

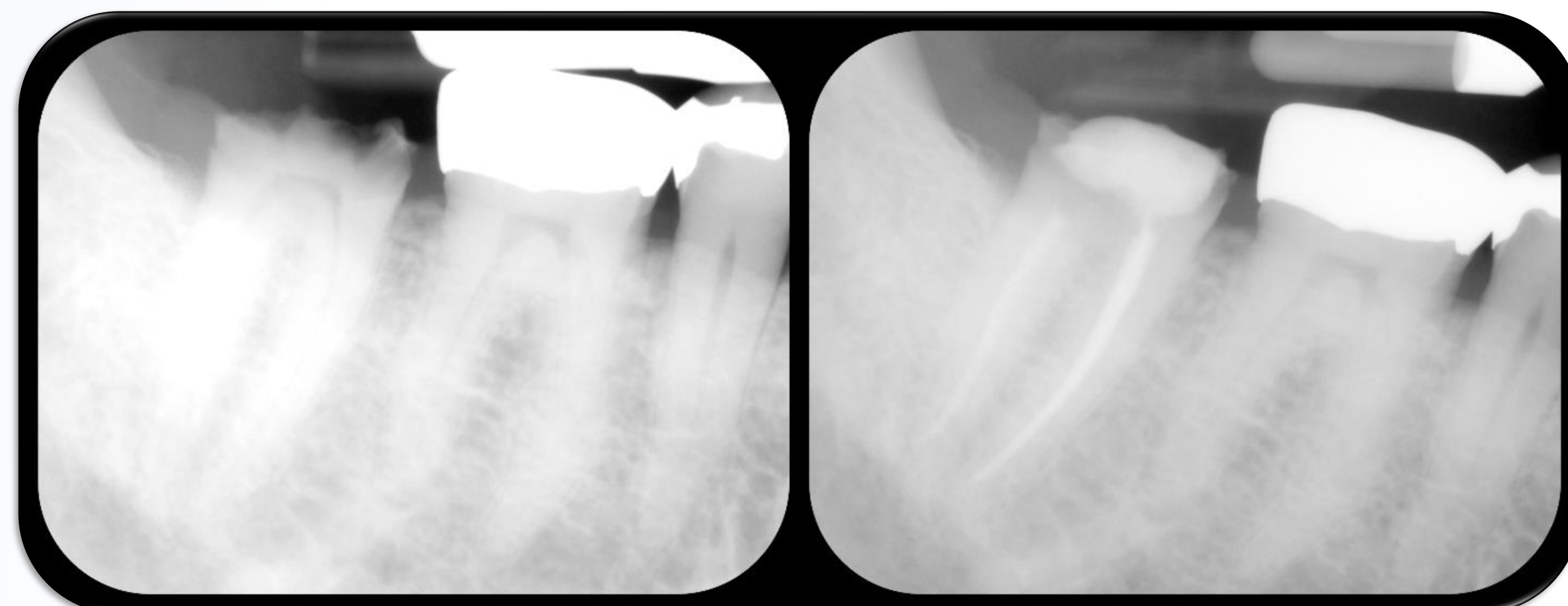
INTRODUCTION

The restoration of severely compromised teeth presents a formidable challenge, particularly when it comes to establishing a suitable matrix for core materials. The utilization of a custom-designed provisional crown as a matrix for core buildup emerges as a valuable strategy, offering the dual benefits of preserving the structural integrity of compromised roots and the remaining coronal structure. Historically, various methodologies have been devised to address this challenge, both direct and indirect method, for the fabrication of custom provisional crowns as matrices¹⁻⁴. In contemporary restorative dentistry, significant progress has been made in the development of materials and techniques aimed at preserving and restoring the structural soundness of compromised teeth. Research indicates that Computer-Aided Design/Computer-Aided Manufacturing (CAD/CAM) fabricated provisional crowns exhibit superior fit and strength when compared to their directly fabricated counterparts⁵.

