



Intraoral scanning with an auxiliary geometry part for the fabrication of interim implant prosthesis.



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Introduction

- The digital workflow in dentistry begins with intraoral scanners that provide digital scans used to fabricate dental structures and prostheses. For implant-supported restorations, the accuracy of digital scans is crucial to achieve a passive fit between the superstructure and implants.
- Lack of accuracy can lead to mechanical failures or biological complications in implant-supported prostheses.
- It's hard to get accurate digital scans of edentulous arches due to the lack of anatomic landmarks and the presence of geometric variations along the dental arch. Challenges include potential confusion between identical scan bodies, difficulties in combining multiple images, and the absence of geometric and color differences to aid in image alignment.
- In a recent study by Patzelt et al., their findings suggested that the intra-oral scanners used could not be recommended for digitizing edentulous jaws in vivo and that technological enhancement and further investigations were needed. Intraoral scanning of the edentulous arches poses a great challenge as the functional movements of the soft tissues cannot be accurately captured in a digital form.
- The poster demonstrates a technique of fabricating an interim prosthesis using an auxiliary geometric part during intraoral scanning.

Technique

- An abutment level impression was made for a patient with four implants in the mandible, presented to the Grad Prosthodontic clinic at The Ohio State University.
- A cast was fabricated. Four Straumann laboratory multi-unit scan bodies were seated, and an intraoral scan was performed using a Trios3 intraoral scanner (Fig 1).

