

Comparison of success rate of management of irreversible pulpitis with implant supported overdentures and root canal treatment for the treatment of respectively.

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Abstract

Background: This research had been carried out for comparison of success rate of management of edentulism and irreversible pulpitis with implant supported overdentures and root canal treatment for the treatment of respectively.

Material and methods: The study comprised of 100 subjects, of which 50 subjects had edentulism and 50 subjects had irreversible pulpitis. The study procedure had been explained to all the subjects and they were asked for consent. All the subjects agreed to sign the consent and hence had been included in the study. The subjects with edentulism had been managed with implant-supported overdentures and root canal treatment had been planned for those subjects having irreversible pulpitis. The success rate of both the treatment plans had been compared and the findings were tabulated. Statistical analysis was conducted using SPSS software.

Results: Group 1 comprised of 50 subjects with edentulism and group 2 subjects had 50 subjects with irreversible pulpitis. Peri-implant mucositis and implant failure had been seen in 1 subject and 2 subjects had peri-implantitis. Hence the success rate was 92%. Zipping, sodium hypochlorite accident and postoperative pain were evident in 3 subjects. Hence the success rate was 94%.

Conclusion: From the results of this study, it can be concluded that the success rate of implant supported overdentures was 92% and the success rate of root canal treatment was 94%.

Keywords: implant, overdenture, root canal treatment, periapical pathology, edentulism.

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Introduction

The management of edentulous patients through prosthetic interventions has historically presented considerable challenges. Traditionally, complete dentures for both the maxilla and mandible have been the conventional method. However, many patients encounter difficulties in adjusting to their mandibular dentures, reporting issues such as discomfort, insufficient retention, instability, and difficulties with mastication. Over the last twenty years, implant-supported overdentures have become a widely accepted treatment option for edentulous individuals, consistently demonstrating favorable

clinical results. These overdentures offer numerous practical advantages over traditional complete and removable partial dentures. Benefits include a reduction in bone resorption, decreased movement of the prosthesis, enhanced aesthetics, improved tooth positioning, superior occlusion, increased occlusal function, and the preservation of the occlusal vertical dimension.¹

The pulp tissue responds to various irritants, primarily bacteria, through an inflammatory mechanism. The pathology of the pulp tissue can vary from reversible inflammation to severe irreversible inflammation leading to necrosis,

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depending on the intensity and duration of the irritant as well as the host's resistance.² The inflammatory response in the periapical tissues to physical, chemical, and/or bacterial irritants from the pulp can manifest as either acute or chronic, contingent upon the interaction between the host and the offending agent. This interaction is influenced by the presence of bacterial toxins and bacteria that penetrate the periapical tissues via the apical foramen.³ Similar processes may occur in other regions of the periodontium, such as through a lateral canal or in the root division area, where communication exists between the pulp chamber floor and the periodontal tissue.

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Material and methods

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Results

Table 1: Group-wise distribution of subjects

Groups	Number of subjects	Percentage
Group 1 (Edentulism)	50	50
Group 2 (Irreversible pulpitis)	50	50
Total	100	100

Group 1 comprised of 50 subjects with edentulism and group 2 subjects had 50 subjects with irreversible pulpitis.

Table 2: Complications of implant supported overdentures

Complications of implant supported overdentures	Number of cases
Peri-implant mucositis	01
Implant failure	01
Peri-implantitis	02
Total	04

Peri-implant mucositis and implant failure had been seen in 1 subject and 2 subjects had peri-implantitis. Hence the success rate was 92%.

Table 3: Complications of root canal treatment

Complications of RCT	Number of cases
Zippering	01
Sodium hypochlorite accident	01
Postoperative pain	01
Total	03

Zippering, sodium hypochlorite accident and postoperative pain were evident in 3 subjects. Hence the success rate was 94%.

