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BOOK OF ABSTRACTS

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ORIGINAL RESEARCH COMPETITION

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IMPACT OF ENDODONTIC IRRIGATION USING AN INNOVATIVE MICROBUBBLE FORMULA ON THE ELEMENTAL CHEMICAL COMPOSITION OF CORONAL DENTIN – AN IN VITRO STUDY

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1ST PLACE WINNER

AUTHORS: BIANCA GOMES, JOANA A. MARQUES, RUI FALACHO, FRANCISCO CARAMELO, JOÃO ROCHA, ARNAB BANERJEE, LINO FERREIRA JOÃO CARLOS RAMOS, PAULO J. PALMA

Introduction: Effective disinfection is fundamental in endodontics. Sodium hypochlorite (NaOCl), though widely used due to its broad-spectrum antimicrobial properties and tissue dissolving ability, is cytotoxic and may compromise dentin integrity. The success of vital pulp therapy (VPT) and regenerative endodontic procedures (REPs) requires balancing disinfection with cell viability preservation. NaOCl cytotoxicity poses significant biological limitations. In addition, the dentinal alterations promoted by NaOCl remain a significant drawback, potentially affecting resin–dentin interaction within the scope of adhesive restorations. Microbubbles (MBs), activated by ultrasound, have recently emerged as a promising biocompatible alternative, with demonstrated antimicrobial efficacy. However, the effects of MBs on dentin remain largely underexplored. Therefore, this in vitro study aimed to evaluate the elemental composition of coronal dentin following irrigation with NaOCl and an innovative MBs formulation.

Materials and methods: Deep coronal dentin discs were prepared from five extracted human third molars (n = 5). Four specimens per tooth were randomly assigned to four experimental groups: distilled water (control), 2.5% NaOCl, 5.25% NaOCl, and microbubbles (MBs) with intermittent ultrasonic activation. All samples underwent a 5-minute irrigation protocol. Scanning electron microscopy with energy dispersive X-ray spectroscopy (SEM/EDS) was used to assess elemental composition, namely calcium (Ca), carbon (C), nitrogen (N), oxygen (O), and phosphorus (P). Ca/P ratios were calculated. Data were analyzed using a mixed effects linear regression model. A significance level was set at 5%. Power analysis was performed.

Results: Irrigation with 5.25% NaOCl significantly reduced C and N content ($p < 0.001$), indicating strong deproteinization, and increased Ca, P and O ($p < 0.05$). In contrast, 2.5% NaOCl produced no significant differences in Ca, P, O, or C ($p > 0.05$), but decreased N ($p = 0.003$) and increased the Ca/P ratio ($p = 0.027$) compared to the control. When comparing NaOCl concentrations, the higher concentration yielded significantly higher P and O levels ($p < 0.05$), and significantly lower C and N levels ($p < 0.001$). Compared to both NaOCl concentrations and control groups, MBs-treated dentin preserved higher organic content (C, N) and exhibited lower inorganic content (Ca, P, O) – $p < 0.05$. Its Ca/P ratio was comparable to the control ($p = 0.648$) but differed significantly from NaOCl groups ($p < 0.05$). A statistical power of 100% was achieved.

Conclusion: NaOCl and MBs induce distinct alterations in the chemical composition of coronal dentin. NaOCl exhibited concentration-dependent effects, with the lower concentration (2.5%) producing a surface composition similar to the control, whereas the higher concentration (5.25%) resulted in a deproteinized surface, characterized by a predominance of inorganic content. In contrast, MBs generated a surface with reduced mineral content and a relative increase in organic components, likely due to MBs' surface coating phenomenon interfering with EDS detection. However, this does not fully explain the previously reported reduction in bond strength after MBs irrigation. Nonetheless, further studies are required to confirm the effects of MBs on dentin's chemical composition using complementary analytical techniques and to explore the long-term implications for adhesive performance.

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ORAL HEALTH AND RELATED QUALITY OF LIFE IN POST-BARIATRIC SURGERY PATIENTS FOR MALTESE RESIDENTS

AUTHORS: ANDREA NICOLE GRIMA BORG

Purpose: Obesity is presenting as a global epidemic. Bariatric surgery, an invasive intervention for weight loss, results in significant systemic health benefits. The impact of these surgeries on oral health and related quality of life is not yet well known. This dissertation analysed the possible negative effects of bariatric surgery on oral health and related quality of life. Bariatric surgery may have an effect on dental caries, gingivitis, periodontal disease, oral mucosal lesions, dental erosion, hypersensitivity and salivary flow.

