

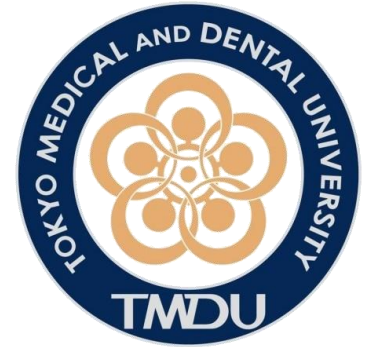


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**III SIE INTERNATIONAL
CONGRESS**
**ENDODONTICS:
CLINICAL
SOLUTIONS**

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Via Olgettina, 58 20132 Milan



Società Italiana
di Endodonzia



THE INFLUENCE OF ULTRASONICATED OBTURATION ON THE DEPTH OF SEALER PENETRATION INTO DENTINAL TUBULES: A CONFOCAL MICROSCOPIC STUDY AND DIGITAL IMAGE PROCESSING

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ROOT CANAL TREATMENT

CLINICAL GOALS



**CLEANING AND
SHAPING**

3D OBTURATION

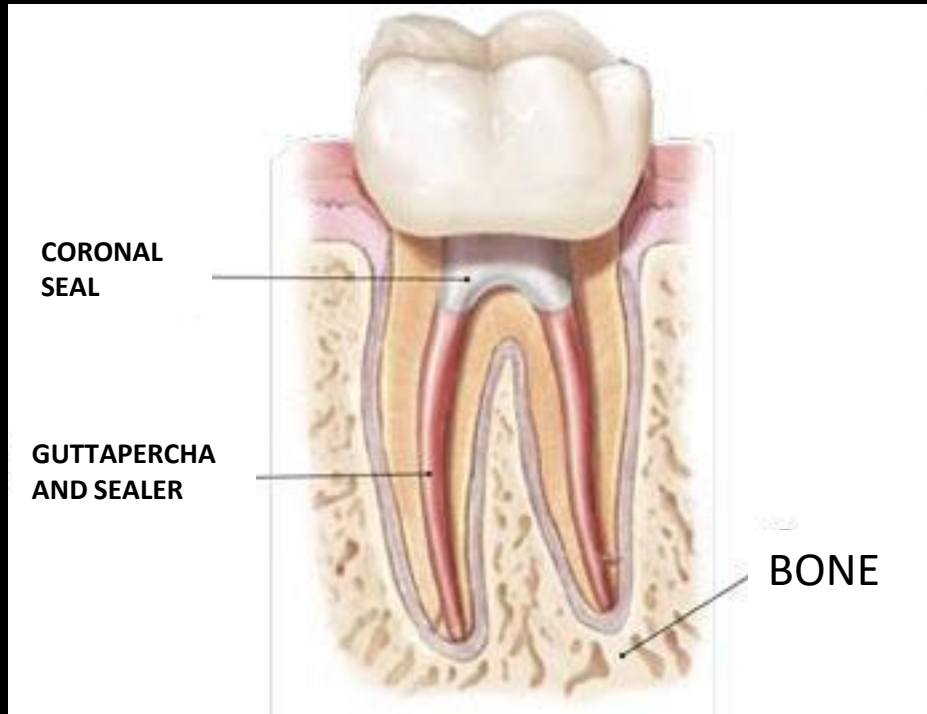
CORONAL SEAL

ENDODONTIC OBTURATION

It allows for every “exit door” of the root canal to be reliably sealed.
Materials:

GUTTAPERCHA

SEALER



PURPOSE OF THE STUDY

To compare between the average depth of sealer penetration in dentinal tubules at apical and middle thirds of roots using three different root canal-filling techniques:

GOLD STANDARD

- CONTINUOUS WAVE OF CONDENSATION
- CARRIER-BASED OBTURATION

NEW TECHNIQUE

ULTRASONICATED CARRIER-BASED GUTTAPERCHA FILLING TECHNIQUE

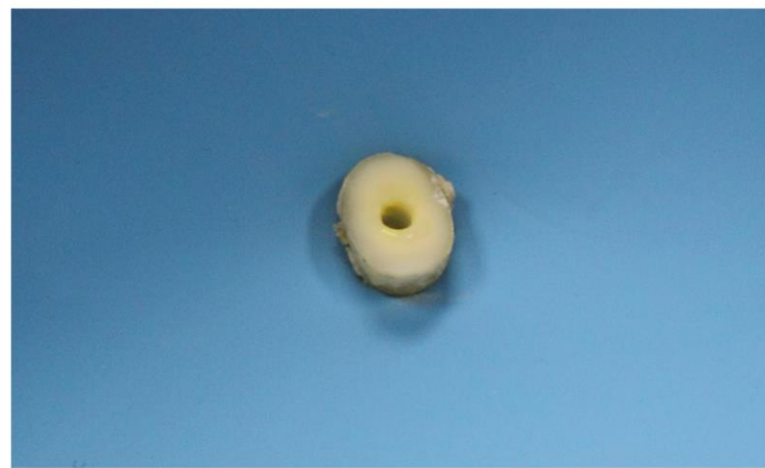


MATERIALS AND METHODS

30 root canals were randomly divided in 3 groups with 10 teeth each, prepared and then obturated using three different obturation techniques.

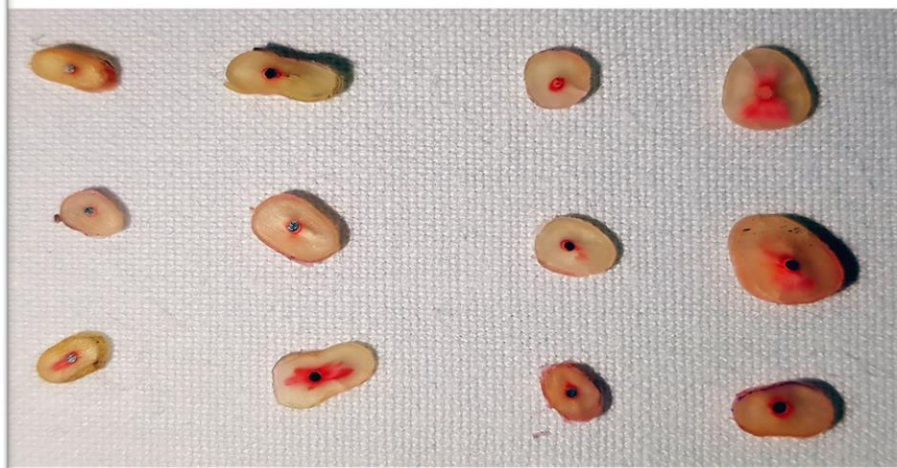
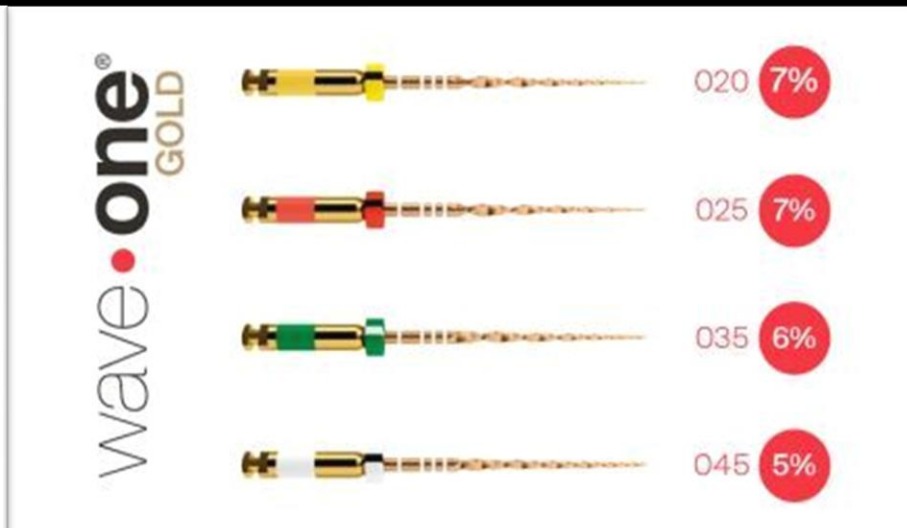


*ProTrain (Dentsply) and apex relever
Root ZX (Morita)*



Post Shaping tooth

*Rotary System WaveOne Gold
(Dentsply)*



*Some of the sections used for the
study*

NO ULTRASONICATION



ULTRASONICATION



The roots were sectioned at 3 and 6 mm from the apex in order to get 60 thin sections.

