

# Digital Workflow Development of Pin Reinforced Indirect Zirconia Posterior Restorations

Dr. Les Kalman BSc (Hon), DDS, FAO, (AA)FAAID, FACD, FIADFE, DICOI • Assistant Professor, Restorative Dentistry, Western University

## INTRODUCTION & AIM

Digital dentistry is continuing to have a profound impact on the delivery of clinical care for both the patient and clinician, by providing improved efficiency, accuracy and a streamlined workflow. This investigation explored the use of the Stabilok Dental Pin System for a pinlay preparation and assessment of an indirect zirconia pinlay restoration using novel technologies, such as thermography, digital shade assessment, scanning, and milling. The goal of the investigation is to revisit the fundamentals for the use of pins, how the pins may support, retain and reinforce indirect restorations, and demonstrate how the use of digital dentistry can simplify and support the workflow for pin-reinforced indirect restorations.

## METHODS & MATERIALS



Figure 1. Fracture dentiform.



Figure 2. Stabilok Dentine Pin System.



Figure 3. Stabilok Twist Drill and Alignment.



Figure 4. Electric Motor RPM Setting.



Figure 5. Stabilok Pin.



Figure 6. Completed pinlay preparation.

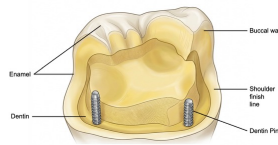


Figure 7. Preparation schematic.

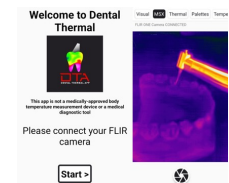


Figure 8. DTA workflow.

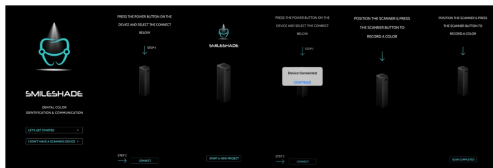


Figure 9. Digital sequence of SmileShade.



Figure 10. Colour assessment and documentation.

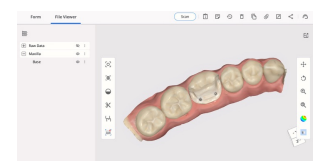


Figure 11. Digitized pinlay preparation.

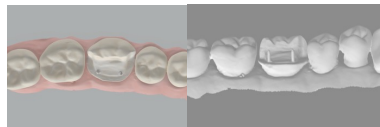


Figure 12. Pinlay preparation as PLY and stl file.

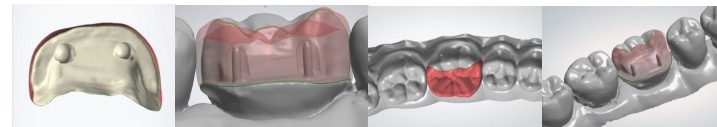


Figure 13. Pinlay restoration designed using 3shape.

## RESULTS



Figure 14. Alien ML 2.0 zirconia pinlay.



Figure 15. Restoration on dentiform.



Figure 16. Fit checker of the pinlay restoration.

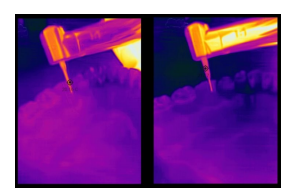


Figure 17. Thermography of drill & pin.

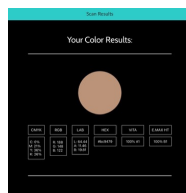


Figure 18. Shade of the restoration.

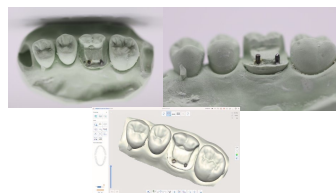


Figure 19. Pinlay cast digitized.



Figure 20. Zirconia pinlay restoration on cast.

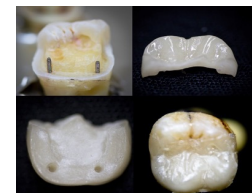


Figure 21. E.max pinlay.

## DISCUSSION & CONCLUSIONS

Although a very limited study on a single typodont, this simulated preliminary investigation illustrated that pin reinforced indirect posterior restorations using digital dentistry is an approach that is simple, efficient and accurate. The workflow resulted in a clinically acceptable zirconia restoration with minimal surface temperature change (< 5-degree increase compared to adjacent typodonts) during drilling and pin placement. Consideration of alternative restorative workflows, including both traditional and modified indirect techniques, remains essential to support accessible, patient-centred care while promoting sustainable and adaptable clinical workflows.

## SUPPORT • ACKNOWLEDGEMENTS

Fairfax Dental:  
Stabilok Dentine  
Pin System



SmileShade



Dental  
Thermal App



Alien Milling  
Technologies