Research question: Does bariatric weight loss surgery such as gastric bypass or gastric sleeve negatively affect oral health and related quality of life in adults?

Methods: An anonymous questionnaire was distributed on the researcher's social media platform and a private Maltese residents' social media bariatric surgery community, 'Bariatric Sleeve And Bypass Surgery Malta Support Group'. Quantitative and qualitative questions assessed demographic characteristics, dietary habits, general health, dental habits, oral symptoms, oral health impact profile and general oral health assessment index. This cross-sectional study followed the non-probability, non-randomized, convenience sampling technique including the snowball effect. It included participants over eighteen years of age at the time of surgery and those having had the bariatric surgery at least six months prior to filling in the questionnaire. The collection of this data was later statistically analysed.

Conclusion: This research concluded in a statistical significance for an increased vomiting experience and a dry mouth feeling after undergoing bariatric surgery. The mean OHIP-14 and the mean GOHAI totals showed good oral health and related quality of life of the participants. However, a higher mean OHIP-14 score resulted in the 20-29-year-olds in all the three aspects of OHIP-14. The aspect of discomfort in the oral cavity of the GOHAI questionnaire showed statistical significance in both males and females. The participants reported good overall oral health and related quality of life.

Recommendations and implications for practice: Any resultant oral health problems may be prevented if the patient presents with good oral health before the surgery and regularly attends for dental follow-ups after the surgery. The aim is to increase patient awareness regarding possible oral complications and recognise the importance of the bariatric surgeon's dental referrals and the role of dental professionals.

Keywords: Post-bariatric surgery, bariatric surgery and dental pain, bariatric surgery and oral complications; bariatric surgery and oral health; bariatric surgery and the dental patient, bariatric surgery and related quality of life

INTERACTION BETWEEN CHLORHEXIDINE AND SODIUM HYPOCHLORITE: A REVIEW ON ITS CLINICAL SIGNIFICANCE IN ENDODONTIC TREATMENTS

AUTHORS: MELISA ECE ÇUR, PROF. DR. HALIME YEGANE GÜVEN[2], DR. ÖĞR. ÜYESI ŞÜKRÜ FATIH ÖZKARSLI[3]

Background: Sodium hypochlorite (NaOCl) and chlorhexidine (CHX) are among the most commonly used irrigating solutions in root canal treatments. Sodium hypochlorite (NaOCl) is a widely preferred endodontic irrigant due to its effective antimicrobial properties and its ability to dissolve necrotic and organic tissues during chemo-mechanical preparation. Chlorhexidine shares similar antimicrobial characteristics with sodium hypochlorite (NaOCl) and has been shown to be effective as both an irrigant and intracanal medicament. Notably, CHX exhibits antimicrobial activity against NaOCl-resistant pathogens such as Enterococcus faecalis, Candida albicans, and Pseudomonas aeruginosa. However, when sordum hypoclorite and chlorohexidine (CHX) are mixed, a brown precipitate forms within the root canal system. Some studies suggest that this precipitate may contain para-chloroaniline (PCA), a potentially cytotoxic and carcinogenic compound.

Aim: This review aims to evaluate the chemical interaction between sodium hypochlorite (NaOCl) and chlorhexidine, which are frequently used in endodontic therapy, and to assess the clinical implications of this interaction based on the current literature.

Materials and methods: A comprehensive literature search was conducted using databases such as PubMed, ScienceDirect, and Google Scholar to identify relevant articles published between 2003 and 2023. Keywords such as “sodium hypochlorite,” “chlorhexidine,” “precipitate,” and “para-chloroaniline” were utilized. The selected studies were analyzed based on content relevance and scientific quality.

Results: The literature reveals varying conclusions regarding the brown precipitate formed by the interaction of sodium hypochlorite (NaOCl) and chlorhexidine. While some studies report that the precipitate contains para-chloroaniline (PCA) with cytotoxic and potentially carcinogenic properties, other studies refute the presence of para-chloroaniline (PCA) and instead suggest the formation of alternative compounds. Additionally, the precipitate is known to adhere to the dentinal walls, potentially impairing the success of root canal obturation. In clinical practice, intermediate solutions such as ethylenediaminetetraacetic acid or isopropyl alcohol are recommended to minimize this interaction. However, some studies indicate that even with chemical and mechanical methods, the precipitate can only be partially removed, and the thin film layer adhering to dentin may not be completely eliminated with current techniques.

