

Ethical aspects concerning endodontic instrument fracture

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Abstract

Aim: The aim of this study was to address several ethical aspects concerning the behavior of endodontists and general dentists regarding endodontic instrument fracture during root canal treatment. **Methods:** The responses of a group of professionals (endodontists and general dentists) to a questionnaire were reviewed and analyzed statistically by Fisher's Exact and chi-square tests at 5% significance level. **Results:** Forty-six percent of the interviewees responded that they would try to solve the problem without informing the patient about the accident. Only 28.1% of the participants affirmed that they would let the patient know right at the moment of occurrence. **Conclusions:** The outcomes of this survey demonstrate that most professionals are afraid of informing their patient about an accidental endodontic instrument breakage during treatment and might be subject to lawsuits.

Key Words:

Ethics, accidents, dental instruments, endodontics.

Introduction

Endodontics is a branch of Dentistry that is in continuing development. Recent findings in this field have allowed higher predictable success rates. Nevertheless, Dentistry as well as Medicine is not an exact science, and treatment success is directly related to biological factors¹.

Endodontic treatment success relies on the combination of several factors that include an accurate diagnosis, treatment method, technical difficulties, available approach and operator's skills and knowledge. In some cases, procedural failures or accidents during root canal treatment are not the dentist's fault, but this is usually not well accepted by patients, mainly because accidents frequently lead to an unfavorable prognosis. At this point, relationship problems rise between the patient and the dentist, and may evolve to lawsuits.

As stated by Cohen and Burns², even the most careful and skilled dentist can fracture an endodontic instrument during root canal preparation eventually. In case it happens, the patient must be warned at the moment of accident and dully informed on the real situation and case prognosis. Explanations must be given in full, but in a proper manner not to alarm the patient and cause misunderstandings. Dentists must work in compliance with the legal principals of Dentistry and having an ethical behavior at all times in order to build a sound relationship with the people that seek their professional services. When an accident occurs during treatment, dental ethics must guide case management in all instances.

Frank³ called the attention to the fact that endodontists must be prepared for different patient reactions after being informed about endodontic accidents, like instrument fracture in the root canal. Those reactions are related to fear, worry, anger and retaliation. Although some reactions may seem irrational in a first moment, the dental staff must be prepared to assist the patient. The patient must be informed if periodical recalls are need for case follow up. The dentist must be honest with the patient when instrument breakage occurs and be aware that the fragment of a broken file in a root canal does not necessarily implicate in treatment failure⁴. Prevention is the best way to reduce

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accident rate during endodontic treatment, but whenever the fracture of an endodontic instrument is perceived, is the dentist's responsibility to inform the patient about the occurrence, possible consequences, treatment sequence and prognosis, and to provide a full documentation of the case (e.g.: dental records, radiographs)⁵⁻⁶.

In a previous survey⁷ that assessed basic questions regarding intracanal breakage of instruments, among other issues, a questionnaire was sent to 300 endodontists listed in the membership board of the American Association of Endodontists. Only 85 replies were received. From this total, 95.3% of the respondents (n=81) would inform the patient if intracanal breakage occurred, and 78.8% (n=67) would also inform in those cases where fragment removal was not possible.

Ree et al.⁸ discussed the factors influencing referral for specialist endodontic treatment among Dutch general dentists. The authors handed out 593 questionnaires and had a response rate of 41%. Of the respondents, 93% felt the need to refer cases to specialists. The majority of dentists preferred to refer to an endodontist rather than an oral surgeon. Root canal obstruction (obliteration, calcification and fractured instruments) was the major factor for referring patients; 37% considered that important and 54% that very important situations caused referral to specialists.

Given that some problems in Endodontics are not predictable, it is important to address ethical aspects of dentists' behavior in cases of endodontic instrument fracture, since it is well known that endodontic treatment success relies on the combination of several factors, including those related to the patient, the tooth, the root canal system, the instruments and materials, as well as the operator⁹.

This study addressed several ethical aspects concerning the behavior of endodontists and general dentists regarding endodontic instrument fracture during root canal treatment.

Material and Methods

The research protocol was reviewed and approved by the Research Ethics Committee of the Dental School of Piracicaba, State University of Campinas, Brazil.

