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Review Article

Long-term maintenance and complications of fixed dental prostheses

Haitham Mohammed Binhuraib[1]*, Sundus Saad Alqarni[2], Nagam Mohammed Mohsen[3], Abeer Ahmad Alharbi[4], Ahmed Ibrahim Alghamdi[5], Adeeb Maseer Almotairi[6], Abdulrahman Hussain Alhussain[7], Rahaf Ayman Felemban[5], Anwar Salem Alzahrani[5], Ehdaa Sameer Eyouni[8], Razan Ibrahim Alhajjaji[9]

[1]Department of Prosthodontics, North Jeddah Specialist Dental Center, King Abdullah Medical Complex, Jeddah, Saudi Arabia
[2]College of Dentistry, King Khalid University, Abha, Saudi Arabia
[3]Self Experts Center, Jeddah, Saudi Arabia
[4]Urwah Primary Healthcare Center, Ministry of Health, Medina, Saudi Arabia
[5]College of Dentistry, King Abdulaziz University, Jeddah, Saudi Arabia
[6]College of Dentistry, King Saud University, Riyadh, Saudi Arabia
[7]Ebtsamtac Clinic, Riyadh, Saudi Arabia
[8]Ghaym Medical Center, Medina, Saudi Arabia
[9]Al Madinah Primary Healthcare Center, Ministry of Health, Mecca, Saudi Arabia

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***Correspondence:**
Dr. Haitham Mohammed Binhuraib,
E-mail: hhuraib@moh.gov.sa

ABSTRACT

Fixed dental prostheses (FDPs), commonly known as dental bridges, play a pivotal role in restorative dentistry, offering patients a means to regain oral function and aesthetics in cases of tooth loss. These prosthetic devices, anchored to natural teeth or dental implants, bridge the gap created by missing teeth, improving chewing, speech, and smile aesthetics. However, the successful deployment of FDPs requires not only their initial placement but also long-term maintenance and an understanding of potential complications. Effective oral hygiene, regular dental surveillance, and professional dental cleanings are essential for preserving FDP longevity. Vigilance is crucial as FDPs, while resistant to cavities themselves, can pose challenges in cleaning around abutment teeth. Complications, including dental caries, periodontal issues, crown or bridge fractures, abutment tooth deterioration, aesthetic alterations, sensory sensitivity, and even prosthetic failure, are potential concerns. Timely intervention and preventive measures are key to addressing these issues. When complications arise, dental practitioners can often repair superficial problems like crown fractures. Profound or recurrent complications may require more extensive interventions, such as fabricating a new bridge or considering alternative restorative options like dental implants or removable partial dentures. By embracing these principles of maintenance and management, patients can optimize the durability and functionality of their FDPs while minimizing associated risks, ensuring a healthy and confident smile for years to come.

Keywords: Fixed dental prostheses, Dental maintenance, Dental complications, Oral hygiene, Dental care

INTRODUCTION

Fixed dental prostheses (FDPs), also commonly referred to as dental bridges, serve as integral restorative solutions within the realm of dentistry, offering patients the opportunity to regain both form and function in cases of tooth loss. These prosthetic devices, firmly anchored to natural teeth or dental implants, bridge the gap created by missing teeth, not only facilitating improved chewing and

speech but also restoring a natural and aesthetically pleasing smile. In contemporary dentistry, FDPs have gained remarkable popularity owing to their capacity to address a spectrum of dental issues. Based on the comprehensive evaluation of edentulism by Almusallam et al, a significant proportion of the participants [426 69%)] were identified as having at least one absent tooth.[1] Almutairy and Mohan (62.5%) identified an equivalent prevalence of missing teeth in a study conducted in the AlQassim region of Saudi Arabia.[2] With the aging population and the advent of advanced dental technologies, the demand for FDPs continues to rise. However, the successful deployment of these restorations necessitates more than just the initial placement; it calls for long-term vigilance, maintenance, and an understanding of potential complications that may arise over time.

Statistics reveal a significant prevalence of tooth loss globally, predominantly attributable to factors such as dental caries, periodontal diseases, trauma, and congenital anomalies. According to the WHO, untreated dental caries in permanent teeth affected an estimated 2.3 billion individuals worldwide in 2020.[3] The consequential tooth loss has substantial ramifications, impacting both oral health and overall well-being.

To address this widespread issue, dental prostheses have become a crucial component of modern dentistry. Among these prosthetic solutions, FDPs stand out as an essential means of restoring oral function and esthetics. This extensive utilization sheds light on the pivotal role of FDPs in improving the quality of life for numerous individuals affected by tooth loss.

While FDPs offer a multitude of advantages, including improved masticatory function and aesthetic enhancement, they are not immune to challenges that can arise over time. Proper maintenance and an awareness of potential complications are crucial for ensuring the continued success of these restorations. Dental practitioners and patients alike must be knowledgeable about the measures required to preserve the structural integrity and function of FDPs, as well as the strategies to address complications if they arise.

