

roots

the international magazine of endodontics

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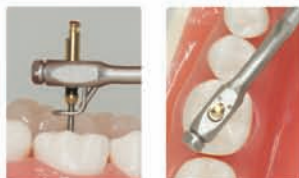
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*A diaphanized maxillary molar with exposed vascular distribution.
(Photo: ©2020 provided by Craig Barrington, DDS)*



Advances in diaphanization and photography reveal wonders of pulp chamber

Author_ Fred Michmershuizen, Managing Editor

Many readers will be familiar with Craig Barrington, DDS, whose photography has been featured on the cover of *roots* a number of times over the years, including the issue you are looking at now. His images also appeared in *Endo Tribune* along with an

interview (see "The immense variability of human tooth anatomy," *Endo Tribune*, December 2016, Vol. 11, No. 4, Page 1).

Since that article appeared, Barrington has refined and improved his technique even further, with

results that are often even more breathtaking in scope and sheer beauty. Barrington's photographs of the interior of teeth often reveal vasculature that is more complex than has previously been revealed. Some of the images resemble other forms in nature, such as the branches of a tree, or a river and its tributaries, or even a coral formation.

In a new interview with *roots* conducted in October 2020 via web conference and email, Barrington shared and described some of his more recent images (Figs. 1-3), and he offered some of his own insights on the complexity of this particular aspect of human anatomy.

For those who are learning of you and your work for the first time, can you please give us a brief explanation?

I use diaphanization, which is the exposing of a former living tissue to a series of chemicals and processes to make it transparent. This is how organs were viewed in 3-D prior to the computer technology we have today. The initial process was created by Werner Spalholz in 1906. The process was introduced to dentistry via



Fig. 1 The dual color stained vascular distribution with the pulp chamber of a lower first molar. In the center bottom portion of the chamber we see a very large vessel structure. It's these large vessels lying on the chamber floor that create the well-recognized dental map. (Photos: ©2020 provided by Craig Barrington, DDS)

publication in the Dental Cosmos in 1913.

Your work has been featured on the cover of roots before, and you also gave an interview to EndoTribune a few years ago that was illuminating as well. How have you refined your technique since we last spoke?

Oh wow!! I crossed in to a new dimension that I never knew was possible. As you see, I have been able to repeatedly expose not only the canal systems of a human tooth but the internal structures in the form of the vascularity and the nerve all in the same specimen. I have been able to do this in a repeatable and reproducible fashion. It has occurred out of pure luck, intense repetition, astute observation and ultimately through learning from error.

How long have you been photographing teeth in this manner?

For more than 20 years now. But the recent photographs are also of a completely new method that came about through luck, reading, repetition, observation and failure.

How long does the diaphonization process take?

This depends on the structures one would like to view vs. the initial starting point of the specimen acquired. If someone wants to view the results of a failed, extracted tooth root canal then it doesn't really matter how the tooth was acquired or whether or how the tooth was stored. With teeth like this, a result can be achieved in 12 to 24 hours. If one would like to achieve a result where the vascularity/nerve are visible, then the collection and storage have specific parameters that need to be followed. Overall, a result can be achieved in about five to seven days from the acquisition of the specimen.

What has surprised you the most about the human anatomy since you started creating these images?

There is still so much we don't know. We think we are in control, but we are very much not anywhere close to understanding the human body and its functions.

Has your work in this area changed your understanding of dentistry in general?

I have taken a turn in a direction that dentistry is not going. I have seen things, entities and formations that no one else has ever seen before in dentistry. I have had time to think about these observations and possibilities that could come about in our clinical options. Currently there is no research, materials



or methods to approach the pattern of results in anatomy that I have seen.

In your view, how can dentists and specialists benefit from studying these images?

We should be working to aid and/or repair the tooth in healing itself vs. removal and replacement of these structures.

The vascular anatomy is quite pronounced in your images. Do you see any uses in dentistry, or in medi-

Fig. 2_ The vascularity of many upper second molars is very dense in many cases regardless of the age of the patient. Through the center of this pulp chamber we see a return flow vascular body.



Fig. 3_ The vessel distribution within the canals of teeth is a gravity defying, law of physics breaking, anti-law of conservation of matter and mysterious observation that needs much more documentation.

cine in general, for how the harvested teeth might be used now or in the future, aside from photography and study?

