Fabrication of Interim Dentures through Digital Workflow for Patients with Failing Implants

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OBJECTIVE

To outline a digital workflow for the urgent fabrication of an interim denture necessitated by failure of implant-retained fixed dental prostheses due to a lack of prosthetic planning.

INTRODUCTION

Prosthetic planning for full arch implant prostheses allows for long term success of the treatment. Assessment of restorative space is paramount to ensure the prosthetic is not subject to mechanical failures. Metal-acrylic fixed complete dentures require at least 15mm of space[4]. Appropriate placement of implants and prosthetic design allow for proper maintenance of the implants by the patient with home care.

Digital technology has been utilized to shorten complete denture workflows without compromising on fit or mechanical properties.[1] Intraoral scanners can be utilized for diagnostic impressions for edentulous patients, when followed by conventional final impressions.[2] CAD-CAM dentures are equal to or superior to conventional heat-packed dentures in trueness and retention.[3]

CLINICAL REPORT

An 80-year-old female presented with maxillary and mandibular fixed complete dentures with inadequate restorative space, suppuration, and history of failed bone regeneration. Upon removal, the maxillary prosthesis necessitated an immediate explantation, while the mandibular prosthesis revealed multiple abscesses. Interim complete dentures were needed to allow implant assessment and treatment. An intraoral scanner was used to capture pre-preparation scans of the existing prosthetics and surrounding soft tissue, and preparation scans of soft tissue with the assistance of a cheek and lip retractor. Centric relation was recorded. Trial dentures were fabricated based on scans. Trial dentures modified as needed, and used for border molding and final impressions. Impressed trial dentures were scanned and served as reference dentures for two-piece 3D-printed interim dentures, which were inserted and monitored throughout periodontal therapy.

CLINICAL REPORT

Figure 1: Pre-treatment images, with and without prosthesis

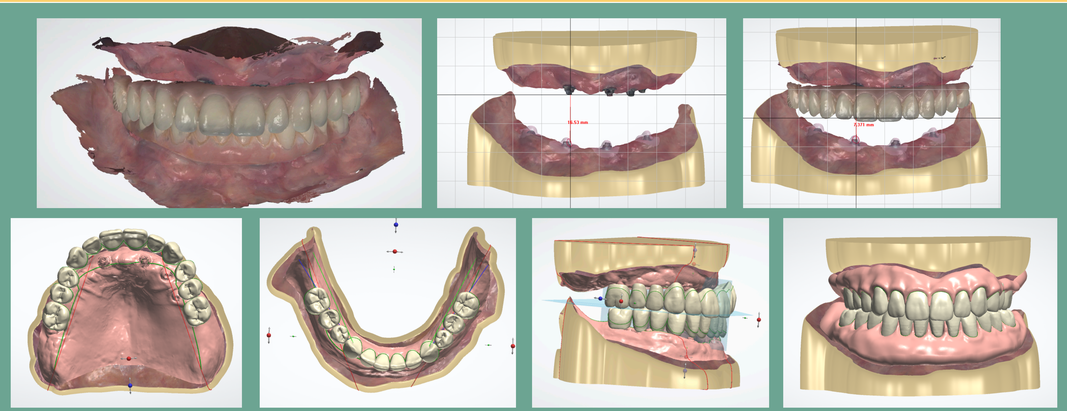

Figure 2: Digital Design of Trial Denture

Figure 3: Trial Denture, Border molding/Final Impressions, Reference Denture Scan

CLINICAL REPORT

Figure 4: Insertion of two-piece interim denture

CONCLUSIONS

The digital workflow enabled the creation of a 3D-printed interim prosthesis across three appointments—diagnostics, try-in, and insertion— reducing chair time and the number of visits required. Digital workflows expedite the fabrication of interim dentures, providing an efficient solution for managing complex scenarios with failing implants and insufficient prosthetic planning.

REFERENCES

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