

DESCRIPTION OF ENDODONTIC PRACTICES IN DENTISTS IN TEACHING ORAL AND DENTAL HOSPITAL

**Yovita Yonas¹, Zoraya Arwidhyan¹, Putu Yuri Divina¹, Hanif Nur Rasyid¹, AryoDwipo
Kusumo², Retno Palupi²**

¹Specialist Dentistry Education Conservative Dentistry, Faculty of Dental Medicine,
Universitas Airlangga, Surabaya – Indonesia

²Department of Public Dental Health, Faculty of Dental Medicine Universitas Airlangga –
Indonesia.

Corresponding author : Retno Palupi, Department of Dental Public Health, Faculty of
Dental Medicine, Universitas Airlangga, Indonesia, address: Jl.
Prof.Dr.Moestopo No. 47, phone numbers : (+6231) 5030255,
5020256, facsimile numbers : (+6231) 5020256. Email:
pretno7774@gmail.com.

ABSTRACT

Background: The advancement of endodontic tools and materials that can improve the success of root canal treatment currently supports tooth conservation efforts. **Purpose:** This study aims to determine the description of endodontic practice performed by general dentists.

Methods: This type of descriptive study was a population of general dentists at Dental and Oral Hospital Universitas Airlangga. The variable used was the practice of endodontic treatment for general dentists at Dental and Oral Hospital Universitas Airlangga. The responses were received as many as 34 forms then analysed and presented descriptively.

Results: The study subjects were 34 people, of which 62% performed endodontic treatment on double rooted teeth. The frequency of endodontic treatment within 1 week of 0-5 teeth was performed by 76% of respondents. The majority of root canal preparation techniques used were crown down as many as 56% of respondents. The root canal irrigation agent sodium hypochlorite was used by 85% of the respondents. The single cone root filling technique was used by 59% of the respondents. As many as 85% of respondents prescribe antibiotics to patients with inflammation. **Conclusion:** Endodontic practice of general dentists at Dental and Oral Hospital Universitas Airlangga still does not use the latest technology and does not adequately meet the guidelines for endodontic treatment that are valid internationally.

Keywords: Endodontic Care, General Dentist Practice, Questionnaire Survey.

INTRODUCTION

Endodontic science is a branch of dentistry that studies the etiology, prevention, diagnosis, and therapy of dental pulp, tooth roots, and periapical tissue (Bramma, Trelia, Menik, & Hanna, 2017; Dorland, 2008; M. K. M. Nasution, Muchtar, & Nasution, 2019). The goal of endodontic treatment is to keep the tooth as long as possible in the oral cavity (Adam & Achmad, 2018; Yuanita, 2017). The advancement of endodontic tools and materials that can improve the success of root canal treatment currently supports tooth conservation efforts (Ahmad, 2009; Deshpande & Naik, 2015).

Endodontic technology and materials have developed so rapidly that it requires operators to always be up to date on the latest developments (Grossman, Oliet, & Del Rio, n.d.; M. Nasution, Syah, & Elveny, 2016). However, several studies revealed that most general dentists and endodontists who practice the knowledge they learned in school fail to use the latest technology and materials while others use the technology without a scientific basis (Jenkins, Lynch, Sloan, & Gilmour., 2009; Mappangara, Tetelepta, Adam, Oktawati, & Sulastrianah, 2018; Widjiastuti et al., 2019).

This survey was conducted to find out how endodontic practice, the application of new technology and the problems surrounding the use of endodontic materials and methods among general dentists participating in Specialist Dentistry Education at Oral and Dental Hospital Universitas Airlangga, Surabaya. Surabaya is a major city where access to endodontic treatment with the latest methods and materials is estimated to be more common. Besides that, Specialist Dentistry Education students are considered to have more access to the latest endodontic science developments. This study aims to determine the description of endodontic practice performed by general dentists (Ahmad, 2009; Deshpande & Naik, 2015; Widjiastuti, Rudyanto, Yuanita, Bramantoro, & Widodo, 2018).

METHOD

This type of study was a descriptive study and the variables used were the practice of endodontic treatment of general dentists at Dental and Oral Hospital Universitas Airlangga. Based on the population of dentists at Dental and Oral Hospital Universitas Airlangga who were accepted as Specialist Dentistry Education participants in 2019, samples were taken by using the simple random sampling method (Notoatmodjo, 2012). The sample inclusion criteria were the population who were willing to be respondents. The sample exclusion criteria were dentists who were not present at the time of data collection and who did not return the questionnaire. Subsequently, ethical approval was submitted to the Health Research Ethics

Commission of the Faculty of Dental Medicine, Universitas Airlangga and received a certificate of ethical acceptance number 166 / HRECC.FODM / III / 2020. In this survey, 16 questions with closed answers were distributed by using Google form. The responses were received as many as 34 forms then analysed and presented descriptively.

