

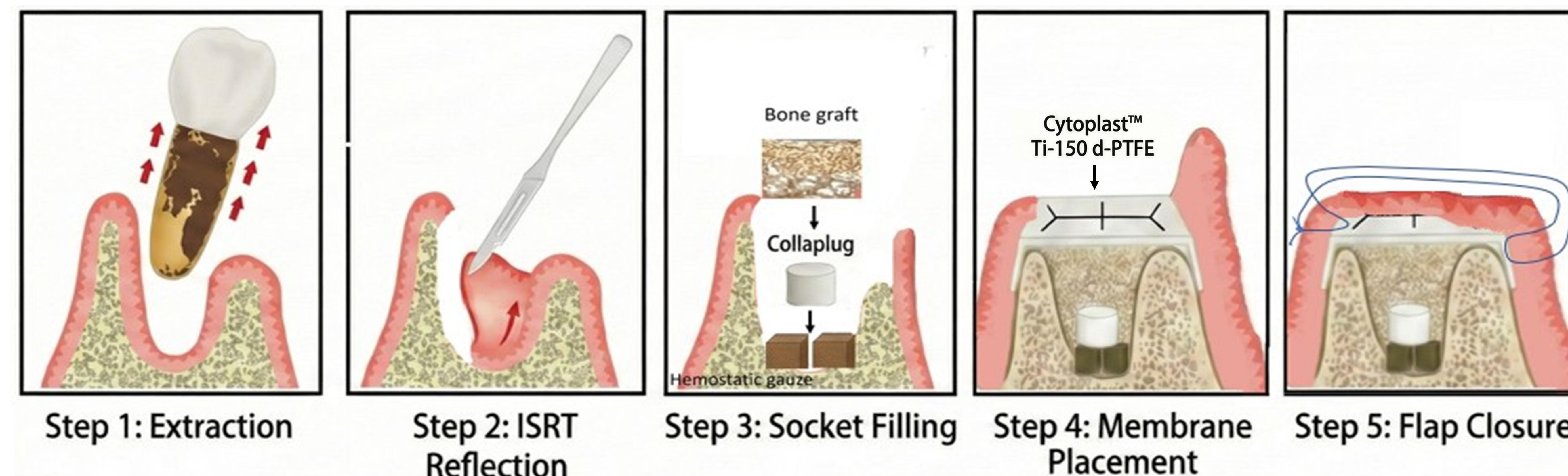
## Background

Alveolar ridge preservation (ARP) has been practiced for decades using various techniques and materials. Intrasocket reactive tissue (ISRT) is a novel approach that may improve primary closure during ARP. These case reports aim to compare the clinical outcomes of ARP using ISRT as a socket sealing material with and without primary closure.

## Materials and Methods

Two systemically healthy periodontitis patients, each with a hopeless mandibular molar, were included. Following initial periodontitis treatment, atraumatic extraction and ARP were performed by reflecting ISRT from the socket base to incorporate into the flap design. The socket was filled sequentially with: **hemostatic gauze**, collagen plug (**CollaPlug®**), bone graft (**Puros® Cortical Particulate Allograft**), and then covered with a titanium-reinforced d-PTFE membrane (**Cytoplast™ Ti-150**). Finally, using the **ISRT** as part of the flap to cover the top of the d-PTFE membrane.

**Study design:** Case 1 was managed without primary closure, while Case 2 achieved primary closure using ISRT. The clinical outcomes and CBCT scans of ARP were evaluated 4-months post-treatment.



**Fig1. Schematic illustration of the surgical procedure**

# Case 1: Management without Primary Closure (Control)

**PATIENT PROFILE** :56-year-old Male. Non-smoker. No underlying systemic diseases.

**Chief Complaint:** Persistent chewing discomfort at mandibular right second molar (#47).

**DIAGNOSIS** :Generalized Periodontitis, stage III, grade C. Tooth #47 presented with deep probing depths, severe bone loss, and Grade III mobility.