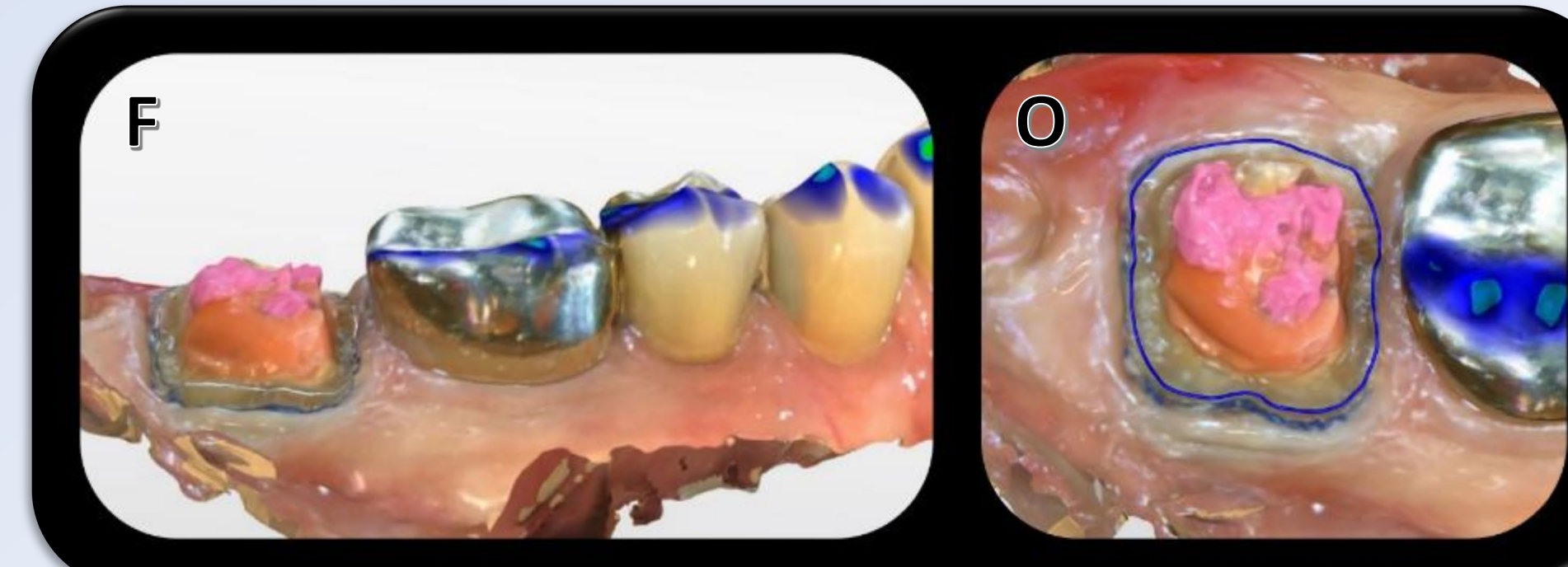
The primary objective of this poster presentation is to introduce a novel dental approach that leverages CAD/CAM technology in conjunction with provisional crown matrix techniques to enhance core buildup procedures. This technique is designed to efficiently restore severely compromised teeth while ensuring precision and predictability in the restoration process.

PATIENT PRESENTATION

The patient presented with severely compromised tooth #31. Patient wish to save the tooth so endodontic treatment rendered to utilize pulp canals and chamber to retain core. Radiographic appearance of tooth #31 following endodontic therapy below:

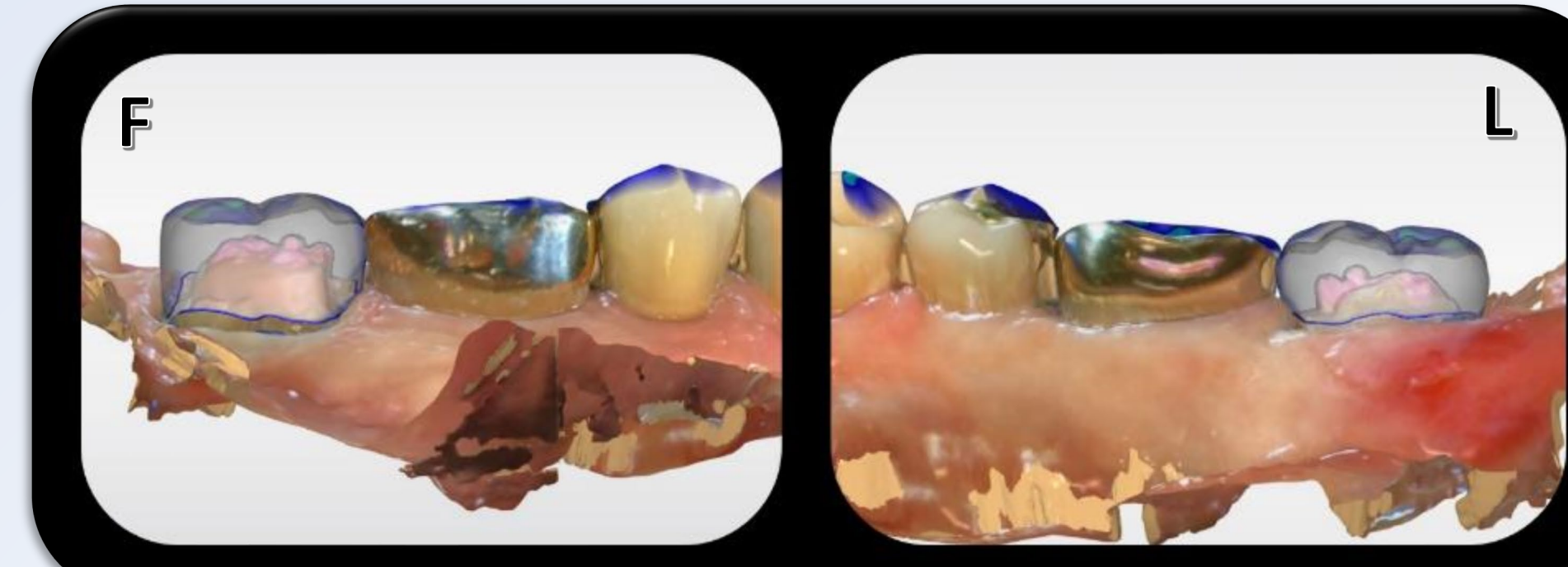


CLINICAL TECHNIQUE



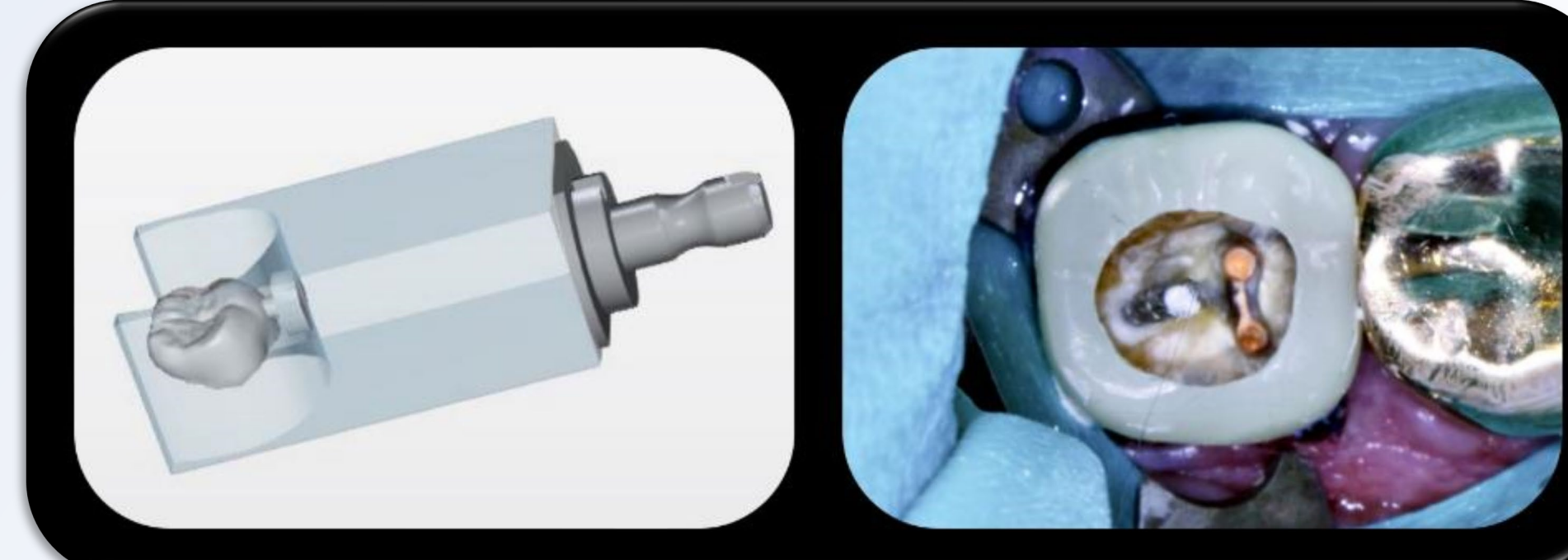
Step 1. Tooth Preparation

Tooth preparation with a well-defined margin for indexing the matrix.



Step 2. Intraoral Scanning

