

Grand Vision for BRS Future: Natural History and Clinical Implication

April 27 2016 2:24-2:32 PM

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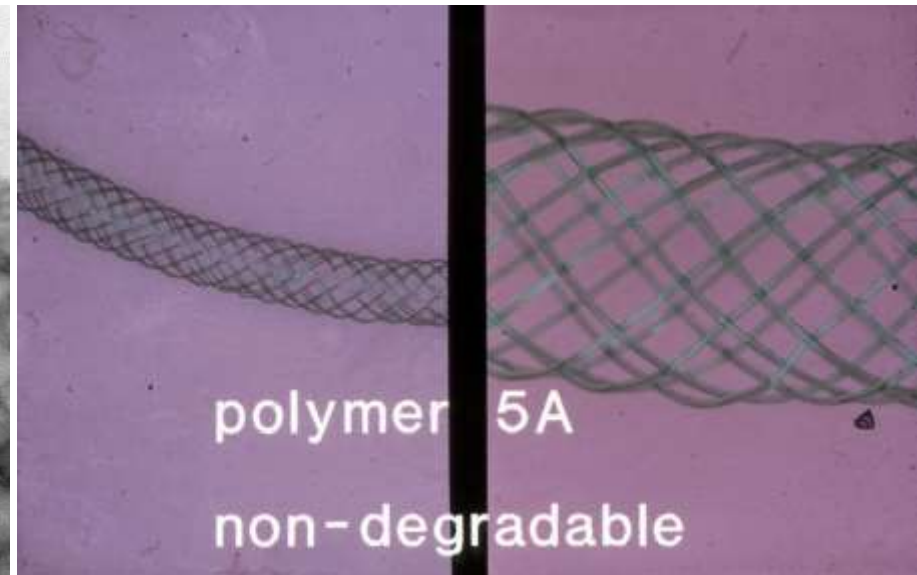
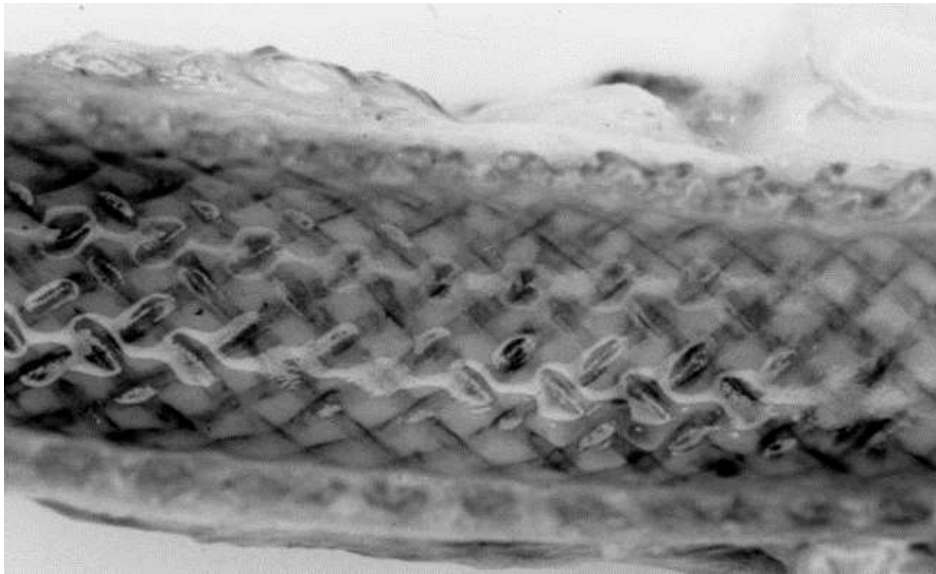
Development of a Polymer Endovascular Prosthesis and its Implantation in Porcine Arteries

WILLEM J. VAN DER GIESSEN, M.D., CORNELIS J. SLAGER, M.Sc., HELEEN M.M. VAN BEUSEKOM, M.Sc., DORETTE S. VAN INGEN SCHENAU, RUUD A. HUIJTS, Ph.D.,* JOHAN C. SCHUURBIERS, B.Sc., WILLEM J. DE KLEIN, Ph.D.,** PATRICK W. SERRUYS, M.D., and PIETER D. VERDOUW, Ph.D.

*From the Department of Cardiology, Thoraxcenter, Erasmus University Rotterdam, Rotterdam, *Akzo Research Laboratories and **Akzo Fibres B.V., Arnhem, The Netherlands*

Van der Giessen, et al. J Interven Cardiol. 1992;5:175-185

PETP self expanding stent



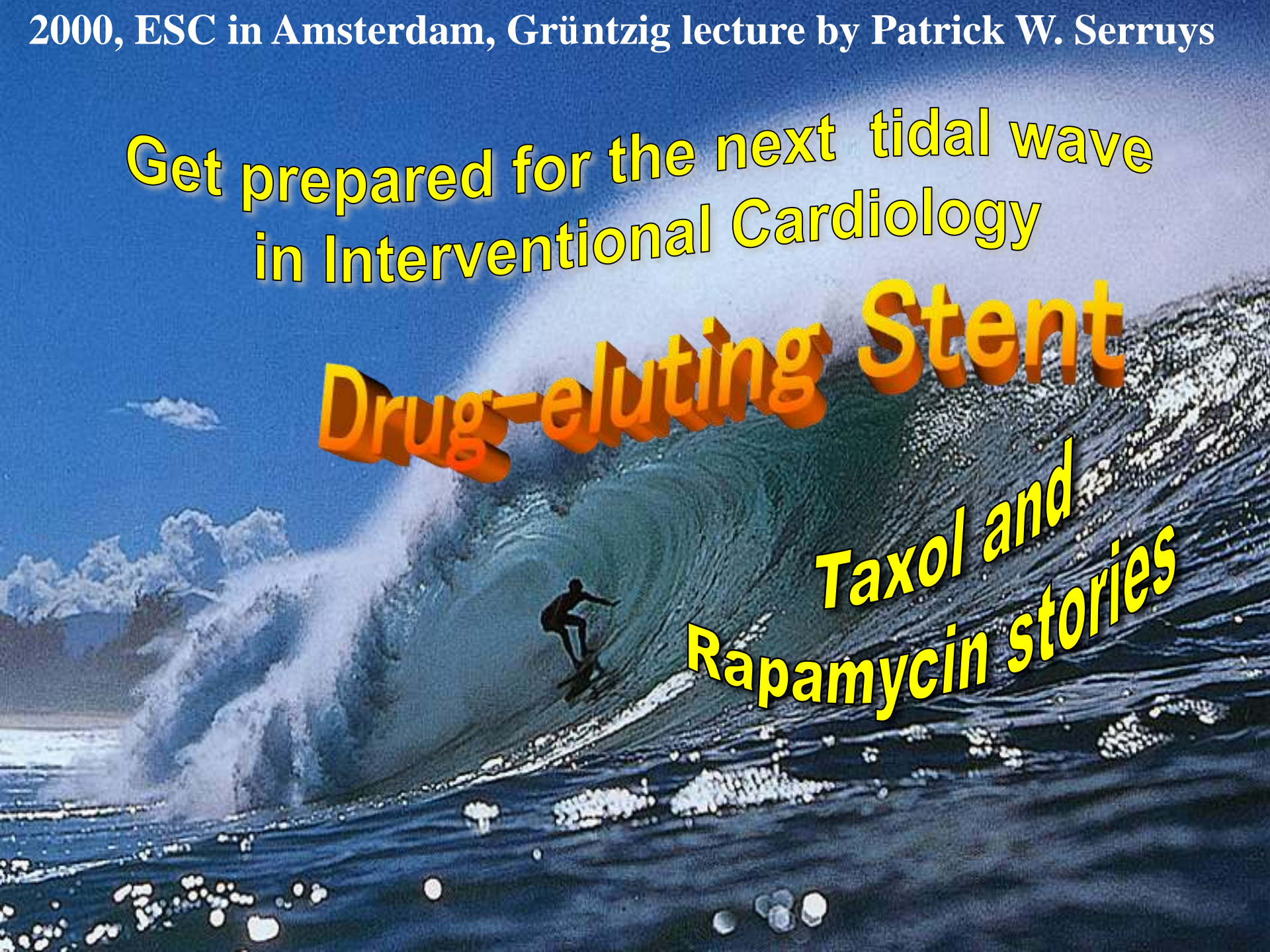
Macroscopic specimen of polyester (PETP) stent 4 weeks after implantation in normal, porcine femoral arteries.

