Insight to BVS From Intracoronary Imaging

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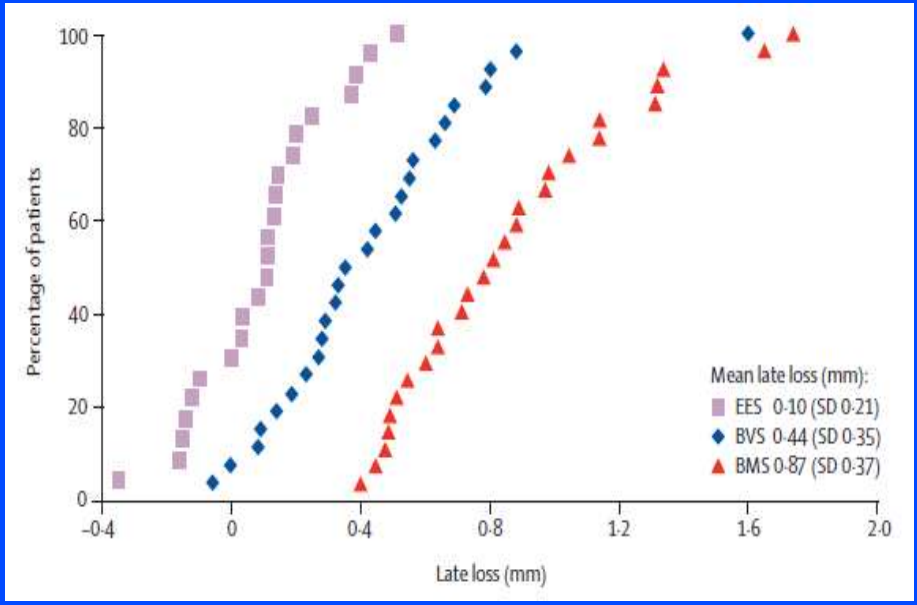
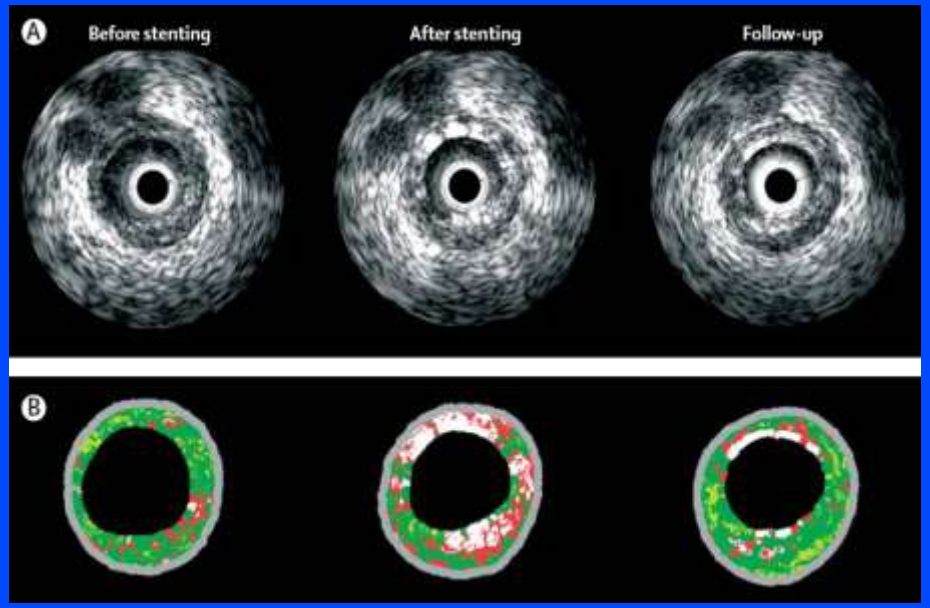
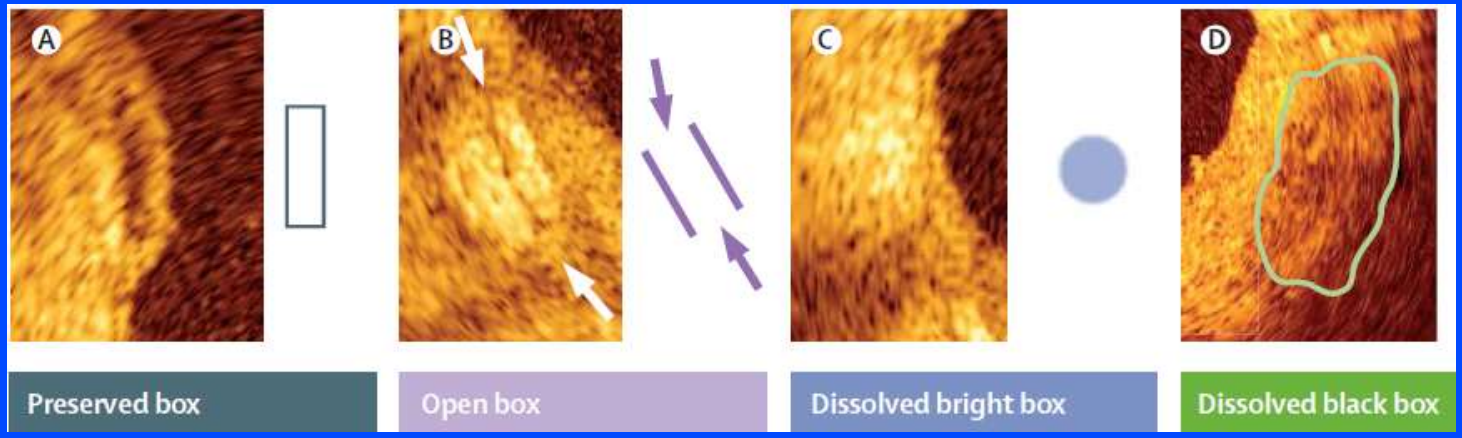
BVS Imaging Follow-up



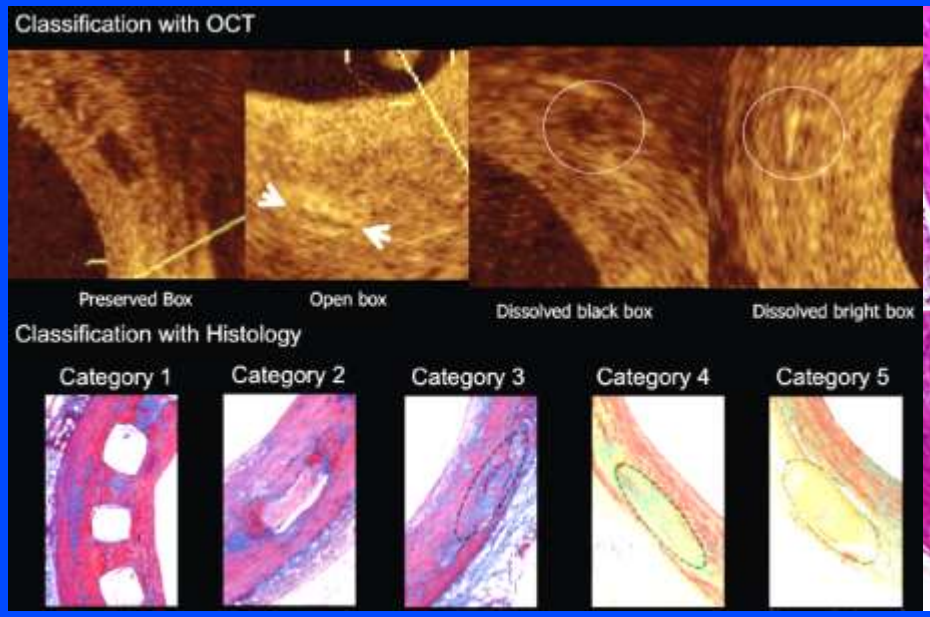


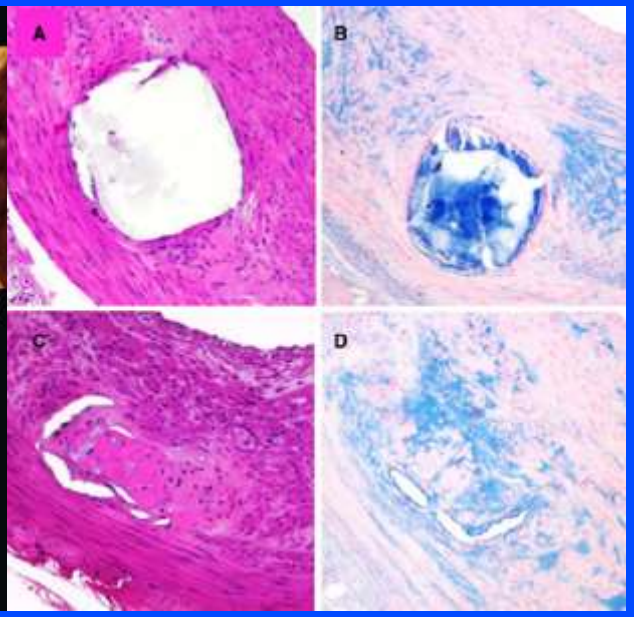


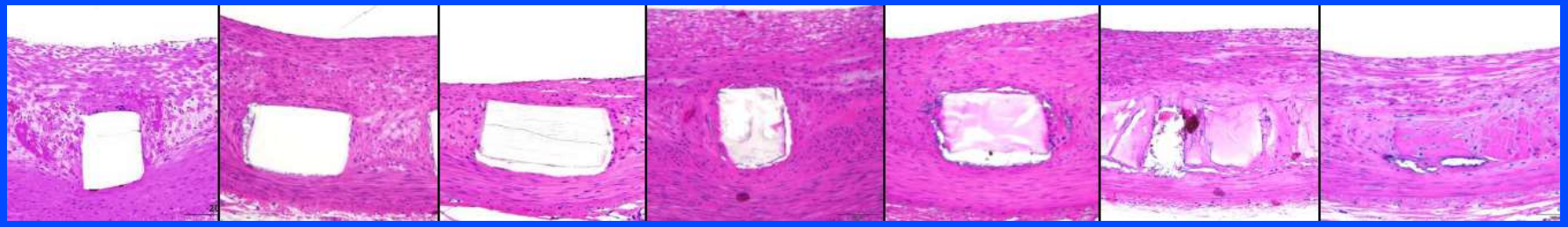
Lancet 2008; 371: 899–907

Insight to BVS From Intracoronary Imaging

Intracoronary Optical Coherence Tomography and Histology at 1 Month and 2, 3, and 4 Years After Implantation of Everolimus-Eluting Bioresorbable Vascular Scaffolds in a Porcine Coronary Artery Model







