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KNOWLEDGE, ATTITUDE AND PRACTICE OF GUIDED ENDODONTICS AMONG POST GRADUATE STUDENTS OF ENDODONTICS DEPARTMENT-A SURVEY DONE AT THE INSTITUTES OF GUJARAT

Dhruvkumar Thakor[1*], Chintan Joshi[2], Sweety Thumar[3],Mona Somani[4], Rinkal Virani[5], Priyanka Chavda[6], Parth Dodiya[7], Patel Aashray[8]

[1]PG student,Department of Conservative Dentistry and Endodontics, Karnavati School of Dentistry,Karnavati University,Gandhinagar, Gujarat, India.
dhruvthakor1@gmail.com

[2]Professor and Head, Department of Conservative Dentistry and Endodontics, Karnavati School of Dentistry,Karnavati University,Gandhinagar, Gujarat, India.
drchintanjoshi@gmail.com

[3]Reader, Department of Conservative Dentistry and Endodontics, Karnavati School of Dentistry,Karnavati University, Gandhinagar, Gujarat, India.
Sweetythumar@yahoo.com

[4]Reader, Department of Conservative Dentistry and Endodontics, Karnavati School of Dentistry,Karnavati University,Gandhinagar, Gujarat, India.
mona.somani179@gmail.com

[5]PG student, Department of Conservative Dentistry and Endodontics, Karnavati School of Dentistry, Karnavati University,Gandhinagar, Gujarat, India.
rinkalvirani95@gmail.com

[6]PG student, Department of Conservative Dentistry and Endodontics, Karnavati School of Dentistry,Karnavati University, Gandhinagar, Gujarat, India.
chavda323@gmail.com

[7]Lecturer, Department of Conservative Dentistry and Endodontics, Karnavati School of Dentistry,Karnavati University,Gandhinagar, Gujarat, India.
parthdodiya@gmail.com

[8]Lecturer, Department of Conservative Dentistry and Endodontics, Karnavati School of Dentistry,Karnavati University,Gandhinagar, Gujarat, India.
patelaashray@gmail.com

Corresponding author: DhruvkumarThakor (dhruvthakor1@gmail.com)

Abstract

Introduction: 3D(3Dimensional) guided endodontics, a minimally invasive approach has improved the endodontics procedure and is an emerging area for endodontists.Hence the aim of the survey is to assess the perception of post-graduate students of Gujarat towards this newer approach of 3D Guided Endodontics.

Method: A total of 124 subjects were selected for the study. An online questionnaire using Google Forms was used to collect the data regarding the post graduate student's knowledge, attitude, and perceptions towards Guided Endodontics.

Result: Out of 124 participants,34.7% used guided endodontics technique. Out of 34.7% participants,32.6% admit that patient comply with the treatment, 60.5% preferred its use in both

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surgical as well as nonsurgical cases and 76.7% used some sort of magnification. Although, 76.7% participants mentioned it as a convenient procedure they did face some difficulty while using it and 100% admit that they require to update the knowledge regarding Guided Endodontics and 83.1% participants were likely to attend continuing dental education program.
Conclusion:These results reflect that endodontic residents are optimistic about the use of Guided Endodontic procedure; however, a need for more research and training was felt.
Keywords: 3D, Guided Endodontics, Postgraduate's

Introduction

Teeth with pulp canal obliteration(PCO) could be a challenge in endodontic treatment.The histologic examination of teeth with PCO usually shows a persisting narrow root canal and although morphological differences between the hard tissue formed after the injury and normally formed dentin are present, determining the correct location of the root canal is diffificult. As canals are calcified it is difficult to locate and negotiate them to full working length,the use of a microscope is recommended in these cases[1-3] It is prone to technical failures including alterations of the root canal geometry and substantial loss of dental hard tissue, which may weaken a tooth considerably or result in root perforation.[4]

Guided endodontics, a recent approach, uses precise software, CBCT, and 3D scanning images to produce a surgical template that directs the drill during access cavity preparation[4]This technique proved to be accurate, expeditious, and operator independent in in vitro settings. Although clinical treatment trials are missing, recent clinical case reports show the successful application of this technique in endodontic practice.[4]It has been indicated for management of teeth with partial or total pulp canal obliteration,to preserve the structural integrity of tooth ,to simplify treatment procedures and to avoid treatment complications related with varying root canal anatomy,to reduce inconvenience of patients andthis procedure showed little pain.[4-8]
Student's perception regarding the guided endodontics treatment is recondite. So, the aim of conducting a survey to assess the perception of post-graduate students of Gujarat towards approach of 3D Guided Endodontics.