Conclusion: The sequential or combined use of sodium hypochlorite (NaOCl) and chlorhexidine can lead to undesirable chemical reactions and the formation of potentially harmful by-products. Various intermediate irrigants have been evaluated to prevent precipitate formation; however, the literature lacks consensus regarding their efficacy. Further research employing advanced analytical methods is required to establish a standardized and safe clinical protocol.

Keywords: Sodium hypochlorite (NaOCl), chlorhexidine (CHX), para-chloroaniline, ethylenediaminetetraacetic acid (EDTA), endodontics

ANALYSIS OF TOOTH MORPHOMETRY IN SELECTED SAMPLE: COMPARISON TO EXISTING DATA AND GOLDEN RATIO ALIGNMENT

AUTHORS: DARJA GOSTILO

Objectives: This study aims to analyze human tooth morphometric parameters in a selected sample and compare them with different populations to explore variations in dental morphology.

Materials and methods: The sample consisted of eighty permanent teeth obtained from the material of the Laboratory of Anatomy of the Institute of Anatomy and Anthropology at Rīga Stradiņš University. Measurements were conducted using a digital caliper to record the mesiodistal and labioliungual widths; crown, root and total tooth lengths. Ratios of root-to-crown and total tooth-to-root length were calculated and compared to the "Golden Ratio" (1.618). Data published from various populations were utilized for comparative analysis, employing statistical tools such as weighted averages, standard deviations, standard errors, T-values, and 95% confidence intervals (CIs) to analyze the results.

Results: The current sample exhibited larger mesiodistal and labioliungual dimensions, particularly in lower central incisors and upper second molars, and smaller mesiodistal dimensions in lower lateral incisors, both upper and lower canines, upper first molars. All other teeth groups showed mixed trends. Overall, selected sample teeth displayed intermediate sizes, in most cases larger than Indian, Polonies, and Nepalese but smaller than American Negroes, Malaysian Chinese, and Southern Chinese populations. The upper canine group from the current sample most closely aligned with the golden ratio, while incisors and premolars deviated significantly. Sex-based analysis revealed that the selected sample tends to have smaller upper jaw canines and first molars than both sexes. Lower jaw lateral incisors, first and second premolars tend to be smaller, while central incisors and second molars exceed averages.

Conclusions: This study highlights the unique dental traits of the sample and emphasizes the need to update clinical and anthropological standards for different populations. The findings show the importance of utilizing this data to address gaps in existing literature.

Keywords: Tooth Morphometry; Dental Morphology; Golden Ratio; Anthropological Dental Studies

LEADERSHIP IN DENTISTRY: INSIGHTS AND IMPACTS FROM GEORGIA'S DENTAL PRACTICES

AUTHORS: NINO GOMURASHVILI

Leadership plays a critical role in shaping healthcare delivery, including dentistry. Effective leadership within dental practices and organizations not only improves team dynamics but also enhances patient care and operational efficiency. The state of Georgia offers a unique context to explore leadership in dentistry due to its diverse population, varied urban and rural healthcare access, and evolving dental policies. This paper examines how leadership styles influence dental practices in Georgia, providing insights into the challenges and opportunities faced by dental professionals in the region.

This study utilized a mixed-methods approach combining qualitative interviews and quantitative data analysis. Dental professionals in various settings across Georgia including private practices, community clinics, and academic institutions were surveyed to assess leadership approaches and their outcomes. Interviews with dental leaders and administrators provided in-depth perspectives on leadership challenges specific to Georgia. Data on patient outcomes and team performance were collected through regional health databases and practice reports. Leadership frameworks, such as transformational and transactional leadership models, guided the analysis.

The findings indicate that transformational leadership is predominant among successful dental leaders in Georgia. Leaders who inspire, motivate, and foster collaboration within their teams report higher staff satisfaction and improved patient care outcomes. In rural areas, where resources are limited, adaptive leadership has emerged as a critical skill, enabling practices to innovate and maintain service quality. Quantitative analysis shows a positive correlation between effective leadership and patient satisfaction scores as well as practice efficiency metrics. Compared to national trends, Georgian dental leaders tend to place greater emphasis on community engagement and culturally competent care due to the state's demographic diversity.

