Gemelli

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Imaging intracoronarico:

IVUS & OCT

my tips and tricks

SULLE SPONDE DEL TICINO

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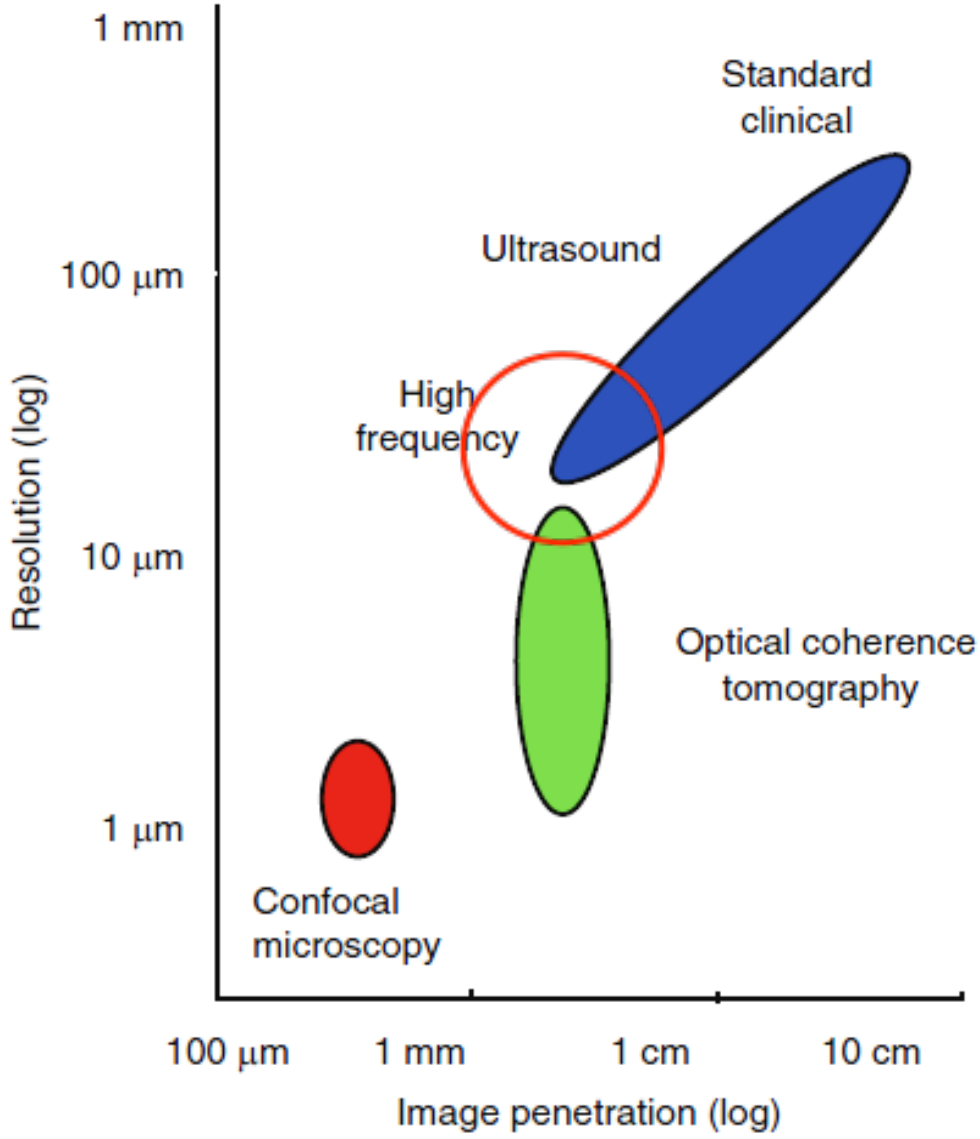
Resolution of current imaging techniques

