Free Flap Reconstruction in head and neck

Case Presentation

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1. Vagal Paraganglioma

50 years old female with complaint of left neck swelling since 2 years ago

*A 7 * 7 cm firm and partially fixed mass palpating in level 2 of left side neck*

Parapharynx is completely pushed to medial on oral examination

Lower cranial nerves are intact

Salt and pepper appearance in MRI suggests Paraganglioma

Figure 1. Incision is marked and Vagal nerve monitoring is set



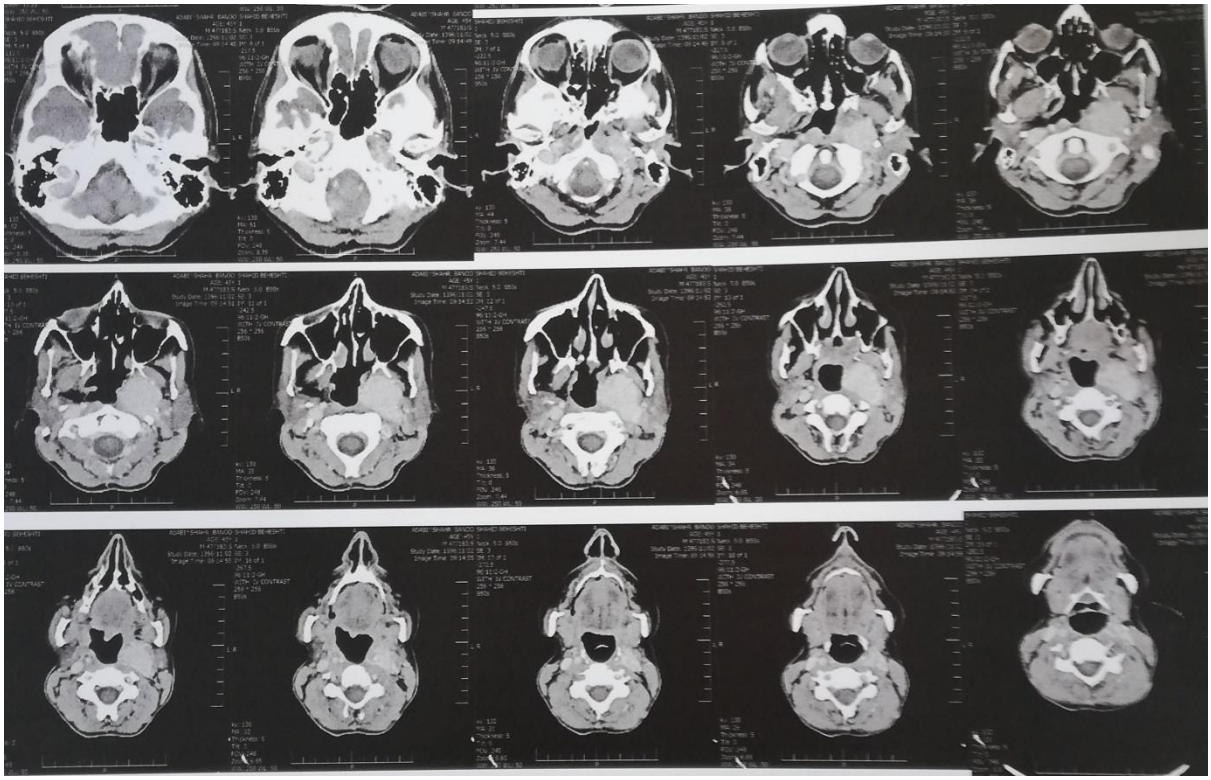


Figure 2. CT Scan Showing Enhanced mass of parapharynx

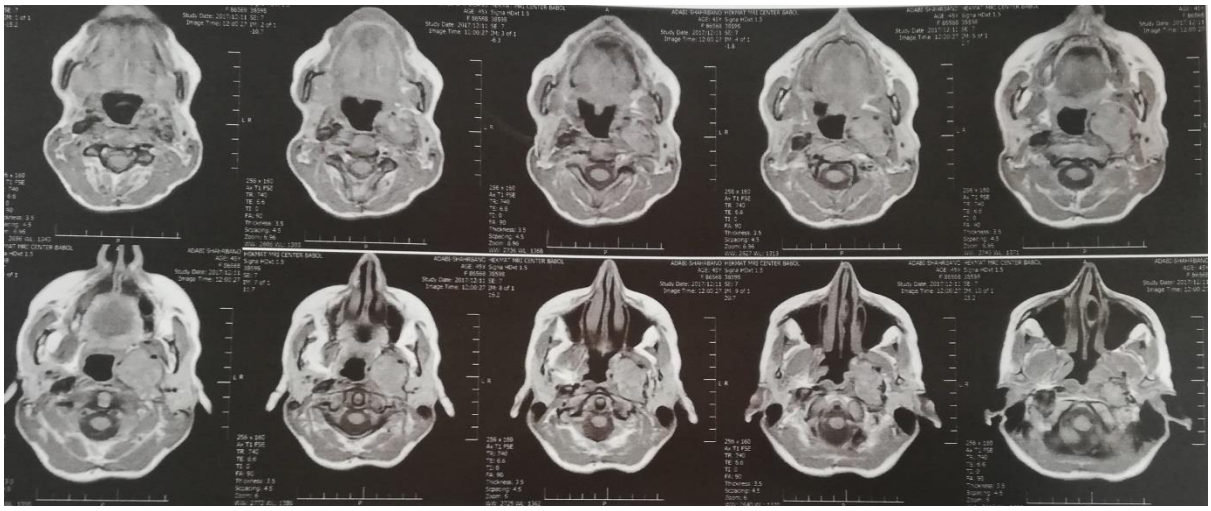


Figure 3. T1 MRI shows parapharyngeal mass

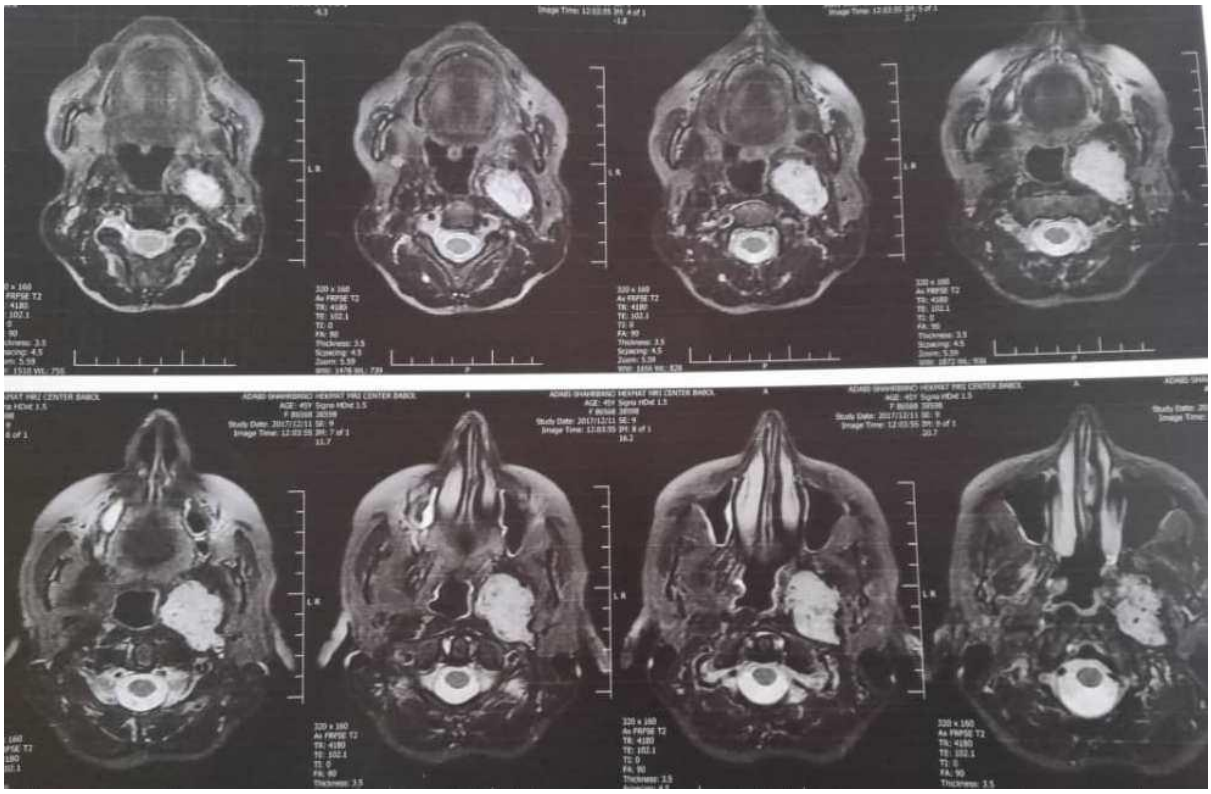


Figure 4. T2 MRI showing salt and pepper appearance of parapharyngeal mass suggesting a paraganglioma

Patient scheduled for tumor resection, because of skull base extension, we planned a mandible split approach to parapharynx.

As the defect after tumor removal seemed to increase the risk of saliva leakage we planned simultaneously reconstruction with anterolateral thigh musculofascial free flap

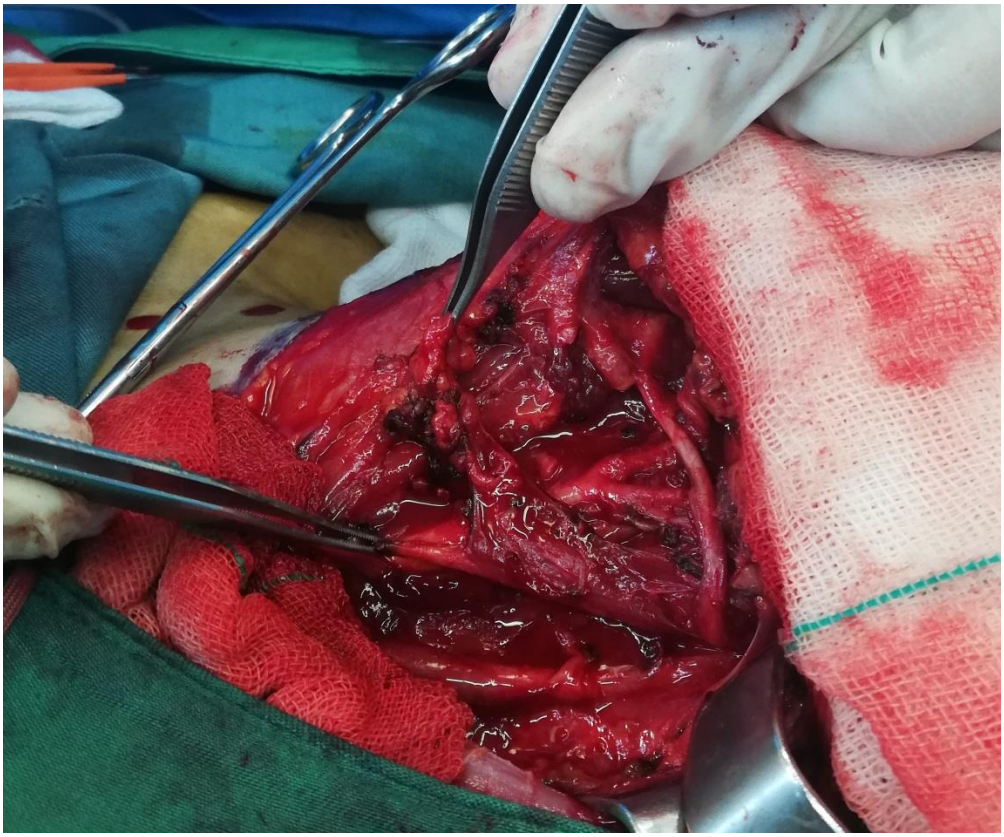


Figure 5. Common carotid is dissected and controlled for tumor resection

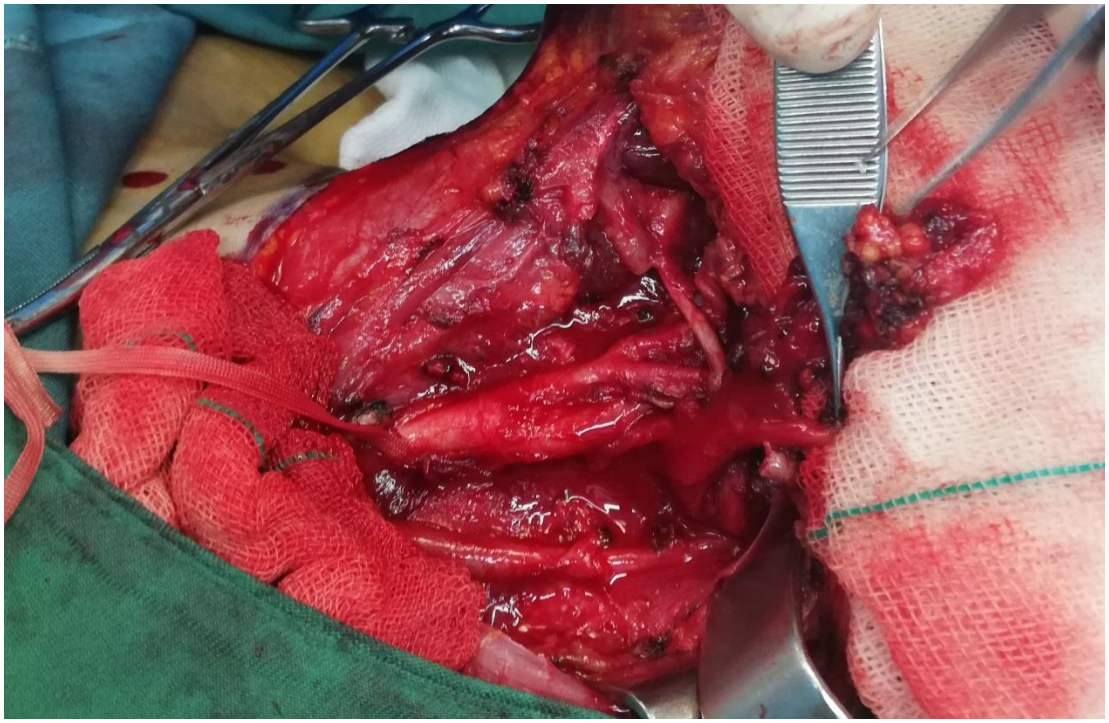


Figure *6*. Vague is sacrificed(not dissectable from tumor) and dissected of the carotid

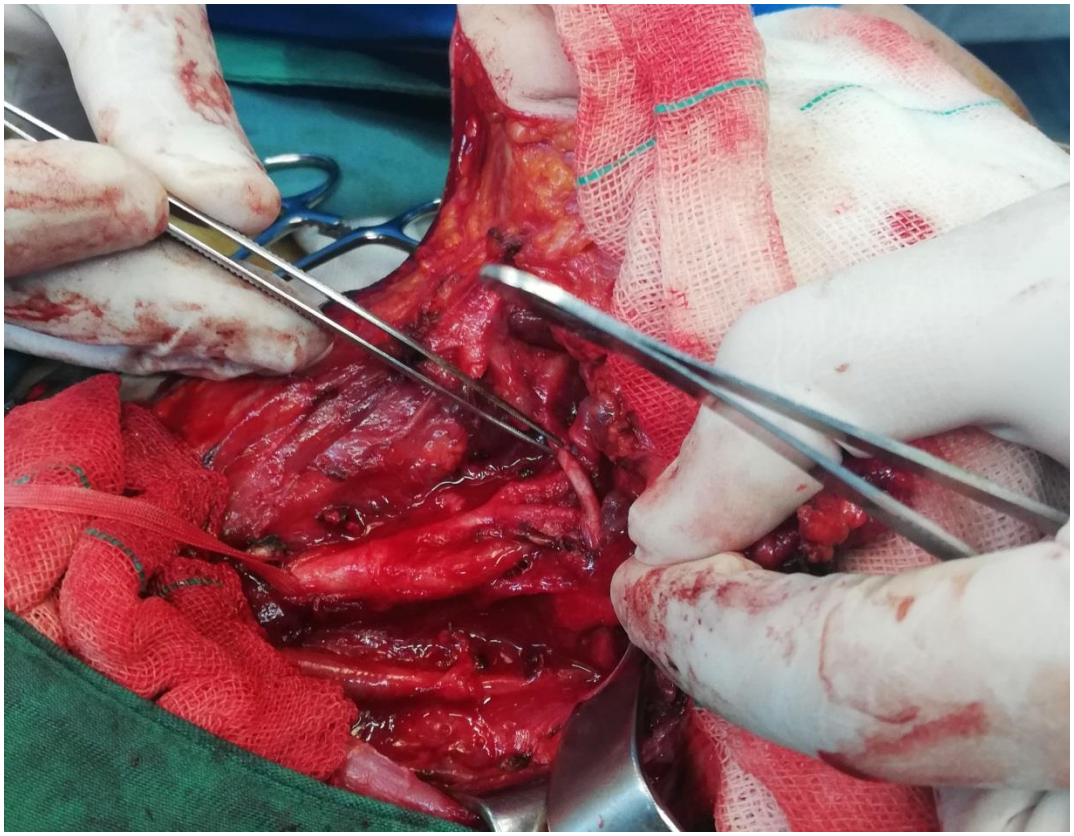


Figure 7. Showing hypogloss nerve



Figure 8. Planning to perform a mandible split approach

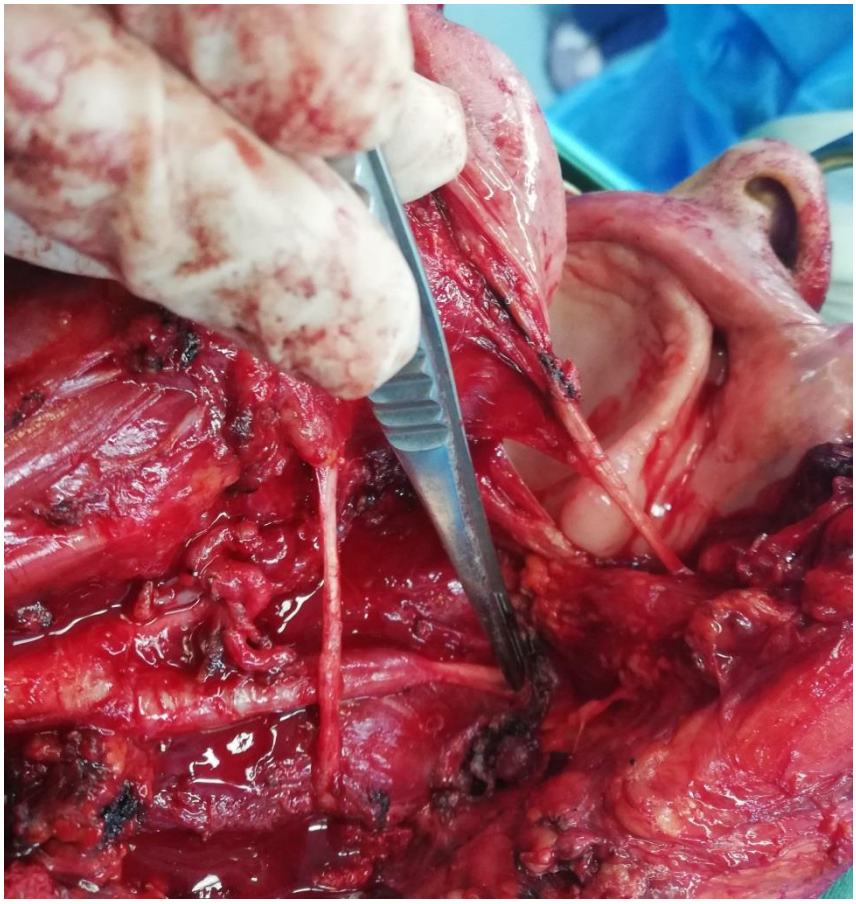


Figure 9. Hypoglossal and Lingual nerve are shown, indicationg internal carotid artery compressed by tumor

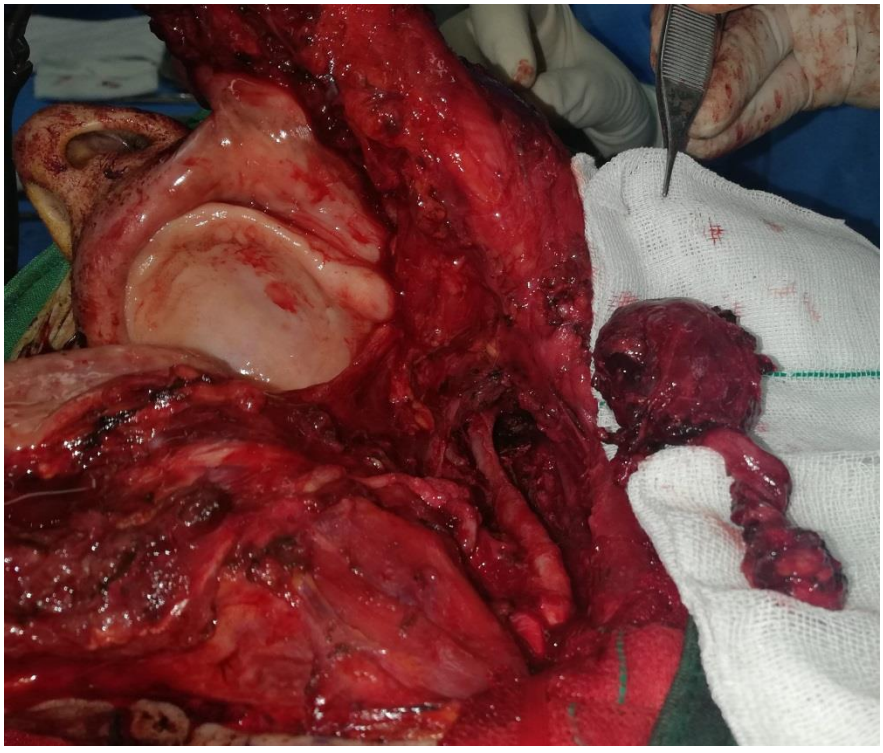


Figure 10. Tumor is completely resected and vagus nerve is seen connected to tumor

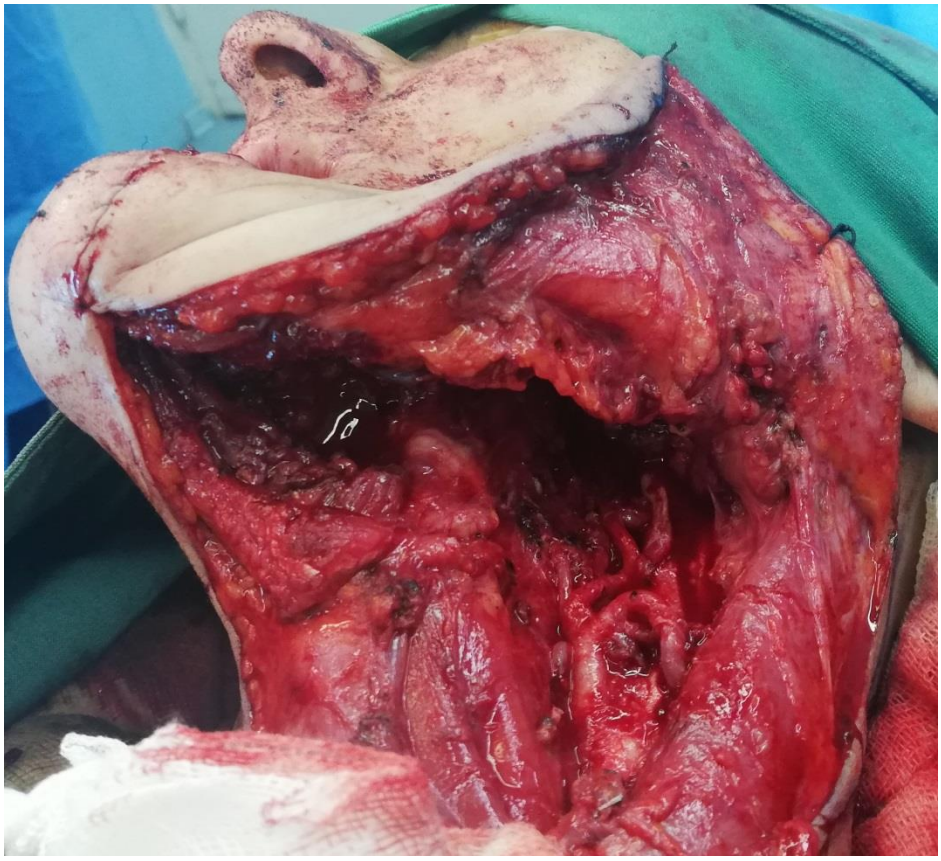


Figure 11. Defect after tumor removal

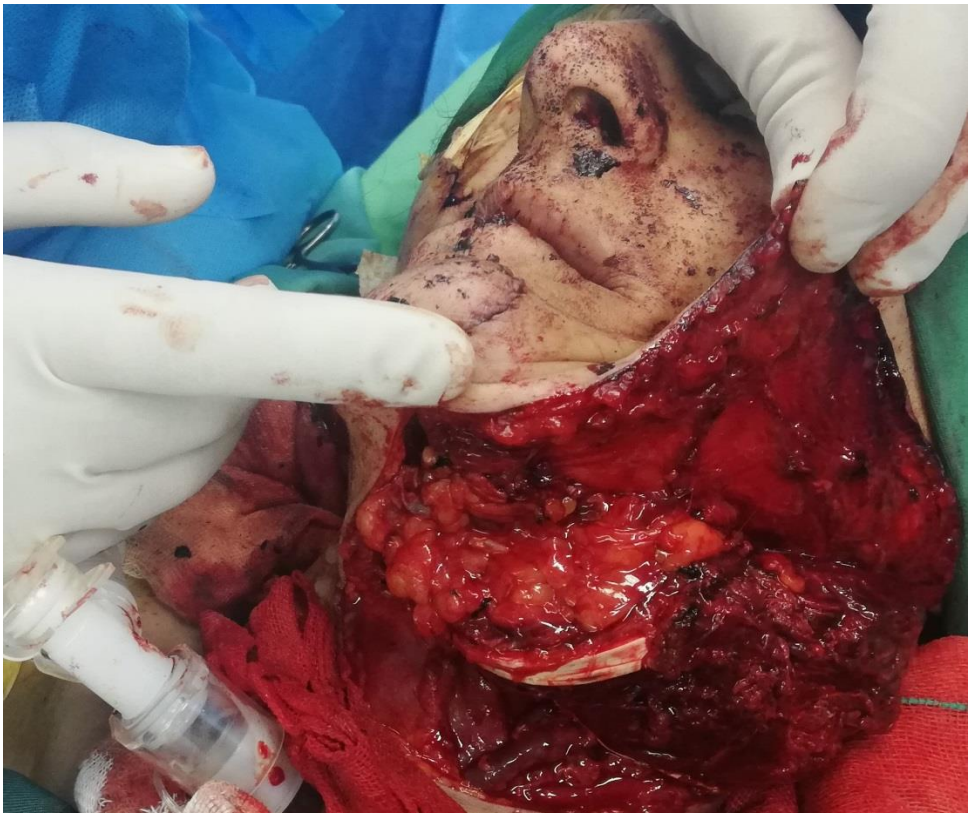


Figure 12. Anterolateral thigh free flap in anastomosed and set in place



Figure 13. Early Post Op



Figure 14. Two weeks after surgery

2. Buccal Basal Cell Carcinoma (BCC)

70 years old male complaint of left buccal mass for more than a year, involving skin and start to discharge since 2 months ago

*A 2*2 cm mass involving left buccal mucosa, extending to skin and involve 3*3 cm of cheek skin*

Obvious limitation of mouth opening in physical exam

Pathology reported as BCC

Patient scheduled for surgery, planned to resect the tumor with safe margins,

Reconstruct the through and through defect with folded anterolateral thigh free flap



Figure 15. buccal tumor invading skin



Figure 16. Mouth opening is restricted (Trismus)



Figure 17. MRI shows tumor approximity to mandible



Figure 18. suspicious bony involvement in MRI



Figure 19. Tumor resected with safe margins leaving this through and through defect

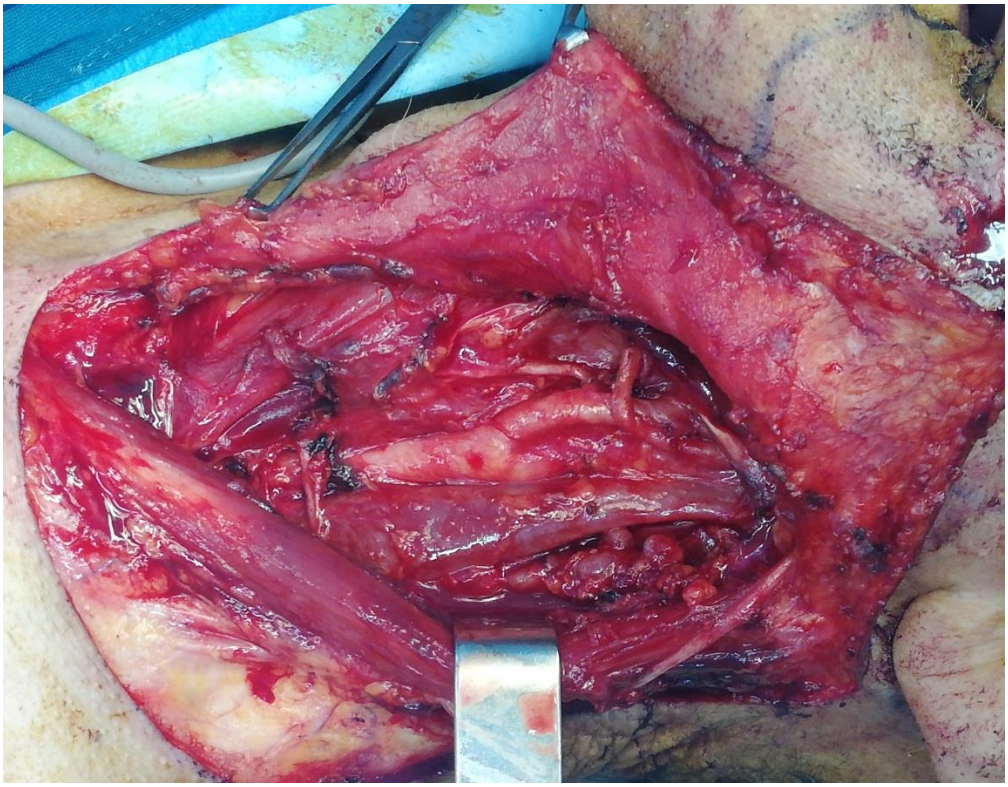


Figure 20. Opening the neck for harvesting recipient vessels and assuring for nodal metastasis clearance



Figure 21. Anterolateral fasciocutaneous free flap harvested ant the distal end is used to cover internal lining of the defect



Figure 22. Flap is passed through skin defect to reconstruct face skin defect

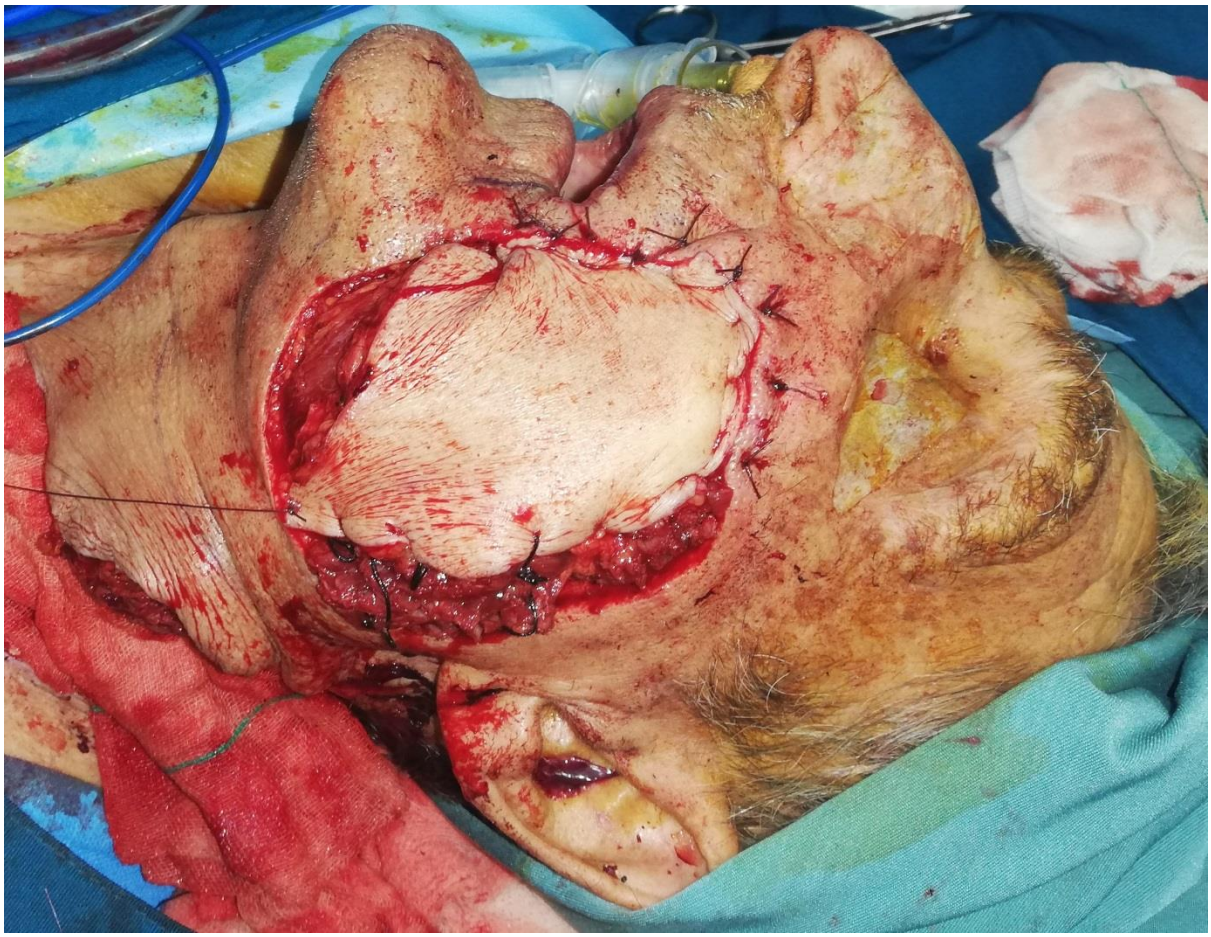


Figure 23. Skin flap skin incised to complete cheek defect reconstruction with no tension



