



By Michael Scherer, DMD, MS, FACP

Dr. Scherer is an Assistant Clinical Professor at Loma Linda University, a Clinical Instructor at University of Nevada – Las Vegas, and maintains a practice limited to prosthodontics and implant dentistry in Sonoma, CA. He is a fellow of the American College of Prosthodontists, has published articles, DVD training series, and in-person and online courses related to implant dentistry, clinical prosthodontics, and digital technology with a special emphasis on full-arch reconstruction. As an avid technology & computer hobbyist, Dr. Scherer's involvement in digital implant dentistry has led him to develop and utilize new technology with CAD/CAM surgical systems, implement interactive CBCT implant planning, and outside of the box radiographic imaging concepts.

Root Overdenture Attachments in an Implant World

The growth and interest of using dental implants is a clinical paradigm shift that has slowly occurred over the past 30+ years in our dental practices. Many clinicians have gotten to the point where a patient who presents to our offices with a hopeless/failing dentition, we are often fast to conclude that extractions and implant treatment is their only option. Some clinicians see the limitations to patient acceptance of implant treatment is often the expensive cost of the procedure and fear of surgical procedures to have implants placed. While both of these factors can be accounted for and managed with patients, I do find it a bit easier to get some patients to accept the idea of saving a few teeth to help stabilize their denture or removable partial denture rather than just going straight to dental implant treatment.

As our baby-boom generation patients continue to age, we are encountering more patients holding onto teeth longer and those same patients are looking for cost-effective dental treatment. To help inspire future generations of dentists in expanding treatment options, we often should look back to how creative dentists in the past would address clinical options.

Looking Back to the 1970s

In the 1970s, using natural tooth roots to help retain a prosthesis was considered a primary treatment recommendation for many patients. At the time, dental implantology was in its infancy and considered by some not ready for clinical practice. As a result of when teeth would fracture or patients would need denture treatment, clinicians would utilize the last remaining tooth in the maxillary or mandibular arch to help keep patients away from tissue-supported dentures.

Many advances in attachment systems were pioneered during this time; some would

even consider the 1970s as the “decade of the overdenture.”¹ During this time-period, clinicians and manufactures established protocols of using endodontically treated teeth with a cemented post and core which contained a stud-style attachment system. Many of the core principles apply today in dental implantology and when a clinician uses a LOCATOR abutment on a dental implant, its proverbial “roots” are actually with root overdenture treatment!

Looking to Today and the Future

Fast forward to today - a patient presents to our office with a chief concern of a fractured fixed partial denture from teeth #6-8. (figure 1) The patient indicated that he had the fixed prosthesis made several years ago and would prefer a similar treatment if possible. Furthermore, the rest of his dentition was healthy with no signs of periodontal disease or dental caries so he could potentially be a great candidate for implant treatment.



Figure 1

We discussed options including dental implants, however, we did indicate that bone grafting would be required in the area. As the complexity of the treatment went up, so did the costs. The patient ultimately saw the bottom-line costs of the dental implant treatment and told me, “Doctor, at my age, that sounds like way too much money for me to spend, do you have any other cheaper options?”



Figure 2

Immediately the thought of a removable partial denture popped into our minds and we presented him with the option of simply extracting the remaining fractured teeth and fabricating him a removable prosthesis. He was interested in the option and when we let him know the cost of the removable partial denture compared to the dental implant option, his interest peaked even more. When we told him that he would need a metal clasp on tooth #8, however, his interest diminished. He did not like the idea of something like that showing when he smiled and immediately let us know his concerns with that reality.

Could we do something else that would meet the expectations of the patient and keep costs reasonable? Thinking back to the 1970s pre-implant dentistry era, could a stud-style root attachment, such as a LOCATOR abutment, cemented into each could potentially appease the patient's concerns with dental treatment? We presented the option of keeping teeth #6 and 8 and using them for retention. We presented him the idea of root canal therapy and cementing an attachment directly into the roots. The benefits were obvious to him, a snap like connection could eliminate the wire clasp showing on tooth #8 and additionally it could give him an implant-like retention and stability without having to go through complex surgical procedures with minimal costs.



Figure 3

On top of the above, we told him that while implants were not a covered service with his dental plan, much of the root canal and removable partial denture treatment were covered and would reduce his out of pocket expenses. He was thrilled and asked the question, "Doctor, that sounds great! When can we get started?!" We responded, "How about right away?" He said yes to treatment without hesitation.