Leadership significantly influences the quality and effectiveness of dental care in Georgia. Emphasizing transformational and adaptive leadership styles can empower dental teams and improve patient outcomes, particularly in underserved areas. For policymakers and dental educators, investing in leadership development programs tailored to Georgia's unique healthcare environment is essential. Future research should explore longitudinal impacts of leadership training and expand comparisons across different states to further validate these findings.

NEXT-GENERATION PROSTHETIC MATERIALS FOR IMPLANTS SUPPORTED OVERDENTURES: AN OCT-BASED BIOMECHANICAL STUDY

AUTHORS: ALISIA SĂVESCU , RARES SCHULLER

Introduction: Dental implant therapy is widely acknowledged as a reliable treatment option for edentulism, yet persistent challenges remain regarding patient expectations, material selection, biomechanical complications, and long-term survival rates. Current evidence estimates the 10-year implant success rate at approximately 84%, although 59% of patients expect lifetime durability. On average, treatment requires four months, with only 12% of patients willing to accept an increased risk of implant failure for faster protocols. Patient acceptance of grafting varies: 61% consent to autologous bone grafting, primarily from the retromolar region, while only 23% accept iliac crest harvesting. Conversely, 43% prefer bone substitutes to avoid donor-site morbidity. Furthermore, 67% of patients are open to higher treatment costs for advanced imaging and guided implant placement to reduce the need for grafting. Minimally invasive strategies are generally preferred, even among denture-dissatisfied patients willing to tolerate higher treatment morbidity. From the clinician's perspective, shock absorption and force transmission remain major concerns. All-ceramic prostheses, despite esthetics, are fracture-prone under repetitive loading. Softer restorative materials can reduce stress on bone, especially in patients with low bone density. Zirconia abutments may concentrate stress and fail more readily than titanium, while differing occlusal resistances can disrupt the masticatory system. Bruxism introduces additional complications, with nocturnal bite forces surpassing daytime levels. Electromyography demonstrates reduced muscular effort in canine-guided occlusion compared with balanced occlusion, though findings in denture wearers remain inconsistent. Sleep bruxism may function as a stress-relieving mechanism, but its clinical management requires further evidence. This study aimed to compare next-generation overdenture materials (PMMA, zirconia, PEEK, PEKK) using OCT-based analysis and biomechanical simulations, in order to assess fracture resistance and stress distribution.

Materials and methods: Given the frequency of prosthetic fractures and the growing number of restorative options, this study evaluated overdentures fabricated from polymethylmethacrylate (PMMA), zirconia, poly-ether-ether-ketone (PEEK), and poly-ether-ketone-ketone (PEKK). Structural integrity was assessed non-invasively using both Spectral Domain Optical Coherence Tomography (SD-OCT) and Time Domain Optical Coherence Tomography (TD-OCT). TD-OCT was operated at 1300 nm with 18 lateral scanning parameters, whereas SD-OCT functioned at 860 nm. Biomechanical simulations were additionally employed to predict fracture resistance and stress distribution across the tested constructs. OCT was selected due to its ability to detect subsurface defects without destructive testing.

Results: All overdenture materials exhibited unique patterns of internal defects and variable biomechanical behavior. OCT imaging successfully identified structural inconsistencies without destructive testing. Predictive modeling revealed differences in stress transmission and fracture thresholds, highlighting the influence of both material composition and prosthetic design. Monolithic constructs showed greater rigidity and higher stress transfer, whereas polymer-based materials demonstrated improved elasticity and shock absorption but lower fracture resistance. These findings confirm that OCT can provide clinically relevant insights into material performance and fracture risk.

Conclusions: The findings underscore the necessity of tailoring restorative material selection to patient-specific biomechanical demands. New designs and CAD/CAM-based processing methods, combined with OCT-based evaluation, represent promising strategies for improving prosthetic reliability. Patient selection, occlusal adjustment, and early bite force monitoring remain critical to reducing complications. Future research should focus on minimally invasive restorative solutions, innovations in dental materials, and long-term assessment of shock absorption to optimize implant survival and patient satisfaction. Integrating advanced imaging and material science holds the potential to redefine prosthetic reliability and patient-centered implant therapy.

