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Custom Alveolar Ridge Splitting (CARS) Technique as a Predictable Horizontal Ridge Augmentation in the Atrophic Anterior Maxilla - A Case Series

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INTRODUCTION

For a long-term survival and success rates of implant supported restorations, implants should be placed with at least 2 mm of surrounding bone in a three-dimension. Implants are placed in the anterior maxilla to restore esthetics as well as function, which can be challenge due to high patient's expectations and if there is hard and soft tissue deficiency. According to the literature, there are

several techniques to perform bone augmentation prior or simultaneous with implant placement, however, all of them has their own complications and limitations. Moreover, bone regeneration was shown to be more predictable and successful in intra-osseous defects than extra-osseous defects because it is a well contained defect with good blood and osteoblast supply.

PURPOSE

The purpose of this case series is to present a new step-by-step surgical procedure known as the Custom Alveolar Ridge Splitting (CARS) technique for maxillary anterior severely atrophic ridges and discuss the advantages and limitations of this technique.

MATERIALS & METHODS

Clinical data in this study was obtained from the Implant Database (ID) at New York University College of Dentistry (NYUCD). This data set was extracted as de-identified information from the routine treatment of patients at the Ashman Department of Periodontology and Implant Dentistry at New York University College of Dentistry. The ID was certified by the Office of Quality Assurance at New York University College of Dentistry. This study is in compliance with the Health Insurance Portability and Accountability Act (HIPAA) requirements.

In the present study, sixteen consecutive cases were selected in patients who desired dental implants with a fixed prosthesis to replace their missing teeth in the anterior maxillary arch and had implants placed with the CARS procedure. Eleven females and five males with age range from twenty-two to sixty-five years old (mean age: forty-five years old) were included. All sixteen cases were effectively treated with successful implant placement. Follow up times were recorded for each of the implants placed.



