

How to Review Coronary Angiogram in Preparation for CABG

대한민국 의료의 미래
**Quantum
Lead 21**

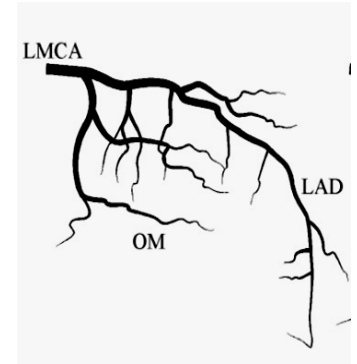
2012년 5월 1300병상 규모의 글로벌병원으로
새롭게 태어납니다.

Kay-Hyun Park, MD
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Seoul National University Bundang Hospital

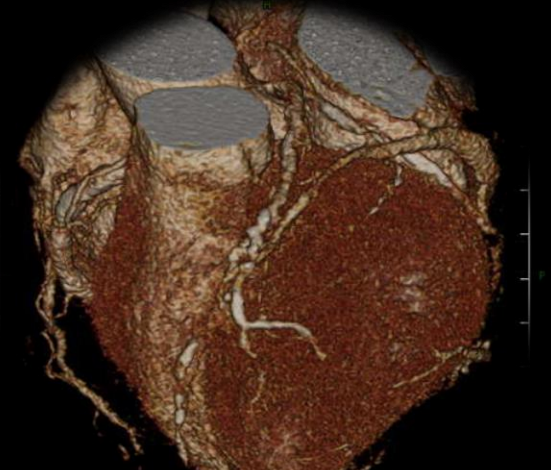
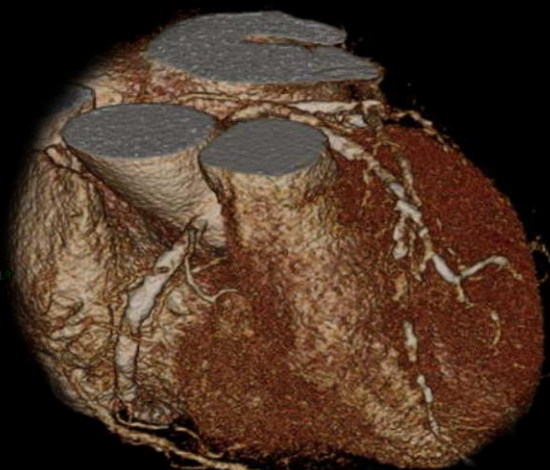
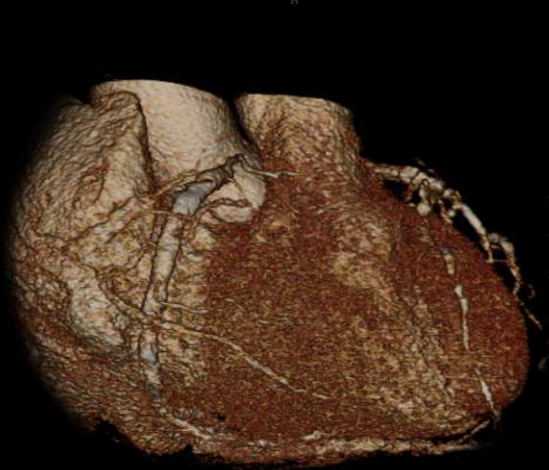
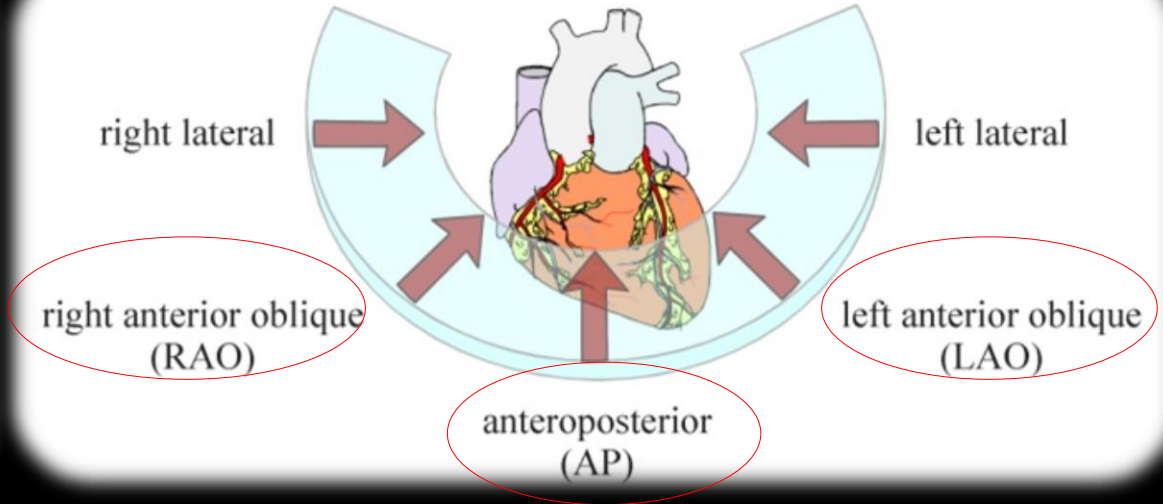
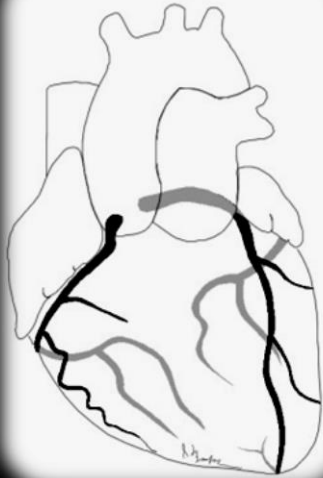


Planning of CABG

- **Determine target vessel & attack (anastomosis) site.**
 - *Surgeon's viewpoint \neq interventionist's view point*
 - *Identification of target*
 - *Location, course and tortuosity*
 - *Branching pattern*
 - *Relationship with adjacent branches*
- **Determine type, number, length, configuration of conduit.**
 - *Save time and unnecessary incision.*
- **Predict the technical difficulty and duration of anastomosis.**
 - *Location & quality of vessel*
 - *technical difficulty and duration of ischemia*
- **Prepare plan B.**
 - *Alternative conduit and/or graft configuration*
 - *CPB (or PCPS=EBS) stand-by needed?*

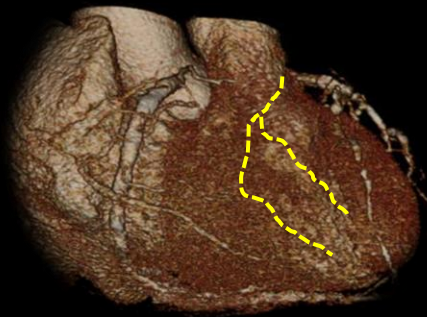


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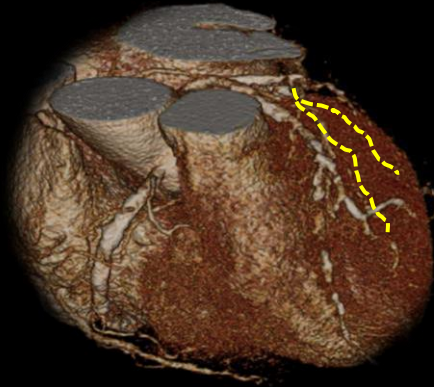


Left coronary artery

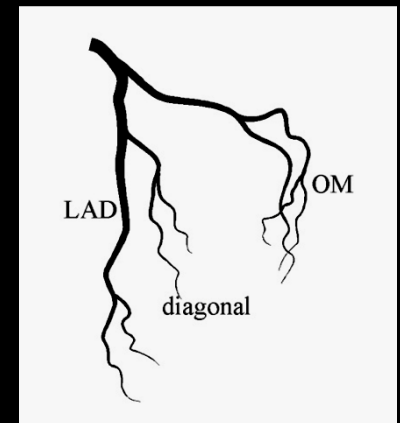
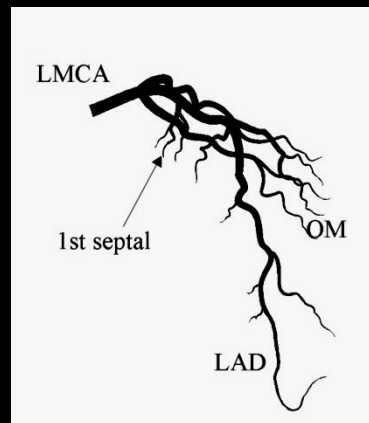
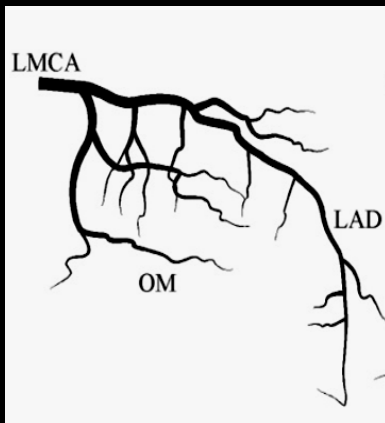
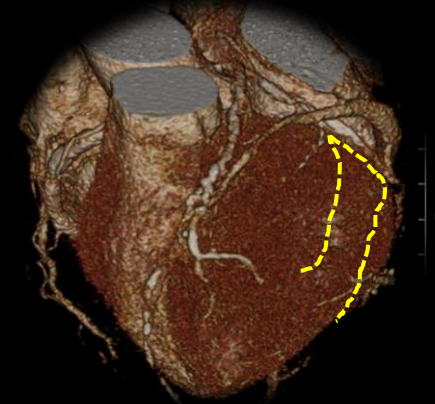
RAO



