

Effect of pretreatment with Ticagrelor
on residual thrombus after PCI in
patients presenting with NSTEMI-ACS
– Preliminary result



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+ Disclosure



- Grant/Research Support: AstraZeneca Korea

Background

- Effective antiplatelet therapy is the cornerstone in treatment of patients undergoing PCI, particularly those with ACS



+ ATLANTIC Study

The NEW ENGLAND JOURNAL *of* MEDICINE

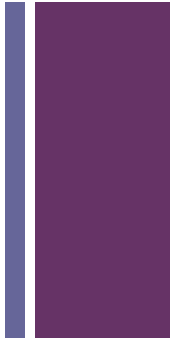
ORIGINAL ARTICLE

Prehospital Ticagrelor in ST-Segment Elevation Myocardial Infarction

Gilles Montalescot, M.D., Ph.D., Arnoud W. van 't Hof, M.D., Ph.D.,
Frédéric Lapostolle, M.D., Ph.D., Johanne Silvain, M.D., Ph.D.,
Jens Flensted Lassen, M.D., Ph.D., Leonardo Bolognese, M.D.,
Warren J. Cantor, M.D., Ángel Cequier, M.D., Ph.D., Mohamed Chettibi, M.D., Ph.D.,
Shaun G. Goodman, M.D., Christopher J. Hammett, M.B., Ch.B., M.D., Kurt Huber, M.D.,
Magnus Janzon, M.D., Ph.D., Béla Merkely, M.D., Ph.D., Robert F. Storey, M.D., D.M.,
Uwe Zeymer, M.D., Olivier Stibbe, M.D., Patrick Ecollan, M.D.,
Wim M.J.M. Heutz, M.D., Eva Swahn, M.D., Ph.D., Jean-Philippe Collet, M.D., Ph.D.,
Frank F. Willems, M.D., Ph.D., Caroline Baradat, M.Sc., Muriel Licour, M.Sc.,
Anne Tsatsaris, M.D., Eric Vicaut, M.D., Ph.D., and Christian W. Hamm, M.D., Ph.D.,
for the ATLANTIC Investigators*

+ ATLANTIC Study

–Result and Conclusion



- Pre-hospital ticagrelor administration a short time before PCI in patients with ongoing STEMI is **safe** but **does not improve pre-PCI coronary reperfusion**
- However, **reduce the risk of post-PCI stent thrombosis**

+ The Reason why Failure of ATLANTIC study

- Short antiplatelet action time
 - median time from randomization to CAG: 48 min
 - median time difference between the two tx. Strategies: 31 min
- Thrombus composition
 - Fibrin-rich thrombus(Red thrombus) in STEMI vs Platelet rich thrombus(White thrombus) in NSTEMI ACS
 - The presence of white thrombus has been more frequently associated with NSTEMI ACS whereas red thrombus has been implicated in STEMI



+ Hypothesis



- the benefit of ticagrelor immediate loading at ER
 - decreased thrombus burden both prior to and in the immediate aftermath of PCI
- Reducing intracoronary thrombus
 - is clinically important
 - Angioplasty and stenting during PCI can result in distal embolization of thrombotic material

+ Rationale



- Ticagrelor
 - Inhibition of platelet aggregation (IPA)
 - reaches 80% at 1 hour and maximum effect at 2 hours
 - vs 20% and 4 hours with a 600mg loading dose of clopidogrel

+ Primary Objective:

- To determine the antiplatelet efficacy of ticagrelor

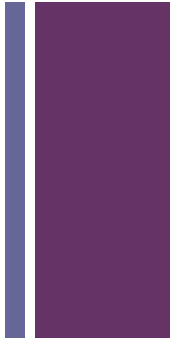
- **immediate initiation**

vs

- **at the time of PCI**

in patients
presenting with
NSTE-ACS

- By measuring residual thrombus burden **after** PCI in patients presenting with ACS with OCT



