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Research Article

**ETHICAL ASPECTS CONCERNING INSTRUMENT  
SEPARATION AND PERFORATIONS DURING ENDODONTIC  
TREATMENT: A CROSS-SECTIONAL STUDY**<sup>1</sup>Aqeela Perveen<sup>1</sup>Demont Morency College of dentistry Pakistan.**Article Received:** July 2020**Accepted:** August 2020**Published:** September 2020**Abstract:**

**Aim.** In dentistry treatment at any stage, an unwanted accident may occur due to the malpractice of the dentists which can be due to the compromise in the endodontic treatment. The main objective of this study is to observe and analyze the behavioral conduct of the dentist related to ethical concerns toward perforation and separation of endodontic instrument during the treatment of root canal in Pakistan.

**Method.** Among the dentist working in private, government and university clinics well-structured and organized 111 questionnaires were distributed. The collected data was thoroughly reviewed and SPSS software used to analyze the data. Moreover, chi-square tests and fisher's exact methods were used to analyze the collected data.

**Results.** According to 54.9% of the respondents, they may inform the patients about his accident during treatment. During the treatment of root canal 43% patients experienced perforation. 53.3% replied that they would tell the patients about the separation of instruments. Moreover 54.5% participants had experienced instrument separation

**Conclusion.** As this survey was limited due to its limited participants however this survey concluded that most of the dentist inform patients in case on any accident and they are well aware of the ethical concerns related to dentistry and did not hesitate to use them to avoid malpractice.

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**INTRODUCTION:**

In dentistry dental malpractice is one of the unintended and careless acts as professionals do not follow the standard of care due to which a patient suffers. According to a study around 15-18% of all malpractice dental deal with endodontic malpractice. Due to advance technology, dentistry techniques also improved a lot but still a lot of cases reported in recent years due to the negligence from the dentist professionals. One of the most common malpractice in dentistry is a broken instrument and perforation. For assuring the security of patients it is necessary to be aware of the legal, basic, ethical and moral practices in dentistry and also there should be a complete guideline for accidental case like instrument separation. Also, a complete detail should be given before the treatment to the patients so that both dentist and patients can be saved from grief. Moreover, when accident may occur patients should be informed so that patient could ready for the possible prognosis, treatment options and consequences. Complete documentation should be provided to the patient. However, to avoid the accidents in endodontic treatment, professionals should be completely aware of the healthcare standards and they should adopt all the strategies which pay key role in preventing the accidents. According to a study the guarantee the endodontic instrument fracture and mishap cannot be avoided only through skill and expertise during root canal treatment.

In dentistry treatment at any stage, an unwanted accident may occur due to the malpractice of the dentists which can be due to the compromise in the endodontic treatment. The main objective of this study is to observe and analyze the behavioral conduct of the dentist related to ethical concerns toward perforation and separation of endodontic instrument during the treatment of root canal in Pakistan.

**METHODOLOGY:**

This research was approved and revised by the research committee of dentistry college that is Demont Morency college of dentistry Pakistan. For this a brief questionnaire was structured and designed including ten questions in which 4 questions were based on the personal data of the participant e.g. gender, age, expertise, and workplace and the remaining were

based on the mishap details, conduct of the dentist and malpractice. One hundred and eleven questionnaire were distributed in dentist either working private or government sector and having different specialties.

Among the dentist working in private, government and university clinics well-structured and organized 111 questionnaires were distributed. The collected data was thoroughly reviewed and SPSS software used to analyze the data. Moreover, chi-square tests and fisher's exact methods were used to analyze the collected data.

**RESULTS:**

Out of the total one hundred and eleven questionnaire, one hundred and ten were returned that means the 99.1% was the response rate. According to the collected data 66 respondents were the general dentist whereas 34 were dental specialists and 10 were the endodontic.