AP

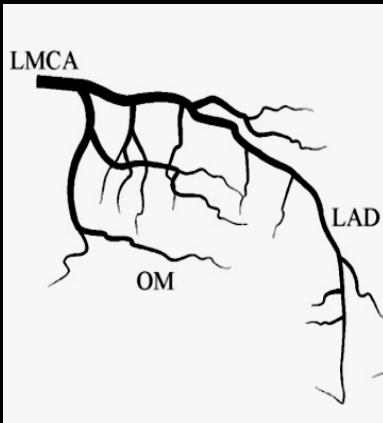


LAO

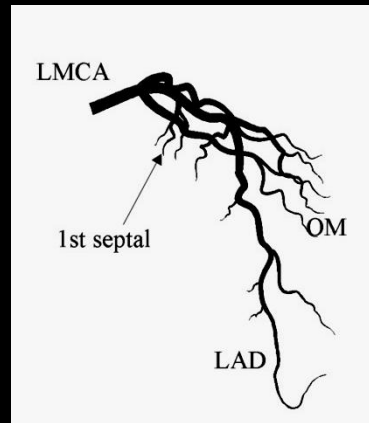


Left coronary artery

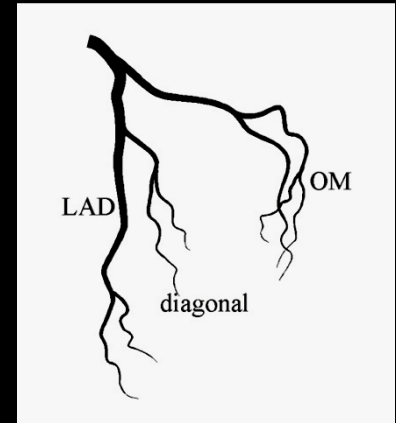
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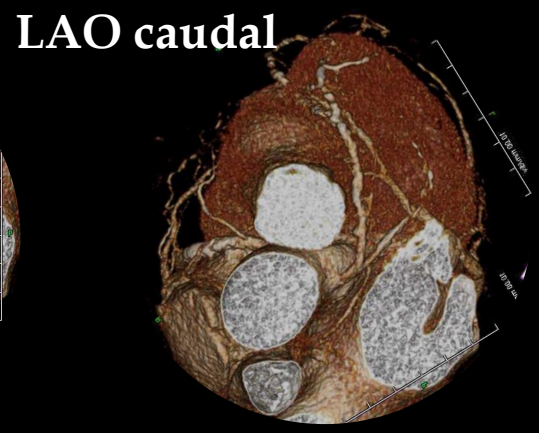
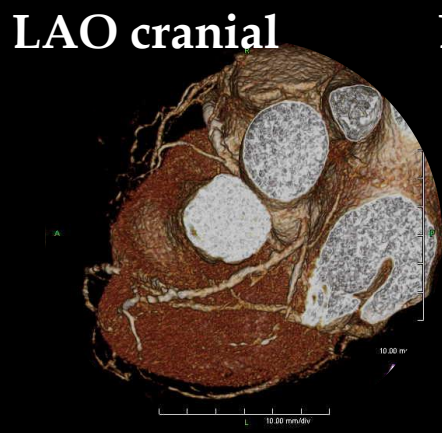
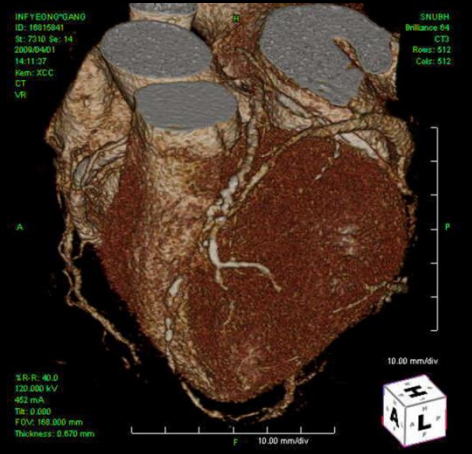
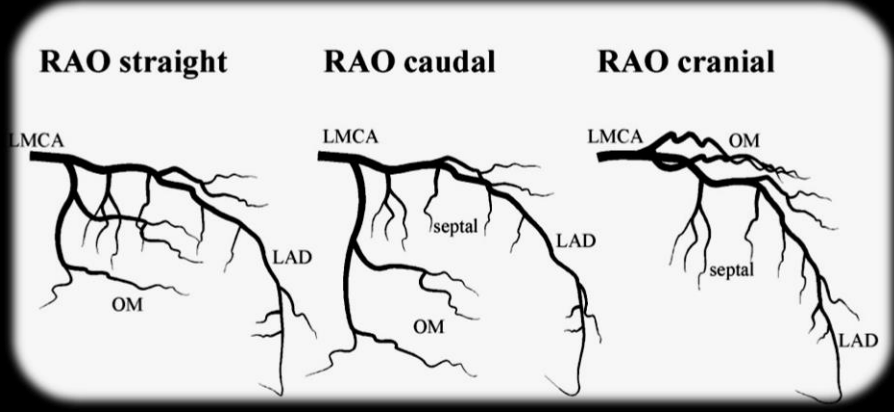
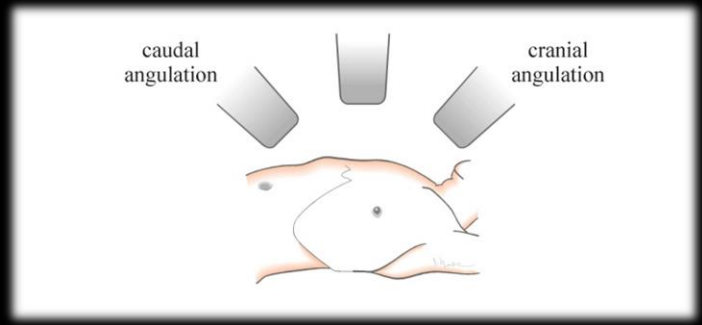
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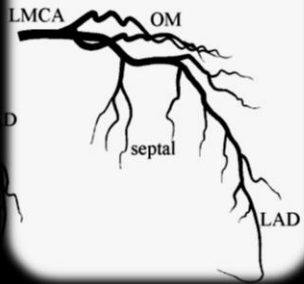
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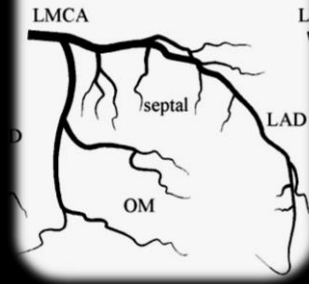
Cranial vs. Caudal view



RAO cranial



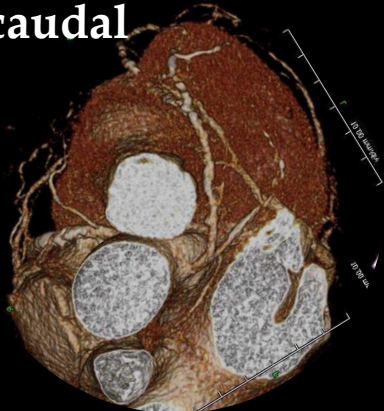
RAO caudal



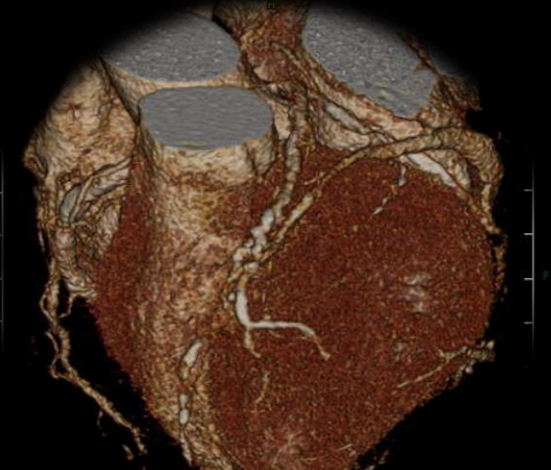
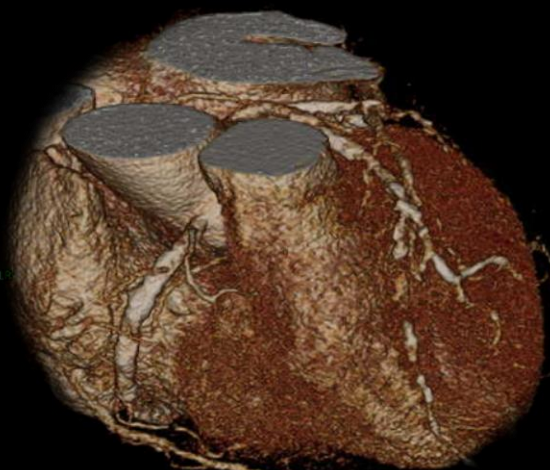
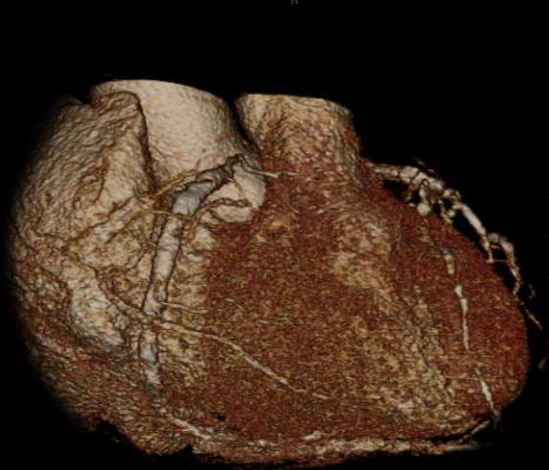
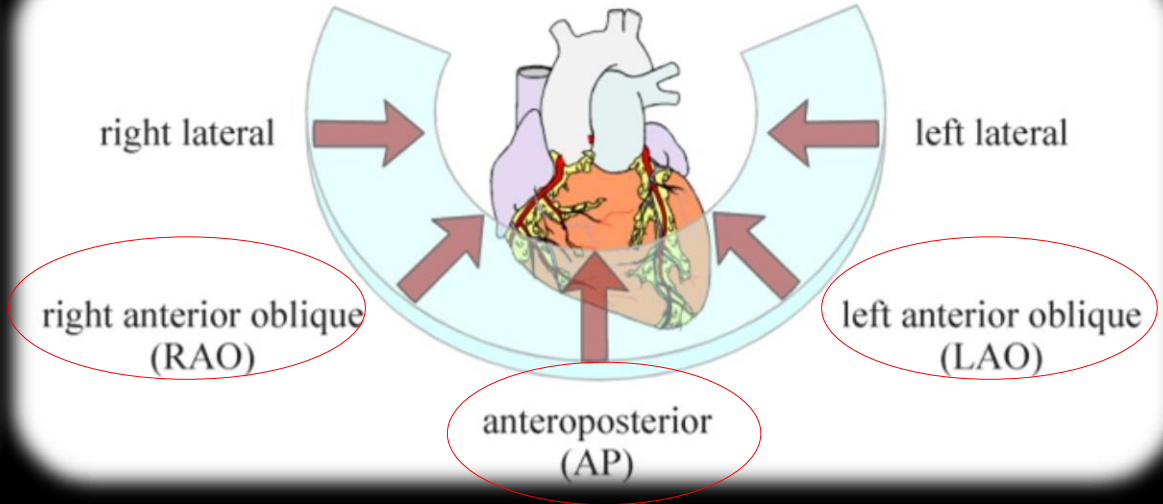
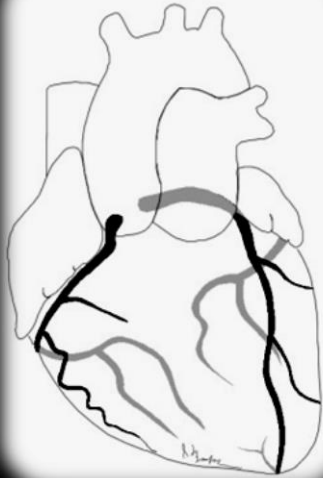
LAO cranial



LAO caudal

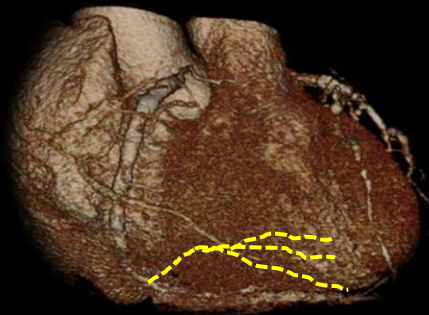


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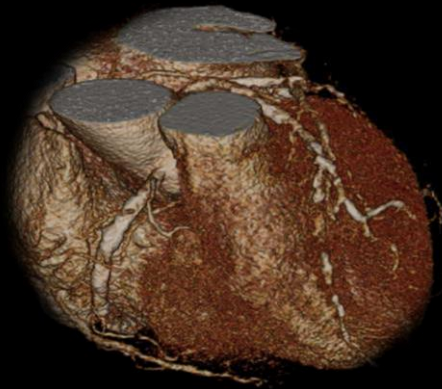


Right coronary artery

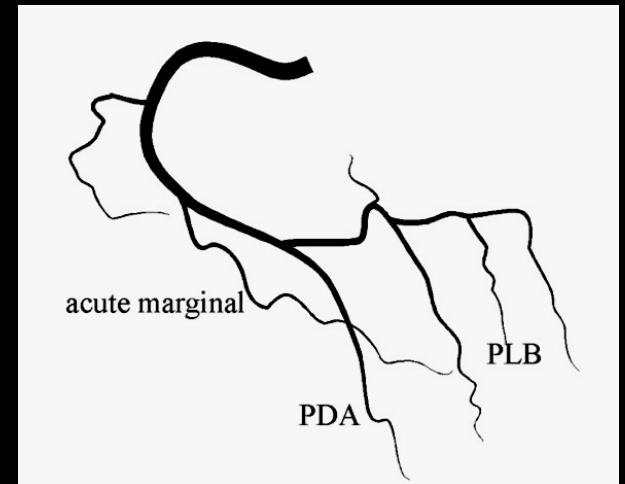
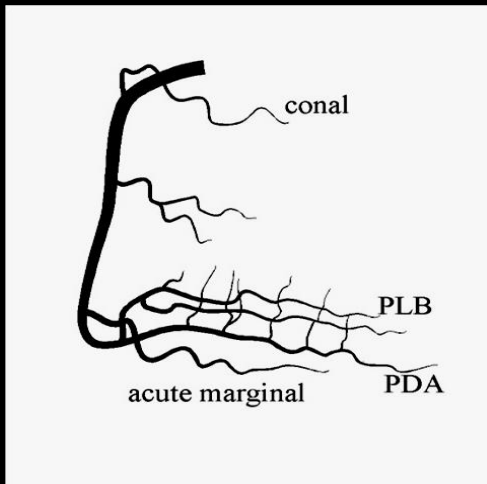
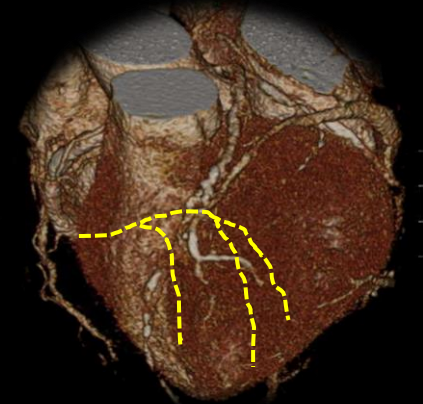
RAO



