

Interpositional Osteotomy for Augmentation of Vertical Defects in the Anterior Mandible Prior to Implant Placement

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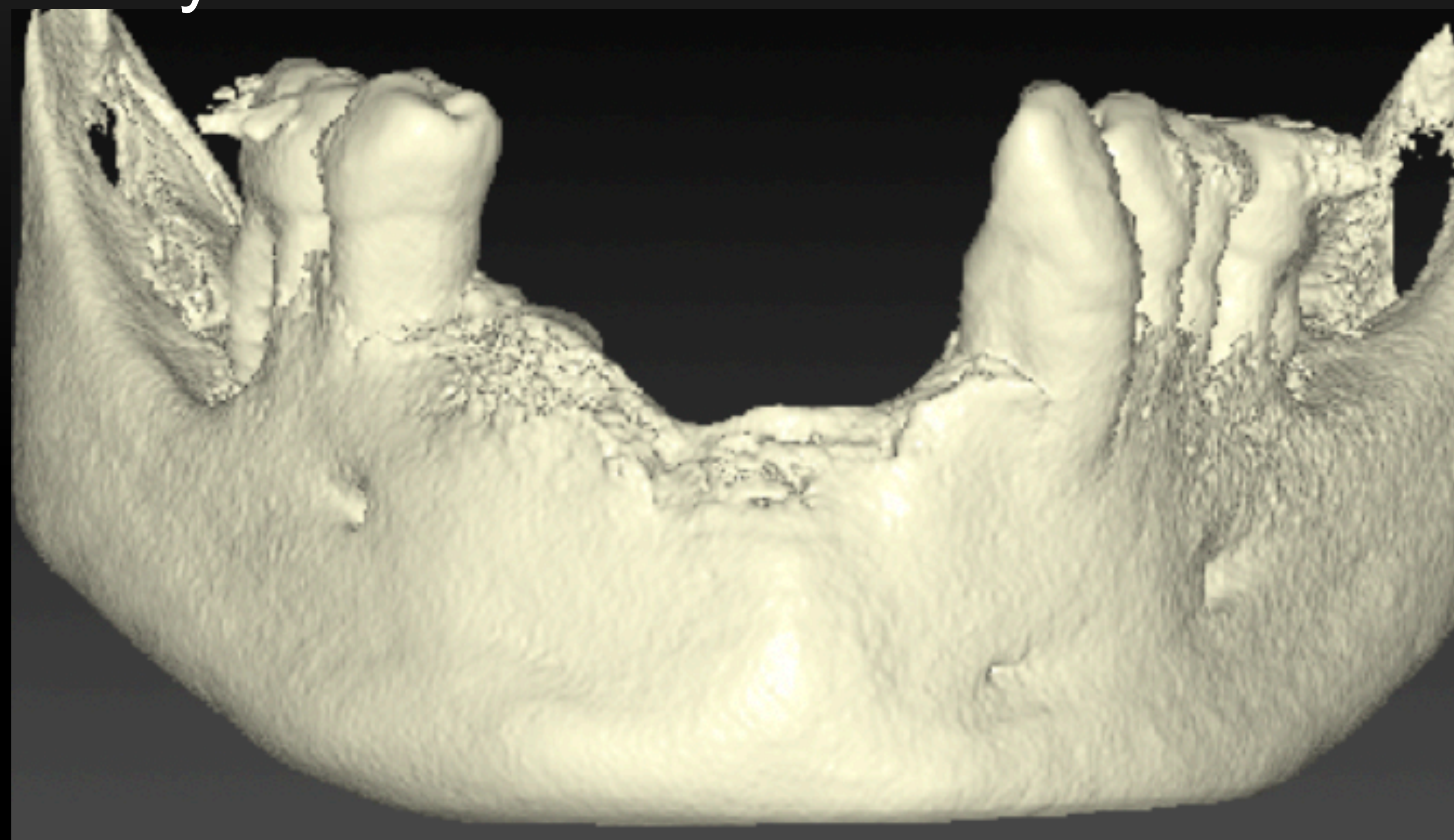


INTRODUCTION:

Vertical ridge augmentation presents significant challenges, with techniques including guided bone regeneration (GBR), block bone grafting, alveolar distraction (AD), and interpositional osteotomy (IO). While GBR with non-resorbable membranes is effective for moderate augmentation, severe defects (>7 mm) or cases with extensive scar tissue pose higher risks of complications such as wound dehiscence, membrane exposure, and infection. In these situations, AD and IO, as vascularized approaches, may offer superior outcomes to conventional methods.

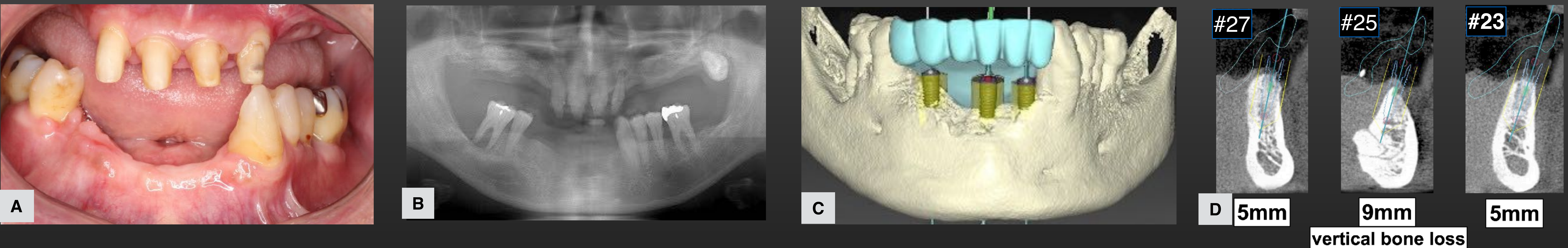
OBJECTIVE:

This case report illustrates that IO offers an effective approach for vertical ridge augmentation in the severely atrophic anterior mandible, particularly after conventional methods have failed.



