

# Safe root canal preparation using reciprocating nickel-titanium instruments

**Q** When I do root canal shaping using reciprocating (NiTi) instrument system, apical blockage often occurs. How can I avoid that?

**A** Apical blockage could lead to the failure of endodontic treatment because of the remaining infected root canal contents such as microorganisms, pulp tissue remnants, and necrotic pulp.<sup>1,2</sup>

### Main causes of canal blockage are the following:

1. Accumulation of dentinal chips or debris. The dentinal debris entrapped in the apical canal is lifted up to the coronal part through instruments' flute. In comparison with continuous rotating motion, reciprocating motion shows less ability of debris removal (carrying coronal way) and is prone to canal blockage.<sup>3</sup> The accumulation of dentinal debris in the apical root canal results in apical canal blockage.
2. Ledge formation. In curved canal, apical transportation of root canal could not be avoided. When repetitive instrumentations are concentrated on one point (at the same length), ledge is formed due to amplification of transportation. It may get worse when the canal is blocked by packed debris in the canal.

### Solutions

1. Establish glide path with rotary instruments such as PathFile/ProGlider, G-file/OneG, and ScoutRace. It could prevent and/or reduce the torsional fracture of shaping instruments and canal aberrations.<sup>4-6</sup> Also, it could reduce postoperative pain and iatrogenic preapical periodontitis.<sup>7</sup>
2. When reciprocating instrument does not advance any more (usually it happens in a curved root canal), you should stop instrumentation and irrigate the root canal copiously to remove the generated dentinal debris. After that, reconfirm apical patency using a small hand file (e.g., size 8 or size 10 K-file) or glide path establishing rotary instruments. This procedure may loosen the packed dentinal debris in apical canal and facilitate debris removal with irrigation. And then, you may restart the instrumentation and can experience advancing of reciprocating file further apically, and sometimes may need to use bigger pecking force momentarily to negotiate the curved area.

From **Jung-Hong Ha**  
(Kyungpook National University)

### Acknowledgement

Readers' forum is edited by Professor Kyung-Mo Cho (Gangneung-Wonju National University).

### References

1. Seltzer S, Naidorf IJ. Flare-ups in endodontics: I. Etiological factors. *J Endod* 1985;11:472-478.
2. Seltzer S, Naidorf IJ. Flare-ups in endodontics: II. Therapeutic measures. *J Endod* 1985;11:559-567.
3. Bürklein S, Schäfer E. Apically extruded debris with reciprocating single-file and full-sequence rotary instrumentation systems. *J Endod* 2012;38:850-852.
4. Ha JH, Park SS. Influence of glide path on the screw-in effect and torque of nickel-titanium rotary files in

- simulated resin root canals. *Restor Dent Endod* 2012;37:215-219.
5. Patiño PV, Biedma BM, Liébana CR, Cantatore G, Bahillo JG. The influence of a manual glide path on the separation rate of NiTi rotary instruments. *J Endod* 2005;31:114-116.
  6. Ha JH, Cheung GS, Versluis A, Lee CJ, Kwak SW, Kim HC. 'Screw-in' tendency of rotary nickel-titanium files due to design geometry. *Int Endod J* 2015;48:666-672.
  7. Pasqualini D, Mollo L, Scotti N, Cantatore G, Castellucci A, Migliaretti G, Berutti E. Postoperative pain after manual and mechanical glide path: a randomized clinical trial. *J Endod* 2012;38:32-36.