Letter

Endovascular treatment of arterial steal secondary to dialysis fistula

Sir,

In the literature, the treatment of an arterial steal syndrome in patients with dialysis fistula has been described to mainly concentrate on decreased or abolished blood flow through the arteriovenous shunt, or bypassing the fistula [1–4]. An important cause of the steal phenomenon in a limb distal to a dialysis fistula is, however, distal artery occlusive disease, reducing limb perfusion to a critical level. In our opinion, awareness of this is important as endovascular treatment of a distal arterial lesion could make surgical intervention unnecessary, thereby preventing morbidity and fistula loss. The two following cases are examples of this.

Case 1. The first patient is a 78-year-old male who developed ischaemic rest pain in his right hand after a brachio-cephalic fistula was formed. A duplex scan showed a 60–80% stenosis (peak systolic velocity ratio 3.0) in the brachial artery, just distal to the arteriovenous anastomosis. At angiography the peripheral arteries could only be visualized with the fistula being occluded by external compression, but it confirmed the presence of a diaphragm-like stenosis of the brachial artery, distal to the anastomosis (Figure 1). The venous limb of the fistula was punctured and after pressure measurements were taken across the stenosis, sequential angioplasty to 3 mm, and then 5 mm was performed through a 5 French sheath. The run-off improved substantially and clinically the patient experienced resolution of the ischaemic symptoms.

Case 2. The second patient is a 59-year-old male who had a left-sided 6 mm PTFE brachio-basilic arteriovenous shunt formed. One month after the procedure he started complaining of pain in the left hand at rest and developed patches of necrosis on the index and middle finger. An angiogram demonstrated shunting through the fistula with no demonstrable distal arterial flow. On fistula compression, an occlusion of the brachial artery above the elbow was revealed. A guidewire was readily passed through the occluding...

Fig. 1. Angiography showing presence of a diaphragm-like stenosis of the brachial artery.
thrombus and rtPA thrombolysis successfully recanalized the vessel. Distal arterial flow was improved and subsequently the rest pain and necrosis in the left hand resolved without any further intervention.

Comment. Previously described treatments involve reduction of the flow through the fistula by ligation or banding [1,2], or compressive bandaging [3]. Another approach has been ligation of the artery distal from the fistula and revascularization by a bypass from proximal to distal artery [4]. This may result in significant morbidity, and may not always be successful in the presence of occlusive distal arterial disease. In patients with a rare occurrence of arterial steal in the presence of a radiocephalic fistula, there may be reversed flow in the radial artery, through the palmar arch. Distal radial artery embolization has been described as a treatment in these cases [5].

In conclusion, it is important to remember that a distal arterial lesion may be responsible for arterial steal in patients with arteriovenous fistulae. Appropriate investigation and treatment will maximize the chances of treating the ischaemia and preserving the arteriovenous fistula.