

PURPOSE

To discuss the workflow to fabricate a wear resistance acrylic-titanium implant-supported fixed complete denture (ISFCD) through a digital workflow and using splinted CAD-CAM crowns.

METHODS

A 78-year-old male presented to the Graduate Prosthodontics Clinic at the University of Alabama at Birmingham School of Dentistry, reporting significant wear and diminished masticatory efficiency of the maxillary implant-supported fixed complete denture (ISFCD) inserted in 2018. Clinical examination revealed extensive wear of the prosthesis and compromised occlusal function with opposing arch treated having implant-tooth supported all-ceramic crowns and non-restorable teeth requiring replacement with implants. Patient refused to replace the maxillary prosthesis with zirconia hybrid. The patient agreed on fabrication of a acrylic-titanium hybrid with having splinted zirconia crown on the posterior teeth to limit the wear and the loss of occlusal vertical dimension.



Fig. 1: Initial occlusal view of the maxillary and mandibular arches

CLINICAL REPORT



Fig. 2: Lateral view of mounted the old hybrid prosthesis at an increased VDO (A); After burning the old prosthesis (B); the new prosthesis at the established OVD (C).



Fig. 3: Occlusal view of the newly fabricated hybrid prosthesis (A); Fabrication of external surface form to fabricate interim FDP (B); The prosthesis with prepared posterior teeth with mesial and distal grooves (C).

