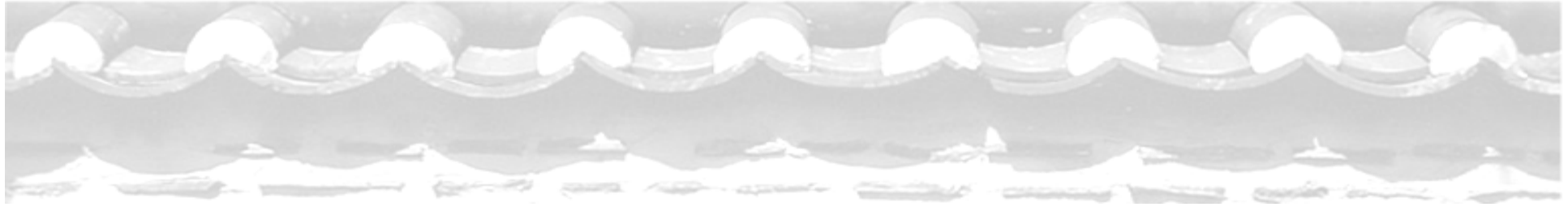




IVUS and Tissue Characterization

Real World Experience

So-Yeon Choi, MD., PhD.
Ajou University School of Medicine
Suwon, Korea



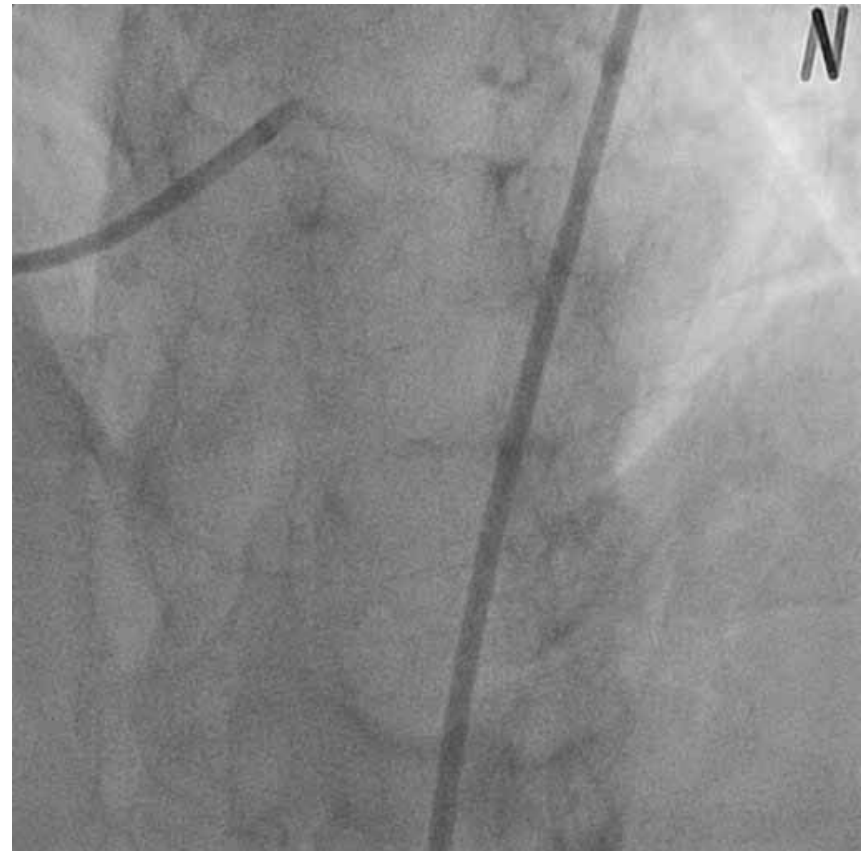
1. Why do we need tissue characterization for coronary plaque?
2. How can we get tissue characterization?
3. What can we do using tissue characterization in cath lab?



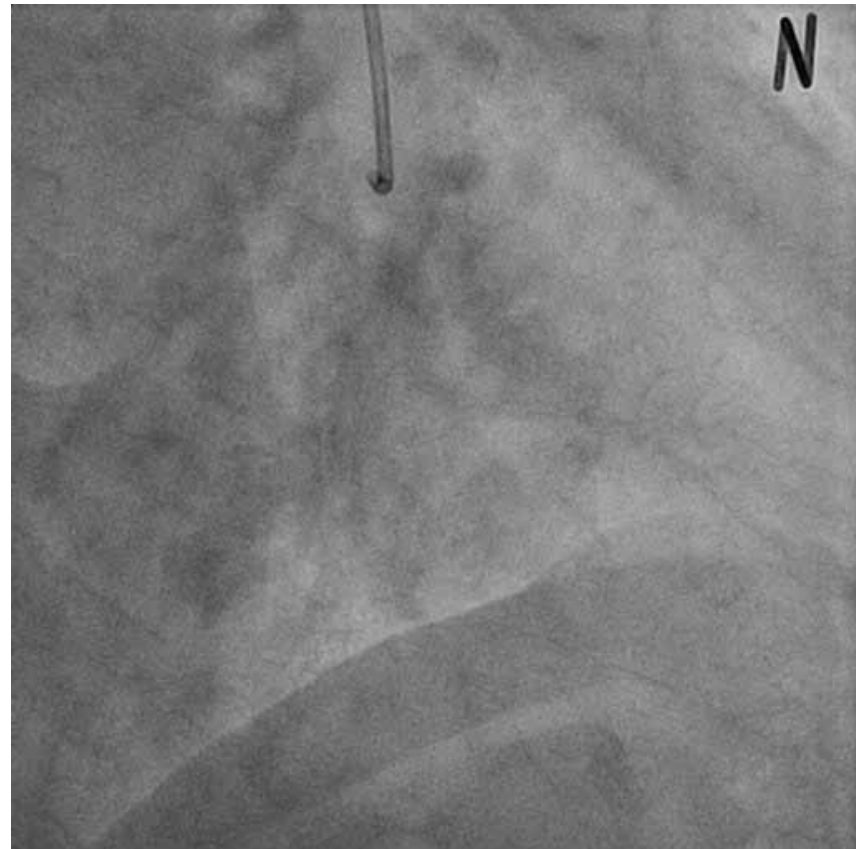
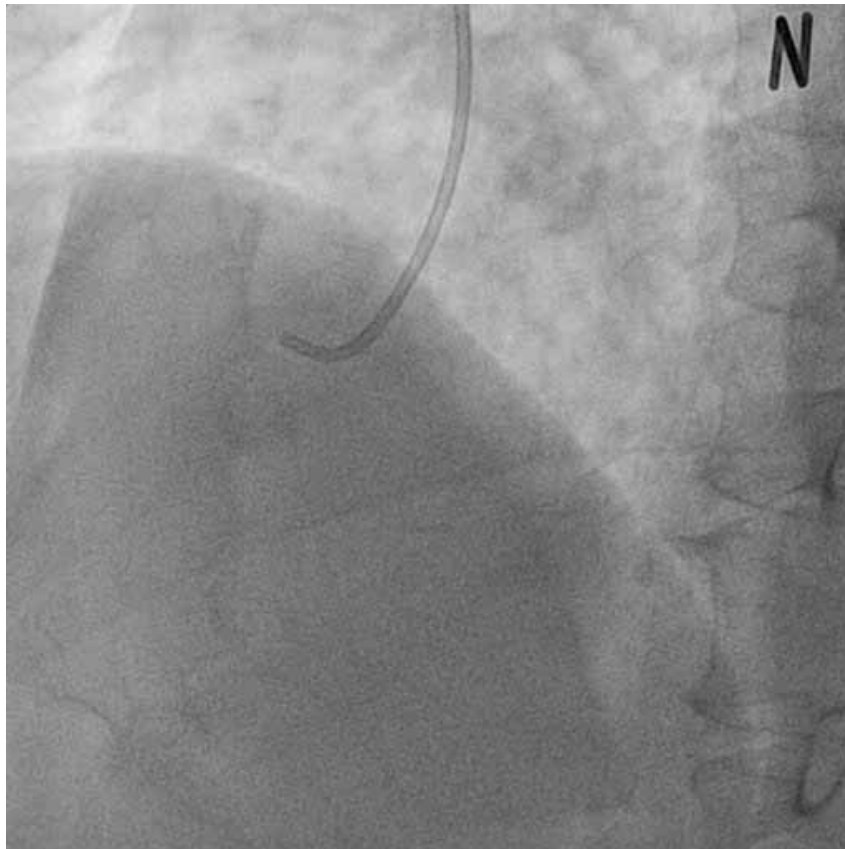
Case

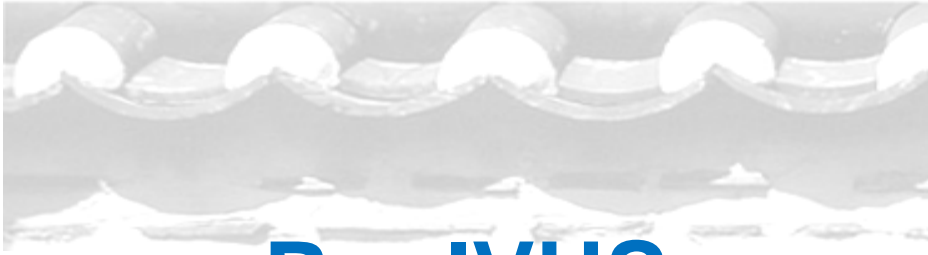
- KCT, M/63
- Chest pain on exertion, stated 1 month ago and aggravated during last 2 weeks
- CV risk factors:
 - HTN for 10 years
 - FHx: elder brother-AMI on his late 40's
- Cardiac enzymes: within normal range
- ECG: no ST/T change
- Echo: EF 65% without RWMA

