

## **Visualization of sealer movement during single-cone obturation with EndoSequence BC Sealer using micro-computed tomography**

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- **Problem** – Due to technique sensitivity and difficulty in reproducibility with traditional endodontic obturation techniques, a homogenous sealer fill is difficult to achieve. The aim of this study was to investigate the movement of a nano-particle sealer in teeth that had received biomechanical instrumentation with single cone obturation technique, by 3D visualization through the use of micro-focus x-ray tomography.
- **Hypothesis** – An obturation technique that can be explained as synchronized hydraulic condensation using EndoSequence BC sealer will have a higher total canal occupancy than traditional methods.
- **Methods** – Sixteen recently extracted human molars were mounted on individual stubs and underwent an initial high spatial resolution CT scan prior to any treatment. Following biomechanical crown-down canal preparation to an apical matrix of 35/.04 and ultrasonic irrigation with 6% sodium hypochlorite, each sample was scanned a second time. Obturation was completed using a single matched gutta-percha cone and EndoSequence BC sealer. The coronal 4 mm of the gutta-percha was thermosoftened and compacted vertically. Subsequent to canal obturation, a third scan was made.
- **Results** – Analysis of volume occupied by sealer in relation to total original canal volumes was found to be extremely high with a mean of 97%,  $\pm 2.8$ , much higher than reported previously using studies on canal surface area occupancy of material, with 75% of samples occupied at the  $\geq 95\%$  level.
- **Conclusion** – A single gutta-percha cone when combined with EndoSequence BC sealer is capable of almost complete canal obliteration.