

Analysing the Variables That Influence the Failure of Endoscopic Medication

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Abstract

The study's goal was to investigate the variables influencing endodontic therapy failure. The College of Dental Science & Research Centre conducted a cross-sectional descriptive study. Indian dental school in Pune. Ninety individuals from the treatment ward were examined for this investigation. The age group of 41 to 50 years old had the highest rate of endodontic failure, per the results. General dentists' (GDPs) endodontic treatment had the highest failure rate. Underfilled and unfilled/missed canals constituted the most common endodontic issue causing causes (17.7%). The investigation came to the conclusion that when treatment was not provided in accordance with acknowledged standards, ETF occurred. The primary causes of ETF are the patients' failure to see experts and microbial infections in the root canal system.

Keywords : *Failure, Endodontic Therapy, Dentistry*

Introduction

According to Cohen and Hargreaves (2006), endodontic therapy is a series of treatments for teeth with diseased pulp that both eradicates infection and shields the affected tooth from further microbial invasion. Numerous studies have looked into this therapy (Farbod and Bolhari, 2018; Vigneshwar and Ramesh, 2017). The tooth pole is made up of the actual intra-dental openings known as root canals and their paste shield, which are present in live connective tissue and blood vessels by nature (Nanci, 2012). The removal of these structures, their

development, the use of disinfectant treatments to clear cavities polluted with bacteria, and the blocking of contaminated canals are all included in endodontic therapy. Inert fillers like gutta-percha and zinc oxide eugenol are used to fill both clean and contaminated canals. Endodontics encompasses periradicular surgery and primary and secondary endodontic treatment, typically reserved for teeth that are still viable (Setzer & Kim, 2014; Kishen, Peters, Zehnder, Diogenes, & Nair, 2016) thorough extraction of the infected pulp and microbe-infested root tissues, as well as thorough sealing of the root canal space, are essential components of successful endodontic treatment. This stops the root canal space from becoming infected and from recurring. Clinical indications and symptoms as well as root canal radiography results can be used to diagnose ETF. Necrotic pulp of periradicular infection, periodontal disease, fractured roots, broken tools, mechanical perforations, root canal underfillings, and missed or unfilled canals are just a few of the many variables that might cause ETF. Not all endodontic treatments are effective (Feiz, 2017). According to Zimpolas et al. (2012), periodontal (32%), endodontic (8.6%), and prosthetic (59.4%) reasons were the most common causes of failure (Tzimpoulas, Alisafis, Tzanetakos, & Kontakiotis, 2012). According to Foss et al. (1999), root fractures (21.1%) were the most frequent cause of failure in 43.5% of endodontic procedures that did not succeed (Fuss, Lustig, & Tamse, 1999). Irreversible caries was the most frequent reason of failure, according to Chen et al. (2008) and Zadik et al. (2008) (Zadik, Sandler, Bechor, & Salehrabi, 2008; Chen, Chueh, Hsiao, Wu, & Chiang, 2008). A questionnaire was created by Toreh et al. (2011) in order to organise a prospective study that would look at the reasons behind failure. where illness (40.3%), endodontic failure (19.3%), suspended fractures and irreversible crowns (15.1%), vertical root fractures (13.4%), irreversible caries (5.2%), oestrogen piercing (4.4%), and prosthetics were the primary causes (Touré, Faye, Kane, Lo, Niang, & Boucher, 2011). Since this study covered the primary causes of ETF, applications have to be considered in order to raise the standard of endodontic treatment provided in dental practises. Therefore, the study's goal was to investigate the variables influencing ETF.

Methodology

In Pune, India, at the College of Dental Science & Research Centre Dental school, a descriptive cross-sectional study was carried out. Ninety individuals from the treatment ward were examined for this investigation. Excluded from the study were teeth with fractured crowns, irreparable and shattered teeth, periodontal and endodontic diseases, and fractured roots. The study involved faculty members from the Department of Dentistry's Endodontics. The endocrine failure patients were assessed using the Strindberg criteria (Strindberg, 1956). These standards were as follows: Three main factors need to be considered: 1) therapy of the sinus tract; 2) increased size or occurrence of new periapical lesion; and 3) clinical symptoms such as pain, swelling, and sinus tract discharge. To assess the quality of root canal fillings, De-Moor et al.'s proposed criteria have been applied (De Moor, Hommez, De Boever, Delmé, & Martens, 2000). Using a magnifying glass, every patient had a complete radiographic examination to observe any unintended injuries, untreated or missing canals, the periapical state of the concerned tooth, and the status of any root canal fillings. Following a meticulous clinical and radiological assessment of the affected teeth, the patients were arranged for additional therapy. The clinic's patients were chosen at random. Group 1 (20–30 years), Group 2 (31–40 years), and Group 3 (41–50 years) were the three age categories into which they were separated. The College Ethics Committee approved this study and granted the study subject informed permission.

