

Original Research

Assessment of Various Causes for Root Canals Failures in Study Population

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ABSTRACT:

Background: Endodontic therapy or root canal therapy is a treatment sequence for the infected pulp of a tooth which results in the elimination of infection and the protection of the decontaminated tooth from future microbial invasion. The present study was conducted to assess the causes of endodontic failures. **Materials & Methods:** The present study was conducted in the department of Endodontics. It comprised of 78 patients of both genders. A total of 140 endodontic treated teeth were included. Missed canal, dislodged/fractured restorations, iatrogenic problems: perforation, file separation, ledges etc were assessed. **Results:** Common reason of endodontic failure was inadequate obturation in 45%, missed canal in 20% and fractured coronal restoration in 35%. The difference was significant ($P < 0.05$). **Conclusion:** Endodontic failure may be due to variety of reasons. The most common reasons are missed canal, inadequate obturation and fractured coronal obturation

Key words: Pulp, Root canal, Restoration

Received: 14 March, 2019

Revised: 20 May 2019

Accepted: 22 May 2019

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This article may be cited as: Kumar M, Parashar A, Gupta B. Assessment of Various Causes for Root Canals Failures in Study Population. J Adv Med Dent Scie Res 2019;7(6): 71-73.

INTRODUCTION

Endodontic therapy or root canal therapy is a treatment sequence for the infected pulp of a tooth which results in the elimination of infection and the protection of the decontaminated tooth from future microbial invasion. It is widely used phenomenon in cases of apical periodontitis, periapical abscess, granuloma and cysts. The effectiveness of the treatment depends upon the careful following of all steps such as access opening, biomechanical preparation, obturation and restoration.¹

Increased dental patient education and awareness in conjunction with technological advancements have helped to promote the view that dentition should remain throughout people's lives. As a result, the need for performing conventional non surgical root canal therapy also has increased dramatically. Endodontic treatment has failure rates also.²

Among various reasons for root canal failures, missed canals, inadequate obturation and fractured coronal restoration are common. A small percentage of endodontically treated teeth do not respond favorably to non-surgical root canal treatment. A et al³ in their study found that missed canals were identified in 64 of the 133 previously treated teeth (48%). Of the total missed canals, 11% involved a maxillary second molar and 44% involved a maxillary first molar. For the maxillary first molars, 93% of all missed canal were identified in the mesio-buccal root. In the mandibular second molars, 29% of missed canals were identified in the distal and 71% were identified in the mesial root. The present study was conducted to assess the various causes of endodontic failures.

MATERIALS & METHODS

The present study was conducted in the department of Endodontics. It comprised of 78 patients of both genders. A total of 140 endodontic treated teeth were included. Ethical clearance was obtained prior to the study. All patients were informed regarding the study and written consent was obtained.

General information such as name, age, gender etc was noted. Intraoral periapical (IOPA) radiograph was used for

assessment of presence or absence of periapical radiolucency, quality of obturation, missed canal, dislodged/fractured restorations, iatrogenic problems: perforation, file separation, ledges etc. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

		Total-78	
Gender		Males	Female
Number of patients		38	40
Number of teeth		60	80

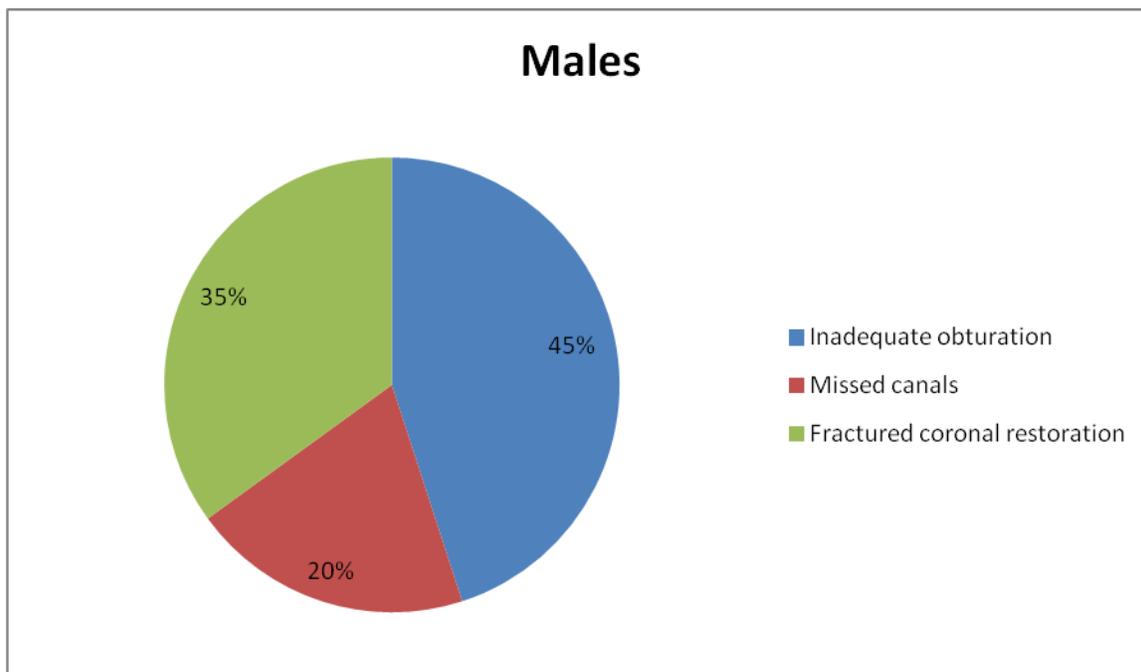
Table I shows that out of 78 patients, males were 38 and females were 40. Males had 60 and females had 80 teeth.