FUNCTIONAL LIMITATIONS AND DESIGN CHALLENGES IN FULL-ARCH IMPLANT-SUPPORTED OVERDENTURES

AUTHORS: RARES SCHULLER, ALISIA SĂVESCU

Introduction: Patient expectations for implant longevity often exceed clinical outcomes, with only 84% success at 10 years despite 59% expecting lifelong results. Most patients prefer minimally invasive approaches and are hesitant toward extensive grafting or accelerated protocols. Biomechanical studies highlight the role of restorative materials in stress transmission, suggesting softer crowns for compromised bone. Bruxism, particularly nocturnal, can generate forces exceeding voluntary bite force, contributing to prosthetic complications. Although occlusal loading shows limited influence on implant survival, bruxism remains a mechanical risk factor. New ceramics like zirconia show promise, but further clinical evidence is needed to guide bruxism management in implantology.

Materials and methods: This study used a standardized full-arch, screw-retained implant-supported prosthetic design to evaluate mechanical performance across five common material combinations: (1) breCAM HIPC monolithic, (2) Graphenano monolithic, (3) breCAM HIPC + BioHPP hybrid, (4) metal framework + breCAM HIPC hybrid, and (5) metal framework + Nexco composite resin hybrid. All materials were fabricated per manufacturer-recommended thicknesses for monolithic use. Mechanical behavior was assessed via two complementary methods: (1) experimental mechanical testing with a Zwick/Roell Z005 universal testing machine (ISO 7500-1 compliant), employing a single-axis load cell and TestXpert software; and (2) finite element analysis (FEA) simulating force distribution at the bone-implant interface. The focus was on resistance to fracture and chipping under functional loading. Zirconia-based superstructures were excluded from this phase and will be addressed in a subsequent study. This combined approach aimed to validate structural performance and guide material selection in clinical practice.

Results: Mechanical testing and finite element simulations revealed notable performance differences among five full-arch prosthetic material combinations. Under frontal loading, monolithic breCAM showed the highest resistance (fracture at 1506 N), outperforming Graphenano (659–850 N) and BioHPP (299 N). One-extension designs demonstrated greater mechanical stability than two-extension ones. Graphenano extensions fractured as early as 175 N, while breCAM resisted up to 3192 N. Hybrid prostheses with metal frameworks (metal + breCAM HIPC, metal + Nexco) showed superior fracture and chipping resistance. Numerical simulations confirmed monolithic materials transmitted greater stress at the implant-bone interface despite lighter restoration weights. Robust regression and Gaussian graphical modeling (GGM) revealed strong correlations between force indicators and mechanical variables, notably e1 with e5, e7, and e8; negative associations appeared with e4 and e6. Results emphasize the superior performance of certain monolithic and hybrid materials in load-bearing zones, supporting their use in patients with high bite forces or bruxism. One-extension designs are mechanically preferable, and material choice crucially affects prosthetic longevity. These findings aid clinicians in selecting materials that balance aesthetics, load tolerance, and biocompatibility.

Conclusions: Mechanical testing revealed that restorations with two extensions exhibited earlier failure compared to single-extension designs. Full-contour breCAM HIPC showed the highest mechanical resistance anteriorly. Among hybrid superstructures, the metal-breCAM HIPC combination demonstrated superior durability, while metal-composite resin exhibited the lowest chipping resistance. The greater elasticity of BioHPP and breCAM HIPC enhanced resilience. Careful material selection and patient-specific considerations are essential for optimal clinical outcomes.

Key words: Implant-supported prostheses, Mechanical performance, Material selection, Bruxism, Finite element analysis (FEA).

THE HIGHLIGHTED NEED FOR "REALITY" DENTAL SIMULATION TRAINING MODULES ACCORDING TO THE PEARL DENTAL SIMULATION FRAMEWORK TO PREPARE BOTH DENTAL STUDENTS AND PRACTICING DENTAL CARE PROFESSIONALS.

AUTHORS: TEMILOLUWA ESHO

Introduction: Dental simulations provide students with practical guidance to ease their transition from pre-clinics to clinicals and to help both students and clinicians improve their skills, dexterity and confidence: the trilogy of skillset for efficient practice. Healthcare, especially dentistry itself, is one of the most relevant examples of the idiom "Don't judge a book by its cover". Many times, a patient will present with a certain set of symptoms. When paired with clinical assessments and paraclinical examinations, dentists reach their primary diagnosis and start treatment accordingly. However, more often than most realise, the true diagnosis can differ from the expected and can completely change the treatment plan altogether.

