HIGH TECH MARSEILLE

1·2·3 FÉVRIER 2023

MARSEILLE·PALAIS DU PHARO

L'INSTITUT MUTUALISTE MONTSOURIS

GHMF

Session GACI:
Quand l'infarctus est complexe..

Quand l'imagerie m'éclaire…..

Nicolas Amabile, MD, PhD

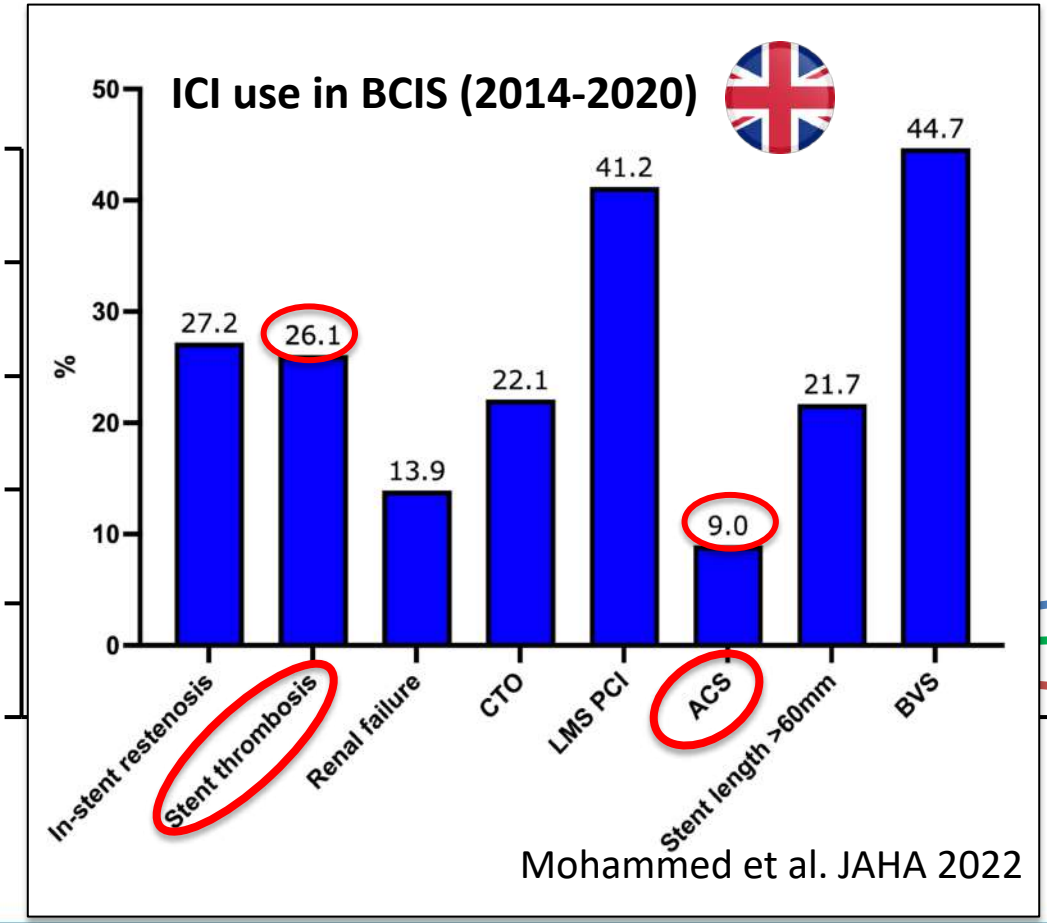
Service de Cardiologie

Institut Mutualiste Montsouris, Paris

Conflits d’interet

- Consulting fees : Boston Scientific , Abbott Vascular
- Proctoring fees : Boston Scientific, Abbott Vascular

Use of IC imaging among patients with NSTEMI/STEMI:



Mohammed et al. JAHA 2022

Percentage of PCI %

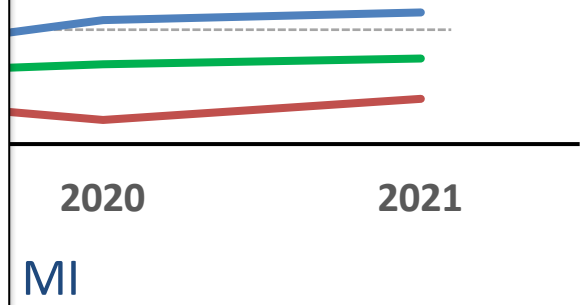
5
4
3
2
1
0

Overall (2017-2021):

NSTEMI: 1.09 %

STEMI: 0.35 %

All MI : 0.75%



MI

How ICI can help during MI ?

Diagnosis

To establish precise diagnosis

To identify ACS pathophysology

PCI guidance

To provide information for decision of PCI or not

To support complex PCI strategies

Complications management

How ICI can help during MI ?

Diagnosis

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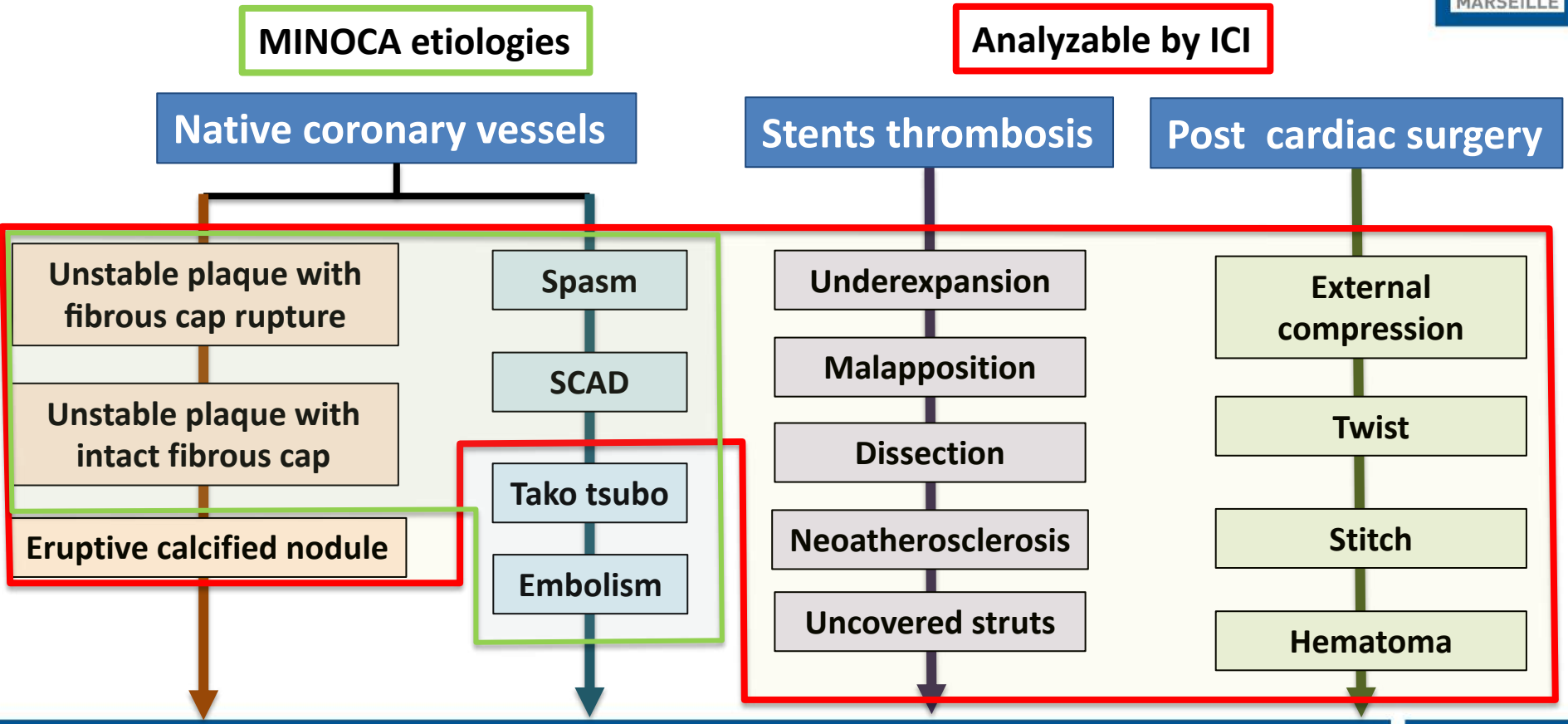
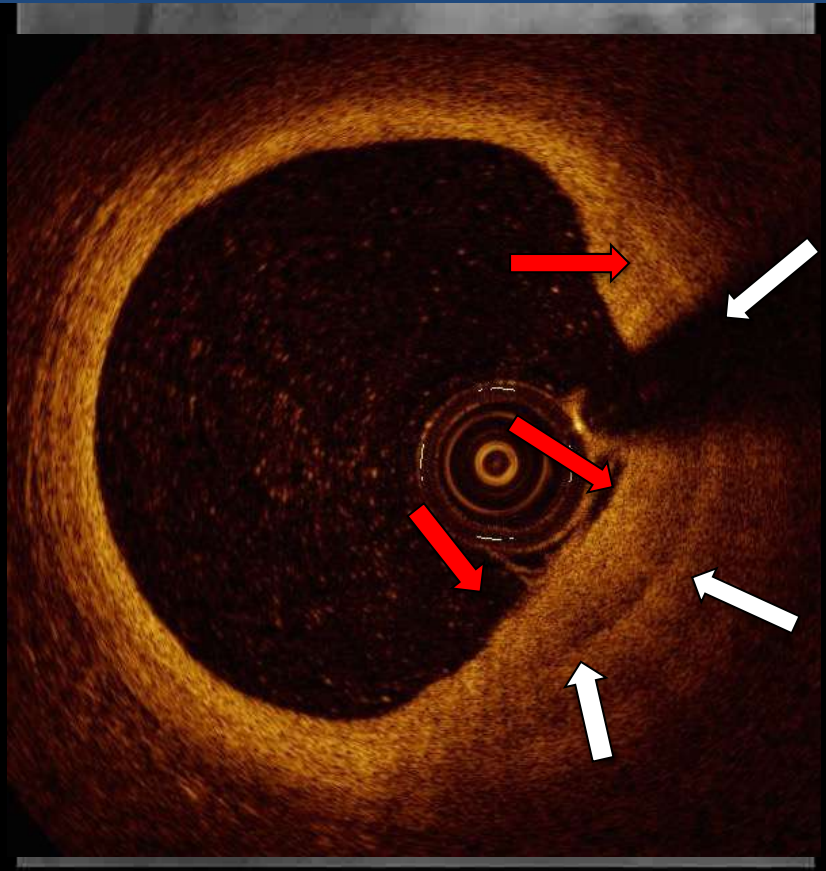
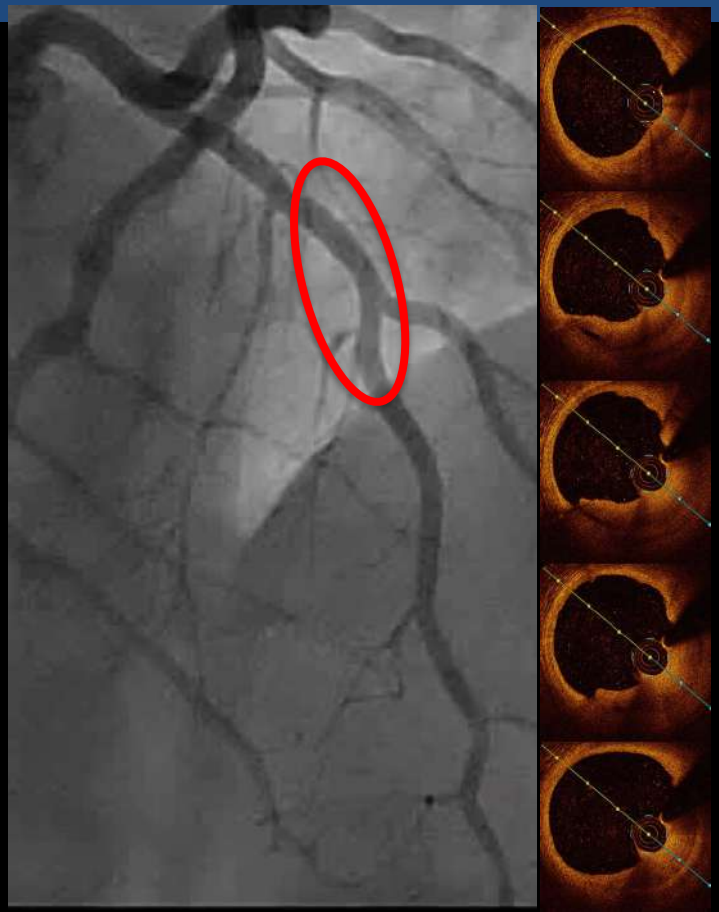
Complications management

