

**An Unusually Exaggerated Postoperative Complication of Cervico-Thoracic Flap: A Case Report**

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**Citation of this Article:** Dr. Mohit Negi, Arjun Agarwal, Anurag Yadav, Priyank Gupta, “An Unusually Exaggerated Postoperative Complication of Cervico - Thoracic Flap: A Case Report”, IJDSIR- June - 2021, Vol. – 4, Issue - 3, P. No. 427 – 431.

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**Type of Publication:** Case Report

**Conflicts of Interest:** Nil

**Abstract**

Reconstructive surgery has evolved through decades, and is still evolving. It is a well-known fact that for head and neck surgeries PMMC flap is considered to be the workhorse, however its complications are also evolving making it inevitable for surgeons to make changes in their techniques for orchestrating least morbid conditions post operatively. However, sticking to only one type of flap technique demarcates a limit to other types of locoregional flap research and evolution in techniques conventionally used. In this case report we have reported a case of oral cancer reconstruction using cervico-thoracic flap and discussion of unusually exaggerated complication encountered<sup>1</sup>.

**Introduction**

Oncological surgery is not always so extensive to require reconstruction but on the other hand it can be so encroaching that it becomes necessary to almost every time reconstructive surgeon has to go for workhorse of reconstruction in oral malignancies i.e. PMMC flap<sup>2</sup>. Although it is used so often, its complications can't be

ignored. Cervico-thoracic flap is one of the options in cases of reasonably large defects<sup>3</sup>. It is always a difficult task for surgeon to choose the best feasible flaps as there is always a dilemma created due the defect size and dimensions to be restored. Although there are countless number of locoregional flaps that can be used like latissimus dorsi flap, Scapular flap, Forehead flap, Nasolabial flap, Temporalis flap then there are distant flaps like radial forearm flap and free fibula flap which are commonly in use for reconstructing oncological defects<sup>4</sup>. Surgical defects variations that can result from head and neck surgeries ranges from primary closures and free tissue transfers to pedicle flaps, including random flaps and axial flaps based according to the distribution of arterial supply. For maintaining a wide pedicle, a random blood supply pattern is always needed. For this reason, many random flaps, such as forehead flaps and cheek advancement-rotation flaps, due to poor mobility are only utilized for reconstruction of small defects. However axial flaps such as trapezius flaps and pectoralis major myocutaneous flaps (PMMF) overcome these limitations.

There disadvantage is bulky or large appearance and a poor colour match with the recipient site which sometimes impair the function of donor muscle groups<sup>5</sup>. This case reports the complication which got unusually exaggerated post operatively. We have also discussed the possible sequelae of patho-physiology for future anticipation of these types of complications.

### **Case report**

A 60-year-old male reported to Oncology Unit of Department of General Surgery, Rohilkhand Medical College and Hospital, Bareilly on 6<sup>th</sup> January 2020 with a chief complaint of non-healing ulcer with pain on left side of his cheek region 5 months ago.

The ulcer at the beginning started as a nodule about 5 months ago which subsequently got converted into ulcer and the patient began to realise pain as the ulcer was growing in its dimension. His mouth opening was 3 finger breadths. The pain was dull, intermittent and aching and was not having any aggravating and relieving factors. Nothing relevant was reported in medical and dental history. He gave history of bidi smoking for 10 years with the frequency of 3-4 per day. On general physical examination he was moderately built and nourished male with no systemic debilities. Local extra oral examination was suggestive of a single, diffuse swelling in the left cheek region. The super inferior extension was from level of ale tragus line till mandibular lower border. While anteroposteriorly, it extended from the commissure of the mouth till the anterior border of the mandibular ramus. Non-pinch able skin over the prominence of the swelling was palpated. Intra-orally, a rubbery reddishwhite ulcero-proliferative growth with alveolus involvement, 3x2cm in size, was present in the left buccal vestibular region, extending from the mesial aspect of 45 till distal aspect of 47. In addition, multiple mobile lymph nodes including level 1b, 2a, and 3 lymph nodes were palpable. Clinical

impression was highly suggestive of carcinoma of the left buccal mucosa with TNM staging T4aN2bMx.

A Punch Biopsy was taken and sent for pathology for confirmation of the disease. Histopathology revealed moderately differentiated squamous cell carcinoma. A contrast CT scan was done with cheek puff in which bony invasion was clearly observed. The final diagnosis of the lesion came to be carcinoma of the left buccal mucosa (T4aN2bMX).

The treatment plan included wide local excision of the lesion along with hemi-mandibulectomy and Modified Radical neck dissection with reconstruction by cervico-thoracic flap from same side. The surgery was performed on 9<sup>th</sup> January 2020.

Wide local excision of the lesion was performed, which included 4x3 cm of skin over buccal region and lining from mucosa 2cm posterior to the commissure of the mouth till the retro molar trigone were resected. The wide local excision margins were superiorinferiorly, maxillary vestibule downwards till the attached gingiva of the posterior mandibular teeth. Hemi mandibulectomy was performed. Maxillary molars of respected side were extracted.

Cervico-thoracic flap was selected from left side to cover the intraoral defect. The excised specimen histopathology examination revealed it as well differentiated squamous cell carcinoma of left buccal mucosa with a staging of T4aN2cMX and stage grouping IVa. Patient was kept in intensive care unit for 2 days post operatively. He was extubated on the 1st postoperative day.

Regular change of extraoral dressing with close monitoring of oral hygiene was done. However on 4<sup>th</sup> day post operatively bluish discolouration was observed

around suture line in the neck (Figure 1).



Figure 1: Depicting bluish discoloration of flap over skin in the neck on 4<sup>th</sup> day postoperatively.