Materials and methods: The PEARL Dental Simulation framework, developed by Pearly Whites Global, is a collection of dental Simulation module frameworks, which aim to bridge the gap between what dental simulations currently offer and the ultimate potential of simulations that meet users' needs for skill development and even surpass their expectations. In the PEARL framework, each letter represents a mode/module that is either standalone or integrates with another mode in a working dental simulation. The letter R represents "Reality". The focus of this module is to make the user believe they are in a certain scenario (e.g. treating caries profunda of tooth UL4 (FDI 24)), but truly, the clinical situation is different (the caries has reached the pulp, and so RCT must be performed). It puts the students to the test, to see if they understand what they are required to do in each unexpected situation, while also guiding them through the best alternatives for each case.

Results: We asked a total of 53 British dental care professionals (both dentists and dental therapists) and dental students how often they come across a case where the initial diagnosis was different to what they encountered mid-treatment, which caused them to have to change their current treatment plan. Out of those who see patients (some students in early years don't), 47% of respondents experienced this at least once a week. They were also asked how often they know exactly what to do in the instance that their mid-treatment situation is different to their primary diagnosis. On a scale of 1-5, with 1 being "Unsure" and 5 being "Immediately know what to do", the average practising dentist said 4.48, and the average dental student said 3.00.

Conclusion: Dentistry is a profession that requires quick thinking, and each decision made can completely make or break the confidence of a patient and the functionality of their bite. It is important to prepare students for the realities of dental practice as much as possible. The "Reality" module of the PEARL framework offers this as a means for relevant education, which has not yet been seen in dental schools' curricula. With further development and investment into this protocol, students may have the opportunity to prepare for almost all situations, guiding them to make the correct decisions which are best for the patient and with confidence.

THE USE OF ARTIFICIAL INTELLIGENCE IN DIFFERENTIATING WHITE LESIONS OF ORAL MUCOSA : ADVANCING EARLY DETECTION AND DIAGNOSTIC ACCURACY

AUTHORS: NATAVAN YAGUBOVA, MELISA BOZKURT OCBE

Background: Accurate differentiation of oral white lesions is critical for timely detection of oral squamous cell carcinoma (OSCC) and oral potentially malignant lesions (OPMLs). However, clinical similarity among lesion types and delays in histopathologic confirmation often complicate diagnosis. Artificial intelligence (AI), particularly conversational models such as ChatGPT, may serve as an adjunctive tool to support clinicians in early lesion recognition and decision-making.

Objective: This study aimed to evaluate the diagnostic accuracy of ChatGPT 5.0 in differentiating four clinically important oral white lesions; white sponge nevus, oral lichen planus (OLP), leukoplakia, and pseudomembranous candidiasis, based on clinical images.

Methods: Twenty clinical images (five per lesion type) were obtained from open-access, peer-reviewed sources. Each image was uploaded individually into ChatGPT 5.0 with a standardized prompt requesting a preliminary diagnosis, differential diagnoses, and a treatment approach. Three evaluators (a final-year dental student, an oral medicine specialist, and an oral radiologist) independently rated the accuracy of each AI output using a 5-point Likert scale. Mean scores were calculated for each lesion type, and a one-way ANOVA was performed to assess differences between groups.

Results: ChatGPT 5.0 provided structured outputs for all cases, with diagnostic accuracy varying by lesion category. Mean scores were lowest for white sponge nevus (7.4/15) and highest for Leukoplakia (13.8/15), followed by pseudomembranous candidiasis (13.6/15) and oral lichen planus (12.8/15). ANOVA revealed a statistically significant difference across groups ($p = 3.48 \times 10^{-5}$).
Post-hoc analysis confirmed that WSN scored significantly lower than all other lesion types, whereas leukoplakia, oral lichen planus, and candidiasis did not differ significantly (all $p > 0.05$).

Conclusion: ChatGPT 5.0 demonstrated strong diagnostic accuracy in identifying leukoplakia, oral lichen planus, and pseudomembranous candidiasis, but performed poorly with white sponge nevus. These findings suggest that AI models may be valuable adjuncts in the early detection of common oral lesions, supporting clinical decision-making and telemedicine applications. However, limitations in recognizing rare hereditary disorders underscore the need for larger datasets, multimodal integration, and continued expert oversight before clinical implementation.

