

INTRODUCTION

- Ceramic implants are being investigated for their biocompatibility, esthetic considerations, metal-free composition and technical performance, compared to their titanium counterparts
- Yttria-stabilized zirconia is the most dominantly used material for the fabrication of zirconia implants, but alumina-stabilized tetragonal zirconia (ATZ) is also commonly seen and evaluated in studies
- This poster looks at studies that aimed to investigate how the two implant designs, one-piece implants and two-piece implants, compare to one another and respond in a clinical setting
- The purpose of this research is to investigate the clinical outcome of zirconia implant-associated survival and success rates, marginal bone loss, and implant–restoration complex integrity
- These studies allow us to consider the survival and success rates of zirconia implants compared to titanium implants

METHODS & MATERIAL

- Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were applied
- The systematic reviews employed PICO criteria question guidelines to search databases
- Utilized study selection, quality assessment, inclusion and exclusion criteria, data extraction and systematic analyses to screen applicable articles
- Primarily focused on articles concerning survival rates and marginal bone loss around one- and two-piece zirconia implants and their clinical outcomes

RESULTS

- One-piece implant survival rates was 95% and two-piece had a survival rate of 94%, over 1- and 3-year observation
- Implant survival rate of 3 different implant surfaces (uncoated, coated, or acid etched) showed that acid-etched implants had better statistically significant survival rates
- Technical complications in the studies include abutment fractures with two-piece implant designs only (narrow diameter or bruxism)
- Although two-piece is more prone to technical complications than one-piece zirconia implants this does not influence two-piece implant outcome since the abutment can be replaced if fractured

ONE-PIECE & TWO-PIECE IMPLANTS



Figure 10: Preparation of ceramic implants (top) and final crown restoration (bottom)



Figure 11: SDS Swiss Dental Solutions ceramic implants

CONCLUSION

- Zirconia presents with a significantly reduced plaque affinity compared to titanium, which leads to a reduced risk of inflammatory reactions around soft tissues
- Roughened surfaces have been shown to improve the bone-to-implant contact and thus the osseointegration, in both titanium and ceramic
- The mean marginal bone loss of zirconia implants was 0.89 mm after 1 year which is comparable to titanium implants
- Two-piece implants have more frequent technical complications compared to 1-piece
- While the survival rates of one and two-piece zirconia implants are considered acceptable, they still do not reach the long-term survival rates of titanium implants

DISCUSSION

- Zirconia implants have demonstrated comparable results to those of titanium implants regarding biocompatibility, osseointegration capacity, and soft tissue response and may therefore be used interchangeably
- Biological complications include periimplantitis, hypertrophic tissue growth, a mixture of swelling, infection, and bleeding, and non-osseointegration
- Implants supporting removable prostheses showed greater bone loss and a higher fracture rate than titanium implants
- Future long-term studies are required to better understand the prosthodontic-implant complex as a whole
- Two-piece implant design is more prone to fracture at the abutment level but still has long term viability if abutment is replaced

LIMITATIONS

- Clinical evidence for ceramic implants is scarce and therefore performance outcomes are undetermined
- Limited information exists on prosthetic procedures and outcomes in relation to zirconia implants
- Limited research on the material and restorative options used to restore, such as single crowns or fixed dental prostheses, for zirconia implants in terms of survival rates
- Screw retained abutments were not used/addressed in these studies
- Lack of angled zirconia implant abutments restricts restorative approaches
- Extremely limited information for performance on hybrid prostheses (i.e. implant retained overdenture)

References

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