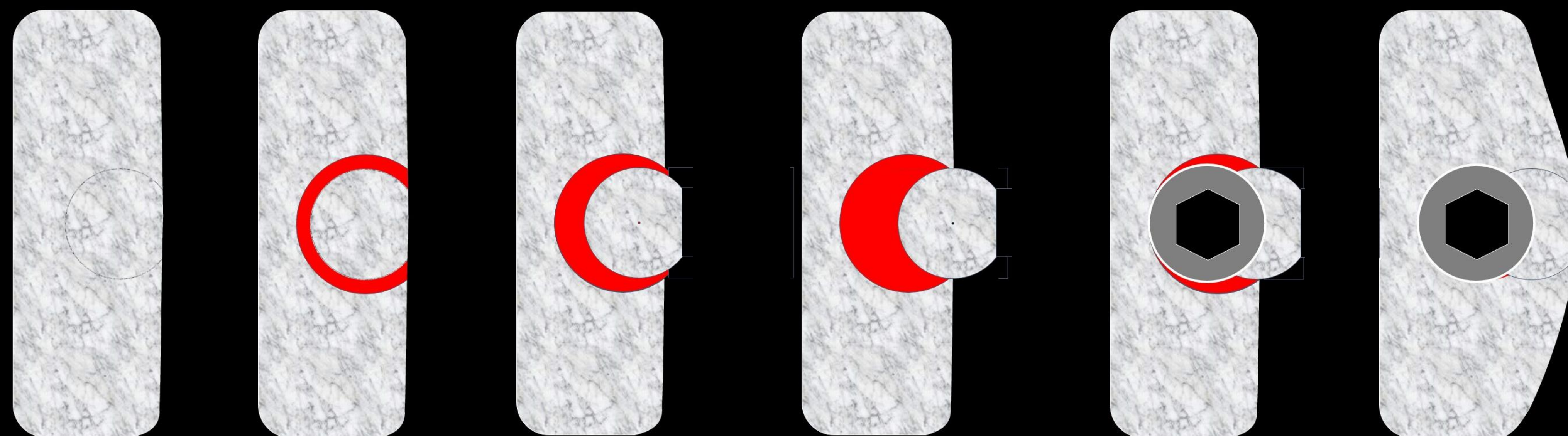
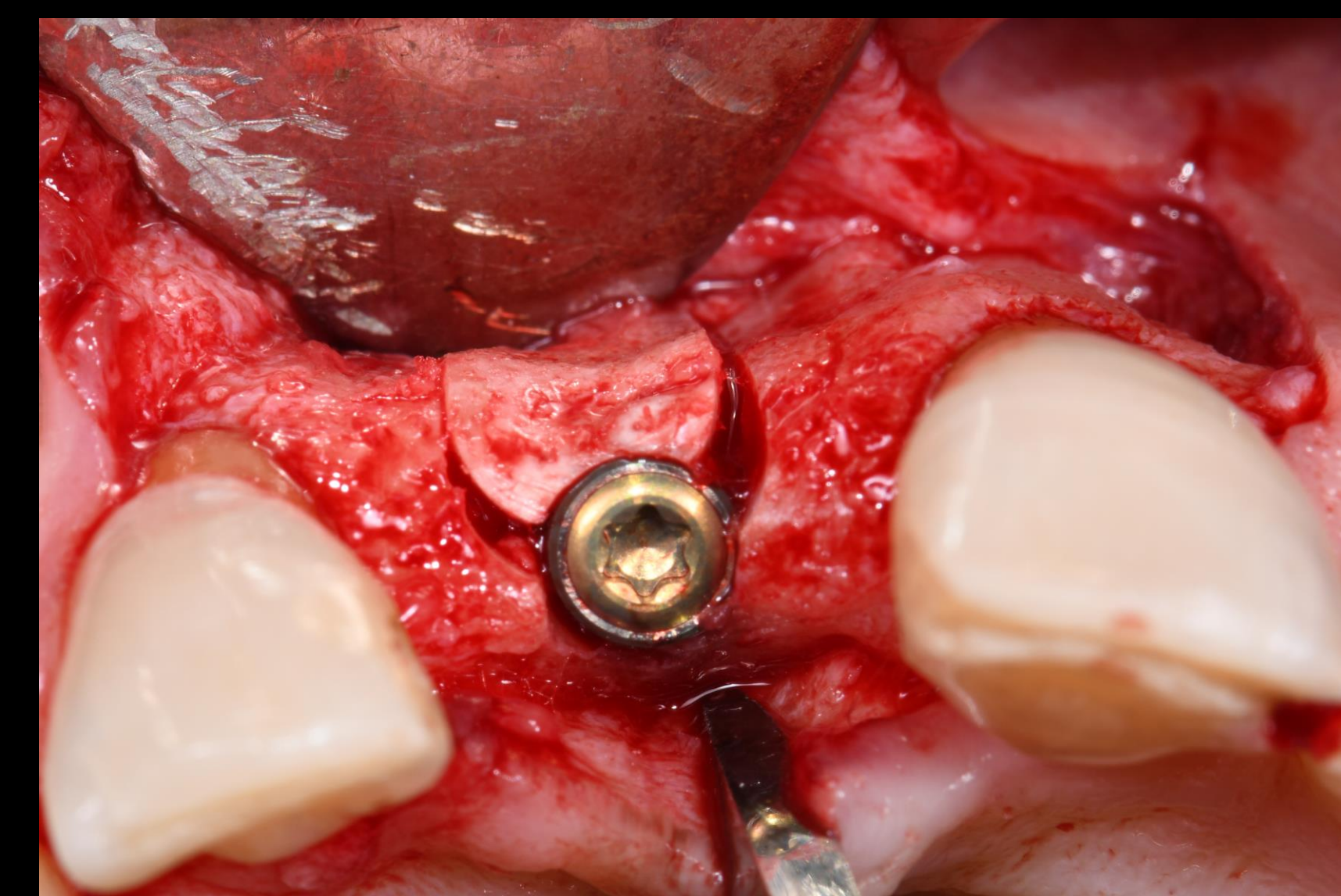
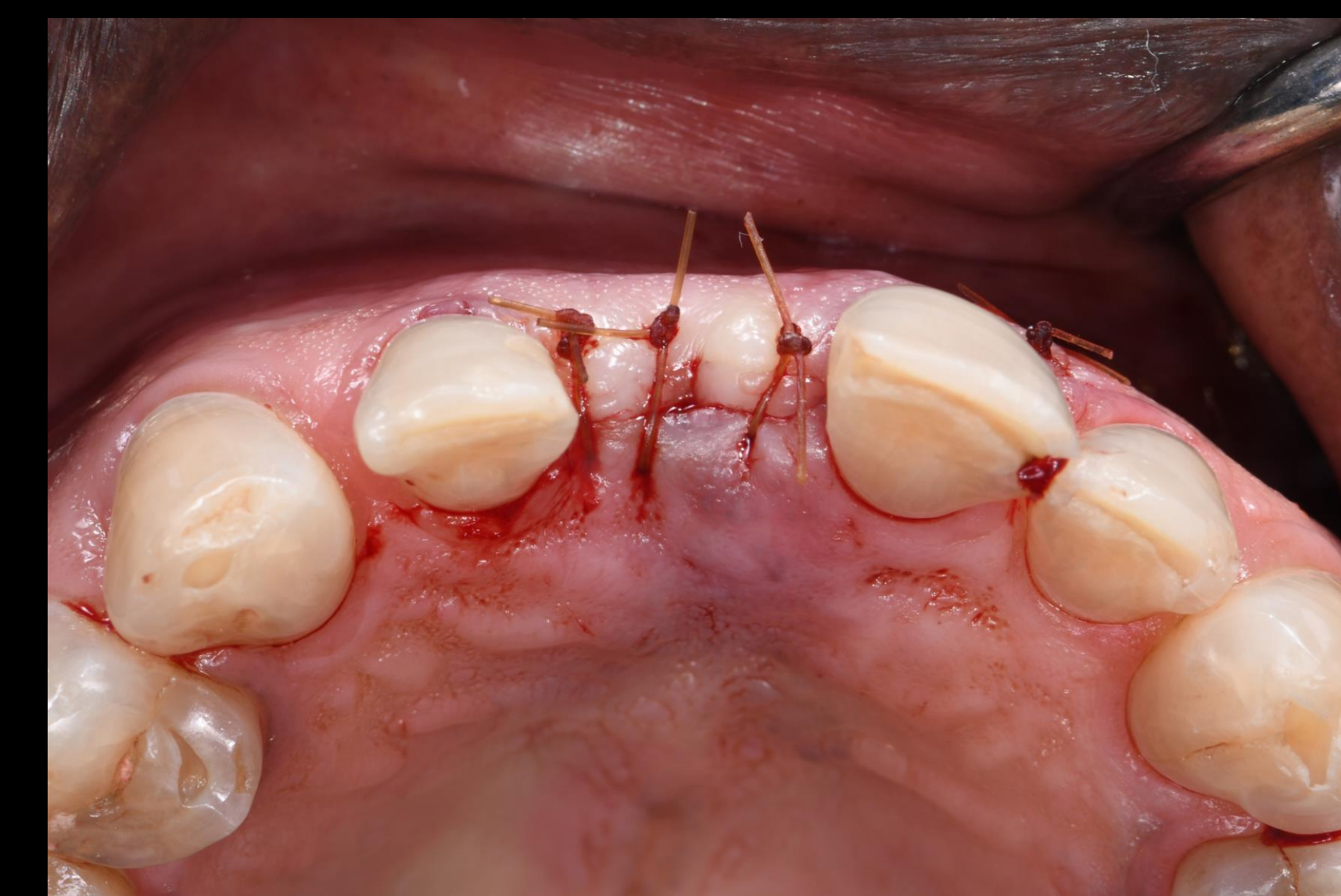