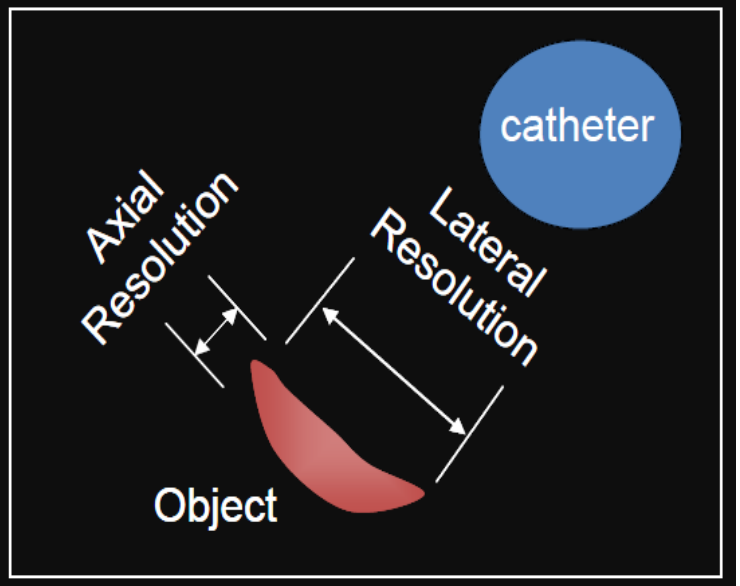


Jang IK (Editor), Cardiovascular OCT Imaging, Springer 2015

IVUS vs. OCT: penetration vs. resolution

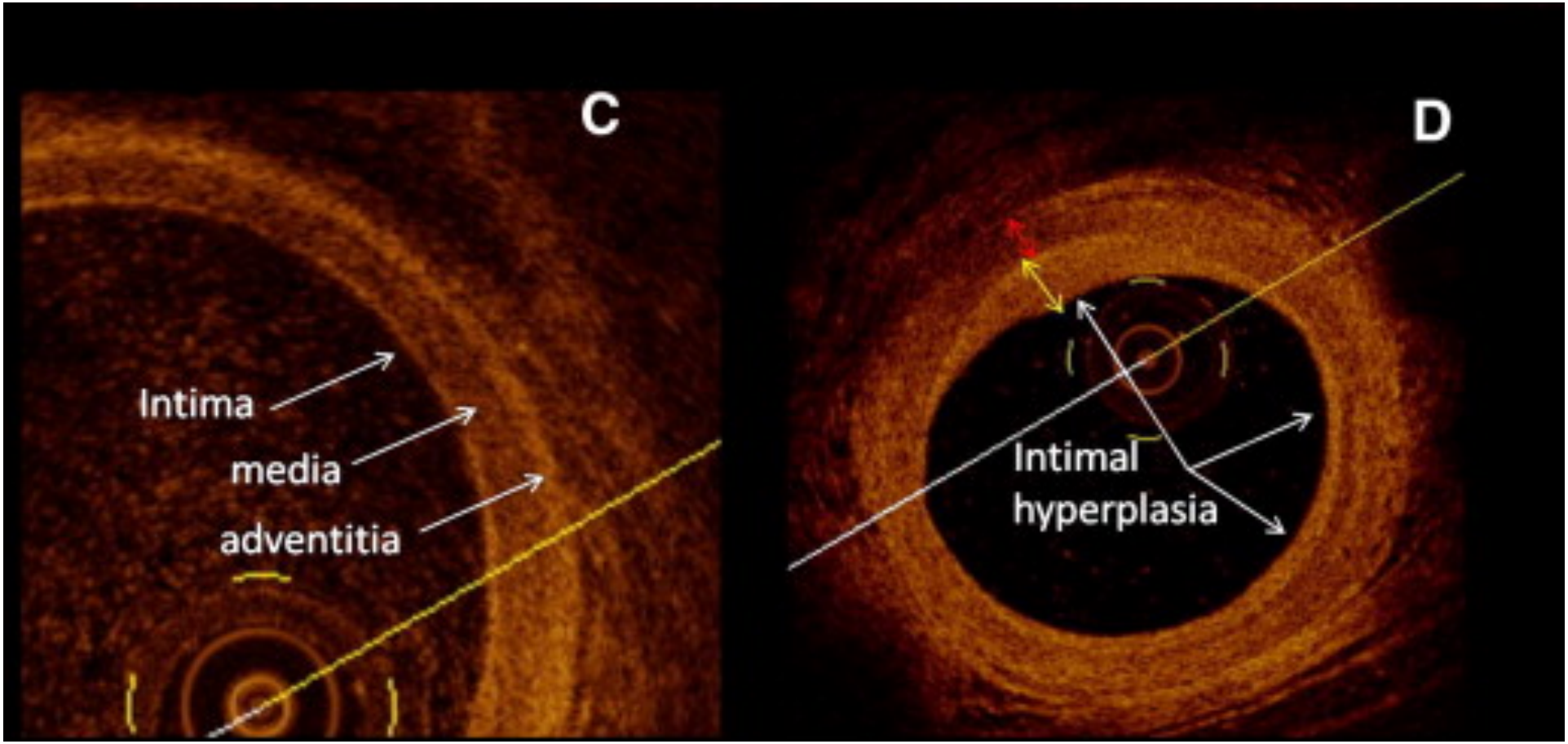
Axial
Measured along the ultrasound beam

