Evolução na Intervenção Coronária Percutânea e Stents

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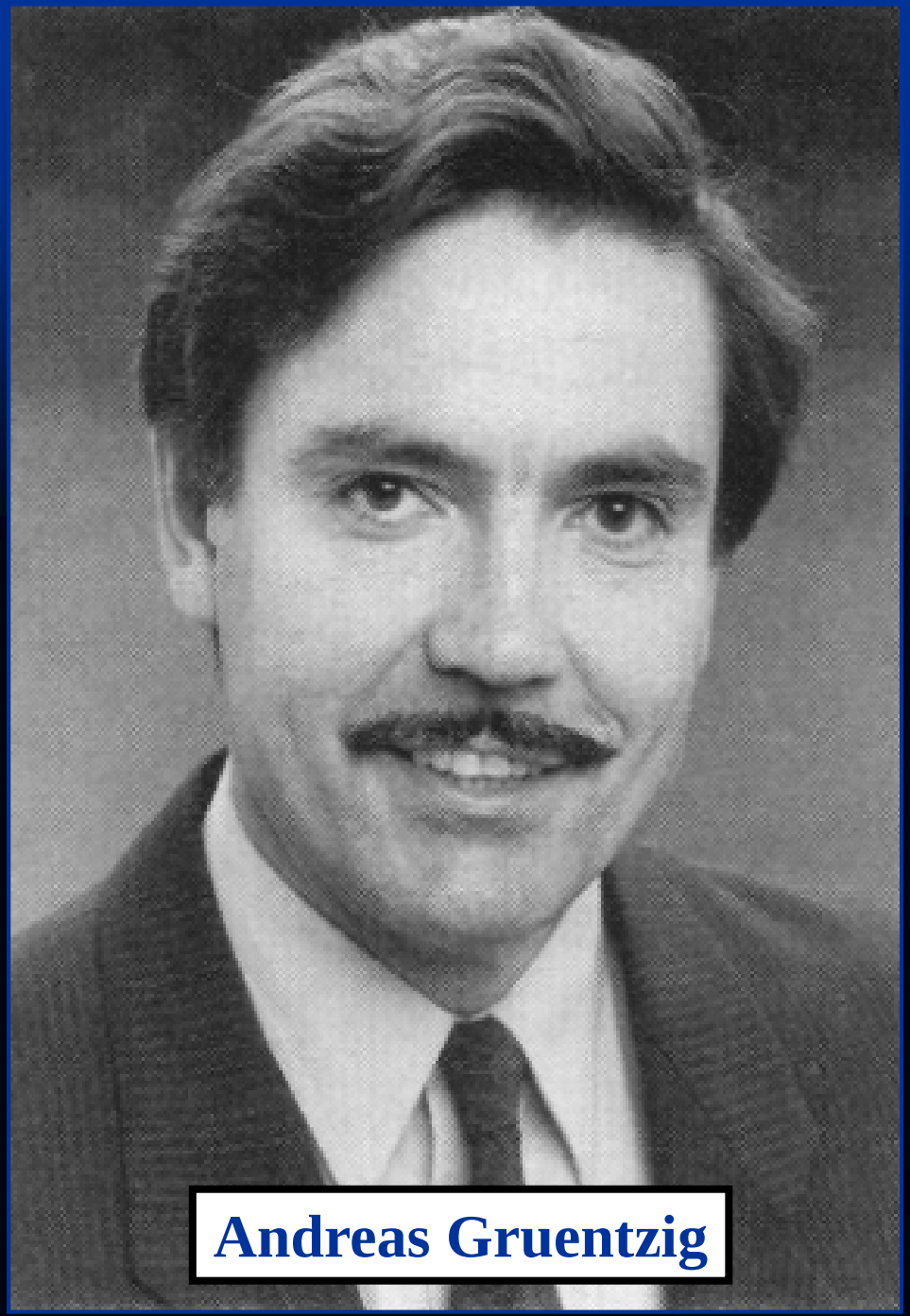

Andreas Gruentzig

Letters to the Editor

TRANSLUMINAL DILATATION OF CORONARY-ARTERY STENOSIS

SIR,—In September, 1977, we introduced a technique for percutaneous transluminal coronary angioplasty (P.T.A.). This technique consists of a catheter system introduced via the femoral artery under local anæsthesia. A preshaped guiding catheter is positioned into the orifice of the coronary artery and through this catheter a dilatation catheter is advanced into the branches of the artery. This dilatation catheter (outer diameter 0·5–1·25 mm) has a sausage-shaped distensible segment (balloon) at the tip.

After traversing the stenotic lesion the distensible segment is inflated with fluid (50% contrast material, 50% saline) to a maximum outer diameter of 3·0–3·8 mm by a pump-controlled pressure of 5 atmospheres (about 500 kPa). This pressure compresses the atherosclerotic material in a direction perpendicular to the wall of the vessel thereby dilating the lumen.

DETAILS OF FIVE CASES TREATED BY P.T.A.

Patient	Age	Sex	Date of dilatation	Stenosis	Primary success
1	38	M	Sept. 16, 1977	L.A.D. 85%	+
2*	44	M	Oct. 18, 1977	L.C.A. 70% (calcified)	–
			Jan. 10, 1978	R.C.A. 80%	+
3	43	M	Nov. 21, 1977	L.A.D. 75%	+
			Nov. 21, 1977	R.C.A. 95%	+
4*	43	M	Nov. 24, 1977	L.C.A. 80%	+
5	61	M	Dec. 20, 1977	L.A.D. 95%	+

L.C.A.=main left coronary artery; L.A.D.=left anterior descending; R.C.A.=right coronary artery.
*Dilatation done at University Hospital, Frankfurt.

Experience with over 250 peripheral-artery lesions treated by this technique has demonstrated, via morphological studies, that the atheroma can be compressed leaving a smooth luminal surface. The patency-rate, two years after dilatation of iliac and femoropopliteal atherosclerotic lesions, was greater than 70%.[1]

After experimental[2] and intraoperative[3] studies the first percutaneous coronary dilatation was done on Sept. 16, 1977. Five patients with severe stenotic lesions of the coronary arteries associated with refractory angina have so far been treated by coronary P.T.A. (table). Angiograms for one of these patients are shown in the figure. No complications were noted. Follow-up studies by serial stress-testing with myocardial imaging (thallium-201) and angiography suggest that P.T.A. may be an effective treatment in certain patients with severe discrete non-calcified lesions of the coronary arteries.

This technique, if it proves successful in long-term follow-up studies, may widen the indications for coronary angiography and provide another treatment for patients with angina pectoris.

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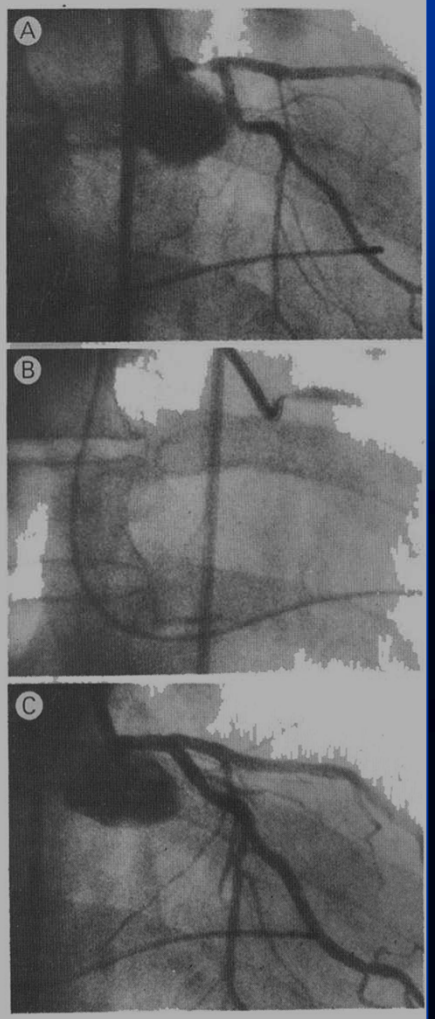
ANDREAS GRÜNTZIG

1. Grüntzig, A. Die perkutane transluminale Rekanalisation chronischer Arterienverschlüsse mit einer neuen Dilatationstechnik; p. 50. Baden-Baden, 1977.
2. Grüntzig, A., Riedhammer, H. H., Turina, M., Rutishauser, W. *Verh. Dt. ges. Kreislaufforschg.* 1976, **42**, 282.
3. Grüntzig, A., Myler, R., Hanna, E., Turina, M. *Circulation*, 1977, **56**, 84 (abstr.).



Details of patient 3.

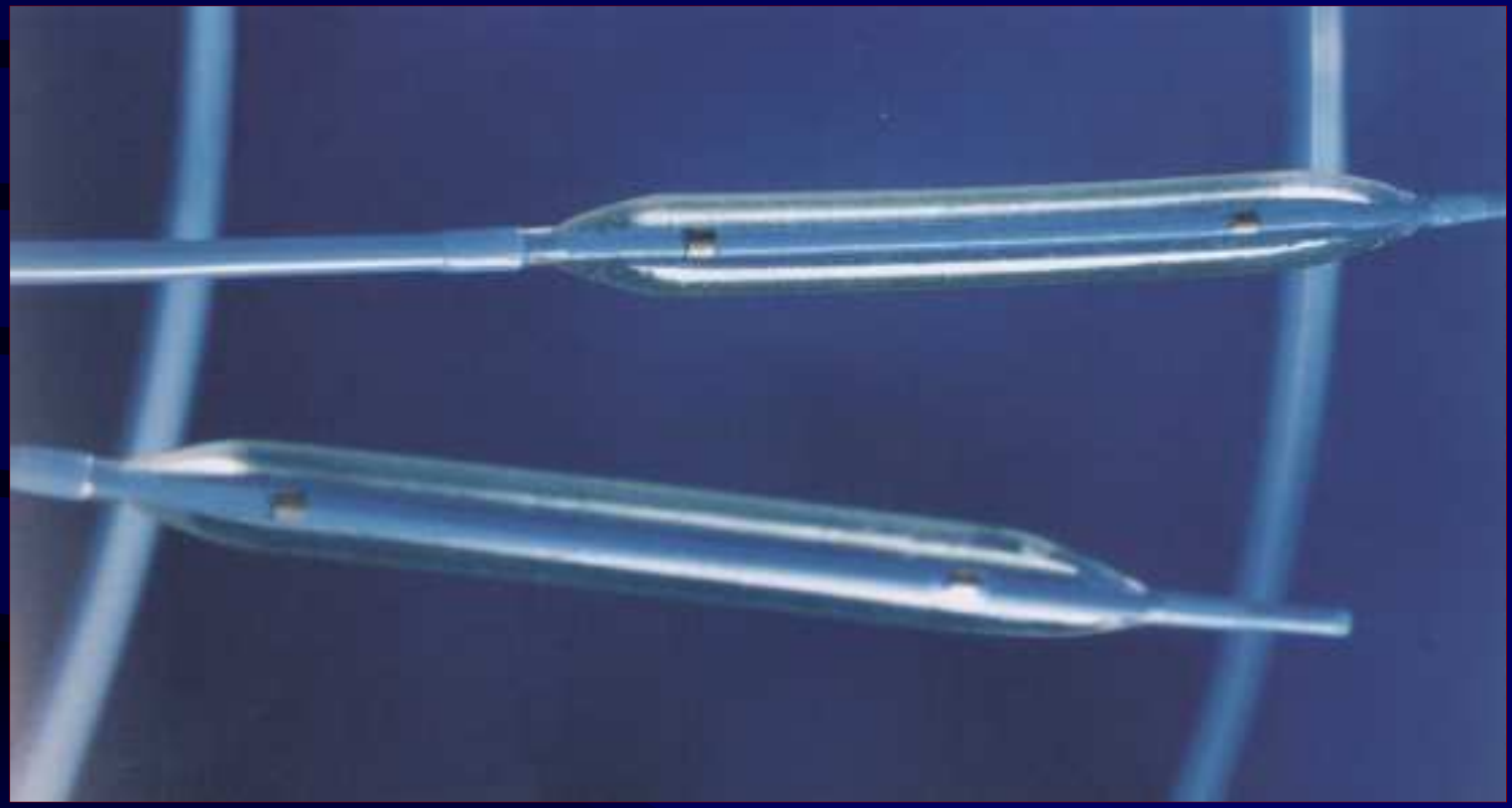
43-year-old man with severe angina pectoris since September, 1977. First angiogram (Nov. 11) revealed severe stenosis of the main L.C.A. and only slight wall abnormalities in some of the branches of L.C.A. After informed consent P.T.A. was done on Nov. 21.

