

A Survey on the Attitude and Practices of Fixed Dental Prosthesis Removal Techniques Amongst Dental Practitioners of Gujarat

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ABSTRACT:

Aim:

Fixed prosthodontic treatment is often encountered with complications such as failure of restorations and damage to abutment tooth/teeth due to improper treatment planning. In such conditions clinicians often need to remove prosthesis for further evaluation and treatment. This survey was carried out to evaluate the attitude and practices of dental practitioners of Gujarat during crown or fixed dental prosthesis removal.

Methods and Material:

The present survey was carried out by contacting 110 private dental practitioners of Gujarat via Google Docs forms and 92 dental practitioners reverted back with filled survey forms. The questionnaire was developed by one of the author and used to evaluate current practices and attitude of dental fraternity towards Fixed Dental Prosthesis (FDP) removal.

Results:


The majority of dental practitioners (95.6%) responded that they regularly perform crown removal procedure in their clinical practice. Most of them (85.7%) reported a frequency of less than 5 cases of crown removal per week. Out of the respondents, 90% said that they preferred to take intra-oral periapical (IOPA) radiograph before crown removal. Major causes of crown removal were endodontic

failure (52.8%) followed by periodontal considerations (22.5%) and faulty FDP design (20.2%). The crown removal technique preferred were airtor-bur (39.6%), gun type (36.3%), and sliding hammer (15.4%). Pneumatic and band removal were least used by dental practitioners. Majority of practitioners (93.3%) preferred using pulling force while performing crown removal.

Conclusions:

The survey concluded that although most of the practitioners were performing Fixed Dental Prosthesis removal on regular basis, the selection of technique and awareness regarding the procedure varied from clinician to clinician.

Key-words:FDPfailure, FDP removal technique

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Introduction:

The field of Prosthodontics involves the restorations that range from a single tooth to the rehabilitation of the entire dentition. Fixed prosthodontics specifically includes restoration of damaged or missing teeth with cast metal, metal-ceramic, or all ceramic restorations. This involves meticulous treatment planning and execution. Successful treatment of patient by means of fixed prosthodontics comprises of many aspects such as patient education and the prevention of further dental complications, thorough diagnosis, occlusal considerations, etc. However, the most meticulously planned and carefully executed prosthesis may not function for the lifetime of individual and may require replacement eventually due to various reasons.

Fixed dental prosthesis (FDP) have limited life span in the dynamic oral environment. They may need to be removed due to functional, biological or aesthetic failures if the need arises.^[1] A wide variety of reasons have been reported to explain the causes of failure. Some of the common causes for failure of a fixed restoration include the endodontic failure, secondary caries, periodontal diseases, extension of the bridge span, fractured ceramic layer, loosened retainer of a bridge, ulcers under the pontics, faulty designs, misplaced finish lines and fractured laminate veneer, etc.^[2] Out of the aforementioned causes, caries was found to be the most common cause of failures that leads to necessity of replacement of FDP as observed in the study carried out by Joanne N. Walton.^[3] It is difficult to judge true causes of failure and its effects.^[4]

Over the years removal of failed FDP has been done by various techniques that can be classified into three categories: conservative semiconservative, destructive.^[6, 7, 8] Disassembly of cemented FDP is faced by few factors that affect its removal. The five chief factors are the taper of the preparation, restoration design and structure, restorative material used, cementing agent employed, and the removal device selected.^[9] Out of these mentioned factors only selection of removal device is in control of dentist performing crown removal. Sometimes it depends on the longevity of prosthesis varying with different type of prosthesis.^[2,10,11,12,13,14] Removal of FDP is always an unpredictable procedure that may results in complications like laceration of soft tissues, damage to gingival finish line, breakage of core buildup, crown fracture etc. The dental practitioner cannot predict the certainty of what lies beneath the crown before removal, including the thickness of the restorative material.^[5]

The technique chosen by the clinician depends on their knowledge, awareness, convenience and patient related factors. Hence a survey based analysis was carried out amongst the dental practitioners to evaluate their attitude and practices of FDP removal techniques.

Materials and Methods:

The present survey was carried out by acquainting 110 dental practitioners of Gujarat via Google Docs forms and out of these 92 dental practitioners responded back with filled survey forms. Practitioners holding a bachelor or master degree in dentistry, with experience of clinical setting of at

least 5 years or more, OPD of minimum 20 patients in a week and a minimum of 15 patients undergoing FDP treatment in a week were included in this survey.

The questionnaire (figure1) was designed by one of the author with comments from the other authors. After various suggestions were incorporated, the questionnaire was piloted on a small scale among dental practitioners based in hospitals, community and general dental practice.

A SURVEY ON ATTITUDE & PRACTICES OF FIXED DENTAL PROSTHESIS REMOVAL AMONGST DENTAL PRACTITIONERS.

