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# Insights into the May 2020 Issue of the *Journal of Endodontics*



Welcome to the May 2020 issue of the *Journal of Endodontics* (JOE). Here we share some of our favorite articles that are published in this issue of the journal. We hope you look forward to reading these and other articles in JOE.

## FEATURED ARTICLES FROM THE MAY ISSUE

In this issue of JOE, Ather and colleagues<sup>1</sup> presented a timely summary on the epidemiology, symptoms, and routes of transmission of coronavirus disease 19 (COVID-19) and discussed specific recommendations for dental practice for patient screening, infection control strategies, and patient management protocol. At this time (March 27, 2020), despite global efforts, the outbreak is still on a rise. In an affected person, this corona virus (severe acute respiratory syndrome coronavirus 2) is abundantly present in nasopharyngeal and salivary secretions and can be predominantly spread through respiratory droplets and contact in nature. Hence, dental professionals will likely encounter severe acute respiratory syndrome coronavirus 2–suspected or –confirmed patients. The authors have discussed certain specific measures for dental patient management in this epidemic period of COVID-19. This is an important review as a starting point for dentists and endodontists, and they are encouraged to continue to update themselves with useful online information, some summarized in this review, as this outbreak continues.

Enhanced magnification is an integral component to contemporary endodontic procedures. In this issue, Al Shaikhly et al<sup>2</sup> compared the dental operating microscope (DOM) and the high-resolution videoscope (VS). The DOM surpassed the VS in almost every parameter measured in this study. However, the DOM is not without disadvantages, and a novel additional disadvantage is on the horizon. The current COVID-19 pandemic may impact how dentistry (including endodontics) is delivered in the future. In trying to eliminate the occupational transmission of airborne microorganisms to dental staff and doctors,

the recommendation of using goggles or face shields complicates the use of the DOM and loupes. If one cannot place the ocular of the DOM near enough to the eyes, the field of view becomes much smaller to the point of being unusable. Although manufacturing loupes that can fit inside of goggles or shields is possible, the magnification may not be sufficient to gain the advantages that the DOM has given to endodontists in the past. Also, the need to make this personal protective equipment disposable or easily disinfected could preclude the efficient, cost-effective use of loupes and headlamps. Additionally, the carts and screens of indirect magnifiers like the VS could be designed with disinfection engineering controls in mind to be easily disinfected, and they could be placed further away from the cloud of potentially infected aerosols generated in endodontic procedures. It may be that the time for indirect visualization and magnification has come, and perhaps with appropriate modifications and technological enhancements, something like the VS will become the preferred method of magnifying our delivery of endodontic care.

Yavorek and colleagues<sup>3</sup> examined factors that contributed to the incidence of nonsurgical root canal therapy after the delivery of single-unit full-coverage restorations using data derived from 88,409 crown placements in the Delta Dental of Wisconsin Insurance database from 2008–2017. The probability of survival of all teeth with crowns placed was 90.4% after 9 years. About 3.5% of the crowned teeth required subsequent nonsurgical root canal therapy, and this was the most common untoward event. The authors concluded that the risk of root canal treatment after crown placement is low. This risk increases with the placement of all-porcelain or metal and porcelain crowns and is inversely related to age.

Mechanical allodynia, defined as tenderness to mastication or a percussion test, is a common finding in teeth with either pulpal and/or periradicular disease. This important clinical presentation is often seen in diseased teeth but can also be detected in adjacent or contralateral teeth. In this issue of JOE,

Kayaoglu and colleagues<sup>4</sup> evaluated 348 patients with either a second premolar or a first molar diagnosed with symptomatic irreversible pulpitis or pulpal necrosis. They found an odds ratio of 3.37 for the presence of pain upon percussion in adjacent teeth. Importantly, an odds ratio of 2.4 was found for pain on the contralateral tooth. Collectively, these findings provide further evidence that teeth with pulpal disease can elicit nociceptive signals of sufficient intensity and duration to cause changes in the central nervous system, resulting in both peripheral and central sensitization. Thus, adequate endodontic therapy promotes homeostasis not only in a diseased tooth but also addresses peripheral and central changes affecting adjacent and contralateral teeth.

A major goal of endodontic therapy is relief of pain, and for the majority of our patients that goal is met. However, it has been previously shown that up to 5% of patients can have persistent pain after root canal therapy has been completed. In this issue, Daline et al<sup>5</sup> presented data from a 3-year follow-up of patients who reported persistent pain at 6 months after endodontic treatment to the National Dental Practice-Based Research Network. They found that among 65 patients who reported persistent pain at 6 months after root canal therapy in the original study, 27 patients responded and met the inclusion criteria for this study. Their results suggest that chronification of pain after endodontic therapy occurs in 1 in 5 patients who report persistent pain at 6 months after nonsurgical root canal treatment. Extrapolation of the data indicated an overall prevalence of postoperative pain at  $\geq 3$  years after nonsurgical endodontic therapy to be between 0.7% and 1.9%. This suggests that the majority of patients with persistent endodontic pain at 6 months experience improvement by 3 years, and over half had resolution without additional treatments. This study underscores the overall effectiveness of nonsurgical endodontic at relieving pain and notes that many of the patients with persistent pain display a combination of odontogenic and nonodontogenic contributing factors.

Subsequent root fracture is considered an important reason for failures in endodontically treated teeth. Several iatrogenic and noniatrogenic factors that compromise the mechanical integrity of dentin have been attributed to the increased fracture predilection in root-filled teeth. Microtissue engineering is the process of designing tissues with improved biological and mechanical properties to support their functional requirements. In their investigation, Li and colleagues<sup>6</sup> characterized the biomechanical properties and fatigue resistance of root dentin microtissue engineered using photodynamically cross-linked chitosan nanoparticles. The findings from their study highlighted the potential of root canal dentin microtissue engineering with photodynamically cross-linked chitosan nanoparticles to diminish root deformation and improve resistance to fatigue loads in endodontically treated teeth. The strategy tested in this study has the potential to improve the resistance to fracture in endodontically treated teeth.

Although minimally invasive endodontic procedures aim to limit the loss of tooth structure and consequently improve the long-term retention of endodontically treated teeth, healing of apical periodontitis is reliant on effective infection control, which could be potentially compromised by inadequate access to the root canal system. In this issue of *JOE*, Vieira and colleagues<sup>7</sup> compared root canal shaping and the removal of microorganisms from oval-shaped mandibular incisors coronally accessed by using either conventional or contracted endodontic access cavities. Despite no significant difference in canal shaping as seen on micro-computed tomographic scans, the removal of microorganisms was significantly less effective in teeth with contracted access cavities compared with conventional access cavities. The authors concluded from their *in vitro* study that excessive dentin preservation has the potential to negatively affect the treatment outcome of infected teeth.

A challenge in treating the immature tooth is maintaining the irrigant in the root canal system and avoiding contact with periapical tissues. Dos Reis et al<sup>8</sup> showed that the volumetric extrusion of irrigant in teeth with open apices was significantly higher with

sonic agitation and the Eddy instrument compared with several alternative irrigation methods. Irrigation with mechanical agitation, ultrasonics, and positive-pressure techniques produced similar amounts of extrusion. For regenerative procedures, irrigation techniques that produce minimal extrusion are recommended.

We hope you enjoy this issue of your *JOE*.

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