List of papers published in the academic year 2020-21

ARMY COLLEGE OF DENTAL SCIENCES

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List Of Papers Published By Faculty In The Academic Year 2020-21

S.no	Research Base	Publication Type	Publication Title	Author-name	Journal-name	Year
1.	WEB OF SCIENCE INDEXED	Original research	An 8-Year Retrospective Analysis of Oral Submucous Fibrosis in Patients visiting Dental College, Secunderabad	Dr.V. Prathima	Journal of Indian Association of Public Health Dentistry	2020-21
2.	WEB OF SCIENCE INDEXED	Original research	An 8-Year Retrospective Analysis of Oral Submucous Fibrosis in Patients visiting Dental College, Secunderabad	Dr. Mrunalini Koneru	Journal of Indian Association of Public Health Dentistry	2020-21
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8.	UGC	Original Research	A Cross-Sectional Study on Knowledge, Attitude, and Perception toward COVID-19 Pandemic among Dental Students of India	Mamta Kaushik	Journal of Dental Research and Review	2020-21

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15.	PUBMED	Original Research	Knowledge and perception of dental practitioners regarding the use of devitalizing agents.	Neha Mehra	Medicine and Pharmacy Reports	2020-21
16.	PUBMED	Original Research	Knowledge and perception of dental practitioners regarding the use of devitalizing agents.	Roshni Sharma	Medicine and Pharmacy Reports	2020-21
17.	PUBMED	Original Research	Knowledge and perception of dental practitioners regarding the use of devitalizing agents.	Lokam Karthik Prasad	Medicine and Pharmacy Reports	2020-21
18.	PUBMED	Original Research	Knowledge and perception of dental practitioners regarding the use of devitalizing agents.	Elkanti Soujanya	Medicine and Pharmacy Reports	2020-21
19.	UGC-CARE LIST	Original research	In Vivo Evaluation of Micronucleus Frequencies in Buccal Mucosal Cells of Orthodontic Patients with and Without Fluoride Use	Harshvardhan S Jios	Journal of Indian Orthodontic Society	2020-21
20.	UGC-CARE LIST	Original research	In Vivo Evaluation of Micronucleus Frequencies in Buccal Mucosal Cells of Orthodontic Patients with and Without Fluoride Use	Prasad Chitra	Journal of Indian Orthodontic Society	2020-21

21.	WEB OF SCIENCE INDEXED	Original research	An 8-Year Retrospective Analysis of Oral Submucous Fibrosis in Patients visiting Dental College, Secunderabad	Prathima	Journal of Indian Association of Public Health Dentistry	2020-21
22.	WEB OF SCIENCE INDEXED	Original research	An 8-Year Retrospective Analysis of Oral Submucous Fibrosis in Patients visiting Dental College, Secunderabad	Mrunalini Koneru	Journal of Indian Association of Public Health Dentistry	2020-21
23.	WEB OF SCIENCE INDEXED	Original research	An 8-Year Retrospective Analysis of Oral Submucous Fibrosis in Patients visiting Dental College, Secunderabad	Harshvardhan S Jois	Journal of Indian Association of Public Health Dentistry	2020-21
24.	WEB OF SCIENCE INDEXED	Original research	An 8-Year Retrospective Analysis of Oral Submucous Fibrosis in Patients visiting Dental College, Secunderabad	Madhusudhan Reddy	Journal of Indian Association of Public Health Dentistry	2020-21
25.	WEB OF SCIENCE INDEXED	Original research	An 8-Year Retrospective Analysis of Oral Submucous Fibrosis in Patients visiting Dental College, Secunderabad	V.V.N. Sunil	Journal of Indian Association of Public Health Dentistry	2020-21
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28.	34341246	Case report	Cold abscess of dental origin in a 7-year-old child	M Divya Banu	Journal of Indian Society of Pedodontics and Preventive Dentistry	2020-21
29.	34341246	Case report	Cold abscess of dental origin in a 7-year-old child	G Shilpa	Journal of Indian Society of Pedodontics and Preventive Dentistry	2020-21

30.	34341246	Case report	Cold abscess of dental origin in a 7-year-old child	Santosh Kumar Challa	Journal of Indian Society of Pedodontics and Preventive Dentistry	2020-21
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33.		Original research	Evaluation of the efficiency of complete dentures using BPS, Lecutonite & Acrylic Materials: An Original Research	Dr. Kiran Rathore	Annals of Romanian Society for Cell Biology	2020-21
34.	UGC	Clinical Innovation	An instrument for seating orthodontic archwires	Prasad Chitra	Journal of the Indian Orthodontic Society	2020-21
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36.	UGC	Original research	Stress distribution patterns in mini-implant and bone in the infra-zygomatic crest region at different angulations: A finite element study	Anirudh Mathur	Journal of the World Federation of Orthodontists	2020-21
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40.	UGC	Original research	Torque comparison between two passive self-ligating brackets with respect to inter-bracket wire dimensions and types: A finite element study	Shubhnita Verma	Journal of the Indian Orthodontic Society	2020-21
41.	Scopus	Case series	Airway changes in patients with sleep apnea using AdvanSync2 Class II correctors - a case series	Prasad Chitra	Medicine and Pharmacy Reports	2020-21
42.	Scopus	Review article	BALANCING ORAL HEALTH AND NUTRITION IN THE TIME OF COVID-19	Prasad Chitra	Annals of the Romanian Society for Cell Biology	2020-21
43.	PUBMED	Original research	Effects of fluoride agents on surface characteristics of NiTi wires. An ex vivo investigation	Prasad Chitra	Journal of Oral Biology and Craniofacial Research	2020-21
44.	PUBMED	Original research	Stereomicroscopic analysis of microleakage, evaluation of shear bond strength and adhesive remnants beneath orthodontic brackets under cyclic exposure to commercially consumed soft drinks	Prasad Chitra	Indian Journal of Dental Research	2020-21

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Original Article

An 8-Year Retrospective Analysis of Oral Submucous Fibrosis in Patients Visiting Dental College, Secunderabad

Vedati Prathima, Mrunalini Koneru, V. V. N. Sunil, Harshavardhan Jois[1], Madhusudhan Reddy[1]

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Abstract

Background: Oral submucous fibrosis (OSMF) is a chronic, progressive, scarring precancerous condition of the oral cavity seen predominantly in the Indian subcontinent and South East Asia. In India, the prevalence of OSMF has been increased over the past four decades from 0.03% to 6.42%. **Aim:** The study aims to provide an 8-year retrospective analysis of OSMF in patients visiting dental college, Secunderabad. **Materials and Methods:** A retrospective analysis was conducted from 2008 to 2016 in dental college, Secunderabad. Data were collected from patient's outpatient records from the department of oral medicine and radiology, year wise in the perspective of demographic details, history of nutritional deficiency, adverse habits, symptoms, clinical features, site involved, and mouth opening. There were no inclusion or exclusion criteria. All the cases which were provisionally diagnosed to be OSMF were included. The data were analyzed with SPSS package version 24. Chi-square test has been applied to check the association of different parameters such as gender, nutritional deficiency, adverse habits, area, palpable fibrous bands, and mouth opening with age. $P < 0.05$ was considered statistically significant. **Results:** The total patients were found to be 107. The mean age of the patients was 38 ± 12. Among the total patients, 86% were males and 14% were females. Among them, 3.7% were unskilled workers. Almost all of them (99%) reported no nutritional deficiency. Majority (51.4%) were having betel nut chewing habit, followed by tobacco chewing, intake of spicy food, smoking, and alcohol. Nearly 43% had limited mouth opening, followed by burning sensation and other symptoms. Palpable fibrous bands were present in 4.1% of the patients. Nearly 83.2% have been affected with OSMF in the buccal mucosa site. Grade 1 (>20 mm) mouth opening was present in 12.1% of the patients, 7.5% were having Grade 2 (11–19 mm), and 3.7% had Grade 3 (<10 mm) mouth opening. A significant association was found between age and adverse habits ($P = 0.023$). There was no significant association between age and sex ($P = 0.924$), nutritional deficiency ($P = 0.766$), area ($P = 0.567$), palpable fibrous bands ($P = 0.221$), and mouth opening ($P = 0.155$). **Conclusion:** Majority of the patients with OSMF were males who were < 30 years, having betel nut chewing habit and Grade 1 mouth opening.

