



Horizontal Ridge Augmentation Using Sticky Bone Covered With Platelet Rich Fibrin Membrane Versus Guided Bone Regeneration Using Native Collagen Membrane in Anterior Maxilla

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Introduction: Several techniques have been proposed to reconstruct deficient alveolar ridges. Guided Bone Regeneration (GBR) using several barriers with different grafting mixtures have been reported. On the other hand, sticky bone graft can be used as an alternative due to the strong interconnection of the bone particulate by fibrin network. **The aim of this study** was to evaluate the horizontal bone gain achieved by sticky bone graft covered by PRF membrane versus guided bone regeneration (GBR) using a native collagen membrane with a 1:1 mixture of autogenous and anorganic bovine bone minerals (sausage technique).

Methods: A total of 28 patients presenting with Cawood Class IV ridge classification (2-4mm residual alveolar width) were included in the study. 14 patients received horizontal augmentation using sticky bone prepared from a 1:1 mixture of autogenous and anorganic bovine bone minerals covered by a PRF membrane. The other 14 patients received horizontal augmentation using guided bone regeneration by a mixture of 1:1 autogenous and anorganic bovine bone minerals covered by a native collagen membrane (sausage technique). CBCT scans were taken immediately postoperative and after 6 months to measure the horizontal bone gain in both groups.

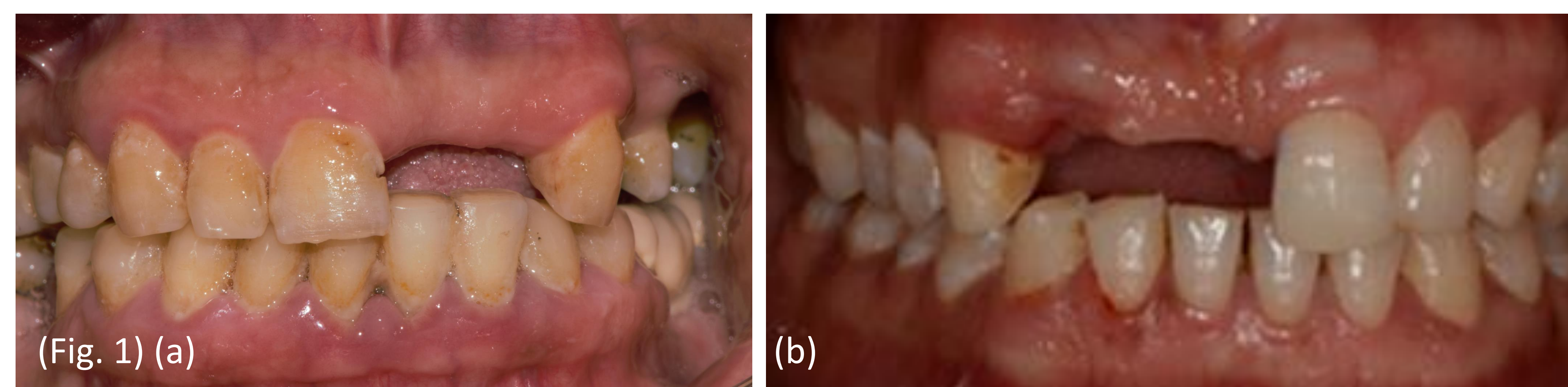


Fig 1: (a), (b) Preoperative frontal intraoral photos.

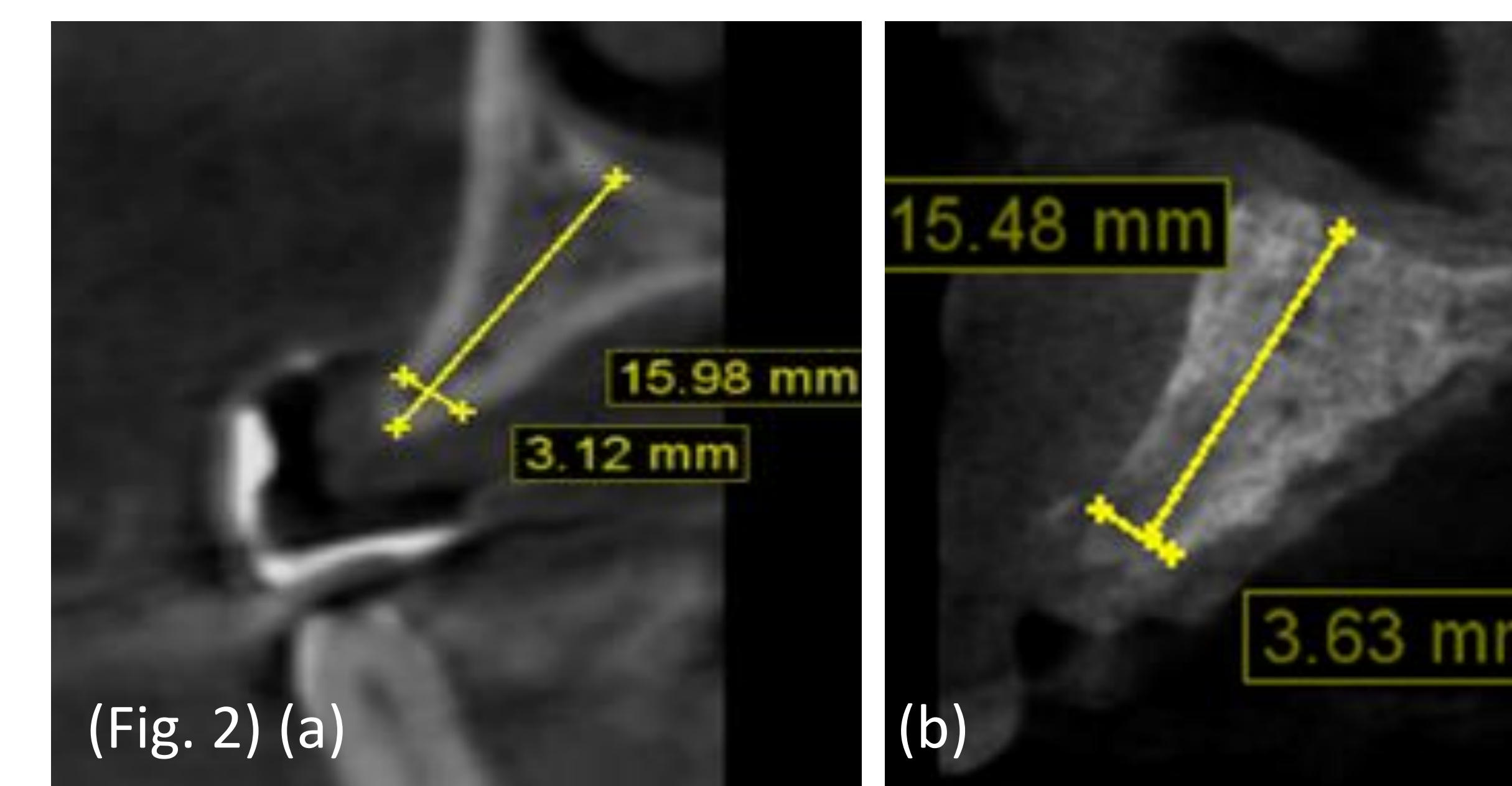


Fig 2: (a), (b) Preoperative CBCT cross sections.

