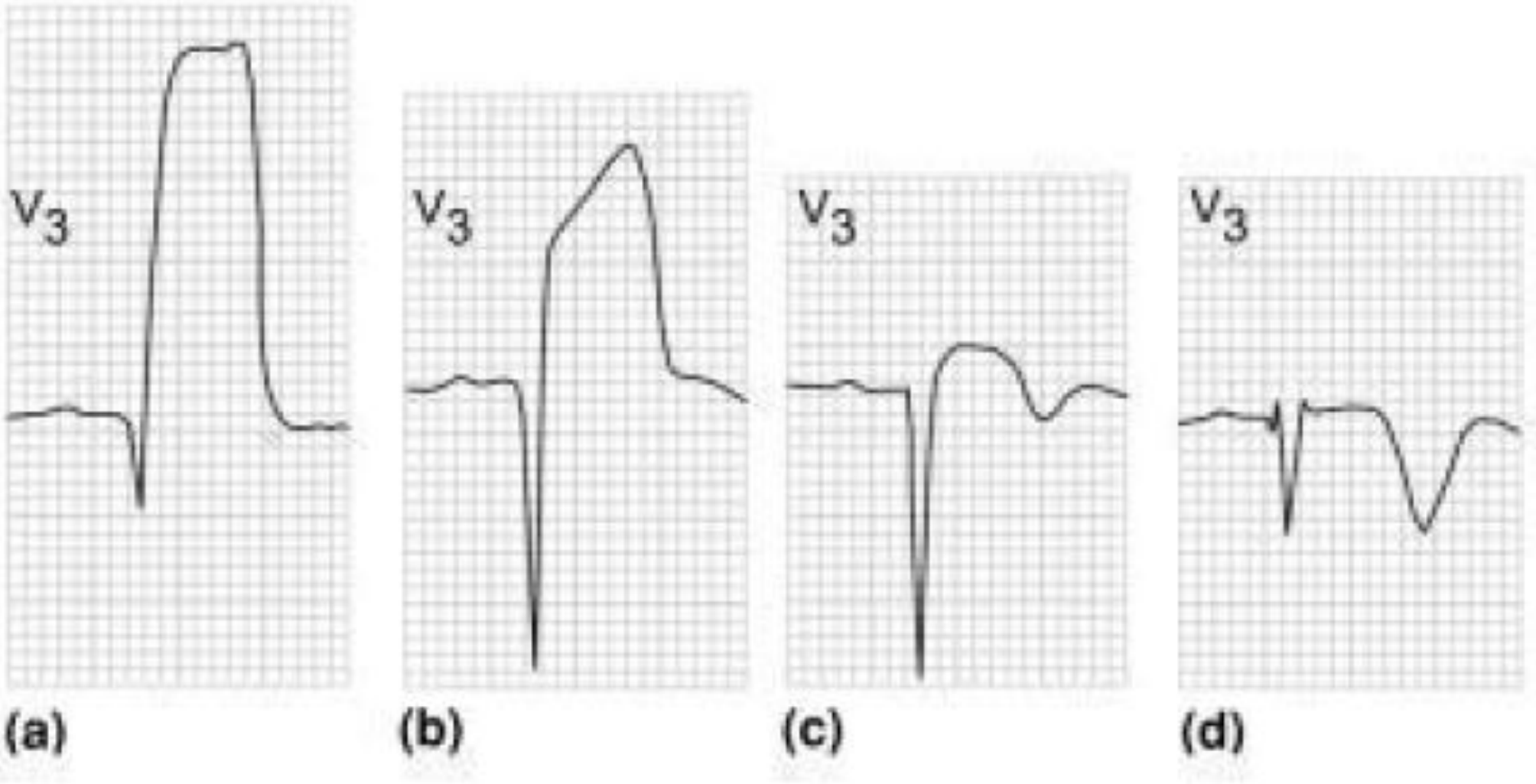

بسم الله الرحمن الرحیم

MI and ECG

Dr . Saeed Nareghi

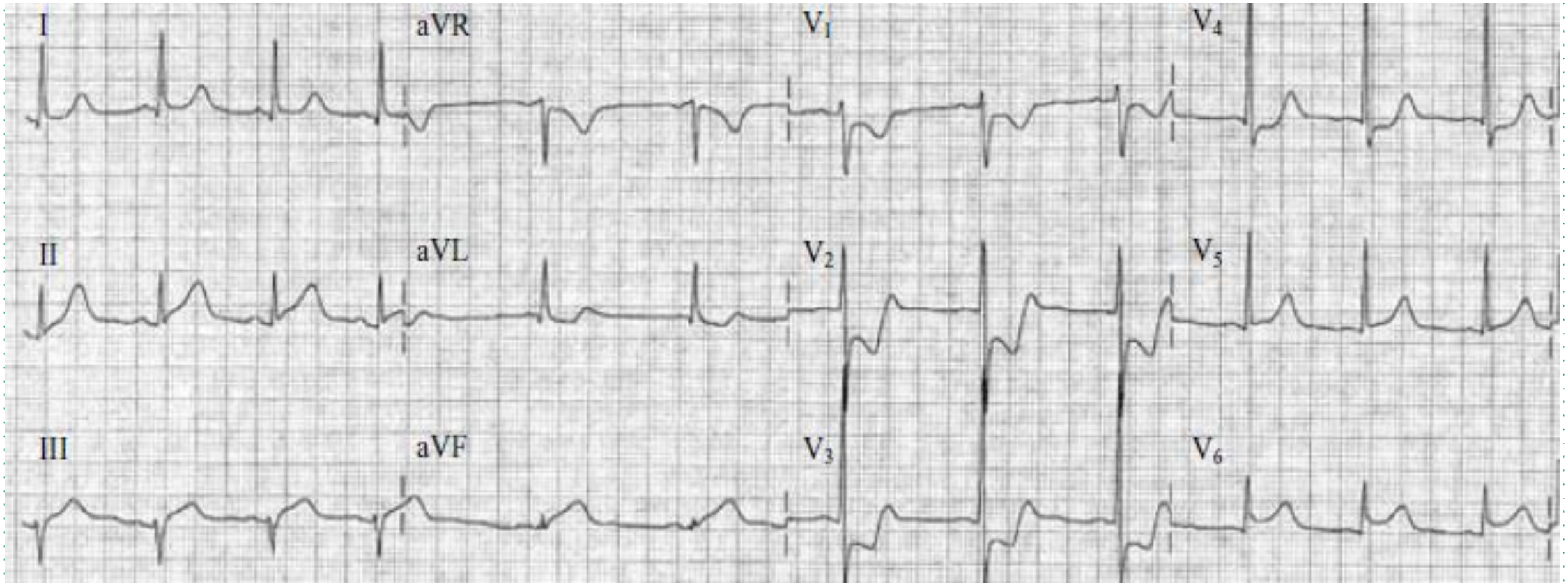


After the complete occlusion,the ischemia occurs first in the subendocardium producing a taller T wave, but the ischemia soon becomes transmural and homogeneous (ST elevation).With persistent occlusion of an epicardial coronary artery the ST elevation evolves from an initial concave upward to a convex upward pattern. Finally, this is usually followed by a Q wave of necrosis and an inverted T wave

Clinical background

1

A 52-year-old man is presented with clinical characteristics of acute coronary syndrome (ACS). Initially, non STEMI was considered as the most striking ST change was ST depression in V1−3. However, the presence of mild ST elevation in II, III, and VF and also in V5−6 suggested a STEMI. There is also isodiphasic ST in I and small ST depression in aVL.

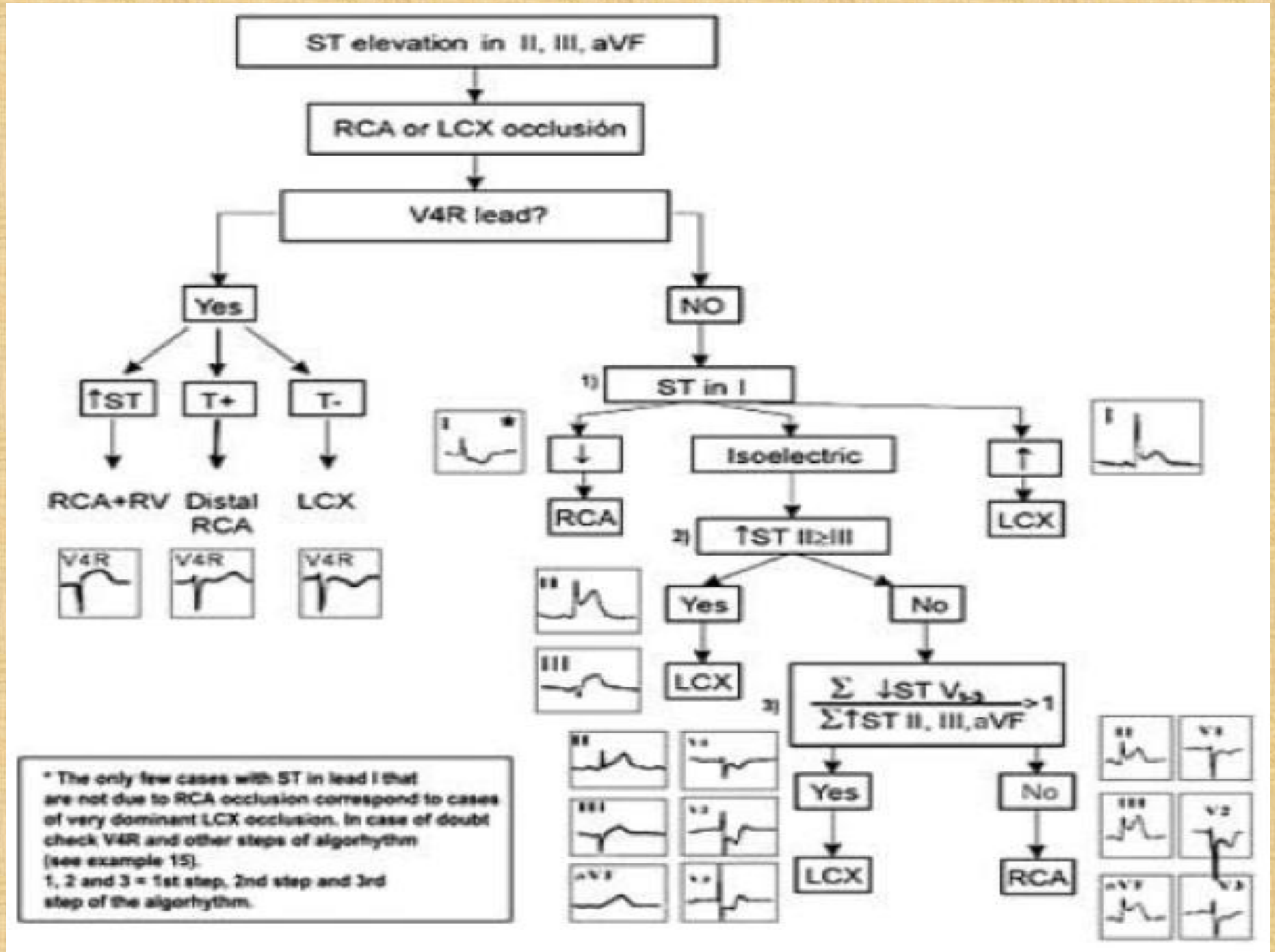


Which is the culprit artery of this ACS?

