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Aims and Scope

The *Restorative Dentistry and Endodontics* (officially abbreviated as Restor Dent Endod; RDE) is a peer-reviewed and open access journal providing up-to-date information regarding the research and developments on new knowledge and innovations pertinent to the field of contemporary clinical operative dentistry, restorative dentistry, and endodontics. In the field of operative and restorative dentistry, the journal deals with diagnosis, treatment planning, treatment concepts and techniques, adhesive dentistry, esthetic dentistry, tooth whitening, dental materials and implant restoration. In the field of endodontics, the journal deals with a variety of topics such as etiology of periapical lesions, outcome of endodontic treatment, surgical endodontics including replantation, transplantation and implantation, dental trauma, intracanal microbiology, endodontic materials (MTA, nickel-titanium instruments, etc), molecular biology techniques, and stem cell biology. RDE publishes original articles, review articles and case reports dealing with aforementioned topics from all over the world.

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History

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B163, Seoul National University Dental Hospital, 101 Daehak-ro, Jongno-gu, Seoul, Korea

Tel: 82-2-763-3818

Fax: 82-2-763-3819

E-mail: kacd@kacd.or.kr

Editorial Office

The Korean Academy of Conservative Dentistry

B163 Seoul National University Dental Hospital, 101 Daehak-ro, Jongno-gu, Seoul 03080, Korea

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Email: editor@rde.ac

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Direct composite veneers for anterior esthetic rehabilitation in amelogenesis imperfecta: a case report

Sivakumar HarithaShree,* Pasupathy Shakunthala

Department of Conservative Dentistry and Endodontics, Tamil Nadu Government Dental College and Hospital, The Tamil Nadu Dr. M.G.R. Medical University, Chennai, India

ABSTRACT

Amelogenesis imperfecta (AI) is a heterogeneous genetic disorder that is caused by mutations in a variety of genes that interfere with normal enamel formation in the absence of systemic disorders. This case report illustrates a minimally invasive approach to treating a patient with amelogenesis imperfecta. A 21-year-old female patient reported with discolored, sensitive, and worn anterior teeth. Clinical and radiographic evaluation confirmed the diagnosis of hypoplastic AI. Considering her age, esthetic concerns, and desire for a minimally invasive approach, direct composite veneers were planned for the upper and lower anterior teeth. A diagnostic wax-up was performed to simulate the final form of the direct veneers. The wax mock-up provided an opportunity for patient approval of the proposed changes in tooth form and smile design prior to the actual procedure. Minimal enamel preparation was carried out, followed by etching and bonding. High-strength nanohybrid composite resin was used to build up each tooth using a layered technique for optimal aesthetics and natural translucency. Finishing and polishing were done to achieve contour, gloss, and harmony with adjacent teeth. The patient expressed satisfaction with both the appearance and the improved confidence in her smile.

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Precision veneering: aesthetic correction of anterior diastema-case report

Zahir Hussain AfrahShabnam,* Nallamuthu Mohanasundaram Keerthana, Balasubramaniyan Ramaprabha

Department of Conservative Dentistry and Endodontics, Tamilnadu Government Dental College and Hospital, T.N.Dr M.G.R Medical University, Chennai, India

ABSTRACT

Diastema, defined as a space or gap between two teeth, particularly in the anterior region, can cause significant esthetic concerns for patients. Among the various treatment modalities available, porcelain veneers present a minimally invasive, highly esthetic, and durable option for managing anterior diastemas, especially in cases where orthodontic treatment is either not preferred or contraindicated. This case report highlights the management of maxillary anterior diastema using ceramic veneers in a young adult, focusing on smile enhancement, soft tissue harmony, and patient satisfaction.

The patient presented with generalized spacing in the anterior teeth, with specific concern for the midline diastema. A comprehensive clinical and radiographic examination was followed by diagnostic wax-up and mock-up to ensure functional and esthetic predictability. Lithium disilicate veneers are selected for their superior esthetics, strength, and longevity. Tooth preparation is conservative, preserving maximum enamel for optimal bond strength. Veneers are bonded using resin cement following a meticulous adhesive protocol.

In young patients, veneers offer a psychological boost with minimal biological cost, and the option of future revision or modification. The case demonstrates how veneers can be effectively utilized for diastema closure with excellent long-term prognosis and minimal intervention, making them a viable and patient-friendly solution in modern esthetic dentistry.

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Conservative management of maxillary diastema: a case-based evaluation of two veneering techniques

Nalathati Aswini,* Thirumalainambi KothaiAbirami, Mahendran Kavitha

Department of Conservative Dentistry and Endodontics, Tamilnadu Government Dental College and Hospital, T.N. Dr M.G.R Medical University, Chennai, India

ABSTRACT

Maxillary anterior diastema is a common esthetic concern affecting the smile and self-esteem of patients. Minimally invasive techniques such as veneers offer a conservative approach to restoring aesthetics and function without compromising natural tooth structure. In the first case, indirect lithium disilicate (IPS e max) veneers were planned following minimal tooth preparation. Shade selection and smile design were performed using digital tools (DTS software) and mock-ups, and the veneers were adhesively cemented using resin luting agents. In the second case, a direct composite veneering technique was adopted. A diagnostic wax-up and silicone putty index were used to guide precise composite layering, ensuring anatomical contour and symmetry. This method provided a chairside, single-visit solution for diastema closure. Both techniques were executed with emphasis on smile design principles, shade matching, and marginal integrity. The indirect veneer case exhibited superior optical properties, marginal adaptation, and long-term durability. The direct veneer technique, though more technique-sensitive, was more economical and efficient. Both direct and indirect veneers serve as effective, conservative options for anterior diastema closure. The choice of technique should be individualized based on clinical parameters, patient expectations, and financial considerations. These cases highlight the versatility and aesthetic potential of veneer restorations in conservative dentistry.

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Biointegration demystified: immediate esthetic rehabilitation with autologous pontic and custom composite post - a case report

Sukumar AkshayKumar,* Ambalavanan Nandhini

Department of Conservative Dentistry and Endodontics, Tamilnadu Government Dental College and Hospital, T.N. Dr M.G.R Medical University, Chennai, India

ABSTRACT

Crown fracture in the aesthetic zone presents a significant functional and psychological disturbance from the patient's perspective and a challenge for the intervening dentist. This case report demonstrates an innovative approach towards restoring a fractured anterior tooth using a custom composite post and natural tooth pontic, ensuring optimal aesthetics and function.

A 24-year-old male patient reported with Elli's class III fracture in the maxillary left lateral incisor. Root canal treatment procedure was initiated and sectional obturation was done. A minimal and conservative post space was prepared and a custom composite post was fabricated and adapted to the root canal morphology to reinforce retention and mimic natural biomechanics. The autologous crown fragment was modified to adapt to the core build-up, perfectly matching the patient's dentition in contour and shade. An immediate chairside procedure was employed to reattach the fractured natural crown fragment.

The technique proved to be a minimally invasive biomimetic approach, negating the need for invasive protocols wherein function and aesthetics were optimized using the patient's natural tooth as a pontic, offering superior psychological satisfaction to the patient. This poster emphasizes conservation, customization, and natural tissue replacement, making it an ideal solution for managing fractured anterior teeth in a single visit.

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Smile spelled in layers

Tanya Jain*

Department of Conservative Dentistry and Endodontics, Saveetha Dental College and Hospital, Chennai, India

ABSTRACT

Given the high aesthetic demand of the anterior region, where even minor discrepancies in shape, shade, or translucency can significantly affect appearance, a conservative, patient-specific treatment plan was essential. Composite veneers were utilized for subtle corrections and direct chair-side enhancement due to their ease of modification, cost-effectiveness, and reversibility. Ceramic veneers, on the other hand, were selected for teeth that required enhanced translucency, long-term durability, and optimal aesthetics, making them ideal for more visible and structurally compromised units.

This case presentation showcases an integrated aesthetic restoration of the maxillary anterior region using a dual-material approach—composite and ceramic veneers—tailored to meet both functional and cosmetic needs. The patient exhibited multiple concerns: discoloration, mild tooth rotation, spacing, and disproportionate morphology, all contributing to compromised smile harmony and reduced confidence.

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Esthetic and functional rehabilitation using direct composite veneers: a clinical case series

Hari Prasath T K*

Department of Restorative Dentistry, Saveetha Dental College, Chennai, India

ABSTRACT

Direct composite veneering offers a conservative and cost-effective approach for the esthetic rehabilitation of anterior teeth, particularly in cases involving discoloration, minor misalignment, diastemas, or incisal wear. This case series presents the clinical management and outcomes of five patients who underwent direct composite veneering for various esthetic concerns. Each case involved a minimally invasive approach, with no or minimal tooth preparation, and utilized nanohybrid composite resins applied using a freehand stratification technique. Shade selection, layering strategies, and finishing and polishing protocols were tailored to achieve natural translucency, surface texture, and integration with adjacent dentition. Clinical follow-up over 12 to 24 months revealed high patient satisfaction, excellent color stability, and preservation of periodontal health, with no signs of marginal staining or debonding. This case-based analysis supports the effectiveness and versatility of direct composite veneers in providing immediate esthetic improvement with predictable long-lasting results, particularly when executed with careful case selection and meticulous technique.

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Case Report

The magic of minimalism- conservative approaches to restorative problems in anterior teeth

Kanishtha Riyaa*

Department of Restorative Dentistry, Saveetha Dental College and Hospital, Chennai, India

ABSTRACT

Restorative problems in the anterior teeth often warrant customized solutions that cater to each of their unique tooth morphology, contact points, shades, microtextures, etc. They can be done with minimally invasive techniques to balance both aesthetic and functional demands, while keeping in mind the availability of fresh enamel that can be bonded to. Such solutions are highlighted in this series of case reports, where keen attention is paid to conservative preparations.

Five case reports of direct composite restorations, no-prep veneers and minimal prep veneers demonstrate some of the conservative approaches in esthetic smile designing and how to restore natural esthetics by merging restorations with the natural dentition and not the other way around.

Science dictates that, despite having fewer mechanical retentive features over tooth preparations, chemical bonding and micromechanical retention can be sufficient to achieve long-lasting restorations. Hence, it reduces the amount of tooth structure to be cut down. The longevity of these restorations is backed by the powerful evidence behind bonding to enamel and dentin.

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Smile over the submerged-ridge augmentation revisited: case reports

Paramasivam Kavitha,* Ambalavanan Nandhini

Department of Conservative Dentistry and Endodontics, Tamilnadu Government Dental College and Hospital, The Tamil Nadu Dr. M.G.R. Medical University, Chennai, India

ABSTRACT

An endodontically treated tooth with considerable loss of supracrestal tooth structure is considered a candidate for extraction. The root submergence technique is a minimally invasive approach that involves decoronation of the remaining crown and the retention of the root remnant of such a tooth, which is deemed unfit for prosthetic rehabilitation, by placing it beneath the mucosa.

This case series highlights the clinical efficiency of the root submergence technique in maintaining the natural architecture of the alveolar ridge, reducing the need for invasive grafting procedures, and followed by a veneer-supported prosthesis in the anterior esthetic zone.

As part of prosthetic rehabilitation, a novel modified design of a partial coverage fixed dental prosthesis was attempted, combining both a resin-bonded fixed dental prosthesis and a facial veneer as a retainer, thereby optimizing both the aesthetic outcome of veneer ceramic restorations and the conservative preparation of partial coverage.

Follow-up proved that the patient's soft tissue profile remained intact, ensuring a natural emergence profile for the veneer-supported fixed prosthesis with stable hard and soft tissue levels with no signs of inflammation or resorption. This technique might be an immediate treatment adjunct and an alternative to invasive prosthetic rehabilitation techniques involving the anterior esthetic zone.

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Restoring the void management of root resorption

Ponnusamy Shanmugapriyan,* Balasubramanian Ramaprabha

Department of Conservative Dentistry and Endodontics, Tamil Nadu Government Dental College and Hospital, Chennai, India

ABSTRACT

Root resorption is a common sequel that follows injuries or irritation to the periodontal ligament and/or tooth pulp. The recent advances in imaging technologies and material science have enabled the clinician to visualize the structural changes accurately and repair them with materials providing favorable properties. This poster reports two cases diagnosed with external and internal root resorption and their management.

In the case of external cervical root resorption in the maxillary left central incisor, the treatment includes curettage to remove granulation tissue and restoring the defect with Biodentine. Followed by strengthening the remaining crown structure using Ribbond fiber-reinforced composite. These fibers resist distortion and effectively absorb and redistribute occlusal forces in high-stress areas.

In the case of internal root resorption of a maxillary left lateral incisor, root canal treatment remains the treatment of choice as it removes the granulation tissue and blood supply of the clastic cells. This was followed by sectional obturation with gutta-percha in the apical third, along with MTA repair for the resorptive defect and the remaining coronal third of the canal.

Various techniques and materials have been employed to fill resorptive defects. Among these, Mineral Trioxide Aggregate and Biodentine exhibit satisfactory properties, including biocompatibility, favorable sealing ability, mechanical strength, and the ability to promote healing of periapical tissues.

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Composite injection molding versus porcelain veneers: a comparative case presentation on the aesthetic management of anterior diastemas

Anushree Anil Verma*

Department of Restorative Dentistry, Saveetha Dental College, Chennai, India

ABSTRACT

Aesthetic closure of anterior diastemas can be achieved through various restorative techniques, with treatment selection guided by patient expectations, location of the diastema and material properties.

This case-based presentation compares two minimally invasive approaches: porcelain veneers and injection molding composite restorations. Case 1 depicts a 29-year-old female presenting with multiple diastemas between the maxillary anterior teeth. Following clinical evaluation and planning, lithium disilicate veneers were chosen for their superior aesthetics, longevity and translucency. Conservative tooth preparation was carried out and the veneers were bonded using resin cement, resulting in a natural and harmonious smile transformation. Case 2 depicts a 32-year-old male presenting with a midline diastema and minor spacing in the mandibular anterior region. Considering budget, enamel preservation, and treatment time, the injection molding technique with flowable composite was selected. A silicone index and wax-up model were used to precisely sculpt the restorations, offering excellent polishability and gingival adaptation in a single appointment. Both patients reported high satisfaction with the outcomes. The comparison highlights that while porcelain veneers excel in aesthetic refinement and durability, the composite injection molding technique offers a conservative, cost-effective solution with immediate results – particularly well suited for mandibular anterior diastemas.

Treatment modality should be personalized based on patient needs, aesthetic goals and clinical indications. Both techniques, when planned and executed correctly, can deliver predictable and satisfying outcomes.

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Preserving the natural, perfecting the aesthetics: a smile couture approach

Anu Elsa Swaroop,[1] Abijeth Baskar,[2] Subash Sharma[3*]

[1]Department of Conservative Dentistry and Endodontics, Faculty of Dental Sciences, Ramaiah University of Applied Sciences, Bangalore, Karnataka, India
[2]Private Practitioner, Consultant Endodontist, Salem, Tamilnadu, India
[3]Department of Aesthetic Dentistry, Saveetha Dental College, Chennai, India

ABSTRACT

Tooth preservation is central to restorative dentistry, even when structural integrity is compromised. This case-based poster highlights a multidisciplinary approach combining post-core-crown rehabilitation with smile designing procedures, gingivectomy and aesthetic veneers to manage a compromised anterior tooth.

A unified post and core were used to rebuild lost tooth structure, providing functional support and serving as the foundation for the definitive crown. Gingivectomy was performed to correct gingival asymmetry and improve the smile line. Adjacent teeth were restored with ceramic veneers to enhance overall aesthetic harmony in shade and proportion.

This conservative, staged strategy allowed for the preservation of the natural root, maintained alveolar bone, and postponed implant therapy while fulfilling the patient's aesthetic demands. It also minimized surgical intervention and optimized soft tissue outcomes for potential future implant placement.

This presentation emphasizes the value of patient-centered, evidence-based planning in extending tooth longevity. The integration of structural reinforcement and aesthetic enhancement demonstrates how preserving natural dentition can offer both visual and functional excellence.

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Veneering the void: conservative diastema closure using Aesthetic Pre-evaluative Temporary (APT) technique and CAD/CAM veneers

Prabhakaran Pooja,* Balasubramanian Ramaprabha

Department of Conservative Dentistry and Endodontics, Tamil Nadu Government Dental College and Hospital, The Tamil Nadu Dr. M.G.R. Medical University, Chennai, India

ABSTRACT

Smile harmony is closely associated with psychological well-being, making its restoration an essential part of comprehensive dental care. Maxillary midline diastema is a common esthetic concern, and its treatment can pose clinical challenges. However, the advent of dental veneers and digital workflow integration has dramatically transformed treatment approaches- delivering rapid, accurate and visually pleasing results. This case report focuses on maxillary diastema closure using ceramic laminate veneers. A 30-year-old male presented with prominent spacing of 2.5 mm between #11, 21 and 22. After a comprehensive evaluation, a treatment plan involving indirect veneers was proposed. The digital workflow began with an intraoral scan to create a precise 3D model of the patient's dentition. Following digital smile design, a wax mock-up was created, and silicone putty guides were fabricated to ensure accurate, harmonious preparation by preventing over- or under-reduction. Oratemp C&B was injected into the silicone index and placed intraorally to create the Aesthetic Pre-evaluative Temporary (APT). The APT provides the final opportunity to share the outcome with the patient in terms of aesthetics, function, phonetics, and to discuss any changes before preparation. In order to be truly minimally invasive, the preparation was done through the APT and verified using the reduction guides and digital scans were made. Using CAD software, e-max veneers were meticulously designed and then milled. After try-in, the veneers were successfully bonded, providing optimal fit and aesthetics. Integrating the APT technique with digital workflow enhanced predictability and conservative veneer preparation, delivering superior esthetic outcomes.

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Broken to beautiful: the resin rehab

Srujan Magar*

Department of Aesthetic Dentistry, Saveetha Dental College, Chennai, India

ABSTRACT

Anterior composite restorations remain a cornerstone of aesthetic dentistry, offering conservative solutions that blend function with beauty. Restoring a Class IV anterior tooth with composite requires both aesthetic and functional precision. In this case, a fractured maxillary central incisor was managed using a direct composite technique.

Emphasis is placed on biomimetic techniques that achieve seamless integration with adjacent teeth. Through clinical photography, each step is documented bevel preparation to layering, contouring, and polishing — emphasizing how small refinements contribute to a lifelike outcome.

This presentation reinforces the philosophy that successful anterior composite restorations are not only judged by immediate visual appeal but by their ability to maintain harmony and durability over time — ultimately "mimicking nature" both visually and functionally.

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Aesthetic correction of dental cant using porcelain veneers

Shreya Gupta,[1*] Subash Sharma,[1] Karthick Raj[2]

[1]Department of Aesthetic Dentistry, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India
[2]Department of Periodontics, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India

ABSTRACT

This paper presents a case report highlighting a minimally invasive and highly aesthetic solution using porcelain veneers to correct a dental cant in a young adult patient with no underlying skeletal discrepancies. Facial and dental midline discrepancies, particularly occlusal canting, significantly impact smile aesthetics and can often go untreated. Traditional correction methods may involve orthodontic or surgical intervention, which can be invasive and time-consuming.

A comprehensive diagnostic protocol, including facial analysis, digital smile design, and mock-up evaluation, was employed to visualize and plan the correction. The treatment objective was to realign the occlusal plane aesthetically by modifying incisal edge positions and gingival zeniths through selective preparation and placement of porcelain veneers on the maxillary anterior and premolar teeth. The treatment outcome demonstrated a marked improvement in facial aesthetics and patient satisfaction, boosting his confidence with no need for orthodontic or orthognathic intervention.

This case underscores the potential of dental veneers as a viable, non-invasive alternative for correcting mild to moderate occlusal cants, especially in aesthetically driven cases.

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Management of complicated crown – root fractures using surgical extrusion and 180 degree rotation: case reports

Samidurai Prema Akshaya,* Mahendran Kavitha

Department of Conservative Dentistry and Endodontics, Tamil Nadu Government Dental College and Hospital, The Tamil Nadu Dr. M.G.R. Medical University, Chennai, India

ABSTRACT

Complicated crown-root fractures involving the anterior maxillary teeth are uncommon yet clinically significant injuries that demand a multidisciplinary approach for optimal functional and esthetic outcomes. Surgical extrusion is a conservative treatment modality that facilitates access to subgingival fracture margins while preserving the natural tooth. Case 1 describes a 45-year-old male who presented with a fractured right maxillary central incisor. Clinical and radiographic evaluation revealed a complicated crown-root fracture (ICD-11: NA0D.05). The tooth was surgically extruded and rotated 180 degrees to enhance the ferrule effect. A cast post and core were fabricated, and the tooth was subsequently restored with a metal-ceramic crown. Case 2 involves a 17-year-old male with a similar fracture in the left maxillary lateral incisor, also diagnosed as a complicated crown-root fracture (ICD-11: NA0D.05). Management included surgical extrusion, restoration with a quartz fiber post and composite core build-up, followed by full-coverage crown cementation.