Figure 24. Early post op



Figure 25. one week post op shows partial dehicency of the wound

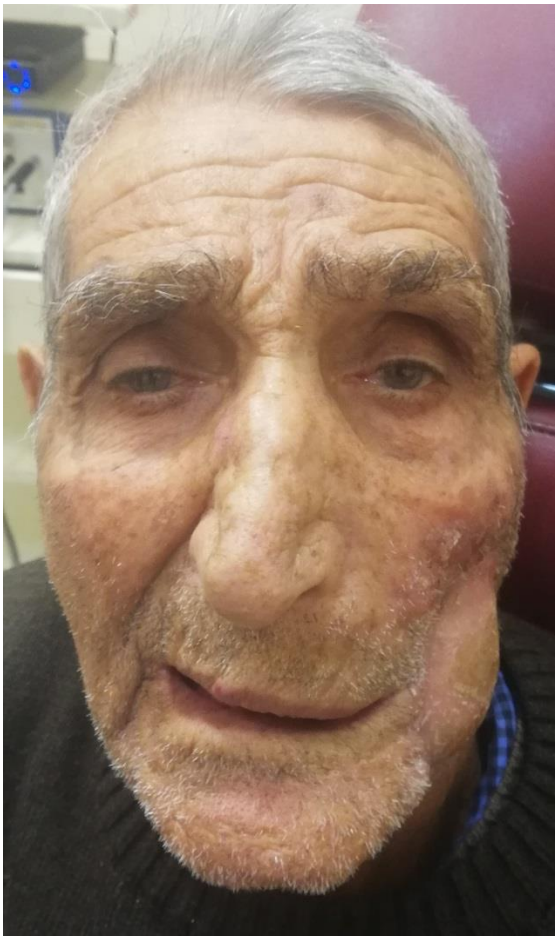


Figure 26. One month Post Op



Figure 27. One Month Post Op

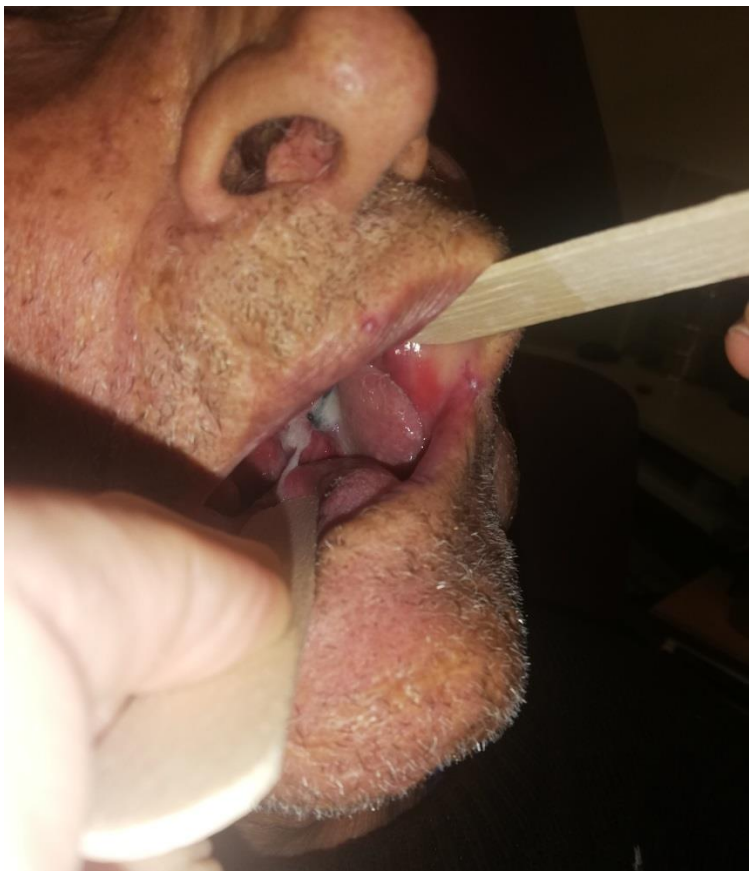


Figure 28. One Month Post Op

3. Nasal Skin Basal Cell Carcinoma (BCC)

12 years old boy, known case of xeroderma pigmentosa (XP), with numerous skin lesions on face

Complaint of recent ulceration of right nasal skin lesion

Pathology reported as BCC

Patient was scheduled for tumor resection and reconstruction with Radial forearm free flap



Figure 29. Right nasal and facial mass (BCC)



Figure 30. Image shows facial mass and nasal destructon



Figure 31. Tumor is removed and a tunnel is made to pass the RFFF pedicle to neck



Figure 32. Radial forearm free flap is set in place and a doyle stent is used to prevent nasal stenosis



Figure 33. RFFF pedicle is passed to the neck for vascular anastomosis



Figure 34. Early Post Op



Figure 35. two weeks post op



Figure 36. Two weeks post op

4. Tongue SCC

50 years old female, complaint of tongue mass for 4 months

Painful ulcerated mass involving ventral surface of tongue, extending to base of tongue and contralateral

In physical bimanual examination floor of mouth is involved

Bilateral neck lymphadenopathy is palpated

Patients scheduled for total glossectomy, bilateral modified radical neck dissection and reconstruction with anterolateral thigh free flap

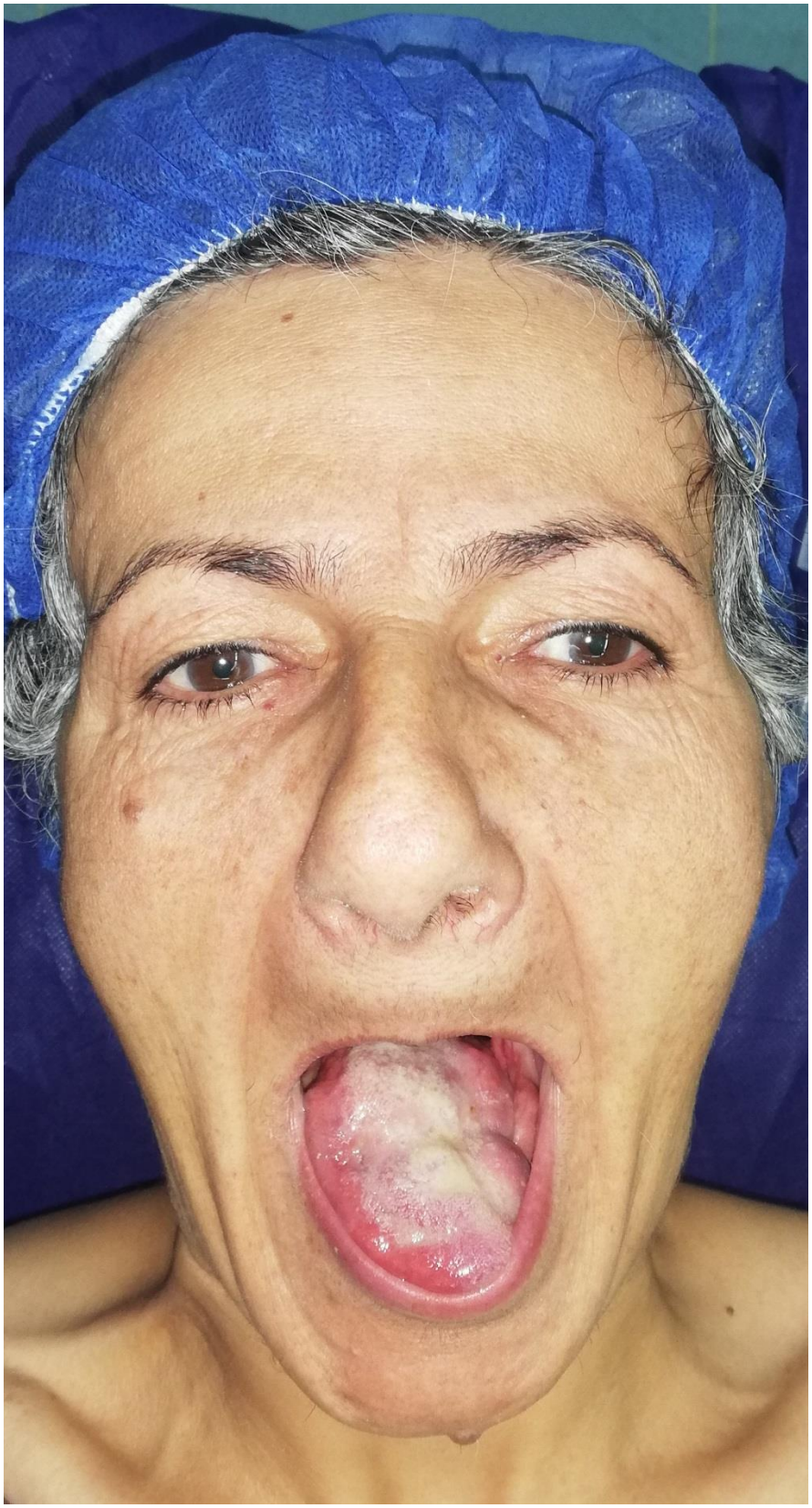


Figure 37. pre operative image shows totally involvement of tongue

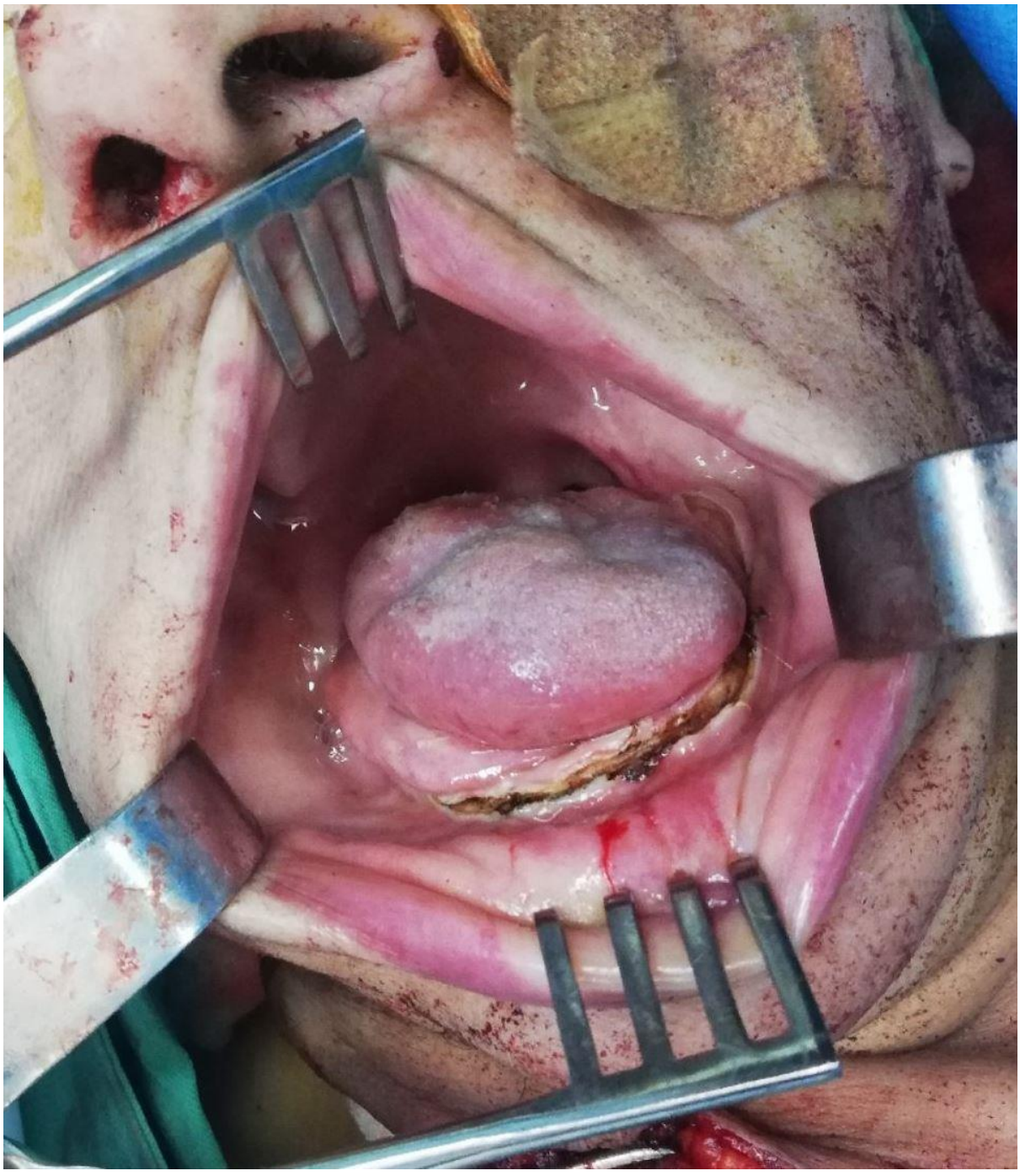


Figure 38. Performing Total glossectomy after bilateral neck dissection

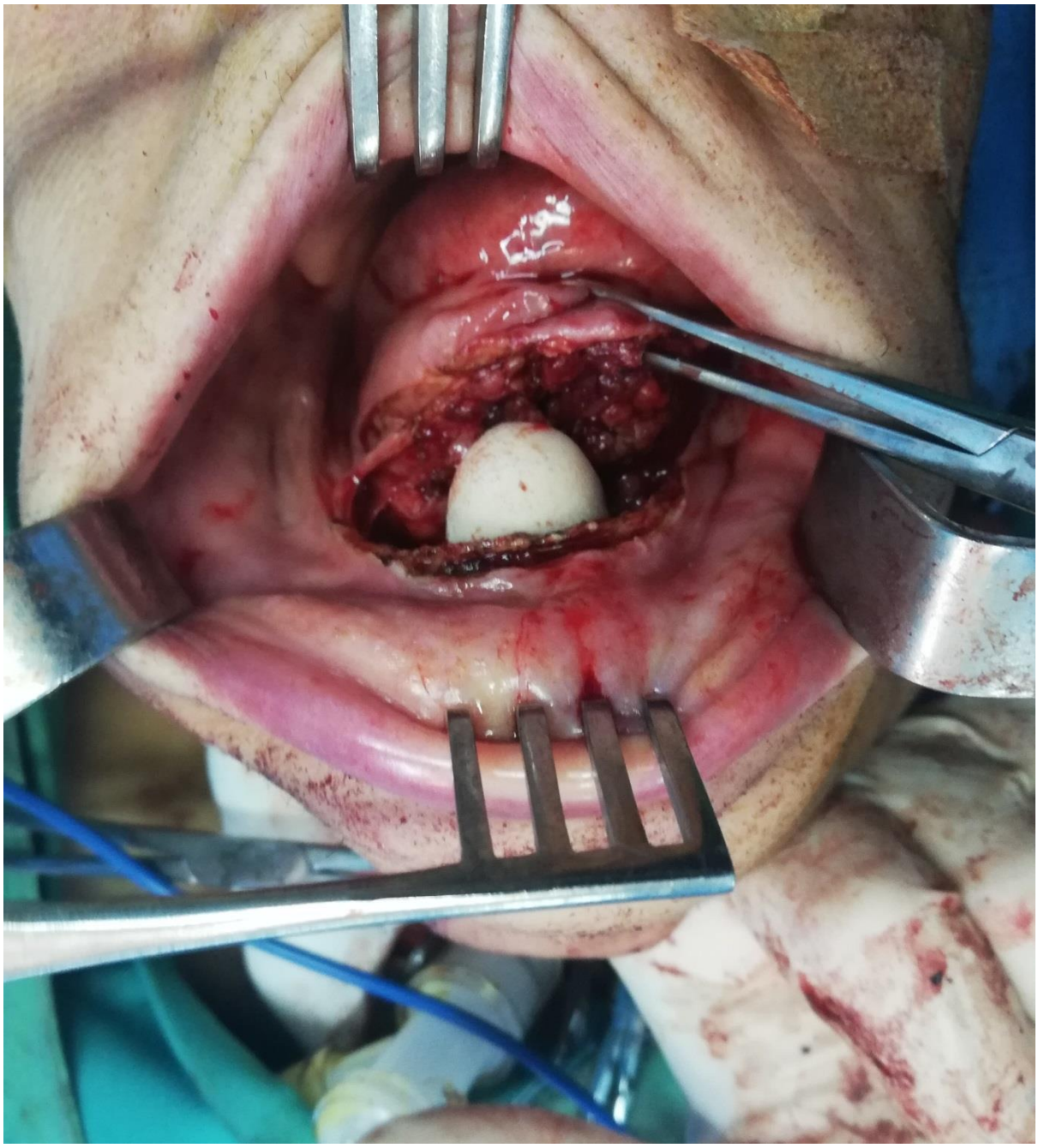


Figure 39. image shows dissection of the floor of mouth to pull through the tongue to the neck

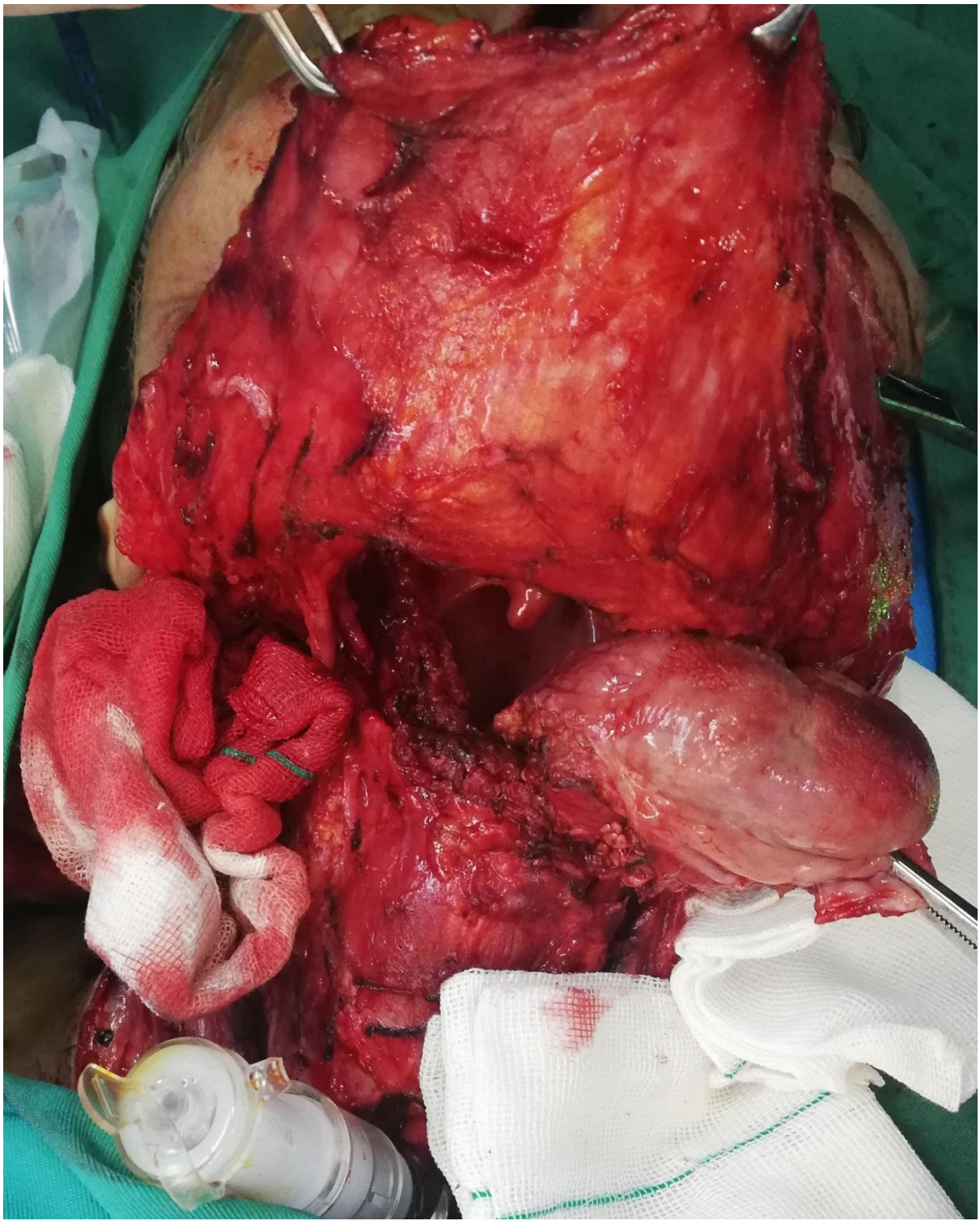


Figure 40. Pull through technique to complete total glossectomy

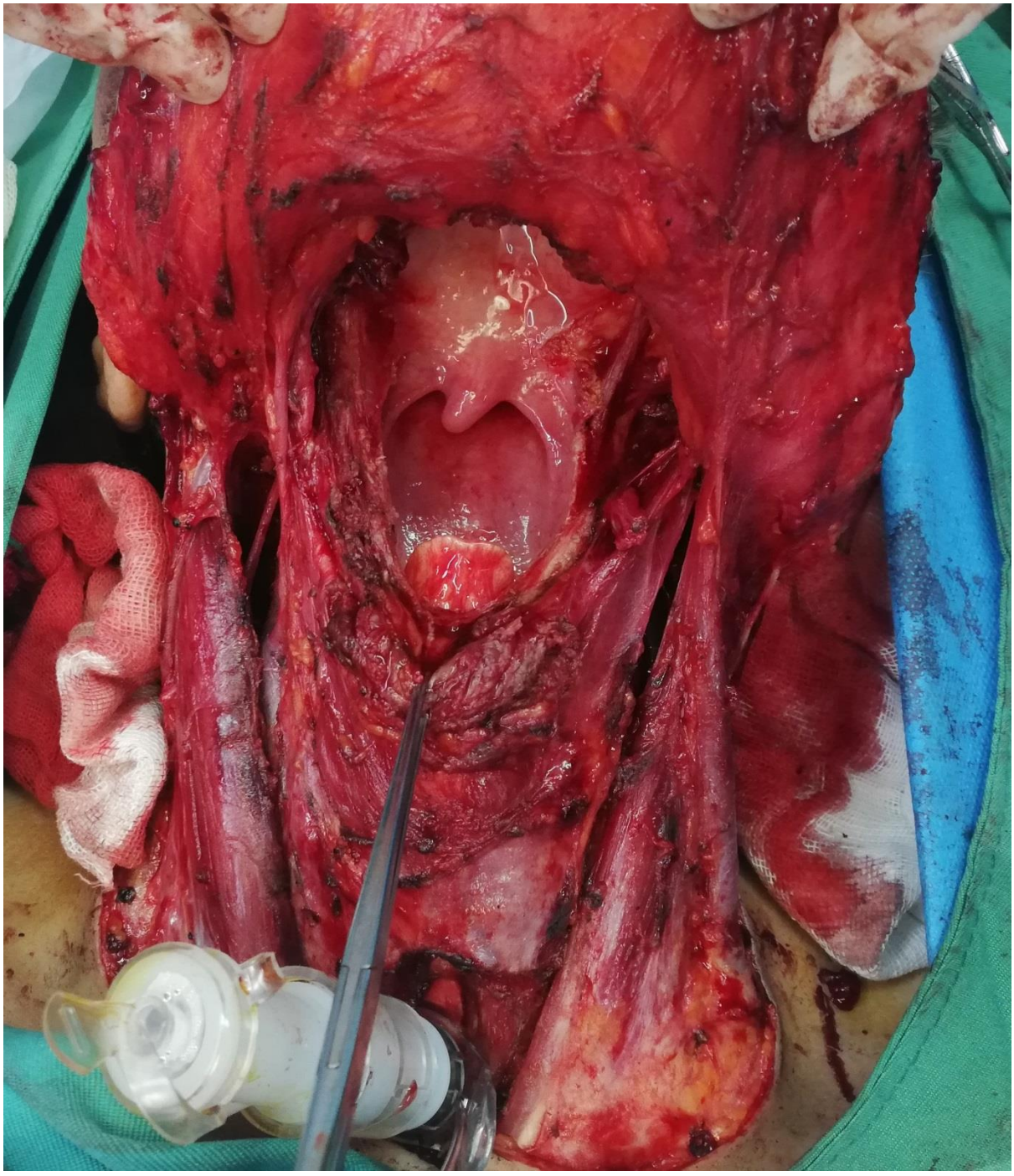


Figure 41. Image shows defect after Total tongue and floor of mouth resection



Figure 42. The Anterolateral thigh free flap inset starting from valecula

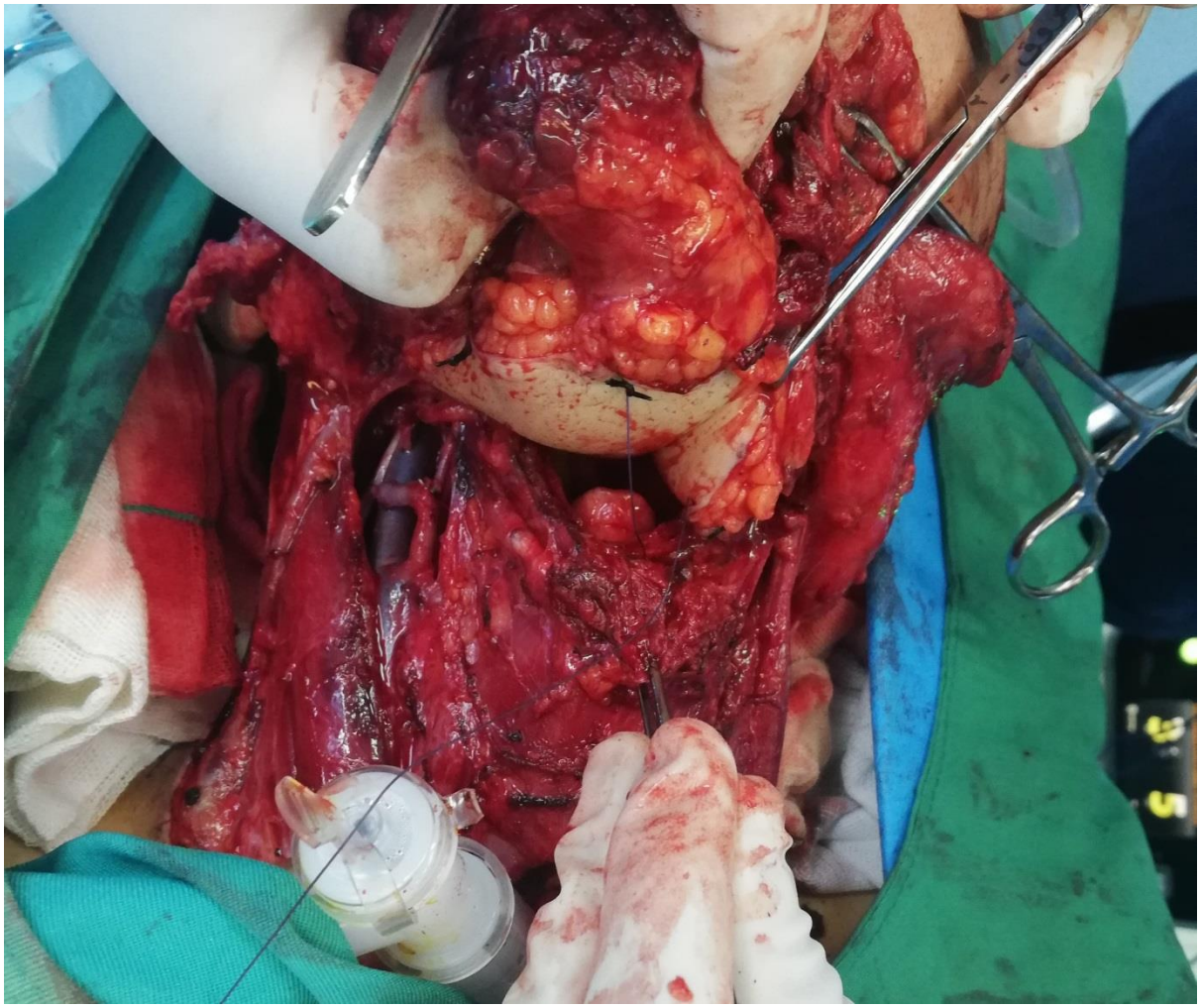


Figure 43. Flap inset continues

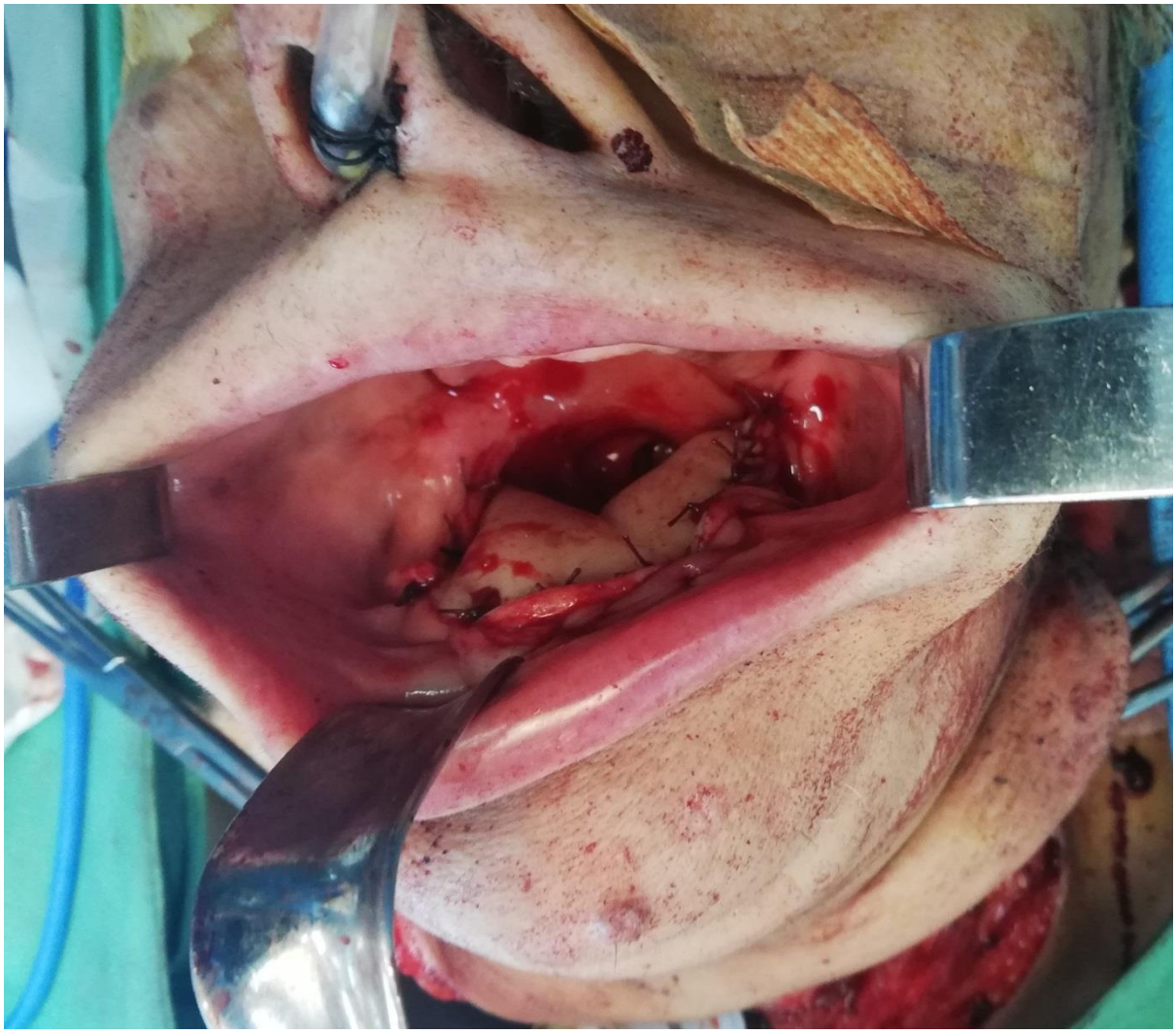


Figure 44. Image shows tongue reconstruction after vascular anastomosis



Figure 45. Two weeks after operation

5. Facial Paralysis

50 years old female complaint of prolonged hemi facial paralysis

History of two previous surgeries on parotid lesion which leading her to persistent facial paralysis

On physical exams patients shows grade 6 House-Brackman facial paralysis.