AP

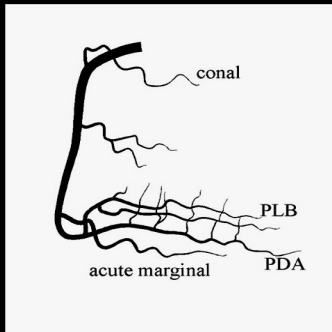


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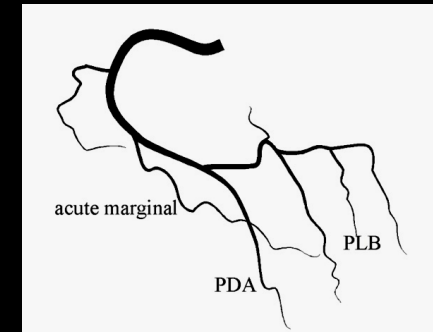


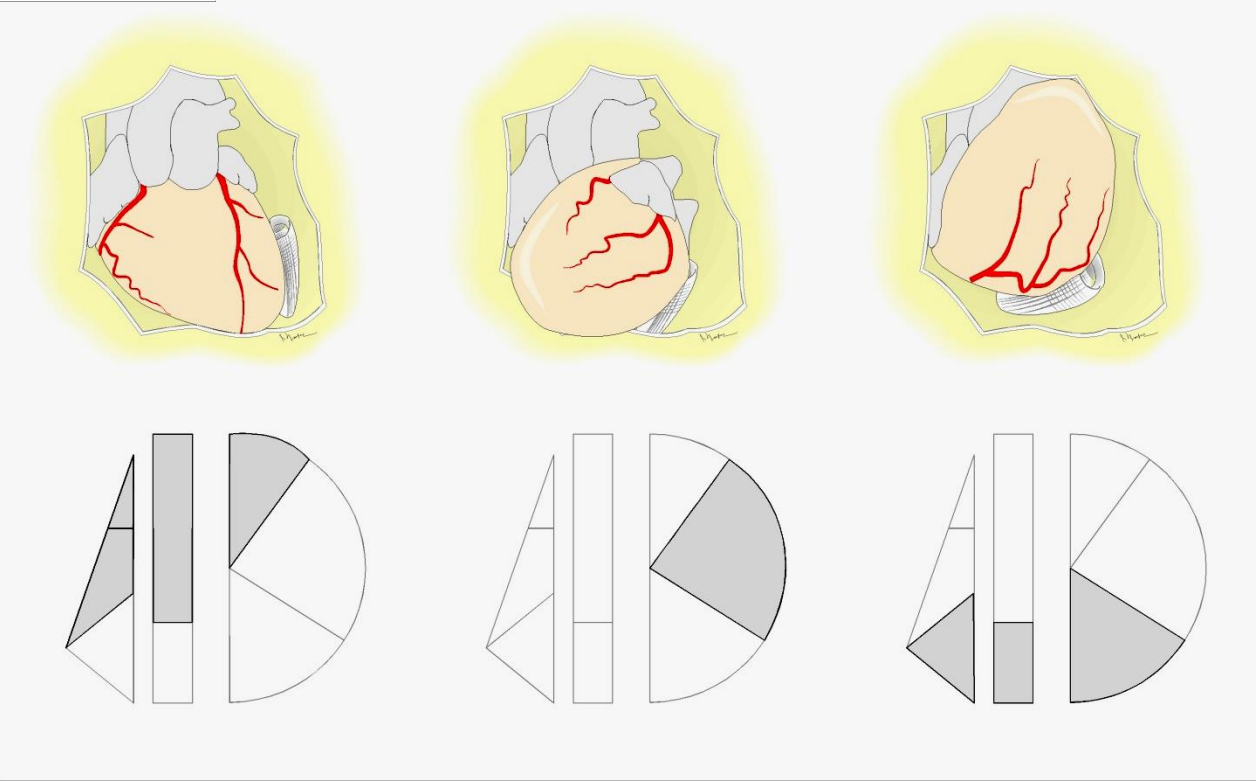
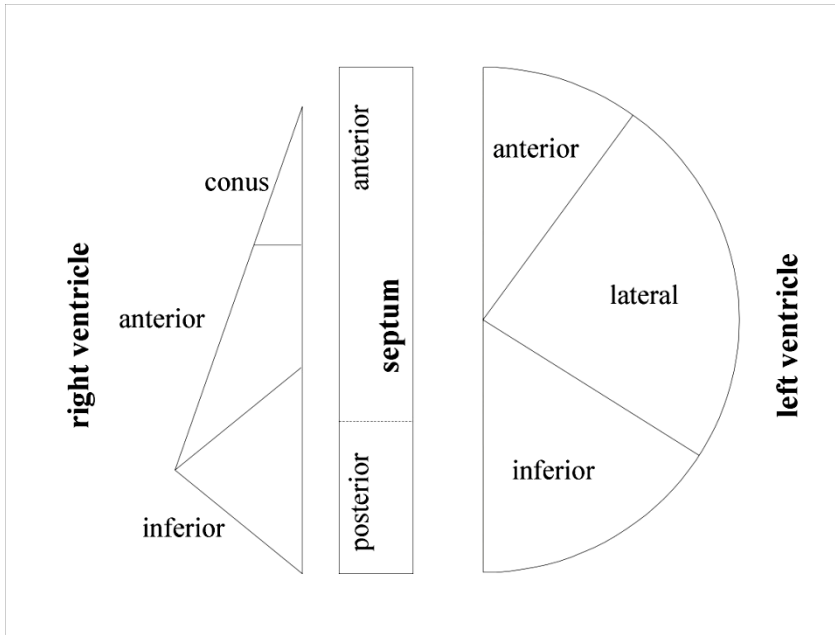
Right coronary artery

RAO

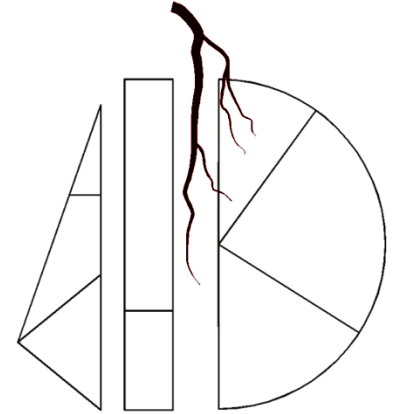
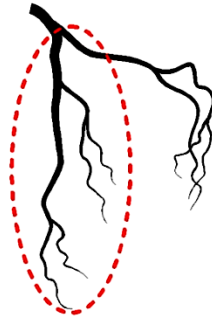


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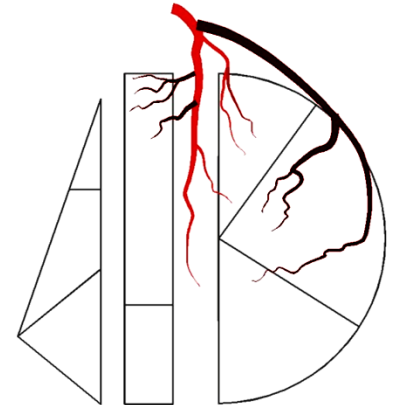
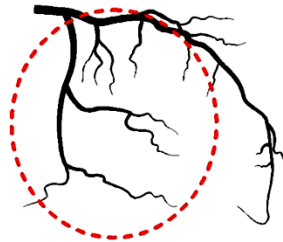


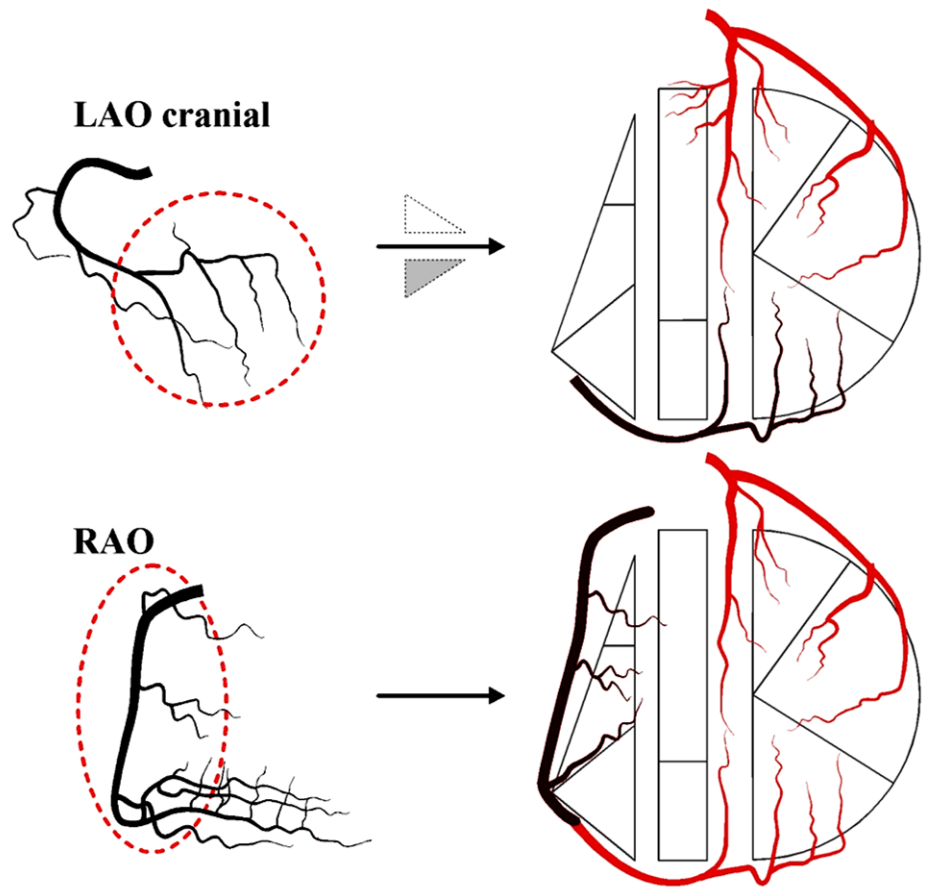


LAO cranial



RAO cranial





환자 ID : [REDACTED]

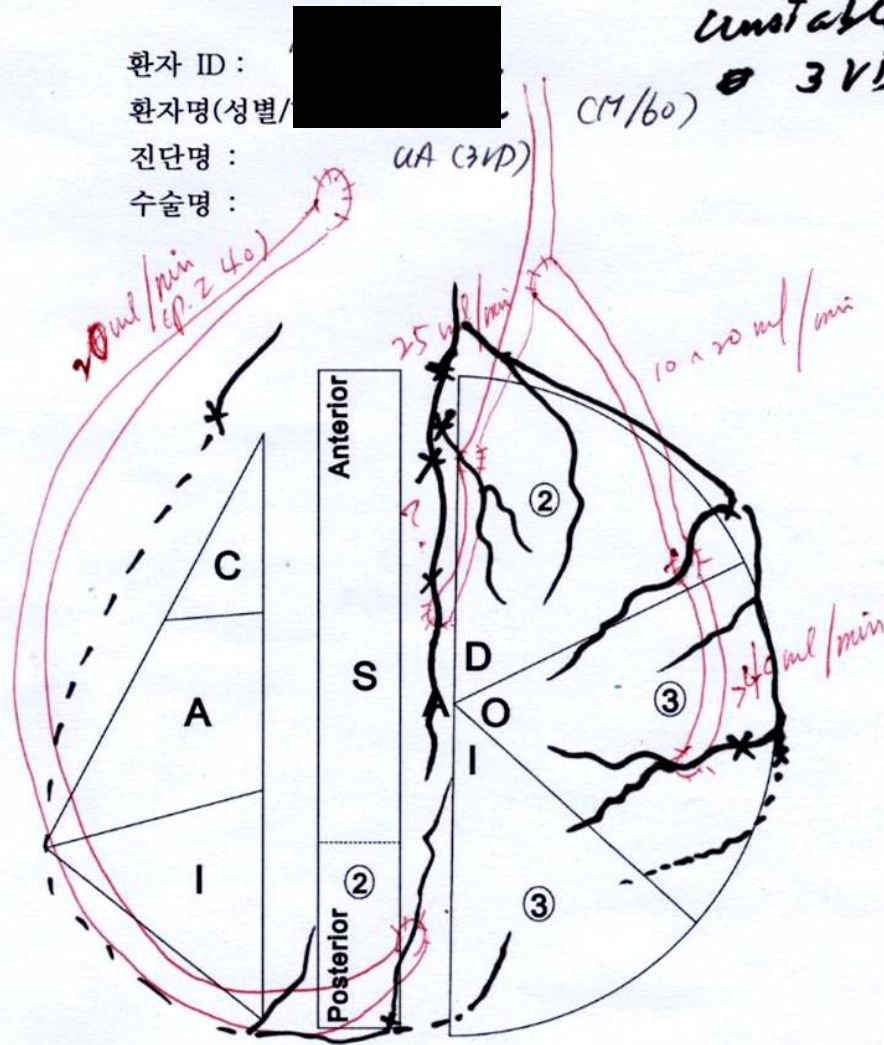
환자명(성별/ [REDACTED])

