

Overlying Materials' Effect on Mineral Trioxide Aggregate (NeoPUTTY) Setting Reaction

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INTRODUCTION

- Pulpotomy is a routine operative intervention in dentistry which entails the amputation of the inflamed coronal part of the pulp while leaving behind the vital radicular pulp. A therapeutic agent is placed over the remaining pulp tissue to allow for continued health and function of the tooth.
- Mineral trioxide aggregate (MTA) has been studied in recent years and clinical trials have demonstrated its consistently excellent results as a therapeutic agent.
- The original manufacturer recommended that the MTA pulpotomy and the definitive restoration be completed in two visits due to its long set time of 2-3 hours.
- This *in vitro* study investigates the hypothesis that MTA is a suitable material for use on a single-visit primary molar pulpotomy and definitive restoration procedure.
- NeoPUTTY (NuSmile, USA) is a pre-mixed MTA that was used in this study as the pulpotomy agent.

OBJECTIVE/HYPOTHESIS

Objective:

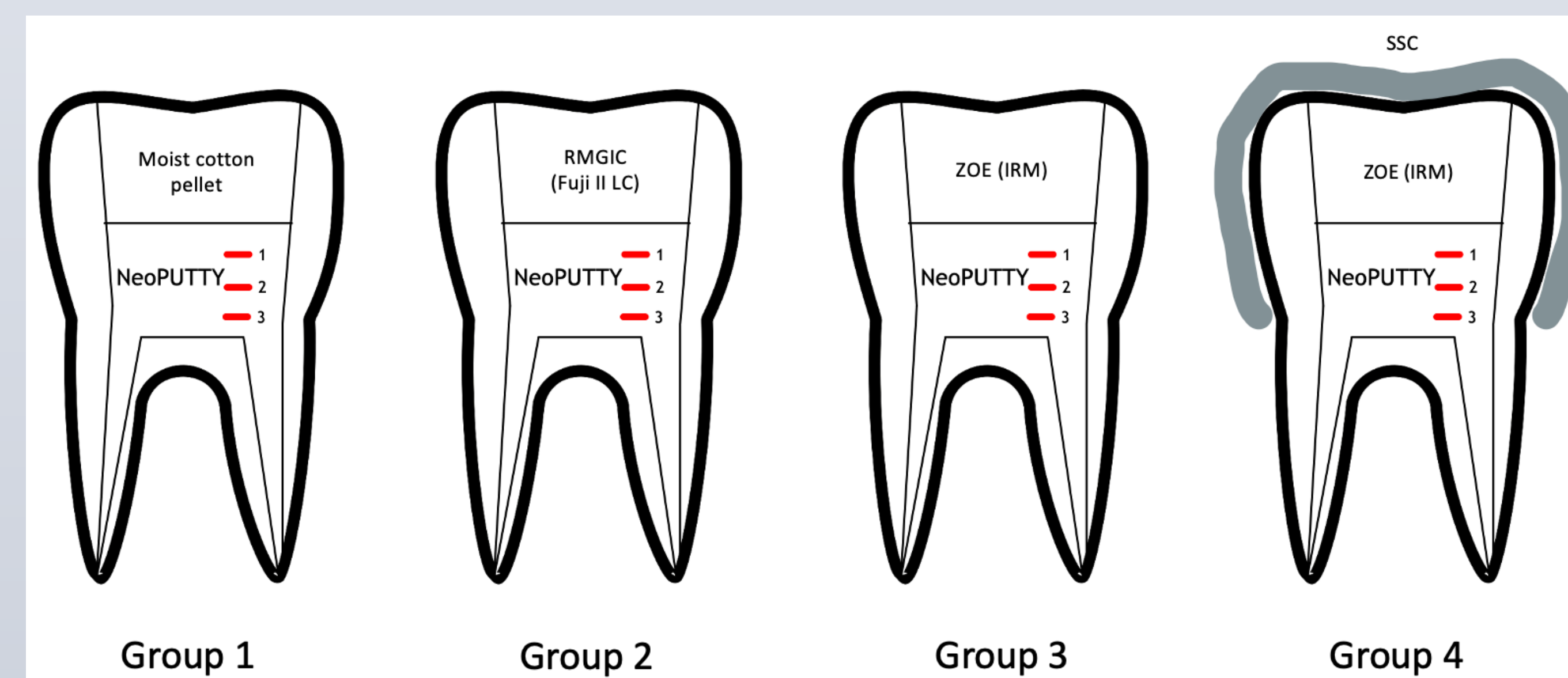
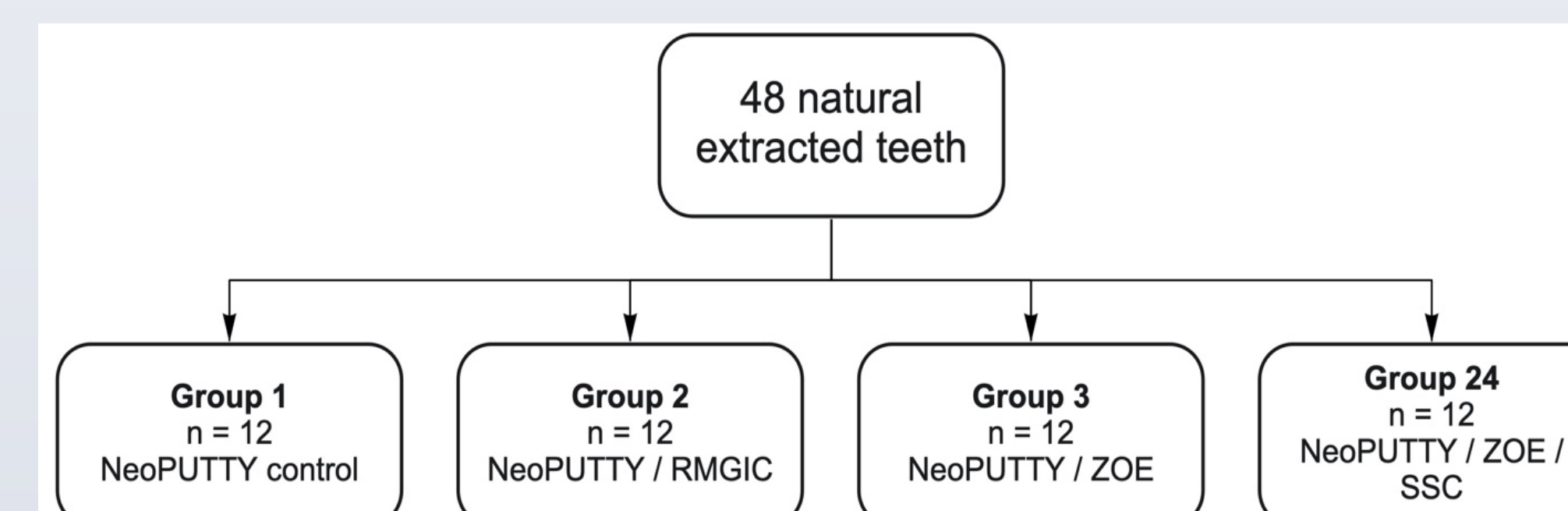
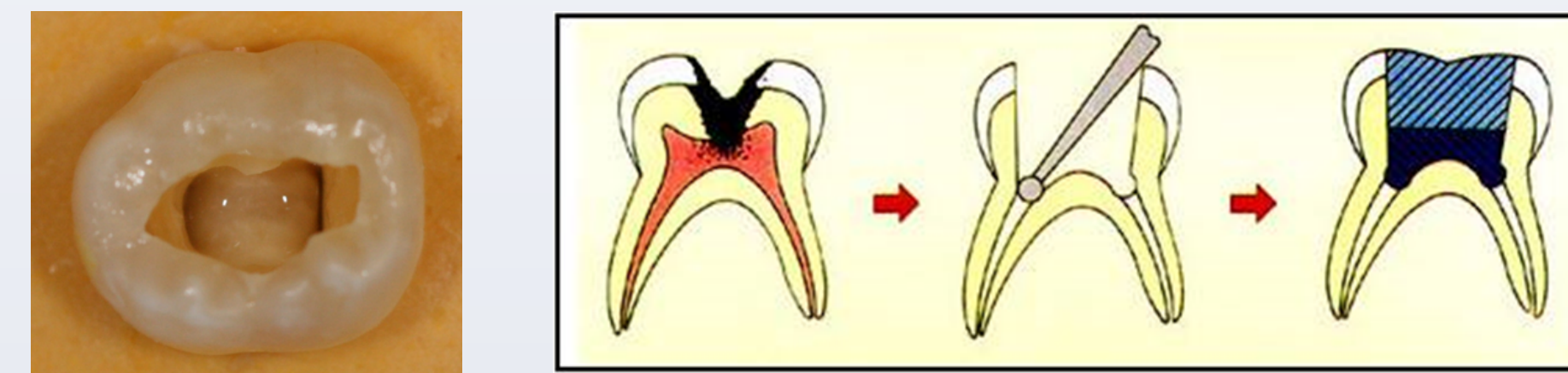
To assess and compare *in vitro* the effect of overlying materials such as zinc oxide eugenol (ZOE), resin-modified glass ionomer cement (RMGIC, Fuji II LC), and stainless steel crowns (SSC) on the setting reaction of NeoPUTTY used as a pulpotomy agent in primary molars, restored in a single visit.

