

# Platysma Flap Reconstruction in Oral Squamous Cell Carcinoma of Tongue: Cases Report

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**Abstract** - Cancer is the one of the most common causes of morbidity and mortality. In Myanmar, oral cancer stood 6<sup>th</sup> and 10<sup>th</sup> position in male and female respectively, contributing 3.5% of the whole - body cancers. The two main goals of cancer therapy are to achieve a disease - free physical state of health and acceptable quality of life. After surgical resection of tumours, oral cavity will result in severe functional impairment of the individual patient. Numerous options can be used for reconstruction of the head and neck, including primary closure, skin grafts, local flaps and free flaps. Platysma myocutaneous flap (PMF) is one of the cervical pedicle flaps and it was first used for the reconstruction of oral defects in 1978 by Futrell. PMF is readily available, easy to harvest, thin and pliable, promoting three-dimensional reconstruction, ease in closure the donor site primarily, minimal donor site morbidity and appropriate flap thickness for oral defects. So, PMF is the alternative use from free flap in intraoral defects.

**Keywords;** *platysma myocutaneous flap, reconstruction, oral cancer of tongue*

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## Introduction

Oral cancer is a multifactorial disease and the incidence of oral cancer in Myanmar is high because the etiology of

oral cancer such as tobacco and betel chewing are habits of Myanmar people. In Myanmar, among oral cancer patients, 68.7% are tobacco chewers or smokers and 11.7% are betel and tobacco chewers (Oo *et al.*, 2010). In UK, head and neck cancer represents 5 to 10 % of all tumours making it the 8<sup>th</sup> most common cancer in male and 16<sup>th</sup> most frequent in female (Watkinson *et al.*, 2012). In Myanmar, oral cancer represents 6<sup>th</sup> position in male and 10<sup>th</sup> in female respectively.

The two main goals of cancer therapy are to achieve a disease free physical state of health and an acceptable quality of life. Treatment modalities are surgery, radiotherapy, chemotherapy and other such as lasers, immunotherapy and gene therapy.

Aim of cancer surgery is to resect the tumour and leave tumour free surgical border (Pagani *et al.*, 2007). After surgical resection of tumours of oral cavity will result in severe functional impairment of the individual patient. Head and neck surgery often have dramatic functional effects on speech, respiration, swallowing and alimentation and the surgical site is often highly visible, leading to unique challenges for the reconstruction. Therefore, adequate functional reconstruction of both hard and soft tissue defects plays a key role in the surgical treatment of head and neck tumours (Eckardt, 2013). The patient's quality of life is improved by reconstruction of anatomic defects following cancer surgery.

Various reconstructive techniques are available, including primary closure, skin

grafts, pedicle flaps and free flaps but all of these techniques have their limitation (Li *et al.*, 2013). Currently, the most commonly used reconstruction technique is microvascular free flap. However, free flaps are not suitable for all patients undergoing a surgical operation. Microvascular free flaps require lengthy surgery, experienced surgeons in microsurgery, microsurgery equipment and a second donor site (Rufat *et al.*, 2014).

As one of the cervical pedicle flaps, the platysma myocutaneous flap was firstly used for the reconstruction of oral defects in 1978 (Peng *et al.*, 2005). Platysma myocutaneous flap (PMF) is a satisfactory reconstructive option for small and medium sized defects in the oral cavity. The PMF was introduced for intraoral reconstruction by Futrell in 1978. PMF is readily available, easy to harvest, thin and pliable, promoting three-dimensional reconstruction, ease in closing the donor site primarily, minimal donor site morbidity and appropriate flap thickness for oral defects (Tosco *et al.*, 2012).

Three different variations of the myocutaneous island platysma flap are available based on the dominant blood supply. Inferiorly base flap with arterial supply from transverse cervical artery, which finds no application in oral reconstruction. Posteriorly based flap with arterial supply from the occipital and posterior auricular arteries and venous supply is external jugular vein. In this version of the platysma flap, it is not possible to maintain the cervical branch of the facial nerve. Wide exposure of muscle is important to access and measure the arc of rotation into the surgical defect.

