

Full arch all on 4 CAD/CAM zirconia implant supported prosthesis

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Abstract

One of the major challenges encountered in treatment of a full arch is sequencing a precise pathway to deliver fixed prostheses for the upper arch. This case demanded a thorough understanding of the limitations imposed by various clinical, laboratory and implant system factors, alongside absolute attention to detail.

Keywords: Implants, Fixed partial denture, All on 4, Zirconia, CAD/CAM

Introduction

One of the major challenges encountered in treatment of a full arch is sequencing a precise pathway to deliver a fixed prostheses for the upper arch. This case demanded a thorough understanding of the limitations imposed by various clinical, laboratory and implant system factors, alongside absolute attention to detail. Several initial wax ups were required to determine the compromise between aesthetics and the physical limitations of the prostheses. Once this challenge had been overcome, an implant supported prostheses with porcelain fused to zirconia framework have been proposed. Evidence suggests that this material offers biocompatibility, accuracy, passive fitting, colour stability, wear resistance and aesthetics. However, chipping of the veneering porcelain has been reported in several clinical studies¹

Brief History

A 35-year-old female patient reported with Recurrent fracture and chipping of acrylic tooth (13) on the upper implant-retained hybrid denture that was done previously. She was Unhappy with appearance of her teeth and this affecting her confidence. She is keen to acquire a more natural smile with good function. The patient's medical history is unremarkable.

Case Discussion

Patient has underwent multiple extractions on her maxillary anterior and premolar teeth due to previous failed restorations. Four implants placed with bone grafting done at the site of extractions and a fixed implant retained hybrid bridge made in 2015. She had No signs of marked asymmetry, lymphadenopathy, or temporomandibular dysfunction. Her Lip at smile was low with Good lip support from maxillary prosthesis. A digitally designed and milled maxillary implant supported with multi-base abutments with a screw-retained FDP on four implants was the preferred option in this case. This was what the patient was keen on while improving aesthetics and minimise complications. The choice of a fixed prostheses would improve masticatory efficacy, retention, stability and support to improve patient comfort. Furthermore, cross-arch

stabilisation and equal force distribution between the 4 implants was a major advantage. Even though the patient would compromise access for oral hygiene and is committed to a lifetime maintenance of the prostheses.



Fig. 1: Implant retained hybrid bridge



Fig. 2: Mock-up with try in and confirmation of aesthetic design



Fig. 3: Verification Jig for master cast

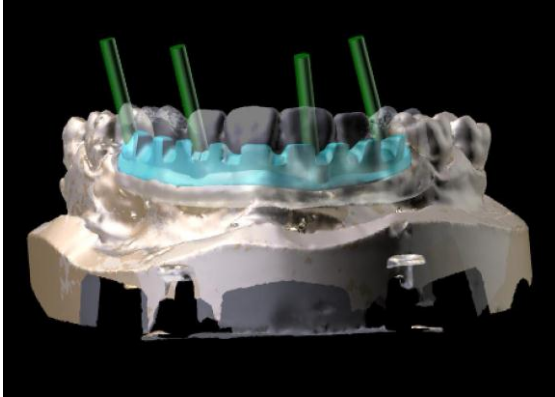


Fig. 4: CAD zirconia framework



Fig. 5: Temporaries placed to confirm wax-up and digital desing.



Fig. 6: Zirconia All on 4 prosthesis placed and screwed in situ



Fig. 7: Smile of Patient after final prosthesis delivery

Conclusion

Screw retained restorations are more favourable with regard to periodontal health due to the interface size and cement lute which may harbour micro flora.

The principles for the design of the zirconia/porcelain prosthesis are based on studies by Guazzato et al² regarding thickness, distribution of the core material and veneering porcelain, thermal and surface treatment of the material, fatigue behaviour, accuracy and passivity.

Success rates of implants and their prostheses have been well published in literature with success rate of the prostheses being greater than 95% at 10 years and greater than 92% at 15 years³

Conflict of Interest: None.

References

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