

Comparison and Clinical Results of Modified Mandibular Ridge Splitting Technique with Simultaneous Implant Placement and Autogenous Chin Graft in the Esthetic Zone

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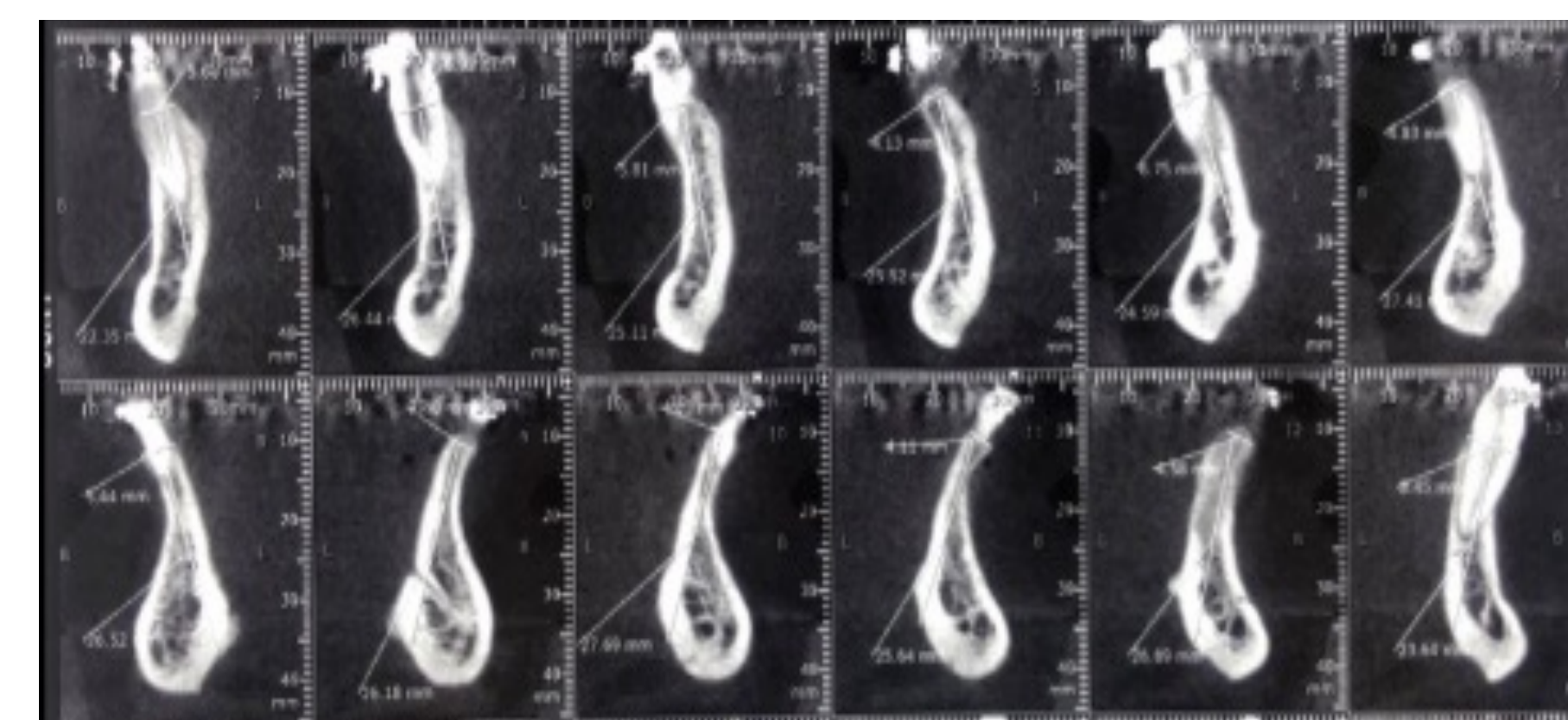
Introduction

The dental implants are excellent options to replace the missing teeth. Post-extraction alveolar bone resorption, however, leads to insufficient ridge width for placing standard-size implants (1). Various techniques could be used to augment the alveolar bone before or simultaneous with implant insertion (2). Guided bone regeneration (GBR), ridge splitting, sinus floor elevation and bone block graft are among efficacious techniques.

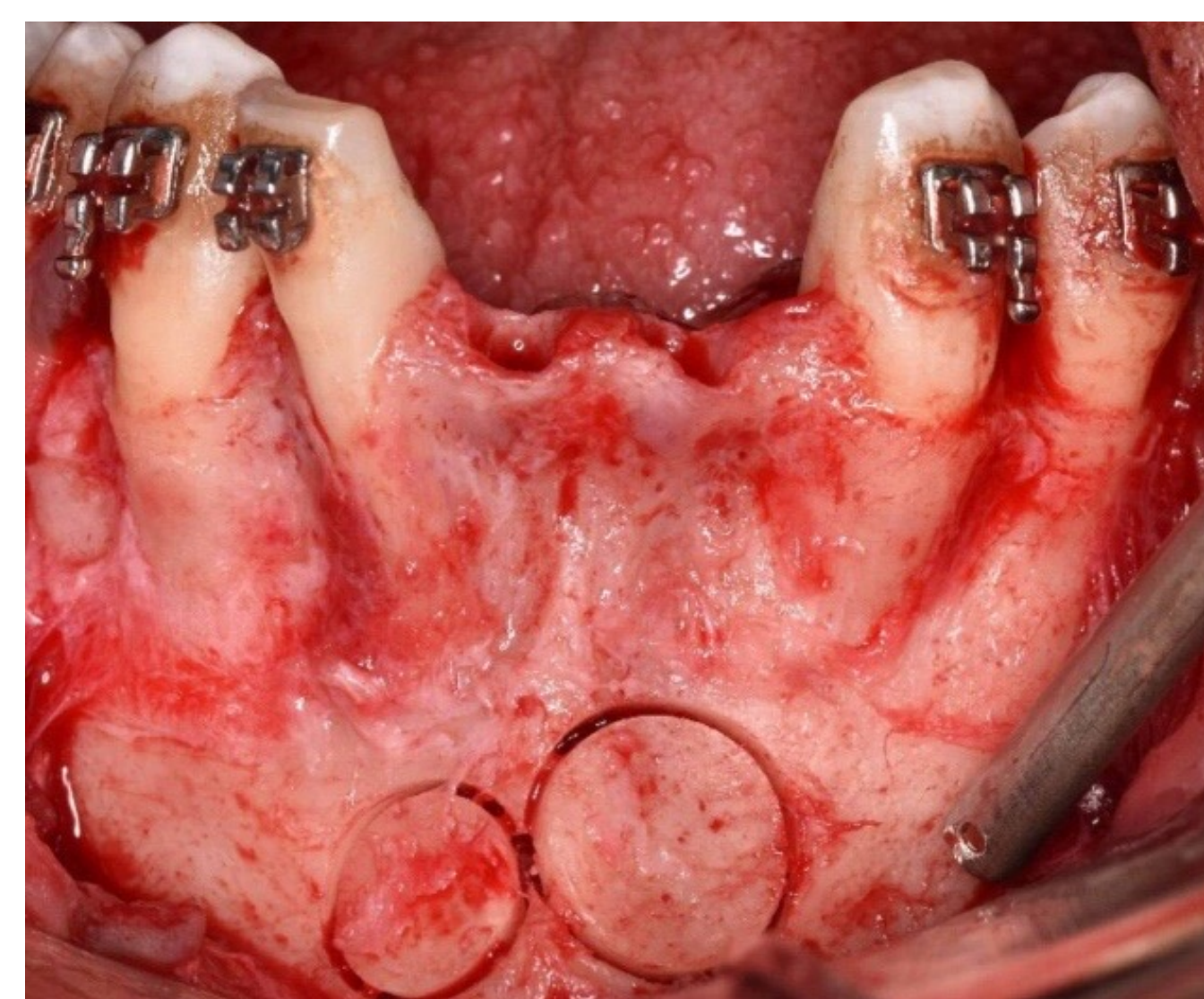
This abstract compares two different approaches for mandibular ridge augmentation.



