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Failures of Crowns and Bridges Among the Patients of Attrai and Raninagar Upazila in Naogaon District, Bangladesh

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Abstract **Original Research Article**

Background: Crowns and bridges are most commonly used for esthetics and functions in Bangladesh and all over the world. These prostheses fail due to decementation and porcelain crack for various reasons where a need arise for removal or disassembly full or by fragments. The study aimed to determine the causes and classes of crown and fixed partial denture disassembly. ***Materials and Methods:*** This cross-sectional study was conducted at Attrai and Raninagar upazila from April 1st 2025 to October 30th 2025. A total of 200 patients including males and females, who reported at Dr Maksudul Alam Dental Care and Dental Surgeons dental care in Naogaon District, Bangladesh for their failed PFM crowns and bridges, were included in the study. ***Results:*** The study included 40% males (n=80) and 60% female (n=120) with a ratio of 0.85. Patients had an age ranging from 18 to 63 years (mean 46 years, SD ± 15.8 years). Failed crowns were more than bridges. Failed prostheses were found more in mandibular arch (54%, n=108) and mostly in posterior segments (80%, n=160) of arches. Majority of prostheses were porcelain fused to metal and biological failure (62%, n=124) was the main reason for prosthesis disassembly. In more than 75% of cases prostheses were removed conservatively. ***Conclusions:*** Caries and pulpal involvement of the abutment teeth was identified as the primary cause for the failure and subsequently removal of most porcelain fused to metal restorations. In the majority of cases, the disassembly procedure was carried out using conservative techniques to preserve the remaining tooth structure as much as possible.

Keywords: Dental crown and bridge removal, Prosthesis failure, life span of crown and bridges.

INTRODUCTION

In Bangladesh, dental crowns and bridges remain the most commonly preferred treatment options for replacing missing teeth. These fixed prostheses offer several advantages, including secure attachment to the abutment teeth, long service life, satisfactory esthetics, and strong retention. However, despite their clinical success, long-term use may eventually lead to mechanical or biological complications. Consequently, failure of certain prostheses is a frequently observed occurrence in clinical practice, and removal or further repair of the failed prosthesis may be required to restore proper function and patient comfort [1, 2].

The survival of crown and brides' prosthesis, underlying tooth structure and core that shows in many studies [3,4]. Different bridges investigate a different types survival rate, depending upon the cases, treatment of abutment teeth and remaking of upon factors related to practitioners, type and material of crown or bridge increases treatment costs directly bridge and patients related factors. As a result, patients budget increases. The lot of techniques are seen in different studies showed life span available for crown and bridge. These include of 85% at 5 years, 96% at 10 years and after 5 years 85%. Many countries crown and bridges are most popular and it is used for conservation of the tooth structure. This is noticed many patients are happy around the world for these conservative approaches [5,6]. But when these prostheses become failure, such as porcelain fracture and connector breakdown, then more numbers of units are placed, can't be reused (crown splitter and spreaders) [7-9]. So, when complications arises and removal of failed prosthesis is all that either due to structural defects or lack of maintenance etc. [10].

Such conservative and esthetic failure or problems with abutments, removal is needed for patients [11,12]. Complications associated with crown and bridges are problems, financial constraints and psychosocial multiple and failure of prosthesis is diverse [13]. Major issues that clinical experiences suggest that safe removal complications like caries, periodontal health problem of is only possible in all cases of temporary cemented abutments, and structural defects in prosthesis have restorations but, contrary to these, permanently been studied in literature [7, 8,14]. In developed countries caries cemented restorations can be removed conservatively only in slightly less than 2/3rd of cases [9]. As there is diversity in available systems and instruments for disassembly of crown and bridges, the selection and preference is merely on the discretion of practitioners and individual cases, moreover, a combination of approaches can be adopted starting with conservative approach at the beginning [15].

Crowns and bridges are most commonly used for esthetics and functions in Bangladesh and all over the world. These prostheses fail due to decementation and porcelain crack for various reasons where a need arise for removal or disassembly full or by fragments.

The objective of the study was to determine the reasons and types of crowns and fixed partial denture disassembly.

