Anterior wall STEMI bailed out by a mini-crush & complicated by a longitudinal stent deformity

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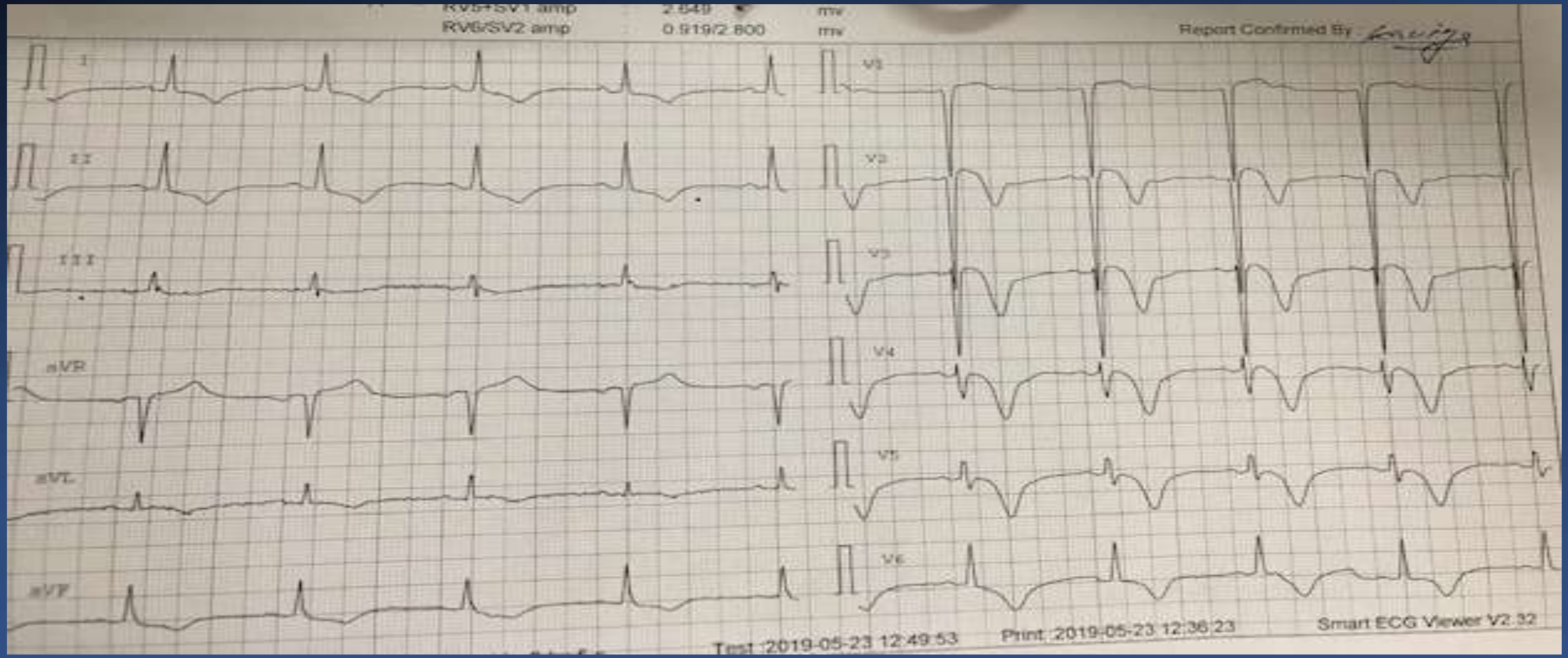
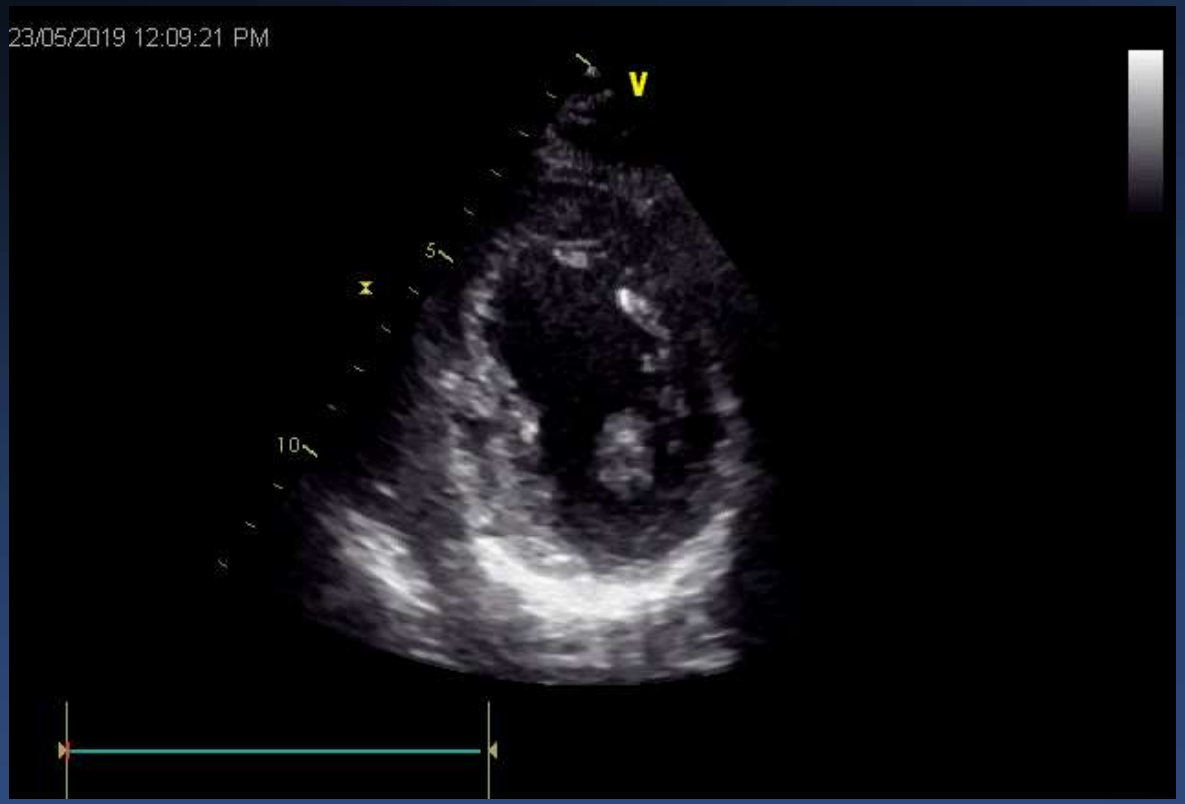
- 54 year old gentleman was admitted with
- chest pain of >4 hours duration
- He had effort angina a month prior to this event when
- triple vessel disease was detected & he was awaiting surgery
- No prior history of diabetes or hypertension
- He was a smoker

- Clinically he was restless & in pain

- Blood pressure was 90/60 with tachycardia
- Jvp was not elevated.Both heart sounds were normal
- There was minimal rales on auscultation

- ECG : sinus rhythm with ST elevation inV1-V2 and
- deep T inversion in Anterior leads & inferolat leads
- Echo regional wall motion in anterior wall with moderate
- LV dyfunction

