special

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Report into W&H Endodontic contra-angle handpiece
WD-74 M (128:1)

„Root canal treatment with nickel-titanium files in dental practice."

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Introduction

The success of root canal treatment largely depends on the perfect preparation and shaping of the canal system. As always, the principle established in 1898 by Eberly applies: "What is filled in the prepared root canal is not as important as what is removed from it".

The first mechanical endodontic contra-angle handpieces became available at the end of the 50's with the Racer system and then in the 60's the Giromatic system, making the procedure very much easier than before. Since then, the development of mechanical systems have made considerable advances. Freely available now are oscillating instruments either in the sonic or ultrasonic range, with full or part rotating systems, as well as other different combinations of movement.

The introduction of the highly flexible NiTi (nickel-titanium) instruments in endodontics has now taken the development of mechanical root canal preparation a stage further. The new mechanical preparation methods are able to carry out a complete rotation of the instrument, right through 360 degrees. In the past, fully rotating contra-angle handpieces were prone to rather harsh critical appraisal. The stainless steel files used were very susceptible to breakage, and any extreme deviations in shape of the canal anatomy were a common occurance Eg., lateral or apical perforations, severe straightening or shoulder formations. In order to help alleviate these preparation errors, NiTi instruments must be regarded as a necessity for full rotation preparation.

Using the WD-74 M (128:1) (Fig. 1)

The design of the new contra-angle handpiece is similar to other current contra-angle handpieces from W&H. To ensure the head of the handpiece is kept as small as possible, an integrated light source and irrigation channel through the instrument were not included in the specification.

Fig. 1: W&H endodontic contra-angle handpiece WD 74 M (128:1) with nickel-titanium file

The procedure detailed below describes a faultless application of the new system:

1. After establishing an access opening using a diamond bur with a high-speed contra-angle handpiece, entry to the canal is carefully exposed at low speed with a rose-head bur. The W&H endodontic contra-angle handpiece is only introduced after complete exposure of the canal entrance. During the actual canal preparation in particularly deep root locations, the dental surgeon must rely primarily on his tactile skill. A bulky light source in the head of the handpiece is therefore superfluous in these circumstances.

2. To ensure effective removal of dentine fragments in the coronal plane, alternate, manual flushing with H_2O_2 and NaOCl is necessary. This also means that an integral irrigation tube can be omitted.

When the mechanical system is used correctly, the canal wall can be uniformly prepared in all areas. Post-preparatory shape deviations in the root canal anatomy were not observed. Extremely curved canals in difficult to access areas can also be prepared safely using this procedure.

Full rotational preparation of the canal wall differs considerably from conventional preparation. Whereas the apical to coronal technique is used for conventional preparation, the crown-down technique should be applied when using the rotating NiTi files. This means that the coronal third part of the canal is widened considerably, especially where there is an acutely curved root canal, funnel shaped with a Peeso bur up to the beginning of the curvature. This method is important to ensure that subsequent files are inserted completely into the canal.

The procedure is then continued with progressively smaller files right up to the apex. Only at this point should a survey radiograph and complete preparation be carried out.

The push-button chuck of the contra-angle handpiece WD-74 M is easy to use and allows quick changing of files.

Fig.. 2: Nickel-titanium-files of Maillefer

Summary

Many dental surgeons specialising in endodontics have reservations concerning rotating systems. This still applies to rotating systems operating with burs or other cutting instruments manufactured from stainless steel. As already described, the use of this type of instrument can cause file breakage, perforations, apical blockages and preparation errors, for instance, canal straightening or shoulder formations.

The different file geometry of the highly flexible NiTi files is an important additional requirement for the more efficient procedure. The Profile® instruments from Maillefer are used in conjunction with the endodontic contra-angle handpiece WD-74 M (128:1) from W&H (Fig. 2).

The instruments are provided with a non-cutting tip and their conical tip varies with the different ISO sizes. All ISO size 08-20 instruments should usually be discarded after one use. The constant stress of bending and sterilization very quickly leads to breakage of NiTi instruments.

The speed reducing transmission of the WD-74 M (128:1) is particularly suitable for NiTi instruments with motors operating at up to 40,000 rpm ensuring compliance with the optimum speed range of 150–350 rpm. In contrast to other manufacturers, W&H concentrates on the upper speed range of the micromotor with the low speed reduction of its endodontic contra-angle handpiece. The recommended maximum speed of NiTi instruments cannot therefore be exceeded.

