





Breast

A novel pedicle extension for lumbar artery perforator flaps: a case report

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INTRODUCTION

Many women, either due to insufficient breast volume or previous abdominal surgery are not suitable for the gold standard autologous breast reconstruction: the deep inferior epigastric artery perforator (DIEP) flap.¹ The lumbar artery perforator (LAP) flap is an alternative autologous breast reconstruction for this patient population. Comprised of the lower flank skin and subcutaneous tissue directly below the breasts and above the waist line, this flap has the advantage of a well-hidden scar that is not visible to the patient. The main criticism for its use is the short pedicle length and incongruous caliber size of the recipient vessel highlighting the need for interposition grafting.² Traditionally, the deep inferior epigastric (DIE) vessels are harvested as an interposition graft to augment the short flap pedicle length and provide a preferable caliber match between the recipient mammary vessels and the flap pedicle.¹

We describe the novel use of anterolateral thigh (ALT) vessels as an alternative pedicle extension graft. To our knowledge, this has not been described in LAP flaps before. We aim to demonstrate that the ALT pedicle can serve as a suitable substitute for the DIE vessels.

CASE

A 44-year-old woman presented to our unit seeking autologous breast reconstruction. She had a background of bilateral mastectomies and immediate transverse rectus abdominis myocutaneous (TRAM) reconstructions with the unfortunate loss of her right-side breast reconstruction ([Figure 1](#)). Given her history of previous abdominal surgery and body habitus, she was an ideal candidate for a LAP flap. A complicating factor was the absence of the DIE vessels as grafts. The senior author (BS) chose to utilise the descending branch of the lateral circumflex femoral artery (LCFA) and vein as an interposition graft. Due to the excellent match to both LAP and internal mammary artery (IMA)

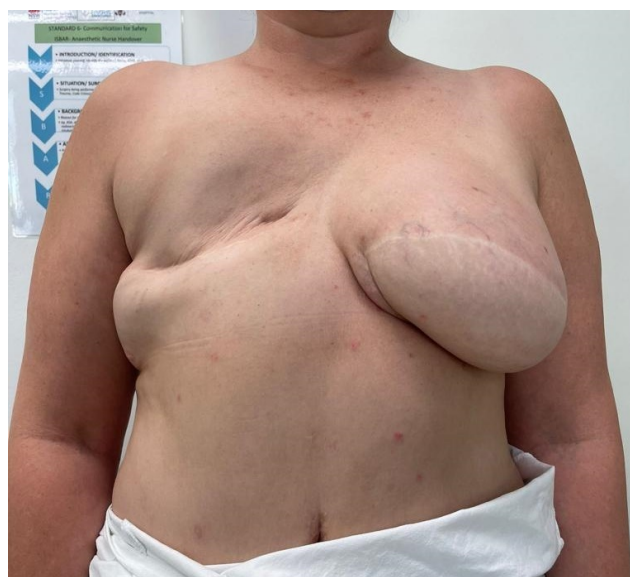


Fig 1. Preoperative photograph highlighting the absence of previously reconstructed right breast

perforators, this graft resulted in a comfortable microsurgical anastomosis and maintained adequate length to produce a smooth medial cleavage for the reconstructed breast ([Figure 2](#)).

The patient was initially placed in the supine position to raise the ALT vessels and prepare the recipient internal mammary (IM) vessels. The interposition graft, consisting of the descending branch of the LCFA and vein, measured 7.9 cm in length. Following the resection of the second costochondral cartilage, the IM vessels were successfully identified and prepared as recipient vessels for the free flap. The incisions were stapled, and the patient was subsequently transitioned to the prone position. Following Doppler ultrasound, the flap was raised from medial to lateral on the LAP in the suprafascial plane. The thoracolumbar fascia was incised and dissected and a large suitable perforator was identified between the erector spinae and quadratus lumborum muscles.³ The harvested flap had plentiful vol-

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Fig 2. Postoperative photograph of the reconstructed breast 10 days post-surgery

