Vol. 106 No. 4 October 2008

Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology

EDITORIAL

Is endodontic treatment passé?

It is easy to forget in today's debate that competently performed endodontic therapy is one of the most predictable dental therapy forms available, with a well documented superb long-term retention of endodontically treated teeth. Dental implants are excellent treatment options in cases when natural teeth have been lost and require replacement. However, the erroneously perceived high rate of treatment success when inserting single tooth implants compared with endodontic treatment has, in recent years, often biased the general dentist's objectivity when selecting treatment options.

Minor concerns about endodontic treatment outcomes often lead to unnecessary tooth extractions and replacement with implants. Many currently published recommendations for extraction of endodontically treated teeth show a stunning ignorance about endodontic treatment outcomes.[1,2] Surprisingly few official comments have been raised from the organized endodontic community to discuss this dissonance. Instead, the American Association of Endodontists has clearly taken a subservient role in this discussion and issued somewhat ambivalent policy statements.[3] In scientific studies of endodontic treatment outcomes, definitive, unambiguous end points must be defined to describe treatment results. Such criteria were defined by Strindberg[4] and have become the gold standard for outcome studies. Thus, after sufficient follow-up time, "success" (satisfactory healing) is described as a complete healing of the periradicular bone with a normal periodontal ligament and lamina dura.

Teeth with failed endodontic treatment are often candidates for some form of retreatment to achieve complete elimination of periradicular disease. However, a case is often made that these teeth, scheduled for retreatment, are at high risk of repeated failure. This misunderstanding has resulted in a never-ending large pool of teeth being candidates for single tooth implants identified by uncritical interests. There is ample evidence that in most of these cases, other treatment options are available to maintain a restorable tooth.

It is somewhat difficult to understand how we got into this untenable position. Poor communication between various "guilds" of dental specialists and other interest groups is certainly one important factor.

The scientific evaluation of successful endodontic treatment requires that the Strindberg criteria of complete bone healing remains the "gold standard." For clinical purposes and in the daily assessment of treatment outcome, some "looser" terms, such as "healing," "functional," and "retained," may be more useful descriptions. For implant assessments, however, even the most fastidious evaluator is likely to use "retained" as a characterization of good outcome. Confusion arises when less-than-precise clinical criteria of implant treatment are used to compare results when strict scientific endodontic criteria were applied. As a result, it is often wrongly stated that the long-term treatment success rate is equal for endodontic treatment and a single tooth implant.[3]

According to many recent reports on the outcomes of endodontic treatment, there are very few teeth that cannot be retained if the full scope of endodontic treatment options is used.[5,6]

Dental implants have been used for many years, but not until recently have relatively objective studies of long-term outcomes been available in the literature. The end point descriptor in implant studies is often unclear and the desirable result often characterized as a "retained implant." It is also rather clear that implants tend to fail in increasing numbers with time, with a 7-year retention rate close to 90%,[7] and with more stringent success criteria the rate falls to 83%. Still, implants with signs of peri-implant infection and maintained by adapted antimicrobial treatment were not considered to be failures in that study.[7] This is a positively biased attitude to peri-implantitis, because it is a difficult-to-treat chronic pathologic condition with a low rate of long-term success.[8] Similar treatment results have been reported by others.[9,10]

The most convincing value of endodontic treatment is its long-term success and permanence. A periapical lesion that heals after a quality treatment, followed by proper restorative maintenance, will not fail later due to endodontic reasons. Endodontic treatment results are also improving with time.[11,12]

Several studies published during recent years have assessed the retention rate of endodontically treated teeth.[13,14] Those studies show how endodontically treated teeth are retained at about 95%-97% after 8 years compared with implant retention of 85%-90% during a similar time period. It is also important to notice that implant data available today are from carefully controlled clinical studies with intensive maintenance. No objective long-term data are available on implant survival in a general dental practice setting. On the other hand, endodontic numbers discussed here are retention data from average nonspecialized dentists.