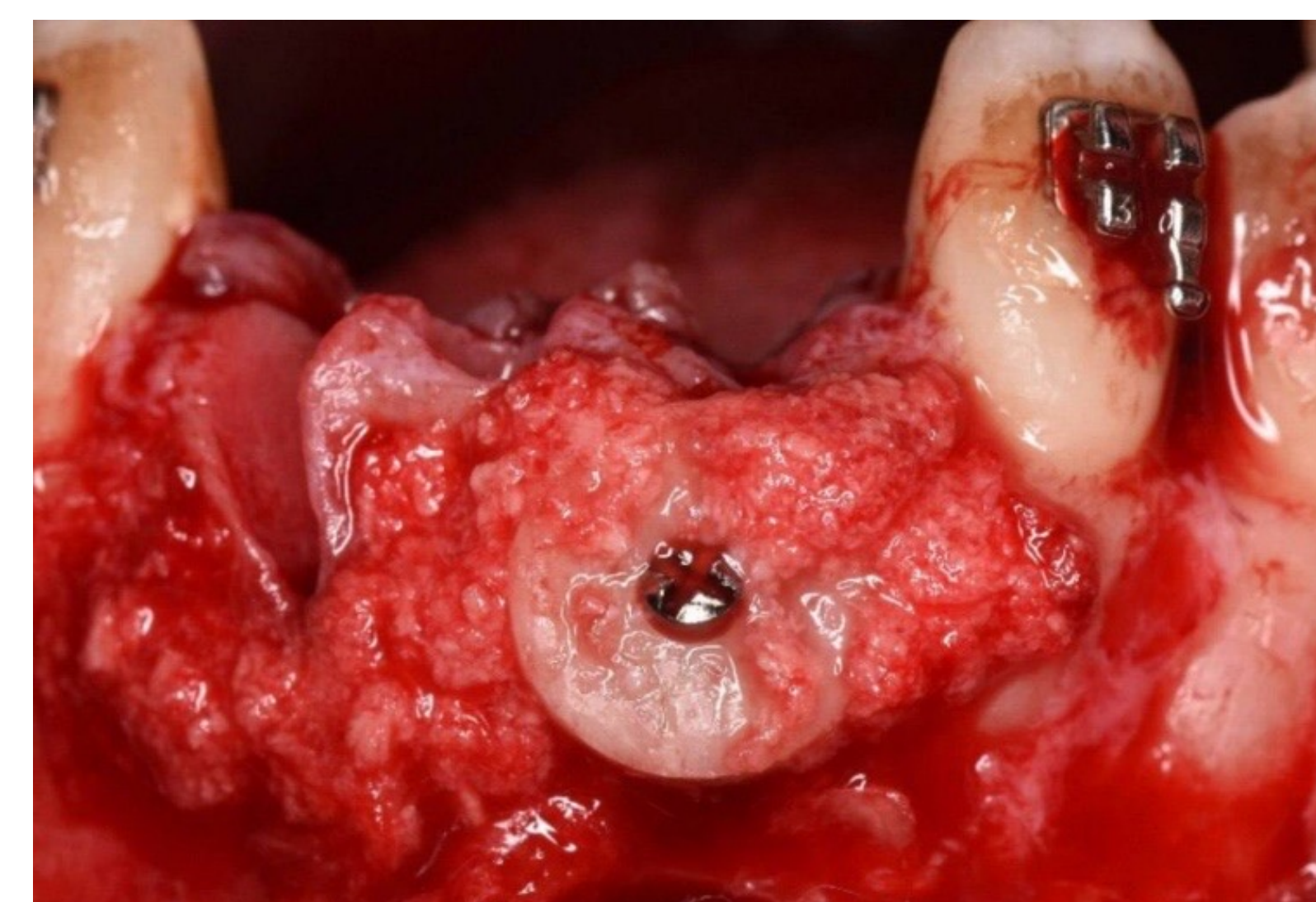
Case 1: Clinical view showing missing of three permanent incisors



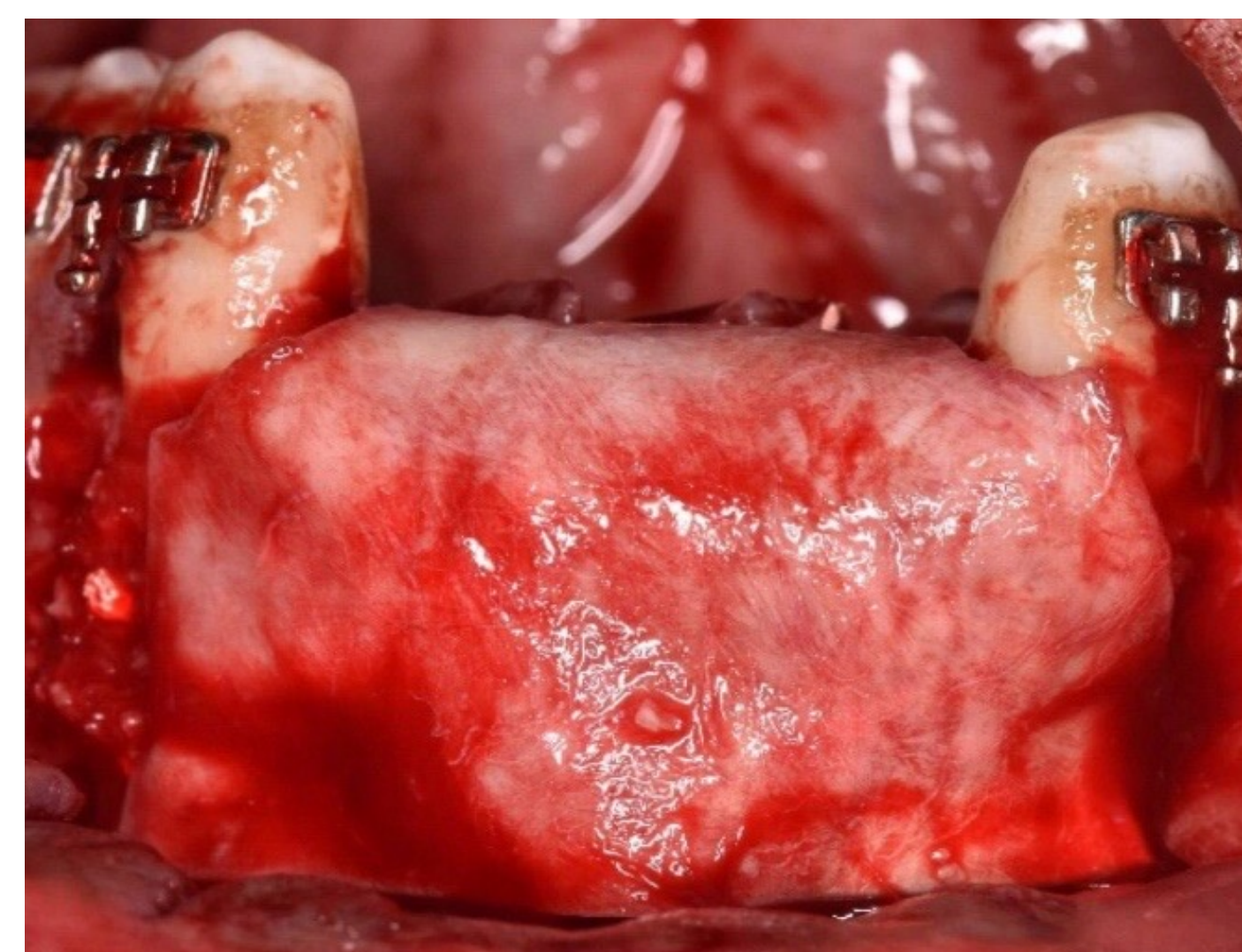
CBCT view of the alveolar bone morphology



