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Greetings to all the readers of our journal and thanks for the support shown towards this academic exercise. Your valuable feedback has helped us immensely to upgrade the text of this journal. Further suggestions for improvement are welcome.

I wish this journal keeps on meeting the expectations of the readers productively.

Dr. S.R. PANAT
Principal
Institute of Dental Sciences
Bareilly
Dear Readers,

I humbly present before you the latest and first issue of year 2013 of Journal Of Dental Sciences and Oral Rehabilitation.

This issue like all the previous issues has an amalgamation of some interesting case reports and comprehensive review articles from all the specialities of dentistry.

The editorial team thanks its patrons for their continued support and blessings.

I hope that you all find this issue informative and productive.

Dr. ANURAAG GURTU
Chief Editor
Journal of Dental Sciences and Oral Rehabilitation
Contents

REVIEW ARTICLES
1. Basal Implants- A Panacea For Atrophic Ridges.................................................................1-4
   Chandana Nair, Swarajya Bharathi, Rashmi Jawade, Meenu Jain
2. Eco - Friendly Dentistry: A Reality.........................................................................................5-6
   Krishna Dixit, K.K. Dixit, Nitya Kapoor
3. Sodium Hypochlorite: Complications And Management.....................................................7-10
   Anurag Singhal, Vineet Vinayak, Tarun Ahuja, Paankhi Longani
4. Advancement In Diagnostic Aids For Oral Premalignant Lesions - A Review..................11-15
   Pravin Gaikwad, Santhosh Kumar S. Hiremath, Shhraddha Singh
5. Use Of Choukroun's Platelet Rich Fibrin In Oral Defects.....................................................16-20
   Shouvik Chowdhury, Gokkulakrishnan S, K.Y Giri
   Anuraag Gurtu, Anurag Singhal, Ridhi Bansal, Ankita Mehrotra
7. Electronic Apex Locators......................................................................................................24-27
   Sonal Soi, Sumit Mohan, Vineet Vinayak, Prabhjot Kaur

CASE REPORTS
8. Pemphigus Vulgaris- A Case Report.....................................................................................28-31
   Sunil R Panat, Ashish Aggarwal, Nupur Agarwal, Pallavi Gupta
9. Aneurysmal Bone Cyst Of The Mandible With Unusual Presentation -
   A Case Report..........................................................................................................................32-34
   Ashish Aggarwal, Nupur Agarwal, Nitin Upadhyay, Kratika
10. Prosthodontic Management Of Resorbed Mandibular Ridges-
    A Simplified Approach..........................................................................................................35-37
    T Mohamed Haroon, Swarajya Bharathi, Chandana Nair, Nagbhushan Mandal,
    Girish Yadav
    Himanshu Sharma, Sarwar Alam, Sonal Upadhyay, Harsh Yadav,
    Paankhi Longani, Poonam Kohli
12. Proliferative Verrucous Leukoplakia - A Case Report.........................................................41-43
    Nupur Agarwal, Sunil R Panat, Puneet Gupta, Ashish Aggarwal, Nitin Upadhyay,
    Devendra Chopra, Vaibhav Gupta, Priyamwada Sethi
    Nitin Upadhyay, Sunil.R.Panat, Nupur Agarwal, Abhijeet Alok, Anuja Joshi
15. Palato-Gingival Groove – A Case Report.............................................................................50-52
    C. Ram Mohan, V. Hari Devaraya Choudary
Basal Implants- A Panacea For Atrophic Ridges

Chandana Nair†, Swarajya Bharathi‡‡, Rashmi Jawade‡††, Meenu Jain‡‡‡

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Abstract: According to the well-known implantological rules for dental restorations, crestal implants are indicated in situations when an adequate vertical bone supply is given. Crestal implants function well in patients who provide enough bone when treatment starts, but results are not predictable as soon as augmentations become part of the treatment plan. In such cases basal implants is a viable treatment option. This article discusses the value of using basal implants in atrophic ridge cases.

Key words: Basal implants, Crestal implants, Overload osteolysis.

INTRODUCTION

Implant supported prosthesis have opened many possibilities of replacing lost tooth. Crestal and basal implants are endosseous aids to create osseointegrated points of retention for fixed or removable dentures. Crestal implants (i.e. implants inserted from the top of the alveolar crest into the bone such as cylinders and blade implants) are indicated in situations where an adequate vertical bone supply is present.

Basal implants, i.e. BOI®, Diskos® by contrast, were developed primarily for immediate use as well as for use in the atrophied jawbone. These basal implants are synonymously called lateral implants or disk implants. These two types of implants are not only differentiated by the way they are inserted and also by the way forces are transmitted. For this reason, the literature on basal implants has introduced the terms “orthopaedic technique” and “orthopaedic implant” to mark a clear distinction between them and the well-known term “dental implant”.

RATIONALE

The term “basal implant” refers to the principles of utilizing basal bone areas free of infection and resorption, and the employing of the cortical bone areas. This rationale stems from orthopedic surgery and from the experience that cortical areas are needed in the structure, therefore, are resistant against resorption and reconstitute itself easily.1 At the same time, load bearing capacities of the cortical bone are many times higher than those of the spongious bone. In basal implants, the vertical implant parts (which connect the base plate(s) with the abutment) do not participate in load transmission to bone primarily, and that is why they are provided thin and polished. Lateral basal implants (Fig 1) which are inserted from the lateral aspect of the jaw bone, provide a disk-diameter of 7mm or more, and are inserted through a T-shaped slot into the jaw bone (the T-shape slot is inverted in the mandible). Screwable basal implants (BCS® brand) have been developed with up to 12mm thread diameter can be inserted into immediate extraction socket. (Fig 2) The polished smooth surface especially in the area of gingival penetration is a built-in prophylaxis that makes peri-implantitis preventable forever.

INDICATIONS

1. Through utilizing horizontal, vertical and oblique bone support, these devices can be implanted under all anatomical conditions, even immediately postextraction. No bone buildup is required and that is freeing the implantologist from performing all augmentations including “sinus lifts”.
2. When planned and carried out properly with enough implants, the devices allow immediate loading even in cases exhibiting severe jaw bone atrophy.

REVIEW OF LITERATURE

Over the years, controversy has existed between advocates of immediate implant loading and proponents of delayed protocols. Early research on immediate loading with root-form implants was conducted with vitallium screws in the 1930s by Alvin and Moses Strock and was often criticized for inducing fibrosis and increased implant failure. The two-stage surgical approach of Branemark, using a submerged healing period,became the treatment of choice for root-form implants from 1980 to 1990. Schnitman reintroduced the concept of immediate loading for completely edentulous patients in 1990. Tarnow also published a pilot study and expanded the procedure for fixed restorations in completely edentulous maxillae. These combined trials of 19 patients over a 9-year period have resulted in implant survival of over 93% (21 of 25 implants for Schnitman and 67 of 69 implants for Tarnow). Gerald Scortecchi evaluated the safety and efficacy of immediately loading a fixed implant-supported prosthesis without bone augmentation in moderately to severely resorbed, completely edentulous maxillae. Over a 41-month period, 783 titanium
implants (627 laterally inserted disk implants, with or without 156 axially inserted Structure implants) were placed in 72 consecutive patients with completely edentulous maxillae using an immediate loading protocol. After 6 months of function, the fixed restorations were removed and each implant status was verified using radiographs, Periotest evaluations, clinical osseointegration criteria, and torque testing at 20 N-cm. Six months postoperatively, 98% of the implants were radiologically and clinically osseointegrated. This clinical trial demonstrates that immediate loading of nonsubmerged, laterally inserted disk-design implants may provide adequate primary anchorage and long-term osseointegration in completely edentulous maxillae. 25 implants for Schnitman and 67 of 69 implants for Tarnow). 3

Gerald Scortecci4 evaluated the safety and efficacy of immediately loading a fixed implant-supported prosthesis without bone augmentation in moderately to severely resorbed, completely edentulous maxillae. Over a 41-month period, 783 titanium implants (627 laterally inserted disk implants, with or without 156 axially inserted Structure implants) were placed in 72 consecutive patients with completely edentulous maxillae using an immediate loading protocol. After 6 months of function, the fixed restorations were removed and each implant status was verified using radiographs, Periotest evaluations, clinical osseointegration criteria, and torque testing at 20 N-cm. Six months postoperatively, 98% of the implants were radiologically and clinically osseointegrated. This clinical trial demonstrates that immediate loading of nonsubmerged, laterally inserted disk-design implants may provide adequate primary anchorage and long-term osseointegration in completely edentulous maxillae.

IN RECENT YEARS, TWO SCHOOLS OF THOUGHT HAVE EMERGED IN THE AREA OF BASAL OSSEOSTEGATION

1. The French school of Scortecci and others favours restoring even severely atrophied mandibular ridges by using a large number of basal osseointegrated implants (BOI), usually 7 to 12 implants. This school combines BOI with screw implants, both in the maxilla and in the mandible. The implant systems thus established are immobile and do not allow jaw regions to change their relative orientation.

2. In the German-speaking countries there is a tendency to favour restoring the edentulous mandible using only a few BOIs, usually inserting four implants in regions 47, 43, 33, and 37, even when providing fixed dentures. This type of implant system is referred to as “flexible” because it permits mandibular shifts and flexion below the fixed superstructure, despite the fact that the load-transmitting segments of the basal implant osseointegrate. The long threaded pins between the load-transmitting osseointegrated disks and the bridge serve as flexible interfaces.

Several basal implant systems with different platforms are available today: internal systems that can be secured against rotation and that have an internal screw connection (Fig. 3) and external systems that do not have a rotation-protected external thread. (Fig. 4) With basal implants, the terms internal and external thus refer to the thread and not as with crestal implants to the type of the surfaces that protect against rotation.

ANTERIOR IMPLANTS

If sufficient vertical space is available, the implants used are usually the ones with two disks. The basal disk has a diameter of 9 or 10 mm, whereas the crestal disk is 7 mm in diameter. If the insertion of double disks fails due to the lack of available bone, a single BOI with a 7- to 9-mm diameter and shafts between 8 and 13.5 mm can be used instead.

POSTERIOR IMPLANTS

The implants used here are usually of a square shape, having a disk of 9 mm or 10 mm with shafts of 10 to 13.5 mm in length, depending on the desired vertical dimension and the available horizontal bone. The height of the disk itself is 0.6 mm: this allows the implant to participate in the flexion of the mandible and provides safe ground for the fixed bridge.

Maxillary arch: The number of necessary basal implants for a full maxillary reconstruction is between 4 and 12. Four implants require meticulous masticatory control, sufficient and good quality of bone in the strategic implant positions, as well as perfect patient compliance. The more implants are placed in the maxilla, the safer treatment develops. Due to the greater softness of the maxillary bone, it is recommended never to under-equip this jaw with implants, especially when loading it immediately.

Mandibular arch: As a rule, 2 to 3 implants can be inserted in the anterior segment, whereas one implant can be accommodated in each distal mandibular segment.

TEMPORARY BRIDGE

The existing complete denture is cut back to the bridge and cemented onto the abutments. In the absence of procedural obstacles or significant postoperative swelling, the definitive bridges are integrated as early as on the third or fourth postoperative day. Often a temporary bridge is not needed, further reducing the risk of wound edge contamination.

DEFINITIVE RESTORATION

The metal framework has to be exceedingly stable. To withstand the bending stress, it should preferably be cast from a nonnoble alloy. This ensures that ceramic material cannot chip off. Typical dimensions providing enough stiffness are 2.5mm width x 3mm height. The physiological movement of tubular bones such as the mandible involves significant travelling of the bone itself. Medial and caudal flexion will bend and twist the mandible by up to 2 mm. Hence Richter5 postulated that prosthetic structures in the mandible should always be divided into three parts. This prostodontic approach is supported for crestal implants, which osseointegrate and transmit loads along their vertical axis. In the case of Basal implants the vertical implant segments do not have to osseointegrate for it to be functional. It is only the basal horizontal load transmission surfaces that have to osseointegrate and transmit masticatory loads. The flexible threaded shaft between the basal disk and the prosthetic structure constitutes a perfectly serviceable interface that follows the torsion movements of the mandible.
Therapeutic Considerations for Overload Osteolysis

First and foremost, the prognosis of the implant must be determined according to the consensus on basal implants. As long as implant removal is not indicated, there are several therapeutic strategies that can be followed:
- First of all, it must be determined whether or not the masticatory pattern is evenly balanced and symmetrical. If this is not the case, the first therapeutic step must be aimed at achieving a bilaterally balanced situation with regard to bone mineralization tendencies.
- In some cases, extensive occlusal adjustment will therefore be required. Deficiencies in vertical dimension must be treated prosthodontically.

The development of anterior masticatory patterns must be prevented with all means and immediately. Existing anterior masticatory patterns can usually be corrected by increasing the vertical dimension; however, the optimum bite plane must be retained or created and this determines, in which jaw the addition has to be made.
- Furthermore, the question must be evaluated whether or not remineralization by way of self-healing or supported by a suitable therapy can be expected at the existing mobile implants. Possible therapeutic steps are temporary isolation of individual implants from the superstructure and thus facilitating remineralization of the bone surrounding these implants.
- If excessive parafunctional habits or nocturnal positional deviations of the mandible are suspected, the fixed denture can be replaced, permanently, temporarily or prophylactically, by a bar-supported denture. This type of denture is supposed to be removed by patients at night. This will help avoid peak nocturnal pressure on the bone/implant interface and result in a very stable direct fixation of the implants relative to each other. Masticatory shear forces will also be more favourably distributed between the bar and the denture interface and result in a very stable direct fixation of the implants relative to each other. Masticatory shear forces will also be more favourably distributed between the bar and the denture.

2) Infection: It spreads submucosally (fig 6) This may result in infected vertical parts if the implants are submerged below the mucosal level over time, eliminating the necessary gateway for suppuration as the area of penetration is closed with scar tissue. Any inflammation of this type will spread just like a submucosal abscess and is treated in the same way. It is recommended to make generous incisions to open the abscess. The mucosal area immediately adjacent to the threaded pin can be excised by electro surgery. In rare cases, reduction osteotomies or the replacement of implants will be required if vertical bone growth becomes excessive.

CONCLUSION
Immediate loading of laterally inserted disk-design implants with a fixed functional prosthesis is a safe and reliable method for management of the completely edentulous maxilla and mandible. With respect to the accepted principle “primum nihil nocere”, i.e. limiting treatment, basal implants are the devices of first choice, whenever (unpredictable) augmentations are part of an alternative treatment plan.

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LIST OF PHOTOGRAPHS

(Figure 1) A typical basal implant for lateral insertion (BOI® brand) with a stable base plate, reduced vertical implant portions, two integrated bending areas, reduced and polished mucosal penetration diameter

(Figure 2) A typical basal compression screw (BCS® brand) with large and polished threads, for cortical engagement

Fig 3: Internal BOI implants can have different platforms. Left: AnITI-compatible Diskos® implant with octagon. Right: A French “Diskimplant” with an external hex. These implants feature all advantages and disadvantages of screw implants with internal connection

fig 4: One piece external basal implants for cortical engagement in vertical or horizontal bone morphology.

Fig 5 Diagram showing a diffuse zone of low mineralization around the base plate of a functionally overloaded basal implant.

Fig 6: Submucosal spread of infections
ECO-FRIENDLY DENTISTRY: A REALITY
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ABSTRACT: Eco-friendly dentistry is a relatively new term and an emerging concept in dentistry. It is an approach that reduces the environmental impact of dental practice and provide dental care in an environmentally friendly way. The purpose of this review is to discuss various ways that a dentist can choose to make the office environmental friendly and conserve precious resources with all the options available today. Eco-friendly dentistry is quickly becoming the standard.

KEYWORDS: High-tech dentistry, Amalgam separator, Eco friendly, Toxic.

INTRODUCTION  
Eco-friendly dentistry is an approach to dentistry that implements sustainable practices by keeping resource consumption in line with nature's economy, by safeguarding the external environment by virtue of eliminating or reducing outgoing wastes and by promoting the well being of all those in the clinical environment by conscious reduction of chemicals in breathable air. Dentistry is a profession dedicated to promoting and enhancing the health and well being. To accomplish these goals dentist uses a variety of materials and equipments. Unfortunately, some of the materials that are currently in use including heavy metal and biomedical waste present potential challenges to the environment.†

CONCEPT OF ECO-FRIENDLY DENTISTRY  
1. Reduces dental waste and pollution  
2. Do high-tech dentistry  
3. Saves water, energy and money

DENTAL WASTE AND POLLUTION  
Following processes are responsible for most dental practice waste:  
- Infection control methods includes disposable barriers and sterilization items and toxic disinfectant  
- Placement and removal of mercury-containing dental material  
- Conventional x-ray systems

INFECTION CONTROL†  
Dental office infection control and sterilization processes can be a major source of pollution and waste in the traditional dental practice. Chemicals used in infection control and sterilization processes in dental office can be quite dangerous. They can jeopardize employee health, contribute to poor office air quality, and can pollute our community's water stream. Nontoxic alternatives for infection control and sterilization have the same or greater effectiveness in getting the job done, while protecting the health and safety of dental practitioners, patients, and our neighbourhoods.

