He brought a world of enthusiasm and knowledge to the global endodontic community

Fred Weinstein, DMD, MDCL(C), FICD, FICD, who passed away Oct. 15, 2017, at the age of 78, is pictured in Anaheim, Calif., at the California Dental Association meeting, CDAs Presents: the Art and Science of Dendrology, in 2012. A retired endodontist from Vancouver, British Columbia, Weinstein often traveled to dental meetings to keep his knowledge of the specialty current and to visit with many friends. (Photo/Fred Michmershuizen, Managing Editor of DT America)

Fred has been an inspiration for me for all these years, ever since we met over 50 years ago,” said Gerald R. Glickman, DDS, MS, professor and chair at Texas A&M College of Dentistry in Dallas, one of many endodontists who shared fond memories of Weinstein.

“What a remarkably kind and insightful individual he was — always inquiring about me and others and never letting on about himself,” Glickman remembered. “He brought a world of enthusiasm and knowledge to the global endodontic community. I will miss him dearly.”

“Fred was that special kind of person who would do anything he could to help out when needed. He cared for everyone and was a dear friend,” said John J. Stropko, DDS, of Prescott, Ariz. “Fred was a teacher always encouraging others to use the latest technology to deliver better treatment results for their patients. During the process, he went to great lengths to clearly communicate his beliefs in an easy-to-understand manner. Our specialty has lost one of its great members.”

“I knew Fred for more than 25 years, and I always found it entertaining to be in his company,” said Anne Lau- ren Koch, DMD. “We went to hockey games, basketball games and endodontic meetings together. Fred was a character, but in the best sense of the word. He was entertaining, charming and unpredictable. That was Fred. But to those of us who knew and loved him, he was much more than that. He was a royal friend who made a maximum effort to understand each of us in a personal and supportive way. Really, at the end of the day, Fred was a mensch. He will be very much missed.”

Weinstein was born in 1939 in Winnipeg, Manitoba. He graduated from the University of Manitoba at the age of 22 with a degree in dentistry, and then he went on to study endodontics at the University of Pennsylvania School of Dental Medicine in Philadelphia, under the tutelage of Dr. Louis Grossman, known as the “Father of Endodontics.” After receiving his Certificate in Endodontics from the University of Pennsylvania in 1969, he moved his family to Vancouver and established an office in the Fairmont Medical Building, where he would go on to practice for more than 40 years.

“He loved his patients, and he equally enjoyed teaching and lecturing throughout the world to advance the learning within dentistry,” his family wrote in an obituary published in the Vancouver Sun.

Weinstein’s accomplishments within the profession were notable. He served as an assistant clinical professor at the University of British Columbia and was a past president of the Canadian Academy of Endodontics, the British Columbia Society of Endodontics, the Interdisciplinary Society of British Columbia and the International Federation of Endodontic Associations (IPEA). He was a member of the Royal College of Dentists, and he was a fellow of the American College of Dentists and the International College of Dentists.

He served on advisory boards for several leading dental manufacturers, and he lectured extensively throughout the world. He also served as a volunteer endodontist at the 2010 Vancouver Winter Olympics, and performed root canal treatment on world boxing champion Sugar Ray Leonard in the 1980s.

“He was especially proud to have served as the general chairman for the 2007 IPEA World Congress in Vancouver. To drum up excitement for that meeting, he dressed as a Royal Canadian ‘Mountie’ at several events leading up to it — something that friends and colleagues remembered for years.

“Fred always had a smile and was known as the ‘Canadian Mountie’ for his outfit that he wore at every dental meeting to promote the IPEA meeting in Vancouver in 2007,” remembered Samuel O. Dom, DDS. “He was truly dedicated to the Canadian Academy of Endodontics and its place in global endodontics. His passion to understand endodontics and friendship will never be forgotten.”

“I cherish my photo of us with him dressed as a Mountie when he was president of IPEA,” said Dr. William Ben Johnson. “Fred and I started out as endodontic colleagues, then became friends. So much so he would go snow skiing with me when I didn’t care for skiing, and I would drink wine with him when I preferred scotch. I’ve lost a friend.”

After his retirement from practice, Weinstein continued to travel to dental meetings to keep his knowledge of the specialty current and to visit with his many friends.

For many years, Weinstein was editor in chief of roots magazine, the international C.E. magazine of endodontics, published by Dental Tribune America.

