

Pathologic Surface Changes in the Submental Flap Used for Intraoral Reconstruction: Report of Two Cases

AMIN RAHPEYMA¹, SAEDEH KHAJEHAHMADI²

ABSTRACT

Soft tissue reconstruction is often necessary after pathologic resection of oral squamous cell carcinoma. Although morphologic changes are common after transfer of the flaps to the oral cavity, pathologic changes within the transferred flaps, used for intraoral reconstruction, are rare events. Despite the widespread use of submental flap for oral cavity reconstruction, there are no reports in this respect. In this article, pathologic changes in the surface epithelium of transferred submental flaps are demonstrated with the report of two cases. The occurrence of lichen planus in a submental flap that had been used for reconstruction of lateral tongue border is reported in one case and in another patient, squamous cell carcinoma arising in the transferred de-epithelialized submental flap, used for maxillary and buccal reconstruction, is shown.

Keywords: Oral cavity reconstruction, Squamous cell carcinoma, Surface epithelium

CASE REPORTS

First Case

The patient was a 65-year-old edentulous female with squamous cell carcinoma (SCC) of the tongue (right lateral border) without cervical lymph node metastasis.

Orthograde submental flap was used for reconstruction after pathologic resection with wide margins [Table/Fig-1a]. A course of radiotherapy was advised by the oncologist. At the second-year follow-up, an erosive lesion was detected on the surface of the transferred flap [Table/Fig-1b]. In the excisional biopsy, it was compatible with lichen planus. Low-power photomicrograph showed hyperkeratosis, saw-toothed rete ridges and band-like infiltration of lymphocytes immediately subjacent to the epithelium [Table/Fig-1c]. There were no other signs of lichen planus in other parts of the oral cavity as well as any previous history of lichen planus. Two-year follow-up of the patient after excisional biopsy showed no signs of recurrence.

Second Case

The patient was a 55-year-old male with left maxillary and buccal squamous cell carcinoma [Table/Fig-2a]. Maxillary bone had been invaded by carcinoma. Size of the lesion was 5×3 cm [Table/Fig-2b]. Orthograde de-epithelialized submental flap was used for reconstruction after surgical resection with wide margins [Table/Fig-2c]. The flap uptake was uneventful. Six months after surgery, an elevated mucosal plaque with smooth, white and well-demarcated borders appeared on the cheek [Table/Fig-2d]. Administration of topical anti-fungal drugs for two weeks was not beneficial. The



[Table/Fig-2a-e]: (a) Pre-operative photograph showing ulcerative mass in the left edentulous maxillary ridge. (b) Maxillectomy defect and resected buccal mucosa. (c) De-epithelialized submental flap is used for reconstruction of buccal mucosa and maxillary alveolar ridge. (d) Buccal mucosa lesion with smooth, white and well-demarcated epithelialized flap. (e) High-power photomicrograph demonstrating hyperparakeratosis (on the left side) and hyperorthokeratosis (on the right side). A number of chronic inflammatory cells are noted within the subjacent connective tissue (H&E staining, original magnification ×400)



[Table/Fig-1a-c]: (a) Submental flap for reconstruction of the tongue lateral border. (b) Two years after engraftment an erosive lesion appeared. (c) Low-power photomicrograph shows hyperkeratosis, saw-toothed rete ridges and band-like infiltrate of lymphocytes immediately subjacent to the epithelium (H&E staining, original magnification ×100)

excisional biopsy revealed hyperkeratosis with a thickened spinous layer (acanthosis). The keratin layer consisted of a combination of hyperparakeratosis and hyperorthokeratosis. Numerous chronic inflammatory cells were noted within the subjacent connective tissue [Table/Fig-2e]. Nine months after the first surgery, an ulcer appeared in the retromolar region within the confines of the submental flap [Table/Fig-3a] that histologically was squamous cell carcinoma in incisional biopsy taken under local anaesthesia [Table/Fig-3b]. The lesion was resected with wide margins and reconstructed with a nasolabial flap [Table/Fig-3c,d].

In both cases, surgical margins in the main specimens were clean and adjunctive radiotherapy was administered after surgery. None of the patients used tobacco (smoking or smokeless) and/or alcohol before and after surgery.



