Original Article

COMPLAINTS AMONG PATIENTS WEARING METAL CERAMIC FIXED PARTIAL DENTURES

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ABSTRACT

Objective: *The objective of this study was to assess the causes of failure of tooth supported fixed partial dentures due to biological and technical complications.*

Materials and Methods: *A total of 115 patients who had problems with their metal ceramic FPDs were included in this study. Age, gender, oral hygiene habits, reason for tooth loss (caries, periodontal disease, and trauma), and level of education (university, secondary, primary school and illiterate) were recorded in history. Detailed intra-oral clinical examination was carried out following the standard techniques of inspection, palpation, percussion and probing. Radiographic examination, when necessary, was also done. Prostheses evaluation included the recording of location of FPD in jaw, the technical complications of de-cementation, ceramic deboning and chipping, fracture of metal-frame, esthetic, occlusal problems, pain on chewing, dislodgement and secondary caries.*

Results: *Out of 115 total patients having FPDs with complaints 55(47.8%) were males and 60(51.7%) were females. Age range was from 20 to 65 years. Maximum number of missing teeth in single patients in both arches was 13 replaced with FPD. Most of the patient were employing tooth brush as oral hygiene measure (74.7%).illiterate patients having compliant FPD were carrying the maximum number (37.1%). Caries (83.4%) were the common cause of tooth loss followed by periodontal problems (9.5%). In both dental arches posterior FPDs were more numerous than anterior. In maxilla it was 25(21.6%) while in mandible 37(31.9%). So it was more in posterior mandible than posterior maxilla.The most common complaint was pain on chewing 58(50.0%) followed by esthetics 18(15.5%.*

Conclusions: *A high number of patients wearing fixed partial denture are having complaints which emphasize need for proper case selection, diagnosis and treatment planning on the behalf of the practitioners.*

Key words: *Missing teeth, Fixed partial denture, Oral hygiene measure*

INTRODUCTION

The profile of the patient population seeking prosthodontics treatment is changing over time. Epidemiological studies have shown that, as life expectancy gradually increases, so does the percentages of elderly individuals in the population[1]. The tendency in this group of patients is to retain more teeth in their late years and a desire towards fixed rather than removable prosthetic rehabilation[2,3]. 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 greater retention and stability in addition to comfort, it is more or less considered as the next best option to implants[4].

Clinician's skills and knowledge has vital role in longevity of Fixed Partial Dentures (FPDs)[5]. Properly designed FPDs not only provides predictable function but also enhances the aesthetics and proves to be good value for money. On the other hand a poorly designed/manufactured prosthesis is likely to fail prematurely and leads to irreversible damage to the teeth and supporting structures beneath. Comprehensive diagnosis, assessment and technical skills are essential when dealing with failed or failing fixed restorations[6]. Enhanced acceptability found in patients wearing FPDs but do have some complications which may lead to failure. Caries at retainer margins and other lesions of abutment teeth, risk of technical complications such as loss of retention and fracture of supra-structure are

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the common complications[7].

Complications are conditions that occur during or after appropriately performed fixed prosthodontic procedures. However, the categorization or classification of FPDs related complications has been felt difficult[8]. On the outcome of FPDs in separate studies, caries and loss of retention were found as the major events complicating the FPDs performance[9]. Walton et al[10] showed in a study having 15 years follow up involving 515 cases, it was found that 65% complications in the form of abutment fracture and periodontal breakdown caused FPD failure[7]. Longitudinal studies have indicated that irrespective of its nature and kind, complications necessitated extensive modifications or even replacement and remaking of FPDs in 50-60% cases during a 22-years follow up period[11].

The objective of this study was to assess the causes of failure of tooth supported fixed partial dentures due to biological and technical complications.