+ Inclusion criteria



■ Patient Characteristics

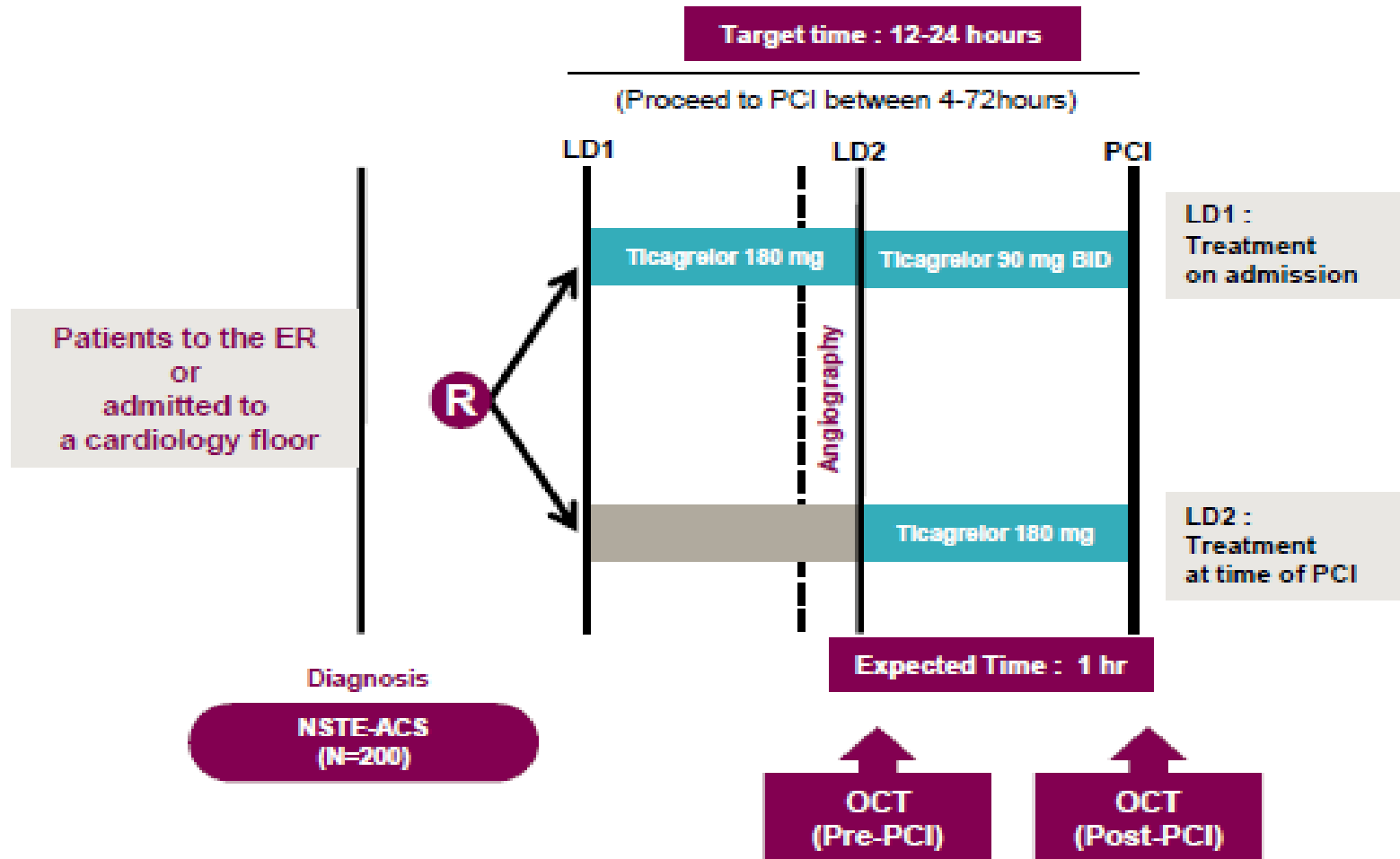
Males and non-pregnant females > 18 and \leq 79 years of age presenting with NSTEMI-ACS defined as having 2 of the following criteria:

- a. Signs and sx c/w UA (lasting greater than 20 minutes) either at rest or with minimal exertion
- b. ECG changes indicative of new ischemia
- c. Levels of cardiac biomarkers above the upper normal limit

■ Lesion Characteristics

1. De novo lesions in native coronary arteries found by diagnostic coronary angiography
2. Angiographic stenosis <100%
3. Reference vessel diameter
 - 2.5 mm – 4.0 mm by visual estimation

