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IMAGING INTRACORONARICO:

IVUS & OCT

my tips and tricks

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UOSA Emodinamica

Fondazione Policlinico "A. Gemelli" , Università Cattolica del Sacro Cuore, Roma

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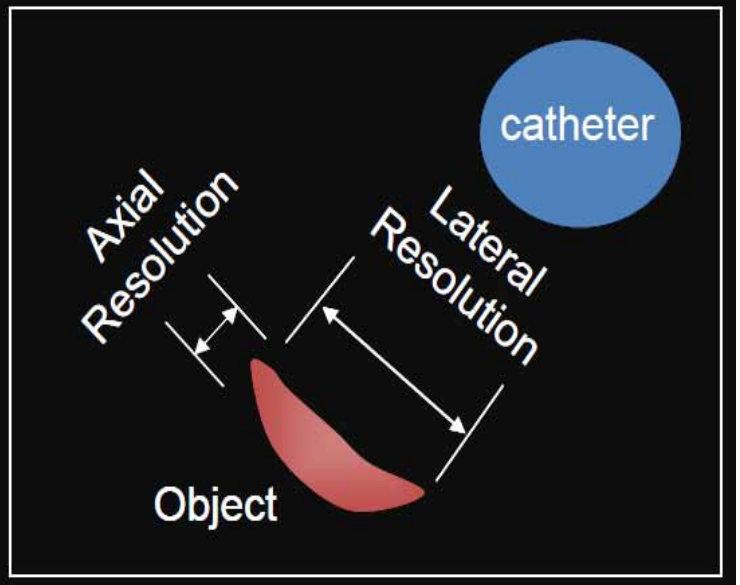
IVUS VS. OCT: PENETRATION VS. RESOLUTION

Axial
Measured along the ultrasound beam

Lateral
Measured along the sweep of the IVUS image



	IVUS	FD-OCT
Size of catheter	3.2-3.5Fr	2.7Fr
Guiding catheter compatibility	5-6Fr (≥0.64”)	6Fr (≥0.64”)
Max frame rate	30fps	100-200fps
Max pullback speed	1 mm/sec	20-40 mm/sec
Wave length	35-80 um	1.3 um
Axial resolution	90-140 um	10-15 um
Lateral resolution	250 um	40-90 um
Tissue penetration	7-10mm	2-3.5mm
Scan diameter	15mm	Approx 10mm

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CLINICAL INDICATIONS FOR FFR and INTRAVASCULAR IMAGING

1. Diagnosis

A. Angiographically indeterminate disease

Left mainstem 'disease' **FF**

Ostial 'disease' **FF** **R**

Diagnosis of 'haziness' **R**

- Thrombus, calcium, dissection, plaque
- Culprit lesion identification/evaluation

B. Angiographically intermediate disease **FF**

2. Guidance of PCI **R**

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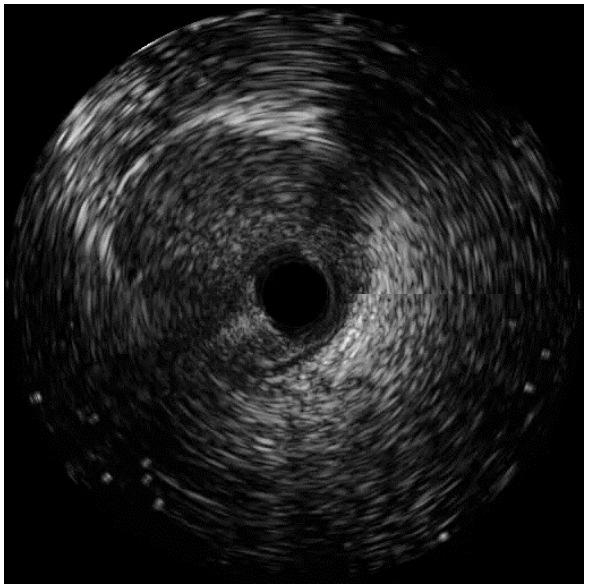
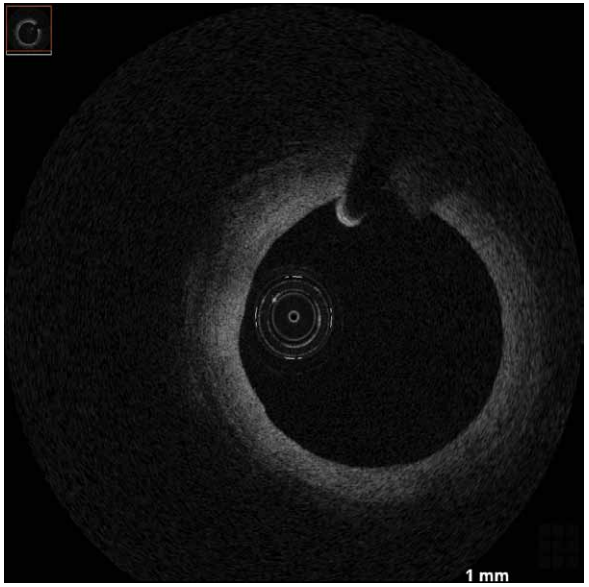
IVUS & OCT





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IVUS INTERPRETATION

Follow the EEL(External Elastic Lamina) !!!

