

Survival Rate of Implant-supported Screw-retained. 3D-printed Provisional Single-crowns Restorations: A 1-year Follow-up

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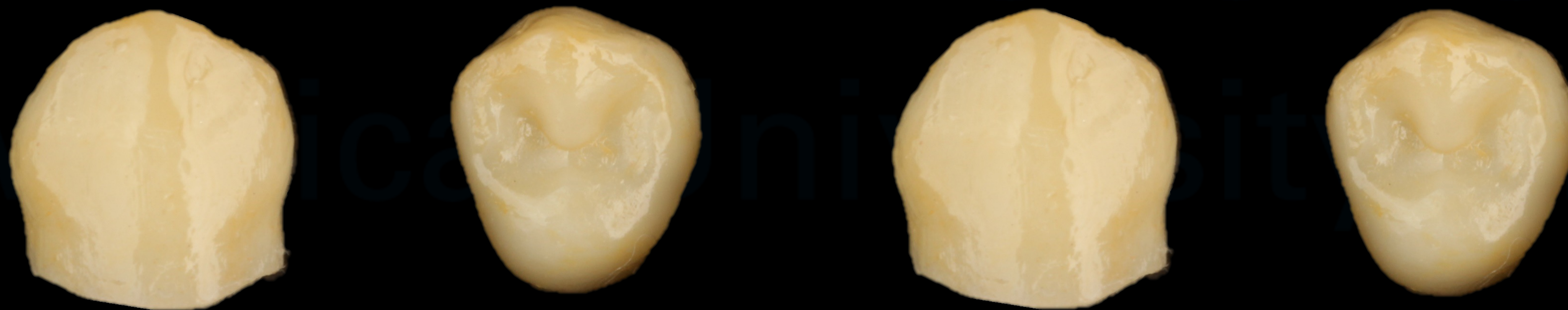


Introduction

Additive manufacturing (AM) processes in dentistry involve creating stereolithography files (.stl files) and using ultraviolet light to solidify resin into 3D-printed prosthetic restorations, offering cost savings and suitable biomechanical properties for temporary use. However, enhancements through the introduction of an inorganic matrix and proper post-curing processes can improve material properties, preventing excessive load transfer and surface wear. Titanium (Ti) base abutments, favored for their biocompatibility and mechanical characteristics, play a critical role in dental restorations. Despite advancements, questions persist about the real-world performance of 3D-printed resin restorations, especially in implant-supported cases.

Objective

Thus, a study aims to evaluate the survival rates of implant-supported screw-retained 3D-printed provisional single-crown restorations after one year of follow-up.



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Public trial

RBR-9qvvvww Analysis of morse taper implants installed at the bone level and 2 mm above bone followed by the installation of crowns ...
Date of registration: 01/27/2022 [mmdd/yyyy]
Last approval date: 01/27/2022 [mmdd/yyyy]

Study type:
Interventional

Scientific title:

en	pt-br	es
Analysis of morse taper implants installed at the bone level and 2 mm subcrestally followed by the installation of crowns printed in hybrid resin, clinical, controlled, randomized study with split-mouth model	Análise de implantes cone morse instalados ao nível ósseo e 2 mm subcrestalmente seguido da instalação de coroas impressas em resina híbrida, estudo clínico, controlado, randomizado com modelo de boca dividida	Analysis of morse taper implants installed at the bone level and 2 mm subcrestally followed by the installation of crowns printed in hybrid resin, clinical, controlled, randomized study with split-mouth model

Trial identification

- UTH code: 11111-1273-1182
- Public title:

en	pt-br
Analysis of morse taper implants installed at the bone level and 2 mm above bone followed by the installation of crowns printed in hybrid resin	Análise de implantes cone morse instalados ao nível ósseo e 2 mm acima do osso seguido da instalação de coroas impressas em resina híbrida

- Scientific acronym:
- Public acronym:
- Secondaries identifiers:
 - CAAE: 52658321.1.0000.5152
Issuing authority: Orgão Emissor: Plataforma Brasil
 - Número do parecer: 5.142.350
Issuing authority: Comitê de ética de pesquisa da Universidade Federal de Uberlândia

Sponsors

- Primary sponsor: Universidade Federal de Uberlândia
- Secondary sponsor:
 - Institution: Universidade Federal de Uberlândia
- Supporting source:

Inclusion criteria

- 1) Age between 18 and 70 years old;
- 2) Need for bilateral unitary rehabilitation with implants in the maxilla or mandible;
- 3) Sufficient bone availability for installation of the conventional-sized implant;
- 4) Good systemic health.

