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Best practice 1

Title: Evidence based dentistry and use of research in clinical practice

Objectives: To provide evidence based dental practice

- ❖ To provide quality patient care based on the sound scientific literature, so as to resolve any difficulties in the clinical practice.
- ❖ To dissolve the variations in patient care and assist with successful decision making
- ❖ To bridge the gap between the research and practice
- ❖ To achieve excellence in patient care.

The Context: Evidence based practice has become the key to success in dental practice

- ❖ In the process of teaching, the faculty members advocate and practice the use of appropriate research strategies.
- ❖ The best data bases are selected and researches with the most promising outcomes are utilized to guide the undergraduate and post graduate students.

The Practice: The college encourages its staff to use the five step process in their daily clinical practice in the hospital:

- Formulating the clinical question.
- Collection of clinical data relevant to the question.
- Critical review of the data to select the sound evidence.
- Utilization of the evidence with their student's own expertise and taking into consideration - the patient's condition, available healthcare resources, and the patients preferences, before implementing the decision in order to give better output.
- Assessment of the clinical outcome, as a product of research and evidence-based decisions.

Evidence Of Success: The clinical set up is improved by the integration of evidence-based methods.

- The use of sound and supported literature improved the staff and student's confidence in their
 - skill, adaptability in the clinic,
 - provoked critical thinking and
 - better decision making resulting in better patient care.

SHORT STUDY TOPICS

- Evaluation of relationship between non syndromic third molar agenesis and different malocclusion in orthodontic patients- A retrospective study
- Comparison between fracture of resistance of as-received and sterilized orthodontic mini-implant- An invitro study

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- Comparison and correlation between antegonial angle and antegonial depth, gonial angle and ramus height among different growth patterns in orthodontic patient- A Radiographic Study
- Artificial intelligence for orthodontic malocclusion detection using clinical images- an interdisciplinary project
- Skeletal growth assessment of segmented middle phalanx using artificial intelligence- an interdisciplinary project



The short studies taken by the students have been published in the following journals:

1. Iranian Journal of Orthodontics 2022

The Effects of Pre-Procedural Mouth Rinses on Shear Bond Strength of Orthodontic Brackets: an in-Vitro Comparative Study

Document Type : Original Article

Authors

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Maqbool Sameena Begum ⁴ Riyaz Khadeer ⁴

2. AIMS Biophysics, 2022



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Review

Artificial intelligence and 3D printing technology in orthodontics: future and scope

Mahamad Irfanulla Khan^{1,*}, Laxmikanth SM¹, Tarika Gopal¹ and Praveen Kumar Neela²

3. Acta Scientific Dental Sciences (ISSN: 2581-4893) 2022



ACTA SCIENTIFIC DENTAL SCIENCES (ISSN: 2581-4893)

Volume 6 Issue 5 May 2022

Research Article

Prevalence of Black Triangles in Post Orthodontic Adult Patients - A Retrospective Study

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The publications of short studies conducted in the Oxford Dental College provide valuable insights into various aspects of dental care and treatment. These studies, often based on small samples, can still offer important findings and contribute to the existing knowledge in the field. The publications may cover a range of topics, from dental materials, Artificial intelligence, and techniques to patient satisfaction and oral health outcomes. They may also include case studies of unique or challenging dental cases, which can provide valuable guidance for other dental professionals. The dissemination of these studies through publication allows for wider access to the findings and promotes collaboration and knowledge sharing among dental professionals.

In conclusion, the publications of short studies conducted at The Oxford Dental College play an important role in adhering to the advancement in the field of dentistry and improving patient care. They provide valuable insights and guidance for dental professionals and contribute to the body of knowledge in the field.

Problem Encountered:

- Patient acceptance
- Cost
- This is overcome by educating the patients with relevant data and clinical outcome.

The department of periodontology has taken the initiative to encourage the use of regenerative therapy in the field of periodontal medicine. The use of autologous platelet rich fibrin and platelet rich plasma in the treatment of intrabony defects, the clinical effects of subgingivally delivered simvastatin and clinical efficacy of 1% alendronate gel as a local gel delivery system

Journal of Periodontology; Copyright 2015

DOI: 10.1902/jop.2015.140646

Platelet Rich Fibrin with 1% Metformin for the Treatment of Intrabony Defects in Chronic Periodontitis: A Randomized Controlled Clinical Trial

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Background: Platelet-rich fibrin (PRF) is a second-generation platelet concentrate which releases various growth factors that promote tissue regeneration. Metformin (MF), a member of biguanide group has been shown to facilitate osteoblast differentiation and thus may exhibit a favourable effect on alveolar bone. The current study was designed to evaluate the efficacy of PRF, 1% MF gel and PRF+1%MF gel, with open flap debridement (OFD), in the treatment of intrabony defects in chronic periodontitis (CP) patients.