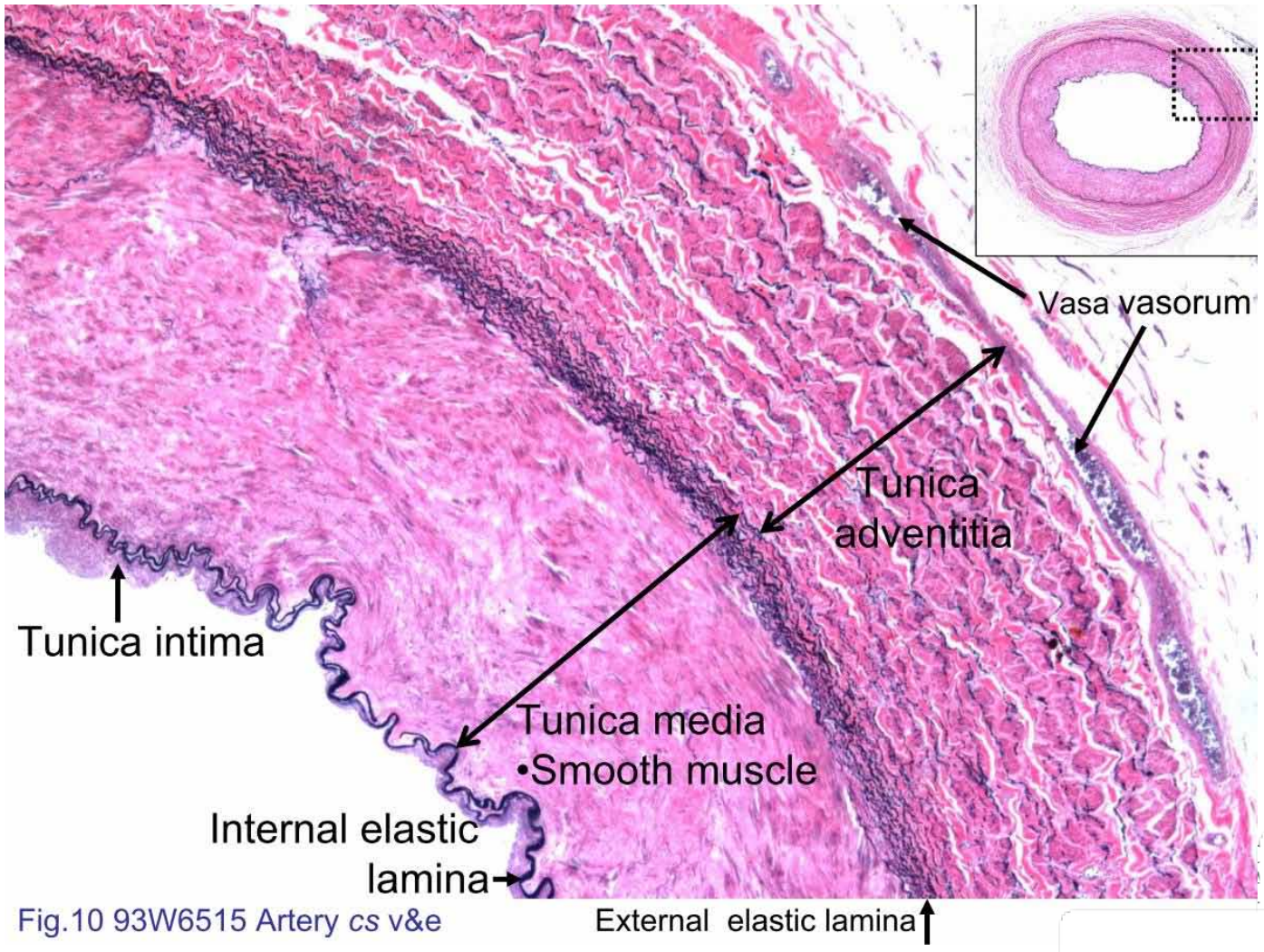

Fig.10 93W6515 Artery *cs* v&e

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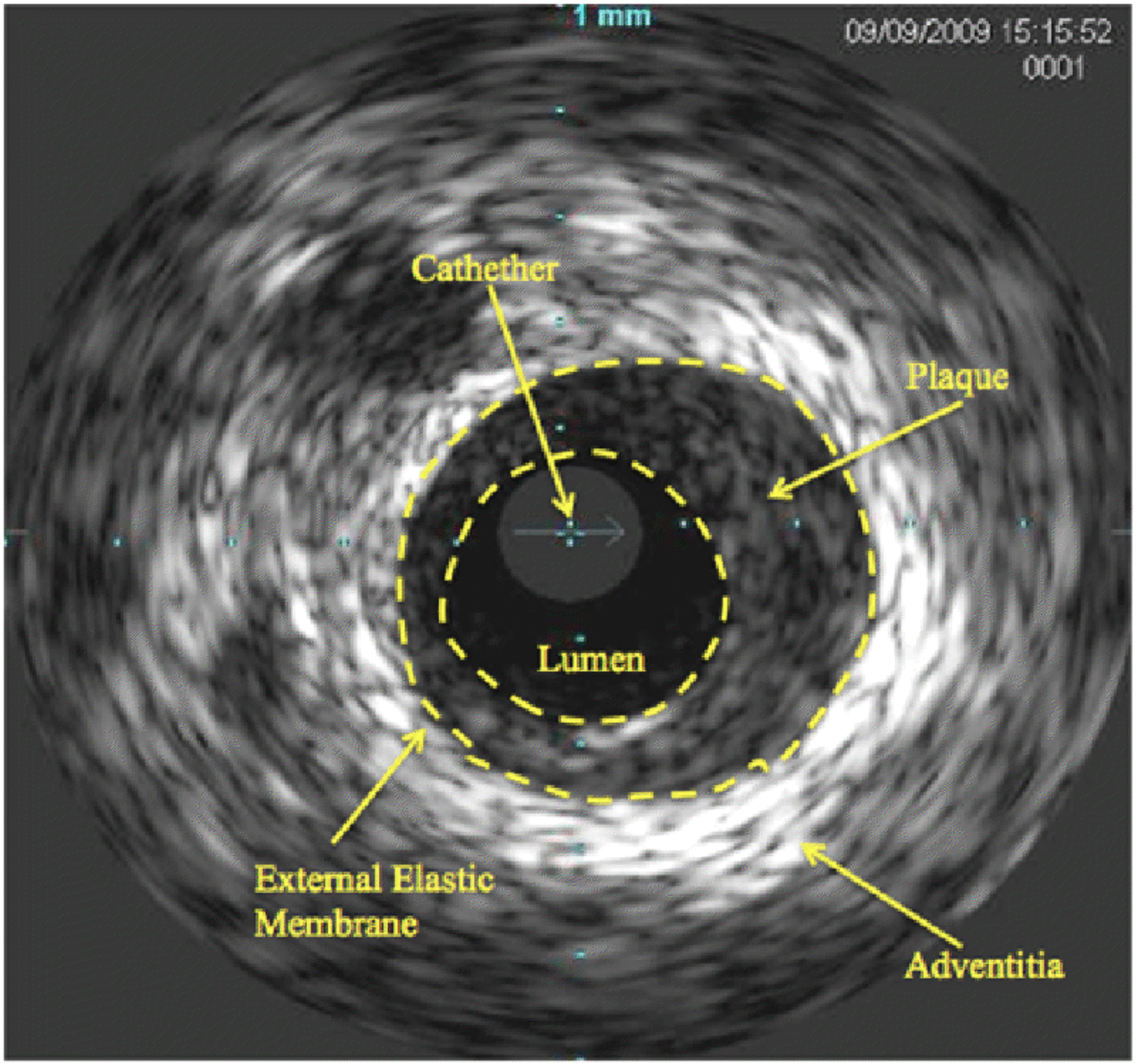
IVUS
INTERPRETATION



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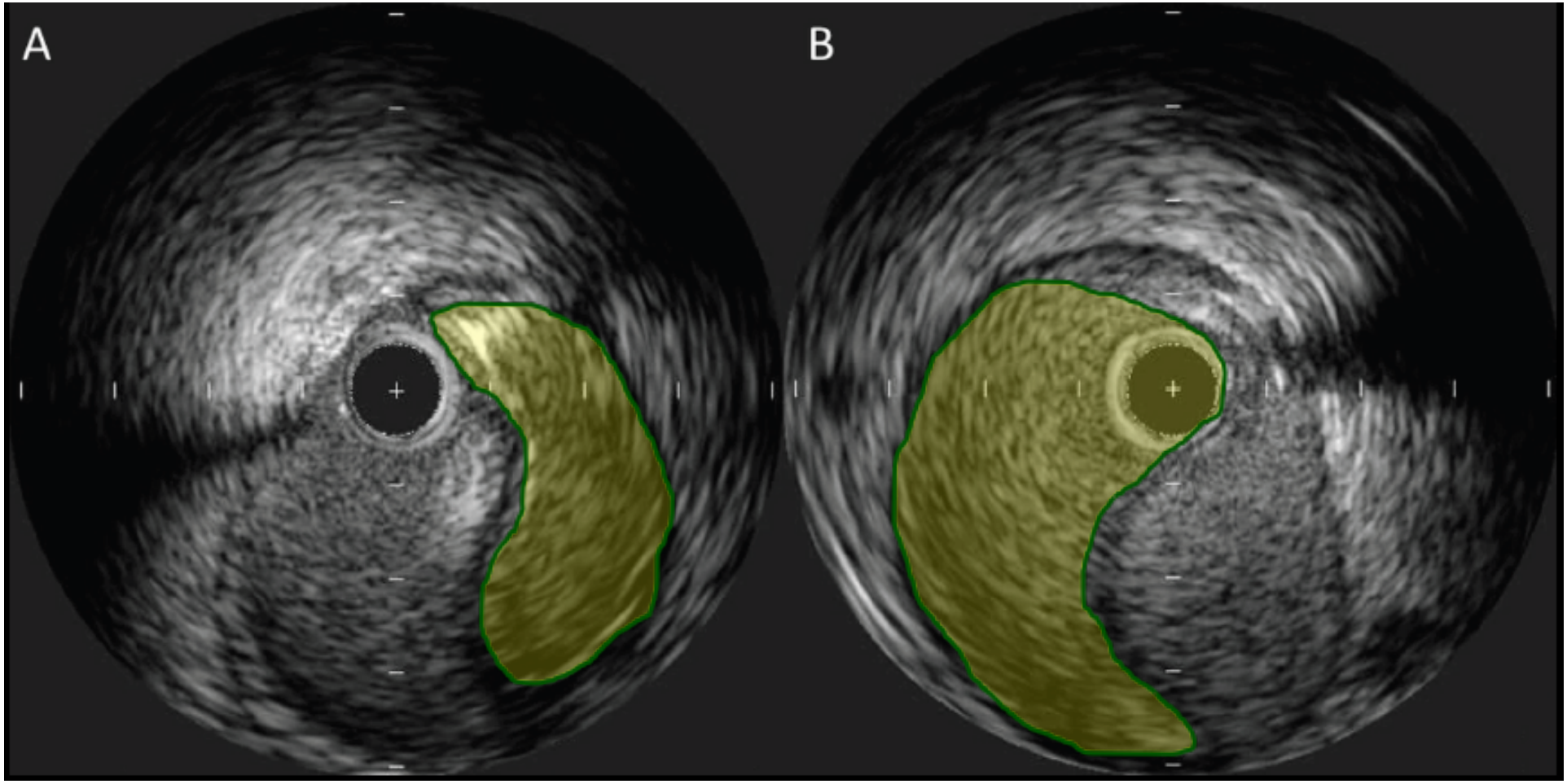
YIN AND YANG IN INTERVENTIONAL CARDIOLOGY



Porto I et al. 2011

JACC cardiovascular Interventions

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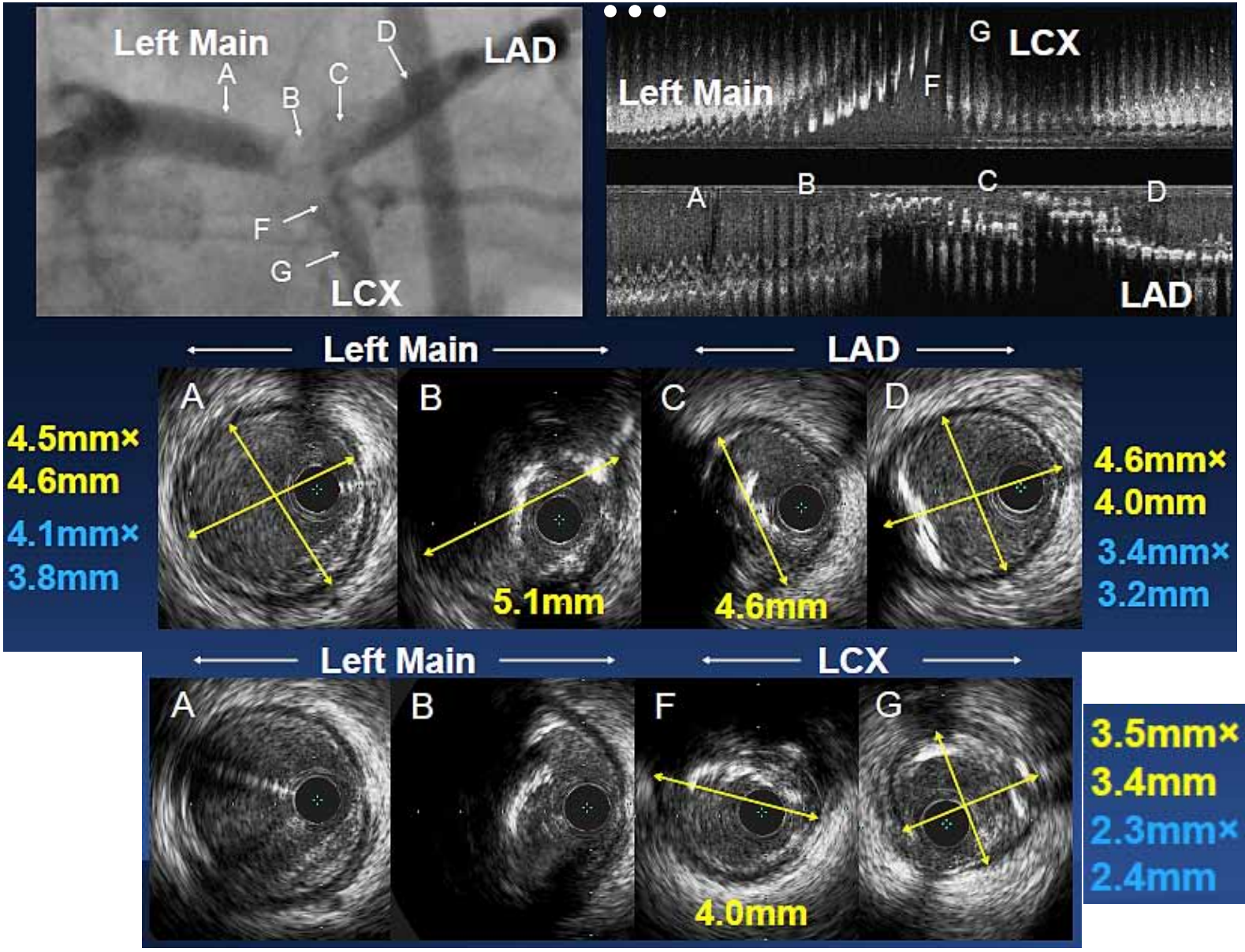
IVUS IN LEFT MAIN
A LOT OF INFORMATION
...



