



XXV Jornadas SOLACI
8° Región Cono Sur



Evaluación de lesiones intermedias y de la placa ateromatosa en la práctica diaria


HOSPITAL ITALIANO
de Buenos Aires
Instituto de Medicina
Cardiovascular

Daniel Berrocal, MD, PhD, MTSAC, FACC
Jefe de Cardiología Intervencionista
daniel.berrocal@hospitalitaliano.org.ar





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8° Región Cono Sur

*NO TENGO CONFLICTO DE INTERESES
PARA ESTA PRESENTACION*

Severidad de la estenosis

FFR

IVUS

OCT

Caracterización de la placa

OCT

IVUS

Guía durante angioplastia

IVUS

OCT

FFR

Seguimiento posterior

OCT

IVUS

Severidad de la estenosis

FFR

IVUS

OCT

Caracterización de la placa

OCT

IVUS

Guía durante angioplastia

IVUS

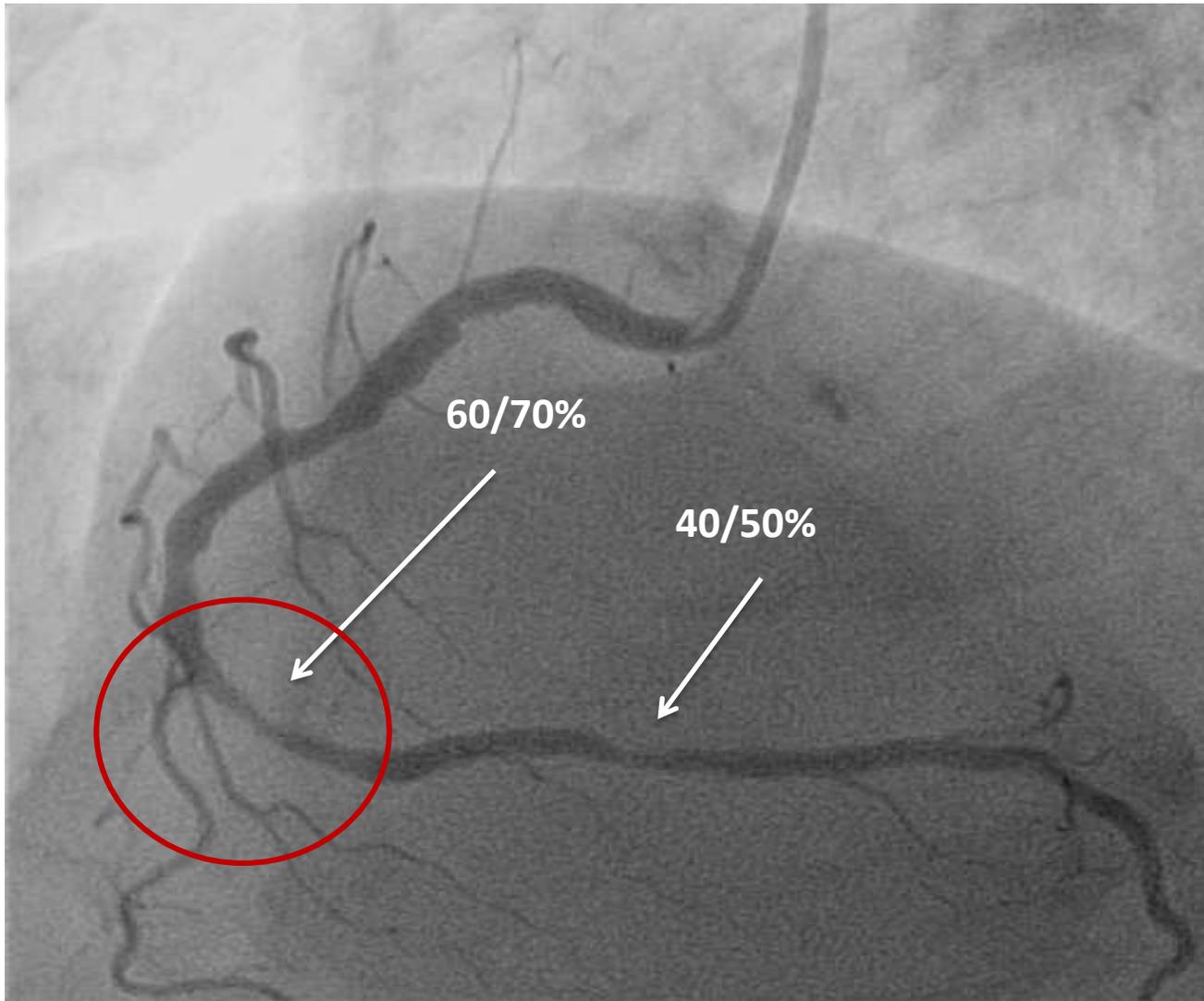
OCT

FFR

Seguimiento posterior

OCT

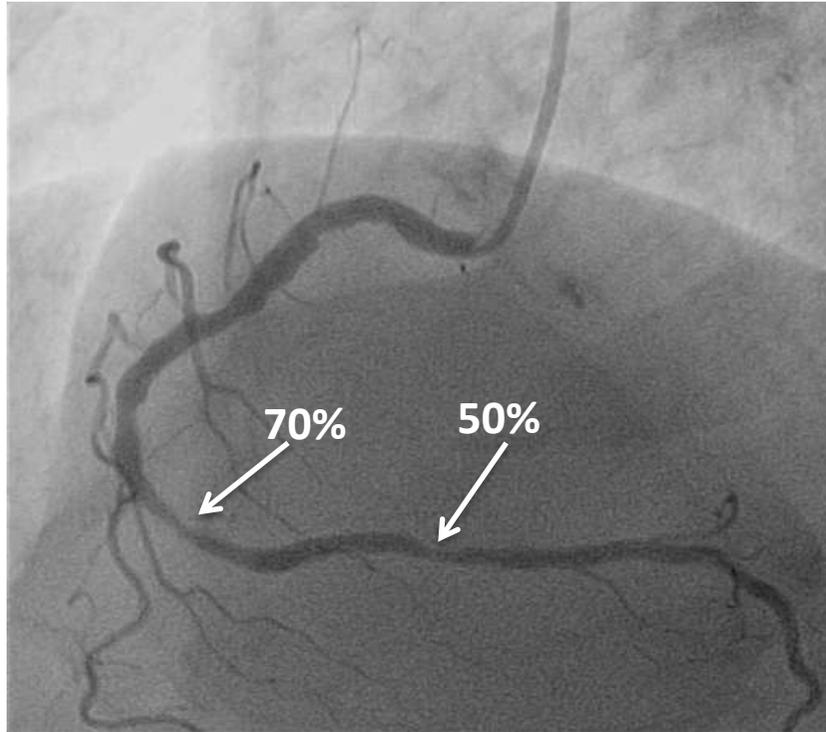
IVUS



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de Buenos Aires

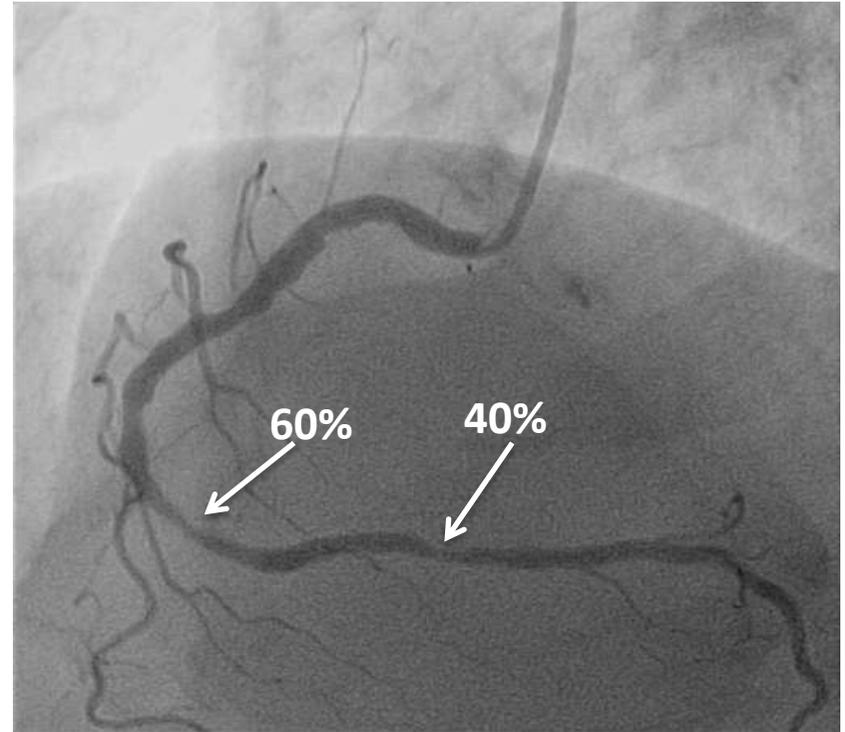
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Hemodinamista 1



Angioplastia

Hemodinamista 2



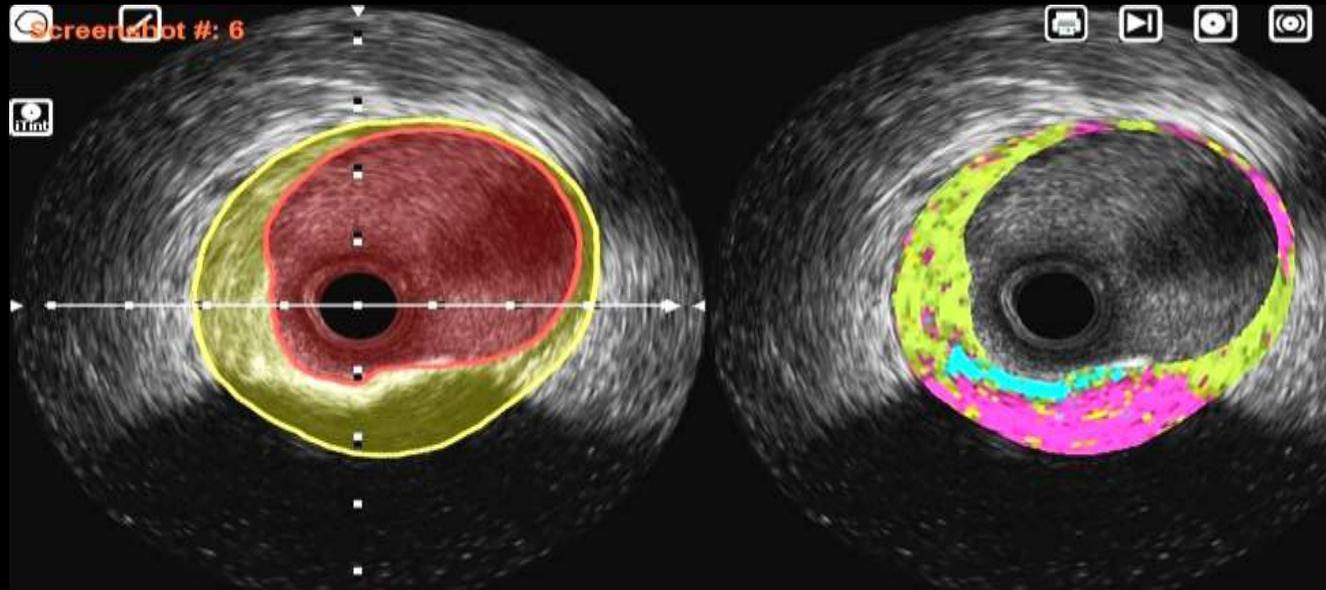
Tratamiento medico



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IntraVascular UltraSound (IVUS)

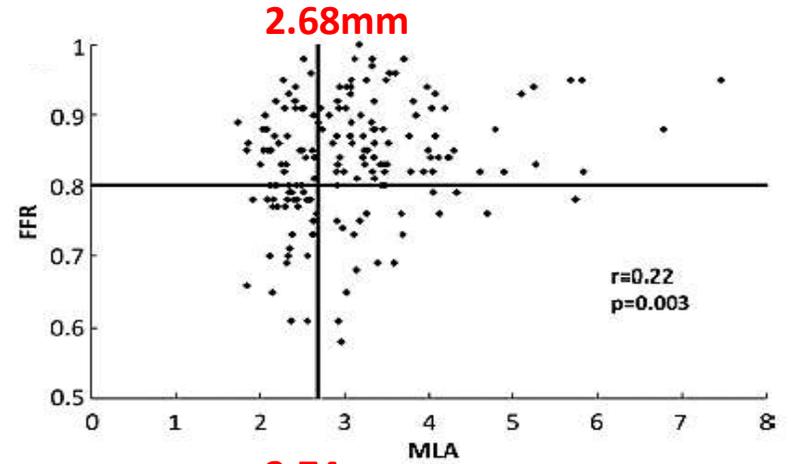
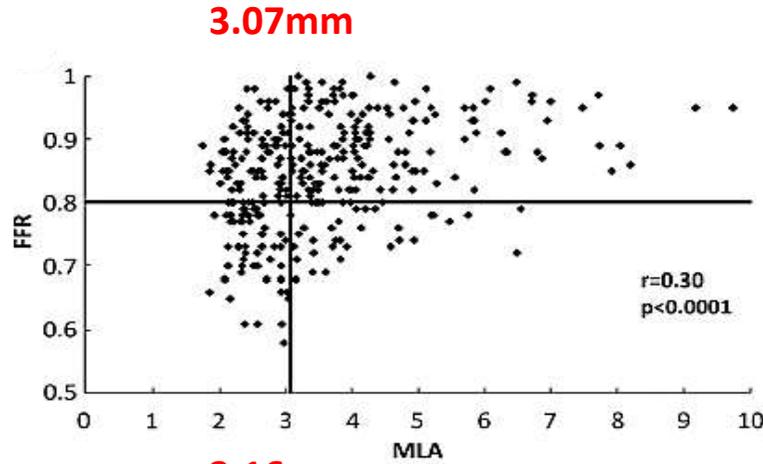


Area $\geq 4 \text{ mm}^2$ = No significativa

Area $\leq 4 \text{ mm}^2$ = Significativa

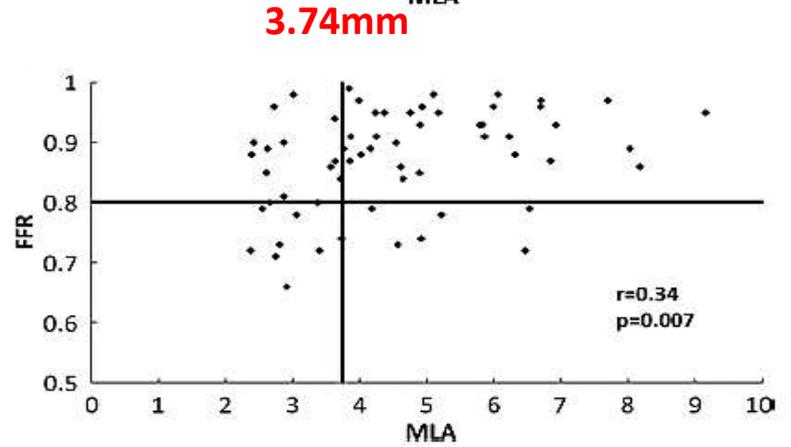
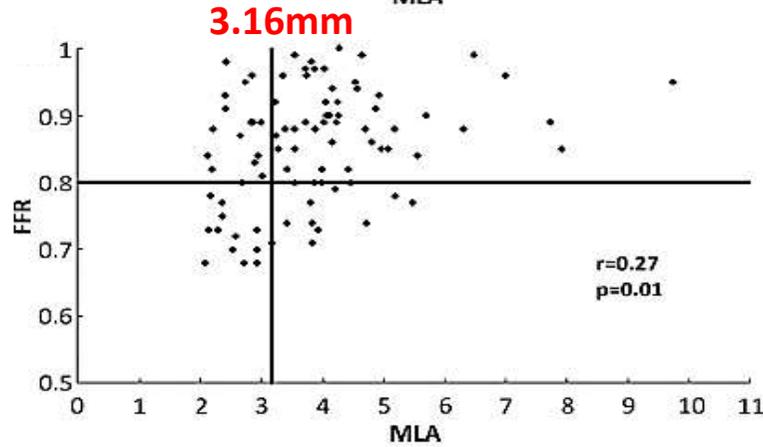
Estudio FIRST

