

Knowledge, attitude, and practice of dental professionals regarding the effect and management of food impaction associated with fixed partial denture prostheses: A survey

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Abstract

Objective: This survey was undertaken to assess dentist's opinion regarding the occurrence and pattern of food impaction in relation to fixed partial denture (FPD) prostheses, its commonly observed consequences, factors contributing to it, and its management.

Methods: A descriptive survey was conducted on a sample size of 150 dental practitioners. The pro forma consisted of informed consent, demographic information, and questionnaire. The results were tallied and quantitative analysis was performed to obtain the descriptive statistics for the data using SPSS version 20.

Results and Interpretation: All the study respondents had come across patients who complained of food impaction in relation to FPD. The most common consequences of food impaction were proximal caries of the adjacent teeth and interdental bone loss. Majority of the dentists considered faulty FPD design with improper contact relation, improper crown contour, poor margin adaptation, and faulty pontic design as the most likely reason for food impaction. Repeating the FPD with emphasis on prescribing and reinforcing the use of proper interdental aids was considered as the ideal treatment option. It was also observed that about half of the dentists always communicated inadequate information of the FPD prostheses that needed replacement to the dental laboratory technician for the successive bridge. Most of the times, prosthodontists were consulted to rectify the problem of food impaction resulting from faulty FPD prostheses. However, it is obvious that it is easier and more prudent to prevent rather than treat food impaction. This study gives an overview of some of the common errors in designing the FPD prostheses which often lead to food impaction and measures to be taken to overcome them.

Conclusion: It may be concluded as all the dentists participating in the survey agreed that food impaction is one of the common complaint among FPD Patients. Proximal caries and interdental bone loss were the prevalent outcomes of food impaction. Faulty FPD design was allegedly attributed as the reason for food impaction. Prosthodontists were routinely consulted to resolve the dilemma of food impaction. However, it is rational to prevent food impaction rather than to tackle the sequel later.

Key Words: Contact relation, crown contour, fixed partial denture prostheses, food impaction, margin adaptation, pontic design

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INTRODUCTION

Food impaction in relation to fixed partial denture (FPD) prostheses is one of the common complaints reported by the patient yet often neglected by the dentists. The dentist should evaluate the etiological factors responsible for food impaction and carry out necessary steps to treat it. However, it is often noticed that symptomatic treatment is given to the patients with food impaction rather than rectifying the cause.

Food impaction is one of the common causes of gingival and periodontal diseases.^[1,2] It also leads to caries of the abutment and the adjacent teeth leading to subsequent failure of the prostheses.^[1,3] Webster defined food impaction as food being packed or wedged.^[2] Hirschfeld^[1] has documented and classified several factors causing food impaction [Table I].

Failure to adhere to principles of crown contour, contact relation (form, type, and position), margin placement, and pontic design often leads to food impaction.^[1,4,5] Food impaction resulting from faulty constructed restoration can be best avoided if suitable precautions are taken while designing the prosthesis. The information of the desired prostheses further has to be effectively communicated to the dental laboratory to avoid subsequent failures.

However, a clear determination of specific guidelines and communication of precise information to the technician about the desired FPD design by dental practitioners are often seen lacking.^[6-9]

When unable to treat recurring cases of food impaction related to FPD prostheses in the practice, general practitioners often consult a specialist for its management. Prosthodontist plays a major role in preventing and treating food impaction by delivering biocompatible prostheses, with emphasis on and attention to important clinical and biological aspects to avoid tissue damage.

Keeping this in mind, a survey was undertaken to assess dentists' opinion regarding the occurrence and pattern of food impaction in relation to FPD prostheses, its commonly observed consequences, factors contributing to it, and its management. Further, the study findings would be incorporated to suggest measures or recommendations to improve designing of FPD to overcome and prevent food impaction.