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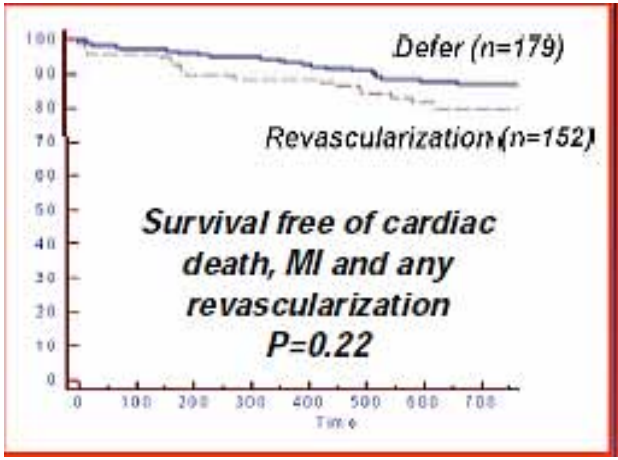
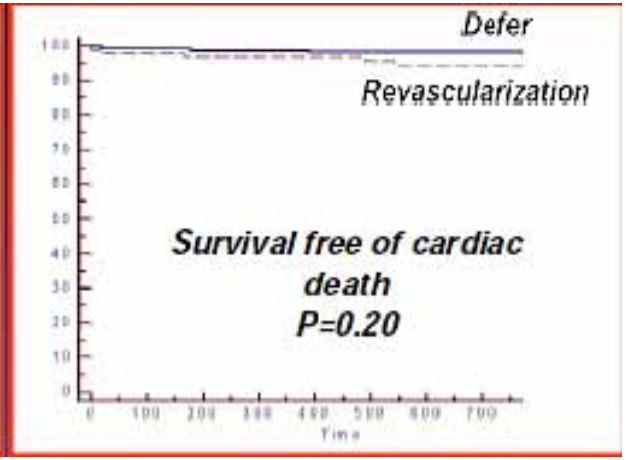
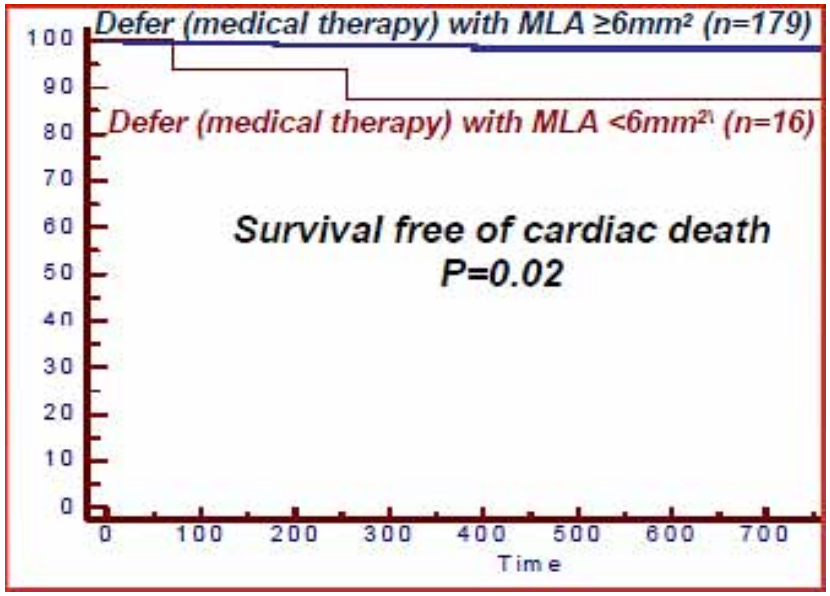
CAN I SAFELY DEFER THIS LEFT MAIN LESION?

The LITRO STUDY







De La Torre Hernandez et al., J Am Coll Cardiol. 2011;58:351-8

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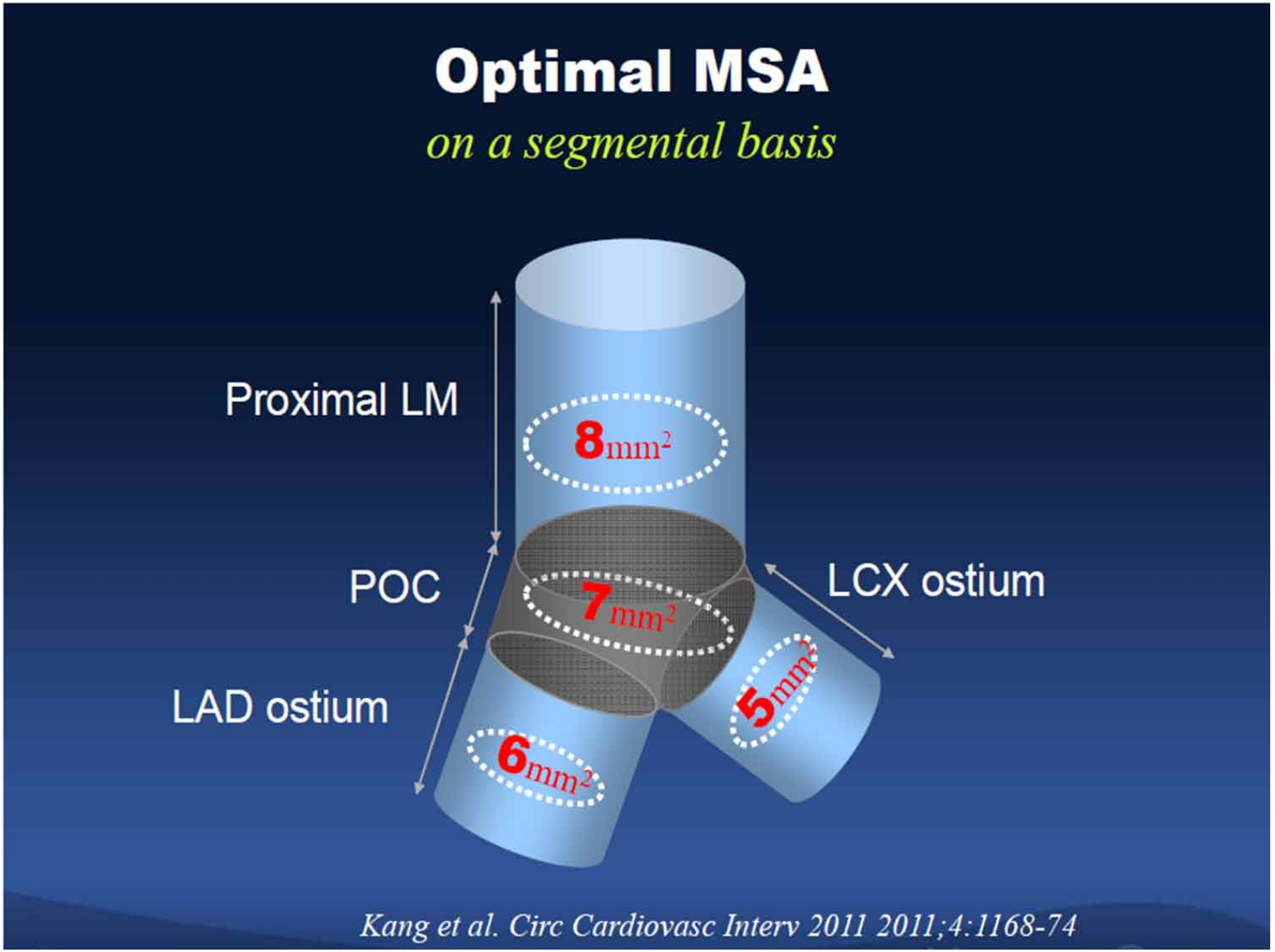
IVUS IN LEFT MAIN:
GOOD FOR PROGNOSIS !!!



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IVUS BEYOND LEFT MAIN

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CASO CLINICO

- Donna, 42 anni. Recente riscontro di ipertensione arteriosa, in trattamento con nebivololo /HCT.
- Dolore retrosternale diffuso ad irradiazione posteriore e alle braccia, con sudorazione algida e durato circa un ora.
- In Pronto Soccorso sintomatologia in attenuazione ECG nei limiti, ma alterazione della troponina (hs-TnT 24, VN<14 ng/L) e ricovero in UTIC.
- Ecocardiogramma senza alterazioni della cinetica segmentaria e F.E. conservata.

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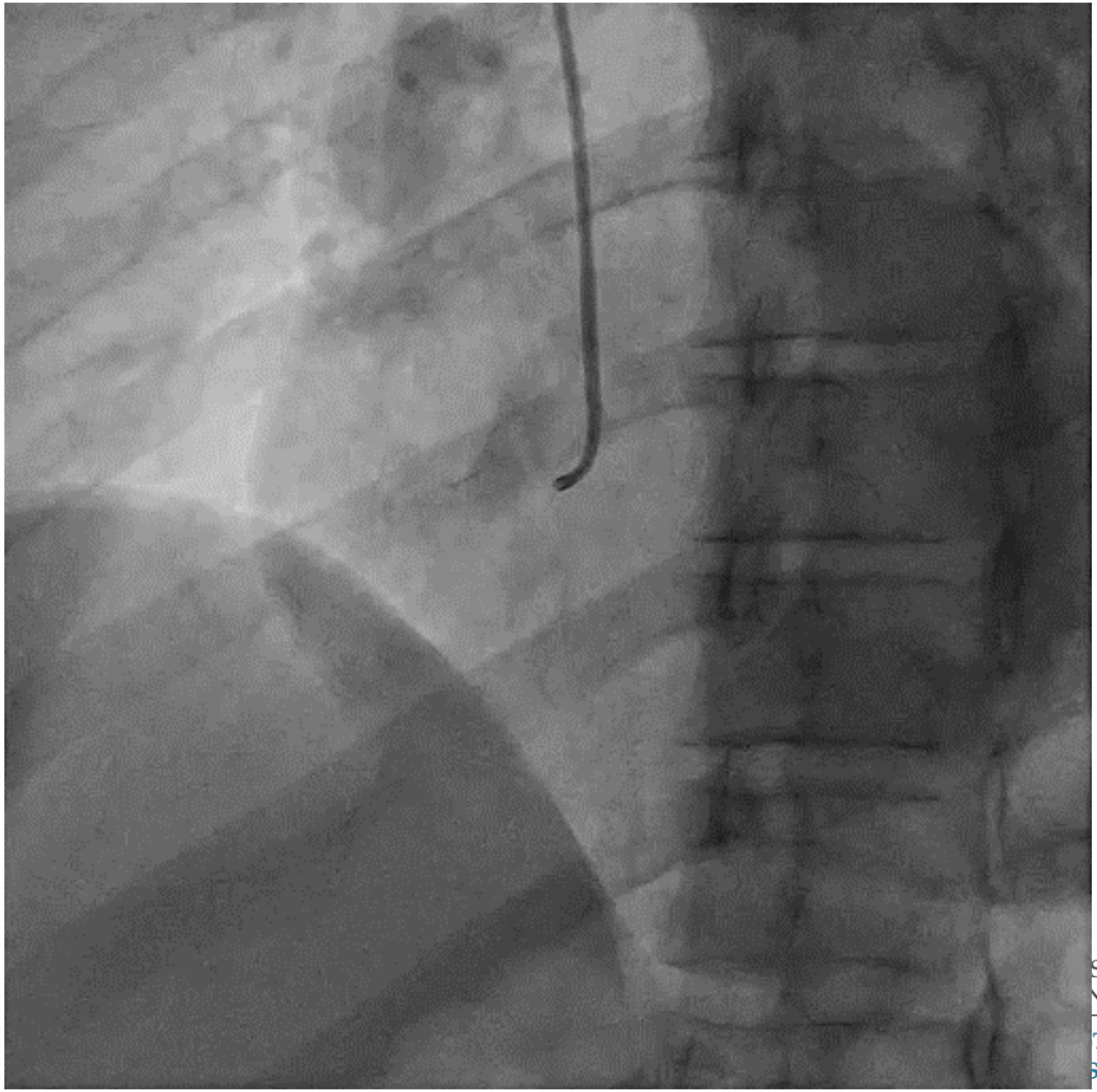
IVUS BEYOND LEFT MAIN