2000, ESC in Amsterdam, Grüntzig lecture by Patrick W. Serruys

Get prepared for the next tidal wave
in Interventional Cardiology

Drug-eluting Stent

**Taxol and
Rapamycin stories**



Get prepared for the next tidal wave
in Interventional Cardiology

Bioreabsorbable scaffold



Circulation

JOURNAL OF THE AMERICAN HEART ASSOCIATION

European Perspectives in Cardiology



“We Are Entering the Fourth Revolution. I Predict That by 2011–2012, the Workhorse of Percutaneous Cardiovascular Intervention Could Be the Fully Biodegradable Drug-Eluting Stent”

Patrick W. Serruys, MD, PhD, FACC, FESC, professor and head of the Interventional Cardiology Department of the Thoraxcenter, the Erasmus Medical Center, Rotterdam, the Netherlands, talks to Barry Shurlock, MA, PhD.

By 2020, only a minority of patients will receive a permanent metallic implant

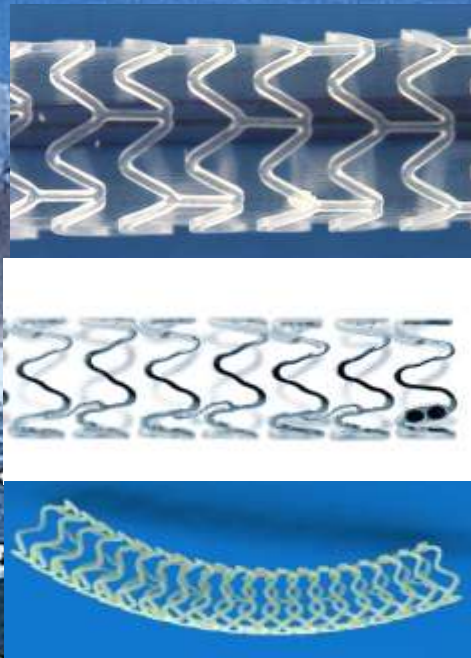
Bioresorbable scaffold

PLLA

Magnesium

Tyrosine polycarbonate

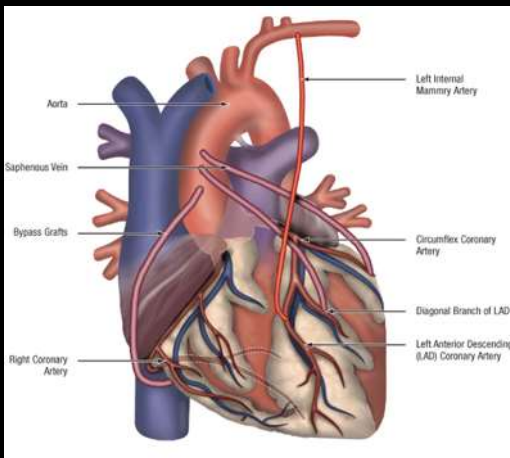
WHY?



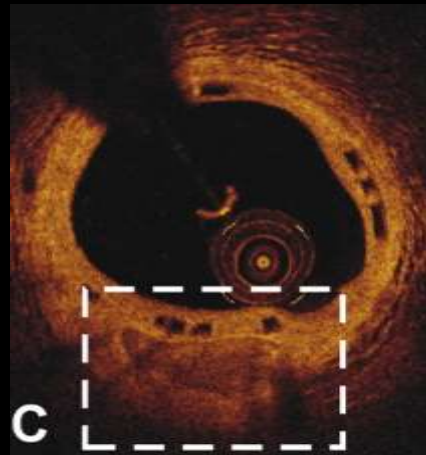
Why BRS may change the landscape of coronary intervention ?

Trifecta in coronary revascularization

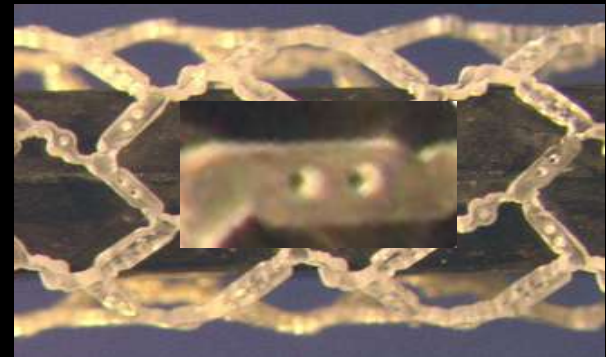
**Endoluminal bypass
(vs. conventional
bypass)**