(A) The angiogram before P.T.A. (done under nitroglycerine cover), with the guiding catheter in the orifice showed 80% proximal stenosis of the L.C.A.

(B) After passage of the dilatation catheter the distensible balloon segment was inflated twice to a maximum outer diameter of 3·7 mm. During the dilatation the patient experienced a short period of angina pectoris which quickly disappeared after deflation of the balloon.

(C) The angiogram after the procedure showed a good result without complications. There was no enzyme rise or E.C.G. change after the treatment. A good clinical result has persisted in the following weeks, confirmed by stress tests.

A ERA DO BALÃO

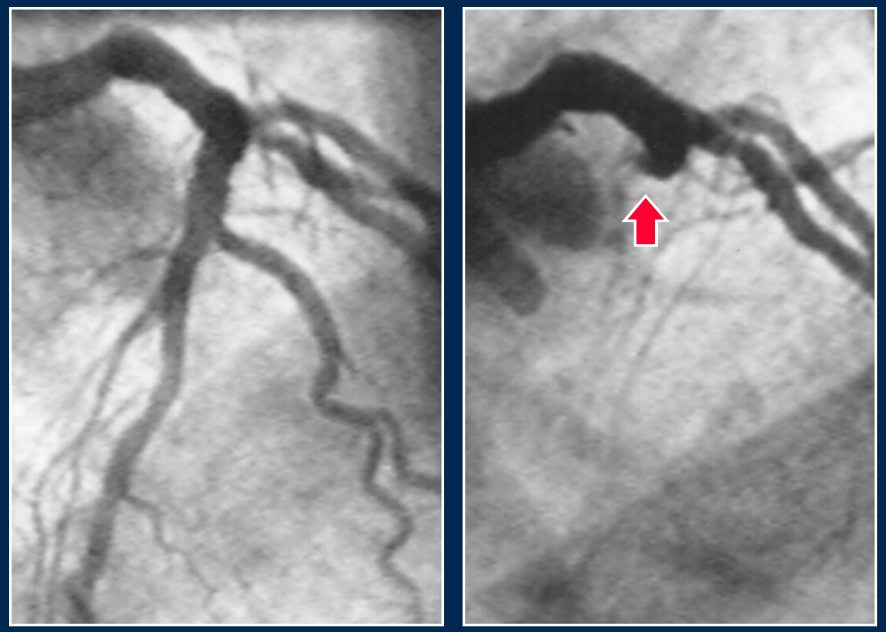


1977

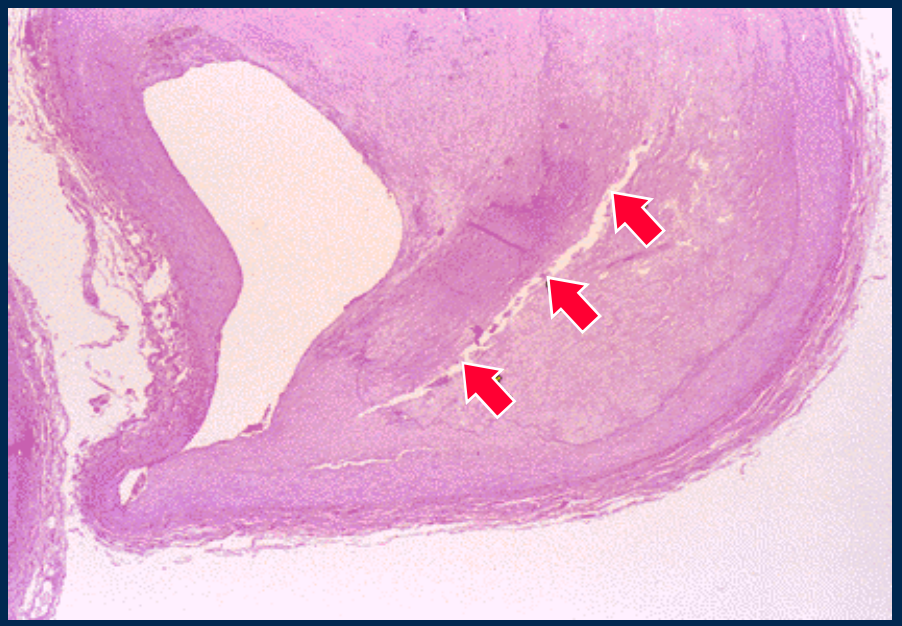
1988-90

ANGIOPLASTIA CORONÁRIA
LIMITAÇÕES

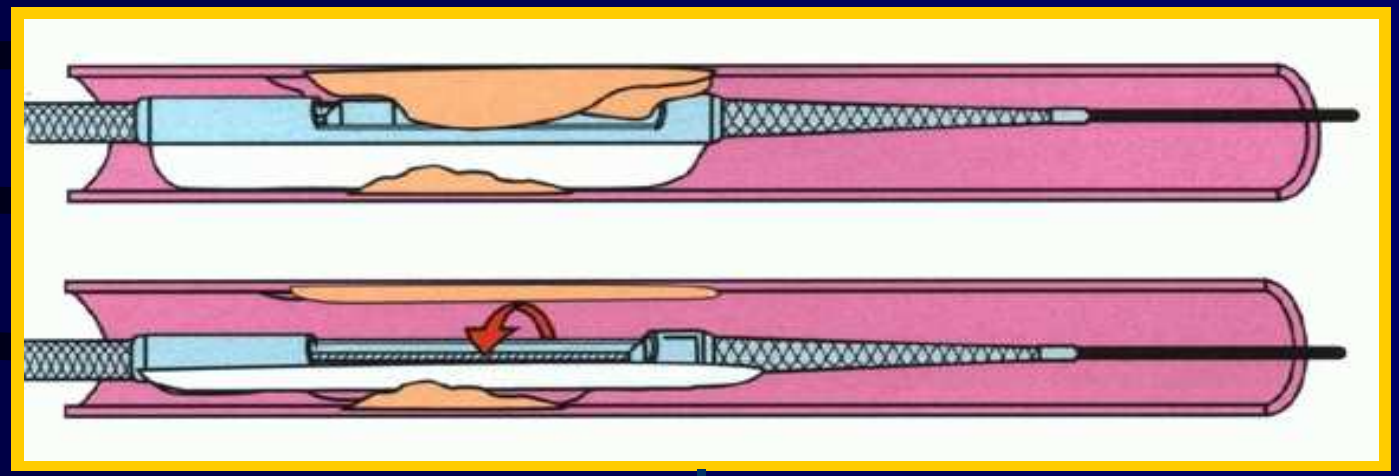
OCLUSÕES AGUDAS
2-10%

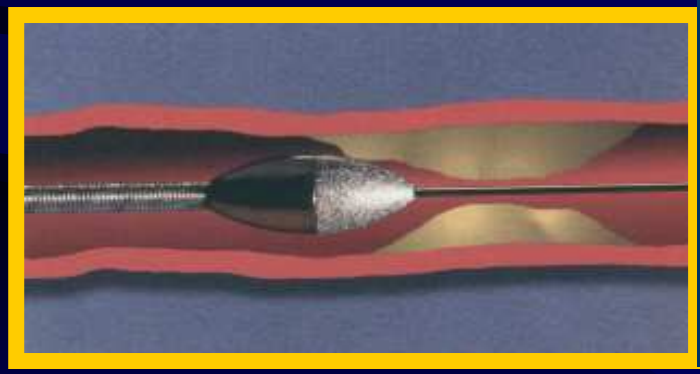


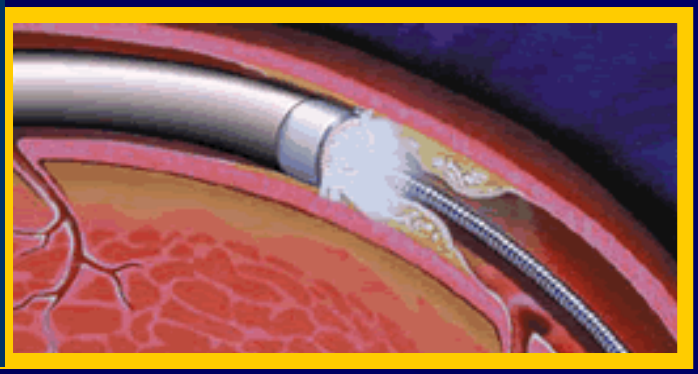
REESTENOSE
20-50%



A ERA DA ATERECTOMIA







1988-90

1993-95

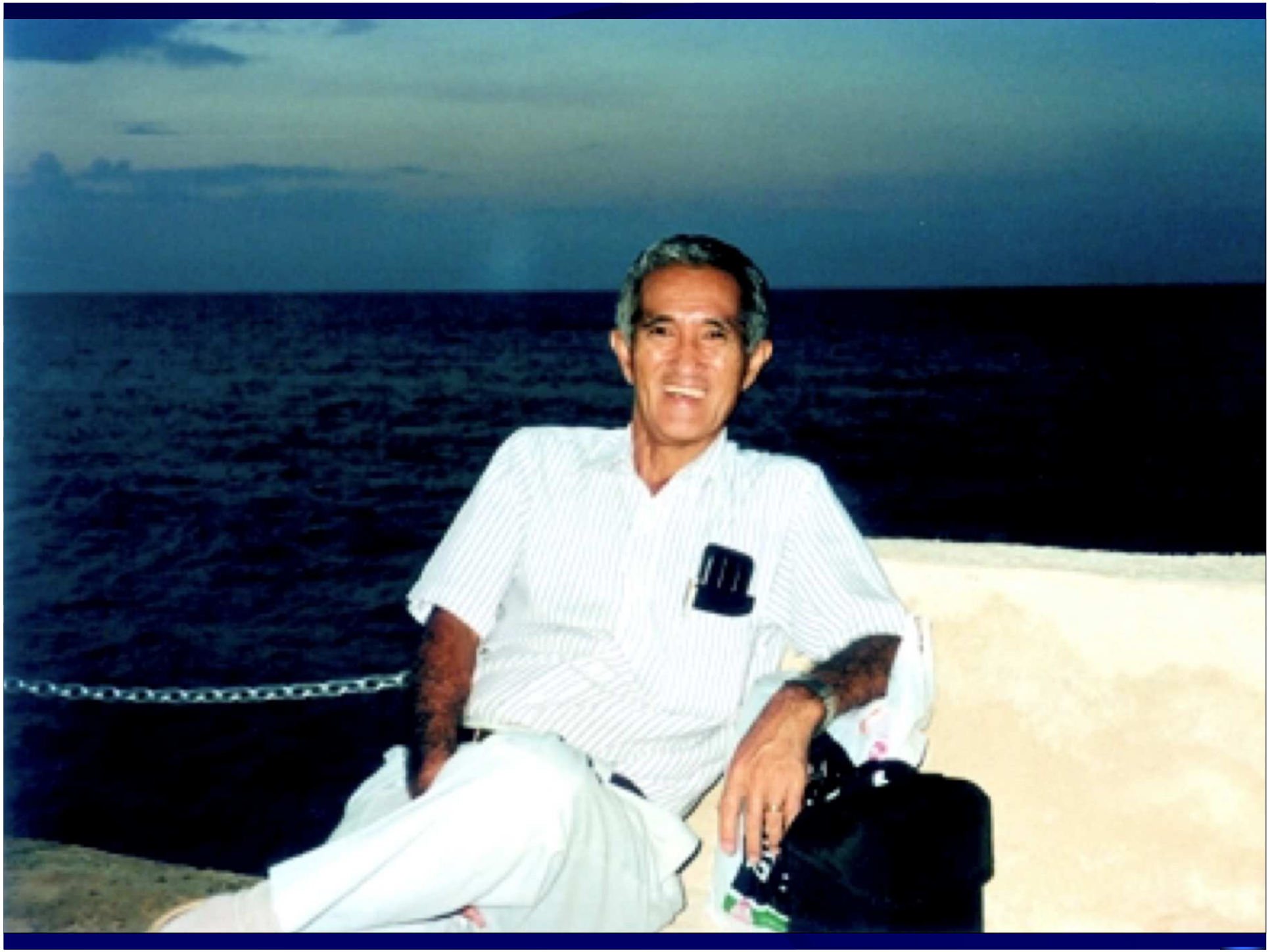
A ERA DA ATERECTOMIA

1. Melhores taxas de sucesso em lesões de alta complexidade (Lesões com calcificação acentuada, lesões aorto-ostiais, lesões não dilatáveis, etc…)