A questionnaire with structured open questions was used. The questions argued about ethical aspects of dentists' conduct in endodontics. Some questions allowed more than one answer. An informed consent form was filled out warranting the confidentiality of the collected data and their use for research purpose only. Three hundred questionnaires were submitted to dentists in the cities of Goiânia and Aparecida de Goiânia, GO, Brazil. The collected data were reviewed and analyzed statistically by Fisher's Exact and chi-square tests. The null hypothesis was that there was no association between the variables assessed in the questionnaire. Significance level was set at 5% and Statistical Analysis System (SAS) statistical software was used.

Results

From the total of 300 questionnaires, a response rate of 66.7% (n=200) was obtained. Based on data collected from the replied questionnaires, it was observed that 76% (152) of the respondents were general dentists (no specialization), 16% (32) were endodontists and 8% (16) were specialists in other areas.

When asked if they had already fractured any type of endodontic instrument during root canal preparation 56% (112) of the participants answered affirmatively. When a correlation was made between professional qualification and fracture occurrence, 87.5% (28) of endodontists and 47.7% (72) of general dentists answered that they had already experienced instrument breakage during endodontic procedures (p<0.0001). The other 12 participants that mentioned experience with instrument breakage were of other specialties and did not represent statistical significance.

When questioned about their first conduct in case of instrument fracture, 53% (106) stated that they would inform the patient about the accident, 46% (92) would try to solve the problem without telling the patient, and 1% (2) did not answer this question.

The participants were also asked whether they would inform the patient if an endodontic instrument had broken during treatment with no possibility of fragment removal. Concerning this question, 54% (108) answered that they would inform the patient about the accident and would schedule another appointment to try again, 29% (58) would tell the patient about the accident and would refer them to an endodontist, and 13% (26) would inform the patient and continue the endodontic treatment (Figure 1).

A statistically significant association (p=0.0028) was observed when both possibilities of professional conduct (either inform or not the patients about the accident) were evaluated considering the interviewees' professional qualifications. The null hypothesis was thus rejected. The percentage of general dentists who would inform the patient

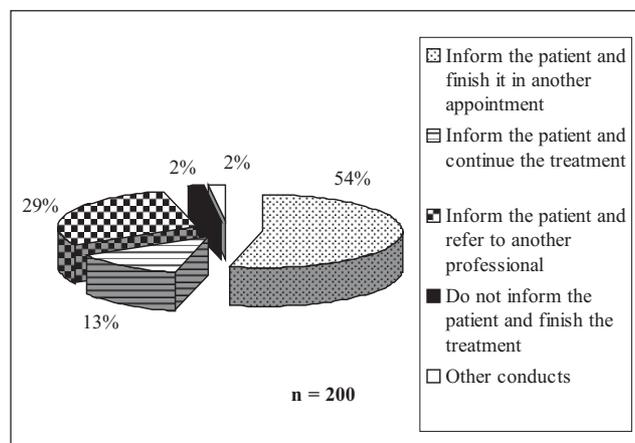


Fig. 1 - Professional conduct in case of endodontic instrument fracture

Table 1 - Frequency of professional qualification [n(%)] related to the conduct after endodontic instrument fracture.

	Inform patient	Solve the problem without informing	No response
General dentist	92 (60.5)	59 (38.8)	1 (0.7)
Endodontist	9 (28.1)	22 (68.8)	1 (3.1)
Other Specialization	6 (37.5)	10 (62.5)	0 (0)

p = 0.0028

at the moment of accident (60.5%) was significantly higher than that of endodontists (28.1%) and other specialists (37.5%). Accordingly, most endodontists and other specialists would attempt to solve the problem without informing the patient (Table 1).

Data crossing regarding to the type of conduct towards the patient concerning the impossibility of removing the fragment with professional qualification demonstrated that there was a statistically significant association between these variables, but only when considering general dentists' responses (*p* = 0.012). In this group of professionals, only 4% (6) reported that they would finish the treatment without informing the patient about the instrument fractured. The great majority of general dentists (96%; *n* = 146) would inform the patient, but they would take other conduct after that (Figure 2).