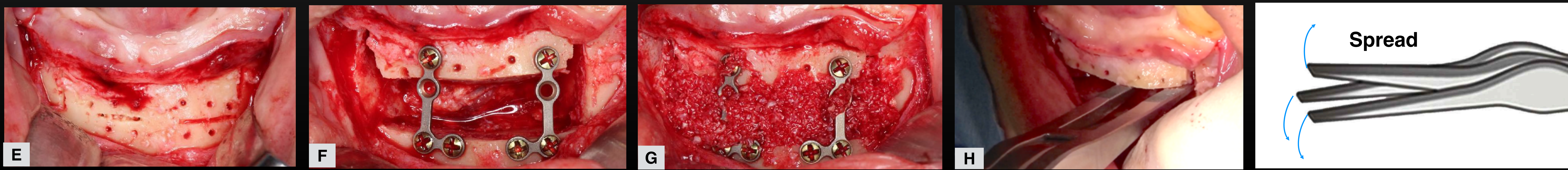
Case Presentation:

A 57-year-old male presented in August 2019 with a history of periodontal disease resulting in severe bone and soft tissue loss in the anterior mandible (Fig.A,B). CT scans revealed vertical (9 mm) and horizontal (3-7 mm) bone loss in the anterior mandible (Fig. C,D).



Surgical Technique :

Under intravenous sedation, an incision was made along the vestibule. After elevating the mucoperiosteal flap, vertical and horizontal osteotomies were performed using Piezosurgery, taking care not to damage a periosteum blood supply to the bone fragment (Fig.E). The mobile bone fragment was lifted and fixed in place with microplate osteosynthesis (Fig.F). FBDA was filled in the gap between the fragment and the basal bone to promote bone regeneration (Fig.G).

