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Porcelain laminate veneers - the current concepts ●

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Intramuscular lipoma of buccal mucosa ●

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A **dental implant** is a "root" device, usually made of titanium, used in dentistry to support restorations that resemble a tooth or group of teeth to replace missing teeth.

Virtually all dental implants placed today are root-form endosseous implants, i.e., they appear similar to an actual tooth root (and thus possess a "root-form") and are placed within the bone (endo- being the Greek prefix for "in" and osseous referring to "bone"). The bone of the jaw accepts and osseointegrates with the titanium post. Osseointegration refers to the fusion of the implant surface with the surrounding bone. Dental implants will fuse with bone; however, they lack the periodontal ligament, so they will feel slightly different from natural teeth during chewing.



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# President's Message



**Dr Antony Thomas**

Dear Colleagues,

While I am writing this message heavy rain is pouring outside and I hope this monsoon season evoked mixed feelings. On one side all dams are filled and the threat of load shedding is far away, in the coming year and a blooming time for the agricultural sector of India. On the other side, the devastating floods and landslides occurred in the terrains of Uttarkhand. Salute to the Indian Air force, Army and other paramilitary troops for evacuating people from the flood hit areas. In Kerala too, number of lives has been taken away and lots of damages has happened. One may blame many things and at the end of the tunnel we can all console the fact that it is a balancing mechanism of nature to counteract our own cruelty towards nature.

Coming to IDA, the monsoon fever has not affected our activities and things are flowing smooth. Gentle breeze with the smooth flow will be a nice experience. The breeze I mean is your presence and support for all activities in IDA.

The highlight of the season is, IDA Kerala State got registered as a society & we had taken the long awaited decision of raising fraternity contribution of HOPE to 10 lacs. We transferred the amount to the bereaved family of Dr. Sharfudheen and it was a moment of mixed feelings. The only thing what we can do for an untimely demise of our colleague is prayers, condolence and helping their families with financial aids. I thank the HOPE office for the support for taking this decision and we are in the trial run of launching a Health Plan scheme. I appeal more members to join Hope and more benefits are awaiting you. A program to rehabilitate inmates of pain and palliative society was inaugurated. Through this "Ashakiran" project we aim the manufacture of disposable aprons and table cloths necessary for our clinics.

Another innovative step for this year is the Dental Assistance Course [DAC] collaborating with Dept. of Higher Education and General Education Govt. of Kerala. This is an Additional Skill Acquisition Program [ASAP] wherein students in plus one & plus two are trained in English and IT as foundation course and special training in Dental Assistance. This will be inaugurated in the month of August 2013. The primary aim is to produce quality assistants for our clinics. We are in the verge of framing a clinic standardization protocol and it will be published soon in our website.

IDA Valluvanad conducted the 'Chilamboli' with a phenomenal Valluvanadan touch and they deserve much plaudits. The interstate CDE with IDA Tamilnadu, the 3rd state CDE to be hosted by IDA Mavelikkara & the Oral Hygiene Day celebration by IDA Pathanamthitta are the forthcoming state events and I appeal the members to participate and make these events a success. I share my love and happiness to all our Muslim brothers observing the Holy Month.

Congratulations to our Hon editor Dr. K Nandakumar for enlightening all of us with this 3rd issue of KDJ.

With warm regards

**Dr Antony Thomas**  
President, IDA Kerala State.



My dear fellow members,

At the very outset let me place on record my heartfelt appreciation to all the branch presidents and secretaries for their commendable leadership and involvement in all the state programmes. First seven months of my three year term as secretary got over. All the scheduled programmes of IDA Kerala state conducted in a befitting manner.

The third executive committee meeting held at Kottayam on 9th June. Several matters regarding our activities discussed on the day. It was a well arranged meeting by central kerala Kottayam branch. I thank all the members of executive committee for attending the meeting and special thanks to office bearers of host branch.

Second state level CDE programme conducted on 19th May at Thalassery. Kudos to Thalassery branch. The third state level CDE programme conducted on 14th July at Mavelikkara. A great effort taken by our CDE chairman Dr. Anil 's branch to conduct the programme in a nice manner. Congratulations to Mavelikkara branch.

CDH programmes are going on extremely in a good manner. All the activities under community dental health were conducted by respective branches. State level BLS programme inaugurated at MINDS, Mahe on 2nd June 2013 by Mr.E. Valsaraj MLA. BLS coordinator Dr. C. K. Asokan, MINDS college team and IDA Thalassery branch has done exemplary work for the success of the programme.

No tobacco day was celebrated jointly by IDA Attingal and Trivandrum branch on 31st May at Trivandrum. The organisers especially Dr. Deepu Mohandas, state coordinator has done fantastic job to conduct the programme without any complaints.

Oral hygiene day was celebrated on August 4th at Pathanamthitta with various programmes. Dr. Rajesh, state coordinator and Pathanamthitta branch worked a lot for the success of the programme.

Inter branch cultural competition CHILAMBOLI 2013 held at Shornur on 7th July 2013. Famous classical and Carnatic singer Smt. Sukumari Narendra Menon inaugurated the function. The programme was well organised by Valluvanad branch. They took best effort for the success of this programme.

The state executive committee directory and office bearers booklet were released during this term. I congratulate Dr. Civy. V. Pulayath for taking so much pain for releasing this booklet.

IDA Kerala State had discussion with government officials for various matters connecting to our profession. The dream project Dental Assistant Course (DAC) in association with the department of higher education and general education of Kerala government is in the final stage.

All other regular activities of IDA Kerala State is going on very smoothly. No words to explain the hard work taken by our Editor Dr. K. Nandakumar for his involvement to publish the journal on time. Our website chairman Dr. Rajeev Simon is very much active in updating the association activities in website.

We are having lot of programme in coming months like Inter state CDE programme jointly with Tamil Nadu at Kottayam resorts on 17th and 18th August, HOPE AGM on 11th august at Kochi, fourth state executive meeting, students conference..etc. Our state conference, 46th KSDC will be on January 2014 at Kollam. I appeal all the members to register for the conference as early as possible and requesting all the branch president and secretary to take initiation.

The tradition of education, science and ethical practice still remain the hall mark of the dental profession. We in IDA have come a long way in serving the public and dental communities. So please join hand with IDA for the better practice ethics among ourselves, protect our members as well as for the better upliftment of the dental community.

With warm regards,



**Dr. O.V. Sanal**

**Dr. O.V. Sanal**

Hon. Secretary, IDA Kerala State



**Dr. K. Nandakumar**

## Dental materials need a quality certification

In choosing a restorative material, dentists have to confront many factors that include the esthetic desires of the patient, functional requirements, tooth color, core or abutment being restored, condition of the tooth, whether the restoration is in the anterior or the posterior region and whether the dentist prefers cementing or bonding the definitive restoration. The generally accepted philosophy is that, teeth should be restored in the most conservative form while satisfying the patient's esthetic and functional requirements. The conscientious dentist must consider all these factors when it comes to the selection of dental materials.

An ideal restorative material would mimic the qualities of natural teeth, such as translucency, opalescence, and fluorescence. The material also would be strong enough to withstand occlusal forces, demonstrating high flexural strength, high fracture toughness, high compressive strength and high tensile strength. It also would be biocompatible, color stable, and gentle to opposing dentition at the same time will not get easily abraded. The material should also demonstrate low solubility in the presence of oral fluids, be relatively easy to fabricate, adapt well to margins with different margin designs, be easy to polish in the mouth, and produce predictable results in a variety of applications. Unfortunately, there is no one material available today that provides the very best of all these characteristics.

There are many international agencies that certify the quality of dental materials, instruments and equipments such as ASTM, ANSI, FDI, ADA etc. In India Bureau of Indian Standards has brought out a few material standards but in effect it had no controlling effect on the Indian market. Now BIS is very silent on the dental materials. The fact is that presently, there is no agency that can ensure quality of dental materials brought to India. Many spurious products have crept into the Indian market because of this. Dentists are lured by the lower price offered by such manufacturers. We do not know from where such products appear. Nobody tests them for the properties. Dentists are also not interested in knowing much about such materials. Neither the government nor the professional bodies seem much concerned about a crucial area that would dictate the future of our profession. Indian Dental Association should take keen interest in ensuring the quality of dental materials. It would be curious to know that dental materials form nearly 40% of the biomaterials used by the health professionals. The prognosis of dental treatment is heavily dependent on the quality of dental materials. If IDA is not initiating a certification programme in Kerala, the future of our profession will be nothing less than a disaster.

**Dr. K. Nandakumar**  
Editor, KDJ

# Evaluation of corrosion behaviour of nickel chromium dental casting alloy in artificial saliva in the presence of different mouth wash solutions

\* T. J. Suneetha, \*\* Jean Mathew, \*\*\* Lin Kovoor, \*\*\*\* Joan Mathew

## Abstract

Nickel Chromium alloys became popular in the early 1980's as low cost alloys. They possess inferior corrosion resistance compared to noble metal alloys. In the oral cavity, the salinity of saliva approaches that of sea water and tends to be highly corrosive to most non-noble metals. During dental treatment, practitioners recommend their patients to use mouthwashes for oral hygiene. These mouth rinses may influence the corrosion behaviour of dental alloys. Corrosion products contain metal ions and may be the reason for allergic/other diseases and mechanical failure of the dental materials. So corrosion test has to be carried out with the commercially available mouthwashes. The objective of this study is to evaluate the corrosion resistance of NiCr alloy in artificial saliva in the presence of 0.01% Chlorine dioxide, 0.2% Chlorhexidine and 0.05% Sodium fluoride mouthwashes. Potentiodynamic polarisation method was performed. Surface analyses of the samples were observed in Scanning electron microscopy. Analysis of potentiodynamic curves showed that NiCr alloy was less reactive in the presence of 0.2% chlorhexidine while Ni-Cr alloy was most sensitive in 0.01% chlorine dioxide followed by 0.05% sodium fluoride mouthwash. SEM analysis also revealed the most corrosion in Chlorine dioxide followed by sodium fluoride and chlorhexidine mouthwash.

**Keywords:** Corrosion, Nickel chromium alloy.

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casting alloy for a specified clinical situation: 1) Biocompatibility 2) Physical and mechanical properties of the alloys 3) Cost. Noble metal alloys have been found to be ideal for dental restoration, because of their corrosion resistance and biocompatibility. Cynically, cost factors have become more influential over the last decades as a result of the rapidly fluctuating international cost of gold and noble metals, in general. Non-precious alloys are being used due to their low cost and adequate physical and mechanical properties. In the 80's, nickel chromium were developed. Ni based base metal alloys are composed of Ni (68%-80%) and Cr (12%-27%), molybdenum and trace elements. Cr presence improves the alloy corrosion resistance in different media including the physiological media with an oxide surface layer formation mainly chromium oxides. The passive film slows the metal dissolution rate, making difficult the ion transfer from metal to solution. Human tissue reaction for dissolved ionic species can vary from a simple allergy to a severe disruption in the region adjacent to the prosthesis since the chemical alloy composition can influence the

## Introduction

Dental casting alloys are widely used in dentistry for many years. The proper selection and manipulation of alloys is

imperative if dental prostheses are to perform well over a long duration. There are three prime factors that influence the clinician's decisions when selecting a dental

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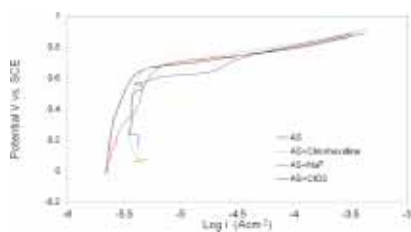


Fig. 1 Anodic plot of NiCr alloy in different media

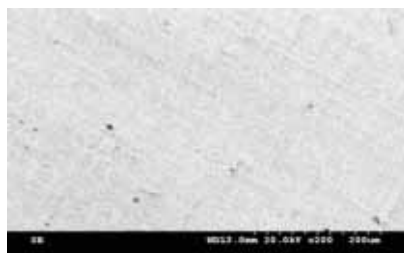


Fig. 2 SEM image of NiCr alloy sample



Fig.3 SEM image of NiCr alloy in artificial saliva

corrosion behaviour. Studies about corrosion resistance in aggressive media, which simulate the oral environment, may provide information about metals or alloys to be used in dental application. Biocompatibility of dental alloy is primarily related to their corrosion behaviour. Corrosion may be described as the deterioration of materials by aggressive action of the environment (atmosphere and oral fluids) and the oral environment is conducive to corrosion. Fluctuations in temperature, presence of moisture, diet induced changes in pH, variations in oxygen pressure and decomposition of food, all contribute to this process. Corrosion is said to be continuous in the mouth because of ions leached out from the restorations by abrasion from foods, liquids and toothbrushes. Dentists recommend patients to use mouthwashes for oral hygiene. These mouthwashes may also influence the corrosion behaviour of metal alloys. So corrosion tests have to be carried out with the commercially available mouthwashes. The aim of this article is to compare the electrochemical behaviour of NiCr alloy in artificial saliva in the presence of chlorhexidine, chlorine dioxide, and sodium fluoride mouthwashes at 37°C.

## Materials and method

An in vitro study was carried out to evaluate the corrosion behaviour of NiCr alloy in artificial saliva in the presence of three different mouthwashes. The alloy used is NiCr alloy (Bego, Germany) with the composition : Ni 65%, Cr 22.5%, Mo 9.5%, Si 1%, Fe 0.5%, Ce 0.5%, C<0.02%.

### Sample preparation:

Wax patterns of 2cm x 2cm x 5cm were invested in phosphate bonded investment and casting is done in induction casting machine with NiCr alloys. Samples were machine polished, cleaned and degreased in acetone. Electrical contact was made. And area of 1 cm<sup>2</sup> was exposed to experiment.

Test solutions: - The reference electrolyte was Fusayama–Meyer artificial saliva which closely resembles natural saliva with a composition : NaCl

0.2g/l, KCl 0.2g/l, CaCl<sub>2</sub>·9H<sub>2</sub>O 0.39g/l, Na<sub>2</sub>S<sub>2</sub>O<sub>8</sub>·H<sub>2</sub>O 0.002g/l, NH<sub>2</sub>HPO<sub>4</sub> 0.0397g/l, Urea 0.5g/l. Three mouthwashes with different active ingredients were used as electrolyte. They are sodium fluoride 0.05%, Chlorine dioxide 0.01%, Chlorhexidine 0.2%. Experiments were carried out in a three cell assembly with Platinum as a counter electrode, NiCr alloy as working electrode and Standard calomel electrode (SCE) as reference electrode. Potentiostat model - Solarton SI 1287, Amete, UK was used for potentiodynamic polarisation measurement. The samples were subjected to scanning electron microscopic analysis with Hitachi S-3000H, Japan.

## Results

### a) Potentiodynamic Polarisation measurements:-

Potentiodynamic polarisation curves of NiCr alloy in different mouthwashes and artificial saliva have been recorded at a sweep rate of 0.02Vmin<sup>-1</sup> and between -0.2 to 1 V. Figure: 1 illustrates the anodic plot for NiCr alloy in different media. Potential on Y axis and Current density on X axis. All the four anodic polarisation curves are plotted together for comparison. All the curves exhibit the similar general features. Anodic branches shows passive, transpassive, oxygen evolution regions. These regions may be associated with formation and breakdown of one or more protective films. The polarisation curve of NiCr alloy indicates the highest corrosion resistance in artificial saliva which was used as control. It shows a passivation region of 0mV to 650mV. The chlorhexidine and sodium fluoride mouthwashes also showed a wide passivation region. But chlorine dioxide exhibited a very aggressive nature breaking the passivating layer at around 500mV. Above 800mV, only oxygen evolution was noticed in all the mouthwash solutions. So, the polarisation curve results concluded that NiCr alloy is most corrosive in chlorine dioxide followed by sodium fluoride and chlorhexidine mouthwash.



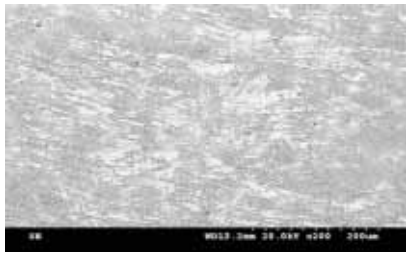


Fig. 4 SEM image of NiCr alloy in chlorhexidine



Fig. 5 SEM image of NiCr alloy in sodium fluoride

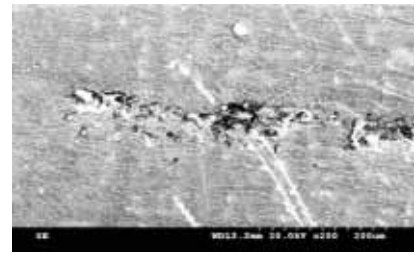


Fig. 6 SEM image of NiCr alloy in chlorine dioxide

### b) Surface image analysis:-

Surface analysis of NiCr alloy sample before (Fig. 2) and after electrochemical measurements were studied under scanning electron microscope. Sample under Fusayama Meyer solution (Fig. 3) showed superior corrosion resistance. SEM observation revealed considerable differences in the surface condition for samples immersed in different mouthwashes. SEM of NiCr alloy in chlorhexidine (Fig. 4) shows uniform dissolution of oxide layer only. SEM of NiCr alloy showed localized corrosion in sodium fluoride (Fig. 5) and chlorine dioxide showed the presence of blisters with corrosive attack beneath the localized corrosive layers (Fig. 6). Certain zones reveal the faceting of the surface which is crystallographically etched after anodizing.

### Discussion

Approximately 90% of all removable partial dentures are now cast from non precious alloys. In designing non precious alloys, chromium is added in the range of 15-30% to obtain an optimum value of corrosion resistance and mechanical strength.<sup>1</sup> The presence of Cr improves the corrosion resistance of alloys in a corrosive environment due to the formation of a Cr rich passive oxide film which is highly resistant to acid attack. Presence of molybdenum in the NiCr alloy increases the resistance to localized corrosion.<sup>2</sup> Potentiodynamic polarisation measurements shows NiCr alloy was most resistant to corrosion in artificial saliva and corrosion behaviour of NiCr alloy exhibited the highest corrosion in chlorine dioxide followed by sodium fluoride and chlorhexidine. Actually, there is an increased use of dental gels and rinses containing high fluoride concentrations (10,000rpm) and pH range between 7.2 and 3.2.<sup>3</sup> NiCr alloy show corrosive nature in fluoride mouth rinses also. Fluoride ions through their complex action can cause localized corrosion and partial dissolution of this protective film. This study confirms that NiCr alloy has the least corrosion resistance in chlorine dioxide mouth rinse when

compared to the other mouth rinses used here. Surface image analysis of NiCr alloy in different mouth rinses illustrated the surface condition of NiCr alloy and showed least changes in artificial saliva followed by chlorhexidine and highest changes in chlorine dioxide followed by sodium fluoride mouth rinse. NiCr alloy undergoes severe oxido-reduction process on its surface, the mechanism and kinetics of which depend on the surface state and experimental conditions i.e pH, composition, electrode pd.<sup>4</sup> Chlorine dioxide mouthwash is a recently launched mouthwash which has equivalent plaque inhibitory action like chlorhexidine. It is pleasant to taste and enhances soft tissue healing. It also reduces inflammation but side effects of chlorhexidine is lacking<sup>5</sup>. Sodium fluoride is a known anti-cariogenic agent and has anti-bacterial property and its a commonly used mouthwash. Chlorhexidine is a mouthwash well recognized in dentistry because of its anti-microbial property. While choosing any dental alloys, biocompatibility should stand first that is it should not be toxic, irritating, inflammatory, allergic, or mutagenic or carcinogenic.

