ANNEXURE-"F"

Information of Mentor of Training Centre

It shall be verified by the Head of the concerned Training Center

Sr. No.	Particular	-	Information to be filled	
1.	Name of Mentor	:	Dr. Anuradha Patil	
2.	Date of Birth	:	03/07/1985	
3.	Address	:	Plot no: 2,3 Bhoomi paradise,Sector 11,Sanpada, Navi Mumbai	
4.	Tel. No./ Mob. No.	:	9819875730	
5.	E-mail id	:	anuradhapatil32@gmail.com	
6.	Nationality	:	Indian	
7.	Qualification in details : (attach documentary proof)	:	BDS, MDS (Conservative Dentistry & Endodontics)	
8.	Teaching experience/ Health Sciences : Profession experience /Consultant/Mentor (attached document proof with signature of Head)	:	10yrs. 9months.25 dys.	
9.	Present Appointment	:	Professor	
10.	Publications (List & Proof)	:	1.	Chaudhari GU, Margasahayam SV, Shenoy VU, et al. Nonsurgical removal of overextended gutta-percha root canal filling in a permanent maxillary central incisor with apical root resorption: a case report. J Evolution Med Dent Sci 2020;9(42):3159-3162.
			2.	Deshmukh SN, Shenoy VM, Margasahayam SV, Ptil AB, Shah JR. Endodontic
			3.	Management of S-Shaped Root Canal in a Maxillary Premolar Using Controlled Memory Nickel Titanium Rotary Files – A Case Report. J Evolution Med Dent Sci 2020;9(51):3894-3897.
			4.	Sumanthini MV , Gorakh DB, Vanitha US, Anuradha P, Saima AK. Efficacy of Passive
			5.	Ultrasonic Activtion Assisted Hand vs. Rotary Retreatment Files in the Removal of Root Canal Filling Material: An Invitro Study . J Clin Diag Res 2020;14(2):ZC01-ZC06.
			6.	Saima Ambareen Khan, Vanitha U. Shenoy, Khalid I, Anuradha Patil, M.V.
			7.	Sumanthini, Nalband R. Management of Bilateral Radicular cyst in the Permanent
			8.	Maxillary Lateral Incisors. Ind J of oral Health and Res 2018;4(1):27-30.
			9.	Nishant G, Roshan S, **Anuradha P**, Rahul K-Radix Entomolaris Journal of Contemporary Dentistry Jan-Apr 2012;2(1):33-37.
			10.	Shalini A, **Anuradha P**, Sanchita B. Interdisciplinary management of anterior dental esthetics Dental Practice Jan-Feb 2012; 10(5):46-48.

10.	Publications (List & Proof)		11.	Shalini A, Sanchita B, **Anuradha P,** To evaluate the efficacy of different system of gutta- percha removal in retreatment"In vitro study" Solaze Journal, vol5, issue 2, Dec 2011.
			12.	**Anuradha P,** Shalini A. Rehabilitation of anterior teeth using laser and direct veneers-A minimally invasive approach Dental Practice Jan-Apr 2011;10(1):12-14.
			13.	Pain management in operative field.**(Book)**
			14.	Magnets in Orthodontics**(Book)**
11	Post Graduate Teaching experience (Attach documentary evidence)	:	5 yrs 10 month 11dys.	
12	Any other relevant information	:	-	

Dr. Anuradha Patil

Date :- 20/07/2022

Name & Sign. of Mentor

For the use of affiliated Training Center:

I have verified the eligibility of the above Director as per the criteria of eligibility prescribed bythe University vide clause no.7 of the University Direction No. 05/2017 (Amended).

Sign & Stamp
Head of the Department
Date: 20/07/2022

Professor & H. O. D.
Dept. of Conservative Dentistry
MGM's Dental College & Hospital
Kamothe, Navi Mumbai - 410 209

Sign & Stamp
Dean/ Principal/ Director of Training Centre
Date: 20/07/2022

M.G.M. Dental College & Hospital
Navi Mumbai
410209.

Training Centre Round Seal

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

We, the Chancellor, the Pro-Chancellor, the Vice-Chancellor, the Members of the Management Council and the Academic Council of the Maharashtra University of Health Sciences, Nashik, certify that

Shri/Smt. PATIL ANURADHA BHAUSAHEB

of Tatyasaheb Kore Dental College & Research Centre,New Pargaon, Kolhapur

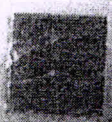
having been examined and found duly qualified for the

Bachelor of Dental Surgery

in June-2006 the said Degree has been conferred on him/her. In testimony whereof is set the seal of the said University.

PRN 0203140543
15th May 2008

VICE-CHANCELLOR



महाराष्ट्र आरोग्य विज्ञान विद्यापीठ, नाशिक

आम्ही, महाराष्ट्र आरोग्य विज्ञान विद्यापीठाचे कुलपति, प्रकुलपति, कुलगुरू, व्यवस्थापन परिषद व विद्यापरिषद सदस्य प्रमाणित करतो की,

नवे पारगाव, कोल्हापुर येथील तात्यासाहेब कोरे दंत महाविद्यालय व संशोधन केंद्रा चे/च्या

पाटील अनुराधा भाऊसाहेब

हे/हया जून-२००६ मध्ये

दंतशल्य स्नातक

परीक्षा उत्तीर्ण झाल्याबद्दल सनाना ही पदवी प्रदान करण्यात येत आहे.

याची साक्ष म्हणून विद्यापीठाची अधिकृत मुद्रा येथे अंकित करण्यात येत आहे.

कुलगुरू

Dean
M. G. M. Dental College & Hospital
Kamothe, Navi Mumbai - 410 209.

DAN 2021

000695

DPU

Dr. D. Y. Patil Vidyapeeth

Pune (India)

(Deemed University)

(Under Section 3 of the UGC Act, 1956)

We, the Chancellor,

the Vice-Chancellor,

the Members of the Board of Management and of the

Academic Council of Dr. D. Y. Patil Vidyapeeth, Pune certify that

Patil Anuradha Bhausaheb

[Student of Dr. D. Y. Patil Dental College & Hospital, Pimpri, Pune]

having been examined and found duly qualified for

the degree of

Master of Dental Surgery

(Conservative Dentistry & Endodontics)

in May 2011.

The said degree has been conferred on her at the

Third Convocation held on Nineth June Two Thousand Twelve.

In testimony *whereof is set the seal of the said University.*

Vice Chancellor

080402024

D.Y. Patil Vidyapeeth DPU Pune

Chancellor

Dean

M. G. M. Dental College & Hospital

MAHATMA GANDHI MISSION DENTAL COLLEGE & HOSPITAL
Accredited by NAAC with "A" Grade
Plot No. 1 & 2 Sector-01 (Old 18 & 19),
Kamothe, Navi Mumbai- 410209
E-Mail ID: mgmdch@mgmmumbai.ac.in

Dr. Srivalli Natarajan
Dean

Tel: 022- 27436604
022-27433185

No.MGM/DCH/791/2022

Date: 20/05/2022

Experience Certificate

This is to certify that Dr. Anuradha Patil. is working in the Department of Conservative Dentistry and Endodontics in MGM Dental College & Hospital, Kamothe, Navi Mumbai and her experience is as under :

- Lecturer – 01/07/2011 to 30/09/2015
- Reader – 01/10/2015 to 21/03/2022
- Professor – 22/03/2022 to Till Date.

M.G.M. Dental College & Hospital
Kamothe
Navi Mumbai
410209.

S. Srivalli.

Dean

महाराष्ट्र आरोग्य विज्ञान विद्यापीठ, नाशिक
Maharashtra University of Health Sciences, Nashik
दिंडोरी रोड, म्हसरूळ, नाशिक - ४२२००४. Dindori Road. Mhasrul, Nashik- 422 004
Tel: (0253)2539192/6659239, Student Helpline:(0253)2539111/6659111
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डॉ. कालिदास द. चव्हाण
एम.बी.बी.एस., एम.डी. (न्यायवैद्यकशास्त्र), पीएच.डी., डी.एस्सी.
कुलसचिव

Dr. Kalidas D. Chavan
M.B.B.S., M.D.(Forensic Medicine)Ph.D.,D.sc.
Registrar

Ref No.: MUHS/E-2/PG/2741/2021 Date: 25/09/2021

To
The Principal,
Mahatma Gandhi Mission's
Dental College & Hospital,
Junction of NH-4 & Sion-Panvel,
Expressway, Sector-1, Kamothe,
Navi Mumbai – 410 209

Sub: Regarding extension to Post Graduate Teacher Recognition
Ref: 1. University Direction No. 01/2017
2. MUHS/E-2/PG/2203/2020 dated 25/11/2020
3. MUHS/PG/E-2/111105/1559/2019 dated 28/11/2019.
4. MUHS/E-2/ UG /2515/2021 dated 14/09/2021
5. Your letter No MGM/DCH/1034/2021 dated 22/09/2021

Sir/ Madam,

With reference to the subject cited above, I am to inform you that, the proposal of extension to recognition as Post-Graduate Teacher of the following teachers have been considered by the University subject to the terms and conditions of appointment order for imparting instructions to the Post Graduate Degree, Diploma or Super-Speciality Course in the subject mentioned against their names.

Sr. No.	Subject	Name of the Teacher	Designation	Status of PG recognition
1.	Orthodontics & Dentofacial Orthopedics	Dr. Ravindranath V.K.	Professor	w.e.f 30/07/2021 to 29/07/2022 only.
2.		Dr. Amol Mhatre	Reader	w.e.f 02/08/2021 to 01/08/2022 only. (against SC Category)
3.	Oral & Maxillofacial Surgery	Dr. Sunil Sidana	Reader	w.e.f 30/07/2021 to 29/07/2022 only.
4.		Dr. Sagar Vaishampayan	Reader	w.e.f 02/08/2021 to 01/08/2022 only (against SC Category)
5.		Dr. Adil Gandevivala	Reader	w.e.f 02/08/2021 to 01/08/2022 only (against ST Category)
6.	Conservative Dentistry and Endodontics	Dr. Divya Naik	Reader	w.e.f 02/08/2021 to 01/08/2022 only.
7.		Dr. Anuradha Patil	Reader	w.e.f 30/07/2021 to 29/07/2022 only.
8.	Prosthodontics and Crown & Bridge	Dr. Anuradha Mohite	Reader	w.e.f 02/08/2021 to 01/08/2022 only. (against SC Category)
9.		Dr. Janani Vivek Iyer	Reader	w.e.f 30/07/2021 to 29/07/2022 only.
10.	Periodontology	Dr. Sarika Shetty	Reader	w.e.f 02/08/2021 to 01/08/2022 only. (against SC Category)
11.		Dr. Sujeet Khiste	Reader	w.e.f 02/08/2021 to 01/08/2022 only.

1) The above mentioned teachers are required to attend **"Research Methodology Workshop"** conducted by **Regional Centre, Pune** of this University **or any other centre authorised by the 3University** (if not attended earlier),**within a period of one year** from the date of recognition. It is clarified that the **validity of' Research Methodology Workshop'** is for **five years** only and it must be **renewed after every five years** as per Circular 14/2011 dated 23/06/2011.

M G M / M E D
INWARD NO.

MGM Dental College & Hospital
Kamothe
9919/21

Dean
M.G.M. Dental College and Hospital,
Kamothe Navi Mumbai 410 209.

Rehabilitation of anterior teeth using laser and direct veneers - A minimally invasive approach

DR. ANURADHA PATIL AND DR. SHALINI AGGARWAL

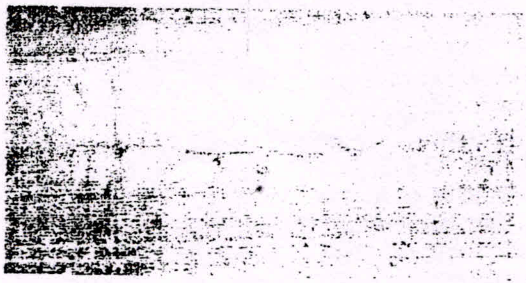

FIG 1a: Pre-operative [illegible]

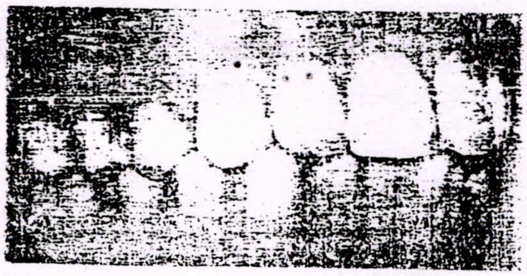

FIG 1b: Pre-operative view - Right lateral

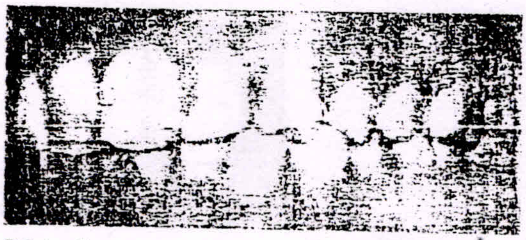

FIG 1c: Pre-operative view - Left lateral

INTRODUCTION

Recent advances in dental materials and adhesive protocols have expanded the restorative procedures available to today's clinicians. Used in combination with proper treatment planning, these innovations enable dental professionals to provide enhanced aesthetic care that fulfills the increasing expectations of their patients. There are many options available to the dentist to correct the aesthetics of discoloured teeth. Bleaching, porcelain veneers and full crowns have inherent advantages and disadvantages. When patients want the most direct, cost-effective treatment possible, direct composite veneers offer a very good solution.

Direct veneers are very thin coats of filling material placed on teeth, which are sometimes altered (prepared) before hand and sometimes not. One of the most challenging procedures in dentistry is the composite direct veneer. Composite resin bonding does offer, however, the quickest and most economic means of providing aesthetic enhancement. The placement of direct composite resin veneers empowers the operating dentist with the ability to create a dramatic aesthetic change in a single appointment. Mastery of direct composite resin veneers is an essential skill in cosmetic dentistry.

This article presents certain steps which increase the predictability of direct [illegible]

CASE REPORT

A 25 year old male patient had a [illegible] complaint of [illegible] teeth. [illegible] stated that he was [illegible] of his teeth. Previous history of [illegible] treatment was [illegible]. It was elicited that his siblings were affected with similar dental anomalies. A clinical examination revealed that his dentition showed the clinical appearance of endemic dental fluorosis (Figures 1a, 1b, 1c). The labial surfaces of the maxillary and mandibular anterior teeth had a yellowish brown discolouration. The labial surfaces of the teeth were pitted in texture, but on probing had a firm base. The occlusal relationship of his teeth was Class I with normal overjet and overbite [illegible] maxillary central [illegible] carious lesion was detected in 22 [illegible] sion with 23 and Ellis Class I fracture with 21. Temporomandibular joints were asymptomatic with no audible sounds and normal range of motion. All other clinical and radiographic findings were unremarkable. The patient had grown up in the [illegible] region of India where the water supply was known to have a high fluoride content. A diagnosis of endemic dental [illegible]

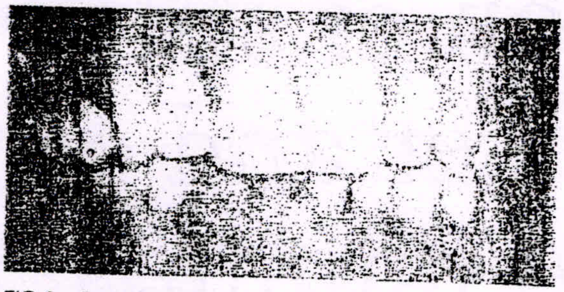

FIG 6a: Post-operative

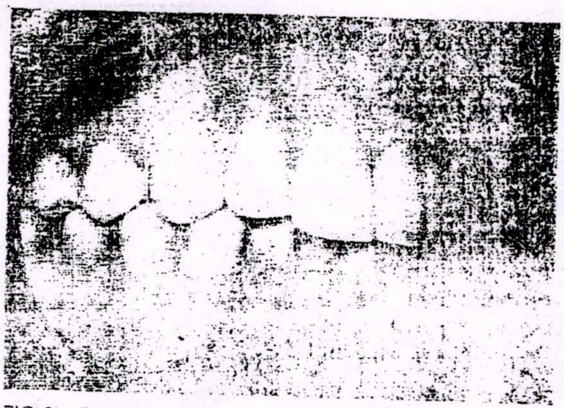

FIG 6b: Post-operative - Right lateral

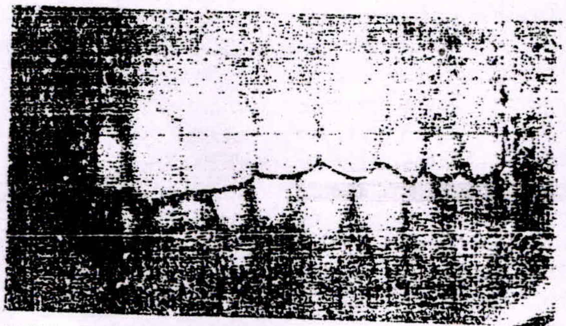

FIG 6c: Post-operative - Left lateral

Although acid etching provides a cleaner, rougher, increased surface area free of biofilm, which gives better retention to restorations, it is technique sensitive and has more chances of postoperative sensitivity. Laser is known to reduce post-operative tooth sensitivity as a lased surface does not require acid etching for composite restorations.

Use of the laser for tooth preparation is much more comfortable for patients but might take slightly more time than conventional tooth preparation with diamond abrasive points. The ability of laser to cut soft and hard tissue and sterilize tissue at the same time has a tremendous advantage over conventional drilling and markedly decreases postoperative sensitivity. The Er:YAG laser provides more surface for adhesion. The lased enamel shows uneven ablation edges, rougher surface and an ablation pattern that is typified by shards of the enamel prism layers, providing a micro retentive surface. The dentin ablation area is less irregular than enamel because dentin is less brittle. Unlike enamel, dentin has no shards, but rather softer edges. The typical retention pattern in dentin is open dentinal tubules which gives strong micro-retention.

The quality of the micro retentive patterns and hence adhesion of composites to a laser prepared tooth surface are of significant importance for conservative dentistry. Many studies have been carried out but much controversy remains as regards the superiority of adhesion to lased surfaces versus to that of conventionally prepared surfaces.

Moritz *et al* have compared the adhesive strength of composite restorations on enamel and dentin surfaces treated with conventional preparation and acid etch techniques and three different laser systems. They found that the adhesive strength for Er:YAG laser was equal to or even better than the usual acid etching techniques. A study by De Munck et al concluded that laser prepared [illegible] gave less bonding adhesive materials than conventionally prepared and etched ones because of [illegible] dentin [illegible] through [illegible]. The majority of the authors, however, [illegible] that the roughness produced with laser [illegible] equal to the acid etched technique [illegible] the bonding strength is similar to [illegible] etching.

Additional acid etching is not required [illegible] [illegible] ing lasing. This is [illegible] cooling [illegible] a [illegible]. This is [illegible] to lower the bond strength of the [illegible] material. Furthermore, the self-etch composite leads to a [illegible] result because the lack of [illegible] preparation.

[illegible]

Laser [illegible] resolve the [illegible] and [illegible] the procedure [illegible] giving a [illegible] [illegible]

For a complete list of references [illegible] [illegible]

face. Croll has named this phenomenon the "abrasion effect". However, in this case it reduced the stains but did not remove them completely.

Use of microabrasion in the treatment of endemic dental fluorosis should be done cautiously. If after one cycle of 20 min. no improvement is noted, a labial veneer restoration should be considered as an alternative treatment. Further treatment with acid can result in an unaesthetic dished out effect or unaesthetic reduction in the mesial distal curvature of the labial surface and may also cause postoperative sensitivity. Having achieved a smoother surface with microabrasion, laser was used to achieve better finish of the tooth.

[illegible]

Dr Anuradha Patil [illegible]

Dr [illegible] [illegible] Department of [illegible] Dentistry, [illegible] Dental College, Pune, Maharashtra, India.

To Evaluate The Efficacy Of Different Systems For Gutta - Percha Removal In Root Canal Retreatment

Dr. Shalini Aggarwal, Dr. Sanchita T. Bhor, Dr. Anuradha Patil.
Dr. D. Y. Patil Dental College and Hospital, Pimpri, Pune.

Introduction

Post treatment disease often warrants retreatment of root canal. Endodontic retreatment requires removal of pre-existing endodontic filling material and disinfection of the root canal system[1].

Classically retreatment of the root canal was done using a combination of Hedström files and a cocktail of chemicals to remove the previous obturation. The rotaries consisted of Gates-Glidden drills and Pesso reamers. Now manufacturers have given us armamentarium exclusively for nonsurgical retreatment. So the operator can remove obturating material, root canal sealer and obstructions if any. These recent technical and scientific advances have resulted in the retention of teeth that otherwise would be condemned to extraction.

Clinical usage of rotary instruments for Gutta-percha removal in root canal retreatment has increased substantially over the last few years. This is due to their rapid action and improved efficiency. Hence it is imperative for the clinician to be aware of the effectiveness of various rotary retreatment kits as well as any of their combinations with chemicals or physical means like ultrasonic and lasers.

In 1964, Goldman et al. investigated the effectiveness of Ruby Laser in caries removal. This investigative work by Goldman et al., and hence the potential application of laser technology to caries removal as well as various fields of dentistry, has led to the development of dental laser systems with different wavelengths, which is accompanied with the development of peripheral equipment such as light guide fibers and tips for laser irradiation. Currently, lasers are widely used in different areas of dentistry. In the field of endodontics, Weichman and Johnson[1] reported in 1971 on the ability of the CO_2 laser to seal the apical foramen. Since then, different laser systems have been applied to root canal treatment[2].

The diode laser has gained increasing importance due to its compactness and low cost. Its wavelength is within the infrared range and thin and flexible fibres can be used. Different wavelengths are described for endodontic use (810 nm and 980 nm). The diode laser has lower penetration depth in the dentine than the Nd:YAG laser and, therefore, a lower risk of unwanted temperature rise in peri-radicular structures.[5]

The aim of the present study is to evaluate the efficacy of following systems in the removal of Gutta-percha from root canals using Scanning electron microscopy (SEM).

- Diode laser plus ProTaper Universal retreatment system (Niti rotary instruments)
- Diode laser plus Hedström file
- E & Q plus Hedström file
- E & Q plus ProTaper Universal retreatment system (Niti rotary instruments)

Material and method

Specimen preparation

As per the biostastistical guidelines, 20 freshly extracted human single rooted mandibular premolars were selected for the study. The teeth were verified radiographically as having single straight patent canals of curvature less than 200, fully formed apices, intact root with no cracks, no calcification, no internal resorption or previous root canal treatment.

The teeth were stored in 3% sodium hypochlorite solution for 24 hrs to remove organic debris which adhered to external root surfaces and disinfect the samples, which were further cleaned with ultrasonic scaler to remove remnants of tissue tags. The samples were stored in saline solution until ready for use.

Access preparation was made on each tooth using high-speed diamond points and water spray and pulp tissues were removed with barbed broaches. A size 10 K-type file was passed 1mm beyond the apical foramen to ensure the canal patency. To standardize samples, teeth were decoronated using diamond disc in a low speed straight hand piece under water spray, so the working length of all samples was approximately 15 mm.

CANAL PREPARATION:

Cleaning and shaping was performed using a modified step-back flare technique (Walton 1989).

The present study used high resolution SEM images to evaluate the effectiveness of the retreatment techniques used on the inner root canal dentin morphology.

Consistently in all the three, the apical third had a mean percentage of remaining filling material greater than the middle and the cervical third. In general, there is increased anatomical variability and difficulty of instrumentation in the apical area.

In this study better performance of diode laser + PTUS may be due to, the heating effect of the laser beam softens the gutta percha and sealer and the flute design of PTUS which pulls GP out and directs it to the orifice and allows its easy removal.

However, E and Q pen + PTUS, E and Q pen + H file showed a high volume of obturating material remaining as compared to diode laser + PTUS in the present study because it efficiently removes gutta-percha from the coronal third of the canal but not from the middle and apical third as E and Q pen softens the gutta percha only in the coronal third of root.

Conclusion:

There is a marked increase in the number of retreatment cases in today's endodontic practice, and so we need to refine our procedure to increase the predictability of retreatment. From this study it appears that the use of diode laser improves the efficiency of removal of root canal content thereby creating a better aseptic environment for re-obturation of the root canal.

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Interdisciplinary management of anterior dental aesthetics

DR SHALINI AGGARWAL, DR ANURADHA PATIL AND DR SANCHITA BHOR

ABSTRACT

Patients who present with non-vital immature teeth pose a special challenge to dentists and require a specially tailored treatment plan. This case report presents management of such mutilated teeth and with the help of periodontal corrective procedure recreate the aesthetic smile. A combination of treatments led to the successful resolution of this particular challenge.

INTRODUCTION

In the past 25 years, the focus of dentistry has changed gradually. Years ago, dentists were in the "Repair Business". Routine dental treatment involved excavating dental caries and filling the enamel and dentinal defects with amalgam. In larger cavities, more durable restorations may have been necessary, but the focus was the same: Repair the effects of dental caries. However, with the advent of fluorides and sealants, as well as a better understanding of the role of bacteria in causing both caries and periodontal disease, the needs of the dental patient have changed gradually. At the same time, our image of the value of teeth in urban society has also changed. Yes, the public still regards teeth as an important part of chewing, but today the focus of many adults has also shifted toward aesthetics ("How can my teeth be made to look better?").[1]

The treatment options for mutilated teeth can be conservation of remaining tooth structure or extraction followed by either placement of removable prosthesis, a fixed prosthetic replacement or an implant. While performing any treatment the prime consideration should be fulfilling the patient's aesthetic demands.

For several decades, professionals all over the world have tried to find the perfect balance between white architecture (teeth) and pink architecture (gums) in the reproduction of anterior teeth, which should be aesthetically pleasant and natural.[2]

The purpose of this paper is to describe a case report in which a multidisciplinary approach with various restorative and periodontal corrective procedures was accomplished to recreate the aesthetic smile of a patient.

FIG 1: Preoperative view

FIG 2: Preoperative radiograph

FIG 3: MTA plug

FIG 4: Application of bonding agent

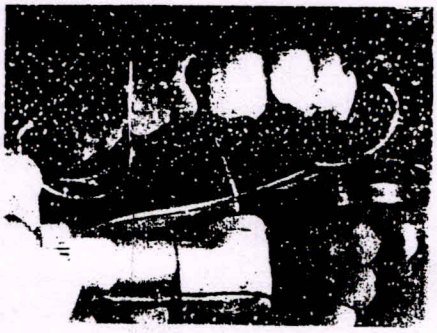

FIG 5: Application of resin cement

CASE REPORT

A female aged 30 years, reported to the Department of Conservative Dentistry Endodontics and Aesthetic Dentistry with chief complaint of intermittent pain in upper front teeth since 6 months. Patient gave history of loss of primary incisors due to trauma at the age of 2 years. Clinical examination showed the presence of caries in 11, 12 and 21. Moderate to severe yellowish brown discoloration with hypoplastic enamel in 11 (**Figure 1**). A periapical sinus was present between right central and lateral incisor. Right central incisor exhibited grade I mobility with vitality test for 11, 12 and 21 being negative. Radiographic examination revealed proximal caries approaching pulp and widening of lamina dura with 11, 12 and 21. It also revealed partial root formation with 11 (**Figure 2**).

MEDICAL HISTORY

The patient gave history of pregnancy induced diabetes with an affliction history of 6-7 months.

Numerous factors have to be taken into account for the formulation of a proper treatment plan while restoring such mutilated teeth, namely restorability, disease susceptibility, papillary and gingival considerations, tooth aesthetics etc. A major concern in this case was the incomplete root formation, inadequate crown-root ratio, flattening of gingival contour,

FIG 12: Bisque Trial

FIG 13: Postoperative

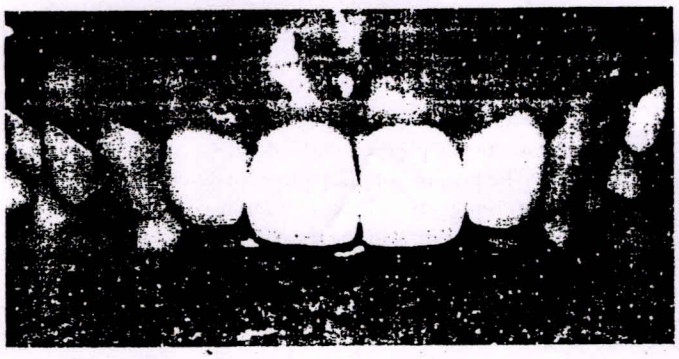

FIG 14: Follow up after 6 months

Immediately after core build up crown preparation was done. After gingival retraction was done rubber base impressions (ColteneWhaledent) were made (**Figures 10, 11 and 12**). Temporary crowns were made cemented with non-eugenol temporary cement. Impression was sent to laboratory for fabrication of metal free ceramic crowns. Final prosthesis was cemented a week later after a bisque trial and glazing (**Figures 13 and 14**).

