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A SURVEY ON PROSTHODONTISTS' PREFERENCE FOR FULL ARCH FIXED IMPLANT SUPPORTED PROSTHESIS IN GUJARAT STATE

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ABSTRACT

The treatment of the completely edentulous patient with complete-arch fixed implant-supported prostheses has been affected by the rapid advancement of materials, designs, and protocols. New materials and treatment procedures have indicated the beginning of a new era in implant dentistry. The purpose of this survey was to evaluate prosthodontists' current preferences for various treatment techniques and materials for full-arch fixed implant-supported prostheses. The research was carried out at K. M. Shah Dental College's Department of Prosthodontics, Crown & Bridge. A survey invitation was sent to Gujarat prosthodontists from September 2020 to February 2021. The online survey included a series of 18 questions about materials, methods, and design preferences for complete-arch fixed implant-supported prostheses. 90 (36%) of the 257 email invites were begun, and 89 (35%) were completed. The majority of responders (86.7%) worked in private practice and had performed less than 5 arches of fixed implant-supported prostheses (44.4%). Nearly half of the respondents (52.2%) chose 6 implants in the maxilla, while the preferred number in the mandible ranged from 4 (34.4%) to 6 (48.9%). Most of them (87.5%) preferred bone-level implant designs, and the plurality was ambivalent on the use of a platform-switched design (66.7%). Two-thirds (64%) preferred that a complete-arch fixed provisional prosthesis should be delivered at the time of surgery. Two-thirds (73.3 %) preferred to make a definitive impression by utilizing rigidly splinted, open-tray copings. While the majority (94.4 %) wanted to build the ultimate maxillary and mandibular prostheses with identical occlusal materials, the specifics of material selection between arches differed substantially. While there are many different protocols, designs, and materials for using a complete-arch fixed implant-supported prosthesis, these findings provide a glimpse of current clinical choices in Gujarat State.

KEYWORDS: Dental Implants, Implant material, Fixed dental prosthesis.

INTRODUCTION

In both scientific and clinical investigations, dental implants have been proved to be one of the most effective treatment options for edentulous jaw replacement. Implant-supported prostheses are now the treatment of choice for restoring missing teeth in patients who are edentulous, either partially or completely.[1]

In early papers, the number of implants used per arch fluctuated greatly and was reported inconsistently. Branemark's design called for five implants in the mandible and six in the maxilla to support a full-arch fixed prosthesis, with all implants positioned anteriorly, parallel to one another, and splinted together by a passively fitted prosthesis.[2] More recently, suggestions for the use of as many as eight implants in the maxilla and six in the mandible for segmented full- arch restorations have also been proposed.[3]

The success rate for implant-supported fixed full dental prosthesis was as high as 86.7 % in a research by Papaspyridakos et al. Pjetursson et al. observed that the 5-year prosthetic survival rate of implant-supported fixed complete dental prosthesis was as high as 95.8% in another systematic review.[4]

The treatment of the completely edentulous patient with complete-arch fixed implant-supported prostheses has been shaped by a rapid evolution of materials, designs, and protocols.[5]

Clinical trials and in-vitro testing have been published, but they have been slow to keep up with the development and evolution of this treatment approach. In terms of the number of implants, implant design, impression technique, loading and tightening protocol, and prosthesis design and material, current evidence is inconclusive. While the dental industry continues to

innovate and introduce novel materials to the market, doctors are frequently faced with the task of administering treatments for which there is little objective evidence. This makes making educated decisions and offering the best available treatments difficult.[5]

MATERIAL AND METHODS

This study was conducted in the Department of the Prosthodontics and Crown & Bridge, K.M.Shah Dental College and Hospital, Piparia, Vadodara in the year 2020. Ethical clearance was granted by the Institutional Ethics Committee, Sumandeep Vidyapeeth. This survey was performed on the prosthodontists of the Gujarat state with the aim of providing a snapshot of current usage trends among an informed and experienced body of clinicians and academics. An invite was sent to 257 prosthodontists to participate in an 18- question online survey; 90 (35%) started the survey. The focus of this survey was limited to the treatment of a completely edentulous patient with complete-arch fixed implant-supported prostheses. Emphasis was placed on the respondents' preferences for optimal treatment. Years in practice, kind of practice, and total number of arches treated were all obtained as demographic data from the respondents. The authors constructed the multiple-choice questions to cover the majority of possible solutions. When uncertainty or unique responses were expected, the respondent was given the option of selecting "other" or "n/a," with a request for qualification. The options for answers to questions containing numerical replies (such as preferred number of implants in the maxilla) were offered in ascending order.