Potential complex causes of myocardial infarction

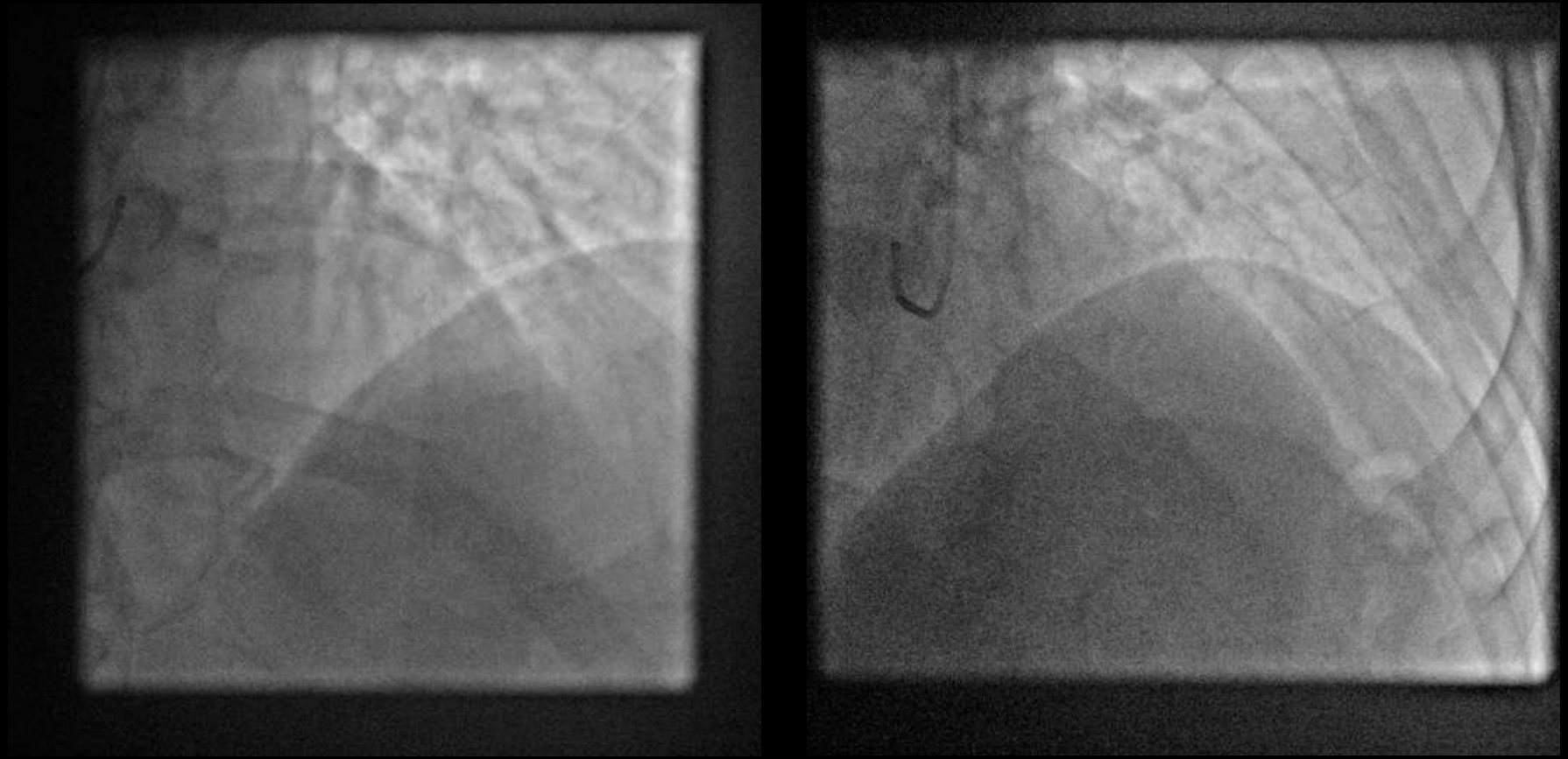


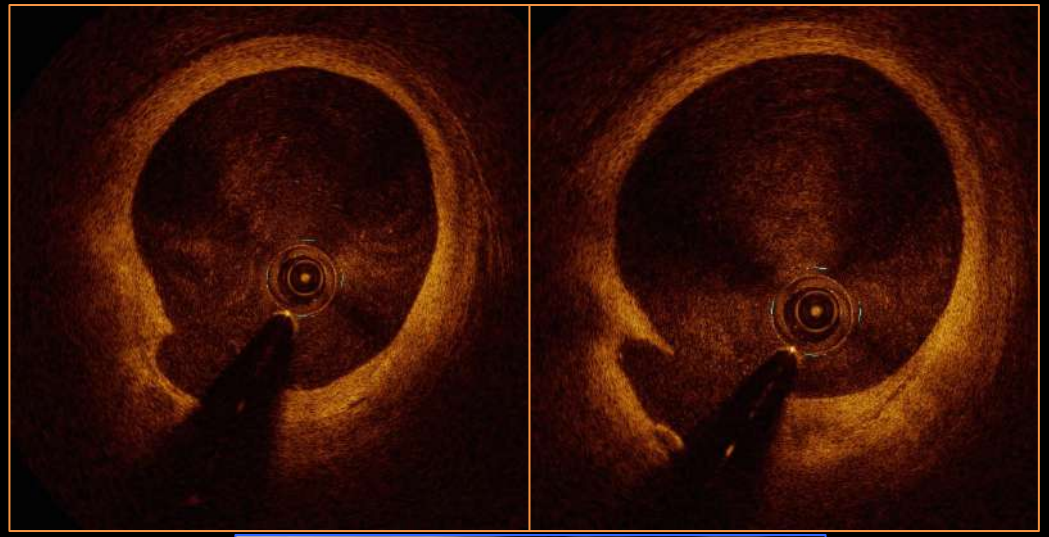
- 35 y-o man / Anterior STEMI/ Successful thrombolysis (H+120 mins)
- Coronary angiography control (Day 2)

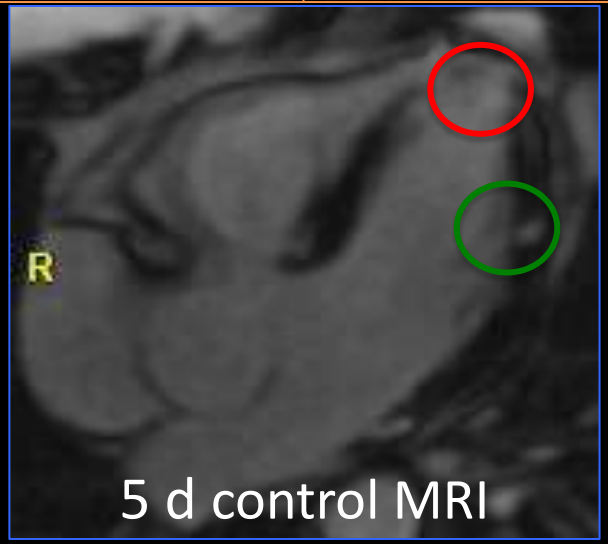




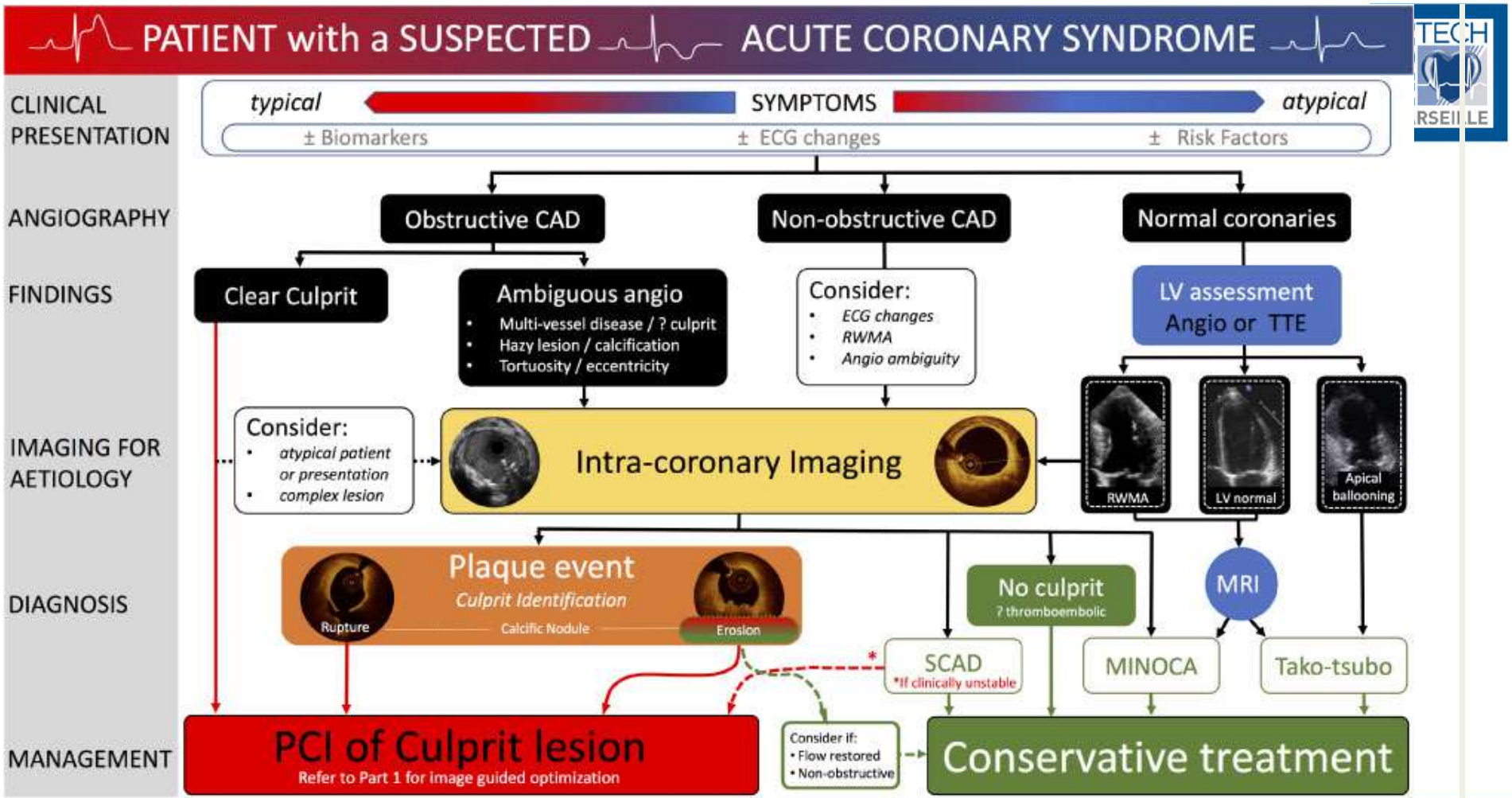
- A 65 year-old man is referred for transient ST elevation MI