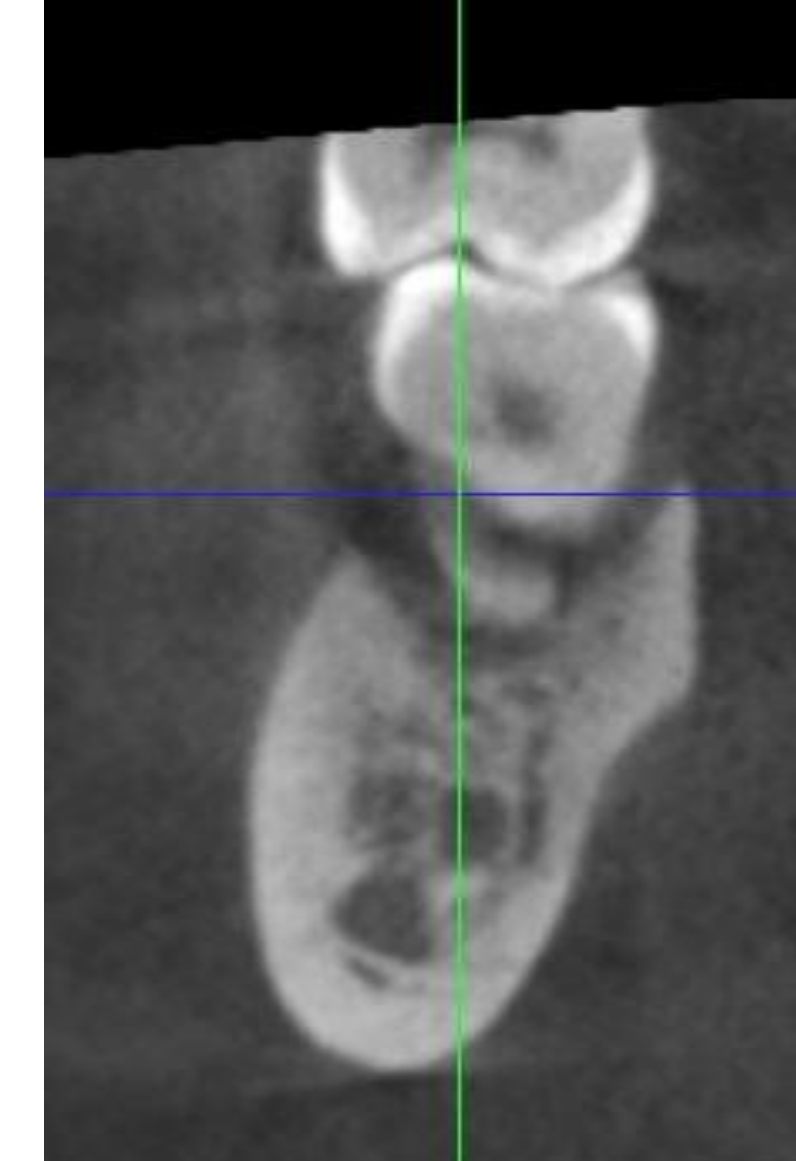
**Prognosis: Hopeless.**

## **SURGICAL PROTOCOL:**

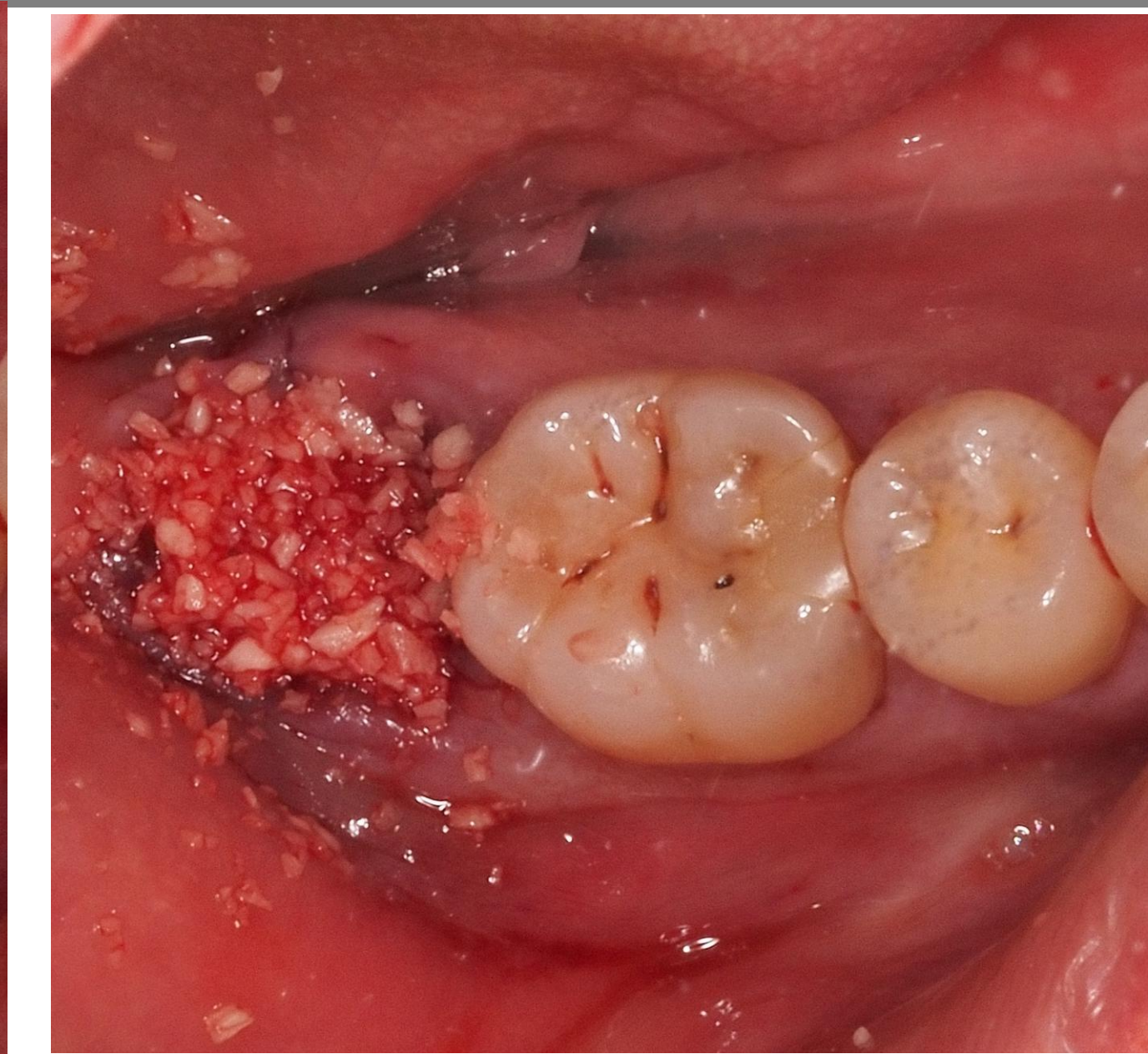
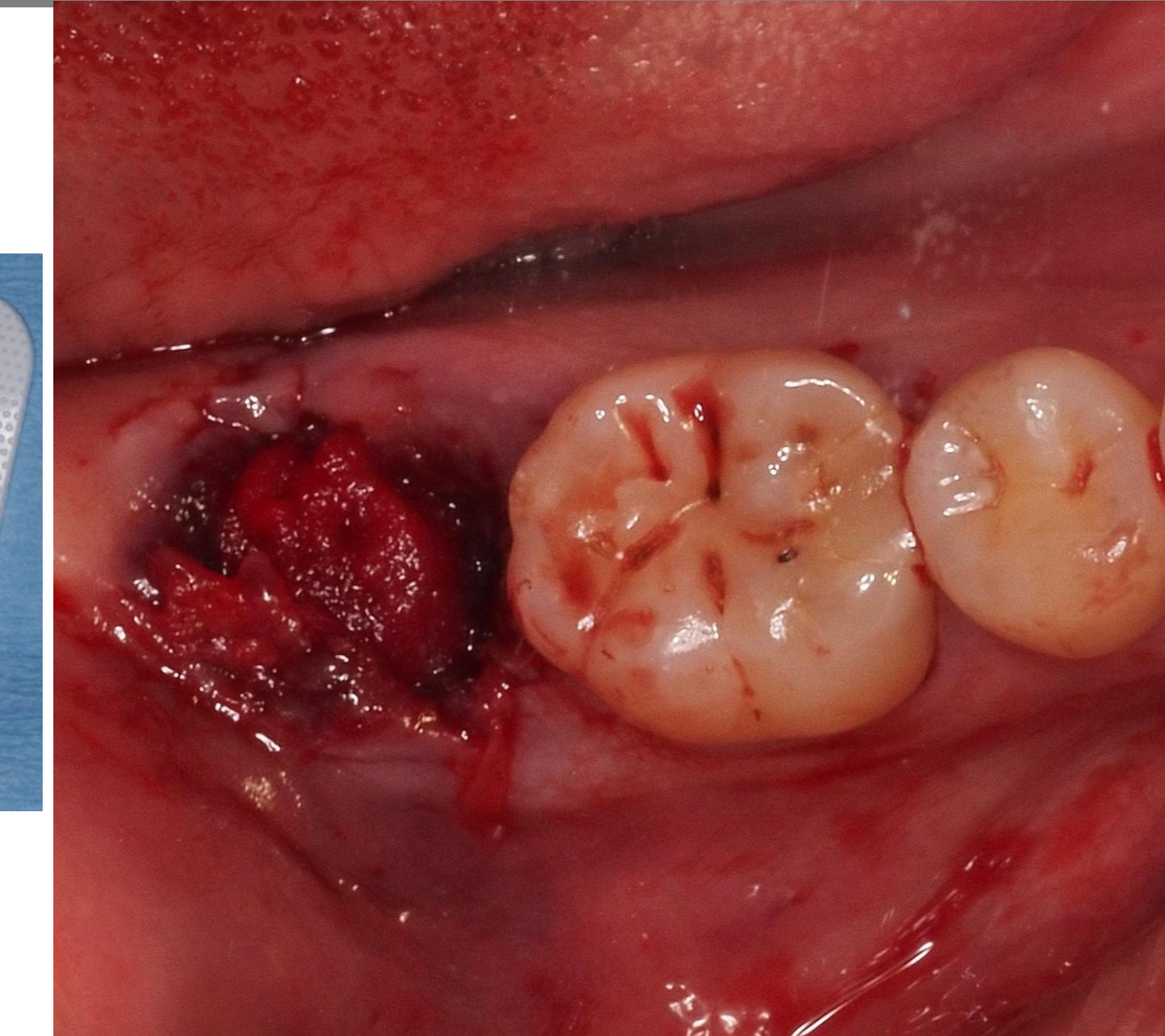
Atraumatic extraction→Socket debridement→ARP Procedure:

1. Hemostatic gauze + CollaPlug®
2. Graft: Puros® Cortical Allograft
3. Membrane: Cytoplast™ Ti-150 (d-PTFE)
4. ISRT was utilized to cover the wound, but tissue volume was limited.

Pre-OP



Surgery



Suture



2 weeks



4 months



## **Clinical observation:**

1. In 2 weeks, healing proceeded via secondary intention due to insufficient ISRT volume.  
→Ridge dimensions were initially maintained.  
→Remove membrane after 6W
2. At 4 months, the horizontal dimension was significantly reduced

Case 2: achieved Primary Closure with ISRT(Test)

