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CASE REPORT

Late partial failure of a free ALT flap[☆]

Marco Pignatti^{a,*}, Fortune C. Iwuagwu^a, Tom F. Browne^b

^a St. Andrew's Centre for Plastic Surgery and Burns, Broomfield Hospital, Mid Essex Hospitals NHS Trust, Chelmsford, Essex, United Kingdom

^b Department of Surgery, Vascular surgery, Broomfield Hospital, Mid Essex Hospitals NHS Trust, Chelmsford, Essex, United Kingdom

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Summary Late failure of microsurgical flaps is a rare event and it has been reported as a consequence of compression of the vascular pedicle or late infection.

We report a case of late partial failure occurring 3 weeks post-operatively which was shown by vascular imaging to be caused by a previously unidentified complete occlusion of the right external iliac artery.

After successful vascular bypass surgery, the suffering flap developed granulation tissue and was skin grafted.

In patients carrying multiple risk factors for peripheral vascular disease, the risk of proximal vessel occlusion as a cause of flap failure, should be kept in mind.

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Reconstruction of defects of the distal leg is still a challenging task.

Microsurgical flaps are considered among the best treatment options because of their ability to bring healthy, vascularised and non-traumatised tissue from an area

distant to the defect, re-establishing at the same time a satisfactory contour with functional and cosmetic advantages.

Although very useful, free flaps still carry a risk of failure, generally reported to be between 1 and 10%.^{1,2}

Urgent re-exploration is necessary in the case of complications and this is possible only by means of close monitoring of free tissue transfers especially in the first 48–72 h when most of the complications occur.¹

Late failure, which is very rare (<1%), is defined as failure occurring after post-operative day 7 or on follow-up visits after hospital discharge.² Reported causes of late failure include compression of the vascular pedicle, late infection and residual tumour.²

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* Corresponding author. Present address: Department of Plastic and Reconstructive Surgery, Azienda Ospedaliero-Universitaria di Modena, Policlinico di Modena, Via del Pozzo 71, Modena, I-41124 Modena, Italy. Tel.: +39 3493774545.

E-mail address: mrpignatti@googlemail.com (M. Pignatti).

We report a case of late partial failure occurring 3 weeks post-operatively as a result of an unidentified proximal large vessel occlusion in the limb, followed by wound healing only after successful vascular bypass surgery. As far as we are aware, such a rare cause has not yet been reported.

Case report

A 52-year-old man, with no previous medical problems, a family history of myocardial infarction and smoker of six cigarettes per day, fell from a height and sustained an open spiral fracture of the right distal tibia and fibula.

The fracture was fixed by an orthopaedic surgery team with an intramedullary nail but a soft-tissue loss of 3×2 cm resulted, leaving the fracture site exposed. The patient was then transferred to our care from the initial treating hospital. The pulses of posterior and anterior tibial arteries at the ankle were palpable and confirmed by Doppler.

A free anterolateral thigh (ALT) flap from the left thigh was used to resurface the fracture site. Vascular anastomosis was performed end to end to the posterior tibial vessels, distal to the zone of injury, without complications. The post-operative period was uneventful through discharge at post-operative day 7.

The flap was viable at the 2 weeks post-operative outpatient clinic appointment (Figure 1a), but at the following appointment, 3 weeks post-operatively, the flap looked dark red, oedematous, showing abnormal perfusion with sluggish bleeding from a scratching test and superficial desquamation (Figure 1b). The patient reported of a painless sudden change in colour to blue at 16 days post-operatively, followed by a progressive change to the clinical picture described. No trauma or other event that could be related to this incident was reported. The rest of the limb was normal in colour and no other symptoms developed.

Surgical treatment was not considered useful at that time but an aetiology was searched.

Once a pedicle thrombosis due to compression or mechanical damage or to infection was excluded, the patient was referred to vascular surgeons for investigations to rule out vasculitis as a possible cause. One week later (Figure 1c), discolouration of the flap had partially resolved leaving two necrotic areas at the proximal and distal tips of the skin island.

After debridement of the necrotic tissue (proximal and distal parts of the flap), negative pressure dressing was started with a surprisingly minimal growth of granulation tissue. There was no improvement of the bed of the wound, which therefore was not able to accept a split thickness skin graft.

The patient, after further more detailed questioning, recalled to have suffered from nighttime claudication over the past year. A Duplex ultrasound showed 100% occlusion of right external iliac artery (Figure 2a), confirmed by computed tomography angiography (CTA) (Figure 2b).

An ileo-femoral by-pass was therefore performed by the vascular surgeon who found very small calibre arteries and severely diseased external iliac and common femoral arteries.



Figure 1 Appearance of the flap, at the outpatient clinic post-operative follow-up. a (top): 2 weeks post-operatively. b (middle): 3 weeks post-operatively. c (bottom): 4 weeks post-operatively.

After by-pass, healthy granulation tissue developed rapidly and accepted a skin graft.

No further problems had developed in the area at follow-up (34 months).

Discussion

Wax and Rosenthal in their large review of 1530 flaps identified 13 late flap failures (0.85%).

Late failure is considered a rare event to which infection and pressure on the pedicle can be contributing factors.² Compared to the large majority of free-flap thromboses that develop within 3 post-operative days, and that can be most successfully re-explored and salvaged, the late thrombosis is so rare that accepted guidelines for its treatment are lacking.³

Salvage by thrombectomy, flap thrombolysis and anti-coagulation of a free transverse rectus abdominis myocutaneous (TRAM) flap after 11 days from surgery and a free

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