

Case report

Trapezius perforator flap for reconstruction of a posterior cervical defect



Ricardo Nascimento*, Joana Costa, Ricardo Horta, Álvaro Silva

Department of Plastic, Reconstructive and Aesthetic Surgery and Burn Unit, Centro Hospitalar de São João, Porto, Portugal

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ABSTRACT

The use of free flaps is considered the “gold standard” for reconstruction of head and neck defects. Locoregional flaps allows a better aesthetic result compared to free flaps, whenever there's an external skin defect. However the use of free flaps is not always adequate in the presence of preoperative comorbidities or previous surgeries. Since the description of the trapezius myocutaneous flap in the 1980's, many authors have published the results of the applicability of this flap in head and neck salvage reconstructive surgery. Nonetheless, the concern with trapezius muscle function remains an important issue. The onset of free-style dissection perforator flaps has attenuated this problem. The authors present a case of a 68 year old man with a posterior cervical wound after a cervical spine trauma, who underwent multiple spine surgeries, successfully treated with an island muscle-sparing trapezius flap. All the details of the dissection technique are outlined. The authors found the trapezius perforator flap to be a reliable and accessible to raise flap with a negligible donor-site morbidity. This flap can be used for occiput, nuchal and spinal areas injuries without the local morbidity related to other flap options.

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1. Introduction

The use of free flaps is considered the “gold standard” for reconstruction of head and neck defects. However achieving a pleasant functional and aesthetic result remains a challenge. Locoregional flaps allows a better aesthetic result compared to free flaps, whenever there's an external skin defect, due to its resemblance in skin colour, texture and thickness. Furthermore, the use of free flaps is not always adequate in the presence of preoperative comorbidities or previous surgeries as it increases the possibility of postoperative complications. Thus, an ideal flap should grant a single stage reconstruction, ease of use, short surgical time, low postoperative complications and good functional outcomes.^{1,2}

The trapezius myocutaneous flap was first described in 1984.³ Since then, many authors have published the results of the applicability of this flap in head and neck salvage reconstructive surgery. However its underuse aside from these cases may be

the result of the unfamiliarity with the proper vascular anatomy and concern with trapezius muscle function impairment.

The onset of free-style dissection perforator flaps has warranted the possibility of raising proper perforator flaps without compromising the trapezius muscle role.⁴

The main vascular supply of the trapezius muscle arises from the transverse cervical artery (TCA), with minor contributions from intercostal, circumflex scapular and occipital perforators. The dorsal scapular artery (DSA) is the deep branch of the TCA; it courses beneath the levator scapulae and rhomboid minor muscles before a branch perforates the fascia between the rhomboid minor and major to run along the medial border of the scapula (superficial dorsal scapular artery) before emerging under the trapezius muscle. This superficial branch runs on the deep belly of the trapezius, persistently sending out one or two cutaneous perforators that pass through the lower trapezius, one to two cm medial to its lateral margin, to supply the overlying skin.⁵ The DSA can also be an independent branch from the third (or less commonly second) part of the subclavian artery. However, this different branching arrangement does not influence the surgical procedure when raising a trapezius perforator flap. The most relevant aspect is the way these vessels descend the back before perforating the trapezius to pierce the subcutaneous tissue.

* Corresponding author at: Rua José Jesus Carneiro, 90, 4435-046 Rio Tinto (Porto), Portugal.

E-mail address: ricardonasc@hotmail.com (R. Nascimento).

The authors performed a posterior cervical reconstruction using the dorsal scapular artery as a pedicle for the trapezius muscle-sparing flap.

2. Case report

A 68-year-old man with a past medical history of obesity, ankylosing spondylitis and hypertension was admitted to the emergency room with a cervical spine trauma after falling from an armchair. After a complete physical examination, the patient was graded as an ASIA-A (American Spinal Injury Association) – complete lack of motor and sensory function below the level of injury (including the anal area).⁶

Cervical spine computerized tomography (CT) revealed a C7 vertebra body transverse fracture. The patient underwent C7 corpectomy and C6–D1 anterior plaque fixation. Three weeks later, due to local infection and medullar compression he underwent C7 decompression laminectomy and posterior fixation of C2–C4 and C7–D2.