Table 1: Hirschfeld classification of factors causing food impaction

Class I: Occlusal wear
Class II: Loss of proximal contact
Class III: Extrusion beyond the occlusal plane
Class IV: Congenital morphological abnormalities
Class V: Improperly constructed restorations

METHODS

A descriptive survey was conducted on a sample size of 150 dental practitioners (graduate and postgraduate dentists) from all over the state of Goa from September 1, 2014, to October 15, 2014. Ethical clearance was obtained from the Ethical Review Committee of the Institutional Review Board.

A pilot study was conducted among 15 dentists. In the pilot study, the respondents were asked for feedback on clarity of the questions and whether there was any difficulty in answering the question or ambiguity as to what sort of answer was required. The dentists who participated in the pilot study were not included in the final sample.

The questions underwent subsequent revisions before the main study for the understanding of subjects. The final questionnaire consisted of twenty questions. The pro forma consisted of informed consent, demographic information, and questionnaire. In the questionnaire, there was an option of choosing more than one appropriate answer for the respective questions if necessary. The questionnaire was self-administered and closed-ended.

The purpose of the survey was to get feedback regarding following aspects of food impaction in relation to FPD/crown:

- Occurrence
- Commonly observed consequences
- The most likely reason
- The most routinely followed line of treatment.

Before administering the questionnaire, the dentists were briefed about the objectives of the study. They were informed that their participation was voluntary and no incentives would be provided for participation and that the survey data will be kept anonymous. Subjects were given 1 h to fill the questionnaire and to return it back.

The data were entered into the MS Excel (MS Office version 2007 developed by Microsoft, Redmond, WA, USA). The results were tallied and quantitative analysis was performed to obtain the descriptive statistics for the data using SPSS version 20 (IBM Corporation).

RESULTS

A total of 150 dentists participated in the survey, out of which 97 were graduates in dental science (BDS) and 53 were postgraduates in dental science (MDS). Seventy-eight of the participating dentists had been in practice for <10 years while 72 had been in practice for more than 10 years [Figures 1-3]. The details of comparison between graduate and postgraduate qualification as well as years of practice are presented in Tables 2 and 3.