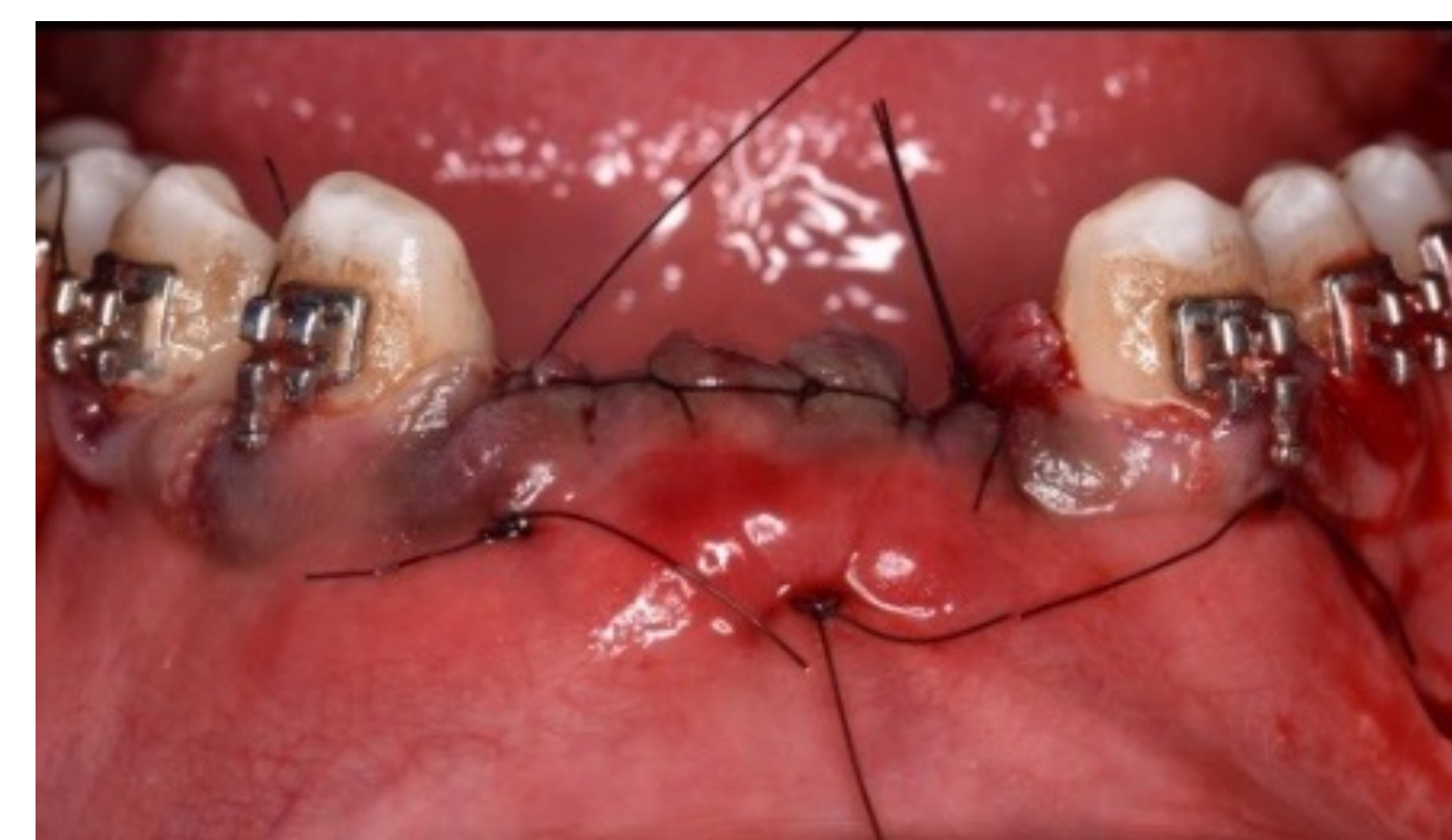
Extracted deciduous teeth; harvesting autogenous bone blocks



Extracted right lateral incisor; One bone block was fixated using screw, and one was milled and placed over the block



Resorbable membrane over the autogenous and particulate xenograft



Tension-free flap closure

Methods

Two patients with deficient bone width in anterior region of mandible are presented.

Case 1 was treated using the staged approach. A 25-year-old male patient with congenital missing of mandibular right and left central incisors and left lateral incisor was referred. The treatment plan included fixed prosthesis supported by two implants in the arear of lateral incisors. The bone morphology, however, was unfavorable in terms of width and contour as there was severe concavity just apical to the crestal area.

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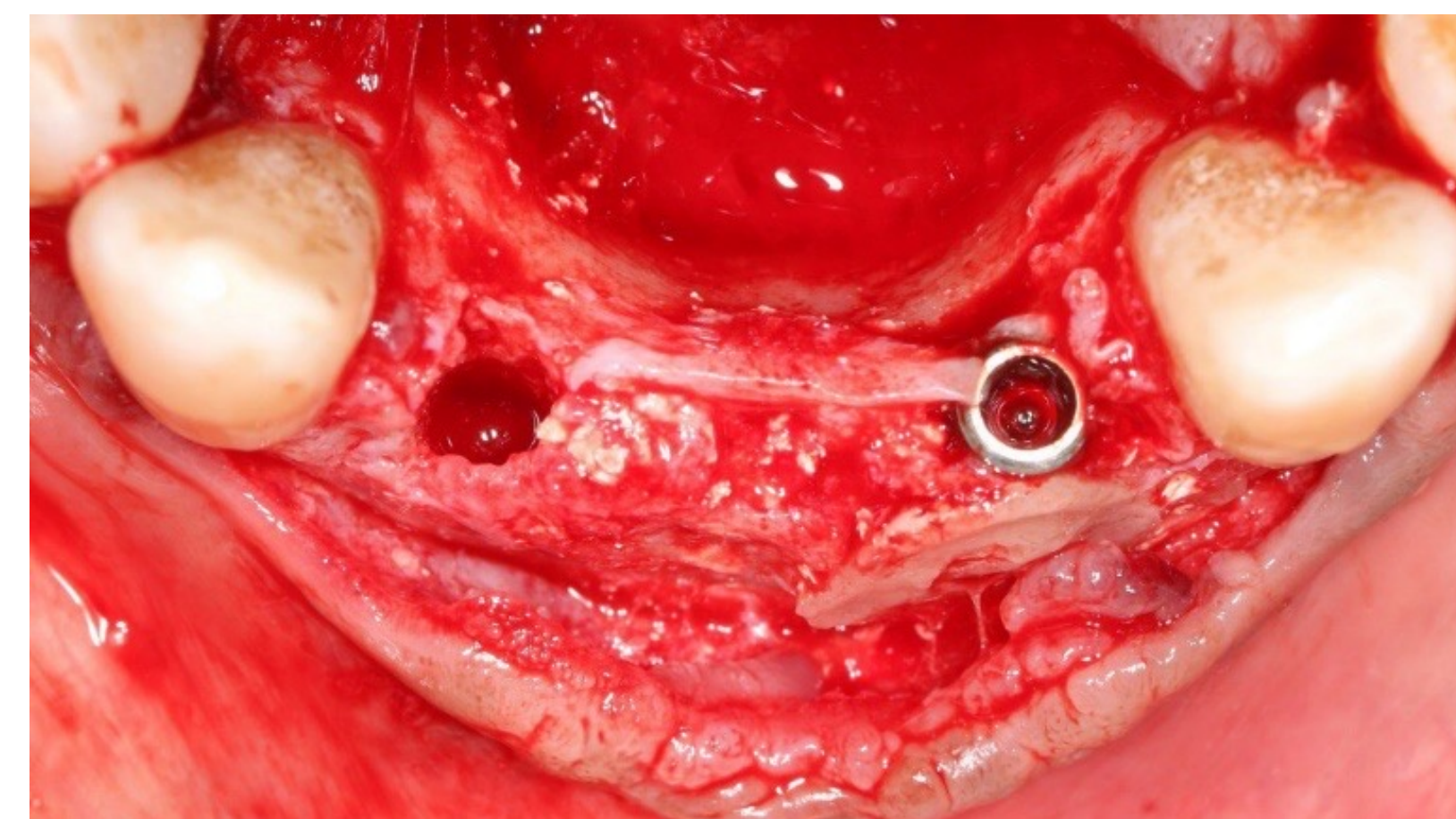
Methods cont'd

An autogenous block bone was harvested from the chin area and was fixated to the alveolar ridge. Around the bone block, a mixture of particulate allograft and xenograft, and a resorbable collagen membrane above them were placed. After 7 months, a second surgery was performed to insert the implants. Surgical exposure of the implants to the oral cavity in conjunction with free gingival was performed 4 months later.