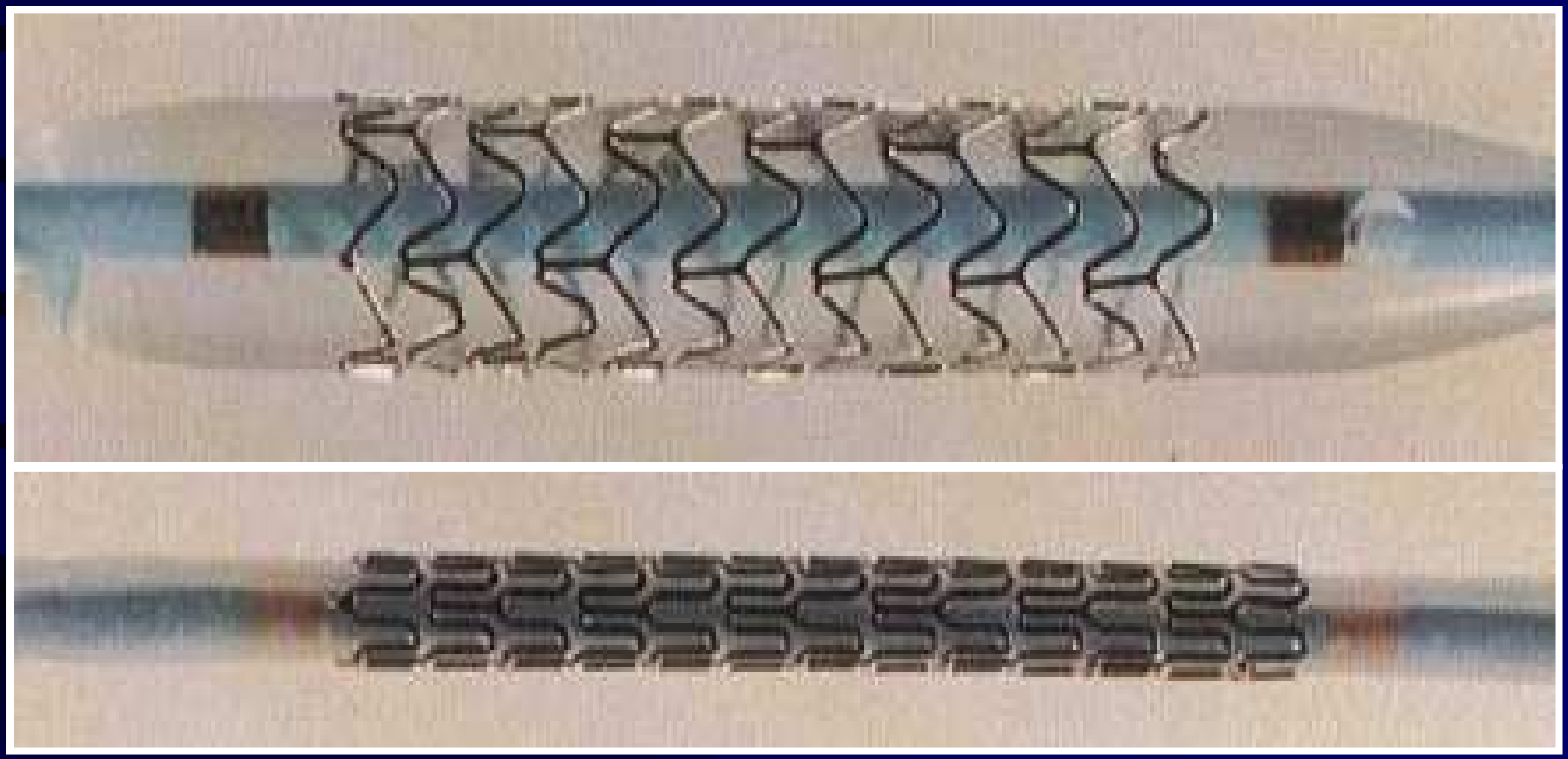
2. NÃO reduziu taxas de oclusão aguda ou reestenose !

CONFRATERNIZAÇÃO - FORMANDOS DO INCOR

SAO PAULO 1992



A ERA DOS *STENTS*



1993-95

2001...

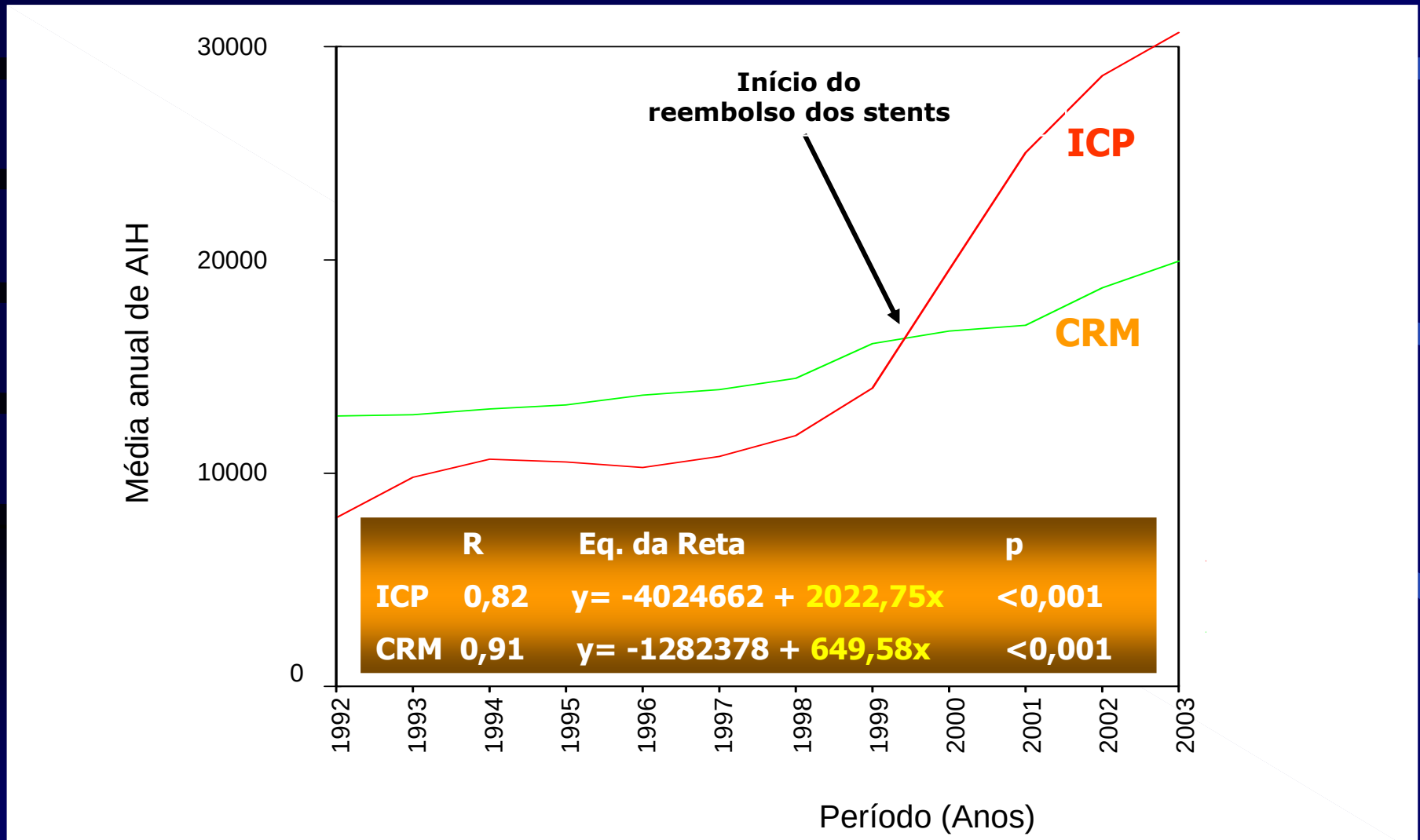
Stents: porque tão aceitos?

1. Excelentes e previsíveis resultados angiográficos imediatos, mesmo na abordagem de lesões complexas.

2. Aumento da segurança do procedimento, reduzindo a chance de oclusão aguda.

3. Melhora dos resultados tardios, por reduzir a incidência de reestenose.

TOTAL DE AIH - ICP vs CRM - DATASUS - 1992 a 2003



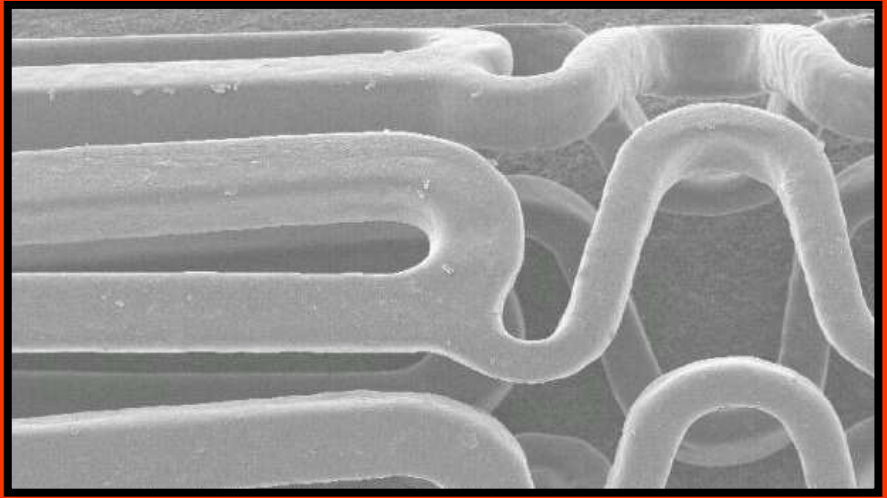
Reestenose Intra-Stent

Mecanismo Exclusivo: Hiperplasia da Íntima

A ERA DOS *STENTS* FARMACOLÓGICOS

Prevenção e tratamento da reestenose:
STENTS RECOBERTOS COM DROGAS

- ACTINOMICINA - GUIDANT
- TA
BO
- TA
- RA RDIS,
J&
- DI SIO
- TA
- etc…



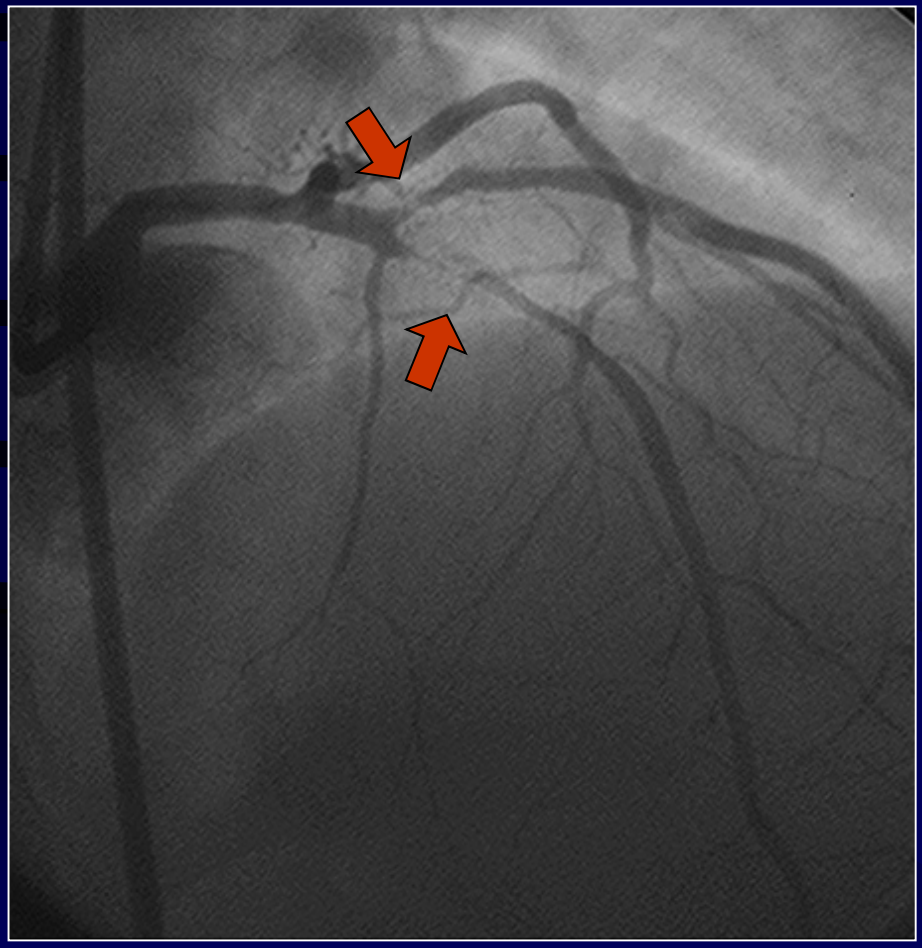
Stent Bx Velocity™ revestido com sirolimus