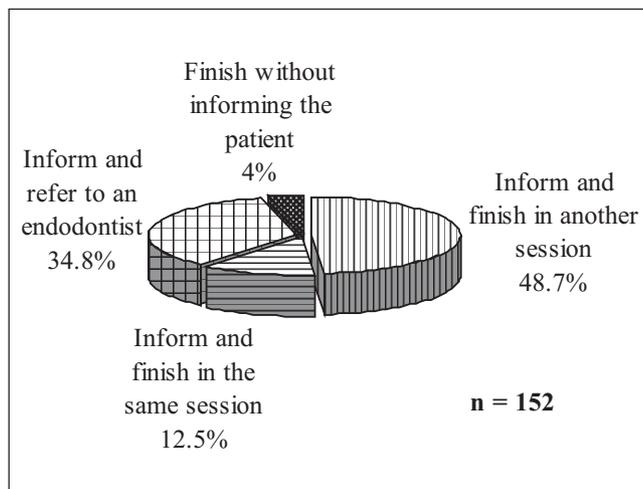


Fig. 2 - Conduct of general dentists in case of impossibility of removing the instrument fragment from the root canal

Discussion

Endodontic failure can lead to problems in the professional-patient relationship, and instrument fracture is considered one of the most unpleasant accidents during endodontic therapy.

In the present study this type of accident was reported by

56% of participants. Among the endodontists, 87.5% affirmed to have already fractured some type of endodontic instrument, which shows that even a specialist, who is presumably more skilled and technically prepared than a general dentist might experience this type of accident. A fractured instrument within root canal is a critical situation that requires a positive and calm attitude in order to establish the most appropriate plan to achieve the best result. In addition, the patient must be promptly informed as soon as the accident is confirmed and should be given full information about case sequence and prognosis^{1,4-5,9}. Patients are not always ready to receive this type of news, but the professional must be prepared to assist them³.

Informing the patient was the conduct chosen by 53.5% of the participants. Nevertheless, a relevant part of the surveyed professionals is afraid of properly communication accidents to their patients, which may lead to an inappropriate conduction of the case. In addition, this result indicates that 46.5% of participants would not have an ethical behavior, keeping their patients unaware of the instrument breakage. An even higher percentage (95.3%) was reported in a previous study.

Analyzing the decision to inform the patient about the accident versus the qualification, it was observed that from the total number of specialist, only 28.1% stated that they would inform the patient about the fracture. This may be justified by the fact that the specialists would feel more capable of resolving the problem themselves because they believe to have more knowledge and are used to dealing with cases like those. Even so, the recommended ethical conduct is to inform the patient about instrument breakage or any other type of accident occurred during endodontic therapy^{2-5,10}. Among general dentists it was observed a more ethical conduct compared to specialists, since 60.5% of them responded that they would inform the patient right after confirmation of instrument fracture.

It was also asked which would be their conduct if the fragment could not be removed. Results showed that almost all general dentists (96%) would inform the patient about the situation. In the study by Itoh et al.⁷, the percentage of professionals that would have the same behavior was considerably smaller (78.8%).

The association between the impossibility of removing the fragment in the same session and the professional qualification showed that, among all general dentists, 48.6% would inform the patient and would finish the treatment in a subsequent session. These findings demonstrate that after an unsuccessful attempt to remove the fragment in the same session, the conduct of trying to solve the problem in another moment can be a viable alternative that avoids session prolongation and minimizes physical and emotional distress both to the patient and to the dentist.

It was verified that 61.2% of general dentists would try to resolve the problem according to their technical capacity

in the same appointment or in another one. However, almost one third of those professionals (34.8%) would refer the patient to a specialist. This shows the limitation of their technical capacity and also indicates their concern to provide the best care possible to the patient, since the case would be handled by a specialist. According to this study, instrument fracture was considered an important aspect to refer a case to a specialist by 34.8% of dentists, which is in accordance with the findings of a previous study⁸.

Endodontic instrument fracture may bring forth problems to patients and dentists, in different ways. Immediate notification of such an occurrence to the patient is a desired and proper conduct to be followed by dentists. The best way to prevent lawsuits in Dentistry is having an ethical and clear attitude towards the patient mainly in situations involving accidents related to dental treatment. It is also necessary to keep accurate and updated dental records (e.g.: radiographs, contracts, prescriptions, casts).

Based on the findings of the present investigation, it may be concluded that 53.5% of the participants reported that they would have a proper ethical conduct in case of intracanal instrument breakage. When fragment removal was not possible, 96% of general dentists would inform the patient about the situation.

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