Baseline coronary angiogram



Baseline coronary angiogram

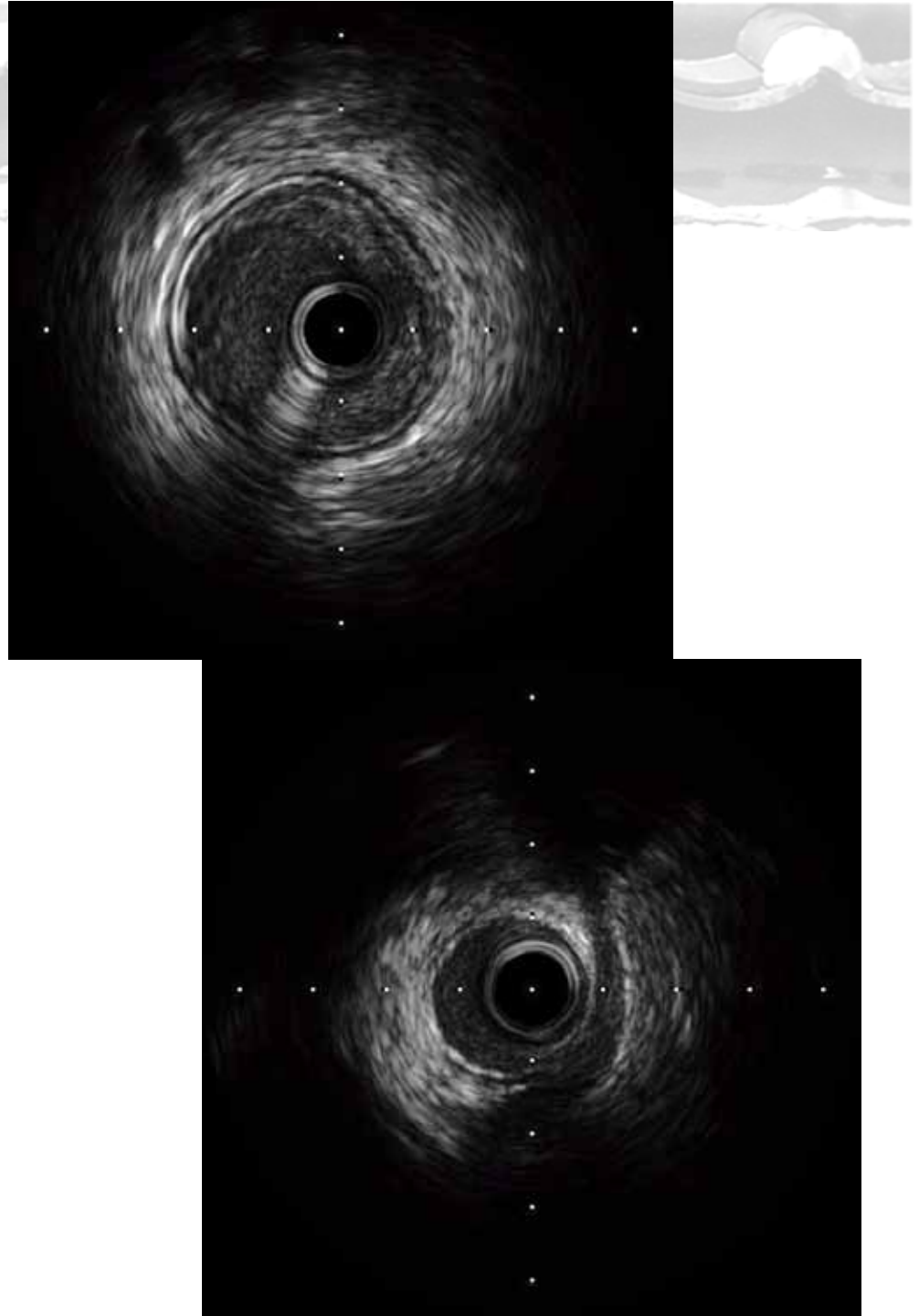


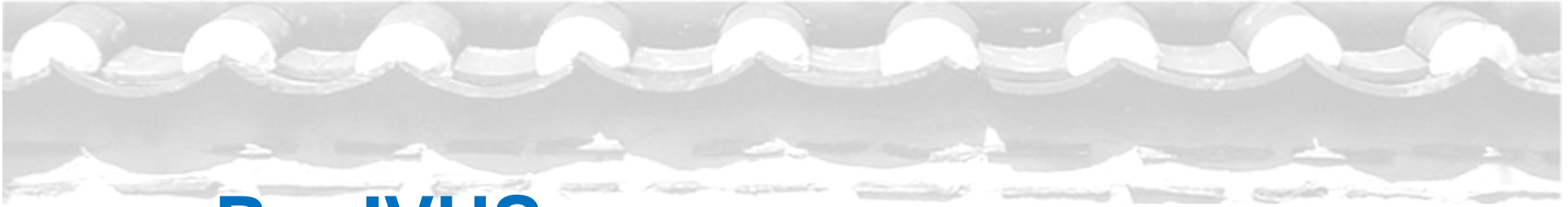


Pre IVUS



LAD

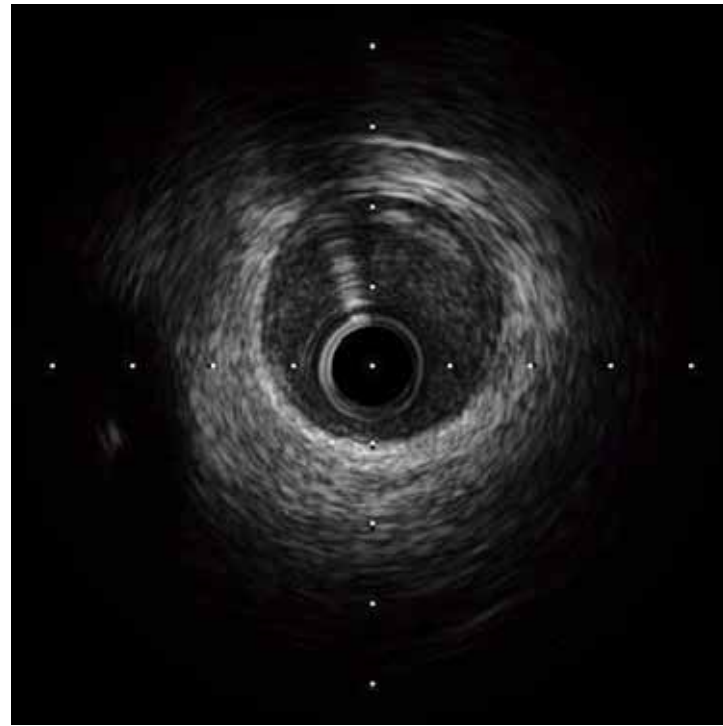


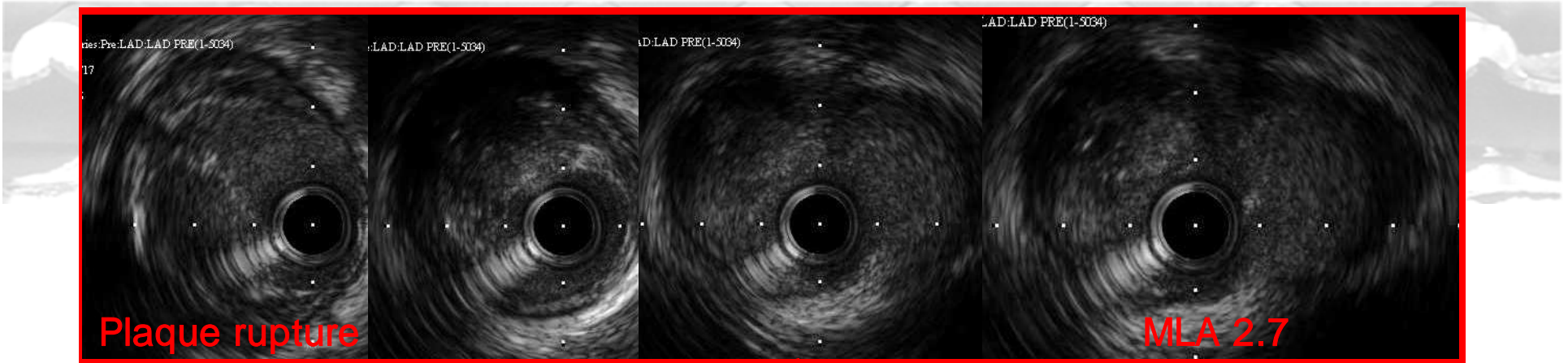


Pre IVUS

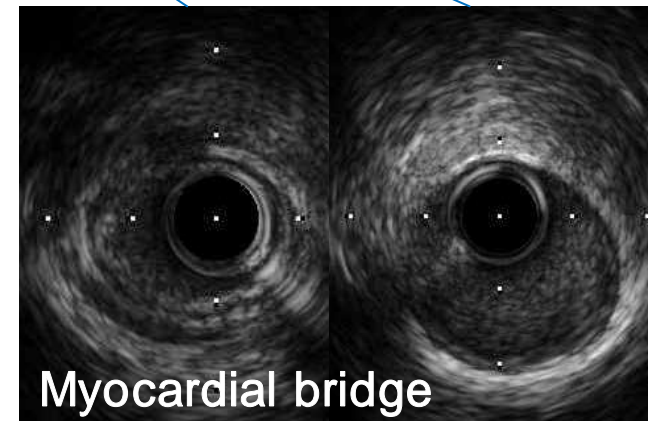
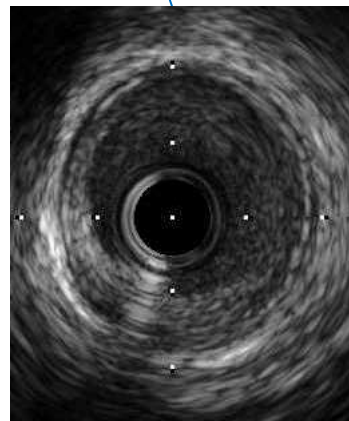
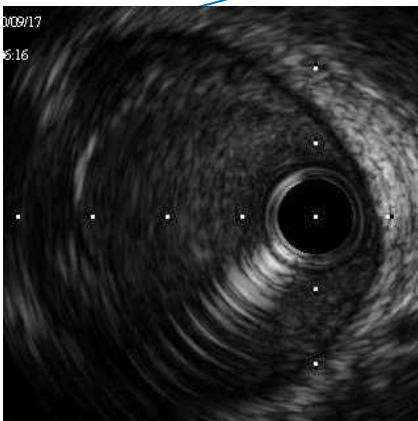
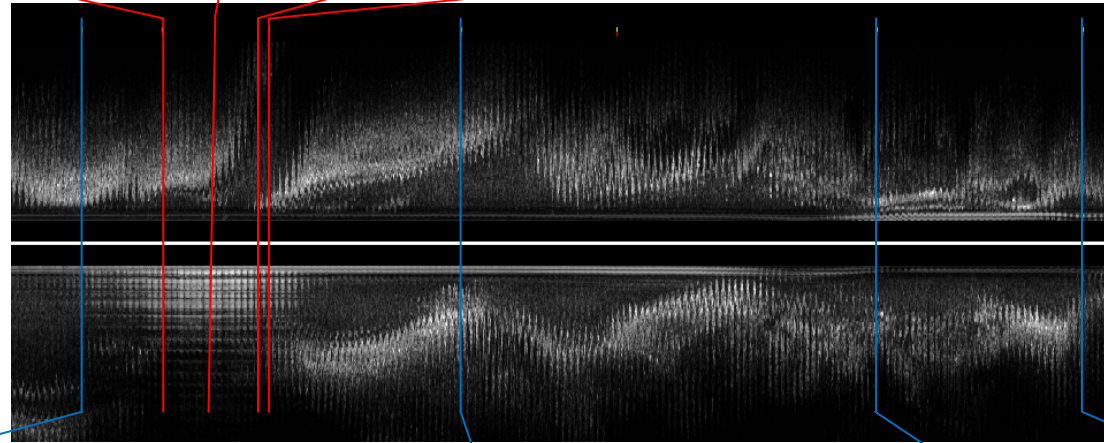


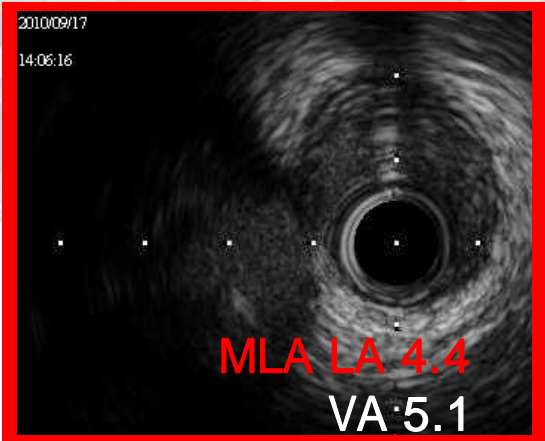
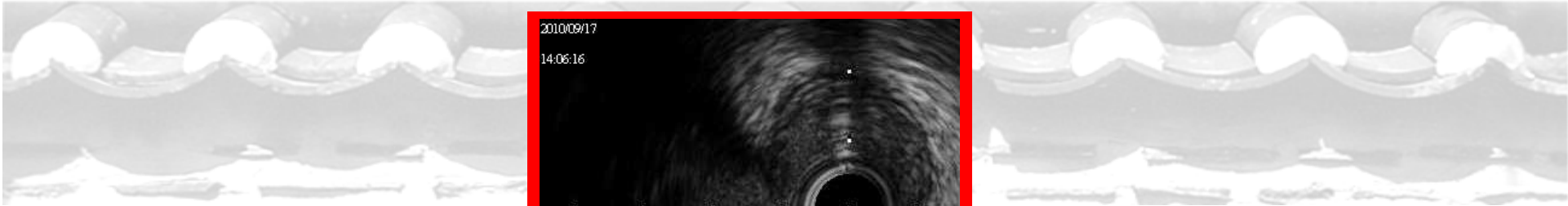
Diagonal



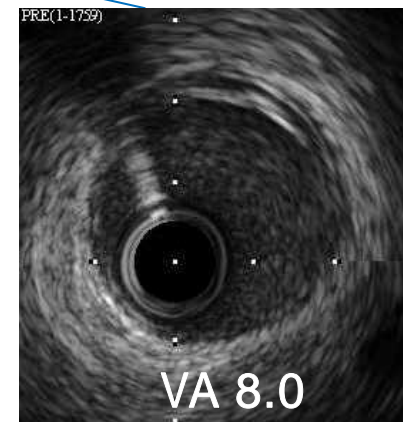
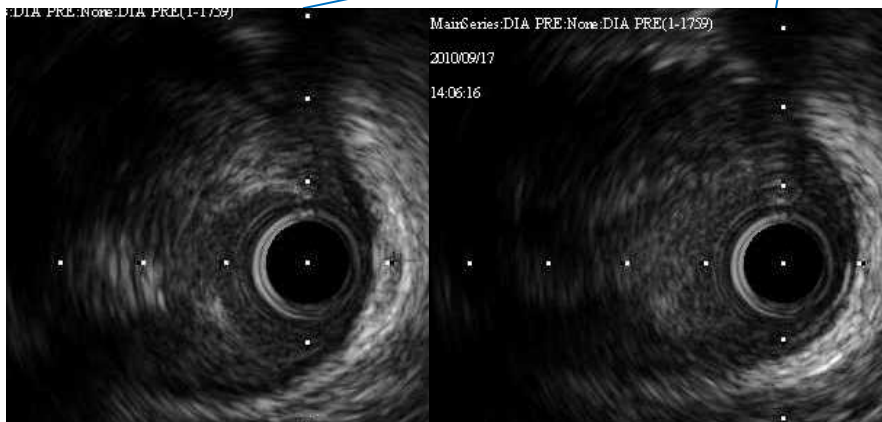
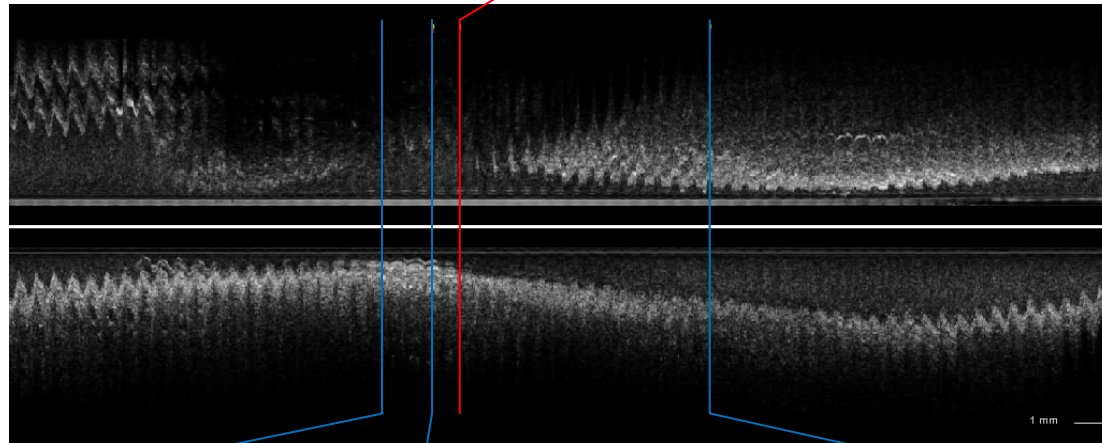


Pre LAD





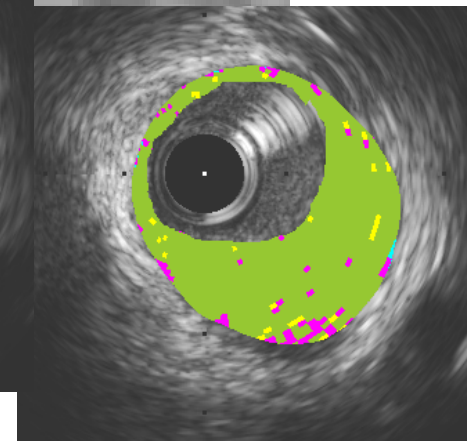
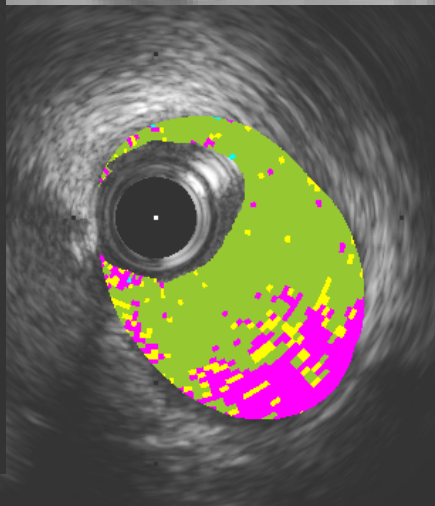
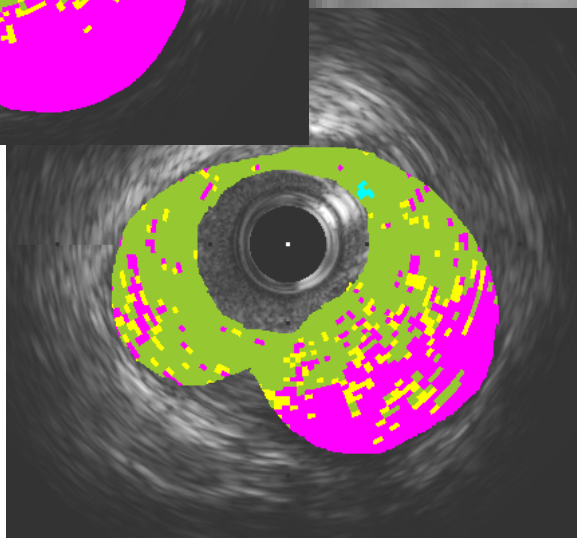
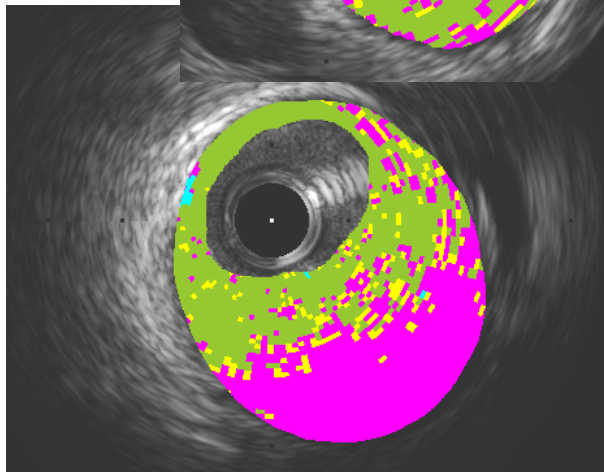
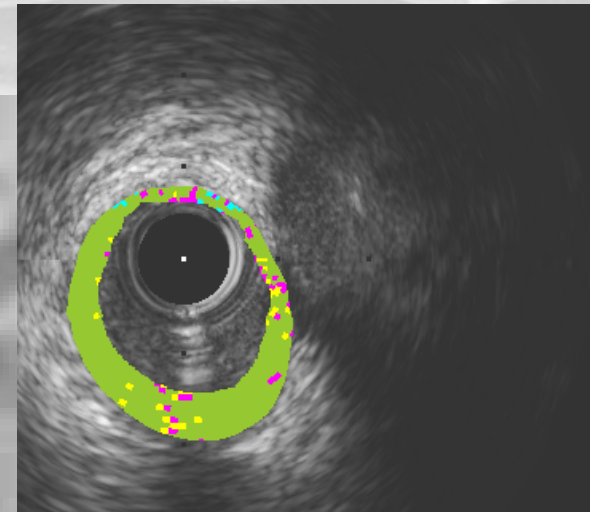
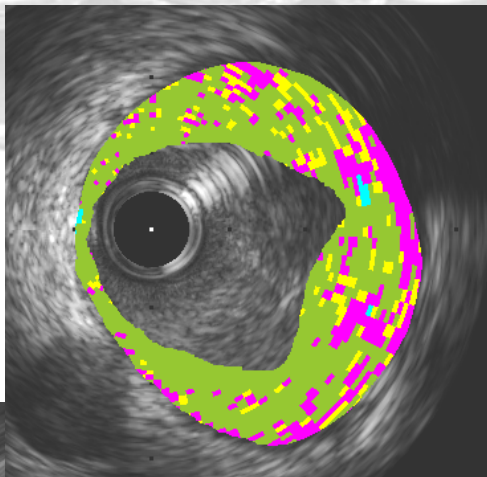
Pre
Diagonal