IN THE ECO-FRIENDLY PRACTICE  
- Steam sterilization replaces chemical-based sterilization  
- Toxic cold-sterilization methods are eliminated  
- Eco-friendly disinfectants maintain a hospital-grade environment in the operatory  
  These eco-friendly options have the added benefit of eliminating that “dental chronic smell” that triggers “that dental office anxiety!”

ECO-FRIENDLY DENTAL CLINICS  
- Choose cloth lab coats  
- Use re-usable cloth patient barriers  
- Implement FDA-registered re-usable pouches and wraps for sterilization  
- Reduce the use of disposable in all dental office processes  
- Use a community's existing recycling programme to separately recycle paper and plastic autoclave bags.  
- Implement an eco-friendly sterilization program, which simultaneously eliminates the need for disposable autoclave wraps and disposable patient bibs.  
- Consider using less harmful surface disinfectants in dental offices, such as tea tree oil and thyme.  
- Reusable operating room cotton towels instead of disposable plastic or paper patient bibs.  
- Reusable stainless steel high and low volume, surgical/endodontic suction tips as an alternative to disposable plastic

DENTAL AMALGAM POLLUTION†+++  
Dental amalgam pollutes the environment in a variety of ways waste water for dental clinic, human waste, mercury vapour. Various consideration should be part of any effort to end the use of mercury in dentistry. Dental clinic that removed
the amalgam filling need an amalgam separator the equipment keeps mercury containing filling material from entering our water supply. Alternative to silver amalgam as a filling material are glass ionomers, indirect restorative dental materials dental ceramic, gold alloys, composites etc.

**CONVENTIONAL X-RAY POLLUTION**

Conventional x-rays create trash and toxic chemical-waste that the dental office is left to dispose of. The chemical fixers and lead foils from x-ray processes have to go somewhere, which often means public sewer systems.

**HEALTH RISKS OF X-RAY FIXER SOLUTIONS**

Traditional x-ray fixers contain chemicals such as Ammonium Thiocyanate and Boric anhydride. These chemicals are known to be skin, eye and respiratory tract irritants, and hazardous if ingested or inhaled. They also may be toxic to blood, thyroid, kidneys and liver and repeated or prolonged exposure can produce target organ damage.

They are toxic to fish, and have shown to cause adverse reproductive and developmental effects in animals with repeated exposure. Boric anhydride has been shown to have neurological impacts such as personality and mood changes, mania and even seizures. The products of the degradation of these materials are shown to be as toxic as the original product. Another by-product of traditional x-rays is lead foils. In the environment, lead waste is held in the topsoil, where it can remain for as long as 2000 years. It is readily picked up by plants, and enters our food system. Lead is a deadly neurotoxin. In most cases, there is a 1:1 correlation between the eco-friendly and the high-tech choice.

**TECHNIQUE EVOLUTION FOR WASTE REDUCTION**

Digital technologies offer early diagnosis, preventive therapies, and education that serve the needs of wellness lifestyle patients committed to maintaining long-term wellness and seeking to avoid invasive or expensive procedures. Many high-tech cosmetic practices see a boost in new patients and practices success when they recognize the eco-friendly value of their high-tech investments.

More High-Tech, Eco-Friendly, Wellness-Based Dental Technologies:
- Oral Detoxification with Laser Hygiene Technologies
- Digital Oral Cancer Screening
- Digital Impressions
- Digital Patient Charting
- On-site Biomedical Waste Disposal Systems
- CAD/CAM Systems in office laboratory restorations which is convenient completion of lab-quality restorations in single appointment, comfort of digital impressions and reduces greenhouse gases produced from patient and staff travel for multiple appointments, and the shipping of impressions and final restorations, sometimes as far as overseas which is useful for the patient as well as the environment.
- Instead of old x-ray machines prefer digital imaging (x-rays) which has instant image availability, improved image quality, enhanced diagnostic efficacy, minimal radiation exposure and it also eliminates toxic x-ray fixer solutions and lead foils which is useful for the patient as well as the environment.
- Use liquid crystal display (LCD) instead of cathode ray tube (CRT) computer monitors.

**SAVES WATER, ENERGY, AND MONEY**

Eco-friendly dentistry conserves precious resources both natural and monetary.

**WATER**

Clean, fresh water is one of our most undervalued dental supplies. We are in the habit of accessing fresh, clean, drinkable water at the flip of a wrist. But that convenience is misleading. The worldwide water crises threatens international health and stability. Green dental practices implement water-saving initiatives from encouraging patients to turn off the water while they brush, to save hundreds of gallons of water every day by investing in a dry vacuum suction system.

**ENERGY**

Reducing our energy use means simple things like changing out light bulbs and turning off equipment when not in use. It also means examining the carbon footprint of the materials and supplies we use, and extending the life of our high-energy-input supplies.

**MONEY**

Eco-friendly dentistry lowers supply costs, integrates high-tech innovations, and makes efficient use of staff time, reducing the overhead and increasing productivity for a very high overhead business. Most green dentists choose to invest those cost savings into high-tech diagnostic and good health that seeks to avoid emergency treatment.

**CONCLUSION**

Reducing waste, changing patterns of consumption and limiting the amount of adverse chemicals entering the breathable air of dental office are achievable and realistic goals. Dentist should take a leading role in society by implementing “Eco-friendly” initiatives to lessen their impact on the environment.

**REFERENCES**


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Sodium Hypochlorite: Complications and Management

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ABSTRACT: Sodium hypochlorite (NaOCl), a reducing agent, is a clear, straw coloured solution containing about 5% available chlorine. It is the most widely used irrigating solution. NaOCl on ionization produces hypochlorous acid and hypochlorite ion. These are responsible for the antimicrobial ability of the same. No unanimity of opinion exists as to which concentration of NaOCl can be used in root canal therapy. On the basis of published data, 0.5- 5.2% solution is an effective concentration for the use as an irrigant in the root canal. If the canal is filled with the solution during the entire cleaning and shaping procedures, the irrigant will act as an lubricant, solvent to the pulpal tissues and a potent antimicrobial of a no. of solution studied , none was more effective than 5.2% solution of NaOCl. However 2.5% concentration of the same is commonly employed as it decreases the potential for toxicity while maintaining some tissues dissolving and antimicrobial activity. The following article deals with the various accidents caused by misuse of sodium hypochlorite and their management.

KEY WORDS: Accident, irrigation, sodium hypochlorite(NaOCl), prevention.

INTRODUCTION
Irrigation with sodium hypochlorite (NaOCl) is an important adjunct used to accomplish this goal. One negative property of NaOCl is that it can cause soft-tissue inflammation if it is expressed outside the confines of the root canal. Clinically, this event manifests as pain and localized or widespread swelling. Various suggestion that have been made to prevent the occurrence of such an accident include marking the working length on the irrigation needle, keeping the needle loose in the canal, not using excessive force on the irrigation syringe, using a perforated needle tip, and keeping the needle in constant motion while irrigating. Although these suggestions are important and helpful, we wondered if following these techniques would prevent an NaOCl accident under all clinical conditions.

COMPLICATIONS OF ACCIDENTAL SPILLAGE
1) DAMAGE TO CLOTHING
Accidental spillage of sodium hypochlorite is probably the most common accident to occur during root canal irrigation. Even spillage of minute quantities of this agent on clothing will lead to rapid, irreparable bleaching. The patient should wear a protective plastic bib, and the practitioner should exercise care when transferring syringes filled with hypochlorite to the oral cavity.

2) EYE DAMAGE
Seemingly mild burns with an alkali such as sodium hypochlorite can result in significant injury as the alkali reacts with the lipid in the corneal epithelial cells, forming a soap bubble that may be blurring of vision and patchy colouration of the cornea. Immediate ocular irrigation with a large amount of water or sterile saline is required followed by an urgent refer ral to an opht hal mologist. The referral should ideally be made immediately by telephone to the nearest eye department. The use of adequate eye protection during endodontic treatment should eliminate the risk of occurrence of this accident, but sterile saline should always be available to irrigate eyes injured with hypochlorite. It has been advised that eyes exposed to undiluted bleach should be irrigated for 15 minutes with a litre of normal saline.

3) DAMAGE TO SKIN
Skin injury with an alkaline substance requires immediate irrigation with water or sterile saline is required followed by an urgent refer ral to an opht hal mologist. The referral should ideally be made immediately by telephone to the nearest eye department. The use of adequate eye protection during endodontic treatment should eliminate the risk of occurrence of this accident, but sterile saline should always be available to irrigate eyes injured with hypochlorite. It has been advised that eyes exposed to undiluted bleach should be irrigated for 15 minutes with a litre of normal saline.

4) DAMAGE TO ORAL MUCOSA
Surface injury is caused by the reaction of alkali with protein and fats as described for eye injuries above. Swallowing of sodium hypochlorite requires the patient to be monitored following immediate treatment. It is worth noting that skin damage can result from secondary contamination.
5) ALLERGY TO SODIUM HYPOCHLORITE

The allergic potential of sodium hypochlorite was first reported in 1940 by Sulzberger and subsequently by Cohen and Burns. Caliskan et al. presented a case where a 32-year-old female developed rapid onset pain, swelling, difficulty in breathing and subsequently hypotension following application of 0.5 ml of 1% sodium hypochlorite. The patient required urgent hospitalisation and management with intravenous steroids and antihistamines. A subsequent allergy skin scratch test performed two weeks after the patient was discharged confirmed a highly positive result to sodium hypochlorite. Even though allergy to sodium hypochlorite is rare, it is important for clinicians to recognise the symptoms of allergy and possible anaphylaxis. These may include urticaria, oedema, shortness of breath, wheezing (bronchospasm) and hypotension. Urgent referral to a hospital following first aid management is recommended.

COMPLICATIONS ARISING FROM HYPOCHLORITE EXTRUSION BEYOND THE ROOT APTEX

1) CHEMICAL BURNS AND TISSUE NECROSIS

When sodium hypochlorite is extruded beyond the root canal into the periradicular tissues, the effect is one of a chemical burn leading to a localized or extensive tissue necrosis. Given the widespread use of hypochlorite, this complication is fortunately very rare indeed. A severe acute inflammatory reaction of the tissues develops. This leads to rapid tissue swelling both intra orally within the surrounding mucosa and extra orally within the skin and subcutaneous tissues. The swelling may be oedematous, haemorrhagic or both, and may extend beyond the region that might be expected with an acute infection of the affected tooth.

Sudden onset of pain is a hallmark of tissue damage, and may occur immediately or be delayed for several minutes or hours. Involvement of the maxillary sinus will lead to acute sinusitis. Associated bleeding into the interstitial tissues results in bruising and ecchymosis of the surrounding mucosa and possibly the facial skin (Fig 3) and may include the formation of a haematoma. A necrotic ulceration of the mucosa adjacent to the tooth may occur as a direct result of the chemical burn. This reaction of the tissues may occur within minutes or may be delayed and appear some hours or days later. If these symptoms develop, urgent telephone referral should be made to the nearest maxillofacial unit. Patients will be assessed by the on call maxillofacial team. Treatment is determined by the extent and rapidity of the soft tissue swelling but may necessitate urgent hospitalization and administration of intravenous steroids and antibiotics. Although the evidence for the use of antibiotics in these patients is anecdotal, secondary bacterial infection is a distinct possibility in areas of necrotic tissue and therefore they are often prescribed as part of the overall patient management. Surgical drainage or debridement may also be required depending on the extent and character of the tissue swelling and necrosis.

2) NEUROLOGICAL COMPlications

Paraesthesia and anaesthesia affecting the mental, inferior dental and infraorbital branches of the trigeminal nerve following inadvertent extrusion of sodium hypochlorite beyond the root rsn et al. in 2005. In both cases, the buccal branch of the facial nerve was affected. Both patients exhibited a loss of the naso-labial groove and a down turning of the angle of the mouth. Both patients were reviewed and their motor function was regained after several months. Sensory and motor nerve deficit are not commonly associated with acute dental abscesses. As there is no other current evidence in the literature it is possible that these neurological complications were a direct result of chemical damage by sodium hypochlorite, but further research (including nerve conduction studies) is required.

3) UPPER AIRWAY OBSTRUCTION

The use of sodium hypochlorite for root canal irrigation without adequate isolation of the tooth can lead to leakage of the solution into the oral cavity and ingestion or inhalation by the patient. This could result in throat irritation and in severe cases, the upper airway could be compromised. Ziegler presented a case of a 15-month-old girl who presented in the accident and emergency unit with acute laryngotracheal bronchitis, stridor and profuse drooling from the mouth as a result of ingestion of a high concentration of household sodium hypochlorite. A similar clinical presentation might occur with the ingestion of any caustic substance. Opinion varies as to the best concentration of hypochlorite, with some practitioners using undiluted household bleach. Fibre optic nasalotracheal intubation followed by surgical decompression has been required to manage airway compromise arising within three hours of accidental exposure to sodium hypochlorite during root canal treatment (Fig 4).

PREVENTION

Preventive measures that should be taken to minimise potential complications with sodium hypochlorite

- Plastic bib to protect patient's clothing.
- Provision of protective eye-wear for both patient and operator.
- The use of a sealed rubber dam for isolation of the tooth under treatment.
- The use of side exit Luer-Lok needles for root canal irrigation.
- Irrigation needle a minimum of 2 mm short of the working length
- Avoidance of wedging the needle into the root canal.
- Avoidance of excessive pressure during Irrigation.

Emergency management of accidental hypochlorite damage

Eye injuries

- Irrigate gently with normal saline. If normal saline is insufficient or unavailable, tap water should be
used

➢ Refer for ophthalmology opinion

Skin injuries
➢ wash thoroughly and gently with normal saline or tap water

Oral mucosa injuries
➢ Copious rinsing with water
➢ Analgesia if required
➢ If visible tissue damage antibiotics to reduce risk of secondary infection
➢ If any possibility of ingestion or inhalation refer to emergency department

Inoculation injuries
➢ Ice/cooling packs to swelling first 24 hours
➢ Heat packs subsequently
➢ Analgesia
➢ Antibiotics to reduce the risk of secondary infection
➢ Request advice or management from Maxillofacial Unit

MANAGEMENT
Proper treatment, the experience can be traumatic and frightening for the patient. General practitioners should therefore take extra precautions to avoid such situations. The best treatment is always prevention. To prevent the adverse effects of NaOCl, consider the following steps:

1. THOROUGHLY EXAMINE THE TOOTH TO BE TREATED.
   A complete clinical and radiographic assessment of the tooth may reveal that the root canal system is complex enough to warrant referral to an endodontist for proper management.

2. ALWAYS USE ISOLATION: A RUBBER DAM IS THE MOST EFFECTIVE
   Barrier to protect the intraoral tissue from the damaging effects of NaOCl.

3. USE AN APEX LOCATOR TO CONFIRM THE WORKING LENGTH.
   After radiography, this is the most accurate and reliable method of determining the actual working length.

4. WHEN IN DOUBT, OBTAIN A RADIOGRAPH
   If you are encountering difficulty in locating the canals during canal preparation, stop and obtain another film. Be confident about the area you are working in.

5. USE PROPER NEEDLE TYPE AND SIZE.
   A smaller-bore, side-venting irrigating needle of a size appropriate for the prepared canal is recommended.

6. USE A PLASTIC STOPPER ON IRRIGATING NEEDLES.
   The binding point. A stopper can guarantee the position of the needle tip inside the canal system, where tactile sensation is limited.

7. USE AN APPROPRIATE METHOD TO DELIVER THE IRRIGATION SOLUTION.
   Use low, constant pressure, withdrawing the needle slightly from

CONCLUSION
Sodium hypochlorite accidents were relatively rare in endodontic practice. Such an event does not decrease the long-term endodontic prognosis for the involved tooth. Sodium hypochlorite accidents may be caused by additional factors other than faulty irrigation technique. Thus the use of sodium hypochlorite as an irrigant is beneficial apart from the rarest of the cases the probability of which again is very less.

