AS SEEN IN
ER
ENDODONTIC REVIEW
of ARIZONA

INNOVATIVE TECHNOLOGY WITH DR. RICHARD MOUNCE

The Future of Endodontic Canal Preparation Has Arrived, Its Twisted!

Previous concerns with rotary nickel titanium (RNT) files have centered on a desire to obtain both safety (preventing breakage) and cutting prowess (efficiency) in the same instrument. Previous file systems were generally either "safe" or they cut well, but they did not tend to do both. The future of endodontic canal preparation is here and it is twisted, i.e. the Twisted File (TF) (SybronEndo, Orange, CA, USA). TF is a very different instrument than the previous generation of RNT files that were ground from nickel titanium blanks. TF is safe in that it has unparalleled resistance to breakage and yet cuts extremely well. TF simplifies canal enlargement in that it can be used Crown Down in a multiple file technique or as a single file technique in many cases. This paper was written to introduce TF and describe its clinical use.

Through a proprietary process of heating and cooling, the molecular structure of nickel titanium can be modified to a state known as R phase. In R phase, nickel titanium can be twisted and this forms the basis for the TF.

R phase technology (amongst other attributes):

1) overcomes limitations of ground file technology and opens up new opportunities for file design. TF is not machined against the grain of the nickel titanium metal at any stage in the process of its manufacture, as are all nickel titanium systems, but one, at this time. Grinding nickel titanium is responsible for the creation of microcracks that can act as the precursor of fracture sites for the file if it is exposed to excessive torsion or cyclic fatigue.

2) optimizes molecular phase and the properties of nickel titanium.

3) employs a crystalline structural modification that maximizes flexibility and resistance to breakage.

4) increases surface hardness.

The Twisted File (SybronEndo, Orange, CA, USA)

TF comes in 5 tapers, .12, .10, .08, .06, .04. All of these tapers have a #25 size tip diameter. TF is packaged in "Large" pack assortments (.10, .08 and .06) and "Small" pack assortments (.08, .06, .04) as well as the individual tapers. TF is available in 23 and 27 mm lengths both individually and in the pack configurations. TF is color coded as individual packs and color coded in the aforementioned "Large" and "Small" pack configurations. Each individual file is color coded for taper and tip size as well.

The attributes of TF are:

Triangular cross-section
Variable pitch
Safe-ended non-cutting pilot tip
One-piece design (the file is made from one piece of metal, the handle is not crimped on the nickel titanium shaft of the instrument)
Laser marks
Large color bands
Special Surface Conditioning

To use TF safely and effectively:

1) Pre operatively estimate the length of the tooth, i.e. determine an estimated working length (EWL).

2) Straight-line access should be achieved and all canals located. The cervical dentinal triangle must be removed.

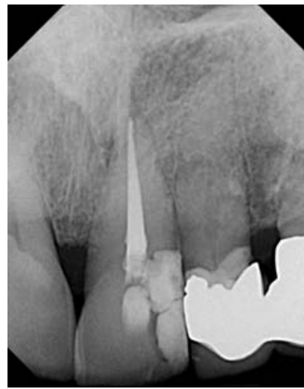
3) If the orifice is open and negotiable, a .12-tapered TF is placed into the coronal third of large roots (the palatal roots of upper molars), a .10-tapered TF is placed into the coronal third of medium sized roots (bicuspids) and .08 taper is used in smaller roots (anterior teeth) as the initial orifice enlargement.

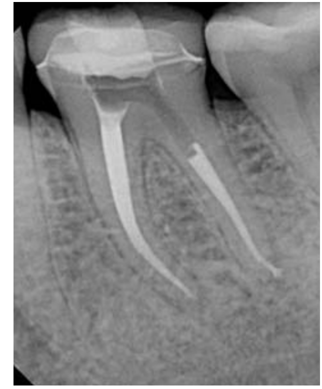
4) All canals must be negotiated to at least a #15 hand file in whatever portion of the canal is being enlarged. Some canals will possess this minimum diameter naturally and others will require that it be created. In any event, all spaces within the root should be negotiated first with small hand #6-15 files to assure that the canal path is open and patent where enlargement with TF will occur.