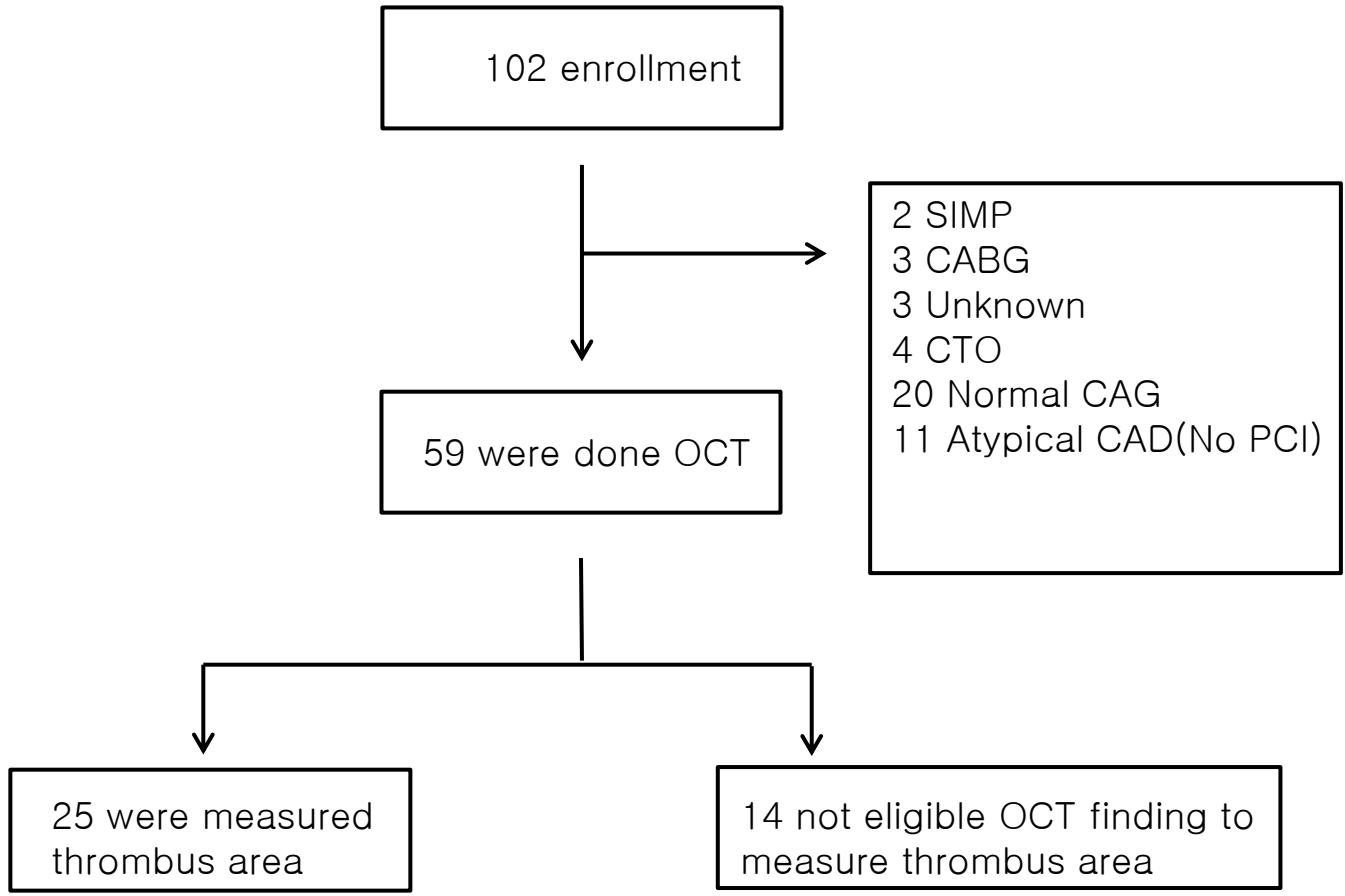
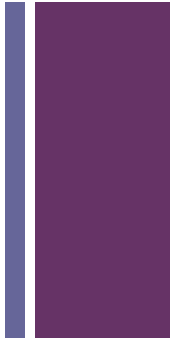
Study Design



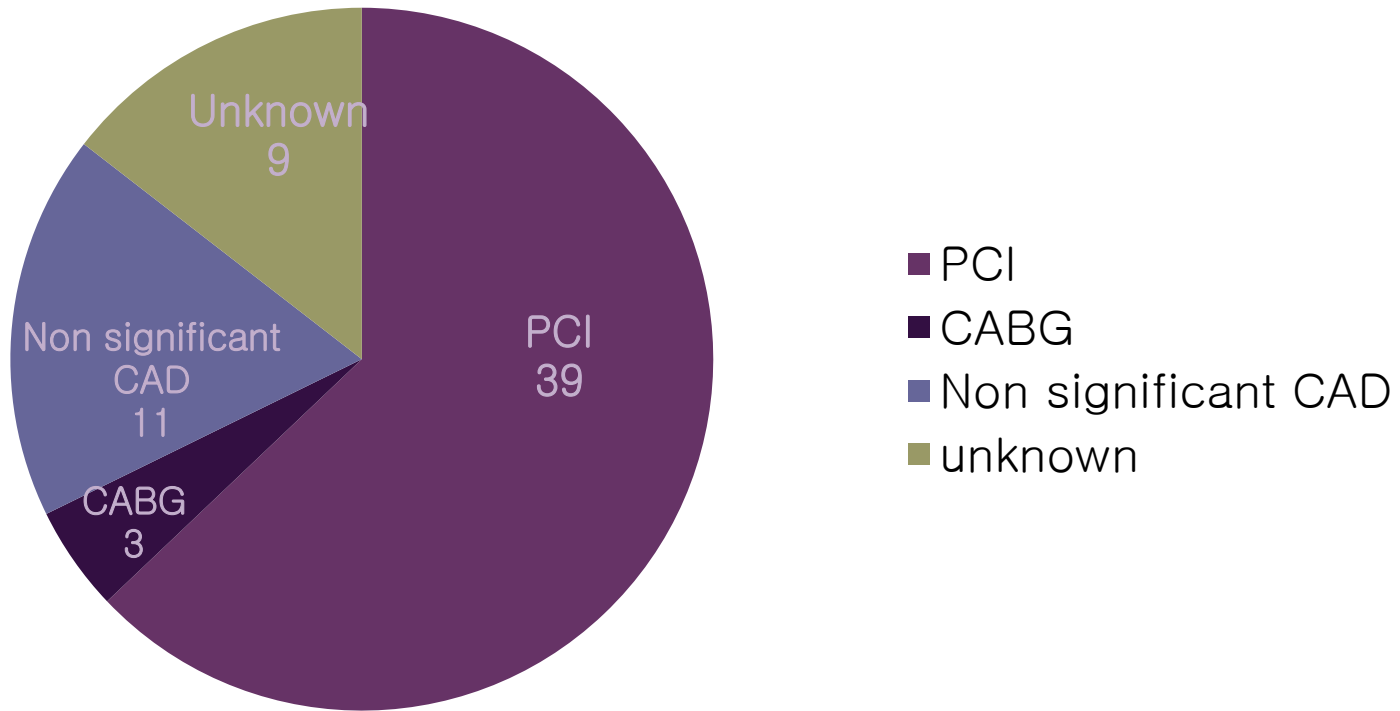
Treatment Regimen The loading dose of ticagrelor will be 180mg. Patients randomized to pretreatment will received a maintenance dose of 90mg every 12 hours until they proceed to catheterization. Post-procedure, the patient will be maintained on ticagrelor at the discretion of the treating cardiologist

