

Knowledge, Attitude and Practice of Patients Opting for a Single Implant Over a 3-Unit Bridge Amongst Practicing Dental Surgeons

Sangram Panda*, Anamika Sinha, Mirna Garhnayak, Abhijita Mohapatra

Department of Prosthodontics, Institute of Dental Sciences, Siksha O Anusandhan (deemed to be) University, Bhubaneswar, Odisha, India. *Corresponding Author's Email: sangrampanda@soa.ac.in

Abstract

This study determines the knowledge, attitude, and practice of patients opting for a single implant over a 3-unit Bridge amongst practicing dental surgeons. Using a Google questionnaire, a descriptive cross-sectional study was executed amongst dental surgeons practicing with undergraduate and post-graduate degrees. Data obtained from the study were recorded in Microsoft Excel 2007 version, and SPSS version 18.0 was used. Most of the dental surgeons who participated in the study have been practicing prosthodontic restoration with the help of implants. The calculation of statistical analysis, such as mean and standard deviation and analysis between variations, was done using student t-tests, and the association between variables was determined using Chi-square. A value was found significant when the p-value was less than 0.05. The treatment options available for restoring an edentulous site vary and depend on several factors, among which economic factors and patient awareness stand high in the pyramid. This study has brought forward many aspects that need to be considered in replacing the edentulous site that dominates the current scenario in dental practice.

Keywords: Dental implant, economics, Fixed dental prosthesis, Single implant, Cost effectivity.

Introduction

Earlier in dentistry, only a few options were available for replacing single edentulous sites like a 3-unit bridge, also known as short-span fixed dental prosthesis (FPD), and removable partial dentures. Between these two, the 3-unit bridge has been most popular in practice for single tooth replacement in terms of its longevity and patient comfort and preference. However, it also came with various disadvantages, such as compromising the structural integrity of adjacent teeth in case of vital tooth cutting and endodontic treatment of adjacent teeth in case enough tooth structure is absent. Dislodgement of dental bridges is a common complaint observed in dental OPDs due to a lack of clinician skills or heavy bruxers.

With the introduction of dental implants and their raging success in daily practice, the outlook towards treating an edentulous site has changed drastically. However, various factors come into play in the decision-making process of the treatment modality, both for the doctor and the patient. In some cases, an implant-supported

single crown may be the treatment; in others, a 3-unit bridge may be better (1, 2).

An implant is often considered for treating a single edentulous site for various reasons. It is a conservative approach regarding adjacent teeth to the edentulous area, and hypersensitivity is also avoidable due to the vital tooth preparation of those teeth. Oral hygiene of the patients is significantly better in patients with implants than in patients with dental bridges, where sometimes food accumulation can happen under the pontic, which might hamper the gingival and, in turn, periodontal health of adjacent teeth. Moreover, implants have an improved aesthetic because of the emergence profile that accompanies them (3, 4).

A significant aspect that must be considered is "cost-effectivity", mainly as this survey has been conducted in India, where most patients do not have dental insurance. Hence, due to the high cost of implants, treatment modalities must be compromised according to the patient's economic status. While some patients seek good

This is an Open Access article distributed under the terms of the Creative Commons Attribution CC BY license (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted reuse, distribution, and reproduction in any medium, provided the original work is properly cited.

(Received 29th October 2023; Accepted 04th January 2024; Published 30th April 2024)

functionality, aesthetics, and comfort over the economic aspects, others put forward their affordability. Hence, the treatment plans should be such that clinical parameters are at par with cost-utility, ultimately benefiting the patient (5). This article helps to determine the knowledge, attitude, and practice of patients opting for a single implant over a 3-unit Bridge amongst practicing dental surgeons.