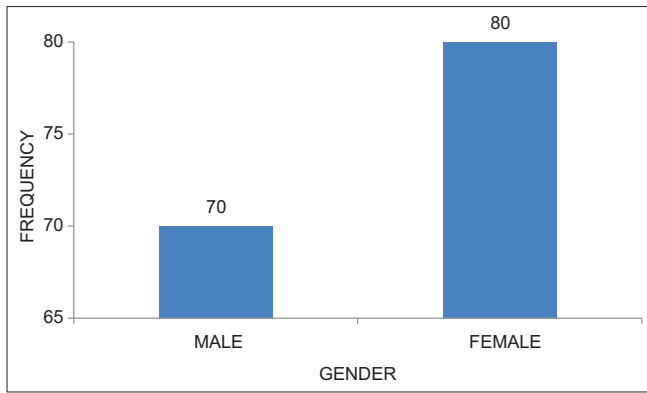


Figure 1: Gender profile of participating dentists

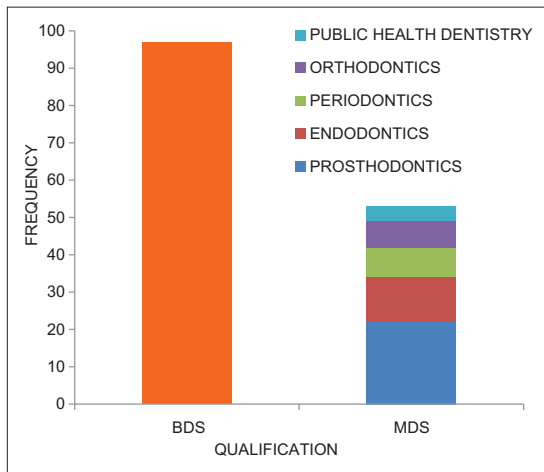


Figure 2: Qualification of dentists

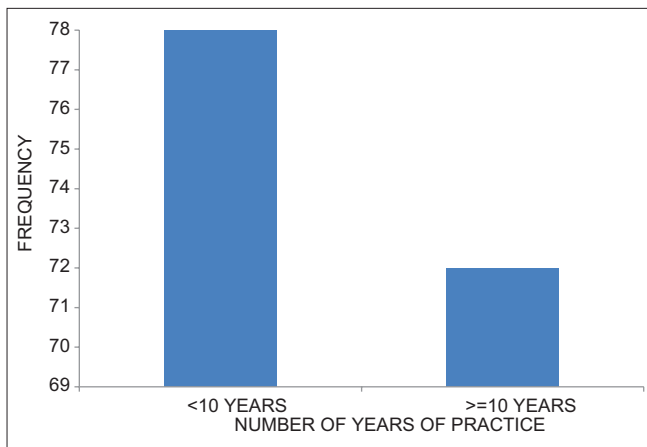


Figure 3: Number of years of practice of dentists

DISCUSSION

This study revealed all of the dentists at one or the other time encountered patients complaining of food impaction in relation to FPD. Results of this study revealed that food impaction was most commonly seen in posterior mandibular region (65%), followed by posterior maxillary region (57%). These results

are in agreement with the study done by Leonard Linkow, who stated that lower FPD collects more food than upper, particularly in the molar region.^[10]

Contradictorily, Jung *et al.*^[11] conducted a clinical study on occurrence of food impaction and observed that it is more frequently observed in maxillary teeth (66%) than the mandibular teeth (34%).

Data of this study revealed the interproximal area (83%) as the most commonly involved surface in food impaction followed by the area beneath the pontic (40%).

Interdental area is the primary site of periodontal disease and caries.^[12] Unfortunately, interproximal surfaces of the restoration are the most neglected areas in the fabrication of restoration.^[8] The absence or presence of unsatisfactory proximal relationship and contour of occlusal surface is conducive to food impaction in the interproximal region.^[3,12] Studies have also reported inflammation of edentulous mucosa adjacent to the pontic due to food accumulation on the surface of the pontics.^[13]

This study results reported that patients commonly presented with complaints of bleeding gums (95%), halitosis (91%), and pain (88%) as signs of food impaction.

Early sequel of food impaction is feeling of vague pain and pressure, gingival inflammation, foul taste, and recession followed by bone loss and proximal caries.^[1] Many times, it is seen that patient momentarily feels relieved of pain and discomfort after using a toothpick in gingiva – occlusal direction.^[1]

This study reported that more than half of the patients (89%) used toothpicks as an interdental aid. However, a significant number of patients also used dental floss (88%) followed by interproximal toothbrush (39%) to maintain oral hygiene.

Toothpicks are detrimental for gingival health. Wheeler has stated that the gingiva is apt to be stripped or pushed apically through lack of protection and consequent stimulation.^[13] Becker and Wayne have demonstrated that most effective means of interproximal plaque control is the use of an interproximal brush.^[13] However, the space between two adjacent proximal surfaces must be wide enough to allow it to pass through with relative ease.

Results of these studies revealed that the most common consequences of food impaction were caries of the adjacent teeth (63%), caries of abutment teeth (41%), pocket formation (55%), and interdental bone loss (48%).

Table 2: Descriptive statistics (frequencies and percentages)