진단명 :

수술명 :

UA (3VD)

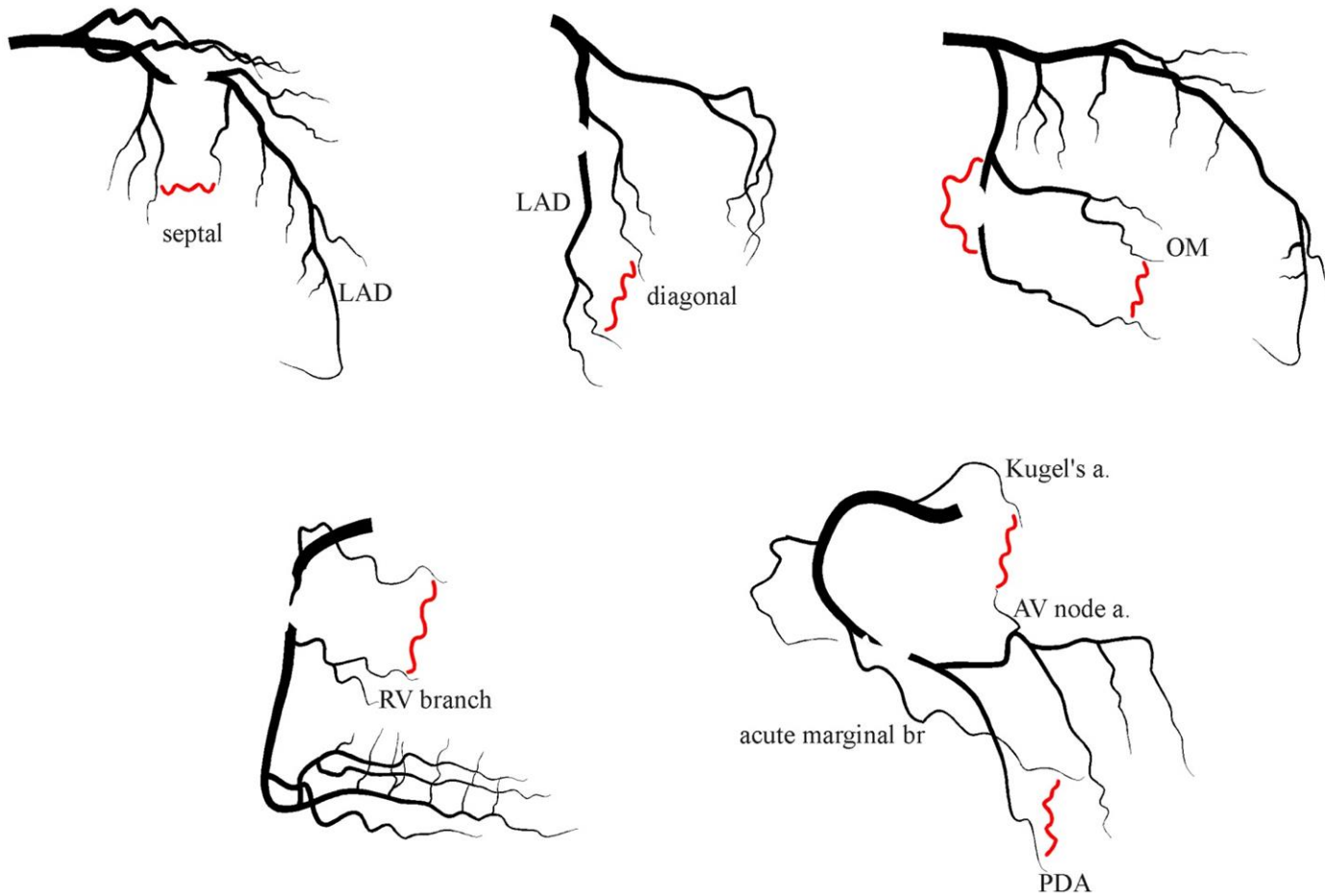
unstable AP
③ 3VD
CM/60



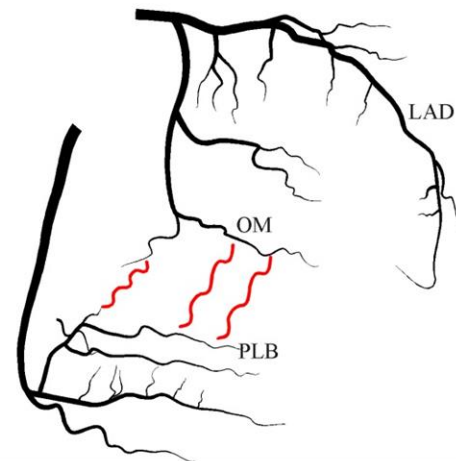
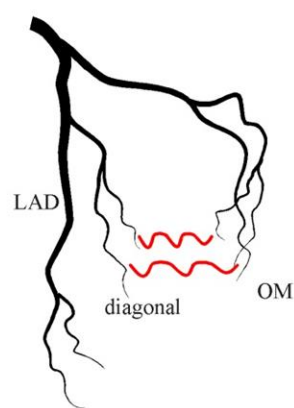
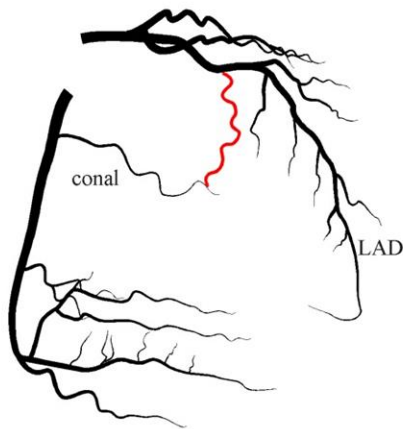
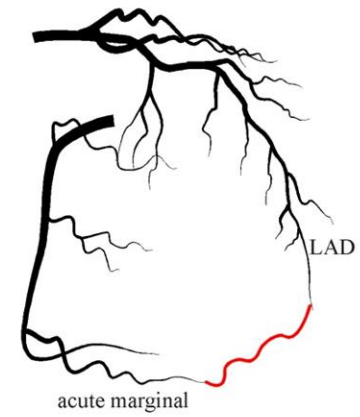
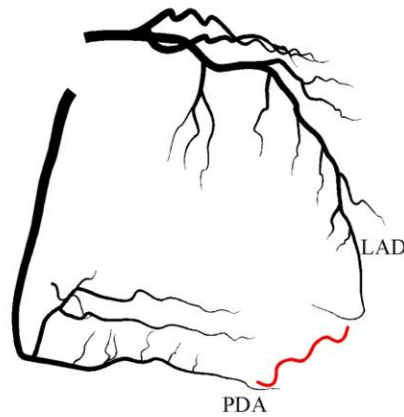
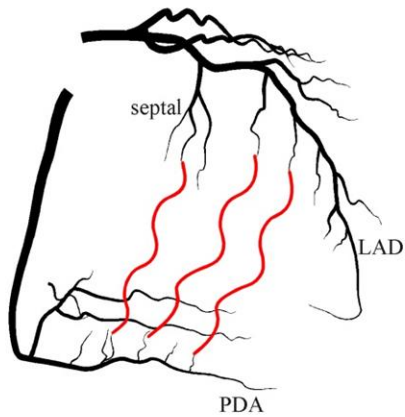
Pitfalls

- Faint or no visualization
 - Truly obliterated lumen vs. patent & graftable lumen
 - RCA : total occlusion vs. left dominance
- Multiple plaques / plaque at branching point
 - Where and how to make anastomosis ?
- Diffuse disease
 - Where and how to make anastomosis ?
- Calcified vessel
 - Calcification vs. contrast enhancement
- Deep-seated or intramyocardial vessel

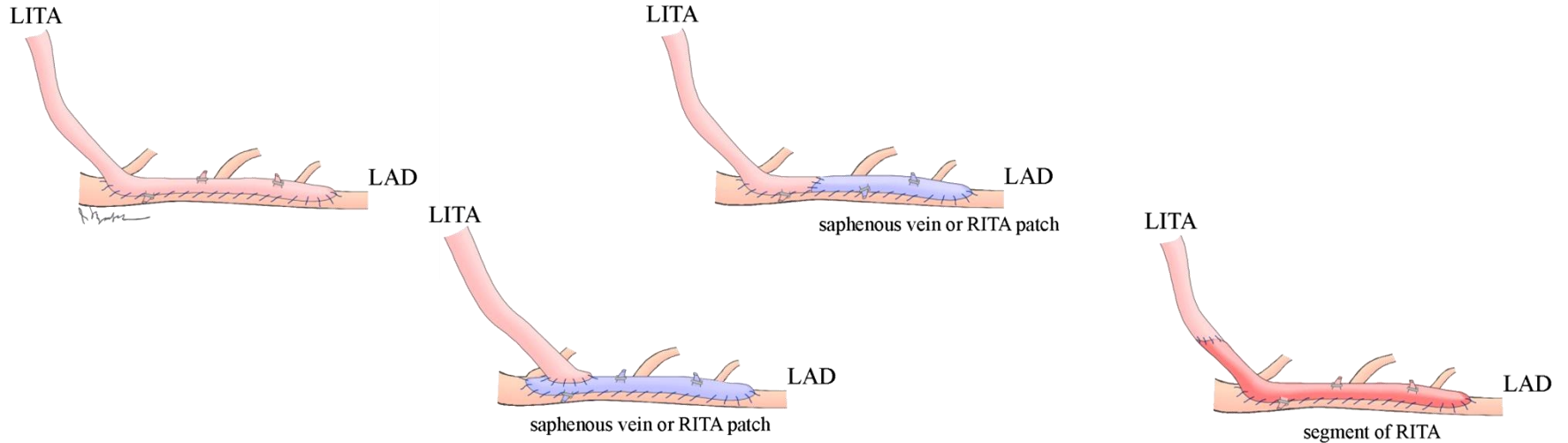
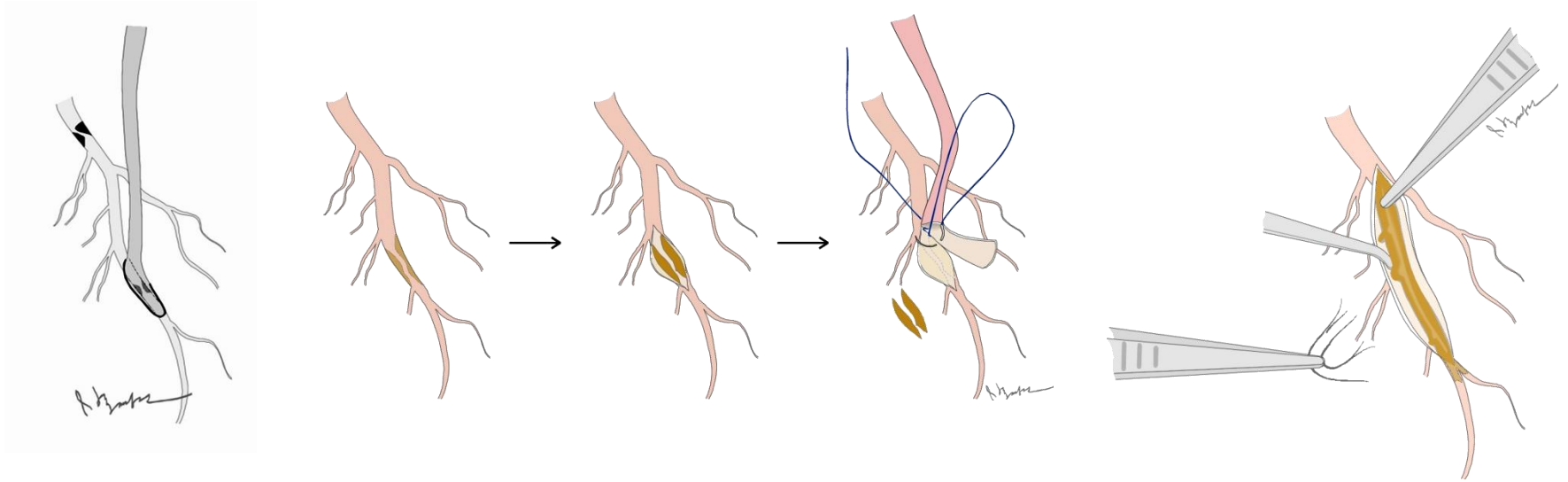
Intracoronary collaterals