The Confocal Laser Scanned Microscope helped us to get 400 detailed pictures of the samples.

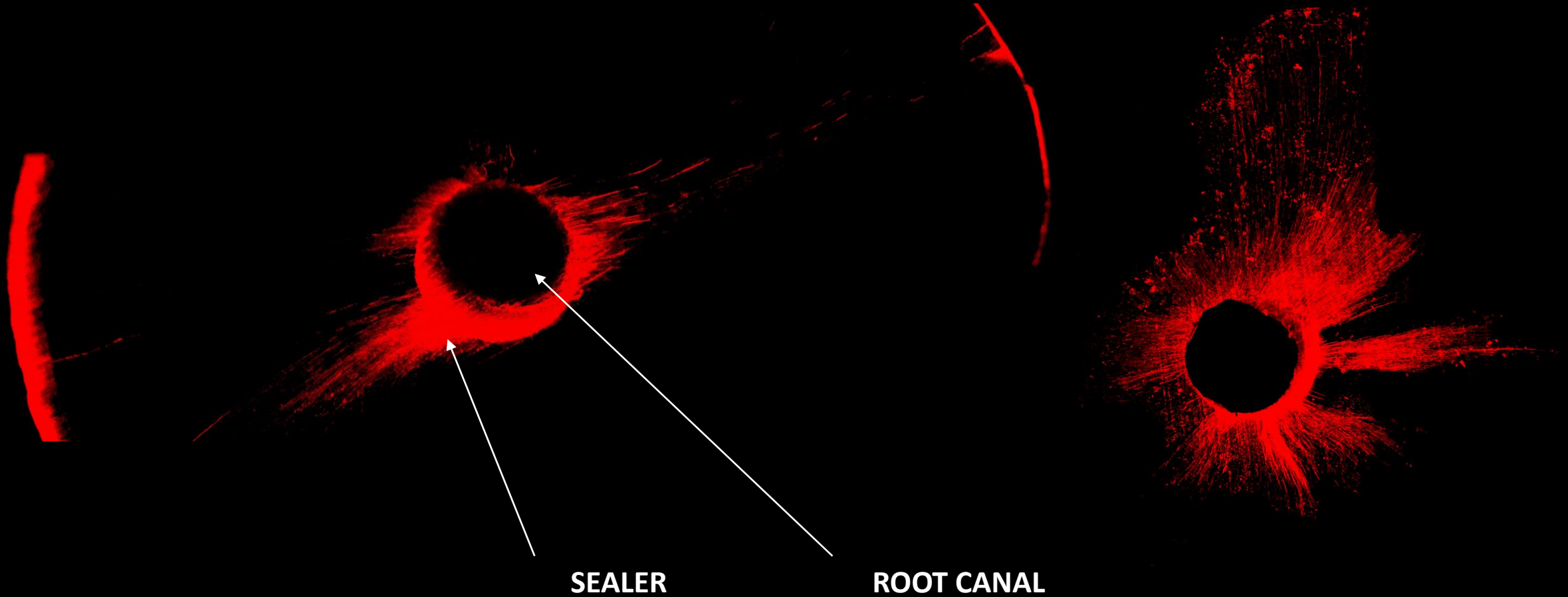


IsoMet (Buehler)

