**C.E. article**
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One thing I find exciting about the specialty is the ever-expanding universe of tools and equipment available to practitioners. When it comes to beefing up one’s armamentarium, there’s no better place to go than a major dental meeting. From the latest files to the most innovative irrigation systems and beyond, it seems there is always plenty to see and learn about at events such as the AAE and ADA annual sessions or the Greater New York Dental Meeting.

Perhaps you picked up this copy of roots at one of these meetings. That’s good, because in this issue you can read about how many of these specialized tools can be used in clinical endodontic practice. Dr. Gary Glassman reports on the use of mineral trioxide aggregate (MTA), which he says can “seal the pathway of communication” between the root canal system and the surrounding tissues. Dr. L. Stephen Buchanan explains why his trusted electronic apex locator is the “most indispensable” device he uses. Dr. John J. Stropko writes about his invention, the Stropko Irrigator, which he designed to help make procedures easier by maintaining a clean field of vision.

Every issue of roots also contains a C.E. component. By reading the article by Dr. Glassman, then taking a short online quiz about this article at www.DTStudyClub.com, you will gain one ADA CERP-certified C.E. credit. Keep in mind that because roots is a quarterly magazine, you can actually chisel four C.E. credits per year out of your already busy life without the lost revenue and time away from your practice.

To learn more about how you can take advantage of this C.E. opportunity, visit www.DTStudyClub.com. You need only register at the Dental Tribune Study Club website to access these C.E. materials free of charge. You may take the C.E. quiz after registering on the DT Study Club website.

I know that taking time away from your practice to pursue C.E. credits is costly in terms of lost revenue and time, and that is another reason roots is such a valuable publication. I hope you will enjoy this issue and that you will take advantage of the C.E. opportunity.

For those of you attending the fall meetings in New Orleans and New York City, be sure to say hello to me in person. As always, I welcome your comments and feedback.

Sincerely,

Fred Weinstein, DMD, MRCD(C), FICD, FACD
Editor in Chief
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From top: Stropko Irrigator, RootZX-mini electronic apex locator, X-Runner all-tissue ablative laser scanner, EndoVac irrigation device Master Delivery Tip. Clinical image provided by Richard Mounce, DDS.
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Mineral trioxide aggregate revisited: A cement for all seasons

Author_Gary Glassman, DDS, FRCD(C)

Pulpal and periradicular pathology develop when the dental pulp and periradicular tissues become exposed to microorganisms. In experimental, germ-free conditions, pulpal and periradicular tissues fail to show the development of pathosis and associated lesions when exposed to bacteria. The conclusion: Microorganisms are the main irritants of the dental pulp and periodontium, and sealing the pathways of communication between the root canal system and the periradicular tissues is imperative if bacterial leakage is to be prevented.

An ideal orthograde or retrograde filling material that seals the pathways of communication between the root canal system and its surrounding tissues should be non-toxic, non-carcinogenic, biocompatible, insoluble in tissue fluids and dimensionally stable. Furthermore, the presence of moisture should not affect its sealing ability; it should be easy to use and be radiopaque for recognition on radiographs.

Because existing restorative materials used in endodontics did not possess these “ideal” characteristics, mineral trioxide aggregate (MTA) was developed and recommended initially as a root-end filling material and subsequently has been used for pulp capping, pulpotomy, apexogenesis, apical barrier formation in teeth with open apices, repair of root perforations and, most recently, in revascularization cases. MTA has been recognized as a bioactive material.

MTA has been shown to seal off the pathways of communication between the root canal system and surrounding tissues, significantly reducing bacterial migration. It is made up of fine hydrophilic particles that set in the presence of water, and it is composed of tricalcium silicate, dicalcium silicate, tricalcium aluminate, tetracalcium aluminoferrite, calcium sulfate dihydrate (gypsum) and bismuth oxide, which provides it with radiopacity.
Portland cement is the most common type of cement in general use around the world, used as a basic ingredient of concrete, mortar, stucco and most non-specialty grout. It usually originates from limestone. MTA is available as gray MTA and white MTA. The crystalline structure and chemical composition of gray and white MTA are similar, except for the presence of iron in gray MTA.

