

JIOM Nepal. 2022 Aug;44(2):27-30.

Proximal Contact Points between Fixed Dental Restorations during Bisque Trial Stage

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Submitted
May 17, 2022

Accepted
Jul 28, 2022

ABSTRACT

Introduction

Proper proximal contact points between a crown and adjacent teeth plays an important role in the gingival health and longevity of the prosthesis. This study was conducted to assess the proximal contact points between a metal ceramic crown and adjacent teeth in bisque trial stage.

Methods

A cross-sectional study was conducted in a total of 75 maxillary and mandibular 1st molar crowns to assess the type of contact points present on the mesial and distal side by using a dental floss. The contact points were categorized as being either open, acceptable or too tight. Descriptive statistical analysis (frequency and percentage) was done using SPSS Software (version 21.0).

Results

In this study 75 crowns were studied to assess the proximal contact points in 150 (75 mesial and 75 distal) sites. A total of 24 (16%) sites showed open contact points, 47 (31.33%) showed acceptable contact points and 79 (52.66%) sites showed too tight contact points.

Conclusion

A significant number of crowns showed open and too tight type of contact points. These can be rectified before final cementation since the assessment was done during the bisque trial stage.

Keywords

Bisque trial, floss, metal ceramic crown, proximal contact point

INTRODUCTION

The Glossary of Prosthodontic Terms defines interproximal contact area as the area of a tooth that is in close association, connection or contact with an adjacent tooth in the same arch.¹ Acceptable or proper proximal contact points between adjacent teeth and fixed prosthesis play a very important role in the gingival health and overall success of the dental prosthesis.² Evaluating the proximal contact points during the bisque trial stage of fixed dental prosthesis treatment gives an opportunity for both the clinician and the technician to rectify any shortcomings that may be present on the fixed dental prosthesis.

Proper contact points between teeth and any type of fixed dental prosthesis should be present for the optimum health of the interdental gingiva, for avoiding pocket formation and for the final success of the treatment.^{3,4} Overlooking the presence of unacceptable proximal contact points between fixed dental prosthesis can lead to serious long term effects ranging from gingivitis, periodontitis, pocket formation, dental caries and eventual failure of the treatment. In addition to this open contacts can lead to food impaction which again can cause all the above listed effects and discomfort to the patients.⁵⁻⁷ Examination of the presence of proper contact points in the fixed dental prosthesis with the help of easily available materials like a dental floss can avoid all these short term and long term complications.^{8,9}

The aim of the present study is to point out the nature of proximal tooth contacts present between adjacent teeth and fixed dental prosthesis in mandibular and maxillary 1st molars during bisque trial stage.

METHODS

A descriptive cross-sectional study was conducted among patients visiting Department of Prosthodontics for placement of full veneer metal ceramic crowns in mandibular and maxillary 1st molars from February 2022 to May 2022. Ethical clearance was obtained from Institutional Review Committee of Chitwan Medical College. (IRC No: CMC-IRC/078/079-108).

Convenience sampling method was used and the sample size was calculated by using Cochran's formula $n=z^2pq/e^2$ (where n=sample size, p=proportion of success, q=1-p, e=margin of error, z=1.96 at 95% confidence level, p=0.95 i.e. 95% success proportion, q=0.05, e=0.05). By using this formula sample size of 72.99 was obtained. $\{n= (1.96)^2 \times 0.95 \times 0.05 / (0.05)^2 = 72.99\}$. From this calculation, sample size was taken as 75.

Data collection was done from willing patients after taking written consent from them. For collection of

data a proforma was used which included nature of contact point on mesial side and distal side of the crown. To record the nature of the contacts a dental floss (Colgate Dental Floss, Colgate 300 Park Avenue; New York, NY) was used. Contacts were noted as open if the floss passed between the adjacent tooth and the crown without any resistance. If the floss shredded while inserting and removing from the contact area or didn't pass at all, it was attributed as too tight. Similarly if the floss passed in between the crown and adjacent tooth with minimum resistance without shredding of the floss the contact was noted as acceptable.

The data collected were entered in Microsoft Excel sheet and descriptive statistical analyses (frequency and percentage) were performed using SPSS Statistical Software Package (version 21.0).

RESULTS

Among the participants in the study 72.2% (N=52) were male while 30.66% (N=23) were female. Similarly, the 21-30 years age group of the patients were most numerous; the age distribution of patients participating in this study is depicted in Figure 1.

