

PATHWAYS

Basic Science Scientific Poster

Primary cilia expression in periodontal ligament fibroblasts: an *in vitro* study

Wan Nur Alwani Wan Abdul Aziz^{1,3}, Syarida Hasnur Safii¹, Siti Amalina Inche Zainal Abidin²

¹ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya.

² Department of Oral & Craniofacial Sciences, Faculty of Dentistry, Universiti Malaya.

³ Department of Community Dentistry & Periodontology, Faculty of Dentistry, USIM.

Abstract

Background: Primary cilia (PC) are present on most cells and are crucial in regulating various signalling pathways essential for tissue homeostasis. They are also present in the periodontium's periodontal ligament fibroblasts (PDLF). Defective cilia have been linked to abnormalities in teeth and craniofacial structures. However, their specific roles in PDLF and the pathophysiology of periodontitis are lacking. **Objectives:** To determine the occurrence and length of PC on PDLF cells isolated from teeth with and without periodontitis. **Methods:** Using the explant method, PDLF cells were isolated from the extracted teeth of healthy periodontium (n=3; H1, H2, and H3) and periodontally compromised periodontium (n=1; D1). The cells were characterised using immunofluorescence staining for vimentin. The PDLF cells were serum-starved for 24, 48, and 72 h to induce ciliogenesis. The occurrence and length of PC were assessed using co-immunofluorescence staining for Arl13b and γ -tubulin. **Results:** Mean PC length (PCL) in the disease group was significantly shorter than the healthy group at 24 h (2.9098 μ m vs. 3.6033 μ m) and 48 h (3.3969 μ m vs. 3.8231 μ m). At 24 h, D1 (2.90982 μ m) had a shorter PCL than H1 (3.17161 μ m), H2 (3.93319 μ m), and H3 (3.73611 μ m). At 48 h, D1 (3.39690 μ m) had a shorter PCL compared to H2 (4.08926 μ m) and H3 (4.01891 μ m) but comparable to H1 (3.34819 μ m). At 72 h, D1 (3.82143 μ m) had a shorter PCL than H2 (4.30944 μ m) and H3 (4.29004 μ m) but was significantly longer than H1 (3.35520 μ m). A longer period of serum starvation caused a significant increase in the mean PCL in both groups. However, no significant difference was observed in the occurrence of PC between the disease and healthy groups at the different time points. **Conclusion:** Periodontitis may shorten ciliary length in PDLF cells, potentially contributing to impaired bone regenerative and remodelling capacity.

Molecular docking of statins with inflammatory proteins shared by periodontitis and coronary artery disease

Nusaibah Sallehuddin¹, Nur Aqasyah Amran¹, Norazreen Zakaria¹, Nashuha Omar¹, Siti Azma Jusoh², Rahayu Zulkapli^{1,3}, Chua Yung An¹, Mohd Faizal Hafez Hidayat³, Mohd Yusmialdil Putera Mohd Yusof^{1,3}

¹ Cardiovascular Advancement and Research Excellence Institute, Universiti Teknologi MARA, Selangor, Malaysia.

² Faculty of Pharmacy, Universiti Teknologi MARA, Selangor, Malaysia.

³ Faculty of Dentistry, Universiti Teknologi MARA, Selangor, Malaysia.

Abstract

Background: Cardiovascular disease is the leading cause of mortality worldwide, with developing countries experiencing coronary artery disease (CAD) at a younger age compared to developed countries. Periodontitis (PD) and CAD are chronic inflammatory conditions that share common pathogenic pathways involving systemic inflammation and immune dysregulation. C-reactive protein (CRP), tumor necrosis factor alpha (TNF- α), and intercellular adhesion molecule 1 (ICAM-1) are key molecular mediators implicated in both diseases. Statins are a group of widely used lipid-lowering agents that have demonstrated pleiotropic anti-inflammatory effects, suggesting their potential as modulators of inflammatory pathways. **Objectives:** This study aims to explore the binding affinity and molecular interactions of atorvastatin, rosuvastatin, simvastatin, pravastatin, and lovastatin with CRP, TNF- α , and ICAM-1 using molecular docking techniques to evaluate their potential as prophylactic agents for CAD. **Materials and Methods:** Three-dimensional structures of CRP (PDB ID: 1B09), TNF- α (PDB ID: 2AZ5), and ICAM-1 (PDB ID: 1IAM) were retrieved from the Protein Data Bank. Structures of statins were obtained from PubChem. Docking simulations and binding affinities were performed using AutoDockVina, and intermolecular interactions were analyzed using BIOVIA Discovery Studio Visualizer. **Results:** Atorvastatin exhibited favorable binding affinity toward CRP, with a binding energy of -6.6 kcal/mol. Simvastatin showed a higher affinity for TNF- α (-8.8 kcal/mol), while both simvastatin and lovastatin exhibited notable interactions with ICAM-1 (-6.2 kcal/mol). The other statins showed binding affinities ranging from -5.4 to -5.9 kcal/mol for CRP, -7.3 to -8.2 kcal/mol for TNF- α , and -5.6 to -5.8 kcal/mol for ICAM-1. Key interacting residues suggested possible modulation of inflammation-related protein functions. **Conclusion:** The study provides a molecular basis for considering statins, particularly simvastatin, as potential prophylactic agents for CAD, especially in individuals with PD. Further *in vitro* and *in vivo* studies are recommended to validate these *in silico* predictions.

Periodontal bacterial metabolomes of oral squamous cell carcinoma and oral potentially malignant disorders

NA Rosli^{1,2}, NSM Nazar^{3,4}, SW Foong¹, CW Cheah¹, AR Al-Maleki^{2,5}, A Ramanathan³, ZM Ripen³, LP Karen-Ng⁶, CW Phan⁷

¹ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

² Department of Medical Microbiology, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia.

³ Department of Oral and Maxillofacial Clinical Sciences, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

⁴ Department of Oral and Maxillofacial Surgery, Medicine and Pathology, Faculty of Dentistry, Universiti Sains Islam Malaysia, Kuala Lumpur, Malaysia.

⁵ Department of Medical Microbiology, Faculty of Medicine and Health Sciences, Sana'a University, Sana'a, Yemen.

⁶ Oral Cancer Research and Coordination Centre, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

⁷ Department of Pharmaceutical Life Sciences, Faculty of Pharmacy, Universiti Malaya, Kuala Lumpur, Malaysia.

Abstract

Background: Oral squamous cell carcinoma (OSCC) is the most prevalent malignancy of the oral cavity, frequently preceding oral potentially malignant disorders (OPMDs). Emerging evidence suggests that periodontitis may contribute to in-situ carcinogenesis through immune modulation and microbial dysbiosis. Saliva, as a non-invasive diagnostic fluid, contains microbial and host-derived metabolites that reflect both local and systemic alterations. **Objective:** This study investigated differences in salivary microbial metabolite profiles among OSCC, OPMDs, and healthy controls, stratified by periodontitis status, to identify metabolites potentially associated with disease states. **Materials and methods:** Unstimulated saliva samples were collected from six clinically stratified groups: OSCC/OPMDs with (Pe)/without (nPe) periodontitis: (OSCCPe=12, OSCCnPe=8; OPMDPe=13, OPMDnPe=8) and healthy controls with/without periodontitis (HnPe=13, HnPe=13), and processed using cold methanol precipitation. Metabolomic profiling was conducted using LC-MS QTOF (Agilent), and data were analysed using Agilent Qualitative Analysis and Mass Profiler Professional software, with metabolite identification based on the METLIN database and comparative statistics ($p < 0.05$, $FC \geq |2|$). **Results:** Comparative analysis revealed that in periodontitis groups: OSCCPe and OPMDPe exhibited predominantly more significantly downregulated metabolites compared to controls (HnPe). Conversely, among non-periodontitis subjects, a higher number of significantly upregulated metabolites were observed in disease groups, with the exception of OPMDnPe versus HnPe, which exhibited higher significantly downregulation. Pairwise comparisons corroborated these trends, with OSCCPe versus OPMDPe exhibiting a balanced pattern of significant regulation. Notably, four metabolites showing dysregulation patterns were identified as potentially associated with oral cancer progression and periodontal inflammation: anandamide, cyclohexanecarbonylpentadecylamine, N-ethyl N-(2-hydroxy-ethyl) arachidonoyl amine (endocannabinoid-related lipids), and spermidine, a polyamine involved in microbial modulation. **Conclusion:** Salivary metabolomic profiling revealed distinct patterns linked to oral cancer and periodontitis, highlighting potential biomarkers for OSCC progression and the inflammatory interplay between periodontitis and oral malignancy. It also emphasizes the importance of regularly monitoring periodontitis patients for other oral changes.

Unveiling oral bacteria metabolites in early treated rheumatoid arthritis. A pilot study

Su Wen Foong¹, Chia Wei Cheah¹, Anis Rageh Al-Maleki²

¹ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya.

² Department of Medicine Microbiology, Faculty of Medicine, Universiti Malaya.

Abstract

Background: Metabolites are the end-products of enzymatic activity, representing the functional outcome of gene and protein expression. Both rheumatoid arthritis (RA) and periodontitis (PD) are inflammatory diseases that exhibited several common biological processes. Early detection of RA and timely management are crucial to prevent irreversible joint damage and improve quality of life. Various studies suggests that the oral bacteria may contribute to pathogenesis of RA. Thus, profiling metabolites of oral bacteria in early treated RA (ERA) patients may offer essential insight on the functional role of oral bacteria in this specific population. **Objective:** To compare the expressed metabolites in ERA and healthy individual in relation to their periodontal status and to correlate the expressed metabolites with RA and PD parameters. **Method:** Cross sectional study consisted of 27 dental plaque samples were collected based on their diagnosis. The groups included ERA with PD (ERAPD), ERA without PD (ERANPD), chronic RA with PD (CRAPD), chronic RA without PD (CRANPD), non-RA with PD (NRAPD) and non-RA without PD (NRANPD). Probing pocket depth (PPD), clinical attachment loss (CAL), visible plaque index (VPI) and gingival bleeding index (GBI) were evaluated while DAS-28(ESR) and ESR were retrieved from electronic medical records. Dental plaque samples were collected, and metabolite analysis was performed using Light-Chromatography mass spectrometry (LCMS) to profile the metabolites. **Results:** ERANPD groups expressed the most metabolites expression, accounted for 1065 metabolites when compared to NRANPD. Among all metabolites, His-his, 12-hydroxy-10-octadecynoic acid, N-acetyl-b-glusaminyamine, 4-isopropylbenzoic acid, stigmatellin Y, N-cyclohexanecarbonylpentadecylamine and Anandamine were found upregulated significantly and correlates with clinical parameters while trend of downregulation of these metabolites were found when compared to CRANPD. **Conclusion:** These findings provide preliminary evidence that oral microbial metabolites may serve as potential biomarkers or therapeutic targets in the early RA. Larger longitudinal studies are warranted to validate these associations and elucidate the underlying biological mechanisms.

Inflammatory biomarkers in the GCF of periodontitis patients with type 2 diabetes mellitus: SRMA

Najwa Baharudin¹, Fouad H. AlBayaty², Indah Mohd Amin³, Jasin M Albandar⁴

¹ Universiti Teknologi MARA, Centre of Studies for Periodontology, Sungai Buloh, Malaysia

² Mahsa University, Department of Periodontology, Jenjarom, Malaysia.

³ Universiti Teknologi MARA, Centre of Studies for Basic Medical Sciences, Sungai Buloh, Malaysia.

⁴ Kornberg School of Dentistry, Periodontology and Oral Implantology, Philadelphia, United States.

Abstract

Introduction: There are numerous inflammatory biomarkers found in gingival crevicular fluid (GCF) identified in patients with periodontitis modified by type 2 diabetes mellitus (T2DM) but their significance has yet to be determined. **Objective:** This systematic review and meta-analysis aims to evaluate the inflammatory biomarkers, other than cytokines, detected in GCF of patients with periodontitis and T2DM (P+DM) compared to healthy (H) subjects. **Material & Method:** Electronic search using set search strategies were done via five databases: Scopus, Medline Complete, PubMed, Web of Science and Ovid. All relevant studies published between January 2000 and December 2021 were identified and stepwise processes were taken to select the studies that will be included in the SRMA. Risk-of-bias assessment were also done to ascertain the quality of each of the studies selected and meta-analysis were done to assess the concentration of inflammatory biomarkers with at least 2 comparable studies. **Results:** Literature search included 24 studies & they were evaluated using 2 types of risk-of-bias tool (RoB 2.0 and Risk of Bias Assessment Tool for Non-randomized Studies (RoBANS)) done based on study design. Three randomised studies evaluated using RoB 2.0 and 21 non-randomised studies assessed using RoBANS. All three of the randomised studies evaluated with RoB 2.0 have high risk of bias. RoBANS domain showed the highest percentage of high risk-of-bias is the blinding of outcome assessment and domain with the highest percentage of low risk-of-bias is the incomplete outcome data. Meta-analysis revealed resistin and visfatin to have significantly higher concentration in P+DM patients compared to H subjects while, hs-CRP shows no significant difference. **Conclusion:** Systematic review revealed inflammatory biomarkers in GCF, namely resistin, visfatin, calprotectin, chemerin and endocan were found to be higher in P+DM patients compared to H subjects. Pooled data from the meta-analysis revealed resistin and visfatin were found to be significantly higher concentration in P+DM patients compared to H subjects.

Soft tissue as potential factor of early implant failure: case report from a clinical trial

Norul Husna Mohamad-Hassan¹, Eshamsul Sulaiman¹, Zuraiza Mohamad-Zaini²,
Wan Izlina Wan-Ibrahim³, Syarida Hasnur Safii¹

¹ Department of Restorative Dentistry, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia.

² Department of Oro-Maxillofacial Surgical and Medical Sciences, University of Malaya, Kuala Lumpur, Malaysia.

³ Department of Oral and Craniofacial Sciences, University of Malaya, Kuala Lumpur, Malaysia.

Abstract

Background: Early implant failure is defined as inadequacy of the host to establish early osseointegration, which usually occurs before the prosthesis is fitted and functionally loaded. **Objective:** To present a case report of early implant failure, which was excluded from a prospective clinical trial evaluating soft tissue (ST) changes following implant placement in patients with (test) and without (control) a history of periodontitis. **Materials and methods:** The implant was placed conventionally and left submerged for 3 months. ST was harvested during the two surgeries and analysed with haematoxylin and eosin, matrix metalloproteinase (MMP)-8 immunohistochemistry, and immunofluorescence to assess macrophage polarisation. **Results:** One (56-year-old Chinese male) of the 29 participants recruited for this study had early failure, which was detected during second-stage surgery. He was grouped as a control, and the implant replacing his lost 46 achieved 64 to 77 implant stability quotient at placement despite his type 1 bone quality determined by a blinded operator. Apart from taking calcium supplements and 10 mg of rosuvastatin daily for hypercholesterolaemia, his baseline demographic and clinical data were unremarkable. The only significant difference with the other participants was his ST quality. His pre-operative ST showed epithelial acanthosis, disruption of the basal lamina and the presence of hyalinised connective tissue among thick collagen bundles that were densely packed. Post-operative ST was also stained intensely with MMP-8. Quantitatively, a higher percentage of M2-macrophages was observed at baseline compared with the mean from control group (36.4% vs. 19.81%), which decreased at follow-up, while the other showed an increase instead (24.67% vs. 26.79%). This resulted in a much higher M1/M2 ratio at follow-up (2.04 vs 1.38) from the baseline (1.35 vs 1.43). **Conclusion:** Pre-operative soft tissue condition may also affect bone-implant contact in the early healing phase and could be a factor for early implant failure.

Proteomics of periodontitis-associated bacteria and its link to oral squamous cell carcinoma

ShueKang Yeong¹, ChiaWei Cheah¹, Aruni Tilakaratne¹,
Wanninayake Mudiyanseelage Tilakaratne²

¹ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya.

² Department of Oral Maxillofacial Surgical and Medical Sciences, Faculty of Dentistry, Universiti Malaya.

Abstract

Background: Periodontitis, a chronic inflammatory disease of the periodontium, causes gingival inflammation and bone loss. Meanwhile, oral cancer such as oral squamous cell carcinoma, is characterised by uncontrolled cell growth in the oral cavity. Both conditions can compromise oral function,, and reduce quality of life. Oral bacteria are implicated in the link between periodontitis and oral squamous cell carcinoma, but the specific molecular alterations and pathways involved in carcinogenesis are yet to be elucidated. **Objective:** This review aimed to explore the role of proteomes of known oral bacteria in carcinogenesis at molecular level. **Methods:** Relevant articles were searched through electronic databases at MEDLINE/Pubmed, EBSCOHost and Web of Science from 2017 to March 2024. **Results:** Three periodontal pathogens, *Porphyromonas gingivalis*, *Fusobacterium nucleatum* and *Treponema denticola*, are involved in cancer development. They express lipopolysaccharide, gingipain, FimA, mfa1, outer membrane vesicles, nucleoside diphosphate kinase, FadA, and *Treponema denticola* chymotrypsin-like protease, which cause cancer via five different mechanisms: inflammation, inhibition of apoptosis, production of carcinogenic substances, cellular proliferation and cellular invasion. **Conclusion:** Periodontitis and oral squamous cell carcinoma are linked through periodontal pathogens, which express various proteins. This highlights the importance of maintaining periodontal health to reduce to the risk of oral squamous cell carcinoma and improve disease outcomes.

Keywords: Proteomics. Periodontitis. Oral cancer. Oral bacteria. Oral squamous cell carcinoma. Periodontal bacteria.

Association between chronic periodontitis and formation of neutrophil extracellular traps in patients with depression, anxiety and stress: a cross-sectional study

Pragya Atray¹, Ashita S Uppoor², Sangeeta Nayak³, Madhumitha M⁴

¹ Department of Periodontology, Manipal College of Dental Science Mangalore, Manipal Academy of Higher Education, Manipal, India.

² Professor and Dean, Manipal College of Dental Science Mangalore, Manipal Academy of Higher Education, Manipal, India.

³ Professor and Head, Department of Periodontology, Manipal College of Dental Science Mangalore, Manipal Academy of Higher Education, Manipal, India.

⁴ Post graduate student, Department of Periodontology, Manipal College of Dental Science Mangalore, Manipal Academy of Higher Education, Manipal, India.

Abstract

Background: Several studies have explored the relationship between systemic health and periodontitis, but the link with depression, anxiety, and stress remains unclear. **Objectives:** This study aims to evaluate the effect of periodontal disease and the formation of neutrophil extracellular traps (NETs) in patients with and without depression, anxiety, and stress. **Materials & Methodology:** In this cross-sectional study, patients were divided into four groups: healthy individuals (Group I), patients with depression, anxiety, or stress (Group II), patients with chronic periodontitis (Group III), and patients with both conditions (Group IV). The severity of conditions was assessed using the DASS-21 scale, while periodontal parameters like plaque index (PI) and gingival index (GI) were measured. Salivary neutrophil elastase (NE) levels were analyzed using ELISA to assess NETs formation. **Results:** The highest average PI and GI were observed in Group IV. Patients with the most severe depression, anxiety, and stress had very poor periodontal status. Salivary analysis showed the highest NETs presence in Group IV, though the difference was not statistically significant. **Conclusion:** Inflammatory destruction via NETosis correlates with disease severity. Patients with both periodontitis and psychological distress (Group IV) exhibited the highest NETs levels and the most severe periodontal conditions and DASS-21 scores, highlighting the significant impact of mental health on periodontal disease.

Keywords: Periodontitis. Neutrophils. Depression. Extracellular traps. Inflammation.

Metagenomic analysis of implant and adjacent tooth microbiome in patients with periodontitis history

Sim NCW¹, Mohamad Hassan NH¹, Al-Maleki AR², Safii SH¹

¹ Department of Restorative Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

² Department of Medical Microbiology, Universiti Malaya, Kuala Lumpur, Malaysia.

Abstract

Background: Patients with a history of periodontitis, even those receiving supportive periodontal care, are at increased risk of peri-implant biological complications compared to periodontally healthy individuals. **Objective:** The study aimed to investigate the supra-mucosal and supragingival microbiome surrounding dental implants and adjacent tooth in patients with a history of periodontitis and periodontally healthy individuals. **Materials & Methodology:** This is a triple-blinded randomized clinical trial where a total of 24 subjects participated: 11 with a history of periodontitis (test group) and 13 periodontally healthy individuals (control group). Each subject received one of the two types of dental implants characterized by different surface modifications—sandblasted large grit acid-etched (SLA) or precision dimension laser-treated (PDL). Implants and crowns were placed according to the standard protocol. Dental biofilms were sampled around the adjacent teeth (supragingival) at four time points: baseline (V1), three months post-implant placement (V4), at zirconia crown placement (V6), and three months after crown placement (V8). For the implants (supra-mucosal), it was sampled at V6 and V8. Bacterial microbiome were analyzed using Illumina MiSeq sequencing. **Results:** At V8, the supra-mucosal microbial community on SLA implants in the test group significantly differed from that of the control group ($p < 0.05$). A longitudinal microbial shift indicative of dysbiosis was observed on SLA implants ($p < 0.05$) and the adjacent teeth ($p < 0.05$) in the test group between V6 and V8. In contrast, no significant changes were observed on PDL implants or the adjacent teeth in both groups over the same period ($p > 0.05$). Co-occurrence network analysis at V8 revealed an increased abundance of disease-associated bacteria and a reduction in health-associated bacteria in the test group (SLA implants and adjacent teeth). In the control group with SLA implants, health-associated bacteria remained dominant. **Conclusion:** The implant surface characteristics and prosthetic components may be important risk factors for microbiome dysbiosis in individuals with a history of periodontitis.

THERAPEUTICS

Basic Science Scientific Poster

Healing of tooth extraction sockets enhanced by ellagic acid in rat - a histological and immunohistochemical study

Fouad H. Al-Bayaty¹, M. Jamil Al-Obaid²

¹ Faculty of Dentistry, Department of Periodontology, MAHSA University, Selangor, Malaysia.

² Science Department, University of Technology and Applied Sciences, Rustaq, Oman.

Abstract

Background: After the process of tooth extraction, the resorption of alveolar bone may occur, Phenolic compounds such as ellagic acid have been considered as the most important bioactive compounds, which are responsible for bone health effects. **Objective:** This study has attempted to evaluate the effects of ellagic acid (EA) on alveolar bone healing after tooth extraction in rats. **Materials and methods:** Twenty-four Sprague Dawley were anesthetized for the extraction of the upper left incisor. Then, the rats were divided into two groups, comprising twelve rats each; the first group has been considered as a control group and was given only normal saline, whereas the second group (treated group) was intragastrical administrated with EA daily once, for 28 days. Then three rats from each group were selected on 7th, 14th, 21st, and 28th days to dissect their maxilla tissue for histological observation. The tissues were fixed, decalcified and embedded in paraffin. sections were taken for immunohistochemical analysis to assess osteocalcin (OSC) and osteopontin (OPN). Furthermore, Malondialdehyde (MDA) and superoxide dismutase (SOD) were measured in homogenate gingival maxilla tissue of rat by commercial kit. **Results:** Based on the histological analysis we have identified that EA treatment has induced earlier trabecular bone deposition in the treated group, resulting in more organized bone matrix on the 14th, 21st, and 28th days after tooth extraction, as against the control group. In comparison to control group, the positive labeling of OSC and OPN of the treated group have been highly expressed in the alveolar socket on 14th, and 21st days, which indicated the possibility of formation of new bone trabeculae at the beginning of the mineralization process, after tooth extraction. In the EA treatment group, lipid peroxidation (MDA) was significantly decreased ($P < 0.05$), as opposed to the control group. However, the antioxidant defense enzyme (SOD) was significantly increased in the maxilla tissue treated with EA ($P < 0.05$), compared to control group, which suggests that, after tooth extraction, EA plays an important role in the protection against the induction of lipid peroxidation, particularly after 28 days of treatment with EA. **Conclusion:** this study has concluded that EA may accelerate the healing process in the teeth socket of rats. Furthermore, the EA treated group showed a stronger positive immunolabeling for OSC and OPN, when compared with the control group.

Keywords: Antioxidant. Ellagic acid. Teeth socket. Alveolar bone. Osteocalcin. Osteopontin.

Gingival fibroblast behavior in antibiotic fortified injectable platelet rich fibrin environment

Kranti Konuganti¹, Ashwini¹, Aishwarya Shetty¹

¹ Department of Periodontology, Faculty of Dental Sciences, Ramaiah University of Applied Sciences, MSR Nagar, MSRT Post, Bengaluru -560054, Karnataka State, India.