Case 2 was treated using the simultaneous approach. A 23-year-old female patient with missing mandibular right central and left lateral incisors was seeking dental implant treatment.



Healed ridge with adequate width after 7 months



Implants placed in lateral incisors position



GBR over the right implant



Tension-free flap closure



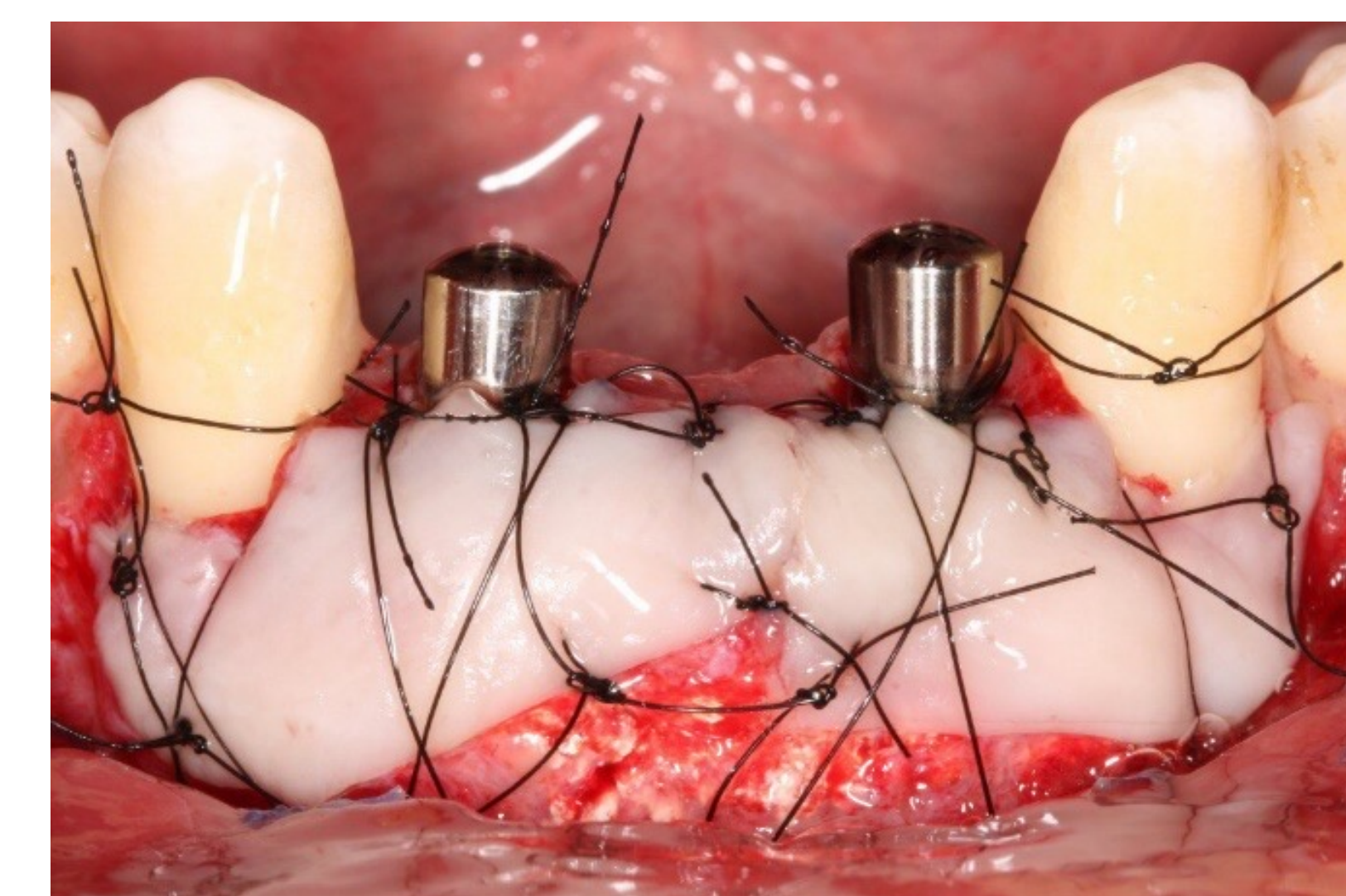
Panoramic view of the inserted implants



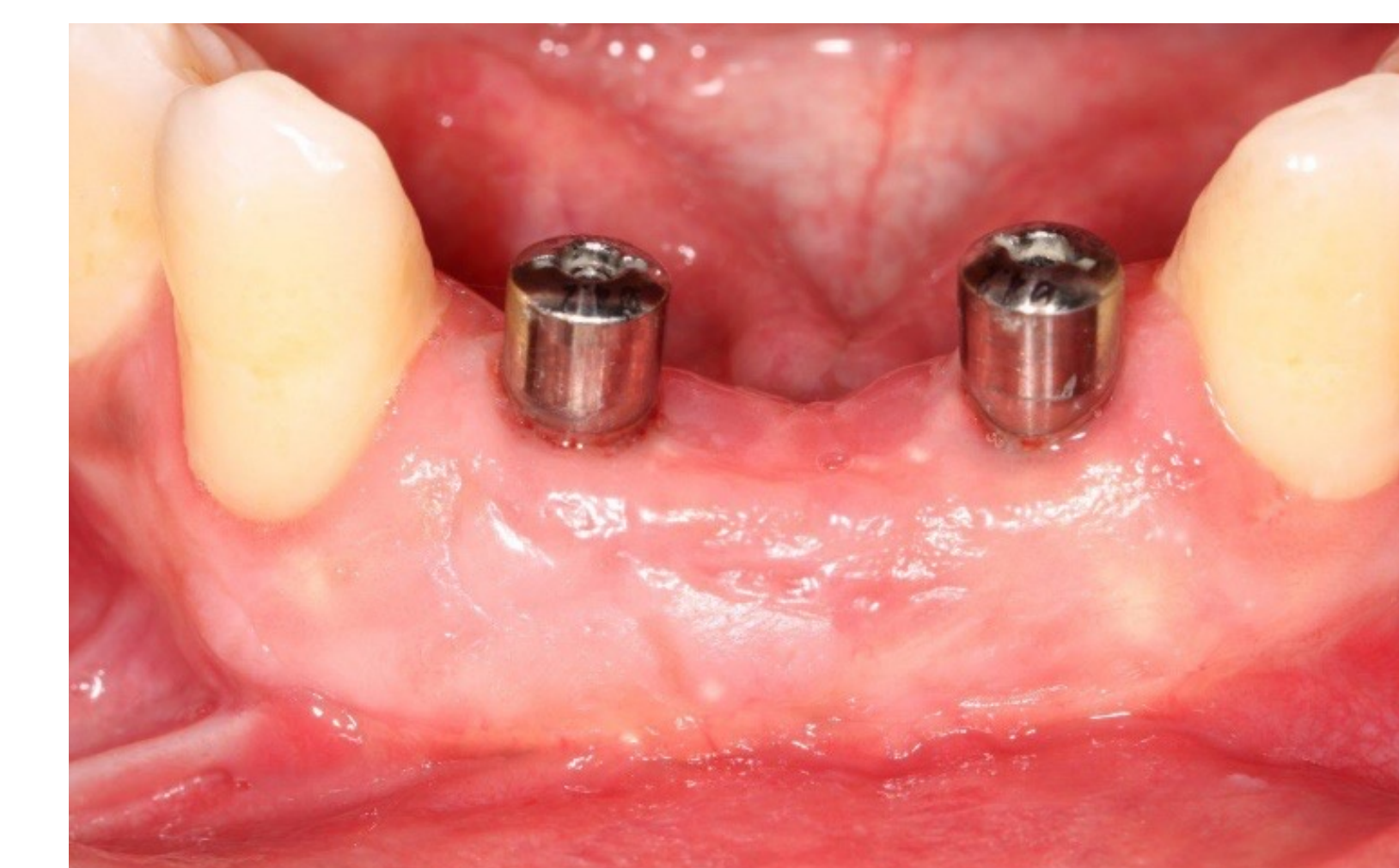
4 months later; mucogingival problem due to the flap advancement