“Above all of Fred’s accomplishments and titles, his family remained his number one priority in his life, always,” his family wrote in the Sun. “He had a gentle heart of gold, compassion and sincerity and a smile that would illuminate a room.”

By Fred Michmershuizen, USA

He will be remembered as a friend, a teacher and a healer. Fred Weinstein, DMD, a retired endodontist from Vancouver, British Columbia, died Oct. 15, 2017, at the age of 78, after a brief illness. His fellow specialists expressed sadness at his passing and acknowledged how his passion for the profession rubbed off on them through many decades of friendship. Many are also remembering him for his ability to have fun — especially when it came time to promote an international endodontic conference hosted in his native country.

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MTA placement with the Produits Dentaires (PD) MAP System

By Dr. Mauro Amato, Switzerland

More than 20 years ago, Torabi-nejad et al (1993) first described a new root-end filling material called mineral trioxide aggregate (MTA). MTA showed in vitro better sealing ability than amalgam or Super EBA when used as a root-end filling material. Later, several in vivo and in vitro studies demonstrated more applications for MTA. Pulp capping, apexification, repair of root perforations and root-end filling are commonly described clinical procedures to seal the pathway of communication between the root canal system and the external surface of the tooth. The application of MTA was first described as being achieved with aid of plastic or metal spatulas (Torabinejad and Chivian 1999). Unfortunately, proper placement was not possible in this manner. Therefore, Produits Dentaires introduced a universal carrier system for clinical and surgical MTA placement. Its Micro-Apical Placement (MAP) System offers different application points for every clinical situation. The Intro Kit and the Universal Kit are for orthograde obturation and the Surgical Kit for retrograde obturation. The NiTi Memory Shape tips can be manually shaped to any required curvature. After autoclave sterilization, the needle returns to its initial shape. With the use of the MAP System, proper placement of MTA has become an easy task for every dentist. In combination with the MAP System, Produits Dentaires offers a white MTA specially developed for placement with the MAP System. The optimized practical size means economical application for each treatment. There are many indications for the PD MTA White, and with the MAP System, proper placement is easy in every situation.

Pulp capping
Vital pulp therapy has become more popular in recent years. Calcium hydroxide has been the most common material for pulp capping, but MTA has shown even better results in bio-compatibility and outcome (Aguilar and Linsuwanont 2011). Cases with large carious pulp exposure can be treated successfully with partial pulpotomy and MTA as a capping agent, keeping teeth vital (Figs. 1a-e).

Apexification
In order to prevent extrusion of root canal filling material in immature teeth with open apices, MTA is used as an apical plug. The results of many studies have shown that MTA induced apical hard tissue formation more often and its use was associated with less inflammation than with other test materials (Simon et al. 2007) (Figs. 2a–g).

Repair of root perforations
Accidental perforation of the pulp chamber or of the root canal significantly changes the prognosis of the tooth. Perforation repair with a bio-compatible sealing material such as MTA may save compromised teeth (Mints et al. 2014) (Figs. 3a–e).

Apical surgery
MTA is the material with the most favorable outcome as a root-end filling material for apical surgery. MTA has been associated with significantly less inflammation, cementum formation over MTA and regeneration of the periradicular tissue (Torabinejad and Chivian 1999) (Figs. 4a–f).

Dr. Mauro Amato is a lecturer and researcher at the department of periodontics, endodontology and endocrinology of the University of Basel in Switzerland. Dr. Amato is a committee member of the Swiss Society for Endodontology. He can be contacted at mauro.amato@unibas.ch
Preservation of root cementum: A comparative evaluation of power-driven versus hand instruments


Background
Grosek et al suggested that cementum plays an important regulatory role in periodontal regeneration. One of the major goals of periodontal treatment is the removal of pathogenic micro-organisms by scaling and root planning. In the past the misconception was to obtain a root surface with smooth and hard surface characteristics that was free of endotoxins which resulted in the removal of the subgingival plaque and calculus deposits, and the removal of all or most of the cementum. Recent studies have reported that endotoxins were not located within cementum and removal of ‘diseased’ cementum was not necessary for a successful periodontal treatment. Saygin et al concluded that preservation of cementum on the root surface was necessary for new attachment and as a source of growth factor. Hence non-aggressive removal of cementum is essential for optimal periodontal health and regeneration.

