



Digital Hybrid Technique for Immediate Complete Denture Fabrication: A Case Report

Amr K. Farrag, Graduate Prosthodontics Resident, Faculty of Dentistry, University of British Columbia, Vancouver (BC), Canada

Anthony McCullagh, Clinical Professor, Department of Oral Health Sciences, Faculty of Dentistry, University of British Columbia, Vancouver (BC), Canada

Chris Wyatt, Professor and Director, Graduate Prosthodontics, Department of Oral Health Sciences, Faculty of Dentistry, University of British Columbia, Vancouver (BC), Canada

Mohamed Gebril, Assistant Professor, Department of Oral Health Sciences, Faculty of Dentistry, University of British Columbia, Vancouver (BC), Canada

Objectives

Introducing a hybrid digital work-flow in the process of fabrication of immediate complete denture prosthesis.

Case History / Technical Steps

Upon detailed clinical and radiographic examination of a 71 years old patient, the case was diagnosed as maxillary and mandibular partially edentulous (ACP classification of partial edentulism – class IV) as well as periodontally compromised remaining maxillary dentition with hopeless prognosis. Different treatment options were discussed including conventional complete dentures and implant rehabilitation options (Fixed & Removable), however the patient decided to proceed with the immediate maxillary complete denture.

An initial intraoral scan was conducted to capture the remaining teeth and denture bearing area in the maxillary arch, as well as the mandibular arch and the bite scan. Additionally a scan of the maxillary denture was also captured and subsequently aligned virtually with the maxillary arch scan. The generated standard tessellation language (STL) file format was utilized for the design and the fabrication of modified 3D printed prototype. The prototype was fabricated with the slight changes to the teeth set-up, and no alteration to the occlusal vertical dimension (OVD). Using the modified maxillary prototype denture, verification of the OVD, phonetics and esthetics was performed. Thereafter, a polyvinyl siloxane (PVS) wash impression was recorded to properly capture the vestibular depth and denture border extension. Based on the approved modified prototype, a milled maxillary immediate denture was fabricated after virtually surgerizing the remaining maxillary dentition. The remaining maxillary teeth were extracted and the immediate maxillary denture was inserted. Retention, support and stability were verified. Phonetic and esthetics outcomes were established and approved.