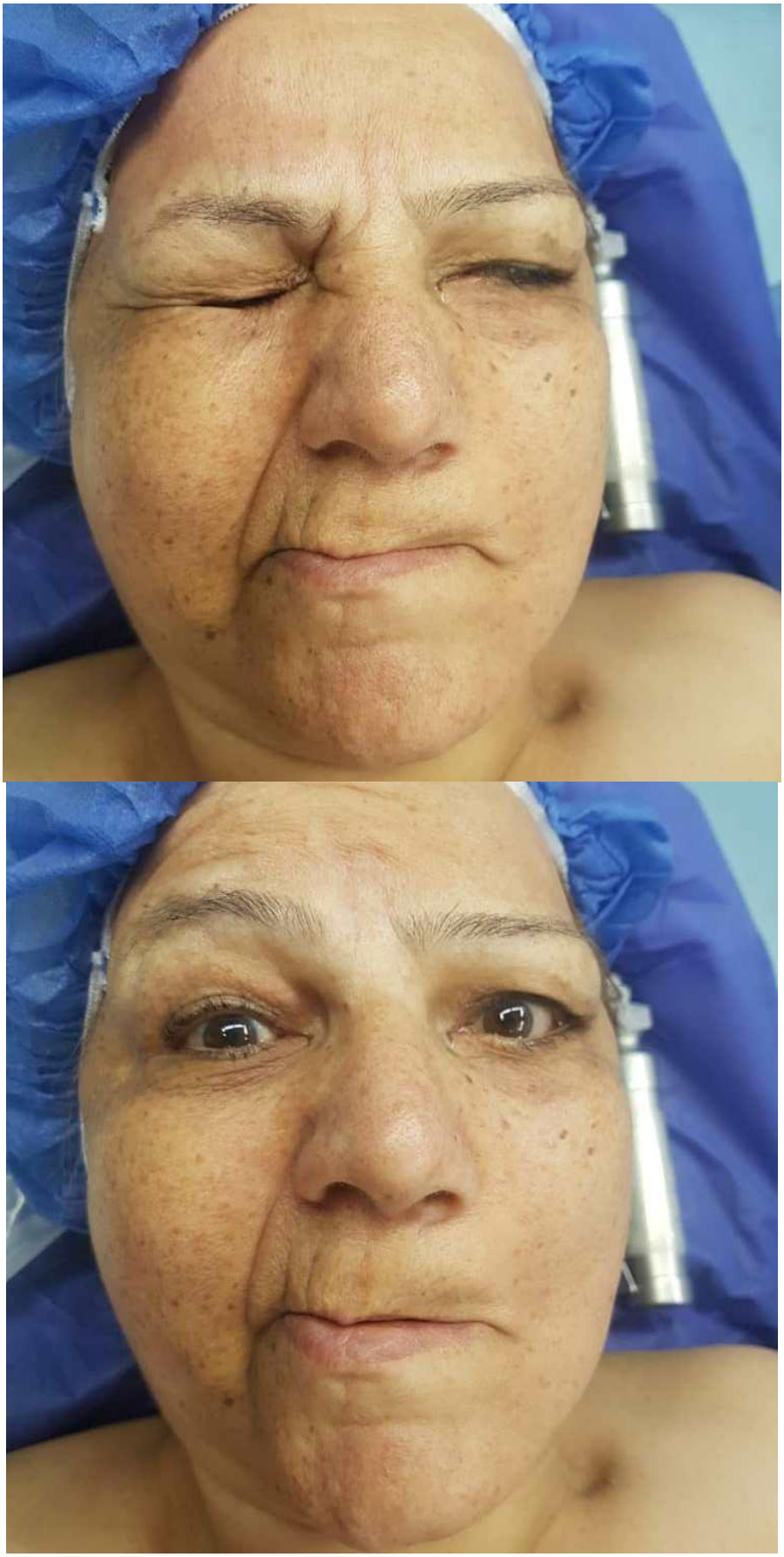


Figure 46. Pre operation



Figure 46. Pre operation



Figure 47. Incision to access face and neck donor vessels

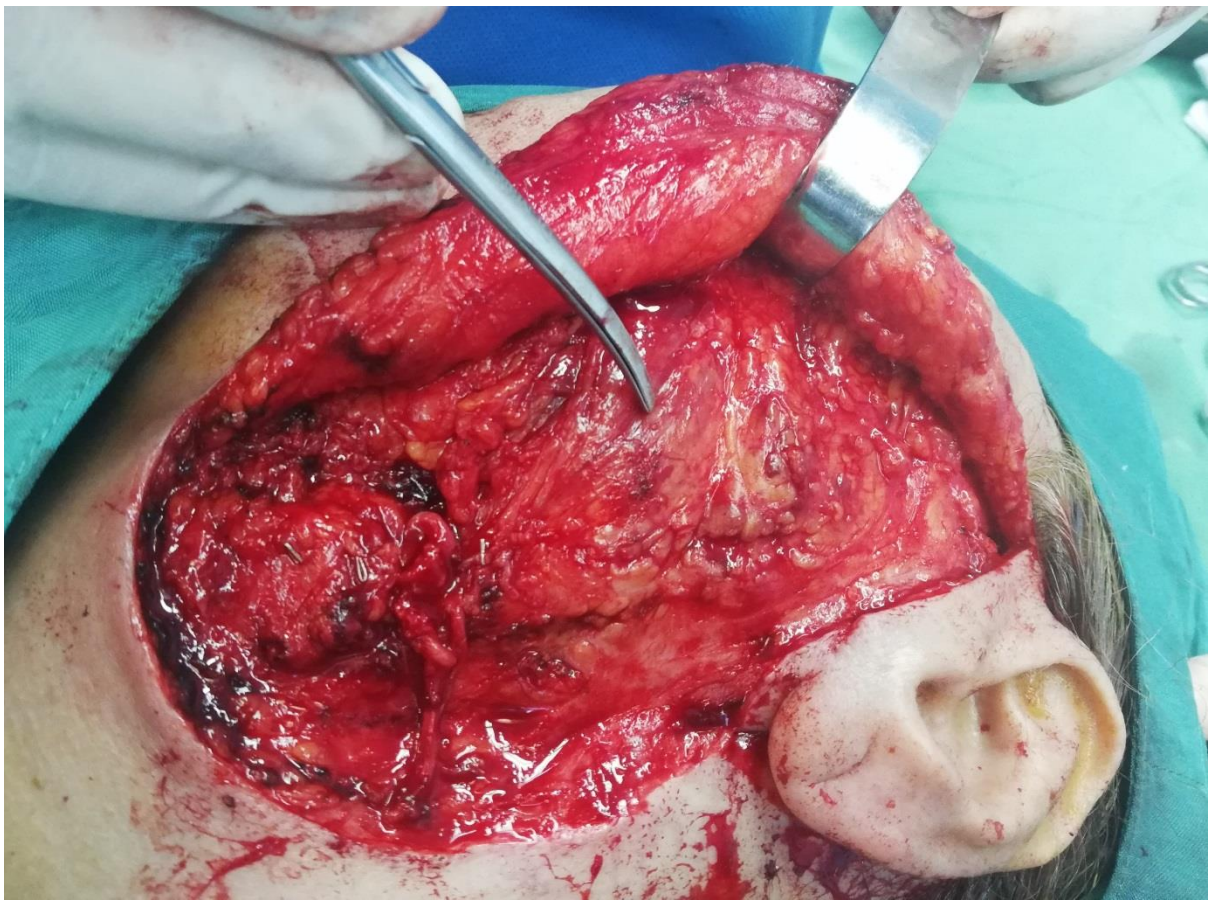


Figure 48. Facial flap elevated to inset gracilis muscle



Figure 49. Facial vein and artery are harvested as donor vessels



Figure 50. Sutures passed through Labial Commisure to anchor muscular flap

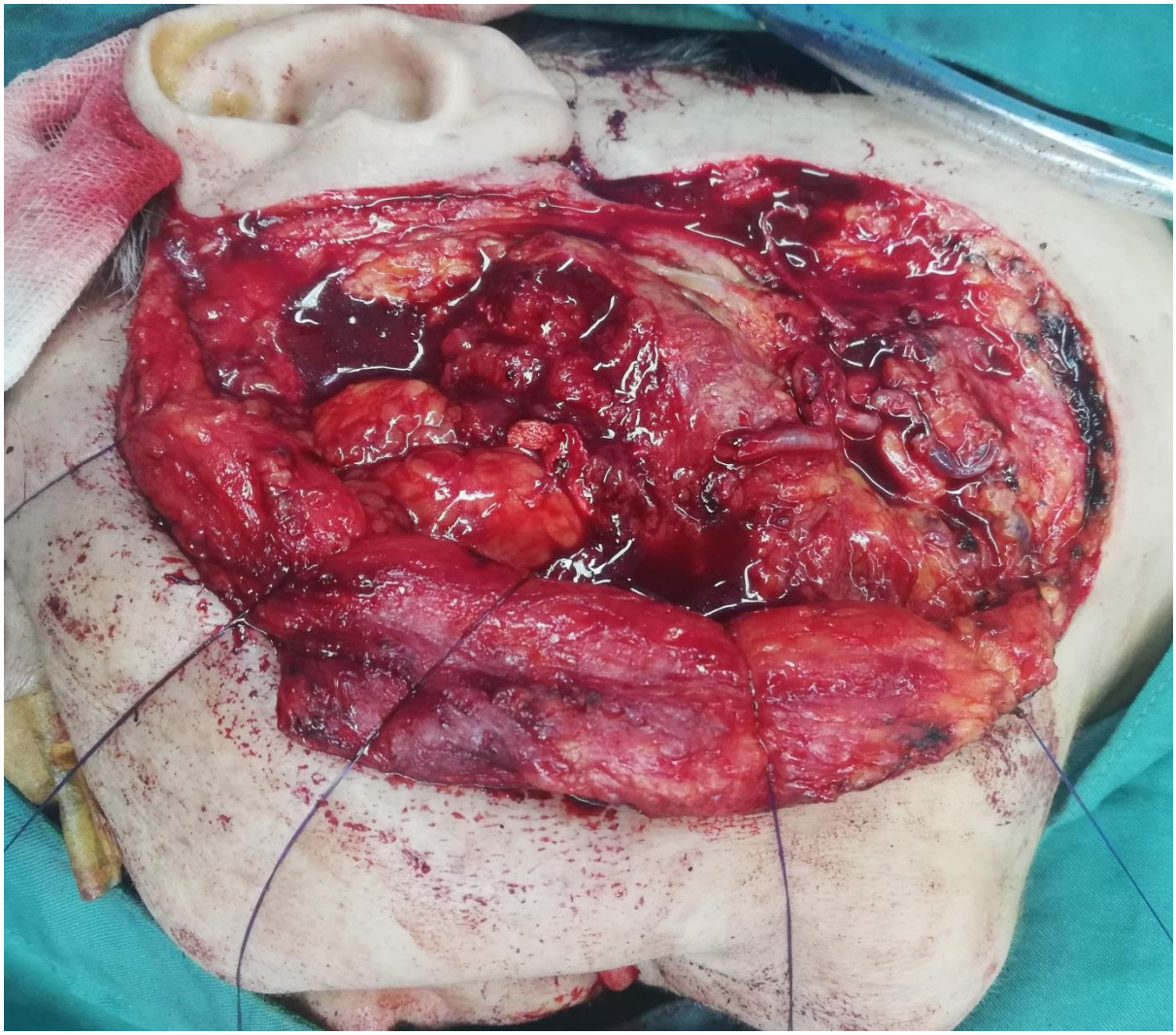


Figure 51. Sutures are passed and ready to inset our flap

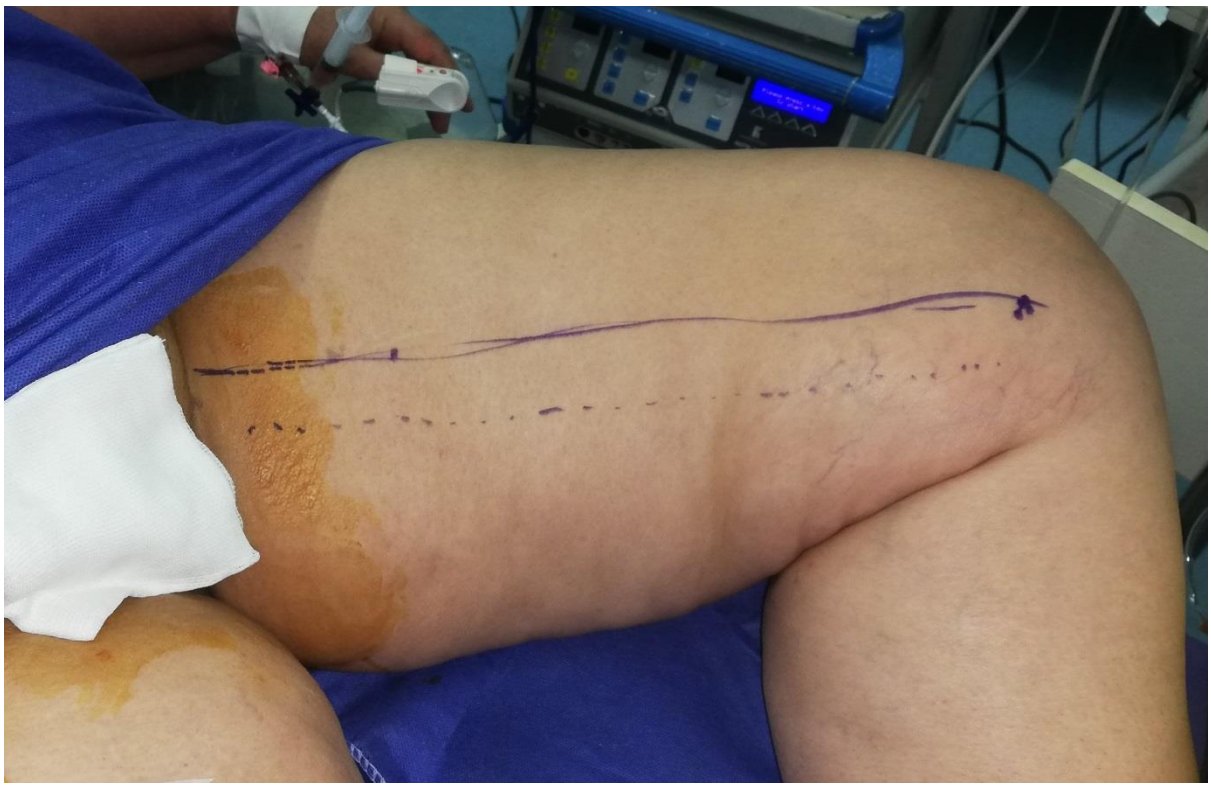


Figure 52. Skin markings for harvesting Gracillis free flap

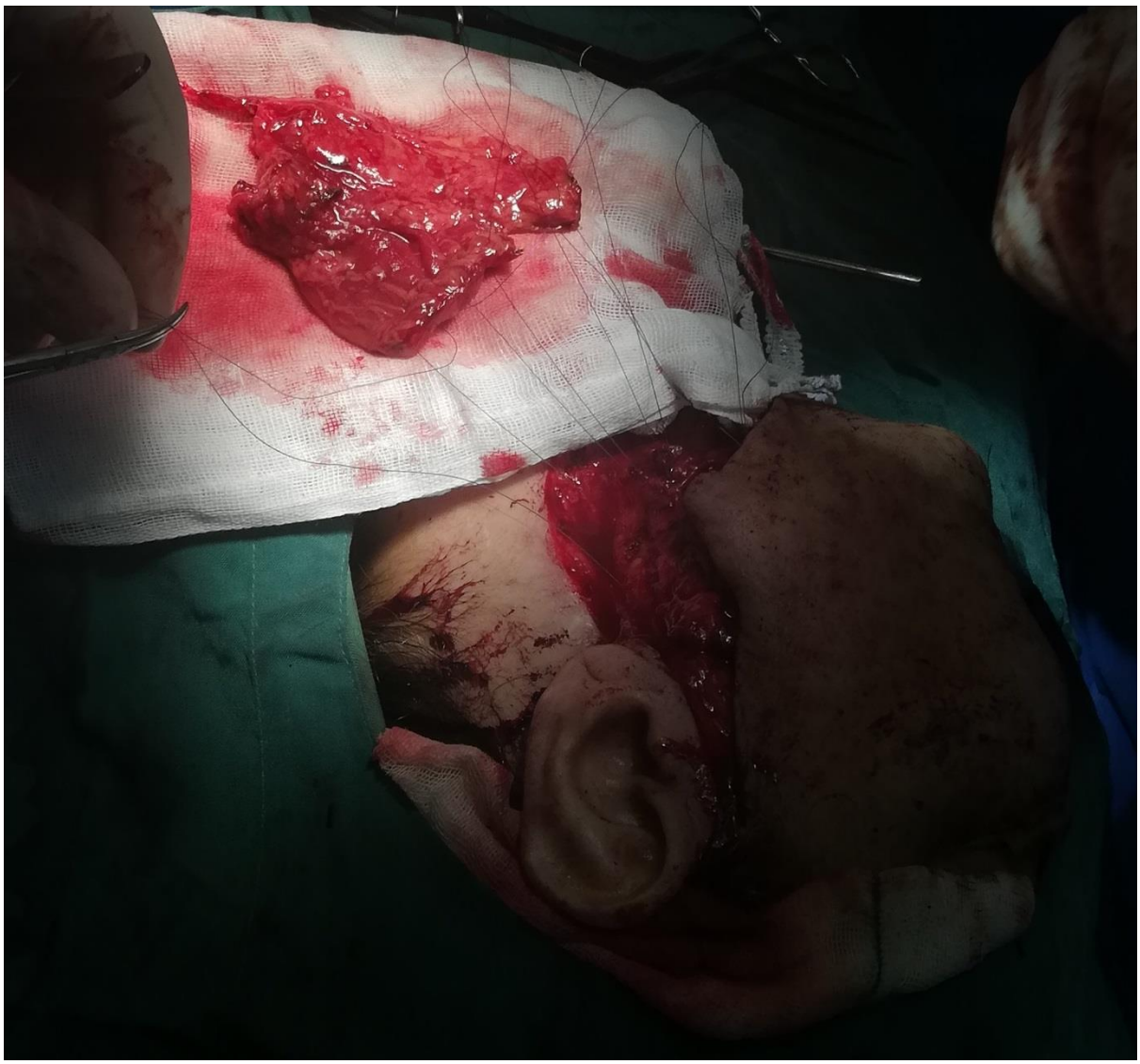


Figure 53. Flap in anchored by sutures to set in place

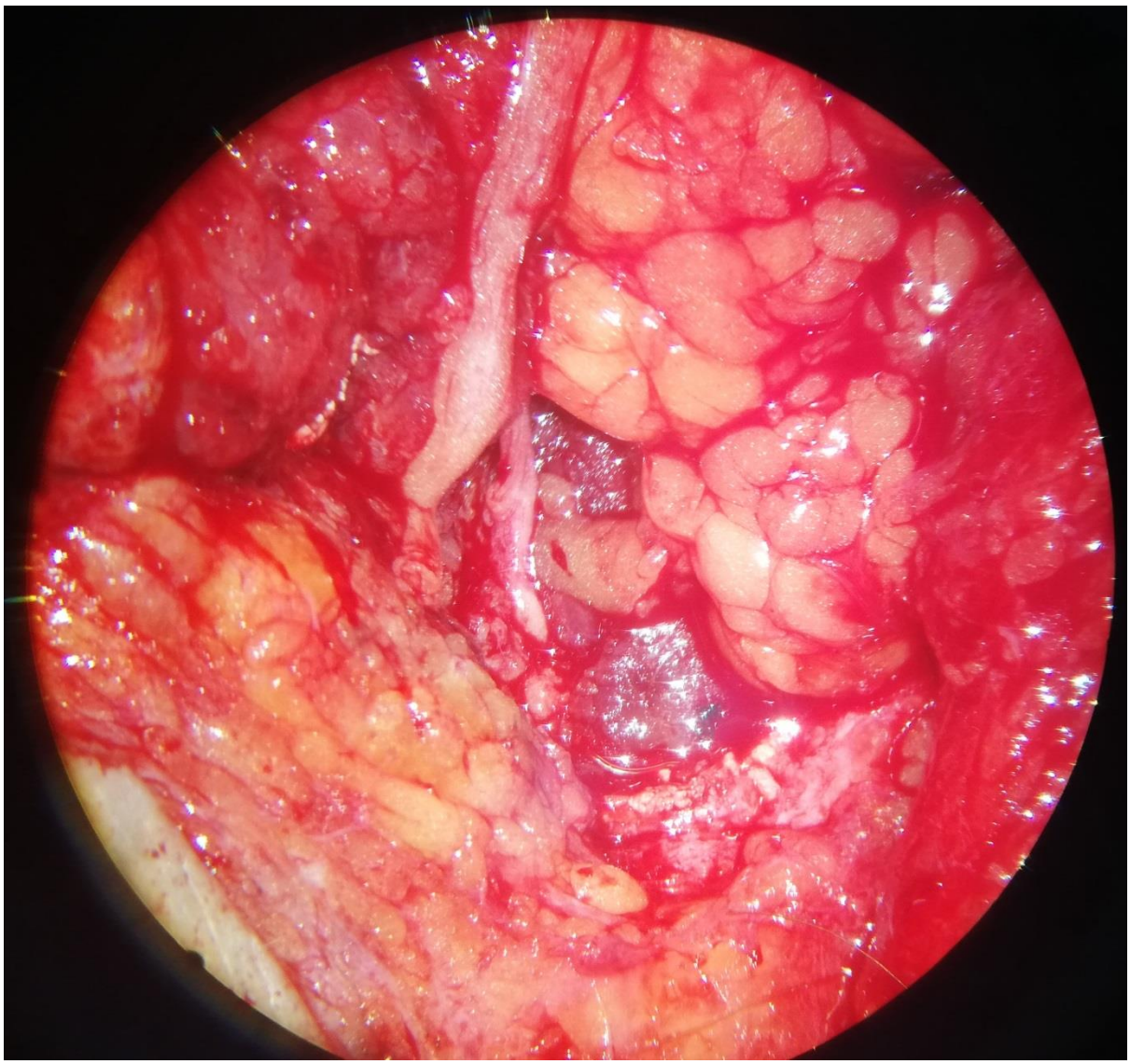


Figure 54. Nerve Anastomosis (Masseteric branch of fifth cranial nerve to obterator nerve)



Figure 55. First week post op



Figure 56. First week post op

6. Tongue SCC

50 years old female

Complaint of tongue mass since 1 year ago

In physical exams 5*5 indurated mass palpated in posterolateral left side of the tongue

Lymphadenopathy in the neck is present

Patient underwent Total Glossectomy (Right side of tongue partially preserved)

Bilateral modified radical neck dissection is done

Reconstruction is done with Anterolateral thigh free flap



Figure 57. Image showing tongue mass involving ventrolateral and base of tongue

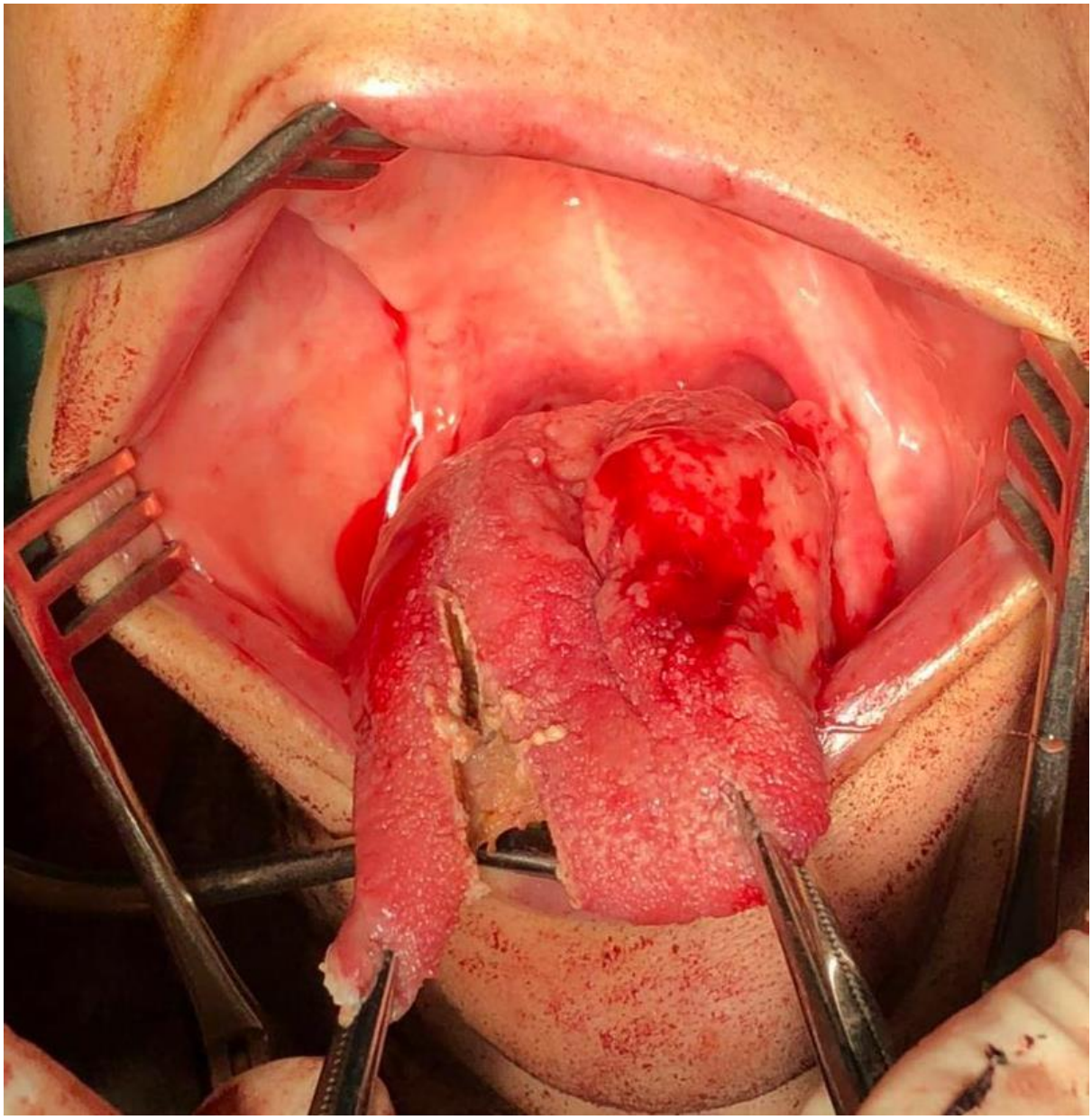


Figure 58. Glossectomy is performing with adequate margin

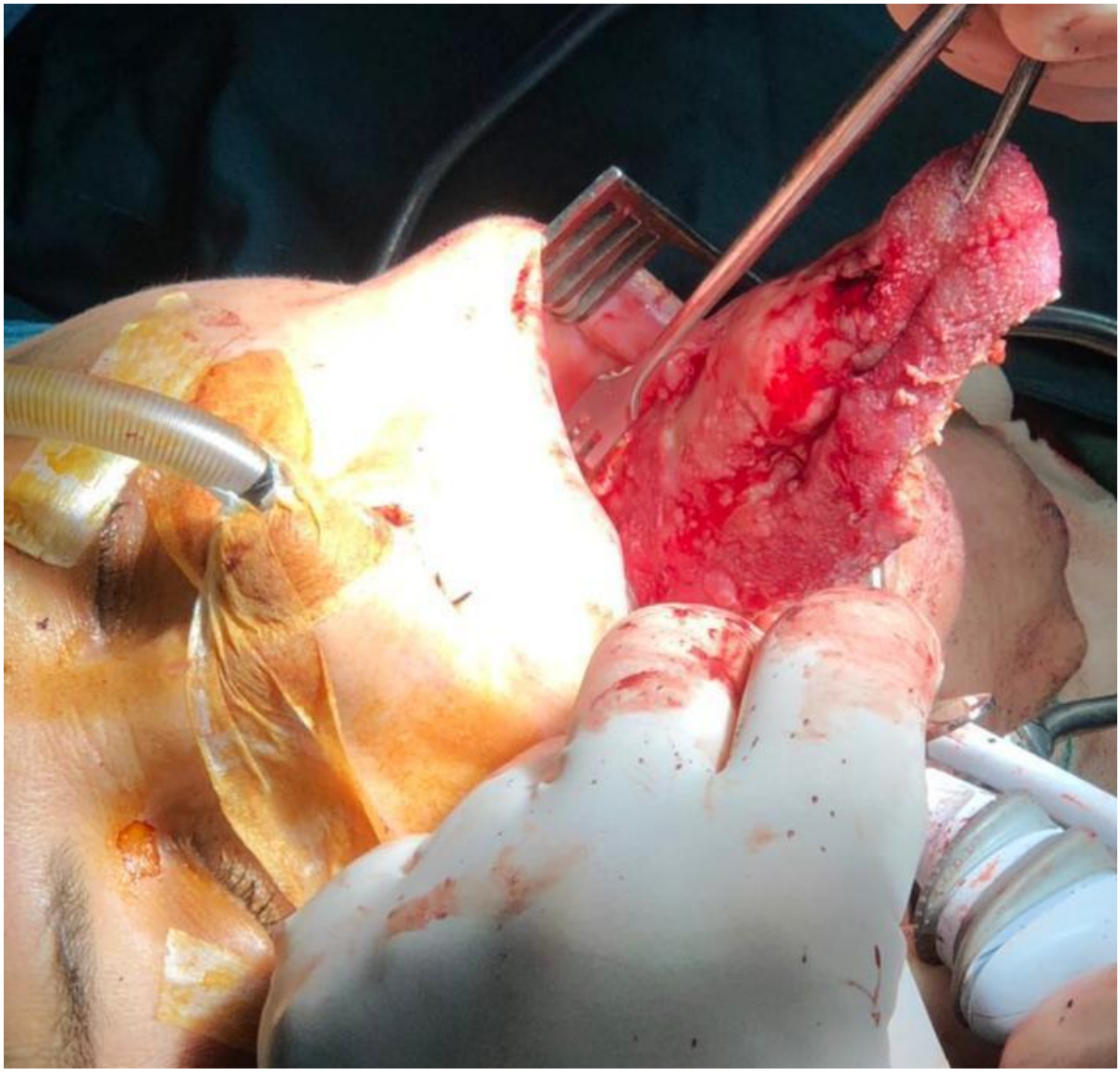


Figure 59. Glossectomy with adequate margin, resection of almost total tongue and base of tongue

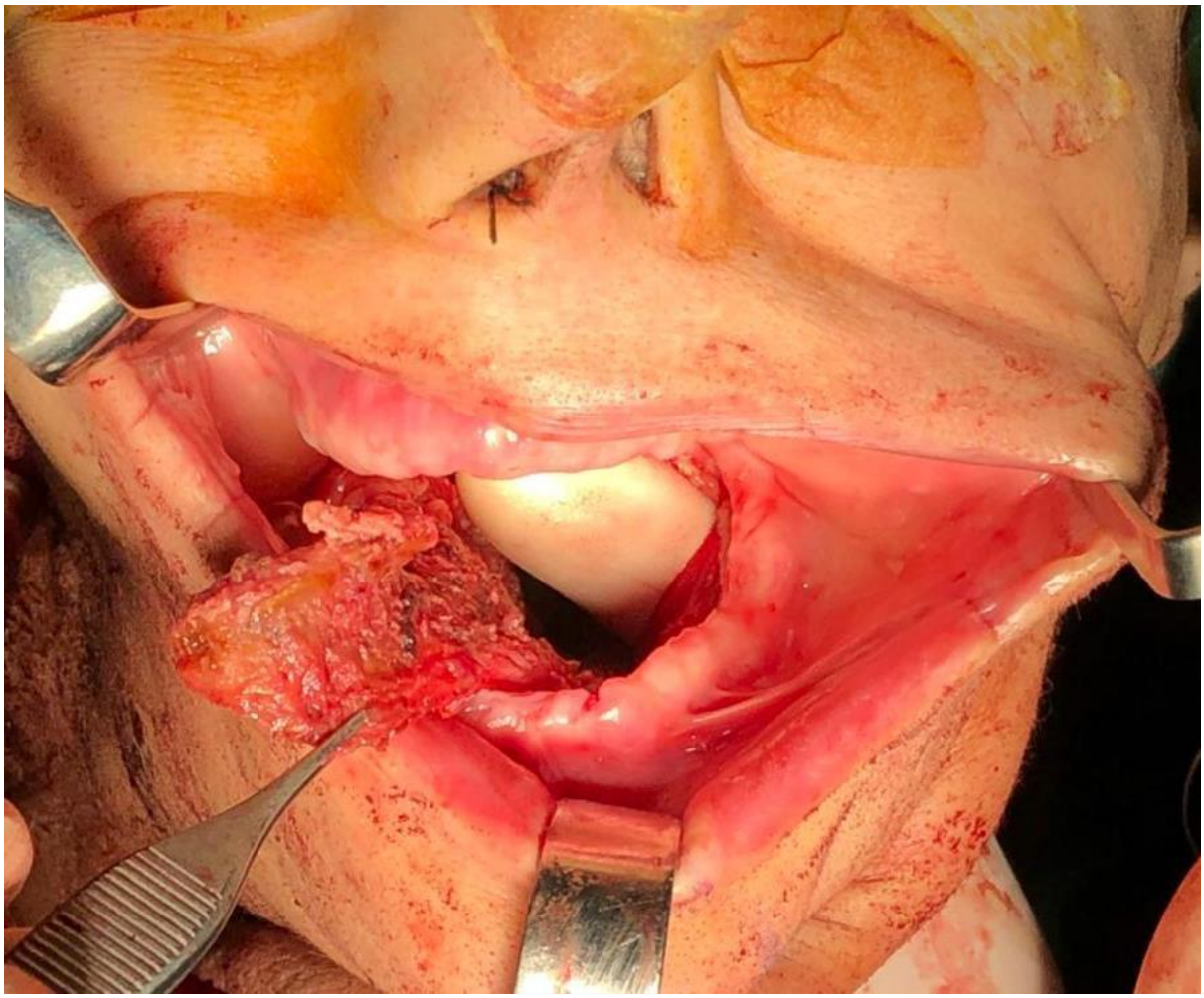


Figure 60. Image shows defect after glossectomy

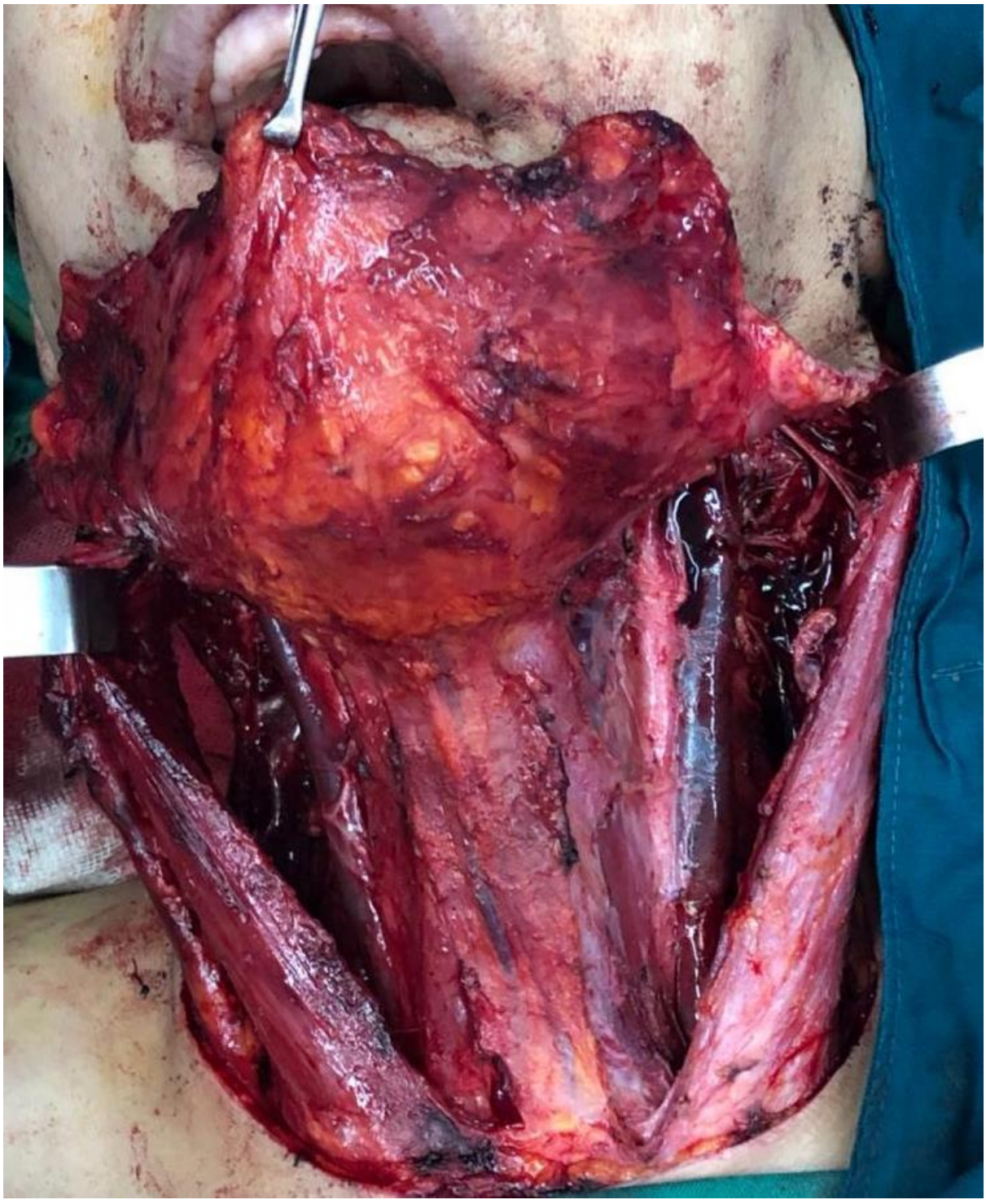


Figure 61. Bilateral modified neck dissection

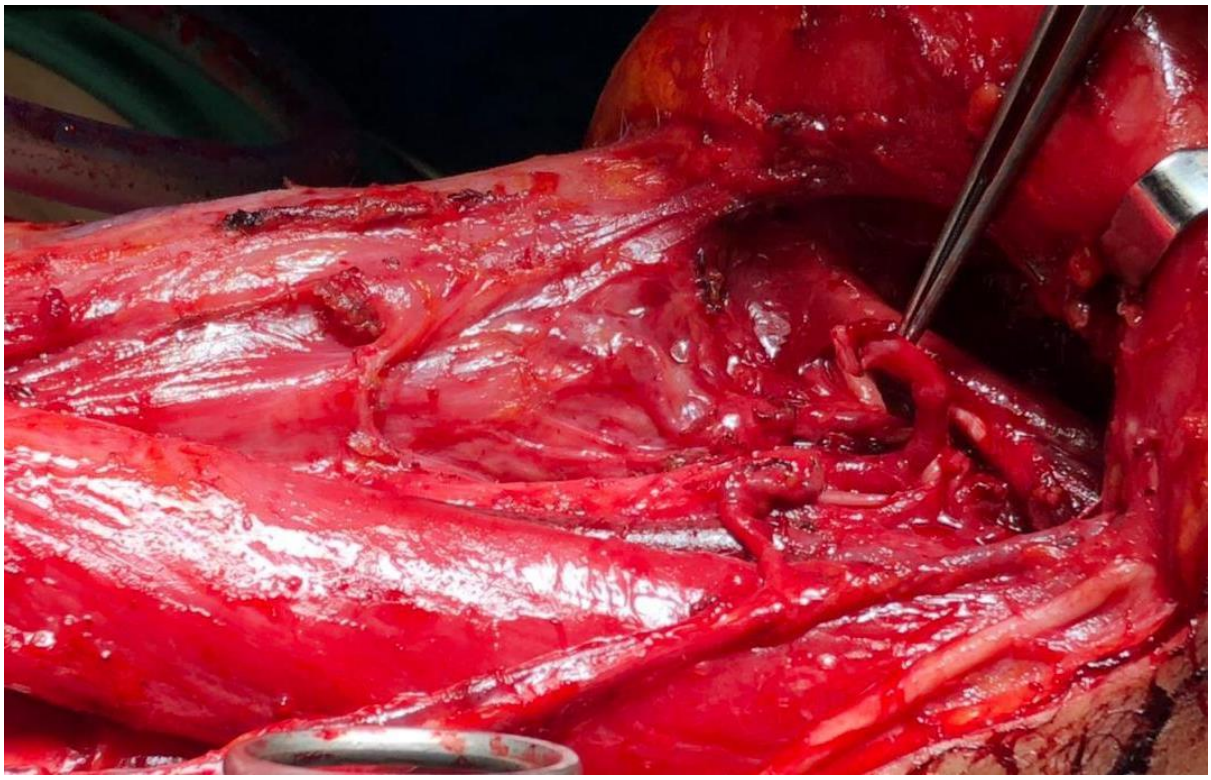


Figure 62. Facial artery and vein is harvested as donor vessels



Figure 63. Perforator vessels are marked before Anterolateral thigh free flap harvest