Ultrasonic with new shaped tips and subgingival air polishing devices have been developed for removal of root accretions with minimal root damage. Air polishing has been suggested as a treatment modality for root debridement resulting in probing depth reductions and removal of subgingival biofilm. No scientific evidence exists today showing the loss of root substance or surface roughness produced by either ultrasonics or Air polishing.

Aim
To assess the amount of cementum remaining following ultra root instrumentation as well as the surface characteristics of the retained cementum.

Material and Methods
- 48 caries-free, single-rooted teeth in 27 patients diagnosed with severe chronic periodontitis with periodontal probing depth (PPD) ≥5 mm in at least two sites per tooth with radiographable bone loss of more than two thirds of root length and scheduled for extraction were included in this study.
- Teeth were randomly divided into four treatment groups. Instrumentation were performed with medium power settings
  1. Piezoelectric ultrasonic scaler - (Air-Flow Master Pizzol, Instrument Tip PS, EMS SAU - U + AP)
  3. Air polishing with the glycine powder (Air-Flow Powder Pero, Peroxy-Flow Nozzles, EMS SAU - AP)
  4. Hand instruments (Kavo curettes 3/8, 1/3, 1/2 American Eagle, Misoulia, MT, USA - HC)

Treatment
- One apicalmost root surface of each tooth was randomly subjected to debondment, and the other apicalmost surface was used as control.
- Following instrumentation, the teeth were immediately extracted traumatically and analyzed with a dissecting microscope.
- Remaining calculus, root surface roughness and loss of root substance were evaluated along with scratches, gouges, cracks, and any other changes in the cementum that was present were noted.

Results
- Remaining cementum:
  - Percentage of coronal cementum remaining following subgingival instrumentation was 86% for U, 80% for U + AP, 94% for AP and 65% for HC.
  - The amount of retained cementum with AP was significantly greater than with HC.
  - Smoother root surfaces were produced by the HC followed by the AP.
  - Clinical and apical sections showed that AP produced the least amount of cementum loss and therefore the greatest retention of residual cementum.

Conclusions
Air polishing was significantly more effective and superior in preserving cementum.
- Hand instrumentation using curettes was most effective in removing cementum in comparison to ultrasonic or hand instruments.

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Top performance Flexible NiTi file
HyFlex EDM performs well internationally

By Coltene

In the course of two major international events in the endodontic industry, Swiss dental specialist COLTENE interviewed over 190 dentists and Endo experts about their experiences with its latest NiTi file system. The results of the product tests are more than impressive: 98% of the participants would continue to use the HyFlex EDM for the treatment of their endodontic cases, even after the tough test.

The necessary cutting edge
Every two years, both the International Dental Show in Cologne (IDS for short) and the Congress of the European Society for Endodontology (ESE Congress) serve as an international platform for professionals with an interest in endodontics to exchange experiences between colleagues. Thus, both events in 2017 provided the ideal occasion for a large-scale test campaign for the latest NiTi file generation from COLTENE. Selected dentists and joint practices throughout Europe were given the opportunity to put the flexible HyFlex EDM's file system through its paces. 76% of the participants particularly praised the high flexibility that leads to good adaptation in the canal. The pre-bendable files work reliably in all the lengths and sizes currently available on the market without displacing the centre of the canal. Like the proven HyFlex™ CM files, the HyFlex™ EDM files also possess the so-called "Controlled Memory" effect and are distinguished by their high level of flexibility. In contrast to classic NiTi files, they have almost no recovery effect and can be pre-bent through the centre of the canal. This significantly reduces the risk of ledging, transportation and perforation. During autoclaving, they recover their original shape so that they can be reused safely until a visible break in their spiral structure clearly indicates the end of their service life. At the same time, the innovative manufacturing process by means of spark erosion contributes to the high breakage resistance of the HyFlex EDM files, particularly under heavy-duty use. In fact, HyFlex EDM files are up to 700% more resistant to cyclic fatigue compared to traditional NiTi files. A special combination of material surface and tapering allows a significant reduction in the number of files used without compromising the preservation of the natural root canal anatomy. These smart features were also evaluated positively in the test and the dentists use the robust high performance instruments primarily for cases where they want to produce reliable results quickly with a reduced number of files.

