

# Clinical evaluation of crown and bridge prosthesis placed in patients attended in the Bangabandhu Sheikh Mujib Medical University

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## Article Info

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## Abstract

The proper diagnosis and clinical assessment are essential when dealing with the complications of fixed restorations in dental prosthesis. This cross-sectional study was carried out to evaluate clinically the crown and bridge prosthesis among the patients attending in the Department of Prosthodontics, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh. A total of 50 patients with full veneer crowns or bridges were selected. Clinical assessment for the contour of the prosthesis, nature of the contact of the prosthesis, type of occlusal contact in ICP were done. Among the study subjects, 44% and 52% of the prostheses were over-contoured buccally and lingually, respectively. The prostheses contacted with adjacent tooth mesially at occlusal one-third in 58%, middle one-third in 40% & cervical one-third in 2% cases. The prostheses contacted with adjacent tooth distally at occlusal one-third in 52%, middle one-third in 44% & nothing abnormality detected in 4%. About half of prostheses (54%) contacted with an opposite tooth at the level of central fossa whereas 40% at buccal to central fossa and only a few numbers (6%) at lingual/palatal to central fossa. The nature of proximal contact was normal in 52%, tight in 36%, and open in 12% of the prostheses. As the prostheses cemented in the patient's mouth were not up to the accepted clinical standards, so enrichment of knowledge about prosthetics are needed and responsibilities should be ensured.

## Introduction

When planned and designed in a correct manner, a fixed dental prosthesis provides predictable function and enhances the aesthetics and is worth the money, but a poorly manipulated prosthesis is likely to fail prematurely and leads to irreversible damage to the teeth and supporting structures beneath.<sup>1-5</sup> Proper diagnosis, technical skills and assessment are essential when dealing with failed or failing fixed restorations.<sup>6-12</sup> Loss of retention, that has been linked to caries, is also a common reason for removing fixed dental prostheses.<sup>13-15</sup> Technical complications (fractures of the fixed bridges, wear of occlusal surfaces, porcelain fractures), poor aesthetics, endodontic treatment through the retainer, and periodontal diseases are other frequent causes for failures.<sup>15,16</sup> In addition, there are scarcity of literature or prevalence studies about patient reported and clinically assessed complications associated with failed and failing fixed dental prostheses.<sup>17,18</sup> Challenges faced by today's dentist is to deliver well contoured and proper proximal-occlusal contact providing prosthesis.<sup>3,5,7,19</sup> So, this study aimed to see the clinical findings of crown

and bridge prosthesis placed in patients attended at Prosthodontics Department of BSMMU in Bangladesh.

## Methods

An individual patient's data, including case history and clinical assessment, was recorded to assess the crown and bridge clinically. Different type of contour of the prosthesis were evaluated. The contour of the prosthesis was assessed in a model of a respective prosthesis with the help of a dental surveyor. Articulating paper was used to evaluate the occlusal contact points, and dental floss was passed through the proximal area to evaluate the proximal contacts. In addition, the nature of proximal contacts was evaluated with the help of a matrix band and the nature of occlusal contact was evaluated with the help of bite paper in oral cavity and checked in the articulator after jaw registration.

## Results

Total of 50 prostheses were clinically evaluated. Buccal and palatal contour are considered as contour indicators. The study

Table-I			
Distribution of contour indicators among the study samples (n=50)			
Contour indicators	Frequency (n)	Frequency (n)	Percentage %
Buccal	Same as contra-side tooth	23	46%
	Flat	5	10%
	Over contour	22	44%
Lingual/palatal	Same as contra-side tooth	20	40%
	Flat	4	8%
	Over contour	26	52%

Table-II			
Distribution of contact point among the study samples (n=50)			
Contact point	Frequency (n)	Frequency (n)	Percentage %
Mesial	Occlusal one-third	29	58%
	Middle one-third	20	40%
	Cervical one-third	1	2%
Occlusal	Buccal to central fossa	20	40%
	At the level of central fossa	27	54%
	Lingual to central fossa	3	6%
Distal	Occlusal one-third	26	52%
	Middle one-third	22	44%
	Cervical one-third	0	0%
	Nothing abnormality detected	2	4%
Nature of proximal contact	Normal contact	26	52%
	Open contact	6	12%
	Tight contact	18	36%

results revealed that 44% of the prostheses were over-contoured buccally. About half (52%) of prostheses were over-contoured lingually. More than half of the prostheses (58%) contact with the adjacent tooth mesially at occlusal one-third. (Table-I)