ESR-14-10708

			2017-07-24	2017-08-04	2017-09-04	2017-09-29	2017-10-23	2017-11-30
기관 번호	기관명	목표대상자 수(경쟁등록)	대상자 등록 수	대상자 등록 수	대상자 등록 수	대상자 등록 수	대상자 등록 수	대상자 등록 수
A	강동경희대학교병원	30	38	40	41	44	48	56
B	경희대학교병원	30	0	1	1	1	1	6
C	중앙대학교병원	20	1	1	1	1	1	2
D	전남대학교병원	20	3	3	3	3	3	3
E	제주대학교병원	20	2	2	2	6	6	7
G	동아대학교병원	20	0	0	0	0	0	0
H	계명대학교 동산병원	20	15	15	16	18	19	24
I	경상대병원	20	4	4	4	4	4	4
			63	66	68	77	82	102



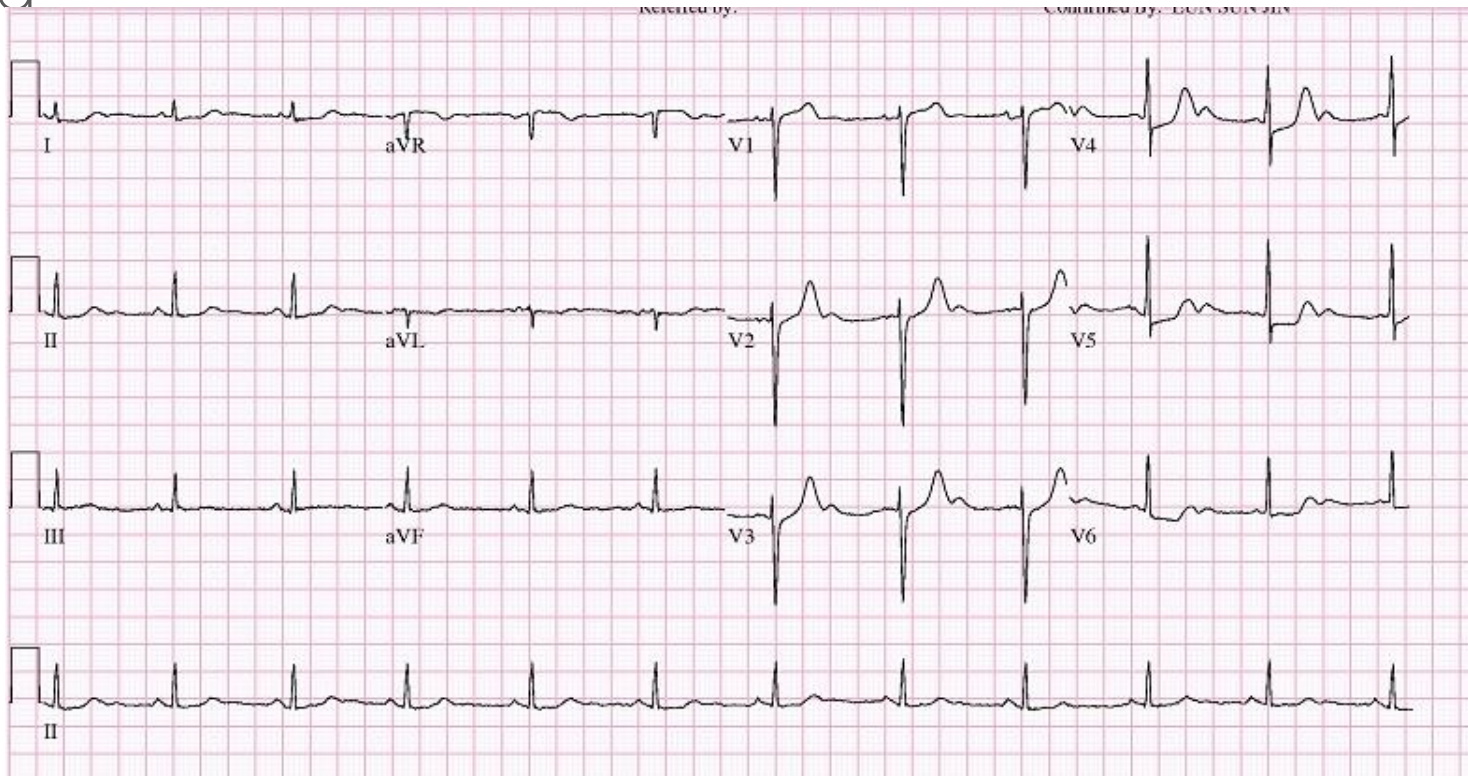
+ Treatment Strategy According to CAG Finding



