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Review Article

Removable dental prostheses for patients with Sjögren's syndrome

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ABSTRACT

Sjögren's syndrome (SS) is a chronic autoimmune condition primarily affecting the salivary and lacrimal glands, leading to pronounced dry mouth (xerostomia) and dry eyes. These symptoms create unique challenges for SS patients requiring removable dental prostheses, as the lack of saliva significantly impacts the retention, comfort, and overall effectiveness of these devices. Without adequate saliva, prosthetic retention diminishes, and patients frequently experience issues such as mucosal irritation and increased susceptibility to infections. To address these issues, tailored material choices are critical in designing effective prosthetic solutions. Soft liners, moisture-retentive acrylics, and antimicrobial coatings are among the innovations improving both retention and comfort for SS patients. The aesthetic and functional outcomes of prosthetic solutions are also essential considerations. Enhanced retention mechanisms, such as implant-supported overdentures, not only improve masticatory performance but also aid in preserving the patient's facial profile and lip support. Advanced materials offering translucency and color stability contribute to a more natural appearance, which is critical for patient satisfaction. The maintenance of these prostheses requires specific care routines to mitigate microbial buildup and tissue irritation. Specialized cleaning agents and salivary substitutes help maintain hygiene and reduce discomfort, while regular follow-up visits enable timely adjustments to accommodate tissue changes and extend the prosthesis lifespan. Implementing a comprehensive approach that considers material selection, functional and aesthetic outcomes, and maintenance strategies can greatly enhance the quality of life for SS patients. By understanding and addressing the specific needs associated with xerostomic conditions, dental professionals can provide prosthetic solutions that offer both reliability and comfort in this challenging context. Regular patient education and diligent care routines remain essential to ensure the long-term success and durability of removable dental prostheses for individuals with SS.

Keywords: SS, Xerostomia, Removable dental prostheses, Prosthetic materials, Oral health

INTRODUCTION

Sjögren's syndrome (SS) is a chronic autoimmune disease characterized by lymphocytic infiltration of the exocrine glands, primarily the salivary and lacrimal glands, resulting in xerostomia (dry mouth) and xerophthalmia (dry eyes).[1] This condition predominantly affects middle-aged women and is often associated with other autoimmune disorders, such as rheumatoid arthritis and lupus.[2] The impact of SS on oral health is substantial, as the reduction in saliva production leads to several oral complications, including increased risk for dental caries, periodontal disease, and mucosal discomfort.[3] For patients with SS, these complications can significantly affect their quality of life, making the role of dental prostheses essential in managing oral functionality and aesthetics.

Removable dental prostheses are commonly used to restore oral function and improve the quality of life for patients with missing teeth. However, for individuals with SS, the design and management of these prostheses present unique challenges due to the dry oral environment.[4] The absence of adequate saliva impacts the retention, comfort, and functionality of removable prostheses, posing difficulties for both patients and dental professionals. Saliva is crucial for the lubrication and adhesion of dentures; thus, its scarcity in SS patients necessitates specific considerations in prosthesis fabrication and material selection to enhance retention and minimize discomfort.[1,3]

Advances in dental materials and techniques have allowed for tailored approaches to managing the oral health needs of SS patients. For instance, the use of soft liners, improved adhesives, and materials with enhanced wettability are being explored to provide better adherence and comfort for patients with xerostomia.[2,4] Moreover, understanding the importance of patient education and routine follow-ups is critical in ensuring the longevity and functionality of these prostheses in a xerostomic environment. This review aims to explore the challenges, material considerations, functional outcomes, and maintenance requirements specific to SS patient.

REVIEW

The management of removable dental prostheses in patients with SS involves addressing unique challenges due to the lack of saliva, which is essential for denture adhesion and comfort. Xerostomia exacerbates the difficulties associated with removable prostheses, as it can result in frictional irritation and poor retention. This condition not only impacts oral functionality but also increases the risk of mucosal lesions and opportunistic infections, which can complicate prosthesis wear.[5] Consequently, dental professionals need to adopt materials and designs that accommodate the dry oral environment typical of SS patients. For instance, the use of soft liners and salivary substitutes has been shown to enhance comfort and improve retention, making them viable options in prosthesis management for this population.[6]

Another critical consideration is patient education regarding maintenance and hygiene practices specific to dry mouth conditions. Given the increased vulnerability to bacterial and fungal infections, SS patients benefit from regular follow-ups and reinforcement of hygiene protocols that focus on the prevention of microbial growth on prostheses. Furthermore, advancements in adhesive technologies provide improved adhesion and reduced discomfort, addressing some of the core challenges faced by SS patients using removable dental prostheses.[6] Implementing these strategies can significantly enhance their quality of life by improving both function and comfort.