Abstract

Background: Injectable platelet rich fibrin (i-PRF) is the liquid form of PRF which is obtained by low-speed centrifugation and has the capacity to stimulate tissue regeneration. With the addition of antibiotics to i-PRF, the resultant platelet concentrate would have an enhanced antibacterial property and furnish better results in periodontal regenerative surgeries. **Objectives:** This study aims to evaluate the effect of antibiotic infusion in injectable platelet rich fibrin(i-PRF) as a carrier matrix on the gingival fibroblasts. **Materials and Methods:** An in vitro experimental study was conducted to evaluate the regenerative potential of the antibiotic infused i-PRF when compared to i-PRF alone. Blood was collected from 5 participants following which i-PRF and its antibiotic infusion was formulated. Antibiotics infused were 5mg/ml Amoxicillin Group-1 and Group 2 was i-PRF alone. The groups were subjected to cell viability and migration assays with gingival fibroblast cell line. **Results:** Statistical significant results was noticed in antibiotic infused i-PRF in Group 2 which showed highest cell viability and mobility of the gingival fibroblasts when compared to i-PRF alone in Group 1. The multiple comparison of the mean differences of the migration distance between the groups at 48 hours obtained were highly statistically significant for both the Groups. **Conclusion:** Within the limitations of the present study, it can be concluded that the modified i-PRF preparation may be used to reduce the risk of post-operative infection in addition to the beneficial healing properties of i-PRF.

Exploring intermittent fasting's role in mitigating periodontal bone loss: an initial study in rats

Nirmal Kumar Kunji Krishnan¹, Nik Madihah Nik Azis¹, Norliwati Ibrahim², Badiah Baharin¹

¹ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Malaysia.

² Department of Craniofacial Diagnostics & Biosciences, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Malaysia.

Abstract

Background: Intermittent fasting (IF) is recognized for its ability to lower inflammation and possibly enhance general well-being. Considering the strong connection between systemic health and periodontal disease—where decreased inflammation contributes to improved outcomes—this study explores IF's potential to support periodontal health. Periodontal disease, driven by bacterial-triggered inflammation and tissue breakdown, increases the likelihood of tooth loss. Although IF's broader physiological effects are well-documented, its specific impact on periodontal tissues remains underexplored. **Objectives:** This initial study seeks to examine how intermittent fasting influences alveolar bone loss in a rat model of periodontitis, employing 2D radiographic imaging for assessment. **Method:** Eight male Sprague-Dawley rats were organized into four groups: (1) periodontitis with intermittent fasting (P+/F+), (2) periodontitis without fasting (P+/F-), (3) no periodontitis with fasting (P-/F+), and (4) no periodontitis without fasting (P-/F-). Periodontitis was established by securing ligatures around the right maxillary second molars. Fasting rats followed an alternate day feeding pattern, while non-fasting rats had constant food availability. After 30 days, ligatures were removed, and fasting persisted for an additional 60 days. Post-euthanasia, alveolar bone loss was quantified using 2D radiographic imaging, measuring from the cemento-enamel junction to the alveolar bone crest. **Results:** One-Way ANOVA analysis identified notable differences in alveolar bone levels across groups ($F(3,4) = 11.13$, $p = 0.021$). Rats with periodontitis showed greater bone loss than those without. Among the periodontitis groups, fasting rats (P+/F+) had less bone loss (0.072 ± 0.099 mm) compared to non-fasting rats (P+/F-) (0.088 ± 0.085 mm), though this reduction lacked statistical significance. **Conclusion:** This preliminary research proposes that intermittent fasting could help shield against alveolar bone loss in periodontal disease, pointing to its promise as a safe, non-medication-based option. The observed weight reduction in fasting rats may also aid in addressing obesity and periodontal disease management.

Phytochemical profiling and anti-inflammatory potential of *Ganoderma lucidum* extracts for periodontitis: insights from HPLC analysis

Nor Idayanti Abd Rahman¹, Hafizul Izwan Mohd Zahari¹, Khor Goot Heah^{2,3}

¹ Department of Periodontology, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Malaysia.

² Department of Preclinical Science Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Malaysia.

³ Oral and Maxillofacial Disease Research Group, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Malaysia.

Abstract

Aim: This study aimed to characterize the solvent-dependent phytochemical profiles of *Ganoderma lucidum* (GL) cultivated in Malaysia and evaluate their potential relevance to periodontitis management through comparative HPLC analysis. **Materials and Methods:** GL mushrooms from Selangor, Malaysia (GanoFarm) were extracted with three solvents of varying polarities: dichloromethane (DCM), methanol, and ethyl acetate. High-performance liquid chromatography (HPLC) was used to profile the compounds, with tentative identification based on comparisons to published data from GL studies in Asia and South America. **Results:** HPLC analysis revealed distinct phytochemical profiles across extraction solvents. The DCM extract exhibited the highest diversity of mid- to low-polarity metabolites, with retention times aligning with lucidenic acid derivatives reported in other GL strains. Methanol extracts showed peaks consistent with polar triterpenoids, such as ganoderic acid analogs—compounds previously associated with anti-inflammatory activity in periodontal models. Ethyl acetate extracts displayed fewer peaks, suggesting limited efficiency in extracting low-polarity compounds. Comparative analysis indicated that Malaysia-cultivated GL shares retention time similarities with Asian strains, particularly in methanol extracts, but diverges from Brazilian GL, which emphasizes polysaccharides. These findings align with broader studies where GL triterpenoids suppressed pro-inflammatory markers like TNF- α and IL-6 by 40–60%, highlighting cross-regional anti-inflammatory potential. **Conclusion:** *Ganoderma lucidum* extracts, especially those from DCM and methanol, contain compounds consistent with anti-inflammatory substances found in GL worldwide. While regional differences in chemical composition exist, similarities in compound patterns across studies suggest GL's potential for managing periodontitis. Solvent choice significantly affects compound extraction, highlighting the importance of selecting appropriate methods. Future studies should prioritize *in vitro* and *in vivo* validation of these extracts to assess their mechanistic efficacy in modulating pro-inflammatory cytokines (e.g., TNF- α , IL-6) and inhibiting osteoclastogenesis, pivotal pathways in periodontitis pathogenesis.

Antibacterial effects of ginger extracts on periodontopathic bacteria

Yuki Shinoda-Ito¹, Hideyuki Aoki², Masahiro Ito¹, Jingbo Zhang¹, Atsushi Ikeda³, Kazuhiro Omori¹, Shogo Takashiba¹

¹ Okayama University, Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama, Japan.

² Ikeda tohka Industries Co., Ltd, Fukuyama, Hiroshima, Japan.

³ Okayama University Hospital, Division of Dentistry, Okayama, Japan.

Abstract

Background: Ginger (*Zingiber officinale*), a perennial herb widely cultivated worldwide, contains bioactive compounds such as [6]-gingerol and [6]-shogaol. While [6]-gingerol is predominant in fresh ginger, [6]-shogaol forms during heat processing. Both have demonstrated antimicrobial properties; however, little is known about their optimal concentration for effectiveness against periodontopathogenic bacteria. **Objectives:** This study aimed to evaluate the in vitro antibacterial effects of ginger extracts (GE) with varying concentrations of shogaol and gingerol on *Aggregatibacter actinomycetemcomitans* (Aa), *Porphyromonas gingivalis* (Pg), and *Fusobacterium nucleatum* (Fn). **Methods:** Three types of GE, specifically FX (0.17% shogaol, 0.27% gingerol), E (2.30% shogaol, 0.60% gingerol), and G2 (0.30% shogaol, 2.30% gingerol), were dissolved in phosphate-buffered saline. Antibacterial activity was assessed using agar disk diffusion, ATP quantification, and bacterial viability assessed by dual-fluorescence staining. Morphological changes were observed through fluorescence and scanning electron microscopy (SEM). Cytotoxicity toward human gingival keratinocytes (HGK), fibroblasts (HGF), and human monocytic THP-1 cells was evaluated using a tetrazolium-based assay. **Results:** Extracts E and G2 inhibited Pg and Fn at concentrations of ≥ 10 mg/mL, similar to 1% povidone-iodine, and Aa at ≥ 20 mg/mL, though with reduced efficacy. FX showed no antimicrobial activity. Only the 100 mg/mL concentrations of E and G2 produced inhibition zones on agar. Viability decreased concentration-dependently, and SEM revealed bacterial lysis in samples treated with E and G2. Cytotoxicity was observed for E and G2 at ≥ 1 mg/mL in all cell types, and for FX at ≥ 20 mg/mL (HGK, HGF) or ≥ 30 mg/mL (THP-1), which is comparable to 1% povidone-iodine. **Conclusion:** Ginger extracts containing shogaol and gingerol demonstrated bactericidal effects against periodontopathogenic bacteria and may present potential for oral infection control.

Impact of *Hibiscus sabdariffa* on alveolar bone microarchitecture in a ligature-induced periodontitis model with osteoporosis

Nurul Yasmin Aminuddin^{1,2}, Badiah Baharin¹,
Putri Ayu Jayusman³, Nurul Syaquinah Nasruddin³

¹ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, Kuala Lumpur 50300, Malaysia.

² Oral Health Division, Ministry of Health, Putrajaya 62590, Malaysia.

³ Department of Craniofacial Diagnostic and Biosciences, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, Kuala Lumpur 50300, Malaysia.

Abstract

Background: Periodontitis and osteoporosis are chronic bone-related conditions that may share pathogenic mechanisms, with osteoporosis potentially exacerbating the progression of periodontitis. Although bisphosphonates offer therapeutic benefits, their risk of osteonecrosis limits long-term use. *Hibiscus sabdariffa*, rich in anthocyanins with antioxidant and antimicrobial properties, presents a potential natural alternative. However, its role in mitigating alveolar bone loss in osteoporotic periodontitis remains underexplored. **Objective:** To evaluate the potential of *H. sabdariffa* in mitigating alveolar bone loss in ovariectomized rat models with periodontitis. **Method:** Thirty-five female Sprague Dawley rats were randomly divided into five groups: baseline (n=3), sham-operated (SO; n=8), ovariectomized with ligature-induced periodontitis (OVX+EP; n=8), OVX+EP treated with zoledronic acid (ZLD; 0.1 mg/kg, intraperitoneally, twice weekly; n=8), and OVX+EP treated with *H. sabdariffa* extract (HSE; 100 mg/kg, orally, daily; n=8). Osteoporosis was induced via bilateral ovariectomy, and periodontitis was established six weeks later through ligature placement on the maxillary second molars. Treatments were administered for four weeks. Following euthanasia, maxilla were harvested for micro-CT analysis. Alveolar bone loss was measured as the distance from the cemento-enamel junction to the alveolar crest, while trabecular microarchitecture was assessed in the interradicular region of the left maxillary second molar. **Results:** The OVX+EP group showed the greatest alveolar bone loss, confirming aggravated periodontal damage in osteoporotic conditions. Both HSE and ZLD reduced bone loss, with ZLD showing greater effect. HSE had lower bone volume fraction than ZLD but higher than SHAM, indicating partial bone preservation. Trabecular thickness was lowest in HSE, while ZLD and OVX+EP showed moderate values. HSE significantly reduced trabecular separation ($p<0.05$) and had the highest trabecular number, suggesting improved trabecular connectivity and formation despite reduced bone volume. **Conclusions:** *H. sabdariffa* may help prevent alveolar bone loss in ovariectomized rats with periodontitis by preserving trabecular bone microarchitecture. It shows potential as an adjunctive therapy for managing periodontal disease under osteoporotic conditions.

Formulation and evaluation of natural extract-based oral gels for periodontitis: a scoping review of *in vitro* studies

Wesley Joel Tan¹, Hafizul Izwan Mohd Zahari¹, Khor Goot Heah¹, Zatilfarihiyah Rasdi¹

¹ Centre of Periodontology Studies, Faculty of Dentistry, Universiti Teknologi Mara, Sungai Buloh Campus, 47000 Selangor, Malaysia.

Abstract

Background: Natural extracts are increasingly explored as therapeutic alternatives in periodontal treatment. One mode of delivery for these agents is through oral gels. However, a clear overview of such gel formulations and their *in vitro* evaluation methods remains lacking. **Objective:** This scoping review of *in vitro* studies aims to identify and describe current formulation strategies, testing approaches, and methodological trends in natural extract-based oral gels intended for periodontal application. **Methods:** A systematic search was conducted in Scopus, PubMed, and Web of Science using combinations of terms including natural extract, oral gel, formulation, *in vitro*, and periodontitis. Review articles, *in vivo*-only studies, and clinical trials were excluded. **Results:** Fourteen *in vitro* studies met the inclusion criteria. Carbopol was the most frequently used gel base, followed by hydroxypropyl methylcellulose (HPMC), chitosan, and thermoresponsive polymers. Cold dispersion and pH adjustment were the most common preparation methods, with some studies incorporating nanoparticle systems or multi-polymer blends. Antimicrobial activity was assessed in 12 studies, while fewer investigated cytotoxicity, mucoadhesion, or drug release. Four studies reported chemical standardization of the extract. Most studies focused on either formulation development or bioactivity testing, but none encompassed all key stages of preclinical gel development. **Conclusion:** Despite heterogeneity in aims and methods, the included studies reflect trends in current formulation and evaluation practices in the *in vitro* development of natural extract-based gels for periodontitis. The review also highlights underreported areas, including mucoadhesion, drug release profiles, and extract standardization. These findings may inform the design of future formulation studies in this domain.

Implant mechanics, biological milieu and peri-implantitis: new insights

Sarah Mariam¹

¹ Department of Periodontology, Bharati Vidyapeeth (Deemed to be University), dental college and hospital, Pune, India.

Abstract

Background: Dental implants constitute an important treatment modality for rehabilitating edentulous and partially edentulous arches. With more implant systems in the market, understanding the micromechanical and microflora related aspects of implants is crucial in understanding this indispensable therapy. Mechanical components of implants have a role to play in forming various bacterial niches that can shift the balance in favor of peri-implantitis and subsequent implant failure. **Objectives:** Purpose is to assess role of mechanical and biological aspects influencing peri-implant and intra-implant environment. It also focuses on advanced molecular techniques like metagenomics and transcriptomics in peri-implantitis. **Methods:** A comprehensive literature review search was carried out using electronic databases such as PubMed, Scopus, Web of Science, Embase, and Google Scholar. The search included keywords such as dental implants, dental abutments, oral microbiota, implant failure, peri-implantitis, metagenomics and transcriptomics. Research material included observational, interventional studies, systematic reviews / meta-analysis published up to June 2025 in the English language which analysed the possible relationship between implant biomechanics, microflora, and implant failure. **Results:** Both mechanical and biological factors in seclusion or together predispose to implant failure. Newer technological advances have paved the way for advanced techniques to identify the not-so-common flora causing peri-implantitis and subsequent implant failure. **Conclusion:** This summarizes various mechanical factors like the type of screw material, sealing agent, preload, implant torque, and micro-gap in defining implant dynamics. It also discusses various biological factors like bacteria causing periodontitis and peri-implantitis, microleakage around various implant abutment interfaces, oral microbiome, and advanced techniques of metagenomics. Selecting an ideal sealing material is paramount to avoid any unforeseen clinical developments.

BIOMATERIALS

Basic Science Scientific Poster

Investigating the angiogenesis of a three-dimensional hydroxyapatite-palm oil scaffold for bone healing

Chen X.¹, Nik-Azis N. M.², Masri S.², Razali M.²

¹ Dean's Office, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.

² Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.

Abstract

Goals: This study aimed to evaluate the pro-angiogenic capacity of a novel hydrogel-based bone scaffold composed of three-dimensional bioprinted hydroxyapatite-acrylated palm olein (3D-HA-APO) composite by assessing vascular endothelial growth factor (VEGF) expression in human umbilical vein endothelial cells (HUVECs). **Materials and Methods:** Three scaffold formulations (G1: 5% hydroxyapatite, G2: 7% hydroxyapatite, G3: 10% hydroxyapatite) were fabricated using optimized hydrogel bioinks containing acrylated palm olein, alginate, and chitosan. HUVEC were seeded on each scaffold and in the leachate medium for four days. VEGF expression in the scaffold supernatant and leachate medium was quantified using enzyme-linked immunosorbent assay (ELISA). Statistical analyses were performed using the one-way analysis of variance (ANOVA) based on normality and variance assessments. **Results:** Quantitative analysis showed statistically significant differences in VEGF expression among the three groups seeded on scaffolds ($p = 0.0029$, One-way ANOVA). G1 exhibited the highest VEGF levels (mean OD = 0.217 ± 0.074), followed by G2 (0.156 ± 0.031) and G3 (0.132 ± 0.035). In contrast, VEGF levels in leachate medium did not differ significantly among groups ($p = 0.254$, One-way ANOVA). The ELISA curve demonstrated excellent reliability ($R^2 = 0.998$). **Conclusion:** Among the three formulations, G1 emerged as the optimal scaffold for promoting angiogenic signaling in vitro. These findings suggest that lower hydroxyapatite content enhances pro-angiogenic activity and provide a basis for future studies related to osteogenic and angiogenic properties of 3D-HA-APO.

Molecular characterisation of benzyl isothiocyanate (BITC) against periodontal pathogens

Nor Haliza Mat Baharin¹, Nurul Jannah Abd Rahman², Nadrahtul Huda Misral², Emma Izzati Zakariah³, Nusairah Ramli⁴, Ummu-Hani Abas², Juliana Jumal⁵

¹ Department of Periodontology and Community Oral Health, Faculty of Dentistry, Universiti Sains Islam Malaysia, Kuala Lumpur, Malaysia.

² Pusat Tamhidi, Universiti Sains Islam Malaysia, Nilai, Malaysia.

³ Department of Chemical Sciences, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, Bangi, Malaysia.

⁴ Faculty of Quranic and Sunnah, Universiti Sains Islam Malaysia, Nilai, Malaysia.

⁵ Faculty of Science & Technology, Universiti Sains Islam Malaysia, Nilai, Malaysia.

Abstract

Background: *Salvadora persica* (miswak) exhibits natural antibacterial properties that help reduce plaque and support oral health. Among its bioactive constituents, benzyl isothiocyanate (BITC) is recognised as the primary compound responsible for its antimicrobial activity against oral pathogens. **Objective:** To evaluate the inhibitory potential of BITC against *Porphyromonas gingivalis* and *Aggregatibacter actinomycetemcomitans*, using quantitative assays and in silico molecular docking. **Methodology:** BITC concentration in miswak was quantified via High-Performance Liquid Chromatography (HPLC). Separation was achieved on reverse phase C18 (250 mm × 4.6 mm) column with a mobile phase comprising acetonitrile and water (1:1). The detection was carried out at 190 nm using ultra violet-visible detector. The flow rate was kept at 1 mL/min. Molecular docking was conducted using AutoDock Vina, with UCSF Chimera employed for structure preparation and visualization, to evaluate interactions between BITC and four key periodontal bacterial proteins (PDB ID: 1CVR, 3H8T, 3M1H, 2F2F). **Results:** HPLC analysis confirmed the presence of BITC in miswak extract. A sharp and well-defined peak was obtained at the retention time of 9.322 ± 0.3 min, consistent with the standard benzyl isothiocyanate (BITC) peak. Molecular docking demonstrated good binding affinities between BITC and four key periodontal bacterial proteins (PDB ID: 1CVR, 3H8T, 3M1H, 2F2F), with binding energies ranging from -4.9 to -5.2 kcal/mol, suggesting its potential to inhibit critical bacterial functions involved in periodontal disease. **Conclusion:** The inhibitory potential of BITC against *P. gingivalis* and *A. actinomycetemcomitans* is demonstrated as evidenced by quantitative and molecular docking analyses. These results suggest that BITC may have therapeutic value, supporting further investigation into its role in evidence-based periodontal therapy.

Multimodal evaluation of quaternary ammonium silane induced structure and functional changes in biofilms and periodontal ligament stem cells

Ranjeet Ajit Bapat¹, Seow Liang Lin¹, Khoo Suan Phaik²,
Spoorthi Ravi Banavar², Umer Daood¹

¹ Restorative Dentistry Division, School of Dentistry, IMU University Kuala Lumpur, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Bukit Jalil, Wilayah Persekutuan Kuala Lumpur, Malaysia.

² Division of Clinical Oral Health, School of Dentistry, IMU University Kuala Lumpur, 126, Jalan Jalil Perkasa 19, Bukit Jalil, 57000 Bukit Jalil, Wilayah Persekutuan Kuala Lumpur, Malaysia.

Abstract

Background: Elimination of bacterial biofilms from the tooth surface possesses a great challenge by mechanical debridement. Chemical adjunct prevents recurrence of infection and progression of endo-perio lesions. **Objective** This study evaluated the antibacterial efficacy of a novel quaternary ammonium silane (K21-0.5% and 1%) and CHX against single-species biofilm of keystone periodontal pathogen *Porphyromonas gingivalis*, dual-species biofilm of *P. gingivalis* and *Fusobacterium nucleatum* and assess its effect on viability on human periodontal ligament stem cells (hPDLSCs). **Methodology:** The K21 solution was developed with sol-gel technique and concentration of 0.5% and 1% concentration (w/v) was obtained. Minimum inhibitory concentration (MIC) was performed using broth dilution method. Bacterial reduction of was quantified via Colony Forming Unit counts, Scanning Electron Microscopy (SEM), and Transmission Electron Microscopy (TEM) for K21 groups and CHX group. Viability of hPDLSCs was also measured using Alamar Blue assay, and cellular morphology was analyzed via SEM and TEM. **Results:** Both 0.5% and 1% K21 exhibited significantly greater antibacterial efficacy than saline ($p < 0.001$) and CHX ($p < 0.05$) for *P. gingivalis* and dual biofilms. For *P. gingivalis* biofilms, at 1%K21 (mean CFU = 3.9831 ± 0.10972), it was significantly more effective than CHX (5.1798 ± 0.39327) $p < 0.05$. Against dual biofilm, comparative analysis showed 1%K21 had mean difference = 1.42958 vs CHX ($p < 0.001$). SEM depicted membrane rupture while TEM showed membrane blebbing with the biofilms compared to CHX group. K21 also maintained increased viability at 30 mins application (1%K21 = 81.13%) compared to CHX group (80.16%). SEM and TEM depicted K21 group maintained the hPDLSCs cell morphology compared to CHX group confirming better biocompatibility. **Conclusion:** 1%K21 demonstrated potent antibacterial activity, significantly reducing pathogenic biofilms while maintaining high hPDLSCs viability. Its efficacy surpassed CHX, with superior biocompatibility, supporting its potential as a safer biomaterial in dental application.

Graphene oxide based antimicrobial coating for titanium to prevent peri-implantitis

Gen Kano¹, Keisuke Okubo², Masato Komoda³, Kimito Hirai¹, Yuki Shinoda-Ito¹, Shin Nakamura¹, Atsushi Ikeda², Kazuhiro Omori¹, Yuta Nishina³, Shogo Takashiba¹

¹ Okayama University, Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama, Japan.

² Okayama University Hospital, Division of Dentistry, Okayama, Japan.

³ Okayama University, Institute for Basic Science in Different Fields, Okayama, Japan.

Abstract

Background: Peri-implantitis, an inflammatory condition associated with dental implants, presents significant clinical challenges due to biofilm formation and the difficulty of fully decontaminating implant surfaces. Current treatment methods are often limited in effectiveness, and reinfection is common. As the population of elderly and immunocompromised patients grows, the need for advanced infection control measures is increasing. Graphene oxide (GO), a nanomaterial with a large surface area and abundant oxygen-containing functional groups, has gained attention for its ability to enhance antimicrobial retention and sustained release. **Objectives:** This study aimed to evaluate the antibacterial efficacy and surface retention of a composite of cetylpyridinium chloride (CPC) and GO (CPC-GO) applied to titanium plates, mimicking dental implant surfaces, to assess its potential in preventing peri-implant infections. **Method:** GO (1.0% w/v) was synthesized and reacted with CPC to prepare CPC-GO. Titanium plates were immersed in CPC-GO or control solutions (PBS, CPC, GO, ethanol) for 30 minutes, rinsed with PBS, and air-dried. *Streptococcus mutans* (ATCC 25175) was cultured, and titanium specimens were incubated in bacterial suspensions (1×10^5 CFU/mL) for 12 hours. Bacterial ATP levels were quantified using a luciferase-based bioluminescence assay. Raman spectroscopy assessed molecular structures on the surfaces, and UV-Vis spectroscopy measured CPC release into pure water after 1 and 48 hours. Statistical analysis was performed using one-way ANOVA ($p < 0.05$). **Results:** CPC-GO significantly suppressed bacterial ATP levels at CPC concentrations $\geq 0.1\%$ compared to the negative control. Raman spectra of CPC-GO-treated plates displayed distinct peaks around 1,450 and 1,580 cm^{-1} , indicating GO presence. UV-Vis analysis showed no detectable CPC release peak at 260 nm after 48 hours in CPC-GO-treated plates, whereas CPC-only specimens showed clear peaks. **Conclusions:** CPC-GO demonstrated stable antibacterial activity on titanium surfaces by anchoring CPC via GO. These findings suggest its potential as a long-lasting antimicrobial coating for dental implants, supporting further research into its broader applications.

Micro-CT and histological analysis following three-dimensionally bioprinted hydroxyapatite–gelatine scaffold treatment in periodontal defects: an animal study

N.H. Junaidi^{1,2}, N. Mohd¹, M.B. Fauzi^{3,4}, M. Razali¹

¹ Universiti Kebangsaan Malaysia, Department of Restorative Dentistry, Faculty of Dentistry, Kuala Lumpur, Malaysia.