Lateral
Measured along the sweep of the IVUS image



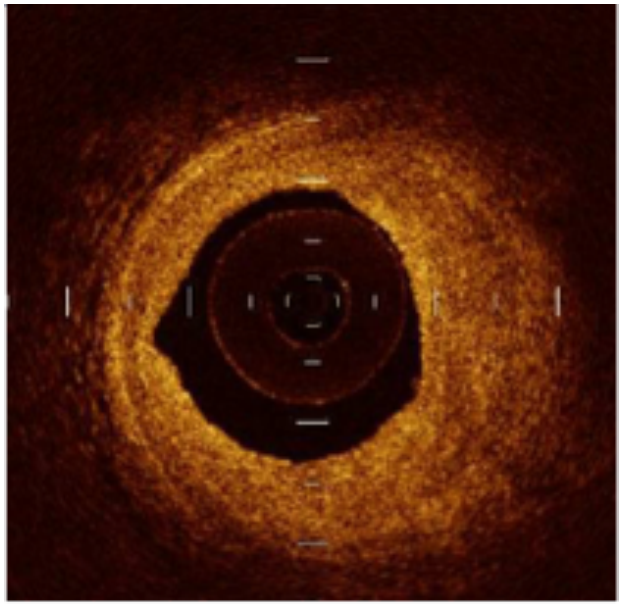
	IVUS	FD-OCT
Size of catheter	3.2-3.5Fr	2.7Fr
Guiding catheter compatibility	5-6Fr (≥0.64”)	6Fr (≥0.64”)
Max frame rate	30fps	100-200fps
Max pullback speed	1 mm/sec	20-40 mm/sec
Wave length	35-80 um	1.3 um
Axial resolution	90-140 um	10-15 um
Lateral resolution	250 um	40-90 um
Tissue penetration	7-10mm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