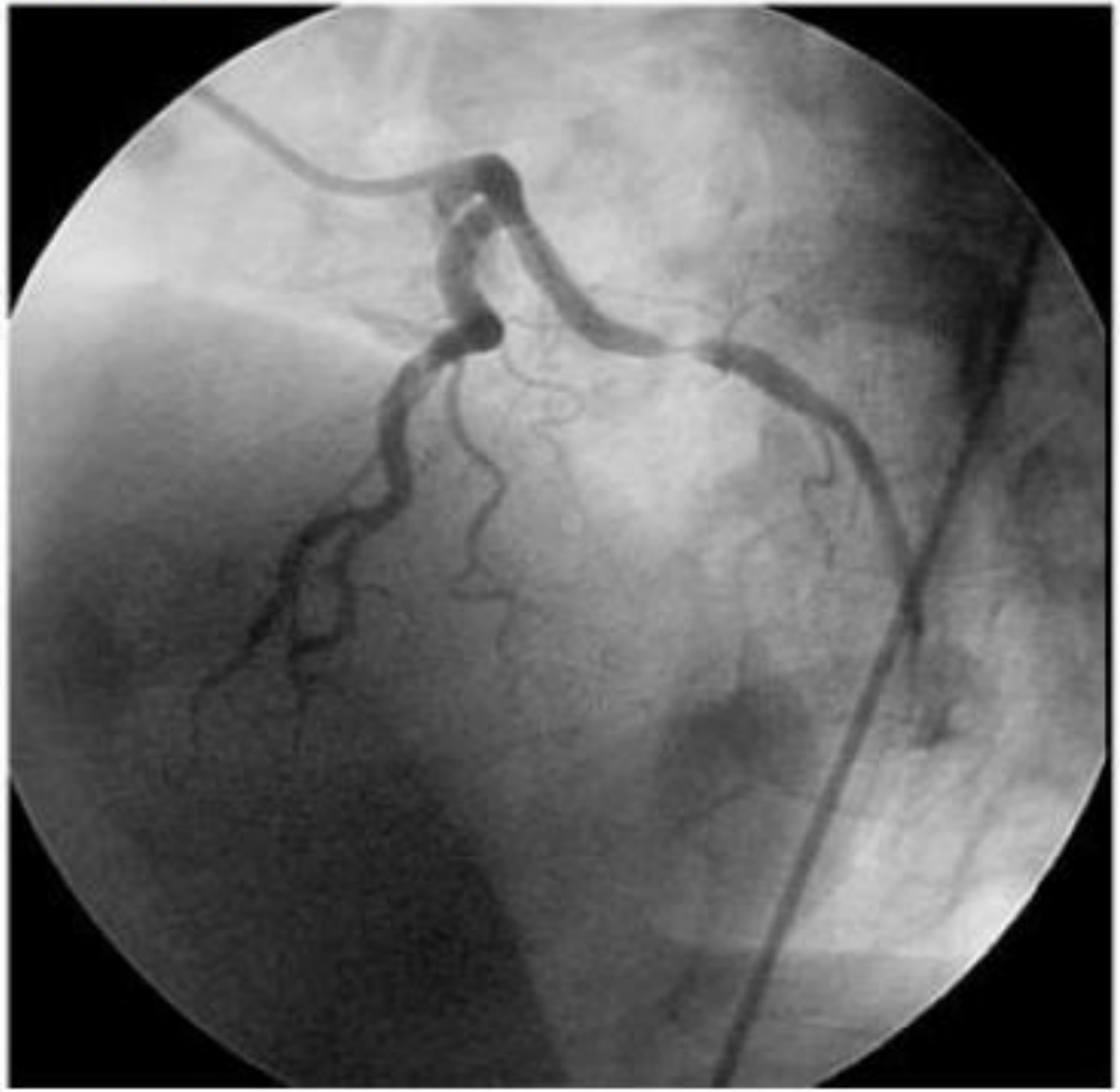
a Non-STEMI due to LAD subocclusion

b STEMI due to LCX proximal occlusion

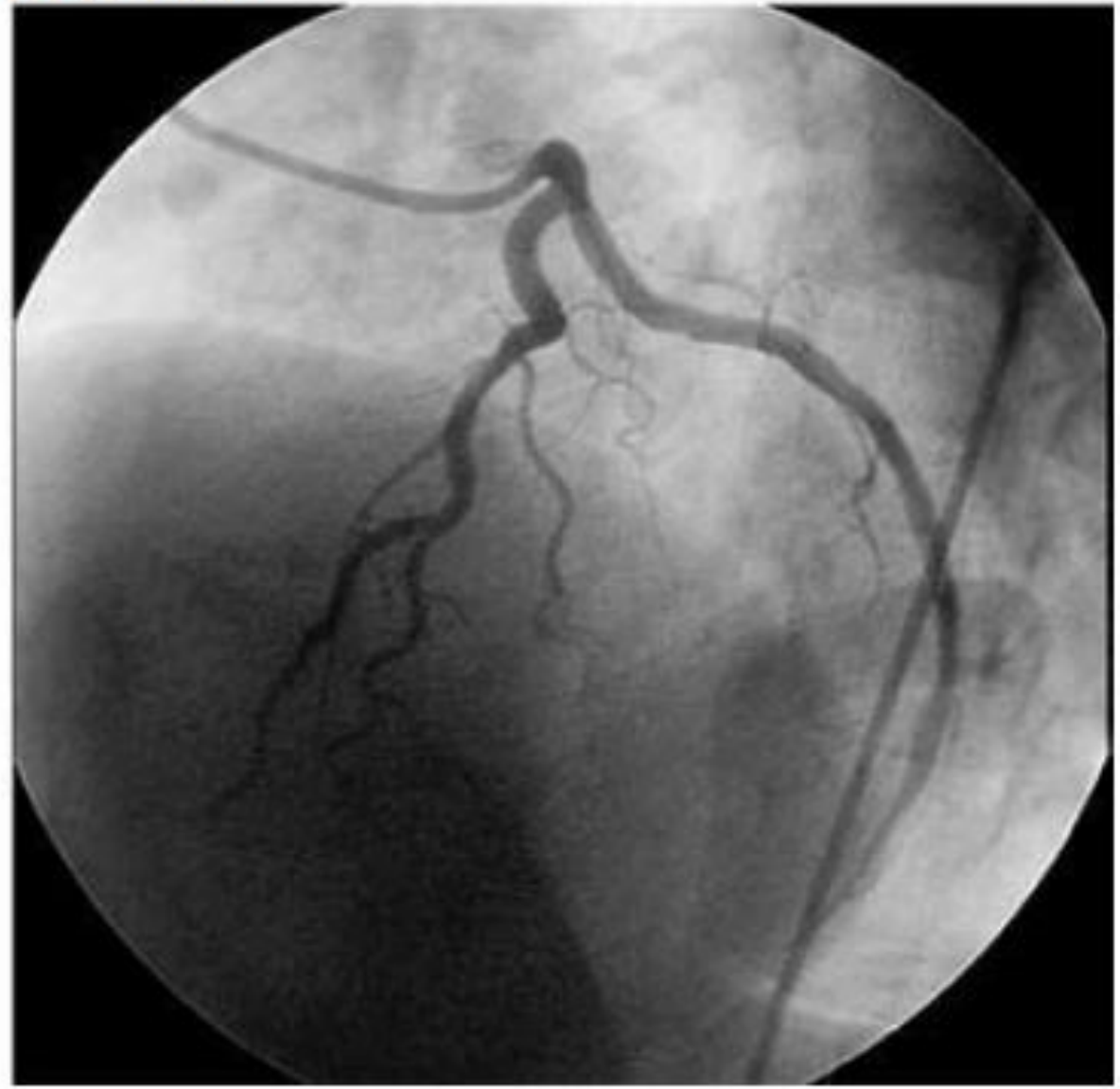
c STEMI due to RCA occlusion


ST elevation in II, III, aVF
RCA or LCX occlusión
V4R lead?
Yes
NO
↑ST
T+
T-
RCA+RV
Distal RCA
LCX
V4R
V4R
V4R
1) ST in I
↓
Isoelectric
↑
RCA
LCX
2) ↑ST II≥III
Yes
No
LCX
3) Σ ↓ST V1-3 / ΣTST II, III, aVF >1
Yes
No
LCX
RCA
* The only few cases with ST in lead I that are not due to RCA occlusion correspond to cases of very dominant LCX occlusion. In case of doubt check V4R and other steps of algorhythm (see example 15).
1, 2 and 3 = 1st step, 2nd step and 3rd step of the algorhythm.

Pre-PCI



Post-PCI



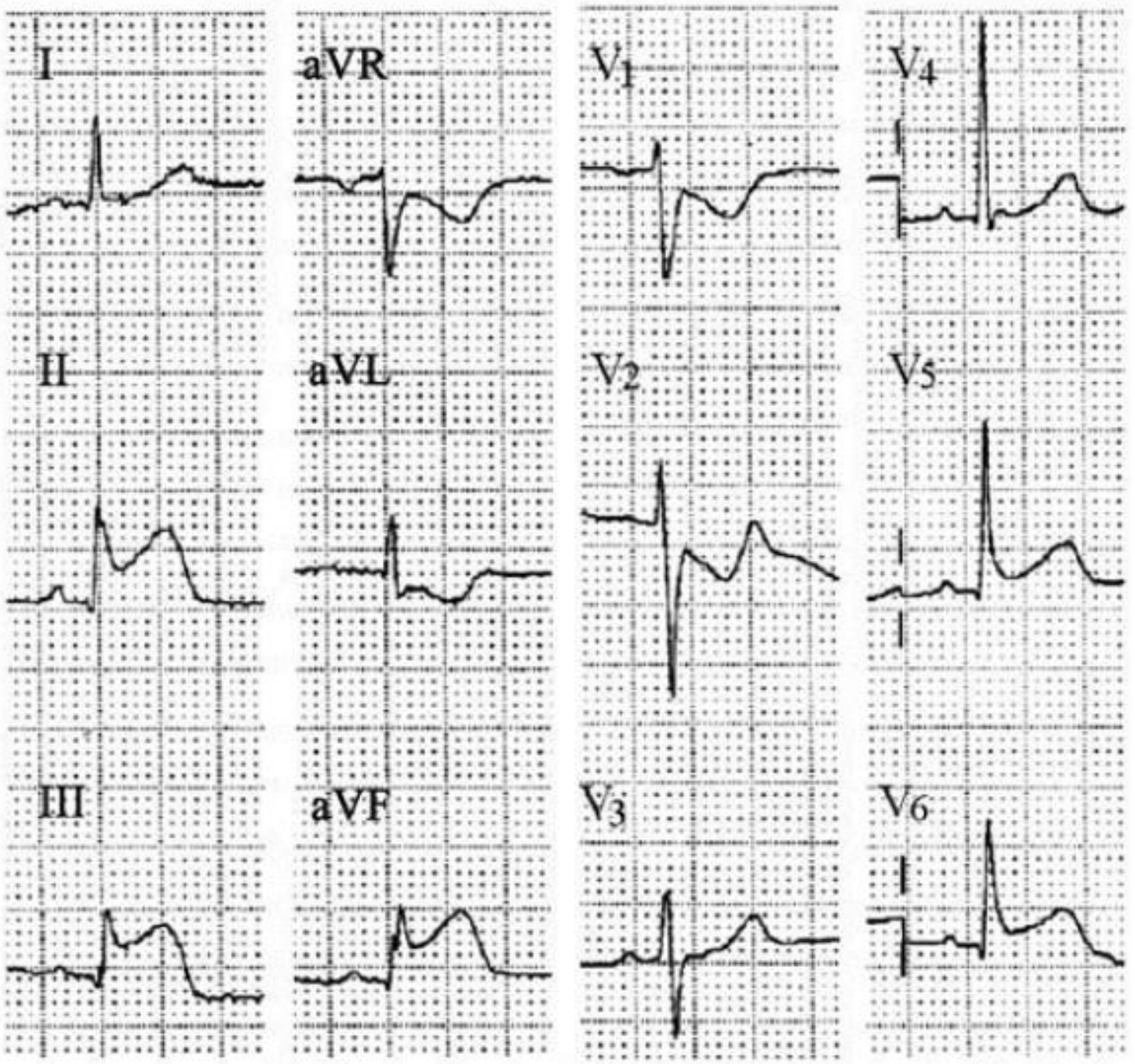
2

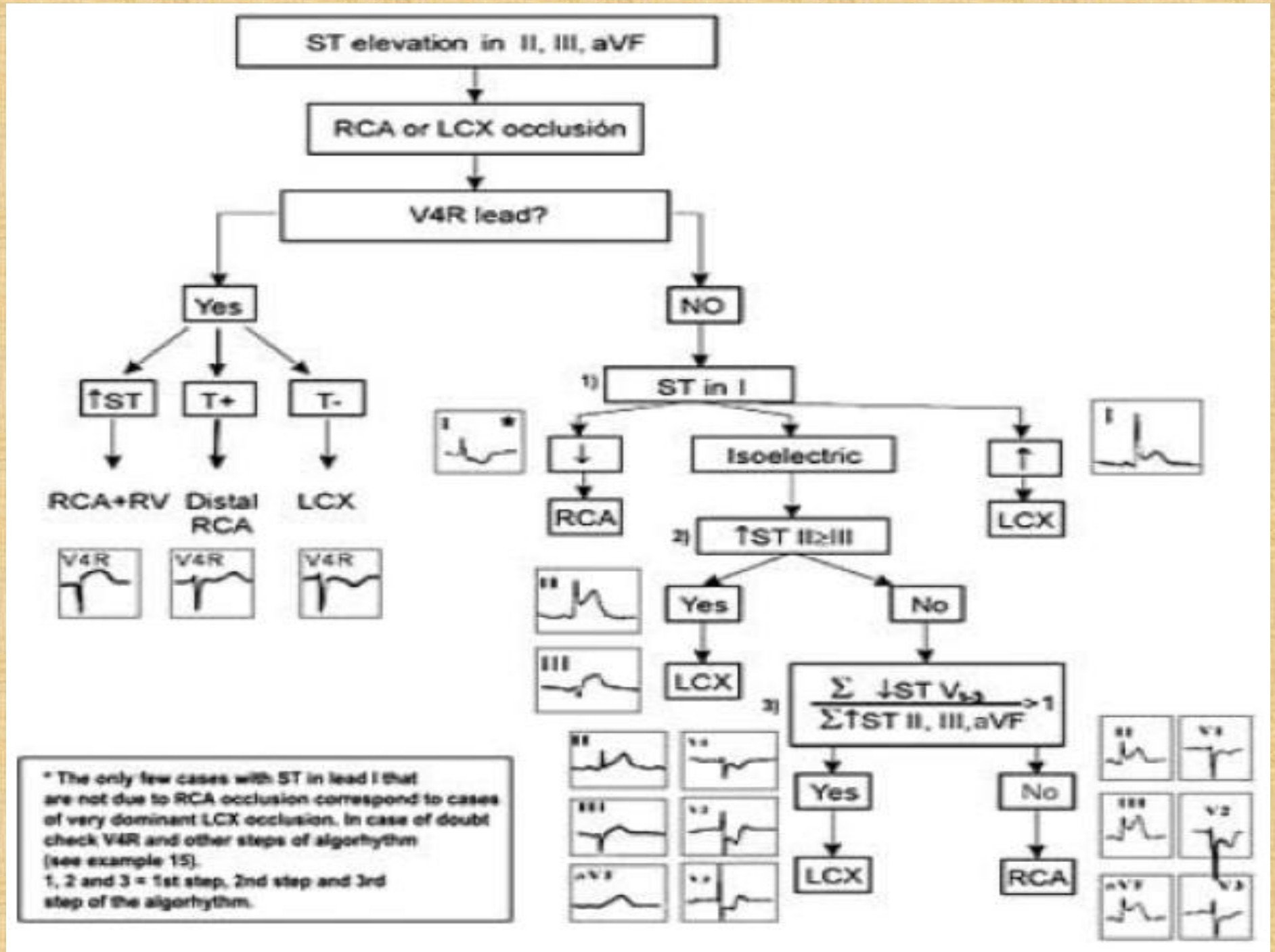
Which is the culprit artery of this STEMI?

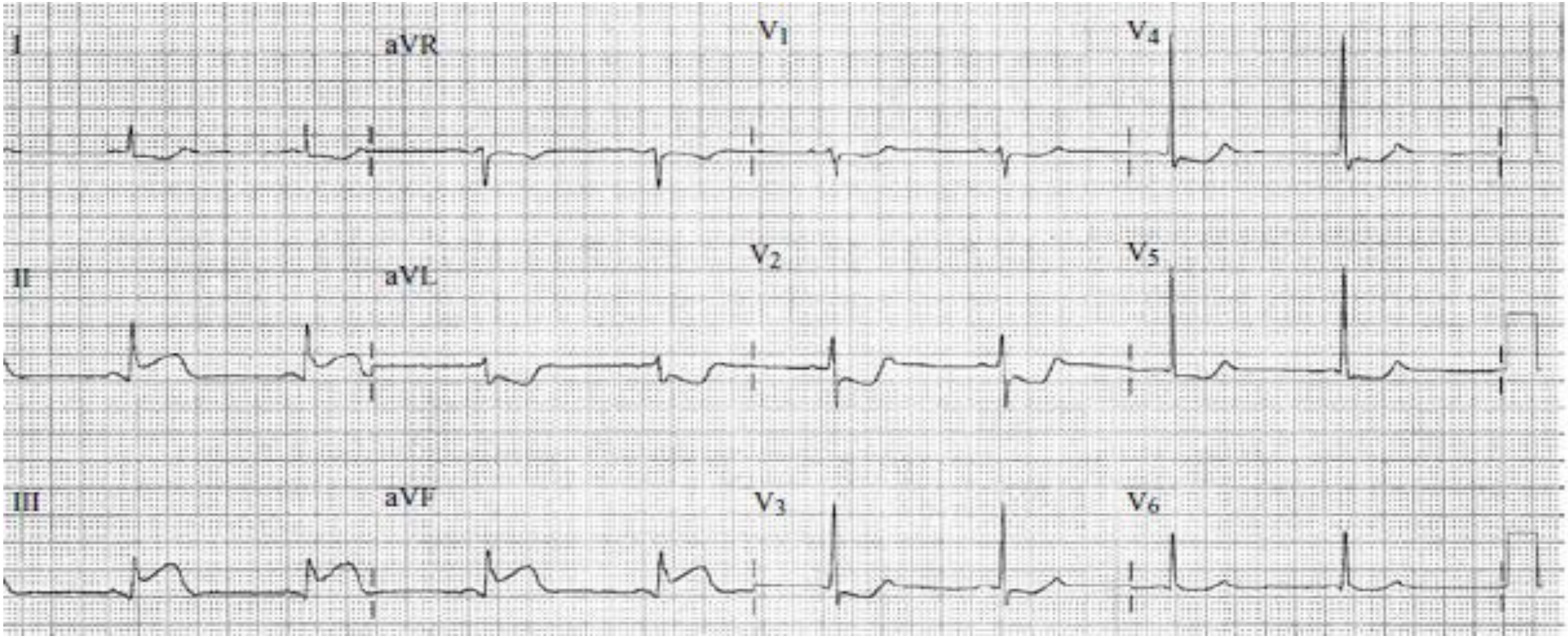
a Proximal dominant RCA

b Distal dominant RCA

c LCX




ST elevation in II, III, aVF
RCA or LCX occlusión
V4R lead?
Yes
NO
↑ST
T+
T-
RCA+RV
Distal RCA
LCX
V4R
V4R
V4R
1) ST in I
↓
Isoelectric
↑
RCA
LCX
2) ↑ST II≥III
Yes
No
LCX
3) Σ ↓ST V1-3 / ΣTST II, III, aVF >1
Yes
No
LCX
RCA
* The only few cases with ST in lead I that are not due to RCA occlusion correspond to cases of very dominant LCX occlusion. In case of doubt check V4R and other steps of algorhythm (see example 15).
1, 2 and 3 = 1st step, 2nd step and 3rd step of the algorhythm.