Question	Response	Percentage
Number of patients reporting with complaints of food lodgment in last 6 months	<5	99 (66)
	5-10	35 (23)
	>10	16 (11)
Presenting complaint along with food lodgment	Pain	88 (57)
	Bleeding gums	95 (63)
	Halitosis	91 (61)
	Any other	12 (8)
Were the patients aware of the occurrence of food lodgment?	Never	2 (1)
	Sometimes	60 (40)
	Mostly	76 (51)
The occurrence of food lodgment was more in relation to	Always	12 (8)
	Short span FPD	18 (12)
	Long span FPD	33 (22)
	Single crowns	38 (25)
Time elapsed after fabrication of prosthesis	No such relation noticed	70 (47)
	<6 months	27 (18)
	6 months to 1 year	66 (44)
	1 year to 5 years	47 (31)
Common site of food lodgment in relation to FPD/crown	>5 years	17 (11)
	Anterior maxillary region	2 (1)
	Posterior maxillary region	85 (57)
	Anterior mandibular region	6 (4)
	Posterior mandibular region	97 (65)
Surfaces most commonly involved in food lodgment	No particular region	31 (21)
	Labia/buccal	16 (11)
	Lingual/palatal	11 (7)
	Interproximal	124 (83)
Consequences of food lodgment observed	Area beneath the pontic	60 (40)
	Proximal caries of teeth adjacent to abutment teeth	94 (63)
	Secondary caries beneath the crown in relation to abutment teeth	62 (41)
	Pocket formation in relation to abutment teeth and adjacent teeth	82 (55)
	Gingival recession in relation to abutment	48 (32)
Presence of use of interdental aids	Interproximal bone loss between abutment and adjacent teeth	72 (48)
	Never	20 (13)
	Sometimes	114 (76)
	Mostly	16 (11)
If yes, interdental aids used by the patient	Always	0
	Dental floss	108 (72)
	Interproximal toothbrush	39 (26)
	Toothpicks	89 (59)
Most likely reason for food lodgment	Anything else	5 (3)
	Faulty FPD/crown design	148 (99)
	Improperly restored adjacent teeth	66 (44)
	Improper alignment of opposing teeth	30 (20)
Contributory factors for faulty FPD design	If other than these	1 (1)
	Improper contact relation of the crown with the adjacent tooth or crown	112 (75)
	Improper contour of the crown	66 (44)
	Improper pontic design	53 (35)
	Poor margin adaptation of the crown	68 (45)
Treatment options considered	Redoing the FPD	138 (92)
	Refilling of the adjacent tooth	74 (49)
	Altering the existing restoration of the adjacent tooth	32 (21)
	Blocking the interproximal contact area	15 (10)
	Prescribing interdental aids	89 (59)
	Other than these	3 (2)
Was the necessary information related to new FPD design communicated to lab technician	Never	8 (5)
	Sometimes	20 (13)
	Mostly	33 (22)
	Always	89 (59)
Did patients respond to prescribed treatment satisfactorily?	Never	0
	Sometimes	25 (17)
	Mostly	100 (67)
	Always	25 (17)

Contd...

Table 2: Contd...

Question	Response	Percentage
If no, were the patients referred to a specialist?	Never	46 (31)
	Sometimes	57 (38)
	Mostly	27 (18)
	Always	20 (13)
Specialist to whom the patients were usually referred	Prosthodontist	104 (69)
	Periodontist	42 (28)
	Any other	4 (3)
Did the symptoms of food lodgment subside after final treatment	Never	0
	Sometimes	10 (7)
	Mostly	119 (79)
	Always	21 (14)
Time period for recall	Once every month	33 (22)
	Once a year	54 (36)
	Once every 2 years	2 (1)
	Other than these	43 (29)
	No recall appointment was made	18 (12)

FPD: Fixed partial denture

Table 3: Comparison of response of BDS versus MDS and experience in practice <10 years versus ≥10 years