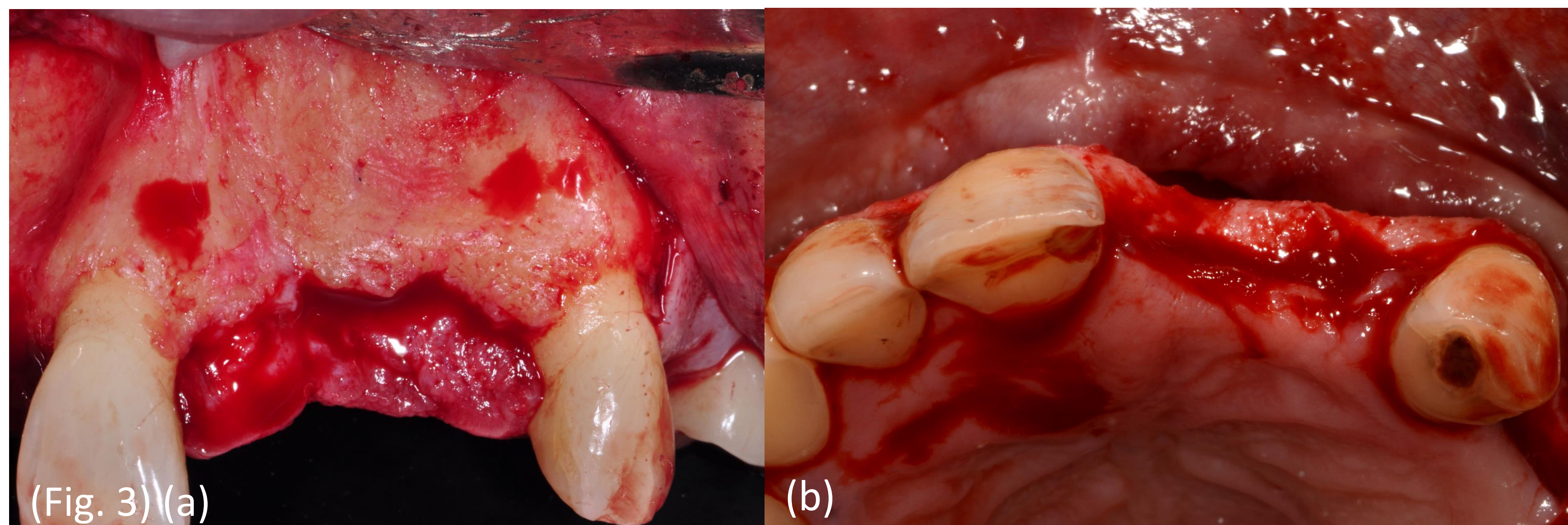


Fig 3: (a), (b) Full-thickness mucoperiosteal flap elevation.