Pre LAD

Pre iMAP

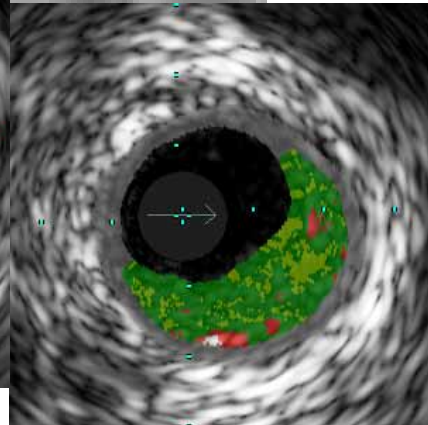
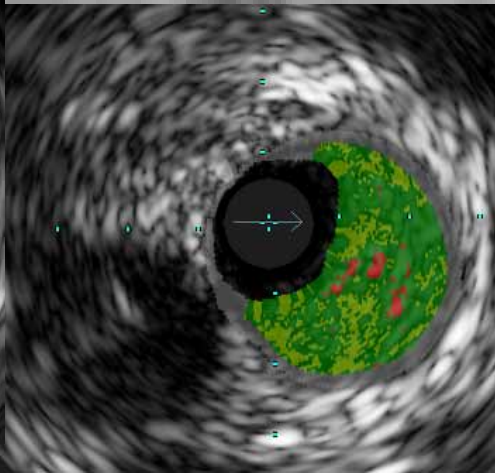
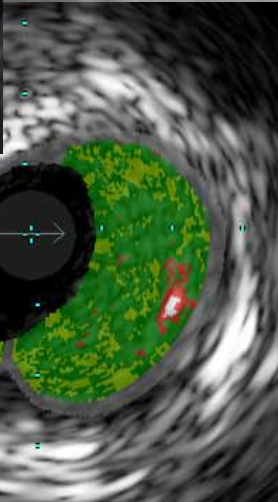
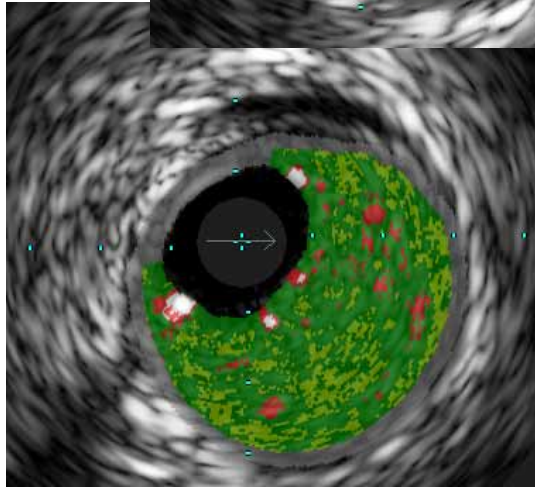
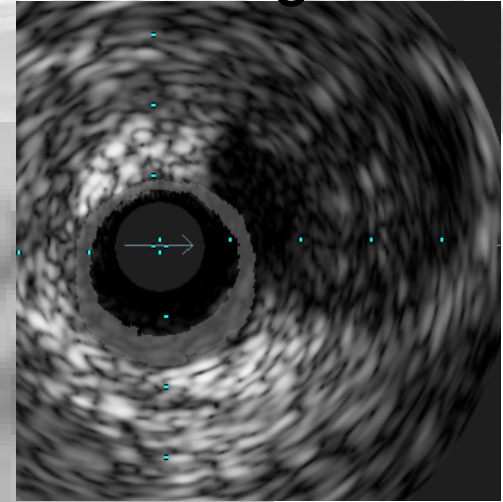
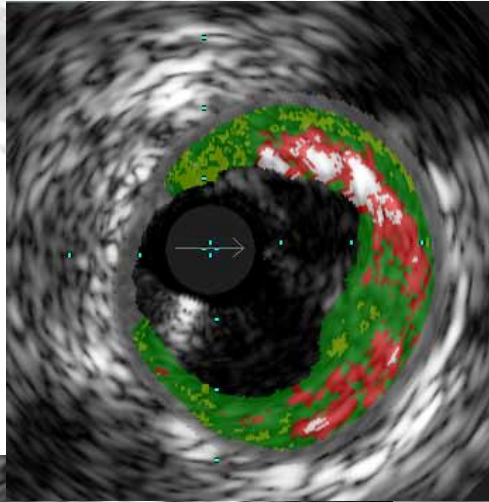
Pre diagonal



