

Restoration of Endodontically Treated Teeth

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Abstract

Restoration of endodontically treated teeth is important for maintaining normal tooth function, prevention of fracture of residual tooth and prevention of dental caries. For that, an extensive literature search of the Medline, Cochrane, and EMBASE databases using the medical subject headings (MeSH) terms; has been conducted. Papers discussing restoration of endodontically treated teeth were screened for relevant information. There were no limits on date, language, age of participants or publication type. The seek for the restoration of endodontically treated teeth has remarkably increased with the subsequent increase of survival rates up to 80% after 10 years of follow up. Controlling the causes of restoration failure constitutes the major issue in decreasing failure rates among different age groups. Metal ceramic crowns are the most common restorative type in both anterior and posterior teeth. Selecting the proper time for restoration is important and should be based upon the clinical status of each patient.

Keywords: Restoration; Endodontics; Treatment

Introduction

Oral care has been recognized as a common health care issue in clinical society. Normal functioning teeth is important for maintaining appropriate oral health in addition to the normal masticatory function needed for chewing of food [1]. The invasive technique of dental implants, the subsequent complications in addition to the contraindication of dental implants in many patients have directed the focus of tooth repair into restoration of endodontically treated teeth [2]. Maintaining normal tooth function, prevent fracture of residual tooth and prevention of dental caries are being considered as the rationale of restoration of endodontically treated teeth [3]. Decreasing tooth loss

is a major component of tooth restoration as the weakness of tooth and tooth fracture originates from increasing the diameter of tooth channel [4]. Furthermore, the good survival rates in the restored teeth have increased the acceptability of patients towards the seek for endodontic treatment [5].

Despite showing good efficacy in maintaining normal functioning teeth, tooth extraction may be also needed after tooth restoration based upon several complications. Periodontal diseases, endodontic failure, vertical root fracture, caries, and prosthetics are considered the main causes of tooth extraction [6]. Additionally, dental caries is the most common cause of dental extraction for individuals below 40 years old, meanwhile, periodontal diseases are the main cause of tooth extraction above 40 years [7].

Derived from the thought that restoration of teeth is important in providing normal tooth function, we aimed to provide a comprehensive review of restoration types, timing of restorative procedures in addition to the survival time of endodontically treated teeth.

Methods

We performed an extensive literature search of the Medline, Cochrane, and EMBASE databases on 28 November 2019 using the medical subject headings (MeSH) (restoration [MeSH Terms] AND endodontically treated teeth [MeSH Terms]). Papers discussing restoration of endodontically treated teeth were screened for relevant information. There were no limits on date, language, age of participants or publication type.

Restoration type

Anterior teeth

The application of composite resin restoration in mild and moderate restoration is considered one of the main choices of restoration [8]. The high efficacies of the bonding of tooth in addition to the aesthetic abilities have increased the use of composite resin restoration as a common restorative type in anterior teeth [9]. When there is a need for a major restoration ceramic or composite resin veneers are the options of choice for proper tooth restoration [9]. Moreover, Metal-ceramic crowns represent another efficient approach for dental restoration; however, due to the reduction of the labial surface that is associated with a reduction in tooth's tissue strength in addition to the cosmetic appearance, the prescriptions of such procedure has been decreased in the current practice [10].

Posterior teeth

Metal ceramic crowns are considered the widely used approach in posterior teeth restoration due to the preservation of the valuable tooth structures [11]. Unlike anterior teeth, composite resin restoration is rarely used in posterior teeth restoration due to the significant loss of tooth structure [12]. Amalgam restoration is a good choice for appropriate restoration. Alcaraz., *et al.* meta-analysis, indicated that amalgam is superior in the restoration of posterior teeth than composite resins with high survival rates in addition to the lower prevalence of tooth decay [13].

Timing of restorative procedure

The selection of appropriate time of restoration approach is extremely important for decreasing failure rates. Pre-existing endodontic status, the position of tooth in the mouth, type of restoration planned and the existing patients' comorbidity are the main components in selecting the proper time of restoration procedure [9]. Completion of dental treatment and time of restoration is a major dilemma as the waiting of the resolution of osteitis constitutes the major challenge for dentists for increasing survival rates of restoration technique [14]. Permanent restoration yielded a higher survival rate compared to temporary restoration as the risk of dental caries, periodontitis and the vulnerability of the tooth to fracture are high among temporary restorations [14]. The meta-analysis of Suarez., *et al.* indicated that no significant difference between restoration before or after 48h following implant placement. Therefore, selection of timing of restoration can be decided by the dentist according to each patient's status.

Survival of endodontically treated tooth

Tooth survival following the restoration of teeth is a major issue that controls the normal functioned tooth and plays a major role in the shifting to alternative approaches of treatment whenever needed. The high expectations of survival from both the dentists and the patients had increased the demand for dental restoration as the first approach for improvement of oral health [15]. Different modes of failure of endodontically treated teeth have been observed by Correa, *et al.* Root fracture below ligament, root fracture above ligament, dislodgement of core/crown and adhesive failure of the post are considered the main mechanisms of dental restoration failure with the percentages of 35%, 18%, 18% and 1%, respectively [16]. Additionally, the main causes of failures were restorative and endodontic, prosthetic and periodontal reasons; however, the least common cause of dental failure was orthodontic reasons [17]. Boren, *et al.* reported 81.5% survival rate of endodontically treated teeth over a period of ten years. The absence of post-operative crown was a significant moderator for survival of restorative teeth [18]. Moreover, Davis, *et al.* demonstrated good survival rates for endodontically treated teeth, 100%, and 96.6% survival rates were obtained after 2 and 4 years of follow up, respectively [19]. The 9 years study of Khalighinejad, *et al.* indicated a survival rate of 93.7% of endodontically treated teeth. Mild and moderate periodontitis and smoking status are considered significant predictors of tooth survival [20].

Conclusion

Restoration of endodontically treated teeth is favored with the high expectations of survival rates. Selecting proper time in addition to the proper restoration type is important for decreasing tooth loss.

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Conflicts of Interest

No conflicts related to this work.

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