+

Male, 77yo, NSTEMI-ACS, Tn I : 0.250 ng/mL

■ EKG



+ CAG



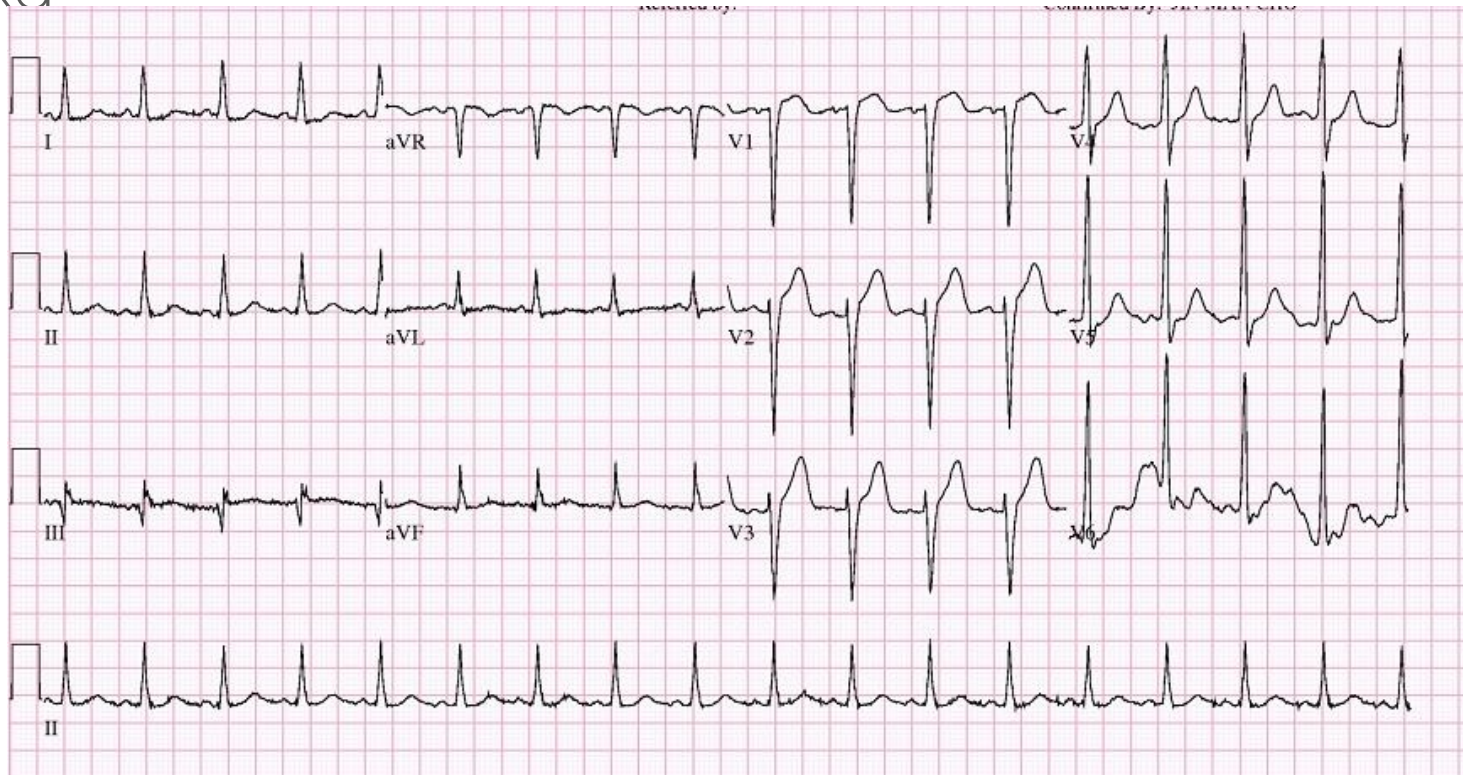
+ After Stenting



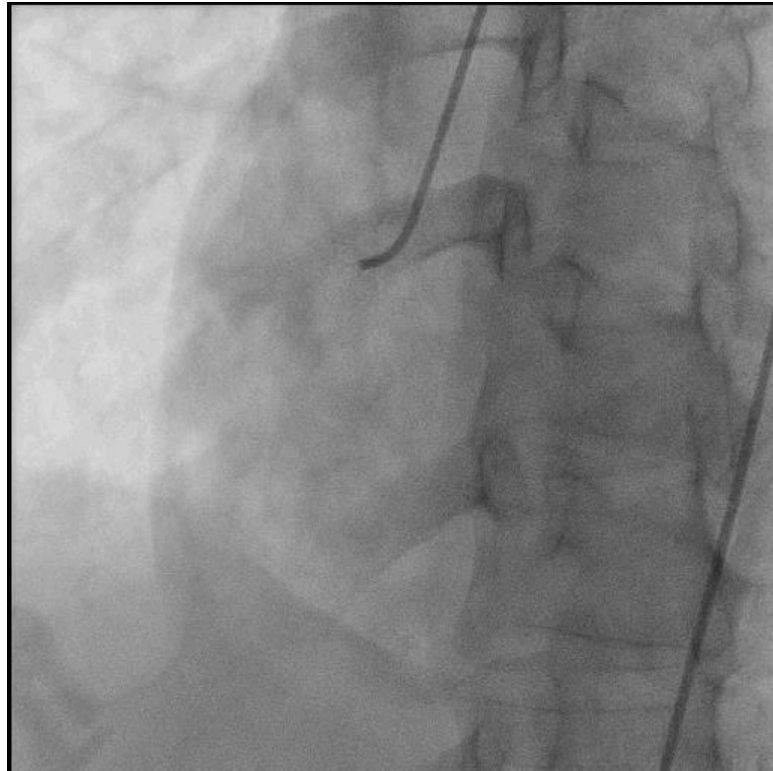