1 month | 6 months | 18 months | 24 months | 30 months | 36 months | 42 months

Circulation. 2010;122:2288-2300

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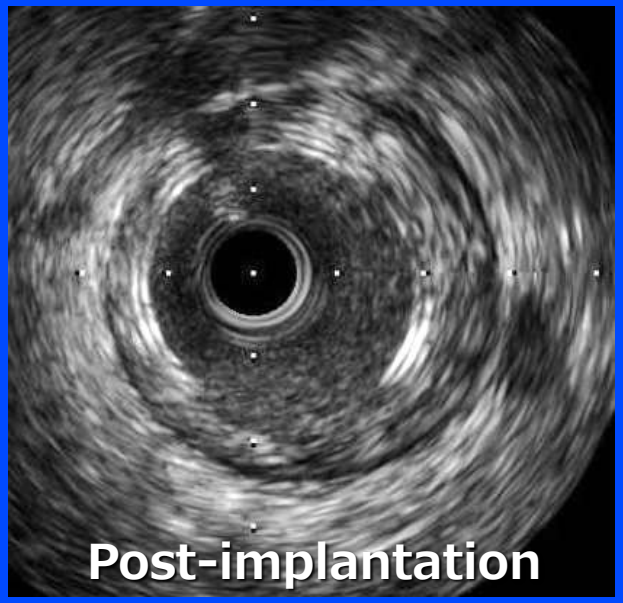
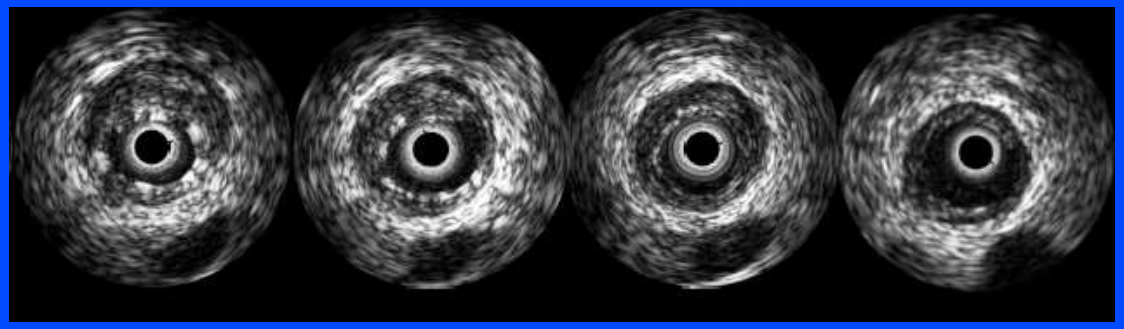
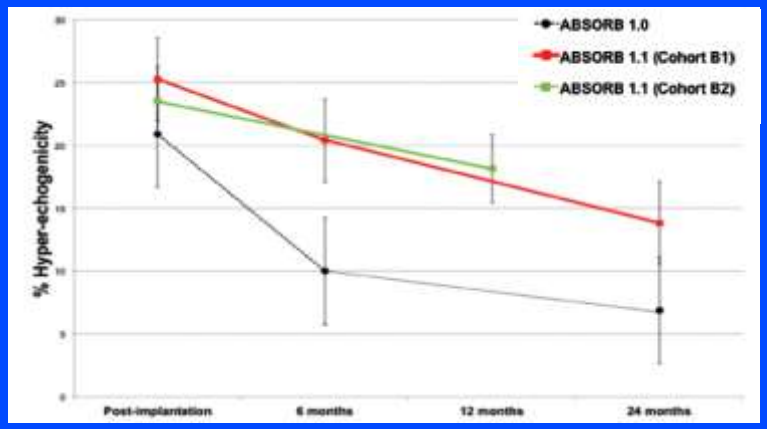
Dynamic Vessel Wall Changes up to 24 Months

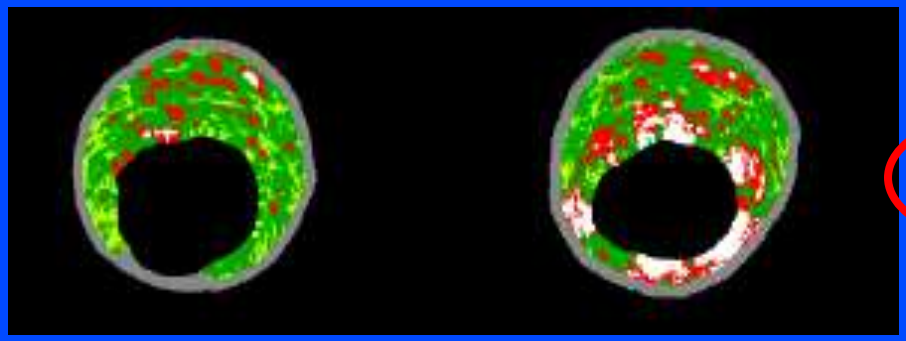
IVUS







IVUS-VH



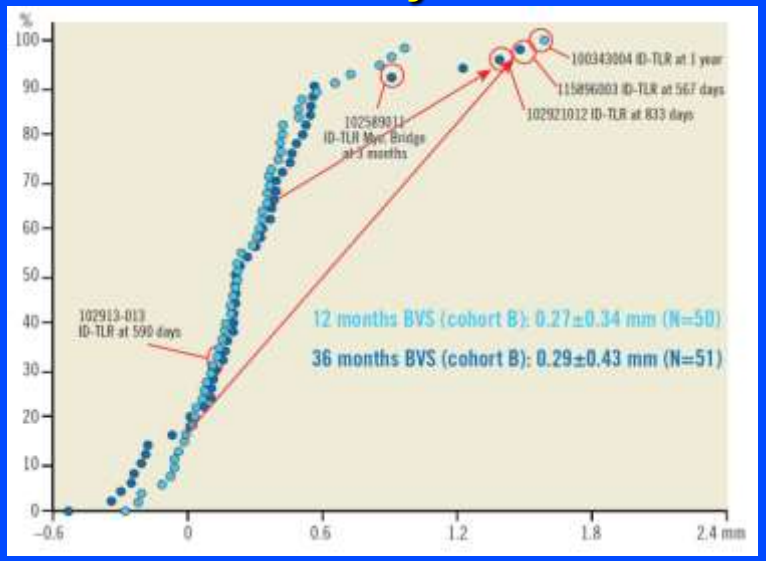
	BL (n=26)	6 mo (n=26)	24 mo (n=26)
Dense calcium area, %	31.2±13.3	29.8±10.5	27.6±8.0
Necrotic core area, %	30.8±8.0	30.6±6.0	31.1±4.5
IVUS Echogenicity	(n=25)	(n=25)	(n=25)
% Hyperechogenicity	25.3±10.4	20.4±8.9	13.8±6.7

Insight to BVS From Intracoronary Imaging

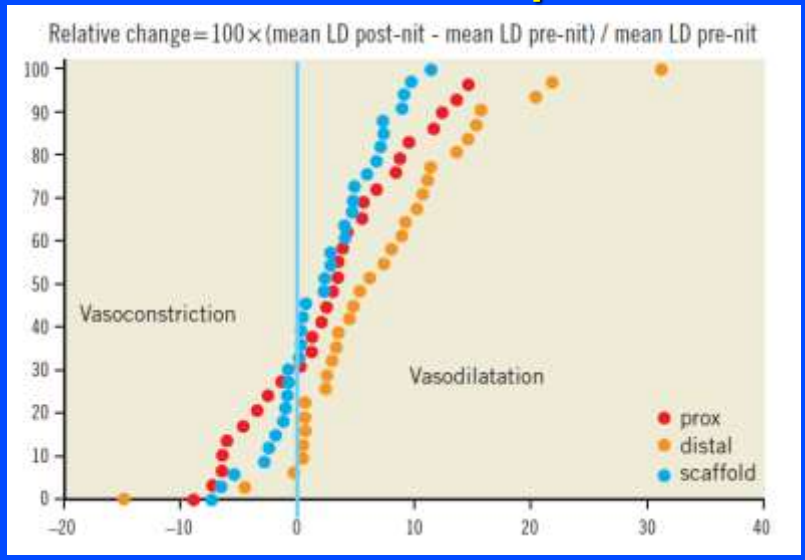
Dynamics of vessel wall changes following the implantation of the Absorb everolimus-eluting bioresorbable vascular scaffold: a multi-imaging modality study at 6, 12, 24 and 36 months

(OCT). Between one and three years, late luminal loss remained unchanged (6 months: 0.19 mm, 1 year: 0.27 mm, 2 years: 0.27 mm, 3 years: 0.29 mm) and the in-segment angiographic restenosis rate for the entire cohort B (n=101) at three years was 6%. On IVUS, mean lumen, scaffold, plaque and vessel area showed enlargement up to two years. Mean lumen and scaffold area remained stable between two and three years whereas significant reduction in plaque behind the struts occurred with a trend toward adaptive restrictive remodelling of EEM. Hyperechogenicity of the vessel wall, a surrogate of the bioresorption process, decreased from 23.1% to 10.4% with a reduction of radiofrequency backscattering for dense calcium and necrotic core. At three years, the count of strut cores detected on OCT increased significantly, probably reflecting the dismantling of the scaffold; 98% of struts were covered. In the entire cohort B (n=101), the three-year major adverse cardiac event rate was 10.0% without any scaffold thrombosis.

