Findings that shed new light on the possible pathogenesis of a disease or an adverse effect

The thrombosed brachial-cephalic fistula used for renal dialysis – A cautionary note

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Summary

Arteriovenous fistulae (AVF) are commonly required for dialysis prior to renal transplantation, and are subsequently left insitu, even if thrombosed. The authors present one of two patients in whom progressive digital ischaemia occurred, and was initially overlooked, many years following formation of an AVF. The patient was surgically explored and clot protruding from the thrombosed vein into the brachial artery was noted. The arterial defect was closed with a vein patch and histological examination of the fistula confirmed clot. The patient recovered satisfactorily and remained well 6 months postoperatively. The authors would suggest that embolisation from a thrombosed AVF does occur, has a significant morbidity and can lead to digital loss. Furthermore, transplant patients are usually long suffering and will often put up with what they describe as 'aches and pains' as part of their illness. The authors suggest those patients suffering with evidence of ischaemia warrant excision of the fistula.

BACKGROUND

The advice normally given to patients having undergone a successful renal transplant is to leave the arteriovenous fistula (AVF) insitu, be it functioning or thrombosed. Furthermore it has been suggested that the thrombosed fistula, although cosmetically not pleasing, has no indication for removal. We present one of two patients in whom progressive digital ischaemia occurred, the diagnosis of which was initially misinterpreted and treatment delayed. Eventually surgical intervention resulted in regression of symptoms.

CASE PRESENTATION

A 55-year-old housewife presented as an emergency with a 24 h history of pain and discolouration of the fingers of the right hand following cradling a 2 litre lemonade bottle on the site of a redundant brachial-cephalic fistula in

her antecubital fossa. She had undergone a successful renal transplant 2 years prior to the event.

She was investigated both surgically and rheumatologically, with no definitive diagnosis made. She was treated symptomatically. She later presented to the vascular surgeons who noted signs of critical ischaemia of the right hand including skin necrosis. Arterial duplex demonstrated a thrombosed brachial-cephalic fistula and a normal arterial tree down to the wrist. She was commenced on intravenous heparin, and underwent an arteriogram which showed normal proximal vessels. She was therefore treated with aspirin and clopidogrel, but on return to outpatients had deteriorated again with splinter haemorrhages (figure 1) and further ischaemic events. An urgent duplex was normal however she failed to improve and thus we elected to take down the fistula.

TREATMENT

At operation the fistula was excised and it became apparent that clot was protruding from the thrombosed vein into the brachial artery. The arterial defect was closed with a vein patch harvested from the long saphenous vein (figure 2). Histological examination of the fistula confirmed clot (figure 3).

OUTCOME AND FOLLOW-UP

The patient had a successful operative outcome and recovered satisfactorily. Furthermore, she remained well at 6 month postoperative outpatient review.

DISCUSSION

Formation of an AVF with vein or a prosthetic conduit is an essential part of the dialysis process prior to renal

Figure 1 Splinter haemorrhages and skin necrosis.

Figure 3 Cross section of the venous component of the fistula demonstrating the clot contained inside.

Figure 2 Operative image demonstrating the brachial artery (yellow arrows), the fistula site (white arrow) and the aneurysmal venous component of the fistula (blue arrow).

transplantation. Not infrequently these fistula thrombose and occasionally become aneurysmal, but the usual advice to such patients is to leave it insitu as it has been considered that complications, both acute and long term, are rare.¹

The above case demonstrates serious and prolonged complications prior to the identification of such embolisation. Despite repeated investigations the diagnosis was difficult to make and the patient was seen in numerous clinics, including medical and rheumatology specialist clinics. Indeed the fistula was left for several months and she suffered multiple episodes of showering emboli into the hand with subsequent pain and discomfort.

A review of the literature identified that embolisation from a thrombosed AVF has been documented both in the USA.^{1 2} and France.³ Furthermore Tordoir *et al* described a 2 year prospective follow-up of 90 patients with AVF describing embolisation in two patients.⁴ Recently an article in the *Annals of the Royal College of Surgeons of England* suggested that the acute blue finger always resolved and such patients do not warrant investigation or treatment as the condition is thought to follow a benign course.⁵

We would therefore respectively suggest that embolisation from a thrombosed AVF does occur, has a significant morbidity and can lead to digital loss. Furthermore, transplant patients are usually long suffering and will often put up with what they describe as ‘aches and pains’ as part of their illness. We suggest those patients suffering with evidence of ischaemia warrant excision of the fistula and vein patching. A direct injury to the limb carrying a thrombosed AVF should be examined and evidence of embolisation warrants the fistula’s excision.

Learning points

- ▶ Thrombosed redundant AVFs can embolise if the thrombus is lying close to the anastomosis. This can cause progressive digital ischaemia.
- ▶ Correct diagnosis in these patients can be easily missed, risking loss of digits.
- ▶ Early assessment by specialist vascular access surgeons should be sought to prevent unnecessary delay to treatment and progressive ischaemia.
- ▶ We suggest those patients suffering with evidence of ischaemia warrant excision of the fistula and vein patching. Alternatively, ligation of the fistula and vein patching to the artery should serve as well.

Competing interests None.

Patient consent Obtained.

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