MATERIALS AND METHODS

This cross-sectional study was conducted at Attrai and Raninagar upazila from April 1st 2025 to October 30th 2025. A total of 200 patients including males and females, who reported at Dr Maksudul Alam Dental Care and Dental Surgeons dental care in Naogaon District, Bangladesh for their failed PFM crowns and bridges, were included in the study. Fixed prostheses already decemented and who reported for re-cementation were excluded. Before performing disassembly of prostheses data was tabulated about the age, gender, time of prosthesis, location in jaws, quality of preparation and reasons for removal. At the end technique of removal was observed and classified. Frequencies and percentages were calculated for various variables of the study.

Inclusion criteria consisted of patients aged 18 years and above who presented with clinically failed porcelain-fused-to-metal (PFM) crowns or bridges requiring active disassembly. Prostheses that were fractured, loose, biologically compromised, or mechanically defective were considered eligible. Cases in which the prosthesis had already become completely decemented and patients sought only re-cementation were excluded from the study. Data collection was performed using a structured checklist documenting patient age, gender, duration of prosthesis service, anatomical location in the maxilla or mandible, quality of abutment tooth preparation, and the primary reason for failure. Following evaluation, each prosthesis was removed, and the disassembly technique used—whether conservative or non-conservative—was recorded and classified. All collected data were entered and analyzed using IBM SPSS Statistics version 25, where descriptive statistics, including frequencies and percentages, were calculated for the study variables.

RESULTS

The study had 40% males (n=80) and 60% female (n=120) with a ratio of 0.85. Patients had an age ranging from 18 to 63 years (mean 46 years, SD ± 15.8 years). Failed crowns were more than bridges. Failed prostheses were found more in mandibular arch (54%, n=108) and mostly in posterior segments (80%, n=160) of arches. Majority of prostheses were porcelain fused to metal and biological failure (62%, n=124) was the main reason for prosthesis disassembly. In more than 75% of cases prostheses were removed conservatively.

Removal of crowns and bridges are frequently. Study included both males and females with an age encountered clinical cases in dental practices. However, ranging from 20 years to 65 years.

Amongst the failed prostheses 110 were crowns and 90 bridges, either conservatively or 13 were bridges. Around 60% of failed prostheses were non-conservatively found in mandible (n=124) while the rest were in maxilla (n=76). The statistics are given in Table-1.

Majority of failed prosthesis (96%) were of metal ceramics type. A very small percentage was of all metal and all ceramic type as given in Table-2. The figure also show that more than half were functional failure and major causes of failure were endodontics about 60% followed by periodontal involvement.

Table 1: Frequency of prostheses distribution in arches of both gender

Gender	Prosthesis	Jaw	Jaw segment	Jaw side
Male- 80(40%)	Crown110(55%)	Mandible124(62%)	Anterior-40(20%)	Right -116(58%)
Female 120(60%)	Bridge 90(45%)	Maxilla -76(38%)	Posterior-160(80%)	Left-84(42%)

Table 2: Types and causes of failure of crown and bridges

Prosthesis Type	Metal Ceramic	192(96%)
	All metal	6(3%)
	All ceramic	2(1%)
Type of Failure	Aesthetics	56(28%)
	Functional	114(57%)
	Mechanical	30(15%)
Cause of Failure	Endodontics	120(60%)
	Periodontal	64(32%)
	Traumatic	16(8%)

DISCUSSION

Crowns and bridges are widely used fixed dental prostheses. In clinical practices the patients prefer this type of prostheses for good function. The current study found less than eight years of survival rate and a high frequency of conservative removal of such failed prostheses. These prostheses fail due to decementation and porcelain crack for various reasons where a need arise for removal or disassembly. The life span of crown and bridges depends on the laboratory experience, fabrication, cementation and care along with oral hygiene maintenance. The oral hygine matainance such regular toothbrushing, flossing, mouth ringe with warm water play an important role. The longer prosthesis remains free of complication the better will be service life. Many studies have observed different life span of such prostheses. Life span of prosthesis in our study was found to be 6 years. This is close to the finding of local study [16]. However, this finding is less when compared to another study [17]. The difference in survival rate is vary person to person including oral hygiene maintenance by patient and regular follow up to dentist. Metal ceramic restorations are widely used restorations all over the world [18]. Our studies also found that majority of failed prostheses (96%) were of metal ceramic restorations, closer to the finding of Kavaz study [19]. As these restorations are economical and versatile in nature, fabricated by almost every dental laboratory, therefore, the observed frequency was high. It was found that majority of failures was of endodontics (60%) and functional (57%) type. This was because that most of such prostheses were found in posterior jaw that is (80%). This may depend on oral hygiene maintenance and periodic follow up from patient perspective. Similarly secondary caries was the main reason for removal of prosthesis.