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Advancement in Diagnostic Aids for Oral Premalignant Lesions: A Review

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ABSTRACT: Early diagnosis and treatment remains the key to improved patient survival. Because the scalpel biopsy for diagnosis is invasive and has potential morbidity, it is reserved for evaluating highly suspicious lesions and not for the majority of oral lesions which are clinically not suspicious. Simple visual examination, however, is well known to be limited by subjective interpretation and by the potential, albeit rare, occurrence of dysplasia and early OSCC within areas of normal-looking oral mucosa. As a consequence, adjunctive techniques have been suggested to increase our ability to differentiate between benign abnormalities and dysplastic/malignant changes as well as to identify areas of dysplasia/early OSCC that are not visible to naked eye. Diagnostic tests for early detection include toluidine blue, brush biopsy, Imprint biopsy, chemiluminescence, tissue Auto fluorescence, biomarkers and spectroscopy. The present paper reviews advance techniques used to improve premalignant and malignant lesion diagnosis.

KEYWORDS: Squamous cell carcinoma, Toluidine blue staining, Auto flouorescence, Brush Biopsy, Chemiluminescence, Spectroscopy

INTRODUCTION:

Cancer of the oral cavity is the sixth most common malignancy reported worldwide and one with the highest mortality rate among all malignancies. In India, oral cancer represents a major health problem accounting for up to 40% of all cancers, and is the most prevalent cancer in males and the third most prevalent cancer in females. It often arises from premalignant lesions such as Leukoplakia, Erythroplakia and Oral Lichen Planus (OLP). Detecting oral malignant and potentially malignant lesions in early stages dramatically affects survival rates. Unfortunately, 50% of patients have regional or distant metastases at the time of diagnosis, which reflects a significant diagnostic delay. Diagnosis of oral cancer at an early stage or at the pre-neoplastic level is critical to improve survival in oral squamous cell carcinoma patients. One major problem inherent in current oral cancer screening is that visual inspection often cannot differentiate between lesions harboring dysplasia and/or early cancer from those that do not. This is especially true for innocuous looking lesions which are subjected to “watchful waiting” and close follow-up despite the fact that some precancerous and cancerous cells within them remain undetected and are allowed to progress to a more advanced stage. The practice of not properly evaluating all suspicious lesions, that is, lesions without a specific etiology such as trauma or infection, invariably results in delay of the correct diagnosis, limiting treatment options.

By far clinical examination and histopathological studies have been used for detection of precancerous and cancerous lesions. As with other fields of medicine, in oral cavity diagnostic approaches are going toward noninvasive, simple, inexpensive, painless and accessible methods such as cytology, brush biopsy, toluidine rinses, chemiluminiscence devices, and auto fluorescence, spectroscopy. This paper reviews recent advances in techniques for detecting lesions early and predicting their progression or recurrence.

VITAL STAINING:

Toluidine blue, also known as tolonium chloride, is a vital dye, more commonly referred to as TB. It has been used for more than 40 years to aid in detection of mucosal abnormalities of the cervix and the oral cavity. It is used preferentially to tissues undergoing rapid cell division (such as inflammatory, regenerative and neoplastic tissue), that is believed to stain nucleic acids, DNA change associated with Oral premalignant lesions or both. The binding results in the staining of abnormal tissue in contrast to adjacent normal mucosa. Hence, it has been used for many years as an aid to the identification of clinically occult mucosal abnormalities and as a useful way of demarcating the extent of a potentially malignant lesion prior to excision. Analysis of current evidence suggests that TB is good at detecting carcinomas, but its sensitivity in detecting dysplasias is significantly lower. Furthermore, there remain a high percentage of false positive stains which impairs its use in primary care settings also as a valid screening mean.
In addition, controversy exists regarding the subjective interpretation. At present, TB is best used by experienced clinicians as an adjunct to clinical examination in the evaluation of the biologic potential of potentially malignant oral lesions.10-17

CHEMILUMINOSENSCENT DEVICES: (reflective tissue fluorescence)

The chemiluminescence technique serves the purpose of improving the identification, visualization, and monitoring of oral precancerous lesions, and consists of the emission of light from a chemical reaction between hydrogen peroxide and acetylsalicylic acid inside a capsule light stick. This reaction emits a blue/white light (430–580 nm) whose principle is based on the reflective properties of tissues that present cellular alterations such as a higher nuclear/cytoplasmatic rate. The “acetowhite” lesion is more defined and sharper, whereas the normal tissue is dark(Fig-1).18-23

This seems to be an easy, safe and noninvasive system capable of helping the dentist to better visualize lesions, as well as its edges. One disadvantage is that this system is expensive. Furthermore, chemiluminescent light seems to be nonspecific as it does not identify the lesion etiology—whether inflammatory, neoplastic benign, or neoplastic malign—and this could lead to unnecessary biopsies. The adjunctive use of T-Blue630 is a feature specific to the ViziLite-Plus system. T-Blue630 is the brand name for pharmaceutical-grade toluidine chloride, a toluidine blue dye. After using the ViziLite to identify abnormal “aceto-white” areas, T-Blue630 can be used to mark suspicious areas for further evaluation, e.g. biopsy.18, 24-25

VELSCOPE: (narrow-emission tissue fluorescence)

Tissue autofluorescence has been used in the screening and diagnosis of precancers and early cancer of the lung, uterine cervix, skin and, more recently, of the oral cavity. The concept behinds that it changes in the structure and metabolism of the epithelium, as well as changes of the subepithelial stroma, alter their interaction with light. Specifically, these epithelial and stromal changes can alter the distribution of tissue fluorophores and as a consequence the way they emit fluorescence after stimulation with intense blue excitation (400 to 460 nm) light. The autofluorescence signal is finally visualized directly by a human observer. Normal oral mucosa emits a pale green autofluorescence when viewed through the instrument handpiece whilst abnormal tissue exhibits decreased autofluorescence.10, 26, 27 This method uses a small optic fiber and consequently does not cover the entire mouth, so it is employed only for isolated lesions, lesion edge, and cancerization field determination.

Several studies have investigated the effectiveness of the VELScope system as an adjunct to visual examination for (i) improving the distinction between normal and abnormal tissues (both benign and malignant malignant changes), (ii) differentiating between benign and dysplastic/malignant changes, (iii) and identifying dysplastic/malignant lesions (or lesion’s margins) that are not visible to the naked eye under white light.10, 18, 15, 28

OPTICAL SPECTROMETRY:

A technique called autofluorescence spectroscopy has been recently tested in oral oncology research. The autofluorescence spectroscopy system consists of a small optical fiber that produces various excitation wavelengths and a spectrograph that receives and records on a computer and analyzes, via a dedicated software, the spectra of reflected fluorescence from the tissue. This can evaluate physical and biochemical properties of a specific oral site by analyzing the emitted fluorescence light, providing automated, noninvasive discrimination between benign and neoplastic epithelial lesions in many anatomic sites. Several small clinical series demonstrated that the fluorescence intensity from normal mucosa is generally greater than that from abnormal mucosa. Studies suggest that fluorescence spectroscopy can provide a simple, objective tool to improve in vivo identification of oral neoplasia. This technique has the clear advantage of eliminating the subjective interpretation of tissue fluorescence changes. However, the downside is that more variables (e.g. combination of wavelengths, methodology of fluorescence analysis etc). Overall, autofluorescence spectroscopy seems to be very accurate for distinguishing lesions from healthy oral mucosa, with high sensitivity and specificity, especially when malignant tumors are compared to healthy mucosa. However, the ability of the technique to distinguish and classify different types of lesion has been reported to be low. Moreover autofluorescence spectroscopy is for practical reasons not suitable to detect new lesions or to demarcate large lesions as the optical fiber can sample only a small mucosal area. This limits the use of spectroscopy to the evaluation of a well-defined small mucosal lesion that has been already identified through visual inspection, with the attempt to clarify its benign or (pre)malignant nature. Further research is needed to support this clinical application of autofluorescence.10, 28

BRUSH BIOPSY:

The Brush Biopsy (CDx Laboratories, Suffren, NY) was introduced as a potential oral cancer case-finding device in 1999. It is one of these new techniques emerging in the recent decade. It was designed for the interrogation of clinical lesions that would otherwise not be subjected to biopsy because the level of suspicion for carcinoma, based upon clinical features, was low. The oral brush biopsy, also known as OralCDx Brush Test system uses a specially designed brush that is used to obtain a transepithelial specimen, (sample of cells) from a mucosal lesion with representation of the superficial, intermediate and
parabasal/basal layers of the epithelium. This test was specifically designed to investigate mucosal abnormalities that would otherwise not be subjected to biopsy because of low-risk clinical features. A specially designed brush is thenon-lacerational device used for epithelial cell collection and samples are eventually fixed onto a glass slide, stained with a modified Papanicolaou test and analyzed microscopically via a computer-based imaging system. Results are reported as "positive" or "atypical" when cellular morphology is highly suspicious for epithelial dysplasia or carcinoma or when abnormal epithelial changes are of uncertain diagnostic significance respectively. 1.5, 10, 26

IMPRINT CYTOLOGY:

The use of frozen sections for intraoperative tissue diagnosis is well accepted, another method is the examination of imprint of fresh specimens. This technique was favourably reported by Dudgeon and Patrick (1927) and Bamforth and Osborn (1958), but not until recently has it achieved the recognition, despite its simplicity, speed, and excellent cellular detail, many centres are still not utilising the technique to its fullest extent. 29

A direct imprint is prepared by pressing a glass slide gently on to the freshly cut surface of the specimen, avoiding a gliding movement, which will distort the shape of the cells. The imprint slide is immediately fixed in 95% ethyl alcohol for 5-6 seconds and then stained (rapid haematoxylin and eosin). The entire procedure is completed during the freezing period of the tissue preparation; thus there is no delay in the completion of the frozen section. Depending on one's preference, a rapid polychrome dye, such as toluidine blue, can also be used on heat-fixed slides. The accuracy of the imprint method was assessed by comparing the imprint diagnosis with the corresponding paraffinsection diagnosis. The overall accuracy rate for this method was 93-8%, with a false-negative rate of 6% and a false-positive rate of 0.24%. 29

CONCLUSION:

At present, the utilization of these techniques in clinical practice is largely anecdotal and is principally directed to help experienced clinicians at improving their ability to detect dysplasia and premalignant lesions in high-risk individuals attending secondary and tertiary centers. Moreover, experienced surgeons use some of the described optic aids to improve the identification of a lesion's margins and extensions in the operatory setting, although it is not know then impact these techniques have on a patient's survival and risk of disease recurrence. Further research with clear objectives, well-defined population cohorts and sound methodology is required before supporting the extensive use of oral cancer diagnostic aids in both primary and specialty settings.

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LIST OF PHOTOGRAPHS

Figure-1 showing "Acetowhite appearance of the lesion
Figure-2a shows lesion prior to use of T blue
Figure-2b shows lesion after the use of T blue

Figure-3a showing lesion prior to use of velscope
Figure-3b Appearance following autofluorescence

Figure-4 The system probe was designed to be used in (gentle) optical contact with tissues, and incorporates two optical fibres, one to transmit the light into the tissue and the other one for collecting the scattered light from tissue; the two probes are built-in one bigger probe so the viewer can see only the latter. Placement of the probe in direct contact with the tissue avoids interference with specularly reflected light.

Figure-5 Use of oral Cdx brush
Use of Choukroun's Platelet Rich Fibrin in Oral Defects

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ABSTRACT: Tissue engineering relates to the cells and biologic mediators or matrix which could be implanted in patients to regenerate tissues. Among the great challenges in the development of bioactive surgical additives regulating inflammation and increasing healing, surgeons face complex tissue remodeling and the consequences on healing and tissue survival. The development of platelet concentrate technologies offers two new kind of fibrin adhesive, platelet-rich plasma (PRP) and Platelet rich Fibrin (PRF). The purpose of this article is to describe the second generation platelet concentrate called PRF over traditionally prepared PRP and the simplicity of preparation of PRF compared to PRP.

KEYWORDS: Platelet, Plasma, Platelet Rich Fibrin.

INTRODUCTION: Tissue engineering relates to the cells and biologic mediators in a synthetic or biologic matrix which could be implanted in patients to regenerate tissues. Tissue engineering composed of scaffolds (collagen, bone materials), signaling molecules (growth factors) & cells (fibroblast, osteoblast). These principles of tissue engineering have found widespread application in several branches of dentistry like oral & maxillofacial surgery, periodontics & oral implantology.

Among the great challenges in the development of bioactive surgical additives regulating inflammation and increasing healing, surgeons must face complex tissue remodeling phenomena and the consequences on healing and tissue survival. Although the use of fibrin adhesives in many field-related protocols is well documented from the past 30 years, it remained controversial owing to the complexity of the production protocols (for autologous adhesives) or risk of cross-infection (for commercial adhesives). The development of platelet concentrate technologies offers a new kind of fibrin adhesive, platelet-rich plasma (PRP). Because of legal restrictions on blood handling, a new family of platelet concentrate, which is neither a fibrin glue nor a classical platelet concentrate, appeared in France. This new biomaterial called as platelet-rich fibrin (PRF). Its production protocol attempts to accumulate platelets and the released cytokines in a fibrin clot. The platelet cytokine quantification in the PRF therefore constitutes a significant step in the understanding of this biomaterial, because these soluble molecules are key inflammation and healing mediators.

The purpose of this article is to describe the second generation platelet concentrate called PRF over traditionally prepared PRP and the simplicity of preparation of PRF compared to PRP.

FIBRIN: Fibrin is the activated form of a plasmatic molecule called fibrinogen. This molecule is present both in plasma and in the platelet α-granules and plays a determining role in platelet aggregation during hemostasis. It is transformed into a kind of biologic glue capable of consolidating the initial platelet cluster, thus constituting a protective wall along vascular breaches during coagulation. Being a soluble protein, fibrinogen is transformed into an insoluble fibrin by thrombin while the polymerized fibrin gel constitutes the matrix of the injured site. Fibrin also provides a matrix for the migration of fibroblasts and endothelial cells that are involved in angiogenesis and responsible for new tissue remodeling.

FIBRIN AND SURGICAL ADDITIVES: Despite advancements achieved in effective antihemorrhagic surgical techniques, finding hemostatic agents remains a persistent problem. There is a wide variety of hemostatic agents, such as collagen sponges, oxidized cellulose, and cyanoacrylate synthetic adhesives. Over a long period of time, fibrin adhesives have been criticized owing to the fact that they are blood-derived products. More simplified tools inherent to the production of autologous fibrin adhesives have recently been developed with the evolution in similar technologies such as PRP-type platelet concentrates.

PLATELET RICH PLASMA (PRP): Several studies have shown that bone regenerative
procedures may be enhanced by the addition of specific growth factors. Platelet-rich plasma (PRP) was proposed as a method of introducing concentrated growth factors PDGF, TGF-β, and IGF-1 to the surgical site, enriching the natural blood clot in order to expedite wound healing and stimulate bone regeneration. PRP platelet concentrates are blood-derived products used for the prevention and treatment of hemorrhages due to serious thrombopenia of central origin, such as medullary aplasia, acute leukaemia, etc. Thus they remain of very limited use.

A natural human blood clot contains 95% red blood cells (RBCs), 5% platelets, less than 1% white blood cells (WBCs), and numerous amounts of fibrin strands. A PRP blood clot, contains 4% RBCs, 95% platelets, and 1% WBCs. The classic PRP production protocol requires blood collection with anticoagulant, two steps of centrifugation, and artificial polymerization of the platelet concentrate using calcium chloride and bovine thrombin.

Since its introduction, PRP has been used in conjunction with different grafting materials in bone augmentation procedures. To date, no conclusions can be drawn regarding the bone regenerative effect of PRP.

**TECHNIQUE:**

a) Venous blood is taken with anticoagulant.

b) The first centrifugation (“soft spin”) allows the blood separation in 3 distinct layers. At the bottom of the tube, the RBC constitutes 55% of total volume. At the top of the tube, the acellular plasma layer made up of circulating plasmatic molecules (fibrinogen) and low in platelets. It is designated platelet-poor plasma (PPP) and constitutes 40% of total volume.

c) Between two layers, an intermediate layer constitutes only 5% of total volume and presents a characteristic buffy aspect that led to it being called "buffy coat." It will compose the major part of the future PRP.

d) Using a sterile syringe, aspiration of PPP, PRP, and some red blood corpuscles to be done. Then the material is transferred to another tube, without anticoagulant. This second tube will then undergo another centrifugation faster than before.

e) With a syringe, the major part of the PPP to be discarded, leaving just enough serum to place the concentrated platelets in suspension. The unit is then gently shaken to obtain a ready-to-use PRP.

f) PRP is then mixed with bovine thrombin and calcium chloride at the time of application, with the help of a mixing syringe. This polymerization will constitute a fibrin matrix with particularly interesting hemostatic and adhesive properties.