Exclusion criteria

- 1) Smokers and ex-smokers;
- 2) Diabetics;
- 3) Patients who are chronic users of medications (eg. Bisphosphonates, Immunosuppressants, anti-inflammatories) or pathologies that alter bone metabolism (eg. Osteoporosis; Diabetes);
- 4) Patients who chronically use anti-inflammatories and antibiotics;
- 5) Sufferers of bruxism;
- 6) Alcoholics;
- 7) Chemical addicts;
- 8) Pregnant women or those who wish to become pregnant in the next year;
- 9) History of radiotherapy treatment in the head and neck region.

33 patients recruited

33 patients were
eligible
0 excluded

33 patients (n= 76
implants) included in the
study to rehabilitate

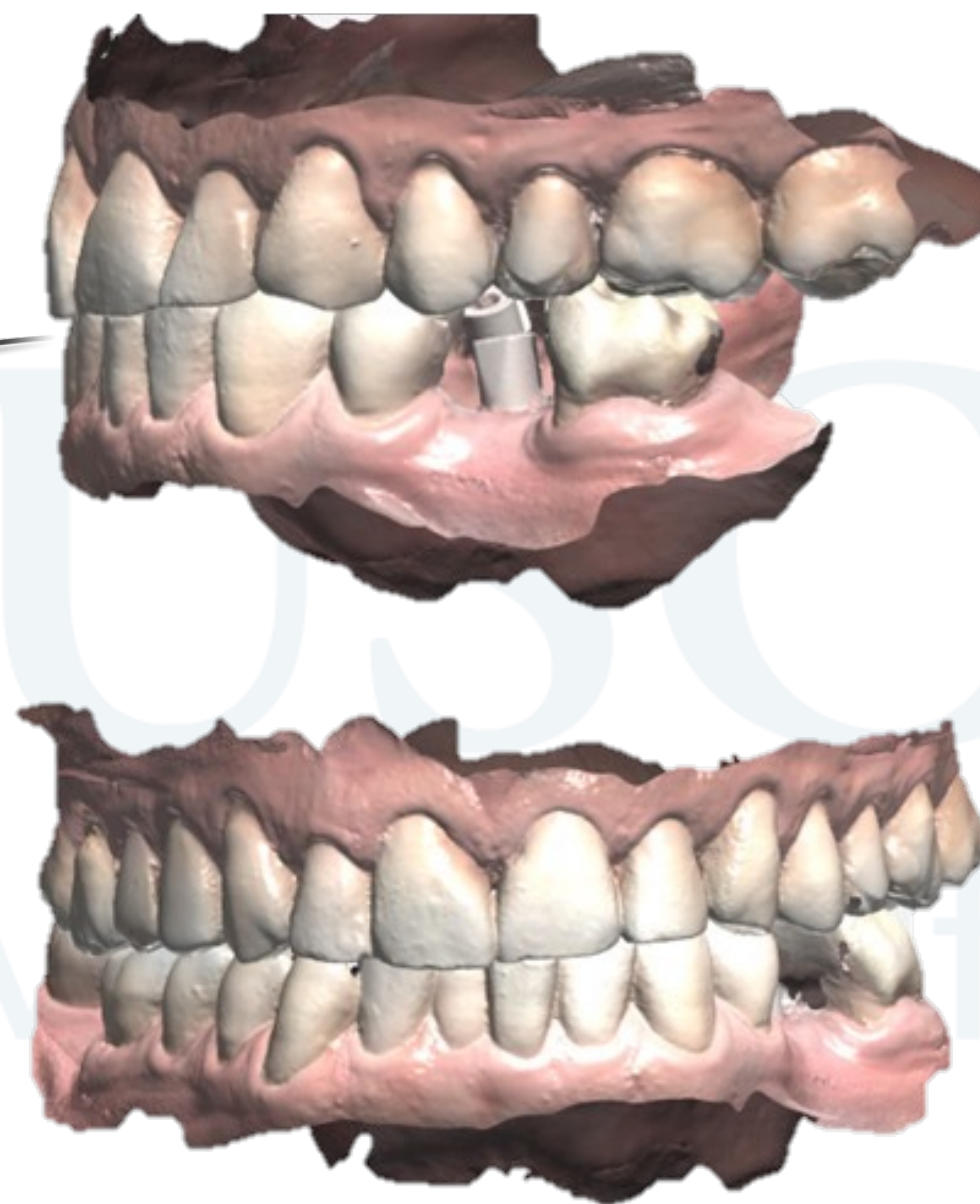
Lost to follow up =
none

Analyzed/follow-up
(n=76 crowns) for 1 year