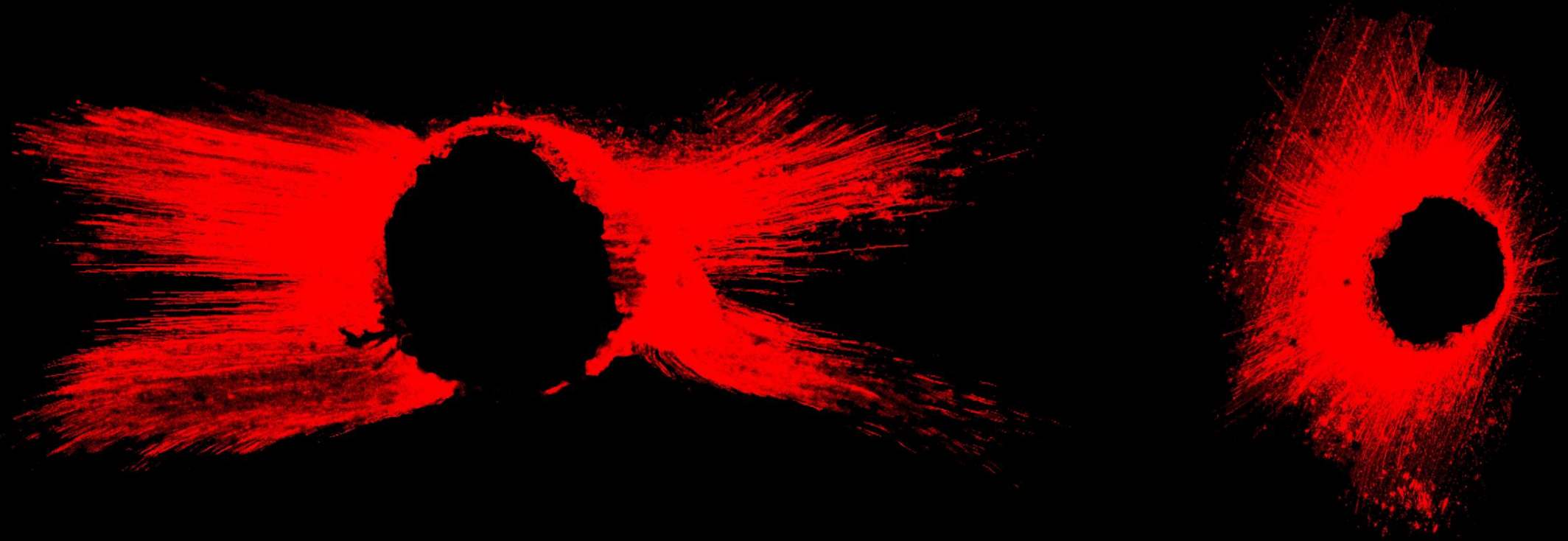


CLSM Zeiss 510 (Zeiss)