METHODS AND MATERIALS

This descriptive (cross-sectional) study was done in the Department Prosthodontics at Khyber College of Dentistry, Peshawar from 15th February 2013 to 7th June 2014. Convenience sampling technique was utilized for sample collection of 115 patients. Approval of the hospital ethical committee was taken. Subjects fulfilling the inclusion criteria were recruited in the study. The purpose, procedures, risk and benefits of the study were explained to the patients. An informed consent and their willingness to participate in the study were taken. They were assured of maintaining confidentiality of their personal and other data collected from them.

Patients presenting with complaints of metal ceramic fixed-fixed design FPDs were selected for this study. Data was recorded in specially designed proforma. Patients' inclusion criteria for the study were; patients of both gender, age ranging between 20 and 65 years, seeking consultation regarding complaints in FPDs having full-coverage design retainers.

After taking relevant history from each subject, the nature of the presenting complaint(s) was investigated from the patient's reason for seeking consultation. Age, gender, oral hygiene habits, reason for tooth loss (caries, periodontal disease, and trauma), bruxism and level of education (university, secondary, primary school and illiterate) were recorded in history. Detailed intra-oral clinical examination was carried out following the standard techniques of inspection, palpation, percussion and probing. Radiographic examination, where required, was also done. Prostheses evaluation included the recording of location of FPD in jaw, the technical complications of de-cementation, ceramic debonding and chipping, fracture of metal-frame, esthetic, occlusal problems, pain on chewing, dislodgement and secondary caries. In addition, information pertaining to the service-life rendered by the FPD as well as of its fitting place (government hospital, private practice dental practitioners) was also recorded.

The collected data were entered in SPSS version 16.0 for analysis. Mean, standard deviation and standard error were determined for numerical variables and percentage and frequency for categorical variables.

RESULTS

Out of 115 total patients having FPDs with complaints 55(47.8%) were males and 60(51.7%) were females. Age range was from 20 to 65 years while the mean age was 42.41 years. The maximum number of missing teeth in single patients in both arches was 13 replaced with FPD.

In this study 74.7% patients employed tooth

Table-1: Oral hygiene measures, educational level and causes of tooth loss of patients FPDs

Oral hygiene measures	n	%
Tooth brush	86	74.7
Miswak	27	23.4
Not all	2	1.8
Total	**115**	**100.0**

Table-2: Educational level and causes of tooth loss of patients FPDs

Educational level	n	%
University	34	29.3
Secondary	18	15.5
Primary	20	17.2
Illiterate	43	37.1
Total	**115**	**100.0**

Table-3: Causes of tooth loss

Cause of tooth loss	n	%
Caries	97	84.3
Periodontal disease	11	9.5
Trauma	7	6.2
Total	**115**	**100.0**

Table-4: Frequencies and percentages of location of FPDs in dental arch

Mandible	n	%	Maxilla	n	%
Anterior mandible	8	6.95	Anterior maxilla	18	15.5
Posterior mandible	37	31.9	Posterior maxilla	25	21.6
Both*	19	16.4	Both	25	21.6
No FPD	53	45.7	No FPD	48	41.4
Total	**115**	**100**	**Total**	**115**	**100**

*bridge replacing anterior and as well as posterior teeth

Table-5: Frequencies of complaints in patients with FPD

Complaints	n	%
Pain on chewing	58	50.0
Fracture	13	11.2
Esthetic	18	15.5
Secondary caries	8	6.9
Dislodgement	16	13.8
Occlusal problem	2	1.7
Total	**116**	**100.0**

Table-6: Frequencies of complaints in patients by location.

	Complaints	location of FPD in maxilla		
		Anterior Maxilla	Posterior Maxilla	Both
Complaints in Maxilla FPD	Pain on chewing	8	9	9
	Fracture	2	2	5
	Esthetic	5	3	4
	Secondary caries	0	6	0
	Dislodgement	3	4	5
	Occlusal problem	0	1	2
	Complaints	**location of FPD in mandible**		
		Anterior Mandible	**Posterior Mandible**	**Both**
Complaint in mandible FPD	Pain on chewing	4	25	12
	Fracture	0	4	2
	Esthetic	2	2	2
	Secondary caries	0	2	0
	Dislodgement	2	0	0
	Occlusal problems	0	4	5

brush to maintain oral hygiene followed by miswak (23.4%) as shown in Table-1. Illiterate patients having compliant in FPD were 37.1% as reflected in Table-2. Caries (83.4%) were the common cause of tooth loss followed by periodontal problems (9.5%) as shown in Table-3.