[illegible]

A mutilated tooth especially in the aesthetic zone poses a great challenge to the clinician. The treatment plan is based upon the consideration of remaining tooth structure and periodontal status. In this situation, the usage of MTA was considered the only effective strategy to create an artificial apical seal of the root apices that had the morphological irregularities. MTA has superior sealing ability under moist conditions.[4] Good sealing is also an essential requirement for healing in this case. Hachmeister *et al.* have reported the potential of the sealing ability of MTA used for the obturation of open apices by the intracanal delivery technique. MTA can be considered a very effective material to promote regeneration of apical tissue, even in infected fully developed teeth with open apices.[4,5]

In open apex teeth, the root canal walls are too fragile and may be too weak to withstand the normal forces of mastication, becoming more prone to fracture. Composite resin materials, capable of bonding to dentin, create the potential to internally rebuild the root, providing dimensional and structural reinforcement. Pene *et al* demonstrated that the strength of an immature tooth could be improved significantly by using a bonded composite technique to fill the canal space.[6]

Ribbond is a Fibre Reinforced Composite, (FRC), which is made up of polyethylene fibres. It is a spectrum of 215 fibres with a very high molecular weight. These fibres have a very high coefficient of elasticity (117Gpa), so it has an excellent resistance to stretch and distortion. They also have a very high resistance to traction (3 GPA), as a result of their closed stitch configure ration and a good adaptability. Bondable reinforcement fibres are also characterized by impact strength five times higher than that of iron. They are translucent and assume the colour of the resin to which they are added. Bondable reinforcement fibres easily absorb water because of the gas plasma treatment to which they are exposed. This treatment reduces the fibres superficial tension, ensuring a good chemical bond to composite materials.[7,8]

Regarding gingival aesthetics, an aspect to be considered is gingival contour, gingival hyper pigmentation and excessive gingival display. In the present case [illegible] Nd:YAG laser was used to improve gingival aesthetics. Recently, a laser has been used to ablate cells containing and producing the melanin pigment. The Nd:YAG laser produces invisible, near-infrared light with a wavelength of 1,064 nm. As the Nd:YAG laser has rays that have an affinity for melanin or other dark pigments; it works more efficiently when the beam is applied in the presence of a pigment. No significant side effects of scarring, or textural or pigmentary changes have been reported. Throughout the depigmentation procedure of the ablation, the laser was cautiously used to avoid injury to the tooth surface and the adjacent tissues. In addition, the thin gingival tissue around the root prominence was ablated gently. The same area should not be ablated several times because the laser can ablate the periosteum resulting in gingival fenestration and bone exposure.[9]

For a complete list of references, visit info@dental-practice.bi

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CASE REPORT

Radix Entomolaris

Nishant Gandhi[1], Roshan Shetty[2], Anuradha Patil[3], Rahul Kumar[4]

Abstract

Variation of root canal anatomy is always a challenge for accurate diagnosis and successful endodontic therapy. A thorough knowledge of most common anatomic characteristics and their possible variations is essential for the clinician. The hard tissue repository of the human dental pulp takes on numerous configurations and shapes. These aberrations occur so often that they can be considered as normal anatomy. Radix entomolaris (RE) is one such aberration where an extra root is present on the distolingual aspect of mandibular first molar (molar with 3 roots). This article presents one case report of mandibular first molars with extra roots which was successfully treated.

Key Words - Radix entomolaris, endodontic treatment, anatomic variations

Introduction

The treatment of the entire root canal system is essential to maximize the possibility of obtaining success in the endodontic therapy. It is necessary for the clinician to have a thorough knowledge of the dental anatomy as well as of its variations.[1] It is known that the mandibular first molar can display several anatomical variations. The majority of Caucasian first molars are two-rooted with two mesial and one distal canal [2, 3]. In most cases the mesial root has two root canals, ending in two distinct apical foramina. Or, sometimes, these merge together at the root tip to end in one foramen. The distal root typically has one kidney-shaped root canal, although if the orifice is particularly narrow and round, a second distal canal may be present [4]. A number of anatomical variations have been described in the mandibular first molar: Fabra-Campos[5, 6] and Bond[7] reported the presence of three mesial canals and Stroner[8] noted the presence of three distal canals. Like the number of root canals, the number of roots may also vary. An additional third root, first mentioned in the literature by Carabelli[9], is called the radix entomolaris (RE)[10]. This supernumerary root is located distolingually in mandibular molars, mainly first molars (Fig. 1). An additional root at the mesiobuccal side is called the radix paramolaris (RP). The identification and external morphology of these root complexes, containing a lingual or buccal supernumerary root, are described by Carlsen and Alexandersen[11, 12].

In spite of high prevalence of RE in certain races, its incidence among the Indian population is found to be low and only 5.97%[13]. This case report is about the detection and management of radix entomolaris (RE) in a mandibular first molar during its root canal treatment.

Case Report

A 35-year-old male patient reported to the dental office with complaints of pain on chewing in right posterior tooth. On clinical examination, there was a gross decay in mandibular right first permanent molar (46). Tooth was tender on percussion. Radiographically the presence of widened periodontal ligament space (PDL) in the mesial roots and the presence of a third root between the mesial and distal roots were evident (Fig.2). The condition was diagnosed as chronic periapical periodontitis and the treatment plan was endodontic therapy followed by full coverage restoration.

Under local anaesthesia with 2% lidocaine access opening was done in 46. The first distal canal was found slightly away from the center (buccally) indicating the presence of the other canal on the lingual side. Upon visual inspection with a microscope (OPMI Pico, Zeiss, Zventem, Belgium), a dark line was observed between the distal canal orifice and the distolingual corner of the pulp chamber floor. At this corner overlying dentin was removed with a diamond bur with a noncutting tip (Diamendo, Dentsply Maillefer) and a second distal canal orifice was detected (Fig. 2). The access cavity preparation was modified from a triangular to trapezoidal outline form and the fourth canal was located. The root canals were explored with DG16 endodontic explorer and the patency of the canals was verified with a size 10 K

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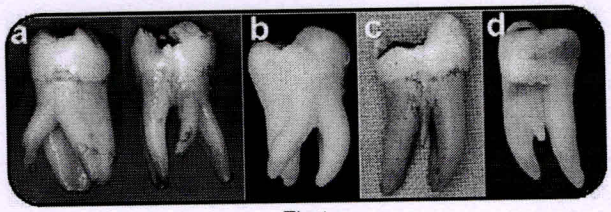

Fig 1

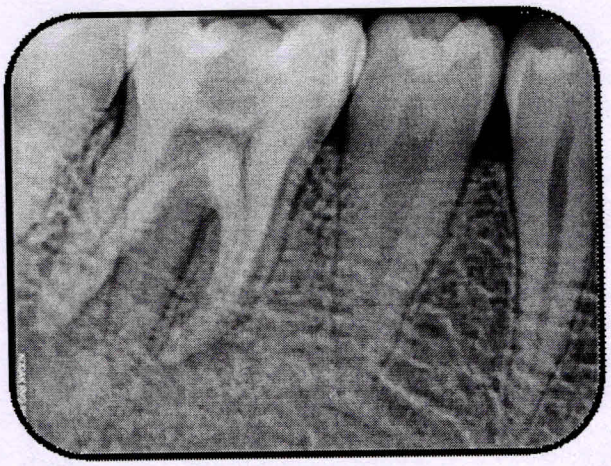

Fig 2: Preoperative X-ray

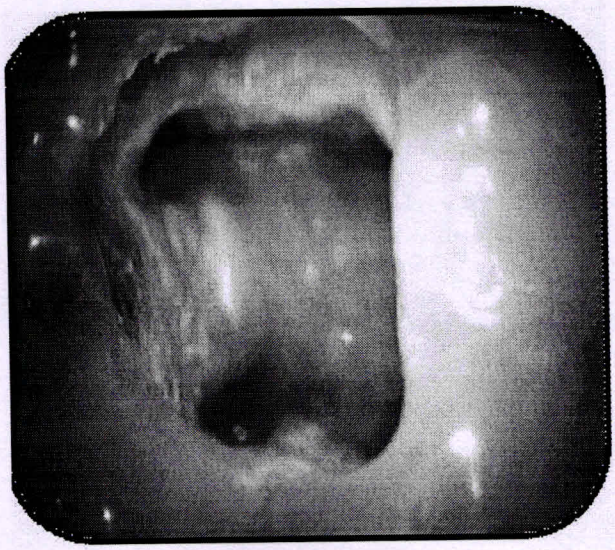

Fig 3: Access cavity

file. The canal length was determined electronically using Root ZX II (J Morita, USA) and the root canals were shaped with ProTaper rotary instruments (Dentsply Maillefer). During preparation, File Eze (Ultradent Products Inc., South Jordan, UT) was used as a lubricant and the root canals were disinfected with a sodium hypochlorite solution (2.5%). Calcium hydroxide (RCCal , Prime dent, India) intracanal medicament given and patient was recalled after 7 days.

At next appointment patient was asymptomatic. Master cone radiograph revealed proper fitting of

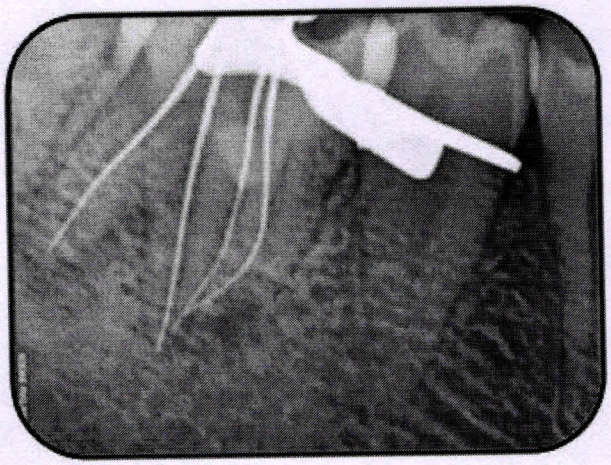

Fig 4:Working length determination

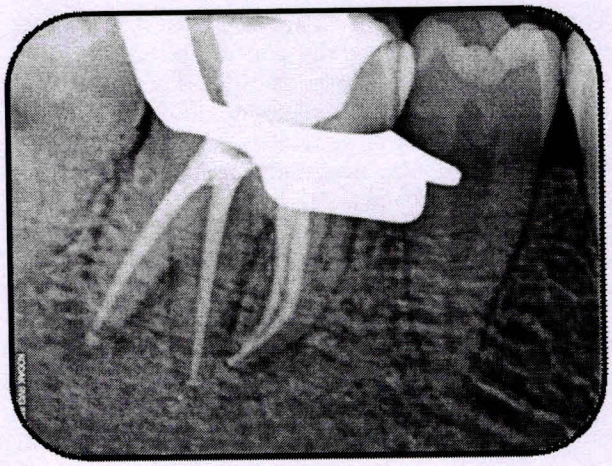

Fig 5 : Obturation

and obturated with 6% gutta percha points and AH plus sealer (Dentsply DeTrey, Konstanz, Germany) using lateral condensation technique (Fig.5). The access cavity was restored with Type IX GIC (Fuji) cement.

Discussion

The success of endodontic therapy depends on the root canal morphology to some extent. Many anatomical variations of mandibular molars have been documented in the literature. Morpho-anatomic changes in teeth may be divided according to the site of their occurrence; i.e., tooth crown, roots and root canals. Third root anomalies may develop during bud morpho differentiation as a result of a developmental aberration of both ectoderm and mesoderm[14].

A classification by *Carlsen* and *Alexandersen* describes four different types of RE according to the location of the cervical part of the RE.[15]

Type A and B - Distally located cervical part of the

RE with two normal and one normal distal root components, respectively.

Type C – Mesially located cervical part,

Type AC - Central location, between the distal and mesial root components.

This classification allows for the identification of separate and nonseperate radix entomolaris.

According to the classification of *De Moor et al*, based on the curvature of the separate RE variants in bucco-lingual orientation, three types can be identified.[16]

Type I - refers to a straight root/root canal,

Type II - refers to an initially curved entrance which continues as a straight root/root canal.

Type III - refers to an initial curve in the coronal third of the root canal and a second curve beginning in the middle and continuing to the apical third.

Unusual anatomy of the mandibular first molar is reported in several studies. The presence of two distal roots is rare but does occur. This additional root can usually be found distolingually, and was recently mentioned in the literature by De Moor et all as "radix entomolaris" (RE)[17]. The prevalence of three-rooted mandibular first molars in extracted teeth, according to published literature, is given in Table 2[18].

Apart from the awareness about the possible existence and the racial prevalence of RE, it can be detected by thorough inspection of pretreatment radiographs, especially those taken from different angles. Intra-oral periapical radiographs may serve as an important aid in identifying RE[19]. It is suggested that the radiographs double periodontal ligament images or unclear view of distal root/canal indicate the possibility of RE[20]. In the present case, all the radiographs taken during the root canal procedure were clearly suggestive of RE and prevented the need for further investigations like cone-beam computed tomography and 3-dimensional reconstruction which are useful to study the morphology of RE in a noninvasive manner.

Table 2 – Survey of available studies: Prevalence of three rooted mandibular first molars

Study	Year	Prevalence (%)	Population
Taylor	1899	3.4	United Kingdom
Tratman	1938	5.8	Chinese
Tratman	1938	0.2	Indians
Turner	1971	5.8	American Indian
Skidmore and Bjorndal	1972	2.2	Caucasians
Yones et al	1990	2.92	Saudi
Loh	1990	7.9	Chinese
Yew and Chan	1993	21.5	Chinese
Gulabivala et al	2001	10.1	Burmese
Gulabivala et al	2002	13	Thai
Huang et al	2007	21.7	Taiwanese
Tu et al	2007	17.77	Taiwanese
Schafer et al	2009	0.68	Germans
Garg et al	2010	5.97	Indian

The presence of and RE or an RP has clinical implications in endodontic treatment. The (separate) RE is mostly situated in the same buccolingual plane as the distobuccal root, and resultant superimposition of both roots can appear on the preoperative radiograph, resulting in an inaccurate diagnosis. A thorough inspection of the preoperative radiograph and interpretation of particular marks or characteristics, such as an unclear view or outline of the distal root contour or the root canal, can indicate the presence of a 'hidden' RE. To reveal the RE, a second radiograph should be taken from a more mesial or distal angle (30 degrees). Clinical inspection of the tooth crown and analysis of the cervical morphology of the roots by means of periodontal probing can facilitate identification of an additional root. An extra cusp (tuberculum paramolare) or more prominent occlusal distal or distolingual lobe, and lingual pulp chamber wall can be explored with DG 16 explorer to reveal overlying dentin or pulp roof remnants masking the root canal entrance. The calcification, which is often situated above the orifice of the RE, has to be removed for a better view and access to the RE. However, care should be taken not to remove and excessive amount

of dentin on the lingual side of the cavity and orifice of the RE. A severe root inclination or canal curvature, particularly, in the apical third of the root (as in a type III RE), can cause shaping aberrations such as straightening of the root canal or a ledge, with root canal transportation and loss of working length resulting. The use of flexible nickel-titanium rotary files allows a more centered preparation shape with restricted enlargement of the coronal canal third and orifice relocation. Therefore, after relocation and enlargement of the orifice of the RE, initial root canal exploration with small files (size 10 or less) together with radiographical and electronic root canal length determination, and the creation of a glide path before preparation, are step-by-step actions that should be taken to avoid procedural errors.

The presence of and RE or an RP has clinical implications in endodontic treatment. The (separate) RE is mostly situated in the same buccolingual plane as the distobuccal root, and resultant superimposition of both roots can appear on the preoperative radiograph, resulting in an inaccurate diagnosis. A thorough inspection of the preoperative radiograph and interpretation of particular marks or characteristics, such as an unclear view or outline of the distal root contour or the root canal, can indicate the presence of a 'hidden' RE. To reveal the RE, a second radiograph should be taken from a more mesial or distal angle (30 degrees). Clinical inspection of the tooth crown and analysis of the cervical morphology of the roots by means of periodontal probing can facilitate identification of an additional root. An extra cusp (tuberculum paramolare) or more prominent occlusal distal or distolingual lobe, and lingual pulp chamber wall can be explored with DG 16 explorer to reveal overlying dentin or pulp roof remnants masking the root canal entrance. The calcification, which is often situated above the orifice of the RE, has to be removed for a better view and access to the RE. However, care should be taken not to remove and excessive amount of dentin on the lingual side of the cavity and orifice of the RE. A severe root inclination or canal curvature, particularly, in the apical third of the root (as in a type III RE), can cause shaping aberrations such as straightening of the root canal or a ledge, with root canal transportation and loss of working length resulting. The use of flexible nickel-titanium rotary files allows a more centered preparation shape with restricted enlargement of the coronal canal third and orifice relocation. Therefore, after relocation and enlargement of the orifice of the RE, initial root canal exploration with small files (size 10 or less) together with radiographical and electronic root canal length determination, and the creation of a glide path before preparation, are step-by-step actions that should be taken to avoid procedural errors.

Conclusion

Clinicians should be aware of these unusual root morphologies in the mandibular first molars in

Indian population. The initial diagnosis of a radix entomolaris or paramolaris before root canal treatment is important to facilitate the endodontic procedure, and to avoid 'missed' canals. Pre-operative periapicals radiographs exposed at two different horizontal angles are required to identify these additional roots and its root canal orifice will result in a modified opening cavity with extension to the distolingual. The morphological variations of the RE in terms of root inclination and root canal curvature demand a careful and adapted clinical approach to avoid or overcome procedural errors during endodontic therapy.

Acknowledgements

The authors would like to thank Dr Sabita Ram,Dean Dept. of M.G.M Dental College, Navi Mumbai for supporting me for the publication. Also I would like to thank Dr.Vanitha Shenoy & Dr.Richard Pereira for helping me throughout the publication.

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International Journal of Stomatological Research 2013, 2(1): 5-10
DOI: 10.5923/j.ijsr.20130201.02

Incorporation of Casein Phosphopeptide-Amorphous Calcium Phosphate into Glass-Ionomer Cement for Orthodontic Band Cementation – An *in vitro* Study

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Abstract Aim: To determine the effect of incorporating Casein Phosphopeptide-amorphous calcium phosphate (CPP-ACP) into self-cured glass-ionomer cement (GIC) and to compare the shear-peel band strength. Materials and method:1) Ion Measurements and CPP Detection: Discs of 6 mm diam x 2 mm thick was prepared for following groups: Group I - GIC & Group II - GIC +1.56% w/w CPP-ACP. The discs incubated at 37°C in 2mL of deionized water (pH 6.9) and 2mL of 50mM sodium lactate buffer at pH 5.0. The release of calcium, inorganic phosphate, and fluoride ions was measured in each solution.2) Shear-Peel band strength: 60 Non carious human molars collected, stored in distilled water after decontamination in 0.5% chloramine. Extracted molars divided into 2 groups each group containing 30 molars. Group I – bands were cemented with GIC & Group II - bands were cemented with GIC +1.56% w/w CPP-ACP. With the use of an Instron universal testing machine, a shear-peel load was applied to each cemented band. SEM analysis was done with each group. Results: Incorporation of 1.56% w/w CPP-ACP into the GIC resulted in an increase in shear peel band strength. Fluoride, Calcium & Phosphate ions release was significantly higher in Group II as compare to Group I. Conclusion: Incorporation of 1.56% w/w CPP-ACP into the GIC significantly increased shear-peel band strength and significantly enhanced the release of fluoride, calcium and phosphate ions at neutral and acidic pH. Thus incorporation of CPP-ACP phosphate can prevent demineralization and promotes remineralization of enamel subsurface lesions.

Keywords Shear Peel Band Strength, CPP-ACP , GIC, Orthodontic Material

1. Introduction

Fixed orthodontic appliances, by hampering effective oral hygiene, can result in increased oral plaque accumulation and increase the risk of white-spot lesion formulation[1]. The reported prevalence of white-spot lesions during orthodontic treatment has ranged from 2 to 96% of affected individuals[1-4].

Orthodontic bands around the crowns of molars and second bicuspids still play an important role in providing stable attachment for an arch wire and the use of additional appliances such as headgear or palatal arch and thus, their retention around the crowns is vital in the successful application of orthodontic forces leading to successful treatment. A common problem experienced by many orthodontists and patients is the development of enamel demineralization and even caries following the use of brackets and bands bonded and cemented to teeth[5-7]. Orthodontic bands are believed to facilitate more enamel demineralization than bracketed teeth[3].

Dental caries is initiated *via* the demineralization of tooth hard tissue by organic acids produced from fermentable carbohydrate by dental plaque cariogenic bacteria. Fluoride ions, in the presence of calcium and phosphate ions, can help replace the lost mineral of early caries lesions by remineralization.

However, unfavorable properties found in many of luting cements, such as high solubility in oral fluids and low bond strengths, may contribute to demineralization beneath the bands. However, GIC are ion-releasing materials and the incorporation into and slow release of fluoride ions from the cement provides a significant anticariogenic property[8].

Casein phosphopeptide-amorphous calcium phosphate nanocomplexes (CPP-ACP) have been shown to prevent enamel demineralization and promote remineralization of enamel subsurface lesions in animal and human in situ caries models[9-11]. The anticariogenic potential of CPP-ACP has been attributed to the ability of the CPP to localize amorphous calcium phosphate at the tooth surface, thereby

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Published online at http://journal.sapub.org/ijsr

helping to maintain a state of supersaturation with respect to tooth mineral[11].

Extensively researched, CPP-ACP has proven to bind readily to pellicle, plaque, soft tissue and even hydroxyapatite when applied within the oral cavity. This helps to maintain a state of supersaturation of calcium and phosphate at the tooth surface, which depresses demineralization and enhances remineralization. Thus a product of combination of these two materials can show a synergistic effect.

The Aims of this study were.

1. To determine the effect of incorporating CPP-ACP into self-cured GIC on shear peel band strength.
2. To evaluate Fluoride, Calcium and Phosphate ions release.
3. To evaluate surface characteristic of both groups under scanning electron microscope.

2. Materials & Method

Ion Measurements and CPP Detection:

Discs of 6 mm diam x 2 mm thick were prepared for following groups.

Group I --GIC

Group II--GIC +1.56% w/w CPP-ACP

The GIC disc was prepared with self-curing glass-ionomer luting cement (Gold label, GC, Tokyo, Japan). The disc containing GIC+ CPP-ACP was prepared from the same GIC, with 1.56% w/w (Percent by weight) CPP-ACP (Tooth Mousse plus/MI paste, GC Corporation, Tokyo, Japan) incorporated. The CPP-ACP and GIC powder were manually mixed, and the powder: liquid ratio 2: 1 as recommended by manufacturer.

The mixed cement was carried into the mold, condensed, and allowed to set at 37°C and 100% humidity for 1 hr in humidor. During setting, the bottom and top of the filled molds was covered by glass slab. The discs was removed from the molds, placed in individual sealed plastic tubes, and incubated at 37°C in both 2mL of deionized water (pH 6.9) and 2mL of 50mM sodium lactate buffer at pH 5.0. The solutions was changed every 24 hrs for 3 days, and the release of Fluoride, Calcium and Phosphate ions was measured in each solution.

A calcium concentration was determined by atomic absorption spectrophotometry[8] (lab India), fluoride and inorganic phosphate was determined by Ion chromatogram [11] (Dionex India ltd.).

By measuring the Fluoride, Calcium and Phosphate ions in parts per million (ppm) in a known volume of deionized water and sodium lactate buffer, it was possible to calculate the total amount of ions released from the specimens. After each reading was taken, the total ions released in micrograms was calculated by multiplying the parts per million (1 ppm = 1 µg/mL) by the deionized water sample volume or sodium lactate buffer. The total fluoride, calcium and phosphate were then divided by the area of the sample disk to obtain the ion release in micrograms per square centimeter.

Shear-Peel band strength:

The force required for debanding was used as a measure of shear-peel band retention. 60 Non carious human third molars collected, stored in distilled water after decontamination in 0.5% chloramine. The teeth were randomly divided into two groups of 30 teeth. In preparation for measuring bond strength, 60 teeth were notched in the apical third with a diamond bur, and then mounted below the cementoenamel junction in block of self cure acrylic, with the long axis of each tooth vertical. The teeth were then cleaned with pumice slurry, rinsed in distilled water and dried thoroughly in a stream of air. As bands do not exist for third molars, first permanent molar bands (3M Unitek) were used with attachments fitted i.e. tubes welded on buccal and lingual surface of bands were seated around the teeth including adaptation of the margins. Bands were selected and placed by the same operator to eliminate any operator bias in band positioning and fitting. 1.56% w/w of CPP-ACP was incorporated to GIC which was manually mixed, and the powder: liquid ratio for GIC used was 2: 1 as recommended by manufacturer. Groups were as follows

Group I - bands were cemented with GIC

Group II - bands were cemented with GIC+ 1.56% w/w CPP-ACP

Once the bands had been positioned accurately on the tooth surface and pressed firmly into place, excess cement was removed with dry cotton rolls. All specimens were then transferred to a humidor set at 37° C for 24 hours before measuring shear peel band strength.

Band removal: - Each mounted tooth was fixed to the customized holding device to the lower load cell of the Universal testing machine. 0.8mm Stainless steel wire was passed from the attachment both on the buccal and lingual side of the band and held by holding device (Fig 1). This configuration allowed all forces to be directed parallel to the long axis of the tooth during debanding. With the use of a Universal testing machine[Star Testing System, India. (Model no .STS 248)] , a shear-peel load was applied to each cemented band. The shear load was applied at a crosshead speed of 5mm/min and the load cell used was 500N. Testing proceeded for each specimen until the band was removed from the tooth. The maximum force recorded during debonding was chosen from the stress– strain curve[12] for each specimen. The force required to deband was registered in Newtons and converted into Megapascals as a ratio of Newton to surface area of the band ($MPa=N/mm^2$).

SEM analysis was done for both groups[FEI- quanta 200 (SEM under low vacuum)].

3. Stastical Analysis

The mean retentive strengths for the cements tested were compared using t- test. In addition, we calculated Weibull modulus. This form of analysis might be more meaningful for evaluating bond strength data because it takes into

account the bond strength values at the extremes of the distribution[13, 14]. Weibull modulus has been used previously to assess fracture processes in chemically activated and light-activated composites[15] and in the evaluation of bonding agents[14] and band cements[13], for orthodontic use. By generating a Weibull modulus for each band cement, numerical evaluation of its reliability is feasible. A low value of Weibull modulus indicates a wide scatter of bond strength values, whereas a high value of Weibull modulus indicates close grouping of bond strength values and better dependability of the cement[14].

4. Results

Incorporation of 1.56% w/w CPP-ACP into the GIC resulted in an increase in shear peel strength. Unpaired t test was applied, $p < 0.001$; which means that there is statistically highly significant difference between the Group - I and Group – II, it has observed that Group – II (2.15 MPa) has more shear band strength than Group - I (1.78 MPa) (Table 1) and higher weibull modulus was found in Group II (Table 1).

Ion and CPP Release

The pattern of fluoride release in water was similar between both groups, with the highest release occurring during the first 24 hrs and a slower but continued release during the next two 24-hour periods. Fluoride release was significantly higher in the pH 5.0 sodium lactate buffer than in water for both materials. Significantly higher fluoride release was found with the Group II, when compared with the Group I at both pH values (Table 2).

Similarly Calcium ion release was detected for both groups at both pH. The release was low relative to fluoride but continuous during the three 24-hour periods (Table 3). At both pH values, inorganic phosphate ion release was significantly higher from the Group II than from the Group I during the first 24-hour period. The release of inorganic phosphate was significantly higher in sodium lactate buffer at pH 5.0 than in water for both Groups (Table 4).

Table 1. Bond strength values for bands cemented with Group I & Group II

Group	No of samples	Mean bond strength MPa	Standard deviation	Weibull modulus
Group I	30	1.78	0.30	3.864
Group II	30	2.15	0.6	4.967

Table 2. Fluoride release

Period	Water (pH 6.9)		Sodium lactate(pH 5.0)	
	Control GIC	GIC+CPP-ACP	Control GIC	GIC+CPP-ACP
24hr	9.1	15.7	22.8	31.6
48hr	3.2	5.2	15.3	19.1
72hr	2.4	3.4	14.5	16.8

Table 3. Calcium release

Period	Water (pH 6.9)		Sodium lactate(pH 5.0)	
	Control GIC	GIC+CPP-ACP	Control GIC	GIC+CPP-ACP
24hr	2.27	5.84	3.24	9.34
48hr	1.50	4.55	2.84	7.85
72hr	1.25	4.04	2.52	7.10

Table 4. Phosphate release

Period	Water (pH 6.9)		Sodium lactate(pH 5.0)	
	Control GIC	GIC+CPP-ACP	Control GIC	GIC+CPP-ACP
24hr	2.4	3.5	4.1	7.4
48hr	2.1	2.9	3.8	7.1
72hr	1.7	2.5	3.5	6.9

5. Discussion

Orthodontic treatment is almost always an elective procedure to improve the patient's dentofacial appearance. Patients may develop areas of decalcification adjacent to orthodontic brackets and bands such lesions could be considered iatrogenic. The effects of decalcification may be white spots on the enamel, or even cavitations. They appear as unsightly lesions on previously healthy teeth at the end of orthodontic treatment. They can require further treatment after orthodontic treatment to mask or remove them.

In this study, 30 third molars were used per group for shear peel band strength testing. This sample size has been recommended as optimal for studies of this nature[14], and specimen storage before use complied with guidelines in the orthodontic literature[14]. A major reason for the use of Glass ionomer cement in a variety of clinical applications is their capacity to bond chemically to different surfaces[16].

In the study reported here the shear peel band strength for Group II was more as compare to the Group I. Strength obtain for Group I was very much similar to the results obtain in other studies by Millett et al where mean values for GIC on natural teeth ranged from 1.27 to 1.65Mpa.

[17-20]. The intent of this experiment was to examine orthodontic luting cements such as GIC and combination of GIC+CCP-ACP for improved handling characteristics and potential fluoride, calcium and phosphate release. Comparisons with previous studies were difficult because different material were used.