Absence of «Delayed» Late Loss

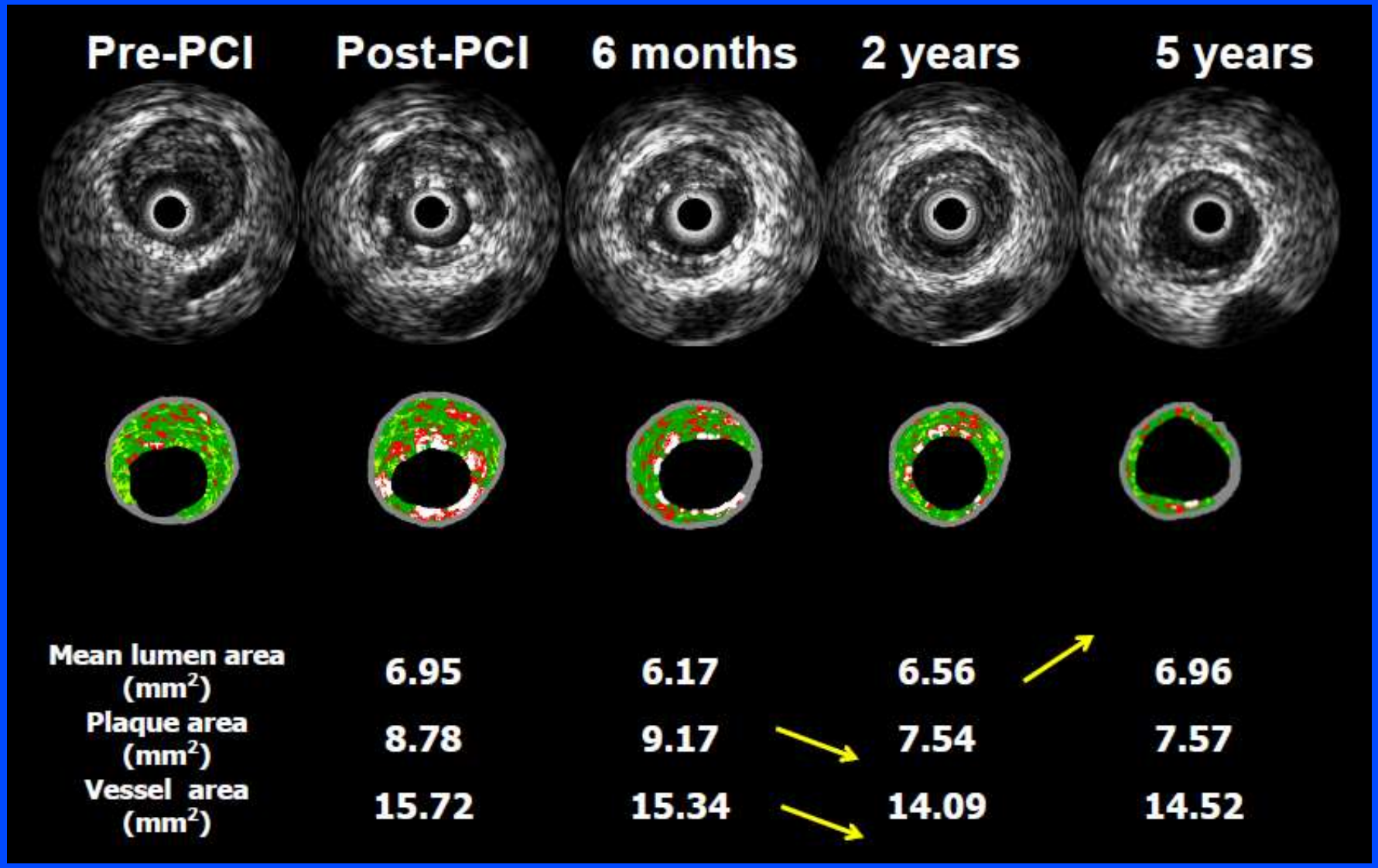


Vasodilation Response



Serruys PW, Eurointervention 2014 Mar 20;9(11):1271-84.

Late increase in Lumen Area. Late decrease in Plaque Area

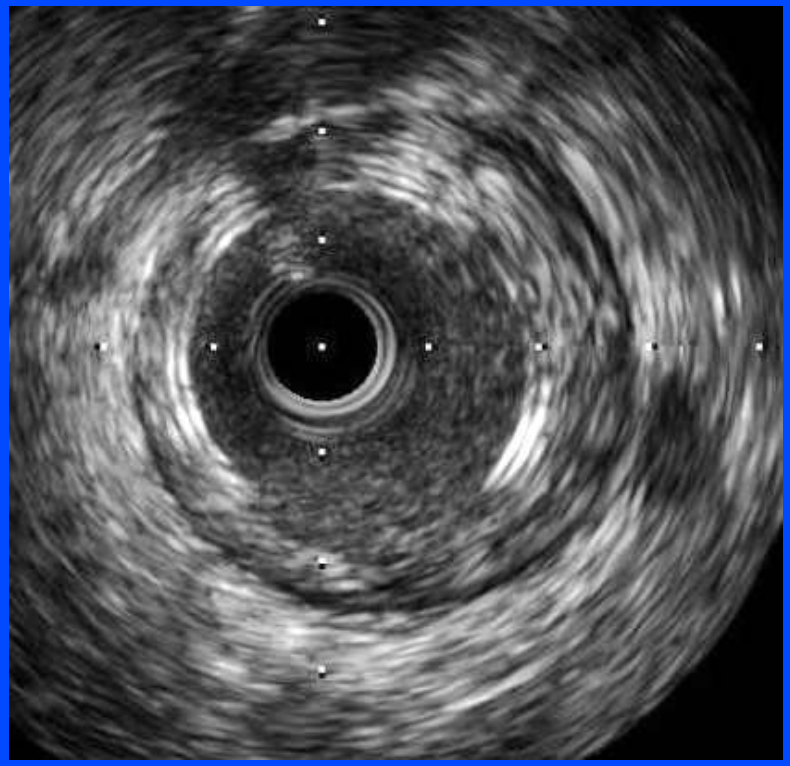


	Pre-PCI	Post-PCI	6 months	2 years	5 years
Mean lumen area (mm^2)	6.95	6.17		6.56	6.96
Plaque area (mm^2)	8.78	9.17		7.54	7.57
Vessel area (mm^2)	15.72	15.34		14.09	14.52

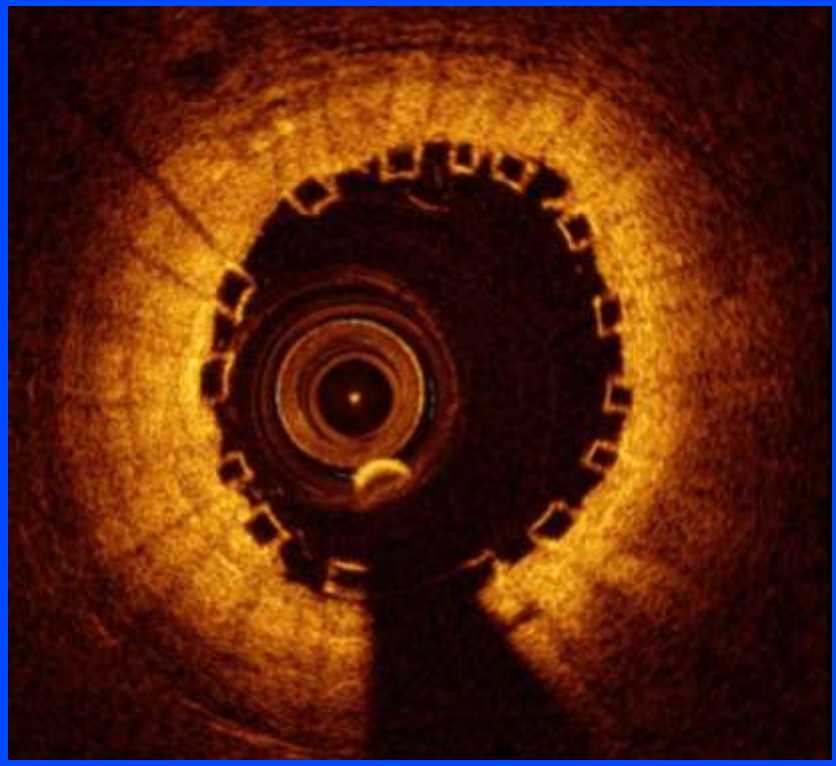
Insight to BVS From Intracoronary Imaging

