

Oral reconstruction with submental flap

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ABSTRACT

Background: Submental flap is a useful technique for reconstruction of medium to large oral cavity defects. Hair bearing nature of this flap in men makes it less appropriate. Therefore, deepithelialized variant is introduced to overcome the problem of hair with this flap. Recently, application of this flap has been introduced in maxillofacial trauma patients. **Materials and Methods:** Deepithelialized orthograde submental flap is used for the reconstruction of oral cavity mucosal defects. **Results:** Four cases including two trauma patients and two squamous cell carcinomas (SCCs) of oral cavity were treated using deepithelialized orthograde submental flap. There were no complications in all four patients and secondary epithelialization occurred in raw surface of the flap which was exposed to oral cavity. **Conclusion:** Deepithelialized orthograde submental flap is very effective in reconstruction of oral cavity in men. The problem of hair is readily solved using this technique without jeopardizing flap blood supply.

Keywords: Avascular necrosis, papillary squamous cell carcinoma, submental flap

INTRODUCTION

Reconstruction of oral mucosal defects in oral cavity after traumatic loss or pathologic resections has still remained a challenge. Depending on the size and location of mucosal defects; various methods such as direct suturing, secondary epithelialization, locoregional, and free flaps have been indicated.^[1,2] Submental flap has been introduced as a valuable technique for reconstruction of medium to large oral cavity defects.^[3] However, as a result of hair bearing nature of this flap in men, it would be less appropriate for intraoral reconstructions.^[4] To overcome this emerging problem deepithelialized variant has been introduced.^[5] This survey is conducted to investigate the capability of this flap to cover soft tissue losses in traumatic events and pathologic resections of soft and hard tissues in oral cavity.

MATERIALS AND METHODS

Surgical technique

In four patients, orthograde submental flap (Pattel modification) is used.^[6] Anterior belly of digastric muscle and mylohyoid muscle in pedicle half is included. In nonpedicle

side, the paddle is composed of platysma, subcutaneous fat tissue, and skin. To apply deepithelialization, the skin is sharply dissected just below the hair follicles after flap elevation [Figure 1]. The raw surface of subcutaneous fat is exposed to oral cavity. After 3 weeks secondary epithelialization was completed.

RESULTS

Demographic information of the patients is summarized in Table 1. Deepithelialized submental flap was used for the reconstruction of oral cavity for mucosal replacement [Figures 2-5]. Secondary epithelialization successfully occurred clinically 3 weeks after the operation [Figure 2c]. Etiology of mucosal defect was trauma ($n = 2$) and squamous cell carcinomas (SCC) ($n = 2$). In one patient, secondary operation was performed under local anesthesia to debulk the flap. Histological view 2 years after first operation is shown in Figure 6. In all patients deepithelialized submental flap successfully reconstructed the defect.

DISCUSSION

Submental flap was introduced by Martin in 1993. It can be used both as free or pedicle flap.^[7] Structural variants of this flap are

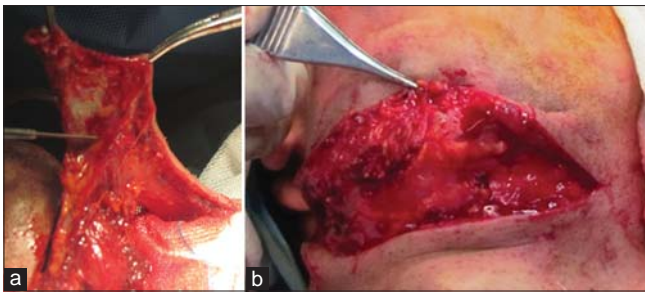


Figure 1: (a) Orthograde submental flap (Pattle modification) is deepithelialized after flap elevation, (b) Deepithelialization began before flap elevation in patients with tight submental skin (not presented in our series)

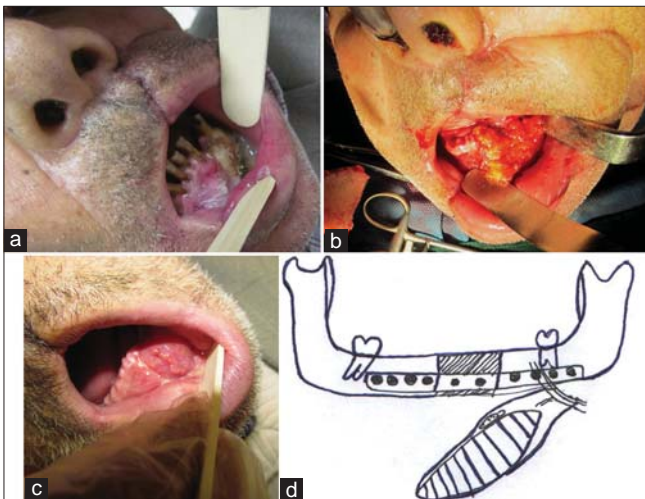


Figure 2: Avascular necrosis of the mandibular segment after trauma is managed with simultaneous bone grafting and deepithelialized submental flap (a) Before, (b) Immediately after, and (c) 3 weeks later, (d) Schematic picture of the flap