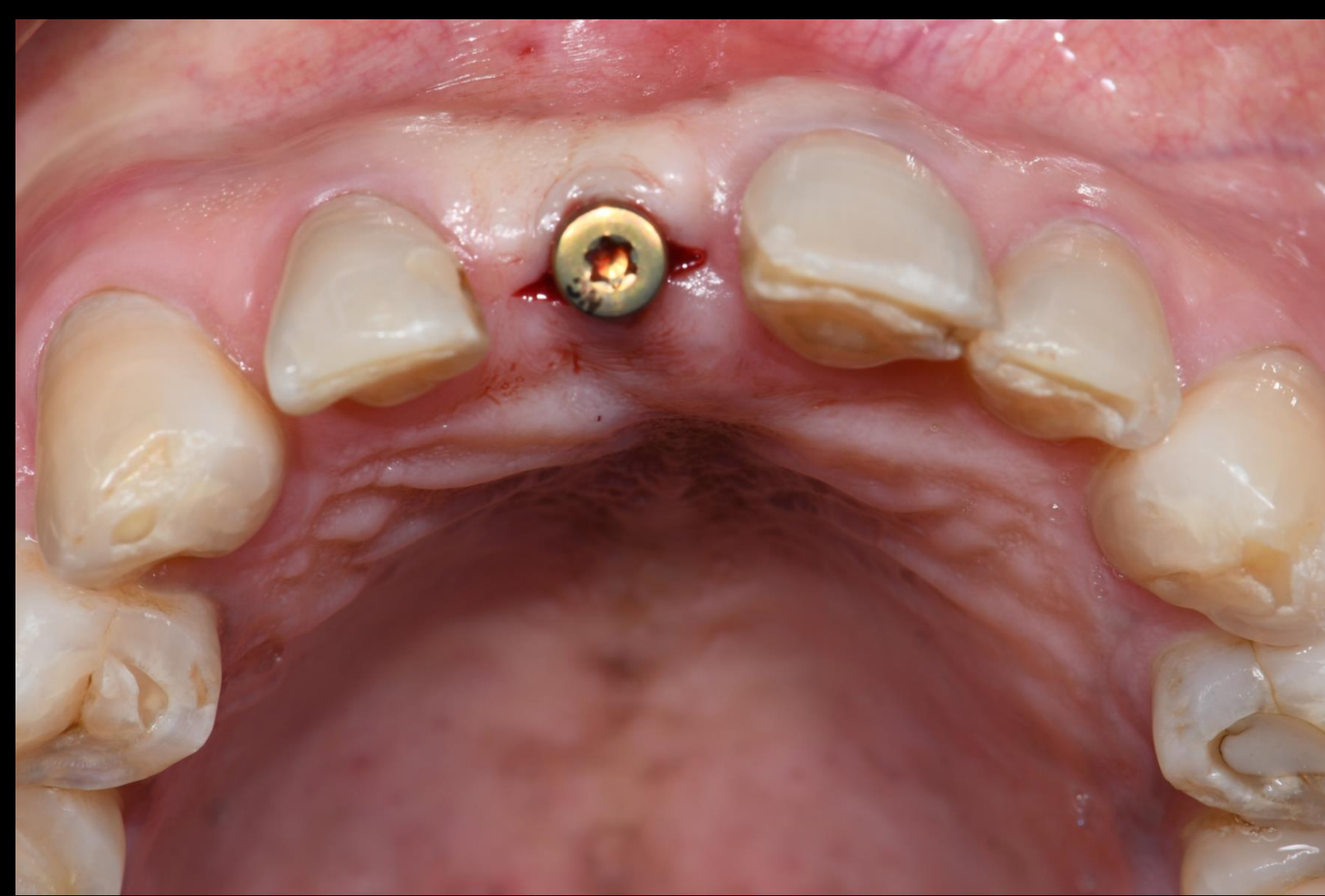
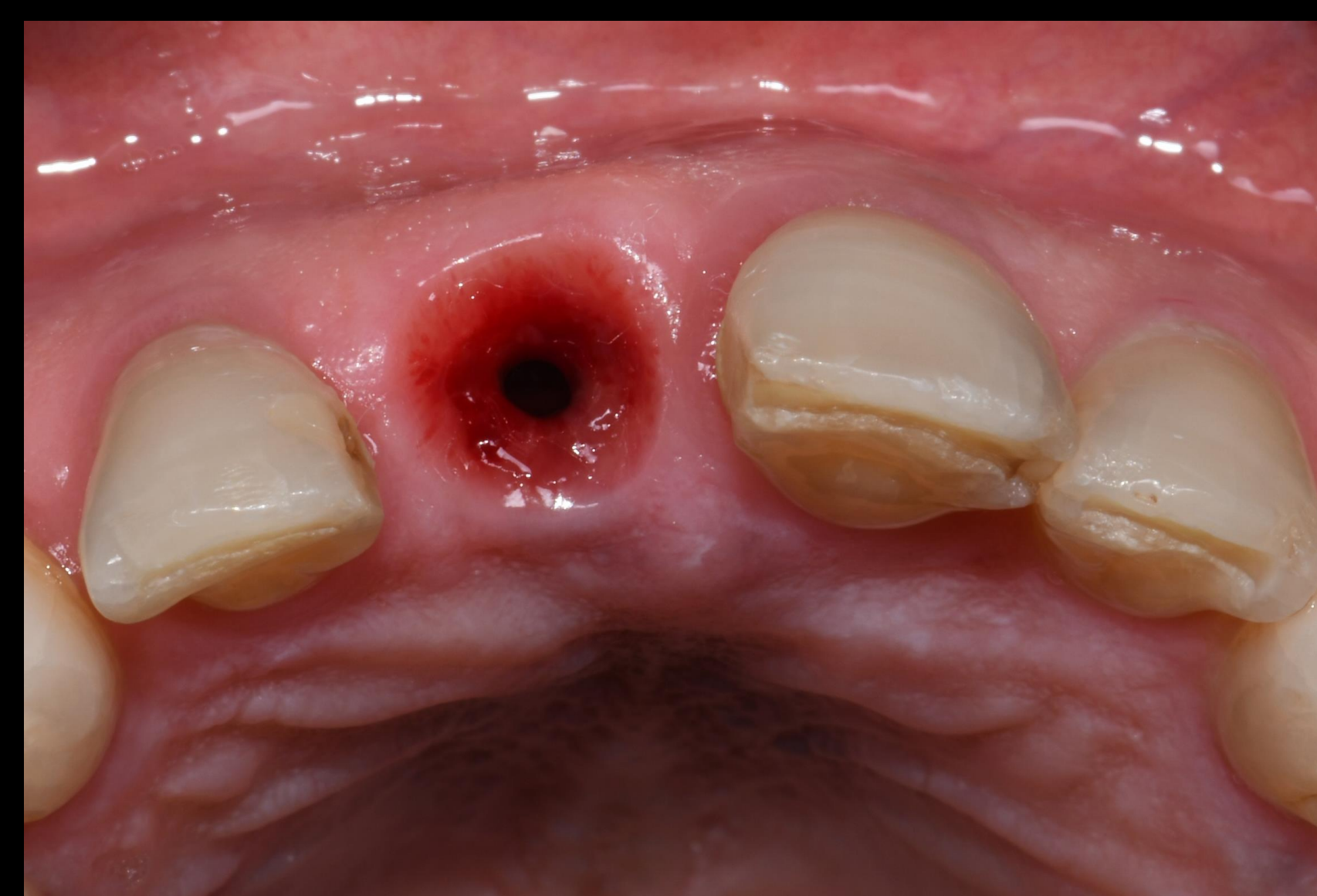
