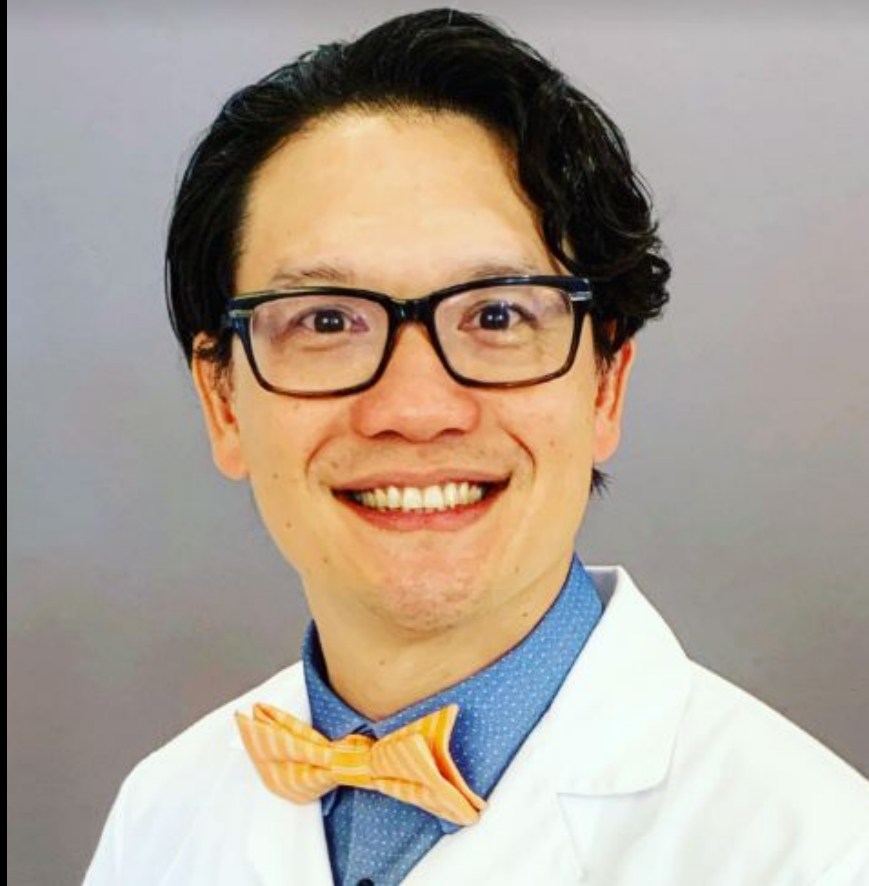




Effects of Aggressive Macro Thread Design and Residual Ridge Width in the Accuracy of Static Implant Guided Surgery

S. Bencharit DDS, MS, PhD,¹ P. Thanasrisuebong, DDS, PhD,² A. Pimkhaokham, DDS, PhD³

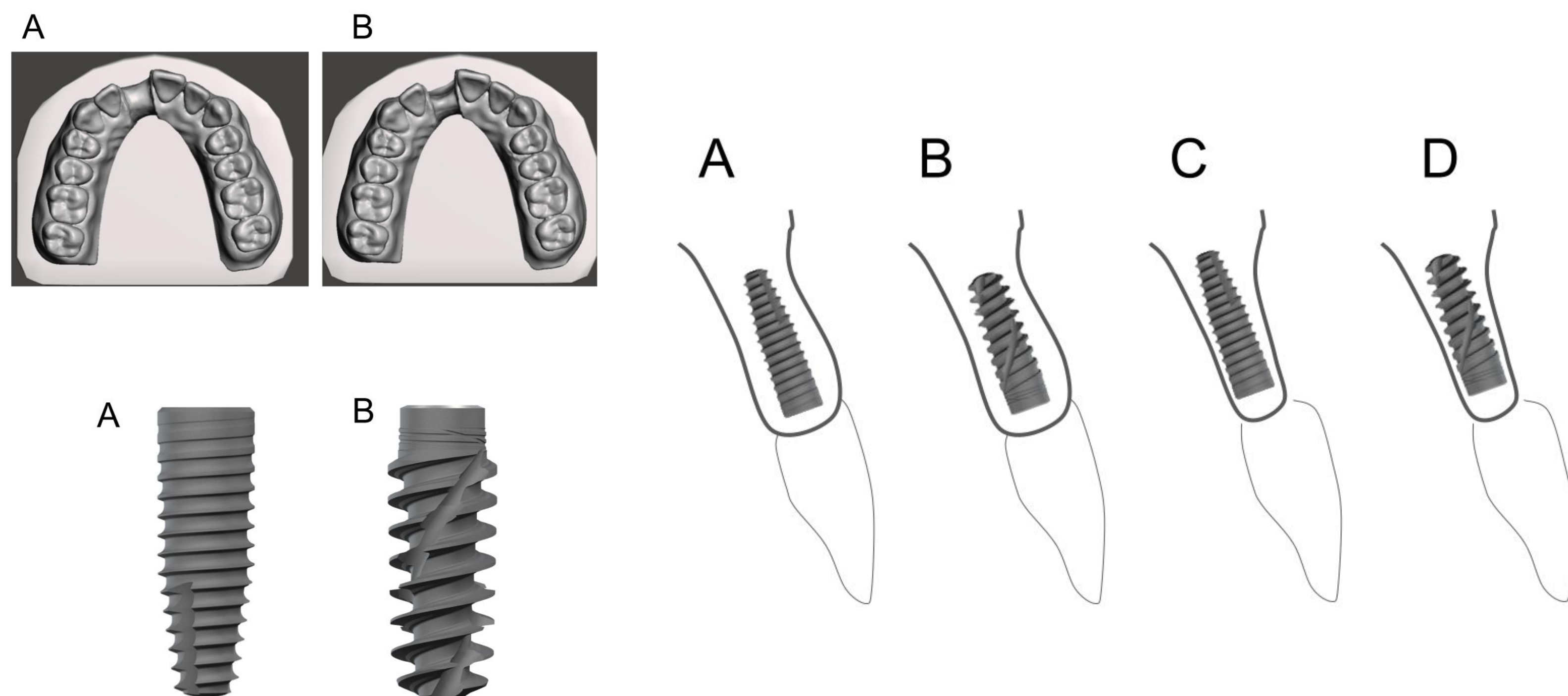
¹ Virginia Commonwealth University, Richmond, VA, USA; ² Mahidol University, Bangkok, Thailand; and ³ Chulalongkorn University, Bangkok, Thailand



