

## Endo Opinion

### A logical basis to judge endodontic innovations

By Barry Lee Musikant, DMD

The introduction of new technology has as its goal to improve a process that was unable to be achieved, poorly achieved by other means or achieving the same or superior results in a more time and cost-efficient manner. Using these criteria as the justification for the introduction of rotary NiTi, the burden of proof is on demonstrating that at least some of these conditions previously existed.

Certainly prior to the introduction of rotary NiTi, dentists were shaping canals in many cases quite well. One simply has to observe the work of Dr. Herb Schilder to recognize excellence before the implementation of rotary NiTi.<sup>1</sup>

Yet, most dentists would admit that achieving that level of perfection is quite challenging using the tools Schilder had to work with. So, while it was possible to attain perfection with what previously existed, the incorporation of rotary NiTi made it possible for more dentists to achieve results approaching the excellence of Schilder.

The justification for the implementation of rotary NiTi is that it produces superior results more simply and in less time than conventional endodontics. Yet to make this an accurate comparison, we have to settle on just what conventional endodontics means.

For most dentists, conventional endodontics means the shaping of canals with a series of K-files used in a stepback manner. Yet, this was not the technique Schilder used to shape canals.<sup>2</sup>

Rather, he used reamers, instruments whose design includes fewer and more vertically oriented flutes than K-files, instruments that are used conventionally, but not nearly as well known as K-files.

If one considers the use of K-files as the only option if one doesn't adopt rotary NiTi, one also has to admit that the adaptation of rotary NiTi does not eliminate the use of K-files since they are a requirement for glide path creation, a

## Rosenberg stepping down from endo chairmanship at NYU

Dr. Paul A. Rosenberg, professor and chairman of the Dr. I.N. and Sally Quatararo Department of Endodontics at New York University since 1990, has announced that he will be stepping down from the chairmanship once a successor is chosen. Rosenberg will continue to be engaged in teaching and scholarly activities as a full-time faculty member in the Department of Endodontics.

As chairman, Rosenberg has shown true leadership and has compiled a list of significant achievements. His chairmanship has been marked by national and international recognition of NYU's post-graduate program in endodontics as one of the leading programs in that specialty.

The program was one of the first in the nation to introduce implants into an endodontic advanced education curriculum and to include endodontic residents in outreach programs to underserved areas. His residents have provided care in Nicaragua, the Dominican Republic, Grenada, Alaska and Maine. He also introduced NYUCD's first mentoring program for predoctoral students. A highlight of his chairmanship was the naming of the department in honor of Dr. I.N. and Sally Quatararo.

Rosenberg has had other notable achievements, including serving as the NYU College of Dentistry's first associate dean for graduate programs, as a director of the American Board of Endodontics, and as a



Dr. Paul A. Rosenberg has a long record of achievement at NYU. (Photo/Fred Michmershuizen, Dental Tribune)

scientific reviewer for the Journal of Endodontics. He has been recognized with the prestigious NYU Distinguished Teaching Award, the highest award presented for teaching by New York University. He has served as both a senator from the NYU College of Dentistry to the University Senate and as a member of the University Council.

In 2008, the NYU College of Dentistry recognized him with the naming of the Paul and Maxine Rosenberg Education Wing at the College of Dentistry. Rosenberg is a prolific author and lectures frequently at

both the national and international levels. His publications and lectures are focused on the biologic causes and prevention of endodontic pain.

Founded in 1865, New York University College of Dentistry (NYUCD) is the third oldest and the largest dental school in the United States, educating more than 8 percent of all dentists. NYUCD has a significant global reach and provides a level of national and international diversity among its students that is unmatched by any other dental school. [ET](#)

(Source: NYUCD)

## Endodontic scholarship to provide educator with leadership training

The American Dental Education Association (ADEA), in partnership with the American Association of Endodontists Foundation, will sponsor an endodontic educator's participation in ADEA's premier leadership development program.

The ADEA/AEE Foundation Scholar in the ADEA Leadership Institute will receive a \$25,000 scholarship to participate in the ADEA Leadership Institute, a year-long program that develops faculty members from all elements

of dental education as the future leaders of dental and higher education. In particular, this sponsorship helps support the costs associated with the fellow's participation in the institute.

The award will be presented in a ceremony during the 2012 ADEA Annual Session & Exhibition in Orlando, Fla., March 17-21, 2012.