Selection Criteria

A) Inclusion criteria

- Prosthodontists who are practicing as clinician and/or are academician in Gujarat State, by filling the questionnaire form online.
- Prosthodontist practicing as clinicians and/or academicians in State of Gujarat
- Prosthodontist who are willing to sign informed consent to participate in the study

B) Exclusion criteria

- General dental practitioners and dental practitioners of other specialties other than prosthodontics will be excluded from this study.
- Prosthodontists who will not fill the questionnaire completely.

RESULTS

Tables are presented with complete data counts and answers in the order in which they appeared in the survey.

Table 1: Survey respondent demographic information.

Sr.No.	Questions	Options	Count	Percentage
1.	Do you provide full-arch, implant-supported, fixed prosthetic treatment to your patients?	• Yes • No	• 90 • 0	• 100 • 0
2.	What is your current primary career?	• Private practice • Academics • Public health/ community clinic • Industry • Retired • Other	• 78 • 46 • 1 • 0 • 0 • 2	• 86.7 • 51.1 • 1.1 • 0 • 0 • 2.2
3.	What is the number of years you have been in practice?	• Less than 10 y • 11-20 y • 21-30 y • 31-40 y • 40+ y	• 63 • 20 • 6 • 1 • 0	• 70 • 22.2 • 6.7 • 1.1 • 0
4.	What is the total estimated number of arches of full-arch, implant-supported, fixed prosthesis you have completed?	• Less than 5 • 6-10 • 11-15 • 16-20 • 21+	• 40 • 20 • 14 • 13 • 3	• 44.4 • 22.2 • 15.6 • 14.4 • 3.3

Table 1 shows the demographic statistics of the respondents. The first question was added to eliminate individuals who did not provide the treatment in question. A "no" response stopped the survey; 0 of 90 (0 %) people did so. The majority of responders (86.7 %) were in private clinics, followed by academics (51.1 %) and public health (1.1 %). The number of years in practice was fairly well distributed across the 10-year groups. The majority of responders had finished less than 5 complete-arch fixed implant supported prostheses, according to the number of complete-arch fixed implant supported prostheses finished (44.4 %).

Table 2: Implant preferences, treatment planning, and protocols for complete-arch fixed implant-supported prostheses.

Sr.No.	Questions	Options	Count	Percentage
5.	What is your preferred (ideal) number of implants in the maxilla for this treatment? (assuming sufficient native bone, opposing fixed, implant-supported, full-arch prosthesis)	• 3 • 4 • 5 • 6 • 7 • 8 • 8+	• 0 • 7 • 1 • 47 • 5 • 30 • 0	• 0 • 7.8 • 1.1 • 52.2 • 5.6 • 33.3 • 0
6.	What is your preferred (ideal) number of implants in the mandible for this treatment? (assuming sufficient native bone, opposing fixed, implant-supported, full-arch prosthesis)	• 3 • 4 • 5 • 6 • 7 • 8 • 8+	• 1 • 31 • 2 • 44 • 6 • 6 • 0	• 1.1 • 34.4 • 2.2 • 48.9 • 6.7 • 6.7 • 0
7.	Which implant type do you prefer for the full-arch, implant-supported, fixed prosthesis?	• Bone-level design • Tissue-level design • Other	• 77 • 11 • 0	• 87.5 • 12.5 • 0
8.	Which implant type do you prefer for full-arch, implant-supported,fixed prosthesis?	• Platform switched • Nonplatform switched • Ambivalent	• 60 • 11 • 19	• 66.7 • 12.2 • 21.1
9.	Assuming sufficient implant stability, do you prefer to deliver a fixed, immediately loaded, provisional restoration?	• Yes • No	• 57 • 32	• 64 • 36
10.	What is your preferred ideal time to deliver the "immediate-load" implant-supported fixed provisional restoration? (will be only answered by those who will answer "yes" to question #9)	• Immediately after (or with) the surgery • Within 48 h • More than 48 h after implant placement	• 30 • 21 • 10	• 49.2 • 34.4 • 16.4
11.	Ideally, how do you perform the pickup/conversion of the "immediate load" provisional restoration? (will be only answered by those who will answer "yes" to question #9)	• Chairside • In the office laboratory • Done by a technician (on-site or off-site)	• 43 • 9 • 9	• 70.5 • 14.8 • 14.8
12.	For full-arch, implant-supported, fixed restorations, what do you prefer to use for the definitive impression?	• Open-tray impression with rigidly splinted copings • Open-tray impression without rigidly splinted copings • Closed tray impression • Intraoral digital scan • Other	• 63 • 5 • 8 • 10 • 0	• 73.3 • 5.8 • 9.3 • 11.6 • 0
13.	For the definitive impression (or any time before fabricating the prosthesis), do you use a separate verification device ("jig")?	• Yes, resin material • No • Yes, stone or plaster • Other	• 69 • 14 • 6 • 0	• 77.5 • 15.7 • 6.7 • 0
14.	For the definitive fixed prosthesis, which do you prefer?	• Use intermediary abutments (multiunit abutments) on all implants • Use intermediary abutments on some implants, where needed • Fabricate it to the implants directly • Other	• 32 • 44 • 10 • 4	• 35.6 • 48.9 • 11.1 • 4.4
15.	After delivery of the definitive full-arch prosthesis, do you proactively retorque the abutment screws at a follow-up visit?	• Sometime • Always • Never	• 51 • 23 • 16	• 56.7 • 25.6 • 17.8

