

Endodontics: Coronal Access Preparation (Maxillary Central Incisor)

Armamentarium

Ruler
X-ray film
Pencil
High speed handpiece
High speed fissure bur or round bur
Slow speed handpiece
Slow speed long-shank #2, #4, #6 bur
Endodontic explorer
Slow speed long shank #4 or #6 round bur
Irrigating syringe
Sodium hypochlorite (tap water for preclinic exercise)
Irrigating needle (with 45 degree bend at tip)

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

Step 1: Starting Radiograph

Begin with an x-ray of the unprepared tooth. This start x-ray is important in making a diagnosis, as well as estimating the initial measurement of the canals. Study the radiograph as a blueprint to establish the size, shape and location of the pulp canal(s) and their relative positions.

Step 2: Pencil Access

For your first time, outline the coronal access on the tooth in pencil, using the coronal preparation slides as a guide.

The access outline for a maxillary canine is similar to an upside-down triangle shape, with the base of the triangle parallel to the incisal edge.

Step 3: Cut Through Center

First, remove all caries and fillings that obstruct the view or that can cause leakage. Undermined enamel should also be removed together with any parts of the crown that make accessibility to the canal(s) difficult.

Using a high-speed fissure bur or round bur held perpendicular to the lingual surface, cut just through the enamel in the center of the pencil-marked area. A common error is to begin cavity too far gingivally. Do not force the bur.

Step 4: Extend Access

Extend the opening laterally to the designated outline by maintaining the point of the bur in the central cavity and rotating the handpiece toward the incisal so that the bur continues to parallel the long axis of the tooth.

If there is pulp exposure, it should be widened with the handpiece in order to properly determine the extension of the pulp chamber.

Step 5: Cut Through Dentin

With a low-speed long-shank #4 or #6 bur (depending on the size of the pulp chamber), make a cut with the long axis of the tooth and cut directly through the dentin into the large pulp horn, or the largest area of the pulp chamber. The bur should be used with a pull stroke from the chamber and out.

Step 6: Explore Access

Use the endodontic explorer to check for the canal. If the explorer meets constant resistance, the pulp chamber has not yet been reached.

Step 7: Cut into Chamber

Continue drilling apically through the dentin. You will feel a slight drop as the bur breaks through the roof and drops into the pulp chamber.

Step 8: Explore Access

When the pulp chamber has been penetrated, probing with the explorer will often produce a "catch" along the ledges, or overhangs, created by the lingual walls or roof of the pulp chamber.

Step 9: Remove Undercuts

Expand the coronal cavity access slightly. Avoid perforating the floor of the pulp chamber. Penetrate the pulp chamber using a slow-speed long-shank round bur (No. 4 or No. 6, depending on size of chamber). Working from inside the chamber to outside in a sweeping motion, remove undercuts, or lingual and labial walls of pulp chamber.

The access on the tooth is extended more toward the cingulum. Additional beveling of the incisal wall is also completed by working from inside to outside to remove the lingual "shoulder" of the canal, thus allowing for the continuous access from the coronal cavity into the canal.

The ideal access consists of smooth walls without ledges. The use of fissure burs very often creates ledges in the floor and walls of the cavity access preparation, which can make canal instrumentation more difficult. Moreover, ledges in the dentin can diminish the tensile strength of the tooth.

In general, the No. 2 is used for working within the canals, while Nos. 4 and 6 are for working within the chamber, using a sweeping motion to avoid gouging the floor of the pulp chamber and creating the illusion of a canal which may lead to perforation.

Remove debris from the chamber as you proceed, using a No. 2, No. 4 or No. 6 bur to eliminate pulpal horn debris and bacteria. If the canal or chamber is calcified, remove dentin with the slow-speed hand piece and appropriate bur.

Step 10: Irrigate

Irrigate periodically to flush out debris. Fill an irrigating syringe with "sodium hypochlorite" and attach an irrigating needle, the tip of which should be bent at approximately a 45 degree angle to the long axis of the needle. The distance from the bend to the tip of the needle should equal 20 mm. For preclinical exercises tap water should be used instead of sodium hypochlorite.

Using this needle, gently flush fillings and debris from the chamber. The needle should fit in the canal very loosely, and the solution should be introduced very slowly, so that it can run back out of the access opening and is not forced through the apex.

Step 11: Straight-Line Access

The resulting cavity should be smooth and continuous, flowing from cavity margin to canal orifice; this is referred to as straight-line access. Verify that you have achieved straight-line access by rotating a file within the canal. The file should have direct and unimpeded access to the canal, achieving 360 degrees of unrestrained motion; you should be able to rotate the file 360 degrees about the cavity outline without encountering resistance within the pulp chamber due to ledges or ridges.