Both cases demonstrate that surgical extrusion and 180-degree rotation can be a predictable and biologically acceptable technique for managing complicated crown-root fractures. Selection of the appropriate post system and restorative material is essential for long-term success. These cases underscore the importance of timely intervention and a tailored, minimally invasive approach to preserve natural dentition in young and middle-aged patients.

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Management of root resorption: case reports

Loganathan Pavithra* **Manohar Rajashree, Mahendran Kavitha, Pasupathi Shakunthala**

Department of Conservative Dentistry and Endodontics, Tamil Nadu Government Dental College and Hospital, The Tamilnadu Dr M.G.R. Medical University, Chennai, India

ABSTRACT

Tooth resorption is a condition associated with either a physiological/pathological process that results in loss of a substance from the tissues such as dentin, cementum/ alveolar bone. Resorption is said to be internal if the original site of the resorptive process starts in the pulp and external if the resorptive process starts in the periodontal ligament.

This case report presents the successful management of two different cases of root resorption. The first case was diagnosed as previously initiated root canal therapy with perforating internal resorption in 21. The second case was diagnosed as previously root canal treated #11 with combined root resorption. Both cases were successfully managed by atraumatic extraction and the resorptive defects were thoroughly debrided and repaired using Biodentin, a bioactive dentin substitute known for its excellent sealing ability, biocompatibility, and ability to promote hard tissue regeneration. Both teeth were replanted. Intentional replantation is a viable alternative treatment option to preserve a tooth with internal root resorption while leaving the periodontal bone architecture almost intact. The follow-up revealed satisfactory clinical and radiographic healing.

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Sparkling smiles: the magic of porcelain veneers

Vinodhini P,[1*] Dr. Subash Sharma S,[1] Karthick Raj SM[2]

[1]Department of Aesthetic Dentistry, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India
[2]Department of Periodontics, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India

ABSTRACT

Veneers have become a cornerstone of aesthetic dentistry, offering a conservative yet effective solution for enhancing anterior dental aesthetics. Ceramic veneers, particularly those fabricated from lithium disilicate, are favored for their excellent translucency, strength, and color stability. Among various indications, the closure of diastema represents both a cosmetic and functional challenge, especially in young adults declining orthodontic therapy.

Lithium disilicate veneers are particularly suitable for diastema due to their superior translucency and optical mimicry of enamel, high flexural strength and bonding compatibility with enamel, and proven color stability.

This poster reinforces their role as a minimally invasive, durable, and esthetically superior option when combined with digital design and careful planning. In the presented cases, periodontal intervention played a crucial role in enhancing gingival symmetry and optimizing the esthetic zone, contributing to a successful outcome. This highlights the importance of a multidisciplinary approach, combining periodontal therapy, prosthodontic precision, and digital smile design.

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Unwrap a smile

Anushka Gupta,[1*] Subash Sharma S,[1] Karthick Raj SM[2]

[1]Department of Aesthetic Dentistry, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Saveetha ‹University, Chennai, India
[2]Department of Periodontics, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India

ABSTRACT

Unwrap a Smile is a journey into the transformative world of aesthetic dentistry, where science meets artistry to create smiles that restore not just teeth, but confidence and identity. This field embraces a broad spectrum of minimally invasive to advanced cosmetic procedures designed to enhance dental appearance while preserving functionality. From subtle refinements to complete smile makeovers, aesthetic dentistry empowers practitioners to tailor treatments based on individual needs, desires, and facial harmony. Whether through contouring, veneers, whitening, bonding, or full-mouth rehabilitation, the aim remains the same—revealing the natural beauty behind every smile. This poster explores the dynamic role of aesthetic dentistry in modern practice, emphasizing patient-centered design, interdisciplinary approaches, and the emotional impact of a well-crafted smile.

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Case Report

I am the pulp – to save or sacrifice? - a case series on intentional pulpotomy versus intentional pulpectomy

Annapoorna Ballagere Mariswamy,* Paras Jagadish Mull

JSS Dental College and Hospital, Mysuru, India

ABSTRACT

Intentional root canal treatment (RCT) is performed not to address disease, but to facilitate restorative or prosthodontic procedures. Clinical scenarios where intentional RCT is indicated include: abutments for overdentures or fixed partial dentures, teeth requiring post and core placement due to extensive coronal damage, discoloration management, deep crown reduction or misaligned teeth predicted to risk pulp exposure during restoration and surgical procedures. However, loss of pulp vitality, proprioception, strength and integrity of dentin, potential for procedural errors (instrument separation, perforation), higher cost and complexity of treatment are some of the drawbacks of intentional root canal treatment. Therefore, in select cases, intentional pulpotomy may be performed as a conservative alternative to elective pulpectomy, allowing preservation of pulp vitality without compromising the treatment outcome. This poster presents a case series highlighting alternative approaches to preserve pulp vitality in clinical situations traditionally managed with intentional root canal treatment.

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Aesthetic and functional rehabilitation with porcelain veneers-a conservative approach

Sajiba K Mahamood,[1*] Subash Sharma S,[1] Karthick Raj SM,[2]

[1]Department of Aesthetic Dentistry, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India.
[2]Department of Periodontics, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India

ABSTRACT

Porcelain veneers have become a cornerstone in aesthetic dentistry, offering a minimally invasive solution to correct a wide range of concerns such as discolorations, spacing, shape discrepancies, and minor misalignments. By preserving the majority of the natural tooth structures, veneers provide a conservative yet highly effective approach to smile enhancement.
This presentation highlights the role of veneers in achieving aesthetic harmony and functional balance through precise planning and execution. Veneers allow for customized treatment tailored to individual facial and dental characteristics, leading to predictable and natural-looking outcomes. The technique emphasizes tissue preservation, optimal shade matching and proportional smile design all contributing to long-term success and patient satisfaction.

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Case Report

Reimagining smiles: a case series on the esthetic versatility of ceramic veneers

Lankizhai RJ,[1*] Subash Sharma S,[1] Karthick Raj SM[2]

[1]Department of Aesthetic Dentistry, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India
[2]Department of Periodontics, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India

ABSTRACT

This case series highlights the versatility and effectiveness of ceramic veneers in contemporary restorative dentistry. Three diverse clinical cases demonstrate how veneers can address both functional and esthetic concerns with a conservative approach. The first case involved a 25-year-old male presenting with trauma to the maxillary central incisors, treated with one ceramic veneer and two all-ceramic crowns for symmetry and functional rehabilitation. The second case featured a 46-year-old female with a diastema and chipped, irregular anterior teeth. Minimally invasive ceramic veneers were used to close the spaces and create a harmonious smile. The third case involved a 28-year-old female with disproportionate anterior teeth, who received six ceramic veneers to improve tooth shape, size, and alignment. This case series demonstrates how ceramic veneers can effectively address diverse clinical needs—ranging from trauma rehabilitation to esthetic improvement through space closure and morphological correction—making them a reliable and conservative option for smile enhancement in modern restorative dentistry.

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Anterior Composite restoration

Akash T,* P Ravishankar, AR Pradeep Kumar*

Thai Moogambigai Dental College and Hospital, Chennai, India

ABSTRACT

The direct composite technique made it possible to restore fractured anterior teeth with composite resin, to close diastema or to build up worn teeth. This technique is conservative and economical when compared to veneers and is easily affordable by all. This procedure requires a meticulous approach to shade selection, tooth preparation, bonding protocols, and layering techniques to achieve results that integrate with the natural dentition. Advances in resin composite materials and adhesive systems have significantly improved the durability, polishability, and optical properties of restorations. The purpose of this case series is to assess the anterior tooth restorations using the direct composite technique.

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A novel non-invasive therapeutic approach to external apical inflammatory palatal root resorption of the maxillary 1st molar: a case report

Lourdusamy Vijay Amirtharaj, Shreya Kothari, Sekar Mahalaxmi

Department of Conservative Dentistry and Endodontics, SRM Dental College, Ramapuram, Bharathi Salai, Chennai, TN, India.

ABSTRACT

External inflammatory root resorption (EIRR) is a progressive condition characterized by the loss of dentine and cementum due to osteoclastic activity. It is commonly associated with factors such as chronic pulpal inflammation, bacterial infection, or trauma, and may ultimately result in tooth loss if not managed effectively. Early diagnosis and minimally invasive management are essential. Recent studies suggest regenerative endodontic procedures (REPs) as promising therapeutic alternatives, promoting repair, symptom reduction, and restoration of tooth function without the need for surgical intervention.

A 28-year-old male presented with discomfort in the upper left posterior region, with a history of root canal treatment and temporary restoration in tooth 26. Clinical and radiographic examination, followed by CBCT imaging, revealed persistent bleeding and significant resorption of the palatal root. After removal of gutta-percha and irrigation, calcium hydroxide was placed as an intracanal medicament. On re-evaluation, hemorrhage persisted. The resorptive tissue was degranulated using a diode laser, and modified Carnoy's solution was applied as a tissue fixative. Subsequently, injectable platelet-rich fibrin (iPRF), prepared from autologous blood, was administered at the resorption site. The palatal canal was obturated with MTA putty, while the mesiobuccal and distobuccal canals were sealed with gutta-percha and bioceramic sealer. Post-endodontic restoration was completed using short fiber composite resin, with a ceramic overlay as a post endodontic restoration. The patient remained asymptomatic at one-week follow-up and was scheduled for follow-up review at 3, 6, 9, and 12 months.

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Crafting ideal smiles - minimally invasive rehabilitation of anterior spacingusing CAD/CAM zirconia veneers

S SonaSri,* B VeniAshok

Adhiparasakthi Dental College, Chengalpattu, India

ABSTRACT

Personality and emotional state are intimately intertwined with perceptions of an esthetic smile, necessitating a highly refined approach. Clinicians should replicate nature by integrating biological preservation, functional harmony and personality resonance. Achieving authentic smiles demands minimally invasive techniques supported by modern materials and digital workflows. High-translucency, yttria-stabilized zirconia has emerged as a durable alternative, offering superior flexural strength, fracture resistance, and masking ability while maintaining translucency ideal for minimally invasive esthetic rehabilitation.

A 28-year-old patient presented with spaced maxillary anterior teeth and discolored enamel. After a comprehensive clinical and radiographic evaluation, a conservative, metal-free restoration plan was developed. Diagnostic wax-up and digital smile design guided minimal tooth preparation, which is designed to preserve enamel. High-translucency monolithic zirconia veneers were fabricated using a CAD/CAM workflow. Intaglio surfaces were treated via air abrasion and MDP-containing primers; teeth were conditioned with enamel-etching protocols. Veneers were adhesively cemented using dual-cure resin cement. Marginal adaptation, shade match, gingival response, and patient satisfaction were evaluated clinically and photographically.

At 6-month follow-up, restorations demonstrated excellent marginal integrity, stable color match, healthy periodontal response, and high patient satisfaction. No fractures, debonding, or complications were reported. This case highlights that minimally invasive monolithic zirconia veneers, with appropriate surface treatment and adhesive protocols, can achieve long-term esthetic and functional success in anterior spacing cases.

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Multidisciplinary esthetic management of post-orthodontic spacing with peg laterals and gingival enlargement: a case report

Blessie R,* Sriram S, Veni Ashok B

Department of Conservative Dentistry and Endodontics, Adhiparasakthi Dental College and Hospital, Melmaruvathur, India

ABSTRACT

Post-orthodontic spacing, particularly in the maxillary anterior region, often presents a significant esthetic challenge, especially when associated with dental anomalies such as peg-shaped lateral incisors and gingival overgrowth. This case report describes the comprehensive esthetic rehabilitation of a 22-year-old female patient who presented with residual spacing following orthodontic treatment, peg laterals and gingival enlargement that further compromised smile harmony. A multidisciplinary approach was adopted, beginning with gingival recontouring to establish an optimal gingival architecture and improve the crown length of the affected teeth. Following adequate healing, direct composite restorations were planned to restore ideal tooth proportions and close the residual diastemas. The putty index technique was employed to ensure precise anatomical reproduction and symmetrical morphology of the restorations. Shade matching and layering techniques were used to enhance the natural appearance and translucency of the final restorations. The putty index served as a guide to control the palatal contours and reduce chairside time, improving overall treatment efficiency. Postoperative results demonstrated significant esthetic enhancement with harmonious gingival contours and natural-looking tooth anatomy, leading to high patient satisfaction. This case underscores the value of combining soft tissue management with conservative restorations for post-orthodontic spacing involving peg laterals. The putty index-guided composite technique provides a predictable, minimally invasive, and cost-effective esthetic solution.

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Smile renaissance: a case report

Satyaa Rajesh,* Nanthini Sappani Muthu, Sathish S, Veni Ashok B

Adhiparasakthi Dental College and Hospital, Melmaruvathur, India

ABSTRACT

Extensive decay of maxillary anterior teeth in adolescents poses significant functional and aesthetic concerns. Restoration via endodontic therapy and prosthetic reconstruction in this age group is underreported, highlighting the need for documentation of outcomes and protocol rationale.

A 14-year-old female presented with gross carious lesions affecting maxillary central and lateral incisors (teeth 12–22). Clinical and radiographic evaluation confirmed pulp involvement requiring root canal treatment (RCT). Cast post-and-core were fabricated for teeth #11, 12, 21, and 22, followed by placement of porcelain-fused-to-metal (PFM) crowns for definitive restoration. The interventions restored occlusal form, midline aesthetics, and patient confidence. At 1-month follow-up, all treated teeth remained asymptomatic, with stable periodontal health and intact prostheses.

This case demonstrates successful combined endodontic and prosthodontic management of extensively decayed maxillary anterior teeth in an adolescent patient. Use of cast post-and-core builds structural integrity in teeth with significant hard tissue loss, while PFM crowns offer functional and aesthetic restoration. Long-term monitoring is essential to assess potential root fracture, crown marginal adaptation, and pulpal status, given ongoing craniofacial growth.

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Pink meets white: enhancing aesthetic outcomes through periodontal precision

Shreya Wankhede*

Department of Aesthetic and Restorative Dentistry, Saveetha Dental College, Chennai, India

ABSTRACT

True smile aesthetics lie in the seamless harmony between pink and white. While restorative advancements often take the spotlight, the foundational role of periodontal refinement—particularly soft tissue augmentation—is both critical and transformative. In cases of ridge defects, thin biotypes, or recession, soft tissue augmentation not only re-establishes contour and volume but also provides a stable and aesthetically pleasing prosthetic environment.

This clinical poster highlights the significance of soft tissue augmentation techniques—such as connective tissue grafts, free gingival grafts, and tunnel approaches—in optimizing the pink framework. These procedures not only enhance the visual continuity of the gingival architecture but also support the longevity and integration of restorative work, including veneers, direct composites, and fixed partial dentures.

By addressing soft tissue deficiencies pre-restoration, we ensure ideal emergence profiles, natural-looking pontic sites, and harmonious gingival symmetry—elements that are often overlooked but vital to high-end aesthetic results. This case-based presentation underscores the philosophy of "small changes, big results," where subtle soft tissue corrections profoundly elevate the final outcome.

Aesthetic dentistry today demands a multidisciplinary mindset—where periodontal plastic surgery blends seamlessly with restorative planning. This work emphasizes that modern excellence lies not just in visible enhancements but in creating invisible support through periodontal precision.

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Conservative smile makeover with veneers: less is more

Riya Kandge-Khedkar*

Department of Aesthetic and Restorative Dentistry, Saveetha Dental College, Chennai, India

ABSTRACT

Smile designing in contemporary dentistry emphasizes harmony between facial features, dental structures, and patient desires. Indirect ceramic veneers have emerged as a preferred modality for enhancing smiles due to their excellent aesthetic qualities, biocompatibility, and minimal invasiveness.

This presentation highlights the principles of smile designing in clinical cases managed with indirect ceramic veneers. A digitally guided approach—utilizing tools such as photographic analysis and basic smile simulation—supports accurate diagnosis, case planning, and patient communication. Emphasis is placed on facially driven treatment planning, ideal tooth proportions, and diagnostic mock-ups to ensure natural, predictable outcomes.

The use of indirect ceramic veneers allows for the preservation of tooth structure while achieving long-lasting aesthetic enhancements. Case documentation demonstrates how a combination of artistic design and clinical precision leads to high patient satisfaction and functional success.

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Case Report

A case report of creating invisible esthetic restorations using a biomimetic approach to enhance the form, function and overall health of the teeth in the maxillary anterior region

Khushboo Maroo*

Private practice, Hyderabad, India

ABSTRACT

In a zest to design beautiful smiles, sometimes dentists end up doing more harm to natural teeth by grinding nature away. Simple conservative treatments can, a lot of times, create beautiful if not picture-perfect smiles, preserving nature and maintaining the integrity of natural teeth, enhancing their form, function, and overall health. A case report with a 4-year follow-up describing a biomimetic predictable approach to restore anterior teeth, enhancing smiles and confidence in a very conservative manner, mimicking nature to do invisible dentistry. A 3mm diastema closure, where the patient was extremely unhappy with her smile and refused orthodontic treatment. A detailed study of form and proportions revealed that her smile can be enhanced by a simple 90-minute procedure with appropriate advance planning and mock-up. Well-polished and contoured composite restorations are very biocompatible to the gingival epithelium, adapting beautifully around it. The multi-layered composite beautifully mimics the dentin-enamel complex found in natural teeth, transmitting light in a very similar fashion and creating restorations that are seamless. This minimally invasive technique results in preserving enamel, increasing bond strength and thus ensuring long-term functionality of the restoration, guiding dentists to do predictably invisible and responsible esthetic treatments.

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Predictable minimal invasive restoration in crown-root fracture: Restorative Alveolar Interface (RAI) concept and virtual rehearsal surgery

Youngsin Kang, Su-Jung Shin, Jeong-won Park*

Department of Conservative Dentistry, Gangnam Severance Dental Hospital, Yonsei University, Seoul, Korea

ABSTRACT

Clinicians frequently encounter traumatic tooth fractures that invade the periodontal tissue. This clinical report aims to discuss the management of crown-root fracture extended to the crestal bone with minimal invasive approaches using the Restorative Alveolar Interface (RAI) concept and Virtual Rehearsal Surgery.

A 37-year-old female complained of a horizontally fractured upper left central incisor (#21), previously treated with root canal therapy and a temporary crown five days ago. Clinical examination revealed no percussion sensitivity, mobility, or bite discomfort, but a crown-root fracture was observed. The treatment plan included nonsurgical endodontic retreatment, intentional replantation with 180° rotation, and definitive crown restoration.

Restorative Alveolar Interface (RAI) was described as a portion of the root surface extending from the alveolar crest apically to the gingival margin coronally. Management of RAI aims at modifying the restorative margin position into a healthier periodontal environment, respecting supra-crestal tissue attachment (STA). Especially in the case of tooth fracture with invasion of the biologic width, RAI management can lead to minimal ostectomy or osteoplasty instead of more aggressive bone reduction. This procedure might reshape supra-crestal tissue attachment (STA) while maintaining an acceptable crown-root ratio.

Virtual Rehearsal Surgery, prior to the surgical procedure, can make the treatment more predictable, allowing clinicians to choose the most suitable treatment option based on that predictability.

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16-year follow-up of an autotransplantation from the right mandibular second premolar to the left mandibular first molar

Ji-Yong Kim* **Jeong-Won Park, Su-Jung Shin, Young-Sin Kang**

Department of Conservative Dentistry, Gangnam Severance Hospital, College of Dentistry, Yonsei University, Seoul, Korea

ABSTRACT

In 2009, the patient was referred to the Department of Conservative Dentistry at Gangnam Severance, Seoul, Korea, for consultation on autotransplantation by the Department of Orthodontics. Extraction of all second premolars except the left mandibular second premolar was planned for orthodontic treatment. At the same time, the left mandibular first molar exhibited extensive secondary caries with minimal remaining tooth structure, rendering it non-restorable. Root canal treatment was performed on the right mandibular second premolar, which was then autotransplanted to the site of the extracted first molar. Orthodontic force was applied to the transplanted tooth six weeks after the surgery.