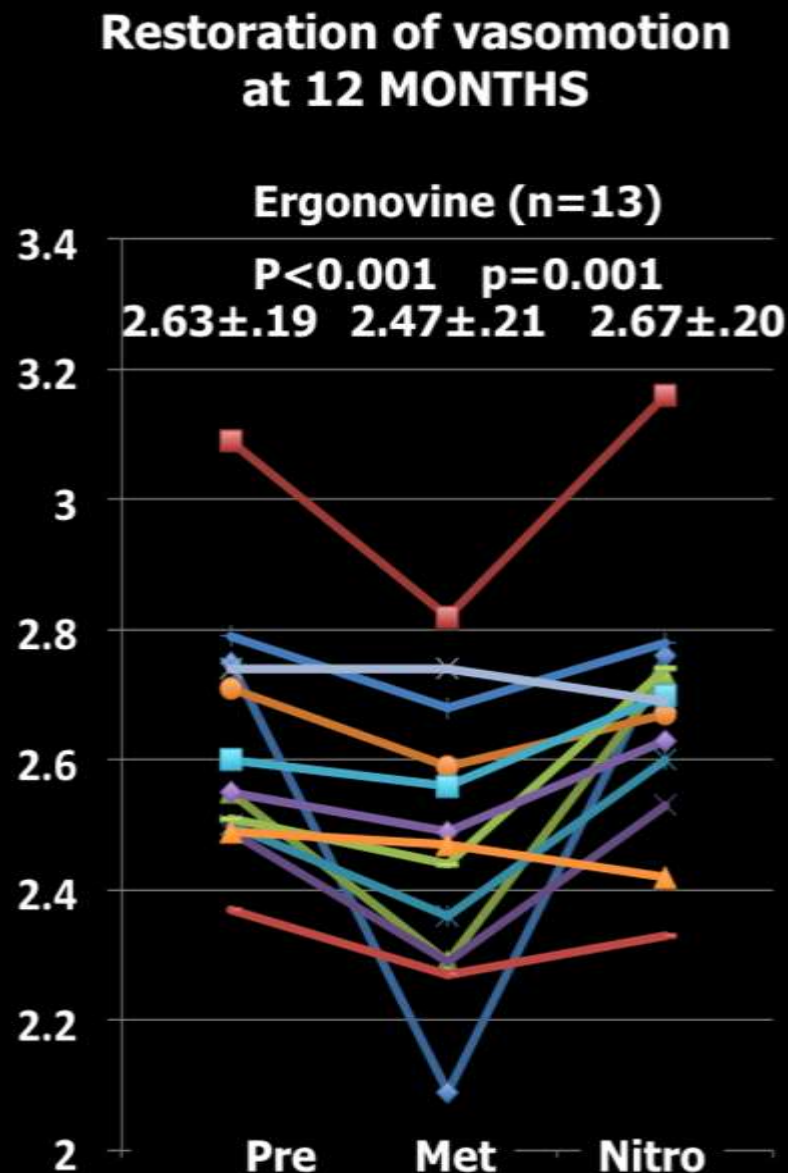
**Preventive PCI
By sealing plaques**



**Bioresorbable
reservoir for specific
indications
(e.g. STEMI)**

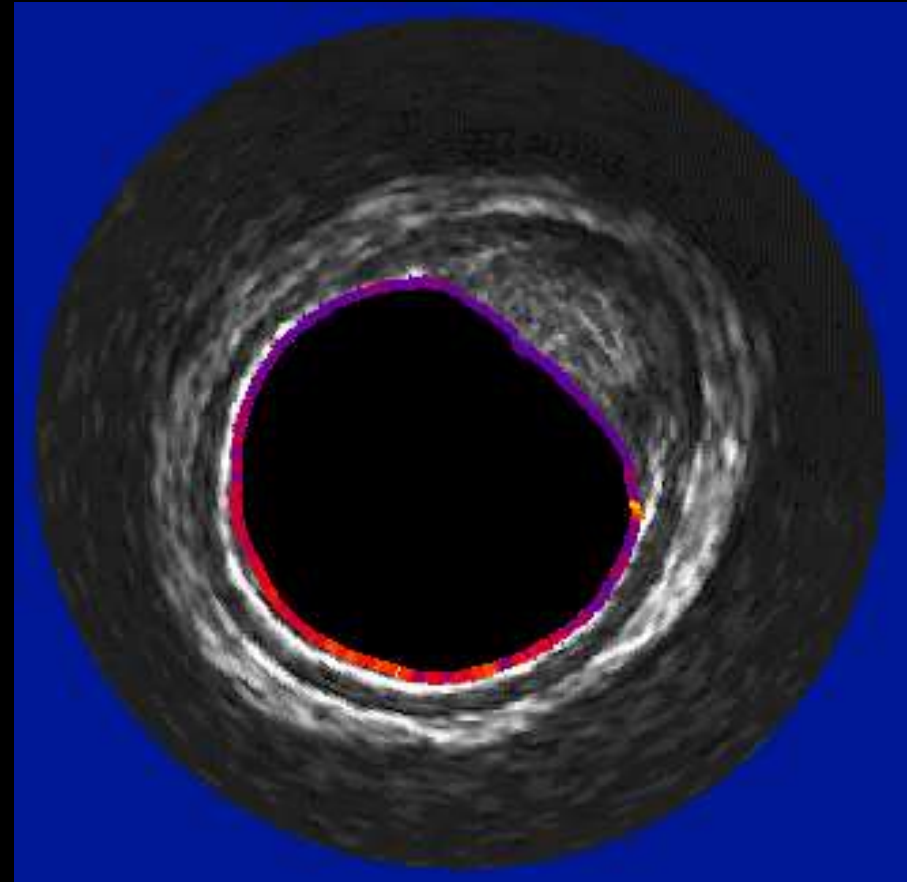


- **Disappearance of mechanical integrity and return of vasomotion (6 to 12 months)**
- **Return of cyclic strain and mechanotransduction**
- **Normalization of endothelial shear stress**
- **Potential for non-invasive imaging**
- **Restoration of contractile phenotype of smooth muscle cells (SMC) with normalized gene expression of endothelium and SMC**
- **Late lumen enlargement and remodeling**
- **Plaque media regression**
- **Shielding and recapping of plaque**
- **Potential indication of STEMI**
- **Reduction of late events**

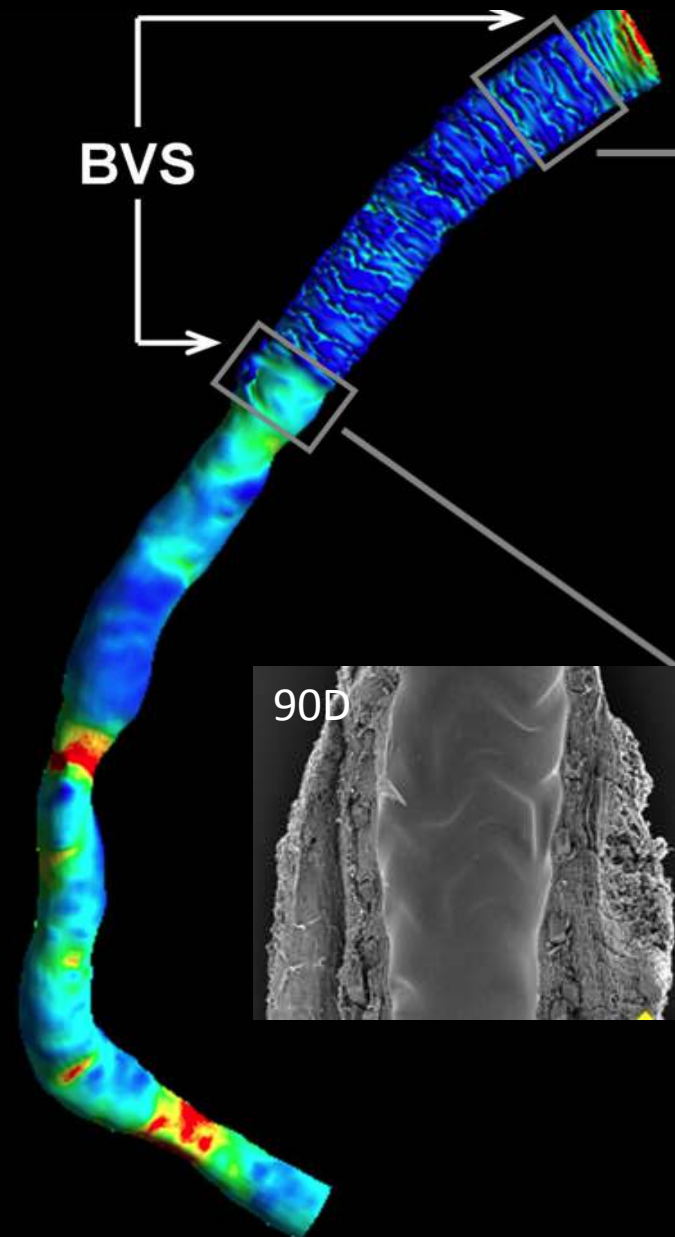
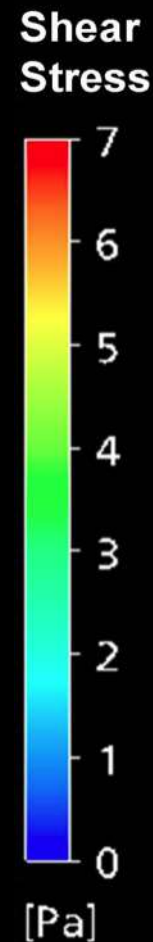


Lancet 2009, JACC 2011

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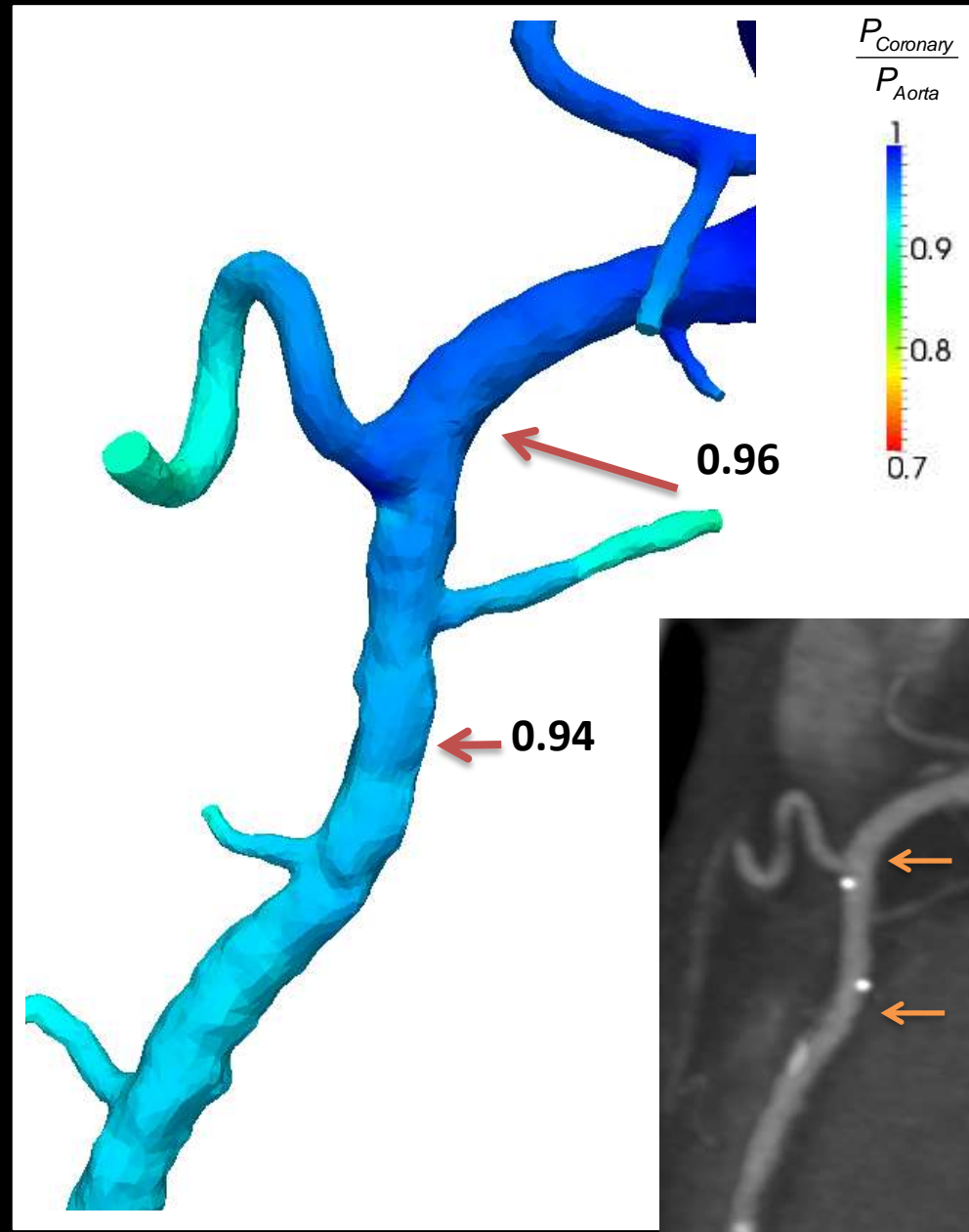


