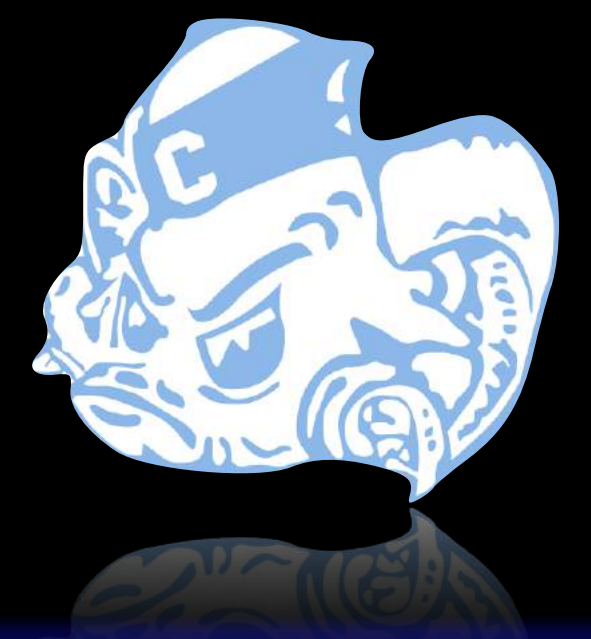


"Complete Digital Workflow In Fabricating A Maxillary Natural Tooth Overdenture: A Case Report For A Patient With History Of Rhabdomyosarcoma"

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Introduction

Patients with facial asymmetry due to stunted growth and development can be challenge to rehabilitate. To restore a complex partially edentulous patient with history of multiple prior treatments for Rhabdomyosarcoma a novel complete digital workflow was utilized as the treatment of choice.

Case Report

CD is a 27-year-old who presented to UNC Graduate Prosthodontics (Chapel Hill, NC) with a history of Rhabdomyosarcoma and wearing complete denture since age 6. The patient's ill-fitting existing prosthesis was scanned chair-side with an IOS (Trios 3) to print a custom tray for border-molding and final impression with VPS impression material (Fig.1).

A monoblock try-in was 3D printed (Carbon) after completing tooth design using a virtual planning software (3Shape) in addition to extra-oral photos (retracted with border-molded/washed prosthesis in place) for facial references (Fig 2.). The prosthesis was utilized for intraoral adjustments to occlusal plane, incisal edge, midline, etc. The adjusted try-in was scanned using a desktop scanner (E4) and merged in 3Shape for a second set up for a final try-in (Fig.5).

Upon verification of changes clinically and patients' acceptance of the changes, a definitive design was completed to manufacture the maxillary prosthesis by additive and subtractive manufacturing the denture base and teeth (Fig. 6). The base was printed with Lucitone Resin and teeth were milled from PMMA blocks (Telio CAD).

Following sandblasting (AlO₂ 50 µm) and surface characterization, the teeth were roughened with high-speed burs and luted/cured to the base according to manufacturer's guidelines. Using stains and glaze (GC Optiglaze) the prosthesis was characterized to mimic the patient's opposing dentition.

