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Oral Health Day

World Oral Health Day on 20 March, the FDI is calling for a focus on prevention to help achieve a healthy 'Smile for life'. In India, "Oral Hygiene Day" is celebrated every year on !st of August by all section of dental profession to commemorate the birthday of Dr Govind B. Shankwalkar the pioneer of Indian Periodontics & his immense contribution to oral health programmes.. As part of the oral hygiene day, various organization took the opportunity to spread awareness and importance of oral health in the community by conducting a series of programs at various locations. All section of the society have an important role to play in effective prevention strategies, in particular by raising awareness of good oral hygiene and habits contributing to good oral health.

Globally, oral disease affects most adults and as many as 90% of schoolchildren. Oral diseases are a significant burden on overall health, with the greatest burden falling on disadvantaged and poor populations. The principal problems are: dental caries, periodontal diseases and oral cancer.

Oral hygiene greatly affects overall long-term health, and promotes a more confident you. When it comes to dental care, prevention through daily cleaning and regular visits to the dentist's office is better not only for your health, but for your budget. That's why it's important for parents to play a key role in reinforcing smart oral hygiene habits. Kids are likely to follow in the footsteps of those who set positive examples and will carry those healthy habits through their own adult lives. Remember, whatever your age, it's never too late to take a serious stand in keeping your teeth healthy and your smile confident". Oral health is as important as general health. It helps you maintain a healthy mouth, teeth and gums. It also helps you improve your appearance. Poor oral health can not only lead to oral diseases but also major health problems like heart disease, diabetes mellitus, stroke, respiratory problems and premature births in pregnant women."

Relatively simple, inexpensive measures can largely prevent these conditions and thus reduce the high burden of oral disease, including brushing with a fluoride toothpaste twice a day; and regular oral health check up.

Edited by: **Dr. K. Nandakumar,** Hon. Editor • Published By: **Dr. O.V. Sanal,** Hon Secretary • **For IDA, Kerala State Branch**
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President's Message

Dr. Thomas K C

Dear colleagues,

Warm greetings from your president.

Presently we are in the second half of the IDA year and I am very happy that our branches are functioning exceptionally well and conducting many CDE and CDH programmes. I would like to acknowledge the support rendered by Dr. Alias Thomas, President IDA head office. Kudos to the excellent effort of our secretary Dr. O.V. Sanal, CDE convenor Dr. Deebu J Mathew, CDH convenor Dr. Subhash Madhavan and editor Dr. K. Nandakumar. Heartful appreciation to Dr. Sabu Kurien for bringing out standard treatment charges throughout the state for the first time in the history of IDA state branch. This will help to create awareness among our fellow professionals regarding the treatment modalities.

Clinic standardisation is in progress with the effort by Dr. Biju A Nair and Dr. Gigu Zakhariah Philip. This will help to improve the standard of the dental clinics in a simple way by self declaration. The state office will be issuing the certificates in a month.

The prestigious health insurance scheme by IDA-HOPE will commence from October 1st and members can join now itself by contacting their branch HOPE representatives. IDA Kerala state appreciate the work done by Dr. Joseph CC, Secretary IDA-HOPE.

The members of IDA Kerala state shared their apprehension about the way of functioning of IDA. Majority feels that the members are not benefitted. The state office has approached the head office in this matter and I am for a referendum among members to take the corrective measures.

Before concluding let me express my deep gratitude to all the office bearers and members for all your valuable opinion in order to safeguard our profession.

Thanking you,

With regards,

Dr. Thomas K C
President, IDA Kerala State.

Secretary's Report

Dr. O.V. Sanal

Dear colleagues,

Greetings from IDA Kerala state

I am very happy that all the branches are doing their activities in a fantastic way. Conducting CDE and CDH programmes in state level as well as in branch level is a big task nowadays. But the branches who took the responsibility for conducting the state programmes especially state executive meeting needs a big appreciation for their efforts. So I want to mention here the branches like Kottarakkara, Malappuram, and Kochi, who hosted executive meetings, Valluvanad, Tripunithara, Trivandrum, North Malabar, Coastal Malabar, Kochi and Central Kerala Kottayam for conducting state programmes in a exceptional way. But unfortunately some branches are abstaining from the activities. State office is not getting any communication from these branches. What I mentioned in last report, almost all other branches sending their activity reports regularly. Special mention to Attingal, Kollam, Central Kerala Kottayam, Mavelikkara, Tripunithara, Kochi, Malappuram, Ernad, Kodungallore, Malabar and coastal Malabar.

Third list of membership has been sent to head office with in stipulated time. As per the decision of state executive, state office sent the form of clinical standardisation and recommend treatment charges to all members of IDA Kerala state. Third state executive meeting held at Tirur on 14th June. We conducted two urgent executive meeting for filling the vacancy and for passing the accounts. Dr T V Ramesan state treasurer of IDA Kerala state resigned and the emergency executive meeting held on 5th July at Taliparamba decided to entrust the responsibility of state treasurer to Dr Dinesh Nambiar for the remaining term. EOGM of IDA Kerala state also held on 5th July for passing the accounts.

First state level CDE programme held at Kottakkeel on 24th May. Second state level CDE programme held at Kottayam on 9th August. The topic was dental jurisprudence and the main faculty was Dr George Paul. It was a well appreciated programme. Congratulations to state CDE chairman Dr Deebu.

Our CDH wing is very active. No tobacco day observed jointly by IDA Coastal Malabar and North Malabar at Payyannur. It was a good public relation programme and congrats to both branches.

The oral hygiene day celebrations conducted at Tripunithara on 1st August in a colourful manner. National president Dr Alias Thomas, state vice president Dr Anil, and CDH chairman Dr Subash Madhavan attended the programme. Congratulations to our new branch IDA Tripunithara and the energetic secretary Dr Kunal Viswam for the efforts taken. A big salute to our hard working CDH chairman Dr Subash Madhavan.

Kerala state students conference was held at Pushpagiri dental college, Thiruvalla on 16th & 17th of may. It was organised by central Kerala Kottayam branch. Congrats to Dr Eapen Thomas, coordinator and CKK branch Chilamboli, our cultural programme will be held on 13th September 2015 at Kochi. State coordinator Dr Anil Thunoli and office bearers of Kochi branch is taking all efforts for the successful conduction of this mega event. Oral health day will be held on 12th September at Kottayam.

Zonal-wise cricket tournament already completed in three parts of Kerala. Finals will be conducted on 27th September at Kozhikode. Sports day of IDA Kerala state will be held on 11th October at Kodungallore. Our sports chairman Dr Dinesh Nambiar is very actively coordinating all these programmes.

Appreciating all the members of IDA Kerala state for actively participating in the programmes and expressing my gratitude to all.

"Don't waste your time with explanations, people only hear what they want to hear."

With warm regards

Thanking you

Dr. O.V. Sanal
Hon. Secretary, IDA Kerala State.

Editorial

Dr. K. Nandakumar

Streamline dental implant treatment

Nearly twenty five years ago, dental implants have become popular in India. Many brands have made a beeline to India because of the fertile nature of the market. The initial skepticism has vanished and practitioners have become confident in offering implant treatment even in highly complicated situations. From where, our dentists got trained in implantology? Very few universities in India offer Diploma Programmes in Dental Implantology. Majority of the short term programmes which are offered by implant manufacturing companies have specific market driven orientation and are inadequate in imparting the basics. Dental Council of India instead of giving the right directions, complacently assigned the implant tag to different postgraduate courses viz. Prosthodontics, Periodontics and Oral Surgery. The DCI, custodian of standards in dental education seems to be least bothered about the inappropriate ways of conducting implant programmes in the country. No regulatory forum is exploring into the quality of the components used in implant treatment. No retrospective study is conducted in India on dental implant treatment though we are completing twenty five years. In fact we conveniently forget the rights of the patient who seeks implant treatment. What ever implant the dentist is placing, automatically becomes the norm. Even the dentist is at a loss in selecting quality dental implants. Neither the government agencies nor the responsible professional associations advise the dentists, on the stringent measures to be followed while selecting a dental implant and use it on the patient. There is a dearth in implant research that can provide adequate evidence that dictate sure success amongst the numerous implant models popularized in India. If the research is well supported, implant made in India will not be a distant dream. The need of the time is the implementation of strict quality control on implant treatment about which the concerned people seems to be unconcerned. The Journal urges the government to take appropriate action before calamitous situations precipitate in the field of dental implant treatment.

Dr. K. Nandakumar
Editor, KDJ

CASE REPORT

Dental anomalies in incontinentia pigmenti

* Akshatha B.S., ** Venkatesh Babu

Abstract

Incontinentia pigmenti is a developmental defect involving many structures of ectodermal and mesodermal origin. The dental features of incontinentia pigmenti occur in over 80% of cases and are of considerable diagnostic importance because, in contrast to many of the dermatological features, they persist through life. This article presents a 10 year old girl diagnosed with incontinentia pigmenti with a variety of dental abnormalities.

Keywords: Bloch-Sulzberger syndrome, Incontinentia Pigmenti, Genodermatosis

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► Introduction

Incontinentia pigmenti (IP) is an X-linked dominant neurocutaneous syndrome with cutaneous, neurologic, ophthalmologic, and dental manifestations. It refers to the loss of melanin from basal cells in the epidermis; melanin collects in the dermis as free pigment or aggregates of melanophages. Garrod reported the first case in 1906. Subsequently Sulzberger described the pathologic changes in 1928 and Haber first recognized the multisystem nature of the disease.[1,2]

It is usually lethal for males in uterus, while affected females show significant variations in clinical expression. The most dramatic clinical manifestation of IP is a 4-stage anomaly of skin pigmentation that commences at or before birth: erythema and bullous lesions, verrucous lesions, hyperpigmentation along Blashchko's lines, and hypopigmented atrophy. However, the most significant medical problems are blindness and neurological disturbances.

Mutations in the gene for NEMO (NF-κB essential modulator) at Xq28 have been shown to cause IP, and a deletion of exons 4–10 is found in 80% of cases. Carrying a NEMO mutation is linked to embryonic lethality in males, while it results in skewed X inactivation in females.[3,4]

Characteristic skin lesions compatible with the early, vesicular and/or verrucous stages of IP are present at birth or develop in the first few weeks of life in approximately 90% of patients. The cutaneous manifestations of the hyperpigmented stage develop during infancy and persist during childhood. The hyperpigmented lesions usually fade during adolescence. The cutaneous manifestations of the atrophic/hypopigmented stage develop during adolescence and early adulthood and persist indefinitely. Hair, nail, and dental anomalies often first manifest during infancy and are permanent.[6,7]

Dental abnormalities are seen in 80% of patients and can involve both deciduous and permanent teeth. Dental anomalies are permanent and thus serve as a very useful diagnostic finding in older patients. Delayed eruption of dentition, partial anodontia, and conical or pegged teeth are the most common dental findings. Poor enamel quality leading to an increased incidence of dental caries and early dental loss has been reported historically, but this association has been questioned.[8,9]

► Case report

A 10 year old girl accompanied by her mother visited the Department of Pedodontics & Preventive dentistry with a chief complaint of irregularly placed teeth in the upper & lower front region of mouth. During investigation of her medical history, it was revealed that the patient was diagnosed with IP with a history of vesiculo bullous eruption on the right arm at birth, over a period of 2-3 years the lesion became verrucous.

After few years till date verrucous unions have subsided with pigmentation which has a whorled appearance, typical of IP. On physical examination there was presence of Brown macular hyperpigmentation on the skin of lumbar & umbilical region of the abdomen (Fig.1) & medial aspect of the thigh. Hair was lusterless & patches of alopecia were seen. The physical and intellectual development of the girl was considered to be normal by paediatricians.

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Family history revealed that the patient was first born to parents of non consanguineous marriage at an uneventful delivery. The patient has an unaffected younger sibling. There was no family history of hereditary disease.

On intraoral examination mixed dentition was seen with notching of maxillary central incisors. Clinically missing maxillary left lateral incisor & gothic palate was seen. (Fig 2, 3 & 4)

Oral examination including panoramic radiographic (Fig. 5) revealed notching of the upper right & left permanent central incisor, missing upper left lateral incisor and dens evaginatus of lower right permanent first molar. Oral prophylaxis was done, and pit fissure sealants were applied to all first permanent molars. The over retained deciduous lateral incisors and lower right deciduous canine was extracted

► Discussion

The clinical manifestations of IP vary widely ranging from subtle cutaneous and dental changes to severe and incapacitating ophthalmologic and neurologic manifestations.[9] The latter are the most serious clinical manifestations of IP. In the present case the patient showed no ophthalmic & neurologic manifestations. The patient in this report demonstrated several of the typical features of IP. The erythematous stage began shortly after birth and persisted for several months. She has patches of alopecia & lustreless hair.

The dental features of IP occur in over 80% of cases and are of considerable diagnostic importance because, in contrast to many of the dermatological features, they persist throughout life. Either or both deciduous and permanent dentition may be affected.[10] The dental features according to Russell & Finn presents as a triad consisting of:

1) Absent teeth
2) Conical teeth with supplemental cusps in the posterior teeth, and
3) Delayed eruption

Among these missing teeth is the most frequent anomaly.[5,11]

According to Carney partial anodontia, pegshaped or malformed teeth are the most common anomalies associated with IP. This patient presented with missing tooth & supplemental cusp in the posterior tooth characteristic of IP.

There is a need for special attention in such patients & parents should be informed about common dental

Fig. 1 Region of abdomen showing brown macular hyperpigmentation

Fig. 2 Intraoral view showing notching of maxillary central incisors

Fig. 3 Intraoral view showing missing maxillary left lateral incisor & Gothic palate

Fig. 4 Intraoral view showing over retained lower left lateral incisor

Fig. 5 Orthopantomographic radiograph confirming the absence of permanent left maxillary lateral incisor

manifestations such as missing or abnormal teeth, delayed eruption. Maintenance of oral hygiene and regular dental care is necessary, and preventive procedures may be indicated. Regular follow-up with a neurologist, ophthalmologist, dentist, and dermatologist should be coordinated as needed.

► Conclusion

According to the frequency, dental and/or oral anomalies represent the most frequent and important IP minor criteria. The majority of dental anomalies and some of the oral anomalies could be corrected. IP is under diagnosed if the symptoms are limited to agenesis of only a few teeth and inconspicuous skin lesions. Dentists are ideally placed to identify individuals with IP and should refer patients with a presumption of IP to proper medical specialists.

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Replacement of congenitally missing tooth, with implants and failure management in the span

* Arjun MR, **Kavita Bekal Kripalani, ***Mohamed Haris P.M.

Abstract

Background: This case report describes replacement of congenitally missing #31 #41.

Methods: Atraumatic extraction was done in relation to #42 #32 with minimal soft tissue trauma. All four walls of the socket were found intact. The socket was prepared to the required depth. After proper treatment planning endo osseous implants (Hi-Tec tapered self threaded, ankylos from densply), measuring 3.5mm in diameter and 11mm in length was inserted into the socket. Two months later the implant placed in #42 failed which was replaced by 4.5mm diameter 11 mm length implant. Final bridge cementation was done with porcelain fused metal (PFM) crown, 6 months after the insertion of the first implant.

Results: The atraumatic operating technique and the immediate insertion of the implant resulted in the preservation soft tissues at the extraction site with minimal resorption of the alveolar bone. The patient exhibited no clinical or radiographic complications through 12 months of clinical monitoring after loading.

Conclusion: The immediate implant provided the patient with natural-looking dentition without a removable appliance. Not long ago a similar case would be restored using a traditional bridge, which would have caused unnecessary injury to adjacent teeth. The sequential surgical, technical, and restorative techniques were blended into one successful protocol, which was demonstrated with this clinical case report.

Keywords: immediate implant placement, extraction, abutment, bridge

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► Introduction

The replacement of missing teeth with implant restorations has been advocated and accepted by the scientific community for fully and partially edentulous patients.[1,2] This treatment modality in oral rehabilitation was initiated by the discovery that dental implants, made of pure titanium, can achieve anchorage by ankylosis. This functional ankylosis is often referred to as osseointegration, and was first described by the two research groups of Branemark and Schroeder.[3] The mechanism of osseointegration has been well described by several authors.[4-7] Recent reports have demonstrated the successful placement of dental implants into the fresh extraction socket in the anterior as well as in molar regions.[8] The technique was made possible due to developments in implant surface. This case report highlights the use of endo osseous Hi-Tec tapered self threaded implants.

► Case report

A 24 year old female Patient was referred to our out patient department for replacement of congenitally missing #31 & 41 (Fig 1). A brief history revealed that Orthodontic therapy to create space for prosthesis in missing #31 & 41 resulted in severe bone loss around #32 & 42 (Fig 2). Both #32 & 42 were Grade II mobile & were splinted to #33 & 43 respectively. Patient was given 2 options one was to Replace #31 & 41 with one implant & 2 crowns. This option was not considered as it was aesthetically compromised (Fig 3). The second option was Extraction of #32 & 42, with immediate implant placement in these regions, followed by implant supported bridge in the mandibular anterior region. (Fig 4). Treatment plan was discussed with patient. Study casts were made along with Orthopentamogram (opg) (Fig 5). Bio-chemical evaluations were done which revealed no abnormalities. Informed consent of the patient was taken before surgical procedure. The implant placement procedure was done under Local anaesthesia (2% Lignocaine with 1:80,000 Ad). The Choice of anaesthesia was buccal & lingual infiltration in the #32 & 42 regions. Both the mandibular lateral incisors were de-splinted from adjacent teeth & extracted as atraumatically as possible (Fig 6). The extraction sockets were chemically & physically curetted using betadine-saline (50% each) combination & a surgical curette. All tissue tags within the sockets were removed. Pilot osteotomy drill of 2mm diameter was placed in the sockets & the osteotomy direction was modified. Both the osteotomies were widened to 3.5mm. An Osteotomy of L=11mm done with sequential drills to place D=3.5mm Ankylos implant. Bone reamer & bone tap were used after the osteotomy drills. Ankylos 3.5mm 11mm implants were placed using the motor driver at 25 rpm (Fig 7). Implant mount was removed

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after judging the sub-crestal placement of implant by 1mm. sutures were placed. Post implant placement IOPA done to assess the position of implant. Patient was given post-op antibiotic & anti-inflammatory cover. (Fig 8)

Complication in the healing phase

The implants were opened after a healing period of 3 months. There was pain on unscrewing the cover screw in #42 region. An IOPA revealed a diffuse radiolucency around the implant in #42 (Fig 9). Patient was informed about the possible failure of the implant & after an informed consent, the implant site was reopened. There was granulation tissue around the implant & a visible mobility of the implant. This implant was removed & the socket was thoroughly examined for dehiscence of buccal or lingual plates of bone.

All granulation tissue was removed with a surgical curette. The socket was chemically cleaned with a 50% mix of betadine (5%) & saline. After a complete assurance of absence of perforations, the osteotomy was widened to receive an ANKYLOS D4.5 L 11 implant.

The site was sutured & patient was administered adequate antibiotic & anti-inflammatory prescription. Post operative IOPA was taken. (Fig 10)

Prosthetic Phase

After a healing period of 3 months (after replacement of implant in #42). Implant cover screw was removed & a gingival former GH1.5 was placed (Fig 11). Impression was made using an open tray technique with Polyether. Abutment selection was done using the posterior balance selection tray. Abutment selected –GH 0.75, 7.5 Degrees, Posterior Balance Abutments. Abutment were milled as per case requirement. Abutment jig was made in pattern resin. A metal coping trial was prepared on the milled abutment and trial was checked for fit, tooth contacts & incisal clearance (Fig 12). After thorough evaluation of the trial & approval of the same, shade mapping was done for the final porcelain fused metal (PFM) crown.

Fig. 1 Congenitally missing #31 & 41

Fig. 2 Sivere bone loss in relation to 32 42

Fig. 3 Compromised esthetics in mock trial on diagnostic cast

Fig. 4 Better esthetics in mock trial with the second treatment plan

Fig. 5 Orthopentamogram

Fig. 6 Extraction of 32 42

Fig. 7

Fig. 8 Iopa taken immidietly after placcement of implant

Shade A2 (VITA classic shade guide) was selected. A bisque trial of the crown was done. Incisal adjustments were done in centric & protrusive movements. Abutment was tightened with a torque driver at 15Ncm. Access hole was sealed with light cure composite Finally PFM crown cementation was done (Fig 13). Cementation of the crown done with Zinc Phosphate cement. All excess cement was removed & flossability of contacts were checked.

IOPA was done to check for excess cement & crown fit. (Fig 14)

Maintenance phase

Patient was recalled after an interval of 3 weeks, 1 month and I year.

A yearly recall visit schedule given to patient.

► Discussion

Though uncommon congenitally missing teeth are always a factor for unpleasant smile. Replacement of the same can be done with either bridges or implants. In the modern era of dentistry where patients are willing to save their tooth rather traumatize them in context to a tooth preparation for bridge, the implant dentistry comes into play. In this case though the lower centrals were missing there was no enough space for replacement of the same with an easthetically successful outcome. This was evident during the mock trial, so the patient was advised immediate extraction of the lower laterals and placement of implants there. This was more favoured because of the fact that the lower laterals were mobile due to localized periodontitis and bone loss.

