Endodontics: Cleaning the Root Canal

Armamentarium

Endodontic explorer or precurved number 10 k file
K files (10, 15, 20, 25, 30, 35, 40, 45, 50)
Ruler
Stoppers
RC Prep
Irrigating syringe
Irrigating needle (with 45 degree bend at tip)
Tap water

The following script has additional content not included in the audio.

Step 1: Explore Canal

Begin by exploring the canals with the endodontic explorer, or precurved No. 10 file. Gently guide the explorer into the canal and "explore". The objective is to identify the anatomy of the specific root canal system, keeping in mind that there may be more than one canal, or that accessory canals may be present in the apical region. This exploration also provides an opportunity to identify potential problems.

A sudden stop along the radiographic canal path may indicate blockage caused by necrotic debris or small pulp stones. A gentle turn of the instrument should enable progression toward the apex. If the curvature of the instrument does not match that of the canal, this can also prevent progression. In this case, remove the instrument, recurve it, and continue exploration of the canal.Periodic irrigation also helps to lubricate the canal walls, aiding instrumentation.

Once the radiographic apex has been reached, cleaning can be carried out. The canal is cleaned using a total of four different sized files.

Step 2: Starting File

Starting with the 10-K or 15-K file, find the first file that fits snugly at the working length.The correct snug fit is evidenced by tugback felt from the apical constricture when attempting to remove the file from the canal. Always remember to place the stopper at the correct working length before placing it into the canal. It is important to continue to use the same occlusal landmark throughout cleaning and shaping, in order to prevent overinstrumentation or incomplete instrumentation. If a file is loose or encounters little resistance, move to the next largest size until one feels snug or slightly tight in the canal.

The correct snug fit is evidenced by a tugback felt from the apical constricture when attempting to remove the file from the canal.

Maxillary anterior teeth tend to have very large canals. Here the 15 K-file goes right through the canal without encountering any resistance. The 20 K-file also fits loosely in the canal. With just a small amount of light pressure both the 25 K and 30 K-files also pass beyond the apex without any resistance or tugback. The first file to encounter resistance within the canal tugback is the 35 K-file.

Cleaning of the canal will begin with this first file that fits snugly, and will continue with three additional files that are successively larger. In this case cleaning will begin with the 35 K-file and will continue with the 40 K, 45 K and 50 K-files, each measured to the working length of the canal, 24.5 mm.Since many canals have curves along their lengths, the files at the working length should be gently precurved to avoid procedural problems. The 8, 10, 15 and 20 K-files are flexible. 25 K-files and larger are not flexible.

Step 3: Reaming Action

Cleaning is done using a combination of reaming and filing actions within the canal. Begin with a reaming action; insert the starting K file, rotate the file one-quarter turn, pull it out of the canal, and repeat: "quarter-turn and out, quarter-turn and out, quarter-turn and out." The emphasis is on the in stroke; the quarter-turns engage the file within the dentin and the file is passively pulled out of the canal. Reaming action permits efficient cleaning of the canal walls, and is repeated until the file no longer encounters resistance within the canal.

To help the file reach the working length, watch-winding may be used. Watch-winding is similar to reaming, but involves quick back-and-forth turns inside the canal, as though one were "winding" a watch. This action is used to get to your working length.

Instruments should always be placed into a canal with extreme caution before the canal has been opened sufficiently with cleaning and shaping. A chelating agent such as RC Prep may be used as both a chelating agent, binding with calcium to soften canal walls, and a lubricant for narrower canals. Simply place a small amount on one end of the file before inserting the file into the canal.

Step 4: Filing Action

Continue cleaning with the starting file using a filing action. Filing action is used to widen the canal and is done circumferentially around the canal walls. This ensures that contact force is applied to the entire surface of the wall, 360 degrees around. While reaming works best at the narrowest portion of the canal near the apex, filing works best in the wider part of the canal.

Step 5: Irrigate

The instrumentation during cleaning and shaping generate debris, which also can lead to infection and inflammation of the root canal or apical region. Copious irrigation helps to clear the loosened debris out of the canal and to disinfect the canal, reducing the chance of

inflammation. Irrigation also serves to facilitate instrumentation by lubricating the canal walls and by removing materials that can create blockage in the canal.

Remember to use the irrigating syringe with a 45-degree bend at the tip and do not force it beyond the apex.

Step 6: Larger Files

Repeat steps 4-6 for each of the 3 larger files. Note that as larger K-files are employed, the taper of the instruments may be wider than that of the canal. If resistance is met a few millimeters short of the apex, go back to using the previous size file and clean again with reaming action, followed by filing action circumferentially. When the next size file is inserted, resistance should be diminished, and cleaning can continue with this larger file.

Once the canal has been sufficiently cleaned with the four successively larger files, the principles of retention form and resistance form are met through the stepback method of shaping of the canal.