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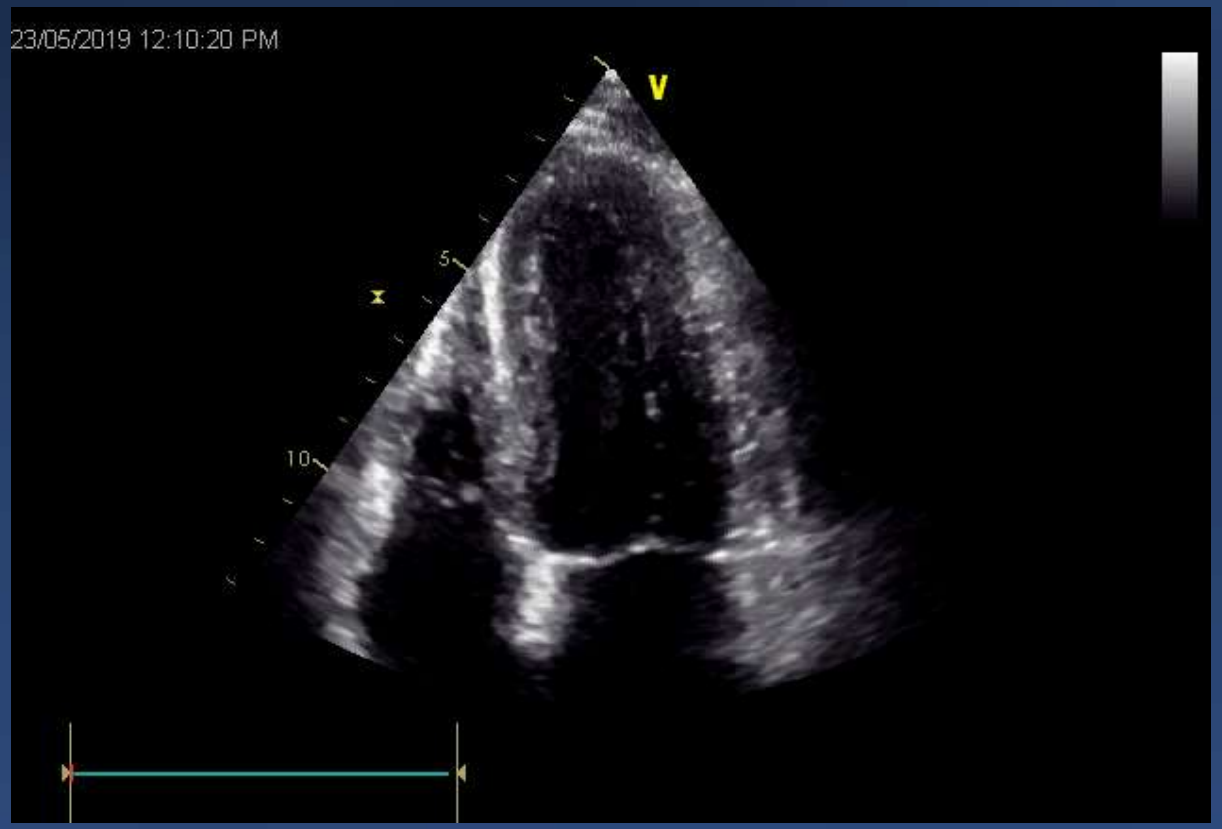
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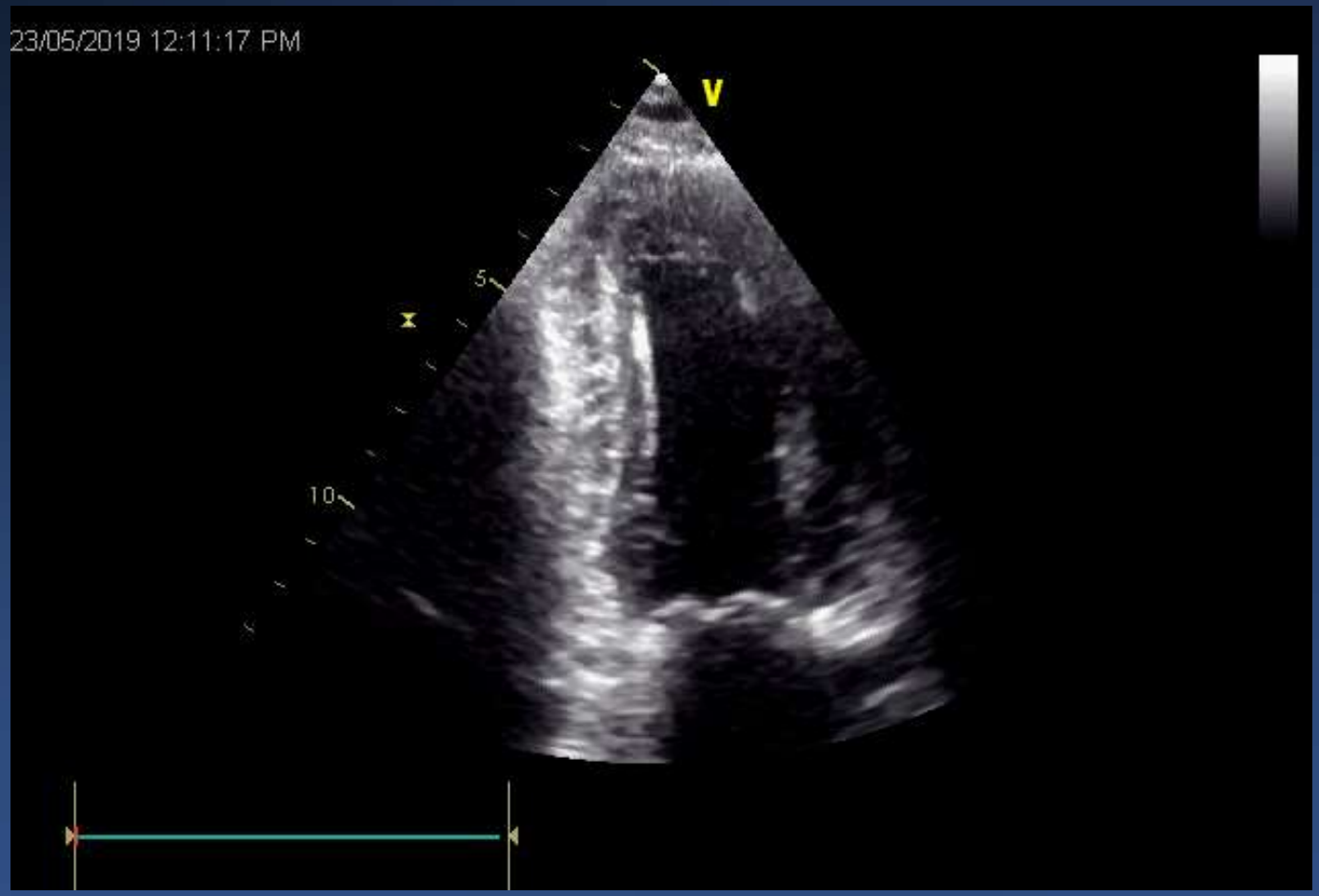
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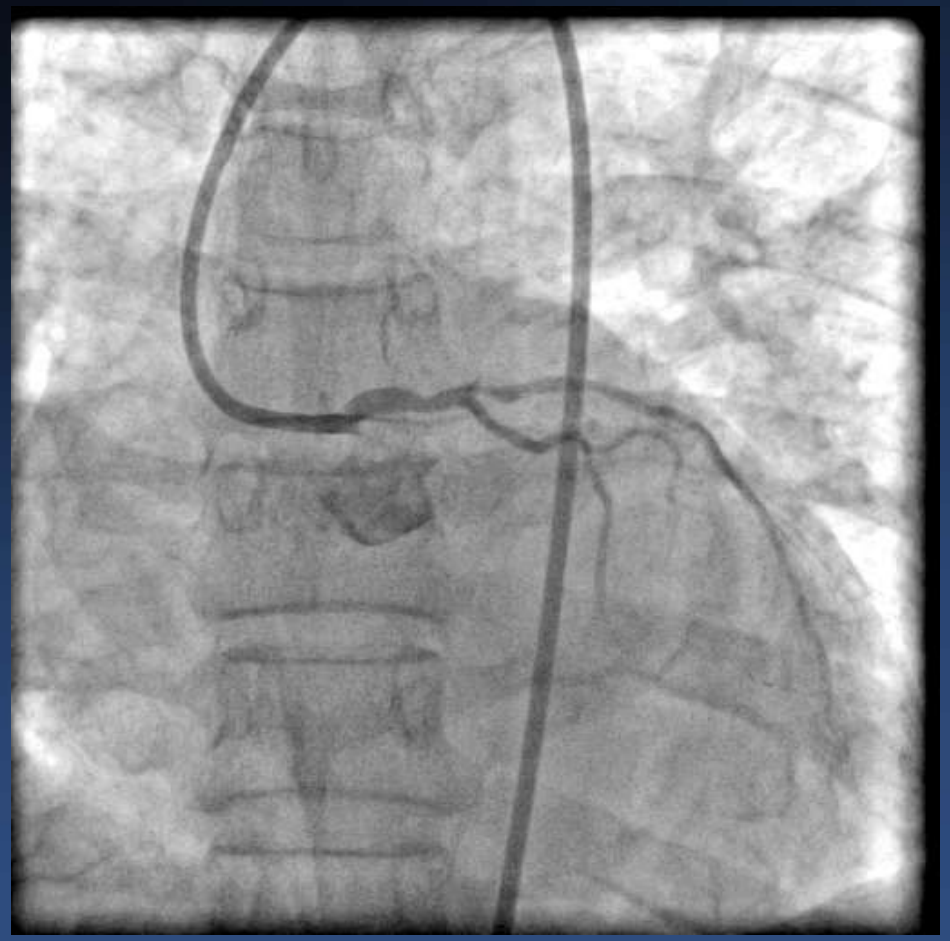
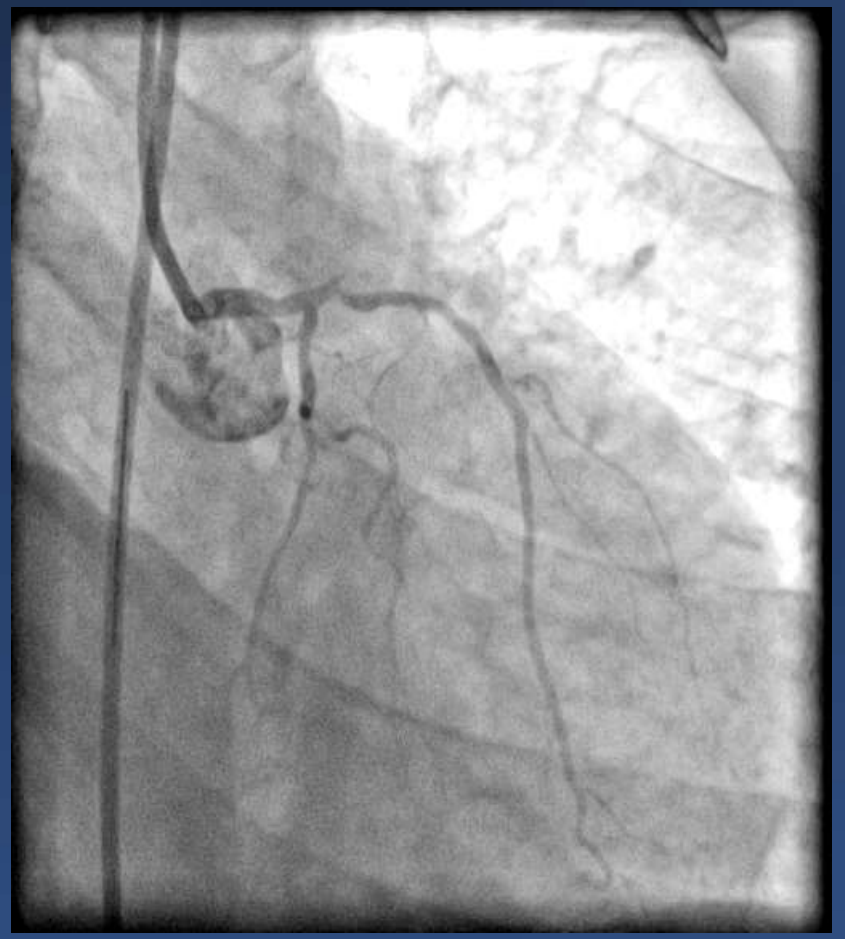
6Fr EBU Rt Femoral Access