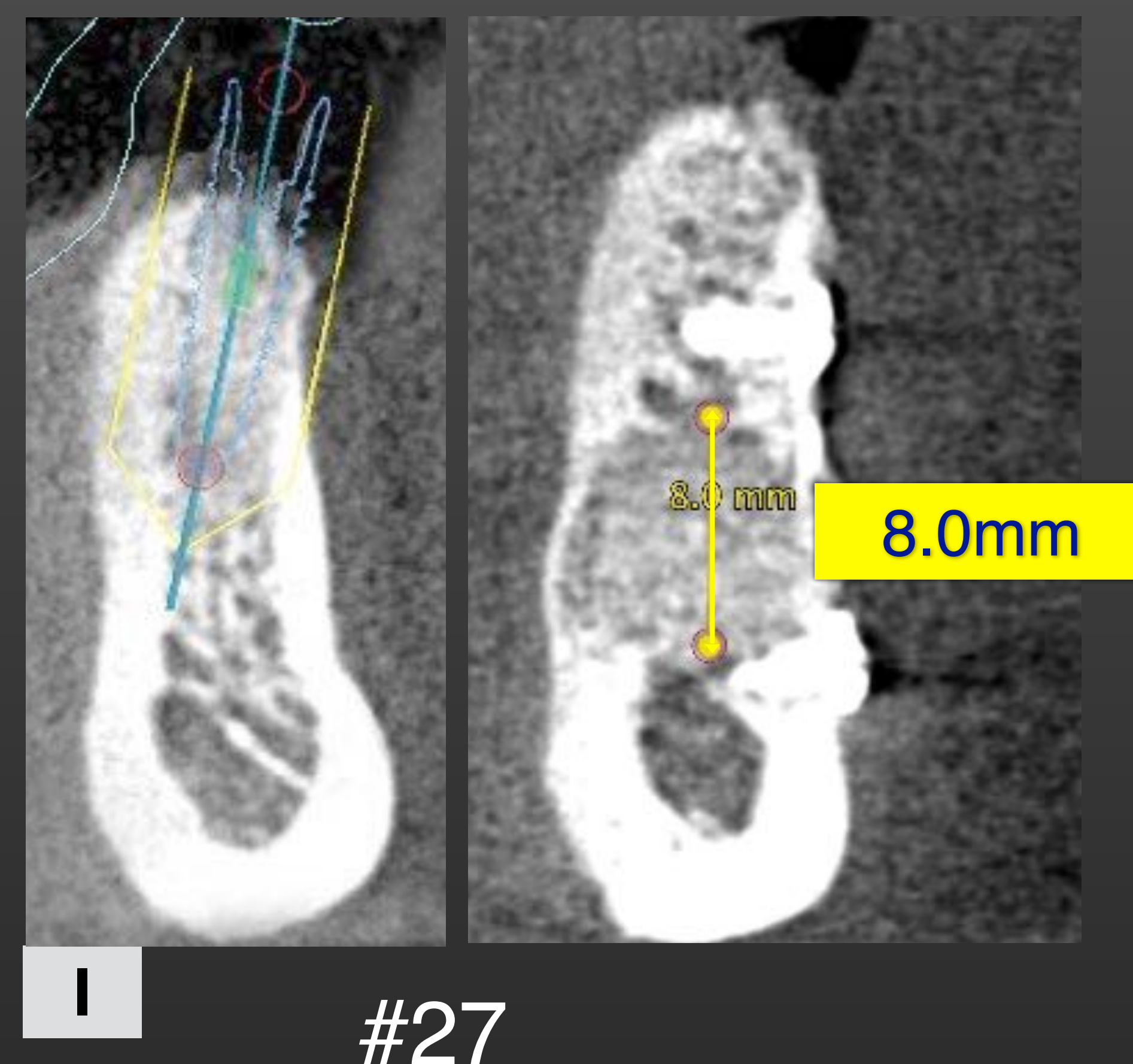
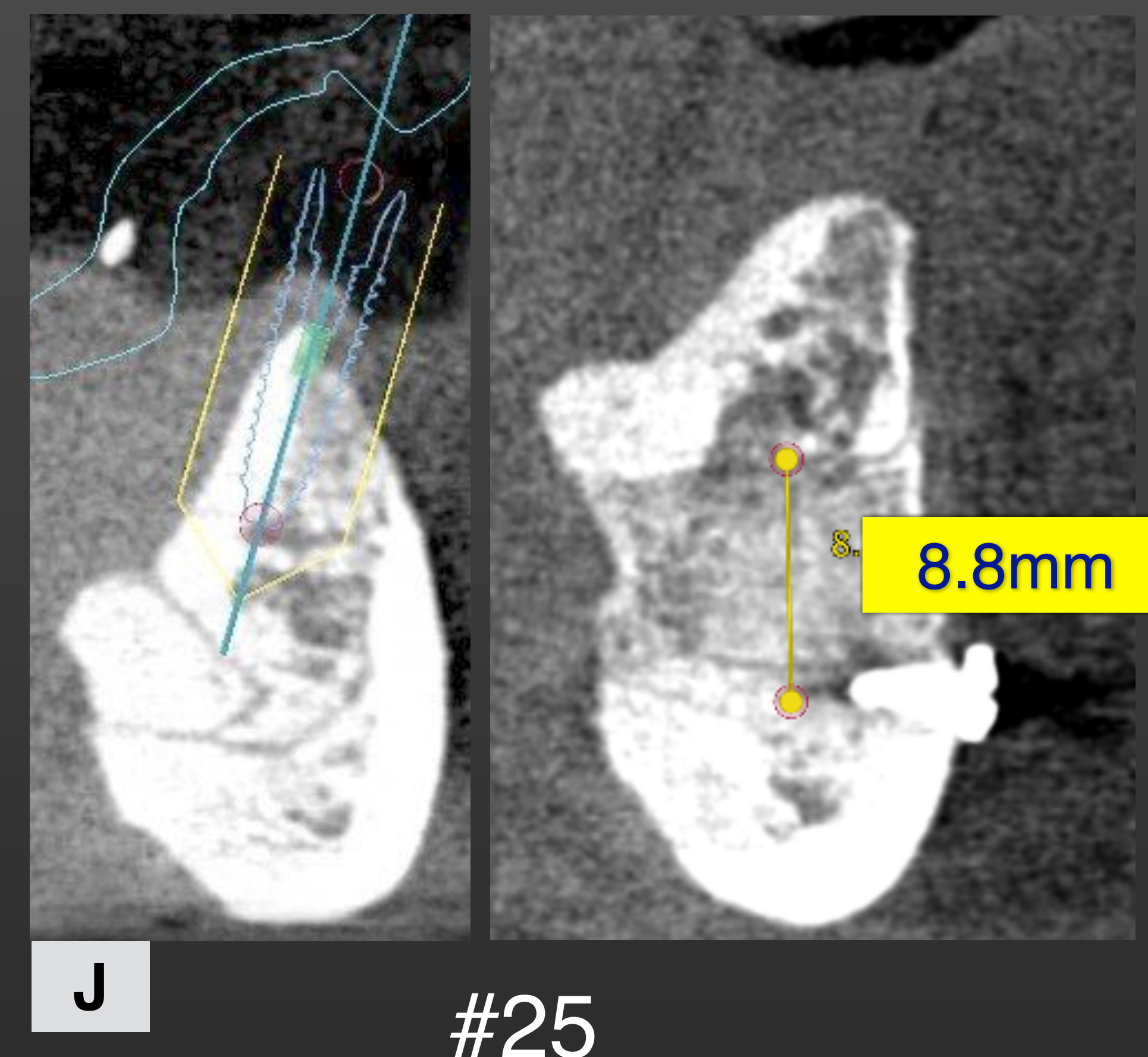
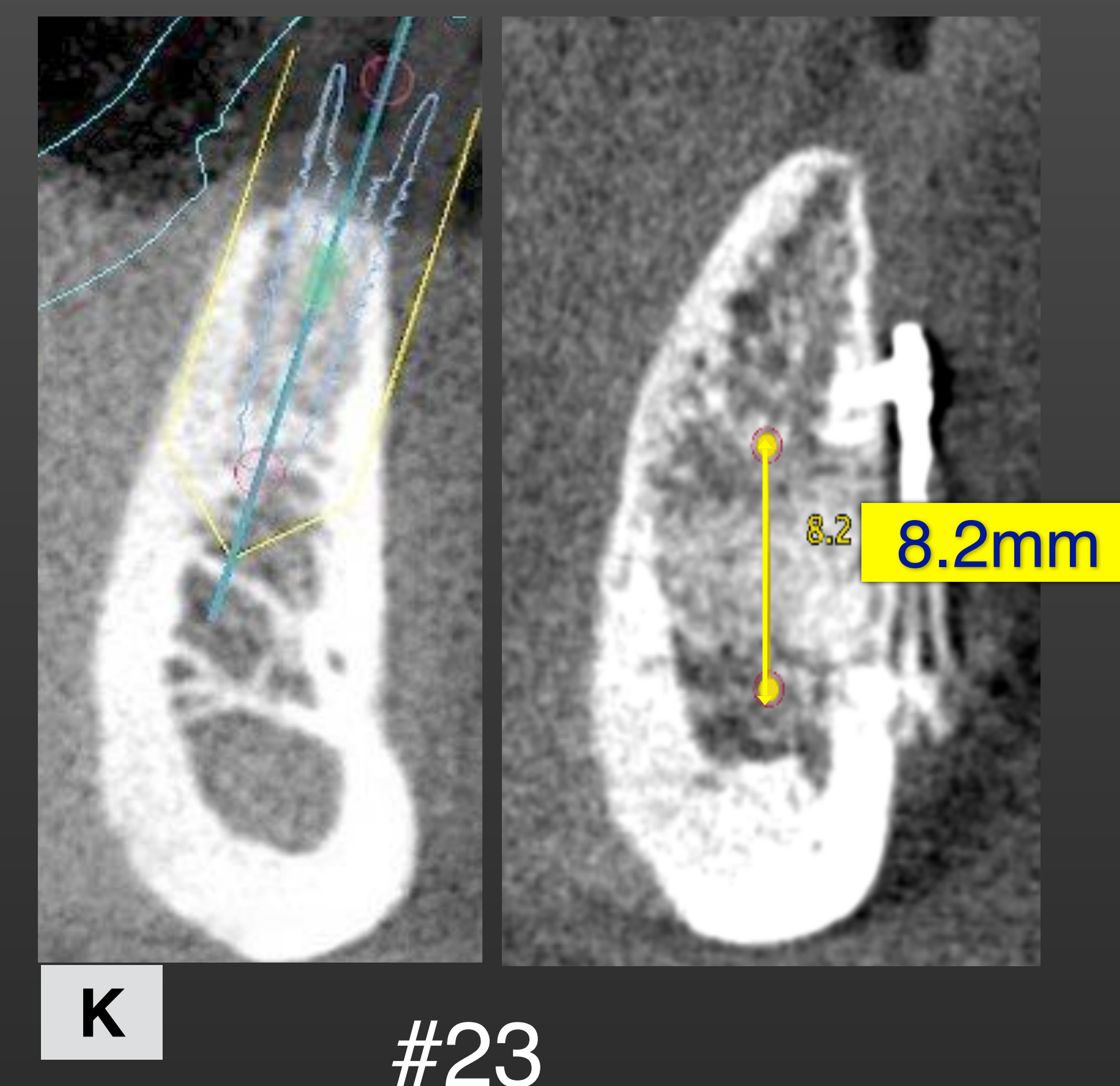


Interpositional Osteotomy

separator for gentle mobilization of the bone fragment to minimize trauma to surrounding tissues, further supporting optimal healing (Fig.H).