² Oral Health Division, Putrajaya, Malaysia,

³ Universiti Kebangsaan Malaysia, Department of Tissue Engineering and Regenerative Medicine, Cheras, Malaysia,

⁴ Advance Bioactive Materials-Cells UKM Research Group, Universiti Kebangsaan Malaysia, Bangi, Malaysia.

Abstract

Background: Periodontitis often leads to soft and hard tissue defects around the affected teeth, if untreated. Periodontal regeneration can be an option but current modalities often yield unpredictable outcomes. Three-dimensional (3D) bioprinting offers a promising alternative by enabling the fabrication of structurally stable, defect-specific scaffolds for tissue regeneration. **Objectives:** This study aimed to investigate the periodontal regenerative potential of a 3D-printed hydroxyapatite–gelatine scaffold (3D-HA-Gel) in a rat model using both radiographic and histological evaluations. **Materials and Methods:** Twenty-four male Sprague-Dawley rats were randomly assigned into four groups: 3D-HA-Gel, 3D-printed gelatine scaffold (3D-Gel), hydroxyapatite granules (HA), and unfilled defects (UD). An additional rat was used to develop a surgical template. A standardized 3 mm × 2 mm buccal bone defect was created at the right mandibular first molar region of each rat. After 8 weeks, animals were sacrificed for analysis. Micro-computed tomography (micro-CT) was performed to evaluate bone mineral density (BMD) and bone volume fraction (BV/TV). Histological evaluation using hematoxylin and eosin (H&E) and Masson's trichrome (MT) staining was conducted to assess the formation of new periodontal ligament and cementum. **Results:** Micro-CT analysis revealed that the 3D-HA-Gel group exhibited the highest mean BMD (91.68 ± 10.60), while the HA group showed the highest bone volume fraction ($76.06 \pm 13.02\%$). However, these differences were not statistically significant. Histological examination of the 3D-HA-Gel group demonstrated newly formed periodontal ligament fibers (H&E) and confirmed the presence of new cementum and organized connective tissue attachment (MT). **Conclusions:** Although radiographic findings did not reach statistical significance, histological evidence suggests that the 3D-HA-Gel scaffold promotes periodontal regeneration, particularly the formation of new periodontal ligament and cementum. These findings underscore the potential of 3D-HA-Gel as a biomaterial for periodontal tissue engineering and highlight the need for further studies with larger sample sizes to validate its clinical applicability.

SEM-based surface characterization of calcium sulfate–chitosan scaffolds for periodontal bone regeneration: a comparative study

Ashiatun Naim Zamaili¹, Nurul Aida Ngah², Farha Ariffin¹

¹ Center of Studies for Periodontology, Faculty of Dentistry, Universiti Teknologi MARA.

² Center of Studies for Oral and Maxillofacial Surgery, Faculty of Dentistry, Universiti Teknologi MARA.

Abstract

Introduction: Scaffold-based approaches aiming for periodontal bone regeneration rely on biocompatible materials that replicate the structural and biological properties of native bone. An ideal scaffold should possess adequate structural support while facilitating cellular infiltration, vascularization, and osteogenesis through an interconnected porous network and appropriate surface roughness. Calcium Sulfate (CS) and Chitosan (CHT) are widely recognized biomaterials with potential regenerative capacity. In combination, these materials may offer synergistic advantages; however, their surface characteristics when formulated together remain underexplored. **Objective:** This study aimed to characterize and compare the microarchitecture, porosity, crystallization, and surface roughness of different CS and CHT formulations as potential biomaterials for bone regeneration. **Methodology:** Six scaffold groups were fabricated, including the combination of CS and CHT in varying formulation ratios, which are CS100, CHT100, CS70:CHT30, CS50:CHT50, CS30:CHT70, and Ethoss as the control group. All scaffolds were analysed using Scanning Electron Microscopy (SEM) at 200× magnification to perform qualitative surface characterization relevant to regenerative performance. In addition, quantitative pore analysis—evaluating pore count and size—was conducted using the ImageJ software. **Result:** Among the groups, CS50:CHT50 exhibited the largest average pore size (33.74 μm^2) and a trabecular-like architecture with interconnected pores, moderate crystallinity, and high surface roughness—closely resembling cancellous bone. In contrast, CS100 had the smallest pore size (4.68 μm^2) and showed a dense crystalline structure with low porosity. CHT100 featured a highly porous amorphous matrix with an average pore size of 10.51 μm^2 . Ethoss showed moderate microporosity with a compact granular morphology and a pore size of 14.32 μm^2 . CS70:CHT30 and CS30:CHT70 had intermediate (19.79 μm^2) to high (10.65 μm^2) porosity, differing in structural cohesion. **Conclusion:** The CS50:CHT50 demonstrated the most favourable surface characteristics, achieving an optimal balance of porosity and structural integrity. Its morphological similarity to alveolar bone highlights a strong potential for periodontal bone regeneration, warranting further biological and mechanical assessment.

Histomorphologic features of early angiogenesis and periodontal regeneration with hydroxyapatite/palm olein composite in rabbit mandibles

Drorise Jemis^{1,2}, Nik Fatin Sarah Nik Mhd Abdul Nasser¹, Masfueh Razali¹

¹ Department of Restorative Dentistry, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.

² Ministry of Health, Oral Health Division, Putrajaya, Malaysia.

Abstract

Background: Three-dimensional (3D) scaffolds offer promise in treating periodontal bone defects by improving graft stability, promoting vascularization, and supporting bone regeneration. However, limited angiogenesis remains a key barrier to successful tissue integration. To overcome this, we developed a 3D-bioprinted scaffold composed of hydroxyapatite and a palm olein-based hydrogel (3D-HA-APO), designed to enhance vascularization and support periodontal regeneration. **Objective:** This study evaluated early blood vessel formation and periodontal tissue regeneration following treatment with the 3D-HA-APO scaffold in rabbit mandibular defects. **Materials and Methods:** The 3D-HA-APO scaffold was fabricated using extrusion-based bioprinting. Standardized 2 mm × 2 mm periodontal defects were surgically created in the mandibles of New Zealand White rabbits. Each rabbit underwent two separate surgeries, 4 weeks apart, on opposite sides of the mandible, allowing simultaneous collection of 2-week and 6-week samples at euthanasia. Defects were randomly treated with either the 3D-HA-APO scaffold (n=3), commercial hydroxyapatite granules (HA) (n=3), or left untreated (empty defect, n=3). All tissue samples were stained with hematoxylin and eosin (H&E). CD31 immunohistochemistry was performed on 2-week samples, and Masson's Trichrome staining on 6-week samples. **Results:** H&E staining of the 3D-HA-APO scaffold showed a heterogeneous arrangement of its tubular structures infiltrated with inflammatory cells, indicating early healing response. New capillaries in the 3D-HA-APO group, initially at the periphery (2 weeks) and later penetrating deeper into the scaffold (6 weeks). The microvessel lumen, lined with endothelial cells, was comparable across all groups. IHC staining exhibits positive CD31 expression, indicating interconnected endothelial structures in the 3D-HA-APO group. Masson's Trichrome staining revealed the presence of newly formed periodontal ligament fibers close to the 3D-HA-APO defects. **Conclusion:** The 3D-HA-APO scaffold supports early angiogenesis and periodontal regeneration, highlighting its potential for clinical application. Further studies are needed to evaluate its degradation profile *in vivo*.

Angiogenesis in regenerated periodontal defects utilizing implanted scaffolds in animal studies: a scoping review

Drorise Jemis^{1,2}, Nik Fatin Sarah Nik Mhd Abdul Nasser¹, Masfueh Razali¹

¹ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.

² Ministry of Health, Oral Health Division, Putrajaya, Malaysia.

Abstract

Background: The regeneration of periodontal defects is challenging due to the complex nature of the periodontium. Bone scaffolds as bone graft substitutes have evolved to recreate the bone tissue microenvironment, including biochemical and biophysical cues for early angiogenesis. **Objective:** This scoping review aimed to explore the angiogenesis pattern in regenerated periodontal defects when bone scaffolds were used in animal models. **Materials and methods:** The systematic search was conducted across three electronic databases: PubMed, EBCOHOST and Web of Science database, based on PRISMA-ScR guidelines until June 2025. The inclusion criteria were: (i) animal models undergoing periodontal defects regeneration, (ii) the intervention to regenerate bone using any types of bone substitutes as bone scaffolds with or without growth factors and (iii) *in vivo* biological assessment of angiogenesis. **Results:** A total of twelve studies were included in the review. Most studies showed evidence of angiogenesis through histological evaluation. Only one study employed immunohistochemical assessment to evaluate vascular endothelial growth factors (VEGF) expression. **Conclusion:** Angiogenesis was most evident in the periodontal regeneration area treated with bone scaffold loaded with stem cells and growth factors. Nevertheless, further comprehensive evaluation and analysis are required to fully elucidate the behavior and patterns of angiogenesis in relation to different bone scaffold constructs.

Association between halitosis and oral microbiome in denture wearers

Nabilah Amran¹, Abish Samuel Stephen², David Gillam¹, Rob Allaker²

¹ Department of Periodontology, Queen Mary University of London, London, United Kingdom.

² Blizard Institute of Cell and Molecular Science, London, United Kingdom.

Abstract

Background: Oral malodour (halitosis) is a common condition often linked to microbial activity within the oral cavity. Denture wearers, due to altered oral environments, may experience increased microbial colonization contributing to malodour. **Objectives:** This study aimed to explore the relationship between oral malodour and the oral microbiome in denture wearers, focusing on identifying volatile sulphur compound (VSC)-producing microorganisms. **Methods:** Twenty-five participants were recruited and divided into three groups: Control (non-denture wearers, n = 8), Partial Denture Wearers (n = 12), and Complete Denture Wearers (n = 5). VSC analysis by Oral Chroma was used to assess malodour. Saliva, dental plaque, tongue coating, and denture surfaces were collected, DNA was extracted and analysed via 16S and ITS marker gene nanopore sequencing to determine microbial composition. **Results:** Participants with partial dentures showed higher VSCs in oral headspace air compared to fully edentulous, with differential abundance of VSC-producing anaerobic genera such as *Porphyromonas*, *Fusobacterium*, *Prevotella* and *Capnocytophaga* higher in tongue and denture surfaces of partial denture wearers. Fungi including *Candida albicans* was also frequently identified, with denture surfaces carrying higher fungal load than other oral sites. There was also a higher fungal diversity in tongue of denture wearers compared to non-denture wearers (controls). **Conclusion:** There is a clear association between denture wearing and changes in the oral microbiome that contribute to oral malodour. Partial denture wearers, in particular, exhibited greater microbial abundance of malodour-associated species in the dentures. These findings highlight the need for improved hygiene strategies targeting denture biofilms and tongue cleaning to mitigate halitosis in denture-wearing populations.

Influence of periodontitis on netosis formation in pre-clinical and early rheumatoid arthritis

Shahbaz M¹, Vaithilingam RD¹, Al-Maleki AR², Cheah CW¹, Aziz J³, Bartold PM⁴

¹ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

² Department of Medical Microbiology, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia.

³ Department of Oral & Craniofacial Sciences, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

⁴ Department of Periodontology, University of Adelaide, Australia.

Abstract

Goal: Inflammation plays a pivotal role in development of rheumatoid arthritis (RA)-related anti-citrullinated protein antibodies (ACPA) and anti-carbamylated protein antibodies (anti-CarP). *Porphyromonas gingivalis* proteases [arginine gingipain (Rgp) and peptidylarginine deiminase (PPAD)] may induce neutrophil extracellular traps (NETs), which release key inflammatory mediators including citrullinated histone H3 (CitH3), LL-37, and myeloperoxidase (MPO). This study assessed the association between Rgp and PPAD expression, NET-associated proteins (CitH3, LL-37, MPO), ACPA, and anti-CarP in preclinical-RA (preRA), early-RA (eRA) and established RA subjects with periodontitis (PD). **Materials & Methods:** Participants from rheumatology and periodontology clinics, Universiti Malaya were divided into PD or healthy (H) groups: preRA-PD (n=10) and preRA-H (n=13); eRA-PD (n=9) and eRA-H (n=12); established RA, RA-PD (n=16) and RA-H (n=14); and nonRA-PD (n=18) and nonRA-H (n=16). Rgp and ppad gene expressions were obtained from subgingival plaque samples. Salivary and serum samples were assessed for NET-associated proteins, ACPA, and anti-CarP. Statistical analysis was performed using SPSS, with p-value<0.05 considered significant. **Results:** Rgp and ppad gene expressions were similar across PD groups and positively correlated with periodontal parameters in PD groups (p-value<0.05). In eRA-PD, serum and saliva MPO and saliva anti-CarP levels were highest; strong correlations were present between rgp with CAL (r=0.783); saliva MPO with VPI (r=0.667) and GBI (r=0.767); and saliva anti-CarP with CAL (r=0.667) and GBI (r=0.850). In RA-PD, salivary LL-37 and serum ACPA were highest (p-value < 0.05). Canonical correlation analysis demonstrated correlations between periodontal parameters with CitH3, LL-37, MPO, and anti-CarP (r>0.45, p-value<0.05). Salivary MPO and CitH3 correlated with salivary anti-CarP (r>0.45, p-value<0.05) and ACPA (r>0.45, p-value<0.05), respectively, while serum CitH3 correlated with serum ACPA (r>0.45, p-value<0.05). **Conclusion:** Rgp and ppad gene expression was closely associated with PD status. Periodontal inflammation in early stages of RA may contribute to RA-related immune responses. **Acknowledgment:** This study was funded by the Fundamental Research Grant Scheme, Ministry of Higher Education Malaysia (FRGS/1/2021/SKK01/UM/02/1).

Keywords: Periodontitis. *Porphyromonas gingivalis*. Neutrophil extracellular trap. Anti-carbamylated protein. Anti-citrullinated protein. Rheumatoid arthritis.

CLINICAL

Clinical Scientific Poster

A multi-disciplinary approach to a periodontally involved molar tooth with hemisection: clinical case report

Ayu Melisa¹, Martina Amalia², Yulia Karen¹

¹ Periodontic Residency Program, Faculty of Dentistry, Universitas Sumatera Utara, Medan, Indonesia.

² Department of Periodontics, Faculty of Dentistry, Universitas Sumatera Utara, Medan, Indonesia.

Abstract

Background: Endo-perio lesions pose a clinical challenge due to the interrelationship between pulpal and periodontal pathologies, which are frequently complicated by furcation involvement in multirooted teeth. Hemisection is a periodontal-restorative procedure indicated for multirooted teeth with localized severe periodontal damage, allowing preservation of the healthy root. This approach supports periodontal stability and alveolar bone maintenance, as an alternative to complete tooth extraction and implant replacement. **Objectives:** To report a clinical case describing the periodontal approach and treatment outcome of hemisection in a mandibular molar with a combined endodontic-periodontal lesion. **Method:** A 39-year-old female patient visited the Dental and Oral Hospital of USU with a decayed mandibular first molar and a wish to preserve the tooth. Clinical examination revealed a fractured distal root in the mandibular molar, a non-vital pulp, >6 mm periodontal pocketing at the distal root, class III furcation, and vertical bone loss. Following endodontic treatment, periodontal flap surgery and hemisection were performed to remove the compromised distal root. After healing, the stable mesial root was retained and restored with a full-coverage prosthesis. **Results:** Management of endo-perio lesions depends on accurate periodontal diagnosis, including assessment of attachment loss and furcation involvement. Hemisection is a periodontal intervention that combines thorough root debridement with consistent patient oral hygiene. Saad et al. concluded that hemisection of a mandibular molar can serve as a conservative alternative to extraction when one root is severely compromised, provided the remaining root maintains sufficient function as a healthy abutment. Park et al. suggest that hemisection can be a viable tooth-preserving alternative to extraction in patients with good oral hygiene. **Conclusions:** Comprehensive periodontal evaluation and interdisciplinary planning are crucial in managing combined endo-perio lesions. Hemisection, when appropriately indicated and combined with periodontal therapy and maintenance, can result in favorable periodontal outcomes, preservation of alveolar bone, and prolonged tooth survival in function.

Keywords: Hemisection. Endo-perio lesion. Furcation involvement. Periodontal therapy.

Periostin as a biomarker of periodontal healing in type 2 diabetic and healthy patients

Norman Mastura¹, Hidayat Faizal Hafez¹, Al-Bayaty Fouad Hussain², Abdul Hamid Hasidah³

¹ Centre of Periodontology Studies, Faculty of Dentistry, University Teknologi MARA.

² Faculty of Dentistry, MAHSA University.

³ Primary Care Clinic, Faculty of Medicine, Universiti Teknologi MARA.

Abstract

Introduction: Periodontitis is a chronic inflammatory condition marked by the progressive destruction of the tooth supporting tissues, which, if left untreated, can lead to tooth loss. Patients with type 2 diabetes mellitus (T2DM) are at increased risk of developing periodontitis and tend to experience more severe disease compared to healthy individuals. Periostin, an extracellular matrix protein found in gingival crevicular fluid (GCF), is a potential biomarker due to its role in tissue remodeling and inflammatory processes within the periodontium. This study aims to assess periostin levels in the GCF of T2DM participants and systematically healthy participants with periodontitis before and after non-surgical periodontal therapy (NSPT). **Methods:** 6 subjects with T2DM and 4 systemically-healthy subjects diagnosed with periodontitis received NSPT and reviewed after 3 months. Clinical parameters such as probing pocket depth, clinical attachment levels, bleeding on probing score and GCF was collected from the subjects at baseline and 3 months after NSPT. The levels of periostin in the GCF was analysed using ELISA. **Results:** All clinical parameters showed improvements for both control and T2DM groups 3 months after NSPT. The levels of periostin in GCF are higher in both groups (mean 0.71 pg/mL in T2DM and 0.67 pg/mL in control) after NSPT compared to baseline (mean 0.22 pg/mL in T2DM and 0.37 pg/mL in control). Higher improvement in GCF levels of periostin in T2DM group can be observed compared to systemically-healthy subjects (mean difference: 0.19 pg/mL). **Conclusion:** The findings suggest periostin may be a useful biomarker for monitoring periodontal disease progression and evaluating treatment efficacy. The changes in the levels of periostin following NSPT may reflect tissue healing and provide insight into individual treatment responses. However, the study's limitations include a small sample size and a short follow-up period. Further large-scale studies are warranted to clarify its function and to establish standardized threshold levels.

Management of recurrent gingival pyogenic granuloma in a young adult using concentrated growth factors

Nusaibah Sakinah Nordin¹, Haslina Taib¹

¹ Unit of Periodontics, School of Dental Sciences, Universiti Sains Malaysia, Kelantan, Malaysia.

Abstract

Background: Pyogenic granuloma (PG) is a benign vascular lesion commonly occurring in the gingiva due to local irritation, trauma, or hormonal influences. While surgical excision is the gold standard treatment, recurrence is still a risk. The use of concentrated growth factors (CGF) as an adjunct to the surgery might have the potential to improve wound healing. **Objectives:** To discuss a case of recurring gingival pyogenic granuloma in a young adult treated surgically with CGF, and to assess its healing and recurrence outcomes. **Methods:** A 20-year-old female patient reported a gingival swelling in the left maxillary area for more than six months. The lesion was about 8 × 5 mm in diameter, located at the interdental papilla between teeth 25 and 26, pinkish red, and easily bled on palpation. Removal was done using a diode laser, but recurrence occurred after one month. Conventional excisional biopsy with total removal of fibrotic interdental papilla was performed, and a CGF membrane was sutured over the exposed tissue to provide guided healing. **Results:** Initial healing in the first week after excisional biopsy was uneventful, with resolution of inflammation and satisfactory tissue regeneration. However, after two months, signs of recurrence were observed at the same site. The potential for an underlying hormonal imbalance was taken into consideration because of the patient's history of recurrent lesions. As the patient reported episodes of stress, referral to a medical physician and endocrinologist was suggested for further evaluation. **Conclusion:** CGF as an adjunct to surgical intervention was found to facilitate early healing at the surgical area; however, recurrence of gingival PG still occurs, presumably due to neglected systemic issues like hormonal imbalance. This instance underlines the significance of a multidisciplinary approach in addressing recurrent PG, especially in young female patients, to address both local and systemic causes of recurrence.

Effectiveness of low level laser therapy, fluoride varnish and desensitizing paste application in the treatment of dentinal hypersensitivity

Laxmi Tejaswin Polepalle¹

¹ Department of Periodontology, MAHSA University, Kuala Lumpur, Malaysia.

Abstract

Background: Dentinal hypersensitivity is a common disorder in dental practice, with existing treatments often offering only transient relief. Low-level laser therapy (LLLT) has emerged as a promising option owing to its prolonged pain-suppressing effects and growing patient acceptance. **Objective:** This study aimed to assess the immediate and sustained efficacy of LLLT, fluoride varnish, and desensitizing paste in treating dentinal hypersensitivity. **Methods:** 120 participants were randomly assigned to three treatment groups: Group 1 (LLLT), Group 2 (fluoride varnish), and Group 3 (arginine calcium carbonate paste). Evaluation using the visual analog scale (VAS) and numerical rating scale (NRS) occurred immediately after first application, at 1 week, after the second application, and at 15 days, 1 month, and 3 months. Clinical parameters, including plaque index (PI) and clinical attachment level (CAL), were assessed at baseline, 1 month, and 3 months. Various statistical methods, including descriptive statistics, paired t-tests, and repeated measures analyses of variance, were employed to comprehensively analyze the study data. **Results:** Intergroup comparisons revealed a statistically significant difference at later time points (15 days, 1 month, and 3 months), with LLLT demonstrating superior efficacy in reducing dentinal hypersensitivity compared to the other two interventions. Intragroup comparisons for clinical parameters PI and CAL exhibited statistically significant differences. However, intergroup comparisons for both clinical parameters did not indicate any statistically significant differences. **Conclusion:** This study's findings suggest that LLLT offers greater and sustained reduction in dentinal hypersensitivity over a 3-month period, outperforming sodium fluoride varnish and arginine calcium carbonate paste.

Radiographic infill of intrabony defects after non-surgical periodontal therapy: a case series

Manmeet Kaur¹, Ei Leen Lim¹

¹ Klinik Pakar Periodontik, Klinik Pergigian Anika Klang, Selangor, Malaysia.

Abstract

Background: Traditionally, intrabony defects have been viewed as a primary indication for surgical intervention due to the belief that significant bone regeneration and pocket reduction are unlikely with non-surgical approaches alone. However, some studies have shown intrabony defect infill is possible with Non-surgical Periodontal Therapy (NSPT) as a sole modality. **Objectives:** Detection of radiographical infill of intrabony defects along with improvement in clinical parameters after NSPT. **Materials and Methods:** 8 cases with Generalised Periodontitis Stage III to Stage IV were treated non-surgically. Adjunct antibiotics were prescribed if necessary. Radiographic and clinical parameters were assessed at baseline and 6 to 18 months post-NSPT. Radiographic infill was detected via measurement of the bony angle to the tooth surface using an angle measurement software while clinical parameters were obtained from clinical records. **Results:** After 6 to 18 months following NSPT significant improvements were observed in both radiographic and clinical parameters for the intrabony defects in these 8 cases. This was evidenced by an increase in the bony angle to the tooth surface, indicating a reduction in the defect depth and a more favorable bone architecture. Reduction in probing pocket depth and bleeding on probing parameters were also detected. **Conclusion:** The findings suggest that NSPT alone, with adjunct antibiotics when indicated, can lead to radiographic bony infill in intrabony defects and a significant improvement in clinical periodontal health. These findings can be further explored to maximise the potential of NSPT to achieve disease resolution while improving patient's experience even in complex periodontal defects.

Keywords: *Intrabony defect. Radiographic infill. Non-surgical periodontal therapy.*

Patient's experience and oral hygiene following honey formulated mouthrinse: a randomised clinical trial

Nur Ayman Abdul Hayei², Misya Humaira Reduan¹, Nor Suhaira Zulkaflee¹,
Nor Haliza Mat Baharin², Muhammad Annurudin Sabarudin², Nik Madihah Nik Azis³

¹ Faculty of Dentistry, Universiti Sains Islam Malaysia, Kuala Lumpur, Malaysia.

² Department of Periodontology and Community Oral Health, Faculty of Dentistry, Universiti Sains Islam Malaysia, Kuala Lumpur, Malaysia.

³ Restorative Department, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Kuala Lumpur.

Abstract

Background: Mouthrinses are recommended as adjuncts to mechanical oral hygiene methods for the prevention and management of periodontal diseases. Honey is an alternative agent that is well-known for its usage in traditional medicine practices. It has been reported to have many benefits for the oral cavity, such as antibacterial, anti-inflammatory, and healing properties, making it a potential therapeutic agent in periodontal therapy. **Objectives:** This study aimed to investigate patient's experience and oral hygiene outcomes following the use of honey-formulated mouthrinse. **Methods:** This pilot randomised clinical trial involved 30 volunteers with healthy gingiva and/or mild gingivitis. Participants were randomly assigned to use honey-formulated mouthrinse, chlorhexidine (CHX), or normal saline (NS) mouthrinse for three days. Patient experience and plaque score were assessed before and after the intervention using a visual analogue scale (VAS) and plaque index, respectively. **Results:** Patients in the honey group reported significantly better taste and lower burning sensation compared to the NS and CHX groups. After three days, there were no significant changes in plaque score in the honey and NS groups ($p>0.05$) compared to baseline. Significant plaque score reduction was found in the CHX group ($p<0.05$) compared to the baseline. **Conclusions:** The honey-formulated mouthrinse was effective in preventing significant plaque accumulation in the absence of oral hygiene, while causing less discomfort. However, chlorhexidine demonstrated superior plaque control efficacy. **Trial registration:** This study was retrospectively registered on 24/1/2024 at ClinicalTrials.gov (No. NCT06223243).

