



TAPER

**JOURNAL OF INDIAN DENTAL ASSOCIATION
THIRUVALLA**

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Dr. Subbalekshmi
(Editor, Taper)

Does education really continue with continuing dental education programs?

Continuing dental education (CDE) programs are the backbone of professional growth for dentists. They promise to keep practitioners up-to-date with the latest advancements, enhance their skills, and ultimately improve patient care. However, it's essential to critically assess whether CDE programs truly deliver on these promises or if there's a gap between theory and practice.

The underlying premise is that by attending these programs, dentists will enhance their knowledge and skills, leading to better outcomes for their patients. While CDE programs provide valuable theoretical knowledge, the practical implementation of this knowledge in a dental practice can be challenging.

The effectiveness of CDE programs often hinges on bridging the gap between learning and application. It's not enough to acquire new knowledge (which is typically the learning outcome from a 3 hour lecture); it must be successfully integrated into daily practice to yield tangible benefits for patients. This can be a complex process, as it requires not only technical proficiency but also adaptation to the specific needs and circumstances of each patient.

Several barriers contribute to the gap between CDE and practical application. Time constraints, financial considerations, and the need for a supportive practice environment all play significant roles. Additionally, dentists may struggle to find appropriate continuing education courses which cater to their specific needs as CDE programs often are based on 'what is the in thing Now' or on the available sponsors.

To address this gap, there needs to be a upheaval of the CDE programs of today. Programs need to be more streamlined with specific learning objectives, be accessible to all and include mentorship and peer support which can be invaluable.

To conclude, CDE programs undeniably offer a wealth of knowledge and potential for professional growth. However, the true value of these programs depends on the dentist's ability to bridge the gap between theory and practice. It is incumbent upon both dental professionals and the institutions offering CDE to work collaboratively to develop strategies that facilitate the effective implementation of new knowledge and skills. Only by narrowing this gap can we ensure that the benefits of CDE programs translate into improved patient care and the continued advancement of the dental profession.

Dear Friends & Colleagues,

I am happy to present the second edition of this volume of TAPER, the Journal of the Indian Dental Association, Thiruvalla Branch. This has been possible due to the relentless perseverance of our dear president Dr Lanu Abraham and his team. Gratitude to all the authors for their contributions and timely responses. Thank you dear friends once again for the opportunity, it has been a pleasure .

I remain.

Dr Subbalekshmi (Editor, Taper)



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■ PRESIDENTIAL ADDRESS

Welcome to the second issue of TAPER the IDA Thiruvalla Journal. The authors of this issue share insights on academic knowledge and innovative ideas which can be adopted to clinical use. The exchange of knowledge and sharing of the enhanced skills are always an inevitable part of dental science and research. I would like to congratulate all the authors for the efforts they have taken for each article. Sincere thanks to our editor Dr. Subbalekshmi. Role of executive members in strengthening the association is much appreciable. A big thanks to all executive members and our dear IDA Thiruvalla Branch members for your continuing support. Hope this journal will help you in rendering better service and attain professional advancement.



INDIAN DENTAL ASSOCIATION

THIRUVALLA BRANCH

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HELP OFFERED TO PROFESSIONALS
IN EMERGENCIES

Indian Dental Association Kerala State Branch

PROFESSIONAL PROTECTION SCHEME

- Legal support in medico-legal issues
- Monetary assistance for court cases
- Compensation of upto Rs.4,00,000 if awarded.

SOCIAL SECURITY SCHEME

- Death Benefits of >15lakhs for the dependents (depending on no. of members)
- Accident and permanent disability benefits

HOPE MEDI

Complete Medical Insurance for the family including parents.

HOPE ASSURE

Professional indemnity up to 2 crores Clinic and residence insurance

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OFFICE ADDRESS

Dr. Premjith S.

Hon. Secretary IDA HOPE
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HOW TO BECOME A MEMBER ?

Apply to the Hon. Secretary, IDA HOPE through the branch representative with

1. Completely filled application in the prescribed form attested by the branch secretary /representative
 2. Admission fee (depending on age) taken as DD/ NEFT in favour of IDA HOPE Payable at Attingal or Account transfer (proof of transfer compulsory)
 3. Two recent passport size photographs
 4. Copy of Degree certificate
 5. Updated Dental Council Registration copy
 6. Age and Address proof
- Enrollment subject to confirmation of credit of the amount to HOPE account.
 - Joining fee and Renewal fee will not be collected from newly joining members in the same calendar year.

New memberships stops at the age of 50
(as on 1st April of current year)

Who can become a member of IDA HOPE ?

Members of IDA Kerala State up to the age of 50 who have a valid dental council registration are eligible to join IDA HOPE.

DEFAULTERS & DROPPED OUT MEMBERS

Members who do not renew by 31st of May will not be eligible for Social Security Coverage. They can renew up to 30th of September by paying a penalty of Rs.500. After 30th of September they will be considered as dropped out from the scheme. If they wish to rejoin, they can enter as a new member if below the age of 50.

ADMISSION – RENEWAL FEES

Admission fee

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

Annual Renewal fee

- Annual renewal amount - Rs. 1200
- Additional Rs. 500 / per death claim in a year
- Platinum Benefit scheme contribution – Rs. 800 (for members >30 years)

Eligibility to join HOPE

- Valid membership in any local branch in IDA Kerala State certified by Branch Secretary.
- Bachelor Degree in Dentistry from any recognised institution in the Indian union.
- Valid registration in any state Dental Council in India.
- Certificate to verify proof of age
- Documental proof of address.


Contact your local branch Hope Representative to

JOIN NOW

Account Details: IDA HOPE
A/c No: 0316053000008249
Bank : South Indian Bank
Branch : Attingal
IFSC : SIBL0000114

HOPE MEDI

Tailor Made Group Medical Insurance Policy for IDA Hope Members.

 For HOPE members	 No Medical Checkup Needed
 Lowest Premium in the Market	 Pre-existing illness Covered
 Add Spouse, Kids & Parents	 Cashless Facility Available

100% claim benefit for IDA KSB Members



HOPE MEDI Claims

Claim Management Guidelines- Reimbursement

For reimbursement of claims, claim form, discharge summary, discharge bill (summary and detailed) from the hospital, medical certificate, investigation reports etc., should be submitted to TPA through M/s Jubilee Insurance Brokers **within 15 days of discharge from hospital.**

In emergency contact:
Hon. Secretary IDA HOPE
@ 9847240328

UNIQUE TO HOPE MEDI

- Parents of primary members are also covered
- No age limits for parents
- No check up tests prior to joining
- Pre existing illness of parents also covered* (after 1 year for new joining)
- Additional expenses bound to occur for treatment in higher centers also covered*

HOPE MEDI-HIGHLIGHTS

- All HOPE members are automatically eligible
- Tailor-made policy for US, 4th term running with minimum glitches and complaints
- No age limit for joining
- No medical checkups prior to joining
- All pre existing illness covered for members and after one year for family
- No additional premium for pre existing illnesses
- Newborn baby cover from day 1 without any additional premium*
- Cashless treatment facility available* Standard treatment charge reimbursed*
- Premium subject to revision each year in accordance to cash out flow
- Policy premium in shared and hence the lowest figure quoted
- Minimum exclusion applicable for payment denial
- Premium paid is eligible for income tax exemption under section 80D.

RENEWAL-30th SEPTEMBER

Getting Hospitalised??

Contact:
Jubilee Insurance
Broking Services
Rahul R : 7736810082
Jomcy George : 9544157066

IDA HOPE - FORMATION

HOPE is the unique scheme, driven as a FREE professional indemnity for its members

Started as PPS in 2002
Formed as HOPE in the year 2007 merging the two schemes

SSS Social Security Scheme **PPS** Professional Protection Scheme

MEMBERSHIP STRENGTH



3750+ MEMBERS

PRESENTLY IDA HOPE PROVIDES

Social Security (Death / Total Permanent Disability)
> 15 Lakhs for the dependents

Professional protection compensations up to Rs. 4 Lakhs (with co-pay of 25% for 2 lakhs)

HOPE ASSURE

- **Extended Professional Indemnity cover of Rs. 25 Lakhs to 2 crores.**
- **Clinic & Residence Insurance against natural calamities-Fire, Floods, Burglary, Theft, Vandalish etc.**
- **Add on policy for Neon Signage & Plate Glass.**
- **New Public liability cover**

RENEWAL - JULY 10

HOPE LEGAL CELL (PROFESSIONAL PROTECTION)

LEGAL AID to the members for cases that may arise during the course of their professional practice.

The coverage for the new members starts **one month** after the acceptance of the complete documents including membership fee by the Hon. Secretary.

Takes up Dento - Legal cases of HOPE members from the first stage itself - Lawyer's Notice.

Engages and gets advice and support of Advocate Pays Advocate's / Legal fee and other expenses.

Fights out the case in Forum / Court Pays the compensation amount, if awarded

For Legal Assistance Contact **Dr. Satheesh K Joseph**, Vice Chairman-Legal Cell **Mob 9447141008**

SOCIAL SECURITY

- Supporting the family in the event of **Death / Total Permanent Disability** of a member.
- The contribution to the family (**Fraternity Contribution**) is collected from the members of the scheme @ **Rs. 500** per claim in a year.
- The coverage for the new members Starts **one year** after the acceptance of the complete documents including membership fee by the Hon. Secretary.

Dr. Anwar M Ali Vice Chairman- Social Security **Mob: 9446354333**

A COMPARATIVE ANALYSIS OF BASAL IMPLANTS WITH ROOT FORM IMPLANTS: A REVIEW OF LITERATURE

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Dr. Lanu Abraham (BDS, IDA President, Thiruvalla Branch, Kerala)

Dr. Vipul Garg (Professor)

Dr. Ankit Aggarwal (Reader)

Dr. Marvi Bhopal (PG Student)

Dr. Shruti Thakur (PG Student)

INTRODUCTION

Dental implants provide a unique treatment modality for the replacement of a lost dentition. This is accomplished by the insertion of a relatively inert material (a Biomaterial) into the soft and hard tissues of the jaws, providing support and retention for dental prosthesis.

The basal bone is very strong and hence constitutes the stress bearing part of our skeleton. Dental Implants when placed in this bone can be loaded with a prosthesis immediately (within 72 hours) and can therefore avoid the need for a 2nd surgery to fix the abutment.

The conventional crestal implants are inserted into the jaw bone from the crestal alveoli axially. They may be placed perpendicular or tilted in the form of cover screws, cylinders and blade implants. Crestal implants are used for single or multiple unit restoration in adequate bone tissue.

The terminology used in implant is distinct, in many ways, from the terms and nomenclature used in other disciplines of clinical dentistry. The dental system is an integral part of the oral cavity, which helps in masticatory function and nutrient intake.

The most common cause for tooth loss in patients is due to periodontitis followed by dental caries, trauma, genetic defects and disorders. The goal of modern dentistry is to restore normal contour, function, comfort, esthetics, speech, regardless

of atrophy/disease/injury of the stomatognathic system. The need for the restoration of function and esthetics due to tooth loss is mainly seen in elderly patients.

The advantage of single tooth implant over other treatment modalities can be summarized as preservation of alveolar bone width and height and avoiding preparation of adjacent natural teeth .

Two very successful implant designs and protocols have been demonstrated in the past few decades for replacement in atrophic jaws which are **Mini Dental Implants** and **Basal Implants**.

Basal implantology also known as bicortical implantology¹ or just cortical implantology is a modern implantology system which utilizes the basal cortical portion of the jaw bones for retention of the dental implants which are uniquely designed to be accommodated in the basal cortical bone areas.

The basal bone provides excellent quality cortical bone for retention of these unique and highly advanced implants.

Basal Implants have demonstrated excellent results in controlled diabetics, in smokers, in chronic destructive periodontitis and in patients who have little or no bone for conventional implants.

The other being the endosteal dental implants that are made of a biocompatible material placed

into a bony ridge primarily as a prosthodontic base or foundation.

“Endo” translates to “in” while osteal is the scientific word for “bone”.

The category of such implants are root form implants, and endosseous is another adjective describing bone (although both the terms can be used).

Lots of endosteal implants have been commonly used including tapered forms, as pin shapes or as plates in what amounted to a crude dental implant procedure.

