CHANGING OUTCOMES
CHANGING LIVES

CHOOSE TO REMOVE

enVast™

PHYSICIAN PRESENTATION

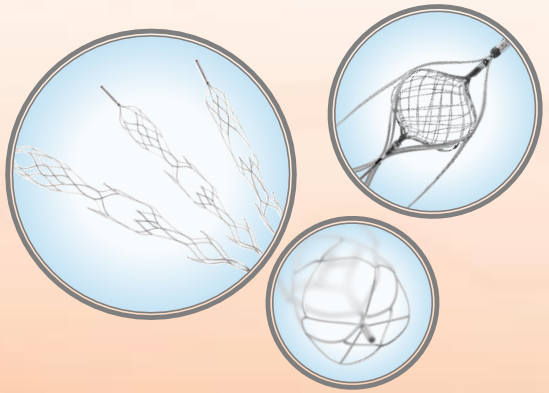
VESALIO CHANGING OUTCOMES CHANGING LIVES

2017
Founded by physicians treating stroke

- NeVa design freeze and establishment of Vesalio in 2017
- 34 Issued & 50+ Filed Patents

2018
Set on resolving vascular occlusions

- Commercial launch of NeVa in Europe



2022
Improving, perfecting, diversifying portfolio

- U.S. FDA Approval for Vasospasm (NeVa VS)
- CE marking of NeVa NET – the 1st SR device with integrated distal filter in thrombectomy
- CE marking of enVast - the 1st SR-type device approved in STEMI

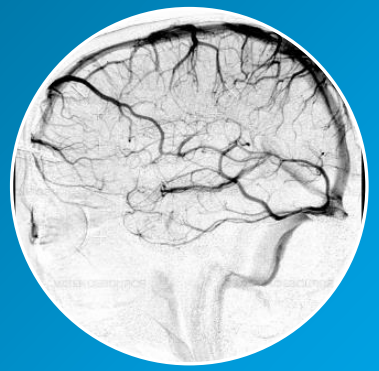
2023
Commercial Expansion and Success

- International commercialization in over 50 countries, expanding into new global regions
- U.S. commercialization with NeVa VS
- 10000th device milestone

Vesalio is advancing the care of patients suffering from vascular occlusion by providing physicians superior technology designed to improve clinical outcomes

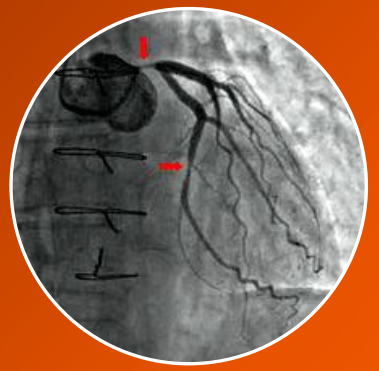
THE CLOT BURDEN: A BROAD ANATOMICAL CONCERN

Clots create vascular occlusions in the brain, heart, lungs, & limbs



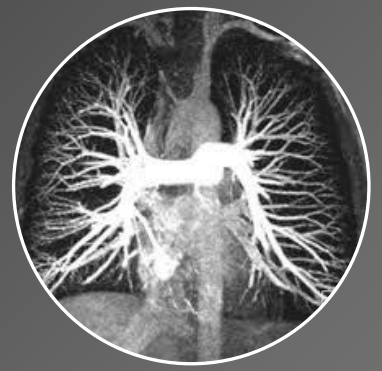
Neurovascular

Clots block circulation to an artery in the brain causing damage and loss of neurological function



Cardiovascular

Clots restrict blood flow to a major artery in the heart, causing a heart attack and muscle damage



Peripheral Vascular

Clots can block flow anywhere in the body resulting in additional acute conditions such as **Pulmonary Embolisms**

CORONARY ARTERY DISEASE: #1 CAUSE OF DEATH WW

Myocardial Infarction (MI) **≈ 17 mio.** annual incidence WW

38%
of MIs[1]

ST-elevation myocardial infarction (STEMI)

The most severe type of CAD, occurs when a major artery is completely blocked

≈6.5 mio.
annual incidence

28%
of STEMIs[2]

STEMI with large thrombus burden

≈1.8 mio.
annual incidence

x2 - x4
higher risk of major adverse events[3]

x2
higher risk of mortality

91%
angiographic presence of thrombus[4]

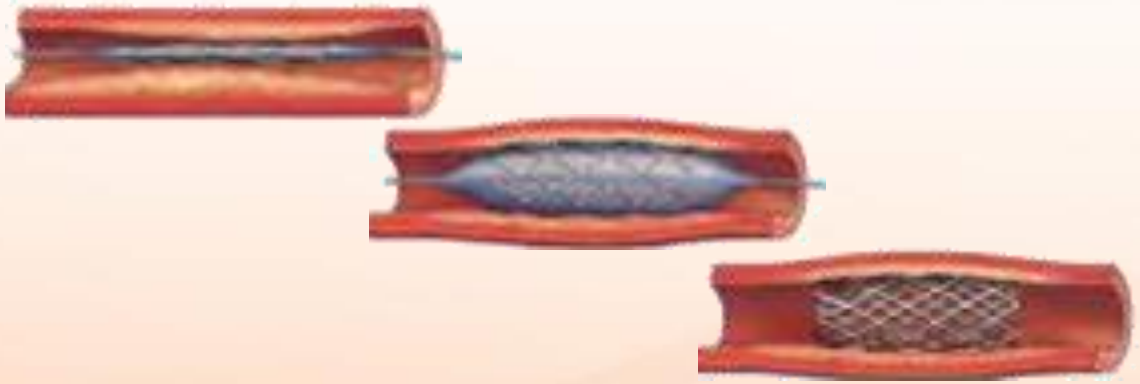
There is no established technique for managing LTB in acute coronary syndrome

1. https://my.clevelandclinic.org/health/diseases/22068-stemi-heart-attack
2. Scarparo P. et al., Impact of Large Thrombus Burden on Very Long-Term Clinical Outcomes in Patients Presenting With ST-Segment Elevation Myocardial Infarction. J Invasive Cardiol. 2021 Nov;33(11):E900-E909
3. Singh M. et al.,. Influence of coronary thrombus on outcome of percutaneous coronary angioplasty in the current era (the Mayo Clinic experience). Am J Cardiol 2001;88(10):1091-6
4. Kumar V. et al., Large intracoronary thrombus and its management during primary PCI. j.ihj.2020.11.009

ENDOVASCULAR TREATMENT MODALITIES FOR STEMI

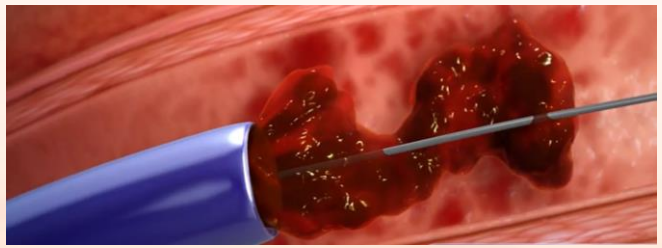
Standard endovascular treatment involves opening the artery with balloon & stent

- Outcomes remain poor in ~50% due to residual thrombus in the vessel



Endovascular aspiration continues to be debated

- CHEETAH, TOTAL, TASTE, TAPAS studies showed success in clot removal but also increased risk of AIS and variable outcomes

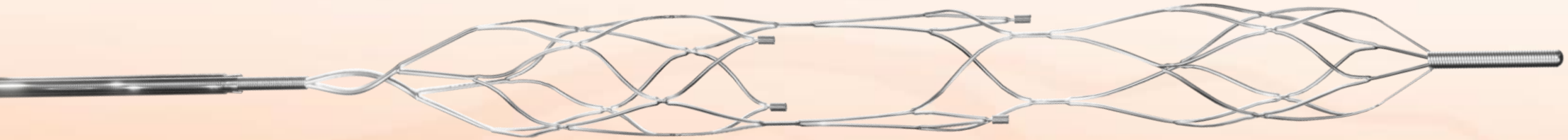


Studies show thrombus aspiration alone does not improve reperfusion or outcomes and bears higher potential for stroke

Neumann FJ, Sousa-Uva M, Ahlsson A, Alfonso F, Banning AP, Benedetto U, Byrne RA, Collet JP, Falk V, Head SJ, Juni P, Kastrati A, Koller A, Kristensen SD, Niebauer J, Richter DJ, Seferovic PM, Sibbing D, Stefanini GG, Windecker S, Yadav R, Zembala MO, Group ESCSD. 2018 ESC/EACTS Guidelines on myocardial revascularization. Eur Heart J 2019;40(2):87-165.

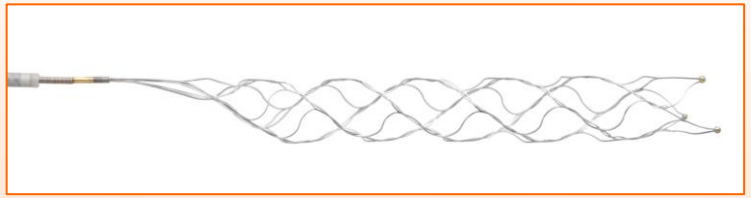
enVast™

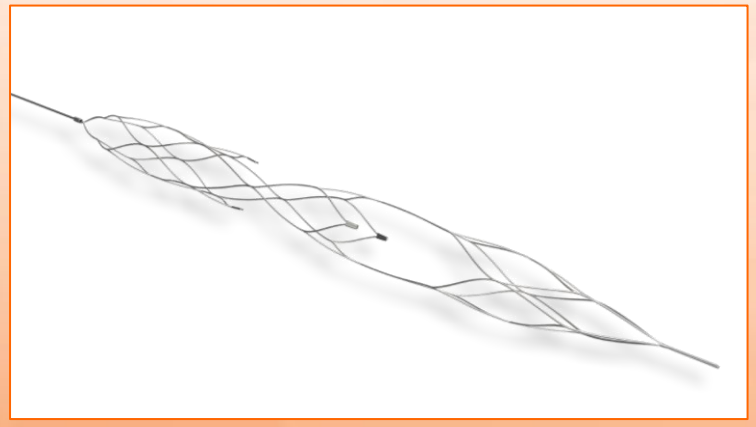
THE FIRST AND ONLY CE-APPROVED STENT-RETRIEVER FOR CORONARY THROMBECTOMY



CHOOSE TO REMOVE

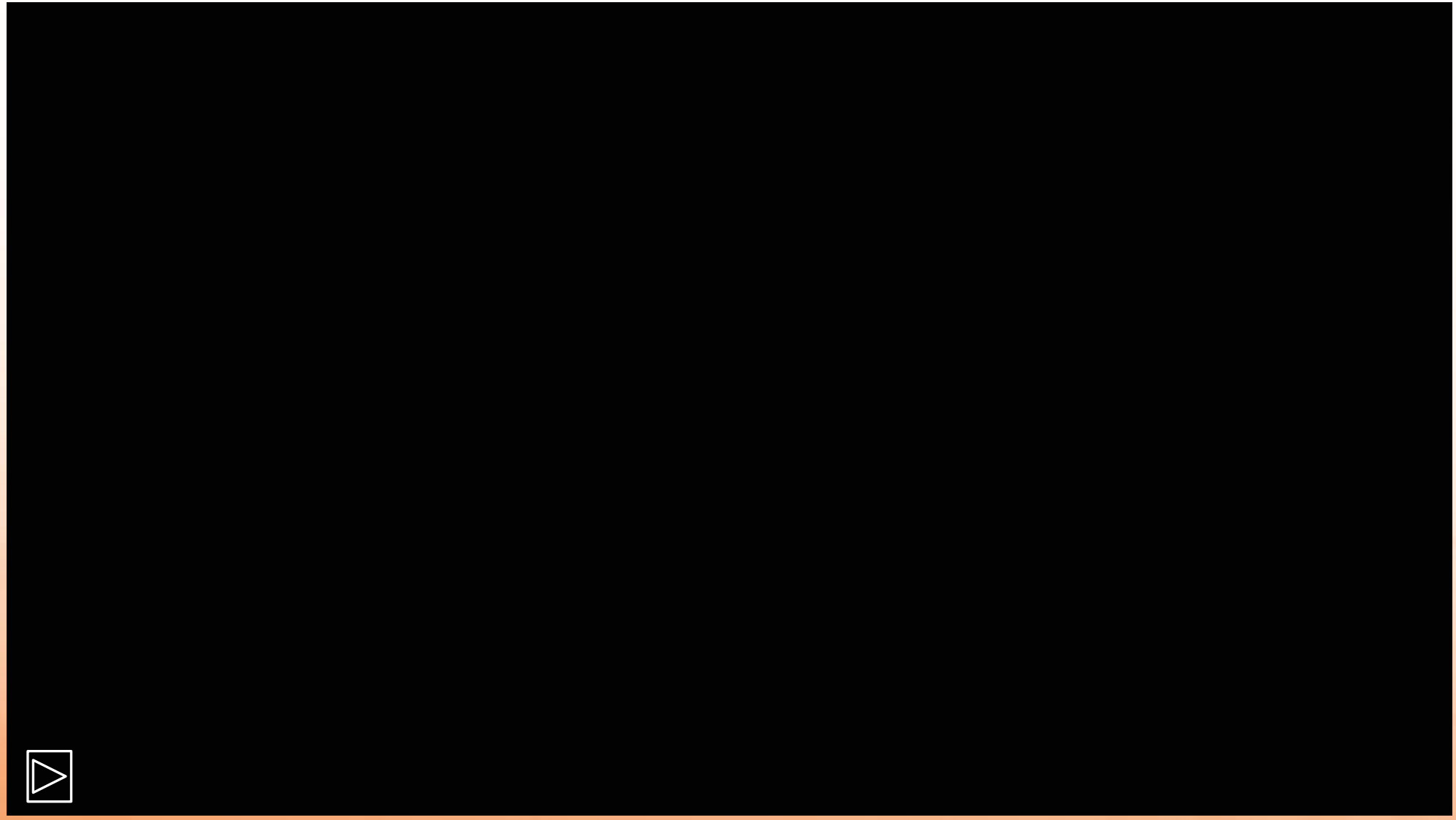
WHAT IS A STENT RETRIEVER





- A stent-retriever is a medical device
  - with a cylindrical mesh structure made of self-expanding nitinol
  - mounted on a wire
  - deployed within a micro-catheter
- Once at the site of the blood clot, the stent is released from within the catheter and self-expands within the thrombus
- This immediately pushes the clot against the wall of the artery, instantaneously reestablishing blood flow to the brain in most cases
- Standard of care for Ischemic Stroke

THE 1ST AND ONLY CE-APPROVED STENT RETRIEVER FOR CORONARY ANATOMY



enVast™ THE RATIONALE

1. TREAT ALL LTB LESIONS

FROM SOFT CLOTS
THAT EASILY FRAGMENT
TO HARD, FIBRIN-RICH CLOTS
THAT CANNOT BE REMOVED

2. IMPROVE PROCEDURAL PERFORMANCE

A REAL SOLUTION FOR HIGH
CLOT BURDEN SITUATIONS

3. PROVIDE EASE OF USE

SYNERGISTIC WITH
ASPIRATION

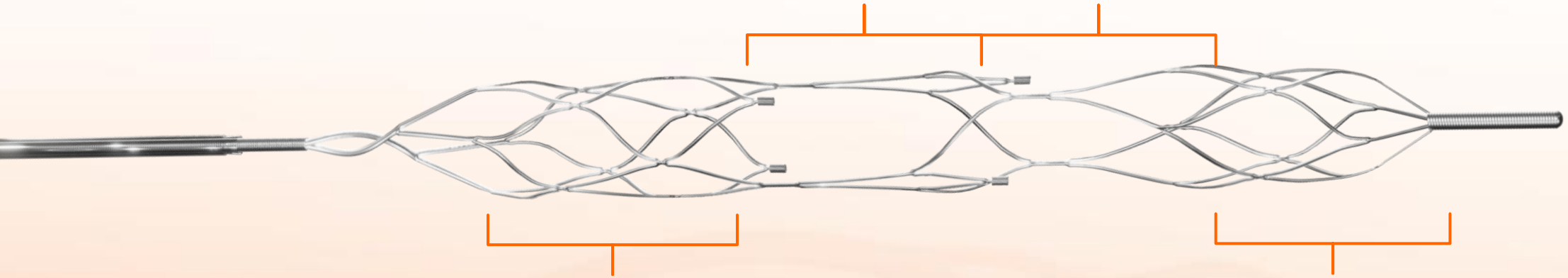
Strive to achieve better patient outcomes

DROP ZONE™ TECHNOLOGY

A BALANCED DESIGN FOR SMOOTH TRACKING AND SAFE RETRIEVAL

DROP ZONES

entry points for large, organized thrombi



FLOW RESTORATION ZONE

radial force optimized for artery apposition

CLOSED DISTAL BASKET

clot retention inside structure

DESIGNED FOR

RAPID, HI-FLOW REPERFUSION

enVast™ FIRST IN HUMAN

- Two tertiary centers in Switzerland (Bern, Lugano)? 61 consecutive ACS patients with LTB (TTG ≥ 3)
- All efficacy data core-lab abjugated by an independent center

EFFICACY OUTCOMES

- enVast deployment was associated with immediate reperfusion in 85% and TIMI-3 flow in 74% of the patients with TIMI 0 after wire insertion
- IMI-3 increase from 31.7% to 90% after enVast (*p <.001*)
- STE Resolution (≥50%) in **71.7%** of patients
- Complete STE Resolution (≥70%) in 43.5% of patients
- enVast retrieved macroscopic thrombotic material in 53% of the cases
- enVast use decreased the angiographic thrombus burden to ≤2 in 57% of the patients.
- MBG 0-1 was detected in 65% of patients at baseline and in 27% after enVast use *(p<.001)*

SAFETY OUTCOMES

- Cardiovascular death in 2 (3.3%) patients (in cardiogenic shock at admission)
- No major procedure-related adverse events (such as: coronary dissection, coronary perforation, cardiac tamponade, coronary occlusion, life threatening arrhythmias)
- 14 *(23%)* non-flow-limiting coronary spasms (resolved with intracoronary nitrates)
- 1 *(1.6%)* unplanned revascularization at 30 days (stent under-expanded)
- 1 *(1.6%)* case (without continuous aspiration) of side-branch embolization requiring additional stent retrieval (resulting in complete vessel reperfusion)
- 1 *(1.6%)* transient ischemic attack at day 29, after a conventional staged PCI

enVast in combination with aspiration proved safe and effective in removing coronary thrombus and allowed immediate prompt restoration of flow in a high proportion of patients with ACS and LTB

ONGOING CLINICAL PROJECTS BY VESALIO

NATURE TRIAL - enrolling

- A prospective, multi-center, randomized trial
- Up to 150 subjects at 8 sites (CH, IT)
- Comparing enVast + conventional tX to conventional tX alone

- enVast to be deployed as the first measure to obtain reperfusion at the occlusion site up to 3 times
- Conventional Treatment defined as: (ballooning, manual aspiration thrombectomy, stenting)

ENVAST REGISTRY – in planning

- A prospective, multi-center registry
- Up to 200 subjects at up to 15 sites
- Assessing the efficacy and safety of enVast + conventional tX