Keywords: Betel nut, oral submucous fibrosis, premalignant condition, retrospective statistical analysis

Introduction

India is considered "an epitome of the world" due to its vast population comprising diverse creeds, customs, and colors. Oral cancer in India is a major health problem. Studies which have been done worldwide on oral cancer have shown the annual incidence of 3,000,000 cases. General predisposing factors for oral carcinoma include alcohol, tobacco use and smokeless tobacco, betel nut chewing, and human papillomavirus. Poor dental care and poor diet may also contribute to oral cancer.[1] Premalignant condition like oral submucous fibrosis (OSMF) which is commonly seen in India plays an important contribution in transformation to malignant conditions. OSMF is a chronic, progressive, scarring precancerous condition of the oral cavity seen predominantly in the Indian subcontinent and South East Asia.[2] In India, the prevalence of OSMF has been increased over the past four decades from 0.03% to 6.42%.[3,4] Studies on OSMF report an estimate of 5 million OSMF patients in India.[5] OSMF is seen commonly in males between the ages of 20 and 40 years. The common sites involved are buccal mucosa, labial mucosa, retromolar

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REVIEW

PACS a User Interface in Oral Pathology

Vadde Venkata Naga Sunil, Madhusudan Reddy, Harshavardhan S Jois, Mrunalini K.

Abstract

Introduction: Diagnosis and histopathological evaluation in oral pathology has evolved over the years considerably and picture archiving and communication system (PACS) is one such comprehensive computer system that is responsible for revolutionizing the digital storage and distribution of high resolution medical images for diagnosing various pathologies using the the digital pathology interface.

Objectives: Current COVID-19 pandemic situation has a significant impact on routine pathology services. Digital pathology can play a key role in safeguarding the clinical services and pathology based research in both current and future. Current review highlights the importance of Picture archiving and communication systems (PACS), its uses, impacts, advantages and disadvantages for the end users, i.e, oral pathologists.

Materials and Methods: Literature review of several peer reviewed articles with the key word "PACS" were searched from the archives of indexed journals.

Result & Conclusion: It was found that integrating PACS to oral pathology practice is pertinent and is necessary in the present global digitalization era.

Keywords: PACS (picture archiving and communication systems), interoperability, telepathology (TP), DICOM (Digital Imaging and Communications in Medicine), digital pathology (DP)

Oral and Maxillofacial Pathology Journal (2021): ***https://www.ompj.org/archives.***

Introduction:

A picture archiving and communication system (PACS) is a comprehensive computer system that is responsible for the electronic storage and distribution of medical images in the medical enterprise.[25,1] Oral Pathology focuses mainly on the identification of structural anomalies, through the naked eye or a microscope, and on the detection of possible relationships with functional disorders of tissues, therefore, identifying diseases.[28,2] The aim of pathology has remained unchanged over time; focused on the analysis and comparison of tissue specimens on specific glass slides. For this, the use of optical microscopes has been fundamental since it was the only available instrumentation for centuries.[3] Despite using very methodical analysis workflows, the same professional can draw different conclusions about the same specimen at different times. Moreover, asking for second opinions is common practice.[4] Consequently, there is a requirement for glass slides and specimen storage, a very expensive process, requiring accessibility, cleaning, and protection, which entails greater care by specialized staff.[33,30] In contrast, digital storage and Use of Open Communication Platforms like PACS for diagnosing various pathologies make a user interface digital pathology a fundamental tool in our daily work by allowing us access to very varied samples, in a very short time and from very distant places.[33,18,5]

Uses of Pacs:

1. Information on the conventional glass slide is replaced by digital soft copy.[6]

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2. Remote access: It expands on the possibilities of conventional systems by providing capabilities of off-site viewing and reporting (distance education, telediagnosis).[7]

3. It enables practitioners in different physical locations to access the same information simultaneously by telepathology.[32,2]

4. Electronic image integration platform: PACS provides the electronic platform for pathology images interfacing with other medical automation systems such as Hospital Information System (HIS), Electronic Medical Record (EMR), Practice Management Software, and Radiology Information System (RIS).[25,8]

5. Pathology Workflow Management: PACS is used by pathology laboratory personnel to manage the workflow of

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A cross-sectional study on knowledge, attitude, and perception toward COVID-19 pandemic among dental students of India

Ichita Joshi[1], Mamta Kaushik[1], Akansha Rajawat[1], Harshvardhan S Jois[2], Neha Mehra[1]

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India

Context: The rapid spread of COVID-19 globally continues to be a threat for healthcare professionals. Dental students and practitioners remain at the risk of having this disease. **Aim:** The aim of this survey was to assess the knowledge, attitude, and perception of dental students across India toward COVID-19. **Settings and Design:** A survey with 51 questions to obtain knowledge, attitude, and perception of dental students toward COVID-19 was formulated, pretested via a pilot study and then validated. **Subjects and Methods:** The final questionnaire was circulated through a link to Google forms, making participation voluntary. **Statistical Analysis Used:** Statistical analysis was carried out using one-way analysis of variance (ANOVA) test and independent *t*-test. **Results:** A total of 610 undergraduate dental students (3rd year, 4th year and students undergoing internship) from various dental colleges across the country responded. On intergroup comparison using One-way ANOVA test, between knowledge, attitude, and perception of dental undergraduate students, attitude toward COVID-19 was found be of statistical significance with $P = 0.008$. **Conclusion:** Knowledge, awareness, and perception toward COVID-19 will help contain the spread of this infectious disease that can be caused during dental procedures. There lies a strong call to conduct educational programs on COVID-19 regarding the infection control practices for all healthcare professions, especially dental school students.

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Relationship between the Depth of Penetration and Fracture Resistance of Various Sealers: A Comparative Study

Abhijeet K Kakani[1], Chandrasekhar Veeramachaneni[2], Muralidhar Tummala[3], Chandrakanth Majeti[4], Ravichandra Ravi[5], Wasifoddin A Chaudhari[6]

Abstract

Aim: The aim of this *in vitro* study was to estimate the penetration depth and fracture resistance of three different sealers and to verify the relationship between the penetration depth and fracture resistance.

Materials and methods: Sixty single-rooted teeth were selected and root canal preparation was done. After the instrumentation, the teeth were divided into three groups of 20 each. The groups were then obturated with gutta-percha (GP)-AH Plus sealer, Resilon-Real Seal, and propoint-bioceramic sealers, respectively. Ten teeth from each group were sectioned at three different regions (i.e., coronal, middle, and apical thirds of the root canal) and were viewed under a confocal microscope to determine the penetration depth of the sealer. The remaining samples were subjected to fracture resistance under a universal testing machine and the statistical analysis was done by using one-way ANOVA and *post hoc* Bonferroni tests.

Results: Propoint-bioceramic group showed the highest fracture resistance values followed by GP-AH Plus sealer and Resilon-Real seal groups with no significant difference noticed between them. Depth of penetration was greater for GP-AH Plus sealer, propoint-bioceramic, with no significant difference followed by the Resilon-Real seal group.

Conclusion: The newer obturating material propoint-bioceramic group showed a greater fracture resistance. No correlation could be established between the depth of sealer penetration and fracture resistance.

Clinical significance: Fracture resistance of tooth obturated with propoint-bioceramic sealer combination is significantly greater than GP-AH Plus and Resilon-Real seal combination, thereby showing propoint-bioceramic as a promising obturating material.

Keywords: Bioceramic sealers, Confocal laser scanning microscopy, Fracture resistance, Penetration depth, Universal testing machine.

The Journal of Contemporary Dental Practice (2021): 10.5005/jp-journals-10024-3038

Introduction

Microbes and their byproducts are the main culprits implicated in the pulpal and associated periapicalproblems.[1] The main aim of the endodontic treatment is to debri de the root canal system devoid of microorganisms. The anatomical complexity of the root canals (lateral canals and tubules) highlights the existence of microorganisms in root canals that offer protection to microorganisms from the antibacterial actions of various disinfectants. Therefore, complete debridement of the root canal system is a key step in managing the infected root canals and providing a fluid-tight seal using a biocompatible obturating material.[2]

The complete three-dimensional (3D) obturation provides a hermetic seal to the root canal system closing all the possible avenues of leakage from the oral c avity and periradicular tissues.[3,4]

A combination of core material and sealer is the most common procedure used for obturation. The advantage of using a sealer is well known; it creates a union between the core material and the canal wall by sealing off any residual spaces; it can penetrate the accessory and lateral canals, and the dentinal tubules.[5,6] Because of the well-known p otential of the bacteria to colonize dentinal tubules the deeper penetration of a sealer is advantageous to show their antibacterial effects and to cause the viable bacterial entombment, thereby depriving them of potential nutrient sources.[4–8]

One of the potential complications after endodontic therapy is root fracture. The factors responsible for postendodontic root fracture include loss of the tooth structure, stresses induced by cavity preparation, instrumentation, obturation, irrigation, coronal restoration, and inappropriate selection of tooth abutments for prosthesis.[9]

The depth of penetration of sealers mainly depends on the variations in physical and chemical properties.[10] Therefore, a

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DENTAL MEDICINE

Knowledge and perception of dental practitioners regarding the use of devitalizing agents

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Abstract

Background. Pulpal pain is amongst the most severe pains experienced by humans. Various chemical agents are used routinely to devitalize the severely inflamed pulpal tissue. Most of these agents are harmful and have detrimental effects. This questionnaire-based study evaluated the awareness and perception of dental practitioners regarding the use of devitalizing agents during endodontic procedures, and various alternatives to minimize the use of these agents.