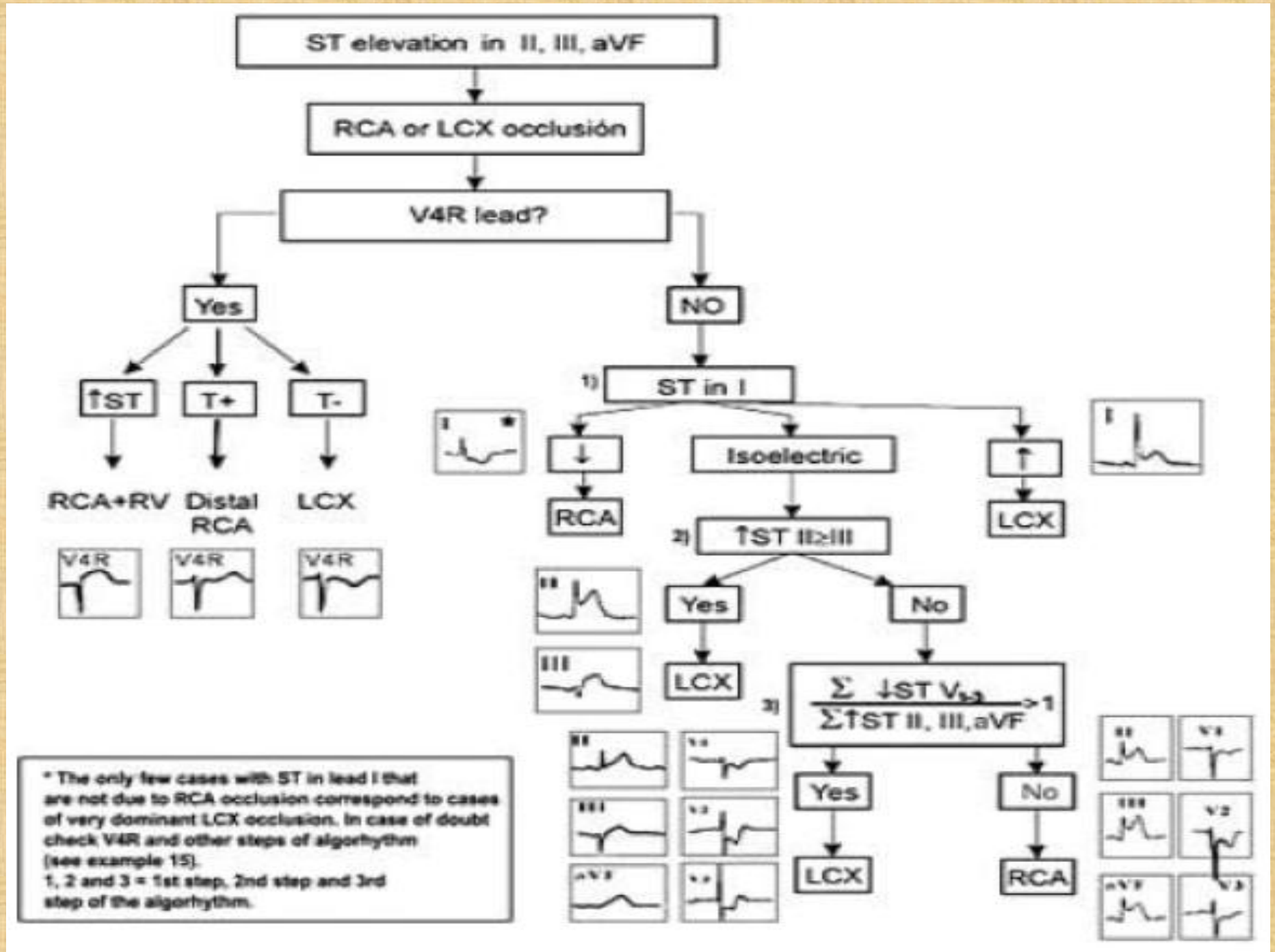
3

Which is the culprit artery of this STEMI?

a Proximal and dominant RCA

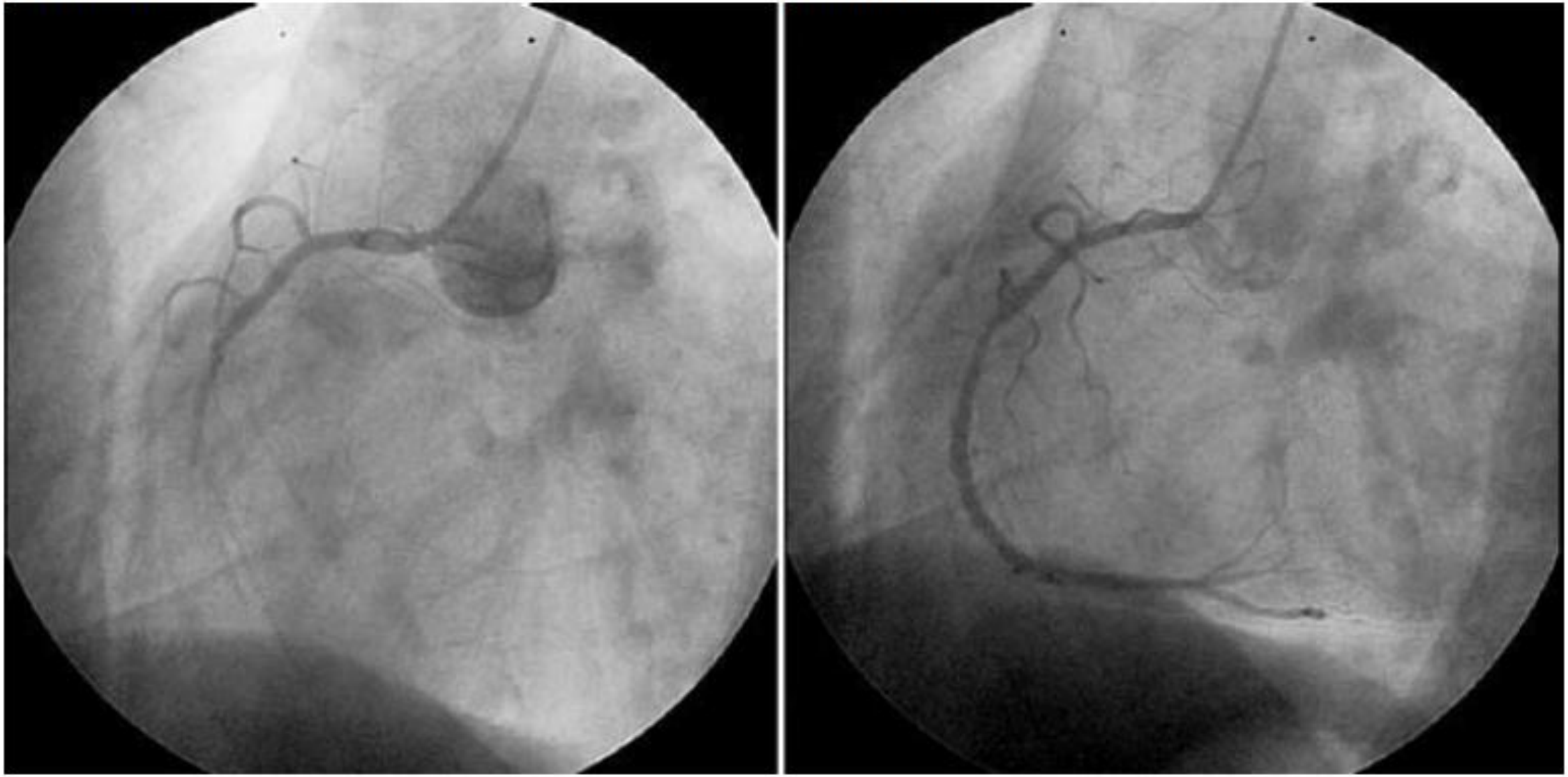
b Distal and short RCA

c LCX


ST elevation in II, III, aVF
RCA or LCX occlusión
V4R lead?
Yes
NO
↑ST
T+
T-
RCA+RV
Distal RCA
LCX
V4R
V4R
V4R
1) ST in I
↓
Isoelectric
↑
RCA
LCX
2) ↑ST II≥III
Yes
No
LCX
3) Σ ↓ST V1-3 / ΣTST II, III, aVF >1
Yes
No
LCX
RCA
* The only few cases with ST in lead I that are not due to RCA occlusion correspond to cases of very dominant LCX occlusion. In case of doubt check V4R and other steps of algorhythm (see example 15).
1, 2 and 3 = 1st step, 2nd step and 3rd step of the algorhythm.

Pre-PCI

Post-PCI

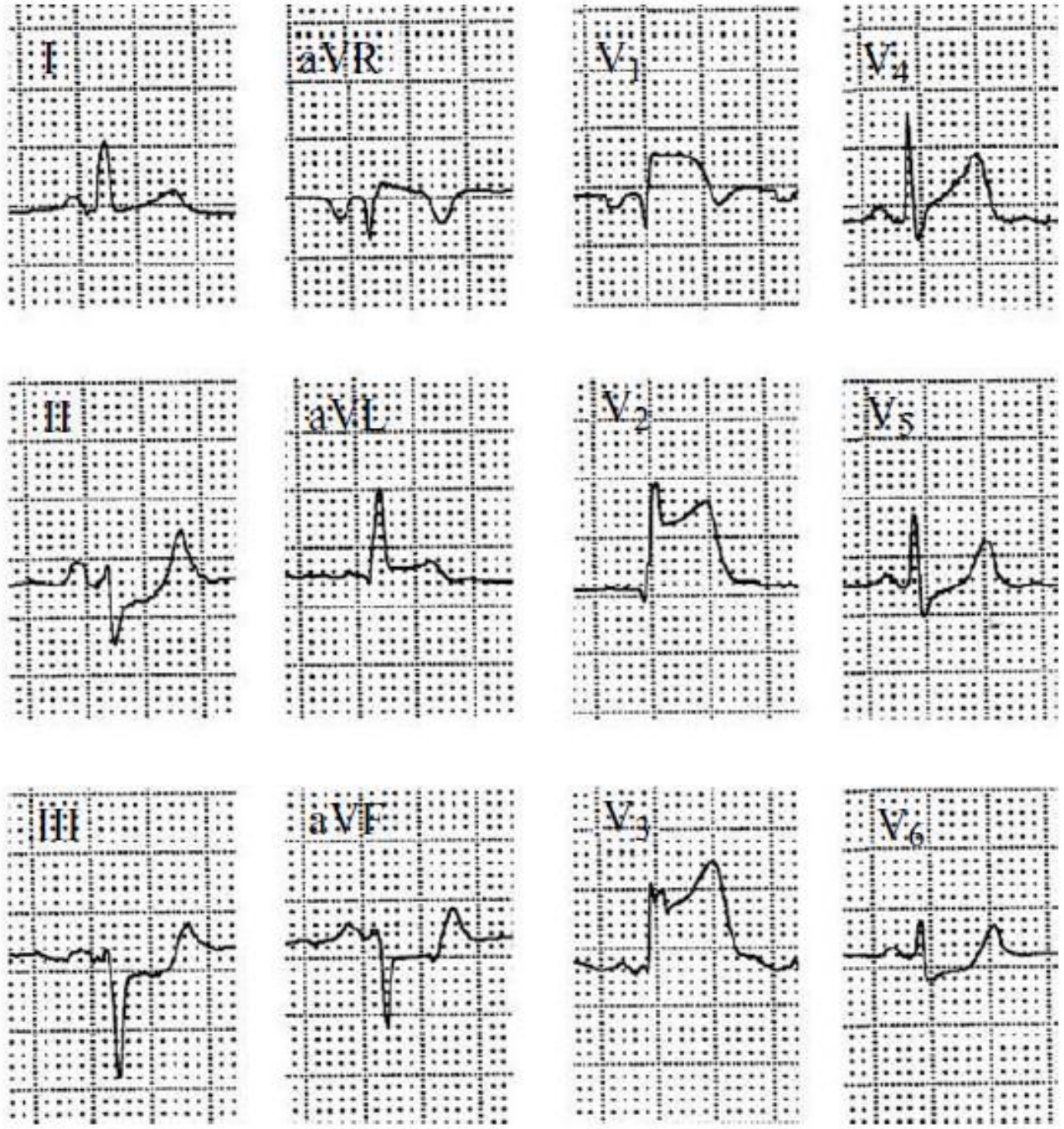


4

a LAD proximal to D1 and S1

b LAD distal to S1 and D1

c LCX



ST elevation in V_{1-2} to V_{4-6}

↓

LAD occlusion

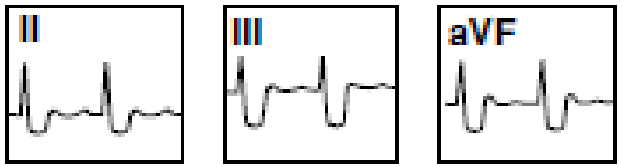
↓

Check ST segment in II, III, aVF

$\Sigma ST\downarrow$ in III and aVF ⩾ 2.5 mm*

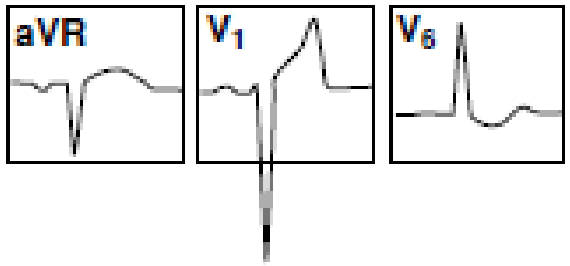
↓

Occlusion proximal to D_1



Occlusion proximal to S_1:

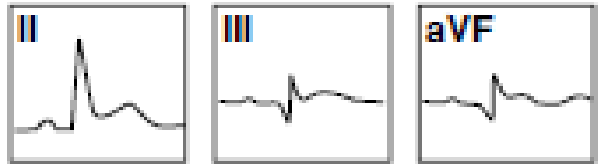
- $\Sigma\uparrow ST$ in aVR and V_1 + $ST\downarrow$ V_6 ⩾ 0
- New RBBB



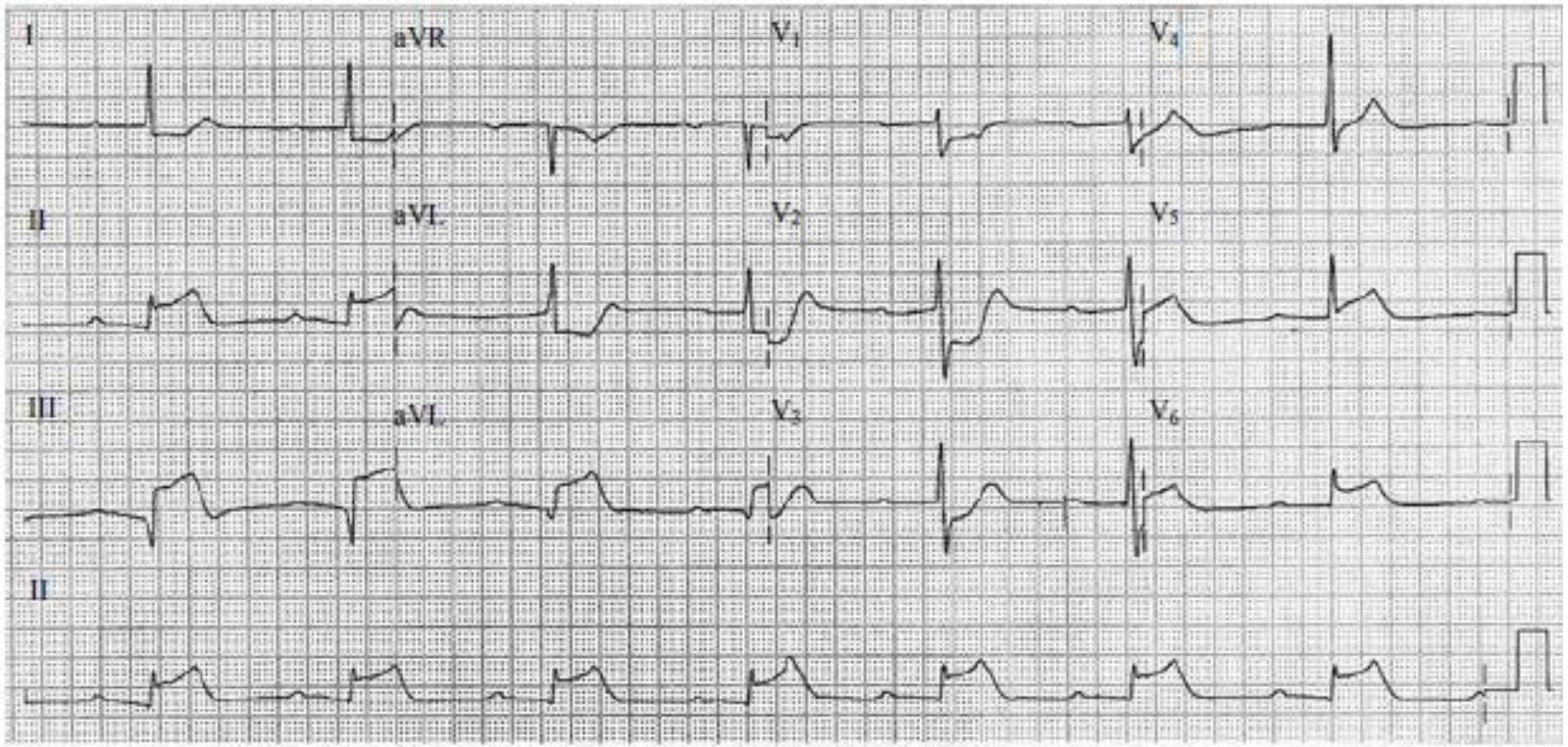
ST = or ↑ in II, III, aVF

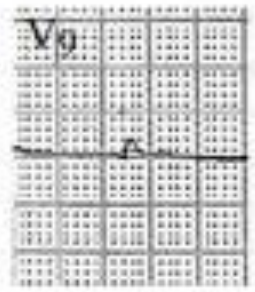
↓

Occlusion distal to D_1



5



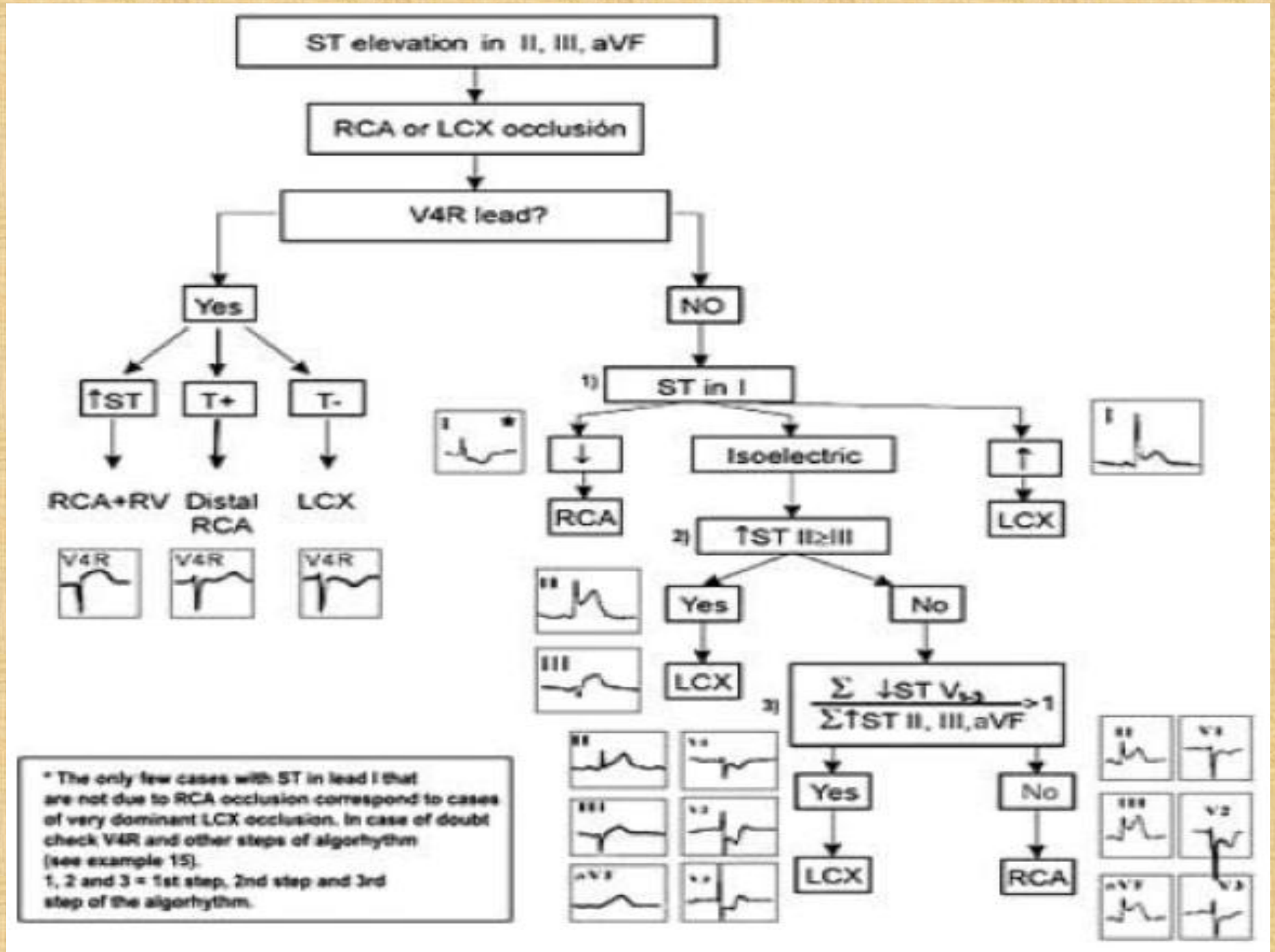


Which is the culprit artery of this STEMI?

a Proximal occlusion of dominant RCA

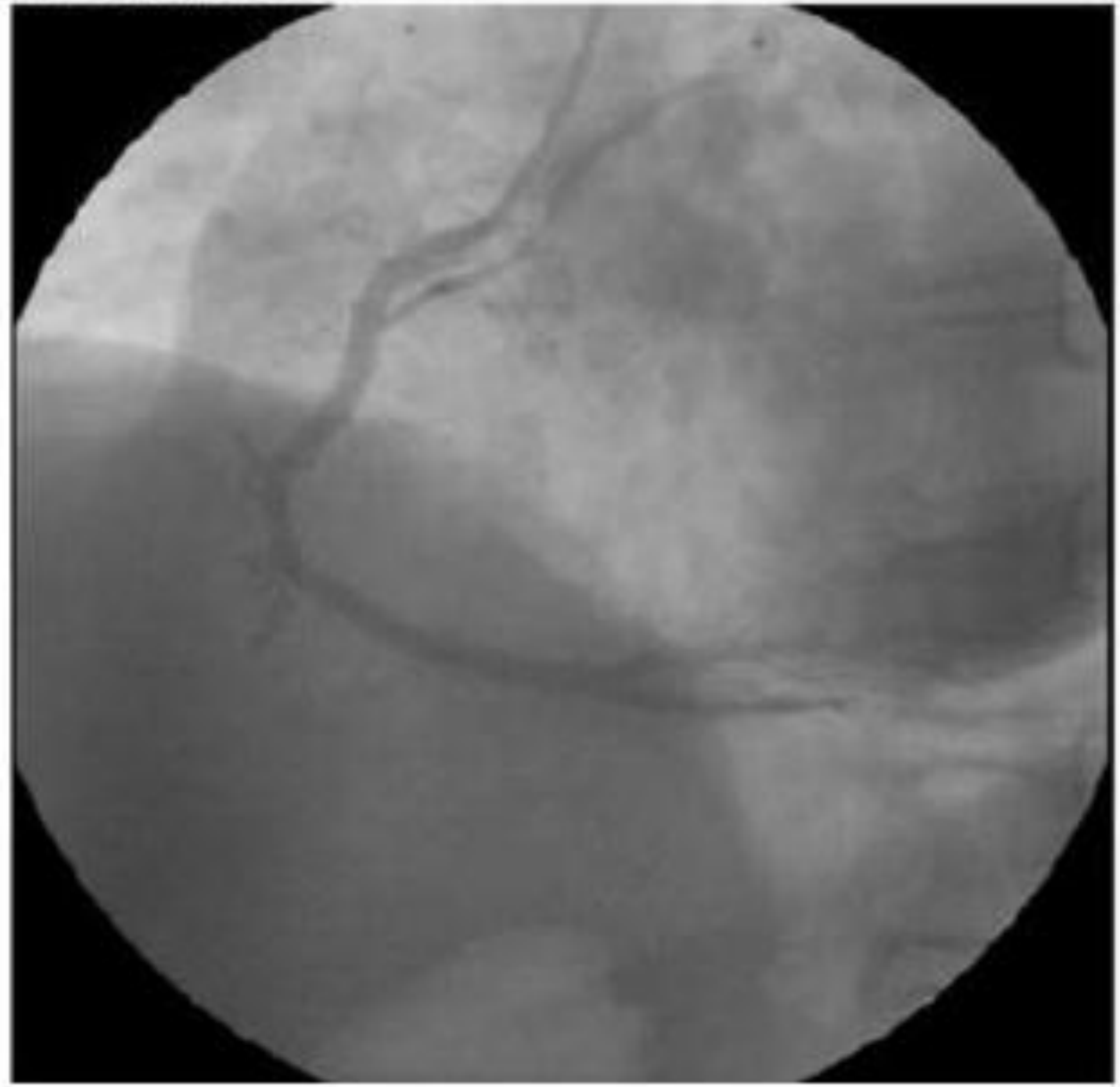
b Nonproximal occlusion of very dominant RCA

