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NATIONAL DENTIST'S DAY

Annually celebrated on March 6th, it is National Dentist's Day. This day was created as a day set aside to say "Thank You" and show appreciation for the dentist.

In many cases, the day of our dental visit usually has us a bit nervous and sometimes anxious. We would often rather be someplace else than sitting in a dental chair. The dentist is not the person that most of us look forward to seeing. However, when the work is complete, such as: our checkup is done, our teeth are cleaned, the cavities are filled, the broken tooth is fixed, the toothache is taken care of and etc., we really appreciate what the dentist has done for us.

If you are not already in the habit of using them, today would be a great day to make a commitment to better dental h0abits.

It's National Dentist Day! Here are a few ideas for recognizing the important service they do:

- Get a dental checkup – Maybe it's time to get back in the office to make sure your teeth are healthy and your habits are on the right track.
- Send your dentist a thank-you card – Let your dentist know that you appreciate the work they put into making sure you're healthy
- Commit to better habits – There's no better time to renew your resolve to start brushing/flossing/swishing mouthwash regularly. Make a plan and stick with it!
- Raise awareness - Whether you teach your children a new song about brushing their teeth or you tell your friends why you're going to the dentist, you can do your part to help people realize the importance of dental hygiene.
- Smile – Don't forget to show off that beautiful smile that your dentist had a part in maintaining !

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National President's Message

Dr. Alias Thomas

I am very happy to address you through Kerala Dental Journal.

As you all know, I have taken charge as the National President at Bangalore during the 68th Indian Dental Conference, on Feb 15th.

My main aim this year is to popularise the image of IDA among the common public through various meaningful & worthwhile projects, and also to work for the betterment of the profession.

Our Organization & profession is passing through quite a tough phase. With increased mushrooming of new & new professional colleges, henceforth, producing multitude of graduating professionals, the scenario is not very pleasing.

To counter this, we ourselves have to find an amicable solution, to maintain a stable doctor: patient ratio, by creating awareness on the importance of Oral Health & its relationship with the General Health.

We can achieve this by putting up boards on roads & highways, that states unequivocally that Maintenance of Oral health is essential for Upholding Overall Health, by the 30 local branches of IDA Kerala State.

We can initiate this project by planning at least 10 boards per branch. And, I am sure that if we set the trend, the other States will soon follow.

IDA is also trying to have a breach with the Government to ensure us a better participation in the Employment sector, and I am sure that something positive will draw out.

KDJ has always been one of IDA Kerala State's prized possessions, turning out better and better as each year rolls through, the continuous recipient of the best Journal award, in National level, for so many years …

I take this moment to congratulate the Editor, Dr. K. Nandakumar Sir for this remarkable achievement, and I am sure that KDJ will continue the singular drive to fame even in the coming years.

Expecting each & everyone of your cooperation in all IDA activities the coming year,

Jai IDA.

Dr. Alias Thomas
National President, IDA

President's Message

Dr. Thomas K C

Dear colleagues,

I am profoundly obliged to you all for the trust and belief upon me to lead as the President of IDA, Kerala state throughout the year 2015.

I take this opportunity to thank our immediate past President Dr.Nizaro Siyo and all the past Presidents for taking our association to the present prestigious level.

Theme for this year is: 'DENTISTRY TOWARDS INDIVIDUALS'. Dentistry in India is at a transitional state and I am really worried about the future of young dentists. Dental colleges are sanctioned by the Government without considering the need of our country. Most of the dental colleges are not keeping professional standards. Many are not paying the minimum salary to doctors.

The charm of our profession is definitely the private practice. But the private practice in Kerala is facing a number of problems. Government is forming new rules day by day to increase the clinical standards. But they are not considering the economic status of the public as well as the practitioner. It is high time that we have to form a separate body in IDA to monitor the private practice which will deal with the Government related matters and also to create standard treatment charges. The need of clinical updating is very important nowadays, especially in the present competitive world. Our efficient CDE Convenor Dr. Deebu J. Mathew has already done its framework.

This year is the Centennial year of Indian dentistry and so the main focus will be given to create awareness among people on "need of good dental health". There are so many ways to do that and our CDH Convenor Dr. Subash Madhavan is coming up with wonderful ideas. In regard to this,we are going to conduct a CDH week from March 1 - 6, 2015, with the state level inauguration on March 1 in Attappadi among the tribals. We would utilise this function to inaugurate a free dental clinic which will be further managed by IDA Valluvanad Branch.

IDA HOPE, will hope that it will further flourish under the new team controlled by Dr. Joseph C.C.

I appeal my members to stand united,work as a team and strengthen the IDA branches. So with all of you to support, there is always scope of more projects and programmes.

My thanks to you all for the timely feedback, continued support and advices. I would like to express my deep gratitude to all my friends who stood with me at all my drawbacks.

Thanking you all once again,

With regards,

Dr. Thomas K C
President, IDA Kerala State.

Secretary's Report

Dr. O.V. Sanal

Dear colleagues,

"Greetings from the state office"

I am really happy about the overwhelming support from the local branch office bearers and my colleagues in state office for conducting the programmes in a beautiful manner within the first two months of new IDA office headed by our vibrant President Dr. K C Thomas. With pride and pleasure as an organizing Secretary of 47th KSDC , I am taking this opportunity to send my heartfelt thanks to all the members of IDA Kerala State who attended the conference and made it a successful and memorable one.

I am very happy being a part of this great organization as a honorary Secretary for the last two years. I am having one more year to complete this great job. When I look back I had a lot of good and bad experiences. But working with our own colleagues in this association made me to forget the bad experiences and everything is for the betterment of IDA and our dental profession.

The first three months of this IDA year got over in a fraction of minute. The new President Dr. K C Thomas and team of office bearers took charge on 18th January 2015 at Kannur. I congratulate the organizers and IDA North Malabar branch for their successful conduction of 47th KSDC at Kannur. It was a memorable and successful conference.

The installation ceremony of different branches got over after the conference. President, Secretary and President Elect attended the programmes. All the branch activities of Kerala State is going on very smoothly. The first list of membership send to head office within stipulated time. The first state programme after the conference was under CDH. A seminar was conducted on 4th February ,world cancer day at Pattambi. Dr. Subash our CDH representative and Dr. Balasubramanian took awareness class for the public. Acquire 2015 President and Secretaries workshop held at Kannur. All the office bearers of different branches participated and popular Jaycee Trainer Mr. M.A.S. Menon conducted a training class about leadership. I thank IDA North Malabar and Co-ordinator Dr. Anilkumar P.K for their work done for the success of the programme.

Around forty members attended IDA national conference held at Bangalore on 14th and 15th of February. It was the rare occasion to view our own member Dr.Alias Thomas installed as the new national President of IDA head office. Congratulations to Dr. Alias Thomas. The first state executive committee meeting held on 22nd February at Kottarakkara. Almost all the executive members attended the meeting.

Under golden feathers of IDA Kerala State one more new branch formed on 28th of February 2015. IDA Trippunithara branch was inaugurated by our National President Dr. Alias Thomas at Hotel Mermaid, Kochi. Seventy members joined to the new branches as charter members. Dr. Jayan B and Dr. Kunal Viswam elected as the charter president and secretary respectively. Congratulations to new IDA branch.

On 1st March as a part of Dentist day celebrations IDA national president Dr. Alias Thomas inaugurated two free dental clinics at Attapadi tribal colony Attapadi, Palakkad and at palliative centre in Kodungallore. The dream week of CDH activities starting from 1st to 6th march was inaugurated by Adv. Shamsudheen M.L.A. at Attapady on 1st March. I appreciate our CDH Chairman Dr. Subash K Madhavan for his tireless effort for the success of these programmes. I congratulate IDA Valluvanad and IDA Kodungallore branch for the contribution towards free dental clinic.

On 6th March IDA Kerala State conducted Dentist day celebration at Trivandrum in association with IDA Trivandrum branch. A seminar about our profession was conducted at NICDS, Neyattinkara and Dr.Antony Thomas and Dr. Santhosh Thomas took classes. A well arranged awareness class was conducted at secretariat employees hall for the employees of secretariat. Dr. Santhosh Thomas took classes and it was well appreciated. I thank Dr. Achuthan Nair and Dr. Arun President and Secretary of IDA Trivandrum branch respectively for their marvelous effort to make dentist day programme a grand success.

I appreciate all the members who actively involved in the association programmes and keeping our association vibrant.

The price of success is hard work, dedication to job at hand and the determination that whether we win or lose, we have applied the best of ourselves to the take at hand.

Thanking You,
Jai IDA

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

Editorial

Dr. K. Nandakumar

Quality of the professionals

The journal is fully convinced that Kerala is the only state in India which can experiment with peculiar things in professional education. Recently the minister in charge of education has gracefully consented with the demand of private college managements to give away the stipulation of securing a minimum mark in the entrance examination to get qualified for admission to the engineering courses. The argument is that, the engineering colleges do not get students and they are all going to other states because of the non-stringent rules prevailing there. To top it all, the peculiar rule says, even if the student gets minus ten, he should not be denied admission. It is very difficult to swallow such a logic of offering admission to a student to an engineering course after proving the incompetency.

The Journal understands that the role of education ministry is to regulate the quality of education and not to ensure admissions to the private colleges. When necessary essentiality certificates were issued to these managements while submitting the application for starting a college, the government was fully convinced that there is a need for the college in the specified area. Now we have found that there is no need for these many colleges in the state. The Journal is of opinion that all the professional colleges – medical, dental and engineering- sanctioned in the recent past are the result of a judgmental error on the part of the administration and planners. Very soon doctors and engineers of our state will go for some jobs which are not at all befitting to their qualifications. Why should we produce such an incompetent lot useful to none and take pride in the once claimed complete literacy? We should realize that there are many good students who are denied a chance for professional education because of the unaffordability of the fees. Government run colleges can give good regulation, quality and an opportunity to merit students. But the recent action of the health ministry to hoodwink the regulatory councils by temporarily shifting posts to new colleges is a danger signal that the new colleges will not have adequate teachers. The people who advice the ministry that the techniques played by private colleges can be followed in government colleges too, is an unpardonable mistake.

Professionals are not broiler chicken fit only to be killed. Professionals have a noble role to play in the society for that they have to be competent and the government has not realized it; or to be precise do not want to.

Dr. K. Nandakumar
Editor, KDJ

CASE REPORT

Rehabilitation of Atrophic Edentulous Maxilla using Zygomatic Implants

*Ashokan CK

Abstract

Results from various studies show that use of zygomatic implants represent a predictable alternative to bone grafting in the rehabilitation of severely atrophic edentulous maxilla. Traditional methods involve sinus lift and bone augmentation procedures using large volume of on lay bone grafts and alloplastic materials to enable implant placement and Osseo-integration. These procedures are expensive,time consuming and less predictable. A rigid anchorage achieved by using zygomatic implants in combination with regular implants in the residual anterior maxilla proved to be much more predictable and less invasive alternative to sinus lift and bone grafting. This paper is an exclusive case report on the surgical procedure and clinical outcome of using zygomatic implants for prosthetic rehabilitation of a severely atrophic edentulous maxilla.

Key words : Zygomatic implants, sinus lift, osseo-integration

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Introduction

Rehabilitation of an atrophic maxilla by fixed implant prosthesis has been challenging to the dentists.[1] Traditional method was unilateral or bilateral sinus lift and bone augmentation by large volume autogenous graft. Literature shows that implant placement in a grafted site has higher rates of failure than in the non grafted maxilla. Surgical placement of zygomatic implants is less traumatic and have more primary stability that enable the patient to wear the prosthesis immediately after the surgery. It has been proved beyond doubt that rehabilitation of severely atrophied maxilla with two zygomatic implants along with few conventional implants in the anterior region is more predictable, less invasive and economical.

Zygomatic implants- biomechanical considerations

Zygomatic implant is a self threading titanium implant with a roughened oxidised surface.[2] Usually, it is available in length from 30-52.5mm. The threaded apical part has a diameter of 4mm and the crestal part has a diameter of 4.5mm. The implant head has an angulation of 450 and an inner thread for connection of abutments. Since it is a long fixture, these implants have a tendency to bend under horizontal loads. So,these implants should be rigidly fixed with at least two conventional implants in the anterior maxilla.

Case report

A 50 year old female patient presented with completely edentulous upper and lower jaw with the expectation of having it replaced with an implant supported natural looking fixed prosthesis. History showed that she had to undergo total extraction because of severe periodontal problem. The patient was wearing denture for the past five years and was very uncomfortable due to poor retention of the denture. No systemic problems were reported. Intraoral examination revealed shallow upper and lower ridge because of severe resorption of the underlying bone incident to constant wearing of the denture. But the ridge was devoid of any redundant tissues and covered with healthy keratinised mucosa.

Routine blood examination including fasting and post meal blood sugar examination was done. An OPG and CT scan has been taken to evaluate the amount of bone in the zygomatic arch and residual alveolar crest. There was severe atrophy of the posterior maxilla and the mandible. After thorough clinical and radiographic evaluation and taking into consideration the patient's expectation,it was decided to undergo a total prosthetic rehabilitation using two nobel bio care zygomatic implants and regular nobel active immediate loading implants in the anterior maxilla where residual bone is available.

Presurgical Evaluation

Three dimensional imaging of the maxilla and zygomatic bone gives the density,length and thickness of the bones and also helps to rule out any pathology in the sinus(fig 1 & 2). A special surgical template for inserting zygomatic implants were made on a stereo lithographic model constructed using a special imaging software and CT scan. The surgical template gives correct

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orientation of the zygomatic implants without any error in angulation and position. Angulation and the orientation of the zygomatic implants in relation to the sinus and body of the maxilla was evaluated using the nobel guide software.

► Surgical Procedure

Although the procedure can be carried out under local anaesthesia, the patient was given general anaesthesia for the better comfort of both the patient and the doctor. The patient was kept under supervision of the anaesthetist throughout the procedure. A palatally placed deep incision was made from the first molar region on left side to the first molar region on the right side. A muco-periosteal flap has been reflected to expose the alveolar ridge and lateral wall of the sinus. Using the surgical template and the special drill for the zygomatic implant, an osteotomy has been carried out till

Fig 1 Pre-operative extra-oral and intra-oral photographs

Fig 2 Pre-operative OPG

Fig 3&4 Surgical placement of implants

Fig 5 Post-operative extra-oral and intra-oral photographs

Fig 6 Completed prosthesis & post-operative OPG

the zygomatic bone through the sinus (fig 3 & 4). A 45mm zygomatic implant has been placed into the osteotomy site using the torque ratchet and a primary stability of more than 40nm has been achieved. The zygomatic implant typically pierce the alveolar bone in the first bicuspid region and was more palatally placed. The same procedure was repeated for the opposite side. Size of the residual ridge in the anterior maxilla was too small to place even the minimum diameter implants. So crestal splitting has been done and four nobel active immediate loading implants have been placed in the anterior maxilla. Six nobel select implants were placed in the mandible with a primary stability of more than 35nm. After placing the healing abutments, the wound has been sutured with 3-0 proline suture.

The patient was put under antibiotics and anti-inflammatory drugs for five days. A rubber base impression was made with the impression posts and the jaw relation and the bite recording was performed on the same day. A provisional implant supported over denture has been inserted in the patient's mouth the following day itself.

Post- Operative Follow Up

Patient has been called for follow up a week later (fig 5 & fig 6).The patient was comfortable with the prosthesis and healing was uneventful. After a month, a new screw retained fixed prosthesis was made. This case has been followed up for the past 6 years and no untoward remarks or complaints have been received from the patient regarding the function of this zygomatic implant supported prosthesis.

Summary and conclusion

Zygomatic implants are designed for use in compromised maxilla.[3-5] They allow the clinician to shorten the treatment time; affording an effective alternative for fixed prosthetic rehabilitation.[6-8] This case with a follow up of six years confirms that zygomatic bone offers predictable anchorage and acceptable support for the functioning of the prosthesis in atrophic jaws. However, adequate surgical skills and experience of the surgeon and the co-operation and compliance of the patients in terms of systemic health and attitude is an adequate requisite for the success of a zygoma implant supported prosthesis.

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Management of a patient with microstomia by split dentures with a difference

*Anbu. Ila, **M. Aarti Rajambigai, ***Suneetha T.J., ****Somasundaram P., *****Jean Mathew

Abstract

Microstomia has been defined as an abnormally small oral orifice. The etiopathologic conditions are numerous but their intraoral structures may be normal. Prosthetic rehabilitation for these patients poses difficulty in all clinical and laboratory procedures. In such cases conventional method of impression making and fabrication cannot be used to rehabilitate the patient. This clinical report describes the prosthodontic management of microstomia case with the sectional maxillary denture with customized hinge attachment and sectional mandibular denture with ball attachment.

Keywords : microstomia, customized hinge attachment, castable ball attachment, sectional special trays with press button

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Introduction

Microstomia can be defined as an abnormally small oral orifice[1] an abnormal limited mouth opening can be caused by surgical treatment of orofacial neoplasms, cleft lip, oral submucous fibrosis, maxillofacial trauma, burns,scleroderma, TMJ dysfunctions, plummer –vinson syndrome and finally aging too.[2]

Some of the treatment modalities include modification of the denture design, surgical procedure like commisurectomy, mouth opening devices to expand oral opening.[3,4] and exercises.[5]

Modification in denture design mainly includes hinge attachments, magnetic attachments,metal frameworks,locking tools, swing-lock latch attachments[6,7]

Prosthodontic treatment for microstomia cases are difficult especially when the mouth opening is below 35mm. impression making is the main task in fabricating the denture.[8,9,10]

Clinical case report

A 38 year old completely edentulous female patient (fig.) reported to the department of prosthodontics, Rajas Dental College, Thirunelveli with the chief complaint of poor facial appearance and difficulty in eating due to reduced mouth opening. Patient was in need of a complete denture. She had a mouth opening of 33mm.

Step by step procedure:

Preliminary impression:

Completely sectioned plastic stock tray was used for making impression for maxillary arch.

The tray was bisected and acrylic resin was added as guide for locking the tray.

The preliminary impression of maxillary arch was made in irreversible hydrocolloid by inserting the first part into the mouth immediately followed by the second part

Partially sectioned plastic stock tray was used for making impression for the mandibular arch.

Final impression:

Sectioned custom tray was fabricated using autopolymerising acrylic resin.

Bisected trays were held together in the handle region of the tray.

Nick and notch was used in upper tray and press button in lower special tray.

After completing the border molding procedure separately for the two individual sections using green stick(low fusing compound) final impressions were made in zincoxide eugenol impression paste.

Laboratory procedures:

Maxillary permanent denture base with customized hinge attachment along the midline was fabricated.

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Mandibular permanent denture base with single ball attachment was fabricate at the canine region.

► **Jaw relation & teeth arrangement:**

Complete maxillary occlusal rim was fabricated and a cut was given along the midline which aids in folding of the denture base with hinge movement. Similarly in canine region for the mandibular occlusal rim.

Jaw relation was recorded and the occlusal rim was completely retrieved after separating the left lower part of the denture base being first from the mouth

Microstomia – denture with a difference

Pre- op

Split stock tray

Primary

Primary

Nick & notch upper special tray

Final impression

Press button in lower arch with final impression

Split occlusal rims

Sectional maxillary denture with customized hinge joint &
Sectiona mandibular denture with rhein's ball attachment

Post - op

Try-in verification:

Esthetics and occlusion were checked during try-in period. Retentiveness of the lower denture base was not upto the mark and another single unilateral ball attachment was casted and attached to the denture base.

Denture fabrication & insertion:

With the addition of second unilateral ball attachment to the mandibular denture base, complete fabrication with heat cure acrylic resin was finished.

Extension and occlusion were checked and finally polished sectional complete dentures were inserted into patient's mouth. Instructions were given.

► Discussion

In microstomia patients , due to reduced oral orifice , insertion and removal of the denture was found to be difficult. Dental literature supports various other techniques for fabricating the sectional dentures. In this case, in each clinical step a method was used for retrieving the maximum accuracy. Initially split stock tray for preliminary impression[8], nick & notch in maxillary and press button in mandibular secondary special trays were been used.[12] Customized hinge attachment in maxillary[6,11] and unilateral ball attachment in mandibular complete denture were been fabricated.

► Conclusion

Main advantages of sectional denture in this case are:

1. easy way of insertion & removal
2. customized attachments were being used.
3. stability and retention of the denture were improved

Finally it is easily available and cost effective than other techniques/ methods

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CASE REPORT

A rare case of congenital duplication of Wharton's Duct

*Tatu Joy, **Meera Mathai, ***Ragupathy L. P.