Methods. An open questionnaire was distributed to a total of 250 dental practitioners. It carried detailed information about the most common devitalizing agent used, the purpose of use, method, and duration of application, recommendations, complications encountered, awareness of complications, and various alternatives. The collected data were subjected to statistical analysis using SPSS (Statistical Package for Social Sciences) version 17.0 (IBM Statistics, Chicago, Illinois, USA). Descriptive statistics were drawn with respective percentages to have a comparative overview.

Results. 209 responses to 250 questionnaires circulated gave a response rate of 83.6%. Amongst them, 63.15% of dentists were using devitalizing agents. The most widely and frequently used devitalizing agent was Devitec (PD Swiss, Vevey, Switzerland) (36.3%), followed by Caustinerf forte (Septodont, Saint-Maur-des-Fosses, France) (29.5%). A total of 32.9% dentists were aware of the recommendations, and 66.02% were aware of the complications of devitalizing agents; 16.26% of dental practitioners encountered complications due to the use of devitalizing agents. The dentists listed the alternate methods regarding the use of pulp devitalizing agents.

Conclusion. Although most of the dentists were aware of the harmful effects and few encountered complications with the use of devitalizers, they continued to use these agents because of the lack of an effective alternative.

Keywords: formocresol, surveys and questionnaires, pulpitis, pain

Introduction

Pain is an unpleasant multi-factorial, multidimensional experience that causes physical and emotional discomfort [1]. It is the most common reason for which a patient seeks dental treatment. Therefore, pain control holds the highest priority in the dental profession. A study by Lipton et al. showed that toothache has the highest prevalence among orofacial pains [2].

Pulpal pain is amongst the most severe pains experienced by humans. It occurs due to the activation of nociceptive fibers in response to inflammatory changes caused by various etiological factors like caries, trauma, tooth wear, and iatrogenic factors [3]. Endodontic therapy aims to control pain, treat pulpal and periradicular disease.

Most dental procedures are performed under local anesthesia to achieve adequate pain control [4]. Profound anesthesia is attainable in asymptomatic teeth. However, teeth exhibiting symptomatic irreversible pulpitis and undergoing root canal therapy (RCT) are challenging to anesthetize as there is a high rate of failure in achieving pulpal anesthesia. Rate of anesthetic failure ranges from 17% (mandibular second molar) to 58% (mandibular central incisor) [5].

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ORIGINAL ARTICLE
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A cross-sectional study on knowledge, attitude, and perception toward COVID-19 pandemic among dental students of India

Ichita Joshi[1], Mamta Kaushik[1], Akansha Rajawat[1], Harshvardhan S Jois[2], Neha Mehra[1]
[1] Department of Conservative Dentistry and Endodontics, Army College of Dental Sciences, Secunderabad, Telangana, India
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India

Context: The rapid spread of COVID-19 globally continues to be a threat for healthcare professionals. Dental students and practitioners remain at the risk of having this disease. **Aim:** The aim of this survey was to assess the knowledge, attitude, and perception of dental students across India toward COVID-19. **Settings and Design:** A survey with 51 questions to obtain knowledge, attitude, and perception of dental students toward COVID-19 was formulated, pretested via a pilot study and then validated. **Subjects and Methods:** The final questionnaire was circulated through a link to Google forms, making participation voluntary. **Statistical Analysis Used:** Statistical analysis was carried out using one-way analysis of variance (ANOVA) test and independent *t*-test. **Results:** A total of 610 undergraduate dental students (3^{rd} year, 4^{th} year and students undergoing internship) from various dental colleges across the country responded. On intergroup comparison using One-way ANOVA test, between knowledge, attitude, and perception of dental undergraduate students, attitude toward COVID-19 was found be of statistical significance with $P = 0.008$. **Conclusion:** Knowledge, awareness, and perception toward COVID-19 will help contain the spread of this infectious disease that can be caused during dental procedures. There lies a strong call to conduct educational programs on COVID-19 regarding the infection control practices for all healthcare professions, especially dental school students.

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Original Research Article

In Vivo Evaluation of Micronucleus Frequencies in Buccal Mucosal Cells of Orthodontic Patients with and Without Fluoride Use

Journal of Indian Orthodontic Society
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Prasad Chitra[1], GS Prashantha[2], Arun Rao[3] and Harshvardhan S Jois[4]

Abstract

Introduction: Fluoride agents to prevent white spot lesions are used often during orthodontic treatment. The beneficial effects of fluoride, when consumed within permissible limits on dental structures, are well known. Their implications on underlying biological tissues, however, are unknown. Mouthwashes and dentifrices with fluorides are associated with metal ion release into the mouth with possible cell genotoxicity. Since these cariostatic agents are frequently used during orthodontic therapy, a deeper understanding of the effects of fluoride on oral tissues was considered necessary.

Methodology: Three groups of patients (30 each)—group 1 (untreated controls), group 2 (non-fluoridated), and group 3 (Fluoridated) were analyzed. Patients in groups 2 and 3 were bonded with the same bracket prescription and treated with similar archwire sequences. Buccal mucosal cells at 4 specific time periods (before treatment, 1 week, 30 days, and 6 months) were collected, using a wooden tongue depressor, and assessed for any nuclear abnormalities. Comparisons of changes were made with an untreated control group and also between the non-fluoridated and fluoridated groups. Relevant conclusions were drawn after analysis of the results.

Results: Greater number of nuclei were observed at the 30-day time interval in the fluoridated group, which was statistically significant at $P < .001$.

Conclusion: Use of fluoridated oral hygiene products in patients undergoing fixed orthodontic treatment with NiTi archwires could increase the risk of micronuclei formation in buccal mucosal cells.

Keywords

Fluoride, white spots, micronuclei, nickel, chromium, buccal mucosal cells

Introduction

According to a consensus report by International Agency for Research on Cancer (IARC) in 1992, the definition of genotoxicity is broad and includes both direct and indirect DNA effects: (a) induction of molecular-related mutations (gene, chromosomal); (b) indirect surrogate mutagenesis-related events (eg, sister chromatid exchange); or (c) DNA damage, leading to mutations.

Genotoxic factors cause disruption to the genetic material in cells in the form of single- and double-strand breaks, cross-linking, structural and numerical chromosomal aberrations, etc.1 To assess genotoxicity, micronuclei are used to assess and bio-monitor carcinogen genotoxicity poisoning due to heavy metals, toxins, etc.2 The benefit of the micronucleus test is due to simple and effective analysis of chromosome mutations in cytological samples relative to the determination of chromosome aberrations and sister chromatid exchanges.3

Fluoride levels, if within limits in water, have beneficial effects on teeth and reduce dental caries, while prolonged fluoride toxicity above this limit induces both skeletal and dental fluorosis and organotoxicity.4-6

In order to avoid white spot lesions (WSL), orthodontists usually recommend fluoridated toothpastes and mouthwashes

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Original Article

An 8-Year Retrospective Analysis of Oral Submucous Fibrosis in Patients Visiting Dental College, Secunderabad

Vedati Prathima, Mrunalini Koneru, V. V. N. Sunil, Harshavardhan Jois[1], Madhusudhan Reddy[1]

Departments of Public Health Dentistry and [1]Oral Pathology, Army College of Dental Sciences, Secunderabad, Telangana, India

Abstract

Background: Oral submucous fibrosis (OSMF) is a chronic, progressive, scarring precancerous condition of the oral cavity seen predominantly in the Indian subcontinent and South East Asia. In India, the prevalence of OSMF has been increased over the past four decades from 0.03% to 6.42%. **Aim:** The study aims to provide an 8-year retrospective analysis of OSMF in patients visiting dental college, Secunderabad. **Materials and Methods:** A retrospective analysis was conducted from 2008 to 2016 in dental college, Secunderabad. Data were collected from patient's outpatient records from the department of oral medicine and radiology, year wise in the perspective of demographic details, history of nutritional deficiency, adverse habits, symptoms, clinical features, site involved, and mouth opening. There were no inclusion or exclusion criteria. All the cases which were provisionally diagnosed to be OSMF were included. The data were analyzed with SPSS package version 24. Chi-square test has been applied to check the association of different parameters such as gender, nutritional deficiency, adverse habits, area, palpable fibrous bands, and mouth opening with age. $P < 0.05$ was considered statistically significant. **Results:** The total patients were found to be 107. The mean age of the patients was 38 ± 12. Among the total patients, 86% were males and 14% were females. Among them, 3.7% were unskilled workers. Almost all of them (99%) reported no nutritional deficiency. Majority (51.4%) were having betel nut chewing habit, followed by tobacco chewing, intake of spicy food, smoking, and alcohol. Nearly 43% had limited mouth opening, followed by burning sensation and other symptoms. Palpable fibrous bands were present in 4.1% of the patients. Nearly 83.2% have been affected with OSMF in the buccal mucosa site. Grade 1 (>20 mm) mouth opening was present in 12.1% of the patients, 7.5% were having Grade 2 (11–19 mm), and 3.7% had Grade 3 (<10 mm) mouth opening. A significant association was found between age and adverse habits ($P = 0.023$). There was no significant association between age and sex ($P = 0.924$), nutritional deficiency ($P = 0.766$), area ($P = 0.567$), palpable fibrous bands ($P = 0.221$), and mouth opening ($P = 0.155$). **Conclusion:** Majority of the patients with OSMF were males who were < 30 years, having betel nut chewing habit and Grade 1 mouth opening.

