

# Original Article

## Platysma Myocutaneous Flap in Head and Neck

### Reconstruction

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### Abstract

**Background:** Platysma myocutaneous flap is one of the methods currently available for reconstruction of small and moderate size defects after head neck cancer resection. **Objectives:** To investigate the long term results of head and neck reconstruction using platysma myocutaneous flap. **Patients and methods:** 23 consecutive patients with malignant head and neck neoplasms who underwent radical surgical resections and immediate reconstructions using a platysma myocutaneous flap were reviewed. The flaps were used to repair defects of the following sites: oral cavity in 15 cases and larynx, lip commissure, parotid gland and oropharynx in 2 cases each. **Results:** In fourteen cases (60.8%) there were no flap-related complications. Flap necrosis occurred in 9 (39.1%) patients [4 (17.3%) partial flap necrosis]. There was no correlation of complications with previous irradiation or facial artery ligation. **Conclusion:** Platysma myocutaneous flap can be considered among the alternatives for small and moderate size reconstructions after oral cavity, oropharynx and larynx cancer resections, even in patients previously submitted to radiotherapy.

**Key words:** Platysma flap. Myocutaneous flap. Reconstructive surgery. Head and neck.

### Introduction

Several options of myocutaneous and microvascular free flaps are currently used in most head and neck surgery services worldwide.<sup>1,2,17,24</sup> These flaps are versatile and reliable and provide a single stage reconstructive technique. However, the bulky and thickness of both muscle and skin, such as in pectoralis major or trapezius myocutaneous flaps, can limit their use, particularly in defects that are not massive specially in cases when the mandible have not been resected. The other alternatives can also be unsatisfactory: primary closure can create functional deficits due to tongue mobility impairment, and free flaps can increase the length and costs of the surgical procedure

Futrell et. al (1978) first reported the application of platysma myocutaneous island flap in intraoral reconstruction. Since then the thickness and flexibility

of the flap is regarded as ideal for reconstruction in several sites such as the oral cavity (specially buccal mucosa and lip), and external skin coverage in the neck and lower face.<sup>3,4,16</sup> The main objective of this study was to analyze a single institution experience with platysma myocutaneous flap as an alternative to local flaps, other myocutaneous flaps and microvascular free flaps for reconstruction after resection of head and neck cancer resulting in defects up to 10cm by 6cm.

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## Patients and Methods

We reviewed the medical cohort of 23 patients with malignant neoplasm of the head and neck who underwent surgical resection followed by immediate reconstruction with a platysma myocutaneous flap from 1988 to 2000. In the same period about 6000 patients underwent oncologic surgical procedures, and in 360 a myocutaneous flap was used for immediate reconstruction. Table 1 displays the main characteristics of the patients, the treatment and complications. From the 23 patients, 18 (78%) were men and 5 (22%) women, ranging in age from 37 to 72 years (median, 57). Primary tumor sites were buccal mucosa (6 cases), lip commissure (2 cases), larynx (2 cases), oral tongue and floor of the mouth (4 cases), lower gum (3 cases), retromolar area (2 cases), parotid gland (2 cases) and tonsil (2 cases). There were 19 squamous cell carcinomas, 2 sarcomas, one mucoepidermoid carcinoma and one basal cell carcinoma. Three patients had been previously treated by surgery and/or irradiation and had recurrent loco-regional disease. In the remaining cases the TNM stage was T1, 1; T2, 5; T3, 9; T4, 5; Tx, 3; N0, 17; N1, 4; N2a, 1; Nx, 1 case.

The surgical procedures for primary tumor resection were buccal mucosa resection (6 cases), lip resection (2 cases), vertical partial laryngectomy (2 cases), pelveglossectomy (4 cases), composite operation (5 cases), tonsil resection (2 cases), and extended parotidectomy (2 cases). In nineteen patients a neck dissection was performed: supraomohyoid dissection (9 cases), radical classical neck dissection (7 cases) and supraomohyoid bilateral dissection (3 cases). A platysma myocutaneous flap was used to cover a mucosal defect in 18 cases, a

skin defect in 2 cases, and a skin and mucosal defect in 3 cases.