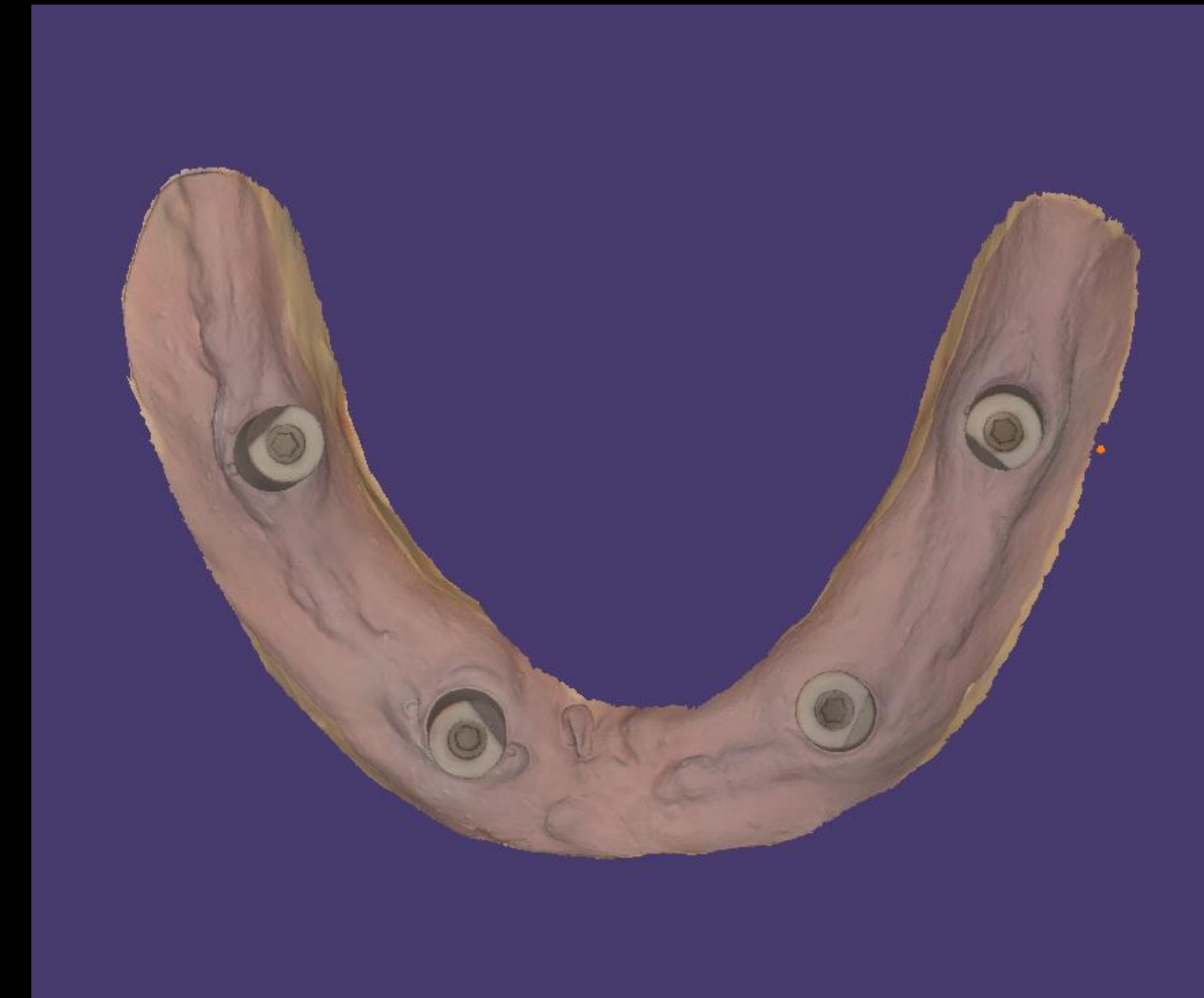


Figure 1 – Intraoral scan with laboratory scan body



Figure 2 – Scan using auxiliary geometry part

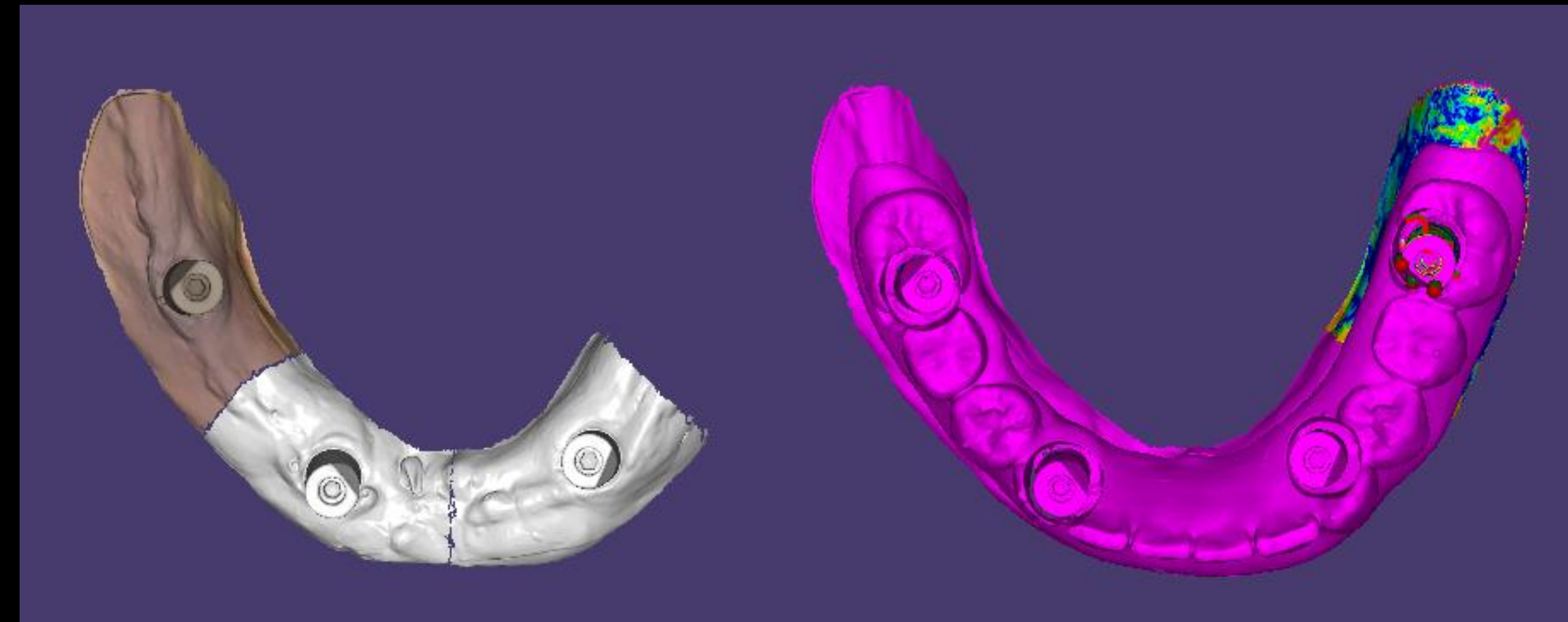


Figure 3 – Sectioning and aligning the scans

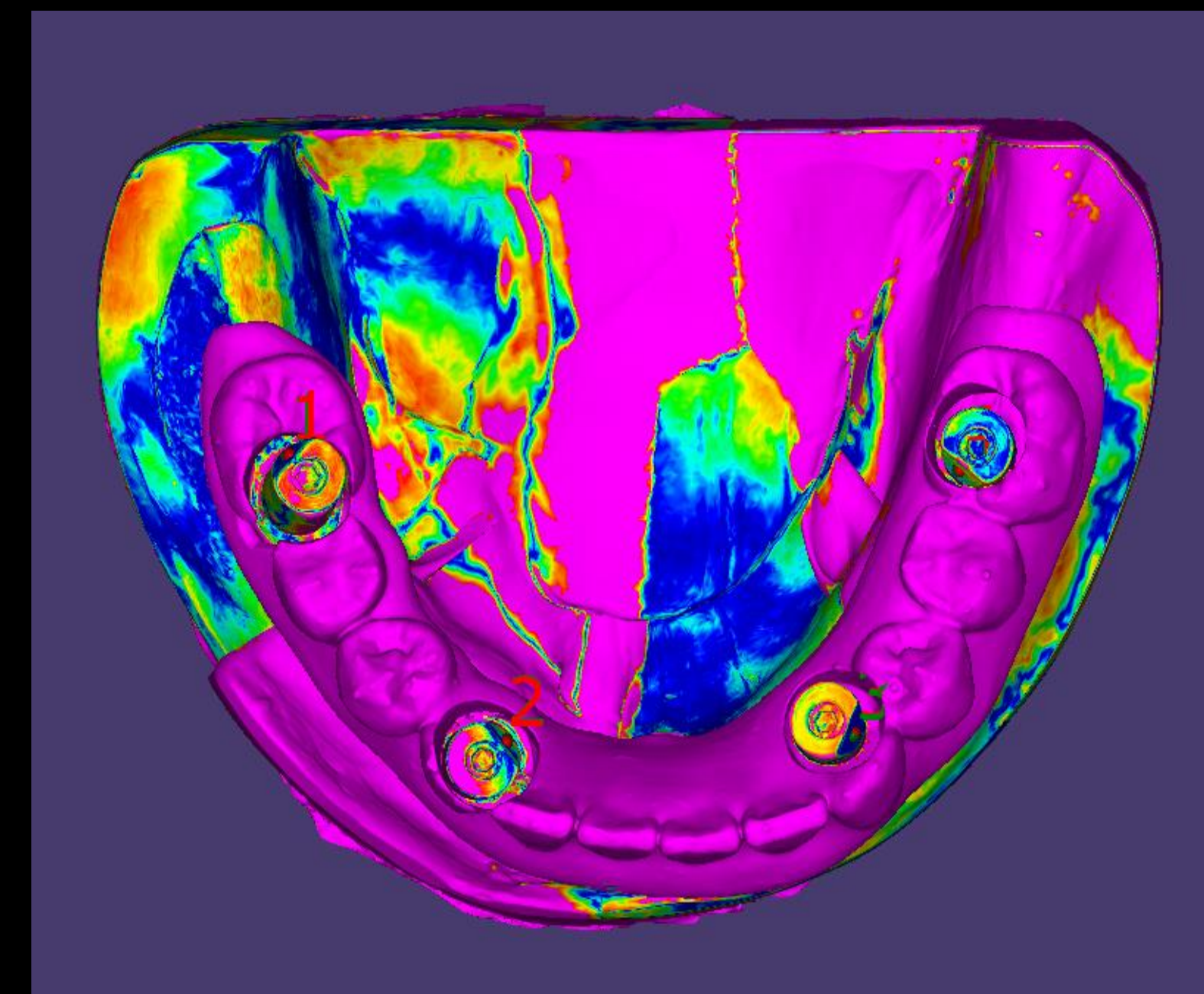


Figure 4 – Aligned scans



Figure 5 – Model created from the modified scan

- A 3D-printed prosthesis was created using EXOCAD software and printed with NextDent C&B resin material.
- Another scan of the same master cast was performed with the scan bodies in the same position, and an auxiliary geometry part was placed over the model (Fig 2).
- The scan without the auxiliary geometry part was sectioned into four parts (Fig 3).
- Each section was then aligned to scan with an auxiliary part using scan bodies as a reference (Fig 4).
- Once all the sections were aligned, the file was then uploaded to Meshmixer software to merge into a single digital model. (Fig 5).
- The obtained digital model was then used to fabricate an interim screw-retained implant complete denture prosthesis.

Results

- A 3D-printed interim prosthesis was successfully fabricated from the newly obtained scan.

Conclusion

- The auxiliary geometry device was successfully used for the fabrication of the interim prosthesis

References

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M., Eguiraun, H., Etxaniz, O., & Solaberrieta, E. (2019). Accuracy analysis of complete-arch digital scans in edentulous arches when using an auxiliary geometric device. *The Journal of Prosthetic Dentistry*, 121(3), 447–454. <https://doi.org/10.1016/j.prosdent.2018.09.017>

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