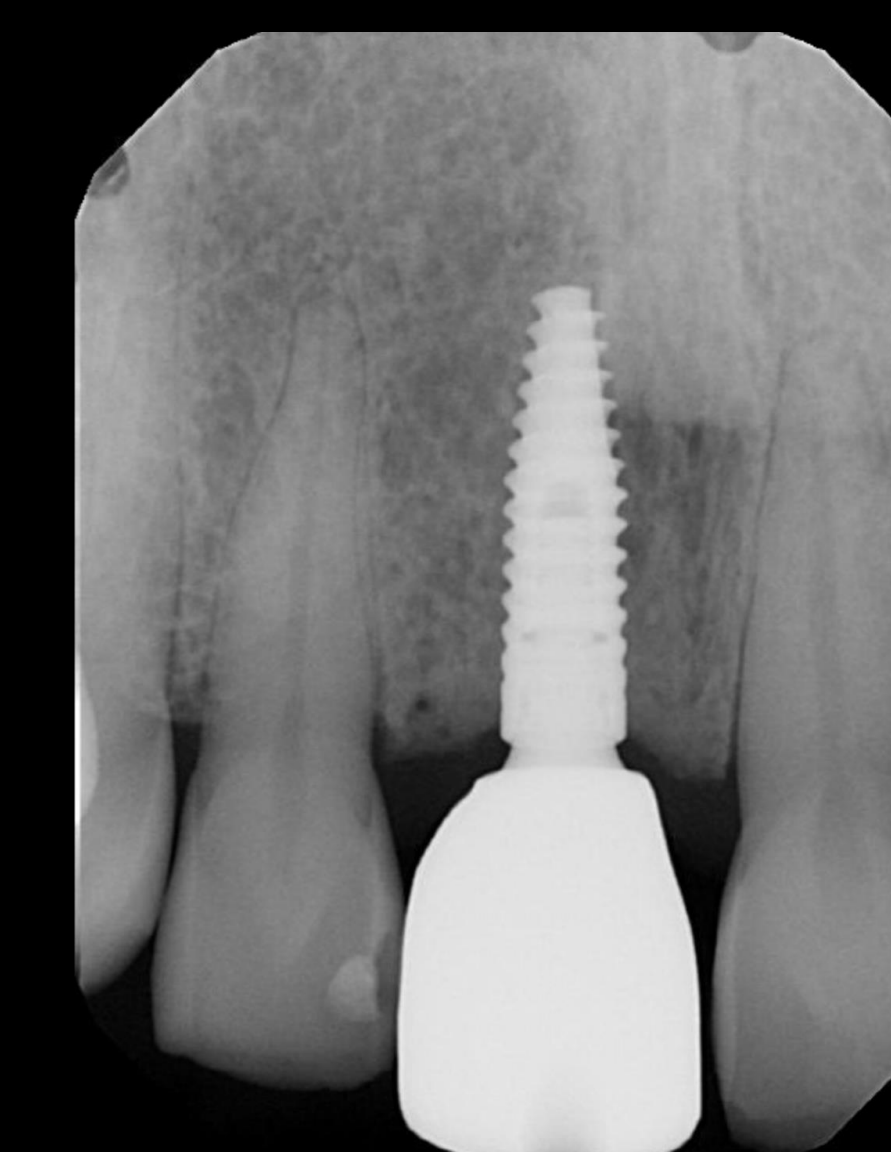
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1-Stage CARS technique