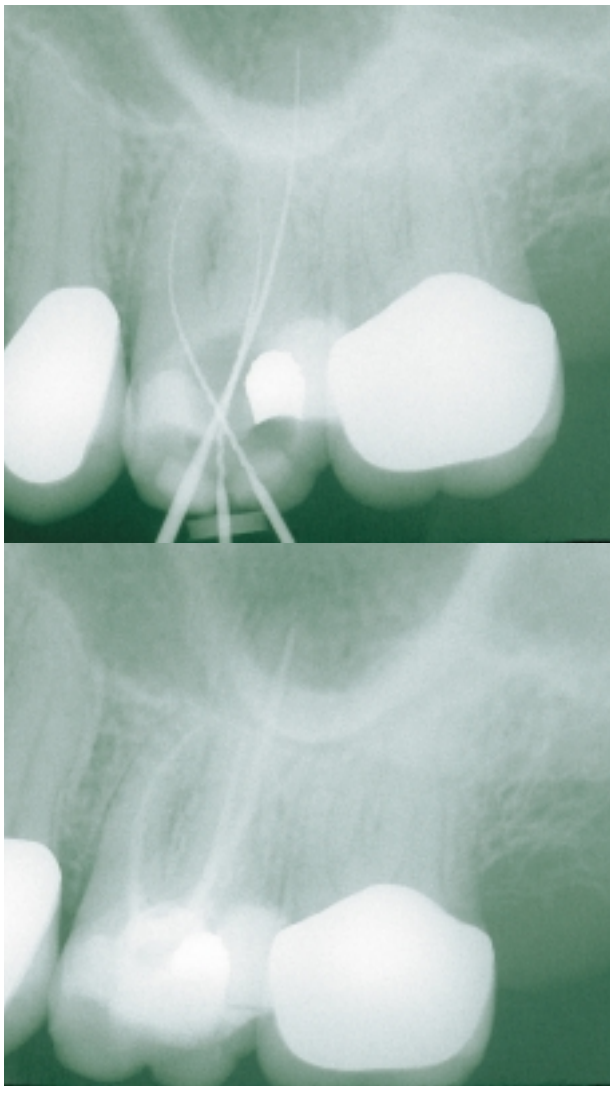
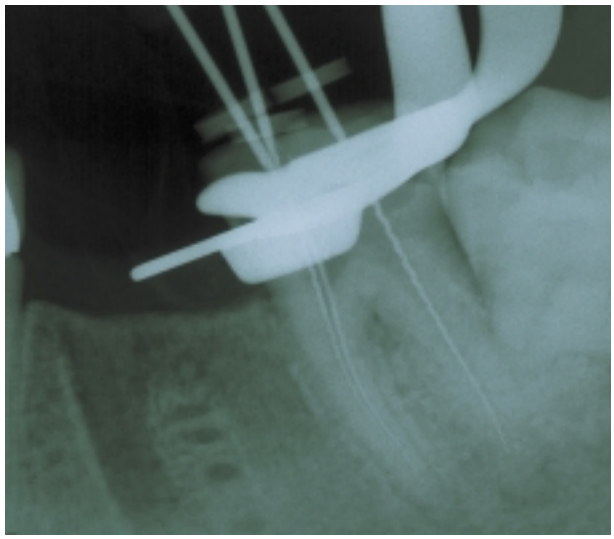


Fig. 3

Full rotating preparation is made possible by the use of special NiTi instruments (e.g. Profile® instruments) combined with a considerable speed reduction of the motor (e.g. W&H WD- 74 M).

The new W&H endodontic contra-angle handpiece WD-74 M used with the "crown-down technique" and NiTi files is particularly suitable for the preparation of curved root canals, as shown in the radiographs (Figs. 3, 4).



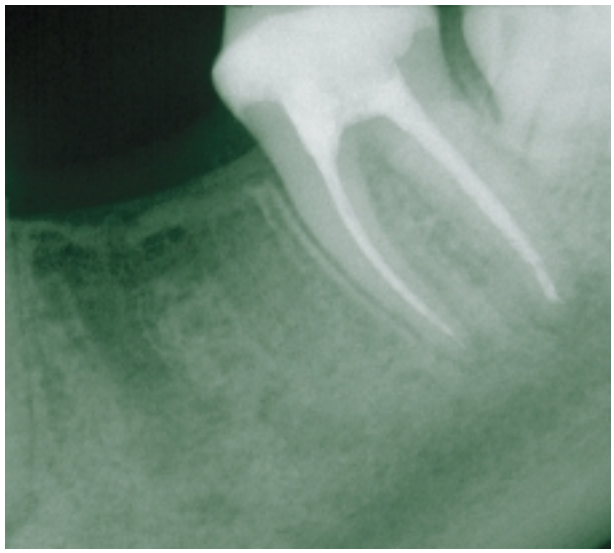


Fig. 4

Curriculum vitae

Dr. Susanne Bratz, (née Will), born 1965

1987–1992 Studied dentistry at Frankfurt am Main

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