c Proximal LCX

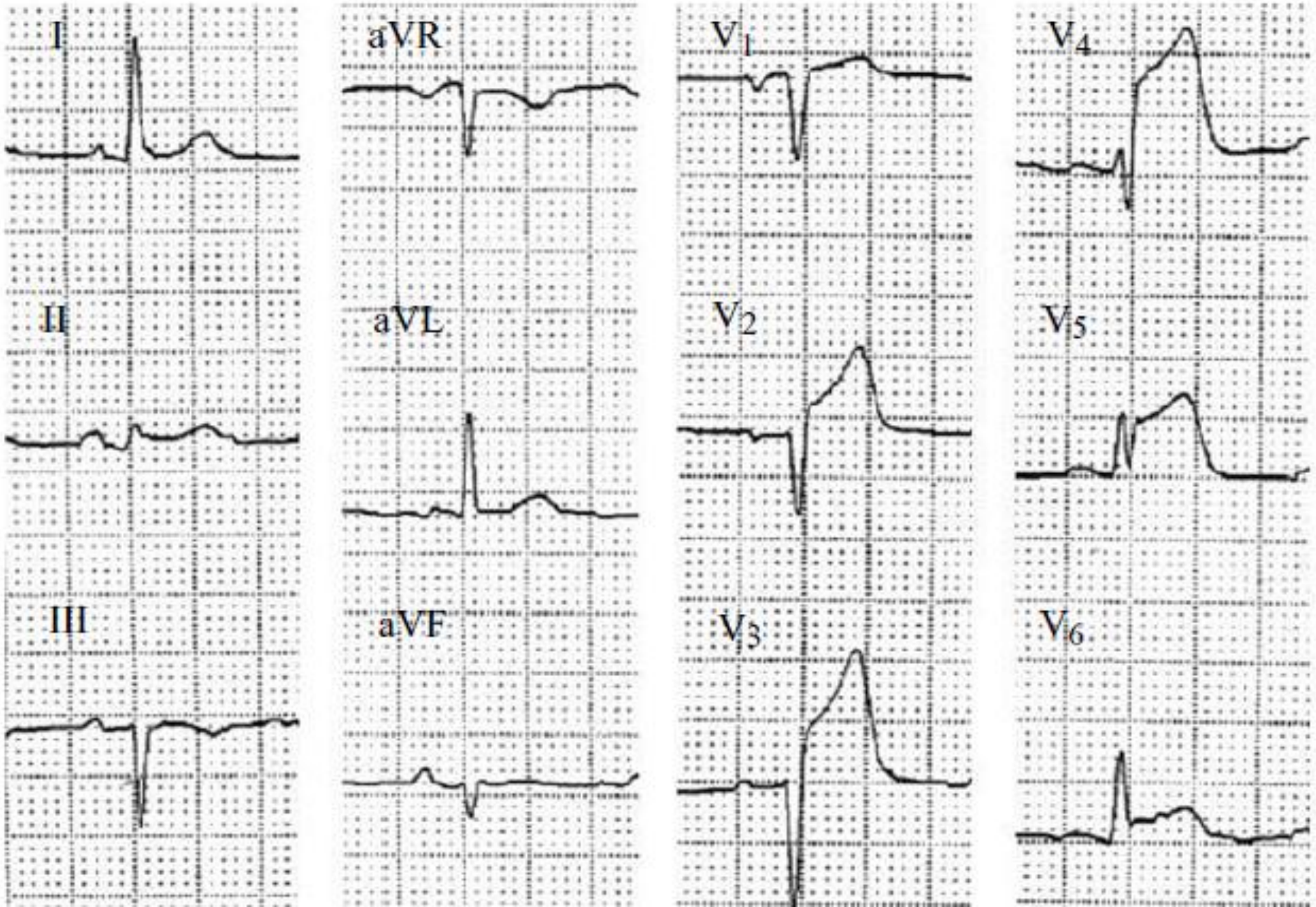

ST elevation in II, III, aVF
RCA or LCX occlusión
V4R lead?
Yes
NO
↑ST
T+
T-
RCA+RV
Distal RCA
LCX
V4R
V4R
V4R
1) ST in I
↓
Isoelectric
↑
RCA
LCX
2) ↑ST II≥III
Yes
No
LCX
3) Σ ↓ST V1-3 / ΣTST II, III, aVF >1
Yes
No
LCX
RCA
* The only few cases with ST in lead I that are not due to RCA occlusion correspond to cases of very dominant LCX occlusion. In case of doubt check V4R and other steps of algorhythm (see example 15).
1, 2 and 3 = 1st step, 2nd step and 3rd step of the algorhythm.

Pre-PCI

Post-PCI



6



Which is the culprit artery of this STEMI?

a LAD proximal to D1 and S1

b LAD distal to D1 and S1

c LAD proximal to D1 and distal to S1

ST elevation in V_{1-2} to V_{4-6}

↓

LAD occlusion

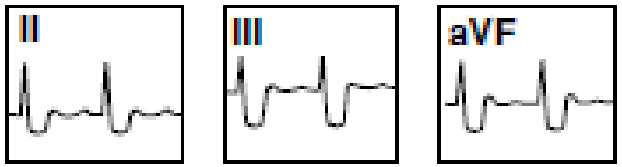
↓

Check ST segment in II, III, aVF

$\Sigma ST\downarrow$ in III and aVF ⩾ 2.5 mm*

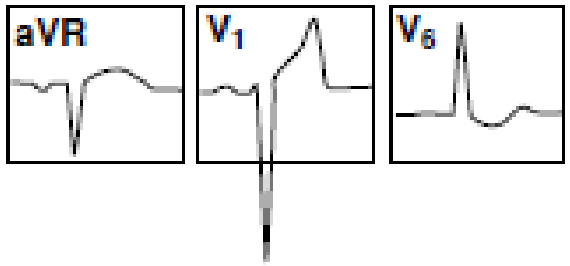
↓

Occlusion proximal to D_1



Occlusion proximal to S_1:

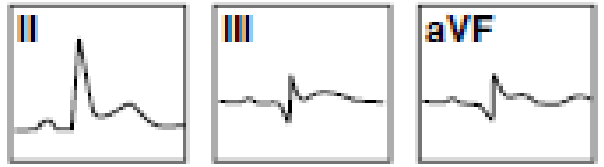
- $\Sigma\uparrow ST$ in aVR and V_1 + $ST\downarrow$ V_6 ⩾ 0
- New RBBB



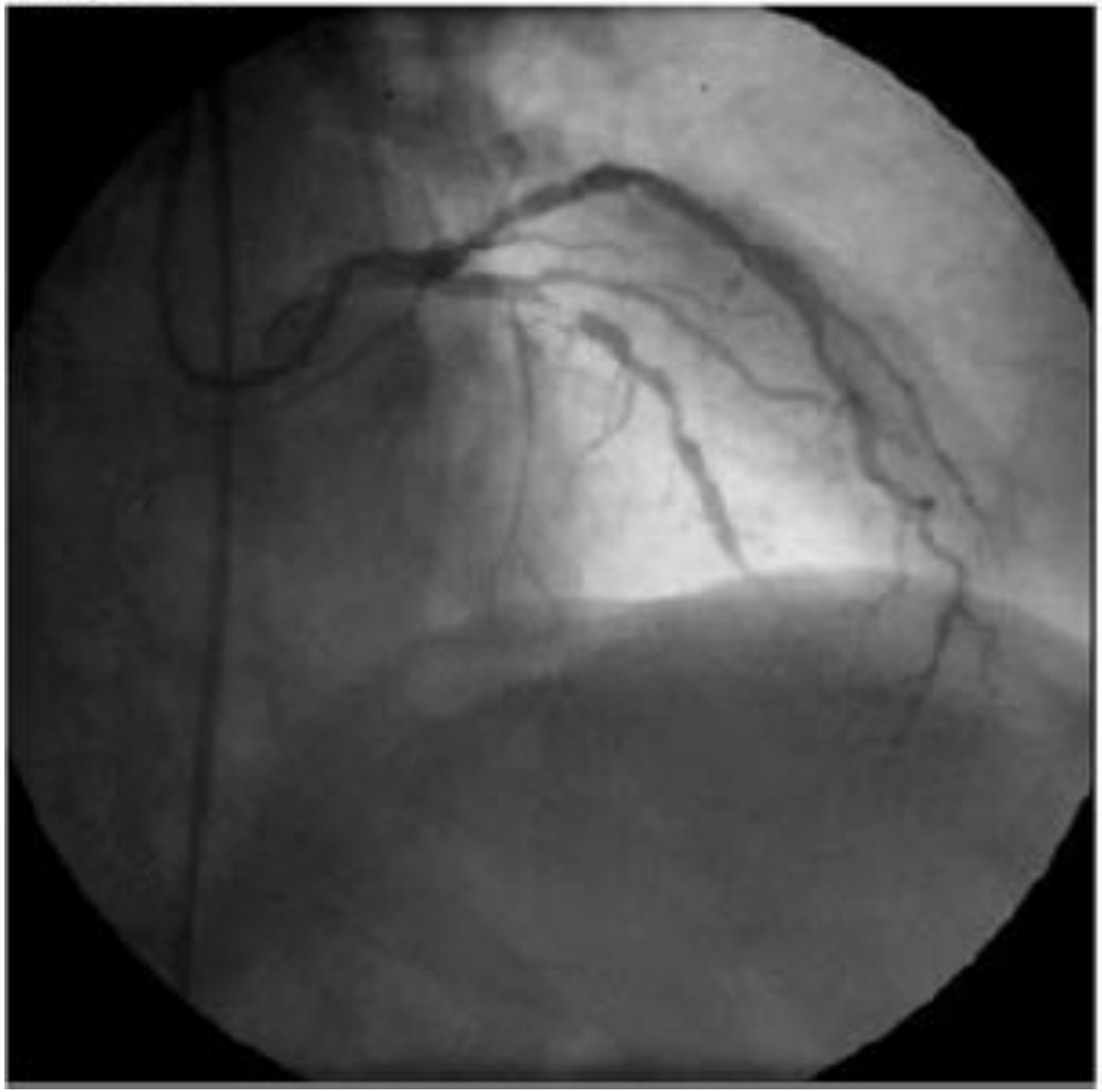
ST = or ↑ in II, III, aVF

↓

Occlusion distal to D_1



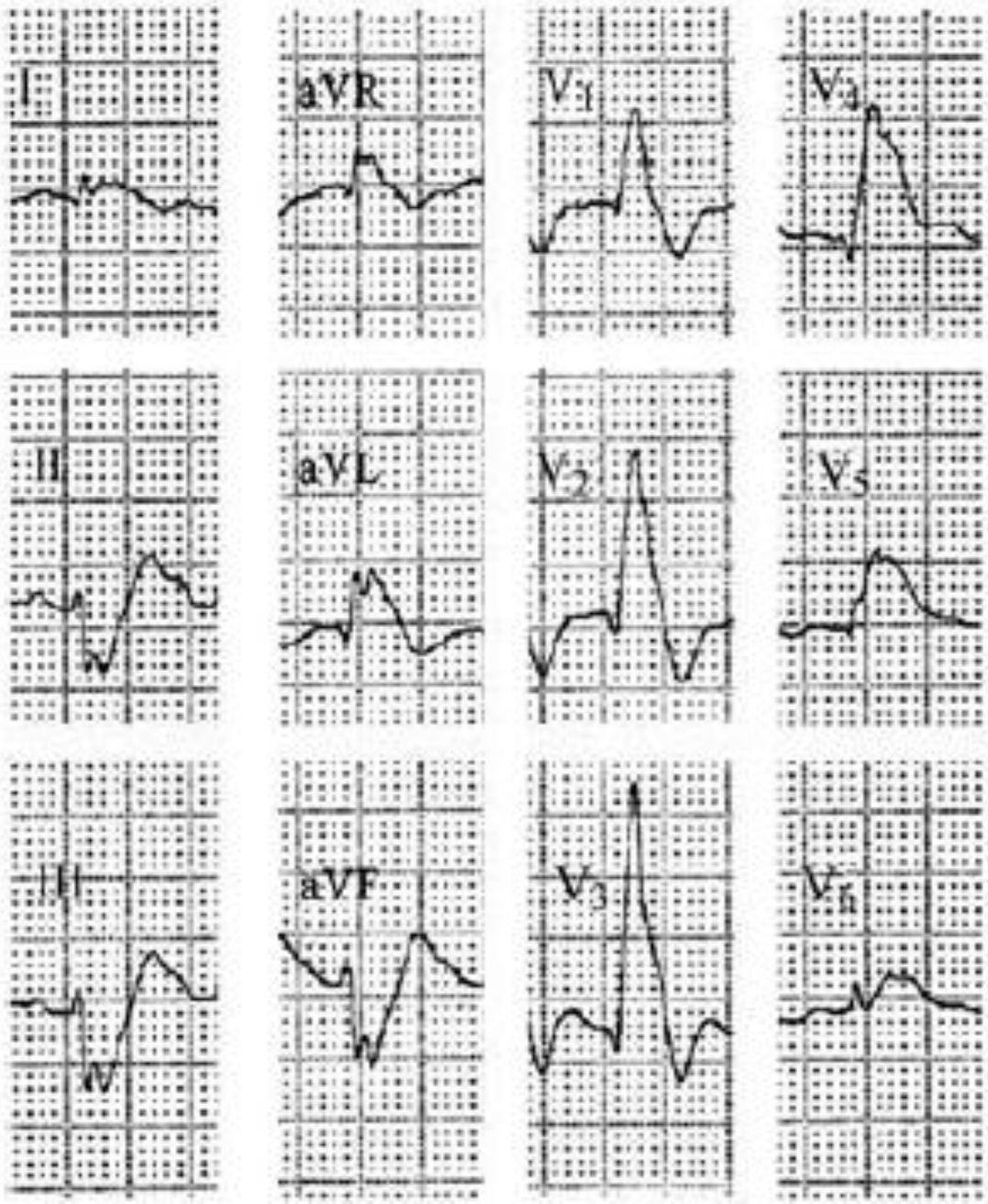
Pre-PCI



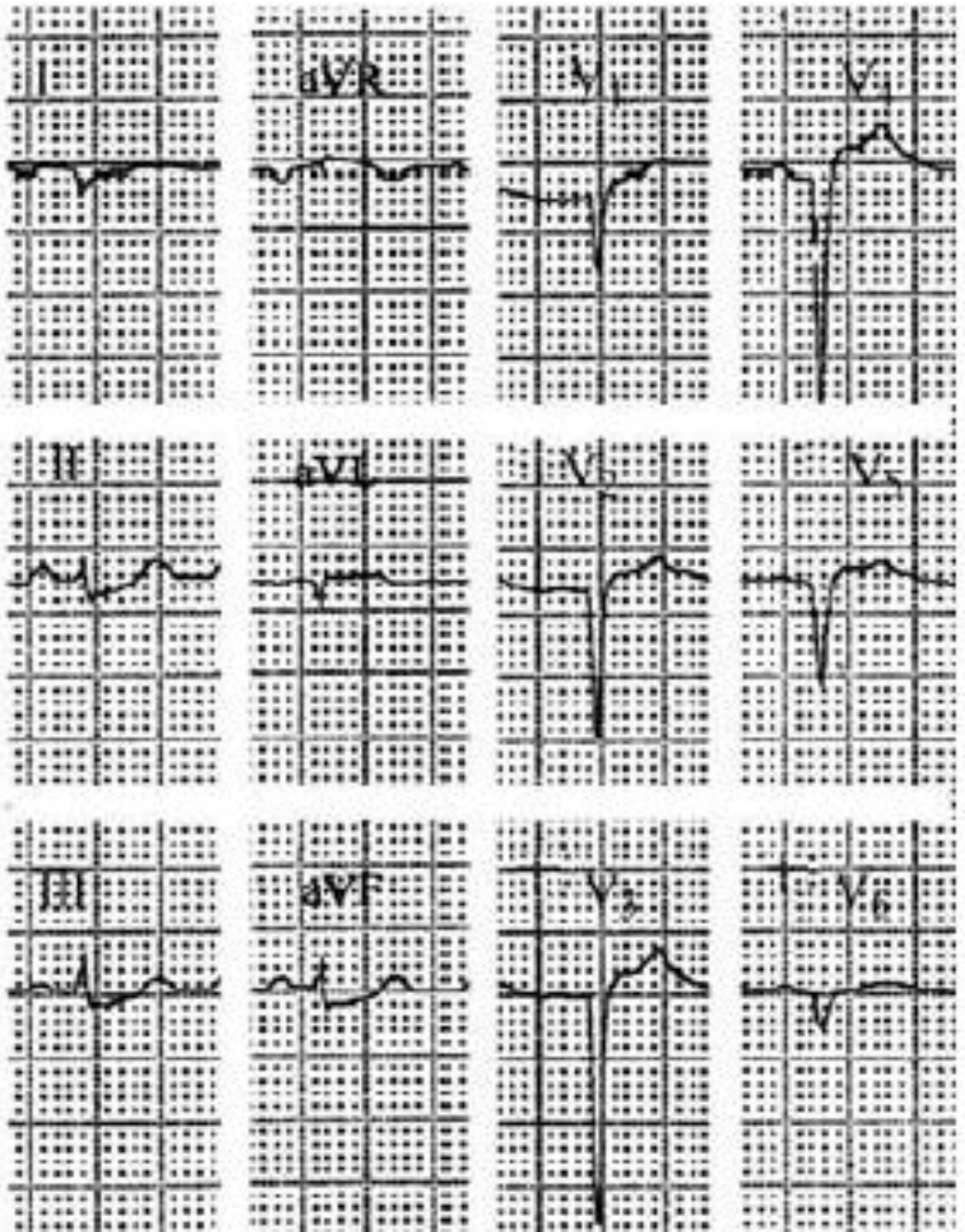
Post-PCI

7

(a) At entrance



(b) 18 hours later



Which is the culprit artery of this STEMI?

