Readers' forum
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Rotational stability of endodontic motors

Q I always worry about rotary file separation during root canal preparation since the rotational speed of the electronic endodontic motor seems unstable. Does an electronic endodontic motor have reliable rotational stability regardless of the power supply via AC adapter or battery?

A Recently, nickel-titanium (NiTi) engine-driven rotary instruments have become a mainstay for not only endodontists but also general practitioners. Among the various motors, wireless electronic motors are becoming popular to dentists for various reasons: they are relatively inexpensive, have lighter weight than traditional motors, and dentists can easily use them due to their wireless feature. Wireless electronic motors use rechargeable batteries as power source. The output of rechargeable batteries can change depending on usage, residual capacity of batteries, temperature and the duration of use. If there is a change in the output of batteries, rotations per minutes (RPM) of wireless electronic motors may tend to change, resulting in different motion and unexpected RPM change.[1] It acts like that of air pressure in an air-driven motor where a drop in air pressure can lead to a decrease of rotational speed. When the rotational speed is decreased, the instrument may become less active, and the operator may tend to force the instrument into the canal, leading to deformation and separation.[2]

During wireless electronic motor use, the actual RPM values were significantly lower than the RPM set on the motor but there was a little change in the rotational speed.[3] These results were in agreement with another study that showed similar significant variations during the use of Tri Auto ZX (J. Morita MFG. Co., Kyoto, Japan).[4] A change of rotational speed from 240 to 280 rpm was observed during usual preparation procedure when using the engine driven with rechargeable battery, and this change is negligible.[4]

There was a study on the RPM changes according to power source. It showed that there was no difference in changes of rotational speed between the power supplied by the AC adapter and rechargeable battery. An endodontic wireless electronic motor with a rechargeable battery may be safely used continuously up to 180 minutes with a reliable RPM maintenance.[3] In addition, according to a study on the rotational stability in endodontic electronic motors, all kinds of endodontic electronic motors had an established rotational stability with/without load.[1]

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