The placement of an implant soon after the extraction may be a challenging procedure due to the frequent existence of bony defects. Various studies have also shown that survival of immediately placed implants is excellent, suggesting that such clinical approach can be successfully adopted in order to minimize the treatment time without reducing predictability with respect to standard protocols.[9,10] In the present case, implant was placed immediately after extraction which showed good osseointegration with no signs of pain and discomfort and no radiolucency at the end of 12 months. The primary outcome variable in case of immediate implant is the bone dimensional changes occurring between implant placement and osseo- integration. These are assessed in terms of height, width or volume, either directly on the alveolar process (in millimeters or percentage), or indirectly, using standardized periapical radiographs. Apart from this, the soft tissue dimensional changes are assessed with periodontal probe or with standardized clinical photographs (in millimeters or percentage).[11] In this case periodic check ups were done starting from the placement of permanent crown (3 months after placement of implant) upto 12 months. The hard tissue changes were assessed using periapical radiograph and soft tissue changes were assessed using periodontal probe. Ideally

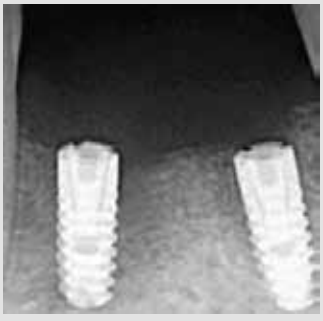

Fig. 9 Iopa after 3 months reveals bone loss around the implant

Fig. 10 iopa taken after replacement of failed implant

Fig. 11 Gingival formers in place

Fig. 12 Metal trial being checked for fit

Fig. 13 Final restoration in place

Fig. 14 Iopa taken after cementation of crown

the distance from the buccal alveolar crest of the extraction socket to the free gingival margin, of 3 mm (4.5 mm on the proximal surfaces) is desirable because it provides the most predictable outcome.[12,13] After three months of implant placement, during the removal of the cover screw, mobility of one among the placed implants (#42) was noted. This implant was removed and replaced with an implant of bigger diameter, after through debridement. The selection of implant with a bigger diameter was to maintain the jumping space less than 2 mm. Frequently, when implants are placed into extraction sockets, a partial in congruency between the outer surface of the implant and the bony walls of the socket is often seen. This space is known as jumping distance or critical space.[14] Use of wider diameter implants helped in obliterating the jumping distance. Therefore, there was no need to place any bone grafts to compensate the jumping distance. Many studies have shown that bone augmentation techniques may not be required when the distance between the implant and the bony wall is < 2mm.[15]. Implant failure may be of a primary or secondary nature. In addition, marginal bone loss around oral implants may continue and create a secondary failure. It is commonly difficult to assess the proper reason for implant failure. For instance, in the case of primary failures, that is, those implants that never osseointegrate, an alleged reason for the observed failure is overheating/poor surgery. However, from a strict scientific point of view, there is little evidence incriminating poor surgery as the cause of primary failures. A minimal demand for believing in the theory of poor surgery would be that this is noted in the clinical records at the time of implant placement. This is seldom the case. Instead, the poor surgery explanation is made retrospectively, perhaps in the lack of other evidence. In reality, we do not know why some implants fail primarily but fortunately the frequency of such failures is small, in the range of 1–2% in most clinical reports. Another substantial controversy relates to the reason for marginal bone loss, which may end in clinical failure. In the recent literature, it has been assumed that an alleged primary disease entitled periimplantitis is the original reason behind marginal bone loss around oral implants.[16, 17] Some - authors have even suggested that any marginal bone loss after the first year of clinical function must depend on periimplantitis.[18] No <8 different definitions exist of what is to be regarded as periimplantitis.[19] In reality, the entire discussion about periimplantitis as a primary disease is probably misconceived.[20–22] The reason for onset of marginal bone loss around implants is in all probability dependent on a complication to treatment, not on disease phenomenon. Infection and similar problems around oral implants is a secondary, not a primary phenomenon[22]. Marginal bone loss has been demonstrated to be initiated by poor clinical handling, use of poor implant designs or by treating complicated patients. At a later stage patient disease, rapidly changing loading situations or reactions to cement particles accidentally embedded in the soft tissues represent other reasons for start of bone loss. Having said this, such conditions left untreated may secondarily result in aggravated bone resorption and periimplantitis further complicating the clinical picture. Osseointegration is nothing but a foreign body response, and long-term clinical function is dependent on tissue equilibrium[22]. Secondary failure of an oral implant is in the great majority of cases preceded by marginal bone resorption, hence the importance of understanding the background to it. Chvartszaid et al.[23] assumed that if small summed trauma to the tissues than minor bone resorption occurred, but if a summed large trauma prevailed, then implant failure would follow. Trauma to the tissues that may disturb the maintained foreign body equilibrium that we call osseointegration is sometimes easy to understand such as inadequate surgery burning away the relevant cells needed for bone repair, but in other cases may be more difficult to identify.

In this case, Hi-Tec tapered self threaded, ankylos endo osseous implant was used. The Ankylos implant offers precisely machined, tapered-cone abutment (Morse taper) connection. This tapered abutment connection provides high resistance to bending and rotational torque during clinical function, which significantly reduces the possibilities of screw fracture or loosening. The unique abutment design of the Ankylos system contributes to the formation of the healthy biological width because the area between implant shoulder and abutment is not exposed on the peripheral contour next to the bone.[24] The bacteria-proof seal and the lack of micromovements because of the friction grip,are two important factors in preventing cervical bone loss. After replacement of the failed implant and a waiting period of another three months, the prosthetic phase was initiated Final restoration was done using porcelin fused metal bridge.

► Conclusion

This article gives a brief view on implant placement in challenging cases where we have to think about extraction of a compromised tooth. The correct indication associated with careful clinical maneuvers of the immediate extraction and implant placement technique allows predictable success of implants even in compromised cases.

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CASE REPORT

Root canal curvature assessment of labial versus lingual access cavity preparations in mandibular incisors

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Abstract

Background: The conventional access preparations in mandibular incisors are from the lingual aspect. Numerous data suggests that the lingual access preparations cause loss of tooth structure and will not provide a straight line access to apical one third of the root canal system. An alternative approach is to prepare the access from the labial aspect. This in vitro evaluation compares the labial and lingual access cavity preparations in mandibular incisors having single or two canals and evaluating the mean curvatures using digital radiographs and image analysis software.

Materials and Methods: 80 mandibular incisors (Group 1) having single canal and 40 incisors (Group 2) having two canals were selected. Samples were randomly divided into subgroups A and B. Subgroups 1A (n=40) and 2A (n=20) were subjected to labial access preparation and subgroups 1B (n=40) and 2B (n=20) were subjected to lingual access preparations. A15 size K-file was introduced into the canal and digital image was taken from the proximal aspect. And two lines were drawn, line A being parallel to the cervical cuvature and line B parallel to the apical curvature. The angle formed was measured with VixWin Pro digital image analysis software. Statistical analysis was performed using non parametric Mann-Whitney U test.

Results: Labial access in single canalled teeth (Group 1A) had a curvature of 8.90±4.80 and lingual access (Group 1B) had a curvature of 12.60±4.50. The p value was statistically significant. Labial canal in labial access cavity preparation (Group 2A) had a curvature of 14.40±4.60 while the lingual canal had a curvature of 16.450±4.80. In lingual access (Group 2B), the labial canal had a curvature of 21.450±8.50 and lingual canal had a curvature of 20.40±6.20

Conclusion: Based on the results, it could be concluded that, labial access cavity preparations in mandibular incisors can provide straight line access to the apical one third of the canal compared to the lingual access cavity preparations.

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Introduction

Adequate access cavity preparation, conservation of tooth structure and straight line access to the apical one third of the canal for the root canal instruments are essential features for successful endodontic therapy.) The conventional access preparations in mandibular incisors are from the lingual aspect with the entry above the cingulum. This was attributed to the simplicity in access preparations with the traditional equipment's before the advancement of high speed handpiece. The area above the cingulum has the least thickness of tooth structure, to access the pulp chamber.[2] Even today, lingual access cavity preparation in mandibular incisors are performed by majority of the dentists without sound scientific evidence. Numerous data suggests that the lingual access cavity preparations in mandibular incisors cause unnecessary loss of tooth structure and will not provide a straight line access to apical one third of the root canal system.[3,4] Contrary to this, access cavities prepared through the incisal ridge provides a straight line access, but it damages the incisal edge which is essential for the structural integrity of the tooth.[5] An alternative approach is to prepare the access from the labial aspect. Logani et al in an in vitro study, weighing the tooth before and after access cavity preparation with labial and lingual access has found that, labial access provide a conservative access cavity preparation and preserve the natural tooth structure.[6]

In clinical radiographs, mandibular incisors shows minimal or no canal curvatures, but from a proximal view, especially in tooth with two canals, there will be a severe curvature.[3] The literature is deficit in comparing the labial versus lingual access cavity preparations and the mean root canal curvature formed by the root canal instruments with these access preparations. This in vitro evaluation compares the labial and lingual access cavity preparations in mandibular incisors having single or two canals and evaluating the mean curvatures formed by root canal instruments using digital radiographs and image analysis software.

Materials and methods

Freshly extracted 120 mandibular incisors that are free of caries, anatomical defects, abrasion and extracted for periodontal diseases were selected. Teeth with severe attrition or radiographic evidence of canal obliterations were excluded. Ethical committee approval was obtained from the institutional

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ethical board. A digital radiograph was taken in a proximal view to find the number of canals. 80 lower incisors (Group 1) having single canal and 40 incisors (Group 2) having two canals were selected. Samples in each group were randomly divided into subgroups A and B having equal number of teeth. Subgroups 1A and 2A were subjected to labial access cavity preparation and subgroups 1B and 2B were subjected to lingual access cavity preparations.

All the access cavity preparations were made by a qualified, single operator to avoid inter-operator bias. The access cavity preparation technique was as follows:

Procedure for labial access cavity preparation:

The technique described by Longani et al[6] was followed for the labial access preparations. The center of the labial surface was marked after measuring the mesio-distal and inciso-cervical dimensions. With tapering fissure bur held at right angle to the long axis of the tooth, initial entry was made just incisal to the mid-labial point. With a No 2 round bur (Mani, Tochigi, Japan), entry was made into the pulp chamber. Once an entry was made, safe end edendoaccess bur (Endo Z, Densply Maillefer, Ballaigues, Switzerland) was used to enlarge the access cavity, holding the bur parallel to the long axis of the tooth and moving it in a brush stroke mesio-distally and cervico-incisally to remove the roof of the pulp chamber. Care was taken not to extend the preparation towards the incisal edge. (Fig. 1A) Completeness of access preparation was verified by another examiner.

Procedure for lingual access cavity preparation:

The initial entry was made with a tapered fissure bur starting at the exact center of the lingual surface holding the bur perpendicular to the long axis of the tooth. The entry inside pulp chamber was made with a No 2 round bur (Mani, Tochigi, Japan). Once the pulp chamber was reached, a safe endedendo access preparationbur (Endo Z, DensplyMaillefer, Ballaigues, Switzerland) was held parallel to the long axis of the tooth and working from inside to outside of the tooth, an conventional access was prepared. (Fig. 1D). The thoroughness of the access preparation was verified by another examiner.

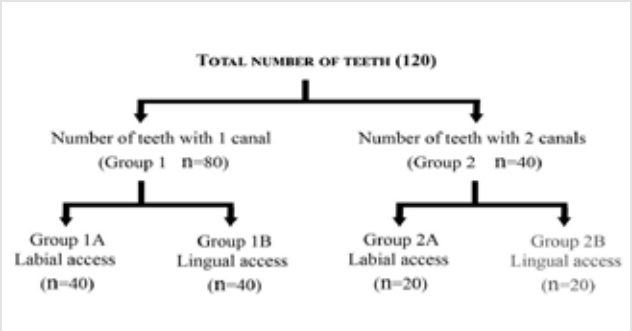

Fig. 1

Procedure for canal curvature measurements:

Once the access cavity preparations were completed, an ISO 15 size K-file (Mani, Tochigi, Japan) was introduced into the canal after irrigation with 3% sodium hypochlorite (Nice chemicals, Kochi, India) and using EDTA (RCPrep, Premier dental products, PA, USA) as lubricant. Then the samples were positioned and stabilized on the surface of a RVG sensorunit (Gendex Dental Systems, Hatfiled, PA, USA) at a distance of 10 cm from the x-ray tube and exactly perpendicular to the proximal surface of the tooth. The x-ray machine was set at 70KVP and exposure time of 0.23 seconds for all the specimens. After exposure, thedigital images obtained were stored in the computer. (Fig. 1B, C, E, F)

The digital images were imported to Adobe Photoshop CS2 software (Adobe systems, USA), and two lines were drawn, first line (line A) being parallel to the cervical curvature of the file and second line (line B) parallel to the apical curvature of the file corresponding to cervical and apical root canal curvatures. (Fig. 2)This image was then imported to VixWin Pro digital image analysis software (Version 1.3, Gendex Dental Systems, Hatfiled, PA, USA). The angle formed by the intersection of the two lines were measured with the angle measurement tool in VixWin Pro digital image analysis software. For samples in group 2, curvatures were measured separately for the labial and lingual canals by inserting only a single file at one time. Statistical analysis was performed using non parametric Mann-Whitney U test.

► Results

Curvature assessment was performed separately for teeth with single canal and two canals. Labial access in single canalled teeth (Group 1A) had a curvature of 8.90±4.80 and lingual access (Group 1B) had a curvature of 12.60±4.50. The p value was 0.001 and statistically significant difference existed between the labial and lingual access. (Table 1)

For teeth in Group 2, curvatures for the labial and lingual canals were measured separately. Labial canal in labial access cavity preparation (Group 2A) had a curvature of 14.40±4.60 while the lingual canal had a curvature of 16.450±4.80. In lingual access (Group 2B), the labial canal had a curvature of 21.450±8.50 and lingual canal had a curvature of 20.40±6.20. The p value was 0.001 and statistically significant difference existed between the labial and lingual access cavity preparations. (Table 2)

► Discussion

Efficient cleaning and shaping of the root canal system is essential for the success of root canal therapy.[7] Most often, the reason behind failure in endodontic therapy lies in the

apical one third of the root canal system. For an efficient cleaning, the instruments should reach the apical third with a straight line access provided by the coronal access cavity preparation. With the advent of rotary instrumentation, the minimum curvature formed by the instruments enhances their longevity, canal cleaning ability and minimizes iatrogenic errors. The result of this study clearly indicates that labial access cavity preparations are more ideal than the conventional lingual access cavity preparations. Less curvatures angles obtained in this study proves that, labial access provides a better straight line access thus making endodontic therapy more successful. Instruments used in lingual access preparations must be curved especially when two canals are present. This curvature will make the instruments more prone for separation and removes dentin from the convexity of the curvature and incisal edge thus resulting in unnecessary tooth loss.

As determined by sample size calculation keeping α value to 5% and power of the study to 80%, 80 samples were used in group 1 and 40 samples were used in group 2.

The incidence of two canals in mandibular incisors is in the range of 22 to 41.4%[8,9] but uncomplicated root canal treatment of two canalled lower incisors are still published as case reports. This explains the high incidence of missing one of the canals during endodontic therapy and compromising the long term success. The coronal projection of the root canals in these teeth has shown that the labial access can provide a better straight line access than the lingual access[10] and could create an ideal environment for locating these missed canals. Locating the lingual canal through the lingual access necessitates the removal of the cingulum. Additionally, orienting dental operating microscope with labial access in mandibular incisor is much easier than orienting with lingual access openings because of the lingual inclinations of the teeth.

The concept of modern molar access shed light for the preservation of cervical dentin. In case of mandibular incisors, the cingulum area may be considered as the strongest part of the tooth as it has bulk of tooth structure and it provides resistance and retention for full coverage restorations. But, it is often removed unnecessarily by lingual access openings, which can be prevented by labial access preparations.[11]

In this study, for the samples in group 2 (teeth with two root canals), there is a possibility of inserting two files at the same time and making the digital image, but it was chosen to use single file at a time. This was to simplify the procedure of drawing the lines in image editing software without any hindrance and to avoid overlapping lines while measuring the curvature angle. The overlapping lines while angle measurement in VixWin Pro digital image analysis software may give a misreading.

In a clinical situation, the radiograph exposed from the labial aspect will not show the severity of the curvatures and left unnoticed. But the curvatures obtained from proximal aspect in this study dictates; labial access could prevent instrument separation as more straight line access was obtained. The severity of the curvature is more aggressive if there is more than one canal present. (Table 2) Cervical pre-flaring was not performed in this study prior to working length determination in order to avoid the possibility of eradicating the natural curvature which is crucial with initial cleaning and shaping.

Labial access preparations were often performed by practitioners in case of crowded dentition, tilted or retroclined tooth, restricted mouth opening and gross carious lesions in the labial surface. But the results of this study calls for the labial access preparations for all cases. Being single visit endodontics is getting more popular and with the advent of resin composite materials with better shade matching, fear of compromised esthetics created by labial access can be ruled out.

There is no replacement for the natural tooth substance and no material can be considered equivalent. The success of root canal treatment lies in the proper rehabilitation of

Table 1: Curvature assessment for teeth with single canal (Group 1)

Group (1A) Labial access	**Group (1B) Lingual access**
8.90±4.80	12.60±4.50

p = 0.001 – Statistically significant

Table 2: Curvature assessment for teeth with two canals (Group 2)

Group (2A) Labial access		**Group (2B) Lingual access**	
Labial canal	Lingual canal	Labial canal	Lingual canal
14.40±4.60	16.450±4.80	21.450±8.50	20.40±6.20

p = 0.001 – Statistically significant

the tooth back to its form, function and esthetics and not mere obliteration of the canal space with obturation material. Often root canal treated tooth fail because of structural failure than endodontic failure.[3,12,13] So before sacrificing the tooth structure by lingual access, the dentist should take all the necessary steps to prepare a labial access that is more conservative, while providing a optimal straight line pathway for efficient cleaning, shaping and obturation of the root canal.

Conclusion

Based on the results of this in vitro study, it could be concluded that, labial access cavity preparations in mandibular incisors can provide straight line access to the apical one third of the canal compared to the lingual access cavity preparations. On comparing the curvature among the single canal and teeth with two canals, two canalled teeth show extreme curvatures with lingual access while statistically significant less curvatures were obtained with labial access.

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REVIEW

Corticosteroids in dentistry

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Abstract

Corticosteroids released from adrenal glands are cycloalkane compounds, which are under the control of HPA axis. They affect metabolisms, fluid electrolyte balance and inflammatory activities. For its anti-inflammatory and immunosuppressive actions it is used for preventing post-operative inflammatory reactions as prophylactic therapy, in endodontic, for various auto immune and allergic skin dermatoses, facial paralysis, central giant cell granuloma, medical emergencies like adrenal crisis and anaphylactic shock. However careful monitoring is also advised.

Key words: corticosteroids, anti-inflammatory, immunosuppressive.

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► Introduction

Human adrenal cortex secretes steroid hormones, having glucocorticoid, mineralocorticoid and little androgenic action. Chemically steroids have a basic 21 carbon ring structure. Synthetic steroids were made by fluorination at 9th position[1] since 1940.[2] Synthetic steroids have revolutionized management of several illness and saved many lives[3] in the form of tablets, injection fluids. However they have adverse effects too[4]. Steroids have spectrum of actions including maintenance of fluid electrolyte balance, cardiac functioning, and skeletal muscle function.[1] Hydrocortisone, prednisolone, dexamethasone are commonly used group of steroids in dentistry and surgery. Synthetic steroids have more duration of action, resistance to metabolic activities, and have high oral activity too. It has then become a common recommendation by dental textbook to suggest oral and injection fluid of steroids for curing oral lesion.[2] Dental patients with history of steroid therapy should be given special care before treatment procedures.[4]

Corticosteroids have wide range of uses in dentistry it can be used in the treatment of vesiculobullous lesions, orofacial granulomatosis to limit post-operative inflammation, in allergic reactions and an intracanal medicament in endodontics.[5] This review aims at gaining knowledge about steroid therapy of oral lesion and about management of dental patients undergoing steroid therapy.[4]

Physiology of corticosteroids

Corticosteroids are adrenocorticotropic hormones which include carbohydrate metabolism,[6] regulating glucocorticoids (cortisol) and electrolyte balance[6] regulating mineralocorticoid (aldosterone) and sex hormones (androgens) which are secreted from different zones of adrenal cortex as follows: zona-glomerulosa –mineralocorticoid, zona fasciculate-glucocorticoid and zonareticularis- androgens. Steroids are organic compounds synthesized from cholesterol1 having four cycloalkane rings[4] and cyclopentanoperhydro phenanthrene[1] nucleus. The secretion of these hormones is regulated by HPA axis via adrenocorticotropic hormones.[7]

Uses of corticosteroids in dentistry

Corticosteroids are widely used in inflammatory and immune mediated condition. Uses of corticosteroids in various fields of dentistry include:

In oral surgery

Corticosteroids are used to limit the post-operative inflammation[8] and to prevent the post-operative edema[9]. They are topically used in preventing ulceration and excoriation due to retraction during surgical procedures[9]. Also corticosteroids are found to be effective in reducing pain, trismus and hospitalization time[10]. Currently, corticosteroids are proven to be efficient in preventing post-operative hypersensitivity of lingual and inferior alveolar nerves following 3rd molar extraction by using conduction with analgesics.[11]

Alveolar osteitis

Alveolar osteitis is the inflammation of alveolar bone as a postoperative complication of tooth extraction. This

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is due to loss of blood clot from socket or due to failure of clot to form.

Combination of hydrocortisone with oxytetracycline have been recently applied in prevention of alveolar osteitis.[12]

Prophylactic drugs

Corticosteroids have been prophylactically given in various surgical procedures like vestibuloplasty procedures, sagittal split osteotomy, pre prosthetic surgery, 3rd molar surgery[9], orthognathic and reconstructive surgeries.[4]

Keloid and hypertrophic scar

Keloid and hypertrophic scar are complications of wound healing due to alteration in collagen synthesis. Keloid extends beyond the limits of original wound where in the hypertrophic scar confined to area of injury[4]. Steroid injection is used for management of both.