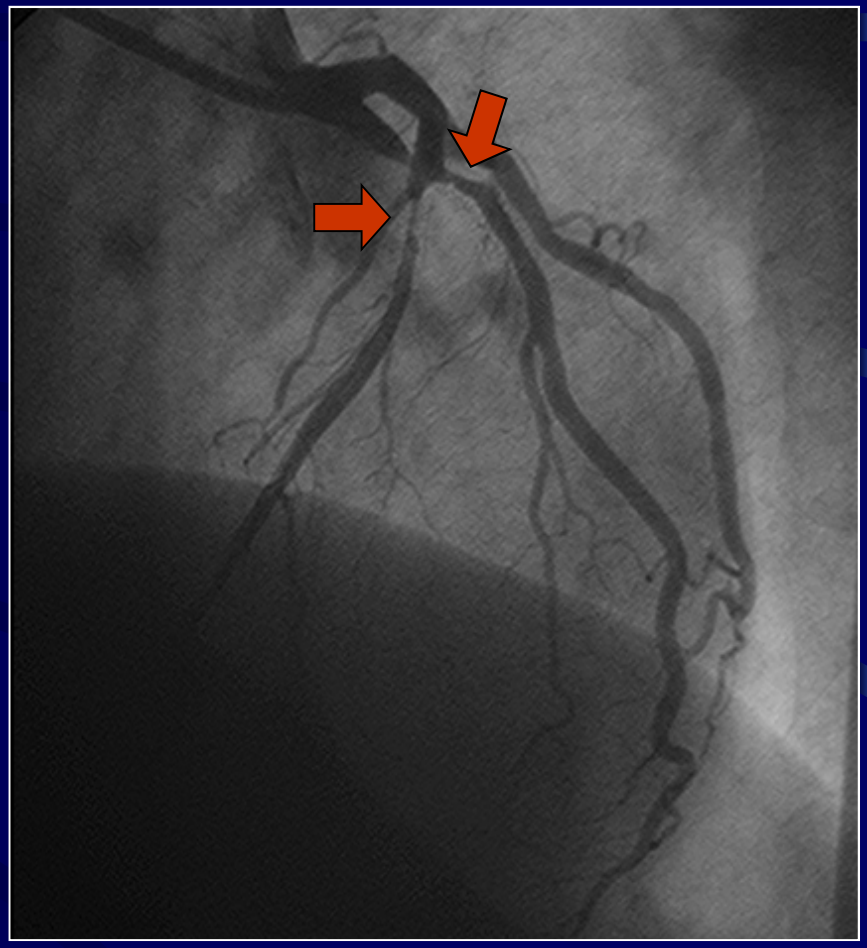
2001…

SIRIUS

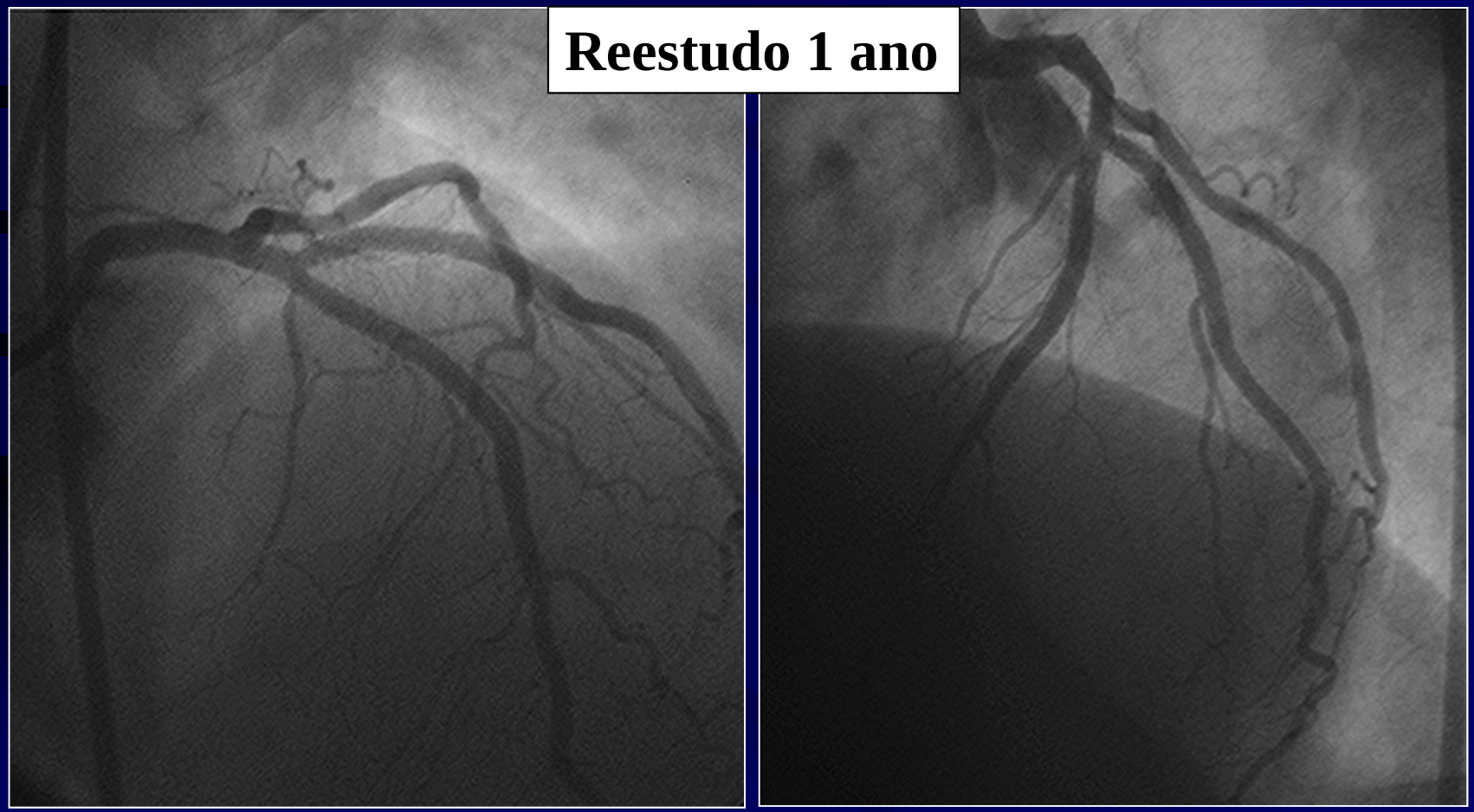
EVENTOS ADVERSOS AOS 9 MESES

FFO, 40 anos, angina estável CFIII
3ª RIS, 1 falência de rapa oral





FFO, 40 anos, angina estável CFIII
3ª RIS, 1 falência de rapa oral
Implante de 2 stents Cypher 3,0 x 33 mm



TUESDAY

ESC Congress News

EUROPEAN SOCIETY OF CARDIOLOGY®

WORLD HEART FEDERATION®

World Congress of Cardiology 2006

The unique meeting of the European Society of Cardiology Congress 2006 and the World Heart Federation's XVth World Congress of Cardiology

Do drug-eluting stents increase deaths?

TWO SEPARATE, independent meta-analyses, presented in Hot Line session I, suggest drug-eluting stents (DES) may increase death, Q-wave myocardial infarction (clinical surrogates of in-stent thrombosis) and cancer deaths, bringing the long-term safety of DES firmly into the spotlight. Discussant Salim Yusuf (McMaster University, Canada) hailed the data as one of the most important presentations to come out of this year's meeting.

"Six million people in the world have been implanted with DES, yet their long-term safety and efficacy is unknown," said Yusuf. "I've a feeling the data we're seeing today is only the tip of the iceberg. We need to encourage more

obtain this data from the manufacturer," said Nordmann. He speculated that the increase in cancer might be due to a rapid impairment of the immune system.

Yusuf widened the debate to include percutaneous coronary intervention (PCI). "The overuse of PCI is an insidious change in the culture of cardiology that needs to be reversed," he said. The use of PCI was established in MI, high-risk unstable angina and cardiogenic shock. However, its use in stable disease was a totally different question.

"There's no beneficial influence on mortality – PCI does nothing to prevent heart attack. All we are doing is providing short-term relief of chest pain. It's not re-stenosis that kills but the

Overview of Current Stent Design

Durable Polymer Coated Stent		Bioabsorbable Polymer Coated Stent					Bioabsorbable Scaffold
Abbott/Boston	Medtronic	BIOSENSORS	Terumo	Boston	Scitech	Envision Scientific	Abbott
Xience/Promus[1] CoCr/ PtCr-EES	**Resolute Onyx**[3] CoNi-ZES	**BioMatrix**[1] 316L-BES	**Ultimaster**[1] CoCr-SES	**Synergy**[1] PtCr -EES	**Inspiron**[1] CoCr - SES	**ABLUMINUS DES** CoCr - SES	**Absorb**[2] PLLA-EES

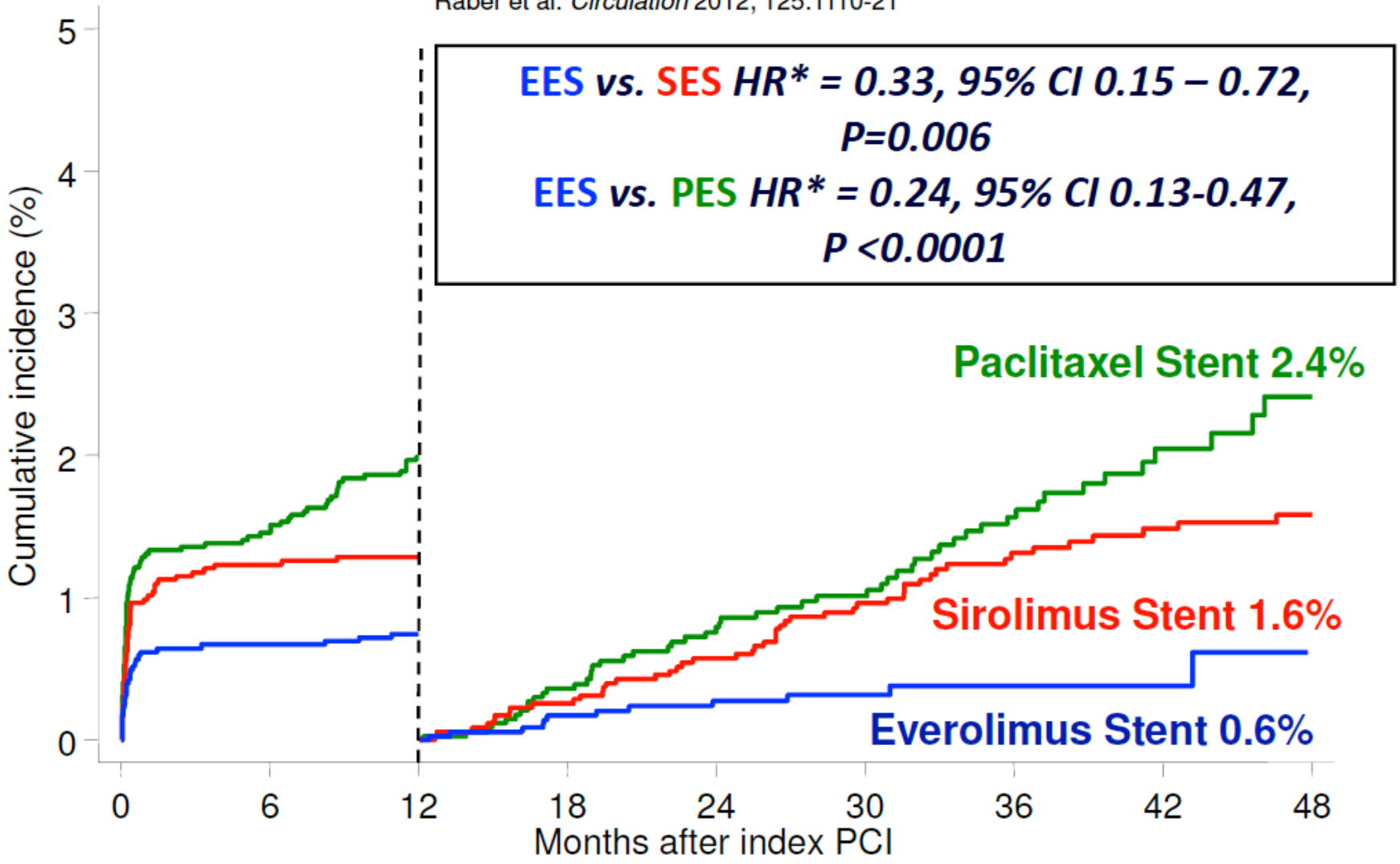
Strut thickness							
81 µm	81 µm	120 µm	80 µm	74 µm	75 µm	73 µm	150 µm

