASHA Fellow.2007.
5. Kummer A,Resonance disorders and nasal emissions: evaluation and treatment using “low tech” and “no tech” procedures.The ASHA Leader.2006.
6. Chalian V.A., Drane J.B., Maxillofacial Prosthetics, Multidisciplinary Practice, The Williams & Wilkins Co., Baltimore, U.S.A, 1972.

Glass ionomer cement – recent advances

* Sujathan, ** Liza George, *** Ajit George Mohan

Abstract

This article describes the properties, advances and shortcomings of glass-ionomer cement as a restorative material. Glass ionomer cements (GICs) are clinically attractive dental materials that have certain unique properties that make them useful as restorative and luting materials. This includes adhesion to moist tooth structures and base metals, anticariogenic properties due to release of fluoride, thermal compatibility with tooth enamel, biocompatibility and low toxicity. The adhesion of glass-ionomer to tooth structure is less technique sensitive than composite resins and its quality increases with time. Therefore glass-ionomer might turn out to be the more reliable restorative material in minimally invasive dentistry based on adhesive techniques. The use of GICs in a mechanically loaded situation, however, has been hampered by their low mechanical performance. Poor mechanical properties, such as low fracture strength, toughness and wear, limit their extensive use in dentistry as a filling material in stress-bearing applications. In the posterior dental region, glass ionomer cements are mostly used as a temporary filling material. The requirement to strengthen those cements has lead to an ever increasing research effort into reinforcement or strengthening concepts.

Keywords: glass ionomer cement; strength; wear; fatigue; brittleness; porosity; glass fibers; resin modification; coating; clinical; restoration

KDJ 2012; Vol. 35, no.2: 249-253

History

Glass-ionomer cement was first introduced by Wilson and Kent in 1972[1]. Glass ionomers are hybrids of the silicate cements and the polycarboxylate cements. The intention was to produce a cement with characteristics of both the silicate cements (translucency and fluoride release) with those of the polycarboxylate cements (ability to chemically bond to tooth structure and kindness to the pulp).

Glass ionomers were first marketed in Europe in 1975 and became available in the United States in 1977. The first commercial glass ionomer was made by the De Trey Company and distributed by the Amalgamated Dental Co in England and by Caulk in the United States. Known as ASPA (Alumino-Silicate Poly-Acrylate), it consisted of an ion-leachable aluminosilicate glass and an aqueous solution of a copolymer of acrylic acid. ASPA was intended for use in restoring class V abrasion/erosion lesions.

Glass ionomer cements

The components of a glass ionomer are a powdered flouroaluminosilicate glass and a polyalkenoic acid. The latter component is a complex polymeric blend of (primarily) acrylic, itaconic, and maleic acids chosen for their ability to form a cement when mixed with glass and effect ion-exchange adhesion to tooth structure.[2] Depending on the product, the liquid component does not necessarily contain all of the acid. Polyacrylic acid is often incorporated into the powder in its dehydrated form, leaving the liquid to consist of water or an aqueous solution of tartaric acid.[2] These various composition characteristics are reflected in the more accurate and scientific term for glass ionomers, namely "glass-polyalkenoate cements."

Mixing of the glass-ionomer powder and liquid generates an acid-base setting reaction commencing with partial dissolution of the surface of the

* Professor & H.O.D, ** Professor, *** Senior Lecturer, Department of Conservative Dentistry and Endodontics, Annoor Dental College, Muvatupuzha, Kerala - 686673.

Fig: 1

Fig: 2

glass particles by the acid. Positive ions (Ca2+ and Al3+) released into solution act to crosslink the acid polymer chains, forming an increasingly rigid matrix as the crosslinked network becomes tighter and more complex. Fluoride ion (F-) is also released from the glass particles, becoming available for both uptake by adjacent tooth structure and release from the matrix into saliva. Fluoride neither plays a role in the glass-ionomer setting reaction nor is it incorporated into the matrix structure. Glass ionomer is thus not weakened significantly by fluoride release.

The early conventional glass-ionomer materials were technique-sensitive, slow setting, opaque when set and sensitive to both desiccation and hydration during setting. This led to premature surface deterioration. Most of these problems have (more or less) been solved in newer generations of glass-ionomer cement. Setting has been accelerated and hydration problems have been reduced. However, unlike composites, their use in stressed situations is still questionable.

The most common indication of the newer, heavily filled, reduced particle size glass-ionomer cements is in non-stress bearing build-ups, root caries, tunnel restorations and long term provisional restorations in primary and adult dentitions. The cement is formed as a result of poly-acidic attack of the outer shell of fluoride containing soluble aluminum-glasses. Dissimilar to resin- based composites that have no chemical reactivity after setting, glass ionomer cements remain reactive for a prolonged time. Also quite the opposite to resin-based composites, bond formation of glass ionomer cements to mineralized tissue is no problem. Although the bond strength reaches only 25% of that can be obtained with resin based bonding systems, the bond is reliable and far more degeneration resistant than the resin systems, where the hybrid layer can break up with time[3]. Glass-ionomer cements do not require extra provisions for consistent retention or adhesion, as they adhere directly to, even humid, dental hard tissues. (fig: 1)

Limitations of Glass Ionomers

As filling material, glass-ionomer cements do not mimic tooth colour as well as composites do and show faster surface loss by wear, but since it is less technique demanding it may serve in many ways more successfully than resin-based composites. Dependant on tradition, in some countries (e.g. Australia, UK) full glass-ionomer Class III restorations are generally accepted, while the material is merely used as only dentine replacement in sandwich restorations. For the time being resin-based composites possesses superior surface characteristics. The resin-modification of glass-ionomer cements, introduced to obtain command set glass ionomer cements, did not contribute to higher wear resistance [4].

As with all restorative materials, there are strict rules for the clinical handling and placement of glass ionomers. The powder-to-liquid ratio is specific for each application, and mixing techniques are demanding. Consequently, the use of capsulated materials is strongly recommended to guarantee routine success. The setting reaction is not unlike amalgam in that there is an initial "snap" set within three minutes for all glass-ionomers, but the chemical reaction continues thereafter for a prolonged period. There is a tendency in the earliest stages for the material to take up additional water, but later the main risk becomes water loss leading to dehydration and cracking. Both situations result in disruption of the setting reaction and resultant nonmature cement with unacceptable properties such as crazing, cracking, and loss of translucency.[5] These untoward occurrences can be prevented by sealing the

restoration surface immediately after removing the matrix to maintain the water balance using a light-polymerized unfilled resin enamel bond. [6]

For the modern high-viscosity autocure materials, loss of water through dehydration is the greatest problem; and its prevention in the oral environment is not difficult. It is nevertheless recommended that final polishing of glass-ionomer restorations be delayed for about 24 hours to allow further maturation of the material. Other properties such as compressive and flexural strength and fracture toughness will limit glass-ionomer use as a restorative material to areas not subject to occlusal stress unless well-supported by surrounding tooth structure. Wear resistance improves markedly as the restoration matures, and clinical results suggest that wear is not a problem.[7]

Resin Modified Glass Ionomers

Resin modified glass-ionomer cements are materials in which a hydrophilic polymerizing resin is added to the glass-ionomer matrix. The admixed resin improves initial aesthetics and tensile strength and fracture toughness. Also desiccation and hydration problems are reduced. Resin-modified glass-ionomer cements set partly through an acidbase reaction and a polymerization of the resin component of the matrix. The resin component can be lightcured.

Another portion of the setting process involves the typical acidbase process between the filler and the poly-acid matrix. The latter reaction does not progress as complete as is the case with traditional glass-ionomers. The hydrophilic character of the resin component also contributes to osmotic swelling.

All of these materials retain the most desirable qualities of conventional versions, namely fluoride release, ion exchange adhesion to conditioned enamel and dentin, and low interfacial shrinkage stress. The enhancements over conventional types, particularly in the case of restoratives, include significantly improved resistance to microleakage, on-command hardening and immediate finishing as with composite resins, improved mechanical properties and translucency and reduced water sensitivity. Despite the transient resistance to water movement in and out of the restoration, post-finishing sealing of a resin-modified glass-ionomer restoration with light-polymerized unfilled resin is recommended to protect acid-base reactive components at the restoration's outer surface. Recent studies additionally suggest that delayed finishing/polishing of these materials may improve resistance to microleakage.[8]

Metal Reinforced Glass Ionomers

Other attempts at improving glass-ionomer properties have involved metal reinforcement (addition of amalgam alloy powder) as well as sintering of silver particles to the glass component to form a cermet (ceramic-metal). Data on improvements in physical properties and clinical performance. However, is equivocal; while other reports suggest diminished caries resistance compared to conventional glass ionomer restoratives.[9]

High Viscosity Autocure Glass Ionomers

More recently, high-viscosity, high-strength versions of conventional autocure glass-ionomer restoratives have been introduced. Originally aimed at remote or underdeveloped regions lacking access to dental care, these materials also have many applications in the traditional restorative setting. Improved physical properties result from chemical modifications and alterations to the heat history of the glass powder that allow higher powder-liquid ratios than earlier conventional restoratives. Characteristics include the adhesion and ion exchange common to all glass ionomers as well as fast setting times, and high levels of compressive and tensile strength, surface hardness, and fluoride release.[10] These attributes render these materials an excellent choice for bases, emergency temporary restorations, long-term provisional restorations, and final restorations in nonstress-bearing areas, particularly in high-caries-risk patients. Contouring and finishing can begin five minutes after placement, using water spray to prevent dehydration,

followed by surface sealing with resin to protect the continuing acid-base reaction.

Poly Acid Modified Composite resin (Compomers)

"Compomers," originally introduced in Europe, have been available since 1993. The term "compomer" is an acronym derived from "composite" and "glass-ionomer," and it reflects the intent to produce a restorative that combines components and properties of both materials. Specifically, compomers purportedly possess the esthetic attributes of composite resins along with the fluoride-release advantage of glass ionomers.[11] Unlike true glass ionomers, however, compomers are resin-based materials containing no water; and the setting/polymerization of compomer restoratives involves neither mixing nor an acid-base reaction. Compomers are in fact light-polymerized composite resin restoratives, modified to contain ion-leachable glass particles and anhydrous (freeze-dried) polyalkenoic acid. The term "polyacid-modified composite resins" was thus proposed by McLean and colleagues and is used commonly in the scientific literature to distinguish these materials from glass ionomers. If it is regarded as a more or less temporary restorative, compomers can replace resin-based composite in anterior proximal restorations and have become in many countries the material of first choice in paediatric dentistry.

Mechanical properties of compomers tend to be somewhat inferior to those of conventional composite resins, thus limiting their use to areas subjected to low stresses.[12] Specifically compomers (and microfill composite resins) are often recommended for restoration of noncarious cervical lesions as their flexibility (relative to hybrid composite resins) presumably renders them more resistant to detachment during tooth flexure. [13]

Clinical Applications for Glass-Ionomer Restoratives

Resin-modified and highly viscous versions of glass-ionomer restorative materials can be used alone or in combination with composite resins to effectively treat many common restorative situations.

Sandwich Technique

The term "sandwich technique" refers to a laminated restoration using glass ionomer to replace dentin and composite resin to replace enamel. This strategy combines the most favorable attributes of the two materials, i.e. caries resistance, chemical adhesion to dentin, fluoride release, remineralization and lower interfacial shrinkage stress of glass ionomer with the enamel bonding, surface finish, durability, and esthetic superiority of composite resin. Additionally, composite resin bonds micromechanically to set glass ionomers and chemically to the HEMA in resin-modified versions. Either resin-modified or highly viscous glass ionomers may be used, depending upon anticipated mechanical stresses and esthetic considerations.

Numerous in vitro studies have reported improved resistance to microleakage and caries with this technique as opposed to resin bonding at dentin margins.[14] Additionally, replacement of dentin in either the open or closed technique with glass ionomer minimizes the complexity of incremental build-up with composite resin. It will also eliminate acid etching of dentin and thus has potential to reduce or eliminate postoperative sensitivity caused by incomplete sealing of etched dentin.

Class III and Class V Lesions

Simple one-surface restorations that are not under occlusal load can be successfully restored with a glass ionomer alone, generally without lamination. The original autocure materials are very suitable, producing satisfactory esthetic results provided that water balance is maintained at insertion.[15] (fig: 2)

Glass Ionomers as Sealants in Fissure Sealing

Thanks to their applicability under humid conditions and direct bonding to tooth enamel [16], the inorganic glass-ionomer cements are also practicable alternatives for resin fissure sealing. Notwithstanding the affirmed low wear resistance of glass-ionomers, which causes the sealant to erode already after some months, its preventive effect was reported still effective after 5 years.[17] Arends et al., (1989), Campos Serra and Cury (1992) and Glasspoole (2001) explained this result by effective fluoride released from the glass-ionomer, which forms in relatively short time a reservoir in the adjacent enamel in a fluoridated hydroxyl apatite structure. [18] Proper conditioning prior to placement will ensure the ion exchange adhesion, and maturation over time allows acceptable longevity. The modern high-viscosity glass ionomers are now the preferred materials, and these can be placed under finger pressure to adapt the cement into the depths of the fissure.[19]

Root Caries

Glass ionomer, given its aforementioned attributes, is clearly the material of choice for root caries restorations. In particular, excellent ion exchange adhesion to dentin, caries inhibition, and simplified placement protocol as compared with composite resin render glass ionomer ideally suited to these situations. Relative esthetic limitations of glass ionomer tend to be inconsequential in root caries sites, and longevity of glass-ionomer restorations in these sites is excellent.[20]

High Caries Risk

There is a glass ionomer designed as a lining for high-caries-risk patients that exhibits a very high fluoride release, making it useful when demineralized dentin is to be left on the cavity floor.

Emergency Temporary Restorations

Fractured cusps/restorations can be quickly and predictably stabilized with glass ionomers pending definitive restoration. Adhesion properties of glass ionomer impart adequate retention even if mechanical undercuts are absent. Coverage of exposed dentin and sharp margins to provide enduring patient comfort is accomplished with minimal chair time.

Conclusions

In contrast to resin bonding, the adhesion of glass-ionomer to tooth structure is not technique sensitive and its quality increases with time. Therefore glass-ionomer might turn out to the more reliable restorative material in minimal invasive dentistry based on adhesive techniques. Glass-ionomer is not only bioactive, but has even features of an intelligent material.

1. For socio-economical reasons,direct restorative techniques are preferred over indirect ones.
2. Interest in amalgam is fading.
3. Resin based composites are Unforgiving, and still are far from perfect.
4. Shortcomings of composites invariably have to be tackled by sophistication of placement techniques.
5. Glass-ionomers and their application technique are still open for improvements.
6. Glass-ionomers are forgiving, bioactive and intelligent materials.
7. Glass-ionomers hold a great potential to become the first choice direct restorative material.