Superiorly based flap with arterial blood supply from the submental artery which is the largest branch of the facial artery. Superiorly based flap is suitable for reconstruction of the anterior and lateral

floor of mouth, tongue, buccal mucosa, retromolar trigone and lower alveolar ridge (Lazaridis *et al.*, 2007).

Hence, the blood supply has been called 'multi-axial' and rapid shift of route of perfusion after skin incision to compensate for interrupted routes has been invoked (Koch, 2002). When the facial artery is ligated, there is retrograde filling of the platysma system through both ipsilateral internal and external carotid contributions as well as contra-lateral external carotid contributions through the labial arch (Li *et al.*, 2013).

According to literature, skin paddle of maximal size is approximately 7 cm x 12 cm (Handa *et al.*, 1989). It is a horizontal ellipse which needs 180-270 degrees of rotation for intraoral reconstruction. In the version, a vertical ellipse provides more versatility for rotation with less tension and kinking. This paddle can be used anteriorly or posteriorly with 90-180 degrees of rotation (Saito *et al.*, 1998). For the vertical flaps, the maximum size is 12 cm x 5.5 cm and minimum is 7 cm x 5 cm (Li *et al.*, 2013).

The purpose of this report is to present platysma myocutaneous flap is an attractive reconstructive option and alternative use from free flap in intraoral soft tissue defect.

## Cases and Methods

Ten patients with oral squamous cell carcinoma (OSCC) of tongue were treated with platysma myocutaneous flap reconstruction after excision of primary tumour and neck dissection at the Department of Oral and Maxillofacial Surgery, University of Dental Medicine, Yangon. The patients had involved five of men and five of women with the age range of 39 to 60 years. Staging of the cases were six of T<sub>2</sub>N<sub>0</sub>M<sub>x</sub> and four of T<sub>3</sub>N<sub>0</sub>M<sub>x</sub>.

## Surgical Technique

The size of the vertical platysma myocutaneous flap was outlined and raised in the ipsilateral neck of the defect to be repaired and incision line was connected with that of the neck dissection. Supraomohyoid neck dissection was taken in all cases. The flap pedicle was usually located 1.5 cm to 2 cm below the lower border of the mandible. The plane of elevation should include the sternocleidomastoid fascia as well as the external jugular vein to provide adequate venous drainage. After excision of tumour and neck dissection, PMF was rotated superiorly and sutured into position through the tunnel under the mandible, which should be sufficiently wide. The epidermis was removed from the part of the flap located into the tunnel. Primary defect of the tongue was reconstructed with PMF. The neck incision was closed primarily.

Table 1. Characteristics of patients, site and staging of tumours and use of flap size

Case	Age, Sex Staging	Site	Size of Flap (cm x cm)
1	39 yrs, F T <sub>2</sub> N <sub>0</sub> M <sub>0</sub>	Tongue (Rt)	5x10
2	50 yrs, M T <sub>2</sub> N <sub>0</sub> M <sub>0</sub>	Tip of Ventral Tongue	5x11
3	51 yrs, M T <sub>2</sub> N <sub>0</sub> M <sub>0</sub>	Tongue (Lt)	5x9
4	41 yrs, F T <sub>3</sub> N <sub>0</sub> M <sub>0</sub>	Tongue (Lt)	5x11
5	51 yrs, M T <sub>2</sub> N <sub>0</sub> M <sub>0</sub>	Tongue (Rt)	5x9
6	42 yrs, M T <sub>3</sub> N <sub>0</sub> M <sub>0</sub>	Tongue (Lt)	5x11
7	55 yrs, F T <sub>2</sub> N <sub>0</sub> M <sub>0</sub>	Tongue (Rt)	5x11
8	52 yrs, F T <sub>3</sub> N <sub>0</sub> M <sub>0</sub>	Tongue (Lt)	5x11
9	57 yrs, F T <sub>3</sub> N <sub>0</sub> M <sub>0</sub>	Tongue (Lt)	5x10
10	52 yrs, M T <sub>2</sub> N <sub>0</sub> M <sub>0</sub>	Tongue (Lt)	5x12

Table 2. Outcomes related to the flap and others complications

Outcomes related to the flap				
Full Viability	Partial Necrosis	Total Necrosis	Fistula	Hypertrophic Scar at Donor Site
7	3	-	-	1

## Results

Intraorally the skin paddle was healed without any problems and allowed for adequate tongue mobility. The dimensions of skin flap were used in range from 5 x 9 cm in minimum and 5 x 12 cm in maximum (Table 1). In all patients the reconstruction was performed as a single stage procedure together with tumour resection (Figure 2) and supraomohyoid neck dissection (Figure 3). The donor site was closed primarily and without complications and neck movement but one of the cases had hypertrophic scar. Three cases had partial flap necrosis but managed by local measures such as surgical wound debridement of necrotic tissue. No complications were found as fistula, wound infection and dehiscence and donor sites morbidity (Table 2).