Additional files sizes allowing more flexible application
Due to limited access endo experts often want more flexibility from their instruments. Pre-bendable tools can extend the horizon into new dimensions. Particularly in a limited working space, modular nickel-titanium systems display their full strength. With a total of seven highly flexible file variants, COLTENE offers a wide-ranging HyFlex NiTi program. In addition to the usual lengths of 25 mm, all preparation files of the popular EDM series are also available in 21 mm working length. The application of the more agile, shorter models is particularly recommended in the posterior molars and in patients with craniodental problems.

The new HyFlex EDM 20/05 prepation file augments the existing Hyflex EDM line. The additional file enables fans of the flexible NiTi range to treat curved channels only with the efficient EDM files. After creating a glide path with the glidepath file 10/05, the new file with the same taper allows minimally invasive, fast preparation of the canal. Subsequently the actual shaping can be done in the usual manner with the universal file Hyflex EDM OneFile, size 25. Depending on the channel anatomy, apical preparation can be finished with EDM files up to ISO size 6A. Even in those large sizes the files work safely and without transportation of the canal center.

Full control in the dental practice
As an established Endo provider, COLTENE has been working closely with leading dentists, universities and endo experts for many years. The multitude of sophisticated treatment aids, ranging from specifically hardened instruments to bioactive obturation materials, reflects the self-image of the Swiss innovation leader. True to the company’s motto “Upgrade Dentistry”, the COLTENE service team regularly asks practice owners and endodontic specialists about their wishes for even more confident work in virtually all situations. This also formed the basis for the development of the production process called "Electrical Discharge Machining" (EDM for short) by the dental manufacturer's renowned R&D department, which ultimately gave the exceptionally break-resistant files their name. The practice-oriented Endo offer is complemented by a large number of application-related workshops, training material and personal services.

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Success evaluation of N2 treated teeth with open apical foramen.
A retrospective study

By Dr Anette Jochko, Dr Robert Teesuwen & Prof. Jerome Rotgans, Germany

Abstract

95 teeth with open foramen were identified in a general dentist practice during the years 1985—2006. 75 of which could be followed-up by X-ray after an average time of 70 months (follow-up X-ray). 40 teeth were subject to vital extirpation (VIT), 28 teeth to vital amputation (VIT), and seven teeth with necrotic pulp underwent conservative root canal treatment (RTC). A significant success rate amounted to 85.7% (VIT 90.1%, VTA 85.7%, non-vital RT 37.6%). Another 12% could be judged as partial success in molars, as a certain number of the molar roots showed apicification, however, others not yet. The percentage difference of a successful apicification between vitally extirpated teeth and non-vital root canal treatment was significant (p = 0.0057).

Introduction

Endodontic treatment of teeth with incomplete root growth poses a special challenge. In young patients, the necessity for endodontic treatment results from an accident or profound caries. Aside from damage control, this treatment aims at promoting tooth maturation including narrowing respectively closure of the apical foramen (apicification) and possibly root extension (apexogenesis).

According to Zelkow (1967) the following treatment options are commonly used:

- For vital teeth: Pulpotomy (VTA) with subsequent conservative root canal treatment (RTC)
- For non-vital teeth: - either RT or - RT in connection with apicoectomy/lateral root canal filling or - inducing of bleeding with root canal filling in the coronal root part only.

Endodontic failures resulted in ten cases (13.3%). Statistic significance was found regarding failure rate of VTA (75%) and root canal treatment of non-vital teeth (28.6%, p = 0.0057).

Within the observation period 19 teeth of the 95 teeth with open foramen (20%) were extracted. There was a significant difference regarding extraction frequency between the VIT group (64.5%) and the non-vital group (35.5%, p = 0.0095).

Different treatment of teeth with incomplete root growth poses a special challenge. In young patients, the necessity for endodontic treatment results from an accident or profound caries. Aside from damage control, this treatment aims at promoting tooth maturation including narrowing respectively closure of the apical foramen (apicification) and possibly root extension (apexogenesis).

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Knakow et al. (1977) disapproved of a VTA inevitably following root canal filling. Joschko (2013) points out that the often diverging roots of immature teeth exclude a dense root canal filling, and that open apical foramen promotes overfilling. Some authors, like Kornienland et al. (2000) and Haft (2001), state that the dental papilla may simulate an apicodontinosis in the area of the open apical foramen.