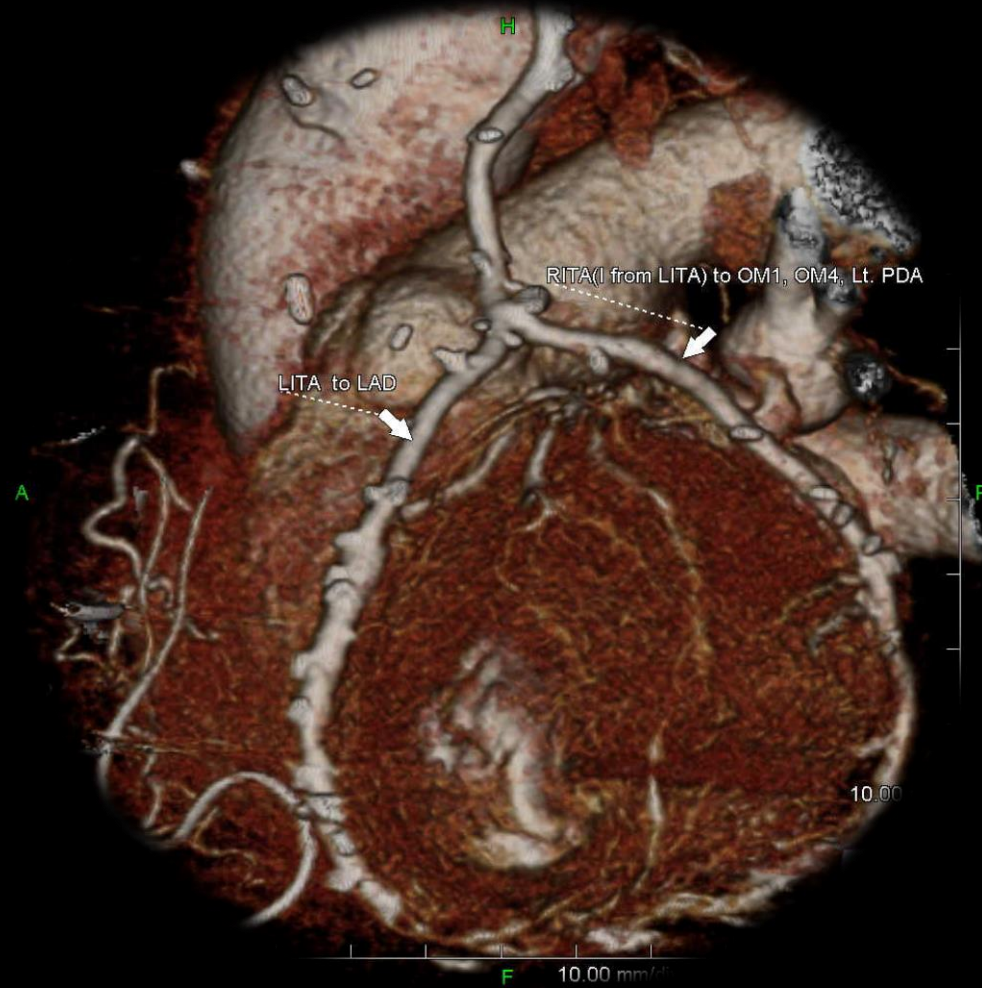
Intercoronary collaterals



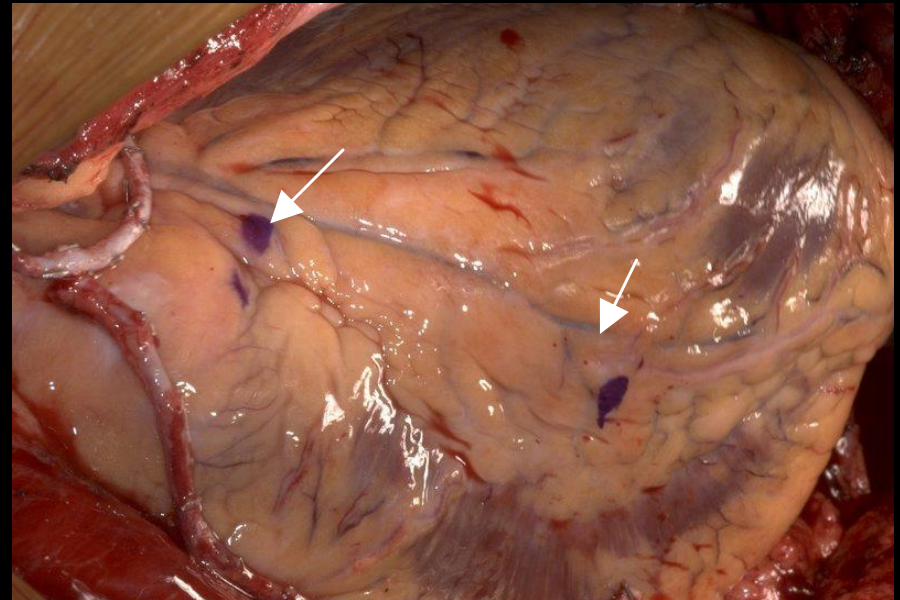
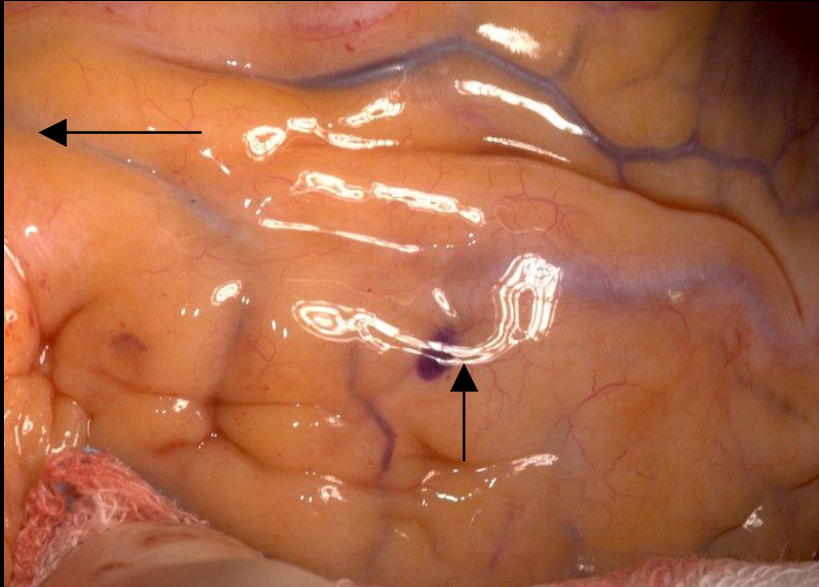
Long angioplastic anastomosis +/- endarterectomy



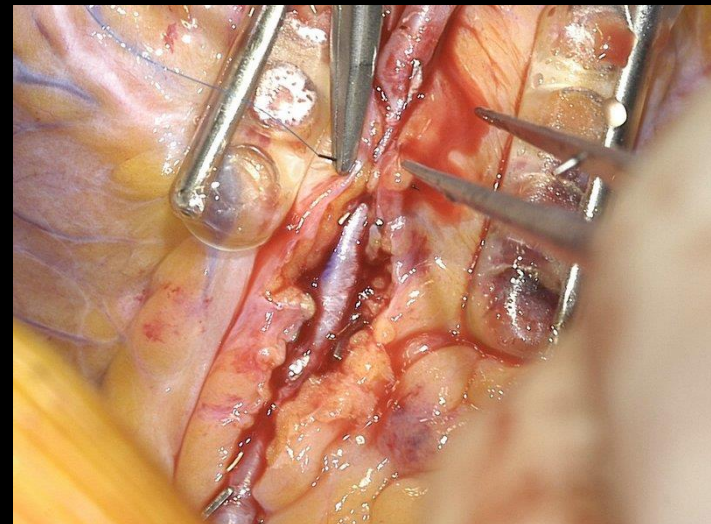
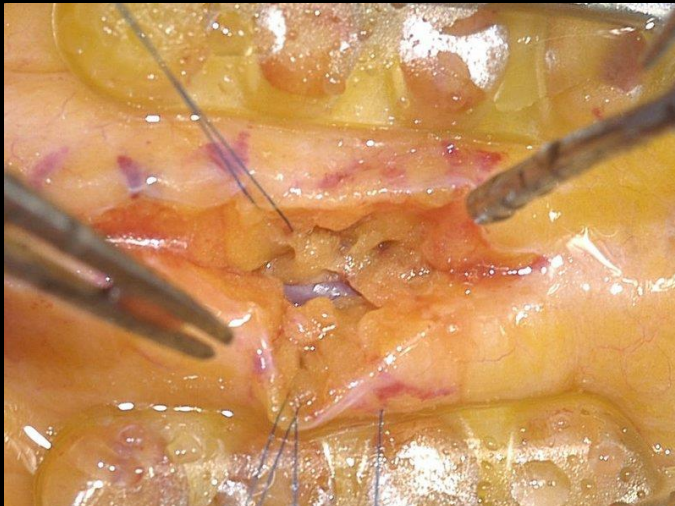
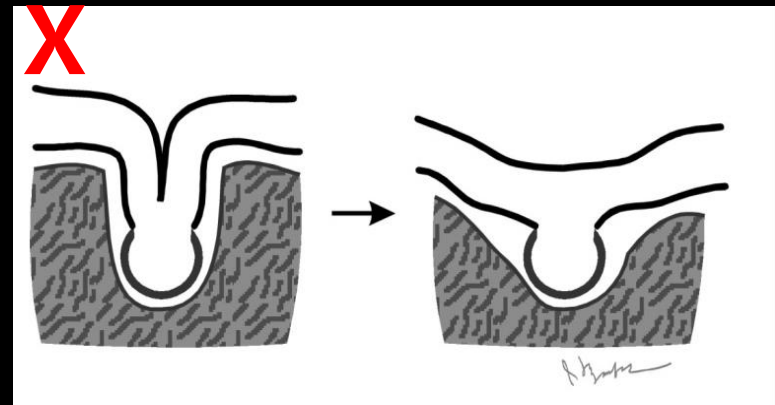
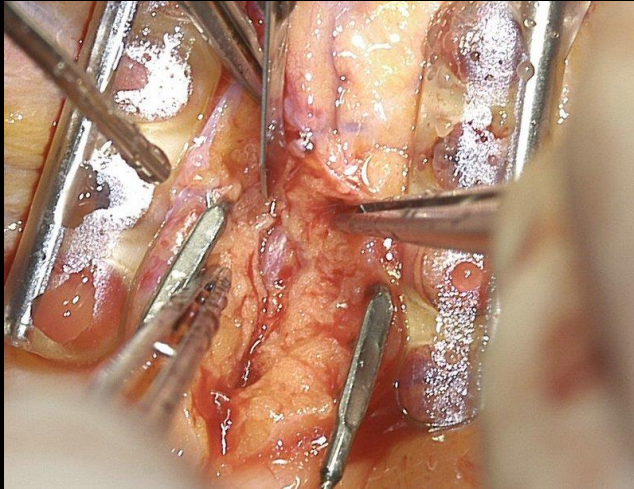
CT angiography after long angioplasty