References

1. Wilson AD, Kent BE. A new translucent cement for dentistry.
2. Mount GJ, An Atlas of Glass-ionomer Cement: A Clinician's Guide, 3rd ed. Martin Dunitz, London, 2002.
3. Pashley DH, Tay FR, Hashimoto M, Breschi L, Carvalho RM, Ito S. Degradation of dentin collagen by host-derived enzymes during aging. J Dent Res 2004; 83: 216-21.
4. De Gee AJ, van Duinen RNB, Werner A, Davidson CL. Early and long term wear of conventional and resin modified glass ionomers. J Dent Res 1996; 75: 1613-9.
5. Anusavice KJ, Dental cements for restoration and pulp protection in Phillips' Science of Dental Materials, 10th ed. WB Saunders Co, Philadelphia, 1996.
6. Earl MSA, Mount GJ, Hume WR, The effect of varnishes and other surface treatments on water movement across the surface of a glass-ionomer cement: II. Austral Dent J 1989, 34:326-9.
7. Mount GJ, Longevity in glass-ionomer restorations: review of a successful technique. Quintessence Int 28:643-50, 1997.
8. Yap AUJ, Yap Wy, et al, Effects of finishing/polishing techniques on microleakage of resin-modified glass-ionomer cement restorations. Oper Dent 28:36-41, 2003.
9. Herrera M, Castillo A, et al, Antibacterial activity of glass-ionomer restorative cements exposed to cavity-producing microorganisms. Oper Dent 24(5):286-91, 1999.
10. Yap AU, Pek YS, Cheang P, Physico-mechanical properties of a fast-set highly viscous GIC restorative. J Oral Rehabil 30(1):1-8, 2003.
11. Mount GJ, Glass-ionomers: Advantages, disadvantages, and future implications. In Davidson CL, Mjor IA, eds, Advances in Glass-Ionomer Cements. Quintessence Publishing, Chicago, 1999.
12. Cattani-Lorente MA, Dupuis V, et al, Comparative study of the physical properties of a polyacid-modified composite resin and a resin-modified glass-ionomer cement. Dent Mater 15(1):21-32, 1999.
13. Starr CB, Class V Restorations. In, Summitt JB, Robbins JW, et al, eds, Fundamentals of Operative Dentistry — a Contemporary Approach, 2nd ed. Quintessence Publishing, Chicago, 2001
14. Gladys S, Van Meerbeek B, et al, Microleakage of adhesive restorative materials. Am J Dent 14(3):170-6, 2001.
15. Mount GJ, Clinical performance of glass ionomers. Biomaterials 19:573-9, 1998
16. Aboush YEA, Jenkins CBG. An evaluation of the bonding of glass ionomer restoratives to dentine and enamel. Br Dent J 1986; 161: 179-83.
17. Mejàre I, Mjör IA. Glass ionomer and resin-based fissure sealants: a clinicalstudy. Scan J Dent Res 1990; 98: 345-50.
18. Glasspoole EA, Erickson RL, Davidson CL. Demineralization of enamel in relation to the fluoride release of materials. Am J Dent 2001; 14: 8-12.
19. Van Duinen RNB, Kleverlaan CJ, de Gee AJ, Werner A, Feilzer AJ. Early and long term wear of 'fast-set' conventional glass ionomer cements. Dent Mater 2005;21: 716-20.
20. Earl MSA, Mount GJ, Hume WR, The effect of varnishes and other surface treatments on water movement across the surface of a glass-ionomer cement: II. Austral Dent J 1989, 34:326-9.

Effects of fixatives on exfoliated normal buccal mucosa cells – a morphometric study

* Ravikumar S. Kulkarni, ** Vandana Raghunath, *** Ram Manohar

Abstract

Objectives: Method of fixation employed may influence the result of histomorphometric studies and even diagnostic cytology. Present study was undertaken to assess the influence of four different fixatives on cytomorphology of normal exfoliated buccal mucosa cells.

Method: Study was conducted on 10 student volunteers. Four slides were prepared by harvesting buccal mucosa cells and fixed immediately by Diethyl ether-ethanol, Biofix spray, Methanol and Air. Cells were stained by Papanicolaou staning method for identification of surface cells which were selected for morphometric study. Nuclear area, Cell area, Nuclear diameter, Cell diameter and Nuclear-Cytoplasmic ratio were measured.

Results: Air and Biofix spray (Group A), Diethyl ether-ethanol and Methanol (Group B) showed similar effect on cell morphometry with very little difference between various parameters. On comparing Group A and Group B, statistical significant difference between cell area and cell diameter was noted.

Conclusion: The findings suggest that in cytomorphometric studies, these differences may have an adverse effect on the outcome of the results if smears fixed with different fixatives are used.

Keywords: Nuclear area, Cell area, Nuclear diameter, Cell diameter, Nuclear-Cytoplasmic ratio.

KDJ 2012; Vol. 35, no.2: 254-257

Introduction

Exfoliative cytology is the study of superficial cells that have been shed from mucous membranes, renal tubules and so on. Some accept this cytological technique as revolutionary and simple diagnostic tool, while others opine that in a field as potentially serious as cancer detection, a method which is not 100 % accurate, has no role to play in diagnosis[1]. The limitation is due to the occurrence of false-negative results, which is estimated between 0%-63.9%.[2]

With advancements in cytodiagnosis, there has been a resurgence of interest in oral exfoliative cytology, since it is a rapid, painless, non-invasive procedure with little discomfort to the patient and can be repeated any number of times for diagnosis, follow-up and research purposes.[3]

Various factors influencing cytomorphology include radiotherapy[4] smoking[5] alcohol[6] nutritional status of patients[7] air drying- either forced or as a result of delayed fixation, tissue dehydration, air drying and rehydration.[8]

Morphometric studies which are extremely tedious, time consuming and subjected to errors have now been simplified with the advent of digital photomicrography and powerful image analysis software.

Present study is aimed at determining to what extent the morphometric values of normal superficial oral buccal mucosa cells are affected by the four commonly used fixatives.

Methodology

The study was conducted on 10 student volunteers between 20-25

* Senior Lecturer, Dept. of Oral Pathology and Microbiology, Azeezia College of Dental Sciences, Kollam 691 537; **Professor and HOD, Narayana Dental College, Nellore 524002; ***Professor and HOD, Educare Institute of Dental Sciences, Malappuram 676504

Table I *Table comparing various studies: Mean ± SD [Range]*

	NA	CA	ND	CD	N/C
Present study (Diethyl ether-ethanol)	71.88±8.09	2741.8±517.8	9.60±0.81	58.44±5.42	0.16±0.01
Ogden et al [Jan 1989] (Diethyl ether-ethanol)	61.1±19.1	1960±788.0	—	—	—
Sivapadasundaram [2003](95% Ethanol]	--	--	8.13±0.79	48.43±5.85	--
Ogden et al [Dec 1989] (Diethyl ether-ethanol)	72.28±11.5	3098±766.0	--	—	—
Goldsby et al [1964] (Diethyl ether-ethanol)	--	--	9.31	59.09	0.16

years of age, irrespective of sex, in the Department of Oral and Maxillofacial Pathology and Microbiology, College of Dental Sciences, Davangere, Karnataka, India.

Normal buccal mucosa cells were harvested using Cytobrush® plus and were suspended in 1 ml of Earle's balanced salt solution to prevent cellular alterations. 250 microliter of the sample was taken into the cytofunnels clamped to the slide holder, placed in Shandon Cytospin which revolved at 1000 rpm for 5 minutes, to obtain a monolayer of cells. Later the slides were taken out and fixed by four different methods - Diethyl ether (98%)-ethanol (95%) (1:1 v/v), Biofix spray, Methanol and Air drying. All smears were stained by Papanicolaou staining method.

The slides were viewed under 20X plain apochromat objective of a trinocular research microscope. Photomicrographs of fields of non overlapping superficial cells were captured using 3-chip CCD digital camera attached to a computer. Later all measurements were carried out on the captured pictures after proper calibration of the image analysis software

The cell area (A) and nuclear area (NA) were automatically calculated by the software by tracing the cell and nucleus outlines with the mouse pointer [Fig.1]. For calculating the cell diameter (CD) and nuclear diameter (ND), the maximum and minimum diameters were measured using the image analysis software and the average taken for further evaluation [Fig. 2].

Results

Mean and standard deviation of NA and ND when compared between the four fixatives, no significant difference was found [Table II].

Similarly no statistically significant difference in CA was found on comparing air with biofix spray and diethyl ether-ethanol and methanol. However, a significant difference with a p value of < 0.01 was found on comparing air with diethyl ether-ethanol, air with methanol, biofix spray with diethyl ether-ethanol and biofix spray with methanol.

On comparing the cell diameter, no statistically significant difference was noted with air and biofix spray. Other fixatives, air and diethyl ether-ethanol, air and methanol, biofix spray and diethyl ether-ethanol and biofix spray and methanol showed a difference in the mean and standard deviation.

ANOVA did not show any significant difference in N-C diameter and N-C area ratios for these fixatives.

Discussion

There have been only a few reports of cytomorphometric studies of exfoliated cells of normal oral mucosa, which could be used as a referral point or baseline for comparison of cytomorphometric values in smear from pathologic conditions [1, 10]

Fixative used should limit the change in dimension of nuclear and cell size to an absolute minimum[9] Hence the method of fixation may influence adversely the results of histomorphometric studies and even diagnostic cytology.

The present study sought to assess the influence of four different fixatives on harvested normal buccal mucosa cells, as it is non-keratinized, easily accessible and obtained in abundance with minimal trauma.

95% ethanol is a standard cytological fixative used in many laboratories. Commercially available ethanol is expensive and may not be available in some

Table II *Results and observations of four fixatives: Mean ± SD [Range]*

Group	NA [μ^2]	ND [μ]	CA [μ^2]	CD [μ]	N / C Area ratio	N/C diameter ratio
Air	78.42±11.47	10.15±1.02	3382.2±279.1	64.88±2.61	0.023±0.004	0.157±0.016
Biofix spray	78.43±8.60	9.88±0.55	3288.0±250.4	64.33±2.26	0.024±0.002	0.154±0.007
Diethyl ether-ethanol	71.88±8.09	9.60±0.81	2741.8±517.8	58.44±5.42	0.027±0.005	0.165±0.013
Methanol	69.05±11.01	9.25±0.70	2656.0 ±555.4	57.20±6.19	0.027±0.005	0.163±0.012
F-value	2.29	2.43	7.68	7.87	1.96	1.77
P-value	0.09	0.08	< 0.001	< 0.001	1.4	0.17

One way ANOVA; $p<0.001$ Highly significant; $p > 0.05$ Not significant

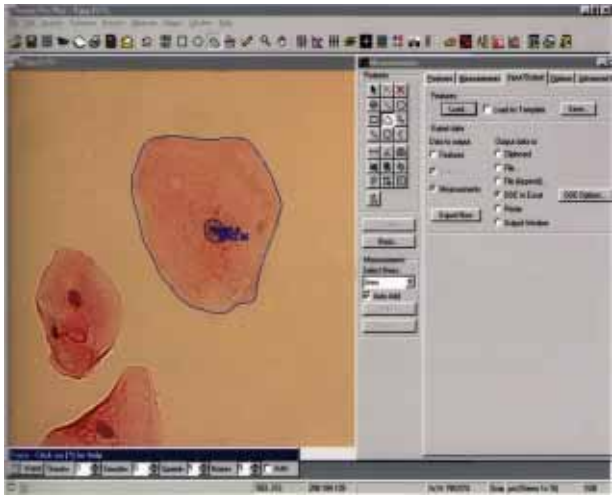


Fig. 1 Nuclear Area and Cell Area

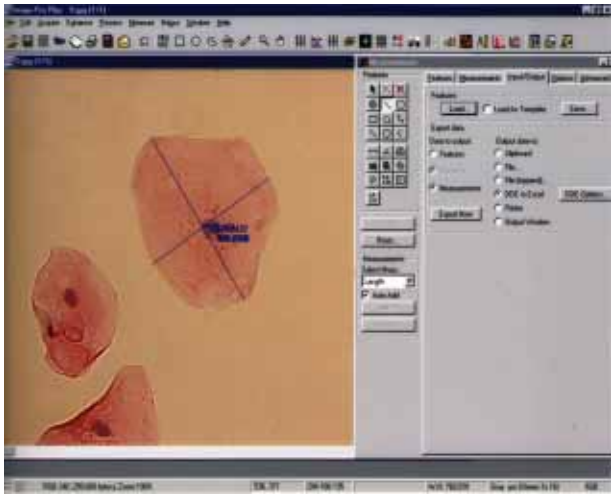


Fig. 2 Nuclear Diameter and Cell Diameter

institutions. Methanol, a tissue hydrant, was reported to be as effective as 95% ethanol with similar presentation value of cells and with no documentation of inhalation side effects under standard laboratory conditions[11]

Use of Cytospin provided a monolayer of cells spread apart with clearly defined outlines and minimal overlapping. Since the cells suspended in Earle's solution are allowed to settle down gradually by centrifugal forces, the adverse effects of rubbing of cells on to a glass slide are eliminated. Hence standardized procedures and sophisticated image analysis software were used to minimize errors in evaluation of the various parameters studied.

The result of our study was cross checked with measurements from studies using similar fixatives. The results revealed the mean CA, NA,CD, ND and N/C diameter ratio from our study were comparable to the studies of Ogden, Cowpe, Green[12] and Goldsby, Gary, Staats[10] respectively where the same fixative had been used.

However on comparing the present study with that of Ogden, Cowpe, Green[9] and Sivapadasundaram, Amit [1], some variation in the value were found which could be due to the difference in the techniques, like obtaining the smear. A table for comparison is given [Table I]

Paul Scheman in their study found that the nuclear and cytoplasmic measurements alone did not provide sufficient information and hence the ratio of the cytoplasm to the nucleus is to be used.[13]

The result from our study of quantitative techniques

applied to exfoliative cytology of normal buccal mucosa cells showed no statistically significant difference between air fixation and biofix spray and between diethyl ether-ethanol and methanol.

The results suggest that for routine cytological work, fixation by any of these methods is unlikely to have an influence on diagnostic cytopathology. However in cytomorphometric studies it would be advisable to take care that all smears are fixed using only one method to eliminate errors due to fixation.

Diethyl ether-ethanol which is expensive and not freely available in all institutions can be replaced with methanol which has similar effect on morphometric values.