Abstract

Congenital anomalies of the salivary ductal system rare. Ductal atresia, duct imperforate, duplication anomalies are the commonly reported cases. Duplication anomalies are common with the gland. But we present a rare case of congenital duplication of Wharton's duct.

Key words: Salivary gland, Wharton's duct, congenital duplication

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► Introduction

Submandibular gland is a major salivary gland which produces saliva of mucous nature. Its duct Wharton's duct is thin walled and is about 5 cm long, which opens on the floor of the mouth at the summit of sublingual papillae at the side of frenulum of tongue. Anomalies of salivary gland and ducts are rare. Commonly reported cases were congenital atresia of the gland and imperforate duct. Duplication anomalies are commonly seen with Stensons duct. We report a case of duplication of Wharton's duct on left side which was found accidently.

► Case report

A 22 year old male patient came to the department of Oral Medicine and Radiology with the complaint of pain the left Submandibular region since six months. Pain was sharp and intermittent and relieved on medication, which was associated with a diffuse swelling seen during intake of food. On extra oral examination, face was apparently symmetrical. Temperomandibular joint on the left side was tender. The mouth opening was normal. Submandibular lymph nodes on the both sides are palpable and non-tender. Bimanual palpation on left side done and submandibular gland was tender. On intra oral examination, inspection revealed two openings one on the normal anatomical position which was dilated and another seen lateral to it of diameter, 1.5×1.5mm (fig 1). On palpation, salivary flow was normal without stimulation. Based on the history and clinical features a diagnosis of saliolith was made. A screening Orthopantomograph was taken which does not have any relevant findings except missing 38 (fig 2). Ultrasonography of the left submandibular gland was taken which was non-contributory. Sialography was performed using Iohexol [Iohexol {755mg}, Tromethamine {1.21mg}, Edeate Calcium Disodium {0.10mg}, water]. 3ml of the dye was administered through the normal Wharton's duct opening, but the dye was seen exuding through the collateral orifice. An occlusal radiograph was taken with cannula on the normal opening and lacrimal probe on the collateral one to trace the ductal path which appeared to be separate. Suture was placed with the two instruments to prevent the backflow the dye (fig 3, fig 4). And dye was reinjected and the orthopantomograph was repeated. An obstruction of the duct was seen 5mm from the isthmus (fig 5). Patient was sent for MRI evaluation which revealed duplication of the left submandibular duct forming a common duct in the deep lobe of submandibular gland with calculi in the common duct along with changes in the parenchyma suggesting sialadenitis (fig 6, fig 7). Patient was not wiling for the surgical intervention. Hence given Tetracycline {500mg} and Diclofenac Sodium as medical management.

► Discussion

The submandibular gland begins at the 6th week of intrauterine life as an epithelial outgrowth into mesenchyme forming the floor of the mouth in the lingo gingival groove. This proliferates rapidly giving off numerous branching processes that eventually develop lumina. Initially the developing gland opens into the floor of the mouth posteriorly, lateral to the tongue. The walls of the grooves into which it drains come together to form submandibular duct. This process commences posteriorly and moves forward so that ultimately the orifice

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Fig 1

Fig 2

Fig 3

Fig 4

Fig 5

Fig 6

Fig 7

of the duct comes to lie anteriorly below the tip of the tongue close to midline. Congenital anomaly of the salivary ductal system rare. Pownell et al[4] reported five newborn with a cystic swelling on the floor of the moth among which one was due to duplication anomaly. But their early recognition is important if effective treatment is instituted. The diagnosis of the congenital abnormalities of the Submandibular duct and gland are made by physical examination. Magnetic Resonance Imaging can be helpful in differentiating congenital imperforate Submandibular duct and duplication anomalies of the ductal system. Soliman Ahemed et al[1] {2007} had reported a case of bilateral duplication of submandibular duct which caused ranula formation which got confirmed by MRI. Gaur et al[2] (1994) reported on a case of three ducts leaving the left submandibular gland in a male adult Indian cadaver, each of which ran independently and ended as an independent opening in the mouth floor. Mori et al[3](1986) also reported on a sialographic examination of a 73-year-old male Japanese patient showing 2 ducts running out of the right submandibular gland, which merged just before forming a sole opening in the sublingual papilla.

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CASE REPORT

Complicated crown fracture: Conservative management using autogenous tooth fragments

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Abstract

Trauma to the anterior tooth is one among the frequent clinical scenarios practitioners encounter in daily practice. This case report discusses means of restoring complicated tooth fracture using ultraconservative and cost effective approach using autogenous tooth fragments.

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Introduction

Trauma to anterior tooth is one of the most common injuries occurring in dentition, especially among children and young adolescents[1]. This increase in frequency among this particular age group may be attributed to the increase in physical activity and/or malocclusion, resulting in relatively forward position of the tooth.[2,3] Management of anterior crown fracture is important to the practioner and the patient alike, due to the physical, psychological and social implications that it carries.

With the advent of adhesive dentistry, newer techniques were developed that could preserve the aesthetics, at the same time, providing sufficient bond strengths. Using patients own tooth fragment have the advantage of obtaining excellent aesthetics, maintenance of original tooth morphology, translucency, economical, time efficient and similar rate of incisal wear[4,5]. Reattachment of teeth was first published by Chosak and tidel in 1964.[6]

Reattachment of tooth fragment is the most conservative approach as it helps to restore the function and aesthetics with minimal loss of tooth structure. The psychological impact on patient, of having the fractured tooth corrected immediately could be an added advantage.

The purpose of this case report is to illustrate the conservative biological approach in treating an anterior tooth with complicated crown fracture following trauma using autogenous tooth fragment.

Case report

An 18 year old male patient was referred to Dept. of Conservative Dentistry and Endodontics, Govt. Dental College, Calicut with chief complaint of pain and broken upper front tooth. A thorough history was elicited, which revealed an occupational mishap resulting in fracture of maxillary left lateral incisor 2 days back (Fig.1). The patient reported of pain when the fractured segment moved. Intra oral examination revealed a fracture in the labio palatal direction without displacement of the fragment. The fracture was incomplete and fragment held in position by soft tissue palatally. An intra oral peri apical radiograph revealed the fracture line positioned supra crestally with no associated root fracture (Fig 2). The alveolar bone and the periapical tissue appeared normal. After, clinical and radiographic evaluation, a diagnosis of complicated crown fracture – Ellis Class III with respect to 22 was made. Since the tooth had complicated crown fracture, single visit endodontic therapy was instituted. As the traumatized tooth had fracture segment that could be repositioned accurately, with no associated hard tissue loss (enamel/dentine) reattachment procedure was planned.

The fragment was immobilized temporarily using flowable composite (Esthet X Flow, Dentsply) with no prior etching. Conservative access cavity was prepared and chamber irrigated with 5.25% NaOCl under rubber dam isolation. The root canal was negotiated with No. 10 K file and working length determined. The canals were shaped using rotary protaper files, master core verified and obturated using lateral condensation techniques using ZnO. Eugenol sealer.

Procedure for reattachment

The fractured tooth surface, the fragment and access cavity was etched using 37% Phosphoric acid for 20 seconds, rinsed thoroughly with water and air dried. Next self adhesive resin cement (RelyX™ U200, 3M ESPE) was applied. The adaptation of the fragment was confirmed prior to light curing and slight pressure was

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applied to maintain the position of the fragment while curing. After the fracture segment has been bonded, a 1mm chamfer was prepared on the labial surface using round bur. After surface etching and bonding, layer of nano hybrid composite (Filtek Z250, 3M ESPE) was applied to the chamfer surface incrementally and light cured. The surface was finished and polished using composite finishing and rubber cups (Shofu Dental, CA, USA). Slight deep bite which was present in relation to the fractured tooth was relieved by selective grinding of opposing incisal edge, evaluated using articulating paper. Post operative care regarding oral hygiene and avoiding forces on anterior tooth was given. The patient was scheduled for one month recall visit. The tooth was evaluated clinically and radio graphically during recall and was found to be asymptomatic with no mobility. The adjacent gingiva and alveolar bone was found to be normal (Fig 5). Recall visits, every 6 months, was scheduled.

► Discussion

Management of complicated crown remains a challenge to practitioner. The psychological and societal component involved, especially in anterior tooth fracture, demands that the injury be repaired at the earliest.

It's always beneficial to maintain pulp vitality, whenever possible. However in this case considerable time (>48 hours) was elapsed after the injury and had a large extent of exposure. Single visit endodontic therapy was instituted as it allows early completion of procedure and minimizes the risk of further contamination[7].

Andreasen and Andreasen states that the reattachment procedure may importantly serve as a transitional treatment alternative for pre-teens or teenage patients to postpone definitive treatment until an age where gingival margin contours are relatively stable.[8]

The ideal material suited for bonding fractured fragments is still being debated. Materials like pins, post and core systems, dentine bonding agents, dual cure resin cements were used by various authors.[9,10,11,12]

Andreasen *et al* used All-Bond 2 and Scotchbond MP to reattach crown fragments to the remaining portion of sheep incisors loaded at different loading rates. They suggested that reattachment with a bonding resin of the enamel dentin crown fragment after crown fracture is a realistic alternative to composite resin build up, although only half the strength of the intact tooth is achieved[13] Munksgaard *et al.*, reported the same values.[14]

Fig 1 Pre Operative photograph showing fractured 22

Fig 2 Pre Operative IOPA showing fracture line supracrestally

Fig 3 Immediate Post operative photograph

Fig 4 1 month Post Operative review

Fig 5 Intra Oral 1 month review

In this case additional chamfer preparation was carried out along the fracture margins. Reis et al.[15] reported that a simple reattachment with no further preparation of the fragment or tooth was able to restore only 37.1% of the intact tooth's fracture resistance. In their study, a buccal chamfer recovered 60.6% of fracture resistance and bonding with an over contour and the placement of an internal groove nearly restored the intact tooth fracture strength with recovering values of 97.2 and 90.5% respectively. They advocated the necessity of using additional preparations to enhance the retention of the reattached fragment

The main cause of failure of the reattached tooth fragment is a new trauma or the use of the restored tooth with excessive masticatory forces, which justify many previous attempts to improve the fracture strength of the rebonded fragment. Biological restoration is highly conservative technique that promotes preservation of tooth structure and allows restoration of tooth with minimal sacrifice of the remaining tooth structure.[16] However, this technique can be used only when intact tooth fragment is available and close repositioning between fragments is possible[17] Reattachment of the fractured fragment after endodontic treatment was possible in this case as the fragment was intact.

The various disadvantages of tooth reattachment includes color change of the fractured segment, susceptibility for debonding in patients exhibiting deep bite/edge to edge bite, and need for continuous monitoring[18]

Conclusion

Reattachment of tooth provides means by which excellent esthetic results could be obtained. With the advent of newer adhesive techniques, considerable bond strengths, favoring success is achieved. However the prognosis is dependent on the cooperation of the patient and oral hygiene maintenance

With the right selection of cases, materials and techniques, predictable results are possible with tooth reattachment. It also provides an ultraconservative, time efficient and cost effective means of restoring a traumatized anterior tooth

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Traumatic bone cyst - an unusual bone cavity

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Abstract

Traumatic bone cyst is an uncommon non epithelial lined cavity but may be incidentally diagnosed in routine dental treatment. Clinical features may comprehend asymptomatic lesion with no bone expansion, most commonly located on the posterior mandibular area. Lesion most often affects patients in second decades of life. Radio graphically traumatic bone cyst is manifested as well defined radiolucent cavity which scallops or festooned pattern around the apexes of the adjacent teeth. The definitive diagnosis of traumatic bone cyst is achieved at surgery. Adequate diagnosis and treatment should be given to avoid complications by the broad palette of other pathological processes in the area of the jaw which can differentially diagnostically be considered. Correct recording of case history with good knowledge of differential diagnosis will enable realization of successful treatment of the patient.

Key words: Idiopathic bone cavity, Hemorrhagic, Mandible

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► Introduction

In 1929, Lucas and Blum for the first time described traumatic bone cyst (TBC) as a separate disease entity.[1] TBC may be identified by a great variety of names in the literature, such as hemorrhagic bone cyst, simple bone cyst, solitary bone cyst, extravasation cyst, idiopathic bone cyst (IBC), primary bone cyst, and others.

The 'traumatic bone cyst' originates from the trauma-hemorrhage theory which involves an event sufficient to precipitate medullar hemorrhage, yet a failure of the hematoma to undergo organization and tissue replacement. Degeneration of the hematoma results in cavitation.[2] Different causative factors such as bone tumor degeneration, altered calcium metabolism, low-grade infection, local alterations in bone growth, venous obstruction, increased osteolysis, intramedullary bleeding, local ischemia, or a combination of such factors have been proposed [3,4]

Most of the IBCs are diagnosed incidentally in orthopantomogram (OPG) and most of the individuals affected are teenage or at early 20s.[4] TBC may occur in patients with ages varying from 2 to 75 years, but 56-70% of all cases are diagnosed during the second decade of life, and only 15% of the patients are more than 40 years of age. The body of the mandible (75%) is usually affected in the premolar and molar regions.[5]

Pain is the presenting symptom in 10% to 30% of the patients.[4,5,6] Other, more unusual symptoms include tooth sensitivity, paresthesia, fistulas, delayed eruption of permanent teeth, displacement of the inferior dental canal and pathologic fracture of the mandible.[7,8,9,10,11] Mild expansion of related bone and thinned but not perforated cortical bone is clinical appearance of IBCs. Because the IBC resorbs the bone instead of expanding, tooth roots, teeth, mandibular canal and other anatomic structures are not displaced.[7, 8, 9, 10, 11]

Radio graphically it is manifested as a well defined, radiolucent, unilocular area, which occasionally presents a typical festooned pattern around the apexes of the adjacent teeth.[12,13] Characteristic for the traumatic bone cyst is this "scalloping effect" when extending between the roots of the teeth. Traumatic bone cyst (TBC) may destroy the bone with no clinical signs or symptoms.[4, 5]

The WHO classification describes TBC as a non-neoplastic osseous lesion because it shows no epithelial lining, which differentiates this lesion from the true cysts of age.[14]

The definite diagnosis of traumatic cyst is invariably achieved at surgery when an empty bone cavity without epithelial lining is observed, leaving very little except normal bone and occasional fibrous tissue curetted from the cavity wall. Sometimes, the cavity contains a straw-colored fluid of bright blood.[4, 5, 15, 16]

Surgery is the management of choice, particularly as refers to confirmation of the diagnosis. Simple curettage of the bone walls is performed, with healing after 6-12 months. Clinical and radiological follow-up after surgery is thus indicated.[17]

The present case report describes the clinical and radiological characteristics, the surgical and histopathological findings of traumatic bone cyst in a patient.

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Case report

A 25 year old male patient came to the department of Oral Medicine and Radiology with a chief complaint of sensitivity in the right and left sides of lower jaw since 3 months, which was intermittent in nature. Patient gave a history of domestic violence to the lower jaw 10 years back. Clinical examination was insignificant. Intraoral examination did not show any abnormality or bony expansion. Vitality tests were done which proved positive. Aspiration was done which was negative.

Routine periapical radiograph revealed a well defined radiolucency with scalloping in between the roots of mandibular second premolar and first molar. Panoramic radiography confirmed the extension and size of the lesion which revealed a well defined unilocular radiolucent area of size 3 × 2.5 centimetres.(Fig 1) CT scan revealed a soft tissue lytic lesion in the right posterior mandible.(Fig 2) The differential diagnosis of traumatic bone cyst, odontogenic keratocyst, odontogenic myxoma and central giant cell granuloma were included.

Patient was operated under local anaesthesia for removal of the cyst with curettage. Bone cavity was identified and was completely empty of tissue or fluid and there was no lining.

Histopathological examination revealed densely inflamed connective tissue stroma with extravasated RBC's. Necrotic changes and chronic inflammatory cells were seen. There was no evidence of any cystic epithelium.(Fig 3)

Panoramic follow-up radiograph taken after 23 months from surgical intervention showed process of bone repair had occurred locally.(Fig 4)

Discussion

In the present case of TBC, the diagnosis is well documented radio graphically and histopathologically. It is an interesting case of possible traumatic origin. Most of the lesions in the jaws occur in the mandible. Maxilla is rarely affected.

Trauma is the most frequently discussed etiologic factor in the formation of a TBC. Of the pathogenic hypothesis of TBCs evaluated by Howe[4], the most widely accepted mechanism involves microtrauma an event sufficient to precipitate intramedullary hemorrhage with osteoclastic activity and elimination of trabeculae within cancellous bone compartment, yet a failure of the hematoma to undergo

Fig 1 Well defined unilocular radiolucency with scalloping in between the roots of mandibular second premolar and first molar

Fig 2 Sagittal CT showing soft tissue lytic lesion in the right posterior mandible

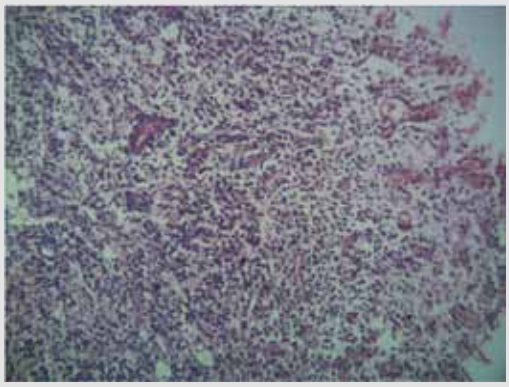

Fig 3 Densely inflammed connective tissue stroma with extravasated RBC's, necrotic changes and chronic inflammatory cells. No evidence of any cystic epithelium.

Fig 4 Follow-up panoramic radiograph taken after 23 months from surgical intervention showing process of bone repair had occurred locally

organization and tissue replacement. Degeneration of the hematoma results in cavitation. The traumatic etiology hypothesis is challenged by the fact that more than 50% of cases have no traumatic history[22]. Suei etal reported no evidence of traumatic history[18].

Other theories include cystic degeneration of fibro-osseous lesions, intraosseous vascular anomalies, alteration of bony metabolism and low level of infection[19]. In some case reports of TBCs, the authors have discussed the possibility of the performed dental extractions to be the responsible trauma factor in their cases.[4,5,20]

The lesion is unilocular and scalloping between the roots. Idiopathic bone cavities are occasionally asymptomatic. Expansion of the mandible rarely occurs. Lesions may contain straw colored fluid, blood and connective tissue, blood clot or nothing. Aspiration of idiopathic bone cavities would return with blood but this is not because the cavity is filled with blood but the disturbance of the tip of the needle to capillaries and negative pressure in the marrow space consequently.

Panoramic radiographs and CT scans are essential for the diagnosis and evaluation of lesions.

Central giant cell lesions, odontogenic keratocyst, ameloblastoma, lateral periodontal cyst, and other destructive bone cysts and tumours should be taken into consideration in differential diagnosis. The lesions in females also are considered in aspect of the florid cementoosseous dysplasia.

Careful curettage of the lesion favors progressive bone regeneration, offering a good prognosis and an almost negligible relapse rate. Osseous regeneration can be verified after some months. Literature mentions about the filling of cavity with blood, bovine lyophilized bone, autologous blood with bone from patient or synthetic bone materials or single bone grafting without blood or intralesional injection of methyl prednisolone or application of gelfoam. [21] Long-term follow-up of patients treated for multiple IBCs is required because of the high probability of recurrence. Further studies would be beneficial to help clarify the etiology and management of these lesions.

Conclusion

In everyday practice, during work with patients and when analysing radiographic images, it is possible to come across cases which radio-graphically and clinically have the appearance of cystic changes. Decision on diagnosis of a TBC will depend on individual experience. Correct recording of case history, knowledge of the symptomatology, correct interpretation of the radiograph will be helpful when deciding on the diagnosis and relevant treatment.

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Management of dentoalveolar fracture in a 2 year old child

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Abstract

Various management protocols are being followed for the management of pediatric fractures. Lot of precautions are to be taken in the management since there can be injury to tooth germs. Here a very conservative approach is followed with just splinting in a 2 year old uncooperative child. We have also added the benefits of conscious sedation in an uncooperative child.

Key-words: Dentoalveolar fracture, splinting, circum mandibular wiring, conscious sedation.

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Introduction

Pediatric fractures are uncommon when compared with fractures in adults. The reasons for this is based primarily up on social and anatomical factors. Most often children are in protected environments, under the supervision of parents and are thus less exposed to major trauma, occupational accidents or interpersonal violence, which are the common causes of facial fractures in adults. The flexibility of the facial skeleton and the relative protection offered by existing fat in the subcutaneous tissue around the bones of the face also contribute to reduction in the incidence of fractures, especially in the maxillofacial region.[1,2]

Approximately half of all pediatric facial fractures involve the mandible and boys are more commonly affected than girls by a ratio of 2:1 and the majority of injuries occur in teenagers. The management of pediatric mandibular fractures is substantially different from that for the adults. This is primarily due to the presence of multiple tooth buds throughout the substance of mandible, as well as due to potential injury to future growth. Although these issues complicate the management of pediatric mandible fractures, the younger patients also have the potential for restitutional remodeling, as opposed to the sclerotic, and functional remodeling seen in adults.[3,4] An understanding of the surgical or treatment options is essential for making informed choices to best manage these injuries. Here we present a case of management of a dentoalveolar fracture of the mandible in a 2 year old child.