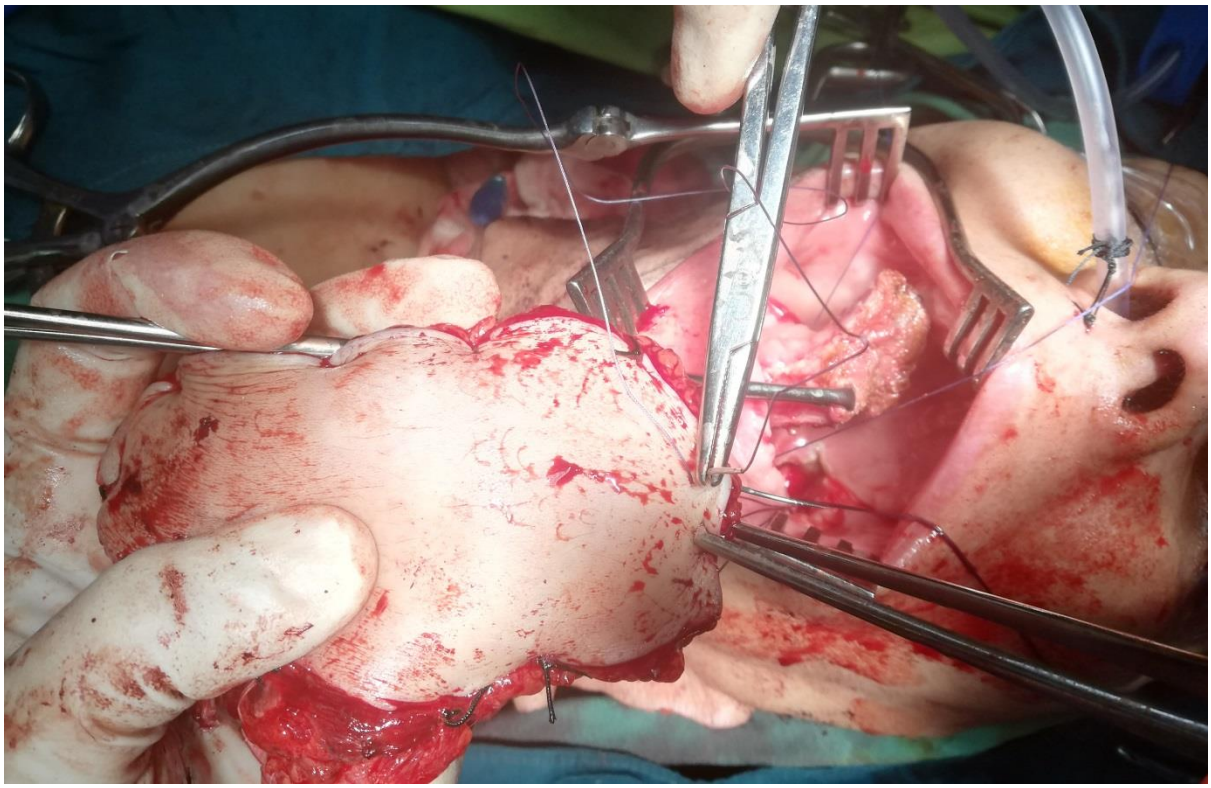


Figure 64. Flap inset is started from the most posterior point at valecula (Reconstructing base of tongue)



Figure 65. Image shows patient after 2 weekd and starting oral feeding normaly

7. Mandibular Ameloblastoma

50 years old female

Complaint of right side mandibular mass involving right hemi mandible causing difficulty in chewing and mouth opening

CT scan shows complete destruction of body and condyle of right side hemi mandible

Patients underwent total removal of hemi mandible via lip split incision

Reconstruction was done with fibular free flap and reconstruction plate

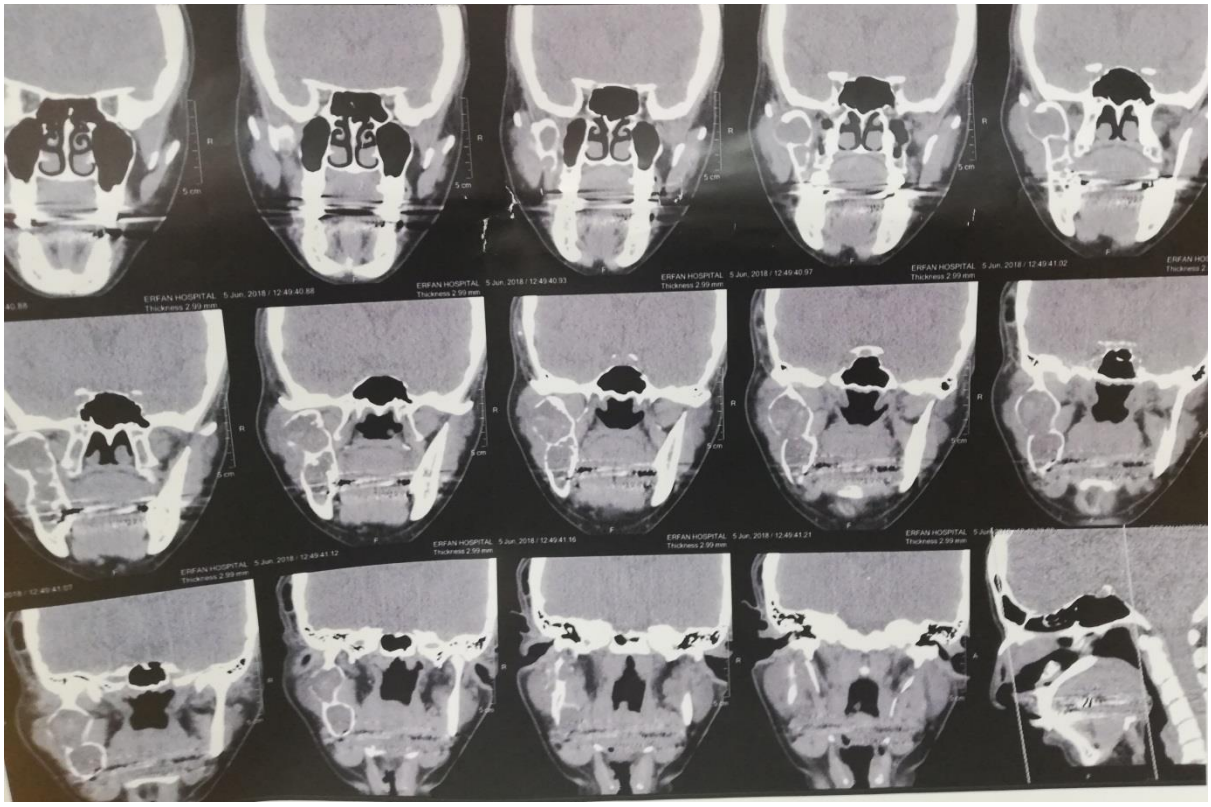


Figure 66. CT Scan, Coronal view

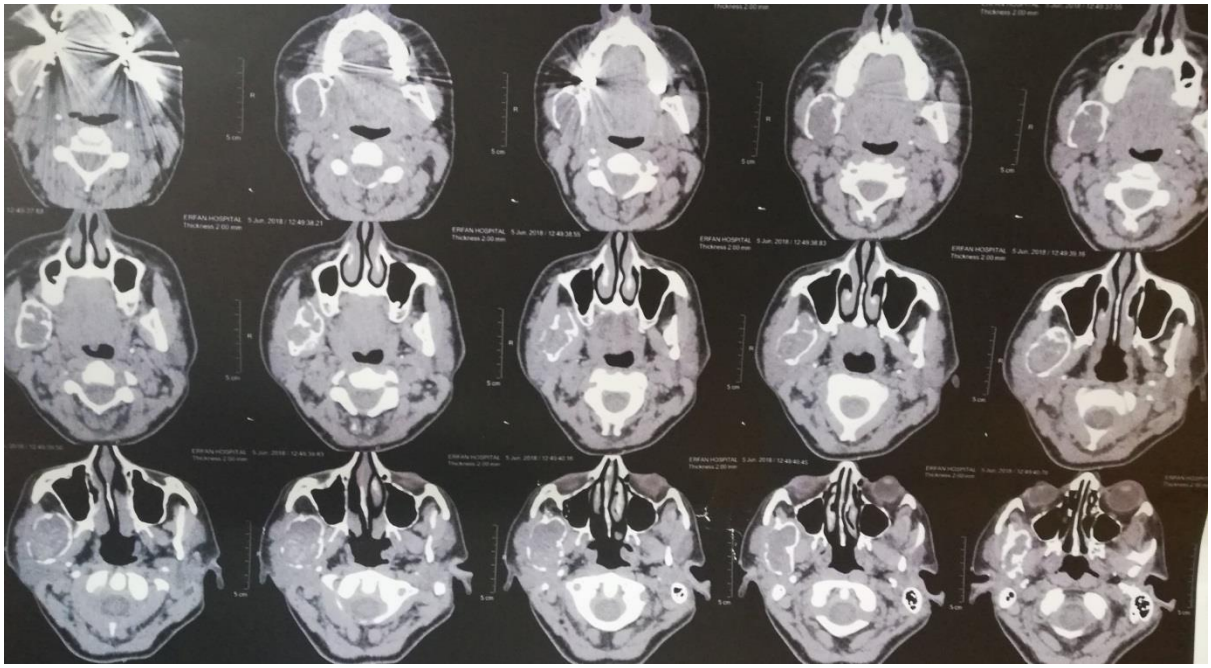


Figure 67. CT Scan, Axial View



Figure 68. Skin marking for the lip-split approach

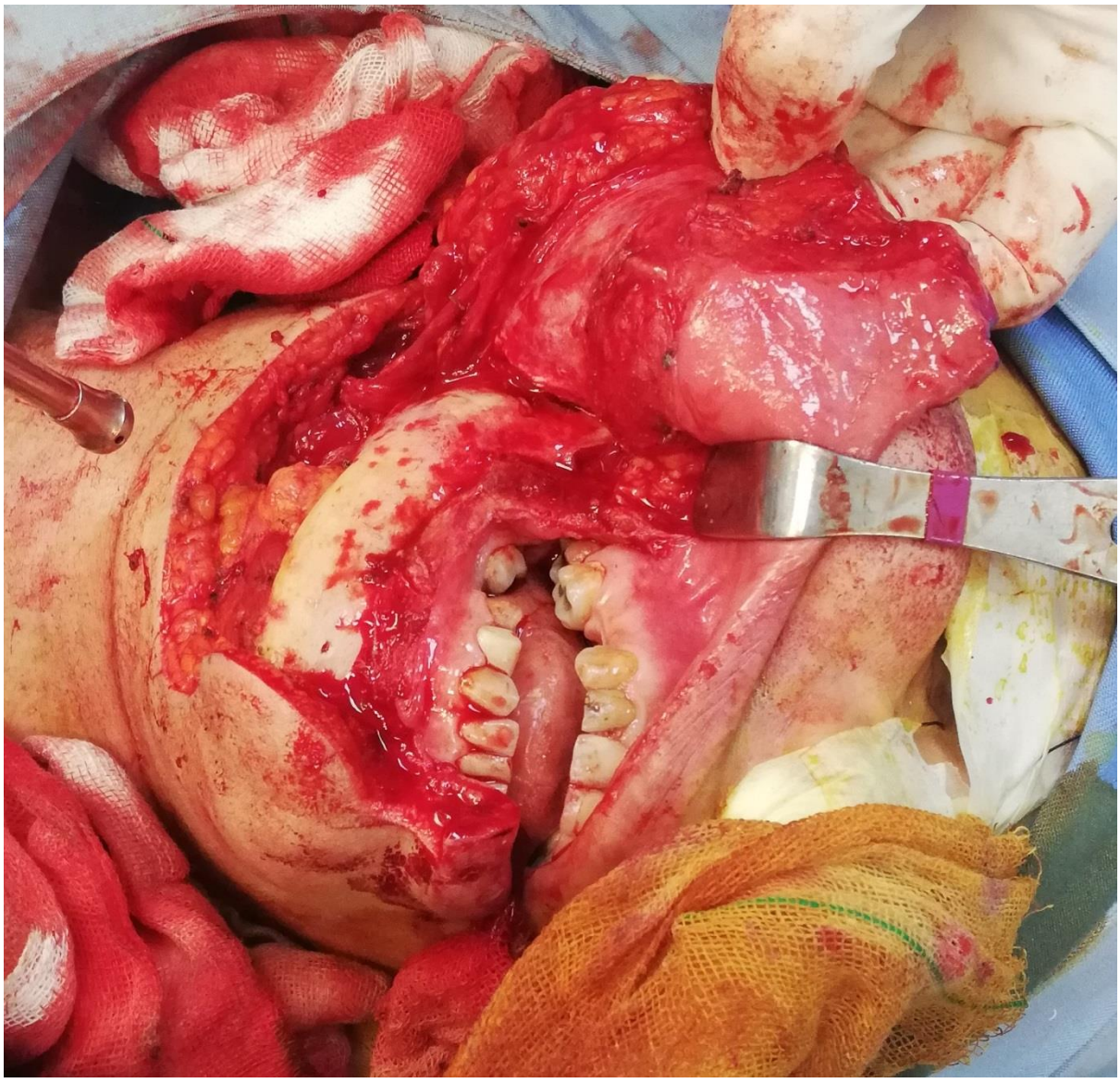


Figure 69. Image shows right hemi-mandible involvement

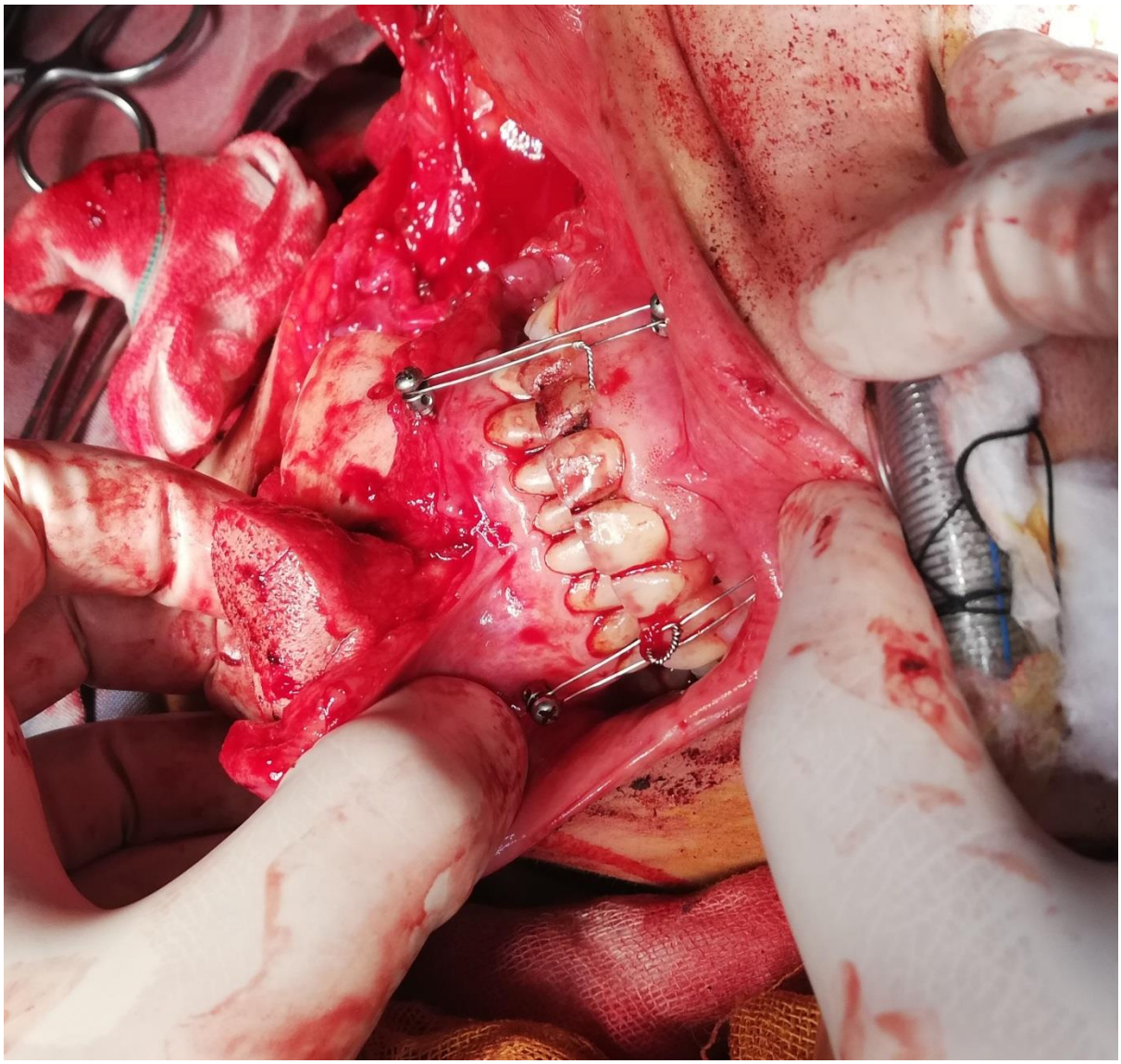


Figure 70. Inter maxillary fixation is done to secure the proper dental occlusion

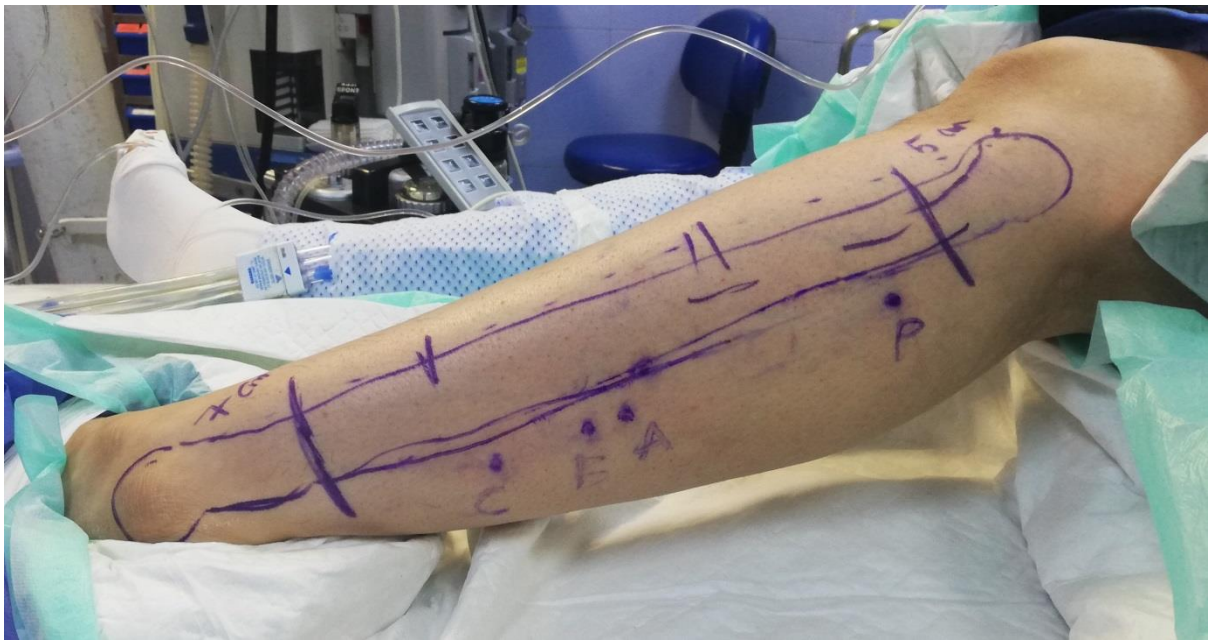


Figure 71. Skin marking for fibular free flap harvest (Perforators are marked)



Figure 72. Osteotomy is done to fabricate the mandible with reconstruction plate

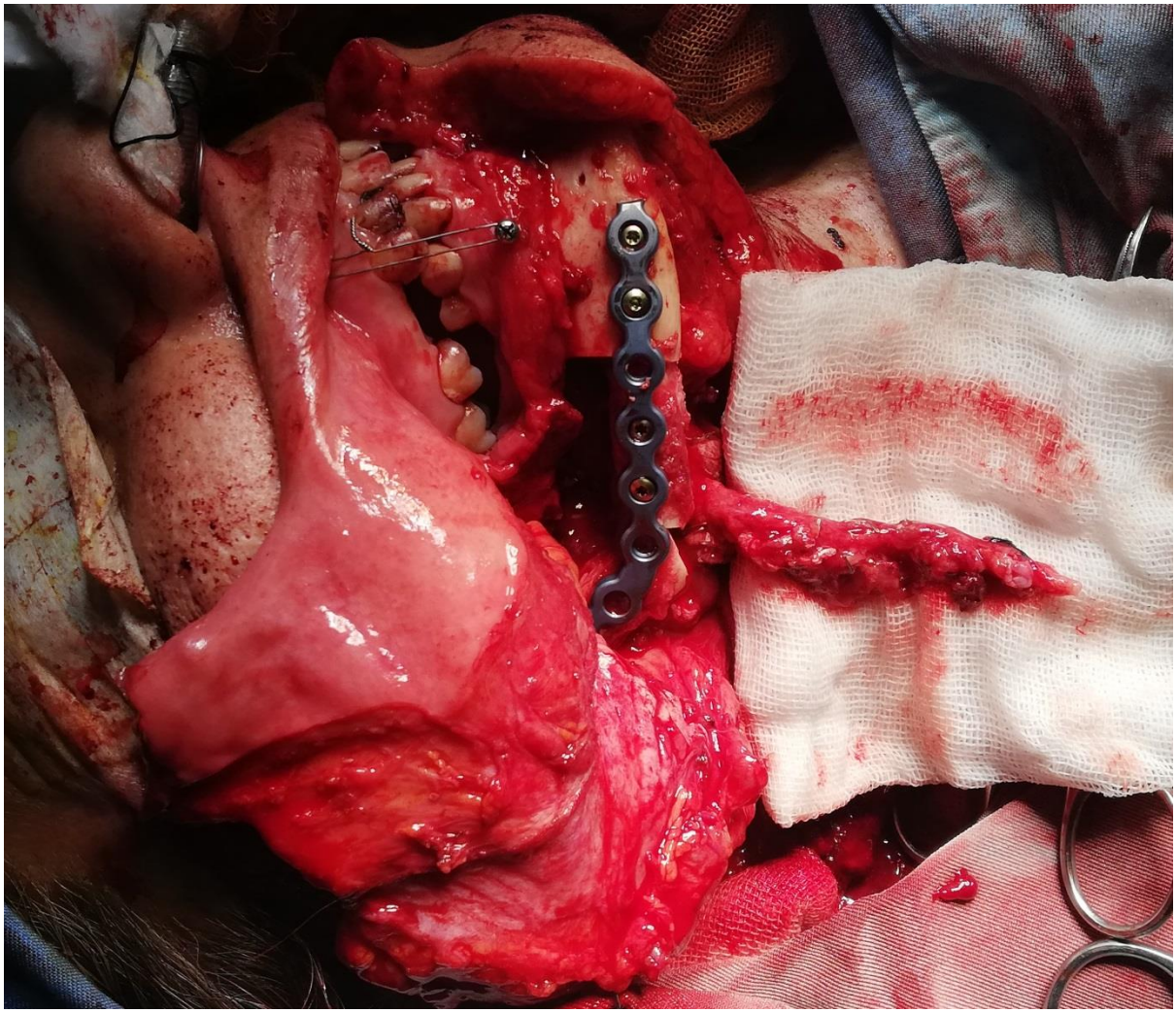


Figure 73. Fibular free flap in place and ready for vascular anastomosis

8. Adenoid Cystic Carcinoma of Parotid

56 years old male with complaint of right facial paralysis for months

Diagnosed with parotid mass and undergone superficial parotidectomy, despite facial nerve involvement patient referred for total parotidectomy and primary facial reanimation with gracilis free flap

Total Parotidectomy is done with resection of facial nerve with free margin in stylomastoid foramen

Facial reanimation was done in the same surgery session with gracilis muscle free flap innervated by masseteric branch of v2



Figure 74. Preoperative image shows unilateral complete facial paralysis

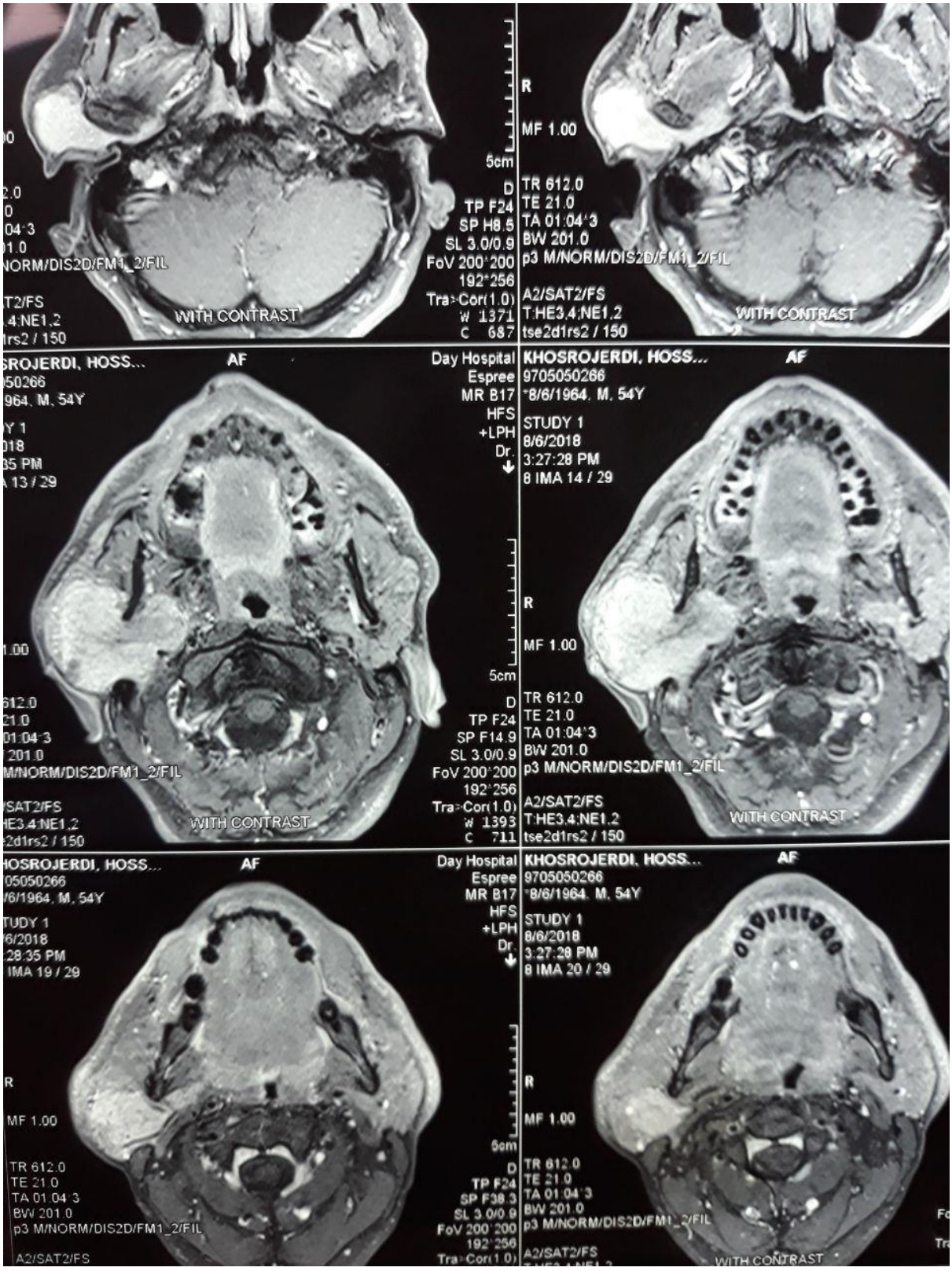


Figure 75. MRI shows parotid mass invading deep lobe

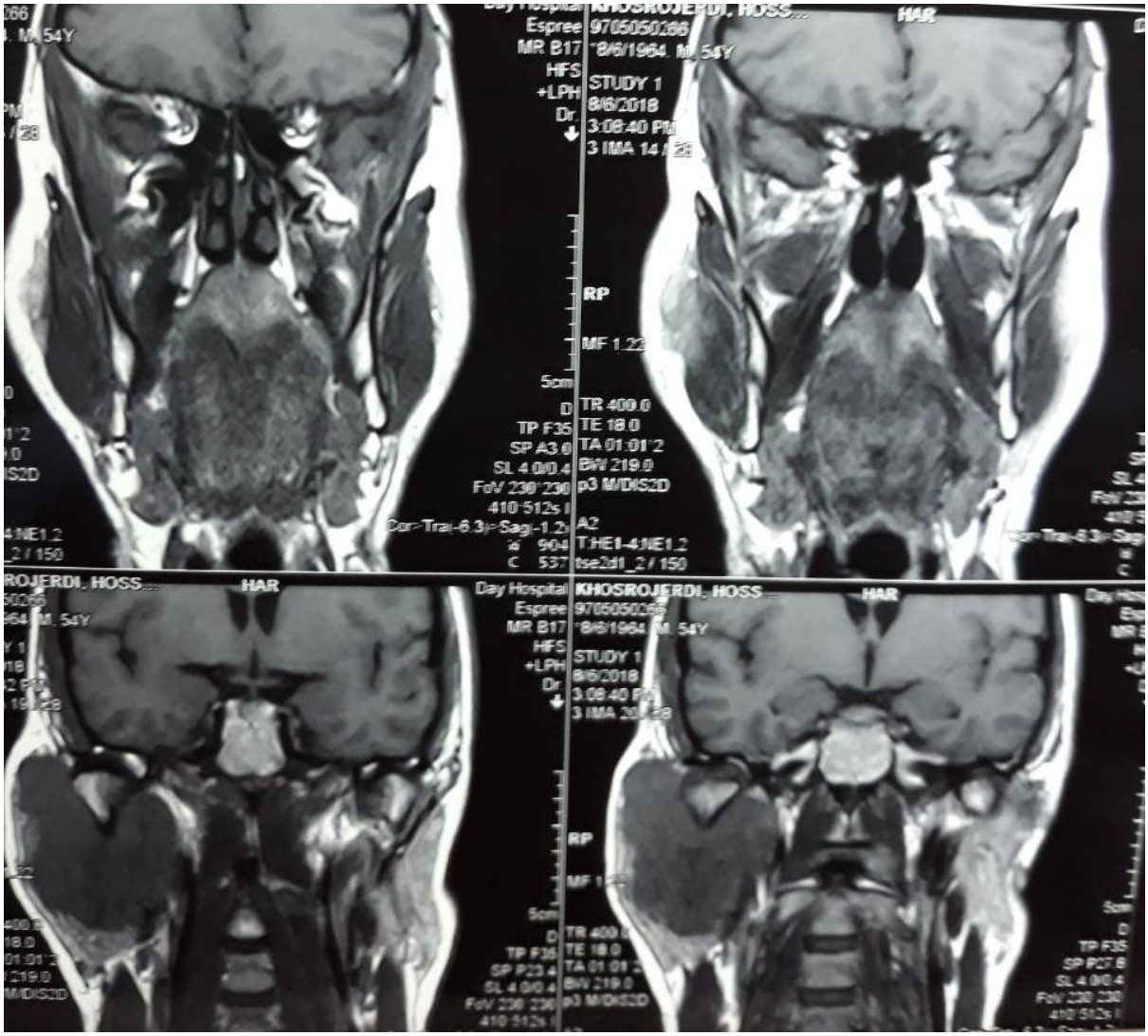


Figure 76. MRI shows invasion to deep lobe

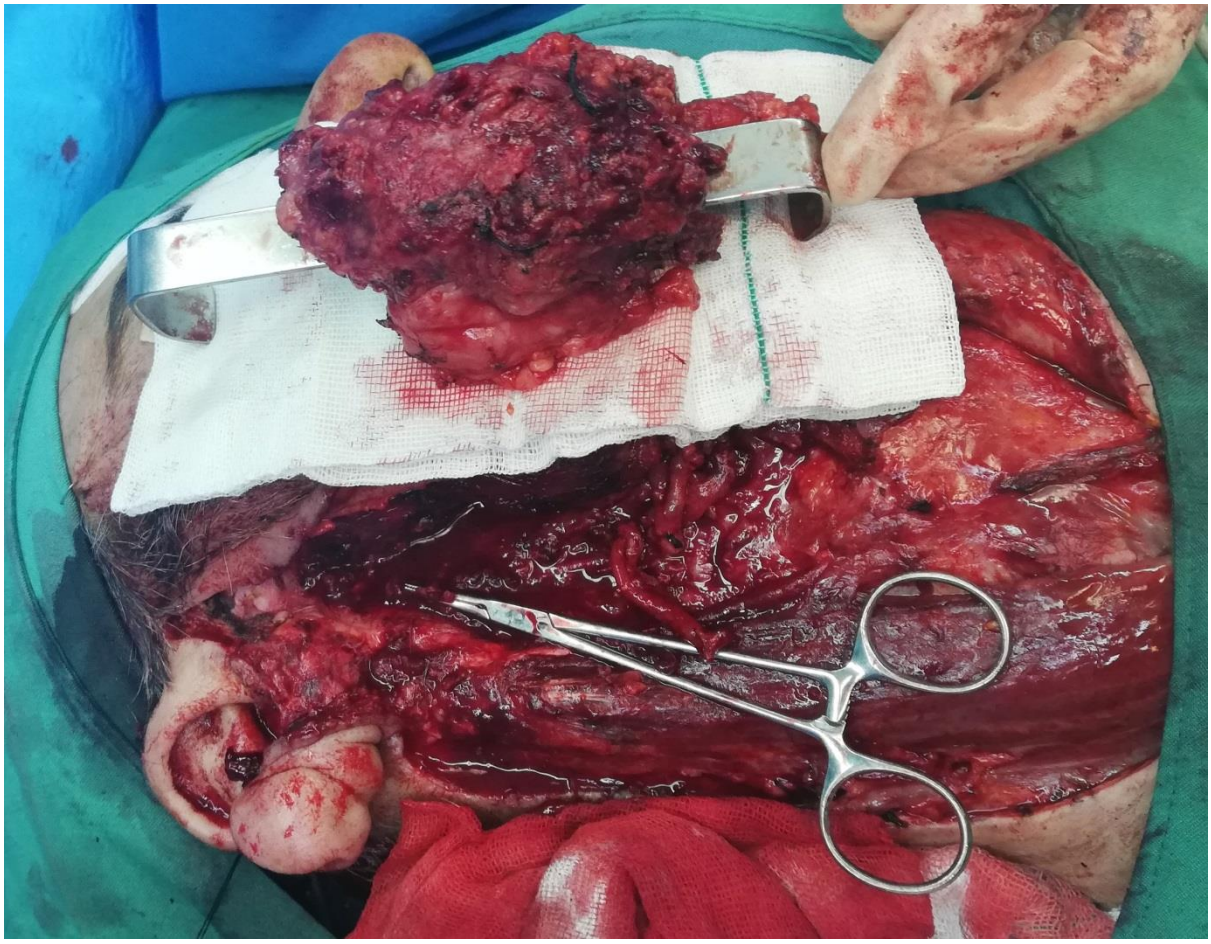


Figure 77. Image shows totally ablation of tumor and involvement of extra temporal facial nerve