Both contain bismuth oxide and calcium silicate oxide. Portland cement is composed mainly of calcium silicate oxide and does not contain bismuth oxide but does contain potassium. Calcium oxide is added in both Angelus white and gray MTA (Angelus, Londrina, Brazil) to reduce the setting time, which is too long in MTA cements of other brands (Fig. 1).

MTA has a similar mechanism of action to calcium hydroxide\(^9\) in that the main component of the material, calcium oxide, when in contact with a humid environment, is converted into calcium hydroxide.\(^{10}\) This results in a high pH of 12.5, making its surroundings inhospitable for bacterial growth and producing an antibacterial effect for a long period of time. But unlike calcium hydroxide products, such as Dycal\(^\circledast\) (DENTSPLY, York, Pa.) and MTA Angelus (Angelus, Londrina, Brazil), it has very low solubility, so it maintains a hard, excellent marginal seal.

Finally, unlike most dental materials, MTA actually needs moisture to set, so it thrives in a moist environment. Of the commercially available MTA products, MTA Angelus is well suited for most of the indicated endodontic procedures due to its setting time of 10 minutes, compared with the four-hour setting time of the other commercially available MTA. It is also packaged in air-tight bottles, allowing the practitioner to use only what is exactly needed, without introducing undue moisture into the remainder and without waste.\(^{11}\)

## Endodontic revascularization

Treatment of the immature, non-vital tooth with apical pathology presents several challenges. The mechanical cleaning and shaping of such a tooth with a blunderbuss canal is difficult, if not impossible, to achieve predictably. The thin, fragile lateral dentinal walls can fracture during mechanical filing, and the large volume of necrotic debris contained in a wide root canal is difficult to completely disinfect.\(^{12}\)

A new technique is presented to revascularize immature permanent teeth with apical periodontitis. The canal is disinfected with copious irrigation and a combination of three antibiotics. After the disinfection protocol is complete, the apex is mechanically irritated to initiate bleeding into the canal to produce a blood clot to the level of the cementoenamel junction.

A double seal of the coronal access is then made, first with MTA over the blood clot and then a bonded composite. The combination of a disinfected canal, a matrix into which new tissue could grow, and an effective coronal seal appears to have the ability to produce an environment necessary for successful revascularization.\(^{13}\) The development of normal, sterile granulation tissue within the root canal is...
thought to aid in revascularization and stimulation of cementoblasts or the undifferentiated mesenchymal cells at the periapex, leading to the deposition of a calcific material at the apex as well as on the lateral dentinal walls.12

_A case of mistaken identity_

A 15-year-old girl of Asian descent was referred to the author’s private endodontic clinic for evaluation on the lower left second premolar. The healthy young patient with an unremarkable medical history presented with a history of buccal swelling of the left mandibular area and discomfort to direct pressure on the tooth. On clinical examination, the patient was asymptomatic, and the tooth appeared intact, without caries. The presence of an enamel pearl on tooth #45 suggested that one may have been present on this tooth, which was fractured during function, resulting in a microexposure and necrosis of the pulp. The tooth had an open apex associated with a large radiolucency (Fig. 2).

Periodontal probings were within normal limits for all teeth in the lower left premolar. The healthy young patient with an remarkable medical history presented with a history of buccal swelling of the left mandibular area and discomfort to direct pressure on the tooth. On clinical examination, the patient was asymptomatic, and the tooth appeared intact, without caries. The presence of an enamel pearl on tooth #45 suggested that one may have been present on this tooth, which was fractured during function, resulting in a microexposure and necrosis of the pulp. The tooth had an open apex associated with a large radiolucency (Fig. 2).

An access cavity was made, purulent hemorrhagic drainage obtained, and the necrotic nature of the pulp confirmed. The root canal was slowly flushed with 20 ml of 5.25 percent NaOCl for 15 minutes. It was delivered with the master delivery tip and the macro canulae of the EndoVac apical negative pressure delivery system (Axis/SybronEndo, Coppel, Texas) (Fig. 3).

The canal was dried with paper points, and a mixture of ciprofloxacin, metronidazole and minocycline paste as described by Hoshino et al.17 was prepared into a creamy consistency and spun down the canal with a lentulo spiral instrument to a depth of 8 mm into the canal. The access cavity was closed with a sterile cotton pellet placed in the chamber and blue Cosmecore (Cosmedent, Chicago). (Fig. 4).