### Conclusion

The result of present study should help attending practitioners to decide the mouthwash when NiCr alloy restorations are given. In this study NiCr alloy exhibited highest corrosion in chlorine dioxide mouthwash followed by sodium fluoride and chlorhexidine. On the basis of the results obtained, we would recommend that the patients with NiCr alloy restorations should be advised to use chlorhexidine and avoid chlorine dioxide mouth wash.

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## Kerala Dental Journal



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# Porcelain laminate veneers – the current concepts

\* Bobby Joseph, \*\*Abhilash.A, \*\*\* Chandan Kumar Kusum

Since the time esthetics has been incorporated in dentistry, the treatment horizon for smile uplift is getting widened enormously. Patient's expectations impose deliberate stress on dentists to fulfill what would be the best for restoring smiles. To achieve esthetics many literatures have reported use of full coverage esthetic preparations at the cost of healthy tissue which would put the pulpal or periodontal health at risk. Many a times the same outcome could have been achieved by merely being more conservative<sup>1</sup>. With the recent updates in facts and finds in dental field, the terms such as pragmatic esthetics and Minimally Invasive Dentistry (MID) are emerging as the most concerned approach to beautify the smile. The dental veneers are one of such minimally invasive dental restorations using thin laminates with high esthetic outcome. They are indirect restorations and are a conservative alternative to full coverage crowns..

These restorations provide rehabilitation with great color stability, brightness and surface smoothness, with functional effectiveness during clinically acceptable period<sup>2</sup>. Direct laminate veneer (resin composite) and indirect laminate veneer (porcelain) both are used as materials of esthetic interest. Resin composite

veneers can be used to mask tooth discolorations and/or to correct unaesthetic tooth forms and/or positions. However, such restorations still suffer from a limited longevity, because resin composites remain susceptible to discoloration, wear and marginal fractures, reducing thereby the aesthetic result in the long term<sup>3,4</sup>.

In search for more durable aesthetics, porcelain veneers have been introduced during the last decade. Glazed porcelain veneers were proposed to be durable anterior restorations with superior esthetics<sup>5</sup>. A study has stated that all-ceramic veneer restorations offer a predictable and highly successful restoration. The estimated survival probability was 93.5% at 10 years, 85.8% at 15 years, and 78.5% at 20 years<sup>6</sup>.

## History

Porcelain laminate veneers were reported to be used first by Pincus<sup>7</sup> for some cinematographic work at Hollywood but that time it could be used only as temporary restoration as micromechanical bonding was not invented yet. The historical advent of bonding capability of promising hybrid resin composite to both enamel and dentine has made it possible to use veneers as a long term clinical modality<sup>8,9</sup>. Most of the operators

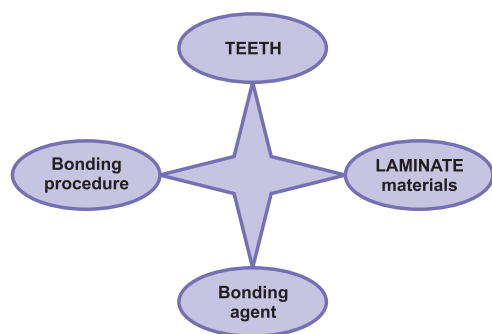
believe that the indication of laminate veneers in dentistry is limited to the anterior region of mouth<sup>10</sup>. Interestingly, Archangerlo et.al reported that it is an effective and conservative treatment for teeth presenting discoloration malformation or necessity for extensive morphological alterations in posterior as well as anterior regions.<sup>11</sup>

## Indications of Veneers<sup>12</sup>

There are myriads of clinical situations where laminate veneers can be used. These are:

- Correction or alterations in tooth shape or position.
- Changes in morphology in patients with microdontia or tooth transposition.
- Sealing of slight to moderate diastemas.
- Fractures of the incisal third.
- Extensive anterior dental restoration
- Abrasions of parafunctional origin.
- Enamel alterations.
- Alterations in tooth color.
- On worn mandibular incisors when conservatively restoring anterior guidance.
- Repair of crown or bridge fractures.

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Pascal Magne<sup>13</sup> divided the indications into 3 principal groups:

*Type 1: tooth discoloration resistant to bleaching procedure*

IA - tetracycline discoloration of degree III & IV.

IB - no response to external/ internal bleaching.

*Type 2: the need for major morphologic modification in anterior teeth*

IIA - conoid teeth.

IIB - diastemata & interdental triangles to be closed.

IIC - augmentation of incisal length & prominence.

*Type 3: extensive restoration of compromised anterior teeth*

IIIA - extensive coronal fracture.

IIIB - extensive loss of enamel by resorption & wear.

IIIC - generalized congenital & acquired malformation.

### Contraindications for veneers<sup>14, 15</sup>

There are no specific contraindications for laminate veneers as opposed to other forms of dental restoration. There are however, certain considerations to be taken into account.

1. Available Enamel: There should be sufficient enamel available for bonding because bonding to dentin is generally much less retentive than to enamel. Porcelain veneers is contraindicated on any tooth with greater than 30% exposed dentin after preparation. If there is lack of enamel support, crowns may well be the treatment of choice in such cases.

2. Ability to etch enamel: Deciduous teeth and teeth that have been excessively fluoridated may not etch effectively. Hence in these cases bonding may get jeopardized.

3. Oral habits: Patients with bruxism often develop shearing stress which is less tolerated by porcelain and hence may lead to fracture of the restoration.

4. Patients with high caries index: There is risk of the restoration to fail, as the margins are more exposed to the contact areas.

5. Compromised periodontal health: This will further reduce the longevity of the restoration.

6. Endodontically treated teeth: It has been proposed that a full veneer crown would hold the integrity of the non- vital tooth better than a laminate veneer.

7. Unsuitable occlusion: In cases with a condition like pronounced overbite or an edge to edge occlusion, veneers may not be suitable. Canine guided occlusion if preferable over group function. There should be no interferences in any of the excursive movements.

The success of ceramic veneers can be attributed to great attention to detail in the following areas<sup>16</sup>

- (1) Planning the case,
- (2) Conservative (enamel saving) preparation of teeth,
- (3) Proper selection of ceramics to use,
- (4) Proper selection of the materials and methods of cementation of these restorations,
- (5) Proper finishing and polishing of the restorations, and
- (6) Proper planning for the continuing maintenance of these restorations.

### Methods of fabrication of veneers

Four diverse laboratory techniques for fabrication of porcelain veneers have gained wide acceptance:

1. The refractory investment technique.
2. The platinum foil technique.
3. Castable and pressed porcelain veneers.
4. Milling systems- CAD/CAM and copy milling.

### Factors affecting the treatment plan for veneers

There are four factors which should be thoroughly evaluated for successful veneer restorations.

These are:

1. The teeth
2. The laminate materials
3. Bonding/luting resins
4. Bonding procedure.

#### 1. The teeth

Concepts regarding the preparation of teeth for porcelain veneers have changed over the past few years. They range from minimal or no tooth preparation<sup>5,17-19</sup> to removal of varying amounts of tooth structure (0.5mm -.75mm)<sup>20-23</sup>. It is believed that by preparing the tooth surface, the aprismatic top surface of mature unprepared enamel, which is known



to offer only a minor retention capacity, is removed. In addition, care must be taken to maintain the preparation completely in enamel to realize an optimal bond with the porcelain veneer<sup>24</sup>. Although the results of the newest generation dentin adhesive systems are very promising, the bond strength of porcelain bonded to enamel is still superior when compared with the bond strength of porcelain bonded to dentin<sup>25-27</sup>.

Laminated structures such as porcelain/enamel or porcelain/dentin by definition are a constant strain system. When a stress is applied in such a system, the material with the highest modulus of elasticity (stiffest) absorbs most of the stress. Because dentin is a lower modulus material (more flexible) than porcelain, it flexes more than enamel under a given load, thus subjecting the veneered porcelain to higher tensile and shear stresses. Being brittle, ceramics fail at a critical strain of 0.1%; therefore, bonding to more flexible dentine can lead to early failure. The stiffness of enamel and its ability to absorb stress clearly demonstrates the need to save as much enamel as possible and to ideally bond porcelain to enamel rather than dentin. Also with “each subsequent reduction in tooth structure there is a substantial increase in crown flexibility, even after restoration” and “veneered incisors should be considered to be similar to natural teeth and restored accordingly”. So it makes lot of sense to conserve some enamel for reasons of strength, never mind the other obvious advantage of being in enamel.<sup>25,26</sup>

For laminate veneers three types of preparations have been described, namely: window, overlapped, and feathered preparations. Though different designs do not provide any mechanical advantage over the other, the incisal overlap preparation gives the technician maximum control of the esthetic characteristics and translucency.<sup>28</sup> Some modifications of tooth preparation for porcelain veneers are reported in literature. Rouse<sup>29</sup> suggested an extension to lingual or palatal regions to improve esthetics for diastema closure or tooth discoloration. However, Gilmour and Stone<sup>30</sup> had advocated for conventional preparation without rupture of contact point to place the laminate on enamel and improve adhesion.

## 2. Laminate materials<sup>31</sup>

Choosing the right porcelain should be based on following conditions:

- Does the veneer need to mask tooth discoloration? If so, how severe is this discoloration?
- What is the functional loading on the new restoration?

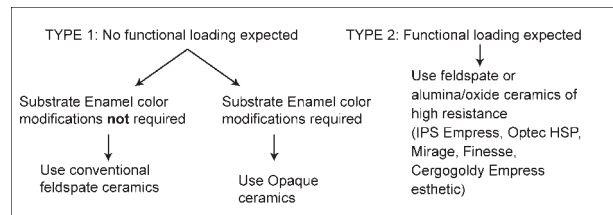
- Does the patient exhibit signs of tooth wear or parafunctional habits?

Depending on these criteria the patients needing the veneers can be classified in three groups.<sup>12</sup>

**Type 1A:** No functional load on restoration is planned and the substrate enamel does not have discolorations to be masked. The only objective in this case is to apply veneers for shape modifying purposes. In this case we can use conventional feldspate ceramics, in view of their excellent optic characteristics that afford optimum esthetic results.

**Type 1B:** The restoration will not bear functional loading but the substrate enamel has discolorations to be masked. In this case ceramics with high degree of opacity should be used.

**Type 2-** The restoration is planned for functional loading as in restoring anterior guidance. This requires the use of a material with great resistance to fracture. Accordingly, feldspate or alumina ceramics of high resistance, and oxide ceramics are indicated. Though Zirconium has good mechanical property, its excessive opacity and inability to etch precludes it to be used as veneer material.<sup>31</sup>



## 3. Bonding/luting resins

For cementation of porcelain veneers a highly filled light-curing luting composite is preferred.<sup>32</sup> In addition to the margins located on the enamel, high filler content reduces micro leakage.<sup>33, 34</sup>

Whereas light cure resins have following advantages:

1. Longer working time compared with dual cure or chemically curing materials.
2. Easier for the dentist to remove excess composite prior to curing,
3. Greatly shortens the finishing time required for these restorations.
4. Colorstability is superior compared with the dual-cured or chemical-cured systems.

Nevertheless, mostly the thickness of the porcelain veneer and partly the color and opacity act as a limiting factor for selection of luting composites. It is recommended that in case of veneer thickness of

0.7mm and above dual cure composite should be used and light curing time should be doubled to get maximum curing.<sup>35, 36</sup>

#### 4. Bonding procedure

Currently, several techniques and products are used for cementation of laminate veneers<sup>37</sup>. However, the conventional cementation with adhesive agent, silane and cement is recommended to provide appropriate bond strength between teeth-cement ceramic<sup>38, 39</sup>. According to literature, the conditioning of enamel and dentin with phosphoric acid followed by hybridization with one- or two-bottle adhesive systems presents the best results on bonding and longevity<sup>40, 41</sup>. Similarly, the ceramic conditioning with hydrofluoric acid followed by silanization also demonstrated the best results with predictable long-term success<sup>42</sup>.

#### Steps in bonding

To achieve optimal success in bonding a detailed procedure has been advocated<sup>28</sup>. The whole procedure may be divided into two steps viz. conditioning steps and cementation steps.

*The conditioning steps* require two distinguished protocols.

- a. Protocol for the porcelain laminate veneers.
- b. Protocol for the tooth and/or restoration complex.

##### A. Conditioning protocol for porcelain veneers:

The following steps should be used in a sequential manner

1. Hydrofluoric acid etching (1 min).
2. Rinsing with copious water (1 min).
3. Neutralizing agent (5 min).
4. Ultrasonic cleaning in ethanol (5 min).
5. Silane coupling agent application + waiting for its evaporation (1 min).
6. Adhesive application (no photo-polymerization).
7. Cement application on the cementation surface of the laminate veneer.

##### B. Conditioning protocol for the tooth and/or restoration complex:

1. Rubber dam application.
2. Application of the Mylar strips around the teeth to be conditioned.
3. Air abrasion of existing resin composite restorations using silicium dioxide (coJet Sand).

4. Phosphoric acid (38%) etching of enamel (30 s).
5. Rinsing with water (1 min).
6. Silane application on existing resin composite restorations + evaporation (5 min)
7. Adhesive application on both the tooth and resin composite (no photo polymerization).

*The cementation steps* should be as follows

1. Positioning the veneer.
2. Photo-polymerization (5 s).
3. Removal of the excess resin cement with the probe.
4. Application of glycerine gel.
5. Photo-polymerization from each direction (each 40s).
6. Removal of excess resin cement with scaler or scalpel.

#### Maintenance phase for veneers<sup>14</sup>

Veneers are highly esthetic and technique sensitive restorations. To get maximum success for the restorations, patients should be properly counseled for its maintenance and warned for its limitations. The following instructions may help in increasing longevity of the veneers:

- 1) Avoid colored food, tea, or coffee during initial 72-96 hours.
- 2) Routine cleaning with soft tooth brush, using a less abrasive tooth paste that is not highly fluorinated.
- 3) Excessive biting habits like nail biting, pencil chewing and biting on hard pieces of foods like bones to be avoided. Patients should be advised not to shear food with the laminated teeth.
- 4) Avoid acidulated fluoridated mouth rinses and chlorhexidine based anti-plaque mouth rinses.

#### Conclusion

Though literature is full with evidence of veneers success yet many dentists opt for full coverage restorations rather than veneers just because they suffer from paralysis by analysis syndrome. It means that these operators just *think* that there is no evidential success rather than researching about it. Agreed that veneers are technique and material sensitive but if used with proper knowledge and skill, these restorations provide the best esthetic and functional outcome. Moreover, being minimally invasive veneers support the age old Devan's philosophy that *primum nil nocere*.

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# Endodontic treatment of a 'radiculous' maxillary second premolar

\* Manju Koshy, \* Joel G. Varghese

## Introduction

Many of the difficulties found in root canal treatment are due to variations in root canal morphology. Extra roots or root canals if not detected are a major reason for failure<sup>1</sup>. A thorough knowledge of the anatomy of root canal systems is required to achieve successful root canal treatment. In the case of maxillary second premolar, laboratory studies have demonstrated a lower incidence of three root canals (type VIII -Vertucci classification, Fig-6) between 0.3 and 2% (Hess 1925, Pucci & Reig 1994, Vertucci *et al.* 1974). Velmurugan *et al.*<sup>2</sup> have reported that out of 220 maxillary second premolar teeth endodontically treated, only three of these had three roots and three canals. Although the preoperative radiograph gives a two-dimensional image of the three-dimensional root canal system, its interpretation reveals external and internal anatomic details that suggest the presence of extra canals and/or roots. For this reason, whenever there is an abrupt straightening or loss of a radiolucent canal in the pulp cavity, an extra canal should be suspected that could be in the same root or in other,

## Abstract

The anatomy of maxillary premolars with three root canals, mesiobuccal, disto-buccal and palatal, is similar to that of adjacent maxillary molars, and they are therefore sometimes called small molars or 'radiculous' (Maibaum 1989, Goon 1993). Aberrations in root canal systems are a commonly occurring phenomenon. Knowledge of the basic root canal anatomy and its variation is necessary for successful endodontic treatment. Usually maxillary second premolars have one or two root canals, but less likely to have three canals. To date, only a few cases of maxillary second premolars with three roots (and three canals) have been reported. Two such cases of maxillary second premolars with three roots and three canals, which underwent endodontic treatment at a dental health centre in Kuwait city, are presented here.

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independent roots. Hence, three different radiographic angulations are mandatory for any tooth to be endodontically treated.

In straight-on radiographs of maxillary premolars, Sieraski *et al.*<sup>3</sup> found that whenever the mesio-distal width of the mid-root image was equal to or greater than the mesio-distal width of the crown, the tooth most likely had three roots.

The following case reports describe the root canal treatment of two patients with three-rooted and three-canaled maxillary second premolars.

## Clinical case 1

A 15-year old Turkish female with noncontributory medical history was referred to the dental health centre for endodontic treatment of the upper left maxillary second premolar. The patient complained of pain in the upper left back region. Clinical examination revealed a temporary restoration and the tooth was tender to horizontal and vertical percussion. Pulp sensibility test showed no response to cold and heat test. Radiographic examination demonstrated periodontal widening and a periapical

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**Case 1**

Fig. 1 Periapical radiograph



Fig. 2 Confirmation of the independent trajectory of the three root canals and their respective roots.



Fig. 3 Obturation of the three root canals

**Case 2**

Fig. 4 Periapical radiograph, showing the complex root morphology of the premolars suggesting the existence of three root canals.



