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INVITED COMMENTARY

Commentary on: "Could Four Dimensional Contrast-enhanced Ultrasounds Replace Computed Tomography Angiography During Follow-up of Fenestrated Endografts? Results of a Preliminary Experience"

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Fenestrated endovascular aneurysm repair (fEVAR) is a well-established alternative to open repair for patients with juxtarenal or short-neck AAAs.[1–3] While computed tomography angiography (CTA) is considered the gold standard for surveillance, it bears the risk of contrast nephropathy and exposure to ionizing radiation, and is associated with high cost and resource allocation. Recommendations for standard EVAR have progressively changed to accept Duplex ultrasound (DUS)-based strategies, at least for patients at lower risk of complications. Currently, there are no specific recommendations from scientific societies regarding fEVAR surveillance, but expert opinion suggests close surveillance is necessary to insure lasting results.[1,2]

Gargiulo et al.[4] addressed the issue of surveillance after fEVAR in a retrospective study comparing CTA and four-dimensional contrast-enhanced ultrasound (4D-CEUS). The authors suggest that 4D-CEUS is as accurate as CTA for detecting diameter and volume changes, endoleaks, and revascularized visceral vessel patency. While the conclusions are interesting, these data must be analyzed with caution. In fact, endoleak detection may be sub-optimal, as one in three endoleaks were not detected with CEUS. A sample of 22 patients is clearly underpowered to obtain conclusions that may influence clinical practice. It may be possible that, due to the relative rarity of fEVAR, one may never obtain enough power for robust conclusions.

Also, the added value of 4D (compared to "standard" CEUS) appears only pertinent for volumetric measurements. While this is a valuable research tool, it is not regularly used in clinical practice and may have very limited influence on the course of treatment.[5] As such, the present study does not add significantly to the larger study by Perini et al.,[6] where CEUS was compared favorably to CTA.

Lastly, DUS and CEUS have important limitations that limit its applicability. These are largely related to access to technology, operator-dependency and anatomical restrains (temporary like bowel gas interposition, or permanent like obesity as the authors rightfully point out). A frequently disparaged aspect is that DUS-based surveillance limits the possibility of pre-emptive treatment, or treatment before a complication actually occurs. Migration, component disconnection, and material fatigue are generally unrecognized with DUS until they result in endoleak, rupture, or occlusion. For fEVAR this may be especially true, given the complexity of the procedure and higher chance of complications, particularly regarding vascularized visceral vessels.[1,3,7] The latter were not directly visualized with CEUS in 8% of patients in the present study.

Current evidence suggests that it is wise to individualize surveillance after EVAR according to the patient's life expectancy and renal function, and adapt the strategy according to postoperative evolution. Despite these promising results, CEUS (or 4D-CEUS) still seems a second-best modality, best suited for patients who have impaired renal function or favorable aneurysm regression and evidence of graft stability over time. As for standard EVAR, common sense suggests that tailoring the intensity of surveillance to individual patient risk, whatever the chosen image modality, may be the preferred strategy.

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