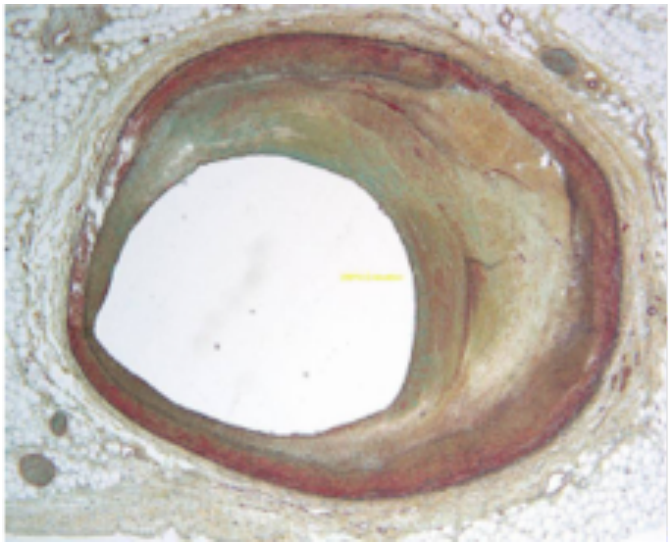
OCT Features



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

OCT Features





OCT signal features

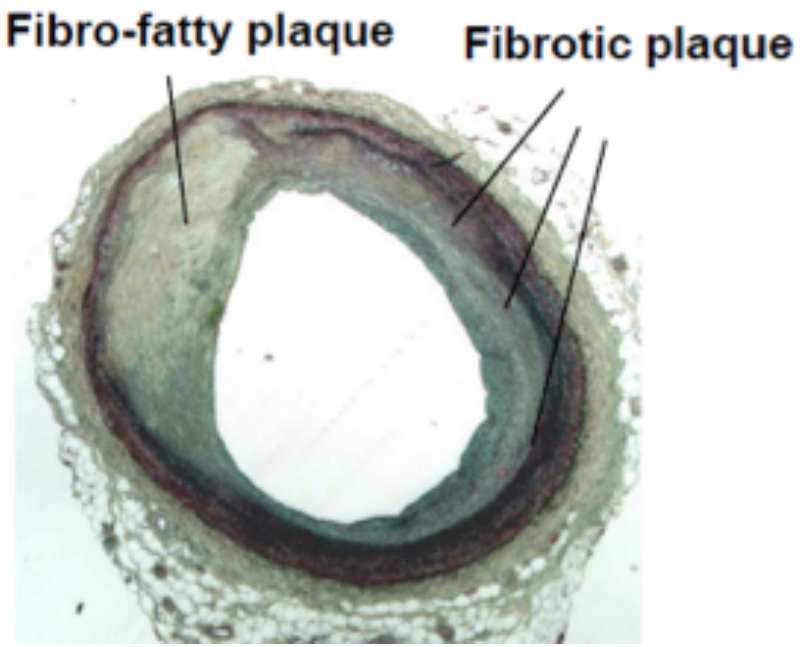
1. **Signal intensity**
2. **Attenuation**
3. **Edge sharpness**
4. **Texture**