For the complete-arch fixed implant-supported prosthesis, Table 2 shows data on implant design, treatment planning, and protocol preferences. In the table, the responses are listed in the order that they were presented to respondents. There was a preference for 6 implants (52.2%) in the maxilla, while preferences in the mandible were largely split between 4, 5, and 6 implants, with a majority choosing 6 implants (48.9 %). When compared to tissue level designs (12.5 %), respondents demonstrated the most support for bone level designs (87.5%). In terms of platform-switched implants, there was a broad consensus in favour of them (66.7 % preferred platform switched, 12.2 % non-switched, and 21.1 % ambivalent). When sufficient implant stability was present, the majority of respondents (64%) preferred to deliver a fixed, immediately loaded temporary restoration. Those who said yes to the previous question chose to do it at the time of surgery (49.2%), rather than waiting up to 48 hours (34.4%) or longer (16.4%), with the majority doing the pickup or conversion chairside (70.5 %). An open-tray technique with rigidly splinted copings (73.3 %) and the use of a second verification device similarly made of resin received significant support for making the definitive impression (77.5 %). On some implants, the majority of respondents chose to use interim abutments (48.9 %). At a follow-up consultation, preferences for proactive retightening of abutment screws were split (56.7 % always, 25.6 % sometimes, 17.8 % never).

Table 3: Material selection and fabrication preferences for complete-arch fixed implant-supported prostheses.

Sr. No.	Questions	Options	Count	Percentage
16.	Ideally, do you fabricate the Maxillary and Mandiular prosthesis with identical occlusal materials?	• Yes • No • n/a	• 85 • 2 • 3	• 94.4 • 2.2 • 3.3
17.	What is your preferred (ideal) definitive prosthesis design/material for the Maxillary?	• Lab-processed resin, denture teeth, over a cast alloy bar • Lab-processed resin, denture teeth, over a milled metal (Ti) bar • Milled PMMA resin, over a cast alloy bar • Milled PMMA resin, over a milled metal bar • Full-contour Zr to the implant (with or without layered porcelain) • Full-contour Zr with titanium bases (with or without layered porcelain) • Zr over milled metal bar • Milled polymer framework (PEEK, Pekkton) with cemented crowns • Milled metal framework (Ti, CrCo) with cemented crowns • Milled Zr framework with cemented crowns • Cast metal framework (Au alloy) with cemented crowns • Other	• 17 • 21 • 20 • 26 • 6 • 10 • 5 • 14 • 18 • 6 • 3 • 3	• 19.1 • 23.6 • 22.5 • 29.2 • 6.7 • 11.2 • 5.6 • 15.7 • 20.2 • 6.7 • 3.4 • 3.3
18.	What is your preferred (ideal) definitive prosthesis design/material for the Mandiular?	• Lab-processed resin, denture teeth, over a cast alloy bar • Lab-processed resin, denture teeth, over a milled metal (Ti) bar • Milled PMMA resin, over a cast alloy bar • Milled PMMA resin, over a milled metal bar • Full-contour Zr to the implant (with or without layered porcelain) • Full-contour Zr with titanium bases (with or without layered porcelain) • Zr over milled metal bar • Milled polymer framework (PEEK, Pekkton) with cemented crowns	• 13 • 17 • 20 • 30 • 11 • 11 • 5 • 13	• 14.6 • 19.1 • 22.5 • 33.7 • 12.4 • 12.4 • 5.6 • 14.6

