MIETHKE GAV 2.0

Tests were performed on the gravitational valve MIETHKE GAV 2.0 using well-accepted techniques to assess magnetic field interactions (translational attraction and torque, 3 Tesla), MRI-related heating (1.5-T/64-MH and 3-T/128-MHz, whole body averaged SAR, 2.7-W/kg and 2.9-W/kg, respectively), artifacts (3-Tesla; gradient echo and T1-weighted, spin echo sequences), and possible functional changes related to exposures to different MRI conditions (exposing six samples each to eight different pulse sequences at 1.5-T/64-MHz and 3-T/128-MHz).

Magnetic field interactions were not substantial (deflection angle 2°, no torque) and heating was minor (highest temperature rise, ≥1.9°C, highest background temperature rise, ≥1.7°C). Artifacts on the gradient echo pulse sequence extended approximately 10mm from the size and shape of the GV. The different exposures to 1.5-T/64-MHz and 3-T/128-MHz conditions did not alter or damage the operational aspects of the GV samples.

The findings demonstrated that MRI can be safely used in patients with this GV and, thus, this metallic implant is deemed acceptable or “MR Conditional” (i.e., using current labeling terminology), according to the conditions used in this study [1)].

1)
Moghtader D, Crawack HJ, Miethke C, Dörlemann Z, Shellock FG. Assessment of MRI issues for a new cerebral spinal fluid shunt, gravitational valve (GV). Magn Reson Imaging. 2017 Dec;44:8-14. doi: 10.1016/j.mri.2017.07.018. Epub 2017 Jul 20. PMID: 28735732.