Figure 1. Oral SCC tongue at right lateral border of tongue



Figure 2. Wide excision of tongue

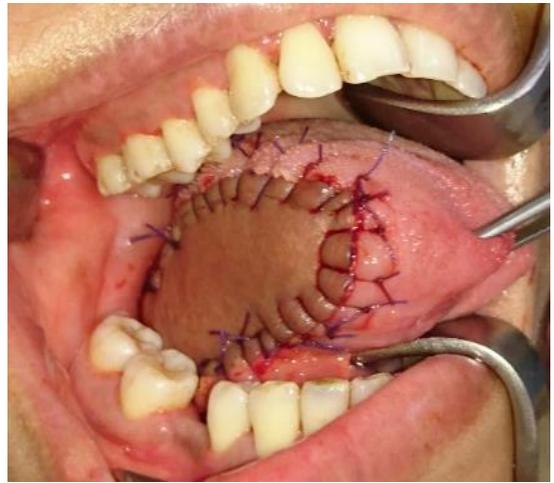


Figure 5. Harvesting with platysma flap



Figure 3. Supraomohyoid neck dissection



Figure 6. Post-operative 1<sup>st</sup> month



Figure 4. Raising of Platysma Flap



Figure 7. Acceptable donor site healing

## Discussion

The goal of reconstruction is restoration of form and function to allow a good quality of life. Malthe and Nahai described "Reconstructive Ladder" in 1982 ranging from primary closures to skin grafts, local flaps, distal flaps, and free flaps.

Reconstruction of tongue is very important because of its pivotal role in speech, swallowing and airway protection. The ideal tissue selected for reconstruction should be versatile in design, adequate in tissue stock, provide consistent texture with minimal donor site morbidity. Therefore, reconstructive options should attempt to maintain mobility or to provide bulk and should be determined based on size of the defect, tissue loss, donor site availability and the patient's ability to withstand prolonged general anesthesia.

Since 1983, the free radial forearm flap (FRFF) has been considered the first choice for the restoration of tongue defect. Recently, the anterolateral thigh flap has challenged the superiority of FRFF because it does not necessitate a skin graft and involve the sacrifice of an artery or possible damage to the tendons of the hand. According to literature, in case of contraindications for microsurgery, pedicle flaps such as pectoralis major myocutaneous flap, facial artery musculomucosal flap or submental artery island flap might be considered as good reconstructive options.

In all cases, superiorly based PMF had been used in intraoral defects reconstruction with preservation of facial artery. Uehara *et al.*, (2001) described the reason for flap success, in cases which the facial artery was ligated, is the retrograde flow from the distal submental artery anastomoses to either the lingual artery or the contralateral facial artery.

Because the blood supply to the skin island does not strictly depend on musculocutaneous perforating vessels, this flap is mostly fasciocutaneous with little muscle. Furthermore, it is easy to transfer because of its adequate arc of rotation 90 to 180 degree. This flap provides good residual mobility, swallowing and speech for tongue reconstruction. Pliability of the flap allows later shaping so as to allow dental prosthetic rehabilitation. Therefore, rough tissue handling, tension, pedicle kinking or compression, or minimization of the pedicled fasciocutaneous paddle should be avoided, which are compromised the tenous vascular perforators and result in partial or total flap loss.

## Conclusion

The ideal tongue reconstruction would provide identical size, shape, sensation, taste, mobility and coordinated articulation and swallowing function in a single procedure. As the result of this study, PMF was effective and alternative use for reconstruction of medium size defect oral squamous cell carcinoma of tongue.

## COI

The authors declare there is no potential conflict of interest.

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