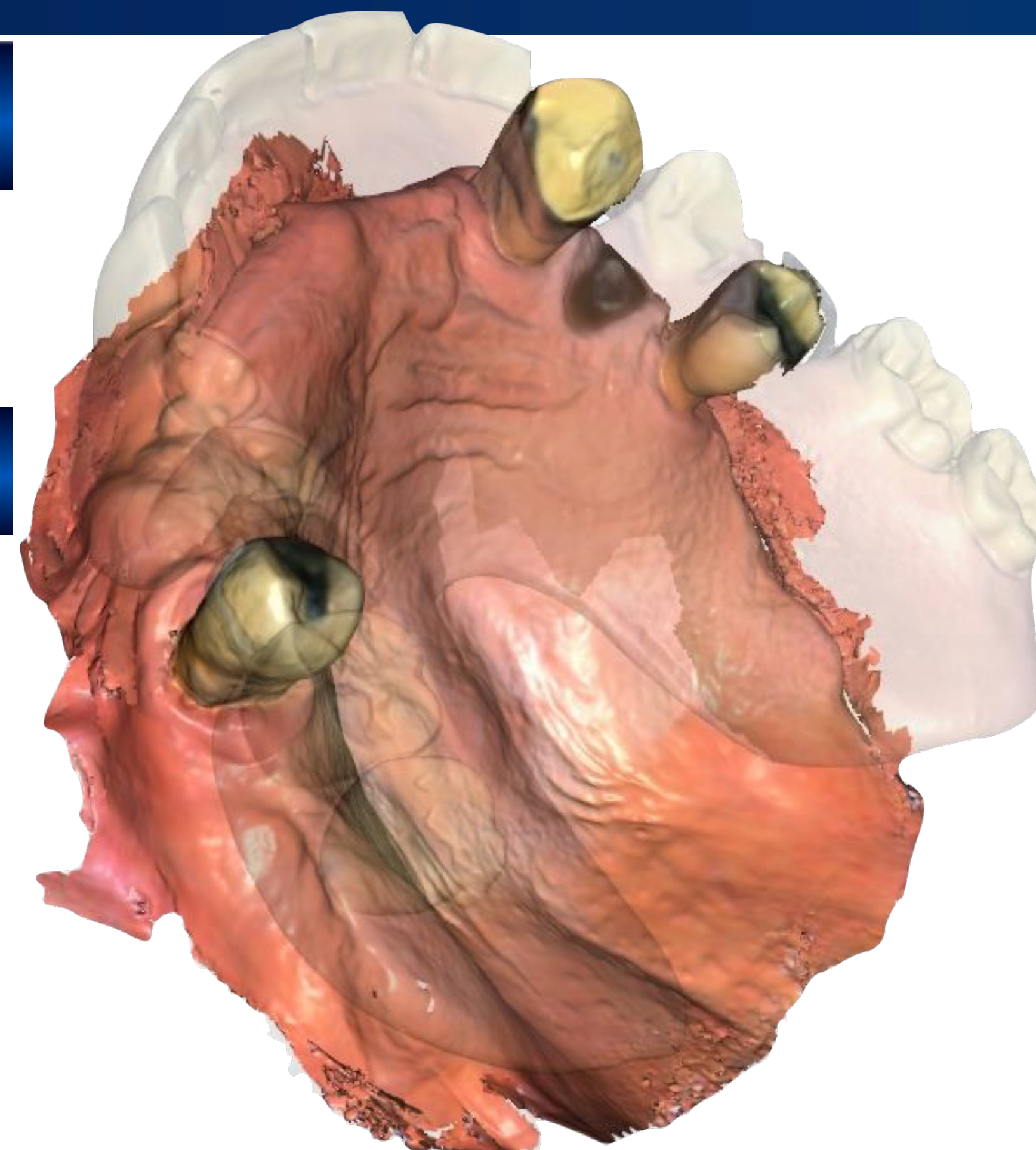


Figure (1) Maxillary arch remaining dentition and denture bearing area

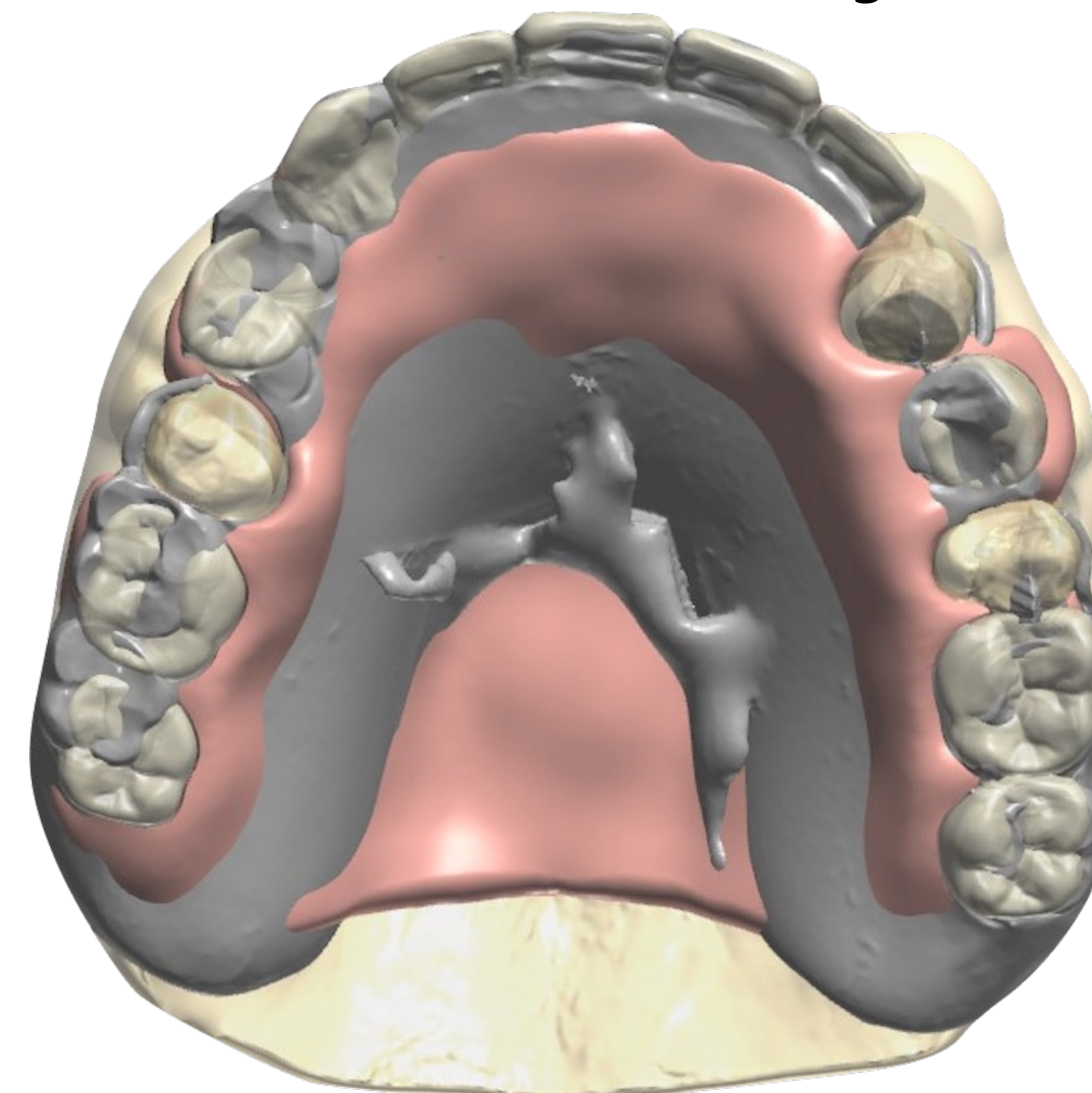


Figure (3) Virtual surgical alignment and virtual surgerizing of the teeth for the design of the immediate denture



Figure (2) The modified maxillary prototype denture was used to verify the vertical dimension of occlusion, the teeth shape, size and color, the denture border extension and denture fit.