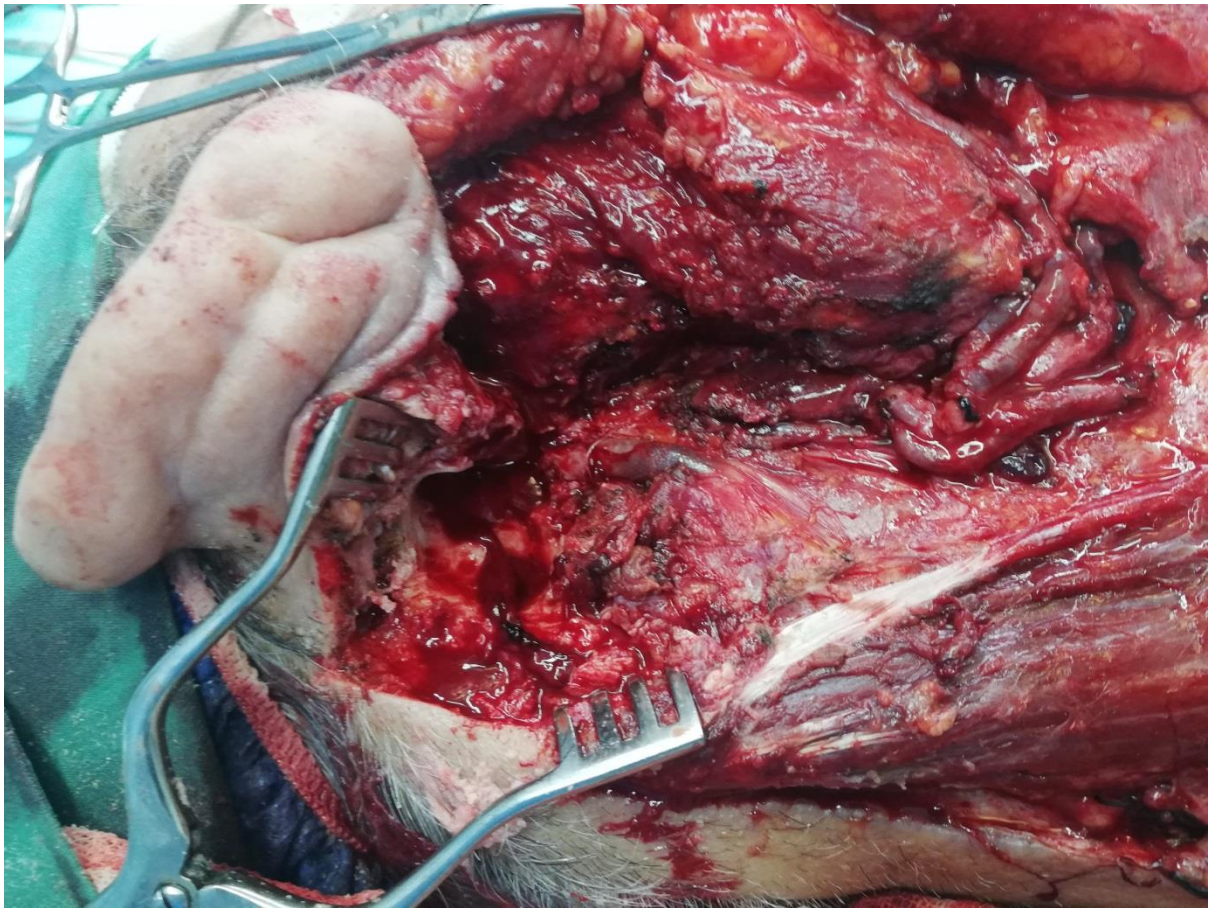


Figure 78. Safe margin is obtained with drilling the bone and resection of facial nerve

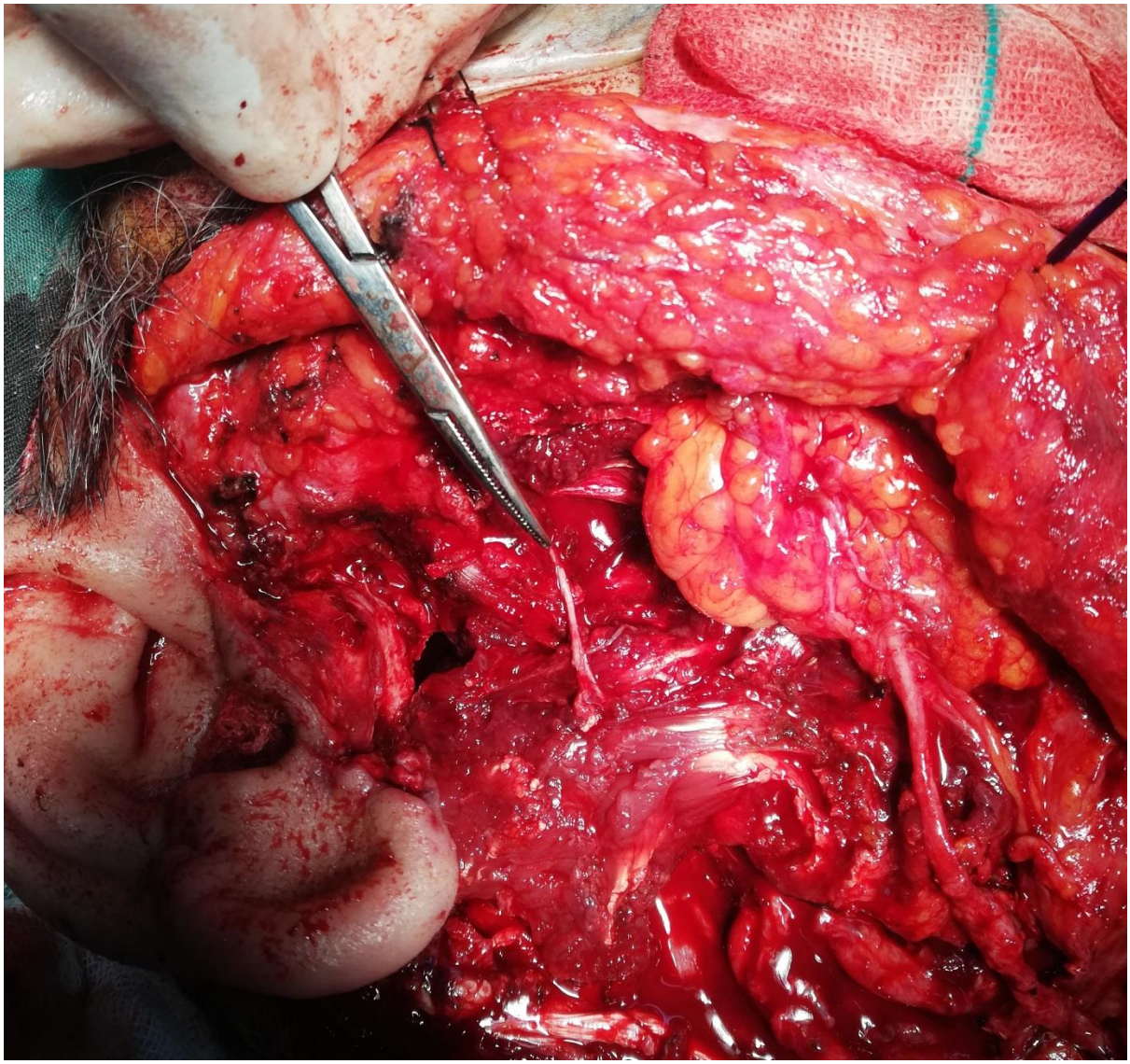


Figure 79. Instrument shows masseteric branch of maxillary nerve v2

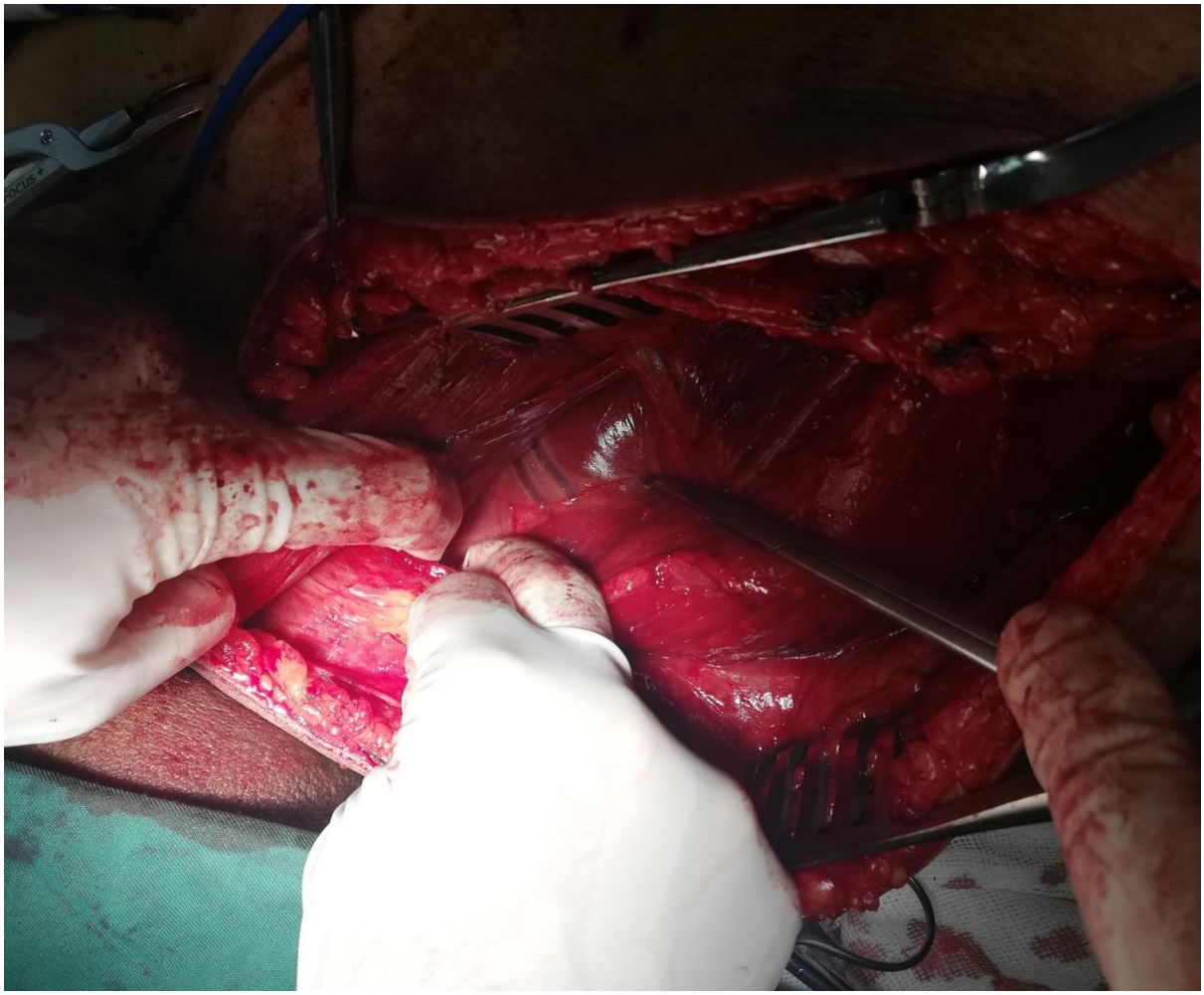


Figure 80. Microvascular team is harvesting gracilis muscle simultaneously. image shows vascular pedicle and obturator nerve

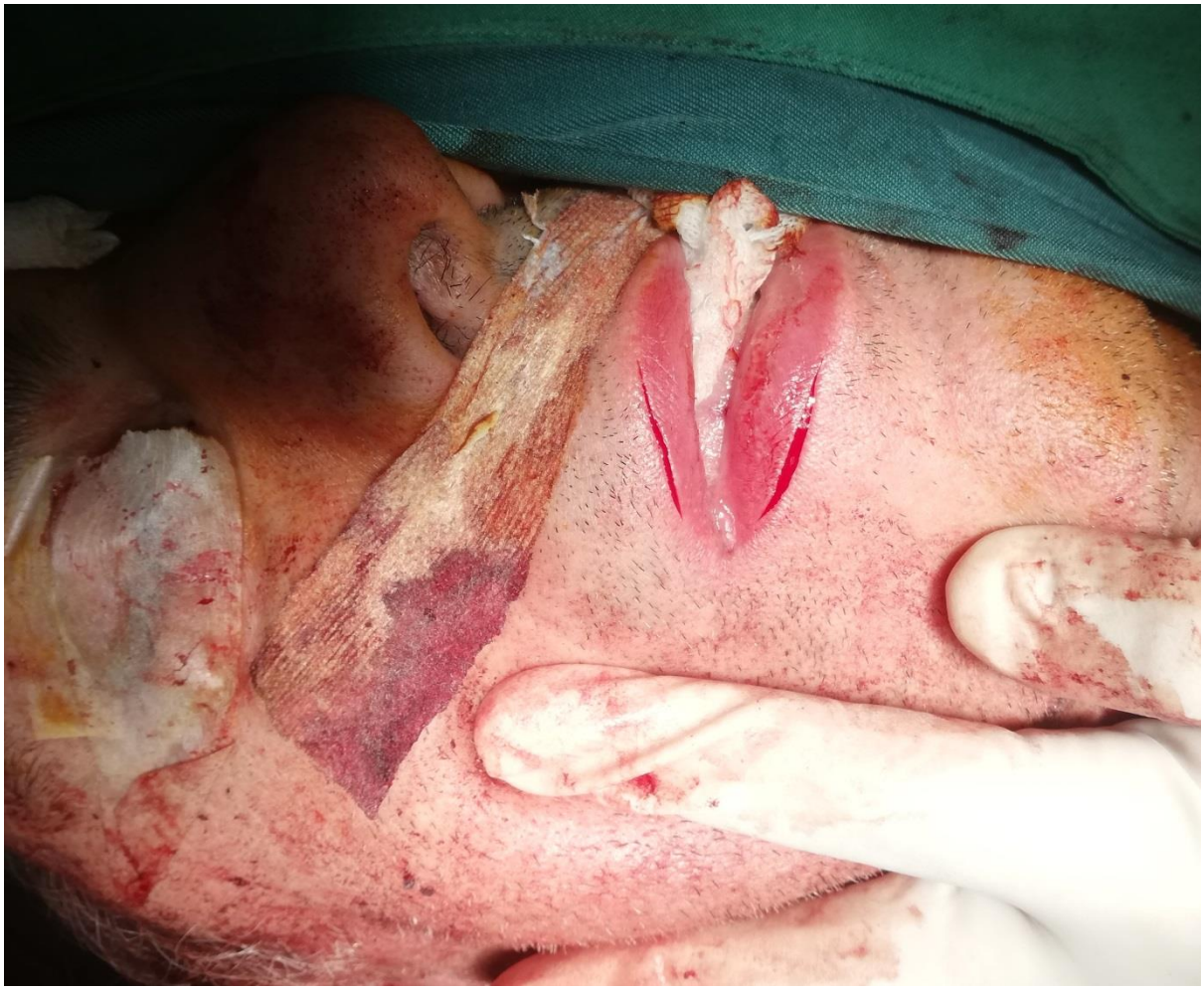


Figure 81. Image Shows incisions to access labial commissure preparing inseting the flap

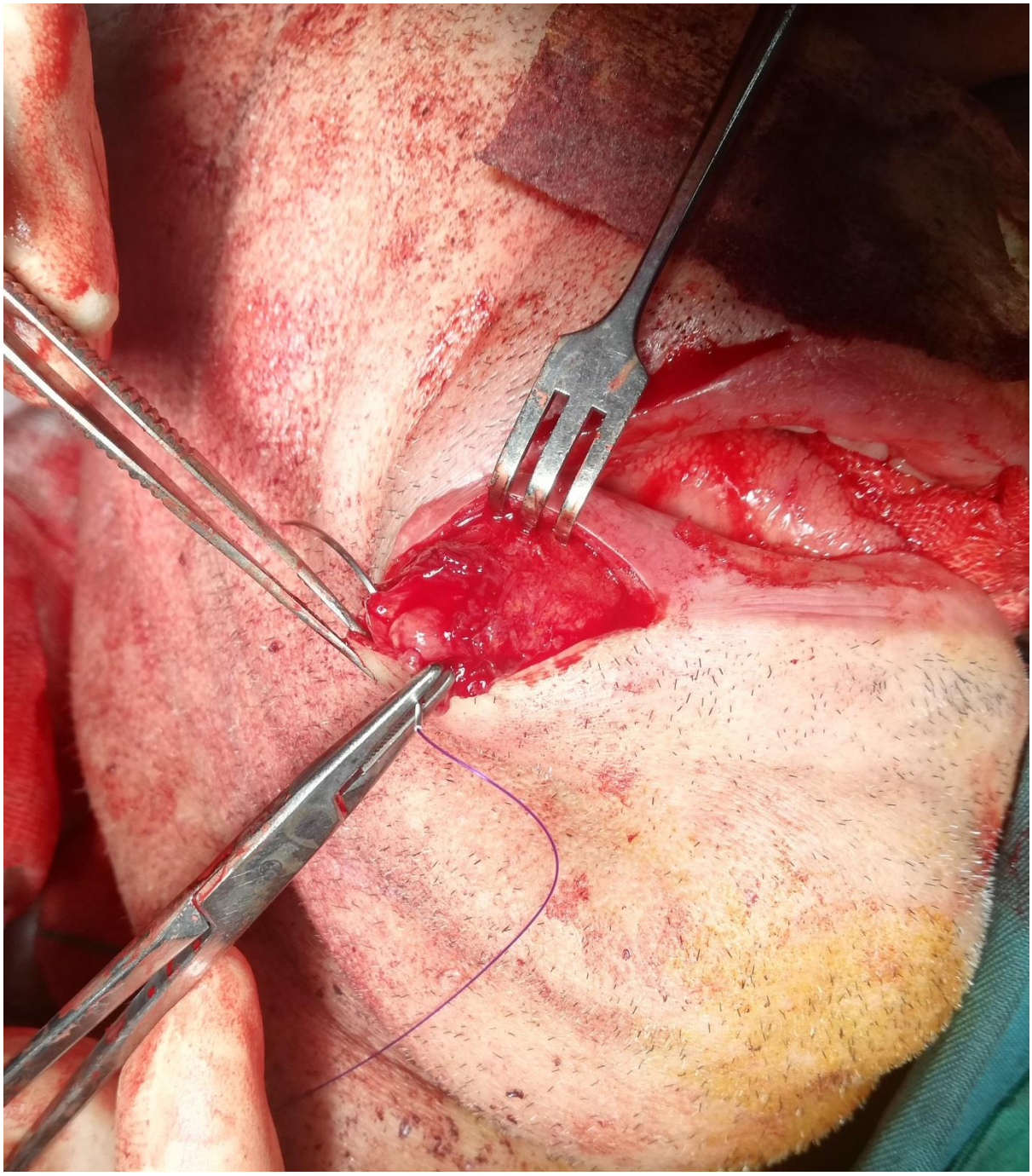


Figure 82. Sutures passing to hang the commissure

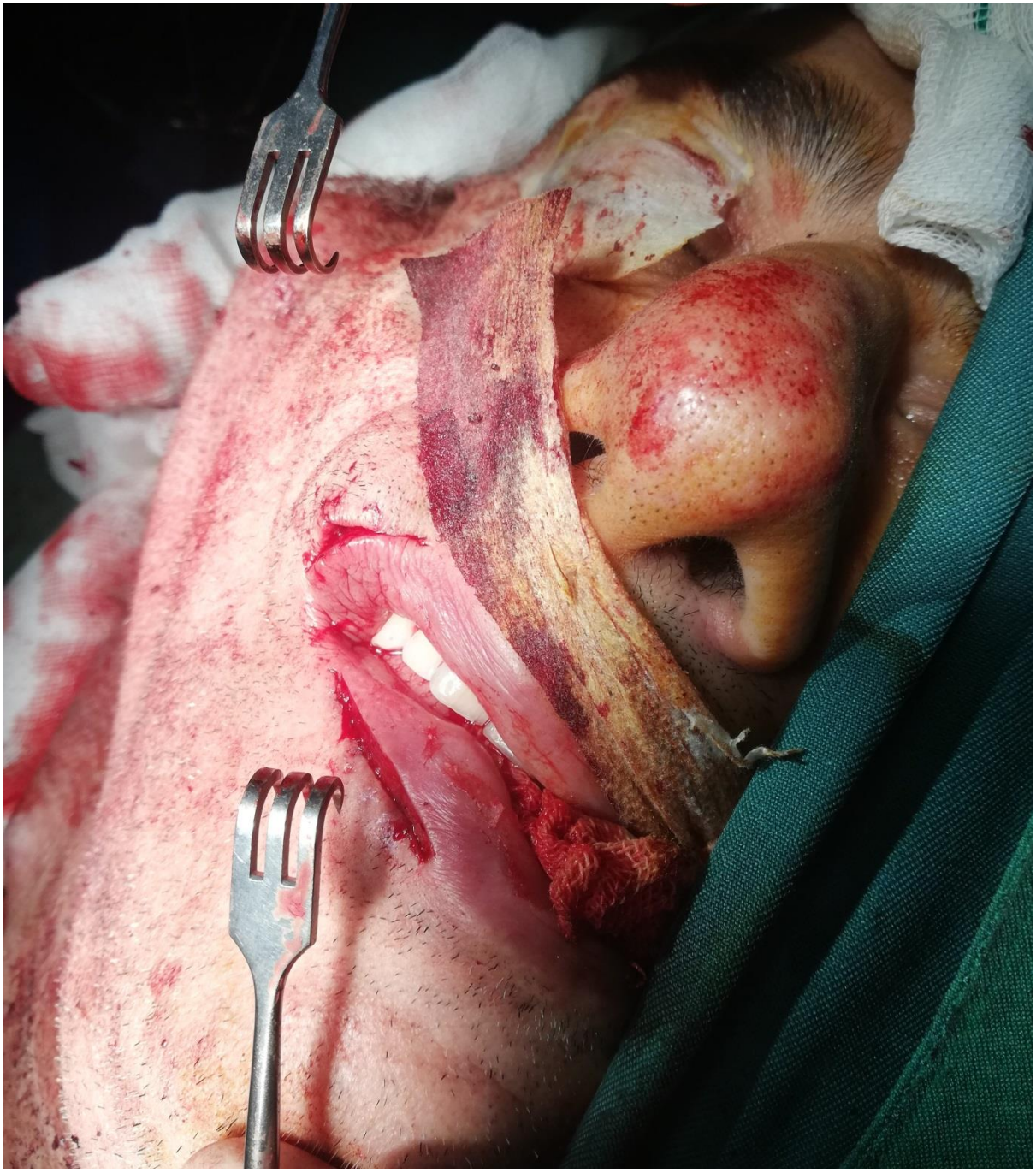


Figure 83. Ready to pass the muscle under facial flap to pull the labial commissure

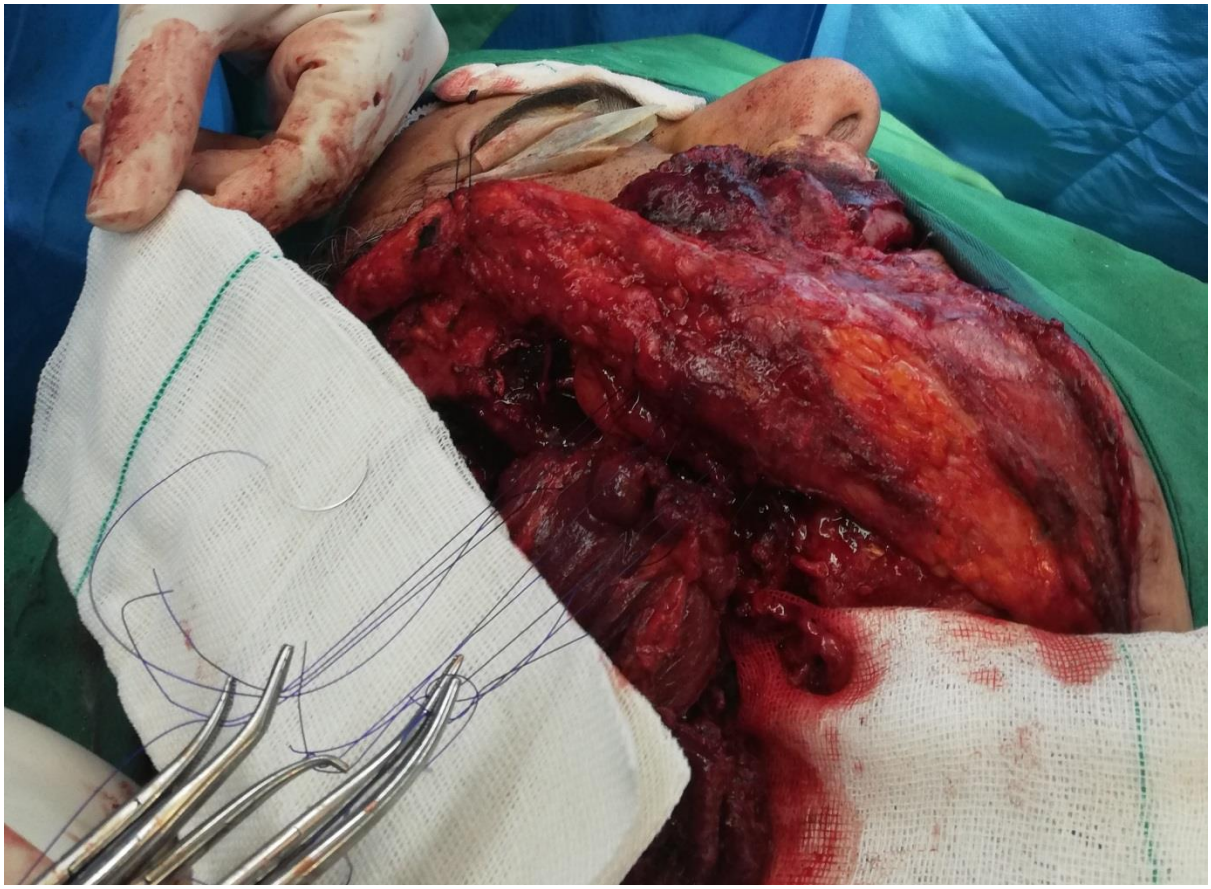


Figure 84. Image shows inseting flap to the face (Connecting commissure to temporal region)

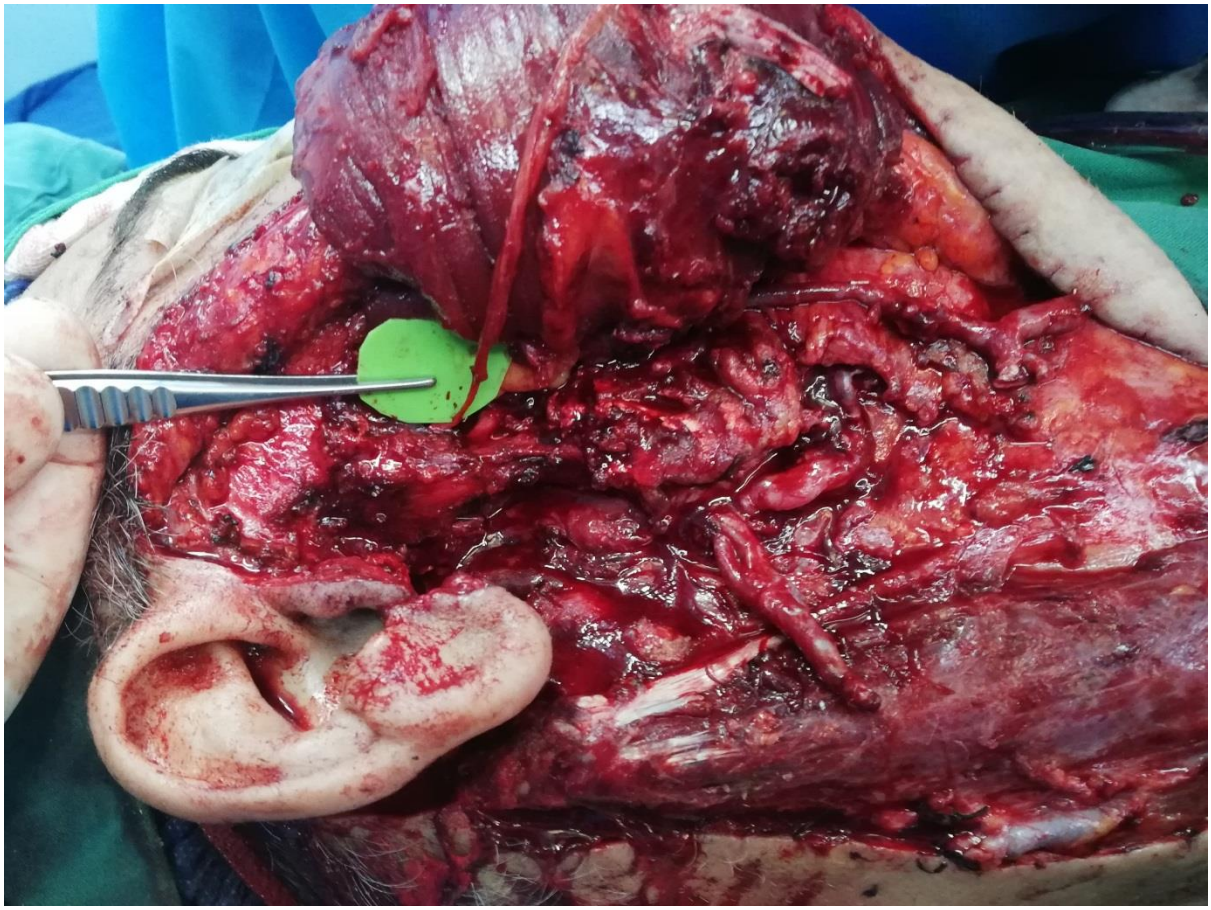


Figure 85. Obturator nerve of gracillis muscle is connected to masseteric branch of maxillary nerve



Figure 86. Early post op result

9. Sinunasal RMS

62 years old male with complaint of facial swelling

Known case of sinunasal rhabdomyosarcoma for 2 years undergone maxillectomy and post op radiotherapy.

Referred for resection by radiation oncologist because of not responding the mass to chemo radiation

Patient underwent total ablation of tumor via weber-Ferguson approach

Defect is reconstructed with Anterolateral thigh free flap



Figure 87. Preoperative image

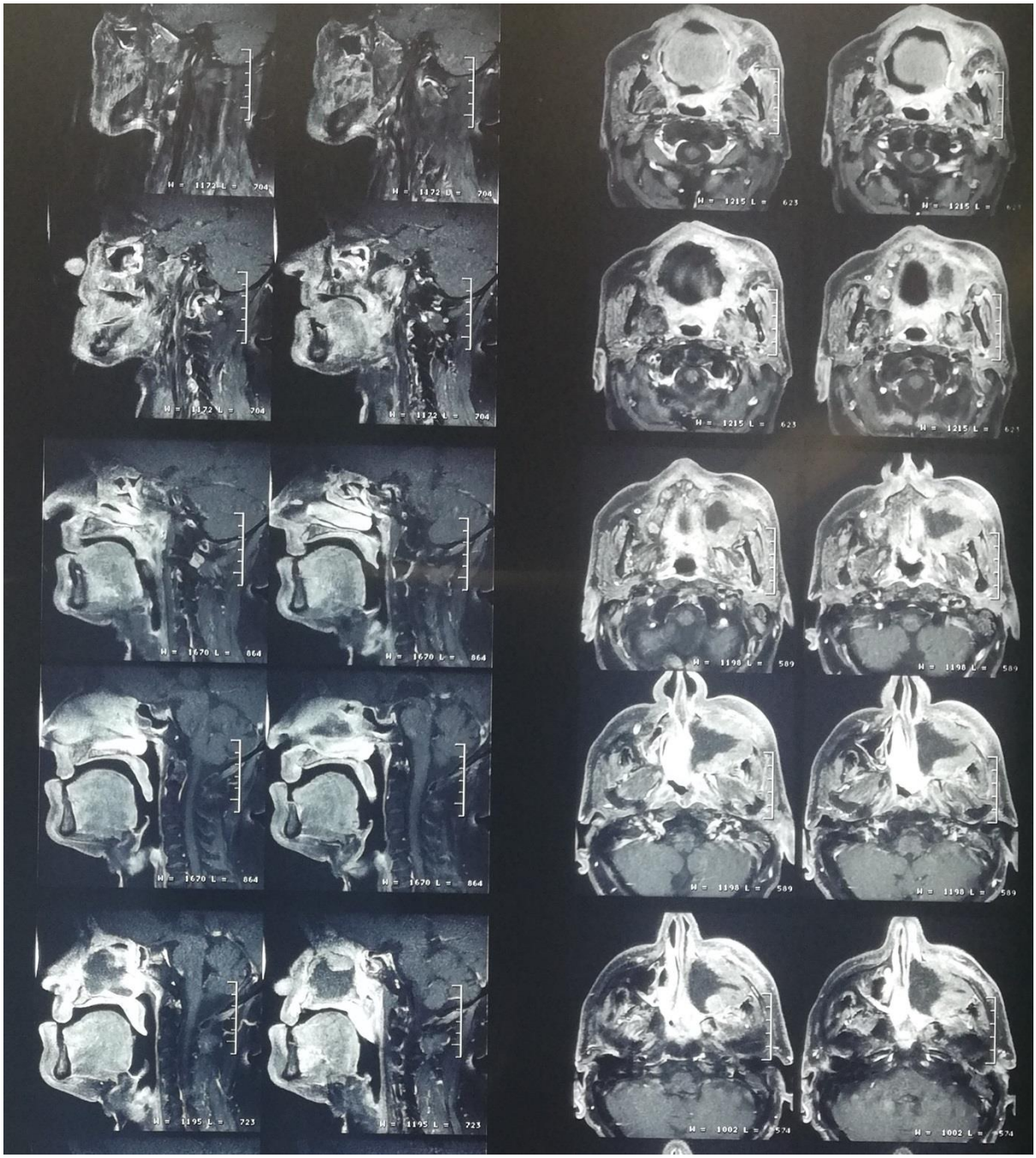


Figure 88. MRI

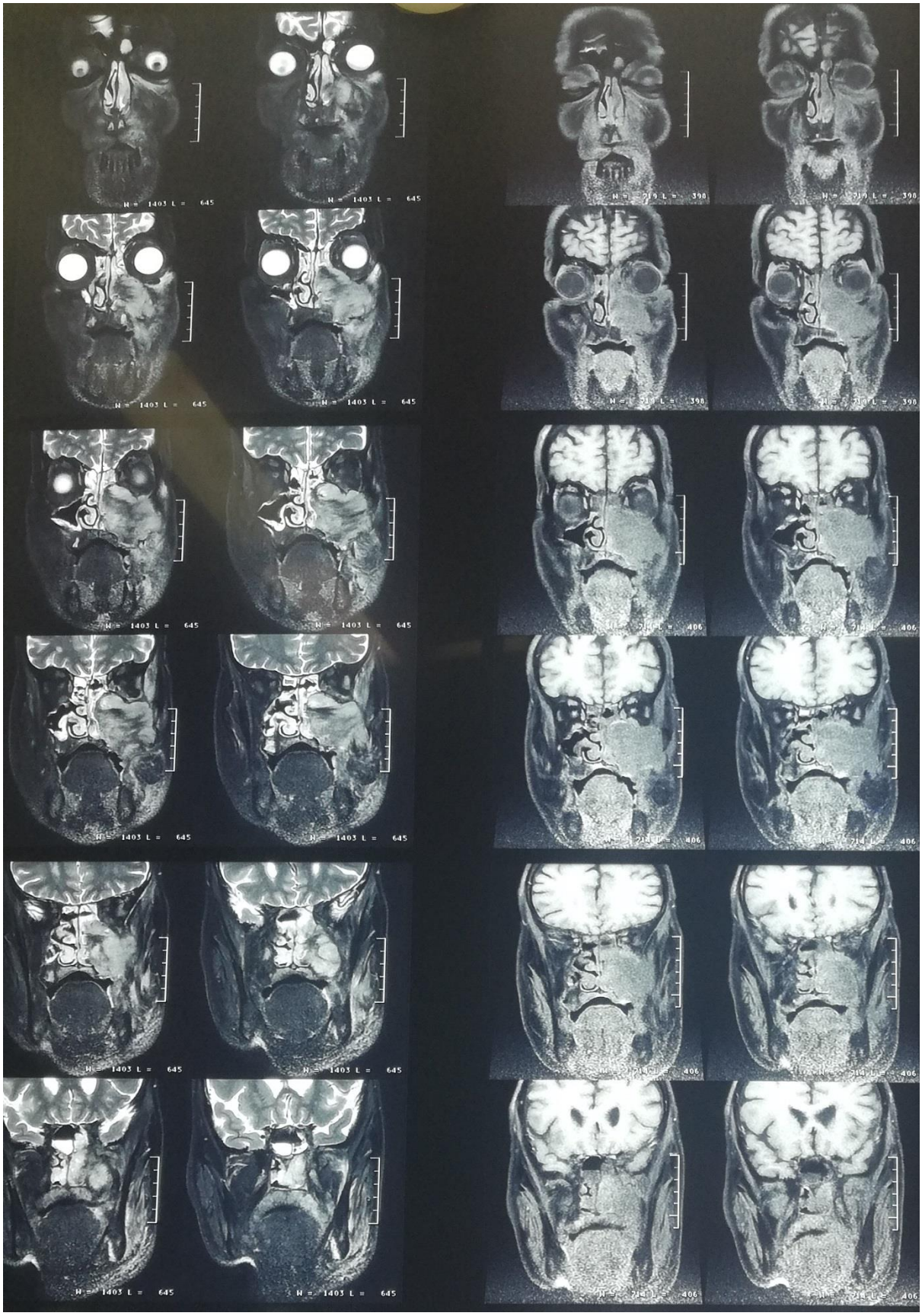


Figure 89. MRI (cont.)



