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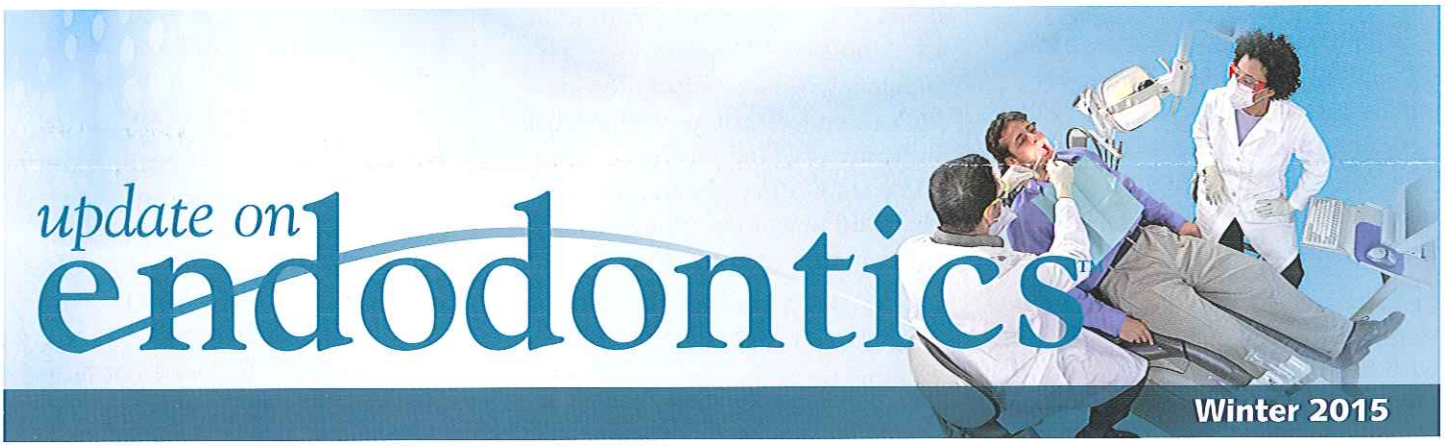

Patient Participation in Clinical Decision-making for Apical Periodontitis

There have been some cultural and legislative shifts regarding the participation of the patient in the process of making clinical decisions. Studies on the preferred role of patients in dental clinical decision-making are scarce. No studies could be identified regarding patient participation in decisions in the management of apical periodontitis (AP), a highly prevalent disease.

The current debate on the management of a tooth with AP appears to focus on the options of root canal treatment to retain the tooth or replacement of the tooth with an implant-supported crown. If patients are not fully engaged in making the clinical decision, the treatments they receive are likely to be those preferred by their dentists, which may differ from what they might select if given the choice. Azarpazhooh et al from the University of Toronto, Canada, investigated patient preferences for participation in clinical decision-making when defined treatment options are considered for a tooth with AP.

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A cross-sectional survey was mailed to a random sample ($n = 800$) of patients registered at the Faculty of Dentistry Clinics, University of Toronto, who had been contacted 4× over a period of 4 months. The university-based sample was supplemented by an external convenience sample of 200 private practice–based patients given the option to complete the survey in the private office or at home, using a prepaid return postage envelope. No incentive was provided to the study participants.

The Control Preferences Scale (CPS) was used to evaluate the patients' preferences for active, collaborative or passive participation in treatment decisions for a tooth with AP. For this purpose, the participants were asked to consider a hypothetical situation in which they had an infection in a tooth that could not be left untreated. Their dentist had discussed various treatment options, including root canal treatment to retain the tooth; extraction of the tooth and its replacement with a fixed or

removable partial prosthesis or a dental implant; or tooth extraction without any replacement. Participants used the CPS to record their preference from among 5 levels of participation (2 active, 1 collaborative, 2 passive) in making the decision regarding their treatment selection.

Among the 434 respondents, 44%, 40% and 16% preferred an active, collaborative and passive level of participation, respectively. In all, 91% of participants preferred to take the dentist's treatment decision into consideration.

Preference for an active role was significantly ($p < .05$) associated with the participant's being born in Canada, <24 years or >65 years of age, and having a higher education level, private dental insurance and a better oral health–related quality of life (OHRQoL) score. Participants who preferred a passive role had a worse OHRQoL score than did those who preferred an active or collaborative role. Multiple logistic regression showed a significant association ($p \leq .025$) between participants' higher education and preference for active participation compared with a collaborative role.

Conclusion

The majority of patients valued active or collaborative participation in deciding treatment for a tooth with AP. This pattern implied a preference for a patient-centered practice mode that emphasizes patient autonomy in decision-making.

Azarpazhooh A, Dao T, Ungar WJ, et al. Clinical decision making for a tooth with apical periodontitis: the patients' preferred level of participation. J Endod *2014;40:784-789.*

Pain After Root Canal Treatment Of Necrotic Anterior Teeth

For both patient and dentist, postoperative pain is an undesirable occurrence. The incidence of such pain following various endodontic procedures has been investigated; however, many of these studies have been retrospective, and few of them have been conducted on nonvital teeth.

