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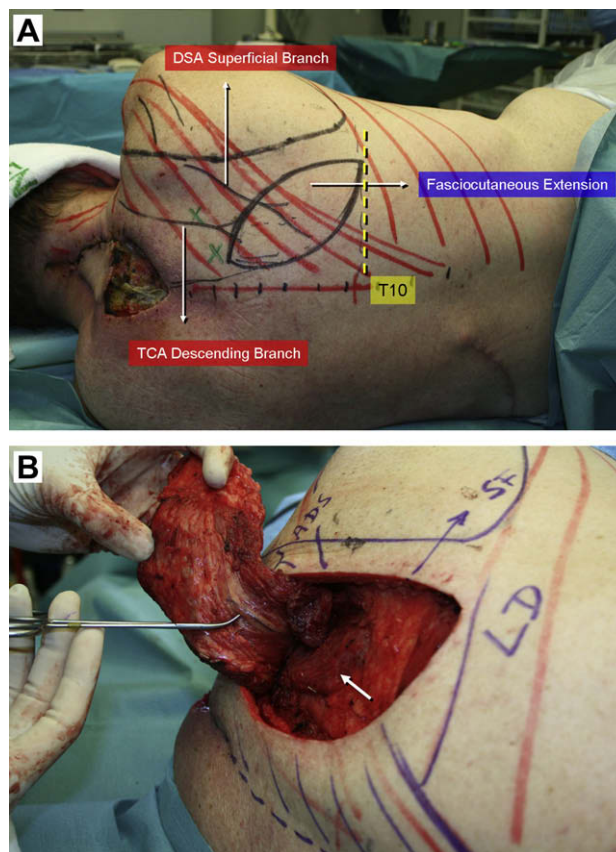
## CORRESPONDENCE AND COMMUNICATION

## Stable coverage of a cervico-thoracic defect with an extended lower trapezius myocutaneous flap

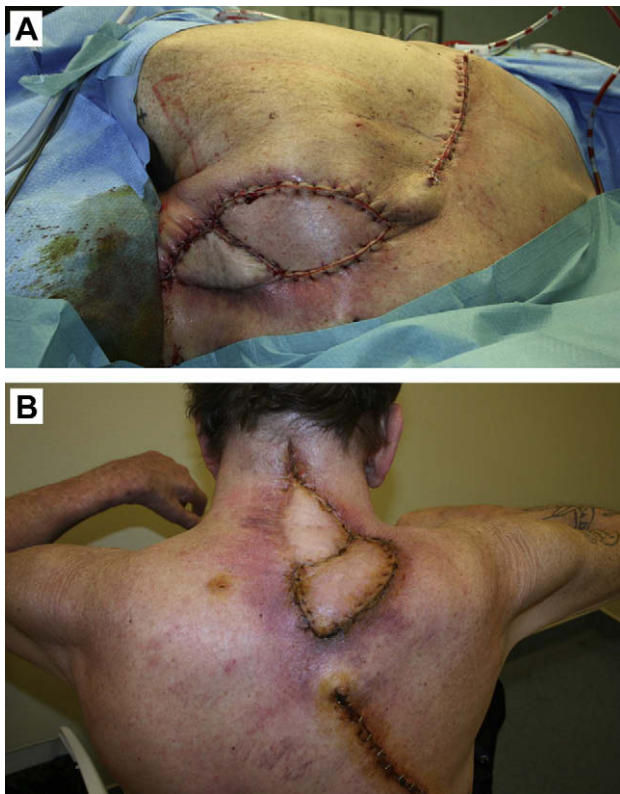
Obtaining stable tissue coverage of posterior cervico-thoracic defects can be challenging, as the back is a region of high tensile and traction forces. The trapezius and latissimus dorsi myocutaneous flaps are the two available muscle compartments and can be transferred on a reliable vascular pedicle. The selection of the flaps depends on a thorough understanding of their anatomy, their arc of rotation and an analysis of the size, extension and location of the defect.

The superior trapezius flap is based on the occipital artery and its paraspinous perforators, while the lateral and lower island trapezius myocutaneous flaps are based on the branches of the transverse cervical artery (TCA). The use of the lower trapezius myocutaneous flap is contraindicated in cases where there is suspicion of trauma to the descending branch of the TCA. Tan et al. incorporated an extension of the flap that runs obliquely from the tip of the scapula towards the midaxillary line. Their technique is based on the vascular supply from the dorsal scapular artery (DSA), which originates either directly from the subclavian artery as an independent branch or from the trunk of the TCA.<sup>1,2</sup> The DSA runs under the trapezius, omohyoid and levator scapulae muscles, but on top of the rib cage, giving off a superficial branch at the medial angle of the scapula which is the pedicle of the dorsal scapular island flap.<sup>3</sup> More distally, the main trunk of the DSA becomes the deep branch of the DSA running under the medial border of the scapula in the mass of the rhomboidei, up to the tip of the scapula.