Discussion

Numerous studies have shown that implant-supported overdentures in the mandible are a highly effective treatment choice, especially for patients with significant residual bone loss. The success rate of implants placed in the anterior mandible is particularly high, with a low incidence of surgical complications. Furthermore, implants are linked to a reduced rate of residual ridge resorption in the anterior mandible. Treatment options are shaped by the individual needs of the patient, the available treatment modalities, and their financial situation. Preferences for fixed versus removable implant-supported overdentures can vary significantly across different cultures and countries. Research suggests that patients with removable implant-supported overdentures report significantly higher satisfaction levels compared to those with fixed implant-supported prostheses. Additionally, older adults, especially postmenopausal women, may experience increased bone resorption, complicating the use of dentures.^{4,5}

The prevalence of pulp and/or periapical pathologies varies according to studies conducted across different countries and populations. The etiology of these conditions is diverse and may involve one or multiple etiological agents. Bacteria are the predominant biological agents responsible for pulp and periapical diseases, and they are typically associated with caries.⁶

The aim of root canal treatment (RCT) is to eliminate inflamed and infected pulpal tissue, thus providing an environment that promotes healing, and arrests the progression of periapical pathology. Periapical healing encourages the long-term retention of functional, endodontically treated teeth.⁷

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In this study, group 1 comprised of 50 subjects with edentulism and group 2 subjects had 50 subjects with irreversible pulpitis. Peri-implant mucositis and implant failure had been seen in 1 subject and 2 subjects had peri-implantitis. Hence the success rate was 92%. Zippering, sodium hypochlorite accident and postoperative pain were evident in 3 subjects. Hence the success rate was 94%.

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Cardoso et al.⁸ conducted a study to assess the oral health-related quality of life and masticatory efficiency in patients fitted with mandibular two-implant overdentures, either with immediate loading or conventional dentures. The study involved fifty completely edentulous individuals who had been using bimaxillary conventional dentures for a minimum of one year. Participants were divided into two treatment groups: one group received mandibular overdentures supported by two implants with a bar-clip system alongside a maxillary conventional denture (n = 25), while the other group was provided with new maxillary and mandibular conventional complete dentures (n = 25). Evaluations of masticatory efficiency and oral health-related quality of life were conducted prior to and three months following the insertion of the dentures. The Brazilian version of the OHIP-Edent questionnaire was utilized to measure oral health-related quality of life, while masticatory efficiency was assessed using chewing capsules analyzed through a colorimetric method. The findings indicated that patients with mandibular two-implant overdentures experienced fewer issues related to oral health-related quality of life compared to those with conventional dentures. Furthermore, the implant overdenture group demonstrated a statistically significant enhancement in masticatory efficiency (p = 0.001). Although no correlation was observed between masticatory efficiency and OHIP scores in the implant group (p > 0.05), a significant correlation was identified in the conventional denture group (p < 0.05). These short-term findings imply that mandibular overdentures retained by two implants with immediate loading, in conjunction with maxillary conventional dentures, yield superior masticatory efficiency and oral health-related quality of life compared to mandibular conventional dentures.

Makanjuola JO et al.⁹ conducted a study to compare treatment outcome and tooth survival of root canal-filled teeth following manual vs rotary instrumentation techniques over a 5-year period. This was a single-centre study conducted as a follow-up to a short-term parallel-arm randomised controlled noninferiority trial in which root canal treatment was performed on teeth using either rotary or manual instrumentation. Patients were monitored at post 6-month, 1-year, 4-year, and 5-year review periods by blinded evaluators. Treatment outcome was categorised as favourable, uncertain, and unfavourable (employing European Society of Endodontology categorisation based on strict clinical and radiographic criteria), and 5-year tooth survival was determined by assessing whether tooth was in situ in the oral cavity or extracted. The Kaplan–Meier method and log rank test evaluated tooth survival. P value < .05 was considered statistically significant. Ninety of 120 treated teeth were assessed in 37 men and 40 women with mean

age of 30.6 ± 10.99 years. Treatment outcome was significantly more favourable in the rotary group compared to the manual group at post 6-month (P = .021) and 1-year (P = .043) review periods. The differences in favourable outcome (P = .498) and tooth survival (P = .296) between the 2 groups were, however, not significant at the 5-year review period. The rotary instrumentation technique was shown to be more effective in resolving clinical symptoms and promoting periapical healing after the post 6-month and 1-year review compared to the manual instrumentation technique; however, both groups had similar favourable outcomes and survival rates after an extended 5-year review period.

Conclusion

From the results of this study, it can be concluded that the success rate of implant supported overdentures was 92% and the success rate of root canal treatment was 94%.

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