Fig. 5 Obturation of the three root canals

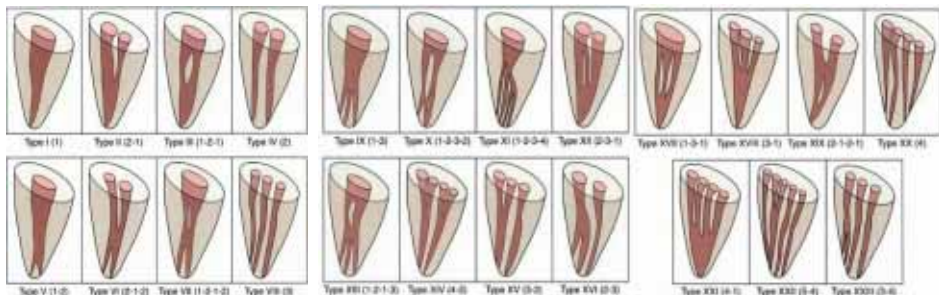


Fig. 6 Vertucci's classification (Type I- Type VIII)

Sert and Bayirli's Additional canal types to Vertucci's classification of Root canal systems (Type IX- Type XXIII)

radiolucency of size 4x4mm were observed (fig 1). A diagnosis of acute periradicular periodontitis was made. Under rubber dam isolation, the dressing was removed and an Endo Access bur was used to modify the edges of access opening in order to make a triangular conformation at the base, in the buccal direction (Sieraski *et al.* 1985). After pulp extirpation, the buccal canals were explored with sizes 8 and 10 files and the palatal with a size 15 H file, resulting in clinical and radiographic confirmation of three canals (fig 2). The counter-curve reduction of the cervical and middle thirds was achieved with sizes 1, 2 and 3 orifice shapers of the profile system (Dentsply Mailefer). Shaping of the apical third was completed with sizes 1-6 taper .06 and .04 instruments of the profile series 29 (Dentsply Tulsa, USA) with copious irrigation with sodium hypochlorite. The root canals were filled with gutta-percha (Sure-Endo, Korea) and AH plus (Dentsply/De Trey, Germany) root canal sealer using lateral condensation technique. Figure 3 shows the completed obturation of the three root canals.

**Clinical case 2**

A 32 year old Egyptian male with non-contributory medical history was referred to our

dental health centre for endodontic treatment of upper left second premolar (fig 4). The tooth was very sensitive to percussion. The tooth was isolated and the coronal access was prepared. On entry into the pulp chamber, three different canal orifices (two buccals and one palatal) were found. The access cavity was enlarged to a triangular outline. A uniform cut was made with a slow speed diamond at the buccal-proximo angle from the entrance of the buccal canals to the cavo-surface angle, resulting in a cavity with a T-shaped outline (Sieraski *et al.*). The canals were cleansed and the length of each root canal was established using an electronic apex locator Root ZX (J. Morita Kyoto, Japan). The root canals were prepared in a crown-down method using gates glidden drills and hand files. Sodium hypochlorite and EDTA solutions were used as irrigants. After cleaning and shaping, the canals were dried and filled by lateral condensation technique using gutta-percha points and root canal sealer. Fig 5 shows the final radiograph of the obturation of three root canals with distinct apical foramen.

**Discussion**

Incomplete obturation of the canal space was found to be the highest cause among those for root

canal therapy failures<sup>3</sup>. The access cavity for maxillary second premolars is usually oval in the bucco-palatal direction. In these cases, the access cavity was modified. The crowns of all these teeth were broader mesio-distally. The access cavities were slightly widened in the mesio-distal direction to uncover the second buccal canal. The completed access cavity preparation was triangular in outline, resembling the access cavity for a maxillary first molar, but smaller in size (radiculous)<sup>2</sup>. Having gained access to all the root canals, followed by cleaning and shaping and completed by a hermetic filling, a successful root canal treatment was achieved.

### Key learning points

- ◆ Clinicians should be aware of anatomical variations in maxillary premolars and be able to apply this knowledge in radiographic and clinical interpretation.

- ◆ Access cavity refinements may be required for stress-free entry to complex anatomy.
- ◆ Complex premolar anatomy may be predictably managed following its identification and negotiation.

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## HANDS ON COURSE ON MBT TECHNIQUE

A comprehensive 3-day Hands on Workshop on MBT course was organized by the Department of Orthodontics, PMS College of Dental Sciences and Research, Vattappara, Trivandrum, ON 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> June 2013. Eminent academician and renowned clinician Dr. Sadashiva Shetty, Principal and HOD, Dept of Orthodontics, Bapuji Dental College, Davangare was the course director. Clinicians and post-graduate

students from all over India participated in this course. Astounding success of this course gauged by the enthusiastic participation of clinicians will be a trigger for future scientific programs.



**Dr. Umesh Unnikrishnan**  
Nambiar's Dental Clinic,  
Cross Junction, Thiruvalla

## In Memoriam

Dr. Umesh Unnikrishnan who expired on 08/07/2013 in a car accident at Kumbanadu, Pathanamthitta Dist. He was the member of IDA Thiruvalla branch. He has been various positions held Hon. Treasurer, & Executive committee member, IDA Thiruvalla Branch, Member – IDA Hope, Executive committee member, IDA Pathanamthitta Branch

# Use of Iso Amyl 2- Cyanoacrylate for Closure of Head and Neck Incisions

\*Ninan Thomas, \*\*A. Thangavelu, \*\*\* Sankar Vinod V.

## Abstract

Various methods are used for closure of head and neck incisions but not all of them have adhesive property. Hence aim of this study is to evaluate the efficacy of Iso-Amyl 2 cyanoacrylate as a wound closure material. A total of 16 cases were selected for the study. The length of incisions varied from 2.0 to 13.5cms. Closure was done by cyanoacrylate tissue adhesive after approximating with subcutaneous Vicryl/Catgut or intermittent holding sutures. The wound was evaluated on the first, third, and seventh postoperative day for gaping, infection and necrosis of tissue edges and any other complications. The results of the study showed 15 cases of excellent clinical outcomes in which healing occurred by primary intention.

**Key Words-** Cyanoacrylate, Iso Amyl 2- Cyanoacrylate, Trauma, Fractures

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tracks, if removed early will result in dehiscence. Added to these setbacks, is an additional requirement of a dressing to protect the wound and suture as well. The ever-striving search for an alternative procedure and material has led to the discovery and development of tissue adhesives. The past forty years has witnessed development and refinement of tissue adhesive.

Cyanoacrylates were first synthesized in 1949 by Ardis<sup>10</sup> but their adhesive properties were discovered later by Coover<sup>10</sup> et al in 1959 who was the first to test them clinically. This procedure allows for normal wound healing and is accomplished without the need of local anesthesia or the entry of foreign material.

Cyanoacrylates are synthetic tissue adhesives that have been used clinically since 1960s as a agent to glue skin wounds. Their tremendous strength and ability to bond immediately attracted the attention of medical community. Since then different forms of this compound like methyl, ethyl, butyl and octyl cyanoacrylates have been developed. Iso Amyl 2-cyanoacrylate appears to be the best tolerated by tissues with lowest tissue reactivity, toxicity and highest tensile strength.

## Introduction

Historically, the art of aiding healing dates back to time when East African Tribes used “acacia thorns” and South Americans used “Black Ants” to close wound primarily. Subsequently, different forms of suture materials made of flax, hemp hair, bark, linen strips came into existence.

Trauma has been the mainstay in day to day practice of oral and maxillofacial surgery and the wound closure of the incision and lacerations bears direct significance to the successful management of

the same. Goals of incision/laceration repair are to approximate the edges of wound so that natural process of healing can take place uneventfully. Precise approximation of skin incisions and lacerations with wound closure techniques is critical to a favourable esthetic and functional surgical result.

Sutures were the classical and conventional techniques for this objective. They require passage of a foreign material through tissues, if tied tightly or left for too long they may leave permanent suture

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Case 1



Laceration of Lower Eyelid



Immediate Post op



Post op 1 month

Hence a study was undertaken to analyse the use and efficacy of Iso Amyl 2-cyanoacrylate in head and neck wound closure.

**Material and Methods**

A total of 16 patients with different types of wounds are admitted in our hospital.

**Selection criteria:**

The patients selected for the study should fulfill the following criteria.

- a) Inclusion Criteria
  - Age between 15-65 years
  - Fresh wound cases
  - Both surgical and traumatic wounds
- b) Exclusion Criteria
  - Systemic Diseases like Diabetes, Hypertension, Bleeding dysesthesias
  - History of allergy
  - Traumatic wounds with tissue loss
  - Patients with neurological problems

These cases were further divided into 3 groups according to the site

1. GROUP 1- Wounds of Upper Third Facial Skeleton
2. GROUP 2-Wounds of Middle Third Facial Skeleton
3. GROUP 3-Wounds of Lower Third Facial Skeleton

16 cases were selected for the study. The length of incisions varied from 2.0 to 13.5cm. 9 cases of incision which were less than 5cm were closed with Iso Amyl 2-cyanoacrylate tissue adhesive alone.

In 7 cases in which the length of incision exceeded 5 cm, closure was done by cyanoacrylate tissue adhesive after approximating with subcutaneous Vicryl/Catgut or intermittent holding sutures. The wound was evaluated on the first, third, and seventh postoperative

day for gaping, infection and necrosis of tissue edges and any other complications.

**Method of Application:**

Following the surgical procedures, the wound edges were carefully approximated by means of sub cutaneous sutures using 3-0 Vicryl/Catgut.

After attaining a dry field, the wound margins were closely approximated and the Iso-Amyl 2 cyanoacrylate was applied in a thin layer over the incision line. In the case of larger incisions, a fine non-toothed Adson's forceps was used to obtain preliminary approximation of the wound margins before application of the cyanoacrylate.

Adhesive was then taken out of its container and then transferred to the sterile field. Drops of Iso-Amyl 2 cyanoacrylate were applied at intervals along the incision to facilitate holding. A thin layer of the cyanoacrylate was then applied over the surface of the approximated incision margins and allowed to extend over normal adjacent skin on either side of the incision. This was allowed to polymerize for a period of 90-120 seconds. The material turns opaque to signal the end of polymerization. Care was taken to avoid placing the material inadvertently into deeper tissues.

Emphasis was placed on proper approximation of the wound edges since major corrections are not possible after polymerization of the tissue adhesive. The wound site was then left undisturbed for a period of 6-7 days. A sterile dressing was placed over the site to prevent any accidental damage to the wound by the patient.

**Post operative care**

Post operatively, the following protocol was observed for all the cases.

1. Wound site was left undisturbed for a period of 6-7 days
2. Local tissue reactions like tissue oedema, wound dehiscence, and allergic reactions were evaluated.



**Case 2**

Laceration of Ear    Immediate post op    Post op 1 month

3. Long term follow up for a period of 3 months to analyze the functional and esthetic results.
4. Appropriate antibiotic coverage.

**Results**

The results of the study showed 15 cases of excellent clinical outcomes in which healing occurred by primary intention. 1 case resulted in failure due to infection and gaping.

**Discussion**

The tissue adhesive have been used as a protective and adhesive surface dressing for gingival surgeries<sup>9</sup>, mucoperiosteal flaps, biopsy sites, wound closure following minor surgical procedures, and in the extraction sites<sup>4</sup>. Iso Amyl 2-cyanoacrylate has been used to stop post extraction bleeding<sup>7</sup> in patients with bleeding diathesis and in the treatment of mandibular fractures<sup>6</sup>, and for the stabilization of cartilage grafts<sup>3</sup>. Iso Amyl 2-cyanoacrylate has also been used for the reconstruction of comminuted fractures and for reconstruction of frontal bone following trauma.

It has also been in use for stabilization of grafts following repair of orbital floor defects. They have been used in the treatment of A.V. malformation<sup>7</sup> of the head and neck region as an alternative to surgery.

**Advantages of Iso Amyl 2-cyanoacrylate**

- Rapid adhesion to hard and soft tissues is achieved rapidly within 30 - 60 seconds.
- Material is easy to apply at the involved site. No specific instrumentation is needed.
- Material can be applied even in the presence of moisture.
- Iso Amyl 2-cyanoacrylate produces immediate haemostasis.
- Reduced pain and discomfort for the patient. This is due to the formation of a barrier between the wound and external environment.

- A mild local anaesthetic effect.
- Reduction in time consumption.

**Conclusion**

Iso Amyl 2-cyanoacrylate, as a tissue adhesive can be used as a reliable and safe method for small tension free incision closure in maxillofacial regions. The fact remains that it is not as strong in terms of tensile strength when compared to sutures, hence cannot completely prevent occurrence of dehiscence. Its main drawback is the inability to be used in areas of tension.

It also demonstrates the effectiveness and advantages of this new, fast, and relatively painless wound closure that may replace the need to suture millions of surgical wounds or lacerations each year. Closure of incisions on the upper and middle third facial skeleton showed excellent results compared to lower third facial skeleton. As the neck region is movable and it is an area of tension sutures are more indicated here.

It should now be subjected to the vigorous randomized controlled trial in order to compare its performance and possible side effects against the mere traditional methods of wound closure before general use can be recommended.

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# The need to use comprehensive dental terms in the public domain in Kerala state

\* Sebastian Thomas, \*\* George Jose Cherackal, \*\*\* Sabu Kurian

India with its innumerable languages and social classes has English as its binding language and its medium of instruction in the higher echelons of education. Accordingly, in the 280 plus dental schools of India<sup>1</sup>, the medium of instruction is English. When these dentists start practice and mingle with the general population they adopt pre existing vernacular terms to refer to many dental procedures and/or materials

In the state of Kerala common man's reference to orthodontic treatment in Malayalam language; '*pallu kettanam*' can be transliterated as binding/ strapping the proclined teeth. The implication being, only if there is proclination, orthodontic treatment may be done. The full range of orthodontic treatments is not realised. A person with anterior teeth crowding may not get the idea that it can be rectified by orthodontic management. Even those who are ready for orthodontic procedures dont get to know the treatment possibilities due to lack of awareness. In a vast and diverse country like India where efforts at dental awareness are minimal in schools or in mass media, public perception is primarily built by the terminologies commonly used and which percolates into public consciousness. When the general populace is unable to utilise the services due to lack of awareness it is the profession which fails.

Similarly, use of terms which are not user friendly nor comprehensive like 'Surgery of the gums' to refer

to periodontology repels common man. A user friendly and comprehensive term like 'management of the gums' may prove more productive.

Common reference to 'grinding the teeth' to fabricate a dental bridge may be substituted with 'modifying the shape of the teeth' instead.

"Drilling the bone" will create a multitude of scary images in the minds of the uninformed and uninitiated patient who might otherwise opt for an implant treatment.

"Post placed inside the tooth" to reinforce the tooth structure may create funny images in his mind, but we doubt he will be keen to have it inside his mouth.

These are all possible instances where clinicians' choice of words holds back the reins of their practice.

More comprehensive terminologies which sound benign and patient friendly should be used and promoted like "alignment of teeth" (*'dantha krameekaranam*' in Malayalam) to refer to orthodontic treatment in the public domain. Collective decision from dental associations in resorting to and subsequently reinforcing proper terminologies among public may make a world of good change in terms of dental awareness and a complete dental care in the long run.

Use of wrong terminologies led to wrong concepts and subsequent mismanagements among the dental students as well. A classical example is "pulling out the tooth". The day a

student enters a dental college he gets to know that in oral surgery he will be "pulling out the teeth". And by the time he enters the clinics the term, the accompanying image and hence the concept is deeply embedded in his mind that his job is to "pull out the tooth". And he does precisely that with disastrous consequences to himself and the patient. The concept that he is supposed to luxate and / or elevate the tooth well and he should use the forceps only after the tooth is luxated misses his mind. He learns it the long, hard way or some times never. The student who wanted to "pull out the tooth" ironically becomes a clinician who fractures all his patients' teeth and then tries to ferret out the remnants.

An alternate term of reference needs to be adopted and reinforced as well. Hours of instruction on extraction of teeth may otherwise be futile.

Research on the effect of language used in clinical practice and dental education should be promoted and this evidence based approach will provide direction to the profession. Soft skills, awareness about local linguistic implications and neurolinguistic programming may be incorporated in the dental curriculum. The authors are of the opinion that Evidence based dentistry requires Evidence based language for furthering the profession.

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# Vertical root fractures

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## Abstract

Vertical root fractures are often being misdiagnosed or remain unrecognized because of either lack of specific signs and symptoms and/or typical radiographic features. Reaching to a correct diagnosis of the condition, thereby, planning an appropriate treatment becomes a responsibility of a dental practitioner. The clinician must be able to interpret the subjective and objective findings that suggest a vertical root fracture and be able to make a prediction as to the eventual potential of healing. The use of current developments in various disciplines of dentistry has made it possible to treat these fractures more efficiently than before. The long-term prognosis has yet to be proven in those cases where successful outcomes have been claimed. This article reviews various etiologic factors, simulating clinical and radiographic conditions, and an appropriate diagnosis of vertical root fractures along with their treatment modalities.

**Key words:** Vertical root fracture, diagnosis, periodontal pocket, endodontic therapy, extraction

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## Introduction

Vertical root fractures are considered to be the most severe among all root fractures that are encountered in the vertical plane.<sup>1</sup> They are mainly seen to be associated with endodontically treated teeth and the two most common causes are excessive pressure during compaction of gutta-percha (especially lateral compaction)<sup>2-4</sup> and post placement.<sup>5,6</sup> They are usually seen in patients older than 40 years of

age<sup>7</sup> and may involve non-endodontically treated teeth as well.<sup>8-10</sup> The mandibular incisors and premolars, maxillary second premolars, mesiobuccal roots of maxillary molars, mesial and distal roots of mandibular molars are most commonly fractured teeth and roots<sup>11</sup> and the fracture occurs predominantly in a bucco-lingual direction.<sup>12</sup>

Vertical root fracture in an endodontically treated tooth is a catastrophic condition for both the

patient and the dental practitioner. It requires subsequent consideration of restorative procedures including complex surgeries and prosthetic replacement in cases where considerable investment of time and money had already been expended. In fact, they are the second most frequent identifiable reason for loss of endodontically treated teeth.<sup>13</sup>