Pre LAD

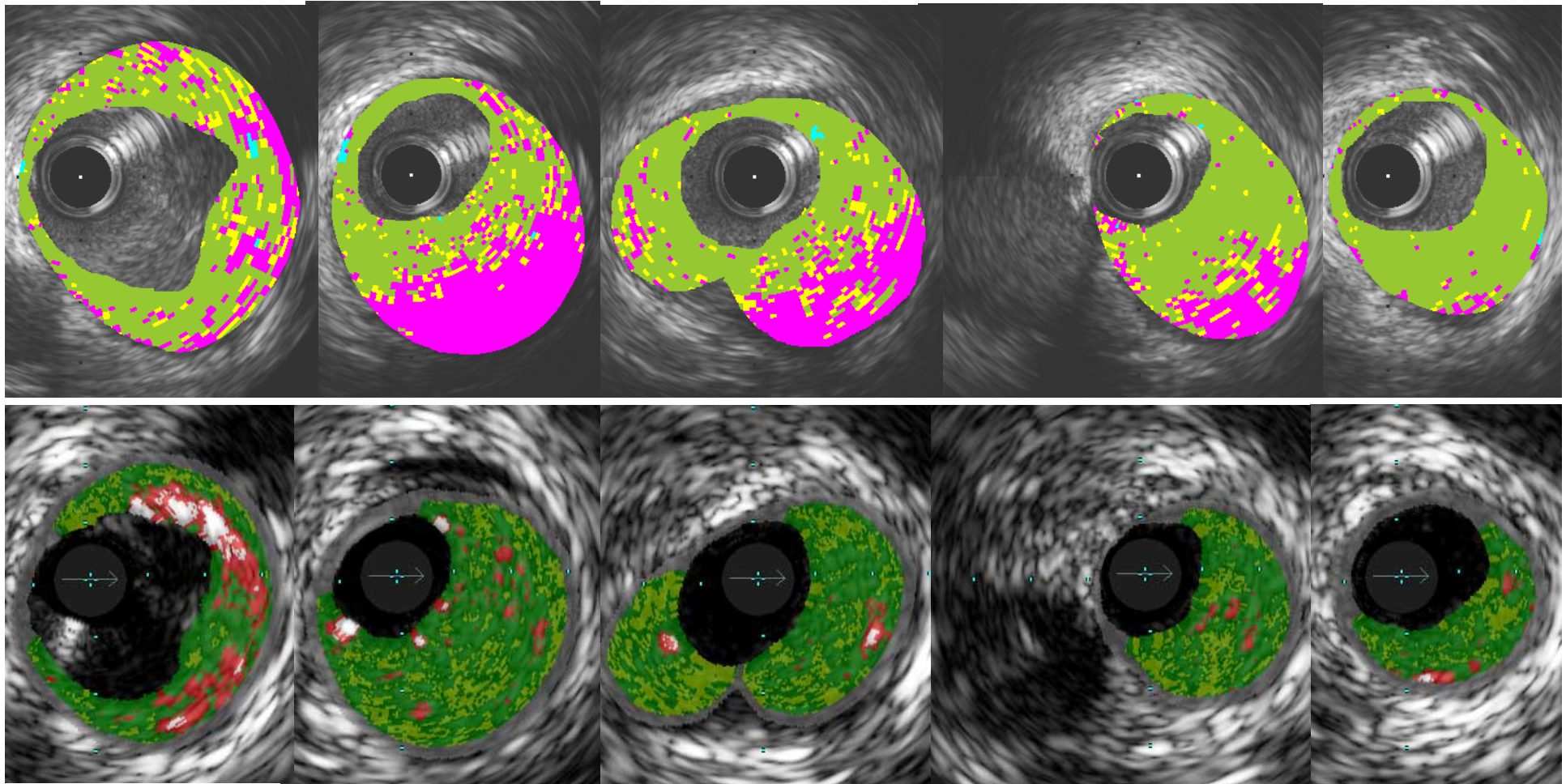
Pre VH-IVUS

Pre diagonal



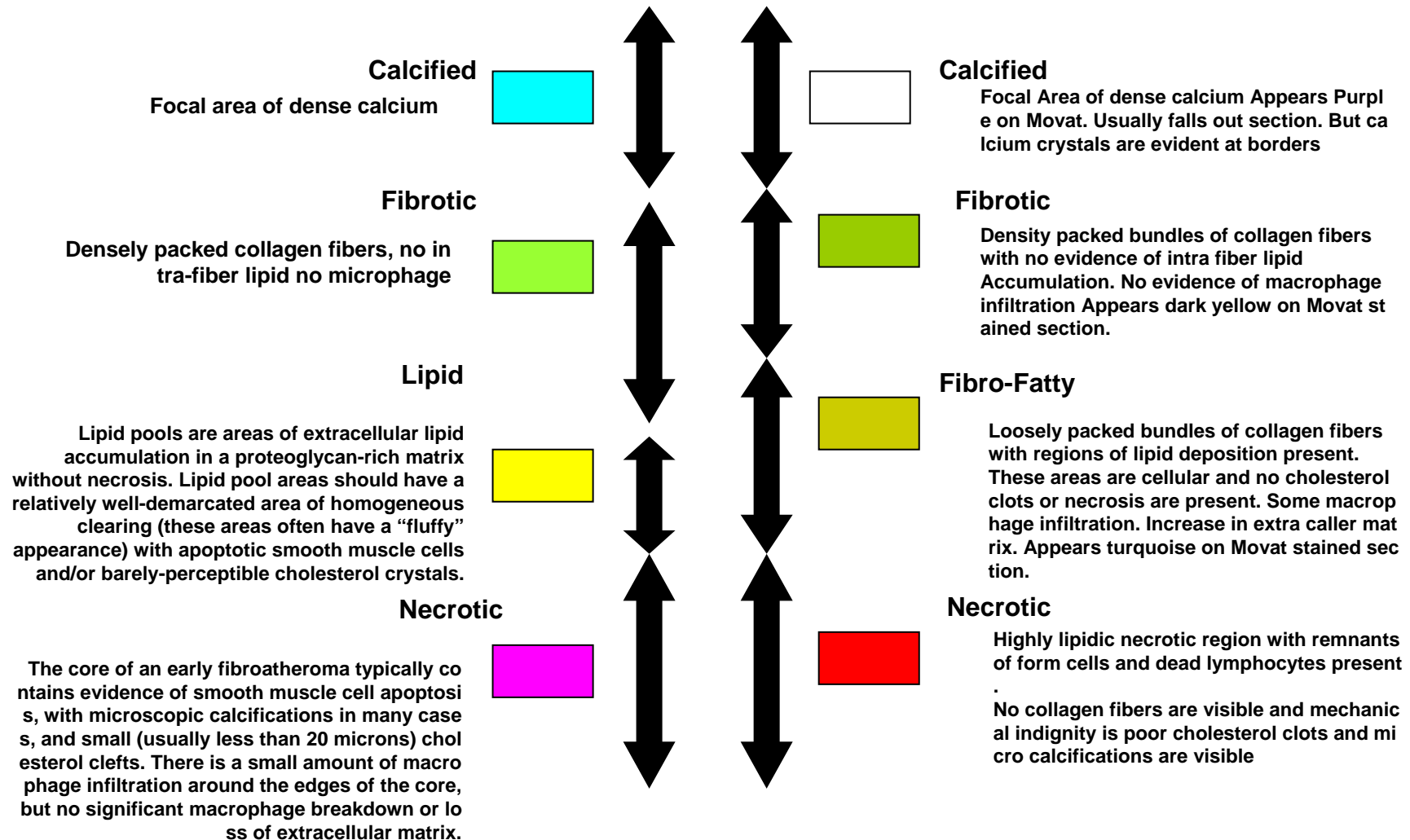
Comparison VH-IVUS vs. iMAP

Pre LAD

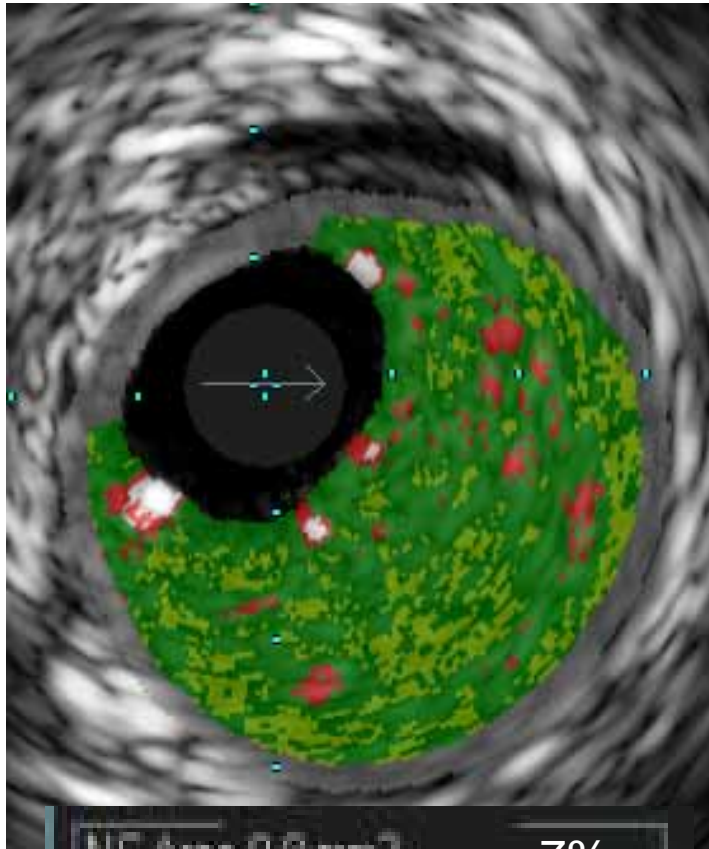


iMap™ Algorithm

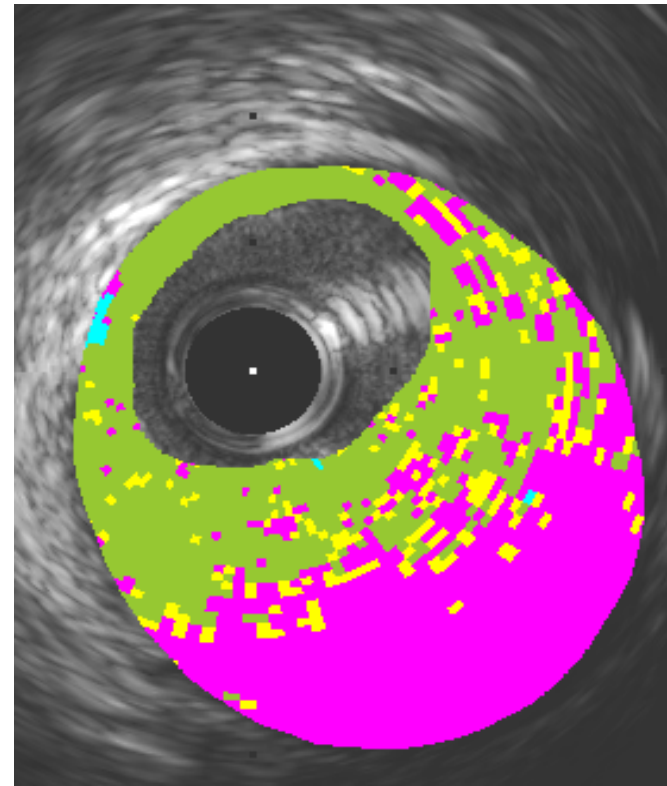
Tissue Type Definitions vs. VH







Comparison VH-IVUS vs. iMAP

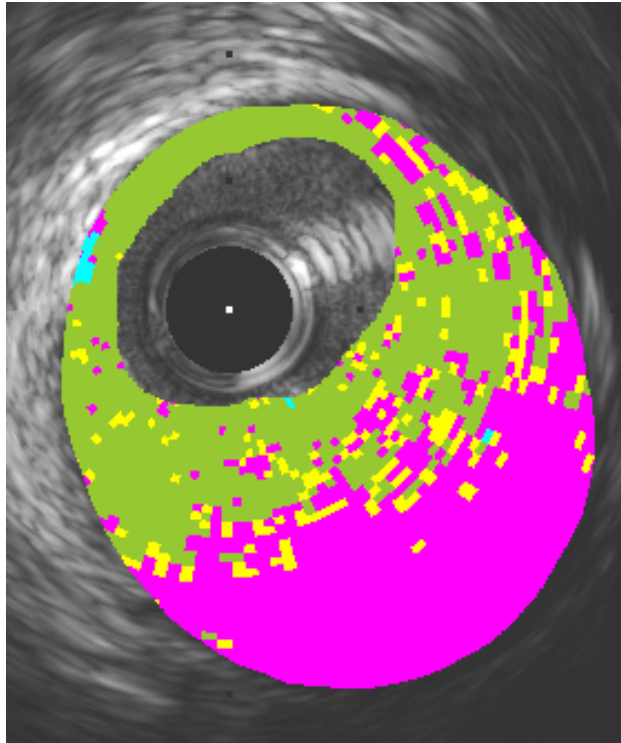






NC Area	0.8 mm ²	7%
FF Area	2.5 mm ²	22%
FI Area	7.7 mm ²	69%
DC Area	0.2 mm ²	2%

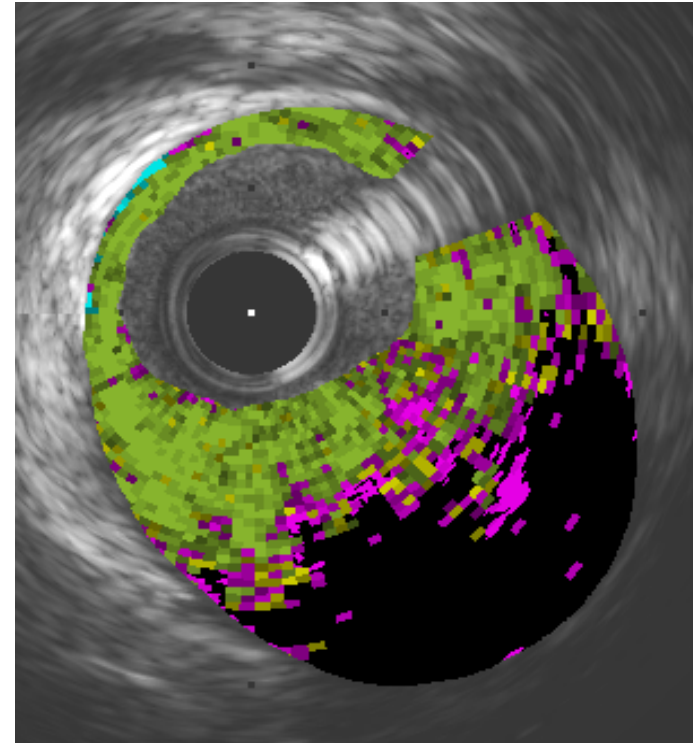




	Area mm ²	Percentage	Confidence
 Fibrotic	0.05	43%	76%
 Lipidic	0.01	6%	57%
 Necrotic	0.06	48%	89%
 Calcified	0.00	0%	77%

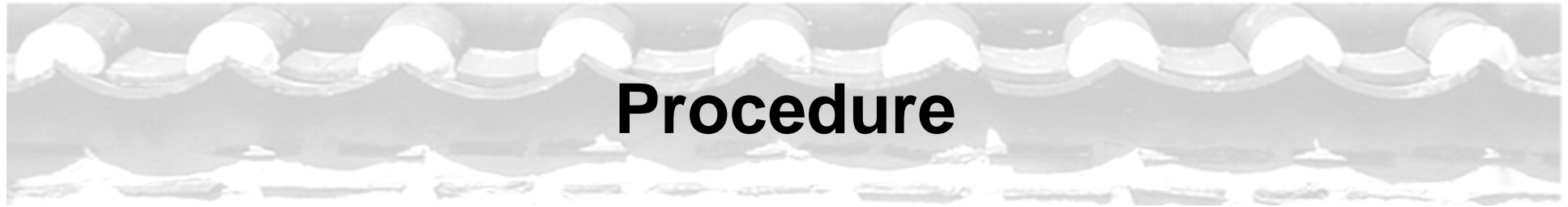
Comparison VH-IVUS vs. iMAP



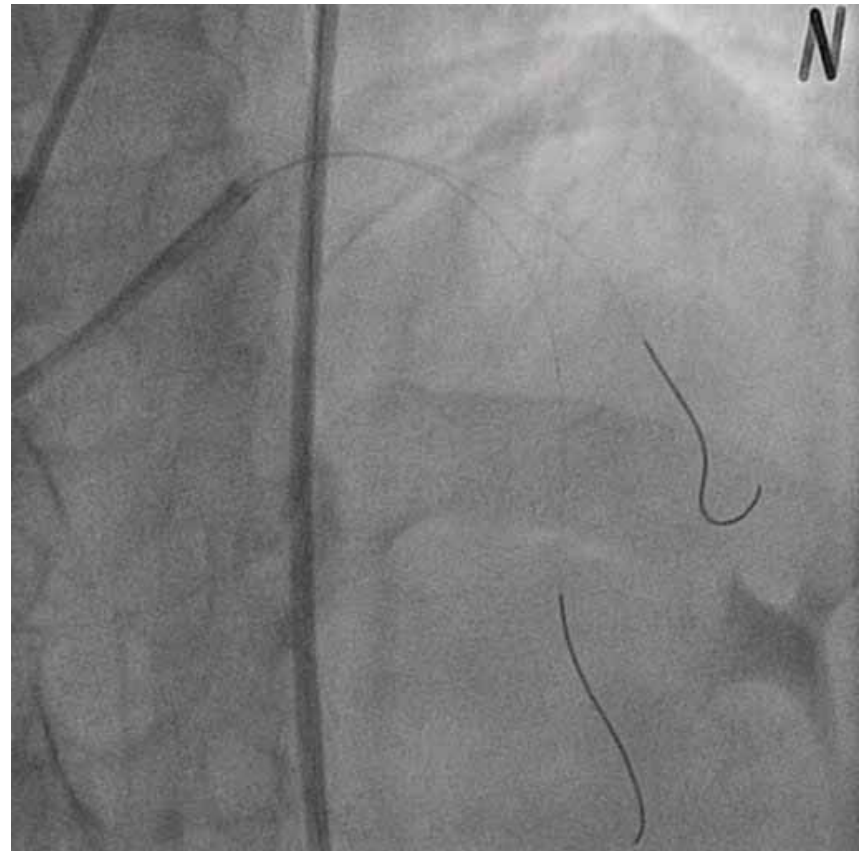
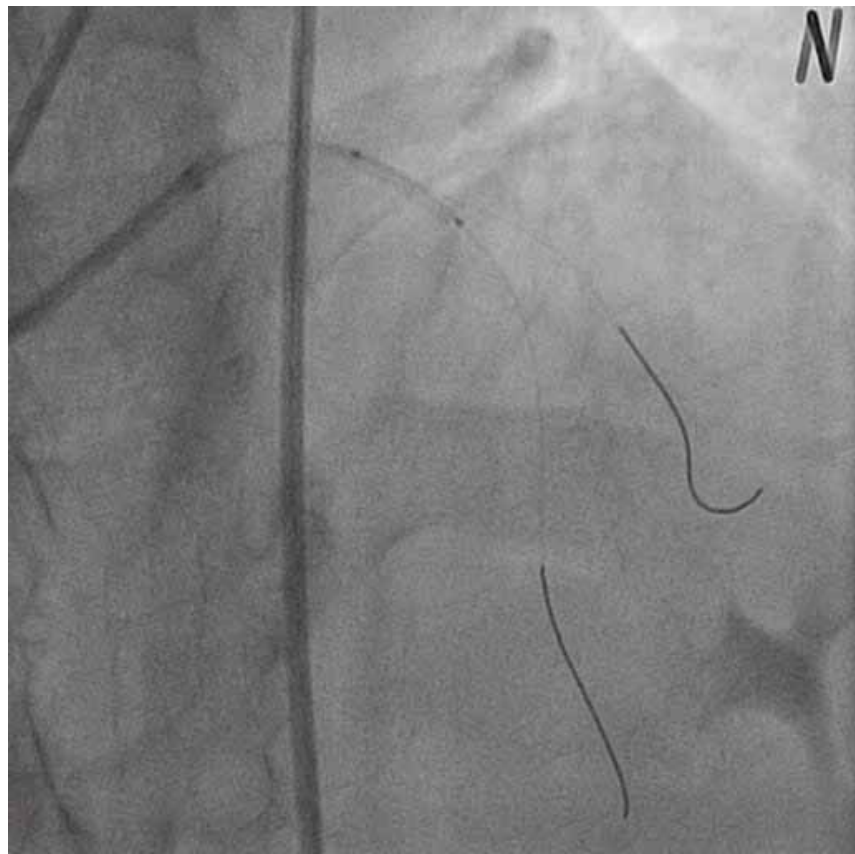
	Area mm2	Percentage	Confidence
 Fibrotic	0,05	43%	76%
 Lipidic	0,01	6%	57%
 Necrotic	0,06	48%	89%
 Calcified	0,00	0%	77%



	Area mm2	Percentage	Confidence
 Fibrotic	0,05	39%	77%
 Lipidic	0,01	6%	57%
 Necrotic	0,01	12%	66%
 Calcified	0,00	0%	77%
 Unknown	0,04	35%	
 Masked	0,01	4%	