References

1) Amit K. Nayar, Sivapadasundaram. Cytomorphometric analysis of exfoliated normal buccal mucosa cells. IJDR, Apr-June 2003; 14 (2), 87-93.
2) Cowpe JG. Quantitative exfoliative cytology of normal and abnormal oral mucosa squames: preliminary communication. Journal of Royal Society of Medicine, Nov 1984; 77, 928-931.
3) Philip B. Sugerman, Neil W. Savage. Exfoliative cytology in clinical oral pathology. Australian dental journal 1996; 41(2), 71-74.
4) Ogden GR, Green MW, Cowpe JG. Effect of radiotherapy on oral mucosa assessed by quantitative exfoliative cytology. Journal of Clinical Pathol 1989; 42, 940-943.
5) Ramesh T. Mendis, Ranatunga N, Thattil RO. The effect of tobacco smoking and betel chewing with tobacco on the buccal mucosa; a cytomorphometric analysis. Journal of Oral Pathol Med 1999; 28, 385-388.
6) Ogden GR, Wight AJ, Rice P. Effects of alcohol on oral mucosa assessed by quantitative exfoliative cytology. Journal of Oral Pathol Med 1999; 28, 216-220.
7) Robert W. Hillman, Benjamin Kissin, Brookline NY. Oral cytologic patterns and nutritional status: Some relationships in alcoholic subjects. Oral surgery, Jan 1980; 49(1), 34-36.
8) Dahlstrom JE, Janice Holdsworth, Mark LB, Sanjiv Jain. Rehydration of air dried smears. An alternative method for cytological analysis of exfoliative cells. Acta Cytologica, March-April 1999; 43(2), 214-217.
9) Ogden GR, Green MW, Cowpe JG. Quantitative assessment of various fixatives on nuclear and cytoplasmic areas in oral cytology. Histochemical Journal, Jan 1989; 21, 703-706.
10) Goldsby JW, Newton GL, Staats OJ. Nuclear and cellular size variations in clinically normal exfoliated buccal mucosa cells. Histochemical Journal, Jan-Feb 1964; 80, 80-84.
11) Kumarasinghe MP, Constantine SR, Hemamali RL. Methanol as an alternative fixative for cytological smears. Malays J Pathol, Dec 1997; 19(2), 137-140
12) Ogden GR, Green MW, Cowpe JG. Quantitative exfoliative cytology of normal buccal mucosa; effect of smoking. Journal of Oral Pathol Med Dec 1989; 53-55.
13) Paul Scheman, Altchuler L. Cytoplasmic- Nuclear ratios of epithelial cells in oral aspirates. O.S, O.M, O.P. Aug 1967; 24(2), 231-239.

Transmigration of Mandibular canines

* Vincia Paul, ** C.R.Sobhana, *** S. Mohan

Abstract

The mandibular canine shows an unusual tendency to migrate to the opposite side of the jaw. Numerous theories have been proposed to explain this rare phenomenon and a broad classification has also been proposed. This paper reports a series of 3 cases with mandibular canine transmigration with special emphasis on etiology and classification of transmigrations.

KDJ 2012; Vol. 35, no.2: 258-260

Introduction

Intraosseous movement of impacted canines crossing the midline (transmigration) is a rare phenomenon. The tooth usually travels along the labial side of the incisor roots and migrates as far as the roots of the first molar on the opposite side

Ando et al were the first to use the term "transmigration." This seems to be the most appropriate term. Tarsitano et al defined transmigration as the phenomenon of an unerupted mandibular canine crossing the midline. Javid expanded the definition to include cases in which more than half the tooth had passed through the midline. Joshi felt that the tendency of a canine to cross the barrier of the mandibular midline suture is a more important consideration than the distance traveled. Moreover, the stage of transmigration of the tooth at the time of examination is a determining factor in the distance traveled.

Transmigration was also defined as pre eruptive migration of a tooth across the midline. Transmigration is more common with mandibular canine.

Etiology

The cause of such rare behaviour is not yet known and there are many hypotheses surrounding it.

1. Bruzst believes that the canine germ is situated in front of the lower incisors & facial growth pushes it towards the contralateral side.

2. Javid and Joshi and Shetye suggested that the cause of transmigration may be an abnormally strong eruption force, which drives the canine through the dense symphyses. They also noted that the conical shape of the tooth aids its passage through the bone.

3. Vichi and Franchi suggested that agenesis of the adjacent teeth may favor retention of the primary canines and the excess space in the arch results in absence of correct guide for eruption. They suggested that proclination of the lower incisors; increased axial inclination of the unerupted canine could play an important role in the mechanism of transmigration.

4. Bennett emphasized that a very small obstacle such as a root fragment could divert a tooth from its normal eruptive path.

5. Marks and Schroeder suggested that a regional disturbance in the dental follicle may lead to local defective osteoclastic function with an abnormal eruptive pathway being formed.

6. A role of genetics is also considered.

7. Related pathologies which favor transmigration include supernumerary teeth, odontoma, dentigerous cyst, other impactions and Gardner's syndrome.

8. Ando et al suggested the premature loss of teeth, inadequate space, and excessively large crowns as etiological factors. However, premature extraction of the deciduous canine is practiced in an attempt to correct the eruption of an ectopic permanent canine.

9. Other factors favouring the appearance of this anomaly are:

i. premature loss of deciduous teeth
ii. osteodental discrepancy
iii. agenesis of the lower lateral incisors
iv. endocrinopathy
v. hereditary factors
vi. traumas
vii. odontomas

* Junior Resident, ** H.O.D. & Professor, *** Professor, Dept. of OMFS, Govt. Dental College, Trivandrum – 695 011

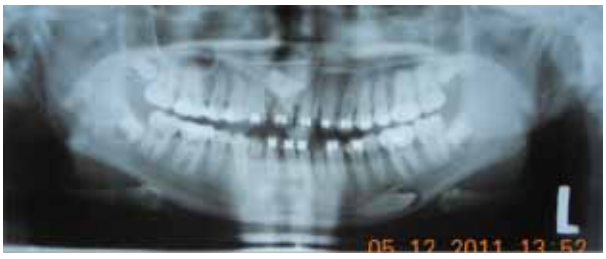


Fig. 1a pantograph showing transmigrated Right mandibular canine to the opposite arch below the roots of 34,35,36, Mupparapu Type 4

Fig. 1b occlusal view of the same patient.

Fig. 1c clinical view showing retained right deciduous mandibular canine

Fig. 1d: surgical removal via vestibular incision and securing the Lt mental nerve

Fig. 1e: the tooth removed after sectioning it horizontally

Fig. 1f: the empty crypt after removal of tooth with mental nerve secured

Classification of transmigrated mandibular canines:

The transmigrated teeth were classified (Mupparapu M; 2002) based on their migratory pattern and the final position within the jaw when diagnosed. The following criteria were used to classify the transmigrated canines:

Type 1: Canine positioned mesio-angularly across the midline within the jaw bone, labial or lingual to anterior teeth, and the crown portion of the tooth crossing the midline

Type 2: Canine horizontally impacted near the inferior border of the mandible below the apices of the incisors

Type 3: Canine erupting either mesial or distal to the opposite canine

Type 4: Canine horizontally impacted near the inferior border of the mandible below the apices of either premolars or molars on the opposite side.

Type 5: Canine positioned vertically in the midline (the long axis of the tooth crossing the midline) irrespective of eruption status

Type 1 is the most common type among the cases reported in the literature and type 2, type 4, type 3 and type 5 follows this, respectively.

Clinical considerations:

Even though the teeth have transmigrated to the contralateral side, they maintain their nerve connection to the originating side. Therefore, it is important to anesthetize the nerve on the originating side. In addition, like any other impacted teeth they have an increased chance of acting as foci of cyst, tumors or infection

Treatment options:

Treatment options proposed for transmigrated mandibular canines are surgical removal, transplantation and surgical exposure with orthodontic alignment.

Surgical extraction is the most favoured treatment. If the patient is symptomatic and has any associated abnormalities, such as a developing apical cyst, neuralgia, resorption of an adjacent tooth root or displacement of teeth, then surgical extraction should be planned immediately. If the patient is asymptomatic, the transmigrated canine can be left in place; however, regular follow-up with radiographs is required to monitor movement of these teeth

Case reports

Case 1:

A 13 yr old girl was referred to the dept. of OMFS from Dept. of Orthodontics, Govt. Dental College, Trivandrum for the removal of impacted mandibular canine and retained deciduous canine which might interfere with tooth movement.

Fig. 2a&b: impacted, erupted Lt canine in the midline aligned vertically; Mupparapu Type 5

Fig. 3b: Occlusal view showing vertically impacted mandibular canines bilaterally

Fig. 3c: clinically swelling Rt side with retained deciduous teeth

Clinically she had retained right mandibular canine absent 43 and normally erupted 33. Her 13 was also missing. OPG showed type 4 transmigration of right canine which lay horizontally below the roots of left premolar up to the 1st molars.

Treatment: The impacted tooth was removed under sterile conditions, using left inferior alveolar nerve block and right mental nerve block.

Case 2:

A 14 yr old boy reported in the dept. for removal of an additional tooth in the front of the lower jaw which caused frequent ulcer. Clinical examination revealed transmigrated 33 to the midline with retained deciduous canine.

Case 3:

A 24 yr lady came with a complaint of swelling right lower jaw of 1 month duration. Clinically there were retained 73 and 83 with missing corresponding permanent teeth with a bony hard swelling extending from 42 to 46. Panoramic radiograph showed radilucency extending from midline to 47 region with transmigrated bilateral impacted canines to the midline.

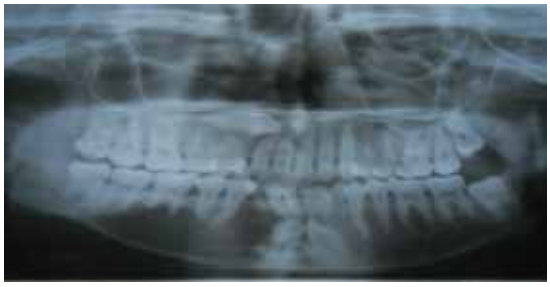


Fig. 3a: panoramic radiograph showing scalloped radiolucency Rt mandible and transmigrated bilateral canine; Mupparapu Type 5

Conclusion

The presence of retained deciduous teeth should be always investigated radiographically. Most of the time the transmigrated canines are asymptomatic but may also be infrequently associated with pathologies such as cysts, tumors or even displacement or root resorption of adjacent teeth. An intraoral radiograph is insufficient and should be invariably supplemented with an occlusal and a panoramic view. In addition, Prior to surgical removal of the transmigrated teeth, it is empirical to administer proper anaesthesia to the side of origin of the transmigrated teeth.

References

1. Transmigration of Impacted Mandibular Canines — Report of 4 Cases; JCDA, April 2006, Vol. 72, No. 3
2. Impacted Transmigrated Canine with Mural Ameloblastoma : An Unusual Case Report with Review of Literature; J Orofac Sci, 2(1)2010
3. Sharpie Y, Kuftinec M, Intrabony migration of impacted teeth. Angle Orthod 2003; 73(6): 738-43.
4. Pinar Sumar A, Ozden B, Otan F, Transmigration of mandibular canines: A report of six cases and a review of literature. J Contemp Dent Pract 2007; 8: 104-110.
5. Mupparapu M., Patterns of intraosseous transmigration and ectopic eruption of mandibular canines: review of literature and report of nine additional cases. Dentomaxillofacial radiology 2002; 31: 355-360.
6. Alaejos-Algarra C, Berini-Aytes L, Gay-Escoda C. Transmigration of mandibular canines: report of six cases and review of the literature. *Quintessence Int* 1998; 29(6):395–8.
7. Joshi MR. Transmigrant mandibular canines: a record of 28 cases and a retrospective review of the literature. *Angle Orthod.* 2001; 71:12– 22.
8. TRANSMIGRATION OF MANDIBULAR CANINE; Tejavathi Nagaraj Professor and Head, Umashree N. Senior Lecturer, Department of Oral Medicine and Maxillofacial Radiology Sri Rajiv Gandhi Dental College and Hospital, Bengaluru, Karnataka, India. e-Journal of Dentistry July - Sep 2011 Vol 1 Issue 3
9. Transmigration of Mandibular Canines—A Review of the Literature and a Report of Five Cases; Simon Camilleri, MSc, LDSRCS (Eng), MOrth RCS (Eng)a; Erica Scerri, *Angle Orthod* 2003; 73:753–762

Ameloblastomatous calcifying odontogenic cyst

* V.T Beena, ** Divya Gopinath, *** R. Heera, **** R. Rajeev, **** R. Sivakumar

Abstract

The Calcifying Odontogenic Cyst (COC) first described by Gorlin et al in 1962, represents a heteregenous group of lesions that exhibit a variety of clinicopathologic and behavioural features. COC has been categorized under two basic groups namely, cystic and neoplastic. Even after several classifications and sub classifications, COC still remains an enigma. Ameloblastoma is one of the well-known odontogenic tumours that has been associated with calcifying odontogenic cysts (COCs), but only a few cases have been reported in the literature till now. In this report we present a case of ameloblastomatous COC/Gorlin's cyst, emphasizing on the rarity of the lesion and distinguishing it from Ameloblastoma ex COC.

KDJ 2012; Vol. 35, no.2: 261-263

Introduction

Calcifying odontogenic cyst (COC), first described by Gorlin and colleagues, are now included in the group of odontogenic tumors in the International classification proposed in 1992 by World Health Organization (WHO) in which, there is odontogenic epithelium with odontogenic ectomesenchyme with or without dental hard tissue formation.[1] This lesion is uncommon and shows considerable diversity in clinical and biologic behavior. It is well known that this lesion often occurs in association with odontogenic tumors such as complex odontoma and ameloblastoma, and all recent histopathological classifications of COCs advocate categorising the variants associated with these tumors.[2,3,4] Although the association of ameloblastoma with this lesion is important, there are only a few reports that detail the clinical and radiographic features of COCs associated with ameloblastoma.

Case report

A 36-year-old male reported to the Department of Oral Medicine and Radiology, Govt Dental Hospital, Trivandrum complaining of a painless swelling on left side of the jaw which had a duration of one year. The swelling progressively increased in size. Panoramic radiograph revealed a well-defined unilocular radiolucency from the lower left lateral incisor to the left second premolar with a bony expansion towards buccal and lingual sides (Fig 1). The lesion contained the unerupted lower second premolar dislocated inferiorly to the lower border of mandible. Calcifications were not clearly observed in the IOPA & occlusal radiographs. The axial CT showed a well circumscribed hypodense region in the mandibular body region with mild buccal and lingual cortical expansion. Unerputed teeth as well as flecks of calcifications were also noticed inside the lytic lesion (Fig 2). Clinical examination revealed a bony swelling of the right mandibular body with slight pain on palpation. Limitation of mandibular movement and sensory disturbance of the lower lip were not observed. The clinical diagnosis of a dentigerous cyst was made and an enucleation was done. Gross specimen consisted of a cystic capsule with some proliferations inside the capsule. Microscopic examination revealed the presence of 4-10 cell layered odontogenic epithelium with well defined basal layer and inner layers resembling stellate reticulum and containing isolated as well as clusters of ghost cells that were undergoing calcification (Fig 3). Ameloblastomatous proliferations in plexiform as well as follicular pattern (Fig 4) were observed in the connective tissue of the cyst wall which also showed ghost cells undergoing calcification. Juxta epithelial hyalinization was also

* Professor & HOD, ** P.G. Student, *** Asso. Professor, **** Asst. Professor, Dept. of Oral & Maxillofacial Pathology, Govt. Dental College, Trivandrum

Fig. 1 Panoramic Radiograph depicting radiolucency

Fig. 2 Axial CT depicting flecks of calcification in the lesion

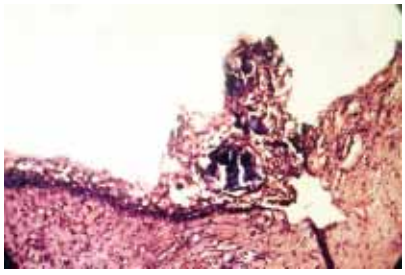


Fig. 3 Cystic lining with calcification (200 x magnification)

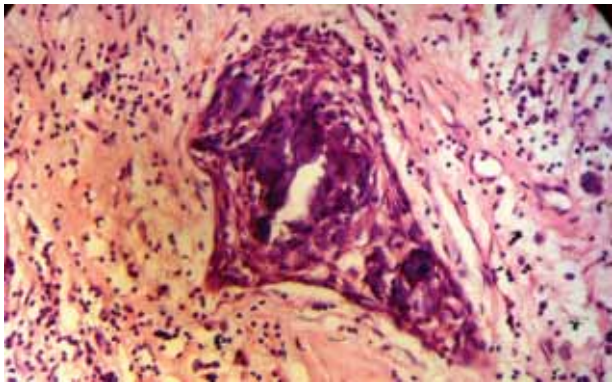


Fig. 4 Ameloblastomatous proliferation in the connective tissue capsule (400 x magnification)

observed in certain areas. The histopathological diagnosis was given as ameloblastomatous COC.