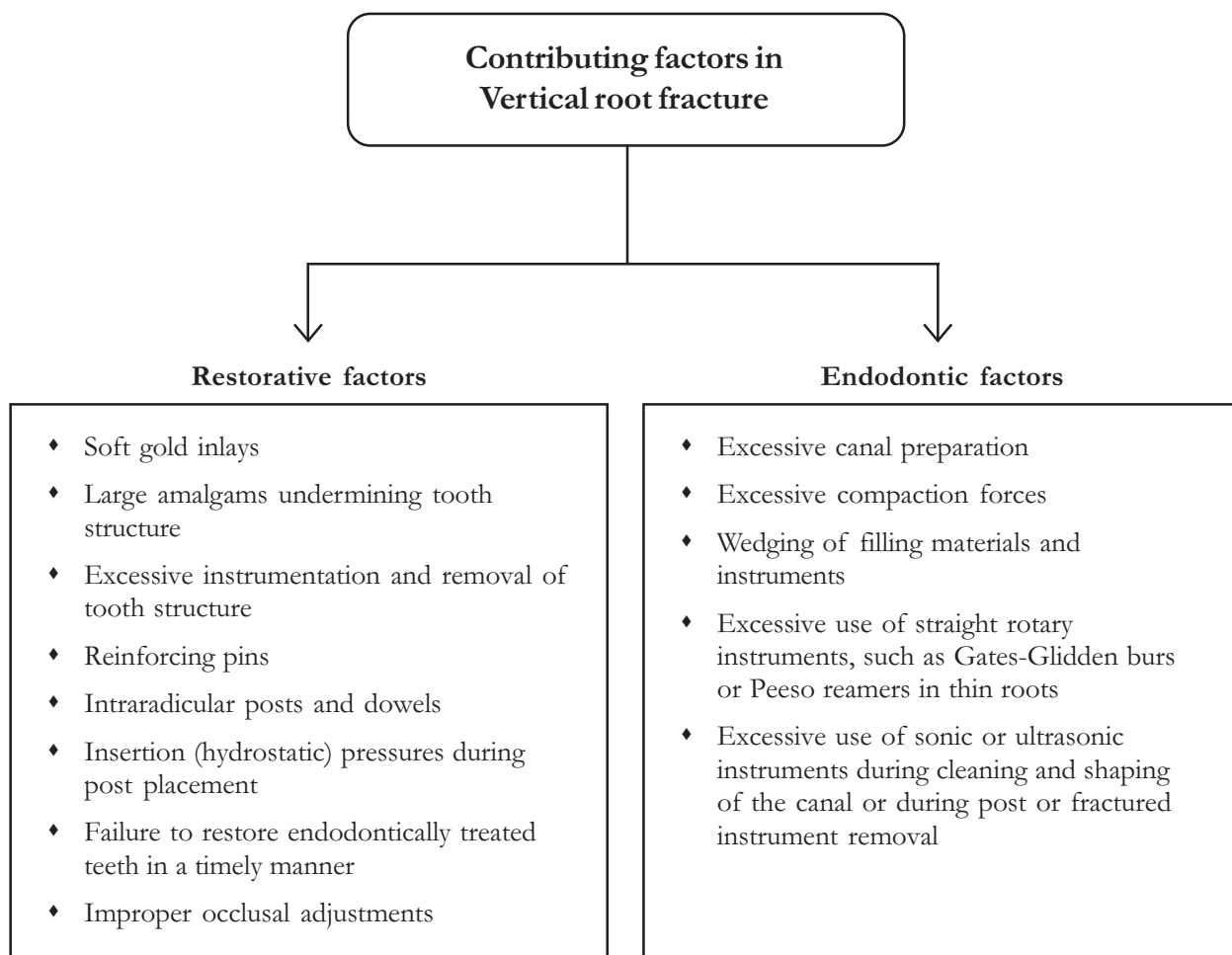
## Classification (Fig. 1)

- ♦ **Class I: Incomplete Vertical Fracture** - *Incomplete vertical fracture through enamel into dentin, but not into pulp.*
- ♦ **Class II: Pulpal Involvement** - *Incomplete crown fracture involving the pulp.*
- ♦ **Class III: Attachment Involvement** - *Incomplete vertical fracture involving the attachment apparatus.*
- ♦ **Class IV: Complete Separation of Tooth Fragments** - *Fracture divides the tooth.*
- ♦ **Class V: Retrograde Root Fracture** - *Apically induced fracture.*

## Etiology

The cause of vertical root fractures mainly is iatrogenic, resulting from dental treatment excesses during restorative and endodontic procedures. It is generally accepted that the removal of excessive amounts of radicular dentin compromises the root, and the amount of dentin remaining is

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directly related to the strength of the root.<sup>14,15</sup> Trauma is the most likely cause of vertical root fractures in vital teeth, typically occurring from physical trauma, clenching or bruxism, or occurring in teeth undergoing apexification.<sup>16</sup>

### Diagnosis

An appropriate diagnosis of vertical root fracture requires a complete medical and dental history followed by thorough visual and tactile examination. Patient often gives a long history of variable discomfort or soreness, usually associated with local chronic infection, which has been difficult to diagnose and treat successfully. The other symptoms include mild to moderate pain<sup>17</sup>, pain on biting, and pain to temperature extremes, especially cold. Development of deep, narrow, isolated periodontal pockets adjacent to the fracture site is a common feature. Broad-based swelling of soft tissues is seen usually in mid-root position. Double or multiple sinus tracts may be present in or close to attached gingiva rather than in the apical region.<sup>18</sup>

Occasionally, the patient can be aware of a sharp cracking sound at the time of condensation of guttapercha, or the cementation of a post.<sup>8,17,18</sup> When pain on biting and bad taste is seen in an apparently well root filled tooth, the fracture is most likely present. Bleeding and an apparent lack of resistance during condensation of a root filling material within the canal can be observed.<sup>19</sup> Dislodgement of a post or post crown or a failed surgery for no obvious reasons may be seen.

Radiographically, vertical root fracture can be seen as actual separation of root fragments, fracture lines along the root or root fillings, space beside a root filling, space beside a post, double images on the external outline of a tooth, or extrusion of cement or root filling material into the fracture site or apically. Radiographic evidence tends to be more likely as the fracture progresses to form a bony defect. Bone resorption can be well appreciated as widening of the periodontal ligament space around the whole length of the root, isolated horizontal bone loss in posterior teeth, halo-like radiolucency (J-type lesion) running



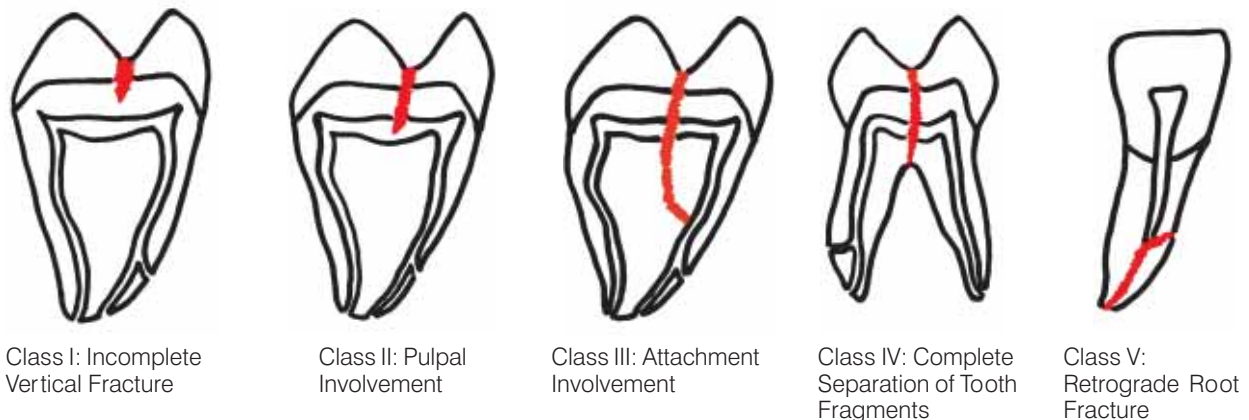


Fig. 1

around the whole of the tooth, step-like bone defects, unexplained bifurcation bone loss or a V-shaped diffuse bone loss on roots of the posterior teeth.<sup>18,20</sup>

#### **Bite test:**

Pain during biting or chewing on a rubber wheel, tooth slooth or a wood stick suggests a presence of a crack. The clinician must inquire whether the pain is similar to the patient's chief complaint. This test can be performed tooth-by-tooth or cusp-by-cusp and make sure to check controls as well.

#### **Periodontal probing:**

Careful probing in small increments around the entire circumference of the tooth may reveal a narrow, isolated, periodontal pocket. The pocket is generally narrow (1 or 2 mm) with normal sulcus depth on either side.

#### **Vitality testing:**

Pulp vitality tests like electrical, thermal or Laser Doppler flowmetry can be helpful in diagnosing a vertical root fracture especially in ostensibly sound teeth. A non-vital tooth that is intact or has minimal restoration is highly suggestive of vertical root fracture.

#### **Radiographs:**

Radiographic assessment based on X-rays taken from different angulations might increase the chance of an early detection of the defect. Unless the X-ray beam is parallel to the fracture line, the root fracture will not be revealed. Changes in the pulp chamber, canal, or periradicular space, however, may suggest the presence of a fracture.

#### **Transillumination:**

A fiberoptic light source is applied directly to the tooth surface. The light gets deflected at the fracture, reducing its transmission through the tooth, hence; the other side of the fracture appears darker.

#### **Restoration removal:**

Sometimes restoration removal may be required to examine the remaining cavity. Enhanced magnification and illumination can be helpful in proper identification of a fracture.

#### **Staining:**

A fracture may be disclosed through staining with a dye, such as methylene blue, in the cavity after restoration removal, or on a surgically exposed root.

#### **Computed tomography:**

Computed tomography is a valuable method for three-dimensional, non-destructive visualization and exploration of vertical root fractures or cracks. However, this type of imaging is typically not yet available in a dental office.

#### **Surgical assessment:**

Diagnostic surgery is performed in cases where the fracture is highly suspected and cannot be confirmed by all other possible diagnostic means. Generally, a reflection of a small triangular 'miniflap' is recommended for surgical exploration of the root fracture.

#### **Differential diagnosis**

When a patient presents with an isolated peri-odontal pocket and non-specific symptoms, differential diagnosis other than vertical root fracture should be considered.<sup>21</sup>

- **Palato-radicular groove:** It is usually found on the maxillary central and lateral incisors with a prevalence of 21%. Clinical and radiographic findings are similar to the one associated with a periodontal abscess.
- **Enamel projections:** They extend into the furcation of 28.6% of mandibular molars and 17% of

maxillary molars. Isolated periodontal pockets have been found adjacent to enamel projections.

- **Cemental tear:** Symptoms include dull pain adjacent to the affected tooth, inflamed gingiva associated with an isolated periodontal pocket and possibly purulent exudates. Radiographs may demonstrate an osseous defect and a radiopaque “foreign body” if the separation is on a proximal root surface.
- **Acute alveolar abscess:** This abscess will most commonly form a sinus tract through the alveolar mucosa. Less frequently, exudate will drain through the gingival sulcus, forming a deep localized periodontal pocket that extends to the apex of the root.
- **Accessory canals:** Accessory canals show a prevalence of 23% and may contain necrotic pulps causing isolated persistent periodontal pockets in endodontically treated teeth.

## Treatment

The treatment of the vertical root fractures is focused upon elimination of the fracture or the entry of irritants through the fracture site. The indicated treatment for a single rooted tooth is extraction mostly; however, for multirooted tooth root amputation or hemisection may be considered. Numerous case reports are described in the literature where innovative attempts to treat and retain vertically fractured teeth have been attempted with varying success. These include bonding using cyanoacrylate<sup>22</sup>, glass ionomer cement<sup>23,24</sup> and composite resin<sup>25,26</sup>; bonding using wires<sup>27</sup>; adhesive resin cement and rotational replantation<sup>28</sup> and fusing the fragments using CO<sub>2</sub> and Nd:YAG laser.<sup>29</sup>

Once the fracture has been diagnosed, the practitioner may consider protecting the tooth with a band (copper or stainless steel) or a temporary crown. Before any procedure is undertaken the tooth must be adjusted so that it is not in occlusion. If the patient is asymptomatic after 1 week, and has no discomfort with thermal changes, then the tooth can be predictably restored with a cast crown. However, an immediate endodontic therapy must be performed where pulpal and attachment involvement is seen. The permanent restoration with a full cuspal coverage is determined on the basis of success of endodontic treatment in such cases. In most of the vertical root fractures with attachment involvement, treatment is often difficult leading to root amputation, hemisection or extraction of the tooth. In complete

fractures, one or more segments of the tooth are being mobile and extend subgingivally. The mobile portion needs to be removed in that case, and if what is remaining is restorable, the endodontic involvement is treated and the tooth is restored. The ability to restore the crown must be considered in the approach to treatment. Extraction or endodontic surgery is the only treatment option in retrograde root fractures.

## Prevention

- Avoid excessive removal of intraradicular dentin during shaping of the canal.
- Minimize internal wedging forces.
- Treatment and restorative procedures that require minimal dentin preparation should be selected.
- Condensation of obturating materials should be carefully controlled.
- More flexible and less tapered finger pluggers or spreaders are preferred because they are safer than stiff, conventional hand type spreaders.
- Posts weaken roots and should not be used unless they are necessary to retain a foundation.
- The post design least likely to stress and fracture dentin is the flexible or cylindrical (parallel-sided) preformed post. Their shape may exert wedging forces particularly if they lack a stop or ferrule on the root seat.
- Any post used should be as small as possible, have a passive fit, and not lock or grip the root internally with threads.
- Cementation should be done carefully and slowly; an escape vent for the cement is probably helpful.

## Conclusion

The clinician should have a thorough knowledge of the various etiologic factors causing vertical root fractures and try to prevent the occurrence of these fractures. It has been recommended that the root fractured teeth must be managed as soon as possible in an attempt to prevent the continued bone resorption that occurs till the fracture exists. In absence of any intervention more complex periodontal surgery or ridge augmentation procedures have to be employed later and the success of future implant supported prosthesis may even be compromised.

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# Rehabilitation following radicular cyst enucleation - the role of fibre and vacuum splint

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## Introduction:

“Oral rehabilitation” is a phrase that is used to encompass several levels of oral therapy. Rehabilitation of masticatory ability in patients with reduced periodontal tissue support is a intricate challenge in dentistry. Destruction of the supporting tissues can be so advanced in some teeth that extraction seems to be the only treatment option. However, after successful periodontal treatment, the remaining teeth may offer sufficient abutments for fixed reconstructions.<sup>1</sup>

The Radicular cyst arises from epithelial remnants stimulated to proliferate by an inflammatory process originating from pulpal necrosis of a non-vital tooth.<sup>2</sup> The cyst usually goes unnoticed because of the size that is rarely palpable, and it is often painless.<sup>3</sup> Radicular cyst is the most common odontogenic cyst commonly seen in the maxillary anterior region, constituting 52.3 - 70.7 % of all odontogenic cysts.<sup>4</sup>

A splint is ‘a device that maintains hard and/or soft tissue in a predetermined position’.<sup>5</sup> Periodontal splinting is the immobilization of teeth that have become mobile owing either to loss of bone supporting the tooth or to trauma. Periodontal splinting is recommended for teeth adversely affected by periodontal disease.<sup>6</sup> It has been proven that while a splint

## Abstract

This article presents a case report of rehabilitation following radicular cyst enucleation. A male patient, 24 years old, complained of swelling and mobile tooth in upper left front tooth region since one year. The diagnosis of radicular cyst was confirmed histo-pathologically and radiographically. Radicular cyst was treated using conventional root canal therapy and surgical enucleation. Following surgery occlusal vacuum splint prepared by Biostar pressure moulded machine was used to decompress palatal swelling. Periodontal health of teeth was restored with fiber reinforced composite resin splint using modified splinting technique. Finally prosthetic rehabilitation was done using cantilever bridge with loop connector. Enucleated cystic site healed uneventfully. Hence the modified splinting technique aids in stabilizing the teeth and acts as an adjunct to periodontal therapy.

**Key Words:** cyst enucleation; fiber reinforced composite resin splint; modified splinting technique; radicular cyst; vacuum splint

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is in place, there is reduction in tooth mobility.<sup>7</sup> Vacuum formed splints are contoured closely over the occlusal surfaces and enable good interdigitation of the dentition.<sup>8</sup>

When teeth are joined together in case of splinting, stabilization, or restoration of missing teeth, the technical elements of marginal fit, correct contour and shape of the restoration, cleansibility, and occlusion must be fulfilled.<sup>9</sup> Fixed tooth-supported prostheses can provide adequate masticatory

function, improved esthetics and stabilize mobile teeth.<sup>1</sup>

This case report describes successful treatment of radicular cyst in relation to upper anterior teeth by root canal treatment and surgical enucleation, followed by restoration of periodontal health of teeth using fiber reinforced composite and orthodontic splint.

## Case report

A 24 year old male patient visited with the complaint of swelling and

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Fig. 1 Pre Operative



Fig. 2 Diffuse palatal swelling



Fig. 3 Cropped panoramic radiograph showing cystic extension



Fig. 4 Completed obturation

mobile teeth in upper left front tooth region since one year (Fig. 1). The lesion was small initially and gradually reached the size of 5x3cm. On clinical examination swelling and facial asymmetry was seen on left side of face. Intraorally, palatal swelling was evident, extending from the left central incisor to the distal aspect of second premolar (Fig. 2). The swelling was fluctuant on palpation which indicated a loss of integrity of palatal bone, and was tender.

Hard tissue examination revealed maxillary left lateral incisor was displaced labially and was 3-4 mm out of occlusion. Thermal and electrical vitality test showed negative response with maxillary left lateral incisor and delayed response in maxillary right lateral incisor, left canine and both centrals. Maxillary left central incisor, and canine showed grade II mobility and grade III mobility in maxillary left lateral incisor. An occlusal view radiograph of the maxilla revealed a well defined large radiolucent lesion with sclerotic margins measuring 5x3 cm with extensive periapical and inter dental bone loss in maxillary left lateral incisor. Panoramic radiograph revealed lesion extending from distal surface of maxillary right lateral incisor to distal surface of maxillary left second premolar (Fig. 3).

Cystic fluid aspiration was done and sent to biochemical report. On basis of clinical, radiographic, and biochemical reports the lesion was provisionally diagnosed as radicular cyst involving maxillary anterior teeth.

### Treatment plan:

The treatment plan included root canal therapy with respect to maxillary centrals, laterals and left canine. Surgical management of the cyst was planned by cyst enucleation along with extraction of maxillary left lateral incisor. Following surgery occlusal vacuum splint made by biostar pressure moulded machine was placed to compress the palatal swelling. Periodontal health of teeth was restored with fiber reinforced composite resin splint using modified splinting technique. Finally prosthetic rehabilitation was planned using cantilever bridge with loop connector.

### Endodontic therapy:

A multi-visit endodontic therapy was planned with respect to maxillary centrals, laterals and left canine. Following rubber dam isolation access cavity was prepared. Canals were shaped using Protaper rotary endodontic system. After thorough debridement and disinfection of canals, the three dimensional obturation of the root canal system was completed (Fig. 4).

### Surgical phase:

For surgical enucleation of the cyst, a buccal approach was adopted. Papilla based incision was placed and a full thickness flap was raised. Cyst enucleation was carried out in toto along with the extraction of maxillary left lateral incisor (Fig. 5) as there was marked bone resorption and tooth was extremely mobile & displaced labially. Lesion measured around 5x3 cm and was send for histopathological report. The histopathology report confirmed the diagnosis of an infected radicular cyst.

### Vacuum splinting:

Following cyst enucleation, occlusal vacuum splint was placed to compress the palatal swelling. Diagnostic cast was made depicting palatal swelling. Ethyl Vinyl Acetate (Eva) splint material was used which is 2 mm thick and highly flexible (Fig. 6). Splint was fabricated in Biostar vacuum pressure moulded machine, which works by compressing and close adaptation of splint material to tissues. Patient was asked to wear splint for 7 days.

### Periodontal splinting:

As teeth were periodontally weak it was planned to splint the teeth to strengthen and stabilize them so that they act as abutment for fixed prosthesis. Fibre reinforced composite splint material was used for splinting. Splint was placed in bonding agent, by careful handling of splint with tweezers and without touching it splint was adapted and cured.