HISTORY

The safety and efficiency of titanium implant-“fixtures” go as far back as 1952 when a Swedish physician (Dr. Per-Ingvar Brånemark) serendipitously discovered the bone bonding properties of this metal.

His ongoing clinical research and experimentation led finally to extraordinary applications in dental medicine and the first dental patient was treated with titanium dental implants in 1965.

Basal implants were developed and improved in-various stages, by the German and French dentists primarily. Single-piece implant was first developed and used by Dr. Jean-Marc Jullietin 1972.

In 1997, lateral basal implants were introduced by Dr. Ihde in the way the “Disk implants” were developed. These implants were round in design and the surface was initially roughened.

In 2002 the base plate design was invented that was fracture proof and was later patented in United States and Europe, Bending zones were introduced in the vertical implant shaft.

2005 onwards, the experiences with lateral basal implants were transformed to screw (BCS, GBC) designs. “In 1999 vertical shaft surfaces were polished, from” 2003 the whole basal implant were produced with polished surface, as polished surfaces show no tendency to inflammation, and in case of sterile loosening, reintegration of the implant was possible if the load was adjusted in time. Roughened osseous surfaces were found to lack this ability. The design was developed to leave enough elasticity for the development and

functional stimulation of bone.

PARTS OF BASAL IMPLANTS

The basal implants are single piece implants in which the implant and the abutment are fused into one single piece. This minimizes the failure of implants due to interface problems, the connections which exists in conventional two and three piece implants.

Surface of the Implants:

Polished surface:

Stops bacteria and plaque from adhering to the implant neck or body.

Body of the Implants:

The thin implant body is combined with wide thread turns that enhances the vascularity around the implant and increases the bone implant contact.

Neck of the Implant:

The abutment can be bent by 15-25 degrees depending upon the length of the implant, provided the implant is placed in dense corticated bone.

Parts of Endosseous impants:

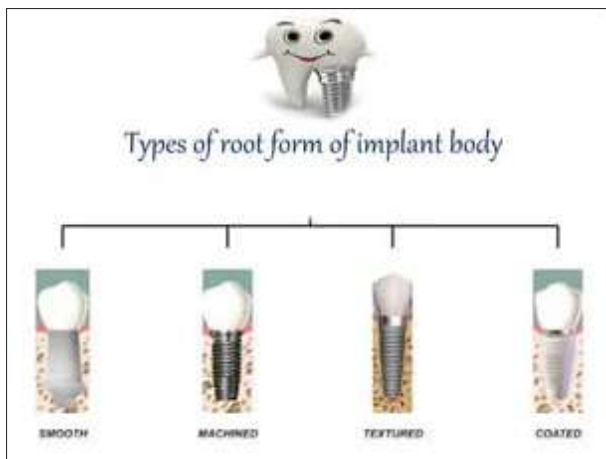
Root form dental implants have the appearance of a tooth root and are embedded in the jaw bone. They comprise three parts: a titanium dental implant, an abutment attached to the top of the implant that sits above the gum line, and a tooth replacement (crown, denture or bridge) placed over the abutment. These implants are commonly between 8.5 and 15 millimetres in length and between 3.2 to 6 millimetres in width.

1. Location of classic and basal implants:

The Classic Implants are positioned in the crestal alveolar bone which consists of bone of less quality and it is more prone to resorption. This type of bone is lost after teeth are removed and decreases through life.

The Basal Implants are inserted into the basal bone that is less prone to bone resorption and infections.

The bone is highly dense, mineralized and offers



an excellent support to implants and a long lasting solution for tooth loss. The basal bone is always present throughout life.

Difference between conventional and basal dental implants:

Conventional dental implants have been used successfully for several decades to replace missing teeth. However, with the advent of basal implants, a new option has emerged for patients with poor bone quality, systemic diseases or those who are not suitable for conventional implants. Here, we will discuss the differences between conventional implants and basal implants.

- **Implant design:** Conventional implants have a cylindrical or tapered shape and are placed in the bone using a two-stage surgical technique. Basal implants, on the other hand, have a unique design with a wider base and a tapered shape. They are placed in the basal bone using a one-stage surgical technique.
- **Bone anchorage:** Conventional implants rely on osseointegration for stability, which means they need a certain amount of bone mass and quality to achieve adequate anchorage. Basal implants, on the other hand, rely on cortical bone anchorage and can achieve stability in poor quality bone.
- **Surgical technique:** Conventional implant placement requires a two-stage surgical technique with a waiting period of 3-6 months before the prosthetic restoration can be placed. Basal implants, on the other hand, use a one-stage surgical technique

and can be loaded immediately after placement.

- **Prosthetic options:** Conventional implants can support a variety of prosthetic options such as single crowns, bridges or dentures. Basal implants, on the other hand, are designed primarily for full arch restorations with a minimum of four implants.
- **Success rate:** The success rate of conventional implants has been well-documented in the literature and ranges from 95-98%. The success rate of basal implants is also high, with reported success rates ranging from 92-98%.
- **Bone preservation:** Conventional implants require a certain amount of bone preparation and may lead to bone loss over time. Basal implants, on the other hand, preserve bone and may even stimulate new bone growth.

Different types 4 of basal implants:

- There are two types of basal implants,
- BOI (Basal Osseo Integrated)
- BCS (Basal Cortical Screw) specifically designed to utilize the strong cortical bone.
- Screwable basal implants (BCS brand) have been developed with a thread diameter of up to 12 mm for insertion into immediate extraction sockets.
- BOI (LATERAL BASAL IMPLANTS) These implants are placed in the jaw bone from the lateral aspect. The masticatory load transmission is confined to the cortical bone structures and horizontal implant segments.
- **Anterior Implants:** With the availability of vertical space, the implants used in the anterior region are usually the ones with two disks. The basal implant disks have a diameter of 9 or 10 mm and the crestal disk has a diameter of 7 mm.

The crestal and basal plate of multi-disc implants have different functions. The main purpose of the crestal plate is to provide supplementary support to the implant.



The emphasis of crestal plate is lost once the basal plate has ossified to full load. The double disks are not inserted due to the lack of sufficient bone as it leads to failure.

- A single BOI with a diameter of 7 to 9 mm and shafts between 8 to 13.5 mm can be used instead. Posterior Implants: Square shaped basal implants are used in the posterior region that have a disk diameter of 9 to 12 mm or 10 to 14 mm with shafts of 10 to 13.5 mm in length, depending on the available horizontal bone .
- BCS (SCREW BASAL IMPLANT) The screw basal implants are flapless implants that are inserted through the gingiva, without giving a single cut, inserted like a conventional implant.
- Bicortical screws (BCS) are also considered basal implants, as they transmit masticatory loads deep into the bone, usually onto the opposing cortical bone. The screw basal implants provide initially some elasticity and they are not prone to peri-implantitis due to the highly polished surface and thin mucosal penetration diameter .

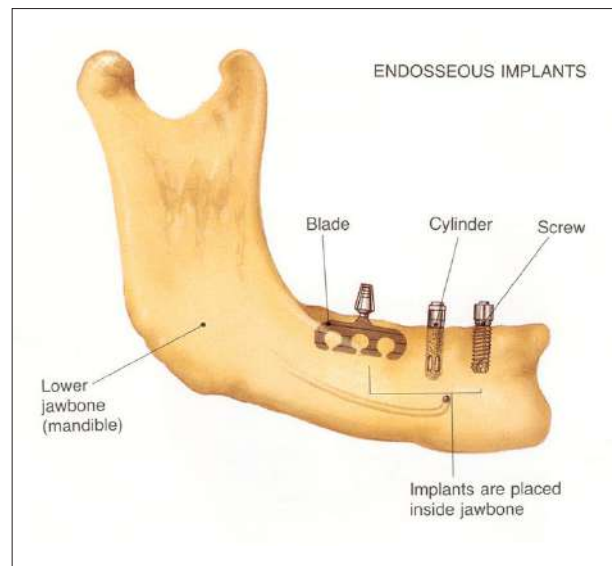
TYPES OF ENDOSSEOUS IMPLANTS

There are two basic types of endosseous implants namely:

- BLADE FORM
- ROOT FORM

In contrast to earlier designs, such as transosteal or periosteal, in which one implant is usually

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fabricated to treat the entire arch, endosseous implants are individual units.

The modern endosseous implants are designed with a macrostructure that optimizes initial stability and a microstructure, or surface texture, which promotes osseointegration.

Indications and contraindications of endosseous implants

INDICATIONS	CONTRAINDICATIONS
1. Severe morphologic compromise of denture supporting areas that significantly undermine denture retention.	1. Endosseous implants are not recommended for patients below the age of 16 because of the potential for further growth of the jaws; the implant is ankylosed in the bone, and therefore it will become sub-merged as the jaws grow.
Poor oral muscular coordination and low tolerance of mucosal tissues.	2. A poorly controlled diabetic is at risk of infection and soft-tissue breakdown around an implant, which may contraindicate implant surgery. The patient may have a history of psychosis, or there may be an ongoing history of drug or alcohol abuse.

Indications and contraindications of basal implants

INDICATIONS	CONTRAINDICATIONS
1. All kinds of situations when several teeth are missing or have to be extracted.	1. Medical conditions: There are a number of medical conditions that preclude the placement of dental implants. Some of these conditions include recent myocardial infarction (heart attack) or cerebrovascular accident (stroke), immunosuppression (a reduction in the efficacy of the immune system).
2. When the procedure of two-stage implant placement or bone augmentation has failed.	2. Medicines: Drugs of concern are those utilized in the treatment of cancer, drugs that inhibit blood clotting and bisphosphonates (a class of drugs used in the treatment of osteoporosis).
3. All kinds of bone atrophy i.e. in case of very thin ridges, insufficient buccolingual thickness, insufficient bone height.	

Conclusion

Both conventional and basal implants have their advantages and disadvantages. Conventional implants are a reliable option for most patients with adequate bone quality, while basal implants are a viable option for patients with poor bone quality or systemic diseases. While conventional implants offer a wide range of prosthetic options, basal implants are designed primarily for full arch restorations. Ultimately, the choice between conventional and basal implants depends on individual patient factors, and a thorough evaluation by a dental professional is necessary to determine the best option for each patient.

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- in a patient after inferior maxillectomy and rhinectomy with mono framework construction supported on a zygomatic implant placed in the glabella: a case report. *Maxillofacial Plastic and Reconstructive Surgery*. 2021;43(1):1-8.
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Non surgical endodontic treatment of periapical lesions with calcium hydroxide as intracanal medicament.

Case Report

Dr. Deepthi Santhosh

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Introduction:

A major goal in endodontic treatment is to eliminate or to achieve a significant reduction in microbial counts from the infected root canal systems [1]. The chemomechanical preparation of root canal system alone is inefficient in achieving disinfection of canals [2]. There are chances of bacterial survival and proliferations in between root canal appointments. The use of intracanal medicaments with antimicrobial activity is found to be effective against these organisms in between appointments. Intracanal medicaments used should be able to simultaneously eliminate bacteria, prevent their growth, stop their ingress and cut off their nutrient supply [3].

Calcium hydroxide is widely used in endodontics as an intracanal medicament. It was introduced in 1920 by Herman as a pulp capping material. It is a white odourless powder Ca(OH)_2 . It has a pH of 12.5-12.8. Antimicrobial activity of calcium hydroxide is related to its release of hydroxyl ions in an aqueous environment [4,5]. Hydroxyl ions are oxidant free radicals which causes damage to the bacterial cytoplasmic membrane, protein denaturation and damages the bacterial DNA. Calcium hydroxide stimulates "blast" cells aiding apexogenesis and its high pH neutralizes endotoxins produced by anaerobic bacteria. Hydroxyl ions act on the cytoplasmic membrane of bacteria and it enhances tissue enzymes activity such as alkaline phosphatase which plays a role of extending roots and apical closure [6].

The vehicles mixed with Ca(OH)_2 powder has an important role in the dissociation process because they determine the velocity of ionic dissociation causing the paste to be solubilized

and resorbed at various by the periapical tissues and from within the root canal. [6,7] The higher viscosity vehicles minimizes the dispersion of Ca(OH)_2 into the tissues and maintains the paste in the desired area for longer periods of time. It is effective in periapical healing by combination of its antimicrobial property and ability to promote hard tissue formation.