1. Do you perform crown removal?
 - (a) Yes
 - (b) No
2. Frequency of patients for the need of crown removal in your OPD in a week?
 - (a) <5
 - (c) 5-10
 - (d) 10-15
 - (e) >15
3. Do you advice a radiograph prior to crown removal?
 - (a) Yes
 - (b) No
4. Need for crown removal in your practice due to.....
 - (a) Failure requiring restoration replacement with supporting tooth structure.
 - (b) Failure requiring restoration replacement along with reconstruction of supporting tooth structure.
 - (c) Severe failure with loss of supporting tooth structure requiring replacement through additional support.
 - (d) Severe failure with loss of supporting tooth structure where conventional FDP no longer possible.
5. Which technique do you prefer most for crown removal?
 - (a) Sliding hammer
 - (b) Gun-type
 - (c) Pneumatic
 - (d) Airtor and bur
 - (e) Band removal
6. How much time do you take for crown removal? _____
7. Do you prefer preservation of tooth and surrounding tissue while crown removal?
 - (a) Yes
 - (b) No
8. Which problems do you face during crown removal?
 - (a) Slippage of instrument
 - (b) Soft tissue trauma
 - (c) Damage to the natural tooth
 - (d) All of the above
9. In which direction do you apply force while crown removal?
 - (a) Pushing
 - (b) Pulling
10. Do you reuse the crown after removal?
 - (a) Yes
 - (b) No
11. Do you use any other method for crown removal?
 - (a) No
 - (b) Yes

Which ? _____

Figure 1: Questionnaire for the survey

A list of dentists in Gujarat was then obtained from the register of the state dental council and entered into a data base. A random number generator was then used to select 110 dental practitioners from this data base. Questions asked in the survey form were regarding the practice and techniques of crown removal procedures. The questions included in this survey focused on parameters like the frequency, causes and preferred techniques of FDP removal. Questionnaire also included points like preference

of taking an intra-oral periapical radiograph before procedure, challenges faced and time consumed during crown removal, preservation of tooth and surrounding tissue while crown removal, direction of force applied and the reusability of FDP after removal. The question regarding causes of FDP failure was asked in the survey and the options provided were similar to the grading system based on severity of FDP failures reported by John J Mannapallil.^[2] Also, pushing or pulling motion applied on crown for removal of FDP plays an important role; thus similar question had been asked in the questionnaire survey about direction of force applied by the practitioners. Another question was asked about reusability of crown because few techniques allow reuse of the crown after removal and it is a major advantage of particular techniques.^[14]

The results obtained from the survey were analysed qualitatively and are graphically represented in figures.

Results:

Data were collected and represented graphically from the survey forms [Figure 1]. The results included the following points.

The majority of dental practitioners (95.6%) responded that they perform crown removal procedure routinely in their clinical practice. Majority (85.7%) of dental practitioners had less than 5 crown removal cases per week whereas 10-15 crown removal cases were encountered rarely (1.1%) by dental practitioners [Figure 2]. 90% dentists said that they preferred taking IOPA radiograph before crown removal. On the question of frequent cause of crown removal, 52.8% of the dental practitioners selected endodontic failure as a major cause followed by periodontal considerations (22.5%) and faulty FDP design (20.2%) [Figure 3]. Crown removal due to aesthetic considerations was least reported from different causes. Airotor-bur (39.6%) and Gun type (36.3%) crown removal techniques were frequently used amongst dental practitioners followed by sliding hammer technique (15.4%). Pneumatic and band removal techniques were least used by dental practitioners [Figure 4]. Usually 10 to 20 minutes were required for crown removal according to survey. All dental practitioners responded positively about preservation of tooth and surrounding tissue while performing crown removal but reported that they face problems that include slippage of instrument, soft tissue trauma and damage to the natural tooth/teeth. Majority of the practitioners (93.3%) used a system based on applying force in pulling direction. 86.8% practitioners did not priorities using the same crown after removal. Although the practitioners had a preferred technique of choice, if the need arose they modified the technique as required.

