



Coverage of Lateral Window after Maxillary Sinus Floor Elevation using a Native Collagen Membrane Suited Against the Inner Surface of the Lateral Wall of the Sinus without Fixation versus Membrane Fixation on the Outer Surface by Titanium Tacks



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Introduction: The posterior maxilla is frequently deficient in the vertical bone dimension due to pneumatization of the maxillary sinus after teeth extraction. Several modifications have been made to the sinus augmentation technique using the lateral window approach. Different types of collagen membranes were frequently utilized for sinus window closure. The aim of the study was to investigate the vertical bone gain following maxillary sinus floor elevation and window closure using a native collagen membrane suited against inner surface of the lateral wall of the sinus without fixation versus membrane fixation on the outer surface with titanium tacks.

Methods: Sixteen patients requiring maxillary sinus augmentation were included in the study. After maxillary sinus floor elevation, in eight patients the membrane was suited against inner surface of the lateral wall of the sinus without fixation (Group A) and in the other eight patients the lateral window was covered using a native collagen membrane fixed on the outer surface of the lateral window by titanium tacks (Group B).



Fig 1: Preoperative panoramic radiograph.

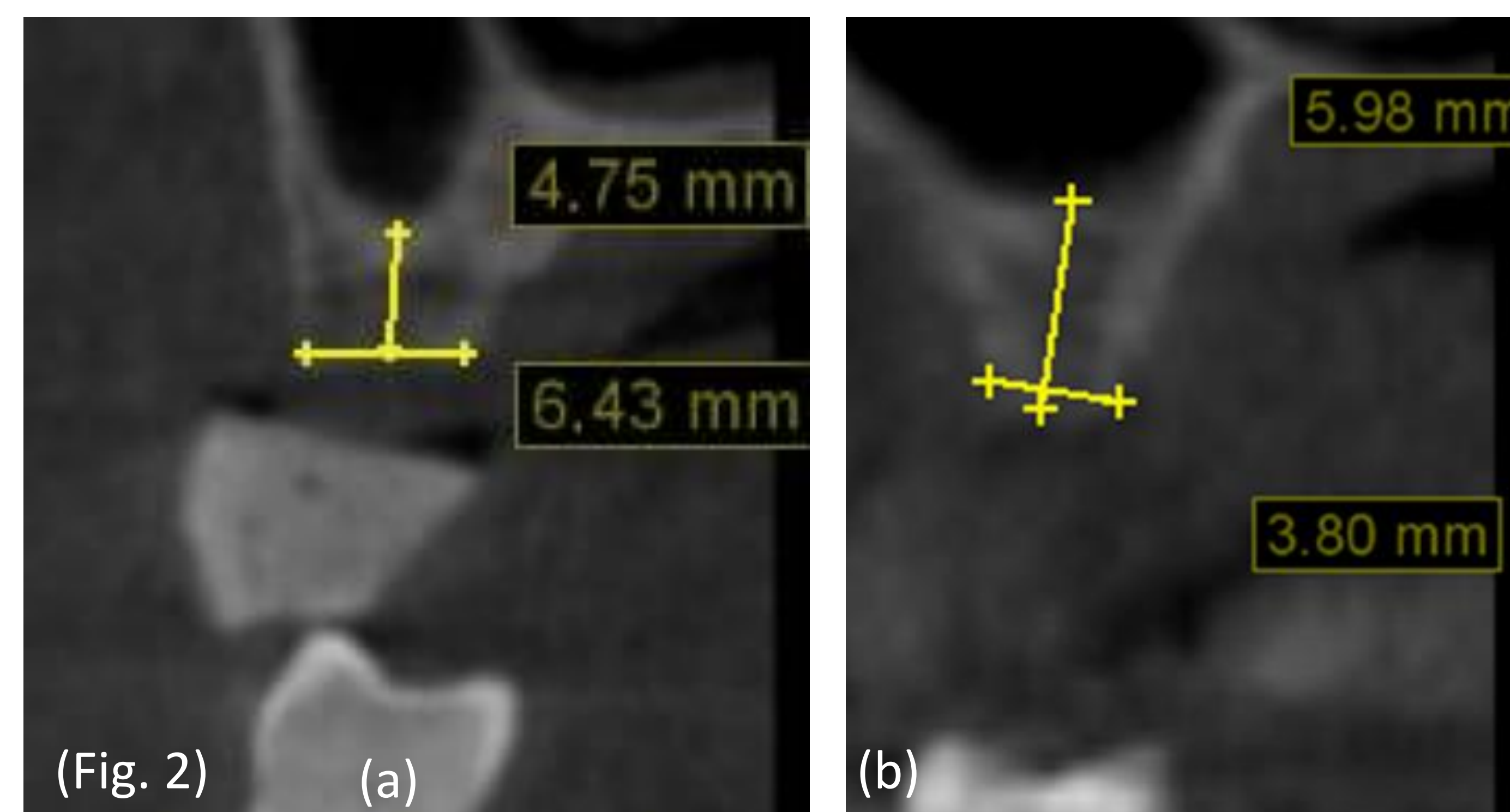


Fig 2: Preoperative CBCT cross sections. (a) The control group (b) The test group.



Fig 3: A full-thickness mucoperiosteal flap elevation.

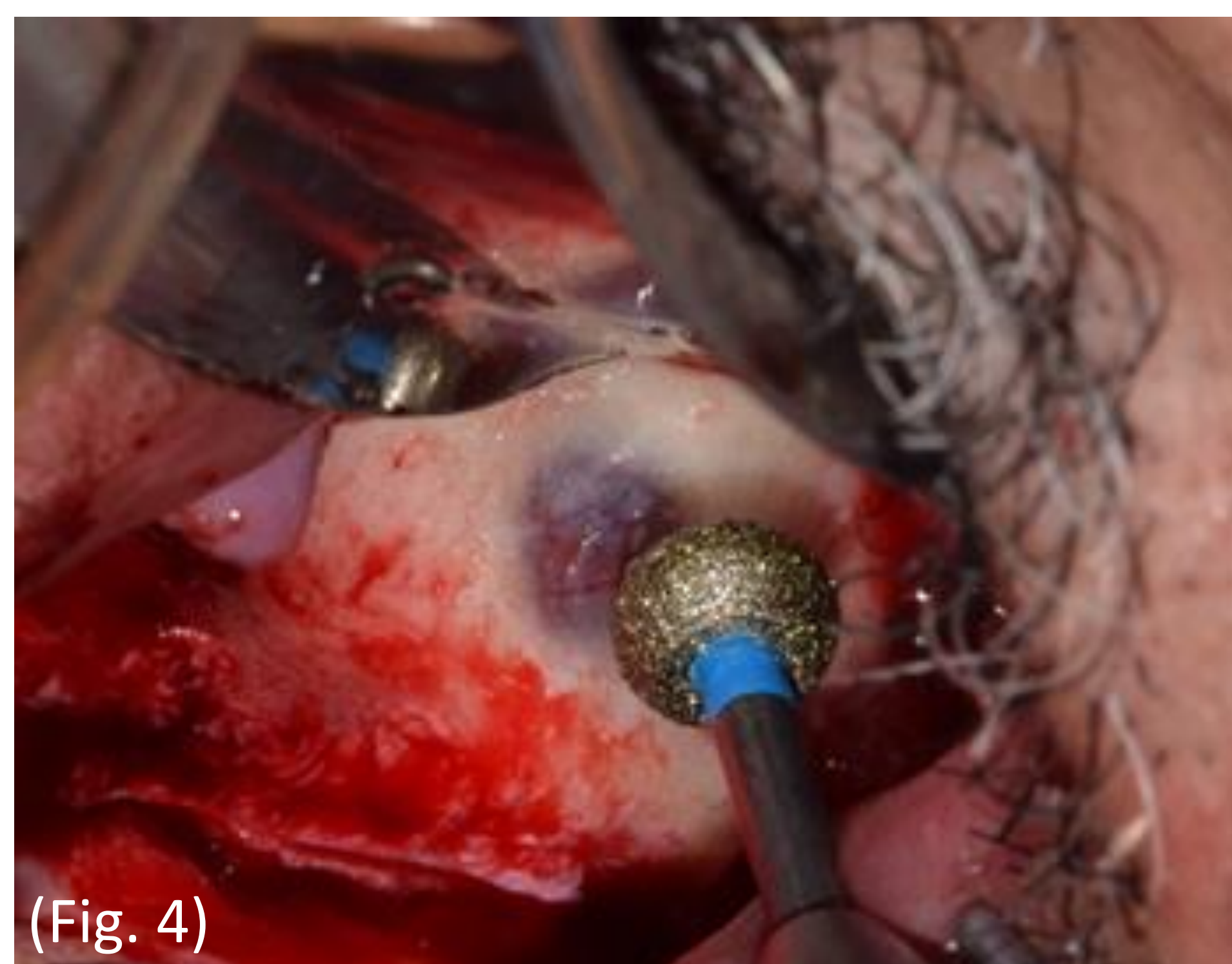


Fig 4: Full exposure of the lateral maxillary wall, an antrostomy is made in the lateral sinus wall to gain access to the sinus membrane using large diamond stone.