**PLATELET RICH FIBRIN (PRF):**
Platelet-rich fibrin (PRF), developed in France by Choukroun et al (2001), is a second generation platelet concentrate widely used to accelerate soft and hard tissue healing. Its advantages over the better known platelet-rich plasma (PRP) include ease of preparation and application, minimal expense, and lack of biochemical modification (no bovine thrombin or anticoagulant is required).

PRF is a strictly autologous fibrin matrix containing a large quantity of platelet and leukocyte cytokines. With its strong fibrin architecture and slow release of growth factors and glycoprotein over several days this natural bioactive membrane can enhance soft and hard tissue healing while protecting both surgical and grafted sites.

**PREPARATION AND CLINICAL APPLICATIONS OF PRF:**

PRF preparation requires an adequate table centrifuge and centrifugation done @ 2700 rpm for 10 minutes (Fig. 1), and a 24 gauge butterfly needle and 9 ml blood collection tubes. Blood is drawn into the tubes without anticoagulant and is immediately centrifuged. Within a few minutes, the absence of anticoagulant allows activation of the majority of platelets contained in the sample to trigger a coagulation cascade. Fibrinogen is at first concentrated in the upper part of the tube, until the effect of the circulating thrombin transforms it into a fibrin network. The result is a fibrin clot containing the platelets located in the middle of the tube, between the red blood cell layer at the bottom and acellular plasma at the top (Fig. 2). Pliers are inserted into the tube to gently grab the fibrin clot with attached RBC's (Fig. 3). Fibrin clots are transferred to sterile metal surface and RBCs are gently scraped away and discarded. The PRF clot is then placed on the grid in the PRF Box (Fig. 4) and covered with the compressor and lid. The PRF Box was devised to produce membranes of constant thickness that remain hydrated for several hours and to recover the serum exudate expressed from the fibrin clots which is rich in the proteins vitronectin and fibronecin. Figure 5 and 6 shows formation of PRF plug for better handling. Figure 7 shows complete coverage of graft and crest with 4 to 6 PRF membranes. Figure 8 shows placement of maxillary implants in reconstructed ridge. Figure 9 shows formation of healthy peri implant soft tissue.

**DISCUSSION:**

PRF is a matrix of autologous fibrin, which are embedded a large quantity of platelet and leukocyte cytokines during centrifugation. The intrinsic incorporation of cytokines within the fibrin mesh allows for their progressive release over time (7-11 days), as the network of fibrin disintegrates. PRF in the form of a platelet gel can be used in conjunction with bone grafts which offers several advantage including graft stabilization, bone growth and maturation, wound healing and hemostasis, and improves the handling properties of graft materials. The easily applied PRF membrane acts much like a fibrin bandage, serving as a matrix to accelerate the healing of wound edges.
According to Simonpieri et al., the use of this platelet and immune concentrate during bone grafting offers the following four advantages: First, the fibrin clot plays an important mechanical role, with the PRF membrane maintaining and protecting the grafted biomaterials and PRF fragments serving as biological connectors between bone particles. Second, the integration of this fibrin network into the regenerative site facilitates cellular migration, particularly for endothelial cells necessary for vascularization and survival of the graft. Third, the platelet cytokines (PDGF, TGF-β, IGF-1) are gradually released as the fibrin matrix is resorbed, thus creating a perpetual process of healing. Lastly, the presence of leukocytes and cytokines in the fibrin network can play a significant role in the self-regulation of inflammatory and infectious phenomena within the grafted material. From a fundamental point of view, it is still difficult to know if the addition of a fibrin clot really permits enhancement of new bone deposit. PRF contains platelet growth factors as well, but these cytokines seem to have a secondary role in the bioactivity of PRF. Therefore, PRF does not appear to enhance cellular proliferation in the long term, but may play an important role in the revascularization of the graft by supporting angiogenesis. It also provides a significant postoperative protection of the surgical site and seems to accelerate the integration and remodeling of the grafted biomaterial.

Use of PRF-
RF is used in soft tissue repair, for better healing and osteointegration in implant surgeries, plastic surgery, cartilage reconstruction and enhances bone formation.

CONCLUSION:
Early publications and clinical experience seem to indicate that PRF improves early wound closure, maturation of bone grafts, and the final esthetic result of the peri-implant and periodontal soft tissues. Literature pertaining to PRF was found in French and the material is being widely used in France. This biomaterial is easy and inexpensive to produce and therefore its systematic use during oral and maxillofacial surgery must be considered as relevant clinical option. The popularity of this material should increase considering its many advantages. In future, more histologic evaluations from other parts of the world are required to understand the benefits.

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LIST OF PHOTOGRAPHS

Fig.1

Fig.2

Fig.3

Fig.4

Fig.5

Fig.6

Fig.7

Fig.8

Fig.9
Machine Assisted Irrigation Agitation Techniques - A Review

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ABSTRACT: Effective irrigant delivery and its agitation is a prerequisite for successful endodontic treatment. Although this can be achieved through chemomechanical debridement but it is not possible to clean and shape root canal completely because of its complex anatomy. Even with the use of various nickel titanium rotary instruments only the body of the root canal can be reached, leaving canal fins, isthmuses and cul-de-sacs untouched. These areas act as reservoirs for tissue debris, microbes and their by-products, resulting in persistent periradicular inflammation. Thus, requiring irrigation to be essential part of endodontic treatment. The technological advancements in the last decade have brought to the forefront new agitation devices which provide soft tissue debridement, smear layer removal through various mechanisms of irrigant transfer, to provide better cleaning and shaping of the root canals. The objective of this review is to present an overview of machine assisted agitation techniques and critique of their debridement efficacy.

KEY WORDS: Agitation, Debris, Irrigation, Machine-assisted, Root canal.

INTRODUCTION
In the hierarchy of cleaning and shaping of root canal systems, root canal irrigants are indispensable aids in dissolving and activating organic debris and destroying microorganisms. It is well established that even with the use of rotary nickel-titanium instruments currently available, central body of the canal, canal fins, isthmus and cul-de-sacs remain untouched that harbors tissue debris, microbes and their by-products which might prevent close adaptation of the obturation material and result in persistent periradicular inflammation. Thus irrigation is the benchmark as it can reach where instruments cannot.

Protocol of effective irrigation comprises of 2 aspects, type of the irrigant and agitation technique. The former includes sodium hypochlorite, EDTA, CHX and normal saline. The latter includes manual agitation techniques and machine assisted agitation techniques.

Machine assisted agitation systems includes: Rotary brushes, Continuous irrigation during rotary instrumentation (Quantec – E irrigation system), Sonic irrigation, Ultrasomics, Pressure alternation devices, non instrumentation technique (NIT), Rinse endo, Endovac system and Other techniques.

ROTARY BRUSHES
A rotary handpiece–attached microbrush has been used by Ruddle to facilitate debris and smear layer removal from instrumented root canals. The brush includes a shaft and a tapered brush section. The latter has multiple bristles extending radially from a central wire core. During the debridement phase, the microbrush rotates at about 300 rpm, causing the bristles to deform into the irregularities of the preparation. This helps to displace residual debris out of the canal in a coronal direction.

Canal brush is an endodontic microbrush that has recently been made commercially available. This highly flexible microbrush is molded from polypropylene and might be used manually with a rotary action. However, it is more efficacious when attached to a contra-angle handpiece running at 600 rpm. A recent report by Weise et al showed, use of rotary brushes removed debris effectively from simulated canal extensions and irregularities.

CONTINUOUS IRRIGATION DURING ROTARY INSTRUMENTATION
The Quantec –E irrigation system is self-contained fluid delivery unit that is attached to the Quantec –E Endo system.

It uses a pump console, 2 irrigation reservoirs, and tubing to provide continuous irrigation during rotary instrumentation. According to Setlock et al, compared with needle irrigation, Irrigation with this results in cleaner canal walls and more complete debris and smear layer removal in the coronal third of the canal walls. However, these advantages were not observed in the middle and apical thirds of the root canal.

SONIC IRRIGATION
It is performed by using a Rispisonic file which is attached to a MM 1500 sonic handpiece after canal shaping. These files have a non uniform taper that increases with file size. They are barbed, so might inadvertently engage the canal wall and damage the finished canal preparation during agitation.

The EndoActivator System is a more recently
introduced sonically driven canal irrigation system. It consists of a portable handpiece and 3 types of disposable polymer tips of different sizes. Polymer tips are color coded small (yellow, 15/02), medium (red, 25/04), large (blue, 35/04). These tips are claimed to be strong and flexible and do not break easily. Because they are smooth, they do not cut dentin. It can effectively clean debris from lateral canals, remove the smear layer, and dislodge clumps of simulated biofilm within the curved canals of molar teeth. During use, the activation produces a cloud of debris that can be observed within a fluid-filled pulp chamber. Vibrating the tip, in combination with moving the tip up and down in short vertical strokes, synergistically produces a powerful hydrodynamic phenomenon. A possible disadvantage of the polymer tips used are radiolucent; therefore, it is difficult to identify them if part of a tip separates inside a canal. Presumably, these tips might be improved by incorporating a radiopacifier in the polymer.

ULTRASONICS

In 1980, an ultrasonic unit designed by Martin et al became commercially available for endodontic use. Compared with sonic energy, ultrasonic energy produces high frequencies but low amplitudes. Two types of ultrasonic irrigation are present, first type is combination of simultaneous ultrasonic instrumentation and irrigation (UI). The second type, often referred to as passive ultrasonic irrigation (PUI), operates without simultaneous instrumentation.

In ultrasonic irrigation it is difficult to control the cutting of dentin and so the shape of root canal. It resulted in Strip perforations and highly irregular-shaped canals. Therefore, UI is not generally perceived as an alternative to conventional hand instrumentation. During PUI, the energy is transmitted from an oscillating file or a smooth wire to the irrigant in the root canal by means of ultrasonic waves. The latter induces acoustic streaming and cavitation of the irrigant.

Two flushing methods might be used during PUI, namely a continuous flush of irrigant from the ultrasonic handpiece or an intermittent flush technique by using syringe delivering. In the intermittent flush technique, the irrigant is injected into the root canal by a syringe and replenished several times after each ultrasonic activation cycle. The amount of irrigant flowing through the apical region of the canal can be controlled because both the depth of syringe penetration and the volume of irrigant administered are known. This is not possible with the use of the continuous flush regime. Both flushing methods have been shown to be equally effective in removing dentin debris from the root canal in an ex vivo model when the irrigation time was set at 3 minutes.

PRESSURE ALTERNATION DEVICES

As it is very difficult for the irrigant to reach the apical portions of the canals because of air entrapment, when the needle tips are placed too far away from the apical end of the canals. Conversely, if the needle tips are positioned too close to the apical foramen, there is an increased possibility of irrigant extrusion from the foramen that might result in severe iatrogenic damage to the periapical tissues. Concomitant irrigant delivery and aspiration via the use of pressure alternation devices provide a plausible solution to this problem.

NON INSTRUMENTATION TECHNIQUE

Lucci et al introduced minimally invasive approach for removing canal contents and accomplish disinfection that did not involve the use of a file. This system consists of a pump, a hose, a special valve and connector that needs to be cemented into the access cavity. Cleaning action is provided by oscillation of irrigant solution at reduced pressure. It has been reported that it results in good cleaning of root canal in vitro.

VAPOUR LOCK EFFECT

Air entrapment by an advancing liquid front in closed-end microchannels is a well-recognized physical phenomenon. The ability of a liquid to penetrate these closed-end channels is dependent on the contact angle of the liquid and the depth and size of the channel. Under all circumstances, these closed-end microchannels will eventually be flooded after sufficient time (hours to days). This phenomenon of air entrapment and the time frame in which complete flooding occurs has practical clinical implications when irrigants are delivered by using syringe needles from the coronal or middle third of a root canal. Because endodontic irrigation is performed within a time frame of minutes instead of hours or days, air entrapment in the apical portion of the canal might preclude this region from contact or disinfection by the irrigant.

RINSE ENDO SYSTEM

The RinseEndo system (Du¨rr Dental Co) root canal irrigation device based on pressure-suction technology. With this system, 65 ml of a rinsing solution oscillating at a frequency of 1.6 Hz is drawn from an attached syringe and transported to the root canal via an adapted cannula. During the suction phase, the used solution and air are extracted from the root canal and automatically merged with fresh rinsing solution. The pressure-suction cycles change approximately 100 times per minute.

The manufacturer of RinseEndo claims that the apical third of the canal might be effectively rinsed, with the cannula restricted to the coronal third of the root canal because of the pulsating nature of the fluid flow. This system has been shown to be superior to conventional static irrigation in dentin penetration of a dye marker; however, a higher risk of apical extrusion of the irrigant was also observed.

ENDOVAC SYSTEM

In the EndoVac system (Discus Dental, Culver City, CA), a macrocannula or microcannula is connected via tubing to a syringe of irrigant and the high-speed suction of a dental unit. The plastic macrocannula has a size 55 open end with a .02 taper and is attached to a titanium handle for gross, initial flushing of the coronal part of the root canal. The size 32 stainless steel microcannula has 4 sets of 3 laser-cut, laterally positioned, offset holes adjacent to its closed end. This is attached to a titanium finger-piece for irrigation of the apical part of the canal by positioning it at the working length. The microcannula can be used in canals that are enlarged to size 35.
or larger. During irrigation, the delivery/evacuation tip delivers irrigant to the pulp chamber and siphons off the excess irrigant to prevent overflow. The cannula in the canal simultaneously exerts negative pressure that pulls irrigant from its fresh supply in the chamber, down the canal to the tip of the cannula, into the cannula, and out through the suction hose. Thus, a constant flow of fresh irrigant is being delivered by negative pressure to working length. A recent study showed that the volume of irrigant delivered by the EndoVac system was significantly higher than the volume delivered by conventional syringe needle irrigation during the same time period.  

**OTHER TECHNIQUES OF ROOT CANAL DISINFECTION**

- **Lasers**: It has been documented in numerous studies that CO2, Nd:YAG, Argon, and Er:YAG laser irradiation has the ability to remove debris and smear layer from the root canal walls following biomechanical instrumentation. A new endodontic side firing spiral tip (RCLase; Lumenis, Opus Dent, Israel) overcomes the disadvantage of the straight emission of the laser beam, and thus claims to enable cleaning of the root canal walls laterally.
- **Photoactivated disinfection**: An alternative approach to microbial killing in the root canal system by laser light involves the use of low power lasers to drive a photochemical reaction that produces reactive oxygen species, a technique termed photo-activated disinfection (PAD). By using exogenous photosensitisers such as tolonium chloride, killing of all types of bacteria can be achieved. In vitro studies of PAD have demonstrated its ability to kill photosensitised oral bacteria (E. faecalis), and more recently microbial killing in vivo in the root canal system has been demonstrated. While PAD can be undertaken as part of the routine disinfection of the root canal system, it also has potential use for eradicating persistent endodontic infections for which conventional methods have been unsuccessful.
- **Ozone**: It is a strong oxidant and is unstable at high concentrations. Heal Ozone by KaVo is a new system introduced for various applications including disinfection/remineralization of caries and endodontic disinfection. The unit looks like a standard handpiece with a protruding needle and a plastic/silicone cap that fits over and seals the access. The needle goes in the canal and provides the ozone.

**CONCLUSION**

Despite the plethora of studies on the effectiveness of various endodontic irrigant agitation regimens, it is noteworthy that none of the system is accurate that can increase clinical efficacy of the treatment outcome. There is a need to determine from a practice management perspective how these devices are perceived in terms of their practicality and ease of use. Understanding these fundamental issues is crucial for clinical scientists to improve the design and user-friendliness of future generations of irrigant agitation systems.
**Electronic Apex Locators**

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**ABSTRACT:** Success or failure of endodontic treatment depends, among other parameters, on an accurate determination of the working length. Electronic apex locators (EALs) are a routinely used procedure in endodontic practice; yet their accuracy has been reported to vary from 35% to 100%. The operating systems of the EALs (frequency or impedance quotient) and different investigative methodologies explain the higher accuracy obtained with the current generation of devices. It is difficult to draw conclusions on the basis of the results obtained with the new generation EALs because of research variables that can influence the results.

