Preservation of the natural dentition is the primary goal of dentistry. Published surveys indicate that patients generally value teeth and express a desire to save their natural dentition in favor of extraction whenever possible. Significant technological and biological improvements have been made in the treatment of endodontic disease, making long-term retention of natural teeth more attainable. Patients emphasize dental professionalism and the provision of appropriate recommendations regarding the maintenance and restoration of their oral health and function. It is essential to employ an evidence-based, interdisciplinary approach that addresses the interests of the patient when determining the best possible course of treatment.

In July 2014, the American Association of Endodontists, in collaboration with the American College of Prosthodontists and the American Academy of Periodontology, hosted a two-day Joint Symposium titled “Teeth for a Lifetime: Interspecialty Collaboration for Long-term Success.” Approximately 375 general dentists and specialists assembled in Chicago to hear about preserving the natural dentition.

The educational program included evidence-based, peer-reviewed and up-to-date advanced regenerative techniques, improvements in minimally invasive restorative methods, and best practices for interspecialty treatment planning.

The majority of endodontic treatments are performed by general dentists with a high degree of success. For complex cases, referral to an endodontist with additional training is recommended for restorable, periodontally sound teeth with single-root canal anatomy. Endodontic treatment on teeth with nonrestorable crowns or teeth with severe periapical conditions is contraindicated, and other treatment options such as implant placement should be considered

When making treatment decisions, the clinician should consider factors including outcome assessment, local and systemic case-specific issues, costs, the patient’s desires and needs, esthetics, potential adverse outcomes and ethical factors.

Outcomes assessment: Success and survival Treatment outcomes play a key role in the assessment of different treatment options. Patients often ask whether a procedure is going to be successful or not. This question can be challenging for a clinician to answer due to the variety of reported outcomes in the literature. There are differences in the methodology and criteria used to evaluate the outcomes for root canal treatment and implant prosthetics, which make comparisons between success rates difficult, if not impossible. Endodontic studies have historically used “success” and “failure” as outcome measures and have focused on a strict combination of radiographic and clinical criteria. In contrast, the implant literature has primarily reported “survival,” i.e., the implant is either present or absent. Therefore, implant studies that solely evaluate survival as an outcome measure will likely publish higher success rates than endodontic studies that rely on biologic healing and factors related to the entire restored tooth. To establish more valid and less biased comparisons, the same outcome measures should be used.

A recent systematic review published in the Journal of the American Dental Association highlights a key area of concern: the survival rate of dental implants compared to that of periodontally compromised natural teeth.38 That are adequately treated and maintained. Nineteen studies with a follow-up period of at least 15 years were included in the analysis. The results show that implant survival rates do not exceed those of compromised but adequately treated and maintained teeth. These findings support other studies comparing long-term survival of implants and natural teeth, providing an important message: Periodontally compromised teeth can be retained with quality treatment and appropriate maintenance. Therefore, it may be advisable to avoid overzealous implant consideration for the periodontally susceptible patient to fully utilize and enhance the capacity of the natural dentition.

Treatment planning options A key focus of the Joint Symposium involved treatment planning decisions regarding endodontic treatment and implant therapy. Should a tooth with pulpal disease be re-treated with root canal treatment and restoration, or be extracted and replaced with a single-tooth implant-supported restoration? This assessment involves a challenging and complex decision-making process that must be customized to suit the patient’s needs and desires. The topic has received considerable attention in the literature, the media and at dental education conferences. Endodontic treatment and implant therapy should not be viewed as competing alternatives, rather as complimentary treatment options for the appropriate patient situation. (Figs. 1a and b) Endodontic treatment is indicated for restorable, periodontally sound teeth with single-root canal anatomy. Endodontic treatment on teeth with nonrestorable crowns or teeth with severe periapical conditions is contraindicated, and other treatment options such as implant placement should be considered.

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Table 1. Survival rates following initial nonsurgical root canal treatment.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Number of Teeth</th>
<th>Follow-up years</th>
<th>Survival (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanz and Figueiredo</td>
<td>1,132</td>
<td>6</td>
<td>87</td>
</tr>
<tr>
<td>Canaris et al.</td>
<td>109</td>
<td>12</td>
<td>94</td>
</tr>
<tr>
<td>Lavizzari et al.</td>
<td>44</td>
<td>12</td>
<td>94</td>
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</table>

Comparative studies: Endodontically treated teeth and single-tooth implants

Large-scale systematic reviews have addressed the relative survival rates of endodontically treated teeth and single-tooth implants. The Academy of Osseointegration conducted a meta-analysis using 35 studies (approximately 25,000 teeth) on milled endodontically treated teeth and 57 studies (approximately 12,000 implants) on single-tooth implants. The outcome data demonstrated no difference in survival rates between the two groups during any of the observation periods. Another systematic review supported by the Academy of Osseointegration compared the outcomes of endodontically treated teeth with those of a single-tooth implant-retained crown, fixed partial denture and no treatment after extraction. At 97 percent, the long-term survival rate was essentially the same for implant and endodontic treatment. Both options were superior to extraction and replacement of the missing tooth with a fixed partial restoration.
In addition to systemic and local factors, it is critical to include the patient’s concerns during treatment planning. Common patient-centered factors include treatments that are biologically relevant to the patient’s anatomy and the type and location of the tooth.

Several factors influence the decision-making process. The following factors include patient-related factors of specific conditions that should be considered in making this treatment decision.

Systemic factors

The list of potential risk factors for peri-implantitis or implant failure is extensive. It includes systemic disease, genetic traits, chronic drug or alcohol consumption, smoking, periodontal disease, radiation therapy, diabetes, drug-induced osteonecrosis of the jaw. This may affect treatment planning for both implant and endodontic treatments. Accurate diagnosis is critical in rendering the highest quality service at one-year follow-up. The root end was resected, ultrasonically resected, the root canal was cleaned, and the root canal system was filled with an appropriate microsurgical root-end filling material.

Access to care

The root end was resected, ultrasonically resected, the root canal was cleaned, and the root canal system was filled with an appropriate microsurgical root-end filling material.

Clinical complications

The root end was resected, ultrasonically resected, the root canal was cleaned, and the root canal system was filled with an appropriate microsurgical root-end filling material.

Microsurgery

The root end was resected, ultrasonically resected, the root canal was cleaned, and the root canal system was filled with an appropriate microsurgical root-end filling material.

Consultation regarding a question is recommended to assist the clinician in rendering the highest quality service at one-year follow-up. The root end was resected, ultrasonically resected, the root canal was cleaned, and the root canal system was filled with an appropriate microsurgical root-end filling material.