

# STENT COATING WITH TITANIUM-NITRIDE-OXIDE FOR REDUCTION OF NEOINTIMAL HYPERPLASIA IN THE PORCINE MODEL

## BACKGROUND

Coronary stents prevent constrictive arterial remodeling but stimulate neointimal hyperplasia. Stainless steel induces a metallic foreign body reaction, which is absent for titanium. The hypothesis of the present study was that titanium-nitride-oxide modifies biologically the stent surface to reduce platelet adhesion and fibrinogen binding.

## METHODS AND RESULTS

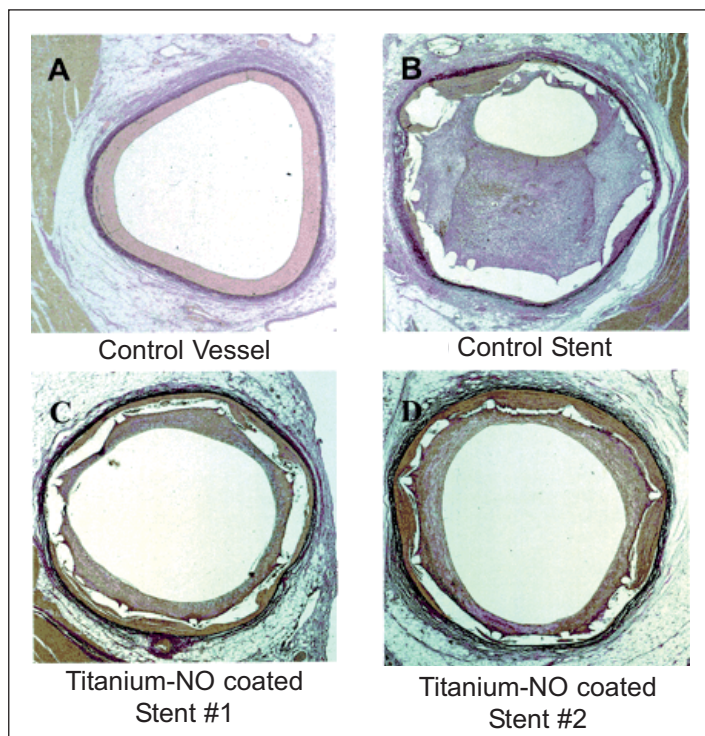
Twelve pigs were instrumented with a stainless steel and a titanium-nitride-oxide coated stents of similar design. Animal were restudied after 6 weeks. Histological specimens of stented segments were analyzed by digital morphometry. Platelet adhesion and fibrinogen binding studies were performed in a perfusion chamber.

Under in vitro conditions, titanium-nitride-oxide coated stents compared with stainless steel showed significant reductions in:

- platelet adhesion ( $P < 0.05$ ),
- platelet adhesion 48 hours after incubation with human plasma ( $P < 0.05$ ),
- fibrinogen binding ( $P < 0.05$ ).

Histomorphometry revealed a significantly larger neointimal area in stainless steel ( $2.61 \pm 1.12 \text{ mm}^2$ ) than in titanium-nitride-oxide coated stents ( $1.47 \pm 0.84 \text{ mm}^2$ ;  $P < 0.02$  &  $1.39 \pm 0.93 \text{ mm}^2$ ;  $P < 0.02$ ).

The reductions were respectively of 44% and 47%.



*Low-magnification photomicrograph of 4 different vessel segments:*

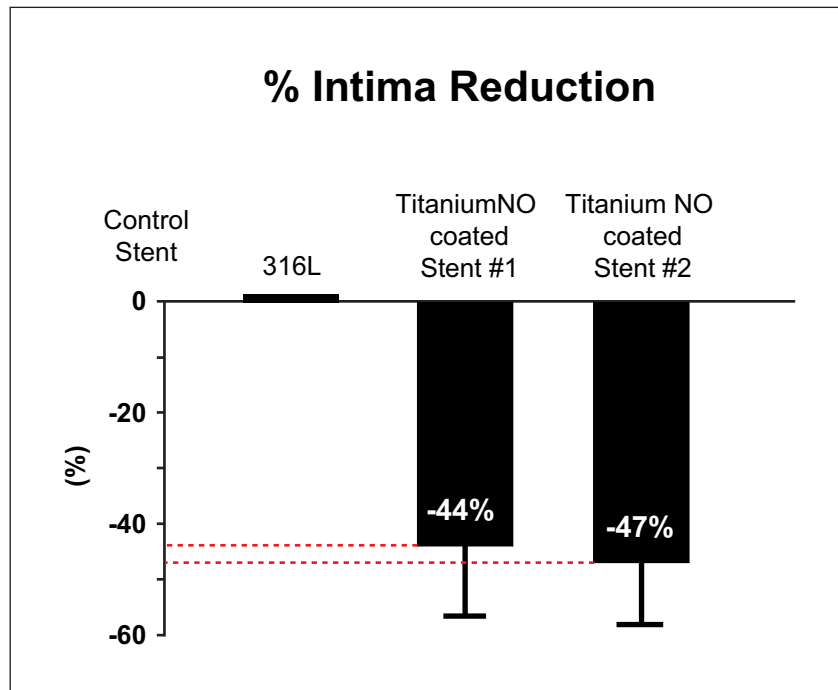
*A, Control segment with normal 3-layer vessel structure.*

*B, Stented segment (uncoated control) with severe neointimal hyperplasia showing near obliteration of lumen.*

*C, D, Stented segments (with titanium-nitride-oxide coated stents) with reduced neointimal hyperplasia.*

# STENT COATING WITH TITANIUM-NITRIDE-OXIDE FOR REDUCTION OF NEOINTIMAL HYPERPLASIA IN THE PORCINE MODEL

## METHODS AND RESULTS



## CONCLUSION

- Titanium-nitride-oxide coating significantly reduces in-stent neointimal hyperplasia up to 47% demonstrating a true antiproliferative effect.

## EXPERTS

Stephan Windecker - Isabella Mayer - Gabriella De Pasquale - Willibald Maier - Olaf Dirsch - Philip De Groot - Ya-Ping Wu - Georg Noll - Boris Leskosek - Bernhard Meier - Otto M. Hess



**HEXACATH**

4, Passage Saint Antoine  
92508 Rueil-Malmaison Cedex - France  
Tél. +33 (0)1 41 39 01 92 - Fax. +33 (0)1 41 39 01 93  
www.hexacath.com

**Circulation**

JOURNAL OF THE AMERICAN HEART ASSOCIATION

Circulation - 2001 ; 104:928-933