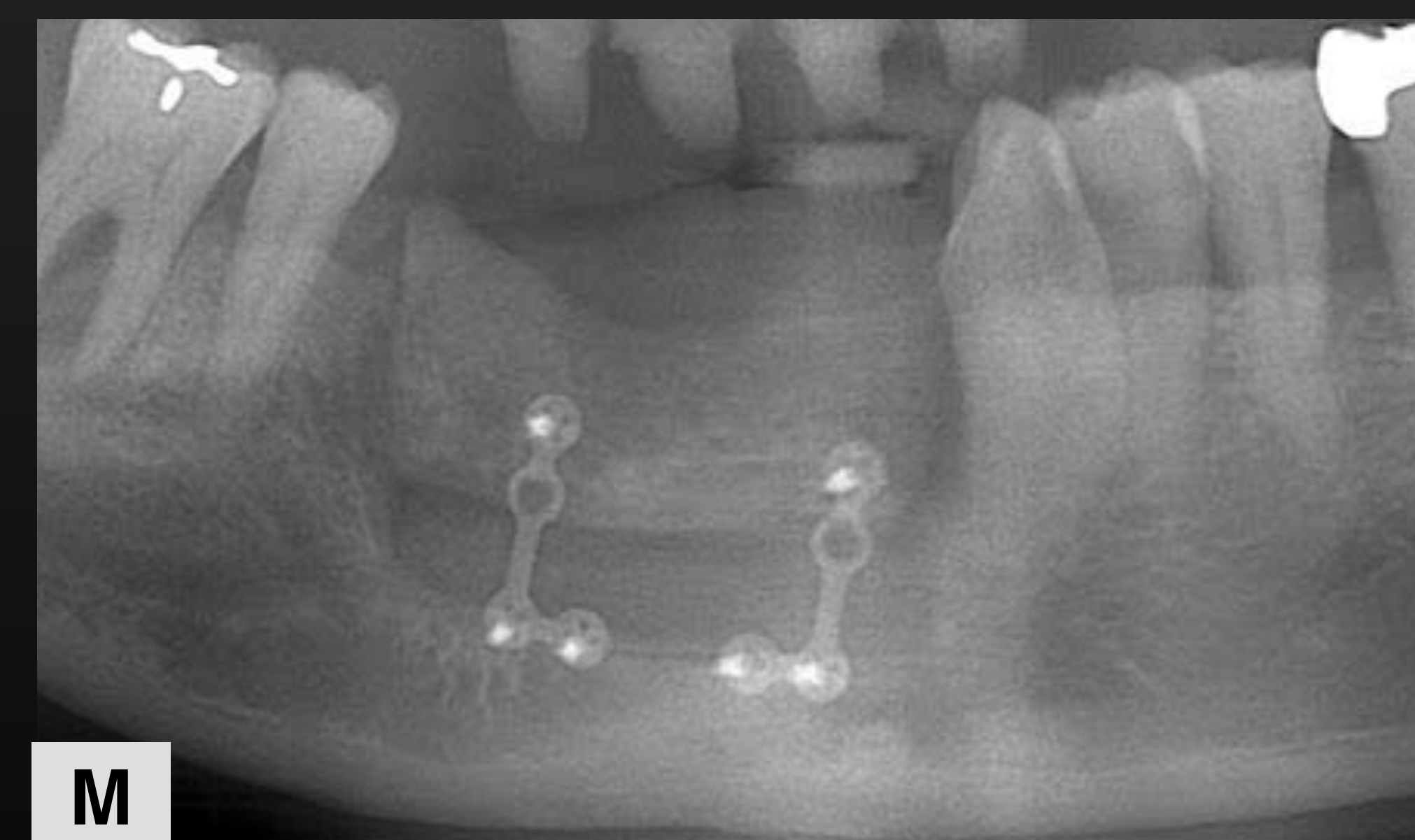
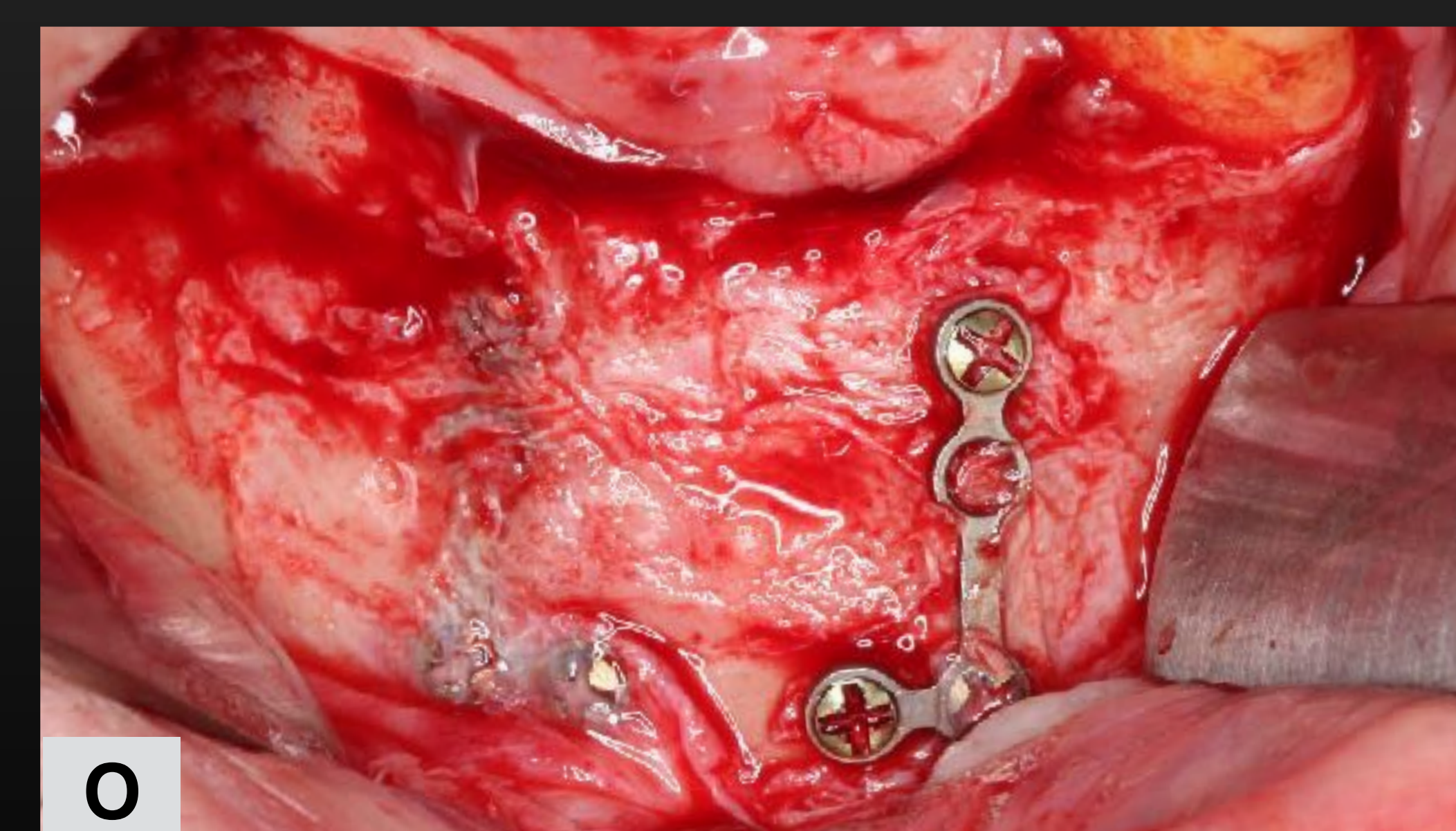