Methods: One hundred and twenty patients with single defects were categorized into four treatment groups: OFD alone, OFD with PRF, OFD with 1% MF and OFD + PRF+1% MF. Clinical parameters like site specific plaque index (PI), modified sulcus bleeding index (mSBI), probing depth (PD), relative attachment level (RAL) and gingival marginal level (GML) were recorded at baseline, before surgery and 9 months post-



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Platelet-Rich Fibrin With 1.2% Rosuvastatin for the Treatment of Intra-bony Defects in Chronic Periodontitis: A Randomized Controlled Clinical Trial

1. Dr. A R Pradeep MDS*, 2. Dr. Vibhuti Garg BDS (MDS)*, 3. Dr. Dharmendra Kanoriya BDS (MDS)*, 4. Dr. Sandeep Singhal BDS (MDS)*

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Background: Regenerative periodontal therapy encompasses the use of various bioactive agents that are not only inflammo-modulatory but also osteoclast-inhibitory or rather, osteostimulative. The hypolipidaemic Statin group of drugs, particularly Rosuvastatin (RSV), are known to be associated with alveolar bone formation and periodontal improvements. Platelet analogues like Platelet rich fibrin (PRF), being rich sources of growth factors, have also come into widespread periodontal regenerative use. The aim of the study is to evaluate and compare the efficacy of open-flap debridement (OFD) with or without PRF or PRF + 1.2% RSV gel in the treatment of intra-bony defects (IBDs) in chronic periodontitis (CP) patients.

Methods: Ninety individuals with a total of 90 IBDs were randomly assigned to one of the 3 treatment groups: 1) OFD alone, 2) OFD + PRF and 3) OFD + PRF + 1.2% RSV gel placement. Plaque index (PI), modified sulcus bleeding index (mSBI), probing depth (PD), clinical attachment (CA) level and IBD depth were recorded at baseline and at 9 months post-operatively.

Results: Significant PI and mSBI reductions were observed in all the 3 groups. PRF placement significantly enhanced the improvements in periodontal parameters than OFD alone. Addition of 1.2% RSV gel to PRF resulted in significantly greater CA level gain and PD and IBD depth reductions over 9 months compared to the other groups.

Conclusions: 1.2% RSV with PRF results in significantly greater periodontal benefits compared to OFD alone or with PRF.

KEY WORDS:

Rosuvastatin calcium; Chronic periodontitis; Periodontal regeneration.

Chronic periodontitis (CP) comprises a group of multifactorial diseases in which periodontopathogens accumulate in dental plaque, triggering host immune-inflammatory responses against periodontal structures that determine the disease outcome, including bone resorption and ultimately tooth loss.¹

Various non-surgical and surgical therapies form the basis of periodontal treatment.² Conventional open flap debridement (OFD) falls short of regenerating tissues destroyed by the disease.³ Periodontal regenerative therapy aims to reconstitute lost structures in order to restore form and function.⁴ Intra-bony defects (IBDs) created as a result of periodontal disease progression are amenable to regeneration using various bioactive agents.⁵

Choukroun's platelet rich fibrin (PRF), a second-generation platelet concentrate,⁶ consists of a fibrin network (slow polymerizing) enmeshing cytokines, glycoproteins and glycanic chains, and is known to promote both soft and hard tissue healing.⁷ It had been found to be associated with significant clinico-radiographic improvements in various periodontal IBDs,⁸ grade II furcation defects,⁹ post-extraction and post-avulsion sites¹⁰ as well as in sinus floor augmentation.¹¹

Statins [hydroxymethylglutaryl coenzyme A (HMG-CoA) reductase inhibitor drugs], like Rosuvastatin (RSV) are an important class of bone-modulating agents, commonly used in medicine to improve lipid profile owing to their anti-inflammatory and antioxidant properties.¹² Their osteostimulative action has led to their use in periodontal regenerative



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Platelet Rich Fibrin Combined With 1.2% Atorvastatin for Treatment of Intra-bony Defects in Chronic Periodontitis: A Randomized Controlled Clinical Trial

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Background: Platelet-rich fibrin (PRF), a second-generation platelet concentrate and Atorvastatin (ATV), a potent member of statin group are known to promote tissue regeneration. Current study was designed to evaluate the combined efficacy of PRF and 1.2% ATV gel with open flap debridement (OFD) in treatment of intra-bony defects in chronic periodontitis (CP) individuals.