Usually splinting is done either labially or lingually however in present case labial splinting was done and further adapted on the palatal aspect of tooth so that



Fig. 5 Cyst enucleation

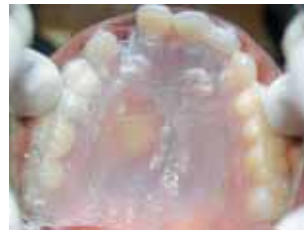


Fig. 6 Vacuum splint placed intraorally



Fig. 7 Modified splinting technique



Fig. 8 Cemented crowns

it provided added stabilization and aided as space maintainer and prevented drifting of tooth towards extraction space (Fig. 7).

### Prosthetic rehabilitation:

After one month uneventful post surgical healing took place. Following splinting the teeth were stabilized enough to act as abutments, hence cantilever bridge prosthesis with loop connector was planned. Tooth preparation was done in maxillary left canine as canine is much stronger and serves as a better abutment. Elastomeric impression was taken. Gingival porcelain loop connector provided better esthetic. Finally prosthesis was cemented (Fig. 8).

### Discussion:

Cysts constitute about 17 percent of the tissue specimens submitted to oral pathology biopsy services. The periapical cyst is the most common odontogenic cyst.<sup>4</sup> It is defined as a cyst about the root of a dead tooth, usually caused by dental caries or disease of the pulp. The development of the cyst is caused by the growth of remnants of Malassez cells involved in the development of the dental organ. It usually goes unnoticed because of the nature that this type of cyst is usually smaller in size, rarely exceeding 1 cm in diameter and is often seen in patients between 30 and 50 years old.<sup>3</sup> In this case patient is 24 year-old, the size of the cyst was 5x3cm, and it was considered big for this age.

The cyst is usually detected incidentally on panoramic radiograph while investigating for other diseases. However, as some of them grow, it can cause the teeth to loosen and once infected, will lead to pain and swelling, after which the patient usually becomes aware of the problem<sup>3</sup>. Though the growth rate of radicular cyst is annual, Takiguchi. M et al reported a case with rapid growth rate.<sup>10</sup> The same was observed in the present case in a very short period of time.

Several treatment options are available for a radicular cyst. The choice of treatment may be determined by some factor such as the extension of the lesion, relation with noble structures, evolution, origin, clinical

characteristic of the lesion, cooperation and systemic condition of the patient. The treatment of these cysts is still under discussion and many professionals opt for a conservative treatment by means of endodontic technique (Hoen, 1990; Rees, 1997). However, in large lesions the endodontic treatment alone is not efficient and it should be associated to a decompression or a marsupialization or even to enucleation (Neaverth; Burg, 1982; Hoen Et Al., 1990; Rees, 1997; Danin 1999)<sup>2</sup>. Hence in present case Radicular cyst is treated by Endodontic therapy with emphasis on thorough debridement, disinfection and three dimensional obturation of the root canal system, followed by surgical enucleation. These two well established procedures are considered the golden standards for the management of such lesions.

Vacuum-formed splints are contoured closely over the occlusal surfaces and enable good interdigitation of the dentition. This technique proved to be successful. The vacuum-formed splints are inexpensive, biocompatible and easy to make with reduced laboratory time. Retention of these splints is achieved primarily by mechanical means because of the closely contoured properties of the plastic splints.<sup>8</sup> In present case we used vacuum splint to compress diffuse palatal swelling. The material was heated to the manufacturer's specification for 50 seconds at a temperature of 220°C at a pressure of 6.2 bar using a Biostar vacuum-forming machine.

Tooth mobility has been described as an important clinical parameter in predicting prognosis.<sup>5</sup> For this reason and also for the sake of patient comfort, splinting has been recommended as a therapy to stabilize teeth. With the introduction of bondable fiber reinforcement materials many of the problems with older types of reinforcement are solved.<sup>8</sup> Periodontal splinting with translucent glass fiber-reinforced composite (FRC) being affordable for the patient, easy for the clinician to construct enables reconstruction of a good masticatory function and acceptable esthetics at a relatively low price (Friskopp et al. 1979, Friskopp & Blomlof 1984, Vallittu 1998). The method seems to have better prognosis than semipermanent splinting with metal reinforcements.<sup>1</sup>

Splinting can at times be detrimental to the health of the strong teeth. Removing interferences and deflective contacts is the key to creating an environment where loose teeth can “heal” and tighten in their sockets<sup>12</sup>. In the present case we used modified splinting technique where we splinted labially and further adapted it on the palatal aspect of tooth so that it provided stabilization and aided as space maintainer and prevented drifting of tooth towards extraction space.

Since the periodontal ligament reaches its normal strength 7 to 14 days following trauma, there are only few situations that merit longer splinting periods. While it has been shown that prolonged and rigid splinting may lead to adverse effects, such as ankylosis and replacement resorption, there is current agreement in the dental trauma literature that splinting periods should be in accordance to the clinical and radiographic findings<sup>13</sup>. Hence in present case we splinted the teeth for two weeks.

After successful periodontal treatment, the remaining teeth offer sufficient abutments for fixed reconstructions.<sup>1</sup> Cantilever bridge prosthesis with loop connector was planned in this case as less masticatory forces act on anterior teeth. Prosthesis helped in maintaining space as the patient had spaced dentition and improved esthetics.

The authors recommend non surgical management of large periapical lesions in view of clinical evidence present. However in specific situations where the size and extent of the lesion is of critical importance surgery is a viable option with good prognosis.<sup>2</sup>

### Conclusion:

Rehabilitation is a multidisciplinary task and inter disciplinary approach is needed in treating cases with large cystic lesion with mobile and displaced teeth. In present case we have successfully treated radicular cyst by Endodontic therapy and Surgical enucleation.

Vacuum formed splint is an ideal way to reduce the palatal swelling following surgical enucleation. The modified splinting technique is useful in stabilizing the teeth and aid as an adjunct to periodontal therapy.

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# Diagnosis and management of vertical root fracture

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## Introduction

Vertical tooth fractures or longitudinal tooth fractures are the fractures of the crown and or root occurring in a plane along the long axis of a tooth that propagates over time. From the simplest to most complex entity they are categorized as crazelines, cuspal fracture, cracked tooth, split tooth and vertical root fracture<sup>1</sup>. Vertical root fractures are longitudinally oriented complete or incomplete fracture of the root that originate from its apical end and propagates coronally. According to literature it is the third most common reason for extraction of an endodontically treated tooth<sup>2</sup>. Overzealous root canal preparation, excessive compaction during obturation and stresses induced during post cementation are recorded as the outstanding reasons for vertical root fracture<sup>3</sup>.

Eventhough many diagnostic aids has been proposed for vertical root fracture including special staining, CBCT, use of dental operating microscope, or surgical exploration (which definitely points to a more accurate option), diagnosis of vertical root fracture is often a matter of prediction rather than identification<sup>4</sup>. The most challenging part of its diagnosis lies in the fact that patient's signs and symptoms are very mild even in advanced stage of bone destruction and the conditions required to

## Abstract

Vertical root fracture is the most complex and distinct entity in longitudinal tooth fracture types. The diagnosis of this condition is often a matter of prediction rather than identification as clinical signs and symptoms are very mild even in advanced stages bone destruction. This is a case report demonstrating challenging diagnosis and management of a vertical root fracture in the most conservative way that was possible by hemisection of the involved tooth and post surgical rehabilitation with the help of endocrown incorporated in cantilever fixed prosthesis. Rationale in adopting each step of treatment strategy is also discussed.

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reproduce this pain is very difficult in clinical situation.

The basic management of a vertical root fracture is influenced by nature and extent of fracture line strategic value of the tooth, restorability, occlusion, periodontal support and based on this the treatment options can vary from bonding of the fractured fragment as in case of incomplete vertical root fracture, root amputation, hemisection and finally extraction in hopeless cases. Attempts to treat incomplete VRF have been reported, such as bonding the separated fragments extraorally and intentional replantation of the reconstructed tooth in anterior teeth<sup>5</sup>. Concerning incomplete VRFs, a surgical technique has been recently presented for the preservation of coronally located

VRFs in which after flap elevation, a groove following the fracture line is prepared by using ultrasonics and sealed with mineral trioxide aggregate and the bone defect is filled with calcium sulfate<sup>6</sup>. Still then the treatment option in advanced stage of vertical root fracture turns out to be root amputation or hemisection and extraction in hopeless cases.

## Case report

A 16 year old boy reported to the OP clinic of conservative dentistry and endodontics with a complaint of localised swelling in relation to his lower back tooth for about two months with occasional pain. There was a history of root canal treatment for the concerned tooth about 2 years back. The involved tooth and adjacent tooth

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Fig. 1

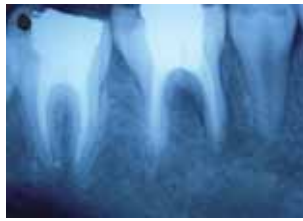


Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6



Fig. 7



Fig. 8

(46 and 47) were heavily filled with amalgam. Neither the tooth was mobile or sensitive to percussion. The soft tissue examination revealed sinus tract formation near linguo-alveolar sulcus in relation to 46 (Fig 1) associated with a 7 mm deep periodontal pocket. A diagnostic IOPA has taken initially which indicated that root canal treatment is already completed for 46 and 47. In addition to this the mesial root showed continuous widening of PDL space all around with J shaped hallow around the mesial root suggestive of vertical root fracture (Fig 2). But clinically any segments of 46 were immovable. Thus it was decided to remove the coronal restoration to check the presence of crack or fracture. After removal of the restoration, methylene blue dye has been used to exactly stain the pathway of propagation of fracture. A fracture line starting from lingual groove to the floor of pulp chamber in the center turned mesially passed in between mesio buccal and mesiolingual canal orifices splitting mesial root ending in buccal marginal ridge (Fig 3) was seen. Type IX GI restoration has been used to restore the tooth in an attempt to bond the segments. But the symptoms persisted in the next appointment also. As the fracture line propagated between mesiolingual and mesio buccal orifices the resection of this root was inevitable. Thus the treatment option was hemisection of mesial half retaining distal half of 46. In the next appointment, after giving an inferior alveolar nerve block and patient got anesthetised a gingival crevicular incision followed by flap elevation to expose the furcation has been done. Placing the long tapered fissure bur first parallel to the long axis of the tooth an initial cut given. This was followed by sectioning along the occlusal surface placing the bur parallel to occlusal surface. Care has given to orient the bur more mesially for the fear of removal of distal tooth structure (Fig 4). An endodontic explorer is used to confirm the completion

of sectioning. The mesial half removed using extraction forceps and vertical fracture line seen after removal of attached granulation tissue (Fig 5). Sharp edges of retained distal half smoothed using composite finishing bur. Flaps approximated and wound sutured. Post operative IOPA has taken to ensure the completeness of procedure (Fig 6). Post surgical instructions have been given to the patient and occlusion relieved in relation to 46. The case reviewed after 3 months and by this time wound site as well as lingual sinus tract healed well. It was decided to go for a cantilever metal crown joining 47 and 46 as both of them endodontically treated but without a post endodontic restoration. Gingivectomy was planned on the distal side of 47 to expose more tooth structure. Endocrown on 47 has been chosen to ensure adequate retention (Fig 7). External crown preparation has been followed by internal modification with removal of restorative material upto the root orifices followed by impression in putty and light body. Distal gingival has already been exposed by gingivectomy. Crown has delivered in the next appointment after occlusal adjustment using glass ionomer cement as the luting agent (Fig 8).

## Discussion

Vertical root fracture itself represents one of the pathways of communication between pulp and periodontium other than neurovascular, lymphatic connections, lateral and accessory foramen, coronoradicular groove etc<sup>7</sup>. The colonization of bacteria in fracture space and subsequent release of bacterial byproducts accentuates the bone destruction in the vicinity. Most often narrow deep pocket with sinus formation in gingival tissue adjacent to the fracture site will be the only clinical manifestation in advanced

cases. Clinically there may not be a separation of tooth fragments and it is not easy to elicit the pain on biting or chewing. IOPA of the involved tooth will demonstrate J shaped hallow around the involved root with continuous widening of periodontal ligament space<sup>8</sup>. Clinically the fracture can be identified if it extends to the coronal tooth structure by flowing methylene blue dye over the suspected area and wiping with surgical spirit so that everything else will be cleared other than the fracture line.

The restoration of the retained half is another challenging aspect of vertical root fracture. The treatment plan should be modified based on restorability of remaining half. Other factors to be considered here are strategic value of the tooth, bone support, root configuration (if it has to undergo endodontic treatment), occlusion, and splinting effect from adjacent tooth. There are case reports demonstrating bonding of the fractured root segments in anterior tooth. As posterior teeth are subjected to occlusal forces it is not sure how much the attempts to bond the fragments of fractured root will be successful. Long term follow up studies are needed to prove this for which root amputation, hemisection and extraction in hopeless cases are still the treatment alternatives.

In the case presented here hemisection was a more favourable option as fracture involved the mesial root only and both 46 and 47 already undergone an apparently good endodontic treatment which remained symptom free for about 2 years. The presence of posterior deep bite with reduced occlusal clearance justifies the option of metal crown. The lack of sufficient coronal tooth structure was another concern which was overcome by a gingivectomy on distal surface 47 and the decision to go for an endo crown in this tooth. It should be mentioned here that mandibular second molars are teeth with highest percentage of vertical root fracture and hence any thoughts of going for a post to achieve retention should be discouraged in this particular case.

The endocrown is a restorative option for endodontically treated teeth. It consists of a circular butt-joint margin and a central retention cavity inside the pulp chamber and lacks intraradicular anchorage. Preparations are limited to removal of the pulp chamber roof, excessively retentive areas, and alignment of the pulpal walls, which be done up to the limit of the anatomic configuration of the chamber itself with an internal taper of 8 to 10 degrees<sup>9</sup>. Entrances and undercuts of mesial and distal canals (1 and 3 mm depth) are protected using an adhesive

system and a flowable resin. Preparations are finalized, allowing a path of draw without interferences.

Another concern in restorative issue in this case was position of 48. As the patient was in age 16 it was unpredictable whether 48 will undergo eruption or impaction. The lab personnel have been instructed not to overcontour the distal surface so as not to hamper the eruption of 48 if at all it erupts. During the fixation of crown glass ionomer cement was used as the luting agent as it is evident from literature that the failure of fixed prosthesis rehabilitation cases arises from secondary caries rather than loss of periodontal support.

## Conclusion

It is highly frustrating for an endodontist to encounter a situation where an endodontically treated tooth presenting with vertical root fracture and expecting the worst out of that. Clinician should adhere to the endodontic tooth preparation manual where conservation is the first principle. Though microsurgical techniques, use of cone beam CT and dental operative microscope might prove useful in at least some incidences of vertical root fracture, critical evaluation of the treatment strategy is a must to further avoid any add on injury to the case presented.

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# Extra follicular type of adenomatoid odontogenic tumor

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## Abstract

The adenomatoid odontogenic tumor (AOT) is a rare odontogenic tumor comprising of only 3% of all the odontogenic tumors and it often mimic like an odontogenic cyst. Though odontogenic in origin the presence of so called “duct like structures” often interspersed throughout the lesion gives a glandular or adenomatoid appearance. It is predominantly seen in the anterior maxilla often associated with an impacted tooth. Here we are presenting a case of extra follicular type of AOT in the anterior maxillary region in a 14 yr old boy.

**Key words:** adenomatoid odontogenic tumor (AOT), adenoameloblastoma, odontogenic tumor

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## Introduction

Adenomatoid odontogenic tumor (AOT) was first described by Steensland in 1905<sup>1</sup>. In 1915 Herbitz reported it as a cystic adamantoma. In 1969 Philipsen Birn proposed the term AOT and was adopted by World Health Organisation in 1971<sup>2</sup>, and the second edition of WHO journal on histological typing of odontogenic tumor, AOT is defined as tumor of odontogenic epithelium with duct like structure and varying degrees of inductive changes in the mesenchymal tissue<sup>3</sup>.

It is an uncommon odontogenic

tumor with frequency 2.2 to 7.1% often present as an intraoral or extraoral swelling. It is referred as two third tumor, because it occur in maxilla in about 2/3 cases, about 2/3 in young females, 2/3 cases are associated with unerupted tooth and 2/3 of involved teeth are canine<sup>2,3</sup>.

## Case report

A 14 year old boy reported to the department of oral medicine and radiology with a chief complaint of swelling in the right upper jaw region since one month. Besides an associated history of

trauma due to fall since 3 months the swelling had gradually increased in size and it was not associated with pain, pus discharge and paresthesia.

On extraoral examination a diffuse swelling in the right anterior maxillary region with moderate obliteration of nasolabial fold and skin over the surface appears to be normal in color. (Fig 1)

On intraoral examination a well defined ovoid shaped swelling of size 3x3 cm seen in relation to the 11,12,13 region, mucosa over the swelling was normal. Vestibular obliteration from 11 to 13 region was noticed, palatally tilted 12 and slight rotation of 11 was noticed (Fig 2). The swelling was tender and compressible. Aspiration the swelling gives yellow straw coloured fluid. (Fig 3)

Intra oral periapical radiograph (Fig 4) with respect to 11, 12, 13 region, maxillary occlusal radiograph (Fig 5) and orthopantomograph (Fig 6) were taken. It reveals a well defined unilocular oval shaped radiolucency of size 3x3 cm present in the apical region of 12 extending from 11 to 13 regions with sclerotic border and internal flecks of calcification. Based upon the history, clinical

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Fig. 1 Facial profile view of the patient demonstrating visible swelling in the middle third of face in the right side with obliteration of naso labial fold



Fig. 2 Intraoral view shows swelling with vestibular obliteration and rotation and tilting of 11 and 12



Fig. 3 aspiration gives yellow straw coloured fluid



Fig. 4 IOPA shows radiolucency with internal flecks of calcification



Fig 5. occlusal radiograph shows radiolucency with displacement of 11 and 12



Fig. 6 OPG shows rounded radiolucency with root displacement of 11 and 13

features and radiographic features we came to a provisional diagnosis of periapical cyst in relation to 12 and the differential diagnosis considered were AOT and calcifying epithelial odontogenic cyst.

Surgical enucleation of the cyst along with 12 done under local anesthesia and the specimen was sent for histopathologic examination (Fig 7) and that reveals islands of spindle shaped epithelial cells in rosette pattern, the centre of rosettes shows areas of eosinophilic coagulum suggestive of amyloid. Areas of duct like arrangement of cells with central lumen were seen. These epithelial cells, lining and ductal structures shows nucleus placed away from the lumen. The connective tissue shows areas of amyloid materials and few areas of calcification (Fig 8). Based upon this a final diagnosis of AOT was made.

## Discussion

The AOT comprises approximately 3% of all odontogenic tumors, ranking behind odontoma, periapical cemental dysplasia, myxoma and ameloblastoma<sup>4</sup>. The origin of AOT is controversial, however evidence suggest that the tumor could be

derived from dental lamina complex system. AOT is prevalent in the second decade of life, females being affected twice compared to male and our case was a male patient. The tumor has three clinico pathologic varieties namely intra osseous follicular, intra osseous extra follicular and peripheral. The follicular type (in 73% of all AOT cases) is associated with an unerupted tooth, whereas extrafollicular type (24%) has no relation with an impacted tooth<sup>5</sup>. Follicular and extrafollicular types are often located in the maxilla than in the mandible and most of the tumor involve anterior aspect of the jaws. In our case the tumor was an extrafollicular type and also found in the anterior region of maxilla.