According to 54.9% of the respondents, they may inform the patients about his accident during treatment. During the treatment of root canal 43% patients experienced perforation. 53.3% replied that they would tell the patients about the separation of instruments. Moreover 54.5% participants had experienced instrument separation this showed that there is no relation between the occurrence of perforation and qualification. 22% would refer patients to other specialist professional, 4.8% would not even bother to inform the patients and treatment will be continue whereas 12% would make no effort to remove the fragment.

When questioned about their initial conduct in case of instrument separation with no possibilities of instrument removal, 18% reported that they would inform the patient of the accident and try to remove the fragment in the next visit.

When the participants were asked about their initial conduct in case of perforation with a good prognosis, 54% write that they would inform the patient about the accident and would try to remove it 17.6% would refer patients to other specialist professional. 9.8% would continue the treatment without informing the patient, 9.8% would make no effort to remove the fragment.

TABLE 1: Questionnaire

1. *Have you ever fractured any type of endodontic instrument?*

- (a) Yes
- (b) No
- (c) Not sure

2. *What is your conduct when intracanal breakage of an instrument occurs with possibilities of fragment removal?*

- (a) Inform the patient and finish the treatment in another appointment (try to remove the fragment)
- (b) Inform the patient and continue the treatment (no attempt to remove the fragment)
- (c) Inform the patient and refer to another professional
- (d) Do not inform the patient and continue the treatment
- (e) Do not inform the patient and refer to another professional (f) Other conduct, state

3. *What is your conduct when intracanal breakage of an instrument occurs with no possibilities of fragment removal?*

- (a) Inform the patient and finish the treatment in another appointment (try to remove the fragment)
- (b) Inform the patient and continue the treatment (no attempt to remove the fragment)
- (c) Inform the patient and refer to another professional
- (d) Do not inform the patient and continue the treatment
- (e) Do not inform the patient and refer to another professional (f) Other conduct, state

4. *Have you ever perforated a canal and/or a crown during root canal treatment?*

- (a) Yes
- (b) No
- (c) Not sure

5. *What is your conduct when you perforate a canal and/or a crown (perforation with a good prognosis) while you prepare it for root canal treatment?*

- (a) Inform the patient and repair it immediately
- (b) Inform the patient and repair it in another appointment
- (c) Inform the patient and refer to another professional
- (d) Do not inform the patient and continue the treatment

(e) Do not inform the patient and refer to another professional (f) Other conduct, state

6. What is your conduct when you perforate a canal and/or a crown (perforation with a poor prognosis) while you prepare it for root canal treatment?

(a) Inform the patient and repair it immediately

(b) Inform the patient and repair it in another appointment

(c) Inform the patient and refer to another professional

(d) Do not inform the patient and continue the treatment

(e) Other conduct, state

Table 2: Personal details of participants

Variables	Frequency	Percent (%)
General dentist	66	60
Endodontist	10	9.1
Other dental specialties	34	30.9
Total	110	100

Table 3: Respondents details

Area of specialization	Instrument separation	Perforation
General dentists	25.5%	23.6%
Endodontists	9.1%	6.4%
Other dental specialists	20.0%	13.6%
Total	54.5%	43.6%

Table 4: Details of question 2

Instrument separation with the possibility of removal	General dentist	Endodontists	Other dental specialists
Inform the patient and finish the treatment in another appointment (try to remove the fragment)	40%	70%	63.6%
Inform the patient and continue the treatment (no attempt to remove the fragment)	13.3%	20%	9.1%
Inform the patient and refer to another professional	33.3%	0.0%	18.2%
Do not inform the patient and continue the treatment	6.7%	10%	0.0%
Do not inform the patient and refer to another professional	3.3%	0.0%	0.0%
Other conduct	3.3%	0.0%	9.1%

TABLE 5: Details in case of instrument separation with the possibility of fragment removal

Instrument separation with no possibility of removal	General dentist	Endodontists	Other dental specialists
Inform the patient and finish the treatment in another appointment (try to remove the fragment)	16.1%	40%	15%
Inform the patient and continue the treatment (no attempt to remove the fragment)	19.4%	50%	50%
Inform the patient and refer to another professional	48.4%	0.0%	35%
Do not inform the patient and continue the treatment	9.7%	10%	0.0%
Do not inform the patient and refer to another professional	3.2%	0.0%	0.0%
Other conduct	3.2%	0.0%	0.0%