[Table/Fig-3a-d]: (a) Ulcerative lesion in the retromolar area. (b) Histopathologic feature of squamous cell carcinoma (H&E staining, original magnification $\times 100$). A histopathologic feature of the keratotic lesion near the oral commissure was similar to the [Table/Fig-2e]. (c) Nasolabial flap was used for reconstruction after resection (One month after operation). (d) Flow up at six month shows uneventful flap uptake

DISCUSSION

After pathologic resection of oral squamous cell carcinoma (OSCC), soft tissue reconstruction is often necessary. Pedicled or free flaps are the most prevalent techniques for reconstruction of the resected lesion [1]. Pathologic changes within the transferred flap are uncommon [2]. Recurrence of the lesion, if any, often occurs in the interface between the flap and the remaining oral mucosa [3]. Despite the widespread use of submental flaps for oral cavity reconstruction, there is not any study describing the behaviour of this flap in situ. Studies in this topic are restricted to histologic changes in free or pedicled myocutaneous flaps (free radial forearm and pectoralis major flaps) used for intraoral reconstruction, which have shown that the transferred flaps maintain their architecture but are characterized by chronic inflammation in all the tissues and *Candida* infection in half of them [4,5].

Negative margins of the excisional biopsy specimen, boundary of the lesion within the flap and the superficial location, not reaching deep structures, all indicated that the pathologic changes were actually within the flap not from the bed or recurrence of the lesion in the adjacent oral mucosa. In the first case, these pathologic changes occurred in the transferred submental skin; in the second patient they happened after complete epithelialization of the raw surface of the flap that had been de-epithelialized before transfer to the oral cavity for prevention of hair problem in male patient.

The skin component of free or pedicled flaps, transferred to the oral cavity, shows some morphological changes as influenced by environmental factors, influenced by saliva, mechanical and chemical stimulus and *Candida* infection [6]. Epithelial changes such as psoriasis, focal acantholytic dyskeratosis and carcinoma are pathologic [7,8]. Pedicled pectoralis major myocutaneous flap, free radial forearm flap and skin grafts with pathologic changes after intraoral transfer have already been reported [9-11]. Two cases that were reported in this article are the first reports of pathologic changes in the submental flap.

The submental flap was introduced in 1993 and nearly two decades have elapsed since its introduction to the reconstruction world [12]. Ease of flap harvest, proximity to the oral cavity and large skin paddle are advantages of this flap [13]. It can be structurally classified into

myocutaneous, fasciocutaneous and osteomyocutaneous [14]. The de-epithelialized variant is used in male patients with heavy beard to avoid the second surgery for hair removal or multiple sessions of laser application [15]. The difference between the second case in this article and the other reports of SCC developing in myocutaneous flaps, transferred to the oral cavity, is the time interval during which the second primary SCC had developed. Most second primary tumours have appeared several years after the initial tumour resection and reconstruction surgery [16]. This time was much shorter in the presented case in this article (9 months). De-epithelialized variant of submental flap used in this patient may have played an important role in this event. Raw surface of the flap exposed to the oral cavity for secondary epithelialization may be sensitive to oncogenes. Thin epithelium with persistent chronic inflammatory cells scattered beneath it (in fibrotic background) may be the other responsible factor.

CONCLUSION

Flap surface should be checked periodically for potential pathologic changes after transfer to the oral cavity. Some changes might have clinical importance. This checkup is more important in de-epithelialized variants. Skinless flap exposed to the oral cavity for secondary epithelialization and thin formed epithelium with persistent chronic inflammatory cells may have critical roles in this topic.

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PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Oral and Maxillofacial Surgery, Oral and Maxillofacial Diseases Research Center, School of Dentistry, Mashhad University of Medical Sciences, Mashhad, Iran.
2. Assistant Professor, Department of Oral and Maxillofacial Pathology, Dental Research Center, School of Dentistry, Mashhad University of Medical Sciences, Mashhad, Iran.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Saeedeh khajehahmadi,
Assistant Professor, Department of Oral and Maxillofacial Pathology, Dental Research Center, School of Dentistry,
Mashhad University of Medical Sciences, Mashhad, Iran.
E-mail: khajehahmadis@mums.ac.ir

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