BVS

IVUS



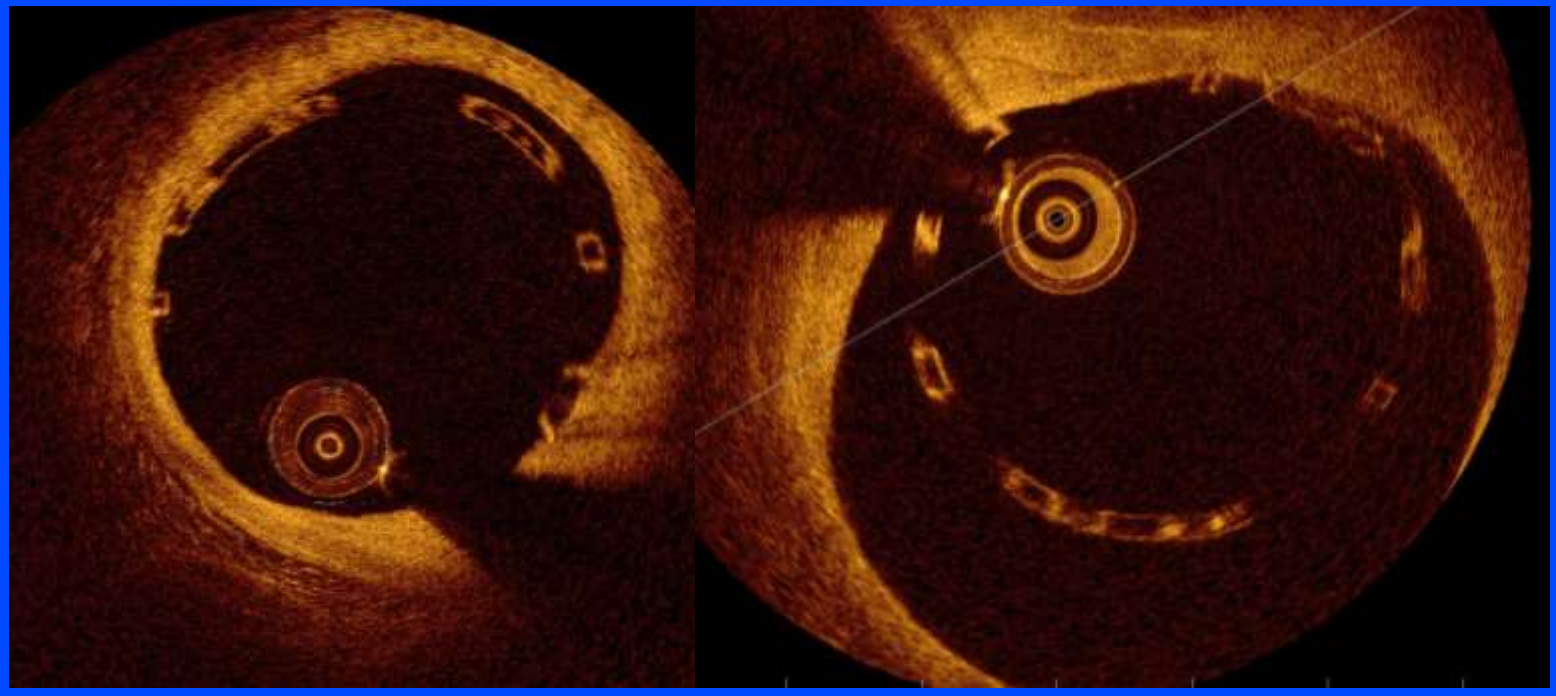
OCT



Insight to BVS From Intracoronary Imaging

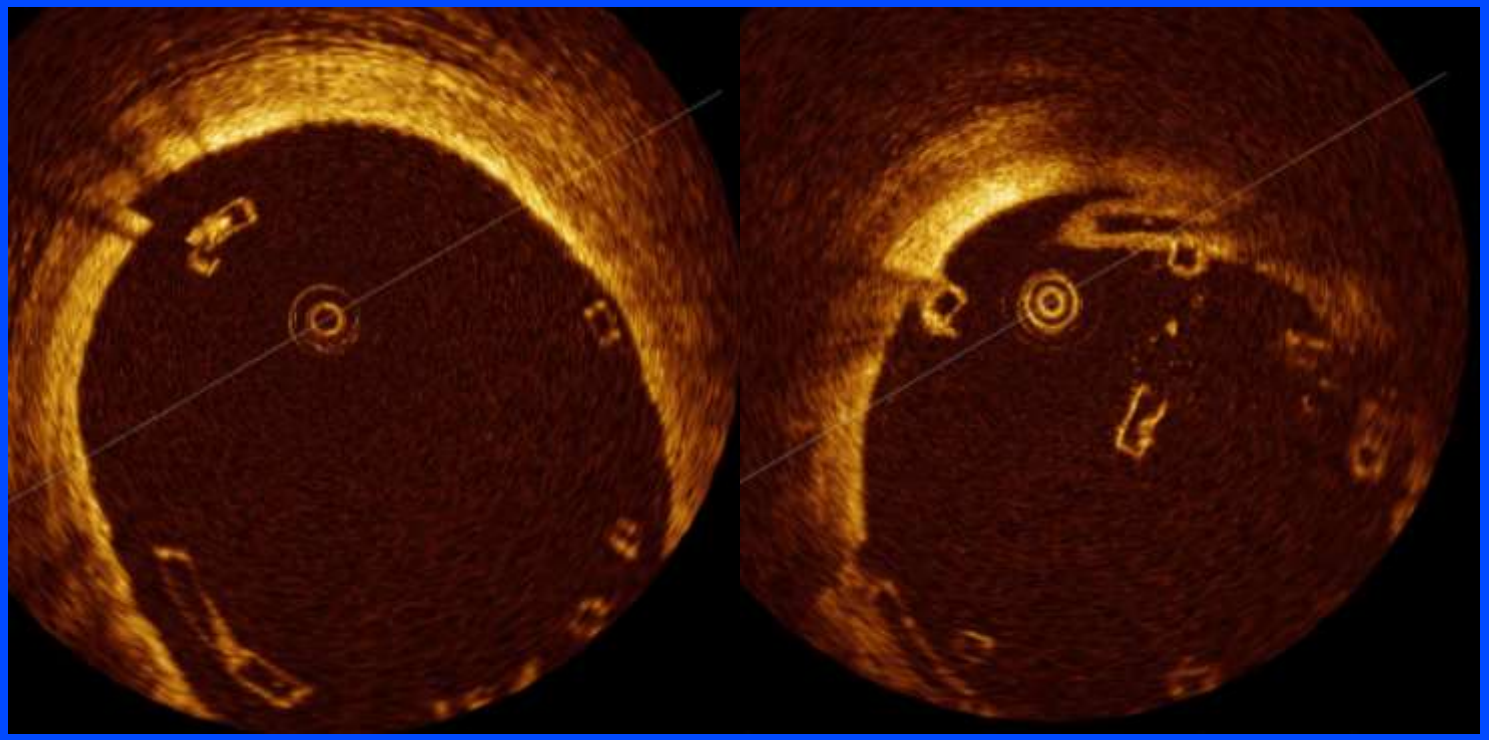
Clinical utility of optical coherence tomography (OCT) in the optimisation of Absorb bioresorbable vascular scaffold deployment during percutaneous coronary intervention

(63%) type A and seven (37%) type B or C. Of 29 scaffolds analysed, 28% required further intervention after OCT review, three (37.5%) due to scaffold malapposition and five (62.5%) due to scaffold underexpansion.



EuroIntervention 2014; 9-online publish-ahead-of-print

Insight to BVS From Intracoronary Imaging



Malapposition

BVS Fracture

Avoid post-dilation with a balloon diamenter > 0.5 mm nominal diameter

Courtesy: H Universitario La Paz Madrid

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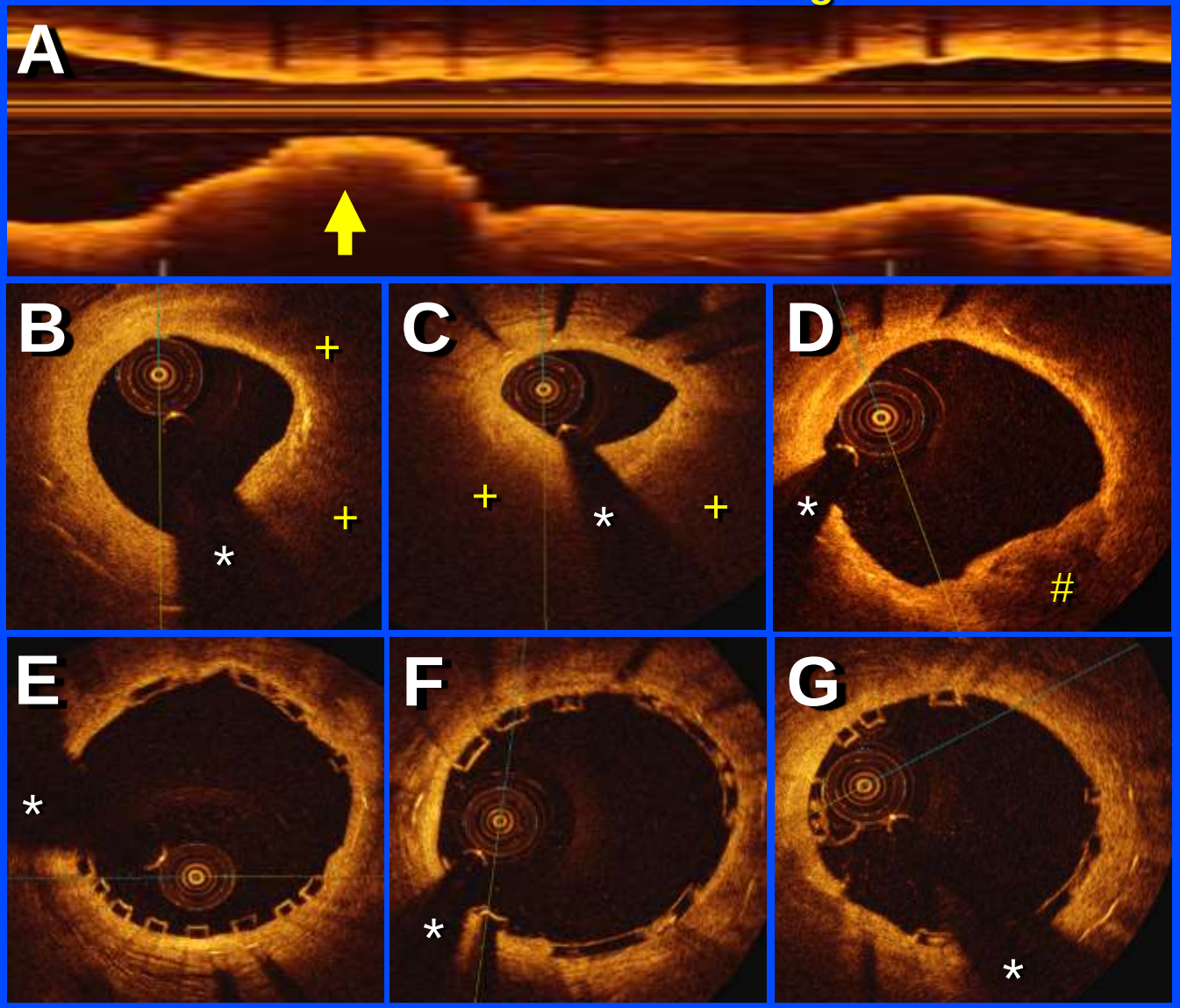
BVS for ISR: OCT Findings



Alfonso F et al. J Am Coll Cardiol. 2014 Jul 1;63(25 Pt A):2875.

