Current concepts in gutta-percha removal for re-treatment

Two-part series by Dr Rohet Khatavkar & Dr Vivek Hegde—Part I

Common reasons for an endodontic failure include missed canals, ledge formation, perforations, separated instruments, inadequately filled canals, coronal leakage, and error in post placement.

For a successful orthograde retreatment, the removal of the endodontic filling material, such as gutta-percha, is essential to allow access to the canals for a successful debridement and re-obturation of the root canal system. This article deals with the removal of gutta-percha based obturating material, as an essential step in a successful endodontic retreatment.

The first step in planning for a tooth requiring retreatment is – “Coronal disassembly”. This involves removal of the coronal restoration including full coverage restoration, core build-up material, and post placed into the canal. After gaining access into the pulp chamber, it is a prerequisite for the clinician to inspect the chamber floor for any missed canals, which can also be a cause of failure.

Techniques for Gutta-percha Removal

The clinician can use various options for the removal of obturating material:

1. K-files or H-files
2. Gutta-percha solvent
3. Combination of paper points and gutta-percha solvent
4. Rotary instruments
   a. Gates Glidden drill/Peeso reamer
   b. GPX gutta-percha remover
   c. NiTi rotary instruments
5. Specialized rotary instruments designed for retreatment
   a. ProTaper Universal retreatment instruments
   b. Mtwo retreatment files
   c. B-Endo retreatment files
6. Heat transfer devices
   a. Heat carrier tips
   b. Ultrasonic tips
7. Soft tissue laser.

1. K-files or H-files
K-files or H-files are the basic instruments in an endodontist’s armamentarium, which can be used to engage the mass of gutta-percha, and by applying an outward firm-pressure mass can be removed. This technique, however, allows for a gross removal of gutta-percha especially from large canals, which are poorly compacted allowing files to bypass the obturating material and “bite” into the mass.

2. Gutta-percha Solvents
A wide array of chemicals are available today as gutta-percha solvents, such as eucalyptol oil, turpentine, chloroform, xyol, methylene chloride, orange-wood oil, methyl chloroform, endosolv E, endosolv B, and tetrahydrofuran. These solvents are available usually in amber-colored bottles.

Chloroform has been proven to be most successful in plasticizing gutta-percha points, and thus facilitating its removal from root canals during retreatment. The reported adverse effects on the health, from exposure to chloroform, have necessitated the use of a less hazardous solvent replacing chloroform.1,2

The use of solvent softens the gutta-percha, and then softened gutta-percha can be easily removed from the canals by placing the file into the canals and applying firm pressure against the canal walls.

Micro-debriders and openers (Dentsply Maillefer) are small files having 90-degree bend at the working end and an attached handle (Fig. 1). It may also be used to substitute standard K-files and H-files.

3. Combination of Paper Points and Gutta-percha Solvents
Most of the literature shows that gutta-percha filling material cannot be removed completely from the root canals. In such cases, a solvent is flushed into the root canals up to the level of pulp chamber, in an effort to maximize the interaction of the solvent and gutta-percha remnants.3,4 Paper points can also be used for retrieving sludge of soft-en gutta-percha formed on the reaction of solvent with gutta-percha.

The ‘wicking technique’ is used, i.e., flushing the root canal with solvent followed by drying it with paper points, which helps in removing the softened gutta-percha along with paper points.

This technique is very useful in narrow canals or the canals with a greater degree of curvature.

4. Rotary Instruments
A. Gates Glidden Drill and Peeso Reamer
The use of Gates Glidden drill or Peeso reamer (Figs 2a & b) is a well-known technique to remove gutta-percha from the coronal and middle portion of the root canal. The non-flexible head and lateral cutting design of these instruments do not allow instrumentation in the curved portion of the root canal. Therefore, the additional use of hand instrument is often necessary. Due to their stiffness and predisposition to fracture, they are safer in the straight portions of the canal of anterior and posterior teeth.

B. G Pax gutta-percha Remover
The GPX gutta-percha remover (Prestige Dental) is a specially designed file used in a slow-speed handpiece. It plasticizes the gutta-percha by frictional heat and facilitates its removal from the root canal by its H-file like flute design. These stainless steel drills are more effective in the coronal and middle–third portion of the root canals. These drills are available in various sizes, ranging from ISO 25–50, and more recently introduced NiTi GPX removers that can be used in curved canals as well (Fig. 3).

C. NiTi Rotary Instruments
The use of NiTi Rotary instruments have the advantage of removing gutta-percha as well as shaping the root canals in an under-prepared tooth, simultaneously. The number of studies carried out for comparing the gutta-percha removal efficacy of rotary with the hand instrument, have shown both techniques to be almost equally effective.5 It has been advocated that the use of rotary devices in endodontic retreatment should be followed by hand instrumentation to achieve optimal cleanliness of root canal walls. The rotary instruments reach the whole working length easily, plasticize gutta-percha through frictional heat, & remove gutta-percha quickly. Later, hand instruments can refine and complete the removal.6 These instruments are recommended to be used at rotational speed of three-four times more than that of the rotational speed which is recommended for routine cleaning and shaping procedures. The rotary instruments also have increased chances of fracture in case they are forced through the mass of gutta-percha.

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