Keywords: Betel nut, oral submucous fibrosis, premalignant condition, retrospective statistical analysis

Introduction

India is considered "an epitome of the world" due to its vast population comprising diverse creeds, customs, and colors. Oral cancer in India is a major health problem. Studies which have been done worldwide on oral cancer have shown the annual incidence of 3,000,000 cases. General predisposing factors for oral carcinoma include alcohol, tobacco use and smokeless tobacco, betel nut chewing, and human papillomavirus. Poor dental care and poor diet may also contribute to oral cancer.[1] Premalignant condition like oral submucous fibrosis (OSMF) which is commonly seen in India plays an important contribution in transformation to malignant conditions. OSMF is a chronic, progressive, scarring precancerous condition of the oral cavity seen predominantly in the Indian subcontinent and South East Asia.[2] In India, the prevalence of OSMF has been increased over the past four decades from 0.03% to 6.42%.[3,4] Studies on OSMF report an estimate of 5 million OSMF patients in India.[5] OSMF is seen commonly in males between the ages of 20 and 40 years. The common sites involved are buccal mucosa, labial mucosa, retromolar

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REVIEW

PACS a User Interface in Oral Pathology

Vadde Venkata Naga Sunil, Madhusudan Reddy, Harshavardhan S Jois, Mrunalini K.

Abstract

Introduction: Diagnosis and histopathological evaluation in oral pathology has evolved over the years considerably and picture archiving and communication system (PACS) is one such comprehensive computer system that is responsible for revolutionizing the digital storage and distribution of high resolution medical images for diagnosing various pathologies using the the digital pathology interface.

Objectives: Current COVID-19 pandemic situation has a significant impact on routine pathology services. Digital pathology can play a key role in safeguarding the clinical services and pathology based research in both current and future. Current review highlights the importance of Picture archiving and communication systems (PACS), its uses, impacts, advantages and disadvantages for the end users, i.e, oral pathologists.

Materials and Methods: Literature review of several peer reviewed articles with the key word "PACS" were searched from the archives of indexed journals.

Result & Conclusion: It was found that integrating PACS to oral pathology practice is pertinent and is necessary in the present global digitalization era.

Keywords: PACS (picture archiving and communication systems), interoperability, telepathology (TP), DICOM (Digital Imaging and Communications in Medicine), digital pathology (DP)

Oral and Maxillofacial Pathology Journal (2021): ***https://www.ompj.org/archives.***

Introduction:

A picture archiving and communication system (PACS) is a comprehensive computer system that is responsible for the electronic storage and distribution of medical images in the medical enterprise.[25,1] Oral Pathology focuses mainly on the identification of structural anomalies, through the naked eye or a microscope, and on the detection of possible relationships with functional disorders of tissues, therefore, identifying diseases.[28,2] The aim of pathology has remained unchanged over time; focused on the analysis and comparison of tissue specimens on specific glass slides. For this, the use of optical microscopes has been fundamental since it was the only available instrumentation for centuries.[3] Despite using very methodical analysis workflows, the same professional can draw different conclusions about the same specimen at different times. Moreover, asking for second opinions is common practice.[4] Consequently, there is a requirement for glass slides and specimen storage, a very expensive process, requiring accessibility, cleaning, and protection, which entails greater care by specialized staff.[33,30] In contrast, digital storage and Use of Open Communication Platforms like PACS for diagnosing various pathologies make a user interface digital pathology a fundamental tool in our daily work by allowing us access to very varied samples, in a very short time and from very distant places.[33,18,5]

Uses of Pacs:

1. Information on the conventional glass slide is replaced by digital soft copy.[6]

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2. Remote access: It expands on the possibilities of conventional systems by providing capabilities of off-site viewing and reporting (distance education, telediagnosis).[7]

3. It enables practitioners in different physical locations to access the same information simultaneously by telepathology.[32,2]

4. Electronic image integration platform: PACS provides the electronic platform for pathology images interfacing with other medical automation systems such as Hospital Information System (HIS), Electronic Medical Record (EMR), Practice Management Software, and Radiology Information System (RIS).[25,8]

5. Pathology Workflow Management: PACS is used by pathology laboratory personnel to manage the workflow of

General Information

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In Vivo Evaluation of Micronucleus Frequencies in Buccal Mucosal Cells of Orthodontic Patients with and Without Fluoride Use

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Methodology: Three groups of patients (30 each)—group 1 (untreated controls), group 2 (non-fluoridated), and group 3 (Fluoridated) were analyzed. Patients in groups 2 and 3 were bonded with the same bracket prescription and treated with similar archwire sequences. Buccal mucosal cells at 4 specific time periods (before treatment, 1 week, 30 days, and 6 months) were collected, using a wooden tongue depressor, and assessed for any nuclear abnormalities. Comparisons of changes were made with an untreated control group and also between the non-fluoridated and fluoridated groups. Relevant conclusions were drawn after analysis of the results.

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Original Article

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Vedati Prathima, Mrunalini Koneru, V. V. N. Sunil, Harshavardhan Jois[1], Madhusudhan Reddy[1]

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2. Remote access: It expands on the possibilities of conventional systems by providing capabilities of off-site viewing and reporting (distance education, telediagnosis).[7]

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Cold abscess of dental origin in a 7-year-old child

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Abstract

Abscess related to an infected tooth is mostly associated with pyogenic infection, but sometimes, it can be asymptomatic and indicate a chronic condition. This case report shows cold abscess with a draining sinus due to dental origin. A 7-year-old female patient complained of pain with respect to grossly decayed tooth and recurrent swelling with no response to medications. After investigations and management of the lesion, it was concluded as abscess due to chronic granulomatous infection. Cold abscess is a classical manifestation of tuberculosis with no signs of inflammation. More than 60% of cases of this pathology occur in patients below 15 years old. It needs various clinical, histopathological, and laboratory investigations. Although rare, it should be considered as a differential

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Knowledge and Attitude of Prosthodontic Post Graduates on COVID 19: A Qualitative Research

Dr Vineet Sharma[1], Dr.Madhuri Rao[2], Dr Preeti Budhwar[3], Dr.KiranKunwar Rathore[4], Dr Amrita Sandhu[5], Dr Kripal Rai[6], Dr.Heena Tiwari[7].
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ABSTRACT-

Background: The disease caused by novel corona virus (COVID-19) is a pandemic. The World Health Organization officially declared COVID-19 as a pandemic on March 11, 2020. The source of the disease is unknown but its routes of transmission are person to person via hands, saliva, nasal droplets and surface contacts. Dental professionals are particularly at risk due to the nature of their clinical work. The prosthodontic dentists have to deal with geriatric patients who are at risk.

Materials and Methods: The risk factors are aged people with additional medical co-morbidities like hypertension, diabetes mellitus, asthma, chronic obstructive pulmonary disease, and other cardiovascular conditions are more prone to develop a severe form of the disease. Majority of these risk factors are seen in old patients who form a major part of prosthodontic practise. Hence a survey was carried out to know the knowledge of the prosthodontic post-graduate students on COVID-19.

Results:A total of 60 participants. 80% has adequate training in COVID 19. 61.6% were confident managing patients with required precautions during COVID 19 pandemic. 63.6% aware of the authority to contact if you come across a suspected COVID 19 patient. 96.6% agreed that the pandemic has affected your academic activities

Conclusion:A better understanding of aerosol transmission and its implication in dentistry can help us identify and rectify negligence in daily dental practice. In addition to the standard precautions, implementation of special precautions could preventdisease transmission from asymptomatic carriers. These special precautions would not only help control the spread of COVID-19 but also serve as a guide for managing other respiratory diseases.

Keywords –Prosthodontic, coronavirus, social distancing, hand hygiene, disinfection

INTRODUCTION -

The novel coronavirus disease 2019 (COVID-19) caused by SARS-CoV-2 was first identified in Wuhan. The World Health Organization officially declared COVID-19 as a pandemic on

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Evaluation of efficiency of complete dentures using BPS, Lecutonite& Acrylic Materials: An Original Research

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ABSTRACT

Introduction: Type of materials used in fabrication of denture base has an effect on dimension during denture base material processing and other factors related to clinical use. The study aims were to assess the efficiency of complete dentures made using bps, lecutonite& acrylic materials

Material and Methods: Ninety patients were selected to construct complete dentures with bps, lecutonite& acrylic materials denture base materials. They were randomly divided into three groups: group 1, patients with bps; group 2, patients with heat curing acrylic resin fabricated by injection moulding technique and conventional methods; and group 3, patients with lecutonite. The dimensional changes were assessed using digital caliper.