Table-II illustrates the distribution of contact point among the 50 samples. Mesial, occlusal, distal and nature of proximal contact point were evaluated. About half of the prostheses (54%) contacted with opposite tooth at the location of central fossa whereas 40% at buccal to central fossa and only a few percentages (6%) at lingual/palatal to central fossa. About half (52%) of the prostheses contacted with adjacent tooth

distally at the level of occlusal one-third whereas 44% at middle one-third and only 4% of the adjacent tooth was missed. Though, the nature of proximal contact was normal among about half (52%) of the prostheses but, in 36% cases, the nature of proximal contact was tight. Only few (12%) of proximal contact were open in nature.

## Discussion

Single crowns and small fixed dental prostheses (FDPs) are the most common fixed restorations performed in general dental practice. For a long period, metal-ceramics

using high gold alloys was considered the material of choice in fixed prosthodontics. Today in Sweden, all-ceramic materials dominate for both single implant and tooth-supported crowns anteriorly as well as posteriorly.<sup>7</sup> For tooth-supported FDPs cobalt-chromium-porcelain is by far the most common material combination both in short-and long-span bridges.<sup>17</sup> Based on the reviewed publications, the following conclusions can be drawn: Both tooth and implant-supported crowns and fixed dental prostheses are safe and predictable treatment methods with high survival rates up to and over 10 years. Metal-ceramic restorations provide higher survival rate and fewer complications than all-ceramic restorations. Biological and technical complications are frequent in all types of fixed prostheses, more so in implant-supported than in tooth-supported restorations. Cantilevers function well on implant-supported restorations but are associated with increased risk of failure and complication when used on tooth-supported restorations.<sup>5-9,13</sup> Modern principles of construction have raised the resin-bonded restorations to a viable treatment option, especially for replacement of a single missing tooth. Single crowns and small fixed dental prostheses (FDPs) are the most common fixed restorations performed in general dental practice.

Though in our present study, about half of the prosthesis was over-contoured buccally and lingually, respectively, but Curtis et al. recommended that buccal and lingual contours should be flat that promote favorable tissue response.<sup>18</sup> Our current study also reveal that more than half of prostheses contacted with adjacent tooth mesially as well as distally at occlusal one-third but about half of prostheses contact with the opposite tooth at the level of central fossa. Curtis et al. recommended that crown contacts should be high (incisal one-third) and buccal to the central fossa.<sup>18</sup>

In addition, this study illustrated that the nature of proximal contact was normal or acceptable among about half of the prostheses. Almost similar results were shown in a previous study conducted by Akhtar et al. in 2015, in where half of the cases were acceptable in terms of nature of proximal contact point.<sup>19</sup> A tooth's or restoration's proximal contact points (PCPs) stay in close association, connection, or contact with an adjacent tooth in the same arch. Maintaining and stabilizing the dental arch requires proper PCP.<sup>20</sup> Food impaction, dental cavities, periodontal disease, occlusion failure, and undesired tooth drift can be caused by weak or slightly opened PCPs. Too tight contact can harm periodontal tissue, induce inappropriate tooth movement, and interfere with the teeth's physiological placement. When a new prosthesis is fabricated, the PCP must be checked before the final cementation during the try-in stage on the cast and intra oral.<sup>21</sup>

Full veneer crowns are ideally made to blend smoothly with the contours of the natural tooth being restored. If the restoration is built too large or the margins overhang the edge

of the tooth, food and bacterial plaque can accumulate along the margins, leading to inflammation and tooth decay.<sup>19</sup> Plaque accumulation in such areas can produce a bad taste and bad breath (halitosis). Establishing ideal tooth contours is complicated by poor visibility, decay that extends below the gum level, the restricted ability of a patient to open their mouth adequately, and other factors.<sup>20</sup>

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## Conclusion

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The prostheses cemented in the patient's mouth were not up to the accepted clinical standards. All prostheses should be done by prosthodontists or under the close supervision of a prosthodontist. Emphasis should be placed on proper case selection, availability of all modern lab facilities & proper monitoring. Enrichment of knowledge about prosthetics and responsibilities are needed to be ensured.

Further study regarding associate factors and prevalence of failure of existing full veneer crown or bridge works in Bangladesh should be conducted.