In endodontics

Corticosteroids are used as an endodontic anodyne.[13] Steroid in combination with broad spectrum antibiotics are used as pulp capping agent to reduce inflammation and allergic reaction. More over steroids act as a cavity liner which reduces the post-operative thermal sensitivity and dentin hypersensitivity.[8] Steroid application on to exposed pulp or remnants of pulp periapical tissue during RCT are proved to eliminate post-operative inflammation and pain.[14]

► In oral medicine

Recurrent aphthous stomatitis (RAS)

RAS is one among the most common oral lesion affecting general population which is characterized by recurring ulcers that are quite painful.[15]

Corticosteroids with immunosuppressive activity interceptive the ulcerative phase of the lesion and with its anti-inflammatory activity decrease the established lesion.[16]

Desquamative gingivitis

Lichen Planus

Lichen planus is a mucocutaneous inflammatory disease described and named by Wilson in 1869 and is one among the potentially malignant disorder.[17] Topical steroids are highly efficient in treating bullous, ulcerative, erosive lesions of lichen planus which reduce the pain and inflammatio.[8]

Mucous membrane pemphigoid

These are auto immune vesiculobullous lesions of oral mucosa which frequently involve the gingiva where the rupture of the vesiculobullous lesions result in raw, eroded, bleeding gingival surface.[15] Corticosteroids are used topically and systemically in mucous membrane of pemphigoid to suppress the blister formation, to promote healing and prevent scarring.[15]

Bullous pemphigoid

Bullous pemphigoid is another autoimmune sub epidermal blistering disease which rarely involves mucous membrane.[15] Treatment modalities includes topical and systemic corticosteroids.

Pemphigus vulgaris

Pemphigus vulgaris is a mucocutaneous intradermal blistering disease which is characterized by painful gingival, buccal, palatal erosions[15]. High mortality and morbidity associated with untreated conditions emphasize the importance of corticosteroid therapy.[18] Here corticosteroids are used topically, intralesionally and systemically.

Erythema multiforme and steven johnsons syndrome (SJE)

Infection or drug induced hypersensitivity reaction where target lesions are the characteristic feature and which is of minimal mucosal involvement.[19]

Two different spectrum of EM include: EM (major and minor)

SJS and TEN(Toxic epidermal necrolysis)

SJS is the very severe bullous form of EM with extensive painful oral mucous membrane lesion, ulcerations and cresting of lips. TEN is a very serious fatal bullous drug eruption.

This disease is so severe that large sheets of skin peels off with resultant scalding brown appearance.[15] Mild cases of EM are treated with oral topical steroids[20], whereas short course of systemic corticosteroids are advised in moderate to severe cases.[21] TEN and SJS are effectively treated by early therapy with high dose of systemic prednisolone for short term with proper tapering of dosages.[22, 23] Other treatment modalities include early therapy with pulse methyl prednisolone.[24]

Central giant cell granuloma

It is a benign, proliferative and destructive lesion of jaws where intralesional steroids are used. After 3 weeks bony regeneration observed radiographically.[25]

Facial pain

Bells Palsy (Idiopathic Facial Pain)

Acute disorder of Facial nerve which manifest as pain in mastoid region and paralysis of one region of face.[26] Using prednisolone, bells palsy could be effectively treated within first 7 days.[27, 28]

Trigeminal neuralgia

Unilateral lancinating facial pain involving trigeminal divisions. Steroids are found to be effective.[29]

Ramsay hunt syndrome

RHS is the reactivated VZV infection affecting geniculate ganglion. It is clinically manifested as facial paralysis with vesicular eruptions in oral cavity. Pain occurs in external auditory meatus.[15] Steroids are used as an adjunctive along with antiviral drugs in the management of facial paralysis of RHS.[30]

Post herpetic neuralgia

It is the persistent neuralgia after HZV infection.[31, 32] Corticosteroids are used in PHN to reduce pain and swelling, found to be effective in reducing the risk of recurrence. It accelerates the resolution of acute neuritis.[33]

Behcet's disease

It is a multi systemic chronic disorder comprising a triad of recurrent aphthous oral and genital ulcers, hypopyon uveitis.[15] For oral ulcers, local corticosteroids are used and in severe cases of mucocutaneous involvement, immunosuppressive therapy is used.[34]

Oral submucous fibrosis

OSMF is a potentially malignant, chronic progressive, scarring disease which is characterized by blanching of oral mucosa, burning sensation and restricted mouth opening due to fibrous bands. Local and systemic application of corticosteroids decrease the collagen formation help in reducing the severity of OSMF.[15]

Melkersson-rosenthal syndrome

This syndrome comprises a triad consisting of bells palsy, scrotal tongue, chelitis granulomatosa. Swelling, persistent tissue edema associated with this syndrome are effectively treated by systemic corticosteroids.[8]

Mucocele

Mucocele is a mucous filled cyst of traumatic origin affecting salivary gland and their ducts. Intralesional corticosteroids are used in treatment of mucocele.[35]

Lupus erythematosis

Oral lesions involve painful ulceration with crusting or bleeding. Symptomatic lesions are treated with topical, intraoral steroids. Low dose systemic prednisolone is also advised.[36, 37]

TMJ disorders

They are the major cause of facial pain; discomfort and disability.[38] Intraarticular steroid injections have been proved useful in resolution of TMJ pain, swelling and dysfunction in inflammatory diseases of TMJ disorders and are often injected along with LA.

Temporal arteritis

Inflammation of temporal artery characterised by jaw pain and claudication with resultant discomfort during mastication due to pain in temporal and masseter muscles. Condition is treated immediately by initiating the glucocorticoid therapy which suppresses the inflammation.[38, 39, 40] Oral prednisolone is the first line therapy in acute condition where the dose is slowly tapered over in weeks or months.[41]

Medical emergencies in dental office

Adrenal Crisis Prophylaxis

Primary adrenal insufficiency is disorder of adrenal gland which affects the production of cortisol. Patients with primary adrenal insufficiency must take glucocorticoid replacement therapy for lifelong. Such patients have to take supplement doses of steroids during physiological stress period as they are unable to produce glucocorticoid endogenously. Otherwise, the decreased glucocorticoid response to stress may precipitate adrenal crisis.[41]

Management made for steroid supplementation depend upon type of dental procedure.[42]

Additional steroid cover is required for

a) Minor dental procedure like scaling, filling
b) Minor surgery procedures like extraction
c) Major surgery under GA like multiple tooth extraction.

Anaphylactic Shock

It is a fatal illness with rapid onset but potentially curable if diagnosed and treated immediately.[43] Steroids may be thought of course fundamental in the management of recurrent idiopathic anaphylaxis.[44]

► Conclusion

Steroids are Dentist's immediate choice and are a common recommendation by dental textbooks in most of oral lesions, for their anti-inflammatory and immunosuppressive action. Being the double edge sword of medicine its use should be monitored carefully.

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CASE REPORT

Radix entomolaris is a clinical approach in endodontics

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Abstract

The aim of this paper is to present cases of mandibular first molars with an additional distolingual root and their management using appropriate instruments and techniques. Mandibular molars can sometimes present a variation called radix entomolaris, wherein the tooth has an extra root attached to its lingual aspect. This additional root may complicate the endodontic management of the tooth if it is misdiagnosed or maltreated. This paper reviews and reports the management of such teeth.

It is crucial to be familiar with variations in tooth/canal anatomy and characteristic features since such knowledge can aid location and negotiation of canals, as well as their subsequent management. Accurate diagnosis and careful application of clinical endodontic skill can favourably alter the prognosis of mandibular molars with this root morphology.

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► Introduction

Endodontic treatment is the elimination of bacteria from the infected root canal and the prevention of subsequent reinfection. The prevention or healing of endodontic pathology depends on a thorough chemomechanical cleansing and shaping of the root canals before a dense root canal filling with an air tight seal. Establishing adequate access for cleaning and shaping is an integral part of this procedure. In order to achieve these endodontic goals, an awareness and understanding of root canal anatomy and be aware of its anatomic diversities such as extra roots, extra canals, webs, fins, and isthmuses that may complicate the endodontic procedure. Several authors have reported about the morphology of the mandibular first molars[1, 2, 3].

For that purpose, the knowledge on the morphology of the root canal system as well as its variations may contribute for endodontic treatment success. It is known that the mandibular first molar may display several anatomical variations. Most of the first molars of the Caucasian population exhibit two canals: one mesial and one distal;[4] (Fig.1) the mesial root has two canals ending into two different apical foramens or, sometimes, these canals are united at the root ending, resulting in a single foramen. The distal root generally shows a large kidney-shape root canal; however, if the orifice is narrow and round, a second distal canal may be present.

The anatomical variations has been described in the mandibular first molar: FabraCampos[5] reported the presence of three mesial canals and Stroner[6] observed the occurrence of three distal canals. The number of roots may also vary in mandibular molars, in which a third additional root, firstly mentioned in the literature by Carabelli[7], is called radix entomolaris. This supernumerary root is located in distolingual position, mainly in the mandibular first molars. When located in the mesiobuccal surface, the anomaly is called radix paramolaris. The identification and external morphology of this anomaly containing a supernumerary lingual or buccal root, are described by Carlsen and Alexandersen[8]. Although both macrostructures are rare conditions in the Caucasian population, the knowledge on its occurrence is important.

Recently, cone-beam computed tomography (CBCT) has emerged as a useful tool to aid in the diagnosis of teeth with complex root anatomies[9,10] (Fig.2). The advantages of CBCT imaging are that it completely eliminates the superimposition of structural images outside the area of interest and provides a high-contrast resolution and data from a single computed tomography imaging process[11].

Radix Entomolaris has an occurrence of less than 5% in the Indian population, and such cases are rarely observed during routine endodontic procedures[12]. We report on one such case in this paper. Radix Entomolaris was observed in the mandibular first molar of a patient being root canal treated.

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► Case Report

A 30-year-old male patient was referred to the Department of Conservative Dentistry and Endodontics with the chief complaint of spontaneous pain in the lower right posterior tooth for 3 days. The patient reported a history of intermittent pain for the past one month. On clinical examination, there was a carious mandibular right first molar (tooth #36). The tooth was tender to percussion and palpation did not reveal any tenderness. There was no mobility, and periodontal probing was within the physiological limits. A heat test resulted in intense lingering pain. The involved tooth showed a premature response to electronic pulp stimulation. The preoperative radiograph showed disto-occlusal radiolucency with pulpal involvement and periodontal space widening relative to the mesial and distal roots with an additional distolingual root (Fig.3). Based on these findings, the tooth was diagnosed with dental caries with symptomatic irreversible pulpitis and apical periodontitis. Endodontic management was planned for the involved tooth.

The patient was diagnosed with chronic irreversible pulpitis of mandibular posterior tooth after receiving inferior alveolar nerve block and experiencing moderate to severe pain on endodontic access preparation or initial instrumentation. Careful exploration of the pulp chamber floor revealed four canal orifices (2 mesial & 2 distal), confirming the presence of additional distal canal. The pulpal tissue remnants were extirpated and working length was determined (Fig.4). The enlargement of the cervical and medium thirds through nickel-titanium rotary instruments (ProTaper Universal, sizes S1 and Sx, DENTSPLY Maillefer, Ballaigues, Switzerland) and Gates-Glidden burs (sizes 4, 3 and 2; DENTSPLY Maillefer, Ballaigues, Switzerland) was performed, resulting in more visible canals, including the radix entomolaris canal. Pulp space preparation was done followed by master cone selection (Fig. 5) and the canals were obturated with a sealer and gutta-percha (Fig.6).

► Discussion

Radix entomolaris (RE) is one of the anatomical variant found in a permanent mandibular molar and was first described by Carabelli[4]. The success of endodontic therapy depends on the root canal morphology to some extent. Accurate diagnosis of supernumerary roots like RE can contribute to the successful outcome of endodontic treatment. The presence of RE in the mandibular first molar has been extensively evaluated in the literature, but only a few studies have evaluated the morphology of mandibular second molars. Distolingually located RE varies from short conical extension to a mature root with normal length. Even though genetic factors may strongly influence the presence of RE. Morpho-anatomic changes in teeth may be divided according to the site of their occurrence; i.e., tooth crown, roots and root canals.

Fig. 1 Morphology of Radix Entomolaris from different aspects

Fig. 2 CBCT SCAN

Fig. 3 Preoperative radiograph

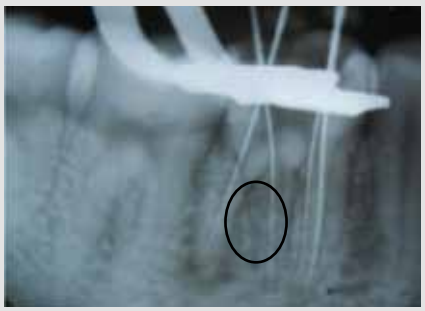

Fig. 4 Working length determination

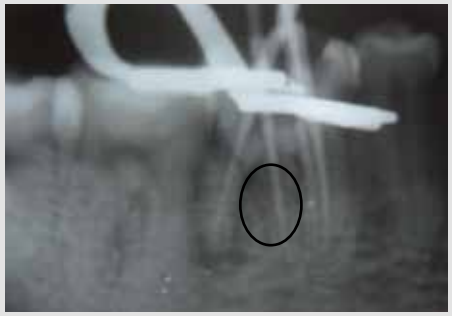

Fig. 5 Mater cone selection

Fig. 6 Postoperative radiograph

The etiology behind the formation of Radix entomolaris is still unclear. Its formation could be related to:

- External factors during odontogenesis.

- Atavistic gene penetrance (Atavism is the reappearance of a trait after several generations of absence).

After identifying RE from the preoperative radiographs, the access cavity was modified into a trapezoidal outline in order to locate the distolingual RE, following previous studies in mandibular first molars.

Based on the curvature of RE in the bucco-lingual orientation and on the work of Ribeiro et al, De Moor et al. classified the RE into three types.[13, 14]

Type I: A straight root/root canal

Type II: A root canal with initial curvature that continues as a straight root characterizes

Type III: A root canal with a curvature in the coronal third followed by a second curve from the middle third to the apical third forms.

The RE of our report has a Type I curve by the De Moor classification[15].

Some of the common problems encountered during the treatment of Radix Entomolaris are

1) Difficulty in Radiographic interpretation.

2) Inability to locate the fourth canal.

3) Modification in access cavity preparation.

4) Confusion in working length determination.

Apart from these difficulties clinicians are prone to commit some iatrogenic errors like straightening of a root canal resulting in loss of working length, ledge formation, zipping, transportation or even perforation.

Conclusion

An awareness and understanding of the presence of unusual root canal morphology contributes to the successful outcome of root canal treatment. Failure to identify and treat a Radix entomolaris can significantly affect the outcome of an endodontic treatment in mandibular molars displaying Radix entomolaris. Although angulated radiographs can play a key role in the identification and endodontic management of Radix entomolaris, the knowledge about prevalence, diagnosis, morphology, canal configuration and clinical approach to treat it would be a very important prerequisite to achieve endodontic success. The use of the operating microscope and the modification of the access cavity are also of fundamental importance for the location of the root canal orifice present in this extra root.

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Reduction of TMJ dislocation using peripheral nerve blocks

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Abstract

Dislocation of the condyle of the mandible is a common condition that may occur in an acute or chronic form. It is characterised by inability to close the mouth with or without pain.

Here a 30 year old female patient came with bilateral dislocated TMJ which could not be reduced by usual manual reduction technique due to severe muscle spasm and pain in the joint. So we used a technique in which masseteric and deep temporal nerves were anesthetized to favour easy and painless reduction as anesthesia to those nerves will reduce the muscle spasm and pain. The technique of administering these blocks are being described here.

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► Introduction

TMJ dislocation is defined as an internal derangement characterized by a condylar position anterior and superior to the articular eminence that is not self-reducing. It is a common condition that may occur in acute or chronic form.

The condition is characterised by the inability to close the mouth with protrusion of the mentalis, spasm and tension in the masticatory muscle, excessive salivation and difficulty in speech. Depression may be noted in preauricular area normally occupied by condyles. The inability to close the mouth is due to the spasm of the masticatory muscles.

It may be due to a combination of few factors:

- Capsular laxity
- Prominent bony eminence
- Muscle spasm
- irregular movement of the disc condyle complex ahead of articular eminence or
- due to spasm of temporalis muscle initiated by myotactic reflex

The etiology is varied. It is observed most frequently in patients with neurologic and connective tissue disorders, those with TMJ dysfunction, and those being treated with phenothiazines and other neuroleptic agents. Extrinsic trauma, especially that sustained while the mouth is open, may result in dislocation. Wide opening of any type as well as capsular laxity may be etiologic. It can also be seen to have an iatrogenic causes like excessive mouth opening during endoscopy and intubation. It also is said that it may occur during intrinsic trauma (Table I).

Normally, in maximum opening position the condyle is in relation to the posterior slope of the articular eminence. In case of dislocation, the condyle is not in its regular position and may be placed anterior, posterior, superior, medial or lateral to the glenoid fossa. The most common type is the anterior dislocation.

In 1832, Sir Astley Cooper proposed the principles for diagnosis and treatment of dislocation and used the term complete dislocations and imperfect dislocation for dislocation and subluxation respectively. The main difference between them is that subluxation is self limiting while dislocation requires expert assistance to reduce.

Bilateral dislocation is more common than unilateral dislocation.

Treatment depends on patient status and varies from simple reduction to surgical intervention. The latter is usually necessary only for chronic recurrent and chronic persistent dislocations and in acute forms nearly all cases are managed by hand reduction.

Different methods of reduction of acute TMJ dislocation

Treatment for acute mandibular condylar dislocation consists of manual reduction through a downward and posterior application of force to the mandible. The downward force clears the condyle of the articular eminence, and the posterior force re-seats the condyle within the glenoid fossa. It is achieved by making the patient sit down and the clinician standing in front or at 11'o clock position. Then pressing the thumb down

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Table 1: Etiology of TMJ dislocation

Intrinsic trauma	Yawning Vomiting Seizure disorder
Extrinsic trauma	Flexion and extension of mandible
Connective tissue disorders	Ehler- Danlos syndrome Marfans syndrome
Psychogenic factors	Habitual dislocation Tardive dyskinesia
Drug induced	Phenothiazines and certain neuroleptics
Iatrogenic	During laryngoscopy, bronchoscopy Intubation to administer General anesthesia Dental extraction and forceful hyperextensions
Miscellaneous	Internal derangement Intra articular obstructions Occlusal discrepancies

on the occlusal surface of lower molar teeth. At the same time elevating the chin with the fingers and pushing the entire mandible posteriorly.

Depending on the amount of associated muscle spasm and pain experienced by the patient along with patient co operation, it can be reduced by the operator as follows:

1. Manipulation without any form of anesthesia.

2. Manipulation with local anesthesia

3. Manipulation under general anesthesia / sedation with muscle relaxants.

A modification of this method was described by Nilaton and this is achieved by placing the thumb intraorally on external oblique ridge in the mandibular molar region and the finger extraorally under the lower border of mandible the thumb is protected in this method from accidental biting of the patient while reducing the dislocation and also prevents disease transfer like hepatitis, AIDS, syphilis etc. This technique is thus known as Nilaton's technique.

But two major factors hamper this procedure: elevator muscular spasm with resistance of manual distraction of the head of the mandibular condyle from the articular eminence,

Fig. 1&2 Pre operative photograph showing dislocated TMJ

Fig. 3 Administration of Masseteric Nerve block

Fig. 4 Administration of Masseteric Nerve block

Fig. 5 Administration of Deep Temporal Nerve block

and pain in and around the joint capsule. If the dislocation is of long duration, pain and spasm of the elevator muscles will occur. In the past, various methods have been tried to overcome these problems but all these methods have its own limitations. In acute cases this can generally be accomplished without the use of anesthesia. In cases of prolonged or chronic dislocation, the use of muscle relaxants and analgesics may be required. If reduction cannot be thus achieved, local or general anesthesia may be required.

Another similar method is by inducing gag reflex to the patient and when patient gags condyle may be repositioned back into the glenoid fossa. One commonly used method is asking the patient to open widely, or to open against resistance.

Through reciprocal inhibition, the muscle tone of the elevator muscles is reduced, and manual reduction (described earlier) can be attempted concurrently.

Another method is the use of muscle relaxants. But the problem with the use of muscle relaxants are that when taken orally the onset of its action itself may take more than 1 hour. Intravenous muscle relaxants are also available for quicker onset but intravenous administration is not advisable in a dental office setup as it will lack the necessary equipments required to monitor the patient during administration.

Similarly various sclerosing agents like rivanol (aethacridine), 5%sodium psylliate (sylnasol), sodium morrhuate, 3% sodium tetradecyl sulfate has been described in the past. However, caustic agents can result in progressive damage to other joint structures, and multiple reports of misapplications and complications have resulted in the abandonment of this technique.

Use of autologous blood injection into the joint to prevent frequent dislocations has been reported as anon surgical method for frequent dislocation in older individual. Blood injected into the upper joint space and around the joint would lead to scarring and fibrosis restricting the mandibular movements. The use of this technique is still debatable in case of younger patient.

If all this techniques fail, we can try to reduce the dislocation under general anesthesia. If this also fails we will have to proceed to surgical methods like temporal myotomy or midline mandibulotomy or eminectomy etc can be done.

After reduction the mandible should be immobilized for several days to allow for capsular repair, muscle rest, and prevention of recurrence.

The main aim of this case report is to familiarize a new method of reduction of dislocated mandible by administering masseteric and deep temporal nerve blocks. These are peripheral blocks and are unique in that they reduce both masseter and temporalis muscle pain and spasms, and they do so quickly and efficiently. These blocks drastically improves the chance of reduction and also reduces the need of administration of general anesthesia or need for surgical intervention. The faster we address the dislocation easier it will be to reduce. If condyle has been dislocated for long then it will be difficult to reduce as pain and muscle spasm will increase. If the procedure is further delayed, fibrosis begins which adds on to the difficulty to reduce.

► Case report

A 30 year old female patient reported to the Department of OMFS of M.E.S Dental College and Hospital with a complaint of inability to close her mouth for the past 1 day. She had similar 2 episodes within past 2 years. On previous occasions a private dental practitioner was able to reduce it, but this time the dentist was not able to reduce the dislocation. So she came to Dept of OMFS for further management. (Fig. 1&2)

The first attempt to manually reduce the bilateral TMJ dislocation failed because the process of applying intraoral downward and posterior pressure triggered intolerable pain and also due to muscle spasm.

