

A CAD/CAM Approach to Treatment of an Edentulous Patient with Microstomia

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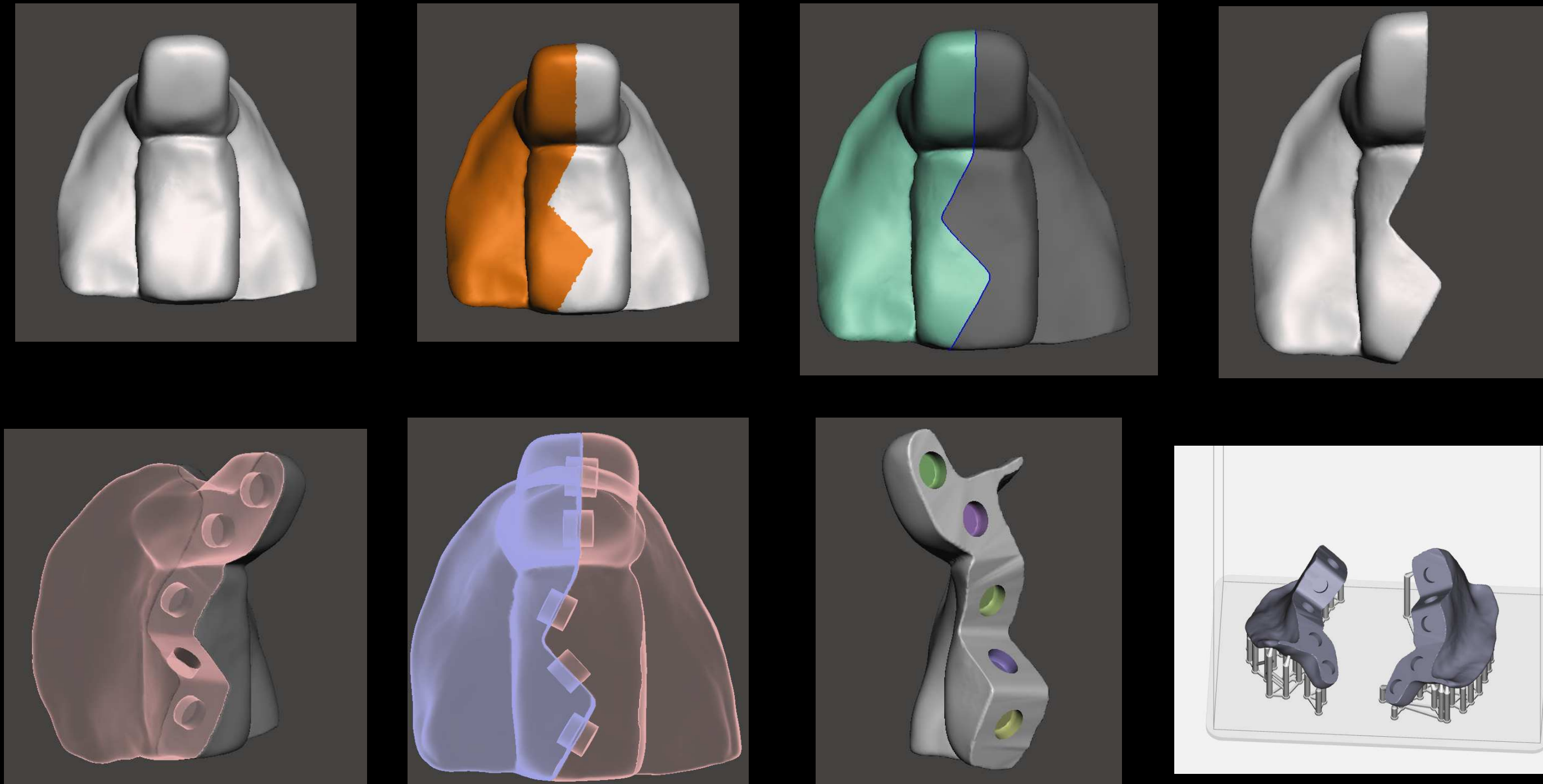
Introduction

Microstomia is the term used to describe a reduction in the size of the oral aperture that is severe enough to compromise quality of life, nutrition, and cosmesis. Most cases are acquired from trauma, or accidental electric, thermal, or chemical burns (NIH). Being edentulous for years without any prosthesis, this patient suffers from microstomia. An adult stock tray could not be inserted into patients oral cavity, neither the intraoral scanner head. The objective was to digitally fabricate a custom tray that would accomplish the goal of making an accurate final impression for a patient that presents with microstomia.

