

PURPOSE

To demonstrate the treatment workflow of a zirconia-titanium hybrid prosthesis for an edentulous patient and discuss the, advantages and considerations of other treatment options.

METHODS

A 60-year-old Caucasian female presented to the UAB Prosthodontics Clinic with an acrylic fixed complete denture supported by four implants on the mandibular arch, opposing a maxillary complete denture. Her chief complaint was cracking of existing prosthesis and difficulty to access for cleansability. Upon evaluation it was noticed that she has limited inter-arch space (9mm at the right posterior region). The patient declined to replace or modify the existing maxillary complete denture. Kindly refer to table 1 for fixed treatment plan options and considerations. Based on clinical findings and evaluation, the decision for a zirconia sleeve over a titanium bar framework was made.

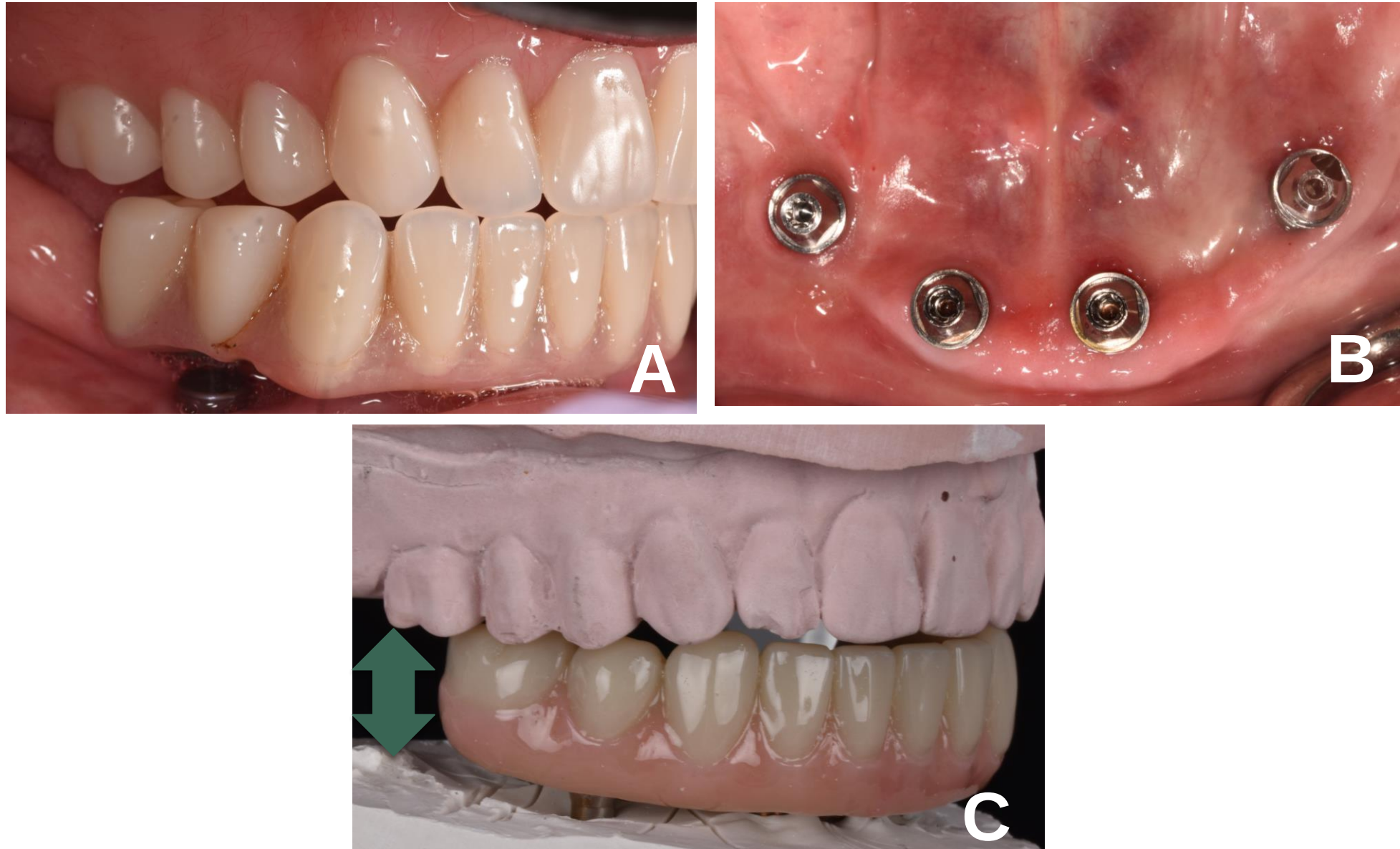


Fig. 1. Initial presentation (A); Position of implants (B); Available vertical space for the prosthesis (C)