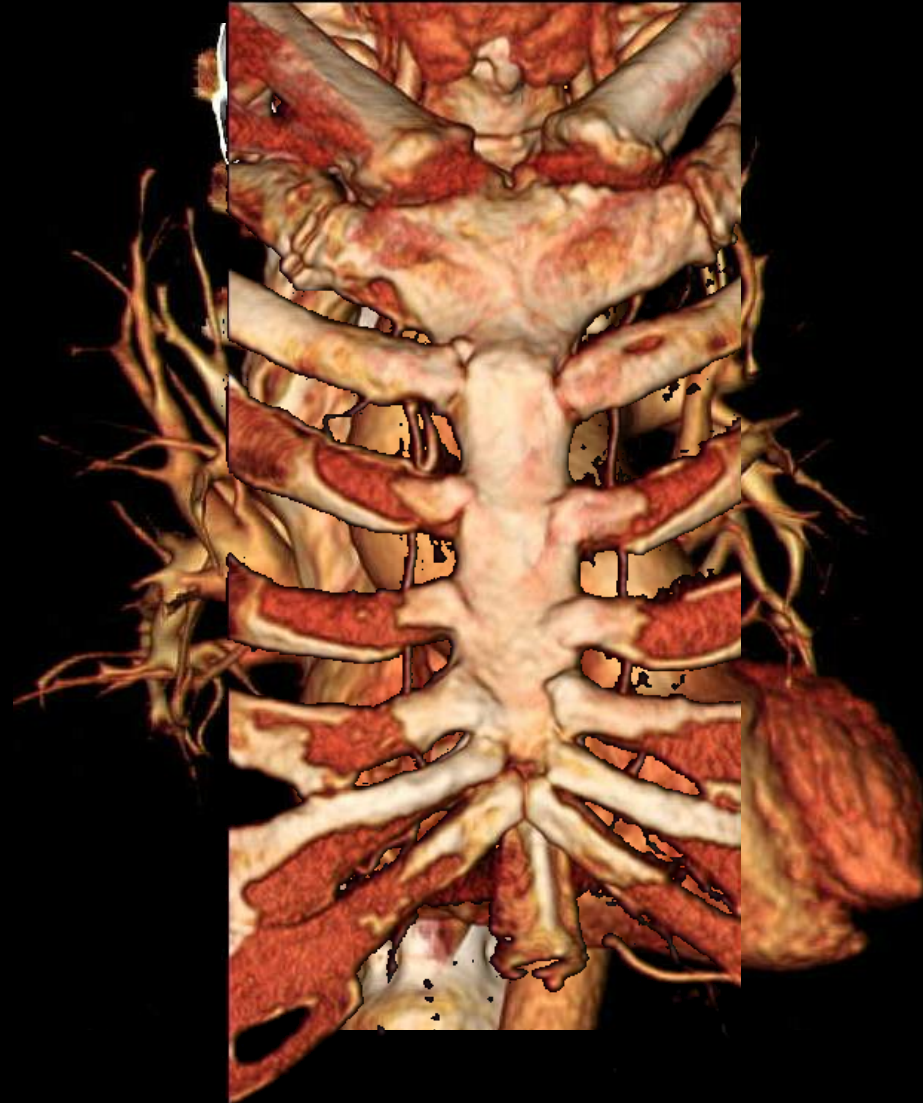
Deep-seated or intramyocardial vessel



Deep-seated or intramyocardial vessel



LITA should be harvested longer than you think enough.

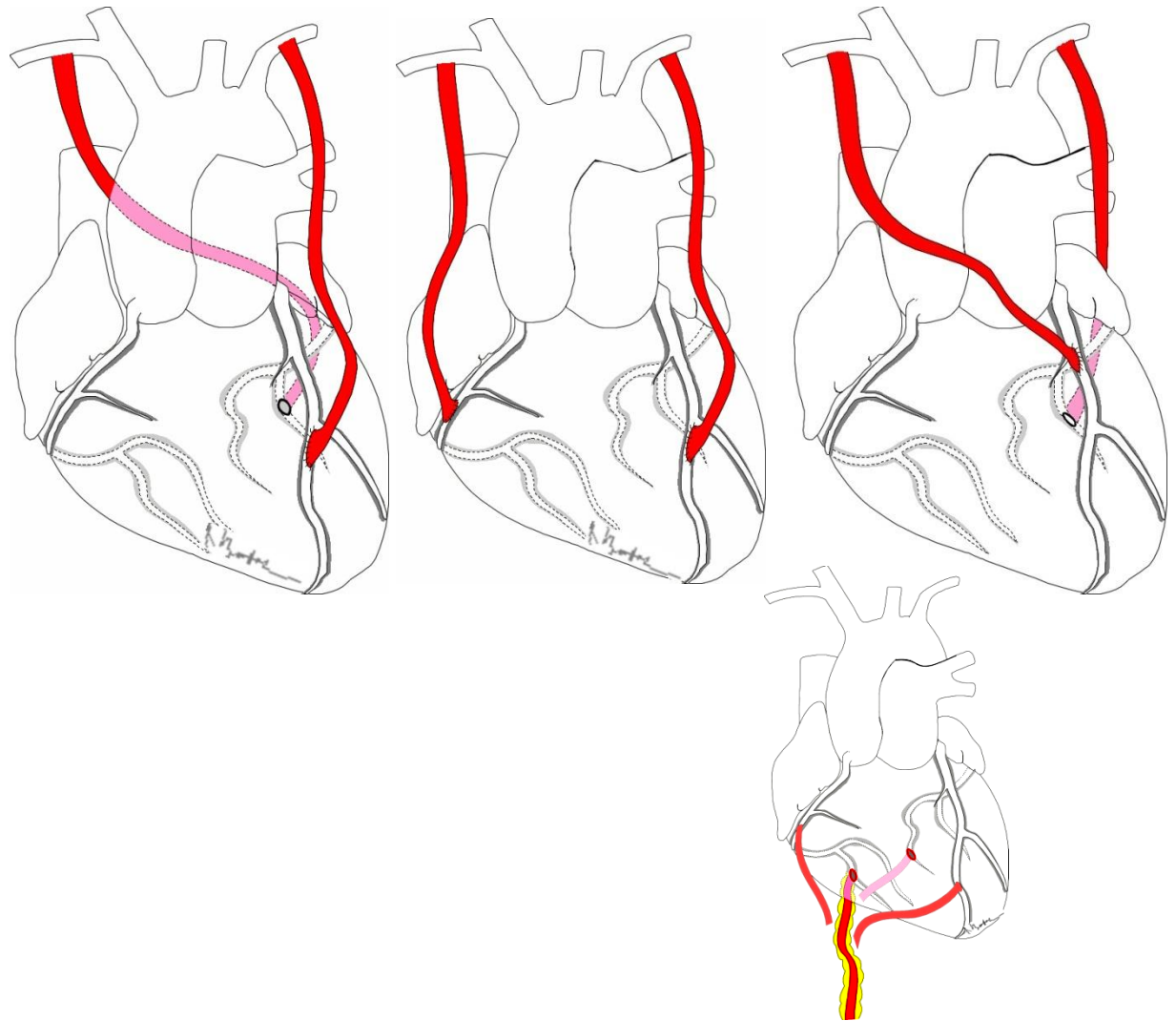


Other things to see in preop. imaging

- Internal thoracic arteries (& subclavian arteries)
- Ascending aorta and arch
- Valve calcifications & insufficiency
- Cardiac size

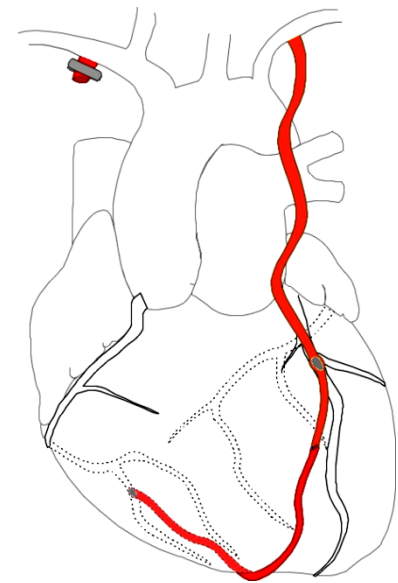
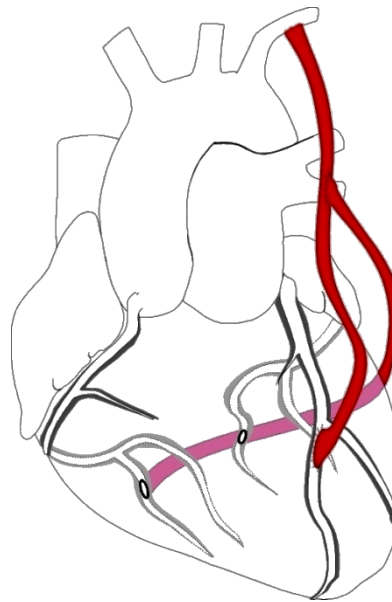
No-Aorta-Touch Technique