A unilocular radiolucency distinct sclerotic border and flecks of calcification inside is characteristic radiographic presentation of AOT. It is usually associated with displacement of the adjacent teeth which was evident in our case, also surgical enucleation is the treatment of choice with rare recurrence (.2%) rate<sup>2,6</sup>. Our patient underwent surgical enucleation of the lesion under local anesthesia with no evidence of recurrence after one year follow up.





Fig. 7 enucleated lesion with involved tooth

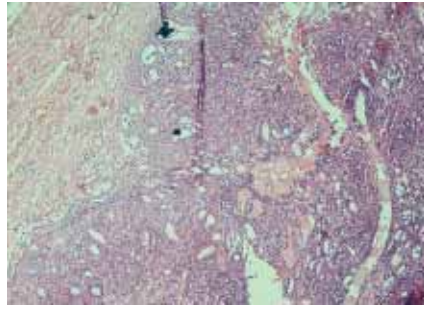


Fig. 8 low power view showing spindle shaped epithelial cells arranged in the form of sheets, strands and whorled masses of cells

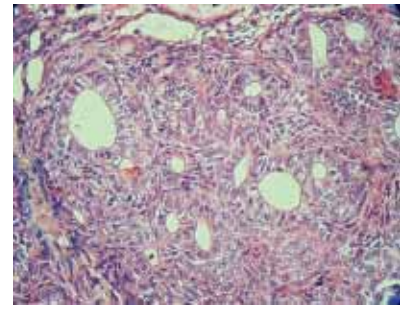


Fig. 9 high power view showing spindle shaped epithelial cells forming rosette and duct like structures.

## Conclusion

A swelling of the anterior maxillary region always requires skillful and systematic approach to diagnosis as numerous entities of different clinical behaviors may appear in this region. Each entity has different prognosis and hence each one has to be dealt with accordingly, AOT is one such lesion of the anterior maxilla which has unique clinical, radiographic and histopathologic features. Good prognosis for this relative entity depends on timely diagnosis and treatment. Only 23% of cases of AOT is associated with erupted tooth, ours was relatively rare type of extrafollicular variety of AOT, and we offered timely diagnosis and proper treatment for the patient.

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# Surgical correction for hemifacial atrophy

\* Roopesh, \*\* Vishnu Mohan, \*\*\* Jinu Vaidain

## Introduction

Hemifacial atrophy consists of slowly progressive atrophy of soft tissues (skin, subcutaneous fat, muscles) and hard tissues (bone, cartilage) of one side of the face. It remains almost as much as an enigma today as it was 1<sup>st</sup> reported by Romberg in 1846 and originally described by Parry, Henich and Romberg. Cases are often considered sporadic and rarely genetic. Cerebral disturbances leading to increased and unregulated action of sympathetic nervous system are considered as primary causative factor. Other factors (Warrenberg) include local trauma, infection, extraction of teeth and rarely genetic.

## Case report

A 22 year old female presented with chief complaint of having an asymmetrical face. She had previously undergone surgery for cyst removal on her left side of the face 17 years ago. Her family didn't have any similar kind of abnormality. She had no systemic illness. No other relevant history was present.

After thorough clinical and radiological analysis following problem was identified.

## Asthetic problem

*FRONTAL* (fig 1)

Deficiency of zygoma and mandible of the left side was noted.

## Abstract

Hemifacial atrophy characterised by atrophy of soft tissue, cartilage and bone of the half of the face has a severe esthetic impact. Purpose of the article is to discuss a case with hemifacial atrophy (with deficiency of zygoma and mandible of the left side) Treatment is done by surgical correction via augmentation genioplasty and onlay grafting with autologous bone. Post operative results show marked improvement of the esthetics and less relapse later.

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Chin was deviated to left side. There was atrophy of skin, subcutaneous tissue and muscles of the affected side. Height of the ramus of the mandible of the affected side was reduced.

*PROFILE* (fig 2)

Patient was seen to have a convex profile with mandibular deficiency.

*RADIOGRAPH* (Fig3,4,5)

A 3D CT was taken to confirm the extent of a lesion.

## Diagnosis

A diagnosis of hemifacial atrophy predominantly involving mandible and zygoma with significant atrophy in skin, subcutaneous tissue and musculature was made. It was decided to perform a surgical correction with augmentation genioplasty (sliding horizontal osteotomy) and onlay grafting of autologous bone from iliac crest.

## Procedure

General anaesthesia was administered to the patient. Surgical access was obtained via a submandibular Risdon's incision 2cm below inferior border of the mandible (avoiding facial nerve injury) in relaxed skin crease (langer lines). Skin and subcutaneous tissue were incised with a scalpel down to the level of platysma. Platysma is then divided exposing superficial layer of deep cervical fascia. The plane of dissection was carried out through this layer over the superficial surface of the submandibular gland. Facial artery and veins are clamped, divided and ligated. Dissection was continued towards mandible exposing pterygomasseteric sling posteriorly. Subperiosteal dissection is done to expose the desired area. Multiple bur holes were drilled on mandible to induce bleeding and promotion

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Fig. 1



Fig. 2

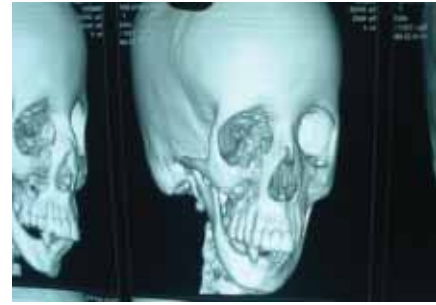


Fig. 3



Fig. 4

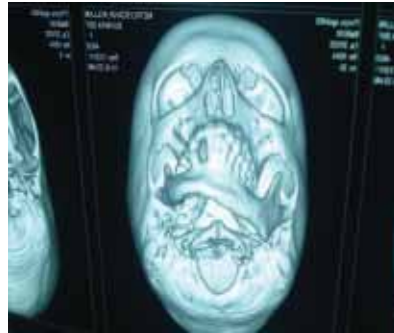


Fig. 5



Fig. 6

of clot formation and neovascularisation (granulation tissue) for the graft to take up.

Intra oral vestibular incision was given and the entire inferior border of symphysis was degloved. Digastric muscles were separated from mandible to reduce the tension after advancing. Periosteal releasing incisions were given to provide adequate coverage after advancement.

Horizontal osteotomy cuts were given 4-5mm below canine through buccal and lingual cortices. Segment mobilized inferiorly and forward with Smith's spreader. The mobilized segment was then slid (sliding genioplasty) and stabilised with bone plates.

Chunks of bone were harvested from right iliac crest bone. Chunks of bone were divided into small divisions (as iliac bone is not uniform) and placed as an onlay graft on mandible mimicking opposite (normal) side. Bone grafts were stabilised with monocortical screws.

Intra oral and extra oral incisions were closed in layers.

There weren't any post operative complications. The patient was satisfied with the appearance post operatively and didn't want any adjunctive procedures to be done to enhance aesthetics.

## Discussion

Case presented is hemifacial atrophy (also called Parry Romberg syndrome) characterised by deficiency of mandible and zygoma with marked atrophy of skin, subcutaneous tissue and muscles with reduction in the height of ramus, deviation of chin to affected side and shortening of body of mandible. The aetiology here is a previous surgery done at the left side for removal of a cyst.

It was corrected with surgical method involving augmentation genioplasty (sliding horizontal osteotomy) and autologous onlay bone grafting. A further improvement of esthetics can be done by injecting silicone/ bovine collagen/ inorganic implant.

## Conclusion

Hemifacial atrophy presenting as a severe esthetic problem involving marked atrophy of soft and hard tissues of one side of the face can be corrected via surgical method. The method used is augmentation genioplasty (sliding horizontal osteotomy) followed by onlay grafting with autologous bone (iliac bone). It can be accompanied with adjunctive procedures like injection silicone, bovine collagen or inorganic implants. Post operative results show much acceptable appearance.



Fig. 7



Fig. 8



Fig. 9

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### Dr. Joseph Joy's Research Paper at the IEFA Conference, Japan



The 9th World Endodontic Congress of the International Federation of Endodontic Associations IEFA which is conducted once in every 3 years was held from May 23 to May 26, 2013 at Tokyo, Japan. Dr. Joseph Joy, MDS

Endodontics from Trivandrum, Kerala had an Oral Research Presentation on May 26 at the Congress. He was the only Endodontist from Kerala to present a paper at the Congress. His research paper was titled "An Exvivo Evaluation of Bacterial BioFilm Removal using Static and Passive Ultrasonic Irrigation Methods".

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# Camouflage treatment of bialveolar protrusion with self-drilling mini-implant

\* Gaurav Jasoria, \*\* Amit Kalra, \*\*\* Mona Manchanda, \*\*\*\* Anil Pandey

## Abstract

The following case report shows camouflage treatment of bialveolar protrusion in a 25 year old post pubertal female in which anchorage was taken from a self drilling mini-implant rather than the molar. The total treatment duration was around 18 months including en-masse retraction of upper and lower anteriors which took around 6 months with self drilling mini-implant. Drill free screws have an edge over the conventional drilling screws and can be used as a viable alternative to the latter because of decrease in operative time, little bone debris, less thermal damage, lower morbidity, and minimal patient discomfort as predrilling is not required.

**Key Words:** Anchorage, self-drilling, mini-implant, miniscrews.

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## Introduction and Literature Review

Among the anchorage devices, mini-implants have increasingly being used for orthodontic anchorage because of their absolute anchorage, easy placement and removal, and low cost. The small size of the miniscrew implants allows them to be placed into bone between the teeth, insertion is a less traumatic procedure, and they can be loaded soon after placement as there is no osseointegration around the screws but only fibrous integration. However, a notable complication is loosening of the screws even though they consist of a biocompatible titanium alloy.<sup>1</sup>

Drill screws are most commonly used for this purpose. A prerequisite for the insertion of screws is the preparation of a pilot hole with a minimum diameter equal to the screws core. Drilling this pilot hole takes time and further more may have some potential disadvantages such as damage to nerves, tooth root, and drill bit breakage. Thermal necrosis of bone has also been observed. Another problem frequently encounters during the insertion of a screw after drilling is stripping of the bone threads when working in thin cortical or soft cancellous bone, especially in the mid face region. The omission of drilling might be helpful to

improve holding power of the screws even in this region.<sup>2</sup>

Self-drilling screws or mini-implants are a recent development. They have a tip like a cork screw and specially formed cutting flute that enables them to be inserted without drilling. This results in less insertion time & more patient compliance. Self- drilling screws can provide intensive screw bone contact and inserting them produces little bone debris and less thermal damage.<sup>1,2</sup>

A Histomorphometric study was done to evaluate the effects of the drilling procedures on the stability of the screws under early orthodontic loading. The screws were divided into the drilling group and the drill-free group. It was concluded that although bone osseointegration was generally found in both the groups, the screws in the drill-free group showed less mobility, more bone to metal contact and more bone area compared with the drilling group.<sup>1</sup>

Yan Chen<sup>3</sup> did a study to compare the influences of different implant modalities on orthodontic mini-implants and surrounding tissues biomechanically and histologically. He found higher success rates in the Drill-free group than the Drilling group. Drill free

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Fig. 1 Pretreatment extra-oral and intra-oral photos.

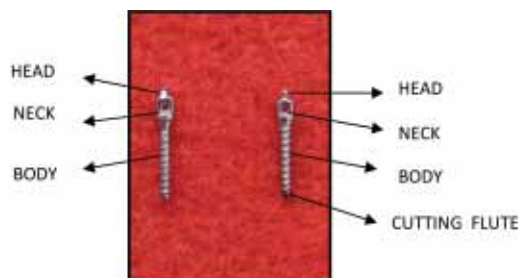


Fig. 2 Design of Self-drilling mini implant.



Fig. 3 Acrylic guide bar in patient's mouth.



Fig. 4 Local infiltration.



Fig. 5 Insertion of self-drilling mini-implant without predrilling.

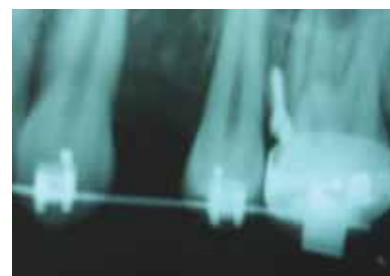


Fig. 6 IOPA radiograph to confirm position of the mini-implant.

or self drilling screws or mini-implants are newly designed osteosynthesis screws with specially formed tips and cutting flutes, which acts like a corkscrew and can be inserted into bone without predrilling.<sup>4</sup> According to a study drill free screws can be placed under administration of topical anesthesia since it does not require predrilling of the pilot hole.<sup>5</sup>

Heidmann suggested the disadvantages of the Drill mini-implants. Since, predrilling is required there are chances of damage to the nerves, tooth roots or tooth germs, thermal necrosis of the bone and drill bit breakage.<sup>2, 6</sup>

This case report shows orthodontic correction of bialveolar protrusion taking anchorage from self drilling orthodontic mini-implants. A post pubertal female patient of around 22 years reported to the department with a chief complaint of forwardly placed upper and lower front teeth. (fig.1)

Fixed orthodontic treatment was started and all first premolar extractions were carried out. After the initial levelling and aligning stage self drilling mini-implants were placed for en-masse retraction of maxillary and mandibular anterior teeth. Since this was a high anchorage case, anchorage was taken from the mini-implant rather than the molar.

### Details of materials used:

**Implant Design:** The mini implants were made up of grade 5 Titanium 95% and Stainless Steel 5%.

They measured 1.4mm in diameter and 8 mm in length and could be grossly divided into the following three parts (Fig.2):

- a) Head
- b) Neck
- c) Body

In addition, there was a cutting flute at the tip of the self drilling mini-implant.

Placement Site:

For en-masse retraction of the maxillary and mandibular anterior teeth the most suitable site for the placement of mini-implant was selected as the alveolar bone between 2nd premolar and 1st molar bilaterally at the junction of attached gingiva and movable mucosa.

### Acrylic guide bar construction and use:

1. The preferred site for mini-implant placement was evaluated for bone quality and quantity<sup>7</sup> using IOPA radiographs.
2. A surgical guide bar was fabricated with a stainless steel wire placed at the site of mini-implant placement and embedded in acrylic which rested on the palatal surface of the maxilla (Fig.3).
3. IOPA radiographs, along with the guide bar was taken for identifying the precise location of mini-implant placement and for avoiding contact with dental roots.



Fig. 7 Loading of implants



Fig. 8 Posttreatment extra-oral and intra-oral photos.

### Surgical procedure:

1. Local anesthesia with 2% xylocaine was administered at the site of mini-implant placement (Fig.4).
2. The purchase point was made just with a straight probe for placement of self drilling mini-implant.
3. A screw driver was used to manually insert the mini-implants on both sides. Mini-implant was inserted at an angle ranging from 60° to 70° (Fig. 5).<sup>5,11</sup>
4. The mini-implants were checked for mobility (primary stability) with tweezers.
5. IOPAs were taken post placement to confirm the position of implants (Fig. 6).

### Clinical set up and loading of mini-implants:

A 19 x 25 stainless steel continuous archwire was placed in the maxillary arch. Crimpable hooks were placed between lateral incisor and canine bilaterally. This was followed by placement of the Drill-free mini-implants which were then loaded immediately. A calibrated Dontrix gauge was used to measure the amount of retraction force being applied. 150-200gms of retraction force was applied per side using a Ni-Ti coil spring or an elastic chain. The patient was recalled initially after one week, and subsequently at every four weeks interval up to six months. The Ni-Ti coil spring or the elastic chain was reactivated to deliver the required retraction force (Fig.7). The implants were also checked for mobility and any surrounding soft tissue inflammation at each appointment.

### Result and Discussion:

After around six months of retraction, the extraction space was closed. The finishing and settling phase was then carried out. The total time duration was around 18 months. Esthetically pleasing profile was achieved. (Fig.8)

Compared with the Drill mini-implants, the Drill-free provides a decrease in operative time, lower morbidity, and less invasiveness since predrilling is not required before implant placement. Although predrilling is the usual procedure for placement of the drill mini-implants, disadvantages such as damage to nerves, tooth roots or germs, drill bit breakage, and thermal necrosis of the bone have been observed.<sup>3</sup>

The insertion of Drill-free mini-implants or screws without previous drilling of a pilot hole has been made possible by changing the tip of the screw. The pointed screw tip with its thread is comparable in design and function to a cork screw. Here, in contrast to the Drill screw, the threads are guided along an axis of rotation upto the screws head. An additional cutting flute cuts the part of the bone like a chisel and acts as a channel for the removal of bone chips produced at the cutting site. According to some studies, the Drill-free screws can provide intensive screw bone contact, and inserting them produces little bone debris and less thermal damage.<sup>2, 8</sup>

In a recent study, microscopic findings have showed that the Drill free screws are adapted well to the bone with few voids whereas the Drill screws have many gross voids between the screw and the bone. Histomorphometric analysis has showed that Drill-free screws have more bone to metal contact and larger bone area than the drill screws. Drill-free method provides a more favorable circumference to maintain a rigid interface in the bone tissue than the drilling method. This might be due to the damage caused by surgical drilling.<sup>9,10</sup> In particular, overheating during drilling and local disturbances can inhibit normal healing. This can also induce undifferentiated connective tissue and prevent bony adaptation around the screw.<sup>1</sup>

Drill-free screw can provide a high initial stability as a result of less bony damage compared with the Drilling type. These advantages could reduce the mobility of these screws under early orthodontic

loading. A manual screwdriver was used to remove the implants with the use of topical anesthetic spray. Primary healing took one week; analgesics were not required.

### Conclusion:

Both Drill and the Drill-free mini-implants are effective anchorage units. Drill free screws have an edge over the conventional drilling screws and can be used as a viable alternative to the latter because of decrease in operative time, little bone debris, less thermal damage, lower morbidity, and minimal patient discomfort as predrilling is not required.