Case report

A 2 year old child reported to the Department of Oral and Maxillofacial Surgery, Kannur Dental College with the history of fall from window. Patient did not have any significant medical history and was not under any medication. She was not co-operative when she reported to the department. On examination there was a dentoalveolar fracture extending from 83 to 73.(Fig 1) 81 was extracted from a local dental clinic before reporting to the department. Treatment plan was acrylic splint fixation and suturing of gingival laceration under GA. The treatment plan was explained to the patient's parents. Informed consent was obtained from the patient's parents. Impression of lower and upper arch were made with addition silicone putty material under conscious sedation.(Fig 2) The anaesthetic agent used 1.5mg ketamine and 0.7 mg midazolam. Suturing of the laceration in the gingiva was done with 3 -0 vicryl. (Fig 3) Splint was fabricated in hot cure acrylic covering occlusal surface of 84, 85, 74 and 75.(Fig 4) Splint fixation was done under GA. The agents used were Midazolam 0.5mg, Emeset 1mg, Fentanyl 20 mcg, Propofol 20 mg and Scoline 7.5 mg,. Endotracheal intubation was done with no 4 non cuffed endotracheal tube. Conterary to wiring we preferred to cement the splint in position to reduce the fracture segment. It is to prevent injury to vital structure and easy removal of the same after 3 weeks postoperatively. The fracture reduced by digital pressure and splint was inserted. The splint was fixed using fugi luting cement. (Fig 5) The post operative period was uneventful. Post operative x ray was taken and showed fractured segments were reduced in correct alignment. (Fig 6) Patient was discharged after 2 days. Review was done after 1 week. Splint removal was done after 3 weeks under conscious sedation. (Fig 7) The fracture segments healed well.

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Discussion

Facial fractures in the pediatric age group generally account for about 5% of all fractures and this percentage drops considerably in those less than the age of 5. Their incidence rises as children begin to go to school and also peaks during puberty and adolescence. A male dominance exists in all age groups.[6] Haug and Foss reported that less than 1% of all fractures occur in patients younger than 5years and 1–14.7% in patients younger than 16years.

In the study of Atilgan et al, falls were the most common cause of maxillofacial injuries in young patients, and the second most common cause was road traffic accidents.[7] However, studies from other parts of the world have reported that road traffic accidents were the leading cause of facial fractures in young adult patients.[8]

Closed reduction techniques with maxillomandibular fixation in very young children can pose several concerns, including cooperation, compliance and adequate nutritional intake. Open reduction with rigid internal fixation (ORIF) of unstable mandibular fractures using miniplates and screws are thought to have a negative effect on skeletal growth and unerupted teeth and involve two-stage surgery because of the need for plate removal after complete healing.[9]

Management of children with primary or mixed dentition is complicated by several factors. First is the presence of secondary, unerupted teeth in the mandible body until 6 years of age or longer. ORIF with a plate in preadolescent children places their secondary dentition at significant risk of injury, and thus only monocortical plating should be performed. Second is the difficulty of maintaining secure mandibular-maxillary fixation (MMF) when the teeth are not present or are not firmly anchored in the mandible. In most preadolescent children, MMF cannot depend on arch bars and requires lingual splints and/or circummandibular wiring.[10]

The process of preparing lingual splints is time consuming because dental impressions with reconstruction of the pre fracture occlusion is required. Irby described the lingual splint under the category "simple splints," and recommended its use in reduction and stabilization of displaced dentoalveolar fractures in children. Operative treatment should involve minimal manipulation and may be modified because the treatment of bony injuries is most easily accomplished by techniques that may adversely affect craniofacial development in children.[11,12]

Yaman et al. discussed a malpractice case and recommended that screws and plates should be removed as soon as healing period is over and especially in pediatric cases, doctors must have a greater responsibility about therapy period. İçten et al. reported the conservative treatment of three mandibular fracture cases. These authors stated that healing of the fractures were observed within three weeks.[13, 14]

ORIF pose many challenges in paediatric fractures. The problems are presence of developing tooth germs, though

Fig 1

Fig 2

Fig 3

Fig 4

Fig 5

Fig 6

Fig 7

the inferior border of the mandible can be plated either through an intraoral/ extraoral approach. Additionally, the extraoral approach carries the risk of scarring and damage to the marginal mandibular nerve; Interference with growth due to placement of miniplates;[15] General anesthesia and hospitalization is needed for removal of the hardware after complete healing; Allergic reactions to metal resulting in inflammation that needs removal of plate have been reported; Stress shielding, especially after rigid plate fixation, has been reported and may cause weakening of bone after removal of implant;[16] Corrosion and release of metal ions can lead to the removal of fixation device.

On the other hand closed approach provide a good reduced position, maintain continuity of periosteal sleeve and maintenance of the soft tissue, thus creating a positive environment for rapid osteogenesis and remodelling processes as well as prevention of any type of non fibrous union. Furthermore, in the splinted mandible, the fracture segments are tightly fixed and serve in reducing tenderness and pain reactions during a child's daily activity.[17]

Lois et al, found that there is no difference in the complication rates of fractures treated by MMF versus ORIF (4.3% and 5.45%, respectively). They concluded that in fractures with displacement in a range of 2–4 mm, there is no difference between MMF and ORIF.[16]

Ellis et al, found lower complication rates in patients with comminuted mandibular fracture, who underwent open reduction and fixation (10.3%) than in those who were treated with closed reduction with IMF (17.1%). Yerit et al, found uneventful healing and no complications when using resorbable osteosynthesis plates and screws for ORIF, while others described some complications due to mucosal exposure of the plates, premature occlusal contact and TMJ disorders.[16]

Circummandibular wiring was not used in our case to reduce injury to vital structure and easy removal of the splint post operatively. Cementation of the splint keeps the fractured segments in correct position and also the splint can be removed easily post operatively without causing any injury to soft tissues. The best option of treatment was splinting with circummandibular wiring in pediatric cases.

Conscious sedation procedures using intravenous midazolam administered with or without inhalation sedation (50% N_2O_2) or premedication were shown to be safe and effective in patients. Its advantages include quick onset, short duration of action, and haemodynamic stability which may be associated with improved patient acceptance. The pharmacokinetic profile of midazolam compares favourably with that of diazepam, permitting more controlled sedation with a quicker recovery time. Midazolam has been associated with shorter recovery room stays and less vomiting in children who undergo outpatient surgery. The safety and tolerability profile of midazolam in paediatric patients is comparable or superior to that observed in adults.[18]

Conclusion

While the basic principles for mandibular fracture treatment are the same as for the adult, certain anatomical features of the pediatric mandible warrant special attention. For the proper treatment, mixed dentition, unerupted teeth, the shapes of teeth and ongoing growth in the mandible should be carefully considered. Although there is no clear consensus about the optimal method for fixation of mandibular fractures; effective, simplest and less invasive method is the best method

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Radicular cyst as a sequel to untreated dental trauma

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Abstract

Radicular cyst is the most common odontogenic cyst arising from the epithelial residues in the periodontal ligament as a result of pulp inflammation from caries or dental trauma. When inflammation leads to pulp necrosis, a radicular cyst may develop if it is not identified and managed on time. The cyst develops gradually and can cause pulp death of uninvolved adjacent teeth. Trauma is one of the most common causes of pulp necrosis of anterior teeth in children. This case report is about the development of a radicular cyst, following uncomplicated crown fracture and pulp necrosis of 41, causing pulp death of all the mandibular incisors and an extra oral draining sinus on the chin, in a 11 year old boy. The pathogenesis of cyst formation and management as well as the importance of immediate care and periodic evaluation of dental trauma is discussed here.

Key Words: Radicular cyst, Dental trauma, Pulp necrosis

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Introduction

Studies have shown that dental trauma leading to loss of vitality is the major etiology that leads to the formation of a radicular cyst and most commonly involved teeth are maxillary anteriors[1]. Radicular cyst is one of the late sequelae of untreated pulp necrosis often caused by dental trauma or caries. The cyst that arises involves the apices of the teeth and hence the names apical periodontal cyst and periapical cyst.

It is the most common osteolytic lesion of the oral and perioral region[2]. The development is usually slow and symptomless unless infected. They can cause bony expansion and can involve adjacent teeth endangering their vitality and prognosis[3,4]. It is an odontogenic cyst of inflammatory origin, preceded by a chronic periapical granuloma and stimulation of cell rests of Mallassez of the periodontal membrane[5].

The two categories of periapical cysts are, those with cavities completely enclosed in epithelial lining called the true cysts and the cysts with epithelium lined cavities that are open to root canals called bay cysts or more recently, periapical pocket cysts. More than half of these cystic lesions are true cysts and the rest are apical pocket cysts[6]. The Radicular cysts that persist even after extraction of the offending tooth are called residual cysts[7].

Case Report

An eleven year old boy reported at the Department of Pediatric Dentistry with a draining fistulous tract on the chin (Fig 1). General examination showed the patient to be in good physical health. Intraoral examination revealed red and inflamed floor of the mouth (Fig 2), enlarged lower labial cortical plate extending from right to left lateral incisors (Fig 3) and uncomplicated crown fracture of 41 (Fig 3). There was no mobility associated with any of the mandibular incisors. Detailed history revealed trauma to 41 fours years ago while playing cricket. Patient had consulted a dental surgeon, but since an uncomplicated crown fracture was the only finding then, no treatment was given. But recurrent swellings of the lower labial cortex occurred and patient was given analgesics and antibiotics repeatedly which gave relief transiently.

The patient then reported to us with a draining sinus on the chin, inflamed floor of the mouth and expanding buccal cortical plate at the mandibular anterior region. There was no mobility of lower

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incisors. Thermal and electric pulp tests were conducted to evaluate the vitality of the mandibular incisors. 41 did not respond while others showed minimal response.

Radiographic evaluation revealed a round, well circumscribed radiolucent area with ill defined border in few areas involving the apices of 31, 32, 41 & 42 (Fig 4). It is often difficult to differentiate periapical granulomas from radicular cysts in radiographs. Periphery of the radicular cyst usually has a well defined cortical border, but in case of infected, rapidly growing cyst a sclerotic border is seen[5].

From history, clinical examination and radiographic evaluation a provisional diagnosis of infected radicular cyst was made. The treatment plan included the endodontic management and apical curettage of the involved teeth, as well as the enucleation of the cyst as well as excision of the extra oral fistulous tract.

Management

Antibiotics and analgesics were prescribed to control the presenting complaint. Endodontic management of all the mandibular incisors were initiated immediately and completed before surgery. Labial flap was raised in relation to lower incisors. Cystic lining and contents were enucleated (Fig 5). Closure was done after adequate heamostasis. Excision of the draining fistulous tract on the chin was done (Fig 6) and the wound was sutured with 6-0 proline. Post surgical period was uneventful.

The cystic epithelium under histopathological evaluation confirmed the diagnosis as radicular cyst. The inflammation on the floor of the mouth resolved completely (Fig 7). Periodic review with radiographs revealed a reduction in the size of the lesion and bone formation (Fig 8, 9). At the end of five months radiographic evidence of considerable amount of new bone formation was appreciated within the lesion. The wound on the chin also healed satisfactorily (Fig 10, 11).

Fig 1 Draining sinus tract on chin

Fig 2 Inflamed floor of the mouth

Fig 3 Enlarge labial cortical plate and fractured 41.

Fig 4 Round radioluscency involving the apices of lower incisors

Fig 5 Cyst Enucleation

Fig 6 Excision of the draining fistulous tract

Fig 7 Floor of the mouth 2 weeks post op

Fig 8 Occlusal radiograph at the end of 3 months

Fig 9 Occlusal radiograph at the end of 5 months

Fig 10 Healed fistulous tract on the chin.

Discussion

Radicular cysts are believed to result from continuous antigenic stimulation from inflamed or necrotic root canals[2]. Histopathologically it shows a cystic lumen lined by stratified squamous epithelium supported by a fibrocellular connective tissue stroma, showing dense chronic inflammatory cell infiltrate with a little cholesterol clefts[3].

The process of the true cyst formation occurs in three stages. That is the Phase of initiation, the Phase of cyst formation, and the Phase of cyst enlargement. During the first phase, the dormant cell rests of Malassez are believed to proliferate under the influence of growth factors released by various cells in the lesion. Regarding the formation of cystic cavity, two long standing theories exist. The first one is Nutritional deficiency theory and the second, the Abscess theory. Nutritional deficiency theory is based on the assumption that the central cells of the epithelial strands gets removed from their source of nutrition and hence undergo necrosis and liquefactive degeneration. The products that accumulate attract nuetrophilic granulocytes into the necrotic area. The micro-cavities thus formed coalesce to form the cystic cavity that is lined by stratified squamous epithelium.

The abscess theory postulates that the proliferating epithelium surrounds an abscess formed by tissue necrosis and lysis because of the inherent nature of the epithelial cells to cover the exposed connective tissue surfaces[2].

The mechanism of cyst enlargement though initially explained by theories based on osmotic pressure is now shifted in favor of molecular basis of cystogenesis. Tissue dynamics and cellular components of radicular cysts suggest a molecular pathway of cyst enlargement[7].

Since radicular cysts grow within the jaw bone, it is conceivable that the expansion of cysts is accompanied by the growth of the cyst epithelium aided by the rate at which the surrounding bone is destroyed. In regard to bone resorption, interstitial collagenase (matrix metalloproteinase-1 or MMP-1) has been implicated as a key enzyme in the initiation of bone resorption. This enzyme, a member of the MMP family, is produced by a variety of cell types including fibroblasts, endothelial cells, keratinocytes, macrophages and osteoblasts[2].

To summarize, for avoiding drastic consequences, dental trauma has to be managed at the earliest with periodic review. Though the immediate treatment objective of any dental trauma should be maintenance of pulp vitality and restoration of aesthetics and function, the importance of periodic evaluation for the identification and management of the delayed sequelae is most important. Unfortunately dental trauma management in a considerable number of cases is either delayed or incorrect. In a study to assess whether caries or trauma is the most common etiology of development of radicular cyst the ratio of trauma to caries was 4.3:1 in both the jaws[1]. Another study reports the development of a radicular cyst caused by untreated trauma to maxillary anterior teeth[3]. This indicates the delay in seeking treatment as well as lack of periodic evaluation of dental trauma that demands education about untreated dental trauma and its unwarranted consequences. Dental professionals need to be fully aware of sequelae of untreated dental trauma and the importance of periodic evaluation of the involved tooth/teeth using vitality tests and radiographic assessment for early diagnosis of delayed sequelae and management on time thus improving the prognosis.

The uncomplicated crown fracture might have appeared insignificant, but the chance of traumatized teeth with closed apices becoming non vital was overlooked, in the present case warranting the endodontic management of all mandibular incisors as well as cyst enucleation and excision of the sinus tract. Periodic radiographic evaluations showed fast healing of the lesion, owing to the age of the patient. Six months postoperative evaluation showed complete healing of the cyst and the extra oral tract.

Immediate care and careful monitoring of healing with radiographs and pulp testing is mandatory in all traumatic injuries to teeth though the injury might appear minimal to prevent such severe sequel from occurring.

Patients need to be made aware of the importance of immediate management of dental trauma as well as significance of periodic evaluation owing to the fact that the teeth involved very often are young permanent anterior teeth.

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A Rare case of occurrence of unusually large Parotid duct calculi with Warthins tumour

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Abstract

Salivary duct lithiasis is a condition characterized by the obstruction of a salivary gland or its excretory duct due to the formation of calcareous concretion. Sialolithiasis accounts for 30% of salivary diseases and most commonly involves the submaxillary gland (83 to 94%) and less frequently the parotid (4 to 10%) and sublingual glands (1 to 7%). The papilliferous cystadenomaslymphomatosum or Warthin's tumor represents the 5-14% of the neoplasias of the parotid. The present study reports a rare simulataneous occurrence of unusually large parotid stone and warthinstumour which was surgically removed.

Key words: *salivary duct calculi, warthinstumour, parotid.*

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► Introduction

Salivary duct lithiasis is a condition which is characterized by the obstruction of a salivary gland or its excretory duct, due to the formation of calcareous concretions or sialoliths.[3] Sialolithiasis usually appears around the age of 40, though it can have an early onset in teenagers, and it can also affect old patients. Salivary calculi affecting the parotid gland are usually unilateral and are located in the duct. It has a predilection for male patients, particularly in the case of parotid gland lithiasis.[3] The size of the salivary calculi may vary from less than 1mm to a few cm in largest diameter.

Warthin's tumor represents the 5-14% of the neoplasias of the parotid and the 2-5% of the submaxillary ones.[6] Warthin's tumor is a relatively rare and generally benign neoformation, characterized by slow growth and still undefined etiology-Warthin's tumor is second only to the pleomorphic adenoma and it usually affects people in their fifties and sixties.[6] There are studies that demonstrated that this tumor is associated with cigarette smoking, which may be due to irritation of the ductal epithelium by tobacco smoke that initiate the tumorigenesis.[2] A concurrent increase incidence in women has been observed in recent years[2]. The change is probably due to a decline in the smoking habit in man and a reverse trend in women. Warthin tumors occur almost exclusively in the parotid glands, in its superficial lobe and rarely in the deeper lobe (10%). The tumor presents as a nodular, not painful mass, slow growing, firm or fluctuant at palpation, multicentric (12–20%) and bilateral (5–14%). The patients can be asymptomatic or can have facial pain-rarely, facial nerve palsy may be seen in tumors associated with inflammation and fibrosis, which can be mistaken for malignant tumor.[2]

► Case report

A 68 year old male reported to the Department of Maxillofacial surgery, Pariyaram Dental College, Pariyaram, with the chief complaints of swelling in the left side of the face with pain of 5 days duration. Patient had facial asymmetry due to a swelling on the left side of the face. The swelling on inspection was diffuse, extending superiorly from the left infra-orbital margin to the lower border of the left side of the mandible inferiorly, anteriorly from the left nasolabial fold to posterior border of the ramus of the mandible posteriorly. The skin over the swelling was smooth, stretched, shiny. There were no secondary changes. On palpation, Two swellings were present,one superiorly very firm in consistency. The below one was located at the mandibular angle region which was firm in consistency. The swellings were not compressible, reducible or fluctuant. CT Scan was done showed a calcified mass in cheek region measuring 3.5 x 3.25cm and tumourous mass in left tail of parotid region.

Under GA the incision was made above and posterior to the orifie of the stensons duct by locating the parotid papilla. Dissection done through the buccinator muscle, identification of the enlarged stensons duct. Longitudinal incision given through the ductal wall,

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large salivary stone and three small stones removed along with some chalky cheesy material. Thorough debridement of the pouchy ductal wall done. Using Lacrimal probe patency to the posterior duct checked which was found to be patent. Small tube drain was passed from the distal aspect to the ductal opening which extended intra orally by 1 cm stabilised at ductal exit using sutures. Excision of the dialated ductal wall by giving an elliptical incision to get to a near normal size of the duct closure done using vicry60. Muscle layer closure, subcutaneous and intraoral closure done using vicryl 30. Tumour was approached by giving an elliptical skin incision taken through subcutaneous tissue. Identification of the parotid massetricfascia. Dissection done through the fascia adjacent to tumour margin. Separation done from the glandular tissue. Layered closure done.

Discussion

Stensen's duct (parotid duct) arises from the anterior border of the Parotid and parallels the Zygomatic arch, 1.5 cm (approximately 1 finger breadth) inferior to the inferior margin of the arch. Stensen's duct runs superficial to the masseter muscle, then turns medially 90 degrees to pierce the Buccinator muscle at the level of the second maxillary molar where it opens onto the oral cavity. Using surface landmarks, Stensen's duct lies midway between the Zygomatic arch and corner of the mouth along a line between the upper lip

Fig 1

Fig 2

Fig 3

Fig 4

Fig 5

Fig 6

Fig 7

Fig 8

Fig 9

Fig 10

philtrum and the tragus. The buccal branch of CN VII runs with the parotid duct. The duct measures 4-6cm in length and 5 mm in diameter. Accesory Parotid gland and duct are noted in 20% of people. The accessory gland is typically found overlying the masseter, and the accessory duct typically lies cranial to Stensen's duct. Excretory ducts are lined by simple cuboidal epithelium proximally and stratified cuboidal or pseudostratified columnar epithelium distally. These cells do not perform any modification of the saliva. Sialolithiasis less common due to thin serous nature of saliva. The other reasons stated are parotid duct is having a straight course unlike submandibular duct which is having a tortous course. Massetric muscle movement is also said mobilize the salivary flow through parotid duct.