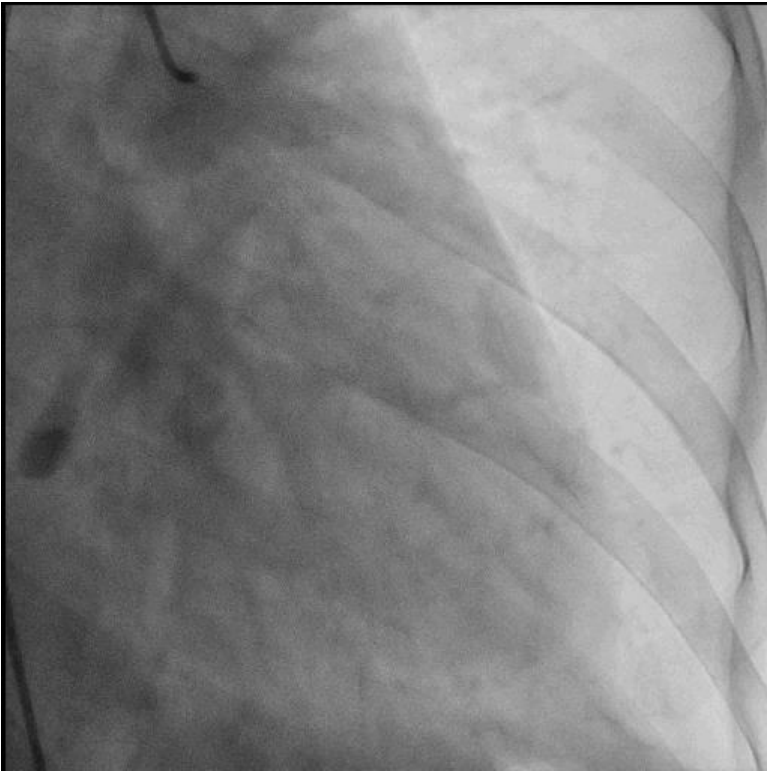
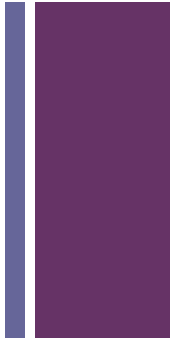
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Female, 44yo, NSTEMI-ACS, Tn I : 1.4
ng/mL

