



Background& Rationale

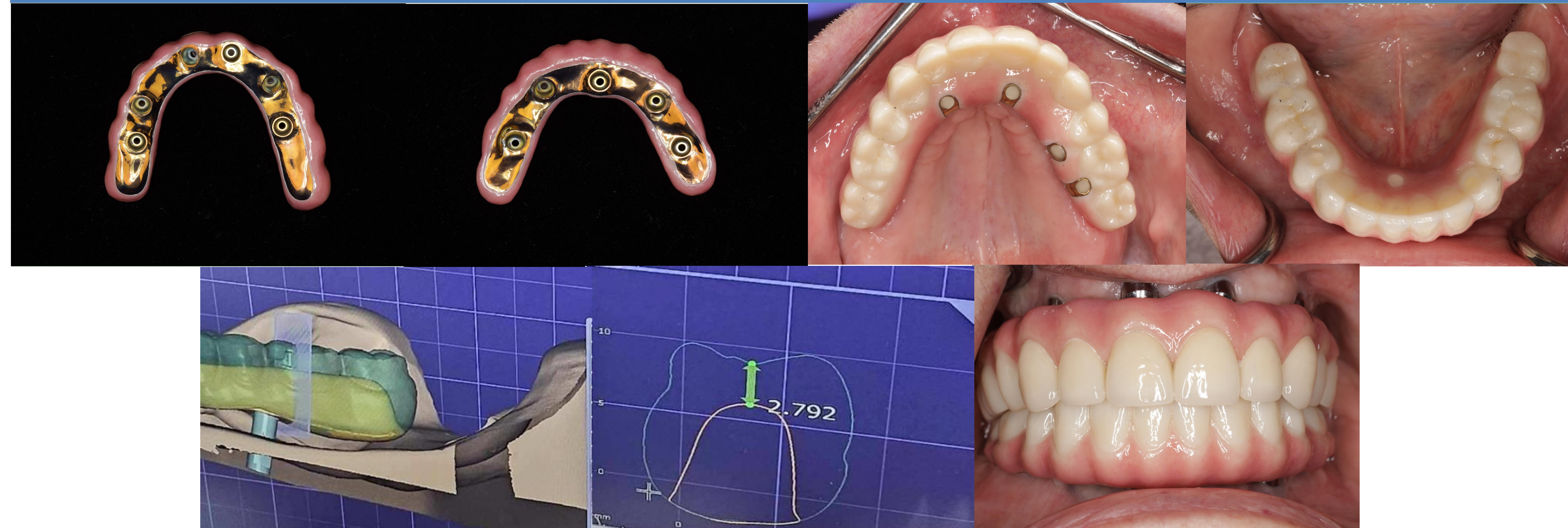
- Full-arch implant-supported prostheses significantly improve oral function, aesthetics, and quality of life. Monolithic zirconia is often favored for its strength, biocompatibility, and aesthetics, but it typically requires 15 mm of vertical space, which can be challenging in cases of limited bone height. While bone reduction surgery can increase clearance, it is invasive and not always feasible.
- A hybrid approach, combining a titanium bar and zirconia, reduces the required space to just 7 mm (4 mm for the titanium bar, 2-3 mm for zirconia around access hole and 2-3mm occlusal clearance).
- This design offers flexibility, allowing for remilling of the zirconia superstructure in case of fractures or occlusal changes without replacing the titanium bar.
- The modularity reduces both costs and complexity during follow-up care. This study evaluates long-term outcomes, patient satisfaction, and performance of this hybrid approach.

Objective

- 1.Evaluate the long-term clinical performance of full-arch prostheses using a combination of monolithic zirconia and titanium after a minimum follow-up of 12 months.
- 2.Analyze design considerations, specifically the reduction of vertical space from 15 mm in monolithic zirconia designs to 7 mm with the hybrid prosthesis.
- 3.Assess post-treatment complications, including fractures and visible cement lines at the zirconia-titanium junction.

Case Series

Case1: Maxillary and Mandibular Full Arch Fixed Implant Supported Prostheses



First Case: A 65-year-old female patient presented with pre-existing implants and restricted restorative space in the posterior region (approximately 6.5 mm at the first molar) received a full-arch prosthesis. A hybrid design using a zirconia overlay on a titanium substructure ensured a predictable and durable restoration.

Case 2: Maxillary and Mandibular Full Arch Fixed Implant Supported Prostheses



Second case: A 58-year-old female patient with pre-existing implants and reduced vertical space in the posterior mandible (approximately 7 mm) presented for rehabilitation. A full-arch prosthesis using a hybrid approach—combining a zirconia overlay with a titanium framework—was implemented, offering a reliable and aesthetic long-term solution.

Discussion

- This study highlights the clinical viability of hybrid zirconia-titanium full-arch prostheses, particularly for patients with limited vertical space or pre-existing implants. By reducing the required vertical space to 7 mm, this approach offers a practical alternative to monolithic zirconia, which requires 15 mm.
- The modularity of the hybrid design is a significant advantage, enabling remilling of the zirconia superstructure without replacing the titanium bar, thus reducing future costs and procedural complexity. However, challenges such as cement line visibility and potential debonding between zirconia and titanium remain, which could affect both aesthetics and long-term durability. Further research is needed to enhance bonding techniques for improved outcomes.

Result

The survival rate for hybrid zirconia-titanium full-arch prostheses is projected to exceed 95%, though minor issues like visible cement lines and zirconia fractures may occur. High patient satisfaction with aesthetics and functionality is expected. These outcomes will be compared to metal-ceramic prostheses to evaluate overall effectiveness and durability

Conclusion

- This case series demonstrates the durability and practical benefits of hybrid zirconia-titanium full-arch prostheses, particularly in managing limited vertical space while maintaining structural integrity and aesthetics. The modular design allows easy adjustments, reducing the need for major revisions.