It may be possible that obstruction caused by large calculi is sometimes asymptomatic as the obstruction is incomplete and some saliva manages to seep through or around the calculus[2]. Long term obstruction in the absence of infection can lead to atrophy of the gland with resultant lack of secretory function and ultimately fibrosis

Conventional extra-oral radiography is of limited use, because most of the images of parotid gland sialoliths are superimposed on the shadow of the ramus of the mandible CT scan is the technique of choice to detect calculi inside or near the salivary glands. Its sensitivity makes it possible to detect recently calcified calculi which go undetected through conventional radiography

Surgical removal of the calculus (or even of the whole gland) has traditionally been used as an alternative to medical therapy, whenever the latter was not possible or proved ineffective.[1,3] Surgical intervention, consists of minimal invasive techniques, such as, stone removal with Dormia basket, under endoscopic (sialendoscopy) or radiological (sialography) guidance, and shock-wave lithotripsy under USguidance. However, the Dormiabasket techniques are limited to removal of stones located in the duct up to the hilum of the gland but are not feasible for parenchymal stones. Another limitation of these techniques concerns the size of the stones, as only calculi with a diameter < 5 mm can be removed from the parotid ductal system.[5] Extra-oral surgical techniques are not indicated because of the risk of leaving unaesthetic scars) and has the disadvantage of compromising the facial nerve, depending on the location of the sialolith. Intra-oral approach has proved more effective.

Conclusion

Salivary sialolith is uncommon in parotid duct and a large sialolith is a rare one. The simultaneous occurrence of parotid sialolith and warthins tumour could be a coincidental finding. Even the simultaneous unusual occurrence not reported. Large parotid stones may not result in complete atropy of the gland as in this case salivary flow was found at ductal opening following calculi removal & ductal reconstruction. Warthins tumour occurs commonly in tail of parotid and more superficially,so without any facial nerve injury surgical treatment could be performed.

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Bilateral recession coverage with amniotic membrane in comparison with sub epithelial connective tissue graft

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Abstract

Background & Objectives: Gingival recession is a common clinical entity observed in populations regardless of their age and ethnicity. Obtaining predictable and esthetic root coverage forms one of the important aspects of periodontal therapy. Various surgical approaches and materials have been employed for the treatment of gingival recession. Connective tissue graft(CTG) remains the "gold standard" of periodontal plastic surgery as it provides excellent predi-ctability, improved long-term root coverage, and superior esthetics over other treatment options. But CTG harvesting is often associated with increased patient morbidity, prolonged surgical time and the possibility of postoperative complications such as bleeding, numbness and sensibility changes in the donor area. To overcome these inconveniences, attempts are made to develop new materials aiming to replace CTG to improve patient acceptance and minimize morbidity. The use of guided tissue regeneration procedures in the treatment of gingival recession has shown promising results and is gaining clinical acceptance. This case report presents bilateral gingival recessions treated with a combined sub epithelial connective tissue graft (SCTG) and coronally advanced flap with amniotic membrane.

Methodology: One patient presenting with 2 bilateral recession was taken up in a split mouth design. On one side root coverage was done by coronally advanced flap with subepithelial connective tissue graft (SCTG) and on the other side coronally advanced flap with amniotic membrane was placed. The percentage of root coverage was calculated at 6 months postoperatively.

Results: At 6 months, both treatments resulted in significant comparable root coverage, although in sites where amniotic membrane was placed there was significant augmentation of keratinized gingiva. In the connective tissue treated sites there was an increase in the gingival biotype

Interpretation & Conclusion: The present case report using subepithelial connective tissue graft (SCTG) and amniotic membrane along with coronally advanced flap procedure in the management of recession defect has shown comparable root coverage, however few beneficial biological properties of amniotic membrane which enhances the soft tissue healing makes it a preferred choice.

Keywords: Periodontal plastic surgery, Gingival recession, Root coverage, Subepithelial connective tissue graft, Amniotic membrane

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Periodontal surgery is thought of in two components: excisional periodontal surgery and regenerative periodontal surgery. Periodontal plastic surgery represents one phase of regenerative periodontal surgery.[1]

Periodontal plastic surgery, encompasses a broader range of treatment and addresses treatment of the following defects: the shallow vestibule (vestibular deepening); the aberrant frenum (frenectomy); marginal tissue recession (soft tissue grafting);excessive gingival display (crown lengthening); deficient ridges (ridge augmentation); ridge collapse following extraction of periodontally involved teeth (grafting extraction sites); loss of interdental papillae (papilla reconstruction); unerupted teeth requiring orthodontic movement (surgical exposure); and aesthetic defects around dental implants (bone and/or soft tissue augmentation).

Gingival recession is a common clinical entity observed in patient populations regardless of their age and ethnicity. Some common consequences of gingival recession, such as tooth hypersensitivity, pain, root caries and esthetic concerns, adversely affect patients overall well-being[2].

As defined by the American Academy of Periodontology, gingival recession is the displacement of marginal periodontal tissues apical to the cemento–enamel junction[3]. If progressive, it can develop into a mucogingival deformity, which is the departure from the inter-relationship between, gingival and alveolar mucosa that may be associated with a deformity of the underlying alveolar bone.

The etiology of gingival recession can be broadly classified into anatomical / predisposing and pathological / precipitating factors[5]. Anatomical / predisposing factors include the presence of inadequate attached gingiva, high frenal attachment, malpositioning of teeth, osseous dehiscence, shallow vestibule and thin periodontal biotype. Pathological/precipitating factors include the presence of recurrent inflammation, oral pathologies, iatrogenic factors or materials (e.g. traumatic tooth brushing, self-inflicted injury and chemical erosion).[4]

Various surgical approaches and materials have been employed for the treatment of gingival recession[5]. In most of these approaches, the exposed root surface is cleansed of bacterial endotoxins and regenerative material is placed over the defect. The materials used in these procedures include autogenous free gingival grafts, autogenous connective tissue grafts, and allograft dermis tissue. Additionally, biologic mediators such as enamel matrix derivative[6], platelet-rich plasma, and recombinant platelet

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derived growth factor have been introduced into surgical protocols with the intent of accelerating and directing the wound healing.[7] Despite the introduction of allograft dermis tissue products and biologic mediators, connective tissue remains the "gold standard" of periodontal plastic surgery as it provides excellent predictability, improved long-term root coverage, and superior esthetics over other treatment options.[8]

CTG harvesting is often associated with increased patient morbidity, prolonged surgical time and the possibility of postoperative complications such as bleeding, numbness and sensibility changes in the donor area[9]. To overcome these inconveniences, attempts are made to develop new materials aiming to replace CTG to improve patient acceptance and minimize morbidity.

This case report presents bilateral gingival recessions treated with a combined sub epithelial connective tissue graft (SCTG) and coronally advanced flap with amniotic membrane.

Case report

A 31 year-old female patient reported to the Department of Periodontology with a complaint of hypersensitivity in relation to the upper left and right back teeth region. She had no significant medical history. On clinical examination, multiple adjacent recessions were identified on the right and left posterior maxillary teeth. The bilateral recession defects, Miller Class I, were measured by calculating the distance between the cementoenamel junction (CEJ) and the gingival margin. Phase 1 therapy was completed with oral hygiene instruction reinforced. The surgical procedure was explained to the patient and informed consent was obtained.

Surgical procedure

Sub epithelial connective tissue graft site

Preparation of the recipient site

Measurements were recorded (Fig. 1) and the surgical area was prepared with adequate anesthesia using 2% lignocaine HCl containing 1:80,000 adrenaline. A trapezoidal flap was designed using 3 different types of incisions - two horizontal

Fig 1: Pre-operative recession on maxillary left premolar (SCTG site)

Fig 2: Combined full- partial thickness flap reflected at the recipient site

Fig 3: Connective tissue harvested from the palate

Fig 4: Connective tissue graft sutured on the recipient site

Fig 5: Coronally repositioned flap completely covering connective tissue

Fig 6: Pre operative recession on maxillary right premolars

Fig 7: Combined full- partial thickness flap reflected at the recipient site

Fig 8: Amniotic membrane placement

Fig 9: Coronally repositioned flap completely covering connective tissue

Fig 10: Three -month post-operative view showing complete root coverage on maxillary left sextant left premolars

Fig 11: Three -month post-operative view showing complete root coverage on maxillary left sextant right premolars

incisions on the mesial & distal directions from the CEJ s to the proximal line angles of adjacent tooth, leaving interdental papilla intact followed by sulcular incision and vertical incision along the mesial & distal aspect of 24 & 25. A full thickness flap followed by a partial thickness one was reflected. A horizontal releasing incision was made in the periosteum, at the base of the flap, to facilitate tension-free coronal displacement (Fig. 2). The exposed root surfaces were scaled and root planed. The intact papillae mesial and distal to the recession were de-epithelized. A measurement of the approximate length and width of the graft required was obtained with the use of a periodontal probe.

Graft harvesting

After preparation of the recipient site, the donor area in the palate was anesthetized by block anesthesia of the greater palatine and nasopalatine nerve with 2% lignocaine HCl containing 1:80,000 adrenaline. Bleeding points were made corresponding to the required length of the graft. The technique described by Bruno[10] was used to harvest the CTG from the palate. The first incision was made perpendicular to the long axis of the teeth, approximately 2–3 mm apical to the gingival margin of maxillary teeth. The second incision was made parallel to the long axis of the teeth, 1–2 mm apical to the first incision, depending on the required thickness of the graft. The donor tissue was removed from the palate as atraumatically as possible. The CTG was placed on saline soaked gauze while (Fig. 3) the palatal wound was closed. A horizontal crossed suspension suture was used to stabilize the donor area. Pressure was applied to the donor area with wet gauze while the graft was trimmed (as needed, in a mesiodistal dimension to fit the recipient site preparation). The epithelial collar was removed and discarded.

Placement of connective tissue graft on the recipient site

The CTG was placed on the recipient site and secured in position with 4-0 vicryl sutures [Fig. 4]. Then the overlying full–partial thickness flap was positioned over the CTG with very little tension on the flap using sling sutures into the mesial and distal papillae covering as much of the CTG as possible using the same suture [Fig. 5].

Coronally advanced flap with amniotic membrane site

A similar surgical procedure was followed for the receipt bed preparation in relation to 14, 15 and 16, similar to that of sub epithelial connective tissue graft site (Figs. 6 & 7). The commercially available amniotic membrane# was cut into the desired shape and length with scissors and placed onto the recession site (Fig. 8). The flap was coronally advanced and sutured (Fig. 9) and periodontal dressing were placed over the surgical area.

Both the connective tissue & amniotic membrane sites were evaluated postoperatively at 2nd week, 1st and 3rd months. On each visit, supragingival plaque was removed, but no subgingival instrumentation was performed. Clinical measurements were recorded and postoperative photographs were taken at the end of 3 months (Figs. 10 and 11).

▶ Discussion

Root coverage forms an important part of periodontal therapy. Obtaining root coverage has become more predictable with understanding in soft tissue healing and the search for the best technique has led to a lot of improvement in surgical procedures aimed in this direction. These procedures may be accomplished for functional reasons or purely aesthetic reasons with patient requesting, and at times demanding root coverage.

Subepithelial connective tissue graft can be indicated for the treatment of single or multiple gingival recessions, correction of the papilla's volume or deformities of the edentulous gingival border, creation and/or increasing of the amount of the keratinized mucosa[11], and perspective improvement of the root coverage associated with restorative procedures, abrasion, or dental caries

In 1985, Langer and Langer[12] described a technique of subepithelial connective tissue graft for root coverage in the treatment of recessions at single or multiple areas, attributing the procedure success to the double blood supply for the graft's nutrition, originating from the connective tissue of both the periosteum and flap. Since then a lot of modifications in the technique for retrieving and the use of sub epithelial connective tissue graft have been reported with improved and more predictable root coverage.

In this case report, the autogenous subepithelial CTG was harvested from the patient's palatal mucosa using the technique described by Bruno[10]. The anterior and posterior extensions of the donor site were limited to canine and palatal root of the first molar region as the palatal root of the first molar represents a natural barrier to graft harvesting because the tissue is thinnest in this area[13]. The lateral border site was formed by a horizontal line 2–3mm from the marginal gingival of the maxillary teeth.

A novel allograft composed of amnion tissue has recently been introduced for use in periodontal plastic surgery. Amnion lines the inner most portion of the amniotic sac and consists of a single layer of epithelium cells, thin reticular fibers (basement membrane), a thick compact layer, and a fibroblast layer. The basement membrane contains collagen types III, IV and V and cell-adhesion bioactive factors including fibronectin and laminins. This amnion layer possesses several types of laminins, with Laminin-5 being the most prevalent. Laminin-5 plays a role in the cellular adhesion of gingival cells and concentrations

of this glycoprotein in amniotic allograft may be useful for periodontal grafting procedures.[14]

Amnion tissue contains growth factors that may aid in the formation of granulation tissue by stimulating fibroblast growth and neovascularization.[15] Additionally, the cells found within tissue exhibit characteristics associated with stem cells and may enhance clinical outcomes.[16] It has been demonstrated that the amniotic membrane enhances the gingival wound healing properties and reduces scarring.

The human amniotic membrane (HAM) has been used in the field of oral and maxillofacial surgery from 1969 onwards, because of its immunological preference and its pain-reducing, antimicrobial, mechanical, and side-dependent adhesive or anti-adhesive properties. The effects of HAM on dermal and mucosal re-epithelialization have been highlighted. Typically, HAM is applied after being banked in a glycerol-preserved, DMSO-preserved or freeze-dried and irradiated state. Even as the use of HAM in flap surgery and in intraoral and extraoral lining is reported frequently, novel HAM applications in posttraumatic orbital surgery and temporomandibular joint surgery have been added since 2010. Tissue engineering with HAM is a fast-expanding field with a high variety of future options[17].

Conclusion

Obtaining predictable and esthetic root coverage is an important part of periodontal therapy. The use of guided tissue regeneration procedures in the treatment of gingival recession has shown promising results and is gaining clinical acceptance. Recent research has focused upon utilization of bio-absorbable collagen membrane in guided tissue regeneration (GTR). This article presents bilateral gingival recessions treated with a combined sub epithelial connective tissue graft (SCTG) and coronally advanced flap with amniotic membrane.

In the management of gingival recession, both the groups showed comparable improvements in clinical parameters measured from baseline up to 6 months, although in sites where amniotic membrane was placed there was significant augmentation of keratinized gingiva. This suggests that amniotic membrane can be used as a barrier membrane as it has shown a tendency to enhance the clinical results of the coronally advanced flap procedure in the management of localized recession defects.

In the connective tissue treated sites there was an increase in the gingival biotype. Advantages of guided tissue regeneration, procedures versus periodontal plastic surgery include the possibility of obtaining new connective tissue attachment instead of a long junctional epithelium; and the possibility of full reconstruction of lost periodontal tissues. Many experts support the hypothesis that therapy with coronally advanced flap alone can be successfully applied when the residual gingiva is thick and wide. If one of the objectives is keratinized tissue gain, however, clinicians should choose a graft.

Clinicians should make their decisions after defining the desired short-term and long-term outcomes, having completed a careful presurgical analysis and having discussed with the patient the impact of morbidity and biologic/economic costs in addition to the potential benefits of therapy.

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"Nano dentistry"- dentistry at subzero level

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Abstract

Development of "nanotechnology" is one of the most path-breaking advancement in science and technology witnessed during the last century. This technology is fast developing since it was first scientifically explained to the world by Nobel Prize laureate Dr. Richard Feynman in 1959. Nanotechnology has revolutionized health care industry. It is steadily and rapidly effacing traditional health care concepts. Modern Dentistry is also witnessing revolutionary changes brought about by the application of nanotechnology and greatly benefitted by it. This article aims to give an outline about the multifarious application of nanotechnology in modern dentistry, which will not only give an insight about the advancements already brought about by this technology but will also give an hint about what is in store in future.

Keywords: Nanotechnology, Nanodentistry

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► Introduction

Development of "nanotechnology" is one of the most path-breaking advancement in science and technology witnessed during the last century. Nanotechnology had made it possible to manipulate matter on an atomic, molecular and supramolecular scale. When science had grown gigantically, nanotechnology had reduced the size of materials we use to the never imagined "nano scales".

The concepts of this wonder technology were first scientifically explained to the world by eminent physicist and Nobel Prize laureate Dr. Richard Feynman in his historical talk "There's Plenty of Room at the Bottom" at Caltech on December 29, 1959, in a meeting of the American Physical Society. Though nanotechnology was only a theoretical concept at that time Dr. Feynman prophesied that this technology would become realistic.[1,2,3]

The term "nanotechnology" was coined in 1974 by Norio Taniguchi, Professor of Tokyo University of Science, to describe the precision manufacture of materials with nanometer tolerances.[1] Dr. K. Eric Drexler, an American Engineer, also contributed enormously for the development and popularization of nanotechnology. His much acclaimed theoretical work "Engines of Creation: The Coming Era of Nanotechnology" and efforts using "The Foresight Institute", a California-based nonprofit organization for promoting transformative technologies, are lauded by the scientific community.

► Nano and Nanotechnology

The term "Nano" is derived from the Greek word νανος, meaning "dwarf".[4,5] According to the National Nanotechnology Initiative (NNI), which co-ordinates the activities of all federal agencies in USA engaged in nanotechnology research, nanotechnology is the manipulation of matter with at least one dimension sized from 1 to 100 nanometers. One nanometer (nm) is one billionth, or 10^{-9}, of a meter.[5] In other words one nanometer is the length that a fingernail grows in one second. Nanometer was officially confirmed as a standard in 1960.

The words Molecular Nanotechnology, Molecular Engineering and Robotic Technology are commonly used synonyms of Nanotechnology.

► Nano dentistry-Definition

Nano dentistry is defined as the science and technology of diagnosing, treating and preventing oral and dental diseases, relieving pain, and of preserving and improving dental health, applying materials structured on the nanometer scale.

The term nanodentistry was introduced to a larger community by R. A. Freitas Jr. through his cover story in the Journal of the American Dental Association more than a decade ago.[6] The application of nanotechnology in dentistry not only promises to improve the properties and functionalities of dental products but also leads to the development of innovative, novel products for the benefit of patients.

► Applications of nanorobots in dentistry

It has been proposed that nanodentistry will make it possible to maintain near-perfect oral health through the use of nanomaterials, biotechnology and nanorobotics.[2] Its applications in dentistry include

1. Dental procedural uses and
2. Developing newer materials

► Approaches to nanodentistry [1,2,3,5,7]

1. Bottom-up approaches
2. Top-down approaches

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Bottom-up approaches
- To arrange smaller components into more complex assemblies.

Top-down approaches
- To create smaller devices by using larger ones to direct their assembly.

Nanodentistry as Bottom-Up Approach
- Local nanoanaesthesia
- Tooth Repair
- Tooth renaturalisation
- Hypersensitivity Cure
- Tooth repositioning
- Nanorobotic Dentifrice (dentifrobots)
- Dental Durability and Cosmetics
- Nanodiagnostics
- Drug delivery
- Gene therapy

Local nanoanaesthesia
Amidst well known alternatives, a colloidal suspension of millions of active analgesic dental robots can be injected into the patient's gingiva. These pass through the gingival sulcus, lamina propria and dentinal tubules by a process of chemical gradation, temperature difference and positional navigation to reach the pulp in a few seconds. These analgesic dental nanorobots gain control over the nerve impulses, anaesthetize the area and finally restores all sensations by similar pathways as commanded by the dentist by means of onboard nanocomputers.

Tooth repair
The process of tooth repair by genetic tissue engineering and regeneration followed by invitro development of a biologically autologous whole new tooth gives a new dimension to the concept of nanotechnology. Thus the prospect of complete dentition replacement therapy could become feasible within minimum time.

Tooth renaturalisation
Affected teeth can be re-manufactured and can be made indistinguishable from their natural originals. Thus this application of nano dentistry is indicated in patients who desire replacement of their previous restorations.

Hypersensitivity cure
Reconstructive dental nano robots can be used to selectively and precisely occlude the selected tubules in minutes using native biological materials thus offering patients a quick and permanent cure.

Tooth Repositioning
Orthodontic nano robots allow rapid and painless tooth repositioning in a very short period of time by manipulation of the periodontal tissues including gingiva, periodontal ligament cementum and alveolar bone.