a LAD proximal to D1 and S1

b LAD distal to D1 and S1

c Subocclusion of LAD involving diagonal branches

ST elevation in V_{1-2} to V_{4-6}

↓

LAD occlusion

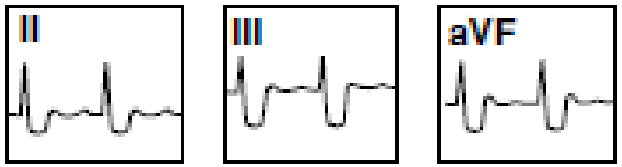
↓

Check ST segment in II, III, aVF

$\Sigma ST\downarrow$ in III and aVF ⩾ 2.5 mm*

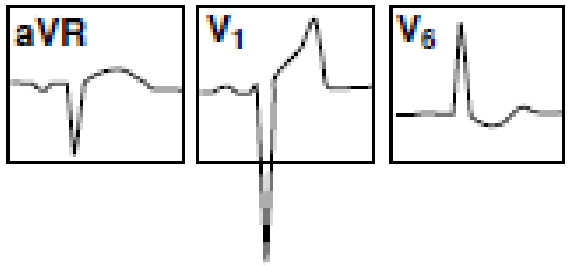
↓

Occlusion proximal to D_1



Occlusion proximal to S_1:

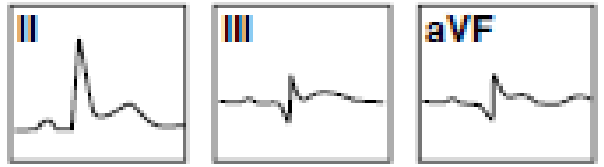
- $\Sigma\uparrow ST$ in aVR and V_1 + $ST\downarrow$ V_6 ⩾ 0
- New RBBB



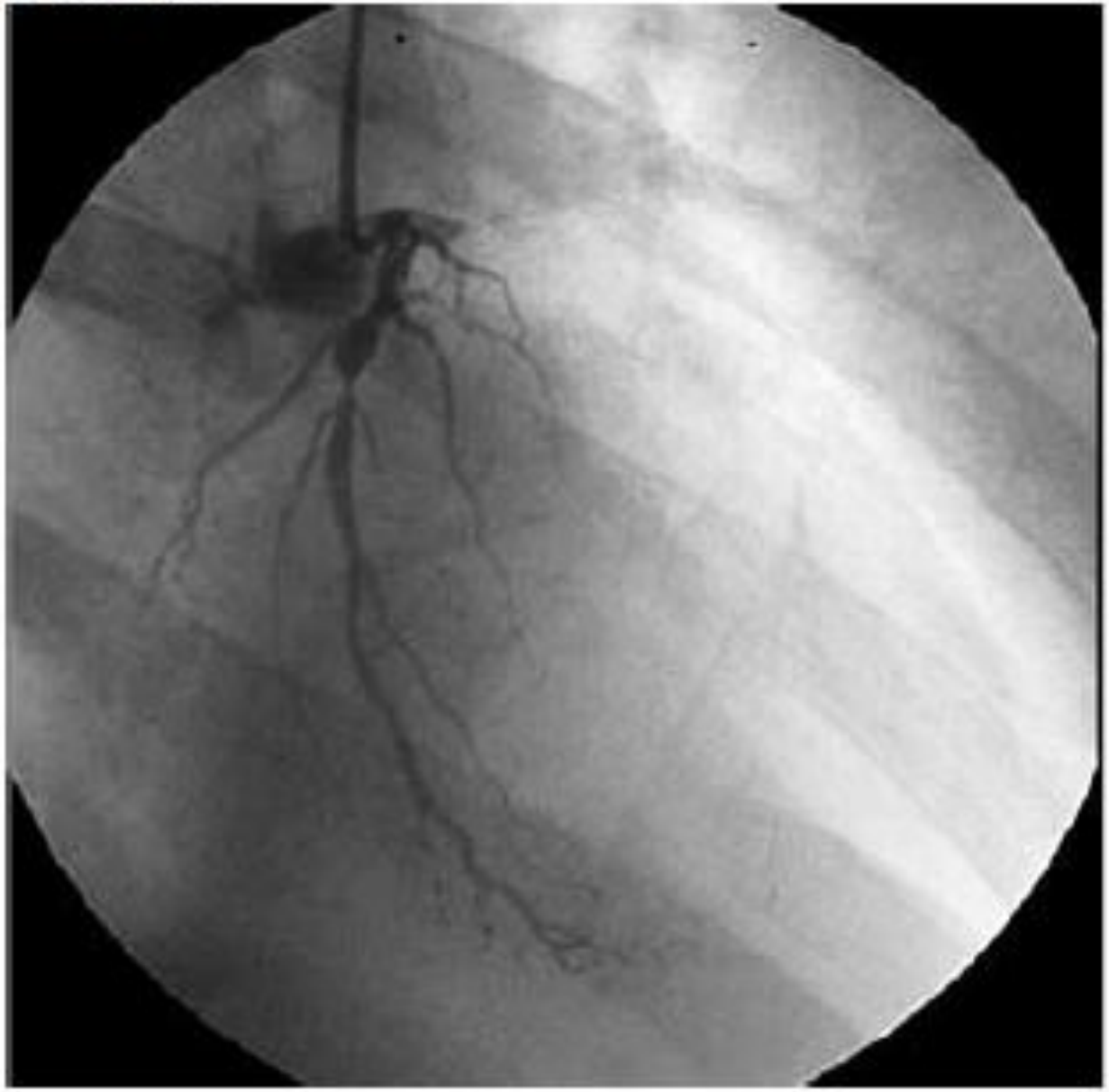
ST = or ↑ in II, III, aVF

↓

Occlusion distal to D_1



Pre-PCI



Post-PCI

8

Which is the culprit artery of this STEMI?

a Proximal LAD to D1 and S1
b Distal LAD to D1 and S1
c Subocclusion of LAD including the septal

ST elevation in V_{1-2} to V_{4-6}

↓

LAD occlusion

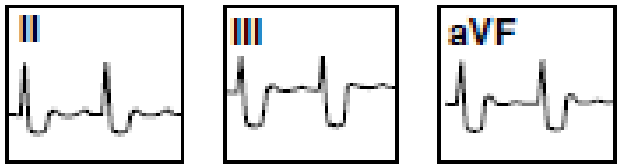
↓

Check ST segment in II, III, aVF

$\Sigma ST\downarrow$ in III and aVF ⩾ 2.5 mm*

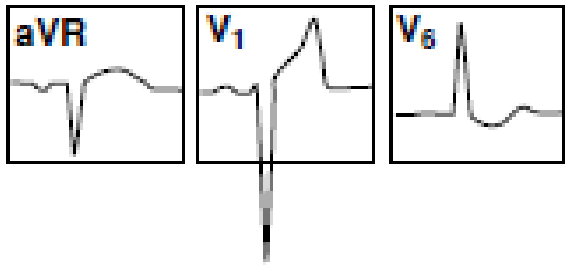
↓

Occlusion proximal to D_1



Occlusion proximal to S_1:

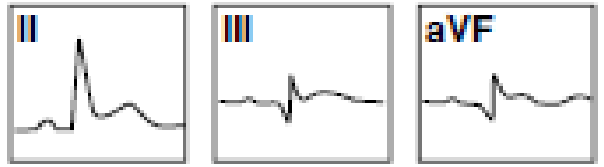
- $\Sigma\uparrow ST$ in aVR and V_1 + $ST\downarrow$ V_6 ⩾ 0
- New RBBB