Figure 90. Weber-ferguson incision



Figure 91. Tumor is approach by elevating flap

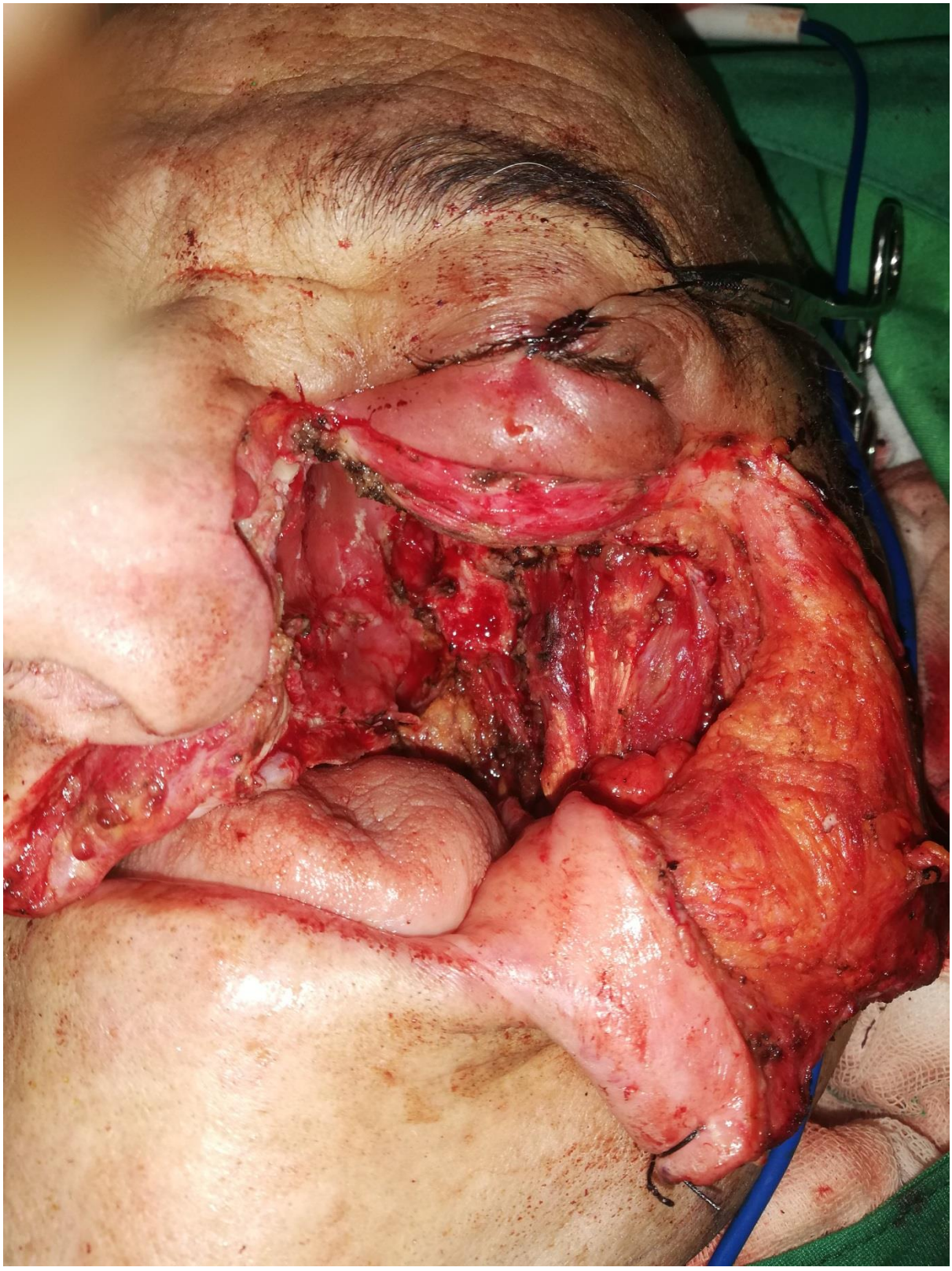


Figure 92. Tumor is toatally removed and pterygoid muscle and plates rsected with left side palate

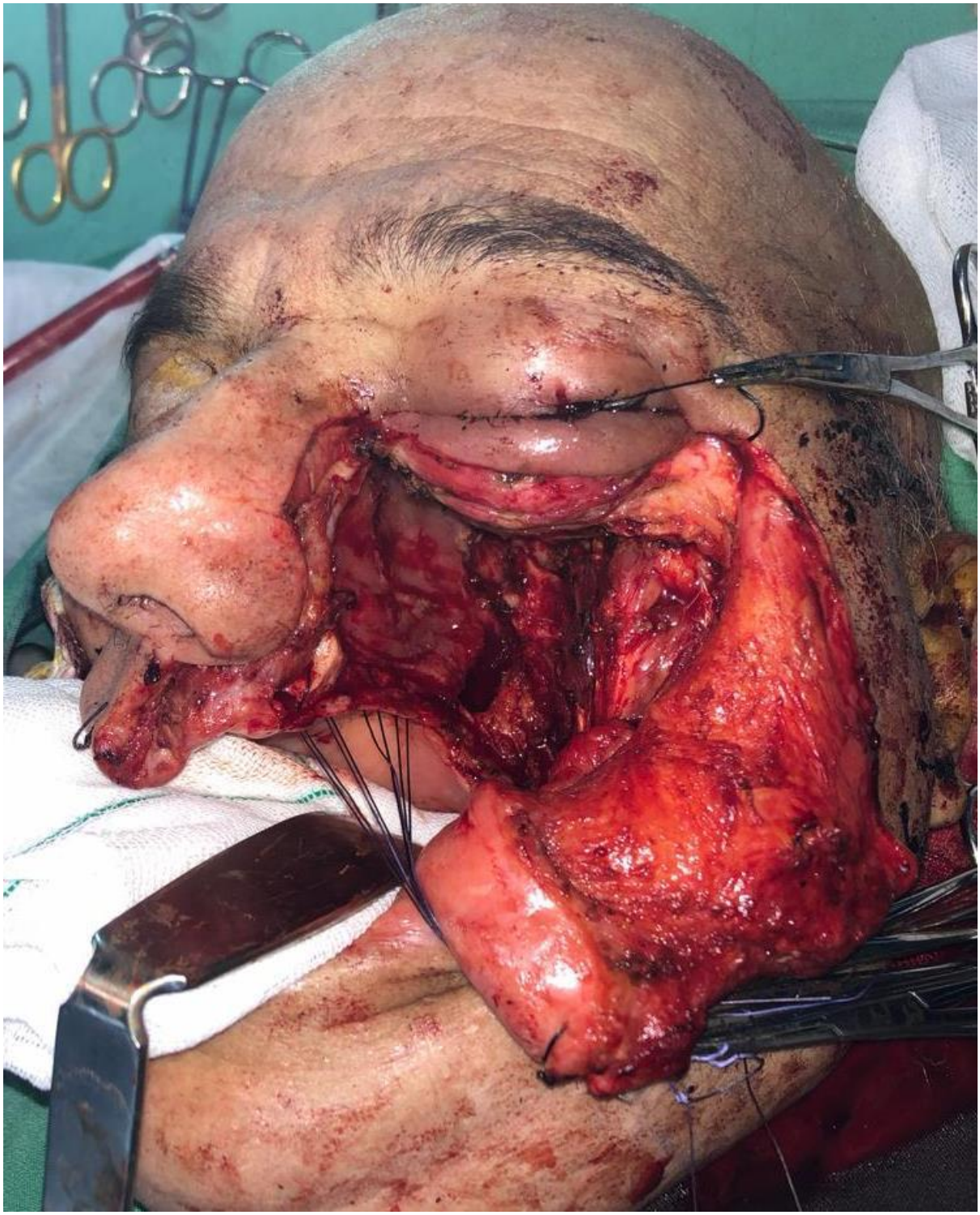


Figure 93. Sutures passed for ease of flap inset to reconstruct the palate defect

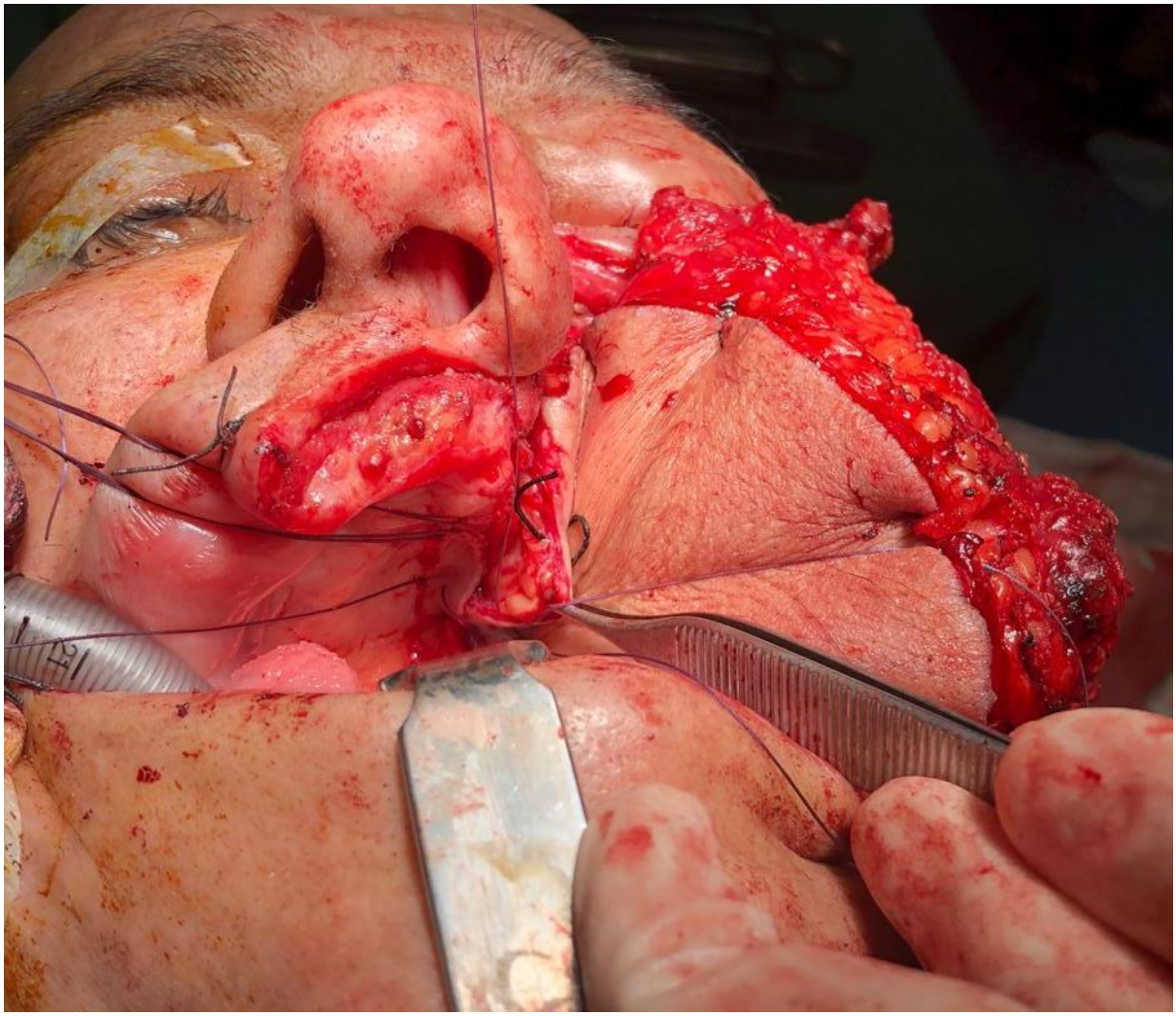


Figure 94. Reconstruction of total palate defect with Anterolateral thigh free flap



Figure 95. Early post op result is shown

10. Tongue SCC

39 years old female complaint of left posterolateral tongue lesion since 3 months

Biopsy shows SCC

In palpation indurated mass is located on left posterolateral of tongue, not involving the base of tongue and not passing through midline

No Lymphadenopathy on neck palpation

Patient underwent hemi glossectomy and left side neck dissection through level 1 to 5

Tongue reconstructed with radial forearm free flap



Figure 96. Image shows left side tongue mass and marking adequate margin to resect tumor

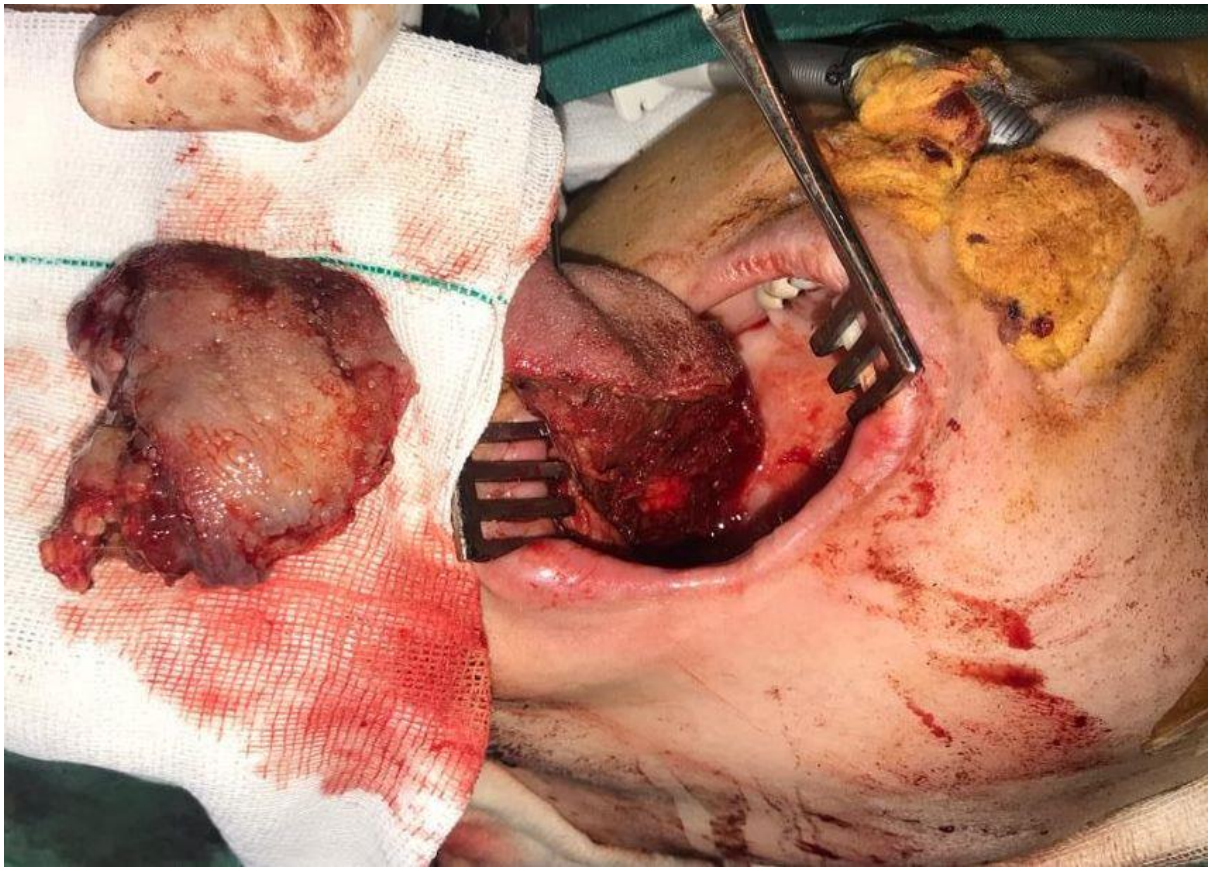


Figure 97. Image shows tongue defect after hemi glossectomy



Figure 98. Image shows neck incision for lymph nodes dissection and planning to preserve facial vessels for anastomosis



Figure 99. Image shows radial forearm free flap at the end of surgery



Figure 100. Image shows final result after 2 months



Figure 101. Image shows final result after 2 months

11. Sinunasal SCC

65 years old male complaint of right facial mass since 1 year ago

Patient is known case of sinunasal SCC underwent 2 surgeries and chemo radiation

Patient is referred with tumor recurrence on face and severe trismus

Patient Underwent total removal of mass with free margins and through and through defect is reconstructed with bi paddle skin free flap harvesting from anterolateral thigh



Figure 102. Pre Op Image



Figure 103. Image shows severe trismus and palate involvement

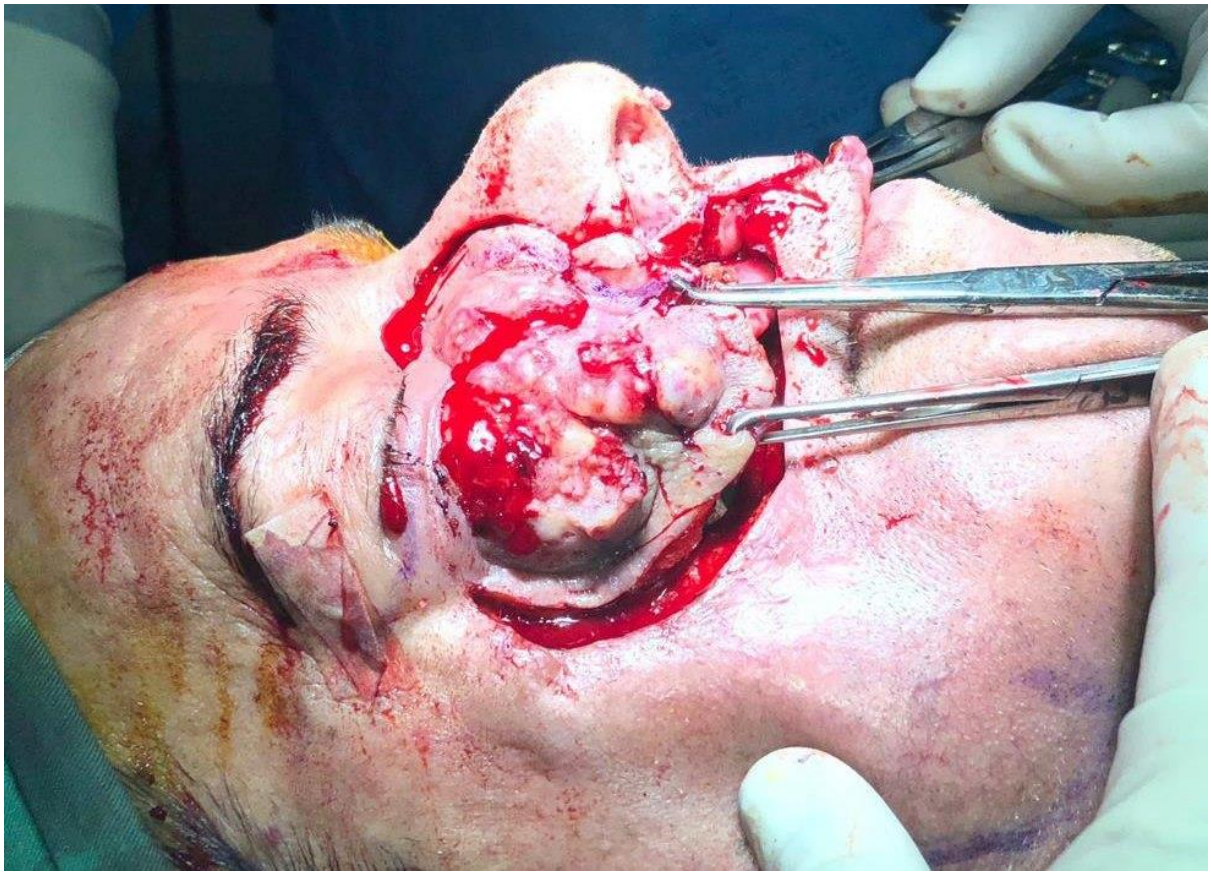


Figure 104. Tumor is planned to be resected with safe margins

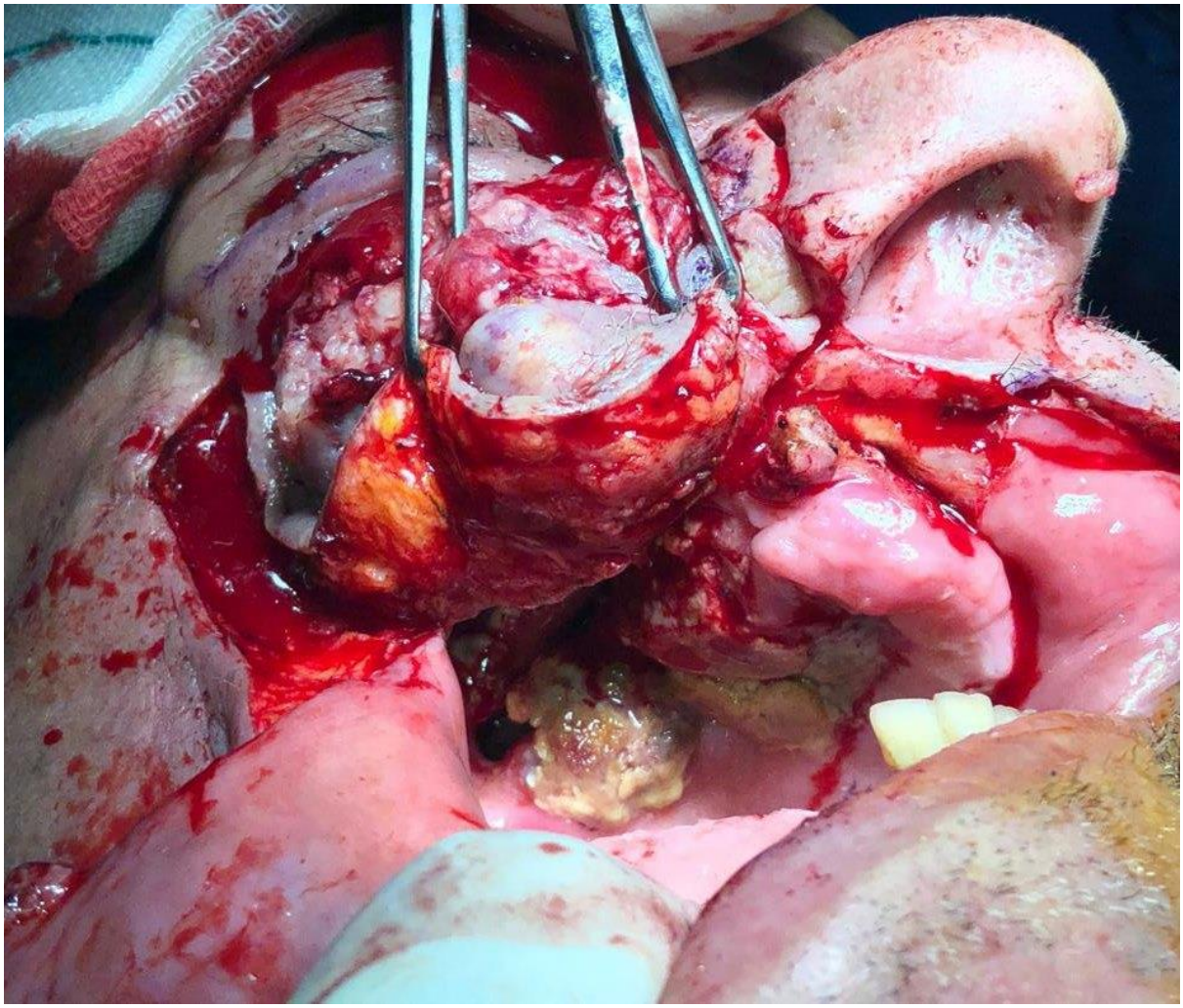


Figure 105. Image shows palate involvement (Tumor is resected with hard palate,soft palate, ptrygoid muscles and ptrygoid plates)

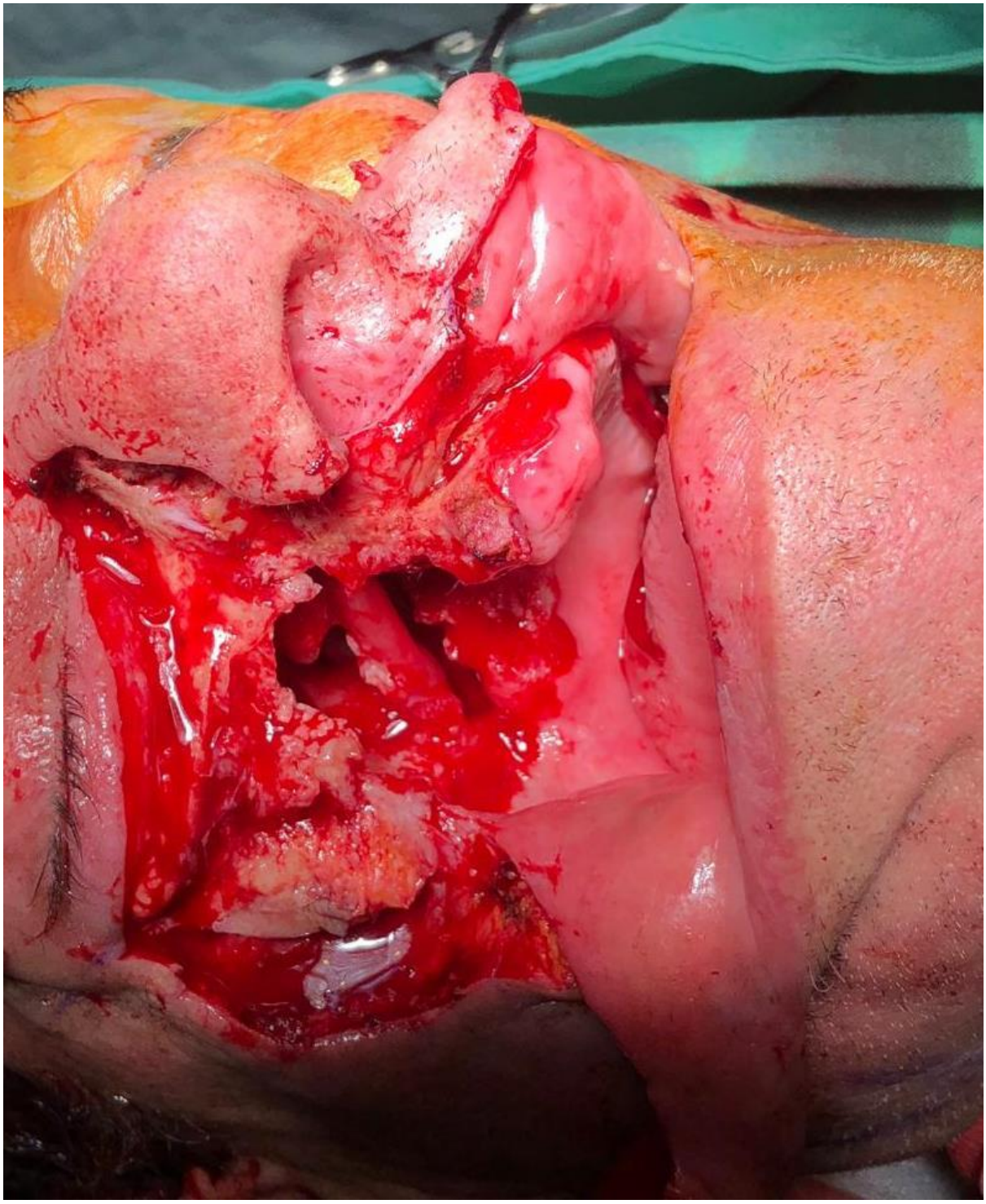


Figure 106. Image shows involvement of marging to be resected for a free margin

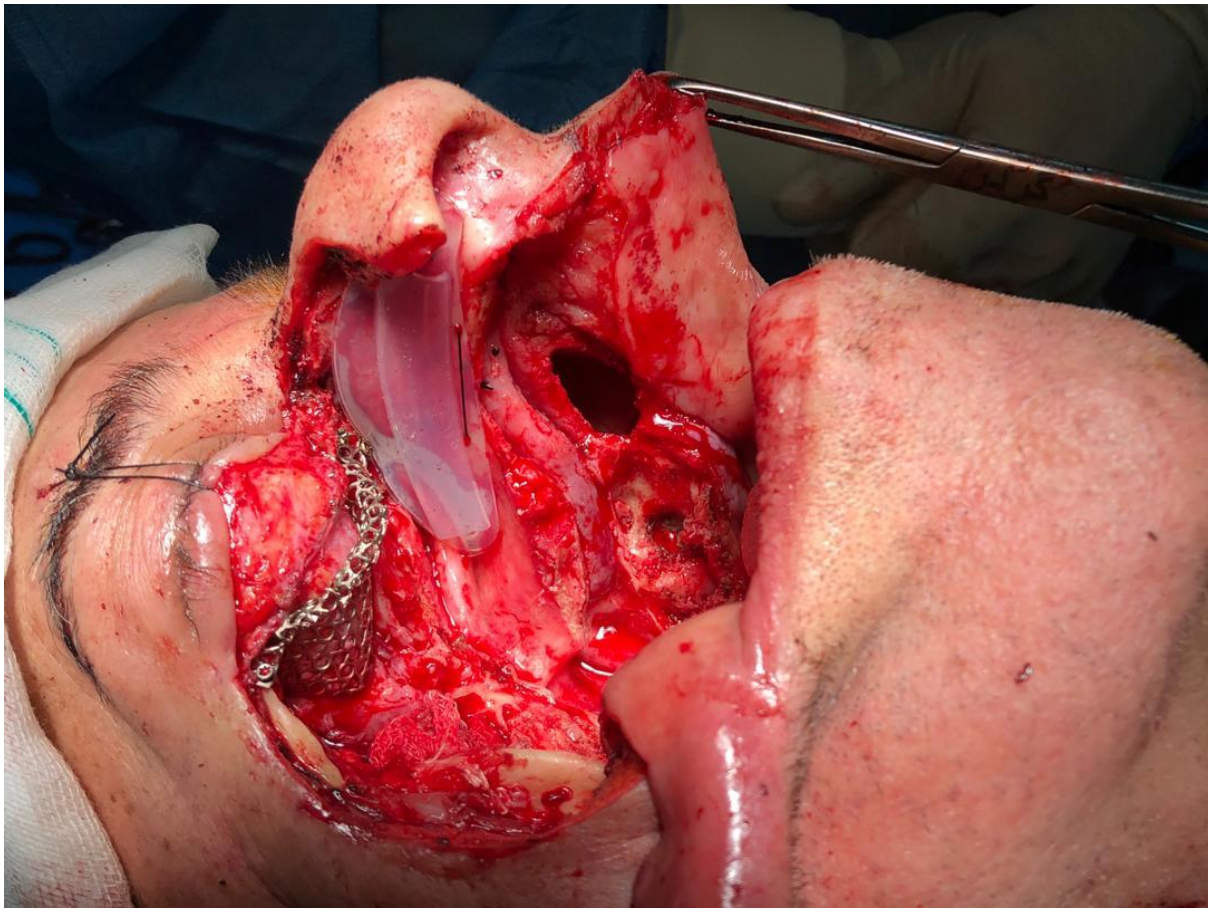


Figure 107. Image shows defect after completion of tumor removal (Inferior orbital rim reconstructed with titanium mesh)

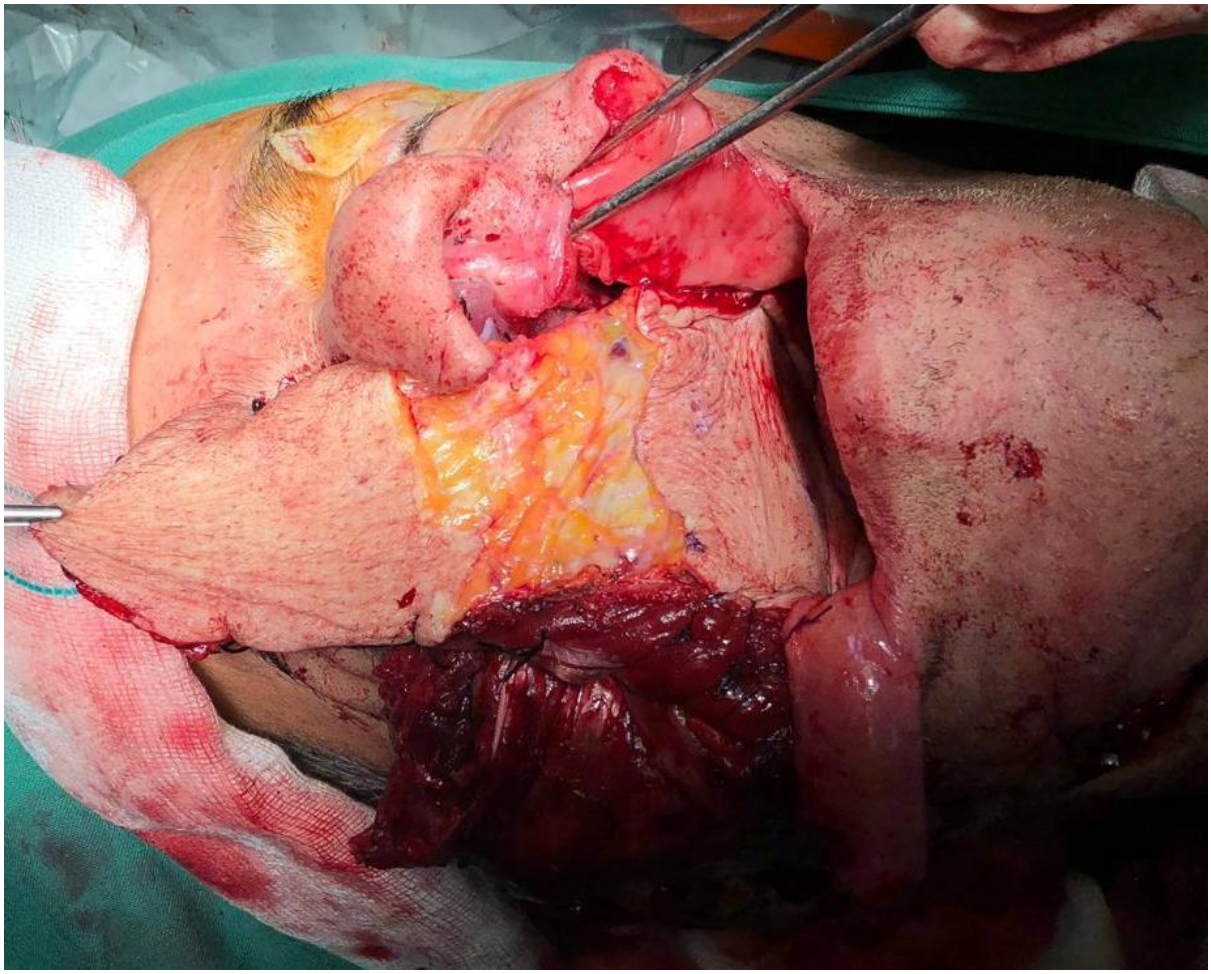


Figure 108. Bi padle skin flap is used to cover through and through defect (Image shows internal lining coverage)



Figure 109. Image shows coverage of facial skin with Anterolateral thigh free flap before vascular anastomosis



Figure 110. Image shows internal lining coverage at the end of surgery



Figure 111. 4 days after surgery shows mild congestion in flap



Figure 112. 4 days post op

12. Lower Lip SCC

45 years old male complaint of lower lip lesion for 4 months

Biopsy shows SCC

No lymphadenopathy on physical exams

Patient is undergone total resection of tumor with free margin, resulting almost total loss of lower lip