RESULTS

A total of 34 respondents filled out the questionnaire completely, then analysed the data. The study results were shown in table 1 which consists of 16 questions. Based on the results of the study, the number of male respondents was 35% while women were 65%. Dentists who perform endodontic treatment of double rooted teeth were more profound than those who perform root canal treatment on single roots alone. The frequency of endodontic treatments performed within 1 week of 0-5 teeth was performed by 76% of general dentists. As many as 59% of general dentists never used rubber dams in endodontic treatment, 35% of dentists sometimes used rubber dams, and 6% who always used rubber dams in endodontic treatment. Calcium hydroxide was the most preferred medicament, calcium hydroxide is used by 50% of general dentists and other dentists use formocresol, antibiotic paste, formaldehyde, metapex, iodoform and some use cotton alone for root canal dressings.

The method of determining the length of work used by 50% of dentists used the apex locator, while others used tactile sensation, instrument radiographs, and pre-action radiographs to measure work length. The preparation tools used by 44% of general dentists were rotary nickel titanium files, nickel titanium hand files were also widely used by general dentists, apart from these two tools, a small proportion of dentists use stainless steel hand files. The crown down root canal preparation technique is the most widely used, 56% of dentists used this technique, while others used the step back technique and the push and pull technique.

The root canal irrigation agent used by 85% of general dentists was sodium hypochlorite. The single cone root canal filling technique was used by 59% of general dentists, another technique used by general dentists was lateral compaction, the warm compaction technique. Endomethasone sealer was a sealer that is widely used by general dentists.

As many as 85% of general dentists prescribe antibiotics in patients with swelling, antibiotics were used in other cases such as if there were symptoms and pain, if a sinus track was found, and if percussion hurts. The antibiotic prescribed by 56% of general dentists was broad spectrum penicillin (e.g. Amoxicillin, Ampicillin).

The method of endodontic file sterilization most commonly used by general dentists was autoclave. There were 88% of dentists felt the need for further endodontic training and 12% did not need further training.

Table 1. Overview of endodontic practice in dentists at the oral and dental hospital Universitas Airlangga

Respondent Characteristics	N	Percentage
Sex		
Male	12	35%
Female	22	65%
Endodontic Case Treated Routinely		
Single-rooted endodontic case	13	38%
Double-rooted endodontic case	21	62%
Isolation Rubber Dam Use		
Always	2	6%
Seldom	12	35%
Never	20	59%
Frequency of Canal Treatment in a week		
0-5 teeth	26	76%
6-10 teeth	7	21%
>10 teeth	1	3%
Dressing/medicament used		
Calcium Hydroxide	17	50%
Form cresol	6	18%
Iodoform	1	3%
Formaldehyde	2	6%
Pasta antibiotic	5	15%
Metapex	2	6%
Septomix	0	0%
Fresh cotton	1	3%
Method of Determining the Work Length		
Apex locator	17	50%
Radiography pre-treatment	3	9%
Irrigation Material Used		
Sodium hypochlorite	29	85%
Chlorhexidine	1	3%
Hydrogen peroxide	3	9%
Ethylene diamine tetra acetate (EDTA)	1	3%
Normal saline	0	0%
Root Canal Type of Obscuration		
Lateral compaction	10	29%
Warm compaction	4	12%
Single cone	20	59%
Type of Root Canal Sealers		
Zinc-oxide eugenol	6	18%
Endomethasone	15	44%
Epoxy-resin	4	12%
Calcium hydroxide	9	26%
Condition for Prescribing Antibiotics		
If there is symptom or sore	2	6%
If there is sinus track	2	6%

If there is swelling	29	85%
If there is teeth ache while percussion	1	3%
Type of Antibiotics Receipt		
Amoxicillin + clavulanic acid	11	32%
Broad Spectrum penicillin (e.g. Amoxicillin, ampicillin)	19	56%
Tetracycline	0	0%
Metronidazole	4	12%
Fluroquinolone	0	0%
Macrolides	0	0%
Sterilization Way of Endodontic File		
Glass bead sterilization	1	3%
Autoclave	21	62%
Chemical Sterilization	10	39%
Dispose after single use	2	6%
Time for Changing Endodontic File		
After one use	1	3%
After 3 times use	8	24%
After 4-5 times use	9	26%
After 6 times use	3	9%
After file becomes blunt (decreased cutting efficiency)	9	26%
After there are distortion symptoms	4	12%
Necessary/not Endodontic Practices Further after Graduation		
Yes	30	88%
No	4	12%

DISCUSSION

This study aims to determine the picture of endodontic practices conducted by dentists at the Dental Hospital of Universitas Airlangga. The results showed that the general dentists at Dental and Oral Hospital quite often performed endodontic treatment on both single and double rooted teeth. Most of them (59%) never used rubber dams during endodontic treatment, only 6% always used rubber dams, and the rest occasionally used rubber dams. This happens because of the cost, skill, and time required for the rubber dam application. Application of rubber dam that is not performed can influence dentists in making decisions on the choice of irrigation material and negatively affect the results of treatment (Ahmad, 2009). Rubber dam application is a must for patient protection and isolation. Dentists who do not do so can be sued by the patient in the event of something such as accidentally ingesting an endodontic device.