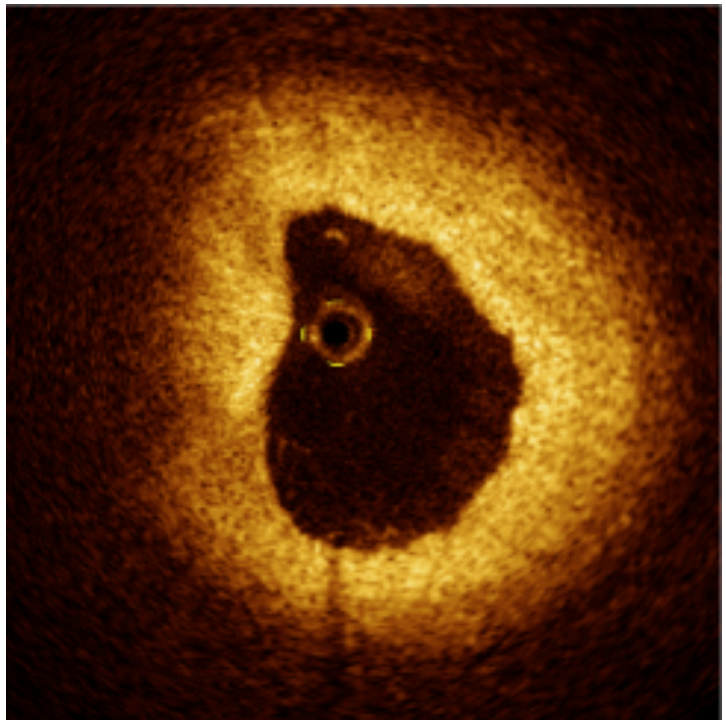
Histology features

1. **Stain colors**
2. **Cellular morphology**

Kume et al., Am Heart J 2006

OCT Features



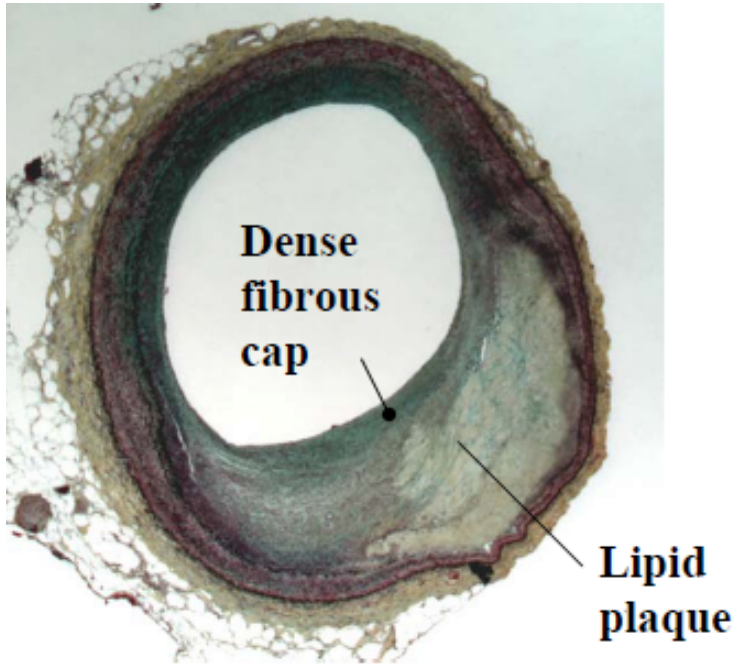