CHALLENGES OF REMOVABLE DENTAL PROSTHESES IN SS PATIENTS

Patients with SS face specific challenges when using removable dental prostheses due to the decreased or absent salivary flow characteristic of this autoimmune disorder. Saliva plays a critical role in the retention and stabilization of removable prostheses by creating a thin film that helps adhere the prosthesis to the oral tissues. In SS patients, however, the lack of adequate saliva significantly impairs this mechanism, resulting in reduced prosthetic retention and increased discomfort during use.[7] As a result, SS patients often experience issues with prosthesis stability, which can lead to complications such as tissue irritation and mucosal soreness, particularly in the mandibular region where retention is already challenging. Furthermore, the dry oral environment in SS patients fosters a higher susceptibility to bacterial and fungal colonization on the surface of dental prostheses. This can result in recurrent infections such as candidiasis, which complicates oral health and exacerbates discomfort. Maintaining oral hygiene becomes more challenging under these conditions, as typical cleaning practices may not be sufficient to manage microbial buildup on prostheses.[8] Consequently, SS patients often require specialized hygiene protocols, including the use of antimicrobial mouth rinses and regular denture cleaning, to mitigate infection risks. Dental professionals must consider these aspects and incorporate patient-specific hygiene recommendations to manage these challenges effectively.

In addition to retention and infection concerns, SS patients often face difficulties related to mucosal sensitivity and the potential for frictional damage caused by prolonged prosthesis wear. The lack of saliva not only reduces lubrication but also increases the likelihood of tissue abrasion. Over time, this can result in ulcerations or localized areas of irritation that can further complicate prosthesis use and discourage patients from consistently wearing their devices.[9] Addressing these discomforts often involves the use of soft liners or cushioning

materials that help distribute pressure more evenly and provide a more comfortable fit. However, these adaptations must be carefully managed and periodically evaluated, as they may alter the fit of the prosthesis over time or harbor microbial growth if not properly maintained. The selection of prosthetic materials for SS patients is also a crucial consideration, as materials that retain moisture can contribute to a more comfortable and functional experience. Advances in denture base materials that exhibit enhanced wettability have shown promise in improving the performance of prostheses in xerostomic conditions. These materials can help compensate for the lack of natural lubrication, making them beneficial in addressing some of the core challenges SS patients face when using removable dental prostheses.[5,7,9]

MATERIAL CONSIDERATIONS FOR PROSTHESES IN XEROSTOMIC CONDITIONS

When designing removable dental prostheses for patients with xerostomia, as seen in those with SS, the choice of materials plays a crucial role in improving patient comfort, retention, and overall functionality. Xerostomia can adversely affect the oral mucosa by increasing friction between the prosthesis and soft tissues, which can lead to mucosal irritation and soreness. To mitigate these issues, soft liners are frequently employed to cushion the interaction between the prosthesis and the oral tissues. These liners help distribute the pressure exerted by the prosthesis more evenly and provide relief from the frictional forces that are exacerbated by a lack of saliva.[9,10] Moreover, soft liners can be adapted to suit individual patient needs, offering flexibility in managing comfort levels and tissue health over time.

Beyond soft liners, advances in acrylic materials have also proven beneficial in xerostomic conditions. Acrylic-based denture materials with enhanced wettability characteristics are increasingly utilized to address the issues posed by dry mouth. These materials improve the adherence of the prosthesis to the underlying tissues by retaining moisture from salivary substitutes or lubricants, thereby reducing friction and enhancing retention.[11,12] In contrast to conventional acrylics, newer formulations designed for xerostomic conditions are more hydrophilic, which allows them to retain a thin film of moisture even in a dry environment, creating a more stable and comfortable fit for SS patients. This property is particularly advantageous as it also promotes mucosal health by reducing the likelihood of tissue abrasion. In addition to the base materials, consideration is also given to the surface characteristics of prosthetic materials in order to reduce microbial colonization. For SS patients who are more susceptible to infections due to decreased salivary flow, the surface texture of the prosthetic material is critical. Smooth-surfaced materials that minimize microbial adhesion and allow for easy cleaning can help prevent infections such as oral candidiasis.[13] Antimicrobial coatings are also being explored as a means to provide an additional layer of defense against microbial buildup on denture surfaces. These coatings can be applied to both acrylic and soft-liner materials, offering a comprehensive approach to addressing the hygiene challenges faced by xerostomic patients. Additionally, some materials used for xerostomic prostheses incorporate salivary substitutes or moisture-retaining compounds within their formulation. These compounds provide a sustained release of moisture over time, which not only enhances the comfort of the prosthesis but also reduces mucosal dryness. This approach allows for a more integrated and proactive management of xerostomia, addressing both comfort and hygiene concerns for SS patients.[9-12]

FUNCTIONAL AND AESTHETIC OUTCOMES OF PROSTHETIC SOLUTIONS

The primary goals of removable dental prostheses in patients with SS are to restore both functionality and aesthetics, addressing the significant oral impairments caused by xerostomia. Functionally, SS patients often face challenges in masticatory efficiency due to impaired prosthetic retention and stability, both of which are affected by the absence of adequate saliva. Achieving functional success with prostheses in xerostomic patients, therefore, requires designs that maximize retention even in a dry environment. Studies have shown that incorporating precision attachments or utilizing overdentures with implant support can significantly improve prosthetic stability in these patients, providing a more effective solution for maintaining masticatory function.[14] These approaches counter the limitations of traditional dentures, which often fail to remain secure without the aid of saliva.