Materials and Methods

Study population for this study consisted of post graduate MDS students in the field of conservative dentistry and Endodontics working at the different dental institute of Gujarat,India. A total of 124 post graduate students practicing from different institutes of Gujarat were included. An online questionnaire of 23questions using Google Forms were used to collect the data. The questionnaire were designed in English language and comprised of a series of questions pertaining to the knowledge and application of guided endodontics, its requirement of CBCT(Cone Beam Computed Tomography). This study questionnaire also included questions regarding software needed for treatment planning and difficulties they face while using guided endodontics as well as patient's compliance while treatment. The form was made available using online mode as Google forms . The online survey link was also circulated through social media and an e-mail to the post graduate students .The response received from each participants by online submission process .

Result

A total of 124 responses were collected, all the participants were post graduate students of Conservative Dentistry and Endodontics department of Gujarat. They were all in age group of

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24years-33 years. 96.8% of the participants were aware of concept of 3D Guided endodontics.80.6% participants prescribed CBCT to their patients (66%=0-2 per month,33%=2-5 per month,1%=5-10 per month) for complicated cases in their practice.43 out of 124 participants used guided endodontics in their clinical practice as shown in the Figure 1. Out of 65.3% participants 71.6% informed that it is a complex procedure. They find it complex because of various reasons mentioned in the Figure 2. Out of 34.7% participants only 32.6% mentioned that patient comply with their decision of 3D guided endodontics.60.5%participants out of 34.7% preferred use of guided endodontics for treatment of both surgical as well as nonsurgical cases,25.6% preferred its use in surgical cases while 14% preferred for only nonsurgical cases. Similarly, their preference of area for use of guided endodontics is shown in the Figure 3. Out of 34.7% participants,76.7% mentioned of use some sort of magnification (42.4% dental loupes, 42.4% opted both loupes and microscope) while using guided endodontics. 72.1% of participants had no idea about which software to use for its treatment planning while 9.3% preferred co-diagnostic XTM and 18.6% opted for other software. Although they face many difficulties while using guided endodontics as mentioned in the Figure 4. 76.7% participants who practices guided endodontics admitted that it is convenient to endodontist for treating difficult cases but only 30.2% agreed that it can be included as routine dental procedure. The respondents are likely to attend (83.1%) workshop/conference or continuing dental education program about Guided Endodontics procedures besides majority (65.3%) of the professional's had no previous experience in Guided Endodontics procedures and wanted training (100%) to help in increasing the knowledge about the topic.