Prepared bed for FGG; Healing abutments placed



Sutured FGG



Healing after 2 months

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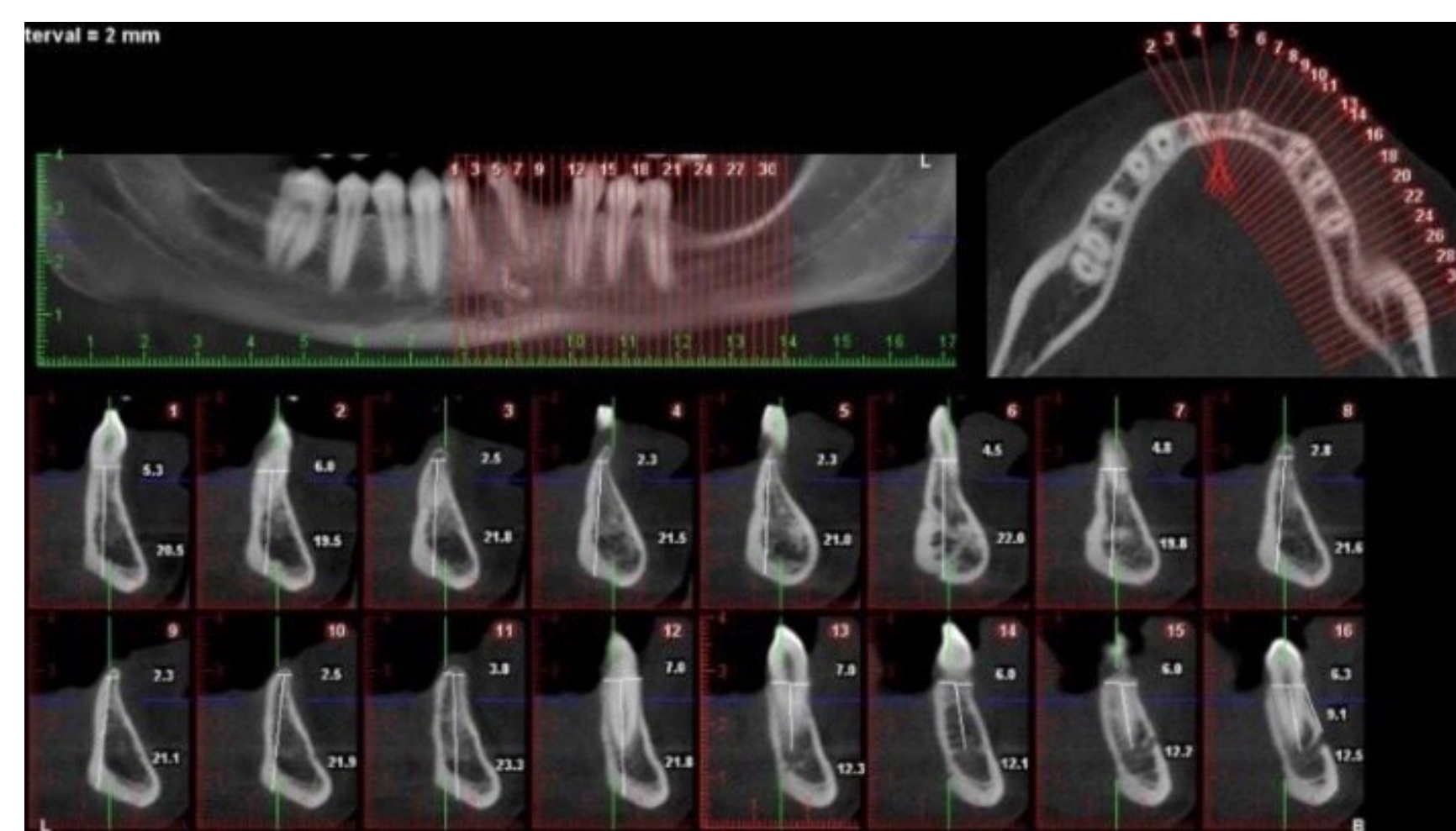
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Methods cont'd

Due to the deficient ridge size observed radiographically and clinically, simultaneous with extraction of the remaining incisors, ridge splitting was performed and implants were placed in position of lateral incisors. For GBR, a block bone harvested from the chin area was milled, and mixed with xenograft. A resorbable membrane covered the area.



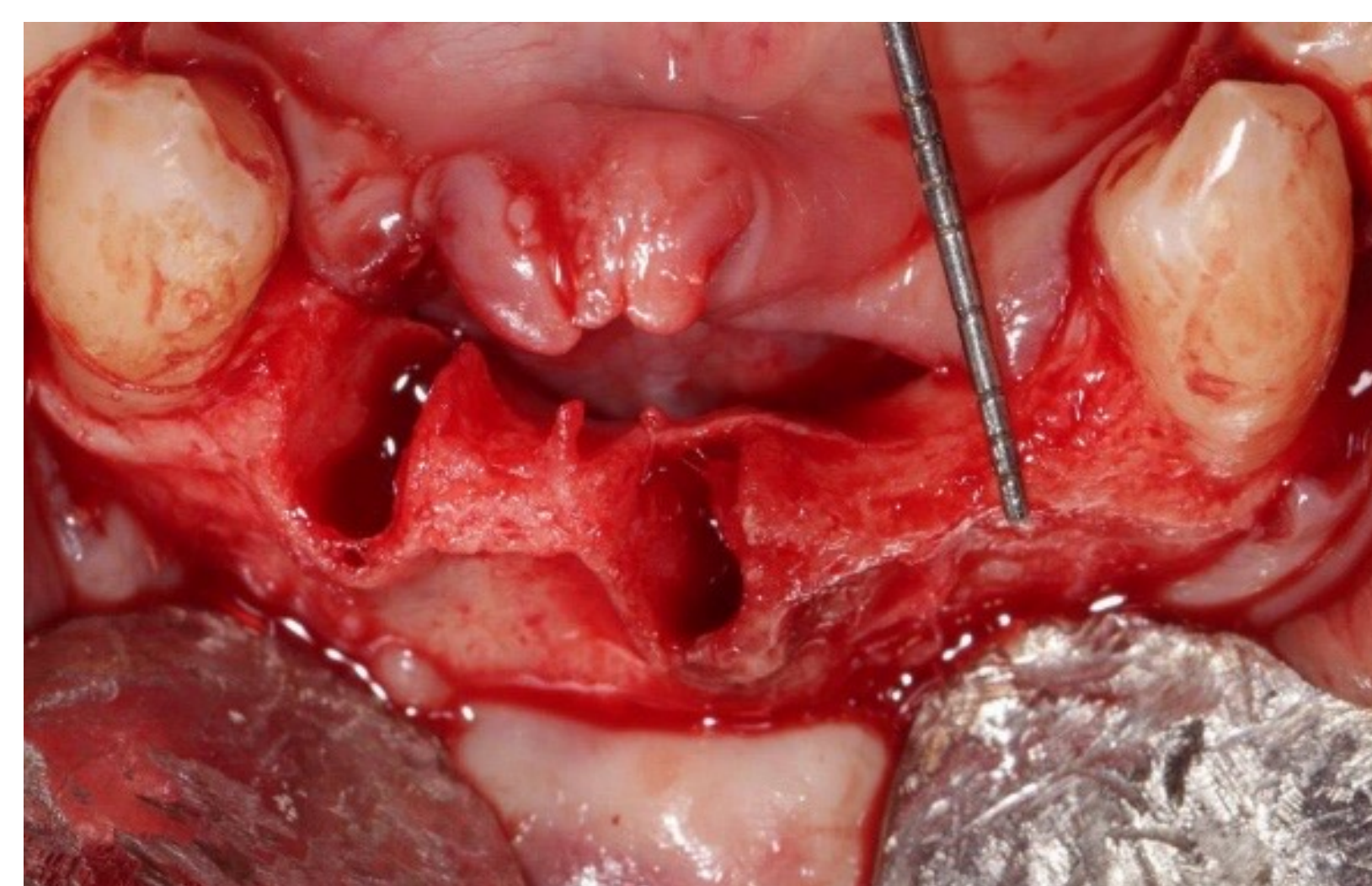
Case 2: Clinical view of the missing incisors



