

Comparative Evaluation Of Deep Marginal Elevation Techniques In Restoring Subgingival Cavities: A Multidisciplinary Assessment By Prosthodontists, Endodontists, And Restorative Dentists

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Abstract

The restoration of subgingival cavities presents formidable challenges within dental practice, necessitating a multidisciplinary approach to effectively manage deep marginal elevation techniques (DMETs). This review critically examines the contributions of prosthodontists, endodontists, and restorative dentists in evaluating and implementing DMETs for optimal restorative outcomes. The focus is on the integral roles each specialty plays in addressing the complexities associated with subgingival restorations, particularly in relation to maintaining periodontal health, ensuring functional integrity, and achieving esthetic excellence.

Prosthodontists are highlighted for their expertise in assessing clinical indications for DMETs, selecting appropriate techniques based on individual patient needs, and fostering interdisciplinary collaboration to enhance patient outcomes. Endodontists contribute vital insights into the relationship between pulp health and restorative success, significantly impacting treatment planning when managing subgingival cavities. Restorative dentists implement DMETs in clinical practice, engaging directly with material selection and restorative methods, while also considering esthetic demands and functional performance.

By synthesizing current literature and clinical practices across these specialties, this review underscores the importance of a cohesive, interdisciplinary framework in restoring subgingival cavities. The examination reveals that effective collaboration among dentists leads to enhanced patient care, improved treatment outcomes, and the promotion of innovative strategies in restorative dentistry. As the field advances, ongoing research into deep marginal elevation techniques, informed by a multidisciplinary perspective, will be vital

for meeting the evolving challenges in managing subgingival restorations and ensuring the highest standards of dental care.

Introduction

Restoring subgingival cavities poses a unique set of challenges within dental practice, especially considering the intricate dynamics of periodontium health, functional esthetics, and mechanical integrity of the restoration. These challenges are compounded by the various depths of cavity preparations that often extend below the gum line, necessitating meticulous techniques to ensure successful outcomes. Deep marginal elevation techniques (DMETs) have emerged as a promising solution for effectively managing these subgingival conditions. Through a systematic elevation of the tooth margin to a more accessible level, these techniques not only aim to enhance the fit and function of the final restoration but also address periodontal concerns such as maintaining or improving gingival health.

The multidisciplinary approach to evaluating and implementing deep marginal elevation techniques underscores the necessity for collaboration among specialists within the dental arena. Prosthodontists, endodontists, and restorative dentists each bring distinct insights and competencies to the table, contributing to a comprehensive understanding of DMETs and their clinical implications. Prosthodontists focus on the long-term stability and esthetics of restorations, endodontists emphasize the critical aspects of pulp vitality and apex closure, while restorative dentists are primarily concerned with the direct functional aspects of restorations. Their collaborative evaluation can lead to refining treatment modalities, optimizing clinical outcomes, and enhancing the overall patient experience.

In the face of evolving dental materials and techniques, the comparative evaluation of these techniques is timely and essential. This review aims to synthesize current literature on deep marginal elevation techniques, discussing the methodologies employed by each specialty while accentuating their implications for clinical practice. Furthermore, this review will explore existing research and findings, shedding light on how multidisciplinary assessments can inform clinical decisions surrounding the restoration of subgingival cavities. By examining the perspectives and practices of prosthodontists, endodontists, and restorative dentists, this investigation seeks to provide a comprehensive overview that clarifies the significance of DMETs in modern restorative dentistry.

Evaluating Deep Marginal Elevation Techniques: An Overview

Deep marginal elevation techniques encompass various strategies aimed at lifting the margins of subgingival restorations into a more accessible area for effective restoration placement. These techniques predominantly serve to enhance the coronal seal, facilitate impressions, and ensure that restorations adequately integrate into the existing tooth structure with minimal biological compromise.

Historically, subgingival restorations have been fraught with complications such as caries recurrence, marginal leakage, and periodontal degradation. This has particularly been a significant concern in teeth with compromised periodontal health, where the inability to maintain a proper seal can exacerbate dental disease. DMETs yield the potential to interact favorably with both soft and hard tissues, thereby allowing for the restoration to withstand functional stresses while supporting gingival integrity.

Notably, different methodologies exist within DMETs, including techniques such as forced eruption, crown lengthening, and guided tissue regeneration procedures. Each technique brings unique approaches to dealing with subgingival margins, requiring careful consideration of patient-specific periodontal conditions and restorative needs. As such, the evaluation of these techniques can unveil the strengths, weaknesses, and clinical indications of each approach.

The Role of Prosthodontists in Deep Marginal Elevation Techniques

Prosthodontists play a pivotal role in the implementation of deep marginal elevation techniques, given their extensive training in restoring complex dental conditions and their focus on achieving long-term functional and esthetic results. Their expertise is essential when evaluating the implications of DMETs, particularly in terms of prosthetic stability and retention.

