

ENDODONTICS



Colleagues for Excellence

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Endodontic Case Difficulty Assessment and Referral

Welcome to *ENDODONTICS: Colleagues for Excellence*...the newsletter covering the latest in endodontic treatment, research and technology. We hope you enjoy our coverage on the full scope of options available for patients through endodontic treatment and that you find this information valuable in your practice. All issues of this *ENDODONTICS* newsletter are available on the AAE Web site at www.aae.org, and cover a range of topics on the art and science in endodontic treatment.

The aim of nonsurgical endodontic treatment is to address pathosis of the pulpal and periradicular tissues. As the average age of the population has increased, the stigma of tooth loss has become less acceptable for most patients than for previous generations. In addition, increasingly complex, sophisticated restorative techniques and involved treatment plans have led to a higher demand for endodontic treatment. Advances in the understanding of endodontic pathosis, aseptic technique, and principles of canal preparation and obturation have also led to significantly increased and predictable healing rates for endodontic treatment—95 percent and higher under ideal conditions according to current literature (Salehrabi R, Rotstein I. *J Endod.* 2004 Dec;30(12):846-50; also see attached reading list).

This newsletter will address one of the important factors relating to retention of endodontically treated teeth—the quality of endodontic treatment. Nonhealing of root canal treatment can be traced to misdiagnosis, errors in treatment planning and poor case selection. This article speaks to each issue and offers a practical tool for overcoming case assessment pitfalls.

Contemporary Endodontic Treatment

Recent technological advances in endodontic treatment have resulted in the retention of teeth that were previously deemed untreatable. However, technology, instruments and materials are not a replacement for clinical skill and experience, but rather adjuncts that a practitioner can employ to reach a desired goal. With that in mind, it is imperative that a careful sequence of case selection and treatment planning is carried out based on clinical factors and the dentist's own knowledge of his or her abilities and limitations.

A recent ADA survey estimates that some 15.8 million endodontic procedures were performed in the United States

alone in 1999. This number has climbed from an estimated six million root canal procedures 30 years prior. With demand as high as it is for the treatment of pulpal disease, general practitioners should at a minimum be comfortable with diagnosis of pulpal and periradicular pathosis, and endodontic treatment planning.

Treatment Planning

The first step in treating the patient is planning the case in full. This initially involves a comprehensive medical review to predict any conditions that may require modification of the usual treatment regimens. The identification of medical conditions that may complicate endodontic treatment will help the dentist avoid potential medical emergencies during treatment. In addition, consideration of complicating patient factors such as anxiety, limited opening or gag reflex will allow the dentist to avoid situations that may compromise treatment outcomes.

Following the medical evaluation, a subjective examination and a radiographic survey should be completed. The practitioner should then be able to perform and interpret diagnostic tests to arrive at a diagnosis and high-quality treatment plan that addresses the patient's needs and desires.

Collection of this data makes it possible to avoid misdiagnosing and therefore mistreating a patient—actions that could lead to a loss of the patient's confidence in the practitioner, the prescribed treatment and ultimately the dental profession. Proper treatment planning not only helps the practitioner avoid procedural shortcomings (e.g., missed canals, excessive removal of dentin, perforations, ledges, separated instruments or over/underfill of the canal space), but also allows the dentist to choose cases based upon his or her experience, skill set and comfort level.

Every clinician must constantly evaluate his or her diagnostic and technical skills. The practitioner then has a legal and ethical obligation to determine, based on the case at hand, whether he or she possesses the skills necessary to predictably manage the patient's endodontic needs, and assure the delivery of timely and effective care. Practitioners electing to perform endodontic treatment are held to the same standard of care as endodontists. Cases that exceed the comfort level or skill set of the dentist should be referred to a specialist with the requisite skills and experience to manage the patient.

AAE Case Difficulty Assessment Form and Guidelines

The American Association of Endodontists has developed a practical tool that makes case selection more efficient, more consistent and easier to document. The *Endodontic Case Difficulty Assessment Form* is intended to assist practitioners with endodontic treatment planning, but can also be used to help with referral decisions and record keeping.

