

## Complaints of patients wearing metal ceramic fixed partial dentures

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### Abstract

**Aim:** The aim of this study was to assess patients' complaints with their tooth supported fixed partial dentures in relation to biological and technical complications.

**Methods:** This study conducted in Albania included patients who had issues with their metal ceramic Fixed Partial Dentures (FPDs) during the period of 2010-2017. The influence of certain key factors such as gender, age, oral hygiene habits, reasons for tooth loss, and level of education was also considered in this study. An in depth intra-oral clinical examination was also executed.

**Results:** The total number of patients having complaints regarding their FPDs was 108. There were 38 males (35.2%) and 70 females (64.8%). Age varied from 20-75 years old. The maximum number of missing teeth from patients was 18 and, a finding evident for both arches. These missing teeth were replaced later by FPDs. Nearly all of the patients were using tooth brush as their main oral hygiene prevention (55%). The two most prevalent causes of tooth loss were caries (83.3%) and periodontal issues (9.3%). Posterior FPDs were more prevalent than the anterior ones in both dental arches. There were 23 in maxilla (21.3%) and 32 in mandible (29.6%). The most recurrent complaint was pain while chewing (50.9%), followed by gingival and periodontal issues (16.6%).

**Conclusion:** Findings from this study conducted in Albania indicate that a considerable number of patients who wear FPDs have complaints regarding the need for correct case selection, diagnosis and treatment planning on the side of the practitioners.

**Keywords:** fixed partial denture, missing teeth, oral hygiene measure, patients' complaints.

## Introduction

The characteristics of the population who seeks prosthodontics treatment have changed over the years. Results from epidemiological studies point out that with the rising of life expectancy, the percentage of the elderly population certainly increases (1). This group of patients is more likely to retain more teeth in the late years and they also incline towards fixed prosthetic rehabilitation rather than removable one (2,3). There is an increase in demand for replacing the lost or missing teeth by using fixed dental prosthesis. This increase is well-noticed not only in developed countries, but also in developing countries all over the world. A fixed dental prosthesis guarantees a considerable retention and stability as well as comfort, and therefore it is seen as the next best option to implants (4). The skills and knowledge of the practitioner play an important role in the durability and endurance of fixed partial dentures (FPDs). If the FPDs are designed properly, they not only perform good function but they also further improve a person's aesthetics. Additionally, they have proven to be good value for the money (5). Alternatively, if prosthesis is poorly designed it will probably fail too early hence leading to irreparable damaged teeth and its supporting structures. Crucial factors to be taken into consideration when dealing with failed fixed restorations are: a complete diagnosis, a thorough evaluation of it and proper technical skills (6). There are several causes which may lead to failure of FPDs, such as: caries at retainer margins and other lesions of supporting teeth, risk arising from technical complications like the fracture of supra-structure (7). These complications may occur during or after performing fixed prosthodontic procedures. However, categorizing and properly dividing the types of complications with regards to FPDs has always proved to be very difficult (8). Based on the results of several studies, the major causes of failures on the FPDs were caries and loss of retention (9). In a comprehensive study carried out by Walton et al (a study involving

a 15-year follow-up period) which included 515 cases, it was shown that 65% of all complications in the form of abutment fracture and periodontal breakdown were the main causes for FPDs failure (7,10). Studies that have taken place over a protracted period of time have highlighted that regardless of their nature and type, complications have required thorough modifications or even going further and replacing the FPDs in 50%-60% of cases (11). The main goal of this study was to understand why tooth supported FPDs fail in relation to biological and technical complications.

## Methods

This was a study which dealt with past evaluations of crowns and fixed partial dentures with patients from Dental Clinic Studio in Tirana, Albania. It has taken into consideration evaluation of cases for the period 2010-2017. Patients that fulfilled the inclusion criteria were the main participants of this study. Everything was properly explained to the participants well in advance: purpose, risk and benefits of this study. Additionally their consent was taken for their participation in this study and they were guaranteed confidentiality for every data that would be collected from them. Patients who had complaints regarding their metal ceramic fixed design FPDs were selected for this study and data was collected and stored accordingly. The participants for this study were from both genders and their age included a range of 20-75 years. They were all looking for consultations and had complaints regarding their FPDs which had full-coverage design retainers. After carefully reviewing the history of each participant and the type of their complaint, an investigation was carried out to find out the reason for seeking consultation. Factors taken into consideration when reviewing their nature of complaints were: age, gender, reason for tooth loss (whether caries or periodontal disease), educational level and the like. All these data were recorded. A complete intra-oral examination was performed keeping in mind all the standard techniques of inspection, palpation, probing and

percussion. Additionally, wherever necessary radiographic exams were carried out. During the evaluation of prostheses the following were included: locating the FPD in the jaw, ceramic de-bonding and chipping, technical problems of de-cementation, breaking of metal frame, pain while chewing food, and secondary caries. Furthermore, other relevant information was also recorded, including but not limited to: service-life rendered by the FPD, as well as its placement location was also recorded (state-owned hospital or private practice).