Question	Response	BDS (%) (total=97)	MDS (%) (total=53)	P	<10 years (%) (total=78)	≥10 years (%) (total=72)	P
Most likely reason for food lodgment	Faulty FPD/crown design	95 (98)	53 (100)	0.30	77 (99)	71 (99)	1
	Improperly restored adjacent teeth	42 (43)	24 (45)	0.81	33 (42)	33 (46)	0.62
	Improper alignment of opposing teeth	18 (19)	12 (23)	0.56	14 (18)	16 (22)	0.541
	If other than these	1 (1)	0	0.47	1 (1)	0	0.40
Contributory factors for faulty FPD design	Improper contact relation of the crown with the adjacent tooth or crown	76 (78)	36 (68)	0.18	65 (83)	47 (65)	0.013
	Improper contour of the crown	37 (38)	29 (55)	0.04*	33 (42)	33 (46)	0.62
	Improper pontic design	30 (31)	23 (43)	0.14	20 (26)	33 (46)	0.012*
	Poor margin adaptation of the crown	43 (44)	25 (47)	0.724	35 (45)	33 (46)	0.90
Treatment options considered	Redoing the FPD	89 (92)	49 (92)	1.0	74 (95)	64 (89)	0.176
	Refilling of the adjacent tooth	47 (48)	27 (51)	0.73	41 (53)	33 (46)	0.394
	Altering the existing restoration of the adjacent tooth	19 (20)	13 (25)	0.48	18 (23)	14 (19)	0.55
	Blocking the interproximal contact area	8 (8)	7 (13)	0.33	10 (13)	5 (7)	0.23
Was the necessary information related to new FPD design communicated to lab technician	Prescribing inter dental aids	52 (54)	37 (70)	0.06	45 (58)	44 (61)	0.70
	Other than these	1 (1)	2 (4)	0.22	2 (3)	1 (1)	0.389
	Never	6 (6)	2 (4)	0.60	5 (6)	3 (4)	0.58
	Sometimes	4 (4)	16 (30)	0	9 (12)	11 (15)	0.60
Did patients respond to prescribed treatment satisfactorily?	Mostly	21 (22)	12 (23)	0.88	21 (27)	12 (17)	0.145
	Always	57 (59)	32 (60)	0.90	44 (56)	45 (63)	0.385
	Never	0	0	-	0	0	-
If no, were the patients referred to a specialist?	Sometimes	18 (19)	7 (13)	0.35	15 (19)	10 (14)	0.413
	Mostly	61 (63)	39 (74)	0.17	49 (63)	51 (71)	0.301
	Always	18 (19)	7 (13)	0.35	13 (17)	12 (17)	1
	Never	33 (34)	13 (25)	0.26	27 (35)	19 (26)	0.24
Specialist to whom the patients were usually referred	Sometimes	38 (39)	19 (36)	0.72	31 (40)	26 (36)	0.615
	Mostly	16 (16)	11 (21)	0.45	12 (15)	15 (21)	0.341
	Always	12 (12)	8 (15)	0.60	10 (13)	10 (14)	0.86
	Prosthodontist	70 (72)	34 (64)	0.31	62 (79)	42 (58)	0.006*
Did the symptoms of food lodgment subside after final treatment	Periodontist	28 (29)	14 (26)	0.70	22 (28)	20 (28)	1
	Any other	2 (2)	2 (4)	0.472	2 (3)	2 (3)	1
	Never	0	0	0*	0	0	-
Recall was done after how long	Sometimes	6 (6)	4 (8)	0.64	5 (6)	5 (7)	0.804
	Mostly	84 (87)	35 (66)	0.00*	58 (74)	61 (85)	0.100
	Always	14 (14)	7 (13)	0.86	11 (14)	10 (14)	1
	Once every month	20 (21)	13 (25)	0.58	17 (22)	16 (22)	1
Did the symptoms of food lodgment subside after final treatment	Once a year	44 (45)	10 (19)	0.002*	28 (36)	26 (36)	1
	Once every 2 years	1 (1)	1 (2)	0.61	1 (1)	1 (1)	1
	Other than these	27 (28)	16 (30)	0.80	25 (32)	18 (25)	0.35
	No recall appointment was made	14 (14)	4 (8)	0.29	10 (13)	8 (11)	0.71
	Did not answer						

*P<0.05 (significant). FPD: Fixed partial denture

Wedging of food eventually leads to plaque accumulation.^[15] Plaque is the etiologic factor for caries and periodontitis. The patient may find it difficult to keep an area of crown with faulty margins and contact areas clean which results in caries of adjacent teeth.^[3] Studies have shown that faulty contact areas (tight, open, or lost) were associated with caries in adjacent teeth significantly.^[3] Every effort should be made to allow easy access to the interdental area for plaque control.^[8,9,13] It is necessary to motivate and educate patient about oral hygiene measures with particular emphasis on the gingival surface of the pontic since it is inaccessible for cleaning with a toothbrush.