Nano Robotic dentifrices (Dentifrobots)
Nanorobotic dentifrices delivered by mouthwashes or tooth paste have the ability to identify and destroy pathogenic bacteria residing in the plaque. They also metabolize trapped organic matter into harmless and odorless vapors and perform continuous calculus debridement. Thus problems of halitosis and tooth decay could be arrested at a very early age.

Dental Durability and Cosmetics
The appearance and durability of teeth may be improved by replacing upper enamel layers with covalently bonded artificial materials like sapphire or diamond, which are several times harder and stronger than natural enamel. These materials are made fracture resistant by incorporation of nanostructured composite materials that possibly includes embedded carbon nanotubes.

Nanodiagnostics
Nanotechnologies afford the possibility of intracellular imaging through attachment of quantum dots (QDs) or synthetic chromophores to selected molecules, for example proteins, or by the incorporation of naturally occurring fluorescent proteins that allow intracellular biochemical processes to be investigated directly.

Drug delivery
Reformulation of a drug into nano particles improves its bioavailability, reduces its susceptibility to degradation and also prolongs the duration of exposure of the drug by increasing the retention of the formulation through bio-adhesion. Hence there would be improved stability, absorption, and therapeutic concentration of the drug within the target tissue, as well as reproducible and long-term release of the drug at the target site.

Gene therapy
Nanotechnology can be applied in gene therapy to replace the currently used viral vectors by potentially less immunogenic nano size gene carriers. These non-viral vectors can be used for the treatment or prevention of genetic disorders by correcting defective genes responsible for disease development by means of delivery of repaired genes or the replacement of incorrect ones.

Nano Dentistry as Top-Down Approach
- Nanocomposites
- Nano Light-Curing Glass Ionomer Restorative
- Nano Impression Materials
- Nano-Composite Denture Teeth
- Nanosolutions
- Nanoencapsulation
- Prosthetic Implants
- Nanoneedles
- Bone replacement materials
- Nano aluminium oxide fibres (Nanoceram)
- Other products

Nanocomposites
Nano composites are non-agglomerated nano particles with a mean particle size of 80-100 nano meters. They comprise of nano hybrid and nano filled resin-based composites that offer esthetic and strength advantages over conventional micro filled and hybrid resin-based composite systems, primarily in terms of smoothness, polishability and precision of shade characterization. Studies prove that they exhibit superior hardness, superior flexural strength and superior modulus

of elasticity, better translucency, reduced filling shrinkage and excellent handling properties when compared to hybrid and microcomposites.

► Nano Light-curing glass ionomer restorative

These restorative materials exhibit excellent esthetics and improved wear resistance and are therefore indicated for primary teeth restorations, transitional restorations, small Class I restorations, sandwich restorations, Class III and V restorations as well as core build-ups.

► Nano Impression Materials

When impregnated with nano particles polyvinyl siloxanes achieves better flow, improved hydrophilic properties and enhanced detail capture. Other advantages include high tear resistance, resistance to distortion and heat resistance.

► Nano-composite denture teeth

Nano composite denture teeth comprises of Polymethylmethacrylate (PMMA), and uniformly dispersed nano - sized filler particles. They are highly polishable, stain and impact resistant material with superior surface hardness and wear resistance.

► Nanosolutions

Nanosolutions produce unique and dispersible nanoparticles, which can be used in bonding agents. This ensures homogeneity and ensures that the adhesive is perfectly mixed everytime

► Nanoencapsulation

Targeted release systems have been developed that encompass nanocapsules including novel vaccines, antibiotics and drug delivery with reduced side effects. These nanoparticles can be engineered for targeted delivery of genes and drugs to oral tissues in the near future.

► Prosthetic Implant

Nanotechnologies help in developing novel implant surfaces with predictable tissue-integrative properties. Nano structured surfaces may control the differentiation pathways into specific lineages and ultimately direct the nature of peri-implant tissues. It is possible to incorporate biologically active drugs such as antibiotics or growth factors during the precipitation of calcium phosphate coatings on Ti implants.

► Nanoneedles

Suture needles incorporating nano-sized stainless steel crystals have been developed. Nano tweezers are also under development, which will make cell surgery possible in near future.

► Bone replacement materials

Hydroxyappatite crystals when embedded with nano particles can be used to treat bony defects. Nanotechnology can be used to simulate the natural biomineralization process to create the hardest tissue in the human body, dental enamel, by using highly organized microarchitectural units of nano rod-like calcium hydroxyapatite crystals arranged roughly parallel to each other.

► Nano aluminium oxide fibres (Nano ceram)

When added, these fibres provide improved performance and added strength to metals, plastics & composites. Being ultra small with a high surface area, they attract negatively charged particles including bacteria, viruses etc and remove them. Thus they are used in water purification, sterilization etc.

► Other Products

Other products include protective clothing and filtration masks using antipathogenic nanoemulsions and nanoparticles, medical appendages for instantaneous healing, biodegradable nanofibres which act as delivery platform for hemostatic, wound dressings with silk nanofibres in development, nanocrystalline silver particles with antimicrobial properties on wound dressings, bone targeting nanocarriers.

► Limitations of nano dentistry [2]

As in the case of any technology, nanodentistry is also not without limitations. The main limitations are:

1- Biocompatibility
2- Cost related issues
3- Insufficient integration of clinical research
4- Funding and strategic issues
5- Ethical and human safety problems
6- Basic engineering problems.

Technology develops by addressing its limitations. Therefore, the limitations stated above and other disadvantages of nanotechnology are bound to be rectified for this wonder technology to improve.

► Conclusion

The advancements made by nanotechnology in dentistry within short span since its use and application give us a hint about what is in store in future. Nanotechnology will definitely take dentistry to a new level in no time. However, it is of utmost importance to address its limitations also to make its use more profound and beneficial. In fact it is the need of mankind and a challenge to the scientific community to improve this technology which had brought about revolutionary changes in no time.

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REVIEW

Zirconia – the ceramic steel

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Abstract

Within few decades since its clinical use zirconia has made an indelible mark in dentistry. The rapidly gaining popularity and increase in the uses of zirconia is owing to its superior chemical and mechanical properties. Owing to its mechanical properties similar to that of stainless steel it is known as –"the ceramic steel". The aim of this paper is to give an insight about various material aspects of zirconia which has revolutionized modern dentistry.

Keywords: zirconia, ceramic steel, transformation toughening, monolithic

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Introduction

The quest for an ideal restorative material is always a topic of interest in dentistry. The development of dental crowns and its evolution from "metal" to "metal free" is a long saga of science and history. The advent of all ceramic crowns in the 19th century was primarily to satisfy aesthetic requirements. However, it did not enjoy much success in early days especially in the posterior region. This paved the way for the introduction of metal ceramic restorations. Metal ceramic restoration has been the gold standard in crown and bridge restorations for years. Again, due to aesthetic reasons there was a resurgence of all ceramic restorations.

Ceramics fall into three main composition categories i.e., predominantly glass ceramics, particle filled glass ceramics and polycrystalline ceramics.[1] Alumina and Zirconia are the only two polycrystalline ceramics suitable for use in dentistry as framework materials able to withstand large stresses.

Zirconia based ceramic restorations seems to offer strength and durability at par with that of metal, while at the same time contributes to aesthetics too.[2] The profound applications and superior results of this wonder material have helped it to earn a remarkable spot in restorative dentistry. The advent of "zirconia" has put an end to the unprecedented rule of the metal ceramics.[3]

Discovery

The name "Zirconium" comes from the arabic word "Zargon", which means "golden in colour". The term zirconium refers to the metal, while zirconia ceramic ("zirconia") refers to zirconia-dioxide-ceramic (ZrO_2). Zirconium dioxide (ZrO_2), a white crystalline oxide of zirconium, was accidentally identified by German chemist Martin Heinrich Klaproth in 1789.[2]

Properties

The atomic number of zirconium is 40. It has a density of 6.49 g/cm^3, melting point of 1852°C and boiling point of 3580°C. Zirconia exhibits high flexural strength ranging from 900-1200 MPa and its compression resistance is about 2000 MPa. The fracture toughness of Zirconia is estimated to be in the range of KIC 7 and 10 MPa/m$^{1/2}$, which is almost twice as high as that of aluminium oxide ceramics, and Young's Modulus is 210 GPa.[2] Zirconia has shear strength similar to that of metal ceramics. Zirconia has mechanical properties similar to that of stainless steel.[4] The amazing mechanical properties of zirconia are mainly due to tetragonal to monoclinic phase transformation known as transformation toughening.[5]

Zirconium does not occur in nature in a pure state. It can be found in conjunction with silicate oxide with the mineral name Zircon ($ZrO_2 \times SiO_2$) or as a free oxide (ZrO_2) with the mineral name Baddeleyite.[4] It is a non-cytotoxic metal oxide, is insoluble in water and has no potential of bacterial adhesion. It also has radio-opacity properties and exhibits low corrosion. Due to its high strength zirconia is known as "the ceramic steel".[6]

Phases of Zirconia and transformation toughening

Zirconium dioxide is a polymorphic material and occurs in three forms: monoclinic, tetragonal and cubic. The monoclinic phase is stable at room temperatures up to 1170^{0}C, the tetragonal at temperatures of 1170-2370^{0}C and the cubic at over 2370^{0}C.[4] However, noticeable changes in volume are associated with these transformations. During monoclinic to tetragonal transformation a 5% decrease in volume occurs when zirconium oxide is heated; conversely, a 3%-4% increase in volume is observed during the cooling process.[2,4]

The process of transformation toughening due to the controlled, stress activated tetragonal (t) to monoclinic (m) transformation in zirconia based ceramics has led to the recognition of the potential for enhanced fracture toughness in them.[5] Microcrack toughening, contact shielding and crack deflection also contribute to the toughening of zirconia based ceramic.[7]

Stabilization of Zirconia

The blending of zirconia with oxides of Magnesia (MgO), Yttria (Y2O3), Calcia (CaO), Ceria (CeO) etc. leads to stabilization of the tetragonal and/or cubic phases. Addition of these oxides results in the generation of multiphase materials known as Partially Stabilized Zirconia (PSZ), whose microstructure at room temperature generally consists of cubic zirconia as the major phase, with monoclinic and tetragonal zirconia precipitates as the minor phase. This 'stabilized' zirconia has superior thermal, mechanical and electrical properties.[4]

Low Temperature Degradation or Aging of Zirconia

Zirconia undergoes low temperature

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degradation via surface transformation from the tetragonal to monoclinic phase in the presence of water or water vapour. This aging phenomenon causes increase of surface roughness followed by microcracking thereby resulting in reduced strength, toughness, and density, ultimately leading to failure of the restoration.[4]

Types

The different types of zirconia ceramics available for dental applications are the zirconia toughened alumina (ZTA), magnesium doped partially stabilized zirconia (Mg-PSZ), and the yttrium doped tetragonal zirconia polycrystals (Y-TZP).[3] Today, the typically used zirconia material by most manufacturers is tetragonal polycrystalline zirconia, partially stabilized with yttrium oxide (Y-TZP).[4]

Fabrication

Zirconia blocks can be milled at three different stages viz. green, pre-sintered and fully sintered. Green-stage zirconia blocks can be milled using dry carbide burs, pre-sintered zirconia blocks can be milled using carbide burs under cooling liquid, and milling of completely sintered zirconia blocks requires the use of diamonds under cooling liquid.[4] Green and pre-sintered zirconia are fabricated using "soft machining" technique whereas fully sintered blocks are fabricated using "hard machining" technique.[8]

Soft machining process is the most common manufacturing system for Y-TZP. This technique consists of compacting zirconia powder in the presence of a binder through a "cold, isostatic pressing process". In soft machining process pre-sintered blocks are fully sintered at final stage. Milling of pre-sintered blocks is faster and causes less wear and tear on the fabrication hardware. The original frameworks milled from green stage and pre sintered zirconia blocks are enlarged to compensate for prospective material shrinkage (20-25%) that occurs during the final sintering.

Hard machining technique adopts "hot isostatic pressing" process whereby Y-TZP blocks are sintered and condensed at high temperatures (1400–1500°C) and under high pressure in inert gas medium. These blocks are hard, dense and homogeneous. Completely sintered zirconia blocks are not subject to dimensional changes. However, they are extremely difficult and time consuming to machine. Owing to hardness of sintered blocks, the fabrication tools are more susceptible to damage.

Applications

a) General and industrial applications

Zirconia has wide variety of uses in various walks of human life. The main use of zirconia is in the production of ceramics. It is used as a refractory material in insulation, abrasives and enamels. Stabilized zirconia is used in oxygen sensors and fuel cell membranes. Zirconium dioxide is also used as the solid electrolyte in electro-chromic devices.

The very low thermal conductivity of cubic phase of zirconia also has led to its use as a thermal barrier coating in jet and diesel engines to allow operation at higher temperatures. Zirconia is used to make ceramic knives as zirconia based cutlery stays sharp longer than a stainless steel equivalent due to its hardness. Single crystals of the cubic phase of zirconia are commonly used as diamond simulant in jewellery on account of its cubical structure and high index of refraction. Zirconium dioxide (ZrO_2) is used in laboratory crucibles, metallurgical furnaces, as a refractory material.

b) Clinical applications

Zirconia has wide clinical applications owing to its superior quality of osseointegration, cell metabolism and soft tissue response. As an orthopedic prosthesis, zirconia is used extensively as the material for manufacturing femoral ball heads in Total Hip Replacements (THR).[2]

In modern dentistry zirconia is used as (i) core material for crowns and bridges (all ceramic restoration), (ii) endodontic posts, (iii) orthodontics brackets, (iv) denture base material substituting metal, (v) precision attachments, (vi) implant fixtures and (vii) implant abutments.

'Monolithic' zirconia

In recent years monolithic crowns manufactured from different ceramic materials such as zirconia, lithium disilicate etc., have been introduced. Monolithic crowns are single layered crowns without a separate core and overlying layered porcelain.[9] Monolithic crowns or mono block restorations are thus made of the same ceramic material throughout. The most prominent advantage of monolithic ceramics is the significantly reduced risk of cohesive and adhesive failure when compared to the veneered crowns.[10] Monolithic zirconia has remarkable durability, excellent fit and will not exhibit delamination and chipping.

Monolithic zirconia crowns are indicated for patients who have compromised occlusal schemes, parafunctional habits or a history of restoration fracture.[11] Without compromising on strength, metal free monolithic zirconia crowns can be fabricated with reduced wall thickness thus requiring minimal tooth preparation when compared to metal ceramic crowns.[12] The unprecedented acceptance of monolithic zirconia crowns in restorative dentistry indicates the prospects of it replacing metal ceramic crowns in the near future.

Conclusion

The advent of zirconia as a dental material has revolutionized modern dentistry. Zirconia is rapidly replacing conventional dental materials and traditional dental practices. In all probability further research and development will only improve and increase the uses of zirconia. Nevertheless, more studies are needed to confirm and validate the clinical advantages of using zirconia in dentistry.

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REVIEW

Stem cells in periodontal regeneration

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Abstract

Advances have been made in identifying dental stem cells and their differentiation potential. Five different types of dental stem cells have been isolated from dental soft tissues: dental pulp, apical papilla, dental follicle, human exfoliated deciduous teeth and periodontal ligament. The characteristic features of these cells have been explored. They express various arrays of biomarkers including those specific for mesenchymal and/or embryonic stem cells. In vitro and in vivo studies have revealed that these stem cells varied in their proliferation and differentiation potential. Recent studies have demonstrated their wide range of plasticity and their potential use for regenerative medicine and dentistry. This article summarizes information available on the different types of dental stem cells and discusses their potential role in periodontics.

Key-words: Stem cells, periodontal regeneration

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Introduction

Stem cells are the foundation cells for every organ and tissues in the body, including the periodontium. Research on stem cells is advancing knowledge about how an organism develops from a single cell and how healthy cells replace damaged cells in adult organisms. This promising area of science is also leading scientists to investigate the possibility of cell-based therapies to treat disease, which is often referred to as regenerative or reparative medicine. Stem cells are one of the most fascinating areas of biology today. But like many expanding fields of scientific inquiry, research on stem cells raises scientific questions as rapidly as it generates new discoveries. The first human dental stem cells were isolated from dental pulp tissue of extracted 3rd molar teeth and were characterized relatively to bone marrow mesenchymal stem cells. These dental pulp stem cells were found to be highly proliferative, clonogenic cells capable of differentiating into odontoblast like cells and forming dentin or pulp like complex when implanted into immunocompromised mice.[1]

Definition of stem cell

Stem cells are unspecialized cells in the human body that are capable of becoming specialized cells, each with new specialized cell functions. An example of stem cells is the bone marrow stem cells that is unspecialized and are able to specialize into blood cells such as white blood cells and red blood cells.[2]

Properties of stem cell

All stem cells regardless of their source have three general properties:

1. Stem cells are capable of dividing and renewing themselves for long periods:

Stem cells may replicate many times. This is called as proliferation. If the resulting cells continue to be unspecialized like the parent stem cells, the cells are capable of long term self renewal.

2. Stem cells are unspecialized:

Stem cells do not have any tissue specific structures that allow it to perform specialized functions.

3. Stem cells can give rise to specialized cells:

When unspecialized stem cells give rise to specialized cells, the process is called differentiation. There are signals inside and outside cells that trigger stem cell differentiation. Internal signals are controlled by cell genes. External signals include chemicals secreted by other cells, physical contact with neighboring cells and certain molecules in microenvironment. Stem cells from tissue may be able to give rise to cell types of a completely different tissue, a phenomenon known as plasticity.[2]

Types of stem cell

Stem cells present a potentially unlimited capacity of auto-replication and they are capable of generating one or more cell lineages that are highly differentiated.[3] (Table 1 and 2)

Stem cell processing

A typical stem cell collection is unmodified and contains red blood cells, immune cells and stem cells, when it is processed and stored. The stem cell collection however, can be modified with the intent of improving treatment of cancer. Stem cell collections from some patients also contain cancer cells. Removal of the cancer cells from the stem cell collection could improve a patient's chance of cure with high-dose chemotherapy and autologous stem cell transplant. Any method of removing cancer cells from the stem cell collection requires that enough cancer cells are removed to make a difference, while other cells important to the bone marrow or immune recovery of the patient remain.[4] (Fig. 1)

Purging: Cancer cells can be removed from the bone marrow or peripheral blood stem cell collection by several techniques, each of which utilizes monoclonal antibodies that recognize and adhere to antigens on the cancer cells. Once the antibody attaches to the cancer cells, there are a number of ways these cells are eliminated from the stem cell product. In one such effective technique, the antibody

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Table 1: Based on origin

Stem cell type	Description	Examples
Totipotent	Each cell can develop into a new individual	Cells from early (1-3 days) embryos.
Pluripotent	Cells that can form any (over 200) cell types.	Some cells of the blastocysts (5 to 14 days).
Multipotent	Differentiated cells can form a number of other tissues.	Fetal tissue, cord blood, and adult stem cells.