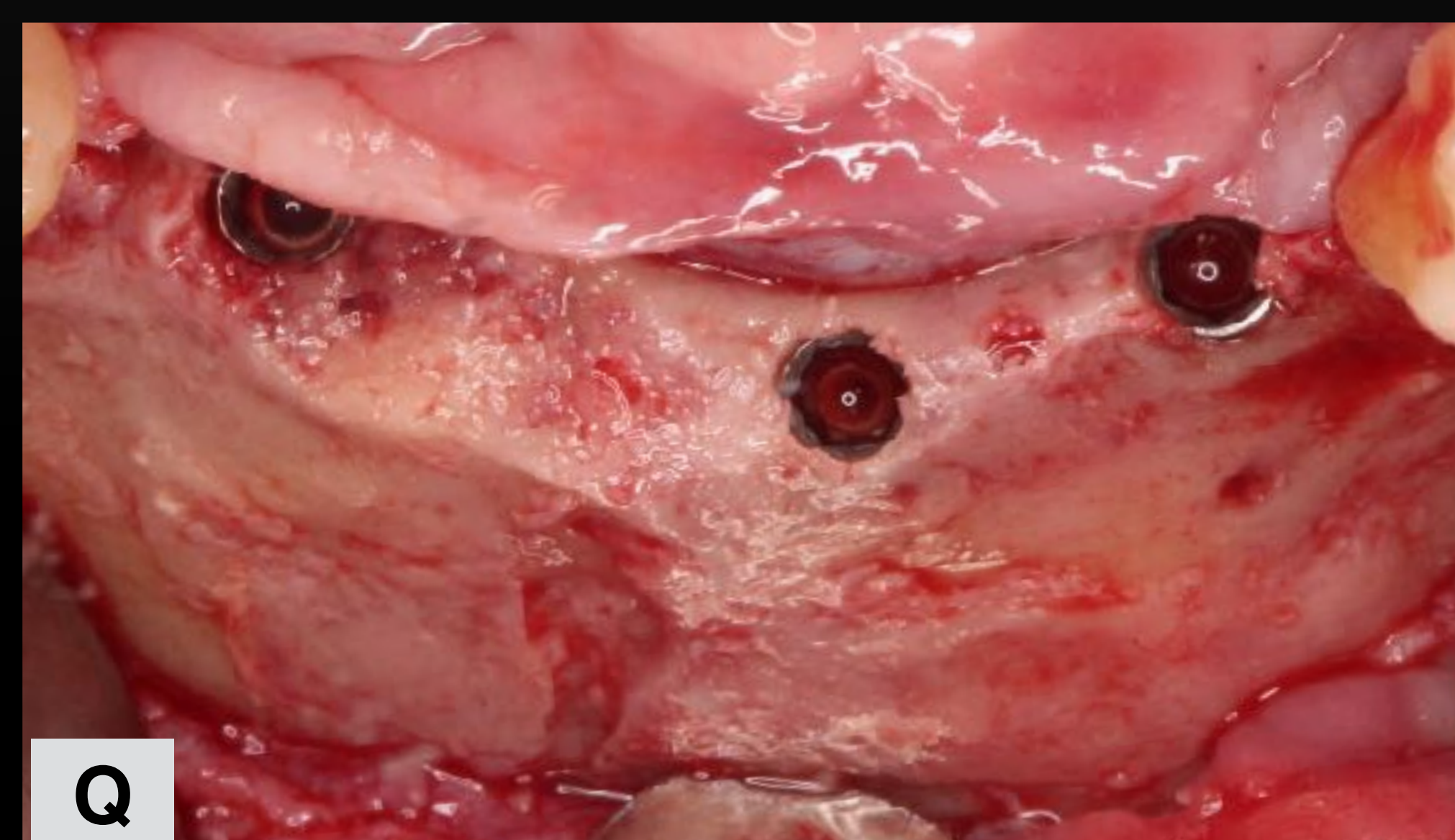
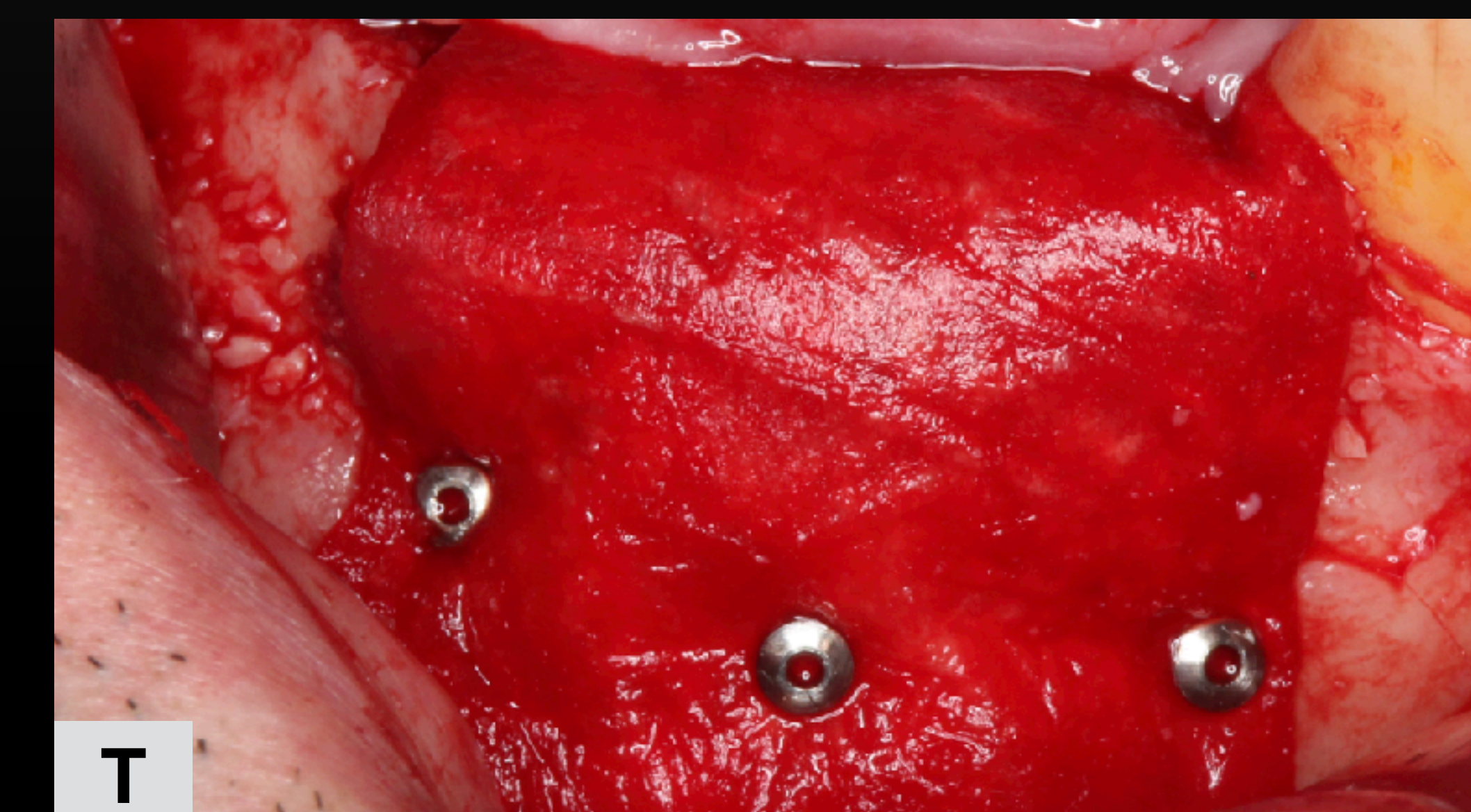
CBCT