Todos los diámetros



Vasos <3.0mm

Vasos de 3.0 a 3.5mm



Vasos >3.5mm

Optical Coherence Tomography (OCT)

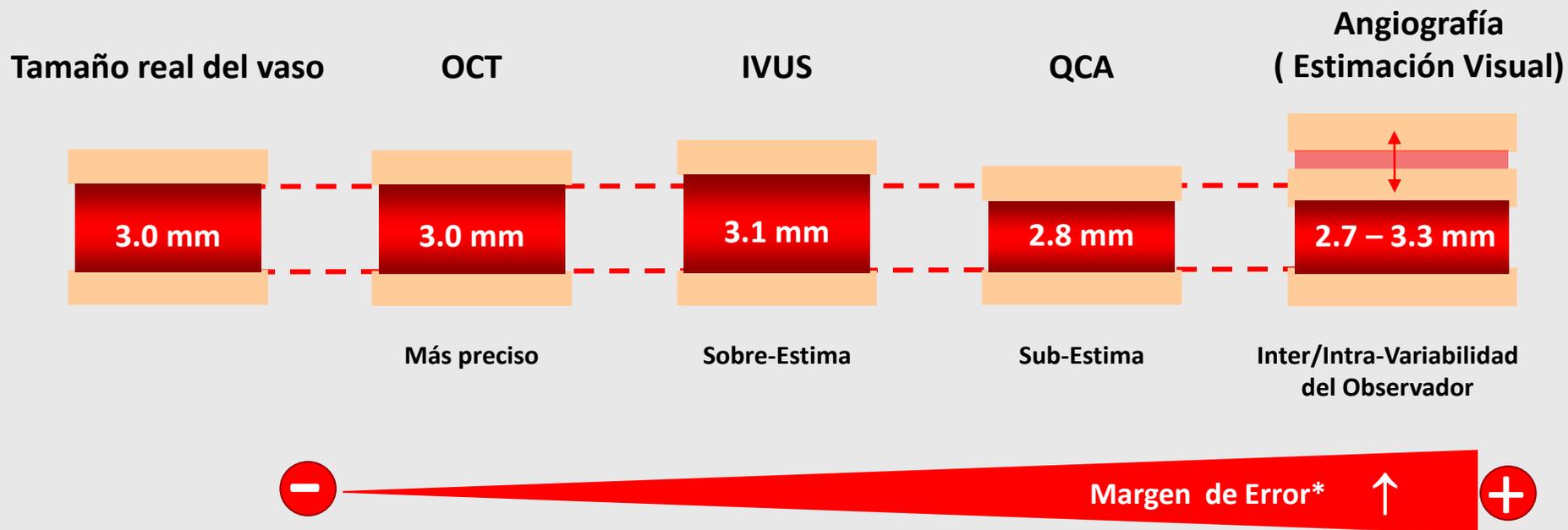
Optical Frequency Domain Imaging (OFDI)

A Area: 2.24mm²
Mean Diameter: 1.69mm
Min: 1.58mm, Max: 1.85mm
B Reference: 6.55mm²
Mean Diameter: 2.89mm
C %AS: A B = 65.8%
D %DS: A B = 41.5%

04/22/2014 12:38:26
0001

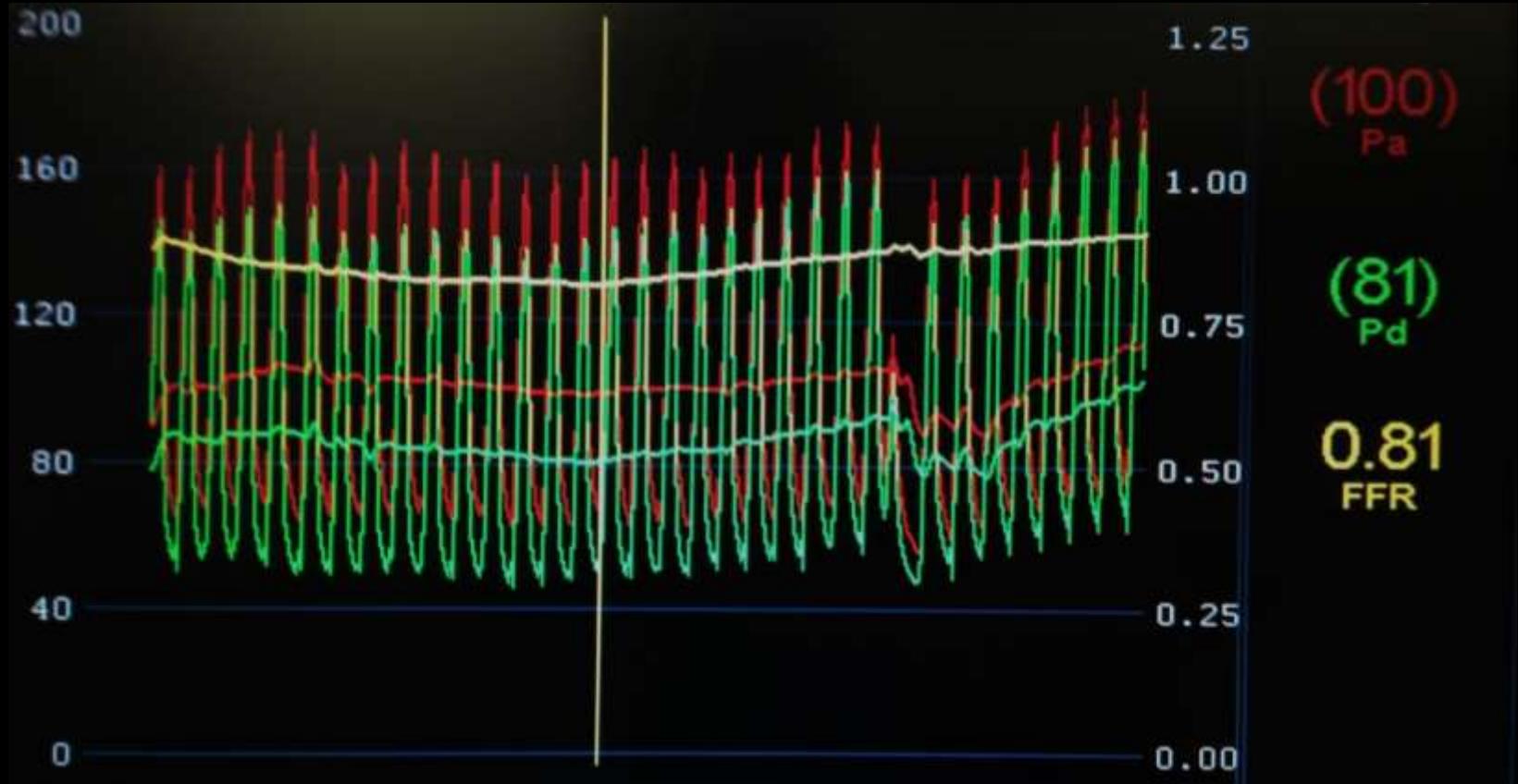


Cuantificación con los distintos métodos

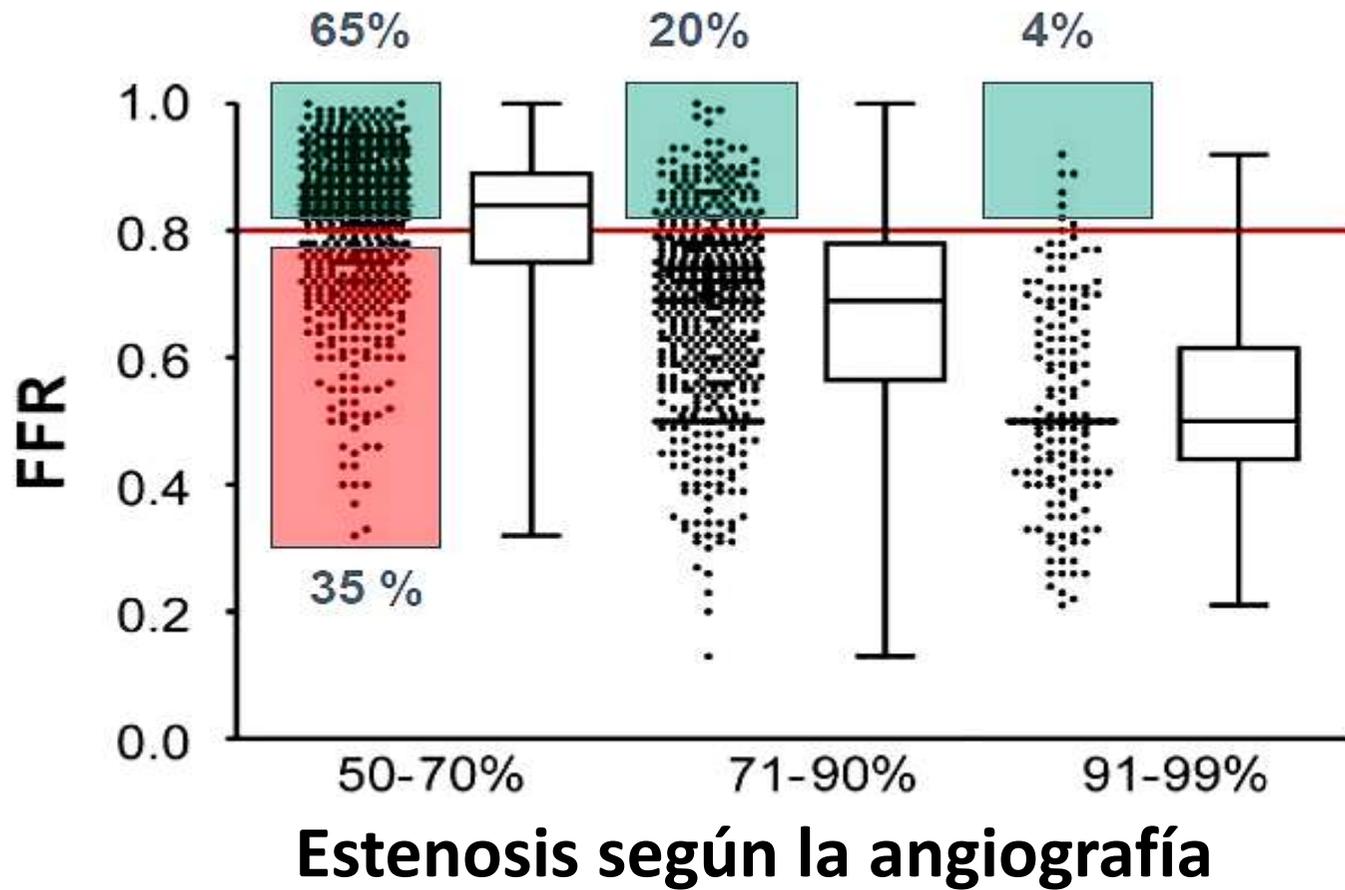


**Margen de error de las estimaciones basadas en la resolución de cada modalidad de imagen:
Resolución de OCT y IVUS: Bezerra, H.G., J Am Coll Cardiol.: Cardiovasc Interv. 2009; 2: 1035.
Resolución de QCA: Dahm, J. and van Buuren, F. Int J Vasc Med. 2012.
Compensación y variabilidad de la estimación visual: datos archivados en Abbott Vascular.