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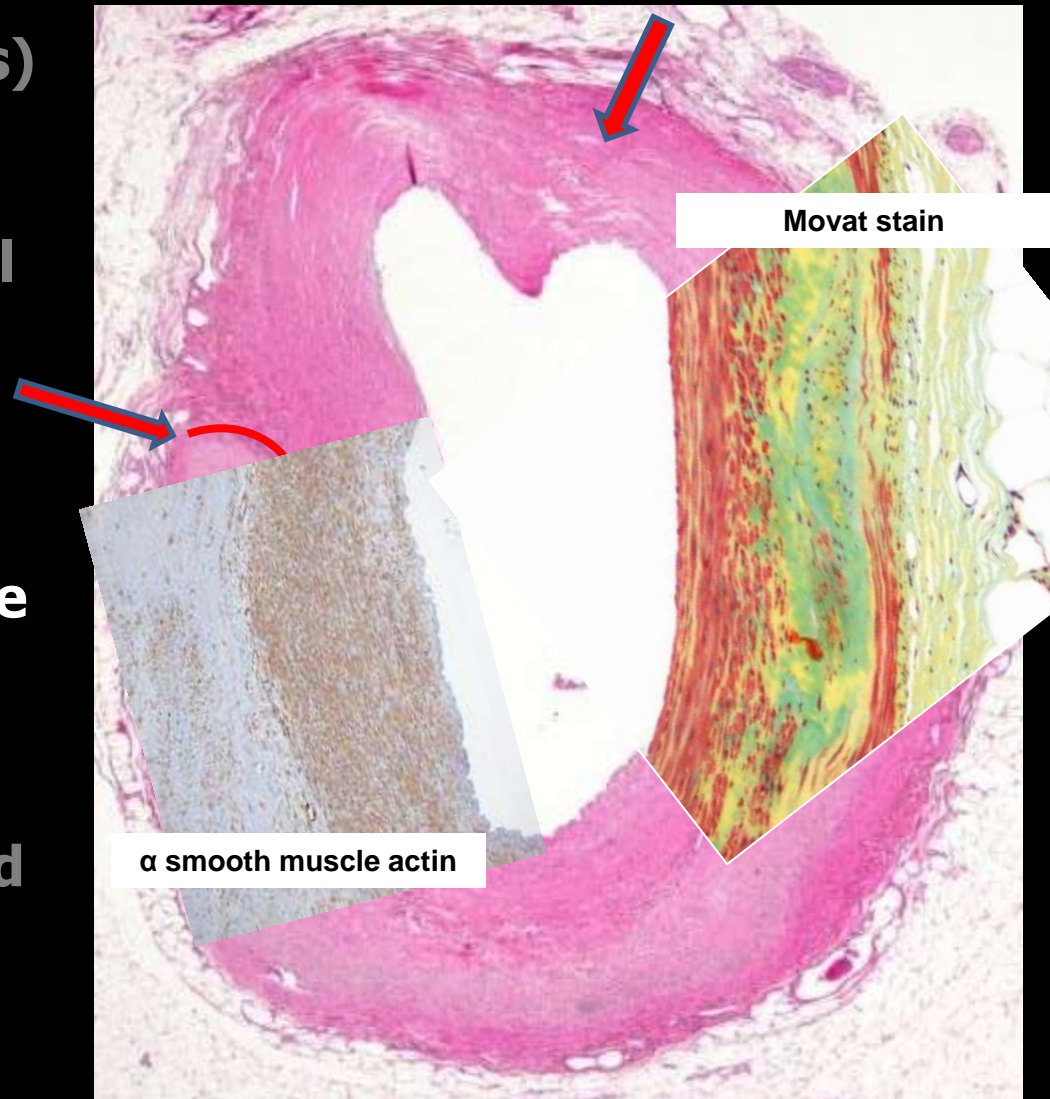


JACC intervention 2014

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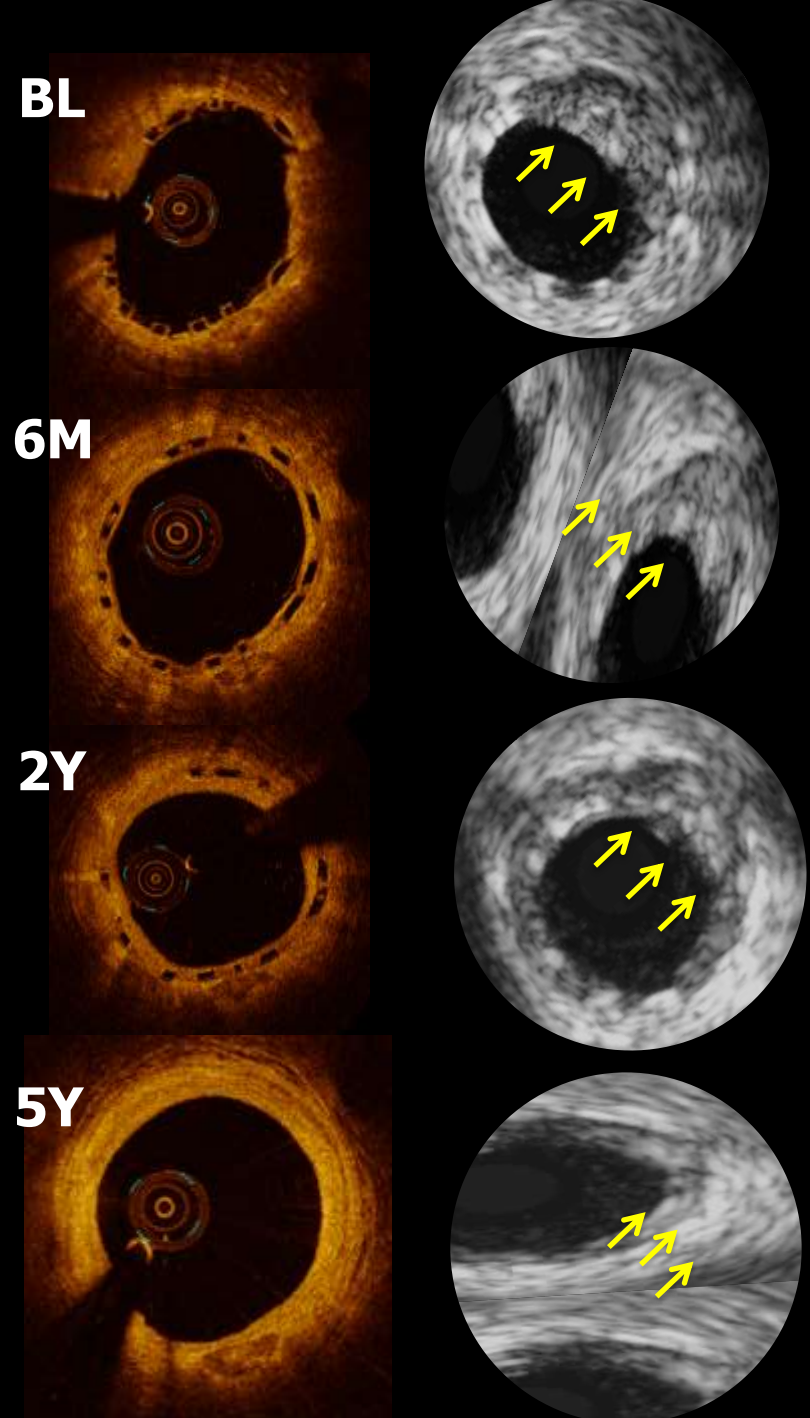