**KEYWORDS:** Apex locators, Endodontics, Root apex, Working length

**INTRODUCTION**

An electronic apex locator is an electronic device used in endodontics to determine the position of the apical foramen and thus determine the length of the root canal space. The apex of the root has a specific resistance to electrical current, and this is measured using a pair of electrodes typically hooked into the lip and attached to an endodontic file. The electronic principle is relatively simple and is based on electrical resistance; when a circuit is complete (tissue is contacted by the tip of the file), resistance decreases markedly and current suddenly begins to flow. According to the device this event is signaled by a beep, a buzz, a flashing light, digital readouts, or a pointer on a dial. Electronic apex locators reduce the number of radiographs required and assist where radiographic methods create difficulty. They may also indicate cases where the apical foramen is some distance from the radiographic apex. Other roles include the detection of root canal perforation. The development of the electronic apex locator has helped make the assessment of working length more accurate and predictable (Fouad & Reid 2000). This article reviews the development, action, use and types of electronic apex locators.

**HISTORY**

The original electronic apex locators operated on the direct current principle. A problem with these devices was that conductive fluids such as hemorrhage, exudate, or irrigant in the canal would permit current flow and therefore gave a false reading. Newer devices are impedance-based, using alternating current of two frequencies; these measure and compare two electrical impedances that change as the file moves apically. The benefit is that these devices are much less affected by fluid conductive media in the canal.

An electronic method for root length determination was first investigated by Custer (1918). The idea was revisited by Suzuki in 1942 who studied the flow of direct current through the teeth of dogs. He registered consistent values in electrical resistance between an instrument in a root canal and an electrode on the oral mucous membrane and speculated that this would measure the canal length (Suzuki 1942). Sunada took these principles and constructed a simple device that used direct current to measure the canal length. It worked on the principle that the electrical resistance of the mucous membrane and the periodontium registered 6.0 kΩ in any part of the periodontium regardless of the persons age or the shape and type of teeth (Sunada 1962).

**ELECTRONIC APEX LOCATORS GENERATIONS**

**THE FIRST GENERATION**

Also known as resistance based apex locators, measure opposition to the flow of direct current or resistance. The Root Canal Meter (Onuki Medical Co., Tokyo, Japan) was developed in 1969. It used the resistance method and alternating current as a 150 Hz sine wave. Pain was often felt due to high currents in the original machine, so improvements were made and released as the Endodontic Meter and the Endo Radar (Elettronica Liarre, Imola, Italy). These devices were found to be unreliable when compared with radiographs, with many of the readings being significantly longer or shorter than the accepted working length (Tidmarsh et al. 1985).

**THE SECOND GENERATION**

Also known as impedance based apex locators, measure opposition to the flow of alternating current or impedance. Second generation apex locators were of the single frequency impedance type which used impedance measurements instead of resistance to measure location within the canal. Impedance is comprised of resistance and...
Capacitance and has a sinusoidal amplitude trace. The property is utilized to measure distance in different canal conditions by using different frequencies (Inoue 1972). An increasing number of second generation apex locators were designed and marketed but all suffered similar problems of incorrect readings with electrolytes in the canals and also in dry canals.

THE THIRD GENERATION

Third generation apex locators are similar to the second generation except that they use multiple frequencies to determine the distance from the end of the canal. These units have more powerful microprocessors and are able to process the mathematical quotient and algorithm calculations required to give accurate readings.

The Endex/Api : The relative values of frequency response method detects the apical constriction by calculating the difference between two direct potentials picked up by filters when a 1 kHz rectilinear wave is applied to the canal. This was described by Saito & Yamashita (1990) and the method was used to develop the Api (also marketed as the Endex by Osaka Electric Co., Tokyo, Japan), the original third generation apex locator (Frank & Torabinejad 1993). The Api is able to measure lengths with electrolytes in the canal but needs to be calibrated in each canal. The main shortcoming of early apex locators (erroneous readings with electrolytes) was overcome by Kobayashi et al. (1991) with the introduction of the ratio method and the subsequent development of the self-calibrating Root ZX (J. Morita, Tokyo, Japan) (Kobayashi & Suda 1994). The ratio method works on the principle that two electric currents with different sine wave frequencies will have measurable impedances that can be measured and compared as a ratio regardless of the type of electrolyte in the canal. The capacitance of a root canal increases significantly at the apical constriction, and the quotient of the impedances reduces rapidly as the apical constriction is reached. Kobayashi & Suda (1994) showed that the ratio of different frequencies have definitive values, and that the ratio of rate of change did not change with different electrolytes in the canal. The change in electrical capacitance at the apical constriction is the basis for the operation of the Root ZX and its reported accuracy. Since its introduction, Root ZX has received considerable attention in the literature. It has become the benchmark to which other apex locators are compared, and maintains a 95% world market share for apex locators in use today (Lively 2003, personal communication).

There are several other third generation apex locators in use worldwide. These include the Justo or Justy II (Yoshida Co., Tokyo, Japan), the Mark V Plus (Moyco/Union Broach, Bethpage, NY, USA) and the Endy 5000 (Loser, Leverkusen, Germany).

THE FOURTH GENERATION

Bingo 1020/Ray-Pex 4 - The Bingo 1020 (Forum Engineering Technologies, Rishon Lezion, Israel) claims to be a fourth generation device and the unit uses two separate frequencies 400 Hz and 8 kHz similar to the current third generation units. The manufacturers claim that the combination of using only one frequency at a time and basing measurements on the root mean square values of the signals increases the measurement accuracy and the reliability of the device (Apex locator Bingo '1020' 1999). (Kaufman et al. 2002).

THE FIFTH GENERATION

5th generation apex locator was developed in 2003. It measures the capacitance and resistance of the circuit separately. It is supplied by diagnostic table that includes the statistics of the values at different positions to diagnose the position of the file. Devices employing this method experience considerable difficulties while operating in dry canals. During clinical work it is noticed that the accuracy of electronic root canal length measurement varies with the pulp and periapical condition (Kovacevic et al., 2006). So, pulp condition and periapical diseases should be considered to evaluate the relation between the pulp state and accuracy of electronic apex locators.

THE SIXTH GENERATION

Adaptive Apex Locator overcomes as the disadvantages of the popular apex locators 4th generation low accuracy on working in wet canals, as well as the disadvantages of devices Vth generation difficulty on working in dry canals and necessarily of compulsory, additional wetting. Adaptive Apex Locator continuously defines humidity of the canal and immediately adapts to dry or wet canal. This way it is possible to be used in dry and in additional wetted canals as well, canals with blood or exudates, canals with still not-extirpated pulp.

USES

Innovative uses for apex locators have been reported. All modern apex locators are able to detect root perforation to clinically acceptable limits and distinguish both large and small perforations (Fuss et al.1996) (Kaufman et al 1997). Azabal et al (2004) found Justy II was able to detect simulated horizontal fractures but was unreliable when measuring simulated vertical fractures. This aids in decision making and consideration of treatment of options (Nahmias et al 1983). Suspected periodontal and pulpal perforation during pinhole preparation can be confirmed by all apex locators as a patent perforation will cause the instrument to complete a circuit and indicate that instrument is beyond the apex (Ingle et al, 2002). Any connection between root canal and the periodontal ligament such as root fracture, cracks and internal/external resorption will be recognised by the apex locators which serves as an excellent diagram tool in these circumstances (Chong and Pittford 1994). Multiple function apex locators are becoming more common and several have vitality testing function. Combination electronic apex locators and electronic handpieces are also becoming common and are able to achieve excellent results with same accuracy as the stand-alone units (Steffen et al 1999).
ADVANTAGES AND DISADVANTAGES

**Apex locator**

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance</td>
<td>1. Easy to operate</td>
</tr>
<tr>
<td></td>
<td>2. Uses K-type files</td>
</tr>
<tr>
<td></td>
<td>3. Operates w/ RC Prep</td>
</tr>
<tr>
<td></td>
<td>4. Digital readout</td>
</tr>
<tr>
<td></td>
<td>6. Built in pulp tester</td>
</tr>
<tr>
<td>5. Operates with RC Prep</td>
<td>1. Requires a dry type environment.</td>
</tr>
<tr>
<td>6. Detects perforation</td>
<td>2. Files cannot contact the metal restorations</td>
</tr>
<tr>
<td>7. Operates with RC Prep</td>
<td>3. There should be no caries or defective restorations</td>
</tr>
<tr>
<td></td>
<td>4. Requires calibration</td>
</tr>
<tr>
<td></td>
<td>5. Requires a lip clip with good contact.</td>
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<tr>
<td></td>
<td>6. Patient sensitivity</td>
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<td></td>
<td>7. Should use a file that fits the canal snugly.</td>
</tr>
<tr>
<td></td>
<td>8. Perforations can give false reading.</td>
</tr>
<tr>
<td></td>
<td>9. Contraindicated in patients w/ pacemakers.</td>
</tr>
</tbody>
</table>

APEX LOCATOR IMPEDANCE TYPE

**ADVANTAGES:**
1. Operate in fluid environment
2. Analogue meter
3. No patient sensitivity
4. Operates with RC Prep
5. No lip clip
6. Low voltage electrical output

**DISADVANTAGES:**
1. Requires calibration
2. Requires coated probes.
3. Can not use files.
5. Difficult to operate.

FREQUENCY TYPE

**ADVANTAGES:**
1. Easy to operate
2. Operates in fluid environment
3. Uses K-Type files
4. Analogue read-out
5. Operates with RC Prep
6. Low voltage electrical output

**DISADVANTAGES:**
1. Must calibrate each canal
2. Sensitive to canal fluid level
3. Needs fully charged battery

CONCLUSION

No individual technique is truly satisfactory in determining endodontic working length. The CDJ is a practical and anatomic termination point for the preparation and obturation of the root canal and this cannot be determined radiographically. Modern electronic apex locators can determine this position with accuracies of greater than 90% but still have some limitations. Knowledge of apical anatomy, prudent use of radiographs and the correct use of an electronic apex locator will assist practitioners to achieve predictable results.

REFERENCES


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Email: peekie20@gmail.com
LIST OF PHOTOGRAPHS

Fig a: EAL Gen 1

Fig b: EAL Gen 2

Fig c: EAL Gen 3

Fig d: EAL Gen 4

Fig e: EAL Gen 5

Fig f: EAL Gen 6
Pemphigus Vulgaris- A Case Report

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INTRODUCTION:

Pemphigus refers to a group of rare chronic mucocutaneous diseases characterized by painful lesions caused by intraepidermal acantholytic structures in the skin and mucous membrane. The exact nature of the disease remains unknown. Pemphigus vulgaris (PV) is characterized by intra-epithelial bulla formation that result from breakdown of the cellular adhesion between epithelial cells.

Literature reveals similar prevalence between sexes. In 1964 autoantibodies against keratinocyte surfaces were described in patients with pemphigus. The disease has two known types – pemphigus vulgaris and pemphigus foliaceus. Although there has been reports of children with this condition. It is usually seen between 5 – 7 years of age. The mucosal lesions of PV are located most frequently in the oral and pharyngeal mucosa; however, the conjunctiva, larynx, nasal mucosa, vulva, vagina, cervix may be involved. The bullous lesions are painful, slow to heal and show a tendency to become invasive. Although any part of the oral cavity may be affected, the soft palate, buccal mucosa and lips are the most common sites.

However, it is generally accepted that disease such as lichen planus and pemphigoid lesions sometimes show similar clinical appearance. In the literature, there have also been reports several other disorders manifesting DG including psoriasis, dermatitis, herpeticiformis, chronic ulcerative stomatitis, erythema multiforme, epidermolysis bullosa and Kindler syndrome. Similar appearances may be seen in reaction to dental materials, mouth washes and medications, and in lupus erythematosus, Crohn's disease, sarcoidosis and leukemia.

Definitive diagnosis cannot be achieved with clinical examination alone, as several other vesiculobullous and ulcerative lesions have a similar appearance. Incisional biopsies are required. Clinical and experimental observations indicate that circulating autoantibodies are pathogenic. An immunogenetic predisposition is well established. Blisters in PV are associated with the binding of IgG autoantibodies to keratinocyte cell surface molecules. These intercellular or PV antibodies bind to keratinocyte desmosomes and to desmosomes free areas of the keratinocyte cell membrane.

In the absence of systemic treatment, the oral lesions are almost invariably followed by the involvement of skin, and occasionally other epithelial surfaces such as oesophagus. Unless there are localized oral lesion in which case treatment with tropical corticosteroids suffices for a time, systemic corticosteroids (eg prednisolone) are essential sometimes administered intravenously. Once the condition is under control, the dosage of prednisolone can be reduced.

Adjuncts alternatives include azathioprine, cyclosporine, cyclophosphamide, dapsone, levimisole,

ABSTRACT: Pemphigus vulgaris is a chronic autoimmune mucocutaneous disease that initially manifests in the form of intra oral lesions, which spread to other mucous membrane and skin. The etiology of pemphigus vulgaris is still unknown. The pemphigus group of disease is characterized by the production of autoantibodies against intercellular substances and is thus classified as autoimmune disease. Most patients are initially misdiagnosed and improperly treated for many months or even years. Here we report a case of pemphigus vulgaris in a 50 year old male patient who reported to department of oral medicine and radiology with a complain of chronic oral ulcer.

KEY WORDS: Pemphigus Vulgaris, Oral Cavity, Autoimmune Disease.
dysphagia. Affecting the pharynx, larynx and oesophagus producing (up to 70% of cases) and it is the only site affected in over level. In PV the oral mucosa is the first site to be involved pemphigus foliaceus the bulla formation occurs at higher spinosum, creating a suprabasal cleft, whereas in PV the oral mucosa was healed without scarring.

**DISCUSSION:**

In PV acantholysis occurs deep in the stratum spinosum, creating a suprabasal cleft, whereas in pemphigus foliaceus the bulla formation occurs at higher level. In PV the oral mucosa is the first site to be involved (up to 70% of cases) and it is the only site affected in over 50% of patients. Distal extension can occur in PV, affecting the pharynx, larynx and oesophagus producing dysphagia.

Unfortunately the high doses and prolonged administrations of corticosteroids that are often needed to control the disease result in several side effects, many of which are serious and life threatening.

**CASE REPORT:**

A 50 year old male patient visited to the Department of Oral Medicine and Radiology with a chief complaint of painful ulcerative area on the right buccal mucosa since last 10 months. The patient reported that the ulcer cause discomfort and affected his normal oral function. Patient reported that he was under treatment for the same in some local hospital but showed no improvement.

Personal and family history was uneventful. On intraoral examination ulcer was seen on the buccal mucosa, with irregular border. It measured approximately 1.5X2 cm. It was about 1.5 cm deep. The overlying mucosa was punched out and ulcerated. On extra oral examination skin lesions were seen on the side of neck and under arms. It was approximately 0.5X0.5 cm. The overlying mucosa rubbed off on rubbing. On the basis of history and clinical examination a provisional diagnosis of pemphigus vulgaris was given. A differential diagnosis of chronic ulcer and pemphigoid was given. A biopsy was taken from the right buccal mucosa from the periphery of the lesion involving normal and ulcerated mucosa and was sent for histopathological examination. Histological finding in the case were characterized by parakeratinised stratified squamous epithelium. Predominant subepithelial split was evident with few areas showing detachment of epithelium overlying connective tissue. Inflammatory component was evident within the stroma. On the basis of histological findings, final diagnosis of pemphigus vulgaris was given.

Initially prednisolone 80 mg was given. Tab Pan D 20mg was given for stomach acidity caused by steroids. For skin lesions gentian violet was given for topical application once in two days. Patient was recalled after 14 days. Prednisolone was decreased by 10 mg in the following week. At the end of 7th week prednisolone was decreased by 30 mg. After 6 months of treatment the cheek mucosa was healed without scarring.

In pemphigus vulgaris, lesions at first comprise small asymptomatic blisters, although these are very thin—walled and easily rupture giving rise to painful and haemorrhagic erosions. In most cases (70 – 90%), the first sign of disease appear on the oral mucosa. While the lesions can be located anywhere within the oral cavity, they are most often found in areas subjected to frictional trauma mainly in the tongue, palate and lower lip. The ulcerations may affect other mucous membrane including the conjunctiva, nasal mucosa, pharynx, larynx, oesophagus and genital mucosa, as well as the skin where intact blisters are commonly seen. In the present case, the oral lesions were the first manifestation of the disease mainly cheek mucosa. The diagnosis is generally based on the oral manifestations, while confirmation is provided by the histological findings, which shows the presence of intraepithelial blisters, acantholysis and Tzanck cells. In our case, a biopsy of the intraoral lesion was obtained.

