



## Invited Commentary

## Commentary on 'Use of Colour Duplex Ultrasound as a First Line Surveillance Tool Following Evar is Associated with a Reduction in Cost without Compromising Accuracy'

A. Chaudhuri\*

Bedfordshire Vascular Unit, Bedford Hospital NHS Trust, Kempston Road, Bedford MK42 9DJ, United Kingdom

The opening statement of the abstract, in this article by McDonnell et al., underpins how clinicians can get stuck in their practice. Why are patients subjected to repeat CT scans, when many studies, including this one, show this to be unnecessary and pointlessly expensive?

The aim of surveillance is simply to look at two things: **form**, i.e. structural integrity and position of the endograft, and **function**, i.e. continued aneurysm exclusion, endoleaks and stenoses/occlusions in limbs and related vessels. The oft repeated cliché that a CT scan equates to 300 chest radiographs (CXRs) seems to be lost in the mix, by perhaps blasé clinicians who simply carry on as is, possibly because EVAR is undertaken in older patients where such considerations might be considered irrelevant. If we scrutinise this further, the radiation dosage from abdominal CT scan is 8 mSv, and from a CXR 0.02 mSv, making the factor actually 400<sup>1</sup>! Furthermore, there are issues with contrast dosage in someone with borderline renal function, and the potential cancer risk associated with CT.<sup>1</sup> If small aneurysm EVAR is taken up (as suggested by the CAESAR and PIVOTAL trials)<sup>2</sup> and therefore likely for younger patients, the latter risks cannot be ignored.

A combination of abdominal X-ray (AXR) and ultrasound (US) therefore conveniently addresses both form and function issues, and as the authors suggest, relatively newer modalities such as contrast-enhanced (CE) US may not be required. There are, however, studies suggesting the benefits of CEUS, and, where appropriate, MRA as referenced (though I cannot see this driving the need for more MR-compatible devices, yet another aspect of device evolution). There will be issues with operator dependence with the former and cost/patient compliance with the latter.

This paper looks at EVAR surveillance only, without muddying the picture by adding FEVAR, which is entirely reasonable. However, there were no AXRs undertaken thereafter, and the authors have ignored the 'form' aspect of the surveillance package without any strong reason to support it. For the sake of the paper, it would be reasonable to accept the CT as the surrogate for the AXR,

and the authors have factored it within the cost analysis. It was interesting to note that though 5 type 1 endoleaks were noted on CDUS, only 3 were correlated on CTA, and the discrepancy highlights the issues with US interpretation. In addition, though CDUS picked up more type 2 endoleaks than CTA, this may become irrelevant from a practical point as most type 2 endoleaks will be either insignificant<sup>3</sup> or not treated anyway.<sup>4</sup> Furthermore, even though endotension was actually noted to be due to a lumbar type 2 endoleak, the authors missed the opportunity for considering laparoscopic clipping, subjecting the patient to open operation, therefore defeating the minimally invasive purpose of the overall intervention. Directionality of a type 2 endoleak, and importantly sac size are issues that guide intervention.<sup>4,5</sup>

The authors have undertaken a very useful cost savings analysis and that along with the clinical results should provide enough impetus to make those institutionalised into routine post-EVAR CT think about changing their practice, perhaps with some incentive from their managers! I would have liked to have seen a per patient cost-savings figure like that referenced, as that would be a constant.

Our approach is to use just a single post-operative CT angiogram (CTA) as a prudent 'baseline' for further scans using only AXR/CDUS thereafter (and hypothetically one could look to push this even further by opting for a non-CT approach—especially if EVAR completion angiography is normal).<sup>6</sup> We opt for CTA only when there is any doubt with the imaging, which is usually US, as indicated by the 6.1% of CDUS that was 'limited'. However, sac size not being picked up on 37% of CTAs in this paper is staggeringly high. Our own stipulation is that **all surveillance imaging should be undertaken/reported only by a vascular radiologist/technologist** and no other, as this has a bearing on (a) what (b) how things are looked at and (c) get reported. The other issue this raises is whether all units undertaking EVAR actually maintain a database of the scan reports or not.

It is well worth the reader recapitulating these issues that have been comprehensively outlined in the ESVS AAA guidelines,<sup>2</sup> though AXR undertaken in conjunction with CTA (as recommended) is possibly redundant, perhaps even wasteful, as 3D CT reconstruction is more than capable of recreating good quality multi-angle AXRs, which is our experience.

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\* Tel.: +44 1234 355122.

E-mail address: [a.chaudhuri@ntlworld.com](mailto:a.chaudhuri@ntlworld.com).

Routine CTAs over a period of 5 years or more should really be scrapped and centres should default to using mostly AXR/CDUS (or CEUS) for standard infrarenal EVAR surveillance. Certainly, CDUS will not be as sensitive or specific as CT particularly for type 2 endoleaks<sup>4</sup> (as indicated by the variability in the discussion), but it will reduce the number of CTs undertaken in any centre. This makes both clinical and- not to be ignored in this day and age- financial sense.

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