SSACHUSETTS
NERAL HOSPITAL

TITUTE FOR HEART,
SCULAR AND STROKE CARE

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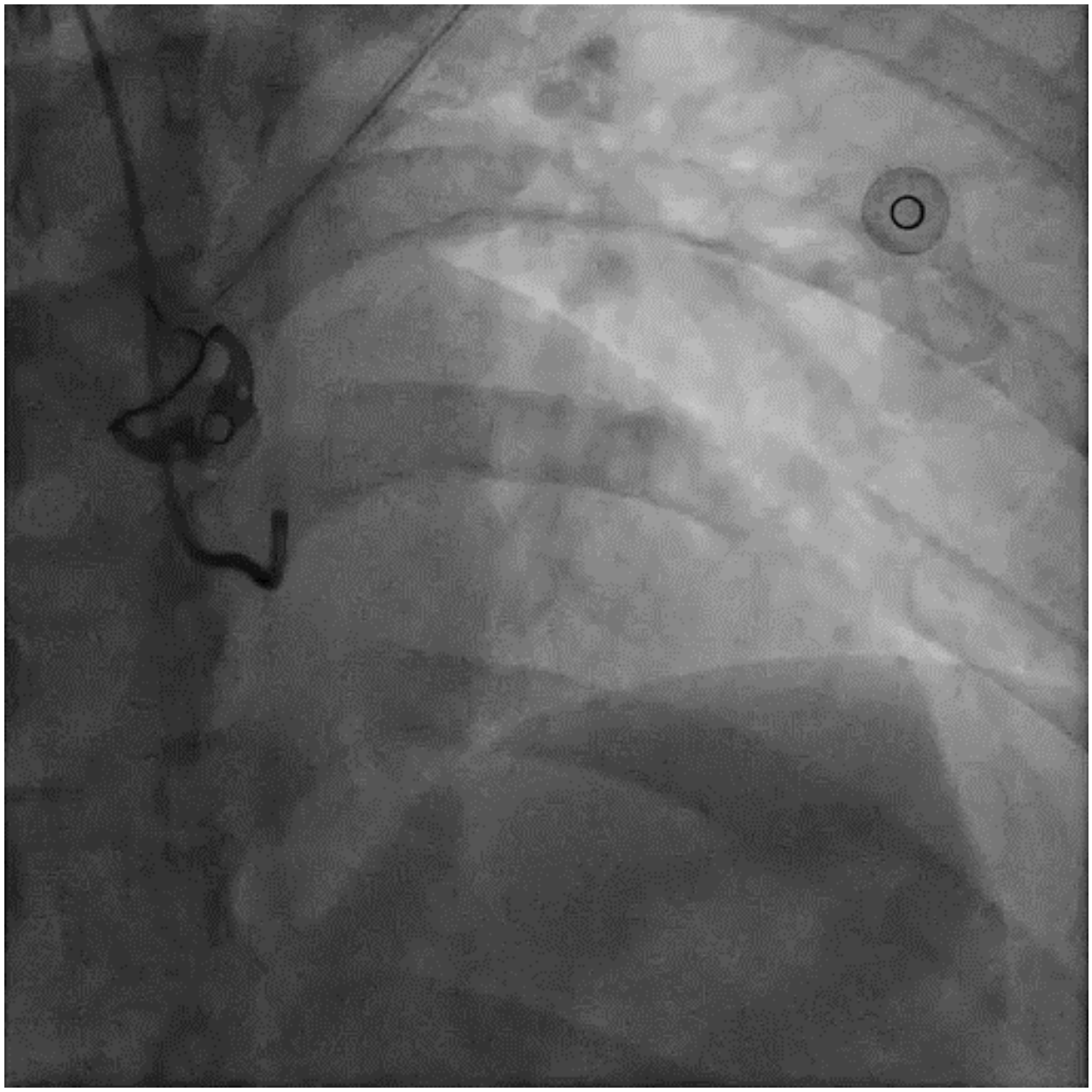
IVUS BEYOND LEFT MAIN



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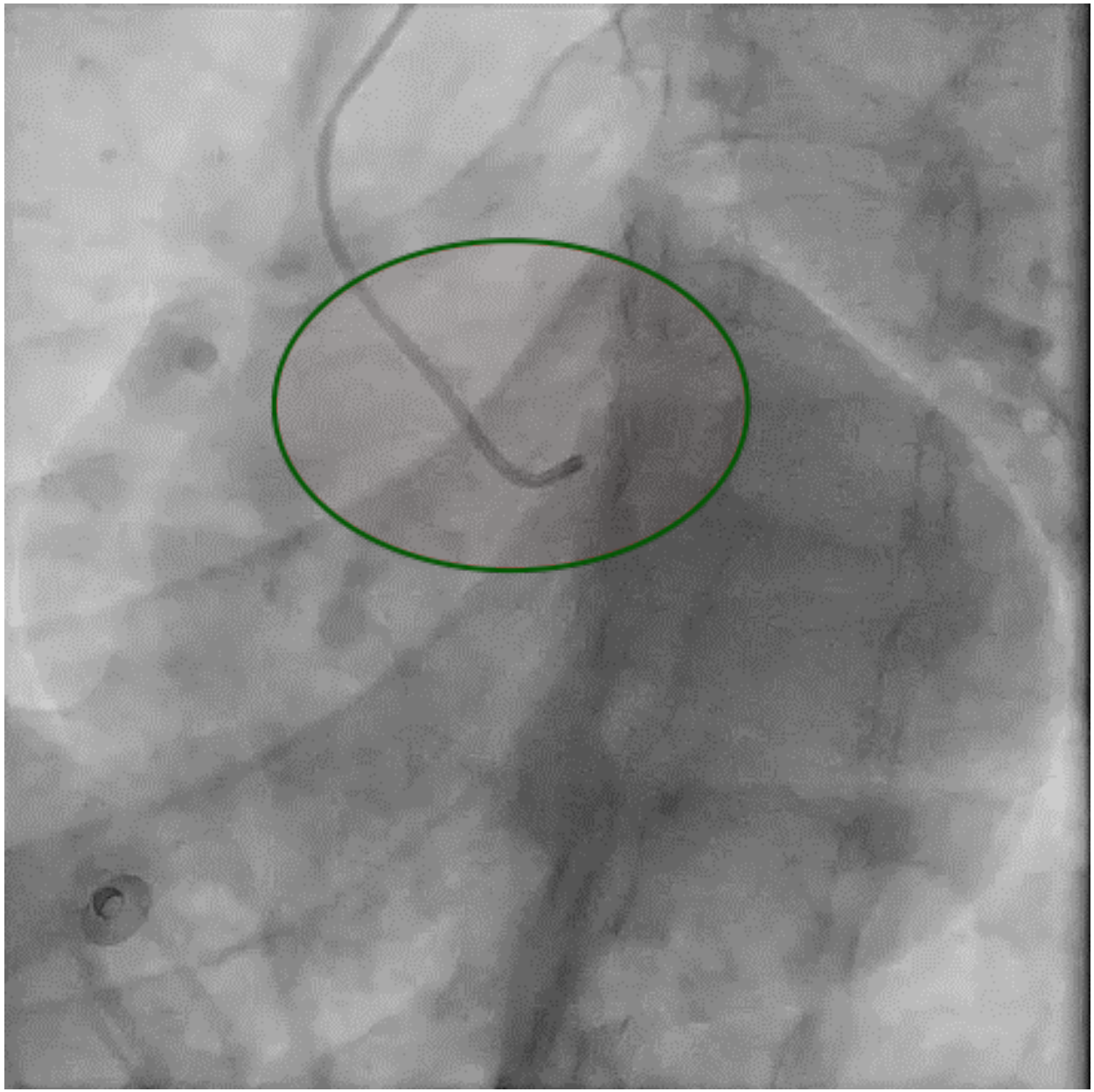

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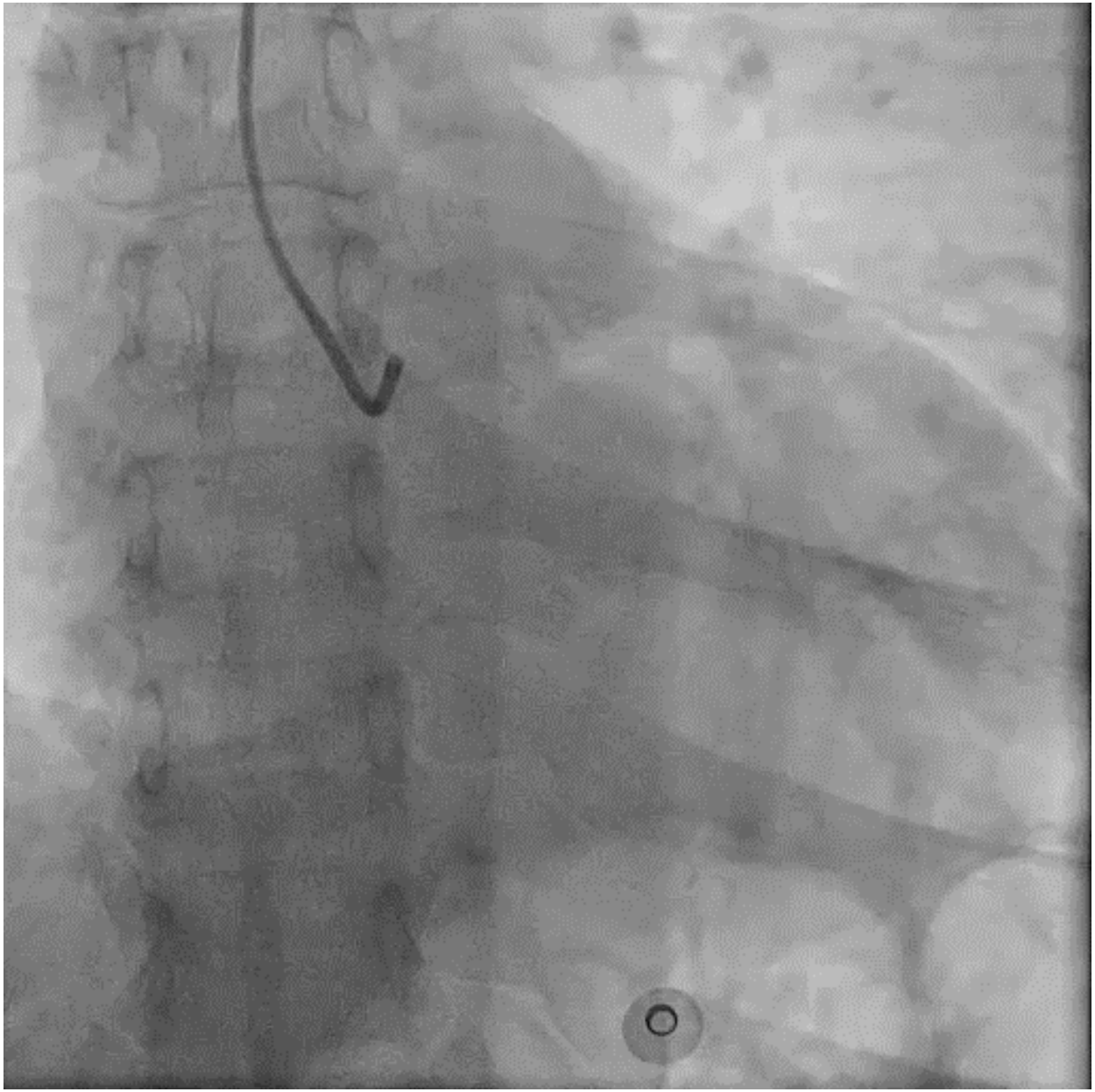