Results: After the twelfth month, injection moulding acrylic resin had significantly the highest dimensional change followed by the lecutonite. There were no significant differences in the dimensions between the three types of denture base materials at normal mouth temperature, while, after hot tea drinking at 45° C, the dimensional change was significantly the highest in cobalt chrome metallic denture base group.

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An Instrument for Seating Orthodontic Archwires

Journal of Indian Orthodontic Society
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Prasad Chitra[1]

Abstract

Full engagement of orthodontic archwires to permit gate closure in self-ligating brackets can be challenging in both the initial stages of alignment with crowded or rotated teeth and also during the later treatment stages with use of heavy rectangular wires.

A handy, reliable tool has been developed to ensure complete seating of any archwire in slots of both conventional and self-ligating bracket (SLB) systems to overcome this problem.

Keywords

Archwire, bracket, slot, archwire seater

Received: 1 February 2021; **Revised:** 22 March 2021; **Accepted:** 22 April 2021

Introduction

Full engagement of orthodontic archwires into bracket slots of conventional and self-ligating brackets during initial alignment of rotated or malposed teeth as well as in the final stages of treatment can be challenging. This is primarily due to tooth or bracket position and archwire dimensions. Orthodontists commonly use a straight or curved probe to ensure seating of the archwire into bracket slots prior to placing ligatures in conventional brackets or closing the slides/gates in self-ligating brackets (Figure 1). The disadvantage of this approach is the inherent rotation of the archwire in the opposite direction when only one side of the wire (either mesial or distal) is engaged with a probe or equivalent instrument (Figure 2). Additionally, there is also a risk of the sharp tip of the probe slipping and injuring the lips and gingiva of the patient.[1-3] The problem becomes acute when heavy dimension rectangular wires are used. Unless heavy dimension rectangular wires engage the bracket slots fully, built-in bracket prescription values cannot be obtained. Incomplete gate closure in self-ligating brackets causes tissue irritation and loss of control. To overcome this problem, a new novel double-sided orthodontic archwire seating instrument has been designed and developed by the author. The instrument has been patented (Indian Patent No: 361311) and commercial production in the future is also envisaged. The instrument can be used with both conventional and self-ligating bracket types with equal efficiency to ensure full seating of archwires in the anterior and posterior regions prior to placement of ligatures or to enable easy closure of self-ligating bracket gates or slides.

Design and Method of Use

The instrument has an elongated handle with metal prongs at either end (Figure 3). The instrument has the following dimensions: handle length of 90 mm, prong length of 8 mm, inter-prong distance of 3.5 mm for the narrow prongs which can be used in the lower arch with reduced interbracket distance and 5 mm for the wide prongs used in the upper arch with wider interbracket distances available with prong groove depth of 0.7 mm. These dimensions were finalized after building and testing multiple prototypes. The instrument is made from medical grade steel and can be autoclaved after each use. The grooves have been designed to enable snug engagement of a 21 × 25 rectangular archwire. The prongs have recessed grooves on the underside which help secure the archwire firmly. Variable pressure on either prong can also be applied by the operator depending on the clinical requirements

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Original Research Article

In Vivo Comparison of Ultimate Tensile Strength and Surface Topography of Three Different Nickel–Titanium Archwires

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Pasupureddi Keerthana[1], Puneeth SB[2] and Prasad Chitra[1]

Abstract

Objective: To investigate the surface topography and ultimate tensile strength of 3 types of nickel–titanium (NiTi) wires before and after 3 months of intraoral use and to assess the efficiency of the wires in cases requiring extensive alignment.
Methods: NiTi wires of 0.016" (0.40 mm) were divided into 3 groups—martensitic stabilized NiTi™ (group 1), austenitic active Copper NiTi™ 27°C (group 2), and martensitic active copper NiTi™ 35°C (group 3)—each further divided into 2 subgroups: (a) as-received wires; and (b) used wires. Each wire was subjected to scanning electron microscopy (SEM) analysis and tensile testing. Ultimate tensile strength data were analyzed using one-way analysis of variance (ANOVA) and Tukey testing at the .05 level of significance.
Results: Martensitic stabilized archwires had a significantly lower ultimate tensile strength (93.99 ± 0.23 MPa) than martensitic active (116.96 ± 0.43 MPa) and austenitic active (106.94 ± 0.36 MPa) archwires. Among the used archwires, the martensitic stabilized ones showed the most and the martensitic active ones the least surface degradation.
Conclusion: Ultimate tensile strength was the highest for martensitic active archwires with superior surface properties and the lowest for martensitic stabilized archwires with an increased amount of surface degradation.

Keywords

NiTi, martensitic stabilized, martensitic active, austenitic active, SEM

Received: 9 April 2020; **Revised:** 2 November 2020; **Accepted:** 4 January 2021

Introduction

Malocclusion is a common problem across all age groups, with its prevalence estimated between 20% and 88%.[1] Tooth morphogenesis, development, and craniofacial growth are factors generally implicated in causation.[2] Crowding of the anterior teeth is a common and perplexing malocclusion with associated aesthetic and functional aberrations.[3] Malocclusion teeth require application of mechanical force for initial leveling and alignment. Prior to the introduction of nickel–titanium (NiTi) alloys into orthodontics, stainless steel (SS) was the material of choice. Degradation of the material on exposure to saliva and other natural bio-flora, with the release of degradation products, commonly termed "tribocorrosion,"[4,5] is associated with NiTi. Degradation of the material has clinical implications, such as low force exertion, stress-induced failure, and an undefined risk of tumorigenesis.[4] Investigators have also focused on adverse intraoral effects, such as pitting, crevice corrosion, and integument formation.[5] Initially, martensitic stabilized conventional NiTi alloys were introduced, followed by active generic NiTi alloys—austenitic active and martensitic active alloys.[6] These had properties of shape memory, greater elasticity, and the potential to simplify treatment.[7-9] Studies analyzing the efficacy of heat-activated NiTi wires in the initial stages of treatment have shown inconclusive results.[10,11] A study evaluating the mechanical properties of heat-activated and superelastic archwires concluded that heat-activated wires had superior mechanical properties.[12] Data related to the efficacy of NiTi archwires in relieving crowding and failure rates on their use intraorally with unpredictable clinical responses occasionally and changes in material surface are scant. In vivo studies of orthodontic alloys have concluded that intraoral ageing of

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Research Article

Stress distribution patterns in mini-implant and bone in the infra-zygomatic crest region at different angulations: A finite element study

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ABSTRACT

Purpose: To evaluate, using the finite element method (FEM), von Mises stress patterns produced both in a mini-implant (MI) and the infra-zygomatic crest region (IZC) at different placement angles and force magnitudes.

Material and methods: FEM modeling of an infra-zygomatic crest MI, of dimensions 2 mm × 12 mm, was designed and placed in the IZC bone. The MI was inserted at 50°, 60°, 70°, 80°, and 90° angulations to the IZC surface. Simulated orthodontic forces of magnitudes 8, 9, 10, 11, and 12 oz were applied to the MI head. Von Mises stress and magnitude both in the MI and surrounding bone were measured.

Results: Von Mises stress in the MI and bone was maximum at 90°. Least stresses were observed at 50° and 60° angulations. As force magnitude increased, von Mises stress increased linearly. Maximum stresses in the MI and bone were observed when loads were 12 oz and minimum stresses were observed at 8 oz.

Conclusion: To achieve optimum primary stability, angles of insertion between 50° and 60° are recommended in the IZC region. Highest von Mises stress values were detected in the MI, followed by cortical and cancellous bone. Also, loading force between 8 and 12 oz exerted stresses below the tolerable threshold of bone and MI. Hence, proper placement of MI in IZC using these findings might provide better biomechanical stability during retraction and may help in preserving the bone-implant interface.

1. Introduction

Anchorage control has been a concern for orthodontists in many clinical situations. To achieve ideal treatment objectives, anchorage demand needs to be assessed in vertical, transverse, and anteroposterior planes. Previously, orthodontists used intra- and/or extraoral anchorage devices that necessitated patient compliance. Anchorage loss was frequently observed in spite of using these adjuncts [1]. Introduction of mini-screw anchorage in 1997 by Kanomi [2] was a significant improvement over traditional anchorage devices, as it enabled absolute anchorage, low cost, and treatment options in different clinical situations, and was minimally invasive, cheap, and permitted loading immediately post insertion [3]. Use of a mini-implant (MI) in interradicular and other intraoral sites provides anchorage for dental protraction, retraction, extrusion, and intrusion, for both erupted and impacted teeth [4].

The infra-zygomatic crest (IZC) region has been an obvious choice for MI insertion due to the thickness of cortical plates and its distance from the dental arch. The IZC serves as an effective region for obtaining anchorage during maxillary dentition retraction, skeletal asymmetry, maxillary canine-lateral incisor transposition, excessive gingival exposure, and scissor bite [5,6].

