

GuttaFlow Bioseal as monocone obturation technique in curved root canals. A scanning electron microscopy study.



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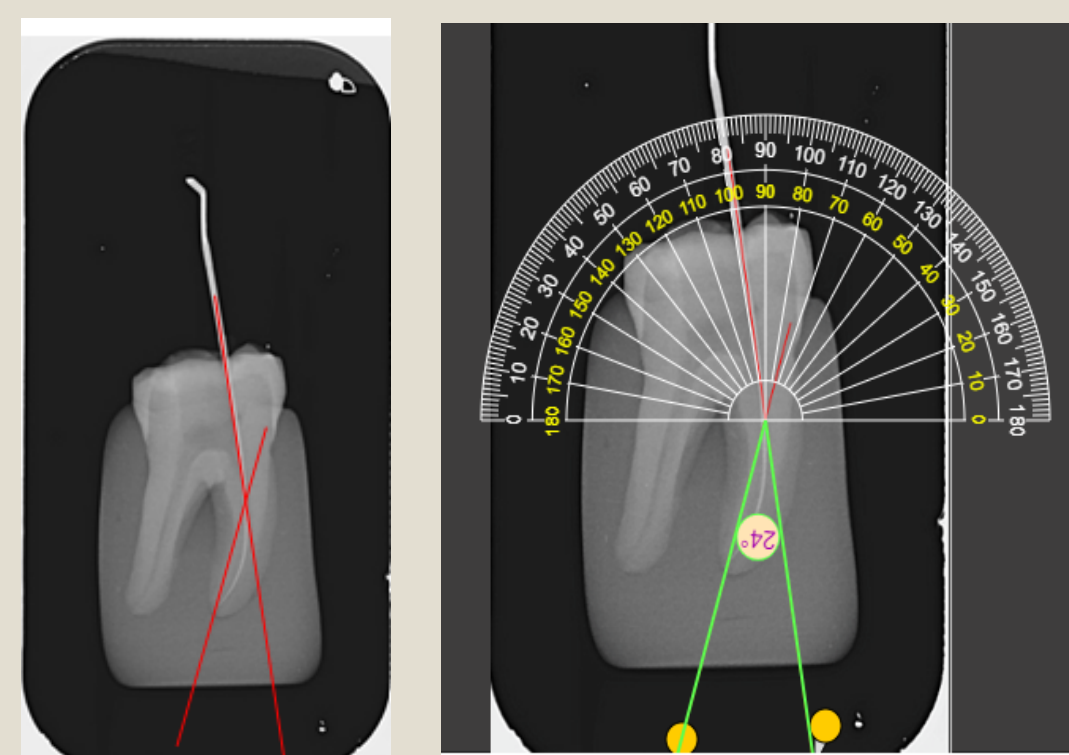
Introduction

The obturation quality has been studied for many years. Due to the continuous development of bioceramic root canal sealers, the evidence on its effectiveness is limited and the understanding on its use in endodontics remains unclear. GuttaFlow Bioseal (GFB) has been evaluated for the sealing ability [1, 2], cytotoxicity [3, 4, 5], physicochemical properties [6, 7], osteogenic activity [8], retreatability [9] and fracture strength of root canal treated teeth [10], but scientific evidence related to the extrusion of root canal sealer beyond the apical foramen and the duration of obturation procedure are not present. Therefore, these aspects in endodontics require further investigation.