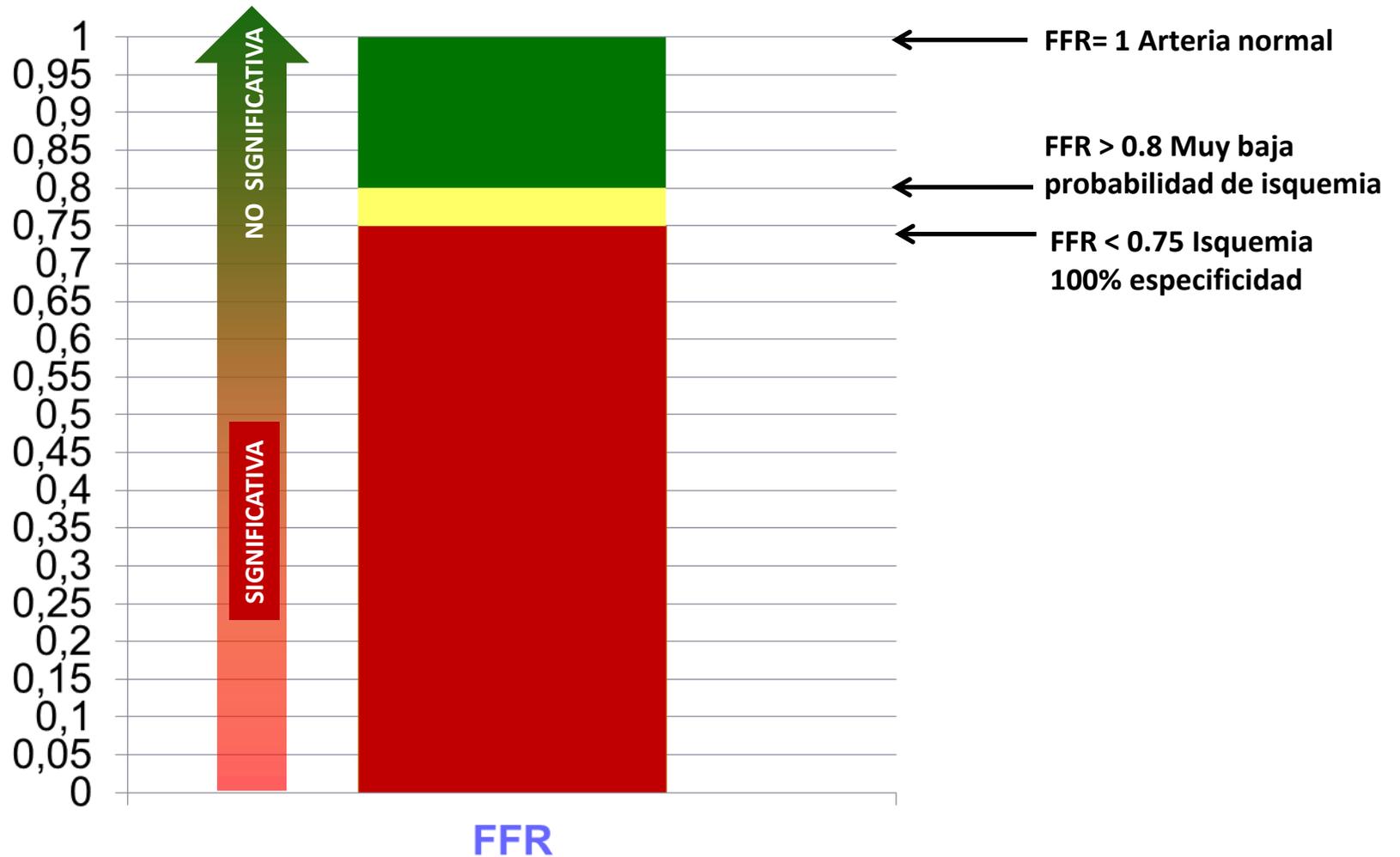
Reserva Fraccional de Flujo FFR



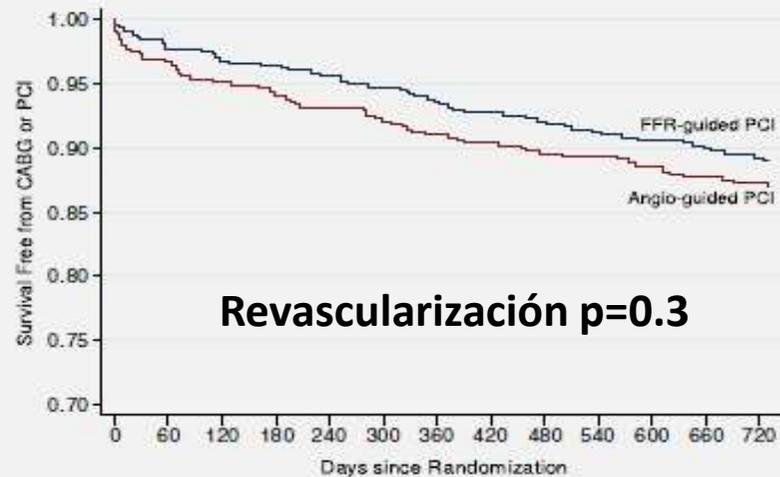
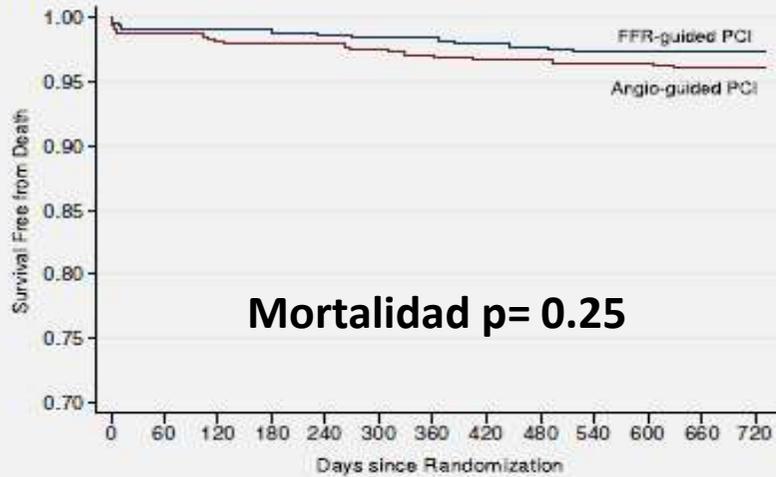
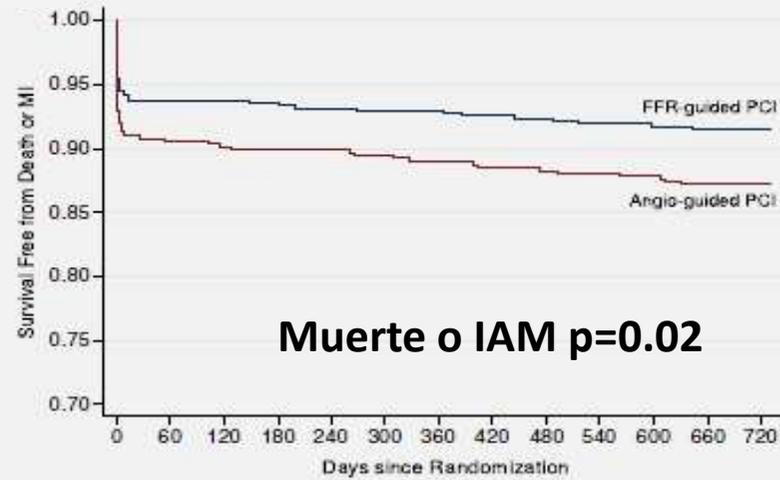
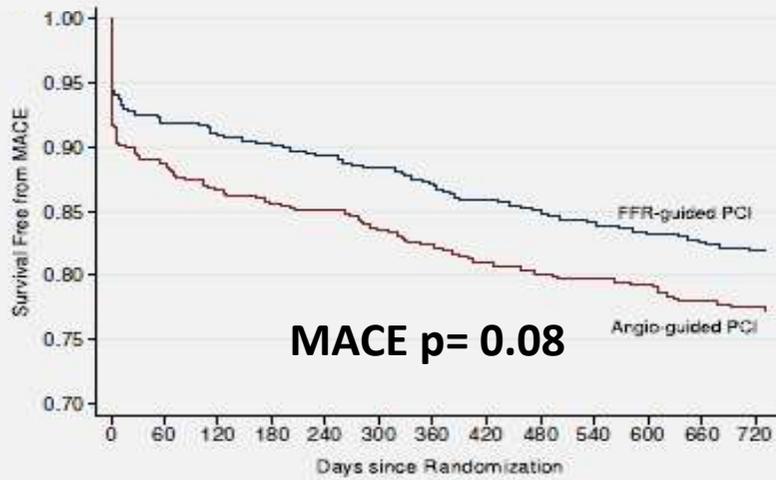
FAME



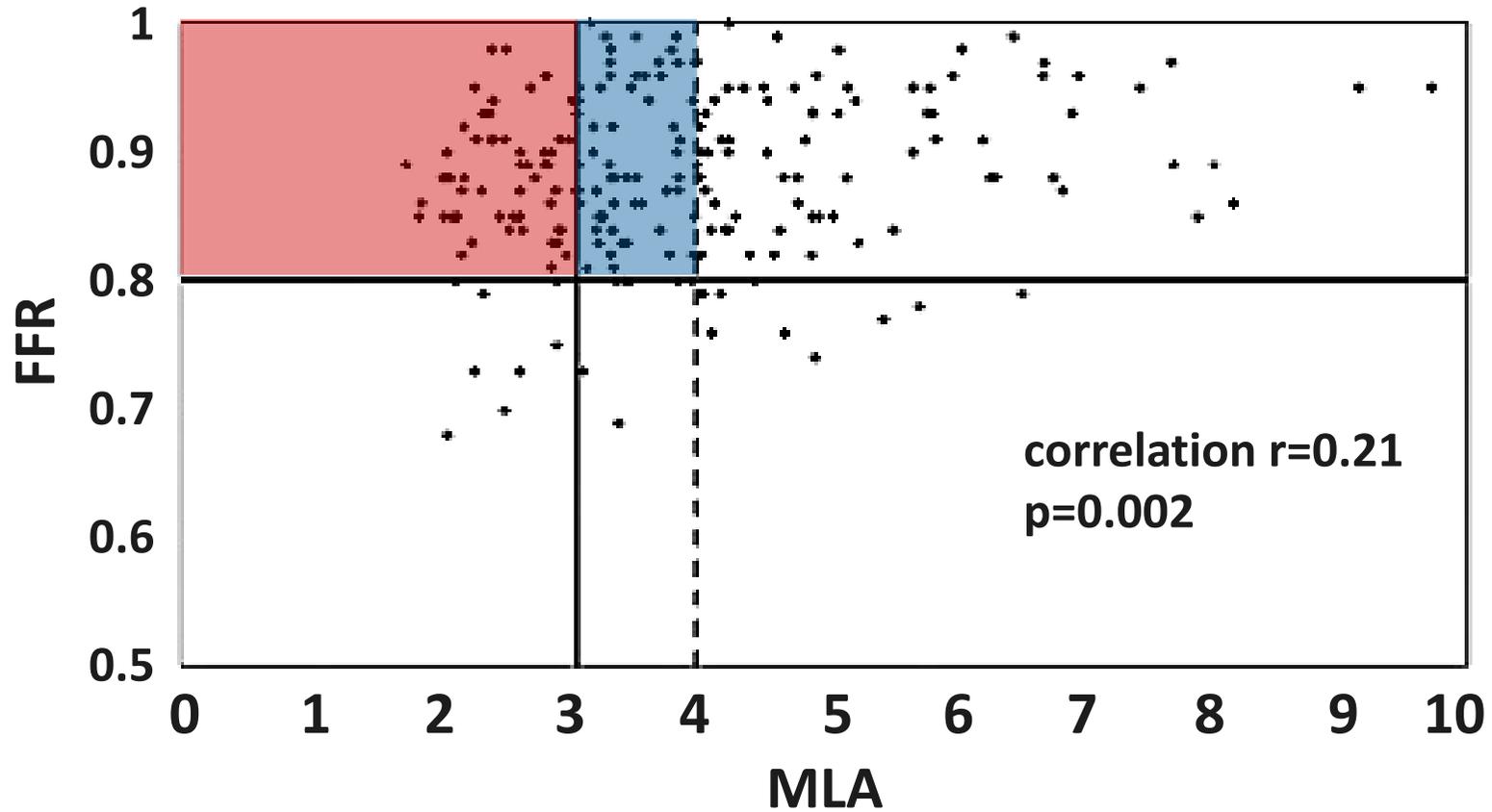
Reserva Fraccional de Flujo FFR

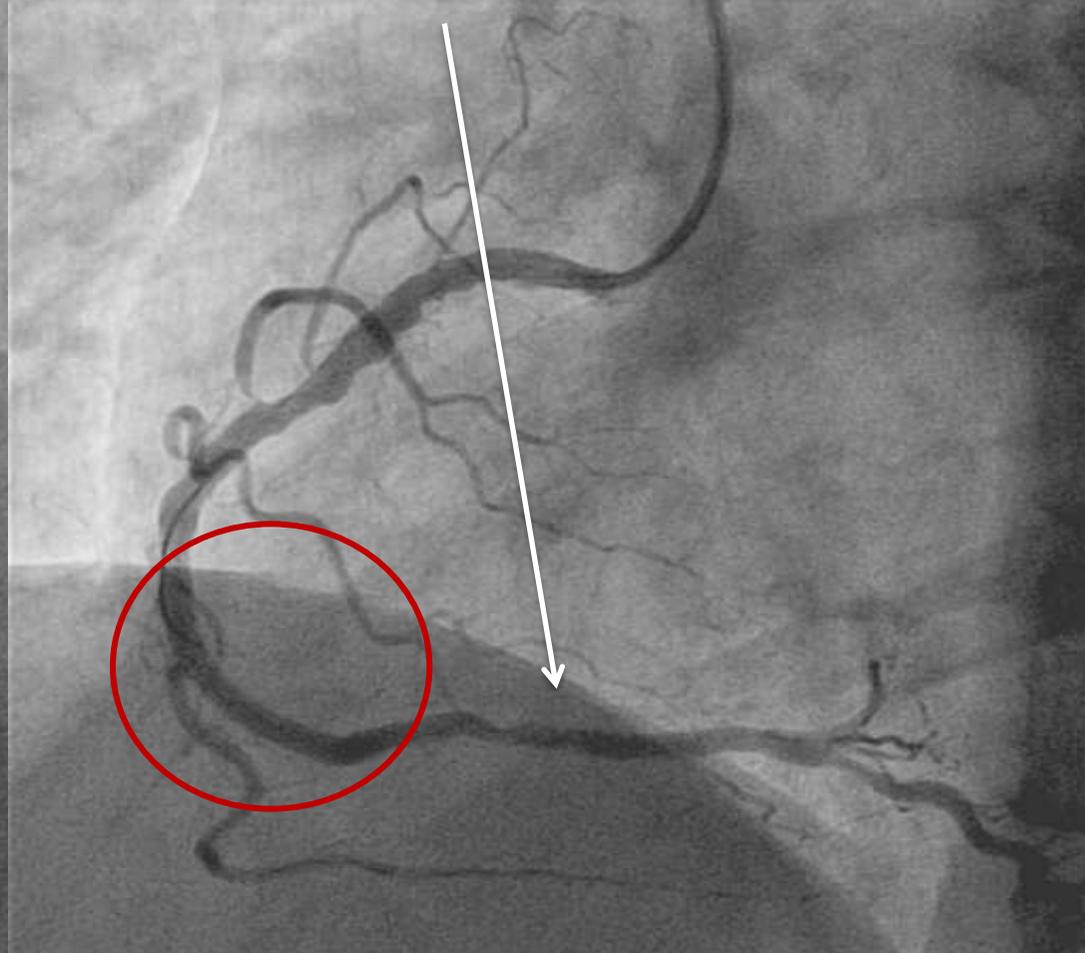
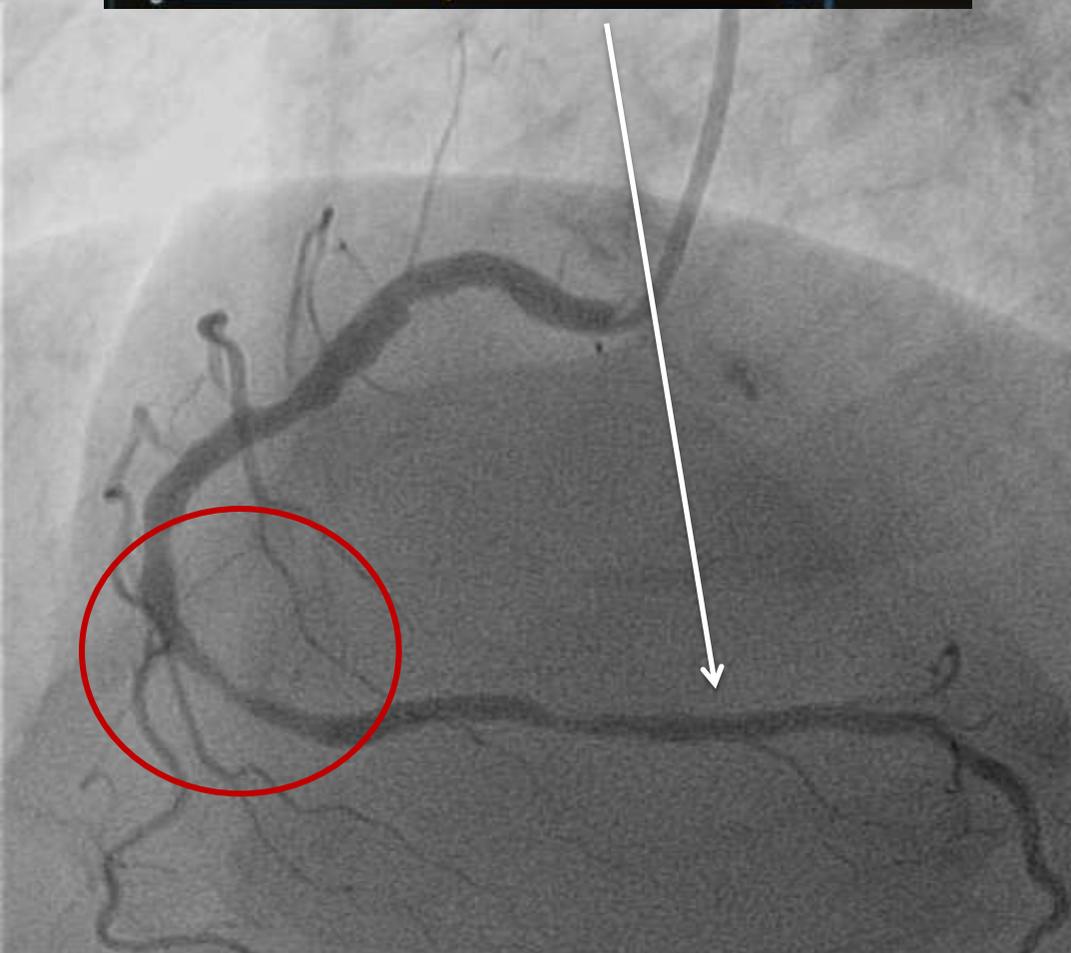
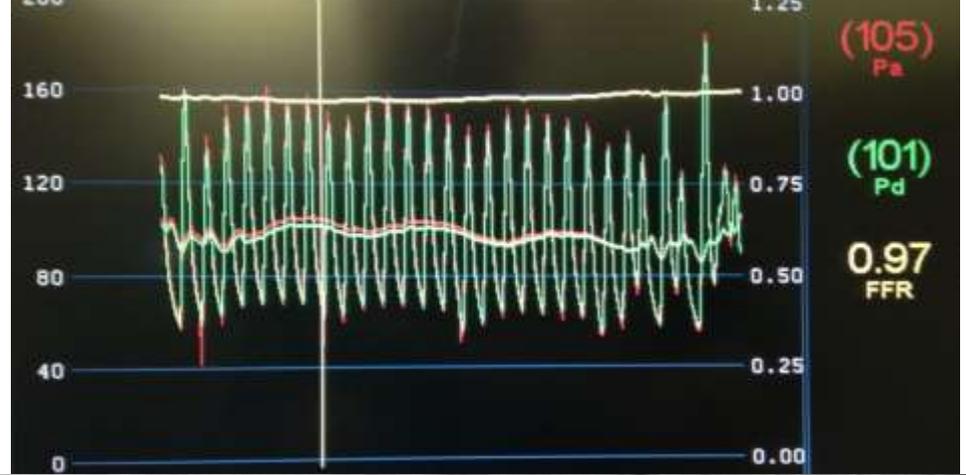
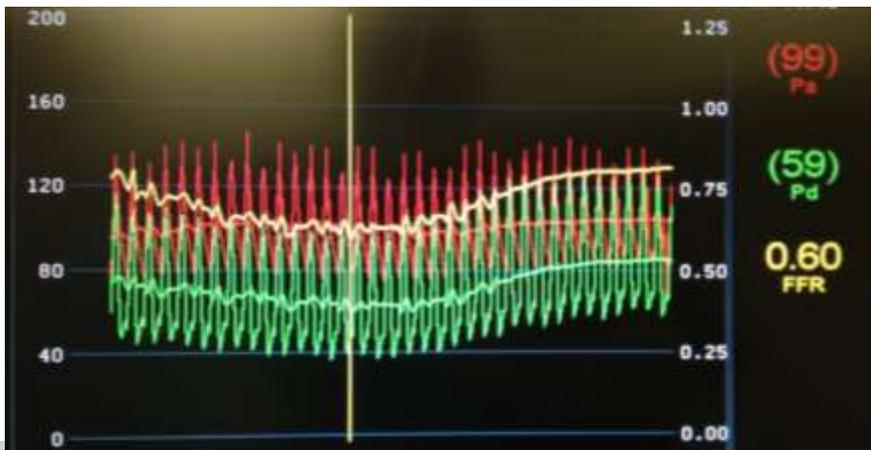