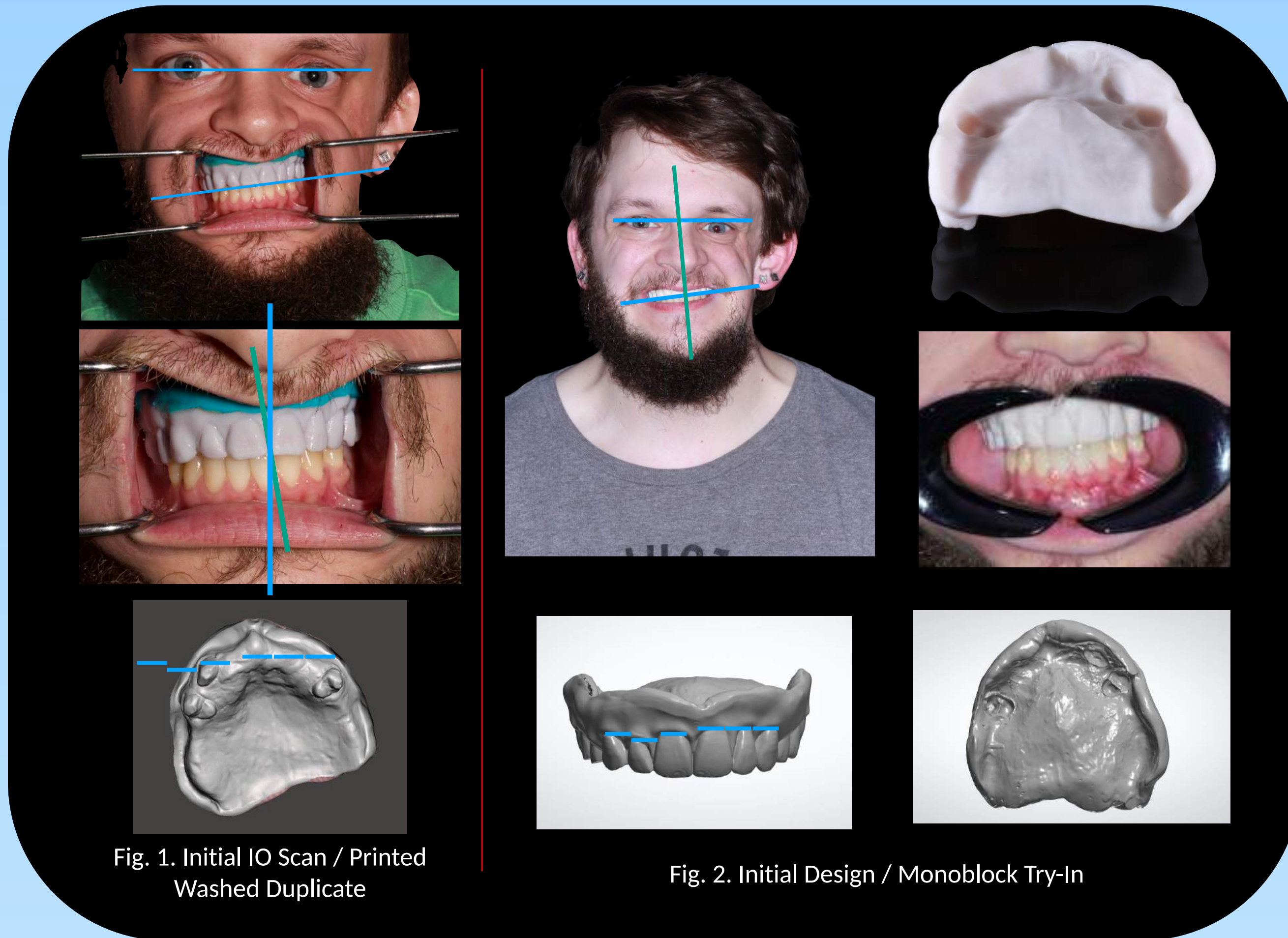


Fig. 1. Initial IO Scan / Printed Washed Duplicate

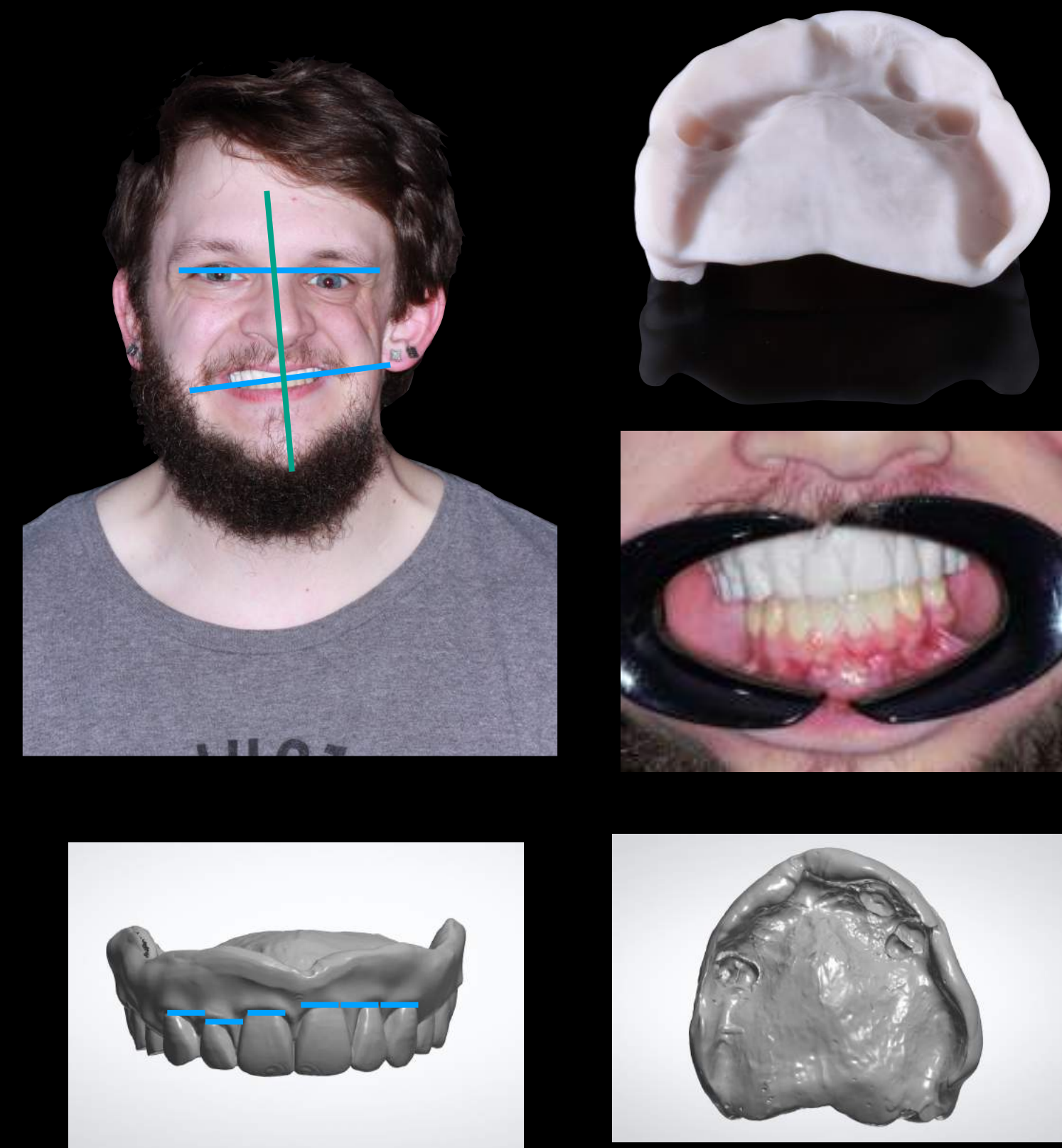


Fig. 2. Initial Design / Monoblock Try-In

