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EDITORIAL

Evidence-Based Endodontics: The One-Visit Treatment Idea

Evidence-based practice has become the new paradigm in all fields of medicine. This idea should also be part of our thinking in the dental community. *Evidence based-practice* can be defined as the explicit and judicious use of the current best evidence in conjunction with clinical experience. Searching for objective evidence and experience, however, may not always be that easy.

First, when looking for evidence in clinical endodontics, there is a substantial shortage of good unbiased studies to be used as an evidence base for clinical decision making. A list of publications presenting unbiased clinical experience comes up even shorter. This is a significant problem in endodontics for which a solution is given on the basis not of science, but of opinion.

It is easy to point at an area where the evidence is rather clear but solidly ignored. I am thinking about the ongoing fierce battle over one-visit versus multivisit endodontic treatment. This has become a very clouded issue that is debated not with scholarly precision but with business-minded intent. It is absolutely necessary to have a clear and objective understanding of the concepts to participate in this assessment of available evidence.

First, endodontic treatment success is often poorly defined. Postoperative or intraoperative flare-up and pain are often the measure of the success or failure of the treatment, although pain during treatment has been proved to have no effect on long-term outcomes. There are also definitions of success that go something like this: "If a tooth has a root canal and it is still in the mouth *5* years later, it should be termed a success" or "A successful endodontic case is one that fulfills the needs of the patient." These definitions may be useful for the individual who prefers to use them, but they are unclear and any outcome study using such criteria would be absolutely useless because the information is anecdotal. Only by using clearly defined criteria for successful outcome or failure can we communicate and compare clinical treatment results. Such criteria were well established nearly *50* years ago and are well suited for evidence-based decision making.' What is important to understand is that regardless of criteria, all
results are coming from the same bell curve. When loose criteria are applied, success appears greater than when more precise criteria are used.

The other important issue is understanding endodontic diseases. In the majority of cases, understanding is predicated on the realization that only 2 distinct disease entities—namely, the diseased vital pulp, which is inflamed but only superficially infected, and the necrotic pulp, which, when infected, involves not only the pulp space, but major portions of the surrounding dentin—exist in endodontic treatment. The latter stage is often aggravated by a periapical osteolytic process. These 2 diseases are often treated by means of one approach, which most regrettably has been called a "root canal." If one equates the treatment of these 2 disparate diseases with "doing a root canal," it is easy to understand why it is confusing to choose between one-visit and multivisit treatment of diseases of the endodontium.

It has been established beyond doubt in animal and human studies that odontogenic periapical bone lesions develop as a result of root canal infections.2'3 Many clinical studies have also shown that microorganisms can be retrieved from failing endodontically treated root canals.4'5 By using state-of-the-art microbial controls in well-controlled prospective human studies, it has been demonstrated that teeth with resorbing apical periodontitis have a significantly lower rate of treatment success than teeth with vital pulp.[6] The collected evidence from clinical studies of high quality sets down a clear correlation between endodontic infection and periapical osteolytic disease processes.

In other clinical prospective human studies, the difficulties of disinfecting infected necrotic teeth have been well documented, demonstrating that mechanical instrumentation—even with full-strength sodium hypochlorite—fails to predictably disinfect the infected root canal dentin.[7,8] There are no objective studies contradicting these observations.

Studies that compare long-term outcomes after single- and multivisit endodontic treatment are few, and hard facts are lacking. However, there are a few often-cited studies on this topic, but the outcome

criteria to a large extent have focused on postoperative pain, which is irrelevant to long-term treatment success. Pekruhn[9] published one of the largest studies on single-visit treatment results. The study uses a 1-year follow-up period, and the inclusion criteria are undefined. Although this study was not intended to compare one-visit treatment with multivisit treatment, many cases were treated in 2 visits. There were significantly fewer failures ($P = .0002$) in the two-visit treatment group than were in the one-visit treatment group, regardless of pretreatment diagnosis. In a well-controlled clinical study on one-visit treatment, it has been shown that predictable root canal disinfection cannot be obtained during one clinical session.1° This resulted in a significantly higher failure rate.10'11

A vital pulp is only superficially infected, and it should be easy to perform an aseptic microsurgical excision of the pulp and, in one treatment session, finish with a root filling. This is purely an issue of technical skills. On the other hand, if the pulp is necrotic and complicated by apical periodontitis, there is ample evidence that a significant dentin infection exists. It is also well established that apical periodontitis is more likely to heal if the root canal is properly disinfected. Thus, disinfection is important. The evidence is overwhelmingly clear that these cases need more disinfection than can be achieved through instrumentation and irrigation. Intracanal intervisit medication is required for complete disinfection. Therefore, because of biological reasons—not technical—this disease condition requires more than one treatment session. Because the difference between a pulp necrosis with or without radiographically detectable radiolucency is only temporal, all these cases should be considered infected.

So, what is the big deal? There is a multitude of lecturers traveling the countryside "In Search of Modem Endodontics," presenting their "Ten Secrets of High-Profit/Low-Stress Endodontics." The core point in many of these road shows is one-visit endodontics. Another example of this misinformation is found in a statement from a public Web page, hosted by an endodontic office, which states: "Research and Clinical practice has demonstrated that there is no difference with respect to successful outcomes when root canals are completed in single or multiple visits." This is based on ignorance. Such ignorance is bad enough; however, there also are more serious problems. We have reached such a frenzy in this cacophony of ignorance that the serious, scholarly practicing dentist is starting to question what is wrong with his/her practice and feel that he/she must have missed the boat. "Isn't my practice modem?" "Am I inefficient?" "What do I tell my patient when other colleagues in the community are routinely treating infected endodontic cases in one visit and use this as an advertising tool?" It is time for all of us to unite if we are serious about evidence-based practice. The leaders and educators should be the first to come forward and declare where they stand on these issues and whether they support quality care in an evidence-based practice environment. As dentists, we should have a strong commitment to medical care of the highest quality. Priority must also be given to more prospective, well-controlled clinical trials to obtain the evidence necessary for a better program of endodontic care.

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