Which Tooth Is It? Which Rotary File Do I Need?

Cincinnati Dental Meeting
Friday, January 28, 2011
8:30 AM-12:00 PM

Endodontic Diagnosis & Treatment Planning

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Medical History

Dental History

Digital Imaging

Percussion
CARBON DIOXIDE ICE

ENDO ICE

DIGITAL EPT

BITING PRESSURE

PALPATION

PERIODONTAL PROBING
ISO Endodontic Instruments

NiTi Rotary File Systems
- Profiles
- Pro Taper Files
- GT Files
- GTX Files
- Quantec
- K3
- Twisted File

Terminology:
- $D_1$: expressed in hundredths of a mm
- $D_2$: $D_1$ plus 0.32 mm
- Tip angle: 75° ± 15° included angle
- Tolerance: ± 0.02 mm
- Length blade ($D_1$ to $D_2$): 16.0 mm

NiTi Rotary File Systems
- EndoSequence
- Race
- LightSpeed LSX
- LLC-V-Taper
- Liberator
- Hyflex X-File
- Hornet Files
- Brasseler
- LightSpeed
- Guidance
- Miltex
- Coltene Whaledent
- EndoSolutions

NiTi Rotary File Systems
- SafeSiders System
- Break-R-Way
- 324 NiTi Files
- Essential Dental Systems
- Break-R-Way Files
- Medidenta

Orifice Openers
- Gates Glidden Drill
- #1=40 ISO File
- #2=60
- #3=80
- #4=100
- #5=120
- #6=140

ProTaper System
EndoSequence System

RaCe System

Twisted File System

Brasseler RaCe File
Alternating Non-spiraled and Spiraled

THE TWISTED FILE
A New Paradigm in Canal Enlargement

Presentation Overview

I. Design Features
II. System Description
III. Strengths
IV. TF Technique
V. Clinical Cases

I. Design Features
TF Meets Clinician Needs

Please indicate the importance of the following in making your file selection:

- More predictable results
- More separation-resistant
- Superior product quality
- Improved flexibility
- Sharper cutting surface
- Favorable clinical results
- Superior product support
- Stays sharper longer
- Available in many sizes/lengths
- More tolerant of curvature
- Lower price

A Quantum Leap in File Design

**The first and only file** made with three unique proprietary processes for unsurpassed strength and flexibility

1. R-phase heat treatment technology
   - Breaks less than ground files
2. Twisted design, not ground
   - Eliminates formation of micro-fractures
3. Advanced surface treatment
   - Maintains file hardness and cutting edges

Twisted Design

TF is twisted to maintain grain structure

Surface Treatment

- Surface deoxidation respects underlying grain structure and is more gentle than other methods
- Protects file integrity
- Improves file durability and cutting performance

Surface Treatment

Triangular Cross-section

- Provides maximal flexibility
- Generates less torsional stress
- Increases cutting efficiency
- R-phase technology makes triangular cross-section possible

Su R, Netzel J, de Schutter J, Effect of electroplating nickel on:

- Transitory instruments on cyclic fatigue resistance, torsional resistance and
**Variable Pitch**
- Minimizes “screw-in” effect
- Allows debris to be channeled effectively
- Greatly reduces torsional stress

**Safe-ended Tip**
- Minimizes canal transportation
- Follows the canal path easily

**One-piece Design and Laser Marks**
- Enhances integrity
- Eliminates galvanic corrosion

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**II. System Description**

**TF File Options**
- Length:
  - 23 mm
  - 27 mm
- Tip:
  - .50
  - .40
  - .35
  - .30
  - .25
- Taper:
  - .12
  - .10
  - .08
  - .06

**Three-file Assorted Packs**
Color-coding

- Color bands indicate taper and tip size
- Easy identification for increased efficiency
  - Reduces treatment time
  - Allows emergency root canals

TF Strengths

- 3 files or less
- Simple to use
- Easy to learn
- Simple sequence
- Can be used in any canal anatomy

- Cuts exceptionally well
- Tracks smoothly
- Minimizes transportation
- Reduces treatment time

Fracture Resistance Breeds Confidence

- TF can withstand significantly more torque than files made by traditional manufacturing processes.

Cyclic Fatigue Study Results

In a comparison of cyclic bending fatigue, TF performed two to three times better than traditional NiTi files.
Flexibility Study Results

TF is up to 70% more flexible than traditional NiTi files.

IV. TF Technique

Confirm Coronal Patency

- Prior to using TF, achieve straight line access to the coronal 1/3
- Establish an apical glide path with at least a #20 hand file
  * Use of the M4 with the #20 hand file is strongly recommended to ensure a smooth apical glide path before rotary instrumentation begins.

Choosing the Appropriate File: Use of the .12 TF

- As an orifice opener in easily negotiated canals
- As a shaping file in large, open and straight canals such as upper central incisors and palatal canals

THE TF TECHNIQUE

- Use of NiTi TF
- Use of M4 with .12 TF
- Use of .06 TF with .12 TF
- Use of .04 TF with .12 TF

For canal-based situations, a large coronal file is required.
TF File Usage

- Motor Speed: 500 rpm
- The file should be rotating freely as you enter the canal
- Advance the file with a single continuous and controlled motion until the file engages dentin and then withdraw the file
  - Do not force the file apically

TF Technique Animation

- Insert 1st file to resistance and withdraw.
- Insert 2nd file to resistance and withdraw.
- Insert 3rd file to resistance and withdraw.

Step 1

- Take the TF .08/25 until it engages dentin and then withdraw immediately
- Wipe the flutes, irrigate and recapitulate with a stainless steel hand file to confirm patency
- Repeat Step 1 with the same TF file until TWL is achieved

Note: If significant resistance is met before TWL is achieved, proceed with the TF .06/35 using the same step.

Step 2

- Next insert the TF .06/30, following the procedures in Step 1
  - For #30 tip size apical shape, you can stop at this point and begin your obturation

Step 3

- For final apical shape larger than #30, use the following appropriate tip size:
  - .06/35 for #35 tip size
  - .04/40 for #40 tip size
Notes on Obturation

- For carrier-based obturation, a larger coronal flare is required.

Results

The most effective irrigation regimen was 5.25% at 40 minutes, whereas irrigation with 1.3% and 2.5% NaOCl for this same time interval was ineffective in removing *E. faecalis* from infected dentin cylinders.

Conclusions

High concentration and long exposure to NaOCl are needed for elimination of *E. faecalis* contaminated dentin.

Results

The EndoVac Group had a mean of 31.6 cfu/mg, whereas the needle group had a mean of 157 cfu/mg. This represents a bacterial reduction of 99.7% in group A and 98.8% in group B when compared with positive controls.

Conclusions

Although there were fewer cfu/mg when using the EndoVac, there was not a statistically significant difference between the EndoVac and needle groups.

Clinical Cases