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Association of root canal treatment and tooth extraction: A clinical audit

An audit of root canal treatment and tooth extraction

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Abstract
Aim: Dental caries is the most prevalent chronic disease in early childhood in most communities worldwide. Several studies have been conducted and documented a high prevalence of early childhood caries (ECC). The present study aimed to determine the association of root canal treatment that may or not lead to tooth extraction.
Material and Methods: A descriptive study was conducted among 156 patients in the Dental clinic of the university health center. Caries experience was measured using the World Health Organization caries criteria. Descriptive statistics and SPSS were used to calculate the qualitative parameters.
Results: The mean age of patients was 27 years. The statistical analysis revealed that dental caries was significantly associated with inadequate oral hygiene. Adequately done root canal treatment may save the tooth from extraction.
Discussion: The high rate of dental caries and tooth extraction recorded in this study strongly emphasized the necessity of community-based preventive programs and professional dental care.

Keywords
Root Canal, Caries, Pulp, RCT, Tooth Extraction

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Introduction

Oral health has not improved over the last 25 years, according to the Global Burden of Disease 2015 study [1], the age-standardized prevalence rate of untreated caries in primary teeth was 7.8% (573 million children), and 126 million children worldwide had incident cases of caries in primary teeth in 2015. According to the WHO, dental caries is still the most common chronic disease in early childhood in a number of communities around the world, affecting both the child and family's quality of life and is considered a public health issue [2, 3]. Individuals are susceptible to tooth decay and injury throughout their lives. If RCT is not performed properly after the dental pulp has become irrevocably implicated in infection and necrosis, this can lead to apical bone loss [4-6].

Caries is one of the most common chronic diseases in the globe. Untreated caries affects approximately 2.4 billion individuals, or 35% of the world's population. Despite massive public resources devoted to caries prevention, the global prevalence of untreated caries has remained stable in recent decades [7]. Untreated caries can be extremely costly in terms of both time and money. Every year, hundreds of billions of dollars are lost as a result [8]. Caries prevention is an important public health aim because of the high prevalence linked with a hefty disease burden. Surgical problems, implant loss, bone loss, peri-implant soft tissue, mechanical, and esthetic/phonetic issues are all possible issues with dental implants. Surgical problems are the most dangerous for patients, as they might result in hemorrhage, neurosensory problems, neighboring tooth destruction, and so on [9]. One of the most difficult aspects of caries therapy is the treatment of deep carious lesions that approach the pulp. Total caries removal may result in tooth discomfort, pulp exposure, or the necessity for pulpotomy, pulpectomy, or indirect pulp capping [10, 11].

Conservative and ultraconservative caries care methods, such as stepwise caries excavation and partial caries removal, have been proposed in the literature in an attempt to reduce these problems [12, 13]. The most common surgical dental operation is tooth extraction, and the majority of antibiotics recommended in dentistry are given following tooth extraction [14]. Removal of an impacted lower third molar is the most intrusive treatment and can result in complications such as swelling, trismus, bleeding, and infection [15].

Material and Methods

Ethical approval was obtained from the ethics committee of the University for the planned study. The patients' data for this retrospective study was collected from the University health center's dental clinic. Data were collected for a period from November 2019 to August 2020 from the health center's record room after obtaining permission. The parameters collected included the patient's age, gender, tooth, which was removed, and tooth that received root canal treatment. Caries experience was measured using the World Health Organization caries criteria. The investigators evaluated restorations radiographically as well as clinically. Descriptive data were analyzed using SPSS software. The percentage/frequency were calculated for the parameters.

Results

The study population consisted of 156 patients aged 4 to 58 years with a mean age of 27 years. The statistical analysis revealed that dental caries was significantly associated with inadequate oral hygiene. The results provided strong evidence for the advisability of leaving behind infected dentin, the removal of which would put the pulp at risk of exposure. However, the significant association of root canal treatment and tooth extraction was found to be stronger among females. Individuals with worse perceptions of their oral health were more likely to report negative impacts fairly/very often, regardless of their gender. The association between impact prevalence and clinical oral health status measures was fairly comparable. However, there were some differences, particularly with respect to the impact of dental caries experience.