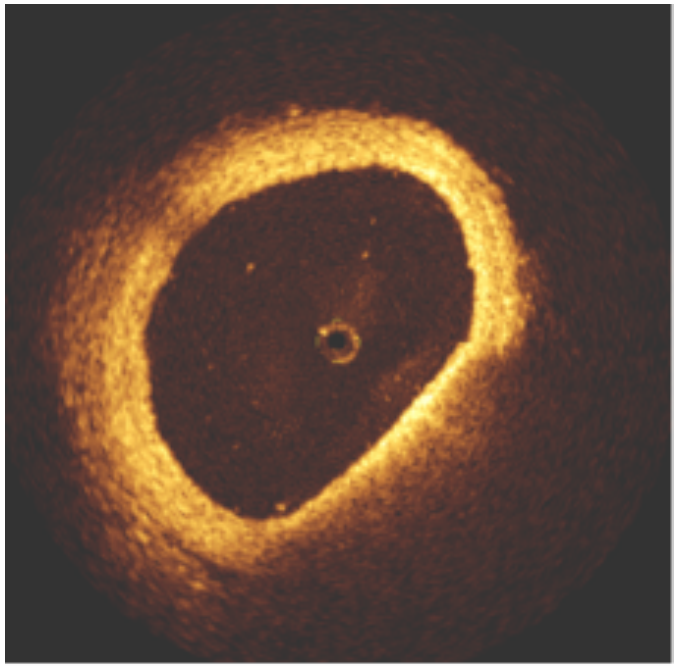
Fibrous plaques

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



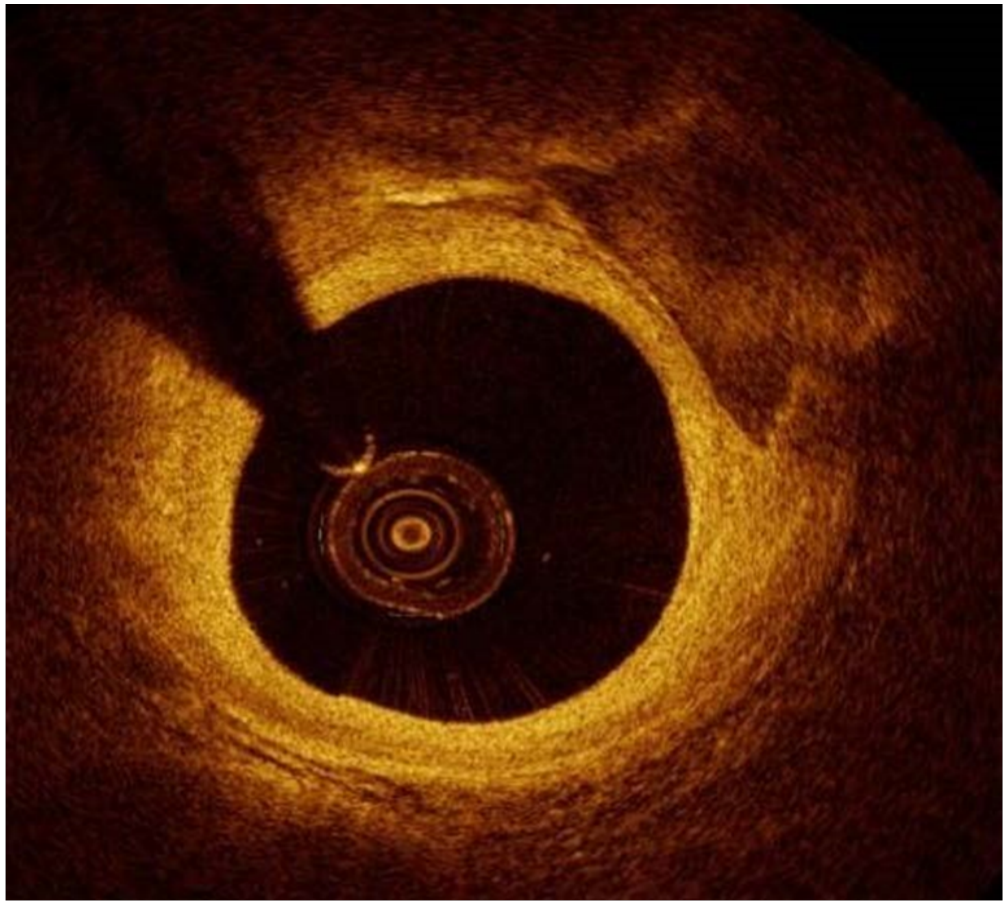


