Clinical Evaluation of Proximal Contact Points in Fixed Prostheses

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ABSTRACT

This cross-sectional study clinically assesses the tightness of proximal contact points of fixed dental prosthesis with natural teeth. Sixty nine (69) patients visiting the Department of Prosthodontics, Armed Forces Institute of Dentists (AFID), Rawalpindi, were included. The crowns, as a single unit or terminal abutment of bridge, prepared and fabricated at the same institute were included. A total of 142 Proximal Contact Points (PCPs) were assessed with dental floss and categorized as acceptable, loose and tight. Among these, 83 (58.4%) were acceptable, 41 (28.8%) loose and 18 (12.6%) tight. Out of 142 PCPs, 104 (73.2%) were Porcelain Fused to Metal (PFM) and 38 (26.7%), all metal. Out of 104 PFM crown/FPD PCPs 59 (56.7%) were acceptable, 32 (30.7%) were loose and 13 (12.5%) tight. Out of 38 all metal crown/FPD PCPs 24 (63%) acceptable, 9 (23%) were loose and 5 (13%) tight. PCPs must be checked for acceptability before cementation. The PCPs of adjacent natural dentition in same patient may serve as guide for assessment.

Key Words: Contact points. Crowns. Cementation. Prosthodontics. Porcelain fused to metal (PFM) crowns.

Badly broken teeth are restored using fixed dental prostheses which protect remaining tooth structure and may also act as retainer of Fixed Partial Denture (FPD) for replacement of missing tooth. They may also be responsible for maintaining occlusion, function and provide esthetics.1 Proximal Contact Points (PCPs) of a tooth or restoration remain in close association, connection or in touch with an adjacent tooth in the same arch.2 Proper PCP plays an important role in maintaining and stabilizing the dental arch.3 Inappropriate contact points, though limited in modern population receives little scientific attention.4 Weak or slightly opened PCPs may cause food impaction, dental caries, periodontal disease, failure of occlusion and an undesirable drift of the teeth. On the other hand, too tight contact may damage the periodontal tissue or cause improper tooth movement or interfere with the physiological placement of the teeth.5 When new prosthesis is fabricated, the PCP has to be checked during try in stage on the cast and intra oral before final cementation.6 The strength of Contact Point (CP) is generally determined by dentist clinically with the dental floss that passes through the CP with a snap.2 To the authors’ knowledge, no study has been carried out so far to assess the PCPs of fixed prostheses with adjacent natural teeth, fabricated at our setup. The objective of this study was to assess the PCPs of fixed prostheses with natural teeth clinically.

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FPD with natural teeth. Out of a total 142 PCPs, 104 (73.2%) were PFM and 38 (26.7%) were all metal. Out of 104 PFM crown/FPD PCPs, 59 (56.7%) were acceptable, 32 (30.7%) were loose and 13 (12.5%) were tight. Out of 38 all metal crown/FPD PCPs, 24 (63%) were acceptable, 9 (23%) were loose and 5 (13%) were tight.

The term PCP refers to the area of proximal contour height on the mesial or distal surface of a tooth that touches its adjacent tooth in the same arch.7

Different methods have been suggested to check the PCP before the cementation.2 The dentists assess the strength of proper PCP in clinical treatment by passing a floss with a snap. This method is simple but it is difficult to detect the detailed changes in the strength.8 Dorfer et al. measured PCP strength with a calibrated metal strip (0.05 mm thick), and reported that the strength varied between teeth, arches and function.9 We carried out clinical assessment manually with the floss as it was practical and gave the fair idea of the tightness of PCP.

Data obtained from this study showed discrepancies in PCPs of crowns/FPD. Discrepancies in PCPs and anatomic contour of the crowns may have adverse effects on surrounding tissues.10 Discrepancies in PCPs were observed in the form of tight and open PCP. One reason of tight contact points may be due to over contoured crown on proximal surfaces. It also reduces embrasure space which results in broadening of the Col area, causing pressure and irritation on the papilla. Over-contoured crown decreases gingival embrasure leading to gingival inflammation and inhibit effective oral hygiene, therefore, the axial reduction of tooth structure should follow the original contour of the tooth so that final restoration is more close to the natural anatomy of that tooth.11 Frequently, dentists prepare the axial surfaces to be flat, forcing technicians to make over contoured crown with wide occlusal tables. Many a times it may not be possible for even good technicians to overcome the discrepancies of preparation.1

Tight contact points make the interdental area to floss extremely difficult for patients. It also makes the area highly susceptible for caries. In a study,1 faulty (tight, open or loose) PCPs were associated with caries in adjacent teeth significantly. PCP within normal limits were associated with less number of carious lesions in adjacent natural teeth. Tight PCP had greater association with presence of caries in adjacent natural teeth than open contact. Presence of carious lesion was observed less in teeth adjacent to crown with open than those with tight PCPs. Greater discrepancies in PCPs between crown and distal teeth were observed than that between a crown and mesial tooth, however, in this study we did not assess the mesial and distal contact points separately and did not compare them with each other.

The data obtained from this study showed PCP discrepancies in PFM and all metal prostheses. Majority of CPs were assessed in PFM prosthesis i.e. 104 (73.2%) as compared to all metal i.e. 38 (26.7%). Probably, it is due to patients’ preference of PFM over the all metal prosthesis; however, there was less difference in PCPs discrepancies in the values of both PFM and all metal. In PFM PCPs, 56.7% were acceptable as compared to 63% in all metal. In PFM 30.7% PCP were loose as compared to 23% in all metal and 12.5% PCP were tight in PFM as compared to 13% in all metal. Wessell et al. suggest that open PCP occur less frequently as compared to tight.8 However, this study showed contradictory result to Wessell et al. study and suggested loose PCPs (28.8%) to be 16.2% higher than the tight PCPs (12.6%).

The crown should be evaluated both clinically and radiographically before final cementation. At try in stage the PCPs of definitive crowns should be assessed for any discrepancy. If any fault is detected it should be adjusted by the dental laboratory before cementation.1 It is, therefore, recommended on the basis of results of this study and following discussion that the ideal PCPs are imperative for the success of fixed prostheses and these must be checked for excessive looseness and tightness. Acceptability of PCPs may be optimized by following standardized procedures during fabrication and vigilant check up by dentist before cementation. If any doubt exists, prosthesis may be cemented temporarily and checked for food impaction in few days' time before permanent cementation. The PCP of natural dentition in the same patient may be good guide for assessment.

REFERENCES