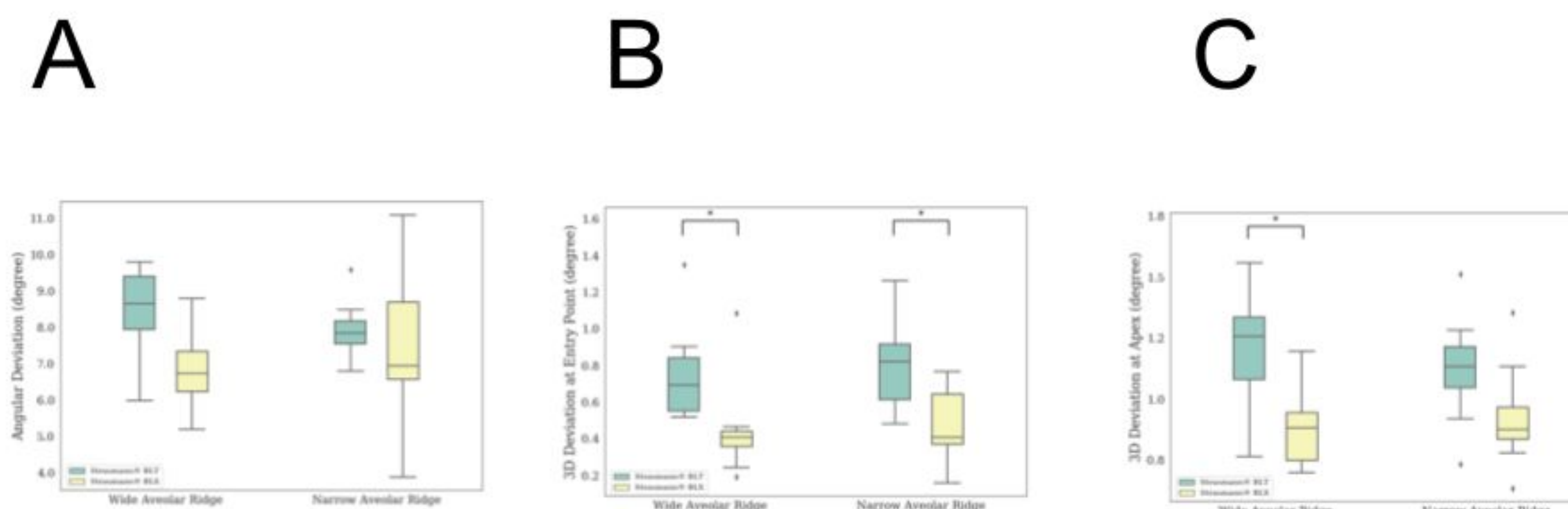
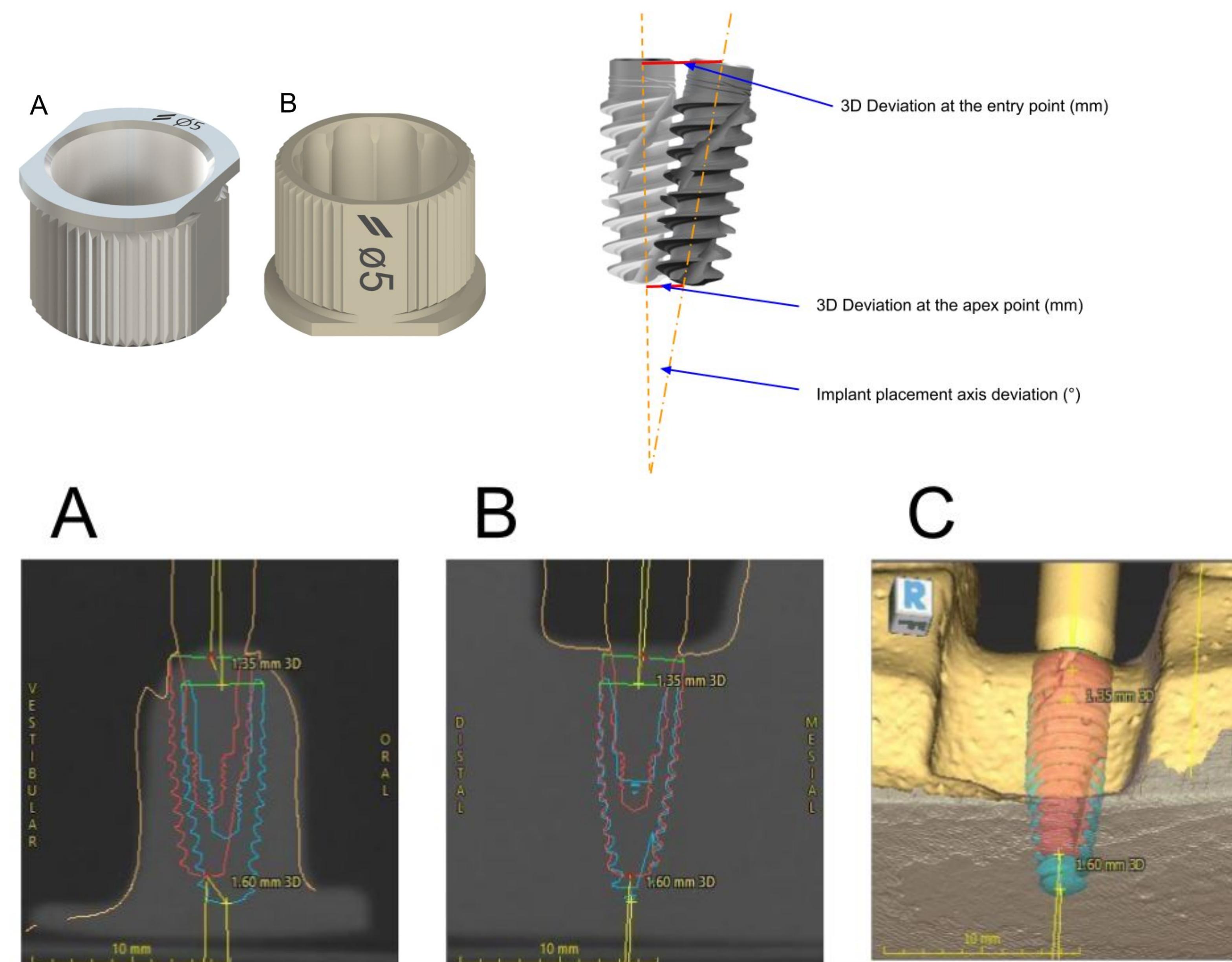
Introduction