A 70-year-old man with ankylosing spondylitis underwent an extension osteotomy of the C7 vertebra with spinal stabilisation, which was complicated postoperatively by wound dehiscence with exposure of the stabilisation device. Coverage with a pedicled myocutaneous latissimus dorsi flap failed with partial flap necrosis and due to subsequent surgical debridements with unsuccessful coverage attempts, there was a doubt about the patency of the descending branch of the TCA. This compromised the use of a lower trapezius flap, and an extended lower trapezius musculocutaneous flap was designed to cover the defect (Figure 1A).



**Figure 1** A: The patient is placed in a lateral decubitus position. Preoperative markings include the scapula and the borders of the trapezius muscle. The pedicle of the descending branch of the transverse cervical artery (TCA) is located halfway in between the medial edge of the scapula and the spine. An elliptical skin island is designed at right angles with the lower border of the trapezius muscle, and an inferior extension is included depending on the size of the defect. The inferior extension of the skin island includes the fascia overlying the latissimus dorsi muscle. DSA: dorsal scapular artery. B: The trapezius muscle is detached from its insertions into the medial edge of the scapula, but detachment does not exceed beyond the spine of the scapula. The superficial branch of the dorsal scapular artery is visualised during cephalad elevation of the trapezius muscle. This branch emerges in the interval between the rhomboideus major (arrow) and minor muscles.



**Figure 2** A: The muscle is transposed into the defect with the pivot point at the spine of the scapula. Wound coverage is complete and the donor site is primarily closed without tension. B: Postoperative view with successful wound healing at 3 weeks and preserved shoulder function. The aesthetic appearance of the shoulder girdle is preserved.

The fascia overlying the latissimus dorsi muscle was included as well as the inferior portion of the trapezius muscle, by medial detachment from the spinous processes. The trapezius muscle was not detached beyond the spine of the scapula, leaving the superior and anterior trapezius muscle fibres intact, thus minimising the risk of shoulder drooping. The DSA was visualised between the rhomboid muscles as well as the TCA which appeared medially and more superiorly (Figure 1B). The flap was easily tunnelled into the recipient site (Figure 2A) and pivoted at the level of the base of the spine of the scapula. The postoperative follow-up at 3 months showed successful wound healing with preserved shoulder function (Figure 2B).

In this patient, viability of the TCA pedicle was questionable since repetitive debridements with wide undermining of the upper back had been performed to address the defect. Therefore, use of the DSA was chosen as the basis for an extended myocutaneous trapezius flap. The contribution of the DSA in the perfusion of the inferior part

of the trapezius muscle has been reported, and it has been suggested that the DSA should be included in the lower trapezius myocutaneous flap to ensure viability of the distal part of the flap.<sup>4,5</sup> The identification and importance of the DSA system, which has an angiosome that is lower and more lateral than the TCA, have enhanced the use of this flap in the reconstruction of the neck.<sup>1</sup> The skin island over the distal end of the trapezius muscle not only captures the fasciocutaneous perforators of the DSA, but also that the flap is based on a fasciocutaneous extension beyond the trapezius muscle. In their anatomical study, Tan et al. outlined the anatomic course of the DSA and confirmed the presence of musculocutaneous perforators of the DSA and the contribution of the latter to the flap. Injection studies showed a cutaneous flare that overlays the distal end of the trapezius muscle and extended beyond the lateral edge of the muscle to a distance that was in excess of 13 cm. Angrigiani et al. also confirmed a consistent arterial supply to the skin and subcutaneous tissue of the medial back from the superficial DSA, either through the trapezius or around its lateral border.<sup>3</sup>

In cases where there is possible damage to the TCA pedicle, perhaps this modification of the lower trapezius flap is a useful alternative. The elevation of the flap is made straightforward with the use of consistent anatomical reference points; the DSA pedicle is easily visualised and there are no difficulties in rotating the flap. If necessary, the rhomboid muscles can be divided to increase the reach of the flap by freeing the DSA.<sup>1</sup>

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