



## Endodontic

## MANAGEMENT OF POST ENDODONTIC COMPLICATIONS IN ROUTINE DENTAL PRACTICE AMONG DENTAL PRACTITIONERS OF DAKSHINA KANNADA – A QUESTIONNAIRE BASED STUDY

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**ABSTRACT** **BACKGROUND:** An ongoing and frequently exasperating problem in endodontics is the incidence of Post Endodontic Complications (PECs) after Root Canal Treatment (RCT). After the appointment, the patient calls or returns to the dentist's office with discomfort is vexing to both the patient and the dentist.  
**AIM:** The study aimed to assess the modalities for preventing and managing PECs among dental practitioners in Dakshina Kannada region  
**METHODOLOGY:** A standard questionnaire consisting of 21 questions was prepared through Google forms and circulated through email.  
**RESULT AND CONCLUSION:** Mostly experienced symptom is pain. In case of missed canals, overinstrumentation, retreatment, Single Visit Endodontics, hand filing, step back preparation, vertical condensation, chance of PECs is more. The management of PECs and their prevention, show wide variations. So an universal agreement is necessary to standardize the preventive methods and for prescription of medicines.

**KEYWORDS :** Post Endodontic Complications, antibiotics, management

### INTRODUCTION

Contemporary endodontics is developing day by day. It is focussing not only on the instruments, but also on the treatment procedures. The basic concept in modern endodontics is painlessness and effectiveness of the treatment.<sup>1</sup>

Endodontic treatment is both an art and a science, and so many facts are arising on how to best accomplish the goals of canal debridement, cleaning and shaping, and obturation.<sup>2</sup> In 1977, Dorn et al studied trends in treatment of endodontic emergencies based on a questionnaire answered by diplomates of the American Board of Endodontists. This study was updated in 1988 by Gatewood and colleagues.<sup>3</sup> The current study was aimed to gather similar data on more routine endodontic treatments performed by dental practitioners who are doing root canal treatment irrespective of endodontists, general dentists or any other dental specialists.

In a systematic review, the incidence of postoperative pain reported as ranging from 3% to as high as 58% of patients. Prevention and management of postoperative pain is an integral part of Root Canal Treatment (RCT). So many factors other than pain were reported as predictors for Post Endodontic Complications (PECs) like age, gender, type of tooth, history of allergic reaction, systemic drug therapy, preoperative symptoms, the absence of periapical lesion, and pulpal necrosis etc.<sup>4</sup> However, literature is scarce with regards to factors which dental practitioners consider in the management of PECs.

### MATERIALS AND METHODS

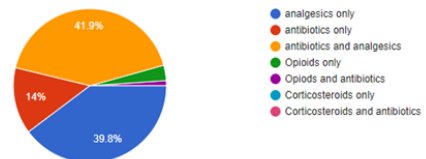
General dentists, Endodontists, specialists other than Endodontists who are doing RCT only were included in the study. The Ethical approval was obtained from the Ethics committee KVG dental college Sullia, Dakshina Kannada. Standard questionnaire having 21 questions were created through Google forms and sent via email. Email ID was asked as mandatory, otherwise responses could not be recorded. Questions included general information, years of experience and concepts about PECs in etiology and methods in prevention and management of those complications among dental practitioners who are doing RCT. A total of 100 responses were recorded during the study period.

### RESULT

In the current study, 42% of the respondents are Endodontists, 39% are general dentists, remaining 19% are Specialists other than Endodontists doing root canal treatment. Among them, 47% are doing

RCT less than 10 per month, 31% are doing 10-25 per month and 22% are doing more than 25 per month. Among these, 66% faced complications less than 25% and 24% faced 25-50% and only 10% dentists faced greater than 50% PECs. Mostly experienced post endodontic symptom is pain as per the opinion of 46% of dentists and 23% opinioned as both pain and swelling and at the same time 21% opinioned as pain, swelling and sinus tract are the usual post endodontic symptoms. Table 1, Table 2 and figure 1 shows the remaining responses

**FIGURE 1 : Prescription Pattern Of Preoperative Medication**



In case of postoperative medication, 32% are prescribing doses as needed only and 32% are prescribing for 1-2 days.