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## Recently created regular posts for the Dental Wing of State Health Services Department (2011-13)

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- Taluk Head Quarters Hospital Mallappally, Pathanamthitta District
- Taluk Head Quarters Hospital, Ranni, Pathanamthitta District
- Taluk Head Quarters Hospital, Kayamkulam, Alappuzha District
- Taluk Hospital Pampady, Kottayam District
- Taluk Head Quarters Hospital Peerumedu, Idukki District
- Taluk Head Quarters Hospital Nedumkandam, Idukki District
- Taluk Head Quarters Hospital, Thrippunithura, Ernakulam District
- Taluk Head Quarters Hospital Kunnamkulam, Thrissur District
- Tribal Speciality Hospital, Kottathara, Attappady, Palakkad District
- Taluk Head Quarters Hospital Malappuram, Malappuram District
- Taluk Head Quarters Hospital Sultan Bathery, Wayanad District
- General Hospital, Kalpetta, Wayanad District
- Taluk Hospital, Neeleswaram, Kasargode District

### (C) Dental Mechanic Posts-19 Posts

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- Community Health Centre Vithura, Thiruvananthapuram District
- Taluk Head Quarters Hospital Sasthamcotta, Kollam District
- Taluk Head Quarters Hospital Ranni, Pathanamthitta District
- Taluk Head Quarters Hospital Kayamkulam, Alappuzha District

- District Hospital Mavelikkara, Alappuzha District
- Taluk Head Quarters Hospital Cherthala, Alappuzha District
- General Hospital Palai, Kottayam District
- Taluk Head Quarters Hospital Thodupuzha, Idukki District
- Taluk Head Quarters Hospital Thrippunithura, Ernakulam District
- District Hospital Aluva, Ernakulam District
- Taluk Head Quarters Hospital Muvattupuzha, Ernakulam District
- Taluk Head Quarters Hospital Muvattupuzha, Ernakulam District
- District Hospital Thrissur, Thrissur District
- District Hospital Thirur, Malappuram District
- District Hospital Manathawady, Wayanad District
- General Hospital Kalpetta, Wayanad District
- District Hospital Vatakara, Kannur District
- General Hospital Thalassery, Kannur District

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- Taluk Head Quarters Hospital Muvattupuzha, Ernakulam District
- General Hospital Kalpetta, Wayanad District

**(E) NRHM Posts: 32 Dental Assistant Surgeon posts and 12 Dental Specialist posts** had been approved through NRHM State PIP Scheme. Steps are in progress for starting 32 new Dental Units.

**Dr. Lali D. L.**  
Deputy Director(Dental)  
Directorate of Health Services  
Thiruvananthapuram

31-7-2013.



# Intramuscular lipoma of buccal mucosa

\* Rathy Ravindran, \*\* Joseph Edward, \*\*\* Ajish M. Saji

## Abstract

Intramuscular lipoma is a benign mesenchymal neoplasm that rarely occurs in the oral cavity but often occur in limbs. A consistent feature is infiltration with dissociation of surrounding muscle fibers which make it difficult to distinguish from well differentiated liposarcoma. Here we report a case of intramuscular lipoma of buccal mucosa with review of literature.

**Key words:** intramuscular, buccal mucosa, lipoma

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## Introduction

Lipomas are the most common benign soft tissue mesenchymal neoplasm. Although it can occur with higher frequencies on the back, abdomen and shoulder; intraoral lipomas are rare. The incidence of lipoma in head and neck region is 15 - 20% while only 1 - 4% of cases occur in oral cavity. The first description of intra oral lipoma was given by Roux in 1848 in a review of alveolar masses, where he referred to it as a "yellow epulis"<sup>1</sup>.

Lipoma is defined as benign, slow growing neoplasm composed of mature fat cells (Rajendran and Sivapathasundaram 2007)<sup>2</sup>. The lipoma is a very common benign tumor of adipose tissue, but its presence in the oral and oropharyngeal region is relatively uncommon, with a prevalence rate of only 1/5000 adults (R Rajendran and B Sivapathasundharam, 2006). Histopathologically most oral

lipomas are composed of mature fat cells. The cells have a clear cytoplasm with a flat nucleus located at the periphery of the cell. A thin fibrous capsule may be seen and a distinct lobular pattern may be present (R Rajendran and B Sivapathasundharam, 2006). Quite often, however, lesional fat cells are seen to 'infiltrate' into surrounding tissues, perhaps producing long thin extensions of fatty tissue radiating from the central tumor mass (R Rajendran and B Sivapathasundharam, 2006). When located within striated muscle, this infiltrating variant is called intramuscular lipoma (infiltrating lipoma).

Lipoma can be classified histologically as conventional lipoma, fibrolipoma, angioliipoma, spindle cell/pleomorphic lipoma, myxolipoma, chondroid lipoma, osteolipoma, myolipoma. Intramuscular lipoma is a rare variant of lipoma first defined by

Regan and his colleagues in 1946<sup>3,7</sup>. Clinically oral intramuscular lipoma presents as a well circumscribed painless, solitary, rubbery, submucosal swelling. Intramuscular lipoma is also known as infiltrating lipoma, is a slowly growing painless lesion characterized by diffuse infiltration of stratified muscle fibers. Intramuscular lipomas (infiltrating lipomas) are usually located in limbs and rare in oral cavity. Extensive English literature search revealed 4 cases in buccal mucosa<sup>8,9</sup>, 9 cases in tongue (Table I). Here we report a case of intramuscular lipoma of buccal mucosa in a 42 year old man and also review of literature.

## Case report

A 42 year old man presented with a history of small exophytic, painless mass on the left buccal mucosa since 3 months. Intraoral examination revealed nontender well demarcated sessile mass measuring 2 X 1.5 cm protruding from left buccal mucosa exhibiting smooth surface and light yellow in color (Fig. 1). Provisional diagnosis of lipoma was made. The treatment undertaken was surgical excision under local anesthesia. On gross examination the excised specimen was polypoid, semifirm in consistency measuring 2 X 0.6 X 1.5 cm. The specimen was fixed in 10% formalin, embedded in paraffin, sectioned and stained with

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Fig. 1 Sessile mass 2x2.5cm protruding from buccal mucosa with smooth surface & slight yellow colour

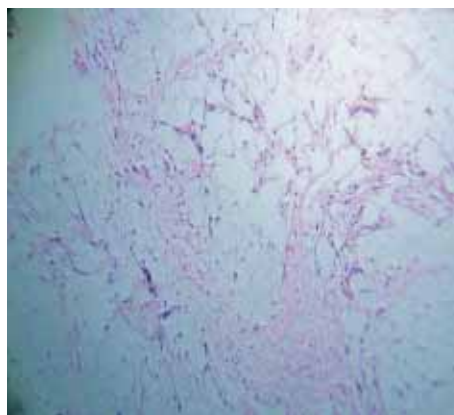


Fig. 2 Photomicrograph showing diffuse infiltration of adipose tumour cells into striated muscle tissue (H&E 10x)

hematoxylin and eosin. On Histopathological examination revealed an intact stratified squamous epithelium covering the surface. The submucosa showed uncapsulated lobules of mature adipocytes extending towards epithelium and down through irregular bundles of skeletal muscle fibers (Fig. 2). No cellular atypia, necrosis, mitotic activity, lipoblastic proliferation observed. Histopathological diagnosis of intramuscular (infiltrating) lipoma was made. The postoperative follow up was uneventful and the patient showed no recurrence on follow up period of 12 months.

## Discussion

Lipomas are common benign soft tissue mesenchymal tumors in any part of body where fat is normally present. They are uncommon in oral cavity accounting for only 0.5 to 5% of all benign oral tumors and they occur in 4th and 5th decades of life. Generally there is equal gender predilection but male predilection has been reported (Furlong et al 2004)<sup>5</sup>.

The pathogenesis of lipoma is uncertain but appears to be more common in obese people. However the metabolism of lipoma is completely independent of normal body fat. Trauma, infection and other factors have been proposed as etiological agents; their etiology remains unclear.<sup>6</sup>

Buccal mucosa and tongue are most frequent intra oral sites followed by floor of mouth, buccal vestibule, palate, lips and gingival. Multiple lipomas are associated with cowden's syndrome or multiple hamartoma syndrome. In approximately 5% of cases lipomas are multiple.

Clinically lipoma is slow growing asymptomatic and when the overlying mucosa is thin and the yellow color of tumor appears through it, diagnosis is made

easily. However in deep seated lipomas, diagnosis is seldom made clinically and in such situation differential diagnosis include cyst, benign tumors such as neurofibroma, fibroma, salivary gland tumor, granular cell tumor. Plain CTscans of infiltrating lipoma shows numerous hyperdense band like structure representing musclefibers running across background of homogenous hypodense area representing lipoma. Contrast CT scans can help in distinguishing intramuscular lipoma from angiolipoma. In the present case CT was not taken as diagnosis of lipoma was made.

Histologically lipoma is very similar to normal fat tissue. However its metabolism is quiet different from that of normal tissue, because its lipids are not available for our metabolism.

Intramuscular lipoma is a rare variant of lipoma first defined by Regan and his colleagues in 1946<sup>7</sup>. Clinically, oral intramuscular lipoma presents as a well circumscribed painless, solitary, rubbery, submucosal swelling. Clinical course of oral intramuscular lipoma is usually asymptomatic, but on rare occasion, the infiltration is so extensive that it can cause muscle dysfunction or sensory changes due to pressure on nerve trunks<sup>8</sup>.

Although intramuscular lipoma is recognized as histologic subtype of lipoma, it is simply lipoma with entrapped muscle fibers. Intramuscular lipomas are of primary importance because of its ability to infiltrate adjacent muscles and recur locally. Histologically liposarcoma to be considered in the differential diagnosis (Table II) and hence detailed histological examination is essential which can be misdiagnosed as liposarcoma because well differentiated liposarcoma contain many areas of lipomatous tissue<sup>1,9</sup>. Our case showed no lipoblastic proliferation, cellular atypia or mitosis.

Table I: On literature search the number of oral intra muscular lipoma cases reported from 1987 to 2012

Author	Year	No. of cases	Age / Sex	Site
Garavaglia J et al	1987	1		Tongue
Takeda Y et al	1989	1	37y / M	Tongue
Kacker A et al	1996	1	78y / M	Tongue
Karapantzoyl et al	1998	1		Tongue
Agoff et al	2001	1	61y / F	Right gingivo buccal sulcus
Keskin G et al	2002	1	54y / M	Tongue
Metin Akbulut et al	2005	1	50y / F	Tongue
Bandeca et al	2007	1	62y / F	Tongue
Susumu Hashitani et al	2008	2	39y, 55y / M	Left buccal mucosa
Collela et al	2009	1	75y / M	Tongue
P Sridhar Reddy et al	2010	1	60y / M	Left buccal mucosa
Monika Garg et al	2011	1	55y / M	Tongue
S Jayachandran et al		1	50y / M	Left buccal mucosa
Our case	2012	1	42y / M	Left buccal mucosa

Table II Differential diagnostic criteria of intramuscular lipoma with well differentiated liposarcoma.

	Intra muscular lipoma	Well differentiated liposarcoma
Lipoblast	No	Yes
Myxoid differentiation	No	Yes
Cellular pleomorphism	Rarely	Usually
Increased vascularity	Minimal capillary	Absent
Mitosis	No	Yes

Special stains for lipoma cells include Oil red O, Sudan black and Bromine Sudan black. (Bancroft, J. D., Gamble, M., 2006). Immunohistochemically lipomas stain positive for vimentin and S-100 protein.

The treatment of oral lipoma is simple surgical excision. Because of infiltrative nature of they tend to recur without adequate surgery and therefore adequate surgical excision is mandatory.<sup>10</sup> Recurrence rate for intramuscular lipoma reported is 3 to 62.5%.<sup>9, 10</sup>

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## CDE Report

Dr Anil G.  
CDE Convenor, IDA Kerala State



Warm greetings to all IDA members. It is a great pleasure to inform you all about the continuing success of our CDE programs. My hearty congratulations to all local branches for conducting CDE's regularly. I really appreciate your interest and support in conducting interbranch CDE's. many other local CDE's and interbranch CDE's have been planned. Kindly visit our website for more details.

Second state level CDE programme conducted on 19th may 2013. The topic was on

- 1) Multi disciplinary approach to anterior facial trauma
- 2) Endodontic management of traumatic anterior teeth
- 3) Medico-legal issues in dental practice taken by Dr.George Paul & Dr. Mithra Hegde



It was held at THE VILLAGE, Pandakkal, Mahe, hosted by IDA Thalassery branch. IDA president Dr. Antony Thomas, Hon.Secretary Dr. O.V. Sanal and CDE convenor Dr.Anil .G was present. More than 100 doctors attend the programme

Our third state level CDE programme conducted on 21st July 2013. The topic was on ' FAILURES IN PROSTHODONTICS' taken by Dr.T.V.Padmanabhan MDS. It was held at hotel Wyte portico, Adoor, hosted by IDA Mavelikara branch. IDA state vice president Dr.K.M. Thomas, state dental council member Dr. Johnykutty Jacob and CDE convenor Dr. Anil G. was present. More than 100 doctors attend the programme.

First time in India an inter - state CDE programme is going to conduct on 17th & 18th August 2013 at Courtallam.



## KODUNGALLUR BRANCH

1st Executive Meeting 25-1-2013: 1st executive committee meeting of IDA KODUNGALLUR branch held at ima hall kodungallur. The main agenda was feedback of 45th ksdc. Decided to conduct family meeting in February. Goal and plans for the year 2013 was discussed.

3rd general body meeting of Ida kodungallur branch held along with family get together at Dr Tennison's residence. A large number of members and families attended. Meeting was followed by Dinner and fellowship sponsored by Dr Tennison.

A dental camp was conducted on 4-2-2013 at government L.P School Nanthyattukunnam near North parur. More than 100 students were examined and toothpaste distributed. Dr Tony Augustine and Dr Anil Kumar attended the camp.

A dental camp was conducted on 8-2-2013 at K.G section of S.N vidyabhavan Chanthrapinni. About 700 students were examined. Dr Rajmohan, Dr Divya, Dr Arunkumar, Dr Shivaprasad, and Dr Flemy Jose attended the camp.

2nd executive meeting 26-2-2013 :

2nd executive meeting of IDA Kodungallur branch held at IMA hall Kodungallur. Decided to send Dr Baiju as promising member from our branch to the state office on the occasion of dentist day celebration. Decided to conduct camps and cde programs.

4th General body meeting 21-3-2013: 4th general body meeting of IDA Kodungallur branch held at Rotary hall Kodungallur. A large number of members attended the meeting. Dr Baiju was honoured as promising member from our branch on the occasion of dentist day celebration.

A branch level cde program on 'emphasis in rubber dam application' was presented by Dr Rajeev mds. Meeting was followed by dinner and fellowship sponsored by Al-noor dental lab Irinjalakuda.

A dental camp was conducted on 17-3-12 at pratheeksha bhavan irinjalakuda. More than 200 differently abled patients were examined. Dr Prasannakumar, Dr Jithin, Dr Kishore, Dr Cyril. And Dr Aneesh were attended.

3rd executive meeting 9-5-2013: 3rd executive committee meeting of IDA Kodungallur branch was held at ima hall Kodungallur. Decided to increase treatment charges. Dr Sunil was entrusted to verify and fix the charges. Dr Shaji presented the balance sheet of 45th ksdc. Decide to conduct a celebration meeting of 45th ksdc success. Meeting was followed by dinner and fellowship.

4th executive meeting 20-6-2013 : 4th executive Committee meeting of IDA Kodungallur branch was held at ima hall Kodungallur. Decide to increase charges by 20%. Decided to conduct conkod celebration meeting on 6th &7th July at Bolgatty palace Ernakulam. A committee was formed to manage funds with 11 members.

5th general body meeting 6-7-2013: 5th General body meeting was held along with conkod celebration meeting at Bolgatty palace hotel Ernakulam. A large number of members and families attended. Meeting was followed by entertainment, fellowship and dinner.





# Report of Chilamboli 2013

**C**hilamboli 2013- the inter branch cultural utsav of Indian Dental Association, Kerala state hosted by Valluvanad Branch on 7th July 2013 was a grand success. It was held in the newly constructed Pisharody Heritage in Shornur

The torrential rains did not dampen the spirits of the hosts and the participants. The function began at 10.30 a.m. the meeting was presided by the State President Dr.Antony Thomas. Dr.Subhash, the host club president welcomed the gathering. After an excellent speech by the State President Dr.Antony Thomas the program was inaugurated by the Chief Guest Mrs.Sukumari Narendra Menon the famous Classical and Carnatic singer of the State. Dr.Subhash briefed about the program. The Chief guest was introduced by Dr.Aruna Subhash after which the chief Guest enthralled the audience with her speech and recitals. Dr.O.V.Sanal, the Hon.Secretary and Dr.Nizaro Siyo, the President elect addressed the gathering. Felicitations were offered by the first V.P. Dr. Thomas, III Vice President Dr.Ranjit and WDC Chairman Dr.Thaj .Dr.Srikanth proposed the vote of thanks after which the meeting was adjourned for the competitions.

Inspite of the best efforts taken only four branches namely Malabar, North Malabar, Ottappalam and Valluvanad participated in the competitions. Eminent panel of judges were present to evaluate the performances.

Good lunch followed the competitions and the valedictory function began exactly at 4.00 after a brief period of entertainments from the audience.

Almost all the participants performed well and it was a tough completion. Valluvanad Branch was adjudged as the award for the best overall performance. The Participants from the branches were awarded according to the performance levels.

President, Secretary, other state office bearers, Our Patron Dr.Korah, the President and secretary of Valluvanad branch gave away the prizes for the winners

WDC gave away prizes to the schools and students for competitions conducted by them. Dr.Thaj and Dr.Mercy were present.

We had already announced that the winning is only a part of the participation. All those present were happy and satisfied with the day. They carried pleasant memories and of course enjoyed the warmth of new friends through Chilamboli.

The President and members of the Valluvanad branch thank the state Office bearers led by our dynamic President Dr.Antony and Secretary Dr.Sanal to have given us this golden opportunity.

All that began well came to a classic end at around 6.00 p.m.

**Dr. Subhash**  
President, Valluvanad Branch  
IDA- Kerala State



## ATTINGAL BRANCH

### IDA Kerala State Inter branch South Zone Cricket Tournament

The IDA Kerala State Inter branch South Zone cricket tournament was hosted by IDA Attingal branch on 28 April 2013. The tournament was conducted at LNCPE cricket ground, Thiruvananthapuram. 4 teams namely, IDA Trivandrum, IDA Kottarakara, IDA Pathanamthitta and IDA Attingal participated in the tournament. The chief guest of this tournament was the National CDH Chairman, Dr. C. Sivakumar and the Guest of Honour was the state CDE Chairman, Dr. Anil.G. Dr. C. Sivakumar inaugurated the tournament by batting a ball, bowled by the IDA Attingal br. President, Dr. Dinesh. N. The reports of the tournament are as follows:

#### Losers Final

IDA Pathanamthitta x IDA Trivandrum  
(Winner – IDA Trivandrum)

#### Finals

IDA Attingal x IDA Kottarakara  
(Winner – IDA Attingal)

*Best Batsman* - Dr. Krishnamohan  
(IDA Attingal br.)

*Best Bowler* - Dr. Ajith  
(IDA Attingal br.)

*Man of the Tournament* - Dr. Sibiram  
(IDA Attingal br.)

Release of 1st issue of IDA Attingal branch Journal – 'IMPRESSIONS' (April 28th)

The 1st issue of the IDA Attingal journal, 'IMPRESSIONS' for 2013, was released by the national CDH Chairman, Dr. C. Sivakumar in the presence of Kerala state CDE Chairman, Dr. Anil.G.