Aesthetic outcomes are also a crucial consideration for SS patients using removable prostheses, as the dry mouth associated with the syndrome can contribute to atrophic changes in the oral tissues, affecting the facial profile and lip support. To address this, prosthetic designs often incorporate facially contoured denture bases that provide additional support to the lips and cheeks, helping to maintain a natural appearance.[15] The selection of artificial teeth that blend well with the patient's natural dentition or existing facial features plays a significant role in achieving aesthetic harmony. Dental materials that offer translucency and color stability are preferred to ensure that the prosthesis remains visually appealing over time.

Patient satisfaction with prosthetic solutions in SS is closely linked to both the functionality and aesthetics of the prostheses, as well as the comfort they provide. As a result, ongoing adjustments are often necessary to optimize fit and appearance as tissue changes occur over time. The integration of aesthetic considerations into functional designs can improve patient adherence to wearing their prostheses, as individuals are more likely to use devices that meet both their functional needs and their expectations for natural-looking replacements.[16] Advancements in material science have led to the

development of acrylics and composites that resist staining and wear, which is particularly important for patients with reduced salivary flow, as they are prone to increased plaque accumulation and discoloration.

Some recent innovations have focused on customizing prosthetic solutions to match individual patient preferences, using digital design techniques to enhance both functionality and aesthetics. Digital imaging and CAD/CAM technology enable precise modeling of prostheses, allowing for a tailored fit that considers the unique contours of each patient's oral cavity. This approach not only enhances functional outcomes by improving retention but also enables precise aesthetic customization, thereby addressing both the functional and visual needs of SS patients.[13,16]

MAINTENANCE AND LONG-TERM CARE OF REMOVABLE PROSTHESES IN SS

Maintenance and long-term care of removable prostheses for patients with SS require specific considerations due to the challenges associated with xerostomia. Reduced salivary flow not only affects prosthetic stability but also complicates hygiene management, increasing the risk of microbial accumulation on prostheses. Regular cleaning is essential to prevent infections, particularly candidiasis, which is a common issue for SS patients with compromised oral health. The use of specialized denture cleaning solutions with antimicrobial properties is recommended, as they help control bacterial and fungal growth on prosthetic surfaces without compromising the material integrity of the prostheses.[13]

The lack of natural lubrication in the mouth can lead to frictional irritation and ulcerations, making the maintenance of soft tissues critical for these patients. Dentists often advise the use of salivary substitutes or artificial saliva to improve moisture levels and enhance comfort. These products can be applied regularly to the oral tissues and prosthetic surfaces to mimic the lubricative properties of saliva, reducing friction and improving the overall wearing experience.[6] Moreover, the inclusion of fluoride treatments in the maintenance routine can help to mitigate the increased caries risk associated with xerostomia, offering an added layer of protection for the remaining natural dentition and prosthetic components.

Frequent follow-up visits are also necessary to evaluate the fit and function of the prostheses over time. SS patients may experience changes in oral tissue volume due to the atrophic effects of the syndrome, which can affect the fit of the prostheses and lead to discomfort or reduced functionality. During these visits, adjustments can be made to the prosthesis to accommodate tissue changes, and relining or rebasing may be performed to enhance the fit and stability.[17] Routine professional assessments also allow for the identification of early signs of wear or material degradation, which are important to address promptly to prevent further complications and ensure the longevity of the prosthesis. Patients with SS are advised to adopt a diligent home care routine, incorporating gentle brushing of the prosthesis and soaking it overnight to maintain cleanliness. The use of soft-bristled brushes and non-abrasive cleaners is particularly important to avoid damaging the prosthetic materials. Educating patients on proper denture handling and storage practices is an integral part of the maintenance protocol, as it empowers them to take an active role in the long-term care of their prostheses and supports better oral health outcomes overall.[6,17]

CONCLUSION

Managing removable dental prostheses for patients with SS involves addressing the unique challenges posed by xerostomia. By selecting appropriate materials and designing prostheses with both functional and aesthetic outcomes in mind, dental professionals can significantly improve the quality of life for SS patients. Regular maintenance and patient education are crucial for long-term success, ensuring that these prostheses provide comfort and reliability in the face of the ongoing oral health challenges associated with the syndrome.

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