GENERAL COMPLICATIONS IN PATIENTS WEARING POLYMETHYL METHACRYLATE HEAT CURE ACRYLIC RESIN PARTIAL REMOVABLE DENTAL PROSTHESSES

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ABSTRACT

Objectives of this study was to determine the frequency of general complications in patients wearing polymethylmethacrylate heat cure acrylic resin partial removable dental prostheses. This descriptive study was conducted during July 2013 to June 2014 at dental outpatient department of Liaquat University of Medical and Health Sciences Pakistan. Data relating to 110 patients were collected using a structured proforma, by methods of patient’s interview, clinical and radiographic examination. Data related to age, gender, location of prosthesis in the dental arch and various complications were recorded. Majority of patients were male with age from 21 to 60 years. Most of complications occurred in maxillary arch especially on right site of the arch. The most prevailing complications in general in this study were loss of retention (56%) mucosal changes (35%), loss of support (31%), discomfort/pain (29%) and loss of stability (26%). On the other hand the least prevalent complications were speech problem (16%), appearance problems (8%) and only 4% of patients were not satisfied with design of prosthesis. Majority of complications were related to retention, support and loss of stability after wearing prosthesis, therefore correct techniques and material in terms of raising and framing the prosthesis must be implied as it will prevent the patient from many complications.

Key Words: Removable Dental Prosthesis, Removable partial Dentures, Complications.

INTRODUCTION

Partial Removable Dental Prosthesis (RDP) is a component of Prosthodontics which help partially edentulous patients to appropriately provide restitution and preservation of oral functions, soothe, look and wellbeing of the patients by the restoration of natural teeth and replacement of missing teeth and other tissues in the vicinity with artificial substitutes. RDP is a simple method which helps patients with missing few natural teeth to replace them. This advent has led to increased usage across the world with a usage of 13% and 29% of adults across Europe. The increased utilization of RDP has also influenced the researcher to focus on the pertinent questions about the affects of RDP on general health of the patients.

Correct treatment planning is vital to successful partial denture construction. It involves designing and constructing the prosthesis by utilizing biological and mechanical principles so that the prosthesis will provide the patient with long term function, while maintaining healthy oral structures. Carefully executed prosthetic treatment along with well noted oral and dental hygiene will lead to little or no damage to remaining teeth and oral tissue.

Still today, the placement of the RDPs in the oral cavity influences the existing environmental situation. Many complications are associated with wearing of RDPs like, alteration in abutment teeth, increased plaque accumulation, transmission of excessive forces to the abutment teeth, oral mucosal lesion, gingival inflammation and gingival recession. Several investigators have correlated the wearing of removable dentures with oral lesions. The frequency of oral mucosal lesions is usually reported to be higher in denture wearers than in non-wearers. Dentures may predispose patients to the onset of mucosal lesions such as candidiasis, inflammatory or reactive hyperplasia’s and traumatic ulcers. The frequency of denture-induced stomatitis,
denture-related hyperplasia and angular cheilitis is higher in denture wearers and almost doubled in men.\textsuperscript{8}

Several etiological factors including trauma, defective denture, denture hygiene, denture age, continuous denture wearing and xerostomia have been reported.\textsuperscript{7,9} When Partial RDP is considered for restoration of teeth especially posterior ones, the design has to be given special consideration as it can lead to problems. A correct design for RDP can prevent rotary movements for projecting supporting tissues\textsuperscript{10}, as well as, the removable partial denture is more fragile and much more susceptible to trauma such as self injurious behavior.\textsuperscript{11}

Many studies were conducted on complications and failures in RDP.\textsuperscript{12-13} Saito\textsuperscript{12} found in his study that the failure rates of abutment teeth were the highest and those of retainers were the second highest. Whereas Preshow\textsuperscript{13} found in his study that RDP increases plaque, gingivitis and risk for caries, particularly root caries, appears to be higher in wearers of Partial RDPs.

The cost of dealing with complications is not only high but it also inconveniences the patients in addition to questioning about the competence of the practitioner. Therefore by documenting the distribution of the various complications it is aimed to provide locally relevant data on the subject that will be of benefit for planning treatment by dentist for their patients.