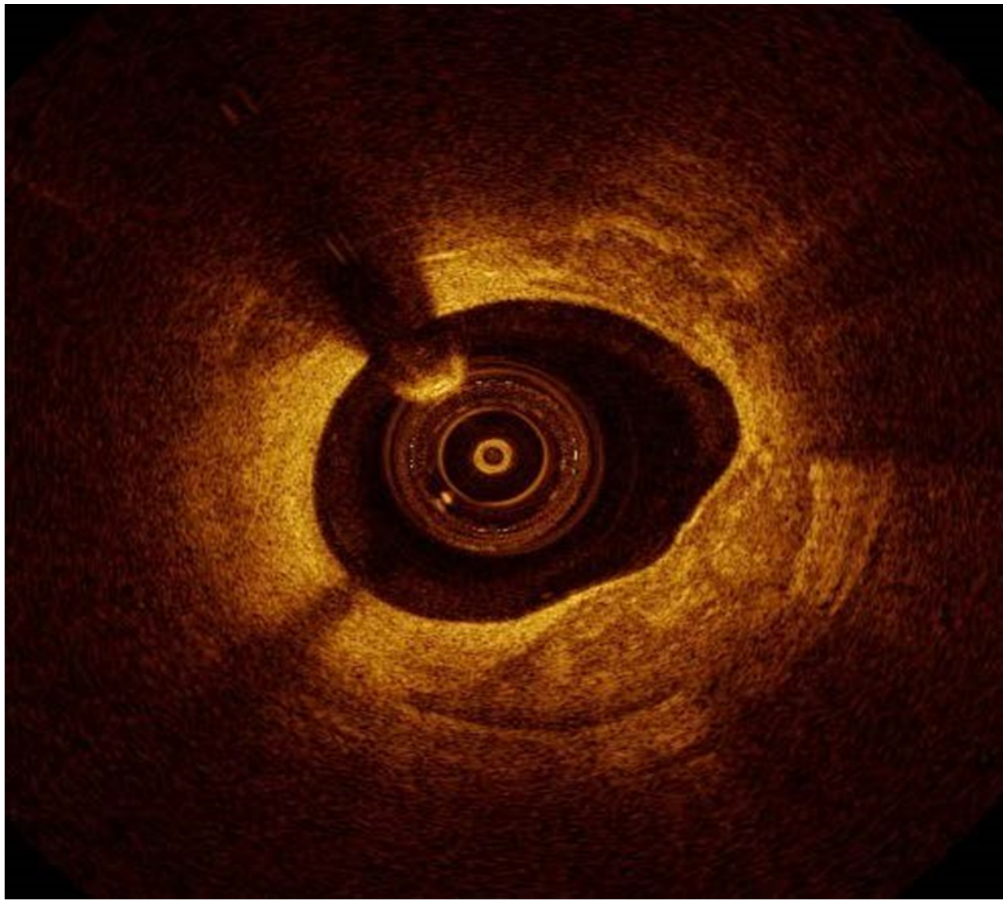
Lipid-rich plaque

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

OCT Features



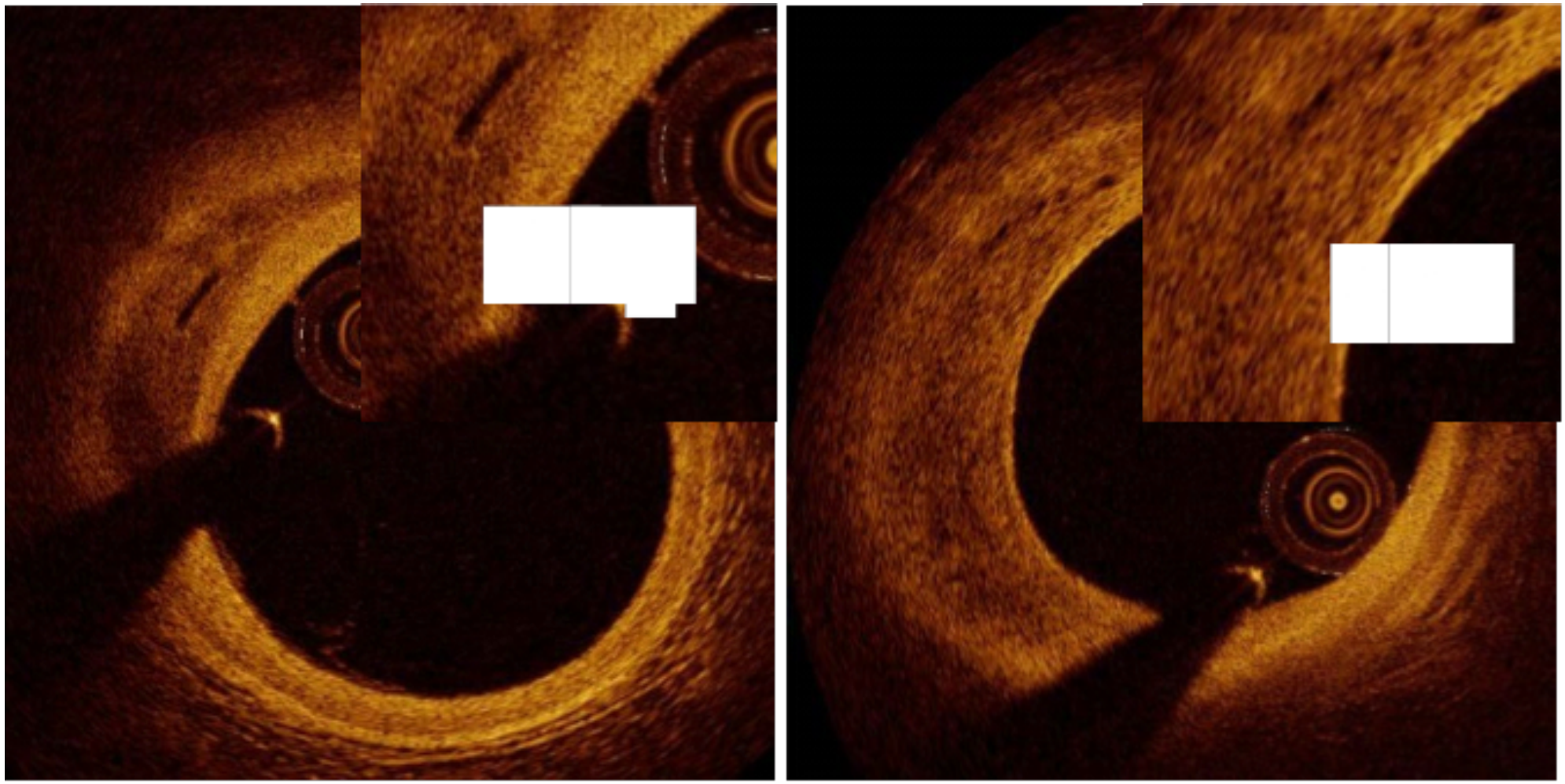


Calcified plaque:

1. Signal intensity is low
2. Attenuation slope is low
3. Edge is sharp

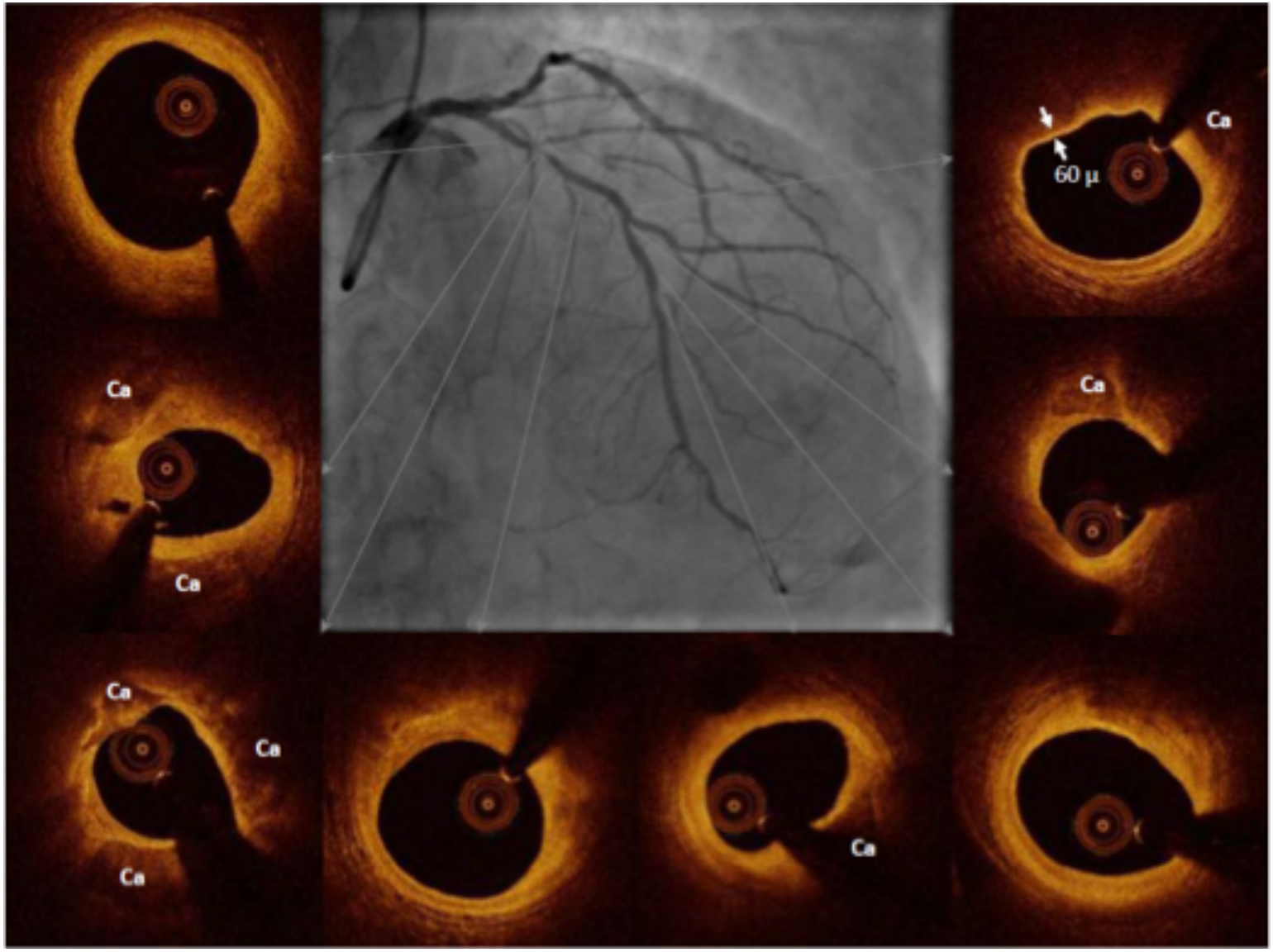
Kume et al., Am Heart J 2006

Fibroatheroma: cap thickness



From G. Guagliumi

OCT pre-PCI: expect variability



From G. Guagliumi