Case Report

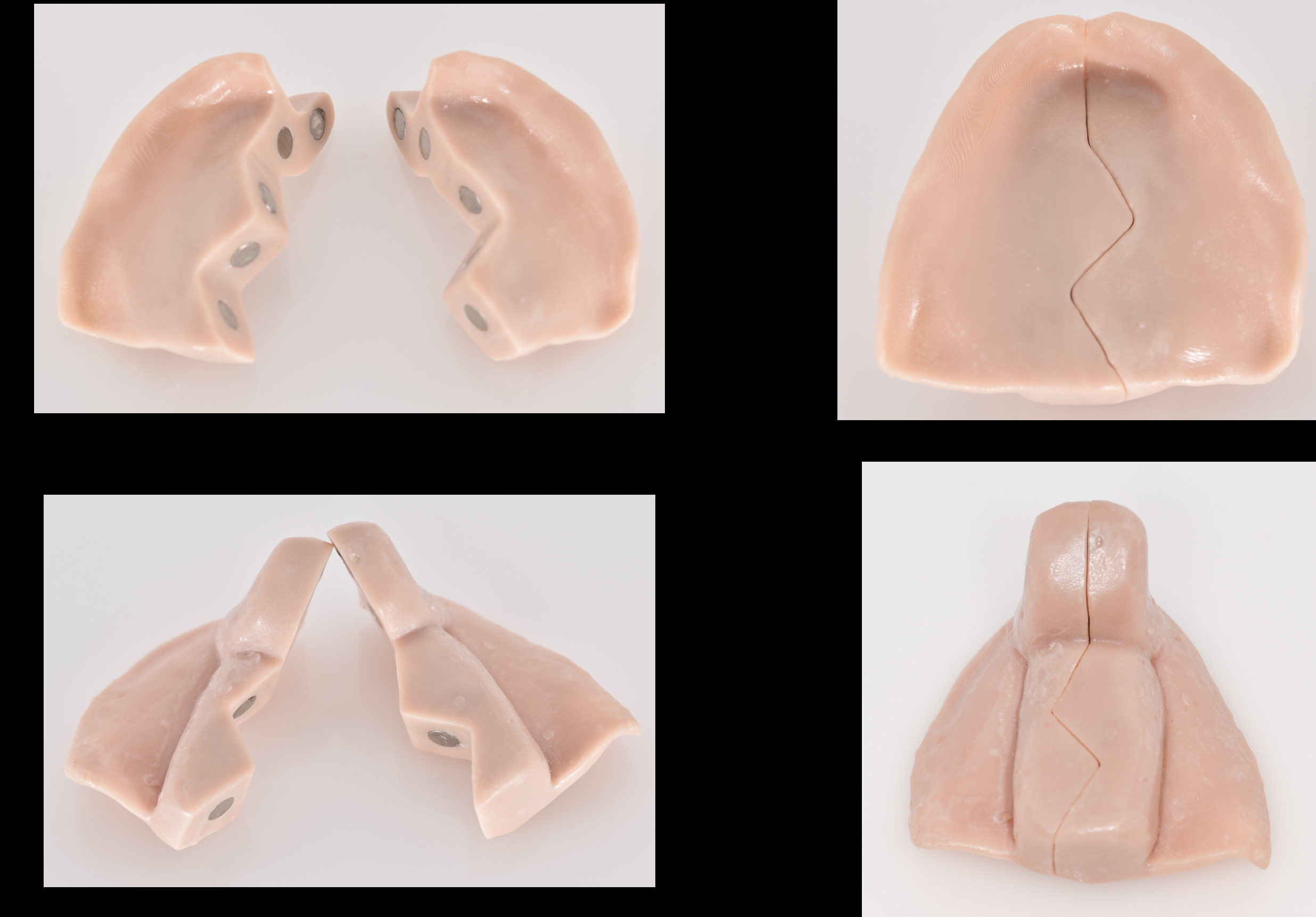
A preliminary impression was taken using alginate in the smallest pediatric stock tray and poured in stone. The stone model was then scanned with the E4D desktop scanner. Using the digital software program MeshMixer, a sectional impression tray was designed and fabricated in two pieces. Magnets were incorporated on adjoining surfaces in order to allow insertion of the tray for a more accurate final impression. The sectional trays were border molded with green stick compound independently. An accurate final impression was captured in PVS with a patient who presents with microstomia using a digitally fabricated sectional impression tray.

