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CASE REPORT

# Accidental latissimus dorsi flap pedicle avulsion during immediate breast reconstruction: Salvage by conversion to free flap

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## KEYWORDS

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"Emergency" free flap;  
Flap pedicle avulsion;  
Salvage microvascular surgery

**Summary** Pedicle damage is a rare complication of latissimus dorsi (LD) flap breast reconstruction. We report a case of accidental avulsion of the vascular pedicle of a totally autologous (extended) LD flap during immediate breast reconstruction in a patient who had previously undergone contralateral breast reconstruction with a pedicled TRAM flap based on the opposite superior epigastric vessels. The intra-operative strategy to salvage the avulsed LD flap by conversion to a free flap while not compromising the contralateral breast reconstruction is discussed.

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## Introduction

The pedicled latissimus dorsi myocutaneous flap is a well-established method of postmastectomy breast

reconstruction.<sup>1</sup> It is used either in combination with a prosthesis or as a totally autologous flap (the so-called extended variety). The most common causes of intra-operative flap failure are related to technical errors of dissection, excessive

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tension or torsion of the pedicle, which may cause flap ischemia and necrosis. We report the successful conversion of an avulsed pedicled LD flap to a free flap breast reconstruction.

### Case report

A 54-year-old non-smoker underwent a right skin-sparing mastectomy and immediate breast reconstruction with a left pedicled TRAM flap for invasive ductal carcinoma in 2001. In 2010 she developed a similar carcinoma of the left breast and requested a totally autologous reconstruction. As the TRAM flap had already been used and the patient did not have adequate gluteal tissue an immediate extended LD flap was planned.

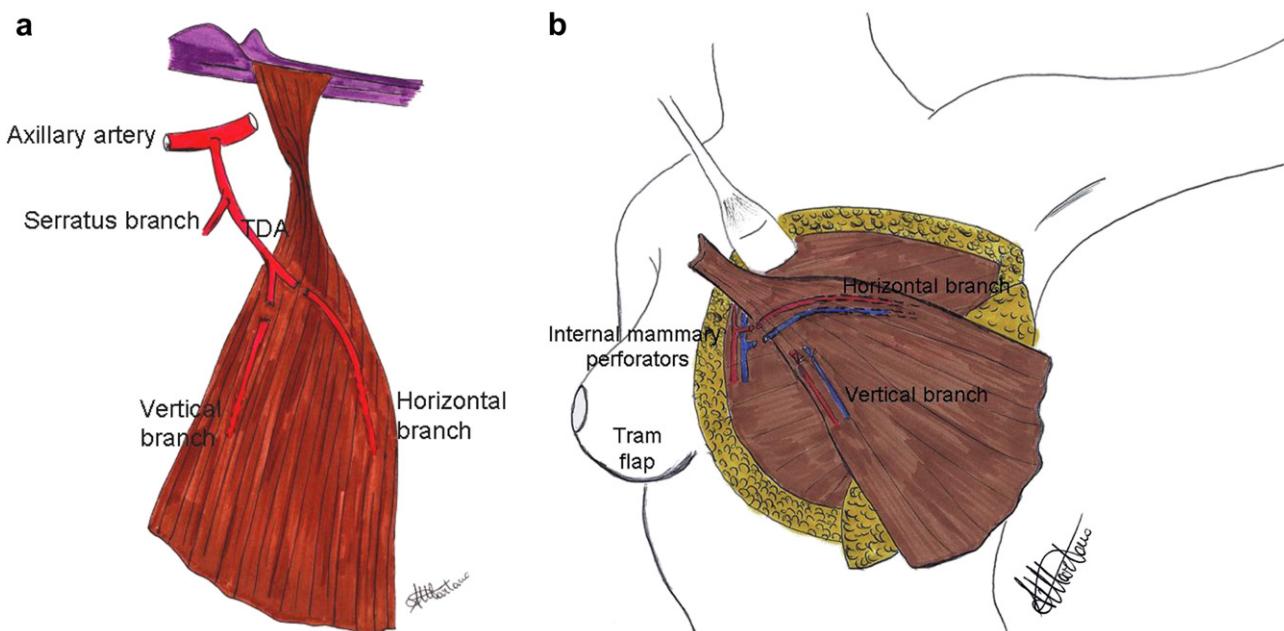
A standard autologous LD myocutaneous flap harvest and transposition into the mastectomy pocket<sup>2</sup> was performed. While undertaking hemostasis of the mastectomy pocket as the flap was temporarily taken out of the mastectomy pocket for better access its vascular pedicle was accidentally avulsed at the level of the two intramuscular branches of thoracodorsal artery (Figure 1). A very short flap vascular pedicle length containing extremely narrow caliber vessels was left. The pedicle had also sustained traction injury over a long distance. The major factor responsible for the avulsion was the weight of the unsupported totally autologous flap which overstretched the pedicle over the edge of the skin-sparing mastectomy access incision while it was lying out of the mastectomy pocket. A contributory factor was that the LD tendon which would have borne the brunt of the traction injury had been divided during the harvest (as per our routine practice) while the intact thoracodorsal nerve was not sufficient to protect the vascular

