

# Application Of Prosthodontic Techniques By Private Practitioners In Northern India- A Survey

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## Abstract

**Objectives-** To know the various prosthodontic techniques followed by the private dental practitioners, to know the problems encountered by the private dental practitioners in various prosthodontic treatments and to compare the techniques prescribed and techniques followed by them. **Materials and Methods-** A survey was done to determine the prosthodontic techniques by some private practitioners in India. A pre-tested questionnaire containing questions on complete denture, removable partial denture and fixed partial denture fabrication was prepared for the private practitioners to be filled up. A total of 700 subjects were included in the final study (70% response rate). **Results-** 80.4% of the practitioners used to do the whole prosthetic treatment themselves. Only 23% of the practitioners took the case history in written form. 61.7% of the practitioners who responded (670) made the study casts before the start of the treatment. Many practitioners who responded faced problems during fabrication of complete dentures, removable partial denture and fixed partial prosthesis. **Conclusion-** The findings from this study showed that the respondents did not follow the techniques and procedures which were being taught in the dental schools which had been deemed to be clinically essential for the successful prosthodontic treatment and there was a need for continuing dental education programs for the private practitioners for up gradation of their clinical skills.

## INTRODUCTION

Prosthodontics is defined as the branch of dentistry pertaining to the restoration and maintenance of oral function, comfort, appearance and health of the patient by the restoration of the natural teeth and / or replacement of missing teeth with artificial substitutes.<sup>(1)</sup> It is an extremely technique specific branch of dentistry pertaining to the oral rehabilitation of the patient by the practitioner who provides complete dentures, removable partial dentures, fixed partial dentures and various maxillofacial prosthesis. Also the practitioner must be aware of the biocompatibility and bioacceptability of the prosthesis and techniques which are being used for the patient.

It is wisely said that "It is more important to preserve what already exists than to replace what is missing".<sup>(2)</sup> This statement indicates that the various prosthesis which the practitioner fabricates should not only replace the missing structures but also preserve what is existing. There are various authors and textbooks describing these techniques which guide the operator and help in providing optimal care and they may have different opinion regarding each technique. In other words each dental school and teacher has

a unique philosophy of imparting education to the patient. However well these techniques are taught or learned they are sometimes not carried out as they should be. According to a survey, there are differences between what is taught as accepted prosthodontic practice and what is actually practiced. Various studies have reported about the following of prosthodontic procedures by private dental practitioners in the past.<sup>3,4,5,6,7)</sup> (Also some practitioners fall prey to certain half baked ideas being promoted by fly by night operators claiming to be experts in the field thereby encouraging such practitioners to indulge in methods which they are not adept in. Another A survey reported that there is a difference in procedures followed for between complete denture construction in dental schools as compared to and in general dental practice.<sup>(7)</sup> The technique taught by different colleges for the same procedure can vary and the techniques prescribed in the textbooks for one procedure can also have difference of approach. For this survey the standardized syllabus prescribed by the Dental Council Of India (DCI) is taken as the benchmark and we have accepted that all the dental graduates are fully acquainted with the ideal prosthodontic procedures as they have passed from recognized dental colleges.<sup>(8)</sup>

There is not enough information available regarding the various techniques utilized by general practitioners and whether there is any standardization of techniques practiced in the available literature. Therefore this study was undertaken to know the various prosthodontic techniques followed by the private dental practitioners, to know the problems encountered by the private dental practitioners in various prosthodontic treatments and to compare the techniques prescribed and techniques followed by them.

### **MATERIALS AND METHOD**

A survey was planned to determine the prosthodontic techniques applied by private dental practitioners of India and to know the problems faced by the practitioners during the various phases of the complete dentures, removable partial denture and fixed partial denture treatments, and to compare the techniques prescribed and techniques followed by the practitioners. Ethical clearance for conducted the survey was obtained from the Ethical Committee of Bapuji Dental College, Davangere, Karnataka.

To conduct the survey, a pre-tested questionnaire performa was prepared for the private dental practitioners to be filled up. The performa contained questions relating to complete denture, fixed partial denture and removable partial denture treatment. There is no standardized version of the performa but it was specially designed in the Dept. of Prosthodontics for the present survey. This questionnaire performa was tested on 50 private dental practitioners practising at Davangere.

The removable partial denture treatment was divided into acrylic partial denture and cast partial denture treatments.

The complete denture section of the performa contained two diagrams of edentulous maxillary and mandibular basal seat area on which the respondents were asked to draw the following: area where the spacer is provided, area where vertical tissue stops are provided and area where perforations are made.