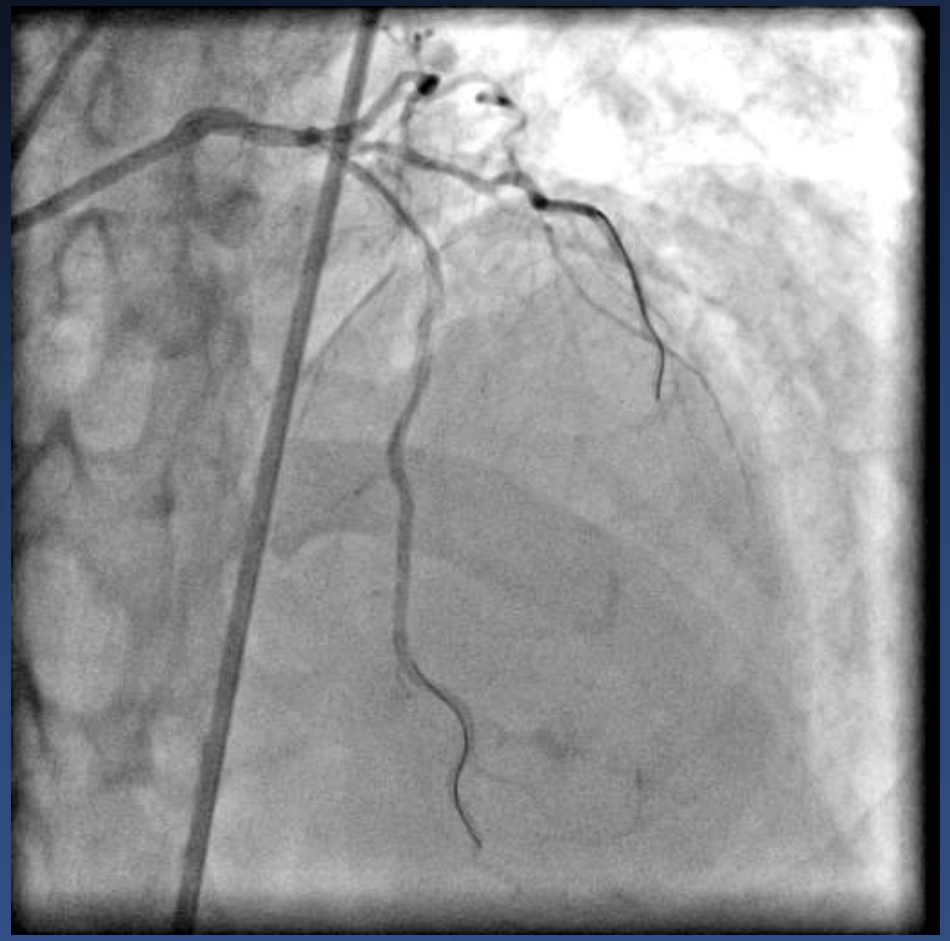




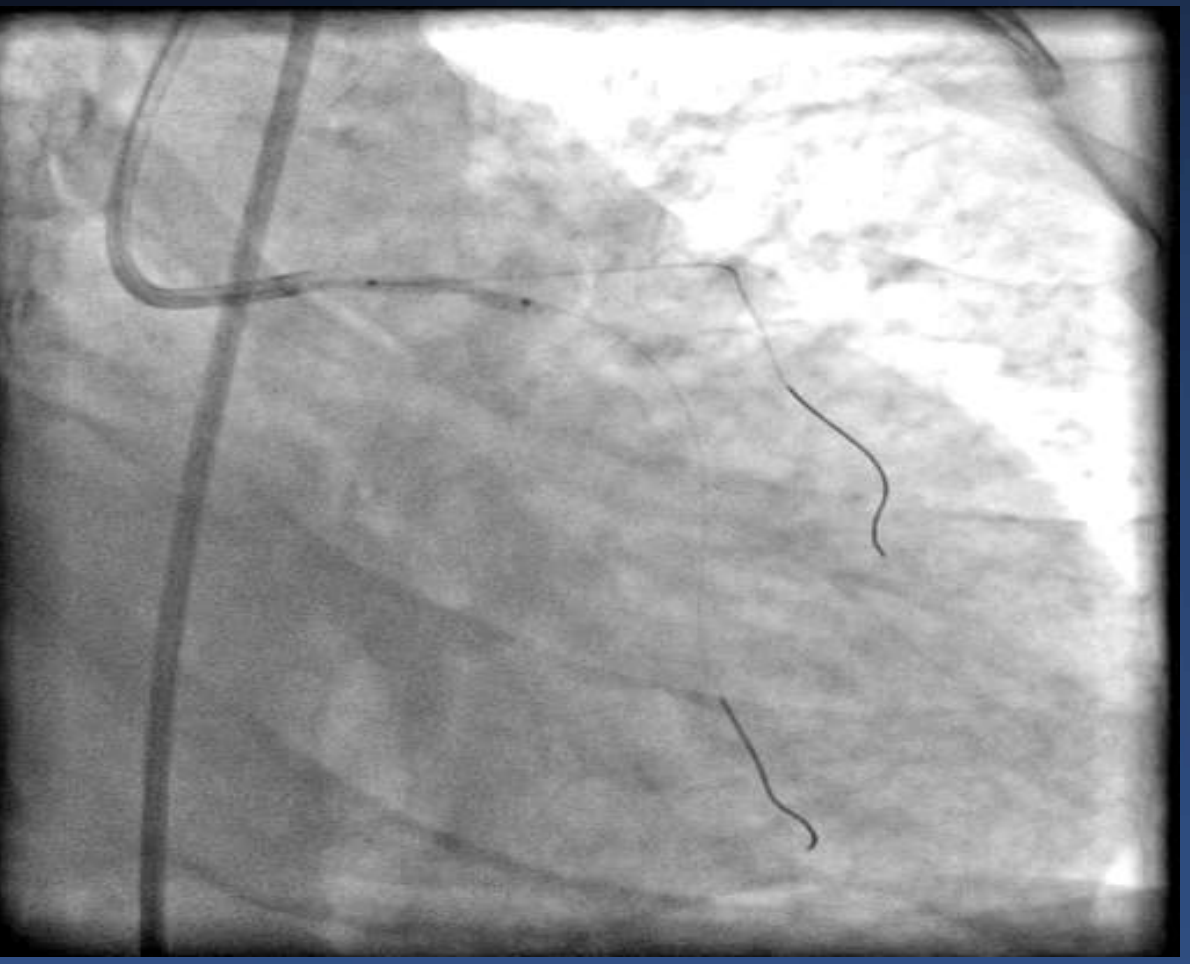
0.014 runthrough wires in LAD &Diagonal

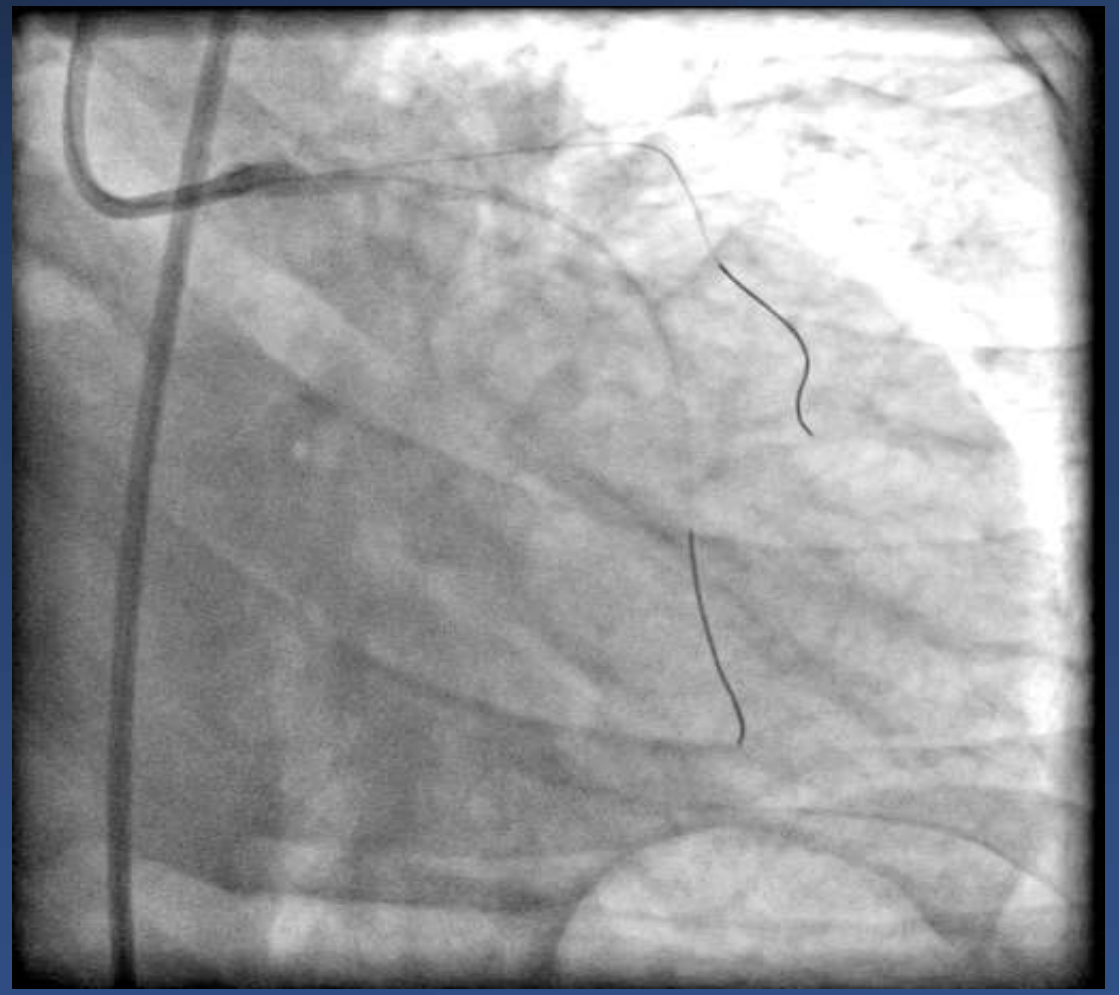
Predilating LAD 2.0x15 sc balloon

Mid LAD dissection\ostial Diagonal 99%

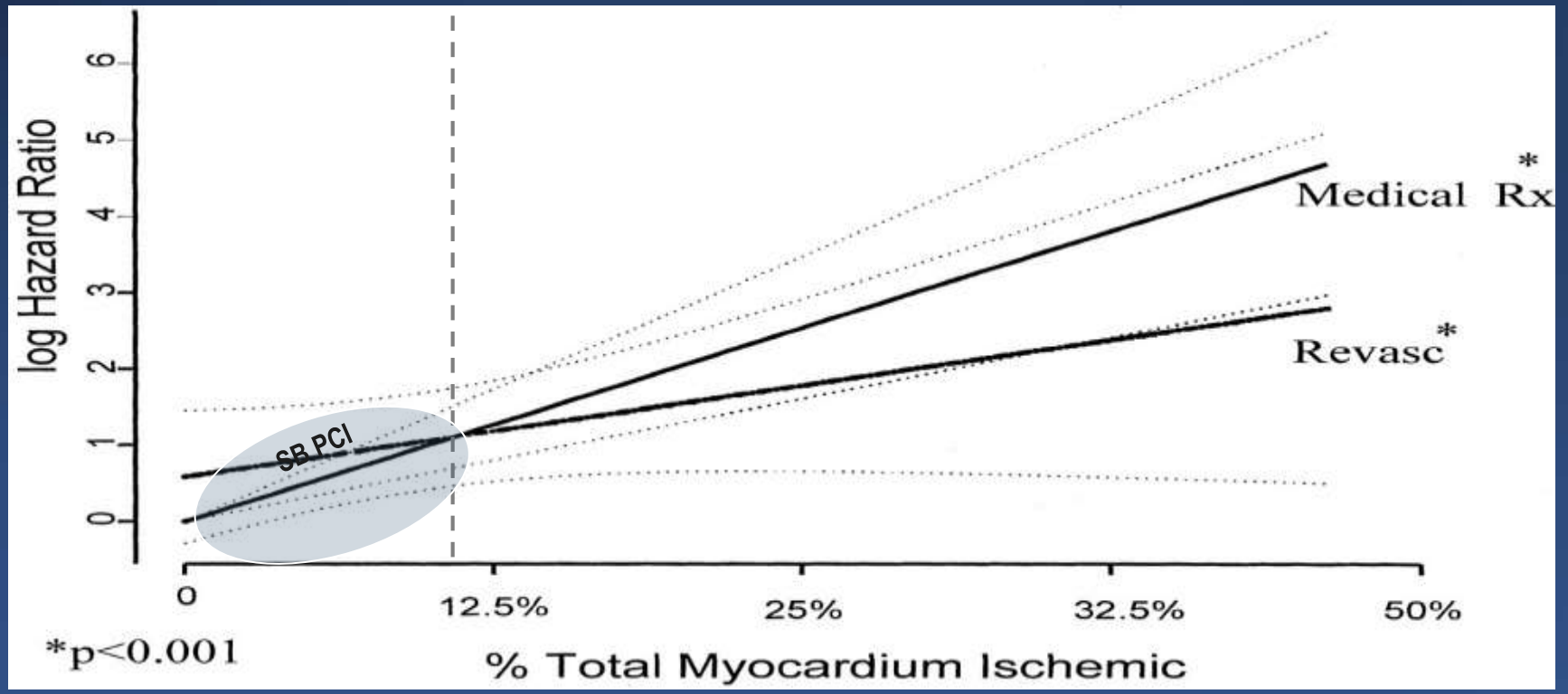


2 stent strategy





- In terms of ischemia at risk, revascularization is better than medical treatment when moderate to severe ischemia exists.
- Therefore, it is important **to define the side branches that can cause ≥10% ischemia**



Hachamovitch, Circulation 2003

Principles in bifurcation stenting

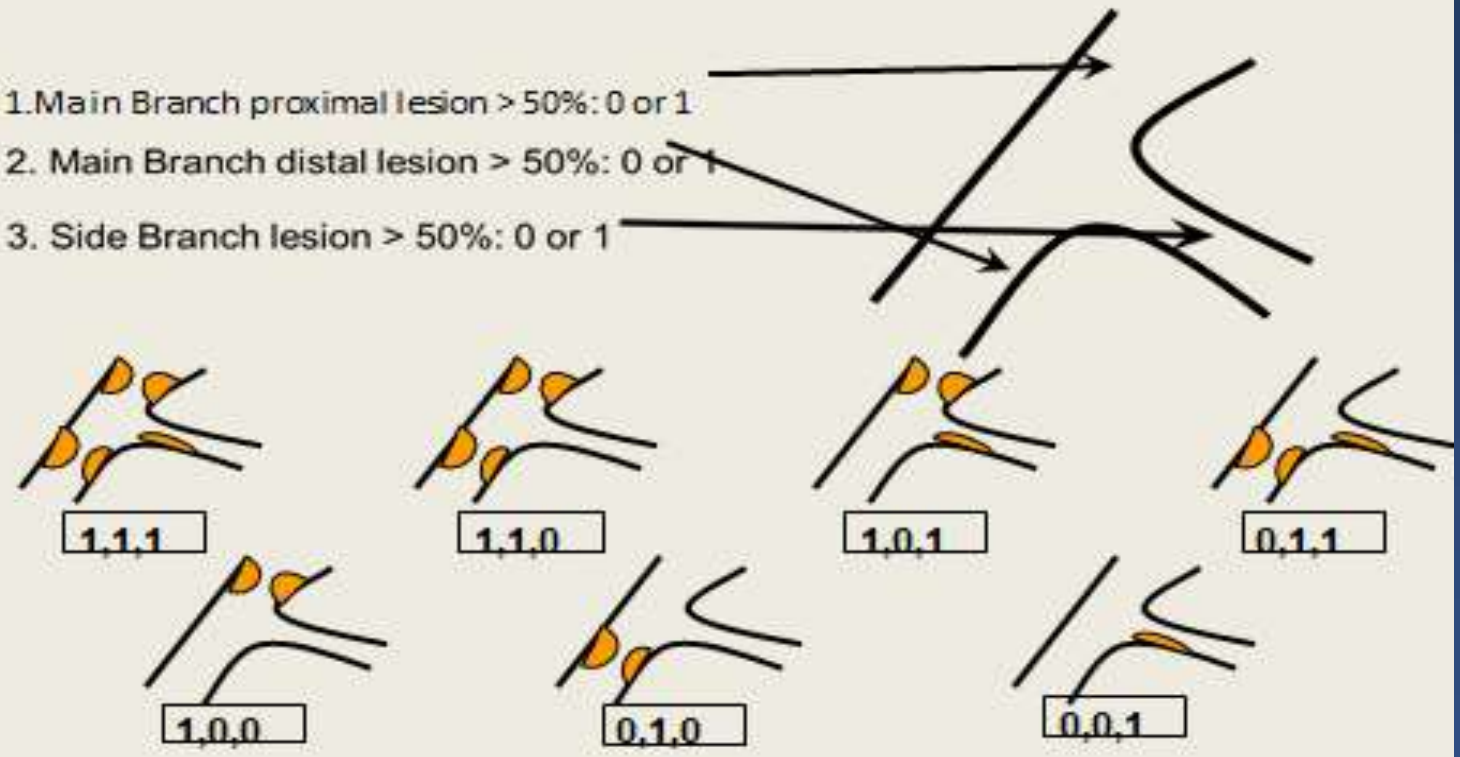
1. Protection only for clinically relevant SB
2. Limit the number of stents
3. Single stent layer, well apposed
4. Respect the original anatomy