- OPCAB with pedicled arterial graft only -

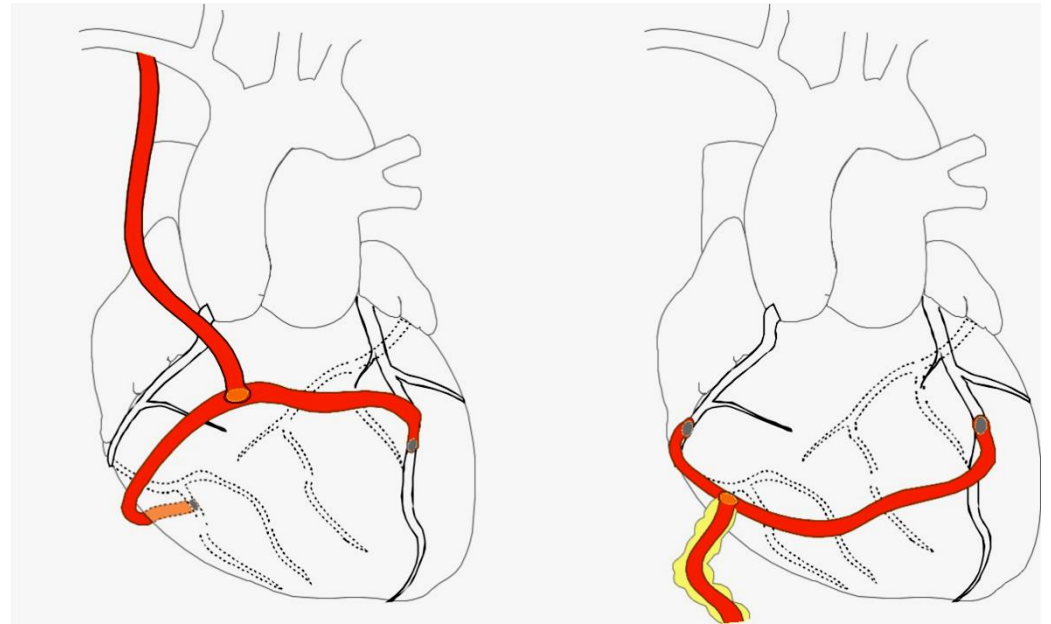


No-Aorta-Touch Technique

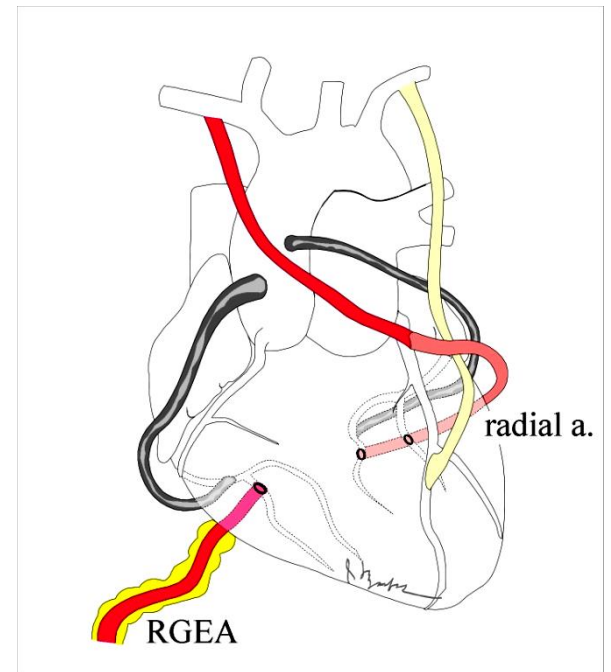
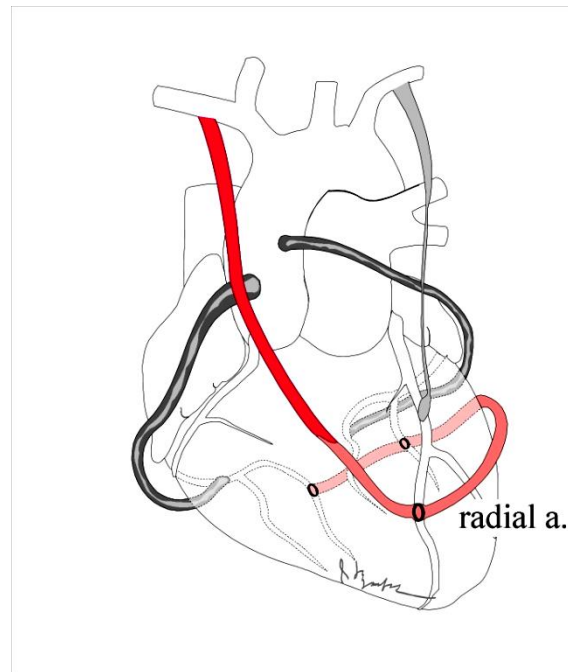
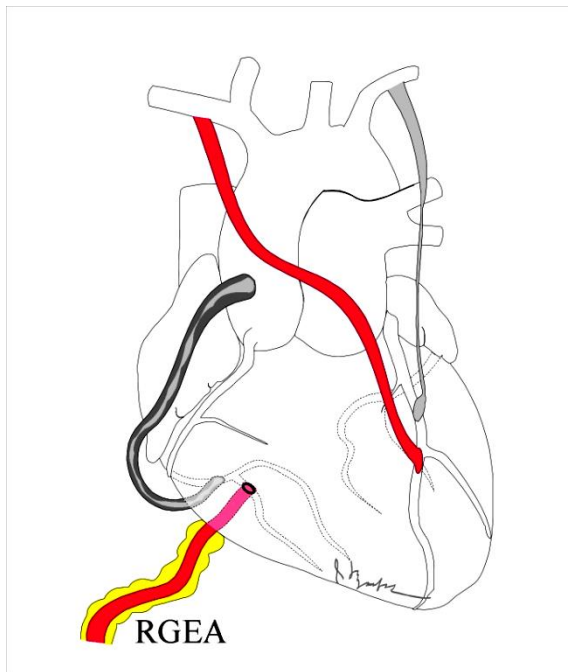
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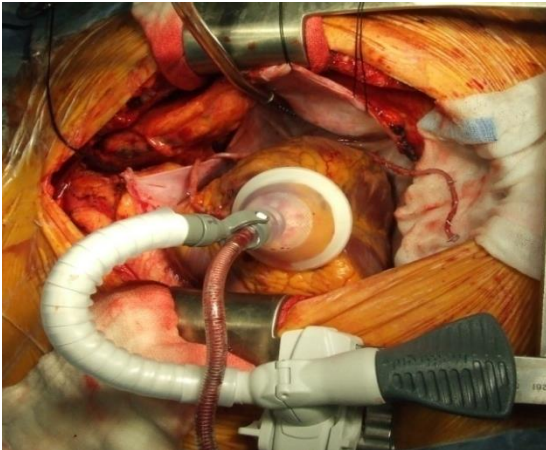
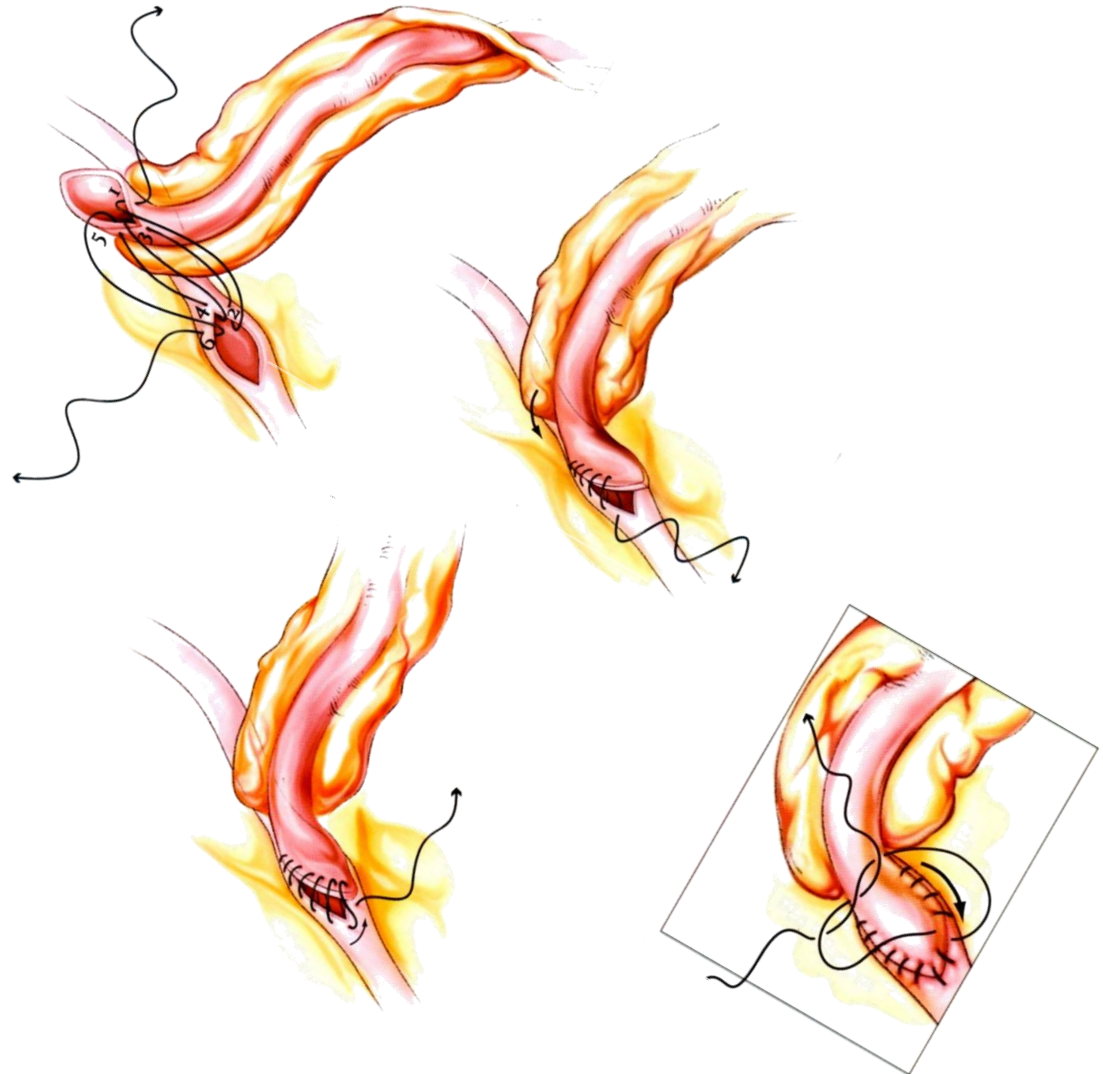
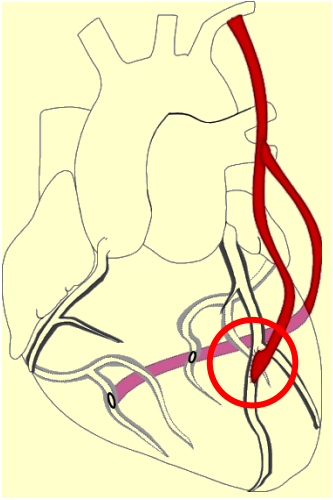
No-Aorta-Touch Technique when left IMA is unavailable



No-Aorta-Touch Technique when left IMA is unavailable

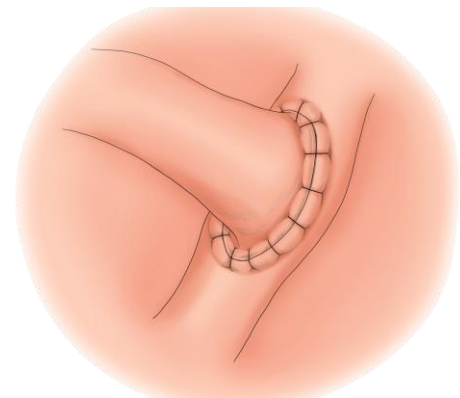
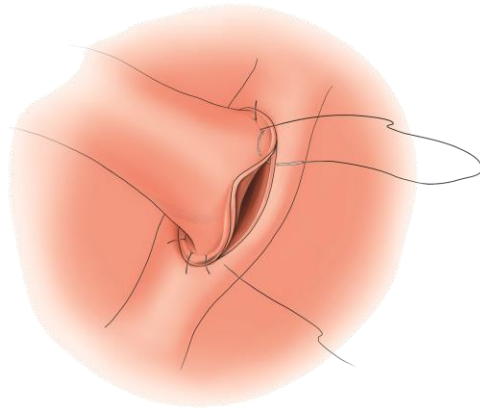
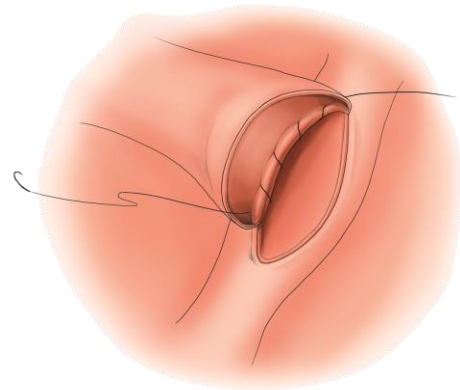
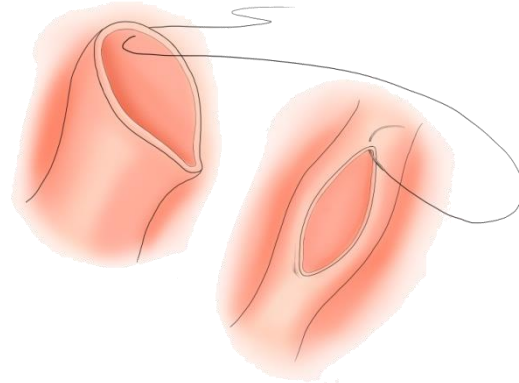
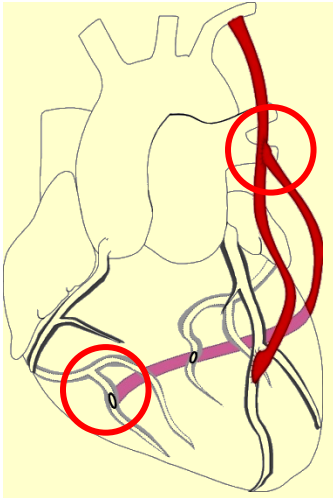


End-to-side anastomosis

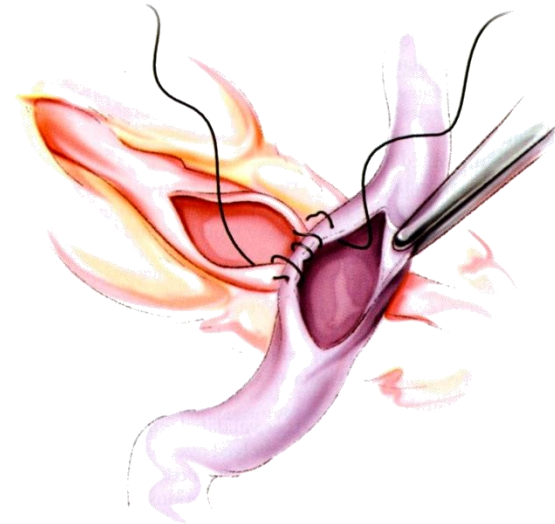
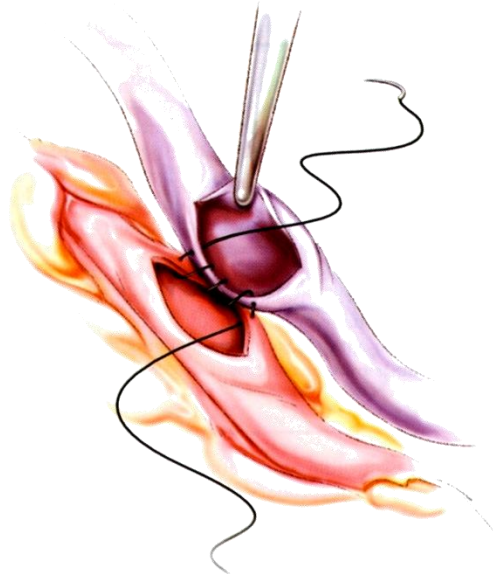
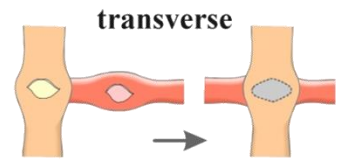
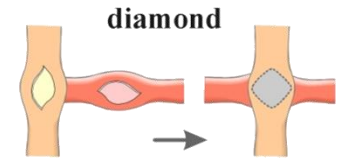
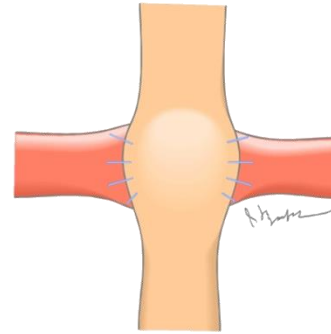
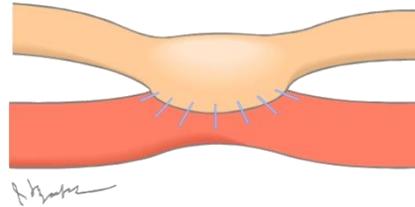
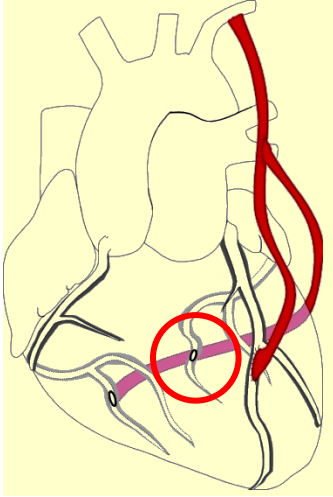