Intraoral scan to capture detailed digital impression of the prepared tooth.



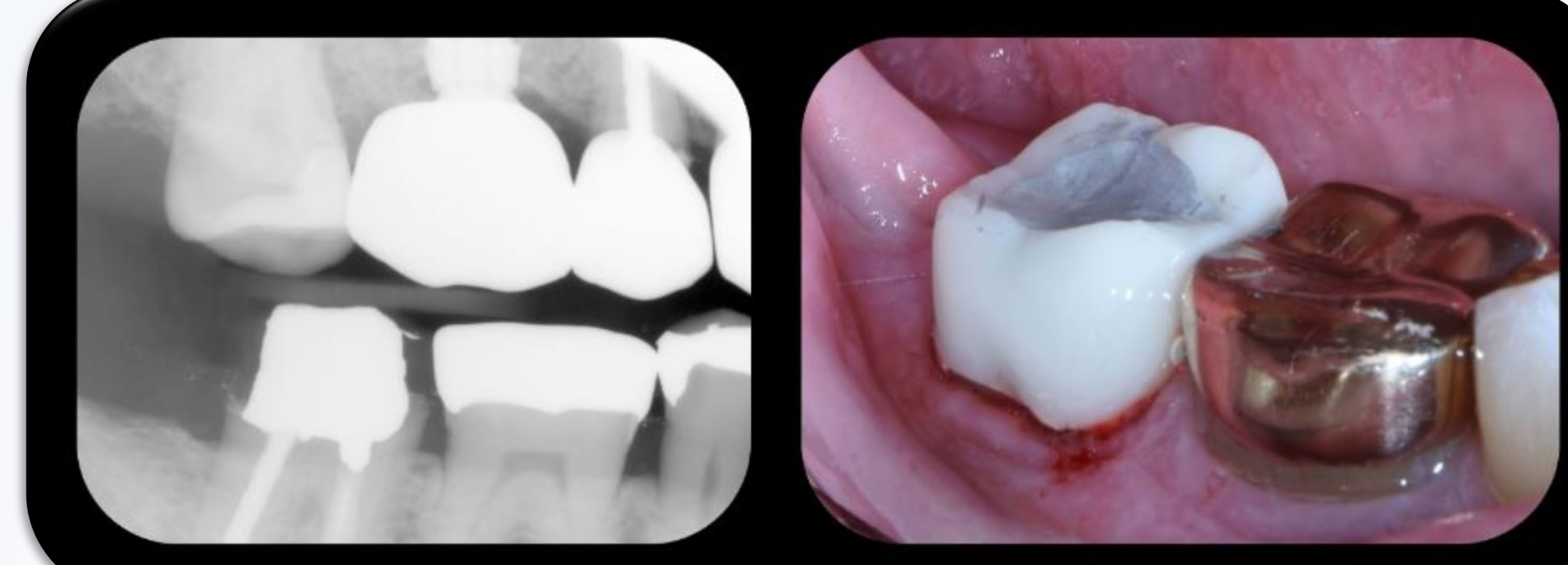
Step 3. CAD Design

Utilize CAD software to create a provisional crown with correct anatomical contours to serve as a template for the final core fabrication.