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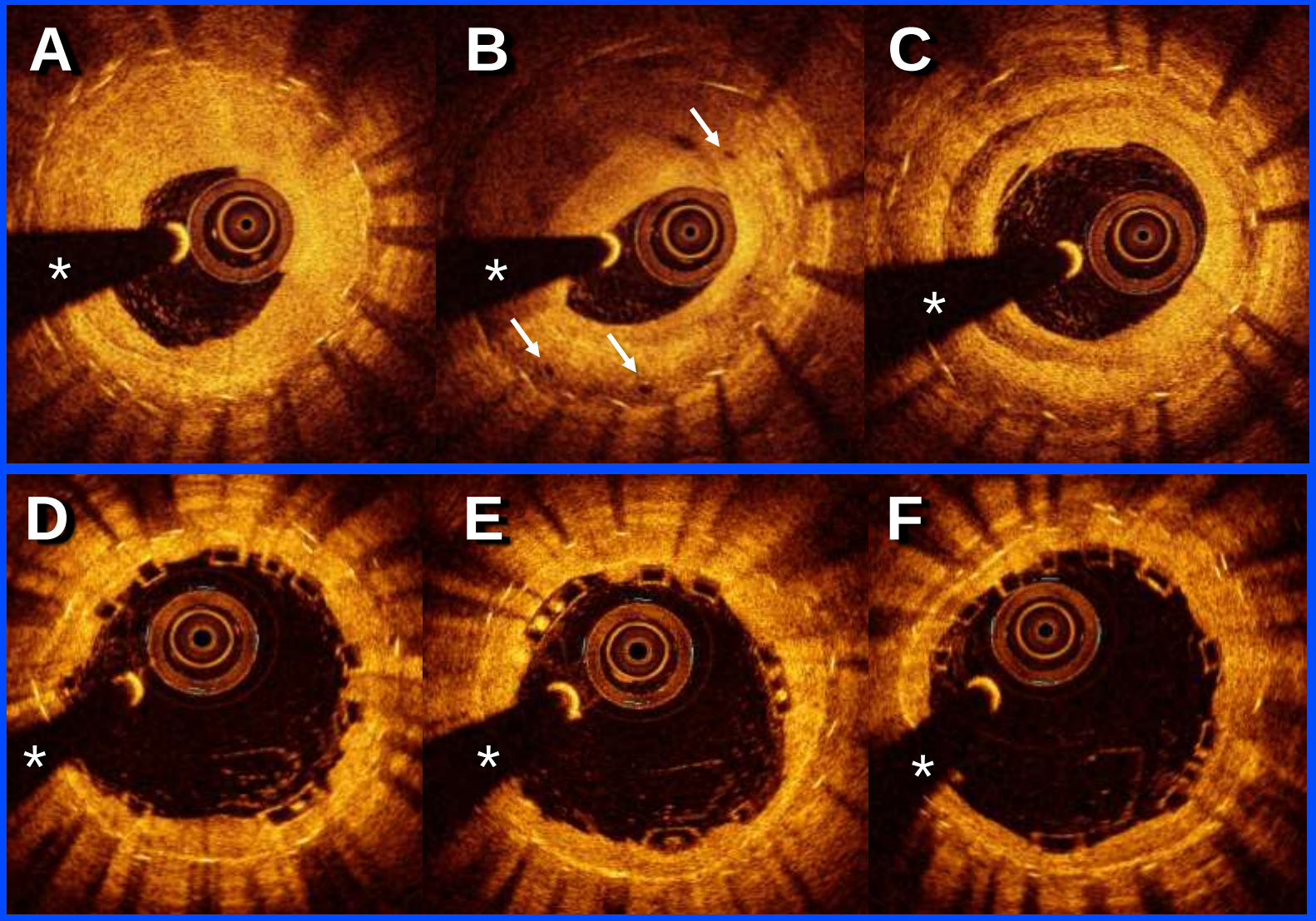
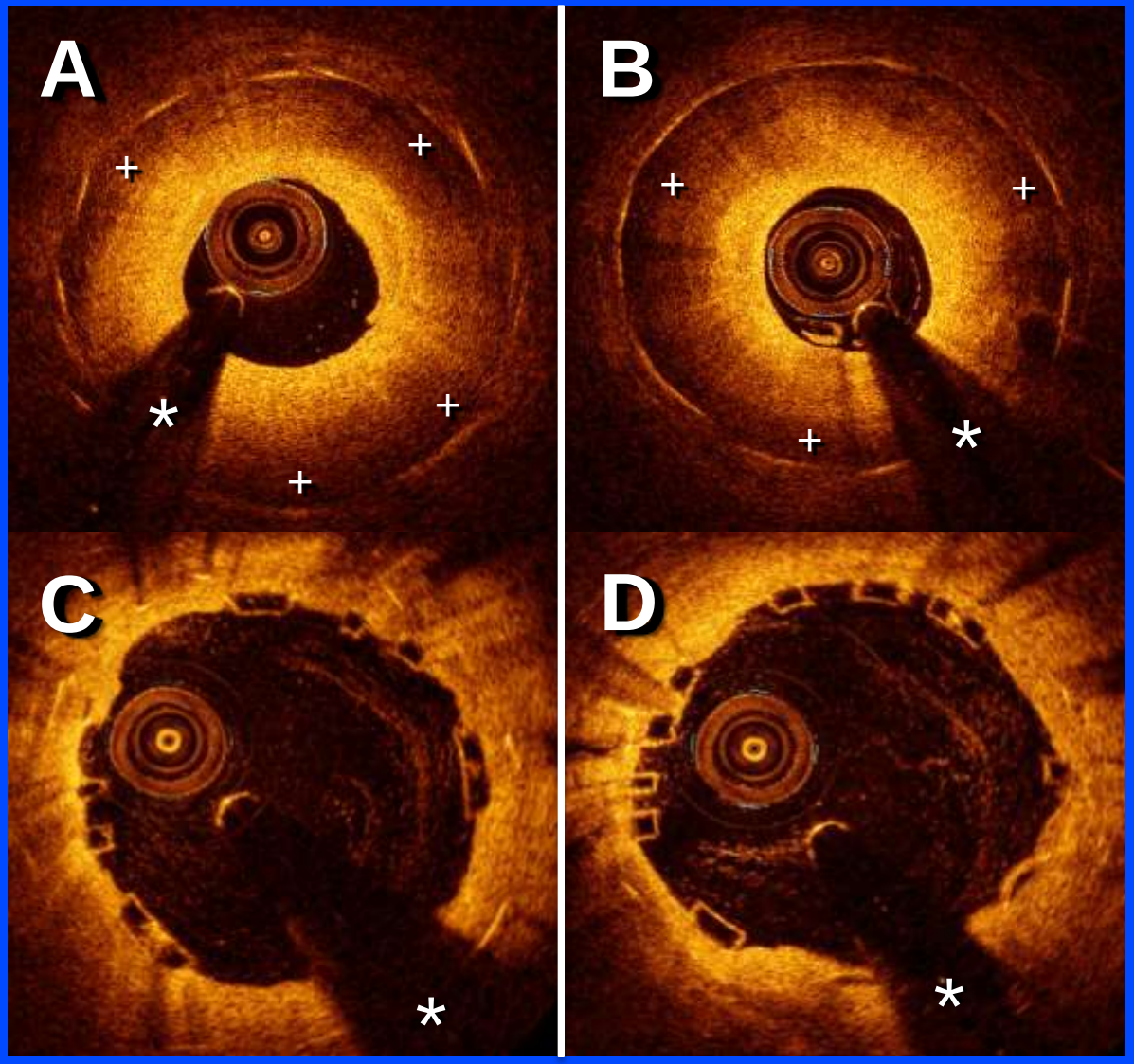
OCT Guidance of BVS for ISR



Rivero F, Alfonso F. Can J Cardiol 2015 (In press)

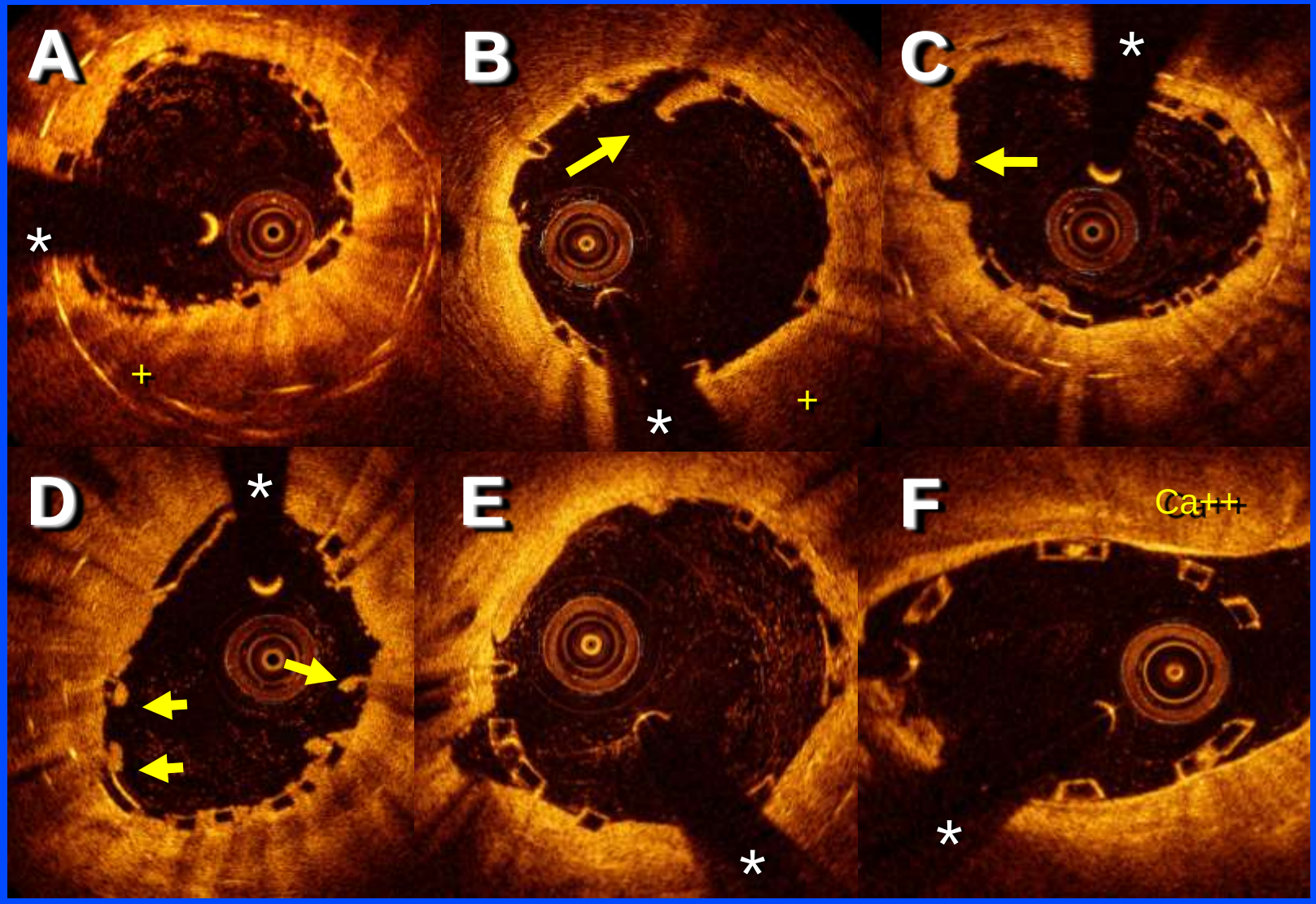
Insight to BVS From Intracoronary Imaging

OCT Guidance of BVS for ISR



Rivero F, Alfonso F. Can J Cardiol 2015 (In press)

OCT Guidance of BVS for ISR: Suboptimal Results?