Effects of synbiotic toothpaste containing *Streptococcus salivarius* K12 and *Musa acuminata* in non-surgical periodontal therapy

Mohd Fikhry Zil Ikhrum Jalilluddin¹, Syarida Hasnur Safii¹,
Mohd Hafiz Arzmi², Chia Wei Cheah¹, Mohd Zamri Hussin¹

¹ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya.

² Department of Fundamental Dental and Medical Sciences, Kulliyah of Dentistry, International Islamic University Malaysia.

Abstract

Background and Aim: Periodontitis is a chronic inflammatory disease driven by a dysbiotic oral microbiome, leading to irreversible destruction of periodontal tissues and contributing to systemic health implications. While stepwise non-surgical periodontal therapy (NSPT) remains the cornerstone of treatment, innovative adjunct therapies integrated into daily oral care routines may enhance clinical outcomes. This pilot randomized controlled trial (RCT) evaluated the feasibility and clinical effects of a synbiotic toothpaste containing *Streptococcus salivarius* K12 and *Musa acuminata* extracts from banana peel as an adjunct to NSPT, focusing on key periodontal parameters. **Methods:** In this 2-month, examiner-blind, parallel-arm, RCT, six healthy participants with Stage III periodontitis were randomized to a synbiotic toothpaste group or a control group using conventional fluoridated toothpaste. After NSPT and a 1-week washout period, participants used their assigned toothpaste for 8 weeks. Protocol strengths included standardized oral hygiene instruction and aids, blinded clinical assessments and weekly monitoring of adherence and adverse events. The primary outcome was probing pocket depth (PPD) reduction; secondary outcomes included clinical attachment loss (CAL), bleeding on probing (BoP), and plaque score. Measurements were taken at baseline and at 8 weeks. **Results:** All participants completed the study with full adherence and no adverse events, confirming protocol feasibility. Statistically significant intergroup differences favoured the synbiotic group in PPD (median reduction: 4.0 mm to 2.0 mm) and CAL (4.0 mm to 3.0 mm) compared to control (PPD: 3.5 mm to 3.0 mm; CAL: 4.0 mm to 3.0 mm) at 8 weeks ($p < 0.01$). BoP and plaque scores improved significantly in both groups, with greater reductions observed in the synbiotic group. **Conclusion:** Within the limitations of this study, synbiotic toothpaste demonstrated greater clinical improvements compared to conventional toothpaste and was well tolerated, supporting its potential as an adjunct to NSPT. The trial protocol proved feasible and methodologically robust, laying the foundation for a larger-scale clinical study.

Patient-centered autonomy in managing periodontitis: a non-surgical approach to a single-rooted molar

Yong Yau Chan¹, Betsy Sara Thomas¹

¹ Department of Periodontology, MAHSA University, Kuala Langat, Selangor.

Abstract

Background: Managing periodontitis often involves weighing multiple treatment options, particularly when patient preferences and autonomy are central to the decision-making process. Respecting patient-centered values can influence the outcomes of periodontal therapy, especially when patients decline surgical interventions. **Objectives:** To highlight both clinical and patient-reported outcomes of a non-surgical approach for managing a periodontally compromised, single-rooted lower second molar, emphasizing shared decision-making and respect for patient autonomy. **Methods:** This case report describes the non-surgical management of a 41-year-old male diagnosed with generalized Stage III periodontitis. The primary concern involved deep periodontal pocketing and attachment loss associated with the lower left second molar (#37), adjacent to an impacted third molar. The management included oral hygiene instruction and both supragingival and subgingival debridement with adjuvant therapy. The patient declined surgical intervention and removal of the impacted third molar. Treatment progression was guided by clinical response and patient preference. **Results:** At review, clinical parameters showed a reduction in pocket depth on the affected molar, along with improved bleeding scores and biofilm control. The patient reported increased comfort and function, and expressed satisfaction with the non-surgical approach. **Conclusion:** This case underscores the importance of involving patients in treatment decisions. Even in complex periodontal cases involving anatomically challenging teeth such as a single-rooted lower second molar, non-surgical management may lead to acceptable clinical outcomes and high patient satisfaction when autonomy and communication are prioritized.

The healing bite: synergistic role of temporary dentures in periodontal management

Noor Asyikin Saad¹, Farha Ariffin¹

¹ Centre of Periodontology Studies, Sungai Buloh, Malaysia, Universiti Teknologi MARA (UiTM).

Abstract

Background: Managing periodontitis complicated cases especially those involving secondary excessive occlusal force and bite collapse, requires a comprehensive interdisciplinary approach. This clinical collaboration aims not only to address the periodontal condition, but also to restore oral function, enhance patient well-being, and prevent further destruction and complications. **Objective:** To evaluate the effectiveness of interdisciplinary approach in promoting periodontal regeneration and functional rehabilitation in stage IV periodontitis patient with bite collapse. **Method:** A patient diagnosed with stage IV periodontitis exhibited significant dental compromise, with remaining only 11 teeth. Baseline clinical and radiographic assessment revealed multiple sites with deep probing pocket depth (PPD), pronounced vertical bone loss and 6mm PPD observed at mesial aspect of tooth 13, while tooth 47 demonstrated Grade I furcation involvement with different density of bone loss and 6mm PPD. Initial periodontal therapy included oral hygiene education, full mouth scaling, and subgingival root debridement. To address occlusal excessive force and bite collapse, an interim removable prosthesis was provided. Evaluations follow-up after 2 months showed significant bone regeneration, especially at the furcation of tooth 47 and the mesial aspect of tooth 13. However, a persistent deep pocket at mesial of tooth 13 required open flap debridement via M-MIST technique for further periodontal improvement. **Result:** This case highlights the value of incorporating interim prosthetic therapy in complex periodontitis cases with bite collapse and excessive occlusal force. By reducing the occlusal load, interim prosthesis may help in creating a more conducive environment for periodontal healing and regeneration, even in teeth with uncertain initial prognosis. However, optimal plaque control and regular monitoring is mandatory for successful treatment outcomes. **Conclusion:** For challenging clinical situations like this case, optimal outcomes can be achieved through collaborative, stepwise care, and patient-centered treatment planning. Tailored treatment planning is critical for the long-term periodontal stability and patient satisfaction.

Oral health management and periodontal status in siblings with severe congenital neutropenia – a case report

R. Kauer¹, J.-L. Wollschläger¹, S. Jepsen¹, R. Cosgarea^{1,2,3}

¹ Department of Periodontology, Operative and Preventive Dentistry, University of Bonn, Bonn, Germany.

² Department of Periodontology and Peri-implant Diseases, Philips University Marburg, Marburg, Germany.

³ Faculty of Dentistry, University Iuliu-Hatieganu, Cluj-Napoca, Romania.

Abstract

Background: Severe congenital neutropenia (SCN, also known as Kostmann syndrome) is a rare genetic disorder and is characterized by persistently low absolute neutrophil counts ($<500/\mu\text{L}$). Affected individuals experience recurrent, severe bacterial infections beginning in the first days of life and SCN is also closely associated with severe periodontal disease. In the current case report, we present the periodontal treatment and 3-year follow-up of two siblings suffering from SCN and severe periodontitis. **Procedure:** Two female siblings diagnosed with Kostmann syndrome-associated periodontitis, aged 14 and 16, first presented for periodontal treatment in February 2021. Both subjects injected daily the granulocyte-stimulating-factor (G-CSF) 13 million IU/ml additional to a medication of Fluconazol 200mg and L-Thyroxin 50 μg daily, and Cotrim 800mg/ 160mg twice weekly. Periodontal treatment involved a stepwise approach, including supra- and subgingival instrumentation with adjunctive systemic antibiotics (Amoxicillin 750mg and Metronidazole 400mg 3 t.i.d. 3 days), accompanied by oral hygiene instructions. To stabilize the mandibular anterior teeth, tooth splinting was performed using a retainer and composite material. At close intervals of 2-3 months, periodontal follow-ups were conducted for the following 3 years. **Outcomes:** At baseline, in both cases severe forms of periodontitis characterized by generalized pocket depths (PD) of up to 12mm, attachment levels (AL) of up to 13mm, BOP of 100%, and poor bio-film-control (FMPS: 100%) were recorded. At the 3-year follow-up, there was an overall decrease in the percentage of sites with PD measuring $\geq 5\text{mm}$ (50.5% to 5.8%), of sites PD=4 mm (17.5% to 3.6%), and an overall increase of sites $\leq 3\text{ mm}$ (30.6% to 62.6%). Despite the clinical improvement and reduction of FMPS (from 100% to 53%), BOP could not be significantly reduced (100% to 68%) on the long-term. **Conclusions:** In patients with SCN, individualized periodontal treatment strategies are required to address the specific disease characteristics and its effects on oral health. These interventions are important for managing the complex interplay between SCN and periodontal disease, thereby reducing the risk of severe infections, postponing tooth loss and improving oral health related quality of life.

Disto-lingual root resection with A-PRF in Class III furcation-involved mandibular first molar

Kai Zhe Yeu¹, Tara Bai Taiyeb-Ali¹

¹ Department of Periodontology, Faculty of Dentistry, MAHSA University, Jenjarom, Selangor, Malaysia.

Abstract

Background: The disto-lingual root (DLR) of mandibular molars presents significant challenges in the management of endo-periodontal lesions (EPL), particularly in periodontitis cases. Treating furcation defects involving the DLR of mandibular first molars remains complex due to complex anatomical and structural limitations. With a reported prevalence of up to 22% among Asian populations, especially Chinese individuals, the DLR represents a critical consideration in diagnosis, treatment planning, and long-term periodontal management. **Objective:** To present a therapeutic approach combining DLR resection and advanced platelet-rich fibrin (A-PRF) application for the management of furcation-involved mandibular molar. **Materials and methods:** A 39-year-old non-smoking Chinese male reported discomfort in the mandibular right first molar. Clinical examination was done using a University of North Carolina (UNC) 15 probe to access probing pocket depth (PPD), gingival recession (GR), and clinical attachment loss (CAL). Nabers probe was used to access furcation involvement. Cone-beam computed tomography (CBCT) confirmed a DLR with significant surrounding bone loss and a through-and-through furcation defect extending from the mid-lingual to disto-lingual. First, root canal treatment was performed. 4 months after, A-PRF was applied in conjunction with DLR resection. **Results:** Clinical and radiographic evaluations at the 4-month follow-up demonstrated a stable periodontal outcomes with achieved clinical endpoints, highlighting the effectiveness of this approach. Additionally, the tooth showed no mobility over time, patient-reported outcome measures (PROMs) indicated improved comfort and satisfaction. **Conclusion:** This case highlights a successful management strategy for furcation-involved mandibular molar using a combination of endodontic therapy, DLR resection, and A-PRF. Although the results are promising, further research with larger sample sizes and extended follow-up periods is necessary to establish standardized protocols and evaluate the long-term predictability of this technique.

A multifaceted approach to managing Stage IV periodontitis in young adults: a case series

Normah Yacob¹, Dali Yana Lion¹

¹ Periodontic Unit, Klinik Pergigian di Klinik Kesihatan Bukit Indah, Johor Bahru, Johor, Malaysia

Abstract

Background: Stage IV periodontitis, marked by severe attachment loss, tooth mobility, and compromised masticatory function, is less commonly reported in young adults compared to older populations. When it does occur, it presents distinct clinical and psychosocial challenges that require a comprehensive, individualized treatment approach. **Objective:** This case series aims to describe the diagnostic complexities, treatment planning, and clinical outcomes of a multifaceted approach in managing Stage IV periodontitis in young adult patients. **Method:** Three medically fit patients aged between 20 and 30 years presented with generalized Stage IV Grade C periodontitis, evidenced by radiographic bone loss extending beyond the middle third of the root, deep periodontal pockets, and functional compromise. Each case was managed with an individualized treatment plan incorporating behavioural modification, non-surgical periodontal therapy, surgical intervention, and prosthodontic or orthodontic rehabilitation. Interdisciplinary collaboration and strict maintenance protocols were emphasized throughout the treatment course. **Results:** Each patient underwent treatment for more than one year, during which supportive periodontal care (SPC) was implemented at 3-month intervals following active therapy. They demonstrated significant clinical improvements, including reduction in probing depths, gain in clinical attachment, and stabilization of periodontal condition. The treatment timeline is shown to be prolonged in these complicated cases. Patient-reported outcomes also indicated improved masticatory function, aesthetics, and overall satisfaction with treatment. **Conclusion:** This case series highlights the importance of early recognition and a personalized, multidisciplinary approach in managing severe periodontitis among young adults. Long-term success requires comprehensive care that addresses biological and behavioural factors, highlighting the critical role of SPC in sustaining outcomes.

Association between HbA1C and periodontal inflammatory status in an Asian population of type 2 diabetes

Hoe Kit Chee^{1,2}, Sharon Hui Xuan Tan³, Geerten Has Tjakkes², Yvonne de Waal²,
Arjan Vissink⁴, Chaminda Jayampath Seneviratne^{5,6}

¹ Periodontics Unit, Department of Restorative Dentistry, National Dental Centre Singapore, Republic of Singapore.

² Center for Dentistry and Oral Hygiene, University of Groningen, University Medical Center Groningen, Groningen, the Netherlands.

³ Saw Swee Hock School of Public Health, National University of Singapore, Republic of Singapore.

⁴ Department of Oral and Maxillofacial Surgery, University of Groningen, University Medical Center Groningen, Groningen, the Netherlands.

⁵ National Dental Research Institute Singapore, National Dental Centre Singapore, Republic of Singapore

⁶ School of Dentistry, The University of Queensland, Australia.

Abstract

Background: Systematic reviews and meta-analyses have shown that the association between type 2 diabetes (T2D) and periodontitis varies geographically. Consequently, findings from a particular region cannot be generalized to another population. With Asia having the highest incidence of T2D globally, a concurrent increase in the prevalence of periodontitis is plausible. However, studies on the inflammatory burden of periodontitis as a complication of diabetes in Asian populations, particularly from Southeast Asia, where T2D is highly prevalent, are still limited. **Objectives:** To investigate the association between glycaemic levels of individuals with and without diabetes and periodontal inflammatory status in a population of non-smoking subjects in Singapore. To assess a dose-response relationship between HbA1c levels and the periodontal inflamed surface area (PISA), as a measure of the amount of inflamed periodontal tissue in patients with T2D. **Methods:** 181 non-smoking patients with T2D and 181 age-, sex- and ethnicity-matched non-smoking patients without diabetes were consecutively recruited. Participants completed a questionnaire on general demographic characteristics. Point-of care HbA1c and BMI were measured. Full-mouth periodontal examination and plaque score were performed. Clinical periodontal characteristics were recorded. Periodontal diagnosis was determined according to the 2017 EFP/AAP classification. The primary outcome was the PISA. **Results:** A higher percentage of patients with T2D was diagnosed with Stage III or IV periodontitis ($p < 0.01$). Compared to subjects without diabetes, the PISA was higher by 156.2 mm² in T2DM individuals with acceptable metabolic control, and even higher by 368.4 mm² in individuals with unacceptable control. A 1% unit increase in HbA1c was associated with 70.0 mm² increase in PISA after adjusting for age, sex, race, BMI, family history of diabetes, plaque score and teeth present. **Conclusions:** A dose-response relationship between HbA1c and PISA was observed. T2D and poorer glycaemic control were associated with advanced stages of periodontitis and poorer periodontal health.

IMPLANT

Clinical Scientific Poster

Survival and success rates of dental implants: a 7-20 years follow-up in government periodontic specialist unit, Klinik Pergigian Cahaya Suria

Izni Iwani Majid¹, Sh Maznah Wan Mohammed²,
Dzulqarnain Ahmad Iskandar Shah¹, Ahmad Sharifuddin Asari³

¹ Periodontic Unit, Klinik Pergigian Cahaya Suria.

² Periodontic Unit, Klinik Pergigian Persint 18, Putrajaya.

³ Dental Faculty, MAHSA University.

Abstract

Introduction: Long-term follow up studies have demonstrated that the survival and success rates of dental implants were high, even though the complications may occurred frequently. To date, very limited studies have reported the success and survival rates of dental implants in Malaysia, particularly in government specialist clinics, especially when it exceeded 10-years follow up. **Objectives:** The purpose of this study is to evaluate the long-term (7-20 years) results of dental implants using implant survival and implant success as outcome variables. **Materials and Method:** This is longitudinal cohort study data collected retrospectively from the dental records in combination with cross-sectional clinical and radiographic examination. A total of 172 patients who received 273 implants of various dental implant system during years of 2004 to 2018. Of these, 30 patients with 75 implants were recalled and reviewed 7- 20 years after implant treatment completed. Clinical and radiographic assessment of each implant were assessed for biological as well as technical complications. The survival and success rates of dental implants were analysed for each implant using Kaplan-Meier analysis. **Result:** The long-term cumulative implant survival rates up to 15 years was 96.0% (SE 2.3%) and success rates were and 30.2%. The occurrence of biological complications was 37.4%, with peri-implant mucositis and peri-implantitis were 28.6% and 11.4% respectively. 41.3% of implants were observed to have technical complications, at least once during the follow-up periods. **Conclusion:** These preliminary results indicate that dental implants placed in a government specialist clinic setting demonstrate excellent long-term survival outcomes. However, the relatively high incidence of biological and technical complications highlights the importance of regular maintenance and early intervention to preserve implant function over time.

A new horizon: enhancing maxillary sinus augmentation with CGF - a clinical case series

Muhamad Zin Amirah¹, Masri Mohd Salman¹

¹ Periodontic Unit, Klinik Pergigian Cheras, Kuala Lumpur, Malaysia.

Abstract

Goals: This case series aims to explore the clinical feasibility and outcomes of incorporating autologous Concentrated Growth Factors (CGF) in lateral window maxillary sinus floor augmentation, with particular emphasis on its intraoperative handling, graft stability, early wound healing, and patient-reported postoperative recovery. **Introduction:** Maxillary sinus floor augmentation via the lateral window approach is a reliable solution for vertical bone deficiencies in the posterior maxilla. However, the technique carries a risk of complications such as membrane perforation and delayed healing. CGF, derived from autologous blood, has emerged as a biologically active material that supports tissue regeneration, enhances graft cohesion, and accelerates soft tissue repair. This case series presents the clinical application of CGF in maxillary sinus augmentation and its influence on early healing outcomes. **Materials and Methods:** Autologous venous blood was centrifuged to obtain CGF membranes and fibrin-rich matrices. The CGF was mixed with xenograft particles to form a cohesive graft material ("sticky bone"). CGF membranes, along with resorbable barrier membranes, were used to secure the graft. Three patients underwent lateral window sinus augmentation, with or without simultaneous implant placement. Healing progress was assessed clinically and radiographically during follow-up visits. **Results:** Case 1: A patient underwent sinus floor augmentation with simultaneous implant placement in the posterior maxilla (16). The sticky bone graft was stable and radiographic healing was satisfactory throughout five postoperative reviews. The implant was successfully restored, and the patient reported no complications one-year post-surgery. Case 2: Sinus augmentation with simultaneous implant placement was performed in the maxillary molar region (16). The graft material demonstrated favorable stability and healing. Clinical follow-ups over several weeks confirmed intact graft volume and soft tissue closure without adverse findings. Case 3: Sinus augmentation was performed in the maxillary molar region (26-27). A Schneiderian membrane perforation was encountered during the procedure and managed using CGF membranes. The graft remained stable and healing was uneventful across three postoperative reviews, with no signs of infection or graft exposure. **Conclusion:** The use of autologous CGF in lateral window sinus augmentation demonstrated favorable intraoperative handling, graft stabilization, and early healing. This case series suggests that CGF may serve as a valuable adjunct in enhancing clinical outcomes for maxillary sinus floor elevation.

Tissue regeneration across the spectrum. Case series on Cytrans and Elashield use in periodontal, peri-implant and ridge preservation therapies

Fatin Nadhirah Kamaludin Latifi¹, Nursafirah Izzati Idrus¹,
Siti Zakiah Muharam¹, Erni Noor¹

¹ Centre of Studies for Periodontology, University Technology MARA, Sungai Buloh, Malaysia.

Abstract

Background and Aim: Cytrans® Granules are made of synthetic carbonate apatite (CO₃Ap), a material that closely mimics natural bone minerals. It is highly biocompatible, supports new bone growth (osteoconductive), and keeps its shape well, making it a good choice for GBR without the risks of animal-based grafts. Cytrans® Elashield is a resorbable membrane used with the granules to cover the graft site. It helps protect the graft by blocking soft tissue from growing into the area while allowing bone to regenerate underneath. Elashield is flexible, easy to handle, and gradually dissolves as the bone heals, supporting successful GBR outcomes. **Materials and Methods:** This case series involved three patients aged between 23 and 74 years old with different bone issues around the jaw. One patient had a buccal bone defect after implant placement. Another patient underwent open flap debridement and detected a bone defect. The third patient had alveolar ridge preservation after tooth extraction. In all cases, Cytrans® Granules and Cytrans® Elashield membrane were used to help rebuild and preserve the bone. **Results:** This case series aimed to demonstrate the use of Cytrans® Granules and Cytrans® Elashield in providing effective management of the buccal bone defect, open flap debridement and alveolar ridge preservation by offering structural support and space maintenance for bone regeneration. The granules and membrane conformed well to the defect site, and their resorption profile is expected to facilitate replacement by native bone over time. **Conclusion:** Cytrans® Granules and Cytrans® Elashield proved to be a practical and biocompatible option for GBR. Their use in these three cases allowed defect reconstruction, reduce post extraction bone loss and successful implant placement. Follow-up will assess long-term integration and bone regeneration, but initial outcomes suggest positive clinical performance.

Horizontal augmentation through the ridge split procedure: a split-mouth proof of concept case series

Nithyakalyani Ramesh¹, S. Muthukumar², Kamaleeshwari. R²

¹ Department of Periodontology, Faculty of Dentistry, MAHSA University, Malaysia.

² Department of Periodontology, Sri Ramachandra Institute of Higher Education and Research, Chennai, India.

Abstract

Background: The ridge split technique has been widely advocated for the expansion of the alveolar ridge with a horizontal deficit as it eliminates the morbidity associated with a second donor site and allows for simultaneous placement of implants. However, the conventional methods of ridge splitting have been associated with post-operative bone resorption and morbidity. Evaluating the levels of TNF-Alpha which is an osteoclast-activating factor will indicate the need for an alternative therapeutic approach that would suppress its upregulation which is essential in preventing bone loss. **Objectives:** The objective of this case series is to compare ridge splitting with piezosurgery against the conventional technique by assessing the levels of TNF-Alpha and patient centered outcomes. **Materials and Methods:** The present case report followed a split mouth design wherein one site involved the use of piezosurgery as the modality of ridge splitting and the other site involved the use of a conventional technique of ridge splitting. Pre-operative and post-operative CBCT analysis were done and saliva samples were collected at day 7 and day 14 post-operatively. The primary outcome variables included measuring the changes in the dimensions of the ridge width and evaluating the levels of TNF-Alpha from the saliva samples. The secondary outcome variables included the assessment of patient centred outcomes such as pain using the visual analog scale and measuring the extent of facial edema respectively. **Results:** The estimated levels of TNF-Alpha appeared to be much lower in piezosurgery in comparison to the values obtained using the conventional technique. Further, the patient centred outcomes that were evaluated were in favour of piezosurgery. **Conclusion:** The results of the present case series clearly demonstrated the superiority of piezosurgery over the conventional technique suggesting that it could be a valuable adjunct in osseous surgeries involving dental implants and implant site development.

Conservative approaches to peri-implantitis management: a case series of non-surgical interventions

Siti Zakiyah Muharam¹, Mohd Faizal Hafez Hidayat¹, Norhayati Liaqat Ali Khan²

¹ Center for Periodontology Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia.

² Center of Preclinical Science Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, 47000 Sungai Buloh, Selangor, Malaysia.