The mission of ADEA is to lead individuals and institutions of the dental education community to address contemporary issues influencing education, research and the

delivery of oral health care for the health of the public. ADEA's activities encompass a wide range of research, advocacy, faculty development, meetings and communications.

ADEA members interested in learning more about the ADEA/AEE Foundation Scholar in the ADEA Leadership Institute and applying should visit [www.adea.org/professional\\_development/adea\\_scholarships\\_awards\\_fellowships](http://www.adea.org/professional_development/adea_scholarships_awards_fellowships). [ET](#)

(Source: ADEA)

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necessity before rotary NiTi can be safely used. Therefore, at best, rotary NiTi implies the reduction in the use of K-files without replacing them completely. All the problems associated with K-files in their creating the initial canal shaping are still present. It is only the latter part of canal shaping for which the rotary NiTi are responsible.

With the notable improvements that rotary NiTi bring to canal shaping, is it not reasonable to assume that these same improvements would exist whether or not K-files or K-reamers unrelieved and relieved were used?

To make this judgment, one would have to appreciate the beneficial effects of a reamer design in comparison to a K-file.

Certainly, Schilder did have that appreciation. He noted in his papers that reamers engaged less along length reducing the resistance to apical negotiation. He noted the superior tactile perception, their greater flexibility and the increased ability to shave dentin from the canal walls.

Yet are these improvements sufficient to eliminate the need for rotary NiTi? It has been stated many times that 02 tapered stainless steel instruments tend to distort transport canal walls to the outside curve as progressively larger tipped instruments become stiffer and stiffer. Equating K-files with K-reamers one would conclude that this is a distinct possibility with either design and the more flexible rotary NiTi instruments would shape these canals to greater dimensions with less chance of distortion.

This progression of thought is undermined by the fact that K-reamers are significantly less stiff than comparably sized K-files, that by incorporating a flat along the K-reamers working length, the cross sectional area is reduced making the instruments even more flexible, that the reduced engagement along length allows the instruments to adapt to the canal walls more readily taking advantage of stainless steel's property of recording curves rather than snapping back to the straight position, a unique NiTi property and detrimental to our goal of distortion-free shaping.

As we can see, the concept of con-

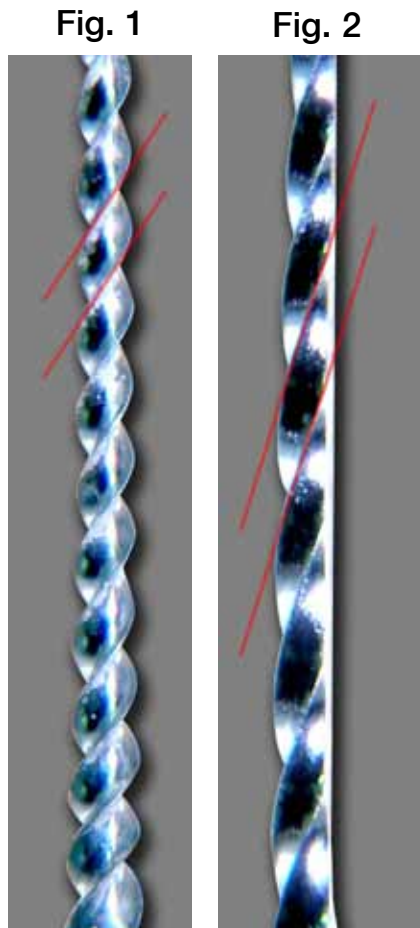


Fig. 1: Photo of a K-File. Note the high number of horizontally oriented flutes. Fig. 2: Photo of a relieved reamer. Note the patented flat side and the decreases number of vertically oriented flutes.