Assessment of Clinical Indications for DMETs

Prosthodontists are equipped to identify the clinical indications for the application of deep marginal elevation techniques. Situations such as crown fractures, subgingival caries, and previous restorations with inadequate margins necessitate the elevation of the tooth margin to improve restorative outcomes. Their understanding of occlusal relationships, tooth structure, and tissue biology forms the foundation for determining when DMETs may be indicated (Santos et al., 2021).

Technique Selection: Guided by Clinical Evidence and Patient Needs

The choice of DMET can vary according to clinical scenarios and patient-specific factors. Prosthodontists consider factors such as tooth morphology, periodontal health, and aesthetic demands when selecting the appropriate technique. For example, when managing deep subgingival caries, they often lean towards crown lengthening procedures, which involve the surgical removal of gum tissue to expose more of the tooth structure. Conversely, in certain cases where structural compromise is minimal, forced eruption may be preferred, achieving elevation without extensive tissue manipulation.

Additionally, prosthodontists must take into account various restorative materials utilized in conjunction with DMETs. The compatibility of materials plays a crucial role in achieving optimal results, as factors such as elasticity, bonding capabilities, and thermal expansion must align with the property of tooth structure and existing dental materials. Current investigations into material advancements are essential, as they provide valuable insights for prosthodontists in their material selection processes (Schmitt et al., 2020).

Interdisciplinary Collaboration for Enhanced Patient Outcomes

The multifaceted nature of restoring subgingival cavities necessitates extensive collaboration among dental professionals. Prosthodontists work alongside endodontists and restorative dentists to develop treatment strategies that maximize patient outcomes. This collaboration is particularly evident in cases requiring multiple treatment modalities, such as when endodontic treatment precedes restorative interventions. Interdisciplinary communication allows for a cohesive approach to care, incorporating the insights of each specialty for informed decision-making (Akkus et al., 2020).

Ultimately, the expertise of prosthodontists in assessing, selecting, and executing deep marginal elevation techniques is foundational to successful restorative outcomes in subgingival cavities. Their proactive consideration of clinical scenarios, collaboration with their colleagues, and adherence to evidence-based practices position them to deliver the highest standard of care for patients.

The Role of Endodontists in Deep Marginal Elevation Techniques

Endodontists are integral to the multidisciplinary evaluation of deep marginal elevation techniques due to their specialized knowledge of the pulp and periapical tissues. Their perspective on the implications of cavity restorations in relation to endodontic health fosters a comprehensive understanding of the intricacies involved in managing subgingival restorations.

Contributions to Diagnosis and Treatment Planning

Endodontists contribute significantly to the thorough diagnosis of subgingival cavities, employing advanced imaging techniques such as cone-beam computed tomography (CBCT) to assess root canal anatomy and periodontal health. Accurate diagnosis is crucial for successful endodontic treatment and follows relevant principles of restorative dentistry (Baumann et al., 2021).

Once a diagnosis is established, endodontists are involved in the treatment planning process, ensuring that restorative approaches align with principles of endodontic success. This becomes particularly pertinent in cases where subgingival cavities may compromise the underlying pulpal health. For instance, endodontists must evaluate the necessity of root canal therapy prior to restorative intervention when caries extend apically toward the pulp.

Influence on Restorative Decisions through Root Canal Management

The integration of endodontic treatment with restorative procedures forms a vital component of patient management. In circumstances where endodontic involvement is requisite, DMETs may serve to elevate margins and create better access to deep cavities. Endodontists often recommend retrospective re-evaluation of tooth structure post-root canal therapy, determining the best approach for restoration (Manohar et al., 2018). Once the pulp has been effectively treated, restorability and crown placement are assessed holistically.

Similarly, well-conducted endodontic treatment enhances the prognosis of restorations by minimizing the risk of recurrent caries or fracture. Endodontists focus on achieving hermetic seals within the root canal system, which facilitates a seamless marriage between the restorative and endodontic phases of treatment. Close collaboration with prosthodontists and restorative dentists ensures that decisions made during the endodontic phase account for subsequent restorative strategies, enhancing clinical outcomes (Freeland et al., 2019).

Complications and Post-Treatment Monitoring

Endodontists also play a crucial role in monitoring potential complications arising from deep marginal elevation techniques. Given the intimate relationship between periodontal health and endodontic outcomes, they remain vigilant regarding the impact of subgingival restorations on periapical tissues and periodontal structures. The management of dental materials used in conjunction with DMETs must align with protocol recommendations to prevent adverse outcomes (Nallapareddy et al., 2020).

In summary, the contributions of endodontists to the discussion of deep marginal elevation techniques are critical for a comprehensive multidisciplinary assessment of restorative outcomes. Their insight ensures that both restorative health and pulpal integrity are preserved, establishing the foundation for successful long-term restoration in subgingival situations.