Materials & Methods



Tooth selection



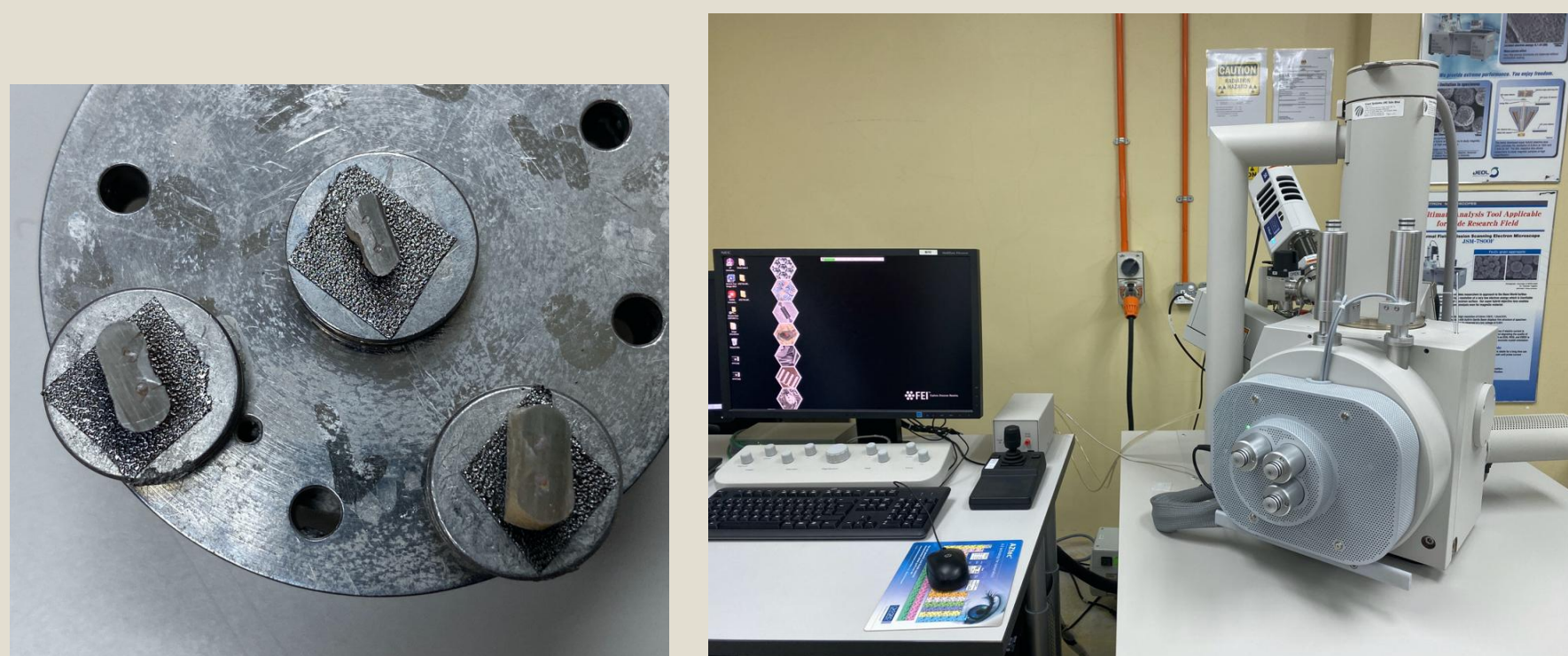
Determination of the degree of root canal curvature



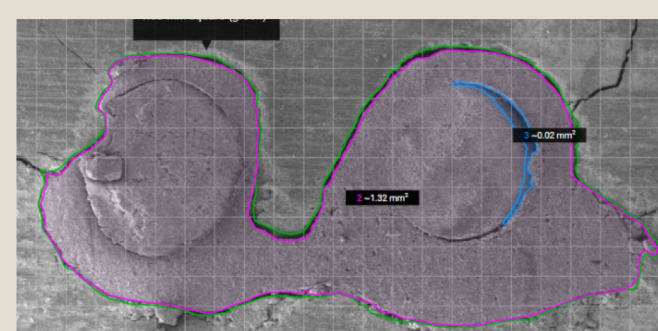
Determination of the working length and root canal preparation



Obturation procedure:
Group 1 (GuttaFlow Bioseal)
Group 2 (silicone-based root canal sealer)