- Static guided implant surgery promises high accuracy and precision of dental implant placements.
- Macro-designs of implant fixtures have shown to have influence on the accuracy of the implant positioning.
- Recently implant manufacturers have produced a more aggressive macrothread design to improve primary stability of dental implants upon insertion especially in the type III or IV bone or in cases with limited bone width.
- The aim of this study was to compare the bone level tapered design (BLT) with the bone level tapered with larger aggressive thread design (BLX) in normal width or wide residual ridge and in the narrow residual ridge.
- The null hypothesis was that with static guided implant surgery, the wide size would have no influence on the accuracy of the implant placement. It was also hypothesized that there would be no difference in the accuracy of two implant designs.

Materials & Methods



Results



Discussion

- BLX (more aggressive thread design) had less general 3D deviation for both entry point of the wide ridge ($P=0.027$) and narrow ridge ($P=0.022$) compared to BLT (less aggressive thread design).
- There was no difference between BLX and BLT in the angulation deviations in both types of ridge width.
- At the apex, BLX had less 3D deviation compared to BLT but only statistically significant difference in the wide ridge (not in the narrow ridge).
- The width of the residual ridge appears to have little influence on the implant deviation.
- The aggressiveness of thread design appears to improve the implant placement accuracy.
- More clinical studies will be needed to validate this in vitro results.

Conclusion

- Aggressiveness of implant thread designs seem to improve implant placement accuracy when guided surgery protocol is used.
- The width of residual ridge has little effect on the accuracy of implant placement in both non-aggressive and aggressive thread designed self tapping implants.

Acknowledgements

- The authors thank Strauman for providing technical support and implant fixtures.
- Thanks also the faculty and staff of the VCU Center of Digital Dentistry and Mahidol University Dental Implant Clinic.