The current study observed that crowns were slightly more than bridges. The crowns 55% and bridge 45%. This finding is in accordance with an earlier study where crowns were more when compared to bridges. However contrary to the finding of this study we found more bridges. The possible reason for this might be that most people opt for extraction of diseased teeth rather than its conservative treatment, which is later replaced with bridges. Secondary caries leading to pulpal involvement and irreversible pulpits was the main reason for failure and removal of prosthesis in our study. Slightly more than one third failures were due to periodontal involvement is 32% followed by a minor percentage of traumatic reasons that is 8%. Our finding is in contrary to a local study done earlier where periodontal problem was the main reason for removal of prosthesis [20]. The current study observed that many of disassembled prostheses were prepared and fabricated by non-qualified technician or quakes. Around 25% were made by qualified dentists in private dental set up while the rest were made in hospitals. Based on the knowledge and clinical practice experience difference a high failure rate found in non-qualified compared to qualified practitioners. For this resons our finding is matching to a local study [20]. Conservative way of dental fixed prostheses is acceptable to both and patients and practitioners. Such techniques is economical and reduce practitioners' efforts and have low financial impact on patient budget. Our study found that majority of prostheses were removed conservatively and to a lesser a degree semi conservatively. In between these, other prostheses were removed destructively. To the best of the authors knowledge no such local study was undertaken previously on the type of crown/ bridge removal techniques.

LIMITATIONS

This study was limited by its cross-sectional design, which does not allow assessment of long-term outcomes of prosthesis failure. The sample was drawn from two dental centers within a single district, which may limit the generalizability of the findings to broader populations. Additionally, the study relied on patient-reported duration of prosthesis use, which may be subject to recall bias. Evaluation of preparation quality and failure causes was based on clinical judgment, introducing the possibility of observer bias.

CONCLUSIONS

Caries and pulpal involvement of the abutment teeth was identified as the primary cause for the failure and subsequently removal of most porcelain fused to metal restorations. In the majority of cases, the disassembly procedure was carried out using conservative techniques to preserve the remaining tooth structure as much as possible.

