

Commentary on “Benefits of Repeat Prostatic Artery Embolization on Persistent or Recurrent Lower Urinary Tract Symptoms in Patients with Benign Prostatic Hyperplasia” Lehrer R, et al. CVIR 2023

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Received: 26 April 2023 / Accepted: 29 April 2023 / Published online: 17 May 2023

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I read with great interest the study of Lehrer et al. [1], which was a single-center, retrospective analysis of repeat prostatic artery embolization (rePAE) in 21 patients with persistent or recurring lower urinary tract symptoms after initial prostatic artery embolization (PAE). Median follow-up after rePAE was 8.9 months. Overall clinical success rate of rePAE was not impressive (33%); however, rePAE proved feasible, complication-free and was associated with a radiation exposure comparable to initial PAE. These results are useful for patient counselling and support the role of rePAE as a treatment option, even after the failure of initial PAE. Many relapsers and non-responders post-initial PAE will still be unsuitable for surgery and may have limited access to other minimally invasive treatments; this further increases the probability of selection of rePAE for the management of these patients.

Remarkably, the authors recorded different clinical success rates between the two aforementioned subgroups (18% for non-responders versus 50% for relapsers). Although the difference failed to reach statistical significance ($P = 0.12$), it may be clinically relevant, reflecting a different etiology of treatment failure between the subgroups. The very low success rate in non-responders might indicate that at least some of these patients were unsuitable for PAE in the first place. This emphasizes the importance of careful patient selection for PAE. On the other hand, rePAE, with its higher success rate for relapsers, could be more confidently proposed to this subgroup,

particularly if these patients had appreciated the minimal invasiveness and safety of initial PAE.

In their comprehensive analysis of the revascularization pattern, the authors reported that approximately one third of the treated branches during rePAE were different from the prostatic artery that had been originally embolized during the initial PAE. Moreover, all patients who had not undergone Cone-Beam Computed Tomography (CBCT) during the initial PAE showed the aforementioned revascularization pattern (from arteries other than the originally embolized prostatic artery). Apparently, these arteries had been overlooked during the initial PAE procedure; it is also likely that these arteries became more prominent and collateralization through them increased after the occlusion of the originally embolized prostatic artery. The role of CBCT as the best modality for detailed vascular planning is also highlighted, although the additional radiation dose associated with CBCT should not be overlooked [2]. Moreover, it is not always possible and practical to catheterize and safely embolize all the potential feeders indicated by CBCT.

The rest (approximately two thirds) of the arteries treated with rePAE by Lehrer et al. were the same, originally treated prostatic arteries which were recanalized at various time after initial PAE. The authors systematically utilized microspheres with diameters of 300–500 microns; smaller microspheres (100–300 microns) could (theoretically) ensure better filling of the prostatic arterial bed and could delay reperfusion of prostatic adenomas. Smaller embolic particle size also seems to be associated with better clinical outcomes and more extensive infarction post-PAE [3]. It is also important to be able to confirm that an apparent occlusion of the prostatic artery on angiography has actually caused prostatic infarction. Contrast-

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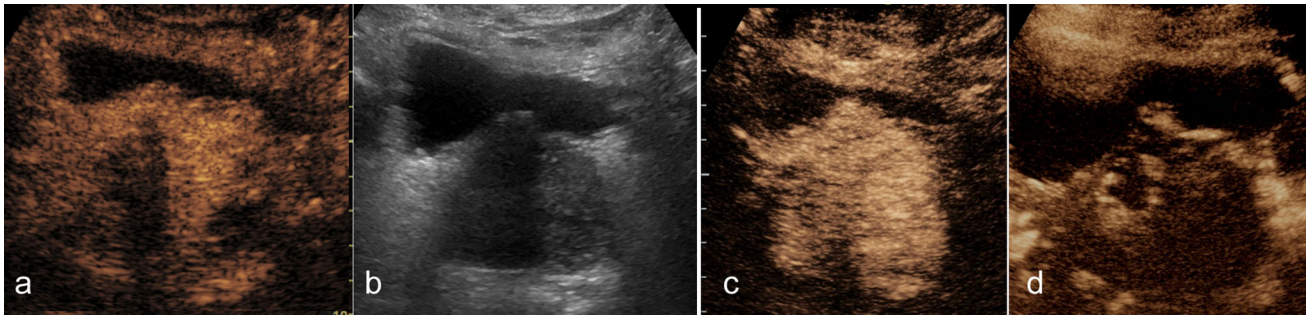


Fig. 1 Representative sonographic images after initial PAE and rePAE. **a** On CEUS one day post-initial PAE, prostatic infarcts (non-enhancing areas) are demonstrated bilaterally, more prominent in the right hemiprostate. **b** On US 3 months post-initial PAE, prostate shrinkage can be appreciated. **c** On CEUS 4 years post-initial PAE, there is almost complete prostatic reperfusion and recurrence of prostate enlargement. Patient also reported severe symptomatic

recurrence. **d** On CEUS at the end of rePAE procedure, extensive bilateral prostatic infarction is shown (more extensive than after initial PAE) as a result of additional embolization of a second left prostatic artery that had been overlooked on initial PAE (not shown). Two months post-rePAE, the patient reported more than 50% of symptomatic improvement

enhanced ultrasonography (CEUS) is a versatile imaging modality with which the authors are familiar [1, 4]; CEUS can easily and reliably show prostatic infarction [4, 5], not only at follow-up but also during PAE, shortly after injection of the embolic (Fig. 1). Unfortunately, even if prostatic devascularization is documented on-site, one cannot predict the risk for reperfusion in the future

In summary, the work of Lehrer et al. [1] provides well-documented and relevant information on clinical and angiographic aspects of rePAE. The need for further research in vascular planning, intraprocedural monitoring and embolic materials for PAE is also emphasized.

Funding This work was not supported by any funding.

Declarations

Conflict of interest The author declares that he has no conflict of interest.

Ethical Approval N/A—commentary on a published paper.

Informed Consent For this type of study informed consent is not required.

Consent for Publication N/A—commentary on a published paper.

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