MYOCARDIAL ISCHEMIA AND INFARCTION

TRANS-ILIAC RAT AORTA STENTING MODEL: A NOVEL HIGH THROUGHPUT PRECLINICAL STENT MODEL FOR RESTENOSIS AND THROMBOSIS

ACC Poster Contributions
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Background: Preclinical stent development requires elaborate large animal models which are time consuming and expensive. We herein report a high throughput rat aorta stenting model which could provide a rapid and low-cost platform for preclinical stent development.

Methods: 74 metal stents (316L stainless steel 13mm, VasoTech, Inc.) coated with various polymers were pre-mounted on 1.5mm x 15mm balloon catheters and were implanted into aspirin treated Sprague-Dawley rats (475±35g) initially using direct access of abdominal aorta (Group A, n=7) then using trans-iliac approach (cut-down, Group B, n=67). The surviving rats were sacrificed at either one month or three months post implantation and the stented arteries were harvested, pressure fixed and analyzed.

Results: Four rats died in group A and 20 rats died in group B within 48 hours post stent implantation (mortality of 43% vs.30 %, p=0.03). All animals that died had stent thrombosis/paralysis with visible thrombus on necropsy. After surviving peri-operative period mortality was 0% with follow up of 1-3 months. Histologically, stented arteries had a thin layer of neointima formation at one month that did not progress at 3 months.

Conclusions: This study suggests that human-sized stents can be successfully implanted into the rat aorta via iliac artery insertion with good survival allowing rapid (1-3 months) assessment of stent efficacy with mortality/paralysis used as indicators of stent thrombosis. The use of dual antiplatelets may improve acute survival. This model will enable testing in diseased (diabetic, athereosclerotic, hypercholesterolemic rats) and transgenic/knockout rat models.