The patient returned three weeks later and was asymptomatic. The access was opened and the canal again flushed with 20 ml of 5.25 percent NaOCl for 15 minutes. It was delivered in the same manner as in the first visit with the master delivery tip and the macro canulae of the EndoVac apical negative pressure delivery system.

The canal appeared clean and dry, with no signs of inflammatory exudate. A #30 K-file was introduced into the canal until vital tissue was felt at a depth of 10 mm into the canal space. It was used to irritate the tissue gently to create some bleeding into the canal. The bleeding was stopped at a level of 5 mm below the level of the CEJ and left for 30 minutes, so that the blood would clot at that level.

After 30 minutes, the presence of the blood...
clot to approximately 5 mm apical of the CEJ was confirmed. White mineral trioxide aggregate, MTA Angelus was carefully placed over the blood clot and allowed to set for 20 minutes. After confirmation was achieved of its set, a bonded composite was placed and the patient was scheduled for follow-up in three months. Unfortunately, the MTA was placed further apically then would have been preferred (Fig. 5).

At the three-month follow-up appointment, the patient was totally asymptomatic, and the radiograph showed complete resolution of the radiolucency, with closure of the apex and thickening of the dentinal walls. Pulp testing was inconclusive (Fig. 6).

At the one-year follow-up appointment, the radiograph revealed that treatment had been performed on this tooth by another dentist, different from her original dentist who made the initial referral. The new dentist, not familiar with revascularization treatment performed, had entered the root canal space, cleaned it out and obturated it with gutta-percha and sealer. Fortunately, the treatment was successful (Fig. 7).

Conclusion

The future of endodontics is bright as we continue to develop new techniques and technologies that will allow us to perform treatment painlessly and predictably and continue to satisfy one of the main objectives in dentistry — being to retain the natural dentition wherever possible and wherever practical.

References

8. Dentsply Tulsa Dental. ProRootTM MTA Root canal repair material; Material safety data sheet (MSDS).

About the Author

Gary Glassman, DDS, FRCD(C), graduated from the University of Toronto, Faculty of Dentistry in 1984; and graduated from the endodontology program at Temple University in 1987, where he received the Louis I. Grossman Study Club Award for academic and clinical proficiency in endodontics. The author of numerous publications, Glassman lectures globally on endodontics, is on staff at the University of Toronto, Faculty of Dentistry, in the graduate department of endodontics, and is adjunct professor of dentistry and director of endodontic programming for the University of Technology, Jamaica. He is a fellow of the Royal College of Dentists of Canada and the endodontic editor for Oral Health dental journal. He maintains a private practice, Endodontic Specialists, in Toronto, Ontario, Canada. He can be reached through his website, www.rootcanals.ca.
The rationale and use of electronic apex locators

Electronic apex locators (EALs) are my best friend when performing a root canal. Of all the devices I use in practice, my RootZX-mini (Fig. 1) is the most indispensable. This is borne out by the fact that most endodontists use an EAL to determine length in every root canal they treat.

The rationale for using an EAL in every single canal you treat? A short review of the anatomy literature reveals conventional radiography to be no greater than 80 percent accurate for length determination, vs. 97 percent accuracy with EALs. One of the worst endo concepts — ever — has been the procedural recommendation that we treat root canals a certain distance from the root apex — a strategy based on the average position of root canal foramina.

Unfortunately, none of our patients is average. Every single root canal you enter for the next 35 years of practice will be different than the one before. So how is it going to work when we arbitrarily assign apical preparation sizes based on averages? Not so good, actually. When we decide all small canals should be enlarged to a #35 file size at the end of the prep, we will often have one of two untoward outcomes: apical damage or incomplete preparation.

So it is with length determination. With an EAL, you will know immediately when you reach the end of root canals with the smallest, first negotiating files — data that is so critical to controlling our use of these instruments and preventing apical damage. Without an apex locator, you will never know where you are in a root canal until you have horsed a #15 KF to estimated length and have taken an X-ray; in small curved molar canals, this can be disastrous. Working initial negotiating files short in error invites apical blockage and ledging, while working them erroneously long invites ripping apically curved canals straight, outcomes that happen more often than most of us realize.