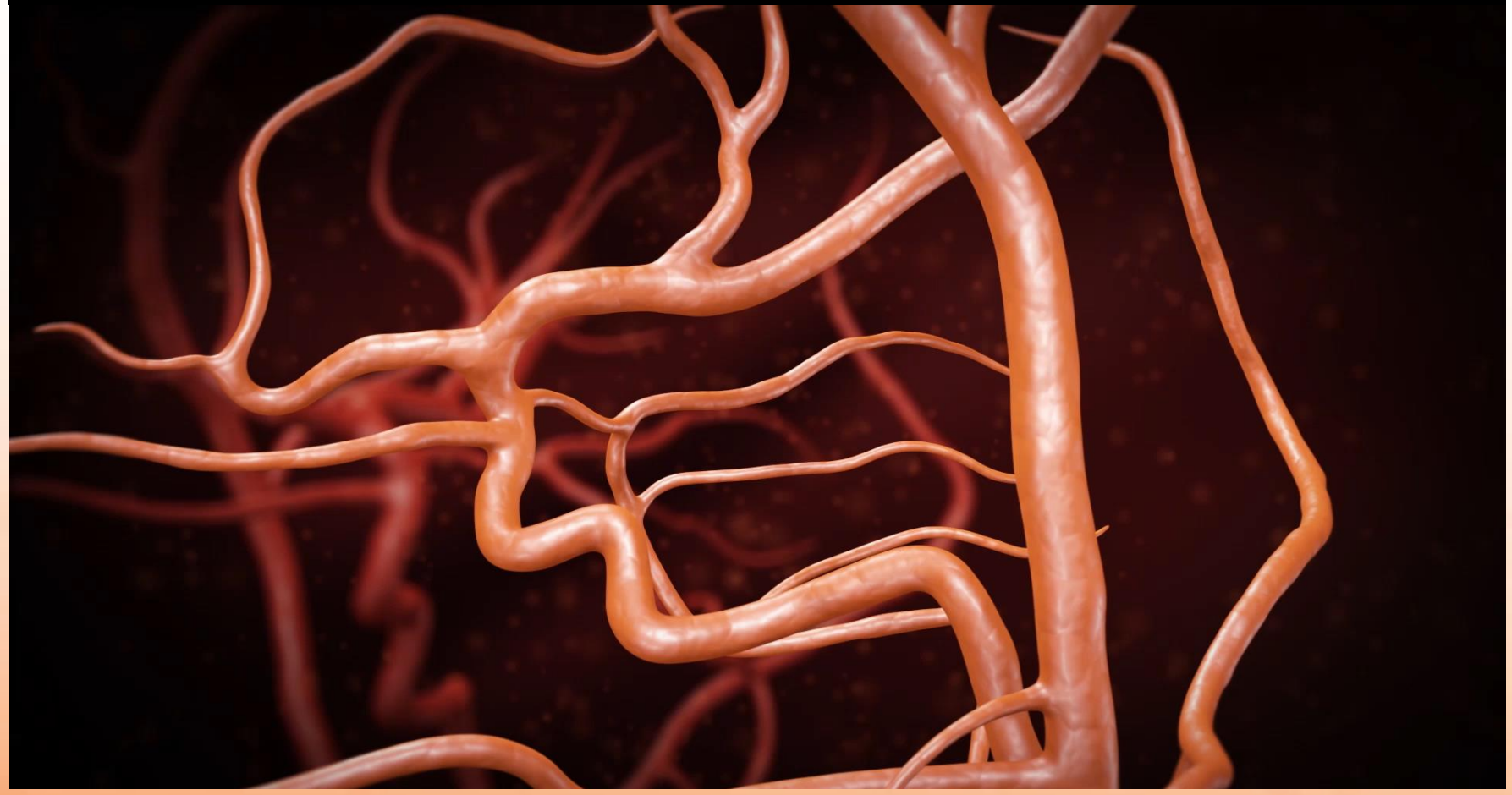
PROCEDURE STEPS

CHOOSE TO REMOVE

enVast™

THE 1ST AND ONLY STENT RETRIEVER CE-APPROVED FOR CORONARY ANATOMY

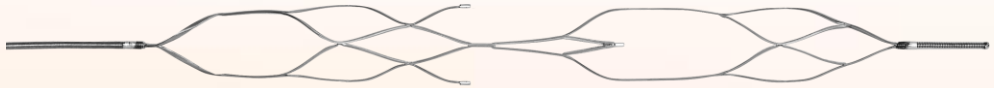
This animation shows enVast in cerebro-vascular anatomy & intervention

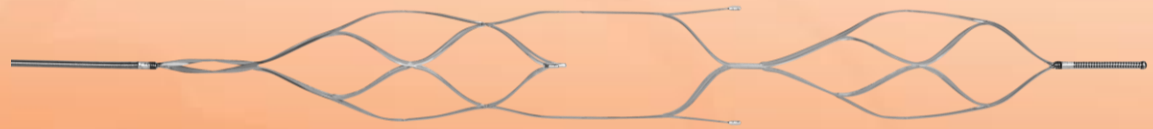


enVast™ CHOOSE TO REMOVE

- Choose an enVast size with labelled diameter that approximates the target vessel diameter

Product Name	Code	Maximal diameter	Working Length	Full Length	Drop Zones	Pusher Wire	Recommended Vessel Diameter (mm)	Min MC inner diameter
enVast 4.0 x 30	EV-4030-F2RR	4.0 mm	30 mm	39 mm	2	180 cm	≥ 2.0 & ≤ 3.5	.021”
enVast 4.5 x 37	EV-4537-F2RR	4.5 mm	37 mm	57 mm	2	180 cm	≥ 2.0 & ≤ 4.5	.021”
enVast 4.5 x 46	EV-4546-F3RR	4.5 mm	46 mm	66 mm	3	180 cm	≥ 2.0 & ≤ 4.5	.021”
enVast 6.0 x 35	EV-6035-F2RR	6.0 mm	35 mm	55 mm	2	180 cm	≥ 3.5 & ≤ 6.0	.027”





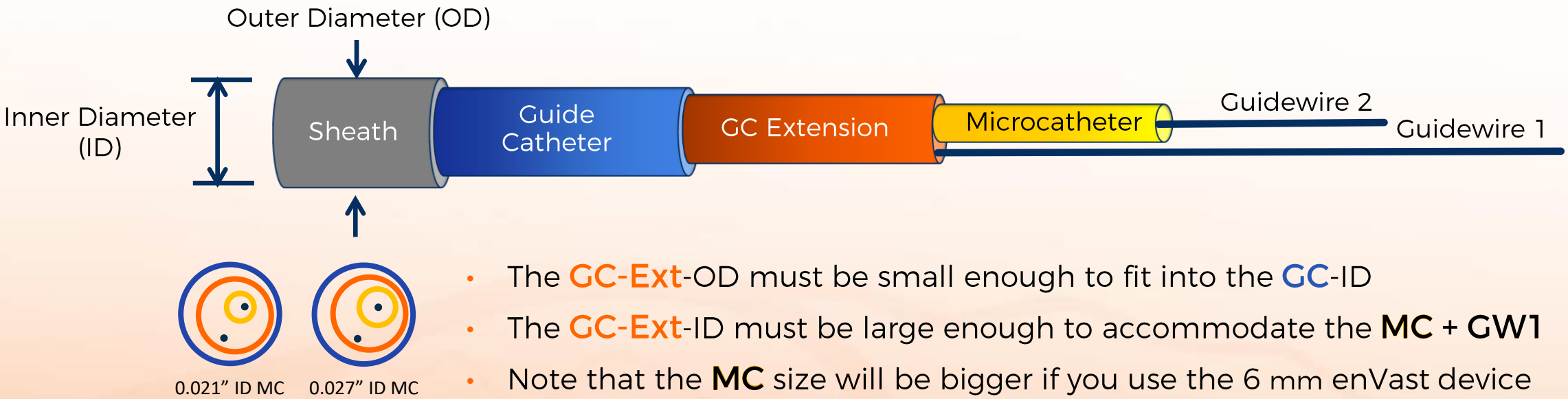
MICROCATHETER CONSIDERATIONS

- Choose a microcatheter size compatible with the enVast size chosen for the procedure

4.0 & 4.5 mm enVast sizes are compatible with microcatheters with min ID of 0.021”	6.0 mm enVast size is compatible with microcatheters with min ID of 0.027”
Via – 0.021”	Marksman – 0.027”
Headway – 0.021”	Via – 0.027”
TrevoPro – 0.021”	Phenom – 0.027”
Phenom – 0.021”	
Rebar 18 – 0.021”	
Velocity – 0.025”	
Marksman – 0.027”	
Via – 0.027”	
Phenom – 0.027”	

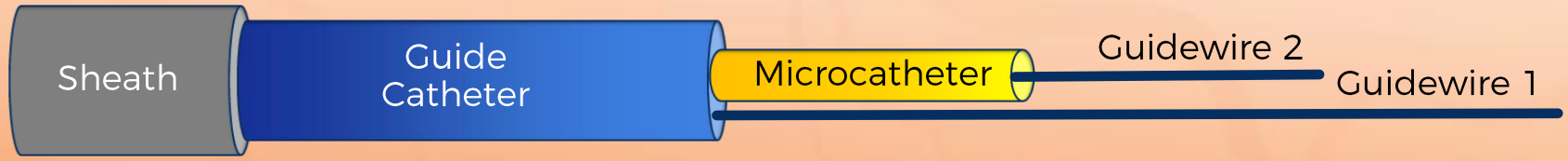
OTHER ACCESS CONSIDERATIONS

- Depending on the location of the lesion, you may choose to use:
  - A Guide Catheter + A Guide Catheter Extension: If clot is distal

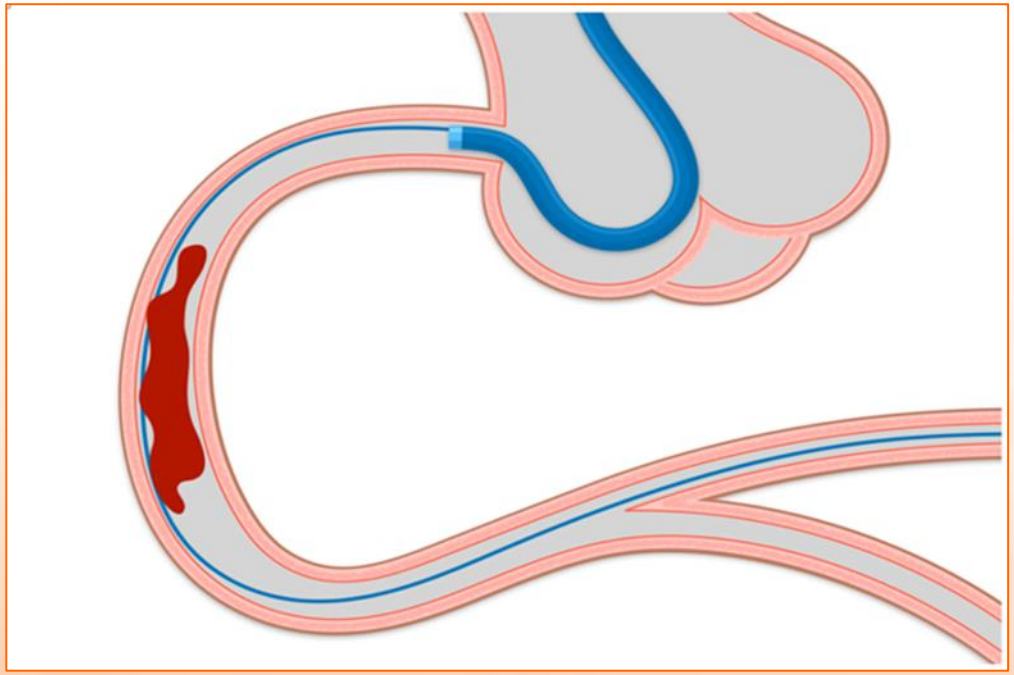


- The GC-Ext-OD must be small enough to fit into the GC-ID
- The GC-Ext-ID must be large enough to accommodate the **MC + GW1**
- Note that the **MC** size will be bigger if you use the 6 mm enVast device

  - A Guide Catheter only: If clot is sufficiently proximal

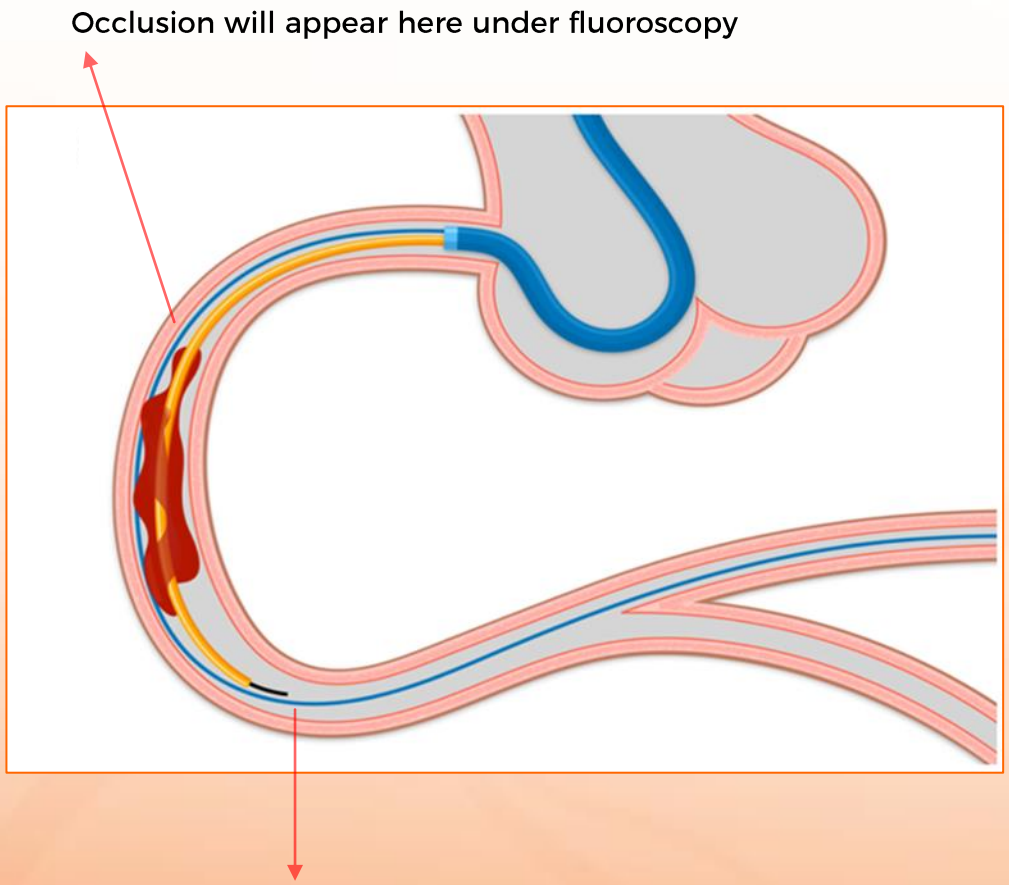


PROCEDURE STEPS – 1st GUIDEWIRE



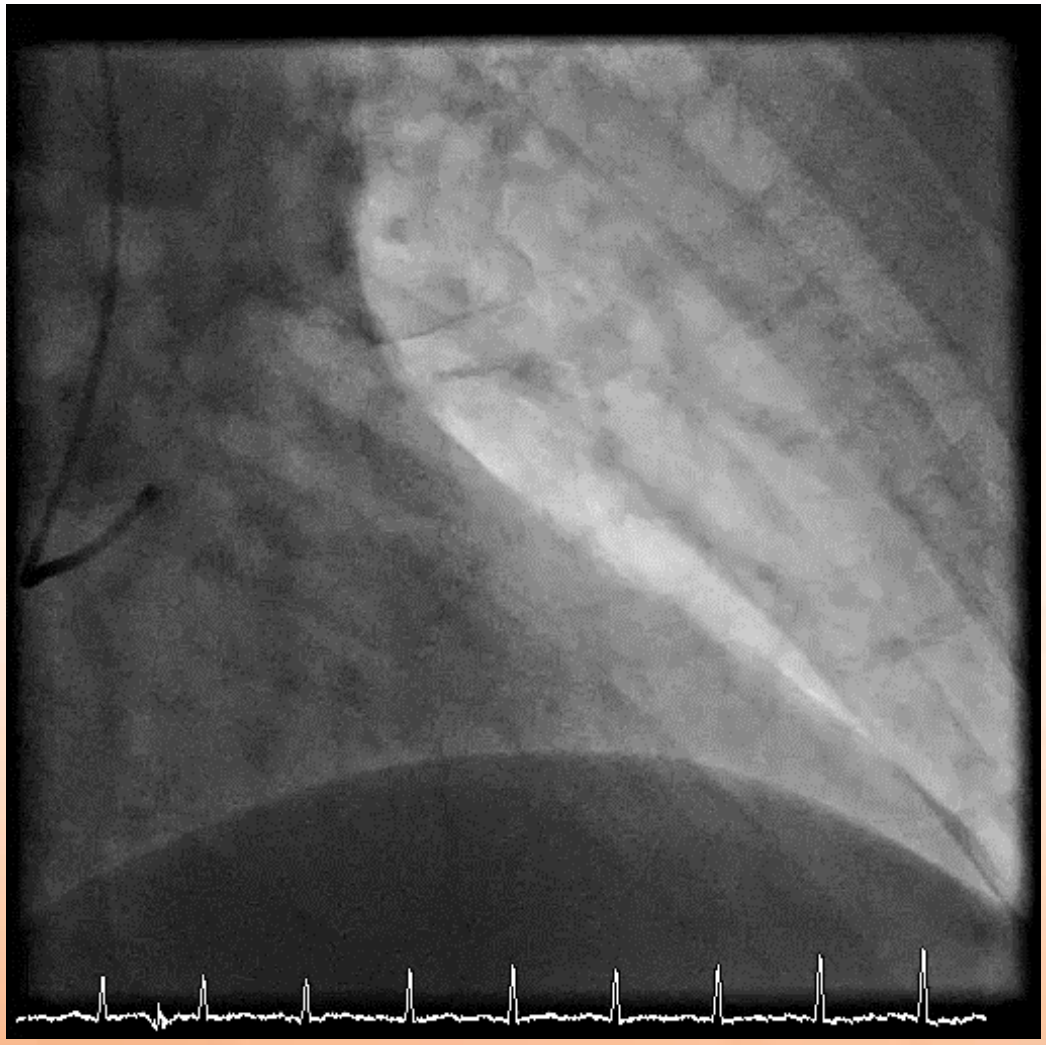
- Cross the lesion with a standard 0.014” coronary wire (GW1) and go as distal as possible
- This wire will stay in place during the procedure and be used as a stabilizer for the Guide Catheter during thrombectomy, and for further intervention

PROCEDURE STEPS – 2ND GUIDEWIRE & MICROCATHETER



- Backload the second wire into the microcatheter (GW2+MC)
- Deliver MC with the wire leading (yellow)
  - Use an approved 0.021 or 0.027 ID MC
  - Flush the MC before use
  - The MC distal tip needs to go sufficiently distal beyond the thrombus for correct enVast positioning **(i.e. the full length of enVast needs to be deployed beyond the fluoroscopic site of occlusion)**
- Once the tip of the MC is at the desired position, remove GW2 from the MC for enVast insertion

ANGIO BEFORE ENVAST DEPLOYMENT



- TIMI 2/3 flow with large thrombus burden in mid LAD

Angio example courtesy of Dr Marco Valgimigli, Lugano, SWITZERLAND

IDEAL ENVAST POSITIONING

- Position with the proximal marker at the edge of the fluoroscopic occlusion location

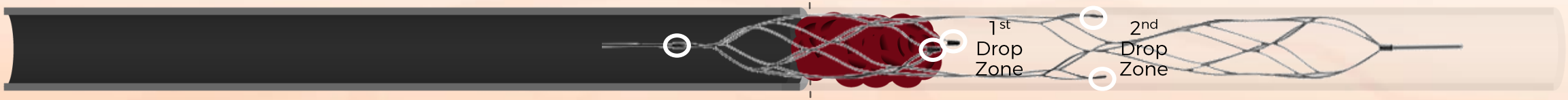
fluoroscopic edge of the occlusion → | *→ clot and the anatomy beyond the clot, -- invisible under fluoro due to the occlusion*

The Flow Restoration Zone and Drop Zones interacting with the clot:

GOOD POSITIONING

Most of the working length of the Flow Restoration Zone and the Drop Zones interacting with the clot:

GOOD POSITIONING



The Flow Restoration Zone and part of the first Drop Zone is not interacting with the clot:

POSITIONING NOT IDEAL

ENVAST PREPARATION

- Carefully remove enVast from the packaging hoop
- Flush enVast by inserting the distal end of the introducer sheath partially into the RHV connected to the MC
- Tighten the RHV, flush and verify that fluid exits the proximal end of the enVast introducer sheath