Step 4. Milling Interim

CAM of interim crown from a biocompatible material.



Step 5. Occlusal Access

Establish occlusal access point through which the core material is placed.



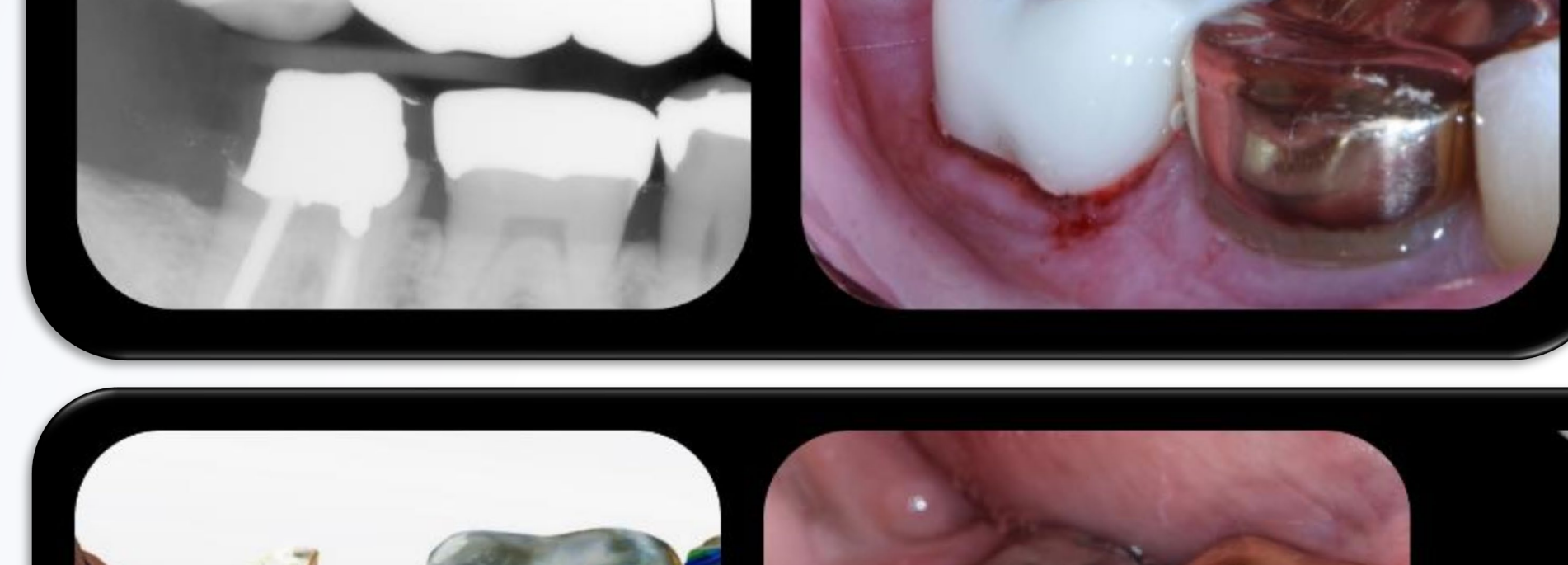
Step 6. Luting of Interim

Luting of interim crown to tooth preparation using a suitable luting agent.