Table 1. Number and percentage of patients undergoing RCT and extraction

Treatment	n = 156	Percentage
RCT	87	56%
Extraction	69	44%

Discussion

The removal of bacteria from diseased root canals and the prevention of subsequent infection are both critical to the success of endodontic treatment. Endodontic failure and disease persistence are frequently caused by an inability to identify and reach affected regions. Dental caries, periodontal disease experience and tooth loss are associated with functional and psychosocial impacts among males and females.

A pathological condition, 'External root resorption' can result from a variety of mechanical or chemical stressors, including infection, pressure, trauma, or orthodontic tooth movement. Although radiography is the most common way to identify root resorption, clinical signs such as pain, edema, and tooth mobility can also be used to diagnose it. Treatment options can vary by case and try to address the source of resorption, while also assisting in the regeneration of the resorptive lesion. It can jeopardize a tooth's longevity to the point where it may need to be extracted early. As a result, it is critical to get a diagnosis and treatment as soon as possible.

In RCT, an inflammatory or infected pulp is removed, and the inside of the tooth is cleaned, sanitized, filled, and then sealed with a restorative substance. Although the treatment has a high success rate, persistent symptoms or infection recurrence can happen in 10% to 15% of cases [16]. In a comprehensive review, tooth survival between two and ten years after initial root canal therapy was found to be between 86 and 93% [17]. A second root canal treatment (Root canal Re-treatment) is indicated in many cases of infection or symptom recurrence. Apicoectomy is a technique in which the root tip, or apex is removed together with the contaminated tissue, and then a root end filling (retrofilling) is put to seal the area when root canal re-treatment fails (Availableat: http://www.colgateprofessional.com/patient-education/articles/apicoectomy). In patients under

45 years old, upper anterior or premolar teeth, cases without preoperative pain, lesions without periodontal involvement, lack of perforating lesions, and teeth with only one periapical surgery are all related with a better chance of apicoectomy success [18]. In the event that the apicoectomy fails, the tooth may have to be extracted. Endodontic microorganisms and their metabolites must be removed during root canal treatment because they may compromise the periodontium's integrity. Sinus tracts that extend to the gingival sulcus or furcation area can heal with adequate endodontic therapy. Endodontic treatment alone is frequently insufficient to heal the combined lesion, and adequate periodontal treatment is required to affect secondary periodontal disease. Wrong tooth extraction is a regular problem among dentists and dental specialists, but it can be avoided.

Caries problems necessitate the extraction of the majority of the teeth. After caries, the prevalence of root broken extracted teeth comes as a major complication. Root canal therapy and retreatment, occlusal stresses, inappropriate prosthetic treatment, and parafunctional habits are all linked to root fractures. Because of the complexity of these lesions, it is critical to get a correct diagnosis in order to get the best therapy and outcomes. As a result, a thorough extraoral and intraoral examination, periapical and Cone beam computed tomography (CBCT) radiographic imaging, periodontal analysis, and the use of additional tests to assess tooth viability should all be carried out.

Conclusion

This review has presented the different modalities to reduce inflammatory complications after tooth extractions. Despite the fact that the number of patients requiring tooth extractions was substantially larger in the dental clinic, the number of tooth extractions was practically the same. In practice, dentists must have sufficient knowledge of the origin, categorization, diagnosis, and treatment techniques of endodontic-periodontal illness in order to increase treatment effectiveness.

Before settling on a final treatment plan, dentist can use the full investigation to help them make a proper diagnosis. The treatment outcomes in this study revealed that primary endodontic lesions can be controlled without surgical intervention by root canal treatment alone, if the dentist has a sufficient understanding of the diagnosis, treatment techniques, and treatment intervals. In brief, prompt and proper treatment of such lesions can help avoid subsequent consequences like tooth loss.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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