

## Commentary on the Article “Systematic Review and Meta-Analysis Comparing Prostatic Artery Embolisation to Gold-Standard Transurethral Resection of the Prostate for Benign Prostatic Hyperplasia”

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We would like to congratulate the authors for their efforts in comparing safety and efficacy of PAE and TURP and for adhering to current standards for systematic reviews and meta-analyses (PRISMA) [1]. There are two main differences compared to our own meta-analysis published previously [2].

(1) Inclusion of an additional randomized trial with a total of 45 patients and (2) the use of a random-effects meta-analysis instead of fixed-effects. Despite the random-effects approach is discussed controversially [3], we agree that it might be appropriate considering the high heterogeneity of the studies available on PAE so far.

Although there are some minor deviations in the results, consisting rather of differences in significance values than in treatment effects, we were not surprised to see that the bottom line stays the same: PAE is safe and effective in the treatment of lower urinary tract symptoms presumed secondary to benign prostatic obstruction (LUTS/BPO). While subjective improvements (e.g., IPSS) are similar after both techniques, objective outcomes (e.g., urinary stream, post void residual urine) after PAE are inferior to those achieved by TURP.

There is a variety of reasons for LUTS. If we treat the prostate to reduce LUTS, we suspect benign prostatic obstruction to be responsible for these symptoms. As resective techniques remove prostatic tissue instead of just

“shrinking, cooking or pushing it back”, it is obvious that they are more effective than minimally invasive techniques are. Accordingly, a relief of obstruction that is clearly inferior to that achieved by TURP has been demonstrated previously by urodynamic studies, whereas only about one-third of the patients was clearly non-obstructive three months after PAE according to pressure-flow studies [4]. Therefore, if the treatment goal is pure relief of obstruction, PAE definitely does not represent the first choice.

However, we should be aware that patient’s expectations and treatment goals, and therefore their preferred treatment, sometimes differ markedly from the criteria physicians base their recommendation on. Thus, urinary flow has been shown to be associated with the least bothersomeness of all IPSS items in patients suffering from LUTS/BPH, while the fear of complications is often underestimated [5].

Therefore, when aiming for a more patient tailored treatment, the question should not be “What is the best treatment?” but rather “What is the ideal treatment for my individual patient?”. A question that cannot be answered without thoroughly assessing clinical findings and patient’s expectations.

But to answer this question, we also need to know the profile of our treatment options. As confirmed in the review by Knight et al. [1], we can consider PAE as safe and effective in the short to mid-term, while additional data regarding long-term outcomes (> 36 months), re-treatment rates and optimum patient selection would still be helpful to improve individual patient counselling.

Given its safety and efficacy profile, upcoming studies might rather compare PAE to other minimally invasive treatments or even to pharmacotherapy.

Moreover, with regards to a more patient-tailored treatment, TURP should no longer be considered as the

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“gold standard” but rather as a “reference standard”, as more recent resective techniques such as anatomical laser enucleation, laser vaporization, or aquablation of the prostate offer clear specific advantages compared to TURP (e.g. improved hemostasis, preservation of ejaculatory function).

That being said, we should appreciate PAE as a valuable addition to our treatment armamentarium for LUTS/BPH and follow the recommendations of the 2020 guidelines version on male LUTS by the European Association of Urology. Thus, PAE can be offered “to men with moderate-to-severe LUTS who wish to consider minimally invasive treatment options and accept less optimal objective outcomes compared with transurethral resection of the prostate”.

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#### Compliance with Ethical Standards

**Conflict of interest** DA, VZ, LH are investigators in several clinical trials assessing PAE. DA is a member of the working group “Benign Prostate Syndrome” of the German Association of Urology (DGU).

**Consent for Publication** For this type of study, consent for publication is not required.

**Ethical Approval** For this type of study, ethical approval is not required.

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

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