Clinical Steps

Anesthetic was placed, a rubber dam applied, endodontic procedures were completed on teeth #6 and #8. The roots were reshaped to slightly below the gingival margin using a diamond rotary bur and a high-speed handpiece. Emphasis is placed on ensuring that there is sufficient restorative space between the top of the residual root and the opposing dentition.

The canals were shaped using a drill that corresponds with the post size for a corresponding LOCATOR root attachment. Ensuring the path of insertion of the future prosthesis is critical and attention was given to ensure that the future abutment was as close to paralleling

the path of insertion for the prosthesis. Since residual roots diverge compared to the path of insertion, LOCATOR root abutments come in 3 angulations to help compensate for divergent angles. Using a paralleling post to ensure the proper angle, a 20-degree abutment was chosen for tooth #6 and #8 as it most closely matches the path of insertion. (figure 2) The post was air abraded (MicroEtcher CD, ZEST Dental Solutions) and cemented using a resin cement (Panavia v5, Kuraray).

Scan body scan housings were applied to the LOCATOR attachment to assist in digital impression procedures. A digital intraoral optical scan of the maxillary arch, mandibular arch, and occlusion was captured (TRIOS, 3Shape). (figure 3) The scan files were sent to a laboratory and the metal framework was 3D printed. Denture teeth were applied to the metal framework and the patient returned for a clinical try-in where esthetics, phonetics, centric, and comfort were confirmed. The removable partial denture sent to the laboratory for final processing.

Continued on following page...

The patient returned for clinical delivery. (figure 4) Block-out spacers and housings were placed onto each attachment and the removable partial denture placed to ensure sufficient space within the prosthesis to ensure complete adaptation to the maxillary dentition. Composite resin (Chairside Attachment Processing Material, ZEST Dental Solutions) was injected around each housing and within the intaglio of the removable partial denture. The prosthesis was placed back onto the dentition and allowed to fully polymerize. After complete polymerization, the prosthesis was removed ensuring the housings were attached to the prosthesis. The processing inserts were removed and nylon inserts placed corresponding to an acceptable retention level. (figure 5)

The patient was given instructions on how to remove and care for the removable

prosthesis. He was very pleased with the final result and has returned for follow up to reinforce hygiene and long-term care. He is still thrilled – he's now telling all of his friends about his new teeth!!

Are root overdentures back even in the modern implant world? This author thinks so! Frankly, we should look back for inspiration and make the choice that is best suited for each and every patient in the modern world. Ultimately root retained dentures and removable partial dentures are a treatment modality that can be part of clinical options we can present to patients! ■

References

1. Fenlon AH. The decade of overdentures: 1970-1980. *J Prosthet Dent.* 1998;79(1):31-36



Figure 4



Figure 5

ATTEND DR. SCHERER'S UPCOMING CE COURSE!

Updates in Digital Dentistry – What Works in Everyday Clinical Practice?

Friday, October 8, 2021 • 8:30am-1:30pm

SDDS Classroom • 5 CEU Core

\$199 SDDS Members • \$189 SDDS Members • \$179 DHP Members

This course covers the latest updates in digital dentistry technology from scanners, 3D printers, milling machines, and much more. This program aims to be a review of digital workflows and technologies focusing on what works and what is still considered emerging technology. Dr. Scherer aims to dispel fact from fiction and emphasis is placed on clinical applications and “real-world everyday practice” workflows that work well in the author’s clinical practice and strategies for what every dentist can do to implement the latest technologies.

Learning Objectives:

- Become exposed to digital technologies and innovations occurring in dentistry
- Recognize the role of digital dentistry workflows and realistic places to begin new or implement new technology into existing digital dentistry practices
- Understand the limitations of the latest technologies and recognize their shortfalls

Sponsored by:

ZD ZEST DENTAL SOLUTIONS

Michael D Scherer, DMD, MS, FACP

Dr. Scherer is an Assistant Clinical Professor at Loma Linda University, a Clinical Instructor at University of Nevada – Las Vegas, and maintains a practice limited to prosthodontics and implant dentistry in Sonora, California. He is a fellow of the American College of Prosthodontists, has published articles, DVD training series, and in-person and online courses related to implant dentistry, clinical prosthodontics, and digital technology with a special emphasis on full-arch reconstruction. As an avid technology & computer hobbyist, Dr. Scherer’s involvement in digital implant dentistry has led him to develop and utilize new technology with CAD/CAM surgical systems, implement interactive CBCT implant planning, and outside of the box radiographic imaging concepts.