Yet the majority of general dentists do not use EALs. Why? Many have been unsuccessful in first use — no surprise; EALs are technique-sensitive to

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Fig. 1. The RootZX-mini. (Photos/Provided by L. Stephen Buchanan, DDS, FICD, FACD)

Fig. 2. Make sure your EAL is in good working condition by checking its batteries, cords and file probes.
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1) Confirm a good condition of the EAL, its batteries, its cords and its file probes (Fig. 2). These are sensitive electronic devices with boards inside that can break when drop-kicked in an operatory. Be gentle with them. When their signal shows halfway, replace the batteries with fresh ones. When EAL cords have been autoclaved repeatedly, they may develop tarnish that inhibits conduction at the cord connections and at the end of the file probe where it touches the shank of the file being used. Using a bur brush here will take care of the tarnish.

Ideally, use a straight file probe that has been gold plated (this prevents oxidation) at its business end. These work the best of all EAL probe designs I have used (Fig. 3).

My least favorite is the spring-loaded test file leads that most dentists attach to their files. They are too wide to fit them between the rubber stop and handle in canals longer than 22 mm. Test leads attached to files during negotiation dampen tactile feedback, increasing the risk of damaging tortuous apical anatomy.

The straight probe can be temporarily set on an alcohol gauze, located on the patient’s bib, as the assistant places the lip clip under the rubber dam — on the opposite side of the tooth being treated, with the EAL display nearby. When estimated length is approached, it is then very convenient to simply retrieve the file probe from under the patient’s chin, touch its thin, V-cut end to the file shank, between the rubber stop and the handle (Fig. 4).

The file in hand is then advanced into the canal until the display meter pegs to the farthest red “Apex” indication, and the instrument is turned slowly in a counter-clockwise direction until the meter is only lit up to the simulated “0.5 mm” mark and the green bar opposite that mark stops blinking and holds steady for a couple of seconds.

Lead sets typically need replacing in my office every six to 12 months. Not autoclaving EAL cords and probes is no bueno, and the temperature and steam fatigues the insulation, so accept this and pop for a new cord set every now and then.

2) Cut a nice access cavity: I am often asked how I use EALS when working next to metallic restorations, as it can be difficult to avoid shorting the signal. My first consideration is to make sure the line-angles of the access cavity have been cut so that files may drop smoothly, without hitch, into each canal without significant flexure of their shank ends.

A well-cut access cavity will allow files to be easily held away from an adjacent metal crown or alloy restoration. To do so, get a finger rest, look carefully as you center the file in the access prep, then direct your attention to the EAL display as you turn the file back and forth until the meter arrives at a reproducible length measurement.

If you still have trouble keeping files from shorting, cut heat-shrink tubing (RadioShack) into 9 mm lengths and place them on your initial negotiating files and the procedure can go on. A little practice and this will no longer be necessary. Not to brag, but I don’t have any greater difficulty using EALS through metallic restorations or crowns and would rather do that than work on teeth devastated by caries.

3) Use a lubricant such as RC Prep or ProLube instead of NaOCl during electronic length determination. This is the second requirement for working successfully through access cavities with adjacent metal. In fact, doing all initial negotiation procedures through an access cavity filled with lubricant will smooth out all EAL use as it helps eliminate the apical blockage so common in vital cases. Not only has there been no evidence-based research proving NaOCl is helpful for negotiation procedures, all of our clinical experience shows lubricants to be the ideal solution to have in the pulp chamber as initial negotiating files are taken into small curved canals. When sufficiently small first files are used in a bath of lubricating solution, apical soft-tissue blockage can be totally avoided.

Plus, all EAL readings are more stable with lubes, and most erratic with bleach. Lose the bleach, until later in the procedure.

4) Increase file size when EAL readings are erratic. Simply using one or two larger sizes of negotiating

‘If you want to eliminate working films altogether, use a lubricant and an EAL during apical gauging procedures and you will know exactly where to fit the cone.’
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file works virtually every time when first or second files taken to length return an erratic, jumpy signal. Going to a larger size file with a lubricant during EAL use will solve erratic signals for most brands of apex locators.

Of all the unnecessary obstacles to success with EALs, this one was my bête noir for years until Johan Masrellez twigged me to the use of lubricants during EAL use.