Discussion

Since its first description by Gorlin et al in 1962[1] many cases of COCs have been reported in the literature, though only a few cases at a time, each showing extreme diversity in its clinical and histopathologic features, as well as in its biologic diversity. Because of this diversity, there has been disagreement concerning the various terminologies used over the past 40 years which includes calcifying odontogenic cyst, Gorlin cyst, keratinizing and calcifying odontogenic cyst, atypical ameloblastoma, calcifying ghost cell odontogenic cyst, atypical ameloblastoma, calcifying ghost cell odontogenic tumor, dentinogenic ghost cell tumor, calcifying odontogenic lesion, epithelial odontogenic ghost cell tumor, odontogenic ghost cell tumor, and ghost cell cyst.[6]

Data on prevalence and incidence are not available irrespective of the variants of the COC. There are several sources which specifies the relative frequency of occurrences with range a of 1.0% to 6.8%[6]. Of the 43500 cases diagnosed by the Oral Pathology Diagnostic Service at Indiana University School of Dentistry only 34 cases of COC were reported.[4] Hong et al has reported 92 cases of COC from the files of Armed Force Institute of Pathology (AFIP) registry of Oral Pathology[4].A pronounced peak frequency of COCs was found in the second decade. There are no particular predilections for either the maxilla or mandible although the cases in the maxilla were more often seen in the older patients. This lesion tends to occur in the canine-incisor region in both jaws, but those in the maxilla occurs more often at the anterior region than those in the mandible. Radiographically, COCs generally appear as a unilocular lesion with a well-defined margin. The presence of calcifications, which were observed in about half of them was the most important radiographic feature for the diagnosis of COCs.[3, 14]

Microscopically COC presents as a cystic lesion in which epithelial lining shows a well defined basal layer of columnar cells, an overlying layer that is often many cells thick and may resemble a stellate reticulum, and masses of ghost cells may be seen in the epithelial lining or in the fibrous capsule. The ghost cells may become calcified. A neoplastic lesion with a solid architecture is also identified.

Several reports have showed that COCs often coexist with other odontogenic tumors, such as ameloblastoma, ameloblastic fibroma, ameloblastic fibro-odontoma and so on.[2,3,12,15] Among them, ameloblastoma may be the most important tumour in terms of its biologic behaviour and all recent histological classifications have established a category for the variant of COC associated with ameloblastoma.[2,4] The classification advocated by Hong *et al.* has two categories for COC associated with ameloblastoma: the ameloblastomatous cystic variant and the neoplastic variant associated with ameloblastoma.[4]

The former is characterized by a unicystic structure in which the lining epithelium shows unifocal or multifocal, intraluminal as well as intramural proliferative activity that resembles ameloblastoma, mostly plexiform, (but in our case both, plexiform as well as follicular pattern) and it also contains isolated

or clustered ghost cells and calcification.[4] Ameloblastoma like proliferations in the stroma of COC typically lacks Vickers and Gorlin criteria[7] for ameloblastoma-like cells. According to one report, ameloblastomatous COC microscopically resembles unicystic ameloblastoma except for the ghost cells and calcifications within the proliferative epithelium.[8]

On the other hand, the latter is called ameloblastoma arising from COC (ameloblastoma ex COC). Ameloblastoma ex COC designates a true ameloblastoma arising from the cyst lining epithelium of COC. It is characterized histopathologically as comprising few or no ghost cells with calcification observed in the transformed ameloblastomatous epithelial portion, while the cyst lining of the epithelium contains a considerable number of ghost cells and calcifications.[9,11]

Out of the 92 cases of COC reported by Hong et al from the files of AFIP registry of Oral Pathology, 11 cases were that of ameloblastomatous COC.[4] Aithal et al.[9], Lida et al.[10] and Mala et al.[11] have documented single case reports of ameloblastomatous COC. Because of the rarity of ameloblastomatous COC, determination of the demographic details such as age, sex and location of this lesion is difficult. According to the case reports in the literature, it seems that most of the patients were between 10 to 30 years old, and the tumor tends to involve the posterior region of the mandible.[8,10] No difference was observed in sex involved. Moreover, there are no complete reports about the treatment and recurrence of this lesion, because of the limited follow up information.[8] To date, none of the cases reported has shown aggressive growth and invasion into the surrounding tissue. In this regard, Buchner has suggested that if the COC is associated with an ameloblastoma, its behavior and prognosis would be that of an ameloblastoma rather than a COC. On the contrary, various other investigators have suggested that ameloblastomatous COC behaves like a cyst and can be managed by conservative surgical enucleation where as for the ameloblastoma ex COC treatment has to be radical.

In our case, although the basal cells showed ameloblastic proliferative activity, ameloblastomatous proliferations inside the connective tissue did not completely meet the histopathologic criteria of early ameloblastoma as suggested by Vickers and Gorlin.[7] Hence the case has been diagnosed as ameloblastomatous COC

To conclude, it is very difficult to determine whether any individual lesion having a cystic architecture is truly cystic or, in fact, neoplastic in nature. More case reports and an extensive and systematic analysis of many more cases including immunohistochemical investigations on cell proliferation activity may answer many such queries. Ameloblastomatous COC is a rare histologic variant. After a thorough search of the literature we could find only 15 cases of ameloblastomatous COC. Eventhough there aren't any reports of recurrence of this lesion there is no doubt that careful post-operative observations are necessary for any COCs which are associated with an ameloblastoma particularly keeping in mind the biological behavior of the latter.

References

1. Gorlin RJ, Pindborg JJ, Odont, Clausen FP, Vickers RA. The calcifying odontogenic cyst—a possible analogue of the cutaneous calcifying epithelioma of Malherbe. An analysis of fifteen cases. Oral Surg Oral Med Oral Pathol 1962; 15: 1235-1243.
2. Buchner A. The central (intraosseous) calcifying odontogenic cyst; an analysis of 215 cases. J Oral Maxillofac Surg 1991; 49: 330–339.
3. Praetorius F, Hjorting Hansen E, Grolin RJ, Vickers RA. Calcifying odontogenic cyst. Range, variations and neoplastic potential. Acta Odontol Scand 1981; 39: 227–240.
4. Hong SP, Ellis GL, Hartman KS. Calcifying odontogenic cyst. A review of ninety-two cases with reevaluation of their nature as cysts or neoplasms, the nature of ghost cells, and subclassification. Oral Surg Oral Med Oral Pathol 1991; 72: 56–64.
5. Toida M. So-called calcifying odontogenic cyst: review and discussion on the terminology and classification. J Oral Pathol Med 1998; 27: 49–52.
6. Peter A Reichart,Hans P Philipsen:Odontogenic tumors and allied lesions: Quintessence Publishing Co ltd 2004.p 155,163
7. Vickers RA, Gorlin RJ. Ameloblastoma: delineation of early histopathologic feature of neoplasia. Cancer. 1970; 26: 699 – 710.
8. Freedman PD, Lumerman H, Gee JK. Calcifying odontogenic cyst: A review and analysis of seventy cases. Oral Surg Oral Med Oral Pathol 1975; 40: 93–106.
9. Iida S, Ueda T, Aikawa T, Kishino M, Okura M, Kogo M. Ameloblastomatous calcifying odontogenic cyst in the mandible. Dentomaxillofac Radiol 2004; 33: 409- 412.
10. Aithal D, Reddy BS, Mahajan S, Boaz K, Kamboj M. Ameloblastomatous calcifying odontogenic cyst: a rare histologic variant. J Oral Pathol Med 2003; 32: 376-378.
11. Mala Kamboj, Manish Juneja. Ameloblastomatous Gorlin's Cyst.J Oral Science 2007; 49; 319-323.
12. Yoshida M, Kumamoto H, Ooya K, Mayanagi H. Histopathological and immunohistochemical analysis of calcifying odontogenic cysts. J Oral Pathol Med. 2001; 30: 582-58
13. Ledesma-Montes C, Gorlin RJ, Shear M, Prae Torius F,Mosqueda-Taylor A, Altini M, et al. International collaborative study on ghost cell odontogenic tumours: calcifying cystic odontogenic tumour, dentinogenic ghost cell tumour and ghost cell odontogenic carcinoma.J Oral Pathol Med 2008; 37: 302-308
14. Tanimoto K, Tomita S, Aoyama M, Furuki Y, Fujita M, Wada T. Radiographic characteristics of the calcifying odontogenic cyst. Int J Oral Maxillofac Surg 1988; 17: 29–32.
15. Lin CC, Chen CH, Lin LM, Chen YK, Wright JM, Kessler HP, et al. Calcifying odontogenic cyst with ameloblastic fibroma: report of three cases. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2004; 98: 451- 460.

Oral lesions in HIV – continuing challenge to the dental profession

* Sunila Thomas

Abstract

With the advent of newer treatment modalities, there is an increase in the demand for dental care among HIV infected patients. The dental professionals play a key role in the early diagnosis and management of oral lesions. The dentist should pay special attention to the clinical situation and immunologic status of these individuals. Some professionals are still reluctant to treat these patients because of the risk of disease transmission. The highest standards of infection control should be practiced in the dental clinics to minimize the risk of occupational transmission. The oral lesions of HIV and the modification of dental treatment are highlighted in this article.

KDJ 2012; Vol. 35, no.2: 264-267

Introduction

HIV infection, the global pandemic continues at an alarming rate despite widespread knowledge of disease prevention. There are about 33.4 million people in the world living with HIV/AIDS with 2.7 million new infections per year and 2 million deaths[1]. In India, the number of people living with HIV infection has reached 5.3 million by the end of 2004[2]. With the advent of HAART (Highly Active Anti Retroviral Therapy), there is a remarkable transition of HIV into a chronic manageable disease. However the situation continues to be a global threat and there should be an awareness among the public in general. Since most of the early manifestations of HIV are seen in the oral cavity, the dental professionals play a key role in the early diagnosis and management of these lesions[3].

Oral environment in HIV transmission

The risk of HIV transmission through oral secretions is a topic of continuing concern, particularly in view of the growing number of infected people. Factors such as low salivary viral titers, low CD 4 positive target cells, anti HIV antibodies and endogenous salivary antiviral factors reduce the risk of viral transmission[4]. Oral epithelial cell does not express CD 4 antigen. However, tonsils and adenoids rich in lymphocytes, macrophages and dendritic cells serve as cellular targets for HIV infection. Secretory Leukocyte Protease Inhibitor (SLPI) binds to CD 4 bearing human mononuclear cells to block HIV infection[4].

Oral lesions in HIV

The oral manifestations of HIV in adults and children were classified according to their frequency of association with the disease[5, 6]. With the introduction of HAART, the relative frequency of these lesions have changed[7]. Now it is logical to consider the lesions according to the type of opportunistic infection.

(1)Fungal infections

Oral Candidiasis remains the most prevalent fungal infection in HIV patients. The most common clinical presentations are pseudomembraneous candidiasis, followed by erythematous candidiasis, angular cheilitis and hyperplastic candidiasis. The frequency of oral Candidiasis is associated with CD4+ T lymphocyte count and HIV viral load and serve as prognostic indicator of immune suppression[8]. HAART has significantly reduced the occurrence of oral Candidiasis[9]. For mild infections, topical amphoterecin, nystatin, clotrimazole or posoconazole are effective but systemic fluconazole is required in

*Reader, Department of Oral Medicine & Radiology, PMS College of Dental Science & Research, Trivandrum

established HIV infection[10]. The deep fungal infections include cryptococcosis, paracoccidiomycosis, pencilliosis and aspergillosis[11].

(2)Bacterial infections

Mycobacterium Tuberculosis results in acute pulmonary infection in susceptible individual. Extra pulmonary TB occurs in immunosuppressed patients affecting internal body sites including the oral cavity. Oral lesions are also caused by Mycobacterium avium intracellulare with widespread involvement of the paranasal sinuses[12].

(3)Viral infections

Herpes simplex

Oral lesions caused by Herpes simplex virus (HSV) may progress to extensive mucocutaneous involvement. Acyclovir 200mg 5 times daily is the treatment of choice. Since resistance to Acyclovir therapy may occur during the course of the disease, newer antivirals like Ganciclovir and Famciclovir are preferred now[11].

Herpes zoster

Herpes zoster is characterized by unilateral occurrence of vesicles along the distribution of Trigeminal nerve. Acyclovir 800mg 5 times daily or Valacyclovir 500 mg 3 times daily is given. Treatment should be instituted early so as to prevent the development of post herpetic neuralgia.

Oral hairy leukoplakia

Oral hairy leukoplakia is an early marker of HIV infection and is associated with a low CD4+ count and high viral load[13]. It occurs as white plaque like lesion on the lateral border of tongue. Acyclovir 800mg 5 times daily is given. There is a considerable decrease in the prevalence of oral hairy leukoplakia after initiation of HAART.

Human Papilloma Virus infection

In the era of HAART, there is an increase in the prevalence of benign HPV related oral mucosal lesions[14]. The oral lesions in HPV may be related to a decrease in HIV viral load and decrease in CD 4 + cell count[15]. The exact mechanism for the reduction in HIV viral load is not clear, although the clinical manifestation of HPV infection may represent a form of immune reconstitution syndrome[10]. Another concern is that patients with oral HPV infection, who receive HAART, may develop oral epithelial dysplasia or squamous cell carcinoma and need careful clinical follow up[8].

Kaposi sarcoma

Kaposi's sarcoma is the most common AIDS associated malignancy caused by HHV 8. The common intra oral sites are palate and gingiva. Lesions appear as red to purple macules, papules or nodules that may ulcerate and cause local destruction. Dental practitioners should be aware of the early lesions presenting as subtle discolouration of the oral mucosa. Current treatments approved by FDA are topical alitretinoin gel and systemic therapy with liposomal daunorubicin, oloxorubicin, paclitaxel or interferon - ∞.[16]

(4) Periodontal diseases

HIV related gingival and periodontal diseases are linear gingival erythema, necrotizing ulcerative gingivitis (NUG), Necrotizing ulcerative periodontitis (NUP) and necrotizing stomatitis. Local debridement combined with systemic antibiotics may be given, but concurrent administration of antifungal agents should be considered because of the risk of developing candidiasis.

(5) Thrombocytopenic purpura

Another concern in HIV infected patients is thrombocytopenia. Clinicians should be concerned about the possibility of petechiae and intra mucosal hemorrhage.