In both dental arches posterior FPDs were more than anterior. In maxilla it was 21.6% while in mandible it was 31.9%. So it was more in posterior mandible than posterior maxilla as shown in Table-4.

The most common complaint was pain on chewing 50.0% followed by esthetics 15.5% as shown in Table-5 while the details of patterns of complaints in both dental arches and location within the arches are given in Table-6.

DISCUSSION

The evaluation and comparison of data for studies on FPD longevity and complications is difficult because of several reasons including the use of non-standardized patient population and materials and the patients treated by clinicians with varying skills and experience levels including general dental practitioners, undergraduate and PG dental students, dental specialist other than Prosthodontists. The varying levels of skills do affect the outcome. Different workers have used different materials, parameters and criteria for success and failure which makes comparison further difficult. To facilitate valid data for success, it is necessary to conduct a randomized controlled longitudinal study of sufficient duration with well-defined aspects including standardization of tooth preparation parameters selection of controlled patient population, use of standardized laboratory procedures performed by skilled dental technicians and patient's education and motivation towards standardized oral hygiene maintenance regime. However, metal-ceramic FPDs used globally have performed satisfactory functions by surviving for a long period (15-20 Years) especially when provided under ideal conditions by dental specialists[12].

Ghani et al[13] studied the biological and technical complications and their levels in 124 patients with FPDs. Many complication events in their study were not older than a year. Complication were; de-cementation (24.8%), caries (20.5%), peri-apical problems (18.1%), periodontal problems (11.1%), prosthesis fractures (9.1%), abutment fracture (7.1%), occlusal

problems (6%) and esthetic-problems (3.3%). In the current study, de-cementation, occlusal problems, secondary caries are less severe than Ghani et al while periapical periodontal problems, fractures were most frequent in this study.

Okstad[14] carried out a systemic review on adverse clinical events associated with FPDs. He studied the biological (e.g., caries, pulpal and periodontal diseases) or as technical complications (e.g., retention loss and fractures). Parameters used to describe the clinical performance of the FPDs were "Success" if the FPD remained intact without any complications and "Survival" if any of the adverse events associated with an FPD did not result in a failure. The incidences of the various types of adverse events were related to the cumulated exposure time of the FPDs and reported as "failure rates" or "complication rates" of particular types of adverse events. The estimated 10-year survival rate of FPDs was 89% (CI: 81-94%), and the success rate was 71%(CI: 48%-85%). The estimated risk of FPD loss over 10 years caused by caries is 2.6%, by abutment fracture 2.1% and periodontitis accounted for a 0.5% risk of failure. Estimated risks of restorable complications per FPD over 10 years are 6.4% loss of retention and 3.2% risk of material fractures of any kind. The estimated risk of FPD abutment tooth complications related to caries is 9.5% and the risk loss of pulp vitality is 10% over 10 years. In the present study complaint/complications were more common than okstad's study. Many factors like clinical skills, laboratory technicalities and patients awareness may be responsible[4].

Results of the present study revealed that porcelain fractures which could be partly explained by fatigue of the materials used i.e. metal alloys, porcelain and acrylic. Which is supported by the study conducted by Saleem et al[15].

In the present study the common cause of missing teeth that were replaced with FPDs was dental caries followed by periodontal problems. Several reason may play a role. First dental caries is internationally proved disease that lead to tooth loss despite of advanced conservative dental procedure in which most of the population in developing countries may not have an access[16]. Secondly most of the patients in the current study were 65 years and periodontal diseases are less prevalent in younger individuals[17].

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