A total of 1000 private dental practitioners from twofour major cities of India (New Delhi, Chandigarh, Bangalore and Pune) were contacted personally through personal visits and also through post (random sample). The Directories of private dental practitioners was obtained from Indian Dental Association branches in the four selected cities.<sup>(9)</sup> Every 5<sup>TH</sup> practitioner from the each directory was included in the study by systematic random sampling. Those practitioners who were busy in their practice and could not fill the form

on the day of the visit were requested to send the questionnaire through post in a self addressed envelope. Out of 1000 private dental practitioners, 700 responded to the survey. Non-responders were not included in the study. Informed consent was obtained from all the private dental practitioners and they The private dental practitioners were assured that the information collected will be kept confidential.

The results were presented in text, tables and statistically analyzed.

Since it was a simple descriptive study dealing with only numbers and percentages, only Microsoft excel was used to calculate the results and no other statistical software was used. The results are presented in both the text and the tabulated form.

### **RESULTS**

Out of 700, 563 (80.4%) of the private dental practitioners reported that they did the prosthetic treatment themselves. 70 (10%) had specialist visiting their clinics for the prosthetic work. 67 (9.6%) private practitioners had private dental practitioners visiting their clinics and also did the prosthetic treatment themselves.

630 (90%) of the private practitioners were doing complete dentures, removable partial dentures and fixed partial denture treatment in their clinics whereas only 25 (3.6%) were doing only complete dentures and removable denture fabrication.

Regarding the taking of case history before starting the treatment, 497 (71%) took the case history orally while 203 (23%) took the case history in a record and only 39 (19.2%) out of 203 maintained the record.

620 (88.6%) practitioners got the lab work done by the technician while 80 (11.4%) did the lab work by themselves.

670 private practitioners responded to the question of making study casts before the start of the treatment and only 413 (61.7%) made the study casts.

100 (15.1%) private practitioners practiced single impression technique while 560 (85%) practiced double impression technique. Out of 100, 85 (85%) practitioners used irreversible hydrocolloid (alginate) impression material while only 15 (15%) practitioners used impression compound as a single step impression material. Out of 560, 398 (71%) of the practitioners used alginate as primary

impression material and 162 (29%) used impression compound as impression materials in double impression technique.

455 (81.2%) out of 560 private practitioners provided spacer for the special tray. In the maxillary denture bearing area, the spacer was provided on rugae, incisive papilla and mid palatine raphe area by 227 (50% of 455) of the private practitioners whereas 190 (41.7%) provided the spacer on the ridge crest area and 38 (8.3%) provided on other areas. In the mandibular spacer area 247 (54.3%) practitioners out of 455 provided the spacer on the anterior crest only whereas 208 (45.7%) provided the spacer on anterior crest, pre-molar and molar area.

A total of 204 (100%) private practitioners responded regarding the provision of vertical tissue stops in the maxillary and mandibular special tray and that too in the pre-molar and molar area. The perforations in the maxillary special tray in the mid-palatine raphe, rughae area and incisive papilla was the response of 343 (62.2%) practitioners out of total of 560 practitioners. 217 (38.8%) practitioners provided perforation in the ridge crest area. In the mandibular tray, 217(100%) practitioner made the perforations and all were made in the mandibular ridge crest.

494 (84.2%) of the practitioners recorded posterior palatal seal with physiological method, arbitrary scraping of casts was done by 34 (6%) practitioners and valsalva maneuver by 25 (4.4%) and sucking finger method was followed by 7 (1.4%) practitioners.

Out of 660 respondents, 443 (67.2%) practitioners followed Niswongers technique, 165 (25%) followed combination technique and 30 (4.6%) followed conventional technique for recording vertical jaw relations. 3 point articulator was used by majority of the practitioners (638, 96.6%) and Hanau articulator was used by 22 (3.4%) practitioners. 639 (96.8%) did the try-in procedure while 21 (3.2%) did not do the try-in.

240 (36.4%) responded regarding the problems encountered in the fabrication of complete dentures. 104 (43.3%) had problems in jaw relation recording, 30 (12.5%) faced problem in obtaining retention and 22 (9.2%) reported that it was a time consuming procedure.

95.8% of the practitioners did the fixed partial denture fabrication. 598 (89.2%) did themselves whereas 72 (10.8%) had specialist visiting their clinic for fabrication.

Table 1, depicts the usage of gingival retraction cord, type of facing given and type of cement used to cement the prosthesis by the practitioners. Total number of respondents in this case was 670.