### DISCUSSION:

During routine endodontic therapy, clinicians can experience situations, at any stage of treatment, where accidents occur, and obstacles have to be overcome. However, hiding the procedural accident from the patient is considered as negligence that exposes the dentist to litigations. Careless endodontic diagnosis or treatment could be avoided by adhering to the standard care. Due to advance technology, dentistry techniques also improved a lot but still a lot of cases reported in recent years due to the negligence from the dentist professionals. One of the most common malpractice in dentistry is a broken instrument and perforation. For assuring the security of patients it is necessary to be aware of the legal, basic, ethical and moral practices in dentistry and also there should be a complete guideline for accidental case like instrument separation. Also, a complete detail should be given before the treatment to the patients so that both dentist and patients can be saved from grief. Moreover, when accident may occur patients should be informed so that patient could ready for the possible prognosis, treatment options and consequences. Complete documentation should be provided to the patient. However, to avoid the accidents in endodontic treatment, professionals should be completely aware of the healthcare standards and they should adopt all the strategies which play key role in preventing the accidents.

A negative effect on the long-term prognosis is foreseeable in the case of intracanal instrument separation. In the present study, more than half of the participants (54.5%) had encountered instrument separation during root canal treatment, and this proportion is far less than which was previously reported (88%). It is an embarrassing situation for dentists to face the patient once such a mishap occurs unless the dentist had

explained to the patient about the complexity of the root canal treatment and its potential complications prior to initiation of treatment. Clinicians have a legal obligation to inform the patient and to document it in the patient's notes—if an instrument has fractured during treatment. However, only approximately half of the participants (53.2%) had identified that they would inform the patient about a fractured instrument if there was a possibility of removal. There is a significant degree of hesitation in informing patients about the mishap, as previously reported.

Possible options, in the management of a case of instrument separation in the root canal, are leave, bypass, or remove. A thorough assessment of the likely prognosis in all cases, based on the potential benefit of removal and the likelihood and risk of complication, is the sole factor by which clinicians should take their management decision.

In the present study, most endodontists (70%) had confirmed that they would inform the patient about the accident and would try to remove the instrument in another visit, and this correlates well to previously reported value (79.3%). Several factors need to be considered in the management of separated files. For instance, the factors to consider in the removal of a fractured NiTi instrument are strategic importance of the tooth, any periapical disease the clinician experiences, other tooth and patient factors, as well as the availability and use of equipment, instruments, and techniques. Chances of improved removal have significantly increased with the application and incorporation of microscopes, fine ultrasonic tips, and staging platforms. Furthermore, there is an improvement in the management of the separated files with the increasing years of clinical experience.

Bacterial infection around the surrounding area of perforation is most likely inevitable if a delay beyond 24–72 hours occurs in diagnosis and or treatment. In the complication of a delay in management, and a subsequent infection arises, immediate extraction of the infected tooth may become necessary. present study showed that half of the general dentists would refer the patient to a specialist in case of poor prognosis, as they know their limitations. American As-sociation of Endodontists has provided an assessment form to evaluate the case difficulty. form is used to envisage the case complexity and mishaps that the dentists could encounter during root canal treatment. All dental practitioners need to be judicious in referring cases to an endodontic specialist by recognizing the limits of their skill, expertise, competency, and experience. To provide optimum patient safety and care and to avoid substandard patient care, a program of continuing professional education is required, as dental procedures are technically sensitive that need extensive training and knowledge as well as cognitive and psychomotor skills.

#### CONCLUSION:

As this survey was limited due to its limited participants however this survey concluded that most of the dentist inform patients in case on any accident and they are well aware of the ethical concerns related to dentistry and did not hesitate to use them to avoid malpractice.

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