



Case report

The pedicled lateral forehead flap in reconstructing oral floor defect - The last resort; case report

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ABSTRACT

Introduction and importance: Locoregional flaps, particularly the pedicled lateral forehead flap, are not usually used in reconstructing oral floor defects following oncologic resection. Rather, microscopic free flaps have evolved to be the standard of care in head and neck reconstruction. However, the pedicled lateral forehead flap could be valuable in floor of the mouth reconstruction in the absence of resources or other options.

Case presentation: A-56 years old lady with multiple comorbidities who underwent near total glossectomy, bilateral supraomohyoid neck dissection, and right lateral mandibulotomy due to a locally advanced lingual squamous carcinoma. The last resort was the pedicled lateral forehead flap after many unsuccessful reconstructive attempts utilizing the free anterolateral flap, free radial forearm flap, and pedicled pectoralis major flap.

Clinical discussion: Decreased donor site morbidity and reliable anatomy are among many of the advantages that made free flaps favorable over locoregional pedicled flaps, especially in oral cavity defects coverage. Of the latter, the pedicled forehead flap, rich in vascularity and neighboring the oropharyngeal defects, could be used with different techniques and modifications. Close monitoring and patient condition optimization is required.

Conclusion: Choosing a particular reconstructive option should be done considering the available resources and expertise and the patient's condition. The pedicled forehead flap remains valuable when other options are inappropriate or have failed.

1. Introduction

Microvascular free flaps have gained the cutting edge over locoregional flaps in head and neck large defects reconstruction [1]. Introduced first in India more than 2000 years ago, the forehead flap can be employed in the reconstruction of various anatomic defects, with the aim of restoring functional and structural integrity of the tissue. Despite the unpleasant, eye-drawing disfigurement left behind, it proved to be a reliable and functional option for a long time throughout the 1960s and 1970s, before it was challenged by more advanced options. Indeed, free flaps are currently regarded as the standard of care in reconstructing large head and neck defects [2].

Herein, following the SCARE 2020 guidelines [3], we present a case where the lateral pedicled forehead flap was successfully used following

various free and regional flaps, proving its reliability in oropharyngeal defects reconstruction.

2. Case presentation

Our team was consulted by the ENT team for the possible reconstructive options for a 56-year-old lady, known case of hypertension, type II diabetes mellitus (DM II), hypothyroidism, dyslipidemia and glossal squamous cell carcinoma (Grade II and stage T4 N2c M0) with neoadjuvant chemoradiation therapy, who was planned to undergo near total glossectomy, bilateral supraomohyoid neck dissection, and right lateral mandibulotomy. We planned to reconstruct the tongue and a 7 × 5 cm oral floor defect with the left anterolateral thigh (ALT) free flap and mandible fixation using an AO plate in a joint operation along with the

Abbreviations: ENT, ear, nose, and throat; AO, Arbeitsgemeinschaft für Osteosynthesefragen; STSG, split-thickness skin graft; ICU, intensive care unit.

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ENT team. Despite an initial success, no audible pulsation was detected on doppler ultrasonography two days post-operatively, henceforth the flap was debrided in the theatre where the veins were found thrombosed, and replaced with a left radial forearm free flap with STSG coverage of the donor site from the left thigh. The next six uneventful days were interrupted by a massive bleeding from the neck, prompting exploration of the flap site; the anastomosis with the external carotid artery was found jeopardized and we attempted multiple trials of re-anastomoses that failed to save the flap. Consequently, the ENT team substituted the necrotic flap with a right pectoralis major pedicled flap and bilateral nasolabial flaps. Lateral forehead flap was considered a month later as a consequence of dehiscence of the flap edges. In three stages, the lateral forehead flap was raised first and 20 days later it was transferred to cover the anterior intraoral defect, with the donor area covered with STSG from the right thigh. Following 50 hyperbaric oxygen therapy sessions across three months, the flap's pedicle was divided in the final stage. The patient was closely monitored in the ICU before being transferred to the ward with an uneventful post-operative period. The patient had no coagulation disorders and was placed throughout her course on prophylactic anticoagulation. The flaps were regularly monitored clinically by assessing the color and capillary refill and by doppler examination. Fig. 1 shows the process of the lateral forehead flap reconstruction across different stages.

3. Discussion

Owing to their design versatility, ample tissue stock, less donor site morbidity, texture compatibility, pedicles with different tissue types, reinnervation potential, two-team approach possibility, and consistent anatomy, the free flaps overtook the locoregional pedicled flaps across the last decades [1,4,5].

On the premise of rich vascularity, dermal pad firmness, absence of hair, and geographic proximity to the oral cavity, the pedicled forehead flap could be considered a valid option in restoring oropharyngeal continuity [6]. In their series, Hoopes and Edgerton [6] utilized three modifications of the lateral forehead flap in reconstructing post-oropharyngeal cancer resection: Immediate total forehead, delayed total forehead, and hemi-forehead, with a satisfactory outcome albeit lacking long-term results. The former two are superficial temporal and posterior auricular arteries dependent while the latter derives its supply solely from the superficial temporal artery [6].