Most patients could be initially misdiagnosed, usually as erythema multiforme, erosive lichen planus or oral candidiasis, and may be improperly treated for months or even years.

Other dermatological diseases associated with large bullae on the oral mucosa which are identified as differential diagnosis of pemphigus vulgaris, should be ruled out. One of them is pemphigoid, the bullous dermatitis of autoimmune origin that is relatively uncommon. It may accompany as a facultative paraneoplastic dermatosis, an underlying malignant disease. The oral mucosa is affected around in every fifth patient. The oral lesion does not precede dermatological symptoms. The bullae on the mucosa are smaller, their duration is short, and remaining erosions heal relatively fast without scars.

Oral signs are always missing in other bullous diseases such as pemphigus erythematosus, pemphigus foliaceus or pemphigus benignus familiaris chronicus. Hailey which is important for differential diagnosis.

The initial aim of treatment is to reduce disease remission. This should be followed by a period of maintenance treatment using the minimum drug doses required for disease control in order to minimize their side effects.

Systemic oral corticosteroids are the treatment of choice in the treatment of pemphigus vulgaris. Topical steroid therapy alone is insufficient for sustained control of the disease because of the systemic autoimmune characteristics of PV. There is no consensus regarding the initial steroid dosage needed to produce remission and its effect on the subsequent course of the disease, but it is generally agreed that low doses (below 60 mg/day) usually do not suffice to induce initial control. In the mild localized lesions of oral mucous membrane pemphigus in patients with low titres of circulating auto antibodies may be controlled at least temporarily, with topical corticosteroid
rinses and cream, including clobetasol propionate. Intralesional triamcinolone may be used for resistant local lesions.

PV is a chronic autoimmune mucocutaneous disease that primarily involves the oral cavity. Therefore diagnosis of periodontal lesion is very important in facilitating early treatment of PV. Although there is no consensus regarding the initial steroid dosage needed to induce remission, it is suggested that administration of high dose corticosteroids may cause fatal complications.

CONCLUSION:

Pemphigus vulgaris is rare with reported incidence of 0.1-0.5 cases per 100,000 individuals worldwide per year. It is slightly predominant in women and primarily manifest in adults during the fifth and sixth decade in life. Juvenile cases have been reported, but are rare. In the majority of patients, pain, mucous membrane erosions are the presenting sign of PV and may be the only sign of PV for an average of 5 months before skin lesions develop.

Morbidity and mortality are related to the extent of the disease, the maximum dose of systemic steroids required to induce remission, and the presence of other diseases. Prognosis is worse in patients with extensive disease and in older patients.

REFERENCES:


LIST OF PHOTOGRAPHS

Fig. 1 Intra Pre-Operative oral photograph

Fig. 2 Lesions on the skin

Fig. 3 Post Treatment photograph
Aneurysmal Bone Cyst Of The Mandible With Unusual Presentation - A Case Report

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ABSTRACT: Aneurysmal bone cyst (ABC) is an uncommon lesion which has been found in most bones of skeleton, although the majority occurs in the long bones and in the spine. Among all the cystic lesions that can be found at the mandible or the maxilla it is very rare. This lesion represents less than 1% of all the bone cysts biopsied. The rare jaw lesions are encountered in the body and ramus of the mandible. Commonly reported in the second and third decade of life, ABC's are characterized by a rapid growth pattern with resultant bony expansion and facial asymmetry. Although ABC is a benign lesion, it can behave locally in an aggressive manner because of its rapid growth and osteolytic capacity. The literature contains conflicting reports on the clinical and radiological features of ABC of the jaws. The radiographic appearance of ABC varies from a unicystic radiolucency or moth-eaten radiolucency to an extensive multilocular lesion. This paper describes a case of ABC in a 20 years old male patient affecting the body of the mandible. Treatment consisted of surgical curettage of the lesion. A brief review of existing literature on ABC is also made.

KEY WORDS: Aneurysmal Bone Cyst, Pseudocyst, Reactive Lesion, Mandible, Multinucleated

INTRODUCTION

Aneurysmal bone cyst (ABC), is a rare non epithelialized pseudocyst of jaws. They represent about 1.5% of all nonodontogenic and nonepithelial cystic of the jaws. Considering all types of jaw cysts the ABC is extremely rare with 0.5%. It was first described by Jaffe and Lichtenstein in 1942. They can usually be found in the metaphysis of the long bones, mainly in the “tibia and the femur”. The average age of occurrence is 13 years and 80% of patients are less than 20 years old with no gender predilection. The WHO defines ABC as a benign intra-osseous lesion, characterized by blood- filled spaces of varying size associated with a fibroblastic stroma containing multinucleated giant cells, osteoid and woven bone. The characteristic radiological features of ABC in the long bones are well documented as a well-defined expansile radiolucent lesion surrounded by a thin overlying cortex. In contrast the descriptions of ABC in the jaws are conflicting and vary from mainly a unilocular radiolucency to a ‘ballooned out' multilocular radiolucency with a honeycomb or soap-bubble appearance.

CASE REPORT

A 20 years old male patient reported to the Department of Oral Medicine and Radiology with a chief complaint of swelling and pain on left side of face since 1 month. The patient was asymptomatic 1 month back after which swelling occurred. Initially the swelling was small in size and had gradually increased to the present size. It was also associated with altered sensation. The patient also had difficulty in eating food. The patient's medical and family history was unremarkable and there was no history of trauma. On extra-oral examination, facial asymmetry was apparent with a solitary diffuse swelling on the left side of mandible, measuring approximately 3×2 cm in its greatest dimensions. It extends anteroposteriorly, 2 cm away from tragus of ear to angle of mouth and superoinferiorly from a line joining tragus of ear to angle of mouth to lower border of mandible. On palpation it was tender and firm with normal overlying skin. (Fig. 1)

On intraoral examination, generalised grade I stains and calculus were present. An ill-defined growth was present on the buccal aspect of 35, 36, 37 and 38 with vestibular obliteration, roughly oval in shape, measuring approximately 3×1 cm in its greatest dimensions, extending from mesial aspect of 35 to the retromolar region. The overlying mucosa appears pink with purulent discharge.(Fig.2) On palpation, it was tender, soft in consistency and was associated with pus discharge. Grade II mobility was present w.r.t 36, 37, 38

Considering the history and the clinical examination, provisional diagnosis of chronic suppurative osteomyelitis was made.

In investigations, IOPAR and panoramic view were taken. (Fig. 3,4) The intra oral periapical radiograph shows ill defined radiolucency on the disto-proximal surface of 36 suggestive of grossly carious tooth. Loss of lamina dura was seen at the apex of the mesial and distal roots. An ill defined radiolucency was seen at the apex suggestive of periapical pathology. Horizontal bone loss was seen on the distal aspect of tooth. W.r.t 37, crown appears normal, loss of lamina dura was seen along the mesial and distal aspects and apex of mesial and distal roots. An ill-defined radiolucency was seen in the apical region suggestive of periapical pathology. Horizontal bone loss was seen on the mesial and distal aspect of tooth. W.r.t 38, the crown appears normal with loss of lamina dura on mesial aspect of mesial root. Bone loss was seen on the mesial aspect of tooth.

Panoramic radiograph revealed a single unicocular lesion with ill defined borders, roughly oval in shape, approximately 2.5×1 cm
in its greatest dimensions, extending from distal aspect of 34 to the mesial aspect of 38. No root resorption was evident. The internal structure comprises of mixed radiolucent and radiopaque lesion. On the basis of the radiographic features a radiographic diagnosis of chronic osteomyelitis was made. The lesion was surgically excised and was sent for histopathologic examination. The microscopic features show predominant bony trabeculae with osteocytes within it and osteoblastic rimming. Few areas show fibrocellular stroma with predominant cystic spaces filled with extravasated RBCs. Multinucleated giant cells were evident with inflammatory component. These microscopic features were suggestive of ossifying fibroma with secondary changes of Aneurysmal bone cyst.

DISCUSSION

Aneurysmal bone cyst is usually considered to be a reactive lesion of the bone rather than a cyst or true neoplasm. Most believe that ABC is the result of a vascular malformation within the bone. The cause of the malformation is however a topic of controversy. It is not clear whether the lesion is primary or occurs in a preexisting bone lesion. Eighty percent of the ABCs occur in patients below 20 years of age with no gender predilection. However, studies have claimed a slight female preponderance. ABC is most common in those regions of the skeleton where there is a relatively high venous pressure and high marrow content. This explains its rare occurrence in the skull bones in which there is low venous pressure. However, when present, the mandible is most commonly affected (mandible-maxilla ratio 3:1), with a higher predilection for molar and ramus region. ABC is extremely variable in clinical presentation, ranging from a small, indolent, asymptomatic lesion to rapidly growing, expansive, destructive lesion causing pain, swelling, deformity, neurologic symptoms, pathologic fracture and perforation of the cortex. The radiological features of ABC in the jaws are quite conflicting; they may appear as a unilocular or multilocular radiolucency with expansion and thinning of the surrounding cortical bone, appears cystic resembling a honeycomb or soap bubble appearance since it may be traversed by thin bony septa. The periphery is usually well defined and the shape is circular or “hydraulic”. After an ABC becomes large, there is propensity for extreme expansion of the cortical plates and it can displace or resorb teeth. A characteristic radiographic feature of ABC is the “ballooning” distention of periosteum with a thin outline of reactive, subperiosteal bone. Histologically, ABC consists of a fibrous connective tissue stroma with numerous blood filled caverns of sinusoids, multinucleated giant cells and osteoid. Hemosiderin is present in variable amounts and osteoid and bone formations are variable. Since a normal epithelial lining is lacking, the lesion is also referred to as pseudocyst. The treatment of the ABC is determined by the nature of any associated lesion. There is no uniform treatment and management of ABC due to its varied nature. The usual treatment of choice is curettage as it is a benign lesion. The failure to remove the lesion completely has been associated with a recurrence, although there has been a report of a case whereby the lesion regressed spontaneously. Some authors have also recommended supplementing curettage with cryotherapy. The defect can be filled up with bone chips prior to cryosurgery. Segmental resections are performed with immediate bone grafting if the lesions have been found to be extensive and cause functional and cosmetic deformities. Radiation is not recommended as sarcomatous change has been reported in these lesions after irradiation. A high recurrence rate of 53–66% has been reported for ABC in the jaws. Therefore, a close follow-up of the cases is recommended.

CONCLUSION

Aneurysmal bone cyst of the jaws represents an enigmatic pseudocyst with variable clinicopathological, histological and radiographic presentations, therefore, often posing a diagnostic dilemma. As the radiological features of ABC are varied, resembling many lesions, histopathologic analysis is a must for the diagnosis.

REFERENCES


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LIST OF PHOTOGRAPHS

Fig 1: Extraoral swelling on left side of face

Fig 2: Intraoral Photograph

Fig 3: Intra Oral periapical Radiograph irt 36, 37, 38

Fig 4: Panoramic view
Prosthodontic Management of Resorbed Mandibular Ridges: A Simplified Approach

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ABSTRACT: Treating the highly resorbed mandibular ridge is a challenging job for prosthodontists. This article presents a case report on neutral zone technique used for treating a completely edentulous patient with resorbed ridges. It emphasizes on using materials available by the chairside to make impressions for resorbed ridges and to locate the neutral zone.

KEY WORDS: Neutral zone, Residual ridge, McCord's technique, Edentulous, Prosthetic.

INTRODUCTION

The basic objectives of Complete Denture Prosthodontics are the restoration of function, facial appearance and the maintenance of patient's health. As the age advances, the supporting bony tissues undergo resorption to a greater or lesser degree, with the potential for constant excessive atrophy due to less efficient osteoblasts, declined estrogen production, and overall reduction of calcium absorption from the intestine.1

Providing complete denture therapy to patients with atrophic residual ridges is challenging. These patients suffer ongoing diminution of denture foundation.2

Modern approaches involve the use of dental implant therapy as a means of improving the denture foundation and supplementing the mechanics of prosthesis support, retention and stability. But there are many systemic conditions that potentially affect implants and the tissues carrying them. Several authors have identified diseases for which dental implants are not recommended, or are at least questionable.3,4

This article tries to present a novel method to gain maximum retention and stability in cases of severely resorbed ridges by simple usage of materials available by the chair side with every dental clinician.

CASE REPORT

A 78 year old male patient (Fig 1) reported to the Department of Prosthodontics and Implantology, Institute of Dental Sciences, Bareilly with a chief complaint of difficulty in mastication and speech. Patient is edentulous since 30 years. Recently he felt increased inefficiency in chewing and speech. Hence, he has came to us for necessary treatment.

On clinical examination, the patient had no gross facial asymmetry. The TMJ, muscles of mastication and facial expression were asymptomatic. On intraoral examination the maxillary and mandibular arches were completely edentulous. No gross abnormalities were detected in the overall soft tissue of the lips, cheeks, tongue and oral mucosa. The maxillary and mandibular arches were severely resorbed (Atwood's class V) with shallow sulcus depth (Fig 2 & 3).

The objective of the treatment was to rehabilitate the patient with complete denture therapy by locating the neutral zone and accordingly arrange the denture teeth and contour the complete denture polished surfaces in order to achieve maximum prosthesis stability, comfort and function.

TREATMENT PROCEDURE:

1) The primary impression of maxillary denture bearing area were made with the impression compound. Custom trays are fabricated in autopolymerizing resin on the primary cast.

Border moulding was done with green stick and final impression was made in light-bodied elastomeric impression material (Fig 8).

2) As the mandibular residual alveolar ridges were severely resorbed and the sulcus depth was very shallow, a good primary impression with impression compound was difficult to achieve. To overcome this problem following impression making method was planned.

a) A preliminary impression of the mandibular residual ridges were made with McCord's Technique (3 parts impression compound + 7 parts greenstick) (Fig. 4). The impression is washed and poured with the dental plaster. The cast is retrieved and a double thickness full space is adapted and a custom tray was fabricated (Fig 5).

b) A preliminary impression was made using Addition silicone elastomeric impression material of putty consistency and poured in dental plaster (Fig 6). A special tray was fabricated with a full spacer (Fig 7).

c) The special tray was trimmed and checked in the patient's mouth, border molded with green stick and final impressions were made in addition silicone elastomeric impression material of light- bodied consistency (Fig 8).
3) On the master casts record bases and wax occlusal rims were fabricated. Maxillo-mandibular relations were recorded and mounted on an articulator.

4) The wax rims were cut at three places at first molar and central incisor regions (Fig 9) and replaced with autopolymerizing resin. These resin pillars will now act as vertical occlusal stops.

5) Now the remaining wax rim is completely removed and is attached with retentive loops made of thin orthodontic wire. (Fig 10)

6) The record bases are trimmed and checked in the patient's mouth and ensured that loops and vertical pillars do not interfere with muscle movements during function (Fig 11). Impression compound was placed over the retentive loops and the neutral zone was recorded. During this procedure the patient was asked to make the movements like puckering lips, swallowing, sucking and by producing exaggerated 'EEE' and 'OOO' sounds to record the neutral zone. Excess material if any will be displaced and should be removed. In case of insufficient material, additions can easily be made using extra material and the process is repeated.

7) The impression compound rims were relined with zinc oxide eugenol impression paste (Fig 12) and plaster indices were constructed. The compound rim is then removed from the record bases (Fig 13). The indices are rearranged and wax flowed into the space to make an occlusal rim to conform to the patient's neutral zone (Fig 14).

8) The teeth were arranged according to these rims and the try-in was performed in the patient's mouth (Fig 15). Trial denture is now placed on the casts and evaluated with the help of plaster indices to confirm the position of teeth is within the neutral zone (Fig 16).

9) Following this the dentures were flaked, processed, trimmed and polished using conventional method and denture insertion was done.

DISCUSSION

Treating the highly resorbed mandibular ridges is a challenging job. Here, in this case report, the simple impression procedures have been followed to get the maximum retention and stability of the complete dentures, especially on the mandibular ridges. When the residual alveolar ridges have resorbed significantly, denture stability and retention are more dependent on correct position of teeth and contour of the external surfaces of dentures. Keeping these factors in mind, dentures were fabricated with their contours harmonizing neutral zone.

Neutral zone is defined as that area or position where the forces between the tongue and cheeks or lips are equal. The neutral zone philosophy is based upon the concept that for each patient there exists a potential denture space, i.e., a specific region where forces generated by the tongue are neutralized by the forces generated by lips and cheeks.