2 stent strategy

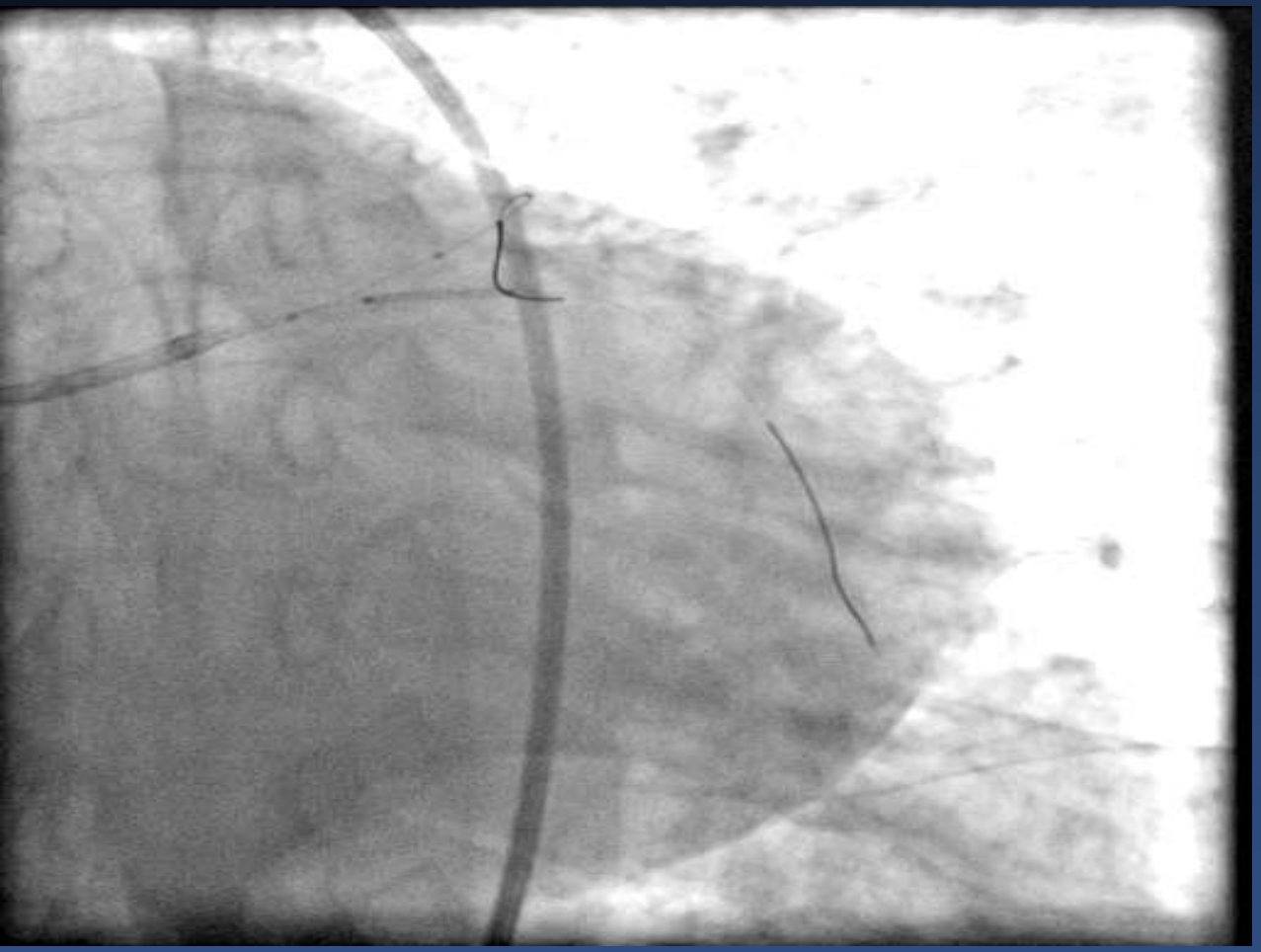
1.Main Branch proximal lesion > 50%: 0 or 1

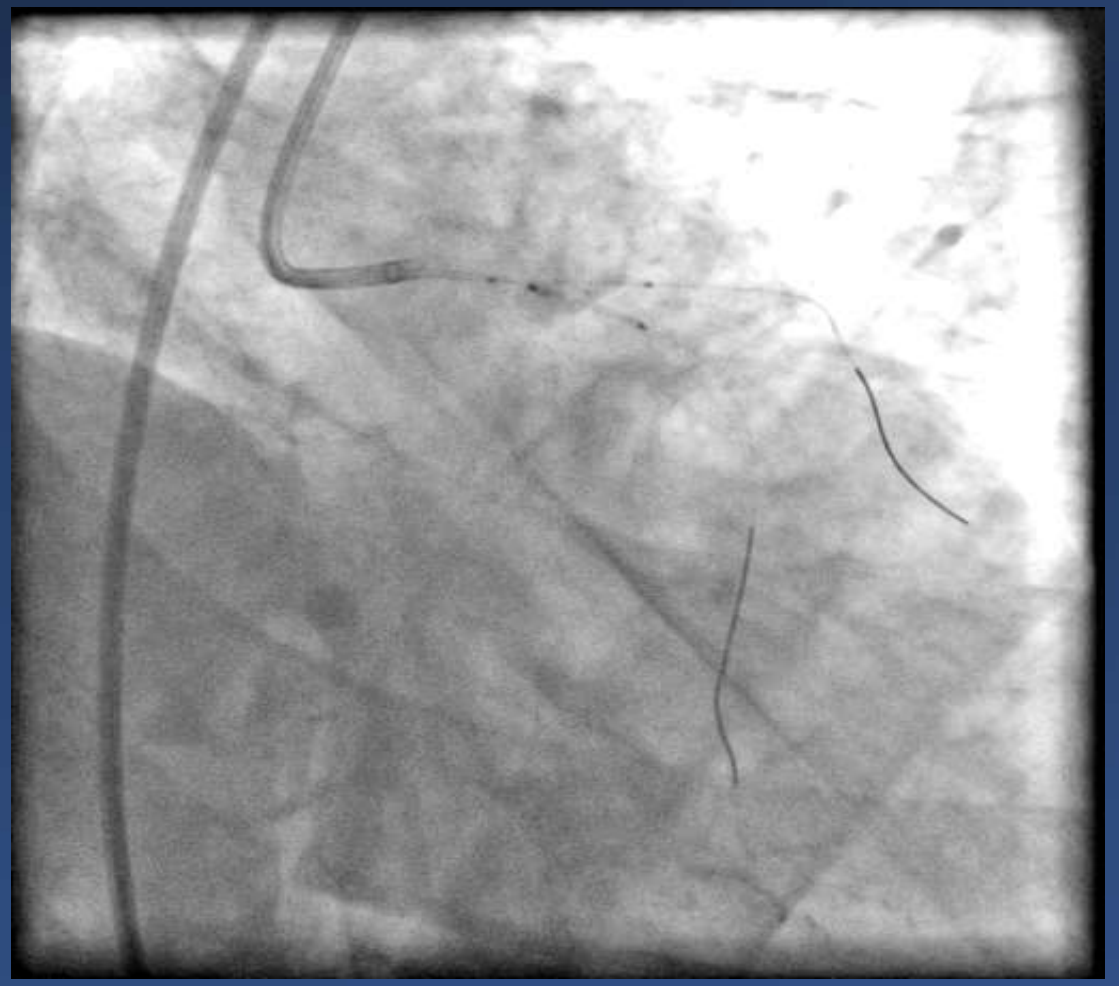
2. Main Branch distal lesion > 50%: 0 or 1

