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Case Report

Optimizing oral health and function with telescopic dentures: A case report in preventive prosthodontics

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ABSTRACT

Preventive prosthodontics is a crucial field within prosthetic dentistry aimed at conserving natural teeth and surrounding oral structures to prevent further deterioration. This approach emphasizes early intervention to maintain oral health, function, and aesthetics while minimizing the need for extensive future treatments. This case report explores the application of preventive prosthodontics through the use of telescopic dentures in a 59-year-old female patient with diabetes. The patient presented with a dislodged fixed partial denture (FPD) and multiple compromised abutment teeth. After assessing her condition, including significant periodontal issues and missing teeth, a treatment plan incorporating a telescopic denture was chosen. The telescopic denture system, featuring dual copings, provided superior retention and stability while preserving natural teeth and bone structure. The treatment involved careful tooth preparation, periodontal therapy, and the fabrication of telescopic copings and crowns. The patient reported significant improvements in masticatory function, stability, and comfort. The case demonstrates how telescopic dentures offer a high-quality solution in preventive prosthodontics, combining the advantages of both fixed and removable prostheses to address complex clinical situations effectively.

1. Introduction

Preventive prosthodontics is a vital branch of prosthetic dentistry that emphasizes the conservation of natural dentition and surrounding oral structures to prevent further deterioration. This approach focuses on early intervention to maintain oral health, function, and aesthetics, thereby reducing the need for extensive prosthetic treatments in the future. The core concepts of preventive prosthodontics include the preservation of residual teeth, which helps maintain alveolar bone, provide proprioception, and improve prosthesis retention. Additionally, it aims to maintain the alveolar ridge, enhance masticatory function by preserving occlusal relationships, and ensure the stability of prosthetic appliances. This approach is particularly beneficial for patients with partial edentulism, geriatric individuals, those with systemic health conditions like diabetes or osteoporosis, and patients at high risk for caries or with limited financial resources. However, preventive prosthodontics is contraindicated in cases of extensive tooth decay, severe bone loss, patient non-compliance, or certain systemic health issues that compromise the prognosis of retaining natural teeth. The advantages of preventive prosthodontics include the retention of natural teeth, improved proprioception, cost-effectiveness, minimized bone resorption, and enhanced aesthetics. Nonetheless, it also has disadvantages, such as the need for rigorous maintenance, limited applicability in severe

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cases, the potential for future complications with retained teeth, and an adjustment period for patients adapting to new prostheses. In preventive prosthodontics, various types of copings are used to enhance the retention and stability of tooth-supported overdentures.[1] In preventive prosthodontics, various types of copings are utilized to enhance the retention and stability of tooth-supported overdentures. Metal copings, made from materials such as gold, cobalt-chromium, or titanium, are valued for their strength and durability, providing robust support for the overdenture but often requiring significant tooth reduction and potentially incurring higher costs. Non-metal copings, which are typically made from resin or composite materials, offer a less invasive option with reduced tooth reduction requirements and a more affordable price, though they may not be as durable as their metal counterparts. Telescopic copings involve a dual-coping system where a primary coping is cemented onto the abutment tooth and a secondary coping is part of the denture itself. This design offers excellent retention and stability, accommodating minor movements and enhancing comfort, though it can be complex and expensive to fabricate. Ball attachments feature spherical metal copings that fit into corresponding housings on the overdenture, providing good retention and allowing some movement for improved comfort, but they are best suited for specific cases and may not offer the same level of stability as other systems. Bar and clip attachments involve a bar connected to copings on the abutment teeth with clips on the prosthesis fitting over the bar. This system provides excellent retention and distributes forces evenly across the prosthesis, though it requires significant space within the prosthesis, which can impact aesthetics and comfort. Each type of coping offers distinct advantages and considerations, allowing for tailored solutions based on individual patient needs and clinical situations in preventive prosthodontics.[2]

Telescopic dentures are a sophisticated type of removable prosthesis that excels in providing superior stability and retention compared to traditional dentures. They consist of a dual-coping system: a primary coping, which is a metal shell cemented onto the abutment tooth, and a secondary coping, which is integrated into the prosthesis and fits over the primary coping. This design ensures a secure and stable fit for the denture, enhancing both function and comfort. The primary coping, usually made from metal such as gold or cobalt-chromium, requires significant reduction of the abutment tooth to fit properly. The secondary coping, which matches the material of the primary coping, ensures a snug fit and accommodates minor changes in the oral environment. The dual-coping mechanism provides excellent retention, making it less likely for the denture to shift or become loose. Additionally, telescopic dentures help preserve the alveolar ridge and prevent bone loss by maintaining natural teeth and supporting structures. This system also allows for some movement between the denture and the supporting teeth, which can improve patient comfort and functionality. However, the fabrication of telescopic dentures is complex and costly, and significant tooth reduction may be required, which might not be suitable for all patients. Regular maintenance and adjustments are also necessary to ensure continued fit and function, but overall, telescopic dentures represent a high-quality option in preventive prosthodontics, offering significant benefits in terms of stability, retention, and bone preservation.This comprehensive understanding of preventive prosthodontics and its components underscores its significance in extending the life of prosthetic treatments and improving patient outcomes.[3,4]

