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Abstracts

vascular aneurysms with assistance from an external magnetic field.

Method. Magseal[®] (APG Medical, Newbury UK) consisting of nanoparticles of magnetite have been developed to provide microcapsules (1.4 µm diameter) which are stable in saline, can be administered intravascularly, and are magnetically active.

Using an established animal model for examining vascular aneurysms (1), Magseal (1–2 ml) was introduced by an angiographically directed microcatheter placed within the aorta and directed towards the neck of the aneurysm in three separate rabbits, each with a surgically manufactured common carotid aneurysm. During Magseal administration, a magnetic fields (0.013 Tesla/mm) was applied along the long axis of the aneurysm. One hour after application the aneurysms were re-evaluated angiographically. A further angiogram was planned at 4 weeks after which animals were sacrificed and comprehensive histological examination undertaken.

Results. Aneurysms showed complete acute obliteration in two, and partial (80%) in one. On removal of the magnetic gradient the degree of occlusion remained unchanged.

One animal died within 2 weeks of the experiment for unknown reasons. Histological evaluation showed persisting obliteration with thrombus formation and granulomata. In the remaining 2 surviving animals, angiography at 4 weeks showed recanalization of the aneurysm.

Multi-organ histological examination did not identify any adverse findings.

Conclusion. Magseal can be magnetically directed into vascular aneurysms allowing short term obliteration. Although the method has yet to show reliable long term stability, these experiments provide the proof of concept encouraging further investigation of intravascular magnetic compounds.

FP29.2. Use of magnetically steered nanoparticles to treat vascular aneurysms – a proof of concept study

P. J. Kirkpatrick¹, A. Spiegelberg², T. Krings³

¹ Addenbrooke's Hospital, UK

² APG Medical Ltd

³ Klinikum der RWTH, Germany

Objective. To develop a method whereby intra-arterial administration of magnetic nanoparticles are navigated into the lumen of