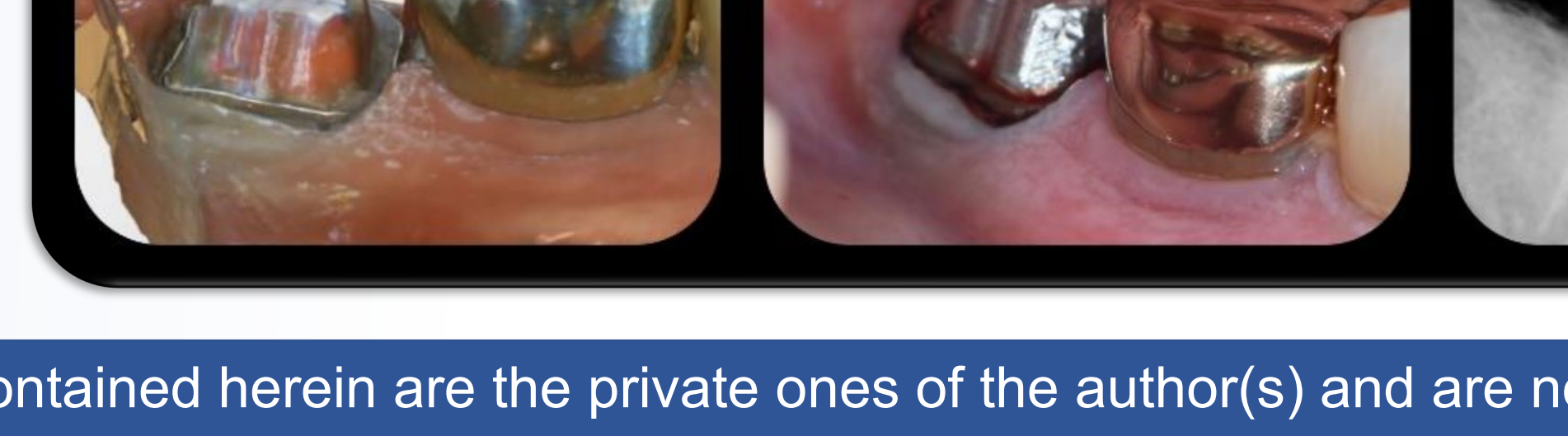
Step 7. Core Buildup

Placement of amalgam or other suitable restorative material that are layered into the pulp chamber.