2. Case Report

2.1. Patient background

A 59-year-old female patient with a history of diabetes presented to the Department of Prosthodontics with the chief complaint of a dislodged fixed partial denture (FPD) that had been affecting her ability to chew properly. Her primary concern was to restore her masticatory function while preserving as many of her natural teeth as possible. Given her systemic condition, it was imperative to design a treatment plan that would accommodate her diabetes while ensuring long-term oral health.

2.2. Clinical findings

Upon examination, it was found that the patient had several remaining teeth, predominantly in the maxillary and mandibular posterior regions. The dislodged fixed partial denture (FPD) spanning from teeth 15 to 28 was removed to allow for a thorough assessment of the underlying abutment teeth.(Figure 1) During the evaluation, it was determined that teeth 14, 15, and 24 exhibited significant mobility, with some showing advanced signs of periodontal disease. As a result, the extraction of these teeth was advised to prevent further deterioration and to create a more stable foundation for future prosthetic treatment. Additionally, it was noted that the patient had missing teeth 16 to 18 in maxillary arch and 46-48 , 36-38 was missing in mandibular arch, which contributed to the compromised occlusal stability.The remaining abutment teeth, specifically teeth 27 and 28, were carefully evaluated. These teeth were found to be both periodontally and endodontically sound, making them suitable for supporting the new prosthesis. To enhance the overall periodontal health and ensure the longevity of the prepared abutments, scaling and root planing were recommended for the remaining teeth, with particular attention to the previously prepared abutment teeth 27 and 28. This periodontal therapy aimed to reduce periodontal pockets, promote gingival health, and provide a healthier environment for the retention of the new prosthetic

appliance.

2.3. Treatment options considered

Several treatment options were considered for this patient. The first option was an implant-retained prosthesis, which could have provided excellent stability and longevity. However, this option was not pursued due to the patient's medical history, particularly her diabetes, which posed potential risks during the implant surgery, and her economic constraints. The second option was a removable partial denture (RPD). While this option was more affordable, it was less favourable because of concerns about the long-term stability and retention, especially given the patient's periodontal status. The third and ultimately selected option was a telescopic denture and conventional temporary partial denture for rehabilitation of mandibular arch. This choice was made for its ability to preserve the remaining tooth structures, maintain proprioception, and minimize residual ridge resorption. The telescopic denture provided a balance between functional efficiency, aesthetic appeal, and conservation of the oral structures.

Figure 1: Intraoral photogrpahs and dislodged fixed partial denture

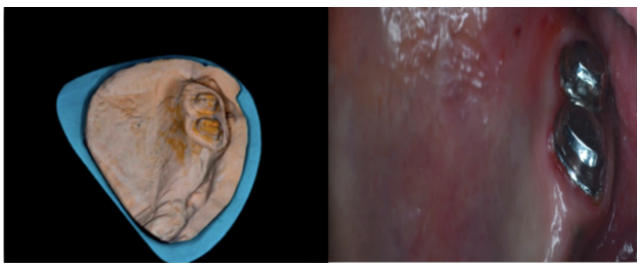

Figure 2: Primary cast and primary telescopic metal coping cemented in relation to 27, 28 using polycarboxylate cement

Figure 3: Secondary cast and secondary telescopic coping/ crown cemented in relation to 27, 28 using Type 11 Glass Ionomer cement

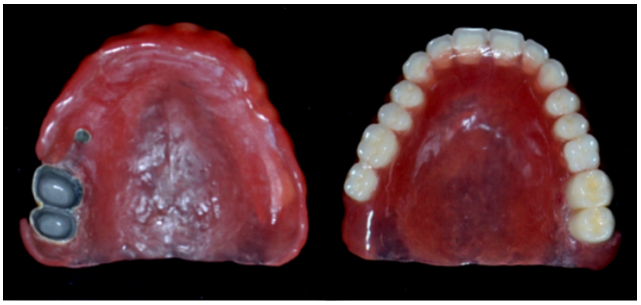

Figure 4: Telescopic denture with secondary copings/crowns with extension in relation to 27 and 28