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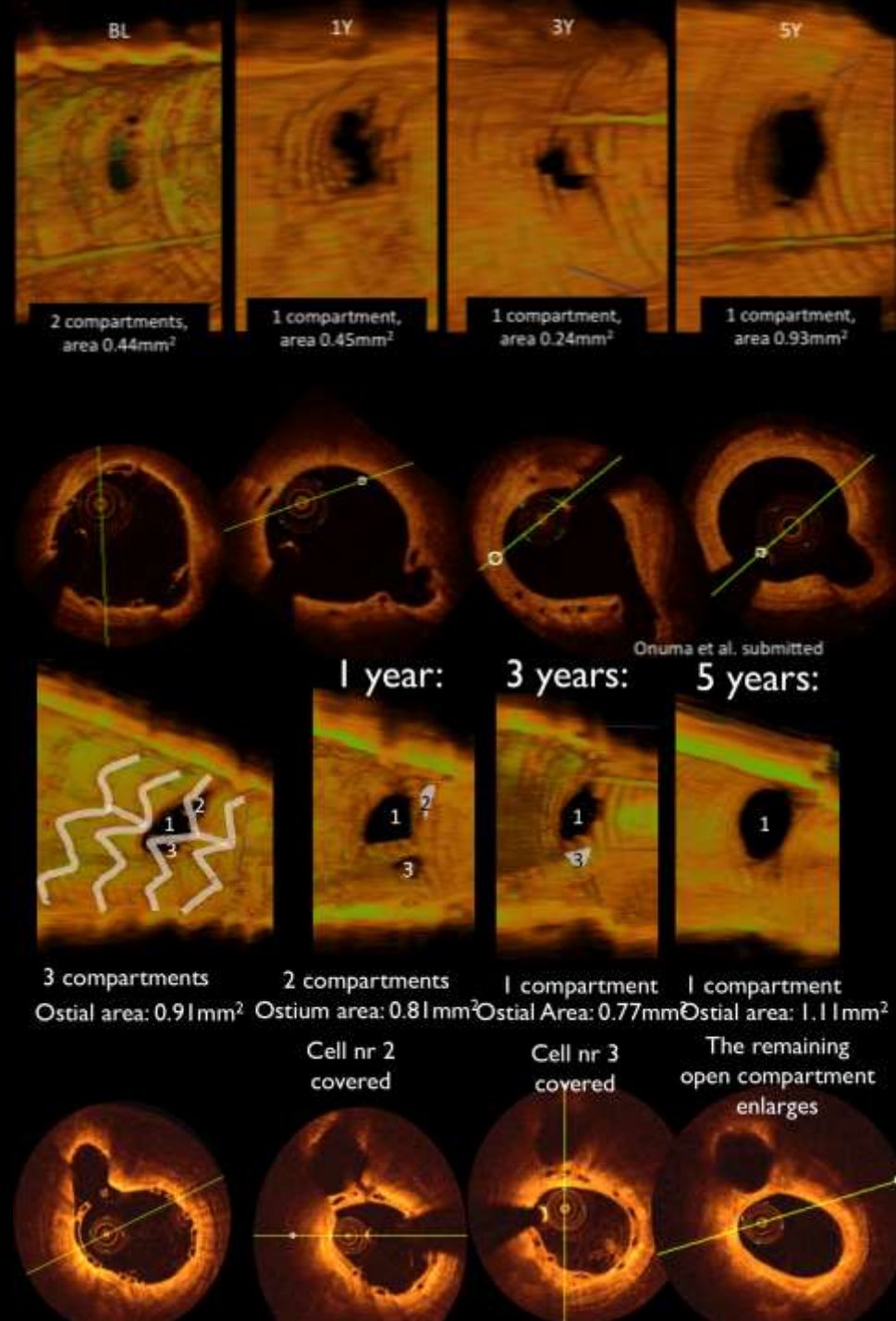


Neomedia?

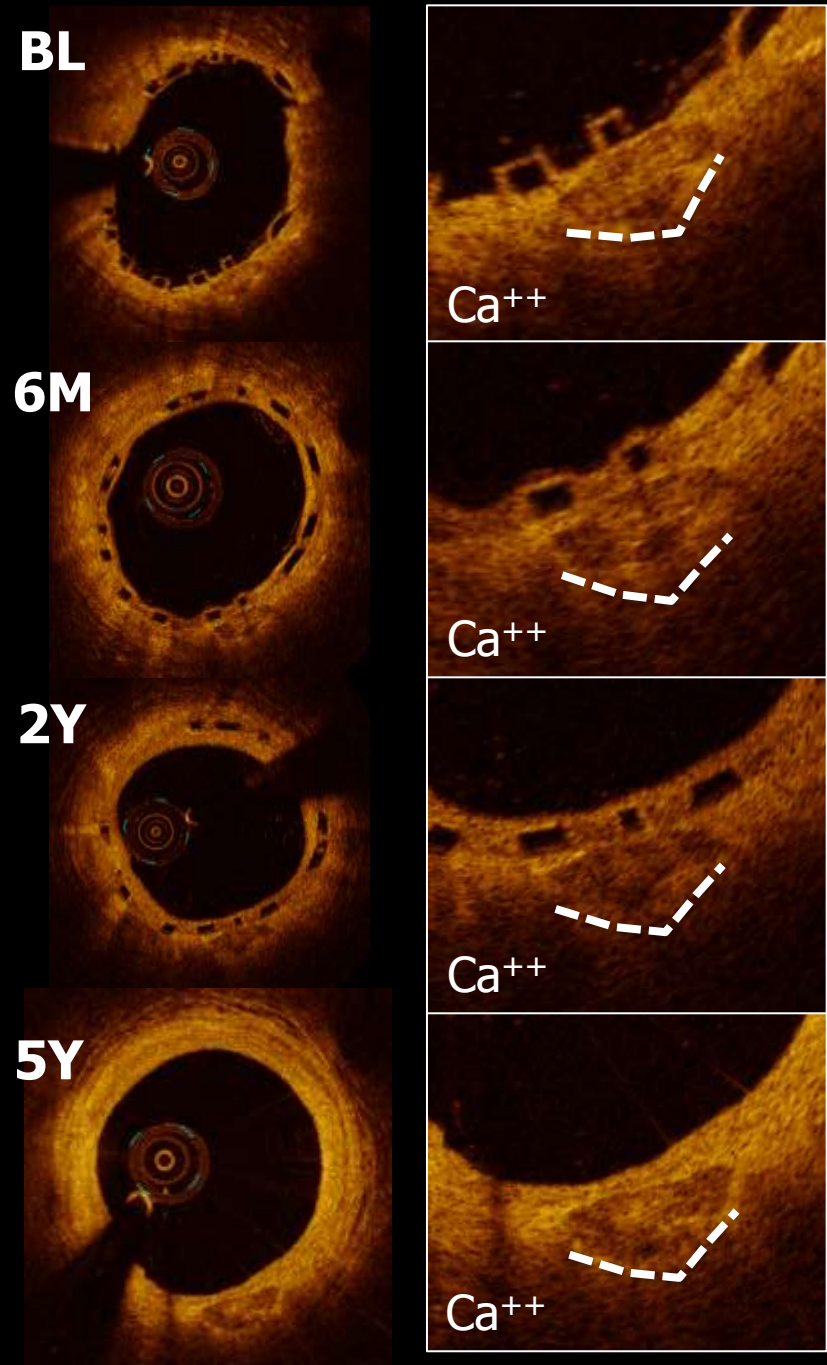
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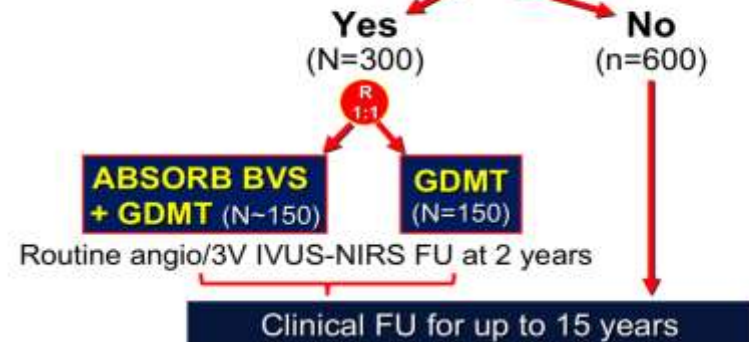
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PROSPECT II Study PROSPECT ABSORB RCT