As per the data of this study, majority of the dentists (98%) considered faulty FPD design as the most likely reason for food impaction. The major contributing factors reported were improper contact relation with adjacent teeth (73%), improper crown contour (44%), and poor margin adaptation (45%), and faulty pontic design (35%).

These results are in agreement with the studies which have reported that restorations with the absence of contact or unsatisfactory proximal contact and faulty occlusal, facial, and lingual contours as the most common reason for food impaction.^[10,14] Several studies have also reported that establishment of improper flat interproximal occlusal contour, with uneven marginal ridges and grooves leads to food impaction.^[1,10] Studies have reported that overextended or overhanging margins constitute one of the iatrogenic factors for food impaction, leading to changes in the subgingival microflora and epithelial and connective tissues.^[16] Studies have also demonstrated that poor fit can present as a gap or an overhanging margin (positive ledge) or a deficient margin (negative ledge), leading to food accumulation and recurrent caries.^[9]

Studies have revealed that buccal and lingual embrasures in the pontic area can trap food particles and interfere with the food flow pattern leading to food impaction. It has been observed that pontic with <2 mm tissue clearance often contributes to food impaction.^[8,17]

This study revealed that 91% of the dentists considered repeating the FPD prostheses as the ideal treatment option for management of food impaction. Fifty-nine percent of dentists were of opinion that prescribing and reinforcing the use of appropriate interdental aids after repeating the failed FPD is also necessary to prevent food impaction.

Several studies too have reported restoring ideal contact and contour with a permanent restoration as the most favorable and effective treatment option to manage food impaction.^[1]

In this study, it was observed that dentists with more years in practice often preferred to treat the problem of food impaction themselves without intervention of a specialist. Data of this study revealed that 79% of dentists for <10 years in practice consulted prosthodontists whereas only 58% of dentists for more than 10 years in practice consulted prosthodontists to rectify problem of food impaction resulting from faulty FPD prostheses. Only 28% of the dentists consulted periodontists for management of food impaction. Sixty-five percent of dentists reported that the symptoms of food impaction subsided after intervention of the specialist.

Ideally, appropriate measures must be taken to prevent food impaction. A thorough periodontal evaluation is indicated in the planning stages prior to fabrication of the prosthesis.^[18] There cannot be a stereotype form for the contact and contour for every tooth. It should be an interpretation that is relative to clinical crown length, tissue architecture, and contour of adjacent teeth and character of opposing occlusion. Regardless of the restoration planned, an adequate tooth preparation is essential to allow construction of a well-contoured restoration.^[19] Gordon suggested that the axial reduction of the tooth structure should follow the original contour of the tooth so that the final restoration is more close to the natural anatomy of the tooth.^[20] A well-contoured provisional restoration is a predictable way to establish a biocompatible prosthesis.^[21]

The information related to desired contact and contour and design has to be effectively communicated to the laboratory technician. The technician then must incorporate the design criteria necessary to produce a successful restoration. However, results of this study revealed that effective communication between dentist and the technician was often lacking and only 59% of the dentists always communicated the information of the desired prostheses to the dental laboratory technician in spite of deciding on repeating the prostheses.

Zahra *et al.* conducted a survey of dental laboratories to examine the communication between the dentist and the dental laboratory pertaining to FPDs, which revealed that technicians were often dissatisfied with the information provided on the work authorization.^[6] It has been seen that the laboratory prescriptions often lacked important information.^[6,8,22] Without proper feedback from the dentist, often, the design, fabrication, and completion of the case are left up to the technician.^[6]

This study certainly has its own limitations. As the subjects were asked regarding their experiences over a wide frame of time, memory and subjective bias could have been possible. The dentists interviewed could have forgotten or not given

importance to certain facts. Furthermore, this survey could have taken a more representative sample on a wider scale. A further extensive clinical study can be done to determine the occurrence and pattern of food impaction and evaluate its cause and management with periodic follow-up of cases treated as a part of the study.