**METHODOLOGY**

From July 2013 to June 2014, a descriptive study was conducted at dental OPD of Liaquat University of Medical and Health Sciences Pakistan by using Convenience (Non probability) sampling technique. 110 partially edentulous patients wearing heat cure acrylic RDPs and who had worn for at least one year were included in this study. Medically compromised patients, mentally handicapped patients and Patient with manual dexterity problem and patients having diagnosed neurological and rheumatoid problems that make denture handling difficult were excluded.

After ensuring the inclusion criteria for patients purpose of study was declared to the patient. Consent was sort and detail history was taken from every study participant. Intraoral examination was performed and wherever necessary radiographic examination was undertaken. All the data was recorded in pre-structured proforma that comprised of two parts. Part-I consisted of demographic data that includes, Name, Age, Gender, Address, Opd slip number, date of data collection, case number and also includes arch location and site of arch. Whereas part-2 consisted of various complications related to prosthesis that includes, loss of Retention that was checked on patients by applying force vertically away from oral tissues on denture, loss of stability was noted by applying force alternatively on prosthesis on both sides of arch, loss of support was checked by applying pressure towards tissues, pain or discomfort with denture was asked from patient related to wearing of prosthesis, mucosal changes were visually checked with the help of mirror, patient was asked about the design of prosthesis that weather he/she is satisfied or not with the design of prosthesis, appearance problem was asked from patient that he/she felt good looking after wearing denture, speech problem was again asked from patient that after wearing denture does he/she feel any problem or not. Data were then entered in SPSS version 17 and descriptive analysis was made and Mean, Standard deviation and Percentages were taken keeping in front the objectives of the study.

**RESULTS**

A total of 110 patients were recruited in this study. Study has very evidently shown the gender difference of the patients who were examined for their RDPs. Analysis showed that more than 57% of the patients were male as shown in Fig 1. Ratio of male to female patients was 1.3:1. The mean age for patients in this study was found to be 43years with a standard deviation of 11. For convenience four age groups were made, detail is shown in Fig 2. It was much clear that majority of the patients were in the age groups of 21 to 40 years and 41 to 60 years with only 4 patients above 60 years of age as shown in Fig 2.

This study has also shown data about the arch where RDPs were placed. Almost equal patients were found with upper and lower arch precisely 52% with upper

### TABLE 1: GENERAL COMPLICATIONS IN PATIENTS WEARING RDP IN DIFFERENT AGE GROUPS

<table>
<thead>
<tr>
<th>Complications</th>
<th>15-20</th>
<th>21-40</th>
<th>41-60</th>
<th>Above 61</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of Retention</td>
<td>0(0%)</td>
<td>19(17.3%)</td>
<td>39(39%)</td>
<td>4(3.6%)</td>
<td>62(56.4%)</td>
</tr>
<tr>
<td>Loss of Stability</td>
<td>0(0%)</td>
<td>23(20.9%)</td>
<td>6(5.5%)</td>
<td>0(0%)</td>
<td>29(26.4%)</td>
</tr>
<tr>
<td>Loss of Support</td>
<td>0(0%)</td>
<td>24(21.8%)</td>
<td>10(9.1%)</td>
<td>0(0%)</td>
<td>34(30.9%)</td>
</tr>
<tr>
<td>Pain or discomfort (yes)</td>
<td>0(0%)</td>
<td>14(12.7%)</td>
<td>18(16.4%)</td>
<td>0(0%)</td>
<td>32(29.1%)</td>
</tr>
<tr>
<td>Mucosal changes: (yes)</td>
<td>0(0%)</td>
<td>11(10.0%)</td>
<td>24(21.8%)</td>
<td>3(2.7%)</td>
<td>38(34.5%)</td>
</tr>
<tr>
<td>Design of Prosthesis: (Pt not satisfied)</td>
<td>0(0%)</td>
<td>4(3.6%)</td>
<td>0(0%)</td>
<td>0(0%)</td>
<td>4(3.6%)</td>
</tr>
<tr>
<td>Appearance problems: (present)</td>
<td>0(0%)</td>
<td>5(4.5%)</td>
<td>4(3.6%)</td>
<td>0(0%)</td>
<td>9(8.2%)</td>
</tr>
<tr>
<td>Speech problems: (present)</td>
<td>0(0%)</td>
<td>5(4.5%)</td>
<td>12(10.9%)</td>
<td>1(9%)</td>
<td>18(16.4%)</td>
</tr>
</tbody>
</table>
arch and 48% with lower arch as reported in figure 3. It was found that in majority 45 patients’ complications were on right site of arch as detail is shown in Fig 4.