Four years after the procedure, a PFG crown was placed to enhance function and longevity. Over a 16-year period of regular follow-up, the transplanted tooth has remained asymptomatic, functional, and periodontally stable, with no signs of mobility or apical pathology.

This case highlights the clinical value of tooth autotransplantation as a viable alternative to dental implants when appropriate case selection is made. Unlike implants, autotransplanted teeth can be moved orthodontically. So it can reduce the discomfort and limitations associated with missing teeth during orthodontic treatment. As a result, autotransplantation enables clinicians to achieve both functional and esthetic outcomes while minimizing inconvenience to the patient throughout the treatment period.

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Rethinking and implementing a conservative strategy for post endodontic restorations - a case series

Kaviya Varshini L,* Akshai S, Sethupathi, Diana Davidson, M.R. Srinivasan

Department of Conservative Dentistry and Endodontics, Sri Venkateswara Dental College and Hospital, Chennai, India

ABSTRACT

Restoring endodontically treated teeth using post and core combined with full coverage restoration requires further unwarranted root dentin and tooth substrate reduction and such teeth will be prone to vertical root or coronal fracture. However, employing adhesives and minimal invasive restorative techniques can drastically reduce this risk. There is enormous *in vitro* and *in vivo* research on post and core designs for anterior teeth; however, this should not justify the use of them in molar teeth, which are subjected to heavy compressive load. Endocrowns have gained popularity not only for their conservative approach but also for their macro- and micromechanical retention, eliminating the need for intraradicular posts. This case series evaluates the clinical performance of lithium disilicate endocrowns. All three cases presented with pain in the molar teeth. A diagnosis of symptomatic irreversible pulpitis, with normal apical tissue, was made. Preoperative assessment using the Tooth Restorability Index confirmed the ferrule height and girth of the remaining coronal substrate to be about 2-2.5 mm and 1.5-2 mm. After completion of endodontic therapy, radiographs confirmed the pulp chamber depth to be 4 mm (Case 1), 3.5 mm (Case 2), and 3.5 mm (Case 3). Before preparation, the pulp chamber floor was sealed using bulkfill-flowable composite (1mm). The occlusal aspect was refined to a butt-joint margin using a wheel diamond. The occlusal clearance measured 3 mm to the opposing teeth. Impressions were taken using the double putty-wash technique. Temporization was done (spot-etched and bonded) with microhybrid composite. CAD/CAM milled lithium disilicate endocrowns were etched with 5% hydrofluoric acid for 20 sec and thoroughly cleaned using an ultrasonic bath (alcohol 5min). Then it was dried and silanated. Under rubber dam isolation, the teeth substrate was totally etched with 37% orthophosphoric acid (selective etch), rinsed and dried, following which the self-etch bonding agent was applied to the dentin substrate for 20 seconds and light cured. The endocrown was luted using light-cure resin luting cement. It was tack cured and excess cement was eliminated with a No.12 blade. Occlusal adjustments, finishing and polishing were done using a ceramic polishing kit. The same protocol was followed for the other cases. Postoperative radiographic evaluation confirmed adequate marginal adaptation, contact, and contour. Five-year follow-up showed good marginal integrity. Bite wing radiographs revealed no secondary caries. This case series supports Endo crown as a durable post endodontic restoration for structurally compromised endodontically treated teeth.

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Conserving strength, restoring function: indirect aesthetic restoration: a case series

Nandika I,* Anand M, Diana Davidson, M.R. Srinivasan

Department of Conservative Dentistry and Endodontics, Sri Venkateswara Dental College and Hospital, Chennai, India

ABSTRACT

Loss of tooth structure due to caries, fracture and endodontic treatment compromises its integrity and reduces its ability to withstand occlusal forces. Studies show that the amount of remaining tooth structure is vital for the survivability of posterior teeth. Though direct composite restorations preserve tooth structure the most, their bond strength plays a vital role in their success. Full coverage crowns, widely accepted choice of restoration for endodontically treated teeth with large cavities, require extensive preparation of an already weak tooth. Minimally invasive adhesive restorations like ceramic onlay and overlay preserve the tooth structure while providing aesthetic and functional rehabilitation in posterior teeth. This case series illustrates an endodontically treated posterior tooth restored with a ceramic overlay and a vital tooth restored with a ceramic onlay. The first case was an endodontically treated 36 with an interim restoration. Removal of interim restoration followed by SDR application on the pulpal floor and buildup with composite resin. Tooth preparation for the overlay was done and an impression was taken. The fabricated ceramic overlay was then luted. A 3-month follow-up showed no post-operative pain. The second case was a rotated lower right premolar (#45) with a large carious lesion. Reversible pulpitis was confirmed with the sensibility test. Caries was removed and tooth preparation was done to accommodate the modified onlay. A glass ionomer cement base was applied and an impression was taken, followed by an interim restoration. It was then restored with a modified ceramic onlay, also correcting the occlusion. These cases demonstrate the clinical effectiveness of ceramic onlays and overlays in restoring posterior teeth conservatively.

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Untangling the curvature – assessment and management of severely curved roots in premolars using various canal curvature measurement techniques: a case series

Preethikhaa R,* Sneha A, Akshai S, Diana Davidson, M.R Srinivasan

Department of Conservative Dentistry and Endodontics, Sri Venkateswara Dental College and Hospital, Chennai, India

ABSTRACT

The Anatomical complexity of the root canal system poses significant clinical challenges, particularly in the presence of curvatures. This case series presents the management of three anatomically complex root canals using the canal curvature measurement technique. Preoperative radiographs were used to determine the degree of curvature using the Schneider, Weine, Pruett, Lutein, and Canal Access Angle method. Case 1: A 25-year-old male patient reported with pain in tooth #35. Intraoral examination and pulp sensibility tests indicated irreversible pulpitis, chronic apical abscess in tooth #35, and radiographic evaluation showed Vertucci type I, apical dilaceration, and distal curvature (Schneider: 50°). Case 2: A 29-year-old female patient reported with pain in tooth #15 and was diagnosed with irreversible pulpitis, symptomatic apical periodontitis. Vertucci type II and mid-root distal curvature (Schneider: 38°) was observed. Case 3: A 25-year-old male patient reported with pain and was diagnosed with irreversible pulpitis, symptomatic apical periodontitis in tooth #25. Vertucci type IV, S-shaped canal (Schneider: Buccal canal-mesial curvature-26°, palatal canal-distal curvature-36°) was seen. All cases had severe curvatures (> 25°). Access was prepared and refined using a US tip (Start X #1) and orifice enlarged using HyFlex CM 25/.08. Hand files #6, 8, 10 were prebent and patency was achieved. Working length was determined using Ingles' radiographic method, Apex locator and a #10 file was made loose to full working length. Hyflex CM rotary files 20/.04,25/.04 Speed: 500 rpm, Torque: 2.5N·cm were used under tactile-controlled activation. Recapitulation and irrigation (PUI-5.25%NaOCl, 17%EDTA, saline) was performed. Obturation was done with a single cone for case 1 and warm vertical compaction with Buchanan#0 NiTi plugger, followed by backfill technique using bioceramic sealer for cases 1 and 2. Gutta flow bioseal was used for case 3. Follow-up was done up to 2 years. This case series highlights the importance of curvature analysis using multiple methods to customize instrumentation strategies, reduce iatrogenic mishaps and enhance treatment outcomes in complex cases.

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From depth to precision: elevating subgingival margins predictably – a case series

Subhathi B,* Diana Davidson, M.R.Srinivasan

Department of Conservative Dentistry and Endodontics, Sri Venkateswara Dental College and Hospital, Chennai, India

ABSTRACT

Restoring teeth with subgingival margins poses a significant clinical challenge primarily due to limited access, difficulty in isolation, impression recording and possible violation of the biologic width. Deep Margin Elevation (DME), a precursor of the open sandwich technique, was introduced as a conservative alternative to surgical crown lengthening and orthodontic extrusion, as it safely relocates deep margins to the supragingival level and this helps achieve a predictable bonding and seal in those areas. This case series presents 3 clinical scenarios involving endodontically treated posterior teeth with deep Class II subgingival caries. A UNC-15 probe was used to measure sulcus depth. If the deep margin encroached more than 2 mm from the alveolar bone crest, surgical crown lengthening was performed in conjunction with DME; otherwise, nonsurgical DME was done. All cases were performed under rubber dam isolation and magnification of 16X. In the first case, the deep margin was exposed using lasers and an ivory band No.8 of 0.05 mm thickness was cut and modified to a height of 3 mm and adapted distoproximally using a Tofflemire retainer to expose the margin. The second case used a stainless steel sectional matrix (thickness 0.03 mm) and it was placed distoproximally. The third case involved gingival margin exposure using electrocautery. A copper band of about 0.03 mm thickness was secured subgingivally and burnished closely to the margin. For all cases, the matrices were stabilized with a plastic wedge and DME was performed using bulkfill flowable composite. The gingival margins were raised by 1.5-2 mm. The remaining proximal walls were built using bulkfill packable composite resin (Tofflemire retainer and band or Sectional ring matrix system). Bitewing radiographs were taken to confirm marginal integrity and seal of the proximal aspect of all teeth. Follow-up was done at 3, 6 and 12 months. No signs of secondary caries, marginal leakage, periodontal inflammation, plaque accumulation, or periodontal pocket were observed. This case series supports the concept of DME, as it not only offers a conservative and biologically sound alternative to other invasive techniques but also facilitates the placement of bonded indirect or direct restorations.

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Veneer vision unveiled- redefining aesthetic restorations with indirect resin composites: a case series

Divya Chandrashekar,* Prakruthi Nagesh, Ashwini .P. Santosh

Department of Conservative Dentistry and Endodontics, VS Dental College and Hospital, Bangalore, India

ABSTRACT

Restoring lost dental aesthetics while maintaining phonation and function is a central goal of contemporary dentistry. Veneers have played a transformative role in aesthetic rehabilitation, offering conservative yet effective solutions. Among the earliest were direct composite veneers, made from tooth-colored resin materials and applied chairside in a single visit. These restorations allow for real-time sculpting to manage discoloration, minor misalignments, and shape anomalies. However, direct composites come with notable limitations, including susceptibility to chipping, staining, and wear, along with a shorter lifespan of approximately 5–7 years. Their success is highly technique-sensitive, depending significantly on the clinician's skill.

Ceramic veneers were introduced to address these limitations, offering superior aesthetics, durability, and the ability to closely mimic the natural optical properties of teeth. However, their major drawback lies in their lack of repairability—any chipping or fracture typically necessitates full replacement rather than repair, leading to increased cost, complexity, and treatment time.

To overcome these limitations, indirect resin composite veneers were developed. These materials combine the aesthetic advantages of ceramics with the conservative, repair-friendly nature of composites. They allow for minimal intervention while achieving excellent aesthetic outcomes and offer the flexibility of intraoral repair when needed.

This case series highlights the clinical application of indirect resin composites in diastema closure, failed direct restorations, and non-carious cervical lesions. The cases demonstrate their versatility and effectiveness in delivering natural-looking, durable, and repairable restorations—making them a valuable option in modern aesthetic dentistry.

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Minimum invasion, maximum precision: the impact of deep margin elevation on indirect bonded restoration - a case report

Maria Jaicy,* Diana Davidson, M.R. Srinivasan

Department of Conservative Dentistry and Endodontics, Sri Venkateswara Dental College and Hospital, Chennai, India.

ABSTRACT

Conservative approaches employed to restore moderately damaged, smaller teeth help in preserving maximum sound tooth structure to bond. Advancements in bonding agents and restorative materials have helped in preserving pulp vitality and have also increased the life expectancy of such teeth. This case report discusses the management of tooth no.34. On clinical examination, the tooth was rotated with caries extending disto-proximally and below the gingival margin. In occlusion, only the buccal cusp was in contact with the opposing tooth. The extent of caries was measured using the WHO probe and it was 2 mm from the bone crest. Non-surgical Deep Margin Elevation (DME) was planned since the tooth margin was within 2 mm from the bone crest. After rubber dam isolation, selective caries removal was performed and DME was done using a stainless steel sectional matrix of thickness 0.025 mm and it was secured with a wedge. The margin was raised to 1 mm using bulk fill flowable composite. The remaining margin was raised using the Tofflemire matrix retainer. A total of 3 mm wall was built using bulk fill composite. Once the bio base was achieved, the tooth was prepped to receive a milled lithium disilicate ceramic inlay. During the inlay delivery appointment, a try-in was done and a radiograph was taken to assess the marginal fit. The fitting surface was etched with 5% hydrofluoric acid for 20 seconds and thoroughly cleaned in an ultrasonic bath. The inlay was dried and the silane coupling agent was applied to the intaglio surface. Under rubber dam isolation, the biobase was selectively etched with 37% phosphoric acid, rinsed, air dried and bonded using universal bonding agent. The treated inlay was bonded onto the prepped substrate using light-cure resin luting cement. Occlusal adjustments, finishing and polishing were done using a ceramic polishing kit.

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Saving the pulp, shaping the smile: a multifaceted restorative approach to anterior tooth rehabilitation using direct composite U veneer - case reports

Prashanth Bytharahosalli Rajachar, Tanvi Srinivas Bonala, Annapurna S Ghatnatti*

Department of Conservative Dentistry and Endodontics, KLE Society's Institute of Dental Sciences, Bengaluru, India

ABSTRACT

Direct composite veneers, enhanced by the precision of the U Veneer template system, offer a conservative and efficient solution for anterior esthetic rehabilitation. U Veneer is a unique, minimally invasive template system that creates beautiful direct composite veneers with predictable shape and symmetry—all in one visit. This case series highlights the adaptability of this technique across three distinct clinical scenarios: Case 1- vital pulp therapy and veneering: An adult patient with an Ellis Class III fracture of the maxillary central incisor underwent direct pulpotomy using mineral trioxide aggregate (MTA) followed by RMGIC lining. A palatal composite shelf was built with a customized Putty technique coupled with reinforcement of Everstick fiber post. U Veneer-guided composite veneers were placed to restore form and esthetics. Pulp vitality was preserved over a 6-month follow-up, with no post-operative sensitivity and excellent cosmetic results. Case 2- diastema closure: A 44-year-old patient sought correction of midline spacing. Composite veneers applied with the U veneer system achieved symmetrical contours and proportional harmony in a single clinical visit. Case 3- fluorosis management: A 22-year-old patient with mild-to-moderate fluorosis received direct composite veneers designed to mask enamel stains and improve shade uniformity. Strategic layering and contouring with U Veneers led to a natural and pleasing smile transformation. These cases demonstrate the versatility and clinical reliability of U Veneer-assisted direct composite. By integrating biological preservation with esthetic enhancement, this approach supports functional restoration and patient confidence through minimally invasive dentistry.

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Shade, shape, shine: crafting the perfect smile

Suprasna Sharan*

Fellow in Aesthetic Dentistry from Saveetha Dental College, Chennai, India

ABSTRACT

Smile transformation with nothing but light, layers, and love.

Aesthetic dentistry today blends technical finesse, biological insight, and creative vision—creating outcomes that are not only functional but emotionally transformative. This case report presents a minimally invasive rehabilitation of an anterior aesthetic concern, emphasizing harmony in shade, shape, and surface detail.

The patient presented with a localized concern, addressed through a conservative and customized smile design approach. Emphasis was placed on preserving natural tooth structure, respecting gingival architecture, and achieving seamless integration with the surrounding dentition.

By prioritizing natural proportions, surface texture, and optical harmony, a result both subtle and lifelike was achieved. This case highlights the power of fine details—contour, translucency, and balance—in elevating the final outcome.

What makes this case noteworthy is its restraint: a restoration meant not to be noticed, but to blend in effortlessly. It reflects the evolving philosophy of modern aesthetics—minimal intervention, maximal effect.

Ultimately, this presentation underscores the clinician's dual role as both technician and artist—restoring not just smiles, but self-confidence.

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Case Report

Shifting shades, saving smiles: protocol-based intra-coronal bleaching in action

Rakshna N,* Sharan Kumar R, Nivetha P, Nishanthine C, M.R.Srinivasan

Department of Conservative Dentistry and Endodontics, Sri Venkateswara Dental College and Hospital, Chennai, India

ABSTRACT

Discoloration of non-vital anterior teeth presents a significant esthetic concern, particularly in young patients. Intra-coronal bleaching serves as a conservative and minimally invasive alternative to prosthetic options for restoring natural tooth color. The walking bleach technique, involving the placement of a bleaching agent within the pulp chamber, is widely accepted due to its simplicity and clinical effectiveness. This case series presents the esthetic management of two systemically healthy patients with intrinsic discoloration of previously root canal-treated maxillary anterior teeth. All teeth were asymptomatic, with radiographs confirming adequate obturation and no periapical pathology. Following a standardized protocol, 2 mm of gutta-percha was removed apical to the cementoenamel junction (CEJ), and a cervical barrier of glass ionomer cement was applied to the level just below the CEJ. Sodium perborate mixed with distilled water in a 2 gm: 1 mL ratio was placed into the access cavity and compacted with small cotton pellets. The access cavity was sealed with a non-eugenol restorative material. Patients were recalled after 3–7 days, and the bleaching agent was replaced if necessary. Most cases required 3–4 cycles. Final restoration was performed using composite resin once the desired shade was achieved. All patients demonstrated a marked improvement in tooth shade with high satisfaction. The esthetic outcomes remained stable, with no relapse in discoloration. This case series supports intra-coronal bleaching using the walking bleach technique as a predictable, safe, and effective method for managing discoloration in non-vital teeth when standardized protocols are followed.

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Root apices under the spotlight-managing a non-healing periradicular pathology in mandibular anterior teeth: a case report

Diana Davidson* Prashanthi, Shireen J, M.R.Srinivasan

Department of Conservative Dentistry and Endodontics, Sri Venkateshwara Dental College and Hospital, Chennai, India

ABSTRACT

Periradicular surgery is an endodontic surgical procedure performed when conventional endodontic therapy fails or when orthograde approach is impossible. Resection, Root end preparation and Root end filling are the 3R's that ensure, eradication of periradicular pathology and long-term success of periradicular surgery. Advancements such as,magnification, ultrasonic tips, and calcium silicate based retrofilling materials have significantly improved the predictability of periradicular surgery. A 17-year old male patient presented with pain, grade I mobility, swelling and pus discharge in tooth nos.31, 41. History revealed trauma. The teeth responded negative to cold and EPT and positive to percussion test. Radiograph revealed periapical radiolucency in relation to 31 and 41 with deviation in root angulation suggestive of a huge periapical pathology. A diagnosis of previously initiated, chronic apical abscess in 31 and pulp necrosis; chronic apical abscess in 41 was made. Under 16x magnification and rubber dam isolation access cavity was prepared. Shaping using protaper gold rotary files (SX-0.19/.04, S1-0.18/.02, S2-0.20/.04, F1-0.20/.07) and cleaning with 5.25% NaOCl (passive ultrasonic irrigation) was done. Triple antibiotic dressing was given. However, the patient remained symptomatic, so surgical endodontics was planned. The canals were irrigated, dried and filled with Gutta-percha and bio-ceramic sealer. Rectangular flap was raised (horizontal incision was done from gingival sulcus to the crestal bone and Vertical relieving incision was given). Labial cortical plate defect was seen exposing the root of tooth no.31. The borders of the bone defect was refined and the root end of tooth no.41 was exposed. Curettage was performed and the granulomatous tissue was sent for biopsy. Root end resection was done. Flap was repositioned and simple interrupted sutures were placed. To stabilize 31, splinting was done using Interlig from 41-32. In the 2 years follow up, the patient showed no signs of discomfort, swelling, sinus tract, periodontal inflammation or pocket. Tooth mobility was restored to normal limits. Radiograph showed successful bone regeneration in the apical region. Progressive resolution of radiolucency, absence of clinical symptoms and signs of inflammation confirmed favorable osseous healing. This case report underscores the importance of deciding appropriate surgical endodontic intervention when required.

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Case Report

The deep rooted mystery of taurodontism unraveled: navigating severe canal complexities through endodontics: a case series

SivaSelva Ganesh,* Shenbagam, Duraivel D, Diana Davidson, M.R Srinivasan

Department of Conservative Dentistry and Endodontics, Sri Venkateswara Dental College and Hospital, Chennai, India

ABSTRACT

Taurodontism can be defined as a change in tooth shape caused by the failure of Hertwig's epithelial sheath diaphragm to invaginate at the proper horizontal level. Effective management of taurodont teeth requires a thorough understanding of their unique anatomy and appropriate modification of the endodontic procedure.