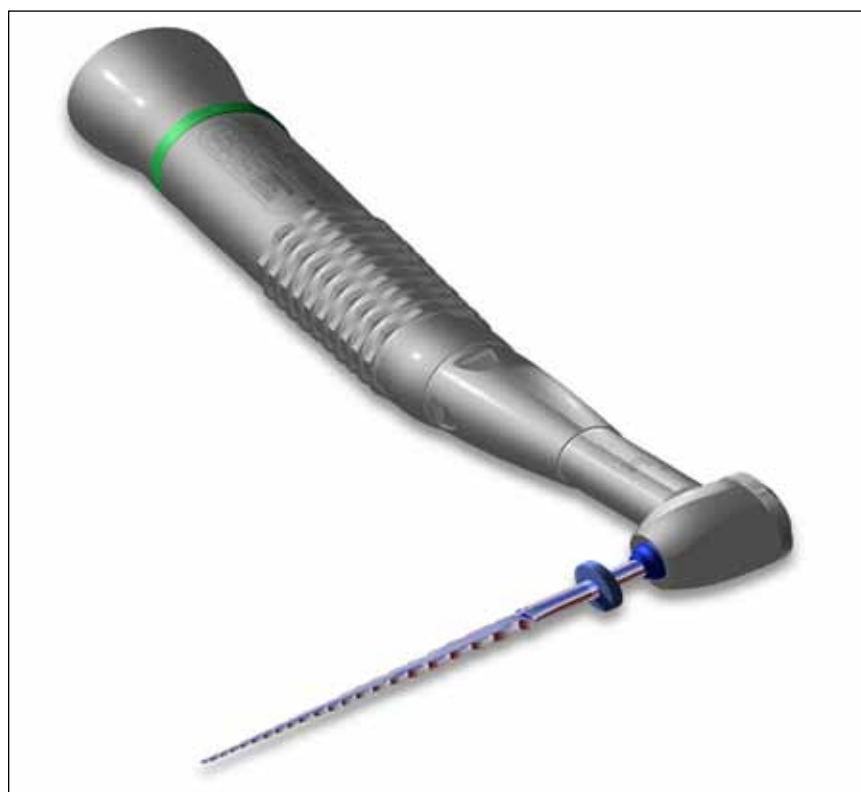


Fig. 4: Illustration of a relieved reamer in a reciprocating handpiece.



Fig. 3: Photo of a relieved reamer which negotiated easily to the apex in a highly curved canal. (Photos/Provided by Dr. Barry Lee Musikant)

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Torsten R. Oemus  
t.oemus@dental-tribune.com

**Chief Operations Officer**  
Eric Seid  
e.seid@dental-tribune.com

**Group Editor & Designer**  
Robin Goodman  
r.goodman@dental-tribune.com

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Frederic Barnett, DMD  
BarnettF@einstein.edu

**International Editor Endo Tribune**  
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Endo Tribune & Online Editor**  
Fred Michmershuizen  
f.michmershuizen@dental-tribune.com

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Implant, Ortho & Lab Tribunes**  
Sierra Rendon  
s.rendon@dental-tribune.com

**Managing Editor/Designer  
Dental Tribune U.S. & Canada**  
Robert Selleck  
r.selleck@dental-tribune.com

**Managing Editor/Designer  
Show Dailies**  
Kristine Colker  
k.colker@dental-tribune.com

**Account Manager**  
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c.ferret@dtstudyclub.com

**Dental Tribune America, LLC**  
116 W. 23rd St., Suite #500  
New York, NY 10011  
Tel.: (212) 244-7181  
Fax: (212) 244-7185

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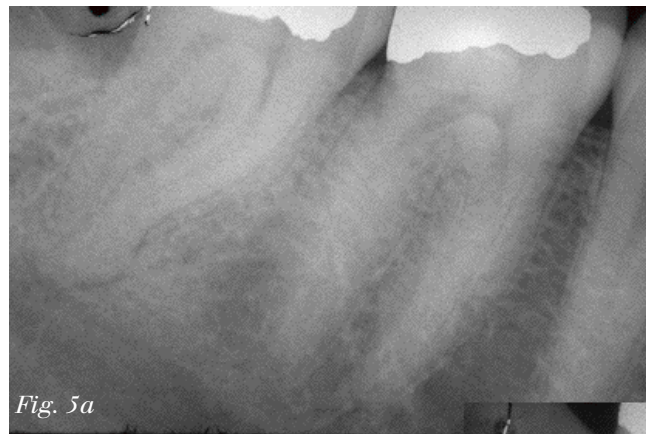
ventional shaping versus the new world of rotary NiTi is a bit more complex than one might originally think. We can state categorically that K-reamers that are relieved are significantly more flexible than comparably sized K-files, that they engage far less along length and provide for a superior tactile perception giving the dentist the ability to know when the reamer is either hitting a solid wall, in a tight, but patent canal or in a canal that is so curved that it requires prebending to negotiate around without distortion. Providing this superior tactile perception sets the relieved reamers apart from K-files.

