

MAGNETIC RESONANCE GUIDED CATHETER-DIRECTED VENOGRAPHY OF VARICOCELE FOR MINIMAL-INVASIVE INTERVENTIONAL TREATMENT. FIRST-IN-MAN SAFETY AND FEASIBILITY RESULTS.

Dr. med. Alexander Massmann MD; Malgorzata Wolska-Krawczyk MD; Dr. med. Peter Fries MD; PD Dr. rer. nat. Dr. med. Günther K. Schneider MD PhD; Prof. Dr. med. Arno Bücker MD

Saarland University Hospital, Clinic of Diagnostic and Interventional Radiology, Kirrbergerstraße, 66421 Homburg/Saar, Germany

Purpose: Varicocele is a pathologic dilatation of the internal spermatic veins and pampiniform plexus predominantly in young adults, causing pain, impaired testicular growth or atrophy, and male infertility. X-ray based fluoroscopy and Digital Subtraction Angiography (DSA) is routinely used for catheter guidance and therapy. In contrast, MR-venography (MRV) is an alternative imaging technique lacking ionizing radiation exposure. Hence, the aim of this study was to evaluate safety and feasibility of MR-guided catheter-directed venography of symptomatic varicocele.

Materials and Methods: After local ethics committee agreement, in-vitro testing MRI compatibility of materials necessary for vascular access and catheter-directed venography, five patients (17-22 years) underwent percutaneous varicocele treatment. Via a 5F sheath in the right femoral vein, a 5F hydrophilic catheter was inserted into the left spermatic vein under X-ray fluoroscopy. Iodinated contrast media (10 ml á 2 ml/s Imeron 300, Bayer Schering, Germany) was injected to confirm the correct catheter position and visualization of varicose spermatic vein by DSA. Afterwards, the patient was transferred into a 1.5 T MR scanner (Aera, Siemens Medical, Germany) adjacent to the angiography suite. Contrast-enhanced MRV was performed via the intravenously placed catheter with 3D-GRE FLASH breath-hold sequences (20 ml á 2 ml/s of 10%, 5% and 2.5% diluted Gadolinium-DOTA Dotarem, Guerbet, France). After completion of MRV, the patient was re-transferred into the angiography suite for usual varicocele treatment with Polidocanol (Aethoxysclerol) 3%.

Results: Catheter-directed MRV was technically successful in 100%. There were no catheter dislocation, interference or complication. DSA and MRV revealed similar depiction of dilated venous plexus, spermatic vein and its aberrant branches. Even using the highest contrast media dilution (Gadolinium-DOTA 2.5%), delivered sufficient image quality. The additional MRV extended the duration of the complete procedure by 20 minutes. Initial technical success of varicocele treatment was 100%.

Conclusion: Catheter-directed MRV for visualization of symptomatic varicocele is safe and technically feasible. Comparable image quality of

spermatic vein and pampiniform plexus anticipates MRV as a non-ionizing modality for future imaging in varicocele treatment.