Inability to monitor polyurethane haemodialysis vascular access graft by Doppler ultrasound

Sir,
In patients with end-stage renal disease (ESRD) who do not yet have a permanent vascular access, haemodialysis is often performed using temporary central venous catheters. The use of such catheters is associated with complications such as bleeding, infection, or thrombosis of the catheter. A vascular access graft (Vectra) has been developed which, unlike a PTFE-graft or native AV-fistula, is suitable for immediate use [1] obviating the need for a temporary catheter. The graft is made of Thoralon™, a self-sealing polyurethane material. In a multicentre study with the Vectra graft, early access, rapid haemostasis, and high patency rates were reported [1].

Case. In a 74-year-old female, who presented with uraemic symptoms due to ESRD caused by reflux nephropathy, a Vectra graft was placed in the left lower arm. Graft occlusion occurred on the first post-operative day. Surgical thrombectomy was performed, peri-operative angiography showed no stenosis in the graft itself or at the anastomoses. Anticoagulation was started with i.v. heparin and acenocoumarol. Two days after the surgical thrombectomy, the graft was cannulated with a single needle and successfully used for haemodialysis. However, one day later graft-thrombosis recurred for which surgical thrombectomy was performed. Two weeks later the graft again was occluded. Doppler ultrasound showed monophasic flow in the afferent artery, but between the arterial and the venous anastomoses only a strong reflection from the outer surface of the Vectra graft was seen, prohibiting Doppler flow measurements.
Apparently the foam-like material of the Vectra graft (polyurethane) does not allow Doppler ultrasound imaging.

Comment. Doppler ultrasound is a useful and non-invasive technique to monitor dialysis vascular access for stenosis [2]. We routinely use Doppler ultrasound in our dialysis department. The inability to monitor the Vectra graft by Doppler ultrasound limits the possibility for non-invasive graft patency monitoring which, in our opinion, is a drawback in comparison with a PTFE-graft.

In our patient, dialysis was started by means of a jugular vein catheter and a PTFE-graft was constructed. This has functioned well for the past 7 months.

In summary, the new polyurethane haemodialysis vascular access graft Vectra in this patient was repeatedly occluded. Vectra graft blood flow could not be imaged by Doppler ultrasound, which limits the possibility for non-invasive monitoring of the graft for stenosis.

1Department of Internal Medicine  C. G. Vermeij1
2Department of Radiology  F. W. Smit2
3Department of Surgery  B. H. P. Elsman3
Deventer Ziekenhuis
Deventer
The Netherlands