With the aim of anatomy and function restoration, multiple options of reconstructing the oral floor defects could be used. At the cost of considerable contracture, the simple option is leaving the defect to heal via secondary intention. Direct closure is possible if sufficient soft tissue can be recruited in the closure, taking care not to compromise the function of mobile structures (The tongue) by excess tethering. Skin grafts are usually resorted to in small defects or as adjunct to other

reconstructive options. Ranging from local mucosal flap for small defects to facial artery musculomucosal flap for moderate defects, local flaps can be utilized when skin grafts are inappropriate or well-vascularized tissue is required for an irradiated bed. However, anatomic and functional integrity of the oral cavity should not be compromised. Myriad of regional flaps can be used; these include the pectoralis major, which used to be the workhorse flap in restoring head and neck defects, nasolabial, forehead, temporalis muscle, deltopectoral, sternocleidomastoid, and platysma flaps. The most favorable free flaps in reconstructing oral floor defects are the radial forearm flap and the enterocutaneous fibular flap, with the former being the workhorse flap in current practice while the latter being especially used in reconstructing the mandible [7].

Although the success rate of free flaps reconstruction exceeds 95% [8], majority of the failures are attributed to vascular thrombosis, particularly vein thrombosis in the first 24 h [9], as was the fate of the primary flap. While infection and mechanical pressure stand behind free flaps failure beyond the first two days, combination of age, recipient area neoadjuvant radiation, DM II, hematoma, and potential operator-dependent factors might have culminated to the demise of the second and third flaps [8,9]. Other risk factors that may undermine free flaps include alcohol withdrawal, increased coagulability, pedicle revision [9,10], and pedicle biting, stretching, or kinking. A bite block was placed to protect the pedicled flap; and careful pre-operative measurement was done to provide sufficiently long pedicle.

The flap is classically elevated at the level of the pericranium [6], as in our case. Nonetheless, other nuanced modifications have been reported such as a more superficial frontalis-saving plane [6]. Akin to McGregor's approach, the flap was introduced through a cheek incision, with the difference in our case being that we exploited an existing nasolabial flap incision scar to slide the flap into the oral cavity. Other methods, such as Millard's approach, can be utilized as well.

The long-term outcome might be difficult to be assessed in this case, as the patient deceased a few months following reconstruction. Notwithstanding, acceptable results are reported in the literature. While the reconstructed tongue tends to appear 'coated', an adaptation process renders it pinkish, moist, and pliable [6]. Impacting lifestyle, dysphagia arises among a considerable proportion of the patients. Different complications could compromise the lateral forehead flap, for instance post-operative bleeding and flap necrosis [6].

4. Conclusion

The lateral forehead flap, due to its versatility and reliability, withstood the test of time until the advent of the free flaps in oropharyngeal defects reconstruction. This case report emphasizes its beneficial role once a surgeon has depleted their arsenal of free flaps. Mouth floor reconstruction was successfully done in this case after the failure of the ALT free flap, the radial forearm free flap, and the pedicled pectoralis major flap. Selection of a reconstructive option could be a decision far from being simple and it should be based on the patient's condition and availability of resources.

Informed consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Provenance and peer review

Not commissioned, externally peer-reviewed.

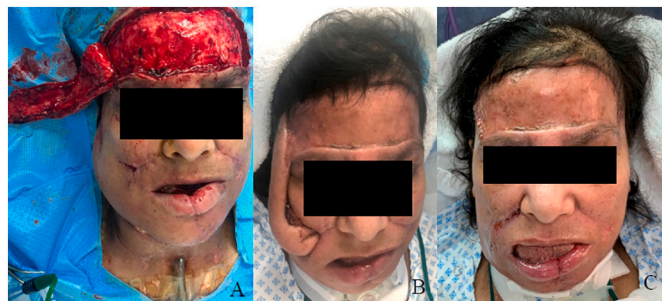


Fig. 1. This figure shows the different phases of reconstruction the defects in our case using the pedicled lateral forehead flap. A: Phase I, raising the flap. B: Phase II, the flap was transferred to the defective area through preexisting nasolabial flap incision. C: Phase III, division of the flap. Please note that coverage of the donor area was done through a split-thickness skin graft.

Ethical approval

Exempted from the IRB approval.

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Guarantor

Ahmed Alotaibi
Qutaiba Shah Mardan
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Research registration number

This paper does not require registry. There is no additional harm to the patient nor an innovative intervention is being applied on the patient.

CRediT authorship contribution statement

- 1- Fuad K. Hashem: Patient management and manuscript editing.
- 2- Qutaiba Shah Mardan: Manuscript writing and editing.
- 3- Nehal Mahabbat: Manuscript writing and editing.
- 4- Ahmed S. Alotaibi: Manuscript writing and editing.
- 5- Mohammed A. Almarghoub: Manuscript writing and editing.
- 6- Felwa A. Almarshad: Manuscript writing and editing.

Declaration of competing interest

None.

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