

# Removal of Foreign Objects from Root Canals

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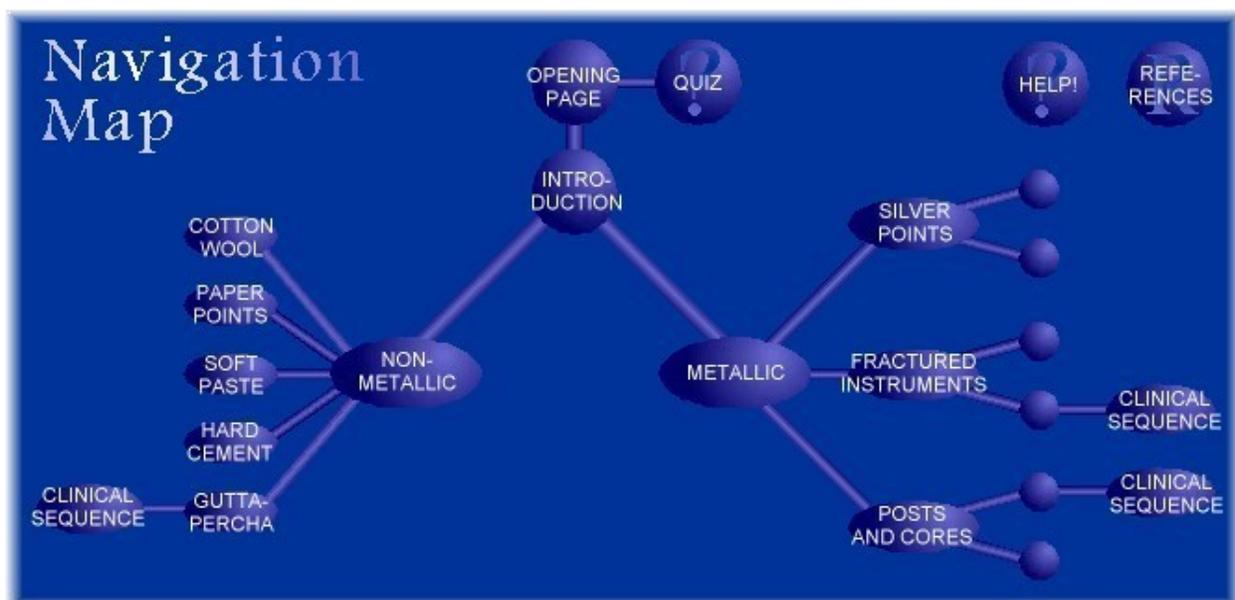
<http://www.dentistry.bham.ac.uk/cal/removal/open.htm>

*One of the most difficult clinical tasks a practitioner may have to undertake is the removal of fractured instruments or other foreign bodies which have become tightly wedged within the root canal. The procedure for removal will vary depending on the nature of the foreign body. In this site, the authors provide a step-by-step guide to the necessary techniques. By answering simple questions, a solution for the case will be suggested. Click on the picture below to advance.*

## **Introduction**

It may be necessary to remove foreign bodies from root canals for a variety of reasons, for instance to re-negotiate and treat an infected root canal or to remove a fractured post so that a new restoration can be placed. In many instances such obstructions can be negotiated and the offending object removed without great difficulty, but in others the procedure is not completed easily. Furthermore, such cases are often time consuming and frequently require specialist equipment which may not be readily available.

Foreign objects that are found in root canals may be classified as non-metallic and metallic. The presence of these objects prevents thorough instrumentation of the root canal system and is likely therefore to compromise the treatment. Some simple questions will be asked in order to determine what sort of foreign object is located (and its situation) in the canal. Then, we will offer you solutions for the problem, as a step-by-step guide.



## ***Is the foreign object :***

- ◆ **Non-metallic** : - *Go to point 1*
- ◆ **Metallic** : - *Go to point 2*

### **1. *Non-metallic foreign body***

#### **a) Cotton wool**

Tightly packed cotton wool that has swollen after absorbing moisture may cause obstruction of the root canal. The placing of a pledget of cotton wool in the root canal below the access cavity is necessary to prevent the temporary dressing material entering the root canal space. This item can be removed with one or two barbed broaches, which are used to engage the material, rotated through 90° and then removed.