The list is so long that it's hard to know where to start. For one aspect, teeth are being extracted and discarded as trash when inside are blood vessels that could be harvested, grown and used in other parts of the body. This doesn't just have to be a wisdom tooth. There is quite a bit of vascularity in every tooth and at every age group.

In another area, the effects of medication on the dental pulp needs to be analyzed, as I have already achieved results that expose the vascularity of the pulp and there are some unusual appearances. It is my very initial hypothesis that one of the medications patients are taking is altering the blood flow in their teeth. This could be used to the advantage of some other attribute in medicine or at least be an aid in the tooth healing itself via a medication the patient takes vs. having a root canal in a clinical setting.

This list is long, so to cover all of it here would be difficult. But how is that for starters?

Your pictures would not be out of place in an art gallery. What do you think?

Probably the first reaction I get from many people is that they immediately see artwork and want to make a picture to hang on a wall. I find that admirable, but it honestly overlooks and somewhat negates that we need to understand that these are human body parts.

It has been my wish and demand that these images not be used as art or for profit but that they be viewed from a scientific basis such that we advance humanity, dentistry and/or medicine and the benefit of all suffering from conditions and/or illness.

I think this quote, from Pope John Paul II in his encyclical *Evangelium Vitae*, applies: "Respect for life requires that science and technology should always be at the service of man and his integral development. Society as a whole must respect, defend and promote

the dignity of every human person, at every moment and in every condition of that person's life."

Do you have plans to publish these photographs?

I have a book in the process of being published with Quintessence. We have a few more months before that gets completed, but then I hope to start on a second, follow-up edition.

Do you have anything you would like to add?

I would like a full-time job researching internal anatomy of human teeth. We need more results and observations in the realm of patterns and associations with various systemic conditions and medications.

Currently all the results achieved have been as a result of my efforts working mornings, evenings and weekends around a full-time active dental practice. Even if I could work two to three days in a row undisturbed and with help, the results could be increased tenfold from what I've been able to achieve on my own, on the time I have available.

There is no doubt that this work could benefit humanity on many aspects and horizons._

_about the doctor	roots
<p>Craig Barrington received his DDS from the University of Texas Health Science Center San Antonio in 1996 and is a member of Omicron Kappa Upsilon. He maintains a practice in Waxahachie, Texas. He has written various articles and publications on the dental operating microscope in general dentistry. For comments, questions or presentation requests, please contact Barrington at cbdds002@yahoo.com.</p>	

AAE conducts media tour on dental emergencies during COVID-19

Author_ AAE Staff

To help increase awareness about the crucial work endodontists are performing during the COVID-19 pandemic, American Association of Endodontists President Dr. Alan H. Gluskin recently completed a media tour in which he delivered a message about the importance of seeking treatment for dental emergencies.

Gluskin took part in 24 unique interviews — with many more airings than that, thanks to a self-contained interview, which was picked up in several media markets throughout the country. In addition to the interviews, Gluskin released video and audio news releases to drive these important points home.

In total, the media tour yielded 387 broadcast TV interviews and 146 radio interviews. There were 1,023 distributions of the video online, with 1,612 total placements and 255.4 million total impressions.

As Gluskin explained to the public, endodontists are the dental specialists who focus on root canal treatment and saving teeth. He said that more than 90 percent of endodontic practices are fully



AAE President Dr. Alan H. Gluskin recently appeared on several news programs discussing the importance of continuing dental visits — even during the pandemic. (Photos: American Association of Endodontists)



'I highly recommend everyone gets to know our new Newsroom site,' says AAE President Dr. Alan H. Gluskin, shown at right during a recent satellite media tour.

reopened now, and most of these specialists were open for emergencies even during the height of COVID-19, reducing the need for patients to seek emergency dental care at ERs and urgent care facilities.

Gluskin also advised patients not to delay routine check-ups with their dentists. Putting off preventive care will only make dental issues worse and could potentially lead to long-term issues with teeth and gums, he said.

To make offices as safe as possible, AAE members have been adhering to all guidelines put forth by the AAE, ADA and CDC, creating a well-protected office experience for all patients in need, Gluskin said.