The role of CPP-ACP in decreasing the incidence of dental caries in the community is anticipated to be additive to the beneficial effects of topical fluoride[21]. The CPP molecules contain a cluster of phosphoseryl residues which markedly increase the apparent solubility of calcium phosphate by stabilizing amorphous calcium phosphate[22] under neutral and alkaline conditions. CPP-ACP nanocomplexes have been shown to prevent enamel demineralization and promote remineralization when used in a mouthwash or sugarfree gum so the combination of GIC & CPP-ACP enhances protection of the adjacent enamel to acid demineralization promote enamel subsurface lesion remineralization. CPP-ACP nanocomplexes subsequently act to buffer free calcium and phosphate ions in the plaque fluid, in order to maintain a state of supersaturation of ACP with respect to enamel mineral, thereby limiting enamel demineralization and enhancing remineralization[9-10, 22-24].

With respect to the release of ions from the GICs, Ion chromatograph was used to monitor fluoride release in this study. This has the advantage of being accurate at very low concentrations and gives a direct measurement of the effective free fluoride ion concentration which may not be possible using other methods[25] it was shown that the fluoride release in sodium lactate buffer (pH 5.0) was significantly higher than that in water (pH 6.9). The pattern of fluoride release for glass ionomer indicates a high initial release rate followed by a slow rate of release overtime. This finding has been previously reported for normal GIC[8, 20, 26]. Fluoride release was significantly higher from Group II than from the Group I at both pH values. It is possible that the CPP-ACP promoted the release of fluoride ions from the GIC by forming CPP-ACP nanocomplexes, which were released from the cement matrix[27].

Significantly more inorganic phosphate was also released from Group II at both pH values (5.0 & 6.9) than from the Group I, consistent with the addition of the stabilized amorphous calcium phosphate. Calcium is an ion not easily leachable from GIC once the cement has set[28], due to its rapid binding, in an insoluble form, to the polyacrylic acid matrix[29]. Elution of calcium, when it does occur, has been attributed to acid erosion of the cement matrix[8, 28].

It has not been clearly established whether the mode of failure for a particular material is associated with its bond strength or elastic modulus. It is known that the pores in a solid body act as stress-concentration points where fracture can initiate[30] and it has been speculated that this explains the frequency of cohesive failure within a GIC[31]. (Fig 2 & Fig 3) illustrates SEM analyses of the fractured surfaces of the different GICs which suggest a greater porosity of the. Group I relative to the Group II. More cracks were seen in Group I & greater porosity in the Group I could be the probable reason for less bond strength. This lends support to the findings of the Weibull modulus for both of these cements.

The CPP-ACP in the GIC may have also directly increased shear peel band strength by the incorporation of the CPP-ACP nanoparticles into the crosslinked matrix of the GIC. Further research in an in-vivo setup would be required before extrapolating these results to the intraoral environment.

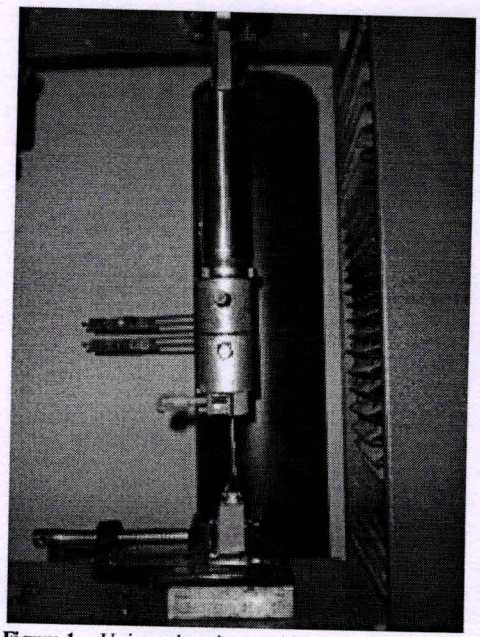

Figure 1. Universal testing machine experiment setup

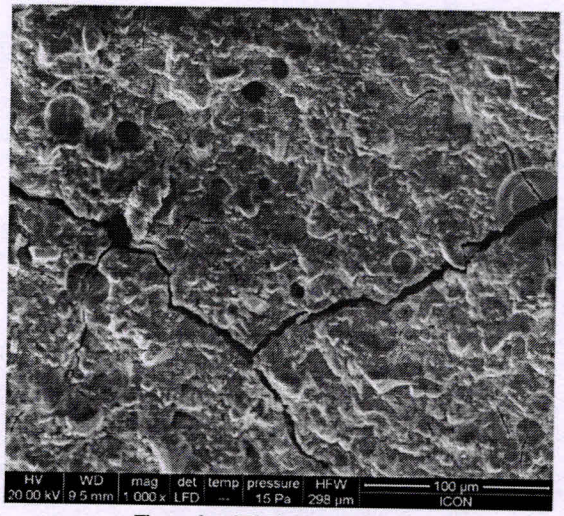

Figure 2. SEM image of Group I

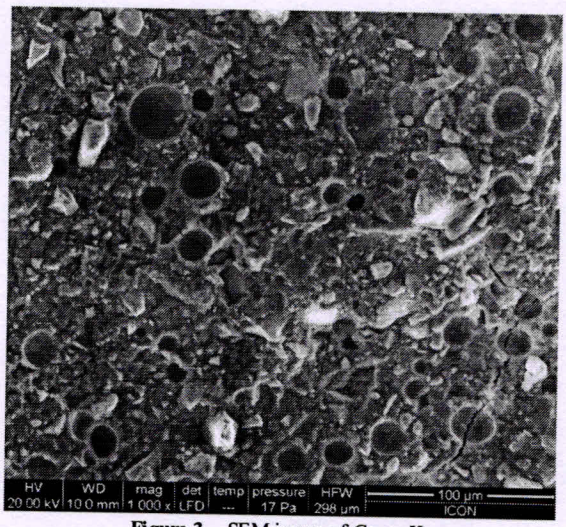

Figure 3. SEM image of Group II

6. Conclusions

Incorporation of 1.56% w/w CPP-ACP into a GIC was shown to increase shear peel band strength and enhance the release of fluoride, calcium and phosphate ions. The results of this study suggest that the 1.56%-CPP-ACP-containing GIC is superior luting cement for orthodontic band cement with an improved anticariogenic potential.

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Original Article

The evaluation of interfaces between MTA and two types of GIC (conventional and resin modified) under an SEM: An *in vitro* study

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Abstract

Context: Mineral trioxide aggregate (MTA) is a biocompatible repair material that is often used along with glass ionomer cement (GIC) in many clinical situations.

Aims: In this study, the interface of GIC and MTA was examined, and the effect of time on this interface was tested.

Settings and Design: Materials tested were set and plastic moulds and analysed.

Materials and Methods: Forty 9-mm hollow cylindrical glass molds were filled with MTA and then according to the group either conventional GIC or resin-modified GIC (RMGIC) is filled immediately or after 45 min. The specimens were then sectioned, carbon coated, and examined using a scanning electron microscope (SEM) and the elemental analysis was done.

Statistical Analysis: Observational study, no statistical analysis done.

Results: The SEM showed that both the groups underwent adhesive separation and gap formation at the interface. The specimens in which GIC was condensed over freshly mixed MTA (group IIA and group IIB) also showed cohesive separation in MTA; however, it was more in the GIC condensed after 45 min over MTA groups (group IA and group IB). The results were better for conventional GIC than RMGIC.

Conclusions: GIC can be applied over freshly mixed MTA with minimal effects on the MTA, but this effect decreases with time.

Keywords: Energy dispersive x-ray analysis (EDAX); glass ionomer cement (GIC); mineral trioxide aggregate (MTA); scanning electron microscope (SEM)

INTRODUCTION

Mineral trioxide aggregate (MTA) was introduced as a retrograde filling material in 1993 by Torabinejad. It is composed of tricalcium silicate, dicalcium silicate, tricalcium aluminate, calcium sulfate, bismuth oxide, and small quantities of other oxides that alter its mechanical properties.[1] Initially, it was used to seal off all pathways of communication between the root canal and the exterior of a tooth.[2] It is now popular as a root-end filling material,[1,2] in vital pulp therapy including direct pulp capping and pulpotomy of immature teeth[3] and as an apical barrier in immature teeth with necrotic pulps. It is now also productively used in regenerative endodontic procedures in immature teeth with apical periodontitis.[4,5]

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Date of submission : 13.01.2016
Review completed : 01.03.2016
Date of acceptance : 05.04.2016

Access this article online

Quick Response Code:

Website: www.jcd.org.in

DOI: 10.4103/0972-0707.181943

How to cite this article: Patil A, Aggarwal S, Kumar T, Bhargava K, Rai V. The evaluation of interfaces between MTA and two types of GIC (conventional and resin modified) under an SEM: An *in vitro* study. J Conserv Dent 2016;19:254-8.

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Journal section: Orthodontics
Publication Types: Research

doi:10.4317/jced.54461
http://dx.doi.org/10.4317/jced.54461

Torque Control During Intrusion on Upper Central Incisor in Labial and Lingual bracket System - A 3D Finite Element Study

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Pol TR, Vandekar M, Patil A, Desai S, Vikram Shetty 5, Saptarshi Hazarika. Torque Control During Intrusion on Upper Central Incisor in Labial and Lingual bracket System - A 3D Finite Element Study. J Clin Exp Dent. 2018;10(1):e20-4.
http://www.medicinaoral.com/odo/volumenes/v10i1/jcedv10i1p20.pdf

Received: 24/10/2017
Accepted: 18/11/2017

Article Number: 54461 *http://www.medicinaoral.com/odo/indice.htm*

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Indexed in:
Pubmed
Pubmed Central® (PMC)
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Abstract

Background: The aim of present study was to investigate the difference of torque control during intrusive force on upper central incisors with normal, under and high torque in lingual and labial orthodontic systems through 3D finite element analysis.

Material and Methods: Six 3D models of an upper right central incisor with different torque were designed in Solid Works 2006. Software ANSYS Version 16.0 was used to evaluate intrusive force on upper central incisor model . An intrusive force of 0.15 N was applied to the bracket slot in different torque models and the displacements along a path of nodes in the upper central incisor was assessed.

Results: On application of Intrusive force on under torqued upper central incisor in Labial system produce labial crown movement but in Lingual system caused lingual movement in the apical and incisal parts. The same intrusive force in normal-torqued central incisor led to a palatal movement in apical and labial displacement of incisal edge in Lingual system and a palatal displacement in apical area and a labial movement in the incisal edge in Labial systemin.

In overtorqued upper central incisor, the labial crown displacement in Labial system is more than Lingual system.

Conclusions: In labial and lingual system on application of the same forces in upper central incisor with different inclinations showed different responses. The magnitudes of torque Loss during intrusive loads in incisors with normal, under and over-torque were higher in Labial system than Lingual orthodontic appliances.

Key words: *FEM, lingual orthodontics, intrusion, torque control, labial bracket systems*

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Conflicts of Interest

The authors state that they have no conflicts of interest.

10.5005/jp-journals-10031-1232

CASE REPORT

The Paradox of a Radiculous Maxillary Second Premolar: A Case Report

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ABSTRACT

The major causes for persistent intracanal infection are unfilled canals and incomplete obturation resulting in endodontic failure. A thorough knowledge of the root canal anatomy and accurate interpretation of preoperative radiographs are essential aspects of endodontic therapy. Quite often the third root or canal is missed as it is not visible under normal vision. Three rooted maxillary premolars have similar root canal morphology as that of maxillary molars and are described as 'Radiculous'. According to Vertucci, the incidence of three canals in maxillary second premolar is 0.3 to 2%. This case report describes the clinical diagnosis and endodontic retreatment of radiculous maxillary second premolar, drawing particular attention to access refinements aided by ultrasonics and dental operating microscope.

Key-words: Magnification, Radiculous, Retreatment, Ultrasonics

How to cite this article: Gorakh BD, Sumanthini MV, Shenoy VU, Anuradha PB. The Paradox of a Radiculous Maxillary Second Premolar: A Case Report. J Contemp Dent 2018;8(2):106-111.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

A thorough understanding of the variations in root canal morphology and correct evaluation of preoperative radiographs are essential aspects of endodontic therapy. One of the primary factors for endodontic treatment failure is undetected extra canals.[1] The variations in the root canal morphology pose difficulties to the clinician during all the operative stages, including access cavity design preparation, chemomechanical debridement followed by obturation of the root canal system.

Anatomical variations in the root canal morphology of maxillary premolars have been reported in a number of *in vitro* studies.[1-3] Vertucci reported an incidence of 0.3 to 2% occurrence of three root canals in maxillary second premolar.[4] Bellizzi in 1985 in his *in vivo* radiographic study found that out of 630 maxillary second premolars, one canal was seen in 40.3% (254), two canals were seen in 58.6% (369) and three canals were seen in 1.1%.[5] According to a study done by Raj and Sumitha in 2010, out of 200 maxillary second premolars of Indian population examined by clearing technique; Vertucci's Type II configuration was the most prevalent (33.6%). This was followed by Type II (31.1%), Type I (29.2%), Type V (2.1%), Type III (1.3%), Type VI (1.2%) and Type VII (1%)[6] (Fig. 1).[4] Three-rooted maxillary premolars have root canal morphology similar to maxillary molars, and were termed as "mini molars" or "radiculous" by Maibum[7] and Goon[8] respectively.

Magnifying visual aid such as the dental operating microscope (DOM), has shown promise in detecting and treatment of canal variations without incurring much damage to tooth structure.[9] This case report describes the management of a radiculous second premolar under DOM.

CASE REPORT

A 24-year-old male patient reported to the Department of Conservative Dentistry and Endodontics with the chief complaint of pain and food lodgement in the upper left back tooth region since two weeks. Patient experienced mild, intermittent, non radiating pain on mastication in the maxillary left posterior teeth region that relieved without any medications. Patient had undergone end-

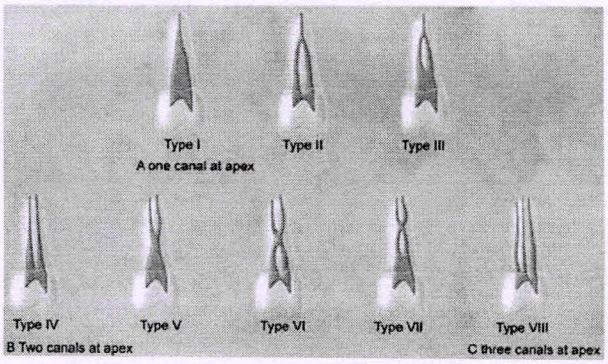

Fig. 1: Diagrammatic representation of Vertucci's canal configurations.[4]

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DOI: 10.7860/JCDR/2020/42735.13487

Original Article

Dentistry Section

Efficacy of Passive Ultrasonic Activation Assisted Hand vs. Rotary Retreatment Files in the Removal of Root Canal Filling Material: An *In Vitro* Study

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ABSTRACT

Introduction: Endodontic treatment failures are caused by persistent or secondary intraradicular infection due to inefficient treatment or re-infection of the obturated root canal system because of coronal or apical leakage. Complete removal of Gutta-Percha (GP) from the root canal system is essential during retreatment procedures in order to re-establish healthy periapical tissues. Many techniques and materials have been advocated in root canal-treated teeth to remove the obturating materials. However, residues of the filling materials have been observed on the canal walls in all the techniques. Therefore, this study was designed to explore the application of passive ultrasonic activation in the removal of gutta-percha and epoxy resin based root canal sealer during endodontic retreatment by rotary and hand instruments.

Aim: To evaluate the efficacy between passive ultrasonic activation assisted hand vs. rotary retreatment files in the removal of gutta-percha and sealer during endodontic retreatment.

Materials and Methods: The current study was an experimental in vitro study where all the procedures were carried out in extracted human teeth from October 2018 till February 2019. Forty extracted human single rooted teeth were selected. The root canals were prepared using ProTaper Next rotary files and obturated by a hybrid warm gutta-percha technique. They were divided into four groups of ten specimens each based on the retreatment procedures: Group 1: H-files, Group 2: H-files and passive ultrasonic activation of xylene, Group 3: ProTaper Universal retreatment files and Group 4: ProTaper Universal retreatment files and passive ultrasonic activation of xylene. The specimens were sectioned buccolingually after retreatment procedure and viewed under stereomicroscope for evaluating the percentage of remaining gutta-percha. Data obtained was subjected to Normality tests. Further statistical analysis was done using one-way ANOVA followed by Tukey Kramer Test for pairwise comparisons.

Results: Irrespective of the technique, all the specimens showed residual filling materials on the canal walls. ProTaper Universal retreatment files with or without ultrasonic activation of solvent showed significantly ($p<0.05$) less filling material remnants when compared to H-files with/without ultrasonic activation of solvent.

Conclusion: Rotary instrumentation supplemented with passive ultrasonic activation was found to be more efficient in removing root canal filling materials.

Keywords: Protaper retreatment files, Root canal treatment, Solvent, Ultrasonic irrigation

INTRODUCTION

The goal of non-surgical endodontic retreatment is complete removal of gutta-percha from root canal walls, re-establish working length, promote disinfection and re-obturate the root canal to establish healthy periapical tissues following inadequate treatment or re-infection [1]. Complete removal of filling materials is essential for identification of the cause of treatment failure and rectification. The most common material used to obturate the root canal space is gutta-percha in combination with a Root Canal Sealer (RCS). Gutta-Percha (GP) can be removed using hand or nickel titanium rotary files, ultrasonic instruments aided by heated or chemical solvents [2]. However, residual gutta-percha and sealer have been observed to be left on canal walls by all the removal techniques [3,4].

Ultrasonics have been applied in endodontic retreatment procedures mainly as an adjunct to aid in the removal of filling materials. The technique is based on a combination of irrigation and ultrasonic vibration to loosen the Root Canal Filling (RCF) material [4]. Passive Ultrasonic Activation (PUA) involves ultrasonic activation of a size 15 (small sized) file or smooth wire freely in the root canal to induce acoustic microstreaming [5]. Several studies have used PUA in conjunction with irrigants like sodium hypochlorite (NaOCl), Ethylenediaminetetraacetic Acid (EDTA) and solvents to remove filling materials [6,7]. Passive ultrasonic irrigation after GP and sealer removal was seen to enhance the cleanliness of dentinal tubules though residual filling materials were observed on the canal walls [8]. Root canal sealers are difficult to eliminate from the canal ramifications during mechanical methods of RCF removal during retreatment procedures. During these circumstances, organic solvents may aid in penetrating these inaccessible areas and remove the residual filling materials [9]. Supplemental passive ultrasonic activation of Endosolv R, a GP solvent was found ineffective in removing filling residues from the canal walls [10]. However, it was found that it may aid in enhancing the dissolving properties of organic solvents [10]. To date, there are very few studies which have evaluated the effectiveness of hand or rotary systems when supplemented with PUA of xylene whilst removing obturating materials. Thus, the objective of this in-vitro study was to evaluate the efficacy of PUA of xylene assisted hand and rotary retreatment files in removing root canal filling materials during retreatment of teeth obturated with a hybrid warm gutta-percha obturation technique. The residual RCF was evaluated by a stereomicroscope after sectioning the teeth. The null hypothesis tested was that there would be no difference in the efficacy of PUA assisted hand and rotary retreatment files in the removal of root canal filling material during endodontic retreatment.

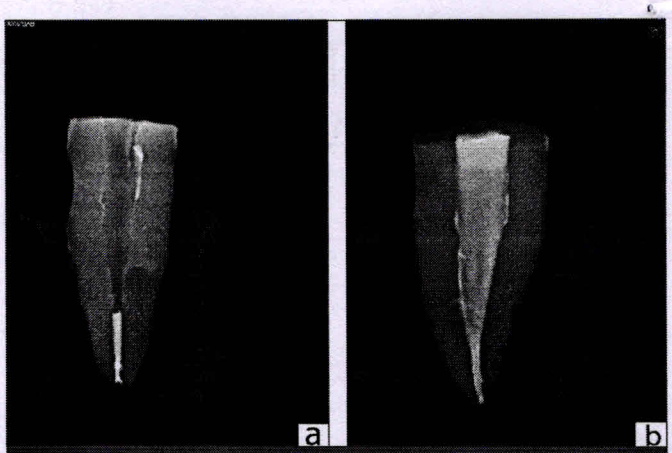
MATERIALS AND METHODS

This experimental in-vitro study was carried out at the Department of Conservative Dentistry and Endodontics after obtaining the Institutional Ethics Committee approval (ethical clearance number: MGM/DCH/IERC/43/18), forty freshly extracted human single rooted permanent teeth with mature apices extracted for periodontal and orthodontic reasons were selected. The sample size was arrived at using the Pass sample size calculating software {PASS 16 Power analysis and sample size software (2018). NCSS, LLC. Kaysville, Utah, USA, ncss.com/software/pass}. The study was done over a period of 4 months (from October 2018 till February 2019). Teeth included were of similar anatomic form, with similar crown-root dimensions, roots with patent canals free from caries, cracks, previous endodontic treatment and resorption. Those with single canal and curvature ranging less than 10 degrees in accordance with Schneider technique, single apical foramen verified radiographically were selected [11]. The radiographs were analysed for the presence of canal complexities, calcifications, patency and previous endodontic treatment, such teeth were excluded from the study. The selected teeth were immersed in 5% NaOCl for an hour to remove any organic debris. Calculus and debris were further removed using hand scalers along with curettage of the root surface to remove any soft tissue remnants without causing undue damage to the root. Following which they were stored in phosphate buffered saline solution until further use. All the teeth were decoronated below the Cementoenamel Junction (CEJ) using a diamond disc to obtain a uniform root length of 16 mm for all the specimens.

Initial Endodontic Treatment

Access cavities were refined using high speed round carbide bur (Mani Inc, Japan). Working length was established at 15 mm, 1 mm shorter than the length at which the tip of a size 10 K-file was visible at the apical foramen. The canal orifices of all teeth were enlarged with size 1, 2, and 3 Gates Glidden drills (Dentsply, Maillefer, Ballaigues, Switzerland). Root canal preparation was accomplished using ProTaper Nextrotary files (PTN) (DentsplyMaillefer, Ballaigues, Switzerland) in a crown-down technique to an apical size of 30, 6% (X3). During instrumentation, the root canals were irrigated with 25 mL of 2.5% sodium hypochlorite (NaOCl), (Tripharma Pvt., Ltd.,). Post-instrumentation, the final irrigation was done with 2 mL of 17% EDTA solution (Dent Wash, Prime Dental Products, Mumbai, India) followed by 5 mL of normal saline, 5 mL of NaOCl and 5 mL of normal saline. Later the canals were dried with absorbent points (Sure Endo Paper Points, Sure Dent Corporation, Korea).

The root canal sealer AH-Plus sealer (DentsplyMaillefer, Ballaigues, Switzerland) was dispensed on a clean glass slab and mixed as per manufacturer's recommendation. It has a working time of four hours and setting time of eight hours. The root canals were coated using the master gutta-percha point (DentsplyMaillefer, Ballaigues, Switzerland). The teeth were obturated by a hybrid warm gutta-percha obturation technique. Herein, the apical 5 mm of the root canal space was obturated by lateral compaction technique. The coronal gutta-percha was seared off using E&Q Master pen (Meta Biomed, Inc. Korea) and the GP was vertically condensed upto 10 mm length to obtain a 5 mm apical plug of GP [Table/Fig-1a]. The down pack was completed and further refined with pre adjusted hand pluggers. Backfill was done with thermoplasticised gutta-percha (Obtura Max system, Obturaspartan Endodontics, Algonquin, USA). Radiographs were taken to confirm the density of obturation [Table/Fig-1b]. The coronal 2 mm of gutta-percha was removed and cavity sealed with IRM (DentsplyMaillefer, Ballaigues, Switzerland). The specimens were stored in an incubator at 37°C and 100% humidity for 30 days to allow the sealer to set completely [12].



[Table/Fig-1]: a) Radiograph of downpack done to obtain 5 mm apical plug of gutta-percha. b) Radiograph of backfill done with thermoplasticised gutta-percha.

Retreatment Procedures

After a period of 30 days, the teeth were randomly assigned to four groups (n=10) based on the retreatment procedure. During retreatment procedures, the roots in all the four groups were copiously irrigated with the same irrigation protocol as followed in initial endodontic treatment procedure both during and post instrumentation.

Group 1: Retreatment with H-file

Gutta-percha and sealer were removed using H-files (DentsplyMaillefer, Ballaigues, Switzerland) in a crown-down technique maintaining apical enlargement to size 30 H-file until no visual evidence of residual filling materials was seen on the file. No solvent was used in combination with H files while removing GP and sealer, in between instrumentation during retreatment procedures, the roots in all the four groups were copiously irrigated with the same irrigation protocol as followed in initial endodontic treatment procedure both during and post instrumentation. Root canal refinement was achieved using PTN X3 file at 300 rpm and #30 hand K-files. Later the canal was flooded with xylene (Fisher Scientific, Thermo Electron LLS India Pvt., Ltd., Mahape) and removed with absorbent points till they came out clean, white and dry (paper wicking) [13].

Group 2: Retreatment with H-file and PUA

Gutta-percha and sealer were removed similar to group 1, following which canal was flooded with 2 mL of xylene and PUA was done in three cycles of 20s each using #20 Irrisafe ultrasonic tip (Irrisafe tips, Acteon, Merignac, France) at a power setting of 3 for a total of 1 minute. The solvent was replenished after each cycle. This was followed by paper wicking.

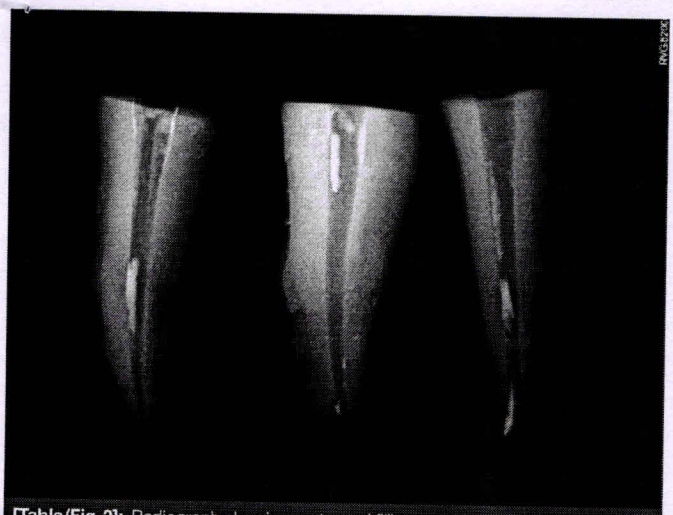
Group 3: Retreatment with ProTaper Universal Retreatment Files

Gutta-percha and sealer were removed with ProTaper Universal Retreatment (PTUR) NiTi rotary instruments by a crown-down technique at a constant speed of 500 rpm for D1 instrument followed by D2 at 400 rpm and torque at 3Ncm to the working length until no visual evidence of residual filling material was seen on the file. Root canal refinement was achieved using PTN X3 file at 300 rpm and #30 hand K-files. This was followed by paper wicking.

Group 4: Retreatment with PTUR Files and PUA

Gutta-percha and sealer were removed similar to group 3 samples followed by PUA as in group 2.

Following retreatment radiographs of all specimens were taken [Table/Fig-2]. However, the radiographs were not analysed for presence of residual filling materials. Instead the specimens were split buccolingually and observed under stereomicroscope for

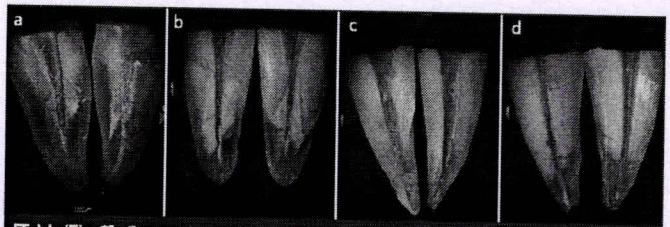


[Table/Fig-2]: Radiograph showing root canal filling material removed from the canal space.

residual RCF. The hand and rotary instruments were discarded after instrumenting five canals. There were no procedural mishaps during the study.

Assessment of RCF Removal

The specimens were further prepared for evaluating the residual filling materials present on the root canal walls stereomicrospically. The specimen were coded before assessment. They were grooved buccolingually using high speed diamond disk and the sections were separated using a chisel. Both the root halves were photographed under a stereomicroscope (Motic DM-39C-N9GO, MoticAsia, Hong Kong) at 10X magnification [Table/Fig-3]. The JPEG images obtained were loaded into Motic image plus 2.0 V software (Motic DM-39C-N9GO, MoticAsia, Hong Kong) for image analysis. No attempt was made to quantify the residual GP and root canal sealer separately. Total percentage of residual filing material was calculated and data was subjected to statistical analysis.



[Table/Fig-3]: Stereomicroscope images of specimens split buccolingually after retreatment procedures. a) Group 1: Retreatment with H- file; b) Group 2: Retreatment with H-file and PUA; c) Group 3: Retreatment with ProTaper Universal retreatment files; d) Group 4: Retreatment with ProTaper Universal retreatment files and PUA.