3. Side Branch lesion > 50%: 0 or 1

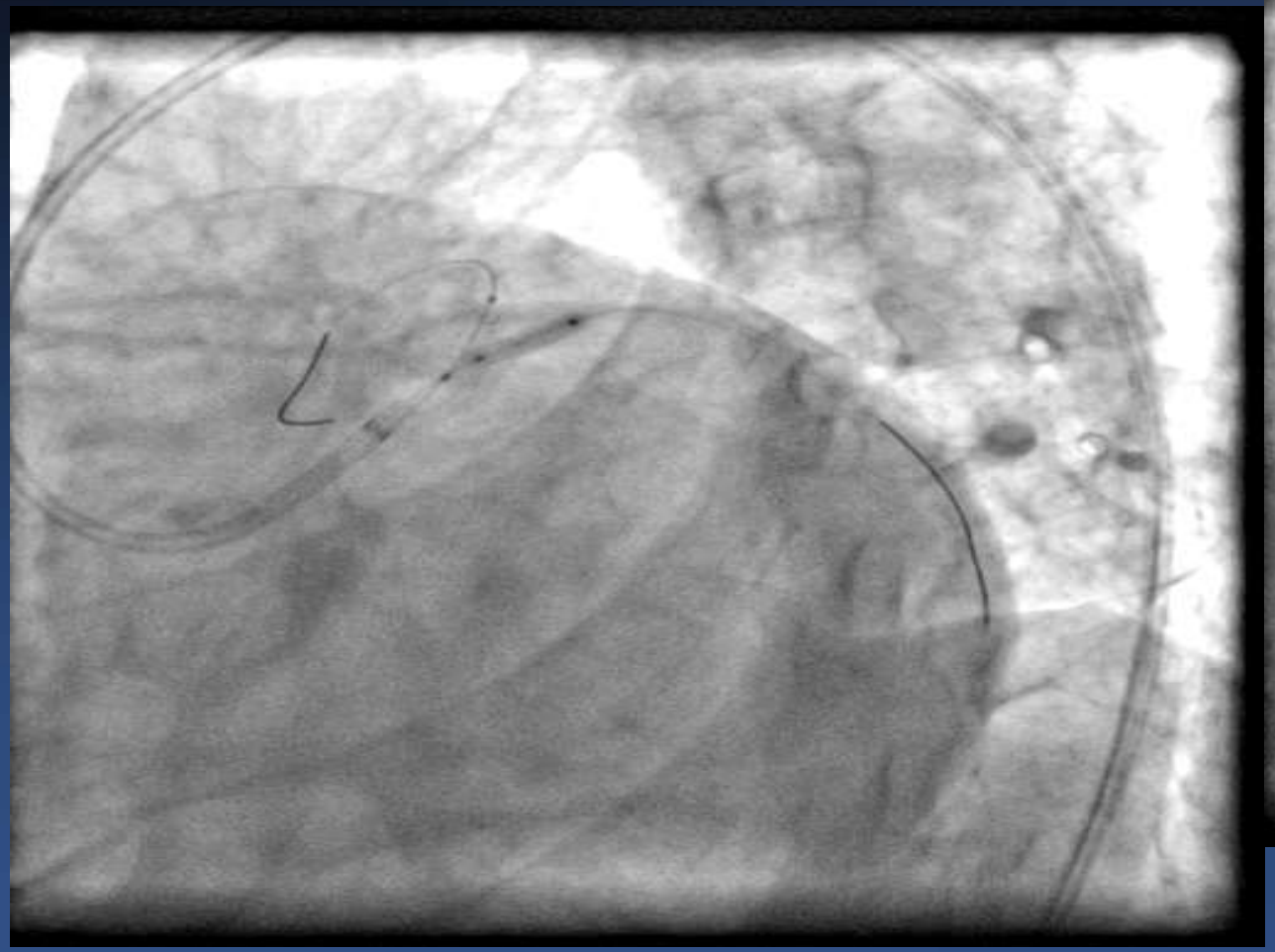


2.5x15 DES in Diagonal 3.0x15 nc balloon in LAD

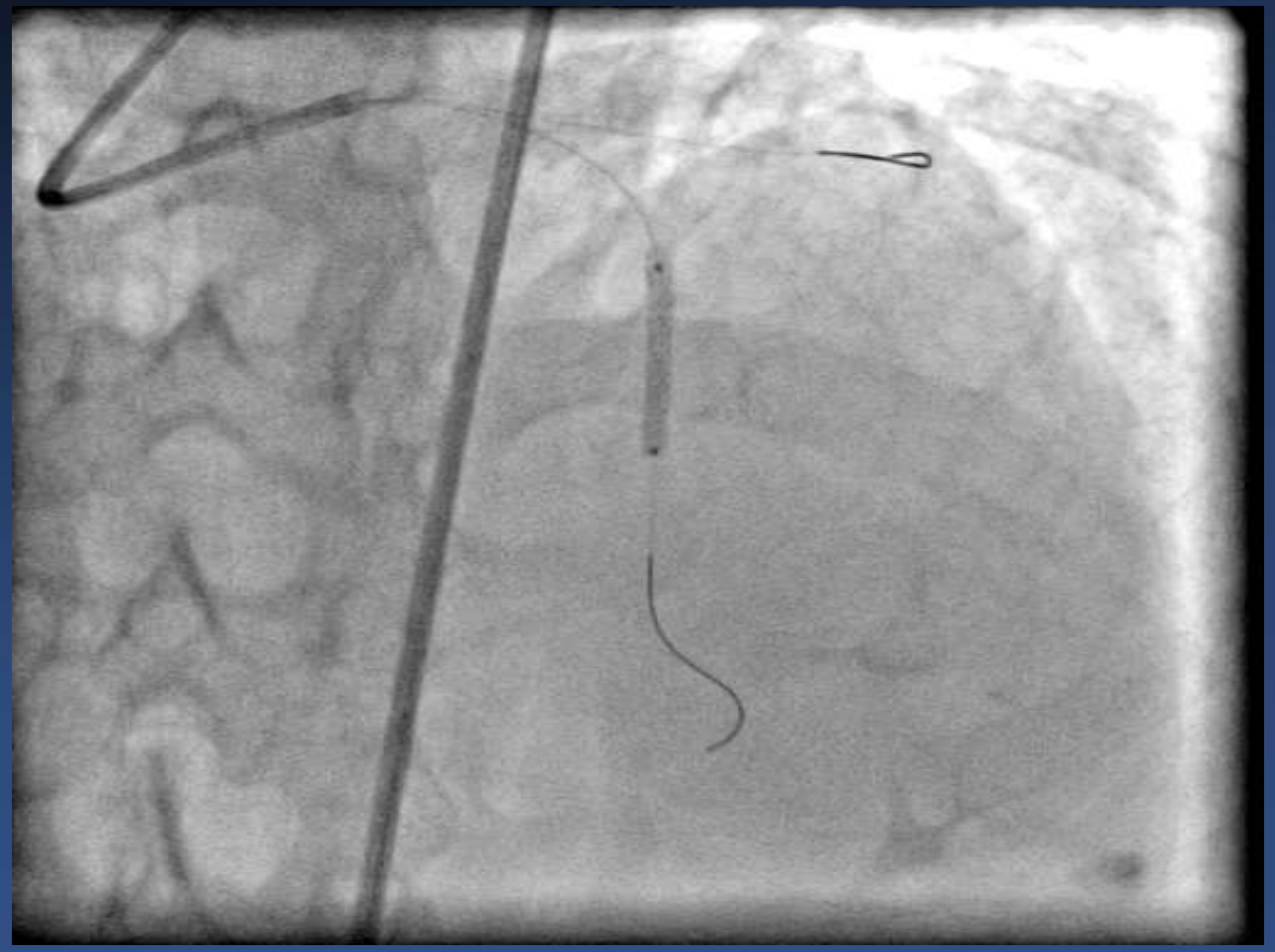




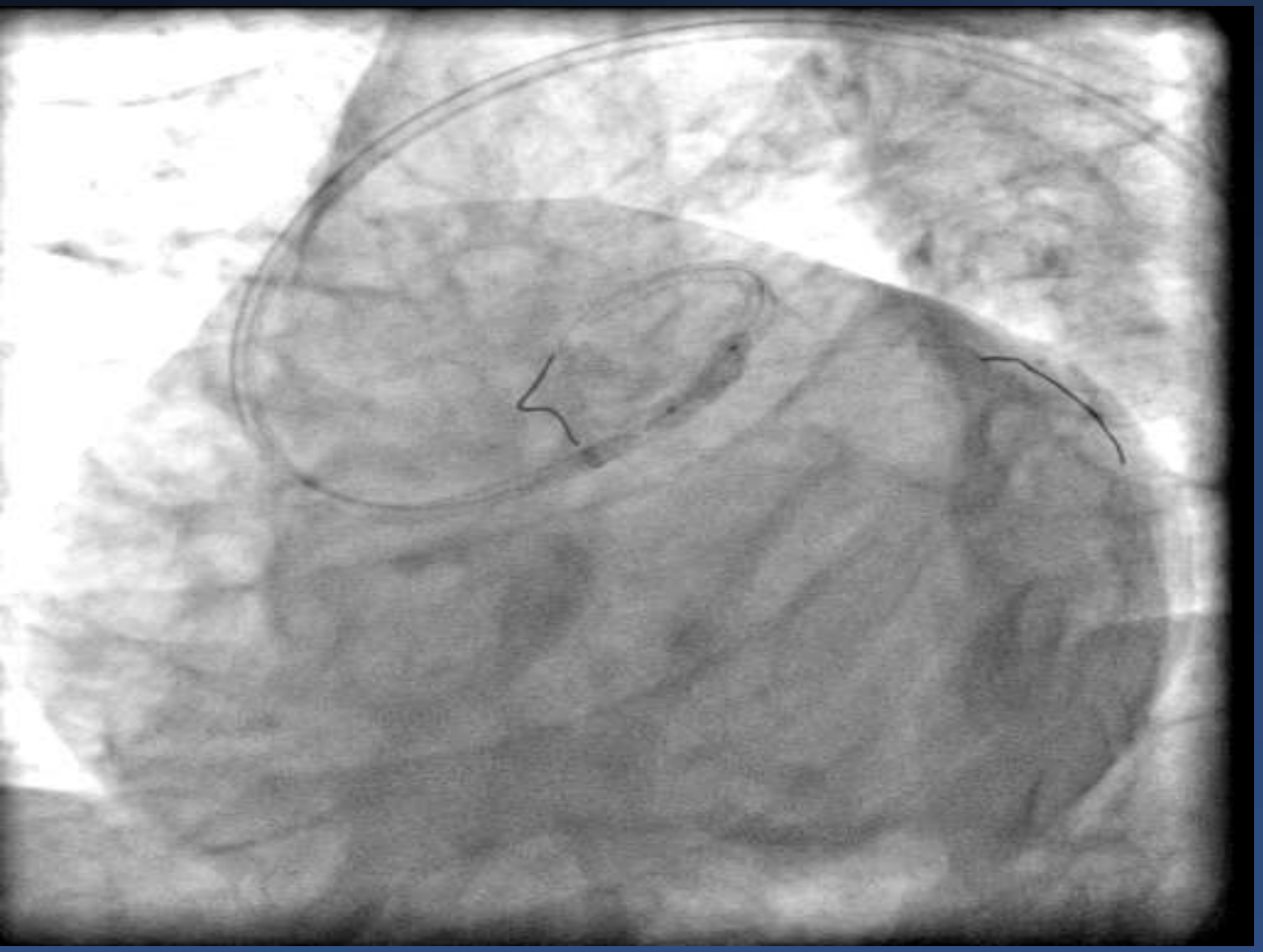
Stent crushed with 3.0x 15 nc balloon in LAD