Case 1: A 14-year-old boy presented with pain in tooth no.26. Intraoral examination revealed a normal tooth crown with restoration. The tooth was non-responsive to cold and electronic pup test, which was suggestive of pulp necrosis; asymptomatic apical periodontitis. Pre-op radiographs and cone-beam computed tomography (CBCT) revealed a slightly apically placed pulp chamber floor. Distance from the highest point of pulp chamber roof to the lowest point on the floor was measured to be 5.5 mm, confirming hypotaurodontism. The presence of pulp stone was also evident. Endodontic therapy was performed under rubber dam isolation and magnification of 25x. Access cavity refinement extended deeper and it was done using start X tip no.1. Four canals, palatal, mesiobuccal one, mesiobuccal two and distobuccal were located and negotiated. Shaping was done using NiTi rotary instruments (SX-0.19/.04, S1-0.18/.02, S2-0.20/.04, F1-0.20/.07). Cleaning using 5.25% NaOCl (PUI) and ultrasonically activated obturation technique was performed with bioceramic sealer and GP. Case 2: A 12-year-old female patient reported with pain in tooth no. 36 and 46. Radiograph showed two rooted teeth, caries approximating the pulp, apically positioned pulpal floor, extended pulp chamber, shortened roots and complex canal anatomy. The highest point from the roof to the lowest point on the floor was about 8 mm, confirming hypertaurodontism. A diagnosis of Irreversible pulpitis, symptomatic apical periodontitis was made. Deeper access using safe-ended long shank burs and widening it buccolingually using US tips was done. Canals were negotiated using pre-bent C pilot files and crown down shaping using Hyflex CM was done. Copious irrigation was done with 5.25% NaOCl (PUI). Apical shaping was kept to a minimum as possible. Obturation was done using the down pack and backfill Hybrid technique. This case series showcases the importance of recognizing taurodont teeth and modifying the endodontic steps to achieve a three-dimensional seal.

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Smile realigned: aesthetic rehabilitation of a labially positioned maxillary resin bonded fixed partial denture

Maheshwaran K S*

Department of Prosthodontics, Sri Ramachandra Dental College and Hospital, SRIHER (DU), Chennai, India

ABSTRACT

Resin-bonded fixed partial dentures (RBFPDs) are a minimally invasive solution for anterior tooth replacement. However, improper planning can compromise esthetics and function. This case report describes a conservative approach to replace a labially positioned, unesthetic RBFPD using digital planning and adhesive protocols.

A patient presented with a unilateral RBFPD replacing the maxillary right lateral incisor that was labially displaced and visually prominent. Clinical assessment revealed an unfavorable pontic alignment due to a lack of prosthetic space, disrupting the dental arch form and smile harmony. A conservative treatment plan was formulated, involving minimal enameloplasty of the adjacent maxillary central incisor to regain prosthetic space. A CAD/CAM workflow was employed to design a new zirconia RBFPD conforming to the natural arch form. The prosthesis was fabricated with a unilateral monolithic retainer and a layered pontic that was adhesively bonded using an MDP-containing primer to enhance zirconia adhesion. The final restoration achieved proper tooth positioning and esthetic integration. Clinical follow-up showed no complications and satisfactory retention.

This case illustrates the esthetic rehabilitation of a compromised anterior RBFPD using conservative space management and digital prosthetic planning. The integration of enameloplasty, CAD/CAM design, and adhesive bonding can significantly improve outcomes in similar clinical scenarios.

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Obliterated but not lost: dynamic navigation redefining endodontic pathways

Vaishnavi Devi. B,* Velmurugan. N

Department of Conservative Dentistry and Endodontics, Meenakshi Ammal Dental College and Hospital, Chennai, India

ABSTRACT

Pulp canal obliteration (PCO) is a clinical challenge frequently encountered following dental trauma or due to aging-related changes. Conventional endodontic management of obliterated canals is often complicated by the inability to locate the canal path, risking procedural errors. The advent of dynamic navigation systems (DNS) has introduced a novel, minimally invasive approach to guide canal negotiation with enhanced precision and predictability.

This case report presents the endodontic management of a maxillary central incisor with pulp canal obliteration in a thirty-year-old male patient, who presented with the chief complaint of tooth discoloration following dental trauma. Clinical examination revealed discoloration and tenderness to percussion, while radiographic evaluation confirmed an obliterated canal space with periapical radiolucency. Given the complexity, a dynamic navigation system was employed for guided endodontic access. A preoperative CBCT scan was integrated into the DNS software to plan a virtual drill path, followed by real-time computer-assisted navigation to precisely locate and access the canal space. The initial drill path was established using DNS, following which canal negotiation, biomechanical preparation, and obturation were meticulously performed under an operating microscope. Non-vital bleaching was subsequently done to address the intrinsic discoloration. The procedure was completed successfully without intraoperative complications. At the 8-month follow-up, the patient remained asymptomatic, with radiographic evidence of periapical healing. This case highlights the clinical value of integrating dynamic navigation and an operative microscope in managing complex endodontic cases, with adjunctive non-vital bleaching enhancing overall aesthetic and functional outcomes.

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Pulp fiction turned fact: CBCT-backed healing with human amniotic membrane in a mature molar pulpotomy

Shabarish Arakkatil Viswanathan,[1]*Arun Jaysheel,[2] Raghvi Ramesh Raina[1]

[1]Private practitioner, Davangere, India
[2]Bapuji Dental College and Hospital, Davangere, India

ABSTRACT

Root canal therapy (RCT) has traditionally been the standard for treating irreversible pulpitis in mature permanent teeth. However, growing evidence now supports biologically driven approaches that preserve pulp vitality. This case report explores the use of human amniotic membrane (HAM) as a regenerative scaffold in partial pulpotomy, coupled with Biodentine™, in a mature maxillary first molar.

A 22-year-old woman presented with lingering thermal pain in the upper left posterior region. Clinical and radiographic findings indicated irreversible pulpitis in tooth #26. Following caries removal and partial pulpotomy (~2 mm), hemostasis was achieved using 5% NaOCl. A rehydrated, freeze-dried HAM was placed directly over the amputated pulp, followed by a 3 mm layer of Biodentine. The tooth was restored permanently and monitored. At 6 months, the patient was asymptomatic with normal responses to sensibility tests. Cone beam computed tomography (CBCT) revealed a 0.5 mm increase in dentin bridge thickness, confirming hard tissue formation.

This case highlights the regenerative potential of HAM in mature teeth previously considered non-viable for conservative treatment. The use of CBCT added precise, three-dimensional validation of healing. When used with biocompatible materials like Biodentine, HAM offers a minimally invasive, cost-effective, and biologically sound alternative to RCT.

Partial pulpotomy using HAM may redefine the treatment approach for irreversible pulpitis, bridging the gap between biologically based healing and measurable clinical success.

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Restore the un-restorable

Mathan Rajan Rajendran,* Chakravarthy Arumugam, Kuzhanchinathan Manigandan*

Department of Conservative Dentistry and Endodontics, Sri Ramachandra Dental College and Hospital, SRIHER (DU)

ABSTRACT

The longevity of endodontically treated teeth has significantly improved due to continuous advancements in both endodontic procedures and restorative techniques. Numerous studies have shown that a substantial number of these teeth can be successfully restored to full function using intraradicular restorative materials. Traditionally, cast metal post and core systems have been employed to provide a stable foundation for prosthetic crowns. This approach offers the advantage of a unified structure, where the core is an intrinsic extension of the post, effectively reconstructing the lost coronal tooth structure. To counteract the grayish hue from the oxidized metal substructure, an opaque layer of porcelain is typically applied, resulting in a restoration that is both strong and aesthetically pleasing. The primary benefit of this method is that it combines the advantages of a cast post—being a single-unit post and core that uniformly distributes occlusal load—with the aesthetic appeal of ceramic. This presentation highlights a clinical case involving an endodontically treated, fractured maxillary central incisor, which was restored using a ceramic-coated cast post followed by a full-coverage all-ceramic crown. The treatment was guided primarily by the patient's aesthetic concerns. The case further illustrates how an interdisciplinary approach, utilizing custom cast posts and complete veneer crowns, can successfully rehabilitate severely compromised teeth—restoring both form and function.

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From space to grace: aesthetic tooth replacement with polyethylene fiber

Jyothirmayee Sravani Yeka,* Kavitha Vislawath

Hyderabad, India

ABSTRACT

Composite restorations reinforced with polyethylene fibers present a reliable and conservative option for managing tooth loss and replacing missing teeth, especially when a full-coverage crown or implant is not ideal. Thanks to their elastic properties that closely resemble natural dentin, along with their high resistance to fracture and fatigue, these materials are well-suited for minimally invasive, biomimetic restorations in both anterior and posterior segments.

A 26-year-old male reported with a missing mandibular lateral incisor following previous trauma. Clinical and radiographic assessment indicated intact adjacent teeth and sufficient alveolar bone. A direct fiber-reinforced composite (FRC) bridge was planned using polyethylene fiber (Ribbond®) combined with a nanohybrid composite resin. Conservative tooth preparation was limited to the lingual and proximal surfaces of the neighboring teeth. After adhering to a standard bonding protocol, the fiber was positioned across the edentulous area and integrated into the composite framework. The missing tooth was then sculpted directly using composite material. Final finishing and occlusal adjustments were completed chairside in a single visit.

FRC bridges offer a structurally conservative and cost-effective alternative for replacing single missing teeth, especially in younger patients or those unable to undergo implant placement. They help maintain natural tooth integrity, enable same-day restorations, and provide both functional stability and pleasing aesthetics over short- to mid-term periods.

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From stump to strength: a case-based approach to pre-endodontic build-up

Nikhil Kumar Bijjala, Siddhi Pershad

Hyderabad, India

ABSTRACT

In the field of Conservative Dentistry and Endodontics, the management of grossly decayed teeth with minimal coronal structure remains a clinical challenge. Pre-endodontic build-up of the root stump is a critical step that restores the structural integrity of the tooth prior to root canal treatment. This build-up ensures proper isolation, allows for optimal access cavity preparation, and ultimately contributes to a successful endodontic outcome. This poster highlights the importance of pre-endodontic build-up through a clinical case presentation.

To demonstrate the clinical significance of pre-endodontic build-up in restoring grossly decayed root stumps, enabling effective isolation, ideal access cavity preparation, and improving the overall prognosis of endodontic therapy in severely compromised teeth.

A 52-year-old female patient with a dislodged maxillary right premolar and compromised tooth structure underwent the following treatment: Surgical crown lengthening followed by pre-endodontic composite build-up, re-root canal treatment (Re-RCT), post-endodontic build-up with Ribbond fiber reinforced composite and the tooth was successfully rehabilitated using an E.max crown for functional and esthetic restoration.

Pre-endodontic build-up is a vital clinical procedure in Conservative Dentistry and Endodontics. It enables adequate isolation, improves visibility, aids in access cavity design, and minimizes the risk of procedural errors. In cases of severely broken-down teeth, this technique transforms a potentially non-restorable tooth into a functional one. Incorporating pre-endodontic build-up as a routine part of treatment planning enhances the prognosis and supports tooth preservation.

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Bonded for success: a case series on resin-bonded cantilever bridges

Sosan Fatima,* Sinony Srujana

Hyderabad, India

ABSTRACT

Cantilever fixed partial dentures (CFPDs) have become a reliable alternative in restorative dentistry, especially when implant therapy is contraindicated. Recent advances in adhesive technology and high-performance materials like zirconia and reinforced glass-ceramics have expanded the scope of CFPDs in both anterior and posterior regions.

This case series demonstrates the clinical applicability of resin-bonded CFPDs through two representative cases, highlighting considerations in design, material selection, and bonding protocols. Case 1: A 39-year-old male missing a mandibular premolar was rehabilitated with a milled, chairside mesial cantilever bridge made of E.max CAD. An onlay-type retainer was bonded using hydrofluoric acid etching, silane primer, and dual-cure resin cement. At six months, the restoration showed excellent stability, function, and aesthetics. Case 2: A 21-year-old male with a missing maxillary central incisor received a single-wing zirconia cantilever bridge bonded to the adjacent incisor. Air abrasion, MDP primer, and dual-cure cement ensured effective bonding. The prosthesis remained intact and aesthetically pleasing over 6 months.

CFPDs offer a minimally invasive, cost-effective, and aesthetic solution when conventional treatment options are unsuitable. Proper case selection, biomechanical planning, and tailored bonding techniques are essential to ensure long-term success. This series supports the use of both reinforced glass-ceramic and zirconia-based cantilever bridges in achieving durable and patient-centered outcomes.

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Contemporary restorative strategies for root canal-treated traumatized maxillary Incisors: case series report

Ranjith Jeba John LR,* Pradeepa MR, I Anand Sherwood*

CSI College of Dental Sciences and Research, Madurai, India

ABSTRACT

This case series explores contemporary, minimally invasive restorative strategies for managing fractured, root canal-treated maxillary incisors. The study emphasizes the importance of assessing coronal tooth structure loss to determine suitable restorative interventions, aiming to preserve tooth integrity while ensuring optimal clinical outcomes. A grid-based photographic analysis using Adobe Photoshop was employed to quantify tooth structure loss, categorizing it into three ranges: < 50%, 50–75%, and > 75%.

For teeth with < 50% loss and intact proximal contacts, direct composite restorations—with or without internal bleaching—were found effective. Discolored teeth benefited from walking bleach followed by composite restoration, offering an aesthetic, conservative option. In cases with 50–75% loss and one lost proximal contact, corono-radicular composite restorations or fiber posts were utilized. The use of the pulp chamber and coronal third of the canal as retentive features eliminated the need for post placement in many cases, preserving more natural tooth tissue.

Teeth with > 75% loss and both proximal contacts missing often required surgical crown lengthening, followed by fiber or cast post and full-coverage crowns. The report highlights that even extensively damaged incisors can often be restored without traditional full crowns, aligning with the principles of tailored, minimally invasive dentistry. This protocol has been consistently applied over 12 years in the author's institution, with encouraging outcomes and minimal restorative failures. The study underscores the potential for artificial intelligence to further refine case stratification and treatment planning based on photographic and clinical data.

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Saving the unsavable

Swetha Ramraj, Mathan Rajan Rajendran, Kuzhanchinathan Manigandan*

Department of Conservative Dentistry and Endodontics, Sri Ramachandra Dental College and Hospital, SRIHER (DU), Chennai, Tamil Nadu, India

ABSTRACT

Mid-root fractures account for approximately 0.5%–7% of dental injuries involving permanent teeth, most commonly affecting young individuals due to high trauma incidence. Restoring the coronal structure of a tooth becomes particularly challenging in the presence of a mid-root fracture, requiring a balance between conservative intervention and long-term restorative stability. In growing individuals, skeletal immaturity limits the use of definitive prosthetic options such as implants, while the presence of a mid-root fracture limits the functional prognosis of post-supported restorations. In such cases, preserving the natural tooth with minimal intervention becomes the ideal approach. Fiber-reinforced composite systems, supported by fiber mesh scaffolds, provide internal reinforcement that ensures controlled stress distribution, enhanced fracture resistance, and seamless aesthetic integration—without the need for aggressive tooth preparation — making them ideal for managing structurally weakened teeth in young patients. This case report highlights the role of fiber reinforcement as a conservative and functional solution that enables interim preservation while deferring invasive options until skeletal maturity.

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The digital edge: smile design driven space closure

Vibish Ram Srinivasan,* Chakravarthy Arumugam, Mathan Rajan Rajendran

Department of Conservative Dentistry and Endodontics, Sri Ramachandra Dental College and Hospital, SRIHER (DU), Chennai, India

ABSTRACT

Injection molding in dentistry is an advanced technique that ensures precision, efficiency, and superior adaptation of dental materials in aesthetic treatments. This case highlights the application of the injection molding technique for the closure of the spacing between teeth, where digital impressions were employed for enhanced accuracy and patient comfort. A high-resolution intraoral scan was used to capture the dental arches, eliminating traditional impression errors and improving the workflow. The digital scan was utilized to subsequently prepare and perform Digital Smile Design, followed by 3D printing of the virtual DSD. A clear matrix was fabricated to guide the injection of flowable resin-based composite materials directly onto the teeth with minimal intervention. The technique allowed for controlled placement, optimal morphology, and excellent marginal adaptation of the restorative material. This approach significantly reduced chair-side time, enhanced aesthetics, and ensured a predictable, minimally invasive solution for space closure. The combination of digital technology and injection molding represents a modern, patient-centered method in contemporary aesthetic dentistry.

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Direct pulp capping with platelet-rich fibrin: a case series

Nishanthine C,* Anand M, Sangita I, Srividhya S, M.R.Srinivasan

Department of Conservative Dentistry and Endodontics, Sri Venkateswara Dental College and Hospital, Chennai, India

ABSTRACT

This case series aims to prove dentin bridge formation in three cases after direct pulp capping in reversible pulpitis using the platelet concentrate PRF and preservation of the vitality of the dental pulp.

The hemostasis process for the pulp exposure and cavity disinfection with sodium hypochlorite was performed under anesthesia. A large PRF membrane was prepared from blood plasma and applied to the pulp exposure. After placing Biodentine, the cavity was closed using glass-ionomer cement and restored with dental composite. Clinical and radiographic findings demonstrated the formation of a dentin bridge in all cases. After the definitive restoration placed pulpal and radiographic examination was conducted during the sixth month, the teeth from both patients were asymptomatic and had normal pulpal response.

Via clinical and radiographic examinations, it was observed that dentin bridge formation occurred after placing the platelet concentrate PRF in both cases. The vitality of the dental pulp was preserved. Further research is needed to refine the clinical protocol, recommended period for control examination, and clarification of the precise indications of platelet concentrates.

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Cracking the canal code: a case report

Monisha. M*

Department of Conservative Dentistry and Endodontics, Rajarajeshwari Dental College and Hospital, Bengaluru, India

ABSTRACT

Guided endodontics has emerged as a precise and minimally invasive approach for managing complex root canal anatomies, particularly in cases with pulp canal obliteration or calcification. This case presentation highlights the application of static guided endodontics in a maxillary central incisor with extensive canal calcification, emphasizing its clinical efficacy and accuracy.

A 25-year-old patient presented with pain and discoloration in the maxillary left central incisor, with radiographic evidence of pulp canal calcification and periapical radiolucency. Diagnosis was a periapical cyst of #21 and 22. Cone-beam computed tomography (CBCT) scan revealed complete coronal pulp chamber obliteration extending 3 mm beyond the cementoenamel junction (CEJ). CBCT scan and digital impression were superimposed to plan a customized 3D-printed access guide. The guide facilitated conservative canal location with minimal tooth structure removal, reducing the risk of iatrogenic errors.

Digital workflow involved CBCT segmentation, intraoral scanning, and virtual planning of the access trajectory using PriciGuide software. A resin guide was 3D-printed and used clinically to create a precise access cavity. The canal was successfully negotiated by hand K-files and instrumented using rotary files, followed by obturation and restoration.

Guided endodontics improves procedural predictability in challenging cases and minimizes the risk of perforation or unnecessary dentin removal. It represents an ideal synergy between digital dentistry and endodontic precision.

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Case Report

Conservative restorative approaches for midline diastema closure: case reports

Andrea Shirle,* Remya Varghese, Minu Koshy

Department of Conservative Dentistry and Endodontics, Sri Ramakrishna Dental College and Hospital, Coimbatore, India

ABSTRACT

Maxillary midline diastema is a common aesthetic concern, often caused by factors like frenal interference, tooth-size discrepancies, or spacing anomalies. While orthodontics and Indirect tooth colored restorations are treatment options, minimally invasive protocol using direct composite resin restorations, aided by putty guides, is the more conservative, cost-effective and immediate treatment option.

To evaluate the aesthetic outcomes of minimally invasive protocol for diastema closure using direct composite resin build-ups guided by palatal putty index and adjunctive techniques (Aesthetic Pre-evaluative Temporary and Pull-through). Case 1: A female patient presented with upper anterior teeth spacing of 2 mm in #11 and 21. Using the palatal putty index, direct composite build-ups were done. Case 2: A female patient presented with upper anterior teeth spacing in #11, 12, 21 and 22. Using the palatal putty index and Aesthetic Pre-evaluative Temporary (APT), direct composite resin build-ups were done. Case 3: A female patient presented with upper anterior teeth spacing in #11, 21 and 22. Using the pull-through technique (#11 and 21) and the palatal putty index (#22), direct composite resin build-ups were done.

