

Use of Zirconia Onlays in Removable Complete Denture Opposing Natural Dentition: A Case Report

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Objective

This technique will help prevent occlusal wear of the removable complete denture opposing natural dentition by utilizing zirconia onlays.

Case History

An 83-year-old female presented for evaluation of a worn and ill-fitting mandibular complete denture opposing natural dentition restored with porcelain crowns (Fig. 1). Upon initial examination, the occlusal surfaces of the denture were found to be severely worn, leading to a loss of vertical dimension of occlusion and a Class III malocclusion. A treatment plan was proposed to fabricate zirconia onlays for her new prosthesis.



Figure 1. (a) Initial Prosthesis

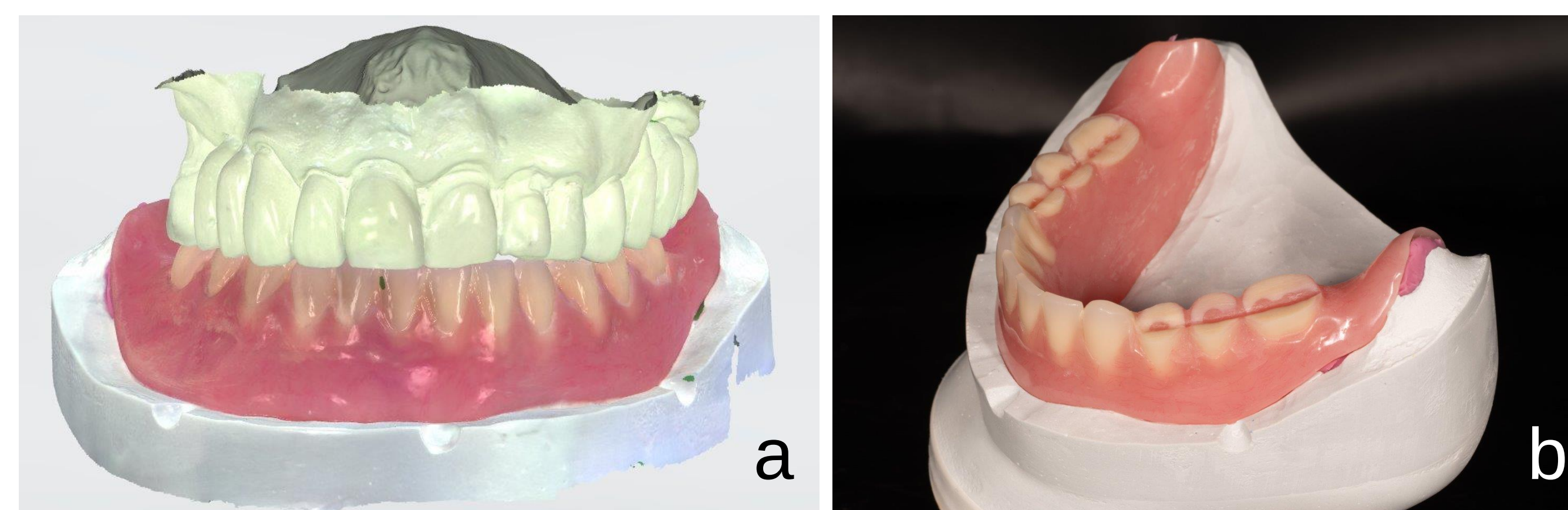


Figure 2. (a) Digital scan; (b) Preparation design

Technical Steps

A new mandibular removable complete denture was fabricated using conventional methods. A digital scan of the denture opposing her natural dentition was obtained with a Trios 4 scanner to serve as the pre-operative scan (Fig. 2). The mandibular denture teeth were then prepared to achieve a minimum occlusal reduction of 2 mm, incorporating a central groove feature to facilitate the seating of the restorations (Fig. 2).

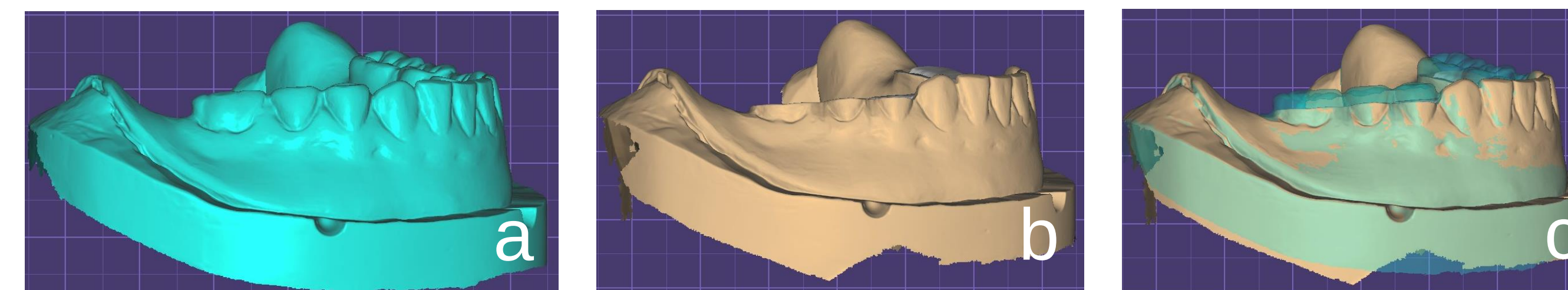


Figure 3. (a) Pre-op scan; (b) Preparation scan; (c) Merged pre-op scan and preparation scan

A scan of the preparations was obtained and aligned with the pre-operative scan using Exocad CAD software (Fig. 3). The onlays were designed by adapting the restoration contours to the denture teeth in the pre-operative scan. The onlays were milled on a Planmeca PlanMill 50S using Ivoclar IPS e.max ZirCad Prime, then sintered and polished according to the manufacturer's instructions (Fig. 4). Both the denture teeth and onlays were air-abraded with aluminum oxide and steam-cleaned. Acrylic monomer was applied to the denture teeth, while Z-Prime Plus was used on the intaglio surfaces of the onlays. The onlays were then cemented in place using 3M RelyX Unicem (Fig. 5).