These 2 case reports here describes about the management of periapical lesions using placement of calcium hydroxide as an intracanal medicament in a traumatised anterior teeth and a lower molar teeth with chronic irreversible pulpitis.

Case 1:

A 19-year-old male patient reported with a chief complaint of pain on upper front maxillary anterior crowned tooth. He gave an history of fall 8 years back followed by treatment and placement of crown. On clinical examination, sinus opening was noticed in the mucogingival region of 11 on labial side. 21 showed a mild pain on clinical examination. Radiographic examination (Vatech) of 11 showed a non-dense radioopaque material extending from coronal to apical region of tooth along the centre, a radiolucency at the periapical region (Fig 1). 21 revealed a periapical circular shaped radiolucency (Fig 1.1). Non- surgical endodontic treatment was scheduled for 21 and Re-endodontic treatment of 11 was planned for this patient. Access opening was done irt 21, irt 11 guttapercha was removed using re treatment files (Dentsply Maillefer, Switzerland), cleaning and shaping was carried out in both tooth till Protaper F3(Dentsply Maillefer, Switzerland) to their assessed working length, saline and sodium hypochlorite solution was used for irrigation

with side vented needles (Neoendo ,Orikam). Final rinse was done with 17% EDTA solution (Desmear, Anabond Staedman, Pharma Research, India) canals were dried with sterile paper points F3 (Dentsply Maillefer, Switzerland) and water-soluble type of calcium hydroxide (RC Help, Prime Dental products, India) was injected into the canals to their respective working length, cotton pellet was placed and temporized by Cavit (3M ESPE, Germany). Intracanal medicament was changed every 2 weeks for over a period of 3 months. Radiographs were taken in between appointments (Fig 1.2). After 3 months evidence of periapical healing was seen (Fig 1.3). Trabecular bony pattern can be seen. Tooth was asymptomatic, obturation was carried out with gutta-percha (Dentsply Maillefer, Switzerland) and Sealapex root canal sealer (Kerr Co, Romulus, MI, USA). Composite (Filtek,3M ESPE, USA) was used as post endodontic material.

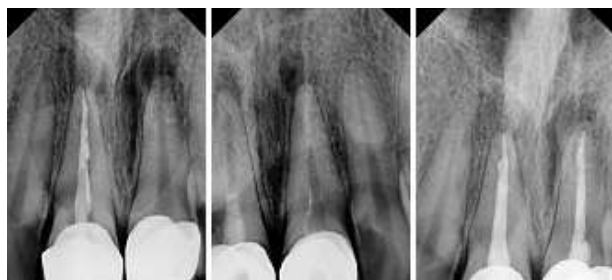


Fig 1.1

Fig 1.2

Fig 1.3

Case 2:

A 38-year-old male patient reported with a history of severe pain on lower right back restored tooth. On clinical examination broken class II DO restoration was seen, tooth was tender on percussion. Radiographic examination of 46 showed circular radiolucency at the apical region of both the roots (Fig 2.1). Non- surgical endodontic treatment was scheduled for this case. Access opening was done cleaning and shaping was carried out in Mesio-buccal, Mesio-lingual and Distal canal till F2(Dentsply Maillefer, Switzerland) to their assessed working length, saline and sodium hypochlorite solution was used for irrigation with side vented 30 G needles. Final rinse was done with 17% EDTA solution (Desmear, Anabond Staedman, Pharma Research, India), canals were dried with sterile paper points F2 (Dentsply Maillefer, Switzerland) and water-

soluble type of calcium hydroxide (RC Help, Prime Dental products, India) was injected into the canals to their respective working length, cotton pellet was placed and temporized by Cavit (3M ESPE, Germany). Intracanal medicament was changed every 2 weeks for over a period of 3 months. Radiographs were taken in between appointments (Fig 2.2). After 3 months reduction in the radiolucency was seen at both root ends indicating a better periapical healing (Fig 2.3). Tooth was asymptomatic, obturation was carried out with singlecone gutta-percha and Sealapex root canal sealer (Kerr,Sybron Endo). Composite (Filtek,3M ESPE, USA) was used as post endodontic material.

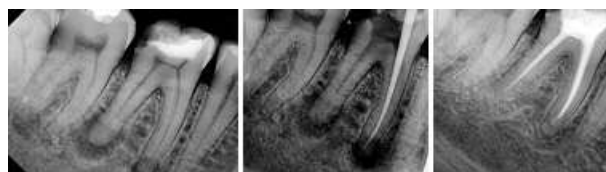


Fig 2.1

Fig 2.2

Fig 2.3

Discussion:

Periapical lesions are the commonly occurring pathologic lesions that affect the periradicular tissues of the tooth [8].

Necrosis of the pulp creates a suitable environment for microorganisms to release toxins into periapical tissue. This secretion leads to inflammatory reaction, which is associated with periapical lesion formation. In cases with periapical lesions conventional root canal treatment have showed improvement in lesions measuring upto 20mm [9]. A systemic literature review by Froum [10] showed that the ideal management of lesions should focus on infection control of the lesion and regeneration of lost support. Nonsurgical root canal treatment should always be the first choice in cases of nonvital teeth with infected root canals [11]. Elimination of bacteria from the root canal is the key of periapical lesions treatment. Calcium hydroxide is the preferred intracanal medicament due to its high alkalinity, tissue dissolving effect, induction of repair by hard tissue formation and bactericidal effect.

Intra canal medicament was applied once per 2 week for 3 months and obturation was completed after 3 months. In this manner high alkalinity and calcium ion availability were obtained and

maintained. In the periapical region significant bone formation was seen on periodic check up visits. Healing of periapical lesions was qualitatively examined by radiographs. Thus non-surgical treatment approach has shown favourable clinical and radiographic healing in periapical lesions. It needs definite follow up over a period of time.

Conclusion:

The case reports shows successful healing of periapical lesions with conventional root canal treatment with intracanal calcium hydroxide dressing in multiple visits.

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Navigating Ethical Challenges in Modern Dentistry

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Abstract:

Ethical considerations play a pivotal role in shaping the dental profession, guiding how oral healthcare providers administer care and interact with their patients. This journal article delves into the intricate realm of dental ethics, delving into key principles, ethical dilemmas, and evolving trends. By scrutinizing the ethical foundations of informed consent, patient autonomy, confidentiality, and societal responsibility, this article aims to provide a comprehensive perspective on ethics in dentistry. Furthermore, it explores emerging ethical challenges in the digital age and emphasizes the importance of ongoing ethical education for dental professionals.

Introduction:

Ethics in dentistry serves as a vital pillar, fostering trust and integrity within the dental profession. Dentists, as healthcare practitioners, navigate a complex web of ethical dilemmas as they strive to safeguard their patients' well-being and maintain the utmost professionalism. This article aims to shed light on the ethical principles shaping dental practice while exploring the modern challenges facing this field.

The ADA Code serves as a written commitment, outlining the obligations that arise from the unspoken agreement between the dental profession and society. Within this code, there are five core principles that form its bedrock¹

Patient Autonomy ("self-governance"): This principle underscores the duty of dental professionals to honor a patient's choices while adhering to accepted treatment guidelines and preserving the confidentiality of each patient.

Honouring patient autonomy entails acknowledging their entitlement to make decisions concerning their oral healthcare. Dentists should actively involve patients in treatment choices, taking into account their values and preferences, while simultaneously providing expert guidance.

Dentists are ethically bound to uphold the duty of confidentiality, diligently safeguarding patient information from unwarranted disclosure. This trust forms the cornerstone for open and truthful communication between patients and dental professionals.

Informed consent represents the bedrock of dental ethics. Dentists bear the responsibility of ensuring that patients comprehend the nature of their treatment, potential risks, benefits, and alternative options. The acquisition of valid informed consent not only respects the autonomy of the patient but also upholds their right to self-determination.

Nonmaleficence ("do no harm"): Within this principle, dental professionals have a solemn duty to shield patients from any potential harm throughout their dental care journey.

Beneficence ("do good"): This principle shines a light on the obligation of dental professionals to act in the best interests of patients and the wider community, with a primary dedication to serving patients and the public at large. Dentist has to work for their welfare. Dentists carry a moral obligation to contribute to the well-being of society. This extends beyond individual patient care to encompass community outreach, initiatives in public health, and advocacy for policies promoting oral health for the broader public.

Justice (“fairness”): Under this banner, the dental profession actively collaborates with society, seeking alliances to enhance access to care for everyone, with a focus on promoting fairness in the distribution of dental services without any prejudice.

Veracity (“truthfulness”): Within this principle, dental professionals are entrusted to maintain the trust inherent in the dentist-patient relationship, communicating honestly and transparently without any deception, and upholding intellectual integrity.

These principles collectively serve as the compass guiding dental professionals in fulfilling their commitments to both patients and society, ensuring that oral health care is not just an obligation but a noble endeavor rooted in trust and ethical responsibility.

Emerging Ethical Challenges:

In the recent decades, dentistry has undergone a significant transformation, and alongside it, the ethical landscape has shifted. Over the years, there has been a noticeable rise in ethical challenges within the daily practice of dentistry. Studies have indicated that similar to general physicians, dental professionals also grapple with ethical dilemmas on a frequent basis. Medical ethics profoundly influence virtually every decision made within the dental clinic.³

Inadequate Sterilization and Waste Management in Dental Clinics, Ethical Knowledge and Attitude Among Dental Practitioners, Competency Issues Among Dental Professionals, Rising Costs of Oral Health Services, Enhancing the Informed Consent Process, Establishing Treatment Consensus Among Dentists, Addressing Advertising Conflicts, Managing the Clustering of Dental Clinics in Urban Areas, Resolving Treatment Disagreements Between Dentists and Patients, Improving Medical Record Maintenance in Dental Practice are among major dilemmas.⁴

Technological Advancements: The field of dentistry has borne witness to profound technological advancements, such as teledentistry and electronic health records. These innovations introduce new ethical considerations pertaining to data security, privacy, and the responsible

application of technology in patient care.

Financial Pressures: Dental practitioners often confront ethical dilemmas when financial concerns conflict with the interests of their patients. Striking a harmonious balance between providing essential care and managing the economic aspects of a dental practice can prove to be a formidable task.

Advertising and Marketing: Ethical concerns come to the forefront when it comes to promoting dental services, with some professionals feeling pressured to engage in aggressive marketing strategies. Maintaining transparency and upholding integrity in advertising is of paramount importance in preserving professional ethics.³

Continuing Ethical Education:

Ethical predicaments in dentistry are far from static; they evolve in tandem with developments in healthcare and shifts in societal paradigms. Dental professionals must engage in ongoing ethical education and training to stay abreast of current ethical standards, guidelines, and best practices. Ethical education is the linchpin that equips dentists to navigate complex ethical scenarios and make decisions in the best interests of their patients.

Conclusion:

Ethical principles serve as the guiding light of dentistry, directing practitioners in the provision of top-notch, patient-centered care while preserving the trust of their patients and the public. As the dental field continues to evolve, it is paramount that ethical considerations remain at the forefront of practice, adapting to novel challenges and technologies to safeguard the well-being of patients and the integrity of the dental profession.

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Advancements in Dental Technology: Shaping the Future of Patient Care

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Abstract

The rapid advancement of technology is profoundly reshaping the landscape of dental care, ushering in an era marked by elevated patient experiences and outcomes. This abstract delves into the forefront of dental technology, encapsulating the revolutionary changes unfolding in patient care. From the integration of artificial intelligence and digital diagnostics to the application of 3D printing and teledentistry, this abstract underscores the pivotal innovations that are molding the future of dentistry. Emphasizing enhanced diagnostics, personalized treatment strategies, and minimally invasive approaches, these technological leaps are poised to redefine the paradigms of oral health management. This abstract aspires to offer insights into the pivotal role that dental technology is assuming in elevating patient care, paving the path for a more efficient, precise, and patient-centered dental practice.