**Figure 1**

Table 1; Procedure done and usage of various materials

| Procedure done /<br>Materials used | No. of<br>respondents | Percentage (%) |
|------------------------------------|-----------------------|----------------|
| Gingival retraction                | 492                   | 73.4           |
| Acrylic facings                    | 498                   | 74.3           |
| Porcelain facings                  | 172                   | 25.7           |
| Zinc phosphate<br>cement           | 445                   | 66.4           |
| Glass ionomer cement               | 178                   | 26.6           |
| Other cements                      | 47                    | 7              |

Total response- 670

Post care instructions after fixed prosthesis were given orally by 595 (80.7%) of the practitioners while 75 (11.2%) gave them in written form. From 310 respondents who faced problems during fabrication of fixed partial prosthesis, 87 (28.2%) faced the problem of sensitivity during tooth preparation while 86 (27.7%) quoted 'high point' as the main problem. Facing fracture or detachment was the reply of 20 (6.4%) of practitioners while 18 (6.5%) felt shade selection as the major problem.

675 practitioners responded to the question regarding the fabrication of removable prosthesis. 480 (71.1%) did only acrylic partial denture fabrication, 10 (1.5%) did exclusive cast partial denture treatment and 185 (27.4%) did both acrylic partial denture and cast partial denture treatment. Study cast was made by only 90 (13.6%) of the 665 practitioners who responded while 575 (86.4%) while 493 (74.1%) of practitioners got the acrylic partial denture work done by the technician.

Only 264 practitioners replied regarding the problems faced by them in fabrication of acrylic partial denture. 99 (37.5%) out of 264 faced problems during insertion while 111 (42%) faced other problems like unsatisfactory esthetics, failure of acrylic denture, high points, retention etc.

A total of 195 practitioners did the cast partial denture treatment. Table 2, depicts the various procedures like surveying, metal framework try-in and post care instructions

given by the practitioners.

**Figure 2**

Table 2; Various procedures done in relation to cast partial denture

| Procedure done            | No. of respondents |     | Percentage (%) |
|---------------------------|--------------------|-----|----------------|
| Surveying of study models | 137                |     | 70             |
| Metal framework try-in    | 175                |     | 90             |
| Post care instructions    | Orally             | 160 | 82             |
|                           | Written            | 35  | 18             |

Total Response- 195

115 practitioners responded regarding the problems encountered during the fabrication of cast partial denture. 52 (45.2%) reported poor lab work as the main problem, 33 (28.7%) cited high cost and 20 (17.4%) reported lack of co-ordination between the dentist and the laboratory.

## DISCUSSION

Dentistry is an art and science and of course it is questionable which is more important, i.e., whether it is art or science. But the reality is that both should go hand in hand for a successful dental treatment.

The private dental practitioners who did not respond to the questionnaire were contacted for the second time but none of them agreed to participate in the study therefore the final sample size was 700.

According to DCI syllabus for recognized dental colleges in India, Students in their undergraduate level spend more than 30% of their academic career in the development of prosthodontics, starting from the first year to final year learning the various aspects of prosthodontics.<sup>(8)</sup> Even though theoretically they study prosthodontics in general, clinically they are mainly trained with removable prosthodontics i.e. conventional removable complete dentures and removable acrylic partial dentures.

Considering that there are many techniques to perform one procedure in prosthodontics, there is no universally accepted single standard technique to perform that procedure.

As already mentioned, Literature reveals that there is difference between the following of prosthodontic techniques in dental colleges as compared to the private practice.<sup>(3,4,5,6,7)</sup> what is taught as accepted prosthodontic practice and what is actually practiced. Different prosthodontic techniques are mentioned by various authors

and textbooks and all these techniques are universally accepted.<sup>(1,2,7,10)</sup>

It is reported by Zarb GA et al<sup>(10)</sup> that both new and returning patients require complete history taking and dentists must be aware of the patient's general health and conditions that might influence the choice of the treatment. But it is contrary with the findings of the present study as only 29% of the practitioners took the case history in a record.

It has been documented in several studies<sup>(11,12,13,14,15)</sup> that to make an accurate impression and to achieve the objective of impression it is necessary to take two impressions (preliminary and final) but in the present study still 15% of the practitioners followed single impression technique. It is also reported in many studies<sup>(3,11)</sup> that impression compound in the material of choice for making preliminary impression but findings of the present study support that 71% of the practitioners used alginate instead of impression compound.