Lip is reconstructed with radial forearm free flap

Facial vessels used to supply the flap



Figure 113. Image shows Preoperative view of lower lip SCC



Figure 114. Lower Lip defect after tumor ablation with free margins

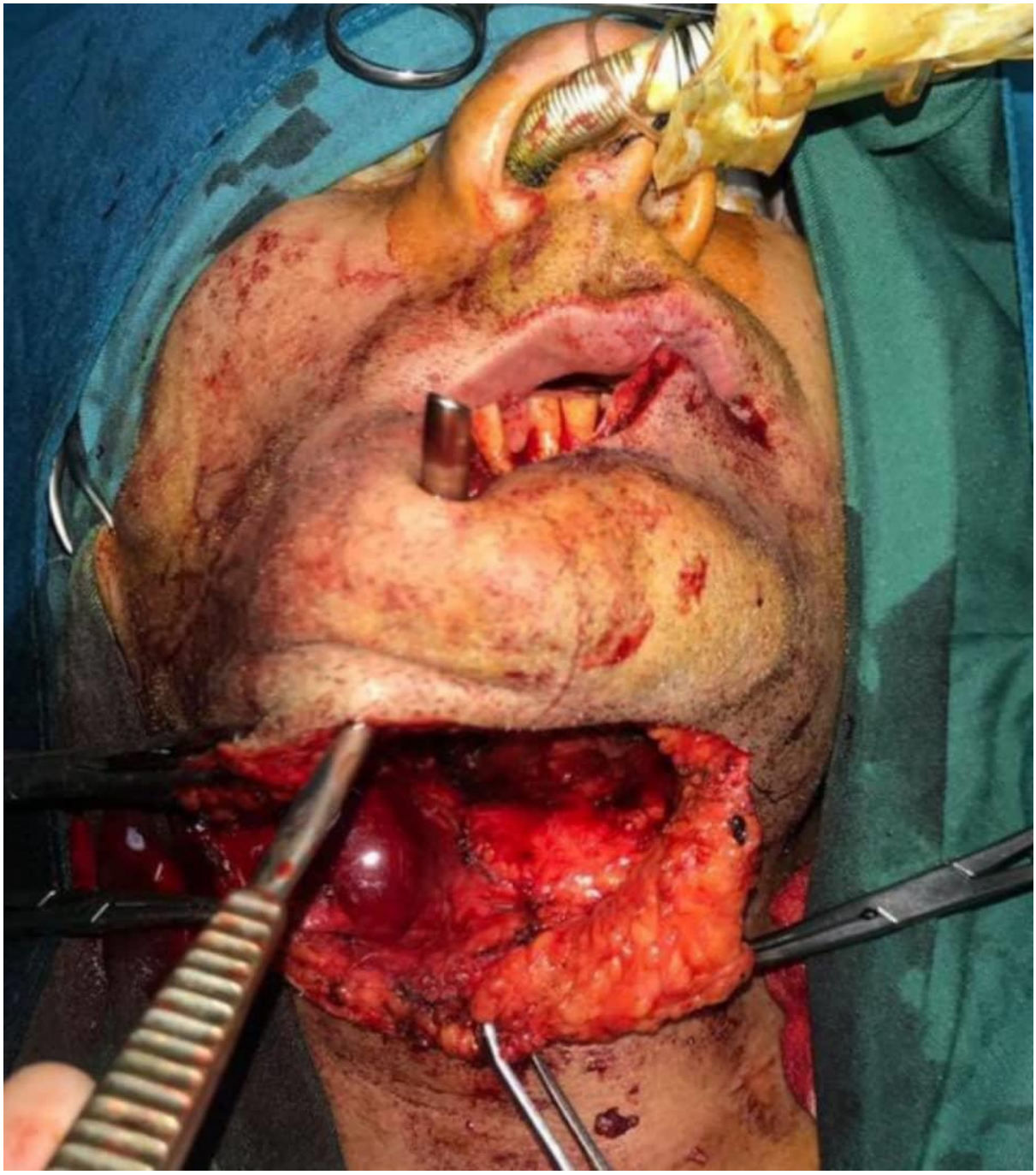


Figure 115. After neck dissection and vascular preservation for free flap, a tunnel is made to pass the flap pedicle to neck



Figure 116. Flap is set in place and anastomosis is done



Figure 117.Image shows lower lip reconstructed with radial forearm free flap after one week



Figure 118. Image shows acceptable donor site morbidity

13. Tongue SCC

40 years old male complaint of right tongue ulcer for 2 months

On physical exam a 4*4 cm indurated mass palpated on right posterolateral of tongue, not extending to base of tongue or passing through midline

No lymphadenopathy is palpated in neck examination

Patient underwent hemi glossectomy and ipsilateral neck dissection, tongue reconstruction with radial forearm free flap

Tracheostomy is done



Figure 119. Image shows tongue mass involving right posterolateral surface of tongue

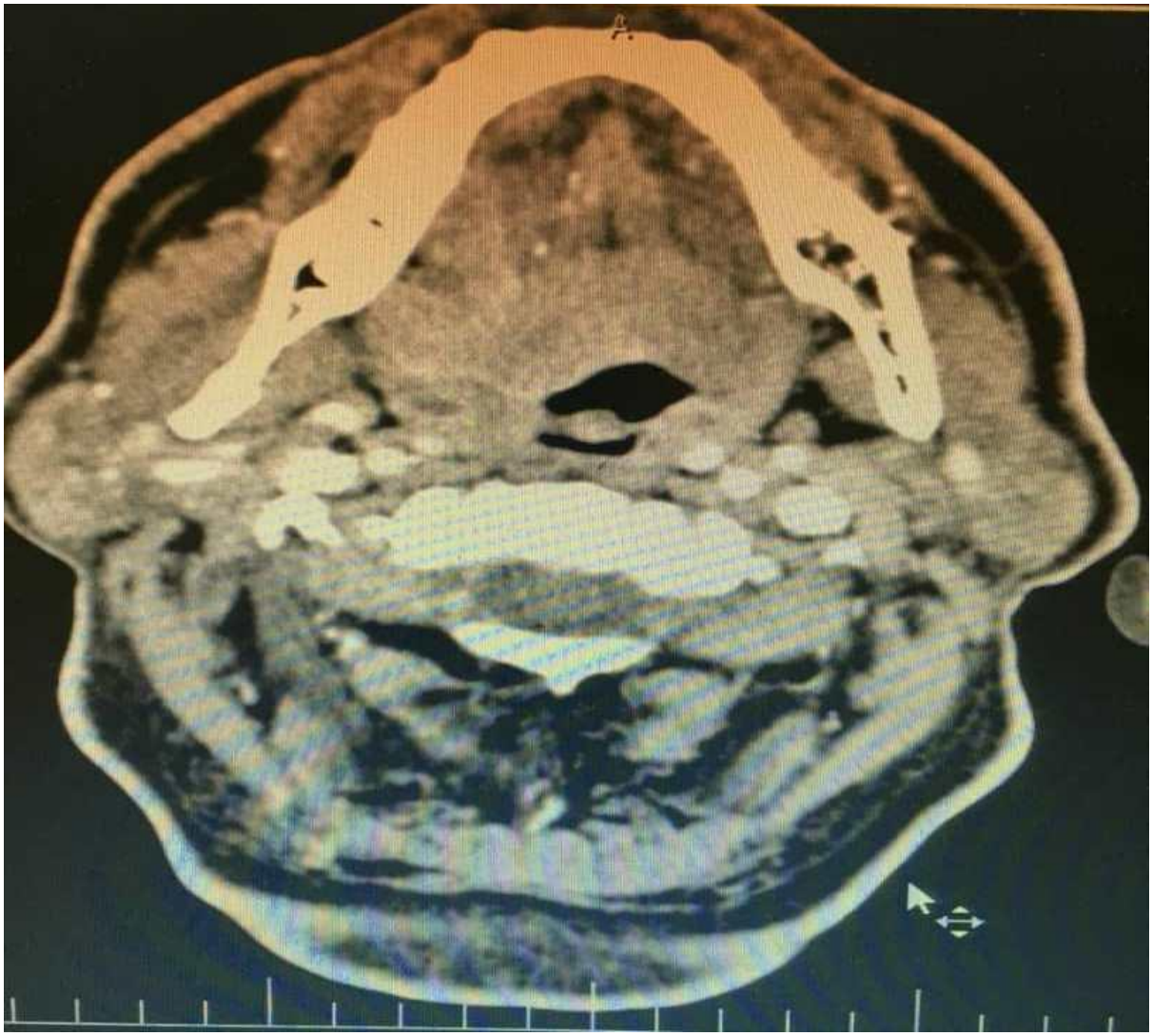


Figure 120. CT Scan shows enhancement on right side of tongue not invading controlateral side

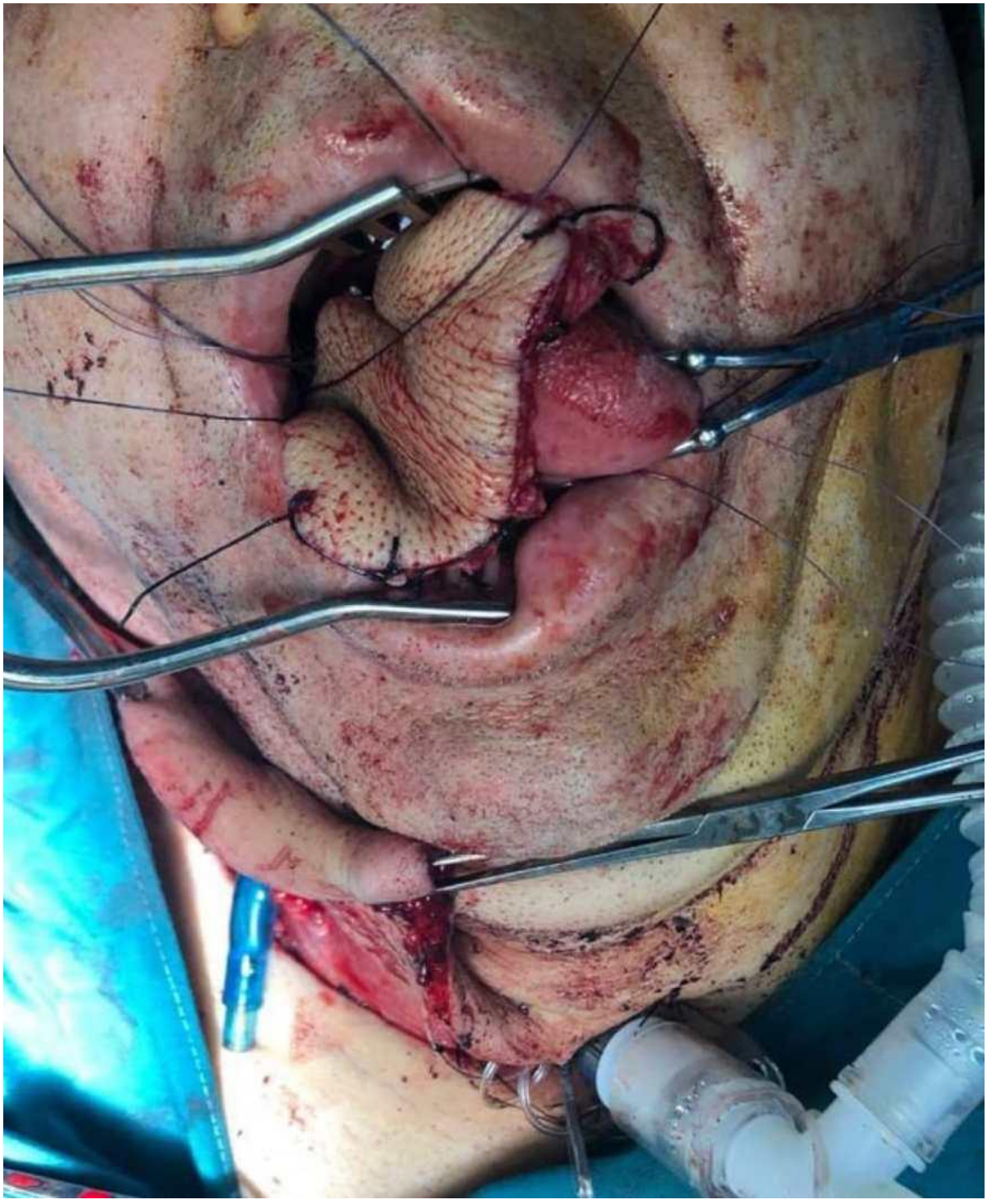


Figure 121. Image shows tongue reconstruction with radial forearm free flap after tumor ablation (Tracheostomy is done)



Figure 122. Image shows tongue reconstructed with radial forearm free flap right after surgery



Figure 123. Final result after 1 weeks

14. Traumatic facial paralysis

45 years old male complaint of left side facial paralysis for 2 years after blunt trauma and crush injury to skull, resulting complete paralysis of facial nerve with no recovery

EMG shows no activity despite physiotherapies

Patient underwent reanimation surgery with gracilis free flap attached to masseteric branch of maxillary nerve

Orthodromic facial reanimation was done at the same surgery



Figure 124. Preoperative view shows complete facial paralysis



Figure 125. Skin marking is shown (Preserving face and neck vessels)

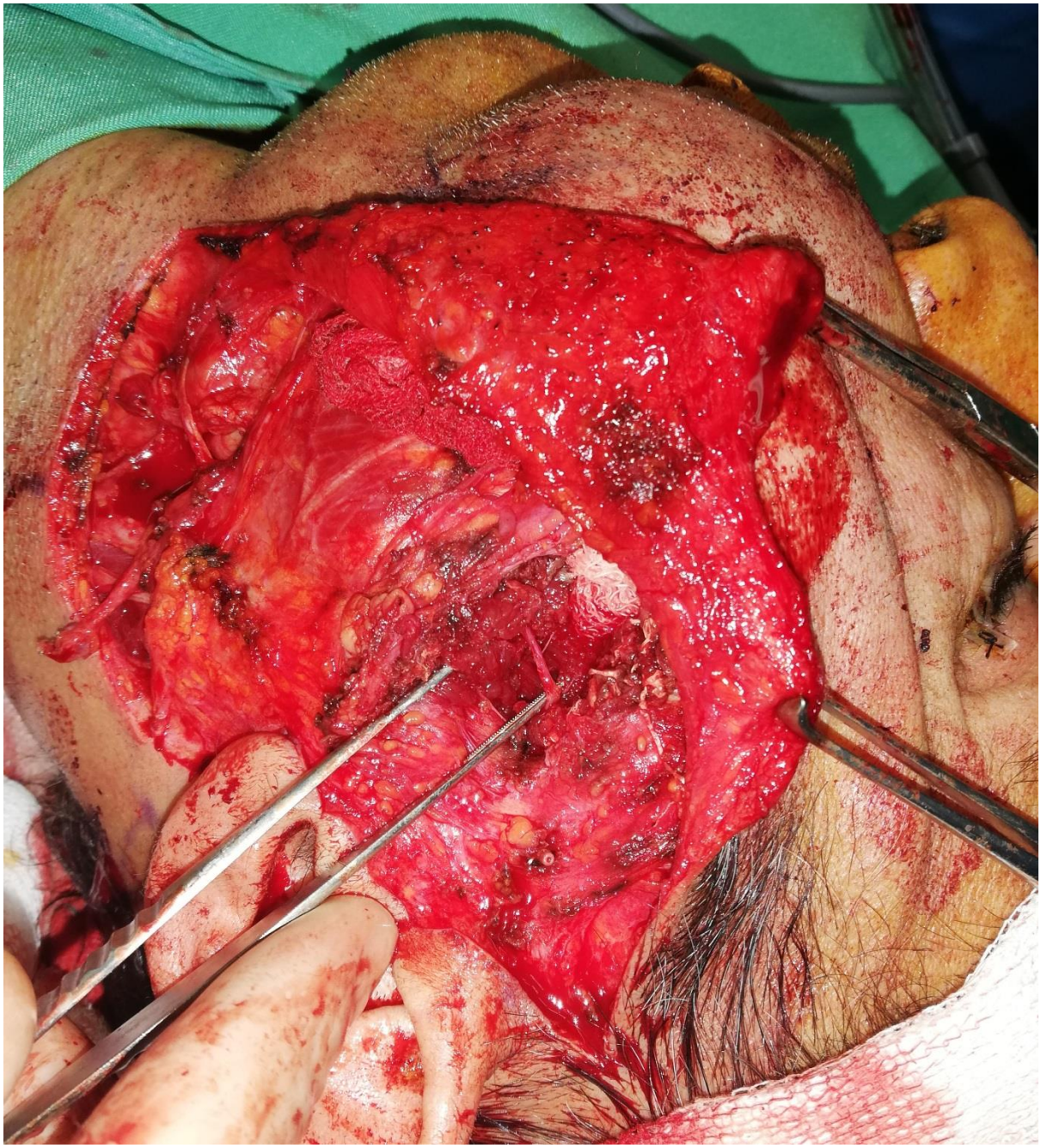


Figure 126. Image shows masseteric branch of maxillary nerve harvested for anastomosis obturator nerve

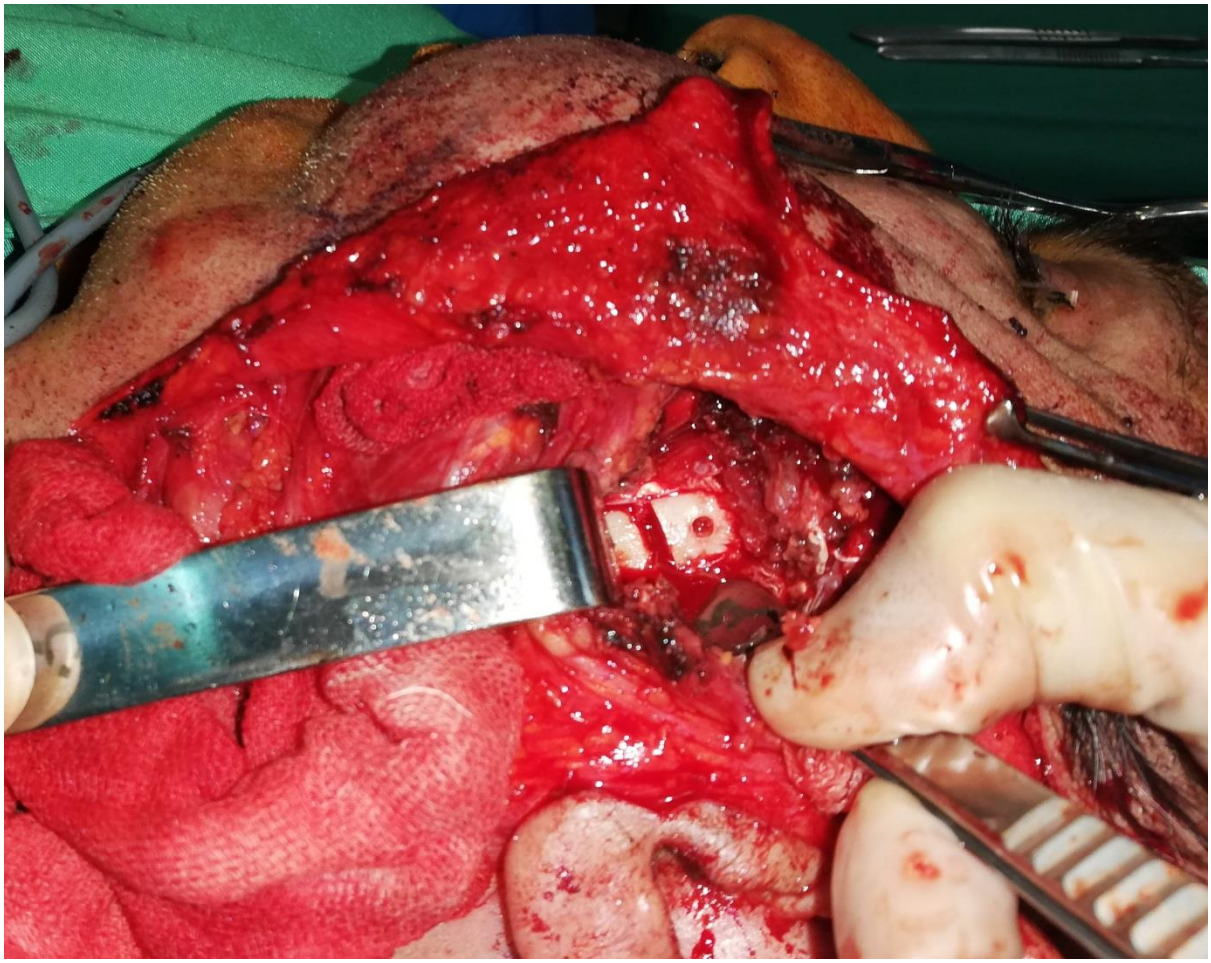


Figure 127. Cronoid process is drilled to perform orthodromic reanimation



Figure 128. Fascia harvested for reanimation via the same incision for harvesting gracilis free flap



Figure 129. Fascia is attached to labial commissure to reanimate smile



Figure 130. Image shows result in operating room



Figure 131. Image shows result in operating room



Figure 132. Image shows final result after 1 month

15. Tongue SCC

55 years old female complaint of anterior tongue mass less than 1 cm, undergone excisional biopsy elsewhere.

Pathology shows tongue involvement with Squamous cell carcinoma, and positive margins.

Patient referred for completion surgery and partial glossectomy was done and confirmed with negative margins.

Tongue reconstruction was done with radial forearm free flap.

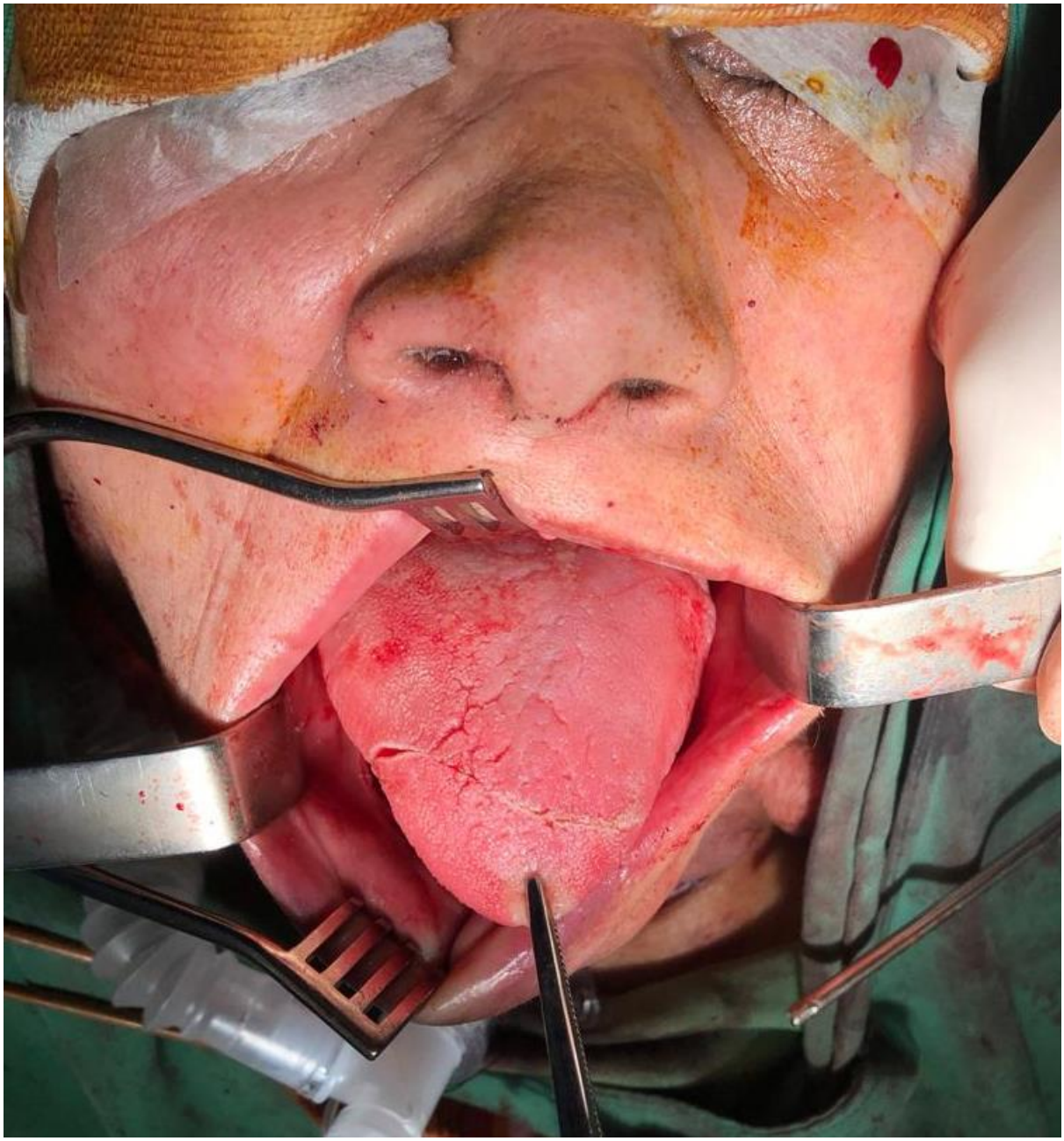


Figure 133. Image shows anterior tongue lesion to be resected with free margins

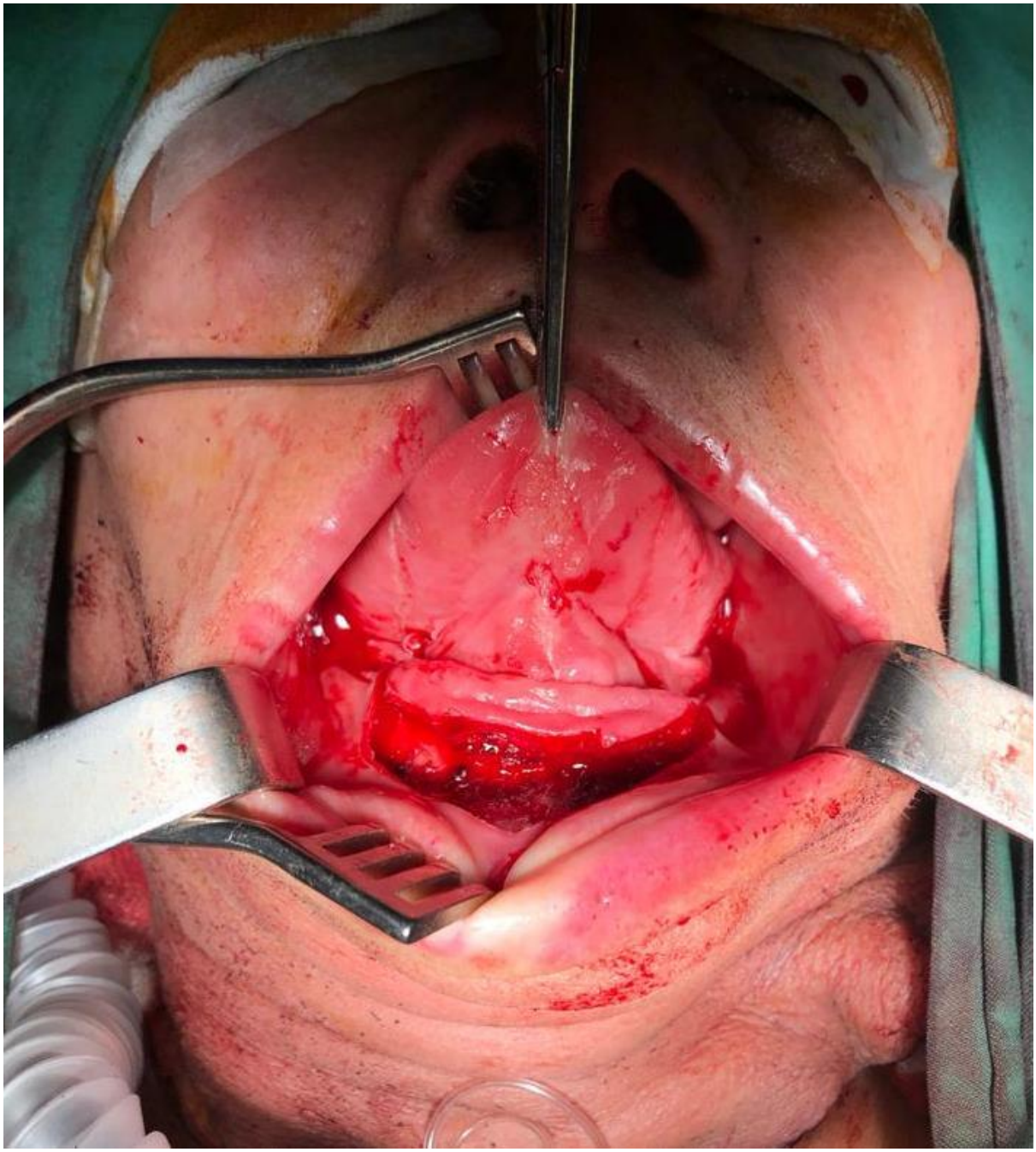


Figure 134. Anterior tongue lesion is planned to be resected with free margins

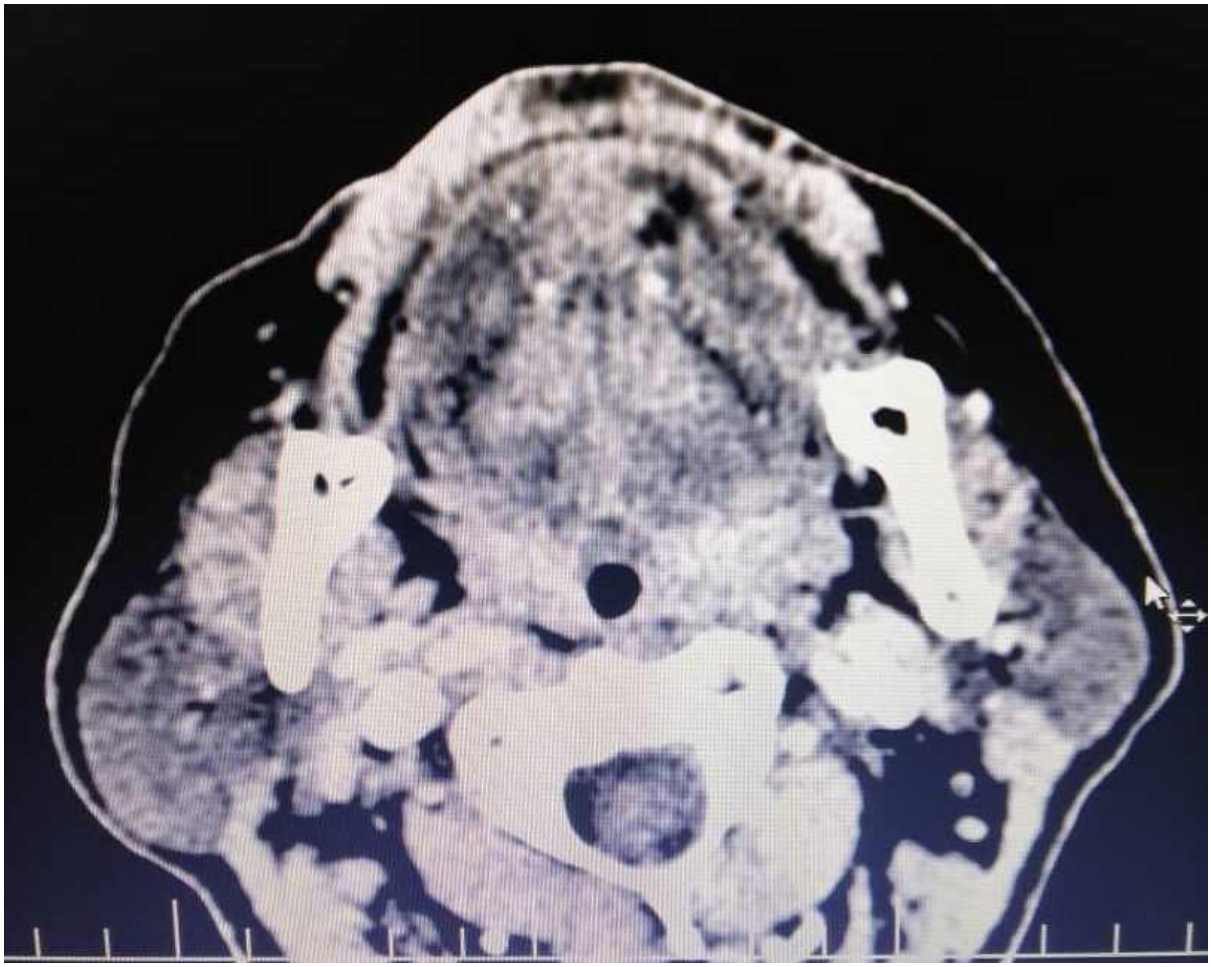


Figure 135. CT Scan shows no base of tongue and floor of mouth involvement

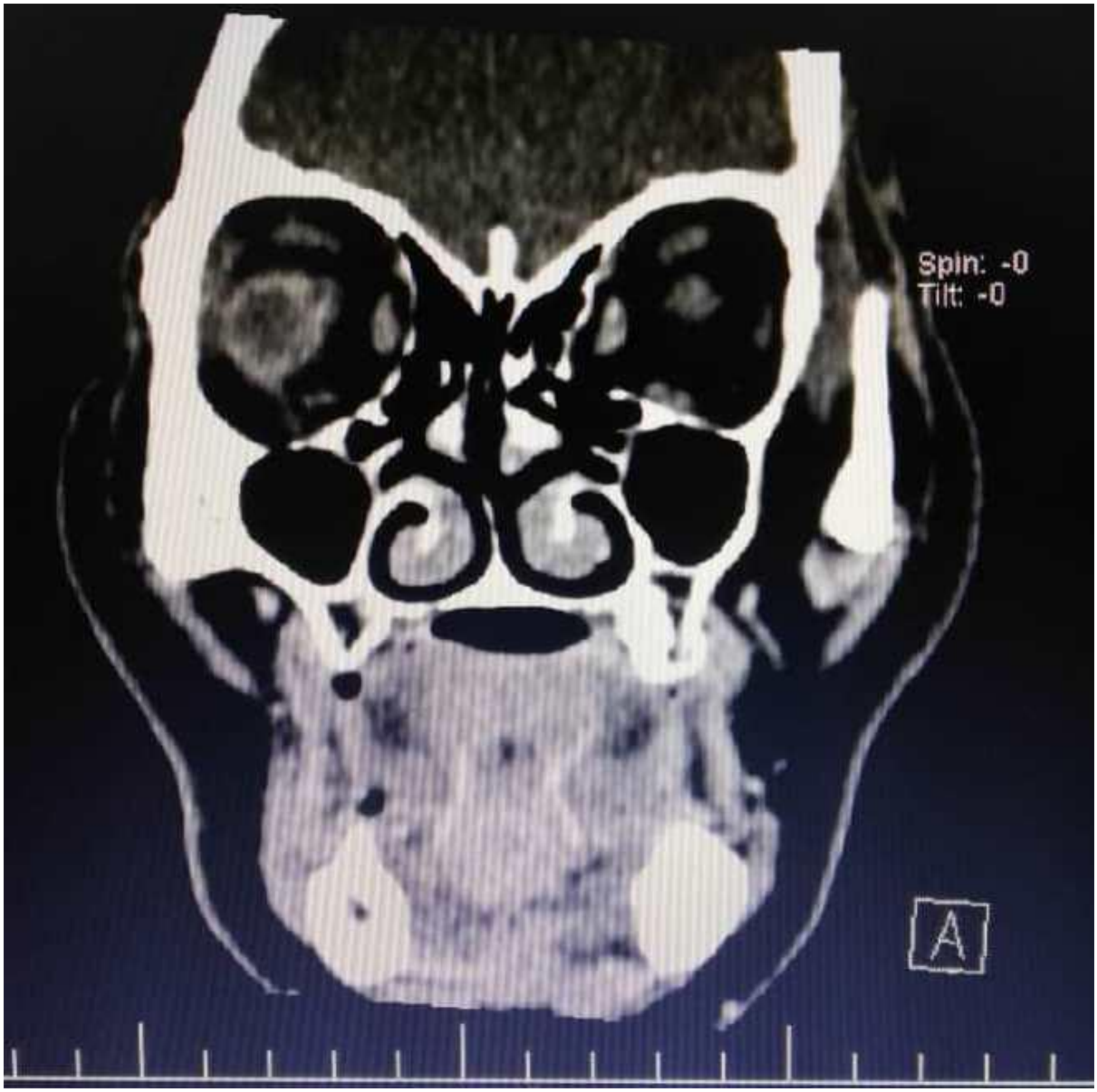


Figure 136. Coronal CT Scan

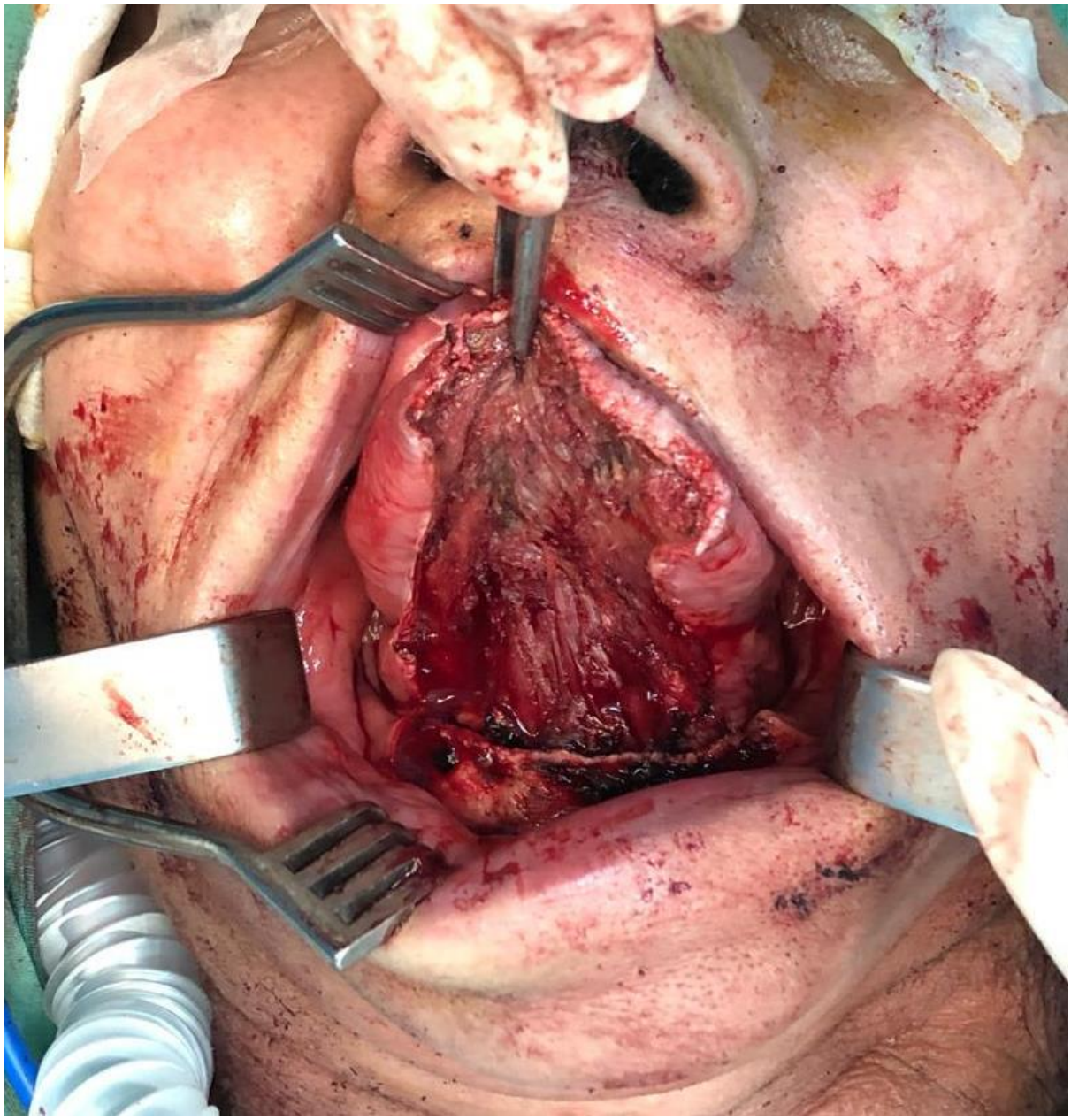


Figure 137. Defect after total resection of mass and checking free margins with intra operative frozen sections