Frequency of patient for need of crown removal in opd per week

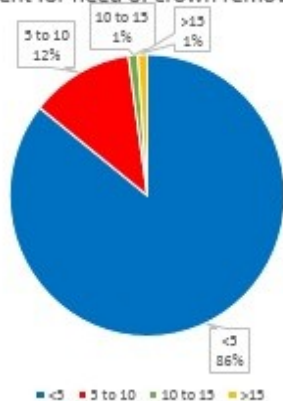


Figure 2:
Frequency of patient for need of crown removal in OPD per week

Frequent cause, for crown removal in your practice

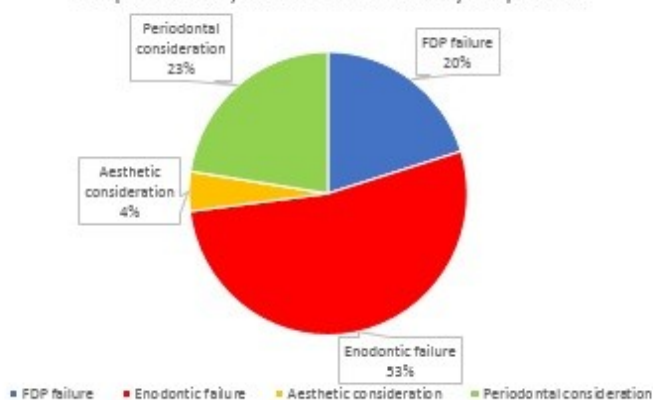


Figure 3:
Frequent cause of crown removal

Technique preferred most for crown removal

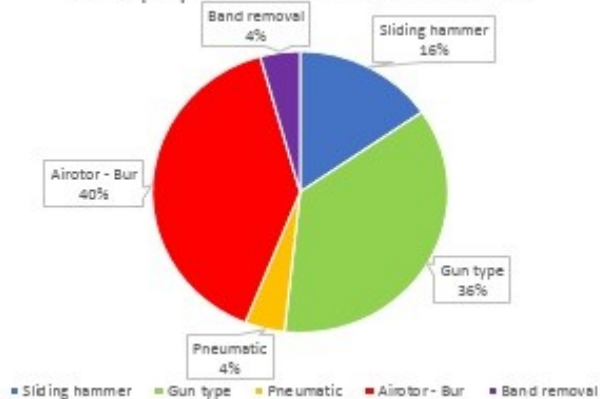


Figure 4:
Technique preferred most for crown removal

Discussion:

FDP do not last forever; however, with good plaque control, patient motivation, and average or above average resistance to disease, a well-designed and well-fabricated restoration can provide many years of service. ^[15] If patient is neglecting the care that should be taken after placement of prosthesis the “perfect” prosthesis or restoration can also fail.

As almost 92 dental practitioners that were included in the survey practiced FDP removal to varying frequency, it is imperative to have a thorough knowledge of the techniques and principals involved in it. The choice of technique for prosthesis removal is important to avoid complications during the procedure. Most of dental practitioners perform crown removal on a regular basis. 90% of the dental practitioners prefer taking IOPA radiograph before performing crown removal. This reflects the awareness towards assessing the condition of periodontium, overhanging margins of restoration and evaluation of bone loss, before FDP removal. In this study, frequent cause of FDP removal was endodontic failure whereas in another study carried out by Joanne N. Walton dental caries was found to be a major cause of crown removal.

The techniques which are used for crown removal are broadly classified in three categories. ^[7, 9]

- 1) Conservative: Richwill crown and bridge remover, Ultrasonics scalers, Pneumatic, Sliding hammer, Crown tractors, Matrix bands.
- 2) Semiconservative: Wamkey, Metalift crown and bridge removal system, Higa bridge remover
- 3) Destructive: Tungsten carbide burs, Burs and Christenson crown remover

All above techniques have their own merits and demerits. ^[1, 4, 5, 6, 10]

In the questionnaire survey it has been observed that majority of practitioners used airtor and bur for prosthesis removal which is categorized in destructive technique in which reusability of crown is not possible. Destruction of crown during the procedure can hamper the structure of tooth and eliminate chances for reuse of prosthesis. ^[15, 16, 17, 18, 19] Application of pulling motion can cause traction on periodontal ligament which is harmful and sometimes breakage of core build up occurs and it is found least in pushing motion. ^[8] Other than WAMKEY, all techniques prefer pulling motion on tooth and reusability of crown after removal can be done. While doing prosthesis removal, if we compare pulling verses pushing motion the pushing is least harmful for tooth and comfortable for patient while performing prosthesis removal. In other considerations, ultrasonic scalers are contraindicated in individual who have contagious diseases like herpes, hepatitis B and in patient with cardiac pacemaker. ^[9] Before use of technique that apply traction (Metalift, Higa) and Percussive forces (Pneumatic, Sliding hammer), periodontal health of abutment should be evaluated. The choice of FDP removal technique may be dictated by intra oral accessibility especially in posterior quadrants. There are many techniques which we can be used for preservation of tooth and surrounding periodontium but use of conservative techniques of crown removal is often avoided on a regular basis.

Conclusion:

Endodontic failure is the most common followed by periodontal considerations and aesthetic failure due to which crown/FDP removal becomes necessary for further evaluation and treatment. Although the choice of technique and instruments are governed by variety of reason like the dentist's knowledge, convenience and accessibility, careful assessment of patient's dental condition should be made before determining the technique of crown removal.

Although most of the practitioners were performing Fixed Dental Prosthesis removal on regular basis, the selection of technique and awareness regarding the procedure varied from clinician to clinician. Also, though there was awareness regarding preservation of abutment tooth/teeth and surrounding tissues, unfortunately conservative technique for preserving the FDP was not seen to be a priority amongst most dental practitioners. The general practitioners/clinicians can be updated regarding advances in coronal disassembly through workshops, journals as well as CDE programmes. Hence, it can be concluded that proper selection of FDP removal technique by the practitioners can enhance future treatment outcome.

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