Recommendations

Dentists should delineate and follow a checklist with regard to contact relation, crown contour, margin adaptation and pontic design of FPD Prostheses for every individual patient. Dentist should also ensure that the laboratory technician has incorporated the prescribed design recommendations in the final prostheses. Table 4 gives an overview of some of the common errors in designing the FPD prostheses/crown which often leads to food impaction and measures to be taken to overcome them.

One way of strengthening effective communication between the dental practitioner and the laboratory technician which may reduce the chances of occurrence of problems arising from faulty FPD design like food impaction is by organizing more continuous professional development courses. This would

give them a common platform to put forward their views and opinions regarding the FPD design considerations.

CONCLUSION

Within the limitations of the study, following conclusions can be drawn. All the study respondents had come across patients complaining of food impaction in relation to FPD or single crown. The most common consequences of food impaction were proximal caries of the adjacent teeth and interdental bone loss. Majority of the dentists considered faulty FPD design with improper contact relation, improper crown contour, poor margin adaptation, and faulty pontic design as the most likely reason for food impaction. Repeating the FPD prostheses with emphasis on prescribing and reinforcing the use of proper interdental aids was considered as the ideal treatment option. However, only about half of the dentists communicated the desired information of the prostheses to the dental laboratory technician even after taking the decision of repeating the prostheses. Most of the times, prosthodontists were consulted to rectify problem of food impaction resulting from faulty FPD prostheses. Moreover, it is always better to take measures to prevent

Table 4: Design considerations for fixed partial denture to reduce chances of food impaction

	Problem	Management
1) Contact relation	a) Too tight contact	a) Tightness and width of proximal contact can be tested by passing a dental floss which should offer some resistance but not make the passage difficult ^[10] Displacement of dies should be checked when the crown is seated on the working cast ^[10] . Tight contacts can be identified by interposing articulating paper between the crown and tooth either on the cast and/or in the mouth. If the contacts are too tight then can be ground a little and polished or reinvested ^[9]
	b) Open contacts	b) Can be modified by returning the crown to the laboratory for addition of porcelain or redoing the crown ^[9]
	c) Cantilever FPD (Masticatory pressure on the pontic causes an open contact)	c) Can be corrected by supporting pontic on both sides ^[10]
	d) Improper location of contact	d) Contacts should be high (incisal/occlusal) and buccal in relation to central fossa except for maxillary molars ^[1]
2) Crown contour	a) Overcontouring of buccal and lingual surfaces of the crown	a) Buccolingual width of the crown should not be >1 mm wider than the CEJ ^[13]
	b) Crowns with convex proximal surface	b) Proximal surface should be concave occlusogingivally below the contact area ^[6]
	c) Exposed furcation area	c) The restoration should be fluted into the furcation area with being an extension of the contours of the exposed root surface to eliminate the triangular region created by the roots and the cervical bulge which acts as food trap ^[13]
3) Margin adaptation	a) Overextended margin	a) Adjust the crown from its axial surface until it is possible to pass a probe from tooth to crown without a catch ^[9]
	b) Deficient margin	b) Crown should be remade. Margins are unacceptable if, it allows insertion of the tip of the explorer inside ^[9]
4) Pontic design and connector placement	a) Embrasure space between the pontics	a) Should be closed ^[13]
	b) Embrasure space adjacent to abutments	b) Should be open sufficiently to allow room for access for oral hygiene ^[13]
	c) Occlusal surface	c) Should not be narrowed arbitrarily ^[13]
	d) Undersurface of the pontic/ pontic ridge undersurface	d) Pontic should have least area of tissue contact (pressure free contact). If any blanching of soft tissue observed at try in (with pressure indicating paste), then the pontic should be recontoured till the contact is entirely passive Mandibular design: sanitary pontic (2-4 mm) above the ridge or modified sanitary with an extended egg shape with minimal tissue contact. Maxillary design: modified ridge lap or modified saddle should be slightly concave or convex with a point contact at the center of the ridge ^[8,23]
	e) Connector placement (placed gingivally)	e) As the occlusogingival dimension of edentulous area decreases, connector can be extended to marginal ridge to provide hygienic embrasure form ^[6]