ST = or ↑ in II, III, aVF

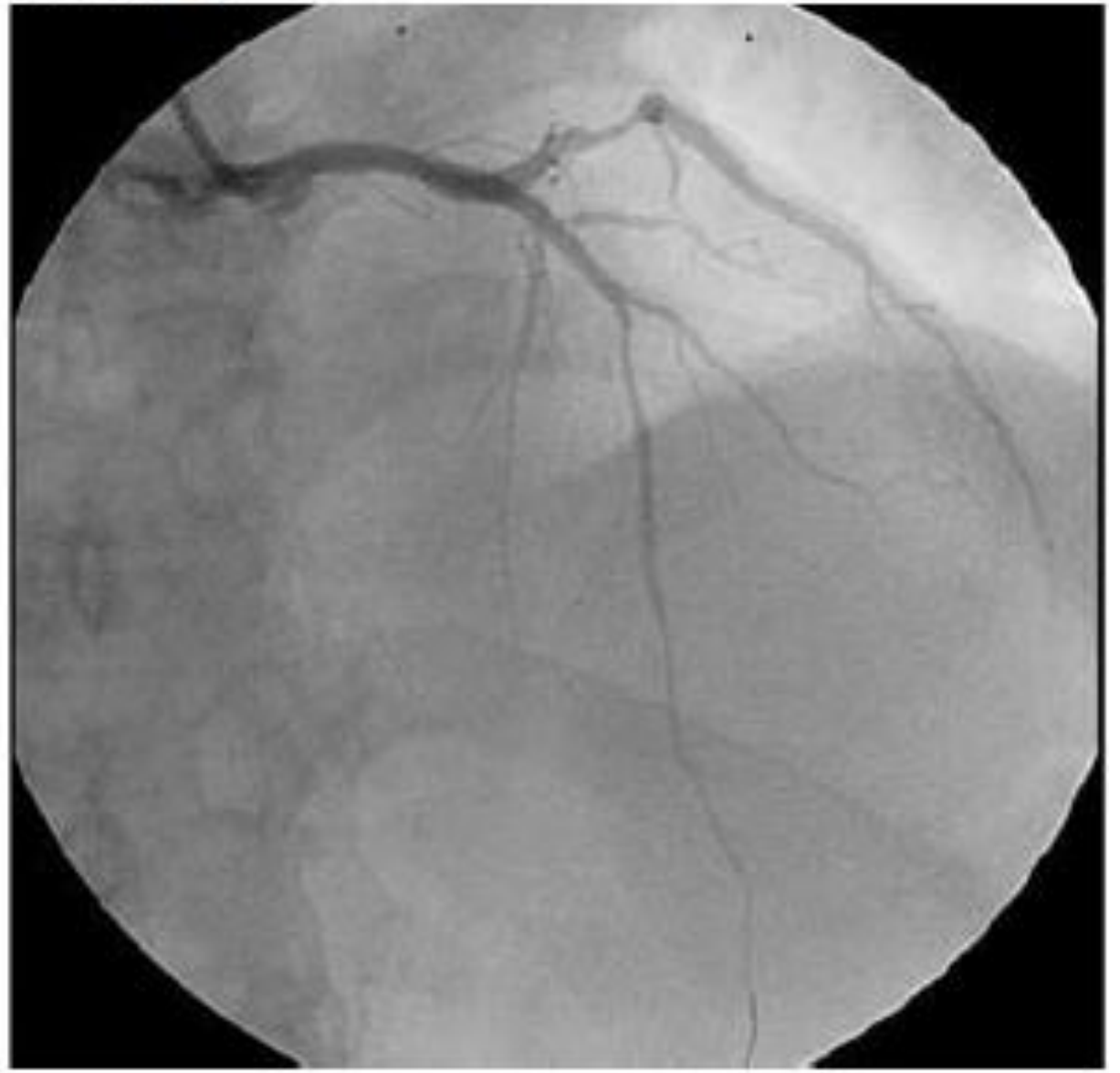
↓

Occlusion distal to D_1

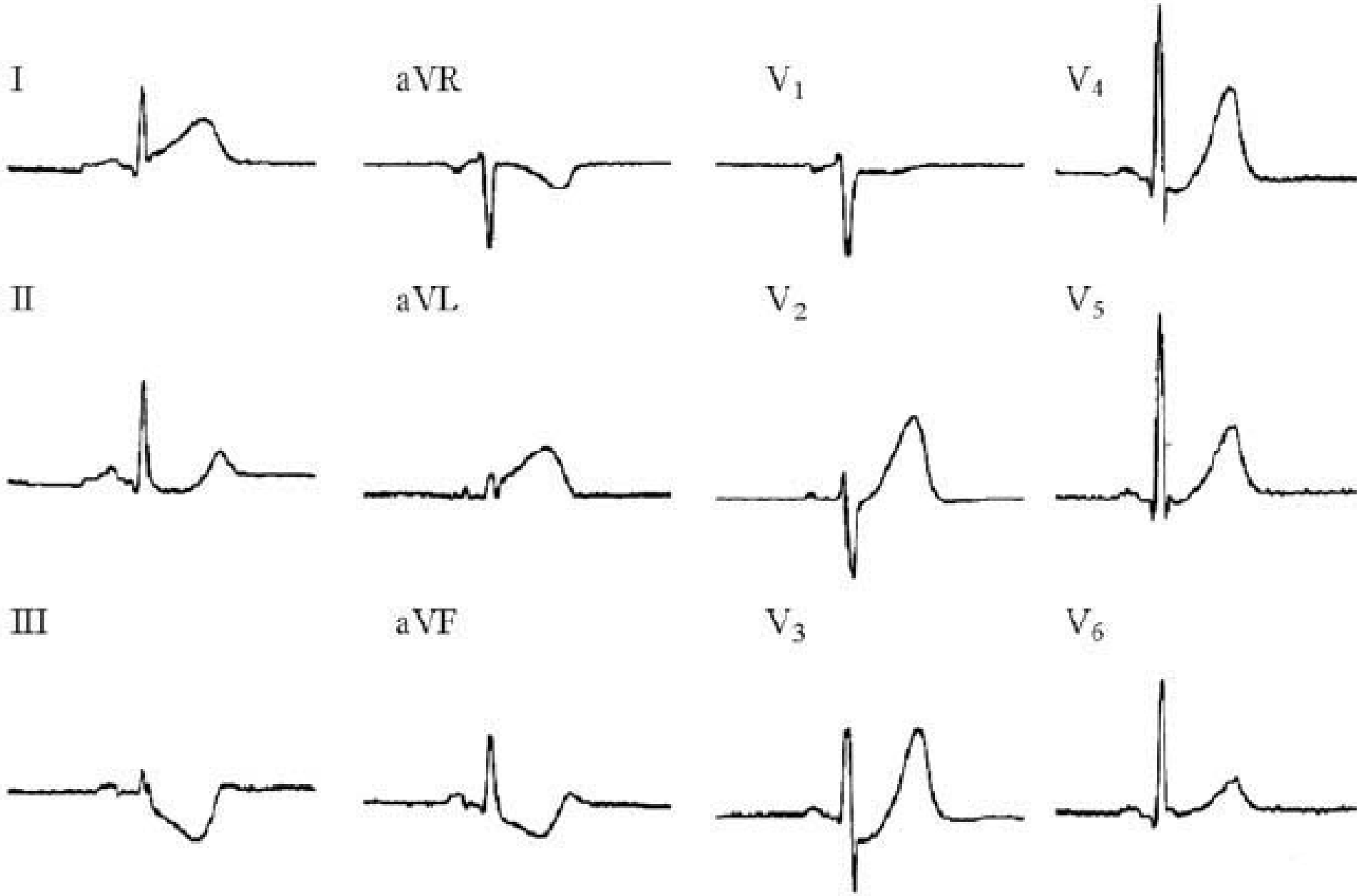


Pre-PCI

Post-PCI



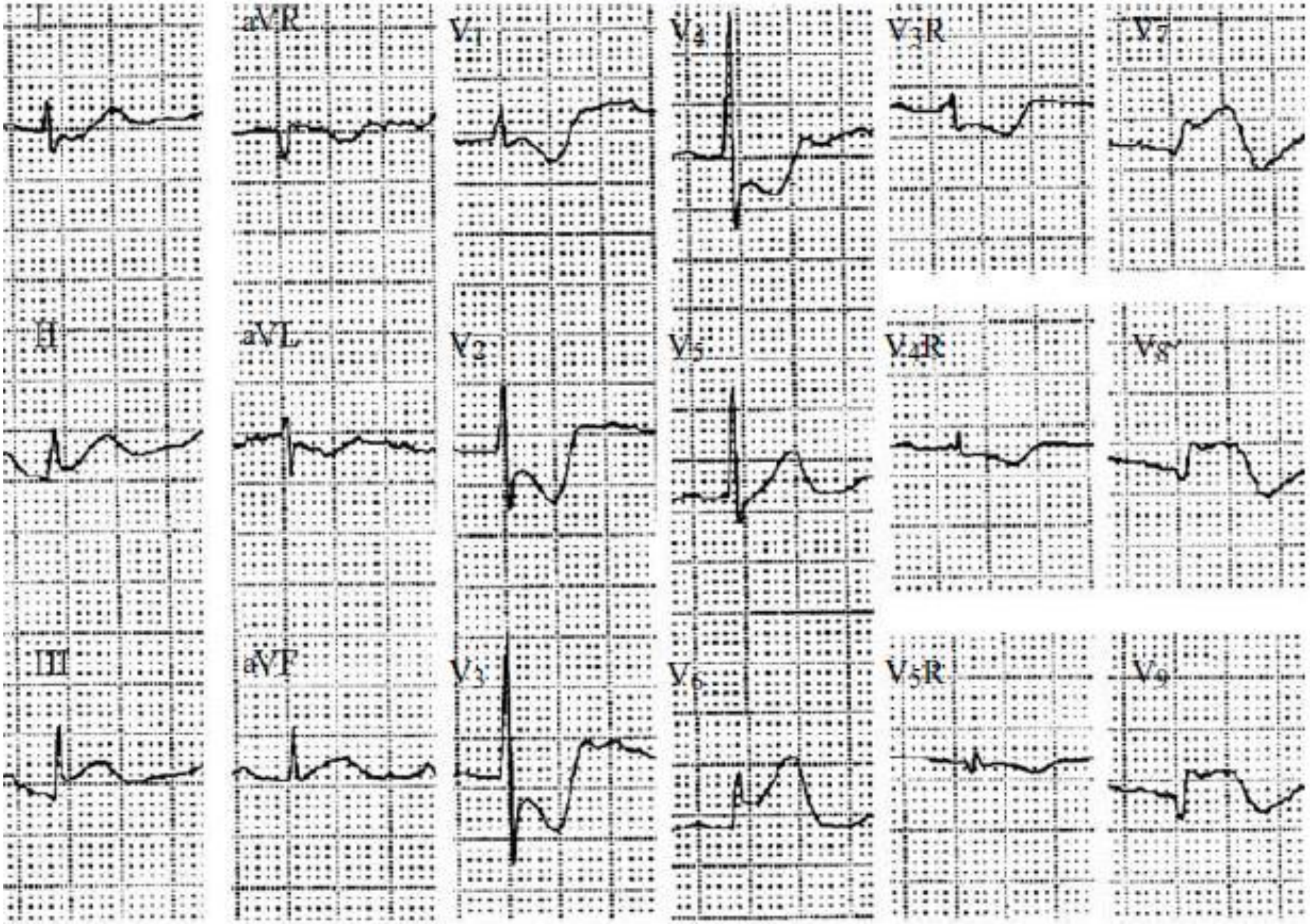
9

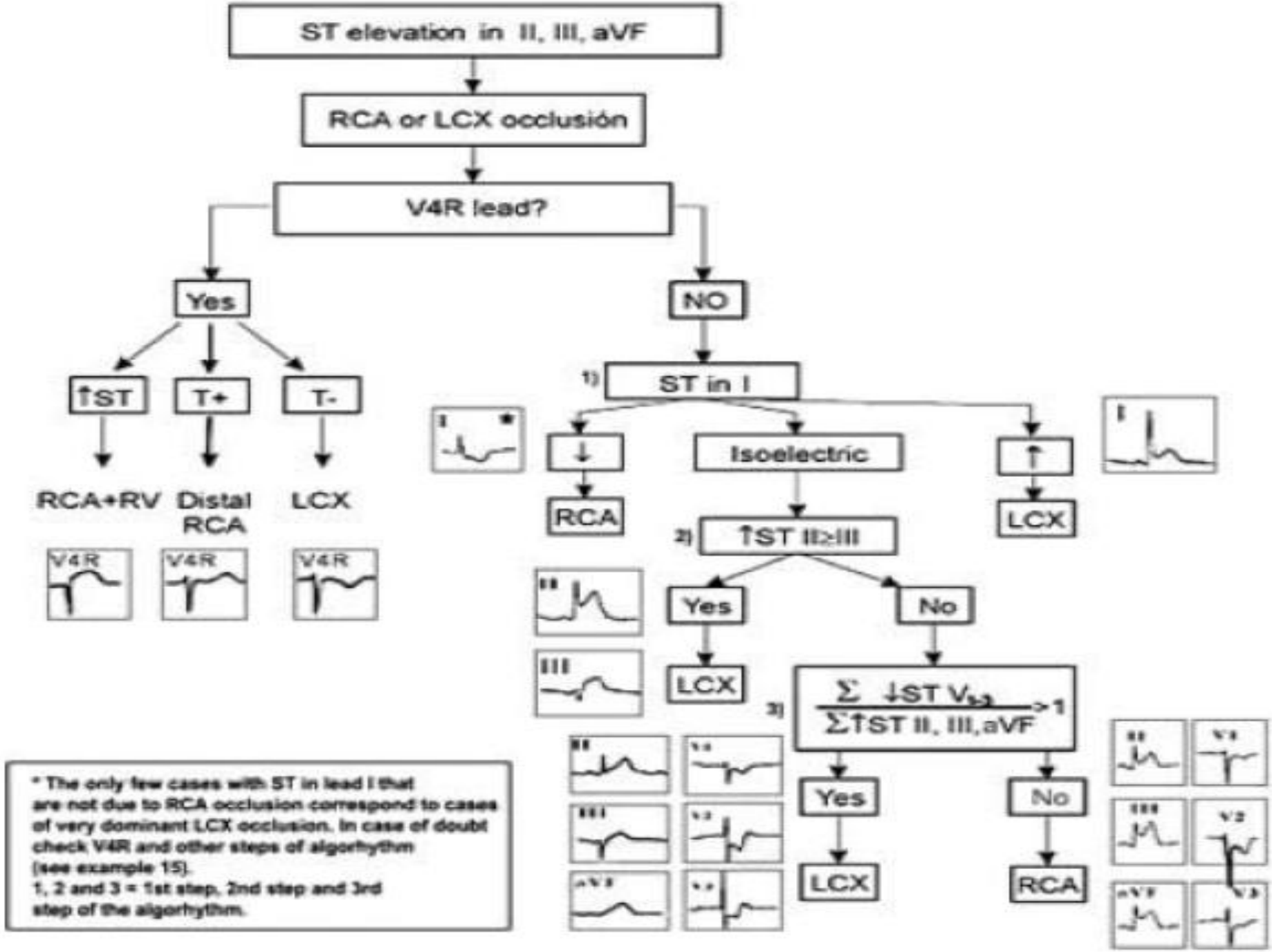


Which is the culprit artery of this STEMI?

a Distal LAD
b OM
c diagonal (D1–D2)

10




ST elevation in II, III, aVF
RCA or LCX occlusión
V4R lead?
Yes
NO
↑ST
T+
T-
RCA+RV
Distal RCA
LCX
V4R
V4R
V4R
1) ST in I
↓
Isoelectric
↑
RCA
LCX
2) ↑ST II≥III
Yes
No
LCX
3) Σ ↓ST V1-3 / Σ↑ST II, III, aVF >1
Yes
No
LCX
RCA
* The only few cases with ST in lead I that are not due to RCA occlusion correspond to cases of very dominant LCX occlusion. In case of doubt check V4R and other steps of algorhythm (see example 15).
1, 2 and 3 = 1st step, 2nd step and 3rd step of the algorhythm.