Materials and Methods

A descriptive cross-sectional study was executed amongst dental surgeons practicing with undergraduate and post-graduate degrees. A 20-module questionnaire form was prepared by revising available literature and previously published scientific research studies, articles, and guidelines. Information from the retrieved data was pooled, and the invigilator framed the questionnaire. The prepared questions were revised, pilot-tested, and finally minimized to 15 questions. A Google questionnaire form was prepared with the final short-listed 15 questions for easy access to the dental practitioner due to the ongoing pandemic. The documents were distributed, and 106 validated entries were obtained. It is a cross-sectional study that includes practitioners managing private clinics and professors or teaching staff in dental colleges actively involved in daily practice, encountering diverse clinical scenarios. The participants are primarily based in India, predominantly in the Khordha district of Bhubaneswar, Odisha, India. Data obtained from the study were recorded in Microsoft Excel 2007 version, and SPSS version 18.0 was used. All the categorical factor representation was done in numbers and percentages. The calculation of statistical analysis, such as mean and standard deviation and analysis between variations, was done using student t-tests, and the association between variables was determined using Chi-square. A value was found significant when the p-value was less than 0.05. Ethical approval or consent was not required because it is a KAP study without involving patients, biological samples, or animals. The authors ensured they had followed the Helsinki Declaration guidelines and maintained the participants' privacy in the study.

Results

This study included a survey of 106 dental surgeons, and it is documented in Table 1. Most of the dental surgeons who participated in the study have been practicing prosthodontic restoration with the help of implants. Among the 106 responses that we received, 76.4% claim that their patients who are in want of replacement of missing teeth are aware of the treatment options available for a single edentulous region, and 34.9% claim that their patients are familiar with "Implants" among whom 52.8% are aware of the economic aspect of the Implants and 47.2% know about the time taken for the treatment procedure. 82.1 % claim that their patients chose implants over the bridge after knowing the treatment options that are available for edentulous sites, among whom 77.4% chose for a better outcome as compared to the bridge, and when there is a necessity for graft placement, 18.9% of patients prefer implants to bridge. Among all the patients who opt for implants, only 14.2% have undergone the bridge treatment earlier. 51.9% of the patients who prefer implants to bridge fall in the age category of 30-50, and 57.5% come from Middle-class families. Among the 106 dental surgeons, only 23.6% prefer immediate placement followed by immediate loading, 46.2% prefer immediate placement followed by delayed loading, and 34.9% prefer delayed placement followed by delayed loading. 75.5% of dental surgeons claim that they are moderately confident of their clinical skills regarding the placement of implants, and 55.7% claim that patients with implants are more satisfied than patients with bridges in their oral cavities.

Discussion

A thorough review of the existing literature and comparable survey instruments was undertaken to identify validated questions and methodologies. This process aided in carefully selecting or adapting questions that have consistently demonstrated reliability and validity in prior studies. Additionally, feedback from experts in the relevant field was solicited, leading to the formulation of a hypothesis.

Tables 1: Summary of results obtained from the KAP study

Question	Total Number of Responses	Details of Responses		
Are your patients aware of the treatment options available for a single edentulous region?	106	Some of them (76.4%)	All of them (18.9%)	None of them (4.7%)
Are your patients familiar with "Implants"?	106	Yes (34.9%)	No (16%)	Few of them (49.1%)
Are your patients aware of the economic aspect of implants?	106	Yes (21.7%)	No (25.5%)	Few of them (52.8%)
Are your patients aware of the time taken for the treatment procedure?	106	Yes (20.8%)	No (32.1%)	Few of them (47.2%)
What is the age group of the patients who prefer implants over bridges?	106	18-30 (45.3%)	30-50(51.9%)	50 & above (2.8%)
Which class of society do your patients who agree to the treatment procedure of implants fall under?	106	Upper/Elite class (40.6%)	Middle Class (57.5%)	Working Class (1.9%)
After knowing the available treatment options for the edentulous region, how many of your patients opt for an implant over a bridge?	106	All of them (17.9%)	Few of them (82.1%)	
What do you think is why your patients prefer implants to bridge?	106	Conservative in terms of adjacent teeth (16%)	For a better outcome (77.4%)	To maintain status in society (6.6%)
Do you prefer Immediate placement followed by immediate loading?	106	Yes (18.9%)	No (57.5%)	Sometimes (23.6%)
Do you prefer immediate placement followed by delayed loading?	106	Yes (46.2%)	No (29.2%)	Maybe (24.5%)
Do you prefer delayed placement followed by delayed loading?	106	Yes (34.9%)	No (29.2%)	Maybe (35.8%)
In case of the requirement of graft placement, how many of your patients prefer implants over bridges?	106	All of them (18.9%)	Few of them (78.3%)	None of them (2.8%)
Have patients who have opted for implants undergone the bridge treatment before?	106	Yes. All of them (14.2%)	Few of them (84%)	None of them (1.8%)
How confident are you in your clinical skills for placing	106	Confident (24.5%)	Moderately confident	Not confident at