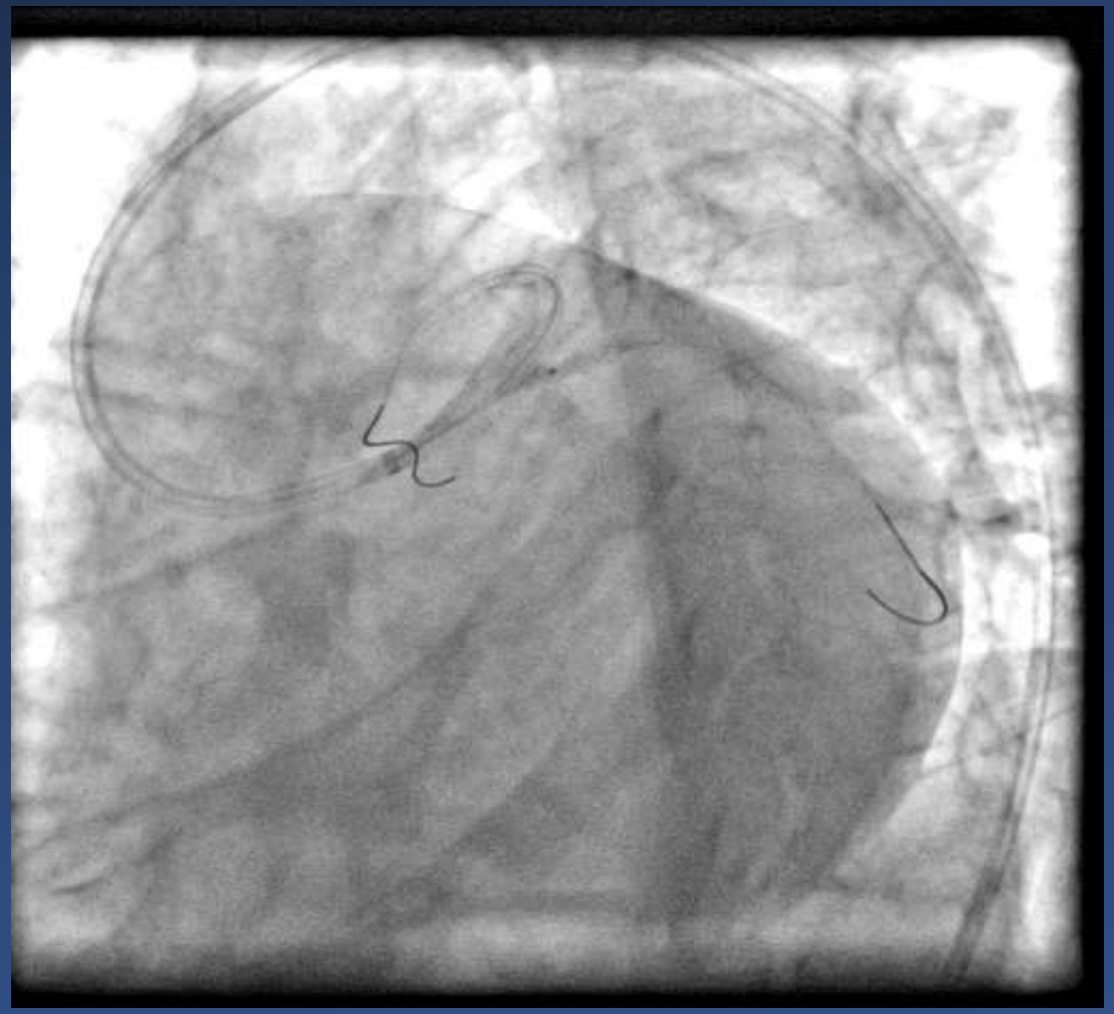


3.0 x23 DES in mid LAD/overlapped with 3.0x48 from Left Main

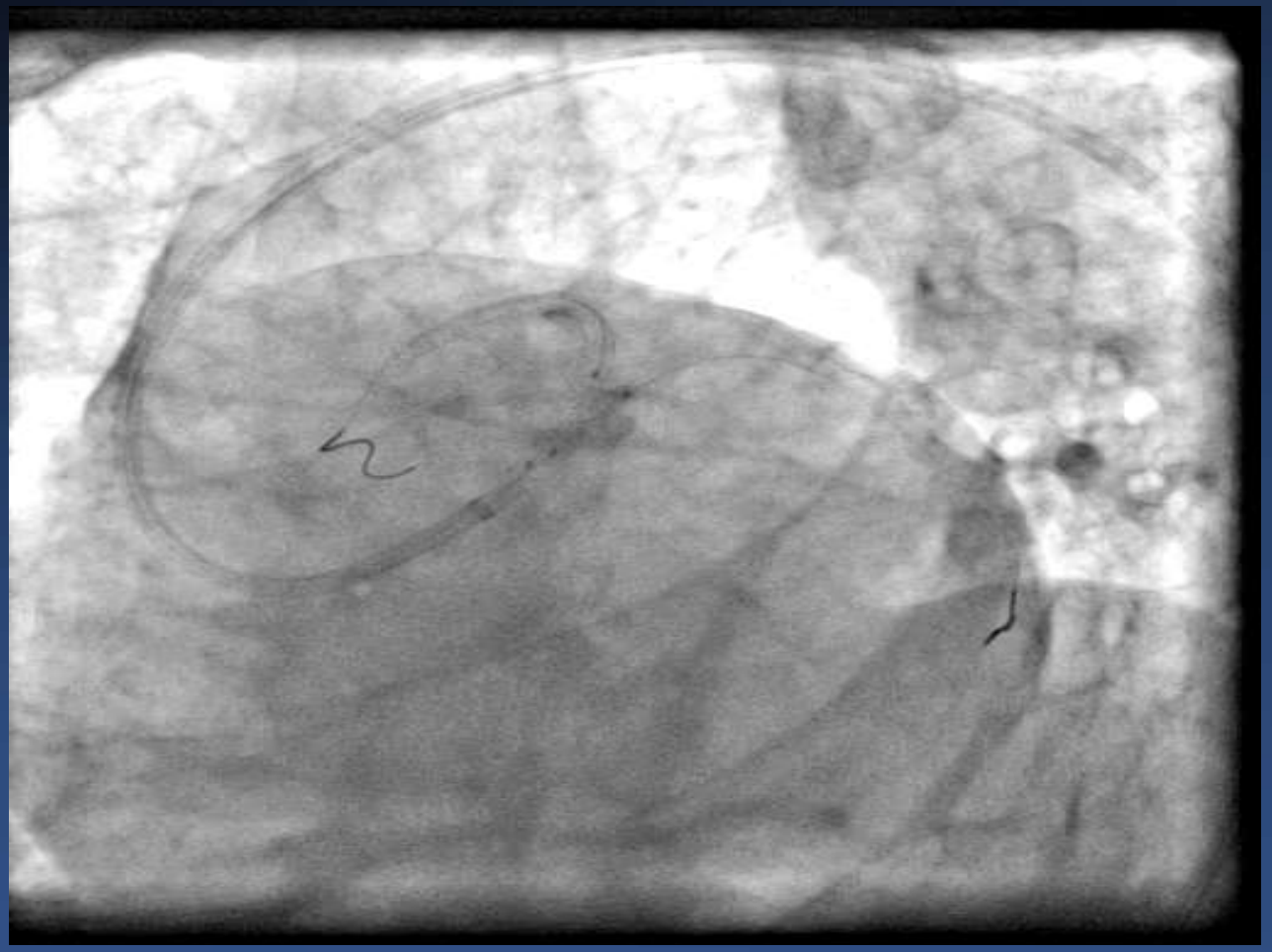


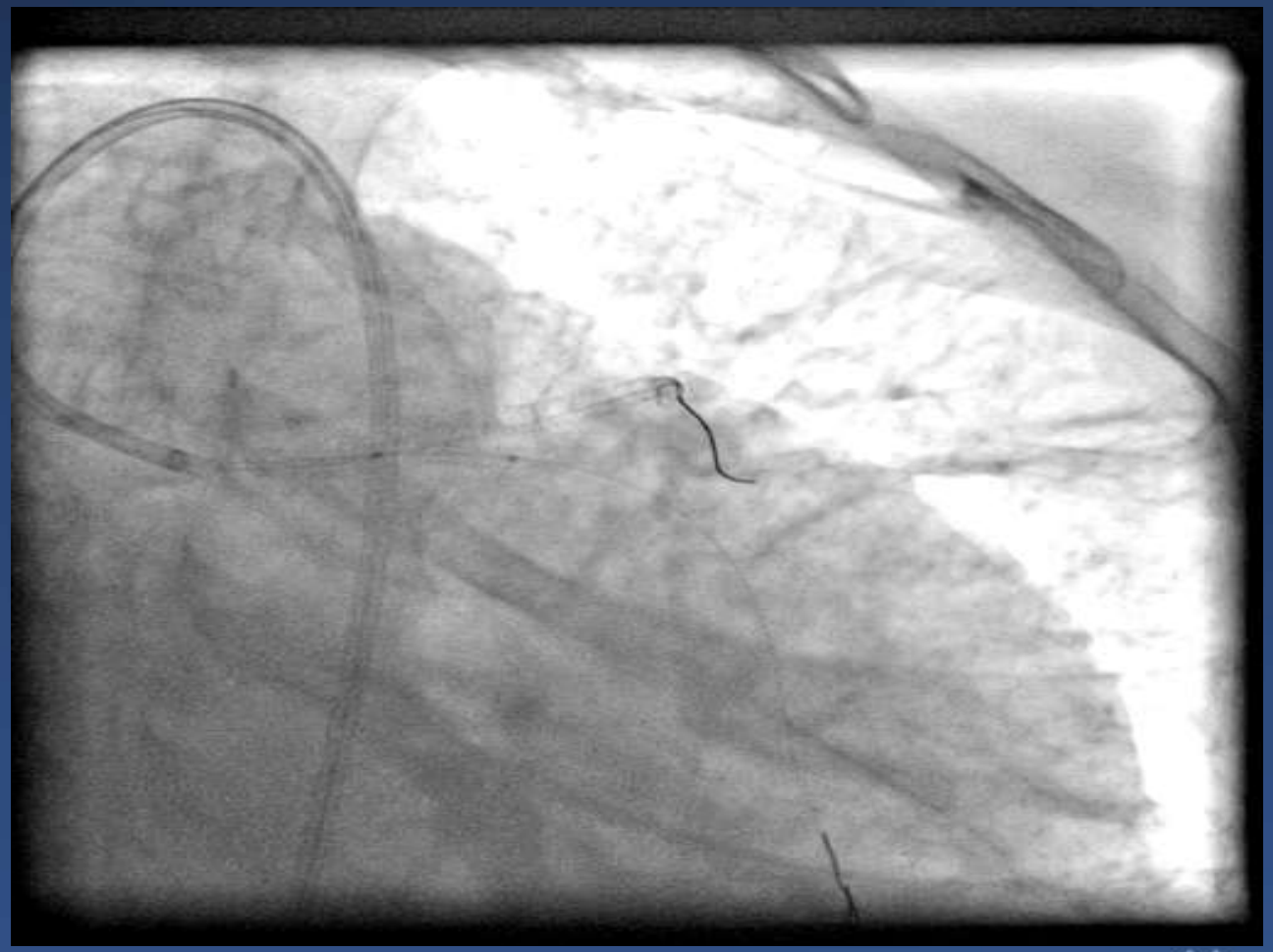
Recrosedwith 0.014 runthrough &post-dilated with 1.5x 12 n c balloon



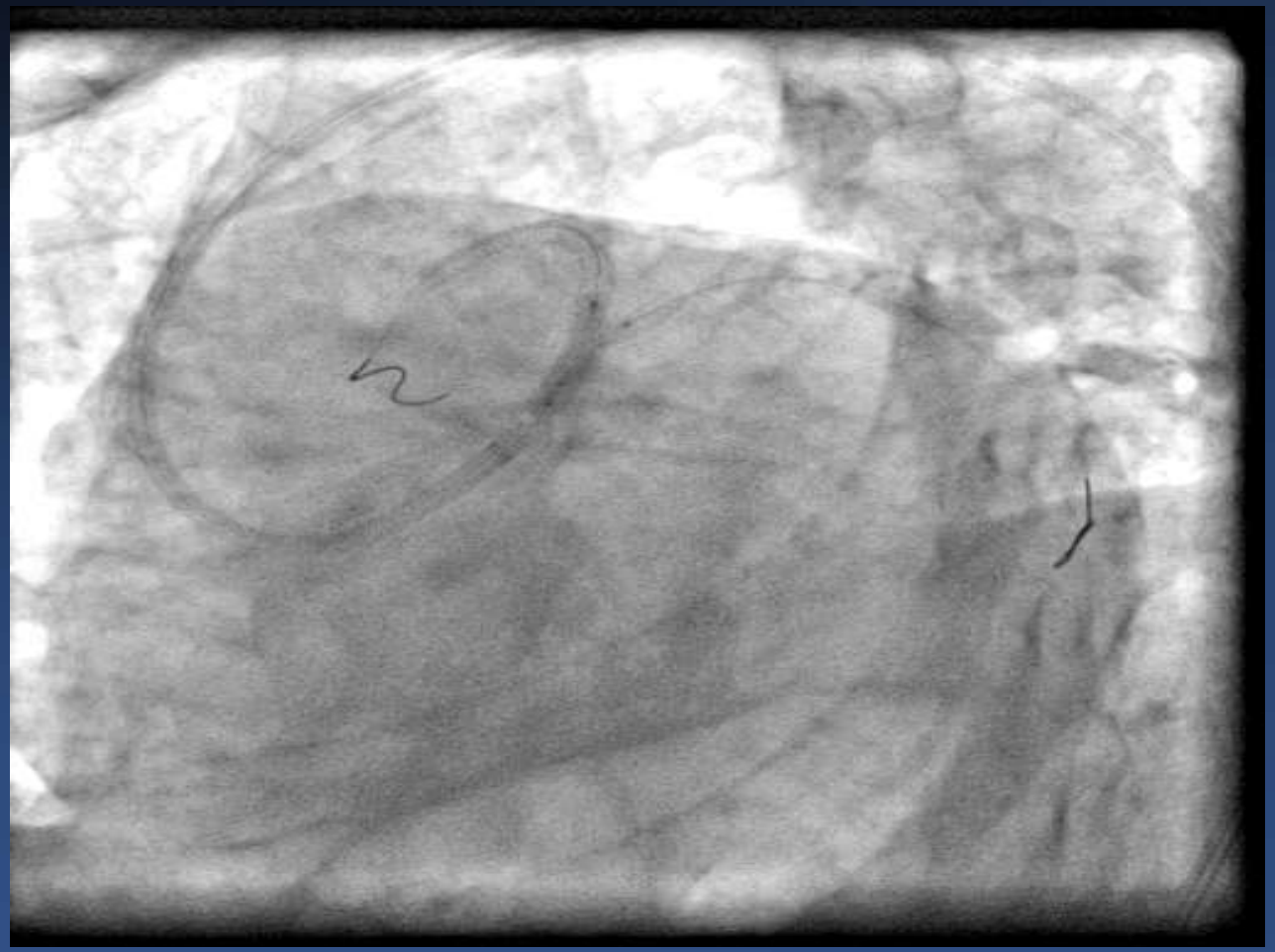


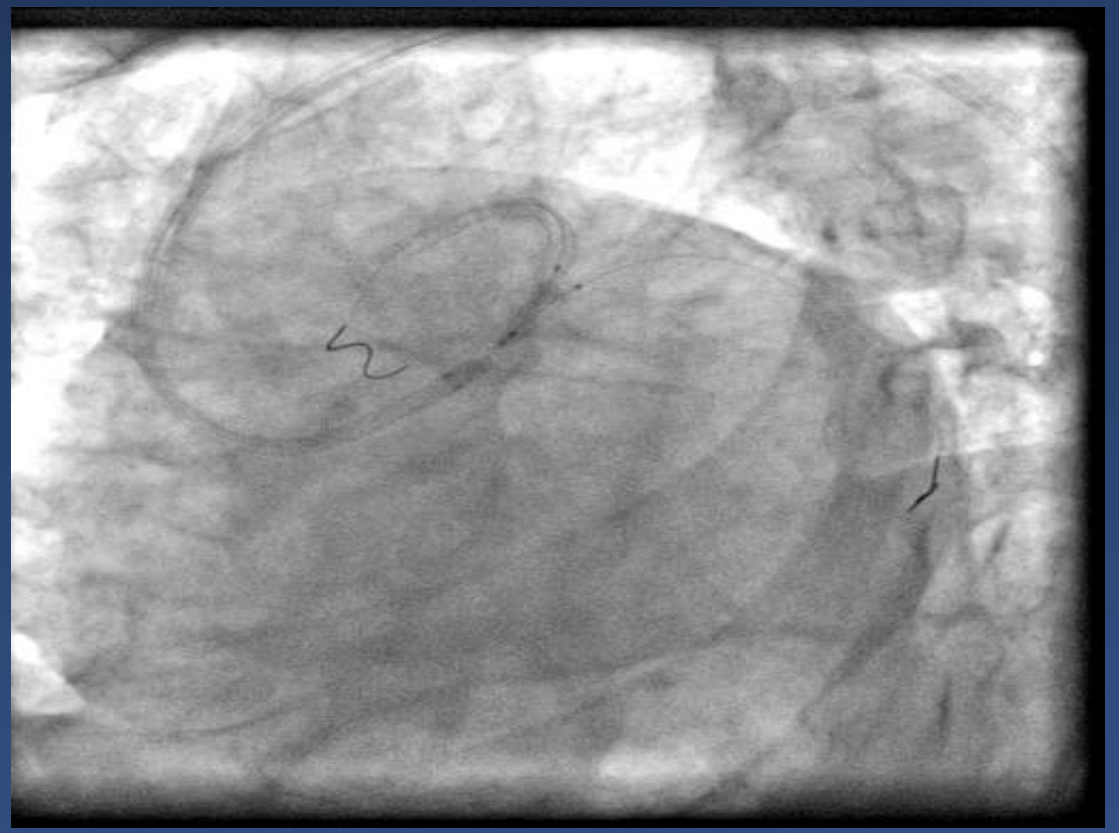
Diagonal Post dilated with 2.0x15 NC balloon