FAME

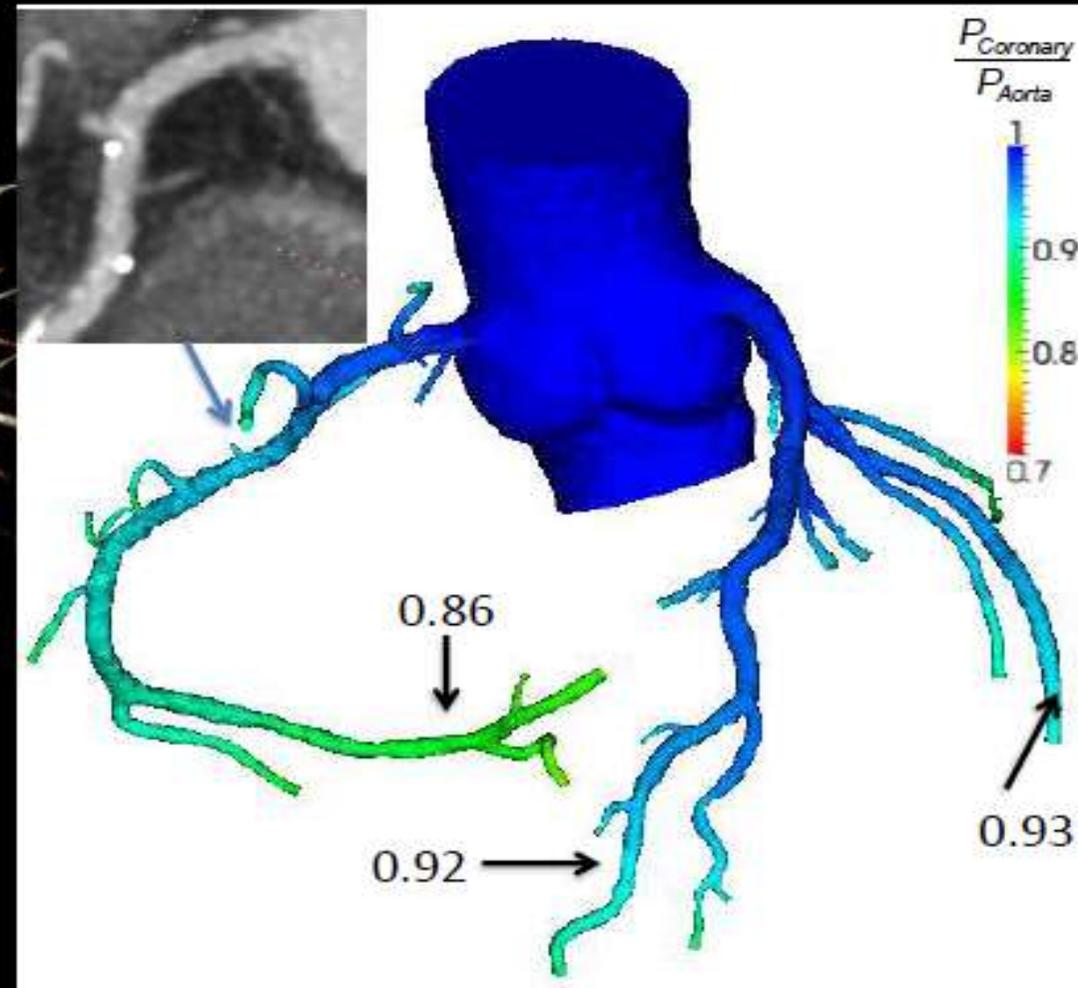
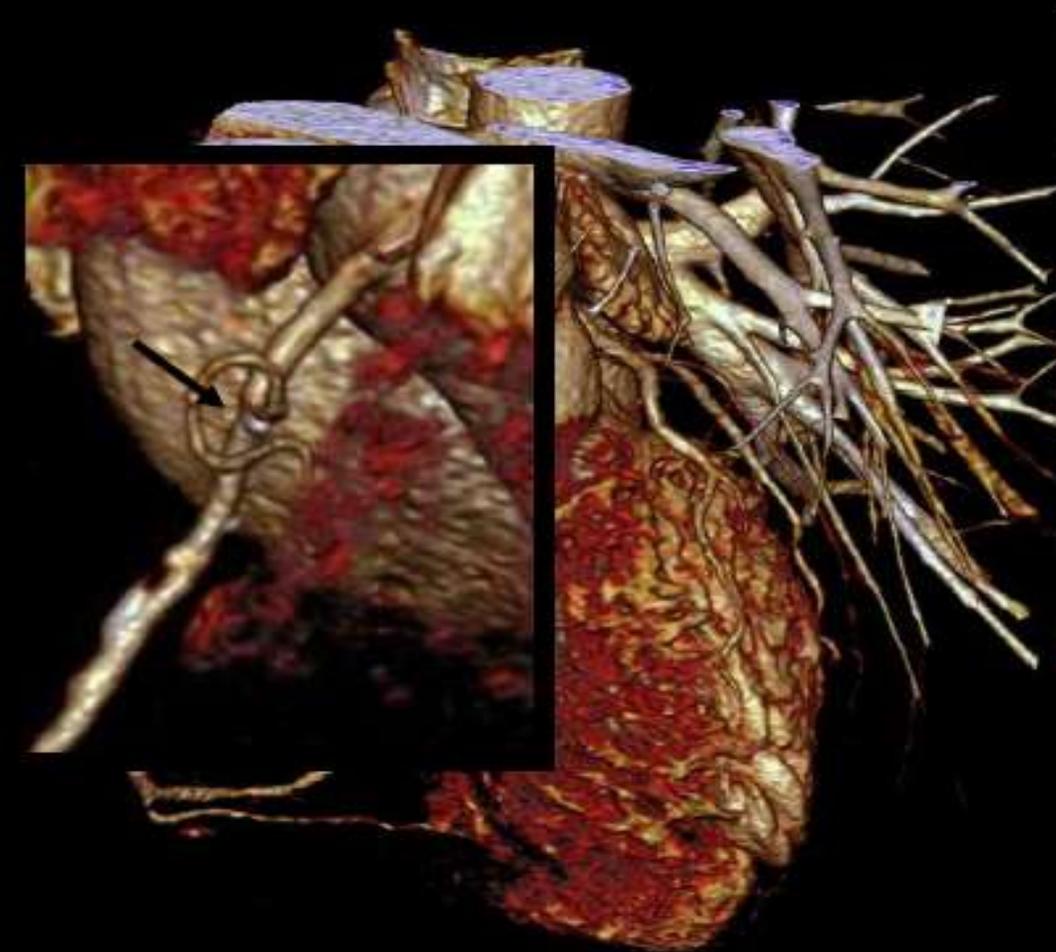


Estudio FIRST

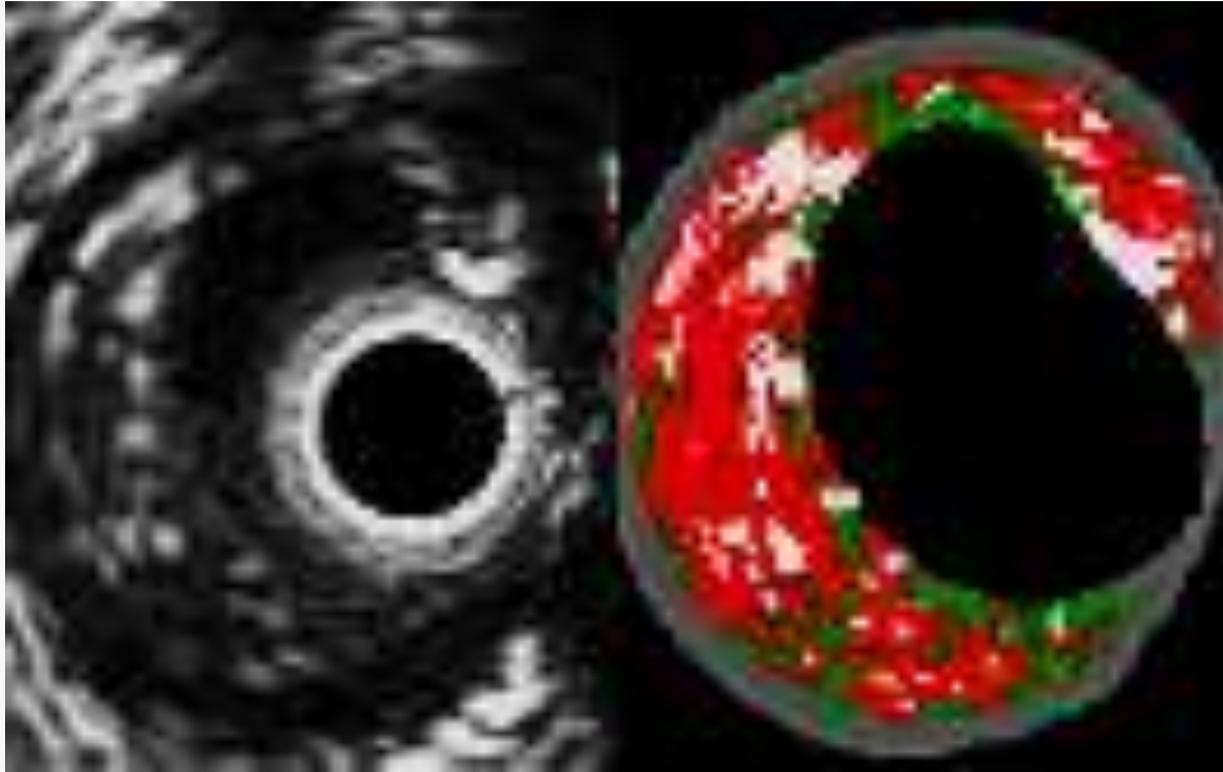




Case 1 (5YR FU)



“Plac Burden” (carga de placa)



PROSPECT: Multivariable Correlates of Non Culprit Lesion Related Events

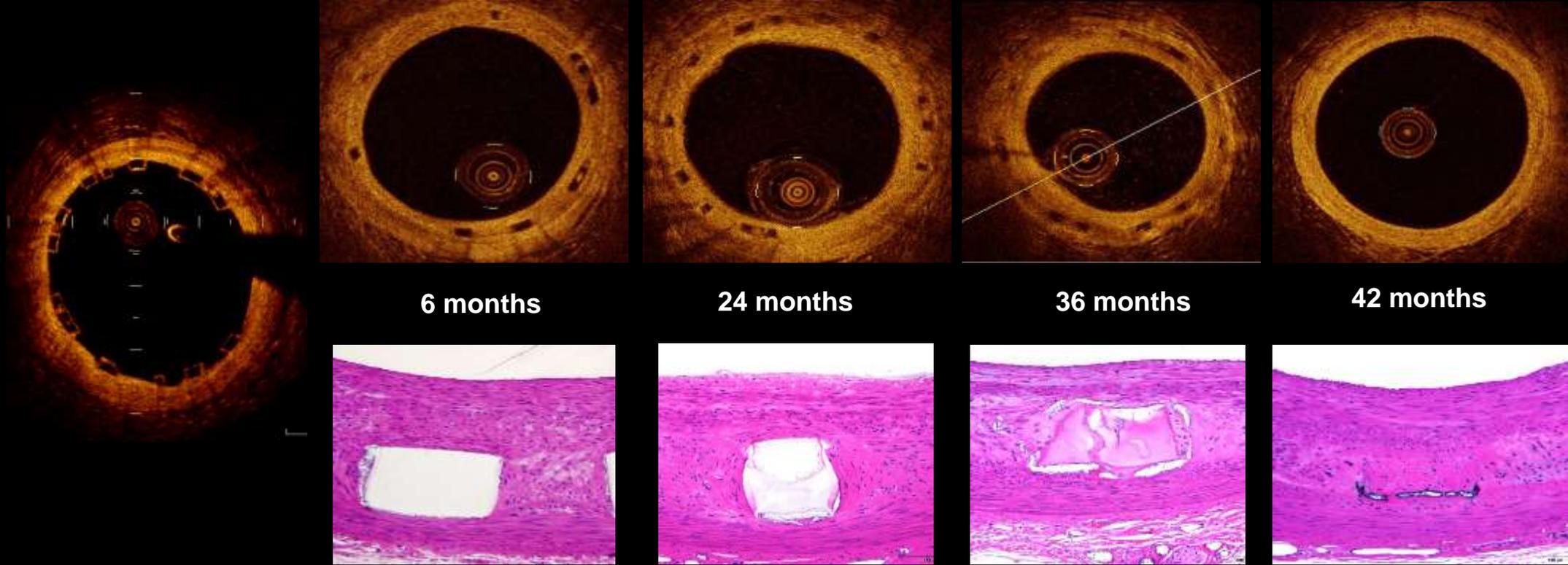
Independent predictors of lesion level events by logistic regression analysis

<u>Variable</u>	<u>OR [95% CI]</u>	<u>P value</u>
PB _{MLA} ≥70%	4.99 [2.54, 9.79]	<0.0001
VH-TCFA	3.00 [1.68, 5.37]	0.0002
MLA ≤4.0 mm ²	2.77 [1.32, 5.81]	0.007
Lesion length ≥11.6 mm	1.97 [0.94, 4.16]	0.07

Variables entered into the model: Minimal Luminal Area (MLA); Plaque Burden at the MLA (PB_{MLA})
External Elastic Membrane at the MLA (EEM_{MLA}) ≤median; lesion length ≥ median (mm); VH-TCFA

Resorption: Vascular Response

Cohort B, Preclinical OCT Images



Representative photomicrographs of porcine coronary arteries, 20x, Hematoxylin and Eosin

Images on file with Abbott Vascular.