#### **b) Soft paste**

If the failed root fillings are in the form of a soft paste, they can be removed easily using Hedström files and copious irrigation. The use of an ultrasonically powered file with associated irrigation is particularly useful here, especially for removing remnants of paste which may remain in the root canal despite careful hand instrumentation.

#### **c) Paper points**

Tightly packed paper points that have swollen after absorbing moisture may cause obstruction of the root canal. However, a paper point carrying a medicament is, in our opinion, unnecessary and should no longer be used in present-day endodontics. This item can be removed with one or two barbed broaches, which are used to engage the material, rotated through 90° and then removed.

#### **d) Hard cement**

Hard cements can be difficult to remove and usually need to be drilled out. This is a hazardous procedure, especially in the apical region of the root canal, where the use of hand instruments is safer. Some cements, however, such as zinc phosphate may be impossible to remove from the root canal as there is no known solvent. An ultrasonically powered file may be used in an effort to chip the cement away, although often with limited success. An apicectomy with retrograde root filling may be necessary in these cases.

#### **e) Gutta percha**

Gutta percha root fillings with a poor seal may be removed by rotating one, two or if possible three small Hedström files around the root canal filling and pulling it out. If this is not successful, softening of the gutta percha using chloroform, xylene, oil of cajaput or heat may be employed to aid mechanical removal with hand instruments. Alternatively, rotary

instruments, for example Gates-Glidden drills, may be used in the straight part of the canal. These are available in a range of sizes and have a safe cutting tip that reduces the risk of perforation. Care should be taken during their use, as considerable heat is produced which can damage the periodontal structures. This can be minimized by using the drills intermittently.

Ultrasonically activated files have been suggested as being useful for the removal of gutta percha, but in our experience this has proved to be a messy and ineffective procedure as these files tend to produce softening rather than removal of the material.

## **2. Metallic foreign body**

### **a) Silver point**

The apical seal of silver points is rarely as good as their radiographic appearance would suggest, and in many cases the seal relies on the cement used. If this washes out, corrosion occurs leading to failure of the root filling. As a result the use of silver points is decreasing in popularity because of possible long-term failure problems. The radiographic aspect of a silver point obturated tooth can be seen in the thumbnail below, which can be clicked for a larger picture.



#### ***Is there sufficient of the point in the pulp chamber ?***

##### **♦ Yes**

##### **Silver point (with sufficient extruded in the pulp chamber)**

Many of the full length points can be removed easily by gripping with Steiglitz forceps or pin pliers provided there is sufficient of the point left in the pulp chamber. Indeed it is essential that when a silver point is used sufficient should be left to extrude into the pulp chamber. This is to allow the point to be gripped with pliers should failure occur. It is also important in these situations not to pack the pulp chamber with amalgam, as this leads to the almost insoluble problem of distinguishing the silver point should failure of the root filling occur and retreatment be required.

##### **♦ No**

##### **Silver point (without sufficient extruded in the pulp chamber)**

Alternative techniques need to be employed when insufficient silver point remains to allow it to be gripped with the pliers. If the point is loose it may be possible to elevate it out of the root canal after pressing the hard edge of a stainless steel excavator into the soft metal of the silver point. If it appears firm, a combination of ultrasonic vibrations from an ultrasonic scaler and the use of the Masserann kit may be employed. The Masserann trepan can only be used in the straight part of the root canal to free the coronal 2 mm of the silver point. It is then possible to grip the the point with either the Masserann extractor or a similar size trepan. If this is unsuccessful further ultrasonic vibration from an ultrasonic scaler may be employed

to try to break the cement seal. These vibrations may be applied directly to the point (although care must be taken not to wear away the soft metal), or through the trepan, or against a Hedström file passing next to the point. This may only be possible if there is sufficient space in the canal. The point may then be removed as described previously or with the Steiglitz forceps. After removal of the point, ultrasonic cleaning is particularly useful for removing any corrosion remnants from within the canal.

