



Evaluation of Comparison of Success Rates of Endodontic Treatment and Dental Implants in Treatment of Periodontitis

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KEYWORDS

periodontitis, implants, RCT, crown.

ABSTRACT:

Background: This study was conducted to evaluate the comparison of success rates of endodontic treatment and dental implants in treatment of periodontitis.

Material and methods: The study included overall 100 subjects with periodontitis. The subjects were divided into 2 groups based on severity of periodontitis. Both the groups consisted of 50 subjects each. The subjects in group 1 had mild to moderate periodontitis. The subjects in the other group had severe periodontitis and had poor prognosis. The subjects with severe periodontitis underwent extraction for the purpose of dental implant treatment. Statistical analysis was carried out using SPSS software.

Results: 3 subjects from group 1 showed continuous pain whereas infection, furcal perforation and crown fracture was evident in 2, 1 and 1 subjects, respectively. 2 subjects from the second group showed peri-implantitis whereas implant mobility and nerve damage were seen in 1 subject each. The success rate of dental implants was higher (92%) as compared to RCT followed by crown placement (86%) for the treatment of periodontitis.

Conclusion: Dental implants showed higher success rate as compared to RCT followed by crown placement for the treatment of periodontitis.

INTRODUCTION

Approximately 700 species of microorganisms colonize the human oral cavity.¹ These bacteria inhabiting the human oral cavity are mainly commensals along with a sparse population of pathogenic bacteria.² Periodontitis is one of the most

common ailments affecting the teeth, leading to the destruction of the supporting and surrounding tooth structure.³ The term "periodontitis" is build up of two words, i.e., "periodont-" meaning "structure surrounding the teeth" and "itis" means "inflammation." Periodontitis is originally a disease



originating from the gingival tissue which if left untreated results in penetration of inflammation to the deeper tissues, altering the bone homeostasis causing tooth loss.³ Periodontal disease has a multifactorial origin.⁴ The main culprit identified in periodontitis is the bacterial biofilm growing on the tooth surfaces.^{5,6} Endodontic treatment also known as endodontic therapy or root canal treatment (RCT) involves the removal of diseased pulpal tissue to prevent and intercept pulpal/periradicular pathosis and protection of the disinfected tooth from future entrenchment by microorganisms. RCT not only prevents severance of periodontal fibers that help in proprioception for occlusal feedback and efficient chewing but also aids in the retention of infected teeth that otherwise might have been extracted.⁷⁻⁹

The use of dental implants to rehabilitate the loss of teeth has increased in the last 30 years.¹⁰ Before dental implants, dentures and bridges were used, but dental implants have become a very popular solution due to the high success rate and predictability of the procedure, as well as its relatively few complications.^{11,12}

Hence, this study was conducted to evaluate the comparison of success rates of endodontic treatment and dental implants in treatment of periodontitis.

MATERIAL AND METHODS

The study included overall 100 subjects with periodontitis. The subjects were divided into 2 groups based on severity of periodontitis. Both the groups consisted of 50 subjects each. The subjects in group 1 had mild to moderate periodontitis. The subjects in the other group had severe periodontitis and had poor prognosis. The subjects with severe periodontitis underwent extraction for the purpose of dental implant treatment. Statistical analysis was carried out using SPSS software.

RESULTS

Table 1: Group-wise distribution of subjects.

Groups	Number of subjects	Percentage
Group 1 (Mild-Moderate periodontitis)	50	50%
Group 2 (Severe periodontitis)	50	50%

Total	100	100%
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Both the groups consisted of 50 subjects each.

Table 2: Gender-wise distribution of subjects

Gender	Number of subjects	Percentage
Males	55	55%
Females	45	45%
Total	100	100%

There were total 55 males and 45 females in this study. For group 1 subjects with mild to moderate periodontitis, Root Canal Treatment followed by crown was planned. Whereas, for the subjects of group 2 with severe periodontitis, dental implants was chosen as treatment modality.

