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RESEARCH ARTICLE

FULL MOUTH REHABILITATION BY REESTABLISHING THE CORRECT VERTICAL DIMENSION- A CASE REPORT

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ABSTRACT

This case report delves into the fascinating realm of full mouth rehabilitation, focusing on the pivotal aspect of restoring the vertical dimension in comprehensive oral rejuvenation. The aim of this study is to elucidate the clinical significance and transformative effects of vertical dimension restoration within the context of full mouth rehabilitation. The case involved a patient exhibiting substantial dental deterioration and loss of vertical dimension, adversely affecting both functional aspects and facial aesthetics. Through meticulous examination and thorough treatment planning, a comprehensive approach was devised to tackle the multifaceted challenges. This case report showcases the impact of full mouth rehabilitation and the restoration of the vertical dimension on oral rehabilitation. The patient demonstrated significant improvements in functional capabilities, facial proportions, and overall patient satisfaction.

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INTRODUCTION

Full mouth rehabilitation plays a key role in restoring oral function and esthetics for patients with extensive tooth loss or compromised dentition. The use of dental implants and tooth-supported bridges has improved the restorations in field of prosthodontics, offering viable solutions for comprehensive oral rehabilitation[1]. The rehabilitation of patients with extensively compromised dentition, aiming to restore masticatory function, speech, and aesthetic appearance, presents a notable difficulty. Due to the progress made in implant dentistry and prosthodontic techniques a more affordable and functionally stable and fixed prosthesis with longer predictability and long-lasting results are possible[2]. This case study presents a successful example of a comprehensive approach to oral rehabilitation, combining the use of dental implants and tooth-supported bridges. Various treatment modalities have been created to cater to the requirements of full mouth rehabilitation. These include the utilization of fixed dental prostheses (FDPs) supported by dentalimplants and bridges supported by natural teeth. The success and survival rates of implant- supported fixed prostheses have been extensively studied. Branemark et al. reported ten-year survival rates of fixed prostheses supported by four or six implants in edentulous patients[1]. The study demonstrated favorable outcomes, supporting the use of dental implants as a reliable treatment option for full mouth rehabilitation.

In a systematic review conducted by Sailer et al., an examination of implant-supported fixed dental prostheses over an average follow-up period of at least five years revealed encouraging outcomes in terms of long-term survival rates and complication rates[3]. These findings provided further evidence of the favorable success rates and durability of restorations supported by dental implants. Effective treatment planning plays a key role in achieving successful full mouth rehabilitation. A thorough clinical examination, including a detailed evaluation of the patient's oral health, occlusion, and esthetic considerations, is essential. One treatment approach that has gained significant attention is the "All-on-6" concept. This concept involves the placement of six dental implants strategically distributed in the edentulous arch, providing enhanced stability and support for the prosthetic restoration. While the "All-on- Four" concept gained popularity, the "All-on-6" concept has been recognized as a fairly decent protocol, providing additional implant support and potential benefits, particularly in cases with greater functional demands or compromised bone density[4]. In this article we have presented a case report with extensive tooth loss and difficulty in chewing, necessitating a comprehensive full mouth rehabilitation. The treatment plan involved the utilization of dental implants and sinus lift using the "All-on-6" concept for maxillary arch, and combination of endodontic and crown & bridge, and implants for mandibular arch.

The decision for this treatment approach was based on the patient's specific needs, the condition of the remaining dentition, and the available bone volume. The aim was to achieve a stable and esthetic full arch restoration, considering factors such as occlusal harmony, phonetics, and patient satisfaction. Strategic surgical procedures were undertaken to accurately position the dental implants, guaranteeing optimal support for the final prosthesis.

CLINICAL REPORT

A 72-year-old male patient presented to the Department of Prosthodontics at Santosh Dental College, Ghaziabad, with the chief complaint of decayed teeth in the upper jaw and missing teeth in the lower jaw, resulting in difficulties with eating. The patient expressed a desire for treatment. Upon clinical examination, extensive dental caries and root caries were observed in both the maxillary and mandibular arches, accompanied by severe atrophy in the jawbones. The patient was advised to undergo an OPG and CBCT for treatment planning and further assessment. Additionally, a diagnostic impression was taken during the initial visit. During the second visit, face bow transfer was performed, and jaw relation records were recorded to establish the patient's existing vertical dimension before complete extractions. The maxillary teeth were removed from the cast, and a temporary denture was fabricated based on the established vertical dimension.