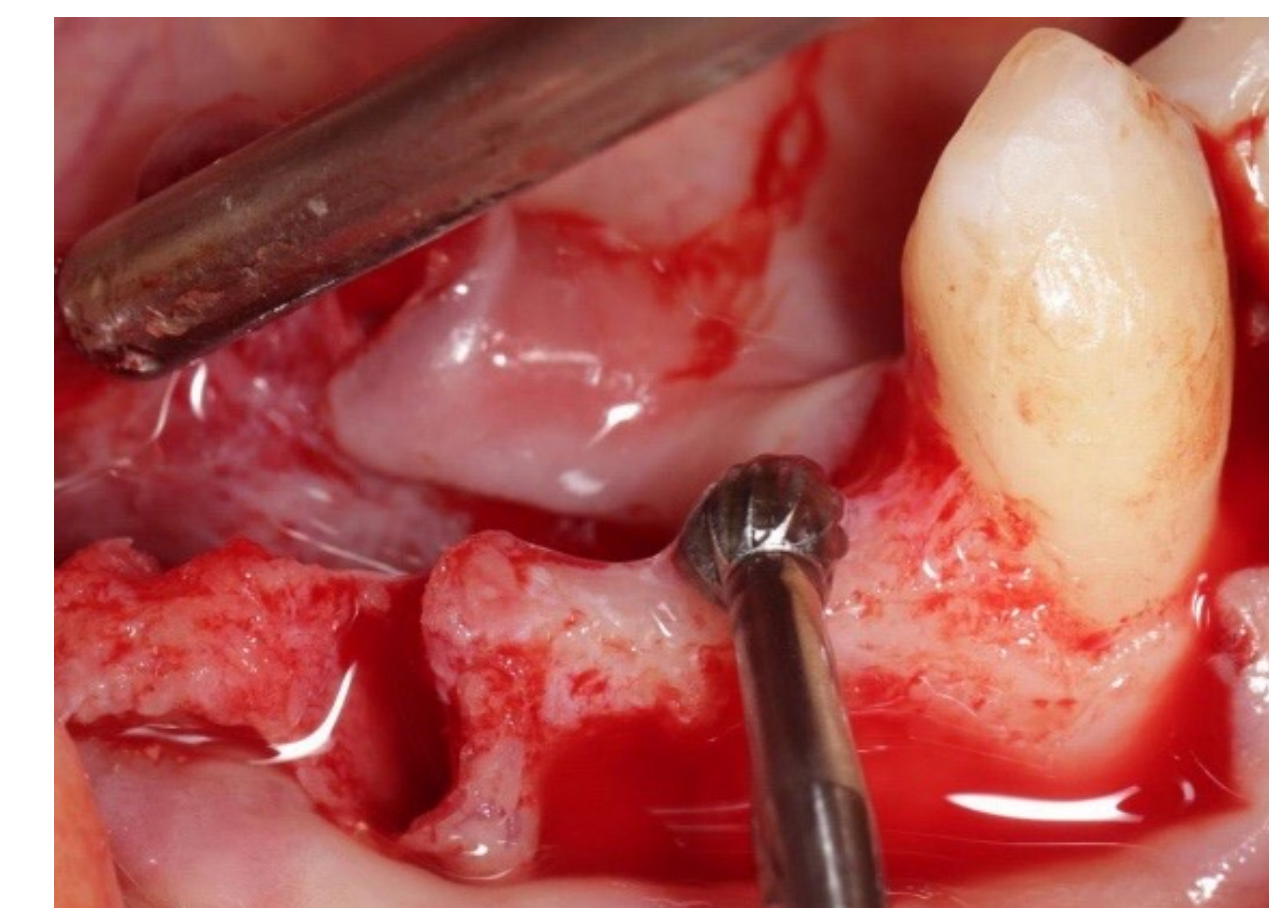
CBCT reveals narrow triangular ridge shape

Results

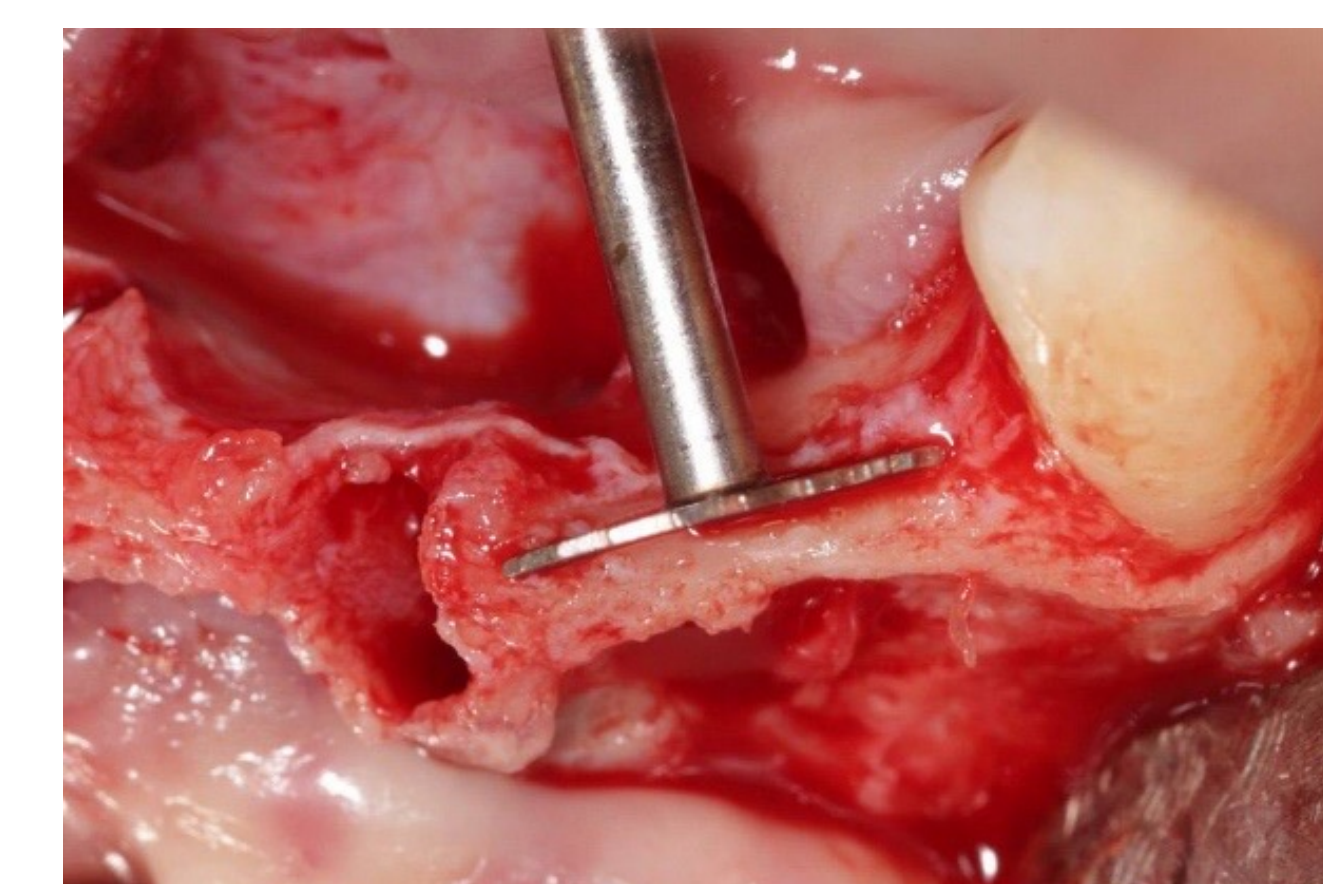
Healing following bone graft procedures and implant placement were uneventful in both cases. Case 2 benefited from shortened treatment time, while case 1 needed extensive bone augmentation and therefore the more predictable staged approach was selected for him.