Introduction:

In the ever-evolving landscape of dentistry, the progress of technology is fundamentally reshaping the paradigms of diagnosis, treatment, and patient care. This inclusive review delves into the cutting-edge trends and revolutionary strides in dental technology, offering insight into their profound impact on patient outcomes and the overarching framework of dental practice. Recent years have witnessed an astonishing metamorphosis in dental technology, delivering an array of benefits to both professionals and patients. From enhanced diagnostics to enriched treatment

experiences, innovations like digital imaging and artificial intelligence are revolutionizing the very essence of the field.

Advancements in Digital Imaging and Diagnostics:

Digital radiography and cone-beam computed tomography (CBCT) have brought about a seismic shift in diagnostic accuracy, unveiling three-dimensional perspectives of oral structures. This elevated precision is paramount, particularly for complex interventions like implant placements and orthognathic surgeries. Simultaneously, intraoral scanners are streamlining the creation of exact digital impressions, leading to diminished patient discomfort and the creation of restorations with impeccable fit..

Transforming CAD/CAM Systems:

The advent of computer-aided design and computer-aided manufacturing (CAD/CAM) systems has ushered in a revolutionary era of precision in crafting prosthetic restorations. Spanning from crowns and bridges to orthodontic appliances, CAD/CAM technology not only streamlines chair time but also elevates the aesthetics and functional excellence of the final outcomes.

Teledentistry and Remote Monitoring:

Teledentistry has transcended geographical boundaries, empowering practitioners to diagnose and consult with patients remotely. Moreover, remote monitoring systems enable the pro-

active tracking of patients' oral health journeys, fostering a preventive approach to care. A study evaluated that teledentistry appeared to be a promising tool in the remote management of surgical and non-surgical patients, especially reducing costs and waiting times.¹

Artificial Intelligence (AI) in Diagnostics:

AI algorithms are now adept at analyzing radiographs, identifying potential pathologies with remarkable accuracy. This not only facilitates early disease detection but also contributes to personalized treatment planning. AI has brought about a transformative impact on the lives of patients, healthcare practitioners, and hospital administrators by performing tasks that traditionally required human effort, but in a remarkably efficient and cost-effective manner. AI's remarkable capability lies in its ability to assist physicians in crucial decision-making processes, harnessing vast repositories of healthcare data, encompassing electronic health records, symptom data, and medical reports. This dynamic integration of data empowers healthcare professionals to optimize health outcomes and potentially avert life-threatening situations.

By analyzing and synthesizing this comprehensive data landscape, AI provides invaluable insights that guide physicians in formulating informed and effective treatment strategies. This technology sifts through immense amounts of information at an accelerated pace, enabling healthcare providers to arrive at decisions with greater precision and efficiency. This not only elevates the quality of care but also contributes to the potential preservation of patients' lives, underscoring AI's pivotal role in modern healthcare².

As a result, AI's contribution to decision-making processes in the medical realm has transformed the way healthcare is practiced. By facilitating rapid data analysis and offering nuanced recommendations, AI is paving the way for enhanced patient outcomes and a safer healthcare landscape².

Minimally Invasive Treatments:

Laser technology has ushered in a new era of minimally invasive procedures, minimizing discom-

fort, pain, and recovery time. Lasers are wielded for soft tissue surgeries, cavity preparation, and teeth whitening, translating to a heightened patient experience. The paradigm of minimally invasive dentistry has transformed the landscape of dental caries treatment, centering on meticulous detection, diagnosis, interception, and therapeutic interventions at a microscopic level.³ The benefit that patients attain through Minimally Invasive (MI) approaches is evident in the enhancement of oral health achieved through disease healing, not merely symptom alleviation. Additionally, MI techniques hold the potential to alleviate the common dental anxieties experienced by patients, often triggered by traditional, highly invasive dental procedures⁴.

3D Printing and Tissue Engineering:

The integration of 3D printing technology empowers the creation of bespoke dental devices and anatomical models for meticulous surgical planning. Advances in tissue engineering hold promise for the realm of regenerative dentistry. The utilization of 3D printing offers a compelling opportunity for developing scaffolds to support soft tissue augmentation. This cutting-edge technology holds the potential to effectively address the intricate attributes of soft tissues, encompassing factors such as shape, inner architecture, thickness, volume, mechanics, and functional nuances that are unique to various oral cavity locations. Significantly, the incorporation of 3D printing introduces the innovative concept of a "digital workflow," enabling the creation of grafts tailored precisely to the requirements of each individual patient. In the field of dentistry, particularly within the domain of soft tissue regeneration, the incorporation of the "digital workflow" introduces a compelling opportunity. This strategy is geared towards crafting a seamlessly fitting graft that is tailor-made for each patient, meticulously tailored to match the exact nature of the defect. Through the strategic adjustment of the inner architecture and external contours to enhance the mimicry of natural tissue, this approach carries the potential to deliver outcomes that are not only functionally effective but also visually pleasing, thereby achieving comprehensive tissue restoration.⁵

Conclusion:

The potential of dental technology to transform the field is unequivocal. These innovations, spanning from precise diagnostics and streamlined treatment planning to individualized care and enriched patient experiences, are propelling dentistry into a realm of unparalleled excellence. As practitioners eagerly embrace these advancements, patient outcomes will only flourish, establishing new benchmarks for oral health care on a global scale.

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ANTERIOR GUIDANCE AND ITS RELATIONSHIP TO SMILE DESIGN

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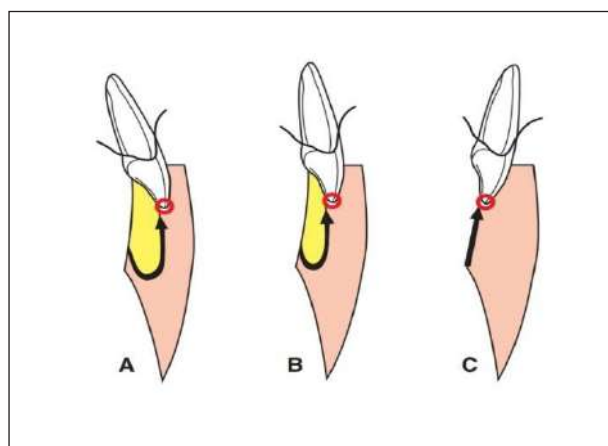
The anterior guidance is the most important determination that must be made when one is restoring an occlusion. The success or failure of many occlusal treatments hinges on the correctness of the anterior guidance. Establishing correct anterior guidance can make a quantum improvement in patient satisfaction.

Besides being the most visible part of the smile, the relationship of the anterior teeth in function is the principal determinant of posterior occlusal form. It is also critically important to the coordinated muscle function of the entire masticatory system. Normal function includes the lips and tongue in a variety of functional relationships, and the anterior teeth must fit into all of those relationships with far greater preciseness.

There is no way to standardize anterior guidance. There are no cephalometric norms that work for all patients, and there are no arbitrary guidelines for interincisal angulation that fit all patients. One of the most important concepts to understand about anterior guidance is that it is highly variable from patient to patient.

The Centric Relation Contact

The most critical tooth contour in the entire occlusal scheme is also the most universally mismanaged. The contour that establish stable, holding contacts for the anterior teeth are so important because any instability of the anterior guidance has the probability of allowing posterior occlusal interferences to be introduced. Correct contouring of anterior holding contacts requires attention on both upper and lower anterior teeth.



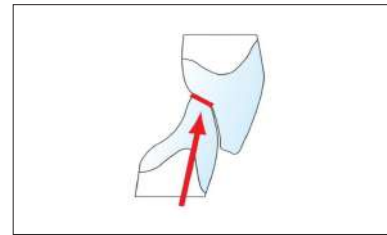
Three different anterior guidance patterns represent variations in the inclination of the upper anterior teeth. The difference in incisal edge position also reflect major differences in the envelopes of function. If the incisal edges on A or B were moved more lingually, there would be a conflict with jaw function and the result would be excessive wear or tooth mobility. If the incisal edges on C were moved toward the labial, there would be no interference to the envelop of function, but there would be interference with the neutral zone, phonetics, and lip closure path. The process of customizing the anterior guidance is designed to precisely locate the correct incisal edge position.

Lower Incisal Edges

The leading edge of each lower anterior tooth should be formed by a definite labio-incisal line angle. Rounding off this contour is a common mistake that reduces the stability of anterior contact. A definite line angle contour is also the most natural looking. If the casts are analysed in centric relation, it may appear advantageous to move the incisal edges slightly forward or back to achieve a solid stop. That decision may be resolved orthodontically, restoratively, or surgically.

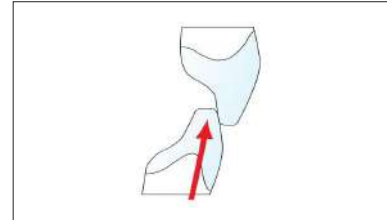


The contour of the centric relation contacts on the upper anterior teeth must be shaped to form a definite stop for the cingulum whenever that can be achieved. Any contacting contour that does not prevent further eruption of the lower teeth will be unstable. A high percentage of anterior wear and instability problems are the result of improper centric relation stops.

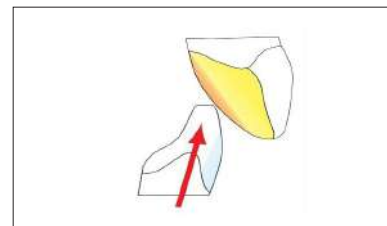


Unstable Contact

This is a common mistake in many orthodontically treated occlusions. Failure to provide a definite stop allows the lower teeth to continue erupting. As the lower incisors erupt into a converging space, crowding is the ultimate result. Attempt to stabilize the lower incisors with a permanent lingual retainer will not be necessary if adequate holding contacts are provided.



An all too common problem results from improperly contoured upper anterior restorations. The lack of a stable holding contact combined with contours that interfere with the envelope of function invariably leads to severe wear on the lower labio-incisal contact area.



Steps in Harmonizing the Anterior Guidance

Preliminary Steps

1. When indicated, the lower anterior teeth should be reshaped or restored first.
2. If restorations are not needed on the posterior teeth, they must be equilibrated before the anterior guidance can be worked out. All interferences to centric relation must be eliminated on both anterior and posterior teeth to establish stable contacts at the most closed position. Eccentric interferences should then be eliminated on posterior teeth. The goal is to move all excursive contact on to the anterior teeth if they are in a position to function in that capacity. Thus any posterior incline that causes separation of the anterior teeth should be reduced until anterior contact can be maintained through the complete excursion.

(If posterior interference prevent a full range of anterior guidance function, it will not be possible to determine or work out a correct anterior guidance)

The Five Steps to Harmony

Step 1: Establish coordinated centric relation stops on all anterior teeth.



Centric relation stops marked in red.

Step 2: Extend centric stops forward at the same vertical dimension to Include light closure from postural rest position.

Step 3: Determine the incisal edge position.



The incisal edges must be precisely determined before the anterior guidance can be worked out.

Step 4: Establish group function in straight protrusion.



The protrusive path starts at centric relation and ends at the incisal edges.

Step 5: Establish ideal anterior stress distribution in lateral excursions.



Lateral excursion with group function anterior guidance.

One thing every dentist should know before attempting to restore anterior teeth is that besides being the key to esthetics, the anterior teeth are also the key factor in protecting the posterior teeth. So important is this job of anterior relationship that posterior teeth that are not protected from lateral or protrusive stresses by the discluding effect of the anterior teeth will, in time, almost certainly be stressed or worn detrimentally. Always keep in mind anterior guidance as one of your goals.

Reference: *Functional Occlusion from TMJ to Smile Design*. Peter E. Dawson DDS. 2007 Edition

DOCUMENTATION AND ITS IMPORTANCE IN DENTISTRY

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ABSTRACT

A well-designed, adequately documented, and properly maintained patient record is an important tool for quality assurance and care continuity. Good clinical documentation skills are supposed to be a fundamental part of dental student training. Dental records consist of documents related to the history of present illness, clinical examination, diagnosis, treatment done, and the prognosis. A thorough knowledge of dental records is essential for the practicing dentist, as it not only has a forensic application, but also a legal implication with respect to insurance and consumerism. This article reviews the importance of documentation and records in dentistry.

