

Review Article

“Role of overjet and overbite in fixed partial denture aesthetics”

Khurshid A Mattoo^{*1} and Puneet Mahajan²

¹Assistant professor, Department of Prosthodontics, College of dentistry, Jazan University, (KSA)

²Postgraduate students, Department of Prosthodontics, Subharti Dental College, Subharti University, India

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Abstract: Clinical examination of any tissue or organ is essential for many reasons and should be done with utmost care and patience. Unfortunately, both of these have been declining as more and more doctors have become increasingly dependant on tests. In dentistry, the problem is magnified since most dentists believe that a neglected and careless clinical examination wont bring much harm to their treatment or their patients. This is absolutely incorrect since the effect of a poor restoration have serious psychological effects on individuals. We present a case of a prosthetic rehabilitation of missing maxillary left central incisor with a resin bonded prosthesis in which poor clinical examination and evaluation was evidenced by development of a poor restoration which was excellent in terms of shade but poor in terms of form.

Keywords: protrusion, canine guidance, condylar guidance, resin bonded prosthesis.

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INTRODUCTION

One of the clinical skills that have to be developed by a prosthodontist in his clinical career is to envision the size, shape, form and length of the definitive prosthesis while he is performing the clinical examination of a patient. Among various clinical dental examinations, the evaluation of occlusion needs a definite understanding of basic knowledge of mandibular movements and all organs that influence these movements especially the role of teeth. Application of this knowledge has to be practiced in every patient. Occlusal examination should be done in both states, static and functional for each dimension (centric, protrusive, right and left lateral, opening and closing). The importance of occlusion can be gauged by the fact that any error in judgement during occlusion cannot be rectified later. For every iatrogenic error induced by a prosthodontist has a solution, but error in occlusion is irreparable. Delicate and sensitive types of fixed partial dentures like resin bonded prosthesis and cantilever prosthesis when planned need more discrete and adept occlusal evaluation, since the failure rates of these fixed partial dentures are higher than that of conventional bridgework (Barber, M. W., & Preston, A. J. 2008; & Wyatt, C. C. L. 2008). Diagnostic cast mounted on a programmed articulator is crucial for beginner to understand the dynamic aspect of occlusion and occlusal schemes.

Esthetic failures have a wide range of reasons and can be due to patient, dentist, technician and ceramist related factors. To the best of our knowledge, there are no studies that indicate esthetic failures due to improper occlusal evaluation. The article in the form of a case report presents a patient who had received a resin bonded fixed partial denture in relation to missing left central incisor, the esthetics of which were impaired due to dentists failure to recognize the anterior guidance at the time of clinical examination.

CASE REPORT

A young adult male patient was reportedly treated by a postgraduate student of the department of prosthodontics in academic institutes about six months back. The patient reported his dissatisfaction about the length of his prosthetic tooth, which he felt was short and was obvious to many viewers. However, the patient was extremely satisfied with the shape and shade of his prosthetic tooth. Dental history revealed that he had extracted his maxillary left central incisor about one year back after it was recommended to be in a hopeless state due to extreme mobility. Three months post extraction, his prosthetic treatment was initiated at that time. The patient's oral hygiene status was good and had an intact natural dentition except a resin bonded fixed partial denture in relation to maxillary missing left

central incisor (**Fig:1**). The pontic length was short approximately by 2 mm from the adjacent right central incisor and about half a mm short from adjacent left

lateral incisor (**Fig:1**). The incisal margin of the pontic was sharp and rough, indicating that the length of the pontic was reduced on a glazed porcelain restoration.



Figure 1: Existing resin bonded prosthesis with a short pontic (note the proximity of overjet)

Static occlusal examination revealed minimal horizontal space (overjet) between the mandibular labial surface of anteriors and the maxillary palatal surface. During protrusion, the mandibular incisors were touching the natural maxillary right central incisor at the middle third, while there was no contact with the pontic. Palatally the thickness of the metal was adequate and margins were intact. After thorough clinical and radiographic examination, the patient was presented, with the treatment option of removal of the current resin bonded fixed partial denture followed by incisal plane correction of mandibular anteriors and fabrication of a conventional three unit porcelain fused to metal ceramic fixed partial denture. Implant supported prosthesis were not considered since the abutment teeth were already prepared palatally. Patient refused the treatment since he expected that the present fixed partial denture can be corrected by adding some material on the short pontic. This option was outrightly rejected since adding of composite over porcelain would have resulted in aesthetic failure in the near future.

DISCUSSION

Reason for Short Pontic:

Since the maxillary incisal plane was not corrected before the treatment began, the natural incisal plane was higher at that level and the canine guidance was not steep enough to disclude the maxillary anteriors in that region without mandibular anteriors touching the maxillary anteriors. If the pontic length would have been kept as long as the central incisors, then lateral forces would be placed on the pontic which would have resulted in bonding failure of the metal wing placed within nearby abutments on lingual surfaces. Horizontal forces are not well tolerated by the resin cement or as a matter of fact any cement. All cements tend to fail under tensile loading. Thus the clinician compensated by keeping the pontic short, so that the horizontal forces

do not impede retainers. If a full retainer would have been chosen instead, then the problem of retainer decementation would not even arise, since full retainers cover the buccal surface of the abutment, therefore loss of retention cannot occur. However the horizontal forces from the incisal plane would still occur on the fixed partial denture and would affect the periodontal abutment condition rather than cementation of the fixed partial denture.

Interpreting and Avoiding Such Clinical Situations:

Occlusal examination should be absolute in both static (centric) and dynamic (eccentric) states. The most important thing that has to be determined at the time of occlusal examination is the need for occlusal equilibration like incisal plane correction. In the present case, the mandibular teeth in the region of the pontic were overlapping each other (mandibular left central incisor was buccally placed to mandibular left lateral incisor) thus minimizing the role of the contact point. When the teeth are not in proper contact, the integrity of the arch is disturbed. As the tendency of natural dentition is to migrate mesially, the force exerted by these changes the inclination of the teeth which results in changes in axial inclinations. This in turn brings the distal end of teeth high over the incisal plane. Also, when contacts are compromised the teeth tend to supraerupt vertically, thus encroaching the incisal plane.

While performing a clinical examination of a patient, one must evaluate the occlusion first in centric and note the relation of maxillary and mandibular anteriors. Adequate horizontal clearance is mandatory to minimize the contacting of anteriors in centric. Then the patient should be asked to move the mandible into protrusion while the clinician should focus on the path that the mandibular teeth travel during the protrusive movement. An articulator that has been programmed according to the patients' interocclusal records helps in

understanding the effect of mandibular movement on the prosthesis. Likewise, the effect of opposing teeth should be evaluated also when the patient is moving the mandible laterally and the path that lower teeth travel should be noted. Determination of incisal plane correct is a clinical decision and has to be made clinically since occlusal plane correction needs to be consented by the patient. A wax up on a mounted cast followed by movement of articulator in various mandibular positions will aid in the determination of the retainer to be used. In this case, if the resin bonded bridge was to be given, the mandibular anteriors should have been corrected first orthodontically to their proper proximal contact positions. If no orthodontic treatment is possible, then incisal plane should be brought down first to minimize its influence on pontic design.

CONCLUSION

Occlusion is a dynamic entity of human dentition and its influence upon the prosthesis design should never be undermined.

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