**PATIENT PROFILE** :56-year-old Female. Non-smoker, systemically healthy.

**Chief Complaint:** Mobility and pain at mandibular left molars (#36, #37).

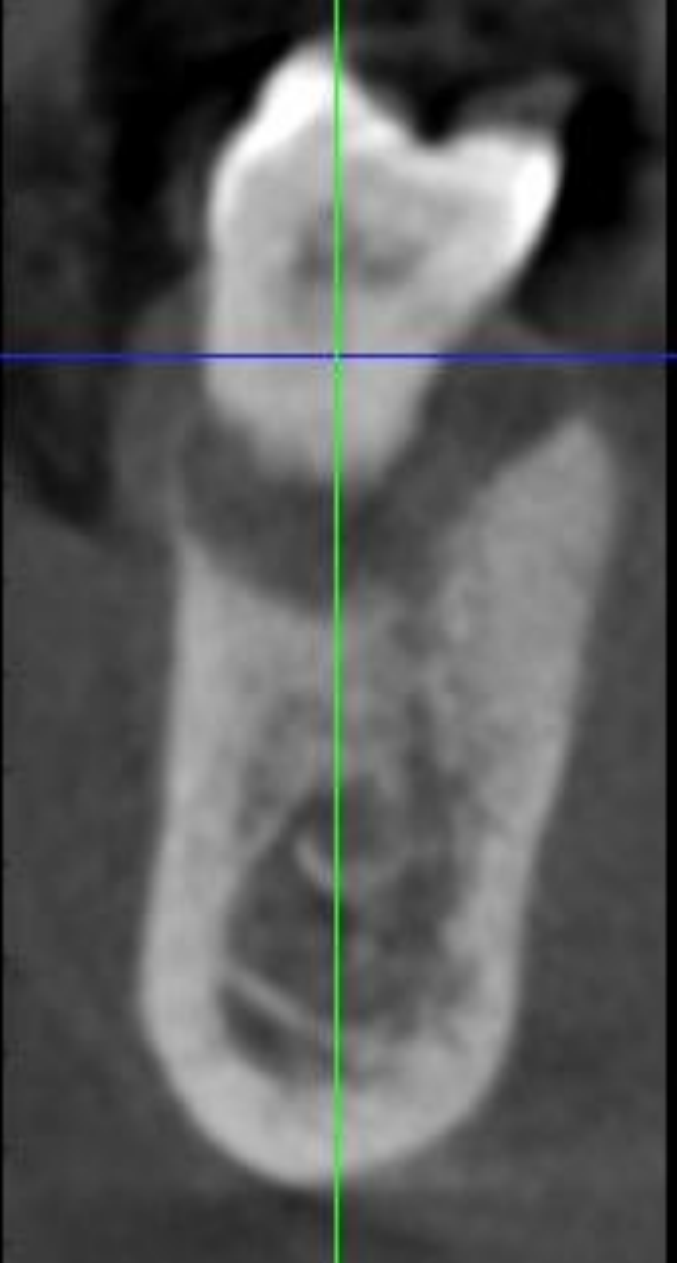
**DIAGNOSIS:** Generalized Periodontitis, stage III, grade C. #36 & #37 with severe bone destruction.