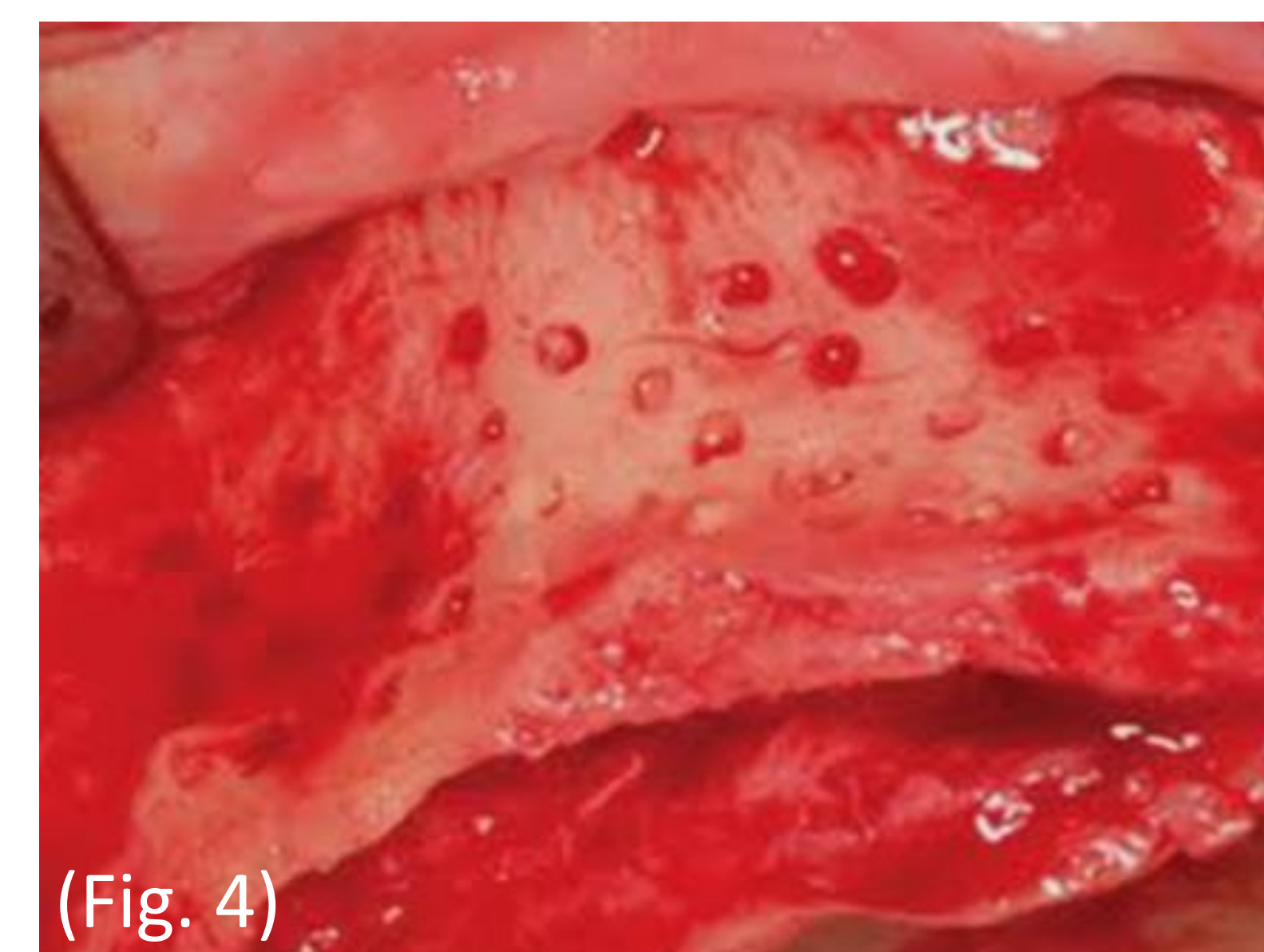


Fig 4: Decortication of the maxillary alveolar ridge after flap elevation.



Fig 5: Particulated autogenous bone harvested by ACM bur.



Fig 6: ACM bur with harvested bone.



Fig 7: Mixture of particulated autogenous bone and xenograft with 1:1 ratio.

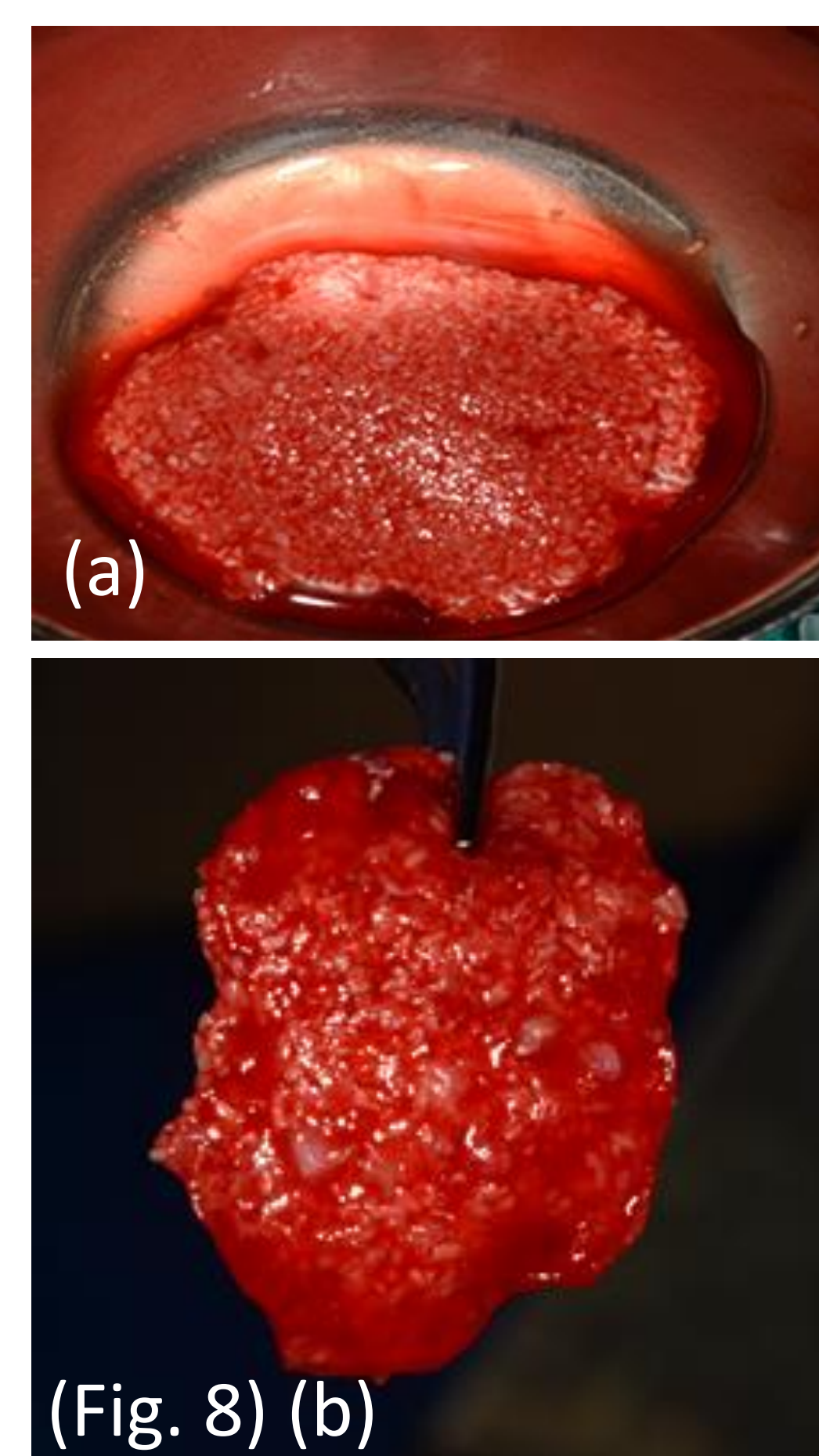


Fig 8: (a) preparation of sticky bone. (b) solidified sticky bone.



Fig 9: (a), (b) PRF membranes.