For root canal medicaments, the use of calcium hydroxide was the most popular followed by formocresol, which is similar to the results of a study conducted on a dentist in Kathmandu (Shrestha, Dahal, & Karki, 2013). Calcium hydroxide is considered as a suitable material for root canal medicaments because of its long-time stability, no harm to the body,

and bactericidal (kills bacteria). It also stimulates the formation of hard tissue and is effective in stopping inflammatory exudate.

The method of determining the length of work used by 50% of dentists used the apex locator, 24% of general dentists using tactile sensation, 18% of general dentists using radiographs with root canal instruments, while 9% used pre-operative radiographs. Periapical radiographs are essential in endodontic treatment aimed at diagnosis, determining the number, location, shape, size, and direction of roots, estimating and confirming the length of the root canal before instrumentation, and for evaluation of root canal filling. However, conventional two-dimensional radiographs have distortions thus they cannot depict the root canal and the position of the apical foramen in real terms. Therefore, the use of an apex locator is needed to determine the length of work without being equipped with a diagnostic radiograph. This method can be used especially in patients who cannot be exposed to repeated radiation too often due to mental, medical, or other oral conditions.

The number of general dentists who use rotary nickel titanium files and nickel titanium hand files is the same, namely 44% for each tool, while the rest uses stainless steel hand files. The main purpose of root canal cleaning and formation is to remove infected hard and soft tissues and to provide space for irrigation agents that can disinfect the canals while maintaining the tooth structure as much as possible. Nickel titanium files have the advantage of super elastic properties and cause less instrumentation errors in the root canals (Pasqualini, Bianchi, & Paolino, DS, 2012). However, not all clinical situations can be resolved with a nickel titanium file, hence the use of stainless steel hand files is also inevitable.

The crown-down technique approach provides several advantages, including preliminary removal of the coronal debris, creation of a reservoir large enough for the irrigation solution, straight access to the apical area of bent roots, and better precision at the apical tip and working length. Most (56%) dentist Dental and Oral Teaching Hospital have used this technique.

Most of the surface of the root canal cannot be reached by the preparation instrument, therefore the use and choice of irrigation agent is very important to clean and disinfect the entire root canal. Sodium hypochlorite, the most commonly used irrigation agent (85% of Dental and Oral Teaching Hospital general dentists), can dissolve organic matter and has antimicrobial properties.

The root canal filling technique most widely used in this study is the single cone canal filling technique. In cases with round, regularly shaped canals, this technique is the preferred technique because it is easy to use and can fill the canals well. However, other techniques

such as warm compaction and lateral compaction have good results in filling root canals with irregular shapes, having isthmus, and lateral canals.

A root canal sealer is needed to close the gap between the dentine walls and the dense core filling material in the root canal thus a hermetic filling is obtained. In this study, the most widely used ingredient was endomethasone (44%). Endomethasone contains paraformaldehyde and ingredients containing paraformaldehyde are contraindicated in endodontic treatment. This sealer is not approved by the U.S Food and Drug Administration and cannot be used in clinical treatment because it can have toxic effects on periradicular tissue. These sealers can trigger allergic reactions, angioedema, and anaphylactic shock. The current popular root canal sealers are resin based sealers which bind to the dentin walls. Study using epoxy resin and methacrylate resin sealer showed no significant difference or worse than other sealers (Teixeira, Teixeira, & Thompson, 2004).

As many as 85% of dentists prescribe antibiotics to patients with swelling, 6% prescribe antibiotics if symptoms and pain are present, 6% prescribe antibiotics if sinus tracks are found, and 3% prescribe antibiotics when the tooth is sore. The antibiotics prescribed by 56% of general dentists were broad spectrum penicillin (e.g. Amoxicillin, Ampicillin), 32% prescribed Amoxicillin + clavulanic acid, 12% prescribed metronidazole. The risk of drug side effects in the administration of systemic antibiotics and the ineffective results of systemic antibiotics against pulp necrosis of the pulp and per radicular tissue, make the need for local antibiotic administration in endodontic treatment. This study shows that general dentists have been over-prescribing systemic antibiotics thus patients are at high risk of developing antibiotic resistance.

As many as 97% used the endodontic file more than once. Some experts recommend using disposable files. However, due to the high cost, most dentists use it more than once. The best sterilization for the reuse of endodontic files is by using autoclave, according to the majority (62%) of the preferences of general dentists at Dental and Oral Hospital Universitas Airlangga. There were 88% of general dentists felt the need for further endodontic training and 12% did not need further training.

A broader description of the dentists' knowledge in the endodontic field is needed for further study, even internationally hence more optimal rules or guidelines for endodontic treatment can be created.

CONCLUSION

The endodontic practice of dentists at Dental and Oral Hospital Universitas Airlanggastill does not use the latest technology and does not sufficiently fulfil the guidelines for endodontic treatment that apply internationally. To improve the quality of the endodontic practice performed by the operator requires further training.

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