		• Milled metal framework (Ti, CrCo) with cemented crowns • Milled Zr framework with cemented crowns • Cast metal framework (Au alloy) with cemented crowns • Other	• 17 • 6 • 4 • 3	• 19.1 • 6.7 • 4.5 • 3.3

The data on material selection and design of definitive fixed prosthesis is presented in Table 3. The majority of responders chose to make both prostheses out of the same occlusal materials (94.4 %). Although there was a wide range of preferences in the maxilla, milled PMMA resin was preferred above milled metal bars by a large majority (29.2%). In the maxilla, the respondent chose 7 different treatments as their favourite treatment, plus additional 3 distinct replies under other. The majority of people preferred milled PMMA resin over a milled metal bar in the mandible, just like they did in the maxilla (33.7 %). The mandible had a wide range of preferences, with 7 different treatments preferred and 3 unique responses under various conditions.

DISCUSSION

A total of 90 prosthodontists from Gujarat state responded to the survey. Only 35% of prosthodontists answered to this survey, which was a low percentage. The findings reveal that even within prosthodontists in the same state, there was a considerable variance in opinion about material selection, implant planning, and protocols for fixed implant supported prostheses patients.

One of the first subjects investigated when implant dentistry began was the number of implants used to support a complete-arch prosthesis, and it continues to be of interest due to the multiple implications acquired from the influence on the outcome of the decision to insert fewer or more implants. There was a trend toward using fewer implants that are dispersed with appropriate antero-posterior distribution in the arch, according to preliminary findings from studies included in our analysis.[2]

The accuracy of implant impression procedures has been documented by a number of researchers. The direct technique (open-tray impression copings) was found to be more accurate in several trials.[6,7] Other studies, on the other hand, indicated that the indirect method (closed-tray impression copings) produced better results.[8,9] while others found no difference.[10] The utilization of different components and study approaches is most likely the reason for the wide range of results. Indeed, whereas Spector et al,[10] reported that repositioning a closed-tray impression coping into an impression only resulted in a 1.5-m Z axis (apico-coronally) inaccuracy, Liou et al,[11] discovered that different closed-tray impression copings resulted in dramatically varied angular misplacements (rotation).

In this study, 64 percent of participants agreed that implants should be loaded immediately. However, evidence suggests that varied loading protocols have no discernible effect on implant success rates.[12]

Patients seeking implant reconstruction now are more likely to be demanding and expect more. They want their prosthesis to look as natural as possible (it should be fixed, aesthetic, practical, and comfortable), they want to spend as little time away from work as possible, and they want surgery that will result in a minimally uncomfortable postoperative outcome.[13]

The use of fixed, implant-supported prostheses to treat a completely edentulous patient is a time-consuming, intrusive, and costly procedure. Multilevel models for the success and failure of this evolving therapeutic approach will require significantly more resources. As such studies were presented, the gap between expert-level efficacy and generalizable effectiveness should be carefully considered. The findings of this study should be viewed with caution. Removable or partially edentulous treatments should not be inferred from the results. These preferences, it's worth noting, are restricted to treatments involving complete-arch fixed implant-supported prostheses. There were no implications for single-unit restorations or removable prostheses choices. The sample number of respondents is small, and there are issues related to selection biases. Only prosthodontists from a single geographic area is allowed to respond. The responses were a snapshot of a single moment in time. These statistics do not take into account a patient's specific needs, desires, or physiological circumstances.

As a result, these findings were not meant to be used in treatment planning. Over time, future technologies, research, and experience will change these results. Over time, the interpretation and application of these data will become less and less valuable. The response rate to a survey has long been seen as an indicator of the quality of the questions asked and the information gathered. It is not necessary, according to the writers of this paper.

There were certain limitations to the current investigation. The response rate is the first constraint (35 %). The second possibility was that survey participants offered responses that they thought were desirable. Further study is needed to investigate current trends in implant dentistry practiced by prosthodontists.

CONCLUSION

When it came to providing complete-arch fixed implant-supported prostheses, there were a lot of different perspectives. In the maxilla, over half of the respondents chose 6 implants, whereas the preferred number in the mandible ranged from 4 to 6. Two-thirds preferred firmly splinted, open-tray copings to make a lasting impression. For more concise and generalizable conclusions, more extensive survey data of expert clinicians from a wide geographic area is required.

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