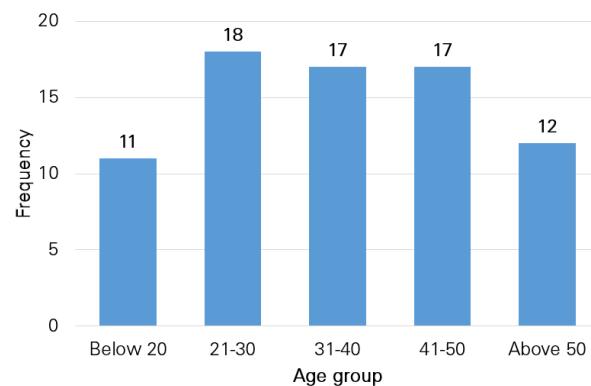


Figure 1. Age of patients

The nature of proximal contacts recorded in this study is shown in Table 1. More than half (52.66%) of the contacts were too tight.

Similarly, out of the crowns analyzed, 47 were mandibular 1st molars while 28 were maxillary 1st molars. The nature of proximal contacts on maxillary

Table 1. Nature of proximal contacts present between adjacent teeth and crown

Nature of contact	Mesial contact point	Distal contact point	Total (%)
Open	11	13	24 (16%)
Acceptable	23	24	47 (31.33%)
Too tight	41	38	79 (52.66%)
Total	75	75	150

Table 2. Nature of proximal contacts present between adjacent teeth and crown on maxillary and mandibular arch

Nature of contact	Maxillary 1 st molar		Mandibular 1 st molar		Total
	Mesial contact	Distal contact	Mesial contact	Distal contact	
Open contact	5	6	6	7	24 (16%)
Acceptable contact	13	11	10	13	47 (31.33%)
Too tight contact	22	20	19	18	79 (52.66%)
Total	40 (26.66%)	37 (24.66%)	35 (23.33%)	38 (25.33%)	150

and mandibular 1st molar crowns are depicted in Table 2. Too tight contact between adjacent teeth and crown were more common in both maxillary and mandibular 1st molars in mesial and distal contact.

DISCUSSION

For a successful treatment and longevity of a crown restoration optimum proximal contacts is one of the most important criteria. This study was done to look into the nature of proximal contacts between adjacent teeth and metal ceramic crown placed on maxillary and mandibular 1st molars during bisque trial stage.

In this study 16% (N=24) site of the crowns had open contacts, 31.33% (N=47) had acceptable contacts and 52.66% (N=79) site of the crowns had too tight contacts. In a similar study by Almalki and Al-Rafee² the distribution of normal proximal contacts was 66.2%, open contacts was 18.3% and 15.5% proximal contacts were tight. In another study by Oh et al¹⁰ they found 58.4% proximal contacts to be normal or acceptable, 12.6% to be tight and 28.8% of the proximal contacts to be open.

In the present study a total of 75 mesial and 75 distal contacts were assessed. On the mesial side 14.66% (N=11) were open contact, 30.66% (N=23) acceptable contact and 54.66% (N=41) were too tight contact. Similarly on the distal side 17.33% (N=13) open contact, 32% (N=24) acceptable contact and 50.66% (N=38) too tight contact were present. In a similar study by Ahmad¹¹ where the presence of type of proximal contacts was assessed it was found that normal contact points were present in 56.7% (51) on the mesial and 34.8% (24) on the distal side. Likewise in that study open contacts were present in 17.8% (16) mesial and 29% (20) distal side. Similarly tight contacts were observed in 15.6% (14) mesial and 29% (20) distal surfaces. Comparing the data between the two studies in this present study too tight contacts were observed in more than half of the surfaces observed in both mesial and distal side while in the study by Ahmad¹¹ more contacts were of normal type in both distal and mesial side. The difference in observations may be due to the difference in level

of skill and technique of the ceramic technician to produce acceptable contact points in metal ceramic crowns.

Even if the majority of type of contact observed in this present study was not of acceptable type since this study was performed in the bisque trial stage it gave an opportunity to rectify the shortcomings in the prosthesis before final cementation. When an acceptable proximal contact is established between the crown and adjacent teeth, it directly enhances the gingival health and longevity of the prosthesis.

The limitation of this study are less number of sample size, assessment of only 1st molar crowns and assessment in only one study setup.

CONCLUSION

Large number of crowns showed open and too tight type of contact points. These can be corrected before final cementation since the assessment was done during the bisque trial stage.

FINANCIAL SUPPORT

The author(s) did not receive any financial support for the research and/or publication of this article.

CONFLICT OF INTEREST

The author(s) declare that they do not have any conflicts of interest with respect to the research, authorship, and/or publication of this article.

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