Severidad de la estenosis

FFR

IVUS

OCT

Caracterización de la placa

OCT

IVUS

Guía durante angioplastia

IVUS

OCT

FFR

Seguimiento posterior

OCT

IVUS

Resolución



	OCT	IVUS	CAG	MSCT	MRI	Angioscopy
Resolution (μm)	10-20	80-150	200	300	300	200
Time aspect I	Real-time	Real-time	Real-time			Real-time
Time aspect II	2-50 sec	20-50 sec				30 sec
Type of scan source	IR-light	Ultrasound	X-rays	X-rays	Magnetic rays	Visible light
Imaging target	Layer	Layer	Bloodflow	Density	Density	Surface



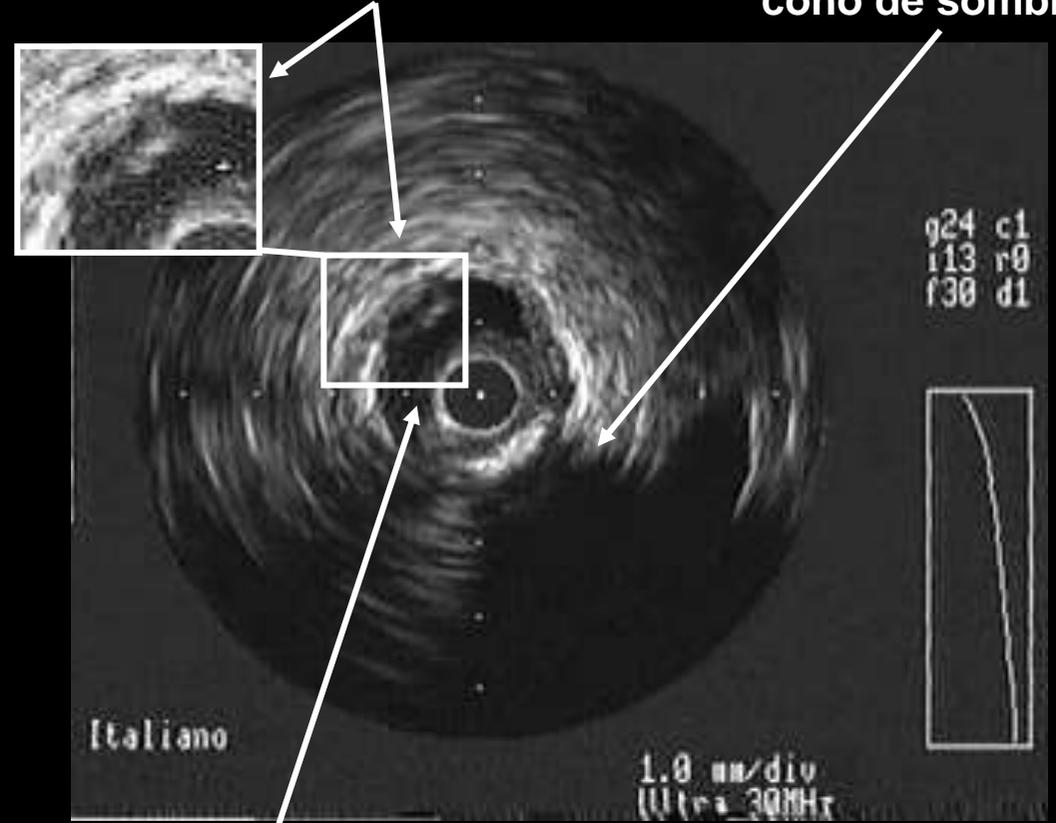
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Trombo



Disección



**Calcio con
cono de sombra**

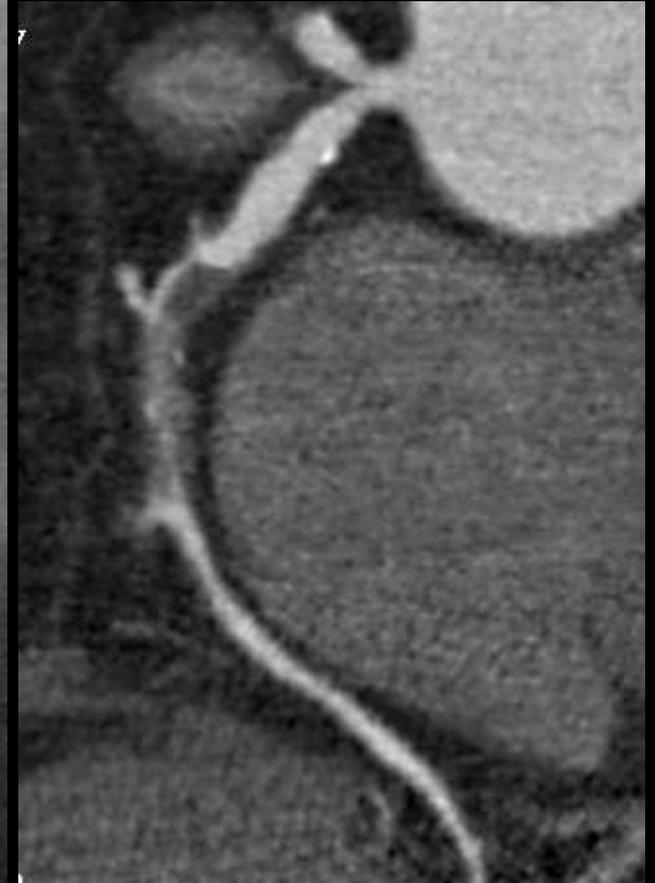
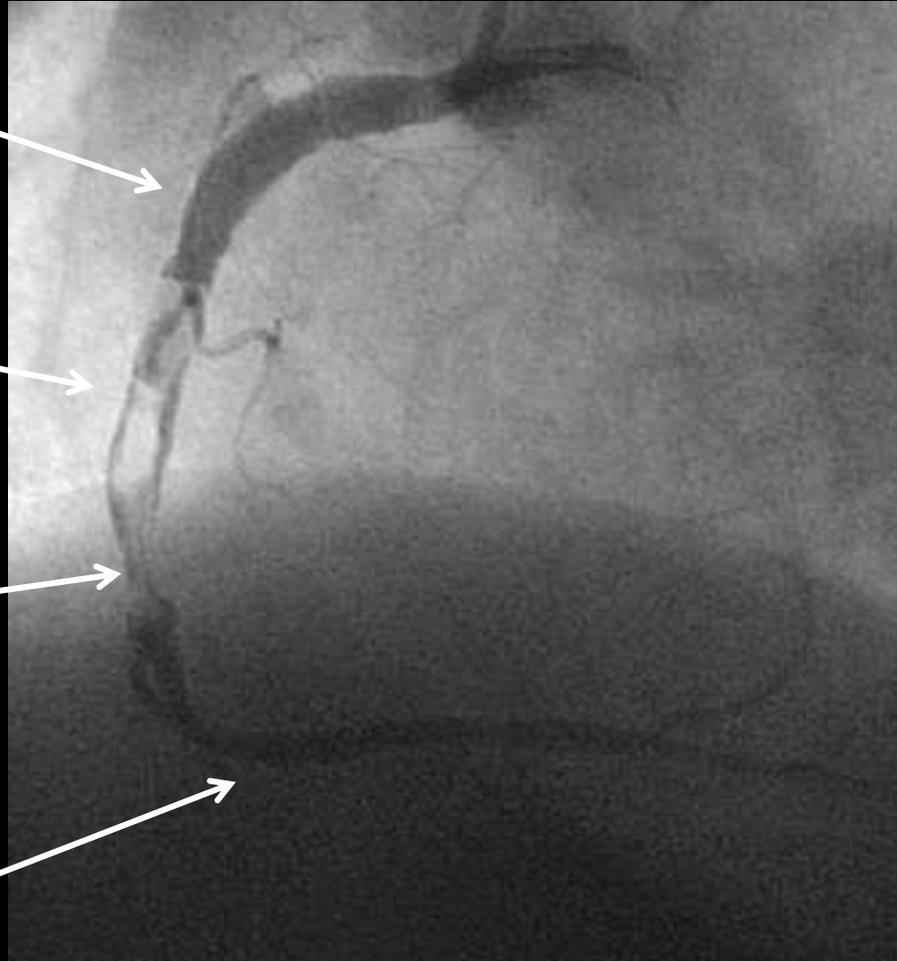
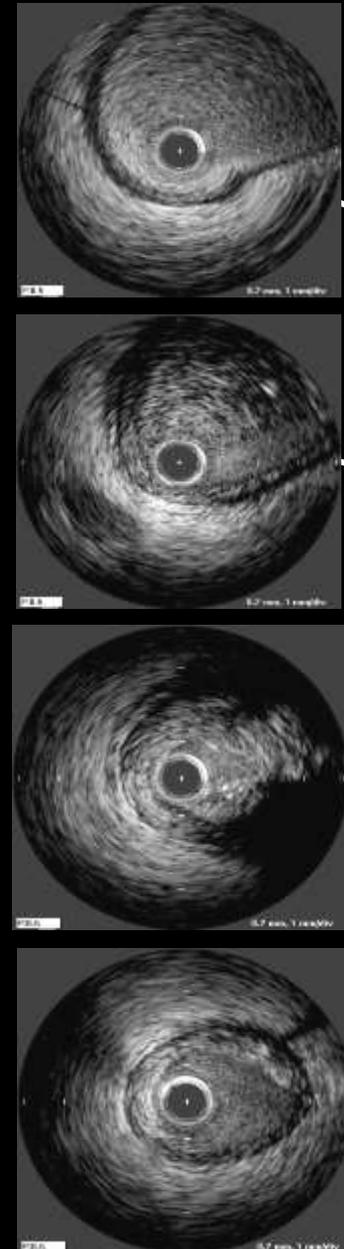
Luz arterial

Placa excéntrica



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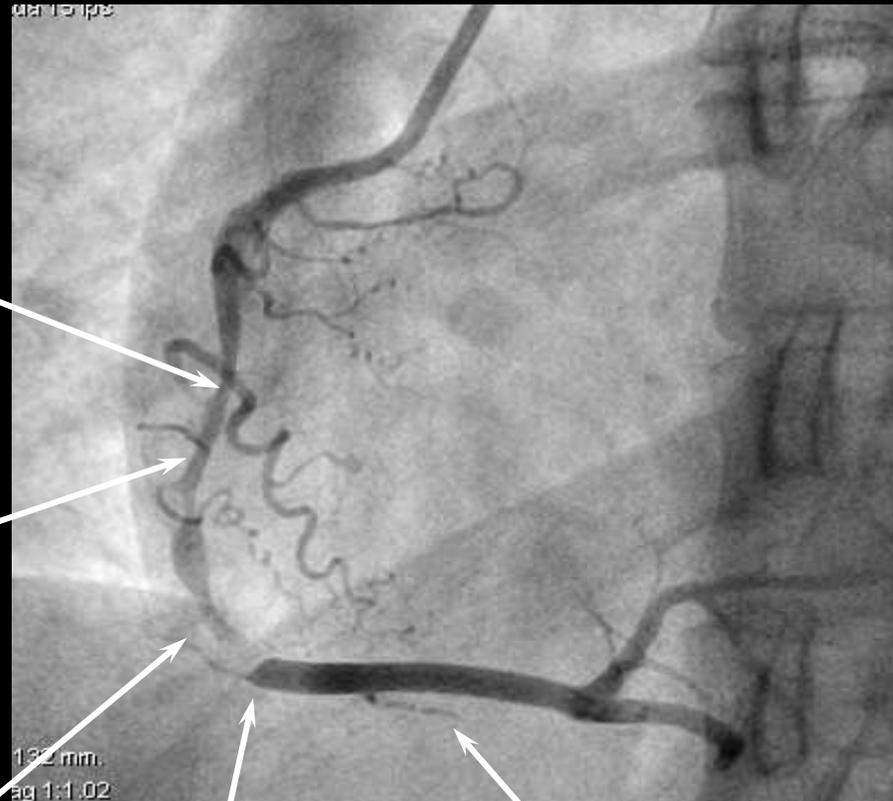
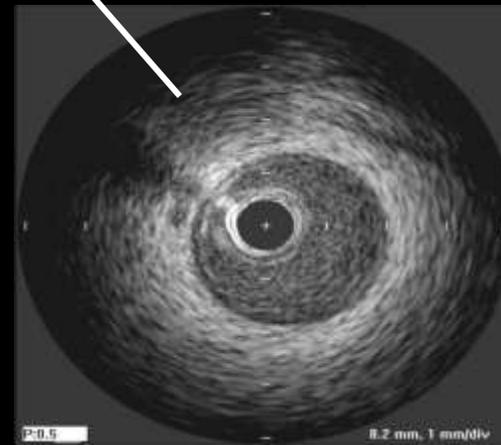
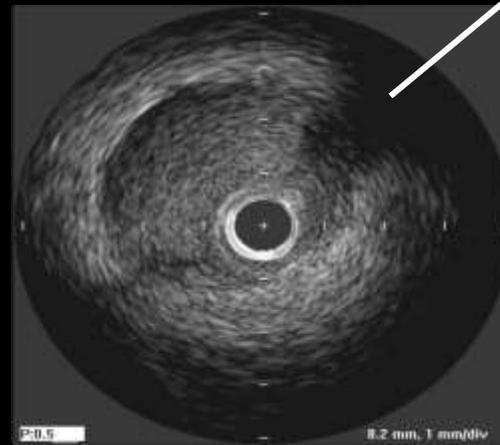
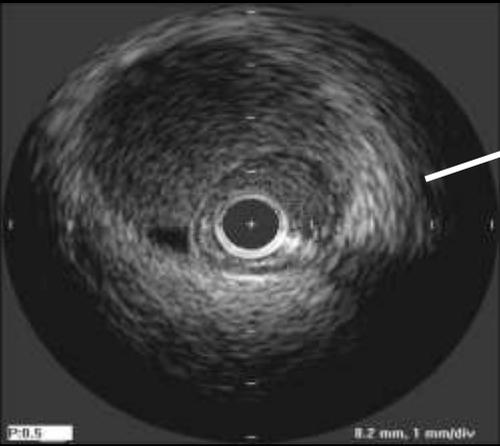




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Diseccción Coronaria Espontánea (Ehlers-Danlos)



The PROSPECT Trial

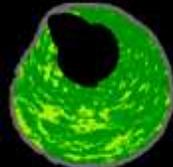
*700 pts with ACS UA (with ECG Δ s) or
NSTEMI or STEMI $>24^\circ$
undergoing 1 or 2-vessel PCI followed by 3-
vessel imaging*



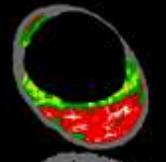
1. Fibrotic



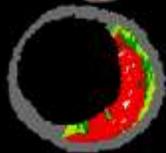
2. Fibrocalcific



3. Pathological intimal thickening (PIT)



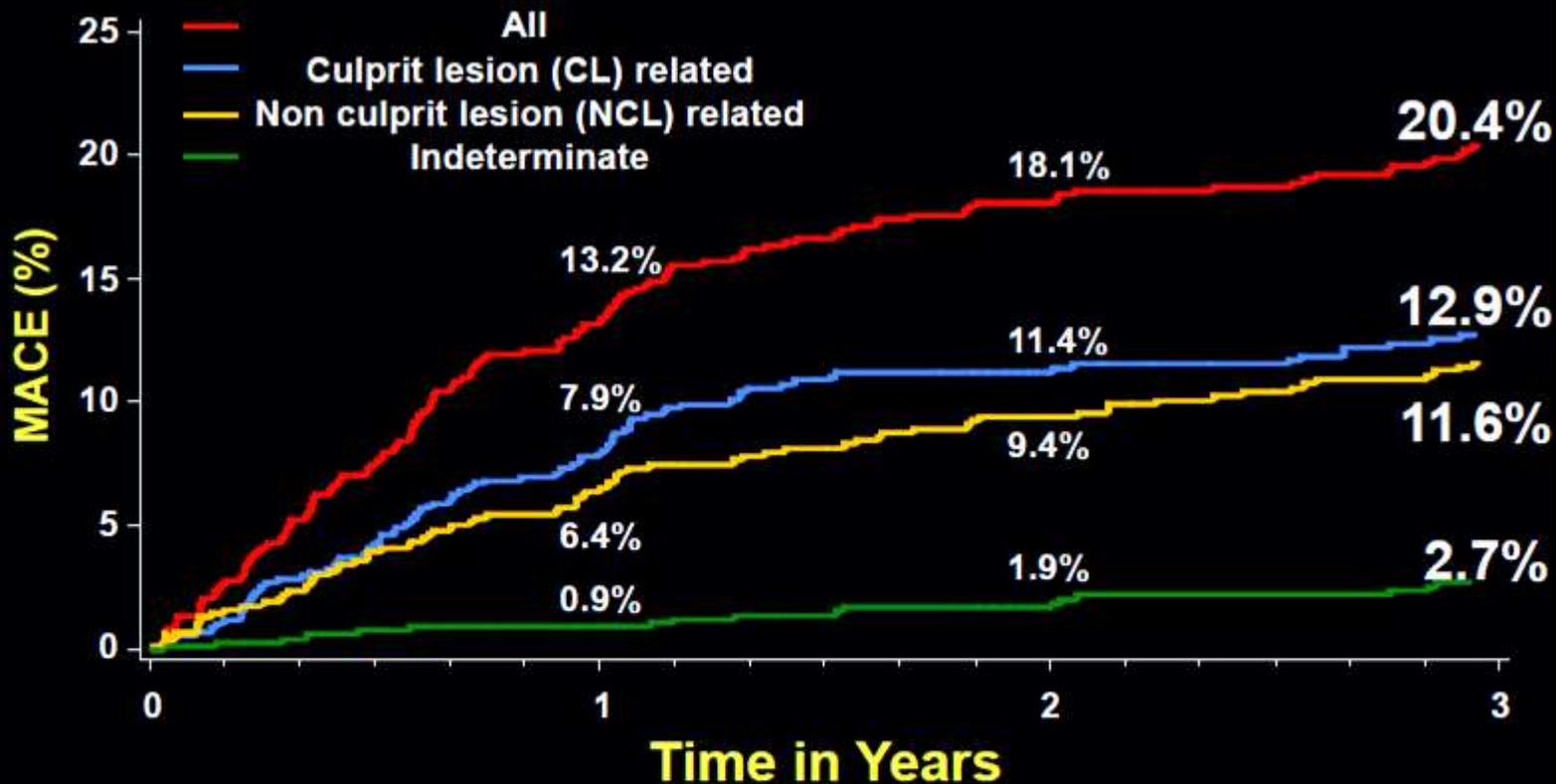
4. Thick cap fibroatheroma (ThCFA)



