

INVITED COMMENTARY

Commentary on “Volume Estimation of Aortic Sac after EVAR Using 3-D Ultrasound — A Novel, Accurate and Promising Technique”

E.L.G. Verhoeven ^{a,b,*}, K. Oikonomou ^a, A. Katsargyris ^a

^a Department of Vascular and Endovascular Surgery, Klinikum Nürnberg, Nürnberg, Germany

^b Department of Vascular Surgery, University Hospital Leuven, Leuven, Belgium

We do congratulate Dr. Bredahl and colleagues for this important work on three-dimensional ultrasound (3-D US) in the evaluation of patients after endovascular aneurysm repair (EVAR).¹ The benefits of US versus computed tomographic angiography (CTA) cannot be stressed enough, or to put it in other words, the risks of yearly CTA are underestimated in our patients.² Fortunately there is a growing implementation of alternative surveillance methods after EVAR, which should be further endorsed by the development of more accurate US techniques, as done earlier with contrast-enhanced US.³

EVAR patients do require follow-up (FU). In patients with favorable proximal neck anatomy and small diameter common iliac arteries the FU scheme can be relaxed and does not require a yearly CTA. In patients with unfavorable anatomy FU may need to be intensified in time frame, which makes it even more important to consider use of US instead of CTA.

US occasionally has limitations related to patient habitus and reproducibility of results. In some patients with aneurysmal sac growth after EVAR, demonstrated type I/II endoleak, or unfavorable AAA anatomy CTA might still be a reasonable first FU tool. However, the main reason for the widespread use of CTA is in fact a practical one. CTA is nowadays quickly available, much less cumbersome for the vascular surgeon, easier to interpret, standardized and easily storable to be used as a reference.

The 3-D US technique is novel and accurate, as demonstrated by the investigators, in the estimation of the aneurysmal sac volume and could be promising for the future. Currently there are still issues such as the duration of the examination, required skills, and device/software cost that limit its applicability in every day practice. The importance of volume versus maximal diameter is an issue that has been stressed earlier, but it has not resulted in a paradigm shift.⁴ Finally, the success rate of US in this series (98%) was notably higher than in most contemporary reports, probably due to the habitus of Nordic patients, use

of advanced software, and the study bias with perseverance of the operators.⁵ These results might not be reproducible in a standard clinical setting.

Could this novel 3-D US technique replace standard US and/or CTA in the FU after EVAR? Standard US in combination with abdominal X-ray has been shown to be effective in evaluating aneurysm exclusion (Type Ia and Ib endoleak), and integrity of the stent-graft components (Type III endoleak).⁶ Standard US however, is somewhat less accurate in diagnosis and classification of type II endoleak and endotension. Higher quality 3-D US with volume measurements could be advantageous in such circumstances, and might be adopted as an additional tool in order to avoid resorting to CTA. In our opinion, every effort to minimize the need for CTA should be explored. CTA should be reserved only for patients in whom the aforementioned modalities have failed or show signs of EVAR complications.

CONFLICTS OF INTEREST

Eric Verhoeven has received educational grants and is a consultant for Cook Inc., W.L. Gore & Associates, Siemens and Atrium-Maquet.

REFERENCES

- Bredahl K, Long A, Taudorf M, Lönn L, Rouet L, Ardon R, et al. Volume estimation of aortic sac after EVAR using 3-D ultrasound — a novel, accurate and promising technique. *Eur J Vasc Endovasc Surg* 2012 [Ahead of print].
- Katsargyris A, Verhoeven EL. Part two: against the motion. All TEVAR patients do not require lifelong follow-up by annual CTA/MRA. *Eur J Vasc Endovasc Surg* 2012;44:538–41.
- Ten Bosch JA, Rouwet EV, Peters CT, et al. Contrast-enhanced ultrasound versus computed tomographic angiography for surveillance of endovascular abdominal aortic aneurysm repair. *J Vasc Interv Radiol* 2010;21:638–43.
- Prinssen M, Verhoeven EL, Verhagen HJ, Blankensteijn JD. Decision-making in follow-up after endovascular aneurysm repair based on diameter and volume measurements: a blinded comparison. *Eur J Vasc Endovasc Surg* 2003 Aug;26:184–7.
- Karthikesalingam A, Al-Jundi W, Jackson D, Boyle JR, Beard JD, Holt PJ, et al. Systematic review and meta-analysis of duplex ultrasonography, contrast-enhanced ultrasonography or computed tomography for surveillance after endovascular aneurysm repair. *Br J Surg* 2012;99:1514–23.
- Oikonomou K, Ventin FC, Paraskevas KI, Geisselsöder P, Ritter W, Verhoeven EL. Early follow-up after endovascular aneurysm repair: is the first postoperative computed tomographic angiography scan necessary? *J Endovasc Ther* 2012;19:151–6.

DOI of original article: <http://dx.doi.org/10.1016/j.ejvs.2012.12.018>

* Corresponding author. E.L.G. Verhoeven, Department of Vascular Surgery, Klinikum Nürnberg, Breslauer Strasse 201, 90471 Nürnberg, Germany. Tel.: +49 9113982650; fax: +49 9113982984.

E-mail address: Eric.Verhoeven@klinikum-nuernberg.de (E.L.G. Verhoeven). 1078-5884/\$ — see front matter © 2013 European Society for Vascular Surgery. Published by Elsevier Ltd. All rights reserved.

<http://dx.doi.org/10.1016/j.ejvs.2013.01.024>