The area of the remaining filling material and the total root canal area were traced and quantified in sqmm [Table/Fig-4]. The percentage of the RCF material on the canal walls was calculated using the formula:

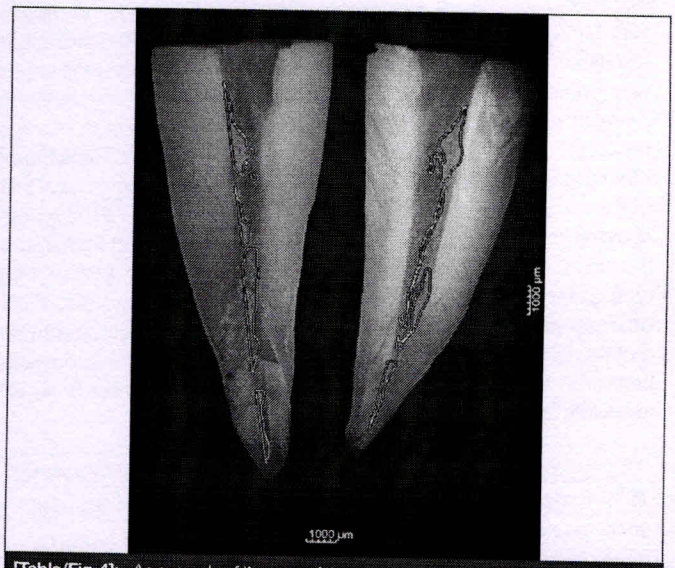
$$\text{Area of remaining filling material X100} = \frac{\%\ \text{area of remaining filling material}}{\text{Total area}}$$

STATISTICAL ANALYSIS

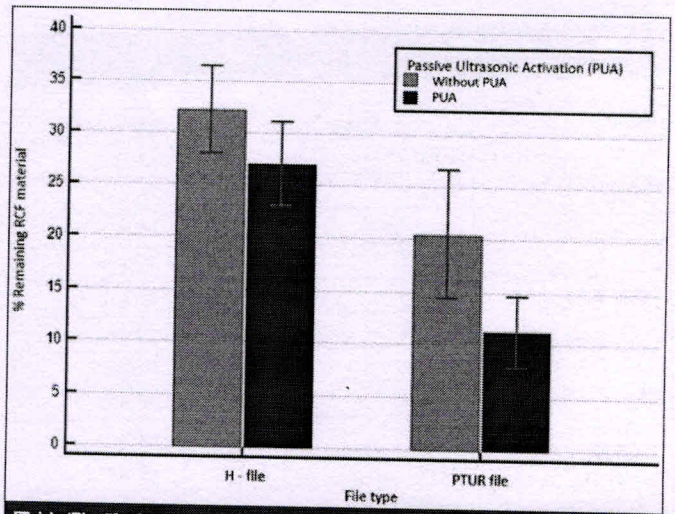
The data obtained was tabulated and subjected to statistical analysis using MedCalc statistical software version 18.2.1 (MedCalc Software bvba, Ostend, Belgium). Normality of data was tested using Shapiro-Wilk test and was normally distributed (p=0.5547). Further analysis was done using one-way ANOVA followed by Tukey-Kramer test for pairwise comparisons. The level of significance was set at 5% and p-values <0.05 was considered significant.

RESULTS

The results of the study showed that PTUR files supplemented with PUA were more efficient in removing RCF material [Table/Fig-5]. [Table/Fig-6] shows the mean and standard deviation of the residual



[Table/Fig-4]: An example of the area of the remaining filling material and the total root canal area traced using Motic image plus 2.0 V image analysis software for all groups.



[Table/Fig-5]: Comparison of mean percentage of remaining RCF materials for hand and rotary retreatment with or without PUA of solvent.

Group	n	Mean % of remaining RCF	Standard error of mean (SEM)	95% confidence interval	Minimum value (%)	Maximum value (%)
Group 1 (H Files)	10	32.1890	2.0268	28.0786 to 36.2994	21.34	41.07
Group 2 (H Files+PUA)	10	27.0410	2.0268	22.9306 to 31.1514	18.24	37.51
Group 3 (Protaper retreatment files)	10	20.5440	2.0268	16.4336 to 24.6544	9.06	34.20
Group 4 (Protaper retreatment files+PUA)	10	11.2160	2.0268	7.1056 to 15.3264	4.67	21.01

[Table/Fig-6]: Descriptive statistics of percentage area of residual RCF material in all the four groups.

filling materials in various groups. The highest mean value for remaining RCF material was seen for Group 1 where the retreatment was done using H-file followed by Group 2 (retreatment with H-file was supplemented with PUA). The specimens in which rotary retreatment was done with or without PUA showed considerably lesser residual RCF materials [Table/Fig-3]. The ANOVA test showed a statistically significant difference between the groups with p<0.001 [Table/Fig-7]. Intergroup comparison by Tukey Kramer test showed

statistically significant difference when Group 4 was compared with Groups 1, 2 and 3 respectively [Table/Fig-8]. Also, statistically significant difference was seen when Group 3, rotary retreatment was compared to Group 1 (p=0.0024). However, a non-significant correlation was observed between Group 3 and Group 2. None of the techniques could remove RCF materials completely [Table/Fig-9]. Most of the specimens were free of RCF remnants in the coronal third of the canals except in those of Group 1 [Table/Fig-9]. All the groups showed residual RCF material on the canal walls predominantly in the apical and middle third [Table/Fig-9]. [Table/Fig-10] shows the type of residual filling materials seen in the different groups. It can be observed that the specimens belonging to the hand retreatment groups showed GP and sealer remnants where as the specimens belonging to the rotary retreatment groups showed lesser or no GP remnants but the sealer residues were present.

Source of variation	Sum of squares	DF	Mean square
Between groups (influence factor)	2454.0697	3	818.0232
Within groups (other fluctuations)	1478.7787	36	41.0772
Total	3932.8484	39	
F-ratio	19.914		
Significance level	p<0.001		

[Table/Fig-7]: One-way ANOVA table.
*p is value statistically significant; DF: Degree of freedom

Group	Group	p-value (<0.005)
Group 1	Group 2	0.0629
	Group 3	0.0024*
	Group 4	<0.001*
Group 2	Group 1	0.0629
	Group 3	0.0610
	Group 4	<0.001*
Group 3	Group 1	0.0024*
	Group 2	0.0610
	Group 4	0.0077*
Group 4	Group 1	<0.001*
	Group 2	<0.001*
	Group 3	0.0077*

[Table/Fig-8]: Tukey Kramer test for intergroup comparison of percentage area of residual RCF material.

Group	Coronal third (n=10)	Middle third (n=10)	Apical third (n=10)
Group 1	6	10	9
Group 2	3	7	7
Group 3	2	10	10
Group 4	2	6	10

[Table/Fig-9]: Distribution of residual filling materials observed in the coronal, middle and apical third of the specimens.

Group	GP+sealer	Only sealer
Group 1 (n=10)	6	4
Group 2 (n=10)	8	2
Group 3 (n=10)	2	8
Group 4 (n=10)	2	8

[Table/Fig-10]: Residual filling materials observed on the root canal walls of the specimens.

DISCUSSION

Success following endodontic retreatment depends on complete removal of RCF material. One of the ideal requirements of an obturating materials stated by Grossman LI is that it should be removed easily from the root canal space when the need arises [14]. Gutta-percha can be removed relatively easily from the canal depending upon the anatomy and quality of obturation.

Single rooted teeth with a single straight root canal were selected for standardisation in the present study. Root canal preparation for all the teeth was accomplished using Protaper Next rotary files (DentsplyMaillefer, Ballaigues, Switzerland) in a crown down technique to an apical size of 30. The canals were obturated by a hybrid technique combining lateral compaction and warm gutta-percha technique. This technique takes the advantage of lateral compaction which provides a tight apical seal through the compaction of several gutta-percha points by a spreader in the apical region and warm gutta-percha that can adapt more effectively to canal irregularities in addition to filling the lateral canals [15]. This technique provides better obturation length control too. It has been reported that warm gutta-percha obturations and resin based sealers pose a challenge during retreatment [16].

The present study evaluated the removal of gutta-percha using a combination of hand/rotary retreatment files, chemical solvent and ultrasonic instruments since a combination technique is recommended for safe, efficient and possibly complete removal of RCF [7,17].

Previous studies have evaluated the RCF removal using radiography, computed tomography, operational microscope and clearing method [18]. In this study, the residual filling material was assessed by longitudinally splitting the roots into two separate halves and photographed under a stereomicroscope. The images were later analysed. This is a well established and effective technique, which the recent studies have used to assess residual filling materials [19]. All the above methods have specific limitations and ideally 3 dimensional visualisation of the root canal system would provide better detection of remaining RCF material [18].

Rotary instruments like PTUR files have been reported to perform better than H-files in retreating teeth obturated with warm gutta-percha obturation techniques as observed in the present study [Table/Fig-3,5] [20,21]. Group 3 and 4 where PTUR with or without PUA showed residual sealer and most of them had no GP residues [Table/Fig-10]. Protaper retreatment files have been shown to leave significantly cleaner walls in lesser time than compared to hand files [Table/Fig-5]. The PTUR files remove large increments of GP in spirals around the instruments resulting in softening of GP and cut it. The active tip of D1 in combination with initial solvent application facilitates further penetration of D2 and D3 which have a non-active tip. The non active tip of D2 and D3 prevents mishaps such as ledging, perforations and instrument separation during filing removal [19]. The tip diameter of the Master Apical File (MAF) used to instrument the canals was a size 30 (PTN X3 file) and the diameter of the retreatment file used at the working length was a size 25 D2 (size 25, .08 taper). It has been shown in a previous study that these retreatment instruments may not remove the RCF materials completely from the root canal as it is of a smaller diameter than compared to the MAF [21]. Supplementary instrumentation performed after the use of PTUR files with a larger apical diameter file than the apical diameter of MAF used in the initial enddontic treatment resulted in more effective RCF removal than the use of only rotary retreatment files in the apical third [21]. However in the present study, root canal refinement after instrumentation with rotary retreatment files was achieved using PTN X3 file at 300 rpm and #30 hand K-files to the working length material. The MAF was used because it has reported that additional instrumentation with a larger size file may result in more apical crack initiation and propagation of existing cracks [22]. The hand and rotary files may mechanically remove the bulk of the gutta-percha and sealer but remnants remaining on the walls will require a solvent for removal [4]. Organic solvents such as chloroform, eucalyptol oil, xylene, halothane, turpentine oil and pandine needle oil have been advocated to soften gutta-percha and RCS to assist in its removal safely and quickly [23].

Chemical solvents used for removal of RCF have been found to form a fine layer of softened gutta-percha and sealer smearing the

canal walls [24]. Residual obturation materials, especially sealer present on the root canal walls and in canal ramifications remain largely inaccessible and resist dissolution [25]. Previously, passive ultrasonic irrigation of NaOCl and EDTA for one minute following gutta-percha removal has shown to improve canal and isthmus cleanliness due to acoustic streaming [25,26]. However, the filling materials were not completely removed.

In the present study, PUA of xylene was attempted to evaluate the filling material removal. Xylene (dimethylbenzene), an aromatic compound has been widely investigated and found to be an efficient solvent for root canal obturating materials including epoxy resin based sealers such as AH Plus [23,27] H-files and PTUR files when supplemented with PUA of xylene showed better removal of the RCF which was statistically significant when compared to hand and PTUR files without PUA of xylene. Hence the null hypothesis was rejected. However, in agreement with other studies, none of the techniques in the current study too could remove RCF materials completely from the root canal [18,19,21]. The remnants seen in Group 1 were observed to be present in coronal, middle and apical third [Table/Fig-9]. Moreover in these specimens residues of GP and sealer were noted [Table/Fig-3,10]. In the specimens of Groups 2 and 3, residual filling materials were present mainly in the middle and apical third consisting of both gutta-percha and RCS [Table/Fig-3,9,10]. However, in Group 3 and 4, the residues were mainly of RCS seen in the apical third [Table/Fig-3,10]. It can be appreciated in [Table/Fig-9] that majority of specimens belonging to Groups 2,3 and 4 showed no residues in the coronal third. In the present study, it was observed that both hand and rotary files showed lesser residual debris when instrumentation was supplemented with PUA [Table/Fig-5]. Better results observed in the PUA groups may be due to the increase in temperature of xylene caused by PUA which could have resulted in enhanced removal of guttapercha in addition to acoustic streaming [6,10,26].

The results of this study are in agreement with one study where chloroform and NaOCl were ultrasonically activated, both were found to be efficient in removing gutta-percha and RCS [3]. Though chloroform was the solvent of choice for removal of GP previously, it is no longer in clinical use owing to its cytotoxicity, carcinogenic potential and toxicity to the tissues [6,27,28]. Xylene (dimethylbenzene) is a less toxic alternative to chloroform. Another study reported PUA of an orangewood oil and eucalyptol resulted in better removal of Zinc Oxide Eugenol (ZOE) sealer discs than epoxy resin based sealers [6]. In agreement to the present study, Cavenago BC et al., reported that the use of passive ultrasonic irrigation with 2.5% NaOCl for three activation cycles of 20s each totaling one minute after GP-sealer removal and irrigation with xylene enhanced the removal of filling materials [7]. In contrast to this study Müller GG et al., evaluated the passive ultrasonic irrigation of Endosolv R for the removal of RCF material from the canal walls and observed that ultrasonic activation of Endosolv R was not effective for removal of filling debris [10]. The residual filling material was guttapercha which may not have been susceptible to dissolution by Endosolv R and in addition, the solvent was not replenished in the canal as generally performed to facilitate removal of residual filling material [29]. Similarly, two other studies reported that passive ultrasonic irrigation technique was ineffective in removing residual root canal filling material during endodontic retreatment. However in these studies, passive ultrasonic irrigation with NaOCl was performed for 3 cycles of 20s totaling one minute in one canal followed by 17% EDTA solution [7,30]. In contrast, in the current study, the organic solvent used was xylene and the solvent was replenished after a twenty second PUA in the canal space. Thus, the specimens where PUA was carried out showed cleaner root canal walls. A comparison of the results of the present study and the studies conducted in recent past is shown in [Table/Fig-11].

Author (s)	Year	Methodology	Conclusions
Wilcox LR et al., [2]	1987	Retreatment system: hand instruments like heated pluggers, k files and barbed broaches After GP-sealer removal, ultrasonic activation of either NaOCl or chloroform done.	Ultrasonic activation of either NaOCl or chloroform resulted in cleaner canal walls.
Müller GG et al., [10]	2013	Retreatment system: PTUR After GP-sealer removal with PTUR. Passive ultrasonic irrigation of Endosolv R(formamide). Solvent was ultrasonically activated for 60 seconds without renewal.	Technique found to be ineffective in removing RCF materials from the root canal.
Cavenago BC et al., [7]	2014	Retreatment system: Bio Ra Ce; After GP-sealer removal with PTUR. canals were irrigated with xylene. Followed by three activation cycles with 2.5% NaOCl performed for 20s totaling 1 min in each canal.	The use of Passive ultrasonic irrigation after GP-sealer removal enhanced the removal of filling materials of the canals.
Latheef AA et al., [8]	2016	Retreatment system: PTUR Passive ultrasonic irrigation with 1 mL 3% NaOCl for 1 min after GP-sealer removal with PTUR.	The use of Passive ultrasonic irrigation after GP-sealer removal enhanced the cleanliness of canals, but could not remove all the filling debris.
Michelona C et al., [30]	2016	Retreatment system: PTUR Human mandibular molars having isthmus in the mesial roots were selected. After GP-sealer removal with PTUR, three activation cycles with 2.5% NaOCl was performed for 20s totaling 1 min in one canal, followed by 17% EDTA solution activated ultrasonically for 1 min.	The Passive ultrasonic irrigation technique was ineffective in removing residual root filling material during endodontic retreatment in root canals with a complex anatomy when used after removal of RCF materials.
Current study	2018	Retreatment system: PTUR After GP-sealer removal with PTUR passive ultrasonic activation of xylene was done in three cycles of 20s each for a total of 1 minute. The solvent was replenished after each cycle. This was followed by paper wicking.	Passive ultrasonic activation of xylene enhanced the removal of RCF though the walls were not completely free of debris.

[Table/Fig-11]: Comparison of the results of the present study and the studies conducted in recent past.

Limitation(s)

In-vitro study design and inclusion of teeth with straight canals, hence the complex intraoral conditions, canal curvatures, isthmi and ramifications could not be accounted for. Also, AH plus being an epoxy resin based sealer, the efficacy of removal using other resin sealer solvents has to be assessed. In addition, ultrasonic files can be used only in the straight part of the canal hence the efficacy of PUA in the presence of curved and narrow canals have to be evaluated. Further studies need to be carried out to investigate the canal cleanliness at different intensities of PUA, different solvents and apical extrusion of gutta-percha and solvent.

CONCLUSION(S)

Within the limitations of this in-vitro study, it was observed that hand and rotary instrumentation when supplemented with PUA of xylene is more efficient in removing RCF materials from the root canal space.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Aug 30, 2019
- Manual Googling: Dec 26, 2019
- iThenticate Software: Jan 20, 2020 (17%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? NA
- For any images presented appropriate consent has been obtained from the subjects. NA

Date of Submission: **Aug 29, 2019**
Date of Peer Review: **Oct 12, 2019**
Date of Acceptance: **Dec 26, 2019**
Date of Publishing: **Feb 01, 2020**

Management of Bilateral Radicular Cyst in the Permanent Maxillary Lateral Incisors

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Abstract

Radicular cyst is an inflammatory odontogenic cyst of the tooth-bearing areas of the jaw. It is classified as an inflammatory cyst because it is a known fact that inflammatory products initiate the growth of the epithelial component. Radicular cysts arise from the epithelial residues in the periodontal ligaments as a result of inflammation usually following pulp death. The present case report discusses the surgical management of bilateral radicular cyst in relation to the maxillary lateral incisors in a 22-year-old female patient.

Keywords: Enucleation, permanent maxillary lateral teeth, radicular cyst, ultrasonics

Introduction

Radicular cysts develop as a sequel of untreated caries with pulp necrosis and periapical infection.[1] The most common inflammatory odontogenic[2] cyst develops over time[3] found at apices of infected or necrotic pulps, occurring between the third and sixth decades of life with male predominance.[4] Clinically, lesion is small, asymptomatic, and the affected tooth is nonvital,[5] until detected by routine radiographic examination.[6] With advancement in imaging technology, cone-beam computed tomography (CBCT) helps the endodontist view the tooth in the third dimension.

The present case report discusses the surgical management of bilateral radicular cyst in relation to the maxillary lateral incisors.

Case Report

A 22-year-old female patient reported to the department of conservative dentistry and endodontics with a chief complaint of food lodgment and discoloration in the upper left front region of the jaw for 2–3 months. On clinical examination, permanent maxillary left canine (23) showed blackish discoloration mesially with cavitation. On vitality testing, all permanent maxillary anterior teeth except maxillary left central (21) and lateral incisor (22) gave normal results and clinically both these teeth had porcelain fused to metal ceramic crown. On radiographic examination, 23 showed radiolucency involving enamel and dentin without any periapical changes [Figure 1a].

On palpation, a soft fluctuant nontender swelling in the left labial sulcus with a pocket depth of 7 mm distally, and Grade 1 mobility was noted with 22.

Radiographically [Figure 1a], 22 showed a faulty post core with external root resorption in middle third and bone loss distally with a periapical radiolucency, having a well-defined radiopaque border. 21 showed satisfactory obturation with normal periodontium.

In view of the above findings, 22 was planned for extraction due to poor periodontal prognosis followed by cyst enucleation and was given the option of an implant by the periodontist. A CBCT was advised.

The patient reported 5 months later with an orthopantogram [Figure 1d] which revealed lesions with 12 and 22 and a CBCT [Figure 1b] which confirmed the cystic lesion with 22 and a perforation of the labial cortical plate in relation to 22, measuring 10.6 mm × 6.6 mm. It was also

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Quick Response Code:

Website: www.ijohr.org

DOI: 10.4103/ijohr.ijohr_10_18

How to cite this article: Khan SA, Shenoy VU, Khalid I, Patil A, Sumanthini MV, Nalband R. Management of bilateral radicular cyst in the permanent maxillary lateral incisors. Indian J Oral Health Res 2018;4:27-30.

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ANNEXURE-"F"

Information of Mentor of Training Centre

It shall be verified by the Head of the concerned Training Center

Sr. No.	Particular	-	Information to be filled
1.	Name of Mentor	:	Dr. Divya Naik
2.	Date of Birth	:	02/11/1984
3.	Address	:	P-303 Gajraj Soc. Near Forest Colony, Opp. Bara Bangla, Kopri, Thane (E) -400603
4.	Tel. No./ Mob. No.	:	9967826262
5.	E-mail id	:	drdolly02@gmail.com
6.	Nationality	:	Indian
7.	Qualification in details : (attach documentary proof)	:	BDS, MDS (Conservative Dentistry & Endodontics)
8.	Teaching experience/Health Sciences : Profession experience /Consultant/Mentor(attached document proof with signature of Head)	:	8yrs. 7months. 25dys.
9.	Present Appointment	:	READER
10.	Publications (List & Proof)		1. Rathod D.M. and Mulay S.A. Evaluation of efficacy of Nd:YAG laser, ozonated water, and ultrasonic irrigation with 3% sodium hypochlorite for disinfection of root canal: An in vivo study. J Endod.2018;30(2):135-139. 2. Rathod D.M. and Mulay S.A. Management of Complicated Crown-Root Fracture Using Newer Radiographic AIDS - A Case Report. Biomed J Sci & Tech Res. 2018; 2(1):1-6. 3. Rathod D.M. and Mulay S.A. Non surgical treatment of large periapical lesion using various formulations of calcium hydroxide & Nd: Yag lasers. Int J Cur Res. 2017; 9(8): 56668 – 56672. 4. Rathod D, Salgar A, Poplai G. Surgical management of endo-perio lesions, Terna J Dent Sci. 2013;1:93-96. 5. Salgar A, Rathod D, Poplai G, Sonarkar S. Extra canal in the mid mesial root of mandibular first molar: A case report. Terna J Dent Sci. 2013:1:89-92. 6. Poplai G, Salgar A, Rathod D. Effect on the tensile bond strength of glass fibre posts after surface pre-treatment with silane coupling agent and hydrofluoric acid- An in vivo study. Terna J Dent Sci. 2013;1:84-88. 7. Rathod D.M. and Mulay S.A. Comparative evaluation of Er:Yag and Nd:Yag laser for gingival depigmentation. J Dent Lasers. 2013; 7(1):38-42. 8. Rathod D.M. and Mulay S.A. Evaluation Of Ultrasonic Irrigation With 3% Naocl & Nd:Yag Laser Against Streptococcus And Staphylococcous In Root Canal – In Vivo. J Pierre Fauchard Academy, September 2012; 26(3):113-116. 9. Mulay S. and Rathod D. NANO "BUSTERS"(Part-

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	Post Graduate Teaching experience (Attach documentary evidence)	:	3 yrs. 7month. 27dys.
12	Any other relevant information	:	-

Dr. Divya Naik

Name & Sign. of Mentor

For the use of affiliated Training Center:

Date: 20/05/2022

I have verified the eligibility of the above Director as per the criteria of eligibility prescribed by the University vide clause no.7 of the University Direction No. 05/2017 (Amended).

Professor & H.O.D.
Dept. of Conservative Dentistry
M.G.M. Dental College & Hospital
Kamothe Navi Mumbai 410 209

Sign & Stamp
Head of the Department
Centre
Date: 20/05/2022

Sign & Stamp
Dean/ Principal/ Director of Training
M.G.M. Dental College and Hospital,
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Date: 20/05/2022

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Training Centre Round Seal

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

We, the Chancellor, the Pro-Chancellor, the Vice-Chancellor, the Members of the Management Council and the Academic Council of the Maharashtra University of Health Sciences, Nashik, certify that

Shri/Smt. RATHOD DOLLY MOTISINGH

of Sharad Pawar Dental College & Hospital, Sawangi(Meghe)Wardha

having been examined and found duly qualified for the

Bachelor of Dental Surgery

in June-2007 the said Degree has been conferred on him/her. In testimony whereof is set the seal of the said University.

PRN 0204191367

25th May 2009

VICE-CHANCELLOR

Dean
M.G. Dental College & Hospital
Kamothe, Navi Mumbai - 410 209.

*09021513

महाराष्ट्र आरोग्य विज्ञान विद्यापीठ, नाशिक

आम्ही, महाराष्ट्र आरोग्य विज्ञान विद्यापीठाचे कुलपति, प्रकुलपति, कुलगुरू, व्यवस्थापन परिषद व विद्यापरिषद सदस्य प्रमाणित करतो की,

सावंगी (मेघे), वर्धा येथील शरद पवार दंत महाविद्यालय व रुग्णालया चे/च्या

राठोड डॉली मोतीसिंह

हे/हया जून-२००७ मध्ये

दंतशल्य स्नातक

परीक्षा उत्तीर्ण झाल्याबद्दल त्यांना ही पदवी प्रदान करण्यात येत आहे.

याची साक्ष म्हणून विद्यापीठाची अधिकृत मुद्रा येथे अंकित करण्यात येत आहे.

मुदुला फडके
कुलगुरू

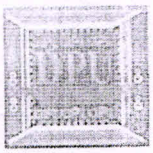
DPU

Dr. D. Y. Patil Vidyapeeth

Pune (India)

(Deemed University)

(Under Section 3 of the UGC Act, 1956)



We, the Chancellor,

the Vice-Chancellor,

the Members of the Board of Management and of the

Academic Council of Dr. D. Y. Patil Vidyapeeth, Pune certify that

Rathod Dolly Motisingh

[Student of Dr. D. Y. Patil Dental College & Hospital, Pimpri, Pune]

having been examined and found duly qualified for

the degree of

Master of Dental Surgery

(Conservative Dentistry & Endodontics)

in April 2013.

The said degree has been conferred on her at the

Fifth Convocation held on Twenty Sixth April Two Thousand Fourteen.

In testimony whereof is set the seal of the said University.

Vice Chancellor

Chancellor

M. G. M. Dental College & Hospital
Kamothe, Navi Mumbai - 410 209.

T.P.C.T'S
TERNA DENTAL COLLEGE
Sector 22, Nerul (w), Navi Mumbai – 400 706 Ph-022-2772 1839

TDC/OFF/ 298 /2018 Date: 09 / 04 /2018

EXPERIENCE CERTIFICATE

This is to certify that, **Dr.Dolly Rathod** (Divya Naik) was working in Terna Dental College as a "Lecturer" in the department of "Conservative Dentistry & Endodontics" from 02/09/2013 to 07/04/2018.

Dr Shishir Singh,
Dean

DEAN
Terna Dental College
Nerul, Navi Mumbai

MAHATMA GANDHI MISSION DENTAL COLLEGE & HOSPITAL
Accredited by NAAC with "A" Grade
Plot No. 1 & 2 Sector-01 (Old 18 & 19),
Kamothe, Navi Mumbai- 410209
E-Mail ID: mgmdch@mgmmumbai.ac.in

Dr. Srivalli Natarajan
Dean

Tel: 022- 27436604
022-27433185

No.MGM/DCH/792/2022 **Date: 20/05/2022**

Experience Certificate

This is to certify that Dr. Divya Naik. is working in the Department of Conservative Dentistry and Endodontics in MGM Dental College & Hospital, Kamothe, Navi Mumbai and her experience is as under :

- Lecturer – 02/09/2013 to 07/04/2018
- Reader – 10/04/2018 to Till Date

S-Srivalli.

Dean

M.G.M. Dental College & Hospital
Kamothe
Navi Mumbai
410209.

महाराष्ट्र आरोग्य विज्ञान विद्यापीठ, नाशिक
Maharashtra University of Health Sciences, Nashik
दिंडोरी रोड, म्हसरूळ, नाशिक - ४२२००४. Dindori Road. Mhasrul, Nashik- 422 004
Tel: (0253)2539192/6659239, Student Helpline:(0253)2539111/6659111
Website: www.muhs.ac.in, E-mail : academic1@muhs.ac.in

डॉ. कालिदास द. चव्हाण
एम.बी.बी.एस., एम.डी. (न्यायवैद्यकशास्त्र), पीएच.डी., डी.एस्सी.
कुलसचिव

Dr. Kalidas D. Chavan
M.B.B.S., M.D.(Forensic Medicine)Ph.D.,D.sc.
Registrar

Ref No.: MUHS/E-2/PG/2741/2021 Date: 25/09/2021

To
The Principal,
Mahatma Gandhi Mission's
Dental College & Hospital,
Junction of NH-4 & Sion-Panvel,
Expressway, Sector-1, Kamothe,
Navi Mumbai – 410 209

Sub: Regarding extension to Post Graduate Teacher Recognition
Ref: 1. University Direction No. 01/2017
2. MUHS/E-2/PG/2203/2020 dated 25/11/2020
3. MUHS/PG/E-2/111105/1559/2019 dated 28/11/2019.
4. MUHS/E-2/ UG /2515/2021 dated 14/09/2021
5. Your letter No MGM/DCH/1034/2021 dated 22/09/2021

Sir/ Madam,

With reference to the subject cited above, I am to inform you that, the proposal of extension to recognition as Post-Graduate Teacher of the following teachers have been considered by the University subject to the terms and conditions of appointment order for imparting instructions to the Post Graduate Degree, Diploma or Super-Speciality Course in the subject mentioned against their names.