**CDH Activities:** CDH activity No. 7 (April 28th)

WDC (IDA Attingal br.) distributed school bags & umbrella to school going children of Rehabilitation Centre.

WDC Chairperson, Dr. Manju Rudy and members of WDC, Attingal branch had donated school bags and umbrellas to 10 deserving children of Navajyothi Rehabilitation Centre for Women & Children in Distress', Kariyavattom, Trivandrum. National CDH Chairman, Dr. C. Sivakumar and Kerala State CDE Chairman, Dr. Anil.G attended this function. Dr. C. Sivakumar made a generous contribution to this institution.

IDA State Event Participated (May 12th)

IDA Kerala State Inter branch cricket tournament finals was held on 12th May 2013 at Viswajyothi school ground, Angamaly. IDA Attingal branch had played 2 matches. The teams who reached the finals were IDA Attingal and IDA Coastal Malabar. IDA Attingal beat IDA Coastal Malabar for a margin of 130 runs and took the Championship trophy. Dr. Arshad B.H was the man of the match and Dr. Sudeer was player of the tournament.

#### CDH activity No. 8 (May 15th)

A dental health education and oral hygiene awareness camp was conducted at Dream Park Montessori school, Attingal on 15th May 2013. Dr.Arun.S conducted awareness class for the students.

CDH activity No. 9 (May 31)

IDA Kerala State observed world 'No Tobacco Day', hosted by IDA Attingal & IDA Trivandrum branch. The World 'No Tobacco Day' was observed by IDA Kerala State on 31st May 2013 at Secretariat,

Thiruvananthapuram. This program was jointly hosted by IDA Attingal & IDA Trivandrum branch.

The Honorable Minister for Food and Civil Supplies, Shri. Anoop Jacob was invited as the Chief guest. In his absence the City Commissioner of Police, Shri. Vijayan inaugurated the ceremony.

The State President, Dr. Antony Thomas, State CDH Convenor, Dr. Civy V. Pulayath, State CDE Convenor, Dr. Anil. G, State Coordinator, Dr. Deepu Mohandas, Member of KDC, Dr. Anish. P, State Journal Editor, Dr. Nandakumar, President, secretary & members of both branches attended this function. A tableau float was organized to circulate around the city and distribute anti Tobacco notices. A Public Anti-Tobacco signature campaign and public Anti-Tobacco pledge was taken at this function. Students from PMS Dental College, Vattapara also participated in this event. The event was published in the newspaper.

1st General Body Meeting (May 26th)

The 1st General Body Meeting of IDA Attingal branch was held on 26th May 2013 at Technopark club, Technopark, Kazhakuttom, Thiruvananthapuram. Report & Accounts of the first 5 months were presented to the members. The Attingal branch cricket team who attained the Kerala state championship trophy was honored with memento during this function. Dr. Abdul Latheef K.H, an eminent speaker talked on 'Chemistry of Relationships' during this meeting. 27 members attended this meeting.



## 'THE PULP' - ONLINE PUBLICATION OF IDA MAVELIKARA

We are glad to inform you that IDA Mavelikara has started an online publication THE PULP, the first of its kind in history of Kerala State Branch.

This online publication was inaugurated by our state president Dr Antony Thomas on 6th Jan 2013 at Mavelikara. Our address is [www.idapulp.blogspot.in](http://www.idapulp.blogspot.in) Any dentist all over the world can join this group "through join this site" form which is on the left side of the first page of our publication.

Any dental or nondental articles can be send to us in this address [idamavelikkara@gmail.com](mailto:idamavelikkara@gmail.com). After scrutiny by our editorial board it will be published.

Dr.BAIJU HARIHARAN is the editor of this publication. Editorial board consists of dr. MATHEW.G.VARGHESE, DR.SAJEEV.S and DR.MATHEW SUNIL.

Our journal has won world wide appreciation and many had visited our journal from all over the world.

I thank all the members who have joined this site and i request all other members to join this site at the earliest and make it a great success and enhance its popularity among dentists all over the world.



## PATHANAMTHITTA BRANCH

### Activity Report - March 2013

1. A branch level cde was conducted on 10th of march 2013, from 9 am to 3 pm on "RiskAssessment and management of periodontoits-non surgical,surgical and with lasers for general practitioners" by Dr SabuKurian, Reader, Dept of Perodontics, Al Azar Dental Collage, Thodupuzha, at Hotel Hills Park, Pathanamthitta. Twenty members attended the CDE.

2. Dentist day celebration was conducted by the branch on 8th march 2013 at MS Higher Secondary School Ranni. As part of the programme a free subscription of ManoramaAarogyam monthly publication for an year was given by the branch for various schools in Pathanamthitta district. The programme was inaugurated by the block panchayat president Mr Benny Mathew,in the presence of school principal Mrs. ValsammaCheriyar, President Dr. Binu Chacko, Secretary Dr. Manoj M Kumar and Dr. Anju Gopinath attended the meeting.

### Activity Report – April 2013

1. First State level CDE hosted by IDA Pathanamthitta was on 7th of April 2013, from 9 am to 4 pm on "Occlusal Harmony in Fixed INDIAN DENTALASSOCIATION

### Activity Report – May 2013

1. First State level Women Dental Council Programme was hosted by IDA Pathanamthitta on 5th May 2013. The

programme was on "Empowering Women" by Dr Susan George. The programme was inaugurated by Dr Merlin Elias, past Chairperson of WDCIDA Kerala State, in the presence of DrThaj S Prasad, Chairperson WDC IDAKerala state, DrMersyJoji, Secretary,WDC IDA Kerala State,DrHema Rajesh, Exe. Member,WDC IDA Kerala State, DrShibiGeboy, Chairperson, WDC Pathanamthitta Branch, Dr K N Thomas, IDA Kerala State 1st Vice President and State Dental Council member DrJohnykutty Jacob. 30 WDC members from different branches attended the programme.

2. A two day family tour was conducted to Munnar on 18th and 19th of May 2013. 26 members participated in the tour programme.

Restorations" by DrMathai Joseph, Prof and HOD, Dept. of Prosthodontics, Mahe Institute of Dental Sciences, Mahe,at Hotel Hills Park, Pathanamthitta. State level CDE Programmes was inaugurated by Dr. Johnykutty Jacob, Kerala Dental Council member in the presence of Dr Antony Thomas, President IDA Kerala State, Dr K N Thomas, 1st vice president, IDA Kerala State and Dr Anil G, State CDE Convino.96 members from different branches of IDA Kerala state attended the CDE.

3. Forth Executive committee meeting of IDA Pathanamthitta was held on 19th April 2013 at Hotel Hills Park, Pathanamthitta at

7 30 pm. Ten executive committee members attended the meeting and decisions on hosting of State WDCprogramme, participation in south zone interbranch cricket tournament, family tour etc was taken.

4. Branch participated in the south zone interbranch cricket tournament on 28th April 2013, hosted by IDA Attingal at Trivandrum.

### Activity Report - June 2013

1. Fifth Executive committee meeting of IDA Pathanamthitta was held on 1st June 2013 at branch President Dr Binu Chacko's residence, Ranni at 7 30 pm. Seventeen executive committee members attended the meeting and decisions on upcoming branch level CDE, evaluation on half year activities etc was taken.

2. Sixth executive committee meeting of IDA Pathanamthitta was held on 27th June 2013 at Hotel Hills Park, Pathanamthitta at 7 30 pm. Fourteen executive committee members attended the meeting and decisions on Oral hygiene day programme, upcoming CDE etc was taken.

3. Second branch level CDE by IDA Pathanamthitta was conducted on 30th June 2013, from 9 am to 4 pm on "Rehabilitation of Badly Damaged Tooth Structure by Fibre Post and Core" by Dr Prasanth Dhanapal, Professor, Conservative Dentistry and Endodontics, KMCT Dental Collage Kozhikode, at Hotel Hills Park, Pathanamthitta. 35 IDA members attended the CDE.



## KOCHI BRANCH

The CDE program organized by Indian Dental Association, Kochi branch was held on Sunday, June 30th, 2013 at Dent Care Auditorium, Muvattupuzha. Kochi. This was the sixth CDE program of this year. The CDE started with a silent prayer followed

by welcome address by Dr. Tatu Joy, President of Ida Kochi. The faculty was Dr.Arun Rajpara, MDS. He was introduced by Dr. Sanjeev, CDE Chairman of Kochi branch. This was followed by lecture. The lecture was assisted by audiovisual aids.

He delivered a very informative lecture on "Art of Predictable all ceramic restoration. Dr.Rajpara, is a very accomplished speaker and has presented several papers on national and international conferences and has won many accolades. There were 78 participants for this program. The program started at 10 am and ended at 2 pm and was very much appreciated by all members.

Dr. Jayakumar, Secretary thanked the speaker and Colgate for supporting IDA Kochi with this program. As a token and affection memento was given to the speakers. All the participants were given certificates. As soon as the lecture came to close the participants were served Lunch.



**MALAPPURAM BRANCH**

**CDH Activities**

1. 7th CDH camp was held at Edavanna on 18/05/2013 in association with CASK, Edavanna. 127 patients were examined by 7 doctors and 29 patients received treatments
2. 8th CDH camp was held at Vaniyambalam on 28/05/2013 in association with Malappuram District Parivar. 126 patients were examined by 7 doctors.
3. World No-tobacco Day was observed at Valanchery, Tirur and MES Dental College campus by the video and poster exhibition in the public places.

**CDE Activities**

1. 4th Branch level CDE was held at Hotel

- Rydgges Inn, Kottakkal on 31st May 2013 from 5pm to 10 pm. The CDE was a lecture on Dental treatment in medically compromised patients by Dr. Benny Joseph
2. 5th Branch level CDE was held at Hotel Surya Regency, Malappuram on 8th July 2013 from 8.30 to 10.30 pm. The CDE included lecture & demo on "Shade Selection" by Dr Sadiq Ali. Attendance was 23

**Day Celebrations / Observation**

1. World No-tobacco Day was observed at Valanchery, Tirur and MES Dental College campus by the video and poster exhibition in the public places.

**Family Get together & EOGM**

1. 1st EOGM & family get together was held on 8th July 2013 at Hotel Surya Regency, Malappuram. 22 members with family attended
- MIDA participated in the zonal cricket tournament held at Wayanad on 28th April 2013

**Executive committee meetings:**

- 5th Executive committee meeting held on 15/5/13 Wednesday 8pm onwards at Surya Regency, Malappuram. 14 members attended.
- 6th Executive committee meeting held on 12/6/13 Wednesday 8pm onwards at Hotel Ernad Inn (Kayal), Malappuram. 11 members attended.



**MALABAR BRANCH**

**CDE PROGRAMMES:-**

- 1) Title: "Sterilization protocols in Dentistry"  
Faculty: Dr. Binoy Ambookken  
Status: Intra branch | Date: 24.05.2013  
Venue: IDA Hall, Calicut  
Start Time: 7 p.m | End Time: 10 p.m  
Attendance: 34 | Certificate: Given
- 2) Title: "Current updates in pediatric dentistry"  
Faculty: Dr.Sunil Mohammed, Dr.T.V.Anupam Kumar, Dr. Madhu.S, Dr. Ratheesh M.Sekharan  
Status: Intra branch | Date: 30.06.2013  
Venue: IDA Hall, Calicut

- Start Time: 10.30 a.m | End Time: 3.30 p.m  
Attendance: 32 | Certificate: Given
- CDH ACTIVITIES**  
Date: 16.05.2013 | Place: Balussery  
No. of Patients: 300
- EXECUTIVE COMMITTEE MEETING**  
EC Meeting No.2 | Date: 11.04.2013  
Place: IDA Hall, Calicut  
Attendance: 23

**OTHER ACTIVITIES**

FILM FESTIVAL: Seven classic films from world cinema were shown from May 6th to 12th at IDA hall, Calicut. (1 Chinese, 1 Italian, 1 Spanish, 1 Tibetan, 1 English and

2 Iranian movies were shown). Dr. Antony Thomas, the state president of IDA Kerala inaugurated the programme, which was well appreciated by all.

**INDOOR SPORTS MEET**

We conducted an indoor sports contest for our members and their families, on 16.06.2013, at IDA hall, Calicut. Matches were held in Chess, Carroms, and Cards for both adults and kids. Dr. Antony Thomas, the state president of IDA Kerala inaugurated the programme.



**KOTTARAKKARA BRANCH**

**CDH Activity**

IDA Kottarakkara conducted a dental camp at Govt LPS, Edakidam, Ezhukone on 04.05.2013 associated with the Platinum Jubilee Celebration of the school. More than 250 participants were examined and 8 red and white lesions were diagnosed.

**CDE Activity**

3RD CDE program on "All you need about surgical extractions" was conducted on 23.06.2013 at Hotel Zamzam, Punalur. Faculty was DR Suvy Manuel MDS, DNB, MOFRCS (Edin); Dept of OMFS, PMS Dental College, Vattapara, Tvpm. About 30 participants attended the program.





## MALANADU BRANCH

### REPORT OF THE FIRST CDE PROGRAM

The first CDE program of IDA Malanadu branch for the year 2012-13' was held on Tuesday, 7th May 2013, 6:30 PM at Hotel Kabani International, Muvattupuzha. Dr Babu John, Past President, welcomed the delegates. Dr Arun Roy James, CDE convener introduced the faculty. Dr Vivek Narayanan MDS, Assistant Professor, Govt. Dental College, Kottayam, was the speaker. He lectured extensively about the diagnosis and management of aggressive periodontitis. The lecture was followed by an interactive session lead by Dr Varghese Mani, Dr Jose Paul, and Dr Jayan Jacob Mathew. Dr Ciju A. Paulose, President IDA Malanadu, presented memento to the faculty. About 50 delegates attended the program



### REPORT OF THE SECOND CDE PROGRAM

The second CDE program of IDA Malanadu branch for the year 2012-13' "STOMA 13" was held on 19th and 20th May 2013, at Mar Baselios Dental College, Kothamangalam. The program was formally inaugurated on 19th May 9:00 AM by Sri. Mathew Varghese, Secretary, Mar Baselios Medical Mission Association. On the first day, there were lectures on various aspects of minor oral surgery by prof. Dr. Varghese Mani, Prof. Dr. Sankar Vinod, Dr Arun George, and Dr Ninan Thomas. The lectures attended till 5:00 PM. Around 75 delegates attended the program. On 20th May, hands-on training was given to 20 participants on impactions, apicoectomy, flap surgery, and implant placement.



### REPORT OF THE THIRD CDE PROGRAM

The third CDE Program of IDA Malanadu Branch, 2013 was held on Tuesday, 18th June, 2013, at Hotel Kabani International, Muvattupuzha. Dr Arun Roy James, CDE Convener, IDA Malanadu Branch, introduced the speaker. The faculty was Dr. Raju Sunny, MDS (Pedodontics), HOD of Pedodontics, Malabar Dental College, Edappal. He lectured on "Pain Management in Pediatric Dentistry". The speaker was presented a memento by Dr Ciju A. Paulose, President IDA Malanadu Branch. About 50 delegates attended the program. The program extended from 6:30 PM to 9:30 PM.



## WAYANAD BRANCH

### Report of IDA Wayanad Branch for The Last 4 Months

**Installation:** The Installation of office bearers of IDA Wayanad Branch for 2013 was held on 19th January 2013 at Sunday at Hotel Brahmagiri, Mananthavadi. Dr. Antony Thomas, President of IDA Kerala State was the chief guest. The new office bearers are, President - Dr. Bennichen V.J, Secretary - Dr. George Abraham, Treasurer - Dr. Rajesh T Jose. The meeting was attended by large number of members and their families.

**Executive Committee Meetings:** Four Executive Committee were held during this period. All the meetings were well attended by the members. Various decisions were

taken. Some of them are to start a benevolent fund for the members, to conduct free denture programme, school dental health education programme, family tour etc.

**1st CDE Programme:** 1st CDE programme of our branch was by Dr. George Scaria, Asst Proff Dept. of Oral Surgery, Calicut Dental College on 15th April 2013, at Hotel Green Gates, Kalpetta on STERILIZATION. 28 members attended the programme.

**2nd CDE Programme:** Our 2nd CDE was on 19th May 2013 by Dr. Prashant Dhanpal Proff Dept. of Conservative & Endodontics on BLEACHING. The programme was well attended.

**Cricket:** This year North Zone Cricket tournament was hosted by Wayanad Branch, held on 28th April at WMO ground Muttill. Wayanad branch, North Malabar, Malappuram, Coastal Malabar and Malabar branch teams participated and Coastal Malabar was the winners and North Malabar was the runner-up.



## CENTRAL KERALA KOTTAYAM BRANCH

### ACTIVITY REPORT - APRIL 2013

**CDE ACTIVITY:** 2nd CDE was held on April 20th by Dr. Santosh Ravindran, GDC Mumbai on Pathway To an Ultrabright Smile at Hotel Arcadia. 46 members attended the CDE which was totally free for IDA members.

**CDH ACTIVITY:** a screening camp was held under the CDH wing of IDA-CKK at Thiruvathukkal, Kottayam in association with Lions club under the leadership of Dr. Ginu Mohan (CDH chairman) and Dr. Annukesh Prasanan on April 14th. Almost 75 patients were screened and offered medical advise.

**FAMILY GET TOGETHER:** 2nd family get together was conducted on 28th April, Sunday at Wonderla water theme park. 28 family joined together to make the summer vacation a memorable one.

### ACTIVITY REPORT - MAY 2013

#### CDH ACTIVITY

Oral Cancer screening camp was held in Thazhathangadi Kottayam on 19th May in association with Kottayam West club under

the leadership of Dr. Annukesh prasannan and Dr. Ginu Mohan (CDH Chairman). Almost 150 people benefited due to this camp.

Dental awareness camp was held at CSI L.P School Mundathanam on May 23rd. children's were taught about the importance of proper oral hygiene and they were given cleaning aid.

#### EXECUTIVE MEETING

3rd executive meeting of IDA-CKK was held on May 24th Friday at Kottayam club, Kottayam.

**IDA-Kerala state Cricket tournament :** IDA-CKK became the zonal champions of IDA-kerala State cricket tournament held at Angamaly on may 5th. Dr. Robin was selected as Zonal Captain.

### ACTIVITY REPORT - JUNE 2013

**STATE EXECUTIVE MEETING:** The 3rd state executive meeting was hosted in our branch at Hotel Arcadia on June 9th which was well appreciated by the state executive members for the manner in which the meeting was organized and the hospitality.

**CDE Activity:** 3rd CDE was on Excellence in Endodontics by Dr. Prasanna Nelakandan on 16th June. There were 46 delegates. Hands-on for 10 participants were arranged on Destination perfect Endodontics, were each participants were given rotary machine and typhodont to work on it.

**CDH Activity:** Dental awareness class was conducted in Anganwady at Pathanad. Parents were taught about the importance of dental hygiene and maintenance of dental health in kids. They were given dental kit.