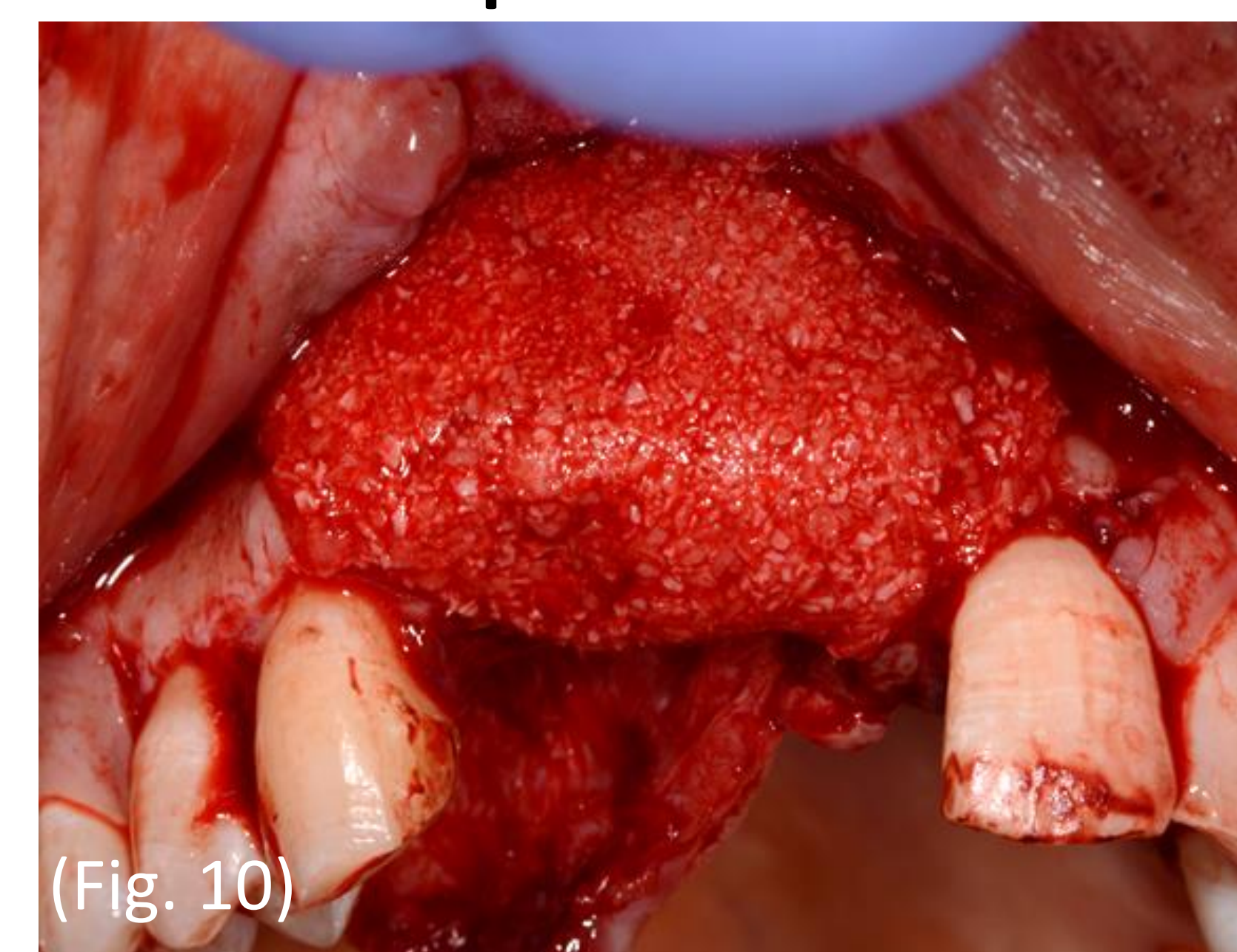


Fig 10: Ridge was build up using sticky bone.

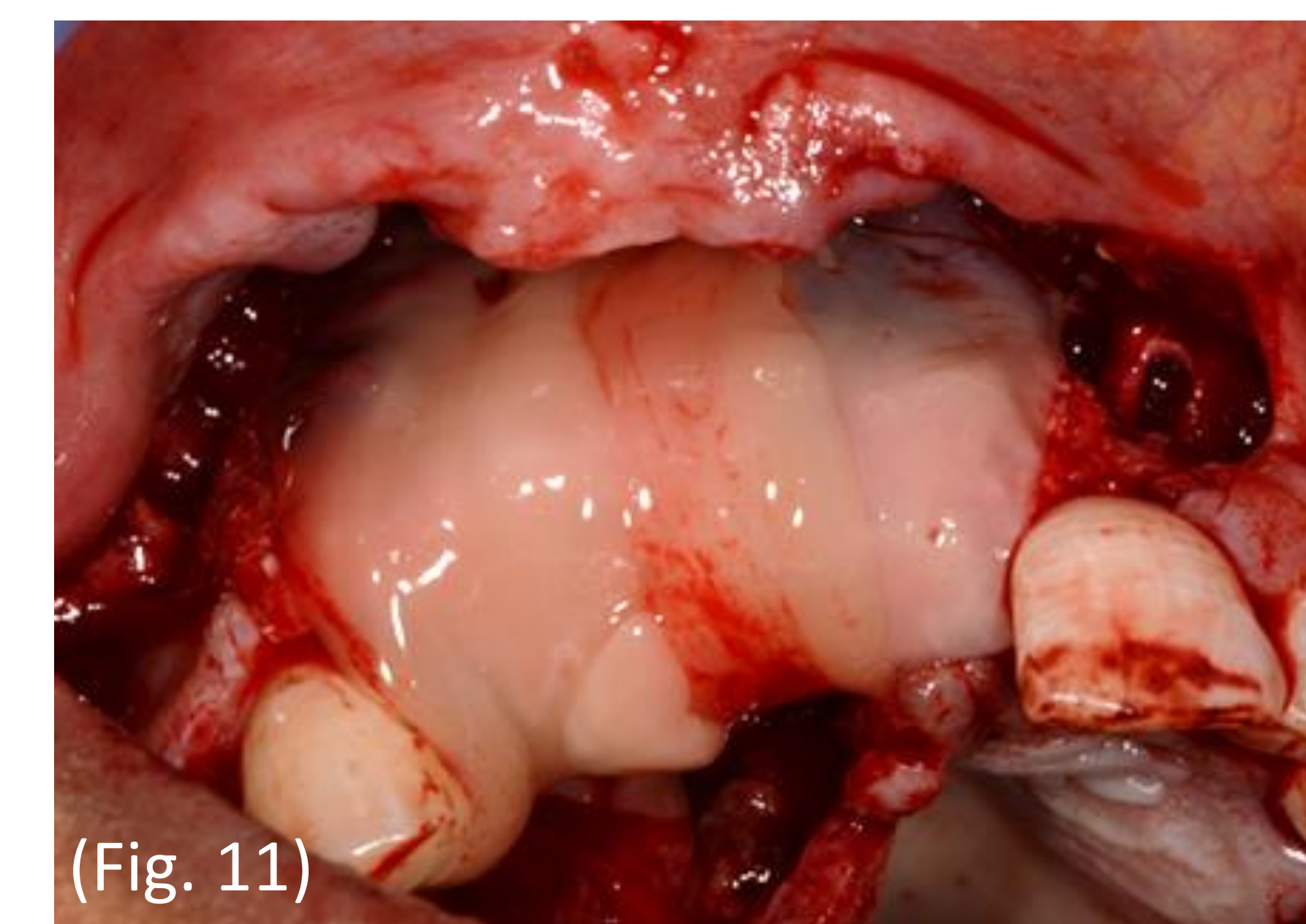


Fig 11: Sticky bone covered by PRF membrane.