Sr. No.	Subject	Name of the Teacher	Designation	Status of PG recognition
1.	Orthodontics & Dentofacial Orthopedics	Dr. Ravindranath V.K.	Professor	w.e.f 30/07/2021 to 29/07/2022 only.
2.		Dr. Amol Mhatre	Reader	w.e.f 02/08/2021 to 01/08/2022 only. (against SC Category)
3.	Oral & Maxillofacial Surgery	Dr. Sunil Sidana	Reader	w.e.f 30/07/2021 to 29/07/2022 only.
4.		Dr. Sagar Vaishampayan	Reader	w.e.f 02/08/2021 to 01/08/2022 only (against SC Category)
5		Dr. Adil Gandevivala	Reader	w.e.f 02/08/2021 to 01/08/2022 only (against ST Category)
6	Conservative Dentistry and Endodontics	Dr. Divya Naik	Reader	w.e.f 02/08/2021 to 01/08/2022 only.
7.		Dr. Anuradha Patil	Reader	w.e.f 30/07/2021 to 29/07/2022 only.
8.	Prosthodontics and Crown & Bridge	Dr. Anuradha Mohite	Reader	w.e.f 02/08/2021 to 01/08/2022 only. (against SC Category)
9.		Dr. Janani Vivek Iyer	Reader	w.e.f 30/07/2021 to 29/07/2022 only.
10.	Periodontology	Dr. Sarika Shetty	Reader	w.e.f 02/08/2021 to 01/08/2022 only. (against SC Category)
11.		Dr. Sujeet Khiste	Reader	w.e.f 02/08/2021 to 01/08/2022 only.

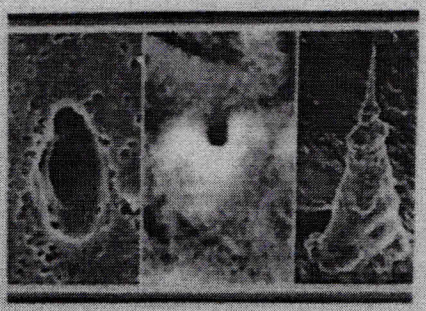
1) The above mentioned teachers are required to attend **"Research Methodology Workshop"** conducted by **Regional Centre, Pune** of this University **or any other centre authorised by the 3University** (if not attended earlier),**within a period of one year** from the date of recognition. It is clarified that the **validity of' Research Methodology Workshop'** is for **five years** only and it must be **renewed after every five years** as per Circular 14/2011 dated 23/06/2011.

MGM / MED
INWARD NO.
Kamothe, Navi Mumbai - 410 209.
4919/21

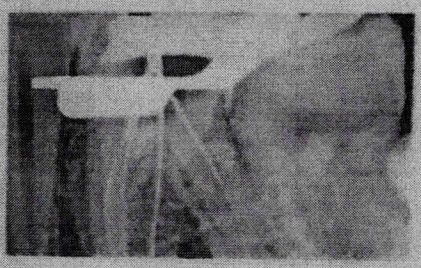
INTERNATIONAL COLLEGE OF DENTISTS
INDIA & SRILANKA SECTION

JOURNAL OF INTERNATIONAL COLLEGE OF DENTISTS

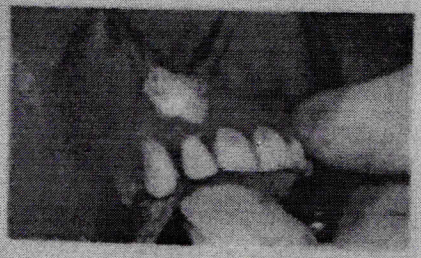
INDIA, SRILANKA AND NEPAL SECTION VOL 5, NO 1, 2012



08 NANO "BUSTERS" (PART-I)



21 RADIX ENTOMOLARIS - ENDODONTIC CASE SERIES



33 PLATELET RICH PLASMA HEALING COMPARABLE TO NONE A CASE REPORT

NANO "BUSTERS" (PART-I)

DR. SANJYOT MULAY, DR. DOLLY RATHOD

ABSTRACT

Science is the fuel for the engine of technology. Today the revolutionary development of nanotechnology has become the most highly energized decipline in science and technology. The growing interest applications of nanotechnology is leading to emergence of a new field called nanomedicine (including nanodentistry).1

Nanodentistry will make possible of comprehensive oral health care by involving the use of nanomaterials, biotechnology and ultimately dental nanorobotics. Nanodentistry is a new trend of oral health that has its application in preventive intervention, curative and restorative procedures. This paper highlights the potential application of nanotechnology in dentistry.

INTRODUCTION

Nanotechnology is engineering of molecularly precise structures. These are the molecular machines of typically 0.1micromilimeter (?m) or smaller than that. "Nano" is derived from the Greek word for "dwarf". The prefix "Nano" means ten to the minus ninth power 10-9, or one billionth. The nanoscale is about a thousand times smaller than micro, which is about 1/80,000 of the diameter of a human hair. The growing interest in the future of dental applications of nanotechnology is leading to the emergence of a new field called Nanodentistry.2

DEFINITION OF NANOTECHNOLOGY

- Webpedia's defined Nanotechnology as "A field of science whose goal is to control individual atoms and molecules to create computer chips and other devices that are thousands of times smaller than current technologies permit".
- Merrim- Webster's collegiate Dictionary defined Nanotechnology as "The art of manipulating on an atomic or molecular scale especially to build microscopic devices /robots".

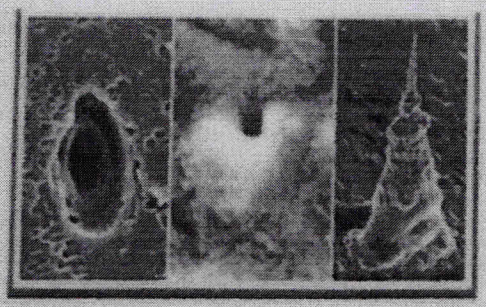


FIG 1: Nanopores

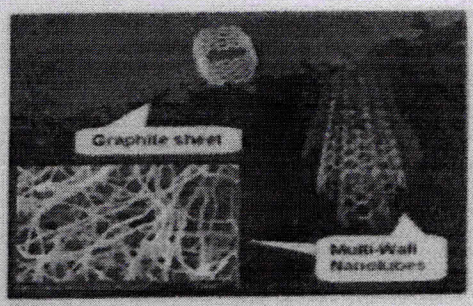


FIG 2: Nanotubes

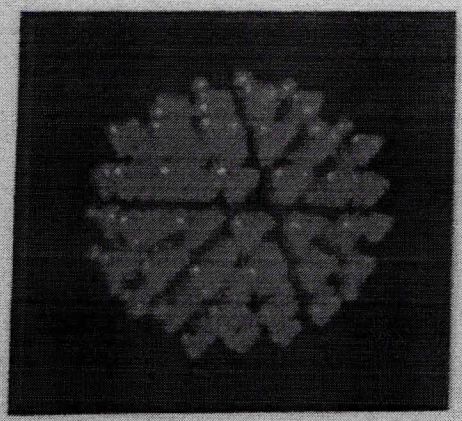


FIG 3: Quantum Dots

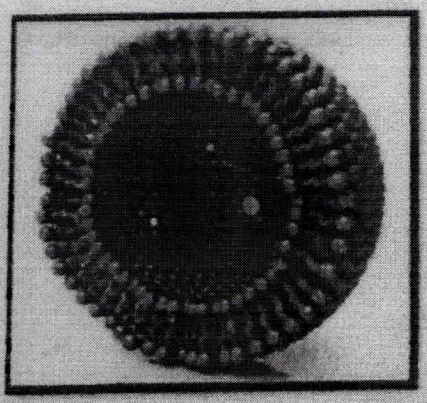


FIG 4: Naonoshells

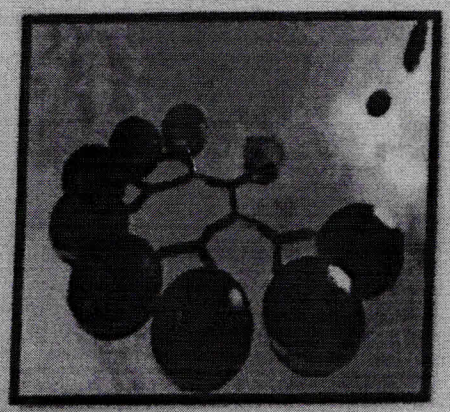


FIG 5: Dentrimers

PIONEERS

The late Nobel prize winning physicist Richard P. Feynman in speculated the potential of nanosize devices as early as 1959. In his historic lecture in 1959, he concluded saying "This development which I think cannot be avoided" He proposed using machine tools to make smaller machine tools, which in turn, would be used to make still smaller machine, tools and so on all the way down to the molecular levels. He suggested that such nanomachines, nanorobots and nanodevices could ultimately be used to develop a wide range of atomically precise microscopic instrumentation and manufacturing tools. These tools could be applied to produce vast quantities of ultra small computers and various micro scale and nanoscale robots. Thus vision of nanotechnology & their application in medicine and dentistry was born

Nanotechnology aims to manipulate and control particle to create novel structures with unique properties and promises advances in medicine and dentistry.3

NANO MANUFACTURING PROCESS

There are two basic approaches for creating Nano devices. Scientists refer to these methods as-

A. The top-down approach
B. The bottom-up approach

The top-down approach

It involves molding or etching materials into smaller components. This approach has traditionally been used in making parts for computers and electronics.

The bottom-up approach

It involves assembling structures atom-by-atom or molecule-by-molecule, and may prove useful in manufacturing devices used in medicine.

Various nanostructures are:? **[Fig no: 1]**

1) Nanopores
2) Nanotubes
3) Quantum dots
4) Nanoshells
5) Dendrimers

Nanopores

Scientists believe Nanopores, tiny holes that allow DNA to pass through one strand at a time, will make DNA sequencing more efficient. As DNA passes through a nanopore, scientists can monitor the shape and electrical properties of each base, or letter, on the strand

Nanotubes

Nanotubes are carbon rods about half the diameter of a molecule of DNA that not only can detect the presence of altered genes, but also may help researchers pinpoint the exact location of those changes.

Quantum dots

Quantum dots are tiny crystals that glow when they are stimulated by ultraviolet light. The wavelength, or color, of the light depends on the size of the crystal. Latex beads filled with these crystals can be designed to bind to specific DNA sequences. When the quantum dots are stimulated with light, they emit their unique bar codes, or labels, making the critical cancer-associated DNA sequences visible, eliminating the need for biopsy.

Nanoshells

Nanoshells are miniscule beads coated with gold. By manipulating the thickness of the layers making up the Nanoshells, scientists can design these beads to absorb specific wavelengths of light. The most useful Nanoshells are those that absorb near-infrared light, which can easily penetrate several centimeters of human tissue. The absorption of light by the Nanoshells creates an intense heat that is lethal to cells.

Dendrimers

Dendrimers are man-made molecules about the size of an average protein, and have a branching shape. This shape gives them large surface area to which scientists can attach therapeutic agents or other biologically active molecules. Researchers eventually aim to create nanodevices that do much more than deliver treatment.

NANOTECHNOLOGY IN DENTAL SCIENCES

Application of nanodentistry can be categorized as:

Nanodentistry as top-down approach

1. Nano aluminium oxide fibers-nanoceram[3]
2. Salivary diagnostics powered by nanotechnologies
3. Nanoneedles
4. Nanobone replacement materials
5. Nanotechnology for dental composites
6. Nanotechnology for glass ionomer cement
7. Nano-Ceramic technology
8. Nanotechnology for impression material

Nanodentistry as bottom-up approach

1. Inducing anesthesia
2. Treatment of hypersensitivity
3. Tooth repair
4. Nanorobotic Dentifrice (dentifrobot)
5. Orthodontic nanorobots
6. Diagnosis & Treatment of oral cancer
7. Photosensitizers and carriers
8. Dental durability and cosmetics

Nanotechnology applied to dentistry in

A) Diagnostic science
B) Preventive dentistry
C) Dental materials sciences
D) Dental surgical procedures
E) Endodontics

DIAGNOSTIC SCIENCE

1) Diagnosis of oral cancer
2) Treatment of oral cancer

PREVENTIVE DENTISTRY:

1) Dental hypersensitivity
Tooth repair
2) Nanox (Toothbrush with Tooth paste)

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(IInd Post Graduate Student)
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INTERNATIONAL COLLEGE OF DENTISTS
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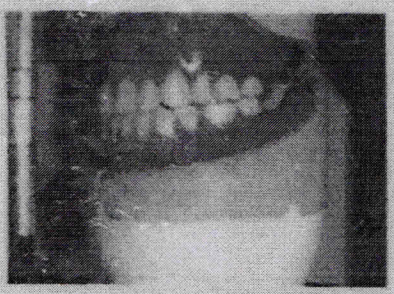
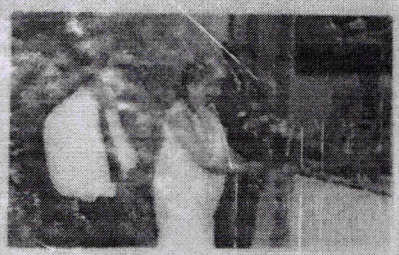
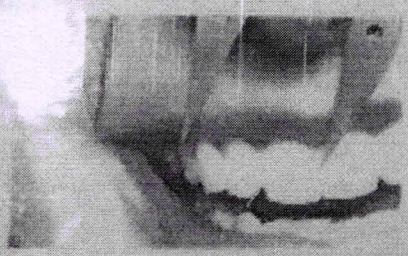


08 COMBINATION APPROACH FOR MANAGEMENT OF ATROPHIC MANDIBULAR RIDGES : A CASE REPORT



17 DENTAL EDUCATORS TRAINING PROGRAMME "CHANGING PARADIGM IN DENTAL EDUCATION"



18 FACIAL SYMMETRY & THE SCIENCE OF SEX APPEAL

MEDI MEDIA GROUP

NANO "BUSTERS" (PART-II)

"Dr. R Sanjyot Mulay, Dr. Dolly Rathod

INTRODUCTION

In the earlier article "NANO "BUSTERS" (PART-I) we discussed the general applications of nanotechnology which included diagnostic science & preventive dentistry. Further to that a lot of research has been taken place over the years in material sciences. "Nanobusters Part II" highlights the application of nanotechnology in Dental material sciences, Dental surgical sciences and Endodontics.

C) DENTAL MATERIALS SCIENCES:

1) Nanocomposites -

Efforts were made to improve the clinical performance of composite filling materials which focused on -

- Reduction of polymerization shrinkage, to improve marginal adaptation and prevent recurrent caries
- Improvement of mechanical properties, especially wear resitance
- Improvement of biocompatibility by reducing the elution of components.

Inorganic-organic hybrids with tailor-made properties created by means of sol-gel processing can be used as coupling agents or fillers. Nanofiller particles can be of 2 types, Nanomeric, or NM, particles and Nanoclusters or NCs.

Nanomeric (NM) particles - [Fig no: 1A] They are monodisperse nonaggregated and nonagglomerated silica nanoparticles which is treated with 3 methacryloxy propyltrimethoxysilane, (or MPTS) MPTS, a bifunctional material so known as a coupling agent, contains a silica ester function on one end or bonding to the inorganic surface and a methacrylate group on the other end to make the filler compatible with the resin before light curing to prevent any agglomeration or aggregation. MPTS also allows chemical bonding of the NM filler to the resin matrix during light curing.

Nanoclusters (NCs) particles [Fig no: 1B] The primary particle size of this NC filler ranges from 2-20nm, while the spheriodal agglomerated particles have a broad size distribution, with an average particle size of 0.6 micrometers.

Commercially available products: [2]
Filtek Z350, Filtek Supreme, Tetric EvoCeram (Ivoclar vivadent)

Nano-ceramic technology based composites. The Organically Modified Ceramic nano-particles comprise a polysiloxane backbone. The chemical nature of the siloxane backbone is similar to that of glass and ceramics. Methacrylic groups are attached to the backbone via silicone-carbon-bonds. These Nano-Ceramic particles can be best described as inorganic-oraganic hybrid particles (methacrylate functionalized silicon dioxide nano filler) where the inorganic siloxane part provides strength and the organic methacrylic part makes the particles compatible and polymerisable with the resin matrix. Iron oxide pigments and titanium oxide pigments and aluminium sulfo silicate pigments are added as per the shade. The good resistance to microcrack propogation might be related to the strengthening effect of the nano-ceramic particles. Propogating cracks are either more often reflected or absorbed by the nano-ceramic particles.

Commercially available products:
CeramX (Densply)[3]

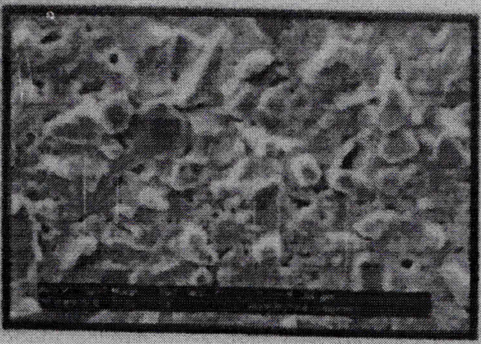
Nanosolution -
Nanosolutions produce unique and dispersible nanoparticles which can be used in bonding agents. This ensures homogeneity and ensures that the adhesive is perfectly mixed everytime. Seal&ProtectTM offers a unique treatment to prevent cervical abrasion. This light cured sealant protects exposed root dentine for atleast 6 months. Prime & bond NT is a fifth generation bonding agent which contains nanofiller of about 7nm in diameter. The average dentinal tubule is about 0.8um and the channels between the collagen fibrils in acid conditioned dentin is about 20nm with wide diameter of 5-10nm. The nanofiller has therefore the perfect size to penetrate these channels to provide added "Nano-retention". This filled adhesive when infiltrated into conditioned dentine, it provides the polymeric toughness as well as strength.

Commercially available products:
Prime & bond NT (Densply), Adper Single Bond Plus adhesive(3M ESPE), Nano bondTM

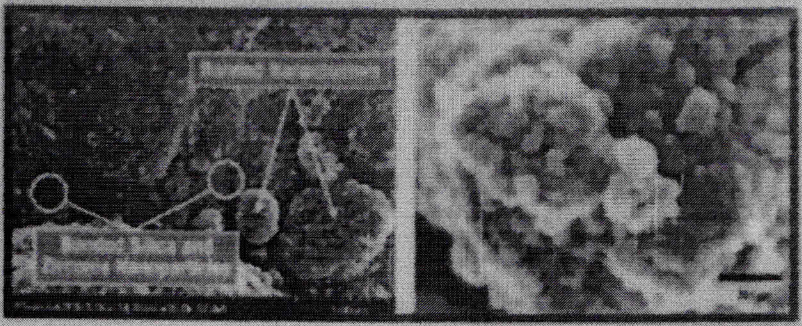
(Pentron clinical technologies).
Seal&ProtectTM.
Nanoreinforced Dental Bonding System utilizing Hybrid Plastics POSS.

(Pentron Corporations-Nanobond)[4]
[Fig no: 2]

This is a new class of dental bonding agents based on Hybrid Plastics Polyhedral Oligomeric Silsesquioxane (POSS) Nanotechnology. This represents the first commercialization of POSS nanocomposites in dental applications. The adhesive is marketed under the name NANO-BOND Universal Bonding System.
Pentron reports that POSS technology results in strengthened resin while it infiltrates the etched surface and provides a strong interface between the tooth and the restorative material. The system consists of a uniquely formulated self-etch primer and adhesive system that are said to work together for great bonding to dentin and cut enamel.



(A) Nanomeric

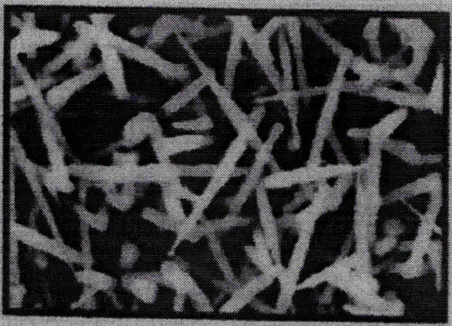


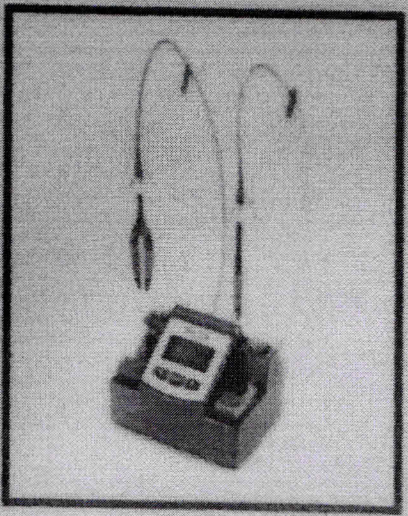
(B) Nanocluster

2) Glass ionomer cement:
Generally glass ionomer restoratives can contain a broad range of particle sizes. Filler particle size can influence strength, optical properties, and abrasion resistance. By using bonded nanofillers and nanocluster fillers, along with (fluoroaluminosilicate)FAS glass newer type of GIC was formulated using nanotechnology along with its fluoride releasing property. Nano light curing glass ionomer restorative is comprised of two part system:
i) Aqueous paste (acidic polyalkenoic acid, reactive resins and nanofillers)
ii) Non aqueous paste(FAS glass, reactive resins, and nanofillers)
Filler content (69%)
1) FAS glass 27% (acid and free radically reactive)
2) Methacrylate funtionalized nanofillers 42% (acid and free radically reactive)

GIC Nano Primer
Nano primer is a one part, visible light-cure liquid specifically designed for use with GIC Nano restorative. It is comprised of vitrebond copolymer, HEMA, water, and photoinitiators. The primer is acidic in nature. Its function is to modify the smear layer and adequately wet the tooth surface to facilitate adhesion of Nano restorative to the hard tissue. In use, Nano primer is applied to the surface for 15 seconds and air dried. The primer is then light cured for 10 seconds. Adequately air drying followed by light curing of the primer before placement of GIC Nanorestorative provides adhesion to tooth structure.

Commercially available products: [5]
KetacTM N100 Light Curing Nano-Ionomer Restorative (3M ESPE)
3) Impression material





Impression material is available with nanotechnology application. Nanofiller are integrated in the vinylpolysiloxanes, producing a unique addition siloxane impression material. The main advantage of material is it has better flow, improved hydrophilic properties hence fewer voids at margin and better model pouring, enhanced detail & precision.[5]

Advantage over conventional impression materials
* Better working and setting time
* Low contact angle of approximately 300 for accurate, reliable impressions in the oral environment
* Outstanding tear strength ensure reliable impressions
* Minimized outgassing time for immediate pour of models

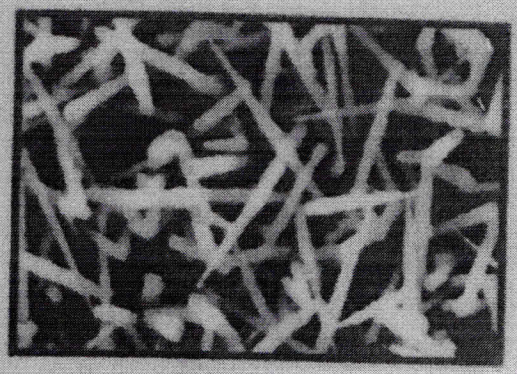
Commercially available products:
Nanotech Elite H-D, Correct Plus Fast Set, Imprint II Penta H

4) Remineralization
Treatment Of Human Caries Using Ultrafine Bioactive Glass Nanoparticles act as remineralizing agents for dental applications.[6]

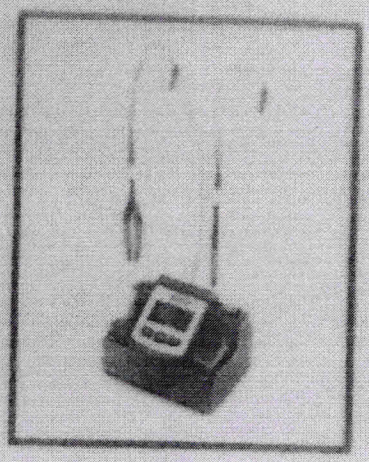
D) DENTAL SURGICAL PROCEDURES
1) Inducing Anesthesia[7]
To induce oral anesthesia in the era of nanodentistry professionals will install a colloidal suspension containing millions of active analgesic nanorobot particles on the patient's gingivae. After contacting the surface of the crown or mucosa, the moving nanorobots reach the pulp via the gingival sulcus, lamina propria, and dentinal tubules. Once installed in the pulp, having established control over nerve impulse traffic, the analgesic dental nanorobots may be commanded by the dentist to shut down all sensitivity to selected tooth that requires treatment. After the oral procedures are completed, the dentist

renders the nanorobots via the same acoustic data links to restore all sensation to relinquish control the nerve traffic & to retrieve from the tooth via similar path. This analgesic technique is patient friendly as it reduces anxiety, needle phobia, and most important one is fast acting and completely reversible action.

2) Nanoneedles - [Fig no: 3A]
Suture needles incorporating nano-sized stainless steel crystals have been developed.
Trade name: Sandvik Bioline, RK 91TM needles [AB Sandvik, Sweden]
3) Nanotweezers - [Fig no: 3B]



(A) Nanoneedle



(B) Nanotweezer

They are under development which will make cell surgery possible in the near future.

4) Nanobone replacement materials -

Hydroxyapatite nanoparticles used to treat bone defects are -
- Ostim ®(Osartis GmbH, Germany) HA
- VITOSS ®(Orthovita, Inc.,USA) HA+TCP
- NanOssTM (Angstrom Medica, USA) HA

E) Endodontics

1) Regenerative Endodontics[8] -
The development and delivery of tissues to replace diseased or damaged dental pulp, has the potential to provide a revolutionary alternative to pulp removal. Scientists are reporting development of multilayered, nanosized film - only 1/50,000th the thickness of a human hair containing a substance that could help regenerate dental pulp which contains - Alpha Melanocyte Stimulating Hormone (alpha MSH). It has anti-inflammatory properties. The scientist in laboratory tests proved that alpha-MSH combined with a widely used polymer produced a material that fights inflammation in dental pulp. Fibroblasts are the main type of cell found in dental pulp. Nano-films containing alpha- MSH also increased the number of these cells. This could help revitalize damaged teeth and reduce the need for a root canal procedure, the scientists suggest.

2) Endodontic sealer[9]
According to Dr. Samran Malik Masudi at 2007, the lead researcher in the team "The NanoSeal Plus is the first sealing material created with active nanoparticles. It also uses material with a structure that is close to the tooth structure, and actively seals all the tiny gaps within the dead tooth, greatly reducing the chances of a future infection." It is made up of calcium phosphate hydroxyapitite nanoparticles ranging from 40-60 nm. Rod in shape when viewed by Transmission electron microscopy (TEM micrograph), it is made by mixing calcium hydroxide $Ca(OH)_2$ and phosphoric acid (H_2PO_4) using a wet chemical method which has the advantages of-

- Biocompatible.
- Antibacterial effect.
- Apical healing ability.
- Seal small gaps.
- Hermetic apical seal.
- Inexpensive.
- Prevent leakage by increasing the adhesive strength.

The size of the active nanoparticles can penetrate the dentinal tubules & enter accessory canals to ensure that all the spaces have been sealed effectively.

CONCLUSION

Trends of oral health have been changing to more preventive intervention than a curative & restorative treatment. Nanotechnology will change dentistry, health care and human life more profoundly than other developments. Nanodentistry will give a new vision towards "comprehensive oral health care".

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ISSN 0970-2199

PIERRE FAUCHARD ACADEMY

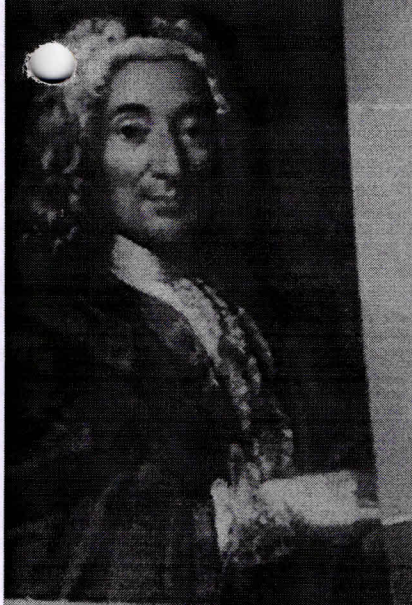
25

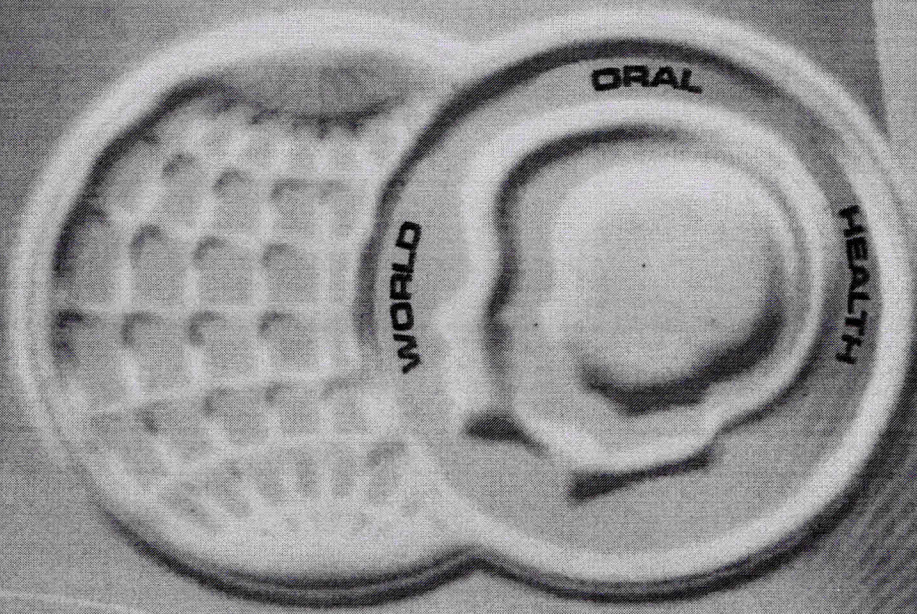
1987-2012

JOURNAL

A Quarterly Publication

PIERRE FAUCHARD ACADEMY





OF PIERRE FAUCHARD ACADEMY

VOLUME 26
NUMBER 3
SEPTEMBER 2012

In-Vivo Evaluation of Efficacy of Ultrasonic Irrigation with 3% Naocl & Nd:Yag Laser for Disinfection against Streptococcus and Staphylococcus in Root Canal

Rathod D.M., Mulay S.A.***

Root canal infection has multibacterial etiology. Micro-organisms and their end products are considered the main cause of pulpal and periapical disease. The success of the endodontic treatment is directly influenced by elimination of microorganisms from infected root canals. In our routine endodontic procedures many a times just chemomechanical therapy is not sufficient to debride the root canals. Therefore, newer modalities or devices must be tried and tested in –vivo for complete disinfection of the root canal.