Polymer coating							
Circumferential 7-8 µm/side	Circumferential 6 µm/side	Abluminal 10 µm	Abluminal 20 µm	Abluminal 15 µm	Abluminal 4 µm	Abluminal < 5 µm	Circumferential 3 µm/side

Bern-Rotterdam Cohort Study

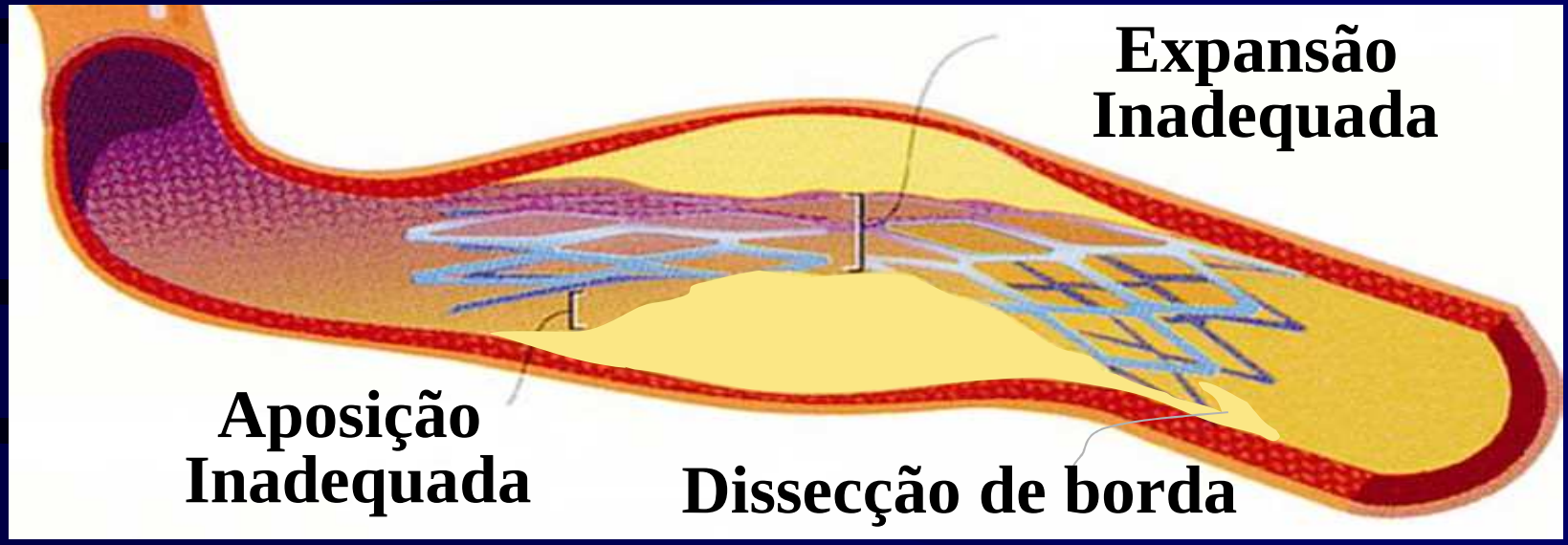
Very Late Definite ST (1-4 yrs)

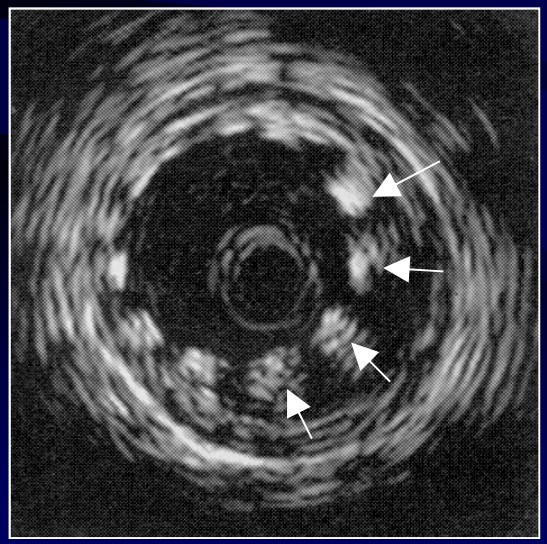
Räber et al. *Circulation* 2012; 125:1110-21