Rivero F, Alfonso F. Can J Cardiol 2015 (In press)

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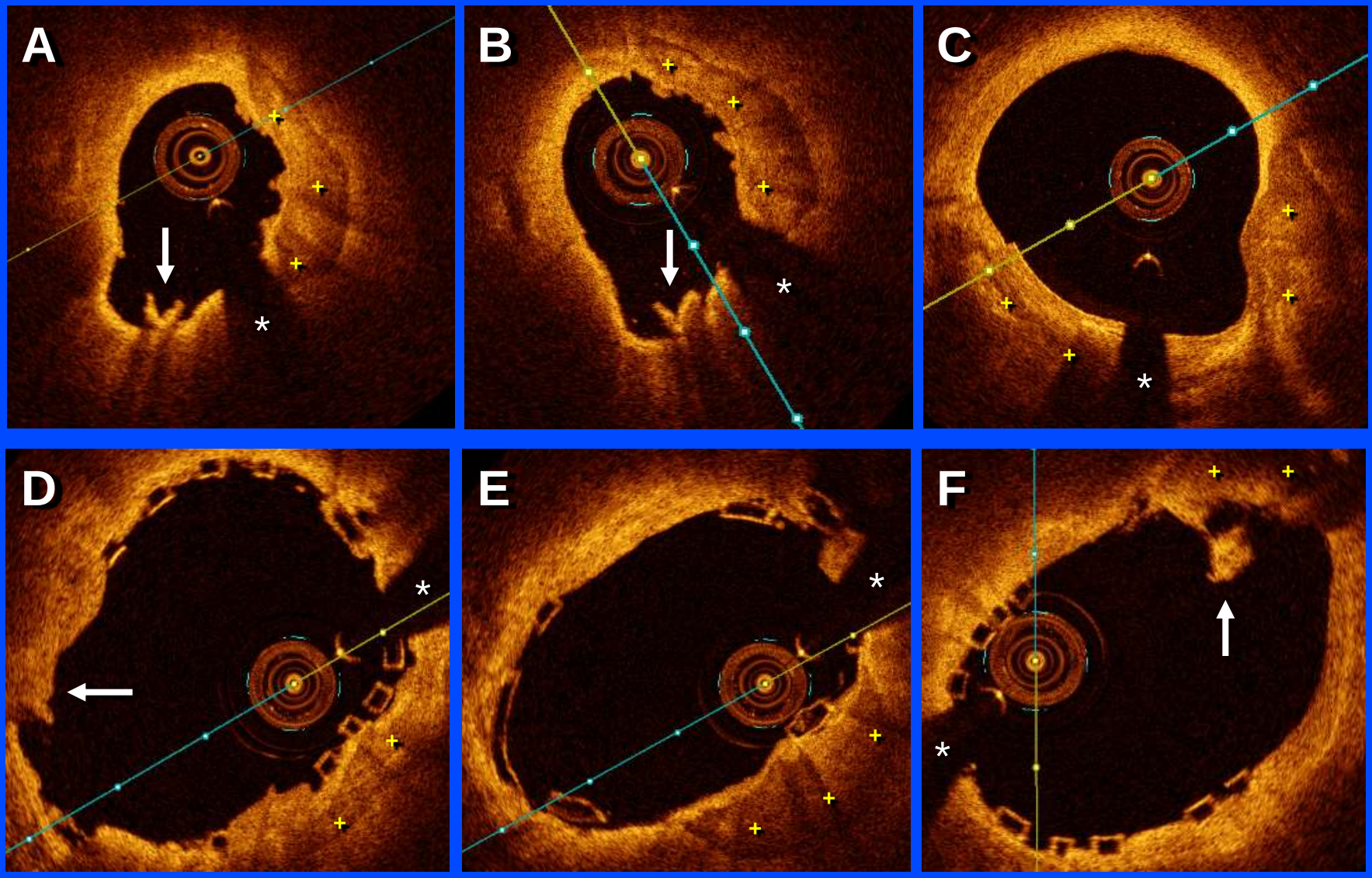
BVS After Rotational Atherectomy in Heavely Calcified Lesions



Alfonso F (HCSC, 13/6/2013)

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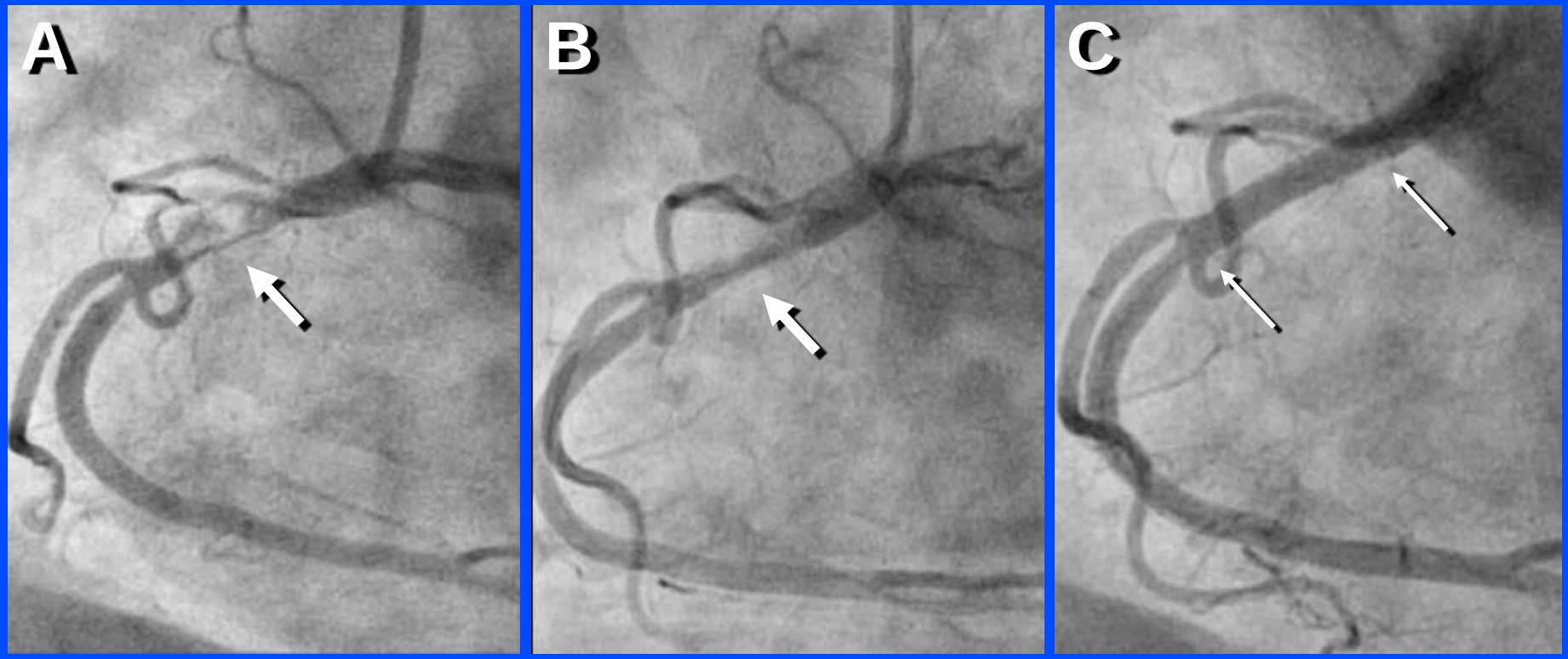
86-year-old man with inferior STEMI



Alfonso F, et al. JACC Cardiovasc Interv 2014 Mar;7(3):e17-8.

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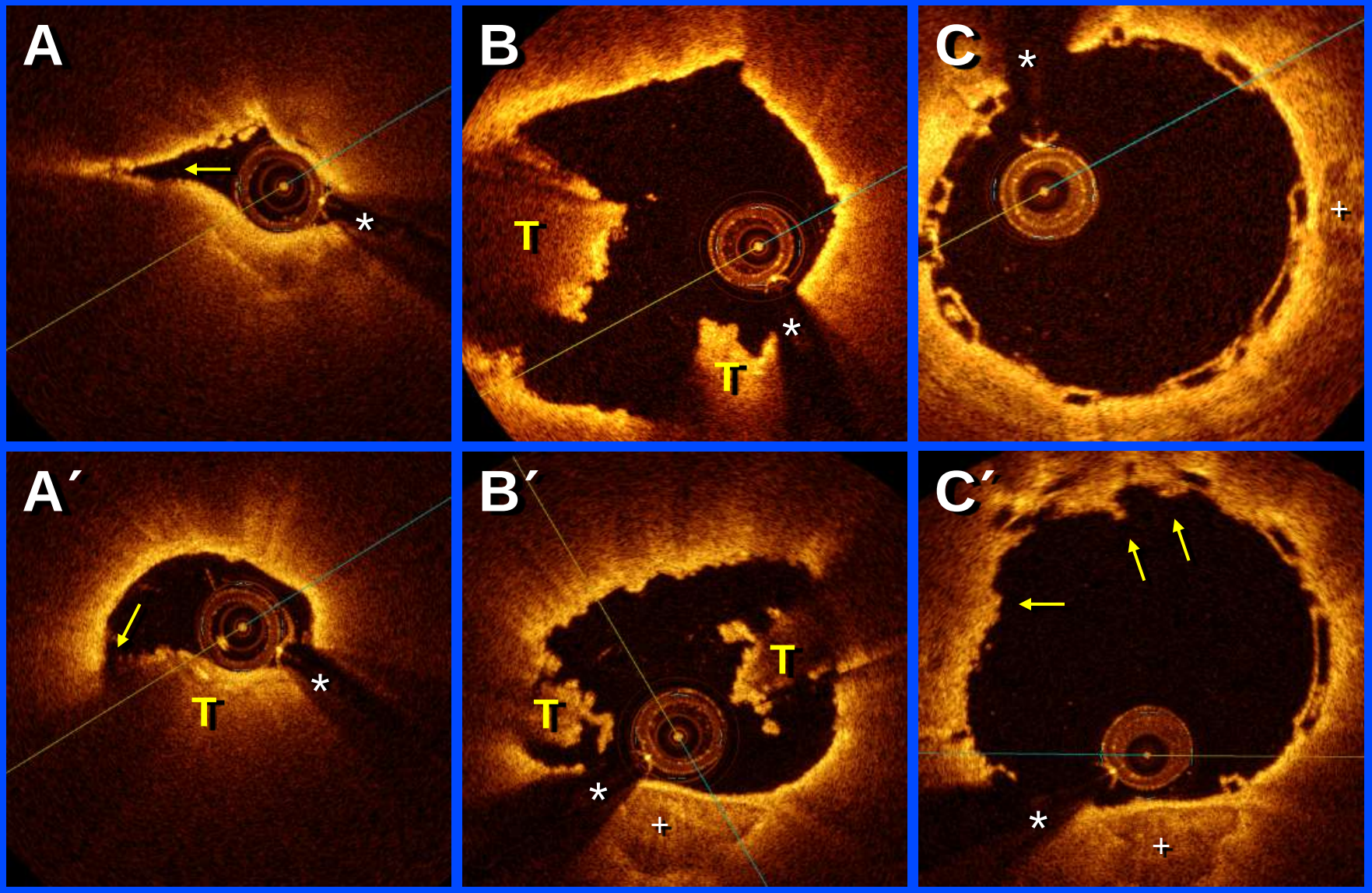
BVS in STEMI



Alfonso F, et al. JACC Cardiovasc Interv 2014 Mar;7(3):e17-8.