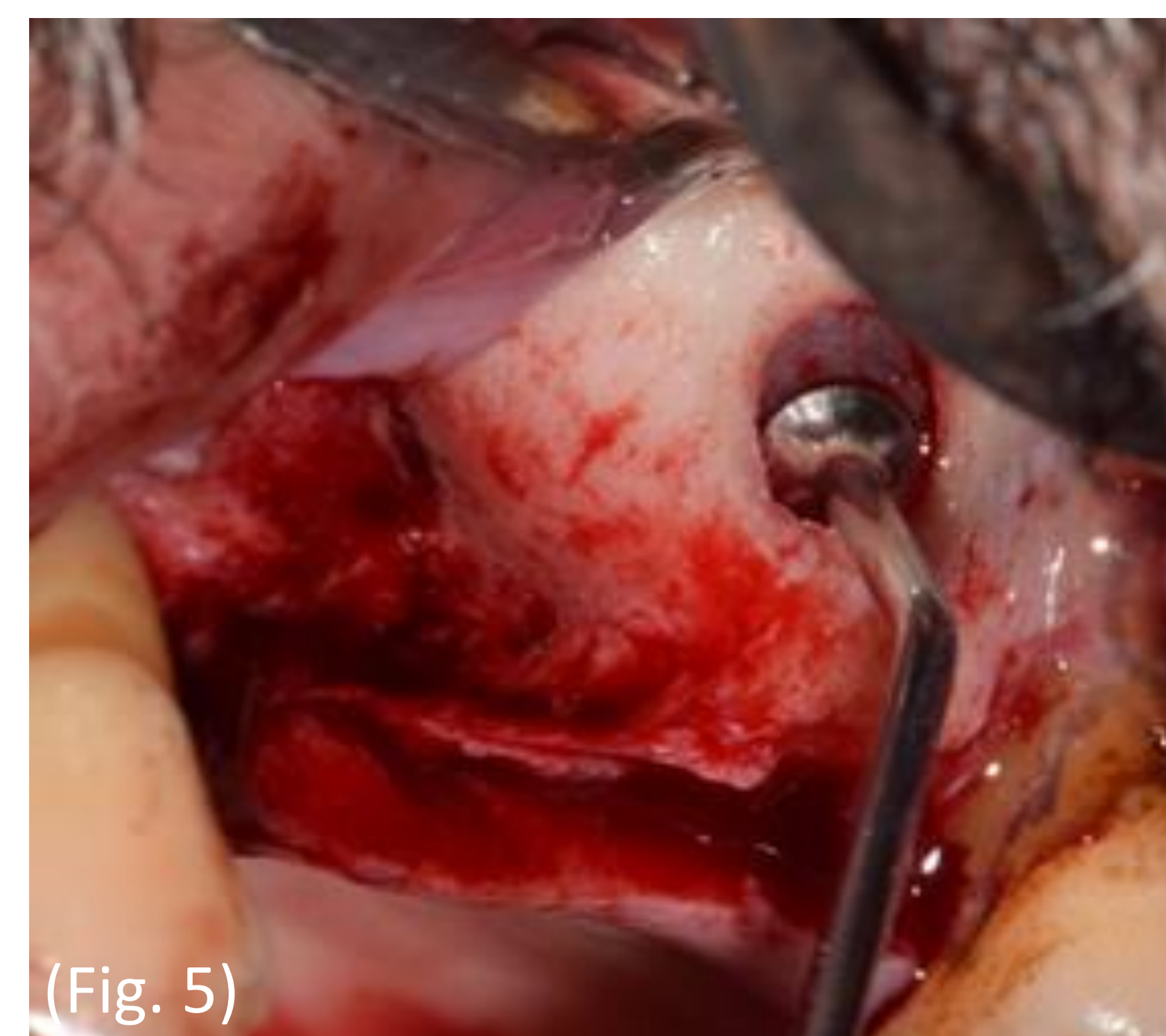


Fig 5: Cleavage at the lower margin of the osseous window is done using the mushroom shaped sinus instrument.

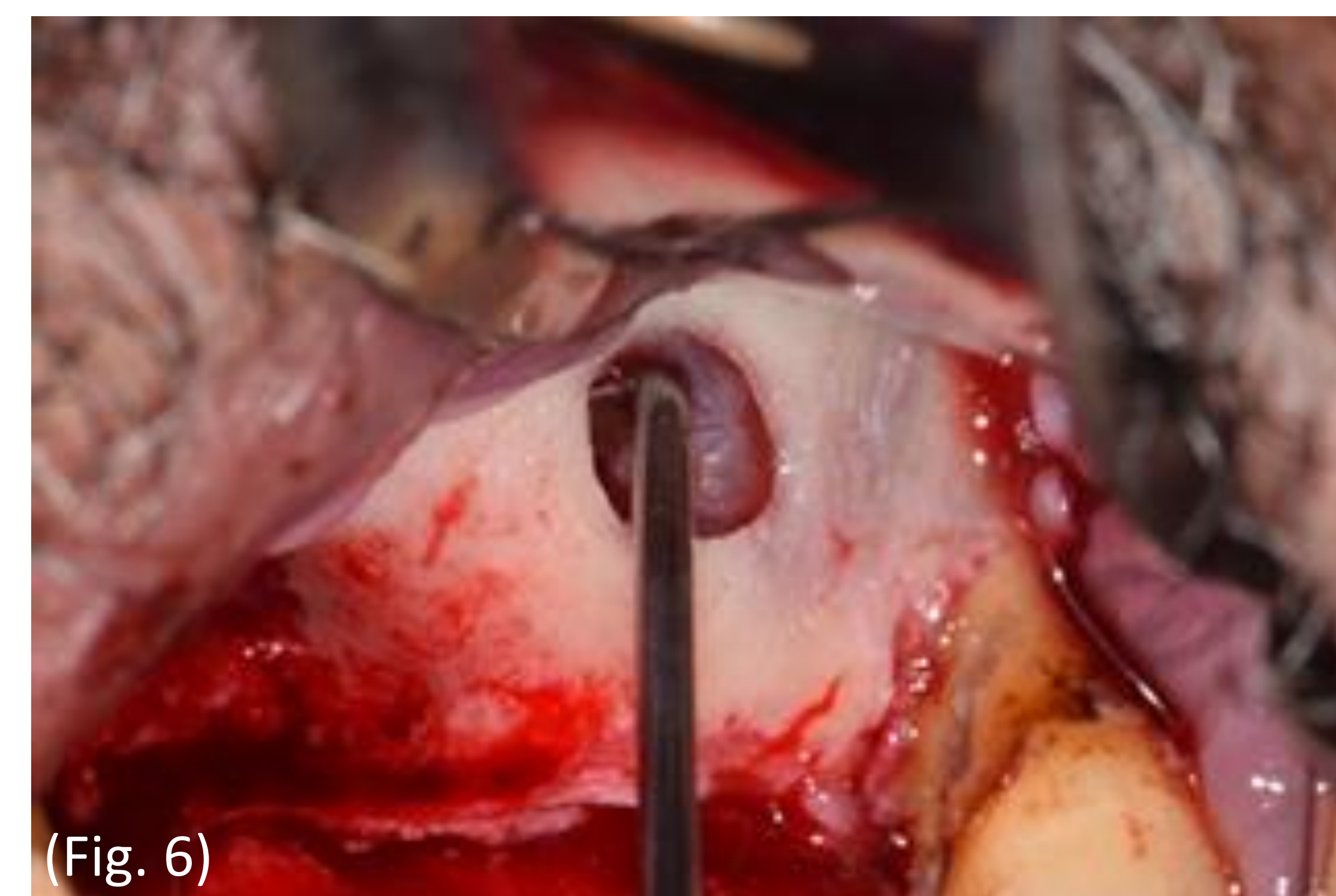


Fig 6: Further membrane elevation antero-posteriorly and medio-laterally is performed with angled sinus elevators.



