

Clinical Paper
Reconstructive surgery

Cheek reconstruction following facial malignant melanoma surgery with the platysma myocutaneous flap

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Abstract. The aim of this study was to evaluate the results of large cheek skin defect reconstruction using a superiorly based platysma myocutaneous flap accompanied by facial artery and vein preservation, following cutaneous head and neck melanoma surgery. This study offers new insight into a procedure that is a viable, but infrequently used reconstruction option. The authors report the cases of 13 consecutive patients with cheek skin defects following melanoma surgery who underwent reconstruction with a superiorly based platysma myocutaneous flap. The procedures were performed at a tertiary clinical centre and a national melanoma surgery referral centre between 2001 and 2008. According to the disease stage, eight patients underwent sentinel lymph node biopsy and five underwent comprehensive neck dissections. All of the patients were monitored for any complications related to the donor and recipient sites. Minor venous congestion of the flap was noted in two patients, with minor marginal skin necrosis in one patient. None of the patients had donor site complications. The superiorly based platysma flap proved to be a safe and reliable option for large cheek defect reconstruction, especially considering that it is a single-stage reconstruction procedure ensuring excellent colour-matching and low donor site morbidity.

Key words: head and neck oncology; midfacial third defects; facial reconstruction; platysma myocutaneous flap.

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Head and neck melanomas constitute 12–21% of all melanomas diagnosed annually, with the face most frequently affected (48.1%).¹ Depending on the disease stage, a wide surgical excision is necessary, with accompanying sentinel node biopsy and elective and curative neck dissections

when warranted. The reconstruction of large head and neck skin defects after melanoma surgery is challenging, and numerous techniques have been described.² It is crucial that oncological principles supersede reconstructive concerns, but a pleasing aesthetic appearance

is an important factor to consider. Aesthetic facial skin subdivisions are based on skin quality, subcutaneous fatty tissue, mobility, and three-dimensional appearance. The cheek is a large facial unit, marked by several junction lines: medially at the nasofacial junction, nasolabial

fold, and labiomandibular crease, laterally at the pre-auricular crease, superiorly at the orbital rim and superior zygomatic arch, and inferiorly at the border of the mandible.²

In this article, the authors present their experience of large cheek defect reconstruction with a superiorly based platysma flap. Barron and Emmett wrote an article on the use of subcutaneous island flaps in 1965, recommending these for the reconstruction of various facial areas.³ Based on that paper, Tessier et al. began using island flaps taken from supra- and infraclavicular areas for intraoral lining. For some time, this was known in the literature as the 'B-T' flap.⁴ An article by Futrell et al. published in 1978 recognized the results and described the use of platysma flaps in oral defect reconstruction.⁵ This article is the landmark for all later work on that particular reconstructive method.

The platysma flap can be superiorly or posteriorly based, depending on the dominant blood supply. Superiorly based flaps have an excellent arterial blood supply from the submental or the facial artery branches, and more inferiorly, from the superior thyroid artery. Venous drainage of the flap is provided through small anterior communicating veins that drain into the superior thyroid vein, anterior jugular vein, or facial vein.^{6,7} Inferiorly based flaps, on the other hand, have excellent venous drainage through the external jugular vein, but lack an arterial blood supply, which comes from the occipital artery. It was thought until recently that fasciocutaneous arterial perforators from the muscle itself supply the overlying skin. Based on recent findings, arterial branches form plexuses in the deeper adipofascial layers, penetrate the platysma muscle, and supply blood to the subdermal plexus. According to this new anatomical data, platysma flaps should be considered fasciocutaneous rather than myocutaneous flaps.⁸ Taking all this into consideration, a more appropriate term, in our view, would be fasciomyocutaneous flap.