The assessment form identifies three categories of considerations which may affect treatment complexity: patient considerations, diagnostic and treatment considerations, and additional considerations. Within each category, levels of difficulty are assigned based upon potential risk factors. The levels of difficulty are sets of conditions that may not be controllable by the dentist. Each of the risk factors can influence the practitioner's ability to provide care at a consistently predictable level. This may impact the appropriate provision of care and quality assurance. For each level of difficulty, guidelines are given to aid the dentist in determining whether the complexity of the case is appropriate for his or her experience or comfort level.

Minimal Difficulty



Figure 1: Radiograph of a minimally restored anterior tooth. The root has no apparent curvature and the canal is not reduced in size. In the absence of any modifying patient factors, the nonsurgical root canal treatment of this tooth would be classified as minimally difficult.

Figure 1 illustrates a case with minimal difficulty: a medically healthy patient who presents with pain that is well localized to an anterior tooth. The patient in this case is not anxious and has no limitation in opening. The objective tests, and pulpal and periradicular diagnoses are consistent with the patient's chief complaint. There is no difficulty obtaining radiographs. The root has no apparent curvature

and the canal is not reduced in size. Achieving a predictable treatment outcome should be attainable by a competent practitioner with limited experience. It should be noted that all canals will have some degree of curvature to their course, even if radiographically they appear straight.

Moderate Difficulty

A case with moderate difficulty would exhibit one or more complicating treatment factors. An example is shown in Figure 2.



Figure 2: Moderately difficult case. The periapical radiograph reveals a pulp space that is not reduced in size. The treatment is complicated by the PFM crown on the tooth.

The patient in this case is healthy, non-anxious, has no limitation in opening and reports pain that is well localized to the mandibular left second premolar. The objective tests, and pulpal and periradicular diagnoses are consistent with the patient's chief complaint. There is no difficulty obtaining radiographs. A periapical radiograph reveals a pulp space that is not reduced in size. The treatment, however, is complicated by the PFM crown on the tooth. There is a risk that the porcelain may fracture during the access, and the orientation of the crown may differ significantly from the orientation of the root. Achieving a predictable treatment outcome will be challenging for a competent, experienced practitioner.

High Difficulty

A case with high difficulty is one in which the preoperative condition is exceptionally complicated. One way a case may be classified as highly difficult is by exhibiting multiple factors in the "MODERATE DIFFICULTY" category on the assessment form. An example of such a case appears in Figure 3.



Figure 3: Highly difficult case. The second premolar has a full-coverage crown that is not in alignment with the moderately inclined root. The canal is visible, but reduced in size.

The patient in this case is healthy, non-anxious, has no limitation in opening and reports pain that is well localized to the mandibular left second premolar. The objective tests, and pulpal and periradicular diagnoses are consistent with the patient's chief complaint. There is no difficulty obtaining radiographs. The second premolar in this case has a full-coverage crown that is not in

alignment with the moderately inclined root. The canal is visible, but reduced in size. In addition, there is an amalgam restoration, cervical to the crown, which may block the canal space. Because of the tooth inclination, presence of a full-coverage crown, diminished canal size and potential blockage of the canal by the amalgam restoration, there is an increased risk of excessive dentin removal and/or perforation during access. In addition, the decreased pulp space increases the likelihood of creating a blockage in the canal during instrumentation. Therefore, achieving a predictable treatment outcome will be challenging for even the most experienced practitioner with an extensive history of favorable outcomes.

A case may also be classified as highly difficult by exhibiting at least one complicating factor from the “HIGH DIFFICULTY” category on the case assessment form. An example would be the maxillary premolar shown in Figure 4.



Figure 4: The S-shaped curve of the root in the second premolar is sufficient to classify this case as highly difficult.

The patient in this case is healthy, non-anxious, has no limitation in opening and reports pain that is well-localized to the maxillary left second premolar. The objective tests, and pulpal and periradicular diagnoses are consistent with the patient's chief complaint. There is no difficulty obtaining radiographs. The S-shaped curve alone is sufficient to classify this case as highly difficult, as there is an increased risk of creating a blockage or separating an instrument in the canal. In addition, obturation of the canal space is more complicated. As with the previous case, achieving a predictable treatment outcome will be challenging for even the most experienced practitioner with an extensive history of favorable outcomes.