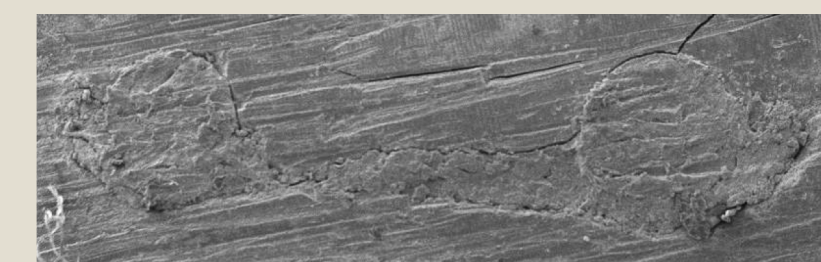
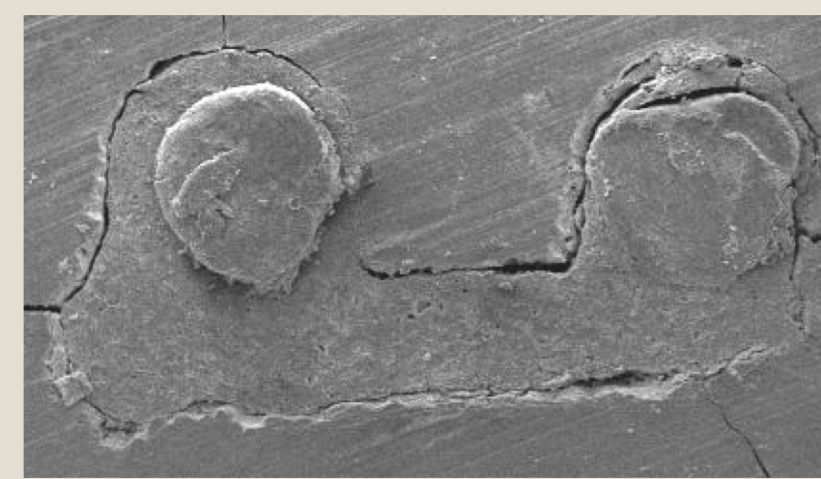
Observation under scanning electron microscopy