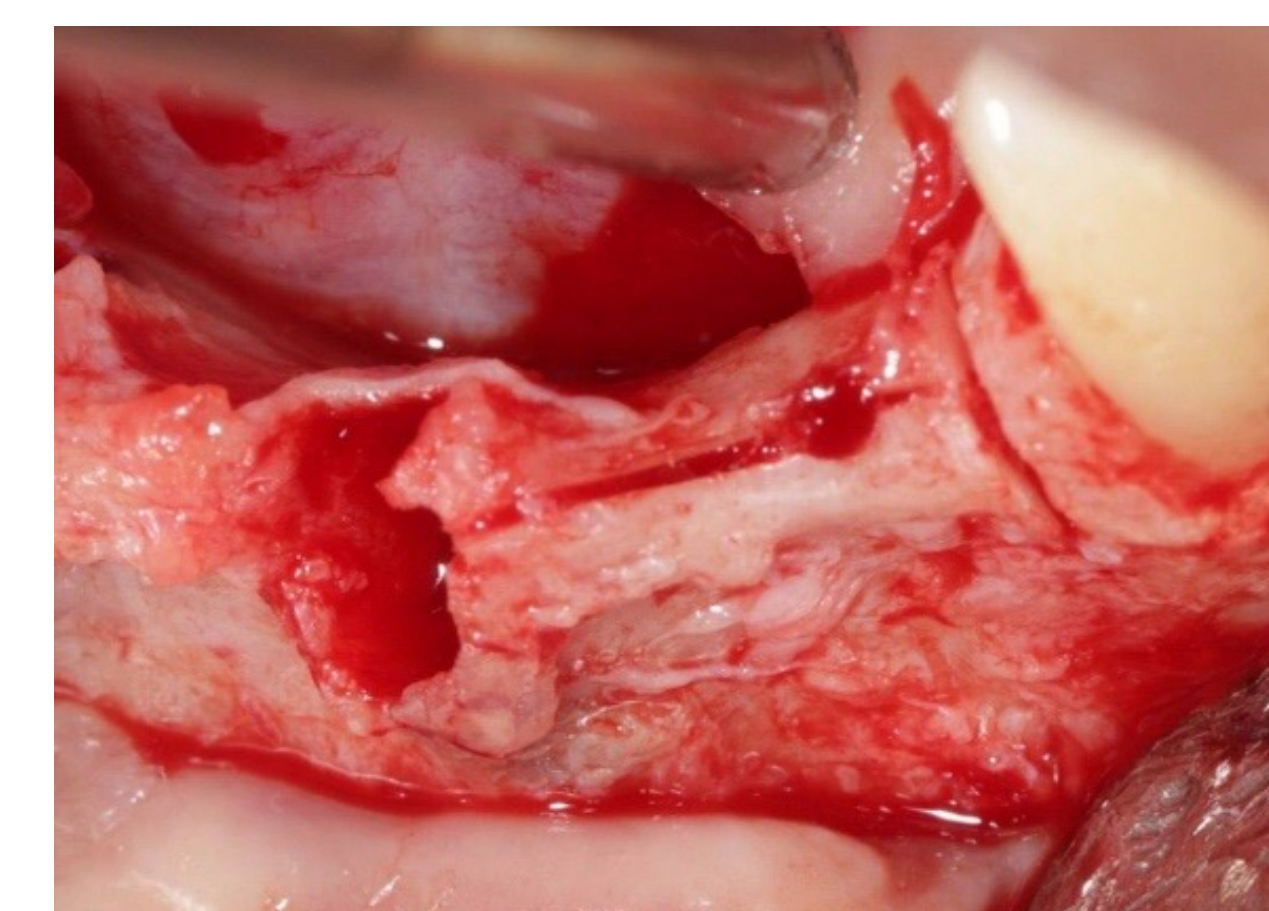
Remained incisors extracted;
Less than 3 mm ridge width



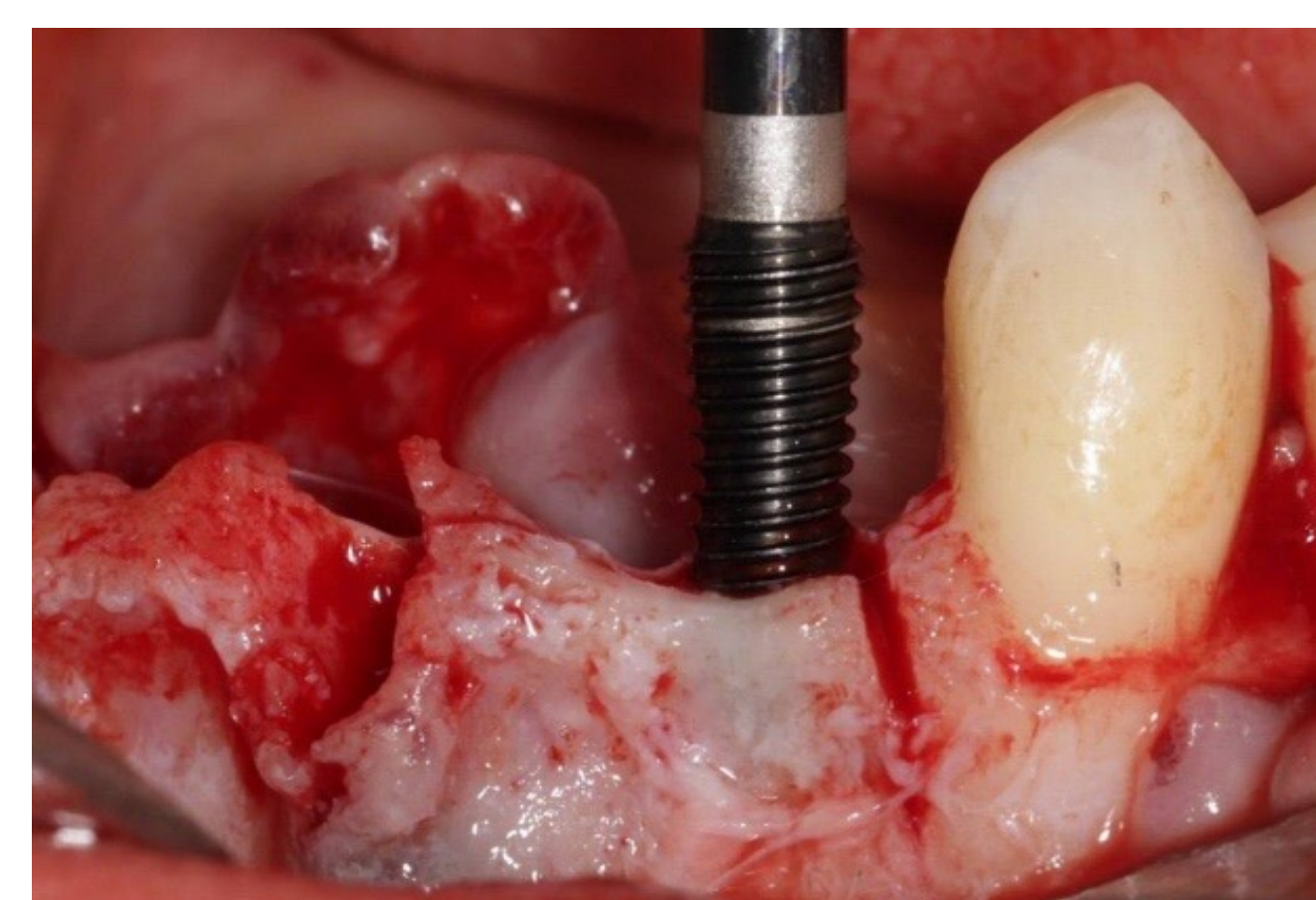
Flattening the ridge before splitting
for left lateral incisor implant site