Fig 7: Grafting the sinus with absorbable gelatin foam.

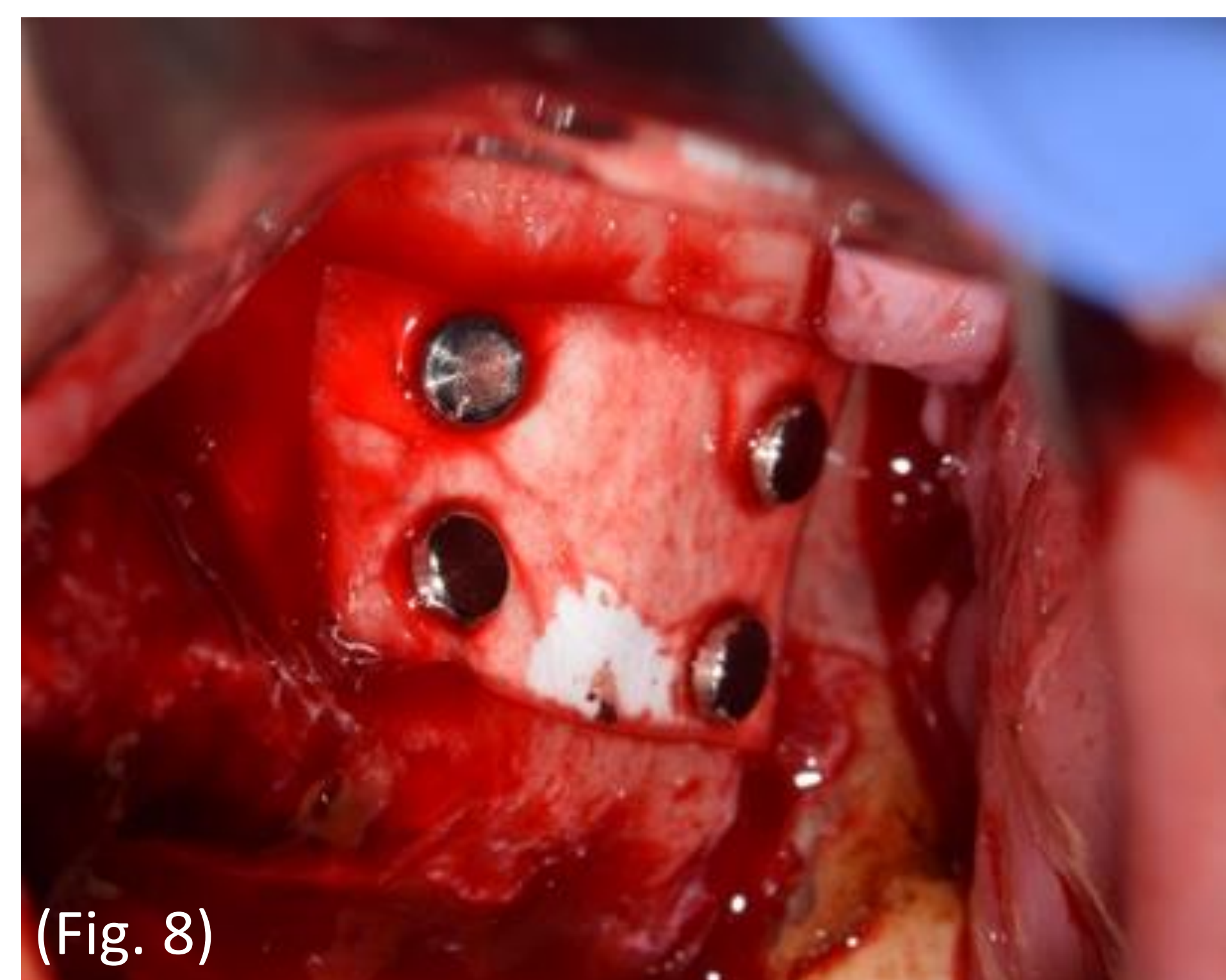
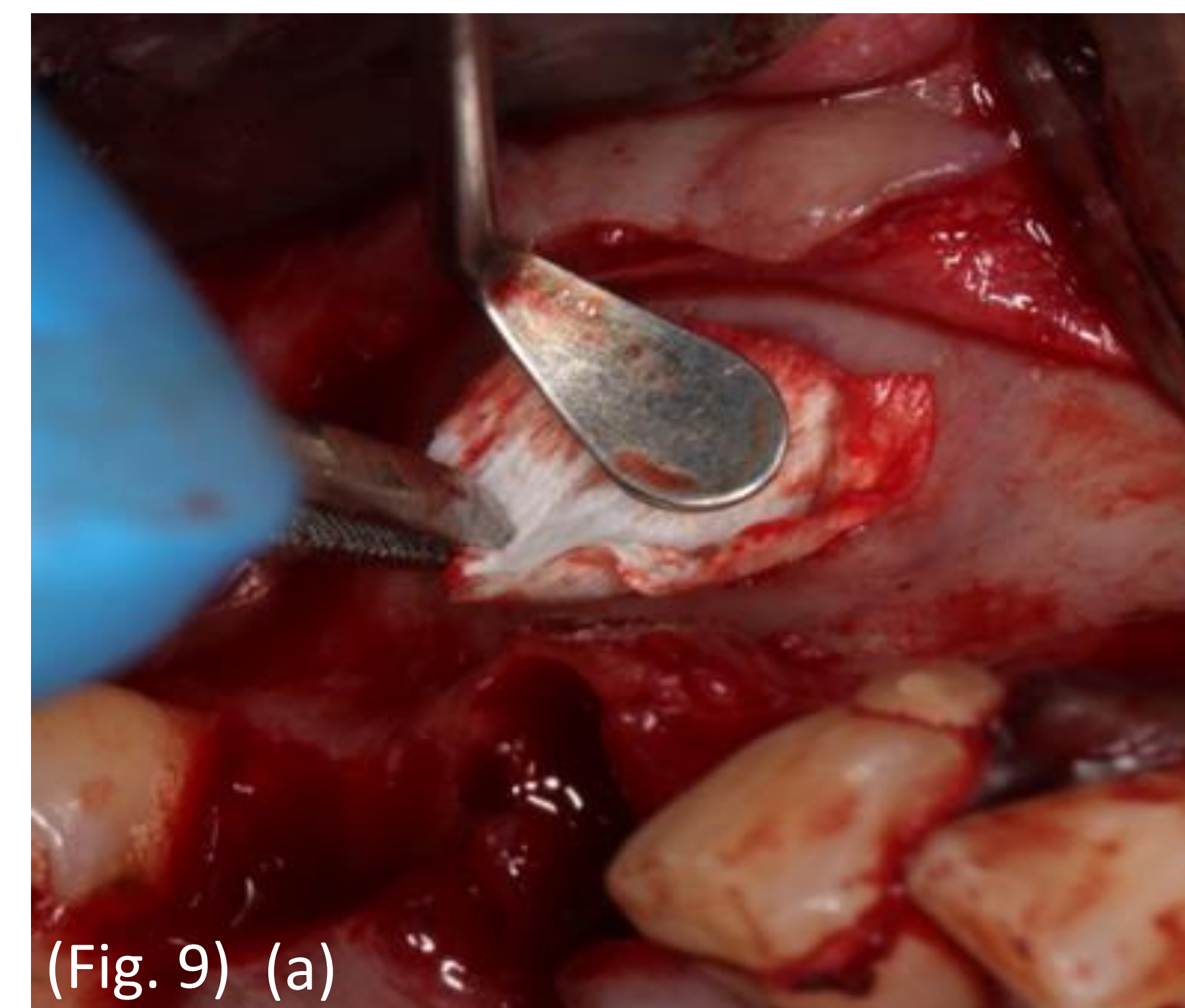
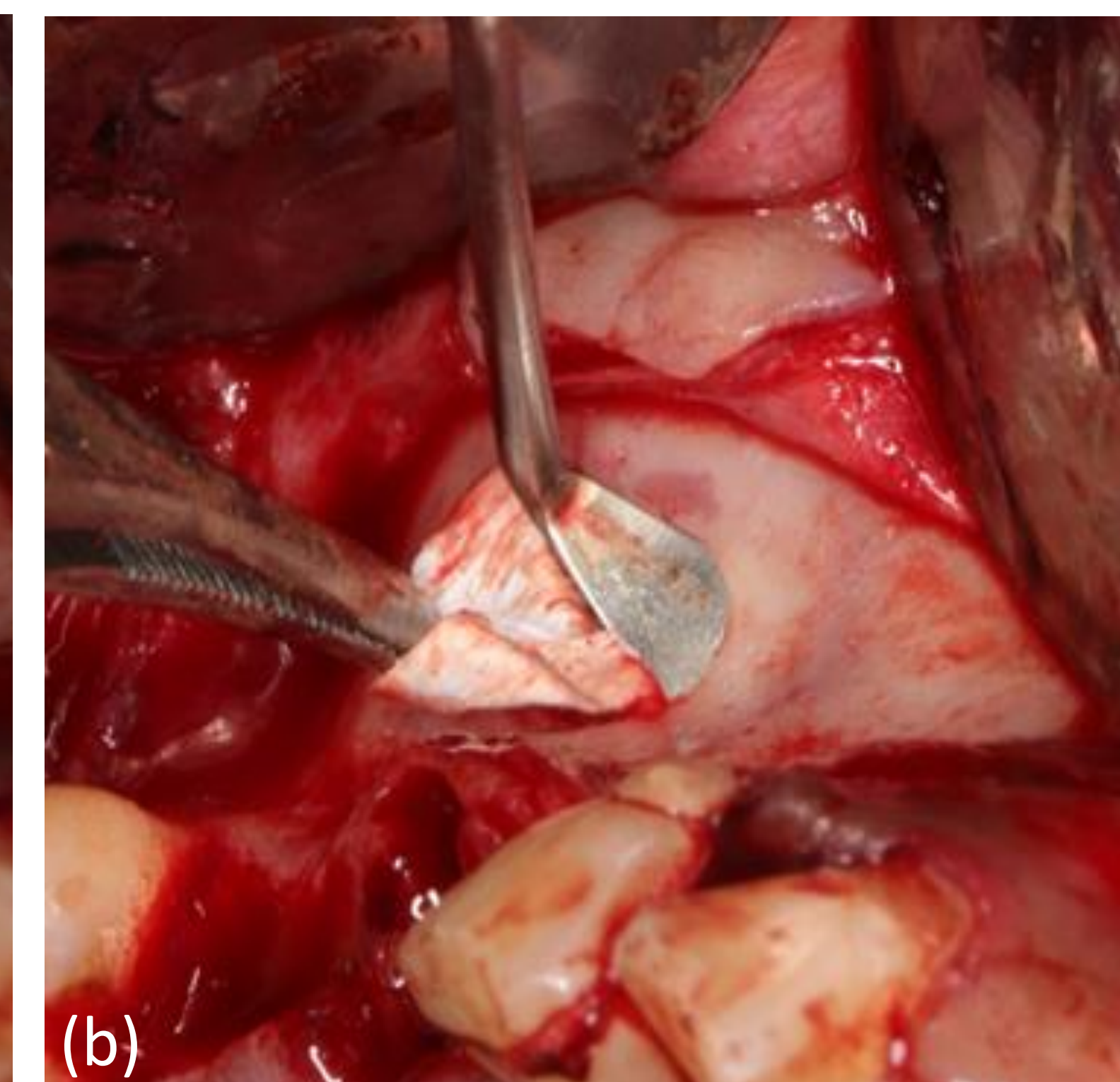