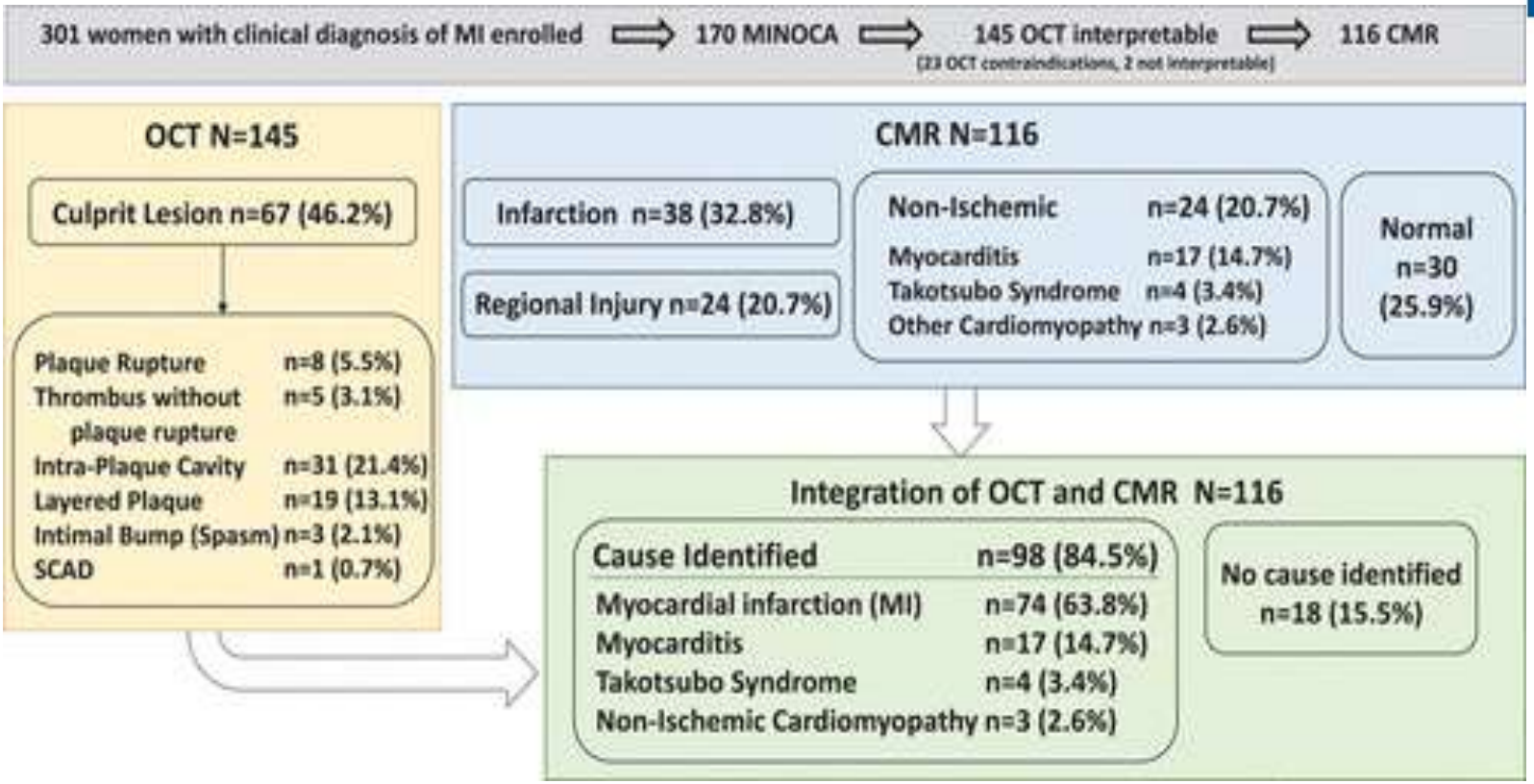




5 d control MRI

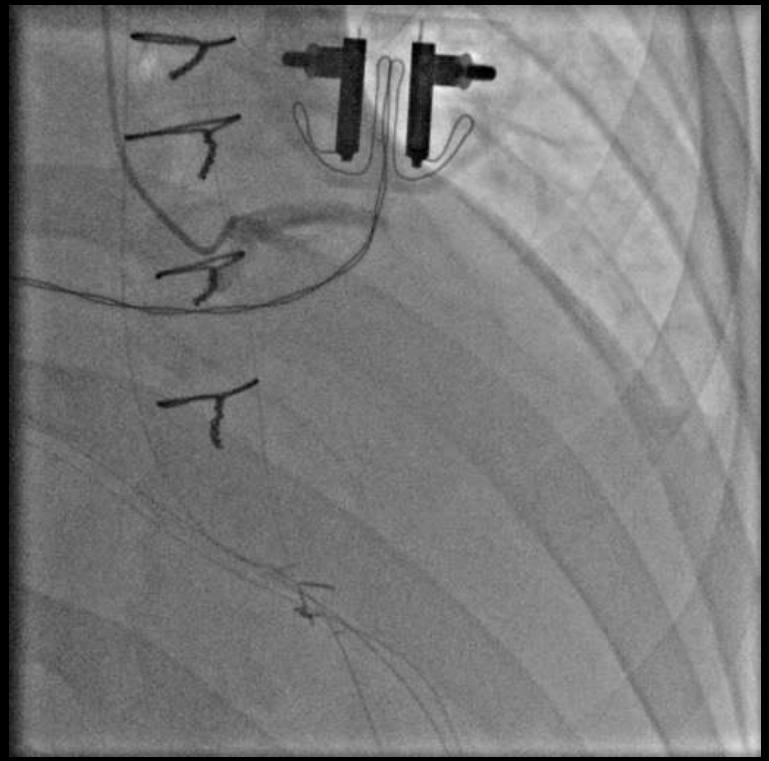

PATIENT with a SUSPECTED ACUTE CORONARY SYNDROME
CLINICAL PRESENTATION
ANGIOGRAPHY
FINDINGS
IMAGING FOR AETIOLOGY
DIAGNOSIS
MANAGEMENT
typical
SYMPTOMS
atypical
± Biomarkers
± ECG changes
± Risk Factors
Obstructive CAD
Non-obstructive CAD
Normal coronaries
Clear Culprit
Ambiguous angio
Multi-vessel disease / ? culprit
Hazy lesion / calcification
Tortuosity / eccentricity
Consider:
ECG changes
RWMA
Angio ambiguity
LV assessment
Angio or TTE
Consider:
atypical patient or presentation
complex lesion
Intra-coronary Imaging
RWMA
LV normal
Apical ballooning
Plaque event
Culprit Identification
Rupture
Calcific Nodule
Erosion
No culprit
? thromboembolic
MRI
SCAD
*If clinically unstable
MINOCA
Tako-tsubo
PCI of Culprit lesion
Refer to Part 1 for image guided optimization
Consider if:
• Flow restored
• Non-obstructive
Conservative treatment

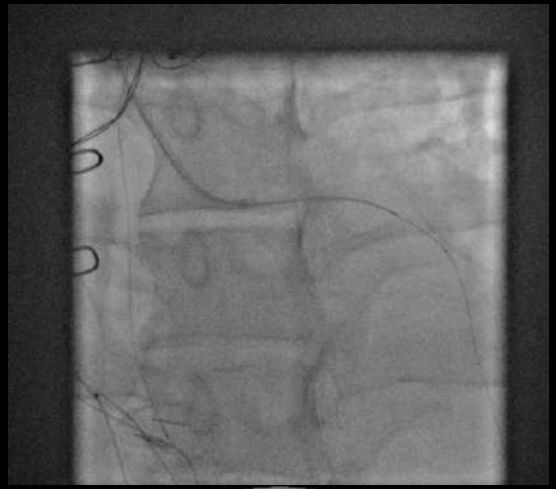
Coronary Optical Coherence Tomography and Cardiac Magnetic Resonance Imaging to Determine Underlying Causes of Myocardial Infarction With Nonobstructive Coronary Arteries in Women.

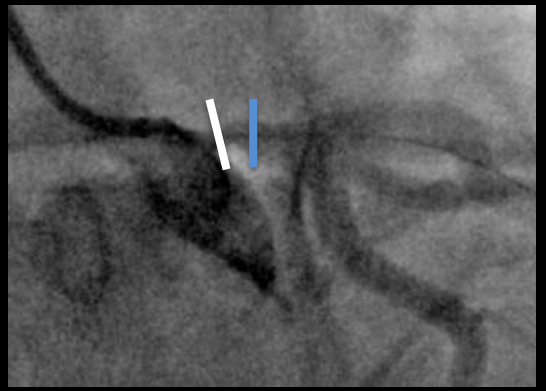


Reynolds HR et al. Circulation 2020 ; 143, Issue: 7, 624-640

- A 28 y old man is referred to the cath lab for anterior STEMI + cardiogenic shock
- Conservative aortic valve reparation (aortic valvuloplasty + coronary arteries reimplantation + supra valvular aortic ring insertion) 72h before