**Prognosis: Hopeless (#36, #37).**

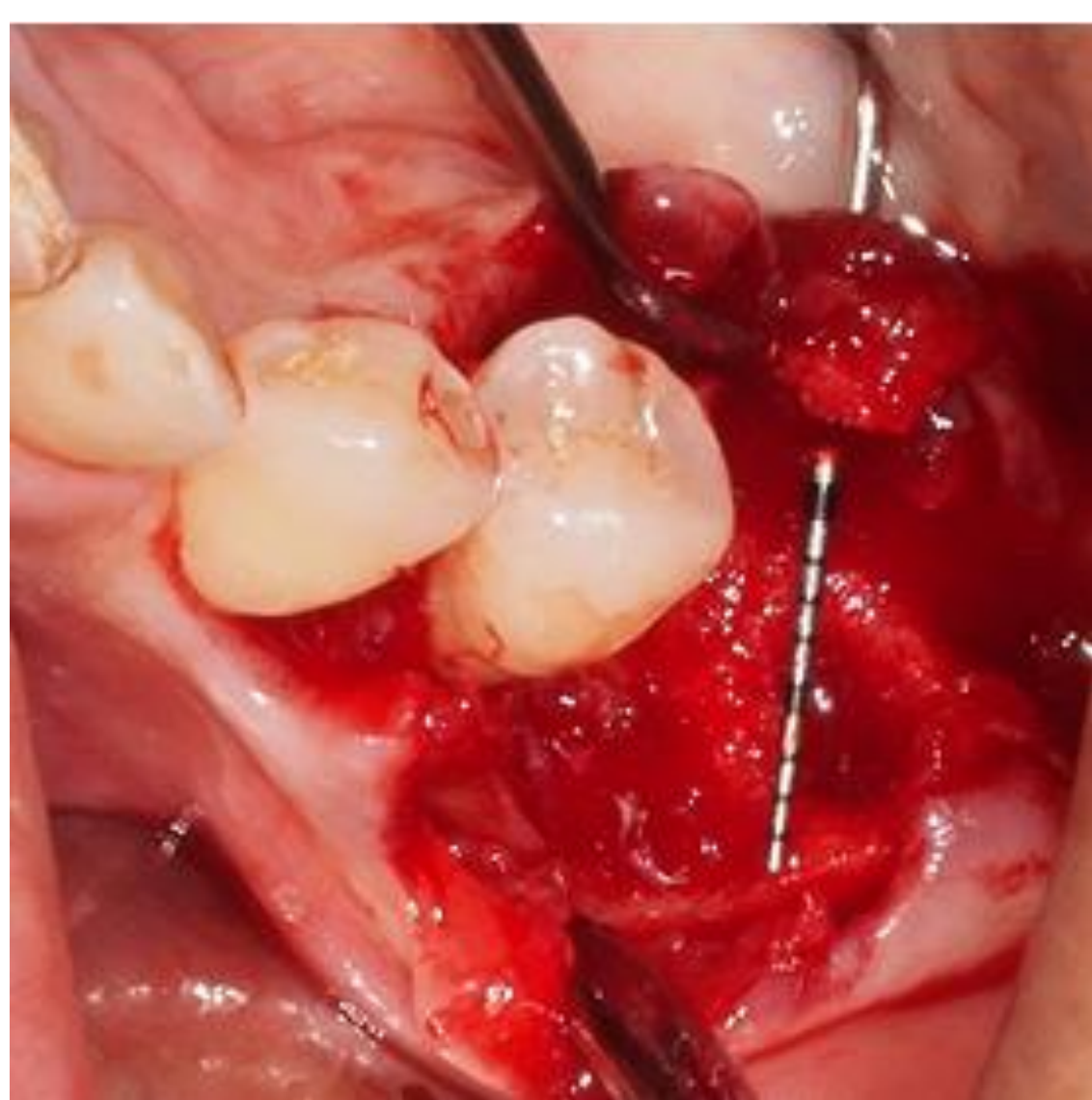
**SURGICAL PROTOCOL**

Atraumatic extraction of #36  
#37→**ISRT Pedicle Reflection:** granulomatous tissue was carefully reflected from the socket base→ARP Procedure as Case 1  
→**Socket sealing:** The ISRT pedicle was used to cover the membrane, achieving primary closure.