Table 2: Based on differentiation potential

	Embryonic stem cell	Adult stem cell
Attributes	Totipotent Easy to identify Isolate, maintain and grow in laboratory SOURCE: Blastocysts from IVF clinics	Multipotent Stem cells may be genetically matched to patient TYPES: Hemopoetic and Mesenchymal
Limitations	Risk of teratomas from implanting undifferentiated stem cells	Not found in all tissues Difficult to identify, isolate, maintain and grow in the laboratory
Ethical Concerns	Destruction of human blastocysts Donation of blastocysts Requires informed consent	No major ethical concerns have been raised

is attached to high-density microparticles containing the heavy metal nickel. The stem cells are then mixed with the high-density microparticles. The attached cells rapidly settle to the bottom of the disposable container due to the greater weight. They then can be separated and discarded, preserving the stem cells and leaving the lighter fraction depleted of virtually all the targeted cancer cells.[4]

CD34 selection: Stem cells have certain markers (antigens) on their surface that distinguish them from other cells. One of the main antigens on stem cells is the CD34 antigen. Positive selection is one technique developed for the separation of stem cells from other cells. This method uses a device that binds the CD34-positive stem cells and removes them from the other cells in the stem cell collection. Although CD34 selection devices are capable of removing large numbers of cancer cells from the stem cell product, they also remove many stem cells and immune cells.[4]

Ex vivo expansion: Small quantities of bone marrow were grown in a culture system outside the body. Hormones were added to a sterile culture system outside the body. This culture system has an added advantage of not supporting the growth of the cancer cells. Small numbers of stem cells were taken that do not contain cancer cells, and were placed in a culture system with the appropriate hormones. They produced a significant number of stem cells that did not contain cancer cells and was suitable for transplantation.[4]

► Sources of stem cells:

A. Adult dental pulp derived stem cells [DPSC]:

The dental pulp can be a rich source of mesenchymal stem cells. The isolated stem cells can then be cultured and offer potential applications for the treatment of mesenchymal tissue disorders. DPSC when cultured were found to generate a dentin, pulp like complex that is composed of mineralized matrix with tubules lined with odontoblasts and fibrous tissue containing blood vessels in an arrangement similar to the dentin pulp complex found in normal human teeth thus demonstrating self renewal capacity. They were also found to be able to differentiate into adipocytes and neural like cells. [5,6]

B. Stem cells in human exfoliated deciduous teeth [SHED]:

SHED were identified to be a population of highly proliferative clonogenic cells capable of differentiating into a variety of cell types including neural cells, adipocytes and odontoblasts. Deciduous teeth therefore may be an ideal resource of stem cells to repair damaged tooth structures, induce bone regeneration and possibly treat neuronal tissue injury or degenerative diseases. SHED are distinct from DPSC with respect to their higher proliferation rate, increased cell population doublings, viability, osteoinductive capacities and failure to reconstitute a dentin pulp like complex. SHED apparently represent a population of multipotent stem cells that are perhaps more immature than previously examined postnatal stromal cell populations.7Stem cells were found to express early mesenchymal stem cell markers (STRO-1 and CD146) and embryonic stem cell markers such as octamer-binding transcription factor 4 (OCT 4), nanog, tumor recognition antigens (TRA-1-60 and TRA-1-8) were found to be expressed by SHEDs.[8]

C. Stem cells from the apical part of papilla [SCAP]:

A new class of dental stem cells was isolated from the dental papilla of wisdom teeth or incisors of 4 month old minipigs - Stem Cells from Apical Papilla (SCAP), hereafter known as SCAP. The dental papilla is an embryonic like tissue that becomes also the dental pulp during maturation and formation of the crown. Therefore, SCAPs can only be isolated at a certain stage of tooth development. However, SCAPs have a greater capacity for dentin regeneration than DPSCs because the dental papilla contains a higher number of adult stem cells compared to the mature dental pulp.[9,10]

D. Dental follicle stem cells [DFSC]:

Human dental follicle progenitor cells were reported in the dental follicle of wisdom teeth at the root-formation stage.[11] Subsequently, rat DFSCs were shown to have the capacity for osteogenesis,adipogenesis,and neurogenesis. The results showed that DFSCs have excellent proliferation rates and a capacity for adipogenesis and osteogenesis. DFSCs were also found to have osteogenic differentiation capacity.[12]

E. Stem cells from periodontal ligament stem cell [PDLSC]:

A further class of dental ectomesenchymal stem cells are Periodontal Ligament (PDL), hereafter known as PDL Stem Cells,

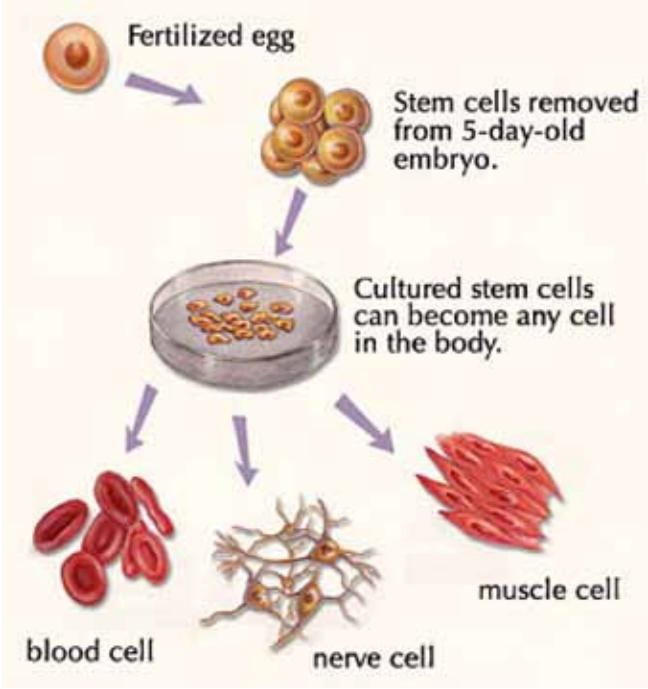

Fig 1: Cultivation of stem cell

which were isolated from the root surface of extracted teeth. These cells could be isolated as plastic-adherent, colony-forming cells, but display a low potential for osteogenic differentiation under in vitro conditions. PDL stem cells differentiate into cells or tissues very similar to periodontium. Moreover, PDL stem cells transplanted into immune compromised mice and rats demonstrated the capacity for tissue regeneration and periodontal repair. It has been shown that a functional periodontium could successfully be established using PDL stem cells.[13]

Stem cells in periodontal regeneration

The concept that stem cells may reside in the periodontal tissues was first proposed almost 20 years ago by Melcher, who queried whether the three cell populations of the periodontium (cementoblasts, alveolar bone cells and periodontal ligament fibroblasts) were ultimately derived from a single population of ancestral cells or "stem cells". Since periodontal regeneration is essentially a re-enactment of the development process including morphogenesis, cytodifferentiation, extracellular matrix production and mineralization, such process support the concept that mesenchymal stem cells remain within the periodontal ligament and are responsible for tissue homeostasis, serving as a source of renewable progenitor cells generating cementoblasts, osteoblasts and fibroblasts through adult life. In the event of injury to the periodontium these mesenchymal stem cells could be activated towards terminal differentiation and tissue repair or regeneration.[14]

Postnatal PDL stem cells express mesenchymal surface markers, such as Stro-1, CD105 (Endoglin, SH2 antigen), CD146 (MUC 18), and CD166 (ALCAM, SB10 antigen), and have a multipotent capacity to differentiate into adipocyte, osteoblast-like, and cementoblast-like cells in vitro, and to form cementum/PDL–like tissues when transplanted into immunocompromised mice. Cells with characteristics of putative MSCs have been found in regenerating periodontal tissues, implying their involvement in periodontal regeneration.[14]

The key factors in attaining successful periodontal regeneration are the correct recruitment of cells to the site and the production of a suitable extracellular matrix consistent with the periodontal tissues (skin, cartilage, bone, cardiovascular components, pancreas, etc). It seems logical that autologous periodontal ligament stem cells cultured within a suitable delivery scaffold, in conjunction with the growth and differentiation factors present in autologous blood clot, will lead to new periodontal tissue attachment via a tissue engineering approach.[15]

Future prospectives

The most recent whole-tooth regenerative therapy research has aimed to induce bioengineered tooth germ to develop a fully functioning tooth using embryonic tooth germ-derived epithelial and mesenchymal cells via the organ germ method. In the future,it will be important to identify sources of cells with tooth-forming ability from patient-derived somatic dental and non-dental tissue-derived stem cell populations. Recently, Induced Pluripotent Stem (IPS) cells have been established from various oral tissues and tested for their ability to differentiate in to dental epithelial and mesenchymal cells.[15]

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Periodontal accelerated osteogenic orthodontics

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Abstract

Orthodontic treatment usually takes about 12-36 months for completion and it is more challenging in the adult patient than in the adolescent due to various biological and clinical factors. With time more and more adult patients are seeking orthodontic treatment. Duration of treatment has also become an important criteria as adult patients prefer shorter treatment time for obvious reasons. This is where Periodontal accelerated osteogenic orthodontics (PAOO) gains significance. PAOO is a novel clinical procedure that combines selective alveolar corticotomy, particulate bone grafting, and application of orthodontic forces. This procedure is based on the bone healing pattern known as the Regional Acceleratory Phenomenon (RAP). It helps reduce orthodontic treatment time to a considerable extent providing better post treatment stability too. Particularly useful in the adult patients, this procedure is gradually gaining popularity. The purpose of this article is to give a general idea regarding PAOO with respect to history, principle, surgical technique, indications and contraindications.

Key words: Periodontally Accelerated Orthodontics, Regional acceleratory phenomenon, Corticotomy, Bone grafting.

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Introduction

An increasing number of adult patients have been seeking orthodontic treatment off late, and the orthodontic professional has been constantly trying for a shorter treatment time. There are several differences, both psychological and biological, between the orthodontic treatment of adults and adolescents[5]. Adults are more specific about the treatment objectives and aesthetics and also regarding the duration of treatment. Moreover in adults there is an increased chance of hyalinization during treatment[5]. They are also more prone to periodontal complications. This makes orthodontic treatment in adults more challenging. This necessitates special concepts and procedures such as use of lighter forces, more precise tooth movement, shorter treatment period etc[5].

Periodontal Accelerated Osteogenic Orthodontics (PAOO) also known as Wilckodontics is a clinical procedure that combines selective alveolar corticotomy, particulate bone grafting, and the application of orthodontic forces[1]. With this technique teeth can be moved 2-3 times further in 1/3rd to 1/4th time required for traditional orthodontic therapy[3]. It can be used to treat moderate to severe malocclusions in both adolescents and adults and can also reduce the need for extractions.

Background

Surgically assisted orthodontic tooth movement has been used since the 1800s[6]. Corticotomy facilitated tooth movement was first described by L.C Bryan in 1893[6]. However it was first introduced in 1959 by Heinrich Kole as a means for rapid tooth movement[5]. A corticotomy is defined as a surgical procedure whereby only the cortical bone is cut or mechanically altered[1]. The medullary bone is not changed as in osteotomy. Kole believed that it was the continuity and thickness of the denser layer of cortical bone that offered the most resistance to tooth movement. Kole's procedure involves the reflection of full thickness flaps to expose buccal and lingual alveolar bone followed by inter dental cuts through cortical bone[5]. Kole used vertical wedge shaped crestal ostectomies leaving only a thin layer of bone over the proximal root surfaces of adjacent teeth[1]. He reported remarkable stability in such corticotomy facilitated orthodontic cases after 6 to 8 months of retention[1]. Because of the invasive nature of Kole's technique it was never widely accepted[5]. Subsequent publications by Generson et al in 1978, Anholm et al in 1986, Gantes et al in 1990 and Suya in 1991 built upon the supra-apical horizontal osteotomy used by Kole[1]. In these publications the osteotomy cut was replaced with labial and lingual corticotomy cuts. A more recent surgical orthodontic therapy was introduced by Wilcko et al which included combining corticotomy surgery with alveolar grafting in a technique referred as accelerated or osteogenic orthodontics and more recently periodontal accelerated osteogenic orthodontics[5]. Several reports have indicated that this technique is safe, effective, extremely predictable, associated with less root resorption and reduced treatment time and can reduce the need for orthognathic surgery in certain situations.

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▶ Principle underlying paoo

PAOO is theoretically based on the bone healing pattern known as the Regional Acceleratory Phenomena (RAP)[1]. RAP was first described by Frost in 1983[5]. Frost noted that the original injury somehow accelerated the normal regional healing process[5]. This acceleration is the regional acceleratory phenomena. It usually occurs after a fracture, osteotomy or bone grafting procedure and may involve recruitment and activation of precursor cells necessary for wound healing concentrated at the site of injury[5]. The demineralization of the alveolar housing over the root surfaces apparently leaves the collagenous soft tissue matrix of the bone, which can be carried with the root surface and then remineralizes following the completion of the orthodontic treatment[3]. Shih and Norrdin demonstrated that when intraoral cortical bone was injured by corticotomy, RAP accelerated the normal regional healing processes by transient bursts of hard and soft tissue remodeling. The main features of RAP in bone healing include decreased regional bone density and accelerated bone turnover which are believed to facilitate orthodontic tooth movement[5]. Once the bone has demineralized there is a 3-4 months window of opportunity to move the teeth rapidly through the demineralized bone matrix before the alveolar bone remineralizes[6].

▶ Case selection

PAOO can be used in most cases in which traditional orthodontic treatment is used. It has been shown to be particularly effective in treating moderate to severe crowding in class II malocclusions requiring expansions, extractions and mild class III malocclusions[5]. PAOO can be used in both maxillary and mandibular arches. The surgical specialists must also evaluate the esthetic needs of the patients and incorporate these requirements in to the surgical treatment plan[1].

▶ Indications[6]

1) To resolve crowding and shorten treatment time
2) Accelerate canine retraction after premolar extraction
3) Enhance post orthodontic stability
4) Facilitate eruptions of impacted teeth
5) Facilitate slow orthodontic expansion
6) Molar intrusion and open bite correction
7) Manipulation of anchorage

▶ Contraindications

1) Patients with active periodontal diseases[5]
2) Gingival recession cases[5]
3) Patients with insufficient attached gingival, dental caries, uncontrolled diabetes mellitus, compromised immune system and patient incompliance[6]
4) Osteoporosis or other bone diseases[6]
5) Bimaxillary protrusion accompanied with gummy smile[5]
6) Long term use of medication (anti inflammatory, immunosupressives, bisphosphonates or steroids)[6].

▶ Surgical procedure

Periodontal accelerated osteogenic orthodontics consists of five steps[5]

1. Flap design
2. Decortication
3. Particulate grafting
4. Closure technique
5. Timing of orthodontic technique

Flap Design: The flap design should be such as to provide proper access to the alveolar bone where corticotomy is to be performed. Basic design is combination of full thickness flap in the most coronal aspect of flap with a split thickness dissection performed in the apical portion[1]. For aesthetic reasons the papilla between the maxillary central incisors should be preserved on labial and palatal aspects. Access to the labial alveolar bone in this area is achieved by tunneling from the distal aspect[5].

Decortication: Decortication should be just enough to initiate RAP response. Decortications of bone adjacent to malpositioned tooth is done using low speed round bur or piezoelectric knife. In 2009 Dibart et al described a new minimally invasive procedure that they called Piezocision. This technique combines micro-incisions limited to the buccal gingiva that allow the use of a piezoelectric knife to give osseous cuts to the buccal cortex and initiate the RAP without involving palatal or lingual cortex[7].

▶ Grafting:

Most commonly used materials are deproteinized bovine bone, autogenous bone, decalcified freeze dried bone allograft or a combination thereof[1]. A typical volume used is 0.25 to 0.5 ml of graft material per tooth is used. Use of platelet rich plasma or calcium sulfate has been reported to increase the stability of graft material[1].

Closure Technique: The flap is closed with non resorbable interrupted sutures without undue tension. Suture removal is done after one to two weeks.

Long term post operative NSAIDs are not prescribed as they are thought to interfere with RAP. Patients are instructed to place ice packs to the affected area to reduce post operative swelling. The patient is recalled every week for one month following surgery for evaluation and monthly thereafter.

Timing of Orthodontic Treatment: Typically placement of orthodontic brackets and activations are done one week

prior to surgery. In any case initiation of orthodontic force should not be delayed more than two weeks post surgery. A longer delay will fail to take full advantage of the limited time period that RAP is occurring.

Side effects[5]

1. Slight interdental bone loss
2. Loss of attached gingiva
3. Subcutaneous hematomas of face and neck
4. Post operative pain and swelling.

Discussion

In Periodontally Accelerated Osteogenic Orthodontics (PAOO), the teeth is moved more rapidly thus shortening the treatment time. This shortening of treatment time is advantageous to the patients periodontal health as it decreases the time available for relatively benign commensal bacterial biofilms to assume qualitative changes and convert to a destructive cytotoxic potential often seen when fixed appliances have remained on teeth for more than 2-3 years[5]. This technique increases alveolar bone volume or thickness leading to an intact periodontium and thus enhances post treatment stability. This is because of the additional step of bone grafting involved in PAOO. This increase in alveolar bone volume can repair pre existing alveolar dehiscences over root prominences and lessen the likelyhood of new dehiscence formation[6]. An obvious disadvantage of the technique is additional cost and morbidity. It has been found, based on case reports that surgical complications appear to be minimal with PAOO. Incidence of root resorption is reduced when compared to conventional treatment. A good coordination between the orthodontist and surgical specialist is a key factor for the successful treatment. However the introduction of a surgical phase to the orthodontic treatment may prevent a patient from considering PAOO. Only after careful consultation and communication with an orthodontist, periodontist and oral and maxilla facial surgeon will the patient be able to understand the advantages and disadvantages of treatment[1].

Conclusion

Periodontally accelerated osteogenic orthodontics is a relatively new innovative procedure and differs from other similar earlier procedures with respect to the additional step of bone grafting. It is an effective treatment alternative in adults with severe malocclusion to decrease the treatment time and increase the quality of treatment. The role of Periodontist in assisting the orthodontists to achieve the desirable results in shorter period of time is increasing. The Periodontist should choose appropriate corticotomy technique, according to the alveolar topography to avoid complications and to assist accelerated orthodontic tooth movement. The role of the Periodontist in the PAOO is becoming increasingly important. It is important for the Periodontist to know the details of the procedure to fulfill the need of the patients and thus helping the orthodontist in attaining quicker and stable results.

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REVIEW

Aloe vera in periodontics

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Abstract

The use of natural products in the prevention and treatment of oral conditions has increased recently and could be having less side effects. Many medicinal plants and their products are widely used for prevention and treatment of oral diseases, and among them Aloe vera is of particular interest and has been used therapeutically for a long time. Aloe Vera has been used medicinally for a few thousand years. Aloe vera has various medicinal properties like antiinflammatory, antibacterial, antiviral, and antitumor which accelerates wound healing and helps in treating various lesions in oral cavity.

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► Introduction

The name Aloe vera is derived from the Arabic word "Alloeh" meaning "shining bitter substance," while "vera" in Latin means "true"[1]. Aloe vera is a plant belonging to the Liliaceae family, of which there are over 360 known species(Vogler 1999)[2]. Since Aloe Vera has naturalized throughout the tropics and warm regions worldwide, its true origin is not known.. There has been partial historic documentation on the evolution of Aloe Vera and its use in past times. It has been rumored that Egyptian queens, such as Cleopatra and Nefertiti used Aloe Vera in their routine beauty regiments. It was also mentioned in the bible that Jesus has his hands wrapped with Aloe Vera after being hung from the cross to soothe the pain and help heal his wounds. The earliest known documentation of Aloe Vera, in reference to medical use, was in 1500 B.C. Many nations, such as Greece, China, Mexico, and the United States have historical documentation of Aloe Vera being used as treatment for different aliments[3]. The Egyptians called Aloe Vera the "Plant of Immortality" because it can live and even bloom without soil.[4]

Its modern use was first recognized in 1934 by Dr. C.E. Collins where several cases of roentgen dermatitis, the ulcerated skin lesions, were treated with aloe vera leaves. In 1937, Dr. J.E. Crew presented a wider use of aloe vera in treating chronic ulcers, eczema, burns,sunburns, poison ivy, and minor injuries. In 1959, the Food and Drug Administration admitted that aloe ointment actually did regenerate skin tissue. Since then topical use of aloe vera is common as doctors use it to treat burns and cut wounds, alopecia, and acne vulgaris and there is evidence that aloe vera may be beneficial in cases of arthritis, digestive system problems, diabetic patients, cancer prevention, HIV infection, and hyper susceptibility illness such as asthma, measles, rhinitis, etc[5].

The plant provides two distinct products: the yellow latex,which is referred to as aloe juice, and the leaf pulp which is the innermost portion of the leaf and is composed of the parenchyma cells whose baseline function is for storage of food and nutrients that contain the Aloe vera gel. The raw pulp contains about 98.5%water with the remaining 1.5%containing a range of compounds including water-soluble and fat-soluble vitamins, minerals, enzymes, polysaccharides, phenolic compounds and organic acids (Hamman 2008). The leaf pulp is commonly delivered as a topical ointment on wounds in a gel, cream or mucilage form (the mucilage being the thick, glue-like gel substance that is derived from the leaf pulp of the Aloe vera plant)[6].

► Chemical composition:

Many compounds with diverse structures have been isolated from both the central parenchyma tissue of Aloe Vera leaves and the exudate arising from the cells adjacent to the vascular bundles. The bitter yellow exudate contains 1,8 dihydroxyanthraquinone derivatives and their glycosides, which are mainly used for their cathartic effects. The aloe Vera parenchyma tissue or pulp has been shown to contain proteins, lipids, amino acids, vitamins, enzymes, inorganic compounds and small organic compounds in addition to the different carbohydrates. Some evidence of chemotaxonomic variation in the polysaccharide composition of aloes exists[7]. The chemical constituents of Aloe vera leaves including the pulp and exudate are given in Table 1.

► Clinical Applications of Aloe vera in periodontics

Studies using Aloe Vera in toothpastes have shown that aloe vera tooth gel and the toothpastes were equally effective against Candida albicans,Streptococcus mutans, Lactobacillus acidophilus, Enterococcus faecalis, Prevotella intermedia, and Peptostreptococcus anaerobius. Aloe Vera tooth gel demonstrated enhanced antibacterial effect against S. mitis.