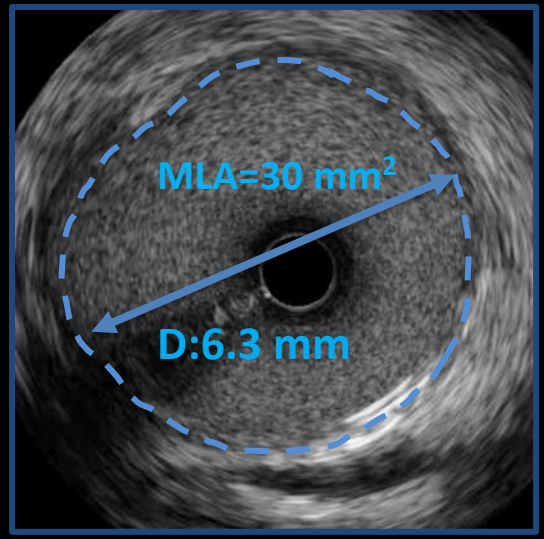


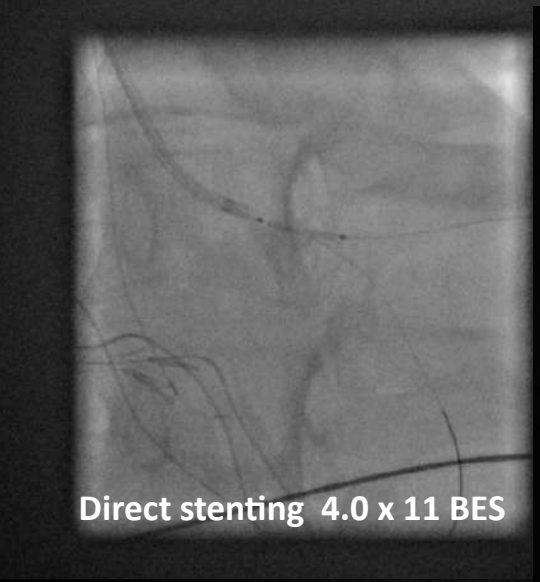




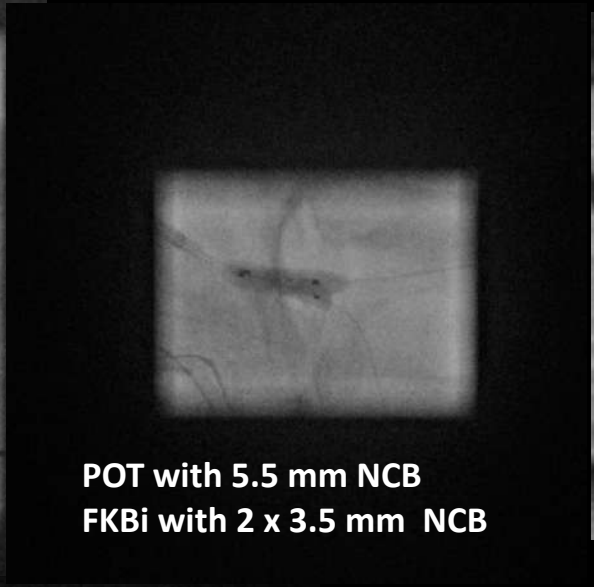

Frame 11


MLA=4.5 mm²

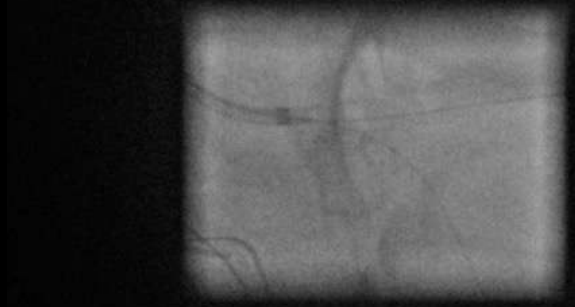

MLA=30 mm²
D:6.3 mm



Direct stenting 4.0 x 11 BES

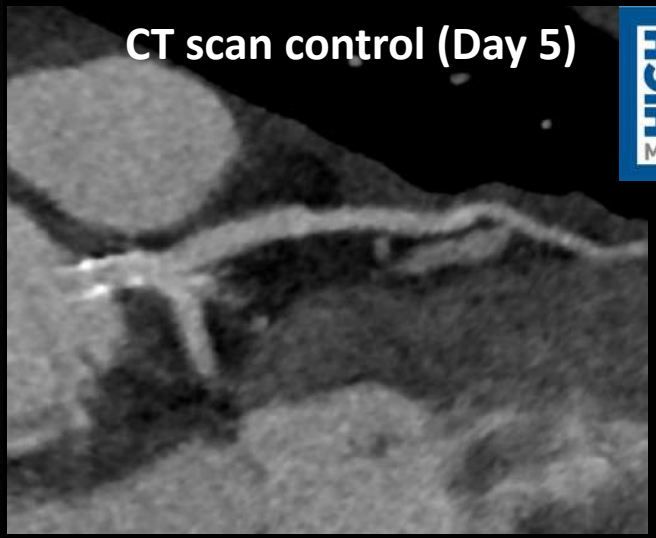


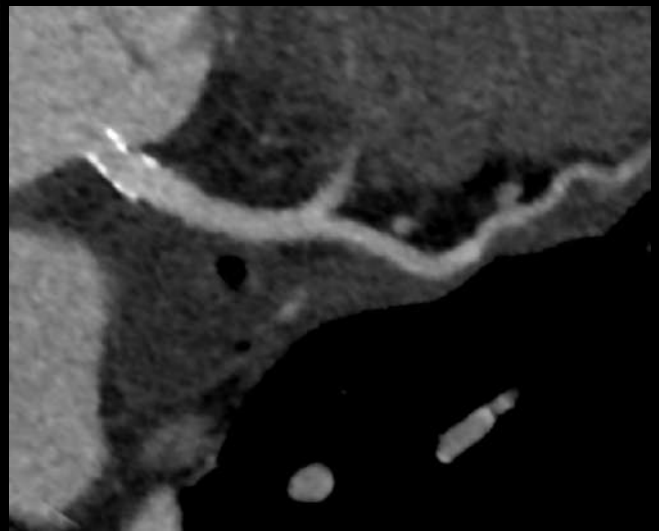
POT with 5.5 mm NCB
FKBi with 2 x 3.5 mm NCB



Final result / IVUS : ok

CT scan control (Day 5)





How ICI can help during MI ?

Diagnosis

To establish precise diagnosis

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PCI guidance

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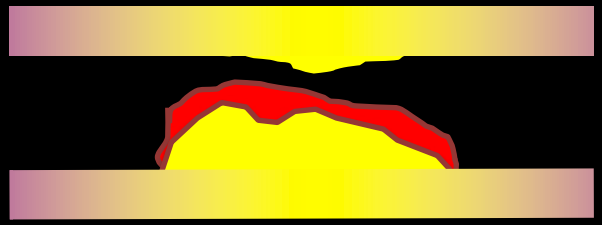
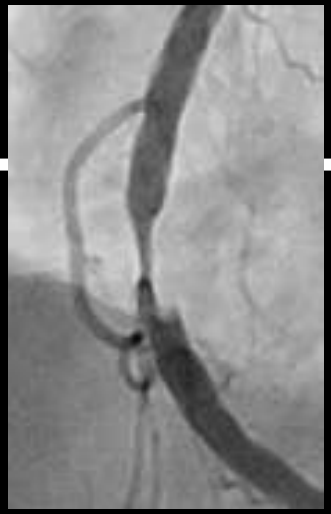
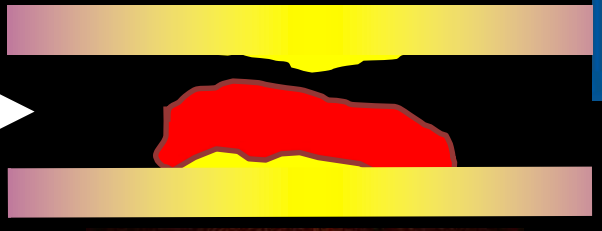
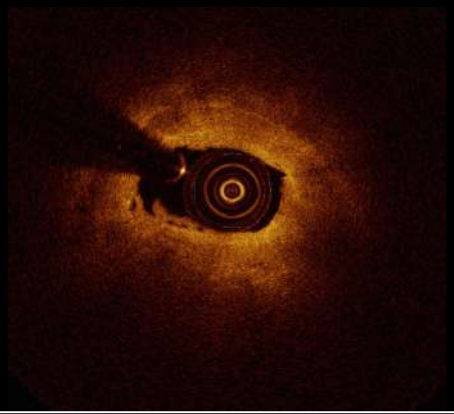
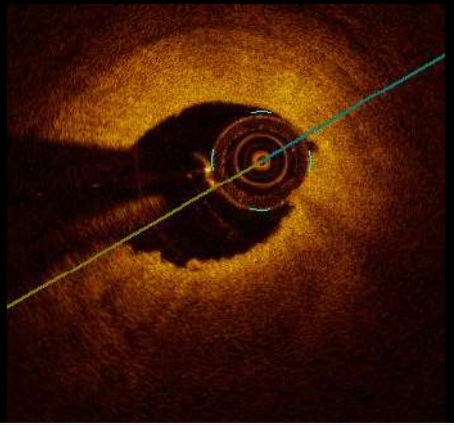
Complications management











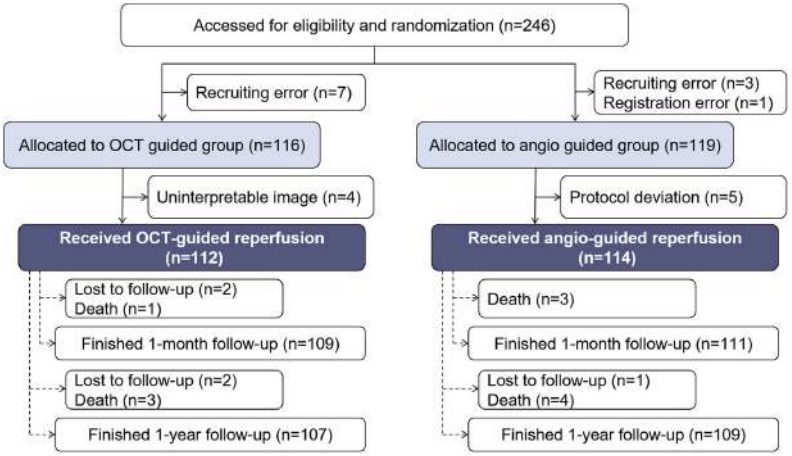
Large plaque burden + limited thrombus volume
Progressive thrombus regression under DAPT
Residual tight stenosis with significant hemodynamic impact
Consider stenting

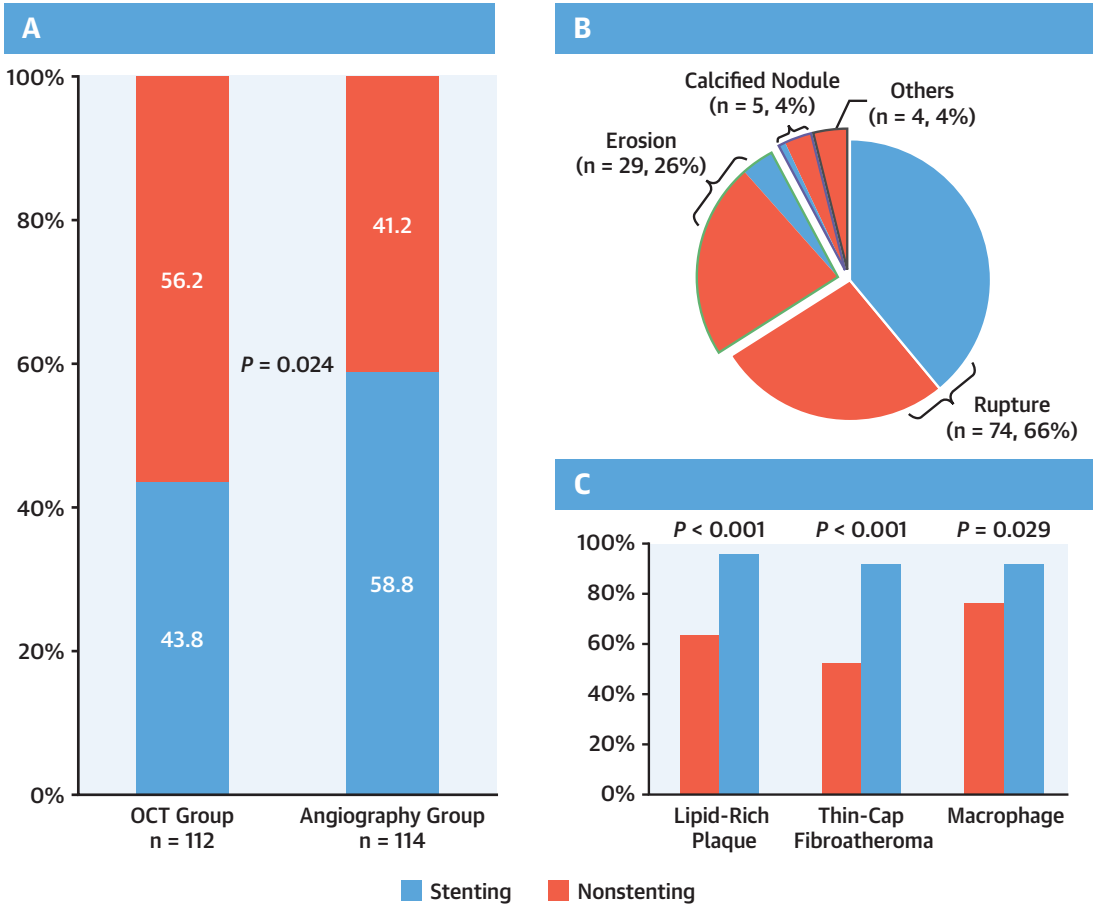
Moderate plaque burden + large thrombus load
Progressive thrombus regression under DAPT
Mild residual stenosis without significant hemodynamic impact
Possible plaque healing with medical therapy-
Stenting is not mandatory