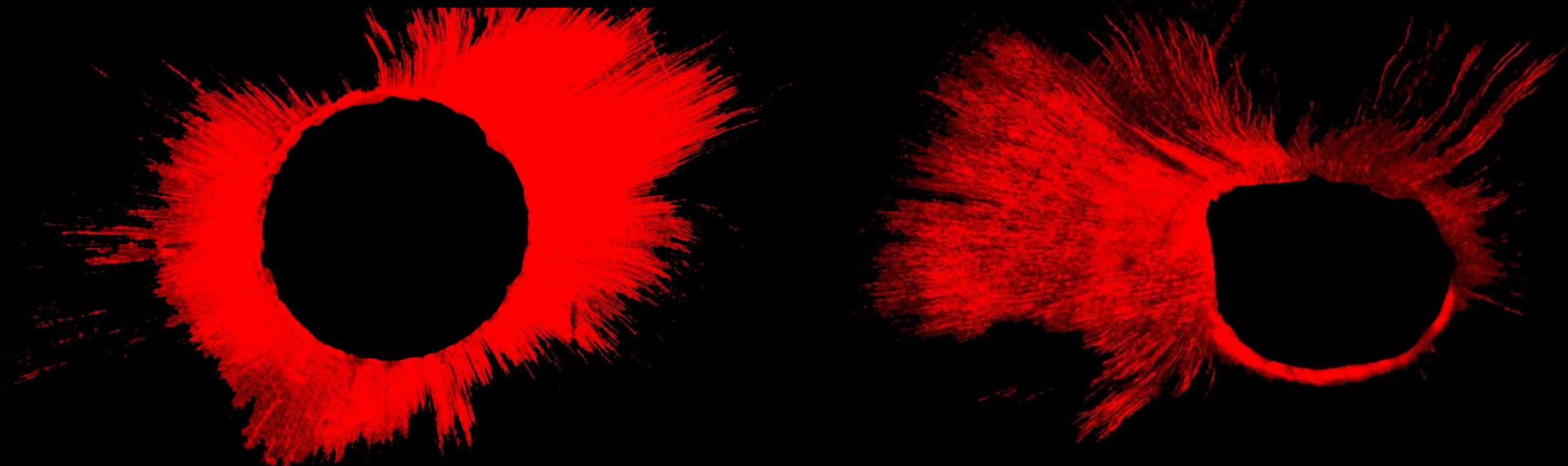
GROUP 1: ULTRASONICATED CARRIER-BASED GUTTAPERCHA FILLING TECHNIQUE

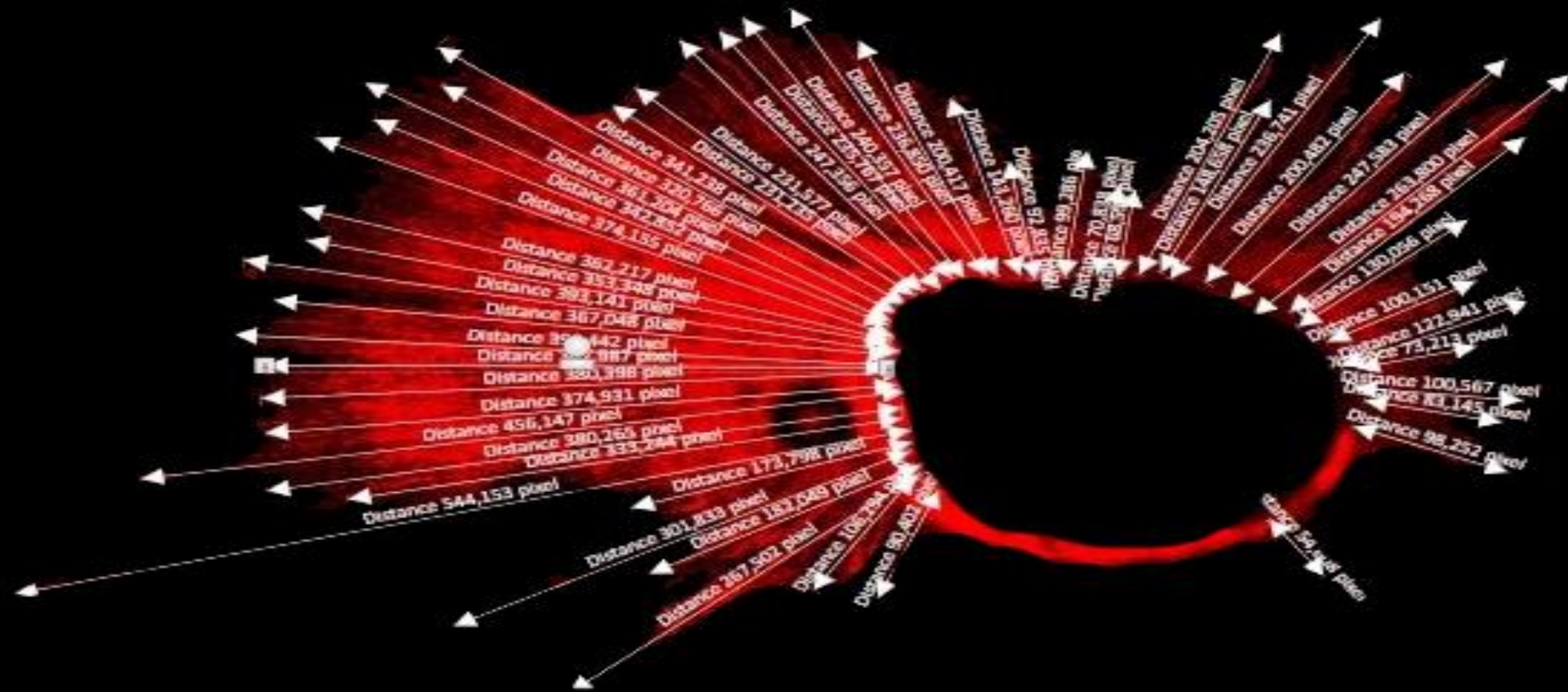