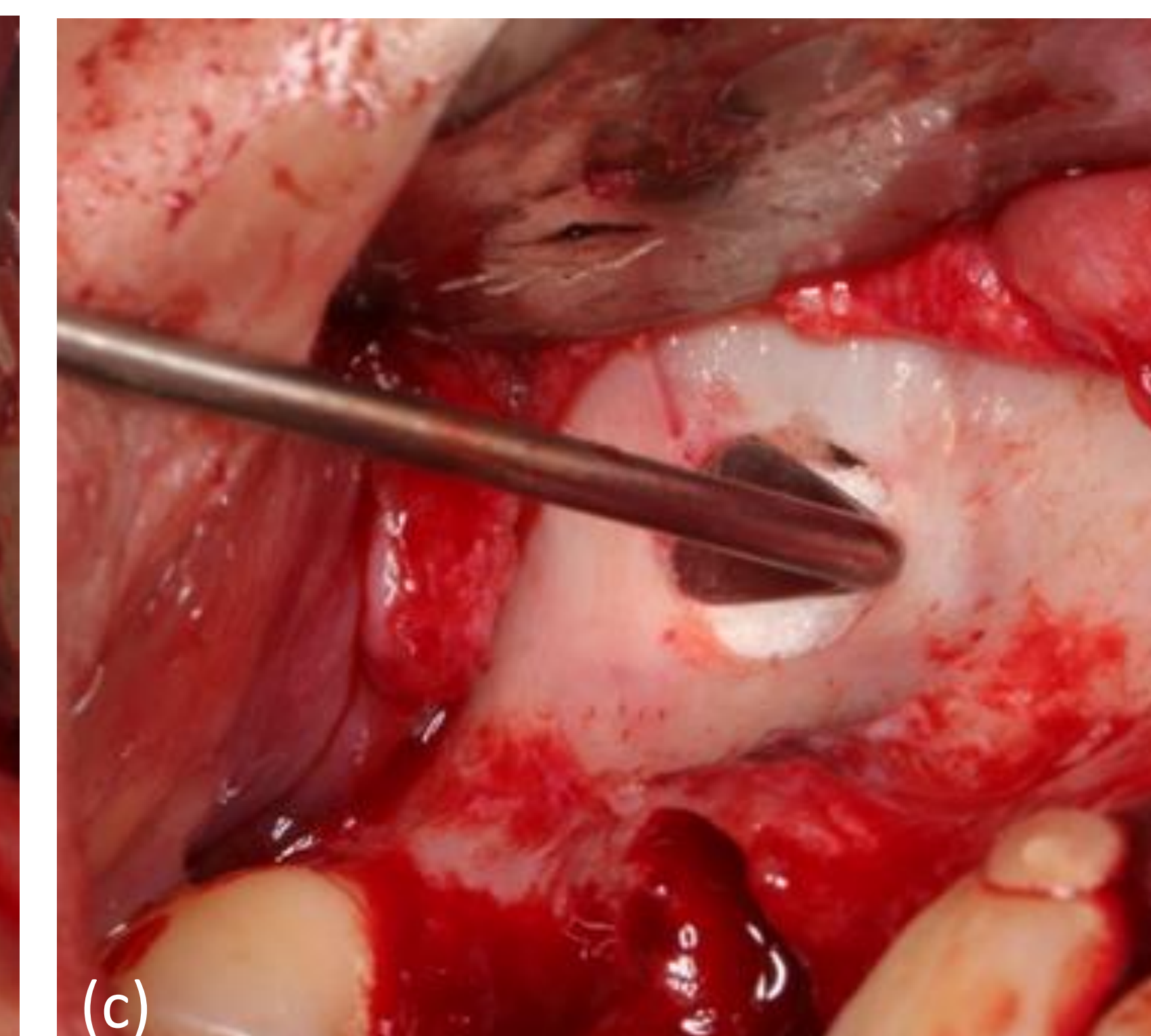
Fig 8: Collagen membrane fixation using titanium tacs for the control group.