implants?			(75.5%)	all (0%)
How satisfied are your patients with the outcome after implant placement compared to patients who have opted for a bridge?	106	Both groups are equally satisfied (34.9%)	Patients with the implant are more satisfied than those with a bridge (55.7%)	They were not able to tell the difference between bridges and implants (9.4%)

This hypothesis posits that implants and dental bridges are equally considered when evaluating treatment options for edentulous spaces. As the results suggested in this study, a single dental implant is a common and effective solution for replacing a missing tooth. Dental implants are artificial tooth roots of titanium surgically placed into the jawbone. They are a sturdy foundation for a replacement tooth, known as a crown, custom-made to match the natural teeth.

Any replacement of missing teeth that is the restoration of any edentulous site has become one of the essential requirements for patients visiting dental clinics to restore esthetics and functionality. Several treatment options are available for replacing a single missing tooth, such as a removable partial denture, fixed partial denture, or implant-supported single crown and according to our study, 76.4% claim that their patients who are in want of replacement of missing teeth are aware of the treatment options available for a single edentulous region. Every treatment option comes with its own set of pros and cons. In our study, 77.4% chose implant over the bridge for a better outcome, and 16% chose it because it is conservative regarding adjacent teeth. In this era of implantology, many surgical and prosthetic procedures take place to achieve the best aesthetic outcome, consequently increasing the cost of the treatment (6). According to a study by Terry R Walton, "fixed partial denture span length and complexity and the use of structurally or biologically compromised teeth have decreased in this practice population since the introduction of Osseo integrated implants" (7).

The definitive treatment for replacing a missing tooth in an edentulous site depends on many factors, varying from case to case. If, in any case, there is the possibility of more than one treatment option, the final option will depend on the

patient's decision regarding their economic affordability, as in our study, 57% of patients come from a middle class or the patient's age might influence the decision; in our study, 51.9% were from the 30-50 age group. Lastly, awareness and patient knowledge also influence treatment options; in our study, 34.9% claim to be aware of Implants as a treatment option. Hence, it becomes essential to understand the patient's requirements, which ultimately leads to the patient's satisfaction after the treatment (8).

According to "the International Congress of Oral Implantologists Glossary of Implant Dentistry, an implant is an implant placed immediately after tooth extraction". This approach enables dental surgeons to reduce the number of surgical procedures and, hence, fewer appointments, resulting in extreme patient satisfaction. As is seen in this study, 46.2% prefer immediate placement (9). According to a study by Cosyn *et al.*, Immediate placement of implants showed higher failure rates than Delayed implant placement (10). As also seen in our study, 34.9% of dental surgeons prefer delayed placement followed by delayed loading.

One of the most recent advancements in implant dentistry includes basal implants, which have emerged as a revolutionary alternative to traditional bridges, particularly in atrophied ridges where conventional solutions may pose challenges. Unlike traditional dental bridges, which rely on adjacent teeth for support, basal implants show improved biomechanics, which anchor directly into the basal bone, a dense layer of bone found in the lower part of the jaw. This unique approach eliminates the need for healthy adjacent teeth to support the restoration. It provides a stable foundation in areas with reduced bone volume, which would not have been possible earlier due to insufficient bone volume

for osseointegration of conventional threaded conical implants (11, 12).