**TABLE 1 showing questions and responses**

QUESTIONS	MAXIMUM RESPONSES	%
Most common cause of PECs	<ul style="list-style-type: none"> <li>Both mechanical and chemical injury to periradicular tissues</li> <li>Microorganisms</li> </ul>	37.4 31.3
which age groups are more prone to PECs?	<ul style="list-style-type: none"> <li>Upto 35 years</li> <li>36-45 years</li> </ul>	21.2 33.3
In which gender would you come across with more post endodontic complications?	Females	49
By using which of the following instruments, post endodontic complications are more as per your experience?	<ul style="list-style-type: none"> <li>Hand files</li> <li>Rotary files</li> <li>Both</li> <li>Reciprocating files</li> </ul>	34 26.8 24.7 10.3
Which canal preparation would cause more PECs?	<ul style="list-style-type: none"> <li>Stepback</li> <li>Stepdown</li> <li>Don't know</li> </ul>	46.9 26 27.1

Which obturation technique would cause more PECs?	<ul style="list-style-type: none"> <li>Lateral condensation</li> <li>Vertical condensation</li> <li>Both</li> </ul>	18 42 19
The most following preventive method for PECs	<ul style="list-style-type: none"> <li>Accurate determination of working length</li> <li>Administration of analgesics immediately after treatment</li> <li>Occlusal reduction</li> </ul>	25.3 20.2 16.2

**TABLE 2 showing response for YES or NO questions**

RESPONSES	%
Overinstrumentation causes PECs	82.8
Intracanal medicament can reduce PECs	80
Preoperative medication can reduce PECs	49
Postoperative medication can reduce PECs	79.4
Visual analog scale is the best method to assess pain	57.6
Systemic condition of the patient has relation with increased incidence of PECs	56.2
Single Visit Endodontics is more responsible for PECs than multivisit	67.3
Retreatment causes more PECs	56.1
Missed canals cause more PECs	59.6

## DISCUSSION

Mostly experienced post endodontic symptom is pain as per the opinion of the clinicians. Professionals should be aware of this postoperative pain and make efforts to prevent or treat it. Patients should be informed about the possibility of Post Endodontic Pain (PEP) and instructed in the use of analgesics.<sup>4</sup> 49 % has opinion that preoperative medication can reduce PECs, among those, 41.9% is giving antibiotics and analgesics, 39.8% are prescribing analgesics only. This finding apparently imitates the results of a previous study, where prophylactic antibiotics significantly reduced the incidence of flare-ups and serious sequelae after endodontic treatment<sup>5,6</sup> whereas another study reported that patients taking antibiotics were more likely to have a flare-up than those were not taking. Thus based upon the lack of efficacy, their cost and potential side-effects, prophylactic antibiotics are contraindicated in preventing flare-ups. In previous studies, it is found that the use of analgesics preoperatively and postoperatively were effective in reducing postoperative pain.<sup>7</sup>

79.4% are giving medicines for PECs after endodontic therapy. As per our study antibiotics are overprescribed for the management of PECs. So it is necessary to improve antibiotic-prescribing habits in the endodontic therapy and to introduce educational initiatives to encourage the proper use of antibiotics. Kumar et al. determined the antibiotic-prescribing habits for pulpal and peri-apical pathology among dentists in Hyderabad, India. The total percentage of dentists who prescribed antibiotics for endodontic management was 68.5% and the most common indication for antibiotics prescription was necrotic pulp with acute apical periodontitis with swelling and moderate/severe preoperative symptoms (92.1%).<sup>8</sup> Walton and Fouad concluded, it was unlikely that the drug was the cause of flare-up, instead they felt it more reasonable to assume that patients with aggressive symptoms are usually taking these therapeutic agents even before the appointment.<sup>9</sup> In this situation, adequate surveys should be encouraged to determine the antibiotic-prescription pattern of dentists in the endodontic treatment.

Maximum response for most common cause of PECs is mechanical and chemical injury to periradicular tissues (37.4%). Majority opinioned that overinstrumentation cause PECs. Making an accurate determination of working length is the main preventive measure for PEC adopted by 25.3% dentists.

Forcing of endodontic instruments beyond the apical foramen can cause extrusion of irritants to the periapical tissue, which can trigger incidence and degree of PECs. One study reported higher incidence of pain occurred during the shaping procedure when instruments were forced beyond the apical foramen whereas Torabinejad et al. reported that unintentional overextension of files, which can occur while determining working length, did not affect the incidence of postoperative pain. In a research, Siqueira et al. found low incidence of PECs in nonvital teeth or teeth with previous endodontic treatment if apical patency was maintained.<sup>10</sup>

In the present study, occlusal reduction was ranked third among the most preferred method to prevent PECs.<sup>7</sup> Data available on the effect

of the occlusal reduction on the postoperative pain is contradictory. Routine prophylactic occlusal reduction in managing postoperative pain is ineffective but in teeth having pain upon mastication it is effective. Rosenberg and Babick found that occlusal reduction could prevent postoperative pain whereas Parirokh and Rekabi reported that occlusal reduction had no such benefits.<sup>7</sup>