Flattening the ridge before splitting for
left lateral incisor implant site



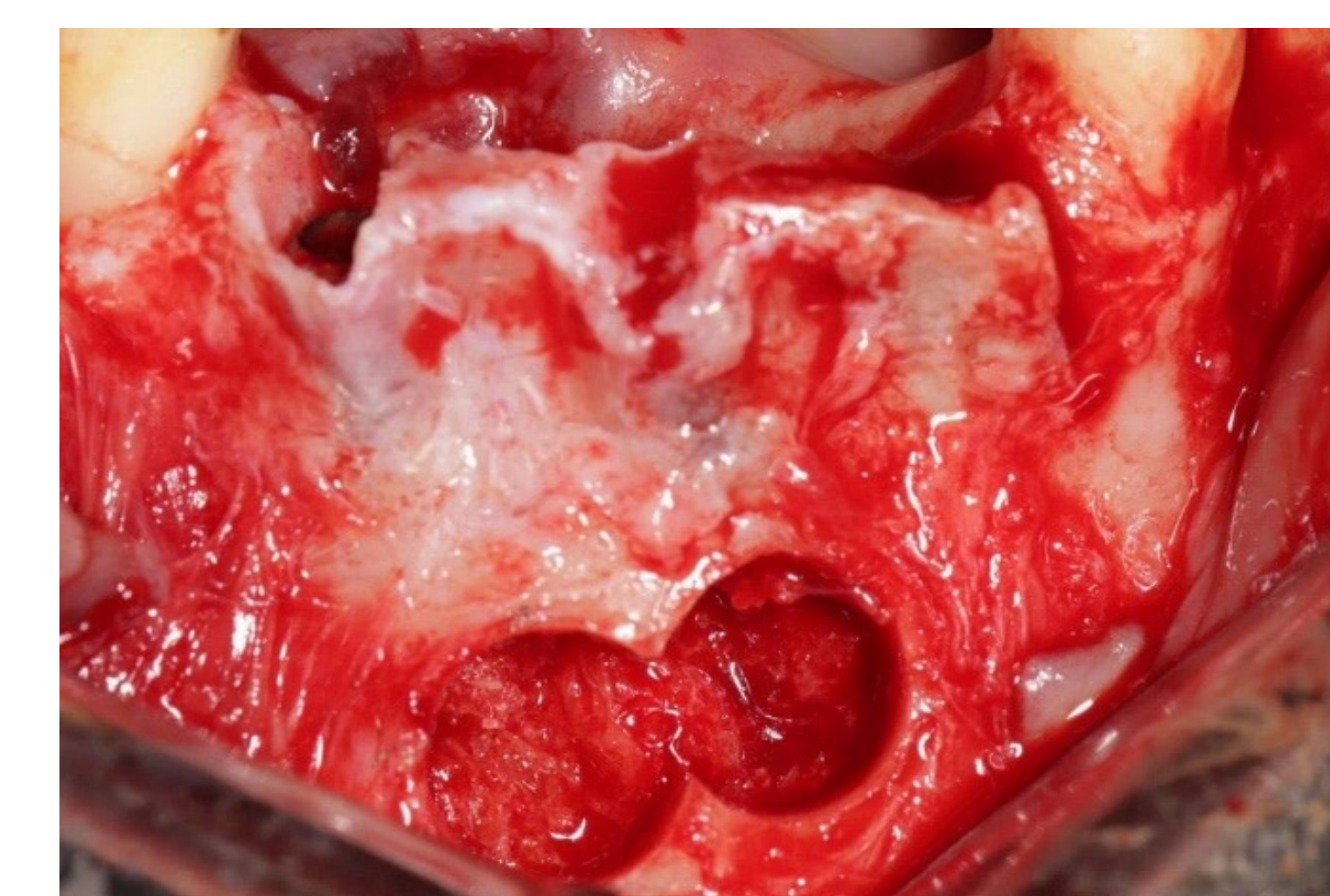
Horizontal and vertical incisions



Expanding the osteotomy site



Two implants inserted in lateral incisors
positions



Flattened crestal bone; Autogenous bone
harvested using trephine bur

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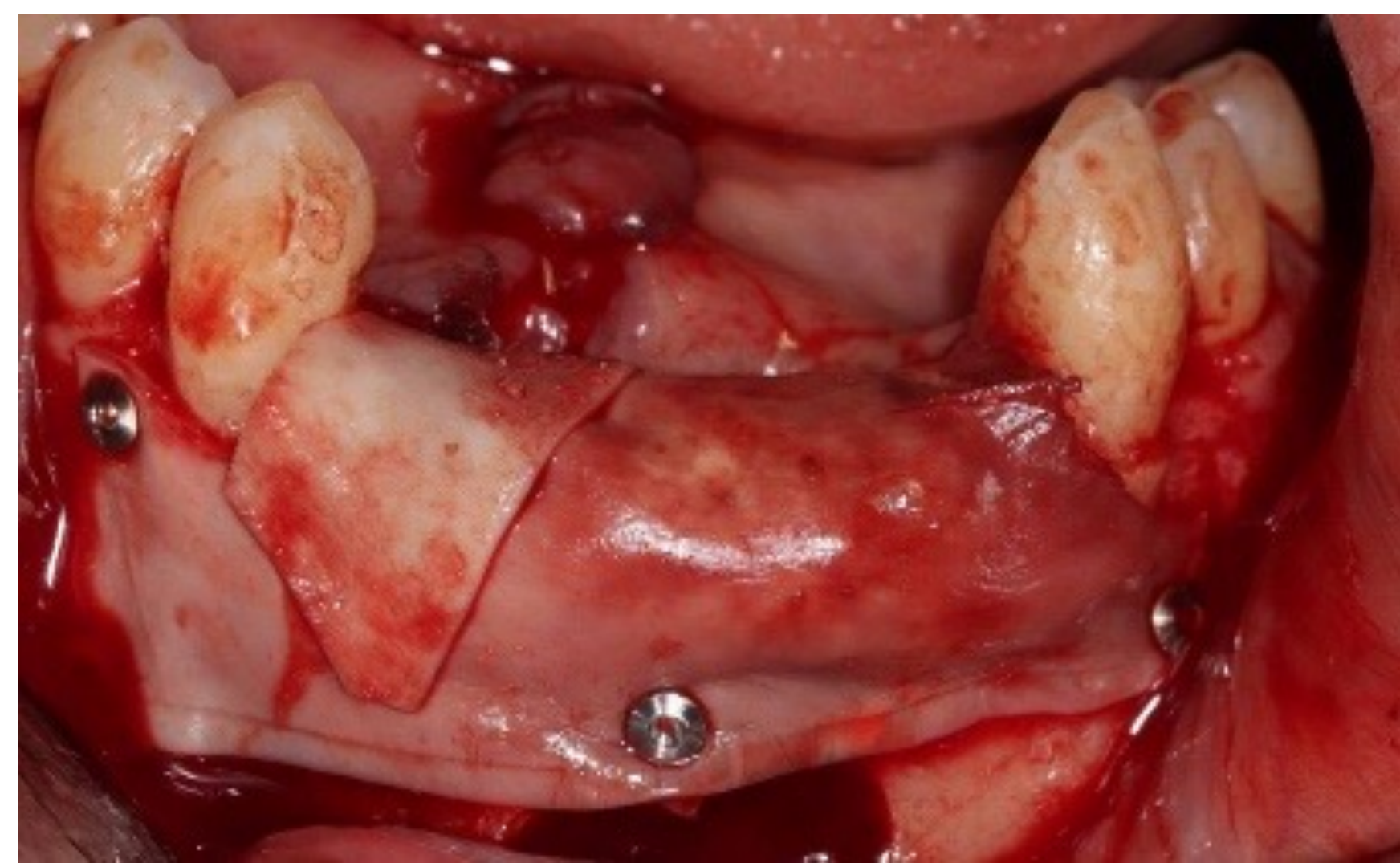
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Conclusion

If the alveolar ridge contour and bone elasticity are appropriate, ridge splitting simultaneous with placement of a standard diameter implant could be performed. The extent of the graft needed and the clinician's expertise is the key factor for this technique.



Milled autogenous bone and particulate xenograft placed over the implants



Resorbable membrane fixated in the area



Resorbable membrane fixated in the area



Healed ridge after 4 months



Panoramic view of the inserted implants

Reference

1. Atieh MA, Alsabeeha NH, Payne AG, Ali S, Clovis Jr M, Esposito M. Interventions for replacing missing teeth: alveolar ridge preservation techniques for dental implant site development. Cochrane Database of Systematic Reviews. 2021(4).
2. Buser D, Sennerby L, De Bruyn H. Modern implant dentistry based on osseointegration: 50 years of progress, current trends and open questions. Periodontology 2000. 2017;73(1):7-21.