**5. VH-thin cap fibroatheroma (VH-TCFA)
(presumed high risk)**

The PROSPECT Trial

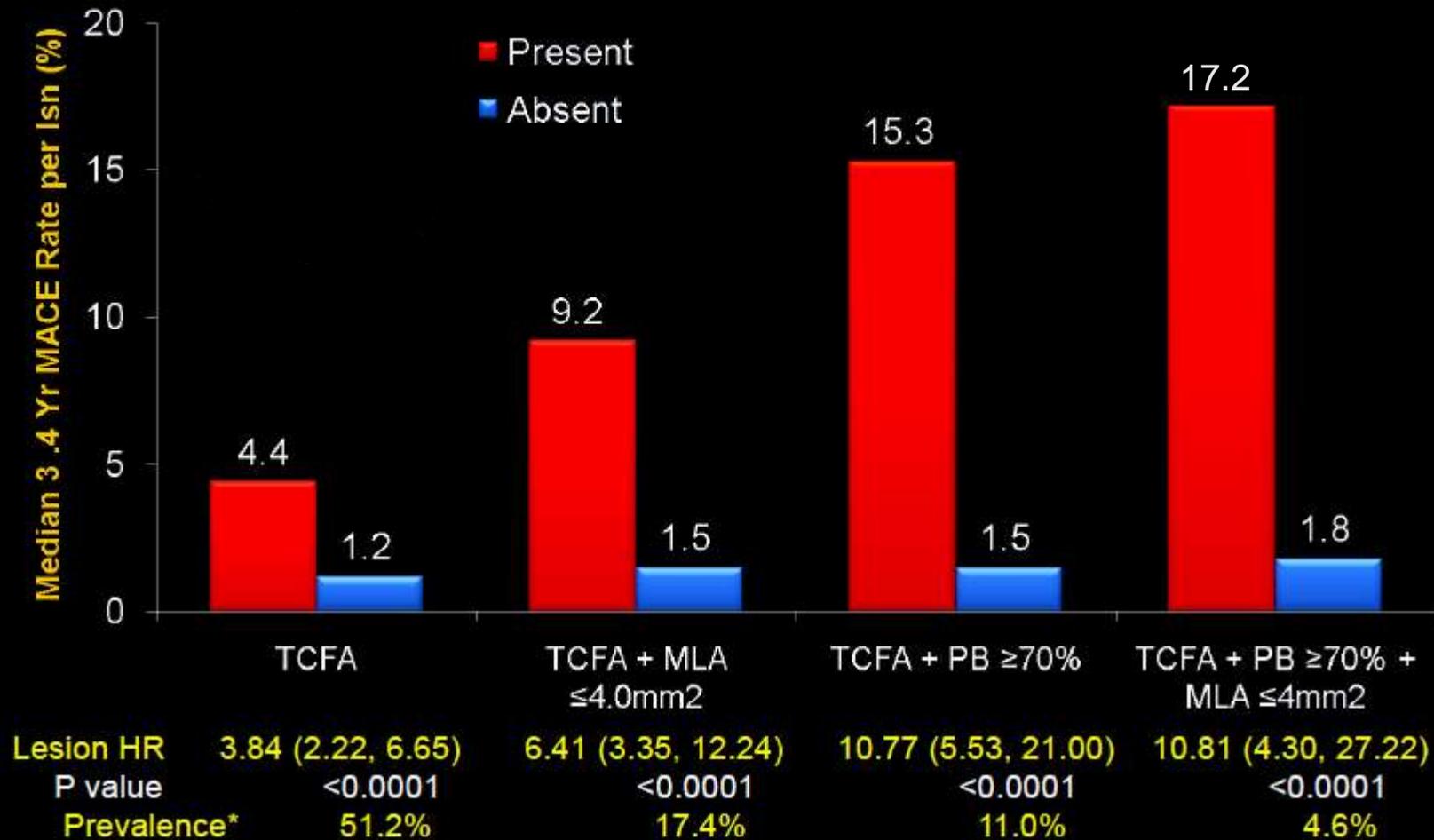
MACE



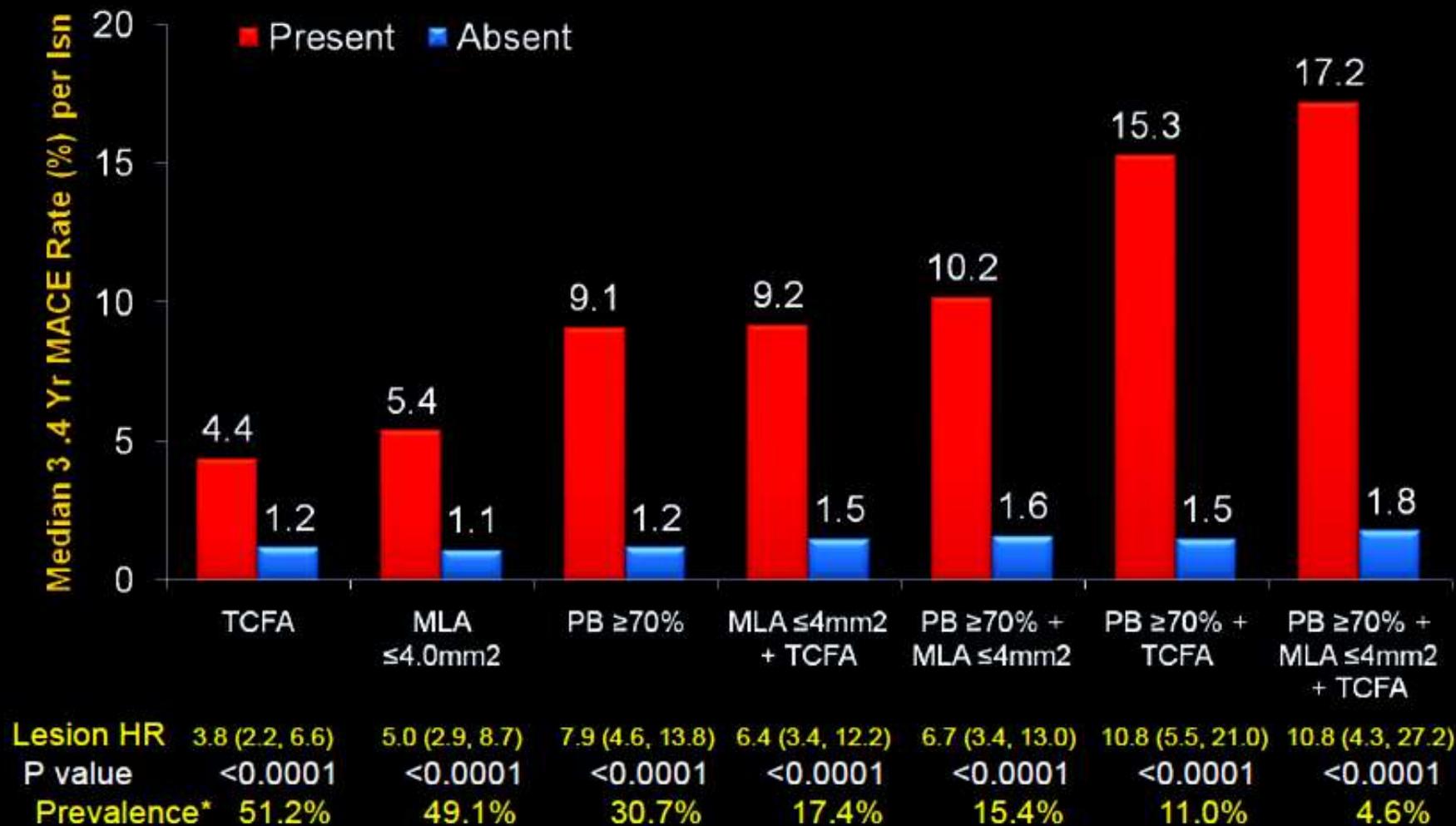
Number at risk

	0	1	2	3
ALL	697	557	506	480
CL related	697	590	543	518
NCL related	697	595	553	521
Indeterminate	697	634	604	583

