Removal of a fractured instrument: Two case reports

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Fractured instruments pose a challenge to every endodontist. The difficulty in the retrieval of these instruments ranges from surprisingly easy to downright impossible. The clinical outcome of cases with fractured instruments depends on several factors, such as the position of the instrument in the canal, the type of material, the instrument size and canal anatomy. Failure in retrieval of the fractured instrument does not automatically result in failure of the case. One can still try to bypass the instrument, choose a surgical approach, or even wait and see. However, if we hear ‘nothing ventured, nothing gained’ in mind, then we should always at least try to retrieve the fractured instrument.

Case I

A 27-year-old female patient was referred to our practice. She was in good health and had an American Society of Anesthesiologists (ASA) score of 1. The patient had some mild clinical symptoms on tooth #76 due to apical periodontitis. She had been told, by the referring dentist, that there was a fractured instrument in her tooth and that the instrument had to be removed first in order to allow for decent retreatment.

Before starting with the treatment, a new diagnostic radiograph was taken. In this case, the diagnostic radiograph (Fig. 1) showed not one but two broken instruments in the mesial root, one in each mesial canal. Thereafter, the tooth was isolated with the rubber dam and the coronal filling was removed. Straight-line access was established, as this is imperative in order to be able to reach and see the fractured instruments. Gates-Glidden burs (DENTSPLY Maillefer) were used to enlarge the mesial orifices coronally.

After reaching the instrument in the mesio-buccal canal, I modified a size 5 Gates-Glidden bur by removing the tip of the bur (Fig. 2). In this manner, one gains an aggressive bur that allows you to create a platform above the instrument. At this moment, the instrument could be clearly visualised (Fig. 3). Ultrasound was then used to loosen the fragment. ProTaper tips (DENTSPLY Maillefer) were used to enlarge the mesial orifices coronally.

During the next visit, the tooth was again isolated and opened. The calcium hydroxide paste was removed, using 10% citric acid and passive ultrasonics with the IRISAFE tip (Satelec). Again, ultrasonics were used to retrieve the instrument. After five minutes, the fragment in the mesio-buccal canal was removed. Another five minutes later, the instrument in the mesio-lingual canal was also removed. While removing the instrument in the mesio-buccal canal was very time-consuming, removing the instrument from the mesio-lingual canal was surprisingly easy. This clearly highlights the aforementioned difficulty range of instrument retrieval.

After the removal of both instruments, working length was determined in both mesial canals with the electronic apex locator (Root ZX Mini, Morita). A glide path was established and the mesial canals were initially shaped with a ProTaper S1 (DENTSPLY Maillefer). Coupous irrigation was performed using 5% sodium hypochlorite. Next, the gutta-percha in the distal canal was removed with a size 25.06 ProFile (DENTSPLY Maillefer), which was rotated at 500 rpm in an X-smart Easy endodontic motor (DENTSPLY Maillefer). No chemical was required for gutta-percha softening. The canals walls were scraped with Micro-Debriders (DENTSPLY Maillefer) in order to remove the last remnants of gutta-percha. All canals were shaped to a size 40.06 ProFile. Final apical shaping was performed with K-Flexofiles (DENTSPLY Maillefer). Smear layer removal was carried out by new irrigation with the canal 10% citric acid. A final wash of the canal was performed with sterile saline. Tapered gutta-percha cones were then fitted.

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