This review delves into the long-term maintenance and complications associated with fixed dental prostheses. It illuminates the pivotal role of oral hygiene, regular dental surveillance, and professional dental cleanings in safeguarding the longevity of FDPs. Furthermore, it examines complications such as dental caries, periodontal concerns, crown or bridge fractures, abutment tooth deterioration, aesthetic alterations, sensory sensitivity, and even prosthetic failure.

By understanding these potential challenges and embracing preventive measures, dental professionals and patients can collaboratively work toward ensuring that FDPs continue to serve as effective and durable solutions for tooth loss.

METHODS

This study was based on a comprehensive literature search conducted on 02 January 2024, in the Medline and Cochrane databases, utilizing the medical topic headings (MeSH) and a combination of all available related terms, according to the database. To prevent missing any possible research, a manual search for publications was conducted through Google Scholar, using the reference lists of the previously listed papers as a starting point. We looked for valuable information in papers that discussed the long term maintenance and complications of fixed dental prostheses. There were no restrictions on date, language, participant age, or type of publication.

DISCUSSION

Effective oral hygiene is the cornerstone of FDP maintenance. Patients with FDPs must recognize the heightened importance of meticulous oral care. They should follow dental professionals' guidance on proper brushing and flossing techniques, focusing not only on natural teeth but also on the areas around and beneath the prostheses.[4] Particular attention should be given to cleaning the margins where the FDP meets the natural teeth or abutments.[5] The use of fluoride toothpaste is recommended to strengthen the natural tooth structure and protect against dental caries.[6] Patients may also be advised to incorporate interdental brushes, dental floss, or water flossers into their daily routine to effectively clean interproximal spaces and remove plaque accumulation.[7]

Regular dental check-ups are instrumental in the continued success of FDPs. During these appointments, dental professionals thoroughly examine the prostheses, ensuring that they remain well-seated and secure. Any signs of loosening or mobility should be promptly addressed to prevent further complications.[8] Additionally, these routine visits enable early detection of potential issues, such as gingival inflammation, abutment tooth decay, or prosthetic wear.[9] Dental practitioners may also assess the occlusion (bite) to confirm that it is harmonious and does not place excessive force on the FDP, which could lead to discomfort or functional problems. Patients are encouraged to adhere to their scheduled appointments to benefit from timely interventions and professional guidance.

Professional dental cleanings conducted by dental hygienists play a pivotal role in maintaining the health of FDPs.[10] These cleanings extend beyond the capabilities of routine home care, as they involve the comprehensive removal of plaque and calculus deposits, especially in areas that are challenging to access around and beneath the prostheses.[11] The removal of these deposits is essential in preventing gingival inflammation and periodontal disease, which can compromise the stability of FDPs over time. Patients are typically advised to undergo professional cleanings at regular intervals, as recommended by their dental practitioner. These appointments not only contribute to oral health but also enhance the longevity of FDPs.

Patients with FDPs should exercise caution when making dietary choices.[12] Certain foods and eating habits can pose a risk to the structural integrity of the prostheses. Hard or overly crunchy foods, such as nuts, popcorn, or hard candies, can exert excessive force on FDPs and lead to crown or bridge fractures.[13] Similarly, sticky or chewy foods may dislodge the prosthesis or cause it to become dislodged. Patients are advised to avoid biting into hard objects or chewing ice, as these activities can result in prosthetic damage. It is prudent to choose a well-balanced diet rich in essential nutrients to support overall oral health. Additionally, patients may be counseled to cut larger or tougher foods into smaller, more manageable pieces to reduce the strain on FDPs during chewing.

By adhering to these principles of long-term maintenance, patients can optimize the durability and functionality of their fixed dental prostheses while minimizing the risk of complications.

Dental caries, commonly known as cavities, pose a significant risk to the natural teeth that serve as abutments for FDPs.[14] While the prostheses themselves are resistant to cavities, the adjacent abutment teeth can become susceptible if proper oral hygiene is not diligently maintained. This risk arises from the fact that FDPs may create additional challenges in cleaning around the margins where the prosthesis meets the natural tooth. Dentists emphasize the ongoing need for patients to practice meticulous brushing and flossing to protect these abutment teeth from caries. Regular dental check-ups allow for the early detection of any emerging issues and provide an opportunity for dental professionals to reinforce the importance of oral hygiene.

Inadequate oral hygiene practices can also lead to periodontal issues associated with FDPs. Neglecting the spaces around and beneath the pontic (the artificial tooth or teeth in the middle of the bridge) can result in gingival inflammation, periodontitis, and even bone loss.[11] This underscores the significance of routine dental check-ups, where dental practitioners can thoroughly examine the periodontal health around FDPs and intervene promptly if any concerns arise. Early detection and appropriate management of these periodontal issues are crucial to maintaining the long-term stability of FDPs.