PROSPECT: VH-TCFA and Non Culprit Lesion Related Events



PROSPECT: Correlates of Non Culprit Lesion Related Events



Caracterización de tejidos

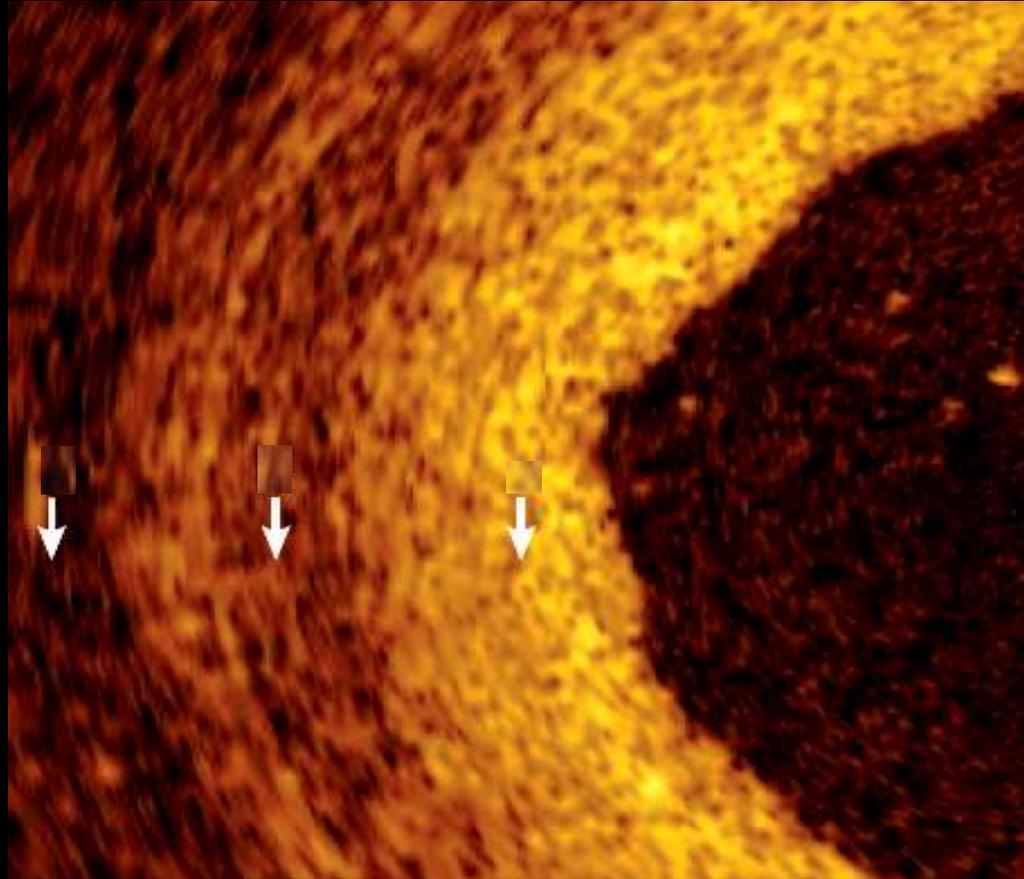


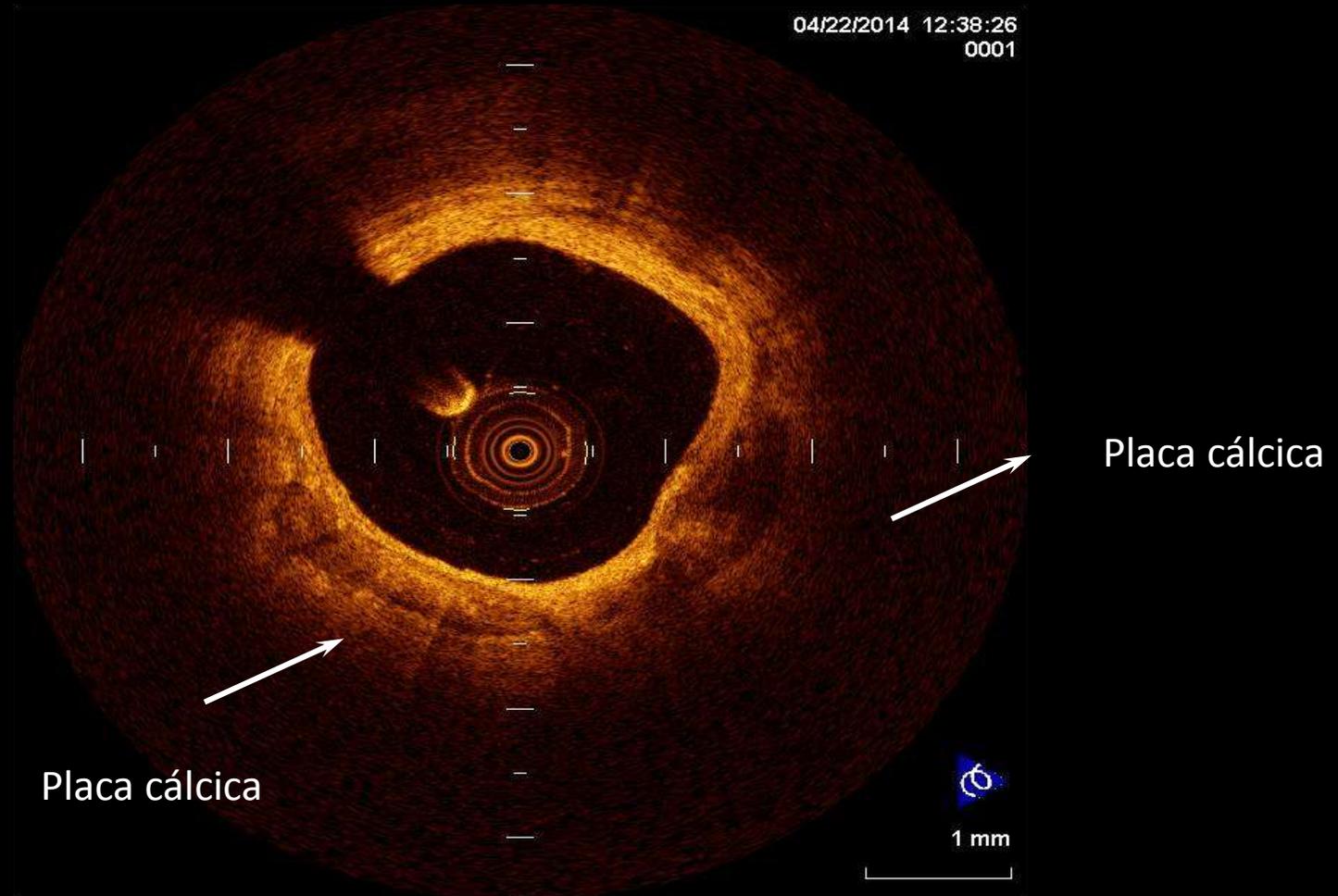
Imagen normal de tres capas



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Morfología de la placa



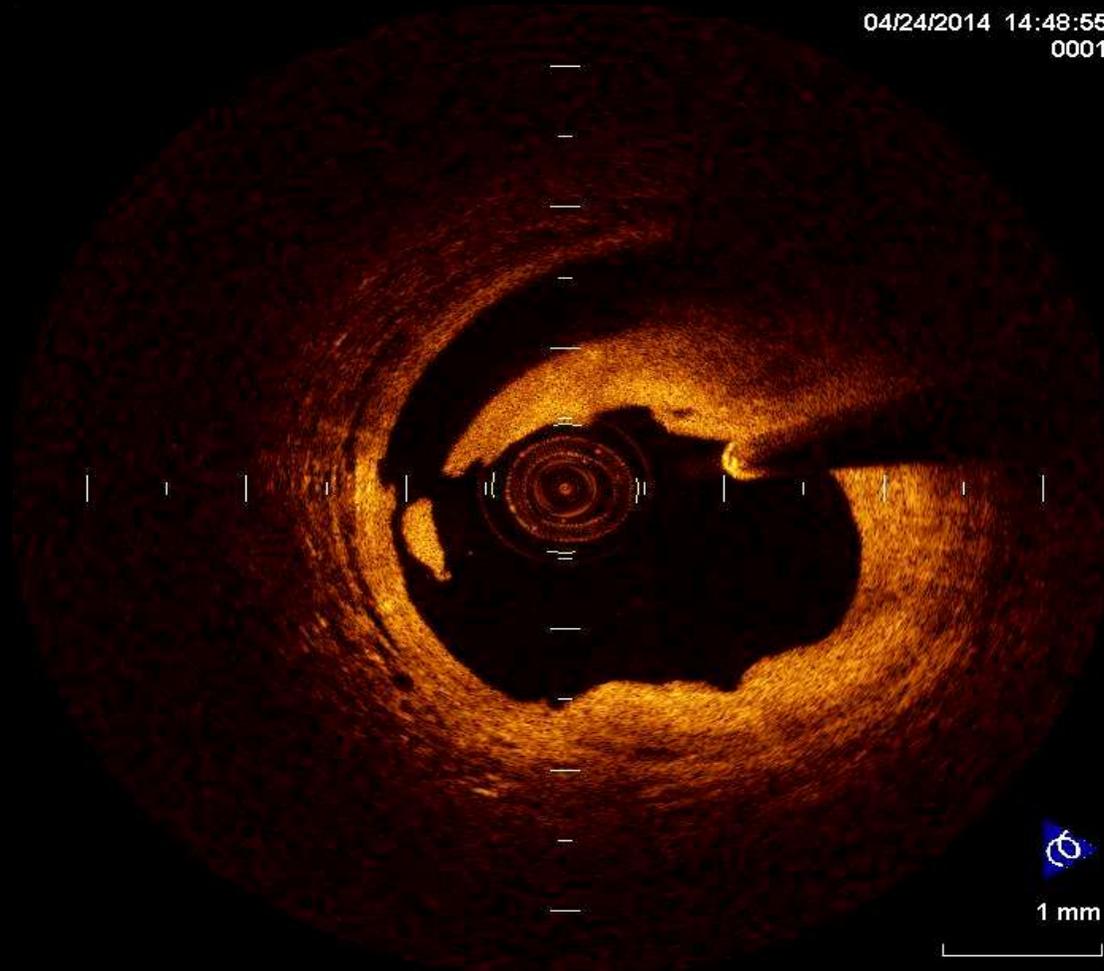


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Ruptura de placa y disección post pre dilatación con balón

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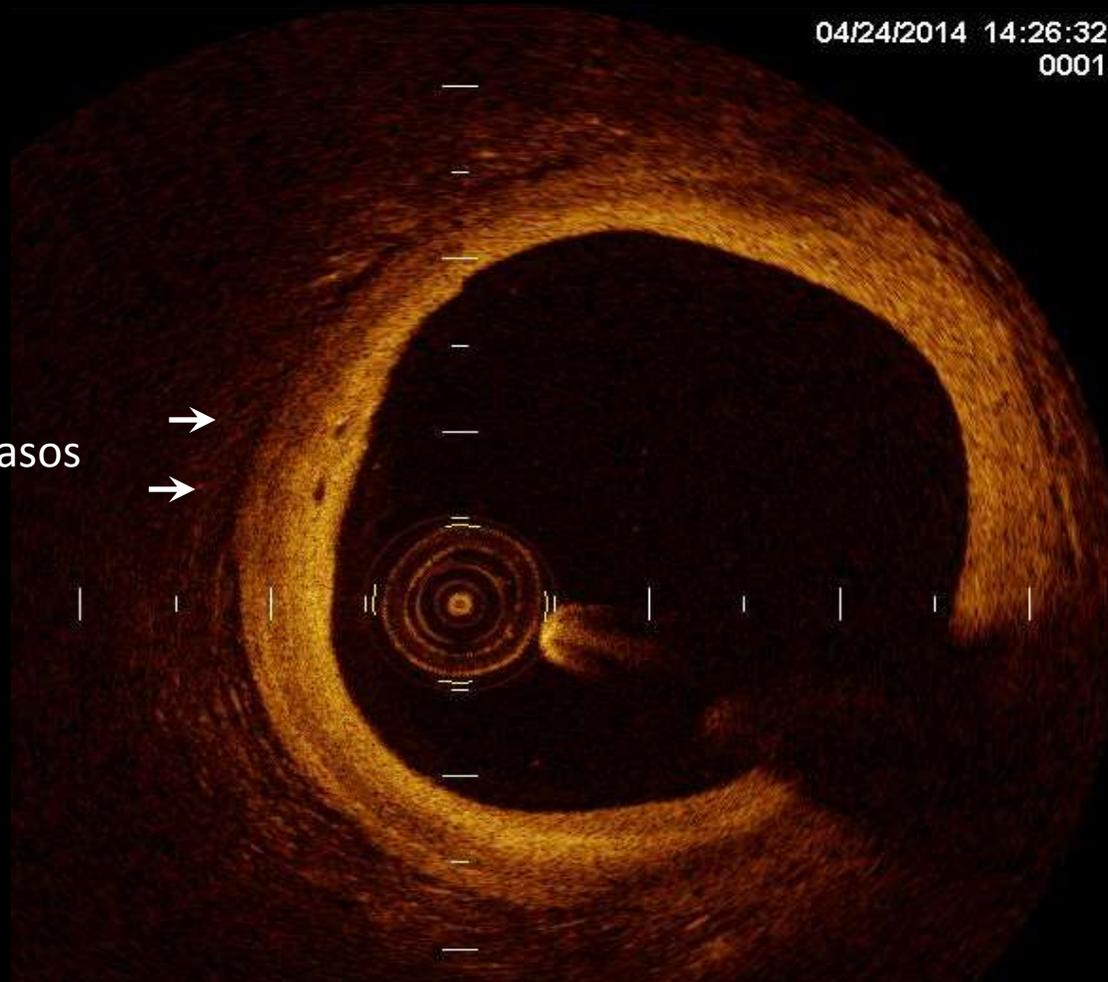
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Morfología de la placa

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Placa con neovasos

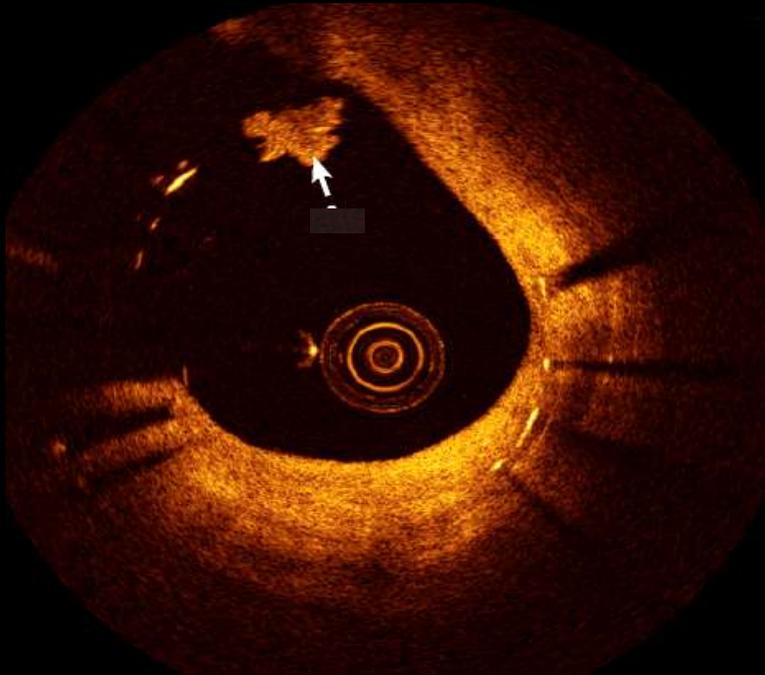




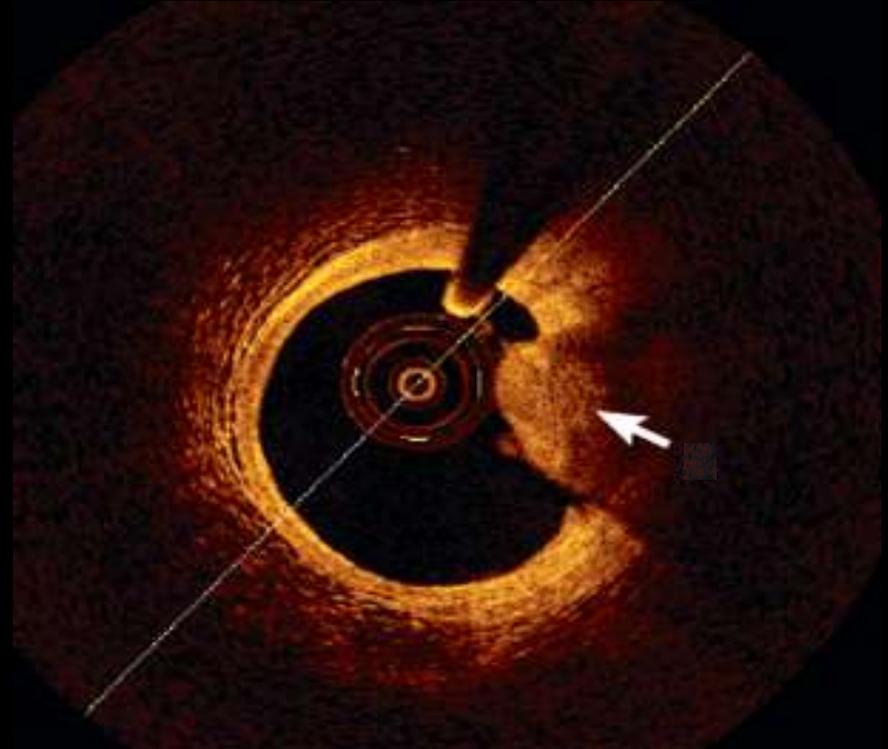
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Caracterización de tejidos



Trombo blanco



Trombo rojo

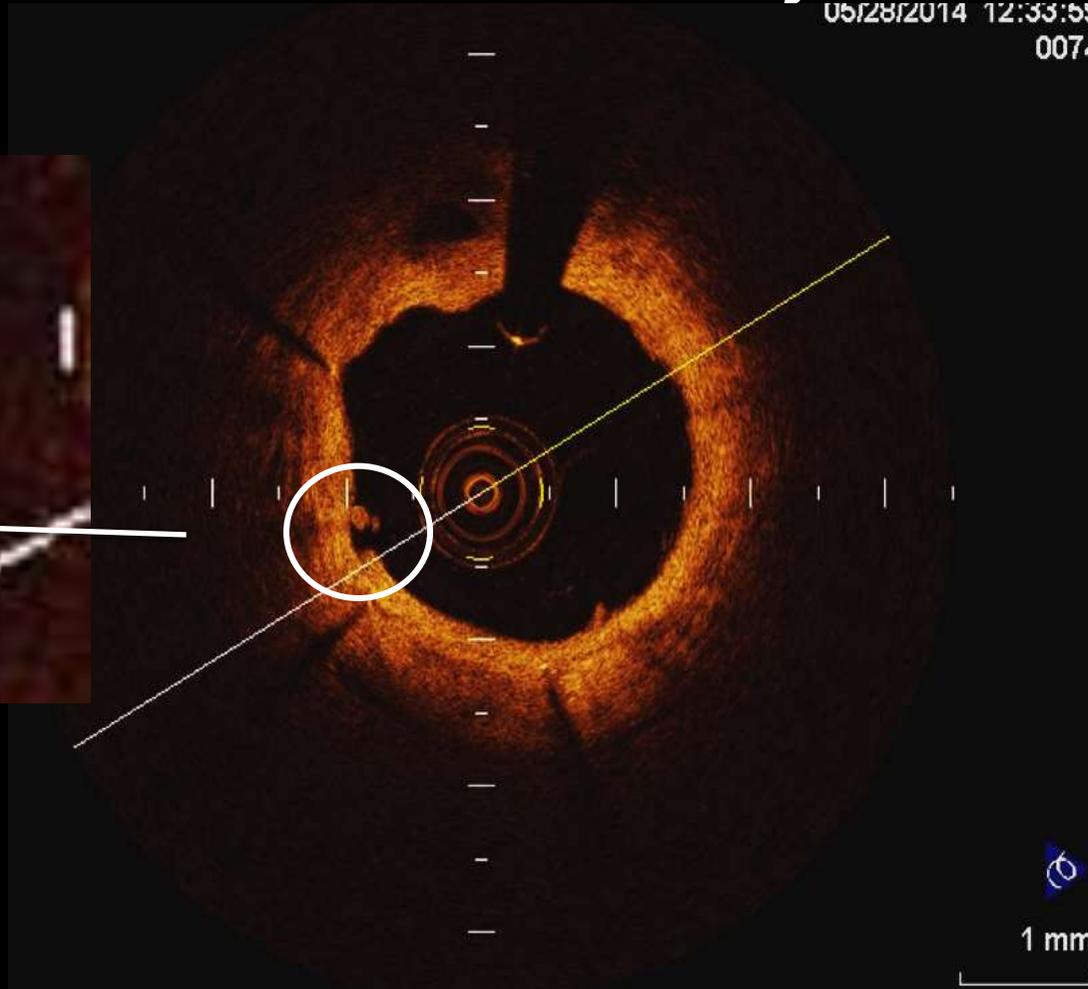
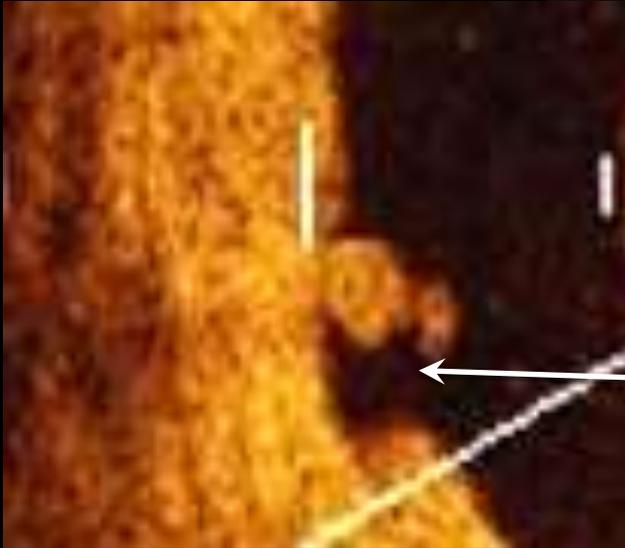