EROSION III

A Multicenter RCT of OCT-Guided Reperfusion in STEMI With Early Infarct Artery Patency

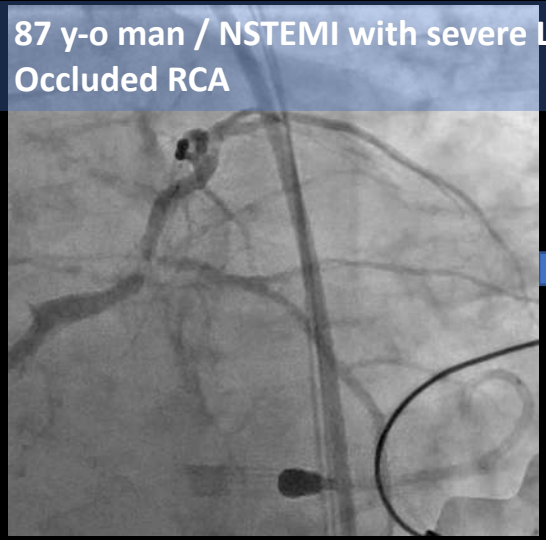
CENTRAL ILLUSTRATION Stent Implantation on the Basis of Optical Coherence Tomographic Guidance Versus Angiographic Guidance in ST-Segment Elevation Myocardial Infarction: The EROSION III Study (N = 226)

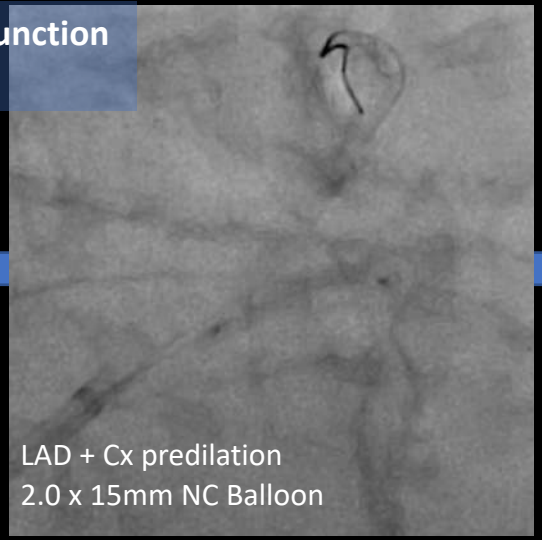




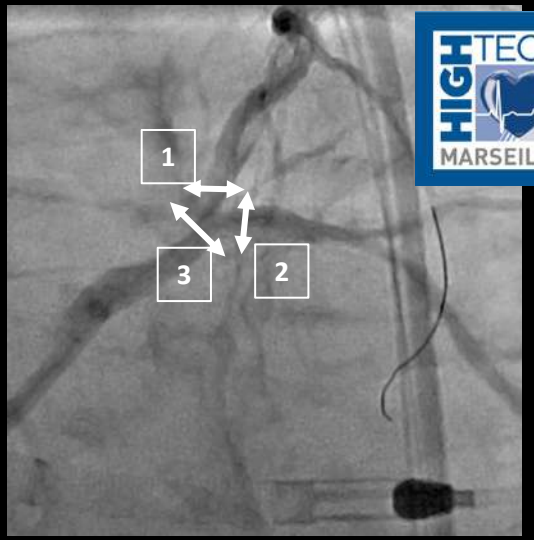
Jia et al. J Am Coll Cardiol Intv 2022;15:846–856

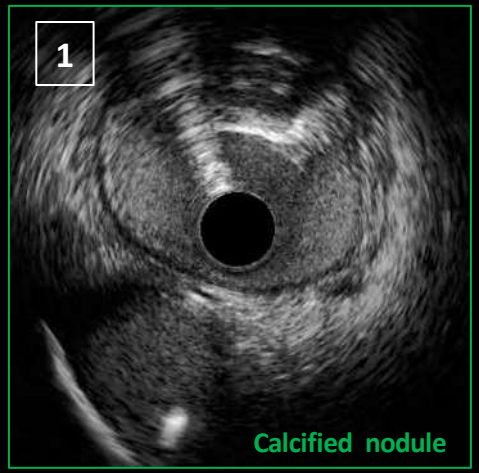
87 y-o man / NSTEMI with severe LV dysfunction
Occluded RCA

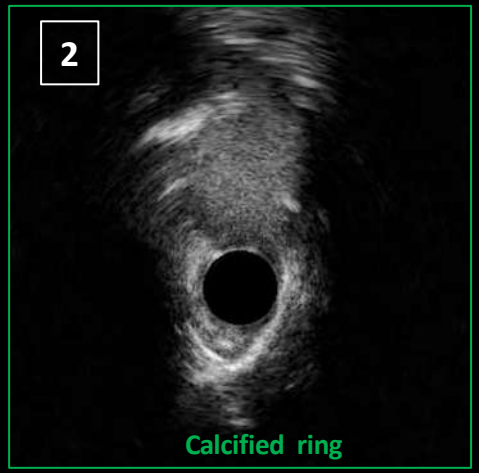


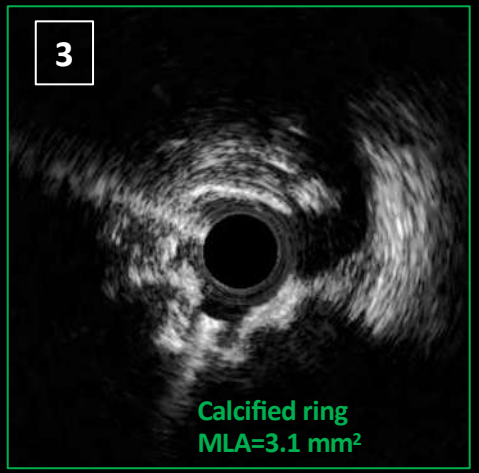


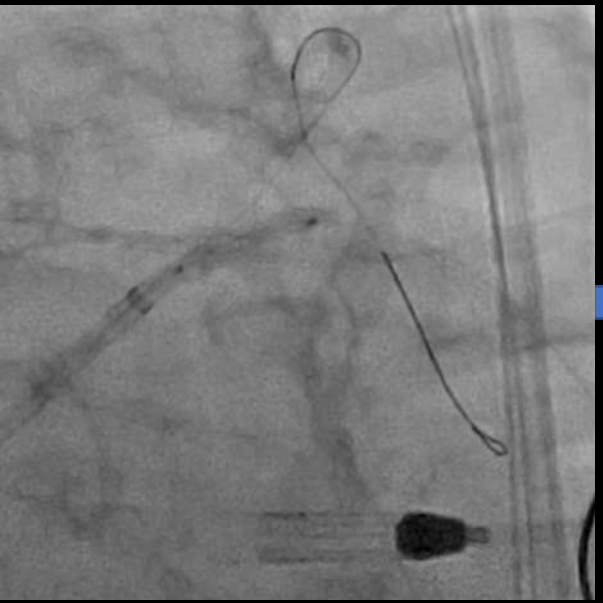
LAD + Cx predilation
2.0 x 15mm NC Balloon





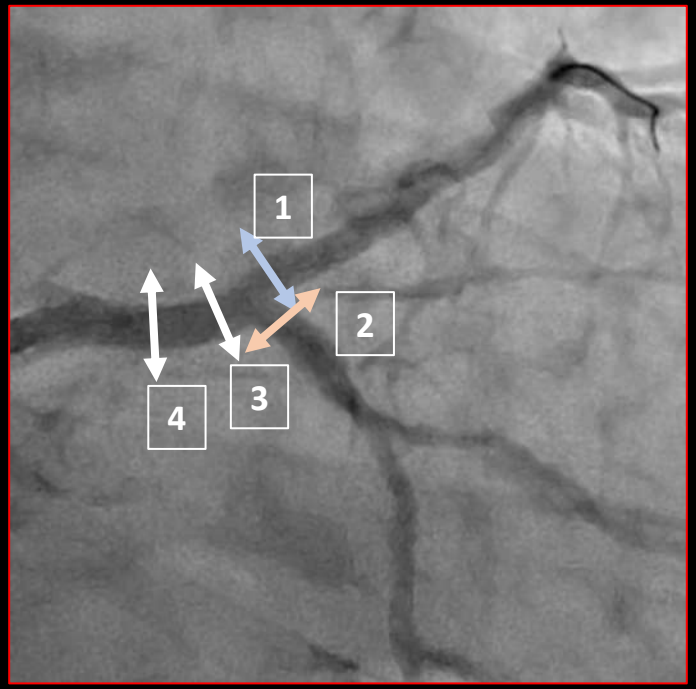


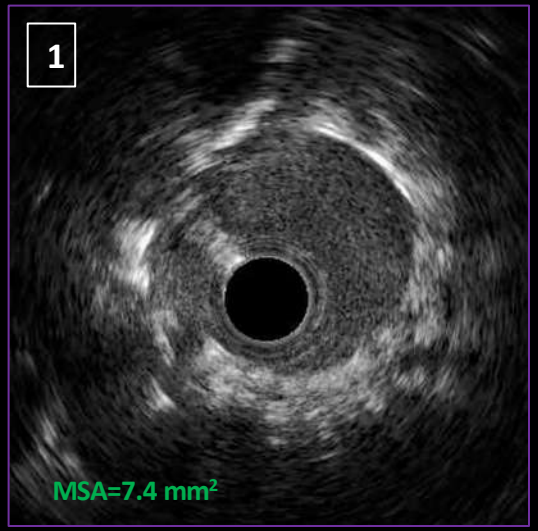


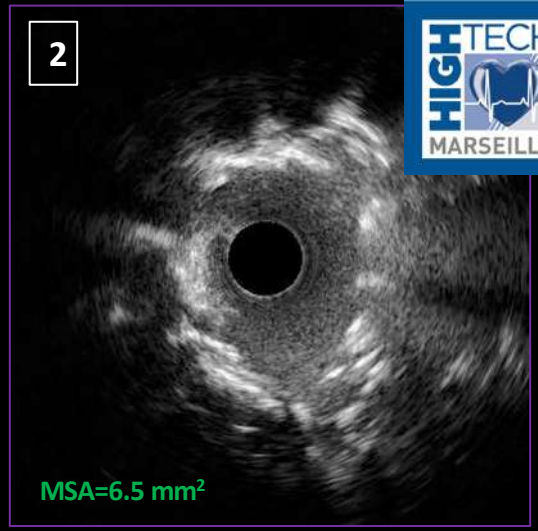


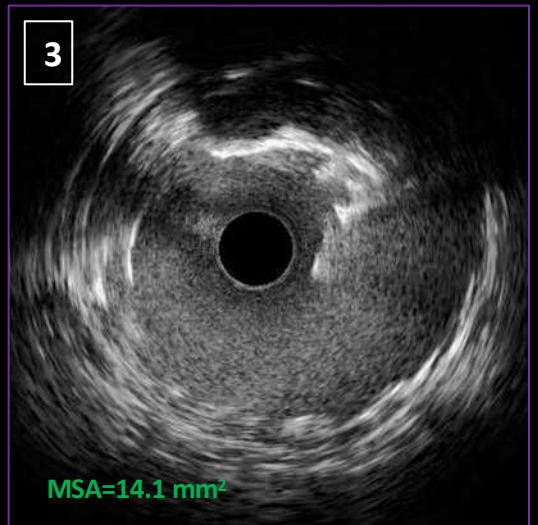
LAD + Cx IVL therapy
3.0 x 12 mm Shockwave catheter