► Discussion

Then our next attempt was made under local anesthesia by giving peripheral blocks and also local infiltration in TMJ capsule. Peripheral nerve blocks were given to masseteric and deep temporal nerves to reduce the muscle spasm and pain in the corresponding muscles.

Lateral joint infiltration was given to reduce the pain in the TMJ capsular ligaments. A 26 gauge needle was used to inject 0.6 to 0.8 ml of 2% lignocaine hydrochloride with 1:100000 adrenaline in both right and left TMJ capsules that is directly into the glenoid fossa to achieve anesthesia of TMJ capsules.

Another 0.6 to 0.8 ml of 2% lignocaine hydrochloride with 1:100000 adrenaline was used for masseteric and deep temporal nerves. These techniques are described shortly.

Masseteric and deep temporal nerve blocks are relatively simple and safe injections that can aid in reducing pain and spasm in the masseter and temporalis muscles, caused by a dislocated mandibular condyle. These have practically very less complications associated with this. Both sensory and motor nerve branches are blocked. This aids reduction in 2 ways:

- it relaxes the spasm, and
- it lessens the pain.

As soon as pain starts to reduce the associated muscle spasm also slowly comes down because pain causes reflexive muscle guarding or stiffening.

Masseteric nerve block

The masseteric nerve penetrates the masseter after it passes through the mandibular notch. The technique used for this injection is as follows:

Step 1: The width of the ramus is visualized by grasping the anterior and posterior borders with the thumb and middle finger.

Step 2: The index finger from the same hand then locates the zygomatic arch at a point halfway between the thumb and the middle finger.

Step 3: The index finger then moves inferiorly until it reaches the mandibular notch.

Step 4: The needle is introduced posterior to the index finger, while the practitioner attempts to hit the neck of the condyle.(Fig. 3) For this patient, who has a petite build, the needle was advanced approximately 8 mm.

Step 5: The 0.6 ml of anesthetic solution was deposited at this point after aspiration.

The mandibular notch is the ideal point at which the anesthetic can be delivered, to achieve maximum anesthetic effect on the masseter muscle

Deep temporal nerve block is given by first palpating the anterior part of temporalis muscle. The target area of the injection is the deep temporal nerves that course along the surface close to the sphenoid bone.

Step 1: Anterior part of temporalis muscle is palpated in the depression just above the zygomatic bone. Deeper to this muscle lies the greater wing of sphenoid bone.

Step 2: Then needle is directed until it hits the sphenoid bone and 0.6 ml anesthetic solution is deposited without withdrawing the needle from bone(Fig.4). This will anesthetise the deep temporal nerve.

Aspiration was done during injection of anesthetic solution in all sites to avoid intravenous administration of anesthetic. The anesthesia takes effect within approximately 2 to 5 min. After injection, patient felt less pain when tried to reduce in the same manner as tried before and reduction was successfully accomplished by applying pressure to mandible in a downward and posterior direction relatively quickly. Muscle spasm and contraction also has significantly reduced after administration of anesthetic solution.

Then patient was placed on Barton's bandage (Fig.5) and jaw movements were totally restricted for 1 week. After one week, three IMF screws were placed each in the upper and lower arch and elastics were placed to limit the mouth opening to a restricted amount. And patient was put on soft diet and more of semi-solid diet. Patient was put on elastics for one month.

► Conclusion

Even though, various surgical methods have been tried for recurrent and chronic cases, all cases irrespective of the duration of occurrence should be initially reduced manually when the muscles are in the state of relaxation. This insures the quick painless reduction of the condyle. We describe here a new technique in which masseteric nerve block, deep temporal nerve block, and lateral joint infiltration are used to reduce pain and spasms during manual reduction of a dislocated mandible. This technique is quick, safe, easy to implement and requires no special apparatus or monitoring devices.

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Post cementation sensitivity in vital abutments of fixed partial dentures

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Abstract

Fabrication of fixed partial denture usually requires preparation of vital teeth. Undesirable threats to integrity of pulp exist during preparation of teeth. Because of sectioning of dentinal tubules, a certain degree of pulpal trauma is inevitable during tooth preparation. Each step in the fabrication of fixed partial denture is a source of potential insult to the pulp. Moreover restorative materials may also be irritating to pulp leading to sensitivity. Pulpal trauma during tooth preparation leads to sensitivity ranging from mild to severe. Completely avoiding sensitivity is impossible. Three percentage to twenty-five percentage pulpal necrosis rate as a result of tooth preparation for complete coverage restorations is well documented. There are various treatment options available for the management of this condition. This paper reviews the factors responsible for such sensitivity and discuss the precautions to avoid it at various stages of fabrication of FPDs.

Key words: Post cementation sensitivity, Dentin hypersensitivity, Abutment sensitivity, Fixed partial dentures.

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Introduction

Prosthodontic procedures required for the fabrication of fixed partial denture on vital tooth have the potential to induce postoperative discomfort, dentinal hypersensitivity, and subsequent pulpal irritation[1]. Dentin hypersensitivity is a "short, sharp pain arising from exposed dentin in response to stimuli typically thermal, evaporative, tactile, osmotic or chemical and which cannot be ascribed to any other form of dental defect or pathology." The first part of the definition provides a clinical description of dentin hypersensitivity, whereas the second part aids in its differential diagnosis[2]. Post cementation sensitivity rates have varied widely in clinical studies ranging from a low of 3% to a high of 34%[1]. However, the incidence of this post cementation complication is underestimated by most clinicians[3].

There are many factors considered to be associated with the occurrence of postcementation hypersensitivity. Overheating and desiccation during tooth preparation could cause pulp damage[4,5] and might explain the hypersensitivity associated with the use of glass ionomers[6]. Pupal damage beneath restorations might also be caused by the infiltration of bacteria that were either left behind or gained access to the dentin due to microleakage[7]. The amount of tooth reduction was considered to be a very important factor affecting postcementation sensitivity. Sixty percent of teeth prepared to within 0.5 mm of the pulp had a severe pulpal reaction, whereas only 5% of cavities with a remaining dentinal thickness greater than 1 mm had a severe reaction[8].

Mechanism of Dentin Sensitivity

Three main mechanisms of dentin sensitivity are proposed[10]: (Fig-1).

a. Direct Innervation (DI) Theory
b. Odontoblast Receptor (OR) Theory
c. Fluid Movement/Hydrodynamic Theory

Regarding the first theory(DI) it has been reported that the nerve's endings enters dentin through pulp and extends to DEJ and the mechanical stimuli directly transmit the pain. However, there is little evidence to prove this theory; firstly because there is little evidence that can support the existence of nerve in the superficial dentin where dentin has the most sensitivity; and secondly because the plexus of Rashkov do not become mature until complete tooth eruption. However, the newly developed teeth can be sensitive too[9].

In the OR theory, odontoblasts act as receptors of pain and transmit signals to the pulpal nerves. But this theory has also been rejected since the cellular matrix of odontoblasts is not capable of exciting and producing neural

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impulses. Furthermore, no synopsis has been found between odontoblasts and pulpal nerves[10].

The principal mechanism underlying dentinal hypersensitivity is explained by the hydrodynamic theory of Brännström[11]. According to this theory, a stimulus such as cold or friction on the dentinal surface, on which the dentinal tubules are open, will create a fluid flow in the dentinal tubule that can cause pain. The treatment strategy for dentinal hypersensitivity is based on either interfering with the sensitivity of the mechanoreceptors or occluding the dentinal tubules[12].

The Etiology of Dentinal and Pulpal Pain

Bacterial infection

It has been shown in numerous experiments that infection is the main cause of pulpal damage under restorations. Even in shallow cavities, bacteria growing on the cavity walls can produce pulpal injury. The smear layer is an another important source of infection in connection with restorations, cavities, and crowns. This layer is produced during the final removal of dentin and it usually contains entrapped microbes that may survive the restorative procedure.

Mechanical trauma

In addition to infection, both the trauma produced by frictional heat during preparation and excessive stress associated with malocclusion may interfere with the flow of blood to the pulp, increase sensory nerve excitability, and produce hemorrhage and local necrosis.

Flow of dentineal fluid

The application of blasts of compressed air to dentin produced pain, presumably resulting from the activation of the low threshold myelinated nerve fibers (A fibers) that are responsible for dentinal sensitivity. A short air blast is capable of removing enough fluid from the dentinal tubules to activate capillary forces that produce a rapid outward flow of dentinal fluid. A rapid outward shift of only 2µm is known to activate intradental A fibers. Possibly the slight sensitivity to cold six weeks after final crown cementation was evidence of a fluid gap nearest the dentin somewhere under the crown or at least tubules opened to the pulp in a gap. Contraction of the fluid produced a compensatory outward flow of fluid from the tubules, similar to what happens when an air blast, mechanical probing, or sugar is applied to the dentin.

Cold may produce sharp pain in connection with a fluid gap under a gold restoration or crown. This is due to the rapid transmission of cold through gold. Pain may occur irrespective of whether there is a communication with the oral cavity. Cold-induced contraction of fluid in the gap evokes a compensatory rapid outward flow of fluid in the dentinal tubules and thus a sharp pain.

Masticatory pressure may alter the volume of fluid in the gap nearest the dentin with the same results. Either an increase or a decrease in volume may result in activation of the intradental A fibers as well as the C fibers. In addition, fluid gaps are often accompanied by proliferating microbes whose toxic products diffuse to the pulp and produce inflammation and/or necrosis. This results in increased excitability of sensory nerves (hyperalgesia)[13].

Dentin sensitivity caused by luting cement

Glass Ionomer luting cement which is one of the most commonly used permanent luting agents for cast restorations has a comparatively low initial setting pH at the time of placement and this has been implicated as a cause of post cementation sensitivity when the prosthesis is being cemented on teeth with intact pulp vitality[14]. Resin based luting cements exhibit lower solubility in comparison to conventional glass Ionomer cements and their pH at placement is also higher as compared to glass Ionomer cements[15]. However resin based luting cements have also been reported to cause post operative sensitivity because their main shortcoming is marginal defects and gaps caused by polymerization shrinkage during placement[3].

Incidence of dentin sensitivity following tooth preparation among men and women

Epidemiological studies and pain and sensitivity research have shown that women and men experience and cope with pain and sensitivity differently. It was observed that women reported more dentin hypersensitivity than men before and after tooth preparation[16].

How can sensitivity and pulpal irritation be prevented?

Various attempts have been made to reduce postoperative sensitivity, particularly in the choice of operative technique and the copious use of water cooling during tooth reduction. Nevertheless, replacing a thermally insulating substance with a conducting metal can make prevention of thermal irritation a challenge, particularly after the pulpal tissues have suffered the insult of tooth preparation.

The pulp will react favourably to a more rigid provisional crown or, at the very least, a rigid cement, such as zinc phosphate or polycarboxylate cement. This could prove effective, for instance, in a molar tooth in which one root canal is infected and the others are more or less healthy, as indicated by a positive vitality test. A perfect seal may result in sensitivity and even toothache, possibly because the outward movement of fluid has been blocked. It is better that this

occur during the placement of a provisional crown than after permanent cementation.

The crown must completely cover the cervical dentin without disturbing the periodontal tissues. This is an important measure. Superficial exposure of dentin for 1 or 2 weeks will result in bacterial invasion of the dentin at least half way to the pulp.

Prior to permanent cementation, the occlusion should be checked. A crown that is just a little too high in some location may result in injury to the tooth's blood and nerve supply. This may lead to a poor cellular response, inadequate blood supply, and hypersensitivity.

All of the lining must be removed from the dentin before final cementation to obtain a good mechanical bonding and interlocking. Next, the dentin is cleaned with a brush or rubber cup using low speed and pumice in a suitable solution.

Luting cements are not irritating, even when placed very near the pulp. To prevent the formation of voids and air or fluid spaces nearest the dentin, the cement should be brushed on the dentin and not only to the inside of the crown. The consequences of fluid spaces near the dentin are known. Moreover, communication to the oral cavity is not necessary to elicit microbial complications and hypersensitivity. Living bacteria may be under the surface of the dentin, and any fluid gap may lead to thermal sensitivity.

The dentin should be kept wet until the time of cementation. Brannstorm in his study has found that normal evaporation from dentin is sufficient to activate capillary forces and produce a rapid outward flow of fluid, resulting in pain that lasts for several minutes and the loss of primary odontoblasts. However, this will not create any problems for the pulp; rather it may have a positive effect, as new cells may produce irregular, reparative dentin that blocks the pulpal ends of the tubules.

Having the patient bite on a cotton roll or pellet while the cement is setting should not cause an inward movement of tubule contents, which may give rise to pain and other pulpal problems[13].

Effect of Immediate Dentin Sealing on Postoperative Sensitivity

Immediate dentin sealing (IDS) is a new approach in which the dentin is sealed immediately after tooth preparation and prior to impression taking. When the dentin was sealed with a three-step etch-and-rinse dentin bonding agent (Optibond, Kerr) before impression taking, the continuity between the hybrid layer and dentin appeared with less gap formation under scanning electron microscopy. The results indicate that dentin treated with the IDS technique could potentially better tolerate long-term exposure to thermal and functional loads compared to delayed dentin sealing. Eighteen patients treated with the IDS technique experienced improved comfort during the provisional restoration stage, limited need for anesthesia during insertion of the definitive restoration, and reduced postoperative sensitivity. Jun HU did a study to investigate the effect of Prime & Bond adhesive on preventing postcementation hypersensitivity of vital abutment teeth restored with a full-coverage restoration using the immediate dentin sealing (IDS) technique and he concluded that preventive treatment with Prime & Bond using the IDS technique can significantly reduce postcementation hypersensitivity[12].

Effect of dentin desensitizers on postoperative sensitivity

Use of dentin desensitizing agents for reducing sensitivity after crown preparation or before cementation has been shown to be an effective clinical treatment. Desensitizers obturate exposed dentin tubules with a resinous material blocking tubule fluid flow, and reduce the sensation of pain. With the use of a thin layer of resin-based dentin desensitizing agent, tubules can remain blocked, and the effect of external agents on dentin sensitivity can be greatly reduced. In a study Nantiya H. Yi et al, concluded that the application of a polymerizable dentin desensitizer significantly enhanced crown retention values when a resin cement or a resin-modified glass ionomer cement was used, and use of a dentin desensitizer when cementing with zinc phosphate significantly reduced crown retention values[17].

► Discussion

Postoperative sensitivity after cementation of fixed prosthesis is a common complaint especially in cases where the abutments have vital pulp[13]. A study carried out by Rosenstiel et al[18] showed that the incidence of this postoperative complication is usually underestimated by most dentists. When fixed partial dentures are used to replace missing single tooth especially in young patients most of the time the abutment teeth are vital. In these clinical situations the dentist has to make the critical decision whether to carry out elective endodontic treatment for the vital abutments or to try and preserve pulp vitality[12,19].

► Conclusion

The following precautions are recommended during precementation procedures to reduce the risk of sensitivity and inflammatory response in the pulp: (1) The provisional crown should be well fitting, covering cervical dentin but not impinging on the periodontal tissues. The permanent crown should be cemented as soon as possible; (2) The superficial smear layer should be removed and the dentinal surface should be treated with an antibacterial solution before the provisional

crown is placed; (3) To decrease dentinal permeability under the provisional crown, the dentinal surface should be covered with a liner that can be easily removed before final cementation; (4) To ensure optimal micromechanical bonding, the dentinal surface should be thoroughly cleaned, and the dentin should be kept moist until cementation; and (5) The occlusion should be carefully checked before cementation of the crown. When these recommendations are followed, patients have seldom complained of postoperative sensitivity during and after final cementation.

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Smart materials in dentistry

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Abstract

There is no single material in dentistry that can fulfill all the requirements of an ideal material. As the quest for an ideal dental material continues, new generation materials get introduced. Smart materials are materials that have properties which may be altered in a controlled fashion by stimuli such as stress, temperature, moisture, pH, and electric or magnetic fields. These properties have beneficial applications in various fields including dentistry. Smart materials started revolutionizing clinical dentistry with the introduction of restorative materials such as smart composites, smart ceramics, resin modified glass ionomer, amorphous calcium phosphate releasing pit and fissure sealants, orthodontic shape memory alloys, smart impression materials etc. This article attempts to highlight the uses and advantages of smart materials inured in current dental practice.

Key words: bioresponsive materials, smart dental materials, shape memory alloys, smart ceramics.

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Introduction

Materials science is not what it used to be. There was little new in the field of dental materials in the first half of 20th century. Traditionally materials used in dentistry were designed to be passive and inert, and they were often judged on their ability to survive without interacting with the oral environment. A change in the scenario was noticed by the beginning of 1960's. Since then materials that are bioactive rather than passive or inert in the mouth began to be more common. Currently materials used in dentistry can be grouped as bioinert (passive), bioactive, and bioresponsive or smart materials based on their interactions with the environment[1].

Smart materials have been around for many years and they have found a large number of applications. The use of the terms "smart" and "intelligent" to describe materials and systems came from the United States of America and started in the 1980s despite the fact that some of these so-called smart materials had been around for decades. Perhaps the first inclination that an "active" rather than "passive" material could be attractive in dentistry was the realization of the benefit of fluoride release from materials which both reflected and permitted a change in material philosophy[2]. Since then dentistry along with the material science is undergoing great evolution and the quest for newer smart materials with more acute recognition, discrimination and reaction capabilities is heading to the goal[3]. This article attempts to throw light into the use and advantages of current smart materials inured in the dental practice.

Nature of Smart Materials

By definition, smart materials includes the materials that have an inherent capability to sense and react according to the changes in the environment. They can respond to the stimuli and environmental changes by activating their functions accordingly and hence they are called as 'responsive materials'. These materials have properties that can be altered in a controlled fashion by stimuli such as stress, temperature, moisture, pH, electric, or magnetic fields etc. A key feature of smart behavior includes the ability of these materials to return to the original state after the stimulus has been removed[4].

The start of usage of smart materials were marked earlier by the magnetostrictive technologies wherein nickel was used as a sonar source during World War I to find German U-boats by the Allied forces[5]. Existing smart materials takes advantages of a variety of properties including piezoelectricity, thermal responses, pH sensitivity etc. Piezoelectric materials can produce a voltage when a stress is applied or vice versa. So structures made from these products can be made to change shape or dimensions when a voltage is applied. Likewise, a change in shape can be used to generate a voltage. Thermo-responsive materials such as shape memory alloys or shape memory polymers, adopt different shapes at different temperatures due to the marked and controlled changes in structure. Magnetic shape memory alloys can change their shape in response to a change in magnetic field, and pH-sensitive polymers are materials

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which swell/collapse when the pH of the surrounding media changes. Other materials show various other effects like change in color in response to changes in pH, light, applied voltage etc[6].

Many types of smart behavior are related to the ability of a gel structure to absorb or release solvent rapidly in response to a stimulus such as temperature, change in pH etc. Structures like gels or salts may be bound either strongly or loosely to solvent like water which is the key solvent in oral environment and can absorb or release this at different rates. Some types of smart behavior may also be defined by any species such as fluoride ions dissolved in the water and which are capable of undergoing reversible interactions with the gel, salt or oral structures. Depending upon the nature of the water and how strongly it is bound, the observed changes may be dependent upon the dimensions of the structures[2].

Classification of Smart Materials

1. Passive smart materials: that respond to external change without external control. Passively smart materials posses self-repairing or stand-by characteristics.
2. Active smart materials: that utilize a feedback loop to enable them to function like a cognitive response through an actuator circuit.
3. Very smart materials: that sense a change in the environment and respond (e.g., by altering one or more of their property coefficients, tuning their sensing, or actuation capabilities).
4. Intelligent materials: that integrate the sensing and actuation functions with the control system[5,7,8].

Smart Materials in Dentistry

Shape Memory Alloys:

Shape memory alloys have come into wide use in dentistry because of their exceptional advantageous properties like superelasticity, shape memory, resistance to fatigue and wear, and biocompatibility. Nitinol, an almost equiatomic nickel-titanium alloy is of particular interest in dentistry. It was discovered in 1959 by William J. Buehler of the U.S. Naval Ordinance Laboratory, and its subsequent development was done by Buehler and Frederick E. Wang[9]. In dentistry it is having applications mainly in the field of orthodontics and endodontics.

The smart behavior of nickel-titanium (NiTi) alloys is because of two unique features termed "superelasticity" and "shape memory." This "smart" property is the result of the substance's ability to undergo a phase change—a kind of atomic ballet in which atoms in the solid subtly shift their positions in response to a stimulus like a temperature change or application of mechanical stress[1].

The crystal structure of NiTi alloy at higher temperature ranges is a hexagonal lattice and is referred to as austenite or parent phase. At lower temperatures the alloy exists in martensite phase that forms a structure similar to that of a closely packed body centered cubic lattice. This lattice organization can be altered either by stress or temperature. During this transformation the alloy exhibit dramatic changes in its physical properties like modulus of elasticity (stiffness), yield strength, and elastic resistivity and give rise to the shape memory and super elastic characteristics.

Shape memory effect is the ability of the NiTi alloy to come back to its original form without showing any permanent deformation. When the alloy is cooled below a particular temperature range called 'transformation temperature', it has a very low yield strength and can be deformed quite easily into any new shape, which it will retain. However, when the material is heated above its transformation temperature, it undergoes a change in crystal structure which causes it to return to its original shape (Fig. 1).

In orthodontics, these materials are used in archwires for the alignment of teeth, during the initial stages of treatment, when large deflection is necessary. They also have a low modulus of elasticity (E) and excellent springback when compared to other alloys. They can be drawn into a resilient, rectangular wire that allow to accomplish simultaneous rotation, levelling, tipping and torqueing movements early in the treatment. The main advantage of the Nitinol wire is that fewer wires need to be used in selected cases[10]. They also offer the advantage of reduced treatment time and cost[11,12].