Keywords: artificial intelligence, oral potentially malignant lesions, oral cancer, lesion detection

RESTORATION OF MASTICATORY FUNCTION IN AN ONCOLOGIC PATIENT WITH A REMOVABLE PARTIAL DENTURE: A CASE STUDY

Congrats!
1ST PLACE WINNER

AUTHORS: DANIELA GUGLIELMINO, ETTORE COGNO, VINCENZO NOTARO

Background: Oral rehabilitation in oncologic patients requires careful consideration of their systemic health, treatment history, and potential complications they could face. In patients scheduled for antiresorptive therapy, implant-supported solutions pose a high risk of medication-related osteonecrosis of the jaw (MRONJ). This case report describes the prosthetic management of an elderly patient with significant systemic compromise, resulting in restoration of his masticatory function through removable partial dentures (RPDs).

Case Presentation: An 86-year-old male patient (ASA Class IV) arrived at the Dental School on referral from his oncologist for comprehensive oral evaluation prior to the start of antiresorptive therapy following a diagnosis of prostatic adenocarcinoma with bone metastases. Clinical examination revealed maxillary partial edentulism classified as Kennedy Class III, modification II and mandibular partial edentulism classified as Kennedy Class I, modification I. Due to the patient's medical status and the high risk of MRONJ, implant therapy was contraindicated.

Treatment: A gnathological evaluation confirmed the absence of mandibular deviations, joint noises, or muscle tenderness, supporting the feasibility of RPD treatment. For the maxilla, the design included a complete palate metal–resin major connector, narrow mesh secondary connector, occlusal rests on 1.7, 2.5, and 2.6, lingual cingulum rest and posterior circumferential clasp on 1.3, simple circumferential clasp (Akers) on 1.7, and a Bonwill double clasp on 2.5 and 2.6. For the mandible, the design incorporated a lingual plate major connector, open lattice minor connector with tissue stops on distal extension saddles, lingual cingulum rests on 3.3, 3.1, and 4.1, posterior circumferential clasp on 3.3, and a wrought wire clasp on 4.1.

Alginate impressions were taken to obtain study casts in dental stone, which were used for treatment planning and fabrication of custom impression trays. The prostheses were delivered after functional adjustments to ensure occlusal balance and stability.

Outcome: The patient reported restored masticatory efficiency, improved comfort, and satisfactory retention and stability of the dentures. Clinical follow-up confirmed balanced occlusion, healthy mucosa without pressure lesions, and absence of TMJ discomfort. The treatment successfully avoided surgical intervention, thereby eliminating the associated risks of MRONJ in this medically fragile patient.

Conclusion: In elderly oncologic patients with complex systemic conditions, removable partial dentures constitute a safe, functional, and reliable alternative to implant-supported rehabilitation. Successful outcomes depend on thorough occlusal evaluation, evidence-based prosthetic design, and a conservative treatment approach are essential for achieving functional restoration while minimizing risk. This case highlights the critical need to integrate medical and dental considerations when planning prosthetic rehabilitation for individuals undergoing antiresorptive therapy.

Keywords: removable partial denture, masticatory function, prostatic adenocarcinoma, Kennedy classification, antiresorptive therapy, prosthetic rehabilitation, MRONJ.

OPTIMISED GROWTH-PEAK ORTHOPAEDIC MANAGEMENT OF SKELETAL CLASS II MALOCCLUSION: MULTIDISCIPLINARY INTEGRATION AND BIOMECHANICAL OPTIMIZATION

AUTHORS: KARINA DOBREVA, ILIYANA ATANASOVA

Introduction: Optimal correction of skeletal Class II malocclusion during growth requires precise timing and interdisciplinary coordination. The pubertal growth spurt represents a favourable orthopaedic intervention window, enabling maximal skeletal modification and reducing future surgical need. Accurate identification of skeletal age through cervical vertebral maturation (CVM) staging, chronological and dental age, and growth velocity ensures optimal outcomes. This case report demonstrates the integration of growth-peak orthopaedic correction, multidisciplinary management, and biomechanically optimised appliance selection in a patient with a history of prior orthodontic treatment failure.