■ EKG



+ CAG



+ Result

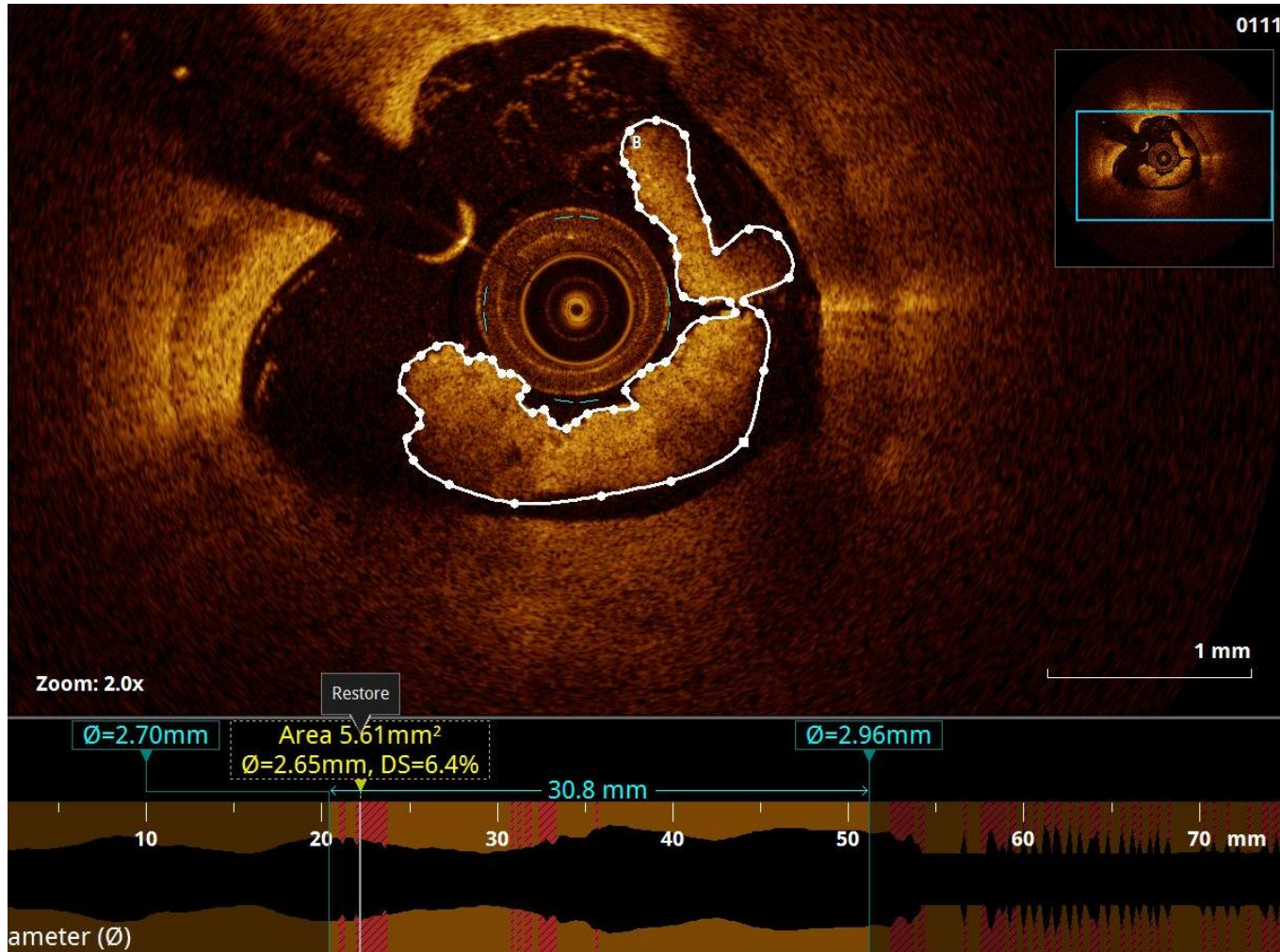
Baseline Clinical Characteristics

	Cath lab loading group (N = 32)	ER loading group (N = 30)	P-value
Age(yr)	62.16(±9.98)	62.23(±8.60)	0.97
sex – Male (%)	26(81.2)	20(66.7)	0.19
Previous medical conditions			
Hypertension - no.(%)	12(37.5)	12(40)	0.84
Diabetes mellitus - no.(%)	7(21.9)	7(23.3)	0.89
Dyslipidemia - no.(%)	4(12.5)	2(6.7)	0.44
CVA - no.(%)	0(0.0)	2(6.7)	0.14

Lab Findings

	Cath lab (N = 32)	ER (N = 30)	P-value
CK-MB, at peak, mg/dL	61.08	28.4	0.071
Troponin-I, at peak, mg/dL	5.25	2.82	0.198
LVEF(%)	56.66	60.45	0.193
PRU	244.13	76.00	<0.05
From loading to CAG interval(hr)		14.60	0.06
OCT done - no.(%)	22(68.8)	17(56.7)	0.325
Presence of thrombus on OCT (%)			
Pre-PCI	13(59.1)	8(42.1)	0.293
Post-PCI	12(54.5)	6(31.6)	0.171