End-to-side anastomosis

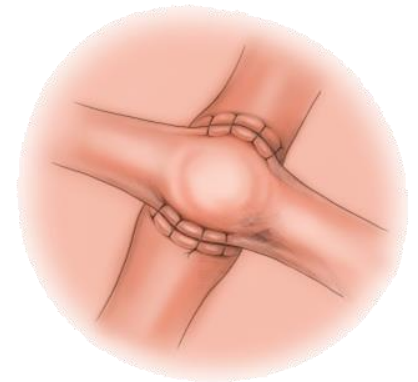
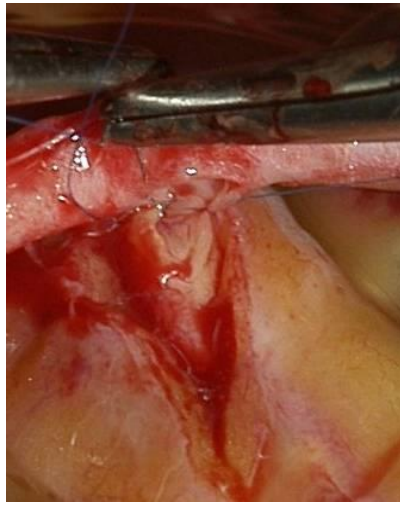
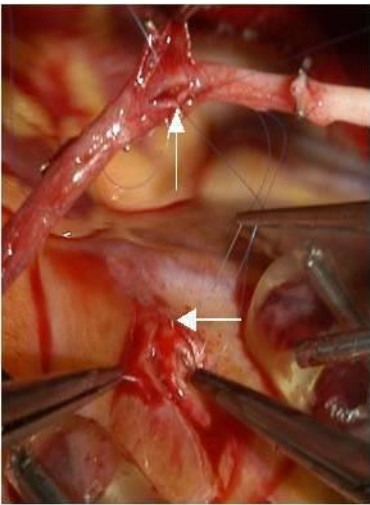
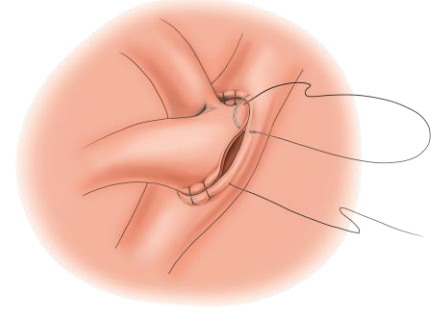
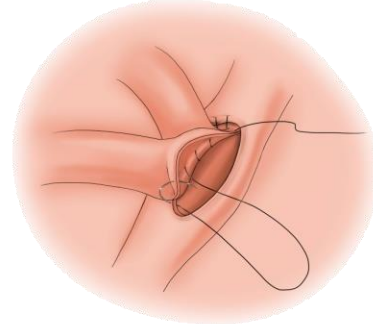
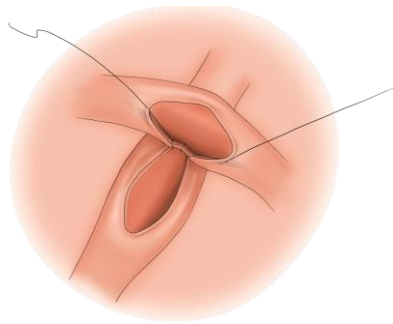
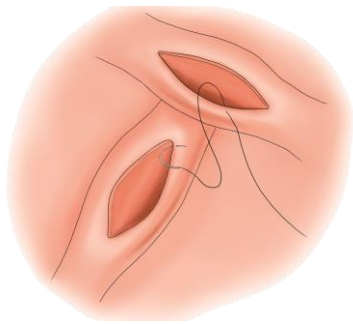
- *perpendicular* -



Side-to-side anastomosis

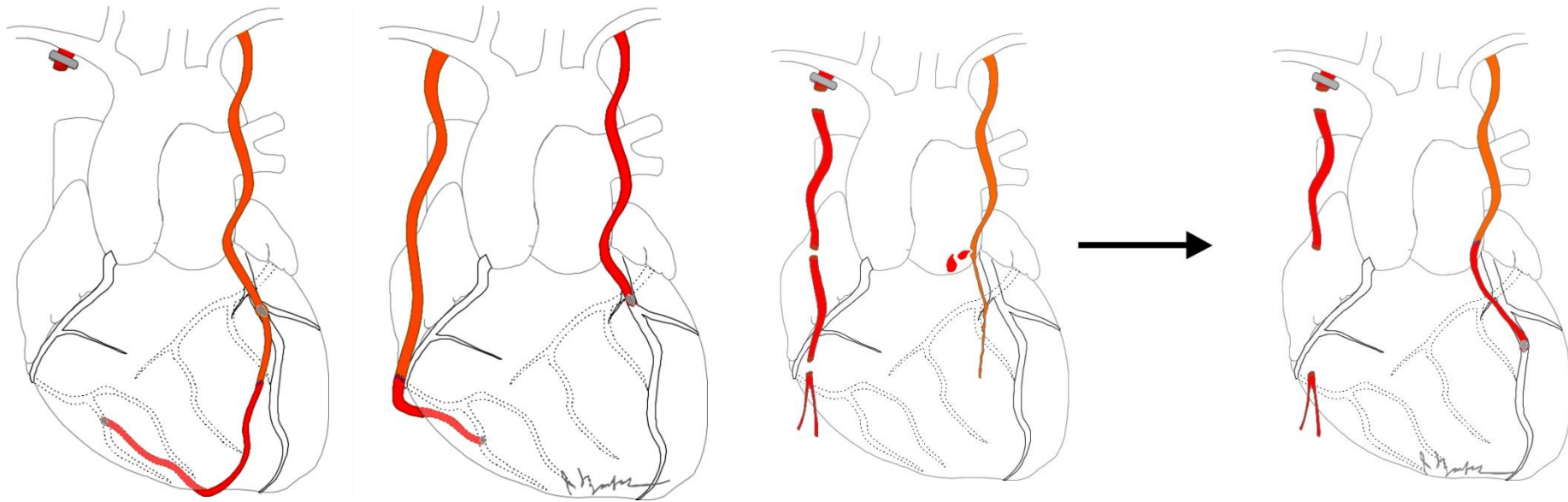


Side-to-side anastomosis

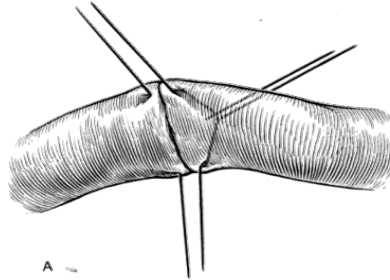
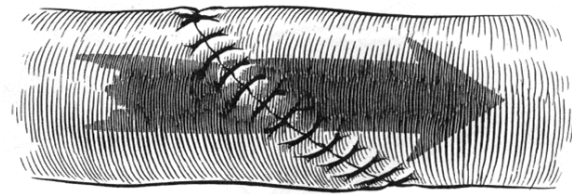
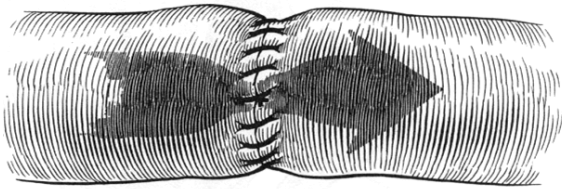


End-to-end anastomosis

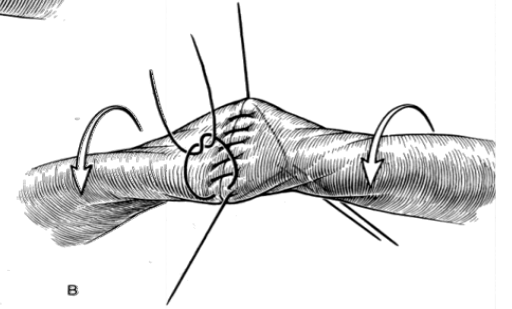
- Revision for graft kinking / torsion / redundancy
- Graft extension (I-graft)
- Use of arterial graft injured during harvesting



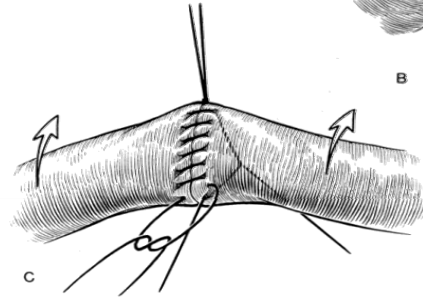
End-to-end anastomosis



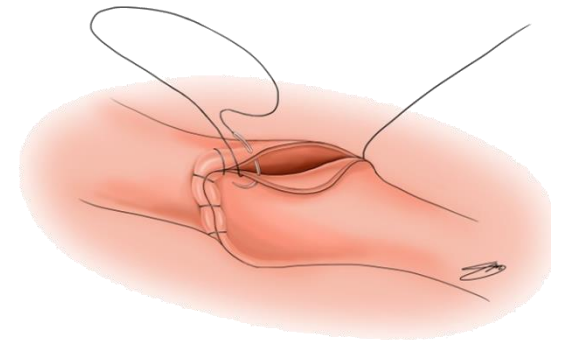
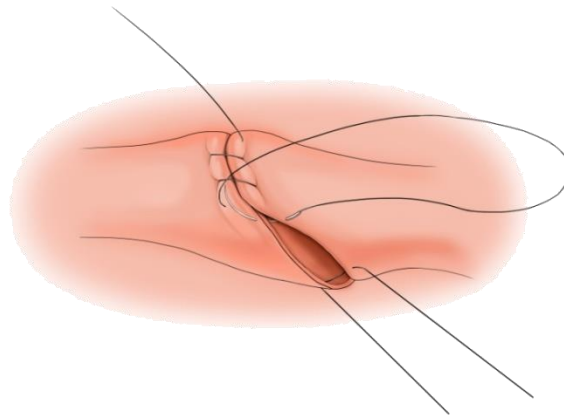
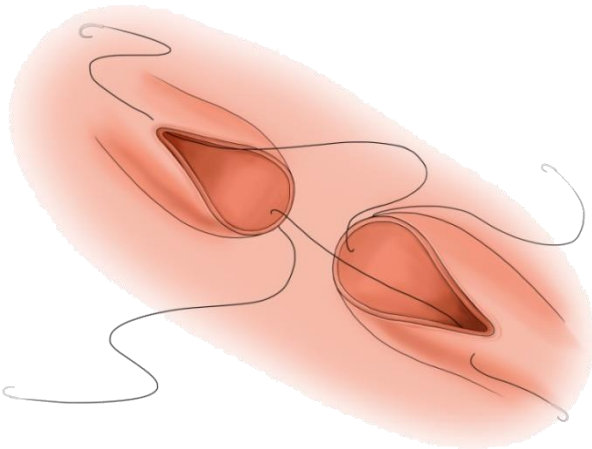
A



B



C



Take-home messages

- Tragedies occur more from wrong planning than from poor execution.
- Seeing angiogram is not just about ‘where’, it should be also about ‘how’.
- There is no royal road to mastering coronary angiogram but practice.
- Drawing by yourself may be the best start.