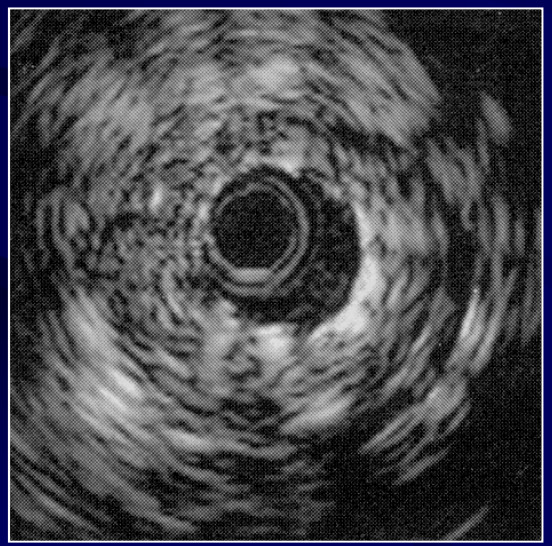


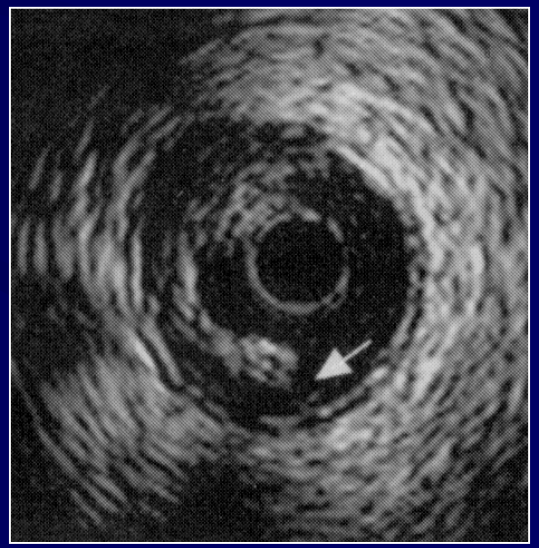
*from Cox proportional hazards model

ULTRA-SOM DURANTE IMPLANTE DE ST

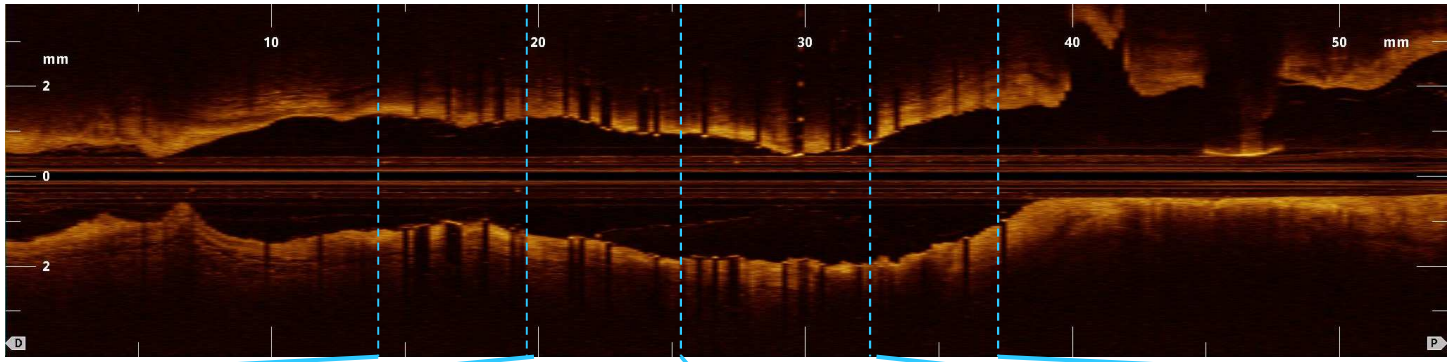








OCT Post-PCI


10
20
30
40
50
mm
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2
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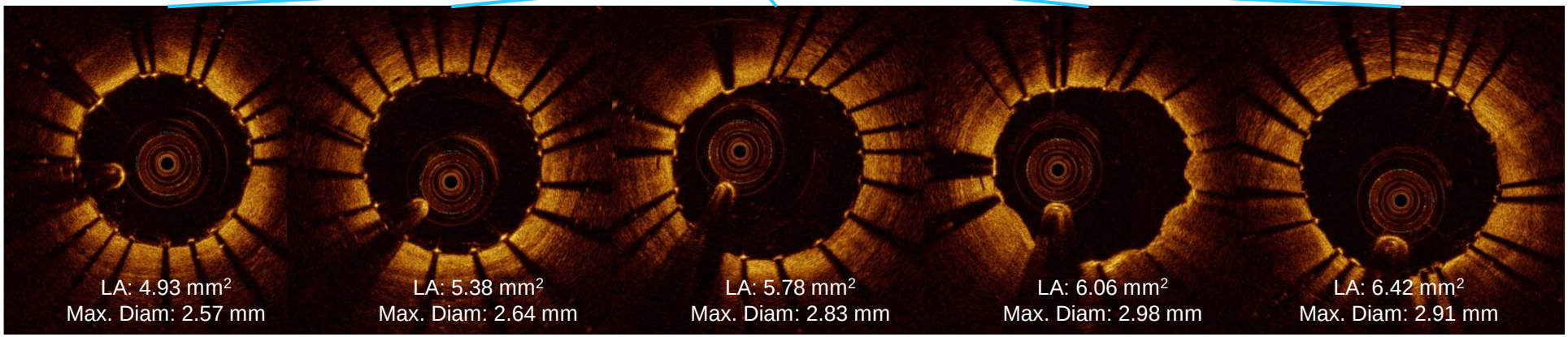
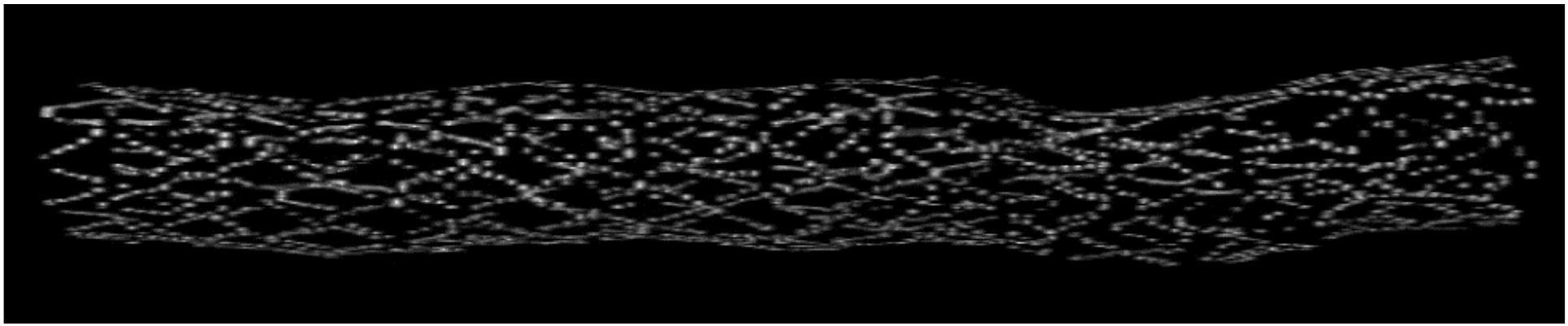
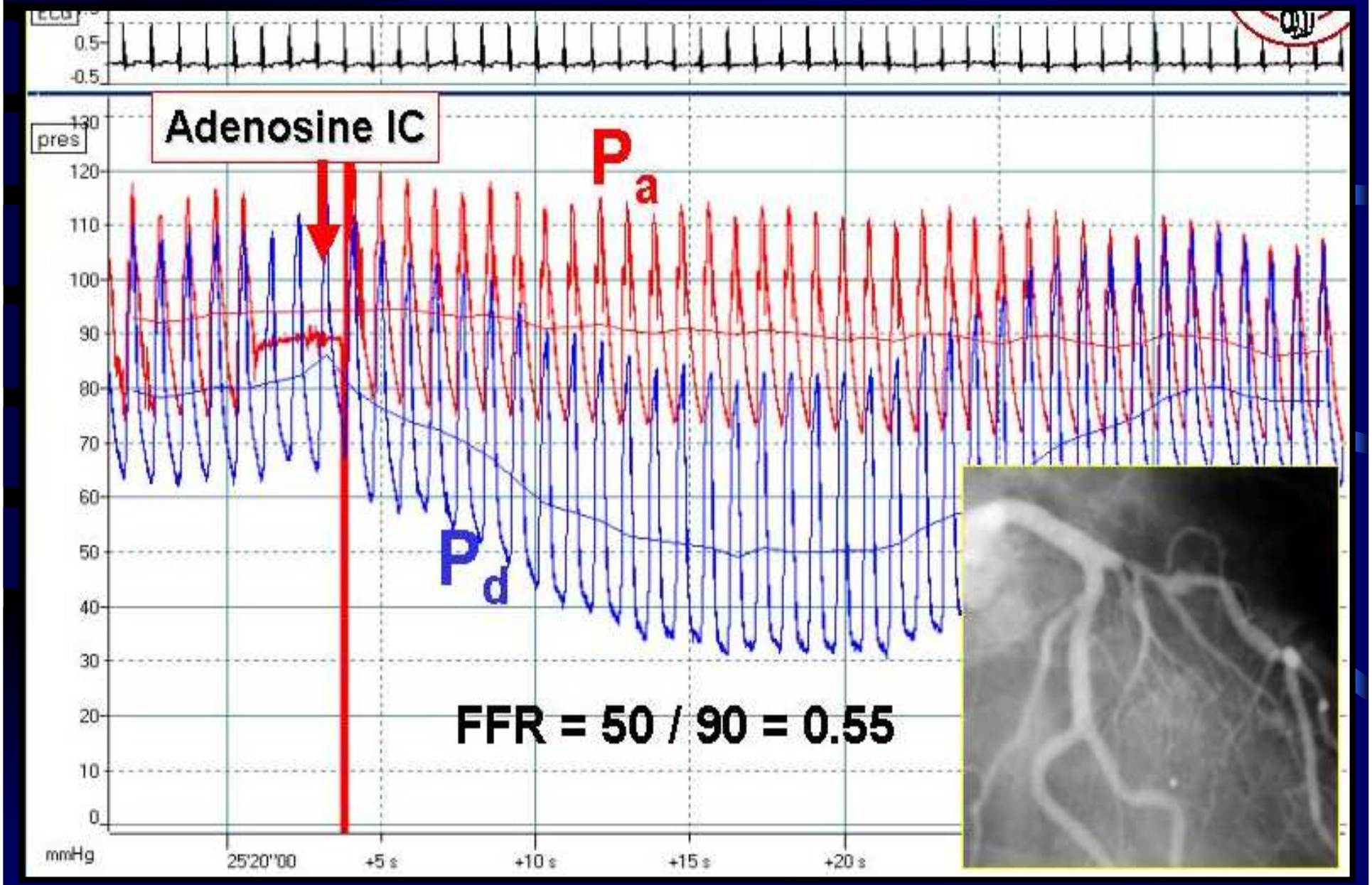
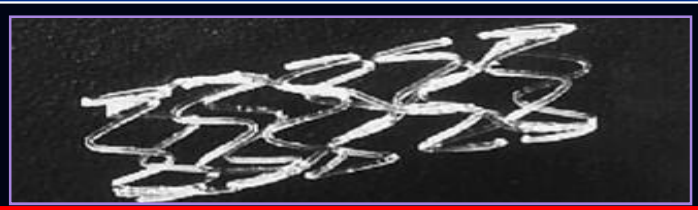
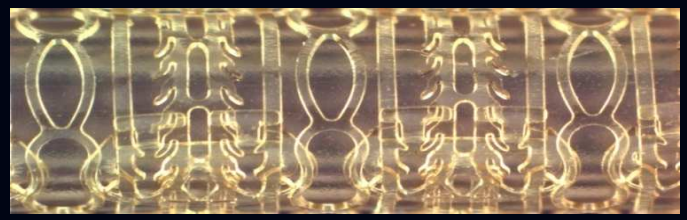
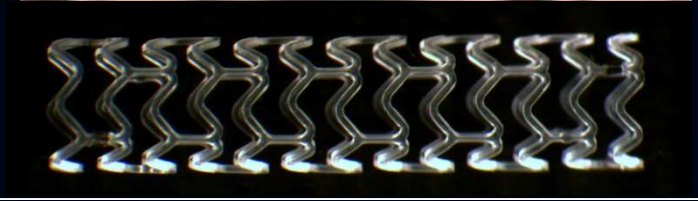

LA: 4.93 mm²
Max. Diam: 2.57 mm
LA: 5.38 mm²
Max. Diam: 2.64 mm
LA: 5.78 mm²
Max. Diam: 2.83 mm
LA: 6.06 mm²
Max. Diam: 2.98 mm
LA: 6.42 mm²
Max. Diam: 2.91 mm

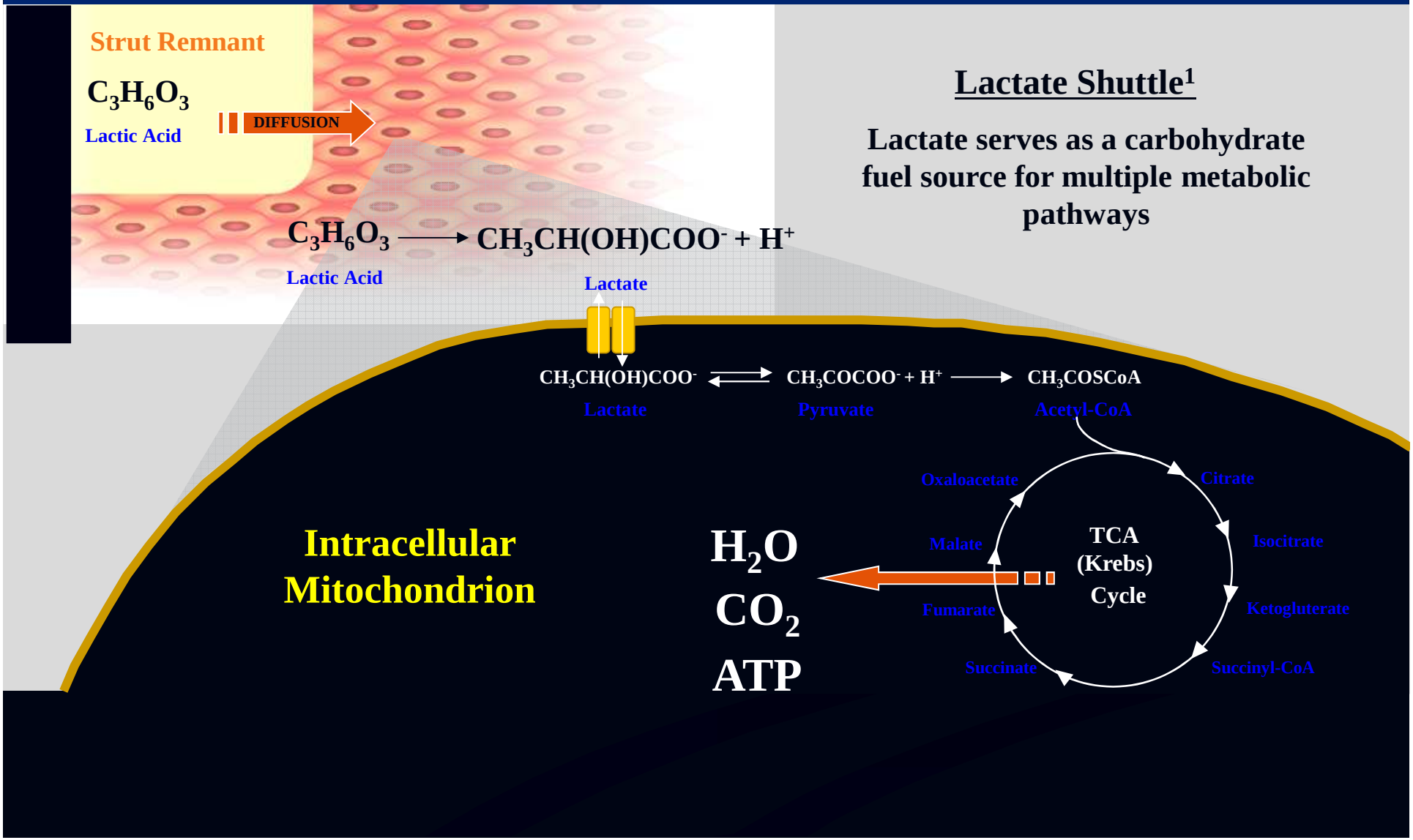



ECG
0.5
-0.5
pres
Adenosine IC
P_a
P_d
130
120
110
100
90
80
70
60
50
40
30
20
10
0
mmHg
25'20''00
+5 s
+10 s
+15 s
+20 s
FFR = 50 / 90 = 0.55

Bioresorbable Scaffolds

Igaki-Tamai		PLLA
Abbott Absorb		PLLA Everolimus
Elixir DESolve		PPLLA based Novolimus
REVA REsolve		Tyrosine- Policarbonate Sirolimus
Biotronik Dreams		Magnesium Sirolimus
Amaranth		PLLA resin