Case Report: A 12-year-old female in permanent dentition presented with a convex profile, deep bite, increased overjet, previous trauma to teeth 11 and 12, tooth rotations, and generalized enamel demineralization with white spot lesions. Functional assessment revealed tongue thrust and mouth breathing. An earlier attempt with a removable palatal expansion plate had been unsuccessful.

Diagnosis confirmed skeletal Class II division 1 at CVM stage 2-3 (before pubertal growth), retrognathic mandible, and hypodivergent vertical growth pattern. Management incorporated myofunctional therapy to eliminate dysfunctional habits, adenoidectomy following ENT airway evaluation to improve nasal breathing, and orthopaedic correction using cervical headgear timed to peak growth. Fixed appliances following the Alexander Discipline (0.018 slot prescription) were implemented with a protocol-based archwire sequence, enabling precise alignment, controlled space closure, and occlusal plane harmonisation through targeted biomechanics.

Treatment prioritised sagittal and transverse coordination with strict anchorage preservation and concluded with minimally invasive restorative interventions, including composite replacement and Icon infiltration, to restore structural enamel integrity and enhance aesthetics. Active treatment lasted 21 months. Retention comprised a clear maxillary removable retainer and a mandibular canine-to-canine bonded retainer. Following orthodontic completion, mandibular third molar buds were prophylactically extracted due to an unfavourable eruption prognosis. Outcomes included elimination of all habits, establishment of skeletal and dental Class I, normalized overjet/overbite, improved smile arc, balanced facial profile, and high patient satisfaction.

Conclusions: Synchronizing orthopaedic intervention during the pubertal growth peak monitoring, confirmed by skeletal and dental age assessment, can transform complex Class II outcomes. Multidisciplinary integration with precisely selected and biomechanically optimized appliances can achieve stable skeletal, occlusal, and aesthetic results, significantly enhancing patient quality of life and self-confidence.

Keywords: Skeletal Class II Malocclusion; Skeletal Age Assessment; Pubertal Growth Peak; Orthopaedic Correction; Multidisciplinary Approach; Alexander Discipline; Biomechanical Optimization;

REPLANTATION OF A MAXILLARY CENTRAL INCISOR AFTER 120 MINUTES OF EXTRA-ORAL TIME

AUTHORS: OMAR MEHREZ, ANAS MEHREZ, YASSER MEHREZ, IBRAHIM DARRAG

Introduction: Dental avulsion is an uncommon but severe injury with a guarded prognosis. The International Association of Dental Traumatology (IADT 2020) emphasises that extra-oral dry time and storage medium are determinant prognostic factors. Milk maintains periodontal ligament (PDL) cell viability by providing an osmotically balanced, nutrient-rich environment, making it an accessible emergency option. Although survival rates fall sharply beyond 60 minutes of dry time, favourable outcomes can still be achieved when guidelines are strictly applied.

Aim: To describe the management and one-year outcome of a maxillary central incisor replanted after 120 minutes of extra-oral time.

Materials and methods: A healthy 17-year-old female presented with an avulsed maxillary central incisor stored in cold milk for approximately 120 minutes. Clinical and radiographic examination confirmed an intact socket without alveolar fracture. The tooth was rinsed with saline, treated with 1.23% acidulated phosphate fluoride gel, and replanted under local anaesthesia using gentle digital pressure. Stabilisation was achieved with a flexible 0.4 mm orthodontic wire and composite resin splint for two weeks, in accordance with IADT 2020 recommendations. Antibiotics and analgesics were prescribed, and root-canal therapy was initiated seven days later. Follow-up at 1, 3, 6 and 12 months assessed mobility, percussion response, radiographic changes and patient-reported outcomes.

Results: At 12 months the tooth was functional, pain-free, and exhibited mobility within physiological limits. Radiographs demonstrated an intact lamina dura with no evidence of inflammatory or replacement resorption. No clinical or radiographic ankylosis was evident. A mild crown discolouration was the only sequela, judged acceptable by the patient, who expressed high satisfaction with both function and aesthetics.

Conclusions: This case illustrates that successful replantation is achievable beyond the conventional one-hour threshold when IADT 2020 protocols are meticulously applied. Immediate storage in a physiologic medium, atraumatic replantation, short-term flexible splinting, and timely endodontic therapy enabled survival after two hours of extra-oral time, reinforcing the clinical value of evidence-based trauma management and the importance of guideline dissemination to the public.

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