Earlier described uses for a platysma flap have included the reconstruction of oral, hypopharyngeal, and laryngeal defects and large skin defects including the lower and middle facial third. It is possible to reconstruct skin defects up to 70 cm² in size.⁶⁻⁹

Patients and methods

This consecutive case series included 13 patients and was approved by the University Hospital Bioethics Board (Zagreb); the study complied with the Declaration

of Helsinki of 1983 as amended most recently at the 64th World Medical Assembly, Fortaleza, Brazil, in October 2013. All of the patients had cutaneous head and neck melanoma and were treated surgically between 1 January 2001 and 31 December 2008 at our national referral centre for head and neck melanoma. Patients were eligible for inclusion if they had a histopathologically confirmed cutaneous melanoma on the head or neck, underwent primary surgical treatment in our institution, and had midfacial third skin defects with subsequent reconstruction using a superiorly based platysma myocutaneous flap. They were treated postoperatively according to standard clinical practices, as approved by a multidisciplinary oncology team. Clinical staging was carried out according to the current National Comprehensive Cancer Network/American Joint Committee on Cancer (NCCN/AJCC) staging system. The patients were included consecutively; demographic information, prior history of skin malignancy, location, lesion and defect size, and occurrence of regional metastatic disease were noted. All of the patients signed informed consent forms after evaluation by a multidisciplinary oncology team.

We present a specific experience of the use of the platysma flap in reconstructing defects following facial melanoma surgery, performed in combination with sentinel lymph node biopsy and neck dissection (Fig. 1).

When performing surgery, the patient is positioned with the neck hyper-extended for better platysma muscle visualization (Fig. 2). The incision length and shape depend on the defect parameters, but an elliptical shape is preferred, due to easier donor site reconstruction. For midfacial third defect reconstruction, the skin paddle should be placed as inferiorly as possible, preferably at the level of the clavicle, so



Fig. 1. Preoperative resection margin outline, intraoperative head position, and incision plan for malignant melanoma surgery when using a platysma myocutaneous flap.

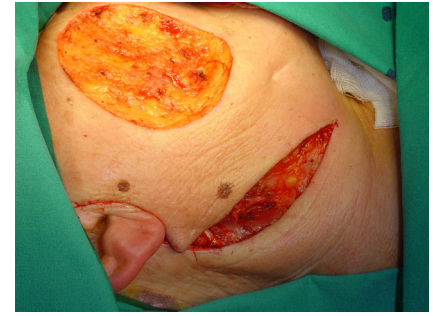


Fig. 2. Platysma flap tunnelling and dissection after assessing the defect size.

that an adequate arc of rotation is achieved. If the platysma flap is combined with a neck dissection, the inferior incision is performed first, incorporating it into the neck dissection incision (Fig. 2). The platysma muscle and the underlying fascia is transected vertically at least 1 cm inferiorly to the edge of the skin paddle. Then, a subplatysmal dissection plane is developed up to the inferior border of the mandible. During the neck dissection of levels I and II, special care is taken to preserve the facial artery and vein. Following the neck dissection, a superior skin incision is performed, and a superficial dissection plane is developed up to the inferior border of the mandible. Once both planes of dissection are fully developed, the platysma can be transected vertically, anteriorly, and posteriorly, in order to fully mobilize the flap. A pedicle with a width of at least 3–4 cm should be preserved so that an adequate number of arterial and venous perforators is provided. If a platysma flap is used without an accompanying neck dissection, it is advisable to perform the dissection planes in reverse order. The reason for that modification is an easier approach to the superior dissection plane when the platysma is firmly attached to the underlying tissue.

An adequate skin tunnel width and flap rotation direction should always be kept in mind, because a tight fit and inappropriate rotation may compromise the blood supply. The flap is then pulled through the tunnel to the centre of the primary defect, where it is anchored with subcutaneous resorbable sutures in order to avoid excessive skin tension. The skin defect is then closed with non-resorbable sutures (Fig. 3). Drainage is usually applied at the donor site (usually one suction drain), and the donor site is closed in two layers. Tension is minimized by turning the patient's head towards the donor side. Wound care is performed on a daily basis until suture removal, usually on the seventh postoperative day. Follow-up is

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