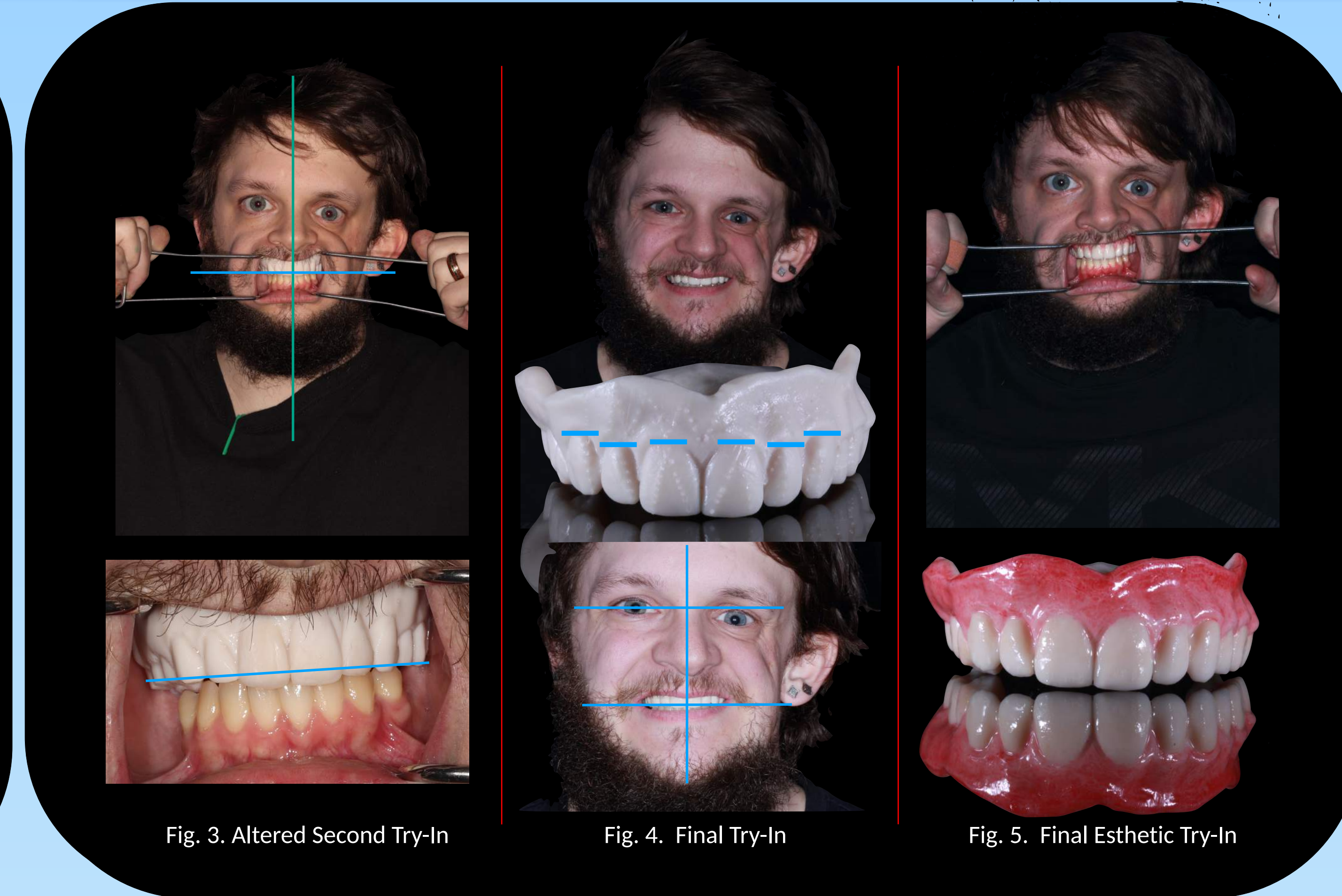


Fig. 3. Altered Second Try-In

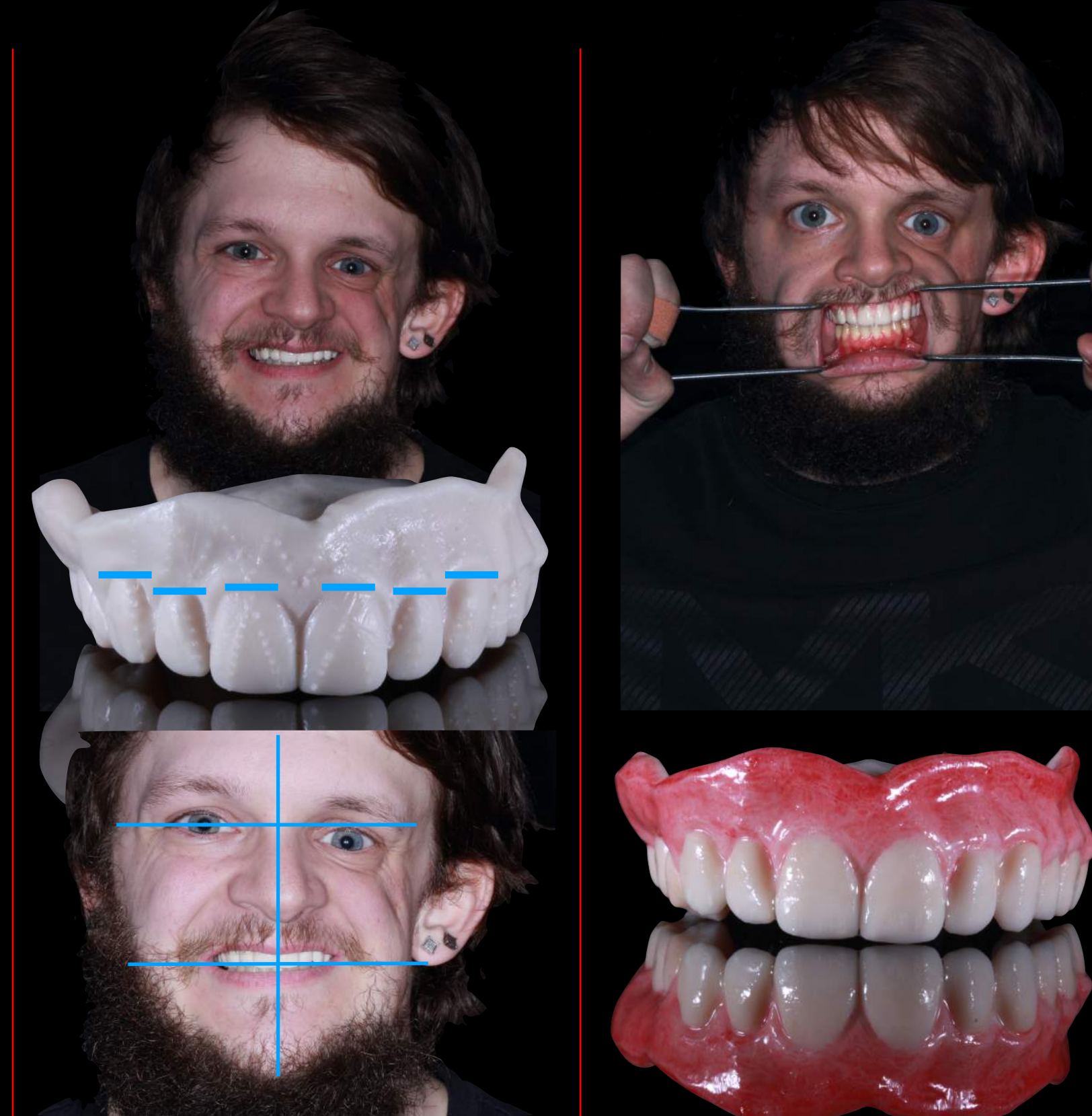


Fig. 4. Final Try-In