Key words: Dental records, Forensics, Medicolegal, Dentist, Documentation

INTRODUCTION

All individuals are unique. Structures in human skull such as frontal sinus, nasal septum, vascular groove patterns, sella tursica, etc can act as useful indicators because of their uniqueness in each and every individual. Hence there exists a need to maintain proper patient record.^{1,2,3} Dental evidence played a vital role in the historical case

of identification of Adolf Hitler. Dental remains found on Hitler's corpse were matched with his dental records in 1945. Dental profiling is used not only to establish the identity of an unknown person but also to confirm the identity of a known person.⁴

DOCUMENTATION AND DENTAL RECORDS

Documentation is defined as the material that provides official information or evidence that serves as a record. It is a process of classifying and annotating texts, photographs etc. Dental records include patients folders, cards, charts etc.⁵ It contains all information about patient history, all investigation done to the patients and all treatments that had been done to the patients. Dental records include all important communication between patient and doctor.⁶ All intraoral and extraoral findings, diagrammatic charts, all necessary clinical details including the status of non-lesional areas, all investigations including photographs, casts, models, lab findings, radiography, biopsy and blood, short summary of observations, findings and comments pointing towards differential and definitive diagnosis.⁷

IMPORTANCE⁸

Documentation is a sign of quality. It provides best possible care for the patient. It contains all communication between the treating dentist and patients' future dentist. It is a defence of allegations of malpractice. Serve as the basis of accreditation, case review and referral for teaching and research purpose.

LAWNEY'S PROCEDURE

Lawney describes a simple ten-step procedure to ensure that records are adequate. A modified and expanded version, appropriate to the National Health Service and UK dentistry, which has been followed in UK is as follows: 9

1. Use a consistent style for entries
2. Date and explain any corrections
3. Use single-line crossout
4. Do not use correction fluids
5. Use ink
6. Write legibly
7. Express concerns about patient needs
8. Never write derogatory remarks in the record
9. Document fully
10. Only use accepted abbreviations for treatments
11. Collate documents
12. Maintain a chronological order

IDEAL REQUISITES OF A DENTAL RECORD

Patient records

Dental records should be recorded in ink legibly or electronic format and not in pencil. Date of every patient visit entered in a chronological order. General patient information like age, gender, place of employment, contact information i.e., telephone numbers, address and any referring party should be entered. Complete recording of patient's case history form such as chief complaint, past dental, medical, family, drug histories, allergies and immunization status in case of children, clinical and radiographic findings, diagnosis, treatment and prognosis.

Copies of test results, instructions for home care, patient follow-up and recall examinations, fees charged and referrals should be included.⁷ Dentist is ultimately responsible for patient's chart. Adequately label and date all diagnostic aids including radiographs, study models, photographs etc. Established terminology, symbols and abbreviations should be used. All entries should be signed or initialled by the treating clinician. Informed consent forms with patient signature for invasive procedures, sedation etc should be taken. Signature of the patient on refusal of treatment advised by clinician. Records should be objective in nature.⁷

Business records

It should include details of billing with date and amount, copies of claims forms submitted by the patient, information related to name, address, nature of the laboratory services used and laboratory charges, scheduling of appointments etc. This information should not be kept along with the patient clinical record.⁷ Classify all patient files into either active or inactive. Active records are documents which are still actively being used by an office. They are usually referenced frequently and conveniently located within the office. Inactive records are documents that are no longer referenced on a regular basis and tend to be stored in a less accessible location. Any mistakes in the records should be corrected with a single line drawn through the incorrect material in an honest, open manner. All communications with the patient including emergency telephonic consultations should be recorded. If a patient is dissatisfied, all communications should be recorded including the problem, the attempt to deal with the problem and solution to the problem. If a patient wishes to discontinue treatment, a note of it should be made in the patient's record along with the reason.⁹

Errors

Failure to document informed consent or refusal. Not recoding the treatment plan and not documenting the health history clearly or failure to update it regularly.¹⁰

Drug records

A drug record of the patient should include:11 name, strength, quantity and form of drug Condition being treated and or dental treatment provided Directions for use of drug Date and method of administration or dispensing of drug.

COMPUTERISED DATA

The data should be entered in such a way that old information be over written and new information can be added. The data should be encrypted and protected by a password. There should be copy of the data available in the practitioner's room in a read only format. The backup system to retrieve the data should be tested from time to time. The right of the patient's privacy, security and confidentiality should be protected all the time.8

RETENTION AND STORAGE OF THE DENTAL ECORD

The files are arranged in a way for easy retrieval- usually in a lateral, open shelf filing system. Many dental offices use a color-coded filing system for patient record files. Color-coded labels usually include the first two letters of the patient's last name and active date of treatment. Every dental surgeon shall maintain the relevant records pertaining to his patients. These records must be preserved for a minimum period of three years from the date of commencement of the treatment in a format determined by the Council or accepted as a standard mode of documentation.12 The NHS Terms of Service, state that dental records should be kept for a period of two years. The Regulations state that treatment records, radiographs, photographs, and study models should be retained after the completion of any course of treatment and care, under a continuing care or capitation arrangement for this period. There are strict time limits applied to such actions, 1. Within three years of the date when the cause of action occurred. 2. Within three years of the patient's date of knowledge that the treatment may have been negligent. 3. If a claim is based upon a Breach of Contract, the action must be raised within five years in Scotland and six years in England and Wales.8 It is therefore possible that a claim for negligence could happen many

years after the event, and that retention of records for the minimum of two years is inadequate. The defense organizations suggest that records be kept permanently. This is often impossible due to space constraints and so the advice given by defense organization is as follows,

1. Treatment Records, X-rays, Study Models, and Correspondence is to be retained for 11 years after the completion of treatment.
2. For children, retention of records until the patient is 25 years old.
3. Orthodontic Models — retain the original pre- and post-operative models permanently, discard any intermediates after a period of five years.8 The storage area of these records should be secure and access strictly controlled. By following these guidelines, the dental records of a patient will be available whenever they are needed. Following these guidelines will be very supportive for forensics at our place.

CONFIDENTIALITY

Dentists are in a privileged position to learn a lot about their patients and this knowledge is acquired under the assumption that it is confidential. Confidentiality encourages open and honest communication, enhancing the dentist-patient relationship, and encourages respect for patient autonomy and privacy.13 There are certain circumstances when information can be disclosed and they include,

1. Sharing of relevant information with other healthcare professionals involved in a patient's treatment.
2. Information may be passed to a third part if the patient or legal adviser gives written consent, for example, an insurance company
3. Where information is requested about a deceased patient and consent of the estate or relative is sought and there is an investigation of sudden, suspicious or unexplained death.
4. Information is required in the preparation of legal reports containing only relevant dental treatments.
5. Access to dental records by the police. Search and seizure warrants may not include dental

records, and therefore should be carefully checked.

6. Clinical research protocols and peer review procedures. The name of the patient must be kept confidential. If information is to be used for teaching purposes, then the patient's consent must be obtained.

CONCLUSION

The maintenance of accurate dental records is beneficial for both the dentists himself for future referral as well as the legal authorities in identification of a deceased individual in a less time-consuming manner. It has been revealed that students were more aware regarding the maintenance of their dental records for medico-legal purposes and they are more likely to maintain an accurate dental record and are more reliable to refer to in cases of identification through dental records. This is attributed to the process of learning the ideal record and the strict obligations by the administration of the faculty in encountering and maintaining their records accurate. Dental identification is one of the most important methods. Reliability and validation of dental records obtained facilitates a positive identification.

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The Two-way Relationship Between Diabetes Mellitus and Periodontal disease-A Review

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Abstract

Diabetes mellitus (DM) is a chronic metabolic disease which has affected about 422 million people worldwide. It is a chronic metabolic condition that causes increased blood glucose levels that over time causes significant harm to the heart, blood vessels, eyes, kidneys, and nerves. Periodontitis, on the other hand, is a chronic inflammatory disease of the tissue surrounding the tooth structure. There are strong scientific evidences suggesting the existence of a two way relationship between diabetes mellitus and periodontal disease. Periodontitis has been identified as the sixth complication of diabetes, which suggests that dentists have to play a significant role in the management of patients with diabetes. The purpose of this article is to gather information from numerous research studies regarding the bidirectional relationship between periodontal disease and diabetes mellitus and to explain the significance of the dental team in the treatment of patients with both conditions.

Introduction

Diabetes is a chronic condition brought on by either insufficient insulin production by the pancreas or inefficient insulin use by the body. As insulin is the hormone that controls blood sugar levels, any variation in its production and consumption results in variation of blood sugar levels. Hyperglycemia, commonly known as high blood glucose, is a common side effect of uncontrolled diabetes that, over time, can gravely affect a variety of body systems, including the

blood vessels and neurons. Reports suggest that there was a 3% increase in age-standardized death rate due to diabetes between 2000 and 2019. Furthermore, this increase is about 13% in low-middle income countries [1]. Type 2 diabetes which accounts for more than 95% of all the diabetes cases reported so far, was initially thought to be non-insulin dependent. However, later it was found that type 2 diabetes is developed when the body becomes insulin resistant or when insulin is not produced in sufficient quantity[2]. Reports on this type of diabetes in both adults and children are increasing at an alarming rate.

Periodontitis (gum disease) is an inflammatory disease caused by microorganisms which affect the supporting tissues of teeth. The alveolar bone and periodontal ligament will gradually be destroyed as a result of this, and gingival recession and/or periodontal pocket formation may follow [3]. Dental professionals have long recognized the connections between DM and periodontitis. In 1993, L oe made the first mention of the elevated risk of periodontitis in DM patients. People with diabetes have a two to three times higher risk of developing periodontitis than people without the disease, and the degree of glycaemic control is a critical factor in assessing risk. One's likelihood of getting periodontal disease can rise if they have high blood sugar levels. In turn, periodontal disease can raise blood glucose levels, making it harder to manage diabetes and increasing the risk of complications related to the disease. Contrarily, periodontitis in non-diabetic individuals is associated with higher blood sugar levels and a higher prevalence of both pre-diabetes and

type 2 DM. [4]. In addition to the five “classic” complications of diabetes, the American Diabetes Association (ADA) has acknowledged that periodontal disease is prevalent in patients with diabetes. As a result, the ADA’s Standards of Care mandate that a physician’s examination include a history of any recent or past dental infections. Since 2009, doctors have been specifically advised by the American Diabetes Association’s “Standards of Medical Care in Diabetes”, to refer diabetic patients to a dentist for a thorough dental and periodontal examination [5]. However, recently, it has become clear that the relationship between the periodontitis and DM is more complicated than it was thought to be earlier and that these two diseases are linked in a bidirectional manner, with each condition having detrimental effects on the other. This paper reviews some of the recent findings related to this topic.

Diagnostic Criteria of Diabetes & Periodontitis

Before exploring the correlation between periodontitis and DM, it is imperative to discuss briefly their molecular mechanisms, symptoms and diagnostic tests. The detrimental effects of hyperglycemia on DM patients include inflammations and subcellular organelle abnormalities in organs, changes in structure/function and turnover of proteins due to their non-enzymatic glycation and the binding of receptors of advanced glycation end products (AGEs), popularly labelled RAGE, to the target cells resulting in tissue damage[4]. According to epidemiological research, the degree of hyperglycemia generally correlates with how serious diabetic complications are[6]. Numerous long-term consequences associated with diabetes mellitus include retinopathy, nephropathy, neuropathy, macrovascular disease, and impaired wound healing. Diabetes frequently manifests with recognisable symptoms such extreme thirst, frequent urination, impaired eyesight, fatigue, and unintentional weight loss[1]. One of the most popular test to study glucose control in DM patients is the glycated hemoglobin (HbA1c). To avoid possible long term effects like macrovascular and microvascular complications, HbA1c levels must be curtailed. There also exist equally suitable

methods such as fasting plasma glucose test, 2-hr plasma glucose test or random blood glucose test., for the diagnosis of DM [7]. Table 1 shows the diagnostic criteria for DM based on the above mentioned blood glucose tests.