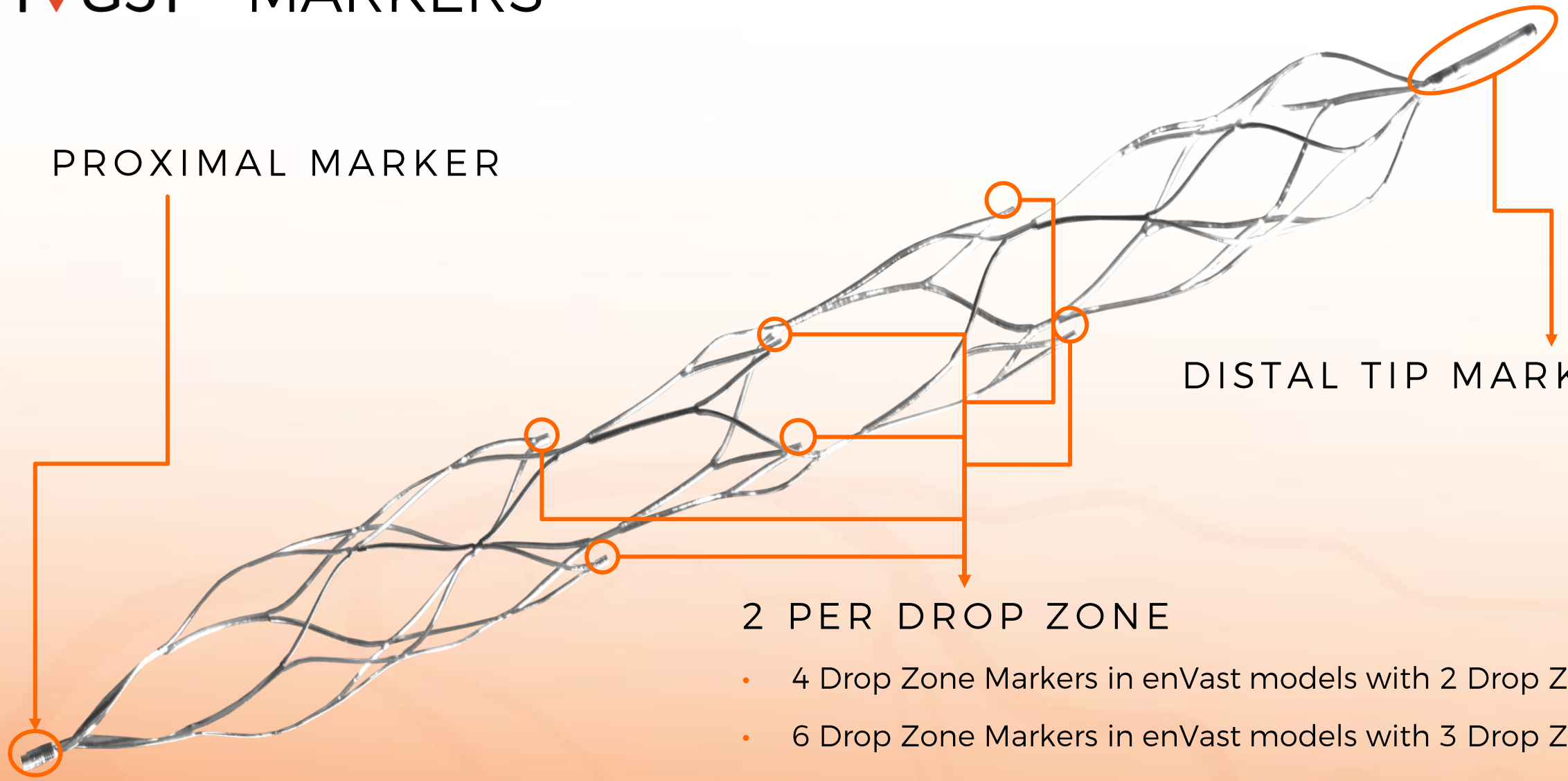
ENVAST LOADING INTO MICROCATHETER

- Loosen the RHV and visually confirm that the tip of the enVast introducer sheath is seated deeply in the hub of the MC
- Tighten the RHV around the introducer sheath to prevent back flow of blood, but not so tight as to damage the enVast device
- Push the enVast pusher wire such that the basket of the device is delivered into the MC
- Continue pushing until the proximal section of the pusher wire completely enters into the distal end of the introducer sheath

ENVAST NAVIGATION TO SITE

- Gently remove the introducer sheath by pulling it back and out
- DO NOT THROW AWAY THE INTRODUCER SHEATH, keep it on the sterile table as it may be needed for a second pass
- Continue pushing the enVast pusher wire until the zebra markers enter the MC hub, start fluoroscopic visualization
- Continue pushing until the enVast tip aligns with the MC tip marker

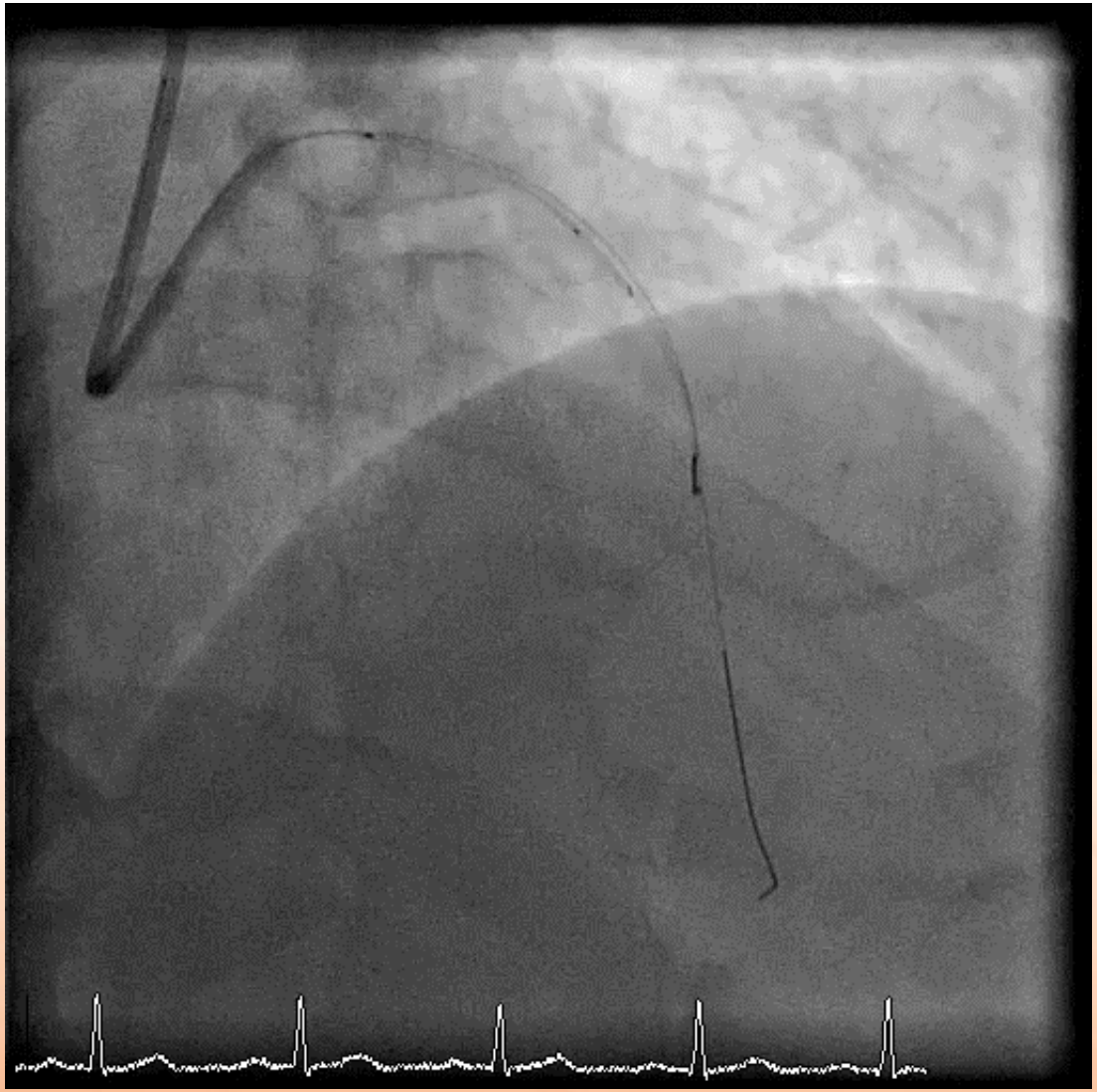
enVast™ MARKERS



- 4 Drop Zone Markers in enVast models with 2 Drop Zones
- 6 Drop Zone Markers in enVast models with 3 Drop Zones

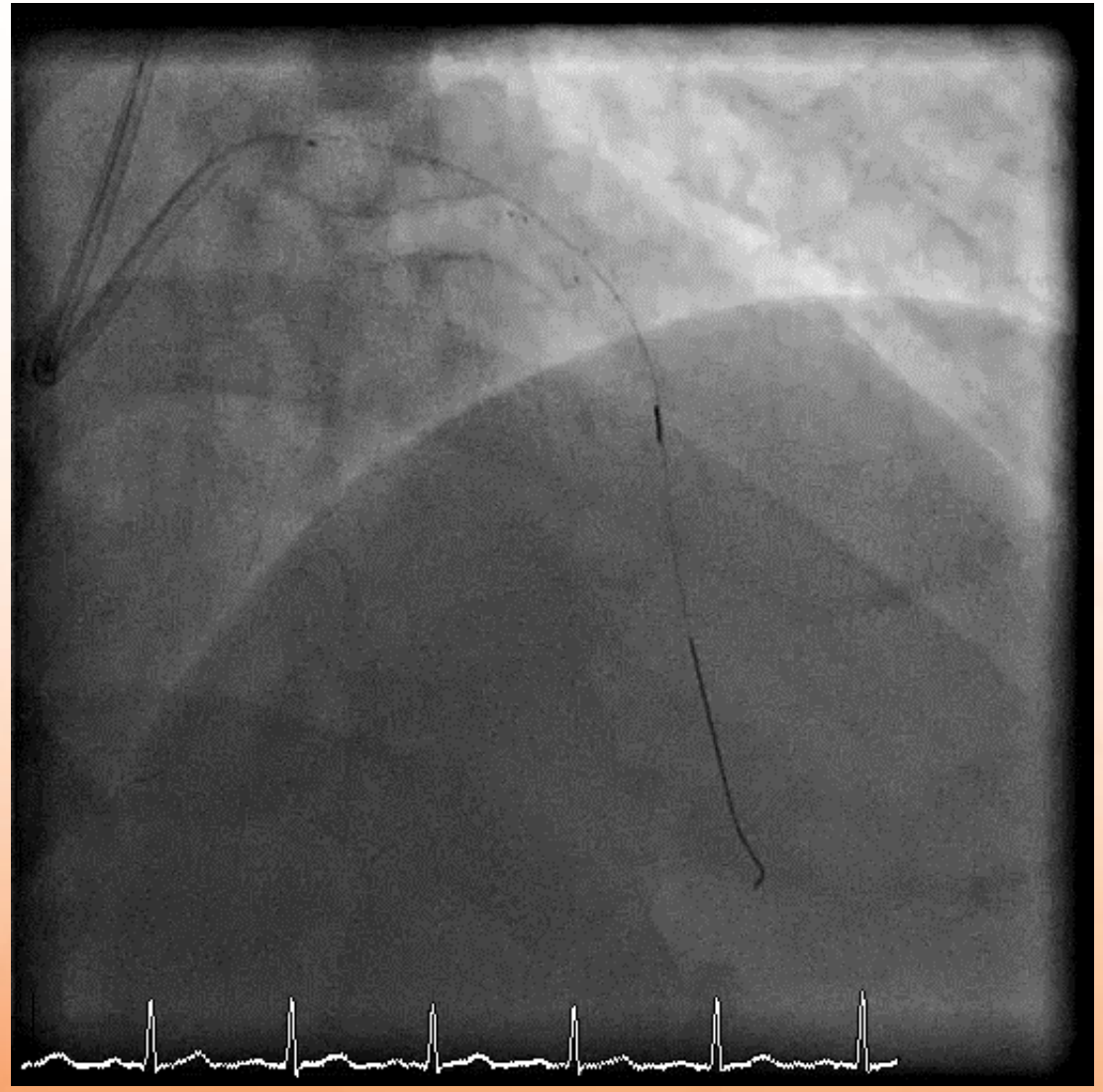
ENVAST DEPLOYMENT - UNSHEATHING

- Release the extra tension on the micro-catheter just before proceeding to enVast deployment
- Hold enVast pusher wire still and glide back the microcatheter proximally to unsheath enVast
- Note that enVast will start anchoring in the artery after ~1cm of unsheathing



Angio example courtesy of Dr Marco Valgimigli, Lugano, SWITZERLAND

FLUORO TO ASSESS BLOOD FLOW RESTORATION



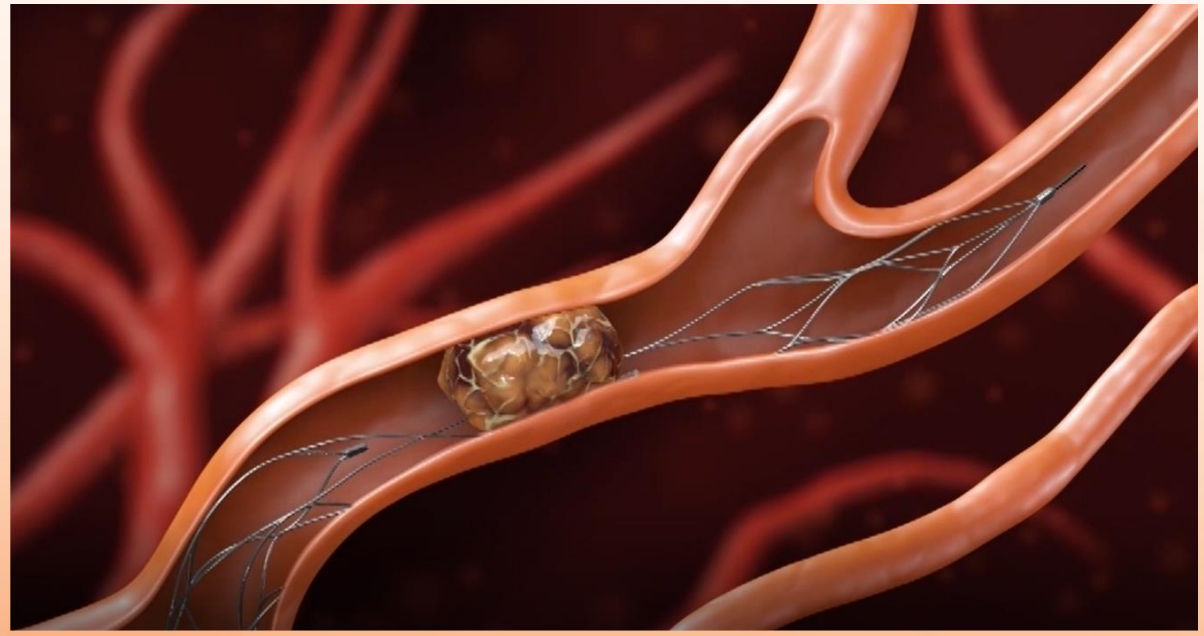
- Fluro acquisition to re-assess blood flow after enVast expansion (device in place)

Angio example courtesy of Dr Marco Valgimigli, Lugano, SWITZERLAND

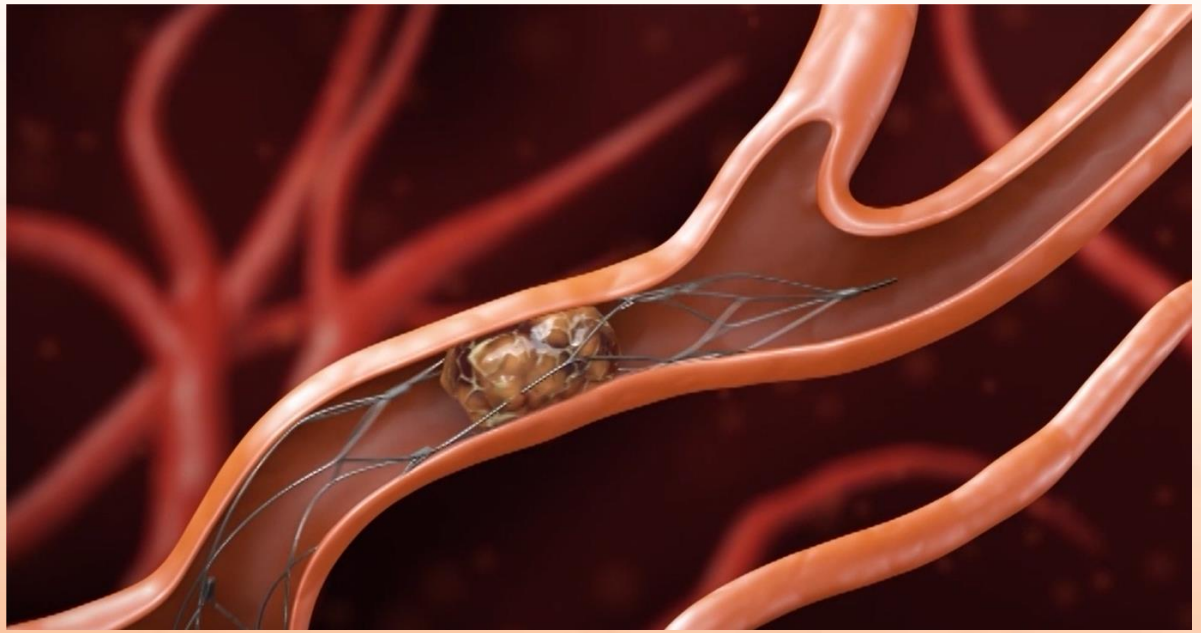
USING THE DROP ZONES

- Drop Zone markers will get compressed when enVast is passing next to a hard, calcified clot in the vascular system

Markers compressed together:
You may be adjacent to a lesion or hard clot, slow down

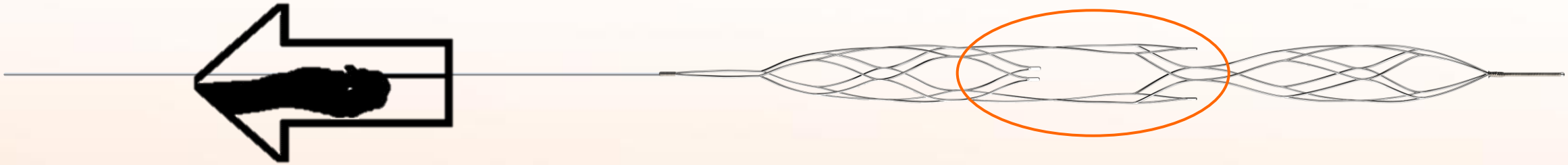


Markers spring open:
You may be at the proximal edge of the lesion or hard clot, the DROP zone is on the clot

