**The effectiveness of obturation with GuttaFlow Bioseal in single rooted mandibular premolars. A scanning electron microscopy study**

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**Abstract:** The efficacy of obturation with GuttaFlow Bioseal is not well documented due to the limited scientific evidence. Further evaluation in various aspects related to obturation is beneficial to provide further insight for future clinical application. This study aims to evaluate the volumetric percentage of obturated root canals, extrusion of material beyond the apical foramen and duration taken for obturation procedure. A total of 30 single rooted extracted mandibular premolars were selected. A standard access cavity preparation was done and the root canals were prepared using Hyflex CM rotary files. The samples were equally divided into 3 groups (n=10) based on the obturation techniques; continuous backfill, interrupted backfill and injectable groups. A matched-taper gutta-percha and GuttaFlow Bioseal were used for the obturation. The obturation procedure was timed using a digital timer and the obturation radiograph was taken immediately after obturation. All samples were sectioned perpendicular to obtain three root segments; apical, middle and coronal. The resected roots were observed under scanning electron microscope (SEM) at 70x magnification. The SEM images were transferred to the SketchAndCalc Area Calculator software for evaluation of the obturated root canals. There were no statistically significant differences in regard to the volumetric percentage of obturated root canals at any level of evaluation and extrusion of material beyond the apical foramen (*p* > 0.05). Duration of obturation using continuous and interrupted backfill techniques were statistically significant longer than injectable technique (*p* < 0.05). The volumetric percentage of obturated root canals and the extrusion of material beyond the apical foramen in all obturation techniques were comparable and the duration of obturation procedure was slightly longer in the continuous and interrupted backfill techniques. Obturation using GuttaFlow Bioseal is a predictable approach and effective.

**Keywords:** GuttaFlow Bioseal; continuous backfill; interrupted backfill; injectable method; scanning electron microscopy;