LM PCI with 2 stents strategy
Culotte technique
3.5 x 19 mm BES (LAD)
3.0x 19 mm BES (Cx)
POT 5.0 mm & FKBi


1
2
3
4

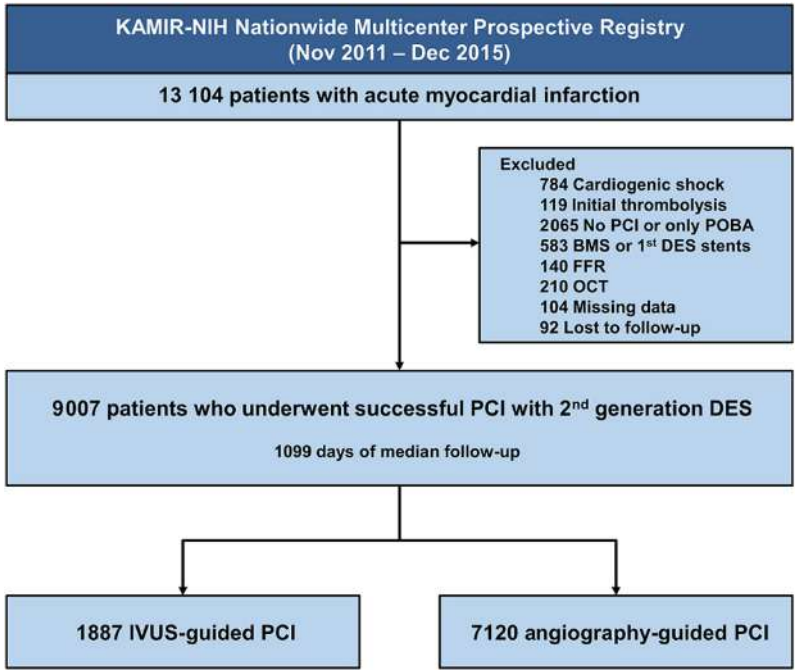

1
MSA=7.4 mm²

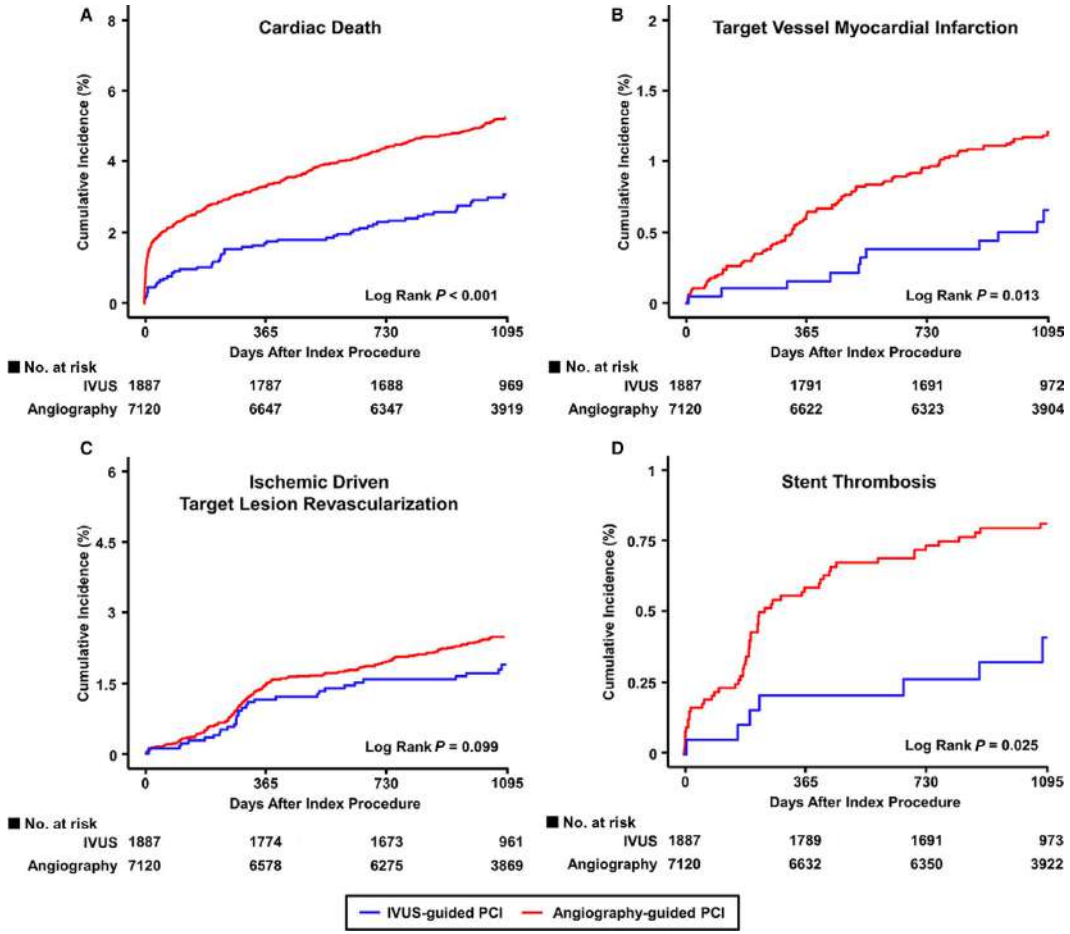

2
MSA=6.5 mm²


3
MSA=14.1 mm²


4

IVUS-guided PCI & outcome following MI





Kim Y et al. J Am Heart Assoc. 2022;11:e023481

How ICI can help during MI ?

Diagnosis

To establish precise diagnosis

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PCI guidance

To provide information for decision of PCI or not

To support complex PCI strategies

Complications management

ICI guidance for complications management during MI

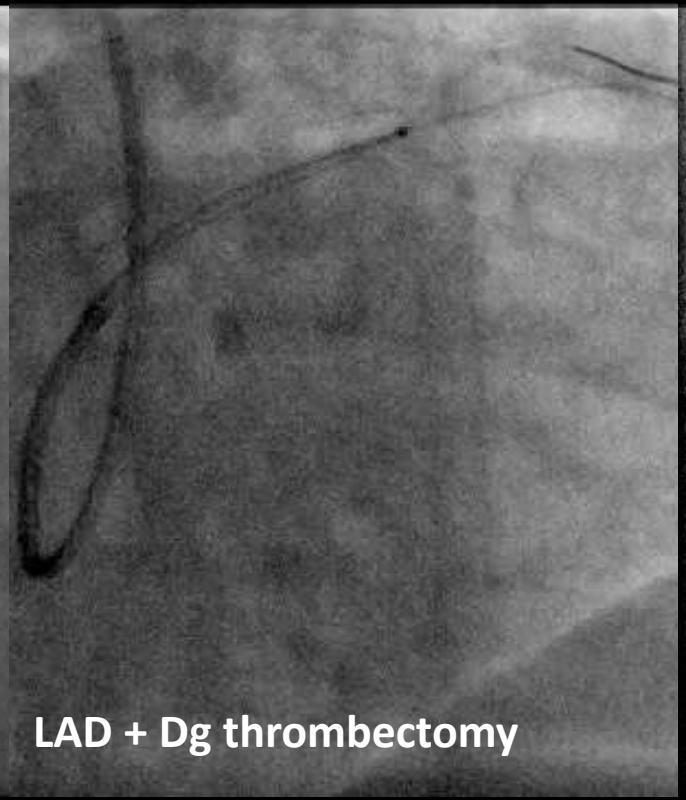
Stent abnormalities : ***underexpansion, struts malapposition, edge dissection***

Acute stent thrombosis management

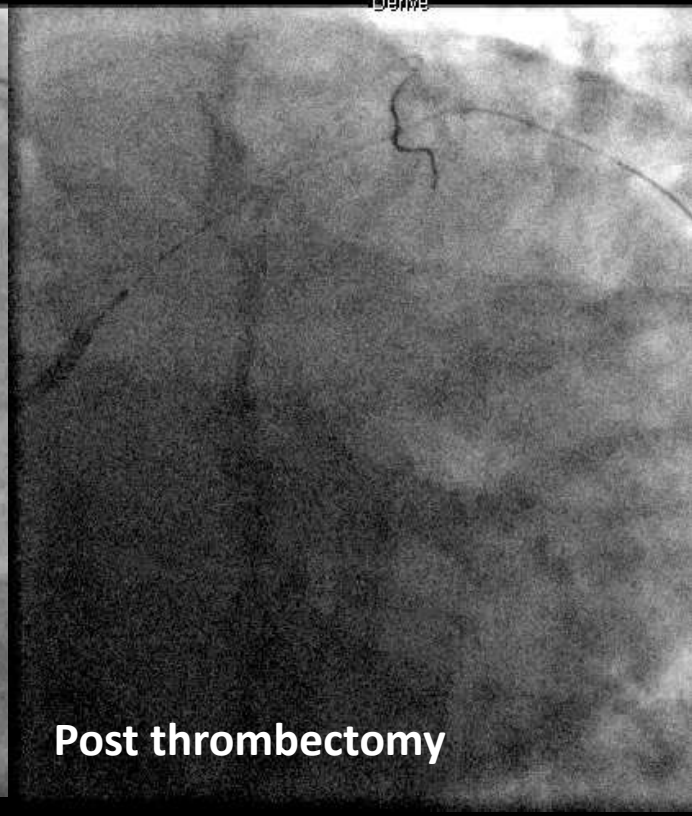
Wire position assesment (in case of dissection)

51 year-old woman / No CV risk factors / Anterior STEMI (H+90 min)