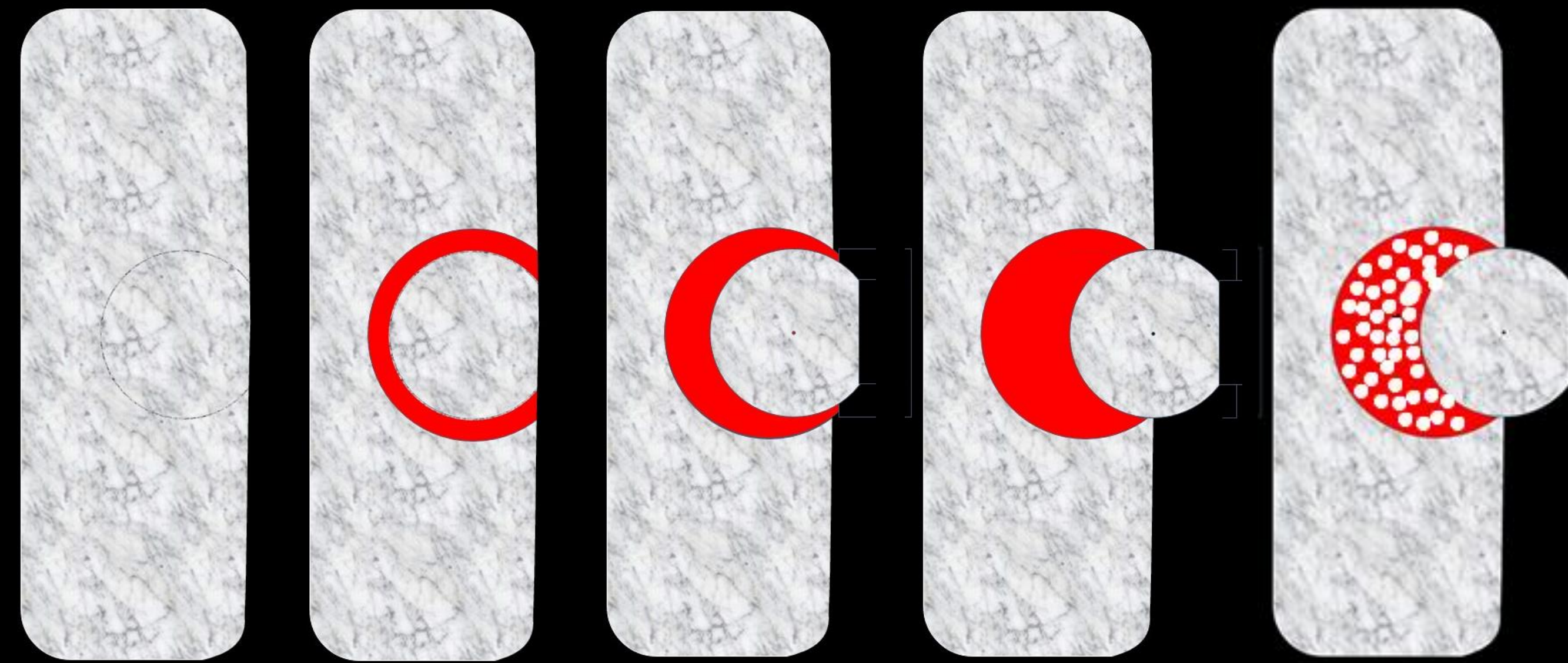
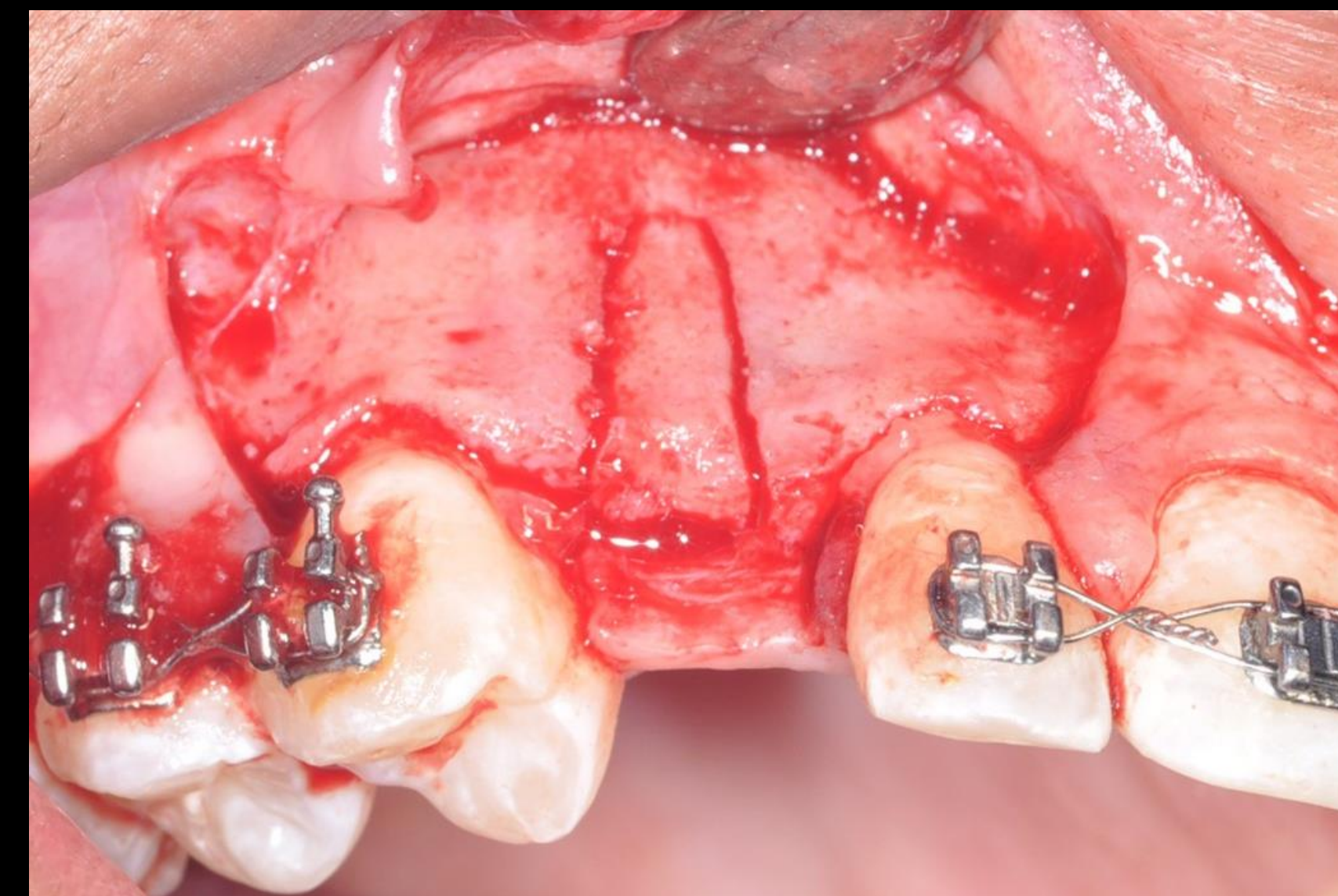
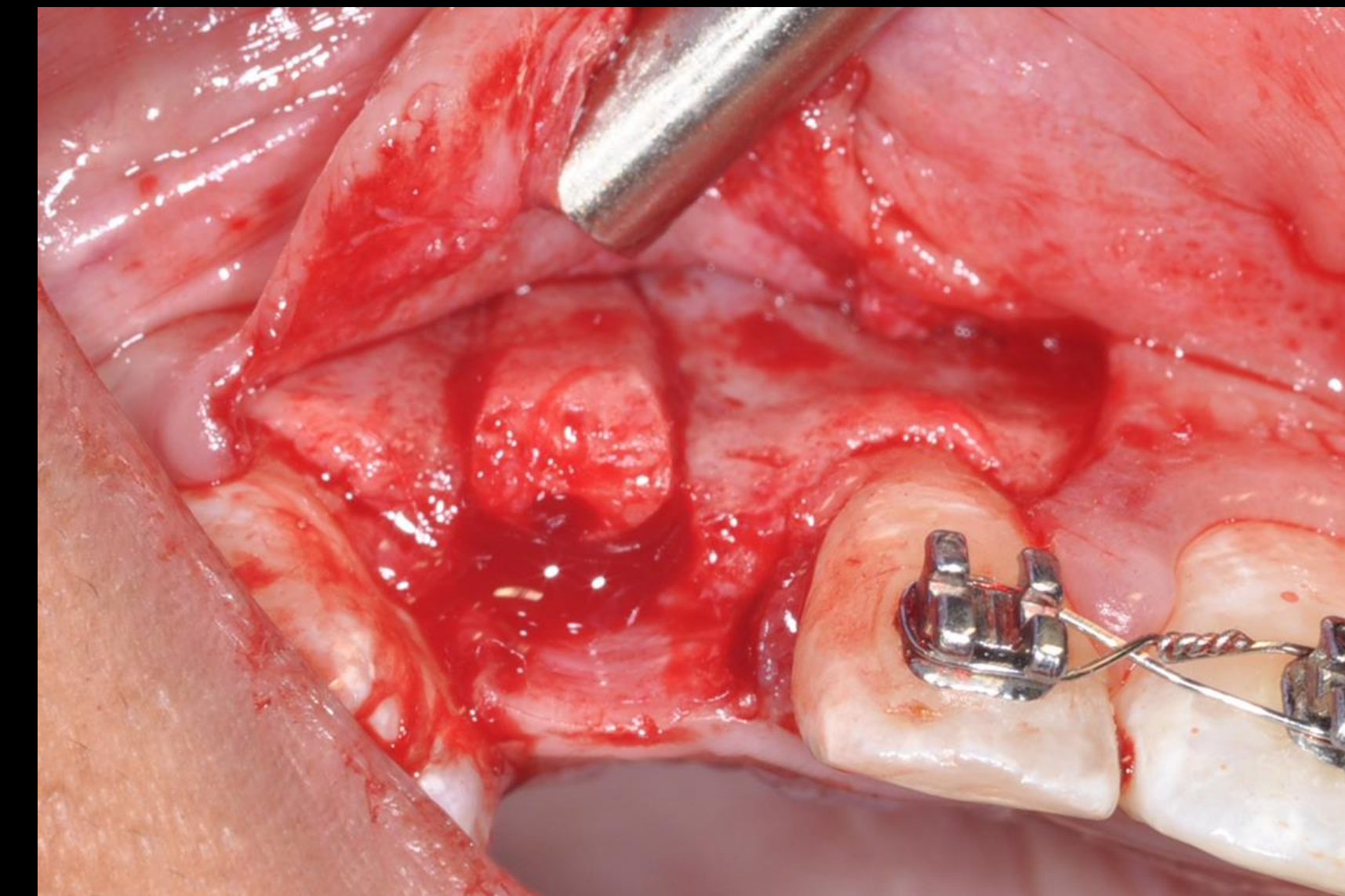