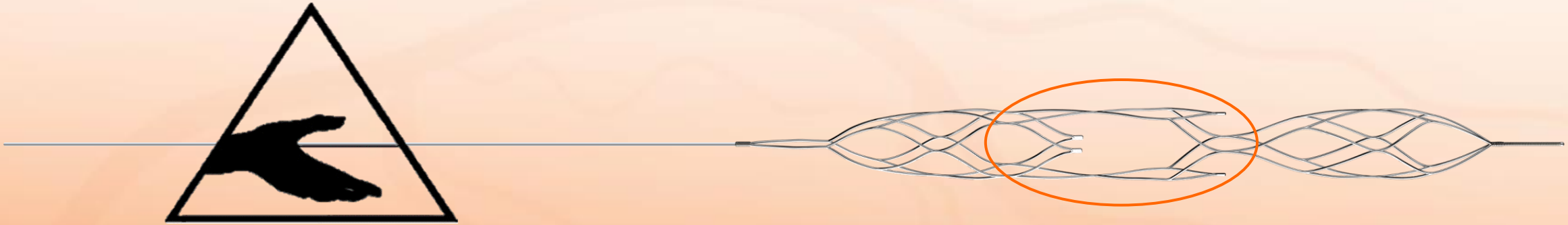


ENVAST WILL ELONGATE WHEN PULLING, LET THE PUSHER WIRE GO FOR IT TO RETURN TO SHAPE

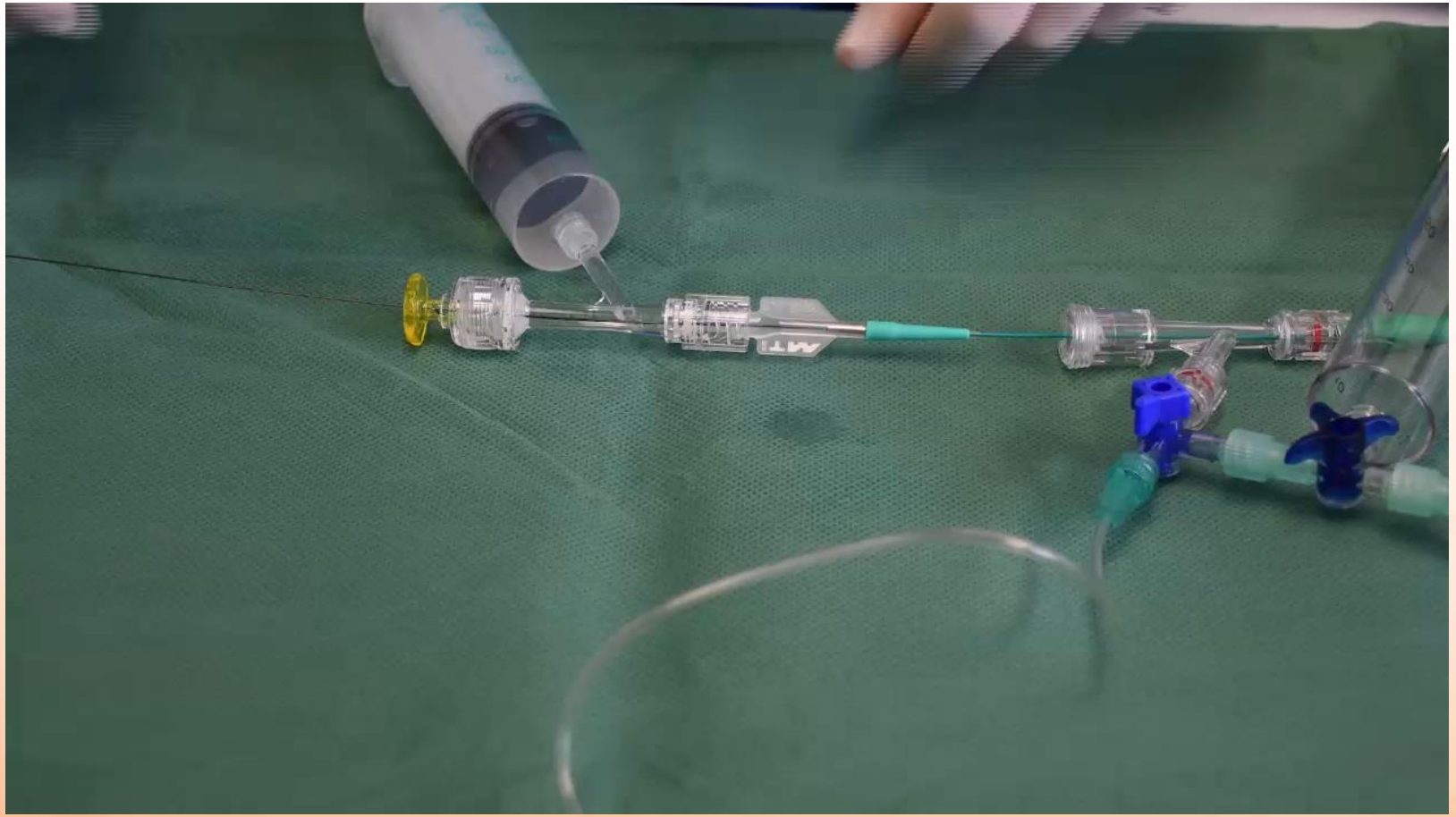
- WHEN PULLING: enVast and the vessel will elongate



- LET IT GO: enVast and the vessel will relax…

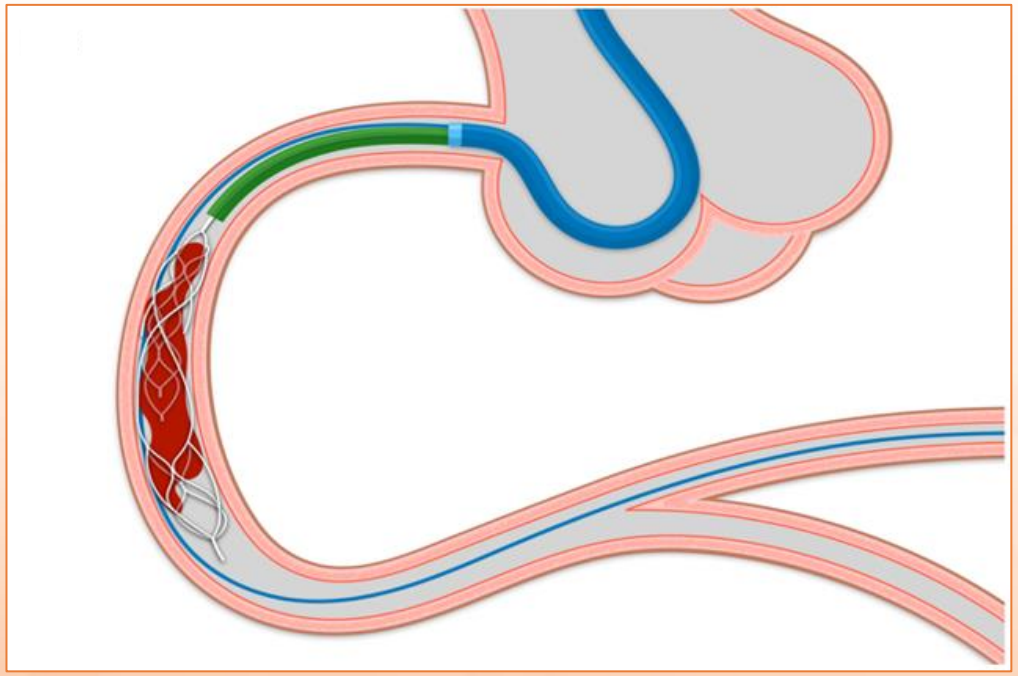


MICRO CATHETER REMOVAL

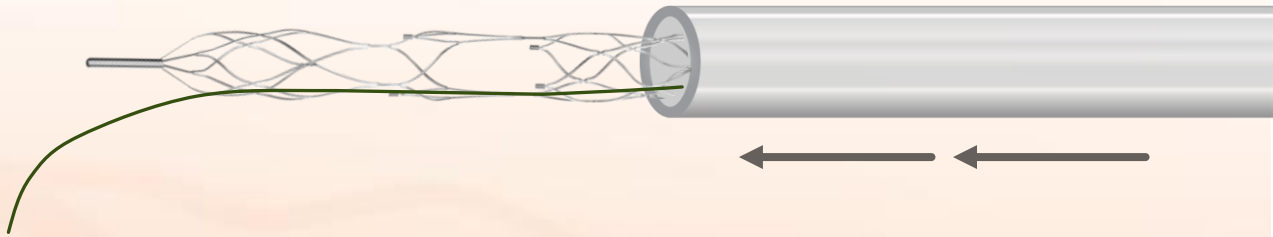


- Remove the MC at this point, especially if you are using a GC-Extension (Optional / recommended for more efficient aspiration through the GC/ GC-extension)

GUIDE CATHETER EXTENSION POSITIONING



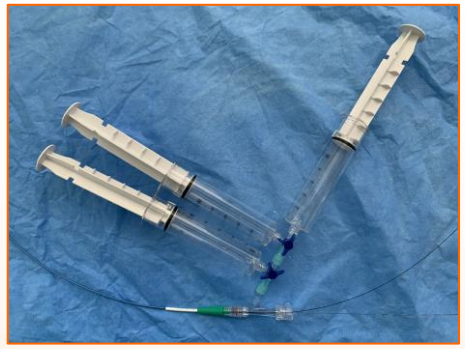
- Drive the GC-Extension (in green) up to the proximal marker of enVast
- Advance over both the enVast pusherwire and GW1



- If the occlusion is close to the Guide Catheter distal tip, the Guide Catheter Extension may not be needed

ENVAST RETRIEVAL

- Use 3- 60ml VacLoc syringes

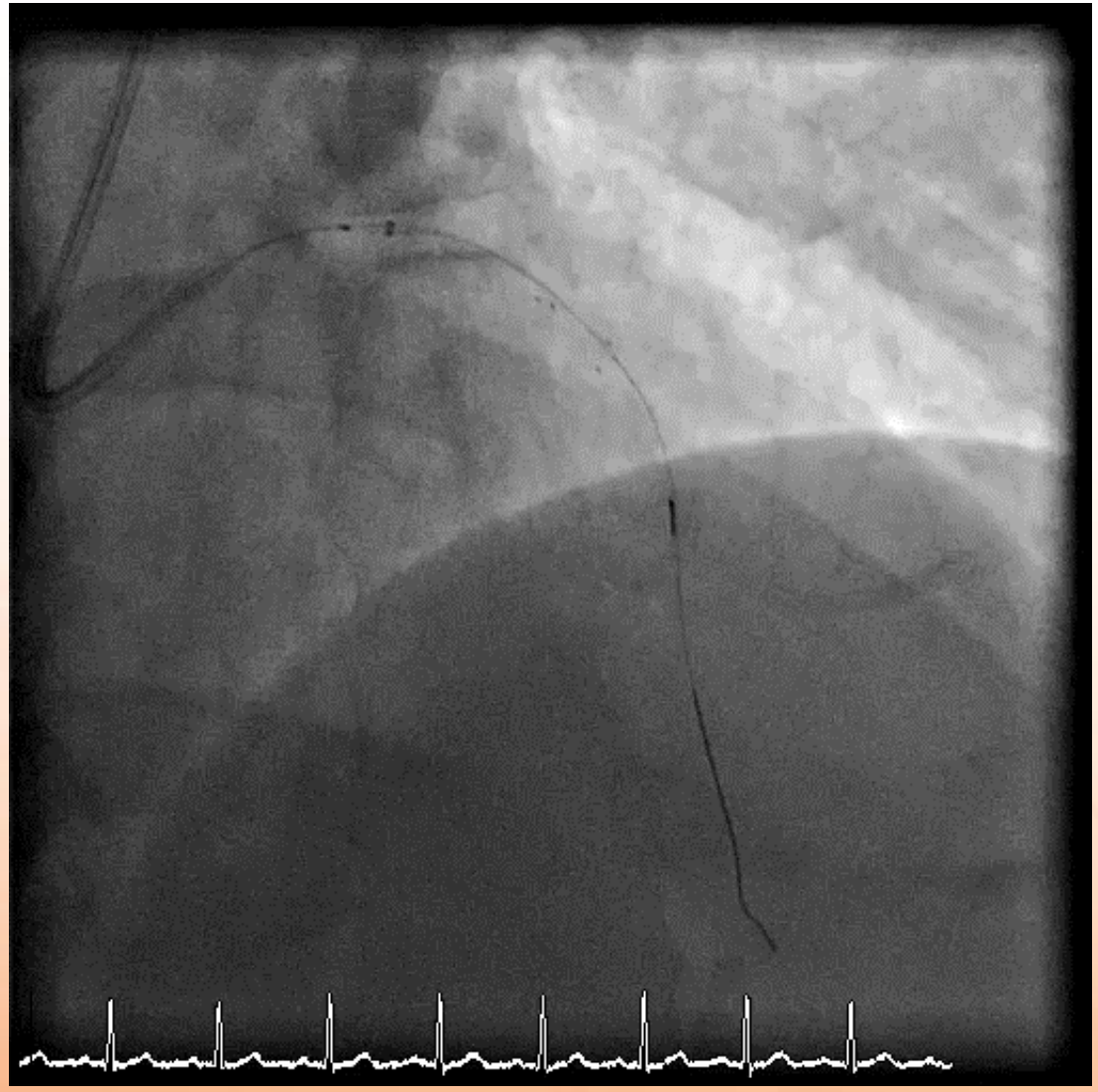


- Check enVast position, take your time and start retrieval slowly

- Withdraw enVast and the GC-Extension simultaneously under continuous aspiration from the GC hub

ENVAST RETRIEVAL

- Withdraw enVast and GC-Extension under continuous aspiration

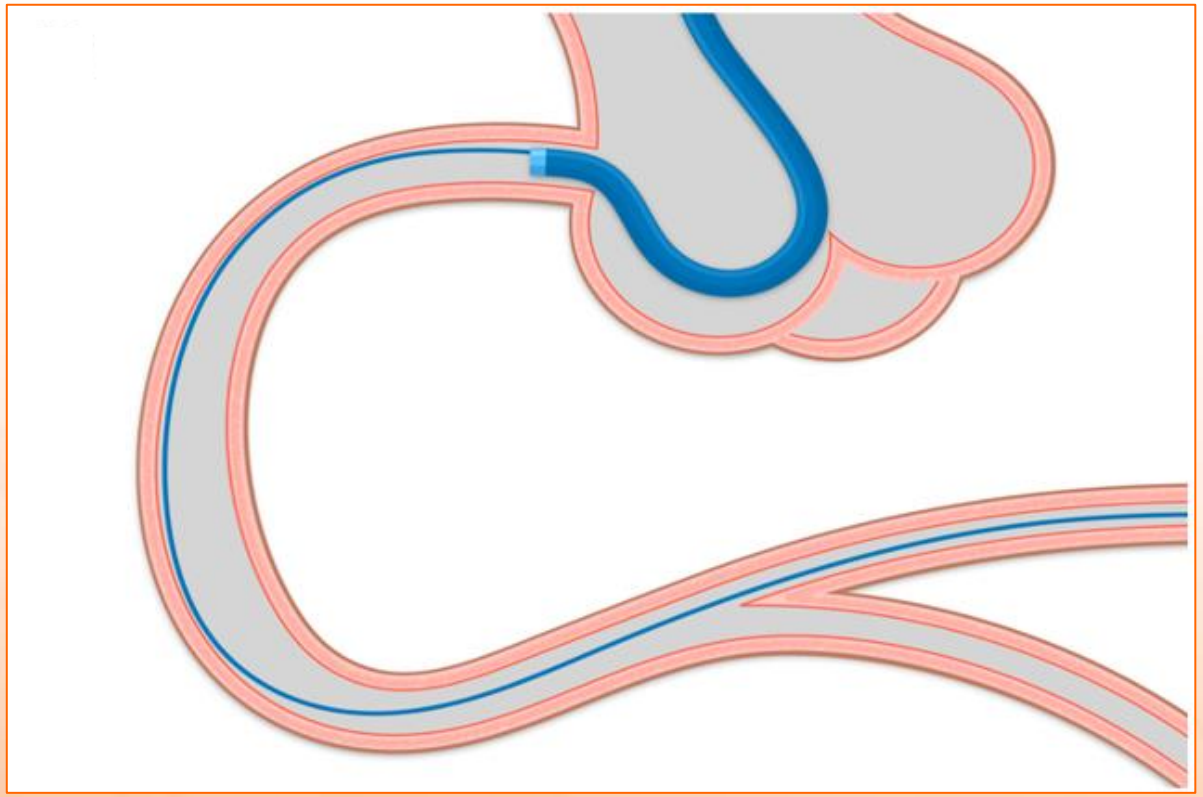


Angio example courtesy of Dr Marco Valgimigli, Lugano, SWITZERLAND

FINAL ASPIRATION

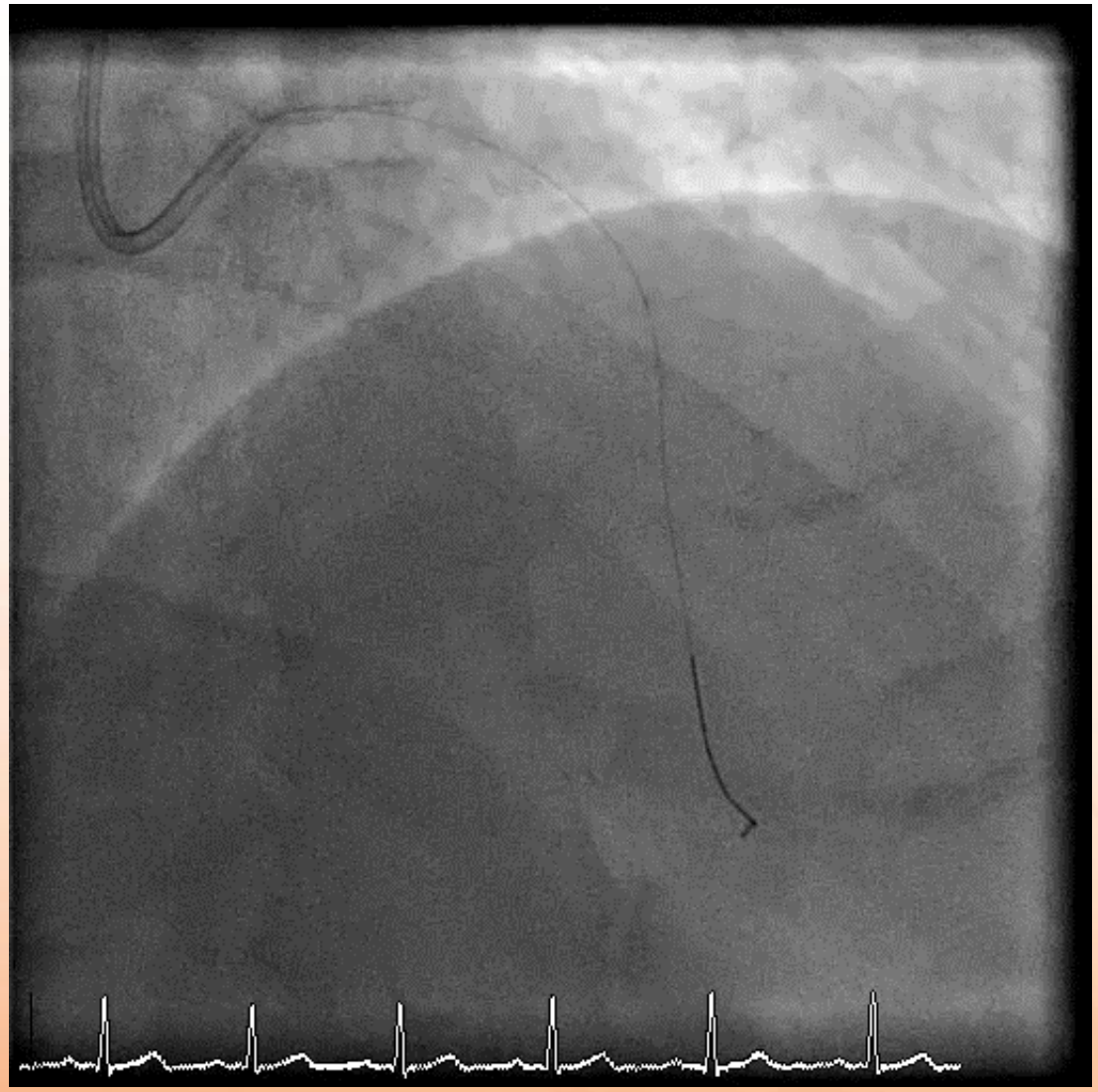
- After enVast retrieval, disconnect all syringes and perform strong aspiration to remove all thrombus from the guide catheter

- Leave the parallel wire in place to continue PCI or repeat thrombectomy if needed (up to 3 passes in the same vascular territory)



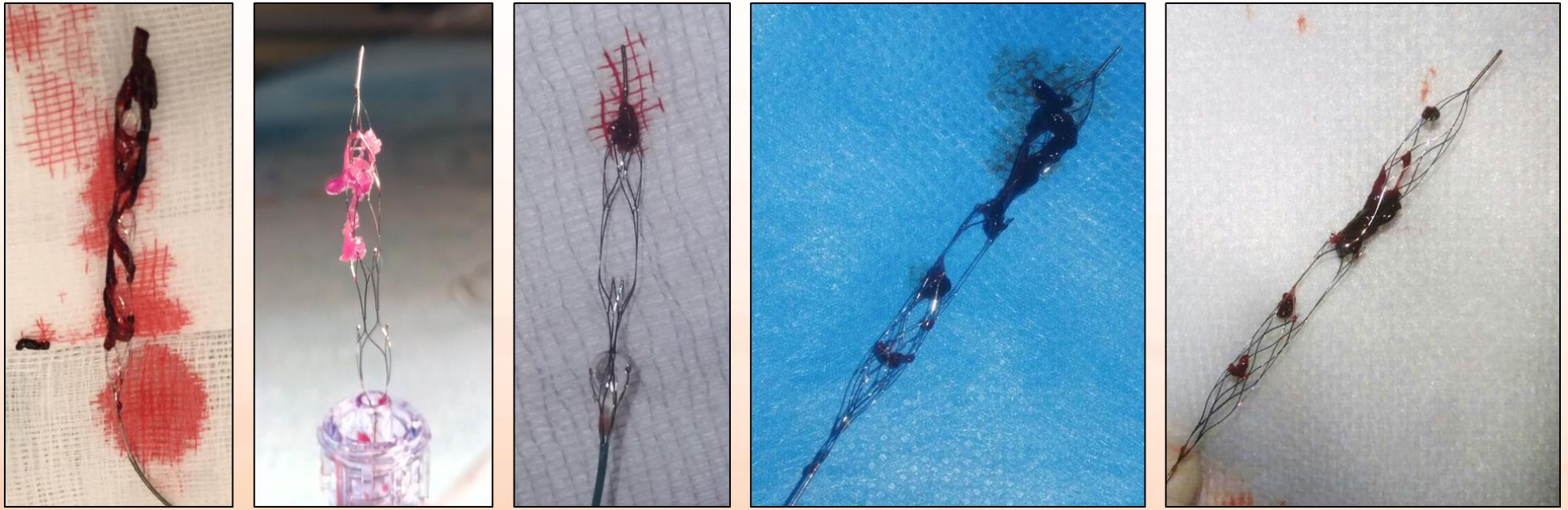
FLUORO RUN

- Do final fluoro run to check recanalization status



Angio example courtesy of Dr Marco Valgimigli, Lugano, SWITZERLAND

enVast™



CHOOSE TO REMOVE

BACK UP MATERIAL

CHOOSE TO REMOVE

ESALIO™

enVast™

FIRST IN HUMAN

CHOOSE TO REMOVE

VESALIO™

enVast™

FIRST IN HUMAN

- Two tertiary centers in Switzerland (Bern, Lugano)
- 61 consecutive ACS patients with LTB (TTG ≥ 3)
- All efficacy data core-lab abjugated by an independent center