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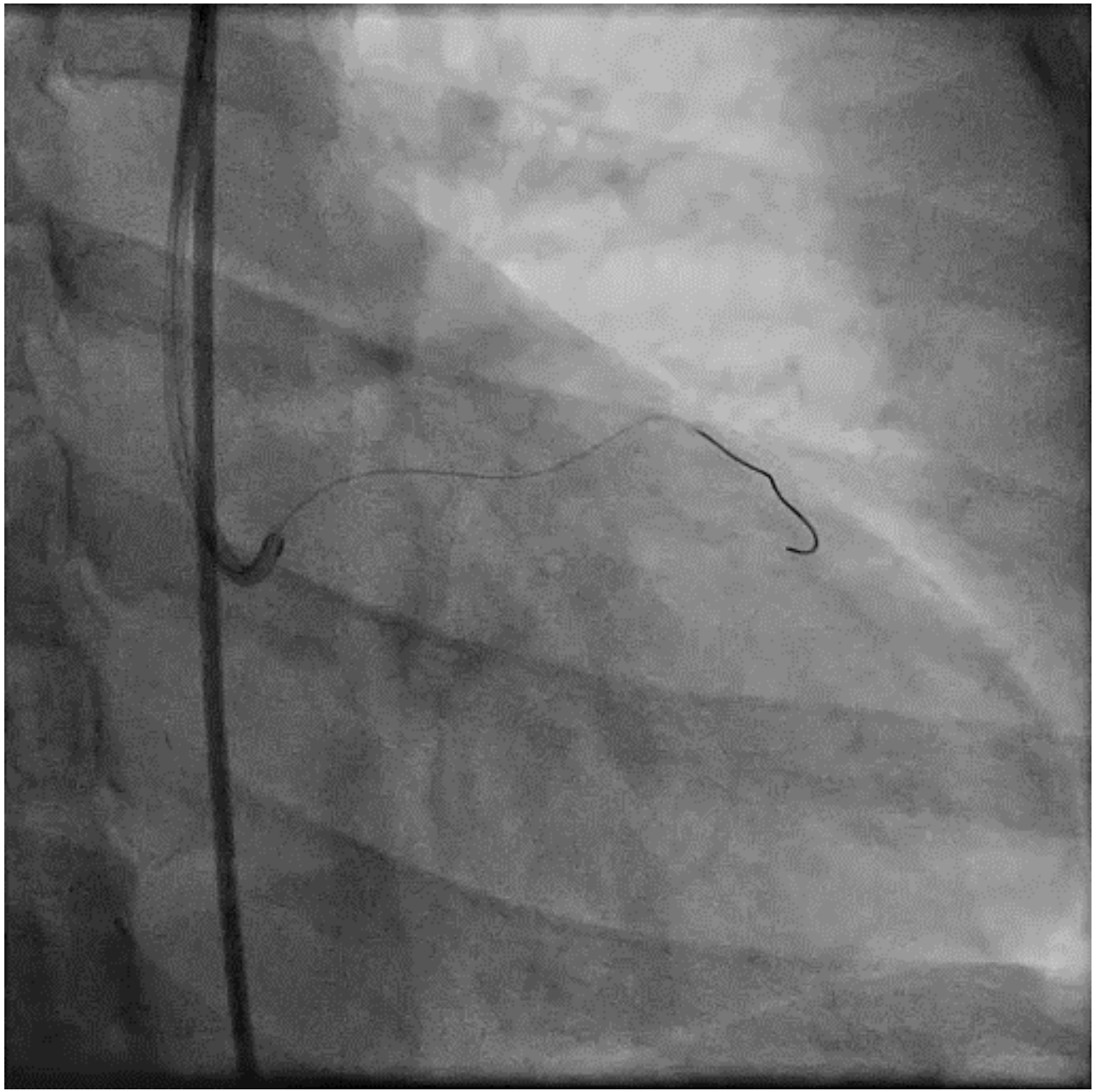

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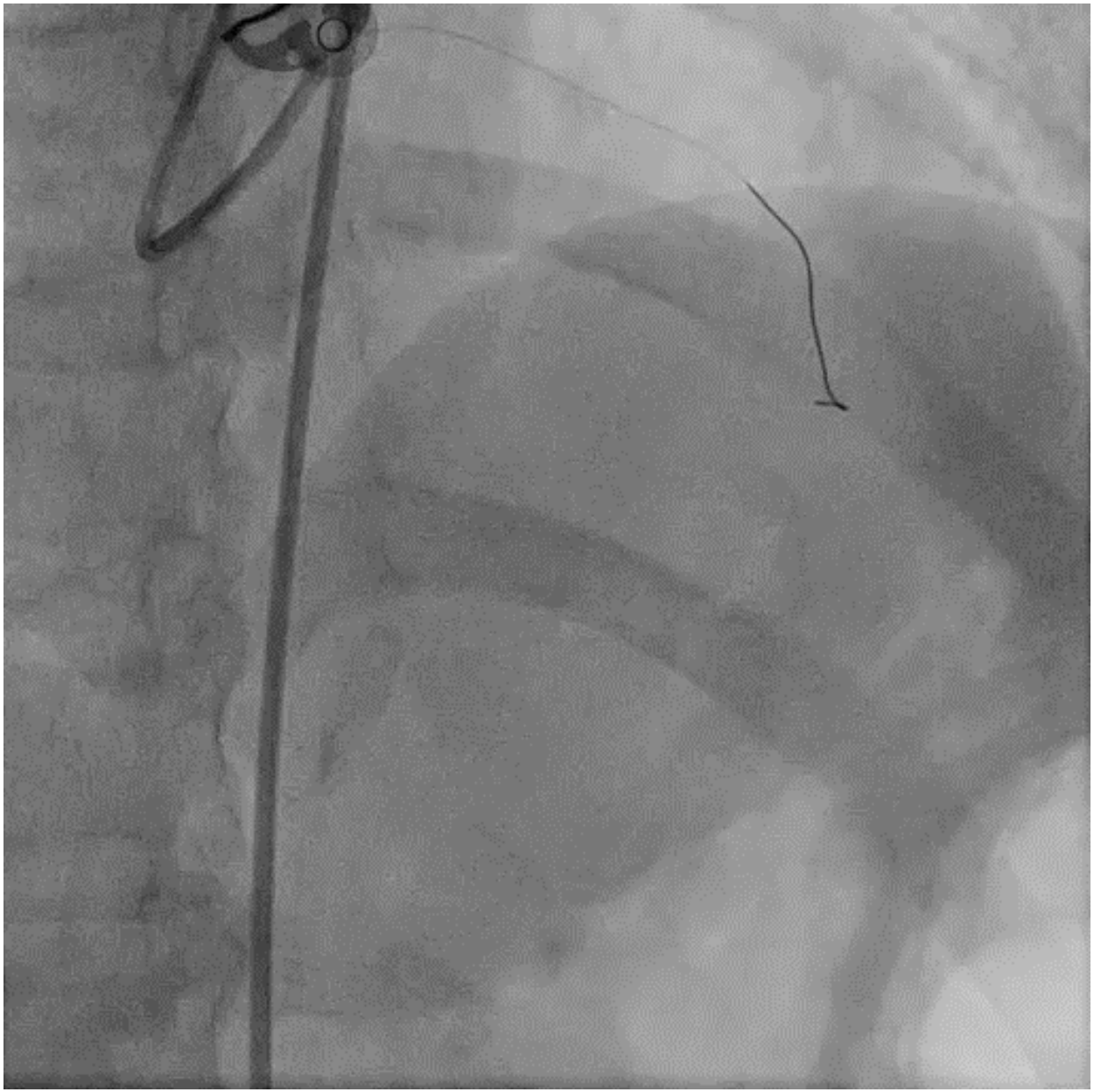