While acceding to the superior usage of relieved reamers over K-files, wouldn't the incorporation of rotary NiTi after glide path creation make the procedure even more efficient and effective? As its name implies, NiTi instruments are used most effectively in rotation. Yet, using NiTi in rotation increases the chances of instrument separation, a product of either torsional stress or cyclic fatigue or some combination of both.<sup>5</sup> In contrast, the relieved reamers are used with either a tight watch winding stroke or in a 30-degree reciprocating handpiece, virtually eliminating the two factors that make rotary NiTi vulnerable to breakage.<sup>4</sup>

The K-reamers, routinely shape canals to a minimum of 35, one mm back to a 40 with a 25/06 overlaid taper. After the canal is shaped to a 20, a tapered peeso is used to straighten any coronal curve that may exist generally to within 6 mm of the apex. The relieved reamers 25 thru 40 are mostly limited to shaping the apical 6 mm of the canal. Even highly curved canals are not susceptible to distortion via these thicker relieved reamers because they are still far more flexible than comparably sized K-files, their motion is confined to a short arc that keeps them centered within the canal and the tactile perception clearly tells the dentist if the tip of the instrument is hitting a wall or negotiating a highly curved canal from the straight position.

With resistance mainly defined by what lies ahead of the tip of the instrument, be it from a solid wall or an abruptly curved canal, the dentist knows when to remove the instrument, bend it at the tip and manually negotiate around the curve prior to reattaching it to the reciprocating handpiece followed by rapid negotiation to the apex.

All the rotary NiTi systems make sense if the premise for their use is based on the K-file, an instrument Schilder clearly understood to be a poor design for the function asked of it. None of the rotary NiTi systems make sense, if the better designed reamers — both unrelieved and relieved — are utilized with a short arc of motion either generated manually or in the reciprocating handpiece. Rotary NiTi addresses the challenge of shaping curved canals without distortion better than K-files. They are



Figs. 5a, 5b: Radiographs showing endodontic case performed with relieved reamers in a reciprocating handpiece.

far more flexible than K-files and somewhat more than K-reamers, but lose their luster for non-distortion because of their rebound effect

in curved canals. Always seeking out the straight position, as their tip size and taper increase there is a greater and greater tendency to

shape to the outside wall of curved canals. Most dentists know this and

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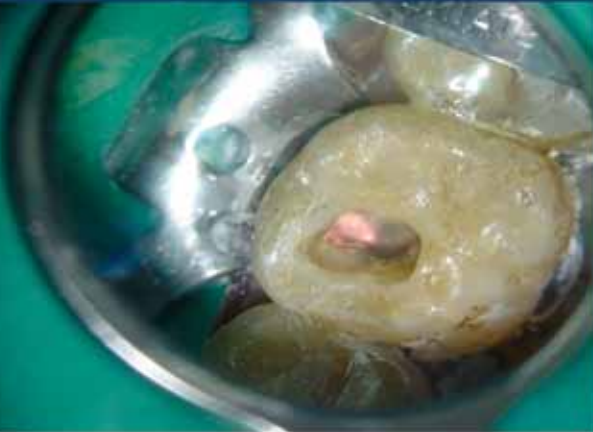
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with the added concern for breakage are generally satisfied in shaping curved canals to a maximum of 25/06 and often a 20/04, a degree of shaping that will minimize breakage and distortion, but also often prove inadequate from the point of view of full debridement and effective irrigation.

An instrument need not be as flexible as NiTi if it is capable of combining the flexibility it does have with the ability to record curves rather than snap back to the straight position. Once the relieved reamer records the curve, it is in effect a passive instrument with the blades shaving the dentin along the length of the canal walls on the downstroke and removing dentin on the upstroke wherever the dentist directs the length of the instrument to contact the canal walls.

In this way a uniform layer of dentin is removed circumferentially retaining the original canal shape and not undermining the thinner walls of oval canals the way it would occur if rotary NiTi was used instead<sup>5</sup>.

That is not to say that relieved reamers could not distort a canal wall. All one would have to do is hit a wall, know you hit the wall and continue to peck aggressive-

**‘An instrument need not be as flexible as NiTi if it is capable of combining the flexibility it does have with the ability to record curves rather than snap back to the straight position.’**

ly despite all the apical resistance encountered. Distortion would inevitably follow.