EFFICACY ENDPOINTS

- ST-segment elevation resolution
- TIMI flow
- TIMI Thrombus Grade
- Myocardial Blush Grade

SAFETY ENDPOINTS

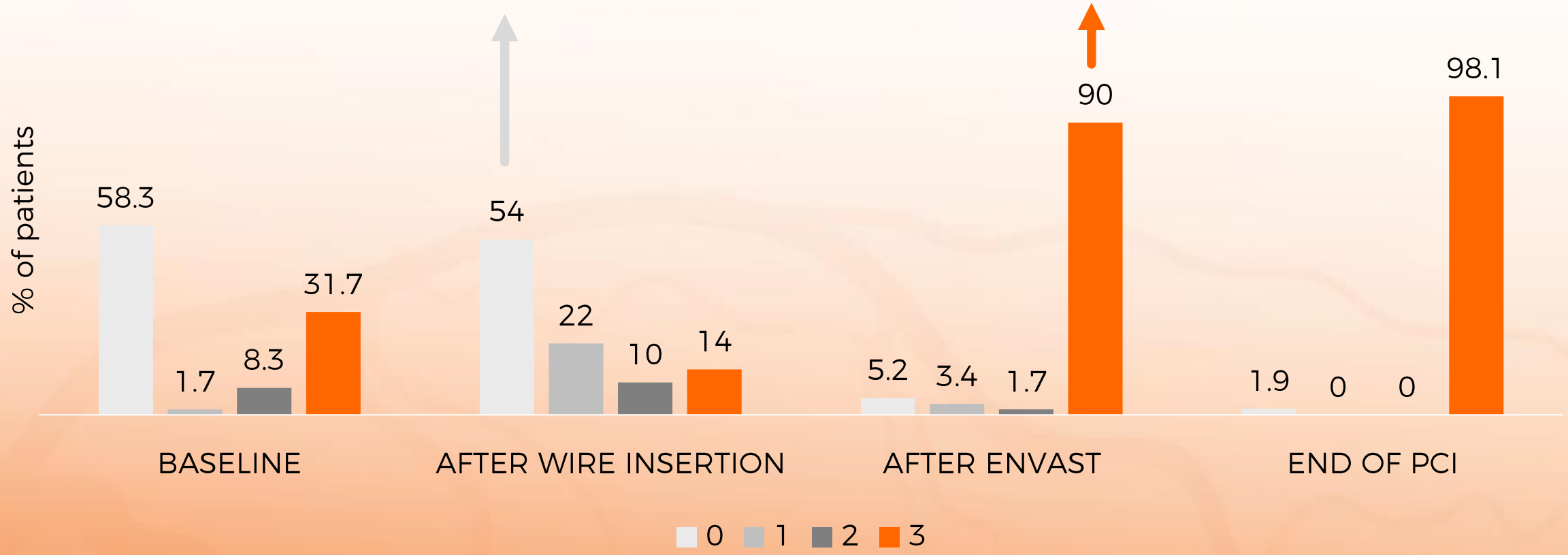
- Device and procedure-related adverse events
- MACCE and Bleedings at 30 days

EuroIntervention. 2021 Feb 5;16(15):e1245-e1253. doi: 10.4244/EIJ-D-20-00221.

EFFICACY OUTCOMES – TIMI FLOW

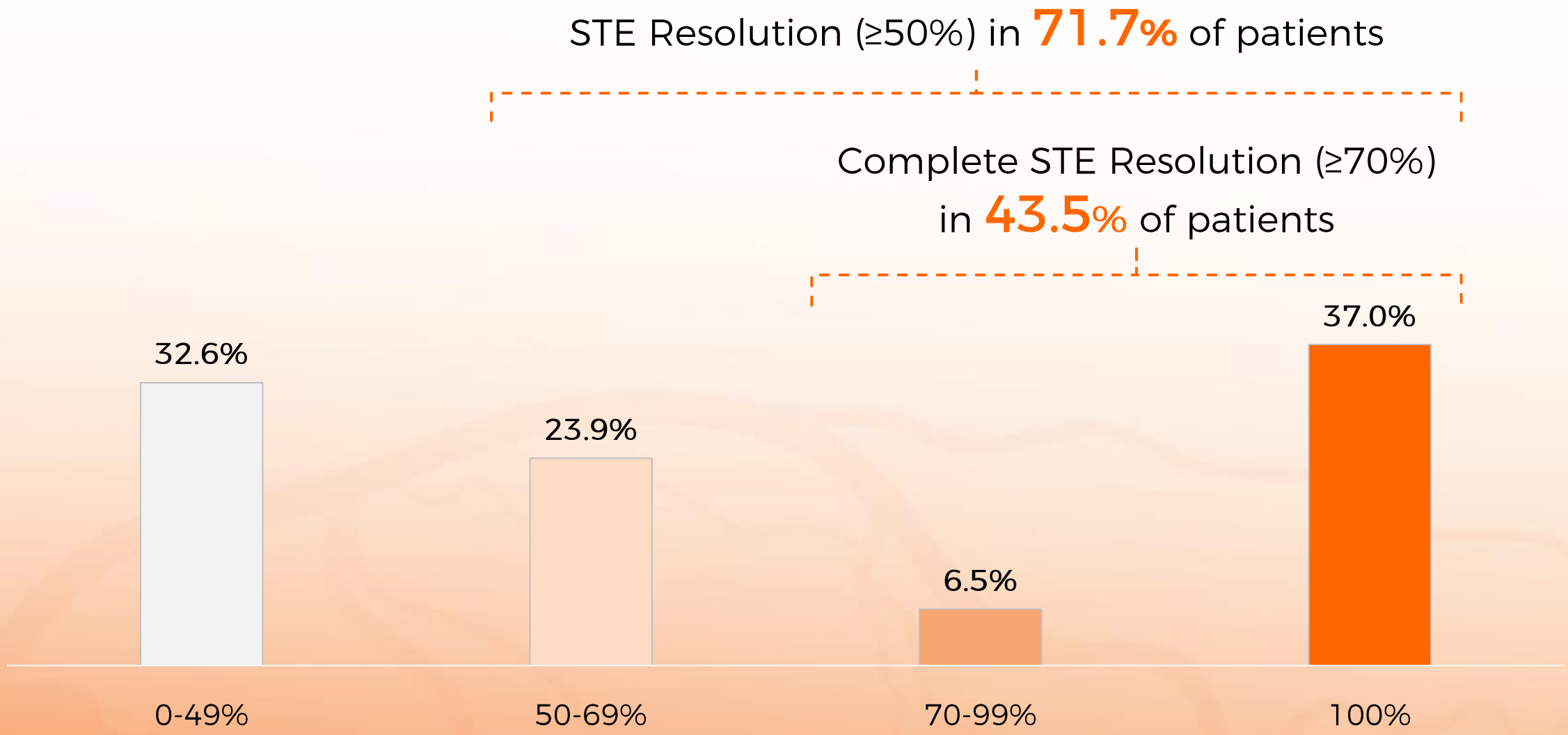
enVast stent deployment was associated with immediate reperfusion in **85%** and TIMI-3 flow in **74%** of the patients with TIMI 0 after wire insertion

TIMI-3 increase from **31.7%** to **90%** after enVast (*p <.001*)



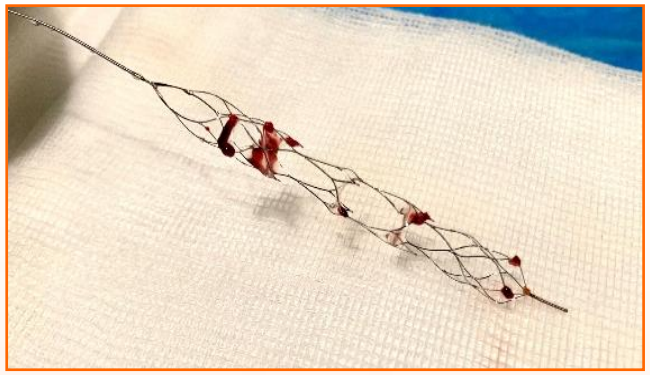
EuroIntervention. 2021 Feb 5;16(15):e1245-e1253. doi: 10.4244/EIJ-D-20-00221.

EFFICACY OUTCOMES – ST ELEVATION RESOLUTION

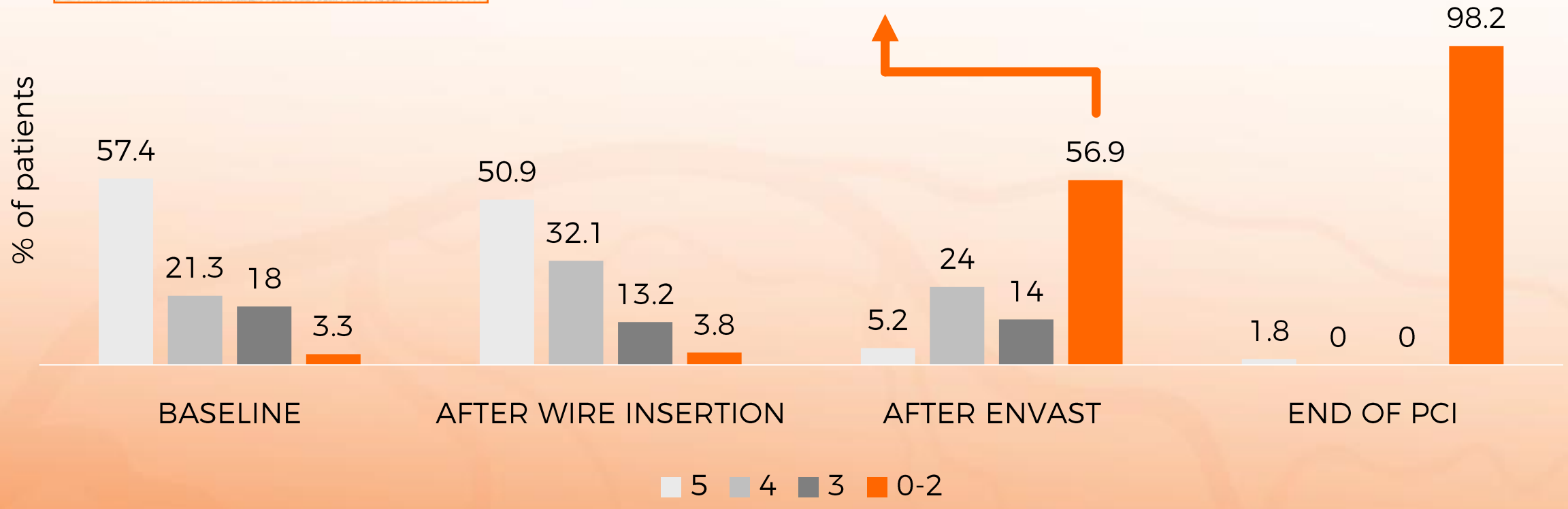


EuroIntervention. 2021 Feb 5;16(15):e1245-e1253. doi: 10.4244/EIJ-D-20-00221.

EFFICACY OUTCOMES – TIMI THROMBUS GRADE



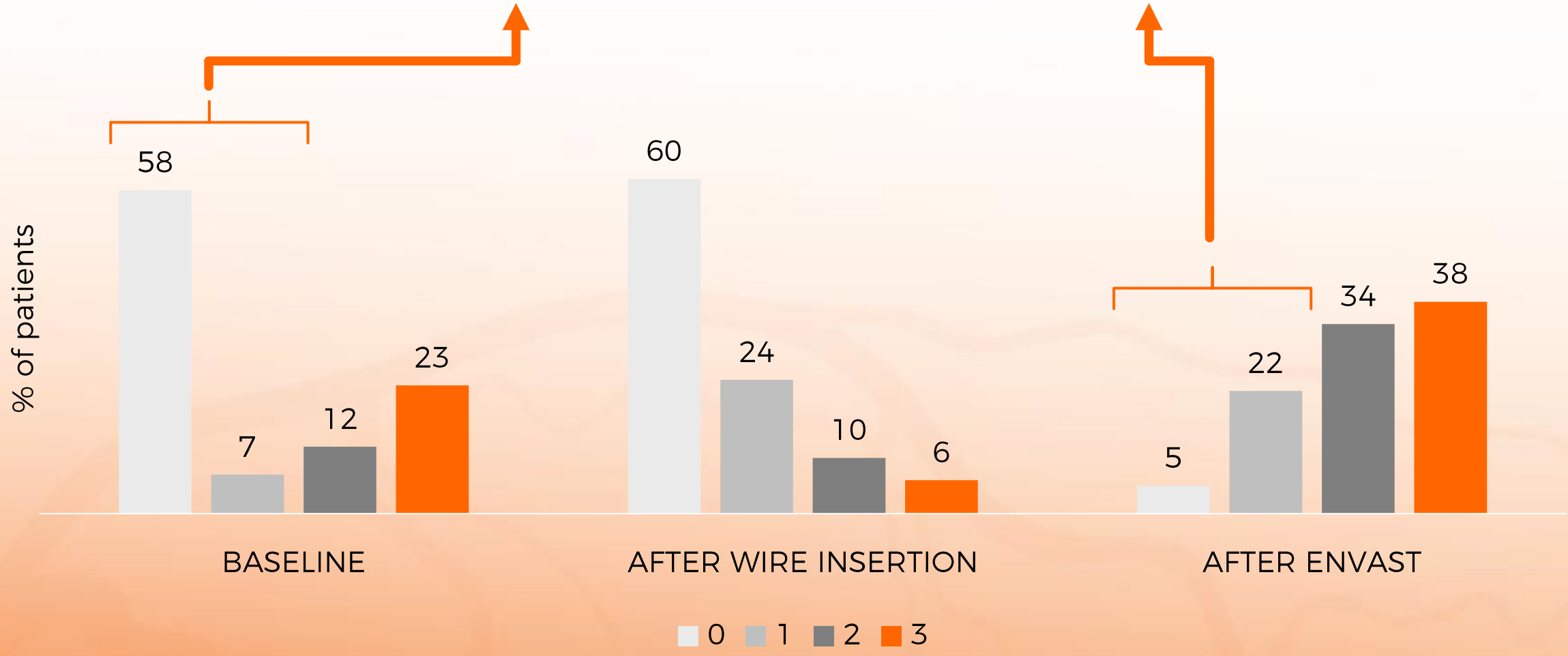
- enVast retrieved macroscopic thrombotic material in 53% of the cases
- enVast use decreased the angiographic thrombus burden to ≤2 in 57% of the patients.



EuroIntervention. 2021 Feb 5;16(15):e1245-e1253. doi: 10.4244/EIJ-D-20-00221.

EFFICACY OUTCOMES – MYOCARDIAL BLUSH GRADE

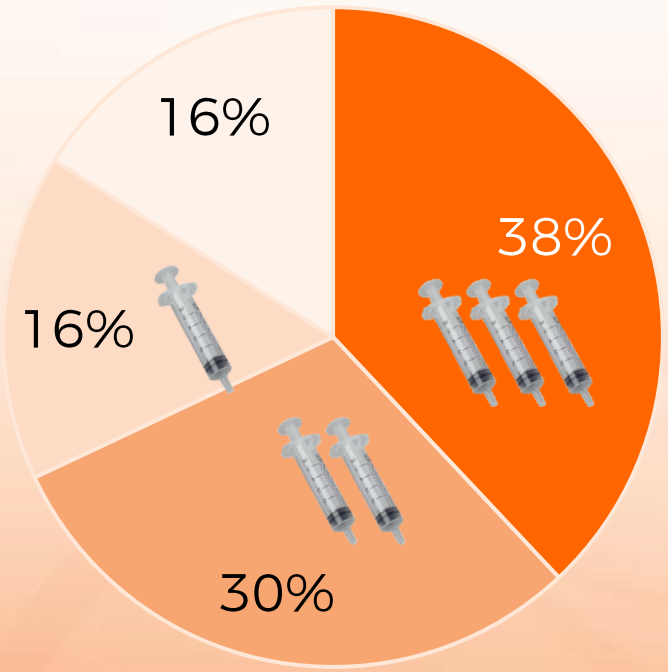
MBG 0-1 was detected in **65%** of patients at baseline and in **27%** after enVast use *(p<.001)*



EuroIntervention. 2021 Feb 5;16(15):e1245-e1253. doi: 10.4244/EIJ-D-20-00221.

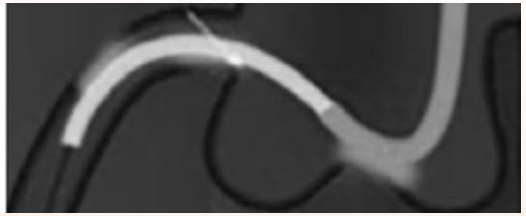
PROCEDURAL OBSERVATIONS

Manual Aspiration
of syringes (60 ml)



