COMPLICATIONS ASSOCIATED WITH TOOTH SUPPORTED FIXED DENTAL PROSTHESIS AMONGST PATIENTS VISITING UNIVERSITY COLLEGE OF DENTISTRY LAHORE

TAYYABA SALEEM, BDS, FCPS
FAIZA AMJAD, BDS, MCPS
MUHAMMAD UMAIR DASTGIR BHATTI, BDS, MSC, DDPH(RCS)

ABSTRACT

The aim of this cross-sectional study was to assess the complications associated with tooth supported fixed dental prosthesis amongst patients reporting at University College of Dentistry Lahore, Pakistan. An interview based questionnaire was used on 112 patients followed by clinical oral examination by two calibrated dentists. Approximately 95% participants were using porcelain fused to metal prosthesis with 60% of prosthesis being used in posterior segments of mouth. Complications like dental caries, coronal abutment fracture, radicular abutment fracture, occlusal interferences, root canal failures and decementations were more significantly associated with crowns than bridges (p=0.000). On the other hand esthetic issues, periapical lesions, periodontal problems, porcelain fractures and metal damage were more commonly associated with bridges (p=0.000). All cases of dental caries reported were associated with acrylic crown and bridges, whereas all coronal abutment fractures were associated with metal prosthesis (p=0.000). A significantly higher number of participants who got their fixed dental prosthesis from other sources i.e. Paramedics, technicians, dental assistants or unqualified dentists had periapical lesions, decementations, esthetic issues and periodontal diseases. This association was found to be statistically significant (p=0.000). Complications associated with fixed dental prosthesis like root canal failures, decementations, periapical lesions and periodontal disease were more significantly associated with prosthesis fabricated by other sources over the period of 5 to 10 years.

Key Words: Tooth supported fixed dental prosthesis, Complications.

INTRODUCTION

The demand to replace the lost or missing teeth by means of fixed dental prosthesis is on the rise not only in the developed countries but also in the developing countries across the globe. Since a fixed dental prosthesis assures the greater retention and stability in addition to comfort, it is more or less considered as the next best to implants. A complication has been defined as “a secondary disease or a condition developing in the course of a primary disease or condition.” Although complications may be an indication that clinical failure has occurred, this is not typically the case. It is also possible that complications may reflect substandard care. But once again, this is usually not true. Most of the time, complications are conditions that occur during or after appropriately performed fixed prosthetic treatment procedures. The longevity and complication rate of fixed dental prosthesis (FDPs) is greatly influenced by the level of skills of the clinician and his or her academic knowledge. The placement of crowns and bridges is one of
the most common procedures in dental practices. When correctly planned and designed, the fixed dental prosthesis not only provides predictable function but also enhances the aesthetics and proves to be good value for money. On the other hand a poorly manipulated prosthesis is likely to fail prematurely and leads to irreversible damage to the teeth and supporting structures beneath. Sound diagnosis, assessment and technical skills are essential when dealing with failed or failing fixed restorations. A major shortcoming of this alternative is the significant tooth reduction of the abutments. Subgingival margins are required in esthetic situations, but these are associated with increased gingival inflammation. In addition, the longevity of a fixed dental prosthesis estimated at 8.3-10.3 years. The most common reason for removals of fixed bridges is carries. Loss of retention, which has been noted to be related to carries is also a common reason for failures of fixed dental prosthesis. Other frequent causes for failures are poor aesthetics, technical problems (fractures of the fixed bridges, porcelain fractures, wear of occlusal surfaces), endodontic treatment through the retainer, and periodontal diseases. Little work has been done to explore the various patient reported and clinically assessed complications associated with failed and failing fixed dental prosthesis.

Complications with fixed dental prosthesis

All patients were then subjected to an oral examination which was carried out using a mirror, dental explorer and dental tweezers by two calibrated dentists. Examiners checked soft tissue including gingiva, tongue and palate for any gingival disease, calculus or abnormality but the main emphasis was on recording the information of the type of prosthesis being used i.e. crown or bridge, material of the prosthesis i.e. acrylic, metal or porcelain fused to metal (PFM), Location of the prosthesis i.e. anterior or posterior and the complication present i.e. biological complications including dental caries, coronal or radicular abutment fracture, root canal treatment failure, periapical lesions, periodontal problems and mechanical failures including occlusal interference, no occlusal contact, decementation of the prosthesis, esthetic problems, porcelain and metal fractures. A periapical radiograph was taken for each patient to evaluate the above mentioned complaints. In addition to periapical radiograph, bleeding on probing, periodontal pocket depth and clinical attachment loss were measured at six sites of each abutment tooth with a UNC-12 calibrated probe to assess the status of periodontal disease.

Similarly, dental caries was assessed by means of explorer using the World Health Organization’s criteria for assessment of dental caries. Additionally bite wing radiographs were taken for those patients who were suspected to have dental caries to confirm the diagnosis.