Questions answered by Gluskin included the following:

- What constitutes a dental emergency? How do you know if you need an endodontist?
- What is the "rubber dam" and why is it important, especially in the era of COVID-19?
- Along with the standard safety and sterilization precautions regularly implemented, what additional prevention steps are endodontists' offices taking?
- What can patients expect when visiting a dental office?
- What preventative care should people be practicing during the pandemic? Where can I go for more information about COVID-19, emergency dental care and finding an endodontist?

Gluskin also emphasized AAE's efforts to help keep emergency rooms clear for those who need them by helping dental patients find the right professionals in cases of dental emergency. Gluskin talked about the AAE's Guidelines on Dental Emergencies and Oral Health through the coronavirus pandemic and directed viewers and listeners to seek emergency dental care from endodontists first, rather than visiting hospital emergency rooms or urgent care facilities.

AAE's new dedicated Newsroom website

The AAE also recently launched a Newsroom web-

site, located at <https://newsroom.aae.org>, designed with the media and public in mind. The new site is designed to serve as a meaningful way to elevate endodontics and endodontists, and it touts the importance of saving the natural dentition through root canal treatment.

"In recent years, the AAE has created an abundance of award-winning engaging content clearly outlining the important work endodontists do, and now we have a digital home for it all," Gluskin said. "This new site is much more than a repository, however. It is a dynamic site and will continue to be updated as we release several more public-facing activations in the coming year. This is just the beginning."

Recent years have put the AAE on the map in terms of creative media and communications. From the installation of a chief marketing and communications officer, to the development of a full marcom team, to the launch of a major public campaign — this has all led to now, several awards later, as the AAE is ready for a dedicated newsroom to serve as a useful media hub, the AAE said.

The Ask the Expert section allows journalists on deadline to get questions answered quickly — directly from AAE member and Public and Professional Relations Committee Chair Dr. Mark B. Desrosiers.

AAE members and dental professionals will also find the site useful, as it includes many downloadable, such as videos, infographics and fact sheets, the AAE said.

While aae.org/patients is the AAE website geared toward the public, any patients who find themselves at newsroom.aae.org will likely find it useful as well, the AAE said.

"I highly recommend everyone gets to know our new Newsroom site," Gluskin said. "Head over to newsroom.aae.org and stay a while. There's something there for everyone to gain, and it really sets the stage for our exciting future creative plans." _

AW-100 Sonic Endodontics handpiece

Author_ Micron Corp. staff

The AW-100 is an air-driven handpiece specifically designed for root canal preparation and irrigation. Its major characteristics, as described by Micron Corp., the company behind the product, are as follows.

The AW-100 provides users effective and efficient root canal treatments, the company said. Especially the strong sonic vibration (2,000-3,000 Hz) greatly exhibits a high irrigation effect in root canals. The vibration generates high-speed stream and bubbles of water, and those are delivered to the entire root canal including accessory canals and isthmuses to wash off smear layer, pulp tissue and debris. This is the key to the long-term success of endodontic treatments.

The AW-100 has a power control ring, and it can adjust the sonic vibration to suit instruments in use or root canal shapes.

The very compact head of the instrument holder allows fine-tuned treatments and easy access to root canals without obstructing the view. It is also effectively used for treatments under microscopes, the company said.

The instrument holder is adaptive to various types of rotary files with a shank diameter of 2.35 mm, which a lot of endodontists frequently use. Users can choose the optimal file according to the treatment plan.

The AW-100 is a patient-friendly device, the company said. It is powered by compressed air, so it will not generate electromagnetic waves that could affect the human body. It is safe to use especially for people who have pacemakers, the company said.

Micron Corp., manufacturer of the AW-100, was established in Tokyo in 1976. Its core technology is the air-driven sonic vibration system based on aerodynamics, and that has been utilized in all the company's products, such as endodontic handpieces, air scalers, air polishers and three-way syringes. Micron Corp. prides itself on providing the highest quality products and it will always take into consideration clinical benefits to users and patients, the company said.

For more information, call a dealer, Handpiece Solutions Inc. at (888) 488-3885, visit www.handpiecesolutions.com or visit Micron Corp. at www.micdent.com.

The AW-100 Sonic
Endodontics handpiece is
available from Micron Corp.
(Photos: Micron Corp.)