Pre Post

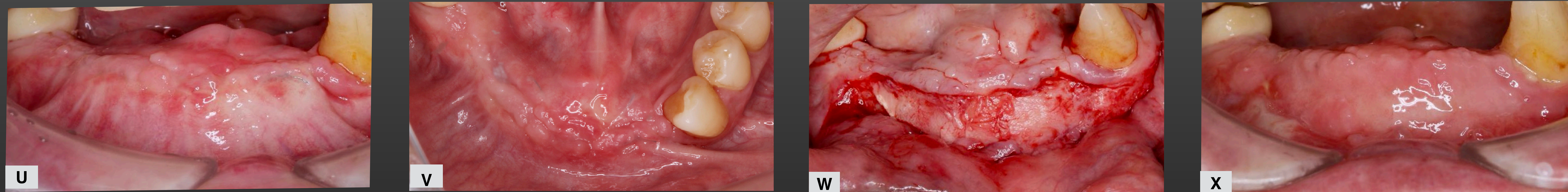


Nine months after surgery, CT imaging confirmed sufficient bone height (Fig.I-K). Three implants were inserted in an ideal position, and simultaneous GBR with a resorbable membrane was performed for horizontal ridge augmentation (Fig.N-P).

Implant placement + GBR

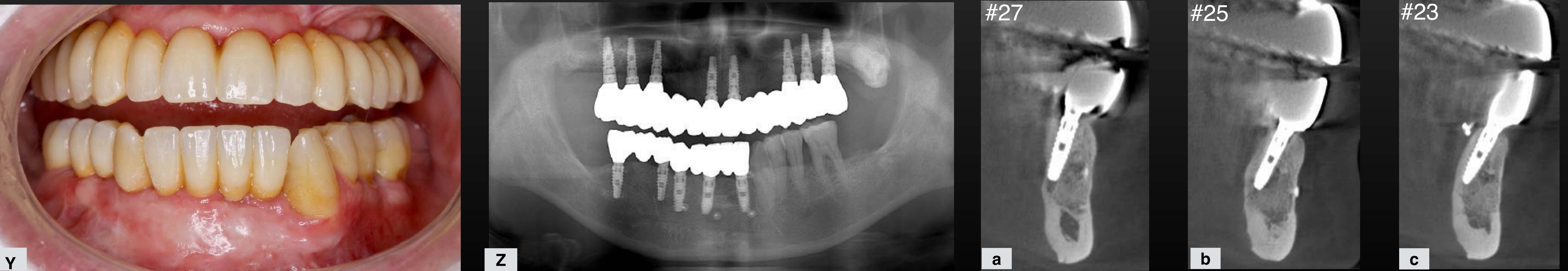


Vestibuloplasty:



Six months after GBR, vestibuloplasty was performed using apically repositioning flap with secondary intention healing (Fig.U-X).

RESULT:



Prosthodontist:
Dr. Masao Yamazaki

At the 2-year follow-up, the patient had stable ridge height with no signs of bone resorption, and the implants remained functional and esthetic outcomes (Fig.Y-c).