Since, *Streptococcous and Staphylococcous* are prevalant in root canal, therefore the purpose of this study is-

To determine the efficacy of Ultrasonic Irrigation with 3% sodium hypochlorite and Nd:YAG Laser for root canal disinfection against *Streptococcous and Staphylococcous* micro-organism.

Root canal treatment in single rooted teeth were included in this study. in which pre-operative sample and post operative sample were taken after using the modalities in each group with the sterile paper point. The collected samples were placed in Brain Heart Infusion transports media and then sent for microbiological culture, which was observed after 48 hrs.

Nd:YAG Laser was more efficient than ultrasonic irrigation with 3% NaOCl against *Streptococcous and Staphylococcous* micro-organism.

Key Words: Disinfection, Nd: YAG Laser, Ultrasonic irrigation.

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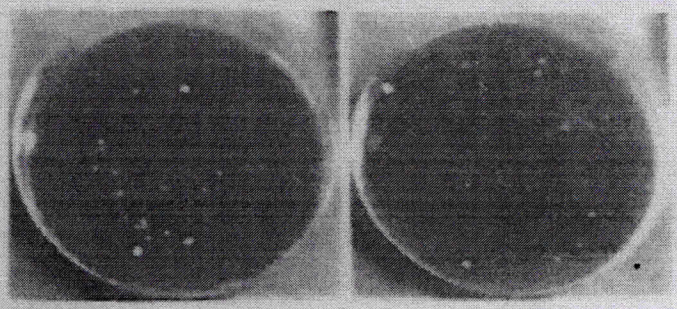
Fig No: 1 Showing agar plates with growth of Streptococcous and Staphylococcous

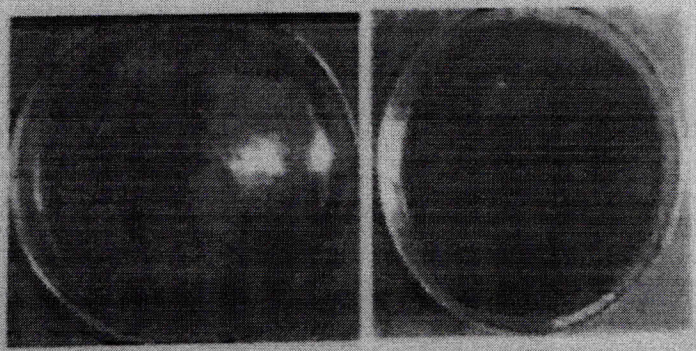
ULTRASONIC IRRIGATION WITH 3% NaOCl



(A) Pre-Operative CFU After 48 Hrs *(B) Post-Operative CFU After 48 Hrs*

Fig No: 2 Showing agar plates with growth of Streptococcous and Staphylococcous.

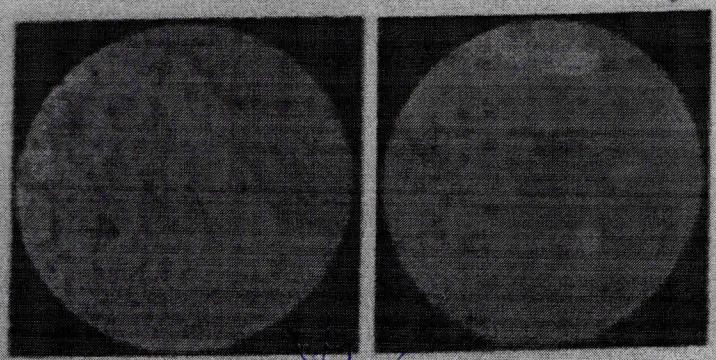
Nd: YAG LASER



(A) Pre-Operative CFU After 48 Hrs *(B) Post-Operative CFU After 48 Hrs*

Fig No: 3 Showing Streptococcous and Staphylococcous under 100X magnification

MICROSCOPICALLY



Streptococcus *Staphylococcus*

However, one of the limitations of this in vivo study was a relatively small sample size.

CONCLUSION

The following are the observations of this in vivo study -

1) Both ultrasonic irrigation with 3% NaOCl and Nd: YAG Laser are effective against Staphylococcus & Streptococcus.

2) Nd: YAG Laser is more efficient than Ultrasonic irrigation with 3% NaOCl against Staphylococcus and Streptococcus.

Conflict of Interest Statement

"I declare that I do not have any commercial or associative interest that represents a conflict of interest in connection with the work submitted".

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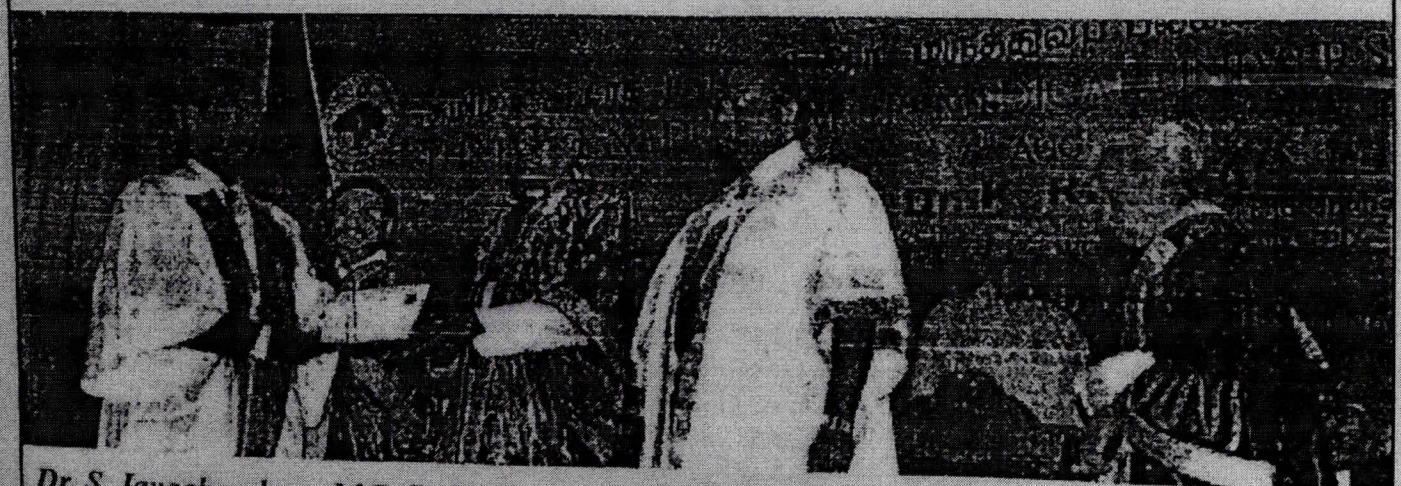
DR. S. JAYACHANDRAN GETS Ph.D (ORAL MEDICINE)



Dr. S. Jayachandran, M.D.S., Professor and Head, Department of Oral Medicine and Radiology, Tamilnadu Government Dental College and Hospital, Chennai, receiving Ph.D (Oral Medicine) Faculty of Dentistry, in the 24th convocation of TamilNadu Dr. M.G.R. Medical University, on 17-08-2012, in the presence of Chancellor, Pro-Chancellor and Vice-Chancellor.

Case Report

Comparative evaluation of ER:YAG and Nd:YAG Laser for gingival depigmentation

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Abstract

Melanin, carotene, and hemoglobin are the most common natural pigments contributing to the natural color of the gums. Although physiologic and ethnic melanin pigmentation is not a medical problem, complaints about "black gums" are common. Gingival depigmentation has been carried out using surgical, chemical, electrosurgical and cryosurgical procedures. Recently, "laser ablation" has been recognized as one of the most effective, pleasant and reliable techniques. Effective depigmentation of the gingiva requires removal of all or most of the melanocytes from the basal layer of gingival epithelium. In present case report the efficacy of gingival depigmentation using neodymium:yttrium-aluminium-garnet (Nd:YAG) and erbium:YAG (Er:YAG) lasers in same patient was evaluated.

Key words

Er:YAG laser, gingival depigmentation, melanin, Nd:YAG laser

Introduction

A smile expresses a feeling of joy, success, sensuality, affection, courtesy, and above all reveals self-confidence. The harmony of -"smile" is determined not only by the shape, position and color of the teeth, but also by the gingival tissues.[1] Gingival health and appearance are essential components of an attractive smile. "Pink zone" enhances the overall esthetics. The color of gingiva plays an important role in this aspect.

Melanin pigmentation is the result of melanin granules produced by melanoblasts intertwined between epithelial cells at the basal layer of gingival epithelium.[2] Although pigmentation may be observed in any location, gingiva is the most commonly affected site, followed by buccal mucosa, lips, palate, and tongue.[3-6] The degree of pigmentation of mucosa varies from one individual to another which is mainly dictated by the melanoblastic activity.[7] Melanin pigmentation of gingiva is generally symmetric and it does not alter normal gingival architecture.[3] Literature documents use of lasers for treatment of hyperpigmented gingiva.[8]

The present case report evaluates and compares the efficacy of erbium:yttrium-aluminium-garnet (Er:YAG) and neodymium:YAG (Nd:YAG) laser for gingival depigmentation.

Access this article online	
Quick Response Code:	Website: www.jdentlasers.org
	DOI: 10.4103/0976-2868.118453

Case Report

A 35 year old male patient reported to the Department of Conservative Dentistry and Endodontics, at Dr. D. Y. Patil Dental College and Hospital, with a chief complaint of "blackish gums" because of which he was reluctant to smile freely in social gatherings.

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How to cite this article: Rathod DM, Mulay S. Comparative evaluation of ER:YAG and Nd:YAG Laser for gingival depigmentation. J Dent Lasers 2013;7:38-42.

Source of Support: Nil, **Conflict of Interest:** None declared.

Terna Journal of Dental Sciences 2013; 1: 89-92.

Terna Journal of
Dental Sciences

Extra canal in the mesial root of mandibular first molar: A case report

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Dr. Dolly Rathod*
Dr. Gaurav Poplai*
Dr. Snehal Sonarkar**

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Abstract

Several cases of unusual anatomy of mandibular molars have been reported. Missed root canals are a major reason for failure of endodontic therapy. Left untreated, mid-mesial canals could be a reason for failure of root canal treatment in lower molars. Knowledge of the anatomy of the root canal system, use of technological advances like CBCT scans, and surgical operating microscopes will help in the diagnosis of a mid-mesial canal. This case reports a rare anatomical configuration of a mandibular first molar which shows the presence of three separate canals in the mesial root. **(Terna J Dent Sci 2013; 1:89-92.)**

Keywords: Mandibular first molar, middle mesial canals, missed canals, root canal anatomy

Introduction

The primary objective of root canal therapy is to obtain a hermetic seal of the root canal space. Knowledge of the most common anatomical characteristics and their possible variations is fundamental because missed canals and spaces within the root canal system may contain microorganisms and their byproducts and may contribute to ...e of therapy.[1] Endodontic treatment of mandibular molars is a constant challenge to the clinician because the number of root canals is highly variable. The usual canal distribution is two canals in the mesial root and one or two in the distal root.

Vertucci and Williams[2] first reported the presence of a middle mesial (MM) canal in a mandibular molar. Pomeranz et al [3] also reported the incidence of three canals in the mesial root of mandibular molar. Since then, several case reports of multiple canals in mandibular molars have been reported. With increasing reports of aberrant canal morphology the clinician need to be aware of and look out for such variations. The purpose of this article is to report the successful treatment of a case of a mandibular molar with three separate mesial canals.

Conflict of interest and source of funding

The authors declare that there is no conflict of interest concerning the contents of the study.

This study has been self-supported by the authors.

Case Report

A 43-year-old female patient reported to the Department of Conservative Dentistry and Endodontics with a complaint of pain in her left posterior mandibular region. She gave a history of sharp, intermittent pain for the past two months and a past dental history of amalgam restoration in the same region. Her past medical history was found to be non-contributory. Intraoral examination revealed Class II (Mesio-occluso-distal) amalgam restoration in 36. The tooth exhibited no mobility, was mildly tender to percussion, and gave a response of acute pain to heat test and an elevated response to an electric pulp tester. The preoperative diagnostic radiograph of 36 (Fig 1) revealed a deep amalgam restoration approaching the pulp with widening of the apical periodontal ligament space. The clinical and radiographic finding led to a diagnosis of irreversible pulpitis with apical periodontitis and endodontic treatment was scheduled. The patient consented to the proposed treatment. Radiographic evaluation of the involved tooth indicated a normal canal configuration of two canals in the mesial root and one canal in the distal root. After administering local anaesthesia (2% Lignocaine with 1:80,000 adrenaline) and rubber dam isolation previous restoration and all carious tissue were removed. The proximal wall was built up with GIC restoration (GC Corporation Tokyo, Japan) and an adequate endodontic access was made. The pulp chamber floor showed four orifices corresponding to 4 root canals: mesiobuccal (MB), mesiolingual (ML), distobuccal (DB), and distolingual (DL) (Fig 2). On careful examination of the groove between the mesiobuccal and mesiolingual canal orifices, the middle mesial canal orifice was identified, located and the

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Terna Journal of Dental Sciences 2013: 1: 93-96.

Terna Journal of
Dental Sciences

Surgical management of endo-perio lesion

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Keywords: Combined endodontic-periodontal lesion, periradicular surgery, platelet rich fibrin, GTR membrane

Abstract

An endo-perio lesion can have varied pathogenesis which can range from simple to complex. The success of a combined periodontal and endodontic lesion depends on the elimination of both of these disease processes. In case of a combined endo-perio lesion, the endodontic therapy results in healing of the endodontic component of involvement while the prognosis of tooth would finally depend on the healing of the periodontal structures. This article includes case report of combined endo-perio lesion which was first treated with conventional endodontic therapy and then followed by periodontal surgery. **(Terna J Dent Sci 2013; 1:93-96.)**

Introduction

Preservation of the natural dentition is the ultimate goal of dental therapy. In endodontics, the goal is not only to maintain the natural dentition, but also to restore lost periodontium.[1] Periradicular bone loss secondary to endodontic pathosis is typically seen in teeth with necrotic pulps. Combined periodontal and endodontic diseases involve the periodontal attachment apparatus. Pulpal necrosis may lead to destruction of the attachment apparatus by extension through the apical foramen or through accessory canals that may be located at different levels on the root surface. An acceptable treatment results, for combined endodontal and periodontal (endo-perio) lesions may be obtained by endo-perio therapy. However, when a significant loss of the periodontal attachment apparatus and osseous structure occurs, the long-term prognosis becomes poor.[2] This report presents a case in which an apical radiolucency was present in maxillary teeth, when a flap was raised. It was treated first with conventional endodontic therapy combined with periodontal regenerative procedures.

Conflict of interest and source of funding

The authors declare that there is no conflict of interest concerning the contents of the study.

This study has been self-supported by the authors.

Case report

A 35 year old patient reported to the Department of Conservative Dentistry and Endodontics, with a chief complaint of swelling in the upper front region of the jaw. Patient had a history of trauma 7 years ago. Patient was systemically healthy and medical history was not contributory to this dental problem. **No extra oral abnormality was detected.** On **intra oral examination, a** swelling of about 3cm x 3cm was present, approximately in relation to 11. Ellis Class II fracture and tooth discoloration was seen in 11. On periodontal probing, it was observed that the entire probe sunk into the pocket indicating that the pocket was about 15 mm deep (**Fig 1a**).

Investigations

a) IOPA revealed a fracture line through enamel, dentin and pulp chamber in the coronal structure of 11 which also had a large periapical radiolucency **(Fig 1b).**

b) Pulp vitality test for 12,11 & 21 was done; 11 showed that the tooth was non-vital.

c) Blood **investigation such as (complete haemogram, bleeding time, clotting time) was done.**

Diagnosis

a) Ellis type II fracture

b) Chronic suppurative apical periodontitis, periapical abscess.

c) Chronic localised periodontitis

Treatment Plan

Emergency phase: Emergency access opening with 11 and drainage of pus.

Phase I - Etiotropic phase: Scaling and polishing

Phase II – Therapy phase: Completion of root canal treatment and surgical treatment

healing, bone growth and maturation, graft stabilization, wound sealing and hemostasis, and improving the handling properties of graft materials. It is saturated with growth factors which expediates the regeneration. Best application of membranes in periapical surgery is seen only when there is a combined endo-perio or perio-endo lesion or large periapical communicating with the alveolar crest. In this kind of apicomarginal bony defect, the PDL and cementum are destroyed. Accordingly, application of a membrane barrier is indicated during periapical surgery to prevent apical migration of junctional epithelium along the denuded root surface into the periapical wound and to induce selective repopulation of cells of the connective tissue attachment. In combined endodontic-periodontal or periodontal-endodontic lesions, the use of a membrane to manage the lesions is directed at the periodontal tissue rather than periapical tissue regeneration. In an animal study, Nyman and Karring surgically elevated buccal flaps and a strip of buccal bone between the mesial and distal line angles was removed corono-apically from the roots to a notch prepared in the root surface as a landmark. This was done without significantly injuring the PDL and cementum. The flaps were then repositioned and sutured. Fibrous connective tissue reattachment and varying degrees of alveolar bone regeneration were histologically observed on the root surfaces 8 months postoperatively. Lindhe et al did the same thing but he made a change by removing the PDL of the extracted teeth by planing the root to half the level and reimplanting them. A fibrous connective tissue attachment failed to form on that part of the tooth even after 6 months.[7] Gottlow et al raised buccal flaps and removed bone corresponding to 50-75% of the root length. The coronal portion of the root was left open to bacterial plaque accumulation for 6 months. Then the roots were scaled and planed and a membrane was placed and sutured immediately. New cementum along with collagen fibre inserts were seen in 30 days. The cementum was primary cellular though and not acellular.[8] A membrane barrier is not required during periapical surgery because fibrous connective tissue reattachment will occur onto the root surface after reposition and suturing of a surgical flap. However, if the cause of dehiscence is pathologic as a result of marginal periodontitis, a membrane barrier is suggested to prevent apical migration of junctional epithelium along the root surfaces during periapical surgery.[10] Bone graft was used as an osteoconductive material in order to form a matrix around which the bone could form.[11]

Conclusion

Although traditional nonsurgical periodontal therapy and regular endodontic therapy can be predictably used to arrest mild to moderate defects, it might be inadequate for the treatment of disease characterized by deep pockets or wide circumferential apical defects. Currently, regenerative techniques are widely available in terms of their predictability to regenerate the lost tissue/bone in all types of defects or for all situations. A careful preoperative diagnosis, appropriate case selection and knowledge of the factors that can negatively affect regeneration outcomes can help to optimize successful regenerative attempts. Treatment strategies used in this case report suggests that combined endodontic-periodontal lesions can be successfully managed with regenerative procedures.

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Dental Sciences

Effect on the tensile bond strength of glass fiber posts after surface pre – treatment with silane coupling agent and hydrofluoric acid – An in vitro study

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Key words: glass fiber posts, silane, hydrofluoric acid.

Abstract

Aim: To evaluate the tensile bond strength of glass fiber posts (Reforpost, Angelus) after surface treatments with silane coupling agent and hydrofluoric acid.

Materials and Method: 40 single rooted maxillary central incisors were selected for the study. The specimens were decoronated with a diamond disc and the root length was standardized at 14mm. Cleaning and shaping was done till rotary protaper F3. Obturation was completed with gutta percha and AH Plus sealer. Post space was prepared after 24 hours using gates glidden drill no. 2 followed by drill no.2 provided with the post to a depth of 10mm from the sectioned root surface. The prepared samples were randomly divided into 4 groups.

Group 1: The posts were not subjected to surface treatment (Control Group)

Group 2: The posts were surface treated with silane coupling agent (Monobod S, Ivoclar).

Group 3: The posts were surface treated with 5% hydrofluoric acid for 60 seconds.

Group 4: The posts were surface treated with 5% hydrofluoric acid for 60 seconds followed by application of silane coupling agent (Monobond S, Ivoclar).

The fiber posts were luted with dual cure luting cement (U100, 3M). The samples were then mounted in acrylic blocks. The tensile bond strength was evaluated using a universal testing machine after 24 hours. **(Terna J Dent Sci 2013; 1:84-88.)**

Introduction

Teeth that have been endodontically treated and having little coronal tooth tissue remaining, compulsorily require a post to retain the core and restoration. Prosthetic failure has been cited as the most common cause of failure in these teeth. Whilst debonding of posts may contribute to this finding, cross-sectional surveys of failed posts have shown that most failures are because of post decementation.[1,2]

Posts made of tooth-coloured material, such as glass fibres or zirconia ceramics have become popular. They increase the transmission of light within the root and overlying gingival tissues. The low modulus of elasticity of fibre-reinforced epoxy resin posts has been purported to be similar to that of dentin reducing the risk of root fracture.[3,4] In addition, the restoration of endodontically treated teeth with metal-free materials eliminates the potential hazards of corrosion and allergic hypersensitivity.[5] Debonding is a common cause of failure encountered with fibre-reinforced composite (FRC) posts.[6]

Surface conditioning of posts is expected to increase the chemical and mechanical bond between the luting composite resin and the post, but the best method has not been definitively determined. In the present study Silane coupling agent and Hydrofluoric acid are used to check if any difference was observed in the tensile bond strength of glass fibre posts.

Aim

To evaluate the tensile bond strength of light transmitting glass fiber posts (Reforpost, Angelus) after surface pre – treatment with silane coupling agent and hydrofluoric acid.

Materials and Methods

40 caries free extracted human maxillary central incisors were randomly selected for the study. Scaling and polishing was performed for all the teeth. The teeth were then stored in physiologic saline at room temperature. Each tooth was sectioned perpendicular to the long axis so that the root length is standardised at 14mm. Cleaning and shaping was performed using rotary protapers till finishing files F3. The root canals were rinsed with 5.25% sodium hypochlorite solution in between the use of each file. The root canal of each tooth was then dried with paper points. Obturation was done using the cold lateral compaction technique with the help of finger spreaders. AH Plus was used as a sealer and standardised F3 gutta percha points as master cones.

The post spaces for each tooth were prepared after 24 hrs of completion of the obturation. The coronal aspect of the gutta

Conflict of interest and source of funding

The authors declare that there is no conflict of interest concerning the contents of the study.

This study has been self-supported by the authors.

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ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 08, pp.56668-56672, August, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

CASE STUDY

NON-SURGICAL TREATMENT OF LARGE PERIAPICAL LESION USING VARIOUS FORMULATIONS OF CALCIUM HYDROXIDE & ND: YAG LASER

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ARTICLE INFO

Article History:
Received 18th May, 2017
Received in revised form
10th June, 2017
Accepted 23rd July, 2017
Published online 31st August, 2017

Key words:

Periapical lesion, Calcium Hydroxide, Non-surgical, Endodontic therapy, Nd:Yag Laser.

ABSTRACT

Large periapical lesions are always a challenge for the clinicians. Treatment planning for extensive lesions is a dilema. Literature has documented successful management of large periapical lesions using non-surgical as well as surgical treatment approach. The pros & cons of non-surgical versus surgical treatment modality should be carefully studied for individual case. This case report presents non-surgical resolution of a large periapical lesion of endodontic origin in maxillary anterior teeth using various formulations of calcium hydroxide as intracanal medicament & Nd: Yag Laser as adjuvant method of root canal disinfection.

Citation: Dr. Dolly M. Rathod and Dr. Sanjyot A. Mulay, 2017. "Non-surgical treatment of large periapical lesion using various formulations of calcium hydroxide & Nd: Yag laser", *International Journal of Current Research*, 9, (08), 56668-56672.

INTRODUCTION

Periapical lesions of endodontic origin are produced by an inflammatory response at the root apices of teeth with non-vital pulps. Periapical lesions develop as a sequelae to pulp disease. Bacterial infection of the dental pulp may lead to periapical lesions (Mφller *et al.*, 1981). They are generally diagnosed either during dental radiographic examination or following acute pain in tooth (Barbakow *et al.*, 1981). Periapical lesions cannot be differentiated into cystic and noncystic lesions merely based on the radiographic features (Ricucci *et al.*, 2006). The ultimate goal of endodontic therapy should be to return the involved teeth to a state of health and function without surgical intervention (Salamat and Rezai, 1986).

Case Report

A 32 year old female patient reported to the department of Conservative Dentistry and Endodontics, with a chief complaint of swelling in the palate. There was a history of trauma to upper front teeth 2 years back. The swelling was first noticed ten months ago. The patient had previously been prescribed antibiotics without any dental interventional treatment. Extraoral examination revealed no abnormality. Intraoral examination detected a well circumscribed, 2 cm diameter fluctuant swelling in the palate in relation to 11&12. Radiographic examination revealed a well defined radiolucent area involving maxillary right central and lateral incisors, measuring around 7mm in diameter (Fig. 1). Electric Pulp Vitality Test for 11,12 & 13 was performed, where 11 &12 showed delayed response and 13 responded normally.

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Diagnosis

The clinical and radiographic findings were suggestive of periapical cyst in relation to 11 and 12.

Treatment Plan

Antibiotic coverage was given for 5 days. Non-surgical endodontic treatment in 11,12 was planned initially. Patient was intimated that surgical intervention may be required if desired outcome was not achieved. A written consent from patient was obtained. Emergency root canal opening was made in 11& 21 to relieve the intraoral swelling. More fluid was expressed through the root canals by compressing the

endodontic therapy. With proper diagnosis & execution of treatment, surgical intervention can be avoided and the case can be managed conservatively with a non-surgical approach.

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DOI: 10.26717/BJSTR.2018.02.000663
Dolly Rathod. Biomed J Sci & Tech Res

BIOMEDICAL
Journal of Scientific & Technical Research

ISSN: 2574-1241

Case Report Open Access

Management of Complicated Crown-Root Fracture Using Newer Radiographic AIDS - A Case Report

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Received: August 22, 2017; **Published:** January 17, 2018

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Abstract

Crown-root fractures are complex traumatic injuries that require multidisciplinary management and may afford uncertain prognosis. Diagnosis of such cases is often difficult. With the newer radiographic aids like CBCT, the diagnosis is more definite and hence treatment outcome can be more predictable. This case report discusses the use of newer radiographic aids and treatment options for fractured teeth with the concept of intentional re plantation as an option to manage complicated crown-root fractures in permanent anterior teeth.

Keywords: Cone beam computerized tomography; Intentional re plantation; Re - attachment

Introduction

Management of patient with traumatic injuries to their dentition is an integral part of general dental practice. Trauma to oral structures like teeth has a great psychological impact on the minds of patients. Since anterior teeth help in maintaining the form, function & esthetics, a treatment plan which would not compromise on any of these values with minimal treatment time is most desirable. Aesthetics plays an important role in contemporary dentistry, especially emphasizing beauty and health. A smile is considered beautiful if it imitates a natural appearance, with well-aligned teeth and defined anatomical shapes [1-3].

Case Report

A 20 years old male patient reported to the department of Conservative Dentistry and Endodontics, Dr. D. Y. Patil Dental College and Hospital, with a chief complaint of broken tooth in upper front region of the jaw. No extra oral abnormality was detected. On intra oral examination

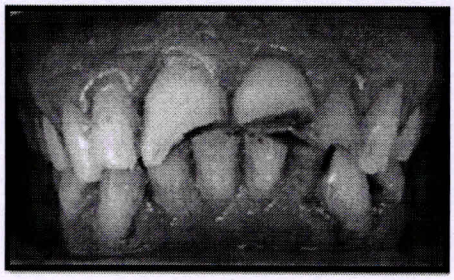

Figure 1a: Fracture lines in 11, 21 & 22.

a. Ellis Class III fracture was seen with 11 & Ellis Class VI fracture was seen with 21 &22 which extended from buccal to the palatal aspect sub gingivally (Figure 1a).

b. Grade II mobility was present with 11, 21 & 22.

Investigations

a. IOPA radiograph of 11, 21 and 22 was taken which revealed a fracture line through enamel, dentin and pulp chamber in the coronal structure with 11, 21 & 22 (Figure 1b).

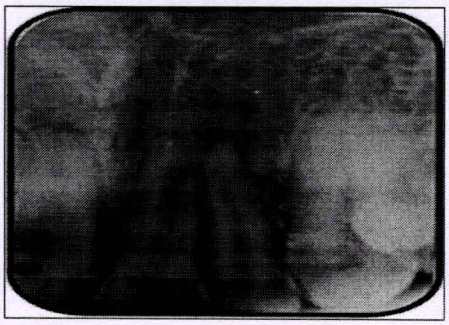

Figure 1b: IOPA with 11, 21 & 22.

b. Pulp Vitality Test for 11, 21 and 22 was performed, using electric pulp test where all three teeth showed delayed response.

c. Orthopantomogram (OPG) was done to rule out involvement of any other teeth or presence of abnormality.

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Original Article

Evaluation of efficacy of Nd:YAG laser, ozonated water, and ultrasonic irrigation with 3% sodium hypochlorite for disinfection of root canal: An *in vivo* study

ABSTRACT

Background: Root canal infection has multibacterial etiology. The success of the endodontic treatment is directly influenced by the elimination of microorganisms from infected root canals. Many authors have suggested that to eliminate bacteria from the root canals predictably, the adjuvant method or agent is recommended.