Methods: Ninety six individuals with single defects were categorized into three groups: OFD with PRF, OFD with PRF+1.2% ATV and OFD alone. Clinical parameters; site specific plaque index (PI), modified sulcus bleeding index (mSBI), probing depth (PD), relative attachment level (RAL) and gingival marginal level (GML) were recorded at baseline before surgery and 9 months post-operatively. Percentage radiographic intra-bony defect depth reduction was evaluated at baseline and 9 months.

Results: PRF+1.2% ATV and PRF alone showed significantly greater PD reduction and RAL gain as compared to OFD alone at 9 months. Furthermore, PRF+1.2% ATV group sites showed similar percentage radiographic defect depth reduction (50.96±4.88%) as compared to PRF alone (47.91±4.79%) and greater reduction when compared to OFD alone (5.54±1.71%) at 9 months.

Conclusion: PRF+1.2% ATV showed similar improvements in clinical parameters with greater percentage radiographic defect depth reduction as compared to PRF alone in treatment of intra-bony defects in CP individuals. Thus 1.2% ATV failed to augment the regenerative potential of PRF alone in periodontal intra-bony defects.

KEYWORDS:

Periodontal Surgery, Periodontal Regeneration, Growth factors, Clinical trials.

Chronic periodontitis (CP) occurs as a result of host-bacterial interactions in which periodontal pathogens produce harmful by-products that initiate host immune inflammatory response ultimately leading to break down of extracellular matrices and bone resorption, which creates bone defects which ultimately results in tooth loss.¹ Periodontal regeneration which forms the ultimate aim of periodontal therapy, is the reconstitution of diseased components to restore the anatomy and function of the periodontium.²

Conventional open flap debridement (OFD) is the basic periodontal surgical treatment modality which contributes much to resolution of disease process but remains insufficient in regenerating tissues destroyed by the periodontal disease, whereas current regenerative methods (Alloplast bone grafts, Root biomodification) offer a limited potential towards attaining the goal of a true, complete periodontal regeneration.³ Platelet concentrates releasing polypeptide growth factors (PGFs) with the ability to regulate cell proliferation, chemotaxis and cell differentiation, currently forms the most realistic approach to attain periodontal regeneration.^{4,5}



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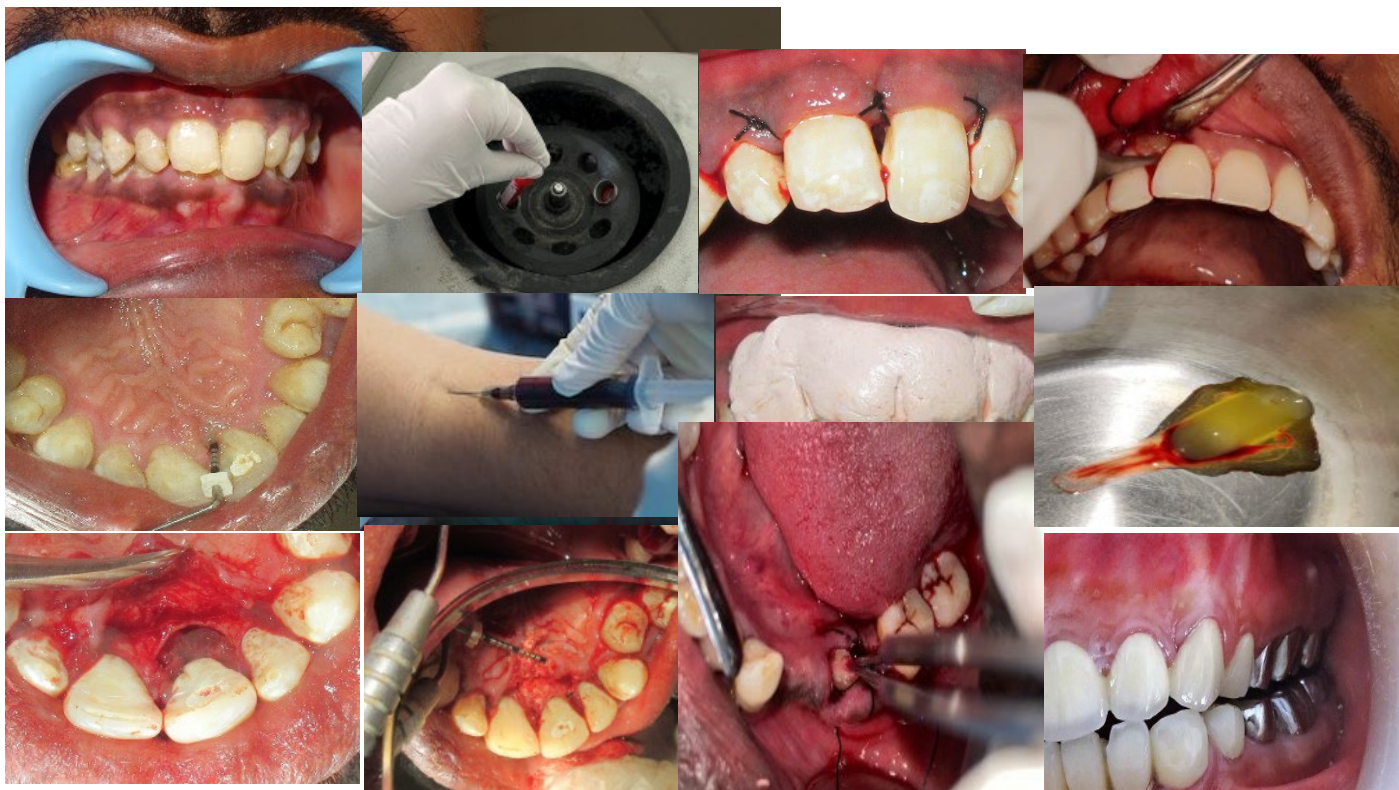
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Best practice 2