After completing the questionnaires, the responses were coded as numeric, in order to facilitate the data entry in SPSS version 16. Data were then recoded in order to carry out analysis. The process of data analysis involved the following steps: The responses related to place of provision of the fixed dental prosthesis were recoded into three categories i.e. hospital or private practice and others which included sources like paramedics, technicians, dental assistants and unqualified dentists. Similarly the responses related to the duration of use of the fixed dental prosthesis were recoded into three categories i.e. less than 6 months, 6 months to one year, one to five years and five to ten years.
RESULTS

Out of the 112 patients who participated in the study 61 (54.5%) were males and 51 (45.5%) were females. Forty five percent participants acquired their fixed dental prosthesis from hospital based care, 34% from private dental practices and 21% from other sources. Almost half (49.5%) of the participants had been using the fixed dental prosthesis from 1 to 5 years followed by 38% who had been using fixed dental prosthesis for the last 7 months to one year.

Table 1 shows that the study participants were evenly distributed into half in terms of type of fixed dental prosthesis being used i.e. crown or bridge. Almost 95% participants had porcelain fused to metal prosthesis and 60% of prosthesis were in posterior segments of the mouth.

Table 2 reports the association between type of prosthesis, material of prosthesis and the associated complications. It shows that complications like dental caries, coronal and/or radicular abutment fracture, occlusal interferences, root canal failures and decementations were more significantly associated with patients who had previously acquired crowns as compared to bridges. On the other hand esthetic issues, periapical lesions, periodontal problems, porcelain fractures and metal damage were more commonly associated with use of bridges. These associations were found to be statistically significant at p=0.001.

Figure 1 depicts the relation between place of provision of prosthesis and associated complications. It shows that a significantly higher number of participants who got their fixed dental prosthesis from other

TABLE 1: DISTRIBUTION OF PARTICIPANTS ACCORDING TO TYPE OF PROSTHESIS BEING USED, MATERIAL OF PROSTHESIS AND LOCATION OF PROSTHESIS

<table>
<thead>
<tr>
<th>Study Sample n= 112</th>
<th>Type of Prosthesis</th>
<th>Material used</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crown n (%)</td>
<td>Bridge n (%)</td>
<td>Acrylic n (%)</td>
</tr>
<tr>
<td>55(49.1%)</td>
<td>57(50.9%)</td>
<td>4(3.6%)</td>
<td>2(1.8%)</td>
</tr>
</tbody>
</table>

TABLE 2: ASSOCIATION BETWEEN TYPE OF PROSTHESIS, MATERIAL OF PROSTHESIS AND ASSOCIATED COMPLICATIONS

<table>
<thead>
<tr>
<th>Complication</th>
<th>Type of Prosthesis n</th>
<th>Material used n</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crown n</td>
<td>Bridge n</td>
<td>Acrylic</td>
</tr>
<tr>
<td>Dental Caries</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Control Abut-</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fracture</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Radicular Abut-</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fracture</td>
<td>5</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Root Canal Failure</td>
<td>14</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Decementation</td>
<td>4</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Esthetic Issues</td>
<td>6</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>Periapical Lesions</td>
<td>8</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Periodontal prob-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lems</td>
<td>2</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Porcelain fracture</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>
Complications with fixed dental prosthesis

The aim of this study was to assess the complications associated with tooth supported fixed dental prosthesis amongst patients reporting to University College of Dentistry Lahore Pakistan.

The results of the study show that complications like dental caries, coronal abutment fracture, radicular abutment fracture and decementation were more significantly present in patients who had acquired crowns as compared to bridges. This finding is similar to studies by Owall et al and Eckerbom et al in Sweden where they found that a significant number of decementations and root fractures were associated with use of crowns as compared to bridges.18,19 The results of present study are also in coherence with study by Valderhaug & Karlsen in Norway where they found that complications like decementations and abutment fractures are more significantly found amongst patients using crowns.20

Results of the present study reveal that porcelain fractures and metal damage were present amongst patients who had been using prosthesis for the past 5 years which could be partly explained by fatigue of the materials used i.e. metal alloys, porcelain and acrylic. This finding is however different from previous studies which have reported that survival decreases more sharply after 10 years.21,22 In the current study a statistically significant number of periapical lesions, decementations and periodontal issues developed in patients using the prosthesis for more than 5 years which is in line with results of previous study by Scurria et al who reported that decementations and periapical lesions were more commonly found in patients using FDP for more than 5 years.23 The most common complications in the current study were decementation of fixed dental prosthesis and periapical lesions which is coherent with previous study conducted by Ghani and Memon in Peshawar, Pakistan, where they found that decementation and periapical lesions were amongst the most commonly reported complications.3

The uniqueness of this study is that although previous studies have reported the complications related to fixed dental prosthesis, they have not tried to explore the association of these complications with important factor i.e. place of provision of the prosthesis
especially in a country like Pakistan where lot of sources other than registered dental practitioners are involved in carrying out dental procedures. The results indicate that complications associated with use of fixed dental prosthesis like root canal failures, deccementations, periapical lesions and periodontal disease were more significantly associated with use of prosthesis that were fabricated by other sources rather than those acquired from hospitals and private dental care over the period of 5 to 10 years. The possible limitation of this study was that of the study design. Although experimental studies are desirable they can be unethical and the intervention may only be administered to one group which may lead to inequalities.24 Because of issues of cost, time and person power, a cross sectional design was therefore adopted.

REFERENCES