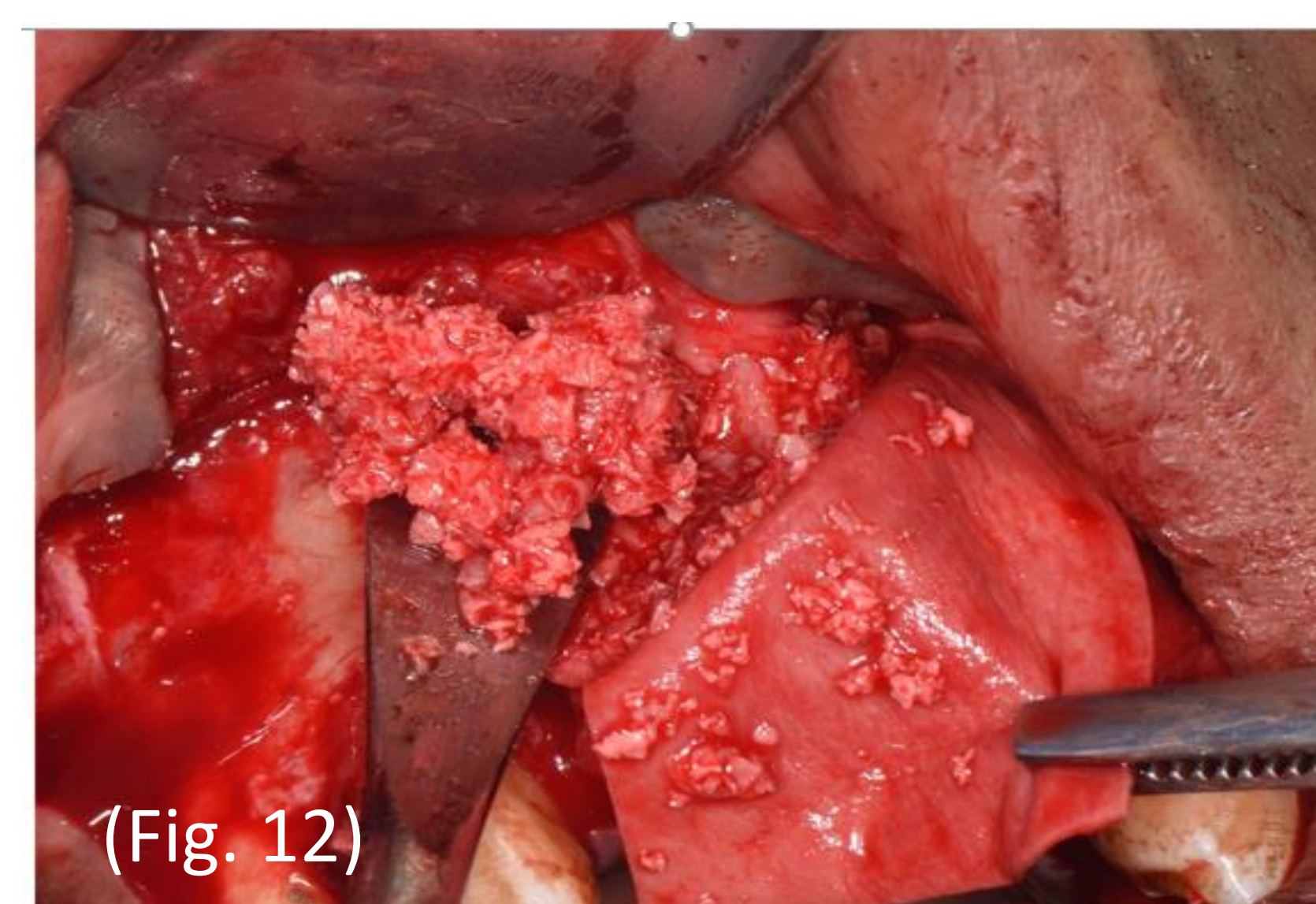


Fig 12: Packing the bone graft beneath the collagen membrane (sausage technique).