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Caracterización de tejidos

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Placa ulcerada y cicatrizada

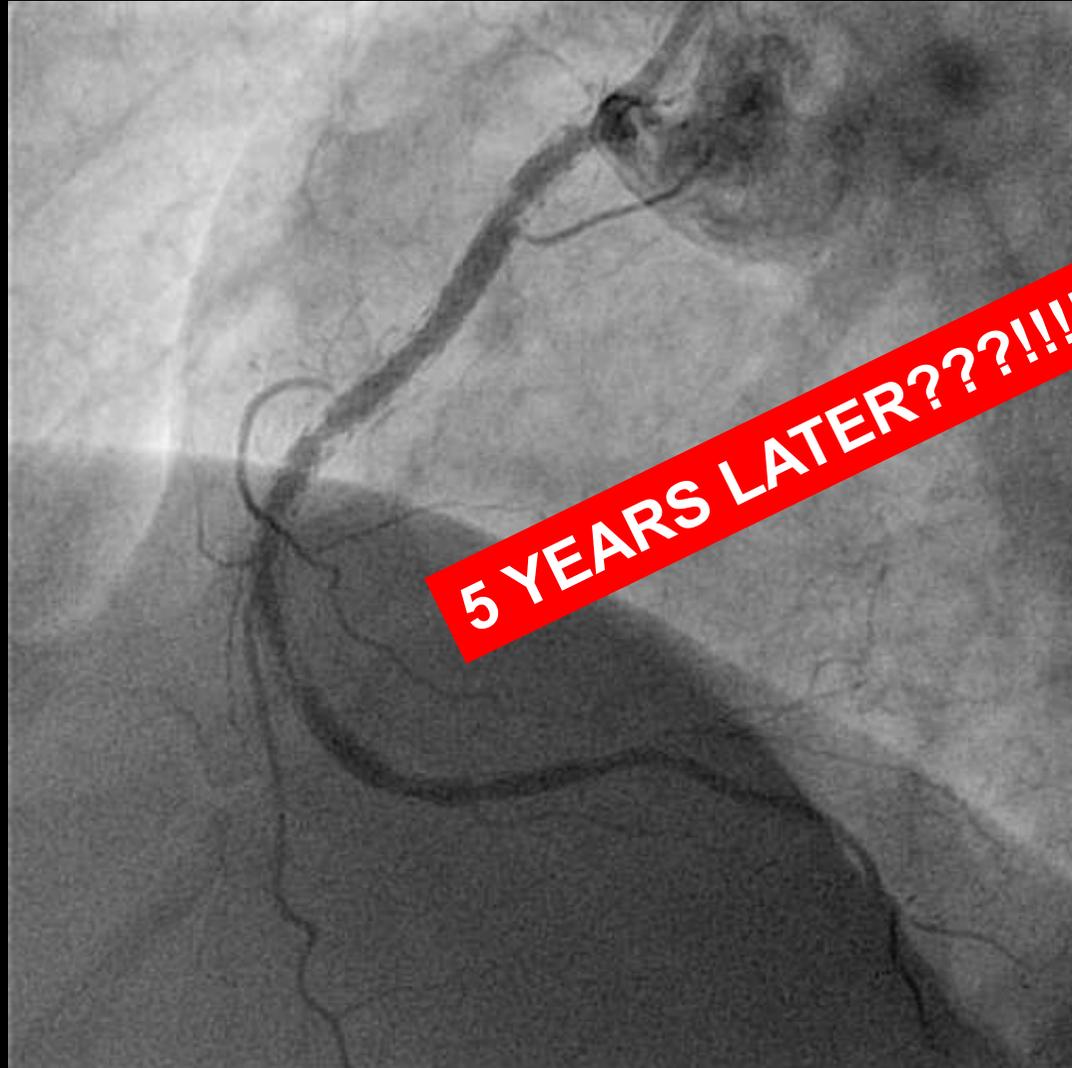


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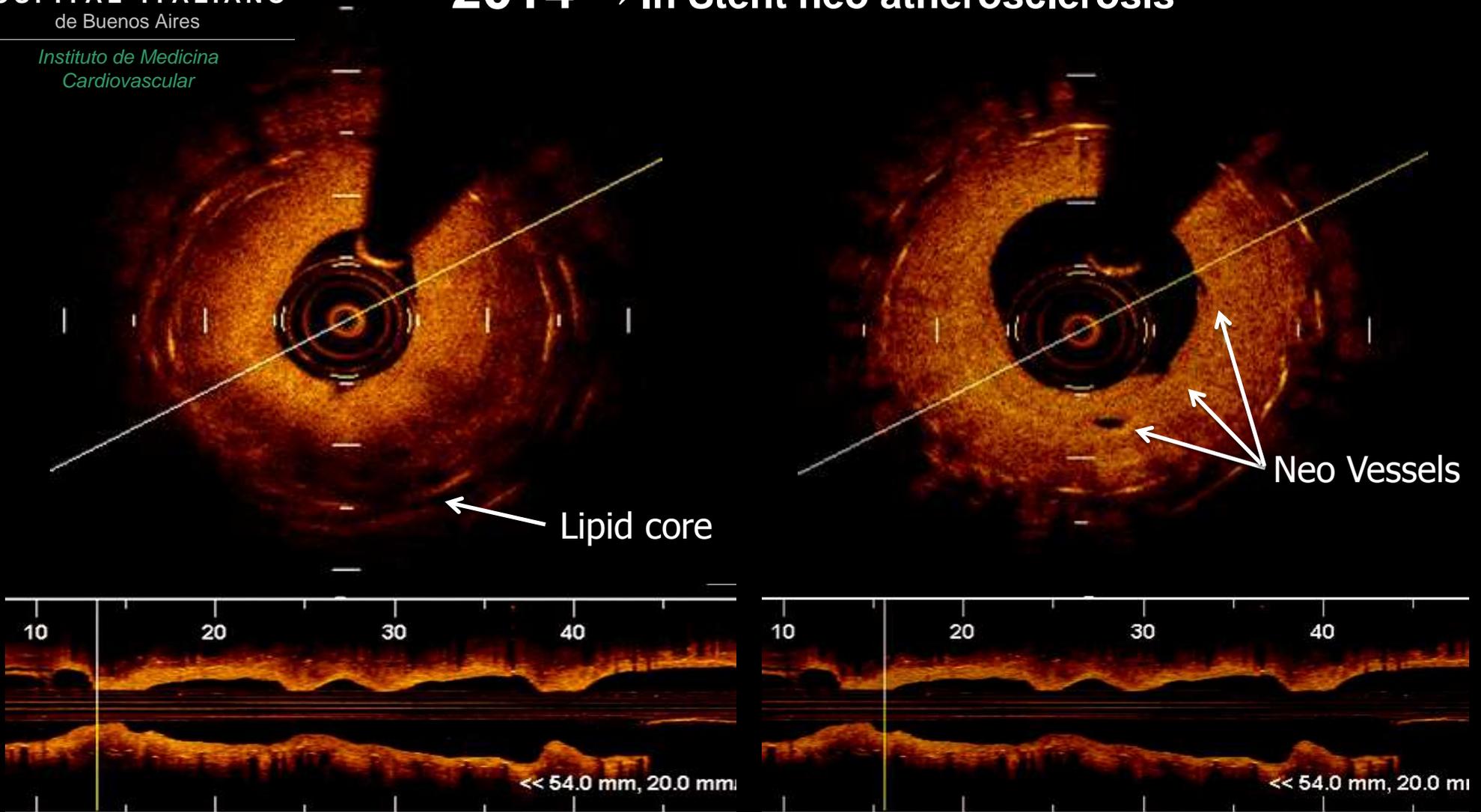
2009 → 3 CYPHER™ due to 3BMS restenosis

2014 → in DES restenosis





2014 → In Stent neo atherosclerosis



Placa estable

Placa vulnerable

Accidente de placa

Inflamación + Remodelamiento + INTERVENCIÓN

INTERVENCIÓN

ESTRATIFICACIÓN

ESTRATIFICACIÓN

INTERVENCIÓN

INTERVENCIÓN



Placa estable
Clínica=Asintomático o ACE

Placa Vulnerable
Clínica=Asintomático o ACE

Accidente de placa CON oclusión
Clínica = IAM ↑ST

Adaptada de Davies MJ Indian Heart Journal 2000; Virmani R. 2000; Sha PK. ACC2002
Pasterkamp G et al. JACC. 1998; 32: 655
Galis ZS et al. J Clin Invest. 1994; 94: 2493
Mallat Z et al. Circulation. 1999; 99: 348

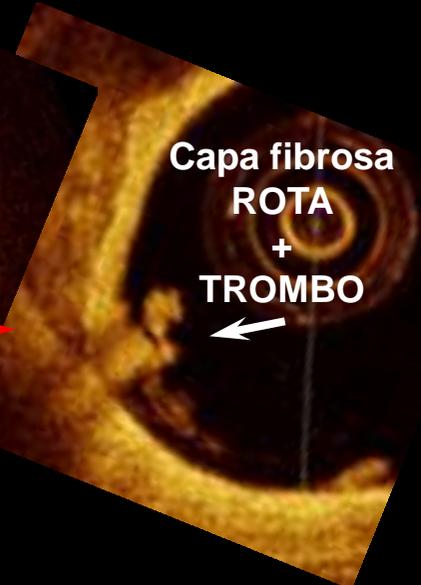
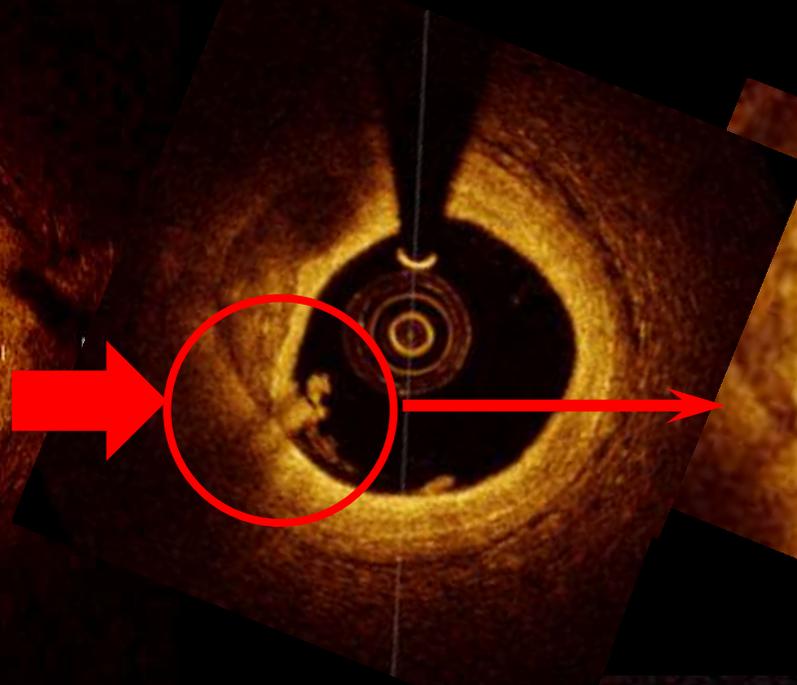
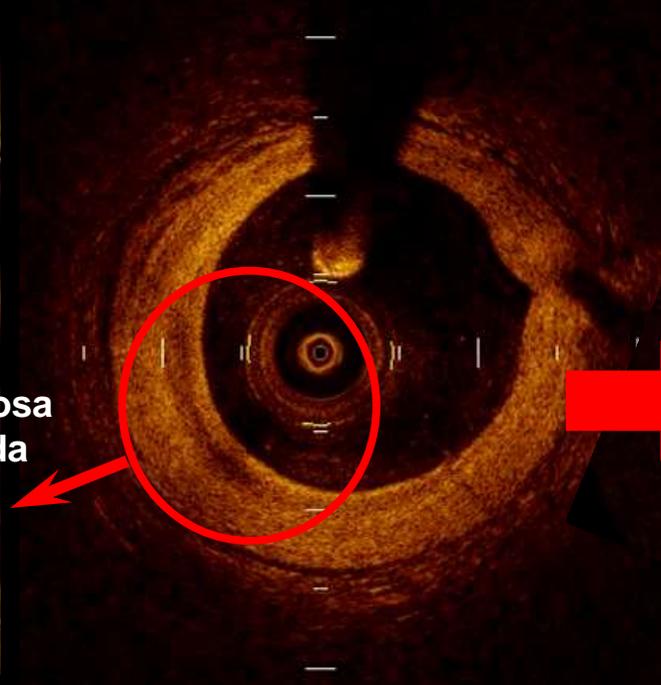
PLACA VULNERABLE

ACCIDENTE DE PLACA

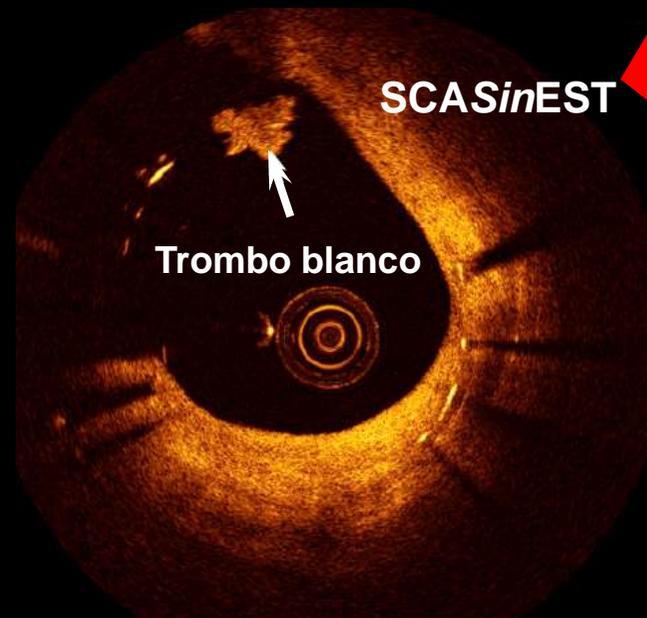


Capa fibrosa adelgazada

Core lipídico

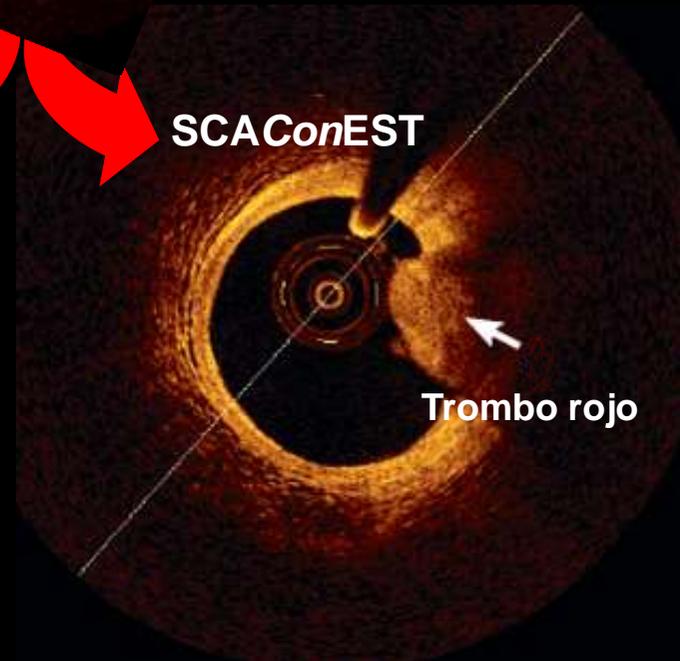


Capa fibrosa ROTA + TROMBO



SCASinEST

Trombo blanco



SCAConEST

Trombo rojo



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XXV Jornadas SOLACI
8° Región Cono Sur

- ✓ FFR es la mejor herramienta para evaluar severidad (funcional)
- ✓ IVUS u OCT/OFDI para evaluar morfología y eventualmente severidad
- ✓ Histología Virtual/OCT/OFDI permitirían detectar placas vulnerables
- ✓ OCT/OFDI proveen detalle mayor histológico por su gran resolución (ideales para seguimiento y reestenosis de stents)