(6) Hyperpigmentation

Hyperpigmentation of the oral mucosa is a common finding in long standing HIV disease. Whether it is a side effect of the drugs or a manifestation of Addison's disease is still questionable.

Modification of dental treatment in HIV positive patients

A major problem for HIV positive patients is the reluctance of some professionals to treat them, because of the risk of HIV exposure. Dental treatments should be modified accordingly, considering the influence of oral lesions on their general health status. Infected patients in a stable immunological status do not require any modification in dental treatment. Symptomatic patients with CD4 + lymphocyte count < 200 cells / mm^3 need careful evaluation. Infection control measures should be adopted to prevent the risk of cross infection.

Oral Surgical treatment

The most common complication in oral surgery is delayed wound healing[17]. Antibiotic prophylaxis is necessary only in patients with Neutropenia < 500 cells/ ml or CD_4+ cell count<100 cells / mm^3. Another consideration is thrombocytopenia. Patients with

Kaposis Sarcoma

Leukolakia

Table I *Guidelines for accidental exposure to contaminated material*

1	Decontamination - Wash with soap and water
2	Disinfection – 5% Sodium hypochlorite
3	Record date, time and description of exposure
4	Maintain confidentiality
5	Evaluation of source patient – HIV, HBV, HCV
6	Managing exposure (i) Seek advice from hospital infectious department (ii) HIV antibody test – 3, 6, 12 months (iii) Post exposure prophylaxis Basic regimen (28 days) – Zidovudine 600 mg/day + Lamivudine 150 mg/day Expanded regimen(28 days) - Basic regimen + Indinavir 800 mg tid

platelet count more than 50,000/mm^3 do not present post operative complications. Surgical treatments are contraindicated with platelet counts below 20,000/mm^3. Before planning surgical tooth extraction, coagulation test and INR should be performed. Avoid nerve block injection, use local infiltration or intra ligamentary injection instead. To maintain hemostasis, 5% tranexamic acid mouth rinse 4 times daily for 7 days post operatively can be used.

Periodontal treatment

Scaling, root planing & curettage cause transient bacteremia. Povidone iodine is used as anti bacterial mouth rinse.

Endodontic treatment

Meticulous instrumentation should be done to avoid instrument passing beyond the apex. Post operative flare up can be managed by NSAID and antibiotics. Burs, reamers and files are disposed after single use, autoclaved or immersed in 2% gluteraldehyde. Hand piece & Ultra sonic scalers should be autoclaved or immersed in Povidone Iodine for 10 minutes or 2% gluteraldehyde.

Orthodontic treatment

Non surgical orthodontic procedures can be performed without any modification. Orthodontic pliers can be dipped in 1% sodium nitrate before autoclaving. Contaminated bands, arch wires, brackets to be immersed in 2% gluteraldehyde.

Prosthodontic Treatment

No modification in dental treatment is required for these patients. For effective infection control, Alginate impression should be immersed in Sodium

hypochlorite for 10 minutes and Zinc oxide eugenol impression in 2% gluteraldelyde for 10 minutes.

Highly Active Anti Retroviral Therapy (HAART)

The goals of HAART are to reduce the viral load, achieve immune reconstitution, prolong life and improve the quality of life of HIV patients. It is recommended for asymptomatic patients with CD4 + lymphocyte count < 350 cells/mm^3. Some patients with virologic failure and drug resistance receive combination of upto six or more anti retroviral drugs called MEGA HAART.

Post exposure protocol

The chance of occupational transmission among dental professionals is 0.3% after percutaneous exposure to infected blood and 0.09 % after exposure of mucosa[18]. All patients should be considered as potentially infectious and universal precautionary measures like wearing double gloves, impermeable mask and protective eye glasses should be considered. The guide lines for accidental exposure to contaminated material are given in Table 1[17].

Conclusion

Oral lesions, if not identified early is a continuing challenge to the clinicians. Early recognition and therapy are vital to reduce morbidity and improve the quality of life of patients. Dental practitioners should be aware of the oral manifestations of HIV and dental treatment should be modified considering the immunological status of the individual. Standard infection control measures should be practiced to minimize the risk of occupational transmission. However the best defense against the disease is prevention of initial infection.

References

1. UNAIDS.Available at http://www.unaids.org/en/Knowledge centre/HIV Data/EpiUpdArchive/2009/default.asp.
2. National AIDS control organization.2004.Available at http://www.nacoonline.org/facts_hivestimates04.htm
3. Greenspan JS. Sentinels and sign posts: The epidemiology and significance of the oral manifestations of HIV disease. Oral Dis 1997; 3 (Suppl. 1): 13-17.
4. Shughars and Wahi. The role of oral environment in HIV – 1 transmission.JADA 1998: (129):851-57.
5. EC-Clearing house. Classification and diagnostic criteria for oral lesions in HIV infection. EC-Clearing house on oral problems related to HIV infection and WHO collaborating centre on oral manifestations of the immunodeficiency virus. J Oral Pathol Med 1993; 22: 289-91.
6. Ramos Gomez F, Flaitz C, Catapano P.Classification, diagnostic criteria and treatment recommendations for orofacial manifestations in HIV infected pediatric patients. J Clin Pediatr Dent 1999; 23: 83-96.
7. Ranganathan K and Hemalatha R. Oral lesions in HIV infection in developing countries: an overview. Adv Dent Res 2006; 19: 63-68.
8. Cristina Frezzini, Jair C Leao, Stephen Porter. Current trends of HIV disease of the mouth. J Oral Pathol Med 2005; 34: 513-31.
9. Umadevi K M R, Ranganathan K,Pavithra S, Hemalatha R, Saraswathi T R et al.Oral lesions among persons with HIV disease with and without highly active anti retroviral therapy in southern India. J Oral Pathol Med 2007; 36: 36-41.
10. Johnson NW.The mouth in HIV/AIDS: markers of disease status and management challenges for the dental profession. Australian Dental Journal 2010; 55: (1 suppl) 85-102.
11. Coogan MM, Fidel PL Jr, Komesu MC, Maeda N, Samaranayake LP. (B1) Candida and mycotic infections. Adv Dent Res 2006; 19: 130-38.
12. Bloom DC, Earhart KC, Keefe MA. Head and neck manifestation of mycobacterium avium complex disease as a consequence of return of immunocompetency in AIDS. Otolaryngol Head Neck surg 2001; 125: 668-69.
13. Margiota V, Campisi G, Mancuso S. Plasma HIV – 1 RNA and route of transmission in oral candidiasis and oral hairy leukoplakia. Oral Dis 2000; 6: 194-95.
14. Hodgson TA, Greenspan D, Greenspan GS. Oral lesions of HIV disease and HAART in industrialized countries. Adv Dent Res 2006; 19: 57-62.
15. King MD, Reznik DA, O' Daniels CM, Larsen NM, Osterholt D et al.Human papilloma virus associated oral warts among human immunodeficiency virus seropositive patients in the era of highly active antiretroviral therapy: an emerging infection. Clin Infect Dis 2002; 34: 641-8.
16. Dezube BJ, Pantanowitz L, Aboulafia DM. Management of AIDS related Kaposi's sarcoma: advances in target discovery and treatment. AIDS Read 2004; 14: 236-51.
17. Trapero J C, Sanchez J C, Guerrero J L, Moreno Lope L A, Lapiedra RC et al. Dental management of patients with human immunodeficiency virus. Quintessence Int 2003; 34: 515-25.
18. Bell DM. Occupational risk of human immunodeficiency virus infection in health care workers: An overview. Am J Med 1997; 102 (suppl 5 B): 9-15.

Ectopic pyogenic granuloma: A diagnostic dilemma?

* Deepa M.S., ** Resmi C. Nair, *** Anita Balan, **** K. Nandakumar

Abstract

Pyogenic granulomas are benign tumors which generally occur in the head and neck region.The first case was reported in 1844 by Hullihen(1). It has been reported as a common lesion of the gingival of the oral cavity. Critical review of the literature suggests its possibility of occurrence on the palate,buccal mucosa,tongue,lip etc and a varied age and site predilection.The purpose of this article is to report 5 cases of pyogenic granuloma occurring on the extragingival sites.

KDJ 2012; Vol. 35, no.2: 268-271

Introduction

Pyogenic granulomas are benign tumors which generally occur in the head and neck region. It was first described in humans in 1897 by Poncet and Dor as 'botryomycosis'[2] because of a supposed link to an equine pathogen. Since then the condition has received multiple designations throughout its history including epulis gravidarum, pyogenic granuloma gravidarum, bloody wart, lobular capillary hemangioma and granuloma telangiectatum. Hartzell in 1904 introduced the term "pyogenic granuloma" and it is still widely used in the world literature.[3] The name pyogenic granuloma is however a misnomer since the condition is not associated with pus and does not represent a granuloma histologically. It has, nevertheless, become entrenched in our vocabulary and is widely used today.

Pyogenic granulomas are relatively common and account for 1.85% to 7% of all biopsy findings from oral cavity lesions. Population studies have determined a prevalence rate of 1 lesion per 25,000 adults.[4]

Etiology & pathogenesis

The pathogenesis of pyogenic granuloma is not clear, but there is much speculation about the etiology. Local trauma or irritation has been noted in 7 to 50 percent of patients with the diagnosis.[5] The occasional presence of microorganisms has led to speculation of an infectious cause[6]. It has been reported as a complication of second-degree burns, with multiple pyogenic granulomas appearing in the affected area. A viral origin has also been hypothesized[7] (warts and pyogenic granulomas share an affinity for the hands, forearms, soles of feet and oral cavity) but seems unlikely because the most common types of human papillomavirus have been ruled out as etiologic agents by polymerase chain reaction testing. Underlying arteriovenous anastomoses may be in some way related to the development of pyogenic granuloma because lesions often develop within port-wine stains. [4] Hormonal influences (specifically progesterone) almost certainly play a role in the pathogenesis of pyogenic granuloma because these lesions commonly develop in pregnant women or in those taking oral contraceptives. [8]

Some drugs such as cyclosporine have an important role in the genesis of pyogenic granuloma.[9] Aguilo reported the formation of pyogenic granuloma as a result of an injury to a primary tooth and Milano et al reported a

* Reader, Dept. of Oral Medicine & Radiology, Azeezia College of Dental Sciences and Research, Meeyannoor P.O. Kollam, Kerala; ** Former P.G. student, Dept of Periodontics, Dental College, Trivandrum; *** Prof. & Head, Dept. of Oral Medicine & Radiology, Govt. Dental College, Trivandrum; **** Prof. & Head, Dept. of Periodontics, Azeezia College of Dental sciences and Research, Meeyannoor P.O., Kollam, Kerala.

Fig. 1 Pyogenic granuloma of lip

Fig. 2 Pyogenic granuloma of tongue

Fig. 3 Pyogenic granuloma of tongue

case of PG associated with tooth development.[10] Fowler et al first reported a case in which PG was found in association with guided tissue regeneration.[11] Kanda et al presented a patient who developed pyogenic granuloma of the tongue early after allogenic BMT done for multiple myeloma.[12,13]

Clinical features

The clinical features of pyogenic granuloma are indicative but not specific. Pyogenic granuloma can occur at any mucosal location of acute or chronic trauma or infection. The most common intra-oral site is the gingiva (61%) where they may develop as dumb-bell shaped masses on the facial and lingual surfaces of the dental arch, connected by a thin isthmus between adjacent teeth. Other sites of involvement include the the lip (14%), tongue (9%), buccal mucosa (7%) and palate (5%).[8] Extra-oral sites include the skin of the upper and lower extremities, head, face, mucous membranes of the nose, eyelids and genitalia.[14] A history of trauma is common in extra gingival sites whereas most lesions of the gingiva are a response to irritation. Females are slightly more affected than males, and the age at presentation ranges from 18 months to 93 years.

The most common symptom of oral cavity pyogenic granuloma is the presence of a mass. The lesion is usually an elevated pedunculated or sessile mass with a smooth lobulated or even a warty surface which is commonly ulcerated and shows a tendency for hemorrhage either spontaneously or upon slight trauma. It is deep red or reddish purple depending upon its vascularity and rather soft in consistency. Some lesions have a brown cast if hemorrhage has occurred into the tissue. The tumor may grow rapidly in size and then remain stable for indefinite periods of time. Rarely does pyogenic granuloma exceed 2.5 cm. in size and it usually reaches its full size within weeks or months, remaining indefinitely thereafter. Pain, aside from the local mass effect, may or may not be present. Adjacent bone resorption may occur.[4,16.]

Some unique intraoral presentations

Although gingiva is the usual site for pyogenic granuloma, lesions may manifest on the lip, tongue, buccal mucosa, palate or anywhere in the oral cavity under rather unique circumstances. The following are a few among the many which reported at the Oral Medicine department of Government Dental College, Trivandrum.

Case 1: Pyogenic granuloma of lip [Figure 1]

A 17-year-old girl reported with an asymptomatic swelling towards the left side of the lower lip of one month duration that bled repeatedly with minor trauma. Examination revealed a brownish-black crusted pedunculated lesion, spherical in shape, measuring 0.75 cm in diameter and was soft to firm in consistency.

Case 2: Pyogenic granuloma of tongue [Figure 2]

A young pregnant woman noticed a slowly growing mass on the right side of the

ventral surface of the tongue. It was of two months duration. Intraoral examination showed a 2.5 x 1.5 cm spherical sessile nodule of the same colour as normal mucosa and with a smooth texture but for the indentation of adjacent teeth.

Case 3: Pyogenic granuloma of tongue [Figure 3]

A 23 year old woman presented with a small swelling on the right dorsal aspect of the tongue. The lesion had been present since one month. A 0.5 cm reddish sessile growth with a granular surface was found on intraoral examination.

Case 4: Pyogenic granuloma of buccal mucosa [Figure 4]

A 14 year old girl developed an asymptomatic growth on the right buccal mucosa three weeks prior to reporting. The lesion was smooth, pedunculated, soft, approximately 1 cm in diameter with colour of normal oral mucosa.

Case 5: Pyogenic granuloma of palate [Figure 5]

A 51 year old male presented with a palatal swelling which interfered with speech and mastication. Intraoral

Fig. 4 Pyogenic granuloma of buccal mucosa

Fig. 5 Pyogenic granuloma of palate

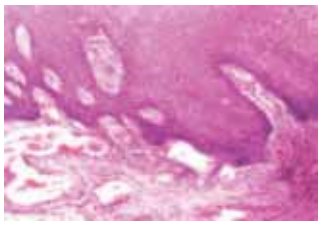


Fig. 6 Histopathological picture of Figure 1- Pyogenic granuloma of lip

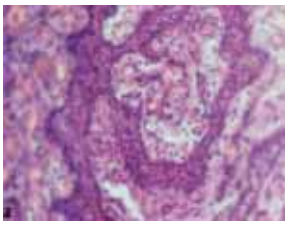


Fig. 7 Histopathological picture of Figure 2- Pyogenic granuloma of tongue

examination revealed a reddish pink pedunculated lesion, dome shaped, measuring 5.0 x 4.5 cm in diameter and soft in consistency. The surface was granular with bleeding from the peduncle.

In all cases diagnosis was confirmed by histopathological examination. Figure 6 and 7 shows the histopathological picture of case 1 and 2 respectively, suggestive of pyogenic granuloma.