Hypothesis:

There is no difference between the setting reaction of NeoPUTTY in an absence or presence of an overlying material achieved 24 hours after its application as a function of microhardness.

MATERIALS & METHODS

- Forty-eight extracted primary molars were used in this *in vitro* study.
- Clinical pulpotomy procedure was replicated in each sample. Occlusal cavities were prepared to the furcation and pulpal debris excavated.
- The pulp chambers were irrigated with 0.12% Chlorhexidine and dried with air and cotton pellets.
- The samples were then randomly assigned to four groups with different overlying materials:

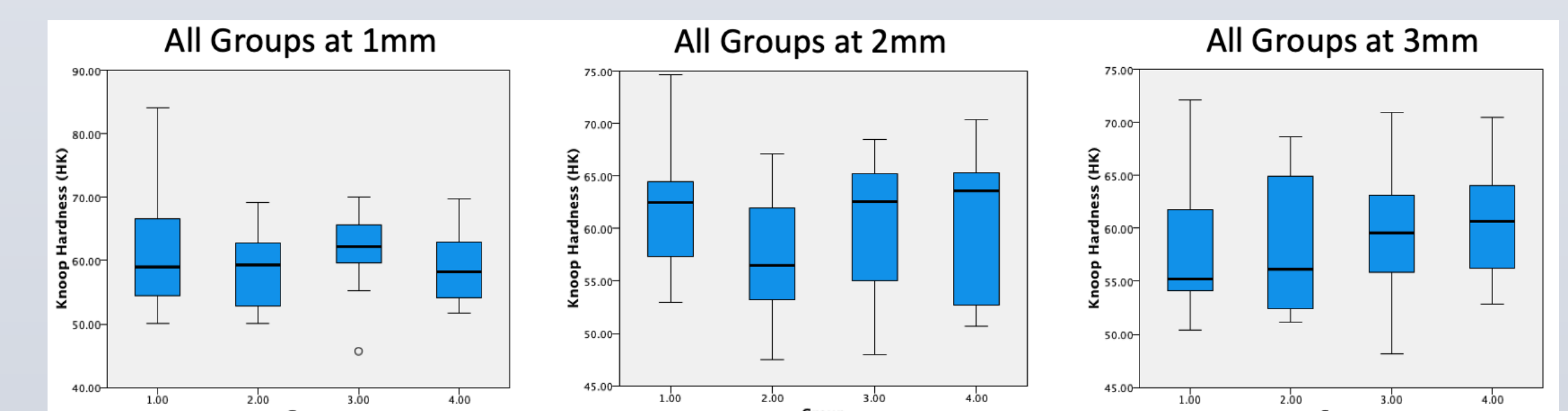
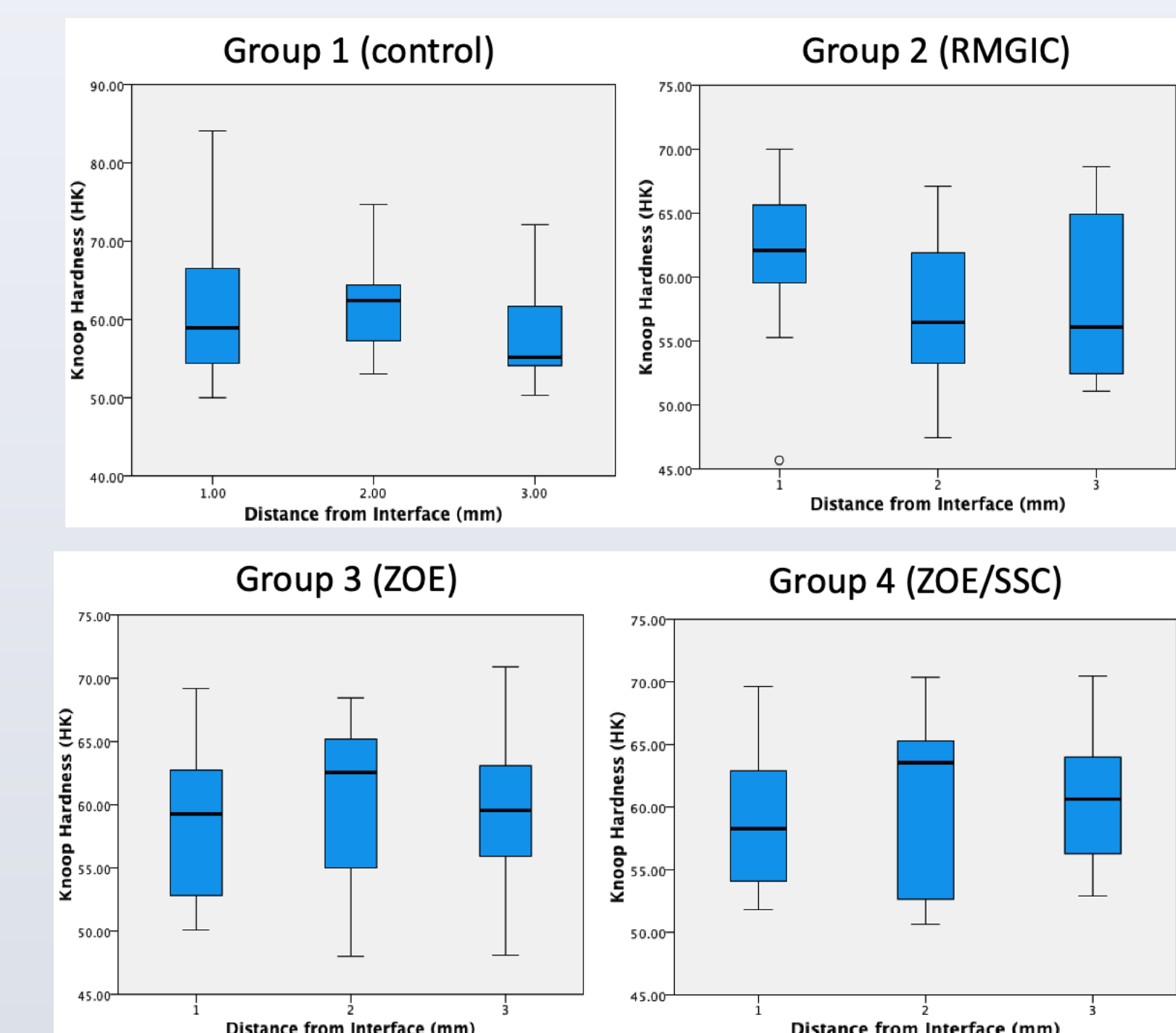


- NeoPUTTY was applied over the radicular orifices and pulpal floor to an approximate thickness of 3mm in all groups.
- The samples were restored based on the treatment group. The samples were stored in an incubator at 37°C at 100% humidity for 24 hours, then sectioned mesio-distally and polished.
- The setting reaction was measured as a function of the Knoop Hardness value (HK) using a Leco Microhardness Tester.
- Each sample was measured at **three zones** with 25gf load force for 30 seconds starting at 1mm from the NeoPUTTY-material interface.
- The data was analyzed using one-way analysis of variance (ANOVA).



RESULTS

- The data was analyzed using one-way analysis of variance (ANOVA).



- No significant differences were found between the points within any of the groups ($P > 0.05$).
- No significant differences were found between the groups at 1mm, 2mm, or 3mm away from the NeoPUTTY-material interface ($P > 0.05$).

CONCLUSIONS

- The setting reaction of NeoPUTTY, measured as a function of its microhardness, is not affected by presence or absence, or type of overlying material used to restore primary teeth in a single visit following pulpotomy procedures.
- This *in vitro* study found no evidence against immediate restoration of NeoPUTTY primary molar pulpotomies.

REFERENCES

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