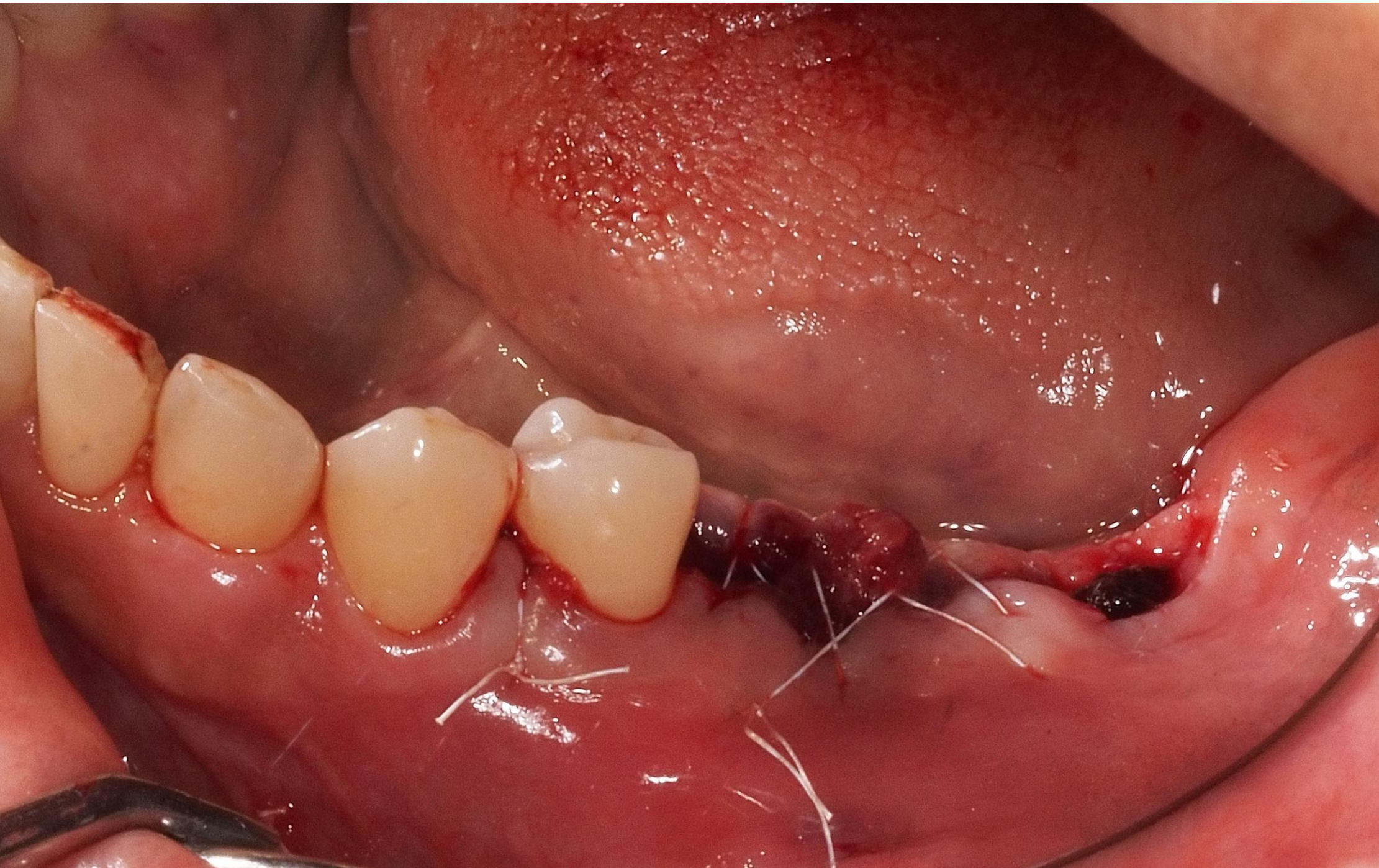
Pre-OP



Surgery