A stress-induced martensitic transformation occurs from the austenitic to the martensitic phase within the alloy. This is accompanied by a change in shape, together with volume and density changes. This ability of resisting stress without permanent deformation, going back to initial lattice form, is called superelasticity (Fig. 2)

Nitinol endodontic files for root canal procedures offer superior flexibility, durability, and torqueability as compared to stainless steel files. Nitinol normally exists in an austenitic crystalline phase that transforms to a martensitic structure on stressing at a constant temperature. In this martensitic phase, only a light force is required for bending. If the stress is released, the structure recovers to an austenitic phase and its original shape. This phenomenon is called stress-induced thermoelastic transformation. This offers the fundamental advantage of ease of use which increases the patient comfort. Super-elastic files can maintain close contour to the canal shape allowing more centered canal preparations and less chance of canal transportations.

Nitinol alloys are also finding applications in the implant dentistry for fabrication of endosseous blade type implants, in the field of oral surgery for the construction of NiTi alloy bone plates to act as alveolar bracing and counteract the effects of mastication during bony repair in the treatment of transverse mandibular fractures; and in the field of prosthodontics for construction of dental prostheses like inlays, crowns, partial denture clasps etc[7,13].

Smart Composites

Stimuli responsive-smart dental composites may be quite useful with various applications including the "release-on-command" of antimicrobial compounds or remineralizing elements and fluoride to fight microbes or secondary caries respectively[14,15]. Composites containing Amorphous calcium phosphate (ACP) are generally considered as smart composites. Amorphous calcium phosphate, a postulated precursor of biological hydroxyapatite is one of the most soluble form of calcium phosphates which can readily be converted into crystalline hydroxyapatite. Smart composites offer the advantages of excellent biocompatibility and sustained release of calcium (Ca) and phosphate (PO_4) ions into the stimulated saliva. Due to their bioactive nature and extended time release of calcium and phosphate, they possess high prophylactic value in preventing caries by highly reducing the demineralization and promoting the remineralization of tooth[4,6].

Microbes producing acids can lower the pH resulting in removal of hydroxyapatite from the tooth. ACP is stable at neutral and at a high pH, but at a low pH (5.8 or less) it get converted into crystalline hydroxyapatite and get precipitated thus replacing the lost hydroxyapatite. Also composites having alkaline glass fillers with fluoride and calcium release can prevent demineralization contiguous to the restorations. They can also reduce the growth of cariogenic bacteria by the buffering and neutralizing action on the acids produced by the microbes[16].

Nanotechnologic advances have also been applied in dental composites to generate newer products with improved properties. These products were able to address the main drawbacks of secondary caries and bulk restoration fracture associated with the conventional composites. Recently novel products has been introduced wherein nano DCPA (dicalcium phosphate anhydrous) and TTCP (tetra calcium phosphate) fillers and whiskers have been introduced which increased the strength of the material without compromising the Ca and PO_4 releasing property. These newer composites are "smart" as they can increase the Ca and PO_4 release dramatically while the pH is reduced from neutral to a cariogenic pH of 4, when these ions are most needed to inhibit caries[17,18,19,20].

Smart Ceramics

With the introduction of smart ceramics by CERCON in 1995, the concept of "all ceramic teeth bridge" was materialized. Ceramics, though available since a long time to fabricate crowns and bridges, have been used with a metal substructure as porcelain fused metal (PFM) crowns. This metal substructure reduces the aesthetic quality of the restoration. The introduction of high tech ceramic, zirconia has allowed the fabrication of crowns and bridges without the metal substructure. Zirconia is a polycrystalline ceramic in which all of the atoms are regularly arranged in crystalline arrays. This arrangement pose greater resistance to the development and propagation of crack through it compared to other forms of ceramics and hence zirconia are tougher and stronger than alumina or other ceramics[1,21,22].

The fracture toughness of the most interesting polycrystalline ceramic now available for dentistry, the transformation toughened zirconia, involves an additional mechanism not found in other polycrystalline ceramics. The mechanism termed as transformation toughening results in the smart behavior of the material (Fig. 3). At firing temperature, zirconia is tetragonal and at room temperature it is in monoclinic phase, with a unit cell of monoclinic occupying about 4.4% more volume than when tetragonal. Zirconia is stabilized in tetragonal phase at room temperature by the addition of yittrium or cerium. But the mineral is only metastable processing the trapped energy within it. At the time

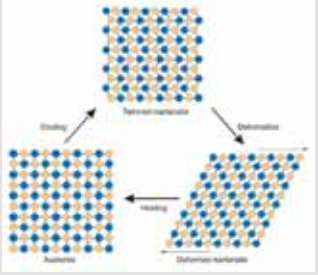

Fig. 1 Diagrammatic representation of the shape memory effect

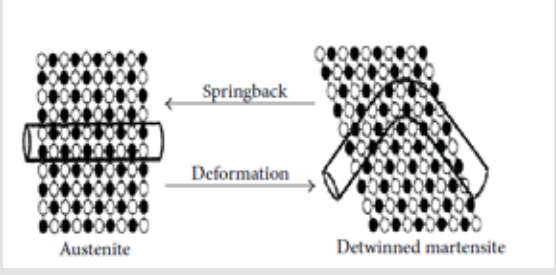

Fig. 2 Diagrammatic representation of the superelasticity effect

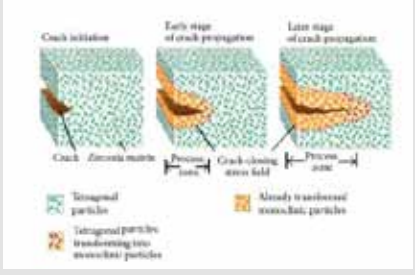

Fig. 3 Phase transition in zirconia.

of crack propagation this trapped energy is released whereby causing the phase transition of zirconia from tetragonal to monoclinic phase. The volume change associated with this phase transition reduces the local stress around the crack tip ultimately preventing the crack propagation[24,25].

Newer all ceramic systems take advantage of the strength, toughness, reliability, and biocompatibility of zirconia and they have been increasingly used in all ceramic teeth frameworks, implant supported crowns and fixed dental prostheses, root canal posts, implant abutments and dental implants[26,27,28].

Smart Glass Ionomers

Oral cavity is subjected to a wide range of temperature fluctuations due to the consumption of hot and cold food and fluids and hence the restorative materials placed in the oral cavity are subjected to thermal changes. The coefficient of thermal expansion (CTE) is the property used to describe the dimensional changes of a substance in response to a thermal change. It is desirable to have a CTE value for the restorative material which is comparable with that of the tooth structure in order to reduce the chances of microleakage, stress concentration, and related complications[29,30,31].

Most of the materials respond to a temperature change in a predictable manner. This includes the composite restorative materials which show an expansion on heating and contraction on cooling in both wet and dry conditions[32]. While dealing with the glass ionomer cements, an interesting behavior has been noticed. For glass-ionomers, little or no change in dimension was observed when heating and cooling between 20^0C and 50^0C in wet conditions. In dry conditions the material showed a marked contraction when heated above 50^0C. The behavior is explained by the mechanism of fluid flow within the material and the fluid exchange with the environment. In wet conditions the expansion on heating is compensated by the fluid flow to the surface of the material to cause a balancing dimensional change which is reversed on cooling. In dry conditions the rapid loss of fluid from the material causes the contraction on heating. This behaviour is akin to that of human dentine where very little dimensional change is observed on heating in wet conditions and a marked contraction is noted in dry conditions. Hence, the glass-ionomer materials is said to be mimicking the human dentine through a type of smart behavior. The formation of reservoirs is one important feature which allows the water to be retained in and transported through the cement structure. This is possible due to the presence of porosity in the material.

The other aspect of smart behavior of these materials is the fluoride releasing property and its recharging capacity. The presence of porosity provides a solution for the rapid loss of fluoride releasing property of glass ionomers after the initial burst. It is shown that fluoride released from these materials can be recharged if it is baked in a solution containing higher concentrations of fluoride as may occur in tooth paste or mouth rinse which allows a more sustained release of fluorides at mouth temperature. It is also shown that this recharging phenomenon is temperature dependent and a more rapid recharging could be obtained with the use of warm fluoride containing solutions[33].

The most common disadvantages associated with the usage of glass ionomers are the limited durability and longevity due to their brittleness and solubility. The introduction of resin modified glass ionomers, compomers, and giomers resulted in materials with an optimum combination of smart interactions and longevity[34].

Smart Impression Materials

The impression is considered as the foundation and blueprint for the success of a restoration. An accurate final impression is the result of properly integrating multiple interrelated steps during the preparation and impression taking process. The selection of an appropriate impression material is equally important. The most significant physical characteristics that are to be considered in selecting these materials are viscosity, hydrophilicity, setting time, tear resistance, elastic recovery, and dimensional stability[35,36,37]. Smart impression materials include a group of newly introduced materials that are exhibiting various advantageous properties over the conventional ones like increased hydrophilicity to get void free impressions, shape memory during elastic recovery and snap-set behavior to resist distortion, and low viscosity ensuring better flow of the material[5].

Smart Fibres for Laser Dentistry

Hollow-core photonic-crystal fibres (PCFs) for the delivery of high-fluence laser radiation capable of ablating tooth enamel have been developed. Sequences of picosecond pulses of Nd:YAG-laser radiation are transmitted through a hollow-core photonic-crystal fibre with a core diameter of approximately 14μm and are focused on a tooth surface to ablate dental tissue. The hollow-core PCF is shown to support the single-fundamental-mode regime for 1.06μm laser radiation, serving as a spatial filter and allowing the laser beam quality to be substantially improved. The same fiber is used to transmit emission from plasmas produced by laser pulses on the tooth surface in the backward direction for detection and optical diagnostics[4].

► Conclusion

In 1996 Friend[6] stated "The development of true smart materials at the atomic scale is still some way off, although the

enabling technologies are under development. These require novel aspects of nanotechnology (technologies associated with materials and processes at the nanometer scale, 10^{-9}m) and the newly developing science of shape chemistry". This statement still holds true to an extent today. Eventhough a number of materials have been identified exhibiting some smart characteristics, most of these behaviors results by chance rather than by design. However, with the understanding of the potential benefits of smart behavior researches are targeted in the designing and development of materials that can behave smart in the environment they are meant for. Being apprised with the evolving technologies it is hoped that in the near future, development of dental materials with controlled structure and properties will be a reality and with numerous applications these materials have been put to, no doubt that "smart materials" hold a real good promise for the future.

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SHED – the future of regenerative dentistry

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Abstract

Tissue engineering concept is an emerging biological technology in clinical dentistry. It is a novel and highly developing field of research. It is based on harvesting the progenitor or stem cells. Stem cells can self-renew and differentiate into different cell types, thus providing new strategies to regenerate missing tissues and treat diseases. The stem cell technology are implicated in dentistry for alveolar bone augmentation, regeneration of pulp, dentin, enamel, tooth root, or even entire tooth regeneration. Tissue engineering which facilitates solid alveolar ridge augmentation are receiving considerable attention in the field of dentistry because of the growing requirement for esthetic and functional reconstruction by dental implant treatments. Stem cells can be harvested from umbilical cord blood cells, bone marrow and various dental tissues. Out of the various stem cells of dental origin, researchers are focussing more on Stem cells from Human Exfoliated Deciduous teeth (SHED) because of its easy availability and low cost. Moreover, "SHED banking" is already on the market for possible future use in regenerative therapies. Thus, clinicians as well as researchers should understand the basic concepts of SHED and its implications in the future of dentistry.

Keywords: Tissue engineering, Stem cells, SHED, Tooth banking

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Introduction

The concept underlying tissue engineering was first proposed in the United States in the mid-1980s to reduce the donor scarcity for organ transplantation. The key ingredient of tissue engineering are the stem cells, growth factors, and scaffolds. The term stem cell was projected by Alexander Maksimov, a Russian histologist, during 1908 in the Congress of Hematologic Society at Berlin. Stem cells are clonogenic cells responsible for normal tissue renewal as well as healing, and regeneration after injuries. The dual capacity of stem cells for self-renewal and for differentiation into particular types of cells and tissues offers great potential for regenerative medicine[1].

Stem cells are of two types - embryonic stem cells and adult stem cells. Embryonic stem cells are found in the inner cell mass of the blastocyst during the early stages of embryo development and has unrestricted ability to generate new tissues and organs (totipotency). However, the use of embryonic stem cells is controversial due to legal and ethical issues. Mesenchymal stem cells (MSCs) are a source of adult stem cells. Sources of adult stem cells in the oral and maxillofacial region are BMSCs: bone marrow- derived MSCs from orofacial bone, DPSCs: dental pulp stem cells, SHED: stem cells from human exfoliated deciduous teeth, PDLSCs: periodontal ligament stem cells, DFSCs: dental follicle stem cells, TGPCs: tooth germ progenitor cells, SCAP: stem cells from the apical papilla, OESCs: oral epithelial progenitor/stem cells, GMSCs: gingiva-derived MSCs, PSCs: periosteum-derived stem cells, and SGSCs: salivary gland-derived stem cells[2]. SHED is of peculiar interest because it is retrieved from a tissue that is disposable and readily accessible in young patients.

SHED was discovered by Dr. Songtao Shi, a pedodontist in 2003, from the deciduous teeth of his six year old daughter which he isolated, grew, and preserved[3]. The application of stem cell therapy using SHED to treat diseases is currently being pursued by many researchers at the institutions around the world.

Characteristic features of SHED

Under the same neurogenic culturing condition, SHEDs expressed different neuronal and glial cell markers. The expression of these markers may suggest a neural crest origin of these cells. As neural crest cell-associated postnatal stem cells, SHED express a variety of neural cell markers including nestin, beta III tubulin, GAD, NeuN, GFAP, NFM, and CNPase3. They express mesenchymal stem cell markers (STRO-1, CD146, SSEA4, CD90, CD73, CD 105, CD106 and CD 166) and lack hematopoietic/endothelial markers (CD34, CD31)[4]. It is

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shown to activate multiple signaling pathways, including TGFβ, ERK, Akt, Wnt, and PDGF [5]. The mRNA expression levels of inflammatory cytokines, including matrix metalloproteinase-1 (MMP1), tissue inhibitors of metalloproteinase-1 (TIMP1), matrix metalloproteinase-2 (MMP2), tissue inhibitors of metalloproteinase-2 (TIMP2), and interleukin-6 (IL-6) are high in SHED[6].

The results of the in vivo transplantation suggest that SHED have a high capability of mineralization[7]. In vivo transplantation of SHED have been reported to result in formation of bone and dentin like-tissue. SHED can differentiate into replacement odontoblasts[8]. SHED exhibit high proliferation rates, increased population doublings, osteoinductive capacity in vivo and an ability to form sphere-like clusters, but fail to reconstitute a complete dentin pulp-like complex[3, 9].

Role of SHED in Craniofacial Tissue Engineering

SHED may be used to repair and regenerate bone and correct craniofacial defects. It has the potential to differentiate into dental tissues like dentin, dental pulp, bone, cartilages, skin, oral mucosa, adipose tissues, and salivary glands.

SHED banking

Banking of SHED was not so popular. But the trend is changing. In India, Stemade Biotech Private Limited was the first private firm to introduce SHED banking. 'StemSave' and 'Store-A- Tooth' are also other companies in India for SHED banking.

Tooth eligibility criteria for SHED banking

Primary incisors and canines with at least one third of root intact contain abundant amount of SHED cells. Primary teeth distal to the canine are generally not preferred. Due to the broader root base of primary molars, they are retained in the mouth for a longer period of time than anterior teeth. Eruption of the posterior permanent teeth generally takes a longer amount of time to resorb the primary molar roots, which may result in an obliterated pulp chamber that contains no stem cells. An exception is the early removal of deciduous molars for orthodontic considerations which will present an opportunity to recover these teeth for stem cell banking[10].

The process of SHED banking

SHED banking involves three steps: Collection, Isolation, and Storage of SHED[11].

Step 1: Tooth Collection

The decision of SHED banking is made by the parents. The dentist visually inspects the freshly-extracted tooth to confirm the presence of healthy pulpal tissue and the tooth which is put in sterile saline solution, is transferred into the vial containing a hypotonic phosphate buffered saline solution, which provides nutrients and helps to prevent the tissue from drying out during transport. A maximum of four teeth can be incorporated in one vial. Placing a tooth into this vial at room temperature induces hypothermia. The vial is then carefully sealed and placed into the thermette, a temperature phase change carrier, after which the carrier is placed into an insulated metal transport vessel. The thermette along with the insulated transport vessel maintains the sample in a hypothermic state during transportation, and the process is known as Sustentation.

Save-A-Tooth device can also be used for transporting stem cells from the dental office to the laboratory. The vitality of the stem cells is both time and temperature sensitive. The time from harvesting to arrival at the processing storage facility should not exceed 40 hours.

Step 2: Stem Cell Isolation

When the tooth bank receives the vial, the following protocol is followed[12].

1) Tooth surface is cleaned by washing three times with Dulbecco's Phosphate Buffered Saline without $Ca^{++}$and Mg^{++} (PBSA).

2) Disinfection is done with disinfection reagent such as povidone iodine and again washed with PBSA.

3) The pulp tissue is isolated from the pulp chamber with a sterile small forceps or dental excavator. Stem cell rich pulp can also be flushed out with salt water from the center of the tooth.

4) Contaminated Pulp tissue is placed in a sterile petri dish which was washed at least thrice with PBSA.

5) The tissue is then digested with collagenase Type I and Dispase for 1 hour at 37°C. Trypsin- EDTA can also be used.

6) Isolated cells are passed through a 70 μm filter to obtain single cell suspensions.

7) Then the cells are cultured in a Mesenchymal Stem Cell Medium (MSC) which consists of alpha modified minimal essential medium with 2mM glutamine and supplemented with 15% fetal bovine serum (FBS), 0.1Mm L- ascorbic acid phosphate, 100U/ml penicillin and 100μg/ml streptomycin at 37°C, and 5% CO_2 in air. Isolated colonies are usually visible after 24 hours.

8) Different cell lines can be obtained such as odontogenic, adipogenic, and neural by making changes in the MSC medium.

9) If cultures are obtained with unselected preparation, colonies of cells with morphology resembling epithelial cells or endothelial cells can be established. Usually cells disappear during the course of successive cell passages. If contamination is extensive, three procedures can be performed:

a) Retrypsinizing culture for a short time so that only stromal cells are detached because epithelial or endothelial like cells are more strongly attached to culture flask or dish.

b) Changing medium 4-6 hours after subculture because stromal cells attach to culture surface earlier than contaminating cells.

c) Separate stem cells using Fluorosence Activated Cell Sorting (FACS), in which STRO-1 or CD146 can be used. This is considered most reliable. Confirmation of the current health and viability of these cells is given to the donor's parents.

Step 3: Stem Cell Storage

Two approaches used for stem cell storage are: 1) Cryopreservation, and 2) Magnetic freezing

1) Cryopreservation

This is the process of preserving cells or whole tissues by cooling them to sub-zero temperatures. At these freezing temperatures, biological activity is stopped. SHED can be successfully stored long-term with cryopreservation. Cells harvested near end of log phase growth (approximately 80–90% confluent) are best for cryopreservation. The sample is divided into four cryotubes and each part is stored in a separate location in cryogenic system so that even if a problem with one of the storage units occurs, there will be another sample available for use. The cells are preserved in liquid nitrogen vapor at −196ºC. In a vial, 1-2 x 106 cells in 1.5 ml of freezing medium is optimum[10,12,13,14].

2) Magnetic freezing

This is also called Cell Alive System (CAS). The CAS cryopreservation method using a programmed freezer with a slight magnetic field was established by Masato et al at Hiroshima University, Japan[15]. In this method, a weak magnetic field when applied to a body will lower the freezing point of that body by upto 6-7^{0}C. The idea of CAS is to completely chill an object below freezing point without freezing occuring, thus ensuring distributed low temperature without the cell wall damage caused by ice expansion and nutrient drainage due to capillary action, as normally caused by conventional freezing methods. Once the object is uniformly chilled, the magnetic field is turned off and the object snap freezes[16].

Advantages

a) It provides a guaranteed matching donor (autologous transplant) for life[10,17].

b) It is easily available, simple, and painless for both child and parent.

c) The cost is around one third of cord blood storage.

d) SHED are adult stem cells and hence it has less ethical concerns compared to embryonic stem cells[10,17].

e) SHED cells are complementary to stem cells from cord blood. While cord blood stem cells have proven its value in the regeneration of blood cell types, SHED are able to regenerate solid tissue types that cord blood cannot - such as potentially repairing connective tissues, dental tissues, neuronal tissue, and bone[18,19,20].

f) SHED may also be useful for close relatives of the donor[10].

Disadvantages

a) The oncogenic potential of these cells is still to be determined in long term clinical studies.

b) Till date the research is confined to animal models.

c) Immune rejection also requires a thorough consideration.

► Conclusion

Regenerative dentistry is an emerging field. Current research areas of stem-cell-based therapy in dentistry are focused on tissue engineering and chair-side cellular grafting approaches that may result in more predictable regenerative outcomes in the future. More intensive basic and translational research is necessary, and clinical randomized controlled trials with long durations should be performed to advance the field using scientific evidence that can ultimately offer long-term benefits to patients. The ultimate goal in dentistry is to have a method to replace lost teeth biologically; a cell-based implant rather than a metal one. If we have in hand SHED, which is easily available and have high potential for differentiation, it is possible to envision complete restoration of the hard and soft tissues in the oral cavity using the patient's own cells, thereby avoiding issues of histocompatability.

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Changing trends in dentist - technician communication

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Abstract

Proper communication between dental office and dental laboratory leads to well-designed prosthesis, satisfied clinician, and comfortable professional relationship between clinician and dental technician. The importance of good communication has been highlighted by numerous studies. The paper-based recording has several major drawbacks such as mis-communication between the laboratory and the clinic, and lack of visual interactivity. Like most areas of the healthcare industry, the field of dentistry also is rapidly changing. This article discusses the potential benefits of web-based application for dental office-laboratory communication and explains system design and requirements that can be used for effective communication between dental clinic and dental laboratory.

