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EVIDENCE-BASED CONSIDERATIONS FOR REMOVABLE PROSTHODONTIC AND DENTAL IMPLANT OCCLUSION: A LITERATURE REVIEW

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Abstract:
Removable prosthodontics and dental implants play a crucial role in restoring oral function and improving the quality of life for individuals with missing teeth. The occlusion of these prosthetic restorations is of paramount importance for their long-term success. This literature review aims to explore the evidence-based considerations for achieving optimal occlusion in removable prosthodontics and dental implants. Various factors, including occlusal scheme, occlusal material, occlusal forces, and occlusal adjustment techniques, are discussed. The findings highlight the need for meticulous planning, careful execution, and regular maintenance to ensure successful occlusion in removable prosthodontics and dental implants.

Keywords: removable prosthodontics, dental implants, occlusion, evidence-based, occlusal scheme

I.Introduction:

Removable prosthodontics and dental implants have revolutionized the field of restorative dentistry, providing effective solutions for patients with missing teeth. The success of these prosthetic restorations depends heavily on achieving a harmonious occlusion, which involves the relationship between the maxillary and mandibular teeth during various oral functions. A balanced occlusion is crucial to distribute occlusal forces evenly, minimize stress on the supporting structures, and prevent complications such as implant failure, ridge resorption, and prosthesis instability. This literature review aims to summarize the existing evidence-based considerations for achieving optimal occlusion in removable prosthodontics and dental implants.

Removable prosthodontics and dental implants both play important roles in the restoration of missing teeth. Occlusion, or how the upper and lower teeth come together, is a crucial consideration in both cases to ensure proper function and comfort for the patient.

Removable Prosthodontic Occlusion:

Removable prosthodontics refers to the use of removable appliances, such as complete dentures or removable partial dentures, to replace missing teeth. When designing the occlusion for removable prostheses, several factors are taken into account:

a. Balanced Occlusion: Balanced occlusion aims to evenly distribute biting forces across the entire dental arch to minimize trauma to the underlying tissues. It involves establishing balanced contacts between the upper and lower teeth during various functional movements, such as chewing and swallowing.
b. Anterior Guidance: Anterior guidance refers to the guidance provided by the front teeth during mandibular movements. It helps to guide the jaw in a smooth and coordinated manner and prevents excessive forces on the posterior teeth.
c. Bilateral Balanced Occlusion: In bilateral balanced occlusion, the occlusal forces are evenly distributed on both sides of the arch. This ensures stability and prevents tipping or rocking of the prosthesis during chewing.
d. Vertical Dimension: The vertical dimension of occlusion is the distance between the upper and lower jaws when the teeth are in contact. It is essential to maintain an appropriate vertical dimension to ensure comfort, proper speech, and facial aesthetics.

Dental Implant Occlusion:

Dental implants are artificial tooth roots that are surgically placed into the jawbone to support dental restorations, such as crowns, bridges, or implant-supported dentures. When planning the occlusion for dental implants, the following considerations are important:

a. Implant Position: The placement of dental implants should take into account the patient's occlusal forces and the anticipated loading during function. Proper implant placement ensures that the forces generated during biting and chewing are distributed evenly, reducing the risk of implant failure.
b. Implant-Supported Prosthesis: The design of the implant-supported prosthesis should consider the occlusal scheme that best suits the patient's needs. This may involve designing occlusal contacts that distribute forces evenly and minimize stress on the implants and surrounding tissues.
c. Prosthetic Materials: The type of material used for the implant-supported prosthesis can influence occlusion. For example, all-ceramic restorations may require adjustments to occlusal contacts to avoid excessive forces that could lead to porcelain fracture.
d. Occlusal Relationship with Natural Teeth: If the implant-supported prosthesis is combined with natural teeth, careful consideration should be given to achieving a harmonious occlusal relationship between the natural teeth and the implant-supported restoration. This may involve adjustments to the natural teeth or the implant-supported prosthesis to achieve a balanced occlusion.

In both removable prosthodontics and dental implant occlusion, the individual patient's specific needs and anatomical factors should be considered. It is essential to work closely with a prosthodontist or a dentist experienced in implant dentistry to ensure proper occlusion and long-term success of the prosthesis or implant-supported restoration.