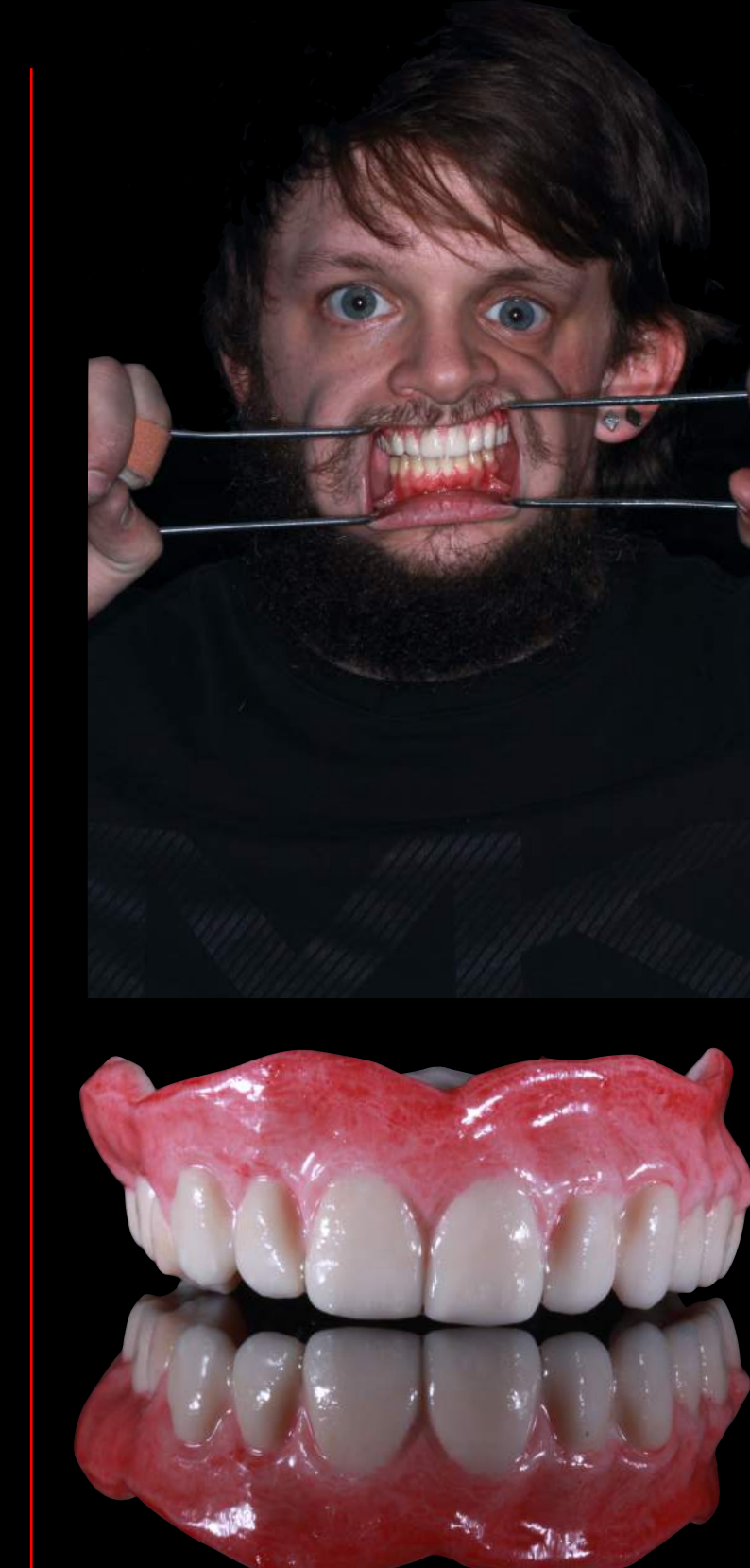
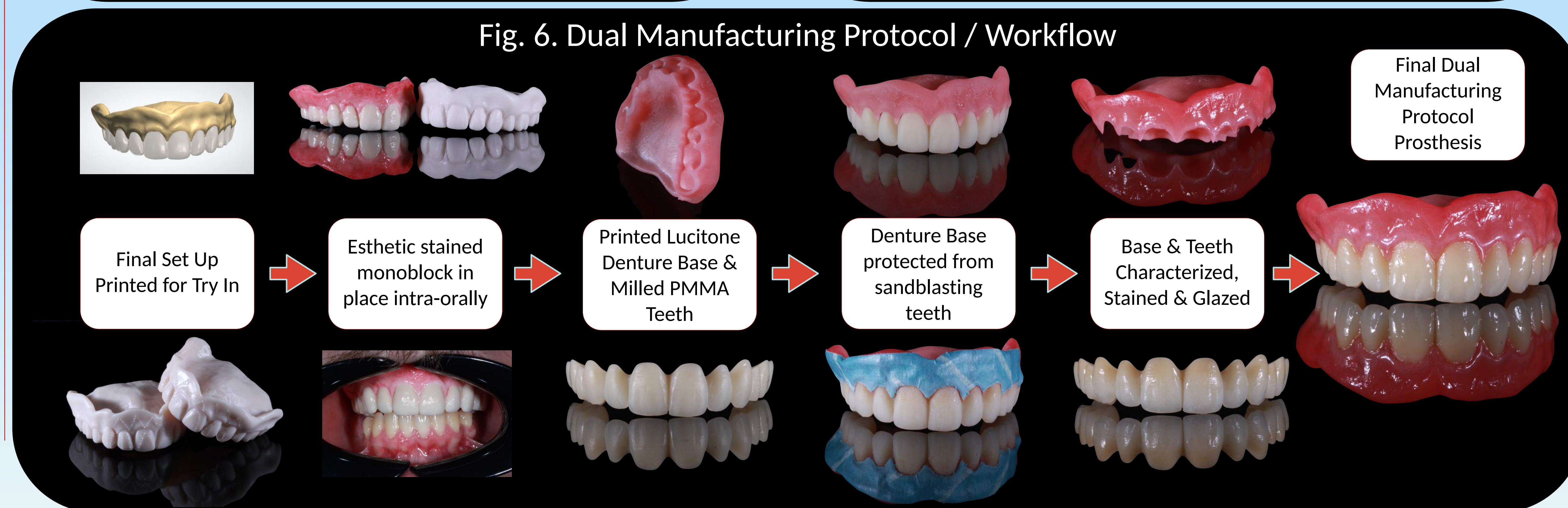


Fig. 5. Final Esthetic Try-In

Fig. 6. Dual Manufacturing Protocol / Workflow



Discussion

The use of CAD/CAM technology to fabricate overdentures has positive benefits, such as elimination of the polymerization shrinkage and reducing the cost of care and time for our patients. Our fully digital workflow shows how these challenging cases could be approached and appropriate results achieved.