The porcelain crowns that adorn FDPs, while durable, can be susceptible to chipping or fracturing, especially when exposed to excessive mechanical stress or trauma.[15] Patients are cautioned against using their teeth for non-standard activities, such as opening packages or chewing on hard objects, as these actions can result in damage to the prosthetic components.[16] Preventive measures include avoiding habits that may compromise the integrity of FDPs and seeking prompt dental attention if any signs of damage or fracture are observed.

The natural teeth serving as abutments for FDPs may experience various issues over time, including dental caries, endodontic problems (root canal issues), or gingival recession.[17] These concerns can significantly impact the stability of the FDP. Dental practitioners closely monitor the abutment teeth during routine check-ups to detect and address any problems promptly. Early intervention, such as restorative treatments or root canal therapy, may be necessary to preserve the structural integrity of these crucial supporting teeth.

Over time, changes in coloration, fit, or appearance of FDPs may occur due to wear, discoloration, or alterations in the contours of the surrounding gingival tissues.[18] While these alterations are typically gradual, they can have a noticeable impact on the aesthetics of the restoration. Patients should be aware of these potential changes and discuss any concerns with their dental provider. Options for improving aesthetics, such as professional cleaning or prosthetic adjustments, may be considered when necessary.

Some individuals may experience heightened dental sensitivity in the abutment teeth following the placement of an FDP. This sensitivity may manifest as discomfort when consuming hot or cold foods and beverages or when biting down on certain foods.[19] Sensory sensitivity should be promptly reported to the dentist for evaluation and management. Dentists can assess the cause of sensitivity and recommend appropriate measures, such as desensitizing treatments or adjustments to the prosthesis.

In more severe instances, FDPs may experience prosthetic failure that necessitates their replacement or consideration of alternative dental treatments. Prosthetic failure can result from a combination of factors, including structural issues within the prostheses, recurrent complications, or significant changes in oral health.[20] When prosthetic failure occurs, dental professionals work closely with patients to explore suitable treatment options, which may include the replacement of the FDP or the consideration of alternative restorative approaches.

Overall, understanding these potential complications and adhering to regular dental care and maintenance routines are essential for maximizing the longevity and function of fixed dental prostheses while minimizing the risks associated with these restorations.

Repair and replacement

When patients encounter superficial complications with their FDPs, dental practitioners can often address these issues through restorative measures. A common example is crown fractures, where a portion of the porcelain crown may chip or break due to accidental trauma or biting into hard objects. In such cases, dentists can employ restorative techniques such as dental bonding or crown replacement to repair the damaged area. Dental bonding involves the application of a tooth-colored resin material to fill in or rebuild the fractured portion, restoring both function and aesthetics.[21] Alternatively, if the damage is extensive or if

the prosthesis is old and exhibiting wear, the dentist may recommend replacing the crown to ensure its long-term durability and appearance.

Profound or recurrent complications related to FDPs may necessitate more extensive interventions. These complications can range from recurrent dental caries or structural issues within the prostheses to problems with the abutment teeth or other components of the restoration.[14] In such cases, dental practitioners conduct a thorough evaluation to assess the extent and nature of the complications. Depending on the findings, they may recommend a range of treatment options.

One potential solution for complex or recurrent complications is the fabrication of a new dental bridge. This process involves designing and creating a completely new set of prosthetic teeth, crowns, or pontics to replace the existing FDP.[22] The decision to fabricate a new bridge is typically made when the existing prosthesis is no longer viable due to extensive damage, compromised structural integrity, or significant wear and tear. The fabrication of a new bridge allows for the customization of the prosthesis to match the patient's current oral health needs and aesthetic preferences. Dental impressions and digital scans are taken to ensure a precise fit and appearance.

In certain situations, the complexity or recurring nature of complications may lead dental professionals and patients to consider alternative restorative options beyond FDPs. These alternatives could include dental implants, removable partial dentures, or other restorative treatments.[23] Dental implants can support individual crowns or bridges. Removable partial dentures provide a removable option for replacing missing teeth and can be a suitable choice for patients with specific dental conditions or preferences.

Maintaining open and transparent communication between patients and dental professionals is paramount in addressing and resolving complications associated with FDPs. Patients are encouraged to promptly report any issues or concerns they may experience with their prostheses. Dental practitioners rely on patient feedback, visual examinations, diagnostic imaging, and other assessments to determine the most suitable course of action for resolving complications. This collaborative approach ensures that the patient's oral health and functional well-being are preserved while addressing any challenges that may arise.

CONCLUSION

The long-term maintenance and management of FDPs are crucial components of modern dentistry. Patients must prioritize meticulous oral hygiene, regular dental check-ups, and professional dental cleanings to preserve the durability and function of their FDPs while minimizing the risk of complications. Additionally, awareness of potential issues such as dental caries, periodontal concerns, crown or bridge fractures, abutment tooth deterioration, aesthetic alterations, sensory sensitivity, and prosthetic failure is essential for timely intervention and resolution.

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