(Fig. 9) (a)



(b)



(c)

Fig 9: The sequence of membrane adaptation to the inner wall of the sinus for the test group. (a) Stabilizing the collagen membrane at the lateral window. (b),(c) Packing the membrane margins to the inner wall of the sinus using sinus elevators.

Results	Mean amount of the newly formed bone
Control Group	45.0±15%
Test Group	30.4±15.8%

Conclusion: Within the limits of this study, coverage of the lateral window following sinus floor elevation by suiting the membrane against the inner surface of the lateral wall of the sinus showed less bone gain compared to membrane fixation on the outer surface of the lateral window by titanium tacks.

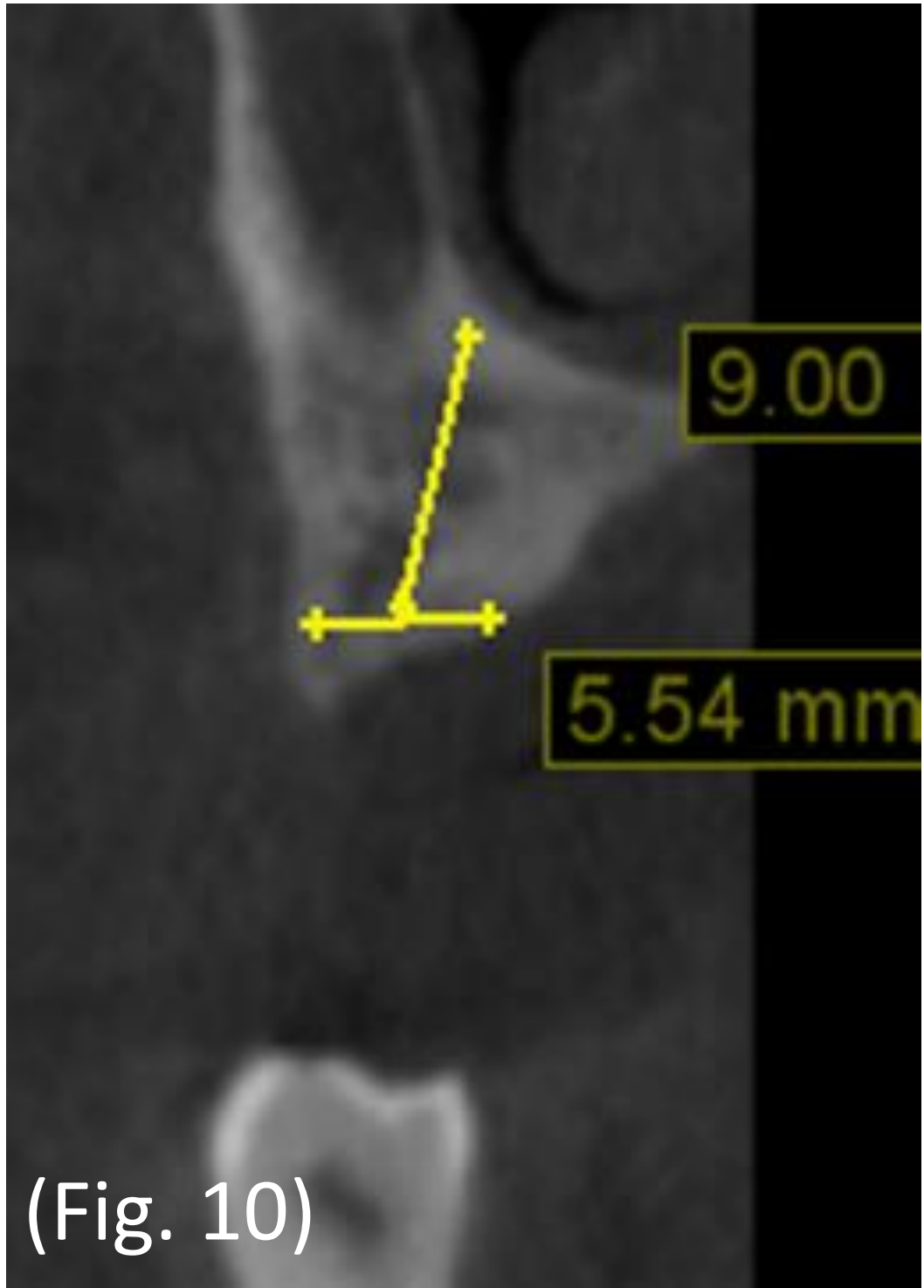


Fig 10: Postoperative CBCT cross sections for the control group.

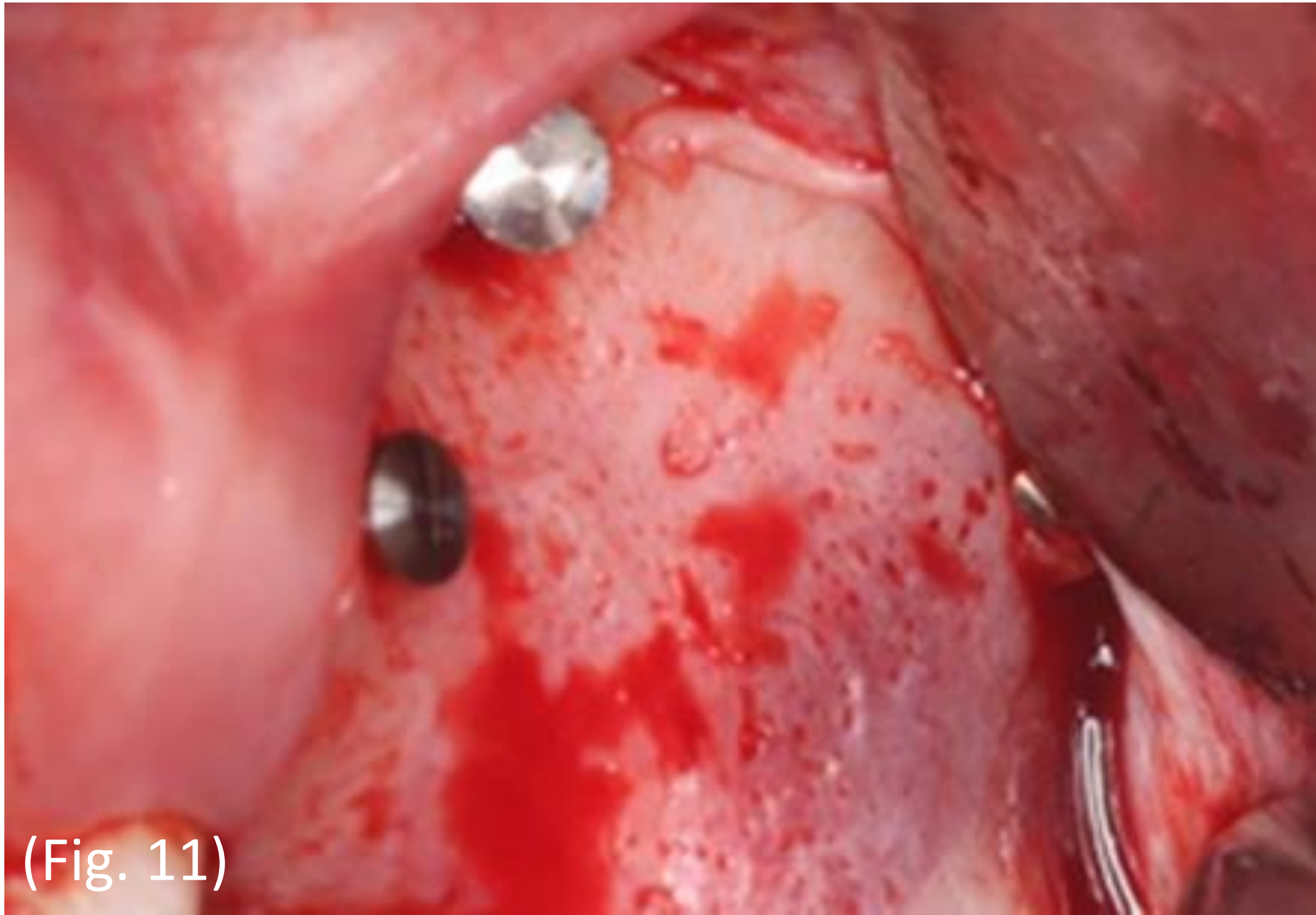


Fig 11: At the second stage surgery, complete healing and full integration of the lateral window with the native bone was observed for the control group.