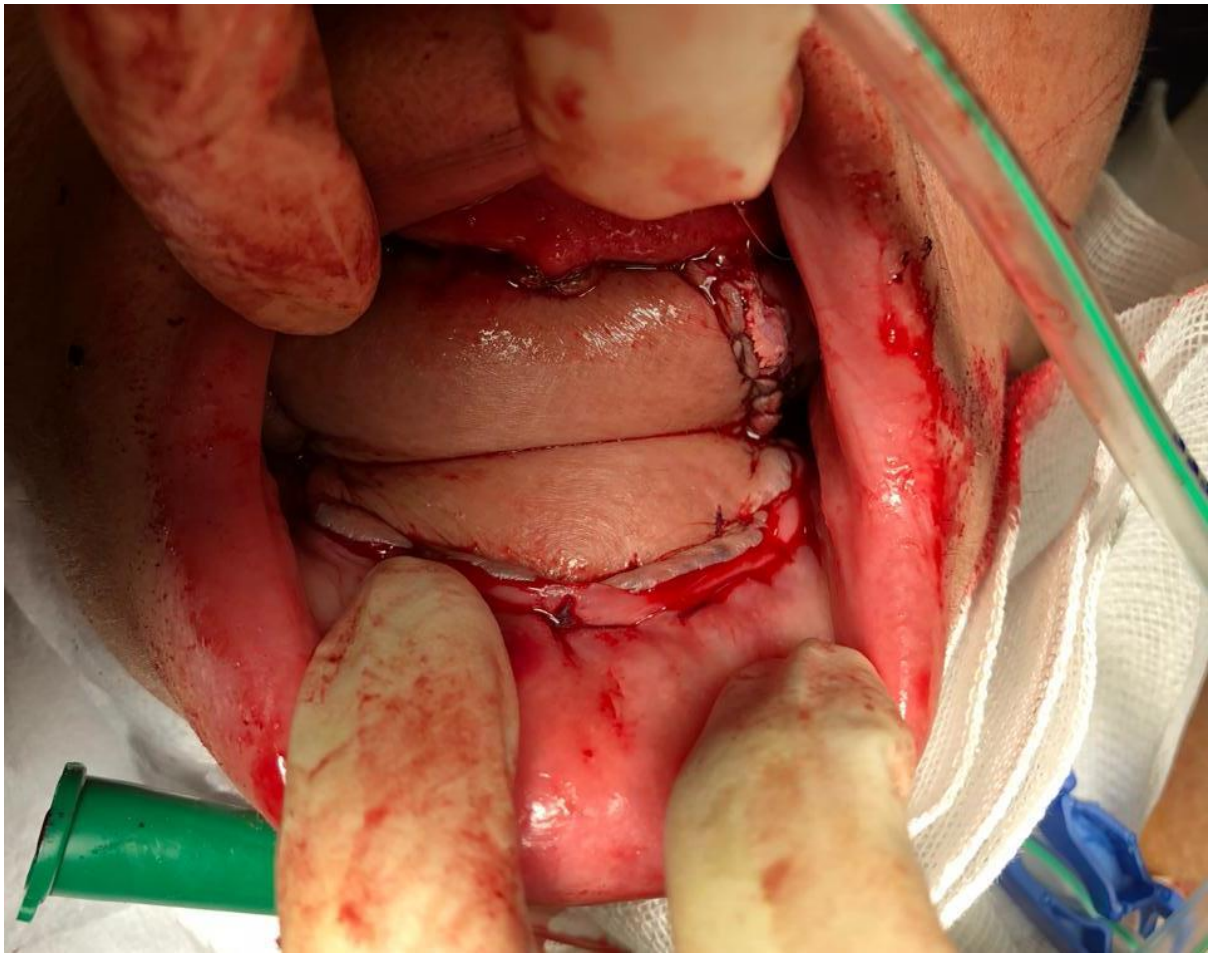


Figure 138. Tongue reconstruction with radial forearm free flap right after anastomosis



Figure 139. Image shows patient after 10 days, starting PO nutrition after discharging nasogastric tube



Figure 140. Image shows Patient after 4 weeks of surgery

16. Pharyngocutaneous fistula

47 years old male with history of laryngeal SCC underwent total laryngectomy and post-operative radiotherapy

Experiences pharyngocutaneous fistula after radiotherapy which is located around ostoma and not healing with conservative treatments

Patient underwent surgery for closure of pcf with local flap, unfortunately unsuccessful

We did perform reconstruction and closure of fistula with lateral tarsal free flap, harvesting donor vessels from radiated neck

Patient experienced partial necrosis of flap skin but after long follow up leakage was stopped



Figure 141. Image shows preoperative view of atrophic neck undergone total laryngectomy, radical neck dissection and radiotherapy



Figure 142. Pharyngocutaneous fistula is shown and its proximity with ostoma (commom carotids are marked)



Figure 143. Image is showing intraop marking of commom carotid and its branches in fibrotic neck to harvest as donor vessel for free flap



Figure 144. Harvesting lateral tarsal free flap



Figure 145. Image shows harvested vessels in neck and prepared for anastomosis

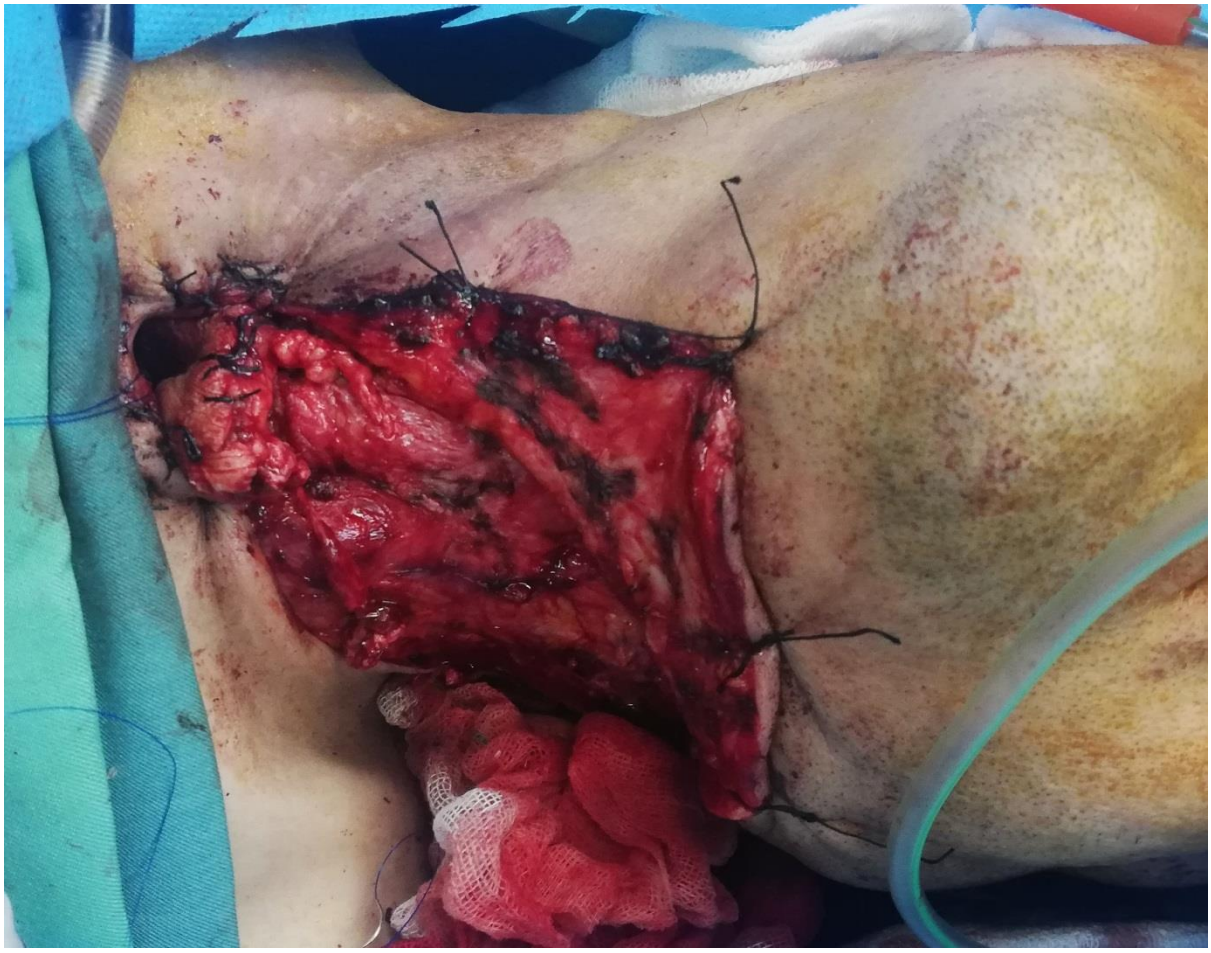


Figure 146. Flap is set in place and ready for anastomosis



Figure 147. Anastomosis is done , right afte anastomosis



Figure 148. Image shows donor site morbidity (Skin graft to cover donor site)



Figure 149. After 2 weeks of surgery epidermal necrosis and partial loss of flap is seen. fortunately saliva drainage from fistula is stopped

17. Tongue SCC

60 years old male, known case of tongue cancer (SCC) since one year ago.

Underwent complete course of Radiotherapy and because of not responding, referred for salvage surgery.

In physical exams a huge mass is involving tongue with extension to base of tongue and bilaterally.

Neck is involved with multiple lymphadenopathies.

Patient is gone under surgery for total glossectomy and floor of mouth resection with pull-through technique.

Bilateral modified neck dissection is done.

Reconstruction is done with anterolateral thigh free flap.

Tracheostomy is done.

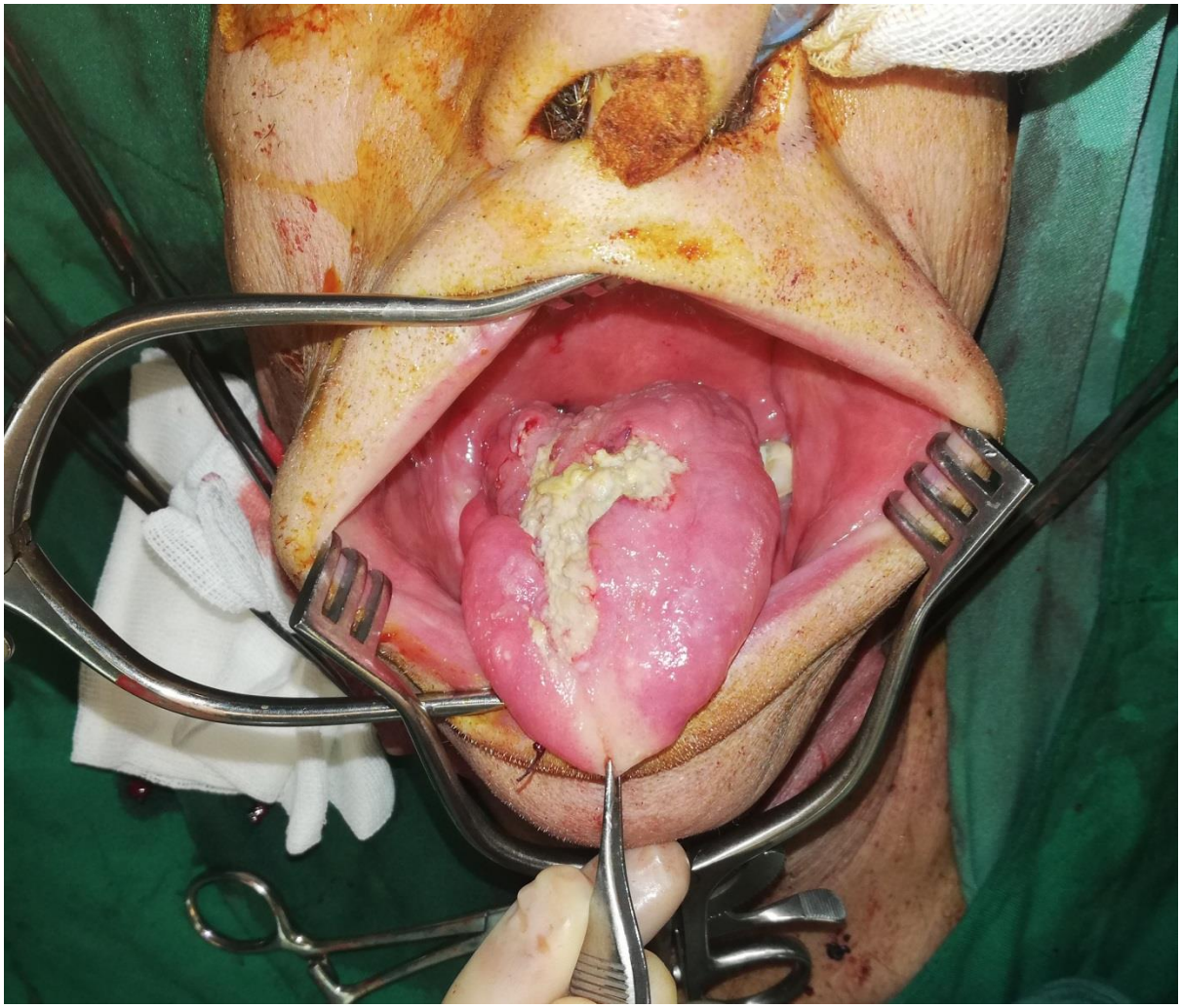


Figure 151١٥٠. Image shows total involvement of tongue with SCC, Base of tongue and floor of mouth is involved

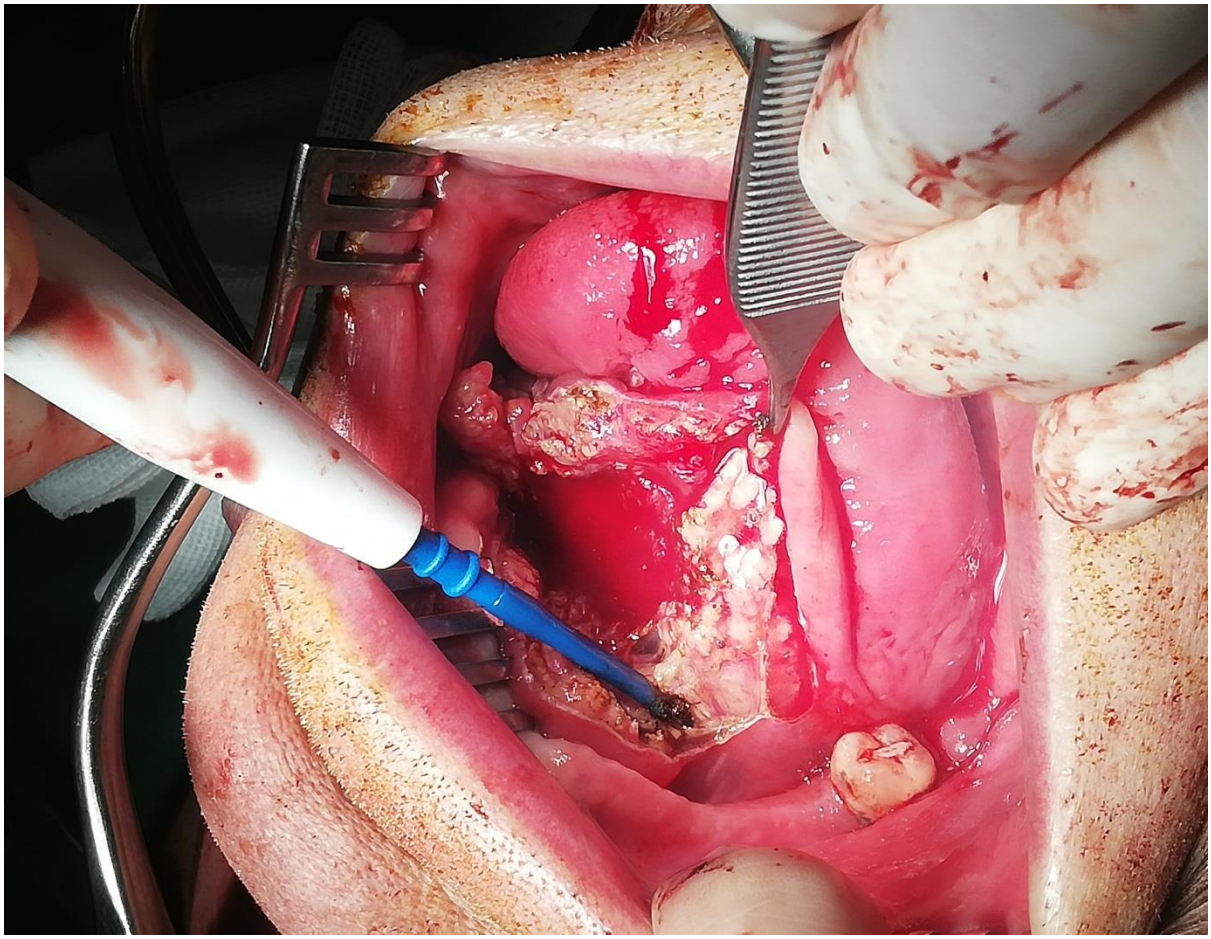


Figure 151. Image shows anterior margin of tumor resection including floor of mouth

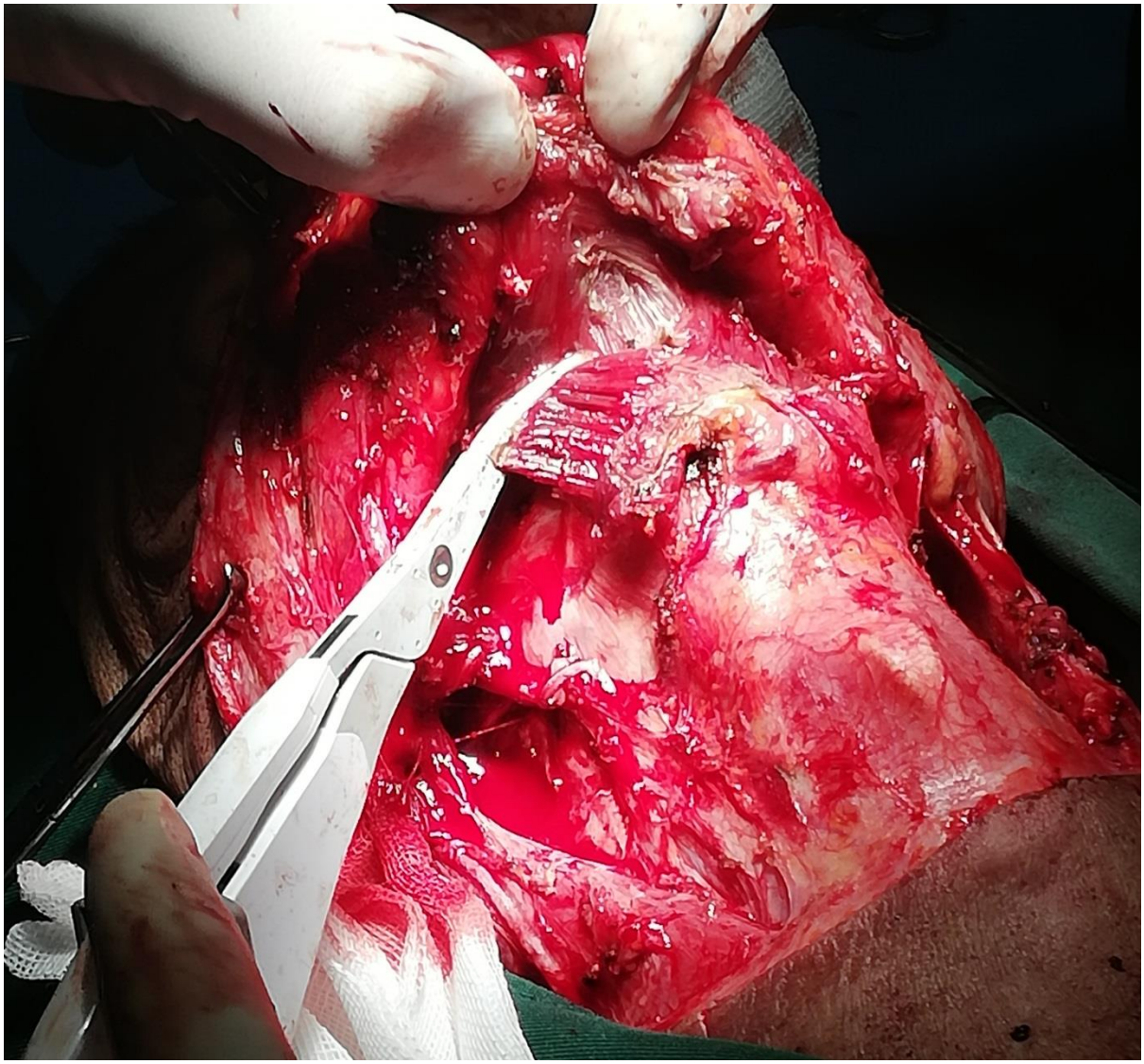


Figure 152. Bilateral modified radical neck dissection is done and releasing suprahyoid muscles to pull through the tongue to the neck

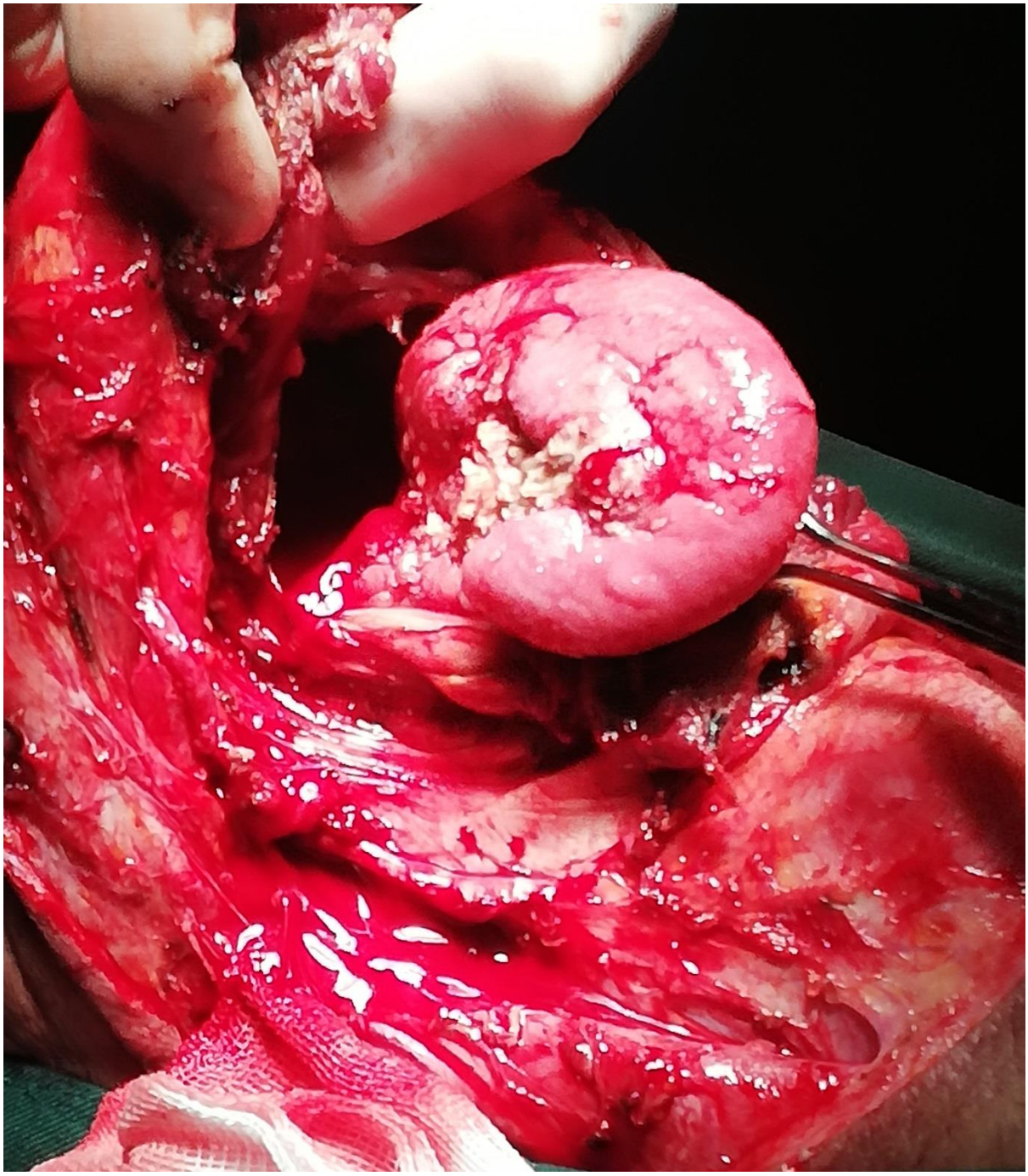


Figure 153. pull-through technique is used to resect the posterior margin with adequate ease and percision



Figure 154. Preoperative skin marking of perforators is shown (Anterolateral thigh free flap to harvest)

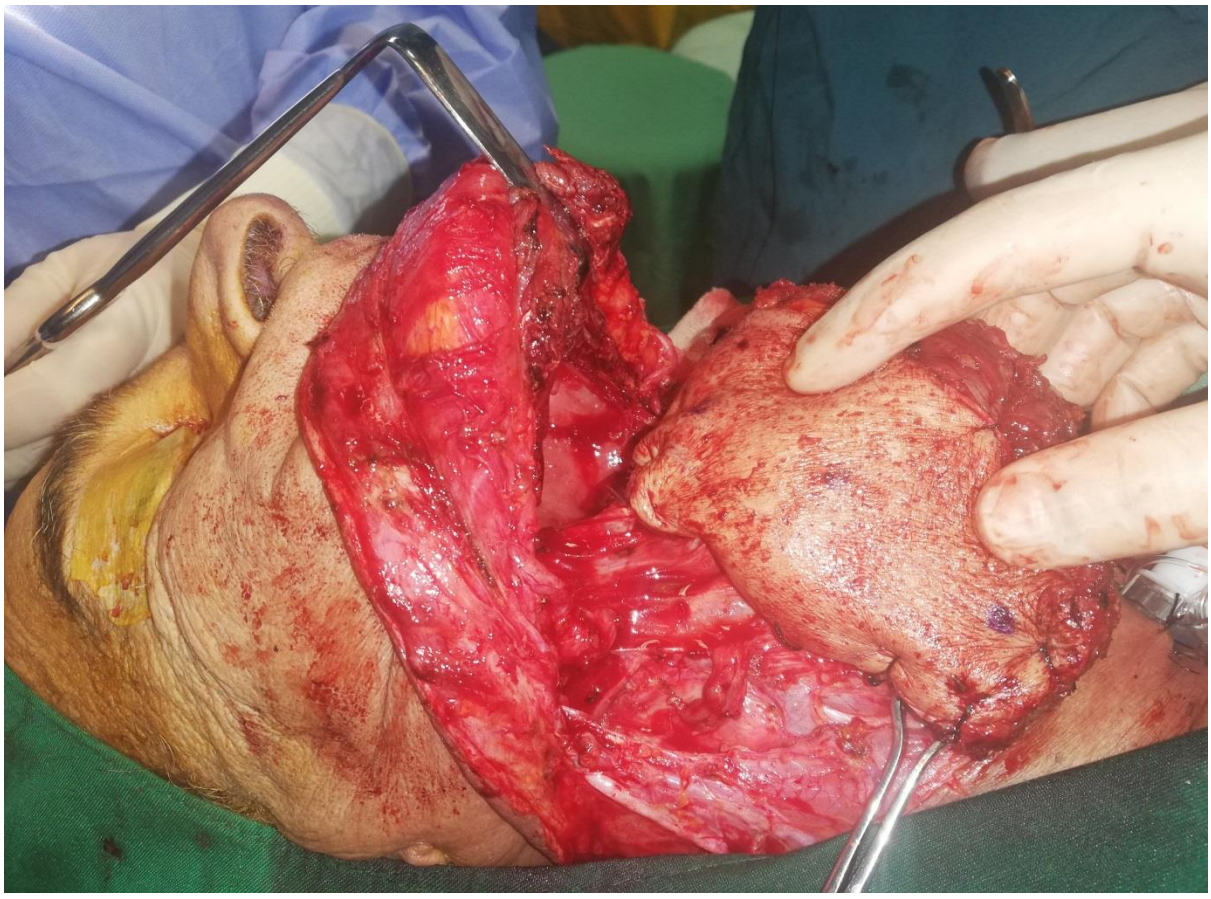


Figure 155. Distal end of Flap inset for creating base of tongue and suturing the flap to the valecula

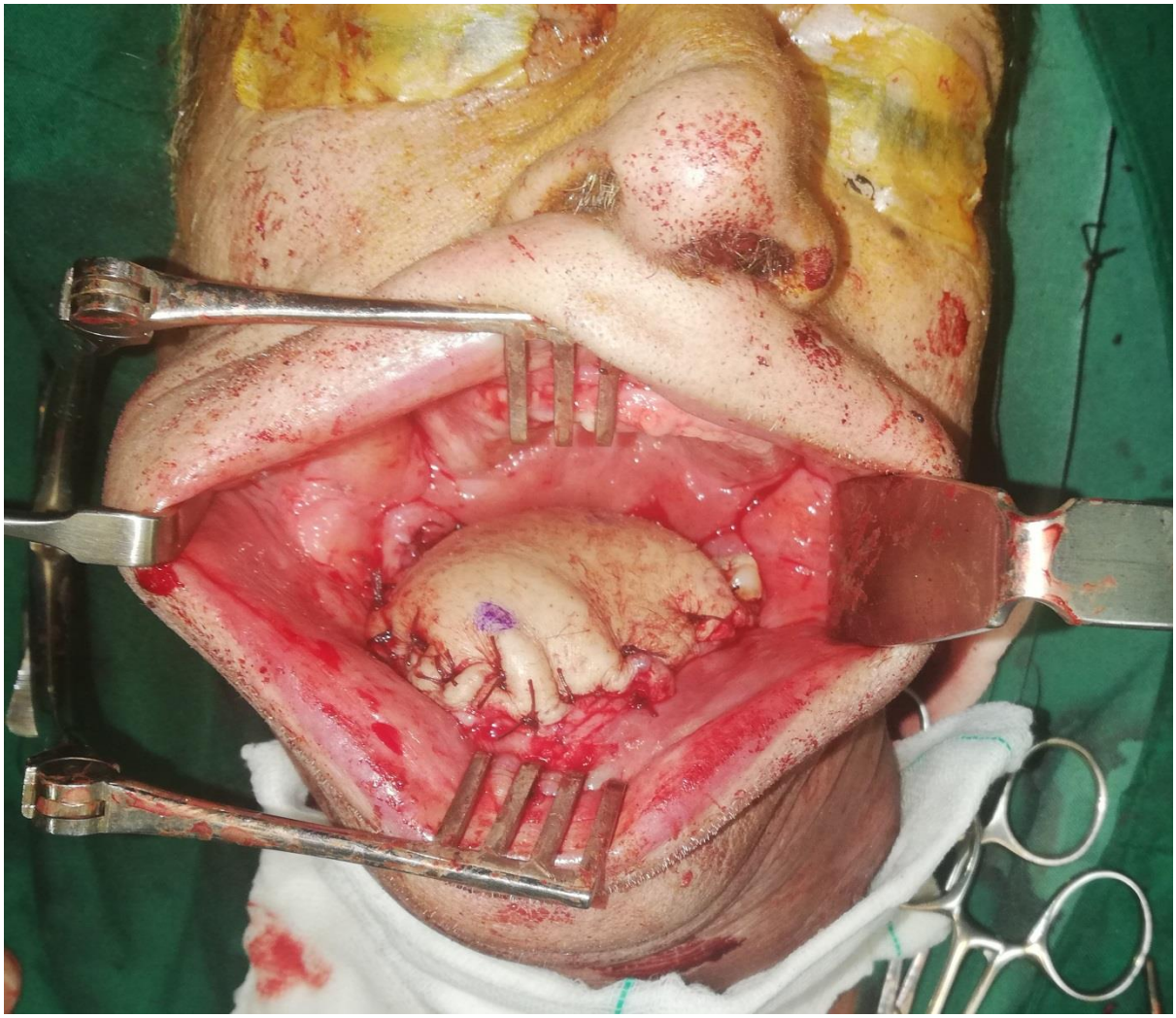


Figure 156. Early post operative image right after completing vascular anastomosis



Figure 157. 20 days post operation (Tracheostomy site is sealed and PO diet is started)