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## References

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1. Schwartz NL, Whitsett LD, Berry TG, Stewart JL. Unserviceable crowns and fixed partial dentures: life-span and causes for loss of serviceability. *J Am Dent Assoc.* 1970;81:1395-401.
2. Walton JN, Gardner FM, Agar JR. A survey of crown and fixed partial denture failures: length of service and reasons for replacement. *J Prosthetic Dent.* 1986;56:416-21.
3. Libby G, Arcuri MR, LaVelle WE & Hebl L. Longevity of fixed partial dentures. *J Prosthetic Dent* 1997;78:127-31.
4. Sharma A, Rahul GR, Poduval ST, Shetty K. Removal of failed crown and bridge. *J Clin Exp Dent.* 2012;4(3):e167-72.
5. Glantz PO, Nilner K. Patient age and long term survival of fixed prosthodontics. *Gerodontology.* 1993;10:33-39.
6. Lindquist E, Karlsson S. Success rate and failures for fixed partial dentures after 20 years of service: Part I. *Int J Prosthodont.* 1998;11:133-38.
7. Palmqvist S, Swartz. Artificial crowns and fixed partial dentures 18 to 23 years after placement. *Int J Prosthodont.* 1993;6:279-85.
8. Baba K, Tsukiyama Y, Clark GT. Reliability, validity, and utility of various occlusal measurement methods and techniques. *J Prosthet Dent* 2000;83(1):83-9.
9. Kerstein RB, Grundset K. Obtaining bilateral simultaneous occlusal contacts with computer analyzed and guided occlusal adjustments. *Quintessence Int.* 2001;32:7-18.

10. Wang C, Yin X. Occlusal risk factors associated with Temporomandibular Disorders in young adults with normal occlusions. *Oral Surg Oral Med Oral Pathol Oral Radiol.* 2012;114:419-23.
  11. Cheng HJ, Geng Y, Zhang FQ. The evaluation of intercuspal occlusion of healthy people with T-Scan II system. *Shanghai Kou Qiang Yi Xue.* 2012;21:62-5.
  12. Sierpinska T, Golebiewska M, Lapuc M. The effect of mastication on occlusal parameters in healthy volunteers. *Adv Med Sci.* 2008;53:316-20.
  13. Oral health surveys: basic methods, 4th ed. Geneva, World Health Organization. 1979.
  14. Leempoel PJ, Eschen S, De Haan AF, Van't Hof MA. An evaluation of crowns and bridges in a general dental practice. *J Oral Rehabil.* 1985;12(6):515-28.
  15. Pradiés G, Zarauz C, Valverde A, Ferreiroa A, Martínez-Rus F. Clinical evaluation comparing the fit of all-ceramic crowns obtained from silicone and digital intraoral impressions based on wave front sampling technology. *J Dent.* 2015 ;43(2):201-8.
  16. Fondriest, James. Shade matching in restorative dentistry: The science and strategies. *The International journal of periodontics & restorative dentistry.* 2003; 23. 467-79.
  17. Carlsson GE. Success and failure of different types of crowns and fixed dental prostheses. *J Pak Prosthodont Assoc.* 2014; 02(01): 25-34.
  18. Becker CM, Kaldahl WB. Current theories of crown contour, margin placement, and pontic design. *J Prosthet Dent.* 1981;45(3):268-77.
  19. Akhtar Q, Danyal S, Zareen S, Ahmed B, Maqsood M and Azad AA. Clinical Evaluation of Proximal Contact Points in Fixed Prostheses. *Journal of the College of Physicians and Surgeons Pakistan.* 2015;25 (9): 702-704.
  20. Matsuzaki M, Aoki N, Shimakura M, Kusakari H. [Buccal and lingual crown contours. The influences of the self-cleansing effect of food and mechanical cleansing]. *Nihon Hotetsu Shika Gakkai Zasshi.* 1987 ;31(6):1454-64.
  21. Touré B, Kane AW, Mbodji EB, Ndiaye C, Bane K, Gaye F, Boucher Y. Prévalence de la prothèse fixée et des parodontites apicales associées au Sénégal [Prevalence of fixed prosthesis-related periodontitis in Senegal]. *Odontostomatol Trop.* 2008 ;31(123):11-6.
  22. Hunter AJ, Hunter AR. Gingival margins for crowns: A review and discussion. Part II: Discrepancies and configurations. *The Journal of Prosthetic Dentistry.* 1990;64(6):636-42.
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