Title of the practice: Encouraging the Under Graduate and Post Graduate students to actively participate in table clinic, paper and poster presentation at national and international conferences.

Objectives: To inculcate the interest towards research among the student community

- The students must use their critical thinking and innovative skills in attempt to master their topic of interest.
- To encourage and motivate students to convert their project work into the publications, also motivate students to undertake further interest in research category.
- The presentations are to be made under specific guidelines provided by the scientific committee, which instigates discipline and a flair for scientific methodologies.
- The aim is to bring out the leadership skills and a healthy spirit of competition, which adds value to their personality.

3.The context: Encouraging students to take up research studies and promoting them to publish articles, the need for orator skills, leadership qualities and an appreciation for scientific methodology is key in any post graduate or under graduate student. Scientific presentations offer several advantages to the students, such as

- Development of critical thinking and innovation skills
- improves knowledge and understanding of the subject
- provides an opportunity to refurbish one's knowledge and stay up to date.
- a holistic development of the student's personality

4. The Practice: the teachers and students must acknowledge the importance of scientific presentations and appreciate their benefits such as team spirit, decision-making and constructive use of time, exploring newer research, self-confidence, and critical thinking in clinical scenarios.

5. Evidence of success:

The students have shown keen interest in newer topics for research presentations.

- The search for these topics has introduced them to innovations in the dental field. A critical evaluation of these methods has helped them develop a scientific approach, which can aid their clinical practice.
- The institution encourages students to present their scientific work in the form of papers, posters, table clinics, and short studies, which can bring numerous benefits. However, it's important to note that all of the work presented is evaluated by both the ethical committee and the institution's internal scientific committee to ensure its quality and content as a result of this the students can showcase their research skills, receive feedback, network with other professionals in their field, and improve their communication skills. Ultimately, this experience can help students advance their academic and professional goals.

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6. Problems encountered and resources required:

- Time management in a clinical setting proved to be challenging. To overcome this students are given an opportunity to continue the research work as alumni.
- Increase in cost of registration in scientific conferences is hindering student opportunity.

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Research Article



The Effects of Pre-Procedural Mouth Rinses on Shear Bond Strength of Orthodontic Brackets: an in-Vitro Comparative Study

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Abstract

Aim: The use of pre-procedural mouth rinse for prevention of COVID-19 can reduce viral load but can alter the bond strength. The purpose of this study was to determine any correlation between the use of these pre-procedural mouth rinse and the shear-bond strength (SBS) of orthodontic brackets.

Methods: Thirty-three maxillary premolars extracted for orthodontic purposes were used. The buccal surfaces of all teeth were bonded with orthodontic brackets. Later, each tooth was embedded into acrylic resin and stored in distilled water. Teeth were randomly divided into three groups (group I: hydrogen peroxide mouth rinse, group II: povidone-iodine mouth rinse, and group III: artificial saliva), and stored in each solution for 12 hours. Later, each tooth was subjected to SBS testing using a universal testing machine. Data were statistically evaluated using one-way analysis of variance (ANOVA) and post hoc test (Tukey's HSD) with a significance of $p < 0.05$.