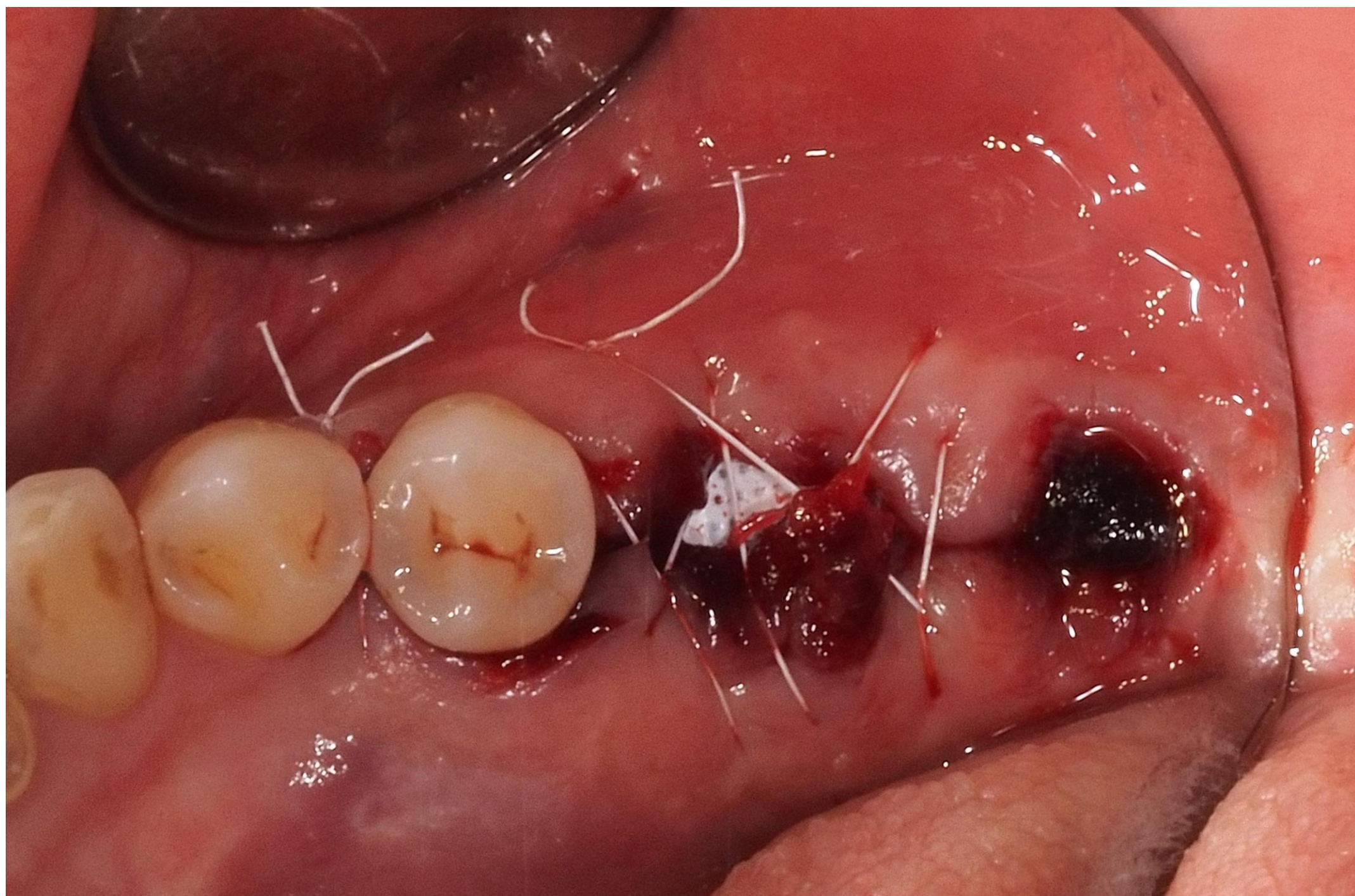
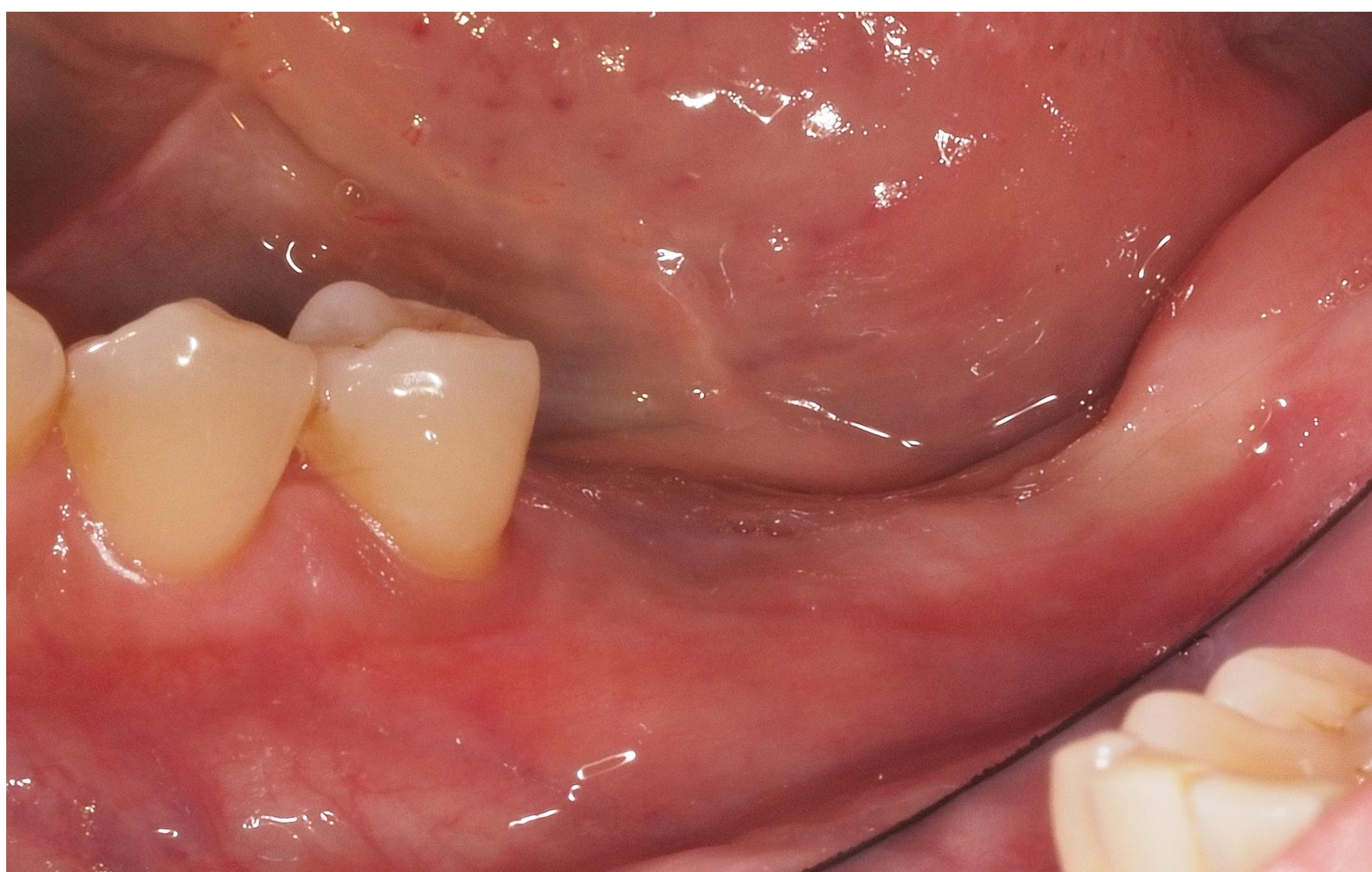
Suture