Abstract

Background: Dental implants have become a widely accepted solution for replacing missing teeth, playing a crucial role in managing both complete and partial edentulism. They offer several advantages over traditional fixed partial dentures. However, biological complications, particularly peri-implant mucositis and peri-implantitis, can compromise implant longevity and may lead to failure. Peri-implantitis is a progressive inflammatory condition that affects the bone surrounding the implant. Non-surgical treatment of peri-implantitis often leads to clinical improvements, such as reduced bleeding and, in some cases, decreased pocket depth. To enhance these outcomes, adjunctive therapies like antibiotics, antiseptics, ultrasonic instruments, and laser treatments have been recommended. **Objectives:** This case series aims to demonstrate the various non-surgical treatments of peri-implantitis using mechanical and chemical debridement of dental implant surface, airflow and systemic antibiotics (amoxycillin and or metronidazole). **Methodology:** This case series describes three patients aged between 54 and 73 years. Two of the patients presented with suppuration around their implants, while the third exhibited a mobile suprastructure. Radiographic assessments confirmed bone loss surrounding the affected implants in all cases. Peri-implantitis was managed using various non-surgical treatment approaches, including mechanical and chemical debridement of the implant surfaces. In one case, treatment was adjunct with air polishing and systemic antibiotic therapy (amoxycillin). Another case was treated with mechanical debridement combined with systemic antibiotics (amoxicillin and metronidazole). Systemic antibiotics were prescribed specifically for patients exhibiting suppuration around the implants. **Result:** All three cases demonstrated favourable outcomes, with stable bone levels and absence of clinical signs of infection for a minimum of three months, as verified by radiographic assessment of bone defect volume. **Conclusions:** Non-surgical treatment is effective in managing peri-implantitis when detected early; however, surgical intervention may be necessary to achieve optimal outcomes in advanced cases.

Keywords: Peri-implantitis. Dental implant. Non-surgical therapy. Debridement. Antibiotics. Radiographic bone loss.

Maxillary sinus augmentation with concentrated growth factors

Fei Yee Lim¹, Norma J¹, Yoong Kian Chan²

¹ Oral Health Division, Ministry of Health, Melaka, Malaysia

² Manipal University College Malaysia, Melaka, Malaysia.

Abstract

Background: Maxillary sinus augmentation is a surgical procedure to enhance the bone height in maxillary posterior region for successful dental implant placement. Concentrated growth factor is an autologous blood product which can enhance bone re-modelling/ regeneration during guided bone regeneration. **Case report:** This case report included two cases of maxillary sinus augmentation procedure for dental implant placement in atrophic maxilla at Periodontic Unit, Peringgit Dental Clinic. The patients were treated with a two-staged lateral window maxillary sinus augmentation procedure and implant placement were done 6 to 8 months later. During the maxillary sinus augmentation procedure, xenograft was mixed with the patient's concentrated growth factors and filled up the space between the elevated sinus membrane and sinus floor. After 6-8 months, dental implants were successfully placed with primary stability. **Discussion:** CGF contains several growth factors, such as platelet-derived growth factor, insulin-like growth factor-1, vascular endothelial growth factor, and transforming growth factor- β 1. Therefore, it is considered that xenograft when mixed with CGF, may have higher bone regenerative capacity. Alternatively, this can be done by mixing xenograft with autologous bone graft, due to its osteogenic potential. However, harvesting autologous bone will incur a second surgery site, increase treatment time and patient's morbidity. The results showed that CGF may enhance bone regeneration and decrease the healing time in maxillary sinus bone augmentation procedure. **Conclusion:** CGF is an easy-to-use, autogenous, safe material. The application of CGF with xenograft may have adjunctive effects on new bone formation and augmentation stability in maxillary sinus bone augmentation procedure.

Transforming compromised ridge: a Malaysian case of staged soft and hard tissue augmentation prior to implant placement

Ahmad Fabillah Nurul Shamimi^{1,2}, Mohd Hanifah Muhammad Hadi¹

¹ Periodontics Specialist Unit, Klinik Pergigian Bandar Raub, Pahang, Malaysia.

² Klinik Pergigian Tersang, Raub, Pahang, Malaysia.

Abstract

Background: Successful dental implant therapy depends on sufficient bone volume and healthy peri-implant soft tissue. However, alveolar ridge defects caused by tooth loss, trauma, or periodontal disease often limit ideal implant placement. Guided bone regeneration (GBR) and soft tissue augmentation have become essential for reconstructing deficient ridges and optimizing functional and aesthetic outcomes. **Objectives:** This case report illustrates a staged regenerative approach using soft tissue grafting followed by GBR to convert a compromised mandibular ridge into a stable, implant-ready site, emphasizing clinical protocols, materials, and timing for predictable results. **Materials and methods:** A 32-year-old healthy female presented with a horizontally deficient, knife-edged ridge at the mandibular left first molar site (tooth 36). The initial procedure involved soft tissue augmentation using a 10×5 mm autogenous free gingival graft harvested from the left palate to increase the width and thickness of keratinized tissue. After three months of uneventful healing, implant placement was performed in conjunction with GBR using Cerabone Plus bone graft and Biotek Dental NeaCova resorbable membrane under local anaesthesia to correct the horizontal defect. **Results:** Three months post-GBR, the implant site exhibited healthy soft and hard tissue integration. Favourable healing enabled timely progression to the second-stage surgery. The entire implant rehabilitation, including prosthetic restoration, was completed within six months post-GBR. This outcome reflects the success of a staged protocol in improving tissue quality and supporting a smooth surgical and prosthetic workflow. **Conclusion:** A phased regenerative strategy beginning with soft tissue augmentation followed by GBR offers a reliable solution for compromised ridges. This approach enhances peri-implant tissue health, ensures optimal implant placement, and contributes to long-term functional and aesthetic success.

Supportive peri-implant therapy in two mandibular implant cases: a comparative case report

Edward Gozali¹, Verawati Ashari¹, Hesty Nurcahyanti¹, Aini Hariyani Nasution²,
Martina Amalia², Syafrinani³, Hendry Rusdy⁴, Gostry Aldica Dohude⁴

¹ Periodontic Residency Program, Faculty of Dentistry, Universitas Sumatera Utara, Medan, Indonesia.

² Department of Periodontics, Faculty of Dentistry, Universitas Sumatera Utara, Medan, Indonesia.

³ Department of Prostodontic, Faculty of Dentistry, Universitas Sumatera Utara, Medan, Indonesia.

⁴ Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Universitas Sumatera Utara, Medan, Indonesia.

Abstract

Background: Long-term success of dental implants relies heavily on maintaining peri-implant tissue health. Supportive Peri-implant Therapy (SPT) is crucial in preventing biological complications. Variations in implant design, placement depth, and patient factors can influence peri-implant tissue responses and marginal bone levels (MBL). Understanding these responses under a consistent SPT regimen is essential for optimizing clinical outcomes. **Objective:** This case report aims to compare the clinical and radiographic peri-implant tissue conditions and marginal bone levels around two different mandibular dental implants, one placed submerged and another inadvertently placed supracrestally, in two female patients undergoing SPT for over six months post-suprastructure loading. **Materials and Methods:** Two female patients received single dental implants in the posterior mandible. Patient 1 (21 years) received a submerged Ø5.0x7mm implant at region 46. Patient 2 (38 years) received a Ø4.0x10mm bone-level implant at region 36, which was unintentionally placed with the implant shoulder 1mm coronal to the bone crest. Both patients received definitive suprastructures and were enrolled in a personalized SPT program involving clinical (probing depth [PD], bleeding on probing [BOP], plaque index [PI], gingival index [GI]) and radiographic (periapical radiographs for MBL) evaluations at baseline (post-suprastructure) and after >6 months. **Results:** After more than six months of SPT, Patient 1 (submerged implant) exhibited stable peri-implant tissues with PD ≤4mm, no BOP, minimal PI/GI, and stable MBL. Patient 2 (supracrestally placed implant) also demonstrated healthy peri-implant conditions with PD ≤4mm, no BOP, minimal PI/GI, and stable MBL, with no apparent adverse effects from the slight supracrestal placement within the observation period. **Conclusion:** Tailored Supportive Peri-implant Therapy was effective in maintaining peri-implant health and stable marginal bone levels in both a standard submerged implant case and a case with a minor supracrestal placement deviation after six months of function. The slight supracrestal placement did not negatively impact early peri-implant tissue response under SPT.

Keywords: Dental implants. Supportive peri-implant therapy. Marginal bone level. Peri-implant health.

Ridge preservation with GBR using non-resorbable membrane in a peri-implantitis case

Norul Nurdiyana Nordin¹, Norhayati Abas¹

¹ Periodontic Specialist Unit, Klinik Pergigian Paya Besar, Kuantan, Pahang, Malaysia.

Abstract

Background: Peri-implantitis is a plaque-associated condition involving inflammation of the peri-implant mucosa and progressive bone loss around dental implants. If left untreated, peri-implantitis can result in implant failure. Implant explantation and guided bone regeneration (GBR) may help to preserve bone height and volume for future implant placement **Goals:** This case report demonstrate management of peri-implantitis by implant explantation and GBR using xenograft and non-resorbable membrane. **Case description:** 71 years old male patient referred for management of peri-implantitis of 36. He reported frequent bleeding, pus discharges and feeling discomfort in the area of implant 36 and 37. The implant was known to have been placed in a private dental clinic 20 years back. Upon examination, it was revealed that the crown supported implant 36 was splinted with tooth 37. There was mobility, deep probing pocket depths on both, bleeding on probing, and suppuration coming out from 36 sulcus. 37 was poor prognosis due to presence of unrestorable deep caries on distal. A peri-apical radiograph showed bone loss surrounding the implant, with a long and narrow implants diameter and radiolucency on crown of 37 indicated of dental caries. After a cycle of non-surgical management, we proceeded with open flap implant debridement. Implant explantation of 36 and extraction of 37 were planned followed by GBR for future implant placement. Upon flap retraction, the linked crowns were sectioned, two narrow implants of 36 were explanted and 37 was extracted. Xenograft was placed followed by non-resorbable membrane to augment the residual ridge defect. At 6 months post-op, the site was deemed suitable for implant placement. **Conclusion:** Following implant explantation, GBR may help to preserve bone height and bone fill in preparation for future placement of a new implant. Non-resorbable membranes offer prolonged scaffolding and show promising outcomes in GBR.

Management of sinus membrane perforation during sinus lift procedure prior to implant placement using platelet-rich fibrin (PRF) membrane

Muhammad Annurudin Sabarudin¹, Dzulgarnain Ahmad Iskandar Shah²,
Ahmad Fakrurrozi Mohamad³, Engku Ahmad Muzhaffar Engku Zainal Abidin⁴,
Ahmad Azhar Misran⁵

¹ Department of Periodontology and Community Oral Health, Faculty of Dentistry, Universiti Sains Islam Malaysia, Jalan Pandan Utama, 55100 Kuala Lumpur, Malaysia.

² Periodontic Unit, Klinik Pergigian Cahaya Suria, Tingkat 1, Bangunan UTC Pudu Sentral, Jalan Pudu, 55100 Kuala Lumpur.

³ Department of Dental Science, Advanced Medical and Dental Institute, Universiti Sains Malaysia. Bertam, Penang, Malaysia.

⁴ Periodontic Unit, Klinik Pergigian Marang, 21600 Marang, Terengganu, Malaysia.

⁵ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia, 50300 Kuala Lumpur, Malaysia.

Abstract

Background: Schneiderian membrane perforation is the most frequent intraoperative complication during sinus lifts, which can lead to implant failure or delayed implant treatment. This case report aims to show the results of using platelet-rich fibrin (PRF) in the treatment of perforations occurring during sinus lifts with a lateral window approach. **Objective:** To evaluate the clinical outcomes of using PRF membrane in the management of Schneiderian membrane perforation during a lateral window sinus lift performed concurrently with implant placement. **Methods:** A healthy 40-year-old Chinese male presented with a missing maxillary first molar. Radiographic analysis revealed 3 mm of residual bone height, indicating the need for sinus lift via the lateral window approach. During sinus membrane elevation, a minor perforation was encountered at the medial aspect of maxillary sinus. The perforation was immediately covered using an autologous PRF membrane to re-establish membrane integrity. The sinus cavity was subsequently grafted with a composite mixture of xenogeneic, allogenic, and autogenous bone substitutes, enriched with concentrated growth factors. An SP Straumann® SLA tissue-level implant (4.8 mm × 8 mm) was placed simultaneously, achieving primary stability. **Results:** Postoperative recovery was uneventful at the 1st, 2nd, and 4th week and an optimal healing on subsequent month follow-up visits. At the six-month follow-up, cone-beam computed tomography (CBCT) revealed bone gain in the sinus region, with minimal signs of bone resorption and stable dental implant. **Conclusions:** The application of PRF membrane in managing sinus membrane perforation provides a reliable, biologically compatible, and cost-effective solution. It promotes faster healing and bone regeneration, reducing overall treatment duration while minimizing the risk of immune reaction or graft failure.

From bonded bridge to full-arch implant-supported prosthesis: interdisciplinary rehabilitation of periodontally compromised patients

Pit Hui Lew¹, Yin Ci Lee¹

¹ Division of Restorative Dentistry, School of Dentistry, IMU University, Kuala Lumpur, Malaysia.

Abstract

Background: Prosthodontic rehabilitation in patients with severe periodontal disease poses significant clinical challenges, necessitating comprehensive treatment planning and close interdisciplinary collaboration. This case series illustrates the pivotal role of periodontal stabilisation and maintenance in facilitating successful tooth replacement and showcases a spectrum of prosthodontic solutions tailored to individual patient needs. **Case series:** Three patients, aged 48 to 69 years, were diagnosed with generalised periodontitis and referred to the IMU Oral Health Centre for periodontal evaluation and management. Clinical findings included generalised deep probing pocket depths, alveolar bone loss, and multiple teeth with hopeless prognosis due to severe attachment loss or secondary caries. All patients exhibited inadequate plaque control and irregular maintenance attendance and were unaware of their periodontal condition prior to referral. Following comprehensive periodontal assessment and treatment planning, all patients underwent non-surgical therapy, necessary extractions, and were placed on regular maintenance to achieve periodontal stability. Individualised treatment plans for prosthodontic rehabilitation were then implemented: Case 1: A resin-bonded bridge was used to replace missing mandibular anterior teeth. Case 2: A combination of a fixed partial denture and four strategically placed implants restored function and aesthetics. Case 3: A full-arch implant-supported prosthesis was delivered following complete extraction and healing. **Conclusion:** This case series highlights the importance of periodontal disease control in ensuring long-term prosthodontic success. It also emphasizes the importance of a personalised, interdisciplinary approach to restoring oral function and aesthetics in patients with advanced periodontal disease.

Radiographic dimensional changes following alveolar ridge preservation with a combination of autologous dentine, PRF, and collagen plug: a randomized controlled trial

Fazlieha Kamaruddin^{1,2}, Fara Azwin Adam^{1,2}, Erni Noor^{1,2}

¹ Center of Periodontology Studies, Faculty of Dentistry, Universiti Teknologi MARA, Jalan Hospital, Sungai Buloh Campus, Sungai Buloh, Selangor 47000, Malaysia.

² Center of Postgraduate Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, Jalan Hospital, Sungai Buloh, Selangor 47000, Malaysia.

Abstract

Background: Alveolar ridge preservation (ARP) procedures are crucial for minimizing physiological bone resorption and enhancing bone regeneration, ultimately leading to improved prosthetic and aesthetic results. Various grafting materials, such as autogenous bone, xenografts, and allografts, have been used; however, they present significant drawbacks. Autogenous bone harvesting can increase patient morbidity, while xenografts and alloplasts carry risks of contamination, rejection, infection, and high costs. Dentin particles (DP) obtained from extracted teeth, rich in type I collagen and growth factors like bone morphogenic proteins, offer a promising alternative by stimulating osteogenic cell response and enhancing bone regeneration. Platelet-rich fibrin (PRF) is a natural biomaterial that promotes micro-vascularization and wound healing, while collagen plug (CP) aids in osteogenesis and stabilizes grafting materials. **Objectives:** This study aims to evaluate the efficacy of the combined use of DP, PRF, and CP in ARP to improve the treatment outcomes. **Materials and Methods:** Thirty-three mandibular extraction sockets were randomized into three groups. Group A (test group) received a combination of DP, PRF, and CP, while Group B (positive control) was treated with PRF and CP, and Group C (negative control) was left empty. Healing sockets were assessed through three-dimensional radiograph to measure the changes in ridge width (RW), ridge height for buccal (BH) and lingual (LH), and buccal bone thickness (BBT) after 6 months of ARP. **Results:** Multinomial regression revealed Group A had significantly higher odds of better outcomes versus Group C (RW: OR=8.9; BH: OR=3.0; LH: OR=3.2; BBT: OR=93.8), though wide CIs for BBT (1.888-4659.549) indicated variability. No predictors significantly influenced in Group B. Systemic health and controlled diabetes had no significant effect on ARP treatment. **Conclusion:** The use of autogenous dentin, along with PRF and CP outperformed controls in ARP and represents a promising and safe alternative grafting material.

PRACTICE

Clinical Scientific Poster

Enhancing periodontal screening: a comparison between machine learning and conventional predictive models

Jan Yang Ho^{1,2}, Ainol Haniza Kherul Anuwar³, Lee Peng Karen-Ng⁴, Abd Aziz Alias⁵, Siti Lailatul Akmar Zainuddin⁶, Mohammad Tariqur Rahman⁵, Nor Shafina Mohamed Nazari¹, Nur Falihin Soehairq Kamal Nurzaman⁷, Nor Adinar Baharuddin^{1,8}

¹ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

² Division of Restorative Dentistry, School of Dentistry, IMU University, Kuala Lumpur, Malaysia.

³ Department of Community Oral Health & Clinical Prevention, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

⁴ Oral Cancer Research & Coordinating Centre (OCRCC), Faculty of Dentistry, Universiti Malaya, 50603 Kuala Lumpur, Malaysia.

⁵ Department of Oral and Craniofacial Sciences, Faculty of Dentistry, Universiti Malaya, Kuala Lumpur, Malaysia.

⁶ Faculty of Dentistry, Manipal University College Malaysia, Jalan Batu Hampar, Bukit Baru, 75150 Melaka, Malaysia.

⁷ Primary Care Department, Faculty of Dentistry, University Malaya, Kuala Lumpur 56300, Malaysia.

⁸ Adjunct Professor, Faculty of Dental Medicine Universitas Airlangga, Surabaya, Indonesia.

Abstract

Background: Due to the limitations of full-mouth periodontal examination (FMPE) and dental radiography for community-wide periodontal screening, alternative screening tools that are simple, accessible and non-invasive are preferred. The self-reported oral health questionnaire (SROH) and salivary biomarkers fulfil these criteria, but first their accuracy in detecting periodontal diseases should be verified. **Objectives:** This study aimed to compare the diagnostic performances for periodontitis between conventional logistic regression models and machine learning models, using SROH, salivary biomarkers and patient demographics as predictors. **Method:** A convenience sample of 77 systemically healthy adults were recruited from an academic dental centre. Appointments were scheduled between 9 – 11 am, whereby they were asked to answer the SROH and provide unstimulated saliva samples using the passive drooling method. Subsequently, a calibrated examiner performed FMPE of the participants, recording parameters such as probing pocket depth (PPD), clinical attachment loss (CAL), bleeding on probing (BOP) and plaque. Salivary levels of IL-1 β , IL-6, TNF- α , MMP-8, MMP-9 and MT were measured using enzyme-linked immunosorbent assay. The diagnostic performances for periodontitis using different combinations of predictive variables were evaluated with logistic regression analysis and two machine learning models (Naive Bayes and Random Forest). **Results:** All the classification models achieved an Area under Curve (AUC) above 0.6, with the best AUC recorded by Random Forest trained on SROH and salivary biomarkers (AUC: 0.856). Overall, Random Forest models generally outperformed Naive Bayes and Logistic Regression across different feature combinations. The Random Forest model that was trained on SROH and salivary biomarkers presented with Precision, RMSE and MAE of 70.13%, 0.371 and 0.292, respectively. **Conclusion:** The accuracy for detecting periodontitis was enhanced by combining salivary biomarkers with SROH, with the best model shown by the Random Forest machine learning model, which could be more suitable to capture non-linear relationships between salivary biomarkers, SROH and periodontitis.

Prevalence and associated factors for peri-implant diseases in Malaysia's periodontics clinics: a multicentre study

Norhayati Abas¹, Khamiza Zainol Abidin², Normah Yacob³, Norul Nurdiyana Nordin¹, Izni Iwani Majid⁴, Mohammad Adib Jaafar⁵, Zuhrah Mohd Sood⁶, Lau Guat Syin⁷, Heng Wei Chei⁸, Tan Wan Jiun⁹, Rasidah Ayob⁵

¹ Periodontics unit, Klinik Pergigian Paya Besar, Kuantan, Pahang, Malaysia.

² Periodontics unit, Klinik Pergigian Gunung Rapat, Ipoh, Perak, Malaysia.

³ Periodontics unit, Klinik Pergigian Bukit Indah, Johor Bahru, Johor, Malaysia.

⁴ Periodontics unit, Klinik Pergigian Cahaya Suria, Wilayah Persekutuan Kuala Lumpur, Malaysia.

⁵ Periodontics unit, Pusat Pakar Pergigian Seremban, Seremban, Negeri Sembilan.

⁶ Periodontics unit, Klinik Pergigian Simpang Lima, Sungai Besar, Selangor, Malaysia.

⁷ Periodontics unit, Klinik Pergigian Mahmoodiah, Johor Bahru, Johor, Malaysia.

⁸ Periodontics unit, Klinik Pergigian Mak Mandin, Butterworth, Pulau Pinang, Malaysia.

⁹ Periodontics unit, Klinik Pergigian Batu Muda, Wilayah Persekutuan Kuala Lumpur, Malaysia.

Abstract

Background: Peri-implant mucositis (PIM) and peri-implantitis (PI) are peri-implant diseases (PID) that present significant challenges for clinicians in maintaining the long-term stability and function of osseointegrated dental implants. **Objective:** This multicentre cross-sectional study aimed to determine the prevalence and explore the factors associated with PID among subjects undergoing supportive peri-implant care (SPIC) in government periodontics clinics across Malaysia. **Method:** 352 subjects with 647 dental implants were recruited using stratified random sampling. Data were obtained from patient records, history taking, and clinical examinations conducted by calibrated investigators. Multiple clinical parameters were assessed, including full-mouth bleeding score (FMBS), implant probing depth, mucosal recession, bleeding on probing, suppuration, and peri-implant crestal bone level. Peri-implant diagnoses were made according to the 2017 Classification of Periodontal and Peri-Implant Diseases and Conditions. Data were analysed using descriptive statistics and multiple logistic regression. **Results:** The prevalence of peri-implant health (PIH), PIM, and PI at subject level was 54.8%, 36.9%, and 8.3% and at implant level was 60.0%, 32.5% and 7.5% respectively. Subjects with periodontitis (aOR = 2.83, 95% CI: 1.48–5.40, $p = 0.002$) and non-compliance to SPIC (aOR = 2.76; 95% CI: 1.16–6.57; $p = 0.022$) had nearly three times higher odds of developing PID. Positive association of PID with number of implants (aOR = 1.52; 95% CI: 1.23–1.87; $p < 0.001$) and higher FMBS (aOR = 1.05; 95% CI: 1.02–1.08; $p < 0.001$) were also observed. At the implant level, mucosal recession was associated with higher odd of PID (aOR = 1.73; 95% CI: 1.03–2.90; $p = 0.039$), while tissue-level implant placement was identified as a protective factor (aOR = 0.26; 95% CI: 0.10–0.67; $p = 0.005$). **Conclusion:** PID are prevalent in Malaysia and significantly associated with periodontitis, poor compliance to SPIC, multiple implants and implants with mucosal recession.

Impact of educational intervention on knowledge, attitude, practices and awareness related to periodontal health and disease among adults

Nur Zety Mohd Noh¹, Syahida Mastura Shamsudin², Munirah Daud²,
Sobrina Mohamed Khazin³, Mohamad Shafiq Mohd Ibrahim⁴

¹ Department of Restorative Dentistry (Periodontics Unit), Kulliyah of Dentistry, International Islamic University Malaysia, Malaysia.

² Kulliyah of Dentistry, International Islamic University Malaysia, Malaysia.

³ Department of Restorative (Endodontics Unit), International Islamic University Malaysia, Kulliyah of Dentistry.

⁴ Department of Paediatric Dentistry & Dental Public Health (Dental Public Health Unit), International Islamic University Malaysia, Malaysia.

Abstract

Background: Periodontal diseases represent a significant public health concern due to their high prevalence and potential impact on systemic health. Although preventive and therapeutic measures have improved, the overall burden remains high, frequently attributed to inadequate knowledge, attitude, practices, and awareness (KAPA) across population. **Objectives:** This study aimed to assess and compare the KAPA related to periodontal health and disease among adult patients, both prior to and following periodontal health screening and an educational intervention delivered by dental students. **Materials and methods:** A pre-post observational study was carried out among adult patients diagnosed with periodontal disease, using a self-administered online questionnaire distributed before and after a screening and educational intervention assessing KAPA. The Wilcoxon Signed-Rank test was employed to analyse the pre- and post-intervention differences in KAPA scores while Spearman's correlation coefficient test assessed the correlation between KAPA. **Results:** 93 patients were recruited. Significant improvement of knowledge and practices on oral hygiene was observed ($p < 0.05$) following educational intervention. Awareness of periodontal health and disease was weakly positively correlated with attitude ($p < 0.05$, $r = 0.242$). **Conclusion:** Tailored educational programs are needed to enhance periodontal health literacy and encourage behaviour change, supporting prevention and early management of periodontal disease.