Arranging artificial teeth within the neutral zone achieves two important objectives: (1) prosthetic teeth do not interfere with normal muscle function; and (2) normal oral and perioral muscle activity imparts force against the complete dentures that serves to stabilize and retain the prostheses rather than cause denture displacement. The neutral zone method typically locates posterior denture teeth slightly facially, when compared to teeth arranged over the crest of the residual ridge.

Using the neutral zone to arrange posterior teeth takes advantage of the stabilizing potential of existing muscle conditions. The fabrication of denture contours to harmonize with neutral zone dimensions of these compromised patients, results in increased denture stability and improved oral function.

Various materials like tissue conditioners, Polyether impression material, Waxes, Impression plaster have been advocated to record neutral zone which has its own advantages as well as disadvantages. In this case report, the entire procedure was aimed at using the materials that have compatible properties and are available easily by the chair side, therefore, impression compound and ZOE were used as they are easy to manipulate unlike impression plaster which is messy and cumbersome to use, and fractured fragments of plaster can be swallowed by patient while performing functional movements. They have good body and are readily available unlike the tissue conditioners which does not have body, one finds it difficult to use even after supporting it with wire loops. They are less technique sensitive than the waxes and are cheaper than the elastomeric impression materials.

CONCLUSION

This article provides a novel approach in the management of completely edentulous patient with resorbed ridges. The technique described is simple which utilizes the routine materials used for denture fabrication, at the same time minimizing the errors and achieving the treatment goals.

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LIST OF PHOTOGRAPHS

Fig 1: Pre-treatment frontal view of patient
Fig 2: Resorbed maxillary residual ridge
Fig 3: Severely resorbed mandibular residual ridge
Fig 4: Impression using McCord’s Technique

Fig 5: Custom tray with double thickness full spacer
Fig 6: Primary impression with putty
Fig 7: Primary cast with special tray
Fig 8: Maxillary and mandibular final impressions with light bodied elastomeric impression material

Fig 9: Rims cut from three regions
Fig 10: Record bases with vertical stops and retentive loops
Fig 11: Record base is verified in patient's mouth
Fig 12: Neutral zone is recorded

Fig 13: Record bases with plaster indices
Fig 14: Wax flowed into plaster indices
Fig 15: Try in done
Fig 16: Teeth are arranged within the conforms of neutral zone

Fig 17: Post treatment happy & satisfied patient
Benign Fibrous Histiocytoma of the Buccal Mucosa: A Case Report

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ABSTRACT: Fibrous histiocytoma represents a benign but diverse group of neoplasms which exhibit both fibroblastic and histiocytic differentiation. The most common location of fibrous histiocytoma occurrence is the skin of the extremities, where it usually presents as a small, firm nodule. Oral and perioral lesions are uncommon, but when seen they occur predominantly on the buccal mucosa and vestibule. This is case report of a healthy 62-year-old female; referred to our department because of a slow-growing mass on the right side of the buccal mucosa. The mass grew over the last nine months. Clinically it was diagnosed as benign mucosal fibroma but histologically it confirmed as benign mucosal histiocytoma. It was treated by surgical excision of the lesion. After excision complete clinical resolution was obtained without any complications. The patient was found to be disease-free after 6-month follow-up.

KEYWORDS: Benign mucosal histiocytoma, Neoplasm, Trauma, Buccal Mucosa.

INTRODUCTION

Fibrous histiocytoma represents a benign but diverse group of neoplasms which exhibit both fibroblastic and histiocytic differentiation. The cell of origin is believed to be the histiocyte, but the varied microscope appearances of the lesion has led to the use of numerous alternative diagnostic terms, including dermatofibroma, sclerosing hemangioma, xanthogranuloma, fibroxanthoma, and nodular subepidermal fibrosis.1,3

The most common location of fibrous histiocytoma occurrence is the skin of the extremities, where it usually presents as a small, firm nodule. Oral and perioral lesions are uncommon, but when seen they occur predominantly on the buccal mucosa and vestibule.2,10 The oral lesion is typically found in middle-aged and older adults, where it presents as a painless submucosal nodule which can vary in size from a few millimeters to several centimeters. Deeper tumors tend to be larger and most lesions cannot be easily moved about beneath the epithelium.3

CASE REPORT

In January 2011, a healthy 62-year-old female was referred to our department with the chief complaint of a slow-growing mass on the right buccal mucosa. The mass grew over the last nine months. Intraoral examination revealed a nodule on buccal mucosal. On palpation the lesion, measuring approximately 1 cm in diameter, was not painful and seemed to be well encapsulated, mobile and of a firm-elastic consistency. The overlying mucosa appeared grossly normal. No lymph nodes were palpable. The oral hygiene of the patient was satisfactory. There were no other abnormalities in the oral cavity and the systemic conditions of the patients were good. The clinical appearance of the lesion suggested the possibility of a neoplasm of soft tissues (benign mucosal fibroma). (Fig. 1)

The lesion was excised under local anaesthesia and was easily removed; with blunt dissection of the mucosa from the underlying tissues. The wound was closed primarily with the placement of 3-0 silk suture. Antibiotic coverage and chlorhexidine gluconate mouth wash were prophylactically used. The post operative course was uneventful. The specimen consisted of an encapsulated mass measuring 1 cm; the cut surface showed a non-tender elastic-hard mass, well circumscribed, non attached to the lower tissue, with normal mucosal surface, not ulcerated and without erosion of the contiguous bone.

Histologically it was characterized by microscopic feature show parakeratinized stratified squamous epithelium overlying fibrolar stroma. Connective tissue show plump to spindle fibroblast and foamy macrophages. Prominent endothelial lined blood vessel with
extravasated RBCs seen. (Fig. 2)

After excision it was obtained clinical resolution and without side-effects or complications. The patients was disease-free after 6-month follow-up. (Fig. 3)

DISCUSSION

The aetiology of oral BFH is obscure. Chronic irritation, continuous trauma and spontaneous development have been reported for those located within the oral cavity.\(^{1,4,13-16}\)

The clinical diagnosis of oral BFH should shell out by clinical features as slowly enlarging, well-circumscribed lesion, no aggressive behaviour with overlying intact mucosa; however, at clinical level, the differential diagnosis with other soft tissue neoplasms is not possible. Histological examination as rare mitosis, absence of cellular atypia and immunohistochemistry patterns as high positivity for vimentin, CD38, factor XIIIa.\(^{1,4,6}\) The differential histological diagnosis includes the neurofibroma: this tumour is identified by positivity of S-100 protein.\(^{11}\) Some leiomyosarcoma are diagnosed incidentally when presumed BFH are removed. The negativity for SMA could differentiate this tumour from true BFH.\(^{1,5}\) Another lesion that can be differentiated from the BFH is dermatofibroma, so-called atypical-BFH.\(^{12}\) Atypical-BFH has similar response to the immunohistochemistry but the first arises in the subcutaneous tissue and the second one arises in the deep tissue. In the soft tissues of the oral cavity the principal lesion that requires a differential histological diagnosis from BFH is malignant fibrous hystiocytoma (MFH). The immunophenotypes of these tumours aren’t sufficient to make a differential diagnosis. Histological pattern is important: the high pleomorphism of the cells, the high mitotic activity, more than 5 per 10 high power fields, and infiltration of the capsule and into the surrounding tissue are present in MFH.\(^{7}\) In the cases presented, the neoplasms were clearly defined at clinical analysis and there were no signs of local invasion. Therefore, we decided to immediately perform surgical excision, postponing imaging analyses (TC-scan and MRI) to determine eventually secondary localizations of the tumour.

The prognosis of oral BFH is very good. Metastases haven’t been reported. Local recurrence is present when the excision is incomplete. Indeed, for the BFH of the buccal mucosa it’s necessary that the specimen has wide margins; the simple enucleation of the tumour from the surrounding tissue may facilitate local recurrences.\(^{1,4,6,10-12}\) In conclusion, it was described two cases of oral BFH, successfully diagnosed and managed by surgical excision.

REFERENCES


LIST OF PHOTOGRAPHS

Fig. 1: Pre Operative Intra oral Photograph

Fig 2: Histopathological Photograph

Fig 3: Post Operative Photograph
Proliferative Verrucous Leukoplakia: A Case report

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ABSTRACT: Proliferative verrucous leukoplakia (PVL) is a rare oral leukoplakia and has four features such as chronic proliferation, multiple occurrences, refractoriness to treatment and high rate of malignant transformation. Here also we are presenting a case of PVL in a 35 years old male patient. On Intraoral soft tissue examination a white patch was noted on right buccal mucosa. Lesion was non scrapable white in color; ill defined exophytic proliferative patch measuring about 4x4cm.

KEYWORDS: Proliferative Verrucous Leukoplakia, Oral Cancer, Malignant, Chronic, Orthopantomogram.

INTRODUCTION:

PVL is an entity with a high tendency to develop OSCCs, the frequency ranging from 60% to 100%. Its rate of malignant transformation is extremely high. The characteristics of its clinical and pathological progress are considered vital bases for the diagnosis of PVL because there are no particular differences between the pathological changes of PVL and those of oral verrucous leukoplakia.

CASE REPORT:

A 35 year old male patient name Sanjeev kumar reported to our department with the chief complaint of a painless rough white patch on right side of inner cheek region since 6 months and also burning sensation associated with the patch since 6 months.

History of present illness revealed that 6 months back patient felt some rough area on right side of inner cheek region which was around 4x4 cm in size. Patient went to see a local dentist who suggested biopsy and it was reported as verrucous hyperplasia on biopsy. Patient was given some topical medicine to apply but he didn't get any relief.

Patient had habit of gutka chewing since 10 years, 3 pouches of gutka/day. He had a habit of keeping gutka in right buccal vestibule for 1 hour and then spitting out. He had habit of tobacco chewing with lime since 5 years once daily. He also had habit of paan chewing with lime infrequently.

On general physical examination right submandibular lymph node was palpable, single in number, mobile, soft in consistency & non tender.

On Intraoral soft tissue examination a white patch was noted on right buccal mucosa. On hard tissue examination stains & calculus was present. On local examination of the lesion non scrapable white in color, ill defined exophytic proliferative patch measuring about 4x4cm was present on right buccal mucosa extending antero-posteriorly 1 cm away from right commissural area till retromolar pad area. The lesion was present at level of occlusal plane in relation with teeth 43, 44 45, 46, 47. On palpation the patches were rough in texture, leathery in consistency & was non tender.

A provisional diagnosis of proliferative verrucous leukoplakia was given. Differential Diagnosis of Verrucous carcinoma and Squamous papilloma were given

Toluidine blue staining along with lugol's iodine was performed and was suggestive of dysplastic changes. In investigations Hematologic findings were normal. Orthopantomogram was done to rule out bone involvement. Excisional biopsy was done and on histopathology parakeratinised stratified squamous epithelium & underlying connective tissue was seen. Increased layers of stratum spinosum & few areas of parakeratin plugging were seen. Chronic inflammatory cell infiltrate in connective tissue, some muscle fibres & areas of mucous salivary gland acini suggestive of verrucous hyperplasia. A final diagnosis of proliferative verrucous leukoplakia was given

DISCUSSION:

In 1985 term proliferative verrucous leukoplakia was given by Hansen et al. It is a type of non homogenous leukoplakia. It manifests in form of white lesions distributed over one or more locations (multifocal) within the oral cavity which are clinically and histologically distinguishable from typical leukoplakia lesions. The term PVL is used for lesions initially presenting homogenous white appearances with change in clinical & microscopic aspects during their natural history. The term proliferative means persistent, diffuse, progressive, and multifocal.
Verrucous is used for warty, verrucal, exophytic, keratotic lesion. Leukoplakia which arises in flat white keratotic patches. It most commonly occurs in 5th to 6th decade. Mean age of diagnosis is over 60 years. Female prediliction (4:1). Most common site is buccal mucosa in women and tongue in men. Most cases occur in western population.

**Etiology**
Hansen reported 62% of patients in his study chewed tobacco. Zakrewaza reported 70%. Silverman et al said 31%. Bagan et al found least i.e 23.3% Association with HPV strain 16 & 18 has also been reported. This was reported by Palefsky 1995, Gopalakrishnan 1997, Eversole 2000. Candida was found in 68 % of the patients. This was reported by Silverman et al. Recently Bagan et al reported EBV associated with PVL. Gender & age related effects on immune competence have also been reported.

It appears initially as solitary inconspicuous flat homogenous leukoplakia, or as multiple involved sites with warty surface. Sometimes erythroplakic changes are also noted.

**Histopathology**
PVL is a clinical diagnosis. Hansen et al reported that PVL on histopathologic continuum goes through 4 stages.

1. Hyperkeratosis
2. Verrucous hyperplasia
3. Verrucous carcinoma
4. Papillary squamous cell carcinoma

Murrah & Batsakis also reported that it goes through 4 stages.

1. Hyperkeratosis without epithelial dysplasia
2. Verrucous hyperplasia
3. Verrucous carcinoma
4. Squamous cell carcinoma

Absence of epithelial dysplasia in initial stage of histopathologic spectrum of PVL prevents it from being recognized as potentially malignant.

**Immunohistochemistry**
Increased tumor growth factor \(\alpha\) was observed in PVL. Alterations in cell cycle regulatory genes like p16 INK4\(\alpha\) & P14ARF. These are genes involved in cell cycle regulation. p16 INK4\(\alpha\) is a tumour suppressor gene located on chromosome 9 in region of 9p21. It is either deleted or mutated in a wide range of malignancies.

**Treatment**
PVL is resistant to all treatments and recurs. Fettig et al suggested aggressive surgery like block resection, but total resection is rarely possible due to widespread disposition of lesion in oral cavity.

Malignant Transformation

There is 100% rate of malignant transformation. This is due to successive appearance of multiple primary tumors (field cancerization).

**Recurrence**
Recurrence after treatment is the rule. Soon after first treatment lesion appears at previous site as well as at new site, gingiva most commonly

**REFERENCES:**

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LIST OF PHOTOGRAPHS

Fig 1:- Pre - Operative Intra Photograph

Fig 2:- After Toluidine Blue Staining

Fig 3:- After Lugol’s Iodine Staining

Fig 1:- Post - Operative Intra Photograph
Maxillary Complete Denture with Metal Palate Base: A Case Report

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ABSTRACT: The purpose of this case report is to deal with the oral rehabilitation of completely edentulous maxillary arch opposing a partial complement of natural dentition prosthetically by incorporating metal denture base in place of a conventional poly methyl methacrylate material to combat the masticatory forces from natural dentition and improve the longevity of the prosthetic replacement.

KEYWORDS: Metal palate denture, Single complete denture, Maxillary complete denture

INTRODUCTION

Many patients becomes edentulous in one arch while retaining some or all of their natural teeth in the opposing arch. Several difficulties are encountered in providing a successful, single complete denture treatment. According to French FA artificial dentures function like mechanical machines in an anatomic environment. In cases where there is a clash between esthetic & functional requirements, a choice is to be made by favouring one at the expense of the other or make some amount of compromises in most of the situations. Single complete dentures may be opposed by (1) natural teeth (2) fixed restorations (3) a removable partial denture (4) an existing complete denture.

CASE REPORT

A 52 year old male reported to the department of prosthodontics (Institute of Dental Sciences) with a chief complaint of completely edentulous maxillary arch and partially dentulous mandibular arch. Intra oral examination revealed high frenal attachment in maxilla (figure1) & opposing partial complement of natural dentition (figure2). Mucosa was normal and the opposing natural teeth required minor alterations. Saliva was of medium consistency and patient was cooperative & philosophical according to house classification.

PROCEDURE

Impression of the lower natural teeth was made with an irreversible hydrocolloid impression material & the dental stone diagnostic cast was poured. Preliminary impression of the edentulous maxilla was made with impression compound and plaster cast was poured for the fabrication of a custom special tray. The peripheral tracing procedures were completed with green stick impression compound and the secondary impression was made with zinc oxide eugenol impression material. Master cast was made with dental stone Type III and the mould of the same was made with reversible hydrocolloid (Agar) and a refractory cast was poured with ethyl silica bonded investment material. On the refractory cast the denture base pattern wax was adapted and the sprues were attached & invested. The denture base was casted with cobalt chromium metal. The denture base covered the palate and residual ridges with retentive loops extending on the ridges and the posterior palatal seal area for mechanical retention of acrylic resin and teeth to the metal.