2 weeks



4 months



**Clinical observation:**

- In 2 weeks, the wound healed uneventfully with complete soft tissue seal.  
→The vertical and horizontal dimensions were sustained.
- At 4 months, the vertical & horizontal dimensions were sustained

Results

Fig 2. Case 1 (without primary closure)

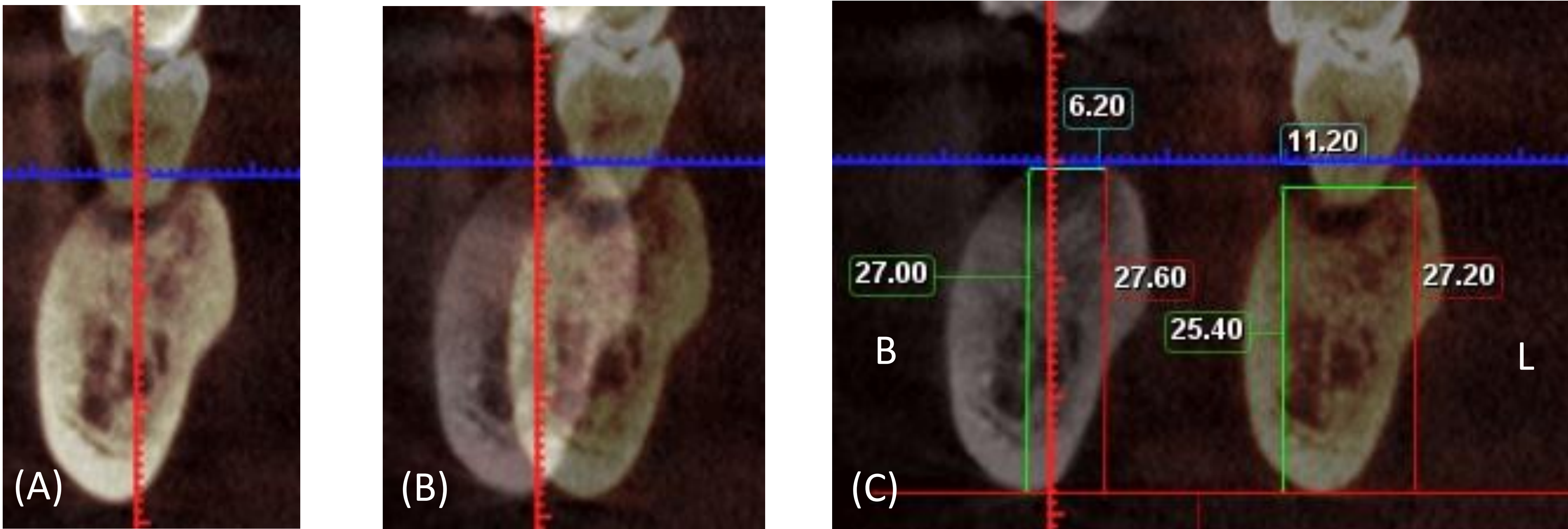


Fig 2. CT: (A) Overlay the baseline image with the 4-month postoperative image (B) Image superimposition (C) Dimensional measurement