900 pts with ACS after successful PCI
3 vessel IVUS + NIRS (blinded)

≥1 IVUS lesion with ≥65% plaque burden present?

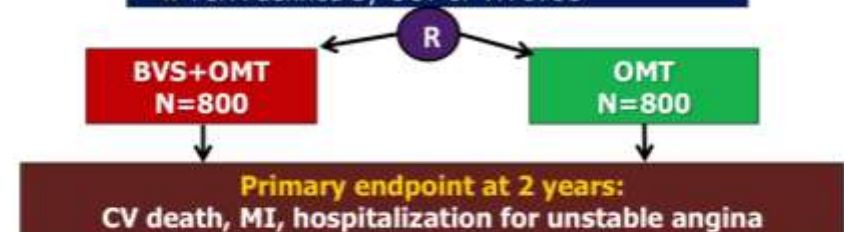


The PREVENTive Implantation of Bioresorbable Vascular Scaffold on Stenosis Functionally Insignificant with signs of Vulnerability

PREVENT Trial (n=1600)

Any Significant Epicardial Coronary Stenosis (DS>50%) (ACS and non-ACS) with FFR >0.80 and with Two of the following

1. MLA <4.0 mm²
2. Plaque Burden at MLA site >70%
3. Lipid-Rich Plaque on NIRS ($_{max}LCBI_{4mm}$ >500)
4. TCFA defined by OCT or VH-IVUS