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REFERENCES

1. Aslam A, Khan DA, Hassan SH, Ahmed B. Ceramic fracture in metal-ceramic restorations: Theaetiology. Dent Update. 2017; 44:448-50, 453-4, 456. DOI: https://doi.org/10.12968/denu.2017.44.5. 448
2. Afridi S, Khan S, Raza M, Khan A, Khan H, Zubair N. Frequency of various grades of failure and their number of units involved in non-maintained metal ceramic fixed dental prosthesis: non maintained metal ceramic fixed dental prosthesis. Pak J Health Sci. 2022.3(05):120-123. DOI: https://doi.org/10 54393/pjhs. v3i05.205
3. Carey C, Din ND, Lamb J, Wright H, Robb ND Abuzar M. Survival of single-unit porcelain-fused-to- metal (pfm) and metal crowns placed by students at an Australian university dental clinic over a five-year period. Dent J. 2021;9: 60. DOI: https://doi.org/10 3390/dj9060060
4. Tajti P, Solyom E, Czumbel LM, Szabó B, Fazekas R, Németh O, et al. Monolithic zirconia as a valid alternative to metal-ceramic for implant-supported single crowns in the posterior region: A systematic review and meta-analysis of randomized controlled trials. J Prosthet Dent: 2023(21). DOI: https://doi.org/10.1016/j.prosdent.2023.05.006
5. Jamal S, Ghafoor R, Khan FR, Zafar K. Five-year evaluation of the complications observed in porcelain fused to metal (PFM) crowns placed at a university hospital. J Pak Med Assoc. 2020;70(5): 845-850. DOI: https://doi.org/10.5455/JPMA. 16442. PMID: 32400739
6. Tan K, Pjetursson BE, Lang NP, Chan ESY. A systematic review of the survival and complication rates of fixed partial dentures (FPDs) after an observation period of at least 5 years. III Conventional FPDs. Clin Oral Impl. Res 2004; 15: 654-66. DOI: https://doi.org/10.1111/j.1600-0501.2004.01117.x
7. Addy LD, Bartely A, Hayes SJ. Crown and bridge disassembly- When, Why and How. Dental Update. The 2007; 34: 140-150. DOI: https://doi.org/10.12968/ aetiology. Dent Update. 2017; 44:448-50, 453-4, denu.2007.34.3.140
8. Herman GL. Bucco-lingual 'dimple' technique for removing full-crown and cast-metal restorations. J Mich Dent Assoc. 2011; 93:42-44. PMID: 21954810
9. Parreira FR, O'Connor RP, Hutter JW. Cast prosthesis removal using ultrasonics and a thermoceramic fixed dental prosthesis: non maintained plastic resin adhesive. J Endod. 1994; 20(3):141-3. DOI: https://doi.org/10.1016/S0099-2399(06)
10. Saleem T, Amjad F, Bhatti MUD. Complication associated with tooth supported fixed dental prosthesis amongst patients visiting University College of Dentistry Lahore. Pak Oral Dent J. 2013:33(1);33-40.
11. Vasileva R. Techniques for fixed dental restorations removal - classification, decision on the correct approach, advantages and disadvantages. J IMAB.2021:27(1). DOI: https://doi.org/10.5272/ jimab.2021271.3510
12. Naz A, Musharraf H, JawadA, Zia K, Kumar B, Lone MA Assessment of failure of prosthesis in fixed prosthodontics among patients reporting to a teaching dental hospital of Karachi. J Pak Dent Assoc. 2020;29(3):105-109. DOI: https://doi.org/ 10.25301/JPDA.293.105
13. Burke FJT, Lucarotti PSK. Ten-year outcome of crowns placed within the General Dental Service in England and Wales. J Dent 2009; 30;234-242. DOI: https://doi.org/10.1016/j.jdent.2008.03.017.
14. Hawthan MA, Chrcanovic BR, Larsson C. Long term retrospective clinical study of tooth-supported fixed partial dentures: A multifactorial analysis. J Prosthodont Res. 2023;67(2):238-245. DOI: https://doi.org/10.2186/jpr.JPR_D_21_00222.
15. Pattaratiwanont R, Piemjai M, Godoy FG. Survival of posterior fixed partial dentures with minimal tooth posterior fixed partial dentures with minimal tooth reduction and improved esthetics: An invitro study. Jreduction and improved esthetics: An invitro study. J Prosthet Dent. 2022:127(4);585-592. DOI: https://doi.org/10.1016/j.prosdent.2020.09.047
16. Naveed SH, Pasha F, Kalsoom F, Qureshi K, Ihsan Z. Frequency of Factors Involved in crowns and Fixed Patial Denture Failure. Med Forum 2020:31(1): 47-49.
17. Rathmann F, Pohl M, Rammelsberg P, Bomicke Wolfgang. Upto 10 years clinical performance of zirconia ceramic and metal-ceramic fixed partial dentures: A retrospective study. J Prosthet Dent 2022. DOI: http://doi.org/10.1016/j.prosdent.2022 11.003
18. Sailer I, Balmer M, Hüsler J, Hämmerle CHF, Känel S, Thoma DS. 10-year randomized trial (RCT) of zirconia-ceramic and metal-ceramic fixed dental prostheses. J Dent. 2018; 76:32-39. DOI: https://doi.org/10.1016/j.jdent.2018.05.015
19. Tuðçe Kavaz, Kadir Gördeli, Nuran Yanýkoðlu. An investigation of the reasons for failure in patients with a fixed prosthesis. On J Dent Oral Health. 2021:4(1);1-5. DOI: https://doi.org/10.33552/OJDOH.2021.04.000578
20. Raza M, Fahimullah, Fayyaz M, Akram S. Complications and their severity in patients of conventional metal ceramic fixed dental prosthesis: A clinical study. Pak Oral Dent J. 2015; 35: 155-8.