However, there are more MI failures reported in the IZC region as compared with other bony locations in the maxilla or mandible [7]. This can be due to parameters such as placement zones, forces applied, inflammation and/or infection after placement, and implant insertion angulation, length, and diameter [8,9]. Proper insertion angle is a critical factor for treatment success in the IZC region. A previous study on interradicular MI has shown that

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Original Article

Alleviation of Lower Anterior Crowding with Super-Elastic and Heat-Activated NiTi Wires: A Prospective Clinical Trial

Pasupureddi Keerthana, Prasad Chitra

Department of Orthodontics and Dentofacial Orthopaedics, Army College of Dental Sciences, Secunderabad, Telangana, India

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Main Points

- Both heat-activated and super-elastic archwires showed similar alleviation of lower anterior crowding in initial leveling and aligning stages.
- Heat-activated archwires can be used to engage grossly malpositioned teeth to obtain greater control at the initial stages of treatment.
- Intercanine width, intermolar width, and arch depth were increased with use of heat-activated archwires.

ABSTRACT

Objective: To compare the amount of alleviation of lower anterior crowding and changes in intercanine width (ICW), intermolar width (IMW), and arch depth (AD) dimensions using 2 different types of nickel-titanium (NiTi) archwires.

Methods: Thirty participants were randomly allocated to 2 treatment groups, using heat-activated NiTi (HANT) or super-elastic (SE-NiTi) round (0.014") archwires. The inclusion criteria were a Little's Irregularity Index (LII) greater than 4, malocclusion requiring non-extraction therapy, all teeth erupted to the second molars in the lower arch, and Angle's Class I malocclusion. The primary aim was to measure alleviation in mandibular crowding over 12 weeks; the secondary aim was to measure changes in ICW, IMW, and AD during those 12 weeks. Simple randomization was performed. The measurements were made on dental stone casts using a coordinate measuring machine at 4-week intervals.

Results: LII at 0, 4, 8, and 12 weeks was 8.59 ± 1.44, 6.17 ± 1.65, 4.65 ± 1.63, and 3.28 ± 1.57 mm in the HANT; 8.87 ± 1.29, 6.92 ± 1.49, 5.25 ± 1.32, and 3.63 ± 1.32 mm in the SE-NiTi group, respectively. ICW increased from 25.43 ± 1.39 to 27.41 ± 1.29 mm in the HANT and from 25.81 ± 1.78 to 27.27 ± 1.83 mm in the SE-NiTi groups over a period of 12 weeks, at $P < .05$. There was a statistically significant increase in IMW, CAD (canine arch depth), and MAD (molar arch depth), favoring the HANT group ($P < .05$). No significant differences in LII between the 2 groups were noted ($P > .05$).

Conclusions: The amount of alleviation of lower anterior crowding was similar with both archwires. ICW, IMW, and AD increased with HANT archwires.

Keywords: Orthodontic wire, nitinol, crowding, arch dimensions, coordinate measuring machine, tooth movement

INTRODUCTION

Fixed appliance therapy is a pillar of contemporary orthodontic treatment, in which archwires are used for force application. The aim of using aligning archwires at treatment initiation is primarily to alleviate crowding. Aligning archwires use light forces to move teeth, thereby reducing root resorption.[1] The dimensional and physical-chemical properties of an archwire determine the amount of force delivered clinically. Ideal properties of aligning archwires include a large range of activation, flexibility, low modulus of elasticity with reduced friction, low cost, and ease of manufacture.[2]

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Original Research Article

Torque Comparison Between Two Passive Self-Ligating Brackets with Respect to Interbracket Wire Dimensions and Types: A Finite Element Analysis

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Balan K Thushar[1], Anirudh K Mathur[1], Rajasri Diddige[1], Shubhnita Verma[1] and Prasad Chitra[1]

Abstract

Objective: This study aimed to analyze the expression of torque between 2 passive self-ligating brackets by simulating different clinical situations using finite element analysis.

Material and Methods: Two passive self-ligating brackets, that is, Damon Q (Ormco, Glendora, California) and Smart Clip (3M Unitek, Monrovia, California), were 3D modeled using micro-computed tomography. ANSYS V14.5 software was used for analysis. Archwire and bracket interactions were simulated to measure torque expression by changing wire alloys (stainless steel [SS] and titanium molybdenum [TMA]) and interbracket dimensions.

Results: Damon Q brackets generated higher torque values compared to Smart Clip brackets with both SS and TMA wires. Damon Q brackets generated the highest torquing moment of 25.72 Nmm and 7.45 Nmm, while Smart Clip brackets generated 22.25 Nmm and 7.31 Nmm with 0.019 × 0.025" SS and TMA wires, respectively, at an interbracket distance of 12 mm. Torquing moments decreased for Damon Q and Smart Clip brackets when wire length increased from 12 mm to 16 mm.

Conclusion: Damon Q with 0.019 × 0.025"wires exhibited superior torquing characteristics as compared to Smart Clip brackets with similar archwires.

Keywords

Finite element analysis (FEM), self-ligation, Damon Q, Smart Clip, torque expression

Introduction

Tooth movement and torque are the basic foundation of orthodontic-induced treatment.[1] Rauch defined torque as a moment generated by rectangular wire torsion in a bracket slot.[2] Correct maxillary anterior teeth labiolingual inclination is required for optimal orthodontic treatment outcomes, good smile esthetics, proper anterior guidance, and Class I anterior and posterior occlusion. Under-torqued maxillary incisors can result in arch length and space discrepancies.[3] The amount of torque expression depends upon the play between bracket slots and archwire, tooth morphology, archwire dimensions, ligation modes, stiffness of archwire alloys, bracket deformation, magnitude of wire torsion, and bracket design.[4-6]

Clinically, an additional factor that affects the torquing moment is interbracket distance which depends on both crown and bracket widths.[6] In 1987, Meyer and Nelson et al[7] mentioned that torquing moments also depended on vertical positioning of brackets on teeth wherein a 3 mm shift could result in a torque angle change up to 15 degrees. However, in 1997, Miethke et al found torque variation of 10 to 15 degrees with vertical discrepancy of 1 mm during placement of

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Original Research Article

In Vivo Evaluation of Micronucleus Frequencies in Buccal Mucosal Cells of Orthodontic Patients with and Without Fluoride Use

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Prasad Chitra[1], GS Prashantha[2], Arun Rao[3] and Harshvardhan S Jois[4]

Abstract

Introduction: Fluoride agents to prevent white spot lesions are used often during orthodontic treatment. The beneficial effects of fluoride, when consumed within permissible limits on dental structures, are well known. Their implications on underlying biological tissues, however, are unknown. Mouthwashes and dentifrices with fluorides are associated with metal ion release into the mouth with possible cell genotoxicity. Since these cariostatic agents are frequently used during orthodontic therapy, a deeper understanding of the effects of fluoride on oral tissues was considered necessary.

Methodology: Three groups of patients (30 each)—group 1 (untreated controls), group 2 (non-fluoridated), and group 3 (Fluoridated) were analyzed. Patients in groups 2 and 3 were bonded with the same bracket prescription and treated with similar archwire sequences. Buccal mucosal cells at 4 specific time periods (before treatment, 1 week, 30 days, and 6 months) were collected, using a wooden tongue depressor, and assessed for any nuclear abnormalities. Comparisons of changes were made with an untreated control group and also between the non-fluoridated and fluoridated groups. Relevant conclusions were drawn after analysis of the results.

Results: Greater number of nuclei were observed at the 30-day time interval in the fluoridated group, which was statistically significant at $P < .001$.

Conclusion: Use of fluoridated oral hygiene products in patients undergoing fixed orthodontic treatment with NiTi archwires could increase the risk of micronuclei formation in buccal mucosal cells.

Keywords

Fluoride, white spots, micronuclei, nickel, chromium, buccal mucosal cells

Introduction

According to a consensus report by International Agency for Research on Cancer (IARC) in 1992, the definition of genotoxicity is broad and includes both direct and indirect DNA effects: (a) induction of molecular-related mutations (gene, chromosomal); (b) indirect surrogate mutagenesis-related events (eg, sister chromatid exchange); or (c) DNA damage, leading to mutations.

Genotoxic factors cause disruption to the genetic material in cells in the form of single- and double-strand breaks, cross-linking, structural and numerical chromosomal aberrations, etc.1 To assess genotoxicity, micronuclei are used to assess and bio-monitor carcinogen genotoxicity poisoning due to heavy metals, toxins, etc.2 The benefit of the micronucleus test is due to simple and effective analysis of chromosome mutations in cytological samples relative to the determination of chromosome aberrations and sister chromatid exchanges.3

Fluoride levels, if within limits in water, have beneficial effects on teeth and reduce dental caries, while prolonged fluoride toxicity above this limit induces both skeletal and dental fluorosis and organotoxicity.4-6

In order to avoid white spot lesions (WSL), orthodontists usually recommend fluoridated toothpastes and mouthwashes

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Case Report

DENTAL MEDICINE

Airway changes in patients with sleep apnea using AdvanSync2 Class II correctors - a case series

Pasupureddi Keerthana, Gunjan Negi, Prasad Chitra

Department of Orthodontics and Dentofacial Orthopaedics, Army College of Dental Sciences, Secunderabad, India

Abstract

Background. Obstructive sleep apnea (OSA) is a condition that affects a patient's ability to sleep normally, predisposing them to many risks and reduced quality of life. Myofunctional therapy has been proven to increase the airway space according to literature.

