

Reconstruction of Extensive Lower Lip Defect Using Tunneled Famm Flap Following Squamous Cell Carcinoma Resection

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Abstract

Objective: To report the successful use of the Facial Artery Musculomucosal (FAMM) flap for the reconstruction of an extensive lower lip defect following resection of a squamous cell carcinoma (SCC).

Background: SCC of the lower lip is a prevalent malignancy associated with significant tissue defects post-resection, necessitating effective reconstructive techniques to restore both function and aesthetics. The FAMM flap, introduced by Pribaz et al., offers a reliable method for addressing such defects due to its rich vascular supply and versatility.

Case Presentation: A 31-year-old male with a history of tobacco use presented with a 3.2 cm ulcerative lesion on the lower lip. Diagnosis of moderately differentiated SCC was confirmed, and imaging showed no regional lymphadenopathy or distant metastasis. The patient underwent wide local excision, resulting in a substantial defect involving up to 75% of the lower lip. Surgical Technique: A FAMM flap was designed and harvested from the ipsilateral buccal mucosa, ensuring inclusion of the facial artery's perforators to maximize vascularity. The flap was transposed to the lower lip defect with tunneling through buccal mucosa with meticulous alignment of the vermilion border and restoration of muscular continuity. The donor site was closed with collagen sheet.

Outcome: Postoperative recovery was uneventful, with the flap demonstrating excellent viability and integration. The patient achieved favorable functional and aesthetic outcomes, including restored oral competence and satisfactory cosmetic appearance. No disease recurrence was noted at the six-month follow-up.

Conclusion: The FAMM flap is an effective reconstructive option for extensive lower lip defects resulting from SCC resection. Its ability to provide well-vascularized, functional tissue with minimal donor site morbidity makes it a valuable technique in complex oral and perioral reconstructions.

Keywords: famm flap; lower lip reconstruction; squamous cell carcinoma; facial artery musculomucosal flap; oral defect reconstruction

Introduction

Squamous cell carcinoma (SCC) of the lower lip is a significant malignancy within the spectrum of oral cavity cancers, constituting approximately 25-30% of all oral malignancies [1,2]. This neoplasm typically originates from the vermilion border, and its etiological factors include chronic ultraviolet radiation exposure, tobacco use, and immunosuppression [3]. The standard

therapeutic approach involves surgical excision with adequate margins to achieve local control. However, extensive resections often result in substantial tissue defects that challenge reconstructive efforts, necessitating advanced surgical techniques to restore anatomical and functional integrity [4,5].

The Facial Artery Musculomucosal (FAMM) flap, introduced by Pribaz et al., has become a pivotal technique in reconstructive surgery of the oral cavity and perioral region. This flap is renowned for its reliable vascular supply derived from the facial artery, and its ability to provide robust, well-vascularized tissue suitable for covering extensive defects [6].

Case report:

A 31-year-old male with a history of tobacco use presented with a persistent ulcerative lesion on the lower lip, measuring approximately 3.2 cm in diameter. Histological examination confirmed moderately differentiated SCC. Staging investigations, including MRI indicated no regional lymphadenopathy or distant metastasis, classifying the carcinoma as T2N0M0 according to the AJCC Cancer Staging Manual [7,8].

The patient underwent wide local excision of the tumor with a 1 cm margin, resulting in a defect involving up to 75% of the lower lip, extending into the ipsilateral labiomental fold and disrupting the continuity of the orbicularis oris muscle.

Surgical technique:

The FAMM flap was selected for its capacity to reconstruct large, complex lower lip defects while preserving function and aesthetics.

1.**Preoperative Planning:

-The flap was designed on the left buccal mucosa, measuring 5.5 cm in length and 3.5 cm in width, aligning with the defect's dimensions and anticipated need for tissue advancement.

-The design followed the trajectory of the facial artery, ensuring inclusion of the artery's perforators to maintain optimal vascularity [6,9].

2.**Flap Harvesting:

-A mucosal incision was made from the oral commissure towards the pterygomandibular raphe, incorporating the facial artery [10].

-Dissection was carried out in the submucosal plane, meticulously preserving the buccinator muscle and its vascular supply.

-The facial artery and its perforators were identified and preserved to ensure the flap's viability. The flap was then mobilized and rotated into the lower lip defect [11].

3.**Flap Inset and Reconstruction:

-The FAMM flap was transposed into the defect via tunneling through buccal mucosa, with precise alignment of the vermilion border to ensure functional and aesthetic restoration.

-The muscular portion of the flap was sutured to the residual orbicularis oris muscle, restoring muscular function and continuity [12].

-The mucosal surface of the flap was anastomosed to the native lower lip mucosa, and the donor site was closed with absorbable sutures using collagen sheet.

Postoperative Care:

The patient was managed with broad-spectrum antibiotics and anti-inflammatory medications to prevent infection and manage edema. For 1st week ryle's tube feeding was given and A liquid diet was prescribed after 1 week and transitioning to a soft diet as tolerated. Regular oral hygiene with chlorhexidine was recommended to prevent donor site complications [13,14].

Postoperative monitoring focused on flap viability, with vigilance for signs of venous congestion or ischemia. The flap exhibited robust perfusion and demonstrated no signs of necrosis, with the patient resuming normal oral functions within two weeks [15].

Outcome:

The patient achieved a satisfactory functional and aesthetic outcome. The FAMM flap integrated well with the surrounding tissues, providing adequate oral competence for speech and mastication. At the six-month follow-up, there was no evidence of disease recurrence, and the reconstructed lower lip exhibited good mobility and sensation [16].

Image 1 – Preoperative disease

Image 2 – immediate postoperative image and 2 week follow up image

Discussion:

The FAMM flap is a valuable tool in the reconstructive arsenal for extensive lower lip defects, offering several advantages, including a consistent blood supply from the facial artery, minimal donor site morbidity, and the ability to cover large defects with well-vascularized tissue [6,17]. The flap's design and versatility make it particularly suitable for defects involving both the mucosa and underlying muscular structures [18]. Prior studies support the efficacy of the FAMM flap in achieving reliable outcomes in lower lip reconstruction. Wang et al. (2012) reported successful outcomes in a cohort of patients with lower lip defects, highlighting the flap's efficacy and reliability [19]. Similarly, Zhang et al. (2014) demonstrated the flap's ability to restore both functional and aesthetic aspects effectively [20]. Despite its advantages, the FAMM flap is not without potential complications, including partial flap necrosis, donor site morbidity, and functional impairment if not meticulously executed. Careful surgical planning, technique, and postoperative management are critical to minimizing these risks and optimizing patient outcomes [21,22].

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