Table II Causes of endodontic failures

Reasons	Males	P value
Inadequate obturation	45%	0.04
Missed canals	20%	
Fractured coronal restoration	35%	

Table II shows that common reason of endodontic failure was inadequate obturation in 45%, missed canal in 20% and fractured coronal restoration in 35%. The difference was significant (P<0.05).

Graph I Causes of endodontic failures



DISCUSSION

Endodontic failure occurs for a variety of reasons, and presence of clinical signs and symptoms along with radiographic evidence of periapical bone destruction indicates the need for re-intervention. The first and most important step is to determine the cause of endodontic failure. Normally, the etiologic factors of endodontic failure can be persistent or reintroduced intra-radicular microorganism, extra-radicular infection, foreign body reaction and true cysts.⁴

The file segment may be left behind if an acceptable level of cleaning and shaping has already been completed and attempting to remove the segment would risk damage to the tooth. While potentially disconcerting to the patient, having metal inside of a tooth is relatively common, such as with metal posts, amalgam fillings, gold crowns, and porcelain fused to metal crowns. The occurrence of file separation is proportional to the narrowness, curvature, length, calcification and number of roots on the tooth being treated. Complications resulting from incompletely cleaned canals, due to blockage from the separated file, can be addressed with surgical root canal treatment.⁵The present study was conducted to assess the various causes of endodontic failures.

In present study, out of 78 patients, males were 38 and females were 40. Males had 60 and females had 80 teeth. A et al⁶ in their study included 48 patients having 90 teeth in mandibular premolars. The most common reason for failure was missed canals (40%) followed by fractured coronal restoration (32%).

Numerous follow-up studies found that the potential for healing and functional retention of endodontically treated teeth can be gleaned from exposed to initial treatment. Endodontic failure related to microorganisms can be caused by anatomical difficulties such as apical ramification, isthmuses, and other morphologic irregularities as well as procedural errors such as missed canals, root perforation, ledge formation, and separated instruments.⁷

Other common failure is microleakage. Microleakage is defined as the "diffusion of the bacteria, oral fluids, ions and molecules into the tooth and the filling material interface" OR "defined as the clinically undetectable passage of bacteria, fluids, molecules or ions between tooth and the restorative or filling material." Many studies emphasize that tooth filling materials are not fixed, inert and impenetrable borders but dynamic micro crevices, which contain busy traffic of bacteria, ions, and molecules. This leakage may be clinically undetectable but is a major factor influencing the long-term success of endodontic therapy as it causes many severe biological effects leading to recurrence of the pathology and failure of the root canal treatment.⁸

We observed that common reason of endodontic failure was inadequate obturation in 45%, missed canal in 20% and fractured coronal restoration in 35%. Another common

complication of root canal therapy is when the entire length of the root canal is not completely cleaned out and obturated with root canal filling material such as gutta percha.

CONCLUSION

Endodontic failure may be due to variety of reasons. The most common reasons are missed canal, inadequate obturation and fractured coronal obturation.

REFERENCES

1. Ebek T, Ana Kidley. Root canal anatomy of the human permanent teeth. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1984;58: 589-99.
2. Abbott PV. Recognition and prevention of failures in clinical dentistry, endodontics. *Ann R Australas Coll Dent Surg* 1991; 11: 150-66.
3. Lin LM, Skrinber JE, Gaengler P. Factors associated with endodontic treatment failures. *J Endo* 1992; 18: 625-7.
4. Lazarski MP, Walker WA 3rd, Flores CM, Schindler WG, Hargreaves KM. Epidemiological evaluation of the outcomes of nonsurgical root canal treatment in a large cohort of insured dental patient. *J Endod* 2001; 27: 791-6.
5. Mindola MJ, Mickel AK, Sami C, Jones JJ, Lalumandier JA, Nelson SS. Endodontic treatment in an American Indian population: A 10-year retrospective study. *J Endod* 2006; 32: 828-32.
6. Friedman S, Abitbol S, Lawrence HP. Treatment outcome in endodontics: The Toronto Study. Phase 1: Initial treatment. *J Endod* 2003; 29: 787-93.
7. Ishley D, Kennedy W, Johnson S, Minnich S. Clinical investigation of second mesiobuccal canals in endodontically treated and retreated maxillary molars. *J Endod* 2002; 28: 477-9.
8. Lynch CD, Burke FM, Ni Riordain R, Hannigan A. The influence of coronal restoration type on survival of endodontically treated teeth. *Eur J Prosthodont Restor Dent* 2004; 12: 171-6.