Some rare presentations [4]

Epulis granulomatosa (Epulis haemangiomatosa) - It is a hemorrhagic gingival mass of granulation tissue protruding from the poorly healing bony socket of a recently extracted tooth.

Parulis – It is a draining granulation tissue mass, surrounding and often hiding the end of a fistulous tract from an underlying intraosseous dental infection.

Traumatic eosinophilic ulcer (Traumatic eosinophilic granuloma) - This lesion of young adults and middle-aged individuals appears to be trauma-induced and routinely demonstrates surface ulceration. It differs from the typical oral/pharyngeal traumatic ulcer in that it is larger (1.5-3.0 cm.), has often alarming proliferation of the granulation tissue of the ulcer bed and has a much greater rate of recurrence. The inflammatory changes in this lesion have a greater tendency to extend deeply into underlying tissues, including muscle, than do those of a more typical pyogenic granuloma.

Intravenous pyogenic granuloma - Rare examples of this have been reported.[16]

Histologic findings

The histopathology of extragingival pyogenic granuloma is quite similar to ones occurring on the gingiva.[17].It is a reactive/inflammatory process filled with proliferating vascular channels, immature fibroblastic connective tissue, and scattered inflammatory cells. The surface usually is ulcerated, and the lesion exhibits a lobular architecture.[4,14]

Differential diagnosis

Differential diagnosis of pyogenic granuloma includes peripheral giant cell granuloma,peripheral ossifying fibroma,metastatic cancer,hemangioma, pregnancy tumor, conventional granulation tissue, hyperpalstic gingivalinflammation, Kaposi'sarcoma, bacillaryangiomatosis, angiosarcoma, NonHodgkin's lymphoma.[13,20]

Treatment and prognosis

Pyogenic granuloma is treated by conservative surgical excision with removal of potential traumatic or infective etiologic factors.[14] Recurrence occurs in approximately 15% of lesions thus removed, with gingival cases showing a much higher recurrence rate than lesions from other oral and extra oral mucosal sites. Therefore, pyogenic granuloma of the gingiva should not only be excised, but the surgical wound bed should be curetted and adjacent teeth should be scaled and root planed. Removal of the lesion in a pregnant woman should be postponed if possible until after delivery. Lesional shrinkage at that time may make surgery unnecessary. Lesions removed during pregnancy may have a higher recurrence rate. It should be emphasized that gingival cases show a much higher recurrence rate than lesions from other mucosal sites.[15]

Although excisonal surgery is the treatment of choice for pyogenic granuloma, some other treatment protocols such as the use of Nd:YAG laser, flash lamp pulsed dye laser, cryosurgery, intralesional injection of ethanol or corticosteroid and sodium tetra decyl sulphatescelerotherapy have been reported as alternative therapies.[13,19]

Conclusion

Pyogenic granuloma is a rapidly growing benign lesion of the skin and mucous membranes. It has been reported as a common lesion of the gingiva of the oral cavity. Critical review of the literature suggests its possibility of occurance on the palate, buccal mucosa, tongue, lip etc and a varied age and site predilection.

These varied presentations can lead to clinical misdiagnosis of this benign lesion.

References

1. Hullihen SP.Case of aneurysm by anastamosis of the superior maxilla.Am J Dent SC 1844;4:160-162.
2. Poncet A, Dor L. Botryomycose humaine. Rev Chir.1897; 18: 996.
3. Hartzell M.B. Granuloma pyogenicum. Translations of American Dermatology Association. 1904; 28: 30.
4. John Svirsky. Oral pyogenic granuloma. Last updated Nov 16, 2001.
5. Mooney M, Janniger C. Pyogenic granuloma Cutis. 1995; 55:133-6.
6. Lee J, Lindhe C. Pyogenic granuloma: pyogenic again? J Cutan Med Surg 2001; 5 (6): 467-70.
7. Miller A, Sahl W, Brown S, Young S, Quinlan C, Patel P, et al. The role of human papillomavirus in the development of pyogenic granulomas. Int J Dermatol. 1997; 36: 673-6.
8. Ojanotko-Harri A.O, Harri M.P, Hurttia H.M, Sewon L.A. Altered tissue metabolism of progesterone in pregnancy gingivitis and granuloma. J Clin Periodontol.1991; 18: 262-266.
9. Bachmeyer C,Devergie A,Mansouri S,DubertretL,Aractingi S.Pyogenic granuloma of the tongue in chronic graft versus host disease.Ann Dermatol Venereol. 1996;123:552-554.
10. Aguilo L. Pyogenic granuloma subsequent to injury of primary tooth development. A Case Report.Int J paediatr Dent. 2001; 12: 438-441.
11. Fowler EB, Cuenin MF, Thompson H.Pyogenic granuloma associated with guided tissue regeneration.: a case report.J Periodontol 1996; 67:1011-1015.
12. Kanda Y,Arai C, Chizuka A,Suguro M et al. Pyogenic granuloma of the tongueearly after allogenic bone marrow transplantation for multiple myeloma.Leuk Lymphoma 2000; 37:445-449.
13. Hamid J,Majid S,Nooshin M.Oral pyogenic granuloma-a review.Journal Of Oral Science vol 48, 2006;4:167-175.
14. Bhaskar S.N, Jacoway J.R. Pyogenic granuloma – Clinical features, incidence, histology and result of treatment: Report of 242 cases. J Oral Surg. 1996; 24:391-398.
15. Jacqueline E. Jones.Pyogenic granuloma of the nasal cavity – A case report. The Journal of Reproductive Medicine. 2000; 45: 749-753.
16. Shafer, Hine, Levy. A textbook of Oral Pathology. Bacterial, Viral and Mycotic infections. Fourth edition: 359-361.
17. Maryam A, Farnaz F,Nooshin M et al.Extra gingival pyogenic granuloma ; a case report.Cases Journal 2008,1:37.
18. Mubeen,Jigna V.Oral pyogenic granuloma with unusual features- A CASE REPORT.Indian dentist research and review.aug 2009,58-61.
19. Vilmann A,Vilmann P,Vilmann H.Pyogenic granuloma evaluation of oral conditions.Br J Oral Maxillofac Surg. 1986,24:376-382.
20. Rajesh T,Rahul L,Suma B,Granuloma pyogenicum – A case report.JIDA 2008 vol 2;12:378-379.

Periodontitis as a risk factor for preterm low birth weight

* Thomas George, ** Nebu George Thomas, *** Gissy Mathew, *** Deepthi P.R.

Introduction

Periodontitis may affect the course and pathogenesis of a number of systemic diseases. Three mechanisms or pathways linking oral infections to secondary systemic effects have been proposed: (i) metastatic spread of infection from the oral cavity as a result of transient bacteremia, (ii) metastatic injury from the effects of circulating oral microbial toxins, and (iii) metastatic inflammation caused by immunological injury induced by oral microorganisms.

Preterm infants who are born with low birth weight represent a major social and economic public health problem. More than 60% of the mortality that occurs among infants without anatomic or chromosomal congenital defects is attributable to preterm low birth weight

The international definition of low birth weight adopted by the Twenty Ninth World Health assembly in 1976 is a birth weight of "less than 2500gnv. The Normal gestation for humans, full term is 40 weeks. Preterm or premature birth is usually defined as a gestational age of less than 37 weeks. Pregnancy can influence gingival health. Changes in hormone levels during pregnancy promote an inflammation termed pregnancy gingivitis[1]. This type of gingivitis may occur without changes in plaque levels[2]. Oral infections also seem to increase the risk for or contribute to low birth weight in newborns. Aim of the present study is to compare and evaluate the periodontal status of mother's who delivered pre term low birth weight baby's to those of mother's delivering normal birth weight baby.

Materials and Methods

Study group comprising of 30 pre term low birth weight baby's mothers (Test) and 30 normal birth weight baby's mothers (Control)were selected among those attending the in patient of department of Gynecology in Pushpagiri Institute of Medical Sciences Thiruvalla. They were 60 patients within age group between age group of 18 to 34 years. Subjects older (>34 years) and younger (<18 years) maternal age, low socioeconomic status, inadequate prenatal care, drug, alcohol, and/or tobacco abuse, hypertension, genitourinary tract infection, diabetes, and multiple pregnancies excluded. Subjects with history of orthodontic treatment, periodontal surgery or periodontal instrumentation undergone in the past one year were not taken for study. Clinical parameters including Plaque Index (Silness & Loe1964), Gingival Index (Loe & Silness 1963), Probing pocket depth and Clinical attachment level were taken and subjected to statistical analysis.

Result

Statistical evaluation of periodontal values yielded the following results Comparison of mean values of the variables between control group and test group

Mean value of gingival index and probing pocket depth shows statistically significant ($p<0.0001$) difference between control group and test group. No statistically significant difference found between control group and test group for mean value of plaque index and clinical attachment level

Discussion

Although increasing efforts have been made to diminish the effects of these risk factors through preventive interventions during prenatal care, they have not reduced the frequency of preterm low-birth-weight infants[3].

Evidence of increased rates of amniotic fluid infection, chorioamnion infection, and chorioamnionitis supports an association between preterm birth or low birth weight and infection during pregnancy[4]. Histologically, the chorioamnion is often inflamed, even in the absence of any bacterial infection in the vagina (vaginosis) or cervical area. This suggests that distant sites of infection or sepsis may be targeting the placental membranes. Vaginosis, caused by gram-negative, anaerobic bacteria, is a significant risk factor for prematurity and is usually associated with the smallest, most premature neonatal deliveries.[5,6] The biological mechanisms involve bacterially induced activation of cell-mediated immunity leading to cytokine production and the ensuing synthesis and release of PG, which appears to trigger preterm labor.[5] Elevated levels of

* Head of the Department, ** Reader, ***Intern, Dept. of Periodontics, Pushpagiri College of Dental Sciences, Thiruvalla

Variable	*Control Group*	*Test Group*
	Mean ± S.D	Mean± S.D
Plaque index	0.26 ± 0.15	0.29 ± 0.27
Gingival index	0.09 ± 0.08	1.12 ± 0.13
Probing pocket depth	2.51 ± 0.20	3.35 ± 0.45
Clinical attachment level	0.19 ± 0.03	0.21 ± 0.06

cytokines (IL-1, IL-6, and TNF-α) have been found in the amniotic fluid of patients in preterm labor with amniotic fluid infection[7]. These cytokines are all potent inducers of both PG synthesis and labor. Intra-amnionic levels of PGE_2 and TNF-α rise steadily throughout pregnancy until a critical threshold is reached to induce labor, cervical dilation, and delivery[3].

As a remote gram-negative infection, periodontal disease may have the potential to affect pregnancy outcome. During pregnancy, the ratio of anaerobic gram-negative bacterial species to aerobic species increases in dental plaque in the second trimester[2]. The gram-negative bacteria associated with progressive disease can produce a variety of bioactive molecules that can directly affect the host. One microbial component, LPS, can activate macrophages and other cells to synthesize and secrete a wide array of molecules, including the cytokines IL-1α, TNF-α, IL-6, and PGE_2 and matrix metalloproteinases[4]. If they escape into the general circulation and cross the placental barrier, they could augment the physiologic levels of PGE_2 and TNF-α in the amniotic fluid and induce premature labor.

In present study comparison of periodontal status pre term low birth weight baby's mothers and normal birth weight baby's mothers shows statistically significant difference in mean value of gingival index and probing pocket depth in accordance to Offenbacher et.al[4], Dasanayake et.al.[9] Above result shows periodontal health of the mother is a potential risk factor for low birth weight.

The role of the host's inflammatory response appears to be the critical determinant of susceptibility and severity[10].

Conclusion

The association between periodontal disease and low birth weight may reflect the patient's altered immune-inflammatory trait that places the patient at risk for both conditions. Thus, periodontitis may be a marker for preterm delivery susceptibility as well as a potential risk factor. Further study assessing the clinical parameters, inflammatory mediators and cytokine levels in subjects has to be done in future.

References

1. Loe H, Silness J. Periodontal disease in pregnancy: prevalence and severity. Acta Odontology Scandinavia. 1963;21:532–551.
2. Kornman K S, Loesche W J. The subgingival microbial flora during pregnancy. Periodontal Res. 1980;15:111–122.
3. Katz V, Fertik G, Collins J, Boyd D, Maynor G, McKaig R, Beck J. Periodontal infection as a possible risk factor for preterm low birth weight. Journal of Periodontology 1996;67:1103–1113.
4. Offenbacher S, Beck J D, Lieff S, Slade G. Role of periodontitis in systemic health: spontaneous preterm birth. Journal of Dental Education. 1998;62:852–858.
5. Hillier S L, Martius J, Krohn M, Kiviat N, Holmes K K, Eschenbach D A. A case-control study of chorioamnionic infection and histologic chorioamnionitis in prematurity. New England Journal of Medicine. 1988;319:972–978
6. Hillier S L, Nugent R P, Eschenbach D A, Krohn M A, Gibbs R S, Martin D H, Cotch M F, Edelman R, Pastorek J G, 2nd, Rao A V. Association between bacterial vaginosis and preterm delivery of a low-birth-weight infant. The Vaginal Infections and Prematurity Study Group. New England Journal of Medicine. 1995;333:1737–1742.
7. Romero R,Baumann P, Gomez R, Salafia C, Rittenhouse L, Barberio D, Behnke E, Cotton D B, Mitchell M D. The relationship between spontaneous rupture of membranes, labor, and microbial invasion of the amniotic cavity and amniotic fluid concentrations of prostaglandins and thromboxane B2 in term pregnancy. American Journal of Obstetrics& Gynecology. 1993;168: 1654–1664.
8. Darveau R P, Tanner A, Page R C. The microbial challenge in periodontitis. Periodontology 2000. 1997;14:12–32.
9. Dasanayake A P. Poor periodontal health of the pregnant woman as a risk factor for low birth weight. Annals of Periodontology. 1998;3:206–212
10. Offenbacher S. Periodontal diseases: pathogenesis. Annals of Periodontology. 1996;1: 821–878.

Bruxism

* K. Nandakumar, ** Midhulag, ** Sreeja, ** Cimi Eqbal

The word "Bruxism" comes from the Greek word "brychein" meaning to grind or gnash the opposing rows of upper and lower molar teeth. Bruxism is defined as diurnal or nocturnal parafunctional activity that includes clenching, bracing, gnashing and grinding of teeth. Bruxism affects both children and adults. It can occur during wakefulness or during sleep. Bruxism during day time is commonly a semivoluntary clenching activity and is also known as "Awake bruxism" (AB) or "Diurnal bruxism" (DB). Bruxism during sleep either during day time or during night is termed as "Sleep bruxism.