Aim. To report the effects of AdvanSync2 Class II corrector in the management of 3 orthodontic patients who reported sleeping difficulties due to breathing problems and retrognathic mandible.

Case presentation. Three patients reported to Department of Orthodontics and Dentofacial Orthopaedics with Class II malocclusion associated with sleep apnea requiring treatment. Clinical examination revealed a retrognathic mandible with airway constriction in all subjects. A non-extraction approach using an AdvanSync2 Class II corrector (Ormco Corp, Glendora, Calif) with fixed appliances was considered. Lateral cephalometric records were obtained at three stages: pre-treatment, post functional and prefinishing/post treatment. The airway was divided into 3 parts in the lateral cephalogram: velopharynx, hypopharynx and glossopharynx. The most constricted part of the airway was noted. Pre and post treatment lateral cephalograms were compared to assess the changes in airway dimensions after using AdvanSync2. Significant enhancement in airway dimensions was noted in all three parts (velopharynx, glossopharynx and hypopharynx) in all patients.

Conclusion. Airway assessment is an important aspect in orthodontic diagnosis. Use of the AdvanSync2 Class II corrector in combination with fixed orthodontic appliances enhanced quality of life in Class II patients by improving airway dimensions. This approach can be recommended in the management of mild to moderate Class II malocclusions associated with mandibular retrognathism and airway constriction.

Keywords: airway, AdvanSync 2, Class II corrector, modified Herbst, sleep apnea

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Introduction

Obstructive sleep apnea (OSA) is a sleep disorder, characterized by episodes of breathing interruption during sleep. Obstruction of upper airway (OUA) is ensnared with development of OSA [1]. 0.7%-2.9% of children may present with large tonsils and adenoids, a major contributing factor in OUA [2,3].

OSA induces neurobehavioral prodromal symptoms and cardiovascular disturbances. There have been instances of hyperactive and inattentive activity in children with OSA and habitual snoring [4]. Snoring during sleep is an alarming indicator of a constricted airway which is frequently noted in school children [5]. The ratio of symptomatic daily snoring and obstructive sleep apnea (OSA) is in the range of 3:1 to 5:1. Some of the non-invasive treatment options in OSA are medication, orthodontic procedures

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BALANCING ORAL HEALTH AND NUTRITION IN THE TIME OF COVID-19

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ABSTRACT

Oral health is an important factor in the initiation and progression of many systemic diseases. Lack of oral health maintenance can have a number of adverse effects on the body, such as progression of upper respiratory and cardio-vascular diseases and enhancement of systemic illnesses such as diabetes. These factors can put patients at risk for contacting COVID-19; hence it is essential that the role of oral health be highlighted in conventional literature. The mouth also is the most important pathway for providing nutrition in order to improve the body's immune response, which in turn is an essential requirement against viral infection. This paper investigates the correlation between COVID-19 and oral health, the importance of maintaining a healthy mouth and adequate nutrition. The specific micro and macro nutrients that have been found to be of increased value to COVID-19 patients and the general population are also discussed.

Keywords: Oral health, Nutrition, COVID-19, Nutrition therapy, Periodontitis, Systemic health

INTRODUCTION

Health is the most important determinant when it comes to assessing quality of life. In December 2019, when a group of patients with symptoms of pneumonia of unknown etiology were admitted to the Wuhan General hospital, nobody could have predicted that it would be the beginning of a global pandemic, affecting millions of people. It led to life threatening outcomes for not only medically compromised persons, but perfectly healthy, young individuals with competent immune systems were also severely affected all across the world. [1]

The Novel Coronavirus strain alters the human immune system. It causes response-reaction changes in the body which leads to autoimmune damage of lung connective tissue. Fast and highly contagious spread of this disease, paired with other factors like complicated and under-researched drug therapy and lack of health care infrastructure available in

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Original research

Bolton's analysis using a photogrammetric method on occlusal photographs

Ashwin Prakash[1], **Prasad Chitra**[2]

Purpose
The aim of the study is to present a photogrammetric technique using standardized occlusal photographs to perform Bolton's analysis and assess reliability of this new method with plaster study casts.

Materials and Methods
The study was conducted on 16 subjects (8 males, 8 females), aged 18-25 years. Standardized occlusal photographs and plaster study casts were obtained. The occlusal photographs were calibrated in Nemoceph® software. Mesio-distal dimensions of all teeth up to first molars were calculated and Bolton's analysis was performed. Similarly, a digital calliper with 0.1 mm sensitivity was used to measure mesio-distal dimensions of all teeth on plaster study casts to perform Bolton's analysis. 28 parameters were measured on study models and corresponding occlusal photographs. Paired t test and intraclass correlation tests were carried out to test validity and reliability of the photogrammetric method. An intraclass correlation test was calculated for 4 derived parameters to test reliability of Bolton's analysis measurements obtained from occlusal photographs as compared to study models.

Results
All 28 parameters showed a statistically significant and excellent correlation (r>.80) in the Intra Class Correlation test. 4 variables used to calculate Bolton's analysis showed statistically significant correlation (r>.96) in the intraclass correlation test.

Conclusion
Photogrammetry is a reliable tool to measure mesio-distal tooth size. Bolton's analysis from standardized occlusal photographs using the described photogrammetric technique can be used as an effective clinical tool.

Keywords: *Photogrammetry, Bolton's analysis, Ophotograph, Nemoceph, Tooth dimensions*

Introduction

Effective and practical diagnostic aids that help in seamless and easy acquisition of data are useful in orthodontics. Digitization has been making an impact in the way we practise dentistry and holds a lot of promise in the future. However, when it comes to 3 - dimensional information, particularly in the pre treatment stage, plaster study models remain the most commonly used diagnostic aid.

Digital scanning technologies have been available from the mid 1990's (1) and digital study models were introduced in 1999 by Orthocad™ (2). Digital study models hold a lot of advantages over plaster study models, obviating the need for physical storage (3), allowing instant accessibility to information, quick referral and virtual treatment planning. Moreover Cone Beam Computed Tomography (CBCT) technology also allow the creation of virtual study models which give 3D visualization of dental crown and root morphology.

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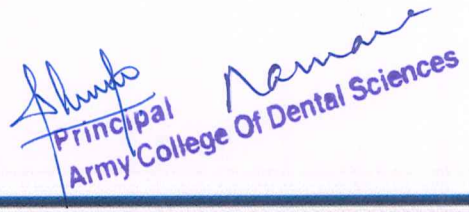
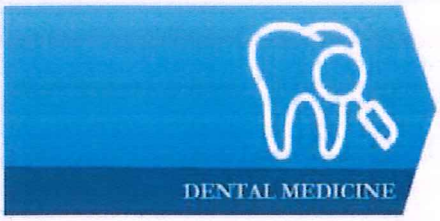


Original Research



Comparison of pain levels in patients treated with 3 different orthodontic appliances - a randomized trial

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Abstract

Background and aims. To compare pain levels experienced during initial alignment with three different orthodontic appliance types and to correlate pain with male and female differences, if any.

Methods. A prospective, randomized 3-arm parallel trial allocated 36 adult orthodontic patients into three appliance groups: MBT 0.022" slot (Mini Twin, Ormco, Glendora, USA), self ligating 0.022" slot Damon 3MX (Ormco, Glendora, USA) and clear aligners (Smile align, Mumbai, India). The level of discomfort was assessed through a questionnaire based on the visual analogue scale at four hours, twenty four hours, third and seventh day after appliance placement.

Results. Patients treated with clear aligners reported less pain than patients treated with conventional and self ligating fixed appliances. Patients treated with MBT conventional appliances showed greater pain levels than Damon appliances. A significantly higher visual analogue scale score was observed at 24 hours and the least visual analogue scale scores on the seventh day post appliance placement.

Conclusion. During the first week of orthodontic treatment, patients treated with clear aligners reported lower pain than those treated with conventional and self-ligating appliances.

Keywords: pain perception; visual analogue scale (VAS); orthodontic appliances

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Background and aims

Pain is defined as "An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage". by the International Association for the Study of Pain. In Greek, pain means penalty. In general, pain during orthodontic treatment is related to the duration and magnitude of force applied [1]. Reitan [2] suggested that light forces were less traumatic and biologically efficient during orthodontic tooth movement and discomfort might be associated with increased force levels. Frustman and Bernick [3] proposed that force application caused compression of the periodontal ligament, ischemia, inflammation and edema which in turn caused pain.