DISCUSSION:

Effective ridge augmentation requires careful selection based on procedure type, expected augmentation, limitations, and risks, especially in a failed case. In severely three-dimensional defect like this case, relying solely on GBR may risk complications such as wound dehiscence and membrane exposure. Recovery from such failed GBR is very difficult. To optimize outcomes, it's much better to employ first an interpositional osteotomy or alveolar distraction that much more predictable than GBR for massive vertical bone augmentation.

	GBR	Interpositional osteotomy
Blood supply	surrounding tissues	periosteum
Bone union	slow	rapid
Infection	not resistant	resistant
Bone	20~50%	0%

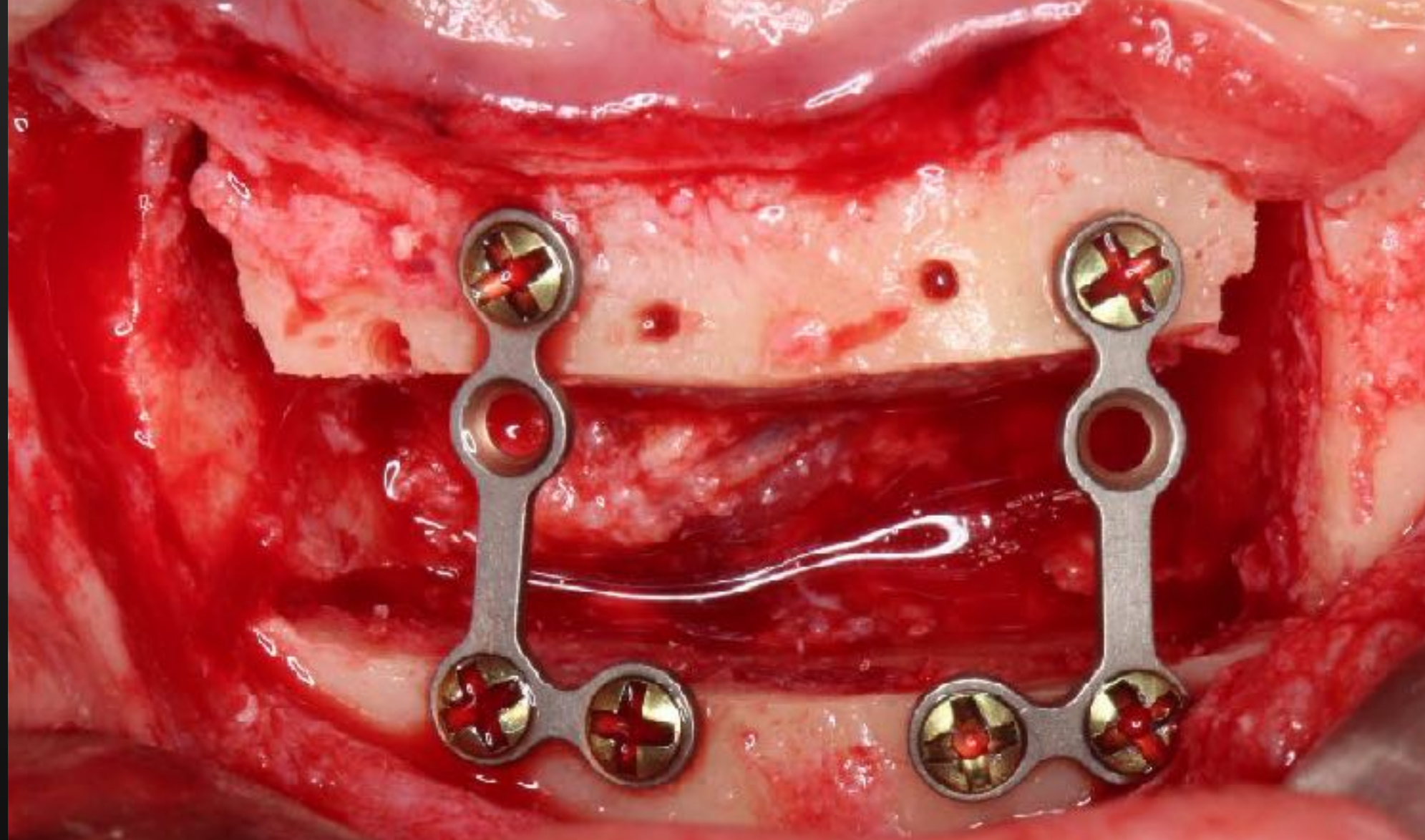
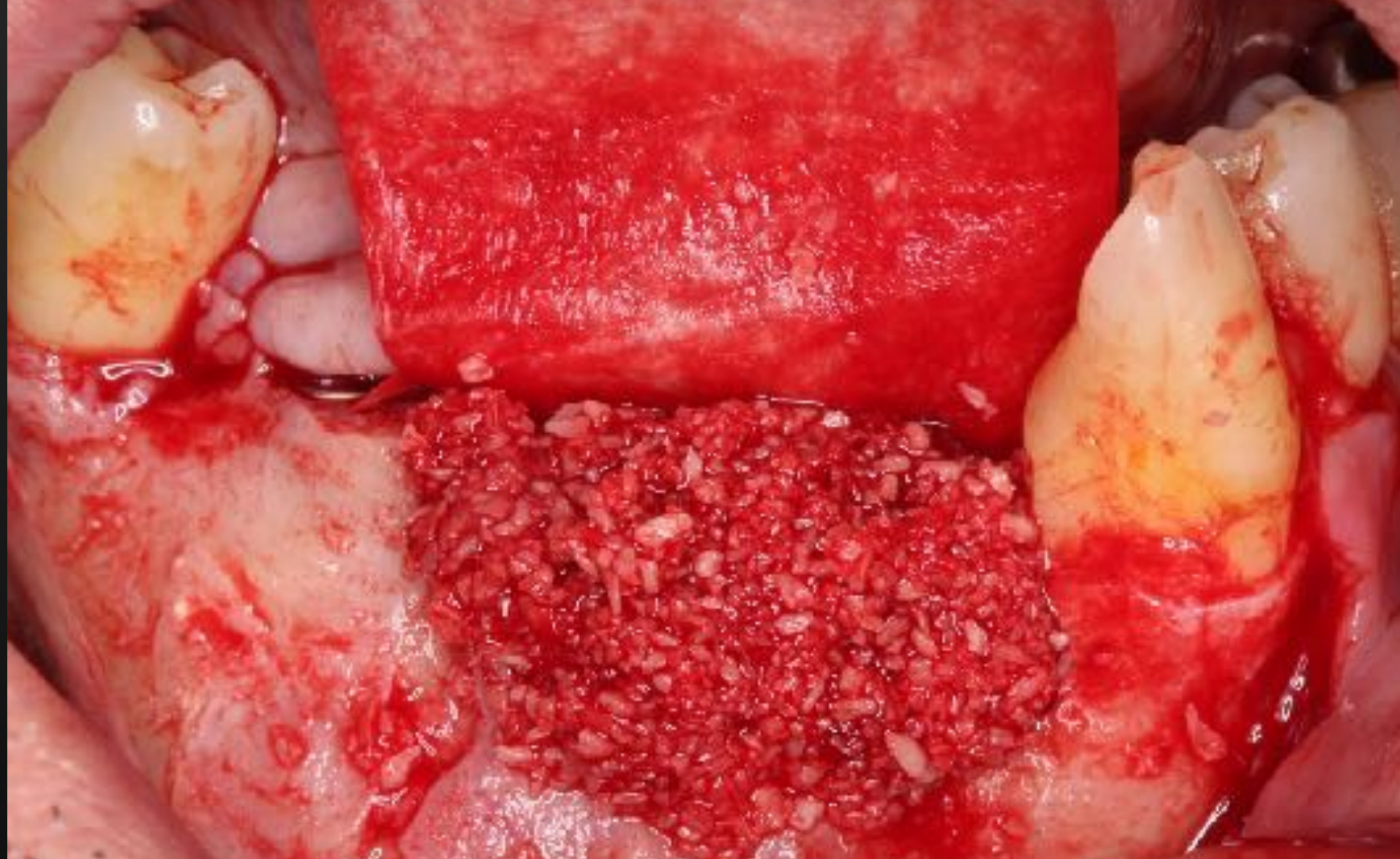
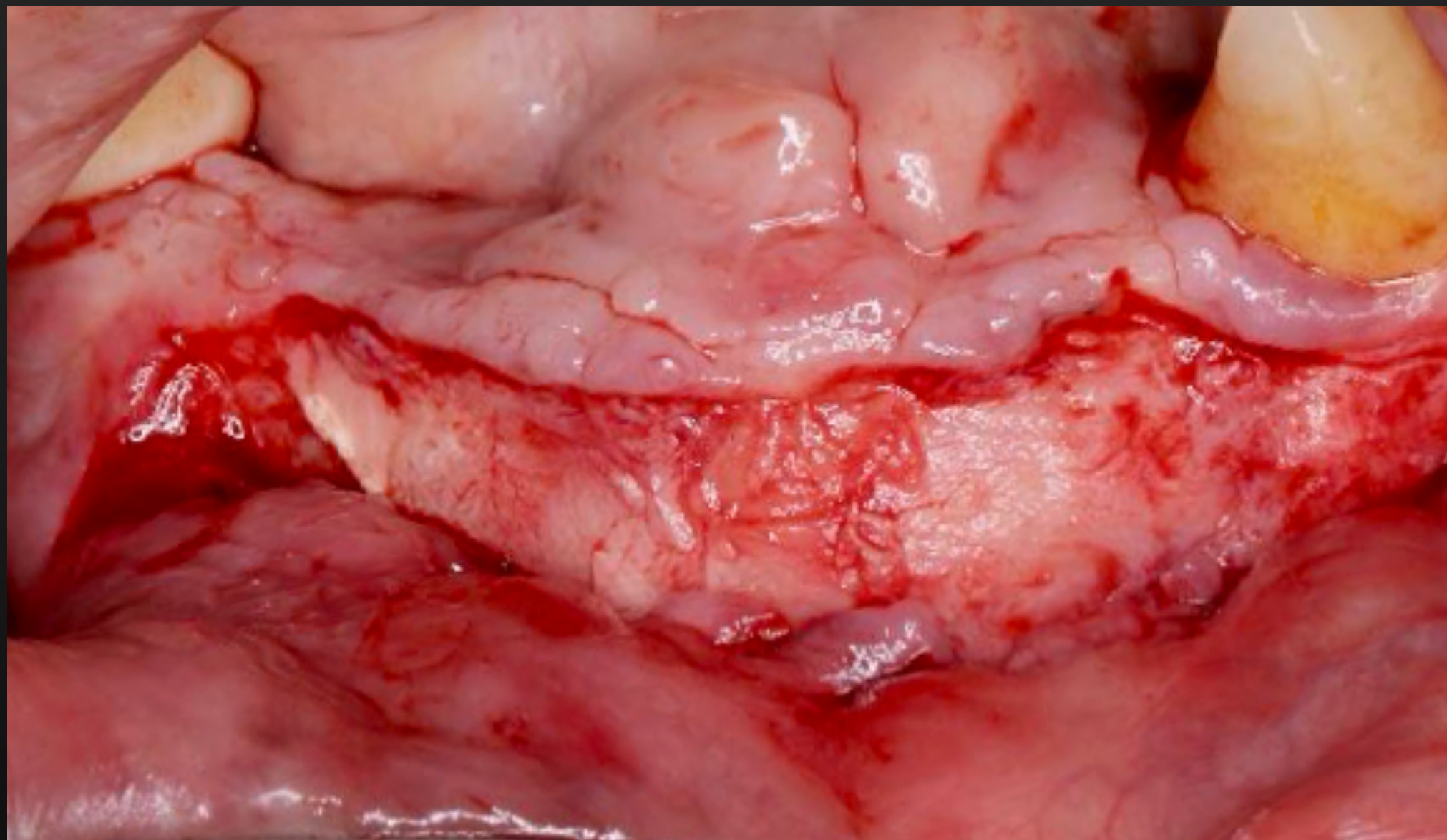
Interpositional osteotomy's

Advantages

- 1. Vascularized bone fragment
- 2. Predictable bone gain
- 3. Lower postoperative maintenance

Disadvantages

- 1. Complexity
- 2. Limited horizontal augmentation



CONCLUSION:

This case reveals interpositional osteotomy is a highly effective method for vertical bone augmentation, particularly in cases of severe alveolar atrophy. With careful patient selection and meticulous surgical technique, this method can provide reliable long-term results even in compromised patients.

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