5) Use an EAL in every canal you treat, and you will become proficient. Pulling the office EAL from the back of a dusty closet once every two months — when radiographic length determination isn’t working and expecting immediate success requires a rich fantasy life. Conversely, when I have an apex locator, I can be on a dental mission in an underserved region and do a pretty nice RCT with no X-ray machine. Get one, if you don’t already have one, and use that sucker every time, and you will have waaay more fun doing RCT. Take this recommendation to heart, and soon you will be ready for the EAL homerun:

6) Stop taking length determination radiographs. If you are able to accept gifts from heaven and are looking for a way to be more efficient when delivering RCT, eschew length determination radiographs. Remember 80 percent vs. 97 percent? So what do we accomplish when we stop everything to capture a length determination X-ray? To see files as they exit molar root structure, multiple X-rays are usually required, so why are we doing this?

Furthermore, curved canals change length as they are worked. When you use an EAL for each negotiating file, it is common to observe the loss of 1/4 to 1/2 mm of canal length just going from the 08 KF to the 10KF, as the original irregular canal path is smoothed. So do we capture a second length determination X-ray after negotiation, and a third after shaping?

Rather than spend the time to capture a radiographic record of a length that will change almost immediately after, consider this:

Using today’s rotary instrumentation, I can literally cut an initial shape, a final shape, gauge the terminus and fit a gutta-percha cone in less time than it usually takes to capture a well-angled X-ray image of a #15 KF at length. Then, when I take an X-ray image with the cones in place I can be certain that the length represented will be stable to the completion of the case. If you want to eliminate working films altogether, use a lubricant and an EAL during apical gauging procedures and you will know exactly where to fit the cone.

I know this works; I practiced for three years (including live demonstrations) without taking a working film after canal location — and my apical accuracy improved.

L. Stephen Buchanan, DDS, FICO, FACD, is a diplomate of the American Board of Endodontics and an assistant clinical professor at the postgraduate endodontic programs at USC and UCLA. He maintains a private practice limited to endodontics and implant surgery in Santa Barbara, Calif., and is the founder of Dental Education Laboratories, a hands-on training center serving general dentists and endodontists who want to upgrade their skills in new endodontic and implant technology. Dr. Buchanan can be reached through his business, Dental Education Laboratories, www.DELendo.com, info@endobuchanan.com.
DENTSPLY Tulsa Dental Specialties, a manufacturer and marketer of products for endodontics (ProTaper NEXT, WaveOne, GuttaCore, ProUltra) recently made a significant donation to help establish the University of Tennessee’s new Advanced Specialty Education Program in Endodontics. The university used the funds to purchase endodontic equipment featuring the latest technology that is housed in a newly renovated, state-of-the-art teaching facility located on the university’s Health Science Center campus in Memphis, Tenn. The new clinic is named after the company in honor of its contribution.

“Ultimately, we are driving better dentistry practices by helping to fund endodontic programs like the one at the University of Tennessee,” said John Voskuil, vice president and general manager of DENTSPLY Tulsa Dental Specialties. “Offering an enhanced education to these students provides health benefits to the entire community because they train on the latest equipment and technologies.”

Previously, UTHSC College of Dentistry students had to leave the state to receive endodontic training. The addition of the Advanced Specialty Education Program in Endodontics was a long-time goal at the College of Dentistry and a demonstration of its commitment to giving patients in the community more options when a higher level of endodontic care is necessary. With the new clinic, students are immersed in a total digital operatory with custom endodontic carts, digital radiography, cone-beam tomography, practice management software and microscopes connected to high-definition plasma screens. Faculty are able to monitor treatment rendered by residents in HD video, as all microscopes can be displayed to the remote endodontic conference room.

“We would not have been able to launch this program without the support and collaboration of partners like DENTSPLY,” said Adam Lloyd, BDS, MS, chair of the department of endodontics at the College of Dentistry. “As a teaching program for the endodontic specialty, our goal is to provide a clinical setting that comes as close to a real-life practice as possible. DENTSPLY is a recognized leader in endodontic best practices and our partnership with them is a tremendous asset in training our residents using the best available technology.”

