

Access Opening Preparation

Guidelines for access cavity preparation:

1) Study the preoperative radiograph: It gives information about the size, shape, number and curvature of the root canals and roots. One should check the depth of preparation by aligning the bur and handpiece against the radiograph.



2) Excavate all the carious lesions: No caries should be left in the tooth, because microorganisms of the carious lesion may be introduced inside the canal and infection might occur.

3) Replace any defective filling: The defective filling should be replaced before beginning the access opening because it will not ensure proper seal of the tooth.

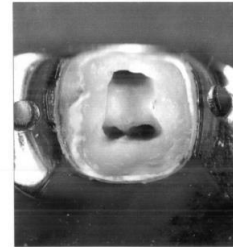
4) Remove unsupported tooth structure: Any weak tooth structure might fracture that causes loss of the seal of the tooth and the reference point which changes the length of the tooth.



2.40 Gross caries



2.41 Carious exposure with hyperaemic pulp



2.42 Pulp extirpated and canals prepared

Burs used for access cavity preparation

Access opening burs: they are round burs with 16mm bur shank (3mm longer than standard burs).



Access refining burs: these are coarse flame-shaped, tapered round and diamonds for refining the walls of access cavity preparation.



Procedure of Access Opening for Anterior Teeth:

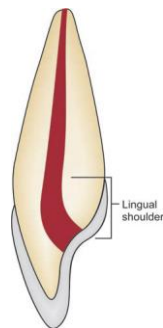
1) Entrance is always gained through the lingual surface of all anterior teeth. The initial penetration is prepared in the exact center of the tooth above the cingulum (in the center of the middle third).

The initial entry in the enamel is done by a round bur no. 4 operated at a right angle to the long axis of the tooth. The guide for enamel penetration is that only the head of the round bur no. 4 should enter the tooth.

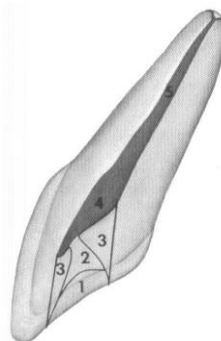
2) The direction of the bur is changed to be parallel to the long axis of the tooth, and drill until the entrance to the pulp chamber. We can know that we reached the pulp chamber when we feel a fall in the resistance to the bur, i.e. the bur falls into a space which is the pulp.

3) Remove the roof of the pulp chamber by working from inside the chamber towards the outside of the chamber (pulling motion).

4) Lingual shoulder (is a prominence of dentin formed by removal of lingual roof which extends from the cingulum to approximately 2 mm apical to the orifice) is removed by moving the bur from inside towards the outside to give a continuous smooth flaring preparation. Lingual shoulder is a convexity inside the pulp chamber.



5) Finishing and funneling with a fissure bur. The final shape funnels down to the orifice of the canal and flare outwards.



6) Extirpate the pulp by introducing an instrument called the barbed broach in the root canal and by outward movement the barbed broach will catch the pulp and remove it from the root canal.

7) Irrigation of the pulp chamber.

The pulp horns should be eliminated with a round bur no. 2 used laterally and incisally, because if they remain, remnants of necrotic tissue would cause discoloration to the anterior teeth.

Procedure of Access Opening for Premolars:

1) Access in posterior teeth is always gained through occlusal surface. In premolars, it is in center of the occlusal surface between buccal and the lingual cusp tips in the center of the central groove. Initial penetration is made parallel to the long axis of the tooth into the exact center of the central groove. Slight variations exist between mandibular and maxillary premolars because of the lingual tilt of mandibular premolars.

2) Penetrate the enamel with No. 4 round bur in high speed contra-angle handpiece. The bur should be directed parallel to the long axis of tooth and perpendicular to the occlusal table. Generally the external outline form for premolars is oval in shape with greater dimensions buccolingual side. The bur will be felt to drop if the pulp is reached.

3) Once the clinician feels “drop” into the pulp chamber, penetrate deep enough to remove the roof of pulp chamber without cutting the floor of pulp chamber. To remove the roof of pulp chamber place a bur (round, tapered fissure or safety tip) alongside the walls of pulp chamber and work from inside to outside.

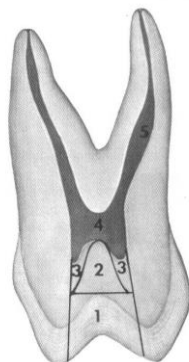
4) Finishing the cavity walls is done with a fissure bur.

The final access opening would be ovoid in shape buccolingually which reflects the anatomy of the pulp chamber and position of the buccal and lingual canal orifices.

* The pulp chamber of the lower premolars is buccally located rather than lingually so we start access opening and push more buccally.

* Access for upper premolars: There are 2 canals, the buccal canal is approached palatally, and the palatal canal buccally.

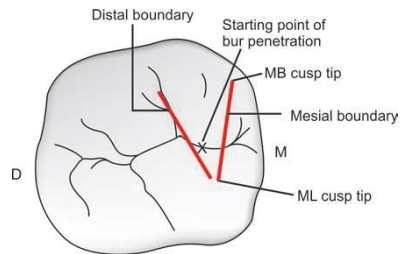
* Floor of the pulp chamber should not be reached.