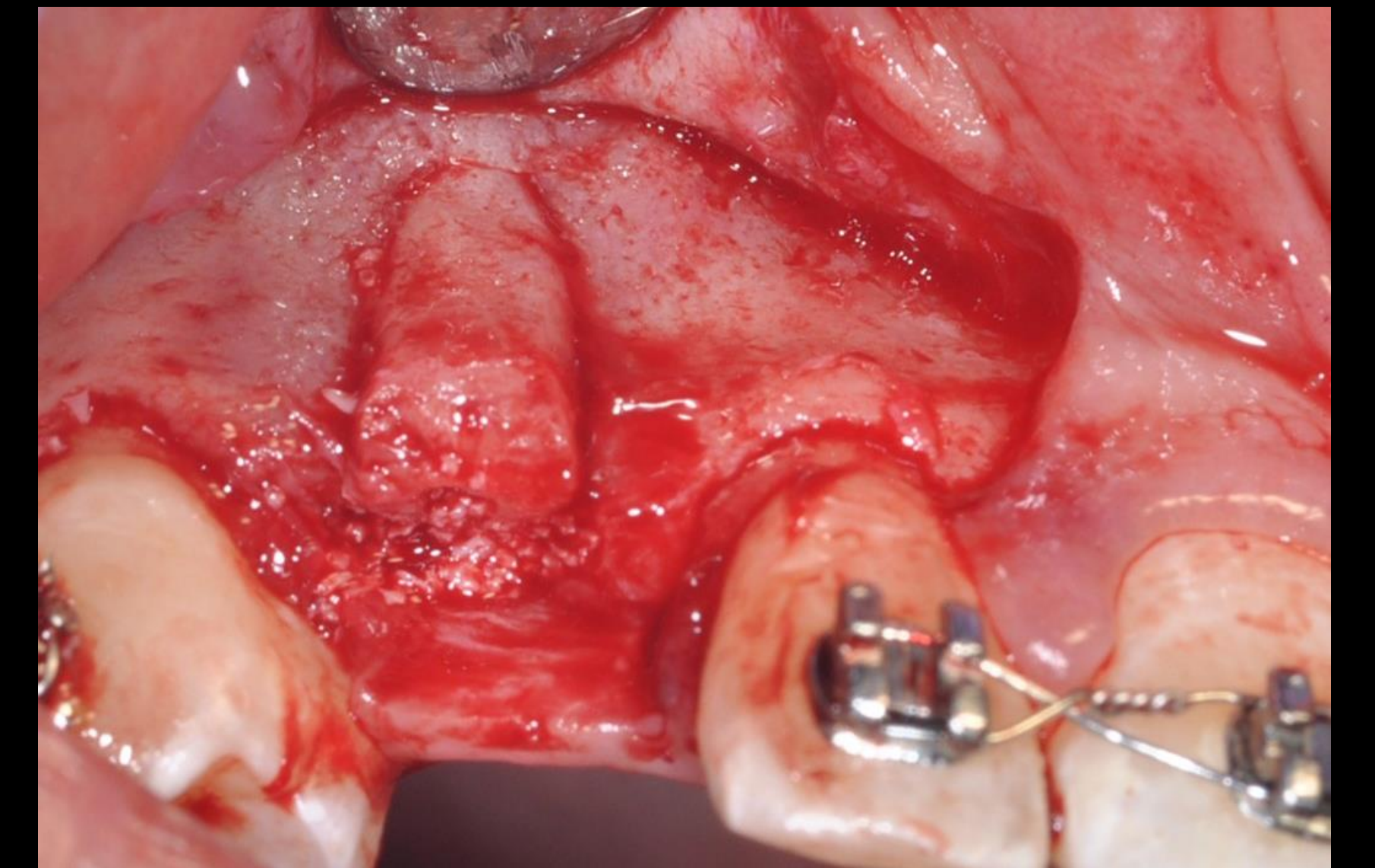
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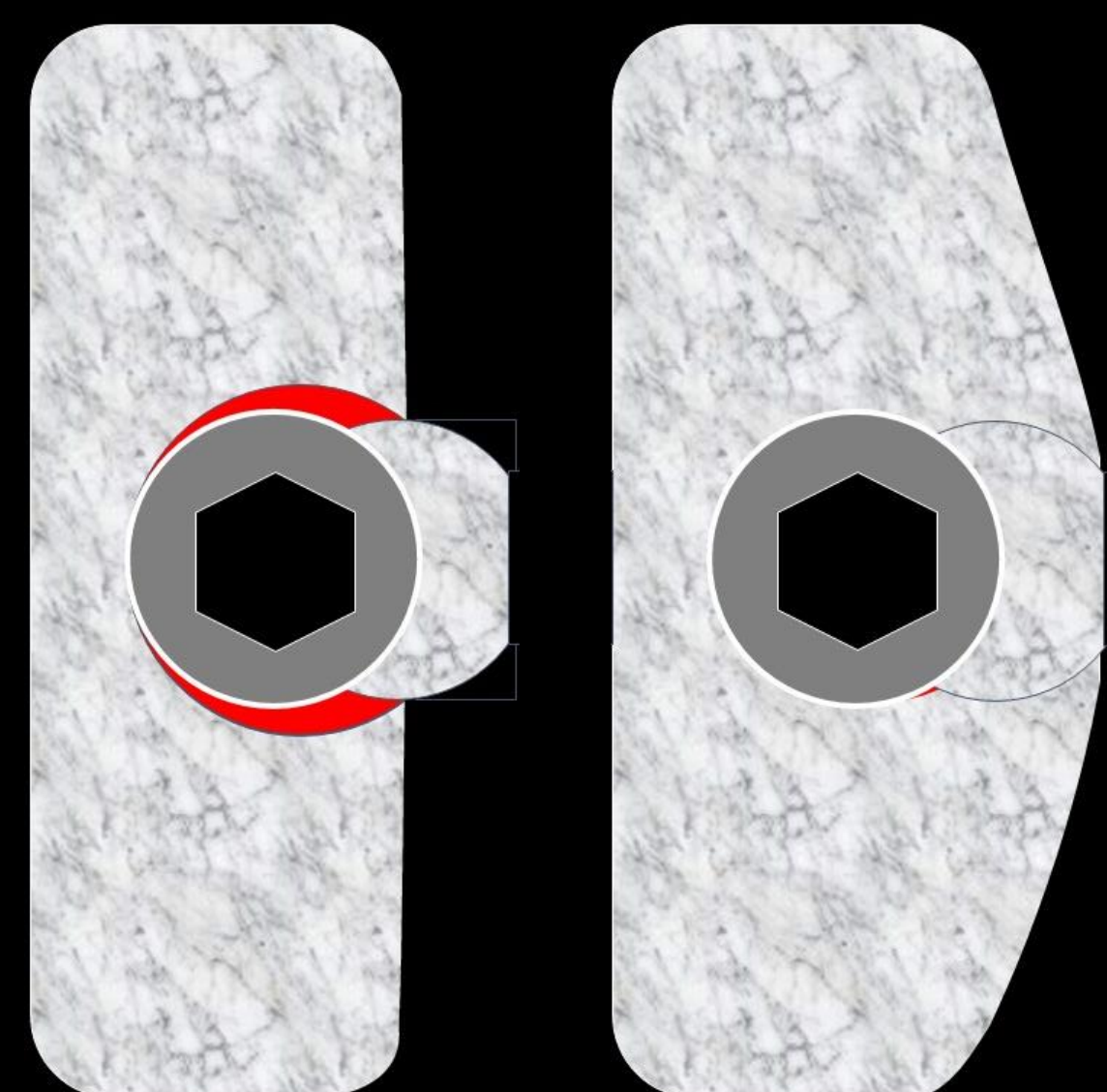
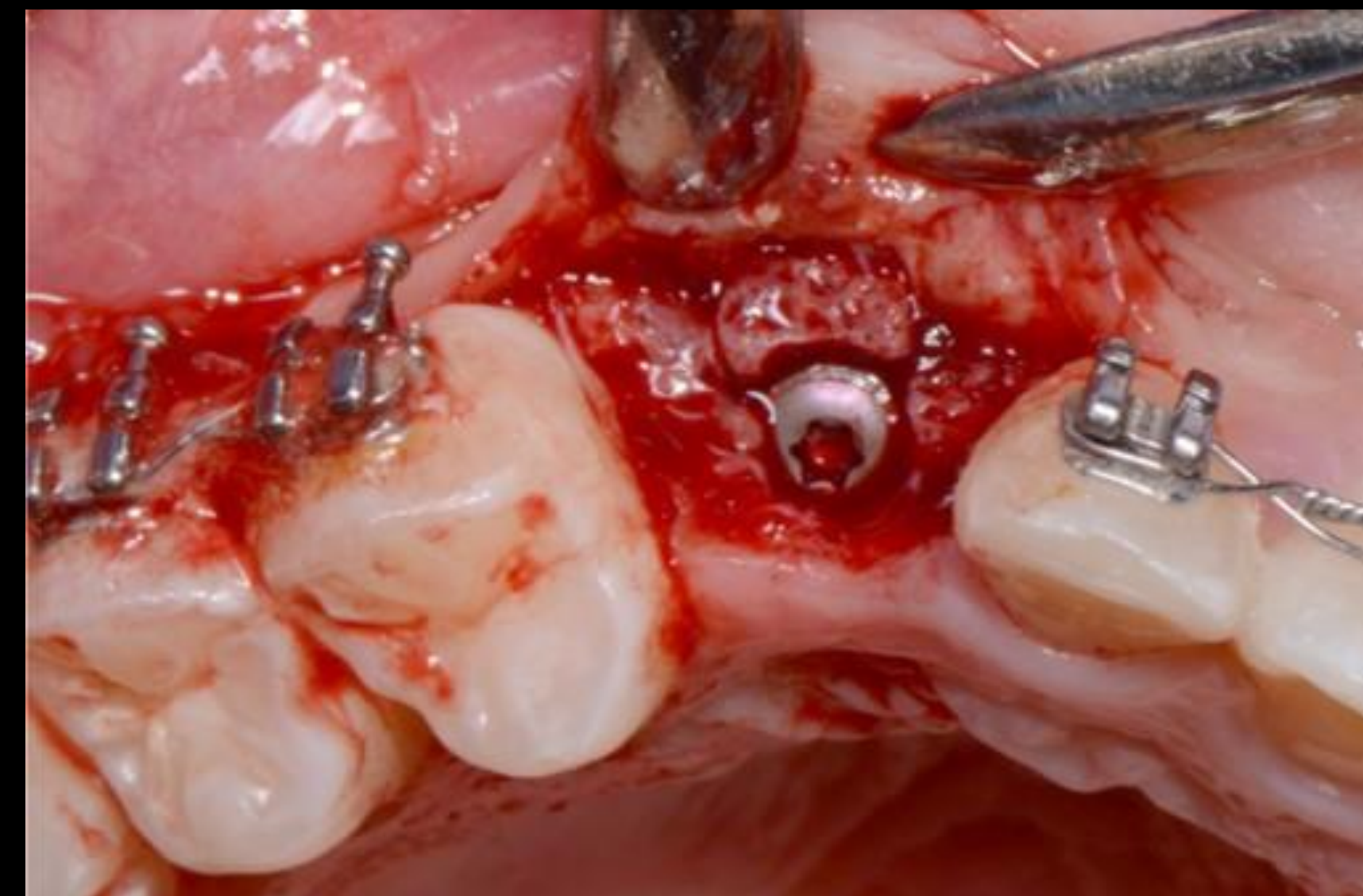