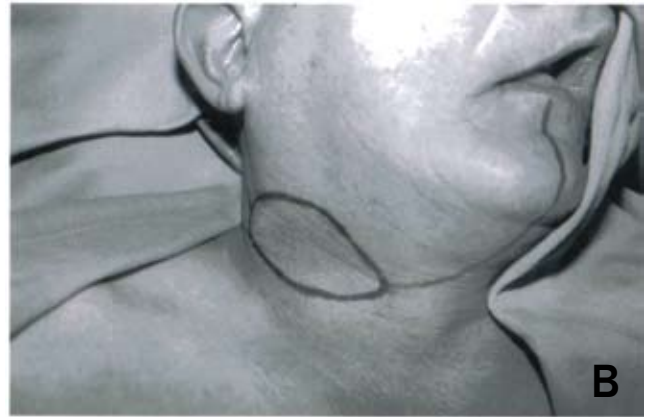
## Surgical Technique

A skin ellipse usually measuring up to 6 by 10 cm is outlined on the neck skin ipsilaterally to the tumor with its lower limit close to the medial part of the clavicle (Figure 1). Location of the skin island must be low enough to facilitate the rotation of the flap up to the oral cavity or lower face, if necessary. Vertical incisions are made from the edges of the skin ellipse to the chin medially and mastoid laterally, resulting in an apron configuration. The superior limit of the incision around the skin ellipse is made through the skin only. By sharp dissection in a supraplatysmal layer the cervical skin is elevated superiorly leaving the myocutaneous flap. Small amount of subcutaneous fat is usually left attached to the platysma. The lower incision is completed through skin, subcutaneous tissue, and platysma. The platysma and skin island are then raised superiorly in a subplatysmal layer up to the inferior margin of the mandible<sup>6,24,25</sup> (Figure 2). After the flap is done, a selective or a comprehensive neck dissection is carried out as necessary. Whenever possible, the facial artery and facial veins are preserved during the submandibular triangle dissection.<sup>4</sup>

Resection of the tumor is then performed along with the neck dissection. After the main resection is finished, the platysma and the skin island are rotated according to the location of the surgical defect. The platysma myocutaneous flap is sutured with a single layer of absorbable sutures (Figure 3) and the neck incision is

**Table 1** - Reported series with 10 or more platysma myocutaneous flap (modified from Ruark et al)<sup>23</sup>

Author	Tumor site	# Cases	Facial artery ligation	Complications n (%)	Flap necrosis n (%)
Futrell et al <sup>11</sup>	Intraoral	14	Unclear	2 (14)	2 (7)
Cannon et al <sup>5</sup>	Oral cavity	22	Unclear	12 (55)	2 (9)
Coleman et al <sup>6</sup>	Face, oral cavity, oropharynx, neck	24	Seldom	10 (42)	7 (29)
Manni et al <sup>14</sup>	Oral cavity	10	No	4 (50)	3 (30)
Conley et al <sup>8</sup>	Pharynx, larynx	14	Frequently	7 (50)	4 (28)
McGuirt et al <sup>15</sup>	Oral cavity, pharynx	20	Yes	5 (25)	1 (5)
Ruark et al <sup>23</sup>	Oral cavity, pharynx	41	Yes	8 (19)	3 (7)
Papadopoulos et al <sup>20</sup>	Face, oral cavity	12	Frequently	2 (16)	2 (16)
Esclamado et al <sup>9</sup>	Oral cavity, oropharynx	12	Seldom	3 (25)	1 (8)
Vriens et al <sup>26</sup>	Oral cavity	17	Frequently	14 (82)	12 (70)
Özcelik et al <sup>19</sup>	Oral cavity, oropharynx	20	Seldom	3 (15)	2 (10)
Verschuur et al <sup>25</sup>	Oral cavity, oropharynx	44	Unclear	18 (45)	9 (50)
Alvarez et al <sup>1</sup>	Oropharynx	36	No	14 (38)	3 (8.3)
Present series	Face, oral cavity, larynx, neck	23	Frequently	10 (32)	7 (29)



**Figure 1** - A skin ellipse on the neck skin ipsilateral the tumor with its lower limit closes to the medial part of the clavicle. A) Patient 1; B) Patient 2.

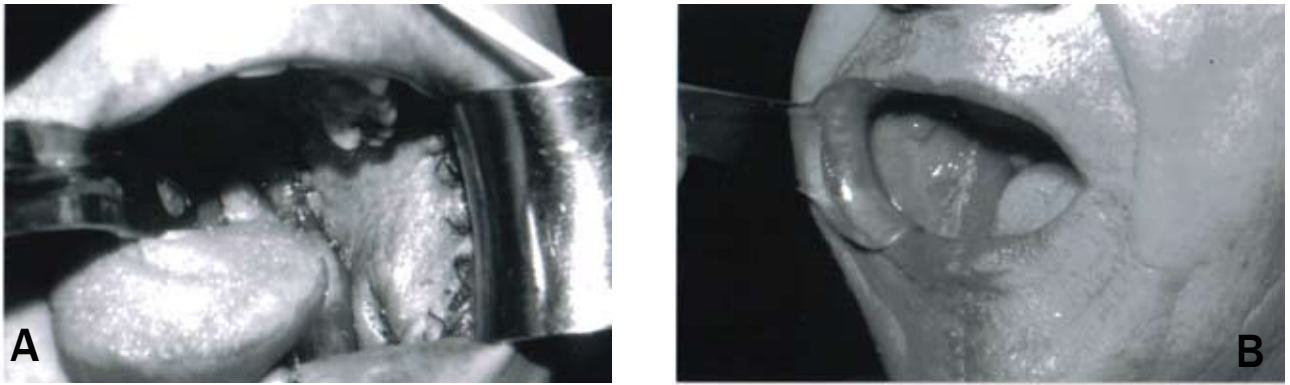


**Figure 2** - The platysma and skin island are then raised superiorly in a subplatysmal layer up. A) Patient 1. B) Patient 2.

closed primarily. Suction drains are used.