The frequency of loss of retention as a complication of wearing RDPs in our study was about 56% while rest of the patients wearing RDPs do not have retention problem shown in Table 1. Few patients reported stability loss and it was found that only 26% of patients were having problem of stability due to wearing of RDPs, this is shown in Table 1. This study has also shown frequency of support problems which was about 31% after wearing RDPs, detail can be seen in Table 1.

It was found that about 29% of patients had some sort of pain/discomfort due to wearing of RDPs as detail shown in Table 1. Table 1 is also showing the details of frequency of mucosal changes that is about 35% while rest of patients did not report any sort of mucosal changes after wearing RDPs.

Out of 110 patients assessed in our study it was found that, majority of the patients (106) were found satisfied with the design of their prosthesis while only 4 patients had some sort of resentment and were not satisfied. It was seen that again majority of the patients, more than 90% did not complained of any appearance problems due to wearing of RDPs. Present study has also shown frequency of speech problems that was 16%, detail is shown in Table 1.

DISCUSSION

It is reported that RDPs play a pivotal role and help partially edentulous patients to properly provide restoration as well as maintenance of oral functions, comfort, appearance and health of the patients by the restoration of natural teeth and replacement of missing teeth and other tissues in the vicinity with artificial substitutes.1 But on the contrary they are also seen to leave behind a number of complications like alteration in abutment teeth, increased plaque accumulation, transmission of excessive forces to the abutment teeth, oral mucosal lesion, gingival inflammation and gingival recession.4-5 This study has revealed the frequency of different complications occurring as a result of wearing RDPs.

Problems of retention, support and stability was prevalent in 44%, 31% and 26% of patients respectively in this study. These complications in RDP wearers were observed in 55% of patients in a study recently carried out in 2012.4-5 Another study has reported even higher
figures about 65% of the study population developed problems of retention and stability after wearing RDPs. A possible reason may be the fit of the denture base to the alveolar ridge compromises with the passage of time as the alveolar ridge is resorbed and this ultimately leads to poor retention, stability and support of the RDP.

Pain was also reported. Our study has revealed that about 29% of the patients experienced pain as a result of using RDPs and these finding are also supported in another study which showed a significant correlation between pain and use of RDPs. 16 Possible reason may be looseness of the dentures or it is the pressure contributing to bone resorption which leads to experience of pain among RDP wearers. 17

Phonetic problems or speech difficulties was found in 16% of patients while data for speech related problems in the research is scarce. One study has reported low phonetic scores in patients wearing RDPs and explained that this may be related to over extension of the upper dentures on to the soft palate which culminate into speech related problems. 15 On the other hand another study has reported that relation of speech problems in RDP wearers is difficult to prove due to a number of confounding factors like number of tooth loss, age of the patient, and others. 13

Mucosal lesions another complication reported in the study was frequent in 35% of RDP wearers. These findings are more or less similar to a study in which it was found that mucosal lesions were prevalent in 45% of the patients wearing RDPs. 18 More or less similar findings were also observed in another study in which nearly half of the study participants were found with oral mucosal lesions and study reported a strong association between development of oral mucosal lesions and wearing of dentures. 19 Oral mucosal lesions as a complication of RDP wearing in our study may be explained by traumatic occlusal contact, poorly fitting dentures or poor oral hygiene. The finding of oral mucosal lesions in our study may be due to similar factors depicted above as majority of the patients belonged to poor socioeconomic background with poor oral hygiene, poor handling seen in almost all of the patients.

CONCLUSION AND RECOMMENDATIONS

Keeping in view the limitations of the study, this study has clearly reported and observed the possible complications that may occur due to use of RDPs. The most common complication in descending order due to wearing of RDP in our study was retention loss (44%) mucosal changes (35%), support loss (31%), pain (29%) and stability (26%). On the other hand the least prevalent complication in ascending order in denture wearers were speech problems (16%), appearance problems (8%) and only 4% of patients were not satisfied with design of prosthesis. Therefore it is recommended in the light of these results that Dental practitioners must keep in mind the complications related to wearing of RDP while treating patients of RDPs and patient should be explained about the possible complications related to wearing of RDP as this will allow them to take maximum care of their dentures. Continuous education programs should be conducted regarding designing of RDPs.

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