The palatal putty index provides a reliable, patient-centered, minimally invasive approach for midline diastema closure. APT method enables precise previsualization of final outcomes before definitive restoration, enhancing both clinician control and patient satisfaction. The pull-through technique was found to be effective for cases with minimal spacing and yields cleaner contacts and smoother emergence profiles. Skill and knowledge of the various methods help a clinician to manage Diastema cases with ease and confidence.

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Comprehensive management of traumatic injury to anterior teeth: a case report

Srujana Hemmanur*

Department of Conservative Dentistry and Endodontics, SRM Dental College, Ramapuram, Chennai, India

ABSTRACT

Traumatic injuries to the anterior teeth are not only common in young individuals but also have a profound psychological and functional impact. The maxillary anterior region, being the most aesthetically prominent, often bears the brunt of such trauma, demanding a treatment approach that balances preservation with optimal rehabilitation. This case report presents the comprehensive management of a 21-year-old male patient who reported with complaints of loose, fractured, and missing upper front teeth immediately following a fall. Clinical examination revealed a missing maxillary central incisor along with multiple crown fractures of adjacent teeth. A conservative yet effective multidisciplinary treatment strategy was adopted. Root canal treatment was performed for the fractured teeth. Following this, one tooth with fractured segments was unified and stabilized by placing a fiber reinforced composite (FRC) post. A definitive core build-up was achieved using composite resin. The other anterior tooth was provided with a custom cast post. The patient was then referred for prosthetic rehabilitation, and a fixed partial denture (FPD) was delivered to restore final aesthetics, form and function. This case highlights the importance of timely diagnosis, meticulous planning, and coordinated interdisciplinary care in the management of traumatic dental injuries. A well-structured treatment protocol not only restores aesthetics and function but also significantly improves the patient's confidence and quality of life.

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Stratified stamp technique: an alternative for the anterior aesthetic restorations - a case report

Popuri Krishna Chaitanya,* Kunkati Mounika

Department of Conservative Dentistry and Endodontics, Drs Sudha and Nageswararao Siddhartha Institute of Dental Sciences, Chinaoutpalli, Vijayawada, India

ABSTRACT

Trauma affected tooth structure and malocclusions such as midline diastema, pose a serious esthetic problem and stagnant a person's confidence. Producing direct restorations in anterior teeth when performed with composite resin demands a long clinical time. The proposed Stratified Stamp Technique (SST) allows for clinically reproducing the wax-up in a quick and easy way. A patient with fractures and discoloration on the upper anteriors is treated with resin-based composite direct restoration. Using SST, a 1 mm thick thermoformed polyethylene-terephthalate-glycol (PETG) template, based on the wax-up, is produced. Traditional layering procedure of composite shades according to the color dimensions of teeth is performed by using putty index as matrix palatally, except for the final labial layer, which is designed with composite loaded inside the template and polymerized through it, in order to ensure accurate tooth morphology reproduction. Compared with other methods, SST permits traditional layering with multiple composite shades, quick reproduction of the final labial layer through a template and with minimal need to refine and polish the restorations, thus leading to satisfactory esthetic outcomes.

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Aesthetic alchemy: sculpting radiant smiles through artistic precision

Kathu C,* Josey Mathew, Liza George

Annoor Dental College, Muvattupuzha, India

ABSTRACT

The smile draws its beauty from the perfect harmony it bestows on the face.

Evolving beyond the confines of cure, dentistry has emerged to be a creative and aesthetic pursuit. A restorative dentist strives to revive the innate beauty of teeth, crafting smiles that resonate in perfect coherence with the individual essence of each patient. Innovations in adhesive materials have heralded an era in which conservative intervention elegantly converges with exquisite aesthetic outcomes. The anterior dentition plays a pivotal role in facial aesthetics, where even minor imperfections can have a substantial impact on a patient's appearance and psychological well-being.

Discoloration of the anterior teeth disrupts the natural elegance of the smile, often evokes deep esthetic, emotional concerns and may also impair function. Each clinical scenario poses unique challenges.

This case series showcases multidisciplinary aesthetic rehabilitation of anterior teeth with prevailing and digital technologies. First case shows aesthetic management of a discolored, mutilated tooth with apexification, indirect custom post and core crown. The second case shows the management of discolored teeth with digitally designed veneers. Embracing a multidisciplinary approach may yield functionally durable and aesthetically enduring restorations that may enrich overall clinical outcome and patient experience.

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Clear matrix, clear results: esthetic anterior restorations using the injection molding technique: a case report

Vanga Bhagyasri,* Janga Ravikumar

Department of Conservative Dentistry and Endodontics, Drs Sudha and Nageswara Rao Siddhartha Institute of Dental Sciences, Chinaoutpalli, Vijayawada, India

ABSTRACT

Achieving predictable and long-lasting esthetic restorations in the anterior region is a challenge in restorative dentistry, particularly in cases involving minimal tooth structure loss. The injection molding technique offers a conservative and highly accurate approach by replicating ideal morphology through a transparent silicone matrix.

A patient presented with an aesthetic discomfort in the anterior tooth region. A diagnostic wax-up was performed, and a clear matrix was fabricated using Exaclear silicone. Following this, selective etching was done, and G-Premio Bond was applied. G-ænial Universal Flo was injected into the matrix and light-cured, effectively reproducing the shape of the wax-up. The restoration required minimal finishing and polishing. The final result demonstrated excellent shade match, marginal adaptation, and anatomical contour.

The injection moulding technique (IMT) is a potent restorative treatment alternative for many clinical scenarios when tooth morphology requires modification or enhancement for aesthetic and/or functional purposes, employing a direct technique. In comparison to freehand composite layering procedures, it offers greater predictability and repeatability, facilitating form manipulation and reducing chair time and expenses, making it especially advantageous for multiple restorations.

This case highlights the effectiveness of the injection molding technique combined with modern adhesive and composite materials to achieve conservative and esthetically superior anterior restorations with predictable clinical outcomes.

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Rooted in complexity: perio – endo continuum

Shreya Bhandary*

Bangalore Institute of Dental Sciences, Bangalore, India

ABSTRACT

Endodontic therapy generally requires a healthy periodontium as a prerequisite for a successful outcome. Hence, a healthy periodontium forms the foundation for long-term success and optimum function and esthetics for any resto-endo procedure. Perforation of the teeth has been reported to be a major factor in up to 9.6% of endodontic failures. Mechanical and chemical irritants, as well as microorganisms present in the root canal, may induce the inflammation and bony destruction of the periodontium. Repair of perforations can be performed via a surgical or nonsurgical approach by sealing the tooth defect using different materials such as glass ionomer cement, calcium hydroxide, and mineral trioxide aggregate (MTA).

The treatment outcome of perforation repair depends on control of tissue inflammation and clinical symptoms, sealing of the perforation site with biocompatible materials, and prevention of microleakage. Control of bleeding, canal cleansing, and lateral condensation for root canal sealing, followed by surgical management to remove excess gutta-percha, has been suggested for the treatment of perforation. A bony defect associated with endodontic perforation can be successfully managed by bone grafting and Platelet Rich Fibrin.

This poster presentation is an attempt to showcase the successful management of perforation repair with a combination of endodontic and periodontal therapy.

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Regenerative endodontic success in an immature necrotic tooth with previously initiated root canal treatment: a case report

Medikonda Asmitha Lakshmi,* Popuri Krishna Chaitanya

Drs. Sudha and Nageswara Rao Siddhartha Institute of Dental Sciences, Chinnoutapalli, Vijayawada, India

ABSTRACT

Trauma to developing permanent teeth during early childhood can result in pulpal necrosis and arrest of root development. Such events lead to the formation of immature teeth characterized by thin dentinal walls, wide open apices, and incomplete root formation. These anatomical limitations make the teeth structurally weak and highly susceptible to fracture, posing challenges for long-term preservation and function. Traditional treatment modalities, such as calcium hydroxide apexification, though historically popular, offer limited success in promoting continued root development and often require multiple appointments.

In contrast, regenerative endodontic procedures have emerged as a promising biologically based alternative, designed to reestablish vascularity, promote apical closure, and encourage maturogenesis in necrotic immature teeth. The success of REPs relies on thorough disinfection of the root canal system, the creation of a conducive environment for stem cell migration via scaffold formation (commonly through blood clot induction), and a hermetic coronal seal using biocompatible materials. Mineral trioxide aggregate is frequently used due to its superior sealing ability and bioinductive properties. This case report highlights a regenerative endodontic approach in a young adult with a previously traumatized anterior tooth, focusing on both biological success and esthetic preservation.

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Remove less, preserve more- a case series on partial pulpotomy

Vishnupriya CM,* Arunachalesh A, Diana Davidson, .M.R. Srinivasan

Department of Conservative Dentistry and Endodontics, Sri Venkateswara Dental College and Hospital, Chennai, India

ABSTRACT

The primary goal of vital pulp therapy (VPT) is to establish a conducive environment for pulp tissue repair and recovery. Case 1: A 13-year-old male patient reported with Class 1 dental caries and pain in 46. A cold test was performed and the tooth responded with non-lingering pain. Radiograph showed caries approximating the mesial pulp horn. A diagnosis of reversible pulpitis, with normal apical tissue, was made. Under 25× magnification and rubber dam isolation, caries was removed and the mesial pulp horn was exposed. It is critical to note that a decision of VPT can be made only after clinical excavation of caries and assessing the pulp wound. Partial pulpotomy was attempted using sterile conical high-speed diamond and red homogeneous fresh bleeding was seen. Haemostasis was achieved in about 2-3 minutes with 1% sodium hypochlorite. No dentin chips or yellowish liquified necrosed areas were observed on the wound. A Tricalcium silicate-based putty cement was placed on the pulpal wound. Once a layer of GIC was given followed by final restoration was performed using bulk fill resin composite. Case 2: A 14-year-old female patient reported with a fracture and pain in tooth #11, 21. History revealed trauma 2 years back. Teeth exhibited lingering pain to the cold test. The percussion test was positive. Radiographic examination revealed a fracture line involving enamel and dentin. A diagnosis of irreversible pulpitis, symptomatic apical periodontitis was made. Partial pulpotomy was planned. The treatment protocol was the same as the previous case. In the 6 to 12 months follow-up patient remained asymptomatic, responded normally to cold and EPT with no periapical changes (clinical and radiographic evaluation). These cases highlight the importance of clinical evaluation to achieve a proper diagnosis and advocate the right treatment approach, which is generally neglected in most cases.

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Comparison of visual shade matching with smart app and intraoral scanner: a pilot study

Ayushi Srivastava,* MS Adarsha, Sudhanva M. E.

Department of Conservative Dentistry and Endodontics, VS Dental College and Hospital, Bangalore, India

ABSTRACT

Objectives: Shade selection is vital for successful dental prostheses, increasingly driven by technology and societal demands for accurate, natural-looking results. This study evaluates and compares reproducibility and observer agreement among three shade-matching techniques—visual method, intraoral scanner, and smart application—to determine if digital technologies enhance consistency and reduce clinician subjectivity in restorative procedures.

Materials and Methods: 20 participants with healthy maxillary right central incisors were selected from the Department of Conservative Dentistry and Endodontics at Vokkaligara Sangha Dental College. Shade selection for the maxillary right central incisor was performed using three different methods: (1) Visual method (VITA Classical Shade Guide), (2) Intraoral scanner (CEREC Primescan), and (3) Smart application (NAiBU). Two calibrated investigators independently performed shade matching under standardized lighting conditions. Data were statistically analyzed using Fleiss' kappa for inter-method agreement among all techniques and Cohen's weighted kappa for pairwise comparisons.

Results: Fleiss' kappa value for all methods combined was 0.0692 (p = 0.0131), indicating statistically significant but slight agreement. Pairwise comparisons showed slight agreement between the visual method and smart application (κ = 0.18), and fair agreement between visual and scanner (κ = 0.30) as well as between app and scanner (κ = 0.247). Confidence intervals confirmed the highest reliability between visual and scanner methods (CI: 0.13–0.65).

Conclusion: Digital shade-matching tools exhibited greater consistency with each other than with the traditional visual method. While visual shade matching remains prevalent, the adoption of digital techniques can enhance objectivity and reproducibility, making them valuable adjuncts in restorative dentistry for improved esthetic outcomes.

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Comparative evaluation of the efficacy of lignocaine (2%) and articaine (4%) at two different temperatures in lower molars with irreversible pulpitis – double-blinded randomized controlled trial

Mohammed Shaukhi N,* Biju P Babu, Kennet P Chirayath

Royal Dental College, Palakkad, Kerala, India

ABSTRACT

Objectives: To compare pain perception during administration, the onset, and postoperative pain following the use of 2% lignocaine and 4% articaine injected at room temperature and after warming the local anesthetic (LA) solution to 42°C in patients with symptomatic irreversible pulpitis of lower molars.

Materials and Methods: This double-blind, randomized controlled trial adhered to PRIRATE 2020 guidelines and was registered in the Clinical Trials Registry–India. Patients diagnosed with symptomatic irreversible pulpitis in lower molars were randomly allocated into four groups: Group A – 2% lignocaine at room temperature, Group B – 2% lignocaine warmed to 42°C using a warmer, Group C – 4% articaine at room temperature, and Group D –4% articaine warmed to 42°C using a warmer, using block randomization. Pain scores were assessed during LA administration by inferior alveolar nerve (IAN) block, 20 minutes post-injection, and postoperative pain employing the Visual Analog Scale (VAS) and electric pulp testing.

Results: Pain during the IAN block was significantly lower when 4% Articaine warmed to 42°C was injected. The IAN block with 2% Lignocaine at room temperature recorded the highest discomfort to the patient. At 20 minutes post-IAN block and during subsequent postoperative evaluations, 4% Articaine injected by warming the solution to 42°C consistently showed the lowest mean VAS scores, followed by injection of 4% Articaine at room temperature. 2% Lignocaine injected at room temperature and injected after warming to 42°C demonstrated statistically significant intra-group improvements ($F = 165.09$), it exhibited higher pain scores across all stages. IAN block using 4 % Articaine warmed to 42°C showed the most effective overall anesthetic performance ($F = 2.52$, $p < 0.0001$).

Conclusions: 4% Articaine warmed to 42°C significantly reduces pain during administration and enhances postoperative comfort compared to other groups. These findings advocate warming 4% articaine during an IAN block for irreversible pulpitis in lower molars.

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Comparative evaluation of bioceramic and resin-based sealers dissolution in three different potential solvents – an *in vitro* study

Mohamed Fasil,* Mohammed Sagir, Kennet J Chirayath

Department of Conservative Dentistry and Endodontics, Royal dental college, Palakkad, India

ABSTRACT

Objectives: To evaluate and compare the solubility of bioceramic sealer and resin-based sealer on exposure to three different solvents-10% formic acid, 20% Hydrochloric acid (HCL) and Xylene.

Materials and Methods: 30 discs of Bio C Sealer (Angelus, Brazil) and AH Plus Sealer (Dentsply, Germany) were fabricated using a standardized mould and allowed to set. Discs were incubated for 72 hours at 37°C. Each disc was weighed in the precision weighing machine (M1). The discs were immersed in 2 mL of the selected solvents for 5 minutes. The discs were dried for 24 hours and then weighed again (M2). The difference between the initial and final weights (M1-M2) was noted to determine the dissolution.

Results: Bio C sealer and AH Plus sealer showed a statistically significant reduction in mean values of post-dissolution ($p < 0.05$) in each solvent.

Conclusions: 10% formic acid, 20% Hydrochloric acid and Xylene have the ability to dissolve both resin-based sealer and bioceramic sealer.10 % formic acid showed higher dissolution for the resin-based sealer. 20% HCL showed higher dissolution for the bioceramic sealer.

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Nanobubble water enhanced irrigant penetration into the dentinal tubules-a confocal laser scanning microscopic study

Anugraha KT, Mohammed Sagir VM, Biju P Babu

Department of Conservative Dentistry and Endodontics, Royal Dental College, Palakkad, India

ABSTRACT

Objectives: The objectives of the study was to evaluate and compare the irrigant penetration depth into the dentinal tubules using sodium hypochlorite as an irrigant by standard needle irrigation, laser activation, ultrasonic activation and nanobubble water enhanced activation systems.

Materials and Methods: Freshly extracted human single rooted single canal mandibular premolars (N = 40) were decoronated at the level of CEJ, the root canals were prepared up to a taper of NeoendoS 25, 6% rotaryfile. During the preparation the canals were irrigated with sequence of 2 mL of distilled water and 2 mL of 17% EDTA. The samples are divided into 4 groups based on methods of activation of 3% sodium hypochlorite as final irrigant as, Group1: No activation (standard needle irrigation), Group2: Ultrasonic activation, Group3: Laser activation, Group4: Nanobubble water enhanced. The irrigant is initially mixed with rhodamine dye and the activation is done in each groups. Horizontal sections of the samples at 3 mm from the apex were obtained and visualized under Confocal laser scanning microscope and dentinal tubular penetration of sodium hypochlorite is noted and measured.

Results: The obtained showed statistically significant values (p = 0.003) of nanobubble water enhanced activation of sodium hypochlorite showed highest value of depth of penetration into the dentinal tubules followed by ultrasonic activation and then laser activation. Least value of depth of penetration is shown by standard needle irrigation.

Conclusions: These results suggest that nanobubble water as an adjunct to various activation system can enhance the dentinal tubular penetration and improve the tubular disinfection.

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Comparative evaluation of the effect of an energy drink on the color stability of three different restorative materials - An *in vitro* study

Vaishna Sudhakaran,* Prasanth Dhanapal. T, Jojo Kottoor

Department of Conservative Dentistry and Endodontics, Royal Dental College, Palakkad, India

ABSTRACT

Objectives: This study aimed to evaluate and compare the color change of three different restorative materials upon 21 days of immersion in an energy drink.

Materials and Methods: Standardized discs of 2 mm thickness and 20 mm diameter were prepared using three different restorative materials per group (n = 10). Group A – Nanohybrid Composite (Filtek Z250 XT - 3M ESPE), Group B – Microhybrid Composite (Spectrum – Dentsply Sirona) and Group C – Giomer (Beautifill II- Shofu). The prepared discs were cured using a light-cure unit for 20 seconds and the specimens were stored in distilled water for 24 hours. The baseline color was recorded using a spectrophotometer based on the CIE L*a*b* color system. All specimens were immersed in a commercially available energy drink (Red Bull) daily for 2 hours for a period of 21 days to simulate long-term exposure. Post-immersion, color measurements were made for each specimen, and the color change (ΔE) was calculated.

Results: All tested specimens exhibited a color change after a period of 21 days of exposure to energy drink. Mean values of the ΔL, Δa and Δb of three groups were measured and ΔE was calculated. The data was subjected to statistical analysis with $p < 0.001$ as the significance level. Microhybrid composite (ΔE = 6.77) was found to be more color stable, followed by nanohybrid composite (ΔE = 8.68) and giomer (ΔE = 10.04) showed the least color stability.

Conclusions: Prolonged exposure to energy drinks leads to perceptible color changes in esthetic restorative materials tested. The microhybrid composite exhibited more resistance to color change than the nanohybrid composite and the giomer.

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Comparative evaluation of remineralizing potential of four different remineralizing agents on artificially demineralized enamel lesion: an *in vitro* study

Ashna. K,* Prasanth Dhanapal. T, Jojo Kottoor

Department of Conservative Dentistry and Endodontics, Royal Dental College, Palakkad, India

ABSTRACT

Objectives: The study aimed to evaluate and compare the remineralizing potential of four different remineralizing agents on artificially demineralized enamel lesions.

Materials and Methods: Fifty human premolars ($n = 50$) extracted for orthodontic purposes were sectioned 1 mm apical to the CEJ and embedded in acrylic resin blocks with crowns exposed. A 4 mm^2 window was created on the buccal surface by applying acid-resistant nail varnish to the remaining areas of the specimens. Specimens were randomly divided into five groups ($n = 10$) based on the remineralizing agent to be applied: Group 1: Control (no Remineralizing agent), Group 2: Sodium fluoride (Sensodyne), Group3:CPP-ACP (Tooth Mousse), Group 4: Calcium Sodium phosphosilicate (Remin), Group 5: nano-hydroxyapatite (Dente91). Specimens in each group were numbered from 1 to 10. Baseline enamel fluorescence was recorded using DIAGNOdent. All the groups were separately immersed in freshly prepared demineralizing solution containing 0.05M acetic acid (pH adjusted to 4.4) for 96 hours to induce artificial white spot lesions. Post-demineralization fluorescence readings were recorded. Specimens were stored in artificial saliva for 24 hours, followed by application of the assigned remineralizing agent twice daily for 15 days. Post-remineralization fluorescence readings were recorded.