Fig 3. Case 2 (Primary Closure with ISRT)

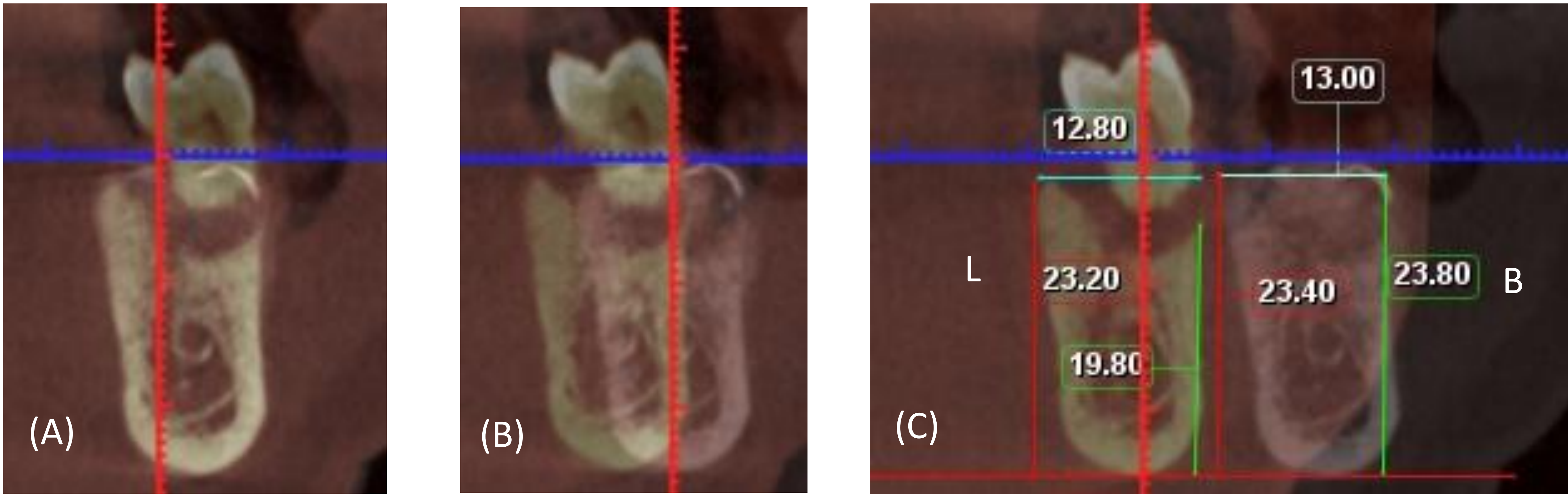


Fig 3. CT: (A) Overlay the baseline image with the 4-month postoperative image (B) Image superimposition (C) Dimensional measurement

Discussion

**Impact of Primary Closure:** In Case 1, the lack of primary closure resulted in significant horizontal bone loss (-5.0 mm).

**Role of ISRT** (Intrasocket Reactive Tissue): ISRT served as a vascularized autogenous soft tissue source. By reflecting and preserving the ISRT, we achieved tension-free primary closure over the non-resorbable d-PTFE membrane in Case 2.

Comparison table

|                             | Case 1 (No Primary Closure)                            | Case 2 (Primary Closure with ISRT)           |
|-----------------------------|--------------------------------------------------------|----------------------------------------------|
| Vertical Bone Gain (Buccal) | + 1.6 mm                                               | + 4.0 mm                                     |
| Horizontal Ridge Width      | - 5.0 mm (Severe Resorption)                           | + 0.2 mm (Stable Preservation)               |
| Clinical Outcome            | Compromised ridge width requiring further augmentation | Ideal ridge dimensions for implant placement |

Conclusion

Incorporating ISRT in ARP procedures may facilitate primary closure and contribute to improve dimensional stability of the alveolar ridge.

**References:**

1. Ahn JJ, Shin HI. Bone tissue formation in extraction sockets from sites with advanced periodontal disease: A histomorphometric study in humans. Int J Oral Maxillofac Implants 2008;23:1133–1138.
2. Kim JH, Susin C, Min JH, et al. Extraction sockets: Erratic healing impeding factors. J Clin Periodontol 2014;41:80–85.
3. Shehabeldin, M, Saleh, MHA, Tseng, S-C E, Sirinirund, B, Zalucha, J, Chan, H-L, Wang, H-L.: Intrasocket reactive tissue: The state of current knowledge. Int. J Oral Implant, 2023; 16: 95-103.
4. Atieh MA, Alnaqbi M, Abdunabi F, Lin L, Alsabeeha NHM. Alveolar ridge preservation in extraction sockets of periodontally compromised teeth: A systematic review and meta-analysis. Clin Oral Implants Res 2022;33:869–885.