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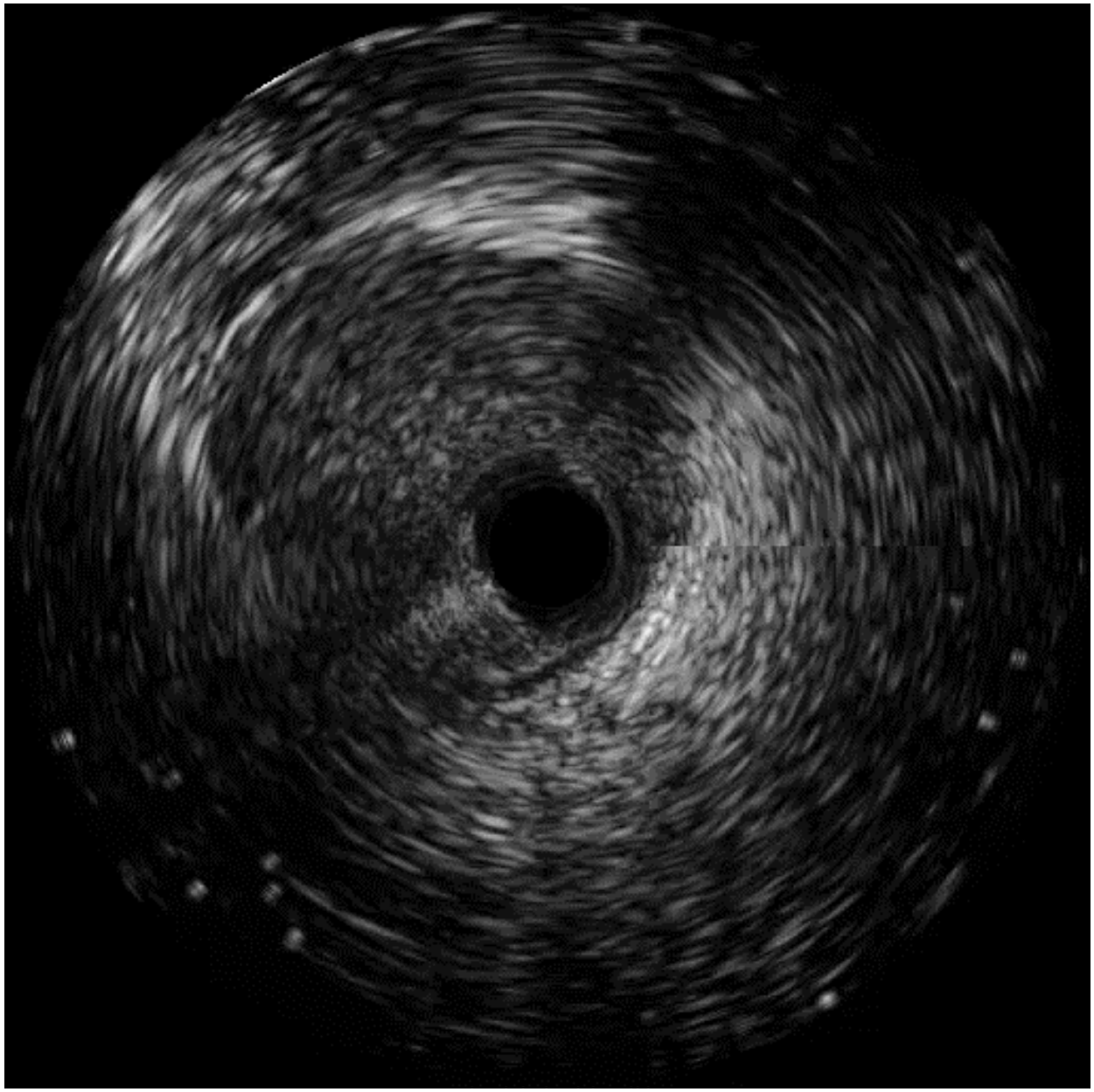
IVUS «VELOCIZZATO»



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IVUS BEYOND LEFT MAIN

True
lumen

Unknown

RISK OF HAEMATOMA «SQUEEZING»

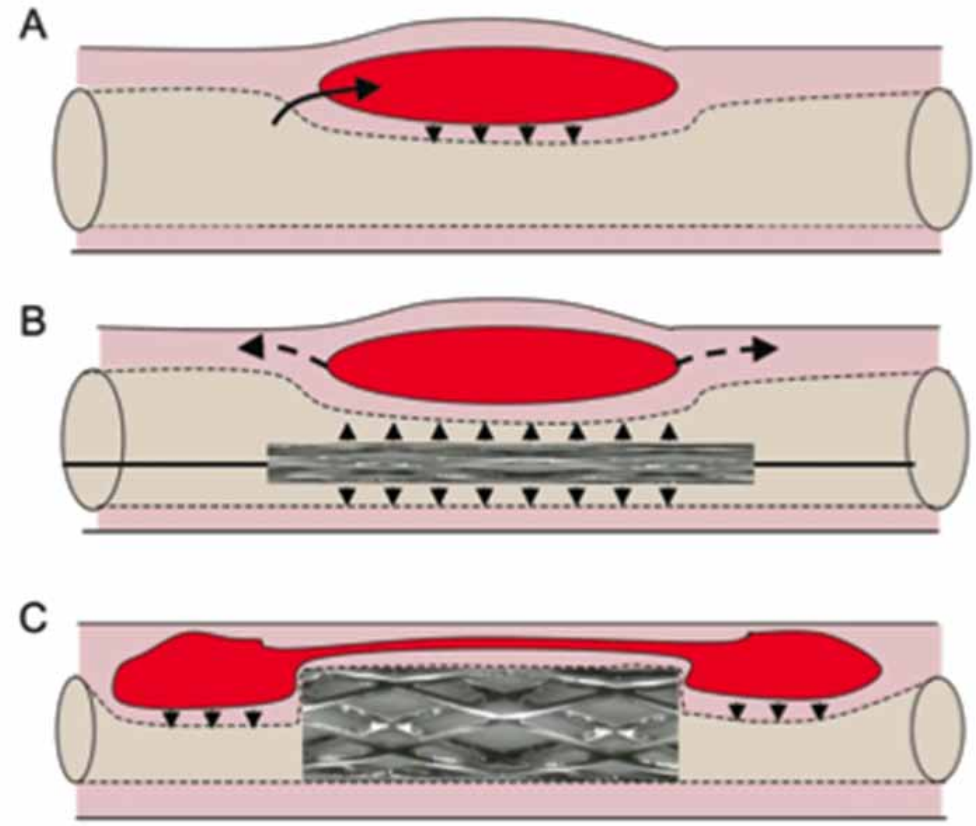

Figure 2. *Risk of propagation of false lumen during stenting for spontaneous coronary artery dissection. (A) Bleeding into the vessel wall either from the lumen or vasa vasorum creates a false lumen, which compresses the true lumen, causing downstream ischemia. (B) Stent deployment of apparently appropriate length to cover the area of angiographic stenosis displaces the blood in the false lumen proximally and/or distally to the stented segment, leading to pre- or post-stent extension of the false lumen and luminal compression (C). Further stenting may be needed to reestablish adequate luminal flow.*

Adlam & Banning
J Invasive Cardiol, 2010

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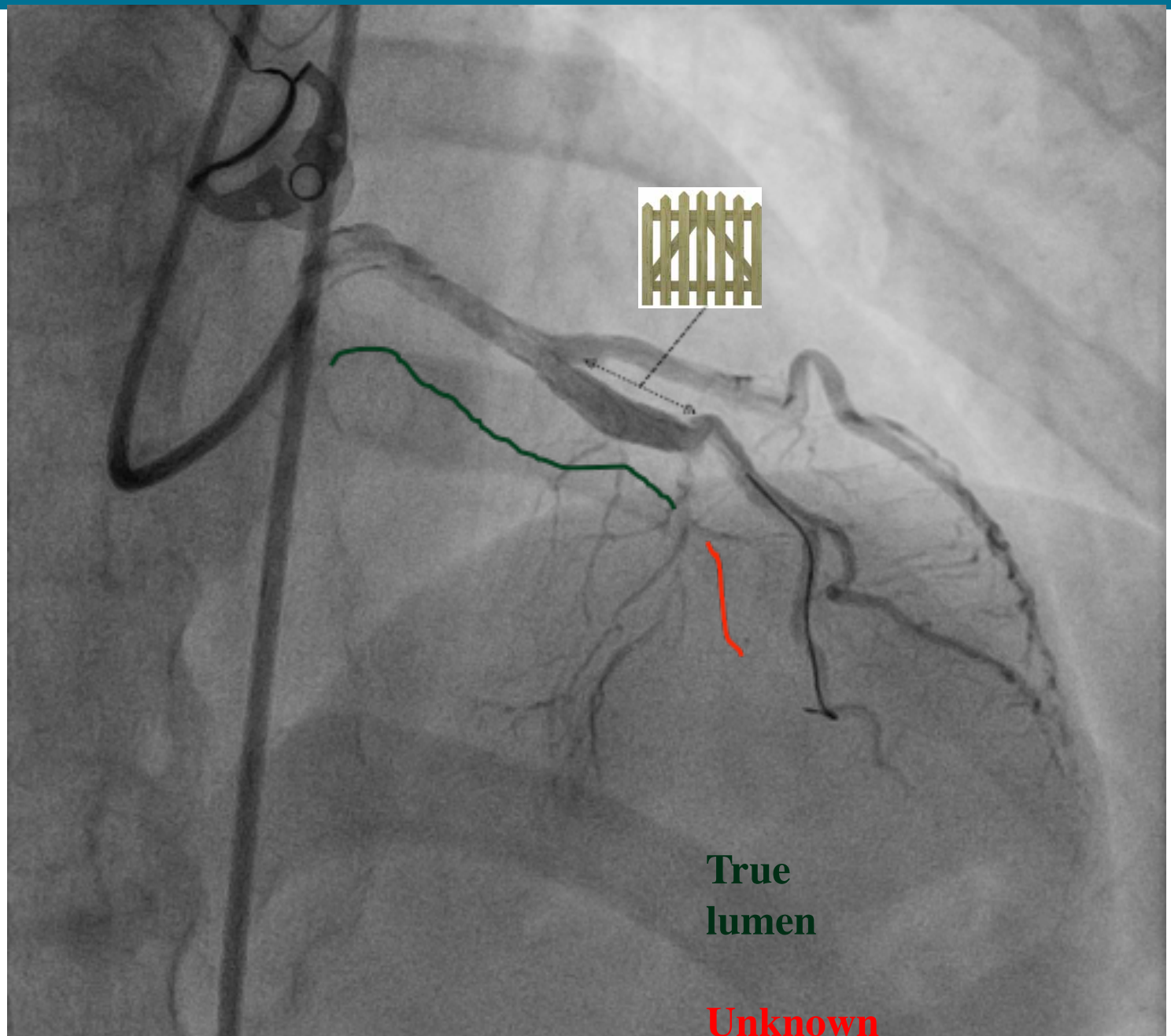