Complications after restorative procedures, such as root fractures, are often mentioned as a strong negative factor against restoring and preserving endodontically treated teeth. However, these treatment complications may be more associated with substandard prosthetic work and poor material choices than with an endodontic complication. In a recent follow-up study of a substantial patient material, the lifespan of well constructed full crowns on cast posts was equal or higher than full crowns on teeth with vital pulp.[15]

Implant is an excellent treatment option for the replacement of a missing tooth. However, it should never be an option for the replacement of an existing restorable tooth. A recent literature review and meta-analysis found that natural teeth surrounded by healthy periodontal tissues yield a very high longevity of up to 99.5% over 50 years.[16] Periodontally compromised teeth that are treated and maintained regularly have a survival rate of 92%-93%.[16] That study concluded that oral implants, when evaluated after 10 years of service, do not surpass the longevity of even compromised but successfully treated natural teeth. Therefore, an implant should not be a treatment alternative for teeth that a reasonable competent dentist can restore and care for.

Endodontic orthograde or retrograde treatment should always be the first treatment choice of a tooth having ongoing endodontic disease.

Larz S.W. Spångberg, DDS, PhD
Section Editor
Endodontology

doi:10.1016/j.tripleo.2008.07.004

REFERENCES

1. Greenstein G, Greenstein B, Cavallaro J. Prerequisite for treatment planning implant dentistry: periodontal prognostication of compromised teeth. Compendium 2007;28:436-47.
2. Greenstein G, Cavallaro J, Tarnow D. When to save or extract a tooth in the esthetic zone. Compend Contin Educ Dent 2008;29:136-45.
3. American Association of Endodontists. AAE position statement on implants. www.aae.org; 2007.
4. Strindberg LZ. The dependence of the results of pulp therapy on certain factors. An analytic study based on radiographic and clinical follow-up examinations. Acta Odont Scand 1956; 14:1-175.
5. Sjögren U, Hägglund B, Sundqvist G, Wing K. Factors affecting the long-term results of endodontic treatment. J Endod 1990;16:498-504.
6. Sjögren U. Success and failure in endodontics. Dissertation, Department of Endodontics, Umeå University, Umeå, Sweden; 1996.
7. Brocard D, Barthet P, Baysse E, Duffort JF, Eller P, Justumus P, et al. A multicenter report on 1,022 consecutively placed ITI implants: a 7-year longitudinal study. Int J Oral Maxillofac Implants 2000;15:691-700.
8. Leonhardt Å, Dahĺen G, Renvert S. Five-year clinical, microbiological, and radiological outcome following treatment of periimplantitis in man. J Periodontol 2003;74:1415-22.
9. Jung RE, Pjetursson BE, Glauser R, Zembic A, Zwahlen M, Lang NP. A systemic review of the 5-year survival and complication rates of implant-supported single crowns. Clin Oral Implant Res 2007;19:119.
10. Pjetursson BE, Brägger U, Lang NP, Zwahlen M. Comparison of survival and complication rates of tooth-supported fixed dental prostheses (FDPs) and implant-supported FDPs and single crowns (SCs). Clin Oral Implant Res 2007;18(Suppl 3):97.
11. Molven O, Halse A, Fristad I, MacDonald-Jankowski D. Periapical changes following root-canal treatment observed 20-27 years postoperatively. Int Endod J 2002;35:784-90.
12. Fristad I, Molven O, Halse A. Nonsurgically retreated root filled teeth—radiographic findings after 20-27 years Int Endod J 2004;37:12-8.
13. Lazarski MP, Walker WA III, Flores CM, Schindler WG, Hargreaves KM. Epidemiological evaluation of the outcomes of nonsurgical root canal treatment in a large cohort of insured dental patients. J Endod 2001;27:791-6.
14. Salehrabi R. Rotstein I. Endodontic treatment outcomes in a large patient population in the USA: an epidemiological study. J Endod 2004;30:846-50.
15. DeBacker H, Van Maele G, De Moore N, Van den Berghe L. Long-term survival of complete crowns, fixed dental prosthesis, and cantilever fixed dental prostheses with post and cores on root canal treated teeth. Int J Prosthodont 2007;20:229-34.
16. Holm-Pedersen P, Lang NP, Müller F. What are the longevities of teeth and oral implants? Clin Oral Implant Res 2007;18(Suppl 3):15.