Rao et al from the Tatyasaheb Kore Dental College and Research Center, India, investigated the incidence of postobturation pain after endodontic treatment of necrotic anterior teeth in 1 or 2 visits. Included in the study were 148 patients (age range, 18–50 years). Root canal therapy and the study were explained to the patients, and oral and written informed consents were obtained. The patients were randomly assigned to the 1-visit (group A, $n = 74$) or 2-visit (group B, $n = 74$) group. Endodontic treatment for both groups consisted of

- administering local anesthesia and isolating the tooth with a rubber dam

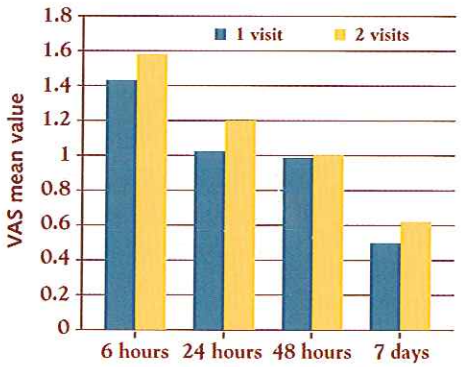

Figure 1. Comparison of postoperative pain.

- enlarging the coronal third with orifice openers
- determining working length with an electronic apex locator confirmed with ≥2 radiographs
- irrigating with 2.5% sodium hypochlorite and saline
- instrumenting with hand files (K-files) and engine-driven rotary nickel-titanium files (ProTaper)

Upon complete canal instrumentation, all teeth were irrigated and dried with paper points. Teeth in group A were obturated with gutta-percha and resin sealer (AH-Plus) using lateral condensation. Teeth in group B were sealed with cotton pellets and temporary restorations, then obturated 1 week later in a manner similar to teeth in group A.

All patients were prescribed 50 mg diclofenac potassium to be taken only if they experienced moderate pain. Patients with intolerable pain were instructed to return to the clinician for emergency treatment. Postobturation pain was evaluated using a modified visual analog scale (VAS):

- 0—No pain
- 1—Slight pain/discomfort
- 2—Moderate pain relieved by analgesics
- 3—Moderate to severe pain not completely relieved by analgesics
- 4—Severe pain/swelling unrelieved by analgesics and requiring an unscheduled visit

Measurements were taken at 6, 24 and 48 hours and 7 days.

The incidence of pain was greatest during the first 48 hours after obtu-

ration. The amount of pain showed no differences among the pain categories or between groups (Figure 1). No patients required unscheduled emergency appointments.

Conclusion

Within the limitations of the present study, no difference in postoperative pain between patients treated in 1 appointment and patients treated in 2 appointments was found. The majority of patients in both groups reported minimal or no pain after 7 days of treatment. It is well established that the best predictor of postoperative pain is the presence of preoperative pain.

Rao KN, Kandaswamy R, Umashetty G, et al. Post-obturation pain following one-visit and two-visit root canal treatment in necrotic anterior teeth. J Int Oral Health *2014;6:28-32.*

MTA-repaired Root Perforations: Long-term Results

Nonsurgical repair of iatrogenic root perforations creates several challenges for the clinician. Adequate visualization of the perforation may be difficult because bleeding from the site is quite common. Additionally, managing both the root canal space and the perforation is technically very demanding. Historically, the prognosis for perforation repair was less than ideal, most likely due to materials that did not provide an optimal seal and/or were not highly biocompatible. Since mineral trioxide aggregate (MTA) was introduced, several studies have confirmed its favorable biocompatibility, sealing ability and bioactivity.

In 2010, Mente et al from Ruprecht-Karls-University of Heidelberg, Germany, published the results from phase 1 of their study of teeth with root perforations treated by the orthograde placement of MTA in the perforation area, in which 86% of the 21 teeth examined were healed. However, none of the analyzed potential outcome factors displayed a significant effect on the outcome, suggesting that the study was underpowered. A power calculation performed after phase 1 indicated that at least 40 teeth would be needed to determine a 95% confidence interval for the healing rate.

Phase 2 of the study reinvestigated the potential outcome predictors with a larger sample size and longer follow-up periods than those applied in phase 1. All the patients involved in phase 1 were recalled for phase 2.

Root perforations in different areas of the root repaired with MTA between 2000 and 2012 were investigated. Calibrated examiners assessed clinical and radiographic outcomes by using standardized follow-up protocols 12 to 107 months after treatment. The outcomes were dichotomized as healed or diseased.

Of the 64 teeth (85% recall rate), 86% were healed (Figure 2). The univariate analyses (χ^2 tests) identified 2 potential prognostic factors: the experience of the treatment providers and placement of a post after treatment. In the multivariate stepwise logistic Cox regression, none of the potential prognostic factors displayed a significant effect on the outcome at the 5% level.