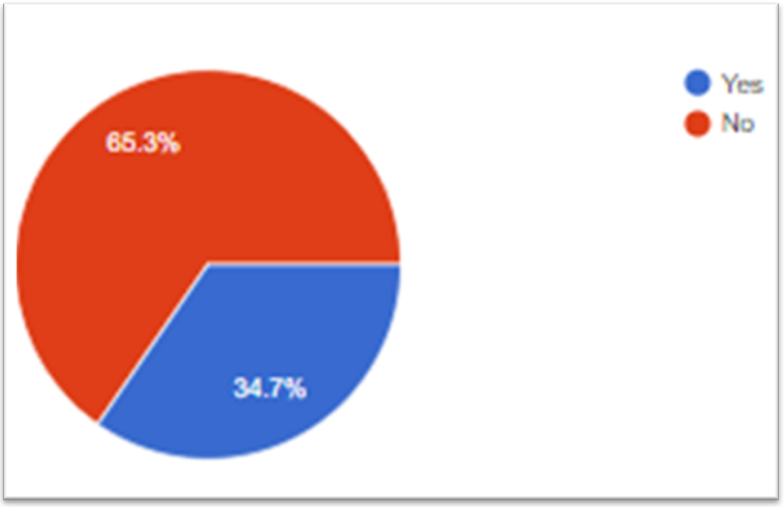

Figure 1: Percentage of post graduate students using Guided Endodontics

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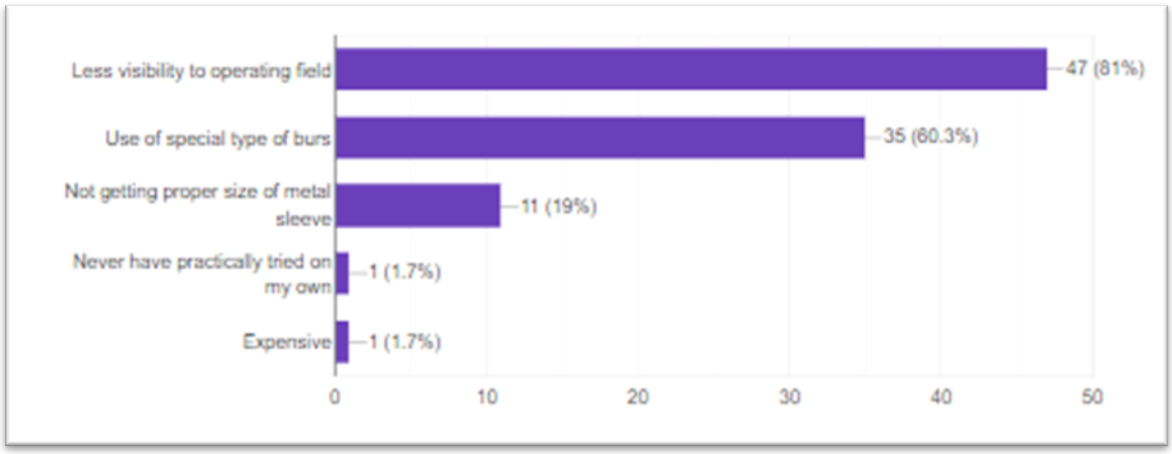

Figure 2: Reasons given by participants for finding Guided Endodontics a complex procedure

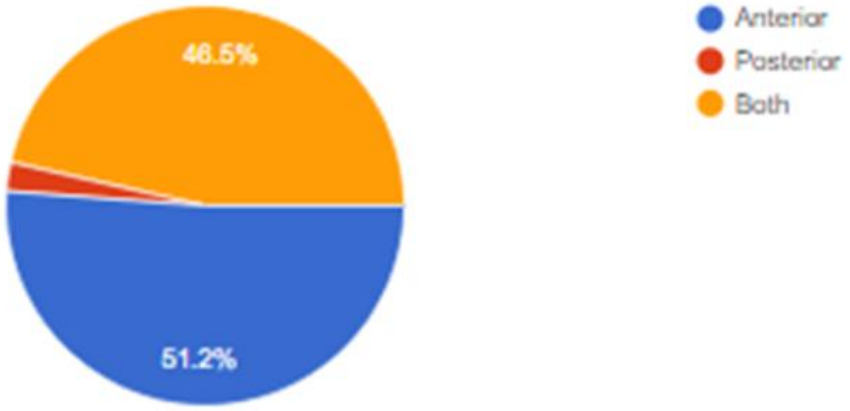

Figure 3: Area of preference for use of Guided Endodontics mentioned by participants