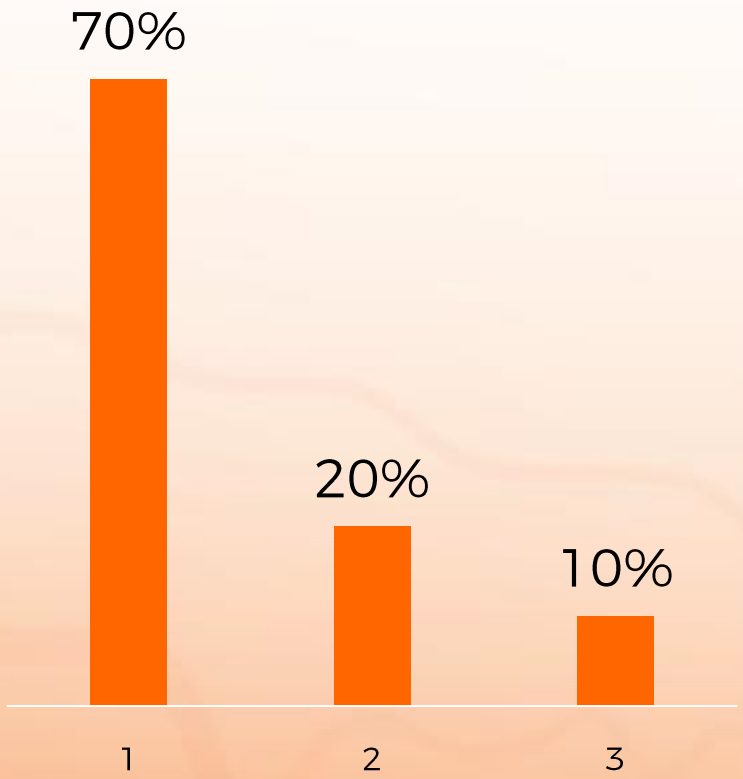
Guide Catheter Extension Use

46%



Macroscopic Thrombus Extraction

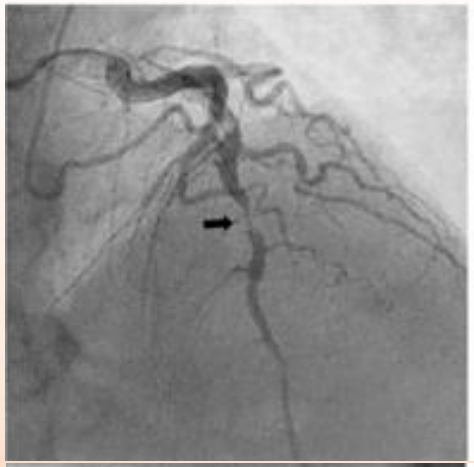
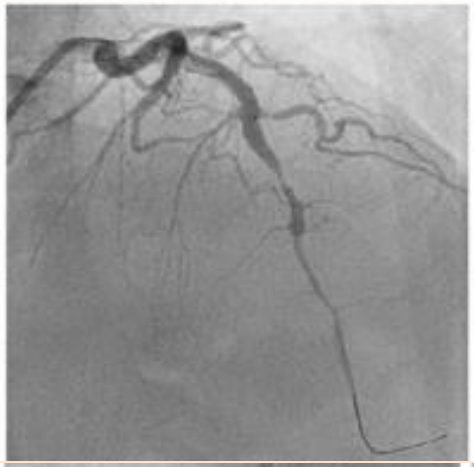
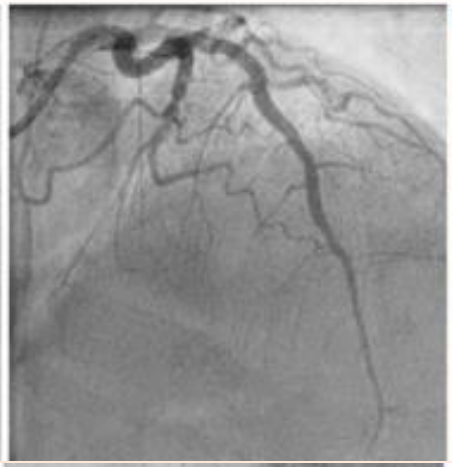
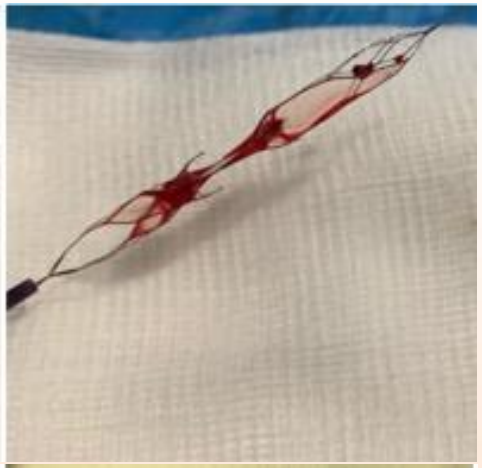
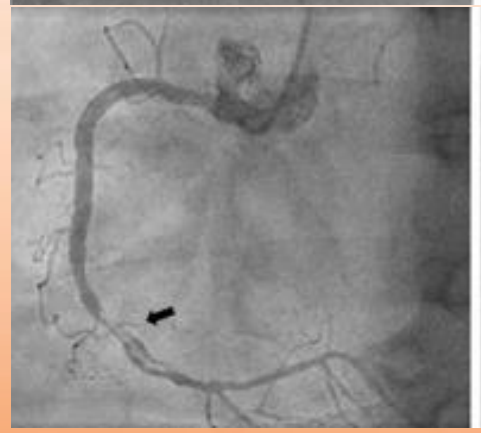
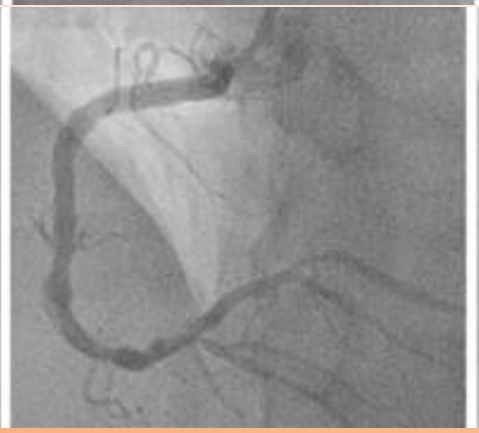
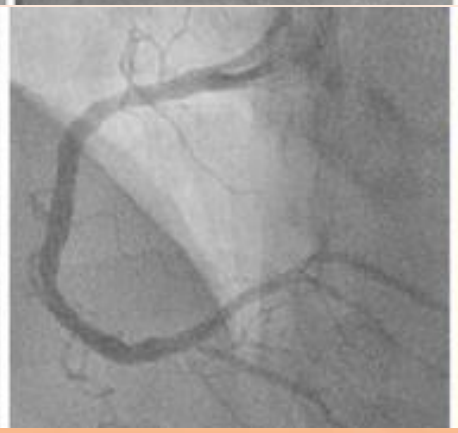
Number of Passes in the total patient population



EuroIntervention. 2021 Feb 5;16(15):e1245-e1253. doi: 10.4244/EIJ-D-20-00221.

ANGIOGRAPHIC RESULTS

- The culprit lesion was visualized for each patient at baseline, after enVast use and at the end of PCI

	Baseline	After enVast	End of PCI	Thrombus
C: 61 year-old man with STEMI and a functional occlusion of mid LAD				
D: 51 year-old man with STEMI and thrombotic sub-occlusion of mid-distal RCA				

EuroIntervention. 2021 Feb 5;16(15):e1245-e1253. doi: 10.4244/EIJ-D-20-00221.

SAFETY OUTCOMES

reported in 61 patients

Procedural Outcomes	n (%)
Coronary dissection	0
Coronary perforation	0
Coronary occlusion	0
Coronary spasm Flow-limiting Spasm resolution	14 (23%) 0 14 (100%)
Embolization Embolization resolution	1 (1.6%) 1 (100%)
Cardiac tamponade	0
Life threatening arrythmias needing treatment	0

Clinical Outcomes	n (%)
Death Cardiovascular Non-cardiovascular	2 (3.3%) 2 (3.3%) 0
Myocardial infarction	0
Unplanned revascularization (any)	1 (1.6%)
Definite stent thrombosis	0
Cerebrovascular events Stroke (any) Transient Ischemic Attack	1 (1.6%) 0 1 (1.6% -*on day 29)
Bleeding BARC 3 or 5	0
Bleeding BARC 2 access site non-access site	3 (4.9%) 3 (4.9%) 0

EuroIntervention. 2021 Feb 5;16(15):e1245-e1253. doi: 10.4244/EIJ-D-20-00221.

CONCLUSION

- enVast in combination with aspiration proved **safe and effective** in removing coronary thrombus and **allowed immediate prompt restoration of flow** in a high proportion of patients with ACS and LTB

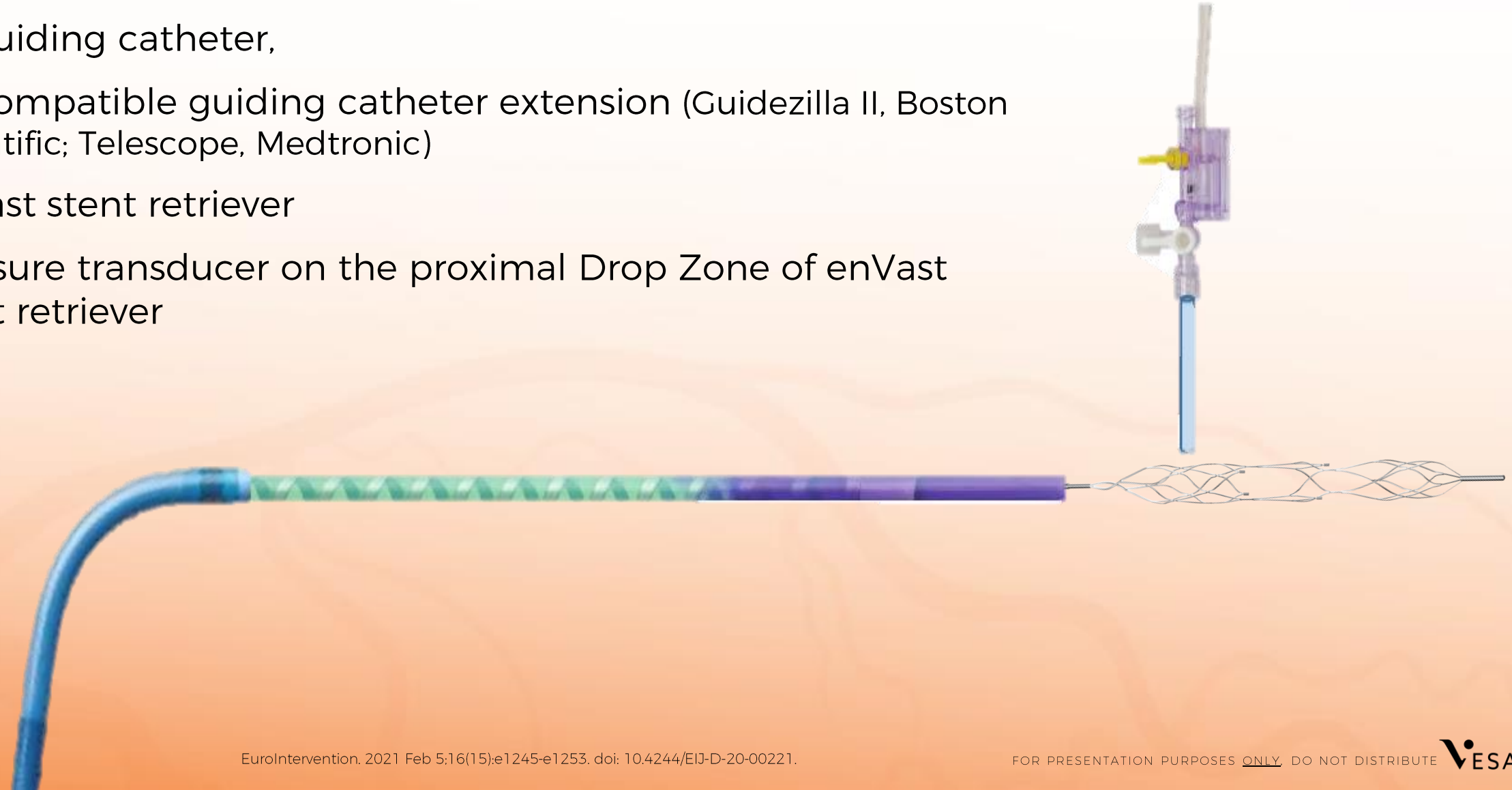
- A randomised study to assess the comparative safety and effectiveness of this new treatment modality in addition to standard intervention among patients with STEMI and LTB in underway

EuroIntervention. 2021 Feb 5;16(15):e1245-e1253. doi: 10.4244/EIJ-D-20-00221.

MODELING OF CONTINOUS ASPIRATION TECHNIQUE

Aspiration system reproduced in vitro:

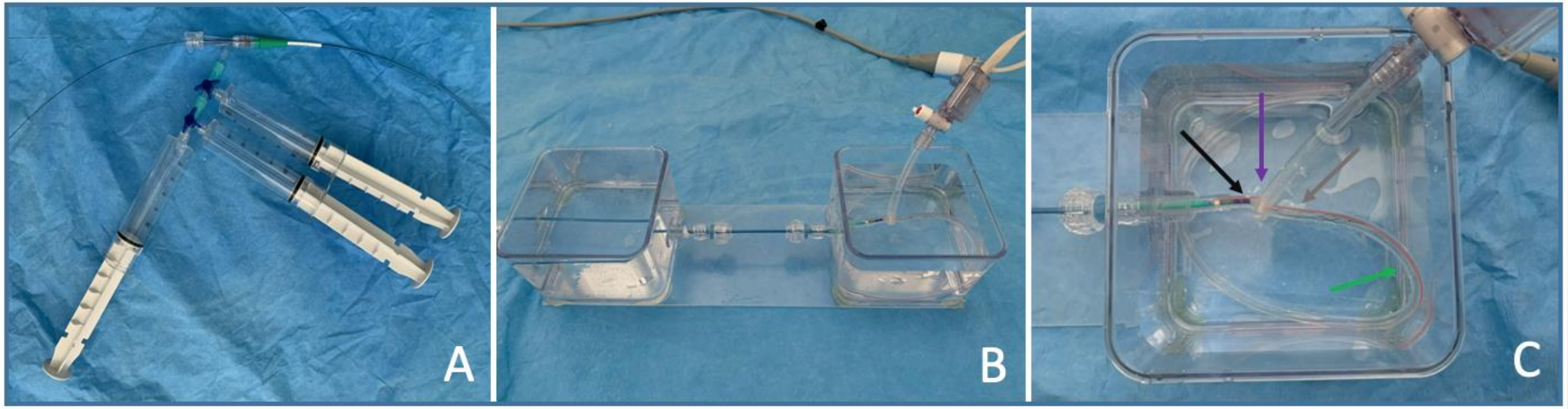
- 6F guiding catheter,
- 6F-compatible guiding catheter extension (Guidezilla II, Boston Scientific; Telescope, Medtronic)
- enVast stent retriever
- pressure transducer on the proximal Drop Zone of enVast stent retriever



EuroIntervention. 2021 Feb 5;16(15):e1245-e1253. doi: 10.4244/EIJ-D-20-00221.

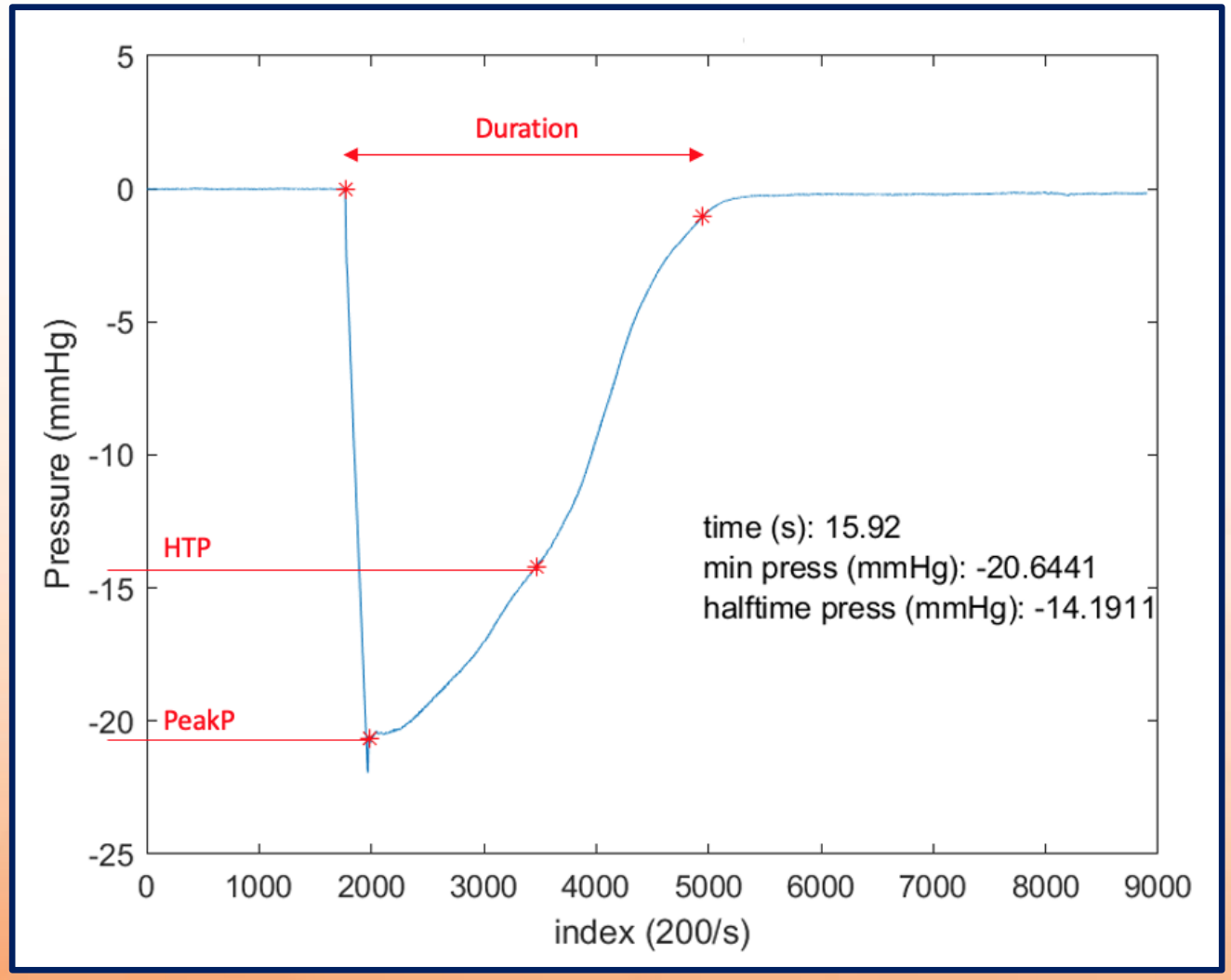
MODELING OF CONTINOUS ASPIRATION TECHNIQUE

Aspiration system reproduced in vitro:



EuroIntervention. 2021 Feb 5;16(15):e1245-e1253. doi: 10.4244/EIJ-D-20-00221.

MODELING OF CONTINOUS ASPIRATION TECHNIQUE



Pressure/Time curve recorded on each aspiration test measuring peak pressure (PeakP), Duration, and half-time pressure (HTP)

EuroIntervention. 2021 Feb 5;16(15):e1245-e1253. doi: 10.4244/EIJ-D-20-00221.

CASE SELECTION

CHOOSE TO REMOVE

enVast™

INITIAL CASE SELECTION

- Up to 5 cases for evaluating the feasibility of the technique
- First 3 cases should be selected among relatively simpler ones

- STEMI (<8h from symptoms onset) with LTB at coronary angiography (TTG ≥3)
  - TTG ≥3 has to be confirmed after wiring

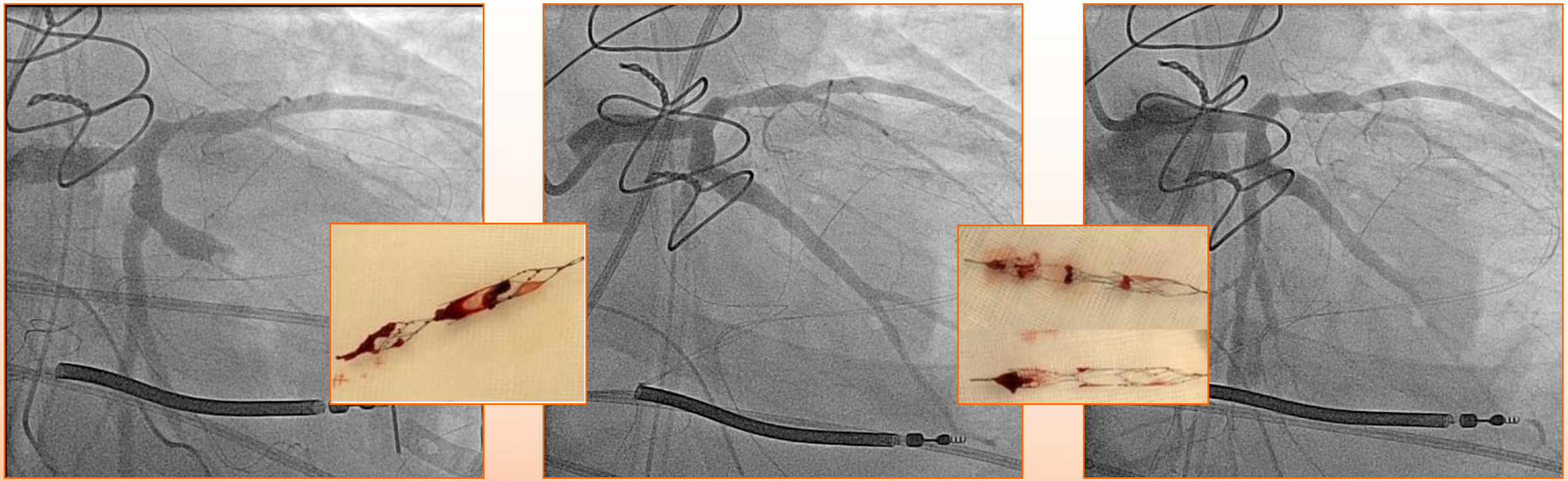
- Recommended vascular territories to treat for initial cases:
  - Coronary arteries of 2 to 6 mm diameter

CASE EXAMPLE: PASSES WITH/WITHOUT CO-ASPIRATION

1st enVast pass done without co-aspiration

1st enVast pass done with co-aspiration

Recanalization after 2 passes



- A macroscopic embolization occurred during stent removal (obtuse marginal branch - distal circumflex) -- resolved with a second pass under continuous aspiration with an intermediate catheter

Case courtesy of Dr Marco Valgimigli, Lugano, SWITZERLAND

61 Y-OLD MALE WITH AORTIC ANEURYSM

RISK FACTORS:

- Family history of cardiovascular disease
- Current smoker (ca. 40 die)
- Hypertension
- Obesity
- Dyslipidaemia
- Diagnosis of 2-vessel coronary artery disease