Two weeks later the patient was reoperated due to wound breakdown with purulent and foetid exudate. Wound debridement and removal of fixation material was performed. Vacuum assisted closure was attempted but failed due to the massive size of the defect (Fig. 1).

The authors proposed the use of an island muscle-sparing trapezius flap to reconstruct the defect, which the patient consented.

3. Dissection technique

Before the beginning of the surgery, a Doppler ultrasound was performed to identify the transverse and dorsal scapular arteries. The skin island of 11 cm × 6 cm was designed eccentrically in relation to the vessel (Fig. 2).



Fig. 1. Posterior cervical defect after wound debridement and removal of fixation material. C7 spinous apophysis was visible.

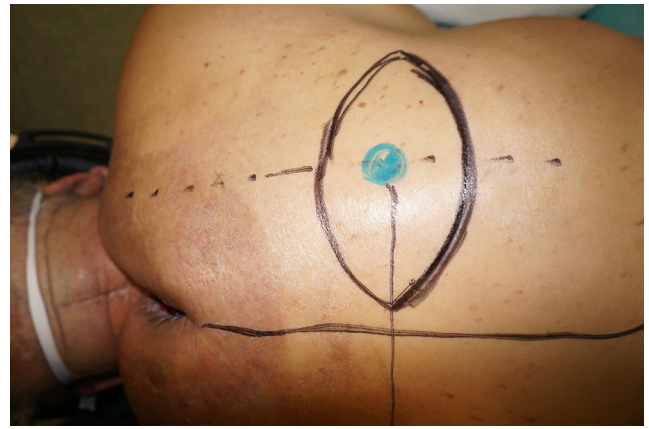


Fig. 2. Preoperative markings. The blue dot was assumed to be a scapular artery perforator identified with Doppler ultrasound. However during surgery that perforator was found more medially. The skin island of 11 cm × 6 cm was designed eccentrically in relation to the vessel. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)



Fig. 3. Flap dissection proceed from lateral to medial, until identification of the trapezius muscle lateral border.

Under general anaesthesia, the patient was placed in the prone position. The wound was cleaned and debrided.

An incision was made along the lateral margin of the flap, the dissection continued from lateral to medial, until identification of the trapezius muscle lateral border (Fig. 3). Dissection proceed in order to identify a reliable perforator to the skin island. A 1.5 cm × 4 cm vertical muscle segment was dissected to provide a small cuff around the pedicle (Fig. 4). To grant a suitable length, the pedicle was skeletonized until it reached the medial scapular border. A subcutaneous tunnel was designed, the flap was rotated 90° and transposed into the defect. The donor-site was closed primarily over a suction drain (Fig. 5).

The postoperative period was uneventful. The flap survived completely (Fig. 6).

4. Discussion

The myocutaneous trapezius flap has been described as a robust flap for reconstruction of head, neck and lower thoracic spine defects. However it has some disadvantages such as the need to change the patient's position during surgery and the necessity of a skin graft to close the donor area whenever a wide skin paddle is required.^{7,8}

On the other hand, raising a true trapezius perforator flap can decrease the donor-site morbidity and avoid flap bulk. On the



Fig. 4. A 1.5 cm × 4 cm vertical muscle segment was dissected to provide a small cuff around the pedicle.



Fig. 5. The donor-site was closed primarily over a suction drain.

authors assumption the main advantage of using this flap is the ability to preserve the trapezius muscle function. Other advantages can be highlighted: the donor site scar of the trapezius perforator flap does not extend into the flank and thereby can be hidden under the clothes; the flap vascularization is not dependent on the subscapular system but on perforators of the DSA which can be beneficial when that system is unavailable just as after latissimus dorsi harvest. When raised as an island pedicle flap, it can reach defects on the ipsilateral and contralateral upper back, spinal, nuchal and occipital regions due its wide arc of rotation, providing like-for-like tissue restoration. These anatomical regions are outside the range of the arc of rotation of the scapular, parascapular and thoracodorsal artery perforator flaps.⁹



Fig. 6. After 4 months follow-up: the flap survived completely, without any functional donor site complication.

5. Conclusion

The authors found the trapezius perforator flap to be a reliable and accessible to raise flap with a negligible donor-site morbidity. This flap can be used for occiput, nuchal and spinal areas injuries without the local morbidity related to other flap options.

Conflicts of interest

The authors have none to declare.

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