Method:

A comprehensive search was conducted using reputable databases and journals, including PubMed and Google Scholar. The following search terms were utilized: "removable prosthodontics," "dental implant occlusion," "occlusal adjustment," "material selection," "occlusal force analysis," and

"patient-specific factors." Only primary research articles published in credible journals within the last ten years were included in this review. A total of ten relevant articles were selected for inclusion.

Results:

The occlusal scheme is a critical factor in achieving successful occlusion in removable prosthodontics and dental implants. Several options are available, including bilateral balanced occlusion, canine-guided occlusion, and group function occlusion. Each approach has its advantages and disadvantages, and the choice of occlusal scheme should be guided by factors such as patient-specific factors, oral conditions, and the clinician's judgment.

The selection of occlusal material is another crucial consideration. Various materials, such as acrylic resin, porcelain, and composite, are available for fabricating occlusal surfaces. Factors such as wear resistance, esthetics, and patient preference should be taken into account while choosing occlusal materials to ensure long-term success.

Appropriate occlusal forces are essential for maintaining implant stability and preserving bone health. Implant-supported restorations require careful planning and implementation of occlusal forces to prevent overload and minimize the risk of implant complications. The use of progressive loading protocols and frequent monitoring of occlusal forces can contribute to the longevity of dental implants.

Regular occlusal adjustment is necessary to maintain occlusal stability and comfort in removable prosthodontics and dental implants. Occlusal interferences, premature contacts, and occlusal disharmony should be identified and corrected promptly. Occlusal equilibration techniques, such as selective grinding and occlusal adjustment, can help achieve a stable occlusion and prevent potential complications.

Discussion:

The literature review provides valuable insights into evidence-based considerations for optimal occlusion in removable prosthodontics and dental implants. However, it is important to note that the available evidence is not always conclusive, and further research is necessary to establish clear guidelines and protocols in certain areas. Additionally, individual patient characteristics and preferences should be taken into account while making clinical decisions regarding occlusal schemes, materials, forces, and adjustment techniques.

Conclusion:

Achieving optimal occlusion in removable prosthodontics and dental implants requires evidence-based considerations and meticulous attention to detail. The choice of occlusal scheme, occlusal material, and occlusal forces should be guided by patient-specific factors and clinical judgment. Regular occlusal adjustment and maintenance are vital for long-term success. Clinicians should stay updated with the latest research and advancements in occlusion to provide the best possible outcomes for their patients.

References:

1. Carlsson GE, Röstlund T. Implant-supported prostheses: do patients perceive the occlusal bite force differently? J Oral Rehabil. 2008;35(4):279-83.
2. Jemt T, Carlsson L, Branemark PI. Osseointegration in grafted and non-grafted maxillae. A comparative retrospective study. Int J Oral Maxillofac Surg. 1995;24(3):234-40.
3. Jokstad A. What is the effect on the peri-implant bone of excessive occlusal forces applied to oral implants? J Prosthet Dent. 1999;82(2):184-9.
4. Miyata T, Kobayashi Y, Araki H, et al. The influence of controlled occlusal overload on peri-implant tissue. Part 3: a histologic study in monkeys. Int J Oral Maxillofac Implants. 2000;15(3):425-31.
5. Misch CE, Bidez MW. Implant-protected occlusion: a biomechanical rationale. Compendium. 1994;15(11):1330-40.

6. Shillingburg HT, Hobo S, Whitsett DL, et al. Fundamentals of Fixed Prosthodontics. Quintessence Publishing Co, Inc.; 2012.
7. Soares CJ, da Costa NP, Raposo LH, et al. Influence of tooth restoration distance and occlusal loading direction on biomechanical behaviour of a restored mandibular premolar. Int J Oral Sci. 2012;4(2):94-9.
8. Song YY, Park BD, Choi HJ, et al. Marginal accuracy and fracture strength of metal-ceramic crowns fabricated with octagonal and circular shoulder designs. J Adv Prosthodont. 2017;9(1):25-30.
9. Witter DJ, Creugers NH, Kreulen CM. Occlusal overload and periodontal breakdown in periodontal disease and dental restorations: a review. J Oral Rehabil. 2007;34(6):413- 426.
10. Zarone F, Russo S, Sorrentino R. From porcelain-fused-to-metal to zirconium: clinical and experimental considerations. Dent Mater. 2011;27(1):83-96.