While the examples described thus far have focused on diagnostic and anatomical factors, it is important to realize that there are a number of patient considerations that may complicate treatment. These include medical complications, difficulties with anesthesia, behavioral management issues, limited opening and emergent situations. Additional considerations would include previous endodontic treatment, a history of trauma, and periodontic-endodontic conditions. For examples of these considerations and how they may affect case difficulty, please refer to the *Endodontic Case*

Difficulty Assessment Form. Dentists should be familiar with the information in the form, and be able to assess each case to determine its level of difficulty.

If Referral is Necessary

If the level of difficulty exceeds the practitioner's experience and comfort, referral to an endodontist is appropriate. There are several components to an effective referral that make the process a positive experience for the patient, referring dentist and endodontist.

1. Develop a referral relationship with an endodontist prior to the need for referral. Endodontists and general dentists are part of the same team and reinforce each other's value. Establishing a relationship with an endodontist will allow the endodontist to serve as a consultant and a resource, and will encourage communication, which will better serve the patient.
2. When it becomes apparent that a referral is necessary, make the referral in a timely manner. An efficient referral minimizes the possibility of potential complications such as pain or swelling associated with untreated endodontic pathosis.
3. Explain the reason for referral to the patient. If possible, the referral should be made with the patient in the office, so that any literature, maps and preoperative instructions may be provided at that time.
4. Discuss your diagnosis with the endodontist, and tell him/her exactly what you have explained to the patient. If applicable, discuss the treatment plan and the desired outcome with the endodontist. It is appropriate to include information regarding the planned restoration—if a post and core is necessary, describe how much post space is desired so that it can be prepared at the time of treatment. If verbal communication is not convenient, information can be provided by written referral.
5. If possible, schedule the restorative appointment within one month of the endodontic treatment. For example, if a buildup and crown are planned following endodontic therapy, this should be scheduled with the referring dentist in advance to avoid lengthy delays between completion of the endodontic treatment and placement of the final restoration. Significant delays in the placement of the final restoration can lead to coronal microleakage and nonhealing.
6. Following endodontic treatment, a report including pre- and post-treatment radiographs should be returned to the patient's general dental office. The prognosis and additional treatment needs should also be clearly stated. For example, if a canal is previously blocked and the endodontist believes that a root end resection may be necessary, this should be communicated in the report.

Conclusion

In today's society, patients are better educated and have higher expectations regarding the dental care they receive. Dental professionals have the technology, methodology and scientific rationale to repair damage to the dentition that was viewed as irreversible only years ago. These advances allow patients to keep their natural dentition, with a few exceptions, for a lifetime. Teeth that have had surgical and nonsurgical endodontic treatment that has not allowed healing can often be disassembled and "re-engineered" to allow healing, preservation and function of the tooth.

Any of the treatment options offered to the patient must have the patient's best interests and health as a primary

goal. The treatment must be delivered in a predictable manner by the treating practitioner to optimize the healing potential. Nonsurgical root canal therapy results in one of the highest retention rates of any dental procedure when completed under optimal conditions. As clinicians, we can ensure the highest quality treatment with our ability to treatment plan for the patient in such a way that we honestly assess the difficulty of the case and our personal skill levels, and then determine whether to treat or refer. In the final analysis, when the treatment proceeds without complication and healing occurs, the patient and the dentist benefit.

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Errata

In the last issue of **ENDODONTICS: Colleagues for Excellence** titled *Disassembly of Endodontically Treated Teeth: The Endodontist's Perspective, Part 2*, the radiographs on page 3 were transposed. Following is the correction; the AAE regrets this error.



Figure 2A: Maxillary lateral incisor with a post, sectioned silver cone and periradicular lesion



Figure 2B: Fine, ultrasonic tips under microscopic enhanced visualization removal of these materials to facilitate retreatment

The information in this newsletter is designed to aid dentists. Practitioners must use their best professional judgment, taking into account the needs of each individual patient when making diagnoses/treatment plans. The AAE neither expressly nor implicitly warrants any positive results, nor expressly nor implicitly warrants against any negative results, associated with the application of this information. If you would like more information, call your endodontic colleague or contact the AAE.

Did you enjoy this issue of *ENDODONTICS*? Did the information have a positive impact on your practice? Are there topics you would like *ENDODONTICS* to cover in the future? We want to hear from you! Send your comments and questions to the American Association of Endodontists at the address below.



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