Degradação do Poli L-Ácido-Lático (PLLA) e Metabolismo do Lactato

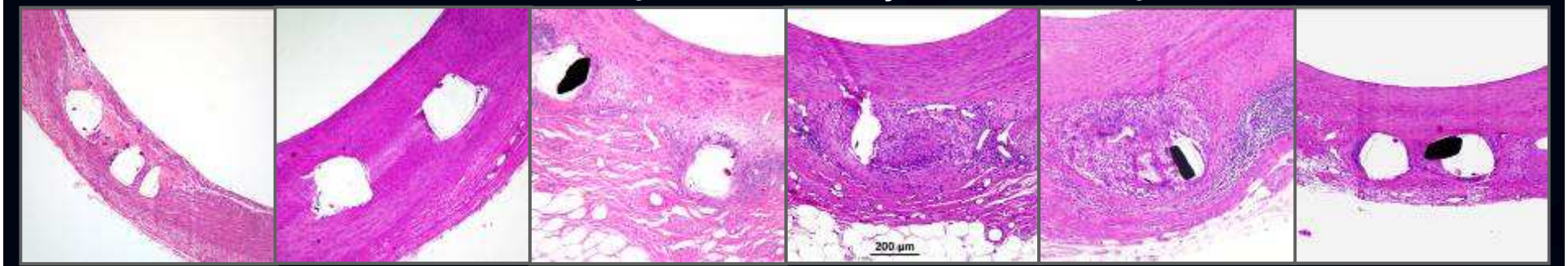


ABSORB BVS Preclinical Study

Demonstrated in Porcine Coronary Arteries to 48 months

BVS Cohort A

1 month | 6 months | 1 year | 2 years | 3 years | 4 years

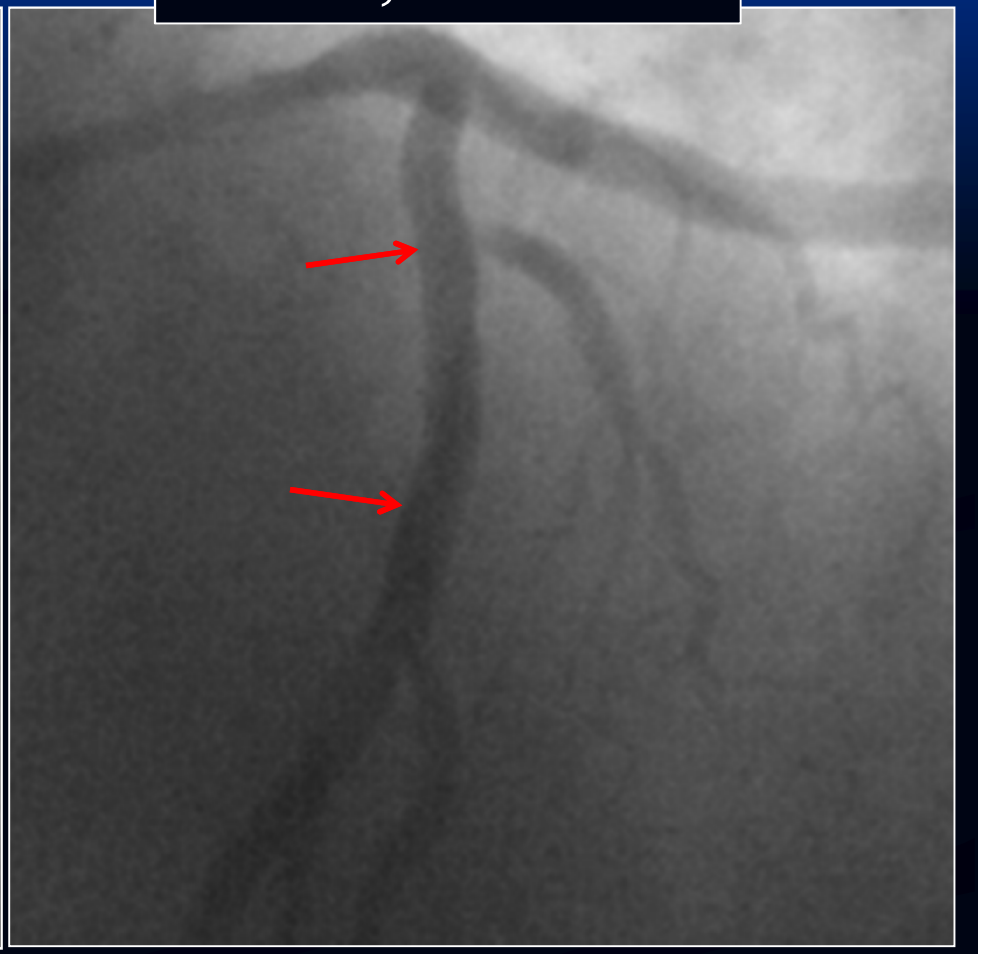


Cypher

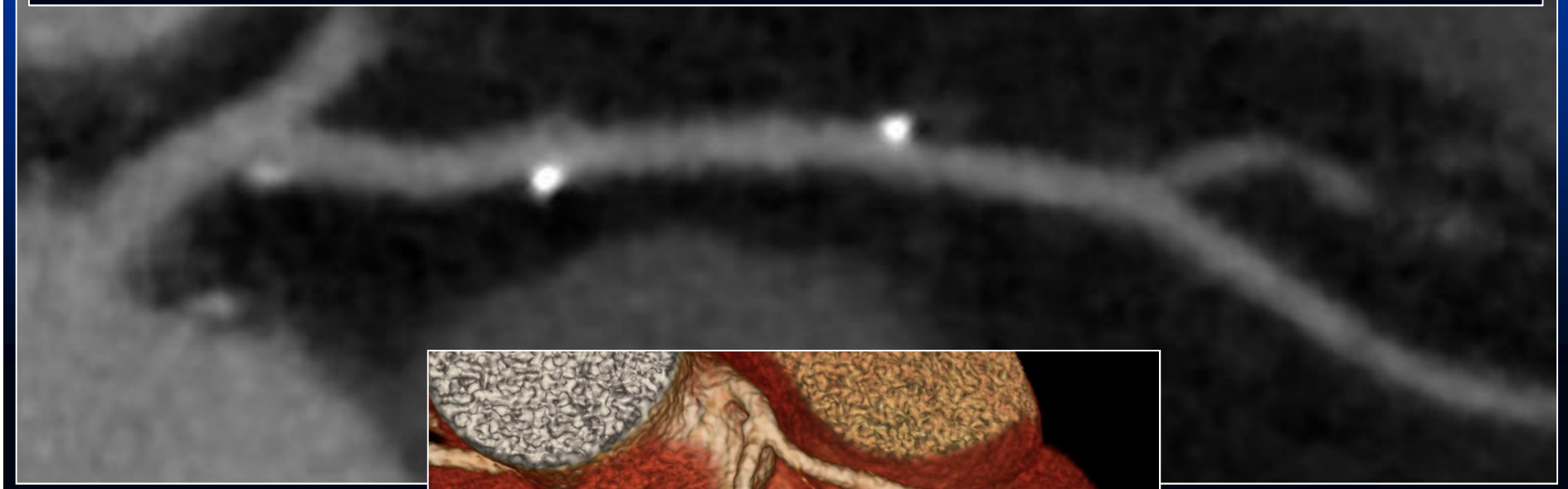
Representative photomicrographs of porcine coronary arteries, 10x
Images taken by and on file with Abbott Vascular