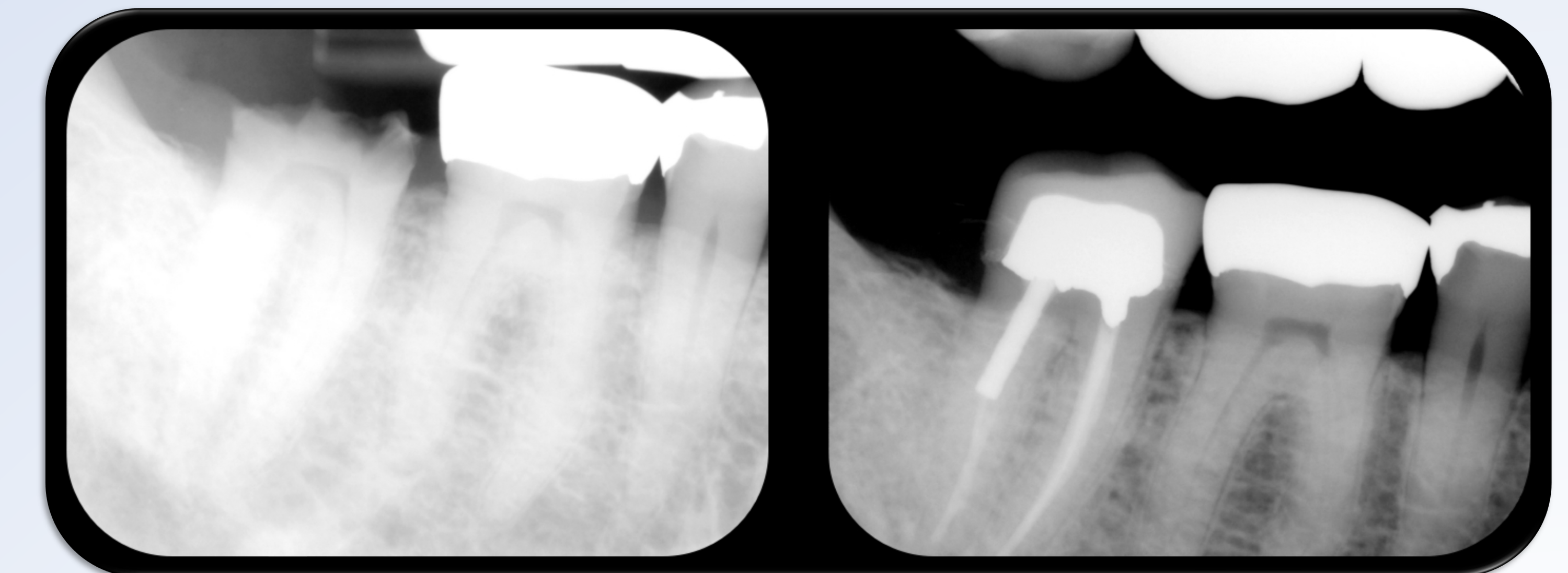


Step 8. Definitive Crown

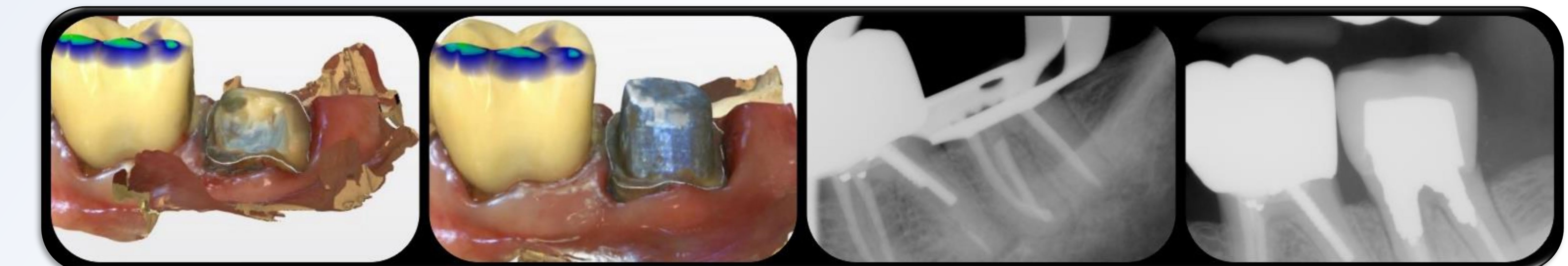
Gently remove and/or prepare through interim crown for the final restoration procedure.



RESULT



The permanent fixed crown for tooth #31 was successfully fabricated and inserted with ideal contours and solid core with optimal retention and resistance forms. Below is another illustrative example showcasing before and after images of a case where this technique was utilized to fabricate the core for restoring severely compromised tooth #18.



CONCLUSION

In these case series reports, our streamlined CAD/CAM provisional crown-based core buildup technique presented an innovative and efficient solution for restoring severely compromised teeth. This technique harnesses digital technology for provisional crown design and fabrication to achieve an optimal and predictable clinical result when it is difficult to place a matrix band.

References

1. Bonilla ED, Anderkvist T, Miller GD. A customized acrylic resin shell for fabricating an amalgam core on the coronally debilitated, endodontically treated posterior tooth. *Quintessence Int.* 1995;26(5):317-324.
2. Bonilla ED. Fabrication of an amalgam core using a customized acrylic resin shell. *Quintessence Int.* 1998;29(3):143-149.
3. Smidt A, Venezia E. Techniques for immediate core buildup of endodontically treated teeth. *Quintessence Int.* 2003;34(4):258-268.
4. Echeto LF, Nimmo A. Using a posterior provisional crown as a matrix for an amalgam foundation. *J Prosthet Dent.* 2010;104(1):56-59.
5. Abdullah AO, Tsiou EA, Pollington S. Comparative in vitro evaluation of CAD/CAM vs conventional provisional crowns. *J Appl Oral Sci.* 2016;24(3):258-263.