Additionally there was wound dehiscence and necrosis observed after subsequent 2 days (Figure 2).



Figure 2: Depicting wound dehiscence and necrosis on subsequent days post operatively.

Wound dehiscence in the suture line of neck was observed and on the 5<sup>th</sup> post-operative day, a swab was taken from the site for culture and sensitivity test. The presence of *Klebsiella pneumonia* species was revealed in reports, which was sensitive to carbapenem initially but got resistant in few days. Immediately injection Linezolid was added as a replacement to Supracef, which was no longer effective, to the drug regime. Again culture sensitivity was taken through

swab and sent for pus culture. Pus drainage started to decrease consecutively. Post-operative day 18<sup>th</sup> for debridement of the defect was planned (Figure 3). However it is worth mentioning the role of white vinegar as an irrigant while dressing which provide a tremendous aid in wound management. Regular irrigation and dressing was done with betadine gauze to achieve healthy granulation tissue.

After achieving proper condition for re-surgery patient was planned for tissue rehabilitation. Patient was planned for forehead flap with skin grafting under general anaesthesia (Figure 4). Skin graft was taken from left leg (thigh) region.



Figure 3: Depicting debrided wound with healthy granulation tissue.

Patient was re-operated on 21<sup>st</sup> post-operative day. Surgery went well and uneventful (Picture 4). Patient was discharged on 59<sup>th</sup> post-operative day. Clinically patient was in depression in his prolonged hospital stay due to which a psychiatry reference was done. Accordingly anti-depressant was prescribed with proper counseling. Due to prolonged Ryle's Tube feeds, opinion of gastroenterology was done and antacids were prescribed.





Figure 4: Depicting wound coverage by forehead flap and skin grafting.

### Discussion

Head and neck oncological defect extension can include significant facial structures like oral mucosa, mandible, and skin which all together create a large void to be filled. There comes role of reconstructive surgery, for managing these kinds of defects it often becomes necessary for surgeon to use the workhorse flap (PMMC) from his arsenal of locoregional flaps however for extensive defects cervico-thoracic is not bad choice of selection.

Head and neck present a significant reconstructive challenge to surgeons, especially with large defects<sup>5</sup>. Options that can be used are primary closure, skin grafts, healing by secondary intention, pedicled flaps, and free flaps but they have their limitations as well. So the choice of reconstruction in these anatomic regions is rotation of locoregional tissue. It have several advantages like excellent skin colour and texture match, no donor region requirement, low surgical risk to high-risk patients, such as hypertension, diabetes, or old age. Due to the technical similarities to the random flap, cervico-thoracic flap is best for reconstruction of large defects<sup>5</sup>.

To cover wounds of the lateral neck in 1960 Conley used laterally based thoracic rotation and cervical flap for the first time. To close the skin defects of the face by using cervico-pectoral rotation flaps was reported originally by Garrett et al. in 1966. Kaplan in 1978 was the first person to coin the term "cervico-facial flap" in a report of the

versatility of this flap for the coverage of head and neck oncological defects. The name "cervico-thoracic flap" was coined in the same report<sup>5</sup>.

Cook et al. devised certain goals for reconstructing mid-facial and cheek region. In addition to providing thickness match and excellent skin colour, texture, also the tissue should be flexible, preserve facial movement, minimise distortion of the eye and upper lip and prevent ectropion. The cervico-thoracic flap meets all of these criteria. They also provide soft tissue coverage for the protection of deeper vital structures, such as the carotid artery facial nerve, mandible<sup>5</sup>.

Cervico-thoracic rotation flap is a random flap with wide pedicles. It is time taking but with considerable advantages like providing adequate thickness, undistinguishable skin colour, with cosmetically acceptable scars along with minimal morbidity. For high risk patients, such as those with systemic diseases and very old and also including those who cannot tolerate a long operative hours, are particularly preferable<sup>5</sup>. It also becomes necessary evaluating the amount of soft tissue requirement and multi-faceted intricacy of wounds.

Liu et al in 2011 reported epidermolysis of the distal skin flap as the most common surgical complication (3 cases, 14.3%)<sup>5</sup>.

Anatomic variations of vasculature have lead to evolution of flap harvesting technique. Veins accompanying arterial vessels drain the skin overlying the pectoral muscle<sup>6</sup>.

Necrosis of flap is a multi-factorial phenomenon. However, collectively analysing all the contributing factors and relating to the clinical situation encountered, can help in early identification and subsequent management of the issue.

This infers to the fact that any occlusion in the arterial supply will severe the health of the flap. Next major cause are the infections which can be complicated by various

factors like systemic disease (diabetes) certain habits like chronic smoking or venous pooling which sometimes fail to drain. The pooled blood provides nourishing environment for bacterial growth complicating the Sequelae of flap necrosis. Hence early detection of colour changes and tension in flap should be meticulously checked<sup>8</sup>.

In hospital setting a sense of fear is always maintained due to nosocomial infections which are usually quite resistant to majority of antibiotic regime. Hence investigations like culture sensitivity test should be frequently done. It is worth mentioning the role of White Vinegar as an irrigant while dressing debrided wound for notorious bacterias<sup>9</sup>. In our case we used it and results were quite satisfying. However if infection is due to multi-bacterial load and heavily resistant then one can also manage the necrosis by Vacuum Dressing which is very helpful in preventing infection by not providing any means for bacteria to grow<sup>10</sup>.

### Conclusion

To conclude, complications are always a part of learning and understanding the procedural errors and post-operative failures. Flap necrosis is most notorious among all and needs to be reduced with time by knowing every aspect leading to its morbidity.

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