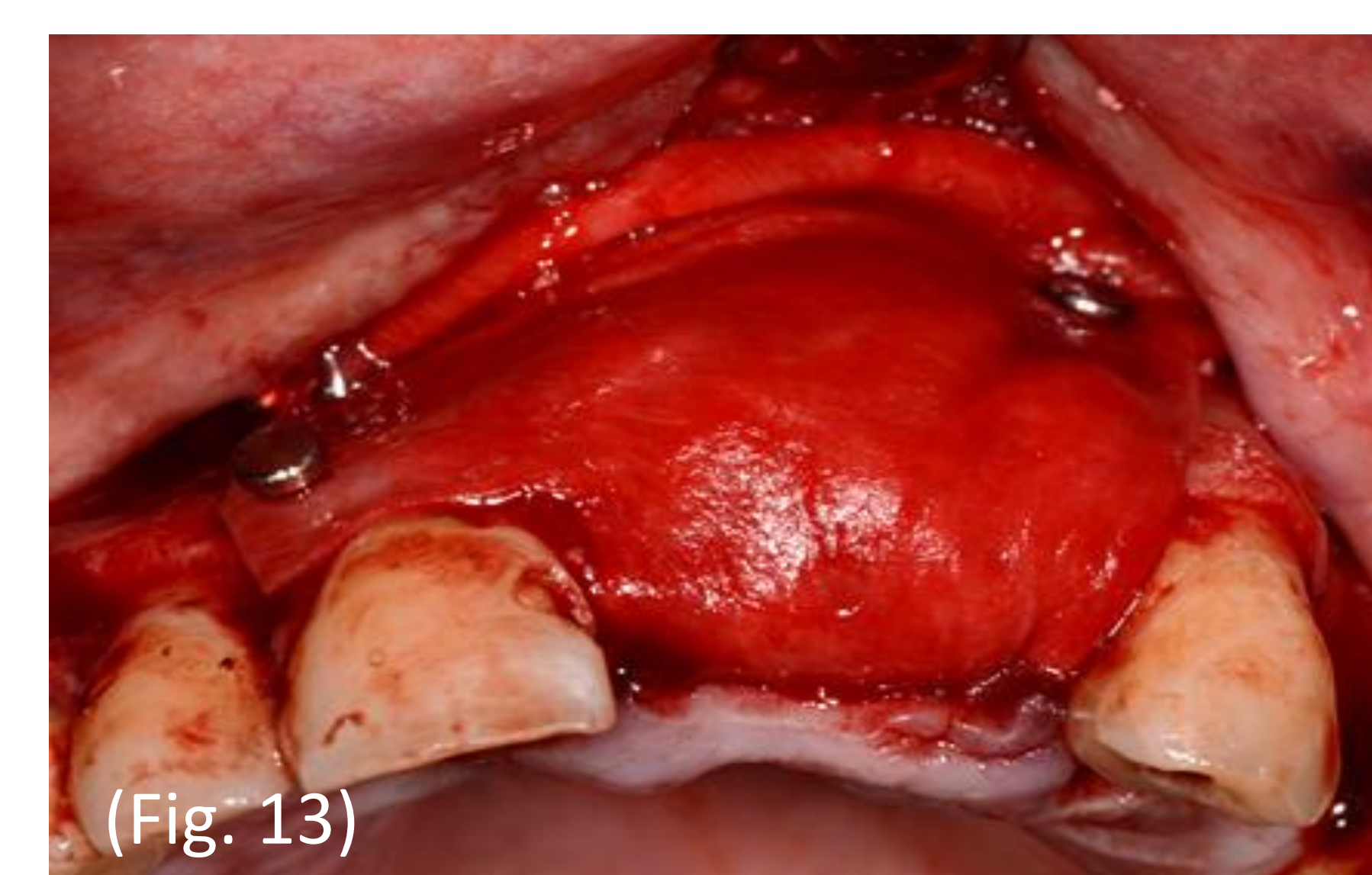


Fig 13: Native Collagen membrane fixation with titanium tacs (sausage technique).

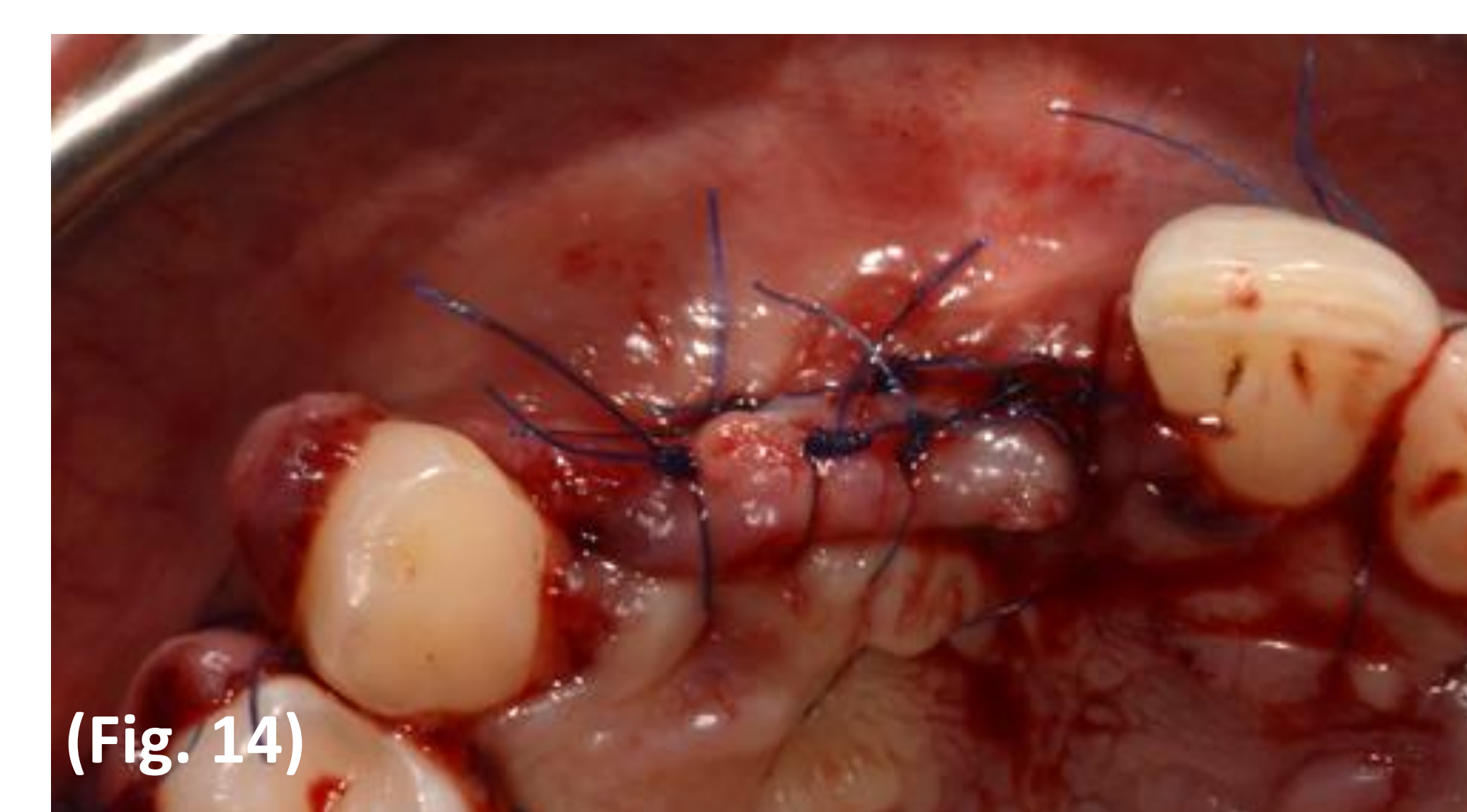


Fig 14: Flap closure.

Results:

In sticky bone group, 2 patients had complications where complete resorption of bone graft and formation of fibrous tissue without new bone formation. Healing was uneventful for all patients in GBR group. Mean horizontal bone gain was statistically significant within each group, and comparing both groups the difference was also statistically significant ($P < 0.05$).