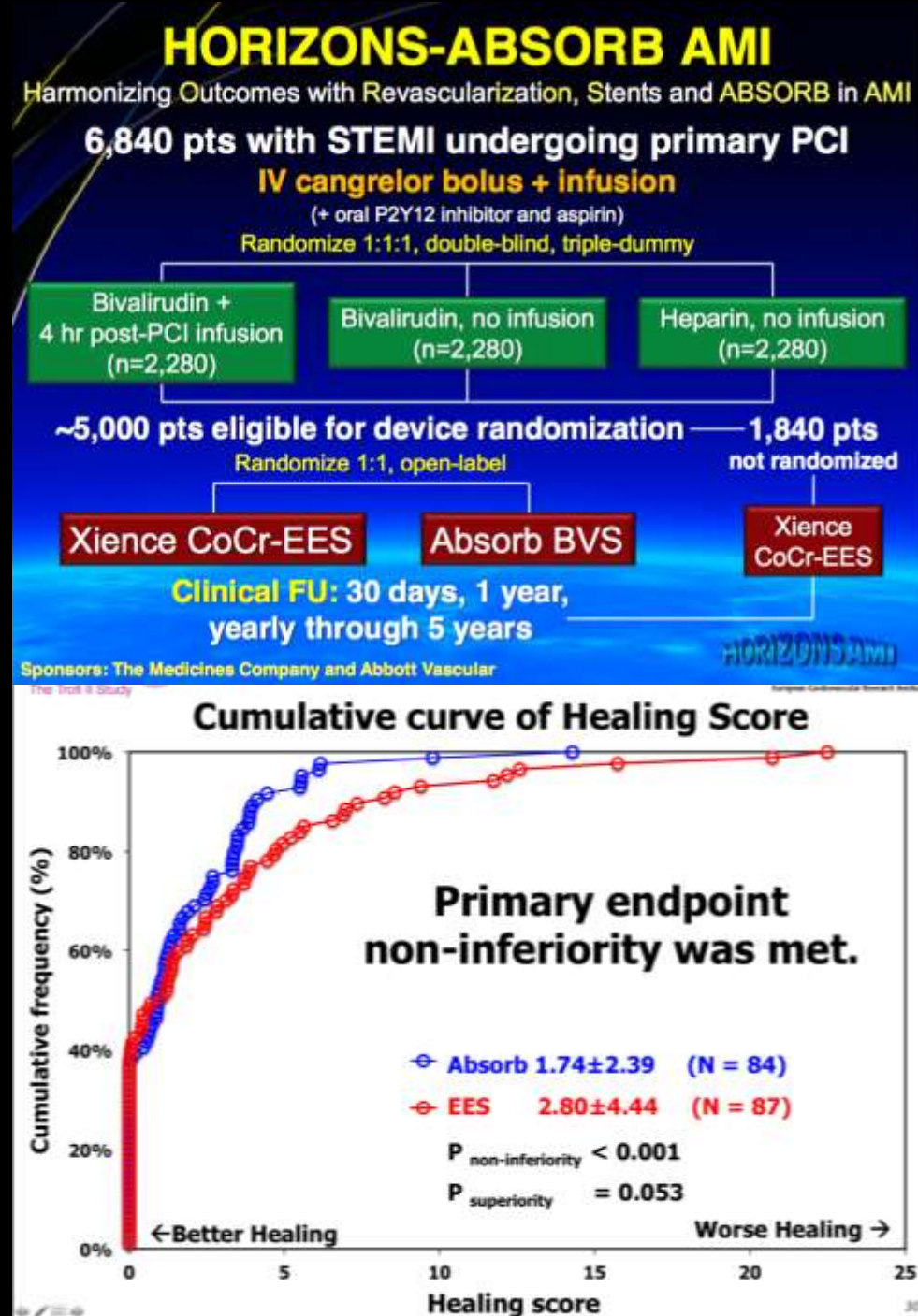


TCFA

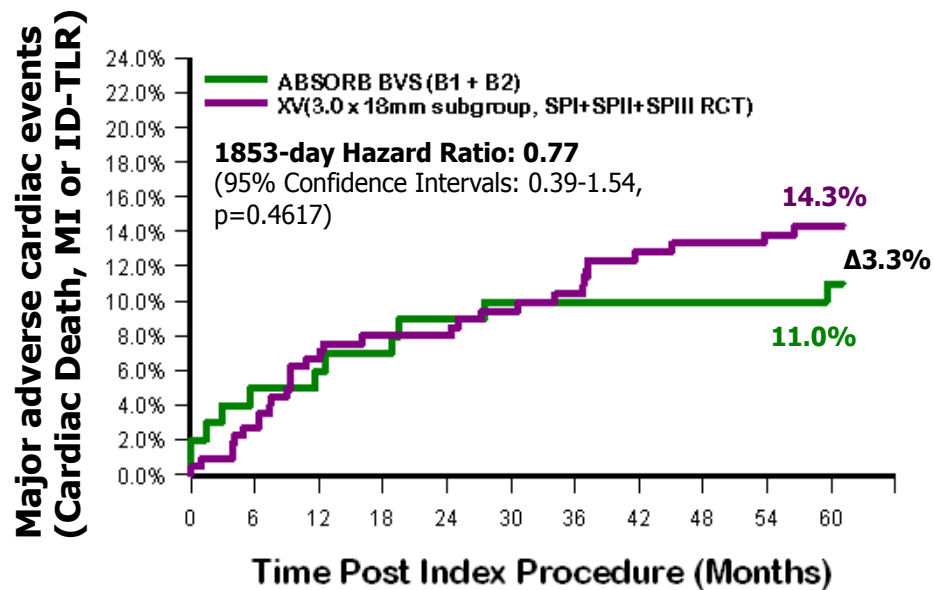
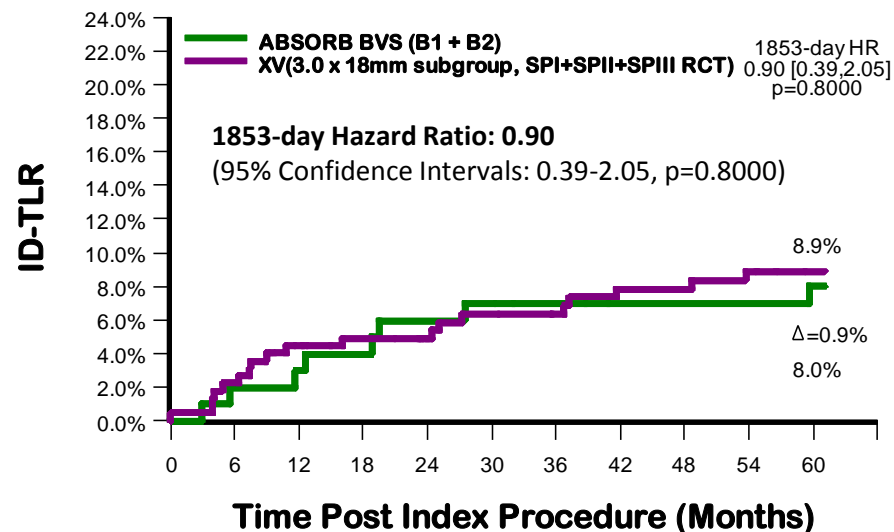
- OCT definition: fibrous cap thickness <65 μm and arc >90°
- VH-IVUS definition: ≥10% confluent NC with >30° abutting to the lumen in 3 consecutive slices

PI: SJ Park

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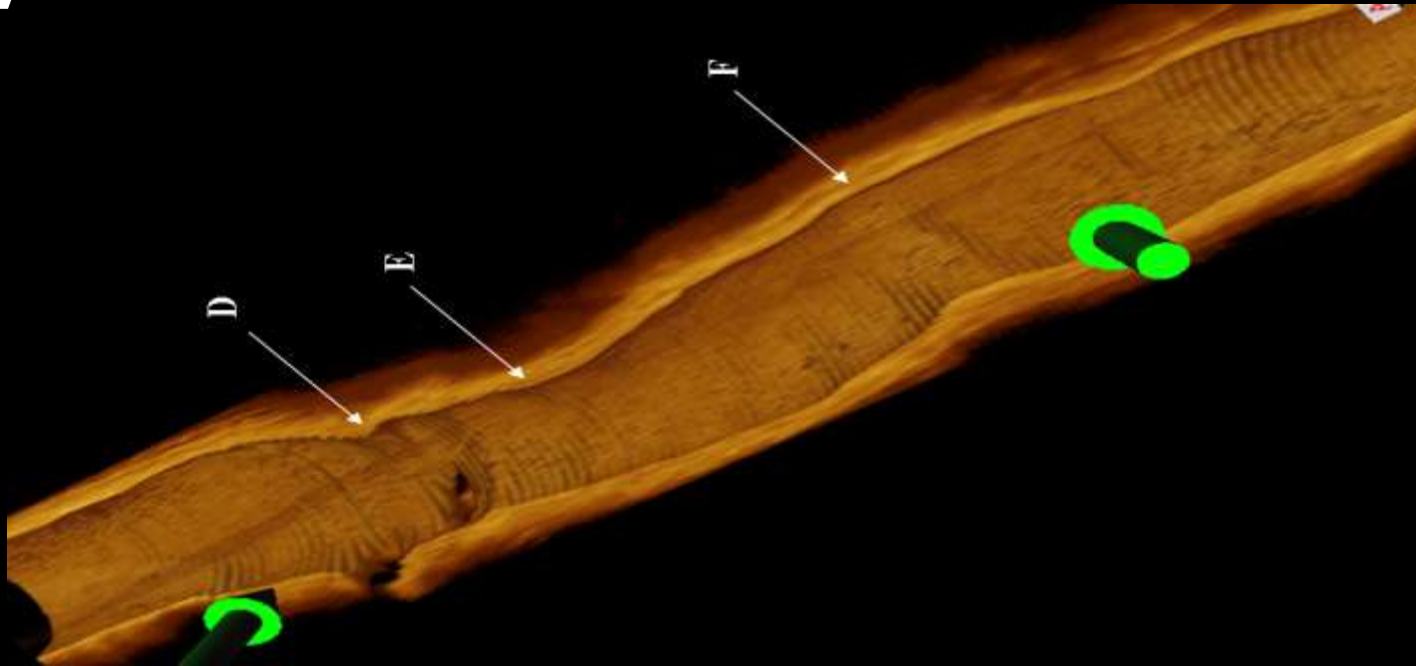


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“Golden tube”

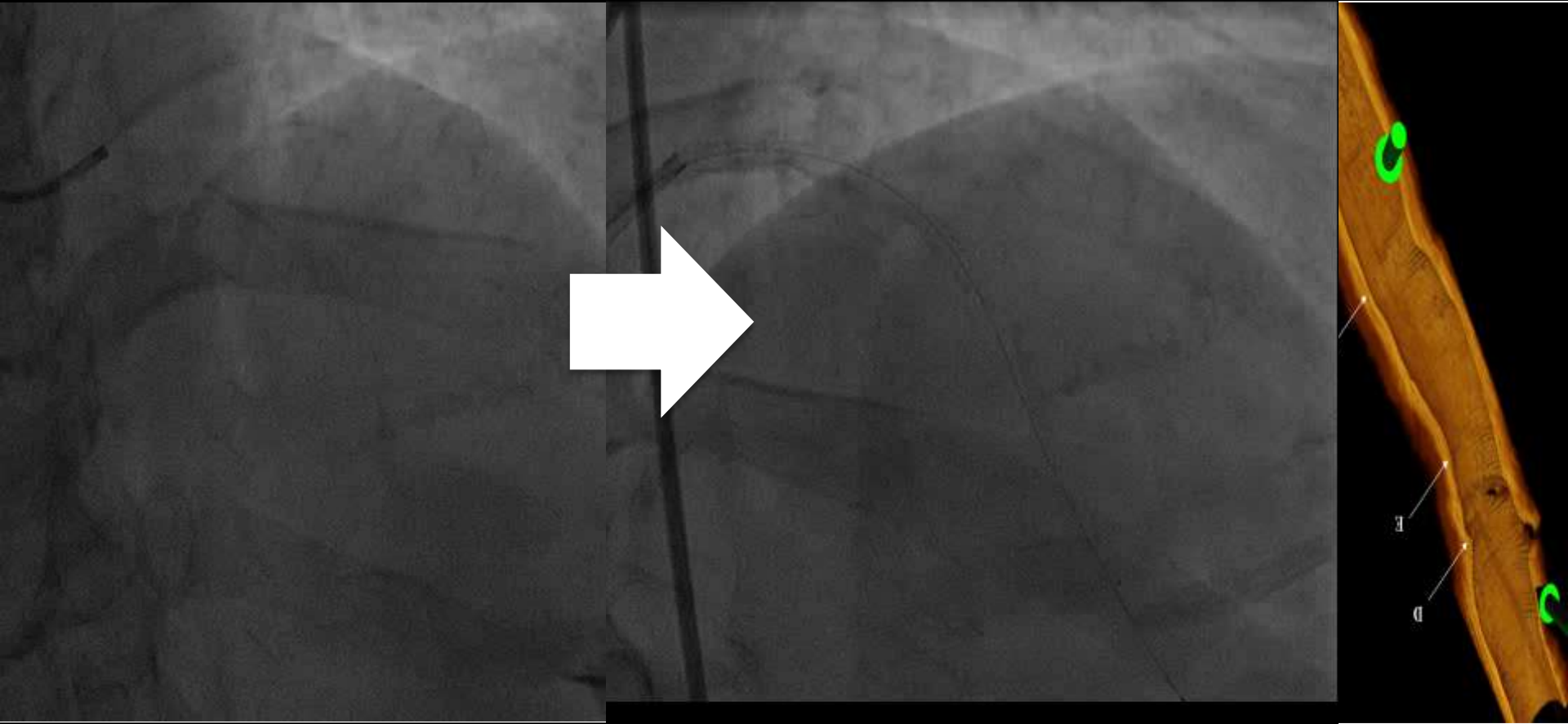
**Vessel with strong homogeneous light reflectivity on OCT
= refurbished endoluminal lining, capping underlying
plaques with late lumen enlargement, vasomotion and
cyclic strain**