GROUP 2: CARRIER-BASED OBTURATION



GROUP 3: CONTINUOUS WAVE OF CONDENSATION



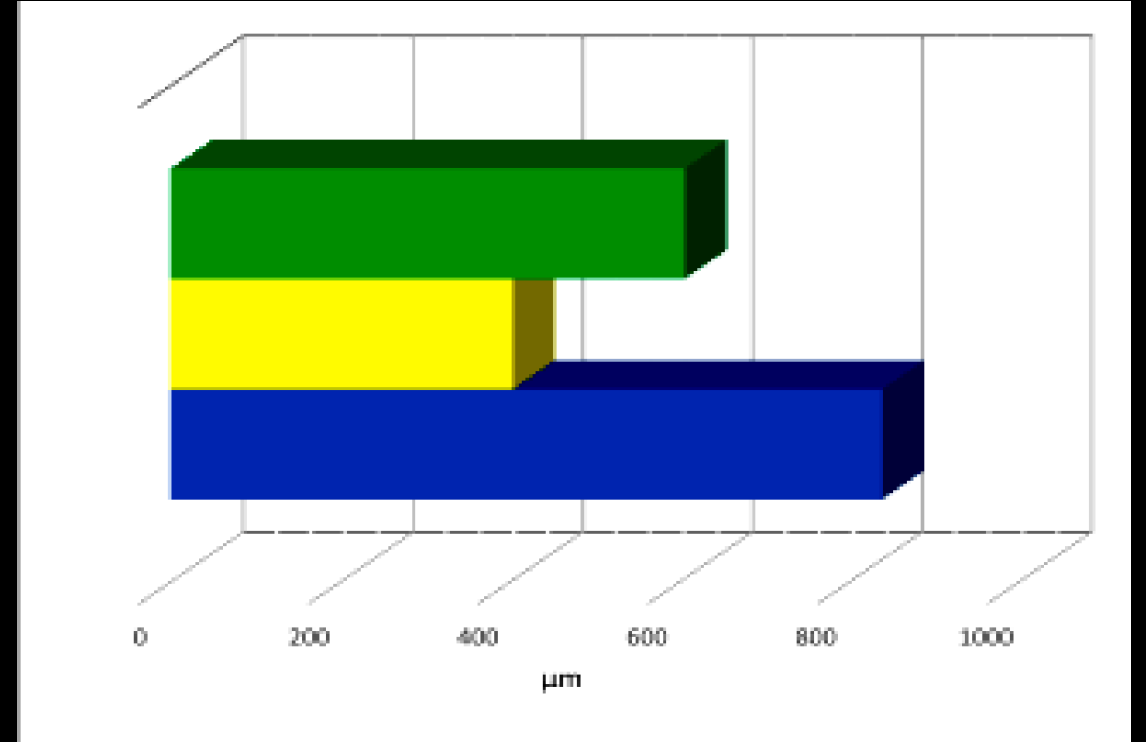
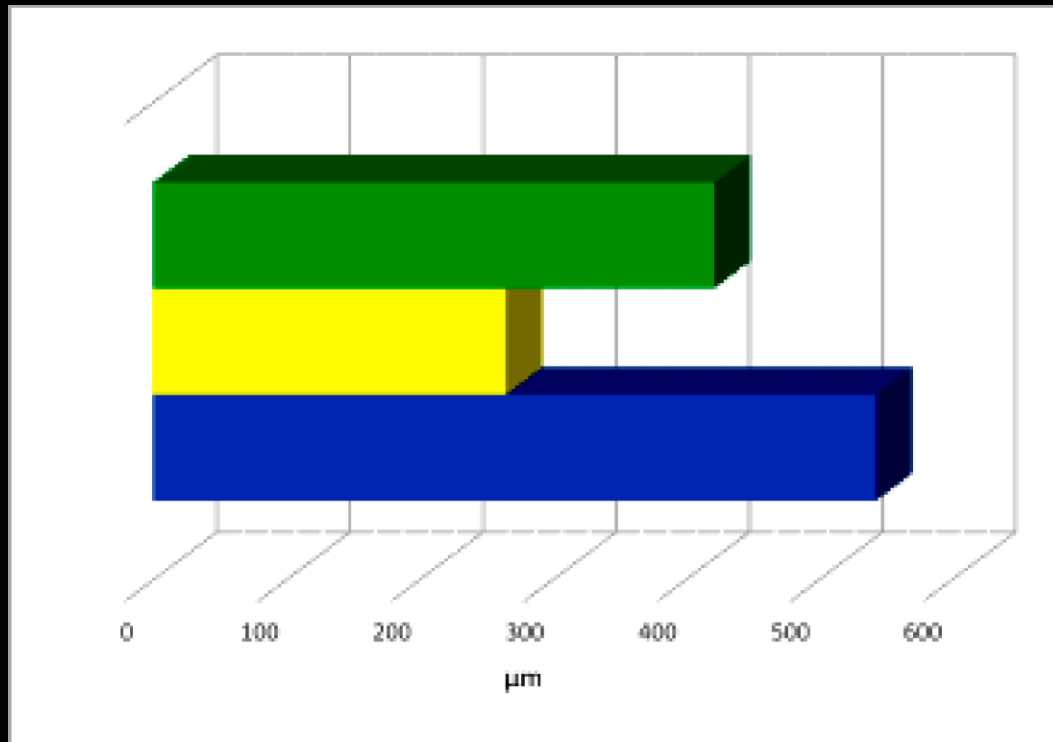