Causes of bruxism

1. Anxiety, stress or tension
2. Aggressive, competitive or hyperactive personality type
3. Abnormal alignment of upper and lower teeth (malocclusion)
4. Sleep problems like sleep talking, snoring, etc
5. Response to pain from an ear ache or teething (in children)
6. Complication resulting from disorders such as Cerebral palsy, Huntington's diseases or Parkinsonism
7. An uncommon side effects of some psychiatric medications including certain antidepressants (Fluoxetine, sertaline and Paroxetine), and Selective Serotonin Reuptake Inhibitors (SSRI) eg: Selegeline

General symptoms

1. Head ache
2. Discomfort & muscle ache (muscles of mastication &muscles of facial expression)
3. Ear ache
4. Tightness &stiffness of shoulders
5. Limitation of mouth opening
6. Sleep disruption of the individuals as well as bed partner

Oral symptoms

1. Abnormal teeth wear
2. # of teeth, restoration
3. Inflammation and recession of gums
4. Excessive teeth mobility
5. Premature of loss of teeth
6. Occasionally swelling on the side of lower jaw caused by clenching

Diagnosis

1. Proper case history
2. Extra oral examination
3. Intra oral examination

Management

Depending on the etiology

1. Professional counselling
2. Correct the teeth alignment (if due to malocclusion)

Sever cases, dentist may need to use onlays or crowns to entirely reshape the biting surfaces of teeth

3. Medications.

muscle relaxant before bedtime

Botulinum toxin (Botox) injections may help some people with severe bruxism that hasn't responded to other treatments

4. Biofeedback

Application of electrical sensors to different parts of your body. These sensors monitor your body's physiological responses to stress — such as teeth grinding — and then feed the information back to you via auditory and visual cues (beeping sound or a flashing light).

5. Behavior therapy.

Once you discover that you have bruxism, you may be able to change the behavior by practicing proper mouth and jaw position

Case report

52 year old male patient came to Department of Periodontics, Azeezia Dental College with complaints of constant clenching of teeth in both day & night time. History revealed that patient is under financial stress. Patient was unable to sleep at night and had the habit of taking Alprazolam 1 mg and in day time he used to keep chewing gum over the teeth. Extra oral examination shows reduction in vertical dimension at occlusion & tenderness on muscles of mastication. Intra orally, severe attrition of upper and lower teeth, fracture lines on upper incisors & inflammation of lower gums.

* Principal, ** PG. Student, Dept. of Periodontics, Azeezia College of Dental Sciences and Research, Kollam

OPG shows generalized widening of PDL space and thickening of lamina dura. We managed this patient with professional counseling, muscle relaxants for tenderness & fabrication of mouth guard using silicone material and the patient was referred to physician for the tapering the dosage of Alprazolam.

52 Year old male patient with complaints of constant clenching of teeth

Intra oral examination shows edge to edge bite with inflammation of lower Gums and fracture lines on upper incisors

Generalized Severe attrition of upper & lower teeth & inflammation of lower gums

OPG shows widening of PDL space & increased bony trabeculae

Fabrication of mouth guard using silicon material

Insertion of Mouth guard

One week post insertion view

Quiz

* Rajitha A.V., * Jerly Abraham, ** Anita Balan, *** Sharafuddeen K.P, ***Nileena R. Kumar, ***Haris P.S.

1. A well defined unilocular radiolucency was discovered fortuitously during radiographic examination in the body of mandible. The most probable diagnosis is:

a. Solitary bone cyst
b. Stafne cyst
c. Haemorrhagic bone cyst
d. Unicameral bone cyst

2. A 30 year old man presented with a complaint of a white leathery lesion in the maxillary labial vestibule of 3 months duration. He gives a history of using smokeless tobacco for the last 1 year. The most probable diagnosis is:

a. Leukoplakia
b. Lichen planus
c. Tobacco pouch keratosis
d. White sponge nevus

3. A 60 year old patient gives a history of radiotherapy for carcinoma-floor of mouth, 7 years ago. The characteristic appearance of teeth is:

a. Amelogenesis imperfecta
b. Dentinogenesis imperfecta
c. Enamel hypoplasia
d. Radiation caries

4. A systemically ill patient presented with yellowish discolouration of oral mucosa, skin and sclera of eyes. The most probable diagnosis is:

a. Carotenemia
b. Jaundice
c. Extrinsic stains
d. Lipoid proteinosis

5. Loss of lamina dura is seen in all except:
a. Hypophosphatemia
b. Hypophosphatasia
c. Osteopetrosis
d. Hyperparathyroidism

6. A 9 year old girl presented with a soft, fluctuant, non-tender swelling beneath the tongue of 1 month duration. The most probable diagnosis is:

a. Ranula
b. Ludwig's angina
c. Dermoid cyst
d. Vascular lesion

7. A clinically normal appearing tongue had the following appearance on protrusion. Diagnose the condition:

a. Cleft tongue
b. Fissured tongue
c. Ankyloglossia
d. Bifid tongue

8. A patient presented with multiple, asymptomatic, discrete yellow spots of long duration on bilateral buccal mucosa. They are most likely to be:

a. Leukoplakia
b. Fordyce granules
c. Lipoma
d. Candida

9. A 60 years old male patient reported with a painless, firm growth on the ventral surface of tongue, of 20 years duration. The surface was irregular. There was no induration or associated lymphadenopathy and tongue movements were within normal limits. Diagnose the condition:

a. Oral squamous cell carcinoma
b. Squamous papilloma
c. Lymphangioma
d. Fibroma

10. How many intraoral radiographs are needed for the full mouth survey of a 7 years old child:
a. 4; b. 12; c. 14; d. 21

Ans. 1-b, 2-c, 3-d, 4-b, 5-c, 6-a, 7-c, 8-b,9-b, 10-c.

* Post Graduate Student, **Professor and Head of the Department, ***Assistant Professor, Department of Oral Medicine and Radiology, Govt. Dental College, Calicut, Kerala.

Secretary's report and association news

My dear fellow members,

Time goes by so fast and the activities we had done were so encouraging and satisfying. The fruitful deliberations in the AQUIRE 2012 had given an introspection on members needs and aspirations. The Dentists day celebrations and the presentation of media awards had fetched wide media coverage. It is indeed very good in observing the enthusiastic participation of lady dentists in the activities of Women Dental Council. The WDC installation ceremony was so colorful and well conducted, kudos to Chairperson Dr. Thaj S Prasad and team. The first State level CDE programme on Practice management and Dental tourism was rich in content and participation. A workshop on Oral Cancer to equip our members to identify and know the various aspects of oral cancer in collaboration with Regional Cancer Center and National Rural Health Mission is on the way in 13 centres in Kerala and is receiving huge response from members. I request all members to make use of this informative programme. All these activities with your active involvement and support had given us more fuel to take up lot more activities.

Dr. Shibu Rajagopal
Hon. Secretary
IDA Kerala State

Dr. Lin Kovoor
CDE Chairman, IDA, Kerala State

CDE

It is with great pleasure I present the first quarterly CDE report. I must say that it does take a fair amount of commitment as this post demands. Also it gives you a good learning experience by attending and organising the programmes with the help of the CDE convenors and the office bearers of all the branches

By the end of April 2012 we have conducted 10 Interbranch level, 10 Branch level and one state level CDE programmes. It is nice to see the members attending the CDE programmes has improved in strength

First State Level CDE Work shop was conducted on 18th March 2012 from 9 am to 5 pm at Hotel Presidency, Cochin. The topic was on Practice Management and Dental Tourism. Dr. Varghese Mani inaugurated the function President ida Kerala state Dr. Raveendranath welcomed the gathering, ida state secretary Dr. Shibu Rajagopal gave vote of thanks. The Faculties were Dr. Rajeev Chitgupy Periodontist from Bangalore, Dr. Manoj Rajan Prosthodontist from Chennai, Dr. Santhosh Sreedhar, Periodontist, Past President IDA Kerala, Dr. Mukul Dabholkar from Mumbai had given a very informative talk and the interaction was also well appreciated. More than 120 members attended and representation from almost all the branches was noted

Dr. Civy V Pulayath
CDH Chairman, IDA Kerala State

Dear Peers in Profession,

The Council on Dental Health of Indian Dental Association Kerala State is in full swing with wide variety of activities. Most of the branches are keen in conducting excellent branch level community programs. Congratulations to all especially to those who intimate in prior and follow up with their reports.

AWARD FOR THE BEST INNOVATIVE CDH PROJECT FOR THE YEAR 2012

A special award will be given for the CDH chairman of the branch who organizes a never before event in the field of dental public health. The guidelines are uploaded in the website.

DENTIST DAY

Hotel Mercy, Ernakulam witnessed a spectacular show on the world dentists day- MARCH 6, hosted by IDA Kochi Branch. Chief guest Actor Salim Kumar inaugurated the function and Leela Menon, famous journalist was the guest of honour. Dr. Civy V Pulayath took a class on " What after BDS" for the students of Amritha Dental College

KNOW ORAL CANCER NO ORAL CANCER

The IDA CDH – RCC _ NRHM workshop series on oral cancer prevention and control for general practitioners took off on 22nd April at Hotel Presidency Ernakulam. It will be continued till August 5 at 12 different centers.

SUSMITHAM

The Kerala Oral Health Survey is a major project of CDH in the year 2012. Project protocol has been approved by the Kerala Dental Council and the Health Department of Kerala State Government has assured their support. Pleased find the details given on website

PATHFINDER

Career Guidance and practice management seminar is planned to be conducted at 7 dental colleges in the state. Applications are invited for the same through cdh@idakerala.com.

NO TOBACCO DAY

IDA Trivandrum will be hosting the state level observation of this event in a grand manner on May 31. Visit website for details. All branches are requested to organize events in connection with this.

DYUTHI

As a part of public dental health education this new venture of awareness publication on innovative topics was flagged off. Posters and booklets on following topics are uploaded in our website for the members to download and use.

- DENTAL SNAKE AND LADDER
- TEETH-GUMS AND YOU
- TOBACCO- THE SILENT KILLER
- ALWAYS GO FOR THE NEW

WDC Report

Dr. Thaj.S.Prasad
Chairperson

Dr. Mercy Joji
Secretary

INSTALLATION CEREMONY :

The installation ceremony of new office bearers of IDA Women's Dental Council of Kerala State 2012 was held at Sneha Inn, Kannur on 25.02.2012. Dr.Anand Godshey, IDA National president was the guest of honour and Ln.Dr.Suchitra Sudheer was the chief guest. Dr.Merilyn Alias installed Dr.Thaj S. Prasad as the chairperson & Dr. Mercy Joji, as the secretary of WDC. Dr. Sudha santhosh welcomed the gathering & Dr. Mercy Joji thanked the audience. Dr. Raveendra Nath (IDA Kerala State president), Dr. Santhosh Sreedhar, Dr. Shibu Rajagopal and Dr. Antony Thomas spoke on the occasion.

PUBLIC AWARENESS PROGRAMME :

The first public awareness programme for women held at Medical trust hospital, Kulanada, Pathanamthitta on 22-04-2012 was informative & Participative. Classes were conducted by Dr. G.Vijayakumar, M.D. on diabetics & Dr.Baiju.R.M., MDSon pregnancy & dental care. Dr. Thaj. S. Prasad (Chairperson), welcomed the meeting and Dr. Mercy Joji thanked the audience, Mrs. Elsy Joseph (Standing committee member – Kulanada Panchayath), Dr. Joji George (IDA Kerala state executive committee) and Dr.Seethi Beagum (Chairperson, WDC mavelikkara branch) spoke on the occasion. Free blood checkup for women, exhibition and distribution of pamphlets & books were the other attractions of the programme.

MALABAR BRANCH

JANUARY
INSTALLATION & FAMILY GET TOGETHER
Date:1.1.2012; Venue: HOTEL MALABAR PALACE, CALICUT
Attendance:100
CDH PROGRAMME
1)Awareness CLASS& CHECK UP CAMP
Date-15.1.2012; Place: MUSLIM ORPHANAGES TTI, calicut
No. of Participants: 60
Associated with any other organizations: MUSLIM ORPHANAGES TTI
first executive meeting- date-15.1.2012; venue-IDA hall

FEBRUARY
CDE ACTIVITIES
First CDE & hands on
Faculty-Dr.Jayashri Hegde, MDS endodontics
Date-12.2.2012
INTERBRANCH CDE
VENUE-IDA hall, Ashokapuram
FIRST STUDENTS PROGRAMME
Inaugaration of students programme & distribution of MOIDEEN SHA CHAMBA award for oral medicine toppers by Principal, Govt Dental College
Topic-CDE on Red lesions
venue-Govt dental college calicut; date-1.2.2012
Faculty-dr.Suma samuel,mds oral medicine
CDH ACTIVIES
Checkup camp
date-19.2.2012; venue-kollam,quilandy

MARCH
CDH ACTIVITIES
AWARENESS CLASS&CHECK UP CAMP
VENUE-cheruvannoor,perambra DATE-4.3.2012
association with other organisation-
Awareness class&checkup camp
venue-koya road calicut; date-18.3.2012
association with other organisation-rank residential association
Dentists day celebrations
checkup camp for mentally challenged at snehabavan,distribution of food, mixie, computer table, sweets, medicines, for them
venue-snehabavan,kundayithode,feroke date-6.3.2012
SECOND EXECUTIVE MEETING
VENUE-Ida hall; date-20.3.2012
Cricket match between team of IDA MALABAR & CHARTERED ACCOUNTANTS, CALICUT
VENUE-GURUVAYURAPPAN COLLEGE GROUND

NEDUMBASSERY BRANCH

INSTALLATION: 12th installation ceremony held on 14/1/2012 at Hotel Surya. The chief guest of the function was the state president of IDA Kerala State Dr Raveendranath M. Dr Major Jude John was installed as the president and Dr Prince Urmese the secretary.

1st Executive: The first executive of the branch was held on 14/01/2012. The state president Dr Raveendranath M was present for the same.

1st CDE: The first CDE on the topic "Diastema Closure" was held on 22/01/2012 at IMA House Kochi in association with "Academy of advanced dental sciences". The speaker was Dr Pankaj Maheshwari. It was attended by around one hundred delegates.

2nd Executive: The second executive of the branch was held on 27 January 2012 at Periyar Club Aluva.

2nd CDE: The second CDE on the Topic "photography" was held on 19 February 2012 at Hotel Surya. The speaker was Dr Binu Abraham.

3rd Executive: The 3rd Executive of the branch was held on 24 February 2012 at Periyar club Aluva.

President Secretary meet & 2nd State Executive Kannur: President Dr Major Jude John and Hon:Secretary Dr Prince Urmese attended the President Secretary's meet on 25 February 2012.

Women's Wing installation of State office bearers was attended by Dr Zahira.

Dentist day: Dentist day celebration was held at "Daivadan Centre and Old age Home" Malayattoor which is an adopted project of our branch since 2003. This year we inaugurated a fully equipped dental clinic to provide dental treatment to the under privileged people in and around Malayattoor.

Chief guest of the function was Mr Radhakrishnan Chengattu and the guest of honour was Mrs Tany Thomas, District mission co-ordinator of Kudumbasree.

In the evening we were honoured by the presence of IDA State President Dr Raveendranath M and Hon:Secretary Dr Shibu rajagopal.

1st Clinical Club: The first clinical club was held at Periyar Club on 24 March 2012. The topic was "Mission Pedodontics". The speaker was Dr Kavitha Kumar Vijith.

Staff Training Programme: Staff training programme in association with 3MESPE was held at YMCA Camp Site Aluva on 25 March 2012. Dr Binu Abraham lectured on front office management and etiquettes required for dental staff. This was followed by lecture and hands on in manipulating various dental materials. It was lead by Mr Agnal and Mr Jaison from 3MESPE.