Discomfort and pain experienced during orthodontic treatment reduces compliance and is a reason to discontinue therapy [4]. The level of pain experienced during orthodontic treatment shows substantial individual variation due to psychological, environmental, psychosocial and emotional factors [5]. Several studies [6-12] have demonstrated that pain intensity rises between 4 to 24 hours after commencement of orthodontic treatment, lasts for 2 to 3 days with high intensity and gradually drops to baseline level by the 7th day. Pain is generally measured indirectly using a visual analogue scale (VAS) which is a valid and reliable tool for assessing pain intensity. VAS is a horizontal 100 millimeter length line, anchored by word descriptors (least pain, severe pain) at each end, which provides good sensitivity and reproducibility [7,13].

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Effect of fluoride agents on surface characteristics of NiTi wires. An ex vivo investigation

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ABSTRACT

Aim: To analyze the degree of corrosion of nickel titanium arch wires in patients with and without exposure to fluorides.

Material and methods: This was an ex vivo study comprising of 60 subjects undergoing fixed orthodontic treatment. Group 1(controls) comprised of 30 sets of new unused NiTi wires and unused 11, 15 brackets, Group 2(patients) comprised of 30 sets of non fluoridated NiTi wires and 11, 15 brackets and Group 3(patients) had 30 sets of fluoridated NiTi wires and 11, 15 brackets. NiTi wires were used over 6 months of treatment (0.014",0.016", 16 × 22", each wire was used for 2 months and replaced with the next size). All wires were retrieved, stored and analyzed. At 6 months, brackets from 11 to 15 were debonded in both treatment groups. Archwires and brackets in 3 groups were subjected to SEM analysis at 500 and 1000*X* to observe differences. Additionally, EDX Spectroscopy was undertaken to evaluate surface elemental compositional differences in groups.

Results: Significant differences among groups were evident in brackets and archwires tested. Maximum degradation, cracks and dark spots were seen in wires and brackets exposed to fluoride agents. EDX spectroscopy revealed least Ni% in fluoridated wires and brackets.

Conclusions: Increased leaching of metal ions was evident when wires and brackets are exposed to fluoride agents during treatment. Use of non fluoridated mouthwash and toothpastes may be considered in orthodontic patients without risk of caries to mitigate such effects

1. Introduction

Fixed appliances for correction of malocclusion are the preferred method for most orthodontic patients. Brackets used in orthodontics are predominantly metal alloys of which iron, cobalt, chromium, nickel and manganese predominate.[1–3] Brackets have also been manufactured using titanium alloys in order to reduce the nickel content in conventional stainless steel alloys.

Arch wires used in orthodontics are available in several types and compositions ranging from alloys of stainless steel, chrome cobalt, nickel titanium, titanium molybdenum etc. In recent years, alloys made with nickel titanium started to get popular in orthodontics due to their favorable properties enabling rapid alignment of teeth with minimal force. NiTi alloys used in orthodontics generally are composed of 55% Ni and 45% Ti.[4] Various types of NiTi alloys have been introduced over time with additions of Cu and Cr to enhance certain mechanical properties. Their exact composition is generally not available. Brackets used in orthodontics remain till treatment end, and are removed after treatment. Orthodontic arch wires in contrast, are replaced every few months as alignment of teeth is accomplished. During the period of treatment, both brackets and arch wires are exposed to the intra oral environment which is humid due to saliva and of variable pH and temperature. Additionally, food and drinks consumed are of very variable pH. The saliva in the mouth is an electrolyte, with metal orthodontic appliances behaving like a cell. The whole system undergoes electrochemical processes resulting in corrosion. The corrosion process is further enhanced due to the presence of microorganisms which cause rapid degradation of metals.[5,6] Corrosion can occur due to loss of metal ions into solution directly or due to the protective surface oxide layer degrading slowly. Corrosion occurs due to simultaneous oxidation and reduction reactions taking place, which are called redox reactions. In general, once the corrosion process begins, it continues till the metal

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Stereomicroscopic analysis of microleakage, evaluation of shear bond strengths and adhesive remnants beneath orthodontic brackets under cyclic exposure to commonly consumed commercial "soft" drinks

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Abstract

Objective: This study aimed to evaluate the effects of Coca-Cola®, Sprite®, and Maaza® on Microleakage, shear bond strength (SBS) and adhesive remnants underneath orthodontic brackets. **Materials and Methods:** A total of 192 human premolar teeth were used in this study. The sample was divided into four groups: Artificial saliva (control) [Group 1], Coca-Cola [Group 2], Sprite [Group 3] and Maaza [Group 4]. All the samples were stored in artificial saliva and immersed in their respective testing media (except the control group) for 15 minutes 3 times a day, separated by intervals of 8 hours. The immersion cycle was repeated for 15 days. After the immersion cycle, 24 teeth from each group were tested for SBS and adhesive remnant index subsequently. The remaining 24 teeth from each group underwent dyeing with methylene blue and were analyzed stereomicroscopically to evaluate microleakage underneath the brackets. Kolmogorov-Smirnov and Shapiro normality tests were performed and homogeneity of variance was tested with the Levene test. One-way ANOVA and Kruskal-Wallis tests were carried out separately for SBS, ARI and microleakage. Statistical analyses were performed using SPSS 20 for Windows (SPSS Inc., Chicago) software. **Results:** Coca-Cola showed a significant reduction in SBS and microleakage ($p < 0.05$) compared to the other groups. ARI did not show any significant differences between any groups ($p > 0.05$). The mean microleakage scores were higher for the gingival side of the brackets compared to the incisal side. Both Sprite and Maaza showed significant differences compared to artificial saliva, despite the SBS not being statistically significant ($p > 0.05$). **Conclusions:** A significant reduction of SBS was observed in Coca-Cola while increased microleakage was seen in all three drinks compared to artificial saliva.

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Full Text

Introduction

The clinical practice of orthodontics has been revolutionized by advances in dental materials in recent years. This began with the introduction of adhesives by Buonocore[1] that permitted the direct bonding of brackets to teeth which irreversibly changed the way orthodontics is practiced. However, white spot lesions (WSLs) associated with dental erosion have been reported to form in enamel around brackets during orthodontic therapy.[2] Its prevalence is reported between 2% and 96% in patients with fixed appliances[3] which is attributed mostly to the demineralization processes occurring around and beneath the brackets due to a decrease in the salivary pH.[4]

The term "soft drinks" refers to all drinks except alcohol, mineral water, fruit juices, tea, coffee or milk-based drinks which may or may not be carbonated.[5] In a meta-analysis of 88 studies, the association between soft drink consumption and nutrition and health outcomes found clear associations of soft drink intake with increased energy intake and body weight. Soft drink intake also was associated with lower intakes of milk, calcium, and other nutrients and with an increased risk of several medical problems (e.g., diabetes).[6] Over the past 2 years, the soft drink industry has seen a value growth of 11% compound annual growth rate (CAGR) and a volume growth of 5% CAGR. In total, 1.25 billion people in the country drink 5.9 billion liters of soft drinks in a year. This makes India's per capita soft drinks consumption large, but still, this is less compared to the global statistics. In a country where more than a billion people consume soft drinks, it becomes pertinent to find out the effects of these substances on orthodontic patients.[7]

Recent literature has shown increase in the consumption of "soft drinks"[8] that are damaging to enamel not only because of the high sugar content but also because most of them have critical pH levels below the safety limit, leading eventually to enamel demineralization and dental erosion.[9],[10],[11],[12],[13] The polymerization shrinkage of the adhesive material may cause gaps between the adhesive material and enamel surface and lead to microleakage, thus facilitating the formation of WSLs under the bracket surface area.[14] Microgap formation between the adhesive material and the enamel surface contributes to microleakage, permitting the passage of bacteria and oral fluids, which may initiate WSLs under the bracket surface area.[14],[15],[16],[17]

Many authors[2],[3] have suggested that microleakage around the brackets might contribute to the formation of WSLs beneath brackets. O'Reilley and Featherstone[18] analyzed the amount of demineralization and remineralization around the fixed orthodontic appliances. They stated that demineralization did not occur due to the etching effect of acid but because of dental plaque accumulation in the mouth. The review of literature has shown that there are many conflicting data regarding the effects of consumption of Coca-Cola, however, there are no studies based on pulp-based drinks such as Maaza. The authors also found a lack of clarity in literature when it comes to quantifying and analyzing microleakage using stereomicroscope.

This study aimed to evaluate the reduction in bond strength of orthodontic brackets and the adhesive remaining on the tooth surface when intermittently exposed to three popularly consumed soft drinks: Coca-Cola, Sprite and Maaza; all the while being immersed in a remineralizing storage medium, to more accurately simulate the in-vivo scenario. The use of stereomicroscope for analyzing microleakage using image analysis tools is highlighted additionally.

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