

REVIEW ARTICLE

Stainless Steel Hand Files - An Indispensable Tool to Successful Root Canal Preparation

Pavana Kamath

ABSTRACT

The advent of rotary endodontics has overshadowed root canal preparation with the use of hand files. However, the role hand files in endodontics cannot be disregarded. Hand files continue to be used at several stages of the procedure where they remain almost indispensable, clearly suggesting that they are here to stay.

Keywords: Hand files, Root canal preparation, Stainless steel hand files.

How to cite this article: Kamath P. Stainless Steel Hand Files - An Indispensable Tool to Successful Root Canal Preparation. *Int J Health Res Educ* 2018;1(1):6-7.

Source of support: Nil

Conflicts of interest: None

INTRODUCTION

Hand files used in endodontics are manually operated instruments, and they are used for cleaning and shaping of root canals in root canal therapy or any other endodontic procedure.

Since stainless steel hand files are not considered part of any "system," it is misleading to think of these instruments as a relic of the past. In root canal preparation, it is impossible to totally skip a hand file. There are several distinct phases in the preparation of a root canal system:

1. Canal location (coronal patency)
2. Canal negotiation
3. Establishing apical patency
4. Creation of a glide path
5. Working length determination
6. Enlargement of the body of the canal
7. Recapitulation
8. Bypassing a ledge
9. Bypassing separated instruments
10. To read the canal anatomy.

These are the fundamental steps where it is impossible to avoid the use of hand file.^[1]

Private Practitioner

Consultant Micro-Endodontist, Dr. Kamath Skin and Smile Care, Mumbai, Maharashtra, India

Corresponding Author: Pavana Kamath, Consultant Micro-Endodontist, Mumbai, India. e-mail: drpavana@gmail.com

CANAL NEGOTIATION

The ability to sense the apical constriction by tactile sensation is invariably increased when a hand file can glide to that area unimpeded due to the selective removal of dentin in the upper portion of the canal system. At this stage, a hand file can give you information on canal anatomy that is easily missed when using a rotary instrument. Endodontic finesse can only be achieved by developing tactile awareness with a hand file. A hand file was used to negotiate through the extreme calcification as well as to locate the bifid terminus. When a canal has an acute curvature, there is a greater risk of ledging and/or blocking. This can be avoided by placing a small J-shaped bend in the apical 3–4 mm of a No. 10 hand K file and then using it to scout the canal system. This simple adaptation to the stainless steel file will allow negotiation in a canal as it makes sudden directional changes. These difficult cases usually require that you use as many small files as you need to reach the terminus, along with copious irrigation.

If apical patency is maintained, blocking a canal and transporting the foramina become a nonissue. It assures maintenance of a fluid glide path and a consistent working length. If the glide path is not maintained, an apical plug of dentin mud will form. This will result in a shortened working length and lead to possible perforations. In addition, thorough cleaning, shaping, and vertical compaction of the root canal space become impossible. To establish patency, a No. 8 or No. 10 hand file is used to keep the apical constriction open by advancing 0.5 mm past the end of the root. The canal system should be filled with fresh irrigating solution to prevent pushing debris apically. Using the classic watch-winding motion, the file is passively advanced, never pushed or forced. If this is done after every working file to reestablish a glide path, your canal system will not become blocked or ledged.

The use of hand files is essential in any endodontic shaping technique. Ni-Ti rotary instrument systems are not a replacement for the K-file. Canal location, negotiation, patency, glide path, and working length determination are essential elements of modern endodontic techniques. In most instances, these steps are best done with the finesse and tactile sense that can only be achieved with a hand file.

THE GLIDE PATH

The endodontic glide path is a smooth radicular tunnel from canal orifice to physiologic terminus (foraminal constriction). Its minimal size should be a "super loose No. 10" endodontic file. The glide path must be discovered if already present in the endodontic anatomy or prepared if it is not present.

The role of the hand file in establishing the glide path is indispensable.

Any endodontically diseased tooth can be predictably saved if the root canal system can be nonsurgically or surgically sealed, the tooth is periodontally sound or can be made so, and the tooth is restorable."

A non-surgical seal requires the creation of a radicular path that can be cleaned of viable and non-viable bacteria, vital and non-vital pulp tissue, biofilm, and smear layer and then shaped to a continuously tapering funnel that can be predictably and easily obturated.

"Getting to the apex" or "slipping and sliding to the physiologic terminus" represents the most important factor in root canal preparation.

Several authors have recommended using stainless steel K-files for preparing the glide path. There are several advantages for using stainless steel K-files as they have excellent tactile sensation and low potential for file separation. Very often, the K-file has an impression of the canal when it is removed from the canal, thereby guiding the operator to the curvatures present in the canal. The stiffness of hand steel files also aids in negotiating blockages and calcifications. In 2006, West recommended using a K-file with an initial watch-winding motion to remove restricted dentin in very narrow canals, followed by a vertical in and out motion with a 1-mm amplitude and gradually increasing the amplitude as the dentin wall wears away and the file advances apically.

In 2008, Kinsey and Mounce described a technique using a reciprocating handpiece attached to small size K-file for glide path preparation.

West has rightly said "The endodontic Glide path is the secret to radicular rotary safety." A confirmed and reproducible glide path is a prerequisite to rotary or reciprocal shaping. To be safe, before rotary shaping, the dentist must always discover manually whether a glide path already exists or needs to be created with a hand file.^[2]

LEDGE BYPASS

Ledges that develop on the canal wall allow space for the deflection of a file. Nickel-titanium instruments are very flexible; therefore, they might curve back on themselves, so they should not be used to bypass ledges. Once the canal has been fully negotiated with at least a stainless steel No. 15 hand file, or if the ledge has been bypassed and removed, then rotary NiTi instruments can be used for further canal enlargement.^[3]

CONCLUSION

Hand files allow the clinician to manually "feel" the unseen dimension in canal anatomy beyond what radiographs alone can illustrate.^[4]

REFERENCES

1. Germain. The Stainless Steel Hand File: Essential or Extinct. Available from: <http://www.DentalCEtoday.com>. [Last accessed on 2015 Jan 25].
2. Passi S, Kaler N, Passi N. What is a glide path. Rev Artic 2016;2:32-7.
3. Mounce R. Using hand files to their full capabilities: A new look at an old yet emerging technology. Dent Tribune;2013.
4. Jafarzadeh H, Abbot PV. Ledge formation: Review of a great challenge in endodontics. J Endod 2007;33:1155-62.