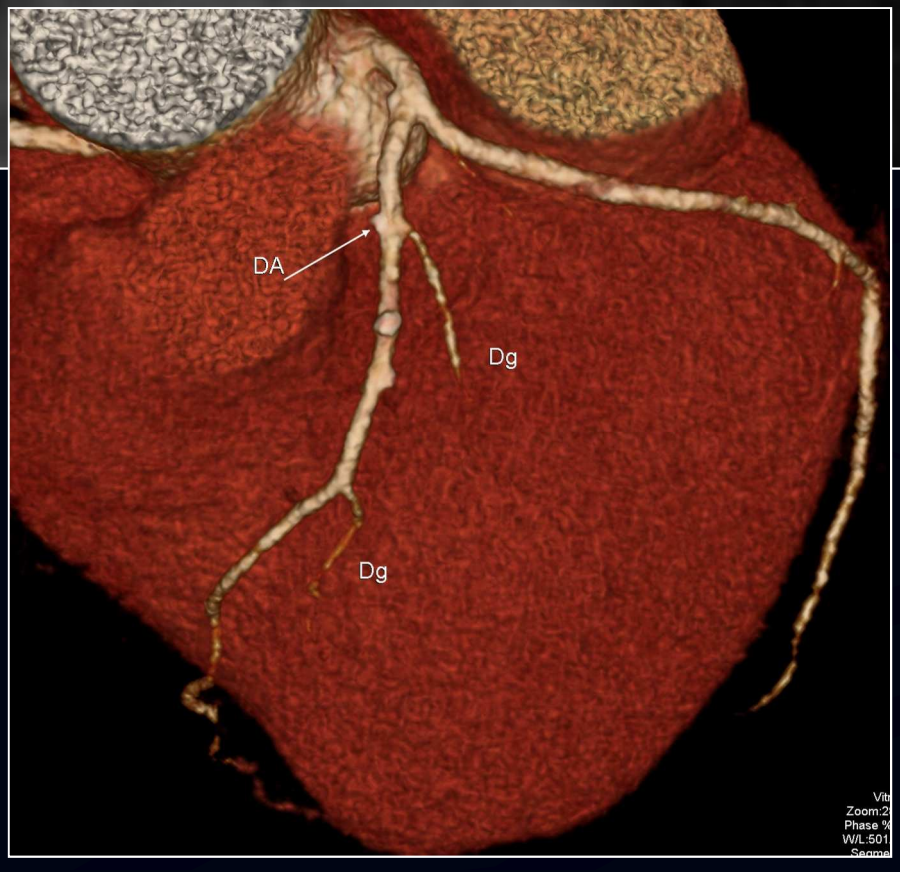
24/10/2011

BVS 3,0 x 18 mm

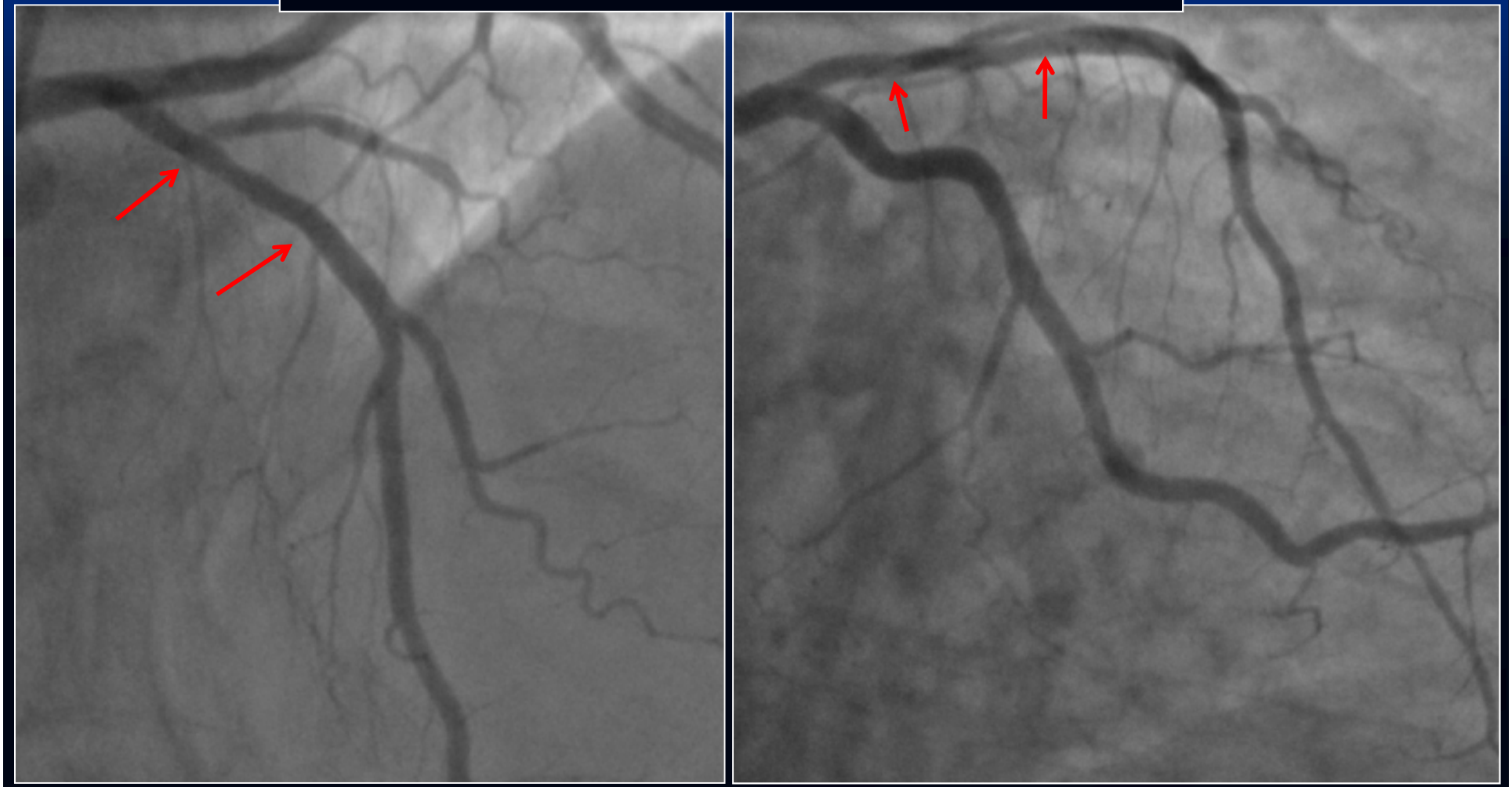


Angiotomografia (27/05/2013): 20 meses

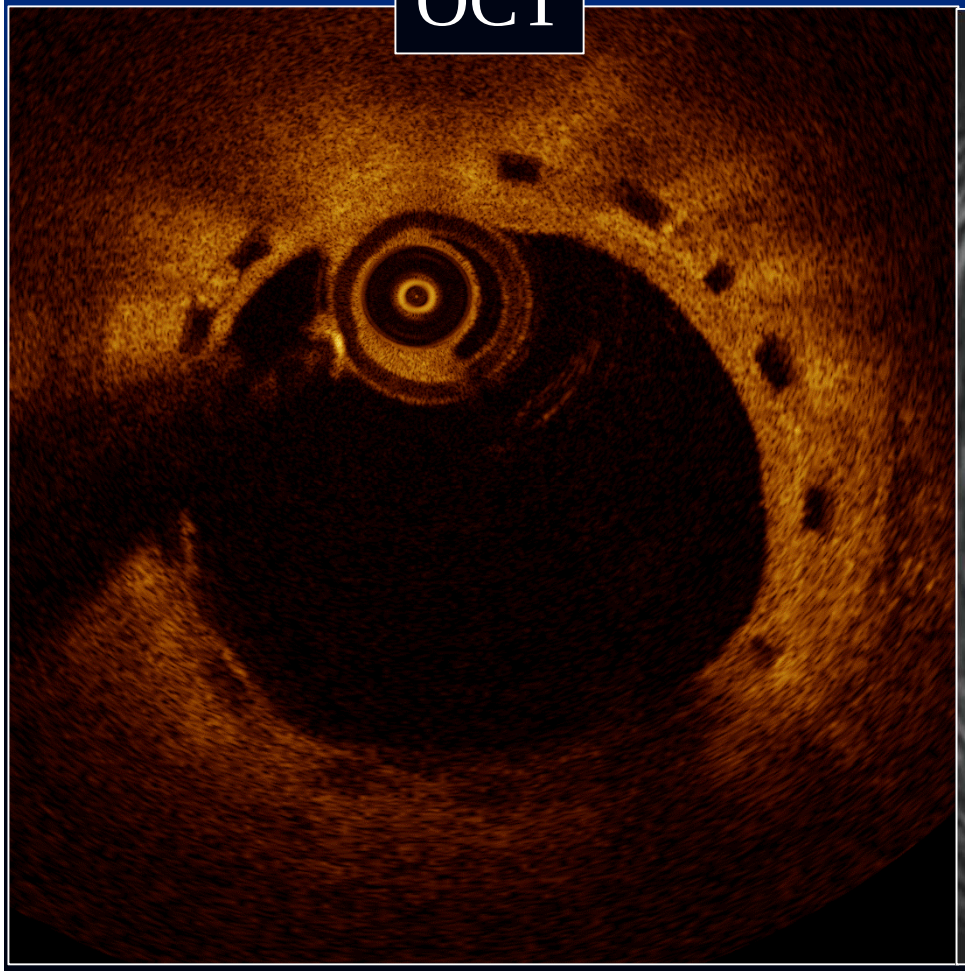




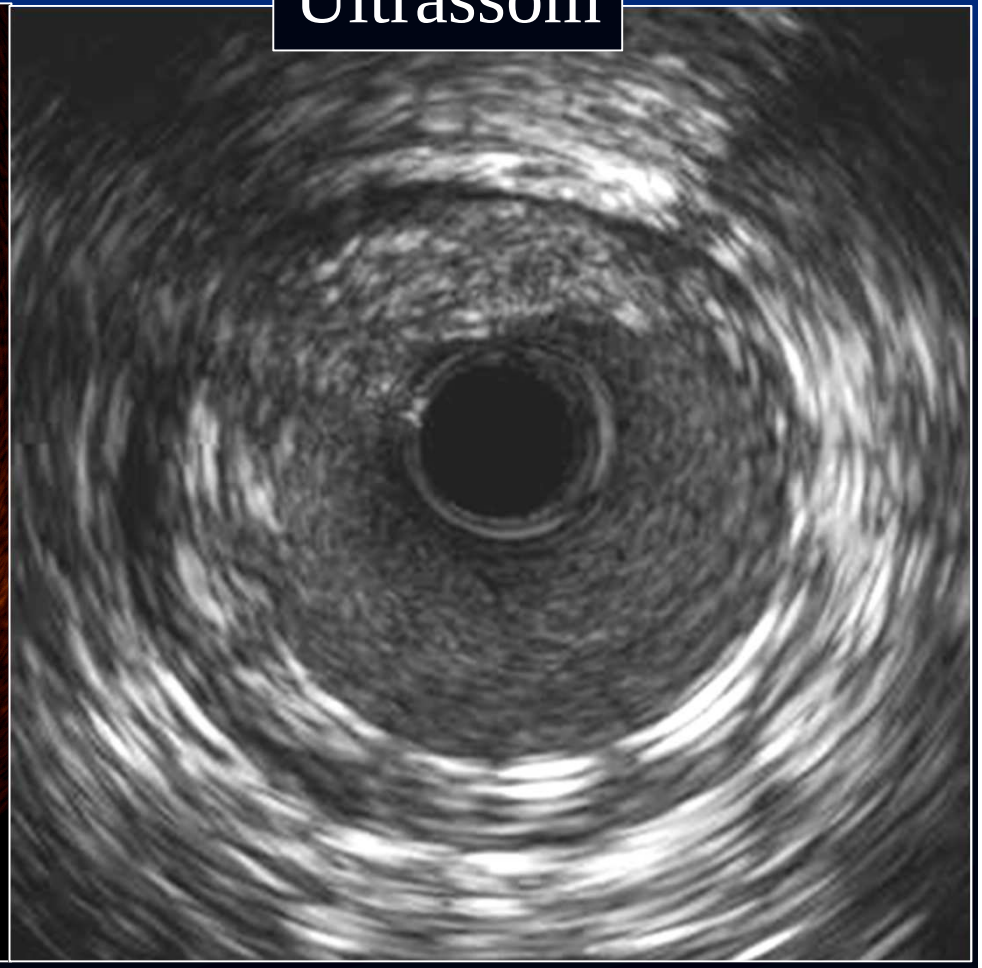
Reestudo 20 meses



OCT



Ultrassom



Device Thrombosis to 1 Year

	Absorb (N=1322)	Xience (N=686)	p-value
Device Thrombosis (def/prob)	1.54%	0.74%	0.13
- Early (0 to 30 days)	1.06%	0.73%	0.46
- Late (> 30 to 1 year)	0.46%	0.00%	0.10
- Definite* (1 year)	1.38%	0.74%	0.21
- Probable (1 year)	0.15%	0.00%	0.55

*One “definite ST” in the Absorb arm by ITT was in a pt that was treated with Xience

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Zotarolimus-Eluting Versus Bare-Metal Stents in Uncertain Drug-Eluting Stent Candidates

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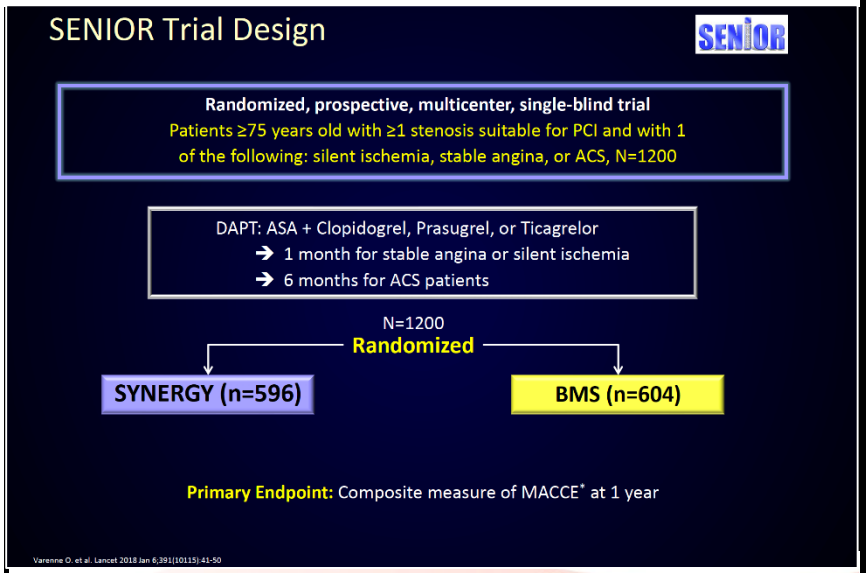
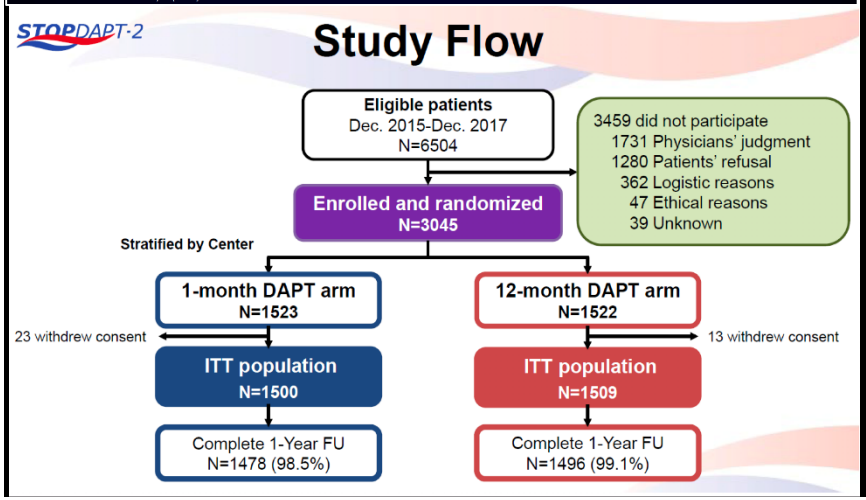




- 28.3% HBR
- 1-month DAPT: Lower risk of MACE in HBR patients

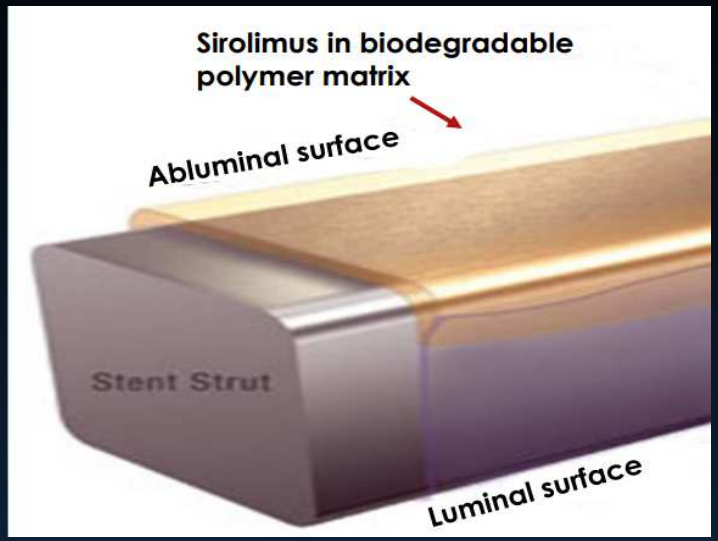
- 75 yo (minor ARC criteria for HBR)
- Net Clinical Benefit at 1 year favoring 1-month DAPT

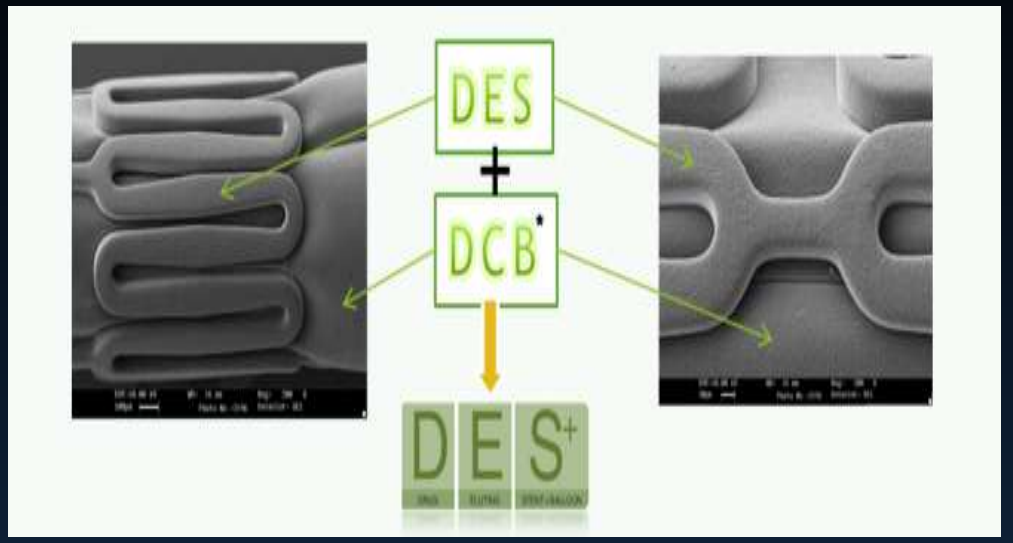
- Not a HBR study, but 1-month DAPT followed by clopidogrel superior than 12-month DAPT
- 90% imaging guided PCI

ABLUMINUS DES:
Designed to Treat Diabetic Patients

Abluminus DES carries drug on Abluminal surface of the stent and exposed parts of the balloon as well as 0.5 mm on the balloon from distal and proximal edges of the balloon surface to achieve maximum diseased area get the drug

The Abluminal coating leads to faster re-endothelialization





Abluminal coating on Stent and Exposed parts of balloon

Evolução na Intervenção Coronária Percutânea e Stents

Obrigado!!!!