Statistical Analysis. Risk factors of complications in the patients studied were compared by means of the Fisher's test. The comparison of the length of

hospitalization was done by T test. A p-value  $\leq 0.05$  was considered significant.



**Figure 3** - After resection is completed the platysma and the skin island are rotated according to the location of the surgical defect. A) Patient 1. B) Patient 2.

## Results

All patients were evaluated for postoperative complications, and follow-up ranged from 7 to 86 months. In fourteen cases (60.8%) there were no flap-related complications. Partial flap necrosis occurred in 4 patients (17.3%), total flap necrosis in 5 patients (21.7%), minor dehiscence of the suture line in 2 patients (8.6%) and infection plus fistula in 2 patients (8.6%). All complications were treated conservatively without further surgical intervention. Partial flap necrosis occurred in 2 of the 3 patients who previously received irradiation, and in 2 of the 13 nonirradiated patients ( $p=0.156$ ). Two of the 19 patients submitted to neck dissection had total flap necrosis, while in only 1 of the 4 patients without neck dissection this was the case ( $p=0.436$ ). The time of postoperative hospitalization varied from 3 to 22 days (mean, 8.1 days). In patients with complications the variation was from 6 to 22 days (mean, 12 days); in patients without complications, it was from 3 to 15 days (mean, 6.3 days) ( $p=0.02$ ). The position of the flap did not add significantly to the scar and there was no need for skin grafts or flap rotation to close the neck incision.

## Discussion

Platysma myocutaneous flap has been used in the reconstruction of small to the moderate non-bulky oral and oropharyngeal defects, and in external skin coverage in the neck and lower face.<sup>1,2,7,12,23,26</sup> Another indication for platysma myocutaneous flap is the reconstruction after extended vertical partial laryngectomy.<sup>8</sup> One of the advantages of the flap, as described in 1978 by Futrell et al.,<sup>11</sup> is that the platysma flap thickness approximates the one of normal oral mucosa. Its use in the oral cavity

is associated with minimal functional impairment of mastication, swallowing and speech functions as well as denture fitting. It is usually easy and quick to perform because it is at the primary field of dissection. Furthermore, the donor site can be closed primarily with no significant cosmetic and functional sequelae.<sup>2,7,12,19,23,26</sup> This flap was most used in the 1980's and early 1990's. In recent years there was a trend of indicating microvascular free flaps in our institution. There are many options for reconstruction of small size defects (tongue flaps; nasolabial flaps; infrahyoid myocutaneous flaps and microvascular flaps). This series of 23 cases reinforces the indication and limits of this technique, that is regarded as a useful option avoiding the use of more costly procedures such as microvascular free flaps in a selected group of patients.

Preoperative irradiation, ligation of the facial artery, prior radical neck dissection, and ipsilateral facial nerve paralysis are considered contraindications to the use of platysma myocutaneous flap.<sup>8,5,11,25</sup> Previous neck irradiation is considered a relative contraindication to the use of this flap due to skin changes and postradiation arteritis.<sup>5</sup> In our series, as in other previous reports, preoperative irradiation was not associated with increased risk of flap necrosis,<sup>5,23</sup> although the small sample size limits our ability to make a general statement about this. Considering our results and the literature, previous neck dissection is the only absolute contraindication to platysma myocutaneous flap.

Conley et al.<sup>8</sup> stated that if the vascular supply provided by the facial artery is violated, the platysma flap is at significant risk, and the incidence of flap necrosis can be up to 40%. This idea was supported by other reports.<sup>6,7,10</sup> It is necessary to emphasize that other transverse upper neck incision would divide the muscular pedicle and

its blood supply<sup>15</sup>. However anatomic studies<sup>1,12,13,23,24</sup> showed that an intact facial artery is not crucial to the survival of platysma myocutaneous flap. This conclusion was supported by clinical experience reported by McGuirt et al.,<sup>15</sup> and Ruark et al.<sup>23</sup>

The complication rate of the flap in our series (32%) is acceptable, and is in accordance to those reported in some previous series.<sup>5,6,8,14,18,25,26</sup> Table 2, modified from Ruark et al.,<sup>23</sup> summarize reported series of platysma myocutaneous flaps.

Platysma myocutaneous flap should be considered as an alternative for reconstruction of small and moderate selected defects (up to 10cm by 6cm) of the lower face, neck, oral cavity, oropharynx and larynx, when it is not necessary to have a bulky flap to restore volume or three-dimensional defects. A previous ipsilateral transverse upper neck incision or previous neck dissection are the absolute contraindications to this flap, while prior irradiation and ligation of the facial artery should be regarded as relative contraindications.

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