	Immediate bone gain (mm)	6-months postoperative bone gain (mm)
Sticky bone group	5.5 ± 0.7	2.1 ± 0.5
GBR group	5.9 ± 1.2	5.2 ± 0.9

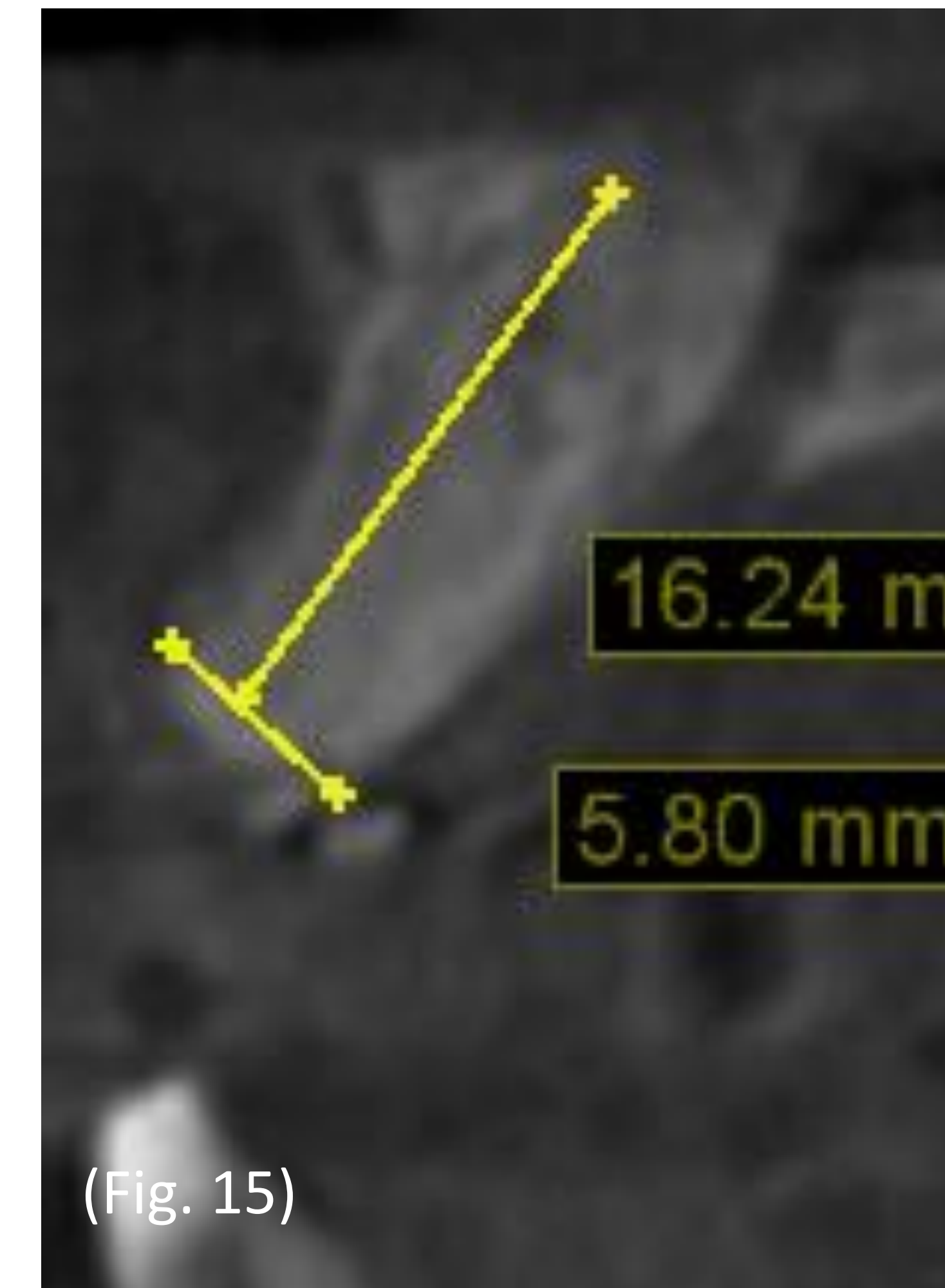


Fig 15: Six months post operative CBCT cross sections for the sausage technique.



Fig.16: Six months postoperative intraoral occlusal photo for the sticky bone technique.