Various methods favouring maturation of the immature teeth are described. Surgical interventions turned out to be less promising (Kreter 1999, Khoury 1990). Herforth (1988) obtained a very high healing rate of apical periodontitis with Xodiform deposits, however the success rate regarding stimulation of hard tissue induction only amounted to 3% versus 83% with calcium hydroxide (MTA). Hermann (1920-1980) introduced calcium hydroxide as material with osteogenic potential. Frank (1966) was the first to use it as medical dressing in teeth with incompletely root growth. These dressings should be replaced approx. every three months for a time period of six through 18 months. Cvek (1972) and Forglin (1985), however, do favor a replacement of the dressing only in case of pathology. The long treatment duration—and thus loss of patient compliance—as well as a decrease of fracture resistance (Cvek 1972, Andreasen, Fabrik and Munksgaard 2002, Andreasen, Munksgaard and Bakland 2006, Trope 2006) are regarded as adverse features of the calcium hydroxide method.

As formaldehyde also features an osteogenic potential (Ohran 1993), teeth with formocresol versus calcium hydroxide were made as well. Within a pulpotomy study, Spedding et al. (1996) judged formocresol as being more appropriate for apicification. Latest literature prefers mineral trioxide aggregate (MTA) over calcium hydroxide (Andreasen et al. 2006, Schwartz et al. 2008, Schaffer 2009, Shapabaz et al. 1999) as well as IImeltig et al. (2006) made a comparison between mineral trioxide aggregate and calcium hydroxide ending up in favour of MTA.

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from the files of the practice examined in this study in the years 1985 through 2006. Treatment method was the so-called N2 method according to Sargenti and Richter (1954), which meant no canal rinsing and application of the paraformaldehyde containing N2. Rubberdam was not used. The N2 powder contained 7% formaldehyde before admission by the EU, afterwards the content was decreased to 5%.

Four cases were excluded:  
1. A non-vital case where the initial X-ray did not clearly reveal whether the apical radio lucency of both roots was a matter of apical periodontitis or apical papilla.  
2. A VitA case was extracted allo loco a few days up to 18 months after VitA.  
3. X-ray was insufficient in the third case; Vit of an upper molar  
4. In the fourth case, the patient did not show up again after destabilization of an upper premolar.

Thus, 95 cases to be judged remained, of which only two non-vital teeth were treated in a two-stage therapy. 93 cases were treated in one appointment inclusive definite filling. For root canal filling, the N2 powder was mixed with N2 liquid to a creamy texture; a harder consistency was needed for VitA. N2 application for root canal filling was done by lentulo, for VitA a carrier instrument was used to bring the material into the excavated pulp cavity up to 1–2 mm into the canal access.

The 95 anonymous made cases were clinically followed-up without recall at an average of 73 months after treatment. 75 cases underwent X-ray control (follow-up X-ray) after an average of 70 months; 54 cases as single-tooth X-ray in parallel technique and 21 cases as orthopantomogram.  

Judged as endodontic failure were:  
1. Pain or fistula in the treated tooth, development of apical periodontitis, lingering or newly developed apical periodontitis.  
2. Treatment success of the 75 cases was analysed in two modes considering the questions:  
   a. Did apexification/apexogenesis occur?  
   b. Did the apex remain unaffected of apical periodontitis?  
   c. In multi-rooted teeth with different apical diagnosis, the worst diagnosis was assumed as being valid for the tooth. A double magnifier served as diagnostic aid. Three persons evaluated the X-rays independently from each other. The doctoral candidate (author AJ), a dentist with ten years of professional experience and the practice owner (author RT). The final diagnosis resulted from the consensus of the three ratings.

Statistic significance was assumed for an error assumption of p < 0.05 for comparison of two parameters and calculated by means of the logrank test.
The longer therapy dated back, the easier it became to treat the aim: apetisation or apenogenesis could be verified. Two cases featured open apical foramina (10.5% confidence interval 7.72–9.95%) in nine patients, with or without root growth being observed after an average of 7.2 months (confidence interval 5.97–8.47%). A statistic significance could be calculated, with apetisation occurring in nine cases after an average of 13.9 months (confidence interval 5.97–21.8%). An interpretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method. An inter pretation bias in this study remains the only practical method.