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► Introduction

Quality and success in prosthodontic practice is the result of a good team work between the dentist and dental technician. It is the communication and understanding which yields the desired goal. Communication as we know depends on the media we use to communicate. Traditionally media included verbal communications, written, pictorial accounts or electronic media. The ideal situation of communication exists when the dental technician can meet the patient and the clinician personally to discuss the case. Such a meeting allows the laboratory technician to evaluate and gather information such as patient's personality, mannerisms and aesthetic demand of the patient that is unavailable from mounted casts or a written work authorization form[1]. But such situations are impracticable and may not be feasible on a day to day basis. There are many barriers to effective communication which can be environmental, educational, personal preferences, social prejudices, linguistic, and state of mind. Many failures of dental prosthesis can usually be traced to a breakdown in communication between members of the dental team (usually the dentist and the technician) which can lead to patient dissatisfaction and most important is the psychological adverse effect on the effectiveness of the team members and their relationship with each other[2]. The American Dental Association has issued guiding principles to improve the relationship between the dentist and the dental technician[3]. Recent improvement and universal availability of internet services with better data transferring abilities has reduced the virtual distance between a dental laboratory and the dental office. Moreover in the digital era we are now capable of obtaining, processing, and transferring 2D and 3D images with no significant loss of raw data over the internet.

Before entering into a professional relationship with a dental lab it is important for the dentist to know the background of the laboratory to which work is being assigned. Educational qualification, experience, key skills and attitude of the lab technician towards the subject are other key areas to be assessed while sending a case to a laboratory. It is also necessary to know the laboratory charges taken from the patient and should be analyzed with the quality of the service provided[4]. Another very important aspect of communication is the patient-dentist-technician communication. A patient looks to the dental professional to restore his or her teeth to ideal health, function and aesthetics. Establishing optimal effective communication and teamwork with the dental laboratory technician and patient helps the dentist to build confidence for all cases and helps ensure consistent and successful results[5,6].

Paper-Based Communication

Traditional communication occurs usually through a laboratory work authorization form with handwritten instructions from the clinician to the dental technician that specify the materials to be used and the type of the prosthesis. In routine practice, a dentist fills the work authorization form (Fig. 1) to order a lab work from a certain dental laboratory. Then the dental assistant and

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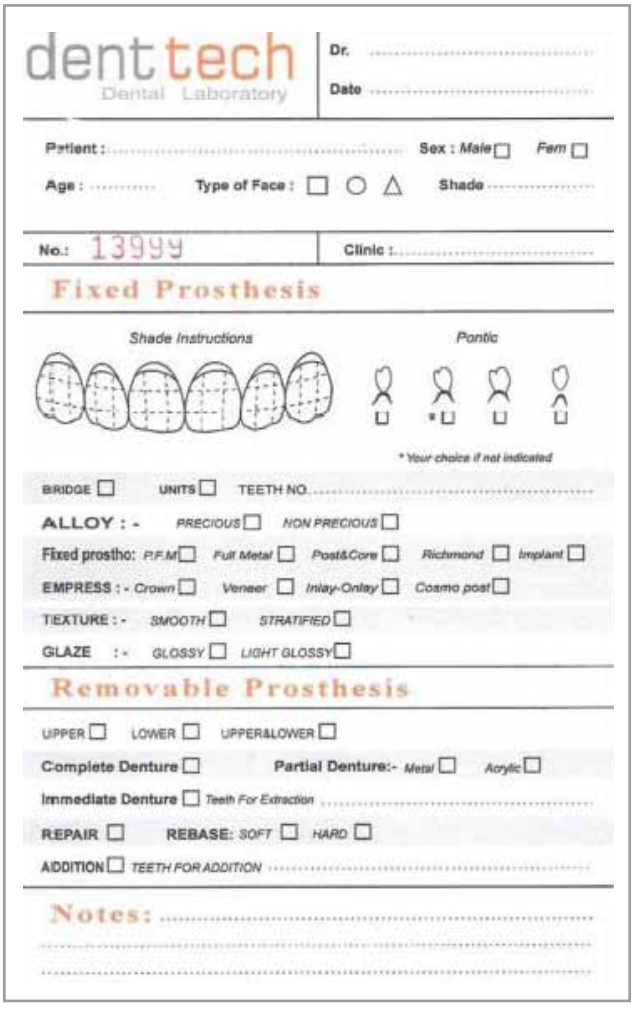
other staff arrange with the laboratory for pickup, payment, and delivery.

According to some previous surveys, technicians were dissatisfied with the insufficient and unclear information provided on the work authorization form[7,8]. Afsharzand et al. stated that "laboratory work authorization forms have been called the most frequently used and abused form of communication between the dentist and the laboratory"[9]. Only 26% of the surveyed laboratories indicated that their work authorizations were complete enough to perform their best service, while 46% reported that they received only the minimum information to complete the task. The survey also showed that lack of communication was a major problem in providing optimum patient services[9]. Recent studies concluded that improper communication starts from dental schools due to insufficient prescription requests written by the students; and that improving and building a solid base of communication should start by implementing correct methods of communication in dental school's curriculum and education[10,11].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Fixed Prosthesis

Shade Instructions Pontic

* Your choice if not indicated

BRIDGE ☐ UNITS ☐ TEETH NO. .....
ALLOY : - PRECIOUS ☐ NON PRECIOUS ☐
Fixed prostho: P.F.M ☐ Full Metal ☐ Post&Core ☐ Richmond ☐ Implant ☐
EMPRESS : - Crown ☐ Veneer ☐ Inlay-Onlay ☐ Cosmo post ☐
TEXTURE : - SMOOTH ☐ STRATIFIED ☐
GLAZE : - GLOSSY ☐ LIGHT GLOSSY ☐

Removable Prosthesis

UPPER ☐ LOWER ☐ UPPER&LOWER ☐
Complete Denture ☐ Partial Denture:- Metal ☐ Acrylic ☐
Immediate Denture ☐ Teeth For Extraction .....
REPAIR ☐ REBASE: SOFT ☐ HARD ☐
ADDITION ☐ TEETH FOR ADDITION .....

Notes: .....

Fig. 1 Dental Laboratory Work Authorization Form

One of the challenging aspects of traditional / paper based communication is transferring the proper shade to the technician. Shade guides remain the most widely used reference point for communicating tooth color. However, transferring the shade is more than sending a "shade number" to the technician. It should involve detailed information related to the color, surface texture, shade characteristics (e.g., enamel crack, hypo-calcified areas, incisal translucency, incisal halo, etc), and other features. Drawing an outline for the tooth and dividing it to vertical and horizontal sections to prescribe the color and all shade characteristic clearly may help to improve the result of shade matching. The best way for shade selection is taking photographs of the tooth to be matched and sending it to the technician[12].

Online Web-based Communication

Communication through the internet becomes the easiest and most accessible way. Recent improvement in internet connection and uploading/downloading data facilitates transferring data between dental office and dental laboratory. In addition, new technologies such as digital shade matching and impression scanning now available in dental offices should support switching from paper-based communication to web-based communication between dental office and laboratory. Web conference applications may also help in providing a useful face to face communication and involving the patient in the case discussion between the clinician and the dental technician. With the development of software and internet technology, there are now many software programs and effective web application that can help to improve communication, reduce time consumption, and enhance security of the shared information[1].

Dental Office-Laboratory Web Content Management System (WCMS)

Web based content management system is a software that provides website authoring, collaboration, and administration tools designed to allow users with little knowledge of web programming

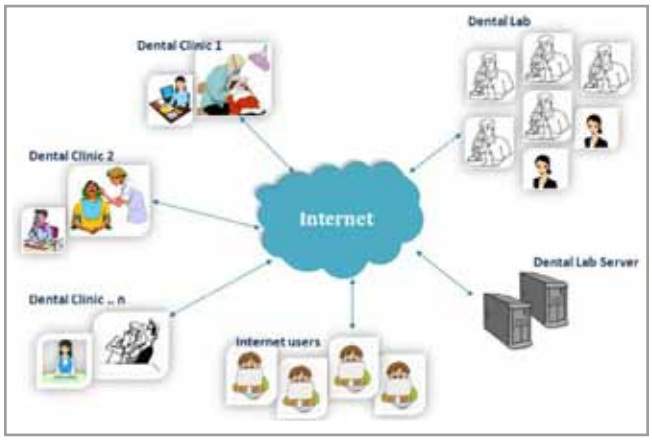

Fig. 2 Basic architecture of the WCMS

languages to create and manage website contents with relative ease. The dental office-laboratory web content management system provides service to the dental clinics and laboratory which are located at different places. It is used as a channel for communication between dentists and technician, dental clinic and dental laboratory, and establishes a portal for long term information sharing. With office-laboratory content management system, the medical data, pictures, and patient records all can be transferred and accessed online. Dental laboratories can track and manage lab cases and payments online. Besides, dental clinics and dentists can track the lab cases, and send messages about the status of the lab cases. Both have an account and can view their lab case history, their current balance, and pay bills online, thus reducing paperwork and time consumption in processing of lab cases. A dental laboratory can customize its communication system for different dental clinics working with it.

The basic idea of content management is to get organized and find a logical, consistent, and easy way to place content on the web. WCMS involves a lifecycle starting from creation to destruction of content. The lifecycle includes reviewing the content before publishing and it may include archiving before destroying. WCMS helps in keeping the site more consistent, ease the navigation, and most important it aids in controlling and tracking the content[1].

Commercial vs Open-Source WCMS

Dental office-laboratory management systems are available as a commercial WCMS and open-source WCMS. Commercial WCMS is a website that is developed and owned by an individual or a company, and users may pay a licensing fee. Open-source WCMS is a website that is available to the public free of charge and have their own community of contributors, consisting of web developers from all over the world who create and share software. Several commercial WCMS are available on the international market in various formats. They are designed to work as needed by most of the dental laboratories, and can be modified as per the laboratory requirements. They are faster to implement and associates a certain degree of safety as opposed to open-source facilities. Moreover, they offer more support and stronger training documentation than open-sources.

However, most of the available commercial WCMS products are costly and may not be affordable for small dental laboratories. Open source WCMS, on the other hand, offer low cost alternative to commercial solutions. It is suitable for small to medium dental laboratories. Besides, troubleshooting is made easier because of the technical support and online community. However, potential concern regarding the open-source solutions is the security. As the source code is available for public, attackers can use the source code to identify vulnerabilities[1].

Main Requirements for Dental Clinic- Laboratory WCMS

The key to successful software installation and integration lies in identification of the needs of the department, laboratory, and clinic. This can happen only through thorough analysis and discussion with the end users. Dental clinic-laboratory WCMS must be designed specifically to match the needs of the users. Areas regarding provision for feedback, online support, training, cost assessment, product tracking, and support for digital media and digital media integration, are few of the concerns which need to be addressed after careful assessment of the need and cost of the software.

Multiple clinics can also be integrated so as to share the information, increase productivity, and reduce man power. Another important aspect to be evaluated is storage, server requirements or need to cloud the services[13].

The core of any WCMS is the content; it is patient's lab case that is being sent from the dental clinic to the dental laboratory to be processed. The full content lifecycle which together constitute the core component of the WCMS are: a) content creation, b) content editing, c) content approval, and d) content publishing.

Dentists need to have the following provisions during various stages of lab case processing.

Lab Case Creation

- Dentists should have the ability to log-in using their account into the system.
- Submit their cases on-line using an electronic form.
- Create a new lab case with basic editing method.
- The system should provide the ability to upload images in the content.
- Choosing the available technician of his/ her preference.
- Add extra comments if required[13].

Lab Case Editing

- Should involve the ability to preview, modify or delete data.
- Submitting after completing all required editing.
- Provide approximate price estimation.
- Indicate approximated delivery date and mode[13].

Approval Process

- Ability to accept or reject the submitted lab case during the approval process.
- Provision for approval or rejection by authorized personnel using their log in IDs.
- Ability to notify the dental clinic regarding the status of lab work.
- Ability to track the case from approval to dispatch[13].

Case Publishing

- The editorial content can be published after passing the approval process.
- The system should provide the ability to cancel, republish or edit the content.
- Ability to manage and update the unpublished contents[13].

► Conclusion

Improving communication between dental office and dental laboratory will save time, effort, and improve the quality of the final product (the prosthesis). Switching towards paperless dental office is highly recommended and may become mandatory when establishing a new dental clinic. Selecting the right web content management system by understanding the individual requirements and design of the software will significantly improve the communication and will ensure long term relationships between dental offices and dental laboratories.

A successful dentist – technician relationship is usually the result of planned communication. In this era of digital communication where 2D, and 3D imaging and treatment planning has become more cost effective and practical, it is imperative to have a knowledge of these recent advances to stay relevant and to be efficient. Familiarity with the internet and remote applications should be used to facilitate faster, convenient and effective patient management. Distance is now a virtual element with most of the day to day activities available on click of a button. As emerging dentist we need to update our knowledge and technology which should go hand in hand for the betterment of the patient and in all other spheres of our clinical practice.

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CASE REPORT

NiTi open coil springs-boon or bane

* Lise Rose Tom, ** Roopesh R., *** Madhav Manoj

Abstract

Open coil springs are among the commonly used methods for gaining space. The Nickel Titanium springs provide continuous light forces over a wide range of activation. Rapid tooth movement demands faster reorganization and adaptation of soft tissue and alveolar bone both initially and throughout the treatment period. The dimension of anterior alveolus appears to set limits to orthodontic treatment and challenging these boundaries may accelerate iatrogenic sequeale at both apex of root as well as marginal bone. When tooth movement is limited, forcing the tooth against the cortical bone may cause adverse sequelae. Two cases are described here in which superelastic NiTi coil springs were used to align blocked out teeth and some iatrogenic effects have occurred as a result on teeth and supporting alveolar bone.

Key words: Open coil spring, Iatrogenic effects

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► Introduction

Open coil springs are among the commonly used methods for gaining space in orthodontics. The open coil spring is a wound spring activated by compression and exerts a net"pushing" force in opposite directions away from its center[1]. These are of two types; Nickel Titanium (NiTi) coil springs and Stainless Steel springs. The superelastic and shape memory properties of nickel titanium provides light continuous forces over a considerable range of activation[2]. SS springs produce initial forces of high magnitude that quickly dissipate even with small deactivations[3]. According to the manufacturer, the coils should have produced the labelled forces when compressed up to 80% of their original length and maintained these forces during deactivation.[4,5]

The iatrogenic effects shown below are of patients who came for fixed appliance therapy in the Department of Orthodontics and Dentofacial Orthopedics, PMS College of Dental Science and Research.

Case 1

This is a patient with Angle's Class III malocclusion on a skeletal Class III base with anterior cross bite,retained deciduous maxillary canines and impacted maxillary permanent canines. Treatment plan involves extraction of deciduous maxillary canines with proclining upper incisors and creation of overjet. Space was required for aligning the permanent canines into the arch. Hence open coil spring was placed on both sides and after 2 months from insertion space was opened up. A mucoperisoteal flap was raised for surgical exposure of impacted canines. An area of bony dehiscence where marginal alveolar bone was lost was observed along with unwanted tipping of upper left lateral incisors.

The anatomic boundary appears to set limits to orthodontic treatment and challenging these boundaries may accelerate iatrogenic sequelae. Anatomic limits set by cortical plates of alveolus at the level of apices of incisors may be regarded as "orthodontic walls"[6]. The average cortical thickness of buccal plate of the dentate maxilla and mandible ranged from 1.6 to 2.2 mm in thickness, with the thinnest area in the lower anterior region and the thickest area in the upper posterior region[7].

It is widely accepted that whenever orthodontic tooth movement occurs, the bone around the alveolar socket remodels to the same extent but non orthodontic tooth movements do not follow this rule.[9] It was De Angelis[10], who reported the bending capacity of alveolar bone. According to him mechanotherapy induces alveolar distortion, and the distorted alveolus alters the electric environment, a process that is attributed to the piezoelectricity of bone; which maintains the size and structural characteristics of alveolar bone. But here in the above cases alveolar bone thickness does not remain same rather it decreases.

Iatrogenic loss may occur even if the apex is contained within the alveolar housing. When space is created there is a force directed not only in the lateral but also in a labial direction which will result in the proclination of teeth. A thin pretreatment alveolus may initiate an iatrogenic reaction at both apex of root as well as marginal bone. This is seen

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in cases of maxillary deficiency combined with prognathic mandible[12]. When tooth movement is limited, forcing the tooth against the cortical bone may cause marginal bone resorption. This type of approach must be carefully monitored to avoid negative iatrogenic effects[11]. Along with rational mechanotherapy and proper periodontal health, consideration of anatomy of incisor alveolus is one of the keys to minimize unfavorable sequelae. Excessive labial or lingual movement of maxillary and mandibular incisors should be avoided to prevent irreversible bone loss, which leaves the tooth with less bone support.[13,14]

Case 2

The OPG shown below is of a 12 year old female patient with completely blocked out upper right canine. Open coil spring was inserted to gain space and align the teeth. Post treatment OPG revealed resorption of lateral incisor root on the side where open coil was used

When an open coil spring is used to create space one tooth is pitted against the other where they are not of equal anchor value for eg for a canine space, the lateral incisor is pitted against the first premolar. Lateral incisor having a smaller root can have either its root resorbed or uncontrolled tipping. When the root is in close proximity or pitted against the bony cortical plates more chance for resorption to occur.[15] More dense the alveolar bone the more root resorption occurred during orthodontic treatment.[16]

The above cases clearly demonstrate the association of anatomic limits set by thin alveolus especially in Class III cases where there is a maxillary deficiency. It is imperative in planning treatment to consider these anatomic walls as a limit to repositioning teeth,as well as danger zone for considerable iatrogenic sequeale. Kaley and Philips found an association between root resorption and approximation of maxillary incisor roots against palatal cortex. When tooth movement is limited, forcing the tooth against the cortical bone may cause adverse sequelae. This type of approach must be carefully monitored to avoid negative iatrogenic effects[9]. Using controlled force levels along with bone mapping can limit extend of iatrogenic effects caused by insertion of open coil springs.

Conclusion

The cases described above are those in which superelastic NiTi open coil springs were used to open up space and the iatrogenic effects that had occurred eventually. A delineation of the limits of orthodontic tooth movement prior to start of treatment would be extremely beneficial. It is worth considering bone mapping to assess the thickness of alveolar housing. CBCT a recent innovation which is very popular now can also be used to assess alveolar bone level precisely. Understanding the anatomic boundary along with controlled force level is essential to retain the open coil spring as a boon than a bane.

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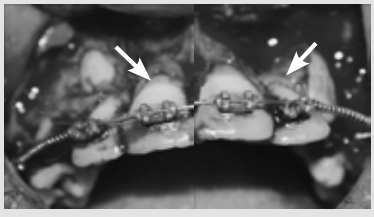

CASE REPORT

Vestibular extension by modification of Edlan-Mejchar technique

*Dhanya Krishnan, **K. Nandakumar, ***T. P. Padmakumar, ***Devisree, ***Teenu Abraham, ****Raju Kurien Ninan

Introduction:

One of the main objectives of periodontal therapy is to achieve an area which permits an optimal level of oral hygiene. A shallow labial vestibule hampers the proper placement of a tooth brush. As a result, a decreased depth of the vestibule is often associated with plaque accumulation and consequently marginal gingival inflammation.

The vestibular extension operations for increasing the width of gingiva involves the production of a wound extending from gingival margin to a level some millimetres apical to mucogingival junction.

The conventional procedure of deepening the vestibule and placing coe pack for prevention of epithelial re-attachment is a successful procedure and literature shows that it was an excellent procedure for gaining the width of attached gingiva.

In 1957, Friedman introduced the term mucogingival surgery as a type of plastic surgery to preserve the attached gingiva, to remove an aberrant frenum or muscle attachments, and to increase the depth of the vestibule[3]. Wennstormn study (1987) showed that the lack of minimally attached gingiva does not necessarily result in development of soft tissue recession. Lindhe and Nyman (1980) showed that in the presence of proper plaque control measures, the apico-coronal width of gingiva and the presence or absence of an attached portion of gingiva are not of decisive significance for the maintenance of the periodontal tissues. It can also be speculated that teeth with a prominent position of the roots as the canines, dehiscene may be present; recessions may develop, irrespective of the apico-coronal width of the keratinized and attached gingival[4].

An adequate amount of keratinized gingiva maintains gingival health by protecting the marginal gingiva from bacterial invasion, preventing an increase in gingival recession, facilitating plaque control, and improving denture stability. Weinman demonstrated that inflammation is perivascular progression, and dense fibrous gingival may be resistant to bacterial insults. From this, the attached gingiva may prevent bacterial invasion[5]. Bowers in 1963 stated that it is possible to maintain a clinically healthy gingiva despite a narrow zone of attached gingiva i.e. <1 mm[1]. Ainamo and Löe found that in patients with different degrees of recession, the width of the attached gingiva was more or less the same[6]. Lang and Löe showed in a clinical study that in areas with < 2 mm of keratinised gingiva, inflammation persisted irrespective of effective oral hygiene. They suggested that 2 mm of keratinised gingiva were adequate to maintain gingival health.[7]

The attached gingiva is by definition the gingiva extending from the free margin of the gingiva to the mucogingival line minus the pocket or sulcus depthmeasured with a thin probe in the absence of inflammation[1]. It is not synonymous with keratinized gingiva because the latter also includes the free gingival margin. Considering the histologic differentiation between the attached gingiva and alveolar mucosa, the attached gingiva is composed of very dense collagenous, fibrous connective tissue with keratinized epithelium, and it is relatively avascular compared to the alveolar mucosa[2]. Many adult patients may have areas of a narrow band of attached gingiva that are stable and do not require a specific intervention. But, in some patients the same condition may lead to exposure of an unacceptable amount of root surface causing esthetic problems, dentinal hypersensitivity, potential root caries, as well as mucogingival problems. The belief that the presence of an attached gingival zone is required for the maintenance of periodontal health has spurred the development of mucogingival surgery.

