

Reply to: André Moreira de Assis, et al. Effects of Prostatic Artery Embolization on the Dynamic Component of Benign Prostate Hyperplasia as Assessed by Ultrasound Elastography: A Pilot Series

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Dear Editor,

According to de Assis et al. [1], prostatic artery embolization (PAE) seems to significantly improve elasticity of hyperplastic prostatic tissue. We would like to comment that this finding is important not only for the evaluation of the effects of prostatic artery embolization (PAE) on the dynamic component of benign prostate hyperplasia but also for the interpretation of BPH-induced bladder outlet obstruction (BOO).

In fact, the exact mechanism(s) by which BPH generate obstructive lower urinary tract symptoms (LUTS) remains unclear [2]. A new proposal for the pathogenic mechanism of BOO-induced LUTS suggests changes of prostatic elasticity during the development of BPH [3].

The exact mechanism(s) by which PAE resolves mechanical obstruction is unknown [4]; however, given the association of PAEs clinical success with the regained elasticity of prostatic tissue, a hypothetical mechanism involving fibroblasts-mediated remodeling of the prostate is not to be excluded.

In fact, fibroblasts are typically activated following injury and are the main producers of extracellular matrix

proteins, and their role as reparative cells is widely recognized.

Although the post-PAE healing process is not known, it is possibly analogous to that of infarct healing which has been extensively studied: fibroblasts sense microenvironmental alterations following myocardial injury and initiate the inflammatory response. Subsequently, infiltration of the infarct with fibroblasts and endothelial cells occurs. Fibroblasts differentiate then into myofibroblasts which express α -SMA and other contractile proteins [5, 6].

Actually, there are no studies examining long-term prostate tissue histology changes after PAE. However, Camara-Lopes et al. [7] who described early prostate tissue histology changes after PAE reported areas of ischemic necrosis and zones between necrotic and normal prostate tissue characterized by inflammatory reactions containing amounts of proliferated fibroblasts.

Currently, elastic properties, of biomaterials including stiffness or shear modulus, can be investigated by elastography. The last is the only cost-effective and safe specialized imaging-based method available to spatially map strain fields [8]. According to authors, elastography evaluates PAE in the treatment of symptomatic BPH in a more systematic fashion. More elastography-based studies are needed in order to offer insights into BPH pathogenesis.

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Compliance to Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval The study on which this letter refers to was approved by the local human research ethics committee, and all procedures performed involving human participants were in accordance with the ethical standards of the institutional and/or national

research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the abovementioned study.

Consent for Publication Consent for Publication was obtained for every individual person's data included in the abovementioned study.

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