+ Thrombus Size Measurement -Area Max



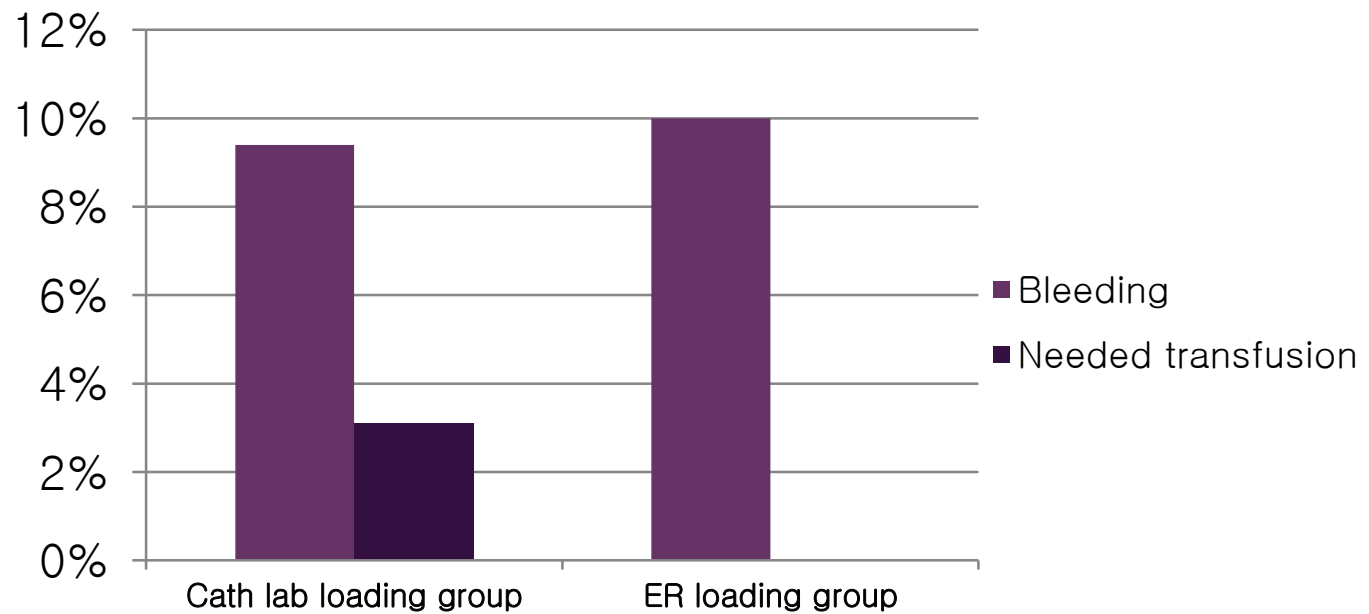
+ Thrombus Area



Pre PCI		
ER(N=12)	CATH(n=13)	<i>p</i>
0.65(±0.44)	0.83(±0.61)	<i>NS</i>

Post stenting		
ER(N=12)	CATH(n=13)	<i>p</i>
0.64(±0.36)	0.41(±0.27)	<i>NS</i>

Complication—Minor bleeding



+ Summary



- NSTEMI-ACS consist of variety of diseases other than significant coronary artery narrowing which need PCI
- Pretreatment of ticagrelor on arrival resulted in better platelet inhibition at the time of PCI
- No difference between pretreatment and on-site treatment in terms of thrombus size and incidence of peri-procedural myocardial infarction

+ Limitation and Discussion



- Small sample size
- Thrombus is 3D structure
 - **Need Volumetric analysis of thrombus**
- Pre-dilatation to introduce OCT catheter will alter the size and shape of the thrombus—2ndary Outcome

+ Corelab OCT analysis



7.4.1. Yr1 cost: 30,000.000 USD to MGH

7.4.2. Payment dates and methods shall be as follows:

Year	Payment Date	Amount (USD)
Yr1	Within 30 days of signing date after Party A makes Yr1 contract with evaluation of Yr1	\$30,000.000

7.5. Party A will pay to the Party B's designated bank account. Party B should notify if the bank account is changed.

Please make payment to the following:

Bank Name: Bank of America

Bank ABA Routing #: 0260-0959-3

SWIFT Address: BOFAUS3N

Account Name: The Mass General Hospital

Account Number: 000051279004

Reference Number: 2017A053401/Jang

Bank Address: 100 Federal Street

Boston, MA 02110, US

Hospital Contact: Jason Mombourquette

Manager of Cash & Collections

jmombourquette1@partners.org

Thank you for Attention!



12/27/2017