Most of the practitioners have opinion that Single Visit Endodontics cause more PECs. Amongst the various complications reported in case of single visit endodontics, incidence of post endodontic pain (PEP) is the most common one. But the prevalence of pain in various reports is different which is because of the variations in the study method, treatment procedure, case selection and experience of the operator.<sup>11</sup>

As per the result, retreatment is more causative than primary treatment for PECs (56.1%). This finding is similar to the study which showed that retreated cases had a higher incidence of interappointment emergency than those received primary treatments and postoperative pain is an expecting sequelae of endodontic treatment in retreatment cases.<sup>7</sup>

Vertical condensation causes more PECs than lateral condensation. Extrusion of sealers or over obturation occurs more in vertical condensation. Although a little apical extrusion can be tolerated by periradicular tissues, post operative complications will occur if it is approximating nerve structures.<sup>12</sup>

49% opinioned that females are more complaining of PECs. Some studies reported that gender had no statistically significant influence on the incidence of PECs even though females showed more response.<sup>6</sup> Incidence of PECs is more in 36-45 age groups as per our study. But previously reported that in several cases, acute exacerbation and pain after endodontic treatment occurred more frequently in younger individuals.<sup>6</sup> So effect of patients' age and gender have been studied but results are conflicting, however they have association with higher chance of pain in endodontic treatment.<sup>13</sup>

According to the present study, 59.6% opinioned that if missed canal is there, probability of PECs is more. Missed canal may be responsible for PECs because of persisting bacterial contamination. It may occur in all teeth, due to poor assessment of root canal anatomy. Extra care should be given in case of mesiobuccal root of the first molar, premolars with two or more roots, mandibular central incisors, dens invaginatus to avoid missed canals. CBCT is very useful in detecting missed canals.<sup>14</sup>

As per 34% respondents, hand filing causes more PECs compared with rotary filing. Hand filing results in more debris load. This might be the reason.<sup>15</sup>

For 46.9%, stepback preparation is causing more PECs than stepdown. Pushing of debris is more associated with step back preparation. In contemporary endodontics, rotary instrumentation with Crown down technique is preferred over manual instrumentation with Step back technique.<sup>11</sup> Aqrabawi et al. and Pasqualini et al. reported that pain was less with rotary instruments after single visit endodontics. Al-Ababreen and Arias et al. also reported that higher incidence of pain was with stainless steel hand instruments than rotary instruments. In order to draw better conclusions, a wider study should be undertaken.

80% believe that intracanal medicament can reduce PECs. Post endodontic exacerbations are clinical manifestations of an acute periapical inflammation with infection. Therefore intracanal medicament are advocated for disinfection or with an anti-inflammatory action beneficial in subsiding the post endodontic flare ups.<sup>16</sup> They can reduce bacteria remaining after biomechanical preparation.<sup>17</sup>

57.6% knew that visual analog scale is the best way to assess pain. 56.2% reported that PECs has some relation with systemic condition of the patient. The systemic condition influence on incidence of PECs has been largely uninvestigated. The little evidence available would indicate that the medical status of the patient is unrelated to occurrence of PECs. Moreover, it seems that this would not be a major factor since flare-up incidence is not increasing in older patients.<sup>18</sup>

## SUMMARY AND CONCLUSIONS

It was difficult to identify, with certainty, specific reasons for PECs. This study may serve as a reference for future studies relating to PECs.

It can be concluded that the common reasons for PECs include occlusal trauma, over-instrumentation, over-medication, extruded materials beyond apical foramen and invasion by microorganisms. Overall success of the endodontically treated teeth includes absence of pain and swelling; absence of drainage and sinus tract; functional tooth with normal periapical physiology and the control of microorganisms.

It is clear that prognosis of endodontic procedures relies on the level of scientific knowledge and ability of the clinician even though success rates in endodontic procedures can be quantifiably and qualitatively improved with the invention of better technology.

The study showed that the management of PECs and their prevention show wide variations. An universal agreement is necessary to standardize methods in managing and preventing them. Making patients aware about expected PECs and prescribing medications to manage can obviously increase patients' confidence in dentists and improve their attitude towards future dental treatment. It also seems that there is a trend regarding prescription of antibiotics unnecessarily. Therefore, various seminars, workshops and educational initiatives should be conducted so as to increase their knowledge about PECs and their management.

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