fasciocutaneous, myocutaneous, and osteomuscular.^[8] Based on blood perfusion, this flap is classified into orthograde and reverse flow.^[9] This flap has several advantages including ease of flap elevation, inconspicuous donor site scar, simplicity, large paddle size, wide arc of rotation, axial blood supply, proximity to the oral cavity, and providing different thicknesses.^[10,11] This flap has been successfully used to reconstruct oral cavity, facial skin, oropharynxes, and pharyngocutaneous fistula.^[12-14] Application of this flap in maxillofacial trauma patients has also been recently introduced. Hair bearing nature of this flap in some races with heavy beards makes it unpleasant for intraoral reconstructions. Despite the limitations of hair in oral cavity, this flap is widely used for reconstruction in males [Table 2].^[15-18,9] In some east Asian races, this flap is used readily without the problem of hair in men.^[19] The problem of hair have been managed using different methods including laser ablation, second operations, mechanical depilation, and electrolysis.^[20,21] Postoperative radiotherapy in malignant oral cavity lesions has inhibitory effect on hair growth of this flap.^[22] These procedures are time consuming and costly, specially in patients with malignant oral cavity lesions who require postoperative radiotherapy. Moreover, the interval during which the hair is growing on the flap in oral cavity is not pleasing for the patients. Eating is difficult and entrapment of the food and debris produce bad odor and sense.^[23] Secondary operations or laser ablation in pharynx and larynx is difficult specially if multiple sessions are required.^[24] Although deepithelialization of the submental flap was introduced in 1997,^[25] it was not widely applied for hair bearing submental flaps which may be due to the fear of surgeons to compromise blood supply of the paddle, specially the most distal parts.

Deepithelialization procedure could be performed through two different methods. First, deepithelialization is performed after flap elevation and hair bearing skin of the flap is discarded. This procedure is recommended for patients whose pinch test shows loose tissue and skin in submental area. The majority of the patients are at old ages therefore the elimination of this skin has good esthetic results.^[26] In patients who do not have excessive skin in submental area and the pinch test shows little skin laxity, this procedure can lead to wound breakdown and dehiscence in

Table 1: Information of the four male patients managed with deepithelialized orthograde submental flap for intraoral reconstruction

Case	Age (years)	Paddle size (cm)	Condition	Dental state	Simultaneous bone graft	Figure
1	78	5×12	Avascular necrosis	Dentated	+	Figure 2
2	27	5×12	Vestibuloplasty	Dentated	+	Figure 3
3	68	6×11	Floor of mouth and alveolar ridge SCC (T4)	Edentulous	-	Figure 4
4	58	6×12	Oropharynx retromolar and buccal SCC (T4)	Edentulous	-	Figure 5

SCC = Squamous cell carcinoma

Table 2: A summary of published data reporting the use of submental flaps for oral cavity/hypopharynx region after cancer ablation

Author	Published (year)	Age range	M/F	Total (patient)	Site	Country
Sebastian <i>et al.</i>	2008	30-78	19/11	30	Oral cavity	India
Amin <i>et al.</i>	2011	32-83	12/9	21	Oral cavity	Egypt
Jiang	2006	41-78	6/10	16	Hypopharynx	China
Chen	2009	28-57	19/14	33	Tongue	China
Chen	2008	28-90	24/14	38	Oral cavity	China

M = Male, F = Female



Figure 3: Vestibuloplasty and bone graft coverage in a maxillofacial trauma patient was performed using deepithelialized submental flap (a) Before, (b) Immediately after, and (c) 3 weeks later

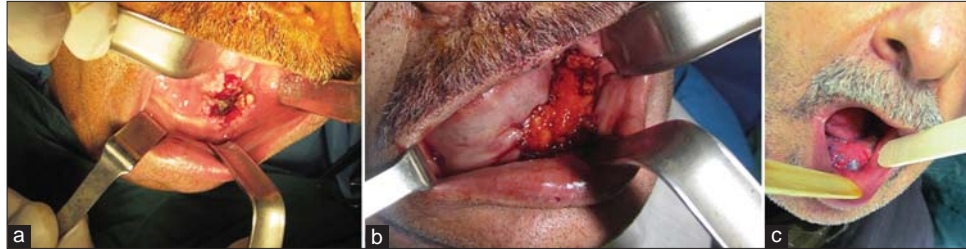


Figure 4: Alveolar ridge and floor of the mouth squamous cell carcinoma with bone invasion (T4) was reconstructed by deepithelialized submental flap (a) Before, (b) Immediately after, and (c) 3 weeks later



Figure 5: Huge papillary squamous cell carcinoma (SCC) of oral cavity and oropharynx reconstructed after resection with deepithelialized submental flap (a) Before, (b) Immediately after, and (c) 3 weeks later

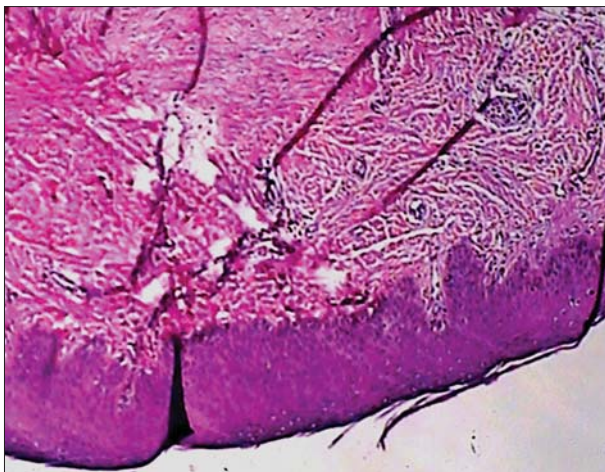


Figure 6: Histologic section of secondary epithelialization in deepithelialized submental flap. Fibrous changes in fat tissue that is covered by thin keratinized squamous epithelium (2 years after operation, H&E staining, original magnification $\times 40$)

submental area. In such situations deepithelialization is performed before flap elevation. In this procedure no skin is discarded, so

wound dehiscence is not a matter of concern.

CONCLUSION

We concluded that deepithelialization is a safe procedure for submental flap in men and it does not jeopardize the blood supply of the flap.

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