Figure (5) Final immediate denture

Discussion / Summary

The immediate maxillary complete denture was delivered. The maxillary denture was showing acceptable signs of retention, support and stability. Chairside adjustments were minimal. The patient was pleased with the final results. The presented technique is very promising and can be applied in the digital work-flow of both conventional and immediate complete denture fabrication.

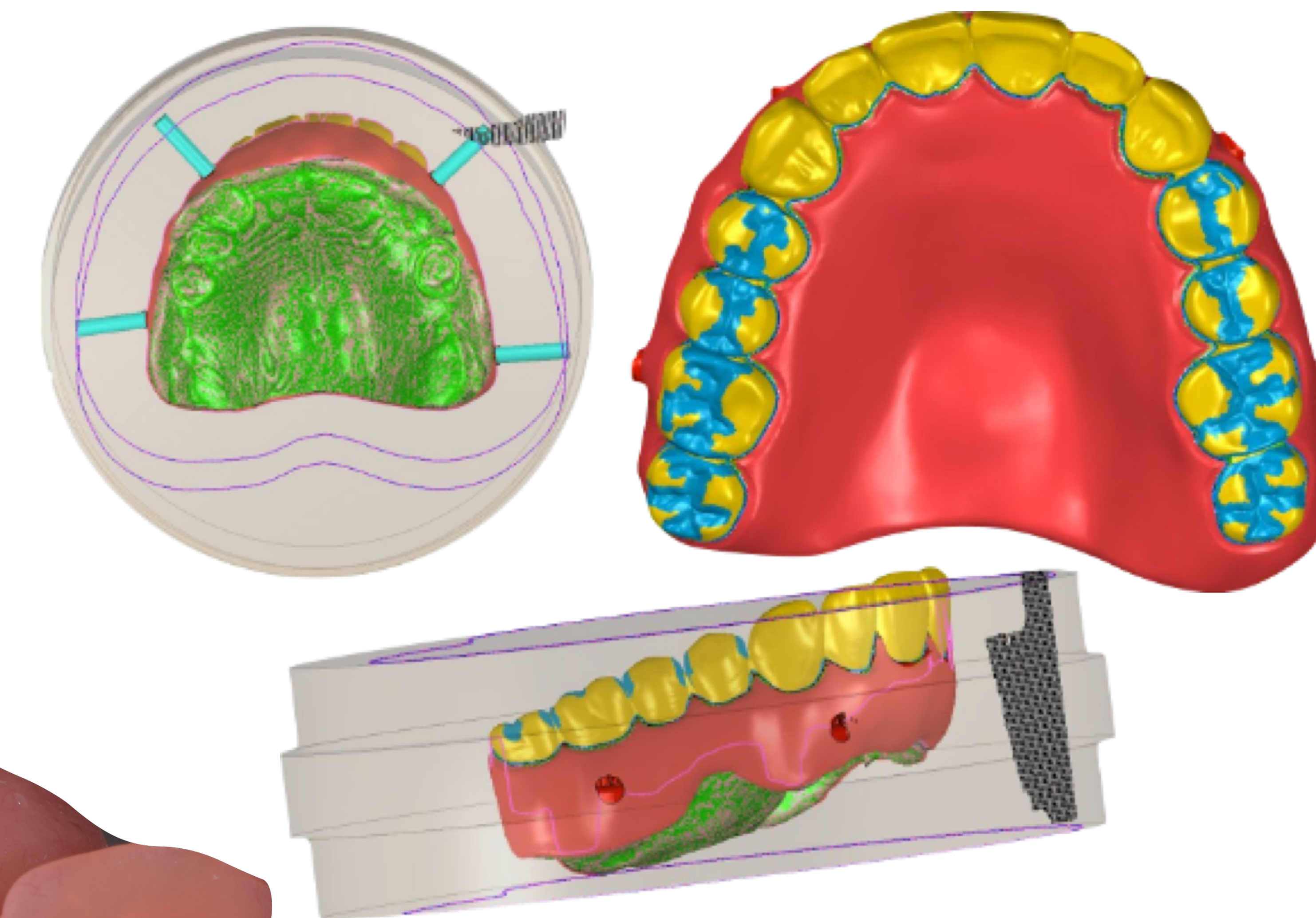


Figure (4) The milling design for the immediate maxillary complete denture