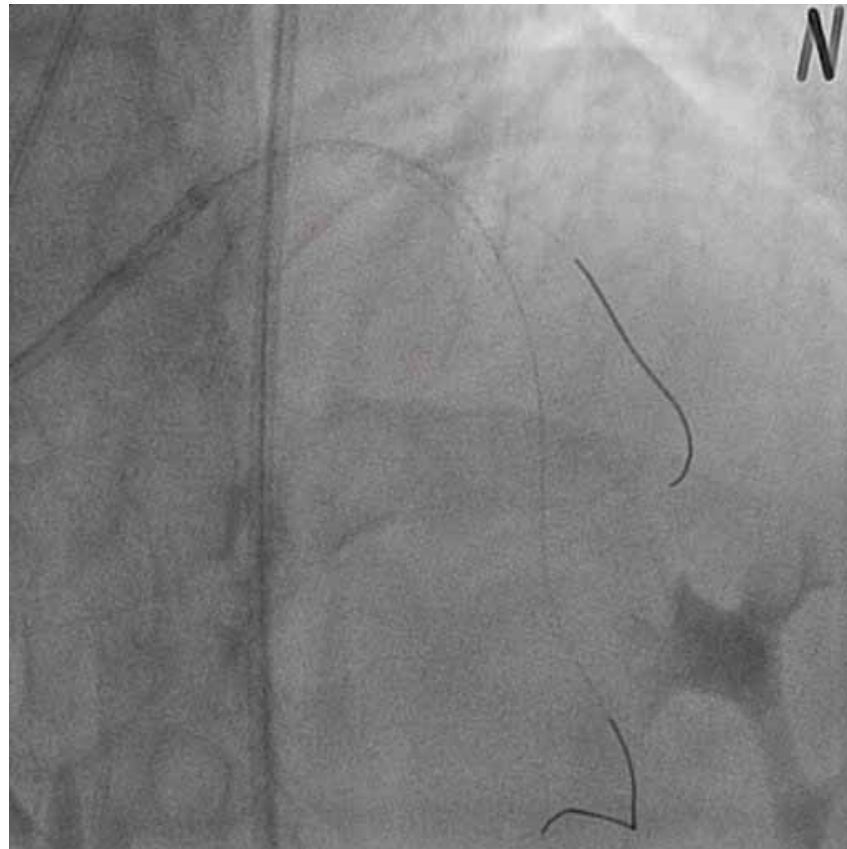


Procedure

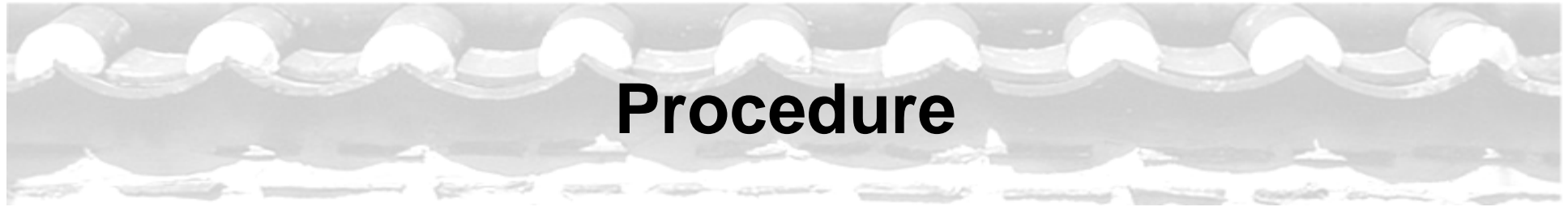


Predilatation with Lacrosse 2.5/15mm, 12atm

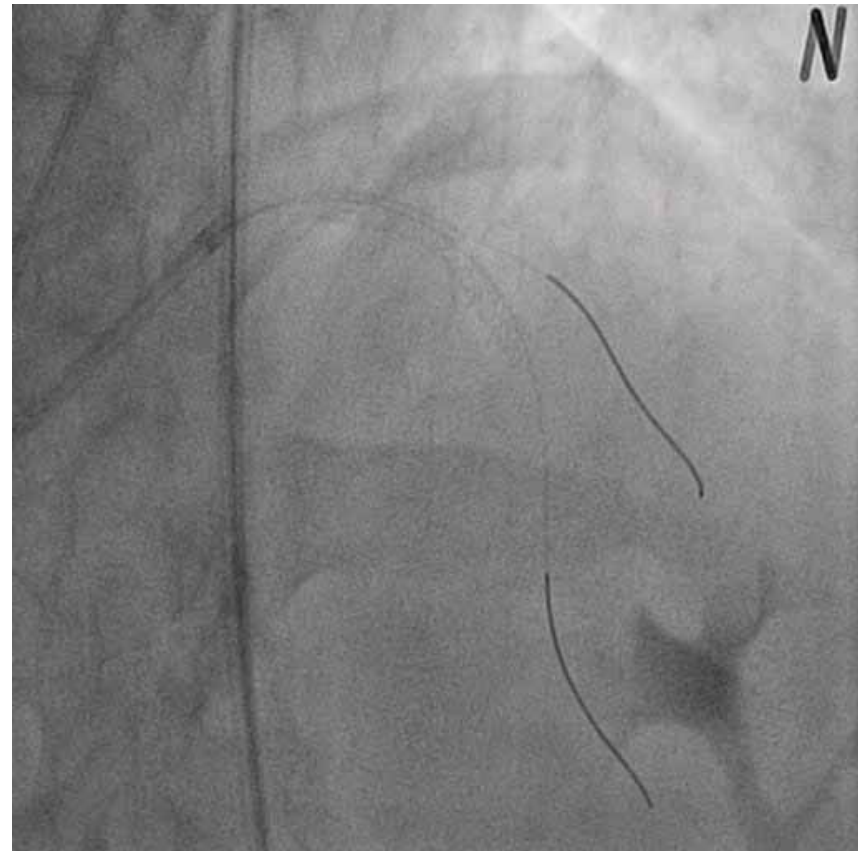
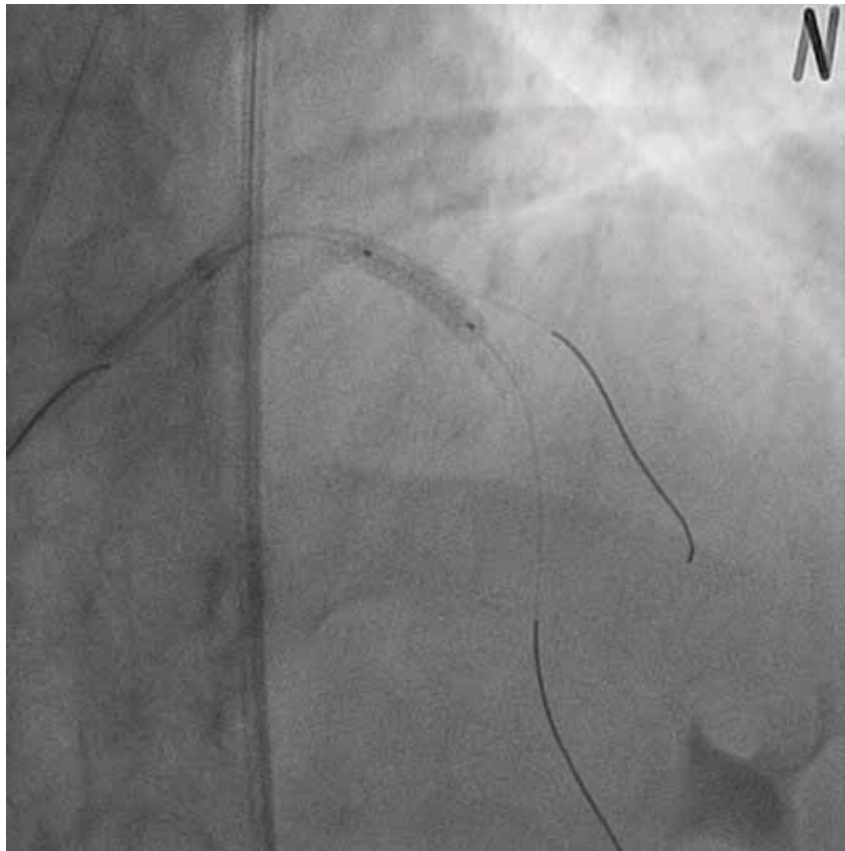
Procedure