Result	HbA1C Test	Fasting Blood Sugar Test	Glucose Tolerance Test	Random Blood Sugar Test
Diabetes	6.5% or above	126 mg/dL or above	200 mg/dL or above	200 mg/dL or above
Prediabetes	5.7 – 6.4%	100 – 125 mg/dL	140 – 199 mg/dL	N/A
Normal	Below 5.7%	99 mg/dL or below	140 mg/dL or below	N/A

Table1: Diagnostic criteria for diabetes are based on blood glucose measurements and the presence or absence of symptoms. Adapted from [4]

The chronic inflammatory disease called periodontitis, which results in the loss of periodontal attachment, is associated with dental biofilm (plaque) accumulation. This condition, which can destroy the alveolar bone and periodontal ligament that support teeth, is brought on by complicated dynamic interactions between a number of different bacterial infections, destructive host immune responses, and other factors like smoking. The pathophysiology of this illness has been described in terms of its major molecular pathways. This eventually results in the activation of host-derived proteinases, which makes it easier to lose the fibres of the marginal periodontal ligament and causes the junctional epithelium to migrate apically, causing the biofilm to extend apically along the root surface. This leads to periodontal destruction. Gingival inflammation, bleeding on probing, clinical attachment loss, deep probing depths, mobility, radiographic evidence of alveolar bone loss, and pathologic migration are the symptoms of periodontitis [8, 9]. Before starting periodontal assessment it is mandatory to obtain the medical history of the patient. This will make it easier to find any environmental or systemic risk factors for periodontitis. Clinical parameters that make up a thorough periodontal evaluation include the biofilm index, periodontal probing depth, presence of bleeding during probing, gingival recession, mucogingival deformity, involvement of the furcation, tooth mobility, and occlusal

trauma. The initial periodontal evaluation includes a thorough radiographic evaluation to assess the degree of both horizontal and vertical alveolar bone loss [10]. The 2017 world workshop classification of periodontal and peri-implant diseases and conditions defines a new periodontitis classification which is based on a multi-dimensional staging and grading system [9]. The four stages of periodontitis are defined in table 2. The availability of direct or indirect evidence of periodontitis progression serves as the primary criterion in table 3's illustration of periodontitis grading.

Periodontitis stage	Stage I	Stage II	Stage III	Stage IV
Interdental CAL at site of greatest loss	1 to 2 mm	3 to 4 mm	≥5 mm	≥5 mm
Severity	Coronal third (<15%)	Coronal third (15% to 33%)	Extending to mid-third of root and beyond	Extending to mid-third of root and beyond
Radiographic bone loss	No tooth loss due to periodontitis		Tooth loss due to periodontitis of <4 teeth	Tooth loss due to periodontitis of ≥5 teeth
Tooth loss	No tooth loss due to periodontitis		Tooth loss due to periodontitis of <4 teeth	Tooth loss due to periodontitis of ≥5 teeth
Complexity	Local	Maximum probing depth ≥4 mm Mostly horizontal bone loss	Maximum probing depth ≥5 mm Mostly horizontal bone loss	Maximum probing depth ≥6 mm Need for complex rehabilitation due to: Masticatory dysfunction Secondary occlusal trauma (tooth mobility degree ≥2) Severe ridge defect Bone collapse, drifting, flaring Less than 20 remaining teeth (10 opposing pairs)
Extent and distribution	Add to stage as descriptor	For each stage, describe extent as localized (<30% of teeth involved), generalized, or molar/furcation pattern		

Table 2: Periodontitis stages. CAL = clinical attachment loss; RBL = radiographic bone loss. Reproduced from [9] under creative common attribution license.

Periodontitis grade	Grade A: Slow rate of progression	Grade B: Moderate rate of progression	Grade C: Rapid rate of progression
Primary criteria	Direct evidence of progression Longitudinal data (radiographic bone loss or CAL) % bone lossage: <0.25	Evidence of no loss over 5 years 0.25 to 1.0	<2 mm over 3 years ≥2 mm over 3 years ≥1.0
Indirect evidence of progression	Case phenotype Heavy biofilm deposits with low levels of destruction	Destruction commensurate with biofilm deposits	Destruction exceeds expectation given biofilm deposits; specific clinical patterns suggestive of periods of rapid progression and/or early onset disease (e.g. molar/furcation pattern); lack of expected response to standard bacterial control therapies
Grade modifiers	Risk factors Smoking Diabetes	Non-smoker Normoglycemic/ no diagnosis of diabetes	Smoker: <10 cigarettes/day HbA1c <7.0% in patients with diabetes HbA1c ≥7.0% in patients with diabetes
Risk of systemic impact of periodontitis*	Inflammatory burden High sensitivity CRP (hsCRP)	<1 mg/L	1 to 3 mg/L >3 mg/L
Biomarkers	Indicators of CAL/bone loss Saliva, gingival crevicular fluid, serum	?	?

Table 3: Periodontitis grades HbA1c:glycated haemoglobin, hsCRP:high sensitive C-reactive protein, PA:peri apical, CAL:clinical attachment loss. Reproduced from [9] under creative common attribution license.

Clinical attachment loss (CAL), can be initially used for the determination of periodontitis stage. However, in its unavailability, radiographic bone loss can be utilised for the same purpose. Periodontitis-related tooth loss in the past could change the stage and also any complexity aspect

could cause the stage to advance to a higher level. For instance, independent of CAL, radiographic bone loss, or tooth loss owing to periodontitis, the existence of class II or III furcation involvement would change to either stage III or IV. The percentage of teeth impacted mostly determines the extent and dispersion. On the other hand, direct indications of progress are the main factor in determining grade. In the absence of direct evidence, indirect evidence of advancement may be used. The grade may move to a higher tier in the presence of periodontitis risk factors [10].

The Pathogenic Mechanism Linking Periodontitis and Diabetes Mellitus

The connections between DM and periodontitis has been known for many decades. A lot of research reports pertaining to this topic can be seen. However, a complete molecular mechanism of this relationship is yet to be understood. Recent works have thrown more lights into this bidirectional relationship which has enabled some authors to propose multiple hypothesis explaining its the mechanisms. Some of the recent reports establishing the connections between DM and periodontitis can be seen in table 4.

Ying-Ying Wu et al	2015	Periodontal disorders and diabetes mellitus share characteristics with other chronic illnesses. Osteoclasts and osteoblasts are likely to be affected by inflammation in severe periodontitis that causes alveolar bone loss.
Wenche S.Borgnakke	2019	Diabetes (dysglycemia) and oral health adversely affect each other in a vicious cycle.

Philip M. Preshaw ¹ and Susan M. Bissett	2020	Periodontitis is more common in people with diabetes, and the degree of glycaemic management is crucial in defining the risk. There is a two-way relationship between the two illnesses, with each disease having negative impacts on the other because to increased inflammation.
F.Barutta et al	2022	Anti-diabetic medications may potentially have pleiotropic effects in addition to decreasing blood sugar levels, which may be relevant in the context of periodontitis.
Simona Santonocito et al	2022	The risk of developing kidney, heart, or other complications is significantly increased in people with periodontal disease and diabetes and can be reduced by lowering periodontal inflammation, which is brought on by both surgical and non-surgical periodontal therapy.
Grigorios Plemmenos et al	2022	The simultaneous control of DM and AGE levels and the removal of dental plaque may lessen periodontal destruction.
Yuan su et al	2023	Periodontitis-derived virulence factors are involved in the pathological mechanism underlying Type 2 Diabetes Mellitus
Alahmari, M. M et al	2023	Provides proof for the common occurrence of periodontitis in DM patients.

Dhingra, K. et al	2023	Periodontitis treatment by subgingival instrumentation improves glycaemic control in diabetic patients
Thakkar-Samtani et al	2023	Undergoing periodontal treatment was associated with significant reductions in overall health care costs for patients with DM.

Table 4: Brief summary of recent reports revealing the connections between DM and periodontitis arranged chronologically.

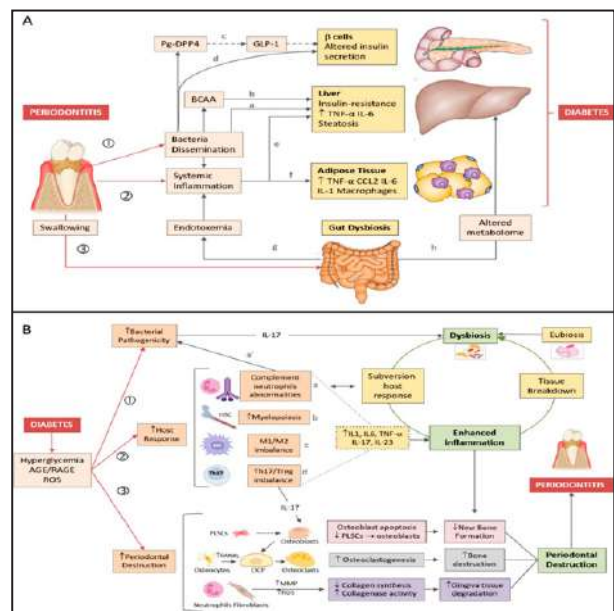


Fig 1: Bidirectional relationship between periodontitis and diabetes. Reproduced from [4] under creative common attribution license.

A comprehensive picture of the underlying mechanism of the two-way link between periodontitis and diabetes is illustrated in figure 1. Figure 1 (A) shows the periodontitis diabetes direction. There are three ways in which periodontitis leads to the development or worsening of type 2 diabetes [4]. They are:

- 1) Bacteria Dissemination: The dissemination of bacteria or bacterial products into the blood stream may worsen type 2 diabetes. The mixing of bacteria or bacterial product in blood may trigger insulin resistance through the inhibition of hepatic glycogen synthesis

and accelerating hepatic gluconeogenesis. The insulin resistance can also be brought about by blocking the insulin receptor substrate by producing branched-chain amino acids. The production of Dipeptidyl peptidase-4 (DPP4) by *P. gingivalis* (Pg-DPP4) which enhances glucagon-like peptide 1 (GLP-1) degradation may also reduce insulin generation. The insuling reduction by *P. Gingivalis* may also occur by inducing β cell dedifferentiation as shown in figure 1 (A).

- 2) Systemic inflammation: Systemic inflammation is induced/exacerbated, favouring both hepatic and adipose tissue insulin resistance.
- 3) Endotoxemia: Periodontal bacteria that are swallowed can cause gut dysbiosis, which favours endotoxemia and alterations to the blood metabolome.

In figure 1 (B), the diabetes periodontitis direction can be seen. By three main mechanisms, diabetes favors the development or worsening of periodontitis. They are:

- 1) Enhanced Bacterial Pathogenicity: IL-17-mediated enhancement of bacterial pathogenicity and periodontal dysbiosis could occur.
- 2) Increased Host Response: The hosts' defences will ramp up in response to the bacterial threat. Diabetes can impact neutrophil and complement function, which increases the individual's susceptibility to infection. Diabetes can also increase myelopoiesis, the M1/M2 macrophage ratio, and the Th17/Treg lymphocyte ratio, all of which raise the levels of pro-inflammatory cytokines and cause inflammation (as shown by the dotted lines in fig. 1(B)).
- 3) Increased Periodontal Destruction: The apoptosis of bone-forming cells is increased by diabetes, while the periodontal ligament stem cells (PLSCs) proliferation and differentiation in osteoblasts are decreased. This inhibits the formation of new bone. By boosting RANKL release by osteocytes and osteoblasts and causing osteoclast precursor (OCP) differentiation in osteoclasts, diabetes promotes osteoclastogenesis. Through increased neutrophil and fibroblast release

of metalloproteinases (MMP) and reactive oxygen species (ROS), diabetes can also accelerates the degradation of gingiva tissue.

There are recent reports on the role of a “trained immunity” establishing the two way relationship between DM and periodontitis. The “trained memory” is a long-lasting memory developed in innate immune cells as a result of microbial activity or inflammation . After reviewing many reports, a hypothesis of the two-way relationship between periodontitis and DM established by trained innate immunity has been proposed by Barutta et.al. in 2022 [4]. Figure 2 summarizes this hypothesis in which both the bacterial product and inflammatory cytokine release due to periodontitis and diabetes-triggered hyperglycemia results in metabolic/epigenetic rewiring of peripheral myeloid cells (peripheral trained immunity) and bone-marrow precursors (central trained immunity). This causes hyperactive myeloid cells to proliferate, enabling them to react better to a second unrelated assault. They concluded that no matter which type of inflammation (DM or periodontitis-induced) affects precursors and circulating innate immune cells first, trained immunity can have a negative impact on both illnesses and may explain why there is a bidirectional association between them.

