Intraoperative contrast enhanced ultrasound adds some important details to the endovascular aortic aneurysm repair completion control

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Contrast enhanced ultrasound (CEUS) has been widely accepted as an effective and reproducible diagnostic tool in the follow-up after endovascular aortic aneurysm repair (EVAR) for a long time. It is particularly useful in the detection of endoleaks (EL) since is a real-time non-ionizing radiation examination, with no nephrotoxic effect with comparable or even superior diagnostic performance compared with standard angiography (1,2).

Several studies have shown a higher sensitivity for low flow endoleaks of this diagnostic method if compared with the most commonly used duplex ultrasound and computed tomography angiography (1-4). Thanks to these experiences, CEUS is currently considered a necessary tool for the EVAR follow-up. Nevertheless, very few papers are available in the literature on its intraoperative use as a diagnostic and interventional method (5,6).

This gives added value to the study by Bianchini Massoni et al. (7), that reported the intraoperative use of CEUS compared with digital subtraction angiography performed in two orthogonal projection (2DSA), for the detection of endoleaks.

Moreover, the authors investigated the utility of CEUS for intraoperative adjunctive procedures.

The intraoperative CEUS examination was easily performed under sterile condition in 60 cases, before the end of the EVAR procedure. Considering any type of EL detection, the two diagnostic methods, i.e., CEUS and DSA showed a “fair” agreement (Cohen’s kappa =0.250), with 2DSA revealing 11 ELs and CEUS 25 ELs. CEUS showed 17 ELs (28%) undetected at 2DSA: 15 type II ELs and 2 type IA ELs (7). Therefore, the intraoperative CEUS showed to be useful in the detection of type II and low flow type I A endoleaks, not easily visible by DSA (7).

More interestingly, this experience highlighted the use of CEUS as a guide to optimize the preventive embolization of type II endoleaks. As a matter of fact, among the 23 cases of type II EL detected by CEUS, 4 (17%) were classified preoperatively as at high risk for persistent type II EL; thus, sac embolization was effectively performed intraoperatively under CEUS control with type II ELs resolution in all the cases (7).

The authors performed the intraoperative sac embolization only in selected cases, preoperatively identified as at risk for type II persistent EL. Only in those cases, a 5F catheter was placed in the aneurysm sac in order to perform the embolization with coils. Data in the literature show the effectiveness of this technique in reducing the incidence of persistent type II endoleaks in selective cases, even thou the most effective embolization method is yet to be defined (8).

The authors suggest that intraoperative CEUS is effective in evaluating the efficacy of this preventive technique, establishing the number of necessary coils, without further radio exposure or use of contrast medium.

The study by Bianchini Massoni et al. (7), despite the
undisputed limits due to the low number of patients and the lack of follow-up data, gives new insights in the use of CEUS.

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**Footnote**

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

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