* Junior Resident, **Assistant Professor, *** Professor **** Professor & HOD, Department of Periodontics, Govt. Dental College, Trivandrum. • Corresponding Author: Dr. Deepu S.L.

Aloe Vera in periodontal disease:

Treatment of periodontal disease by different type of local drug delivery system has been investigated. Subgingival administration of aloe vera gel results in improvement of periodontal condition.

Aloe Vera can be used as a local drug delivery system because of its various benefits such as:

1. It is easily available.
2. It is cheap
3. Easily applicable with minimal equipments

Aloe Vera latex contains anthraquinones, which are compounds that are used in healing and arresting pain because they are anti-inflammatory in nature. Applications directly to the sites of periodontal surgery along with periodontal dressing or to gum tissues when they have been traumatized by toothbrush-dentifrice abrasion, sharp foods, dental floss, and toothpick injuries. Existing evidence indicates that Aloe Vera used in variety of concentrations might be effective in shortening the duration of wound healing[8].

► Other dental use of Aloe Vera

Oral lichen planus

Hayes described first case of treatment of oral lichen planus using Aloe Vera juice and Aloe Vera gel for 3 months. Choonhakarn et al. carried out a double blind study to explore the efficacy of Aloe Vera gel in management of oral lichen planus and found that Aloe Vera gel is more effective than placebo. As indicated by other studies, Aloe Vera can be used in dosages of two ounces Aloe Vera juice three times a day for three months and for local application Aloe Vera gel can be used.[8]

Extraction sites

Extraction sites heal properly and dry socket formation is prevented when Aloe Vera is applied on extraction site.

Oral recurrent ulceration:

Acute mouth lesions are improved by direct application in gel form on herpetic viral lesions or aphthous ulcers. It has been reported that acemannan hydrogel accelerates the healing of aphthous ulcers and reduces the pain associated with them.

Bleaching property

Aloe Vera when added to toothpaste has bleaching property for the teeth. Denture patients with sore ridges and illfitting dentures can benefit as fungus and bacterial decontamination reduce the inflammatory irritations. Saponins which contain glycoside, are soapy substances that have both cleansing and antiseptic properties.

► Contraindications

Aloe Vera should be used cautiously in pregnancy, lactating mothers and allergy to lilliacea family. Side Effects: - Side effects may be categorized into due to topical or systemic routes as follows:

A. Topical: It may cause redness, burning and stinging sensation. Allergic reactions are mostly due to anthraquinones, such as aloin and barbaloin. It is best to apply it to a small area first to test for possible allergic reaction.

B. Systemic: Abdominal cramps, diarrhea, red urine, hepatitis, dependency or worsening of constipation. Prolonged use has been reported to increase the risk of colorectal cancer. Laxative effect may cause electrolyte imbalances (low potassium levels)[9].

Table 1: Active ingredients of *Aloe vera* leaf pulp and exudates.

Class	Compounds
Vitamins	B1, B2, B6, C, A ($\beta\beta$-carotene), choline, folic acid, $\alpha\alpha$-tocopherol
Enzymes	Alkaline phosphatase, amylase, carboxypeptidase, catalase, bradykinase, cyclooxidase, peroxidase, carboxypeptidase, cyclooxygenase, lipase, oxidase, phosphoenolpyruvate carboxylase, superoxide dismutase
Anthraquinones	Aloe emodin, aloetic acid, anthranol, aloin A and B (or collectively known as barbaloin), isobarbaloin, emodin, ester of cinnamic acid
Inorganic compounds	Calcium, chlorine, chromium, copper, iron, magnesium, manganese, selenium, zinc, potassium, phosphorous, sodium
Carbohydrates	Pure mannan, acetylated mannan, acetylated glucomannan (acemannan), galactan, glucogalactomannan, galactogalacturan, galactoglucoarabinomannan, arabinogalactan, pectic substance, xylan, cellulose
Saccharides	Mannose, glucose, L-rhamnose, aldopentose
Organic compounds and lipids	Arachidonic acid, $\gamma\gamma$-linolenic acid, steroids (campesterol, cholesterol, $\beta\beta$-sitosterol), triglycerides, triterpenoid, gibberellin, lignins, potassium sorbate, salicylic acid, uric acid
Chromones	8-C-glucosyl-(2′-O-cinnamoyl)-7-O-methylaloediol A, 8-C-glucosyl-(S)-aloesol, 8-C-glucosyl-7-O-methyl-(S)-aloesol, 8-C-glucosyl-7-O-methylaloediol, 8-C-glucosyl-noreugenin, isoaloeresin D, isorabaichromone
Nonessential and essential amino acids	Alanine, arginine, aspartic acid, glutamic acid, glycine, histidine, hydroxyproline, isoleucine, leucine, lysine, methionine, phenylalanine, proline, threonine, tyrosine, valine

Conclusion

Aloe Vera has been traditionally used worldwide as a folk remedy for various diseases because of its multiple biological activities. Preparations containing Aloe extracts is vast and consists of pills, capsules, creams, powders, and aqueous solutions. The pharmacological attributes of Aloe Vera have been revalidated in modern sciences through various in vivo and in vitro studies. These scientific studies are good enough proof that drug has immense potential as a dental therapeutic. So proper diagnosis, knowledge of the traditional medicine,and implementation of that knowledge to the treatment plan are important in ensuring success with this dental therapeutic agent.

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GUIDELINES FOR CONDUCTIONG AND ACCREDITING CONTINUING DENTAL EDUCATION PROGRAMMES IN THE STATE APPROVED BY KERALA DENTAL COUNCIL

Dr. Johnykutty Jacob
Executive Committee Member
& Ethics Committee Chairman
Kerala Dental Council

PREAMBLE

The Dental Council of India have issued guidelines on section 2(a) to 2(i) of the Dentists Act, 1948 for continuing Dental Education Regulation, 2007 with the approval of the Government of India. Ministry of the Health and Family Welfare, New Delhi. The said regulation provides for renewal of registration in 5 years and a system of continuing Dental Education is to be introduced throughout India. It is also ordered that Dentist would need to accomplish 100 points in 5 years for renewal thair registration. Since the registration and renewal of registration are the duties and responsibilities of the State Dental Councils., it became necessary to have a system of accreditation and approval of the Continuing Dental Education programmes by the State Dental Council. Thus it is decided to formulate guidelines for the conduct and accreditation of CDE Programmes.

1. All registered Dental Sureons would need to accomplish 100 points in 5 years (20 points of CDE per year)

It will be essential to achieve a minimum of 15 points and a maximum of 25 points in a year. 10 points for asepsis and infection control and 5 points for dental jurisprudence over a period of 5 years are mandatory.

Continuing Dental Education Programmes for which credit points are mandatory would commence from the year 2015 onwards and all dental surgeons registered to date on the rolls of the State Dental Council would be subjected to these requirements.

2. Organizations / Institutions competent to conduct Continuing Dental Education Programmes.
   (i) Academic Departments of all Government and approved Dental Colleges in the State
   (ii) All Government Bodies under the Health Department
   (iii) Indian Dental Association State and Local Branches and Dental Speicality Associations
   (iv) Any other approved organizations / associations (National / International) as may be decided by the state dental council.
3. Procedures to be followed for accreditation
   (1) Request and programme notice with details of speakers, subject, time and venue should be submitted to the Registrar, Kerala Dental Council, Red Cross Road, Thiruvananthapuram 35, two weeks before the commencement of the programme.
   (2) Allotment of credit points will be solely at the diseretion of the Kerala Dental Council
   (3) All Procedures performed on patients should be under strict aspectic condtions
4. The award of credit points would be as follows:
   - Full day lecture or conference - 6 CDE Points
   - Half day lecture or workshop - 3 CDE Points
   - Evening Product Introduction lecture business meeting - 2 CDE Points
   - 45 minitues lecture with 15 minute question & answers - 1 CDE Point
   - CDE Points to faculties will be double the points to the participants
5. The Certificate with accredited points should be issued only at the last hours of last day of the CDE Programme.
6. The delegates should enter their Name, Kerala Dental Council Registration No. & Signature while registering with the programme during their entry at the venue on the 1st day of te programme itself.
7. After the programme a short report of the programme and list of participants with their Kerala Dental Council Registration No. & Signature should be submitted to the Registrar, Kerala Dental Council within 7 days.
8. Kerala Dental Council will appoint a CDE observer for all CDE programmes in the State for which credit points are allotted
9. Funding of the Continuing Dental Education

Financial Assistance from the Council for conduct of Continuing Dental Education Programmes should be limited to the Government Dental Colleges, the Co-operative Dental College and Indian Dental Association State Branch and local branches provided that no financial assistance from other government sources has been received. The fund will be disbursed on the production of bills by the Principal or Secretary, as the case may be, for the amount sanctioned, with the approval of the Council.

Association News

Report on
THE MULTICENTRE MEGA DENTAL-MEDICAL CAMP CONDUCTED IN CONNECTION WITH 47TH KERALA DENTAL CONFERENCE.

A four-day dental and medical camp has been conducted in different centers in Kannur from 15-19 January in connection with the IDA state conference held at St.Michales Anglo Indian High School, Kannur. He camp was conducted in collaboration with Madhava Rao Sindhya hospital with the community dentistry department of Calicut Dental College and Mobile medical clinic of Malabar Gold and Diamonds. The well equipped mobile dental clinic team of doctors and paramedical staff headed by Dr.Shaheer executed the dental procedure procedures for the needy patients under strict aseptic precautions on all four days. This very successful community level program conducted for the first time in connection with the state conference attained tremendous media attention and boosted the image of our association among the common people of Kannur. More than 2000 people in and around Kannur including school children, teachers were benefitted from this camp. DR.C.K.Ashokan,Dr.Subair,Dr.Pramod John and Dr.Chethan took dental and oral cancer awareness classes for the participants of the camp.

The inauguration of the Dental camp on 15th January was conducted in Town Higher Secondary School, Kannnur.The camp was inaugurated by the District Panchayat President, Prof.K.A.Sarala. Dr.Pramod John, HOD oral medicine, Kannur Dental college and Dr.C.K.Ashokan took classes. Around 500 people attended the camp. Twenty-seven patients under went treatment.

The Dental Camp on 16 Th was conducted in St.Michales Anglo Indian High School and The District Collector Sri.Bala Kiran IAS inaugurated the camp. Around 500 patients including the students and teachers were screened and 21 patients undergone treatment. Dr.C.K.Ashokan conducted dental care awareness class.

The dental camp on 17th January was conducted in Puzhathi Higher secondary school and the camp was inaugurated by the District police chief P. N. Unnirajan IPS.

About 400 patients were examined and and 25 patients undergone treatment.

A mega medical camp on life style diseases was conducted on the same day in Talap Mixed UP School with the fully equipped mobile clinic from Malabar Gold and diamonds and team of doctors headed by Dr. Moidu Madathil, Chief physician of MadhavaRao Sindhya hospital. Hundred patients previsly registred for the camp has undergone lab investigation to rule out diabetes any renal,cardiac and liver diseases and those tested positive have treated by the medical team.It has been decided to give the follow up treatment free of cost for all the patients till March 31.

On the final day the dental camp was conducted in Madhava Rao Sindhya Hospital and the camp was inaugurated by the noted writer Sri. T.Padmanabhan.Dr.Subair took awaenwss classes. About 500 patients have been examined andand 20 patients undergone treatment.

Dr.C.K.Ashokan
Camp Coordinator, 47th KDC

CDH Report

Dr. Subhash Madhavan
Chairman CDH

World Cancer Day Observed By CDH, IDA Kerala State

CDH of IDA, Kerala State observed the world Cancer Day on February 4th in Sree Mahrishi School Pattambi, hosted by the Valluvanad Branch. The program consisted of a formal observance meeting followed by a seminar on Oral Cancers. The chief guest was Adv.V.T.Balaram, the MLA of Thrithala Constituency, Kerala State

The meeting was presided by the Chairman CDH, IDA Kerala State, Dr.Subhash Madhavan. The meeting was called to order at 11.00 a.m.

After a prayer by the students of Sree Mahrishi Vidyalaya Dr.Sreekanth.S., the president of Valluvanad branch IDA welcomed the gathering. He also emphasized the importance of the day.

In his Presidential address Dr.Subhash Madhavan, Chairman, CDH, Kerala State spoke about the importance of the day. He also spoke in length about the projects to be implemented this year. He stated that today was just the beginning for more events to follow. March 1 to 6th will be observed as ORAL AWARENESS WEEK and the inauguration will be on 1st march 2015 at Attappady. He also mentioned that the state has decided to adopt 10 tribal colonies and provide free dental care. A free dental clinic is being established there. He also informed that oral health seminars and camps will be conducted in 300 schools throughout the state.

After lighting the traditional lamp the Chief guest addressed the gathering. He spoke about the social commitment to prevent cancer, treat and rehabilitate cancer

victims. He also mentioned that Kerala State stands first in palliative care and free cancer treatment to the poor in india.

The program was felicitated by Dr.Joji, past CDH Chairman, the School management and service organization representatives.

Dr.Rajeev Chandran, Secretary, Valluvanad Branch, proposed the vote of thanks.

After the national anthem, the meeting was adjourned for Seminar on ORAL CANCERS, PREVENTION, EARLY DIAGNOSIS AND TREATMENT. The seminar was conducted by Dr.C.Balasubramaniam, Past President of IDA, Kerala State, Valluvanad Branch. More than 200 students attended the seminar and well appreciated.

The seminar ended by 2.00 p.m

IDA Hope Report

Dr. Joseph C.C.
Hon. Secretary

Dear friends in the profession,

My sincere gratitude for your confidence & support that showed to me attain better heights of the office of IDA HOPE. It is my pleasure working with the profession in different magnitudes. I will list out some salient features of our scheme.

- IDA HOPE is a members welfare scheme of IDA Kerala state and registered as IDA KSB Society in 2013 Reg No.TVM/TC/651/2013
- It was formed by merging the PPS& SSS of IDA Kerala state in 2007-08
- It has 2630 members. Out of that 2366 are active. Till now 264 drop outs.
- IDA Hope has made its presence in all the 29 local branches of IDA Kerala State.

Objectives of the Scheme

- Indemnity insurance and legal aid to the members.
- Financial compensation to the families of the Deceased member or Total Permanent disability.
- Medico-legal awareness/education.
- Encourage promote and popularize ethical treatment amongst Dentists.

Membership

- Member from any local branch of IDA Kerala State with a valid DCI registration
- Membership is co terminus with the membership of IDA Kerala State.

Admission Formalities- New members

- Copies of Birth Certificate or passport or SSLC for proof of age and residence.
- Copy of professional degree certificate and post graduate certificate if any.
- Copy of dental council registration certificate and latest renewal receipt
- Two passport size photographs (1.In Application form, 2 For the Certificate)
- Application Form (To be endorsed by the branch representative or the secretary for proof of branch membership)
- DD for admission fees drawn in favor of IDA Hope Payable at Thamarassery.

Admission Fees for New Members

- Up to the age of 30 - Rs. 5000
- 31-40 yrs of age - Rs. 7500
- 41-50 Years of Age - Rs. 10000
- New memberships stops at the age of 50

Annual Renewal fee

- Annual renewal amount - Rs. 1200
- Additional Rs.500 / claim in a year

The management committee shall be the final authority to accept/deny all the applications.

Membership Contributions - Fraternity contribution

Payment of fraternity contribution @ of Rs. 500/- is mandatory along with the next year's renewal in the event of death of any member.

Membership Renewal

- The membership renewal period is between 1st April to 31 May every year at local branch level.
- Table with the list of members and their renewal amount, status etc will be sent to the representatives by the end of March.
- You may contact your representative to know your amount
- The membership will be terminated if not renewed before the end of the year.
- Receipts will be issued by local branch Representative. 1st page counter foil is for the member and 2nd page counter foil along with payment should reach the state office before April 15th.
- The receipt book with the 3rd counter foil to be returned before the end of the financial year for auditing

Personal accident insurance from united India insurance

- From Nov 2014 onwards
- Hospitalization expenses due to accidents
- Upto I lakh
- Hope Member is covered under United India insurance mediclaim for accidents only, hence choice of coverage under other medical claim rests on members choice because only one claim will be entertained by the insurance company.

PRESENT STATUS

The present membership of IDA Kerala State is around 3500 including members above the age of 50 Present membership of IDA HOPE is 2366 The maximum expectable membership for IDA HOPE will be around 3000-3500.

SOCIAL SECURITY – Current year we had 2 Claims, one death & 1 permanent disability claim. Total – 2claims Legal – 14cases at present,

Membership Rights and Obligations

- In the event of death of a member of at least 12 months membership the nominee/ legal heirs will be paid an amount 1000000 (10 lakhs)
- In case of death due to accidents a benevolent contribution is paid as soon as member ship is realized from the scheme office.
- The Professional indemnity coverage of the member will commence one month after the acceptance of membership.
- The maximum liability that will be borne by the scheme shall be Rs. 200000/-
- Continuous membership is obtained on timely renewal.
- The members shall maintain proper records and adopt standard protocols and safe dental practices as recommended by the scheme from time to time.

LEGAL ISSUES

Presently 14 cases pending in the consumer redressal forum.

The cases are as under.

- Post Extraction Pain / Dry Socket.
- Post Extraction Bleeding
- Post Extraction Infection / trismus
- Removal of Lower third Molar Causing Fracture of Mandible
- Wrong tooth extraction
- Post filling pain
- Full Denture Not Satisfactory
- Orthodontic result Not Satisfactory
- Orthodontic Brackets Breakage / Multiple non attending appointments.
- Anesthetic complication in Orthognathic surgery / Death of the Patient.
- Bridge not satisfactory

Before starting and procedure on a patient, the member is advised to

1. Write the details of clinical findings,
2. Diagnosis,
3. The treatment options advised,
4. Treatment given etc
5. Medical / Dental / Allergy History (even if no history – note that) in the case paper, if not relevant to the present procedure. This will help us to defend in majority of the cases.

In an event of medico legal case

- Never panic
- Explain to the patient/relatives in polite manner that we have done the procedure for the best interest of them. Complications very rarely occur and are part of the life, which we never wish to happen.
- Be firm, but don't agitate them.
- False justification will lead to trouble. Now day's patients are well aware of the treatment procedures.
- Inform the IDA HOPE representative of your branch & IDA HOPE secretary.
- Send the following to the secretary within a week on receipt of the notice.
  - Your Name, IDA Hope No:
  - Copy of the notice received
  - Copy of the case sheet

  Detailed version of the case with your explanation.

Do not send any reply of your own or through any advocate with out the permission of the scheme office. All cases were well managed by our team with the help of our advocates especially Adv. Shyam Padman.

HOPE TEAM - THE MANAGEMENT COMMITTEE

- Chairman – The President ida kerala- Dr.K C Thomas. Kannur
- 1 st Vice Chairman – Dr. Samuel K Ninan (Legal Cell) Pathanamthitta
- 2 nd Vice Chairman – Dr. Bijukumar S D. (SSS) kollam
- Hon. Secretary – Dr. Joseph CC Tamarassery, Mob : 9447252873
- Joint Secretary – Dr. Manoj Joseph Michel Calicut, Mob : 9349982041
- Treasurer – Dr. B. Madhavankutty Tamarassery, Mob : 9447447080
- Internal Auditor – Dr. Nizaro Siyo Tamarassery
- Members from IDA Kerala State – President, IPP, Pre Elect, Secretary & Treasurer
- One representative each from local branches elected from the IDA HOPE members
- President / Secretary of the local branch who are state executive members.

The Office and Address of the Scheme shall be that of the Secretary of the scheme.

You are always welcome to contact me at the address below for any query / details etc.

Dr. JOSEPH CC,
Hon. Secretary – IDA HOPE, Dental Specialty Clinic,
Thamarassery, Calicut (Dt) KERALA Pin - 673573.
Phone: 0495 2222904 (clinic), 0495 2372971 (Resi), Mobile 9447252873
Email: secretaryidahope@gmail.com, josephjyothi@yahoo.com

FOR HOPE MEMBERSHIP PROMOTIONS

For north zone **HOPE office**
For Central zone **Dr. Samuel K Ninan** Legal Cell Chairman - 9447440004
For south zone **Dr. Bijukumar SD** Social Security Chairman - 9447077147

For hope membership renewal details will be sent to your hope representatives of branch directly and you can pay the amount directly to him. All these things are possible with dedication, determination of the leaders and the trust of the members. We are sure that our experiences in leading IDA Kerala State in the past and the continuous support of members.