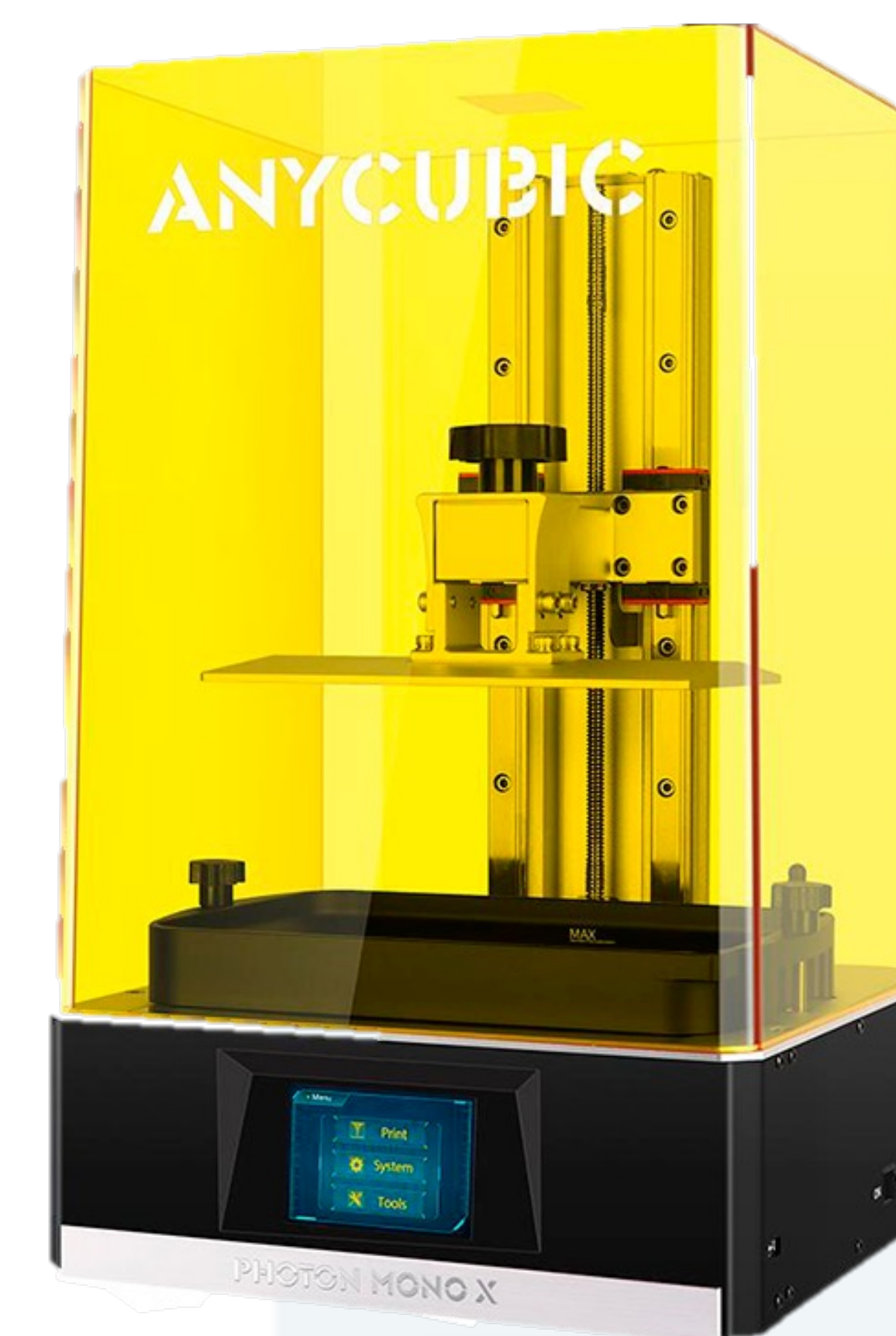
Surgery



Intraoral Scan



3D printing



Crown Delivery



	Crown Survival Rate%	Failure reason
Baseline	100% (76 crowns)	Fractures of the restoration (63 cases) Abutment screw loosening (2 cases)
6 months	24.77% (19 crowns)	
12 months	17.19% (13 crowns)	

Conclusion

Within the confines of this study, the utilization of screw-retained 3D-printed crowns exhibited a notably low rate of survival. This suggests that employing these crowns in single rehabilitations may yield suboptimal success rates. Substantial enhancements in the 3Dprinting crown fabrication process are imperative to achieve higher rates of survival and improved clinical outcomes.

References

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