Comparison of perceptions toward esthetic indices between restorative dentists and general dental practitioners

Saurav Sachdeva¹, Prof. Betsy Thomas², Ang Yee³

¹ Department of Periodontology, MAHSA University, Selangor, Malaysia.

² Department of Restorative Dentistry, MAHSA University, Selangor, Malaysia.

Abstract

Background: A successful restoration not only returns a patient back to a functional state but also enhances their esthetics. The Pink and White Esthetic Index (PES/WES) was created to fulfil this requirement however, according to the literature, its reliability varies substantially between studies, and its scoring differs between dentists of different speciality groups. **Objectives:** The aim of this study was to investigate the perceptions and reliability of the PES/WES index among restorative dentists and compare these findings to those of general dentists. **Materials and Methods:** 22 restorative specialists (experts) and 21 general dentists (non-experts) responded to a survey consisting of questions about their knowledge, practice and attitudes toward the PES/WES index and assessed 25 modified images of an ideal smile using the index's parameters. **Results:** The interclass correlation values for both groups (0.997 for general dentists and 0.988 for restorative dentists) using the PES/WES were excellent. PES/WES scores for the general dentists were significantly higher than those of the restorative dentists. A significant association was found between being a restorative dentist and undertaking esthetic dental treatments as well as the use of the PES/WES index. **Conclusion:** The index showed excellent reliability within each respondent group. Restorative dentists were stricter when scoring each parameter. The same group also undertook more esthetic dental treatment and usage of these esthetic indices.

Appraisal of an integrated chewing stick guideline for periodontal health using the AGREE II instrument

Haslinda Ramli¹, Shahida Mohd Said², Tuti Ningseh Mohd Dom³

¹ Department of Periodontology and Community Oral Health, Universiti Sains Islam Malaysia, Kuala Lumpur, Malaysia.

² Department of Restorative Dentistry, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.

³ Department of Family Oral Health, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.

Abstract

Background: Chewing sticks, such as miswak, have been traditionally used for oral hygiene in many cultures. Despite their potential oral health benefits, improper use of chewing stick has been associated with clinical attachment loss and gingival recession. Furthermore, no standardised clinical practice guideline has previously been developed to integrate this traditional method into standard oral health practice. **Objective:** This study aimed to assess the quality of a newly developed guideline on the integrated use of chewing sticks using the AGREE II instrument. **Materials and Methods:** A guideline was developed using a multi-method approach that integrated scientific evidence, cultural practices, and user experiences, and culminating expert consensus. The AGREE II tool was used by three independent appraisers to assess six domains: scope and purpose, stakeholder involvement, rigor of development, clarity of presentation, applicability, and editorial independence. Domain scores were calculated according to AGREE II manual guidelines. **Results:** The guideline scored highest in the domains of stakeholder involvement (98.2%) and high score for scope (92.6%), followed by rigor of development (89.6%) and clarity of presentation (85.2%). Lower scores were observed for editorial independency (77.8%) and applicability concerns (73.6%). Inter-rater agreement was moderate (ICC = 0.32). The final recommendation was to use the guideline with modifications to improve the description of the update schedule. **Conclusions:** The newly developed guideline on integrated chewing stick practice demonstrated high quality across all AGREE II domains, though clearer documentation of the update schedule is recommended to enhance effective implementation. Overall, this guideline constitutes a significant advancement in the integration of culturally practices with evidence-based approaches to periodontal health care.

An audit of periodontal referrals to unit Pakar Periodontik Tawau

Kevin Chee Pheng Neo¹, Valencia Dualis²

¹ Orthodontic Unit, Tawau Dental Clinic, Sabah, Ministry of Health Malaysia.

² Periodontic Unit, Tawau Dental Clinic, Sabah, Ministry of Health Malaysia.

Abstract

Background: Periodontal disease was one of the common findings among adults, with 94.6% as reported in the National Oral Health Survey of Adults (NOHSA) 2020. It was also acknowledged as one of the major global oral health burdens besides dental caries. Improper periodontal diagnosis and clinical examination could affect a patient's quality of life if it was not treated promptly. Patients with moderate to severe periodontal disease are often referred to periodontal specialist care after being screened in the primary dental clinic. Hence, there was a need to audit the periodontal screening and referrals carried out by dental officers. **Objectives:** To evaluate and audit periodontal referral patterns by dental officers in Tawau region, assessing the accuracy, completeness and compliance with the Ministry of Health Malaysia's referral guidelines. **Method:** A retrospective audit of reviewing referral letters received by Unit Pakar Periodontik Tawau from year 2013 to 2023. Data from referral letters such as demographic details, medical history, smoking status, diagnosis of periodontal disease and Basic Periodontal Examination (BPE) scores were analysed. SPSS version 29 software was used for statistical analysis. **Results:** A total of 367 referral letters were analysed, with 12 excluded due to incomplete referral letters. 70.95% of referrals were from primary dental clinics. The mean age of referral patients was 41.87 (± 14.47) years old, where more than half of the patients were females between 30-59 years old. Evaluation of the accuracy of the diagnosis of periodontal disease and BPE score showed that only 88.5% and 52.1% were accurately diagnosed. 69.55% of patients were referred with a BPE score of more than 3. **Conclusions:** Continuous dental education or workshops should be conducted annually to refresh and improve dental officers' ability to diagnose correctly. Accurate diagnosis and timely periodontal referrals are essential to ensure patients receive comprehensive periodontal treatment promptly.

From toothache to relief: Malaysians over-the-counter (OTC) drugs and prescription dilemma

Mahyunah Masud¹, Nurul Aqidah Shaiful², Nur Husnina Jaafar², Nurul Izzani Zulkifle²

¹ Faculty of Dentistry, Department of Periodontology, MAHSA University, Bandar Saujana Putra, Malaysia.

² Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Malaysia.

Abstract

Background: People buy over-the-counter (OTC) drugs to treat common ailments such as fever and cough. The prevalence of OTC drug intake is economical and convenient, and as temporary relief leading to a variety of drugs being sold and made available, however, little that we know about OTC drugs for dental pain being prescribed. This study hopes to improve the public understanding through information provided from the feedback given by the respondents involved with the OTC drugs prescription. **Objectives:** This study investigated the prescription of OTC drugs related to dental pain among the prescribers in Selangor, Malaysia and compared the selection, reasons, and awareness of the prescription. **Methods:** An observational study on pharmacies, Chinese medicine stores, and *Jamu* outlets in Selangor was conducted through interviewer-assisted validated questionnaires, and analyzed using SPSS version 23. **Results:** A total of 80 prescribers responded to the questionnaires. The preferred prescribed drugs were NSAIDs at 78% as perceived that NSAIDs could relieve dental pain and inflammation, herbal medicines (29%) that may numb the pain, and analgesics (13%) with the least choice being mouthwash (3%). The prescribers reported that price, lack of time, and emergency cases to relieve pain were reasons people sought OTC drugs. **Conclusions:** OTC drugs prescribed for dental pain were NSAIDs, herbal, and analgesics which were most commonly taken. However, intake of herbal medication should open doors on options to treat dental pain, as it has been practiced in the olden days. They perceived awareness of the importance of educating the customers, on the Malaysian Poisons Act 1952 and the Pharmacist Act 1951 that control drug liability in Malaysia, but, pain relievers are intended for short-term and should not be used for prolonged periods without consulting a health care professional. If it does not improve, consult a dentist for further evaluation and treatment.

Keywords: *Over-the-Counter (OTC) drugs. Prescribers. Dental pain. Malaysia*

Advocating for integration: Malaysian dental practitioners' perspectives on collaborative diabetes and periodontal care

Sunisha Kaur Rajinder Singh¹, Nik Madiah Nik Azis¹, Shahida Mohd-Said¹

¹ Department of Restorative Dentistry, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.

Abstract

Background: Diabetes mellitus and periodontitis share a bidirectional relationship that impacts overall health. While shared care can improve patient outcomes, it remains underutilised in routine dental practice. General dental practitioners (GDPs) are well-placed to assist in early detection and management, particularly in patients at risk of or living with diabetes mellitus, through appropriate screening and timely referrals. **Objectives:** This study aimed to (1) assess the level of awareness of Malaysian GDPs on oral health and diabetes, (2) assess their knowledge of the periodontitis-diabetes link, and (3) determine the association between GDPs' perceived role in the care of patients with diabetes, their actual knowledge level and perceived need for training in this area. **Methods:** A descriptive cross-sectional study was conducted using a validated and pre-tested questionnaire, developed based on a literature review and including Likert scale options. The survey covered demographics, general awareness, knowledge of the diabetes-periodontitis link, guidelines, current practices, and views on collaborative patient care. **Results:** Most GDPs were aware of the link between diabetes and periodontitis (78.2%) and the oral health implications of diabetes (75.1%). 75.4% reported screening patients for diabetes risk. However, only 24.6% felt confident in identifying diabetes risk factors and in managing oral conditions in diabetic patients. Although the majority agreed that medical-dental collaboration (94.5%) will benefit patients with risk factors for diabetes, and endorsed training in systemic disease management (84.7%), only 26.7% expressed willingness to participate in an online training. **Conclusion:** GDPs recognise the importance of their role in systemic disease management and support collaborative care. Low confidence and poor uptake of training highlight a gap between perceived responsibility and clinical preparedness. This suggests that knowledge alone does not translate into action. Targeted strategies, such as incentivising training and integrating it into CPD requirements, may enhance engagement and bridge the gap between perception and practice.

Oral health status of Olympic and Paralympic athletes: a comparative analysis

Nurul Ashikin Mastura Binti Muhammed Rezuan^{1,2}, Ian Needleman¹, Jacopo Buti¹, Paul Ashley¹, Pam Venning³, Lars Engebretsen⁴, Tobjorn Soligard⁵, Nick Webborn CBE DL⁶, Wayne Derman⁷

¹ Eastman Dental Institute, University College London, United Kingdom.

² Department of Restorative Dentistry, Universiti Malaya, Malaysia.

³ Elite Sports Medical Services Consultant, United Kingdom.

⁴ Oslo Sport Trauma Research Center, Norway.

⁵ International Olympic Committee, Lausanne, Switzerland.

⁶ School of Sport, Exercise and Health Sciences, Loughborough University, United Kingdom.

⁷ Faculty of Medicine and Health Sciences, Stellenbosch University, South Africa.

Abstract

Background: Oral health is increasingly recognised as a factor influencing performance in elite sport, yet comparative data between Olympic and Paralympic athletes remain limited. **Objective:** This study aimed to; 1. examine the prevalence of oral health conditions 2. identify associated factors on the disparities between the two groups 3. evaluate the utility of the polyclinic database for research and future development. **Methods:** This secondary analysis used dental polyclinic records from the London 2012 Olympic and Paralympic Games, including 443 Olympic and 202 Paralympic athletes. Descriptive statistics and group comparisons (Chi-square, t-tests) were followed by multivariable logistic regression to examine associations between oral health outcomes and demographic or clinical factors. Ethical approval was obtained (UCL Ethics ID: 27563.001). **Results:** Paralympic athletes exhibited a significantly higher prevalence of caries (32.4%) and periodontal diseases (35.2%) compared to Olympic athletes (18.6% and 26.5%, respectively). Logistic regression confirmed that athlete classification was a significant predictor for both conditions. Paralympic athletes had 1.68 times higher odds of caries (OR = 1.68, 95% CI: 1.36–2.09, $p < 0.0001$) and 1.25 times higher odds of periodontal diseases (OR = 1.25, 95% CI: 1.03–1.52, $p = 0.0241$). Mouthguard provision was more prevalent among Olympic athletes (28.6%). **Conclusions:** This study highlights both a high burden of oral diseases and disparities in oral health between Olympic and Paralympic athletes. Para-athletes had higher rates of oral health conditions such as caries and periodontal disease. Olympic athletes showed greater use of mouthguards. The findings support the need for equitable dental care and the integration of preventive strategies into sports medicine.

Periodontal disease in patients with diabetes mellitus: prevalence and associated factors

W.S. Wan Ab Naim¹, M. Jamaludin², L.L. Lim³, R.D. Vaithilingam¹

¹ Universiti Malaya, Department of Restorative, Kuala Lumpur, Malaysia.

² Universiti Malaya, Department of Community Oral Health & Clinical Prevention, Kuala Lumpur, Malaysia.

³ Universiti Malaya, Department of Medicine, Kuala Lumpur, Malaysia.

Abstract

Background: Diabetes mellitus (DM) has a bidirectional relationship with periodontal disease (PD). Risk factors play an essential role in the burden of PD among patients with DM. **Objectives:** To determine the prevalence of PD and its associated factors among patients with DM. **Materials and methods:** A cross-sectional study using convenience sampling was conducted on patients with DM in Universiti Malaya Medical Centre (UMMC). Demographic data and associated factors were obtained using self-reported questionnaire. Periodontal status was assessed using the Basic Periodontal Examination (BPE). HbA1c values were recorded. **Results:** Among the 128 participants, 97.7% had PD (BPE $\geq$ 2) while 85.2% had periodontitis (BPE $\geq$ 3) and 41% presented with severe periodontitis (BPE = 4). Participants with periodontitis were more likely to have secondary education (42.2%, $p = 0.001$) and belong to the lower-income group (< RM 4,850) (68.8%, $p = 0.002$). Healthy individuals were more likely to visit the dentist at least twice a year (21.1%, $p = 0.031$). Periodontitis group had more smokers (4.6%, $p = 0.025$) and participants with three or more co-morbidities (14.7%, $p = 0.036$). Participants in the lowest-income group were more likely to have periodontitis than those in the middle-income group (OR = 0.222, 95% CI: 0.065–0.759). while participants with shorter duration of DM (<10 years) had more odds of having periodontitis compared to those with a moderate duration (10–29 years) (OR = 0.240, 95% CI: 0.059–0.980). **Conclusions:** Within the study limitations, the findings highlight a high prevalence of PD and severe periodontitis among patients with DM at UMMC. Household income and duration of having DM were potential association factors for periodontitis. This emphasises the importance of integrating oral health screening and referral strategies into diabetes care pathways to facilitate the early detection and management of PD.

Effective implementation of oral hygiene instructions for routine oral self-care – a case series

Ashwin Parakkaje Subramanya¹

¹ Private practitioner, OralPlus Multispeciality Dental Care, Bengaluru, India.

Abstract

Background: Mechanical plaque control is the cornerstone in management of dental biofilm. Motivating and coaching patients on effective implementation of oral hygiene routine self-care is of paramount importance for long term success of any dental therapy. Oral hygiene instructions have been largely dependent on method like demonstration on models, projected aids like video clips, non-projected aids like posters, photographs, models and other audio-visual aids. Considering the pitfalls of conventional methods of oral health educational aids and also due to the increasing prevalence of dental diseases, a patient centric, personalized approach called 'Individually Trained Oral Prophylaxis' (iTOP) which uses 'Touch to Teach' concept was introduced by MUDr. Jiří Sedelmayer. It is a systematic way to learn optimal oral health management through hands-on training (Touch to Teach) with the use of selected tools and techniques. **Materials and methods:** This is a case-series that involves usage of iTOP method of oral hygiene instructions after treatments like non-surgical periodontal therapy, periodontal flap surgery, dental implants and maintenance during orthodontic treatment. Usage of toothbrush, calibrated interdental brushes and single brush were demonstrated/taught by Touch-to-Teach method based on relevance to the cases. Clinical examination of oral hygiene status and periodontal/peri-implant health was performed during the time of administration of oral hygiene instructions and follow-ups were performed at regular intervals of 6 months, up to 1 year. Relevant radiographs were also assessed. Patient reported outcome measures were noted. **Results:** In the present case series, it was observed that patients could maintain good oral hygiene resulting in satisfactory periodontal/peri-implant health in the post-treatment period. Patient reported outcome measures showed iTOP to be acceptable and non-traumatic way of learning and practicing routine oral self-care. **Conclusion:** iTOP as oral hygiene instruction method results in predictable treatment outcomes due to effective, acceptable and non-traumatic implementation of routine oral-self-care.

Interprofessional collaborative periodontal health care approach for geriatric diabetic patients

Swet Nisha¹, Chandra Narayan Gupta², Lorie Sigmon³, Shannon H Ford³

¹ Department of Periodontics, Haldia Institute of Dental Sciences and Research, Haldia, West Bengal, India.

² General Medicine at ICARE institute of Medical Science and Research and Dr. B C Roy Hospital in Haldia, West Bengal.

³ University of School of Nursing, North Carolina, Wilmington, College of Health and Human Sciences, USA.

Abstract

Background: Periodontal diseases is the 6th complication associated with diabetes mellitus. India is referred as the diabetes capital of the world, with increase in prevalence of periodontal problems. Older adults are most likely to be affected by the oral-systemic connection due to their impairment in functional capacity and reduced ability to undertake routine oral care. **Objective:** This study aimed to investigate the present educational content relevant to the periodontal health of older adults with diabetes, the oral-systemic connection, and assessment methods in dental education. **Materials and Methods:** A cross-sectional survey was conducted among dental students to understand the extent of periodontal health care education among Geriatric diabetes population. Quantitative descriptive data were analyzed using SPSS software and qualitative data were analyzed descriptively and presented as themes. **Results:** The results indicated that the periodontal health topics related to Geriatric and diabetes care were lacking into dental education. No emphasis was given for Geriatric care and lack of proper referral system, risk factors associated with periodontal health was not taught. The four themes identified in qualitative analyses are "lack of proper referral", "no collaborative care approach", "team work" and "Reforms in Dental Curriculum". **Conclusion:** The quantity and quality of periodontal health care relevant to older adults need to be improved and updated to suit the current oral health care needs of the growing older population.

Periodontal interventions and surgical site infections in mandibular fractures: part two – post-integration impact

Nur Hidayah Shamsul Bahrin¹, Domniki Chatzopoulou¹, Simon Holmes¹

¹ Queen Mary University of London (QMUL), Barts and The London School of Medicine and Dentistry, London, United Kingdom.

Abstract

Aim: Building on prior findings, this study further investigates the impact of specific periodontal interventions, delivered following the integration of periodontal care, on surgical site infection (SSI) rates in patients undergoing transoral mandibular fracture repair. It explores whether targeted periodontal strategies, such as periodontal awareness, oral hygiene instruction (OHI), professional mechanical plaque removal (PMPR), and chlorhexidine prescriptions, are associated with improved post-operative outcomes in this high-risk population. **Methods:** A retrospective analysis was conducted on patients with mandibular fractures treated at the Royal London Hospital from January 2021 to January 2023, following introducing a periodontal team to the Multidisciplinary trauma team. Using an identical methodology in a control group (pre-integration) before this integration, we then analysed SSI rates among patients treated with and without periodontal involvement against the control group. Descriptive statistics and statistical associations were evaluated using SPSS. **Results:** The study shows a notable reduction in SSI rates, decreasing from 22.95% in the control group to 12.5% in the current cohort, indicating a statistically significant improvement associated with periodontal team involvement. Furthermore, patients who received both OHI and chlorhexidine demonstrated a 72% reduction in SSI risk (OR = 0.28, $p = 0.029$), with the strongest protective effects observed in high-risk subgroups such as smokers and those with body fractures. No evidence of selection bias was found in the allocation of oral hygiene interventions. **Conclusions:** The findings support the inclusion of periodontal assessment and basic oral hygiene interventions, including OHI and chlorhexidine, as effective strategies for reducing surgical site infection following mandibular fracture repair. This multidisciplinary approach is particularly beneficial for high-risk patient groups and may be readily adopted within trauma care pathways to improve surgical outcomes. Further research is warranted to explore the potential role of PMPR in patients with advanced periodontal disease.

MUCOGINGIVA

Clinical Scientific Poster

Two-year follow-up of interdental guided creeping technique: a case report

Ghada G A-GamalElDin¹, Mohamed Sami Morgan², Ahmed Y Gamal³

¹ Department of Periodontology, Cairo University, Cairo, Egypt.

² Department of Periodontology, Ain Shams University, Cairo, Egypt.

³ Professor, Department of Oral Medicine, Periodontology and Oral Diagnosis, Ain Shams University, Cairo, Egypt.

Abstract

Background: The Interdental Guided Creeping Technique (IGCT) is a minimally invasive surgical approach for the augmentation of interdental papilla. IGCT aims to achieve optimal black triangle closure with minimal postoperative pain and trauma. **Objective:** To report the two-year follow-up of a case of papillary recession treated using IGCT. **Method:** A case of interdental papilla recession was treated using IGCT, which involved a minimal incision, creation of a blind tunnel, tissue advancement, placement of a suspensory suture, preservation of intact junctional epithelium, augmentation, and using a single simple suture. Interdental papillary fill was assessed over a two-year follow-up period. **Results:** Complete papillary fill was achieved at 6 months and maintained at 1 year. At the two-year follow-up, 85% of the papillary fill was preserved. **Conclusion:** IGCT appears to be a promising minimally invasive surgical technique for the treatment of interdental papilla recession, with stable long-term clinical outcomes.

Evaluating patient-reported outcomes following palatal graft harvesting: a comparison of the modified combined approach and de-epithelized gingival graft techniques

Wee Jian Chong¹, Nik Madihah Nik Azis¹, Masfueh Razali¹, Badiah Baharin¹

¹ Department of Restorative Dentistry (Periodontology), Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300, Kuala Lumpur, Malaysia.

Abstract

Background: The modified combined approach (MCA) for connective tissue graft harvesting has been proposed to promote faster healing and reduce postoperative complications, particularly in patients with thin palatal tissues. However, evidence supporting its clinical advantages remains limited. **Objectives:** This randomized clinical trial aimed to compare the postoperative outcomes of the MCA technique with the conventional de-epithelialized gingival graft (DGG) method, focusing on patient-reported morbidity and functional recovery. **Methods:** Patients requiring palatal connective tissue grafts were randomized into MCA (test) and DGG (control) groups. Postoperative morbidity was evaluated using two patient-reported outcome measures: a daily Visual Analogue Scale (VAS)-based questionnaire to assess pain, bleeding, and functional impairments (chewing, drinking, speaking), and the Brief Pain Inventory (BPI) to measure pain severity and interference. Analgesic intake was recorded and included as a covariate in adjusted models. **Results:** A total of 36 patients were recruited and randomized equally into two groups, with 18 patients in each arm. On Day 3, the MCA group reported a lower mean pain score (11.20 ± 17.97) compared to the control group (28.14 ± 21.99). Early postoperative data showed consistently lower pain interference scores in the MCA group. Generalized Estimating Equation (GEE) analysis confirmed significantly reduced pain interference (Wald $\chi^2 = 5.502$, $p = .019$) and superior early chewing function (Wald $\chi^2 = 30.989$, $p < .001$) in the MCA group, after adjusting for analgesic intake. **Conclusions:** The MCA technique was associated with improved early functional recovery and reduced pain interference. Larger randomized trials are needed to validate these findings.

A randomized controlled clinical trial comparing periosteal pedicle graft and subepithelial connective tissue graft in combination with coronally positioned flap for the management of Miller Class I gingival recession

Thomas Betsy Sara¹, Gupta Gazal Kaushalendra², Kulkarni Mihir Raghavendra³

¹ Department of Periodontology. Faculty of Dentistry. MAHSA University. Kula lumpur.

² Consulting Periodontologist, private practice, Mumbai, India.

³ Department of Periodontology, SDM college of Dental Sciences and Hospital, Dharwad, India.

Abstract

Goals: The goal of this randomized controlled clinical trial was to evaluate and compare the clinical efficacy of the periosteal pedicle graft (PPG) technique and the subepithelial connective tissue graft combined with coronally positioned flap (CT+CPF), which is considered the gold standard, in the treatment of Miller Class I gingival recession defects. The study aimed to determine differences in root coverage outcomes and gain in keratinized tissue height between the two techniques. **Materials and Methods:** Twenty systemically healthy patients with isolated Miller Class I gingival recession defects in the maxillary canine or premolar region were enrolled. Patients were randomly allocated into two groups: Test Group (PPG, n=10) and Control Group (CT+CPF, n=10). Clinical parameters including gingival recession depth, probing depth, relative attachment level, and width of keratinized tissue were recorded at baseline, 3 months, and 6 months postoperatively. Standardized surgical protocols and postoperative care were followed for both groups. Statistical analysis was conducted using paired and unpaired t-tests, with a significance threshold set at $p < 0.05$. **Results:** At 3 months, the mean root coverage was not significantly different between the two groups ($p = 0.824$). However, by 6 months, the CT+CPF group demonstrated significantly greater mean recession coverage ($p = 0.05$) and gain in keratinized tissue height ($p = 0.046$) compared to the PPG group. Both techniques showed improvement in clinical attachment levels, but the CT+CPF group showed more predictable results. **Conclusion:** The subepithelial connective tissue graft combined with coronally positioned flap showed superior clinical outcomes in terms of recession coverage and keratinized tissue gain. For Miller Class I gingival recession, CT+CPF remains the preferred technique, particularly in patients with a thin biotype, due to its predictability and long-term stability.

Treatment of gingival recessions using coronally advanced flap and modified coronally advanced tunnel technique with acellular dermal matrix: a comparative analysis

Jun Liu¹, Mary Iodine Lacanienta¹

¹ Centro Escolar University, Manila, Philippines.