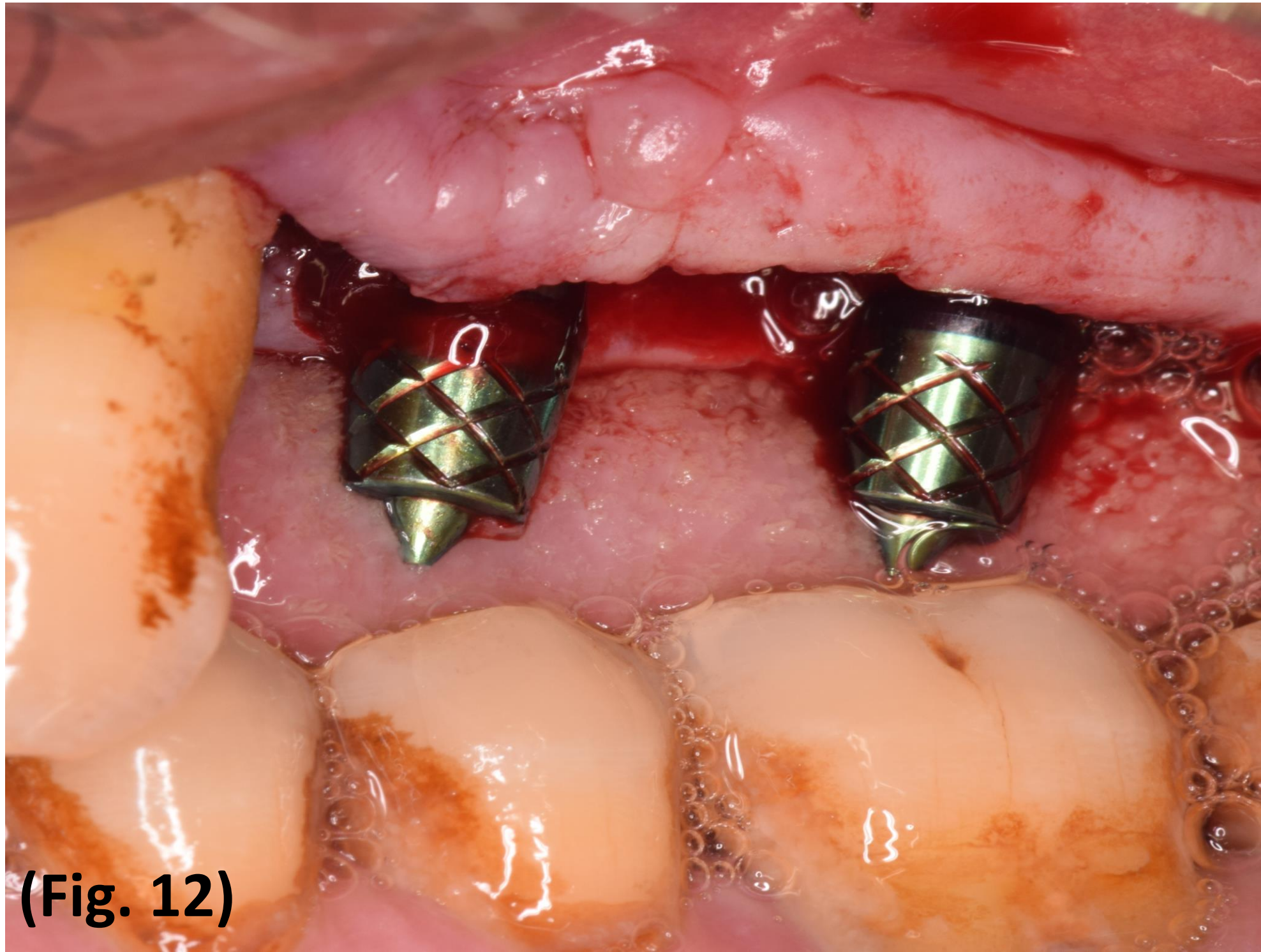


Fig 12: Implant placement for the control group.

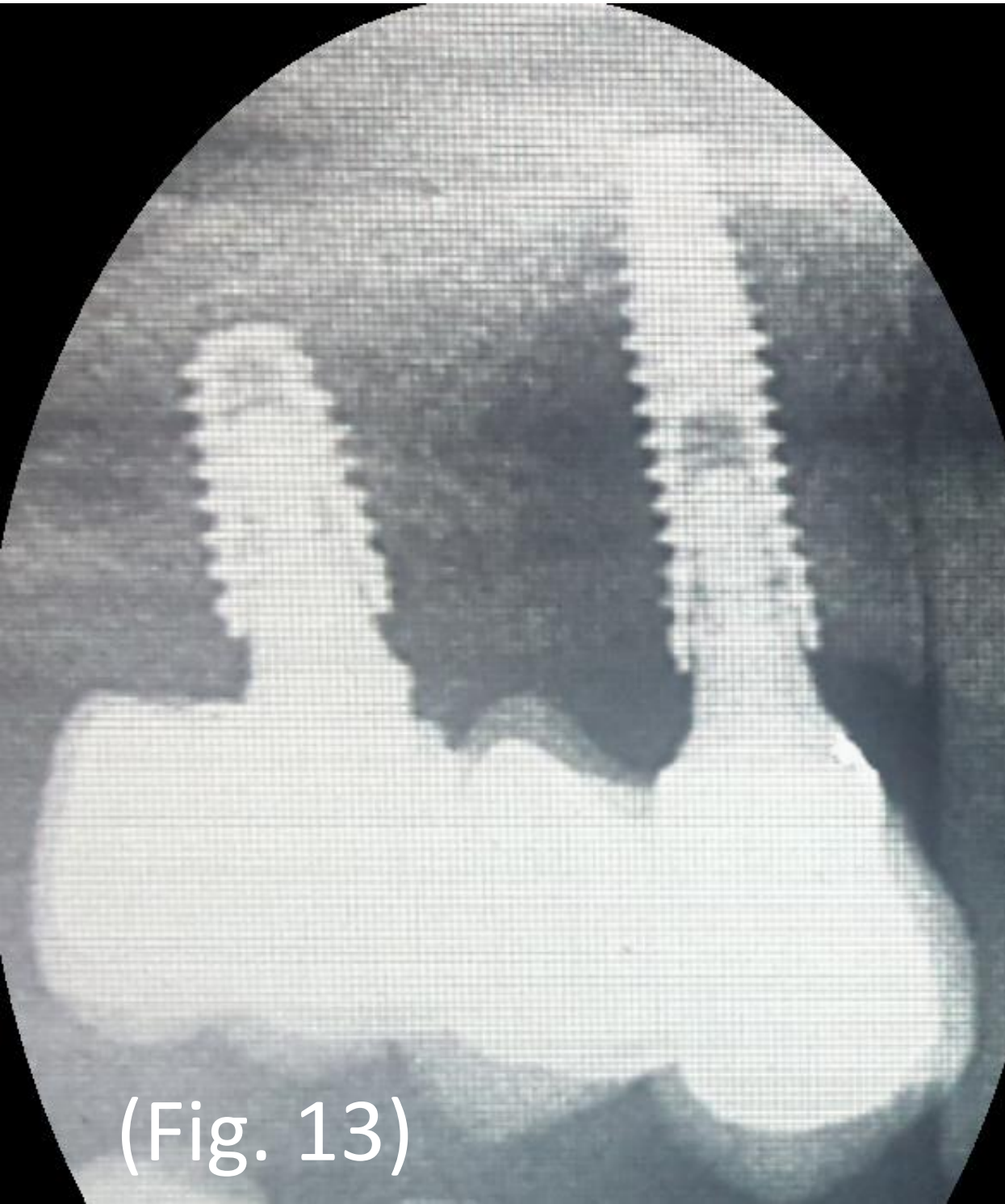


Fig 13: Post prosthetic radiograph for the control group.