## **b) Root canal instruments**

The separation (fracture) of root canal instruments is a procedural hazard in root canal therapy. This problem can be kept to a minimum by good quality control, discarding any damaged instruments, using the instruments in the correct sequence and not rotating the instrument more than a quarter turn.

### ***Is the separated instrument screwed through the apex ?***

- ◆ **Yes**

#### Fractured root canal instruments (screwed through the apex)

If the separated instrument is screwed through the apex a surgical approach is usually indicated to free the fragment. If possible, the apex of the tooth should be removed and the fragment pushed up into the empty canal space. The root canal can then be cleaned and obturated at the time of surgery prior to placing the retrograde filling. If it is not possible to remove the fragment a retrograde amalgam filling should be placed and the canal cleaned and obturated as far as possible.

In the event of failure to remove a separated instrument it may be possible to bypass it, although in our experience it is difficult to bypass a separated instrument which lies in the apical third because the root canal is usually more circular in cross section in this area.

- ◆ **No**

#### Fractured root canal instruments (not penetrating the apex)

The removal of separated instruments that have not penetrated the apex commonly involves a combination of procedures. The use of Masserann trepans coupled with ultrasonic vibration can be used to extract the fragment as described in the silver points removal page.

In the event of failure to remove a separated instrument it may be possible to bypass it, although in our experience it is difficult to bypass a separated instrument which lies in the apical third because the root canal is usually more circular in cross section in this area.

c) **Posts and cores**

The retreatment of failed root fillings in teeth with post retained crowns is preferable to their immediate apicectomy. This is because an apicectomy shortens the remaining root leaving less for retention of a subsequent post crown. The procedure also leads to irritants being sealed into the canal which may subsequently leak out past the retrograde restoration or through a lateral canal. If the root canal can be renegotiated, cleaned and obturated these problems are minimized.

The removal of the post should not be attempted, however, if it is felt that the force required to remove it could result in root fracture.

***Is the post fractured ?***

♦ **Yes**

Fractured posts

A post that has fractured in a root canal can pose a major problem. In such a situation the risk of root fracture or perforation during removal of the post remnant may be high. These fractured posts can often be loosened by using a ultrasonically powered chisel at the cement interface. The chisel breaks up the luting cement and the irrigant washes it away, and this in turn helps removal with the Masserann trepan which is used to cut down along the cement. Care must be taken to check the edges of the trepan, sharpening them when necessary. Occasionally the edges can flare out, with resultant danger of excessive removal of dentin and increased risk of weakening the root or even perforation. A smaller trepan can be used, as described in the silver point removal page, to grip the fractured portion.

If the fractured post is of the threaded type a groove cut in the end of it may enable it to be unscrewed, provided the cement seal is first weakened. If this is unsuccessful the Masserann kit can be used: the trepan should be of a diameter to cut along the threads of the post, as this will minimize the amount of dentine removed while easing cutting of the metal. If a Masserann kit is not available the post may have to be drilled out using an end-cutting bur. However, this becomes a more hazardous procedure as one gets higher up the canal.

♦ **No**

Posts and cores

Post removal can generally be accomplished in anterior teeth by using a post extractor such as the Egger post remover. The first part of the procedure with this extractor involves shaping the core to accept the jaws. After gripping the core the feet of the Egger post remover can be placed on the shoulder of the preparation. In the event of an uneven shoulder an instrument may be placed in between one of the feet and the shoulder to enable the force of withdrawal to be applied along the long axis of the tooth. The knurled knob screws the jaws together and the wing nut advances the feet which impart an apical force on the root face so that the instrument's jaws and the post are drawn coronally.

Sometimes a pair of extraction forceps can be used to grasp a post requiring removal but care is necessary that excessive force does not result in fracture or extraction of the tooth. Ultrasonic vibration from a scaling tip or the head of an endosonic driver may be used to try to break the cement seal. Unfortunately, the Egger post remover cannot be used on a correctly fitted threaded post, although these may occasionally be unscrewed if the cement lute has failed.