Aims: The present study was conducted to evaluate and compare the efficacy of Nd:YAG laser, ozonated water, and ultrasonic irrigation using 3% sodium hypochlorite for disinfection of root canal.

Methodology: In thirty single-rooted teeth, access opening and instrumentation till #25 file was done under rubber dam. The first sample was collected by introducing a sterile paper point for preoperative microbial sampling. Ten teeth in each group were treated with Nd:YAG laser, ozonated water, and ultrasonic irrigation using 3% sodium hypochlorite for disinfection of root canal. The second sterile paper point was placed to collect the postoperative sample. Paper points were put in a test tube containing transport medium and sent for microbiology laboratory.

Results: According to the results of the present study, there was highly significant difference ($P < 0.0001$) in percentage reduction in all the three study groups. There was a statistically highly significant difference ($P < 0.0001$) in pre- and post-operative colony-forming units in samples treated with ultrasonic irrigation with 3% sodium hypochlorite (Group III).

Conclusions: In the current study, ultrasonic irrigation with 3% sodium hypochlorite was the most effective treatment modality as compared to Nd:YAG laser and ozonated water for disinfection of root canal.

Keywords: 3% sodium hypochlorite, disinfection, Nd:YAG laser, ozonated water, ultrasonic irrigation

INTRODUCTION

WD Miller in 1890 was perhaps the first to associate disease and inflammation in the jaws with the infected dental pulp canal space.[1] One of the crucial points in endodontic therapy is to disinfect root canal before root filling because of the role of bacteria and their by-products in both the initiation and perpetuation of pulpal and periapical disease.

The mechanical action of the instruments alone is not effective in cleaning a root canal satisfactorily owing to the complexity of the internal dental anatomy, for example, apical, deltas, lateral canals, and accessory canals.[1] Hence, this process is conventionally carried out by the mechanical action of the endodontic instrument on the canal walls, the chemical action of the irrigating solutions, and the physical action of the irrigation/aspiration process.[2]

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Access this article online	
Website: www.endodontologyonweb.org	Quick Response Code
DOI: 10.4103/endo.endo_93_17	

How to cite this article: Rathod D, Mulay S. Evaluation of efficacy of Nd:YAG laser, ozonated water, and ultrasonic irrigation with 3% sodium hypochlorite for disinfection of root canal: An *in vivo* study. Endodontology 2018;30:135-9.

ozone molecules can readily enter the cells, causing the microorganism to die.[15]

Sodium hypochlorite is considered as gold standard as a root canal irrigant for disinfection of root canal.[16] Studies have shown that, when activated ultrasonically, it potentiates and enhances the antibacterial efficacy of NaOCl.[17]

Mechanism of action of ultrasonic irrigation

When a file is placed in the root canal, it causes acoustic streaming effect by mechanical energy, thus dislodging the debris from canal, and by the warming effect, it potentiates the activity of NaOCl. Ultrasonic synergistic system has a significantly superior ability to clean the root canal space when compared to conventional hand filing irrigating technique. NaOCl has tissue-dissolving capacity as well as antibacterial properties.[17,18]

Hence, with minimal upgradation of existing armamentarium in a dental operatory like endosonic equipment, disinfection of the root canal can be achieved better than conventional method. Use of ozone therapy and Nd:YAG laser is adjuvants. Use of sodium hypochlorite is still being the gold standard in disinfection of root canal system.

CONCLUSIONS

The following are the observations of this *in vivo* study:

1. Ultrasonic irrigation with 3% sodium hypochlorite was the most effective treatment modality as compared to Nd:YAG laser and ozonated water for disinfection of root canal
2. Ultrasonic irrigation with 3% sodium hypochlorite showed 94%, Nd:YAG laser 82%, and ozone 82% reduction in CFU.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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ANNEXURE-"F"

Information of Mentor of Training Centre

It shall be verified by the Head of the concerned Training Center

Sr. No.	Particular	-	Information to be filled
10.	Name of Mentor	:	Dr. Jayeeta Verma
11.	Date of Birth	:	03/12/1987
12.	Address	:	1403, Saisanskar Near Telecom factory, Deonar, Mumbai
13.	Tel. No./ Mob. No.	:	9819246333
14.	e-mail id	:	jayeetaverma@gmail.com
15.	Nationality	:	Indian
16.	Qualification in details : (attach documentary proof)	:	BDS, MDS (Conservative Dentistry & Endodontics)
17.	Teaching experience/ Health Sciences : Profession experience /Consultant/Mentor (attached document proof with signature of Head)	:	7yrs. 4months. 15dys.
18.	Present Appointment	:	Reader
19.	Publications (List & Proof)	:	1. **Verma J,** Padhye L, Verma S. Effect of brushing on colour stability of nanohybrid composite after immersion in brewed beverages - an invitro study. Med Pharm Rep. 2021;94(4):465-70. 2. Mehta S, **Verma J**. Systematic review on relation between surface treatment and outcome of delayed replantation of permanent anterior avulsed teeth. JCDR. 2021;15(6):ZE01-ZE04. 3. Satpute TS, **Verma JS**, shah JR, Shinde AK. Pulp revascularization of a non- vital immature young permanent tooth- a case report. J evolution Med Dent Sci. 2021;10(11):845-848. 4. Karmani V, Merchant A, Dhumale A, **Verma J**. Indigenous remedies for oral health in the current COVID – 19 Pandemic. Int J of Dent Sci and Innovative Research (IJDSIR). 2021 January;4(1):28-33. 5. Verma S, Verma M, Mekewar SR, **Verma J**, Gehdoo RP, Patil S, Verma B. Assessment of Lumbar Facet Joint Nerve Blocks in Chronic Low Back Pain: A Tertiary Care Hospital Based Study. Int Arch BioMed Clin Res. 2020 July - Sept; 6(3):AN1-AN4. 6. Shinde A, **Verma J**, Shah J, Satpute T. Esthetic management of traumatic teeth – a case report. Int J of Dent Sci and Innovative Research IJDSIR. 2020;3(4):112-116 7. **Verma J**, Satpute T, Shah J, Shinde A. Endodontic management of mandibular first premolar with trifurcation : A case report. International journal of scientific research 2020;9(8): 8. Shenoy VU, Shaikh S, MV Sumanthini, **Verma J**, Chavan P, Gawali S. To evaluate the buffering capacity of various drinks commonly available in India. MGM J Med Sci. 2020 April - June;7(2):56-62.

19.	Publications (List & Proof)		9. Verma S, **Verma J**, Mekewar SR, Verma M, Gehdoo RP, Patil S, Verma B. A Comparative Prospective Study Between Suprascapular Nerve Block and Intra Articular Steroid in Pain Management for Frozen Shoulder Patients. Int Arch BioMed Clin Res 2020 ; 6(2) :AN 1- AN3 10. Karmani V, **Verma J**. Eggshells: An Unidentified Remedy. Dent Poster J. 2018 Jan June;7(1):1. 11. Mehta S, Bapatla S, Pathak T, **Verma J**. Self perceived halitosis amongst school, junior college and dental college students in Navi Mumbai – a KAP study. J Dent Treat Oral Care. 2017 Nov;2(1):101 12. Mehta S, **Verma J**. Waterlase- Gentle approach to dental problem. Dent Poster J. 2016 Nov- Dec;5(3):poster 1. 13. Verma S, Mehta N, Mehta N., Mehta S, **Verma J**. Malpositioned LMA confused as foreign body in nasal cavity. M.E.J. ANESTH. 2015 October;23(3):351-354 14. **Verma J**, Padhye L, Verma S. Mouth-watering but erosive : A comparative evaluation of pH of Indian spices. Int Poster J Dent Oral Med 2015 Sept;17(3):poster no 899 15. **Verma JS**, Padhye L, Mandke L, Sumanthini MV, Shenoy V. A Prefatory Assessment of Erosive Potential of Commonly used Indian Spices. J Cont Dent. 2015 May - August;5(2):86-89 16. **Verma J,** Padhye L, Mandke L.Think And Drink!!A Preliminary Assessment Of Salivary pH Before And After Consumption Of Various Beverages - International Journal of Biotechnology and Biosciences(IJBBs).2014 April-June;4(2):131-135. 17. Pulp therapies in young permanent teeth. **(Book)** **(Additional Degree)** Post Graduate Diploma in Hospital Administration(PGDHA) 18. Post Graduate Diploma in Hospital Administration(PGDHA) **(Additional Degree)**
11	Post Graduate Teaching experience (Attach documentary evidence)	:	4months 6dys.
12	Any other relevant information	:	-

Jayeeta

Dr. Jayeeta Verma
Name & Sign. of Mentor

Date: 20 / 05 /2022

For the use of affiliated Training Center:

I have verified the eligibility of the above Director as per the criteria of eligibility prescribed bythe University vide clause no.7 of the University Direction No. 05/2017 (Amended).

Professor & H. O. D.
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Sign & Stamp
Head of the Department
Date:

Sign & Stamp
Dean/ Principal/ Director of Training Centre
Date: 20/05/2022

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Verma Jayeeta Surinder Kumar

of Bharati Vidyapeeth's

Dental College And Hospital, Mumbai

having been examined for the Degree of

Bachelor Of Dental Surgery

and having been declared to have passed its Examination in

June-2009

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Bachelor of Dental Surgery

(B.D.S.)

has been conferred on her at Pune, on the

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I certify that Dr Verma Jayeeta Surinder Kumar

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in the month of May 2014.

Branch : Conservative Dentistry

Date : June 16, 2014

Place : Navi Mumbai

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This is to certify that Dr. Jayeeta Verma. is working in the Department of Conservative Dentistry and Endodontics in MGM Dental College & Hospital, Kamothe, Navi Mumbai and her experience is as under :

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ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)
IJDSIR : Dental Publication Service
Available Online at: www.ijdsir.com
Volume – 3, Issue – 4, August - 2020, Page No. : 112 - 116

Esthetic Management of Traumatic Teeth- A Case Report

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Citation of this Article: Dr. Aditya Shinde, Dr. Jayeeta Verma, Dr. Jimish Shah, Dr.Tanvi Satpute, "Esthetic Management of Traumatic Teeth- A Case Report", IJDSIR- August - 2020, Vol. – 3, Issue -4, P. No. 112 – 116.

Type of Publication: Case Report
Conflicts of Interest: Nil

Abstract

Introduction : A frequent question is " will my black or broken tooth turn to normal & will I have a pleasing smile?" What most people want are teeth that make them look healthier, younger and more attractive. Trauma of the oral and maxillofacial region occurs frequently and comprises 5% of all injuries for which people seek treatment.

Treatment plan : 11– Direct composite resin restoration. 21 – Non surgical endodontic treatment followed by in office bleaching was planned.

Conclusion : A beautiful smile seems to reflect a certain style of living, and the enhancement of facial beauty is one of the primary goals of patients seeking elective dental treatment. A well designed smile is a product of accurately diagnosed, methodical treatment planning, use of advanced materials and contemporary techniques rendered by the dentist.

Keywords: Obturation, Bleaching, Esthetic, Pink tooth.

Introduction

Esthetics is an important factor in patient's decision to undergo dental treatment.A frequent question is " will my black or broken tooth turn to normal & will I have a pleasing smile?" What most people want are teeth that make them look healthier, younger and more attractive. Trauma of the oral and maxillofacial region occurs frequently and comprises 5% of all injuries for which people seek treatment. Among all the facial injuries, dental injuries are the most common, of which crown fractures and luxations occur most frequently. Trauma to the teeth may result either in injury of the pulp with or without damage to the crown or the root. In few cases, the pulp may succumb immediately or may undergo progressive degeneration and ultimately get necrosed. Traumatic injuries to the teeth can occur at any age. Causes : young children learning to walk, child abuse, sports accident affects teenagers and young adults, automobile accidents, fights and assaults.

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smile is one of the most gratifying and appreciated service a dentist can render. Patients demand for esthetic with minimally invasive procedure, has resulted in the extensive utilization of direct composite resin restoration.

Direct composite restoration has several distinct advantages, such as :- conservation of tooth structure. reversibility of procedure. lower cost to patient. relative ease of addition or removal of material when required[3]. Closing diastema in one visit. Color, shape and tooth position can be corrected at once. Correction can be done immediately. Tooth discoloration is defined as "any change in the hue, color, or translucency of a tooth due to any cause; restorative material, pulpal necrosis or hemorrhage may be responsible."[4] . The discoloration may be due to extrinsic or intrinsic stains. This can be patient related or dentist related. Patient related causes : pulp necrosis, intrapulpal hemorrhage, age, calcific metamorphosis, developmental defects, tetracycline. Dentist related causes : pulp tissue remnants, intracanal medicaments, obturating materials, pins and posts, resin composites.

Bleaching is a treatment modality involving an oxidative chemical that alters the light absorbing or light reflecting nature of a structure, thereby increasing its perception of whiteness. Non vital bleaching has not found much favour amongst the clinicians because of the fear of resorption. But case reports have shown that adhering to the proper barrier placement methods can definitely prevent the development of the resorption. The protective barrier was placed 1 mm below the facial CEJ because it resulted in more acceptable aesthetic results, particularly in the cervical region. Several barrier materials are used eg: polycarboxylate cements, zinc phospate cements, MTA, intermediate restorative material [5] .Non vital bleaching has several advantages over other post endodontic treatment options like crowns. In contrast, non vital bleaching is a non invasive procedure and it also preserves the patient's natural tooth structure.

Conclusion

A beautiful smile seems to reflect a certain style of living, and the enhancement of facial beauty is one of the primary goals of patients seeking elective dental treatment. A well designed smile is a product of accurately diagnosed, methodical treatment planning, use of advanced materials and contemporary techniques rendered by the dentist.

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E-ISSN:2454-9894 P-ISSN: 2454-9886

International Archives of
BioMedical and Clinical Research
(An Official Publication of "Ibn Sina Academy of Medieval Medicine & Sciences")
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Section Anaesthesiology

Original Article

Assessment of Lumbar Facet Joint Nerve Blocks in Chronic Low Back Pain: A Tertiary Care Hospital Based Study

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ABSTRACT

Background: Lumbar facet joint nerve blocks may be repeated to reinstate pain relief without any deleterious effects. The basis for intra-articular injections has been the inflammation of the joint. Therefore, the main purpose of the study was to evaluate lumber facet joint nerve blocks in managing chronic low back pain.
Methods: The total population was included in this study 120.All cases were divided in non-steroid and steroid group. This study was conducted in Department of Anesthesia. The duration of study was over a period of two year.
Results: The result of this study revealed that significant alteration in pain scores from baseline, at 3, 6, 12, 18, and 24 months in both groups, in which no differences occur among Groups I and II.
Conclusions: This report reveals lumbar facet joint pain diagnosed by controlled, comparative local anesthetic blocks may be treated with lumbar facet joint nerve blocks either with or without steroid.

Keywords: Lumbar Face Joint, Bupivacaine, Steroid

Available Online: 30th September 2020

Received: 20.05.2020
Accepted: 10.06.2020

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INTRODUCTION

The rising prevalence of chronic low back pain has been reported by recent researches.[1] Freburger et al[1] also found an increasing prevalence of chronic impairing low back pain over a 14-year interval from 3.9% in 1992 to 10.2% in 2006. It is also reported that most of the episodes of low back pain will be short-lived, with 80% to 90% of these attacks resolving in about 6 weeks.[2,3] Several structures in the lumbar spine containing discs, facet joints, and sacroiliac joints have been considered the major sources of pain in the low back. Lumbar facet joints have been implicated as the source of chronic pain in 21% to 41% in a heterogeneous population with chronic low back pain.[4-13] They have used controlled comparative local anesthetic blocks with 80% pain relief and the ability to perform previously painful movements as the criterion standard. Additional, based on the responses to controlled diagnostic blocks, false-positive rates of 17% to 19% have been established with an overall false-positive rate of 30%. Rubinstein and Van Tulder[14] found that there is solid evidence for the diagnostic accuracy of lumbar facet joint blocks in assessing low back pain.

Access this article online	
Website: www.iabcr.org	Quick Response code
DOI: 10.21276/iabcr.2020.6.3.2	

How to cite this article: Verma S, Verma M, Mekewar SR, Verma J, Gehdoo RP, Patil S, Verma B. Assessment of Lumbar Facet Joint Nerve Blocks in Chronic Low Back Pain: A Tertiary Care Hospital Based Study. Int Arch BioMed Clin Res. 2020;6(3):AN1–AN4.

Source of Support: Nil, **Conflict of Interest:** None

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ORIGINAL RESEARCH PAPER

Volume - 9 | Issue - 8 | August - 2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ENDODONTIC MANAGEMENT OF MANDIBULAR FIRST PREMOLAR WITH TRIFURCATION : A CASE REPORT

Endodontic

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ABSTRACT

The internal and external anatomy of any tooth must be clearly understood by the clinician for successful endodontic treatment. The mandibular first premolar may pose as an enigma for the clinician. It is generally a single rooted tooth with single canal. However, variations may be seen which should be understood clearly for predictable out come. This case report highlights a mandibular first premolar with single root canal and three root canals. Thermoplasticized technique of obturation has been used in this case to achieve a 3 dimensional obturation..

KEYWORDS

trifurcation, E & Q Plus obturating system, root canal treatment

INTRODUCTION:

The root canal anatomy plays a significant importance in the successful outcome root canal treatment. Every tooth may be different as regards to the pulpal anatomy and configuration. As a clinician, one must be aware of the various anatomical variations and decide treatment plan accordingly. Various studies done over the years have shown that Mandibular premolars have a deviant anatomy. (1-3) Mandibular premolars may be one of the most difficult teeth in the mouth to treat due to the number of root and root canals and also the small size of the access cavity preparation and visibility.

Several reports have shown that the incidence of one root canal system in mandibular first premolar varies from 69.3% to 86% and two canals varies from 14% to 25.5%.(4-7) The occurrence of three canals has been reported by Vertucci and Zillich et al. to be 0.5% and 0.4%, respectively. (6,7)

The following case report explains the treatment of mandibular first premolar with three root canals.

Case report:

A 25 year old male reported to the Department of conservative dentistry and endodontics with dull pain in the lower left back region of the jaw since one week. The patient reported visiting another private dentist for treatment with the same tooth one month ago. Clinical examination revealed a temporary restoration in relation to #34. The tooth was sensitive to percussion and palpation. There was no mobility and the periodontal status was normal. Radiographic examination revealed a previous access opening done with the tooth.

Following the delivery of local anaesthesia (2% lidocaine and 1:100,000 epinephrine), Temporary restoration was removed and access cavity was modified. The canal orifice was widened using Gates Glidden drill no 1-3.(Mani, Japan).

The mesio – buccal and lingual canals were identified using 10 no. k file (Mani, Japan) and working length was determined using Root ZX II (J. Morita, Tokyo, Japan) electronic apex locator and confirmed radiographically. Cleaning and shaping was done using protaper files. (Maillefer Dentsply, USA) in a crown – down method to enlarge the main orifice to the level of the bifurcation to achieve a straight line access. While negotiating the lingual canal, a third disto – buccal was identified. Straight – line access to the disto – buccal was achieved and working length was determined. Complete cleaning and shaping was then completed using the protaper file system. Copious irrigation was done alternately using 5% NaOCl (Vishal Dental Products, Mumbai, India) and normal saline between each instrument. Master cone using gutta percha points (Dentsply, USA) that fit snugly was selected for each canal and tug back was also checked. Since three separate master cones could not be placed in the canal simultaneously, it was decided to obturate the canals separately. E and Q plus system (Meta Dental Corp., Cheongju, Korea) was used for obturation. the stopper was adjusted to 4 mm short of the working length. The master cone was coated with AH-Plus sealer (Dentsply, USA) and inserted into the canal. The excess gutta-percha was cut using the pen at 1800c. After down packing the three canals, the canals were back-filled with thermoplasticized gutta percha using the E & Q plus gun at 200o C and Down packing of the warm gutta-percha was done with appropriate cold pluggers to obturate the root canal three-dimensionally (3D). Finally the access cavity was sealed by composite restoration and the patient was referred to the Department of Prosthodontics for further treatment.

DISCUSSION:

To achieve endodontic success, the entire Root canal complexities must be debrided, disinfected and obturated. Iyer et all (8) reported an incidence of vertucci class V canal configuration in 2.4% of Indian population (Chennai). As a group, mandibular premolars are very difficult to treat; they have a high flare up and failure rate. The root canal system is wider buccolingually than mesio distally. (9) Mesial and distal angled views will often reveal the presence of a bi/trifurcation of the root canal. Optimum opening of the access cavity is absolutely necessary. While scouting the root canal, any obstruction or deflection of the file may indicate the presence of more canals. Thus, it is very important for the clinician to develop a sense of tactile feel and direction with appropriately precurving of the files to detect any aberration.

Despite the existence of complicated dental anatomy, shaping outcomes with nickel-titanium instruments are mostly predictable. Cautious use of rotary or hand nickel-titanium files prepares the canals to a predetermined shape. Use of sodium hypochlorite is considered as the golden standard for irrigation.

The E & Q system (Meta Dental Corp.) is one of the more recent thermoplasticized systems in the market. It takes the best of the other two commercially available and popular thermoplasticized systems, namely SYSTEM B which employs a continuous wave of obturation, and OBTURA II. (10). Thermoplasticized gutta percha technique shows better obturation as compared to single cone lateral condensation technique.

CONCLUSION:

Pre- operative radiographs are essential before initiating any treatment. Though rotary instrumentation has made the treatment protocols easier and quicker for the clinician, the importance of tactile sensation and adequate knowledge of the clinician is of utmost importance. Use of thermoplasticized gutta percha also increases the chances of a more probable outcome.

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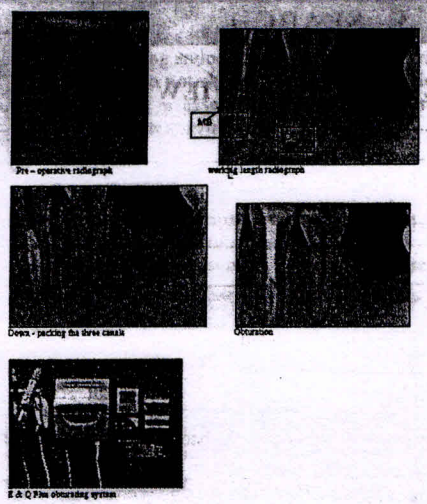
PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr



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Original Article

To evaluate the buffering capacity of various drinks commonly available in India

Vanitha U. Shenoy, Saimanaaz Shaikh, Sumanthini Margasahayam Venkatasubramanyam, Jayeeta Verma, Padma Chavan[1], Santosh Gawali[1]

Department of Conservative Dentistry and Endodontics, MGM Dental College and Hospital, Navi Mumbai, Maharashtra, India and [1]Department of Biochemistry, MGM Medical College, Navi Mumbai, Maharashtra, India

Abstract

Introduction: Consumption of carbonated and health drinks and fruit juices containing acid, as one of the ingredients, can lead to erosion of the tooth.

Aim: The purpose of this study was to measure buffering capacity of commonly available drinks and their titratable acidity.

Materials and Methods: Sixteen commonly available drinks were taken and divided into four groups (sports/energy drinks, carbonated drinks, fruit juices, and water). Each group comprised four drinks. Their initial pH was measured with pH meter and their titratable acidity was measured, both by adding 0.1M NaOH into 30 mL of each drink, in the increments of 1 mL, till the pH raised to 5.5 and 7.0, respectively.

Statistical Analysis: The volume of NaOH required to raise the pH to 5.5 and 7.0 was recorded in each group. The data were subjected to analysis of variance (ANOVA) followed by Tukey's *post hoc* test.

Results: Study groups showed significantly lower initial pH compared to the control group. Intergroup comparisons within study groups showed no significant differences with respect to their initial pH. Titratable acidity of energy drinks was found to be maximum to reach the pH 5.5 and even for pH 7. Titratable acidity was the minimum with carbonated drinks to reach pH 5.5 and with fruit juices to reach pH 7.0.

Conclusion: No significant differences were observed between the energy drinks–carbonated drinks, energy drink–fruit juices, and carbonated drink–fruit juices with respect to their initial pH. Energy drinks had the most erosive potential due to their significantly greater buffering capacity as compared to carbonated drinks and fruit juices.

Keywords: Beverages, buffering capacity, dental erosion, pH, titratable acidity

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INTRODUCTION

Dental erosion is irreversible, usually painless, loss of dental hard tissue that occurs due to a chemical process, such as dissolution or chelation, without the involvement of microorganisms[1,2] Demineralization of the tooth by erosion is caused by frequent contact between the tooth surface and acids caused by a series of extrinsic and intrinsic factors. Extrinsic factors are related to frequent consumption of acidic foodstuffs, carbonated beverages,

Received: 19-04-2020
Accepted: 01-05-2020
Published: 19-06-2020

Access this article online	
Quick Response Code:	Website: www.mgmjms.com
	DOI: 10.4103/mgmj.mgmj_29_20

How to cite this article: Shenoy VU, Shaikh S, Margasahayam Venkatasubramanyam S, Verma J, Chavan P, Gawali S. To evaluate the buffering capacity of various drinks commonly available in India. MGM J Med Sci 2020;7:56-62.

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E-ISSN:2454-9894 P-ISSN: 2454-9

International Archives of
BioMedical and Clinical Research
(An Official Publication of "Ibn Sina Academy of Medieval Medicine & Sciences")
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Section Anaesthesiology

Original Article

A Comparative Prospective Study Between Suprascapular Nerve Block and Intra Articular Steroid in Pain Management for Frozen Shoulder Patients

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ABSTRACT

Background: The main cause of shoulder pain and dysfunction in middle aged and elderly populations.2 It most commonly affects women aged between 40 and 60 years. Frozen shoulder has been shown to have an incidence of 3% to 5% in the general population and up to 20% in those with diabetes. This disorder is one of the most common musculoskeletal problems in orthopaedics.

Methods: Total 70 cases were included in this study. This study was conducted in Department of Anesthesia. The duration of study was over a period of one year.

Results: This study revealed that pain intensity on 1st, 3rd, 6th week which were 50, 25, 20, 5 & 50, 25, 20, 5 in both group. The p value <0.05 score of pain was considered significant. We also observed p value of range of motion which was also considered significant.

Conclusions: This study conclude that both IASI and SSNB interventions are effective in the management of AC, and efficacy of both is more or less similar in relieving shoulder pain, functional disability, and improving ROM in the management of AC.

Keywords: IASI and SSNB interventions, musculoskeletal problems, shoulder pain

Available Online: 30th June 2020

Received: 12.01.20
Accepted: 18.02.20

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INTRODUCTION

In the general population, adhesive capsulitis has an incidence of 3- 5 % and 20% in those with diabetes. Generally, frozen shoulder has been regarded as a condition for which "recovery is always sure and may be confidently expected".[1] Previously, several researchers have reported that most of the affected patients obtain a full range of movement of shoulder as well as complete or nearly.[2-5] complete relief of symptoms. Mostly female patients have developed adhesive capsulitis.[6-8] It can occur sequentially in 13 – 50 % of patients. Diabetes mellitus is the most common co-morbid condition with an incidence of 10 – 36%.

Frozen shoulder is a dangerous painful condition with gradual restriction of all planes of movement in the shoulder. The American Academy of Orthopedic Surgeons has defined it as a condition of uncertain etiology described by signi... restriction of both active and passive shoulder motio... arises in the absence of a known intrinsic shoulder diso... Adhesive capsulitis, periarthritis shoulder are some o... other terms which are used to define it. It is the main ... of shoulder pain and dysfunction in middle aged and el... populations.[10] It most commonly affects women ... between 40 and 60 years. Frozen shoulder has been s... to have an incidence of 3% to 5% in the general popu... and up to 20% in those with diabetes. This disorder is o... the most common musculoskeletal problems ... orthopaedics.[11] Many treatments like rest, non-steroidal ... inflammatory drugs, active and passive mobilization ...

How to cite this article: Verma S, Verma J, Mekewar SR, Verma M, Gehdoo... Patil S, Verma B. A Comparative Prospective Study Between Suprascapular N... Block and Intra Articular Steroid in Pain Management for Frozen Shoulder Pati... Int Arch BioMed Clin Res. 2020;6(2):AN1–AN3.