Zirconia - Titanium Hybrid Prosthesis for An Edentulous Patient: Advantages and Considerations

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CLINICAL REPORT

Implant-Retained Complete Arch Prosthesis	Advantages	Potential Complications	Prosthesis Thickness
Acrylic - Titanium	Ti is a biocompatible material, increased anterior posterior spread, high strength of metal alloy, long-term clinical outcome and complications are known	Tooth fracture, denture teeth wear, prosthesis fracture	3-5 mm + 5-7 mm (metal alloy thickness + restorative material thickness)
Milled PMMA – Titanium	Ti is a biocompatible material, increased anterior posterior spread, high strength of metal alloy, highly crosslinked PMMA, one piece white and pink PMMA (no weak link), easier repair of sleeve	Unknown; however, PMMA supra-structure may get wear and decemented	3-5 mm + 5-7 mm (metal alloy thickness + restorative material thickness)
Zirconia	Zr is a biocompatible material, wear resistant, good esthetics, high strength	Limited extend of cantilever, decementation from Ti Base	≥8-10 mm material thickness, > 5.5 mm connector height
Zirconia - Titanium	Ti is a biocompatible material, increased anterior posterior spread, wear resistant, good esthetics, high strength of Zr & Ti, easier repair of sleeve	Unknown; however, zirconia supra-structure may get decemented	3-5 mm + 2-3 mm (metal alloy thickness + restorative material thickness)

Table 1.

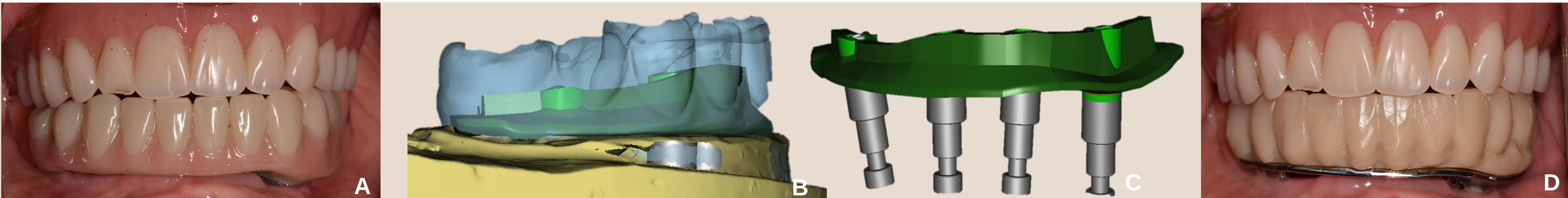


Fig. 2. Manufactured prototype (A) ; Designed bar using prototype providing 1 mm space for cleanability (B and C); Milled bar and restorative material try-in (D)

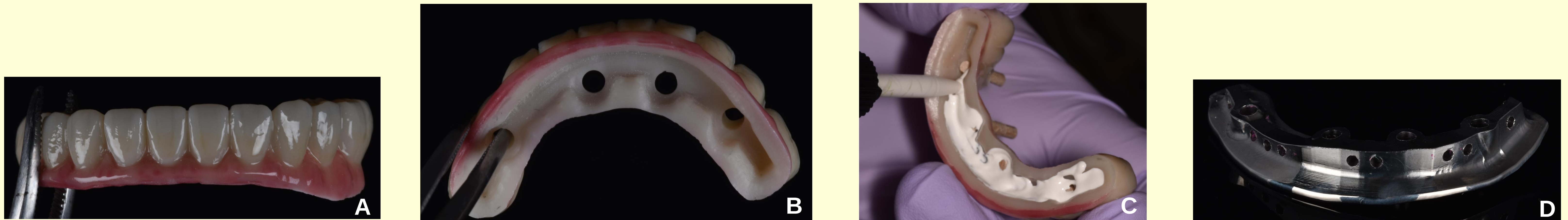


Fig. 3. Finalized zirconia prosthesis (A and B) ; Intaglio surface of prosthesis and bonding surface of bar are sandblasted with 50 µm Al₂O₃ at 2 bars, MDP primer (Monobond Plus; Ivoclar) is applied, components luted with a resin cement (Multilink Hybrid Abutment ;Ivoclar)



RESULTS

Zirconia- titanium hybrid mandibular fixed prosthesis can be an alternative treatment option for a patient with limited inter-arch space with good long-term prognosis.



Fig. 4. Fabricated prosthesis and frontal view after the insertion

CONCLUSION

Prosthetically driven implant placement is crucial for an implant retained prosthesis for edentulous patients. With various materials available in dentistry, proper assessment of prosthetic space available, and understanding the required space for different prosthesis options considering cost-effectiveness, are critical factors in determining treatment methods that can provide longevity of prosthesis with fewer mechanical complications and better patient outcomes.

REFERENCES