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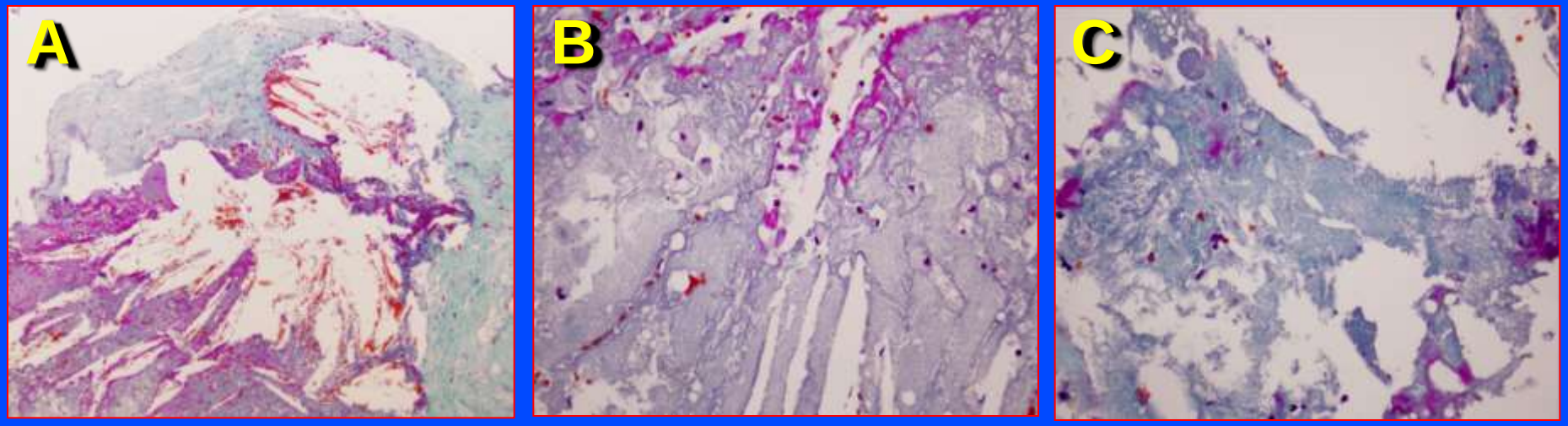
Ruptured Fibrous Cap
Complex Fibroatheroma

Cholesterol Crystals
Necrotic Core

Thrombus

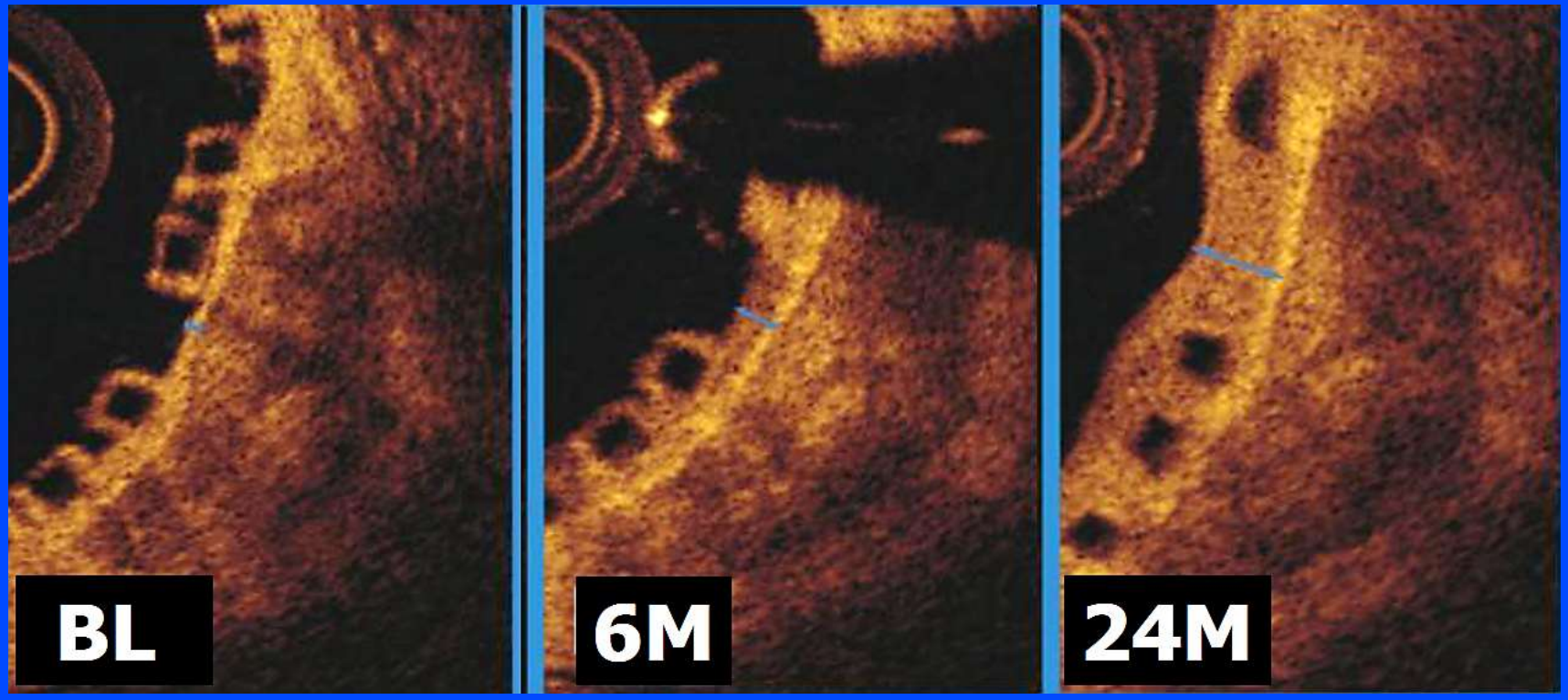


Red thrombus but also a ruptured fibrous cap underlying a complex fibroatheroma, including cholesterol crystals and foam cells and a large necrotic core

Alfonso F, et al. JACC Cardiovasc Interv 2014 Mar;7(3):e17-8.

Can the Scaffold «Cap» the Plaque ?

Circumferential evaluation of the neointima by optical coherence tomography after ABSORB bioresorbable vascular scaffold implantation: Can the scaffold cap the plaque?



Brugaletta S, Radu M,… , Serruys PW. Atherosclerosis. 2012 Mar;221(1):106-12.

Insight to BVS From Intracoronary Imaging

Bioresorbable vascular scaffold treatment induces the formation of neointimal cap that seals the underlying plaque without compromising the luminal dimensions: a concept based on serial optical coherence tomography data

In Absorb BVS, neointima tissue continued to develop at midterm follow-up (2.17±0.48 mm2 vs. 1.38±0.52 mm2, p<0.0001) and covered the underlying tissues without compromising the luminal dimensions (5.93±1.49 mm2 vs. 6.14±1.49 mm2, p=0.571) as it was accommodated by the expanded scaffold (8.28±1.74 mm2 vs. 7.67±1.28 mm2, p<0.0001).

Neointimal tissue develops following either Absorb BVS or BMS implantation and shields lipid tissues. The neointimal response in the BMS causes a higher reduction of luminal dimensions compared to the Absorb BVS. Thus, Absorb BVS may have a value in the invasive re-capping of high-risk plaques.

Bourantas CV, et al EuroIntervention 2014;10-online publish-ahead-of-print October 2014

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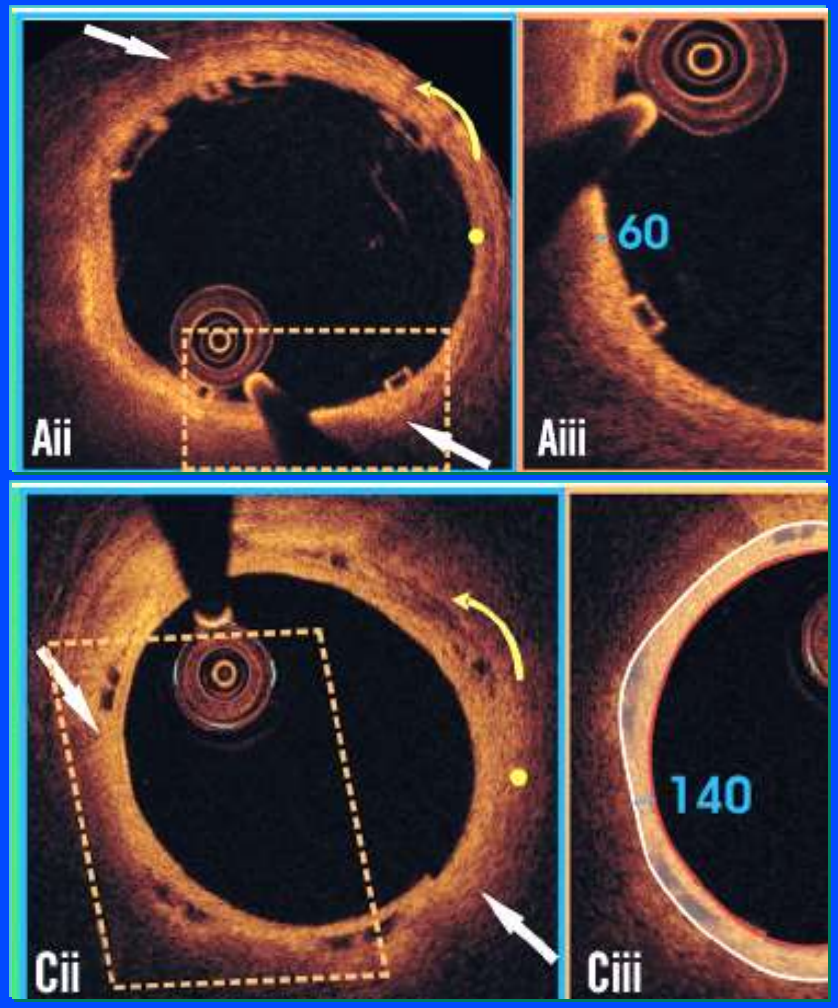
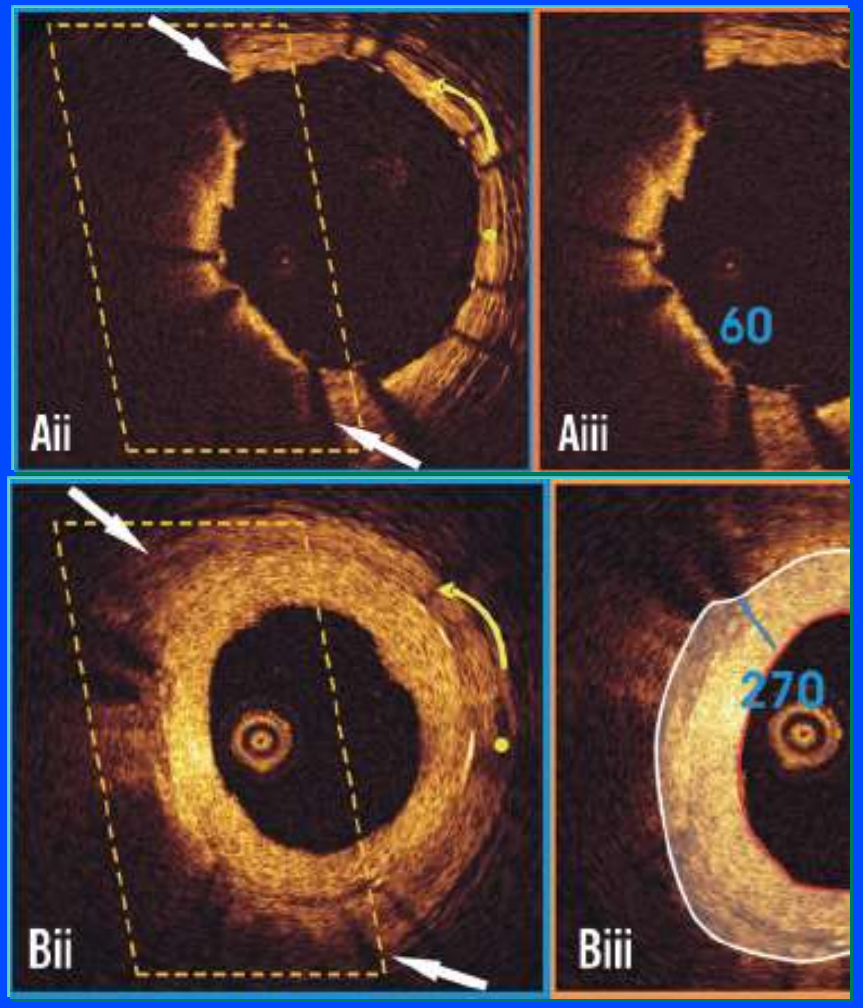
Neointimal Cap Seals Underlying Plaque