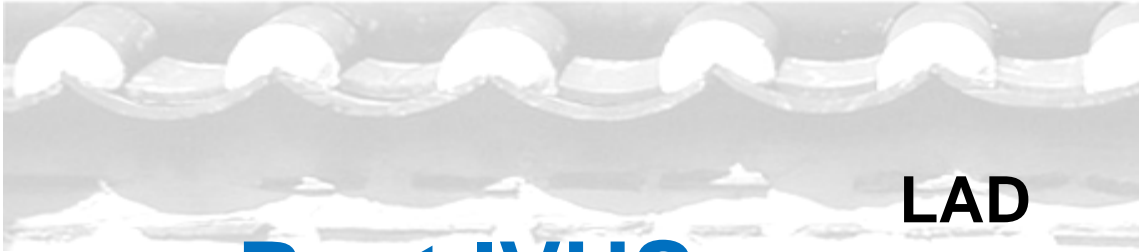
Promus element 3.5/28mm, 8atm



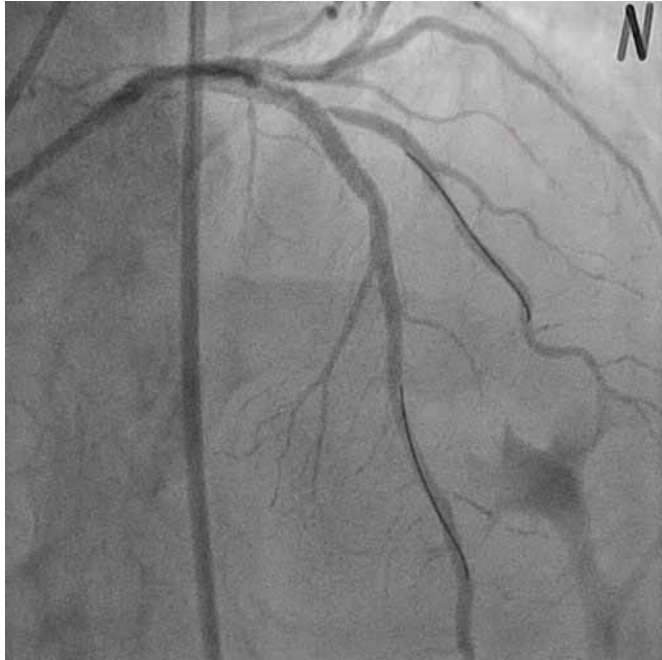
Procedure



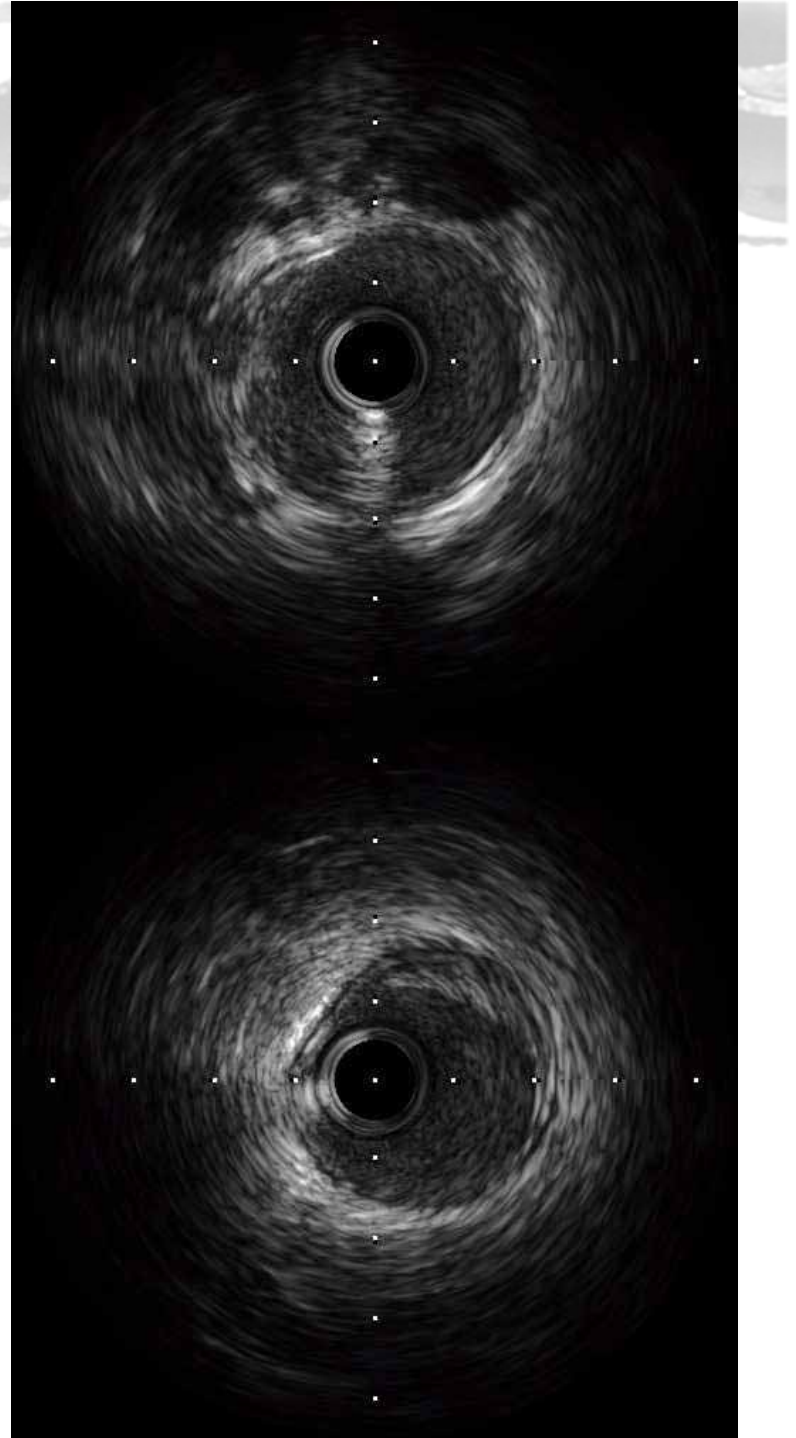
HP with Lacrosse 3.5/15mm, 20atm

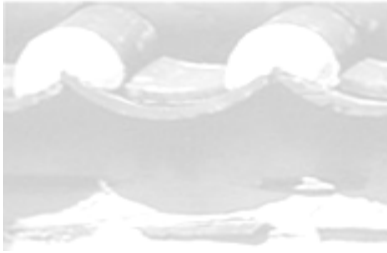


Post IVUS

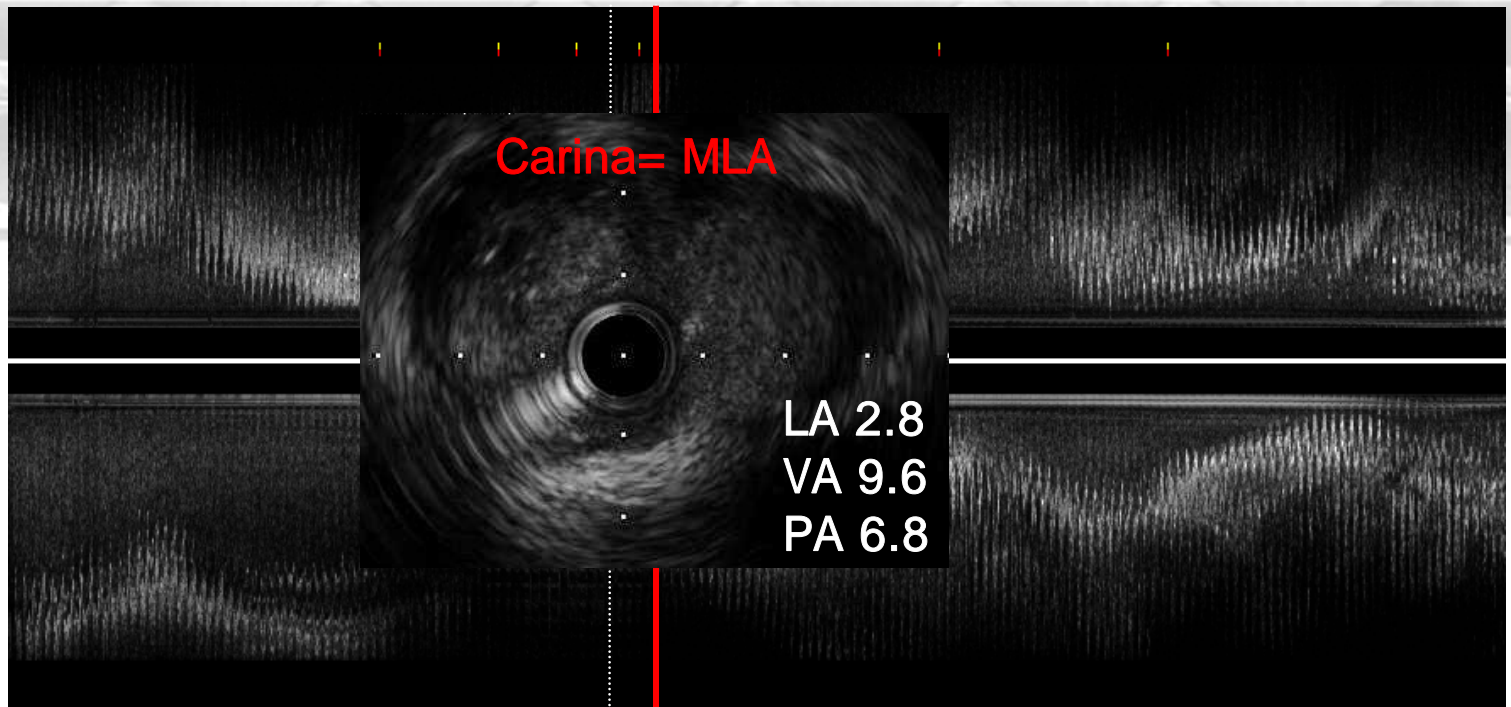


Diagonal

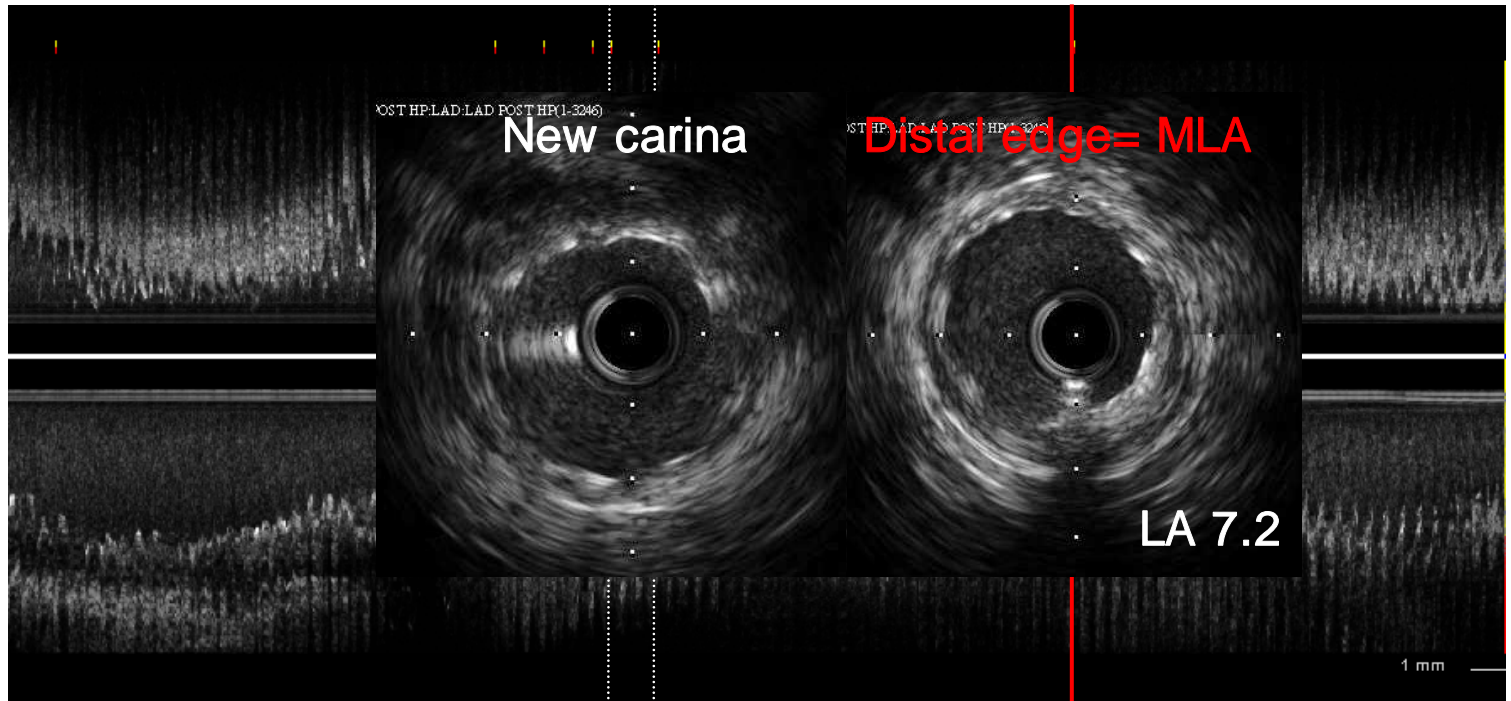




Pre LAD

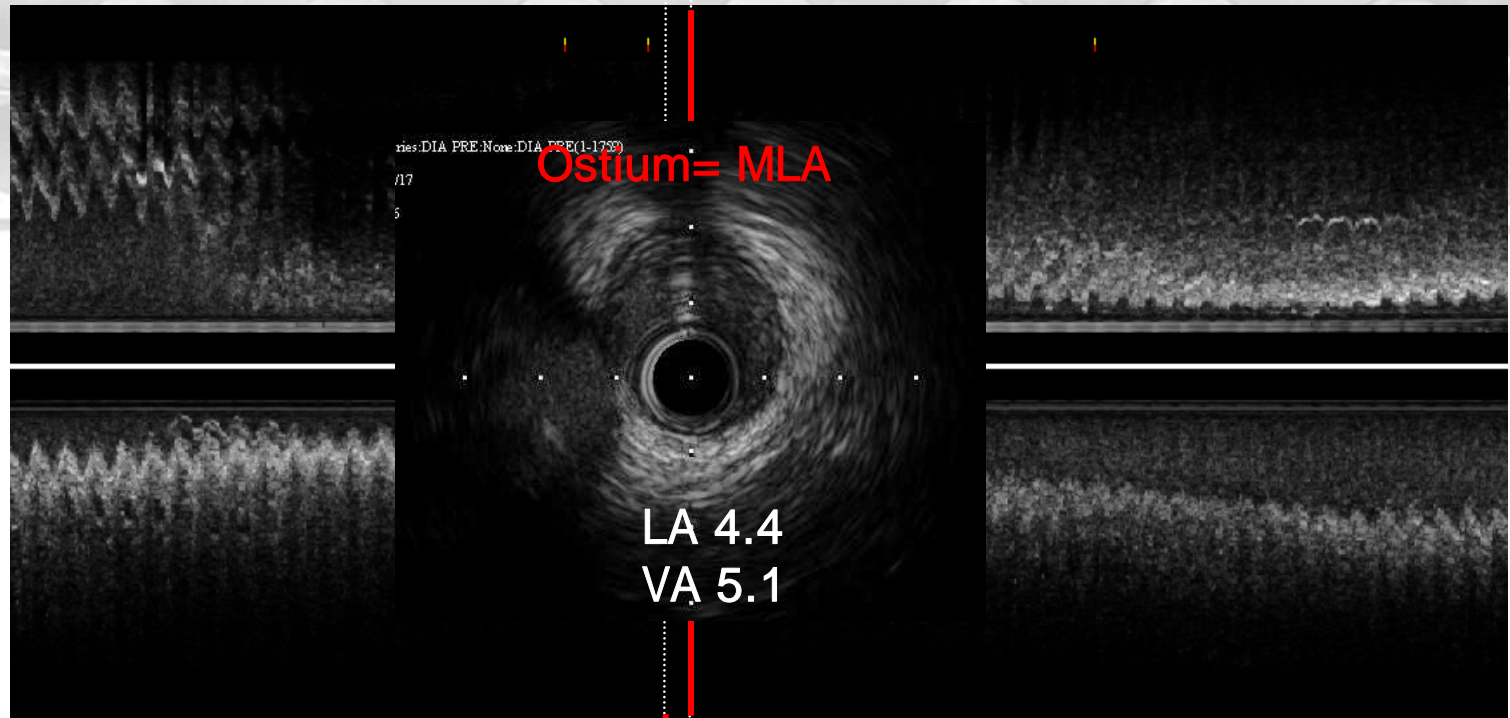


Post LAD

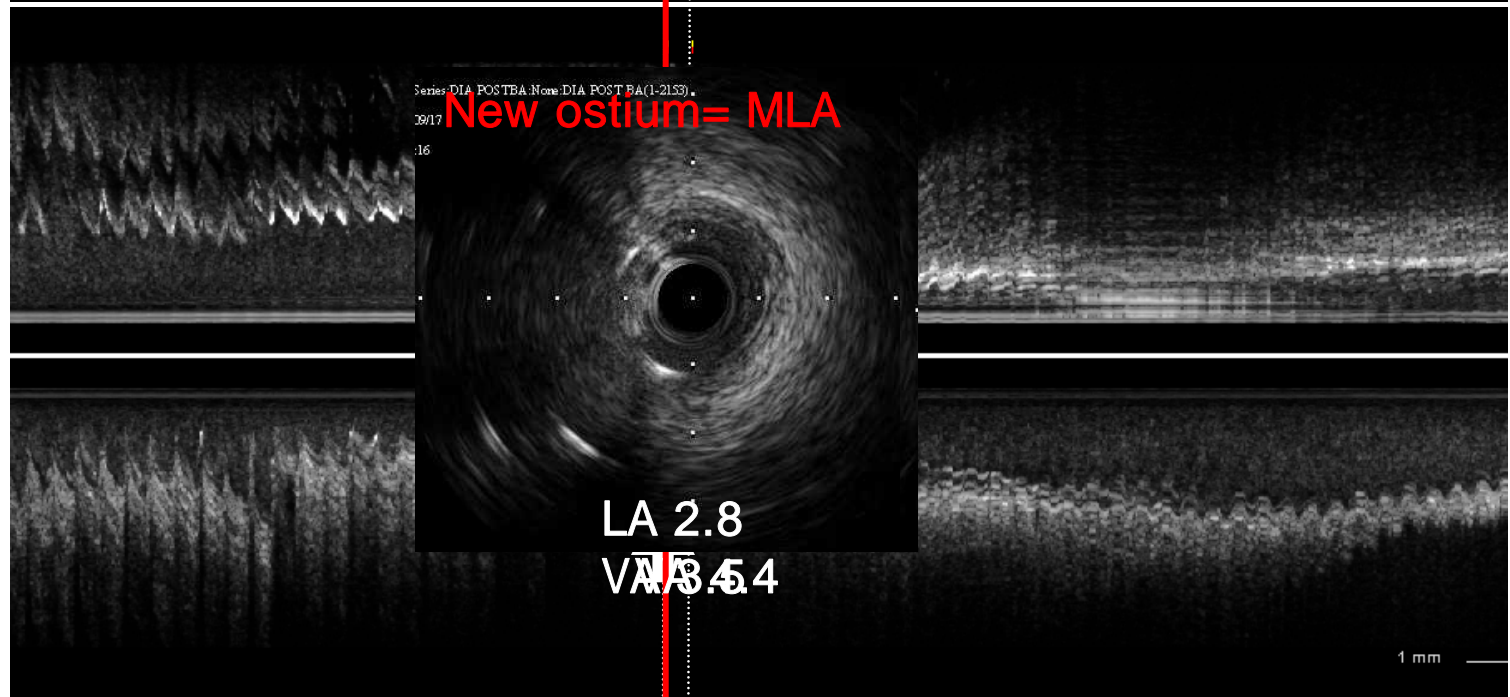




Pre
Diagonal



Post
Diagonal

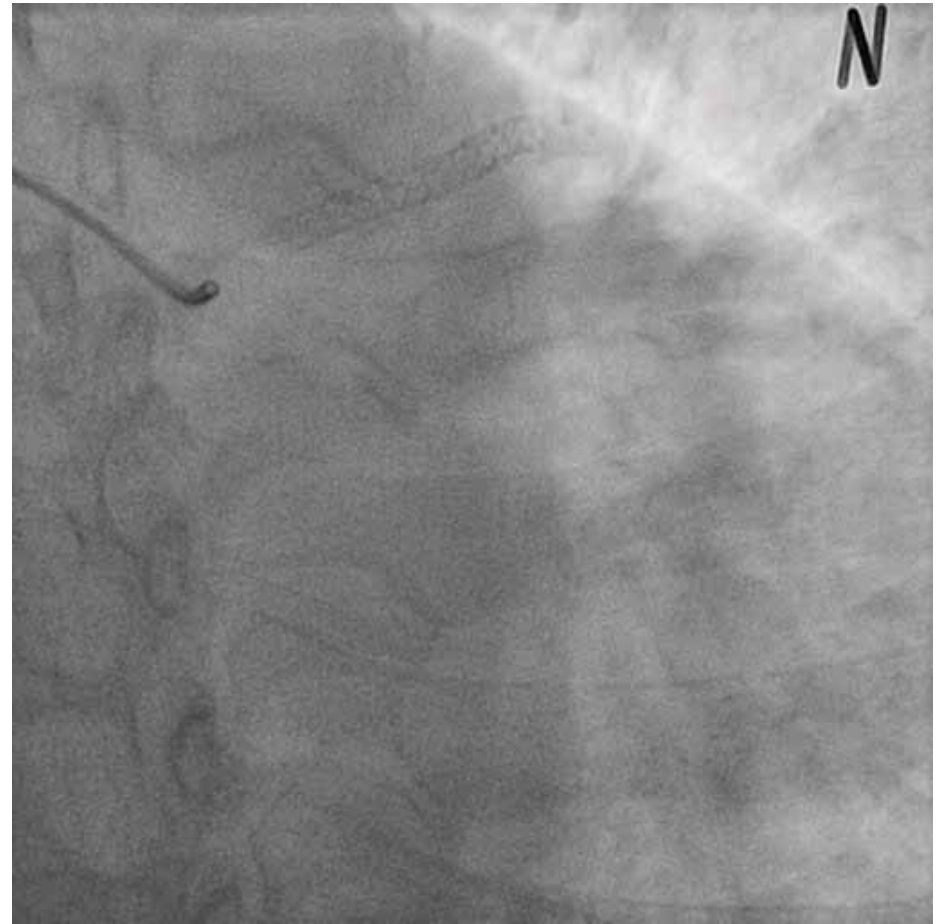
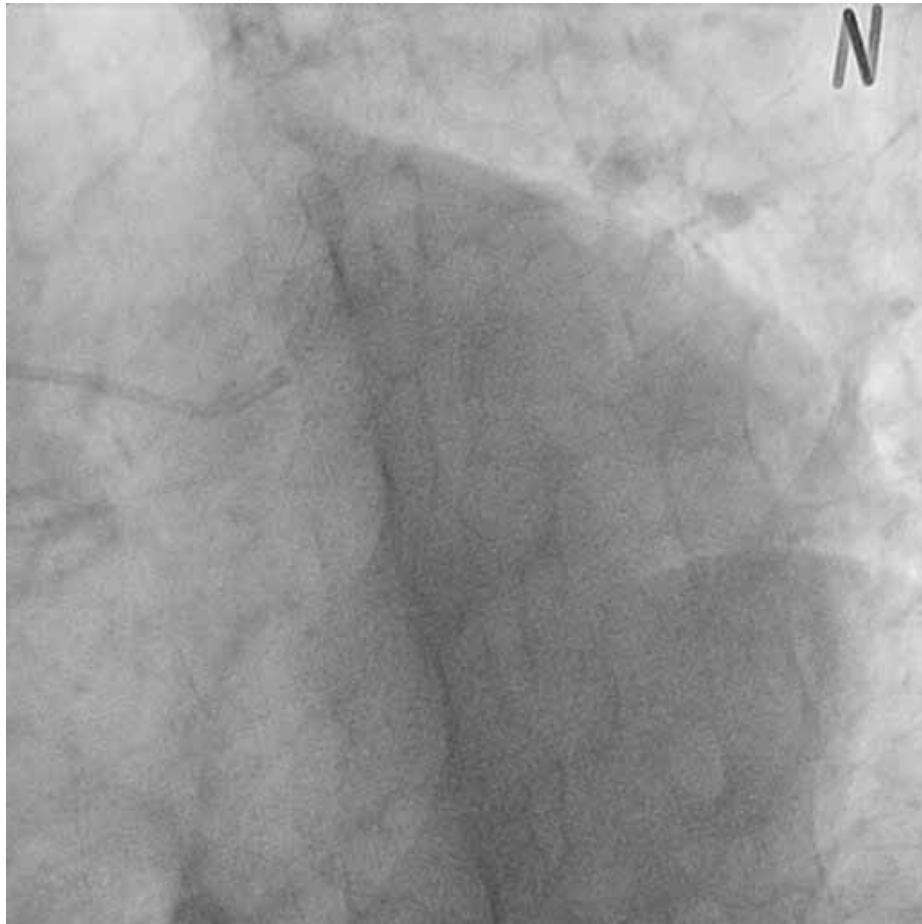