The vertical dimension of occlusion was established and occlusion rim on the maxillary denture base was constructed & contoured for adequate lip support in the anterior region to simulate the vertical and horizontal overlap of the anterior teeth. The anterior region of the occlusal rim had the same thickness as the incisal edges of the anterior teeth to allow for this vertical overlap. After this with the help of functional chew in method the centric records were made and transferred on the mean value articulator.

Arrangement of the artificial teeth was carried out to reveal the necessary changes to be made on the lower teeth. Adjustments in the artificial teeth were incorporated in preference to making changes to the natural teeth. A trial of waxed up maxillary complete denture was made followed by acrylization of the complete denture (figure3) with heat polymerized acrylic resin. The interferences in denture were eliminated and denture given to the patient. Post insertion instructions were given to the patient regarding its maintenance & hygiene.

DISCUSSION

One of the most clinical situations involving a single denture is that of a complete upper denture and lower natural teeth. When a complete denture is opposed by natural teeth, it will almost require some degree of
contouring to provide a harmonious occlusion. The reason for such alteration is mainly due to (1) unfavourable inclination of the occlusal plane (2) malpositioned individual teeth assumed positions resulting excessively steep inclinations, and (3) too wide buccolingual width of natural teeth.

Balance in natural dentition is mainly seen only in centric occlusion but not in the protrusive or lateral excursions. Protrusive & bilateral balance is not necessary for tooth retention as natural teeth resist stress from all directions individually and are thus stable. On the other aspect, artificial dentures merely rest on surface on the tissues with a film of saliva between the dentures on the mucosa. The teeth and base function as one unit, and force exerted against any tooth in an unfavourable direction dislodges the whole denture. Dentures remain stable only when forces exerted against the teeth are directed favourably to the base support. Balanced occlusion contributes greatly to stability, efficiency & comfort. Horizontal thrust not only tends to dislodge the dentures, but also tends to destroy the alveolar ridge.

Maxillary denture base may lack retention and encounter tissue changes of the edentulous ridge followed by discomfort, occlusal problems and fracture of denture bases. There might be occlusal stress on the maxillary denture and the underlying edentulous tissue due to forces from teeth and musculature and opposing natural dentition, & the position of the mandibular teeth which are improperly aligned may also avoid achievement of bilateral balance for stability and lead flexure of the denture bases. The midline fracture in a denture is often a result of flexural fatigue. Areas of stress concentration such as large frenal notch act as additional factors, also denture with a wedged or locked occlusion contribute to concentration of stresses. Though poly methyl metha acrylate (PMMA) denture bases have good mechanical, biological & esthetic properties, the impact & fatigue strength of PMMA are not entirely satisfactory, thus may fail when there is excessive parafunctional and or functional forces.

Cobalt chromium bases in maxillary denture reduce functional deformation and thrust to the supporting tissues occurring in the anterior part of the maxilla. Besides rigidity and fracture resistance these metal bases have several other added advantages like excellent strength to volume ratio, good adaptation to the supporting tissues, enhanced control of denture plaque, high thermal conductivity, high biocompatibility, very little dimensional changes in time through fluids absorption and does not interfere with phonation due to its decreased bulk which also makes the denture light weight.

**SUMMARY AND CONCLUSION**

In this particular case though the occlusal plane was dictated by the mandibular natural teeth, the plane was not very steep and hence the teeth required very little modification and a balanced maxillary complete denture was given to the patient which had a metal denture base with acrylic teeth. This combination provided great comfort to the patient as the metal denture base was strong to resist the catastrophic failure (failure results from a final loading cycle that exceeds the mechanical capacity of the remaining sound portion of the material) and flexural fatigue if PMMA was to be used as denture base. The metal denture bases are good thermal conductors & less bulky. There would be no propagation of crack from the deep labial notch as well. The PMMA in the posterior palatal seal would allow for relining of the denture in the long run.

**REFERENCES**


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LIST OF PHOTOGRAPHS

Fig1: Pre-Operative view - High Frenal attachment

Fig2: Mandibular arch

Fig3: Maxillary denture with metal palate base

Fig4: Post-Operative view after denture insertion
**PYOGENIC GRANULOMA : A CASE SERIES**

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**ABSTRACT:** Pyogenic granuloma (PG) is a relatively common benign vascular lesion of the skin and mucosa. The exact cause is not known but multiple factors have been implicated in the etiology of pyogenic granuloma. It predominantly occurs in second decade of life in young females, possible because of the vascular effects of female hormones. The pyogenic granuloma typically evolves rapidly over a period of few weeks. It can mimic a number of malignant tumors making the histopathological examination of lesion necessary. It predominantly occurs in second decade of life in young females, possible because of the vascular effects of female hormones. Clinically oral pyogenic granuloma is a smooth or lobulated exophytic lesion pedunculated or sometimes sessile base, which is usually hemorrhagic. Hereby we are reporting three case reports of pyogenic granuloma at different age groups, sex and site.

**KEY WORDS:** Pyogenic granuloma, Maxilla, Recurrence, Pregnancy Tumor, Histopathological.

**INTRODUCTION**

Pyogenic granuloma (PG) is a benign localized exuberant mass composed of proliferating capillaries in loose stroma produced after injury or local infection. Pyogenic granuloma which often arises in 2nd or 3rd trimester is termed as “Pregnancy Tumor”. It is well-circumscribed elevated, pedunculated or sessile lesion, which may be covered with necrotic white plaque which clinically resembles pus, hence early clinicians have suggested the name 'Pyogenic Granuloma'. It is well-circumscribed elevated, pedunculated or sessile lesion, which may be covered with necrotic white plaque which clinically resembles pus, hence early clinicians have suggested the name 'Pyogenic Granuloma'. PG has no malignant potential but recurrence is quite common after excision.

**CASE REPORT :- 1**

A 10 year old male patient reported to Department of Oral Medicine and Radiology, Institute of Dental Sciences, with a chief complaint of swelling on right upper front tooth region since 1-2 months (Fig 1). History of present illness revealed that initially the swelling was of small size but increased to present size. Pain was present in that region and history of constant bleeding while brushing and eating hard foods. Intra oral examination revealed a growth of roughly .5 X 1 cm in size, roughly oval in shape is present on upper front tooth region present interdentally between 11 and 12. Overlying surface appears lobulated, pinkish in colour. On palpation all inspector findings were confirmed. It was sessile, soft, bleeds on touch and tender on palpation. On hard tissue examination stains and calculus were present. No missing and decayed tooth was present. Based on the clinical examination and history, provisional diagnosis of pyogenic granuloma was given with differential diagnosis of irritational fibroma and peripheral giant cell granuloma. Radiographic examination revealed no bony changes. The lesion was surgically excised and sent for histopathological examination which revealed epithelium is stratified squamous parakeratinized type. Connective tissue stroma was present consisting of loose, dense fibrillar connective tissue. Endothelial cell proliferation and history, provisional diagnosis of pyogenic granuloma was given with differential diagnosis of irritational fibroma and peripheral giant cell granuloma. Radiographic examination revealed no bony changes. The lesion was surgically excised and sent for histopathological examination which revealed epithelium is stratified squamous parakeratinized type. Connective tissue stroma was present consisting of loose, dense fibrillar connective tissue. Endothelial cell proliferation was present with abundant fibroblasts and area of haemorrhage suggestive of pyogenic granuloma (Fig 4). So the final diagnosis of pyogenic granuloma was given.

**CASE REPORT :- 2**

A 25 year female patient reported to to Department of Oral Medicine and Radiology, Institute of Dental Sciences, with a chief complaint of swelling on right upper front tooth region since 3 months (Fig 2). History of present illness revealed that initially the swelling was smaller in size but it increased to the present size over a period of time. History of blood discharge from that lesion was present while eating, brushing or by touching. On intra oral examination a well defined oval swelling roughly oval in shape, roughly 1X 2 cm in diameter extending from distal surface of 14 to mesial surface of 15. Overlying surface appears smooth, pink in colour in anterior part and erythematous area on posterior surface. On palpation all inspector findings are confirmed. It is sessile, bleeds on touch, non tender. On hard tissue examination all teeth were present. Stains and calculus was present. Based on the clinical examination and history, provisional diagnosis of pyogenic granuloma was given with differential diagnosis of irritational fibroma and peripheral giant cell granuloma. Radiographic examination revealed no bony changes.
bony changes. The lesion was surgically excised and sent for histopathological examination which revealed epithelium is stratified squamous parakeratinized type. Connective tissue stroma was present consisting of loose, dense fibrillar connective tissue. Endothelial cell proliferation was present with abundant fibroblasts and area of haemorrhage suggestive of pyogenic granuloma. So the final diagnosis of pyogenic granuloma was given.

CASE REPORT :- 3
A 19 year old male patient reported to Department of Oral Medicine and Radiology, Institute of Dental Sciences, with a chief complaint of swelling on right upper front tooth region since 3 months (Fig 3). History of present illness revealed that initially the swelling was of small size but increased to present size. Pain was present in that region and history of constant bleeding while brushing. Intra oral examination revealed a solitary growth of roughly 1 X 2 cm in size, roughly oval in shape is present on upper front tooth region present from mesial surface of 12 to distal surface of 13. Overlying surface appears lobulated, pinkish in colour. On palpation all inspector findings were confirmed. It was sessile, soft, bleeds on touch and tender on palpation. On hard tissue examination stains and calculus were present. No missing and decayed tooth was present. Based on the clinical examination and history, a provisional diagnosis of pyogenic granuloma was given with differential diagnosis of irritational fibroma and peripheral giant cell granuloma. Radiographic examination revealed no bony changes. The lesion was surgically excised and sent for histopathological examination which revealed epithelium is stratified squamous parakeratinized type. Connective tissue stroma was present consisting of loose, dense fibrillar connective tissue. Endothelial cell proliferation was present with abundant fibroblasts and area of haemorrhage suggestive of pyogenic granuloma. So the final diagnosis of pyogenic granuloma was given.

DISCUSSION
The term “Pyogenic Granuloma” is a misnamed entity. It is neither infectious nor granulomatous. The lesion is common on gingiva, followed by lips, tongue & buccal mucosa. Surface is smooth lobulated, ulcerated & shows tendency for bleeding. Consistency is soft. It is seen quite often in children and young adults but is unusual in elderly. Although exact pathogenesis is not known. It was believed to be a botryomycotic infection but later suggested that it is caused by infection of streptococci & staphylococci. But now it is believed that low grade trauma or irritation, hormonal influences, viral oncogens, or certain kinds of drugs are the causative factors. Approximately one-third of the lesion occurs after trauma. Poor oral hygiene may be precipitating factor in many of these patients. The usual size of pyogenic granuloma is less than 2cm, but there are reports of giant pyogenic granulomas in immunocompromised patients. Young pyogenic granulomas are highly vascular in appearance because they are composed predominantly of hyperplastic granulation tissue in which capillaries are prominent whereas older lesions tends to become more collagenized & pink.

Pyogenic granuloma develops in up to 5% of pregnancies hence the term “pregnancy tumor” and “granuloma gravidarum” are often used. Differential diagnosis includes peripheral giant cell granuloma, peripheral ossifying fibroma, metastatic cancer, haemangioma, hyperplastic gingival inflammation, Kaposis sarcoma, bacillary angiomatosis. Radiographically, there is no findings. In long standing cases bone destruction can be seen but it is very rare.

Although many treatment have been proposed but surgical excision is the best treatment modality with excision extending down to periosteum and the adjacent teeth should be thoroughly scaled to remove the source of continuing irritation. After excision, recurrences occur in upto 16% of cases, so in some cases re excision is necessary. Recurrences is believed to occur from incomplete excision and failure to remove the etiological factors.

CONCLUSION
Although pyogenic granuloma is a non-specific growth in the oral cavity, proper diagnosis, prevention, management & treatment of the lesion are very important. Pyogenic granuloma arises in response to various stimuli such as low grade local irritation, sex hormones, traumatic injury or certain kind of drugs. Excisional surgery is the treatment of choice.

REFERENCES

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LIST OF PHOTOGRAPHS

Fig 1: Case 1

Fig 2: Case 2

Fig 3: Case 3

Fig 4: Histopathological Picture
INTRODUCTION:

The dental pulp is closely connected with the periodontal ligament through apical foramina, accessory foramen and sharpeys fibres, and result in periradicular lesions, principally either from periodontal apparatus or pulpdentin organ. These entities were collectively called endoperio lesions. There could be many etiological factors of which developmental anomalies are the rarest ones causing this disease. The region in which the lateral incisors are located is considered to be an area of embryological risk, where number of malformations occur. Until recently, if a tooth is present with a draining sinus tract and periodontitis, it would be extracted due to contraindicated endodontic treatment and hopeless periodontal prognosis. As a result, many teeth were sacrificed unnecessarily. So, such a developmental anomaly with no history of dental caries or trauma, but which makes the tooth nonvital and causes loss of attachment, is the palatogingival groove or radicular lingual groove which is an unrevealed etiology.

This defect can be treated successfully using combined endodontic and periodontic therapy. However if clinicians are aware of the forms in which these conditions may occur and can apply proper treatment modalities, a number of teeth with radicular lingual grooves could be saved.

CASE REPORT:

A 38 year old male visited our O.P.D with complaint of pain and pus discharge in the right upper front region of jaw for past 6 years. History revealed that pain was mild and intermittent.

Clinical Examination:

Soft tissue examination revealed, there was an intraoral sinus with pus discharge in relation to labial mucosa of 12. Periodontal examination revealed the gingiva on the palatal aspect of 12 was inflamed, edematous, bleeding on probing. There was pus discharge from gingival sulcus and a deep isolated tubular periodontal pocket with depth of 9mm and grade II mobility was present in relation to 12. Endodontic examination revealed mild pain on percussion and no response to pulp vitality tests. On radiographic examination, a radiolucent “para pulpal” line superimposed over the root canal and “pear shaped” radiolucency in the coronal aspect was present and a circumscribed radiolucent area with irregular borders having crestal bone loss was found in the region of 12.

DIAGNOSIS AND TREATMENT:

Radicular lingual groove on the palatal aspect of 12 causing periapical abscess with intraoral sinus and localized chronic periodontitis.

As there was pulpal and periodontal involvement this type of lesion will necessitate both endodontic & periodontic treatment

* Oral hygiene prophylaxis
* Root canal therapy
* Surgical procedures:
  * Curettage with root planing
  * Removal of etiology by saucerisation.
  * Apicectomy
  * Restoration of defect and retrograde restoration with glass ionomer cement.

Preoperative antibiotics prescribed and oral prophylaxis was done. Root canal therapy completed in relation to 11 and 12. Full thickness mucoperiosteal flap raised, curettage with root planing accomplished. Granulation tissue curetted in periradicular area in relation
to 11 and 12 and apicectomy was performed. The deep palate gingival groove was saucered with bur. The saucerect defect and apex were closed with chemically cured glass ionomer cement. Flap approximated with intermittent sutures and the patient was given post-operative instructions. Patient recalled after 24 hours for review and sutures were removed after a week's time, periodic post-operative review and radiographs were taken.

RESULTS:
Postoperative examination revealed healing was satisfactory and patient was asymptomatic with a one year follow up. Radiographically a dramatic reduction in diameter of the periradicular lesion was found. Going by the above treatment protocol, a single tooth can now be diagnosed correctly and treated successfully with a predictable prognosis.

DISCUSSION:
A palato-gingival groove is a developmental anomaly showing alterations in the growth and infolding of inner enamel epithelium and hertwigs epithelial root sheath creating a groove that passes from cingulum of maxillary incisors apically on to the root. Consequently periodontal pocket is formed resulting in retrograde infection involving the apex. Theoretically, this is an endoperio lesion showing a classification of “primarily periodontic origin resulting in endodontic lesion”. The endodontic treatment was followed by the periodontal procedures with retrograde restoration. On contrary, in this case no bone regenerative substitutes were used and healing was satisfactory, adding the factor of cost effectiveness of this technique.

CONCLUSION:
The knowledge of tooth anatomy and the etiology offers a strong base for establishing a perfect diagnosis. The Radicular Lingual Groove is most often missed out during oral examination, so dentists must be cautious in diagnosing this developmental defect.

REFERENCES:
LIST OF TABLES AND PHOTOGRAPHS

Fig 1 Preoperative radiograph
Fig 2 Preoperative Intra Oral Photograph
Fig 3 Post obturation Radiograph
Fig 4 Full Muco-periosteal flap raised (labial)
Fig 5 Full Muco-periosteal flap raised (palatal)
Fig 6 Enucleation and curettage
Fig 7 Apicoectomy with retrograde restoration.
Fig 8 Suture placed
Fig 9 1 yr postoperative
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