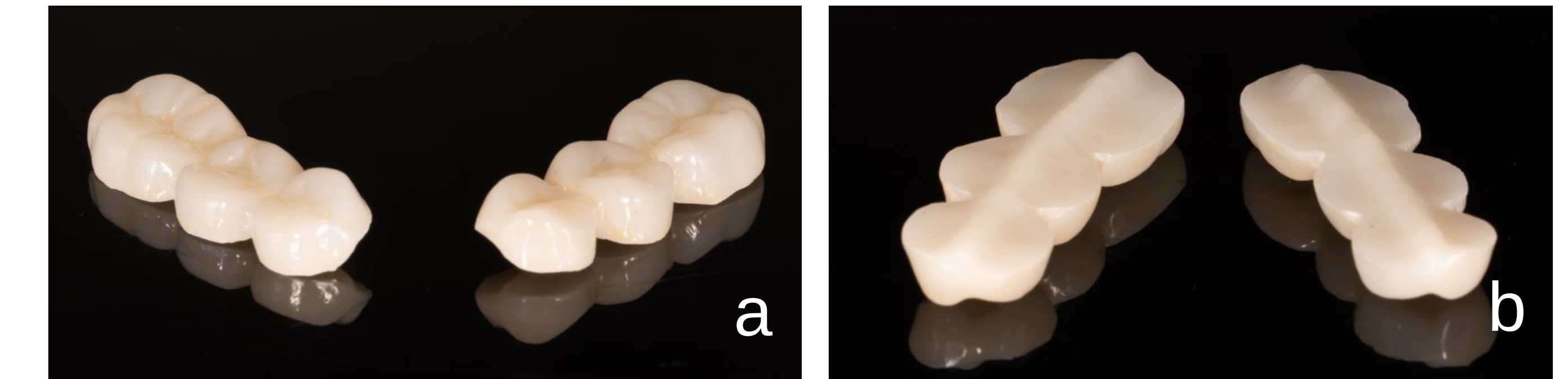


Figure 4. (a) Polished zirconia onlays; (b) Intaglio view

Conclusion

The use of zirconia onlays in removable complete dentures facilitates the preservation of vertical dimension of occlusion and provides a cost-effective technique compared to gold onlays.

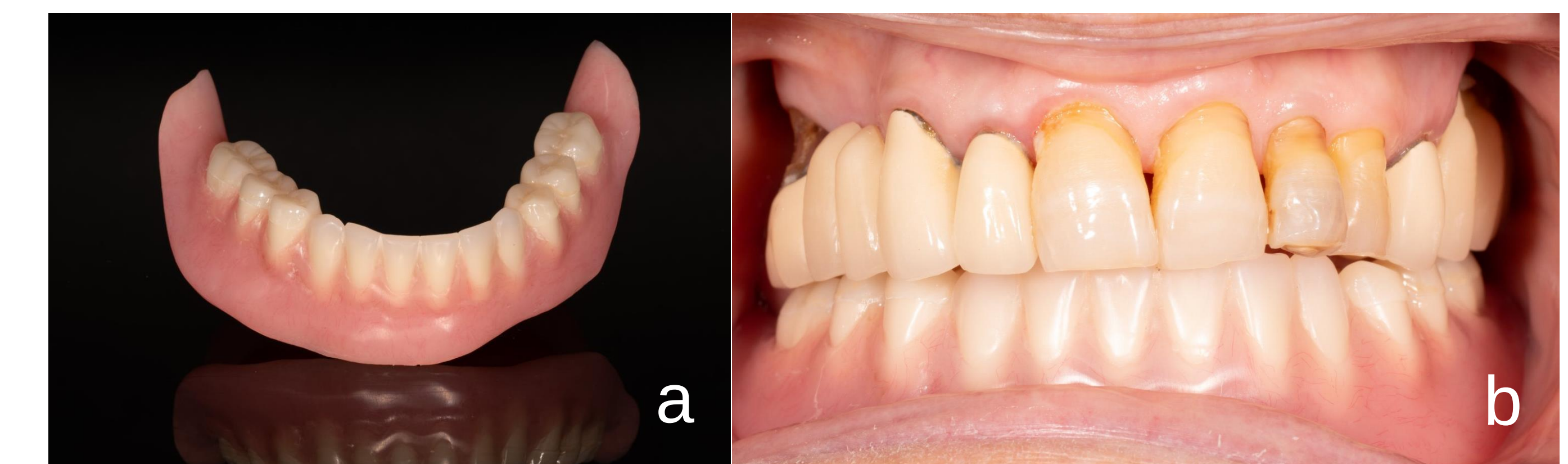


Figure 5. (a) Final mandibular prosthesis; (b) Frontal intraoral view

References

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