MEDICAL HISTORY

2015

- Total occlusion of the middle LAD and anterior infarction (conservative management)
- PCI of the LCX. Unsuccessful attempt of LAD recanalization

2016

- Cardio-MRI: No viability in the LAD myocardial territory. Severe reduction of the cardiac function (LVEF 30%)
- Diagnosis of aortic aneurysm

Jan 2020

- Surgery of ascending aorta and PFO closure
- Cardiorespiratory instability requiring intubation and inotropic/vasopressor therapy
- Significant increase of cardiac enzymes levels

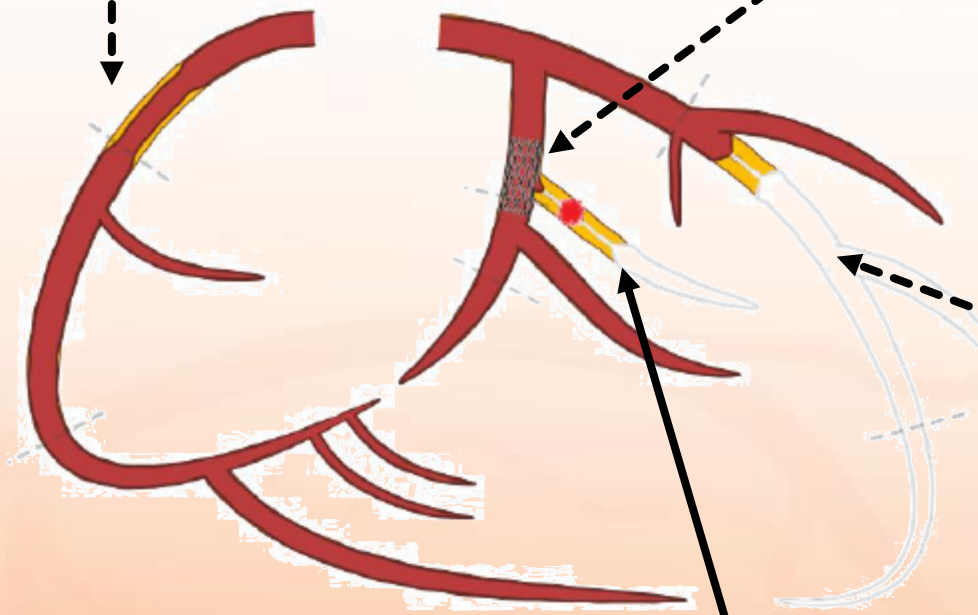
→ EMERGENCY CARDIO ANGIOGRAPHY

Case courtesy of Dr Marco Valgimigli, Lugano, SWITZERLAND

61 Y-OLD MALE WITH AORTIC ANEURYSM

Non-significant (<30%) stenosis of the proximal RCA

Good long-term result of previous PCI on LCx

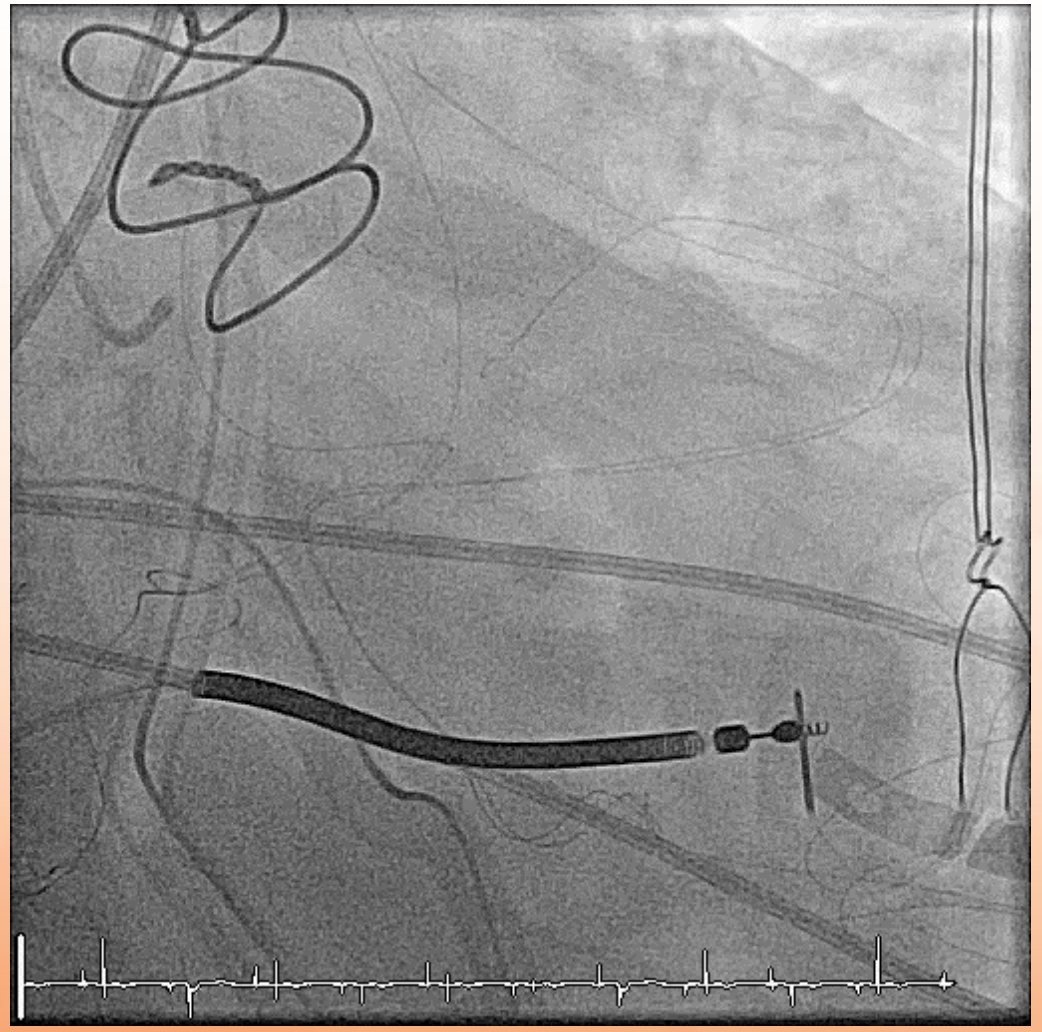


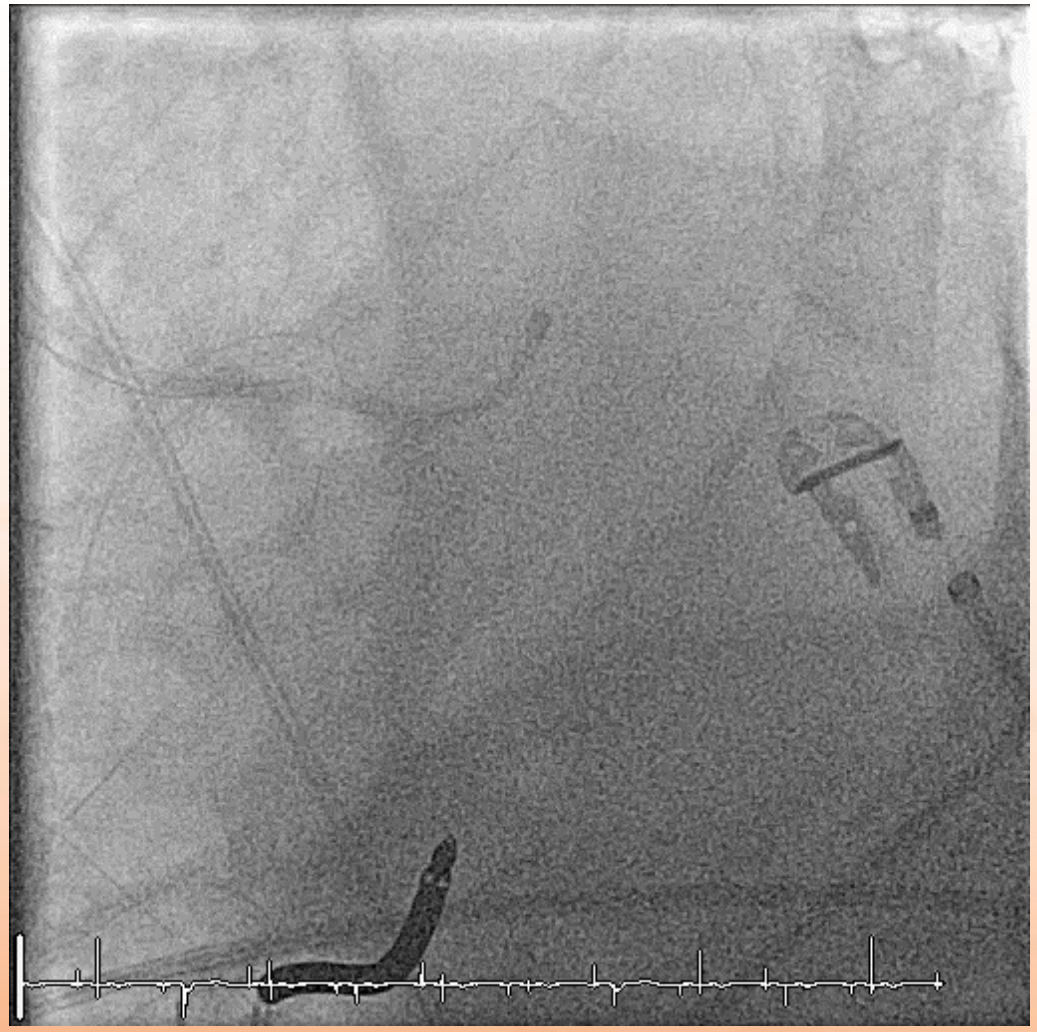
Chronic occlusion of the middle LAD

Acute thrombotic occlusion of the 1st marginal branch

Case courtesy of Dr Marco Valgimigli, Lugano, SWITZERLAND

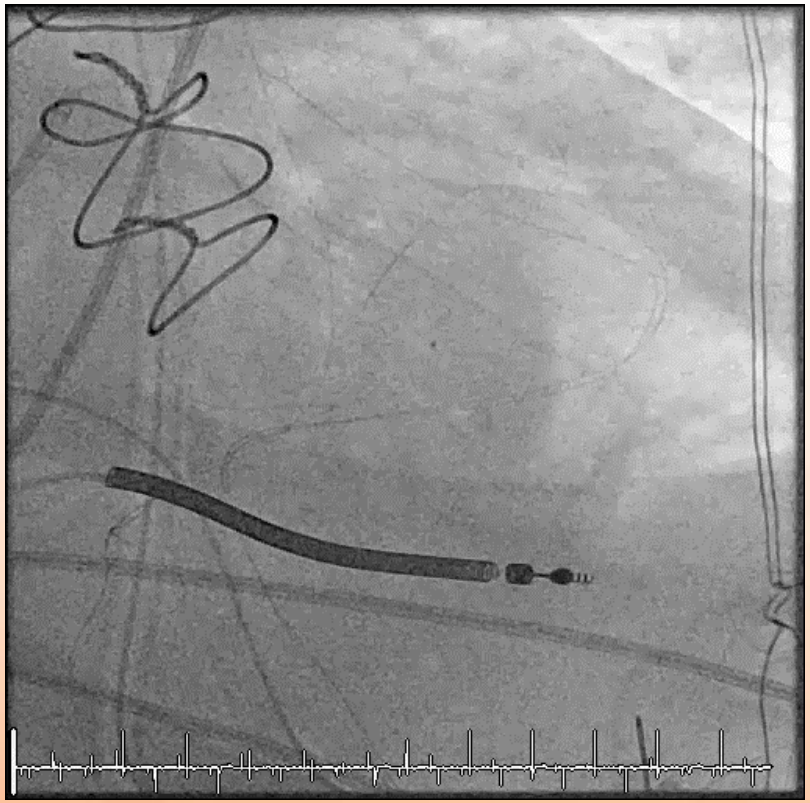
61 Y-OLD MALE WITH AORTIC ANEURYSM
ACUTE THROMBOTIC OCCLUSION 1ST MARGINAL BRANCH