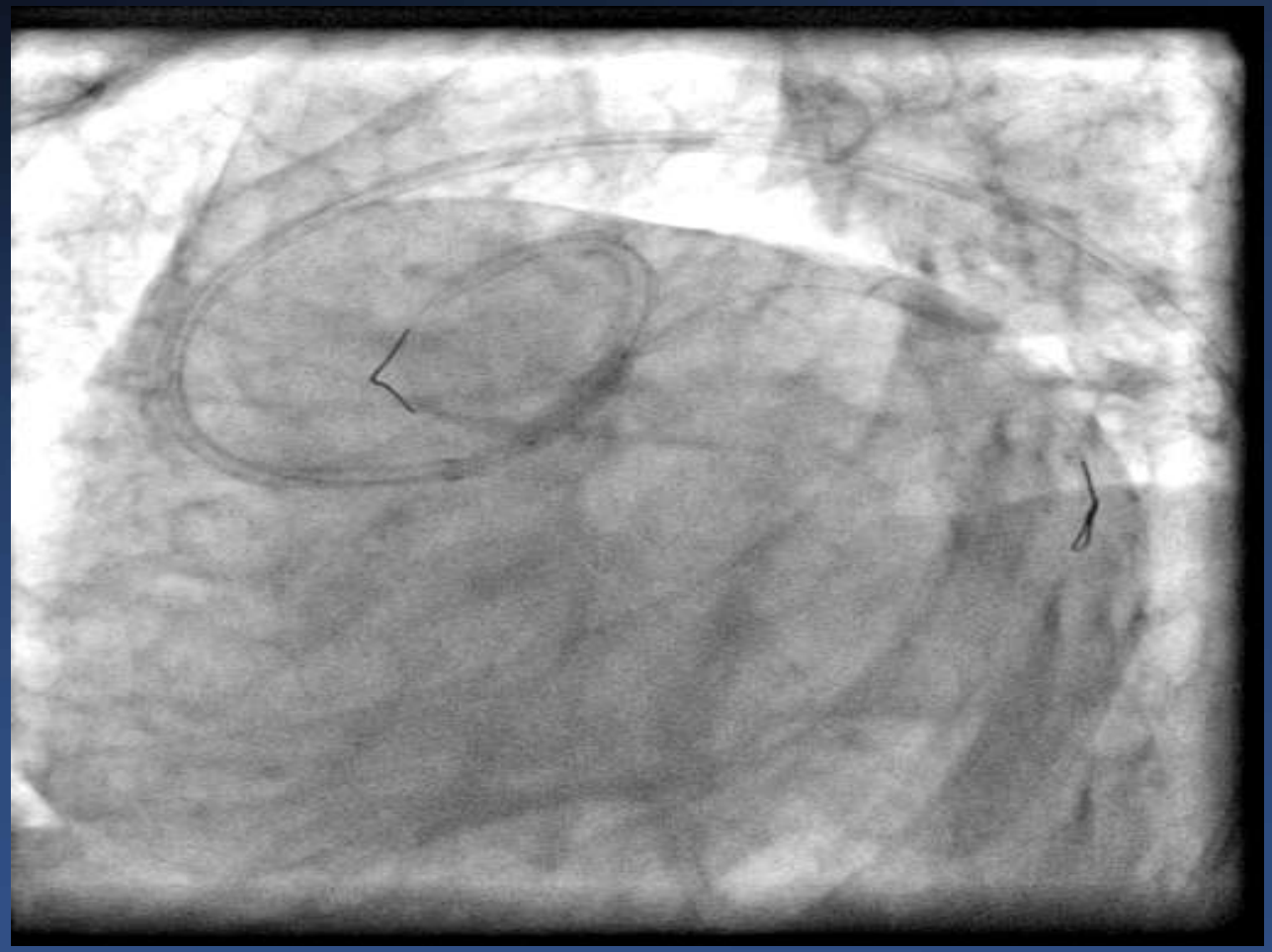


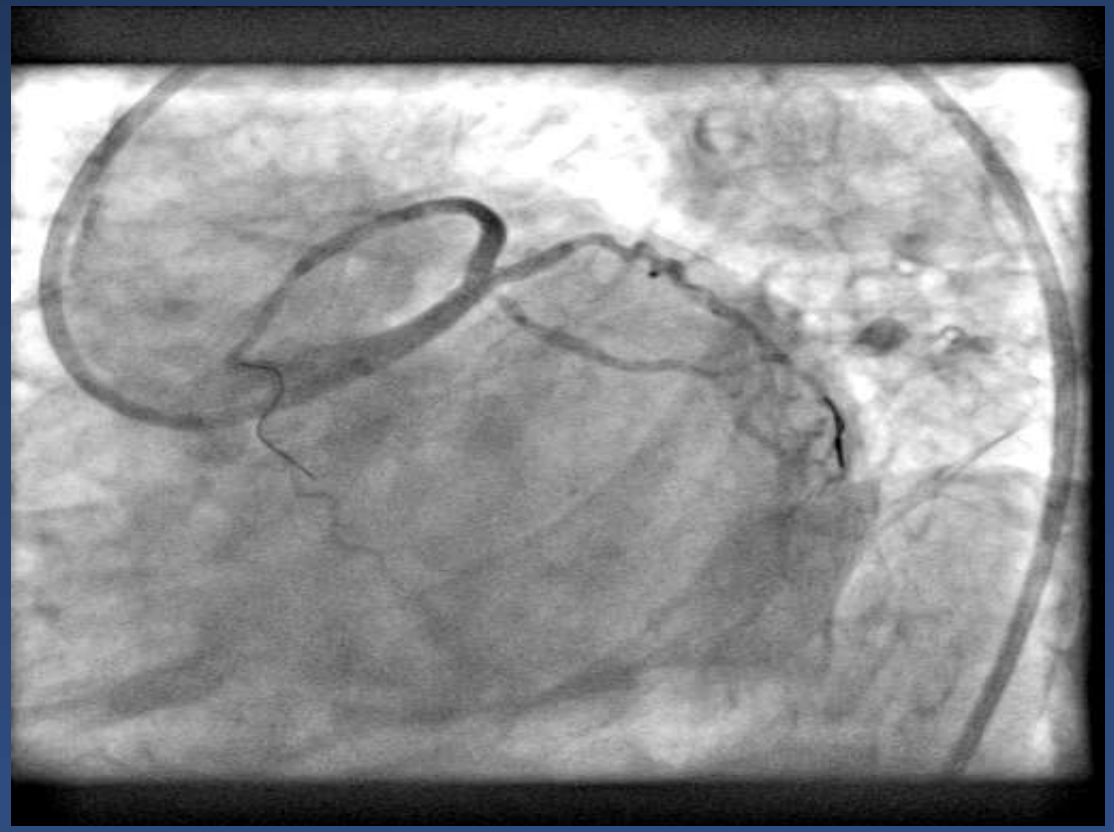
Simultaneous kissing balloons



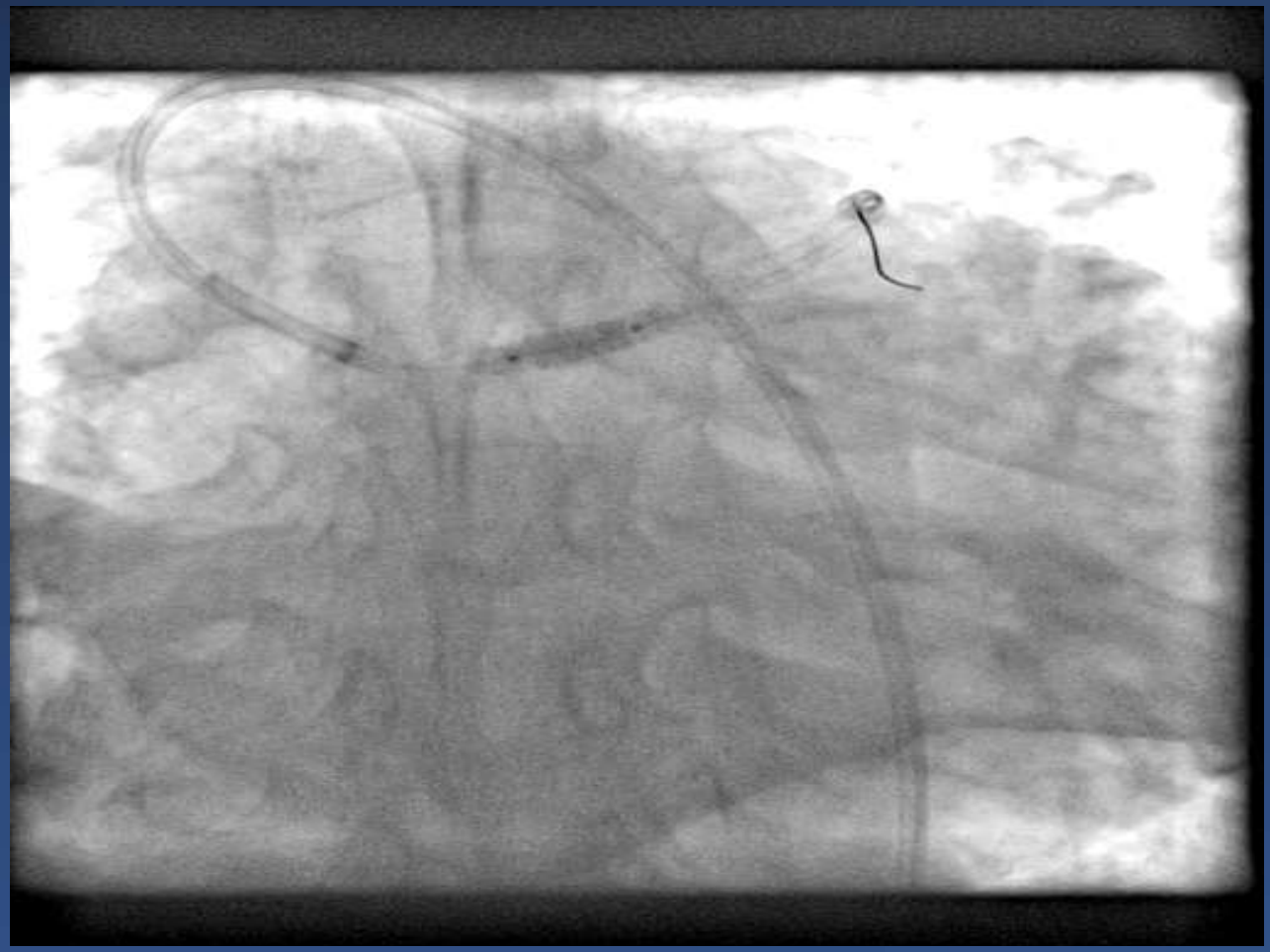


POT





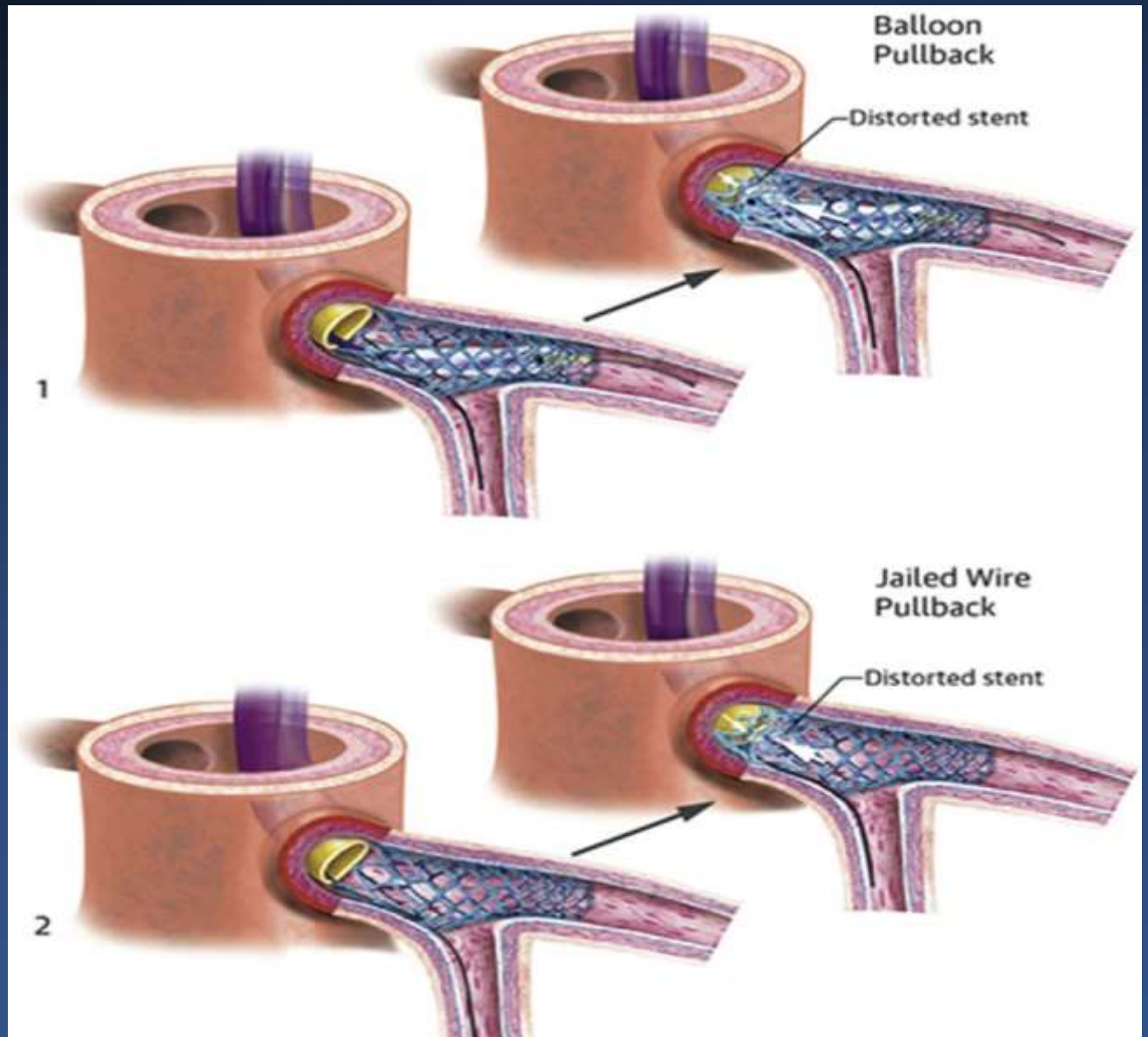
Longitudinal deformation stent due to guide

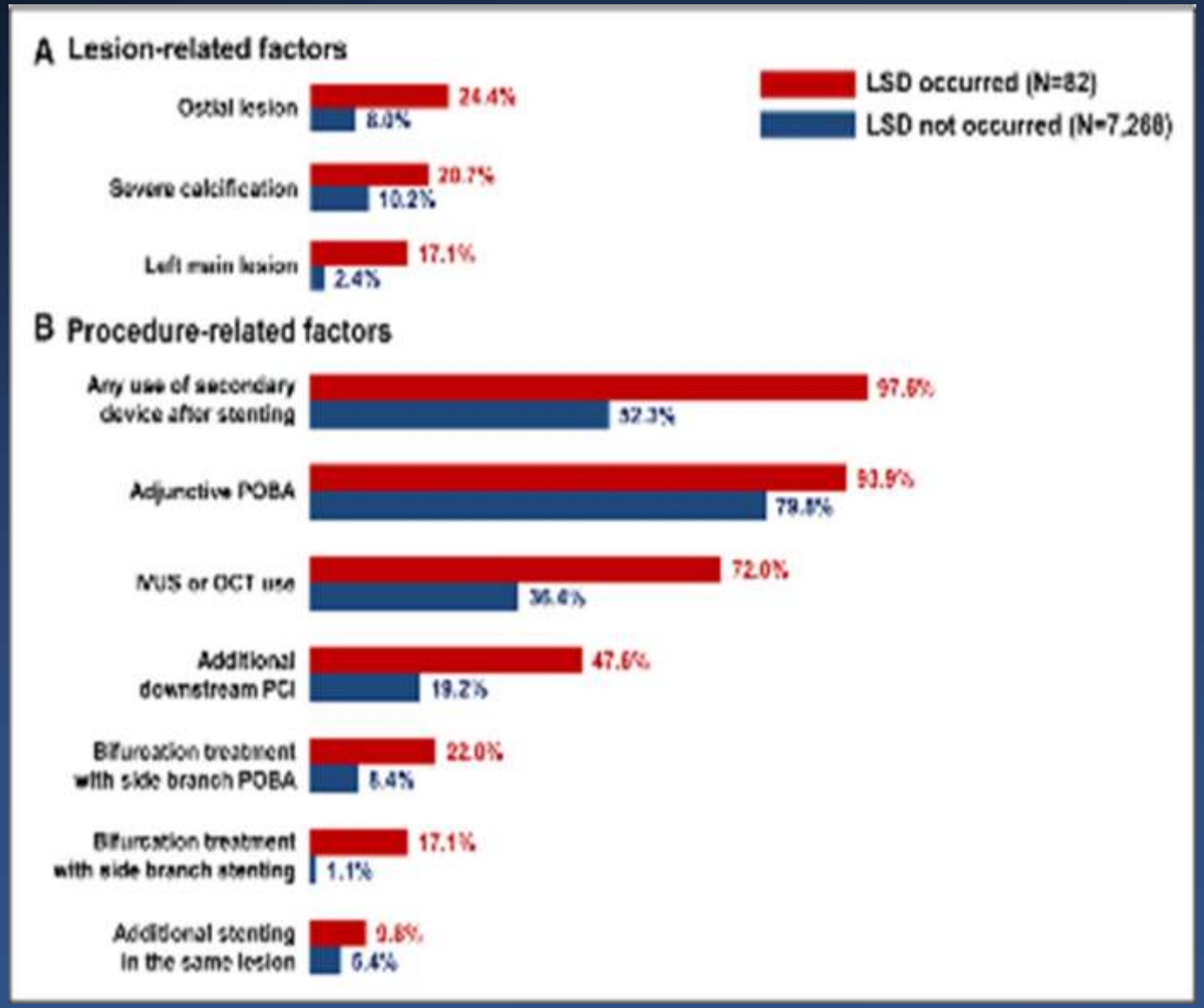


Longitudinal stent deformation (LSD)