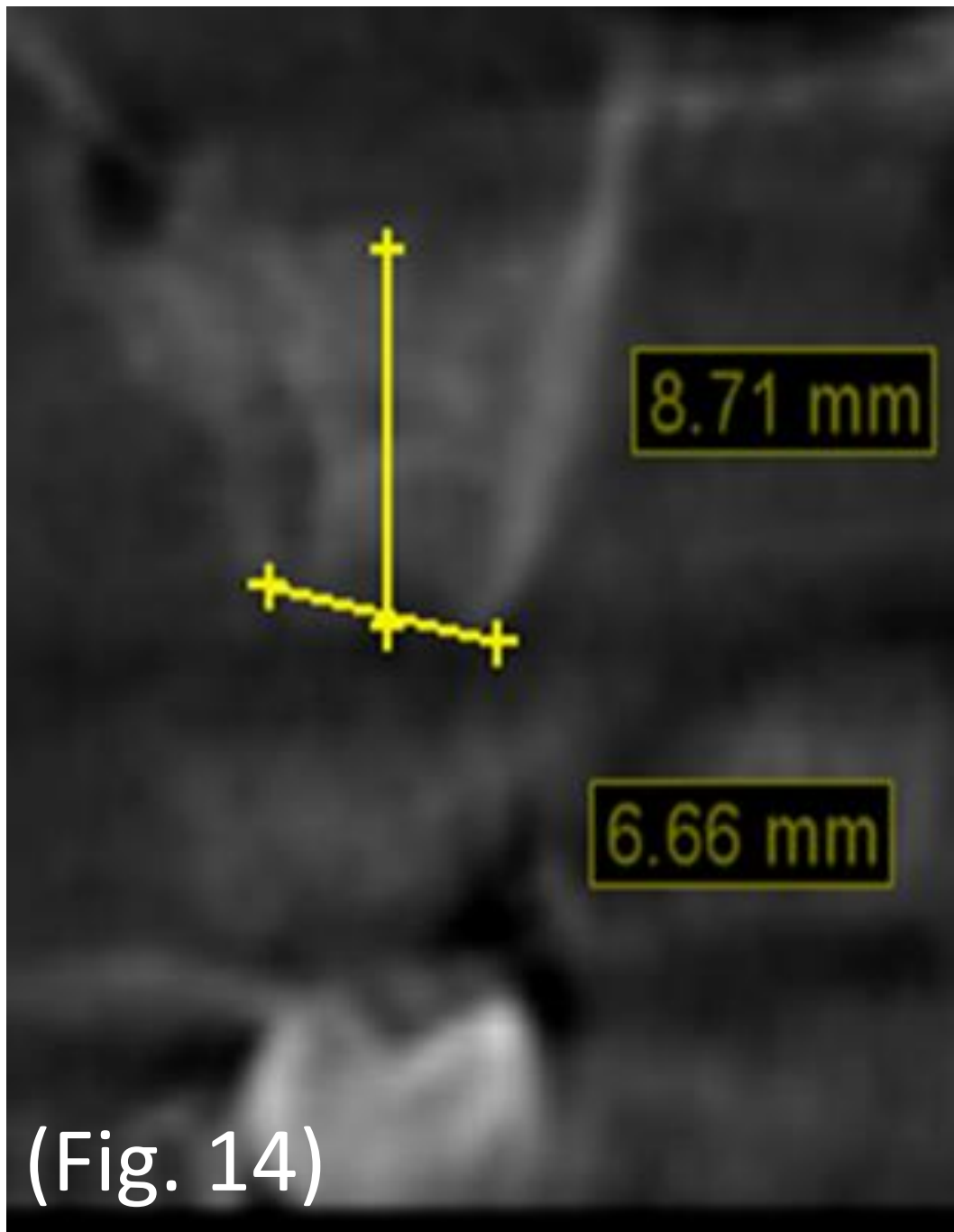


Fig 14: Postoperative CBCT cross sections for the test group.

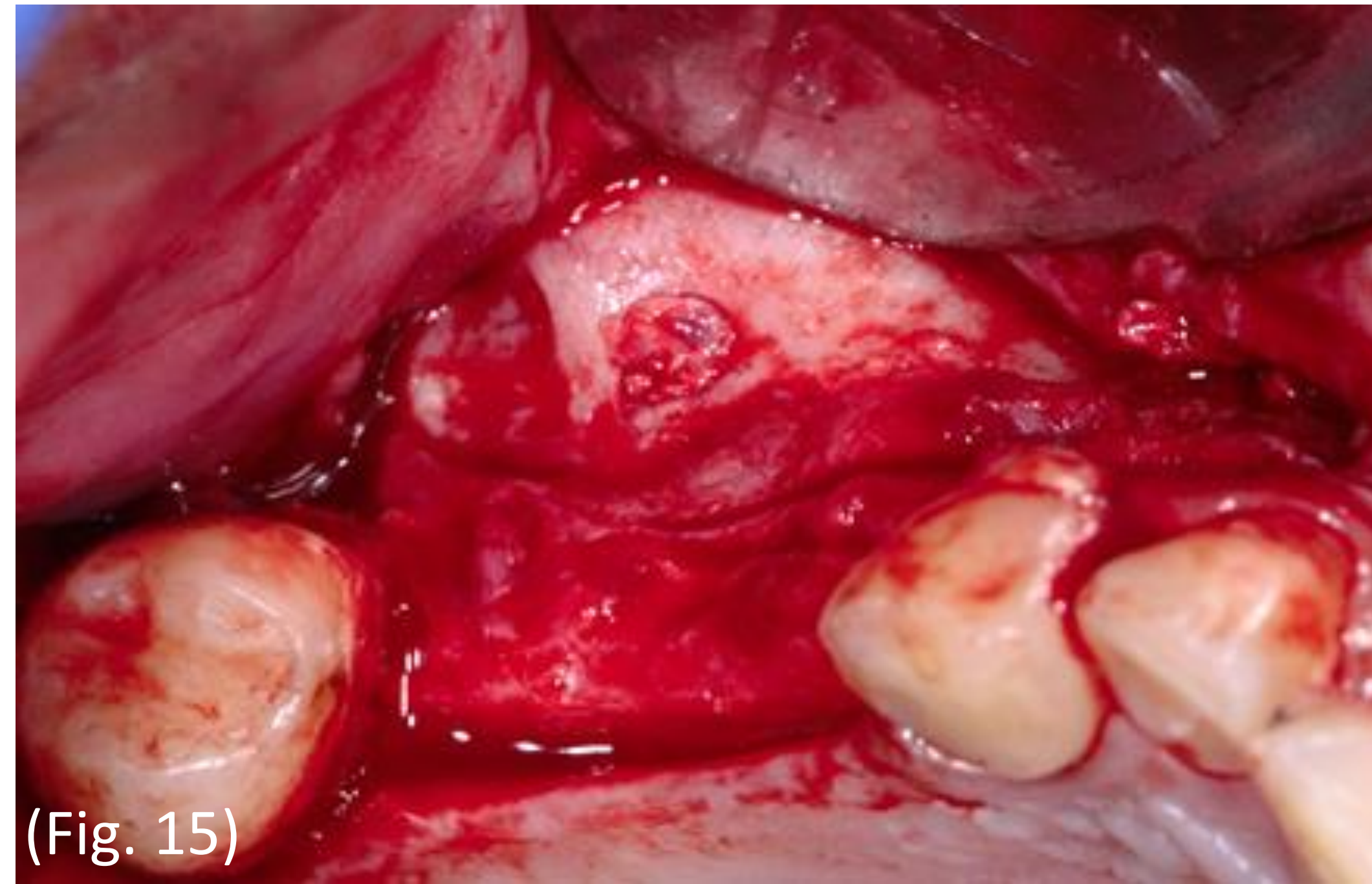


Fig 15: At the second stage surgery, Healing of the lateral window with fibrous tissue was observed for the test group.