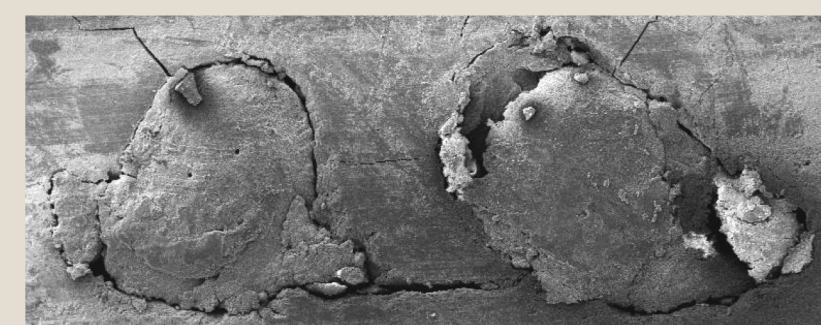
SketchAndCalc AreaCalculator Software

Results

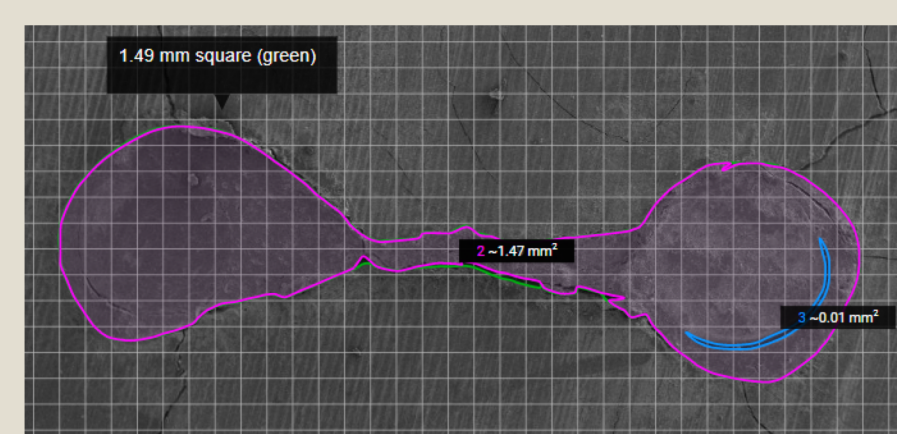
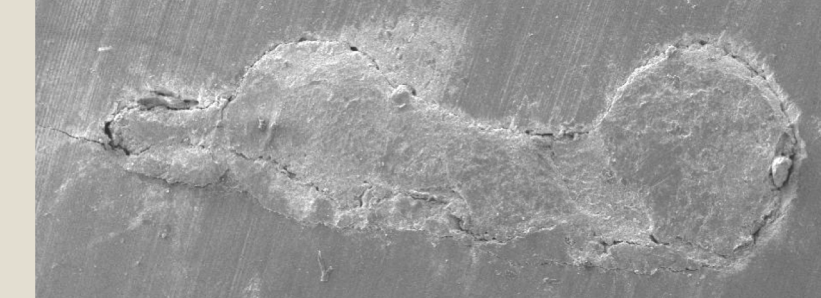
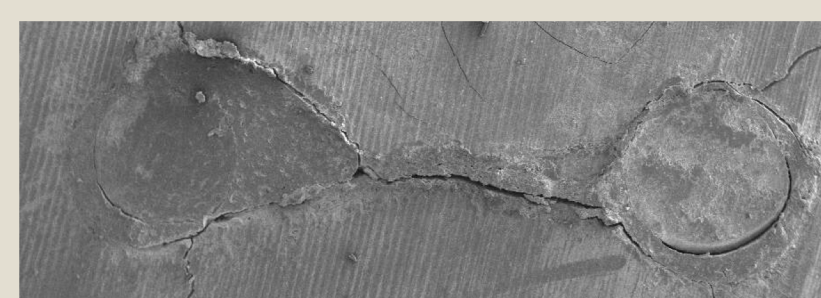
Apical