The collected data were entered in SPSS, version 16.0, for subsequent analysis. Means, standard deviations and standard errors were calculated for numerical variables and frequency distributions for categorical variables. Chi-square test was used to compare the differences in the proportion of categorical data. A p-value  $\leq 0.05$  was considered

statistically significant.

## Results

The total number of participants who had complaints regarding their FPDs was 108, out of which 38 or 35.2% were males and 70 or 64.8% were females. Their age varied from 20-75 years old, whereas the mean age was 42.4 years old. The highest number of missing teeth in patients in relation to both arches was 18 and these were replaced by FPDs.

After carefully reviewing the results of this study, we noticed that 55% of all participants used tooth brush in order to have a good oral hygiene and this was followed by miswak - the teeth cleaning twig (26%). The most prevalent cause of tooth loss was caries (83.4%) followed by periodontal issues (9.5%). ( $p < 0.01$ ), as shown in Table 1.

**Table 1. Cause of tooth loss**

Cause of tooth lose	N	%
Caries	91	84.3
Periodontal disease	10	9.3
Trauma	7	6.5
Total	108	100.0

When comparing both dental arches, posterior FPDs were more prevalent than the anterior ones. It resulted to be 22% in maxilla, whereas in mandible it was 32%. Therefore, it was more evident in posterior mandible than posterior

maxilla as indicated in Table 2.

The most widespread complaint was pain while chewing food with 50.9%, which was followed by gingival and periodontal issues (16.6%), as indicated in Table 3.

**Table 2. Frequencies and percentages of location of FPDs in dental arch**

Mandible	n	%	Maxilla	n	%
Anterior mandible	7	6.5	Anterior maxilla	18	16.7
Posterior mandible	32	29.6	Posterior maxilla	23	21.3
Both	19	17.6	Both	25	23.1
No FPD	50	46.3	No FPD	42	38.9
Total	108	100	Total	108	100

**Table 3. Frequencies of complaints in patients with FPDs**

Complaints	N	%
Pain on chewing	55	50.9
Gingival and periodontal problems	18	16.6
Secondary caries	7	6.5
Dislodgement	15	13.9
Occlusal problem	2	1.9
Esthetic	17	15.7
Total	108	100

## Discussion

Many factors may influence the failure of FPDs and patients' complaints, and that is why evaluating and comparing the data for the durability and complications that may arise from FPDs is very difficult. Some of these above-mentioned factors may be: the use of non-standardized patients and tools, as well as the specialists who are treating these patients may be with different experience levels, including general dental practitioners, undergraduate and dental students, and lastly dental specialists other than prosthodontists. These different skill levels do affect the outcome of the results of our study. Depending of different practitioners, they have used different parameters and criteria and those are determinant factors which have a significant impact on the success and failure of FPDs. This is exactly what makes our comparison difficult.

In order to have better valid data for success, it is suggested to carry out a detailed long-term study with sufficient time duration. The study should have very well-defined aspects including standardization of the parameters in preparing teeth, appropriate selection of patients, use of standardized lab procedures, which must be carried out by skilled dental technicians. Patients should be well-motivated towards regular oral hygiene.

However, metal ceramic FPDs have been satisfactory and they have "survived" for a long period of time (15-20 years), especially when they are prepared by dental specialists (12). De Backer

conducted a study in relation to biological and technical complications using 124 patients with FPDs. Most of the complication events in this study were just about a year old. In our current study, problems such as de-cementation and occlusal issues, as well as secondary caries are less serious than in the study carried out by De Backer et al. (13). However, periapical periodontal issues and fractures were more dominant in our study.