complications arising from faulty FPD design by ensuring appropriate design and construction rather than rectify the shortcomings later.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Khairnar M. Classification of food management – Revisited and its management. *Indian J Dent Adv* 2013;5:113-9.
2. Morris ML. Artificial crown contours and gingival health. *J Prosthet Dent* 1962;12:1146-56.
3. Durr-E-Sadaf, Ahmad Z. Porcelain fused to metal (PFM) crowns and caries in adjacent teeth. *J Coll Physicians Surg Pak* 2011;21:134-7.
4. Marzouk MA, Simonton AL, Gross RD. *Operative Dentistry. Modern Theory and Practice*, 1st ed. St Louis, Tokyo: Ishiyaku Euro America Inc; 1985. p. 237-40.
5. Pawar S. Failures of crown and fixed partial dentures-a clinical survey. *Int J Contemp Dent* 2011;2:120-1.
6. Zahra A, Behnoush R, Vicki CP. Communication between the dental laboratory technician and dentist: Work authorization for fixed partial dentures. *J Prosthodont* 2006;15:123-8.
7. Lynch CD, Allen PF. Quality of communication between dental practitioners and dental technicians for fixed prosthodontics in Ireland. *J Oral Rehabil* 2005;32:901-5.
8. Morrow R, Rhoads J. *Dental Laboratory Procedures. Fixed Partial Dentures*, 2nd ed. St Louis, Toronto, Princeton: C. V. Mosby Co.; 1986.
9. Wassell RW, Walls AW, Steele JG, Nohl F. A clinical guide to crowns and other extra coronal restorations. The clinical Guide Series. *BDJ Books*. London: British Dental Association; 2002. p. 101-3.
10. Linkow LI. Contact areas in natural dentitions and fixed prosthodontics. *J Prosthet Dent* 1962;12:132-7.
11. Jung JH, Oh SC, Dong JK. A clinical study on the occurrence of food impaction. *J Korean Acad Prosthodont* 2000;38:50-8.
12. Takei HH. The interdental space. *DCNA* 1980;24:169.
13. Becker CM, Kaldahl WB. Current Theories of crown contour, margin placement and Pontic Design. *J Prosthet Dent* 2005;93:107-15.
14. Wheeler RC. Complete crown form and the periodontium. *J Prosthet Dent* 1961;11:722-34.
15. Parkinson CF. Excessive crown contours facilitate endemic plaque niches. *J Prosthet Dent* 1976;35:424.
16. Kosyfaki P, Martin MP, Strub JR, Dent M. Relationship between crowns and the periodontium: A literature Update. *Quintessence Int* 2010;41:109-22.
17. Rosenstiel SF, Land MF, Fujimoto J, editors. *Contemporary fixed prosthodontics*, 4th ed. St. Louis: Mosby; 2006.
18. Eissmann HF, Radke RA, Noble H. Physiologic design criteria for fixed partial Dental restorations. *DCNA* 1971;15:543-68.
19. Skurow HM, Lytle JD. The interproximal embrasure. *DCNA* 1971;15: 641.
20. Christensen GJ. Frequently encountered errors in tooth preparation for crowns. *J Am Dent Assoc* 2007;138:1373-5.
21. Goodacre CJ, Bernal G, Rungcharassaeng K, Kan JY. Clinical complications in fixed prosthodontics. *J Prosthet Dent* 2003;90:31-41.
22. Berry J, Nesbit M, Saberi S, Petridis H. Communication methods and production techniques in fixed prosthesis fabrication: A UK based survey. Part 1: Communication methods. *Br Dent J* 2014;217:E12.
23. Hurzeler MB, Sturb JR. Combined therapy for teeth with furcation involvement used as abutments for fixed restorations. *Int J Prosthodont* 1990;3:470-6.

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