CAD



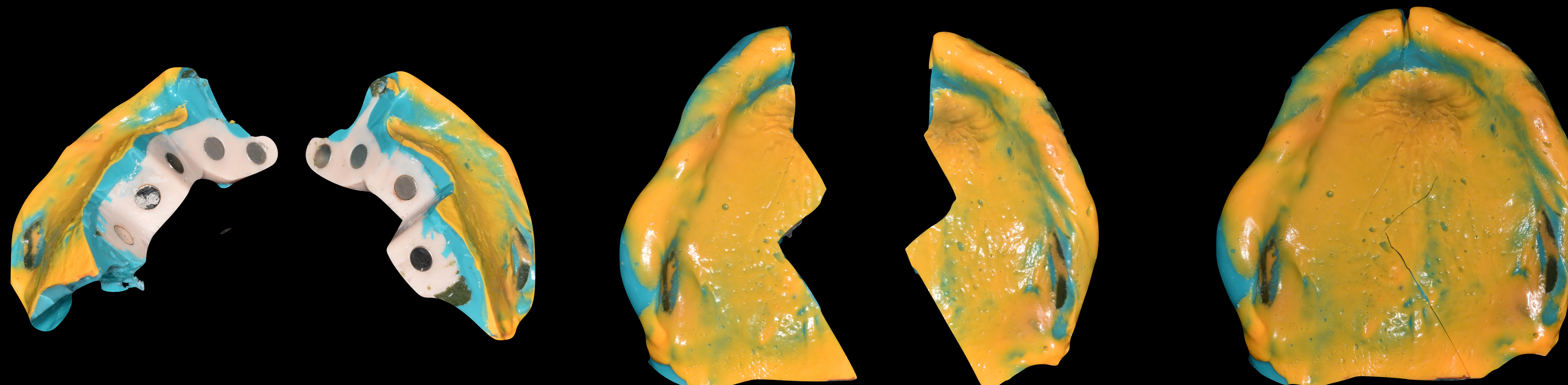
Meshmixer software was utilized to design a sectional impression with slots to incorporate the magnets for assembly

CAM



Sprintray printer was used to print custom trays. Magnets were assembled into custom trays to gain retention

Sectional Final impression



Sectional impression trays were border molded and impressed independently. Careful trimming at finish line of sectional impression tray was done to accomplish a smooth, continuous border.

Discussion

Previous techniques for making sectional impressions have been described as using interlocking custom trays with different impression materials (Given, Auclair). Other methods described in the past have been the button technique, with snaps together following the making of sectional impressions (Patel et al). With the utilization of dental CAD software and magnets, a novel approach to the sectional impression technique was created.

In the field of Prosthodontics, thinking and creating new workflows is extremely important to the profession. Patients constantly present with problems that need to be solved in order to give the best care possible. Digital workflows continue to evolve in dentistry. With the use of digital software, an accurate impression was able to be made. This technique can be utilized to provide accurate intraoral impressions for the microstomia patient as well as other patients with restricted mouth opening, such as patients post radiation therapy and trismus.

References

Given, D.A., AuClair, W.A., Seidenfaden, CDT, J.C. and Paiva, J. (2010). Sectional Impressions and Simplified Folding Complete Denture for Severe Microstomia. Journal of Prosthodontics, 19: 299-302. <https://doi.org/10.1111/j.1532-849X.2009.00564.x>

Patel A, Sethuraman R, Prajapati P, Patel JR. Microstomia: entry made easy in no entry (with sectional tray and sectional denture). BMJ Case Rep. 2013 Jul 9;2013:bcr2013200053. doi: 10.1136/bcr-2013-200053. PMID: 23843416; PMCID: PMC3736418.