BVS



BMS



Bourantas CV, et al EuroIntervention 2014;10-online publish-ahead-of-print October 2014

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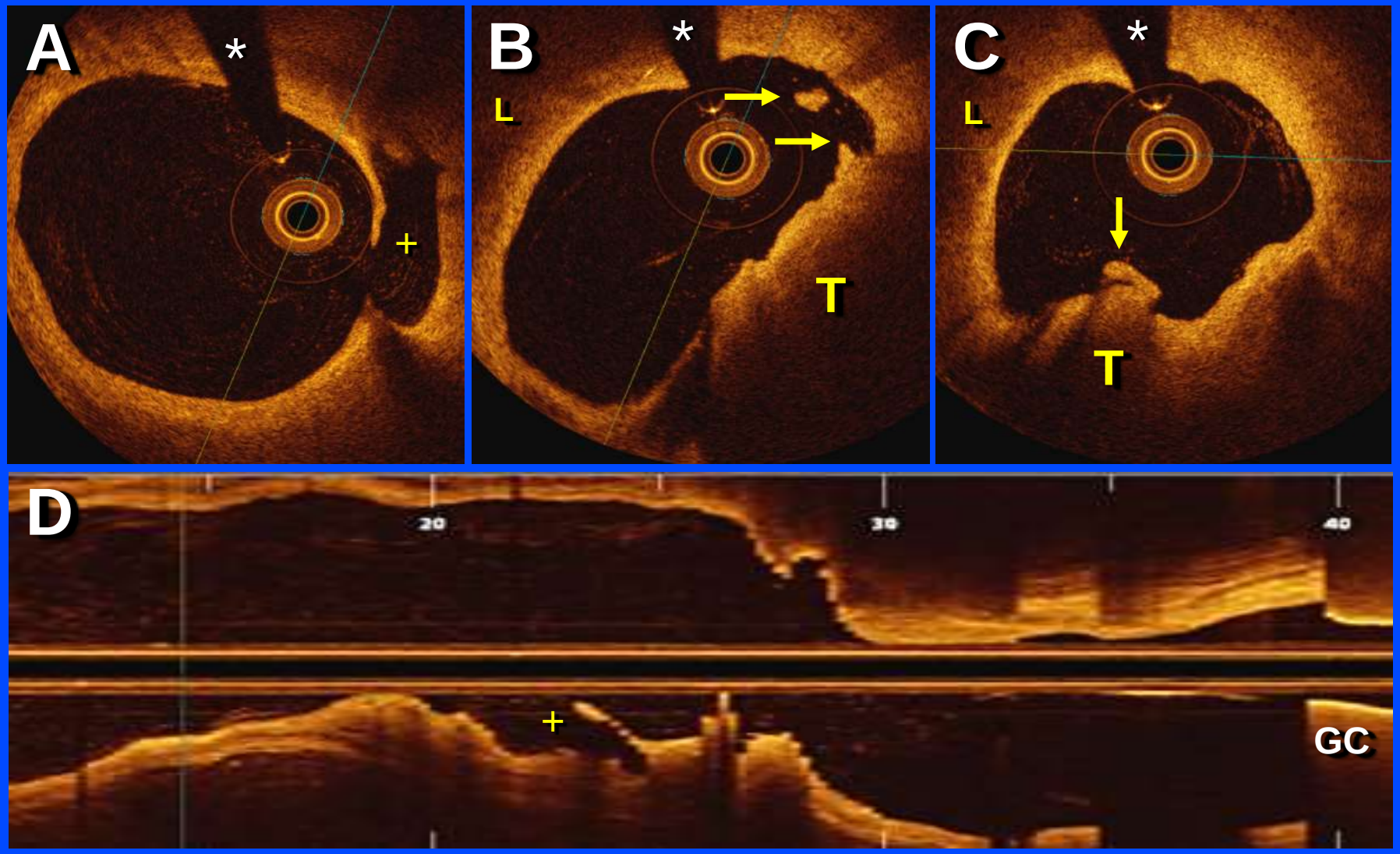
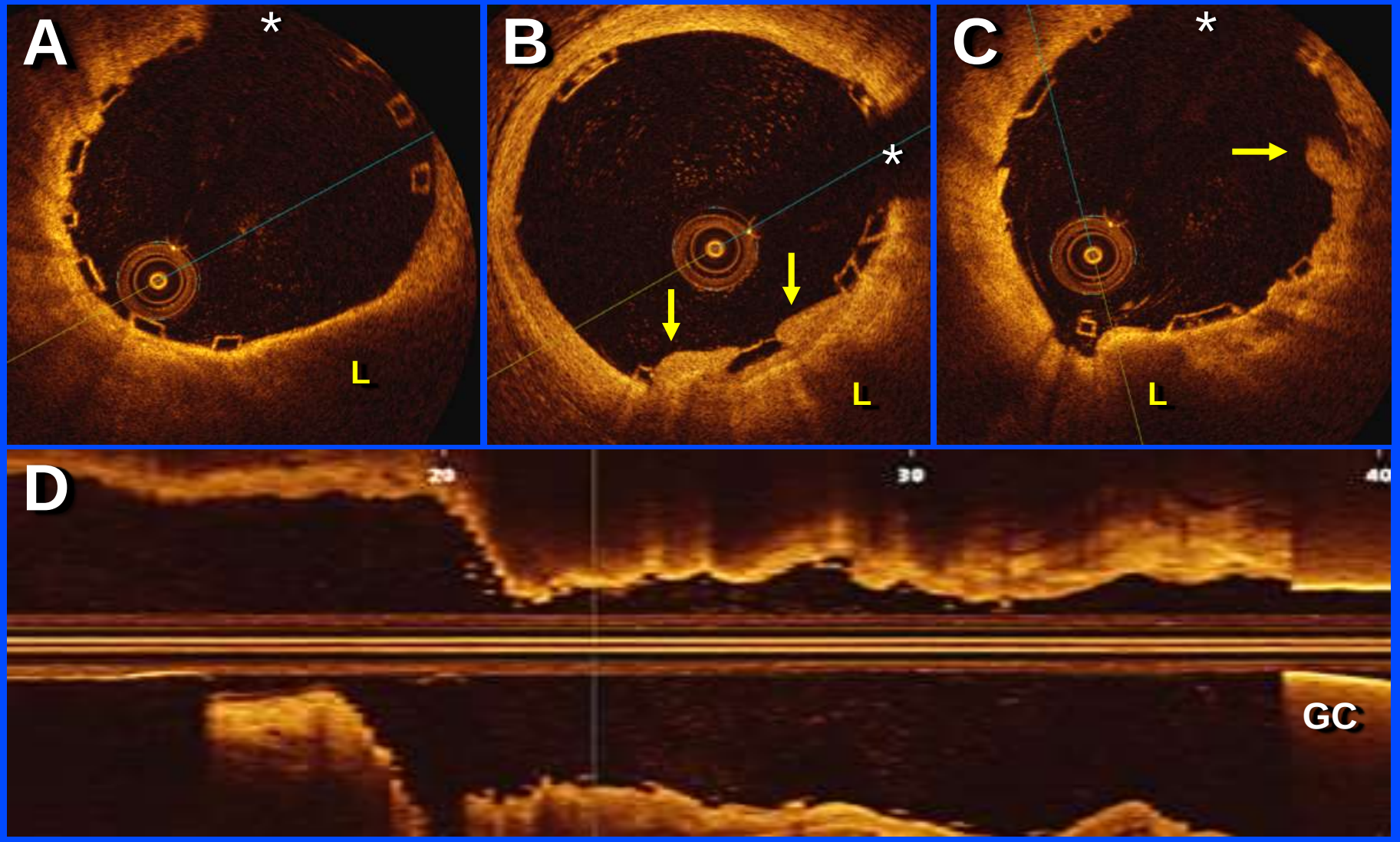
Anterior STEMI. Ambiguos Lesion in the RCA (Non-Culprit)



Cuesta J, Alfonso F. Port J Cardiol 2015 (In Press) e17-8.

Insight to BVS From Intracoronary Imaging

Anterior STEMI. Ruptured Plaque With Red Thrombus in a Non-Culprit Vessel



Cuesta J, Alfonso F. Port J Cardiol 2015 (In Press) e17-8.

Insight to BVS From Intracoronary Imaging

- Imaging has been instrumental to confirm the value of BVS in simple lesions
- Imaging appears very attractive to guide and optimize complex coronary interventions
- Imaging will be able to assess final healing pattern after BVS implantation