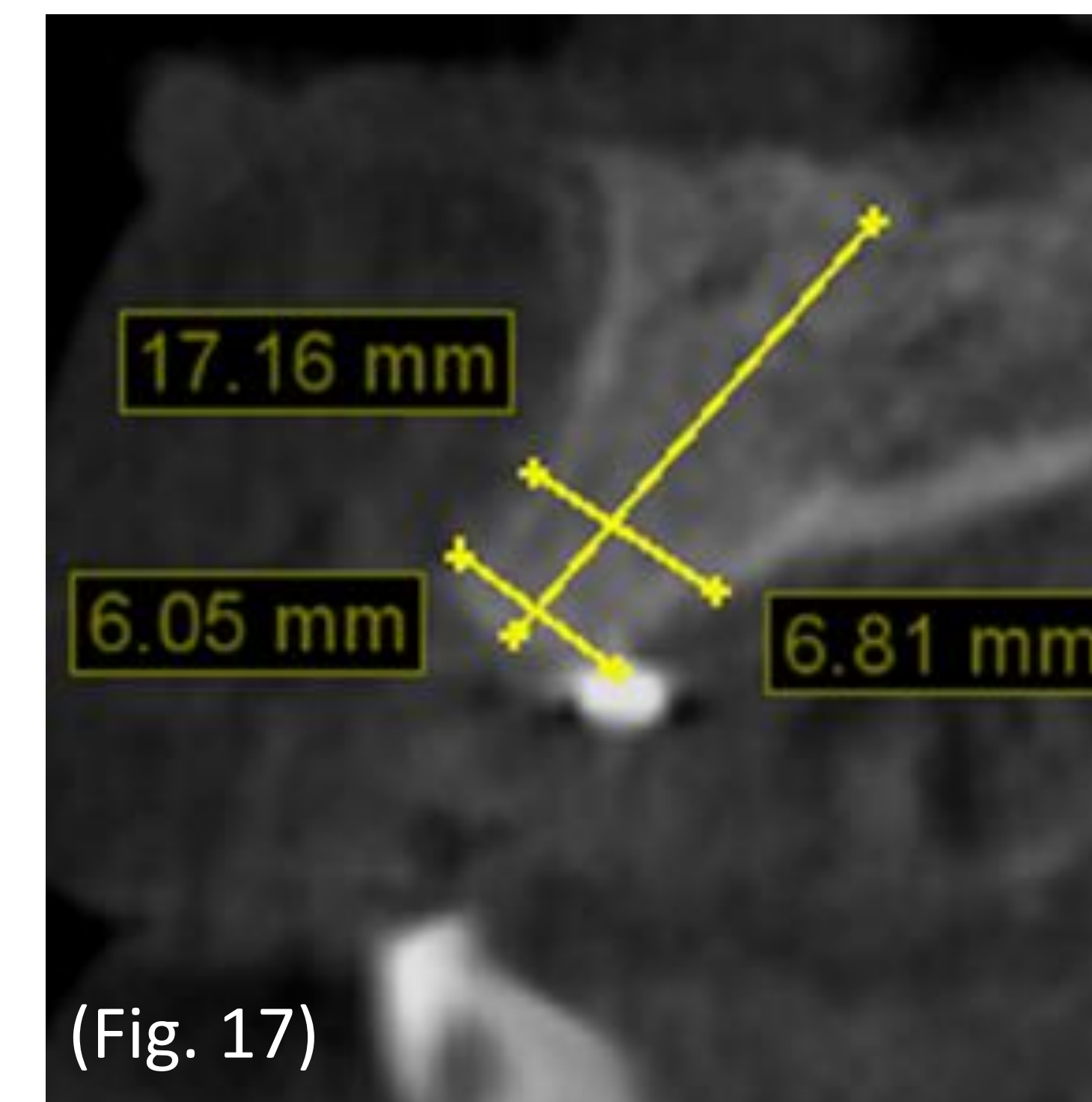


Fig 17: Six months post operative CBCT cross sections for the sticky bone technique.



Fig 18: Six months postoperative intraoral occlusal photo for the sausage technique.

Conclusion:

Within the limitations of the study, horizontal ridge augmentation using sticky bone covered by PRF membrane is a simple technique with unpredictable results compared to guided bone regeneration using native collagen membrane.



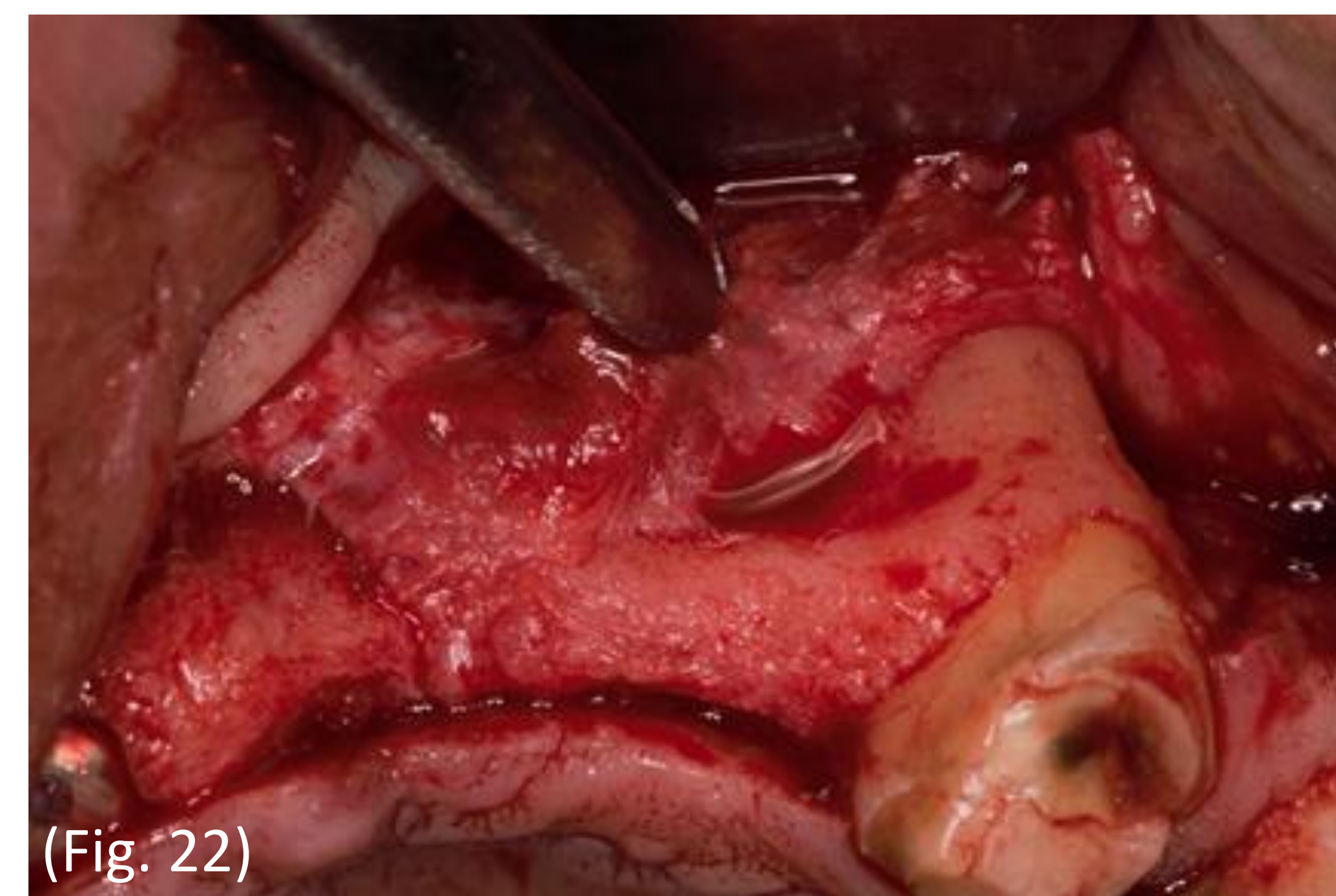
(Fig. 19)
Fig 19: Implant placement after using sticky bone for augmentation.



(Fig. 20)
Fig 20: Soft tissue healing (Sticky bone group).



(Fig. 21)
Fig 21: Final restoration (sticky bone group).



(Fig. 22)
Fig 22: Resorption of the sticky bone.