Table 3: Complications of RCT in group 1 subjects.

Complications	Number of subjects
Continuous pain	03
Infection	02
Furcal perforation	01
Crown fracture	01
Total	07

3 subjects from group 1 showed continuous pain whereas infection, furcal perforation and crown fracture was evident in 2,1 and 1 subjects, respectively.

Table 4: Complications of dental implants in group 2 subjects.

Complications	Number of subjects
Peri-implantitis	02
Implant mobility	01
Nerve damage	01
Infection	00
Total	04

2 subjects from the second group showed peri-implantitis whereas implant mobility and nerve damage were seen in 1 subject each.

Table 5: Success rate of both treatment methods.

Fate of treatment	RCT followed by capping	Dental implants
Success	43 (86%)	46 (92%)
Failure	07 (14%)	04 (08%)
Total	50 (100%)	50 (100%)



The success rate of dental implants was higher (92%) as compared to RCT followed by crown placement (86%) for the treatment of periodontitis.

DISCUSSION

Regardless of the clinical conditions, dental progress is the anticipated outcome following root canal treatment (RCT). When the tooth is completely repaired and functional, the surgery should be regarded as complete. The root canal treatment protocol is a method of analyzing therapeutic success from many perspectives, with particular principles including the dentist and the patient itself.¹³ The importance of signs, the importance of health conditions, and the value of images are also references for dentists (there is no periapical irritation and the root canal gap is entirely filled).^{14,15} The combined impact of the root canal system's mechanical instrumentation, filling with an inert substance, and chemical debridement known as the periapical tissues are maintained and restored during root canal treatment (RCT).^{16,17}

Today, dental implants are one of the restorative methods to replace missing teeth. Improvements in implant design, surface characteristics, and surgical protocols made implants a secure and highly predictable procedure with a mean survival rate of 94.6 % and a mean success rate of 89.7 % after more than 10 years.¹⁸

Hence, this study was conducted to evaluate the comparison of success rates of endodontic treatment and dental implants in treatment of periodontitis.

In this study, 3 subjects from group 1 showed continuous pain whereas infection, furcal perforation and crown fracture was evident in 2, 1 and 1 subjects, respectively. 2 subjects from the second group showed peri-implantitis whereas implant mobility and nerve damage were seen in 1 subject each. The success rate of dental implants was higher (92%) as compared to RCT followed by crown placement (86%) for the treatment of periodontitis.

Chatzopoulos GS et al¹⁹ conducted a study to assess and compare the survival rates of implant and root canal treatment as well as to investigate the effect of patient and tooth related variables on the treatment outcome in a large-scale population-based study. Dental records of patients who received root canal treatment and implant therapy were retrieved from the electronic records of the University of Minnesota

School of Dentistry. Demographic characteristics, dental insurance status, socioeconomic status as well as medical history and tobacco use were recorded. The treatment outcome was included as a binary variable (survival/failure). A total of 13,434 records of patients who had implant (33.6%) or root canal therapy (66.4%) were included. The survival rate analysis and Kaplan-Meier table revealed the majority of the implants were removed within the first year (58.8%), while only 35.2% of the root canal treatments failed in the same time period. The overall survival rate was significantly ($p < 0.001$) higher for implant therapy (98.3%) compared to root canal treatment (72.7%). A statistically significant association was found between treatment ($p < 0.001$), age ($p < 0.001$) and anxiety ($p = 0.004$) with treatment outcome. **CONCLUSIONS:** Implant therapy exhibited significantly lower failures when compared to root canal treatment, but the selection of either treatment should be based on multiple factors. Higher age and anxiety were also significantly associated with root canal and implant treatment failure. This study demonstrated that both root canal and implant treatments are sound options with high survival rates; however, root canal therapy exhibited a significantly higher failure rate.

CONCLUSION

Dental implants showed higher success rate as compared to RCT followed by crown placement for the treatment of periodontitis.

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