

PtoTaper ® Protocol
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The ProTaper system is the alternative to all other file systems in which each file has a fixed taper. Each ProTaper file has a variable changing taper over the length of its cutting blades. Specifically, the ProTaper shaping files have small-sized tips, which act as guides to follow the path of the canal previously secured with hand files. Progressively tapered shaping files work away from their apical extents and, importantly, selectively cut dentin toward their larger, stronger and more active blades.

In fact, this variably tapered concept and method of use resulted from the Schilder technique, in which precurved reamers were sequentially selected, rotated in an envelope of motion and cut dentin on the withdrawal stroke to create a predictably tapered shape. ProTaper shaping files have a cross-section similar to that of reamers and, as such, are followed to passively “float” into the canal and “follow” the glide path. To optimize safety and efficiency, shaping files are used like a brush to laterally and selectively cut dentin on the outstroke. A brushing action creates lateral space, which will facilitate moving the shaping file’s larger and more active blades safely and progressively deeper into the canal. It is remarkable to note that, in this method of use, the files are essentially loose during the majority of their work within a canal. In the ProTaper concept, more than the instrument design, the motion with which the file is used, creates the shape.

ProTaper Universal is a global endodontic concept involving all steps of the root canal treatment from access to obturation and retreatment. Specific instruments have been designed to simplify and make each procedure easier. The new line is compounded of an Endo access kit, proFinders (scouting files), proTaper paper points, ProTaper Gutta Percha points, ProTaper obturators and a retreatment kit. The safety of the ProTaper rotary files has been improved with the elimination of the transition angle between the tip and the first cutting flute, and a modified cross-section for F3 making this file much more flexible. The new kit features two additional finishing files, F4 with a 0.40 tip diameter and F5 with a 0.50 tip diameter to address larger canals and for clinicians who believe in larger apical sizes. The ProTaper files are available for hand use and in 31 mm length.

Protocol

- 1- Cut an access cavity using the Endo access kit (Dentsply-Maillefer)

- 2- Refine the canal orifices with the X-Gates at 700rpm to get a straight line access. Place the X-gates along the natural axis of the orifice without working the instrument. Then, starting rotation, use a circular motion without pressure to create a funnel at this level. This should be followed by a brushing outstroke motion away from the furcation until the head of the X-Gates gets passively inside the canal orifice.

- 3- Fill the pulp chamber with a lubricant.

A- Scout the coronal two-thirds

- 1- Select an ISO \neq 10 K file precurved, and scout the canal to light resistance. Then, use a watch-winding-pull motion to create space at this level.
- 2- Repeat the same procedure with the \neq 15 K file and the \neq 20 K file.
- 3- Transfer the length of the \neq 15 K file to S1.

B- Shape the coronal two-thirds (300rpm) with NaOCl irrigation

At this stage, the apical four or five millimetres of S1 should be loose inside the root canal.

- 1- Start working S1 with a firm brushing outstroke action away from the furcation to progressively reach the level of the 15 K file. Use a slow motion with a 4mm amplitude. Visually check the location of the debris on the flutes. No debris should be observed on the apical aspect of S1.
- 2- As described for S1, work S2 slightly shorter than S1.

C- Scout the apical one-third

- 1- A \neq 10 K file, precurved, is used with a lubricant to negotiate the apical third of the root canal and reach the apical limit.
- 2- Determine the working length with apex locator or an X-ray. Smooth the path of the canal using an up-and-down motion with a short amplitude (2mm) until the file is loose.
- 3- Do the same with the \neq 15 K file to get a long (4 to 5mm) and reproducible glide path.

D- Shape the apical one-third

- 1- Switch to NaOCl and work S1 with the same brushing action to the working length, but stop brushing 1mm shorter and let the file passively reach the apical limit.
- 2- By hand, drop the rotary S2 to resistance in order to assess the distance of work to be done with that file. After an adequate work by S1, S2 should never have more than 2mm of work to accomplish.
- 3- Then use the engine-driven S2 as described for S1. Due to the brushing outstroke motion, the operator should feel that the previous resistance met in step 2, has been completely relieved.
- 4- Disconnect the handpiece from S2 and confirm precisely the working length with an apex locator connected on S2 handle.

E- Finish and blend the apical one-third with the coronal two-thirds

1 –By hand, drop the rotary F1 to resistance in order to assess the distance of work to be done with that file. After an adequate work by S1 and S2, F1 should never have more than 2mm of work to accomplish. Then, the engine-driven F1 is passively allowed to progress apically, in one or more passes, to reach the canal terminus minus 0.5mm. F1 must be used in a non-brushing manner with no vertical pressure. The author preference for this stage is to use a manual F1 with an apex locator connected on it, to precisely achieve the apical shape. For manual ProTapers, the recommended motion is: Reciprocating motion without pressure and withdraw while rotating clockwise to remove debris.

2- Following F1, a \neq 0.2/20 K file is dropped inside the canal to gauge the apical diameter. If the file is snug at the working length, the apical size is 20. In this case, F2 and F3 must systematically be used in a step-back fashion to increase the deep shape. Manual (or rotary) F2 is placed $\frac{1}{2}$ mm shorter than F1 and manual (or rotary) F3 $\frac{1}{2}$ or one mm shorter than F2. The finishing files F2 and F3 should never have more than 2mm of work to do.

3- If the 0.2/20 K file moves beyond the foramen, gauge again with the \neq 0.2/20 K file. If the file is snug at the working length, the apical size is 25. use F2, shy from the working length, as described for F1. Then use F3 one millimetre shorter than F2.

4- The same gauging procedure with ISO K files is repeated for larger apical sizes.

NB:

- Between each active file, the root canal system is irrigated with 2ml of NaOCl, apical patency is confirmed and the canal re-irrigated.
- Sx is used after S1 and F2 if relocation of canal orifice is needed or to create more shape in the coronal third.