INVITED COMMENT

Regarding “Identification and implications of transgraft microleaks after endovascular repair of aortic aneurysms”

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This report is important because it describes a failure mode after endoluminal abdominal aortic aneurysm (AAA) repair not previously recognized. This is a fabric defect at the site of suture holes that results in a persistent Type III endoleak. Extravasation of contrast at suture points and between the interstices of the fabric has been recognized since the introduction of the AneuRx device 5 years ago and has been referred to as porosity or Type IV endoleak. This form of endoleak, however, usually seals within days of implantation and is not seen on contrast computed tomography (CT) at 1 month. The unique features of the current report are that the endoleaks have persisted for up to 2½ years after operation and have been associated with broken sutures. The Type III endoleaks in this report must also be distinguished from previously reported seam defects in Stentor (Mintec, LaCiotat, France) prostheses and the chronic fabric wear against metallic stents seen in Vanguard (Boston Scientific, Natick, Mass) prostheses.

The authors also describe a number of special maneuvers that allow the site of these small Type III endoleaks to be identified. It has long been recognized that contrast CT is an excellent method of detecting the presence of an endoleak but is not always a reliable way of detecting the site of an endoleak. The authors have rightly emphasized that they are not describing previously unrecognized endoleaks, but rather endoleaks that have been seen on standard contrast CT without the exact site of origin being identified. It is important for us all to understand this, to avoid excessive and unwarranted imaging on large numbers of patients whose clinical course is satisfactory as determined by diminishing size of the aneurysm and absence of endoleak. There is no indication on the evidence available that this large group of patients may be harboring unsuspected and potentially dangerous microleaks.

This report raises several questions. First, does the entity of “microleak” exist? The angiograms in Figs 7 and 9 and the duplex ultrasound scan in Fig 8 are convincing. The operative findings of bleeding through the endograft in two patients are more questionable because thrombus has to be manually removed to see the endograft and may result in starting a bleeding point that did not previously exist. On the other hand, it should be noted that the authors would have been likely to note a jet of blood if one existed, because they opened the aneurysm sac without the application of any clamps in one patient and with only one iliac clamp applied in the other.

Are these microleaks iatrogenic? The authors have considered this possibility, acknowledging that a single small puff of contrast through an iliac limb in immediate juxtaposition to the end hole of the catheter in one of the two patients in whom a power injection was used may have resulted from the injection itself. The technique of balloon occlusion of an iliac limb and manual injection of contrast through the balloon catheter after removal of the guide wire as depicted in Fig 9 leaves little doubt as to the genuine nature and site of the microleak, being well clear of the gate area and site of the endograft, being well clear of the gate area and site of the endograft, being well clear of the gate area and site of the endograft, being well clear of the gate area and site of the endograft.

Are these microleaks of any clinical significance? An increase in the diameter of AAAs in three of the four patients reported would suggest that the answer is yes. Another way of establishing this would be to look at the effect of treating microleaks in patients B and C where this was attempted. In both cases secondary endografts were placed within the limbs of the primary endograft at sites where microleaks had been diagnosed. In patient B the known endoleak persisted on follow-up CT. In patient C the follow-up CT scan was inconclusive because contrast media were seen in the aneurysm sac in the preinfusion...
run. There is no evidence that repairing a microleak will cure an endoleak previously noted on conventional contrast CT or reverse the trend of aortic sac enlargement.

This report also highlights a problem in the management of some patients undergoing endoluminal AAA repair. This has arisen from patients being operated on in a specialist department of vascular surgery by surgeons with expertise in endovascular repair and then returned to “local” medical officers who acted on their own interpretation of follow-up imaging rather than that of the core laboratory. In fairness the core laboratory report may well have not been available. Nevertheless, management by triumvirate is not in the patients’ best interests. Patient A, for example, was variously thought by the operating surgeons to have a Type IV porosity endoleak and by the local medical officers to have a Type II lumbar endoleak and a Type I left limb endoleak that was treated with an extension endograft. The core laboratory thought the patient had a Type III endoleak at the junction of modular components of the graft, plus a Type II lumbar endoleak, whereas the operative findings demonstrated bleeding from the right limb of the endograft. In situations such as these, it would be preferable for the management of the patient to remain in the hands of the original, experienced operating team.

The major limitation of this report is the absence of pathologic and scanning electron microscopy data on the two explanted prostheses. Despite this deficiency the authors have made a convincing case for the existence of microleaks and the need to further investigate their significance. The techniques of “directed” angiography and duplex scanning to identify these microleaks are useful and merit further study with a controlled protocol in experienced centers. It will be important to establish that treatment of microleaks has a tangible benefit in the form of reversing the trend of AAA enlargement to counter the argument that they are incidental findings of no significance in patients with conventional “macro” endoleaks. It seems the techniques described would be most useful in (1) patients with an enlarging aneurysm but no evidence of endoleak and (2) patients with an enlarging aneurysm and an endoleak whose site of origin has not been identified.

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Please see the related article by Dr Jon S. Matsumura et al on pages 190-7.