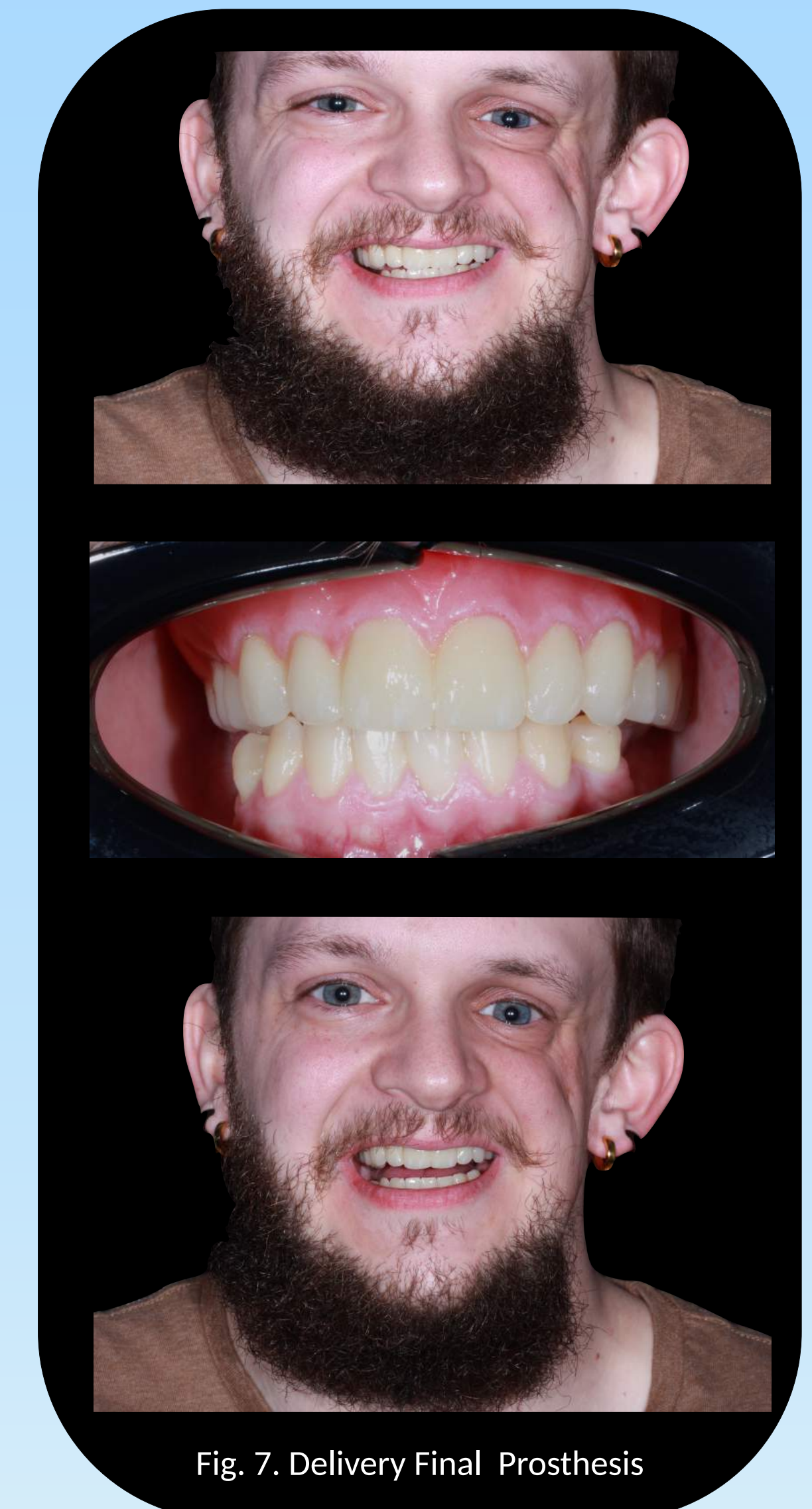


Fig. 7. Delivery Final Prosthesis

References:

1. Millet et. al. 2020 CAD-CAM immediate to definitive complete denture transition: A digital dental technique. The Journal of Prosthetic Dentistry
2. Lo Russo, Lucio; Salamini, Angelo; Troiano, Giuseppe; Guida, Laura (2020). Digital dentures: A protocol based on intraoral scans. The Journal of Prosthetic Dentistry