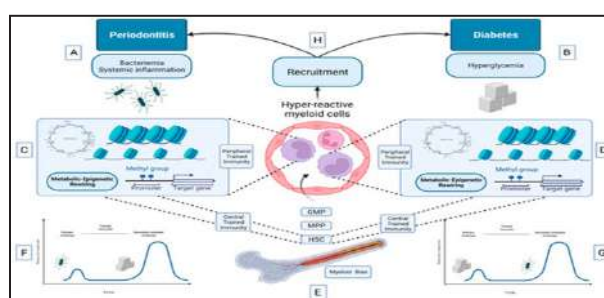


Fig 2: Illustration of the hypothesis that diabetes and periodontitis are related in both directions by a mechanism involving trained innate immunity. HSC (hematopoietic stem cells), MMP (multipotent progenitors), GMP (granulocyte/macrophage progenitors). Reproduced from [4] under creative common attribution license.

The Effects of Periodontal Therapy on Diabetes Control

Untreated periodontitis causes a heightened state of systemic inflammation as a result of the

circulation of bacteria, bacterial products, pro-inflammatory mediators, and cytokines. Diabetes complications due to rise in HbA1c levels will occur as a result of decreased insulin signalling and increased insulin resistance. There are lower amounts of circulating bacteria and bacterial products, cytokines, and inflammatory mediators following periodontal therapies and decreases in periodontal inflammation. As a consequence, there is a decrease in the level of systemic inflammation, which enhances insulin signalling and reduces insulin resistance. HbA1c is decreased, diabetes control is enhanced, and problems related to diabetes are decreased as a result [3]. Figure 3 shows how significant periodontal therapy is when it comes to controlling DM.

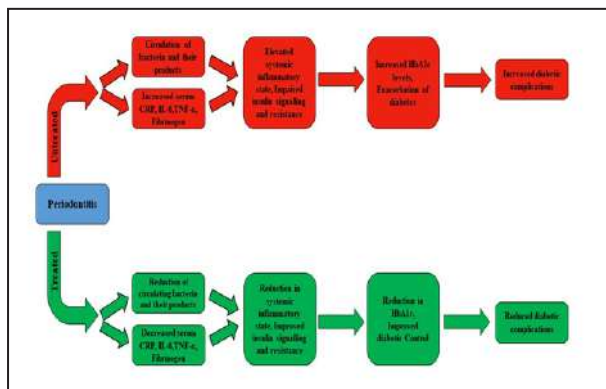


Fig 3: The effects of periodontal therapy on diabetes control. Adapted from [12]

The effects of DM therapy on Peri-odontitis.

Recent research suggests that medications currently used to treat DM2 have added favourable impacts in periodontitis independent of their glucose-lowering action in both experimental animals and humans. Anti-diabetic treatments include oral antidiabetic drugs, insulin or their combinations.

Periodontitis is improved when 1% metformin (MF) gel is applied locally to the periodontal pockets in addition to scaling and root planning. Additionally, recent meta-analyses came to the conclusion that mechanical periodontal therapy also benefits from the local treatment of periodontitis with metformin gel. The effectiveness of specific anti-diabetic medications as adjuvants in the treatment of periodontitis, however, needs to be established through larger intervention studies. Current DM2

medications like metformin (MF), sulfonylureas, and GLP-1 receptor agonists may also directly benefit periodontitis patients by reducing inflammation, bacterial dysbiosis, and bone loss while also promoting bone formation, according to latest researches in experimental animals. This suggests that anti-diabetic medications may have pleiotropic effects in addition to lowering blood glucose levels, which may be relevant in the context of periodontitis [4]. According to a recent study, metformin can repair bone homeostasis that has been harmed by hypoxia. In rat apical periodontitis, metformin administered intracranially to reduce bone resorption was linked to improved osteoblast differentiation and reduced osteoclast formation[25] The effect of MF on periodontal and peri-implant health has been the subject of numerous reported animal studies and clinical studies, which Aljofi et al. examined in 2023. They discovered that MF had a protective effect on the health of the peri-implant and periodontium. They also emphasized the significance of further research examining this beneficial or protective effect of MF in order to comprehend the temporal sequence and dose response effects of MF[26].

Contrarily, insulin can improve glycemic control more quickly and has anabolic effects on bone. In comparison to the oral antidiabetic drug (OAD) group, the prevalence, severity, and length of periodontitis and periodontal inflamed surface area (PISA) were lower in the INSULIN group. In patients with type 2 diabetes mellitus who were receiving insulin therapy and OAD therapy, Pattayi et al. reported that a proportional relationship was seen between PISA, clinical attachment loss, and HbA1c levels. Although the two groups had similar levels of oral hygiene and glycemic control, the INSULIN group had lower periodontal parameters than the OAD group [27].

Conclusions:

There are enough data to support the hypothesis that periodontal disease and diabetes mellitus are mutually dependent conditions. The most recent data confirm that diabetes increases a person's risk for developing periodontal disease, and that periodontal disease worsens glycemic control in diabetic patients. As a result, it is imperative

to create the awareness among people about periodontitis prevention and effective and safe management from its earliest stages. When diagnosed in its early stages, periodontal disease is treatable and preventable. It is the responsibility of dental professionals to inform the diabetic patients about the reasonably priced periodontal treatments. The cornerstone of current treatment for the reciprocal relationship between DM and periodontitis is prevention strategy, which aims to break the periodontitis-DM cycle. In order to achieve this, it is highly advised by current guidelines that dentists and diabetologists work closely together.

Current DM medications like metformin, sulfonylureas, and GLP-1 receptor agonists, may also directly benefit periodontitis, according to recent studies in experimental animals. Nevertheless, more research is required to determine the efficacy and appropriateness of these medications. Investigating novel periodontitis prevention and treatment strategies would be important for the management of comorbid systemic diseases. In fact, a deeper comprehension of the connected pathogenesis of various chronic inflammatory diseases, such as periodontitis and diabetes mellitus, may result in an integrating structure that can help to elucidate how infectious, inflammatory, and metabolic diseases tend to cluster together as well as serve as the foundation for novel therapeutic holistic interventions.

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GERIATRIC DENTISTRY

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Abstract

Aging is a natural phenomenon. It is the net effect of all morphologic and functional alterations that occur in an individual, which leads to functional impairment, thus decreasing the ability to survive stress. The loss of dentition, often regarded as a classic reflection of aging, has disastrous effects on the functional, esthetic and emotional status of an elderly person. Further, financial constraints and lack of family support or of transportation facilities affect access to dental services in later life. Thus, the untreated oral cavity has its deleterious effects on comfort, esthetics, speech, mastication and consequently, on quality of life in old age.

Introduction

Advances in modern medicine and medical technology has caused a substantial increase in the longevity of the elderly. Aging occurs at different rates in different individuals. The key elements that determine the quality of life of an aging person are their physical and mental well-being. Oral health caregivers and contemporary dental treatments should hence cater to the needs of the geriatric patient.

Terminologies

- Geriatrics - The branch of medicine or dentistry that treats the problems peculiar to the aging patient, including the clinical problems of senescence and senility. (DCNA January 1989)
- Gerontology - the branch of dentistry that deals with the oral health problems of the older people.
- Geriatric dentistry - the provision of dental care for adult persons with one or more chronic debilitating, physical or mental illness with associated psychosocial problems (DCNA January 1989)

Classification of ageing

- According to DCNA
 - Well elderly
 - Functionally dependent elderly
 - Severely disabled medically compromised elderly
- According to WHO (based on age group)
 - Onset (60-65 years)
 - Initial (65-74 years)
 - Intermediate (75-89 years)
 - Late (90 and above)
- According to Ettinger and Beck (based on ability to seek dental services)
 - Functionally independent older adults
 - Frail older adults
 - Functionally dependent older adults

Age changes in masticatory apparatus

Advancing age results in significant changes in body composition, epithelium, connective tissues and functioning of internal organs. Muscle activity lacks coordination and hence the masticatory ability becomes diminished. Bone density declines as bone resorption exceeds bone formation. Metabolic derangements due to diabetes mellitus and menopause further increases the rate of residual ridge resorption. Age related changes in the temporomandibular joint can result in ankylosis, disc displacement, disc perforation etc. Mucous membrane becomes friable and is susceptible to minor irritation. Glossodynia and glossopyrosis are common complaints of the elderly. The dentition encounters physiologic wearing by the processes of attrition, abrasion and erosion. The quantity and quality of saliva diminishes, thereby causing dry mouth, mucosal injury and microbial infections. Olfactory and gustatory changes further cause inadequate food

intake which ultimately affects the nutritional status of the aging individual.

Provision of care to the geriatric patient

Over the past few years, there is a rapid growth in the number of people requiring domiciliary dental care services. Fiske and Lewis define domiciliary care as 'a service that reaches out to care for those who cannot reach a service by themselves.

To give dental care to elderly, there could be four basic options:

- Patients themselves go to dental clinics
- Dentists travel to homes or nursing homes with portable equipment
- Use of van or bus to provide treatment operator – Mobile dental service
- Providing dental care in dental operator inside the facility or nursing home

Treatment planning in geriatric patients

When it comes to treating an individual, MM De Van's dictum "The perpetual preservation of what remains is more important than the meticulous replacement of what is lost" is the golden rule. The design and implementation of comprehensive preventive dentistry protocols for elders presents the dental profession with many challenges. In treatment planning for frail and dependent residents, it is a challenge to respond to changes in their behavior and decreased cooperation by improving the effectiveness of collaboration with the health care team.

Many elderly persons are unable to effectively perform plaque control procedures due to physical disabilities that result in the lack of manual dexterity or impaired range of motion of the wrist, elbow or shoulder. Their plaque removal efforts may be enhanced by use of an electric device or by adaptation of manual plaque control aids.

Kenneth Shay suggested a five-point Geriatric Dental Assessment tool called OSCAR,

- O, Oral – Teeth, restoration, prostheses, periodontium, pulpal status, oral mucosa, saliva

- S, Systemic – normative age changes, medical diagnosis, pharmacologic agents,
C, Capability – functional ability, self-care, oral hygiene, transportation to appointments,
A, Autonomy – decision-making ability, dependence on alternative
R, Reality – Prioritization of oral health, financial ability or limitations.

Dentist must concentrate on "OSCAR" as it influences the treatment plan which needs the meticulous integration of dental and non-dental factors.

A straightforward yet comprehensive approach to treatment planning for older adults uses the familiar mnemonic SOAP (Subjective findings, Objective findings, Assessment, and Plan).

Provision of dental care for the old patient may be made in the sequence:

- i. Assessment & Provisional treatment plan – the basic treatment plan should be laid out at the onset i.e., the initial visit itself. What the patient wants and what he/she can tolerate are the factors that require prime concern. A comprehensive case history recording, detailed clinical dental examination, diagnostic impressions and radiographic investigations are therefore necessary in this appointment.
- ii. Primary care – includes pain relief, treatment of causative factors, management of periodontic & endodontic infections, oral hygiene instructions etc.
- iii. Definitive treatment plan – initial treatment plan is reassessed and a definitive treatment plan is formulated.
- iv. Secondary care – Prosthodontic and restorative factors are taken into considerations.
- v. Tertiary care – comprises of prevention, monitoring and maintenance.

Prosthodontic considerations for geriatric patients

It is always better to retain the natural teeth as long as possible. This reduces the period of edentulousness as well as the rate of ridge resorption. The patient must be able to accept the prosthesis and attempt to learn to use it.

Complete dentures fabrication must be done by

using the appropriate impression technique, with maximal extension of base as limited by function. Previous dentures or photographs can be used as guides for determining the jaw relation records and for selection of teeth.

Overdentures constructed over natural teeth are a preferable treatment option as it helps in proprioception, as well as to retain healthy teeth, thereby decreasing the rate of residual ridge resorption. They have become more popular as a replacement for traditional complete dentures in individuals with insufficient tooth structure left to support either fixed or removable partial dentures.

The design of partial dentures should be as simple as possible. Saddles should be preferably tooth supported and the components should be rigid enough to distribute occlusal forces. The elderly who wears dentures should be taught proper home care of both dentures and tissues on which they rest as well as the need for continued professional care.