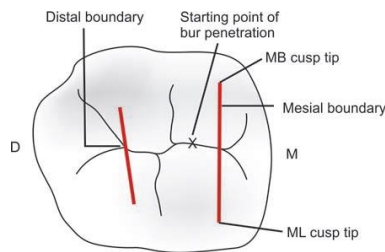
ACCESS CAVITY PREPARATION FOR MOLARS

1) Remove caries or any restoration, if present. Determine shape and size of the access opening by measuring boundaries of pulp chamber mesially and distally and coronally on the radiograph.

2) Determine the starting point of bur into the enamel. It is determined by mesial and distal boundary. For maxillary molars the mesial boundary is a line joining the mesial cusps and the distal boundary is the oblique ridge. The starting point of bur penetration is on the central groove midway between mesial and distal boundaries.



For mandibular molars the mesial boundary is a line joining the mesial cusp tips and the distal boundary is the line joining buccal and the lingual grooves. The starting point of penetration is on the central fossa midway between the mesial and distal boundaries.

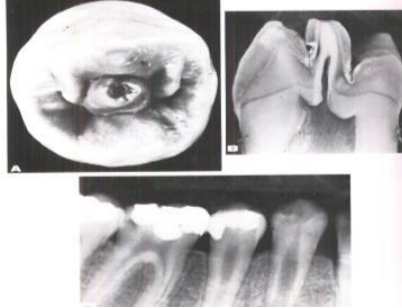


3) Penetrate the enamel with No. 4 round bur. Penetrate the bur deep into the dentin until the clinician feels “drop” into the pulp chamber. Now remove the complete roof of pulp chamber using tapered fissure, round bur, safety tip diamond or the carbide bur working from inside to outside. The shape and size of the internal anatomy of pulp chamber guides the cutting.

Anomalies of pulp cavities:

We have certain anomalies which interfere with root canal treatment. ex: calcification or complete obliteration of root canal, open apices, etc ...

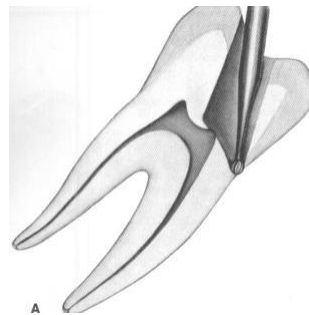
- 1- Dentinogenesis imperfecta: There is a small pulp chamber with root canal obstruction.
- 2- Hyperparathyroidism: There is a calcified pulp chamber and loss of lamina dura.
- 3- Hypofunction of pituitary gland: There is a retarded eruption of the teeth and the apices of the root will be opened.
- 4- Dentinal dysplasia: There is an obliteration of the pulp chamber and the root formation is defected.
- 5- Shell teeth: The pulp chamber is quite big with short root.
- 6- Dense invagination: There is an improper shape of root canal.



Errors in Access Opening:

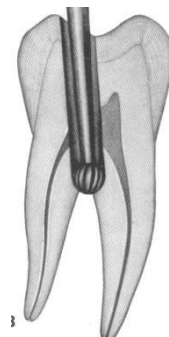
1- **Perforation:** It is common when drilling is continued apically or laterally after we reach the pulp chamber. It is mostly see in:

- a) Old patients. It is due to pulp recession.
- b) Teeth restored by crowns, inlays or big restorations. It is difficult to know the long axis of the tooth so it is better to remove the restoration and work.
- d) Tilted teeth.
- e) Failure to complete a convenient extension.



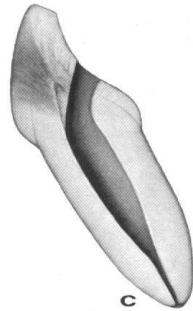
2- **Cutting more apically:** It will lead to flattening of the floor of the pulp chamber and this will weaken the tooth structure which will cause:

- a) Losing the funneling shape of the canal orifice.
- b) Perforation into the furca.
- c) Gouging: Going laterally in the access opening, so the wall of the cavity will not continue with the wall of the root canal.

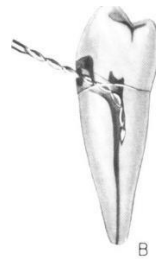


3- **Narrow access opening.** This will cause incomplete pulp extirpation and instrumentation through the pulp chamber or pulp horn. This is identified by:

- a) Severe bleeding.
- b) Change of the colour of the floor dentin, to dark blue.
- c) Anatomical landmarks of the floor of pulp chamber, which are convex floor and presence of grooves connecting the canal orifices, are not seen clearly.
- d) If a probe is placed in the pulp chamber and pulled against the walls and it catches in the pulp chamber then there is still roof of the pulp chamber, therefore indicating presence of remnants of pulp tissue.



4) **Entrance through labial surface.** This is sometimes performed due to severe crowding or caries in labial surface, or proximal surface if the adjacent tooth is missing. This type of access opening causes incomplete pulp extirpation.



5) **Over extended access opening preparation.** This access opening causes undermining and weakening of the enamel walls.