Several studies<sup>(15,16,17)</sup> have suggested the use of adequate spacer over the entire denture bearing area with vertical tissue stops which is contrary with the findings of the study as still 18.8% of the practitioners were not providing spacers. It has been reported by various authors<sup>(18,19)</sup> that best way to record the posterior palatal seal area is by the combination of methods but in the present study still 88.2% of the practitioners followed the physiologic method. Only 25% of the practitioners followed the combination technique to record vertical jaw relations which is contrary to that reported by Carlson GE.<sup>(20)</sup> More practitioners in the present study did the try-in procedure than that reported by Arturo JM<sup>(5)</sup> in his study. Moreover, there were many problems quoted by the practitioners during the fabrication of complete dentures. Most of the problems are directly related to the technique applied and expertise of the practitioners as well as sound knowledge in the subject. Lacunae in any one of these will render an unsatisfactory final product by the practitioners.

Tooth Sensitivity was one of the problems faced by the practitioners during tooth preparation in fixed partial dentures. Certain patients have very sensitive teeth, and it is difficult to anaesthetize them adequately during the treatment. Such teeth are better treated with cements that do not irritate the pulp. While most of the practitioners used zinc phosphate for cementation, reinforced zinc-oxide eugenol or ortho-ethoxy benzoic acid cements are good choices for these patients.<sup>(21)</sup>

It is reported by Carr AB et al<sup>(22)</sup> that it is very essential to fabricate a study cast before the starting with removable partial prosthodontics. The results of the present study reveal that only 13.6% of the practitioners made the study cast which is contrary with the above statement. Some authors<sup>(23)</sup> have condemned the practice of lab technicians designing the removable partial denture frameworks as they cannot make valid decisions without biological knowledge of the oral structures. This is contrary to the findings of the present study as 74.1% of the practitioners used lab technicians for designing their framework.

It is reported that surveying of the diagnostic cast is mandatory for fabricating cast partial denture.<sup>(22)</sup> But only 30% of the practitioners in the present study were doing the survey. Most of the problems which the practitioners faced during the removable partial denture treatment are related to the callous attitude of the practitioners towards the patient as well as lack of the proper knowledge and expertise for the required treatment.

This survey was conducted in four major cities of India where most of the modern dentistry is practiced.<sup>(9)</sup> The survey highlighted the techniques used by the private practitioners in these cities and it can be said from the results that some of the private practitioners in these modern cities still utilize short cut and non-appropriate techniques for prosthodontic rehabilitation of the patients which is the main strength of the survey.

This study has some weaknesses also, and their influence on the accuracy of the results must be acknowledged. For example, it cannot be known with certainty how accurate self reports of usage are, whether a technique is always or sometimes employed. Also as we have no information regarding the technique followed by non-responders, this could also influence the out come of the results to some extent.

### **CONCLUSION**

The sample of private dental practitioners provides a unique opportunity to determine the various prosthodontic techniques followed by them and to know the problems encountered by them while treating prosthodontic subjects. For the fabrication of an ideal prosthesis, it is required that the practitioners follow the protocol and methods which have been mentioned in standard text books, cited by various authors and taught in the undergraduate curriculum. One possible conclusion is that there is a disconnect between the undergraduate prosthodontic curriculum and the general

practice of dentistry. From the present study it can be concluded that majority of the private practitioners follow short cut procedures and many of them follow their own convenient method for the treatment of prosthodontic problems. Almost all of them do practice fixed partial denture treatment, even they are not clinically trained. There is a lot of difference between the techniques prescribed and the techniques being followed by the practitioners. The problems encountered by the practitioners during various phases of prosthodontic treatment are avoidable and can be attributed to the lack of knowledge regarding materials and techniques and due to the adoption of various inappropriate methods. One of the problems experienced by the practitioners was sensitivity of teeth during tooth preparation which can be avoided by doing tooth preparation under local anaesthesia. Other problem was that of porcelain facing fracture that can be avoided by sticking to the guidelines mentioned in text books for tooth preparation and fabrication of prosthesis and properly imparting post care instructions to the patient. Lack of retention was also one of the problems encountered during fabrication of complete denture and it can be avoided by making the initial impression with appropriate impression material followed by final impression for capturing the minute details of the soft tissues.

Continuing dental education programs in the field which can highlight the hazards of shortcuts and stress the importance of prescribed techniques can help to improve the practitioners' clinical effectiveness and the quality of the treatment rendered to the patients. It may also be necessary to emphasize strongly the basic prosthodontic principles in the undergraduate teaching curriculum.

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