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In 1963, Edlan and Mejchar described a method for deepening the vestibule, which appeared to be particularly applicable to cases with little or no attached gingiva remaining[8]. This paper describes the case report of a patient in whom vestibular extension was carried out by a technique which is a modification of the Edlan and Mejchar procedure to correct a shallow vestibule. The results of the procedure may increase the amount of attached gingiva, deepen the vestibular depth, and prevent progression of gingival recession.

► Case report:

A 31 year-old female reported to the Department of Periodontology at Azeezia College of Dental Science and Research, Kollam complaining receeding of gums in relation to lower front teeth and grade I mobility of 31 and 41 (Fig.1). The problem had developed gradually over a period of 1 year. Both of these teeth also had Miller's class II recession. The width of the attached gingiva was reduced, measuring 3 mm. After thoroughly reviewing the patient's clinical history and carrying out a detailed examination, a diagnosis of chronic generalised gingivitis with localised periodontitis in the region of the mandibular incisors was made. It was decided to carry out extension of the patient's mandibular labial vestibule to increase the width of attached gingiva.

Initial therapy included patient education and motivation for adoption of stringent home plaque care measures, thorough scaling and root planing and occlusal correction. Routine blood investigations(blood glucose- fasting and post-prandial,haemoglobin, bleeding and clotting times, total and differential leukocyte counts, were carried out.

Vestibular extension procedure:

Prior to the surgical procedure, a calibrated periodontal probe was placed on the labial aspect of the mandibular central incisors to measure the distance between the gingival margin and mucogingival junction.

The surgical procedure is described below:

Incision: Mesial to one of the mandibular canines and starting from mucogingival junction,an incision was made for a distance of 10 to 12 mm extending on to the lower lip. A similar incision was made corresponding to the other mandibular canine. These two incisions were joined by a horizontal incision across the midline (Fig.2). Loose labial mucosa separated from underlying muscle. The mucosa included within this incision was reflected from the underlying muscular tissue using sharp dissection. This resulted in a loose flap of labial mucosa with its base on the gingiva. The lip mucosa was reflected from the underlying muscular tissue

The loose flap of labial mucosa separated from underlying muscle was fixed with interrupted sutures to the most apical portion of the periosteum,. Later the mucous membrane of the lip was also sutured to the most apical portion of the periosteum(Fig.3).

Fig 1 Pre-operative view

Fig. 2 Incision placed

Fig. 3 Sutures placed

Fig. 4 Periodontal dressing placed

Fig. 5 One week post-operative

Fig 6. Two weeks post-operative

Fig. 7 One month review

Fig. 8. Gingival colored composite placed

Placement of periodontal dressing and postsurgical management: A periodontal dressing was placed to protect the operated area(Fig.4). An antibiotic and anti-inflammatory were prescribed to the patient in addition to chlorhexidine rinses. Other postsurgical instructions included intermittent cold formentation on the first postoperative day, soft/liquid diet for one week, and maintenance of good oral hygiene. The patient was asked to return after one week for review

Postoperative recall: The one week postoperative examination revealed excellent healing (by first intention) and a considerable gain in the width of the attached gingiva(Fig.5)

Suture removal: By the end of 2nd week suture removal was done. Wound healing was satisfactory (Fig.6).

Patient came for review after 1 month. There was adequate gain in attached gingiva upto 5 mm. (Fig.7)

Management of gingival recession of mandibular incisors.

Patient was recalled after 2 months for further checkup. Gingival recession in relation to 31 and 41 was covered using gingival colored composite and flowable composite was used to cover interdental area of mandibular incisors (Fig.8).

► Discussion

The technique of vestibular extension used for the present case may be described as a modification of that described by Edlan and Mejchar in 1963 for deepening the mandibular labial vestibule. In original Edlan and Mejchar technique which was developed to deepen the vestibule and not to cover recession,there was alveolar bone exposure which was not seen in this case. Moreover a gain in attached gingival upto 5mm is obtained by this technique. During healing there will be formation of two fibrous bands on the inner aspect of the lower lip. However, these bands did not lead to contraction of the lip or any functional impediment of the patient. This finding is consistent with the observations of Wade 9.

Thus, based on the findings of the present case it can be concluded that in cases with a shallow vestibule and a reduced width of attached gingiva on the labial aspect of the mandibular anterior teeth, this technique provides a predictable way in which gingival health can be achieved and maintained.

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IDA HOPE

Help Offered to Professionals in Emergencies - Indian Dental Association, Kerala State)
Reg. Under IDA KSB Charitable Society, Reg. No. TVM/TC/651/2013 Website : www.hope.idakerala.com

Dear IDA Hope Member,

Greetings from The IDA Hope Office.

The IDA Hope management Committee, at a meeting held on 26-07-2015 at IMA House, Kochi decided to adopt with final amendments to **The Personalized Health Insurance Scheme**, extended by **The United India Insurance Company**. This is the most economical insurance scheme considering the risk profile.

The IDA HOPE HEALTH INSURANCE is being launched on **the 1st of October 2015.**

The hospital admission expense and treatment charges have gone up many folds and our scheme is aimed at giving sufficient relief to ourselves and our immediate family members in the event of a major illness.

The scheme is extended only for IDA HOPE Members, Spouse, Children and Parents.

The Salient features of The PERSONALISED IDA HOPE HEALTH INSURANCE SCHEME

1. Meet the hospitalization expenses of the members and their dependents including parents by way of
   A). Cashless facility offered by Third party administrators of the insurance company
   OR
   B) Reimbursement of such expenses through TPA where there is no cashless facility. Here in our case M/s VIDAL HEALTH TPA PVT LTD is the Third party administrator, based in Kochi.
2. Cover will be from day one.
3. All pre-existing illness will be covered for everybody.
4. Critical illness (listed below) are covered for members, spouse and children only.
   To cover critical illness a provision of reserve fund has been made for claims upto 5 lacks per person and maximum of 20 claims per year.
5. The scheme offers insurance under Three slabs for Member , Spouse ,Children (2 lacs, 3 lacs, 5 lacs) .
6. The scheme can be extended to cover parents under slab Three only (5 lacs)
7. Room rent will be 1% of Sum insured up to a maximum of 2500 per day & ICU charges 2% of Sum insured.
8. Pre hospitalization and post hospitalization expenses cover for 30days and 60 days respectively.
9. **No co-sharing of hospital expenses.**
10. **No medical check up for entry irrespective of age.**

Critical Illness list cover under scheme:

Critical Illness 1) Cancer, 2) Heart Ailments 3) Multiple Sclerosis 4) Paralysis, 5) Heart Surgery 6) Accident Induced Trauma Care 7) Stroke 8) Renal Failure 9) Motor Neuron Disease with permanent Symptoms 10) Major Organ Transplantation 11) Major Burns 12) Benign Brain Tumor 13) Bacterial Meningitis 14) Apallic Syndrome 15) Chronic Lung Disease 16) End Stage Liver disease 17) Inter vertebral disc prolapse.

The Premium calculation is done as under:

Member	–	Basic premium depending on slab (2 lac , 3 lacs , 5 lacs)
Spouse	–	Add 15% of basic premium.
Per Child	–	Add 10 % on basic premium.
Per Parent	–	Add 20 % on basic premium.

PREMIUM INCLUDING SERVICE TAX

Sl No.	Description	Basic premium for member incl.ST		
		Slab 1 (2 lac)	Slab 2 (3 lac)	Slab 3 (5 lac)
A	Insured member alone (Basic Premium)	2998	4052	6726
B	Member + spouse	3447	4660	7735
C	Member + spouse +1 dependent child	3747	5065	8407
D	Member+ spouse +2 dependent children	4047	5470	9079
E	Member+ spouse + 2depedent children +1dependent parent	nil	nil	10424
F	Member+ spouse+ 2dependent children + 2 dependent parents	nil	nil	11769

(The above mentioned features will not be available under any standard health insurance policy for individual families at this cost. Premium stated above is only for the year 1st Oct. 2015- 30th Sept. 2016 and may change subject to revision of premium by the insurer depending on overall claim outgo)

For IDA HOPE HEALTH INSURANCE – A new VIRTUAL account in The South Indian Bank LTD., Thamarassery is being started. The Details are as under.

For IDA Hope Health Insurance payments

Bank Name : South Indian Bank, Thamarassery (0428)

A/C Name : IDA - HOPE

IFSC Code : SIBL 0000428

Virtual Account No : A 1 2 2 A 1 1 _ _ _ _ (Hope No.)

The Premium can be paid to above bank account only either by cash or cheque or transferred directly from your bank account by NEFT (National Electronic Fund Transfer).through net banking.
The last four digits will be your HOPE number. Fill all boxes. eg. HOPE No. 621 shall be filled as 0621.

- We request each one of you to subscribe to IDA HOPE HEALTH INSURANCE. COME LET US ALL JOIN for our MUTUAL BENEFIT.
- Completed application form and payment details are to reach the Hope office on or before the 20th Sep. 2015, 5.30 pm. Payment shall be made only directly to the South Indian Bank virtual account –details furnished below.

Thanking you,

Yours sincerely,

Thamarassery
05-08-2015

Dr. Joseph. C.C
Secretary IDA Hope

Dr. Thomas K C
Chairman IDA HOPE

For more information and premium calculation you can contact our insurance consultant
Mr. Alex. P.V (Retd .Senior Manager, United India insurance Co Ltd)
Director of Cosmos insurance brokers Pvt. ltd. 39/2338 ,2nd floor ,Durbar hall Road Ernakulum 682016
Tel : **0484 2351432 ,09447608146,** Tele fax: 0484 2351433 E mail: cosmosbrokers@rediffmail.com

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FUND TRANSFER DETAILS

Bank Name : South Indian Bank Ltd. Thamarasery Branch (0428)

Account Name : IDA - HOPE

A/C No. : A 1 2 2 A 1 1 _ _ _ _ (Hope No.)

IFSC Code : SIBL 0000428

REMITER DETAILS

Name :.....

HOPE No. :.....

Bank and Branch :.....

Premium Paid :.....

Date :..... Signature :.....

IDA HOPE

Help Offered to Professionals in Emergencies - Indian Dental Association, Kerala State)
Reg. Under IDA KSB Charitable Society, Reg. No. TVM/TC/651/2013 Website : www.hope.idakerala.com

TAILOR MADE GROUP HEALTH INSURANCE SCHEME FOR IDA HOPE MEMBERS

SI No	Description	Details
(a)	Name of Member	Dr.
(b)	Hope No:	
(c)	IDA No:	
(d)	KDC Reg No:	
(e)	Name of IDA Branch	
(f)	Clinic Address	(g) Residential Address
(h)	Phone / Clinic No : Mob :	Resi :
(i)	Email ID	
(j)	Have you renewed your IDA Membership	
(k)	Have you renewed your Hope Membership	
(l)	Fee Transfer details (Premium)	

For office use only

SI No	Description	Details
(a)	Reg No: (IDA HOPE HEALTH)	
(b)	Date	
(c)	Signature –Secretary ida hope	
(d)	Seal	
(e)	Premium Payment	

UNITED INDIA INSURANCE CO. LTD.
Branch Office Kalamassery
P.M.S Building, Floor No: 2
Eloor Road, Kalamassery
Cochin – 683104
Ph No: 0484-2559488 / 2558548

PROPOSAL FORM FOR TAILORMADE GROUP HEALTH INSURANCE IDA HOPE

Details of persons to be covered

Sl. No	Name of Insured Persons	Date of Birth	Age	Sex	Relationship with Proposer
1					
2					
3					
4					
5					
6					
7					
8					

Sum Insured : Rs ...../- Premium: Rs...../-

Passport size photographs of the insured persons to be affixed.

MEMBER	SPOUSE	CHILD 1	CHILD 2
MEMBER	**SPOUSE**	**CHILD 1**	**CHILD 2**
1.....	2.....	3.....	4.....
CHILD 1	CHILD 4	FATHER	MOTHER
CHILD 3	**CHILD 4**	**FATHER**	**MOTHER**
5.....	6.....	7.....	8.....

The above details are true to be best of my knowledge and belief

Date :

Place :

Name & Signature of the Member :

Association News

Kochi Branch

May 2015

Executive Meetings: Fourth EC meeting was held on 12-05-15 at IMA House Kaloor.

CDE; On 31-05-2015 IDA Kochi Branch conducted a CDE programe by Dr. Santhosh Ravindran about "Eliminating Errors for a successful practice in Aesthetic Dentistry." And "Fixed tooth replacement in 30 minutes" with 6 approved credit points from KDC at Hotel The Senate Ernakulam. 17 members were present for the said CDE.

Sports – Cricket: IDA Kochi Branch Participated in IDA Kerala State- Zonal Cricket Tournament at Valappad, Kodungalloor.Hosted by IDA Kodungalloor Branch.

IDA Kochi Branch played first round against IDA Tripunithura Branch. We won the match and entered into Semi finals. In Semi Finals IDA Kochi Branch played against IDA Kottayam Central Branch and IDA Kottayam won the match.

June 2015

CDE; On 07-06-2015 IDA Kochi Branch conducted a CDE programe by Dr. Amit Gulati about "Prosthetic Options in Implantology" with 6 approved credit points from KDC at Dent Care Dental Lab, Muvattupuzha, Ernakulam. 115 members were present for the said CDE. Executive Meetings; Emergency EC meeting was held on 12-06-15 at IMA House Kochi.

July 2015

Executive Meetings; 6th Executive committee meeting of IDA Kochi branch was held on 9-07-2015 at IMA House Kochi. Monthly Meeting and Installation of WDC Kochi;

5th monthly meeting in connection with the installation of Women's Dental Council of IDA Kochi Branch, was held at IMA House Kochi on 24th July 2015,

The Honorable Justice of the High Court of Kerala Mrs. Mary Joseph Inaugurated WDC Kochi. Around 150 members were present.




Trivandrum Branch

Second general body was held at Trivandrum Tennis Club on 30-5-2015.

Doctors day celebrations was celebrated in a grand way at Seemoolam club Trivandrum. Talk by Dr Prasanth Pillai on Basal implants, followed by dinner a good number of members turned up for the particular day.

CDE activities: CDE on BASIC LIFE SUPPORT was conducted in two sections at trans towers on thye following dates. A team from MIMS conducted the program. More than 200 members benefitted from this program.

CDE on ESTHETICS & POST-ENDO RESTORATIONS- TRENDS & TRANSALATIONS by Dr. Narasimhan Bharadwaj on 5-7-2015. A total of 100 members attended the program.

Executive committee meetings: Six executive committee meetings were held to discuss various activities.

Clinical Society meetings: 5 clinical society meetings was conducted on every second Tuesdays.

March- Dr Aju Ommen George

April- Dr Rajesh Gopal

May- Dr Prasanth

June- Dr Sreejith

July- Dr Rani Sreekumar

Family get together A memorable family get together was conducted at Uday Samudra Resorts Kovalam on August 1st and 2nd. The get together became more attractive with the presence of IDA kerala state President Dr K C Thomas & family and honorable state Secretary Dr O V Sanal & family.



Chalakkudy Branch

Our second executive meeting was at hotel sidhartha on 23rd May. We participated in the IDA cricket tournament on 24th May at valappad

We conducted our second CDE programme on July 5th on BLS and how to manage medically compromised patients on a dental chair in association with MIMS Calicut

Our third executive meeting was at hotel meadows chalakudy on 28th July

Attingal Branch

CDE The 2nd inter branch CDE with 6 KDC Credit points was conducted at Park centre, Trivandrum on 17th may 2015. The topic was on One Visit Endodontic by Dr Madhu Hariharan.98 members attended the CDE

3rd BRANCH EXECUTIVE COMMITTEE MEETING

The 3rd branch executive committee meeting was held at Attingal club, on 2nd Tuesday at Attingal by 7pm.President Dr Arun Roy welcomed the members. Meeting discussed about the coming programmes of the branch.

ASAP

IDA Attingal started ASAP DAC Class at Government College Attingal on 23rd may 2015. 28 students joined for DAC in one batch. Dr Arun S is the coordinator Dr Rahul, Dr Meera, Dr Abhilash, Dr Premjith & Dr Deepak is taking classes for students.

Coastal Malabar Branch

THIRTEENTH CDH ACTIVITY- 10.05.2015: Thirteenth CDH activity of IDA Coastal Malabar Branch was done at Pilathara St. Joseph college auditorium on 10.05.2015,Sunday. This CDH activity was done in association with Kannur Association for Integrated Rural Organization and Sport(KAIROS).The programme was inaugurated by Sri.C.M. Venugopal(President, Cheruthazham Grama Panchayath).Dental awareness class was taken by Dr.Santhosh Sreedhar. Dental check up was done after the awareness class.

THIRD EXECUTIVE COMMITTEE MEETING-18.05.2015: Third executive committee meeting of IDA Coastal Malabar Branch was held on 18.05.2015 at hotel Topform. Payyannur. Secretary Dr.Rahul Nandakumar collored the President and the meeting was called to order. Hon.Secretary, Dr.Rahul Nandakumar presented the minutes of second executive committee meeting and was passed by the executive committee.

Third CDE was finalized to be conducted on 21st June, Sunday from 04.30PM to 09.30 PM at hotel KBC,Green Park,Edat,Payyannur.

ANTI TOBACCO DAY CELEBERATION- 31.05.2015,SUNDAY: Indian Dental Association Kerala State Branch celebrated Anti tobacco day at payyannur on 31.05.2015,Sunday.This State level CDH programme was hosted by IDA Coastal Malabar Branch.

The programme started with a magic show by K.C.Thomas and students of Poinachi Dental college based on anti-tobacco theme at 09.00 AM near to Gents Garage,opp.New busstand,Payyannur.Inaugural function started at 09.30AM by welcome address by Dr.Pratap.Pavithran,President,IDA Coastal Malabar Branch. Presidential address was given by Dr.K.C.Thomas,President,IDA, Kerala state. Inaugural address and flagging off the rally was done by Sri.P.K.Mani,Circle Inspector of Police,Payyannur. He appreciated IDA Kerala State for conducting such kind of public programme which will promote the awareness of public regarding oral health.

THIRD CDE PROGRAMME - 21.06.2015,SUNDAY: Third CDE programme for the year 2015 of IDA Coastal Malabar Branch was held at Hotel J.K.Residency,Cheruvathur on 21.06.2015,Sunday from 04.00PM to 09.30 PM.The faculty of the programme was Dr.M.Shivashankar (Prosthodontist). The topic was "ALL CERAMIC RESTORATIONS".The lecture was for two and a half hours from 04.30 PM to 07.00 PM.On the same day a small talk for 20 minutes about" DENTINE HYPERSENSITIVITY" was given by Dr.Santhosh Sreedhar(Past President, IDA Kerala State) from 04.00PM to 04.20PM. IFTAAR PARTY was conducted on the same day from 07.00PM TO 07.30 PM.Releasing of the telephone directory of IDA Coastal Malabar Branch was done by handing over the first copy to Dr.Sudha Santhosh by Dr.P.K.Jayakrishnan."Self demonstration " was given by Dr.M.Shivashankar from 07.30PM to 09.00PM. The programme was a half day programme and it was a well attented one. 59 members attented the CDE programme.

FIFTEENTH CDH ACTIVITY- 12.07.2015,SUNDAY: "CHARITY WORK AT SNEHALAYAM OLD AGE HOME,KANHANGAD"

15th CDH activity of IDA Coastal Malabar Branch was organised by our Women's Dental Council at" Snehalaya Old Age Home" at Kanhangad on 12.07.2015,Sunday from 09.30am to 01.00pm.Welcome address was given by Dr.Suja Vinod(Chairperson,WDC).Presidential address was given by Dr.Pratap Pavithran(President,IDA Coastal Malabar Branch).He congradulated the chairperson and other members of WDC for organising the charity work in a grand manner.Director of Snehalaym Old Age Home, Father Mosses Appan, addressed the gathering..

Inauguration of the CDH activity was done by Dr.Santhosh.Sreedhar(Past President,IDA Kerala State). 24 cots were donated to the old age home chairperson and other board members of WDC,IDA Coastal Malabar Branch.

FOURTH EXECUTIVE COMMITTEE MEETING-20.07.2015,MONDAY: Fourth executive committee meeting of IDA Coastal Malabar Branch was held on 20.07.2015 at hotel Taste Buds,Cheruvathur,at 08.00PM. Secretary Dr.Rahul Nandakumar collored the President and the meeting was called to order. Hon. Secretary, Dr.Rahul Nandakumar presented the minutes of third executive committee meeting and was passed by the executive committee.

FOURTH CDE PROGRAMME - 26.07.2015,SUNDAY: Fourth CDE programme(interbranch CDE) for the year 2015 of IDA Coastal Malabar Branch was held at Hotel J.K.Residency,Cheruvathur on 26.07.2015,Sunday from 08.30AM to 04.30 PM.The programme was in augurated by Dr.Dinesh. Nambiar(Treasurer,IDA KERALA STATE).The faculty of the programme was Dr.George Skariah(Asst.Professor,Oral and Maxillofacial surgery,Govt.Dental College,Trivandrum).

Quilon Branch

World no tobaco day

On May 31 world no tobaco day IDA Quilon along with Meditrina hospital Kollam celebrate no tobaco day.start with a bike rally from Meditrina hospital to Quilon beach around 8km flag off by police commissioner Kollam followed by quiz, documentary, and posture presentation for the public.

5th. General body and CDE was on20-6-2015 at lions hall Kollam.

CDE topic Medical emergencies in dental practice.

6th General body and CDE was on16-7-2015 at ferns hall Kollam.

Topic orthodontic for general practicenor.

Kunnamkulam Branch

FAMILY GET TOGETHER: Second General Body Meeting and Family Get together of IDA Kunnamkulam was held on 23rd May 2015 at Hotel Samudra Theeram, Chavakkad. The Programme started at 7 pm by Welcoming the gathering by the President Dr.Ratheesh. We had Magic Show, Gaanamela and Mimics by Prof. Jayan Thandalam and Team, It was well enjoyed by the Kids and Members. Cookery show was conducted by Mrs. Asha Sunil for the females. By 10 pm, the programme adjourned for Dinner.