- Defined as shortening or distortion of a stent in the longitudinal axis after deployment.
- Reported in 0.2% of all interventions
- Can lead to stent thrombosis,emergency CABG/-death
- Thinner struts lead to better stent deliverability
- but risks deformity

Mechanisms of longitudinal stent deformity

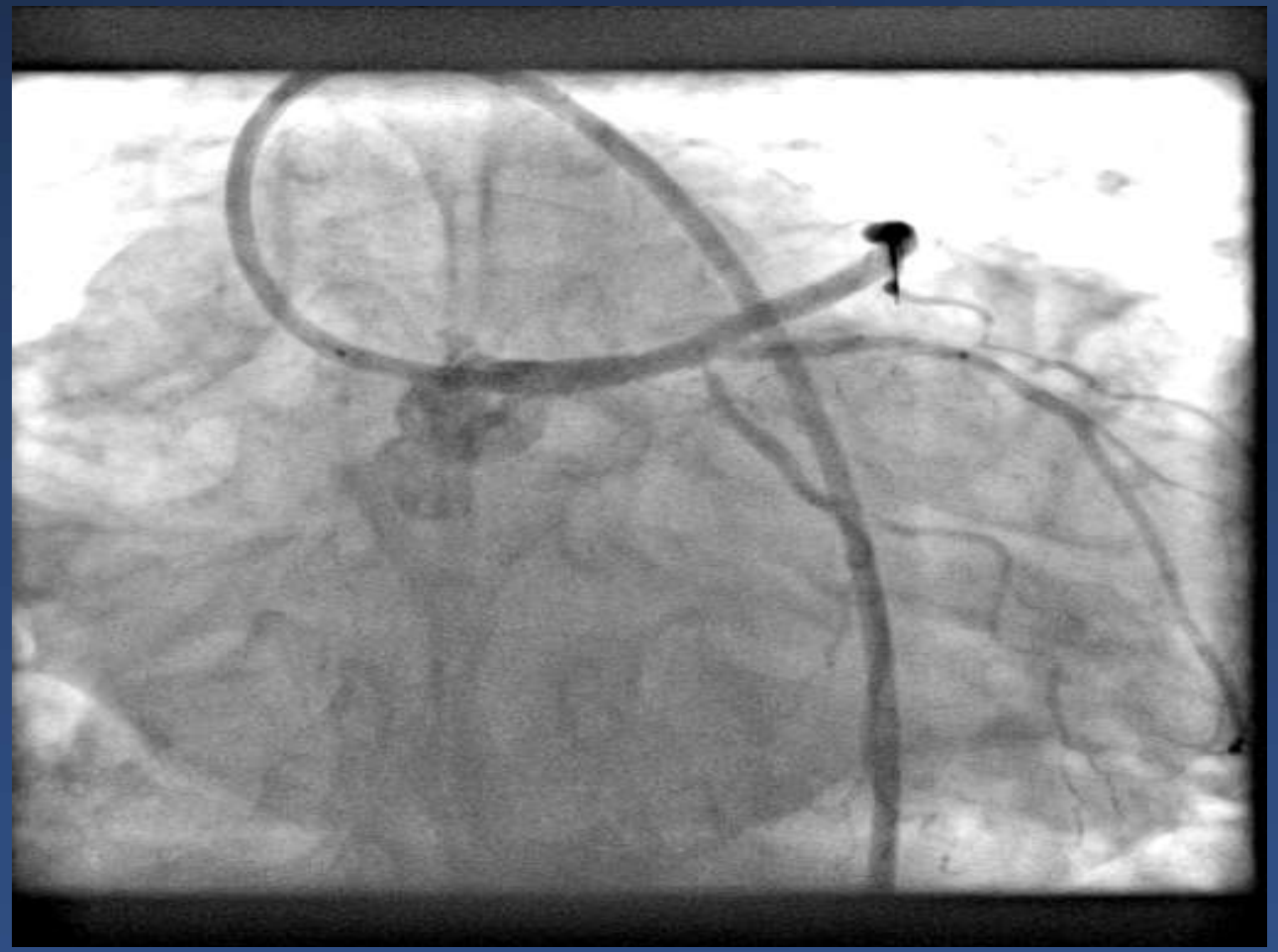


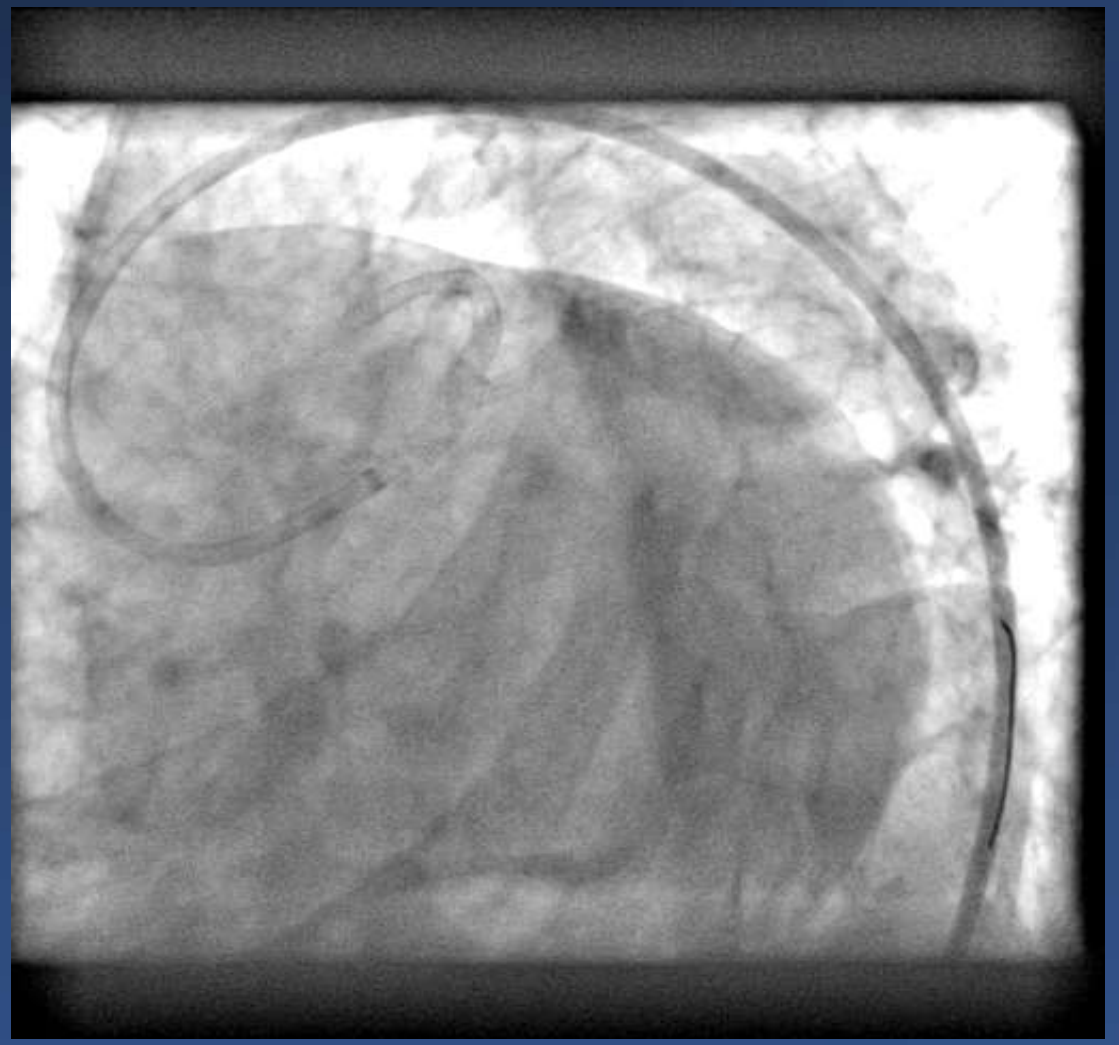


- Key is a balance between a stent material which reduces recoil,
- maximises lumen area & increases flexibility without reducing radial strength & deliverablity.
- Risk factors are –
- ostial lesions
- calcified lesions
- use of or passage of multiple devices through a
- deployed stent
- Guide induced damage in particular EBU

- **Needles in Our Technology Haystacks**
- Defining Efficacy Is Easy, Characterizing Complications Is the Challenge
- **Elazer R. Edelman** and **Pei-Jiang Wang**
- **Originally published**1 Nov 2017https://doi.org/10.1161/CIRCINTERVENTIONS.117.006059Circulation: Cardiovascular Interventions. 2017;10

Post dilatation of LT Main stent with 4.5x15 NC balloon





Out comes

STEMI In left main bifurcation disease has a guarded prognosis-
Multiple ischemic territories →shock & heart failure
High thrombotic burden, unstable hemodynamics, need for more contrast loads & longer procedural times contribute to MACE

- **journal of the American College of Cardiology**
- Volume 55, Issue 10 Supplement, March 2010DOI: 10.1016/S0735-1097(10)61713-5 **PDF Article**
- **ST ELEVATION MYOCARDIAL INFARCTION DUE TO LEFT MAIN CULPRIT LESIONS: PERCUTANEOUS CORONARY INTERVENTION OUTCOMES**
- Gilbert J. Zoghbi, Vijay K. Misra, Brigitta C. Brott, Silvio E. Papapietro, David Dai, Fang-Shu Ou, Tracy Y. Wang, Lloyd W. Klein, John C. Messenger, William B. Hillegass and on behalf of the ACC NCDR Cath PCI Registry Participating Centers

Key to good outcomes are

- Quick but effective procedures with good final results
- Prevent slow flow &early restoration of adequate epicardial & microvascular coronary flow
- Minimise contrast use
- Treat shock & heart failure-
- Liberal use of adjuant devices like IABP & Impella
- when indicated

- A higher mortality is seen when multi vessel stenting is required in STEMI(6.2% vs 3.6%in single vessel stenting)
- Similar results seen when bifurcation stenting is required

- **Journal of the American College of Cardiology**
- Volume 71, Issue 11 Supplement, March 2018DOI: 10.1016/S0735-1097(18)31821-7
- **IN-HOSPITAL MORTALITY IN PERCUTANEOUS CORONARY STENTING OF SINGLE VERSUS MULTIPLE VESSELS IN ACUTE ST-ELEVATION MYOCARDIAL INFARCTION**

- Nene Ugoeke, Obiora Maludum, Hetavi Mahida and Renato Apolito

- Our patient had a good recovery & on follow up has no angina or heart failure
- Lv EF has improved

Discussion Points

- In STEMI is primary PCI a viable option when there are complex lesion subsets-LT Main ,Bifurcation,multivessel disease or cardiogenic shock
- Is there a higher risk of procedural failure or poor outcomes
- In a highly thrombotic milieu of STEMI is there a higher risk of stent thrombosis when 2 stent strategy is applied in bifurcation disease
- Should this patient have been referred for CABG

Conclusion/Take-home Message

- STEMI especially involving Anterior wall can present in diverse unpredictable ways
- High risk PCI in Left main & bifurcation disease is not uncommon in this setting & if properly performed can lead to reduced mortality & morbidity
- Key is reduce procedure time
- reduce contrast volume
- when multiple ischemic areas are involved ensure side branch patency with 2 stent strategy if necessary
- COMPLEX PCI IS THE ANSWER