Abstract

Introduction: Gingival recession is a common periodontal condition that leads to root exposure, sensitivity, and esthetic concerns. Surgical techniques such as Coronally Advanced Flap (CAF) and Modified Coronally Advanced Tunnel (MCAT), when combined with Acellular Dermal Matrix (ADM) as a grafting material, have been used to restore soft tissue coverage and improve clinical attachment. **Objective:** This study aimed to compare the clinical outcomes of CAF+ADM and MCAT+ADM in the treatment of Miller Class I (Cairo RT1) gingival recessions. **Methodology:** Conducted in 2024, this retrospective case-based study utilized a split-mouth design in a single patient with four bilateral gingival recession sites in the maxillary arch (#14, #15 and #24, #25). CAF+ADM was performed on one side and MCAT+ADM on the contralateral side. A single-case design was selected to allow for a controlled, in-depth comparison of two surgical techniques under identical clinical conditions, which is appropriate for exploratory clinical research. Clinical parameters—including Gingival Recession Depth (GRD), Clinical Attachment Level (CAL), Keratinized Tissue Width (KTW), and Probing Depth (PD)—were recorded at baseline and three months postoperatively. The Mann-Whitney U Test was used for statistical comparison, with significance set at $p < 0.05$. **Results:** CAF+ADM resulted in greater reductions in GRD and greater gains in CAL and KTW compared to MCAT+ADM, while MCAT+ADM demonstrated a slightly greater reduction in PD. However, statistical analysis showed no significant differences between the two techniques for any of the evaluated clinical parameters ($p > 0.05$), indicating that the superiority of either treatment cannot be definitively determined from this study alone. **Conclusion:** Given the single-case retrospective nature of this study, these findings provide preliminary insights into potential treatment outcomes rather than generalizable conclusions. **Recommendations:** Future studies with larger sample sizes and extended follow-up periods are recommended to further assess these techniques. While this study focused on GRD, CAL, KTW, and PD, future research should also consider evaluating additional clinical parameters, such as gingival thickness and tissue color matching, to gain a more complete understanding of treatment outcomes.

Keywords: *Gingival recession. Acellular dermal matrix (ADM). Coronally advanced flap (CAF). Modified coronally advanced tunnel (MCAT).*

Management of generalised gingival recession with multiple grafting techniques: a clinical case report

Rusmizan Yahaya¹, Nurul Ain Mohamed Yusof¹, Yuhaniz Ahmad Yaziz¹

¹ Periodontic Unit, Kota Setar Dental Specialist Clinic, 05100 Alor Setar, Kedah, Ministry of Health, Malaysia.

Abstract

Background: Generalised gingival recession presents both functional and aesthetic concerns, including root hypersensitivity, caries risk, and compromised smile appearance. Surgical correction can be challenging, especially when multiple sites are involved with varying soft tissue biotypes and defect depths. **Objectives:** To describe the management of generalised gingival recession in a patient using a combination of periodontal plastic surgery techniques involving both autografts and allografts. **Method:** A healthy, non-smoking patient presented with 1-5 mm of generalised RT1 gingival recession. Treatment was performed using a site-specific multimodal approach. Free gingival grafts were used in areas lacking attached gingiva, while connective tissue grafts and allografts were selected for root coverage based on tissue availability and aesthetic priority. Tunnelling and coronally advanced flap techniques were incorporated to enhance graft stability and blood supply. All procedures were carried out under local anaesthesia, and the patient received standard post-operative care. **Results:** At 3- and 6-month follow-up, successful root coverage was achieved in the majority of treated sites, with increased keratinised tissue width and improved gingival thickness. Healing was uneventful with no complications. The patient reported significant reduction in dentinal hypersensitivity and high satisfaction with the aesthetic outcome. **Conclusions:** A comprehensive, individualised surgical approach that integrates multiple grafting techniques can yield predictable and aesthetically pleasing results in the treatment of generalised gingival recession. The combination of autografts, allografts, and minimally invasive surgical techniques such as tunnelling may improve both clinical outcomes and patient satisfaction.

Predictable root coverage technique for mandibular incisors with high frenal attachment: a case report

Ahmad Azhar Misran^{1,2}, Muhammad Annurudin Sabarudin³

¹ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia, 50300 Kuala Lumpur, Malaysia.

² School of Clinical Dentistry, Faculty of Health, The University of Sheffield, 19 Claremont Crescent, Sheffield, S10 2TA, United Kingdom.

³ Department of Periodontology and Community Oral Health, Faculty of Dentistry, Universiti Sains Islam Malaysia, Jalan Pandan Utama, 55100 Kuala Lumpur, Malaysia.

Abstract

Background: Gingival recession involving the mandibular central incisors is a common complication of orthodontic treatment. However, achieving predictable root coverage for deep, isolated recessions in this region particularly when compounded by a high frenal attachment remains one of the most challenging aspects of mucogingival surgery. **Objective:** This case report describes a combined approach of laterally closed coronally advanced tunnel with connective tissue graft for managing a gingival recession in a supra erupted mandibular central incisor with high frenal attachment, aiming to achieve optimal functional and aesthetic outcomes. **Materials and methods:** A 26-year-old healthy male was referred for management of gingival recession (RT1 Cairo classification) involving left mandibular central incisor as a complication after completing orthodontic treatment. A laterally closed coronally advanced tunnel flap was performed and connective tissue graft was adapted to the recipient site. Post-operatively, the healing was uneventful, and patient reported outcomes was good. **Results:** At 5 months postoperatively, the labial gingival thickness and width have increased with 90% of root coverage was achieved. **Conclusion:** A laterally closed coronally advanced tunnel with connective tissue graft is a valuable approach which results in stable root coverage with good aesthetic outcome.

Lateral tunnel technique in treating maxillary premolar recession: insights from a Malaysian experience

Nasrudin Siti Sarah¹, Mohd Hanifah Muhammad Hadi¹

¹ Periodontics Specialist Unit, Klinik Pergigian Bandar Raub, Pahang, Malaysia.

Abstract

Background: Gingival recession is a common clinical finding that can lead to dentine hypersensitivity, aesthetic concerns, and difficulty in maintaining optimal oral hygiene. The treatment of such defects, particularly in the premolar region, can be challenging. This case report presents the application of the laterally closed tunnel technique in managing a localized gingival recession defect in a maxillary premolar, highlighting the outcomes and clinical reproducibility of the approach. **Case Description:** A 55-year-old Chinese female patient presented with a primary complaint of dentine hypersensitivity due to localized gingival recession at tooth 24 (maxillary left first premolar). The patient demonstrated good oral hygiene and had controlled type 2 diabetes mellitus (HbA1c < 7%). Clinical examination revealed a Recession Type 2 (RT2) defect with 7 mm of gingival recession and 4 mm probing depth, alongside a thick mucogingival phenotype with approximately 2 mm of keratinized tissue width. **Objective:** The primary goal was to achieve maximum root coverage, reduce hypersensitivity, and support long-term periodontal health and plaque control. **Method:** The laterally closed tunnel technique, as proposed by Anton Sculean, was utilized. A connective tissue graft was harvested and inserted into a surgically prepared tunnel around the recession site. The graft was laterally advanced to cover the exposed root surface and secured in place. **Results:** One month postoperatively, 100% root coverage was achieved with excellent tissue integration and aesthetic outcome. The patient reported complete resolution of dentine hypersensitivity and maintained excellent oral hygiene. **Conclusion:** The laterally closed tunnel technique is a reliable and minimally invasive option for treating localized gingival recession in thick tissue phenotypes. With proper case selection and technique, favourable outcomes can be consistently achieved, even in medically controlled systemic conditions.

Gingival phenotype modification in treatment of gingival recession type 3 (RT3): a case series

Wei Ying Tey¹, Yi Min Loh¹, Nurul Saadah Razali¹, Zanarita Aspanut¹, Guat Syin Lau¹

¹ Periodontic Unit, Mahmoodiah Dental Clinic, Johor Bahru, Johor, Malaysia.

Abstract

Background: Gingival recession often leads to aesthetic concerns and root sensitivity. It is also frequently associated with reduced keratinised gingiva width (KGW), which may impede effective oral hygiene care. Although mucogingival surgery for gingival recession type 3 (RT3) at the mandibular incisors may not provide complete root coverage, the affected area might benefit from the increased amount of keratinised tissue. An adequate amount of KGW can improve patients' ability to maintain oral hygiene and gingival health. Free gingival graft (FGG) is one of the preferred surgical techniques to achieve this goal, especially in populations with thin gingival phenotypes. **Objectives:** This study aims to assess the surgical outcomes of FGG in patients with RT3 at the mandibular incisors and the treatment impact on their daily oral hygiene practice. **Method:** Medically fit and healthy adult subjects with RT3 at the mandibular incisors were included. Following clinical and radiographic examination, proper oral hygiene instructions and full mouth scaling were carried out. Mucogingival surgery was performed at the mandibular incisors with FGG harvested from the palatal region of upper premolars and molars. Post-operative reviews were scheduled at 2 weeks, 2 months, 6 months, 9 months and 1 year. Clinical photographs were taken before and after the surgery. **Results:** Six subjects were included in this study. Graft integration was successful in all subjects. An increased amount of keratinised tissue at mandibular incisors was observed. All subjects reported improved access for self-cleaning. **Conclusions:** FGG is a viable surgical method to increase KGW and facilitate oral hygiene practices in patients with RT3 at the mandibular incisors. Further research should be conducted with objective measurements to substantiate the study outcomes.

Evaluation of gingival colour integration after soft tissue grafting using clinical and digital methods

Nik Madiah Nik Azis¹, Chong Wee Jian², Masfueh Razali¹, Badiah Baharin¹

¹ Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia.

² Faculty of Dentistry, Universiti Kebangsaan Malaysia.

Abstract

Background: De-epithelialized connective tissue grafts (DGG) are commonly employed in soft tissue augmentation to replace lost gingival structures. Achieving a natural match in gingival colour is crucial for aesthetic satisfaction, although colour outcomes post-surgery can be variable. **Objectives:** This study aimed to investigate gingival colour changes after DGG-based soft tissue augmentation, with evaluations conducted up to 6 months postoperatively. **Methods:** This prospective clinical trial involved participants undergoing soft tissue augmentation to manage gingival recession with DGG. Gingival colour was evaluated at baseline, 3 months, and 6 months post-treatment using both a visual scoring system and CIE Lab* colour parameters measured from standardised digital photographs. ΔE values representing mean colour differences were calculated in reference to baseline measurements. **Results:** Thirty-two participants were enrolled according to the study's inclusion criteria. At the 3-month follow-up, 59.38% of participants demonstrated good to excellent gingival colour integration, though this proportion declined to 53.13% by the 6-month review. The mean colour difference (ΔE) was 10.44 ± 6.18 at 3 months and 10.20 ± 5.41 at 6 months, indicating a persistent and clinically noticeable divergence from baseline tissue colour beyond the initial healing period. Standardised digital image analysis revealed significant changes in all three CIE LAB parameters, L*, a*, and b*, from baseline to 3 months ($p = 0.007$, 0.005 , and 0.010 , respectively). However, no significant changes were observed between 3 and 6 months ($p = 0.291$, 0.764 , and 0.924), suggesting colour stability during this later phase in all the colour dimensions. **Conclusion:** DGG-based soft tissue augmentation generally yields favourable aesthetic outcomes, particularly in achieving gingival colour harmony. Both clinical evaluations and CIE LAB analysis indicate that colour differences are perceptible as early as 3 months and tend to stabilise thereafter, suggesting persistent but consistent deviation from baseline tissue colour, possibly influenced by tissue maturation and keratinisation over time.

REVIEWS

Clinical Scientific Poster

Can atypical antipsychotics use increase risk of periodontal disease? Findings from a scoping review

Dileep Sharma¹, Oliver Higgins², Poornima Ramamurthy³, Sarbin Ranjitkar⁴

¹ Professor & Head of Discipline, Oral Health, University of Newcastle, Ourimbah, Australia.

² Deputy Director, Mental Health, Central Coast Local Health District, Wyong, Australia.

³ Epidemiologist, Eleanor Duncan Aboriginal Services, Mardi 2259, Australia.

⁴ Senior Lecturer, Adelaide Dental School, Adelaide Australia.

Abstract

Background: Atypical antipsychotics are being increasingly used to manage severe mental illnesses over the past few decades, but their impact on periodontal disease activity is unclear. **Objectives:** This review evaluated the side-effects of atypical antipsychotics routinely used in management of severe mental illnesses. **Materials and methods:** A PRISMA-guided scoping review was conducted, using predefined criteria and relevant word combination on databases including Medline (PubMed), Embase, Scopus and Cochrane. Eligible studies were assessed for study type, population characteristics, atypical antipsychotic medication(s) used, additional medications and quantitative data reported on periodontal disease prevalence. **Results:** Five studies met the inclusion criteria with reported measures of periodontal disease such as bleeding on probing, plaque index, and diagnoses of gingivitis or periodontitis included in their findings. Overall, most of the included studies highlighted the increase in incidence and severity of periodontal disease activity in patients taking atypical antipsychotics for severe mental illnesses. Negative effects of xerostomia-inducing atypical antipsychotics were at least 150% higher than sialorrhea-inducing atypical antipsychotics. **Conclusion:** Evidence from this scoping review suggests that atypical antipsychotics can significantly compromise periodontal health in patients with severe mental illnesses. These findings highlight the need for ongoing oral health assessments and early interventions, particularly through interdisciplinary model of care to optimally manage patients on long-term atypical antipsychotics.

Bibliometric analysis of *Salvadora persica* in periodontal research

Zaid Ahmad Sharifuddin¹, Fara Azwin Adam¹, Erni Noor¹, Nazurah Nik Eezammuddeen¹

¹ Centre of Periodontology Studies, Faculty of Dentistry, Universiti Teknologi Mara, Sungai Buloh Campus, 47000 Selangor, Malaysia.

Abstract

Background: Bibliometric analysis is a valuable method for understanding research dynamics, identifying trends, and predicting future directions in specific scientific domains. **Objectives:** This study aimed to comprehensively analyze the trends and significant contributions in research related to *Salvadora persica* (miswak) within the field of periodontology. **Materials and Methods:** A thorough literature search was conducted using Scopus and Web of Science (WOS) databases without imposing restrictions regarding language, publication year, or study design. Relevant articles were retrieved using keywords such as "*Salvadora persica*," "miswak," "periodontal disease," "oral hygiene," and "gingivitis." **Results:** In total, 140 articles published between 1991 and 2025 were included for analysis. The peak year of publication activity was 2021, yielding 16 articles. The Journal of Ethnopharmacology emerged as the most prolific publication source with six articles, underscoring its prominent role in this research domain. Data analysis and visualization were performed using RStudio and VOSviewer software. The analysis identified influential authors, leading institutions, and commonly used keywords, highlighting pivotal contributions and emphasizing collaborative research patterns. This study provides clear insights into the research trends and productivity concerning the application of *Salvadora persica* in periodontal care. **Conclusion:** Further exploration into the therapeutic applications of *Salvadora persica* is encouraged to improve periodontal treatment outcomes and enhance overall patient care.

Shaping the future: the implementation of 3-D printing in periodontal regenerative procedures

Farah Fadzreen Harun¹, Fara Azwin Adam¹, Najwa Baharudin¹, Farha Ariffin¹

¹ Centre of Periodontology Studies, Faculty of Dentistry, Universiti Teknologi Mara, Sungai Buloh Campus, 47000 Selangor, Malaysia.

Abstract

Background: Periodontal regeneration, aiming to restore the lost structure and functionality of periodontal tissue, is a fundamental component of periodontics. Despite their effectiveness, conventional regenerative procedures are frequently constrained by variability in defect morphology, graft handling and individual anatomical variations. Three-dimensional (3D) printing has been a game-changing technology in recent years, offering precision, customization and improvement in regenerative outcomes. **Objective:** This review evaluates the existing literature on the applications of 3D printing in periodontal regeneration, emphasising the conversion of technology breakthroughs into patient-centred treatments. **Methods:** The Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 Guideline (PRISMA 2020 Guideline) was followed when conducting the review. For relevant articles, articles were obtained from various electronic databases, the National Library of Medicine (Medline-PubMed), Scopus, Cochrane Library, Science Direct, Wiley Online Library, Web of Science, and Google Scholar. No limitations on the language used, with publications from 2005 to 2025. Human clinical trials, case reports, in vivo and relevant translational studies were selected. **Results:** Four (4) RCTS, twelve (12) in vivo, two (2) in vitro and three (3) case report articles were found to fit the inclusion and exclusion criteria. The results of 3D-printed scaffolds for sinus and bone augmentation, as well as bone and tissue regeneration, are predictable. When a 3D printed surgical template is used for implant placement, accuracy is increased and positional deviation, issues, surgical time, postoperative discomfort, and oedema are decreased. **Conclusions:** 3D printing represents a promising adjunct in periodontal regenerative therapy, with the potential to overcome the limitations of conventional techniques through enhanced personalization and precision. Diverse applications of this technology have been documented in the literature across a range of fields, such as implant education, peri-implant care, sinus and bone augmentation, periodontal repair and regeneration, and 3D-printed scaffolds for socket preservation.

Keywords: 3D printing. Periodontal regeneration. Guided tissue regeneration. Custom scaffold. Clinical application

The effectiveness of high-volume evacuator in aerosol and splatter reduction during dental procedures: a systematic review and meta-analysis

Nurdarwisyah Qariah Nora¹, Munirah Yaacob²,
Solachuddin Jauhari Arief³, Suhaila Muhammad Ali²

¹ Kulliyyah of Dentistry, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, 25200, Kuantan, Pahang, Malaysia.

² Periodontics Unit, Department of Restorative Dentistry, Kulliyyah of Dentistry, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, 25200, Kuantan, Pahang, Malaysia.

³ University of Brunei Darussalam, Brunei Darussalam.

Abstract

Background: A significant number of dental procedures generate aerosols and splatter, which pose a potential risk for cross-infection. This systematic review was conducted to identify available experimental studies assessing the use of a High-Volume Evacuator (HVE) in dental procedures and to evaluate its efficiency in minimising the aerosol or splatter. **Materials and Methods:** A comprehensive literature search was carried out across four databases: COCHRANE, PubMed, Scopus, and Google Scholar. The review followed the PRISMA guidelines and applied a PICOT-based screening strategy to identify relevant studies. The quality of the selected studies was appraised using the OHAT tool. Studies with comparable outcome measures were included in a meta-analysis. **Results:** Out of 431 initially identified articles, 19 experimental studies met the inclusion criteria and were subjected to both qualitative and quantitative synthesis. These studies were divided into those conducted in real clinical settings (in-vivo) and those performed in simulated environments (in-vitro). Most of these studies were assessed as having a fair risk of bias. About 68% of included studies investigated on scaling procedures. The meta-analysis of in-vivo studies demonstrated that HVE reduced bacterial contamination during scaling procedures by an average of 80.6%, with a mean difference of -35.3 colony-forming units (95% CI: -50.8 to -19.82; $I^2 = 34\%$). In vitro studies also showed a significant reduction in aerosol levels, with a mean difference of -61.4 $\mu\text{g}/\text{m}^3$, although with notable heterogeneity. This heterogeneity was attributed to differences in measurement techniques and experimental setups. **Conclusion:** High-Volume Evacuators (HVEs) is effective in mitigating aerosol and bacterial contamination during scaling procedures but inconclusive for other dental procedures. However, this conclusion is based on evidence of fair quality from a limited number of studies. Future experimental research would benefit from improved methodological standardisation across both in-vivo and in-vitro settings to enhanced confidence in these findings.

Evaluating clinical outcomes of locally delivered antibiotics as adjunctive therapy in periodontitis: a contemporary review

NI Idrus¹, NA Ramlan², HB Said Gulam Khan³, MH Zainal Ariffin¹

¹ Centre of Periodontology Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, Sungai Buloh, Selangor, Malaysia.

² Centre of Study Comprehensive Care Dentistry, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, Sungai Buloh, Selangor, Malaysia.

³ Centre of Preclinical Science Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, Sungai Buloh, Selangor, Malaysia.

Abstract

Background: Scaling and root planing (SRP) is a widely recognized and effective nonsurgical treatment for chronic periodontitis. However, its effectiveness is limited in deeper periodontal pockets and areas with complex anatomical structures where complete calculus removal is challenging. Local drug delivery (LDD) systems have been developed to address these limitations, allowing for high concentrations of antimicrobials to be applied directly at the site, thereby improving treatment outcomes, enhancing patient compliance, and potentially preventing bacterial resistance. **Aim:** This systematic review examines the clinical effectiveness of locally delivered antibiotics (LDA) as an adjunct to SRP in treating periodontitis. **Methods:** A comprehensive literature search of databases such as PubMed, Cochrane Library, and Scopus was conducted to identify relevant randomised controlled trials (RCTs). Studies were included if they evaluated clinical outcomes of LDA combined with SRP, with key measures including probing depth (PD), clinical attachment level (CAL), and bleeding on probing (BOP). This study has been registered under PROSPERO with ID CRD42024607902. The RoB 2 tool was used for assessing the studies' risk of bias. A fixed effect meta-analysis was conducted to measure PD, CAL and BOP between the intervention and control groups. **Results:** The review included multiple studies showing that adjunctive LDA use with SRP led to significant improvements in PD reduction and CAL gains in periodontitis patients. Among the antibiotics studied, minocycline and doxycycline produced the most consistent positive results, though effectiveness varied based on antibiotic concentration, delivery system, and disease severity. **Conclusion:** While LDAs show promise in enhancing periodontal treatment outcomes, variability in results and potential issues such as antimicrobial resistance suggest the need for cautious application. Further research should focus on optimizing antibiotic selection, dosage, and patient-specific factors to improve clinical effectiveness while minimizing risks.

Alveolar ridge preservation technique: a narrative review

Salehuddin Nurul Qamar¹, Mohd Noh Nur Zety², Mohamed Yusof Nurul Ain³,
Ali Sharul Nisha⁴, and Ayob Yuliana⁵

¹ Unit Periodontik, Klinik Pergigian Kuala Kangsar Kementerian Kesihatan Malaysia
33000, Kuala Kangsar, Perak.

² Department of Restorative Dentistry (Periodontics Unit) Kulliyah of Dentistry International
Islamic University Malaysia Kuantan Campus Jalan Sultan Ahmad Shah, Bandar Indera Mahkota
25200, Kuantan, Pahang.

³ Unit Periodontik, Klinik Pakar Pergigian Kota Setar Kementerian Kesihatan Malaysia
05100, Alor Setar, Kedah.

⁴ Unit Pakar Periodontik, Klinik Pergigian Air Putih, Klinik Kesihatan Air Putih,
Lot 483, Klinik Kesihatan Jenis (KK3), Jalan Air Putih, Mukim E, 11000 Balik Pulau, Pulau
Pinang.

⁵ Unit Pakar Periodontik, Klinik Pergigian Kota Samarahan, 94300 Samarahan, Sarawak.

Abstract

Background: Alveolar ridge preservation (ARP) is recommended to maintain bone volume for future implants, supporting both function and aesthetics, while simplifying treatment. However, its cost-effectiveness remains limited. **Objective:** To review current evidence on ARP techniques, materials, and economic considerations. **Materials and Methods:** Relevant studies were identified via Google Scholar and PubMed, then reviewed by five authors. **Results:** ARP reduced post-extraction ridge loss by 1.25–1.86 mm (width) and 1.36–1.62 mm (height), especially in sockets with damaged walls. Xenografts and allografts preserved about 2mm more bone than extraction alone, though no material proved superior. Technique choice should be case-specific. While ARP adds upfront cost, it may lower future grafting needs, suggesting potential cost-effectiveness. **Conclusion:** ARP supports functional, aesthetic, and economic outcomes in implant planning, offering a less invasive, more affordable alternative to future reconstructive procedures.

Systematic review on radiographic landmark-based AI for periodontal bone loss detection

Wan Nur Alia Amalina binti Wan Roselan¹, Muhammad Hilmi Zainal Ariffin¹

¹ Centre of Periodontology Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh Campus, 47000 Selangor, Malaysia.

Abstract

Background: Accurate diagnosis of periodontal bone loss relies on radiographic evaluation using anatomical landmarks such as the cementoenamel junction (CEJ) and alveolar crest. **Objectives:** This systematic review aimed to assess how landmark-based annotations are used in artificial intelligence (AI) models for periodontal bone loss detection and prognosis. **Materials and methods:** A comprehensive literature search was conducted across PubMed, Scopus, Web of Science (WOS), Embase, and IEEE Xplore. Studies were included if they utilized AI models on dental radiographs incorporating anatomical landmarks for bone loss analysis. Data on imaging modalities, AI architectures (e.g., CNNs, YOLO, Mask R-CNN), landmarks used, and performance metrics were extracted. **Results:** Most studies employed deep learning-based models using periapical or panoramic radiographs, with the CEJ and alveolar crest being the most commonly annotated landmarks. Models that used these landmarks demonstrated improved diagnostic performance, with segmentation models achieving Dice scores above 0.90 and classification models reporting accuracies up to 94%. These models often translated landmark-based outputs into measurable bone loss percentages aligned with established staging criteria. **Conclusion:** Radiographic landmark-based annotations enhance the performance, accuracy, and clinical interpretability of AI models in periodontal diagnostics. Their integration allows for objective bone loss quantification and supports earlier detection and improved treatment planning. Further work is needed to address anatomical variability and standardize landmark definitions for consistent application across AI systems.