Results: CPP-ACP ($p = 0.0001$) and nano-hydroxyapatite ($p = 0.001$) showed greater remineralization than the control. Both also differed significantly from sodium fluoride ($p = 0.004$, $p = 0.015$). No significant differences were seen between control, sodium fluoride and calcium sodium phosphosilicate.

Conclusions: Remineralization fluorescence readings conclusively prove that CPP-ACP and nano-hydroxyapatite showed superior remineralization, while calcium sodium phosphosilicate had moderate efficacy, with no significant difference from other groups.

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Comparative evaluation of nanoleakage between a two-step universal adhesive, a single-step universal adhesive and a single-step universal adhesive with resin coat on dentin: an *in vitro* confocal laser scanning microscopy study

Aarya Bose,* Jojo Kottoor, Biju P Babu

Department of Conservative Dentistry and Endodontics, Royal Dental College, Palakkad, India

ABSTRACT

Objectives: This study aimed to evaluate and compare the nanoleakage of a two-step universal adhesive, a single-step universal adhesive and a single-step universal adhesive with resin coat applied to dentin, using confocal laser scanning microscopy (CLSM).

Materials and Methods: Forty extracted premolars were sectioned and randomly assigned to four groups (n = 10).Group A: Two-step universal adhesive — G2 Bond Universal (GC Corp, Tokyo, Japan) Group B: Single-step universal adhesive — G-Premio Bond (GC Corp, Tokyo, Japan) Group C: Single-step universal adhesive with resin coating — G-Premio Bond followed by G-aenial Universal Flo Bond (GC Corp, Tokyo, Japan) Group D: Control (no adhesive applied). Specimens were restored with G-aenial Posterior (GC, Tokyo), immersed in 0.1% Rhodamine B at 37°C for 24 hours, sectioned (1 mm), and evaluated for nanoleakage using CLSM.

Results: Group A (Two-step): Exhibited the least nanoleakage, significantly lower than all other groups, particularly the control (mean difference = –814.75 μm, $p = 0.0001$). Group B (Single-step): Showed significantly more nanoleakage than Group C (Single-step + Resin Coat), with a mean difference of 71.34 μm ($p = 0.001$). Group C (Single-step + Resin Coat): Demonstrated reduced nanoleakage compared to Single-step alone, confirming the added benefit of resin coating. Group D (Control): Recorded the highest nanoleakage values, significantly greater than all adhesive groups.

Conclusions: All adhesive protocols significantly reduced nanoleakage compared to the control. The two-step universal adhesive technique proved to be the most effective, followed by the single-step adhesive with a resin coating. Applying a resin coat over single-step adhesives improves sealing and reduces nanoleakage.

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Surface roughness of a composite restorative material polished using two different polishing systems immediately and after 24 hours of curing: An *in vitro* study

Nafsy Salim,* Biju P Babu, Mohammed Sagir

Department of Conservative Dentistry and Endodontics, Royal Dental College, Palakkad, India

ABSTRACT

Objectives: This study aimed to evaluate and compare the surface roughness of a nanohybrid composite upon polishing immediately and after 24 hours of curing using two different polishing systems.

Materials and Methods: 50 nanohybrid composite (Estelite sigma quick) discs of standard shade and dimensions (10 mm diameter and 4 mm thickness) were prepared using a plastic ring and polymerised using a polywave light curing unit for 40 seconds. The cured composite specimens were divided into five groups ($n = 10$) for different polishing regimens. Group 1: covered with Mylar strips (control group). Group 2: polished using Shofu Super-Snap immediately after curing. Group 3: polished using Shofu Super-Snap 24 hours after curing. Group 4: polished using Eve Diacomp Plus Twist immediately after curing. Group 5: polished using Eve Diacomp Plus Twist 24 hours after curing. Surface roughness was measured for all specimens using a surface profilometer.

Results: The mean surface roughness score was significantly higher in the specimens polished 24 hours after curing ($p < 0.001$) than the specimens polished immediately after curing for both the polishing systems tested. The control group exhibited the lowest surface roughness. Among the polishing systems, the Shofu Super-Snap provided superior surface smoothness compared to the Eve Diacomp Plus Twist on the nanohybrid composite.

Conclusions: Immediate polishing with Shofu Super Snap provided the superior surface smoothness of the nanohybrid composite in comparison with polishing using Eve Diacomp plus twist.

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Comparative evaluation of three-dimensional dentinal tubule penetration of three root canal sealers using confocal laser scanning microscopy

Rini. P. S,* Prasanth Dhanapal. T, Jayakanth. K

Department of Conservative Dentistry and Endodontics, Royal Dental College, Palakkad, India

ABSTRACT

Objectives: This study aimed to evaluate and compare the mean fluorescence intensity and thereby the depth of penetration of different categories of root canal sealers into the radicular dentinal tubules by cone focal laser scanning microscopy.

Materials and Methods: Twenty-four recently extracted single-rooted mandibular premolars were selected. After access cavity preparation and working length determination, the root canal was instrumented to a standardized size of 30/0.06 using rotary files. During instrumentation, the canal was irrigated with alternating 2.5 mL of 3% NaOCl and 17% EDTA, using normal saline as an intermediate rinse. Final irrigation followed the same sequence with ultrasonic activation (60 sec/solution), concluding with a 10 mL distilled water rinse to remove residual chemicals. Specimens were divided into three groups ($n = 8$) based on sealers to be used: Group A (BioRoot RCS), Group B (AH Plus), and Group C (Apexit), each mixed with 0.1% rhodamine dye for CLSM visualization. All specimens were obturated with corresponding single gutta-percha cones coated with their respective group sealers. Apical third horizontal sections were CFLSM-analyzed for 3D sealer penetration, assessing maximum depth, penetration area, and mean fluorescence intensity in dentinal tubules.

Results: The bioceramic sealer showed significantly greater penetration depth ($p = 0.002$) and higher mean fluorescence intensity ($p = 0.032$), AH Plus displayed intermediate results, and Apexit had the lowest values for both parameters.

Conclusions: Bioceramic sealer outperformed AH Plus and Apexit in penetration depth and fluorescence intensity, indicating its enhanced sealing efficacy three-dimensionally.

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Comparative evaluation of shear bond strength of composite repaired using different surface conditioning protocols: an *in vitro* study

Anagha. C,* Prasanth Dhanapal. T, Kennet J Chirayath

Department of Conservative Dentistry and Endodontics, Royal Dental College, Palakkad, India

ABSTRACT

Objectives: This study aimed to evaluate and compare the shear bond strength of composite repaired using different surface treatment protocols and two restorative materials.

Materials and Methods: Thirty-two composite discs (Filtek Z250 XT) of 10 mm diameter and 3 mm thickness (n = 32) were prepared, cured and stored in artificial saliva for 15 days. The samples were randomly allocated into 4 groups (n = 8).

Group A: Roughened with bur + Bonding agent application + Repair by adding 4mm Filtek Z250 XT composite. Group B: Roughened with bur + Bonding agent application + Repair by adding 4mm Tetric N Ceram composite. Group C: Roughened with bur + Silane coupling agent application + Bonding agent application + Repair by adding 4 mm Filtek Z250 XT composite. Group D: Roughened with bur + Silane coupling agent application + Bonding agent application + Repair by adding 4 mm Tetric N Ceram composite.

Scotchbond™ Universal Adhesive was used as the bonding agent. Samples were stored in distilled water for 24 hours and subjected to measure shear bond strength using a universal testing machine.

Results: Obtained data were analyzed using one-way ANOVA and intergroup comparison was done by Tukey's post hoc test. Group C demonstrated the highest mean bond strength, followed by Group D, Group A and Group B. The differences among groups were statistically significant ($p < 0.001$).

Conclusions: Composite repaired using the same composite after surface treatment using silane coupling agent showed significantly higher shear bond strength.

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Affinity of a novel phyto-enzyme to dentin collagen for chemomechanical caries removal: an in silico study

Shekar Shobana,* Iyanar Kannan, Sokkalingam Mothilal Venkatesan

Tagore Dental College and Hospital, Tamilnadu Dr MGr Medical University, Chennai, India

ABSTRACT

Objectives: This study aimed to assess the binding affinity of Ginger rhizome-derived protease enzyme to dentin collagen for chemomechanical caries removal.

Materials and Methods: The structure of the Ginger protease enzyme (receptor; id:1CQD) and the structure of type I collagen representing dentin collagen (ligand: 1BKV) were downloaded from the RCSB protein data bank (rcsb.org) in protein data bank (PDB) format. Water molecules were eliminated from the enzyme prior to docking using the Discovery Studio 2025 software and converted to PDB format. The PDB receptor and the ligands were uploaded into ClusPro 2.0 software, and docking was done. The receptor was kept fixed, whereas the ligand was rotated by 70,000 rotations. For each rotation, the ligand was translated in the x, y and z axes relative to the receptor on a grid. The rotation with the lowest binding score was chosen from each of the clusters. The binding energies of 30 clusters were generated by the Clus Pro tool.

Results: The lowest binding energy of the receptor and ligand was -1097.7, suggestive of a stronger binding affinity and a stable interaction between the receptor and the ligand.

Conclusions: This in silico study suggests a stable and potentially effective interaction, supporting the enzyme's potential application in chemomechanical caries removal. These findings provide a promising foundation for further *in vitro* and *in vivo* studies to evaluate the clinical efficacy and biocompatibility of Ginger protease in dental caries management.

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Association between root canal orifice distribution and the incidence of the second mesiobuccal canal in maxillary first molar of an Indian sub-population – an *in vivo* cone beam computed tomography study

Amjad Mohamed K,* Kennet J Chirayath

Department of Conservative Dentistry and Endodontics, Royal Dental College, Kerala, India

ABSTRACT

Objectives: The primary objective was to measure the inter-orifice distance between the first mesiobuccal (MB1) and palatal (P) canals, angulation between MB, DB, and P canal orifices, and to correlate this data with the presence or absence of the second mesiobuccal (MB2) canals in maxillary molars.

Materials and Methods: Axial sections of maxillary first molars were obtained by CBCT scans. Root canal orifice locations were marked and evaluated for the presence of MB2 canals. The distance between the root canals MB1 and P was measured, and the mean obtained. The angle between the different canal orifices formed at the floor was calculated.

Results: Mean and standard deviation of the inter-orifice distance and angulation were calculated. Significant difference in mean inter-orifice distance was observed between molars with and without MB2 canals (p = 7.04492E-05). Similarly, the angle between orifices differed significantly in the presence of the MB2 canal (p = 4.16484E-20).

Conclusions: The distance between the MB1 canal orifice and the P canal orifice showed correlation in predicting the presence of the MB2 canal in maxillary molars. The angulation between the MB1-P-DB canals also has a contributory role in predicting the presence of the MB2 canal, thereby aiding the clinician to expect the presence of MB2 canals.

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Multi-component approach, an innovative strategy for the long-term management of dentin hypersensitivity

Venkatappan Sujatha*

SRM Dental College, Ramapuram, Chennai, India

ABSTRACT

Objectives: This study aimed to comparatively evaluate the tubular occlusion (TO) and depth of penetration (DoP) of oyster shell-derived nanohydroxyapatite (os-nHA) incorporated with niobium pentoxide (Nb_2O_5), on polydopamine (PD) pre-treated demineralized dentin, and to assess the material's retention after 21 days of mechanical brushing combined with an acid challenge.

Materials and Methods: os-nHA powder was synthesized and characterized. Nb2O5 was incorporated to synthesize os-nHA at a 3:1weight ratio. The mixed powders were ball milled to ensure homogeneous dispersion. Dentin discs (DDs) were prepared from mid coronal dentin, exposed to 6% citric acid for 2 minutes and were randomly grouped (n = 28) into: 1:CPP-ACP, 2: os-nHA, 3: os-nHA-PD, 4: os-nHA-Nb, 5: os-nHA-Nb-PD, 6: Artificial saliva (AS). The experimental agents were applied to the dentin discs (DDs) twice daily for 7 minutes and stored in AS. After a 21-day remineralization period, 50 percent of the DDs from each group were examined for TO and DoP using SEM. The remaining DDs were exposed to 2 minutes of brushing twice daily for 21 days, followed by a final exposure to 6% citric acid to evaluate mineral retention.

Results: All experimental groups (2, 3, 4, and 5) demonstrated significantly greater TO and DoP compared to CPP-ACP and AS, after a 21-day remineralization period and following 21 days of brushing and acid challenge. Among the experimental agents PD pre-treated groups significantly had the highest TO and DoP after remineralization and improved mineral retention post brushing/ acid challenge.

Conclusions: Incorporating Nb_2O_5 improved the remineralization potential of os-nHA, and with PD pre-treatment, increased the resistance to mineral loss after brushing and acid challenge.

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Rapid biomimetic dentin surface repair using polydopamine nanoparticles incorporated biogenic amorphous calcium phosphate

M. Madhana Madhubala[1], B. Saravana Karthikeyan[1], Jayasree R[2], G. Rajkumar[3], V. Dhivyac, Janis Locs[4], Srinivasan Narasimhan[5], Sekar Mahalaxmi[1]

[1]SRM Dental College, Bharathi Salai, SRM institute of Science and Technology, Tamil Nadu, Chennai, India
[2]10X Assistive Technology, IITM Research Park, Taramani, Tamil Nadu Chennai. India
[3]Department of Physics, Easwari Engineering College, Ramapuram, Chennai, Tamil Nadu, India
[4]Institute of Biomaterials and Bioengineering, Faculty of Natural Science and Technology, Riga Technical University, Riga, Latvia
[5]Hamad Dental Center, Hamad Medical Corporation, Doha Qatar

ABSTRACT

Objectives: In this study, nanopolydopamine (nPD), a bioinspired polymer known for its adhesive and bioactive properties, was incorporated into eggshell-derived amorphous calcium phosphate (eACP) to enhance biomimetic remineralization of dentinal lesions. The objective of this study was to evaluate the synergistic effect of eACP-nPD on dentin remineralization and collagen stabilization on artificially induced dentinal lesions.

Materials and Methods: eACP, nPD and eACP-nPD composites were synthesized and characterized using various characterization techniques, followed by cytotoxicity assessment. Dentin slabs (2 mm × 3 mm × 3 mm) were prepared and randomly subjected to the following therapeutic treatments (n = 12): artificial saliva (AS), casein phosphopeptide-amorphous calcium phosphate (CPP-ACP), eACP, nPD, and eACP-PD followed by pH cycling for 28 days. Microhardness, surface topography, and elemental analysis were assessed using Vickers microindenter, SEM-EDX and XRD, respectively, whereas collagen degradation resistance was assessed by weight loss analysis, hydroxyproline (HYP) assay and microRaman spectroscopy

Results: eACP-nPD biocomposite induced significant structural modifications, resulting in strong characterization outcomes with good biocompatibility. Analysis of treated dentin surfaces revealed complete occlusion of dentinal tubules, promoted rapid hydroxyapatite crystal nucleation and growth, enhancing the mineralization process. Mechanical testing showed a marked increase in surface hardness reflecting improved mechanical stability and resilience of the remineralized dentin, similar to native dentin. The treated dentin collagen slabs confirmed the characteristic higher intensity peaks of amide as well as proline, showing higher collagen degradation resistance.

Conclusions: eACP-nPD aids in effective and rapid biomimetic dentin remineralization accompanied by collagen protective effect.

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Comparative evaluation of efficacy of PRF, low-level laser therapy and PRF+ low level laser therapy on healing of periapical lesion: an *in vivo* study

Karikalan Meenakshi,* Balasubramanian Ramaprabha

Department of Conservative Dentistry and Endodontics, Tamil Nadu Government Dental College and Hospital, The Tamil Nadu Dr. M.G.R. Medical University, Chennai, India

ABSTRACT

Objectives: This study aimed to evaluate and compare the effectiveness of Platelet-Rich Fibrin (PRF), Low-Level Laser Therapy (LLLT), and their combination (PRF + LLLT) on postoperative pain reduction, soft tissue healing, and periapical bone regeneration in patients undergoing periapical surgery.

Materials and Methods: Twenty-seven patients with periapical lesions were randomly divided into three groups ($n = 9$): Group 1 (PRF), Group 2 (LLLT), and Group 3 (PRF + LLLT). At 1 week postoperatively, pain was assessed using the Visual Analog Scale (VAS), and soft tissue healing was evaluated using the Early Wound Healing Index (EWHI). Bone regeneration was assessed via Hounsfield Units (HU) on CBCT scans taken preoperatively, and at 6 and 12 months. Data were analyzed using ANOVA and Tukey's *post hoc* test.

Results: showed significant bone density improvement over time ($p < 0.001$). Groups 2 and 3 exhibited higher HU values than Group 1 at both follow-ups ($p < 0.001$), with Group 3 showing the highest mean HU (417). Pain reduction was greatest in Group 2 ($p < 0.05$), while Group 3 had the most favorable soft tissue healing ($p < 0.05$). No significant difference in HU was noted between Groups 2 and 3.

Conclusions: LLLT alone and in combination with PRF significantly enhanced periapical bone regeneration compared to PRF alone. While bone density outcomes were comparable between Group 2 and Group 3, the combination group offered superior healing quality and enhanced patient comfort.

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Comparative evaluation of pulpal anesthesia and pain during injection using Inferior alveolar nerve block with preheated versus cooled versus buffered and conventional 2% lignocaine in teeth with symptomatic irreversible pulpitis: a randomized clinical study

Jayavelu Vijayalakshmi,* Pasupathy Shakunthala

Department of Conservative Dentistry and Endodontics, Tamil Nadu Government Dental College and Hospital, The Tamil Nadu Dr. M.G.R. Medical University, Chennai, India

ABSTRACT

Objectives: The efficacy of 2% lignocaine with 1:80,000 adrenaline is often compromised in symptomatic irreversible pulpitis. Modifying local anesthetics (LA) through preheating, buffering, or cooling may enhance their effectiveness. This study aimed to evaluate these modifications in improving anesthesia success in mandibular first molars with symptomatic irreversible pulpitis.

Materials and Methods: A total of 120 patients diagnosed with symptomatic irreversible pulpitis in mandibular first molars were randomly assigned to four groups: Group A: Preheated 2% lignocaine (42°C, injected at 37°C), Group B: Cooled lignocaine (4°C), Group C: Buffered lignocaine (with 0.18 mL of 8.4% sodium bicarbonate), Group D: Conventional lignocaine.

Visual Analog Scale (VAS) scores and electric pulp test (EPT) readings were recorded preoperatively. After confirming profound anesthesia, endodontic access was initiated, and intraoperative pain was recorded using VAS. Pain during injection and onset time were also evaluated. Five patients were excluded due to anesthetic failure; 115 were analyzed. Statistical analysis was performed using one-way ANOVA, Tukey's *post hoc* test and paired *t*-test.

Results: All modified groups showed significant intraoperative pain reduction compared to preoperative levels ($p < 0.05$). Preheated LA showed the greatest pain reduction, followed by buffered and cooled LA. Onset was fastest in the preheated group. Buffered LA caused the least pain during injection.

Conclusions: Preheated, buffered, and cooled lignocaine are more effective than conventional LA in achieving anesthetic success in irreversible pulpitis, with preheated LA offering more pain reduction, faster onset and buffered LA providing more comfortable injection.

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Comparative evaluation of anti-microbial efficacy of calcium hydroxide, lignocaine, lignocaine with ibuprofen, lignocaine with diclofenac as intracanal medicament in teeth with symptomatic apical periodontitis: a randomized controlled trial

Balakrishnan Uma Bharathi,* Balasubramanian Ramaprabha

Department of Conservative Dentistry and Endodontics, Tamil Nadu Government Dental College and Hospital, The Tamil Nadu Dr. M.G.R. Medical University, Chennai, India

ABSTRACT

Objectives: This study aimed to compare and evaluate the antimicrobial efficacy and postoperative pain reduction of calcium hydroxide, lignocaine, lignocaine with ibuprofen, and lignocaine with diclofenac as intracanal medicaments in patients with symptomatic apical periodontitis.

Materials and Methods: Fifty-six maxillary incisors with symptomatic apical periodontitis were randomly assigned to one of the four groups: Group I: Calcium hydroxide; Group II: Lignocaine; Group III: Lignocaine + Ibuprofen; Group IV: Lignocaine + Diclofenac.