A systematic review was conducted by Okstad regarding the adverse clinical events which are associated with FPDs. He evaluated the biological conditions (caries and periodontal issues) as well as complications that may arise from technical issues (retention loss and fractures). If the FPD stayed without any complications of any kind, the clinical performance was marked as "success", and even if the FPD didn't fail even though it bore some complications, the clinical performance was marked as "survival". The 10 year "survival" rate resulted to be 89% (CI=81%-94% and the success rate resulted to be 71% (CI=48%-85%). The most important factors were the following: i) Caries caused FPD loss in 2.6% of the cases; ii) Abutment fracture caused FPD loss in 2.1%; iii) Periodontitis caused FPD loss in 0.5% of cases (14).

Estimated risks of complications which are deemed to be fit for restoring over a time period of 10 years are 6.4% retention loss and 3.2% risk of material fractures of all types. The estimated risk of FPD supporting tooth issues in relation to caries is 9.5% and the risk regarding loss of pulp vitality is 10%

over 10 years. Complaints and complications were far more prevalent in the current study than Okstad's study and a multitude of factors may account for this, like: clinical skills, lab technicalities, and patients' awareness as well (4). The results of our current study highlighted that porcelain does fracture and this may be explained by the materials' fatigue used in those, i.e. metal alloys, porcelain and acrylic. This result is well-supported by the study carried-out by Hemmings et al (15).

## Conclusion

The results of our current study conducted in Albania

**Conflicts of interest:** None declared.

## References

1. Kanstrom L, Zamaro G, Sjosted C. Healthy ageing profiles. Geneva, World Health Organization; 2008.
2. Zitzmann NU, Staehelin K, Walls AW, Menghini G, Weiger R, Zemp Stutz E. Changes in oral health over a 10 year period in Switzerland. *Eur J oral Sci* 2008;116:52-9.
3. Begwitz IC, Soderfeldt B, Palmqvist S, Nilner K. Oral prostheses and oral health-related quality of life: a survey study of an adult Swedish population. *Int J Prosthodont* 2007;20:132-42.
4. Ioannidis G, Paschalidis T, Petridis HP, Anastassiadou V. The influence of age on tooth supported prosthetic restoration longevity. A systematic review. *J Dent* 2010;38:173-81.
5. Tan K, Pjetursson BE, Lang NP, Chan ES. A systematic review of the survival and complication rates of fixed partial dentures (FPDs) after an observation period of at least 5 years. *Clin Oral Implants Res* 2004;15:654-66.
6. Briggs P, Ray-Chaudhuri A, Shah K. Avoiding and managing the failure of conventional crowns and bridges. *Dent Update* 2012;39:78-84.
7. Creugers NHJ, Kreulen CM. Systematic review of 10 years of systematic reviews in Prosthodontics. *Int J Prosthodont* 2003;16:123-7.
8. Manappallil JJ. Classification system for crown and fixed partial denture failures. *J Prosthet Dent* 2008;99:273-8.
9. Ghani F, Memon MR. Complications in Metal-Ceramic Fixed Dental Prostheses among Patients Reporting to a Teaching Dental Hospital. *JLUMHS* 2010;9:17-27.
10. Walton TR. An up to 15-year longitudinal study of 515 metal-ceramic FPDs: Part 2. Modes of failure and influence of various clinical characteristics. *Int J Prosthodont* 2003;16:177-82.
11. Glantz PO, Nilner K, Jendresen MD, Sundberg H. Quality of fixed prosthodontics after twentytwo years. *Acta Odontol Scand* 2008;60:213-8.
12. Hemmings K, Harrington Z. Replacement of missing teeth with fixed prostheses. *Dent Update* 2004;31:137-41.
13. De Backer H, Van Maele G, De Moor N, Van den Berghe L, De Boever J. A 20-year retrospective survival study of fixed partial dentures. *Int J Prosthodont* 2006;19:143-53.
14. Jokstad A. After 10 years seven out of ten fixed dental prostheses (FPD) remain intact and nine out of ten FPDs remain in function following biological and technical complications that have been repaired. *J Evid Based Dent Pract* 2010;10:39-40.
15. Saleem T, Amjad F, Bhatti MUD. Complications associated with tooth supported fixed dental prosthesis amongst patients visiting university college of dentistry Lahore. *Pak Oral Dental J* 2013;33:207-11.
16. Hamasha AA, Sasa I, Al Qudah M. Risk indicators associated with tooth loss in Jordanian adults. *J Com Dent and Oral Epidem* 2002;28:67-72.
17. Shigli K, Hebbal M, Angadi GS. Relative contribution of caries and periodontal disease in adult tooth loss among patients reporting to the Institute of Dental Sciences, Belgaum, India. *J Gerodontology* 2009;26:214-8.