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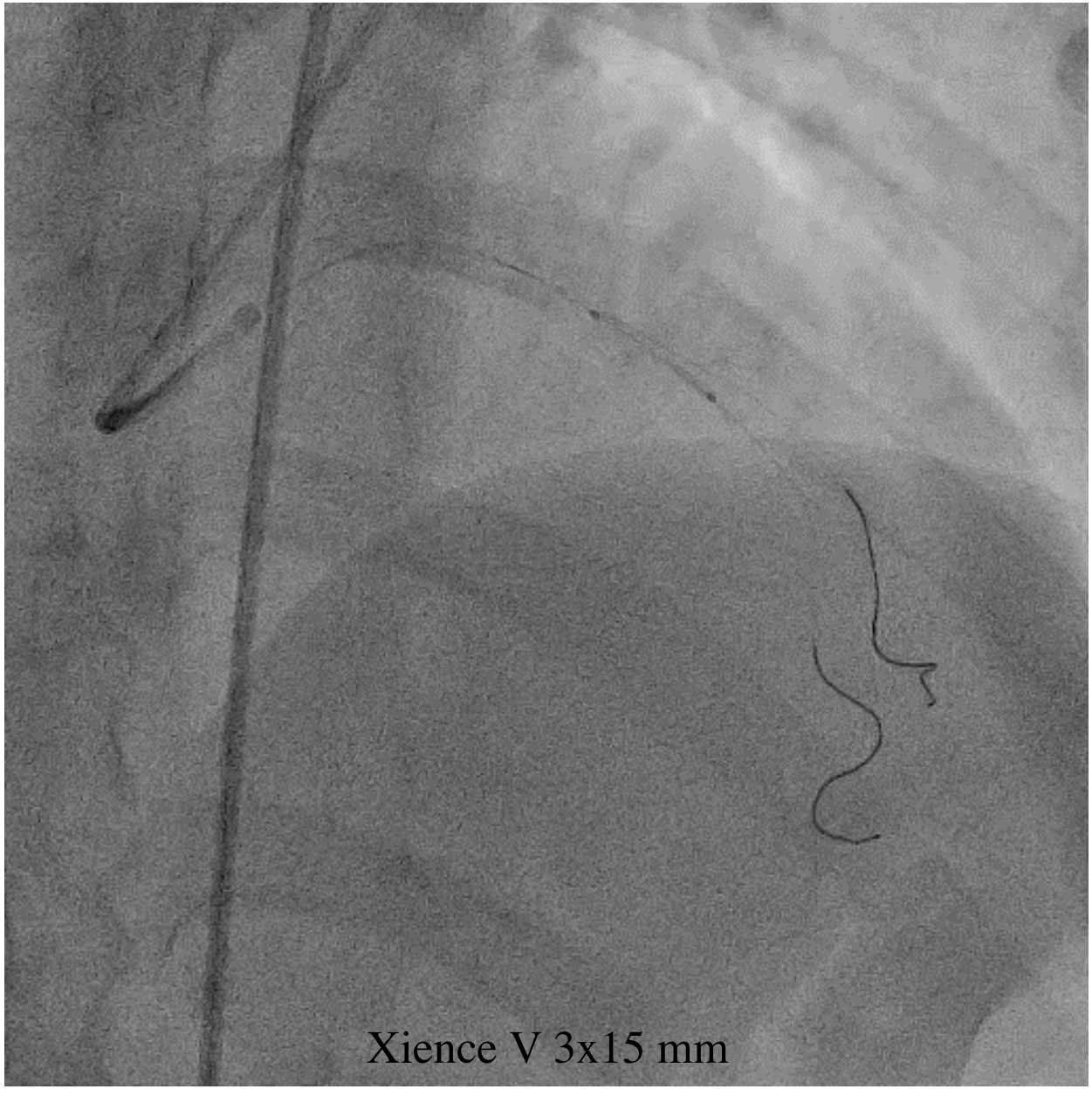

Xience V 3x15 mm

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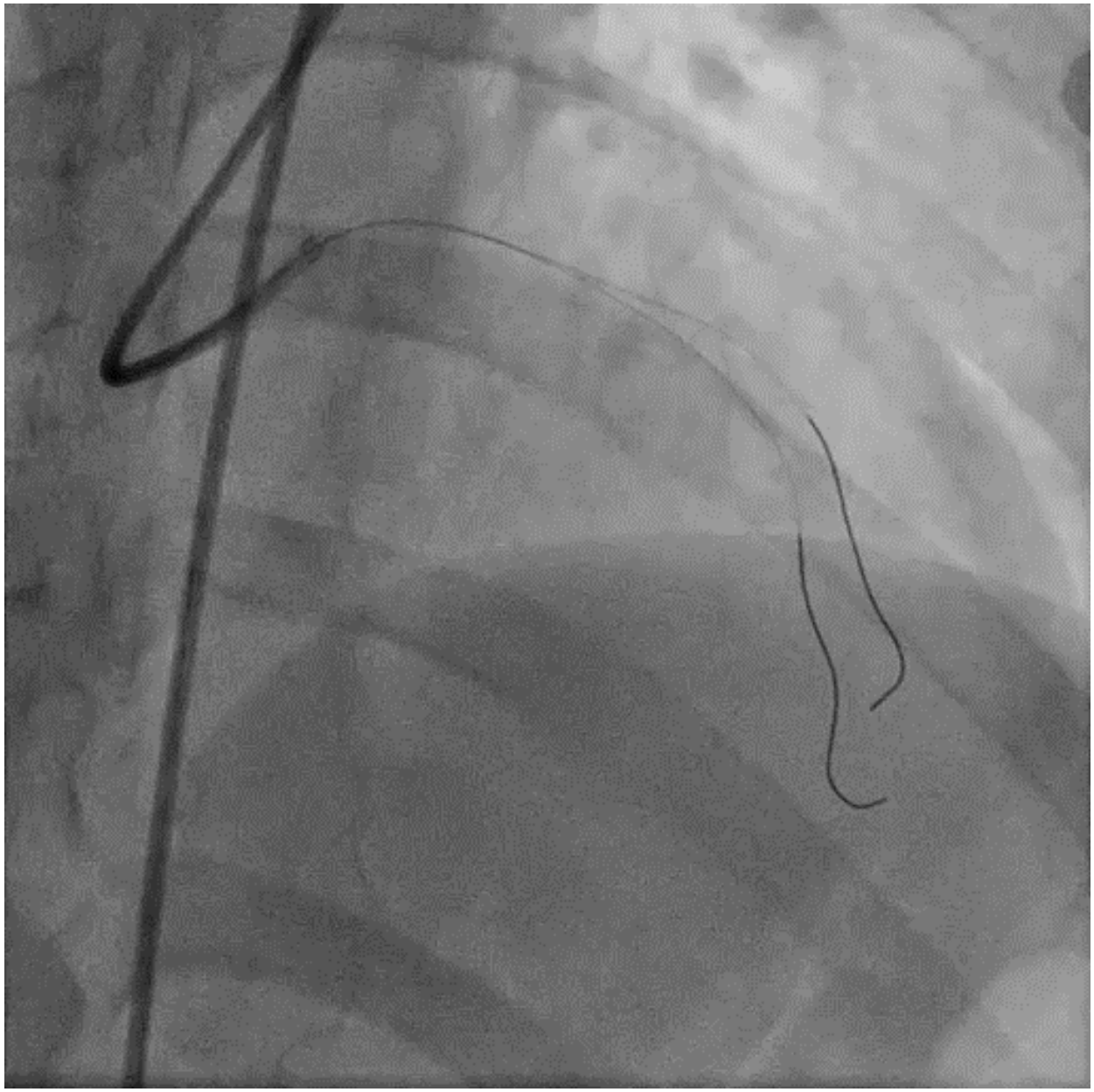

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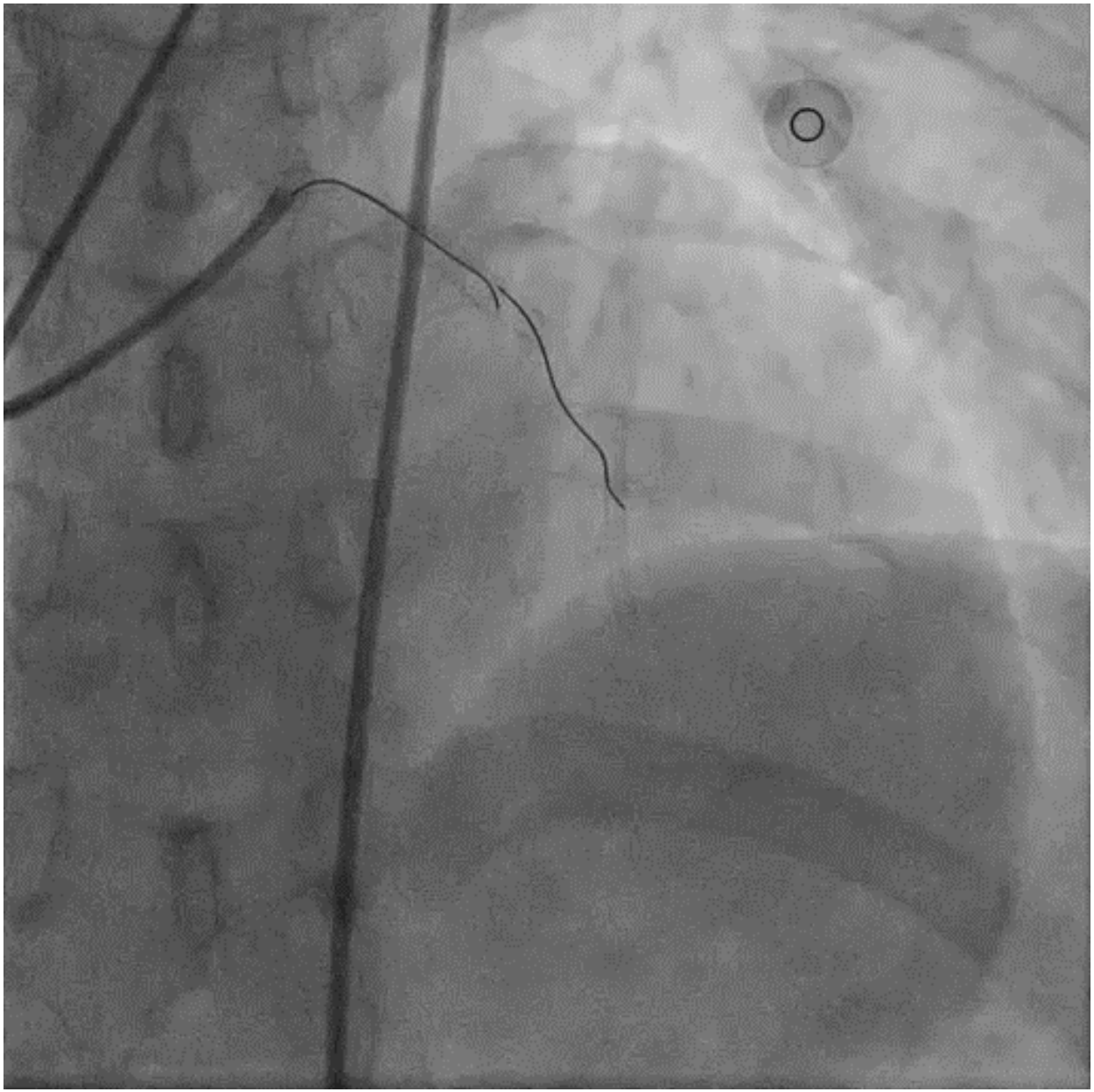