6) The TF can be used either Crown Down or as a single file technique. Specifically, TF can be inserted in orders of decreasing taper, .12, .10, .08, etc, in essence, Crown Down. Many canals will allow a single TF file, if used appropriately. Generally, roots that are amenable to a single file technique tend to be straighter and relatively wide open, i.e. not calcified or highly curved. In any event, if the canal will passively allow a single TF to be advanced to the TWL through multiple insertions, the clinician can do so. This said, after each insertion, it is important that TF be wiped clean of debris, the canal irrigated and recapitulated before reinsertion. The TF is not forced with undue pressure to reach the EWL or TWL. Apical movement is incremental and passive. If the TF used will not allow insertion to the TWL and a single file technique is not feasible, a smaller TF can be used and the process carried out Crown Down. In the vast majority of cases, if a Single File technique is not possible, 2-3 TF files are all that are required to prepare a canal Crown Down, even one of significant curvature.

7) TF is inserted passively in 2-3 seconds with 1-2 mm of dentin engagement. TF is not used with a pecking motion. Insertion is continuous and controlled. The canal is irrigated and recapitulated after every TF insertion. TF is not left rotating stationary in the canal. TF is inspected after every insertion for deformation and stretching. SybronEndo recommends TF be a single use file. I have used TF in 3-5 canals very safely and efficiently. SybronEndo also recommends that TF be used at 500 RPM. Some clinicians may find that with experience TF can be rotated at higher speeds. TF can be used with any electric motor with or without torque control.

8) Since the tip sizes are fixed at a #25, the decision the clinician makes with these instruments at the start of treatment with regard to the first TF taper determines, in some measure, the final taper. In other words, if the initial taper at the orifice level is .12, the final prepared taper throughout the length of the canal will generally be .12 or .10. The taper should not change abruptly at mid root from a larger TF to smaller. Utilizing the same final taper throughout the entire root can provide a continuous taper and fulfill one of the principles of canal preparation, i.e. to prepare narrowing cross sectional diameters that keep the canal in its original position. The final (master apical taper) taper in common anatomies are (much like the initial taper used at the orifice):





Clinical cases performed with TF

a) the palatal roots of upper molars: .12 TF

b) bicuspids: .10 or .08 TF

c) lower anteriors: .08 or .06 TF.

If possible, the taper used initially should match the final taper taken to the apex. There should not be an abrupt change in taper along the length of the root. For example, a .12 TF in the coronal third is not matched with a .04 taper in the apical half. Such a lack of taper would not optimize irrigation or obturation hydraulics. Alternatively, if a canal will allow a .10 taper TF in the coronal third without risk of canal transportation or perforation, this taper can generally be taken to the apex.

9) After the master apical preparation is achieved, a cone is fit and the clinicians chosen technique can obturate the canal. TF preparations can be matched by TF gutta percha* and TF paper points**. I obturate canals with SystemB, under the surgical operating microscope (SOM)(Global Surgical, St. Louis, MO, USA) with the Elements Obturation Unit***. Ideally, after obturation, while the tooth is clean and dry and under the rubber dam, the access should be sealed to prevent coronal leakage. I use PermaFlo injected with the Skini syringe (Ultradent, South Jordan, UT, USA) for this purpose. *,**,*** SybronEndo, Orange, CA, USA

Having extensive experience with TF, this file provides a powerful blend of safety and efficiency. It has functionality second to none in that it can be used both Crown Down or as a Single File in many canal anatomies. I welcome your feedback.

Dr. Mounce offers intensive customized endodontic single day training programs in his office for groups of 1-2 doctors. For information, contact Dennis at 360-891-9111 or write RichardMounce@MounceEndo.com. Dr. Mounce lectures globally and is widely published. He is in private practice in Endodontics in Vancouver, WA, USA

Dr. Richard Mounce can be reached at:
RichardMounce@MounceEndo.com

ARE YOU AS
VISIBLE TO
REFERRING DENTISTS
AS YOU NEED TO BE?

Your comprehensive directory created to bring AZ Endodontists and referring General Dentists...together.

Who's going to refer you to their patients in 2008?

How much revenue growth from referrals have you planned for your practice this year?

Be seen in Endodontic Review of Arizona and assist your practice in making this your highest revenue producing year possible!

- In-depth, personal profiles about you and your practice.
- Informative, cutting-edge articles on your unique endodontic specialty.
- Excellent quarterly exposure to your target market – delivered directly to Arizona's general/endodontic practices.

Reserve your presence in this important, "must-have" marketing tool!

Call Today! 480-621-8955

Or email publisher@endoreviewaz.com for more information.

Visit us Online! www.EndoReviewAZ.com