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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/20615
DOI URL: <http://dx.doi.org/10.21474/IJAR01/20615>



RESEARCH ARTICLE

INTERDISCIPLINARY MANAGEMENT OF SUPRAERUPTED PREMOLAR: A CASE REPORT

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Manuscript Info

Manuscript History

Received: 16 January 2025

Final Accepted: 19 February 2025

Published: March 2025

Key words:-

Interdisciplinary Dentistry,
Supraeruption, Intrusion, Bridges

Abstract

Prosthodontic rehabilitation of patients with missing teeth are often complicated by situations such as supraeruption of the teeth in the opposite arch, rotation/tilting of the teeth adjacent to the edentulous space. Delayed replacement of missing teeth complicates both functional and aesthetic prosthodontic rehabilitation. However, such situations can be overcome by an interdisciplinary approach of Prosthodontics with Orthodontics. In order to align and place teeth, various orthodontic procedures, such as intrusion utilizing Temporary Anchorage Devices (TADs), are used. Prosthodontic rehabilitation can then be used to restore the missing tooth or teeth with the best possible function and appearance. This article aims to demonstrate the importance of multidisciplinary approach through a case which was prosthodontically restored after orthodontic alignment.

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Introduction:-

In modern dentistry, the successful integration of prosthodontics and orthodontics plays a pivotal role in achieving optimal functional and esthetic outcomes, especially in cases where missing teeth have been absent for extended periods. Prolonged edentulism without prosthetic restoration can cause complications such as supraeruption, drifting, reduced masticatory efficiency, speech difficulties. In a study on the positional alterations of adjacent teeth in edentulous gaps, **Petridis et al.** reported drifting of the adjacent teeth and supra-eruption of opposing teeth (1). According to **Rosenstiel et al.**, not replacing a missing posterior tooth can disturb the stomatognathic system and cause undesirable reactions such as drifting, rotation, or supraeruption of teeth (2). However, the positional stability of teeth opposing or adjacent to an edentulous area may not have a significant impact on a patient's oral function unless there are occlusal interferences or there is esthetical concern of the patient. The time by which the patient feels necessary to replace the missing teeth, it becomes challenging for the Prosthodontist owing to supraeruption, rotation, or tilting of teeth. To address these issues, a combined approach involving orthodontic treatment to realign and stabilize the dentition, followed by prosthodontic rehabilitation, offers an effective solution.

This article illustrates how integrating orthodontic and prosthodontic techniques can optimize both functional and aesthetic outcomes in complex dental rehabilitation.

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Case Report

A 27-year-old male presented to the Department of Prosthodontics and Crown & Bridge with the chief complaint of missing lower left two posterior teeth causing difficulty in chewing. Intraoral examination along with the assessment of panoramic radiograph of the patient revealed missing mandibular left first and second premolars and supraeruption of the maxillary left first premolar (Figure 1). The dental history of the patient revealed that extraction of the lower first and second premolars were done around 9 years ago due to caries but did not seek prosthetic intervention leading to supraeruption of the opposing maxillary first premolar over time thus reducing the interarch space and hindering the prosthetic replacement of the missing teeth. The treatment options available to correct the occlusal plane for the supraerupted teeth was reducing the crown height of the left maxillary first premolar tooth which may necessitate intentional endodontic treatment or orthodontic intrusion of the supraerupted tooth which had the advantage of being least invasive or extraction. The patient did not want to go for extraction rather wanted a treatment without sacrificing the supraerupted tooth. After consultation with the Department of Orthodontics and discussing the plausible treatment options with the patient, he agreed for orthodontic intrusion followed by prosthodontic rehabilitation with fixed partial denture. The patient was unwilling for any invasive procedure for implant placement. The orthodontic intrusion of the supraerupted tooth was done in the Department of Orthodontics using interradiacular TADs (Temporary Anchorage Device) with one placed buccally (size 1.5x8mm) and one palatally (size 2x6mm) (Figure 2 & 3). Buccally the TAD with a length of 8mm was selected as mini screws with longer length allows excellent anchorage. However, in the palatal side, TAD with a length of 6mm length was selected considering the risk factors such as thick mucosa and presence of numerous blood vessels and nerves. After the desired occlusal plane was achieved for the supraerupted teeth (Figure 4), the patient was planned for fixed partial denture with the left mandibular canine and first premolar being the abutments (Figure 5). After the crown preparation, impression was taken with addition silicone and sent to the laboratory for the fabrication of the prosthesis. The final porcelain fused to metal prosthesis was delivered replacing the lower left first and second premolars (Figure 6).



Figure 1:-Supraeruption of the left maxillary first premolar.



Figure 2



Figure 3



Figure 4:- Maxillary First Premolar PostOrthodontic treatment.



Figure 5



Figure 6

Discussion:-

Supraeruption, the excessive eruption of teeth beyond the normal occlusal plane, is a common clinical finding. The average plane formed by the teeth's incisal and occlusal surfaces is referred to as the "occlusal plane" in the Glossary of Prosthodontic Terms.

The replacement of the missing teeth may be delayed by the patients owing to multiple factors such as negligence, lack of awareness, financial difficulties, unavailability of dental health care facilities, etc (3). The more the time passes without replacement of the missing teeth the more is the loss of the vertical space. Supraeruption of teeth can lead to various problems such as trauma from occlusion owing to occlusal prematurities, food impaction and proximal caries. Also it can lead to temporomandibular joint disorders as the smooth mandibular movements are affected (4). Based on the extent of supraeruption from the occlusal plane, it can be classified into mild (between 0.1 mm and 1.5 mm), moderate (1.6–3.5 mm), and severe (exceeds 3.5 mm) (5,6). It can also be classified into conservative, semi-conservative, and non conservative procedures based on the amount of reduction needed for a supraerupted tooth (7). The treatment options are based on the degree of the problem and its consequences. Supraeruption of teeth opposite to the edentulous space poses a serious challenge to the Prosthodontist for rehabilitation (8). In case of mild supraeruption, enameloplasty may be enough. But for other situations endodontics therapy or surgical crown lengthening or orthodontics intrusion will be required (9). Intentional endodontic therapy for the supraerupted teeth can weaken the tooth structure due to moisture and collagen loss, increasing fracture risk. Moreover, restoring such teeth with full crowns may be challenging due to reduced clinical crown height. Surgical crown lengthening may lead to furcation area involvement affecting the periodontal health of the patient. However, orthodontic intrusion especially with the help of Temporary Anchorage Devices (TADs) offers the option of being the least invasive procedure (10). The use of TADs also have the advantage of being limited to the problematic area. The subsequent prosthodontic rehabilitation options are removable partial denture, fixed partial denture or implants. Removable partial dentures are not well accepted by patients as it requires removal of the denture for cleaning, limited stability during speaking and chewing than fixed options like implants of fixed partial denture. Implants though offer the option of being fixed, implant placement is an invasive procedure. Fixed Partial Dentures offer a quick and effective solution for missing tooth provided the abutments are in good condition. It is also less expensive when compared to implants.

Conclusion:-

Orthodontics focuses on the alignment of teeth and jaws, while prosthodontics deals with the restoration and replacement of missing or damaged teeth. An interdisciplinary approach ensures a holistic treatment plan, optimising both function and aesthetics for complex dental cases. This case also utilised the interdisciplinary approach to restore the missing left mandibular first and second premolars by fixed partial denture following intrusion of the maxillary first premolar.

Patient consent

The consent of the patient was taken before the publication.

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