Source of Support: Nil, **Conflict of Interest:** None

Access this article online	
Website: www.iabcr.org	Quick Response code
DOI: 10.21276/iabcr.2020.6.2.09	

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Table 6. Distribution of cases according to Pain intensity

TOTAL SCORE	SSNB group	IASI group
Baseline	40.76	43.07
1 week	23.07	20.76
3 week	11.53	13.84
6 week	3.84	6.15

Table 7. Distribution of cases according to range of motion

FLEXION	SSNB group	IASI group
Baseline	130	140
1 week	150	150
3 week	160	160
6 week	170	170
Abduction	SSNB group	IASI group
Baseline	80	90
1 week	100	100
3 week	120	120
6 week	150	140

DISCUSSION

The present study found equal effectiveness of IASI with the ultrasound-guided local anesthetic injection around suprascapular nerve in AC in terms of pain relief, improvement in function, and passive ROM of the affected shoulder. Even at the 6th week of follow-up, the effect was prolonged and sustained. Diabetes mellitus was the most commonly associated comorbidity. In a study, Taskaynatan *et al.*[12] compared the efficacy of single IASI injection with SSNB in cases of AC of the shoulder. They found improvement in shoulder pain and ROM in both the groups at 4-week follow-up. Teja and Banshiwal[13] injected local anesthetic agent to block suprascapular nerve and compared its effect with IASI in AC of shoulder. They found significant improvement in pain, restriction of movement, and SPADI scores at 4-week follow-up. Ozkan *et al.*[14] showed that SSNB with mixture of 40 mg methylprednisolone acetate and 5 mL 1% lidocaine in patients with frozen shoulder and diabetes mellitus indifferent to IASIs provides significant reduction in pain and improvement in range of movements at 12 weeks. The findings of the present study are supported by the existing literature. For the management of AC, SSNB is a safe and effective option. It can be easily performed at outpatient basis.[15] SSNB is also preferred over other therapeutic options such as anti-inflammatory drugs and IASIs. As SSNB has lesser side effects, it is widely used in elderly population who have many comorbidities such as diabetes.[16] It is also reported that the pain relief from the regional anesthetic block extends beyond the pharmacological blocking effect. The reason could be that reduced peripheral inputs could decrease in the central sensitization of postsynaptic dorsal horn nociceptive neurons of the spinal cord.[17]

A reduction of substance P and nerve gro synovium and afferent C fibers of the glenoh the blockade may also contribute to the lc Additionally, a transient reduction in the lc could enable participants to have a better ag recommended exercises, which have a kn effect[19] Though, the relations between pain-associated disability, and pain are mul complex in nature. It requires more investiga The main limitations of the study were that could not have been blinded to the allocatec main strengths of the study were use methodology and statistics, successful imp blinding and allocation, low number of dropo follow-up.

CONCLUSION

This study concludes that both IASI and SSN are effective in the management of AC, and is more or less similar in relieving shoulder p disability, and improving ROM in the manage

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Dental Poster Journal

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Dental Poster Journal (2018), Vol 7, No.1, Jan-June Issue

1. Poster

Eggshells: An Unidentified Remedy

Vishal Karmani, Jayeeta Verma

[Year:2018] [Month:Jan-June] [Volume:7] [Number:1] [Pages No:2] [No. of Hits: 45]
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2. Poster

Neutrophil Elastase expression in oral Squamous cell carcinoma as a positive predictor of lymph node metastasis

Pooja Jaiswal, Supriya Kheur, Pratiksha Mahajan, Mamatha Reddy, Roopa Madalli ,Nitin Gupta , Archana Gupta

[Year:2018] [Month:Jan-June] [Volume:7] [Number:1] [Pages No:2] [No. of Hits: 42]
Commentary (ShowText.aspx?
ID=155&Type=FREE&TYP=TOP&IN=&IID=32&Value=1&isPDF=YES)
| Poster Image (jpg) (PosterImages.aspx?ID=155&IID=32&sno=2)

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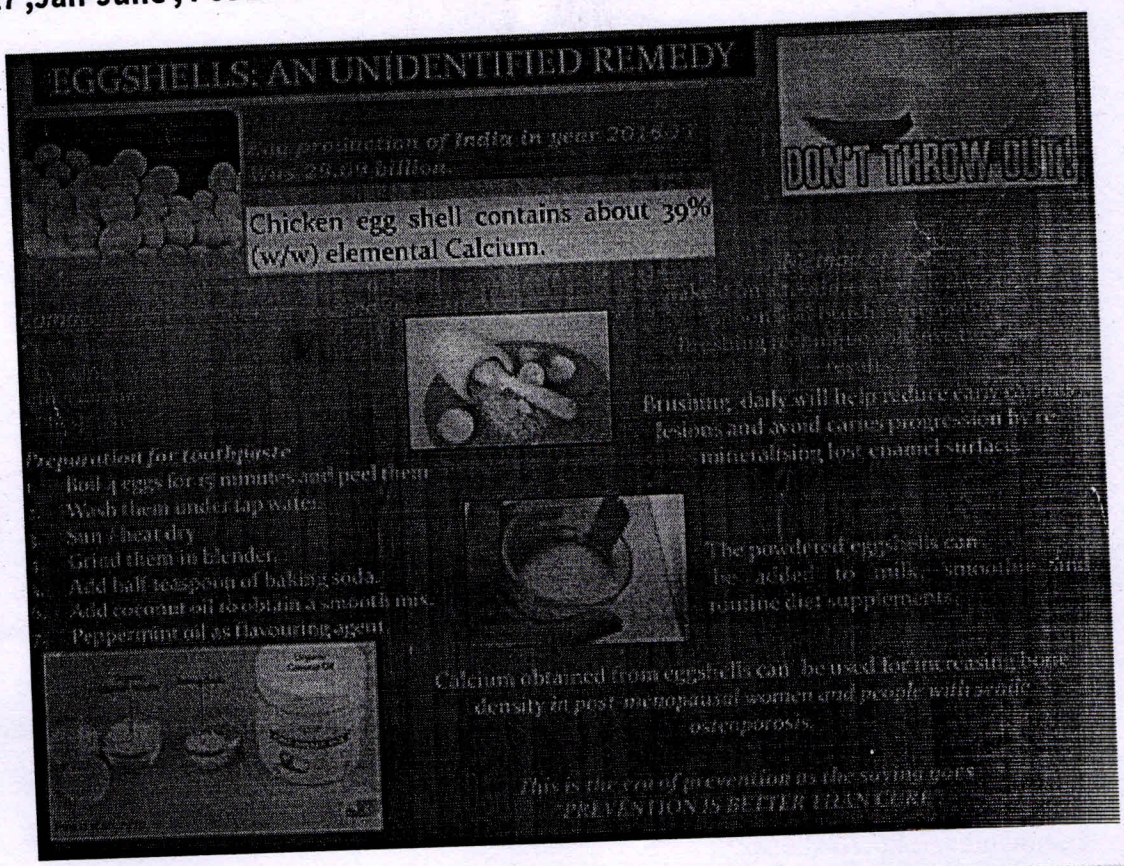
Vol7 ,Jan-June , Poster 1



Poster journal

Eggshells: An Unidentified Remedy

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Commentary

As it is said 'An ounce of prevention is worth a pound of cure', an important step in treatment of disease is to prevent it from progressing further. Dental caries is a universal disease which affects individuals of any age, gender or race. Countless efforts are made to prevent its progression likes fluoride treatments, caries vaccines, demonstration of brushing techniques and public health programs. A newer modality for the same includes the use of chicken eggshell powder (CESP) in treatment of early carious enamel lesion which are opaque white in appearance and develop due to subsurface loss of calcium. CESP is known to have 98% calcium which acts as localized source of calcium when used in oral cavity. Experiments have shown that increased pH increases re-mineralization potential of teeth[1]. There is continuous re-mineralization and demineralization occurring in caries which can be arrested at early stages without operative intervention just by increasing the mineral content around the tooth structure[2].Eggshells being the best source of calcium[3] can induce re-mineralization in the presence of phosphate and alkaline medium. The effect can also be enhanced by systemic consumption of CESP in food products like pizza, shakes and breads[4]. It effects by increasing the concentration of calcium on bone and hence prevent or treat postmenopausal osteoporosis[5]. CESP increases bone mineral density and delays bone demineralization. This poster aims at providing a simpler way of using this eggshell powder in day to day life.

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Keywords: Calcium, Chicken Egg Shell Powder, Dental Caries, Re-mineralization

How to cite this article: Vishal K , Jayeeta V. Eggshells: An Unidentified Remedy-Dent Poster J 2018; 7(1):1.

Source of support: Nil.

Conflict of interest: None declared.

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Mini Review

Volume 2 Issue 1 | Journal of Dental Treatment and Oral Care

Self-Perceived Halitosis amongst School, Junior College and Dental College Students in Navi Mumbai Region- 'a Kap Survey'

Shaili Premal Mehta[1*], Sushma Bapatla[2], Tushar Pathak[3], Jayeeta Verma[4], Vaibhav Thakkar[5] and Janaki Iyer[6]

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Citation: Shaili Premal Mehta (2017) Self-Perceived Halitosis amongst School, Junior College and Dental College Students in Navi Mumbai Region- 'a Kap Survey'. J Dent Treat Oral Care 2(1): 101

Received: October 15, 2017; **Published:** November 06, 2017

Abstract

Aim: The aim of this study is to evaluate the knowledge, attitude and practices of school, junior college and dental college students regarding self-perceived halitosis create awareness regarding halitosis in Navi Mumbai region.

Materials and methods: A structured questionnaire was given to 600 students which included , 200 students from 9th and 10th standard , 200 students from 11th and 12th standard and 200 students from 1st and 2nd year dental college. Questions were designed to relate halitosis to habits, oral hygiene, systemic disease and practices performed to mask halitosis.

Result: Out of the total, 21% reported of having halitosis, 22% were doubtful about the condition and 57% reported negative for halitosis. Out of the total 127 students who reported affirmative for halitosis, 51% were male students and 49% were female students. 75% of the students felt bad breath during morning hours, 6% in the afternoon, 8% in evening and 11% all day. In this study significant relation between oral pathologies such as dryness of mouth, bleeding gums, dental caries and halitosis was found. Around 84% students thought they should consult a dentist for halitosis. Out of the total students who suffered from halitosis, 17% suffered from systemic disease. The students showed overall poor oral hygiene habits such as not brushing twice daily, not using tongue cleaner and mouthwash. It was found that 48% students having halitosis consume chewing to mask bad breath.

Conclusion: The knowledge among the young population regarding halitosis and oral hygiene habits is inadequate. Most of the students were unaware about the different extra oral etiological factors for halitosis and end up thinking that it is because of a dental origin.

Keywords: Bleeding Gums; Caries; Habits; Halitosis; Oral Hygiene; Self-Perceived; Systemic Disease; Volatile Sulphur Compound

Abbreviation: VSCS; Volatile Sulfur Compounds: H_2S; Including Hydrogen Sulphide: CH_3Sh; Methyl Mercaptan: $(Ch_3)2s$; Dimethyl Sulphide

Introduction

Halitosis is a term derived from the Latin word "halitus" (breath) and the Greek suffix "osis" [1]. It is also called as bad breath, fetor oris, ozostomia, stomatodysodia, breath malodour. It is a symptom in which an unpleasant odor is present on the exhaling out [2]. Halitosis represents a common dental condition, although sufferers are usually not conscious of it. According to American Academy of Periodontology, Glossary of Periodontal Terms, Halitosis is defined as breath that is offensive to others, caused by a variety of reasons including but not limited to periodontal disease, bacterial coating of tongue, systemic disorders and different types of food [3].

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Dental Poster Journal

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Dental Poster Journal (2016), Vol 5, No.6, November-December Issue

1. Poster

WATERLASE- Gentle Approach to Dental Problem

Shaili Mehta, Jayeeta Verma

[Year:2016] [Month:November-December] [Volume:5] [Number:6] [Pages No:150] [No. of Hits: 679]

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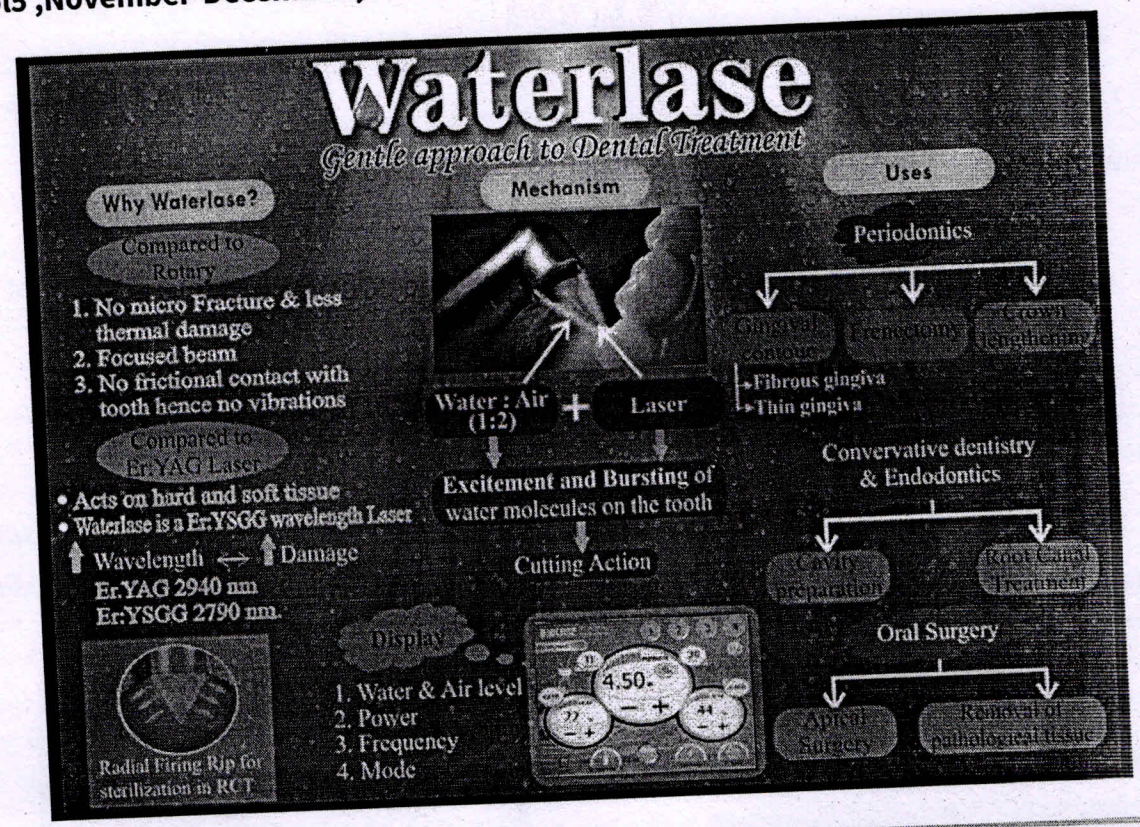
Vol5 ,November-December , Poster 1



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.TERLASE- Gentle Approach to Dental Problem

naili Mehta[1], Jayeeta Verma[2]

[1]BDS Student, MGM Dental College & Hospital, Navi Mumbai, India.

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Commentary

It is said that "It's the sound of the drill that sends chills down the spine." The main concern for a dentist is patient's anxiety and fear to drills and anesthesia. The aim of this poster is to introduce a water-based laser, Waterlase© which works on Hydrokinetic System (HSK). Waterlase© that provides an effective, virtually painless, noiseless treatment to the patients which they desire and deserve[1]. Use of laser helps to reduce heat production, vibration and eliminates risk of micro fractures compared to rotary instruments[2].It has shown less pulpal inflammation during cavity preparation as compared to rotary[9] Waterlase© is a glass fibre optic type of laser which acts without tooth contact hence reduces frictional vibration[3]. Waterlase© uses Erbium chromium dopped yttrium scandium gallium garnet (Er:YSGG) wavelength in optimum amounts of water and air[4] and excites water molecules on the target tissue. Waterlase© is a versatile product which can be used on hard as well as soft tissue[5,12] hence it is more effective than Nd:YAG, carbon dioxide laser, diode laser, argon laser because most of these laser holds good for soft tissue. Wavelength of a laser is directly proportion to the damage caused to the tooth structure. Similarly frequency is inversely proportional to the damage caused to the tooth structure. Wavelength of Erbium chromium dopped yttrium scandium gallium garnet (Er:YSGG) is less than Erbium chromium dopped yttrium aluminum garnet (Er:YAG) laser also , the frequency of Er:YSGG is more than Er:YAG laser[6] thus causing less damage to the hard tissue[7]. It can be used in endodontics for access cavity preparation and sterilization of root canal due to its radial firing tip[8]. It can be used for fibrous and thin gingival contouring[5]. It is also effective in invasive procedure like removal of pathological tissue[5] i.e cyst, granulation tissue. It also is a boon to reduce patients anxiety to the sound of the drills and the fear of anesthesia[4].This poster highlights the use of this novel instrument and its implications in dentistry providing benefits to both dentist as well as patient.

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Keywords: Er:YSGG laser, excites water molecule, radial firing tip, reduces anxiety, sterilization of canals, Waterlase©.

How to cite this article: M Shaili, V Jayeeta. WATERLASE- Gentle Approach to Dental Problem. *Dent Poster J 2016*; 5(6):1.

Source of support: Nil.
Conflict of interest: None declared.

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MALPOSITIONED LMA CONFUSED AS FOREIGN BODY IN NASAL CAVITY

SIDHARTH VERMA*, NITIKA MEHTA**, NANDITA MEHTA***, SATISH MEHTA**** AND JAYEETA VERMA*****

We present a case of confusing white foreign body in the nasal cavity detected during Endoscopic Sinus Surgery (ESS) in a 35-yr-old male which turned out to be a malposition of classic laryngeal mask airway (LMA). Although malposition of LMA is a known entity to the anesthesiologist, if ventilation is adequate, back folded LMA in nasal cavity might not be recognized by the surgeon and lead to catastrophic consequences during endoscopic sinus surgery. In principle, misfolding and malpositioning can be reduced by pre usage testing, using appropriate sizes, minimizing cuff volume, and early identification and correction of malposition.

Introduction

Laryngeal mask airway (LMA) is now the airway of choice in nasal surgeries. Due to its blind technique of insertion, LMA carries inherent risk of malposition and misfolding which may compromise patient safety. Early recognition and corrective actions are therefore imperative for risk reduction.

Case History

A 35 year old male patient presented with history of bilateral nasal obstruction, post nasal drip and headache for last 4 years. Patient had a history of previous endoscopic sinus surgery 2 yrs back but his symptoms were persistent. He was a non-smoker, non-alcoholic and his medical history included no other comorbid condition. A CT scan revealed sinusitis along with bilateral polyps. He was then scheduled for Endoscopic Sinus Surgery (ESS) for polypectomy.

On examination, he had a Mallampati class I airway, poor dentition, and no artificial teeth or dentures. He was 161 cm tall and weighed 65 kg. His heart rate was 76 bpm and regular and arterial blood pressure was 128/76 mm Hg. The lungs were clear by auscultation.

On the day of surgery, after sedation with midazolam the patient was taken to the operating room (OR), where routine monitors were attached for monitoring blood pressure (systolic, diastolic and mean), SpO_2, heart rate and ECG. An eighteen G venous cannula was inserted. Induction of anesthesia was accomplished with 2.5 mg/kg propofol and 0.8 mg/kg rocuronium. A size 4 LMA was inserted in the first attempt and showed good

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Poster 899, Language: English
Poster Award
Mouth Watering But Erosive: A comparative evaluation of pH of Indian spices
Verma, Jayeeta / Padhye, Leena / Verma, Sidharth

The way to a man's heart is through his stomach. An army marches on its feet. Many other such cliches center around one of life's necessities - eating. But for eating, teeth are mandatory. Thus it is essential to protect our teeth from the various chemical insults, which may lead to erosion.Dental erosion is irreversible loss of tooth structure due to chemical dissolution by acids, not of bacterial origin.
Critical pH of the Mouth is 5.5. Indian cuisine consists of many spices which can lowers the pH of the mouth; dissolving the protective outer layer of the teeth. This study determines pH of the Indian spices like turmeric, red chillies, hing, dhaniya powder etc. The information could be considered useful when advising patients who eat Indian curries about causes of acid erosion of their teeth.

Keywords: Spices, Dental Erosion

Poster Award: Best Poster of the Session

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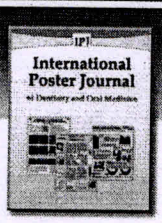

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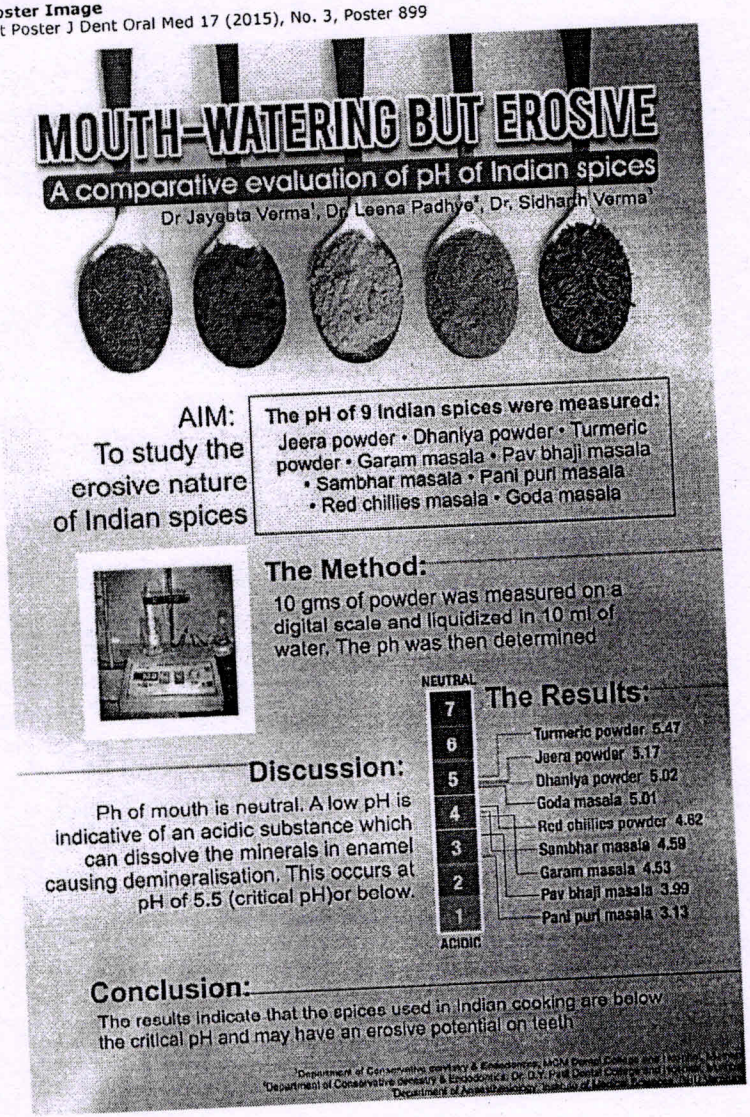

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10.5005/jp-journals-10031-1113

ORIGINAL ARTICLE

A Prefatory Assessment of Erosive Potential of Commonly used Indian Spices

[1]Jayeeta Surinder Verma, [2]Leena Padhye, [3]Lalitagauri Mandke, [4]MV Sumanthini, [5]Vanitha Shenoy

ABSTRACT

Objective: Spices are an integral part of Indian cuisine and their consumption is increasing in popularity. These mouth-watering spices can lower the pH of the mouth; dissolving the protective outer layer of the teeth. Thus, it is essential to protect our teeth from the various chemical insults which may lead to erosion. The purpose of the study was to assess the erosive, potential of these spices.

Materials and methods: The pH and the titrable acidity of commonly used Indian spices, like turmeric, red chillies, cumin and coriander powder were determined. The same test was carried out for spice mixes (masalas), like garam masala, pav-bhaji, sambhar, panipuri and goda masalas. The single powder spices were home-made while the spice mixes were ready to use available in the market. The initial pH was measured using digital pH meter and titration was carried out against 0.1M NaOH.

Results: All the spices showed an endogenous pH lower than critical pH. Among these, panipuri masala, a spice mix used in a widely relished snack in the western part of India showed the lowest pH and also required the highest quantity of 0.1M NaOH to neutralize its acidity.

Conclusion: People may be placing themselves unintentionally at risk of dental erosion due to their diet and clinicians may find this study to be helpful while counseling patients regarding their dietary habits.

Keywords: Dental erosion, Indian spices, pH, Titrable acidity.

How to cite this article: Verma JS, Padhye L, Mandke L, Sumanthini MV, Shenoy V. A Prefatory Assessment of Erosive Potential of Commonly used Indian Spices. J Contemp Dent 2015; 5(2):86-89.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

From connoisseurs to novices, Indian cuisine has captivated taste buds and received great praise through the centuries. India has been known for its spices and spice trade was carried between India and the world well before beginning of Christian era.[1] Apart from their culinary use as taste and flavor enhancers, spices are also consumed for their beneficial medicinal properties, such as tonic, carminative, stomachic, diuretic and antispasmodic. Spices have been generally believed to increase the salivary flow and gastric juice secretion, thus aiding in digestion.[2] However, these mouth-watering spices may be an etiological factor in dental erosion due to their acidic content.

Dental erosion occurs as a result of acidic attacks during simultaneous unsaturation of both hydroxyl-and fluorapatite in saliva, causing loss of dental hard tissue layer by layer. Dental erosion is defined as 'loss of dental hard tissue by a chemical process that does not involve the influence of bacteria'.[3] Research has suggested that erosion is the most common cause of noncarious tooth substance loss (TSL). Dissolution of mineralized tooth structure may have a multifactorial etiology attributable to either intrinsic or extrinsic sources as shown in Table 1.[4] Dental erosion is also seen in systemic conditions (diseases and syndromes), like cerebral palsy, salivary gland agenesis, Down's syndrome and Sjögren's syndrome.

Spices that form an important part of authentic Indian cuisine may also be an important extrinsic etiological

Table 1: Extrinsic and intrinsic etiological factors of dental erosion[5]

Extrinsic erosion causes (Caused by acidic products originating from outside the body)	*Intrinsic erosion causes* (Due to acids from stomach reaching the teeth)
1. Occupational related • Wine tasters • Swimmers • Acid fumes in industries	1. Gastric reflux • Increased gastric pressure e.g: pregnancy • Increased gastric volume e.g: after meals • Sphincter incompetence
2. Dietary habits • Acidic foods • Soft drinks • Fruit juices	2. Vomiting • Gastrointestinal disorders • Psychosomatic • Drug-induced
3. Medications • Mouthwashes • Vitamin C	3. Regurgitation
4. Life style	4. Rumination

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our results, more observational long-term tests need to be carried out *in vivo* in order to ascertain the effect of the Indian spices consumed on a daily basis by the general population on the dental structures. Also, other readily available spices need to be evaluated.

CONCLUSION

Within the limitations of the study, the results indicate that the spices used in Indian cooking have an endogenous pH below the critical pH and, thus, may have an erosive potential on teeth. Among these, panipuri masala showed the least pH and highest titrable acidity and, thus, must be consumed cautiously. This information could be considered useful while treating erosive tooth lesions and advising patients regarding their dietary habits.

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Int. J. Biotech Biosci, ISSN 2231-0304
Vol 4 (2) : 131-135 (2014)

THINK AND DRINK!! A PRELIMINARY ASSESSMENT OF SALIVARY PH BEFORE AND AFTER CONSUMPTION OF VARIOUS BEVERAGES

Jayeeta Verma, Leena Padhye and Lalitagauri Mandke
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Abstract
Consumption behavior plays an important role in regulation of oral health. Low salivary pH results in erosion and dental caries. The aim of this study was to evaluate the effect of consumption of various drinks on salivary pH in healthy volunteers of Mumbai. Saliva was measured before and after consumption of Pepsi, Nimbooz, Amul milk and Mixed fruit juice. The drop in pH was noted at intervals of 5, 15, 30 and 45 minutes. A graph was calibrated to show the fall and gradual rise of pH. Pepsi was shown to have the greatest fall of pH while Amul milk showed least. The pH returned to original values after 45 minutes of consumption of all drinks. Thus, the results of this study showed that the drinks can pose to be hazardous to the oral cavity.

Key Words: *dental erosion, extrinsic acids, beverages, salivary pH, pH paper*

INTRODUCTION

Dental erosion has been reported to be a growing health problem possibly accounted for by the monumental increase in the consumption of soft drinks, fruit juices and sport drinks in many countries, including India (Bamisea and Kolawal, 2009). Dental erosion is the chemical dissolution of the surface of dental hard tissues (enamel and dentine) by acids without the involvement of microorganisms (Ghai and Burke, 2012). Enamel is the hardest substance in the human body with hardness of 296 KHN; (Shafer's - Textbook Of Oral Pathology) however soft drink consumption even for a relatively short period of time is known to have reduced enamel microhardness (Bamise & Ogunbodede, 2007).

Research has suggested that erosion is the most common cause of non carious tooth substance loss (TSL). Dissolution of mineralized tooth structure occurs upon contact with acids that are introduced into the oral cavity from either intrinsic or extrinsic sources (Gandhara & Truelove, 1999). (Table 1).

An acidic environment ensures the safety of any product by providing conditions which do not allow the pathogenic organisms to survive. A pH of 5.5 is considered to be the 'critical pH' for enamel dissolution. The 'critical pH' is the pH at which a solution is just saturated to a particular mineral, such as tooth enamel (Dawes and Colin, 2003)

A vast amount of research has been done to carry out the effect of carbonated drinks on teeth, but very less has been done on juices and milk which also contain fermentable carbohydrates. Hence, the present study was done to evaluate the effects of four commonly consumed beverages on the salivary pH before and after consumption.

as this is when the amount of saliva is at its lowest and damage could occur.

- Try to avoid brushing your teeth immediately after an acid attack. This is when the enamel is at its softest and there are greater chances of enamel demineralisation.

In the present study, trials were carried out using commercially available; ready – to – drink products. To further confirm our results, more tests need to be carried out on various freshly prepared juices as these are considered to be a healthier alternative. Also, a larger sample size needs to be studied across various age groups.

CONCLUSION

Within the limitations of the study, results indicate that the beverages consumed are below the critical Ph; however no drink reduced salivary pH below its critical value. Pepsi produced the lowest pH while milk caused least pH changes after 15 minutes of consumption of drink and may have an erosive potential on teeth.

This information could be considered very useful when treating erosion and advising patients about their diets. However, further study needs to be done in this regard to check the quantity, frequency and method of consumption in causing erosion and the buffering capacity of saliva. Also, other age groups need to be included to ascertain overall erosive potential.

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