Conclusion

The treatment options available for restoring an edentulous site vary and depend on several factors, including economic factors and patient awareness, which stand high in the pyramid. This study has brought forward many aspects that need to be considered in replacing the edentulous site that dominates the current scenario in dental practice. According to the findings of this study, a single dental implant is a popular and effective method of restoring a missing tooth. Artificial titanium tooth roots are surgically inserted into the mandible to form dental implants. They serve as a strong base for a crown a replacement tooth crafted to resemble the natural teeth precisely.

Abbreviations

Nil

Acknowledgment

We thank the authorities, Institute of Dental Sciences, Siksha O Anusandhan (Deemed to be University), for their support. We also thank all the participants of the study for their cooperation.

Author's Contribution

SP conceptualized the study and drafted the manuscript. AS collected and analyzed the data. SP, AM, and MG finalized and critically reviewed the manuscript.

Conflicts of Interests

The authors do not have any conflicts of interest.

Ethical Approval

Approved by the institutional review board.

Funding

No funding received.

References

1. Christensen GJ. Three-unit fixed prostheses versus implant-supported single crowns. *J Am Dent Assoc.* 2008;139(2):191-194.
2. Yi Y, Heo SJ, Koak JY, Kim SK. A retrospective comparison of clinical outcomes of implant restorations for posterior edentulous area: 3-unit bridge supported by 2 implants vs 3 splinted implant-supported crowns. *J Adv Prosthodont.* 2022;14(4):223-235.
3. Goodacre CJ, Naylor WP. Single implant and crown versus fixed partial denture: A cost-benefit, patient-centred analysis. *Eur J Oral Implantol.* 2016;9 Suppl 1: S59-S68.
4. Siegenthaler M, Strauss FJ, Gamper F, Hämmerle CHF, Jung RE, Thoma DS. Anterior implant restorations with a convex emergence profile increase the frequency of recession: 12-month results of a randomized controlled clinical trial. *J Clin Periodontol.* 2022;49(11):1145-1157.
5. Scheuber S, Hicklin S, Brägger U. Implants versus short-span fixed bridges: survival, complications, patients' benefits. A systematic review on economic aspects. *Clin Oral Implants Res.* 2012;23 Suppl 6:50-62.
6. Wittneben JG, Wismeijer D, Brägger U, Joda T, Abou-Ayash S. Patient-reported outcome measures focusing on aesthetics of implant- and tooth-supported fixed dental prostheses: A systematic review and meta-analysis. *Clin Oral Implants Res.* 2018;29 Suppl 16:224-240.
7. Walton TR. Changes in the outcome of metal-ceramic tooth-supported single crowns and FDPs following the introduction of osseointegrated implant dentistry into a prosthodontic practice (published correction appears in *Int J Prosthodont.* 2009 Jul-Aug;22(4):353). *Int J Prosthodont.* 2009;22(3):260-267.
8. Al-Quran FA, Al-Ghalayini RF, Al-Zu'bi BN. Single-tooth replacement: factors affecting different prosthetic treatment modalities. *BMC Oral Health* 2011; 11: 34.
9. Koh RU, Rudek I, Wang HL. Immediate implant placement: positives and negatives. *Implant Dent.* 2010;19(2):98-108.
10. Cosyn J, De Lat L, Seyssens L, Doornewaard R, Deschepper E, Vervaeke S. The effectiveness of immediate implant placement for single tooth replacement compared to delayed implant placement: A systematic review and meta-analysis. *J Clin Periodontol.* 2019;46 Suppl 21:224-241.
11. Zaki AA. Surgical research in implant dentistry. *Br Dental J.* 2023;235: 927.
12. Patel K, Madan S, Mehta D, Shah SP, Trivedi V, Seta H. Basal implants: An asset for rehabilitation of atrophied resorbed maxillary and mandibular jaw- A prospective study. *Annal Maxillofac Surg.* 2021;11(1):64.