Preoperative pain was recorded using the Visual Analog Scale (VAS). After access opening and patency filing, root canal samples were taken using sterile paper points (Sample 1) and transferred into aerobic and anaerobic transport mediums. Respective intracanal medicaments were placed using a Lentulo spiral in the canals and sealed with temporary restoration. Postoperative pain levels were recorded at 6, 12, 24 and 48 hours by contacting the patients via telephone. Post-treatment samples (Sample 2) were collected on the 7th day and microbial analysis was done.

Results: Microbial analysis revealed a significant reduction in CFUs across all groups. For aerobes, Groups I, III and IV were equally effective ($p = 0.00$). All groups were comparably effective post-treatment in eliminating anaerobes ($p = 0.001$). For post-operative pain, Group II (Lignocaine) had the fastest reduction in pain ($p < 0.05$)

Conclusions: The combination of non-antibiotic agents such as lignocaine, diclofenac, and ibuprofen has been shown to be a promising intracanal medicament offering dual benefits—enhanced antimicrobial activity and superior post-operative pain relief—suggesting its potential as an effective alternative to conventional calcium hydroxide therapy in endodontic practice.

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Antimicrobial potential of an indigenous bioactive root canal sealer with or without *Terminalia chebula*: a confocal laser scanning microscopy and microbial culture analysis

Aruna Kumari Veronica,[1*] Anand V Susila,[2] Venkatachalam Prakash[3]

[1]Department of Conservative Dentistry and Endodontics, Bharath Institute of Higher Education and Research, Selaiyur, Chennai
[2]Department of Conservative Dentistry and Endodontics, Madha Dental College and Hospital, Chennai, Tamil nadu, India
[3]Department of Conservative Dentistry and Endodontics, Shree Balaji Dental College and Hospital, Chennai, Tamil nadu, India

ABSTRACT

Objectives: This study aimed to evaluate and compare the antimicrobial efficacy of an Indigenous Bioactive Root Canal Sealer, with and without its combination with Terminalia chebula, and a Commercial Bioactive RCS root canal sealer against a polymicrobial biofilm using colony-forming unit (CFU) analysis and confocal laser scanning microscopy.

Materials and Methods: Eighty extracted human teeth were divided into two primary groups: 40 for CFU quantification and 40 for confocal imaging. Each group was further subdivided into four subgroups: Group A: Indigenous Bioactive Sealer, Group B: Indigenous Bioactive Sealer with *Terminalia chebula*, Group C: Commercial Bioactive RCS, and Group D: Infected control (no sealer). Standardized root canal preparation was performed, followed by inoculation with a polymicrobial suspension containing *Enterococcus faecalis, Streptococcus mutans, Lactobacillus* acidophilus, and *Candida albicans*. After two weeks of incubation, sealers were applied to Groups A to C, while Group D remained untreated, and all samples were incubated for an additional week. CFU counts were determined from dentin shavings, and confocal microscopy was used to visualize bacterial viability within dentinal tubules using a fluorescent live/dead stain.

Results: All experimental groups showed significantly reduced CFU counts compared to the control (Group D) across all tested microorganisms ($p = 0.001$). Group B (Indigenous Bioactive Sealer with Terminalia chebula) exhibited the strongest antimicrobial effect, with complete inhibition of Lactobacillus acidophilus and the lowest *E. faecalis* levels. Confocal laser scanning microscopy revealed the highest dead cell percentage in Group A (47.5%), followed by Group B (40 %), Group C (31 %) and Control (29%).

Conclusions: efficacy against polymicrobial endodontic pathogens. This was confirmed by significant reductions in viable microorganisms observed through CFU analysis and confocal laser scanning microscopy.

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Evaluation and comparison of microtensile bond strength of three different bonding systems to dentin treated with Novamin-based desensitizing agent-an *in vitro* study

Akhilesh C R,* Prasanth Dhanapal, Mohammed Sagir VM

Department of Conservative Dentistry and Endodontics, Royal Dental College, Kerala, India

ABSTRACT

Objectives: This study aimed to evaluate and compare the in vitro microtensile bond strength of three different bonding systems to dentin treated with a Novamin-based desensitizing agent.

Materials and Methods: Intact premolars (n = 32) were collected and cleaned. The mid coronal dentin was exposed and etched with 37% phosphoric acid. Specimens were divided into four groups (n = 8): Group A, B, C and D. Group A (control), no desensitizer was applied. Groups B, C and D were treated with a Novamin-based desensitizer on the occlusal surface for 4 minutes per day for 14 days using a brushing stroke. The selected adhesives were applied to the groups as per manufacturer instructions: Group A -Single Bond, Group B - Parabond, Group C - Tetric N Bond Universal, and Group D- Clearfil Liner Bond F, respectively. A 5 mm high block of composite resin was built upon the bonded surface and polymerized for 40 seconds in all groups. Specimens were stored in a water bath at 37°C for 24 hours. The specimens were sectioned to obtain dentin sticks of 1 × 1 × 10 mm dimension using a digital cutter. These sticks were subjected to microtensile bond strength testing using a universal testing machine.

Results: Statistical analysis was done using G Power Software V.3.1.9. One-way analysis of variance was done to find the difference between the four groups. Every experimental group showed a significant statistical difference (p < 0.05). As a significant difference was found between the groups, *post hoc* Tukey's test was done.

The group with the highest microtensile bond strength value was Group A (Control), followed by Group C (Tetric N Bond Universal), Group B (Parabond) and Group D (Clearfil Liner Bond F) in descending order, with the least microtensile bond strength value observable for Group D.

Conclusions: Within the limitations of the study, based on the results obtained, Tetric N Bond Universal bonding agent proves to function better than Parabond and Clearfil Liner F bonding agents when an adhesive restoration is required after using a Novamin-based desensitizing agent.

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Biovalidation of carboxymethyl chitosan-based scaffold for pulp–dentin regeneration: an animal study

Balasubramanian Saravana Karthikeyan,* Sekar Mahalaxmi

Department of Conservative Dentistry and Endodontics, SRM Dental College, SRM Institute of Science and Technology, Chennai, India

ABSTRACT

Objectives: Conventional pulp capping materials like calcium hydroxide and mineral trioxide aggregate (MTA) primarily control infection and inflammation, resulting in reparative dentin rather than complete regeneration. While tissue engineering now aims for complete pulp–dentin regeneration, effective scaffold development is still emerging. This study focused on designing and evaluating a carboxymethyl chitosan (CMC) biopolymeric scaffold to support pulp–dentin regeneration. This study aimed to synthesize and characterize the CMC scaffold; to assess its biological response on cultured dental pulp stem cells (DPSCs) and to validate its pulp capping efficacy in Wistar rat molars *in vivo*.

Materials and Methods: CMC scaffolds were fabricated by freeze-drying and characterized by SEM-EDX, XRD, and FTIR. Cytocompatibility was assessed using the MTT assay, while biomineralization potential (expression of ALP, OPN, DSPP, and DMP-1) was analyzed for 21 days by RT-qPCR. *In vivo* efficacy was tested by orthotopic placement in rat molars, evaluating dentin bridge formation histologically over three months, with MTA as a positive control. Statistical analysis used one-way ANOVA and Tukey's *post-hoc* test ($p < 0.05$).

Results: SEM-EDX showed the scaffold's porous structure; FTIR confirmed carboxyl and carboxymethyl groups; XRD indicated its amorphous nature. The scaffold demonstrated high cytocompatibility and significantly upregulated dentin-specific genes after 21 days. Histological analysis showed a well-organized odontoblastic layer and a thicker calcific bridge with CMC compared to MTA.

Conclusions: Within the study's limitations, the multifunctional CMC scaffold exhibited superior physico-chemical and biological characteristics, increased cytocompatibility, and enhanced biomineralization, supporting its potential as a promising alternative to MTA for pulp–dentin regeneration.

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Comparative evaluation of depth of penetration of 10% nanohydroxyapatite desensitizer with and without 940 nm diode laser - an *in vitro* study

P. Pravika,* N. Ravikumar

SRM Dental College, Ramapuram, Chennai, India

ABSTRACT

Objectives: This study aimed to evaluate the efficacy of 10% nanohydroxyapatite desensitizer (nHAP) alone and in combination with 940 nm diode laser (DL) for assessing the penetration depth into dentinal tubules using confocal laser scanning microscope (CLSM).

Materials and Methods: 20 extracted human mandibular molar teeth were decoronated to obtain dentin discs of dimensions 4 mm in diameter, 1.5 mm in height and grouped as follows: Group 1: 10% nHAP (n = 10); Group 2: 10% nHAP + 940 nm DL (n = 10). 10% nHAP was mixed with 0.1% rhodamine B dye and was applied on the dentin discs of both the groups for 15 days followed by 940 nm DL application in continuous noncontact mode with power of 1 watt at a distance of 2 mm by an optical fiber with tip diameter of 320 micrometers for 90 seconds in group 2 after which specimens were viewed under CLSM.

Results: Statistical analysis of the data was performed using an independent t-test. No statistically significant differences were observed between groups 1 and 2 (p = 0.08).

Conclusions: 10% nHAP alone and in combination with 940 nm DL exhibited similar efficacy in terms of penetration depth into dentinal tubules.

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Comparative evaluation of graphene oxide and copper oxide nanoparticles as catalysts in hydrogen peroxide tooth bleaching – an *in vitro* spectrophotometric study

Nivetha Krishnan,* Sriram Sankar, Veni Ashok

Adhiparasakthi Dental College and Hospital, Chennai, India

ABSTRACT

Objectives: This study aimed to compare the bleaching efficacy of graphene oxide nanoparticles and copper oxide nanoparticles in combination with hydrogen peroxide (H_2O_2). Also, this study evaluated and compared the bleaching efficacy of graphene oxide nanoparticles and copper oxide nanoparticles in combination with hydrogen peroxide using a spectrophotometer.

Materials and Methods: Thirty extracted maxillary central incisors were stained using coffee solution for 2 weeks. Baseline color values (L_1, a_1, b_1) were recorded using a spectrophotometer. Samples were divided into three groups ($n = 10$). Group I was treated with 35% H2O2; group II was treated with 1wt% graphene oxide nanoparticles and 35% H2O2; group III was treated with 1wt% copper oxide nanoparticles and 35% H_2O_2

Post-treatment values (L_2, a_2, and b_2) were recorded immediately, and after 7 days in artificial saliva (L_3, a_3, b_3). Color change was calculated as ΔE_{2-1} and ΔE_{3-2}. Data were analyzed statistically ($p < 0.005$).

Results: Mean change in color difference (ΔE*2-1) was higher in group II (2.670 ± 0.653) than in group I (2.3950 ± 0.890) and group III (2.3400 ± 0.7865). The Mean change in color difference (ΔE*3-2) was higher in group II (6.9387 ± 1.42952). Than in group I (5.3780 ± 1.54678) and group III (4.9670 ± 1.63924). The results obtained were statistically significant

Conclusions: Graphene oxide nanoparticles significantly enhance the bleaching efficacy of hydrogen peroxide and may serve as effective bleaching catalysts in aesthetic dental treatments.

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Comparative evaluation of fracture resistance of lithium disilicate veneers based on different processing methods

Francy Teena S,* Sudhakar Venkatesan, Veni Ashok B

Department of Conservative Dentistry and Endodontics, Adhiparasakthi Dental College and Hospital, Tamil Nadu, India

ABSTRACT

Objectives: This study aimed to evaluate and compare the fracture resistance of Lithium Disilicate veneers based on two different processing methods: CAD/CAM and HEAT PRESSED.

Materials and Methods: An *in vitro* study was conducted on 20 laminate veneers divided into two groups based on the processing methods: Group 1-CAD-CAM, and Group 2-Heat Pressed. The fracture resistance of these veneers following thermocycling was determined using a universal testing machine. Statistical analysis was done to compare the groups.

Results: An *in vitro* study was conducted on 20 laminate veneers divided into two groups based on the processing methods: Group 1-CAD-CAM and Group 2-Heat Pressed. The fracture resistance of these veneers following thermocycling was determined using a universal testing machine. Statistical analysis was done to compare the groups.

Conclusions: PRESSED lithium disilicate group demonstrated the best mechanical performance in this *in vitro* study, highlighting its potential advantage in clinical applications. Further clinical studies are necessary to validate these findings under dynamic oral conditions.

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Effect of targeted anti-inflammatory intracanal medicament on postoperative pain and substance P expression in symptomatic irreversible pulpitis – a randomized clinical study

Janani Balachandran,[1*] Vaishali Srinivasan,[2] Venkatesh Alagarsamy[1]

[1]Department of Conservative Dentistry and Endodontics, Sree Balaji Dental College and Hospital. Bharath Institute of Higher Education and Research, Chennai, Tamil Nadu, India
[2]Private Practitioner, Chennai, Tamil Nadu, India

ABSTRACT

Objectives: Managing pain in teeth with irreversibly inflamed pulps remains challenging, with some patients experiencing persistent postoperative discomfort. This study aimed to evaluate the effect of an intracanal medicament containing ketorolac tromethamine on substance P expression in periapical tissues and its correlation with postoperative pain reduction.

Materials and Methods: Twenty-four patients diagnosed with symptomatic irreversible pulpitis were randomly allocated into two groups following root canal preparation. Group 1 ($n = 12$) received calcium hydroxide, while Group 2 ($n = 12$) received calcium hydroxide combined with ketorolac tromethamine as the intracanal medicament. Pain levels were assessed at baseline, 24 hours, 48 hours, and one week using a Visual Analog Scale (VAS). Periapical exudate samples were collected post-instrumentation (S1) and after one week, prior to obturation (S2), to evaluate substance P levels using enzyme-linked immunosorbent assay (ELISA).

Results: Statistical analysis revealed that Group 2 showed a significant reduction in substance P levels at S2 compared to Group 1 ($p < 0.05$). Correspondingly, pain scores at 48 hours and 1 week were significantly lower in the ketorolac-treated group ($p < 0.05$).

Conclusions: These findings suggest that the addition of ketorolac tromethamine to calcium hydroxide as an intracanal medicament effectively reduces the neurogenic inflammatory marker substance P and provides superior pain control post-treatment in patients with symptomatic irreversible pulpitis. This strategy may serve as a valuable adjunct in endodontic pain management protocols, potentially minimizing the need for systemic analgesics following treatment.

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Impact of mechanical pre-treatment of dentin on the micro-tensile bond strength of fiber-reinforced composites used in non-carious cervical lesions: an *in vitro* comparative study

Revathy Parthasarathy,* Venkatesh Alagarsamy, Trinita Henry

Department of Conservative Dentistry and Endodontics, Sree Balaji Dental College and Hospital, Bharath Institute of Higher Education and Research, Pallikaranai, Chennai, Tamil Nadu, India

ABSTRACT

Objectives: The objective of this study was to evaluate the micro-tensile bond strength (μTBS) of various fiber-reinforced composites used for restoring non-carious cervical lesions, with and without Mechanical Dentin Pre-treatment using Air abrasion and Laser.

Materials and Methods: Sixty freshly extracted human maxillary premolars were included in this study. A Cuneiform-shaped cavity was prepared in the cemento-enamel junction on the buccal surface of the premolars with occlusal margins in the enamel and gingival margins on the cementum, using a high-speed handpiece. These teeth were randomly distributed into three groups according to the pre-treatment protocol: without pre-treatment, Mechanical pre-treatment of the cavity with Air-abrasion and Er,Cr:YSGG-Laser. Each group had four subgroups (n = 5): a) short glass fiber reinforced resin composite (everX Flow™), b) polyethylene fiber (Ribbond) reinforced resin composite and c) Braided glass fiber impregnated with light-cured composite resin (InterligTM), and d) only conventional resin composite. All the samples were bonded using universal bonding agent (3M ESPE Adper Single Bond Universal Adhesive) in selective etch mode and restored with composite. After finishing and polishing, the samples were evaluated for μTBS. Data were initially recorded in Microsoft Excel, with subsequent statistical analyses conducted using IBM SPSS Statistics for Windows, Version 26.0 (Armonk, NY: IBM Corp). Data was analyzed using one-way analysis of variance (ANOVA), followed by Tukey's HSD *post-hoc* test to identify the specific pairwise differences. A p-value of < 0.05 was considered statistically significant.

Results: The study found that both surface pre-treatment and the type of fiber-reinforced composite significantly influenced the μTBS (p < 0.001). Overall, bond strength was highest with Laser pre-treatment, followed by Air Abrasion. Among materials, EverX Flow™ (64.72 MPa) yielded the highest bond strength, while the conventional composite showed the lowest.

Conclusions: Mechanical pre-treatment of dentin had significantly improved the μTBS of fiber reinforced composites in non-carious cervical lesions, while the untreated groups showed the lowest. Among the groups, Laser pre-treated dentin with EverX Flow™ exhibited the highest μTBS.

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Mechanical behavior of two bulk-fill composites following preheating: an *in vitro* analysis

Athira K*

Tagore Dental College, Chennai, India

ABSTRACT

Objectives: This study aimed to compare the effect of preheating on the microhardness and compressive strength of two different bulk fill composites.

Materials and Methods: Two bulkfill composites, Shofu Beautiful II and Tetric N-Ceram Bulk Fill, were selected for the study. The samples were divided into 4 groups according to the type of material used and heating protocol. 88 samples were tested, with 22 samples in each group.

The samples were obtained at room temperature and after being heated in the heating device for 10 minutes at 50°C. All the samples were tested for microhardness and fracture resistance. Statistical analysis was performed using one-way ANOVA followed by Tukey's *post hoc* test, with a significance level set at $p < 0.05$.

Results: A statistically significant relationship was observed between compressive strength and the different composite materials ($p = 0.000$*). Post hoc analysis revealed that Group 2 showed significantly higher compressive strength compared to the other groups. Similarly, a statistically significant difference was also found in microhardness among the tested composite materials ($p = 0.000$*). In post hoc analysis, Group 4 and Group 3 demonstrated significantly higher microhardness values than the other groups.

Conclusions: Shofu PH shows significantly lower compressive strength than other groups, while Ivoclar NH and Shofu NH show lower microhardness compared to other groups. Composites behave differently with heat treatment, resulting in different mechanical properties.

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Effect of a novel plant derived enzymatic chemo-mechanical caries agent on microhardness of dentin

Dhavamani Rajamadevi,* Shekar Shobana, Gopal Shankar Narayan*

Tagore Dental College and Hospital, The Tamil Nadu Dr. M. G. R. Medical University, Chennai, India

ABSTRACT

Objectives: This study aimed to evaluate the effect of Zingibain enzyme on the dentinal microhardness when used as a chemo-mechanical caries removal agent.

Materials and Methods: Twenty freshly extracted human permanent molars—10 carious and 10 intact—were decoronated and sectioned mesiodistally. The samples were categorized into four groups (n = 10 each): Group I (Positive Control): Intact, untreated dentin; Group II (Test – Caries): Caries excavated using Zingibain enzyme; Group III (Negative Control): Carious dentin without treatment; Group IV (Test – Intact): Intact dentin treated with Zingibain enzyme. All samples were subjected to Knoop microhardness testing. Data were analyzed using one-way ANOVA followed by Tukey's *post hoc* test ($p < 0.05$).

Results: Statistically significant differences in dentinal microhardness were observed among the groups ($p < 0.001$). Group I exhibited the highest mean hardness (59.51 ± 3.08), while Group III showed the lowest (26.51 ± 3.16). Group II demonstrated a higher mean hardness (32.92 ± 6.35) compared to Group III, though the difference was not statistically significant ($p = 0.117$). Group IV maintained a relatively high hardness (47.73 ± 9.77), indicating minimal adverse effects on sound dentin.

Conclusions: Zingibain enzyme demonstrated potential as a chemo-mechanical caries removal agent by partially preserving the mechanical integrity of carious dentin and exerting a minimal effect on intact dentin. Its use may offer a biologically favorable and minimally invasive approach in conservative dentistry.

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Impact of cervical lesion-directed access design and different fiber-reinforced composite restorations on fracture resistance of endodontically treated premolars: an *in vitro* analysis

Anila Bandlapally Sreenivasa,* Roopadevi Garlapati

Department of Conservative Dentistry and Endodontics, Sibar Institute of Dental Sciences, Takkellapadu, Guntur, Andhra Pradesh, India

ABSTRACT

Objectives: This study aimed to evaluate and compare the fracture resistance of endodontically treated mandibular premolars with cervical lesion-directed access cavities restored using nano-hybrid composite with polyethylene fiber, glass fiber, and their combination.