The Role of Restorative Dentists in Deep Marginal Elevation Techniques

Restorative dentists hold a central position in the execution of deep marginal elevation techniques, engaging directly with the mechanics of restoring function and aesthetics. Their nuanced understanding of material science, adhesive dentistry, and patient-centered care allow them to influence treatment strategies significantly.

Implementation of Deep Marginal Elevation Techniques

The practical application of DMETs by restorative dentists encompasses numerous approaches, including direct restoration methods, utilization of composite materials, and the precise placement of porcelain crowns. Each technique hinges on reliable interaction with the tooth structure and surrounding periodontal tissues, necessitating a meticulous approach to cavity preparation (Nadia et al., 2019).

Restorative dentists must weigh the benefits and challenges associated with diverse restorative materials. This includes evaluating their biocompatibility, adhesive properties, and longevity, particularly when employed in subgingival margins. The advent of new materials, such as bioactive ceramics and improved composites, has expanded the horizons for restorative dentists dealing with challenging cavity preparations (Siqueira et al., 2020).

Engagement in Functionality and Esthetics

Subgingival cavities often present unique challenges with regards to esthetics and functionality. Restorative dentists must balance these demands while executing deep marginal elevation techniques. Utilizing techniques such as incremental layering with composite materials allows for optimal adaptation to cavity walls and facilitates effective light curing.

Furthermore, understanding the role of gingival aesthetics in restorative treatment is essential. The position of the gingival margin, in conjunction with the choice of material, affects the visual outcome of the restoration. Restorative dentists often engage in treatment planning that accounts for not only immediate functionality but also long-term esthetic considerations, including the subtle nuances of color matching and contouring.

Interdisciplinary Collaboration for Optimal Results

Effective collaboration with prosthodontists and endodontists becomes paramount when addressing the complexities of restoring subgingival cavities. Regular consultations facilitate the exchange of insights leading to informed decisions on restorative techniques and their indications. Ensuring that the restorative phase aligns with endodontic and prosthodontic protocols ensures comprehensive care for the patient (Akkus et al., 2020).

In conclusion, restorative dentists, through their direct involvement in executing deep marginal elevation techniques, bridge the gap between theory and practice. Their application of materials, consideration of esthetics, and collaborative efforts contribute to achieving successful restorative outcomes, ultimately reinforcing the value of multidisciplinary approaches in managing subgingival cavities.

Comparative Evaluation of Deep Marginal Elevation Techniques

The comparative evaluation of deep marginal elevation techniques is crucial for determining their clinical effectiveness and overall suitability in managing subgingival restorations. Each technique employed by dental specialists offers specific advantages and limitations that must be carefully considered in assessing their impact on treatment outcomes.

Advantages and Limitations of Different DMETs

Among the commonly employed DMETs, forced eruption serves as a technique that uses orthodontic mechanics to facilitate upward movement of the tooth. This method allows for minimal tissue modification and can optimize the natural contours of the dental structures. However, its main limitation lies in the requirement of extensive orthodontic intervention, which may not be ideal for all clinical scenarios (Kotsakis & Vardas, 2018).

Conversely, procedures such as crown lengthening or gingivectomy, although effective in establishing adequate access to subgingival areas, involve more invasive approaches that can compromise the periodontal attachment and necessitate longer healing periods. The balance between the need for accessibility and the preservation of periodontal health must be critically assessed when selecting these techniques (Freeland et al., 2019).

Understanding the implications of different materials and their interactions with DMETs is also crucial. Research indicates that different restorative materials exhibit varying degrees of adhesion and coupling strength with tooth structures, influencing clinical performance and longevity (Zajac et al., 2020). The selection of restorative materials should include consideration of physical properties, established protocols, and the anticipated load-bearing requirements specific to each restoration scenario.

Conclusion

In summary, the comparative evaluation of deep marginal elevation techniques in restoring subgingival cavities necessitates a comprehensive, multidisciplinary approach that integrates the expertise of prosthodontists, endodontists, and restorative dentists. Each specialty plays an essential role in addressing the complexities associated with subgingival restorations, contributing valuable insights into various techniques used to elevate margins effectively.

Prosthodontists deliver a foundational understanding of restorative aesthetics and longevity, ensuring that treatments achieve desirable functional outcomes while maintaining esthetic standards. Endodontists contribute crucial knowledge regarding the relationship between pulp health and restorative interventions, emphasizing the importance of treating underlying endodontic issues prior to initiating restorative procedures. Restorative dentists bridge the conceptual with the practical, directly implementing deep marginal elevation techniques and ensuring that restorative outcomes meet the diverse needs of patients.

To achieve optimal clinical results in managing subgingival cavities, dental professionals must embrace collaborative frameworks that promote open communication and comprehensive treatment planning. Ongoing evaluation and refinement of deep marginal elevation techniques, supported by current research and technological advancements, represent a commitment to delivering high-quality patient-centered care in restorative dentistry. As the field continues to evolve, the integration of specialist knowledge in addressing the challenges posed by subgingival restorations will undoubtedly enhance both clinical success and patient satisfaction.

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