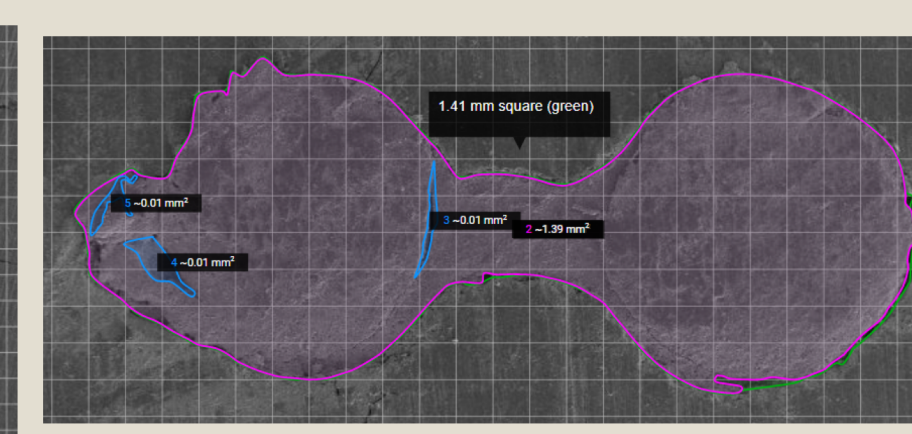
Middle



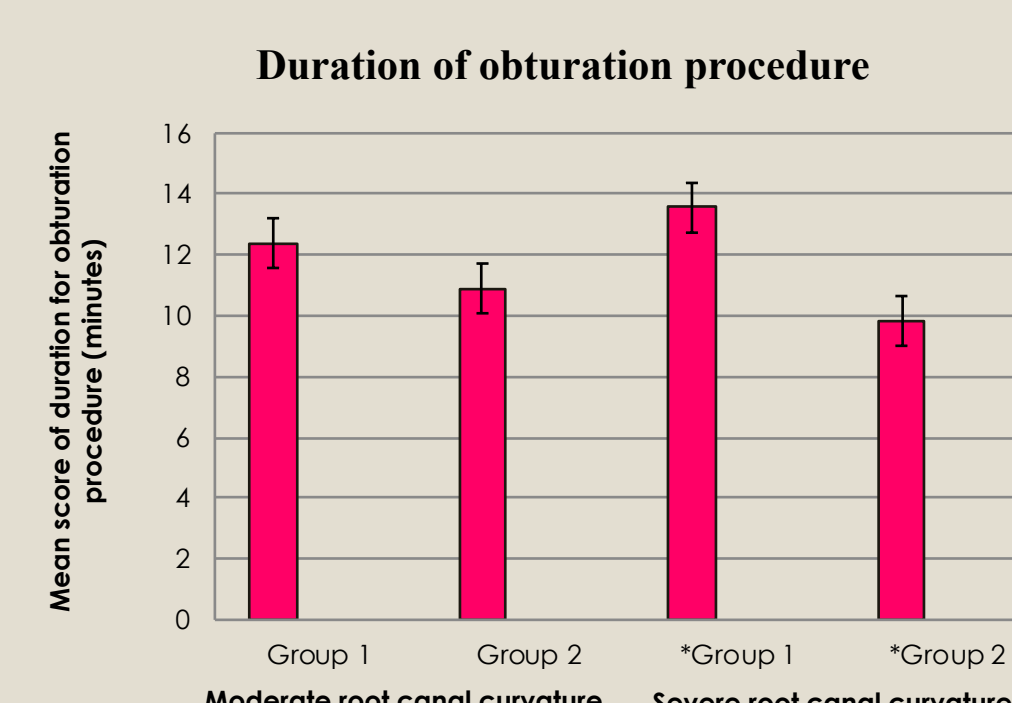
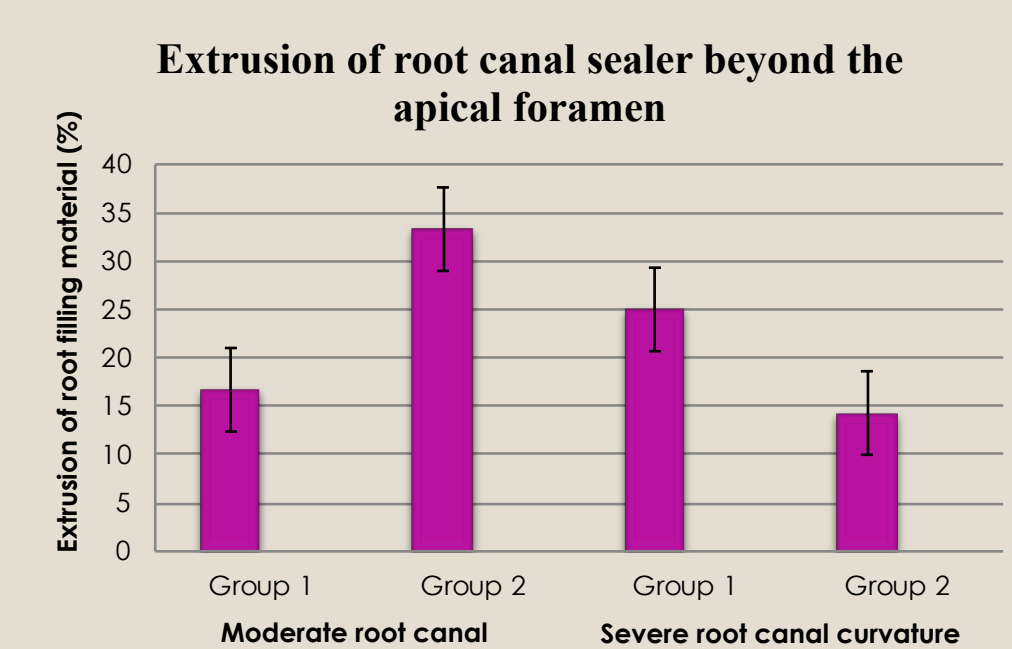
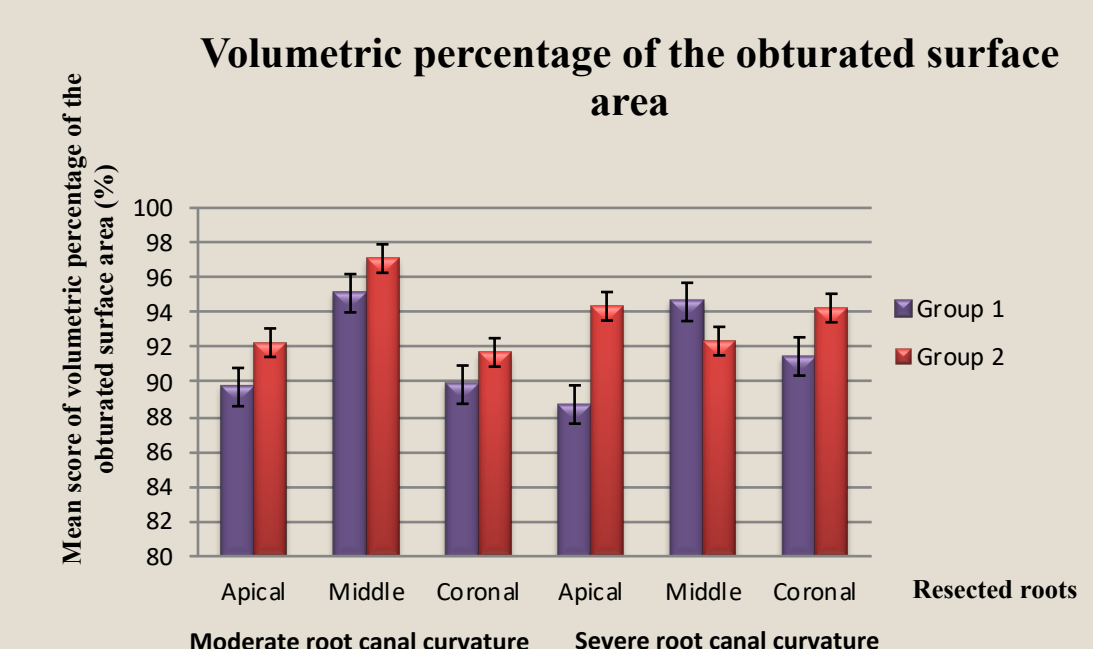
Coronal



Group 1



Group 2



Discussion

The obturated root canals in moderate and severe root canal curvatures between GFB and silicone-based root canal sealer were equivalent at any level of evaluation.

The extrusion of root canal sealer beyond the apical foramen in moderate and severe root canal curvatures between GFB and silicone-based root canal sealer were comparable.

These findings could be attributed to the similar obturation technique and material viscosity but the later was not possible to confirm because of beyond the scope of the present study. Perhaps, future research can be done to validate these findings.

Duration of obturation procedure using GFB in severe root canal curvature was slightly longer than the obturation procedure using silicone-based root canal sealer. This might not be associated with the status of root canal curvature directly, but the amount of gutta-percha (GP) from the combination of GP cone and GFB.

Conclusions

Within the limitation of the present study, the conclusions were:

- The volumetric percentage of obturated surface area at the apical, middle and coronal root regions, as well as the extrusion of root canal sealer beyond the apical foramen between GFB and silicone-based root canal sealer were comparable irrespective of the status of root canal curvature.
- The duration of obturation procedure using GFB in severe root canal curvature was 27.5% longer than the obturation using silicone-based root canal sealer.

Acknowledgement

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