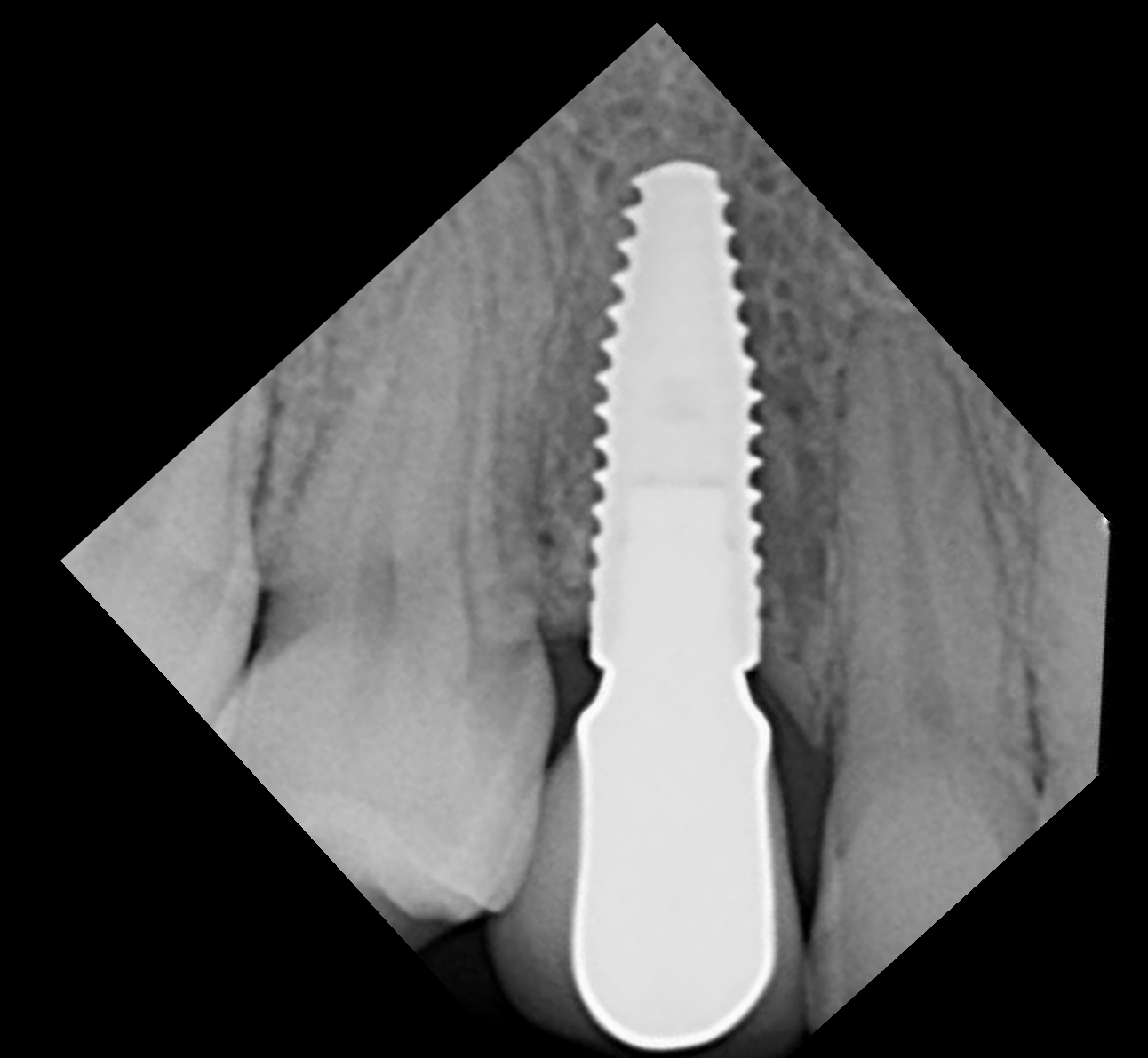
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2-Stages CARS technique