pedicle from avulsion. Due to the nature of the avulsion and the residual anatomy, it was impossible to re-anastomose the residual rudimentary pedicle to the thoracodorsal vessels.

It was deemed that vein graft placement to the proximal thoracodorsal vessels would take too long, prove to be very difficult technically and thus lead to unnecessarily prolonged flap ischemia. Therefore it was decided to anastomose the remaining pedicle to the ipsilateral internal mammary vessels. Unfortunately the left main internal mammary vessels were supplying the pedicled TRAM reconstruction of the right breast (performed 10 years earlier). Besides the short length of the remaining pedicle made it impossible to reach the internal mammary vessels (IMVs) for end-to-side anastomoses. Additionally there was great discrepancy between the IMVs and the residual intramuscular flap vessels. Hence, we decided to use the internal mammary perforators which provided adequate length and good size match thus facilitating the anastomoses to the LD flap pedicle. End-to-end anastomoses were successfully performed using interrupted 9/0 monofilament nylon sutures (Figure 1). Specifically we performed the microsurgical anastomoses between the horizontal branch of thoracodorsal pedicle and the internal mammary perforator between 2nd and 3rd rib space. There were no microvascular problems and the reconstruction was successful; the patient started chemotherapy four weeks post-operatively and has to date developed no fat necrosis (Figure 2) even following radiotherapy.

### Discussion

Intra-operative avulsion of the vascular pedicle during latissimus dorsi flap breast reconstruction must be extremely



**Figure 1** a) Schematic diagram illustrating the site of intraoperative avulsion of the thoracodorsal vascular pedicle which necessitated conversion to a free flap. b) Schematic diagram showing the flap positioning for microvascular anastomoses of the internal mammary perforators to the horizontal branches of the thoracodorsal vessels.



**Figure 2** Pre (left) and 5-month post (right) operative views of the immediate latissimus dorsi free flap breast reconstruction patient. She declined nipple reconstruction and is very happy with the softness and mobility of her new breast even following adjuvant radiotherapy.

rare or greatly under-reported. In contrast vascular pedicle avulsion during free flap surgery is well documented.<sup>3</sup> Although a very rare complication, such disruption can lead not only to free flap failure but also put the patient's life at risk due to bleeding. The most commonly described causes of intra-operative flap complications are venous thrombosis, arterial thrombosis, and bleeding/haematoma that can occur immediately after microsurgical anastomosis.<sup>4,5</sup> In the case herein reported, vascular pedicle avulsion occurred at an anatomical site where microsurgical salvage was difficult to perform. The microsurgical anastomoses were made between the horizontal branches of thoracodorsal and the perforators of the internal mammary vessels (Figure 1). The choice of recipient vessels was dictated by the need to prevent vascular compromise to the previous right contralateral TRAM flap (which was being nourished by the left internal mammary vessels) as well as the extra length of the perforators which was needed to facilitate the anastomoses.

The authors would like to stress the importance of how a straight forward case of pedicled flap breast

reconstruction can easily be transformed into a complex and longer microsurgical one.

## Conclusion

Intra-operative vascular pedicle avulsion is a rare complication of pedicled flap breast reconstruction; it could be devastating due to dramatic flap failure. As surgeons we must be aware of such complications, and be adequately trained in the different techniques of breast reconstruction including the microvascular surgery which was required to re-establish blood flow in our case. Using microsurgical techniques, we were able to successfully perform the reconstruction despite the multiple difficulties encountered and the challenging nature and unfavorable position of the avulsion. The aim of the present communication is to share our experience of this rare intra-operative complication with the reconstructive surgical community and thus provide them with a possible method of successfully and safely managing an accidentally avulsed flap.

**Conflict of interest**

None.

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None.

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