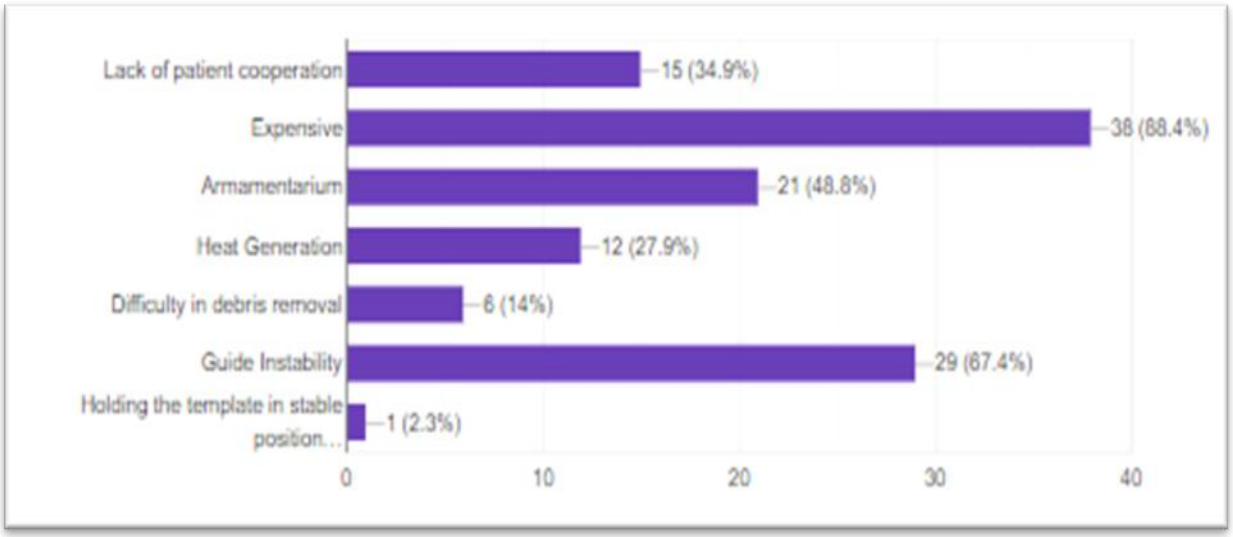

Figure 4: Problems faced by participants while using Guided Endodontics

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Discussion

Digitalization in dentistry begins with the introduction of CEREC 1, First digital impression machine by Marco Brandestini and Werner Mormann in 1985. The guided endodontics technique was first described by Krastl et al.[6], is available for clinical application in dentistry in teeth with pulp canal calcification that required root canal treatment. It is used for various cases in endodontics, such as calcification [9,10], Dens Evaginatus[11], an anomalous tooth [12] access cavity preparations [13] and micro-endodontic surgical procedures [14]. PCO is challenging in endodontic treatment. Various techniques have been indicated to combat PCO, such as CBCT, digital radiography, dental operating microscope (DOM), and ultrasonic tips. [9,15] As CBCT provides 3D visualization of the structures to be examined, it facilitates diagnosis and allows for a more careful treatment plan, so it has become an essential tool in the field of endodontics [4, 16.] On assessing it was found that 80.6% participants in this survey, prescribed CBCT to their patients. Whereas, 74% clinical success rate was seen with the use of DOM and ultrasonic tips to access obliterated root canals[17].Guided endodontics can be indicated, when other treatment modalities have been exhausted as it presents high predictability guaranteed results in treatment, This method is becoming more accessible and does not require much investment by the operator [4,18,19.] Although it is a newer approach, we found in our study that almost all (96.8%) participants were aware about the concept of guided endodontics, but only 34.7% are using it in their clinical practice. Majority of participants did not use guided endodontics as they find it as a complex procedure and the reason they have given were lack of visibility, use of special type of burs, not getting proper size of metal sleeve.As stated by Krastl et al[6] and Connert et al[20], the guided endodontic technique could be restricted to the anterior teeth due to the accessibility to and presence of curvatures. However, Lara-Mendes et al [18], demonstrated that it was possible to performing the guided root access procedure in molars. Therefore, the guided endodontic technique is feasible for use in posterior teeth, provided that the patient presents no limitations in mouth opening. 46.5% participants out of 34.7% who used guided endodontics believed that it can be used in both anterior and posterior region while 51.2% believed that it can be used only in anterior region. while performing any endodontic procedure magnification is of utmost importance, to which majority of participants responded positively and mentioned that they used some sort of magnification (Dental operating Microscope, Dental loupes, or both) even while using guided endodontics.To minimize the potentially high risk of iatrogenic damage to the tooth structure, 3D-printed guides were designed to aid the preparation of the access cavity. Impressions can be taken to obtain a study model and a Digital Dental 3D Scanner is then used to obtain a stereolithography file of the arch to be used in computer-assisted designs of the splints[21]. The 3D implant planning software is used to design the splints and a 3D printer is used to fabricate the guides, but majority of participants did not know which software is used for treatment planning and designing guide but very few knew about Co-Diagnostic XTM software and some participants mentioned use of other software. Although majority of the participant responded guided endodontic as a convenient procedure to endodontists, but they also faced many difficulties while using it. Difficulties such as use of special type of armamentarium, heat generation during drilling as there is less space for irrigation there is difficulty in debris removal as well, and many other participants also mentioned that guide instability and lack of patient compliance as it is a costly procedure. This technique provides more reliable outcome, reduces working time, eases the work of clinicians and so it may be a promising method for the endodontic or surgical treatment of complex cases[4]. Moreover, the technology used to design the

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guides is today available worldwide [21]. Thus, in the future, guided endodontics may be more widely used in clinical practice [6,13], at least when treating PCO teeth and complex surgical cases. While assessment of the knowledge regarding the guided endodontics it was found that all the participants were keen to attend the dental workshop and educational program to update their knowledge as majority of the participants had no previous experience of guided endodontics procedure and few agreed it to be included as routine dental procedure.

Conclusion

The guided endodontic technique is a predictable and preservative method to treat difficult cases such as calcification of tooth, micro-endodontic surgical procedures, Dens Evaginatusto avoid the iatrogenic errors. Moreover, it may be performed with limited complications. The survey participants had an optimistic perception and at the same time showed a consensus on the need for research and training towards guided endodontics. More survey research should be conducted in the other geographical area that would help in understanding the global awareness of the topic.

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