The capacity of the practitioner to assess the true state of the dentition and the surrounding oral tissues is crucial to the success of fixed prosthodontic therapy for older persons. The periodontal and endodontic therapy should be successfully done to ensure a favorable prognosis for a fixed partial denture.

Osseointegrated implants can be prescribed for elderly patients provided the physical and medical conditions are favorable enough to lessen the complications of the surgical procedure. The principles of osseointegration can be reconciled with various prosthodontic techniques to help make this treatment accessible to older adults.

Conclusion

Dental care is the most neglected health issue among the elderly. This is primarily due to lack of awareness. Inability of many of the geriatric patients to seek dental care on their own adds to the problem. Modern advancements in dentistry offer variety of treatment solutions to various geriatric dental issues. However, this can be of use to the maximum beneficiaries only by increasing awareness and improving accessibility to treatment. Emphasis should be given to domiciliary

dental care for geriatric patients. Radical change in the attitude and approach of the whole society to oral health care of the aged is required. No doubt, our senior citizens also deserve to “smile with confidence” at the twilight phase of their life.

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INFORMED CONSENT: ESSENTIALS AND ITS IMPLICATIONS FOR DENTAL PRACTITIONERS

Dr. ZUBIN CHERIAN, BDS; LLB*

ABSTRACT

Informed consent is the process in which a healthcare provider educates a patient about the risks, benefits and alternatives of a given procedure or intervention. The patient must be competent to make a voluntary decision about whether to undergo the procedure or intervention. The main purpose of taking the informed consent from the patient is to protect the patient. A consent form is a legal document that ensures an ongoing communication process between the patient and his or her healthcare provider. The process of taking informed consent from the patient is mandatory before commencing any therapeutic or diagnostic procedure on the patient. Any examination by doctor without prior consent amounts to an assault on the patient and is liable under the tort and criminal laws. Medical Council of India (MCI) has laid down the rules according to which surgical treatment without consent is considered as misconduct and is punishable. Informed consent was practically non-existent till the time Consumer Protection Act, 1986 came into existence. Now taking informed consent from the patient is seen as more of a legal requirement than an ethical or moral obligation on the part of the treating doctor towards his patient. This article discusses the implications of taking informed consent for Dental Practitioners.

Keywords: Autonomy, Confidentiality, Ethics, Informed Consent, Privacy.

INTRODUCTION

The practice of informed consent has historical importance and plays a critical role in medical practice. The element of consent is one of the complex issues in modern medical practice. It is a well known fact that the patient must give valid consent for medical treatment; but it is his prerogative to refuse treatment even if the said treatment will save his or her life. The earliest expression of this fundamental principle, based on autonomy is found in the Nuremberg Code of 1947. This code makes it mandatory to obtain voluntary and informed consent of human subjects. The Nuremberg Code¹ was adopted immediately after World War II in response to medical and experimental atrocities committed by the German Nazi regime. Similarly the Declaration of Helsinki adopted by the World Medical Association in 1964 emphasized the importance of obtaining freely given informed consent for medical research by adequately informing the subjects of the aims, methods, anticipated benefits, potential hazards and discomforts that the study may entail². Several international conventions and declarations have similarly ratified the importance of obtaining consent from patients before performing therapeutic or diagnostic treatment.

INFORMED CONSENT

Informed consent means an agreement, compliance or permission given voluntarily without any compulsion³. It can be defined

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1. Nuremberg Code, 1947
2. Declaration of Helsinki, Original version, 18th meeting, World Medical Association, 1964.
3. Pillay V. V, Handbook of Forensic Medicine and Toxicology, 13th edition, Paras Publications, Hyderabad; 2003; 24 – 25.

as “the voluntary and revocable agreement of a competent individual to participate in a therapeutic or research procedure, based on adequate understanding of its nature, purpose and implications.”⁴ Informed consent is now accepted as the cornerstone of medical practice. In India, There has been an increase in the number of malpractice suits that have arisen because of the lack of informed consent or due to inadequate consent from the patients for various procedures. Informed consent is the continuous process of providing the patient, or, in the case of a minor or incompetent adult, the parent or legal guardian with relevant information by the doctor regarding diagnosis and treatment needs so that an informed decision regarding consent for treatment can be made by the patient or the parent or legal guardian of a minor.

LEGAL AND ETHICAL BASIS FOR INFORMED CONSENT

Consent is not only necessary to prevent legal actions for Assault or Battery, but it is also essential to defend any suit for medical negligence. A doctor has a legal duty to advise and inform the patient in his/her care, all the necessary information relating to his or her treatment. For taking a valid consent from the patient, the patient must be informed about the nature and purpose of the medical procedure. Valid consent provides a defence to the Tort⁵ of Battery⁶. Consent has its basis in medical ethics by subscribing to the principle of respect for patient autonomy. Patient autonomy in clinical medicine is the right of every person to determine what is done to him medically and to be actively involved in medical decision making. The principle of beneficence in medical ethics is fundamentally based on the concern for the patient’s welfare. Consent in medical practice displays respect for the wishes, and concern for the patient’s welfare.

ELEMENTS OF INFORMED CONSENT

- a) Capacity: All adult patients are assumed to have capacity to give consent.
- b) Disclosure :Patients need to be sufficiently and appropriately informed about the benefits, risk or complications of the procedure they are being subjected to before they can give their consent.
- c) Voluntariness: Consent must be given freely and it must be free from any form of coercion, duress or undue influence by family, friends, employers, insurers and healthcare professionals.

KINDS OF CONSENT

The consent for medical treatment may be either implied or express. It can even be tacit or anticipatory. In implied consent, the demeanor, behaviour and actions of a patient indicate his consent for treatment. In case of expressed consent, the patient specifically grants permission to a physician to undertake the diagnosis and treatment of a specific problem. It may be given either verbally or in writing. In case of tacit consent, the patient who is not agreeing to undergo a medical procedure has to take some active action to refuse, if he does not want the procedure to be done on him. Anticipatory consent is the consent taken where additional problems or situations that may arise in course of treatment or procedure and the patient may not be able to consent, as he or she may temporarily lack the capacity to give the consent.

INFORMATION THAT SHOULD BE DISCLOSED TO THE PATIENT FOR OBTAINING CONSENT

The information that need to be disclosed to the patient for obtaining his or her consent should be

4. Sim J; Informed Consent : Ethical Implications for Physiotherapy, Physiotherapy, 1986; 72; 584 – 587.
5. Tort is a wrongful act other than a breach of contract for which relief may be obtained in the form of damages or an injunction. MERRIAM – WEBSTER.COM; <http://www.merriam – Webster.com/dictionary/tort> (last visited September 19, 2023, 9.30 pm.)
6. Battery is an offensive touching or use of force on a person without the person’s consent, MERRIAM – WEBSTER.COM, <https://www.merriam-webster.com/dictionary/battery> (last visited September 19, 2023, 9.45 pm.)

- the nature of the procedure and its indications; the possible benefits and consequences of the procedure; the risks associated with the procedure; the possible alternatives to the procedure and their benefits, risks and its consequences which may include doing no treatment for the particular condition; the questions asked by the patient and the explanations provided.

CONSENT IN EMERGENCIES

The principle of necessity states that acting out of necessity legitimates a wrongful act in criminal and civil law. Acting unlawfully is justified if the resulting good effect outweighs the consequences of strictly adhering to the law. The principle of necessity in medical practice allows the doctor to proceed with medical treatment or surgery even in the absence of consent. The important factors necessary to seek defence under the principle of necessity are as follows:- where the unconscious patient is in an emergency situation; procedures are essential for the patient's immediate survival or well-being; there is no known objection to treatment; where it is unreasonable, unethical or dangerous to postpone the procedure; when it is done out of necessity and not for convenience; and in cases where there is concurrence of the medical team.

INFORMED CONSENT AND THE DOCTOR-PATIENT RELATIONSHIP

Consent finds its basis in the principle of respect for persons, which is an essential component in building trust in the medical profession and the healthcare system. Everything in the doctor-patient relationship is consensual. Before a clinician examines, treats or cares for a competent adult, he or she must obtain the patient's consent. It is an active communicative process, and a process of building trust and mutual respect. The obligation to respect patient's autonomy requires "respectful treatment in disclosing information and fostering autonomous decision making." In medical profession, respect for autonomy obligates professionals to involve their patients to disclose information, to probe for and insure

understanding and voluntariness, and to foster adequate decision making."

CONCLUSION

The valid consent is an important ingredient in routine medical practice such as for the examination of a patient for diagnosis, therapeutic intervention, treatment and surgery. Consent should be obtained to safeguard the healthcare professional from future medical negligence suits. Barring physical examination, informed consent is necessary for every medical examination and surgical procedures. The informed consent promotes the rights of a patient as autonomous beings to ensure that they are treated with justice, beneficence and respect. Neglecting its importance can lead to unethical behaviour and loss of patient's rights. It can therefore, be concluded that informed consent should be taken seriously by all clinicians in the broader interest of doctor-patient relationship and there should no compromise in providing information that is not "reasonable" in the eyes of the court. In the event of an adverse medical outcome, written medical records and a valid informed consent from the patient can be the doctor's best defence in a court of law. The courts usually demand relevant medical documents of the patient in medical negligence suits. Therefore it is good practice to document the advice given to the patients and to obtain informed written consent from patients in order to avoid medical negligence litigations.

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4. Dr. Nanditha Adhikari, Law and Medicine (Central Law Publications, 2015).

REVIEW OF AH PLUS ROOT CANAL SEALER

Dr. Shahina Juvairiya MDS, Endodontist



AH Plus is an epoxide-amine resin pulp canal sealer that is an ideal choice where aesthetic demands are high. The material has a perfect working consistency and because it is slightly thixotropic, it flows better under pressure. AH Plus is heat tolerant and the setting reaction is not adversely affected during thermoplastic obturation, making it very well suited for warm compaction techniques.

Dentsply AH Plus Root Canal Sealing Material is a two-component paste/paste root canal sealer. The AH Plus sealer shows extremely low shrinkage making it a suitable choice of material to seal the root canal.

Most of the studies confirmed that AH Plus fulfills the requirements of a root canal filling material as defined by the specifications for root canal filling materials and the guidelines of the European Society of Endodontology (ESE).

The properties of an ideal root canal sealer as described by Grossman are:

1. Exhibits tackiness when mixed to provide good adhesion between it and the canal wall when set.
2. Establishes a hermetic seal.
3. Has radiopacity so that it can be seen on the radiograph.
4. Is a very fine powder so it can mix easily with the liquid.

5. Doesn't cause shrinkage on setting.
 6. Doesn't cause staining of tooth structure.
 7. Is bacteriostatic, or at least does not encourage bacterial growth.
 8. Exhibits a slow set.
 9. Is insoluble in tissue fluids.
 10. Is tissue tolerant, that is, non-irritating to periradicular tissue.
 11. Is soluble in common solvent if it is necessary to remove the root canal filling.
- AH Plus achieves a tight seal due to its self-adhesive properties and dimensional stability.
 - It is biocompatible and exhibits moderate anti-microbial properties and therefore has the potential to significantly reduce the germ load in the canal.
 - It is extremely radio-opaque so it is clearly visible on radiographs.
 - AH Plus is a good sealer choice for use with ProTaper Thermafil obturators as the setting reaction is not adversely affected by thermoplastic obturation.

I've been using AH Plus(Dentsply) for well over 6 years, and I've been very happy with it. I love the way it flows—I'm always sure that it goes into those little voids around my obturation material, and I've seen it flow into lateral canals over and over again.

REVIEW OF CASTROVIEJO MICRO NEEDLE HOLDER

Dr. Merlin Thomas, MDS (Periodontist)

Have you ever encountered difficulties in suturing when handling detailed and precise work at micro level? Castroviejo micro needle holder would be an ideal option to ease procedural complexity while suturing. It is a light weight and firm gripped tool that is apt for technique sensitive procedures such as periodontal plastic surgeries. It is available with multiple variations in sizes and styles such as Tungsten Carbide Inserts, Straight or Curved Designs, Smooth or Serrated Jaws and With or without Lock. The recommended suture sizes for this needle holder includes sizes of 5-0, 6-0, 7-0 and 8-0. I strongly recommend this product for handling technique sensitive procedures for better procedural outcome.





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