Attingal Branch

INSTALLATION CEREMONY : The installation ceremony was held at IMA Headquarters, Trivandrum on January 11th Sunday 5pm.Chiefguest of the meeting was Dr K.C.Thomas IDA State President -Elect.PresidentDr.Arun.S installed DrArun Roy as new president in the presence of Dr K.C.Thomas. KDC Vice president Dr Anish.P felicitated the gathering. After this the whole office bearers were installed by President Dr Arun Roy. Vote of thanks was delivered by newly elected Secretary Dr Alex Philip. The meeting was followed by gala banquet and entertainment programmes.200 members and family members attended.

1stBRANCH EXECUTIVE COMMITTEE MEETING: The 1st branch executive was held at Attingal club, Attingal on January 26 Monday,7pm. President Dr Arun Roy welcomed the members and expressed his gratitude for electing him as the new president.Also thanked all members for conducting the

installation meeting in such a grand manner. Later the meeting discussed about the whole years programmes.The meeting decided to conduct a CDE programme by renowned faculty Dr Chandrasekharan Nair on March 8th Sunday.

Central Kerala - Kottayam Branch

Executive Committee Meeting: 1st executive committee meeting was held on 7th January 2015 at Kottayam club.

Installation : Installation of Dr. Geogi Cherian as president of IDA Central Kerala Kottayam branch and his team of office bearers was held on 31st Jan 2015 at Citizen's Club, Kottayam. Dr. Thomas K. C (IDA Kerala State President) was the Chief Guest. Mr. Siby Malayil (Cine Director), Dr. Mathew Vayalil (KDC President) and Dr. George Varghese (Principal GDC Kottayam) were the Guests of honour. Dr. Renju Titus Thomas took charge as Honorable Secretary.

Family Get Together : 1st family get together was held on 31st Jan 2015 at Citizens club Kottayam.

Presidents & Secretaries Seminar: President Dr. Geogi Cherian, Hon. Secretary Dr. Renju Titus Thomas and CDH convenor Dr. Nitin Joseph attended the seminar held on 8th Feb. 2015 at Kannur.

CDH : 1st CDH programme was conducted on 11th Feb 2015 by Dr. Anukesh at Little Flower School, Kurichy

Executive committee meeting: Second Executive committee meeting was held on 18th Feb. 2015, at Kottayam club Kottayam.

State executive committee meeting: All state executive committee members of IDA CKK attended the meeting held on 22nd Feb 2015 at Nila palace, Kottarakkara.

Trichur Branch

Conducted annual general body meeting on 2nd jan 2015 at hotel dass continental.president Dr Tharian Emmatty welcomed all the members.sec Dr Abilash presented annual report and treasurer Dr Sunil Fahed presented audited annual statement.Installation of new president Dr Suresh Kumar J and the new team.Dr Varghese Mani gave Oath of office to the new committee.Dr Suresh Kumar J gave acceptance speech.Dr Abilash gave vote of thanks.Meeting was attended by 67 members.The house adjourned for dinner and other proceedings Conducted 1st executive committee meeting on 9th Jan 2015 at hotel mothi mahal at 8pm.Conducted 2nd general body meeting and 1st FAMILY MEETING at hotel dass continental at 8 pm on 7th Feb 2015.the meeting was attended by 80 members of ida thrissur and their families

Coastal Malabar Branch

INSTALLATION CEREMONY ON 27.12.2014 Installation of office bearers of IDA Coastal Malabar Branch was held on 27.12.2014 at hotel J.K.Residency, Cheruvathur at 07.30 pm. President Dr.Ahamed Shafi installed Dr.Pratap.Pavithran as President of the branch and Dr.Rahul No. 1 as Hon.secretary for the year 2015. Dr.Alias Thomas, President elect, IDA Head office was the chief guest of the programme. Guest of honours were Dr.Thomas.K C, President,IDA Kerala state and Dr.O V. Sanal, secretary,IDA Kerala state. Newly installed president,Dr. Pratap Pavithran installed the team of office bearers for the year 2015.Dr.Santhosh. Sreedhar, past president,IDA Kerala state, Dr.Anil.M, Principal, Mahe dental college, Dr.Saji.P,Principal, Pariyaram dental college, Dr.Jayaprasad kodoth, Principal, Poinachi dental college, and Dr.Anil.Thunoli,past president, IDA North Malabar branch felicitated the function. An entertaintment programme was conducted after the installation ceremony.

FIRST CDH ACTIVITY - 1/1/2015 Inaugaration of CDH activities of IDA Coastal malabar branch was done by conducting a treatment camp at old age home, Thabore on 01.01.2015 by our CDH representative Dr.Sajan. Joseph.

FIRST EXECUTIVE COMMITTEE MEETING- 29/1/2015 First executive committee meeting of IDA Coastal malabar branch was held on 29/01/2015 at hotel KBC,Green Park,Edat,Payyannur at 08.00pm.Secretary Dr.Rahul . Nandakumar Collored the President and meeting was called to order.We discussed plans and policies of the year 2015.Various sub-committees were formed.Discussed about CDE & CDH activities. Decided to inaugurate CDE for the year 2015 on 09.02.2015. Decided to conduct CDH week from March 1st to March 6th and a state level programme on May 31st-Anti tobacco day. Discussed about IDA HOPE, Clinic standardization,Journal publication, mutual benefit scheme, family sports and picnic, upcoming events etc.

Kochi Branch

1) On 2nd January 2015,we had our first EC meeting at IMA House kaloor Kochi.IDA Kochi Branch have a strength of 26 EC members. In first EC meeting 20 members were present; meeting was hosted by Dr.Siby T Chenanngara, Dr.Balu Soman and Dr.Ajit P. Attaching the invitation letter of First EC.
2) On 29th January Thursday 2015 we had our first monthly meeting and scientific session on LASERS in DENTISTRY. Apart from usual presentation; it was an active, interactive session. Panel members of doctors were
   - Dr. Simple Varghese, MDS Periodontist
   - Dr. Jose Paul, MDS Periodontist
   - Dr. Mahesh Narayanan, MDS Periodonist
   - Dr. Madhu H, MDS Endodontist
   - Moderator-Dr. Noorudeen MDS Periodontist

   Meeting started at 8pm, Total 52 no of members were present. Meeting was well appreciated by the members. By 10 pm meeting was adjourned, followed by dinner. It was sponsored by Dent Care Dental Lab.
3) On 11th February Wednesday 2015-IDA Kochi Branch had the 2nd executive committee meeting a IMA House Kochi. Various topics were discussed. Meeting lasted for 2 hours,followed by dinner. Meeting was hosted by Dr. Angana G, Dr. Sanjeev R and Dr. Jayakumar S.
4) President and secretary of IDA Kochi branch attended president & secretary seminar on 8-2-2015 at Kannur (acquire 2015)
5) Attended 47 th kerala state dental conference at Kannur in Jan 2015.
6) President and secretary attended 68th national dental conference in feb 2015 at bangalore.

Kunnamkulam Branch

Installation ceremony 2015

The installation of IDA kunnamkulam was held on 7th december 2014 at hotel samudra chavakad. Dr Thomas k c president IDA kerala state was the chief guest of the day. The programme started by briefing the history of our branch.Dr Rathesh installed as the new president followed by the installation of other members.Lighting of the lamp and keynote address was given by chief guest Dr Thomas k c and falicitation was given by Dr Subash state CDH.The programme was conculded by vote of thanks by the secretary Dr Mohammed sanju and meeting adjourned for dinner.

1st Executive meeting of IDA kunnamkulam was held on 11th december 2014 at hotel samudra chavakad.we discussed and decided plans and projects of 2015.

CDE Activites

1st CDE of our branch was held on 10th jan 2015 at hotel liwa tower kunnamkulam by Dr Faiz on " FAILURES IN FPD".The programme started by welcoming the gathering by the president. The talk was very informativee

2nd CDE was held on 14th jan 2015 at hotel samdura chavakad by Dr Ravi varma on "FAILURES IN COMPOSITES". we had maximum number of participation from our branch.and was very informative.

CDH Activites

On request from BPHC Maranchary medical officer, Dental screening camp was conducted on 13th feb 2015 for students of diifferent govt schools at PHC veliyancode.Dr Mohmmed sanju conducted the camp.

General body meeting and IDA carnival

1st general body meeting, Family get together and IDA carival was held on 15th feb 2015 at hotel liwa tower kunnamkulam.The programme started by lunch. we had different dress material and snacks stalls by our own members..

Wayanad Branch

Installation Ceremony : Installation ceremony of Wayand Branch held on 24th January 2015, 7.30 PM at Wyndvalley resorts Kalpetta. Branch President Dr. Frens Jose Presided the function and District Collector Mr. Kesavendrakumar IAS was the Chief Guest. Dr. Sanal O. V Hon. Secretary IDA Kerala State installed. Dr. Noushad Palliyal as 10th President of IDA Wayanad. State President Dr. Thomas K.C was the guest of honour. Newly installed president Dr. Noushad Palliyal installed his team of office bearers. Central council member Dr. Renjith. C. K felicitated the function. Dr.Rajesh T Jose Secretary IDA Wayanad welcomed the gathering and hon. Treasurer Dr. Rajith. M. proposed vote of thanks.

1st Executive Meeting : 1st Executive meeting held on Feb 2nd 2015 8 PM at Wyndvalley resort Kalpetta. The president pipelined his plan and project in this IDA Year. We have discussed dentist day celebration, CDE, CDH activities, family tour, Staff Training, Free denture distribution etc.

Publication: Dr. Sanoj P.B has penned a book on dentistry for public awareness. The book is inspiring aswellas humours it was relesed at 47th KSDC at kannur. The book was published and marketed by DC Books.

Aquire 2015 President Dr Noushad Palliyal and Secretary Dr.Rajesh T Jose attended President secretary seminar held at Malabar Residency Kannur on 18th February 2015.

Malabar Branch

INSTALLATION OF NEW OFFICE BEARERS 2015

Installation of the office bearers of IDA MALABAR Branch was held on 25th January 2015 at Hotel Malabar Palace Kozhikode at 5.30pm. Dr.Saju N.S was installed as the new president of IDA Malabar Branch by Dr.O.V Sanal (Hon. Secretary IDA Kerala State) Chief Guest of the function and he administered the Oath to the newly elected President of IDA Malabar Branch. Outgoing President Dr.Sandeep Rajagopal handed over the President's Collar to newly installed President. Followed by the installation of other office bearers. Shri.M.N Karassery was the Guest of Honour. Felicitations were given by Dr.Nizaro Siyo IPP IDA Kerala state and Dr.Firoze Moopan. Many important Dignitaries witnessed the occasion including Dr.Antony Thomas (Past President IDA Kerala State), Dr.Vishwanath (Past President IDA Kerala State). Nearly two hundred members attended the function. Vote of Thanks was delivered by Dr.Sudheer K.T newly elected Hon. Secretary IDA Malabar Branch.

CDH Activity No.1 Dental awareness camp was conducted by IDA Malabar branch in association with Public Health and Anganvadis. We conducted dental awareness classes and interactive sessions for Adolescent girls on 26th January 2015 at Karaparamba High School Kozhikode. About 45 students and 15 teachers attended the camp.

CDH Activity No.2. Dental awareness camp was conducted by IDA Malabar Branch on 26th January 2015 at Billathikulam LP School Kozhikode. An awareness class on oral habits was given to students. About 40 students and 10 teachers attended the camp.

CDH Activity No.3 Dental Orientation and awareness camp was conducted by IDA Malabar Branch on 31st January 2015 at Katuvayal Anganvadi near English Church Kozhikode. Various brushing techniques were demonstrated and awareness class on oral habits were given to students and teachers. About 35 Students and 10 teachers attended the camp.

Malanadu Branch

Installation Report

24th installation of IDA malanadu branch was held on 10 th January 2015, Saturday at Hotel Kabani International Muvattupuzha. Meeting was started at 7:00 p.m. presided by Dr. Byju Paul Kurian. Meeting was started with the collaring of the President Dr. Byju Paul Kurian by secretary Dr. Joby J. Parappuram. Followed by prayer song. Dr. Litto Manuel welcomed the gathering.

Dr. Giju George introduced the new President. Dr. Jaymon K Alias introduced Dr. K.C.Thomas. The IDA State President Elect Dr. K.C.Thomas installed the new President, Dr. Jayan Jacob Mathew followed by the installation of new office bearers by Dr. Jayan.

Chief guest for the day was Adv. Eldhose Kunnappilly, President, Ernakulam District Panchayat. He was introduced by Dr. Siju v jose. He also inaugurated the IDA activities for the year 2015.

Dr. K.C.Thomas inaugurated DHWANI – Dental Health Welfare Activities for the Neglected Individulas by unveiling its logo. Malanadu Clinical Club, another initiative from Malanadu Branch to increase the member activities was inaugurated by Dr. Ciju A. Paulose, State Vice President of IDA.

Charter Day celebrations was conducted along with that. Dr. John Joseph one of the senior charter member started that with the cake cutting. Pleasantries were given to the guests by Dr. Jayan and Dr. Joby. Dr. Arun George, President Elect gave vote of thanks. Meeting was adjourned for fellowship and dinner by 10:00.

Nedumbassery Branch

Installation and inauguration of IDA Nedumbassery,2015 was held on 25 the January,Sunday 6:30 pm at Hotel Elite Palazzo Angamaly. Dr.Prince Urmese, President installed Dr. Jose G. Parackal as the new president followed by the installation of new office bearers. Dr. K. C. Thomas president IDA Kerala state was the chief guest, who inaugurated the IDA year 2015. Branch bulletin "Reflections" was released in this occasion. Mementos and gifts were presented. Treasurer Dr. Teny Mathew welcomed the gathering Dr Subash Rajagopal,secretary delivered the vote of thanks..

Our first executive meeting was held at Periyar Club Aluva on 6 the February. Goals and plans, budget were presented.

Programme schedule: 1st clinical meeting on 24th February

Dentist day celebrations on March 6th

1st CDE on march 22nd in PEADODONTICS...

Mavelikkara Branch

Installation ceremony: The installation of IDA Mavelikara's new President Dr. Sunil Babu and his team members for the year 2015 was held on 11/1/2015 in a Houseboat over Punnamada backwaters, Alappuzha.

The chief guest for the programme was Dr.Ciju Paulose, Vice president, IDA Kerala state and Guest of Honor was Dr. B. Padmakumar, Additional Professor, Department of Medicine, Alappuzha Medical College.

Dr. Major Ninan, outgoing president IDA Mavelikara welcomed the gathering and thanked all members for the support given to him in his tenure. Dr. Samith V., Secretary, IDA Mavelikara, read out the secretary's report for the year 2013-14.

The new President for the year 2014-15, Dr. Sunil Babu, was installed by Dr. Anil G. CDE Convener Ida Kerala state. Dr.Sunil Babu in his presidential address laid out his vision for 2015. The Chief guest and the Guest of honour addressed the gathering. Dr. Akhilesh Chandran, Joint secretary, IDA Mavelikara delivered the vote of thanks.

After the official programme there was variety entertainment for the kids and family of the members convened by Dr.Baiju Hariharan and Dr.Pradeep John George.

First CDE report : IDA Mavelikara conducted its first CDE in 2015 on February 22nd, at Hotel Travancore Regency, Mavelikara. The topic Management of Medical Emergencies in Dental Practice was discussed in detail by eminent faculty, Prof. Dr. Radhika Krishnan, M.B.B.S., DNB, MNAMS. A Medical Emergency Kit containing essential drugs and delivery systems were distributed to participants. Demonstrations for Basic Life Support, Defibrillator, Nebuliser, Multiparameter monitor, Glucometer, Airway and intubation, Oxygen cylinder and its attachments, Ambubag, IV lines etc was conducted. Participants from neighboring branches, namely, Thiruvalla, Central Kerala, Alappuzha etc also attended. The programme was well-attended and registrations crossed 150.

North Malabar Branch

INSTALLATION CEREMONY : Installation of the new office bearers of 2015 was held on 18 january Sunday at st'michaels school comple, Kannur. Dr. Shali Ranjith was the master of ceremony. Dr.Dinesh Nambiar the programme co ordinator welcomed the gathering. The chief guests of the programme was the president of IDA Kerala State Dr. K.C Thomas. Dr. Mohammed Sameer P.T [president elect, IDA Kerala state] Dr. Nizaro Siyo [IPP Kerala State] and Dr. O.V Sanal Hon. Secretary IDA Kerala state were the guests of honour. DR. Anil thunoli in his out going address thanked all the members for the co-operation and support rendered through out the year. He made special mention about the conference organising committee for conducting the state conference during his tenure in a grand manner. He later installed new president Dr.C.P.Faizal. In his presidential address Dr. Faizal C.P congratulated the previous office bearers for their fantastic efforts. He outlined the programme planned for the coming year and sought the co-operation of all members for successfully implementing them.He promised to live up to all his expectations. He then installed all his office bearers. The programme was inaugurated by Dr.K.C.Thomas . Dr. Nizaro Siyo, Dr. O.V.Sanal and Dr. Mohammed Sameer P.T offered the felicitations. Dr. Mahesh Raj V.V delivered the vote of thanks. The programme was followed by high tea.

Chalakudy Branch

Installation ceremony of the office bearers for the year 2015 was conducted on 26th January at Hotel CLAY HOUSE chalakudy.IDA state president dr K C Thomas was the installing officer. Dr Beryl paul took charge as the president and Dr Sijo Manavalan as Secretary.

Pathanamthitta Branch

01/02/2015: INSTALLATION CEREMONY of Dr. Gigu Zakariah Philip as the 14th president of IDA Pathanamthitta was held at Hotel Hills Park, Pathanamthitta. Chief Guest and President of IDA Kerala State branch Dr. Thomas KC inaugurated the activities of the branch. Dr. Biju U Nair delivered his farewell speech and installed Dr. Gigu Zakariah Philip & he installed his team of office bearers. Dr. Anil G & Dr. Thomas Varghese were guests of honor.

Branch Theme: Bringing dentistry to the people.

MEMBERSHIP STRENGTH presently stands at 92 members comprising of 83 renewed members, 2 life members, 4 new members and 3 student members as per the list in Head Office of our association.

1st Executives Committee Meeting was held on 20/02/2015 at Hotel Hills Park, at 9:10 PM after the 1st CDE.

CDE Report: One CDE conducted & second CDE in planning. 20/02/2015: 1st CDE on the topic Successful Fixed Prosthetic Rehabilitation – A Discussion by Dr. Nirmal George Saibu MDS Senior Lecturer, Al Azhar Dental College, Thodupuzha, was held at Hotel Hills Park, Pathanamthitta.

Preparations are initiated for 2nd CDE on the topic Save Problem Solving in Restorative Dentistry – A New Innovative Approach to be held at Hotel Hills Park, Pathanamthitta on 15/03/2015.

PUBLICATIONS: The first edition of the branch journal Xtract was released by Dr. Anil G at the installation.

Branch Awards: Each year the executive nominates four of its members for its branch awards which are to be distributed during the installation ceremony. The Awards & their winners were:

Dr. Sony Thomas Award to Dr. Anitha Ann Markose, Dr. Johnykutty Award to Dr. Gigu Zakariah Philip, Dr. Rajesh V Award to Dr. Giboy Kurian, Dr. Reji Abraham Award to Dr. Jacob John Plackkal.

ATTENDING STATE/ NATIONAL PROGRAMS: President & members of the branch had attended the 2nd State Executive Committee held at Hotel Nila Palace, Ezhukone on 22/02/2015.

Quilon Branch

Installation reports: 23rd Installation of IDA QUILON BRANCH was held on 10th January 2015 at rotary centre Kollam. Meeting was started at 8pm.Chief guest for the day was Dr.Alias Thomas ida national president elect.

The new office bearers are DR.John Shibu.N President DR.Nizamudeen.M Secretary. Dr. Manoj Augustine Treasurer. Dr. Sundaresan B.S President elect.

A curtain raiser for current year activities was inaugurated 'A year long cancer detection and awareness programme among costal areas of Kollam'

The meeting was followed by dinner fellowship various cultural programs by Asianet fames artistist.

AQUIRE 2015

President and secretary seminar on 20th February was attended by Dr. John. Shibu and Dr. Nizamudeen at Kannur

First executive committe meeting

First executive committee meeting of ida quilon was held on 28-1-15 at hotel Ritz kollam. Various Projects and CDE programs were discussed. Treasurer presented proposed budget for the year 2015.

Trivandrum Branch

AGM with installation of the new office bearers was conducted on February 6th 2015 at Sree Molam Club. Dr Achuthan Nair was inducted as the new president of IDA Trivandrum branch. President inducted the rest of the office bearers. The chief guest of the day was ADGP Sheikh Darvesh Sahib Sait. The installation and general body was attended by good number of members and their family. The function was further carried out by entertainment programs in which our members and their family members mesmerized the evening with some beautiful songs.