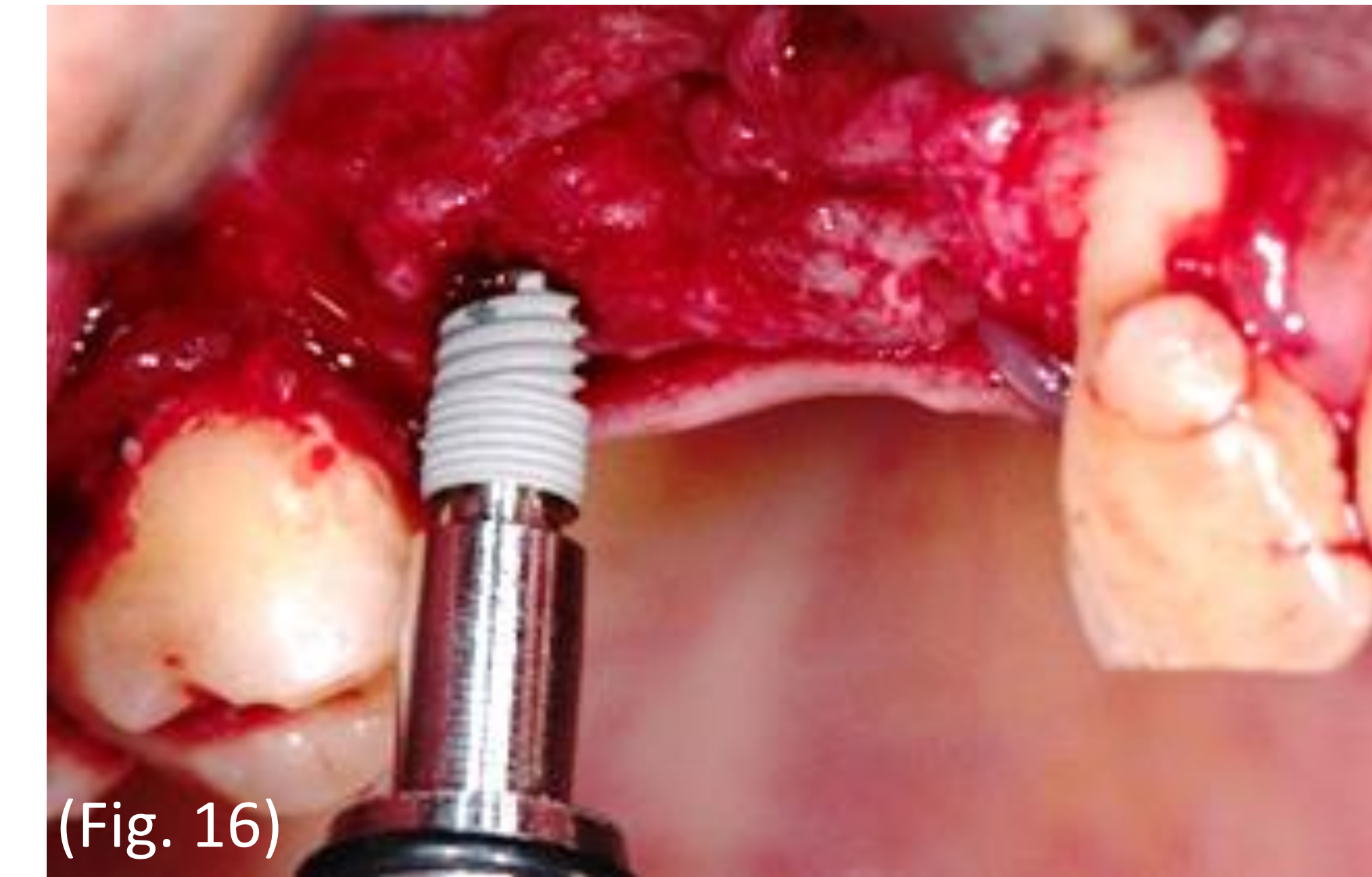


Fig 16: Implant placement for the test group.

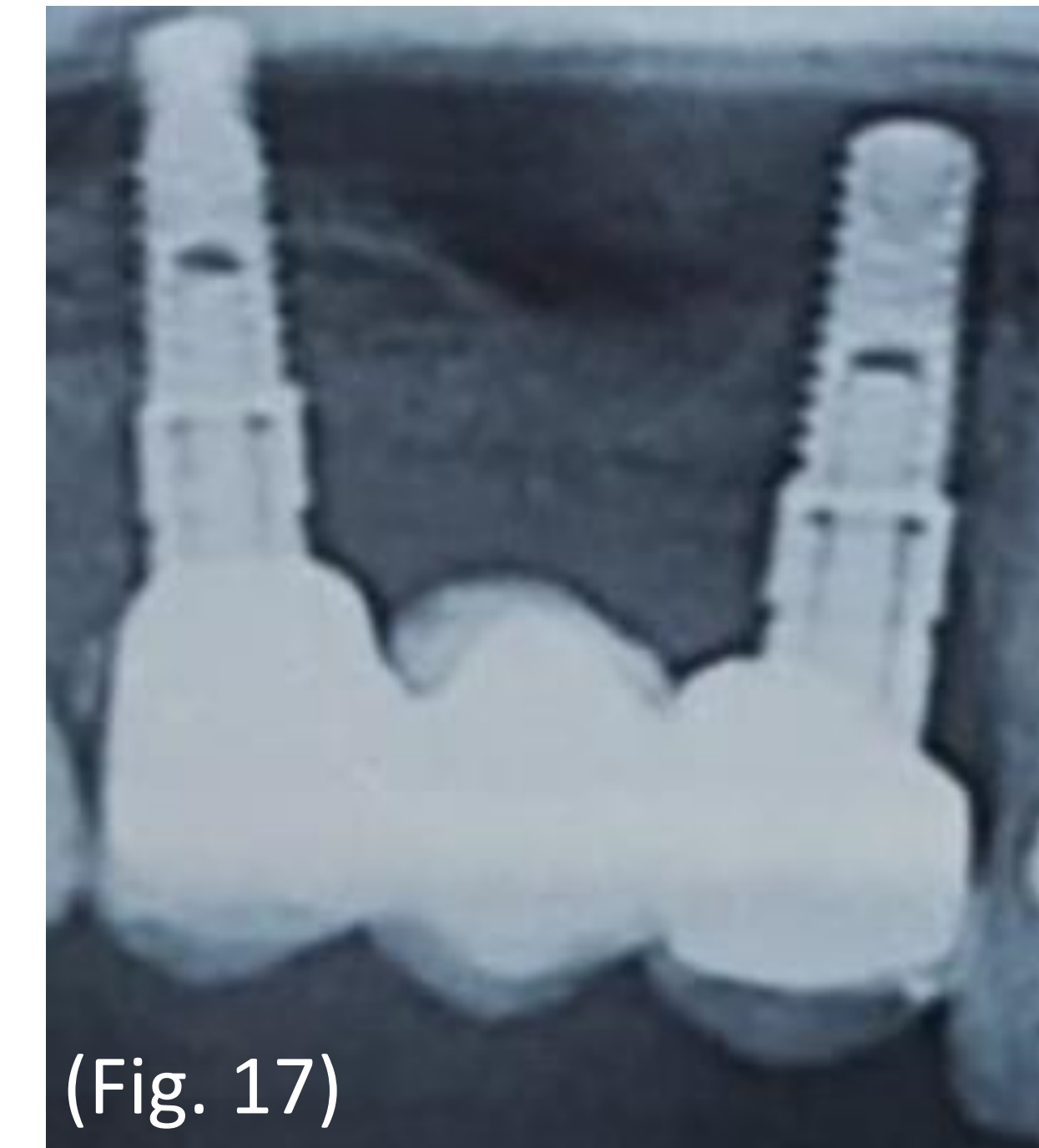


Fig 17: Post prosthetic radiograph for the test group.