University of Tennessee officials and representatives from DENTSPLY unveiled the new facility by holding a ribbon cutting and community open house on Sept. 6.
X-Runner all-tissue ablative laser scanner

Designed for use with the Lightwalker AT, combo erbium, Nd:YAG dental laser system

“The X-Runner” was designed specifically for the award-winning LightWalker AT Dual Wavelength dental laser. X-Runner is the first ablative all-tissue laser scanning handpiece in the dental industry. The X-Runner has automated all-tissue ablation capabilities and lets the user instantly adjust spot size and shape of the cutting area.

According to the company, X-Runner is the perfect tool to use whenever deep, wide or precise cuts need to be made in hard or soft dental tissues. The shape and size of an ablation area can be selected in advance to optimize the cutting process, enabling dentists to work more precisely, faster and with greater ease than ever before. The new handpiece is ideal for a wide range of treatments, from standard cavity and veneer preps to high-precision surgical and implantology procedures.

All parameters and settings that are available with the LightWalker AT’s standard laser handpieces (energy, frequency, mode, spray) can also be used with X-Runner, and users can instantly switch between the new automated modality and the classic handpiece modality without the need to swap handpieces. X-Runner offers a variety of treatment shapes (circular, rectangular/linear and hexagonal) that can be set according to a number of parameters, such as the size of the ablation area (width and length, or diameter in the case of the circle and hexagon) as well as the number of laser passes needed to produce the required ablation depth. X-Runner can also produce a precise linear cut, for instance to cut the root apex or to perform an incision in soft-tissue surgery. You can watch the X-Runner in action at www.t4med.com/lightwalker_videos.html.

The award-winning Fotona Lightwalker AT is a high-performance, ultra-fast and versatile laser with both Er:YAG and Nd:YAG wavelengths and a long list of technological and clinical advancements that puts it in a class of its own.

According to the company, Lasers4Dentistry, with the Fotona lineup, is a leader in the U.S. market with a history of breakthroughs in dental technology:

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• The highest-power erbium laser available, 20 watts of Er:YAG energy for ultra-fast cutting of both hard and soft tissue.
• 15 Watts of Nd:YAG energy for treating periodontal disease, soft-tissue surgery and effective biostimulation.
• Quantum Square Pulse (QSP) technology for ultimate performance, cutting speed and treatment precision.
• Industry-leading 50 µs Super Short Pulse (SSP), resulting in less need for local anesthetic.
• Proprietary Variable Square Pulse (VSP) increases cutting precision and speed and provides patients with a more comfortable experience.
• OPTOflex® articulated arm delivery system, the gold standard for efficiency, ergonomics and reliability.
• X-Runner, the world’s first and only automated dental laser scanner.
• Optional high-visibility green aiming beam.
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PIPS Laser Endo harnesses the power of the Lightwalker

PIPS™ Laser Endo (PIPS™) harnesses the power of the proprietary Lightwalker Er:YAG laser, both exclusively available from Technology4Medicine (www.T4Med.com), to create photoacoustic shock waves within the cleaning and debriding solutions in the canal. The containment of the shockwaves thoroughly streams these solutions three-dimensionally through the entire canal system, enhancing their effectiveness. The canals and subcanals are left clean and the dentinal tubules are free of smear layer. It is a well-established fact that different dental procedures require different laser wavelengths. Wavelength is important to clinical outcomes because specific body tissues interact in different ways depending on the particular laser source.

The Lightwalker is a true dual wavelength system. With the choice of two complementary wavelengths, LightWalker is the “universal” laser. Practically all laser-assisted dental treatments can be performed with either the most highly absorbed Er:YAG laser wavelength or the selectively absorbed, deeper penetrating Nd:YAG laser wavelength.

There are many advantages to using the Lightwalker and its proprietary PHAST (Photo Active Systems Technology) and PIPS (Photon Induced Photoacoustic Streaming) for endodontic procedures:

- First is the entire root canal and subcanal system is more effectively cleaned and debrided than with traditional instrument-only techniques, reducing the risk of re-infection.
- The minimally invasive nature of PIPS preserves more tooth endoskeleton than traditional instrument techniques because filing can be limited to as small as ISO #20 or #25, maintaining more post-restoration tooth strength.
- Sub-ablative power levels eliminate the risks of thermal damage, ledging and demineralization inherent to other laser endodontic methods.
- Because the PIPS tip is inserted only into the coronal opening and not into the canal, there is no risk of tip breakage from curved canals or unwanted apical extrusion of chemical irrigants, as is possible with standard laser endodontic methods.
- Less filing time and less soaking time for chemical agents can significantly reduce treatment time while being more effective.