3-4 weeks after





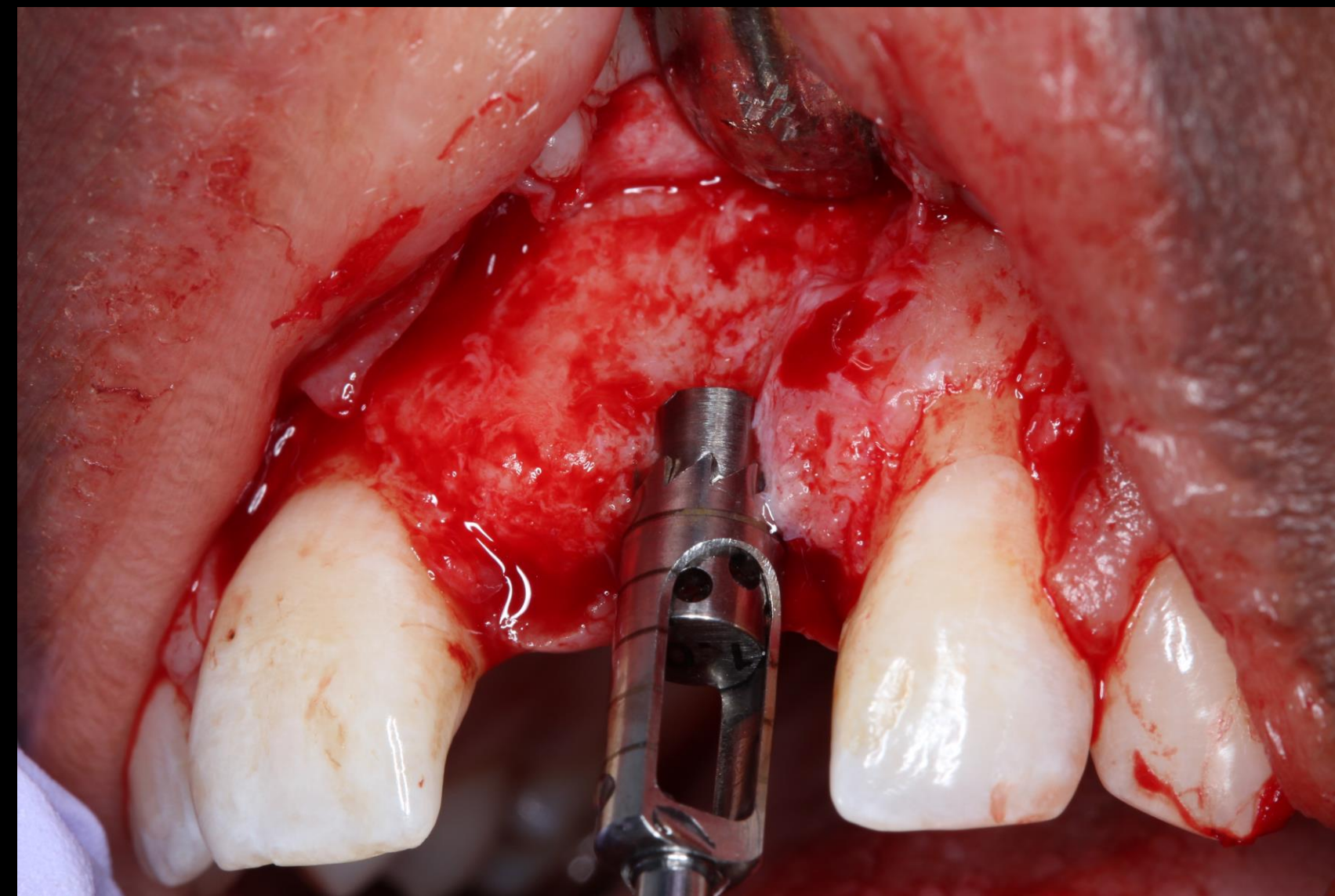
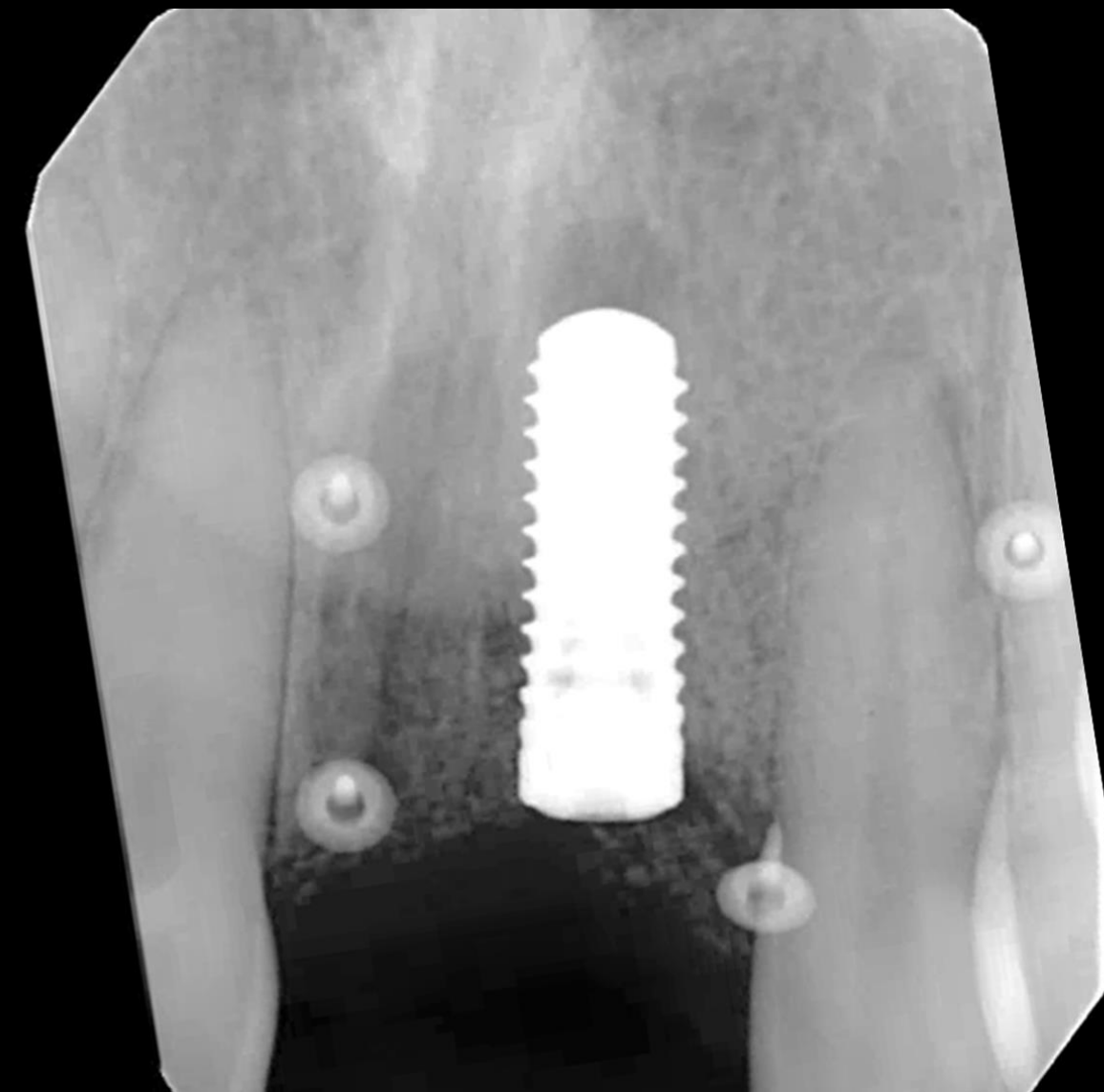
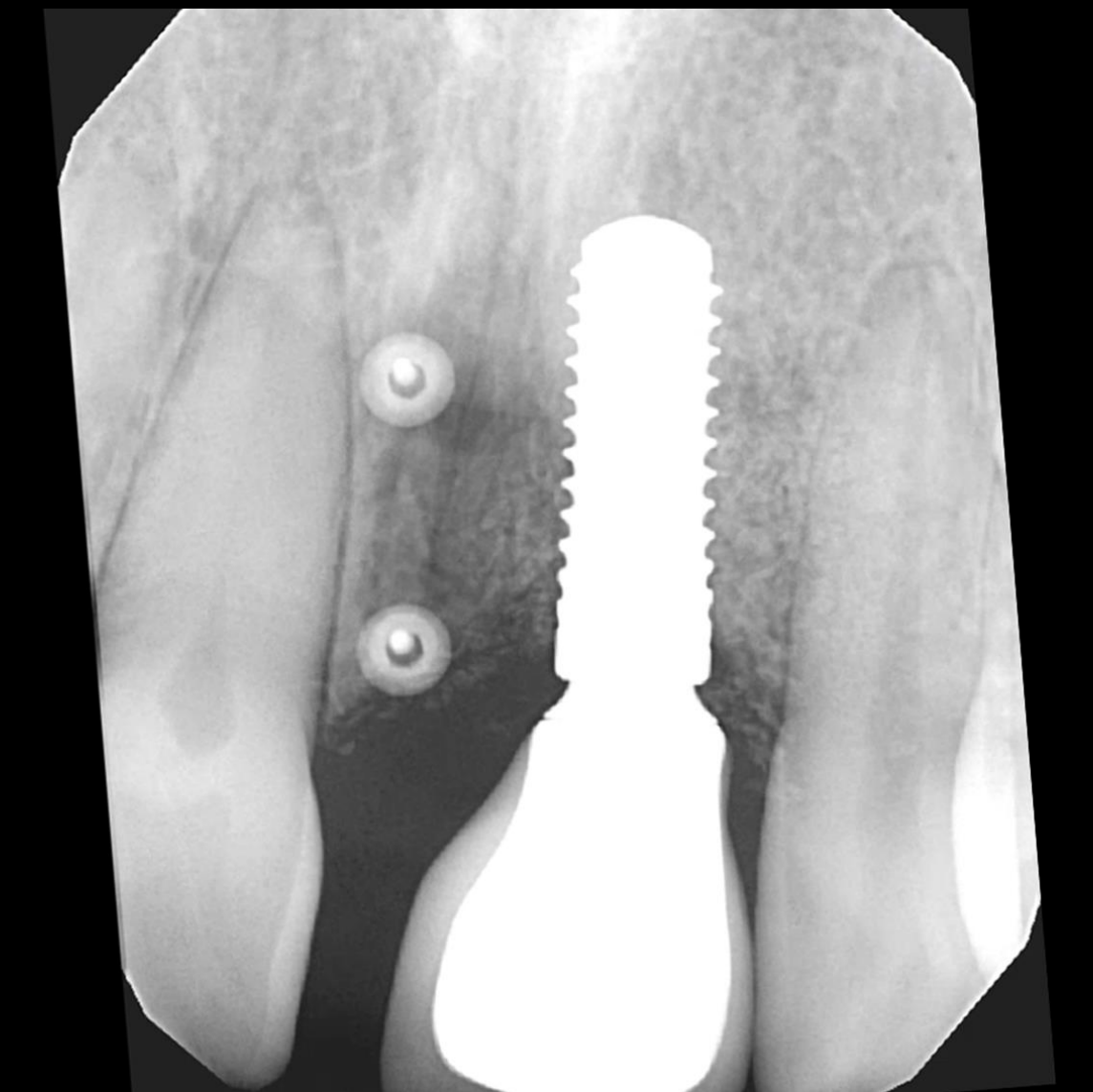
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CARS + Implant + GBR



RESULTS

In the sixteen cases followed, all implants were successfully placed, restored (six to twenty-one months after implant placement), and were followed for twelve to twenty-four months after loading. In one case the segment was fractured, and successful retreatment was completed two months later.

This implant was successfully placed, restored (six months after implant placement), and was followed for an additional twenty-four months after loading. To date all twenty-two implants have functioned well with no failures or complications.



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DISCUSSION

Advantages: No membrane is needed; Less time consuming; Less traumatic; Less postoperative complications (possibly); Creation of an intraosseous defect; Implant surrounded by natural bone; No need for additional grafting. **Disadvantages:** Buccal plate fracture; Bone Block exposure; More than one surgery needed. **Limitations:** Technique sensitive; Steep learning curve; Low documentation; No bone height gain. **Indications:** Bone width gain needed.

CONCLUSIONS

In summary, within the limitation of this case series, it can be concluded that the CARS technique may present another option for horizontal alveolar ridge augmentation in the anterior maxilla in cases of atrophic alveolar ridges. Further research with a greater number of patients and case-controlled comparison studies are necessary to determine the success and advantages of the CARS technique compared to those conventionally used for horizontal ridge augmentation.

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