Results: The highest mean SBS was observed in the artificial saliva (control group), followed by the povidone-iodine and hydrogen peroxide groups.

Conclusion: Hydrogen peroxide mouth rinses should not be used during fixed orthodontic treatment because it alters bond strength.

Keywords: Orthodontic brackets, Mouth rinse, Shear bond strength

1. Background

To obtain favorable outcomes in orthodontics, clinicians must consider bonding strengths of orthodontic brackets to enamel. Debonding of brackets during treatment, is unfavorable and delays orthodontic treatment. Several factors have been suggested, including deficient operator technique, moisture contamination, changes in enamel surface, masticatory forces, and food stimulants and soft drinks [1].

The sudden outbreak of the corona virus disease

in 2019 (COVID-19) that leads to respiratory disease due to SARS-CoV-2 infection, has led to widespread health problems and concerns [2]. The danger of the COVID-19 virus transmission through saliva is very high and the droplets from dental treatment can remain for many hours in the air, possibly leading to numerous transmissions [3]. Hence, precaution and preventive care should be considered even in asymptomatic carriers [4]. One of the suggested ways to decrease viral load in dental environment is to use adequate pre-procedural mouthwashes [5,6].

The purpose of this study was to determine the association between application of these pre-



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Research Article

Prevalence of Black Triangles in Post Orthodontic Adult Patients - A Retrospective Study

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Abstract

Introduction: Black angle (Latin: Angularis Nigra), also known as open gingival embrasures, and colloquially known as "black triangle", is the space or gap seen at the cervical embrasure, below the contact point of some teeth. The gingival black triangle does not only play a role in aesthetic concerns but also may cause plaque accumulation, further worsening periodontal disease, and phonetic problems.

Aims: The purpose of this study was to determine the prevalence of posttreatment black triangles in adult orthodontic patients and to examine the association of sex, type of malocclusion, and treatment plan with open gingival embrasures.

Material; and Methods: About 3500 patient records from three dental colleges were reviewed. A sample of 173 subjects was obtained and was used to determine the prevalence of black triangles in adult patients after orthodontic treatment. The data obtained were analysed using the chi-square test. The statistical analysis in this study was done using SPSS software.

Results: The mean age of the population included in the study was 22.61 ± 4.47 years. The prevalence of black triangles was 1.73% before orthodontic treatment in the selected study sample. The same sample showed prevalence rate of 36.42% post orthodontic treatment.

Conclusions: In an average Indian adult orthodontic population, 36.42% of patients had open gingival embrasures after treatment.

Keywords: Black Triangle; Orthodontic Treatment; Prevalence

Introduction

The interdental papilla is a part of gingiva that fills the gap between two adjacent teeth. This papilla serves as a biological barrier protecting the periodontal tissues beneath it, as well as contributing to gingival aesthetics. The loss of papilla can lead to cosmetic deformities (called "black triangle disease"), phonetic problems where space allows passage of the air or saliva, and lateral food impaction. The interdental papilla is a key to anterior esthetics, and its loss or short interdental papilla may lead to a black gingival triangle [1].

Black triangle is defined as "Any interproximal soft tissue loss due to periodontal disease, traumatic, mechanical or chemical preparation or crown lengthening procedures" [2].

Open gingival embrasures or "black triangles" are the embrasures cervical to the interproximal contact that is not filled by gingival tissues [3]. They are both unesthetic and are an area where food can get trapped, leading to worsening of gingival health and speech problems. To improve aesthetics, the equilibrium between the gingiva and the teeth should be as natural as possible. When the healthy gum tissue pulls away from the top of the teeth, it can cause a black triangle to appear between them [4].

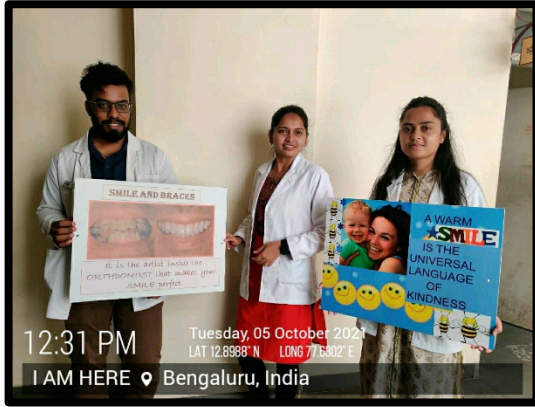
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Scientific presentation by UG students



Paper presentation by PG students



Orthodontics conference



Oral surgery conference