The SEM images below demonstrate the effectiveness of PHAST Laser Endo...
The innovative Stropko Irrigator has essential uses in any discipline of dentistry — to make restorative, endodontic, periodontal, surgical, micro-adhesive dentistry, orthodontic and implant procedures easier by constantly maintaining a clean field with uninterrupted vision. The Stropko Irrigator (Fig. 1) has numerous advantages over the standard dental tips. 

It easily replaces the standard three-way syringe tip and accepts a variety of luer-lock tips, enabling more precise management of irrigation with air and/or water. The large variety of luer-lock tips enables direct access to any area of the mouth or tooth, during any procedure, no matter if it is the lingual of an anterior, the distal of a molar or an apical retro-prep during surgery.

Using the Stropko Irrigator, cleaning and drying can be done with more precision and control, eliminating all unintentional splashing or contamination of the working area. With standard syringe tips, it is not possible to prevent the dentinal dust from obstructing the vision. A good example of vision control can be observed while throughing in search of hidden canals as demonstrated in Figures 2 and 3.

Figure 2 shows how vision is obstructed by debris created during endodontic instrumentation. In Figure 3, note the vast improvement of vision when the Stropko Irrigator is used. The debris is eliminated as it is created, thus permitting continuous clear vision.

The outcome of any dental procedure is achieved easier, faster, with more predictability and less stress. Needless to say, the advantages of using the Stropko Irrigator are especially appreciated when using a surgical operating microscope during any dental procedure.

The Stropko Irrigator is available in two lengths: the 2.5-inch original length (SI-OL) and the 4-inch extra long (SI-XL). The Stropko Irrigator allows the operator or the assistant to remain ergonomically comfortable and stay clear of the working site. Using the supplied adapters, the Stropko Irrigator easily replaces the older three-way syringe tips. No adapters are needed for the newer “quick-connect” three-way syringes.

The Stropko Irrigator is manufactured in the United States using the strictest of quality control measures and has the coveted C.E. mark. It has been imitated but never duplicated and can be purchased at most dental suppliers, or visit www.stropkoirrigator.com for more information.
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Wykle Research has announced the release of two new Calasept Endo products, which it distributes for Nordiska Dental of Sweden, the manufacturer of Calasept and Calasept Plus.

Calasept Irrigation Needles are high-quality, double-side-vented, luer-lock irrigation needles that optimize the cleansing of canals, creating a “swirl effect.”

The needles are available in 27 g or 31 g, in packs of 40 needles.

Features include the following:
• Bendability
• Luer-lock hub
• Sterile and disposable
• Designed for ease in cleaning roots
• High-quality stainless steel

Calasept Irrigation Syringes are 3 ml luer-lock, single-use syringes. They are color-coded to eliminate risk when using multiple irrigation liquids. They are available in packs of 20 syringes, 10 white and 10 green.

Features include the following:
• High-quality, three-part syringe
• Color-coded
• Luer-lock

These new products complement Wykle’s Calasept line, which includes Calasept and Calasept Plus calcium hydroxide paste for temporary filling of root canals, sold in packages of four syringes with 20 needles. Calasept EDTA is 17 percent EDTA solution. Calasept CHX is 2 percent chlorhexidine solution for irrigation. Both solutions are packaged with a luer adaptor for easy filling of syringes.

Wykle Research distributes Calasept Endo products by Nordiska Dental, a Swedish manufacturer of dental supplies. Wykle Research and Nordiska Dental will continue to provide new endo products.

For more information, contact Wykle Research at (800) 859-6641 or visit the company online at www.wykleresearch.com.
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Please note that all the textual elements of your submission:

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- contact info (email address please)
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Insert figure references in your article wherever they are appropriate, whether that is in the middle or end of a sentence, but before the period rather than after. Our preference is to have figure references noted in the appropriate place within the text, as it helps the readers to orient themselves when moving through the article. In addition, please note:

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