Materials and Methods: Sixty extracted human mandibular premolars with single canals and intact structure were selected and stored in 0.1% thymol. A standardized wedge-shaped cervical lesion was prepared at the CEJ of the buccal surface, followed by cervical lesion-directed access and endodontic treatment using ProTaper Gold files up to F3, after which obturation was completed. Teeth were randomly divided into 6 groups ($n = 10$): Group 1 – intact teeth (control), Group 2 – endodontically treated without restoration, Group 3 – restored with nanohybrid composite, Group 4 – composite with polyethylene fibers, Group 5 – composite with glass fibers, and Group 6 – composite with both fiber types. Samples were embedded in acrylic resin and tested for fracture resistance using a universal testing machine. Data were analyzed using One-way Analysis of variance and Tukey's *post hoc* tests ($p \leq 0.05$).

Results: Group 1 showed the highest fracture resistance (994.00 N), followed by Group 5 (846.00 N), Group 6 (793.00 N), Group 4 (746.00 N), and Group 3 (594.00 N). Group 2 had the lowest (280.00 N). Differences were statistically significant ($p = 0.000$).

Conclusions: Glass fiber-reinforced composite restoration exhibited improved fracture resistance in endodontically treated mandibular premolars with cervical lesion-directed access cavities, followed by a synergistic combination of glass and polyethylene fibers. Polyethylene fiber outperformed the composite alone, while unrestored teeth showed the weakest resistance. Glass fiber remains the most effective reinforcement.

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Comparative evaluation of fluorescence and opalescence intensity of direct and indirect resin composite, hybrid restorative material, and ceramic block: an *in vitro* study

Ridhima U Gupta,* Ashwini P Sanotsh, Anithakumari Rangappa

Department of Conservative Dentistry and Endodontics, V S Dental College and Hospital, Bangalore, India

ABSTRACT

Objectives: This study aimed to evaluate and compare the fluorescence and opalescence intensities of four esthetic restorative materials—Tetric N Ceram 2 (direct composite), SR Nexco Paste (indirect composite), Edelweiss CAD/CAM block (hybrid composite), and IPS E.max CAD (ceramic)—before and after artificial aging through thermocycling.

Materials and Methods: Forty-eight disc-shaped specimens (n = 12 per group) were fabricated. Composites were cured with appropriate light-curing units, and CAD/CAM blocks were milled and, where required, crystallized. All samples underwent 5000 thermocycles between 5°C and 55°C. Fluorescence and opalescence intensities were recorded using an FRU spectrometer. Color parameters (L*, a*, b*) were measured before and after aging, and ΔE values were calculated to determine color stability.

Results: All materials exhibited significant optical changes after thermocycling. IPS E.max CAD exhibited the highest stability (ΔE = 1.34), followed by SR Nexco (ΔE = 1.50). Tetric N Ceram 2 showed moderate change (ΔE = 2.39), while Edelweiss CAD/CAM demonstrated the highest color shift (ΔE = 3.97). Significant changes were noted in a* and b* values for resin-based groups.

Conclusions: Material composition and aging significantly influence fluorescence and opalescence. IPS E.max CAD and SR Nexco Paste showed superior optical stability, whereas Edelweiss CAD/CAM was the least stable post-aging.

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Determination of phytocompounds in Tridax procumbens leaves and assessment of antibacterial activity against Enterococcus faecalis using molecular docking technique – an in silico study

Kamali Kathirvel,* Deepa Natesan Thangaraj, Karthick Kumaravadivel

KSR Institute of Dental Science and Research, Tiruchengode, India

ABSTRACT

Objectives: The present study aims to investigate the antimicrobial potential of phytocompounds extracted from *Tridax procumbens* leaves against *E. faecalis*, employing *in silico* molecular docking techniques targeting the Enterococcal Surface Protein (ESP), a crucial virulence factor. To determine the Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC).

Materials and Methods: Fresh leaves of *T. procumbens* were collected and shade-dried to retain their phytoconstituents. GC-MS analysis was performed to identify the phytocompounds present. The 3D structure of ESP was retrieved from the Protein Data Bank. Molecular docking studies were carried out using AutoDock Tools 1.5.7 to determine binding affinities. Antibacterial activity was further assessed by the broth dilution method.

Results: Molecular docking revealed a significant interaction, with the best binding energy of -4.5 kcal/mol between ESP and selected phytocompounds. *In vitro* studies confirmed their antibacterial potential, which shows the Minimum Inhibitory Concentration (MIC) of 0.9 µg/ml and minimum bactericidal concentration (MBC) of 5.6×10^8 CFU/mL.

Conclusions: This study highlights the promising role of Tridax procumbens phytochemicals as potential inhibitors of *E. faecalis*, supporting their future use in herbal-based endodontic therapeutics.

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Comparative evaluation of fracture resistance in endodontically treated premolars reinforced with Prolene mesh and Ribbond fibers using different fiber orientations as foundations

Saiswetha Narayanan*

Department of Conservative Dentistry and Endodontics, Karpaga vinayaga institute of dental sciences, Tamil Nadu, Chennai, India

ABSTRACT

Objectives: Fiber-reinforced restorations offer enhanced mechanical performance in endodontically treated teeth. This *in vitro* study aimed to compare the fracture resistance of endodontically treated maxillary premolars reinforced with polypropylene (Prolene mesh) and polyethylene (Ribbond) fibers and evaluate the influence of fiber orientation.

Materials and Methods: Forty extracted maxillary premolars were decoronated, endodontically treated, and randomly divided into four groups ($n = 10$): Group 1 – unrestored; Group 2 – composite resin; Group 3 – Ribbond + composite; Group 4 – Prolene mesh + composite. Fracture resistance was assessed using a universal testing machine. Additionally, Prolene mesh was placed in different orientations (horizontal, vertical, circumferential, bidirectional), and their effects on fracture load and failure patterns were analyzed. Fracture types were examined under a stereomicroscope (×40). One-way ANOVA and post hoc Tukey tests were used for statistical analysis ($p < 0.05$).

Results: Polypropylene-reinforced teeth showed significantly higher fracture resistance (380.0 ± 23.36 N) compared to polyethylene-reinforced teeth (258.02 ± 11.05 N). Among fiber orientations, horizontal Prolene placement demonstrated the highest fracture resistance (668.8 ± 89.2 N), followed by circumferential (326.8 ± 17.2 N) and vertical (307.8 ± 185.4 N). Favorable fracture patterns were observed in 80% of the polypropylene group and 60% of the polyethylene group. Adhesive failures were more frequent in horizontal and circumferential groups, whereas cohesive failures dominated vertical and bidirectional groups.

Conclusions: Polypropylene fibers, especially in horizontal orientation

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Evaluation of the biological and mechanical properties of mineral trioxide aggregate with different concentrations of Nigella sativa aqueous extract: an *in vitro* study

Shanmugapriya.K*

Department of Conservative Dentistry and Endodontics, Karpagavinayaga Institute of Dental Sciences, Chengalpattu, India

ABSTRACT

Objectives: Mineral trioxide aggregate (MTA) is widely used in endodontics due to its biocompatibility and regenerative potential. However, its prolonged setting time and limited bioactivity and mechanical strength have driven interest in natural additives such as *Nigella sativa* (NS). This study aimed to evaluate the effects of incorporating aqueous NS extract into MTA on its cytocompatibility, mineralization potential, setting time, and compressive strength.

Materials and Methods: Three groups were studied: Group A – MTA with 30% NS extract, Group B – MTA with 50% NS extract, and Group C – MTA without NS (control). Cytotoxicity was assessed using the MTT assay on human dental pulp stem cells after 24 hours. Mineralization was evaluated via Alizarin Red S staining at 14 days. Setting time was measured using the Gilmore needle method. Additionally, an ongoing experiment is evaluating the compressive strength of cylindrical MTA specimens stored at 37°C in 100% humidity for 72 hours, using a universal testing machine. Data are analyzed with one-way ANOVA and Tukey's *post hoc* test ($p < 0.05$).

Results: Group B showed the highest cell viability (87.6%), greatest mineral deposition (OD: 0.79), and shortest setting time (initial: 35 minutes; final: 150 minutes). It is anticipated that compressive strength will also be enhanced in a concentration-dependent manner.

Conclusions: Incorporating NS extract into MTA improves its biological and mechanical properties, suggesting its potential as a natural additive for enhanced endodontic materials.

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Periapical healing outcome in single-visit root canal treatment: a 1-year follow-up study

R Jesanth Joel,* I Anand Sherwood, S Swathi Priyadharshini

CSI Dental College, Madurai, India

ABSTRACT

Objectives: This study aimed to evaluate the periapical healing of teeth with apical pathology following single-visit nonsurgical endodontic treatment. The primary objective was to assess radiographic healing using Periapical Index (PAI) scores. The secondary objective was to determine the clinical success rate of single-visit root canal treatment (RCT).

Materials and Methods: A total of 40 posterior teeth (maxillary and mandibular) from patients aged 18–70 years were included. All teeth were non-vital and exhibited periapical lesions. After applying inclusion and exclusion criteria, patients were randomly divided into two groups: Group 1 (n = 20) received obturation with zinc oxide eugenol (ZOE) sealer (DPI ZOE sealant, Dental Products of India) and Group 2 (n = 20) with a bioactive Bioceramic sealer (Bioactive RCS, FKG Dentaire, Switzerland). Root canal treatment was performed using NiTi rotary instrumentation, 2% chlorhexidine irrigation with sonic activation, and single-cone obturation. Preoperative and postoperative healing was evaluated using PAI scores at baseline and over a 1-year follow-up period.

Results: PAI scores were compared between groups to assess changes in periapical status. The Mann–Whitney U test revealed that the Bioceramic sealer group exhibited significantly better healing outcomes (lower PAI scores) than the ZOE group ($p < 0.05$). Kaplan–Meier survival analysis supported the clinical longevity of both groups, with higher survival rates observed in the Bioceramic group.

Conclusions: Single-visit RCT using Bioceramic sealer demonstrated superior periapical healing and clinical performance compared to ZOE sealer, making it a preferable choice in managing apical pathology.

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Biogenic synthesis and antimicrobial activity of silica-coated silver nanoparticles for aesthetic dental applications

Shobana. K, Vidyashree Nandini. V

Department of Conservative Dentistry and Endodontics, SRM Kattankulathur Dental College and Hospital, Kattankulathur, Tamil Nadu, India

ABSTRACT

Objectives: This study aimed to synthesize AgNPs from *Cissus Quadrangularis* (CQ) extract, forming CQ-AgNPs, and to coat their surfaces with silica, resulting in light-coloured Ag@SiO2 nanoparticles.

Materials and Methods: Particles were synthesised, characterized and tested for antimicrobial activity by ZOI, minimal inhibitory concentration (MIC), antibiofilm and fluorescence against *Streptococcus mutans*, Lactobacillus acidophilus and cytotoxicity evaluation on dental pulp fibroblasts.

Results: X-ray diffraction (XRD) confirmed the formation of pure AgNPs, whereas energy dispersive X-ray spectroscopy (EDS) mapped their elemental atoms. Fourier-transformed infrared (FTIR) spectroscopy confirmed the successful condensation of silica, which significantly increased surface area. Transmission electron microscopy (TEM) displayed the spherical shape of nanoparticles and an average size of 11 nm for CQ-AgNPs and Ag@SiO2NPs. Ag@SiO2NPs demonstrated potent antimicrobial action against *Lactobacillus* and *S. mutans*, with MIC determined as 600 μg/mL, and inhibition of approximately 44% ($p < 0.05$) of biofilm formation. At the MIC concentrations, neither NPs did not exhibited cytotoxicity.

Conclusions: Ag@SiO2NPs might have a useful application in dental materials. The possibility of incorporating antimicrobial properties in restorative materials without compromising aesthetics makes the AgNPs@SiO2 NPs promising agents against S. mutans biofilm formation, hence the prevention of dental caries. This represents a great step towards the development of more interactive biomaterials in dentistry to overcome clinical problems.

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Tooth armor: the hidden force behind every restored tooth

Ayesha Satapathy*

Hi-Tech Dental College and Hospital, Bhubaneswar, India

ABSTRACT

Objectives: This study aimed to compare the fracture resistance of mandibular molars restored with composite resin alone, composite reinforced with Ribbond fiber, and composite reinforced with titanium mesh.

Materials and Methods: Sixty freshly extracted human mandibular molars with intact crown structures were selected and standardized Class I cavity preparations were performed. The teeth were randomly divided into four groups ($n = 15$ per group):
Group A (Control): Intact teeth with no cavity or restoration.
Group B: Cavities restored with composite resin only.
Group C: Cavities restored with composite resin and Ribbond fiber placed between the cavity floor and restoration.
Group D: Cavities restored with composite resin and titanium mesh placed between the cavity floor and restoration.
All specimens were thermocycled and subjected to fracture resistance testing using a universal testing machine. The maximum load at fracture was recorded and statistically analyzed.

Results: Group D (composite with titanium mesh) demonstrated the highest mean fracture resistance, followed by Group C (composite with Ribbond), Group B (composite only), and Group A (intact teeth). The difference between Group D and other groups was statistically significant ($p < 0.05$).

Conclusions: Use of titanium mesh in combination with composite resin significantly enhances the fracture resistance of restored mandibular molars. This technique may offer a viable, minimally invasive alternative to full-coverage crowns in selected clinical cases.

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Comparative evaluation of Zoledronic acid + gelatin sponge, Teriparatide + gelatin sponge and gelatin sponge on the healing of periapical lesions using CBCT– an *in vivo* study

Venkatraman Bharath,* Mahendran Kavitha

Department of Conservative Dentistry and Endodontics, Tamil Nadu Government Dental College and Hospital, The Tamil Nadu Dr. M.G.R. Medical University, Chennai, India

ABSTRACT

Objectives: The aim of this study was to quantitatively evaluate and compare bone regeneration in periapical lesions using Zoledronic acid + Gelatin sponge, Teriparatide + Gelatin Sponge, and Gelatin Sponge.

Materials and Methods: Twenty-five subjects with periapical lesions measuring 10-20 mm in relation to maxillary and mandibular anteriors indicated for periapical surgery were selected. Preoperative bone density values at the periapical region were measured in Hounsfield units using CBCT. After root canal treatment, under local anesthesia, full full-thickness mucoperiosteal flap was raised, the periapical lesion debrided, followed by root resection and retrograde filling (GIC). 25 subjects were randomly divided into three Groups for placement of the experimental material in the bone cavity -Group I (Zoledronic acid + Gelatin sponge), Group II (Teriparatide + Gelatin Sponge), Group III (Gelatin Sponge). The flaps were repositioned and sutured. Clinical and radiographic follow-up was done at 3, 6, 9 and 12 months. Bone density evaluation of the periapical region was done 6 months and 12 months after the surgery. Statistical analysis was conducted using One-way repeated-measure ANOVA with Bonferroni adjustments, with statistical significance set at $p < 0.001$.

Results: Mean 6 months and 12 months gray scale values obtained for Group I and Group II were higher than the mean 6 months and 12 months gray scale values for Group III (p-value < 0.001)

There was a statistically significant difference in bone density values between Group I and Group III; Group II and Group III (p-value < 0.001)

There was no statistically significant difference between Group I and Group II (p-value = 0.1)

Conclusions: Both Zoledronic acid + Gelatin Sponge and Teriparatide + Gelatin Sponge can be considered valuable options for placement in bone defects following periapical surgery and are effective in promoting bone regeneration.

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Prevalence of Class 1 caries among outpatients with diabetes visiting a private dental hospital - a retrospective analysis

Revathi Bhaskaran,* Sandhya Raghu, Kiran Kumar

Saveetha Dental College, Chennai, India

ABSTRACT

Objectives: The aim of the present study was to assess the prevalence of Class 1 dental caries in patients with type two diabetes mellitus.

Materials and Methods: We reviewed patient records and analyzed the data of 86,000 patients between June 2019 and March 2020, from which 600 diabetic patients were included in the study and assessed for age, sex and presence of Class 1 dental caries in each tooth. Collected data was tabulated in an Excel sheet and imported into SPSS version 17 for statistical analysis.

Results: The result was highly significant (*t*-test; $p < 0.001$). Patients in the 40- to 50-year-old age group showed a high prevalence of caries (64%), while those in the 20- to 30-year-old age group showed a minimal prevalence (17.6%). Males showed a higher prevalence than females, with 56.4% and 43.5%. This result was not significant (Chi-square test; $p = 0.013$). Tooth number 37 (15.5%) showed a high incidence, followed by 38 (7.1%) and 47 (6.8%). Mandibular posteriors (60.3%) showed a higher prevalence than maxillary posteriors (30.3%).

Conclusions: The result was highly significant (*t*-test; $p < 0.001$). The 40- to 50-year-old age group patients showed a high prevalence of caries (64%), while the 20- to 30-year-old age group showed a minimal prevalence (17.6%). Males showed a higher prevalence than females, with 56.4% and 43.5% respectively. This result was not significant (Chi-square test; $p = 0.013$). Tooth number 37(15.5%) showed high incidence followed by 38(7.1%) and 47(6.8%). Mandibular posteriors (60.3%) showed a higher prevalence than maxillary posteriors (30.3%).

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Description of participants: Ensure correct use of the terms sex (when reporting biological factors) and gender (identity, psychosocial or cultural factors), and, unless inappropriate, report the sex or gender of study participants, the sex of animals or cells, and describe the methods used to determine sex or gender. If the study was done involving an exclusive population, for example in only one sex, authors should justify why, except in obvious cases (eg, prostate cancer). Authors should define how they determined race or ethnicity and justify their relevance.

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Journal article	1. Oh HK, Shin DH. Effect of adhesive application method on repair bond strength of composite. Restor Dent Endod 2021;46:e32. List all authors when six or fewer (ex. reference 1); when seven or more, list six and add *et al*. (ex. reference 2 and 4). 2. Bergamo ET, Yamaguchi S, Lopes AC, Coelho PG, de Araújo-Júnior EN, Benalcázar Jalkh EB, *et al*. Performance of crowns cemented on a fiber-reinforced composite framework 5-unit implant-supported prostheses: in silico and fatigue analyses. Dent Mater 2021;37:1783-1793. 3. Shah RA, Hsu JI, Patel RR, Mui UN, Tyring SK. Antibiotic resistance in dermatology: the scope of the problem and strategies to address it. J Am Acad Dermatol 2021 Sep 20 [Epub]. https://doi.org/10.1016/j.jaad.2021.09.024. 4. Van Meerbeek B, Vargas M, Inoue S, Yoshida Y, Peumans M, Lambrechts P, *et al*. Adhesives and cements to promote preservation dentistry. Oper Dent 2001;(Supplement 6):119-144. 5. Yoshida Y, Van Meerbeek B, Okazaki M, Shintani H, Suzuki K. Comparative study on adhesive performance of functional monomers. J Dent Res 2003;82(Special Issue B):Abstract 0051, pB-19.
Book & Book chapter	6. Seltzer S, Bender IB. The dental pulp: biologic considerations in dental procedures. 3rd ed. Lippincott; 1984. p400. 7. Fouad AF, Levin L. Pulpal reactions to caries and dental procedures. In: Hargreaves KM, Cohen S, Berman LH, eds. Cohen's pathways of the pulp. 10th ed. Mosby Elsevier; 2010. p504-528.
Website	8. International Association of Dental Traumatology (IADT). The dental trauma guide [Internet]. IADT; 2014 [cited 2021 Jun 10]. Available from: https://dentaltraumaguide.org
Corporate publication	9. ISO-Standards ISO 4287 Geometrical Product Specifications Surface texture. Profile method: terms, definitions and surface texture parameters. 1st ed. Geneve: International Organization for Standardization; 1997. p1-25.

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dence-based systematic approaches is expected. The use of tabulated and illustrative material is encouraged. The Conclusion section should reach clear conclusions and/or recommendations on the basis of the evidence presented. If a review includes a meta-analysis as part of a systematic review, it should be submitted as a research article.

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- Comments for the Reader's forum: Reader's forum will present various questions, suggestions, and critiques on the subjects of operative dentistry, restorative dentistry, and endodontics from the readers.

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Editorial assistant: Hye-Young Lee
RDE editorial office
The Korean Academy of Conservative Dentistry
B163, Seoul National University Dental Hospital, 101 Daehak-ro, Jongno-gu, Seoul 03080, Korea
Tel: +82-2-763-3818, Fax: +82-2-763-3819, E-mail: editor@rde.ac

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RDE Restorative Dentistry & Endodontics

Author's checklist

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