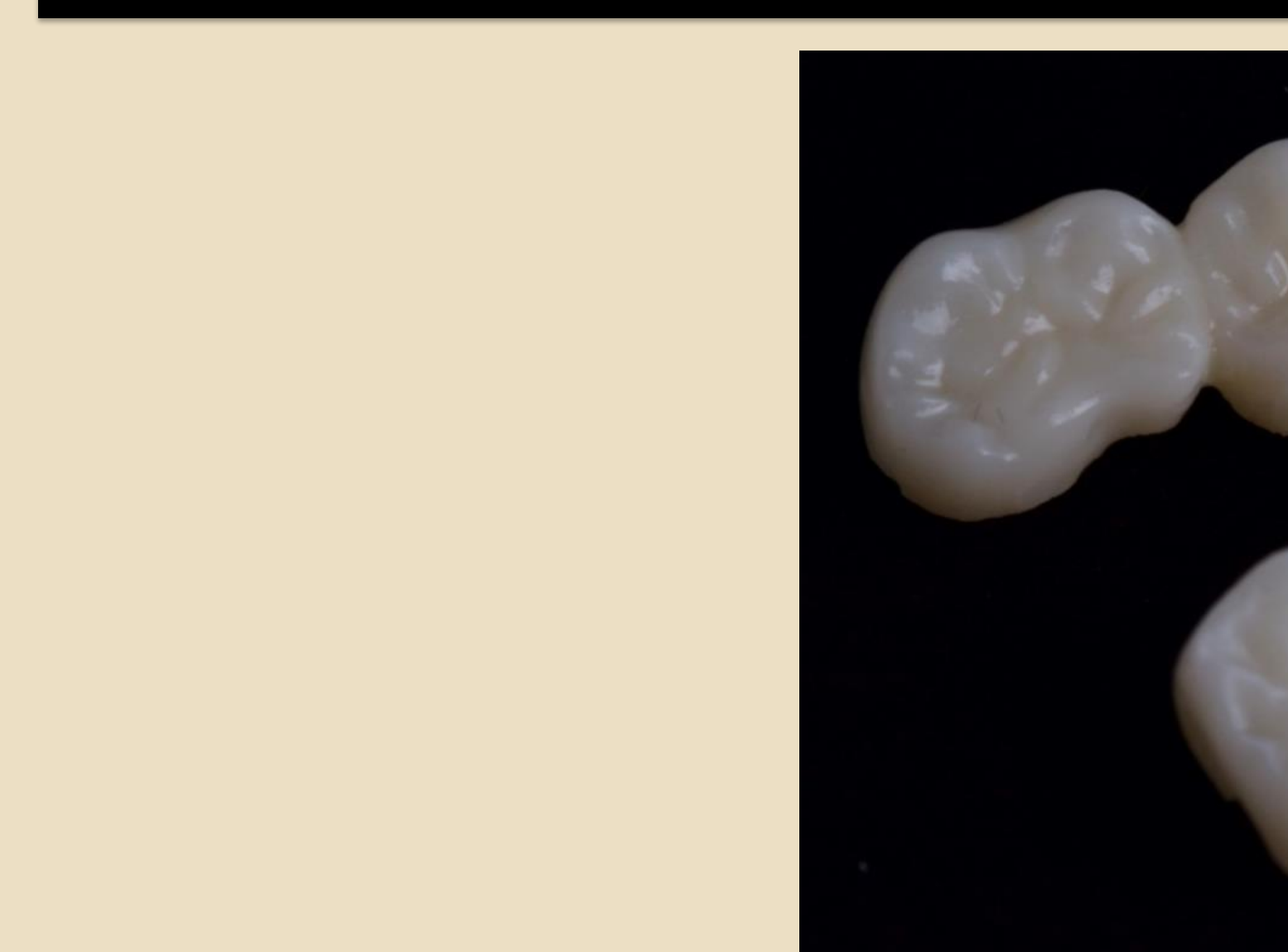
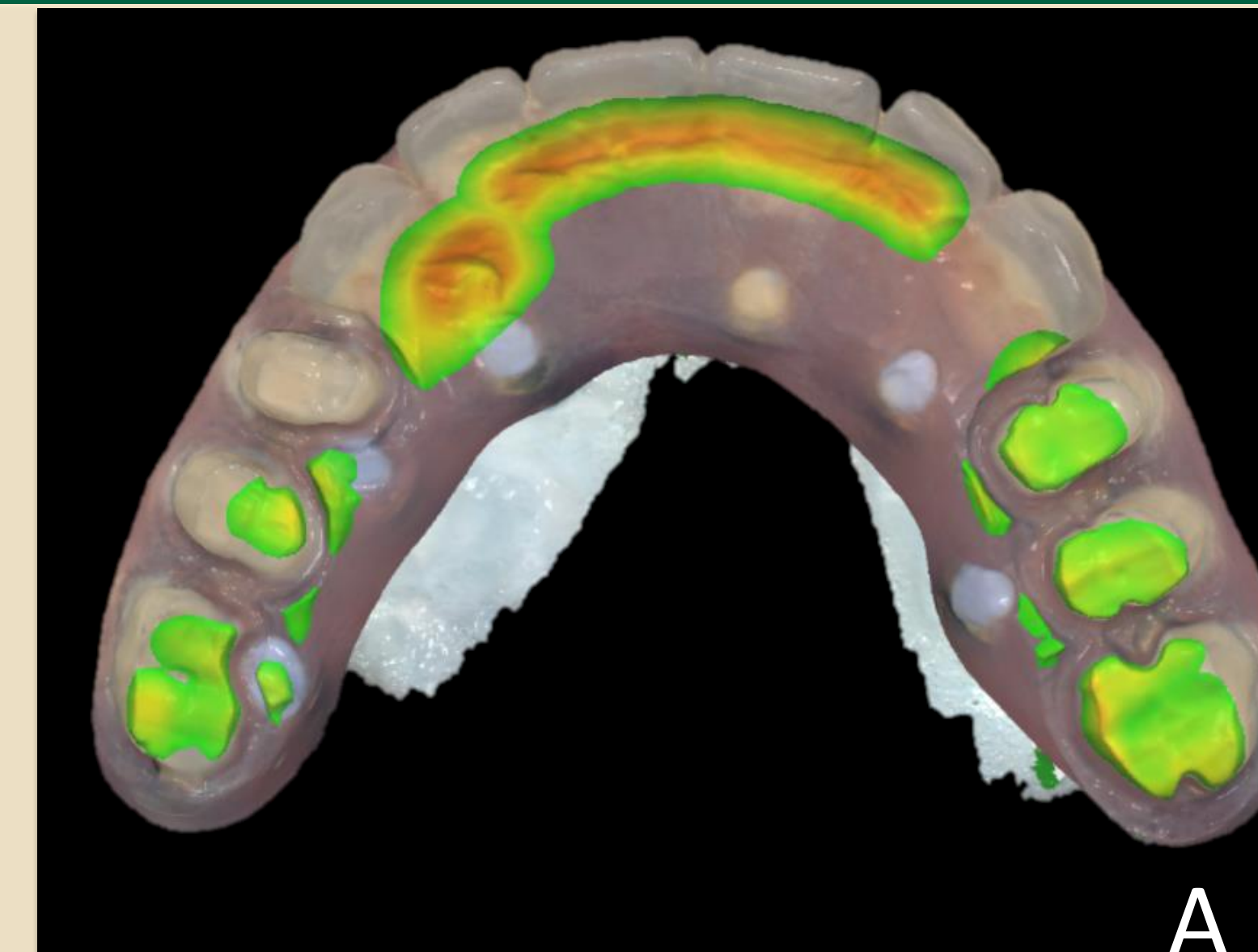


Fig. 4: IOS from the prosthesis with prepared teeth assessing the amount of reduction (A); Fabricated splinted zirconia crowns from 3Y-TZP (B); Prosthesis before luting the splinted crowns using a resin cement (C). Prosthesis after luting the splinted crowns The cementation process with Panavia cement post sandblasting of the splinted zirconia crowns.

RESULTS



Fig. 5: Occlusal and frontal view, 6-month follow up

CONCLUSIONS

Wear and fracture of denture teeth is a common complication associated with an acrylic-titanium ISFCD which alters the occlusal scheme and vertical dimension of occlusion (VDO) specifically when the opposing arch has natural dentition or restored with a wear resistance prosthesis. Zirconia is a wear resistance material presenting a wear similar to enamel. The use of a splinted zirconia crowns on the acrylic-titanium ISFCD may provide a cost-effective and wear resistance prosthesis for patients. However, long-term follow up is needed to assess the treatment effectiveness considering the lack of studies on bonding of zirconia crowns on the PMMA base prosthesis. However, this clinical report used multiple retentive features and splinted the crowns to maximize the retention and resistance form of crowns.

REFERENCES

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