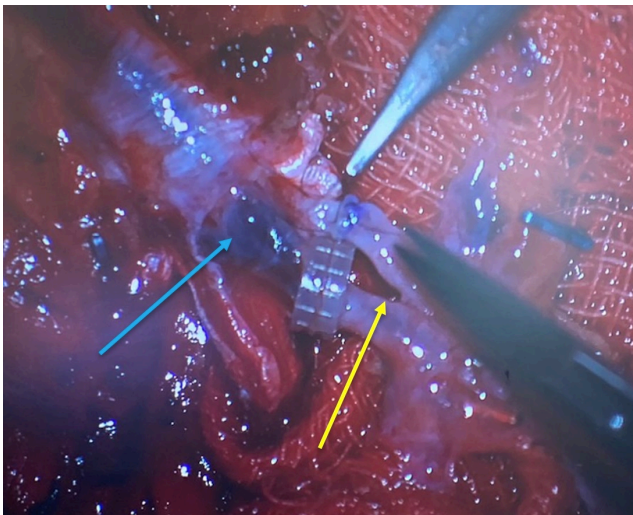


Fig 3. Intraoperative photograph of the anastomosis between the anterolateral thigh pedicle (yellow arrow) and lumbar artery perforators (blue arrow)

ume to reconstruct the right breast weighing 1.1 kg. The flap pedicle length was 3.2 cm and comprised of one artery and vein. The flap/graft anastomoses ([Figure 3](#)) were performed on the back table while the patient was being returned to the supine position. In the supine position, the graft/IM anastomoses were routinely performed on the chest. The ALT vessels demonstrated remarkable similarity in size and caliber to the DIE vessels, thereby providing a favourable basis for vessel matching.⁴ Specifically, at the flap end, the vein exhibited a caliber of 3 mm, while the artery measured 2 mm. At the chest end, the vein displayed a diameter ranging from 3.0–3.5 mm and the artery measured 2.5 mm. The use of the ALT vessels as grafts facilitated a comfortable microsurgical anastomosis, ensuring optimal blood flow and sustaining flap viability.

The previous loss of the right-side breast reconstruction did not pose any unforeseen difficulties. The anticipated presence of tissue scarring and fibrosis within the right breast pocket was observed. This was carefully dissected, and the scar tissue released. The ALT vessels not only provided a well-established blood supply but also served as a vascular scaffold for the flap, facilitating precise positioning and shaping to attain a natural looking breast contour ([Figure 2](#)).

DISCUSSION

Autologous breast reconstruction has become increasingly popular since its introduction in the 1990s. The LAP flap was initially described as an option for autologous breast reconstruction in 2003.⁵ In 2015, Peters and colleagues showed that the main disadvantage associated with this flap is the need for interposition grafting, with 80 per cent of the 28 free LAP flaps requiring an interposition graft.⁶ The interposition graft was taken from the DIE vessels in 77 per cent of these patients.⁶ In 3 per cent of these patients, the graft was taken from the thoracodorsal vessels.⁶ None of these patients utilised the ALT vessels for interposition grafting. A PubMed search for 'lumbar artery perforator flap' and 'ALT pedicle extension' yielded no results, so to our knowledge, ALT vessels have not been previously utilised as a pedicle extension for the LAP flap.

The use of the LAP flap was first described by Kato in 1999.³ Since its inception, this flap has been used as a pedicled flap for lumbosacral trunk reconstruction as well as a free flap for breast reconstruction. The pedicle of the LAP flap is rather short with an average length of 5.25 cm, making interposition grafts frequently necessary.⁶ Several interposition grafts have been described in the literature including the traditional DIE vessels as well as the thoracodorsal vessels, however, these are not always available.³

This case describes the senior author's initial experience with the ALT pedicle as an interposition graft for LAP flaps. It illustrates that the LCFA and vein can serve as a reliable interposition graft in LAP flaps when abdominal vessels are unavailable. These vessels were of similar calibre match at both proximal and distal ends and a comfortable anatomical area for our unit in which microsurgical reconstructions include many ALT free flaps for head and neck as well as lower limb reconstructions.

One of the challenges encountered was the transition of the patient's position from supine to prone and back to supine. To address this, a two-table setup was employed in the operating theatre. Implementing such position changes successfully necessitates meticulous planning, an adequate number of personnel and close coordination with the anaesthetist to ensure patient stability throughout the transitions. The position changes should be executed efficiently to minimise the overall duration of the surgical procedure and reduce complications associated with prolonged anaesthesia and surgical intervention. The total operating time was 369 minutes with 64 minutes time for flap ischaemia. The patient's postoperative course was uneventful.

CONCLUSION

The LAP flap is gaining momentum for autologous breast reconstruction due to its robust vascularity, hidden donor site and ability to import large volumes forming a natural *décolleté* line and cleavage for the reconstructed breast. The ALT pedicle can serve as a viable alternative to the DIE vessels, expanding the range of patients who can benefit from autologous breast reconstruction. Furthermore, the use of the ALT pedicle provides the reconstructive surgeon with a familiar option, adequate length and an excellent caliber match resulting in an improved arc for ideal aesthetic flap positioning.

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PATIENT CONSENT

Patients/guardians have given informed consent to the publication of images and/or data.

CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.

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