Results

Ninety patients between the ages of 21 and 50 were included in the study. General dentists have a high failure rate (78.8%) for endodontic treatment, while specialists have the lowest failure rate (21.1%). The third age group had the highest rate of endodontic failure (41%) whereas the first age group had the lowest rate (24.44%). In terms of tooth type, maxillary molars accounted for the majority of endodontic failures (44.4%), followed by mandibular molars (20%) and maxillary premolars (15.5%); mandibular teeth displayed the lowest percentage of endodontic fractures (1.1%). Under-filled canals (33.3%) and unfilled and missed canals (17.7%) were the factors that had been associated with the most endodontic issues; mechanical holes (5.5%) and broken instruments (6.6%) were the factors associated with the least endodontic damage.

Discussion

Treatment failure due to noncompliance with established guidelines is known as ETF (Seltzer, Bender, & Turkenkopf, 1963; Sundqvist, Figdor, Persson, & Sjögren, 1998). According to Nair, Sjögren, Krey, Kahnberg, & Sundqvist (1990) and Lin, Skribner, & Gaengler (1992), periradicular tissue and root canal infections are the primary causes of endodontic fungal fever (ETF). According to the findings of these investigations, endodontic treatment is effectively treated with root canal fillings of high quality (Noor, Maxood, & Kaleem, 2008; Nie & Lin, 1999). Dryness in the root canal (more than 2 mm) is typically the result of poor preparation and frequently causes treatment failure. According to research by Chagal et al., there is a 14% risk that endodontic therapy for teeth with apical periodontitis will not be successful if there is a 1 mm decline in length. According to Chugal, Clive, and Spångberg (2003), persistent necrosis and pulp-infected tissue in insufficient or malfunctioning canals are the cause of pericardial tissue stimulation. Ineffective endodontic treatment was most frequently caused by unfilled canals. The doctor may miss these empty channels during root canal filling, they might stay hidden during root canal excavation, or he might not be able to locate them. This was consistent with related research demonstrating that there was a chance of losing root canal anatomy during endodontic therapy because of the intricacy of the root canal system (Cantatore, Berutti, & Castellucci, 2006).

An individual's age has a big impact on how well their endodontic treatment goes. The age group of 50–41 years old accounted for the highest percentage of endodontic failures (41.11%), while the age group of 21–30 years old had the lowest percentage (24.44%). The difference between the first and third age groups was statistically significant ($p = 0.011$). The calcified channels in the older age groups were the obvious cause of the failure in the 41–50 age group. Poor dental health and improper patient-specialist contact could be the second factor.

ETF is also influenced by the tooth's placement. In this regard, the posterior teeth experience the majority of failures. The findings indicated that maxillary molars (44.4%), mandibular molars (20%), and maxillary premolars (15.5%) had the highest rates of endodontic treatment flaws. 5.5 percent of endodontic failures occurred, which is higher than that of maxillary injectors. Untreated or unfilled canals following endodontic therapy were the most common causes of endodontic failure. Cantatore, Berutti, and Castellucci (2006) found that the high endodon-

tic treatment failure rate in mandibular injectors was caused by the existence of additional canals that were left untreated after the initial treatment. Another explanation would be that multi-canal teeth have stiff, curved canals, which makes it challenging for professionals to successfully treat these teeth with endodontics. This difference was significant, according to the test results in the current study ($P = 0.001$). Similar conclusions were reached by Navar et al. in their investigation (Noor, Maxood, & Kaleem, 2008). The effectiveness of endodontic therapy is mostly dependent on skill, experience, and specialised training. 78.8% of the injured patients in this research received care from a GDP. Similar research has shown that failure rates for patients treated by a GDP rather than a specialist can be much higher (Sjögren, Hägglund, Sundqvist, & Wing, 1990; Weiger & Axmann-Krcmar, 1998). Research indicates that the success rate of endodontic therapy administered by a GDP is 65-75%, while endodontic therapy administered by experts has a success rate over 90% (Eriksen, 1991). This variation in success rate could indicate a difference in the endodontic specialist's and GDP's technical level of care.

The study demonstrated the high significance of test statistics by comparing GDPs and dentists. One of the study's shortcomings was the absence of detailed information regarding GDPs' training and experience.

According to the study's findings, general dentists' lack of knowledge and continuous training periods were the main causes of ETF. Furthermore, the intricate structure of the affected teeth, the patients' failure to see a specialist, and a lack of appropriate specialised tools and training for even dentists using these instruments were all contributing factors to ETF. Thus, it is recommended that GDPs be encouraged to pursue further dental education and that teeth with complex anatomy be assessed using excellent preoperative radiography.

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