Figure 5: Intraoral photograph of mandibular conventional trial denture

Figure 6: Pre and post-operative Intraoral photographs

2.4. Sequence of treatment

The treatment began with the careful removal of the dislodged FPD. This was followed by a detailed evaluation of the abutment teeth to assess their suitability for supporting the new prosthesis. Teeth with Grade III mobility were extracted to create a stable foundation for the prosthesis. After the extractions, the remaining teeth underwent scaling and root planing to manage periodontal health and reduce inflammation. As the treatment began with the careful removal of the dislodged fixed partial denture (FPD).Next, the remaining prepared abutments 27 and 28 were modified in such a way to create adequate space for the placement of telescopic copings and crowns. Border moulding was performed using green stick compound, followed by the final impressions using addition silicone putty and light body material in a two-stage process to ensure a precise fit for the prosthesis. Once these preparations were completed, the telescopic primary metal copings (Figure 2) were fabricated in

the dental laboratory and cemented onto the abutment teeth using polycarboxylate cement.Followed by two stage impressions was again made to record the maxillary arch with the telescopic primary copings to fabricate telescopic secondary porcelain-fused-to-metal (PFM) copings/crowns with extensions. (Figure 3) To further enhance retention and stability, telescopic secondary copings/crowns with extensions were designed as overlays to fit snugly over the telescopic primary copings. These crowns provided additional support for the telescopic denture and were cemented in place using Type II glass ionomer cement. Finally, the maxillary telescopic denture (Figure 4) and mandibular conventional temporary partial denture (Figure 5) were fabricated and inserted. The dentures were meticulously adjusted for proper occlusion, and the patient was given detailed instructions on their use and maintenance to ensure long-term success.

2.5. Outcome

The patient experienced a significant improvement in her masticatory function with the new telescopic denture. The prosthesis provided enhanced stability and retention, allowing her to chew more efficiently and comfortably. Intraoral (Figure 6) and extraoral photographs taken before and after treatment showed a marked improvement in her oral health and overall facial aesthetics. The patient was satisfied with the outcome, and follow-up visits confirmed the continued success of the treatment.

3. Discussion

The treatment approach in this case highlights the application of preventive prosthodontics principles, emphasizing the preservation of existing oral structures while addressing the patient's functional and aesthetic needs. The novelty of this treatment plan lies in its tailored approach to managing a complex clinical situation involving both periodontal compromise and partial edentulism. The use of telescopic copings and crowns provided a dual benefit: preserving the remaining abutment teeth while offering superior retention and stability for the prosthesis. Unlike conventional treatments such as fixed partial dentures (FPDs) or removable partial dentures (RPDs), this method integrates the advantages of both fixed and removable prostheses, offering a hybrid solution that maximizes function, comfort, and longevity. Compared to conventional FPDs, which typically require extensive tooth preparation and can weaken abutment teeth, the telescopic denture system requires minimal tooth reduction, preserving more of the natural tooth and reducing the risk of future complications. Moreover, unlike RPDs, which often suffer from poor retention and stability, especially in cases with significant alveolar ridge resorption, the telescopic denture provides superior retention and occlusal stability due to its snug fit over the telescopic primary copings using secondary copings/crowns.[5,6] The present technique offers several distinct advantages, including the preservation of natural teeth, enhanced retention and stability, prolonged abutment tooth life, and improved patient comfort. However, it also has limitations, such as increased complexity and cost, higher maintenance requirements, and a potential adjustment period for the patient. Additionally, the design was unilateral telescopic support, there may be limitations in evenly distributing the occlusal load, which could affect the long-term stability and comfort of the prosthesis.Despite these challenges, the decision to utilize this technique was driven by the need to preserve remaining tooth structures, enhance prosthesis stability, and improve the overall prognosis for the patient.[7,8] While more complex and resource-intensive, the long-term benefits of this approach, including improved retention, comfort, and preservation of oral health, make it a superior choice in cases where conventional prosthetic solutions may fall short, offering a comprehensive solution that addresses both the immediate functional needs and the long-term oral health and quality of life of the patient.[9,10]

4. Conclusion

The case reports underscore the importance of a tailored approach in prosthodontic treatment, particularly when dealing with complex clinical scenarios involving periodontal compromise and partial edentulism. The decision to use telescopic dentures supported by telescopic copings and crowns exemplifies a preventive prosthodontic strategy that prioritizes the preservation of natural teeth, enhances prosthetic stability, and improves patient comfort and function. The treatment not only addressed the immediate functional needs of the patients but also contributed to the long-term preservation of oral structures, thereby improving overall prognosis and quality of life. Despite the complexities and higher initial investment, the outcomes of these cases demonstrate that the benefits of telescopic dentures—such as superior retention, stability, and conservation of natural dentition—make them a valuable option in cases where conventional prosthetic approaches might fall short. The success of these treatments highlights the importance of individualized care plans that consider both the present and future needs of the patient, ultimately leading to more sustainable and satisfactory results.

5. Source of Funding

None.

6. Conflict of Interest

None.

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