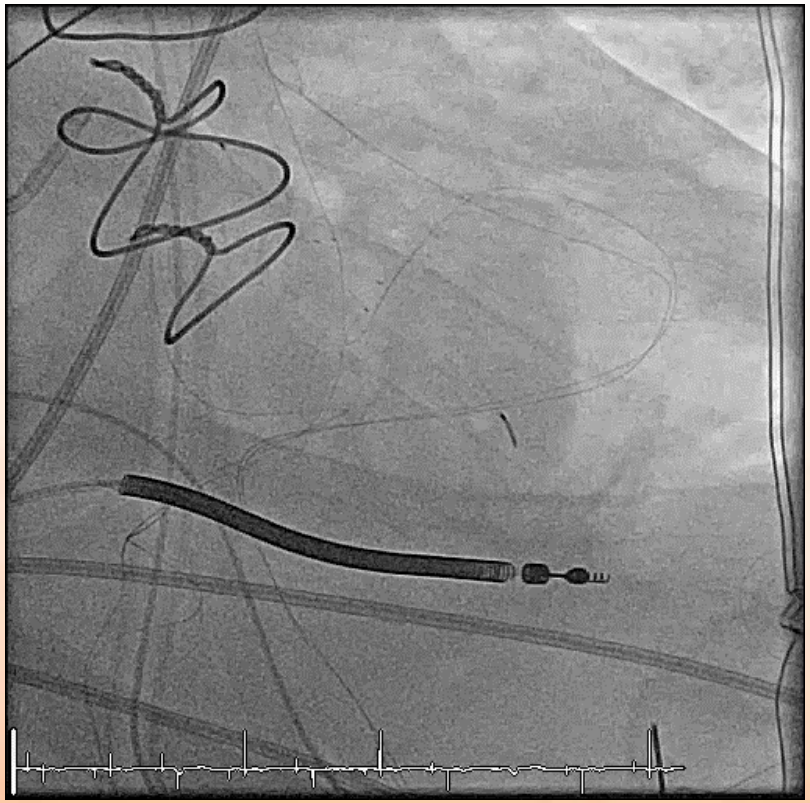


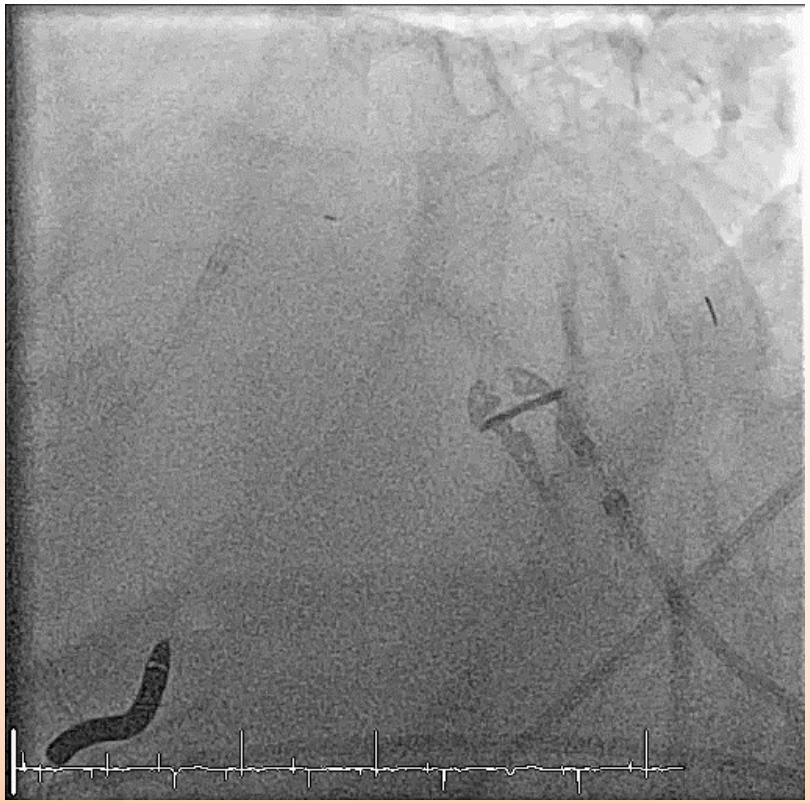


Case courtesy of Dr Marco Valgimigli, Lugano, SWITZERLAND

61 Y-OLD MALE WITH AORTIC ANEURYSM THROMBECTOMY WITH ENVAST

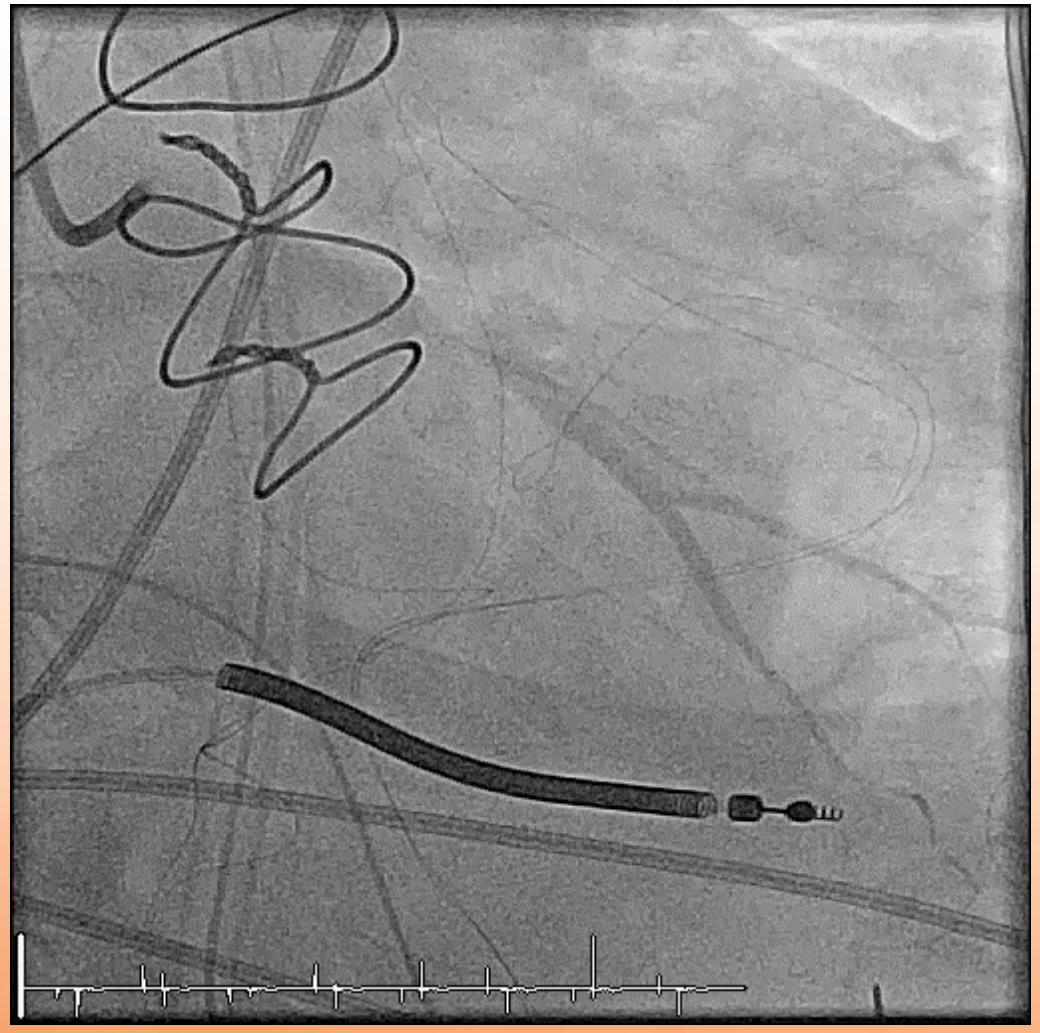


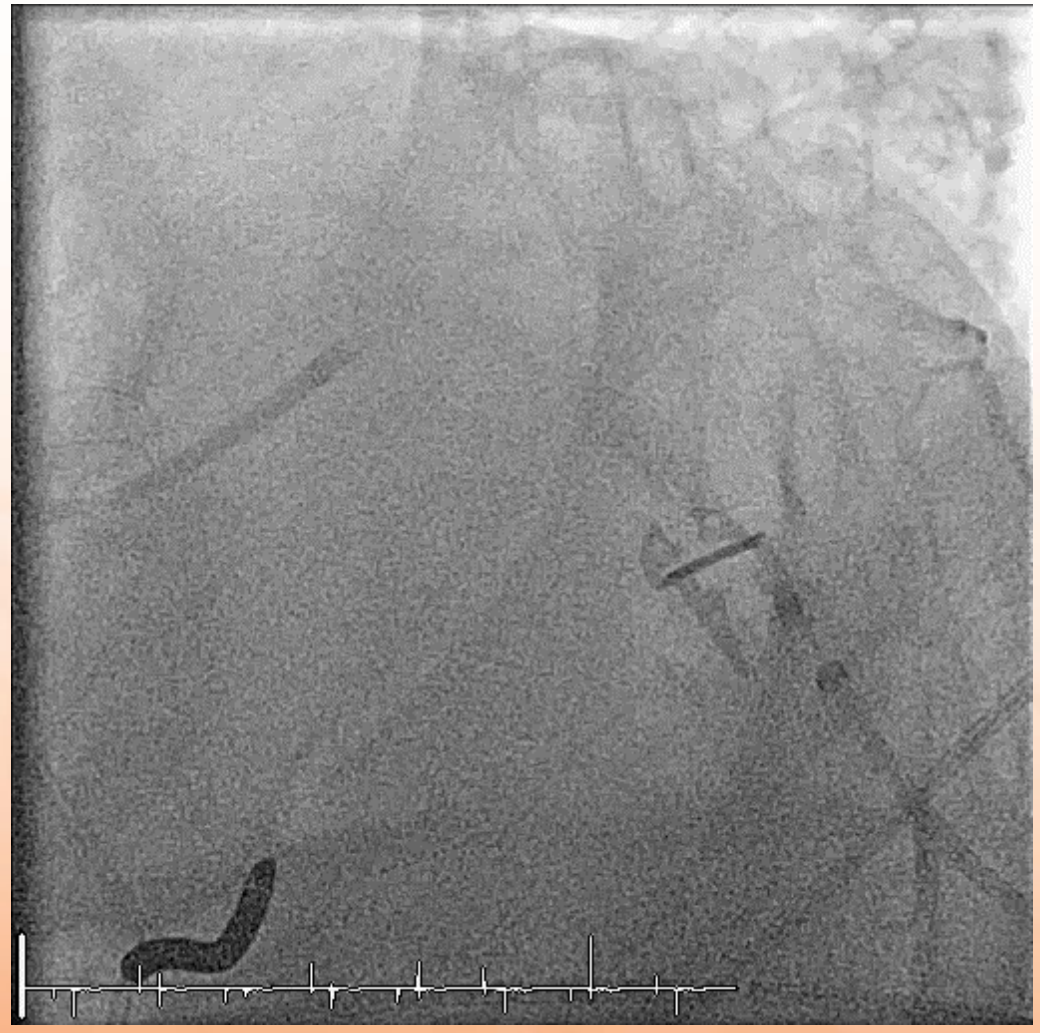




Case courtesy of Dr Marco Valgimigli, Lugano, SWITZERLAND

61 Y-OLD MALE WITH AORTIC ANEURYSM THROMBECTOMY WITH ENVAST - RESULTS





Case courtesy of Dr Marco Valgimigli, Lugano, SWITZERLAND

ANATOMY AND TERMS

CHOOSE TO REMOVE

ACUTE CORONARY SYNDROME AND HEART ATTACKS

- Acute coronary syndrome (ACS) is when the arteries that carry blood, oxygen, and nutrients get blocked. Heart attacks are a form of ACS. They occur when your heart doesn't get enough blood supply. A heart attack is also known as a myocardial infarction(MI).

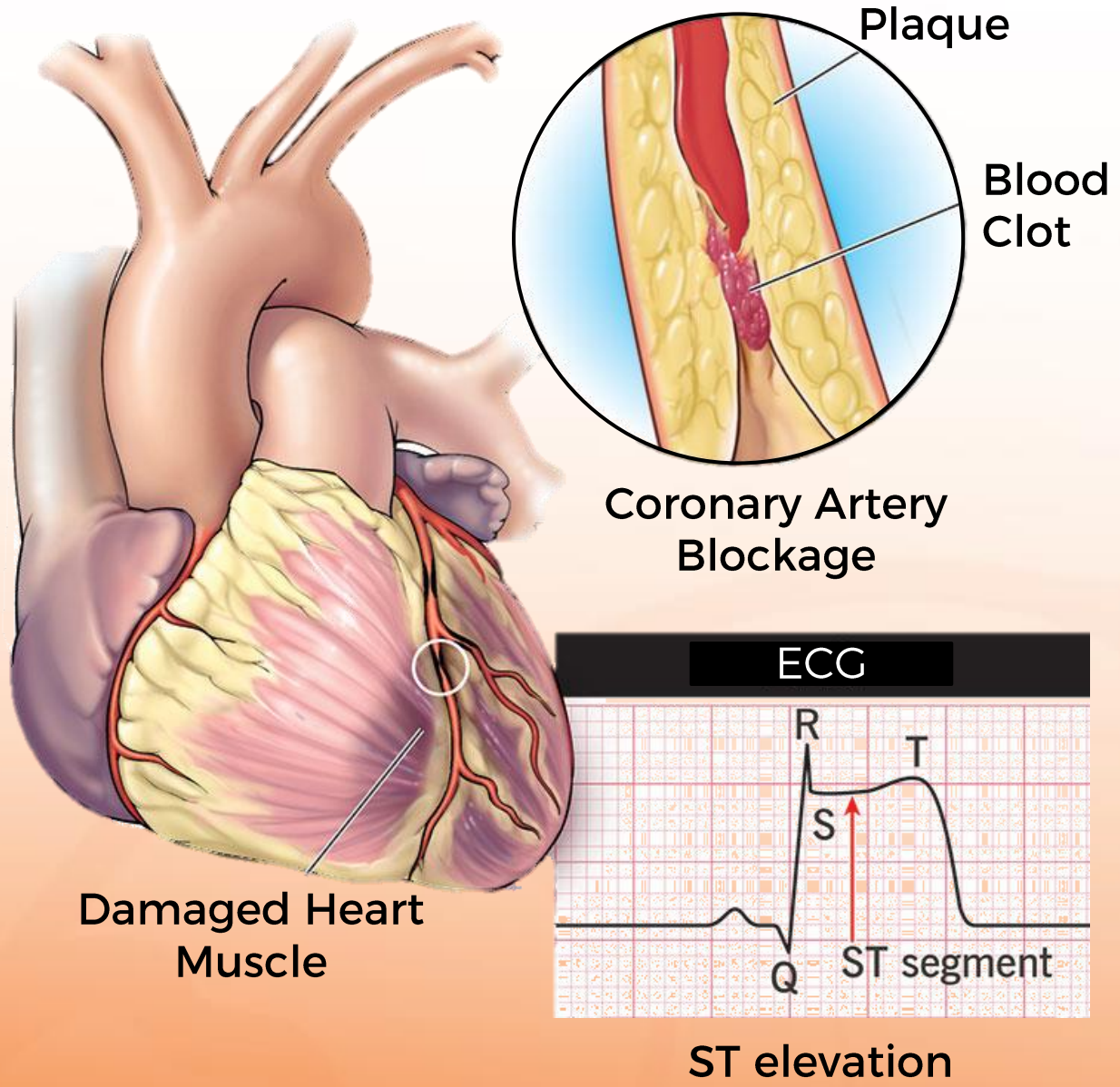
- The three types of heart attacks are:

  ST segment elevation myocardial infarction (STEMI)

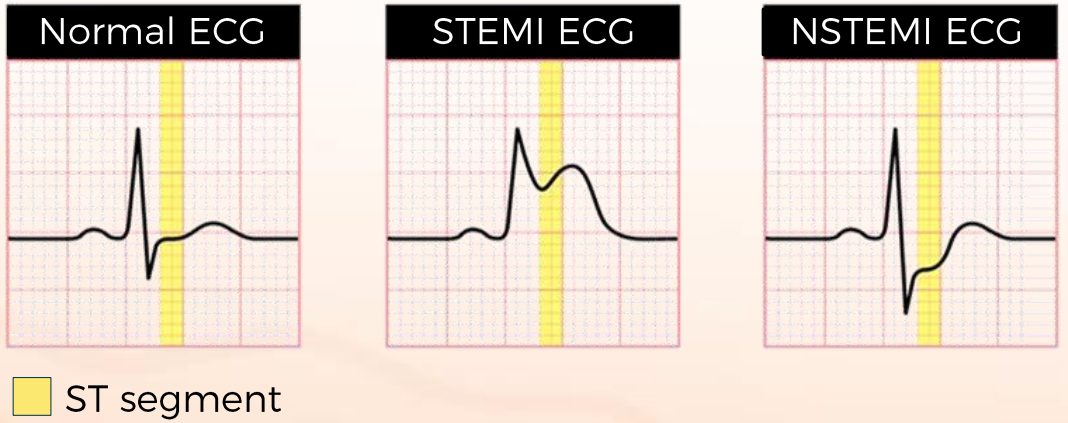
  Non-ST segment elevation myocardial infarction (NSTEMI)

  Coronary spasm, or unstable angina

STEMI



- "ST segment" refers to the pattern that appears on an electrocardiogram, which is a display of your heartbeat. Only a STEMI will show elevated segments

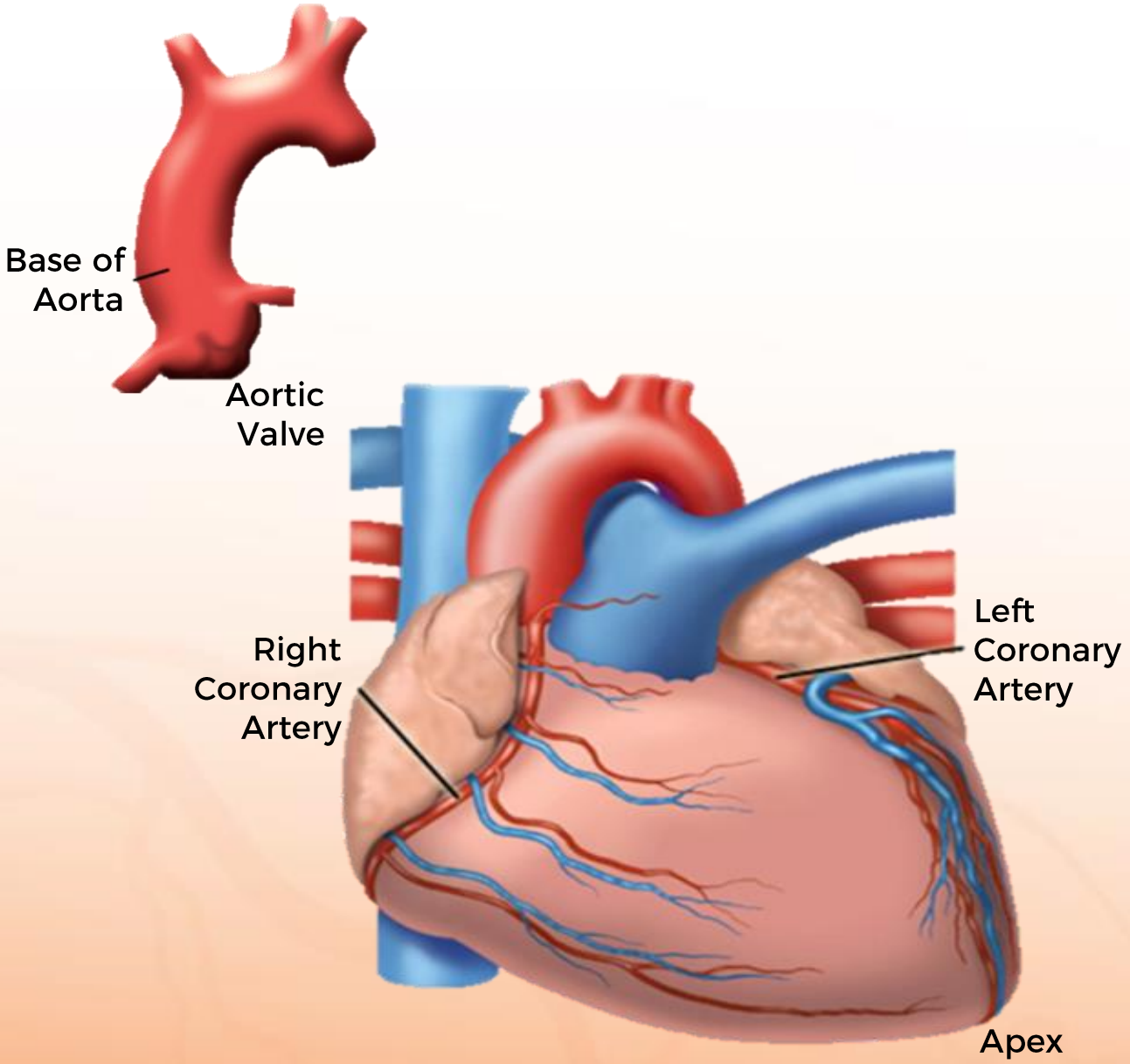


- Both STEMI and NSTEMI heart attacks can cause enough damage to be considered major heart attacks

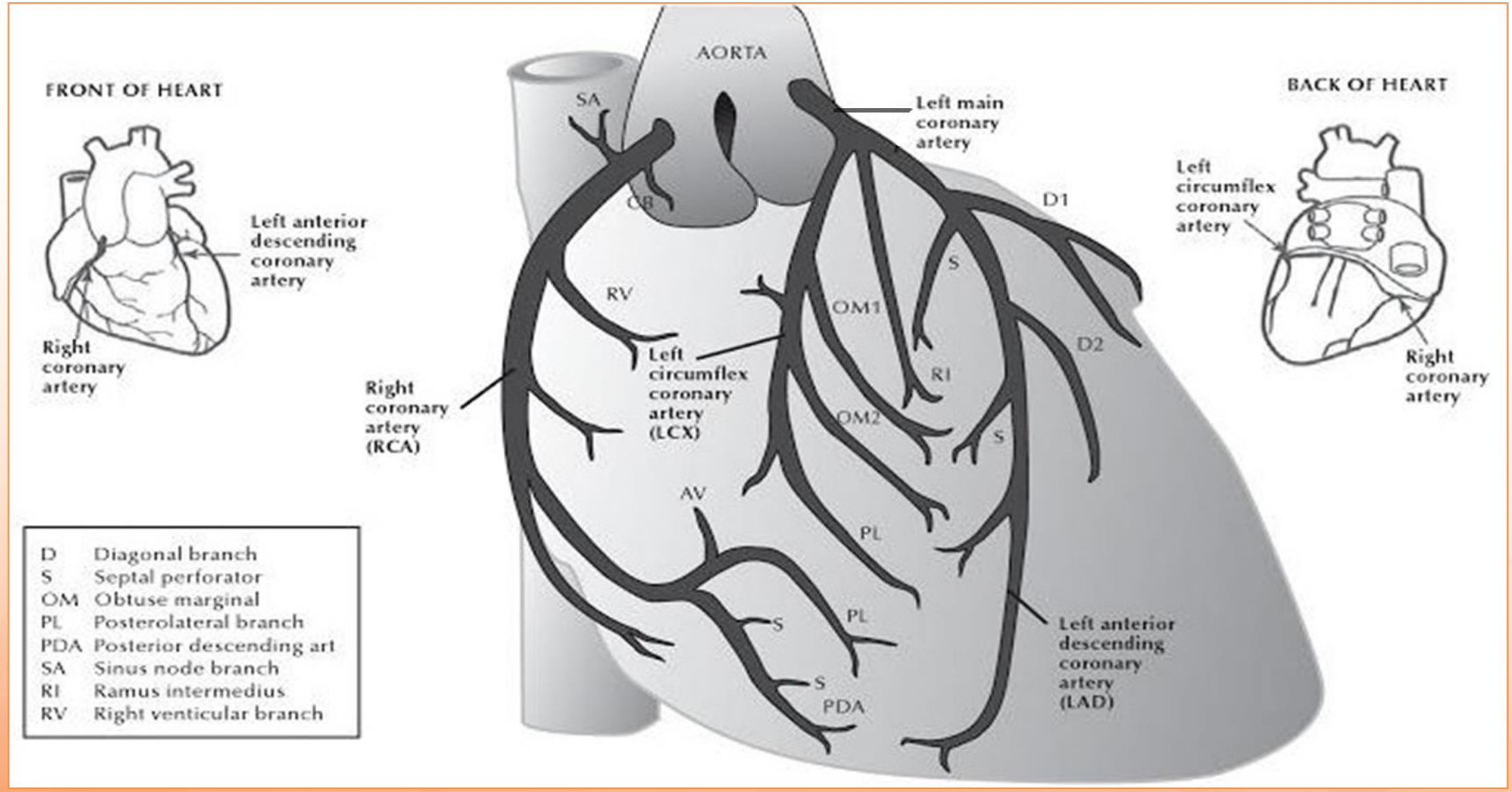
https://my.clevelandclinic.org/health/diseases/22068-stemi-heart-attack

THE CORONARY ARTERIES

- The heart has two main arteries, the left coronary artery (LCA) and the right coronary artery (RCA)
- The coronary arteries branch off the base of the aorta just above the aortic valve and run along the surface of the heart
- The coronary arteries circle the top of the heart and branch downward towards the apex
- The main arteries run along the surface and their branches penetrate into the muscle



THE CORONARY ARTERIES



ABBREVIATIONS

- PCI = percutaneous coronary interventions
- STEMI = ST elevation myocardial infarction
- ACS = acute coronary syndrome
- RCA = right coronary artery
- LAD = left anterior descending artery
- LCX = left circumflex artery
- LTB = large thrombus burden
- MBG = myocardial blush grade
- TIMI = thrombolysis in myocardial infarction flow score
- TTG = TIMI thrombus grade

TIMI = Thrombolysis In Myocardial Infarction Perfusion Grade

- The TIMI Myocardial Perfusion Grade is a technique to assess myocardial perfusion

GRADE	DESCRIPTION
0	NO PERFUSION There is no antegrade flow beyond the point of occlusion
1	PENETRATION WITHOUT PERFUSION The contrast material passes beyond the area of obstruction but “hangs up” and fails to opacify the entire coronary bed distal to the obstruction for the duration of the cine-angiographic filming sequence
2	PARTIAL PERFUSION The contrast material passes across the obstruction and opacifies the coronary bed distal to the obstruction. The rate of entry of the contrast material into the vessel distal to the obstruction or the rate of clearance from the distal bed is perceptibly slower than its entry into or clearance from comparable areas not perfused by the previously occluded vessel—e.g., the opposite coronary artery or the coronary bed proximal to the obstruction
3	COMPLETE PERFUSION Antegrade flow into the bed distal to the obstruction occurs as promptly as antegrade flow into the bed proximal to the obstruction, and clearance of contrast material from the involved bed is as rapid as clearance from an uninvolved bed in the same vessel or the opposite artery

Myocardial Blush Grade

- Myocardial blush grade (MBG) is a simple visual angiographic assessment of myocardial perfusion in the infarct area

GRADE	DESCRIPTION
0	No angiographic signs of thrombosis
1	Possible presence of thrombosis, based on angiographic characteristics (reduced contrast density, haziness, irregular lesion contour, or a smooth convex “meniscus” at the site of total occlusion suggestive but not diagnostic of thrombosis)
2	Presence of thrombosis visible in more projections, with markedly irregular lesion contour, a significative filling defect, and the greatest dimension ≤ ½ vessel diameter
3	Definite thrombus with greatest linear dimension > ½ but < 2 vessel diameter
4	Definite thrombus of large size, with the largest dimension ≥ 2 vessel diameter
5	Recent total occlusion

TIMI = Thrombosis Grade

- The TIMI thrombosis grade is a technique for angiographic thrombus burden assessment

GRADE	DESCRIPTION
0	NO PERFUSION There is no antegrade flow beyond the point of occlusion
1	PENETRATION WITHOUT PERFUSION The contrast material passes beyond the area of obstruction but “hangs up” and fails to opacify the entire coronary bed distal to the obstruction for the duration of the cine-angiographic filming sequence
2	PARTIAL PERFUSION The contrast material passes across the obstruction and opacifies the coronary bed distal to the obstruction. The rate of entry of the contrast material into the vessel distal to the obstruction or the rate of clearance from the distal bed is perceptibly slower than its entry into or clearance from comparable areas not perfused by the previously occluded vessel—e.g., the opposite coronary artery or the coronary bed proximal to the obstruction
3	COMPLETE PERFUSION Antegrade flow into the bed distal to the obstruction occurs as promptly as antegrade flow into the bed proximal to the obstruction, and clearance of contrast material from the involved bed is as rapid as clearance from an uninvolved bed in the same vessel or the opposite artery