PRECISE TRACKING OF NOVEL SUSTAINED RELEASE ANGIogenic PEPTIDE-LINKED MICROSERIES IN A SWINE MYOCARDIAL INFARCTION MODEL

ACC Poster Contributions
Ernest N. Morial Convention Center, Hall F
Monday, April 04, 2011, 9:30 a.m.-10:45 a.m.

Session Title: Angiogenesis and Cytokines
Session-Poster Board Number: 1076-111

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Background: Bolus doses of angiogenic peptides like FGF/VEGF have not proven effective in clinical trials. Angiogenic peptide linked microspheres releasing growth factors over a long period of time have produced sustained angiogenesis in animal models. However, there remains a lack of ability to track these agents in vivo to better understand their bio-distribution over time.

We present a technique where we inject superparamagnetic iron oxide (SPIO) and Barium labeled microspheres to precisely track them in a swine MI.

Methods: Microspheres were fabricated via a water/oil/water emulsion and incubated in a solution of simulated body fluid that included either BaSo4 or FeRex for 10 days at 37 °C after which they were lyophilized in powder form.

In vitro: Dose escalation study was done using .3ml injections through a 25g needle over 30 seconds into a phantom steak followed by Xray and MRI.

In vivo: Microspheres (10mg) coated with barium and with FeRex + .1 ml tissue dye were co-injected intramyocardially (.7ml) in normal heart tissue in 3 locations. Post procedural MRI was taken to localize injections and compared to sites on necropsy.

Results: In vitro: SPIO labeled (A) and Barium (B) labeled microspheres were seen at a minimum dose of 3mg on Xray and MRI resp. Non labeled microspheres showed no signal.

In vivo: SPIO labeled microspheres (C) were discretely seen in 3 locations on MRI and confirmed on necropsy.

Conclusions: Proof of concept for precise long term tracking of Sustained Release Microspheres is demonstrated.