Initial angio

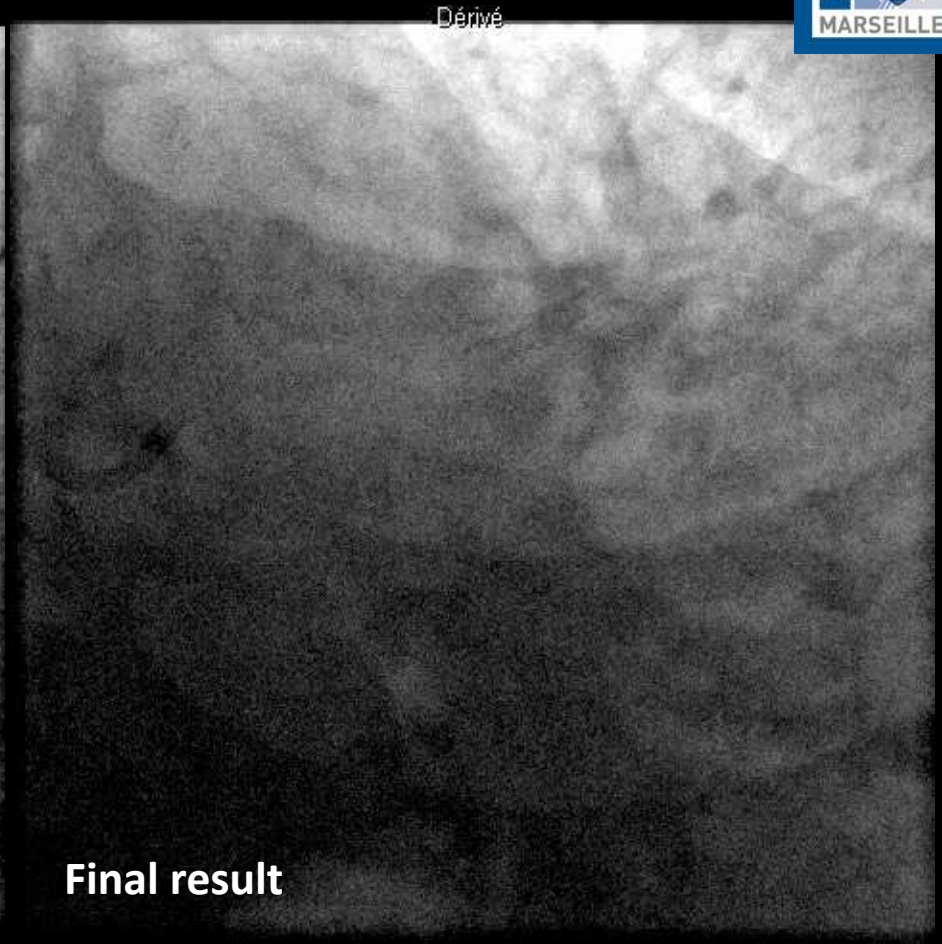


LAD + Dg thrombectomy



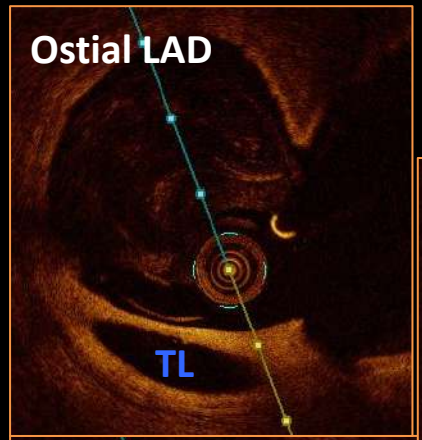
Post thrombectomy

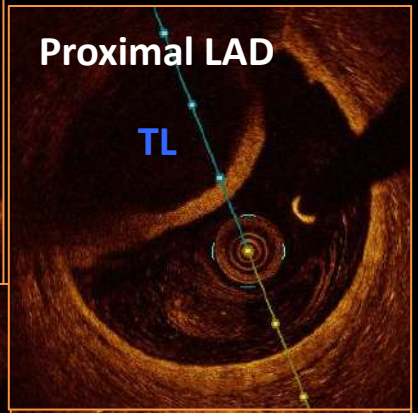
Dg Stenting

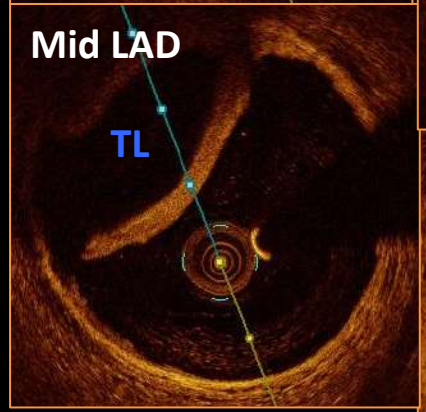


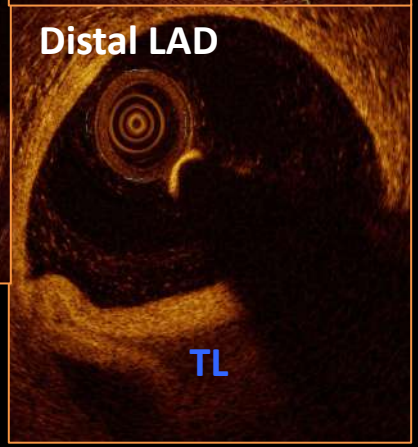
Final result

Deferred control (48h)







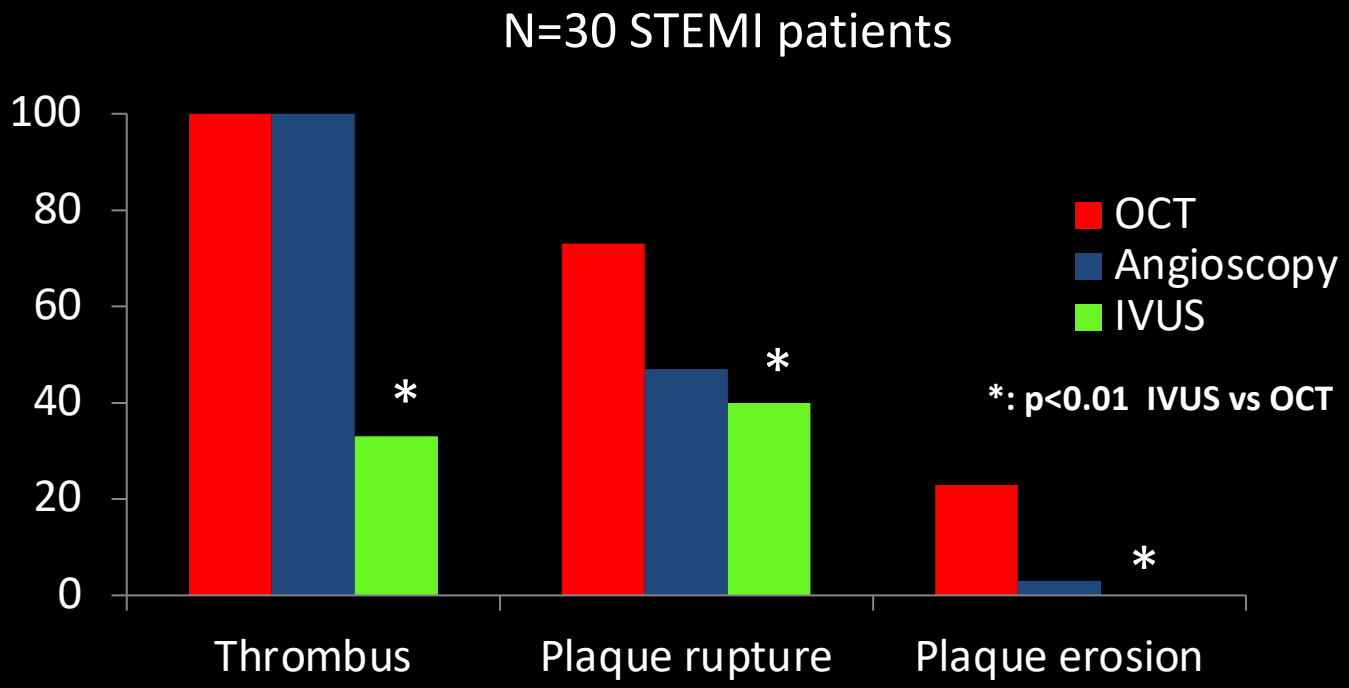


ICI in complex MI : wrap up

- ICI : not for all MI !!
- Under-used tools
- Efficient / Safe / Major impact on PCI workflow
- Extremely useful for complex diagnosis
- Mandatory for MINOCA ?
- Positive impact on outcome of STEMI/NSTEMI PCI
- Valuable addition in case of complex PCI & complications management

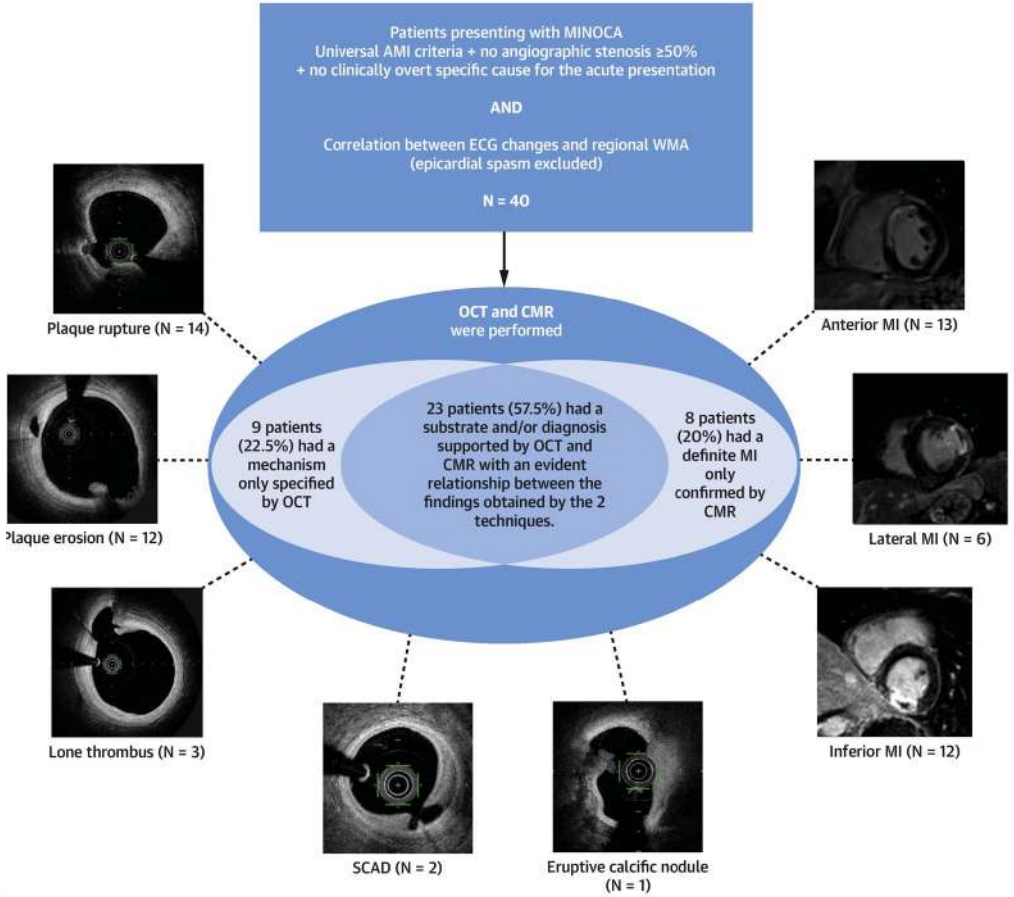
- The initial time & money investments could be rewarded by clinical benefits

OCT vs. IVUS vs. Angioscopy for underlying lesion analysis in STEMI patients



Kubo et al; , JACC 2007 (50): 10, 933-939

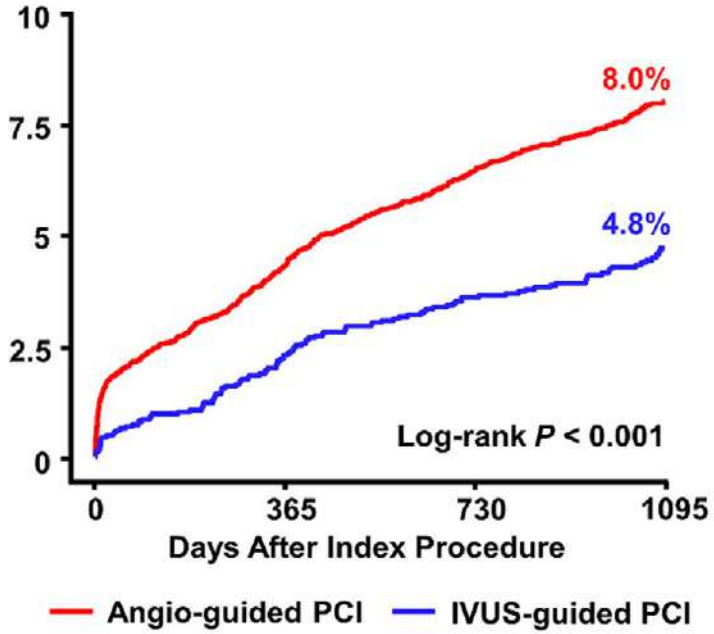
OCT and CMR for the Diagnosis of Patients Presenting With MINOCA and Suspected Epicardial Causes



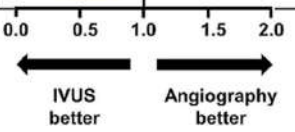
Gerbaud, E. et al. J Am Coll Cardiol Img. 2020;13(12):2619-31.