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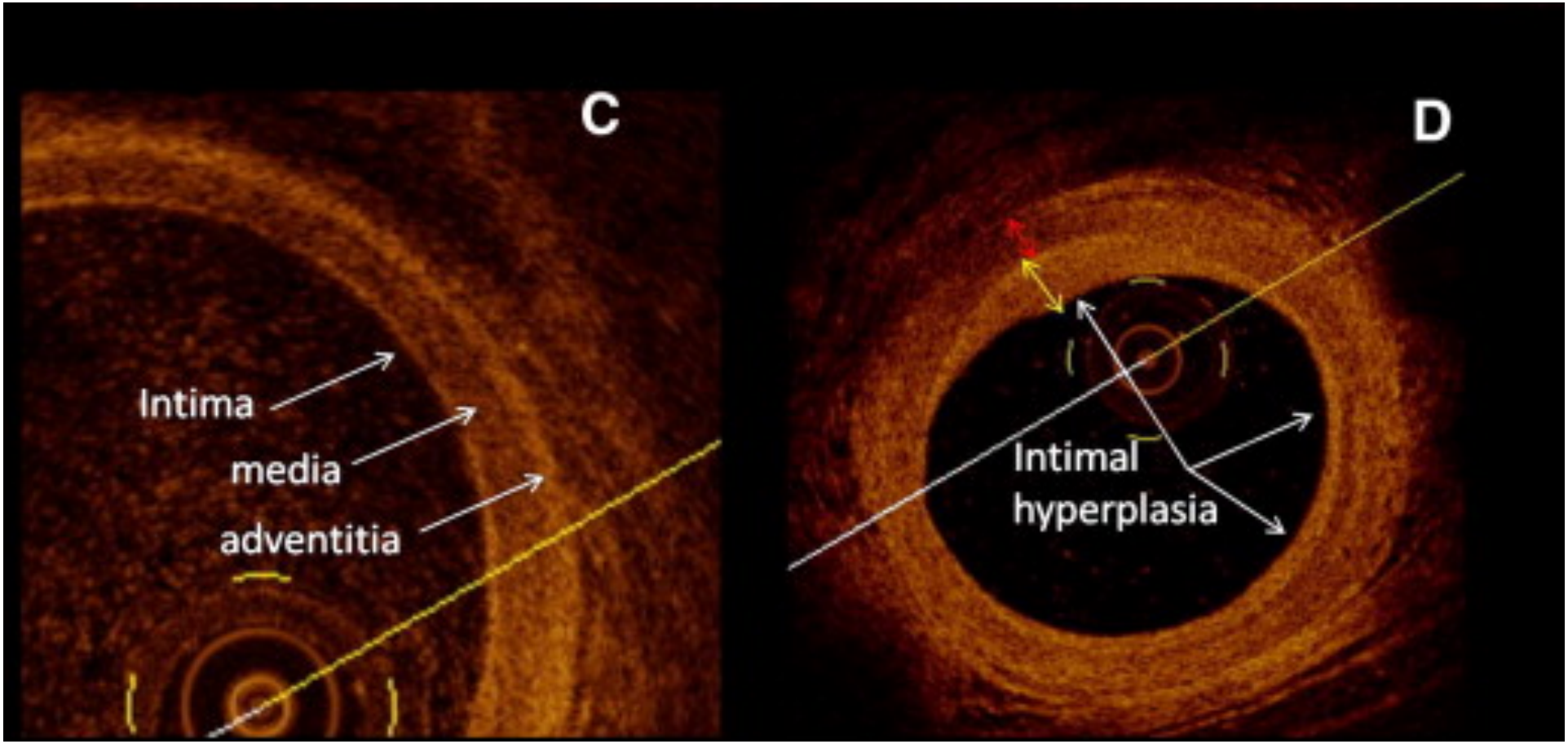
OCT Features



Di Vito L, Porto I. et al. Int J Cardiol 2013

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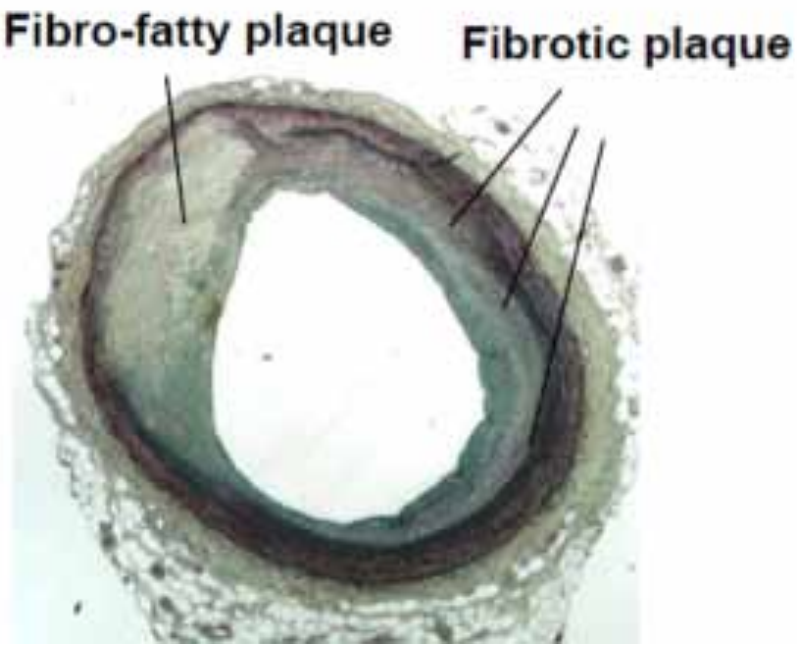
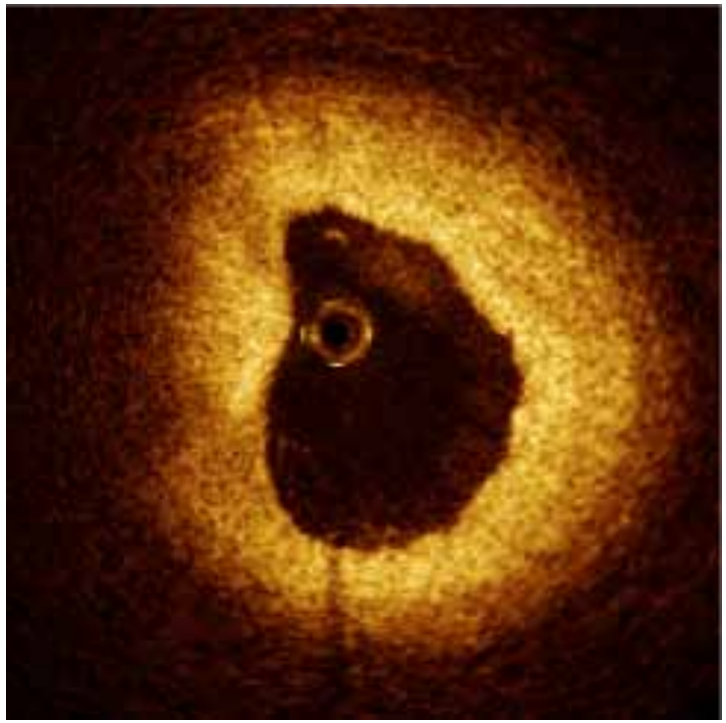
OCT Features



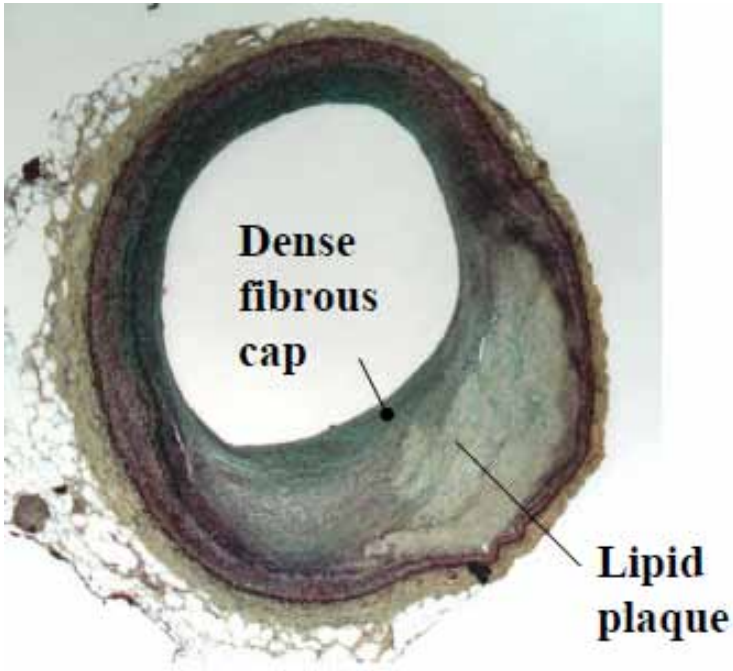


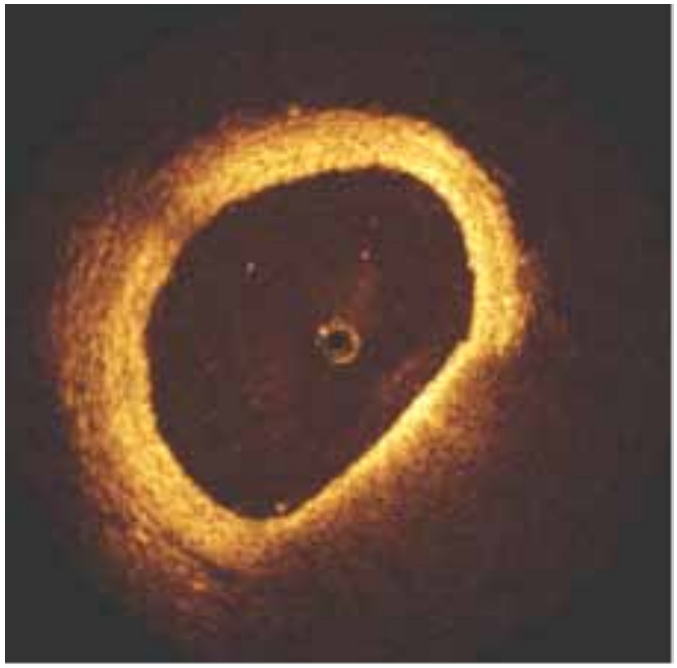
Fibrous plaques

1. Signal intensity (backscatter) is high
2. Attenuation slope is low
3. Sharpness of edges depends on adjacent tissue
4. Standard deviation is low: homogenous texture

Kume et al., Am Heart J 2006

OCT Features





Lipid-rich plaque

1. Signal intensity in the top is high, but attenuates very fast
2. Attenuation slope is high
3. Edge is diffuse

Kume et al., Am Heart J 2006