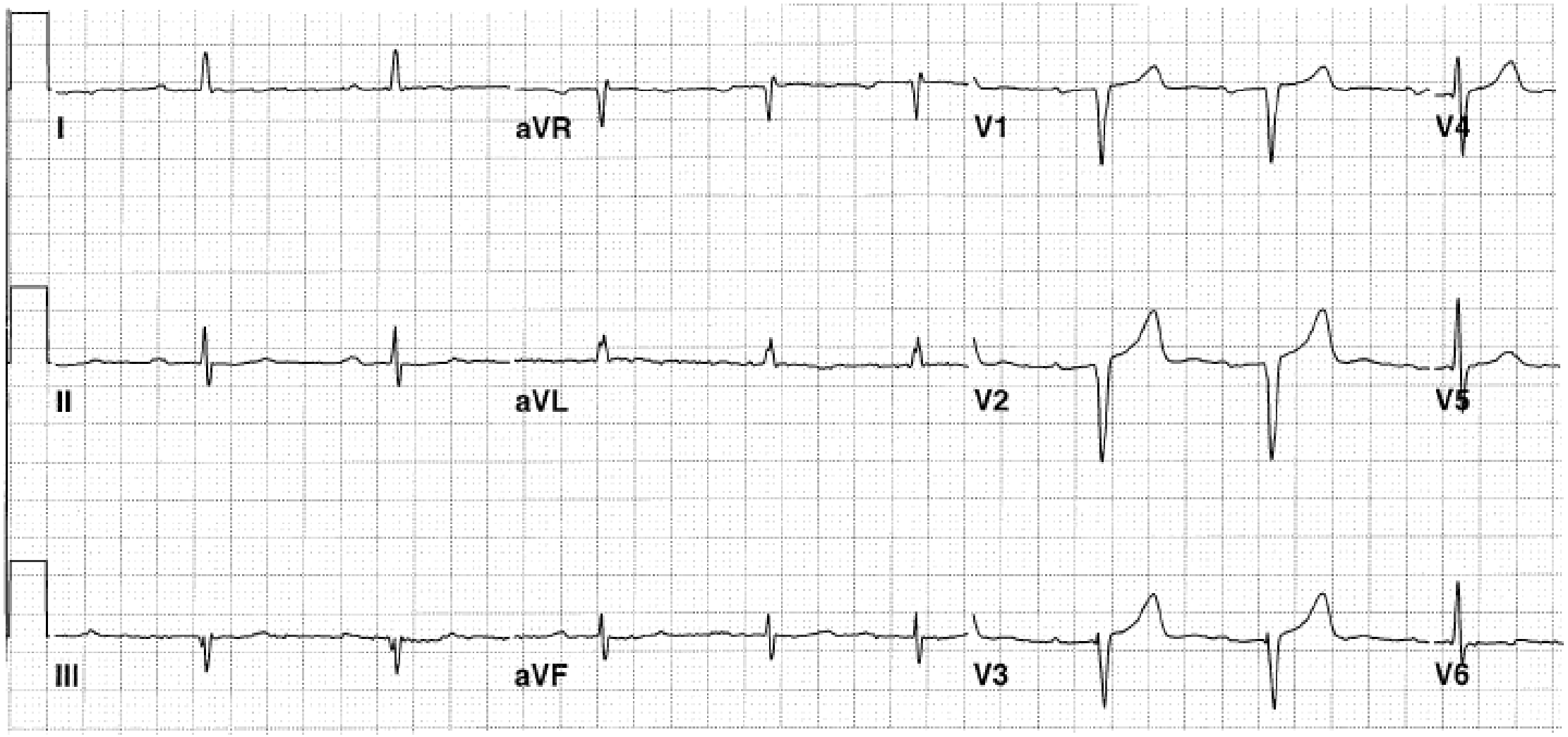
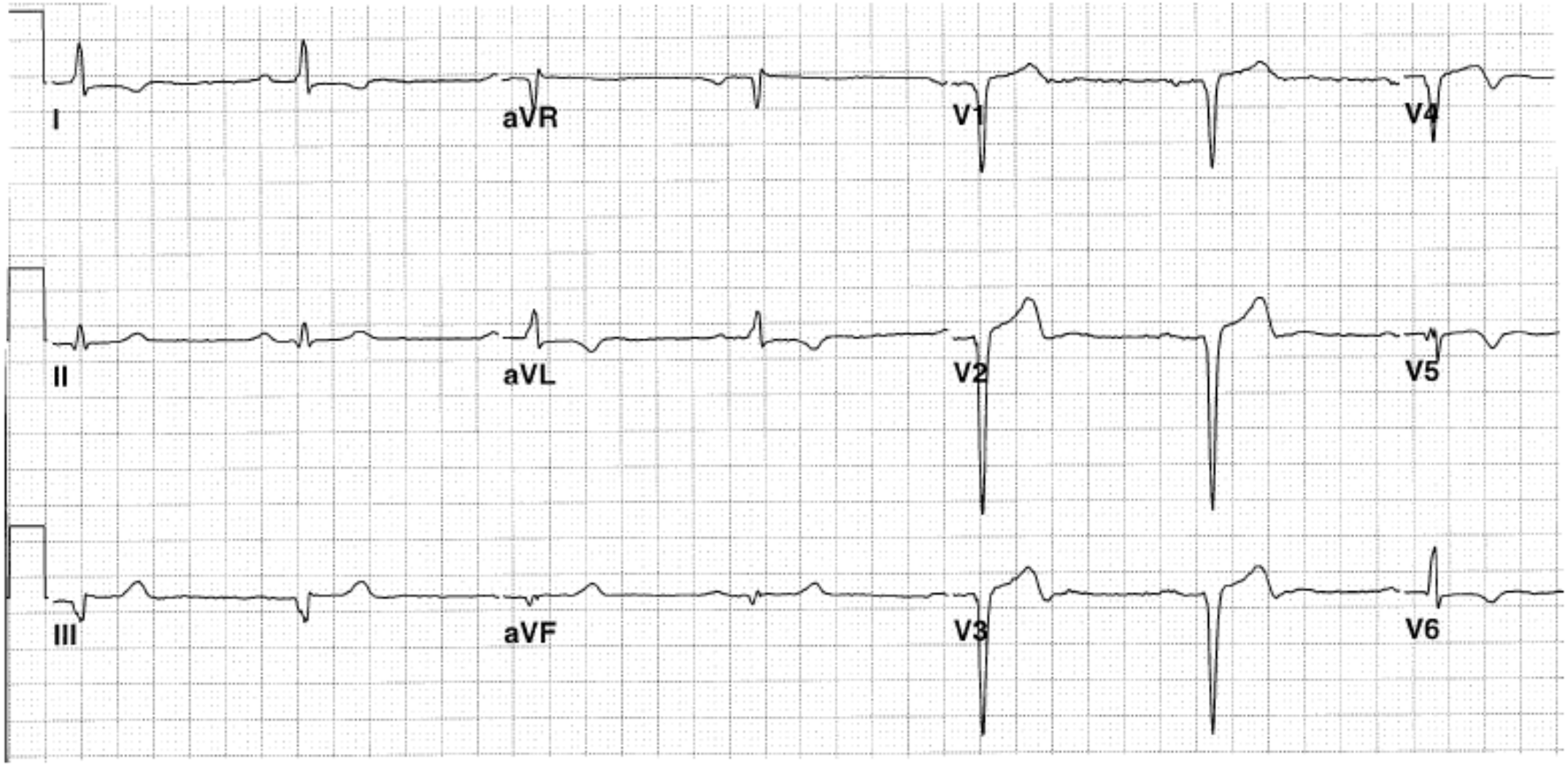
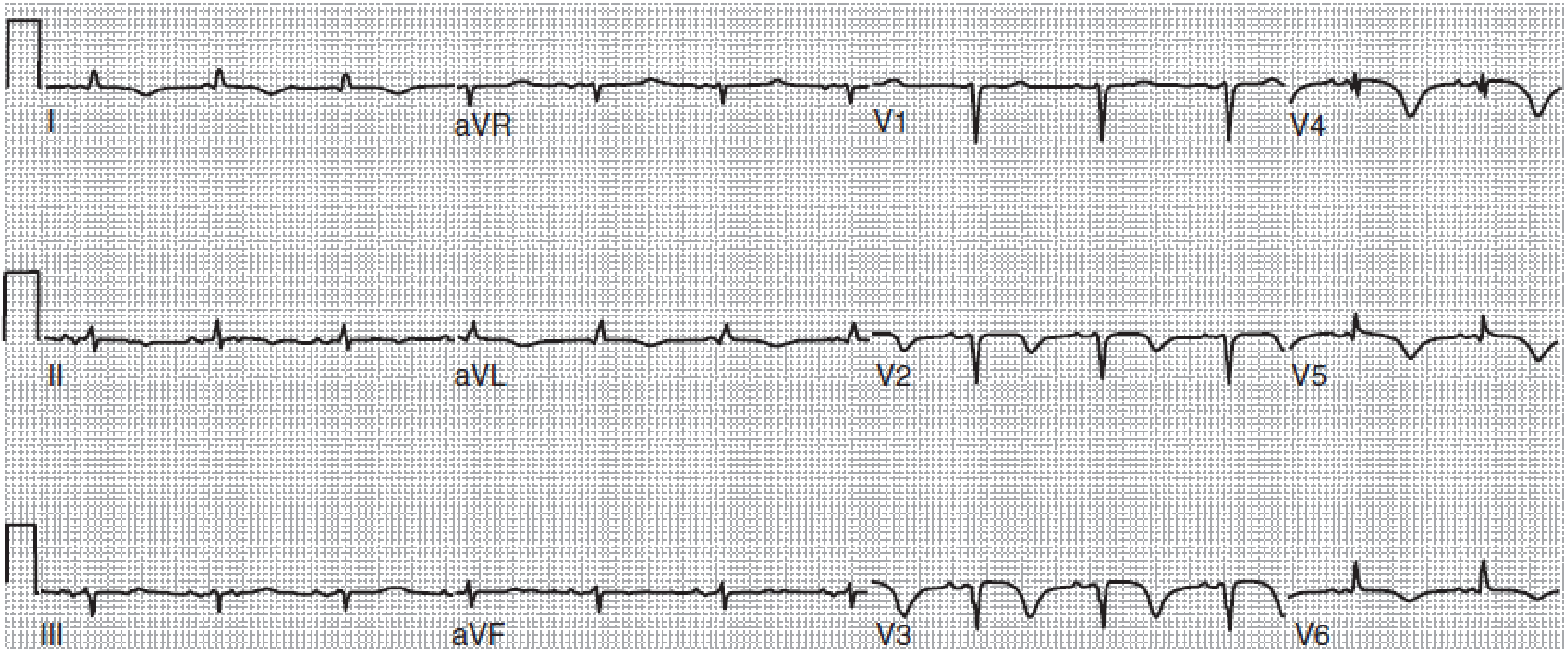


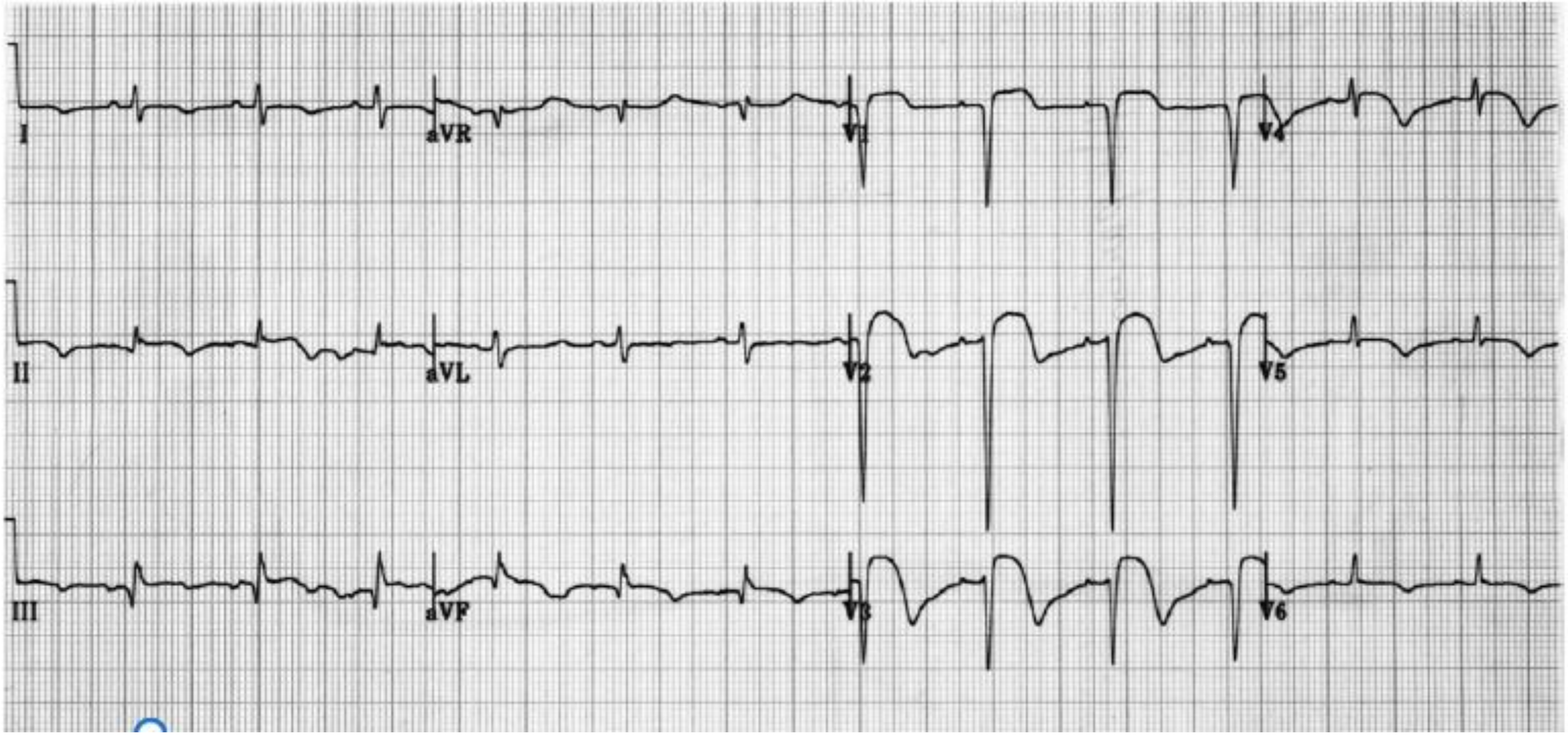
Figure 8–1 ECG of an obese 76-year-old man who has no evidence of structural heart disease and shows normal left ventricular function on the echocardiogram. Note the Q wave in lead III and QS pattern in leads V_1 and V_2 (i.e., poor R wave progression).



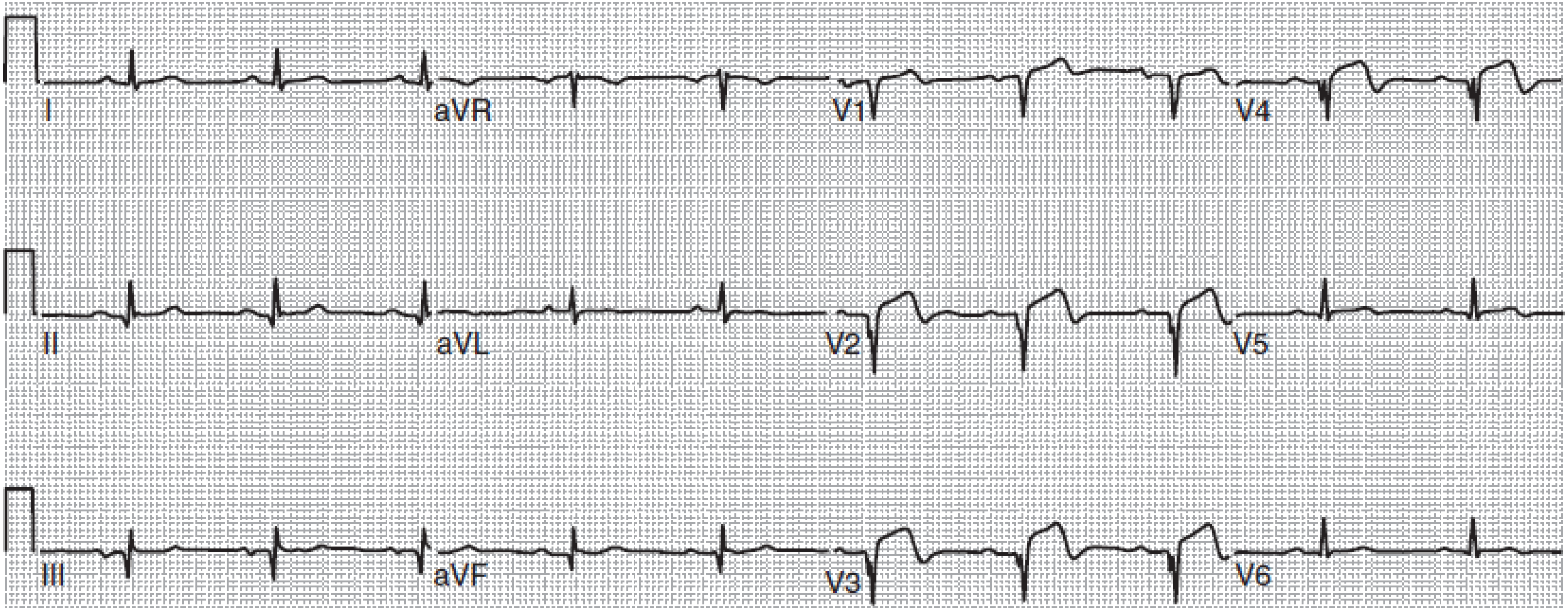
ECG of a 65-year-old man with an anterior infarction involving the inferior wall, attributed to occlusion of the left anterior descending artery “wrapping” around the apex.



ECG of a 77-year old man with anterior myocardial infarction (MI) caused by ostial occlusion of the intermediate branch without major obstructions in other major coronary arteries. There was mid-anterolateral dyskinesis with contractile apex. Abnormal Q waves are present in the leads V_2 and V_3 with decreased R amplitude in leads V_4–V_5 and diffuseT wave abnormalities.



Acute anteroseptal and inferior myocardial infarction related to cocaine use. The patient is a 30-year-old woman known to be a cocaine user. She developed severe chest pain; the ECG recorded 90 minutes after the onset of pain reveals ST segment elevation in the anteroseptal and inferior leads (not shown). Coronary arteriogram reveals complete thrombotic occlusion of the proximal left anterior descending artery. Percutaneous transluminal angioplasty was performed with satisfactory results. The visualized artery was long and wrapped around the apex of the heart



ECG type 1 pattern of anterior myocardial infarction in a 55-year-old man with occlusion of the left anterior descending coronary artery distal to the first septal perforator and diagonal branch and no major obstructions in other large coronary branches. Note the Q wave in leads V_2–V_4. The narrow q waves in the inferior leads are normal for this patient's body build

والسلام