However, the relieved reamers offer such superior tactile perception of what the tip of the reamer is encountering that knowing when to remove the reamer, bend it at the tip and manually negotiate around the impediment is obvious making it unlikely that distortions will result.

Schilder knew what he was doing when he chose K-reamers over K-files. He never needed rotary NiTi to create a standard of shaping that rotary NiTi does not



Fig. 6



Fig. 7

*Figs. 6,7: Radiographs showing endodontic cases performed with relieved reamers in a reciprocating handpiece.*

measure up to. You can achieve that standard in a thoroughly safe manner by using relieved reamers, instruments that Schilder would have noticed negotiate through the canal with even less resistance than non-relieved reamers and in using them with either a tight watch-winding motion or in the reciprocating handpiece they are being used with the tight arc of motion that Schilder would have approved of (Figs. 5a, 5b). **ET**

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#### **ET** About the author

Barry Lee Musikant, DMD, is a member of the American Dental Association, American Association of Endodontists, Academy of General Dentistry, the Dental Society of New York, First District Dental Society, Academy of Oral Medicine, Alpha Omega Dental Fraternity and the American Society of Dental Aesthetics. He is also a fellow of the American College of Dentistry (FACD). As a partner in the largest endodontic practice in Manhattan, Musikant's 35-plus years of practice experience have established him as one of the top authorities in endodontics.



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# Endodontists 'strike it rich' in Vegas

By Fred Michmershuizen, Managing Editor

As the saying goes, what happens in Vegas stays in Vegas. But don't tell that to the many endodontists who descended upon the Mandalay Bay Convention Center for the ADA's 152nd Annual Session and World Marketplace Exhibition. What meeting attendees learned — and the many new products that they obtained — will definitely not stay in Vegas.

To help attendees "strike it rich" in Las Vegas, the American Dental Association assembled leaders in dental practice, research, academia and industry to present hundreds of continuing education courses.

The Annual Session, held Oct. 10-13 (Monday through Thursday), offered attendees the choice of more than 260 relevant and topical continuing education courses, including many for those who practice endodontics.

Course titles included: "The New Art of Endodontics: Everything's Changed Except the Anatomy," "Gaining Procedural Mastery with New Tools" and "How to be Safe, Simple and Super-Efficient," among many others.

More than 500 companies offered attendees the opportunity to view and compare the latest dental products and services, many of which were of interest to endodontists.

The reps from Coltene Endo were busy telling meeting attendees about HyFlex controlled memory NiTi files. Jordco was on hand



Dr. Fred Weinstein, from Vancouver, British Columbia. (Photos/Fred Michmershuizen, Dental Tribune)



Erin Rohs, left, and Anne Franch of Coltene Endo offer information to ADA meeting attendees about HyFlex controlled memory NiTi files and other products for endodontists.



Meeting attendees shop the exhibit hall floor at the ADA meeting in Las Vegas.



Ione Booth of Jordco tells meeting attendees about Endoring II hand-held endodontic assistant.

to display its many products for endodontists, including its Endoring II hand-held endodontic assistant. Dentazon Corp. showcased its

Friendo warm vertical condensation device, and SS White offered its EndoGuide precision micro endodontic burs. **ET**

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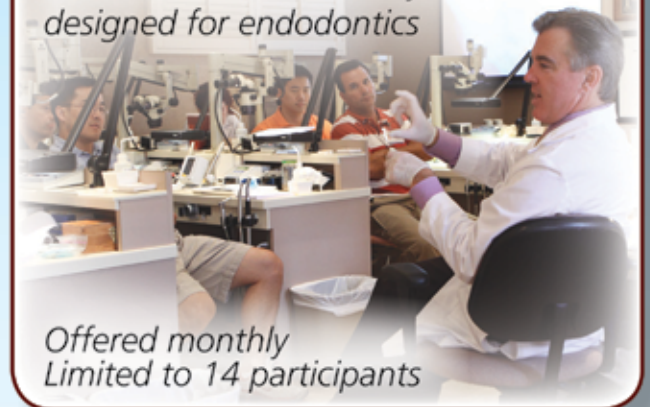
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Evolution XR6



The Evolution XR6. (Photo/Seiler)

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