



ACC.14

TCT@ACC-i2 | innovation in intervention

A1755

JACC April 1, 2014

Volume 63, Issue 12



## TCT@ACC-i2: The Interventional Learning Pathway

### IMPACT OF POLYMER COATINGS ON VASCULAR HEALING IN THE ABSENCE OF ANTI-PROLIFERATIVE DRUGS IN A PORCINE MODEL OF CORONARY STENTING

Poster Contributions

Hall C

Saturday, March 29, 2014, 10:00 a.m.-10:45 a.m.

Session Title: Stem Cell Therapies and Translational Research

Abstract Category: 44. TCT@ACC-i2: Translation and Pre-clinical Research

Presentation Number: 2102-311

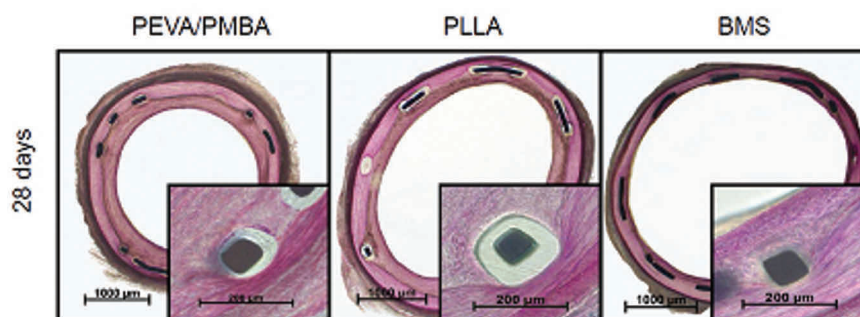
Authors: *Tobias Koppa, Eric Wittchow, Robert Byrne, Gerd Bayer, Tobias Diener, Michael Joner, Deutsches Herzzentrum Muenchen, Munich, Germany, Biotronik SE & Co., Erlangen, Germany*

**Background:** In the absence of anti-proliferative drugs (APD), the specific contribution of polymer coatings to vascular reactions remains poorly defined. Objective: To examine the comparative healing response after implantation of stents coated with permanent or biodegradable polymer and uncoated stents in a porcine model of coronary artery stenting.

**Methods:** Juvenile pigs were randomly allocated to implantation of stents coated with permanent polymer (PP, methacrylate-based, n=10), biodegradable polymer (BP, poly-lactic acid-based, n=10) or bare metal control stents (n=10), in the absence of APD. At 28 days, animals were sacrificed and specimens prepared for histopathologic assessment.

**Results:** A total of 30 stents were implanted in 28 pigs. At 28 days endothelialization was complete in all treatment groups. In terms of vessel wall inflammation, PP stents showed significantly increased inflammatory scores compared with BP coated (p=0.03) and uncoated stents (p=0.02). There was also significantly greater neointimal growth with PP coated stents compared with uncoated stents (p=0.02).

**Conclusion:** In the absence of anti-proliferative drugs, stents coated with methacrylate-based PP, but not with poly-lactic acid-based BP, provoked significant vessel wall inflammatory reactions and increased neointimal growth compared with uncoated stents. The use of biodegradable polymer coatings may be the preferable approach to facilitate drug elution with a minimum of vessel wall toxicity.



Histological overview images (x40 magnification, Verhoeff van Gieson staining) and x200 magnified images (inserts, Hematoxylin/Eosin staining) showing bare metal control stents and stents with permanent Poly(n-butyl methacrylate) (PBMA)/ Poly(ethylene vinyl acetate) (PEVA) polymer coating as well as stents with biodegradable Poly L-lactic acid (PLLA) polymer coating at 28 days.