AN INTEGRATED ORTHO-PROSTHO APPROACH FOR MANAGEMENT OF SUPRAERUPTED PREMOLAR: A CASE REPORT

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. The longer the replacement of missing teeth is delayed, the more challenging it becomes for the prosthodontist to rehabilitate both functionally and aesthetically. However, such situations can be overcome by an interdisciplinary approach of Prosthodontics with Orthodontics. Various Orthodontic techniques help to align and position teeth which followed by prosthodontic rehabilitation can help to restore the missing tooth/teeth with optimal aesthetics and function. This article aims to highlight the importance of multidisciplinary approach through a case which was prosthodontically restored after orthodontic alignment.

Keywords: Interdisciplinary dentistry, supraeruption, Intrusion, Bridges.

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. Missing teeth for a prolonged period of time which have not been prosthetically restored leads to a range of complications such as supraeruption of the opposing teeth, drifting of the teeth adjacent to the edentulous space, reduced masticatory efficiency, speech difficulties. In a study on the positional alterations of adjacent teeth in edentulous gaps, **Petridis et al**.[1] reported drifting of the adjacent teeth and supra-eruption of opposing teeth. According to **Rosenstiel et al.**[2], not replacing a missing posterior tooth can disturb the stomatognathic system and cause undesirable reactions such as drifting, rotation, or supraeruption of teeth. 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.

The aim of the article is to express how the amalgamation of the skills and knowledge of two different specialities leads to an enhanced esthetical and functional outcome.

CASE REPORT

A 27 years 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 and the patient did not go for any prosthetic replacement for the missing teeth. The prolonged period of edentulousness resulted in the supraeruption of the opposing maxillary first premolar 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. 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 interradicular TADs (Temporary Anchorage Device) with one placed buccally (size 1.5x8mm) and one palatally (size 2x6mm) (Figure 2 & 3). 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

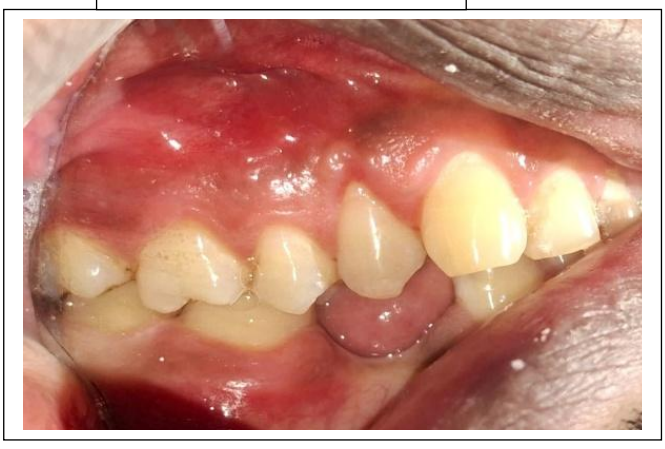

Figure 4: Maxillary First Premolar Post Orthodontic treatment

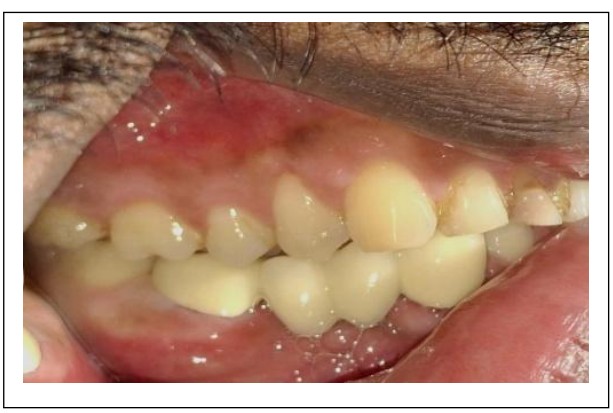

Figure 5

Figure 6

DISCUSSION

Supraeruption is the excessive eruption of teeth beyond the normal occlusal plane, is a commonly observed phenomenon in routine practice in case of missing opposite teeth. 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 ths 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 supraeuption 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 of the supraerupted tooth has potential disadvantages of tooth weakening due to moisture and collagen loss and and makes the tooth more prone to fracture. Even a full coverage crown of the endodontically treated tooth becomes challeging owing to short clinical crown height and may not offer an effective solution. Surgical crown lengthening may lead to furcation area involvement affecting the periodontal health of the patient. However, othodontic 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. Combining both disciplines allows for a more comprehensive treatment plan that addresses both the functional and aesthetic aspects of a patient's dental health.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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