ALAPPUZHA BRANCH

Installation ceremony: The installation ceremony of Dr Mathew.M the 12th President of IDA Alappuzha branch was held on 22nd Jan- 2012 Chief guest of the day was Dr Shibu Rajagopal and Guest of Honours was Dr Samuel K. Ninan (Secretary-IDA Hope kerala state) and Dr Pratap Kumar (Past President-IDA Kerala State)

CDE Activities: The first CDE program of our branch was held on 15th of march 2012 at Prince Hotel, Alappuzha. Faculty was Dr Sebastian (Associate Professor, Pushpagiri Dental College Thiruvalla) Topic was on Overdenture.

Clinical Club: The First clinical club of our branch was held on 26th feb 2012. The topic was on Traumatic Factors in newly Erupted Permanent tooth and the moderater was Dr Rupesh. S (Reader: Pushpagiri dental college) the topic was on Traumatic Factor in newly Erupted Permanent tooth

Executive Meetings: The first executive meeting of our branch was held on 31st Jan 2012 at Pagoda Resort Alappuzha, 9 members were present for the meeting

The second executive meeting was held on 25th Mar 2012 at Alleppey Rotary Club, Alappuzha

CENTRAL KERALA - KOTTAYAM BRANCH

JANUARY 2012

Executive Committee — The First Executive Committee Meeting of the IDA CKK was held on 3rd January 2012 at Hotel Pearl Regency, Kottayam . 26 members were present for the meeting.

Family Meeting – The First family meeting and INSTALLATION CEREMONY was held on 28th January at Hotel Windsor Castle. State President Dr. Raveendranath was the Chief Guest while Secretary Dr.Shibu Rajagopal was the Guest of Honor. 310 members attended the function.

Journal - The 1st Issue of our Journal "SMILE" was released on that day. State President released it by handing over the first copy to Dr.Babu Ittyvirah. Online version of the Journal can be viewed at www.smileonline.org.in

FEBRUARY 2012

Executive Committee — The Second Executive Committee Meeting of the IDA CKK was held on 6th February at Kottayam Club. 19 members attended the meeting.

IDA National Conference – 8 of our members attended the IDA National Conference which was held at Mumbai from 9th to 12th February 2012. IDA Central Kerala Kottayam bagged the following awards there:

1. Best Overall Branch,
2. Best President-Dr.Antony PG
3. Best Secretary –Dr.John Reju Philip
4. Best CDE Chairman – Dr.Bobby John Varghese
5. Best Scientific Activities
6. Best Journal
7. Runner up –Best CDH Activities.

CDE – Inaugural CDE was conducted on 19th February at Hotel Pearl Regency. It was on Rotary Endodontics and the Faculty was Dr.Jayshree Hegde from Bangalore. It was a Full Day cum Handson Program. 60 members attended the class while there were 12 participants for the Hands-on.

MARCH 2012

Dentist Day — Dentist Day was celebrated on March 6th at St.Marys HSS, Manarcad. Pencil sketching and Painting Competitions were held on that day. A Dental Check up and Dental Awareness Class was conducted in which over 240 students along with teachers participated.

CDE — The Second CDE of our Branch was held on March 25th 2012 at Hotel Pearl Regency, Kottayam. It was an Interbranch CDE - Full Day Program with a Hands-on Session. Faculty was Prof. Dr. Prasanth Dhanapal MDS. Topic was "POST & CORE -SIMPLIFIED". 53 participants benefited from the lecture while 8 registered for the Hands-on.

ATTINGAL BRANCH

INSTALLATION CEREMONY-2012

The installation of Dr Abhilash G.S was conducted at The Gateway Hotel Varkala on January 29th 2012. Dr Raveendranath, President IDA Kerala State was the chief guest of the function. Dr Shibu Rajagopal, Hon Secretary of IDA Kerala State and Dr K. Chandrasekharan Nair were the Guests of Honour. In his presidential address, Dr Alex Philip thanked all the office bearers for helping him in the smooth conduction of last year's activities. He also gave away the presidential awards for the year 2011. Later Hon Secretary Dr Arun Roy presented the annual report of the year 2011. In his inaugural address Dr Raveendranath appealed all the members about the importance of ethical practice. Installation of incoming president Dr Abhilash was done by outgoing president Dr Alex in the presence of Dr Raveendranath. Later all the office bearers were installed. Hon State secretary Dr Shibu Rajagopal inducted the new members of the branch. 'GURUVANDANAM' Honouring the legendary faculty Dr Chandrasekharan Nair was done by the State president.

1st Branch Executive Committee meeting: The first executive meeting was held on 29th January at The Gateway Hotel, immediately after the installation function.

2nd Branch Executive Committee meeting: The second executive meeting was held on 9th February at Attingal club. The main agenda was the future programmes for the year 2012. Meeting decided to conduct charity programmes in old age homes in connection with Dentist's Day Celebration.

ACQUIRE 2012: The President/ Secretary's training programme Acquire 2012 was held at Kannur on 25th February. President Dr Abhilash G.S, Secretary Dr Arun Roy, State V.P Dr Premjith and Dr Sudeep attended the programme.

CDH ACTIVITIES: IDA Attingal Branch conducted charity programmes in two Old Age homes on 11th March Sunday at Kilimanoor and Palamkonam near Attingal in connection with Dentist's Day Celebrations. Distribution of Food Packets, Bed sheets, Lungis and Towels to the inmates were done. President and Secretary handed over Medicines and Provisions to the old age home authorities.

The names of the old age homes are

1.Santhitheeram old age home at Palamkonam near Attingal.

2.Chakkulathamma old age home at Kilimanoor. Members of the executive committee and other members of the branch attended the charity programme.

BSBF IDA-COLGATE SCHOOL DENTAL HEALTH PROGRAMME

In connection with the BSBF- National oral health programme of IDA and Colgate, dental health materials like Tooth pastes, Tooth brushes and Brushing charts were distributed to more than Ten thousand children from 30 Government lower primary schools in and around Attingal, Kilimanoor and Varkala. Informative classes were also conducted in schools.

3rd Branch Executive meeting: The 3rd branch executive meeting was held at Attingal Club on 18th March. Dr Abhilash G.S. presided the meeting. Secretary Dr ArunRoy presented the previous meeting's minutes and also described the actions taken against the decisions taken on the 2nd executive meeting.

CDE PROGRAMME: The first CDE programme was held at Park Rajadhani, Ulloor on March 25th Sunday. State CDE Chairman Dr Lin.C.Kovoor inaugurated the programme. The topic was 'Practical Periodontics' for general practitioners. The Faculties of the cde programme were Dr Arun Sadasivan MDS and Dr Unu.S MDS.

MALANAD BRANCH

I. INSTALLATION
Date: 03-12-2011; Place: Rotary Community Hall, Perumbavoor
Chief guest: Sri Saju Paul, MLA of Perumbavoor

II. FAMILY GETTOGETHERS
a. Meeting No. 1
Date: 03-12-2011; Place: Rotary Community Hall, Perumbavoor
b. Meeting No. 2
Date: 03-03-2012; Place: Chinnas Auditorium, Koothattukulam

III. CDE PROGRAMMES
a. STOMA 2011; Faculty: Dr Varghese Mani, Dr George Varghese, Dr Ambili Mundeth; Status: State Level CDE cum Hands-on workshop
Date: 13 & 14 November 2011; Venue: Mar Baselios Dental College, Kothamangalam
Certificates: Given
b. 'FPD CEMENTATION'
Faculty: Prof Dr. Paul Varghese, MDS (Prosthodontics)
Status: Intrabranch CDE
Date: 24-01-2012; Venue: Hotel Kabani International, Muvattupuzha
c. COMPREHENSIVE ENDODONTICS 2012
Inauguration by Sri P P Thankachan, Hon. UDF Convenor
Faculty: Dr Prasanth Dhanapal, Dr George Jacob, Dr Usha Mohandas, Dr Varghese Mani
Status: State Level CDE cum Hands-on workshop
Date: 19 & 20 February 2012; Venue: Mar Baselios Dental College, Kothamangalam
d. Title: IDA-COLGATE FUTURE DENTAL PROFESSIONALS PROGRAM
Faculty: Dr Majo Ambooken, Dr Jayan Jacob, Dr Jacob Kuruvilla, Dr Priya John
Status: Student Activity
Date: 09-11-2011; Venue: Mar Baselios Dental College, Kothamangalam

IV. CDH ACTIVITIES
a. Date: 04-12-2012; Place: MTM Higher Secondary School, Pampakuda, Muvattupuzha
Associated with: Y's Mens Mammalassery & Mar Baselios Dental College, Kothamangalam
b. Date: 28-12-2011; Place: Mar Elias Higher Secondary School, Kottapady, Perumbavoor
Associated with: NSS Unit
c. Date: 16-02-2012; Place: Govt. U P School, Perumbavoor
d. Date: 16-02-2012; Place: Prateeksha Bhavan, Palakuzha, Koothattukulam
Associated with: Annoor Dental College, Muvattupuzha & Society of Periodontists and Implantologists of Kerala
e. Inauguration of MIND (Malanadu Initiative for Neoplasia Detection)
By Dr D Babu Paul, IAS
Date: 03-03-2012; Place: Chinnas Auditorium, Koothattukulam
f. Inauguration of DentÓÇare (School Dental Health Program)
By Sri. Captain Raju, Cine Actor
Date: 03-03-2012; Place: Chinnas Auditorium, Koothattukulam

V. EXECUTIVE COMMITTEE MEETING EC Meeting No. 1
Date: 03-01-2012; Place: Hotel Kabani International, Muvattupuzha
DENTISTS DAY CELEBRATIONS
Date: 03-03-2012; Place: Chinnas Auditorium, Koothattukulam
Chief guest: Dr D. Babu Paul IAS
Guests of Honour: Capt. Raju (Cine actor), Dr George Thomas (IPP IDA National), Adv Shibu Kuriakose
VI. RELEASE OF MALANADU DENTAL JOURNAL
Date: 03-03-2012; Place: Chinnas Auditorium, Koothattukulam
Released by: Dr George Thomas (IPP IDA National)
VII. Launch of Website www.ida-malanadu.org.in
Date: 03-03-2012; Place: Chinnas Auditorium, Koothattukulam
By: Adv. Shibu Kuriakose, Secretary, MBMM Association
VIII. WOMEN WING STATE CONFERENCE
Date: 20-02-2012; Place: Mar Baselios Dental College, Kothamangalam
Inaugurated by: Prof. Dr Neena Joseph, Faculty, IMG, Kakkanadu
Key-note address by: Dr Usha Mohandas

MALAPPURAM BRANCH

Installation ceremony of new office bearers for INDIAN DENTAL ASSOCIATION, Malappuram branch for 2012 was held at Hotel Woodbine, Manjeri on 15th January 2012 at 5 p.m. Dr.Antony Thomas President-Elect of I.D.A Kerala State was the Chief Guest, Mr. P.K. Basheer Ernad M.L.A was the Guest of Honour.

Dr. Biju J. Nair, president IDA Malappuram presided the ceremony. Dr.Deebu Jacob Mathew Vice-president I.D.A Kerala State also addressed the gathering. Dr.Antony Thomas President-Elect of I.D.A Kerala State installed the New Team of office bearers under presidentship of Dr.Joy Thomas. Installation ceremony was followed by new year celebrations with entertainment programs by Women's wing & Calicut Thrillers & culminated with mouth watering cuisines.

CDH Activities As a curtain raiser for current year activities launched community dental health program SNEHA POORVAM IDA' a project for adoption of all Pain & Palliative clinics of Malappuram District as part of observation of World palliative care day on 15th January 2012 at Pain & palliative care center Wandoor, as part of this program IDA Malappuram is adoption palliative care patients all over Malappuram District & head office project 'BRIGHT SMILES, BRIGHT FUTURE' National oral health program will held at 114 Government schools of the district based on the list provided by the Head office.

IDA Malappuram is preparing Members Directory, Dr. Sujith (9895824084) is heading this project Kindly give your details for the above purpose in the form enclose & mail it to me or log on to our website www.idamalappuram.com & update your details

Dentist day & OBSERVATION OF INTERNATIONAL WOMEN'S DAY: On March 6th 2012, Tuesday observation of Dentist's Day was held at SOORYA Regency Malappuram 7 p.m onwards 10 years of IDA Malappuram event kicked off with logo & theme release by Dr.Krishnankutty & Dr.Rajan Mathews, Dr.Biju.J. Nair I.P.P honored of our senior dentist Dr.Joy Thomas. State Vice-president Dr.Deebu released Journal Punchiri Installation of women's wing would took place during dentist day as part of International Women's Day observation.

Executive committee meetings:

1st Executive committee meeting held on 21-12-2011 8 pm onwards at Soorya Regency, Malappuram.

2nd Executive committee meeting held on 11-1-2012 8 pm onwards at Prasanth residency, Malappuram.

3rd Executive committee meeting held on 08-2-2012 8 pm onwards at Soorya Regency, Malappuram.

KASARGOD BRANCH

The installation of office bearers for 2012 was held on 26.01.2012 at Hotel Highway Castle. Dr.Raveendranath State IDA President was the Chief guest.

The new office bearers are

President Dr. K.Shobha Bhat

Secretary Dr.Manohar

Treasurer Dr.Hari Krishnan Nambiar

The meeting was attended by a large number of members and was followed by dinner.

Dentists day 2012 celebration was held on 6-03-2012 at IMA Hall here.

A talk was given by eminent speaker Mr.Krishna Mohan on ''Communication Skills'' and its relevance in dentistry. The meeting was well attended and was followed by dinner.

CHALAKUDY BRANCH

Ist General body meeting of Chalakudy IDA branch was held on 13th March 2012, at Cosmos Club

Dr. Binu T. Abvahan was the faculty of the day and his topic was "practice Management" in Dentistry

Camp Activities

On 25th March Dr. Johny Mampally and Dr. Aby Hormese treated 16 mentally disable Childrens at our outreach Clinic-2, which is located at Madonna School Potta, near Chalakudy.

Tribute to Dr. Ajay Nair

It is with deep grief and sorrow, that we announce the passing away of one of the younger members of the Executive Committee of IDA Kerala State.

Dr.Ajay Nair was the beloved member of IDA North Malabar Branch and was the Rep. to State from that branch. He was very actively involved in all the branch activities including cultural, sports and social events.

He was well-known and well liked by all members who had a chance to come in touch with him, especially due to his palmistry skills.

He leaves behind a horde of sorrowing and grieving friends who have still to accept the reality of his leaving for heavenly abode.

At this moment of time all of us pray that his soul rests in peace and to give his wife-Aaja, son-Arjun and brother-Arun, the strength to overcome this terrible tragedy.

LOVING TRIBUTE

Dr. U.S. Mohandas Nayak

Past President, Indian Dental Association - H.O.

D.O.B.: 30-9-1936 **Expired: 20-2-2012**

You may have left from our midst, But your Spirit and the Values you Cherished will continue to Guide us in our endeavour to attain the Ideals set by you.

President & Members

INDIAN DENTAL ASSOCIATION

KERALA STATE BRANCH