"Le passage"

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In modern endodontics three major steps can be distinguished (creating an adequate shape, cleaning with chemicals, sealing the system) when creating a certain shape in the canal, and this can vary from one canal to another, even inside the same tooth and same root. Chemical preparation of the root canal space goes hand in hand with the shaping step, having as the main task the cleaning and disinfection of the root canal space, and, with cryotherapy, an anti-inflammatory role in order to reduce postoperative pain and reduce inflammation. The final step is the 3D sealing of the root canal space.

In this article, I will discuss the shaping part, review some important dates in the history of endodontics, and present the latest files and techniques available. In 1907, Dr Kerr created the K-File (Kerr) was introduced as the





first twisted file to be used for enlarging a canal and is still in use today. Nickel-titanium (NiTi) files were introduced in 1991 and are still in use today. In 2007, at the European Society of Endodontology congress in Istanbul in Turkey, I gave my first lecture on the heat treatment of NiTi files and the creation of twisted NiTi files, and now all NiTi rotary files are heat-treated to different levels to create different properties. More recently, Traverse files (Kerr; Fig. 1), produced with another technique of heat treatment, were introduced, further advancing endodontics. files (Fig. 2), including a 25/.08 orifice opener of 17 mm in length, making it an ideal kit for all clinical situations as start-up files or initial file for shaping the canals. All Traverse files have a maximum flute diameter of 1 mm (Fig. 3), and this can limit the over-enlargement in the coronal part of the canal and will help the file to engage the space deeper and faster. The two other files are size 18/.06 and 13/.06. The job of these two files is to create a quick and safe access to the apex, that is, a traverse or "Le passage" from the coronal part to the apical part of the root.

The focus in this article is on clinical application in different clinical situations. Traverse files are a set of three The first sequence (Fig. 4) is for large canals or canals that are easy to access. One starts with a 25/.08 Traverse





at a speed of 650 rpm and a torque of 3 Ncm; the file will prepare as deep as it can go. This is followed by a 10 K-File to determine the working length and then a 18/.06 Traverse to full working length. The last file is an SM3 TF Adaptive (35/.04) for apical preparation running under Adaptive Motion (Fig. 5). A medium gutta-percha cone can be adapted, followed by 3D obturation. Cases done with the sequence are shown in Figures 5 and 6.

The second sequence is for cases of medium difficulty, and this is the sequence that will be used the most for posterior teeth and mandibular incisors. Figure 7 shows the sequence that I recommend for such cases. For all cases, I start with the 25/.08 orifice opener in the straight part of the canal, and do not need to push it further, at a speed of 650 rpm and torque level of 3 Ncm in continuous rotation. This is followed by an 8 K-File taken to full working length, as determined with the help of an apex locator. A 13/.06 Traverse, using the same settings, is driven with small push and pull movements to full working length. Now one changes the motor settings to Adaptive Motion and uses an SM2 TF Adaptive (25/.06) to full working length and eventually if possible follows it with an SM3. If the SM3 reaches full working length, a medium gutta-percha cone can be adapted. If the SM2 is the last file to reach working length, one can use either the medium or the fine-medium cone as the master cone. Of course, this is to be followed by 3D obturation of the root canal system. Figures 8–10 show examples of cases treated with this sequence.

The third sequence is for special cases, such as tiny canals, deep-split canals, calcified canals and canals with multiple curvatures. This sequence, shown in Figure 11, is similar to the previous sequence, except both a 13/.06 and 18/.06 Traverse are employed. One starts with the orifice opener as with all the sequences, followed by



14 **roots**



8 and 10 K-Files taken to working length. The M4 handpiece can be a great help in establishing a small path. A 13/.06 Traverse is taken to full working length, followed by a 18/.06 Traverse, employing the same settings for speed and torque, 650 rpm and 3 Ncm. Once this step is done, one shifts to Adaptive Motion and uses the SM2 file and if possible the SM3. Figures 12–14 show examples treated with this sequence.



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