RESULTS

TECHNIQUE	SEALER PENETRATION AT 3mm FROM APEX (μm)	SEALER PENETRATION AT 6mm FROM APEX (μm)
CARRIER-BASED OBTURATION	321,504	442,831
CONTINUOUS WAVE OF CONDENSATION	408,420	591,957
ULTRASONICATED CARRIER-BASED GUTTAPERCHA FILLING TECHNIQUE	543,052	838,419

Data obtained starting from 3000 measurements taken on the samples

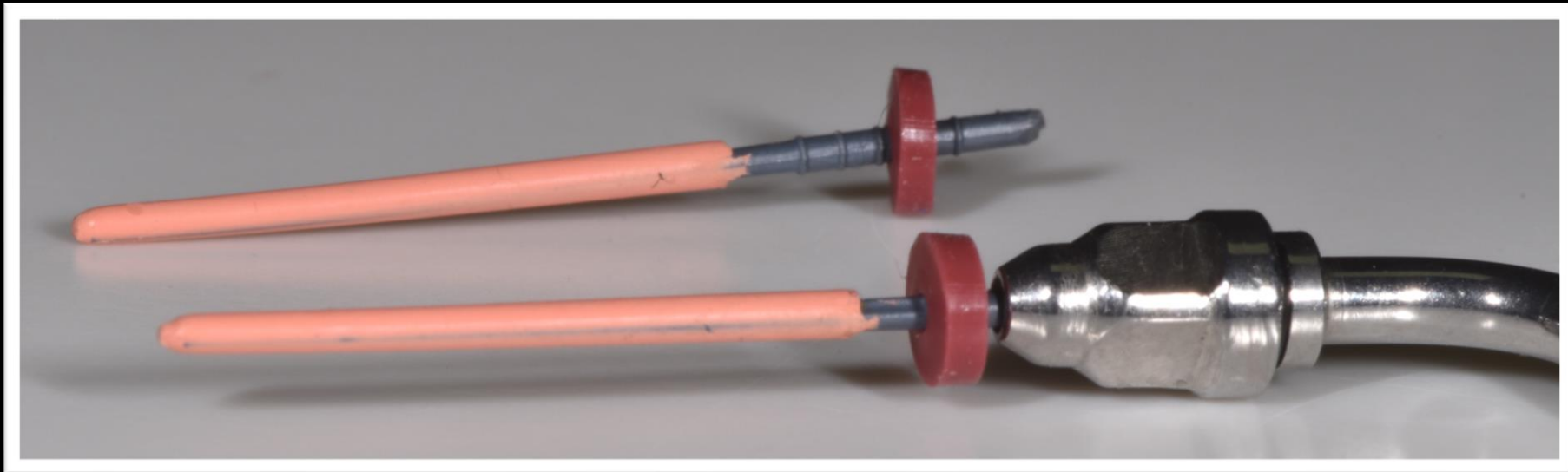
GRAPHICS



*Sealer penetration in dentinal tubules at 3 mm from the apex (Left) and at 6 mm from the apex (Right). Green indicates the **Continuous Wave of Condensation** technique, Yellow indicates **Carrier-Based Gutta-percha** technique and blue indicates the **ultrasonicated** technique.*

CONCLUSIONS

The use of ultrasonication during obturation results in deeper penetration of the sealer in the dentinal tubules which might be reflected clinically as better sealing when compared to the other tested techniques.





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**THANK YOU FOR THE
ATTENTION**