IVUS-guided PCI & outcome following MI

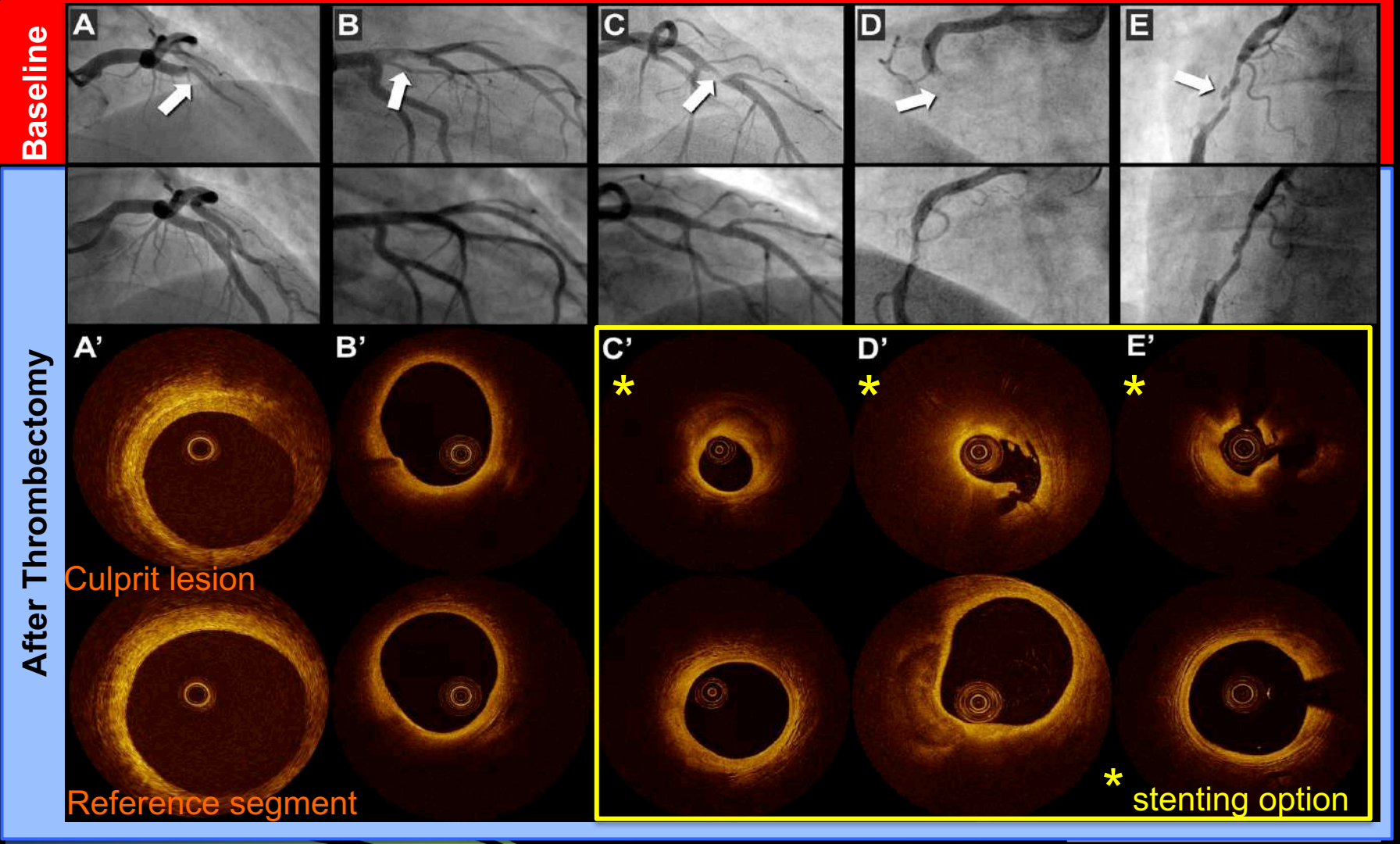
A Cumulative Incidence of Target Lesion Failure



	IVUS	Angiography	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)	*P* Value for interaction
Age					
<65 y	35/1101 (3.2)	176/3859 (4.6)	0.70 (0.49 – 1.01)		0.117
≥65 y	55/786 (7.0)	395/3261 (12.1)	0.56 (0.42 – 0.74)		
Clinical presentation					
STEMI	36/838 (4.3)	272/3703 (7.3)	0.58 (0.41 – 0.82)		0.683
NSTEMI	54/1049 (5.1)	299/3417 (8.8)	0.58 (0.43 – 0.77)		
Coronary artery					
LM disease	20/196 (10.2)	37/216 (17.1)	0.55 (0.31 – 0.94)		0.211
Non-LM disease	70/1691 (4.1)	534/6904 (7.7)	0.53 (0.41 – 0.68)		
No. of diseased vessels					
Single-vessel disease	31/901 (3.4)	223/3652 (6.1)	0.56 (0.38 – 0.81)		0.304
Multi-vessels disease	59/986 (6.0)	348/3468 (10.0)	0.58 (0.44 – 0.77)		
No. of implanted stents					
Single stent implantation	46/1120 (4.1)	359/4766 (7.5)	0.53 (0.39 – 0.73)		0.926
Multiple stents implantation	44/767 (5.7)	212/2354 (9.0)	0.63 (0.46 – 0.87)		
Lesion length					
≥35 mm	35/589 (5.9)	189/1796 (10.5)	0.56 (0.39 – 0.80)		0.683
<35 mm	55/1298 (4.2)	382/5324 (7.2)	0.58 (0.44 – 0.77)		



Kim Y et al. J Am Heart Assoc. 2022;11:e023481

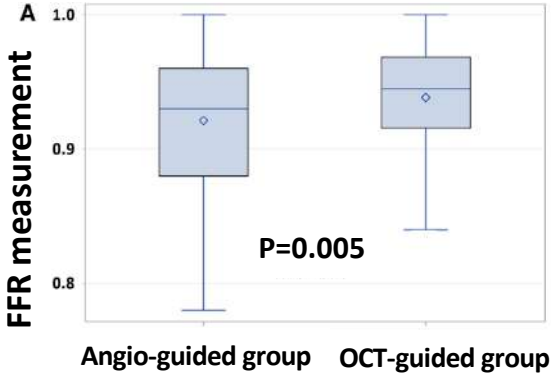


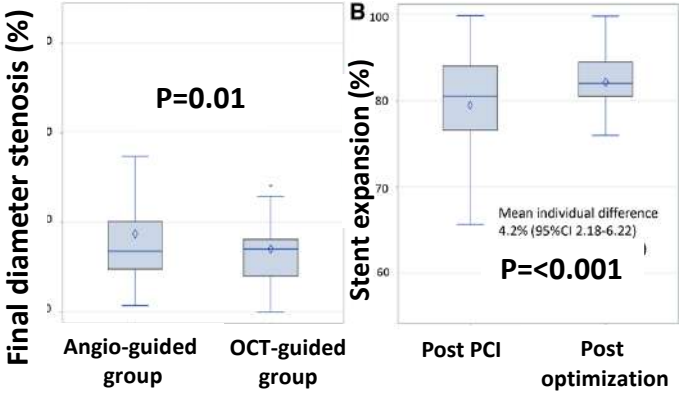
Souteyrand, Amabile et al, EuroIntervention 2015;11:895-904

What are the advantages of OCT-guided PCI in ACS ??

DOCTORS trial

Higher post PCI FFR

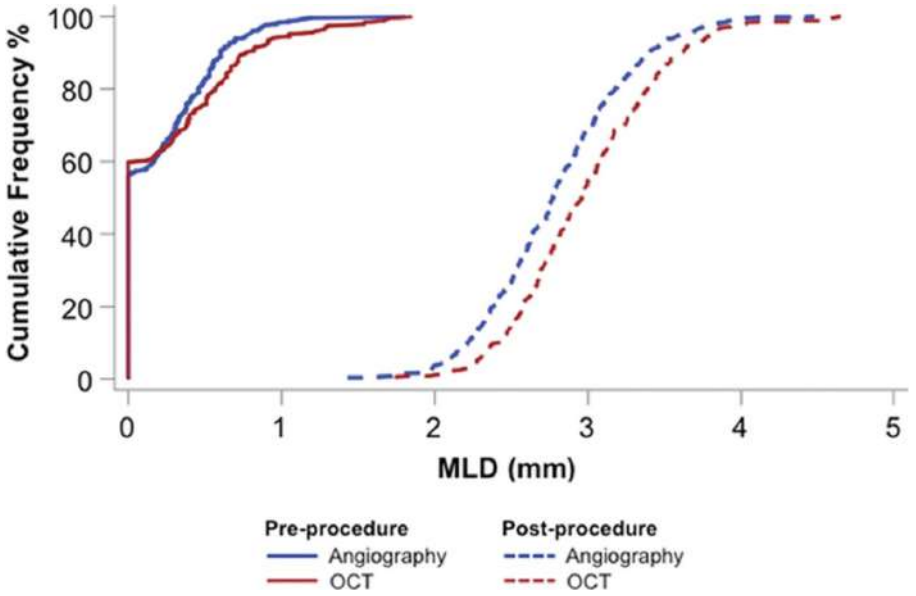




Lower post PCI residual stenosis

TOTAL trial Post hoc analysis

Larger in stent minimal luminal diameter



- Sheeth TN et al. Circ Cardiovasc Interv. 2016 Apr;9(4):e003414.
- Meneveau et al. Circulation. 2016 Sep 27;134(13):906-17

OPTical Coherence Tomography IMAging in Patients With Acute myocardiaL Infarction (OPTIMAL) (OPTIMAL)

⚠ The safety and scientific validity of this study is the responsibility of the study sponsor and investigators. Listing a study does not mean it has been evaluated by the U.S. Federal Government. Know the risks and potential benefits of clinical studies and talk to your health care provider before participating. Read our disclaimer for details.

ClinicalTrials.gov Identifier: NCT03084991

Recruitment Status : Recruiting
First Posted : March 21, 2017
Last Update Posted : June 9, 2021

See Contacts and Locations

View this study on Beta.ClinicalTrials.gov

Sponsor:
Harbin Medical University

Collaborator:
Abbott

Information provided by (Responsible Party):
Yu Bo, Harbin Medical University

Study Details | Tabular View | No Results Posted | Disclaimer | How to Read a Study Record

Study Description

Go to

Brief Summary:
The purpose of the study is to investigate the clinical outcomes, safety and cost-effectiveness of intravascular OCT imaging in patients with acute myocardial infarction undergoing percutaneous coronary intervention (PCI). About 4500 patients with acute myocardial infarction (estimated 1500 with OCT guidance and 3000 without OCT guidance during PCI) will be prospectively enrolled in 20 sites in China. The total duration of the study is expected to be 5 years, 2 years for enrolment and 3 years for follow up.

Condition or disease
Acute Myocardial Infarction

Detailed Description:
This is a prospective, multi-center, non-randomized, observational registry study of patients with acute myocardial infarction (AMI) that require catheterization. The purpose of this registry is to investigate the clinical outcomes, safety and cost-effectiveness of intravascular OCT imaging in patients with AMI undergoing PCI.The duration of the study is expected to be 5 years, 2 years for enrolment and 3 years for total follow up.The clinical study will be conducted in 20 centers in China.Approximately 4500 subjects (1500 with OCT imaging and 3000 without OCT imaging) will be enrolled in this study.Subjects will be followed up at 1, 3, 6, 12months and every 6 months afterwards up to 5 years. All