Will this golden tube become **the endoluminal bypass
that interventional cardiologists have been waiting for
so long?**

Endoluminal bypass by the bioresorbable scaffolds

Courtesy of Dr. Colombo

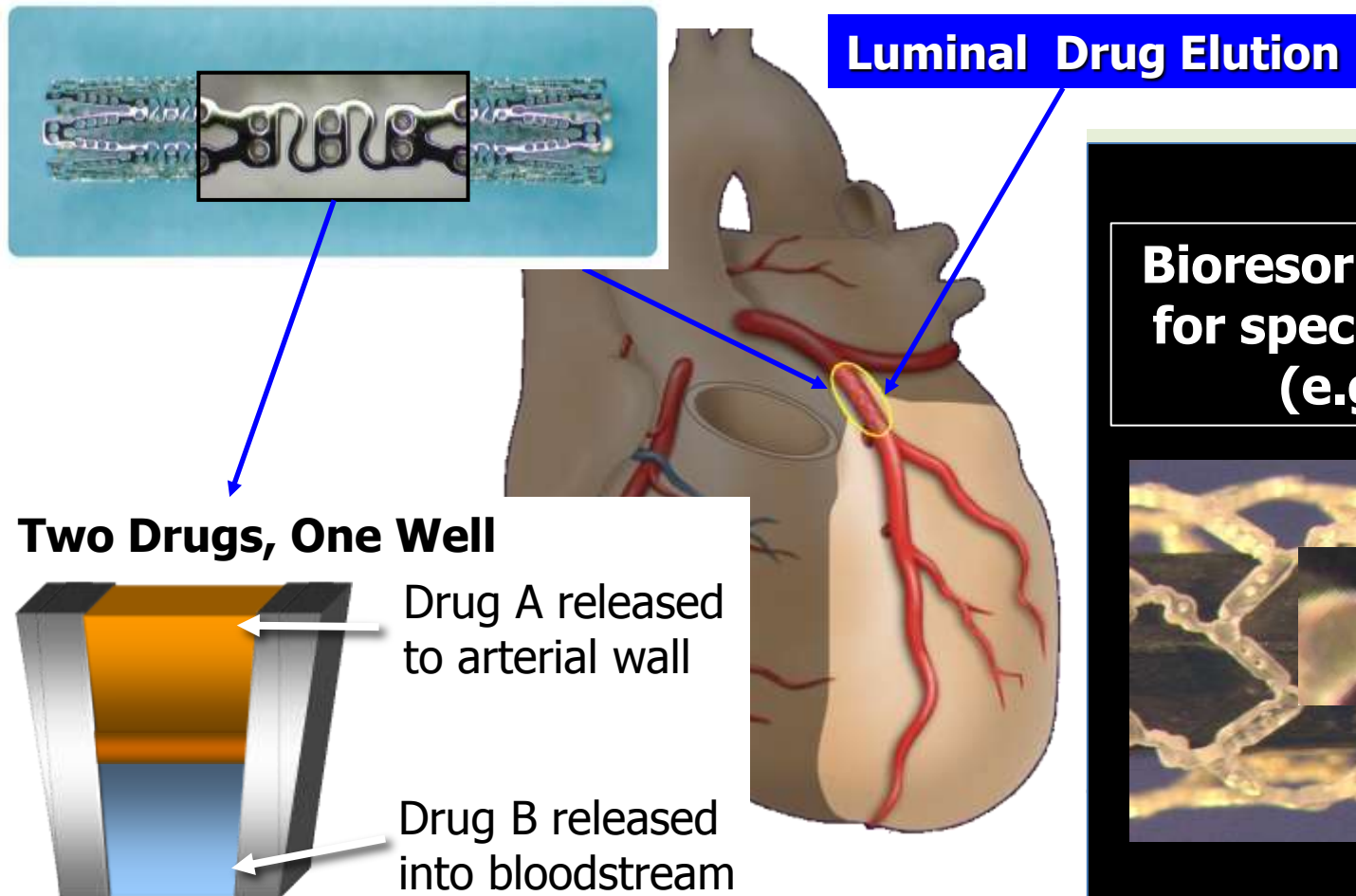


130mm of endoluminal bypass

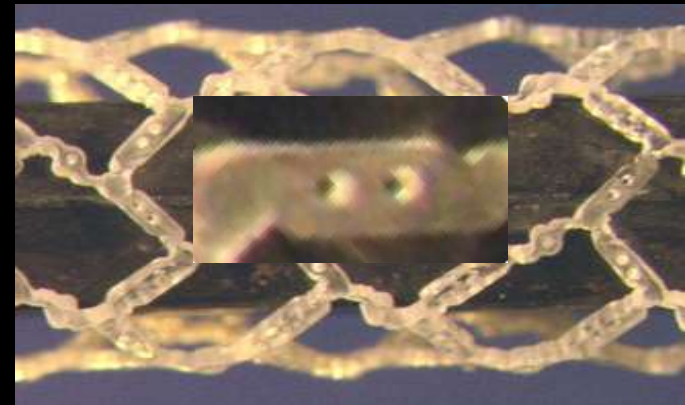
Prophecy on short term

**Specific stent device (reservoir with drug) for specific syndrome
(e.g. myocardial infarction and diabetes)**

Vascular Drug Delivery: Acute MI



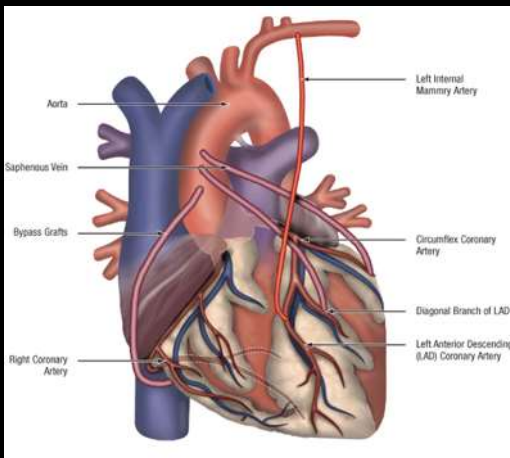
**Bioresorbable reservoir
for specific indications
(e.g. STEMI)**



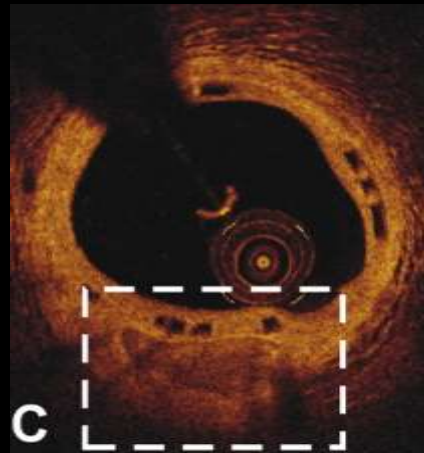
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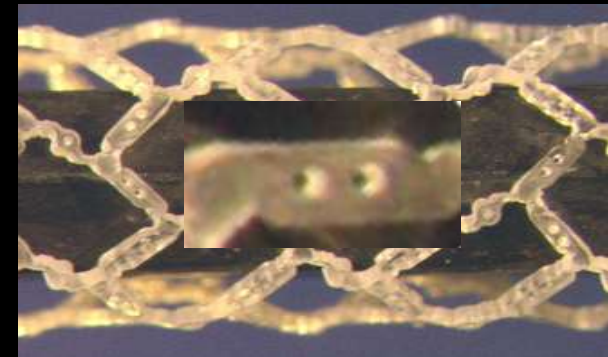
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**Preventive PCI
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Thank You!



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EuroIntervention

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