INTER BRANCH CDE: The first Inter Branch CDE on ELIMINATING ERRORS FOR A SUCCESSFUL PRACTICE IN AESTHETIC DENTISTRY AND FIXED TOOTH REPLACEMENT IN 30 MIN by Dr.Santhosh Ravindran. Was held on 3rd May 2015 at Hotel Samudra Theeram, Chavakkad from 9 am to 5 pm. We had a Lecture at the morning session and hands on in the afternoon. The talk was very informative and helpful for the members to upgrade their knowledge. We had 6 credit points approved by the KDC and Dr. Deepu was the moderator for the programme.

The Forth CDE of IDA Kunnamkulam was held on 20th June 2015 at Hotel Samudra, Chavakkad on MANAGEMENT OF MEDICAL EMERGENCIES IN DENTAL OFFICE by Dr. Siji J Chiramel. We had 3 credit points approved by KDC and Dr. Nidish Kumar was the moderator of the day.

The Fifth CDE of IDA Kunnamkulam was held on 25th July 2015 at Hotel Samudra, Chavakkad on JURISPRUDENCE by Dr. Beena Varma. We had 3 credit points approved by KDC and Dr. Nidish Kumar was the moderator of the day.

EXECUTIVE MEETING: Third Executive meeting of IDA Kunnamkulam was held on 6th June 2015 at Hotel Samudra, Chavakkad. We had discussion and decision taking regarding the programmes for the next 3 months.

Wayanad Branch

1. 4th Executive meeting held at Dr. V J Mary's Residence pulpally on 8.6.2015 and 17 members attended.

2. **CDH:** a. The 4th Executive meeting decided to conduct free denture distribution programme as "Aswas 15" to 60 needy patients of BPL list selected at screening campus conducted at S. Bathery Lions Club, Mananthavady IMA hall and Leo Hospital kalpetta.

b. President Dr. Noushad Palliyal taken a class an dental awareness and common dental problems at Shams Ulama Islamic Academy,Kunjipally

3. Family Tour A family tour was conducted to Wild Planet Resort,Devala Tamil Nadu on 21st and 22nd June 2015. 10 Families attended the programme was filled with fun games and variety entertainments programmes.

Malabar Branch

(I) SECOND EXECUTIVE MEETING: The Second executive meeting of IDA Malabar Branch 2015 was held on 07/05/15 at IDA hall Asokapuram Kozhikode.

(II) IDA NORTH ZONE CRICKET TOURNAMENT: IDA Malabar Branch Participated in the IDA North Zone Cricket Tournament on May 10th held in BH Stadium Manjery. IDA Malabar Branch became the Champions by defeating IDA Malapuram Branch in the Final.

(III) CDE PROGRAMME No.3: The third CDE and Second Inter Branch CDE of IDA Malabar branch was held on 17/05/2015 at Hotel Maharani Kozhikode. The programme started at 9.30 am and was inaugurated by Dr.Nizaro Siyo IPP IDA Kerala state. The topic of CDE was Fundamentals in Management of Emergencies in Dental Office and Suturing Techniques. The Faculty was eminent oral & Maxillofacial Surgeon Dr.Aju Oomen MDS,FDS, RCS(ENG),FFD. RCS(Ire)DNB.

(IV) CDH PROGRAMME No.6: Dental Screening and awareness camp was held in PMSA Memorial A.M.L.P School Chollamukku Nediyiruppu PO Kozhikode on 23/05/2015.

(V) ANTI TOBACCO DAY CELEBRATIONS: IDA Malabar branch celebrated Anti Tobacco day on 31/05/15 by organising different Programmes.

IDA Malabar Branch in association with JCI Calicut displayed a large number of posters showing various adverse effects of use of Tobacco and Tobacco products in different places of Kozhikode city including New Bus Stand, Mananchira and Kozhikode Beach premises.

IDA Malabar branch arranged a float in a tempo traveller showing the adverse effects of tobacco and simultaneously announcing the adverse effects of tobacco and giving awareness to the public which ran throughout the Kozhikode City.

IDA Malabar Branch in association with JCI and IMA arranged a rally and an awareness talk in Kondotty. IDA Malabar Branch arranged a Rally in the Kozhikode City in the evening Flagging of the rally was done by Deputy Collector Smt.Shamin Sebastian at 4.00PM. Rally started from the Northern end of the Kozhikode Beach.

(VI) NEPAL RELIEF FUND: IDA Malabar collected an amount of RS.1,15,000/- from its members and handed over to the Prime Ministers Relief Fund for Nepal Relief through deputy Collector Smt. Shamin Sebastian On the Flagging of ceremony of Anti Tobacco day Rally.

(VII) CDE PROGRAMME No.4: The fourth CDE of IDA Malabar branch was conducted in association with KMCT Dental College on 07/06/15 at KMCT Medical College Anatomy Lecture Hall, Mukkam, Kozhikode.

(VIII) SHORT FILM CONTEST: IDA Malabar decided to conduct a short film contest based on Anti Tobacco theme.

(IX) CDH PROGRAME No.7: Dental Screening and awareness camp was held in Kollathara Shivadas Library Hall at Kollathara Kozhikode on 23/05/2015. An Dental Awareness class was given by Dr.Dinesh KR Past Secretary IDA Malabar branch.

Central Kerala - Kottayam Branch

IDA KERALA STATE STUDENT DENTAL CONFERENCE

MIRABOLANTE, was held @ Pushpagiri College Of Dental Sciences on May 15th, 16th & 17th. Inauguration was held on 15th May, and was a success - 830 registrations from 22 Dental colleges. Valedictory function was held on 17th May 2015 which was inaugurated by IDA Kerala State President Dr. KC. Thomas. Dr. Sanal OV gave a vibrant speech. The presence of Cine artists Mr. Niyaz, Ms. Saranya Mohan and Director Subin made the evening a memorable one.

SPORTS: IDA CKK branch bagged the Zonal Cricket Championship held @ Kodungalloor on 24th May 2015

EXECUTIVE COMMITTEE MEETING: 5th executive meeting was held on 20th May @ Kottayam club, 13 members attended the meeting.

COC MEETING: 3rd COC meeting was held on 20th May 2015, @ Kottayam club.

CDE Hands on CDE program on BASIC LIFE SUPPORT by AHA instructors, was held on 21st June 2015 @ Hotel Arcadia. 104 members attended the program.

Distribution of emergency drugs and ambu bag

Medical emergency kitS and Ambu Bag were distributed to members on 21st June 2015.

FAMILY GET TOGETHER. Monsoon Fest Family get together was conducted on 27th & 28th June 2015 at Kuttikanam, Trisangu Haven Resort. 30 Families participated in the get together.

Mavelikkara Branch

Activity report- June-July 2015

The month of June started with a very informative and interactive CDE programme on Basic and Advanced Endodontics by expert faculty Dr. Lora Misra, Associate Professor, Department of Conservative Dentistry and Endodontics, Institute of Dental Sciences, Bhubaneswar. The class, held at Wyte Portico, Adoor, was followed by a hands-on on extracted teeth using latest techniques in rotary endodontics.

An executive meeting was held on 9th June,2015 to discuss new proposals for HOPE. It was decided by the executive that linking IDA's HOPE with a general insurance scheme would be in the best interest of all members. Discussion on destination for monsoon tour of the branch also was held.

The state executive meet held at Tirur, saw active participation from IDA Mavelikara branch with the presence of Dr. Anil G, State Vice-president, Dr. Sunil Babu, Branch President, Dr. Samith V., Branch Secretary and Dr. Biju Bhaskar, Rep to State.

An emergency executive meeting was held on7th July as per the complaints received from numerous members of IDA Mavelikara against a Naturopath, for malicious propaganda against Dentistry. After considering various options for redressal, the executive decided against taking direct action against the aggravator and instead concluded that the appropriate means would be to communicate with the Kerala Dental Council, which is the statutory body which governs Dentistry in our state through IDA Kerala State, with the support of other local branches of IDA.

In mid- July, members of our branch had a wonderful opportunity to brush with the cool climes and light monsoon drizzle, exploring nature, at Misty Mountain Resort Kuttikanam, on a two-days fun-filled tour, which turned out to be wholly refreshing from the daily grind of dentistry.

IDA Mavelikara two-times champion of Chilamboli are getting ready to make a grand comeback on stage with commencement of elaborate preparations for the show initiated by Dr. Baiju Hariharan and Dr. Anoop Samuel.

Sundays are not lazy anymore, with cricket team members under the captaincy of Dr. Gopakumar, actively participating in practice sessions as a warm up towards upcoming IDA state level cricket tournament.

The news about the death of past Indian President Dr. A.P.J. Abdul Kalam was received with great grief by our branch members. As a tribute to this great leader, members of our branch unanimously agreed to keep their clinics open on the next Sunday as suggested by the legendary figure, who opposed the idea of declaring holidays at the death of great men/women and instead contribute towards the growth of the nation by working an extra day to pay him/her tribute.



Tellicherry Branch

1ST CDE programme conducted on 03-05-2015 at Parco Residency. Dr. Ajey Kumar E.G was the faculty. The topic of 1st CDE was partial and full mouth rehabilitation using implant supported restorations. 31 members attended. 3 credit points was awarded by KDC.

2nd CDE programme was conducted by Dr. Santhosh Ravindran. The topic was Single Tooth replacement in 30 minutes. 30 members attended the programme. 3 credit points were awarded by KDC.

3rd CDE programme was conducted by Dr. Sivashankar. Topic was all ceramics from preparation to bonding. 32 members attended the CDE. 6 credit points were awarded by KDC.

Executive Committee Meetings

3rd executive committee meeting was held on 08-05-2015.

4th executive committee meeting was held on 01-07-2015.

1st general body meeting was conducted along with IFTHAR PARTY on 09-07-2015, at Parco Residency. Celebrated 'NOMBU THURA' along with family members. Around 30 members attended along with family.


Kodungallur Branch

IDA Kodungallur branch conducted 2 executive committee meetings and 1 general body meeting during the month of May- June period. Other programs conducted by the branch included

24-05-2015: Central zone cricket tournament was hosted by IDA Kodungallur at Valappad. 6 teams from the central zone participated namely IDA Kochi, IDA Tripunithura, IDA Central Kerala, IDA Chalakkudy, IDA Malanadu and IDA Kodungallur. IDA Central Kerala was the winner and IDA kodungallur was the runner up

CDE: 02-05-15 : CDE program was " Eliminating errors for a successful practice in Aesthetic Dentistry". Faculty was Dr Santhosh Ravindran from Mumbai. 46 branch members participated.

11-06-2015: CDE program was on Sterilization Protocols by Dr Binoy Ambookken. 50 members participated

CDH: 4 dental treatment camps were organised at the free dental treatment centre on the 2nd and 4th Fridays of the respective months

1-06-2015: Antitobacco day was held at Malabar Dental College with a rally and a street play. President Dr Mahesh Narayanan spoke on ill effects of Tobacco and SI of Police Flagged off the Rally. Pamphlets against tobacco was distributed. A street play was also undertaken by the students.



North Malabar Branch

EXECUTIVE COMMITTEE MEETING:

1. Fourth executive committee meeting was held on 12 –06 – 2015 at I.D.A. Hall,Podikkundu,Kannur.

2. Fifth executive committee meeting was held on 29 – 07– 2015 at I.D.A. Hall,Podikkundu,Kannur.

EMERGENCY EXECUTIVE COMMITTEE MEETING:

1. Second Emergency executive committee meeting was held on 05 – 06– 2015 at I.D.A. Hall,Podikkundu,Kannur.

C.D.E PROGRAMMES:

1. Topic: Invisible Aesthetics & Fixed Tooth Replacement in 30 Minutes, Venue: Hotel Broad Bean,Kannur, Date: 24– 05 – 2015

Faculty: Dr.Santhosh Raveendran

C.D.H PROGRAMMES:

1. IDA NMB in association with blood bank district hospital had successfully conducetd blood donation camp at kannur dental college, anjarakandy on 15-05- 2015 in which a total of 55 students had participated.

2. A dental check up and awarness class were conducted at Thavakara U.P.School, kannur. Dr.Geetha C.P. took the awarness class.Dr. Faizal C.P,Dr. Arun Narayanan, Dr.Shoma Anil, Dr.Sreelekha Arun participated in the camp. Around 44 students were examined.

3. IDA NMB in association with kerala state had conducted a non tobacco day programme at Thaliparamba on 31 – 05- 2015, a public function at bus stand premises.





Kasargod Branch

A cde meeting was conducted on 15 May, Friday at IMA hall kasargod at 7.30pm. The topic was"decision making in periodontics in daily dental practice an overview" by Dr Shutho Prathap. Asst prof. Yenepoya dental college. M'lore. Meetin was well attended followed by dinner. Our sponsors where Blue cross pharmaceuticals.. We had our 3rd CDE meeting on 17 July at IMA hall Kasargod. Dr Ashwin, paedodontist at Vasan dental care Kannur spoke on paediatric dental treatments. the meeting was sponsored by Variety Fling pharma. The meeting was well attended n followed by dinner.


Tripunittura Branch

EXICUTIVE COMMITTEE MEETINGS: Executive committee meeting was conducted at Dr Biju nedumburams (vice president)residence on 19th april 2015.it was decided to conduct a staff training program.

Executive committee meeting was conducted on 28/06/2015at classic fort hotel, tripunithura.decisions were made on conduction of oral health program at koothambalam hall, dr kunal and dr james was made incharge to book the hall and invite guests,wdc activities was planned. This EC decided to participate in athaghosham 2015 with a plot to create more dental awareness among public.

CDH PROGRAMME: On 12/04/2015 IDA Tripunithura conducted free dental screening and free dental treatment camp was conducted at Sreepoornathreysya Balasramam. Awareness class was conducted by Dr kunal viswam(hon secretary), Dr Jayan B(President), Dr James Thomas(CDH Chairman),Dr Sabu, Dr Ajith also participated in the camp.

CDE PROGRAME: Second cde program was conducted at N M Royal county Tripunithura on 14/6/2015 on FAILURES IN FIXED PARTIAL DENTURE, Program was conducted by Dr Vinod Krishnam MDS(Prostho). Kerala dental council approved the program with 3 credit points.

WDC INSTALLATION: WDC Office bearers of tripunithura was installed on 14 june 2015 at N M Royal county Tripunithura at 7 pm. Dr Vasundhara menon (president), Dr Twinkle tom(secretary),Dr chetana krishnakumar(vice president),Dr Avneet kunal(jt secretary). As a part of wdc activities a dental survey will be conducted among the schools in and around the branch areas. The surveys will b about does the children brush at night.wdc tripunithura has also planned to conduct many awareness programs in govt schools,for pregnant women and institution adoption as well.

NO TOBACCO DAY: IDA Tripunithura along with Tripunithura Cricket Club organised a mini marathon highlighting the importance of quitting all tobacco products.municipal chairman Sri: R venugopal read out the anti tobacco pledge and opposition leader Sri: C N sundaran flagged off the march. About people participated in the run. mini marathon was from Tripunithura Cricket Club premises to statue junction and back to the club.

This programme was well covered by all the major news papers and club fm(radio).and was very well appriciated and participated by the public and by many social organizations and political parties.

Staff training program: IDA tripunithura in association with dentcare dental lab conducted a staff training program(chairside assistant)on 5/7/2015 at dentcare dental lab muvattupuzha.56 dental assistants working with various dentists of tripunithura branch participated.

Malappuram Branch

DENTISTS DAY CELEBRATIONS: Dentist's Day celebration were held at community hall, valanchery on 6/03/15. The programme was inagurated by Dr Govindan, President Doctors club valanchery. Dr. PT Muhamed Sameer, President elect, IDA Kerala State was the chief guest and key note speaker was Mr K M Abdul Gafoor, Member, Jilla panchayath. Mr T P Abdul Gafoor, President, Valanchery Grama panchayath. Mr T P Moideen Kutty, Member, Valanchery Grama panchayath, MIDA honoured Dr. PT Muhamed Sameer,president elect,IDA Kerala by adorning ponnada. Also a Short Telefilm – 'Burning india to ashes' were played.

CDE PROGRAMMES: 1st inter branch one day CDE was held on 29/3/15 at Hotel Rydes Inn Kottakkal.on topic Implantology revisited.international renowed speaker Dr Ronnen Bordovski was the keynote speaker. Dr Ajay Haridas, Dr Rajgopal Menon Prasad were also the invited speakers.

We also hosted IDA Kerala state CDEs on 'practice management' on 14/5/15 at Hotel Rydges Inn Kottakkal. The renowed Mrs Sangeetha Elizabeth Panicker was the speaker for this one day programme.

FAMILY TOUR: The family tour of Malappuram was conducted on 29/4/15 to Silver Storm water theme park and Aathirapilli water falls. It was fun filled and well coordinated by Dr Muhamed Sameer PT.

KERALA NORTH ZONE CRICKET TOURNAMENT: We conducted IDA Kerala north zone cricket tournament first time at Boys high school stadium Manjery on 10/5/15.Many teams from north zone of IDA participated.IDA Malabar won the championship and We TEAM MIDA became runners up.

4TH IDA KERALA STATE EXECUTIVE MEETING AND EOGM: We also hosted the 4th IDA Kerala state executive meeting and EOGM on 14/6/15 at Sangamam residency Tirur.

CDH ACTIVITIES: In the past couple of months we had conducted CDH camps at Manjeri, Melattur, Kodakkal in association with various renowed organizations like rotary club,jci etc

EXECUTIVE MEETINGS: We had 3 executive meetings so far in which we have planned many activities for the betterment of our fraternity. Our motto for this year is 'Enrich friendship, Enhance Profession'.

HOPE ACTIVITIES: We also handed over the HOPE cheque rupees of 10 lacks to the family of our own member Late Dr Sasimohan at his residence,Thrissur. Most of the members of our branch are associated with HOPE which not only protects us in legal issues in our clinical practice but offers a helping hand in unforeseen disasters in our life.

WDC Report

Dr Sudha Santhosh, Dr Shwetha Suraj and WDC members of IDA Coastal Malabar under the leadership of Dr Suja Vinod actively participated in the Anti Tobacco day celebrations of IDA Kerala state on May 31 st.

We proudly announce the formation of WDC in three local branches

1. IDA Palakkad, 2. IDA Thrippunithara, 3. IDA Kochi

Contribution to Nepal Relief Fund: Womens Wing of IDA Attingal and IDA North Malabar generously contributed cash and relief materials to the Nepal relief fund.

CDH Report

Dr. Subhash Madhavan
Chairman CDH

IDA-AWARENESS CLINIC IN LULU (Little Town)

Lulu little town was with Bank,ATM, Police station, Hospital, Dental clinic,Saloon etc,exclusively for children to make them selfsufficient. IDA state office was very much in favour of this event as this could provide much needed publicity for IDA.

Clinic was inaugurated by Malayalam cini artist Kavya madhavan on 11-04-2015. IDA Naitonal President Dr. Alias Thomas, CDH Chairman Dr. Subash Madhavan, Dr. Balu Soman, Dr. Kunal Viswam were also present there. Two dental surgeons were appointed for the camp for explaining the importance of brushing, how to brush, about parts of dental chair to the children.

On an average of 80 children visited our clinic per day,with the number going up to 300 on weekends and holiday. A maximum of 323 children visited out stall on a Sunday and the lowest was 58.

After 44 days of operation IDA clinic in Lulu came to end on 24-05-2015. IDA dental clinic at Lulu was a big success with the help of Kochi, Thrippunithura, Malanadu, Kodungallor and Nedumbassery branches.

SMILING COMPETITION AT LULU MALL KOCHI

A smiling competition in various categories was held in Lulu mall on 6th May 2015 from 4pm to 6pm. IDA National President Dr. Alias Thomas inaugurated the function, Dr. Ciju Poulose, Dr.Subash Madhavan, Dr.Balu Soman, Dr.Kunal Viswam were also present.

Dr. Arun Babu, Dr.Vinod, Dr. Avaneeth Kunal, Dr.Lovely Balu, Dr. Merlyn Alias were the judges for the competition. Dr. Rajeev Pillai (Dental surgeon/ Actor/ Celebrity Cricketer) was tha chief guest for the programme. Gold coins and consolation prizes were distributed for the winners.

NO TOBACCO DAY

IDA Kerala state observed No Tobacco Day at Payyanur on 31st May 2015 which was hosted by IDA coastal Malabar. IDA State President Dr. K.C.Thomas Inaugurated the function and also flag-off the rally from Payyanur to Thaliparamba. Anti Tobacco Pledge was given by Dr. Subash Madhavan.

The rally was consisted of 14 cars and 1 bus and announcement vehicle move to Pilathara From Payyanur. Magic Show, street play by Pariyaram Dental College Students, No Tobacco poem by Karivalloor Narayanan were also performed.

The Valedictory function at Thaliparamba was hosted by IDA north Malabar. The function was well attented and appreciated in all centers and became a grant success.

Eranad Branch

CDH: As part of our program 'Sparsham' our adoption program & reaching needy IDA Ernad handed over the fund to Mr.Ibrahim & Mr.Kunhyapu, Trustees of Ashraya special School at Wandoor for purchase of school kits for the students

CDE: Inter-branch CDE on 'Aesthetic Dentistry' by Dr.Santhosh Ravindran was held on 26th July 2015 Sunday at KPM Residency, Perinthalmanna 9am-4pm, 25 members attended the program.

Tour: IDA Ernad branch organized a two day tour to Pothundy near Nenmara, Palakkad on May 23rd & 24th, members with their families attended the tour, it was rejuvenating experience to all, enjoying the nature & naadan food at it's best, the tour was extended to Poabson's Estate Nelliyampathy.

Executive committee meeting: On 12th May 2015, 4th executive committee meeting was held at KFC Restaurant Wandoor 8 to 9.30pm 7 members attended.

On 13th June 2015, 5th Executive committee was held at KPM Residency, Perinthalmanna, 8.30-9.30pm, 5 members attended.