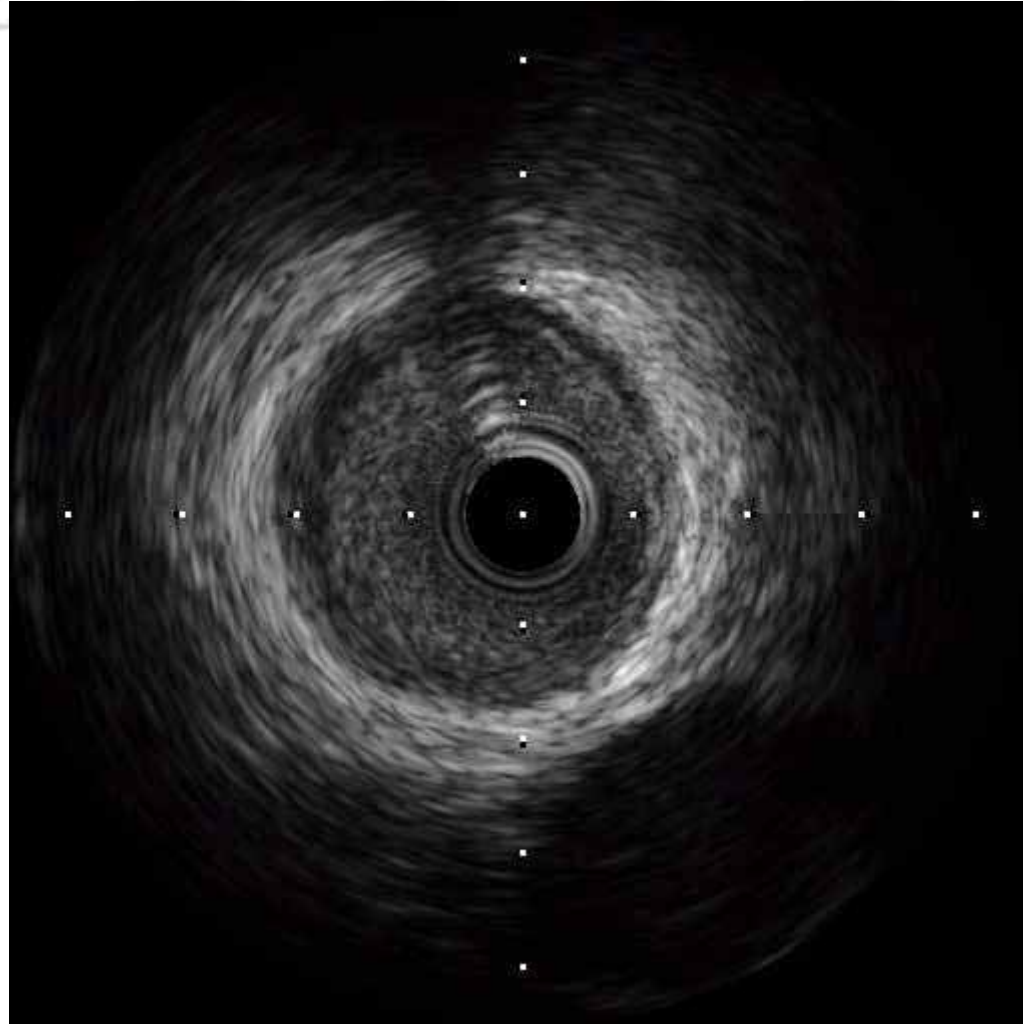
Case

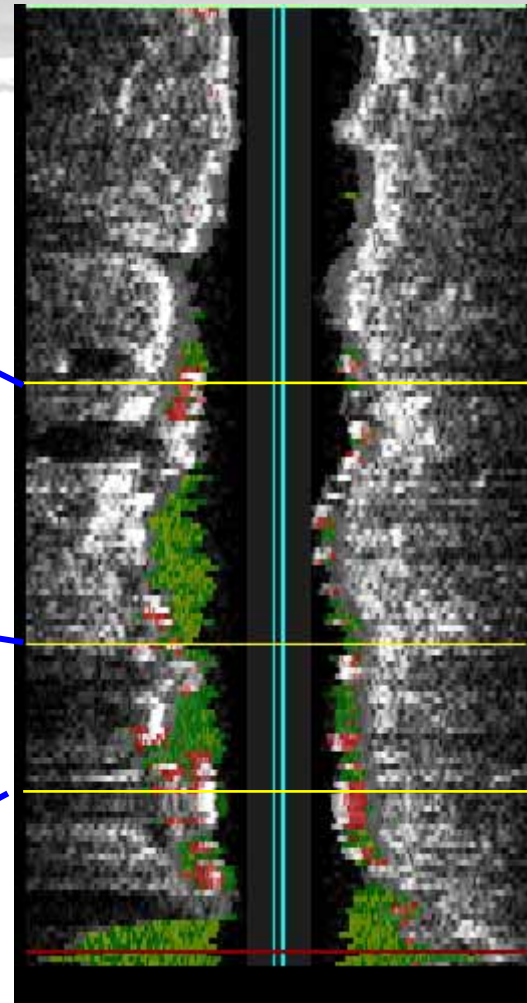
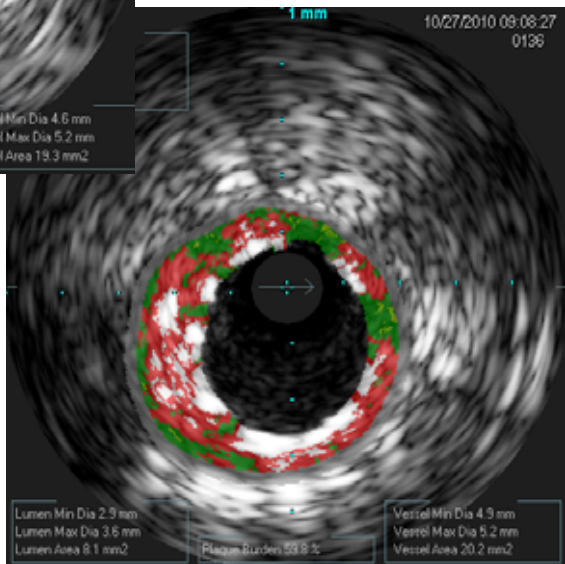
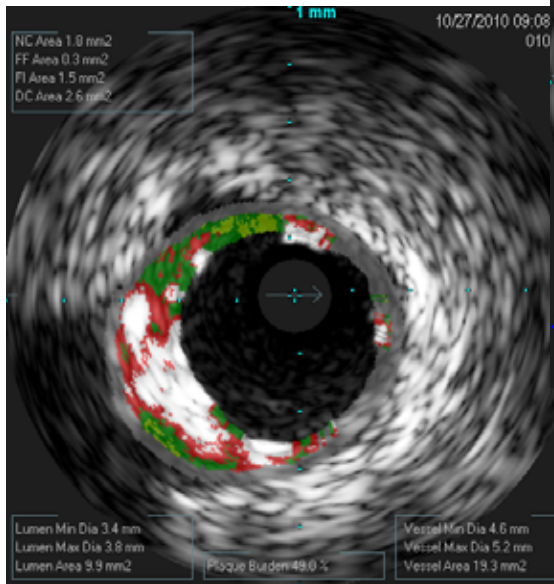
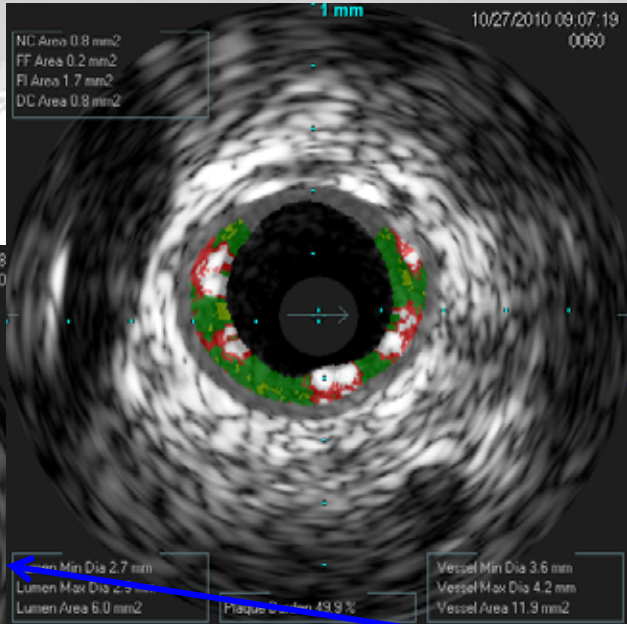
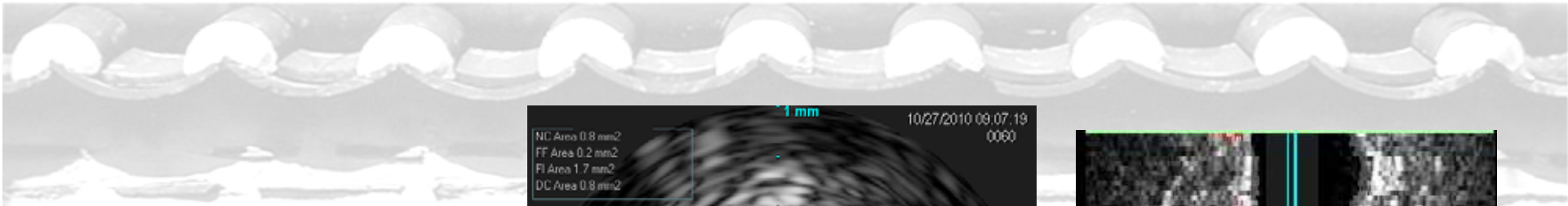
- SYS, F/59
- Atypical resting chest pain
- CV risk factors:
 - HTN for 5 years, Dyslipidemia
- Previous PCI:
 - 2 years ago, Cypher 3.5/23 mm at pLAD

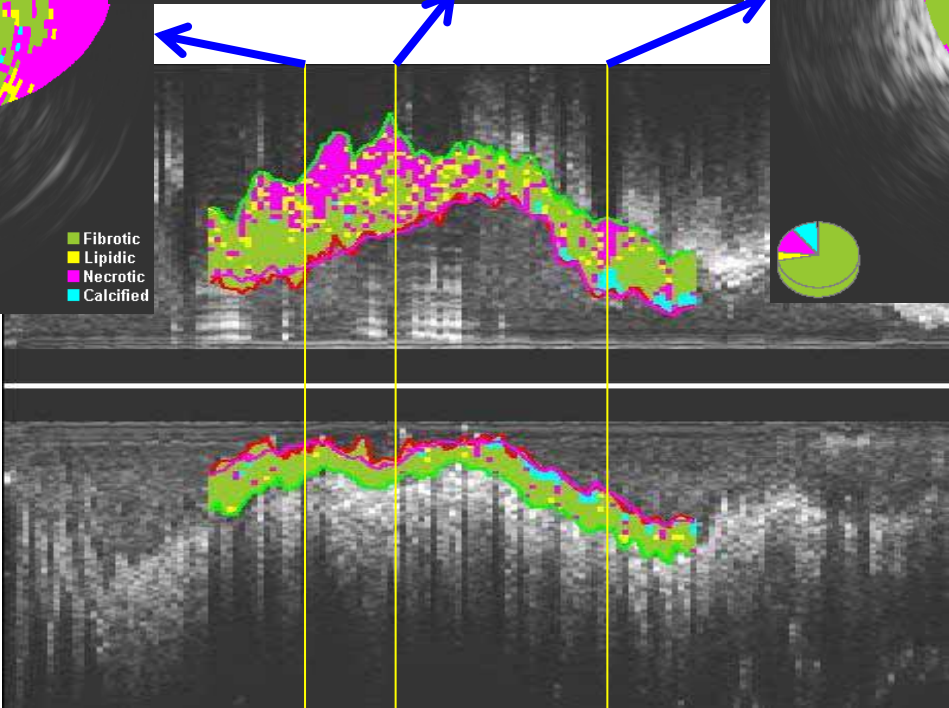
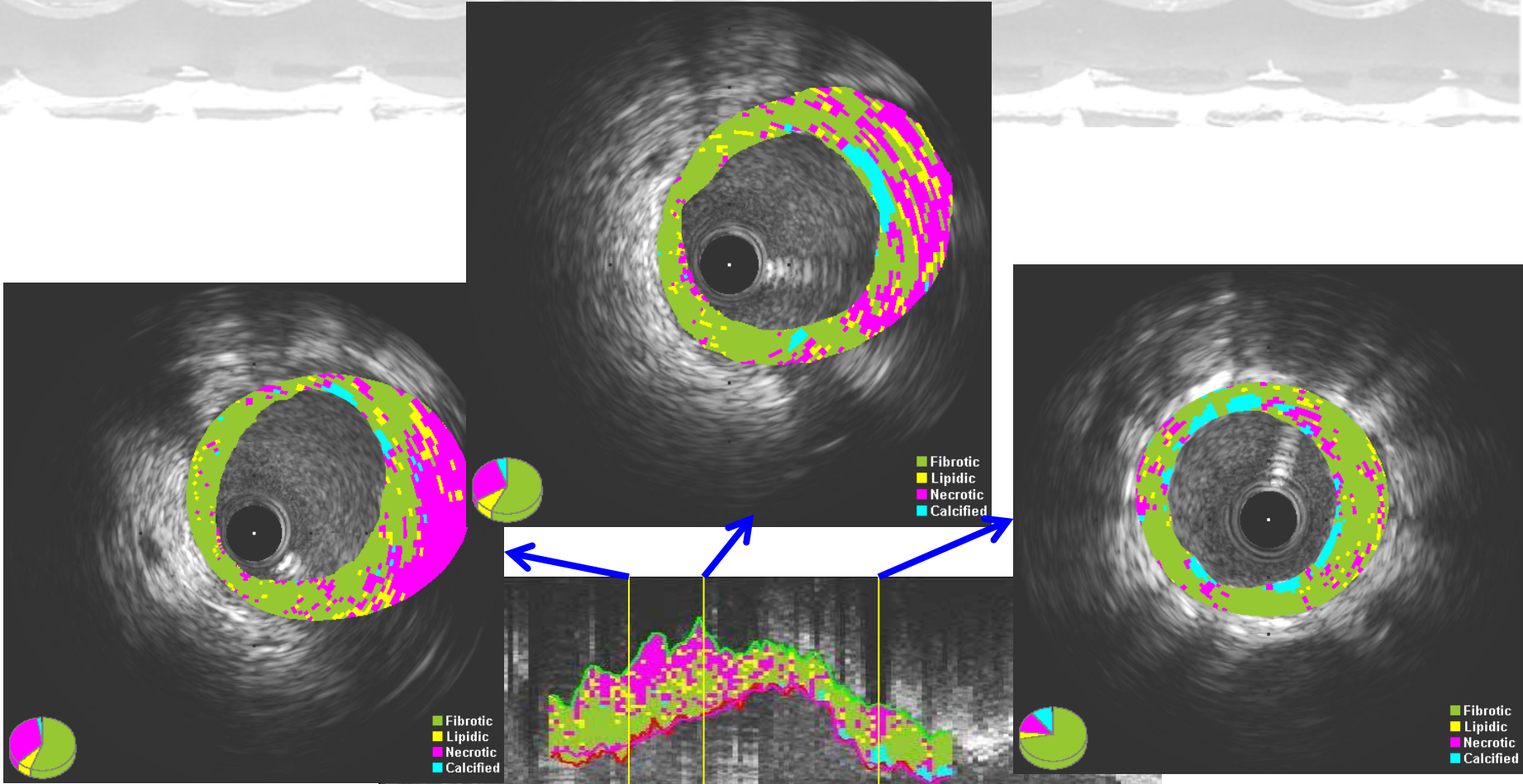
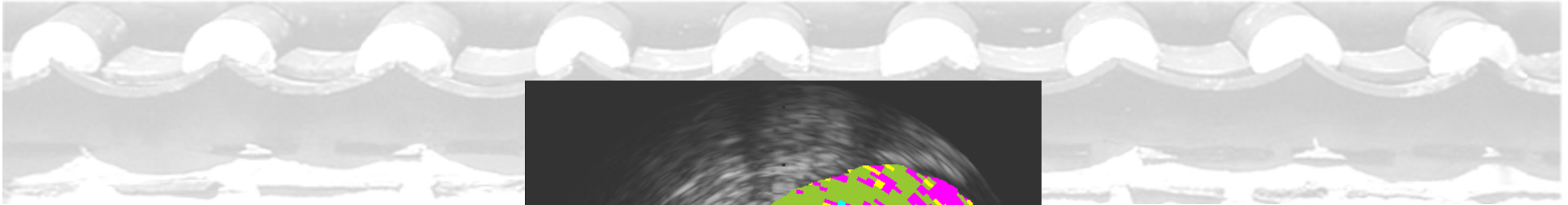
Baseline coronary angiogram