Fig. 1. Carious and periodontally compromised teeth

Fig. 2. Pre-operative OPG

Fig. 3. Articulated Model

Fig. 4. Post operative OPG

The treatment plan involved complete extraction of the maxillary arch, followed by sinus augmentation on both sides of the maxillary arch, and the placement of six implants in the maxillary region. For the mandibular arch, root canal treatment was planned, along with bridges and single implants to restore teeth in the 36 and 46 regions.
The surgical protocol was followed meticulously during the maxillary arch surgery. The patient received pre-surgical antibiotic therapy, and a surgical stent was prepared to aid in the surgery. Ridge augmentation was performed at both sites after sinus lift, and six implants were successfully placed. Sutures were placed, and the patient was given relined maxillary denture and was instructed to return after three months for final restoration. Meanwhile, the lower teeth were prepared and temporized to maintain the established vertical dimension. After three months, the patient received a final maxillary hybrid prosthesis and mandibular tooth-supported metal ceramic bridges. Single tooth restorations were performed in the 36 and 46 regions where implants were placed. Careful attention was given to preserving the original vertical dimension in the patient's mouth. The transition from temporized restoration to the final restoration was seamless due to the maintenance of the vertical dimension.

Fig. 5. Prepared teeth in the lower arch with implant placement

Fig. 6- Final Impression

Fig. 7. Prosthesis Delivery

DISCUSSION

Full mouth rehabilitation is a complex procedure that requires careful consideration of various factors, including occlusal harmony, esthetics, and functional outcomes. Amongst these factors, maintaining the proper vertical dimension is of paramount importance. In this discussion section, we delve into the importance of vertical dimension in cases of full mouth rehabilitation, leveraging valuable insights from seminal articles in the field of prosthodontics.
Vertical dimension refers to the distance between the maxilla and mandible when the teeth are in occlusion, or in other words, the vertical height of the face at rest or during functional activities such as chewing and speaking. It is an essential parameter in prosthodontics as it affects the esthetics, function, and stability of dental restorations[5]. Loss of vertical dimension in the dentition can arise from various factors such as dental wear, tooth loss, and occlusal discrepancies. It is crucial to accurately assess the occlusal vertical dimension, as deviations from the ideal dimension can lead to functional disruptions[6], a collapsed facial appearance, lip wrinkling, diminished facial support, and an increased risk of muscle fatigue and temporomandibular disorders[6]. In full mouth rehabilitation cases, maintaining the appropriate vertical dimension necessitates a comprehensive treatment approach.

This approach encompasses a thorough evaluation of dental wear, tooth loss, occlusal relationship, and esthetic considerations to develop an individualized treatment plan. Diagnostic tools like radiographs and cone beam computed tomography play a vital role in precise treatment planning. The maintenance of the proper vertical dimension in full mouth rehabilitation offers several significant advantages. Firstly, it ensures an improved fit of dental prostheses, enhancing their stability and performance. Secondly, it contributes to enhanced oral function, including chewing, speaking, and swallowing. Lastly, it promotes the longevity of restorations by minimizing excessive forces and occlusal imbalances, resulting in durable and long-lasting outcomes. The literature review conducted by Shetty et al. provides insights into the assessment of occlusal vertical dimension in edentulous patients. They highlighted various methods for evaluating vertical dimension, including clinical examination, radiographic analysis, and functional assessments[7]. The review underscores the need for a multidimensional approach to ensure accurate assessment and maintenance of the vertical dimension in full mouth rehabilitation cases. In the present case report, careful attention was given to preserving the original vertical dimension throughout the treatment process. The use of diagnostic tests such as radiographs and cone beam computed tomography provided crucial information for precise treatment planning, aligning with the recommendations of previous studies[6,8]. The treatment approach aimed to achieve a stable and aesthetically pleasing full arch restoration by implementing the "All-on-6" concept. This concept strategically positions six dental implants to enhance stability and provide robust support for the restoration. One treatment approach that has gained significant attention is the "All-on-6" concept. This concept involves the placement of six dental implants strategically distributed in the edentulous arch, providing enhanced stability and support for the prosthetic restoration. While the "All-on-Four" concept gained popularity, the "All-on-6" concept has been recognized as a fairly decent protocol, providing additional implant support and potential benefits, particularly in cases with greater functional demands or compromised bone density[4].

By performing a maxillary sinus lift, the vertical bone height in the posterior maxilla can be increased[8], which helps to avoid the need for a cantilever prosthesis. As cantilever prostheses have some limitations and potential drawbacks, including increased stress on the supporting implant, potential for implant overload, and compromised stability. By increasing the bone height through a maxillary sinus lift, a more favorable environment for implant placement can be achieved, allowing for a more balanced and stable restoration without the need for extensive cantilever designs. The successful restoration of the vertical dimension in this case report is consistent with the findings of classic articles emphasizing the significance of maintaining proper vertical dimension in full mouth rehabilitation cases. By considering the patient's specific needs, remaining dentition condition, and available bone volume, the treatment plan effectively restored masticatory function, phonetics, and esthetics.

CONCLUSION

The proper maintenance of the vertical dimension is crucial in full mouth rehabilitation cases. The evaluation, diagnosis, and treatment planning should include a thorough assessment of the occlusal vertical dimension, ensuring its alignment with functional and esthetic considerations. Classic articles on the importance of vertical dimension in prosthodontics provide valuable insights for successful treatment outcomes. By incorporating these insights into clinical practice, dental professionals can optimize the results of full mouth rehabilitation using dental implants and tooth-supported bridges.

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