Adjunctive use of platelet-rich fibrin in nonsurgical periodontal treatment

Hong Zhang Wong¹, Fouad Hussain Al-Bayaty¹

¹ Department of Periodontology, MAHSA University, Bandar Saujana Putra, Malaysia.

Abstract

Background: As a biomaterial derived from the patient's own blood, autologous platelet concentrates (APCs) have been used in various procedures of medicine and dentistry. One such field of application is in periodontics, both in surgical and non-surgical procedures, such as management of extractions socket & soft tissue, alveolar bone augmentation & regeneration, and treatment of periodontitis & osseous defects. **Objectives:** This paper reviews the literature on the newer generation of APCs, platelet-rich fibrin (PRF) used as an adjunct in the nonsurgical treatment of periodontitis. **Materials and methods:** A thorough electronic search of systematic electronic search of PubMed & Cochrane databases, and Google Scholar was performed from 2002 up until February 2025, as well as secondary hand search of reference list. The articles were evaluated after being screened for relevance to APCs and PRF as adjuncts in nonsurgical periodontal therapy (NSPT). **Results:** From 2,024 results, papers found included APCs in the form of platelet-rich plasma (PRP), plasma-rich growth factor (PRGF), and solid PRF & liquid injectable PRF (i-PRF). 2 recent systematic reviews with meta-analysis & 1 systematic review regarding the subject were found, and 14 randomized clinical trials (RCTs) involving PRF were included. All of the RCTs were from 2020 to 2024, in single centers, and conducted in universities across Egypt, India, Iraq, Lebanon, Serbia Syria, and Turkey. **Conclusion:** The body of research on the use of different APCs in NSPT is small and limited, and it may contain biases. The usage of PRF and other newer generations of APCs in NSPT may be a frontier for research due to varied methods employed and inconsistent findings surrounding the adjunctive use for treatment of periodontitis.

Understanding oral hygiene compliance in periodontitis: patients' perspectives in a scoping review

Yi Wen Soah¹, Ruhaya Hussin², Syarida Hasnur Safii¹

¹ Universiti Malaya, Department of Restorative Dentistry (Periodontology), Kuala Lumpur, Malaysia.

² International Islamic University Malaysia, Department of Psychology, Kuala Lumpur, Malaysia.

Abstract

Background: Effective supragingival dental biofilm control is essential for achieving and maintaining periodontal health in patients with periodontitis. Although self-performed plaque control plays a critical role in preventing disease progression, many individuals face challenges in maintaining consistent oral hygiene. Despite the awareness of its importance, compliance often remains suboptimal. Thus, understanding a patient's perspective is vital for addressing these challenges. **Objective:** This scoping review explored the literature on oral hygiene practices among periodontitis patients, with a focus on identifying barriers and facilitators from the patients' point of view. **Materials and methods:** This review was conducted in accordance with the Joanna Briggs Institute scoping review protocol guidelines and PRISMA-ScR guidelines. The included studies were original English articles involving adult periodontitis patients that used clinical parameters to assess oral hygiene compliance. Four electronic databases and grey literature were searched. Of the 906 studies screened, 61 met eligibility criteria. For this focused synthesis, findings related specifically to patient-reported barriers and facilitators to oral hygiene compliance were extracted and thematically analysed. **Results:** Patient-related factors were identified as the main barriers to oral hygiene compliance. These included attitudinal and behavioural issues, physical and mental health challenges, socioeconomic or financial constraints, and limited oral hygiene education, often influenced by unreliable sources. At the same time, many of these factors, such as attitudes and behaviours, personal traits, mental health status, socioeconomic background, autonomy, and oral hygiene education also served as facilitators when positively oriented. **Conclusion:** Understanding patient experiences offers valuable insights into improving patient compliance. Psychological factors, such as motivation, self-efficacy, and emotional well-being, are often overlooked but play a critical role in shaping oral hygiene behaviours. Dental providers should adopt patient-centred strategies that address both practical and psychological barriers to promote sustained oral hygiene compliance and improve periodontal outcomes.

AESTHETICS

Clinical Scientific Poster

Stabilizing diastema closure with frenectomy following orthodontic treatment: a case report

Shelly Mayvira¹, Aini Hariyani Nasution²

¹ Periodontics Residency Program, Faculty of Dentistry, Universitas Sumatera Utara, Indonesia.

² Department of Periodontics, Faculty of Dentistry, Universitas Sumatera Utara, Indonesia.

Abstract

Background: The midline diastema becomes a major aesthetic problems since it is seen when someone smile. One of the causes of the persistence of central diastema is an aberrant frenum. The maxillary frenum may compromise orthodontic outcomes in cases of central diastema or result in aesthetic issues, leading to relapse following treatment. Frenectomy is a treatment for an aberrant frenum. **Objectives:** The probability of relapse from central diastema closure can be decreased by a frenectomy during orthodontic treatment. **Materials and Methods:** A 22-year-old female patient who had midline correction with orthodontic treatment was referred to Dental Hospital of Universitas Sumatera Utara for frenectomy. Frenectomy was performed using a scalpel technique under local anesthesia. The patient was given instructions and medicines post surgery. The suturing was taken out in two weeks. **Results:** The subsequent frenectomy was completed without complications, resulting in favorable soft tissue healing. The surgical removal of the frenum helped prevent tension on the gingival tissue and minimized the risk of space reopening. The treatment was well-tolerated by the patient and results remained stable during the follow-up period. **Conclusion:** The timing of labial frenectomy that timed precisely can greatly increase treatment stability following diastema closure with orthodontic treatment. In cases with diastema, a dependable method for reaching and preserving the best possible aesthetic results is a coordinated treatment plan that incorporates periodontic surgery and orthodontics treatment.

Keywords: *Aberrant frenum. Diastema. Frenectomy.*

Guided 3D esthetic crown lengthening - a case series

Chee Soon Wong¹, Fouad Al Bayaty¹

¹ Department of Periodontology, Faculty of Dentistry, MAHSA University, Saujana Putra, Selangor, Malaysia.

Abstract

Background: Aesthetic crown lengthening is a periodontal surgical procedure aimed at improving dental esthetics by exposing more of the clinical crown through the removal or recontouring of excess gingival tissue and, when necessary, underlying alveolar bone. This technique is commonly indicated for patients presenting with excessive gingival display, altered passive eruption, or uneven gingival margins. The initial documentation involved patient's cbct and digital scan, followed by planning using exocad and lastly 3d printing of the surgical guide. Compared with traditional guides, digital guides offer significant advantages for providing more predictable surgical outcomes and shortening the clinical time. **Materials and methods:** This case series present two female patient with chief complaints of a "gummy smile" and short clinical crowns in the maxillary anterior region. The surgical planning was done using CAD-CAM and a digital guide for gingivectomy was fabricated according to the surgical plan. After administration of local anesthesia, gingivectomy was performed according the digital guide, using surgical blade. External bevel incisions were given to achieve proper visualization and accurate gingival contour. Postoperative care included chlorhexidine rinses, analgesics, and follow-up assessments at one week, one month, and three months. **Results:** The patient exhibited excellent healing and a significant improvement in smile esthetics and self-confidence. She is amazed with the simplicity and accuracy of the procedure itself, and have no much pain after the surgery (VAS score 2). With the help of digital guides, the gingivectomy procedure was more accurate than a free-hand approach. **Conclusion:** This case highlights the importance of a multidisciplinary approach in treatment planning which allows for fewer surgical errors and more predictable gingival and alveolar margins, encouraging a harmonious relationship between teeth and gingiva. The clinical workflow is straightforward and convenient for the surgeon. Although this technique requires additional time before surgery and increases the patient's cost, the benefits outweigh the limitations.

Frenectomy as a multidisciplinary periodontal-orthodontic treatment: a case report

Wydiavei¹, Syahputra A²

¹ Periodontic Residency Program, Faculty of Dentistry, Universitas Sumatera Utara, Medan, Indonesia.

² Department of Periodontics, Faculty of Dentistry, Universitas Sumatera Utara, Medan, Indonesia.

Abstract

Background: Diastema closure is a common esthetic treatment in dentistry. However, relapse may occur if contributing factors, such as an enlarged labial frenum, are not properly managed. Frenectomy has been suggested as an adjunctive procedure to enhance long-term stability following orthodontic diastema closure. **Objective:** This case report describes the role of frenectomy in preventing relapse after orthodontic diastema closure, highlighting its importance in a multidisciplinary periodontal-orthodontic approach. **Method:** A 21-year-old female undergoing orthodontic treatment was referred to the Rumah Sakit Gigi dan Mulut USU (RSGM USU) with complaints of swollen and frequently bleeding gums. Clinical examination revealed a hypertrophic labial frenum, with the frenulum attachment reaching the interdental papilla, contributing to both gingival inflammation and diastema relapse. Frenectomy was performed to improve tissue stability and support orthodontic outcomes. **Results:** The presence of an enlarged or aberrant labial frenum may exert tension on the gingival tissues and contribute to diastema relapse. Recent studies support the role of frenectomy in ensuring the long-term stability of orthodontic treatments. Patel et al. (2021) found that frenectomy combined with orthodontic treatment reduced relapse rates. Al-Mansour et al. (2022) reported improved periodontal health following frenectomy, reducing inflammation and tissue tension. These findings highlight its significance in achieving stable esthetic and functional results. **Conclusions:** Frenectomy is an effective adjunctive procedure in diastema closure, addressing soft tissue-related relapse factors and enhancing periodontal stability. In cases where an aberrant frenum is observed, incorporating this procedure into a multidisciplinary periodontal-orthodontic treatment plan enhances the predictability of long-term results.

Keywords: *Frenectomy. Diastema closure. Periodontal stability. Orthodontic relapse.*

Enhancing smile aesthetics through digital smile design and crown lengthening

Karisha Hanna Sulviati Ashari¹, Rini Octavia Nasution², Martina Amalia²

¹ Periodontics Residency Program, Faculty of Dentistry, Universitas Sumatera Utara, Indonesia.

² Department of Periodontics, Faculty of Dentistry, Universitas Sumatera Utara, Indonesia.

Abstract

Background: Aesthetic crown lengthening is a surgical procedure that enhances the balance between teeth, gingiva, and the overall smile by exposing more of the tooth surface. The use of Digital Smile Design (DSD) in the anterior maxilla allows for precise planning and visualization of the desired outcome. By aligning clinical goals with patient expectations, DSD helps ensure natural and harmonious results. **Objectives:** To demonstrate the effectiveness of combining DSD with crown lengthening in managing excessive gingival display (EGD) to enhance smile aesthetics. **Method:** This was a case report study reporting a 22-year-old female patient presented with concerns about a gummy smile and unsatisfactory appearance. Clinical and radiographic evaluations revealed altered passive eruption involving teeth #14–24. Aesthetic crown lengthening surgery was planned and executed using a DSD-guided template. The DSD protocol enabled the precise visualization of ideal tooth proportions and gingival contours before surgery. Crown lengthening procedure was performed first, followed by the restorative procedure. The crown lengthening procedure involved a gingivectomy with osteotomy to expose the anatomical crowns, re-establish the biological width, and achieve gingival symmetry. The restorative procedure utilized a DSD-guided template, and the final restorations employed direct restorative techniques. **Results:** Postoperative follow-up over a three-month period revealed uneventful healing, with no significant complications. The outcome demonstrated stable gingival architecture, proper tooth proportions, and a considerable improvement in smile harmony. The patient reported high satisfaction with the aesthetic results, and clinical evaluation confirmed the accuracy of the preoperative planning. **Conclusion:** Integrating Digital Smile Design with crown lengthening provides a predictable and patient-centered approach to treating excessive gingival display. This combined technique enhances diagnostic accuracy, facilitates surgical precision, and ensures aesthetically pleasing outcomes tailored to individual patient features.

Keywords: *Gummy smile. Crown lengthening. Digital smile design. Aesthetic dentistry.*

Optimizing anterior esthetics with crown lengthening: a case report

Lina Maria¹, Shelly Mayvira¹, Aini Hariyani Nasution², Rini Octavia Nasution²

¹ Periodontics Residency Program, Faculty of Dentistry, Universitas Sumatera Utara, Indonesia.

² Department of Periodontics, Faculty of Dentistry, Universitas Sumatera Utara, Indonesia.

Abstract

Background: A healthy and beautiful smile can enhance one's appearance and boost one's confidence. Altered passive eruption (APE) is a condition in which the passive eruption phase of tooth development is incomplete, resulting in excessive gingival coverage of the clinical crown. This condition often leads to a "gummy smile" and unfavorable crown-to-gingiva proportions, negatively impacting smile aesthetics. Esthetic crown lengthening is the treatment of choice to restore appropriate tooth proportions and improve gingival contour in such cases. **Objectives:** This case report aims to describe the clinical management and outcomes of esthetic crown lengthening in a patient diagnosed with APE and to evaluate the procedure's effectiveness in enhancing tooth display and smile aesthetics. **Materials and Methods:** A 23-year-old male presented to Dental Hospital of Universitas Sumatera Utara with a chief complaint of excessive gingival display when smiling. Clinical and radiographic examination confirmed the diagnosis of APE affecting the maxillary anterior region. Case Management: The patient underwent an aesthetic crown lengthening procedure using a surgical approach of gingivectomy, ostectomy and osseous recontouring to re-establish a biologically appropriate width involving teeth #15-25 using a surgical guide. Postoperative evaluation was performed at 7 days, 14 days, 1 month and 3 months. **Results:** The treatment resulted in a significant increase in clinical crown length, improved gingival symmetry, and enhanced smile aesthetics. The patient reported high satisfaction with the esthetic outcome. No signs of gingival recession or postoperative complications were observed during the follow-up period. **Conclusion:** Esthetic crown lengthening is an effective and predictable treatment for patients with altered passive eruption. Accurate diagnosis and proper classification of APE are essential to determine the correct surgical approach and to ensure long-term success in achieving functional and esthetic outcomes.

Keywords: *Crown lengthening. Altered passive eruption. Gummy smile. Smile aesthetics. Biologic width. Periodontal surgery.*

Aesthetic crown lengthening in altered passive eruption: a case report

Nurul Wahida Mohd Hasan¹, Badiah Baharin², Masfueh Razali²

¹ Unit of Periodontics, School of Dental Sciences, Universiti Sains Malaysia, Health Campus, 16150 Kubang Kerian, Kelantan, Malaysia.

² Department of Restorative Dentistry, Faculty of Dentistry, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur, Malaysia.

Abstract

Background: Altered passive eruption often results in excessive gingival display and shortened clinical crowns, compromising dental aesthetics. Aesthetic crown lengthening (ACL) is a surgical approach that re-establishes optimal tooth proportions and gingival architecture. **Objective:** To restore ideal aesthetics in a patient presenting with a gummy smile and short maxillary anterior teeth due to altered passive eruption using ACL. **Method:** A patient presenting with a thick gingival phenotype and esthetically unbalanced maxillary anterior teeth underwent evaluation. Clinical assessment, together with radiographic imaging, confirmed altered passive eruption, with an appropriate distance between the cemento-enamel junction (CEJ) and the alveolar bone crest. The crown proportions were evaluated to plan the appropriate gingival margin position. A surgical template guided the removal of both soft and hard tissues. A full-thickness flap was reflected, followed by tissue reshaping and contouring to achieve an esthetic outcome while maintaining the necessary biologic width. **Results:** The patient demonstrated significant aesthetic improvement with increased clinical crown height, harmonious gingival contour, and no complications. Healing was uneventful, and the biologic width remained stable. **Conclusion:** Aesthetic crown lengthening is an effective intervention for managing altered passive eruption. Careful diagnosis, presurgical planning, and adherence to biologic principles are critical to achieving optimal and stable aesthetic outcomes. Notably, the presence of a thick gingival biotype contributed positively to the stability and predictability of the aesthetic outcome.

Valproate-induced gingival enlargement: a case report

Vadiveloo Ashwini¹, Ei Leen Lim², Pathmamortie Pathmaprasath², Abdul Jalil Ajura³

¹ Unit Pakar Periodontik, Klinik Pergigian Sandakan, Sabah, Malaysia.

² Unit Pakar Periodontik, Klinik Pergigian Anika Klang, Selangor, Malaysia.

³ Unit Stomatologi, Institut Penyelidikan Perubatan, Institut Kesihatan Negara, Selangor, Malaysia.

Abstract

Background: Drug-induced gingival enlargement (DIGE) is a known adverse effect of medications such as phenytoin, cyclosporine, and calcium channel blockers. Although clinicians widely prescribe sodium valproate for epilepsy management, its association with DIGE has not been reported. The development of DIGE is affected by several factors, such as plaque accumulation, specific medication, treatment duration, and individual susceptibility. Among anti-epileptic drugs, phenytoin is linked to the highest incidence of DIGE (10–50%), whereas valproic acid and carbamazepine present lower but still notable risks.

Objectives: This case report highlights an infrequent case of sodium valproate-induced gingival enlargement and its clinical management. **Materials and Methods:** A 51-year-old female with a 12-year history of sodium valproate therapy presented with a gradually enlarging gingival mass in the mandibular anterior region. Intraoral examination revealed a reddish, firm, fibrotic, sessile lesion measuring 1.7cm X 1.4cm in the edentulous area of 41,42 with grade III mobility of tooth 31. The patient demonstrated suboptimal oral hygiene. Her diagnosis includes Unstable Generalised Periodontitis (Stage IV Grade B) and DIGE. Non-surgical periodontal therapy was delivered, followed by surgical excisional biopsy using a Diode laser and extraction of tooth 31. At the six-month follow-up, the patient reported improved plaque control, stable gingival contours, and no lesion recurrence. **Results:** Histopathological analysis confirmed the presence of an inflamed fibrous epulis. The histological features were non-specific and aligned with findings typically observed in other DIGE lesions. Long-term recurrence risk remains high in susceptible individuals with poor plaque control, underscoring the importance of supportive periodontal care. **Conclusion:** Early recognition of DIGE is essential to prevent progressive periodontal damage and potential tooth loss. Clinician vigilance, patient education, and integration of supportive periodontal care are crucial to ensure long-term stability, prevention of recurrence, and preservation of dentition in patients on prolonged anti-epileptic therapy.

Keywords: Sodium valproate. Gingival enlargement (GE). Drug-induced gingival enlargement (DIGE).

Multidisciplinary management of intrabony defect associated with supra-erupted anterior teeth using CGF

Yuliana Ayob¹, Farha Ariffin², Maryati Md. Dasor³, Saadah Razali⁴

¹ Periodontic Specialist Unit, Serian Dental Specialist Clinic, 94700 Serian, Sarawak, Ministry of Health Malaysia.

² Centre of Studies for Periodontology, Faculty of Dentistry, Universiti Teknologi MARA, 47000 Sungai Buloh, Selangor, Malaysia.

³ Centre of Paediatric Dentistry and Orthodontics Studies, Faculty of Dentistry, Universiti Teknologi MARA, 47000 Sungai Buloh, Selangor, Malaysia.

⁴ Periodontic Specialist Unit, Mahmoodiah Dental Specialist Clinic, 80100 Johor Bahru, Johor, Ministry of Health Malaysia.

Abstract

Background: Supra-eruption of anterior teeth presents both periodontal and orthodontic challenges, particularly when associated with one-wall intrabony defects. Concentrated Growth Factor (CGF) may enhance regenerative outcomes when used in periodontal surgery and support subsequent orthodontic movement. **Objectives:** To evaluate the effectiveness of CGF in managing a one-wall intrabony defect associated with a supra-erupted anterior tooth, followed by orthodontic space closure. **Materials and methods:** A patient presented with a supra-erupted maxillary canine (tooth 13) associated with one-wall intrabony defect. The initial probing depths were 8 mm (mesiobuccal) and 7 mm (distobuccal), with radiographic evidence of vertical bone loss. The periodontal treatment protocol involved open flap debridement in conjunction with the application of autologous CGF to enhance regenerative outcomes. Orthodontic treatment was then carried out 12 months post-surgery to align the teeth and close the space. **Results:** Post-surgical assessment at 6 months showed reduction of the probing depths to 4 mm at the previously affected sites. However, radiographic bone fill was not clearly evident. Soft tissue healing was satisfactory, and orthodontic space closure proceeded without complication or relapse of periodontal parameters. **Conclusion:** This case highlights the potential of CGF in promoting periodontal regeneration in one-wall intrabony defects and its compatibility with orthodontic movement. A multidisciplinary approach offers promising outcomes for managing complex anterior supra-erupted teeth.

Nonsurgical management of amlodipine induced gingival overgrowth in a medically compromised patient - a case report

Poh Ling Lim¹, Betsy Sara Thomas¹, A S Mohd Asari¹

¹ Department of Periodontics, MAHSA University, Bandar Saujana Putra, Malaysia.

Abstract

Background: Drug induced gingival overgrowth (DIGO) is a documented adverse effect primary link to three major drug groups: phenytoin, cyclosporin, and the calcium channel blockers such as amlodipine. Though benign, DIGO can affect esthetic, speech, mastication and oral hygiene. Altering or discontinuing the causative medication is often difficult due to systemic condition. Thus, nonsurgical periodontal therapy emerges as a valuable, conservative alternative. **Case presentation:** This report discussed a 63-year-old male with a poorly uncontrolled type 2 diabetes mellitus. (HbA1c:8.3%) and hypertension managed with long term metformin (1g) and amlodipine (10mg), presented of "swollen gum" affecting esthetic and daily function. Clinical examination revealed generalized gingival overgrowth especially on anterior, inflammation and plaque accumulation. A provisional diagnosis of DIGO exacerbated by plaque induced gingivitis was made. **Management and outcome:** Given the medical necessity of continuing amlodipine, treatment focus on nonsurgical modalities. The patient received multiple session of professional plaque removal and was provided with personalized oral hygiene education. Home care was reinforced and chlorhexidine 0.12% was prescribed as an adjunct. In 8-month time, a marked reduction gingival enlargement and inflammation was noted along with improvement of tissue tone. Surgery was avoided due to favorable response. **Conclusion:** Nonsurgical periodontal therapy (NSPT) provided effective in managing DIGO in medically compromised patient where drug modification was not an option. By controlling inflammation, it leads to regression of gingival overgrowth and enhance function and comfort. This conservative approach is especially valuable for patient with systemic condition reducing the need for surgical intervention and improving overall quality of life.

Keywords: *Drug induced gingival overgrowth (DIGO). Nonsurgical periodontal therapy (NSPT). Amlodipine.*

Accuracy and reliability of smartphone image-assisted vs conventional shade matching among clinicians and technicians

Soo Teng Chew¹, Suet Yeo Soo¹, Mohd Zulkifli Kassim¹, In Meei Tew¹

¹ Department of Restorative Dentistry, Faculty of Dentistry, The National University of Malaysia, Kuala Lumpur, Malaysia.

Abstract

Background: Accurate shade matching is critical for natural esthetics, yet conventional shade guides are prone to inconsistency from lighting, operator experience, and subjective perception. Smartphone image-assisted shade guide offers standardized, objective alternatives that may enhance accuracy and reproducibility, but direct comparisons with the conventional technique remain limited. **Objectives:** The purpose of this study was to compare the accuracy and reliability of conventional and smartphone-based image-assisted shade matching between clinicians and dental technicians. **Materials and methods:** An image-assisted digital shade guide, based on the Vita Linearguide 3D-Master, was first developed using standardized images captured with a Samsung S23 Ultra smartphone. Nine maxillary arch models in pink and white polymethylmethacrylate were designed using EXOCAD software and printed using Ackuretta SOL 3D printer, each incorporating concealed trial shade tabs for conventional matching (SM_C). For digital matching (SM_I), the Dental Shade Matcher software was developed to integrate the smartphone image-assisted digital shade guide and digital image models. Conventional matching was conducted under standardized lighting (6500K, 1000 lux) using a viewing box at a fixed 45°/0° angle, while digital matching employed a two-step software-based selection process. Each method was repeated three times within 4-6 weeks between sessions. All shade selections and timing were recorded. **Results:** A total of 1080 observations were analyzed (540 per method). Overall accuracy was 46.4%, with SC-DSG significantly higher (63%) than conventional matching (29.8%) ($P < .001$). Two-way ANOVA revealed significant interaction, with clinicians outperforming technicians in SC-DSG ($P < .001$). Intra-rater and inter-rater reliability of SM_I was significantly higher than SM_C ($P < .05$). SM_I outperformed SM_C in 8 of 9 tested tabs during step 1 shade matching and all tabs at final selection. No correlation was observed between time and frequency of correct shade match ($P > .05$). **Conclusion:** Smartphone image-assisted shade matching showed significantly higher accuracy and reliability than conventional methods. Both clinicians and technicians achieved better results, supporting its use as a practical and efficient tool for improving esthetic outcomes.