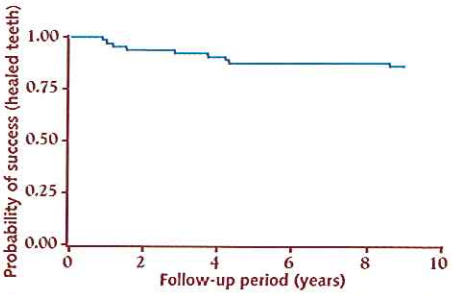

Figure 2. Kaplan-Meier plot for probability of success related to follow-up period ($n = 64$).

Conclusion

The 86% success rate for teeth undergoing root perforation repair in this historical cohort study indicated that the orthograde repair of root perforations by using MTA is an appropriate treatment option in all areas of the root. Additionally, this favorable success rate remained consistently high, even after follow-up periods of >4 years and up to 9 years after treatment.

Mente J, Leo M, Panagidis D, et al. Treatment outcome of mineral trioxide aggregate: repair of root perforations—long-term results. J Endod *2014;40:790-796.*

Antibiotic Pastes And Crown Discoloration

The goal of revascularization, a regenerative endodontic procedure indicated for incompletely developed teeth that have thin dentin walls and open apices subsequent to pulp necrosis, is to enable thickening of the dentin walls by use of mineralized tissue and continuing physiological root development. Proper disinfection of the root canal is necessary for successful regeneration to occur.

Triple antibiotic paste (TAP) containing ciprofloxacin, metronidazole and minocycline has been proven effective for canal disinfection, but several case reports have shown that minocycline causes significant crown discoloration (Figure 3). Recently, antibiotic alternatives to minocycline in combination with ciprofloxacin and metronidazole, including amoxicillin, cefaclor and doxycycline have been proposed for use. Akcay et al from Izmir Katip Çelebi University, Turkey, compared the effect on crown discoloration of the different antibiotic combinations used for regenerative procedures.

Seventy extracted bovine incisors were sectioned to a standardized root length of 10 mm above the facial cementoenamel junction. After pulp tissue removal, the root canals were irrigated with sodium hypochlorite and temporary filling material, and cotton pellets were placed from the apical aspect. The specimens were randomly divided into 7 groups ($n = 10$ each):

1 Control group specimens were left empty.

2 Calcium hydroxide ($Ca[OH]_2$) group received $Ca(OH)_2$ mixed with distilled water.

3 Double antibiotic paste (DAP) group received equal portions of metronidazole and ciprofloxacin mixed with distilled water (powder/liquid ratio, 3:1).

4 TAP with minocycline group received equal portions of metronidazole, ciprofloxacin and minocycline mixed with distilled water (powder/liquid ratio, 3:1).

5 TAP with doxycycline group received equal portions of metronidazole, ciprofloxacin and doxycycline mixed with distilled water (powder/liquid ratio, 3:1).

6 TAP with amoxicillin group received metronidazole, ciprofloxacin and amoxicillin mixed with distilled water (powder/liquid ratio, 3:1).

7 TAP with cefaclor group received metronidazole, ciprofloxacin and cefaclor mixed with distilled water (powder/liquid ratio 3:1).

Apical openings were sealed with sticky wax, and all samples were stored at 100% humidity in an incubator at 37°C for 3 weeks. Spectrophotometric readings were obtained on the buccal surfaces of the crown on day 1 and at weeks 1, 2 and 3 after filling, and the ΔE value was calculated. Data were analyzed with 2-way analysis of variance and the Tukey post hoc tests ($p = .05$), with the human perceptibility threshold set to 3.7 units.

Before treatment, the teeth did not have significantly different spectrophotometric values. The control group, $Ca(OH)_2$ and DAP groups did not induce color changes exceeding the perceptibility threshold at any time interval. The TAP with minocycline group induced more coronal discoloration than did the other groups at all time points tested. TAP with minocycline, doxycycline and cefaclor induced severe color changes exceeding the perceptibility threshold from day 1 of evaluation. TAP with amoxicillin induced severe color changes from week 1 of evaluation.

The discoloration in the teeth increased with time. Statistically significant differences in the induced coronal discoloration was seen between the initial color and the color observed on day 1 ($p < .001$) and at week 1 ($p = .001$), week 2 ($p < .001$) and week 3 ($p < .001$).

Figure 3. Clinical appearance of crown discoloration after antibiotic paste.

Conclusion

Within the limitations of this study, all antibiotic pastes, except DAP and $Ca(OH)_2$, induced crown discoloration. DAP did not induce clinically visible coronal discoloration up to 3 weeks after placement.

Akcay M, Arslan H, Yasa B, et al. Spectrophotometric analysis of crown discoloration induced by various antibiotic pastes used in revascularization. J Endod *2014;40: 845-848.*

In the next issue:

- Bacteria in dentinal tubules of root-filled teeth
- Oral rehydration salt-liquid as storage medium for avulsed tooth
- Intrusive luxation of permanent teeth

Do you or your staff have any questions or comments about **Update on Endodontics**? Please call or write our office. We would be happy to hear from you.