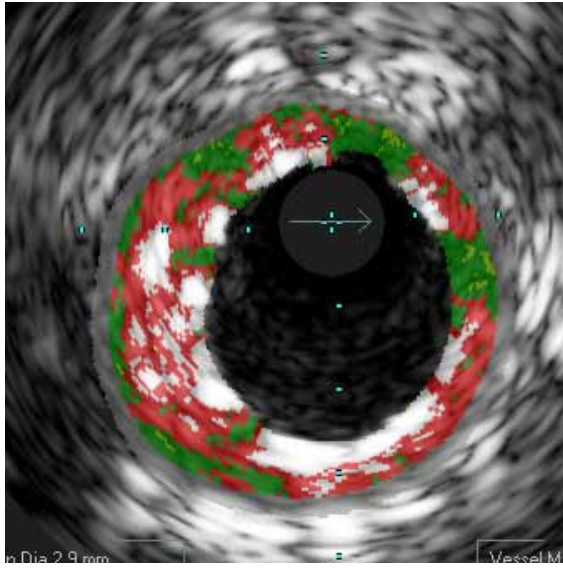
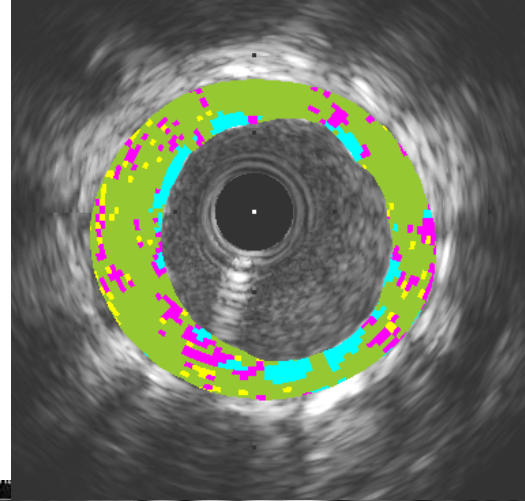
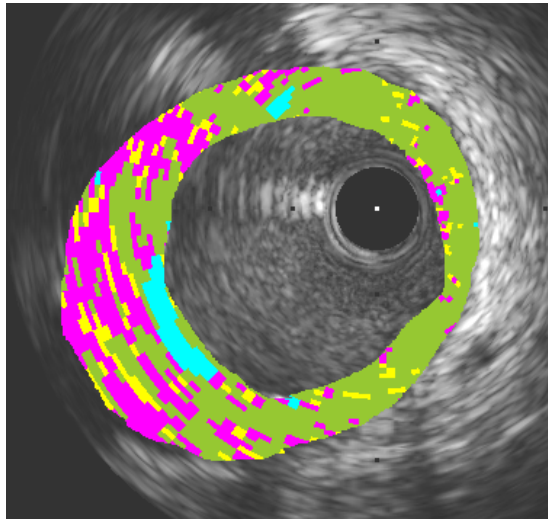
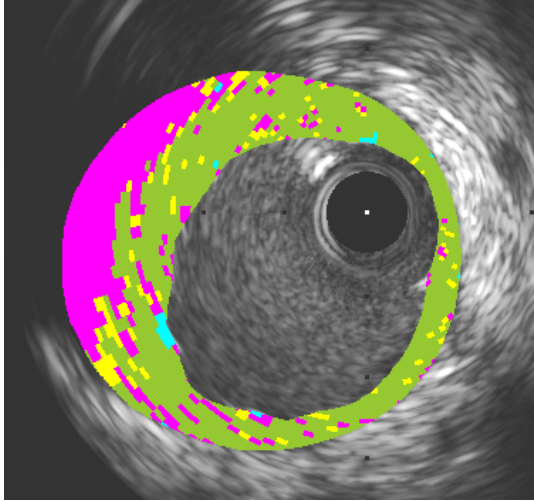
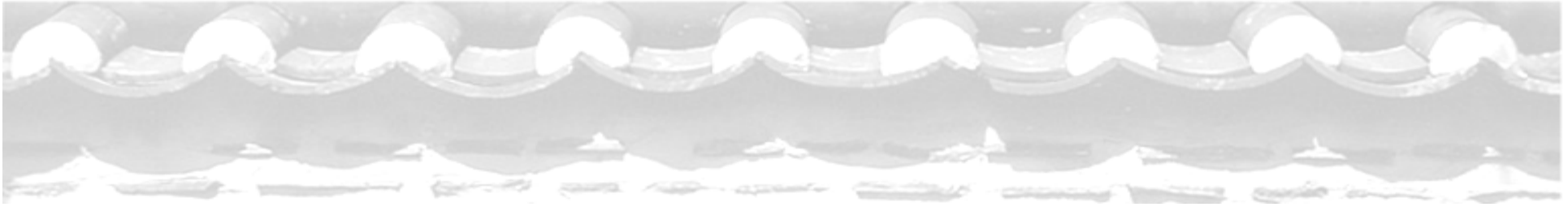


Baseline IVUS



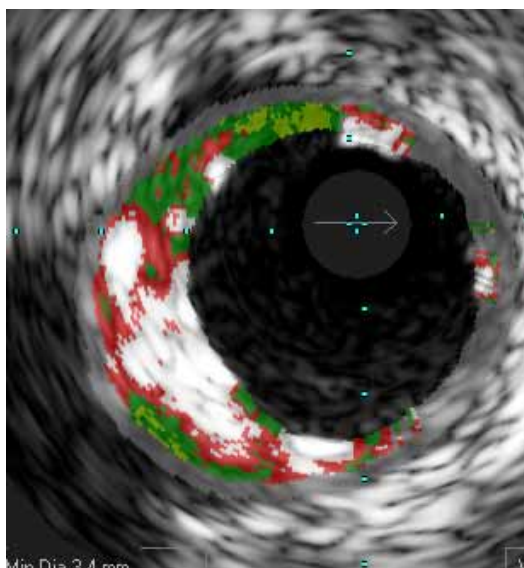




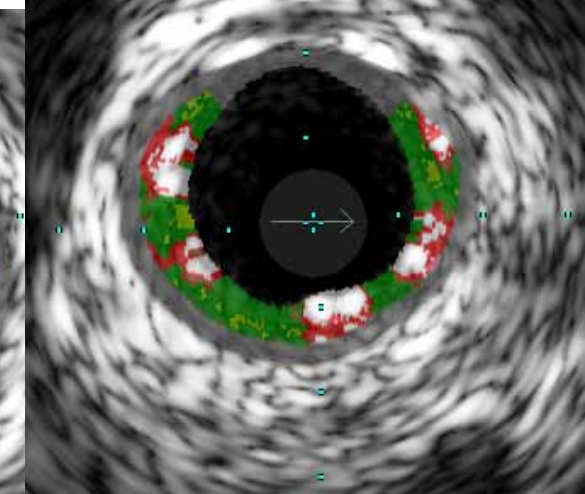


Min Dia 2.9 mm

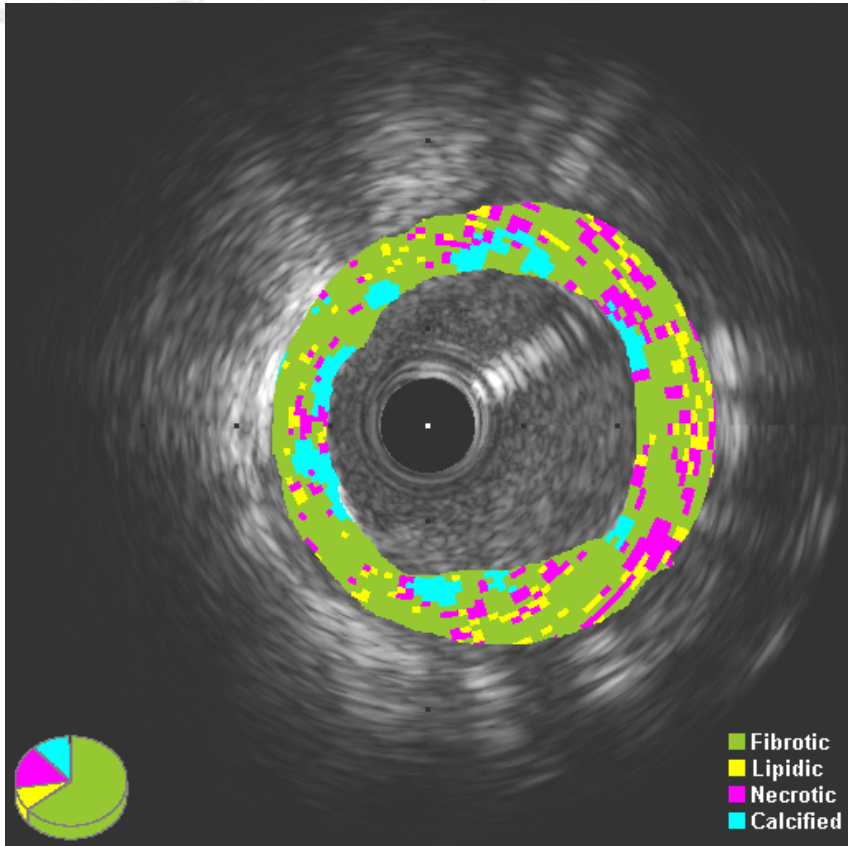
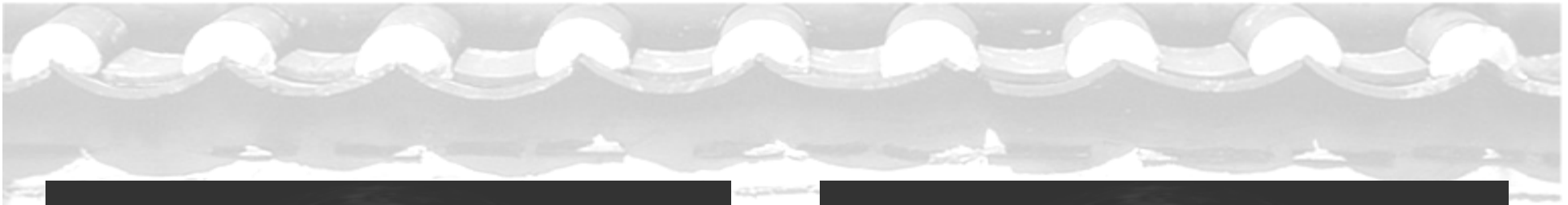
Vessel M






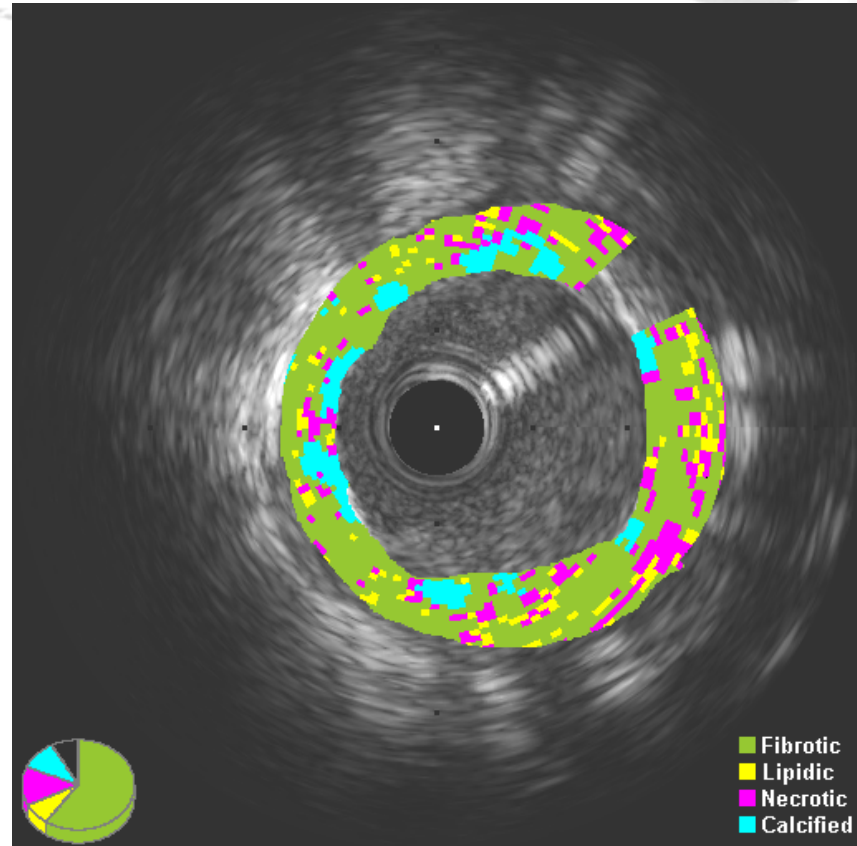
Min Dia 3.4 mm
Max Dia 3.8 mm





Vessel M
Vessel M

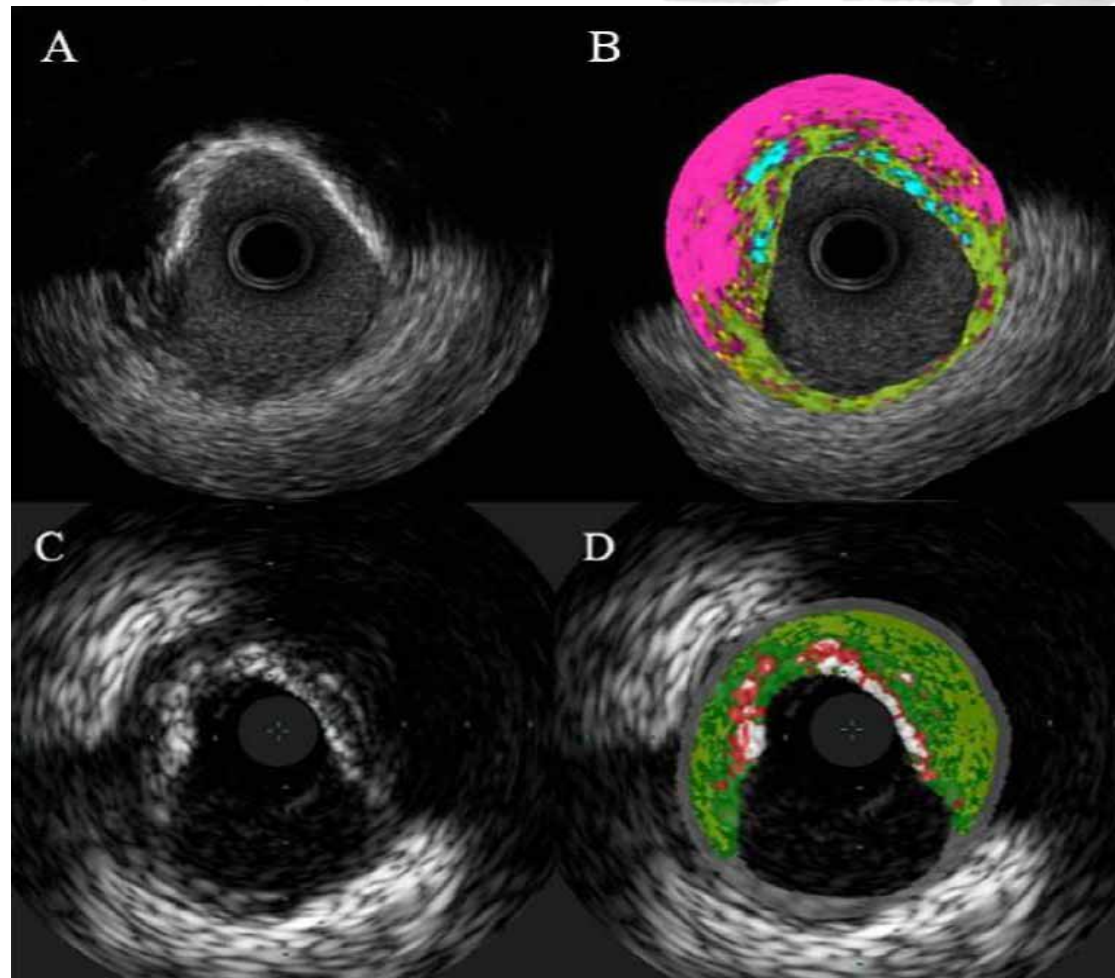


	Area mm2	Percentage	Confidence
 Fibrotic	0,06	64%	72%
 Lipidic	0,01	8%	56%
 Necrotic	0,01	15%	57%
 Calcified	0,01	11%	86%



	Area mm2	Percentage	Confidence
 Fibrotic	0,05	59%	72%
 Lipidic	0,01	7%	56%
 Necrotic	0,01	13%	58%
 Calcified	0,01	10%	87%
 Unknown	0,00	0%	
 Masked	0,01	7%	

Case: Calcified Plaque



Adopted from Ton van der Steen, Thorax center ErasmusMC, EuroPCR2010



Take Home Messages

- Tissue characterization might be helpful to detect vulnerable plaque in coronary arteries.
- Tissue characterization by IVUS is based on ultrasonic radiofrequency data.
- Different tissue characterizations by IVUS present different data. So, we need to have more clinical experience and handle the data with care.

Every body is not same,
every plaque is not same!

GIRLS' GENERATION

