Conus Branch

An Often Forgotten Friend

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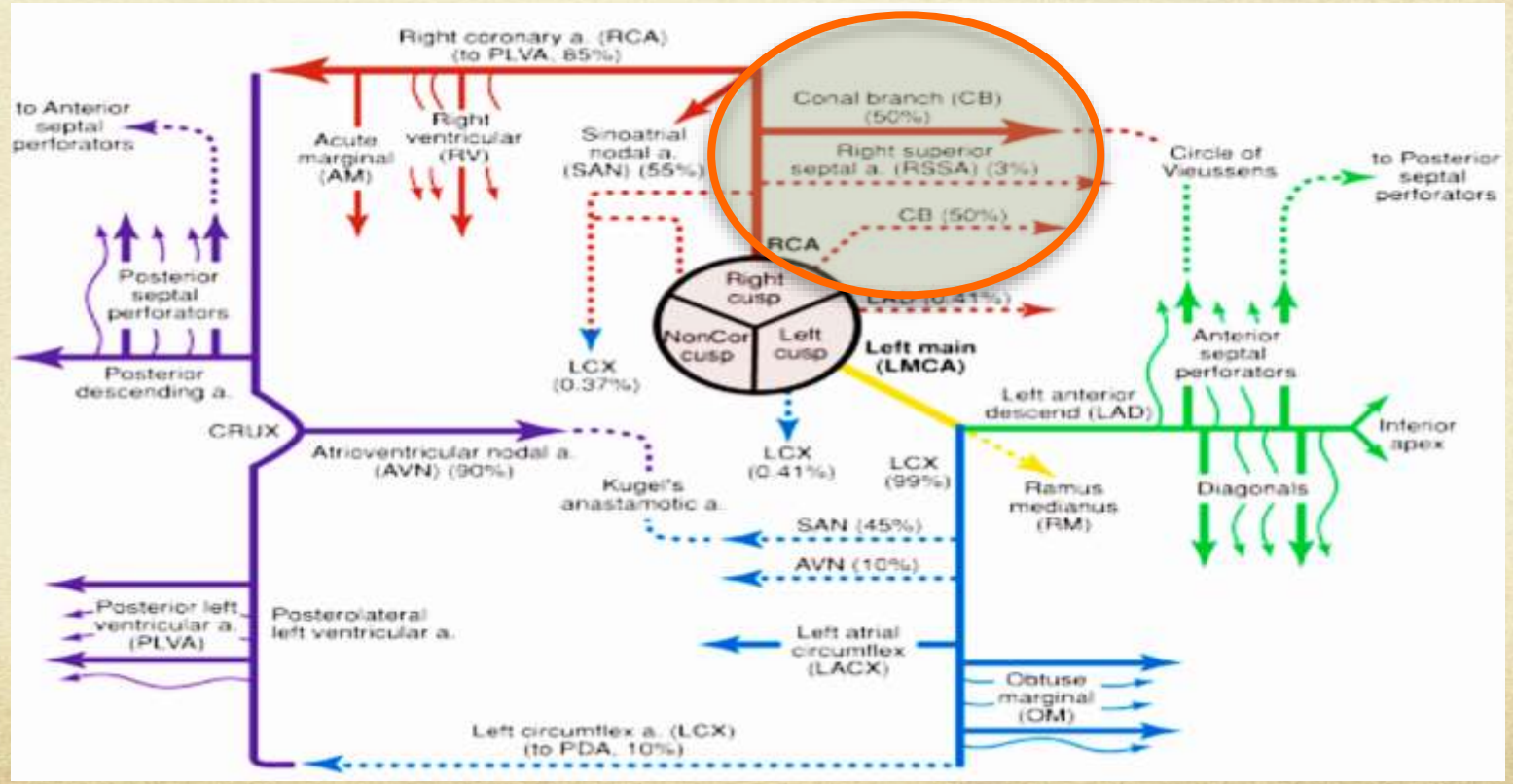
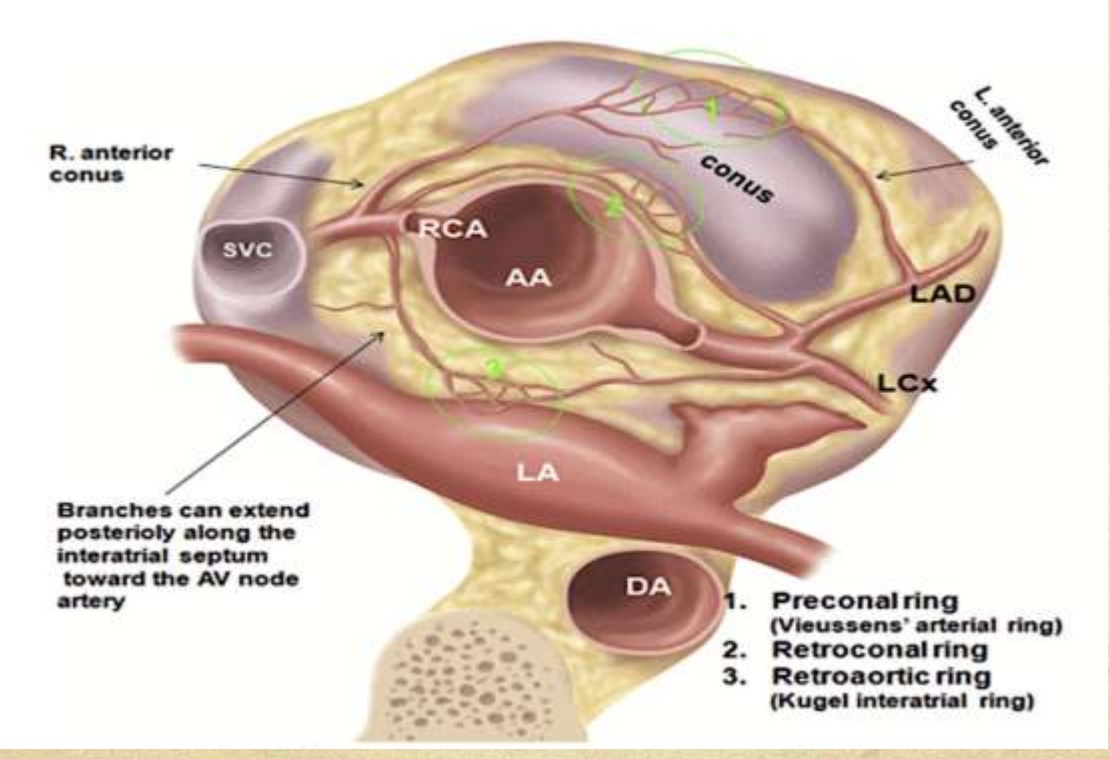
Anatomy of conus branch (CB)

- Supplies perfusion to the outflow tract (infundibulum and supraventricular crest) muscle, or the “conus”, of right ventricle
- Usually considered as the first branch of RCA in the majority
  - 1/3 from ostial RCA, 2/3 from proximal RCA
- But independent orifice from RCC sinus in up to 50% population
- Unique angiogenesis ability

Coronary arterial circulation

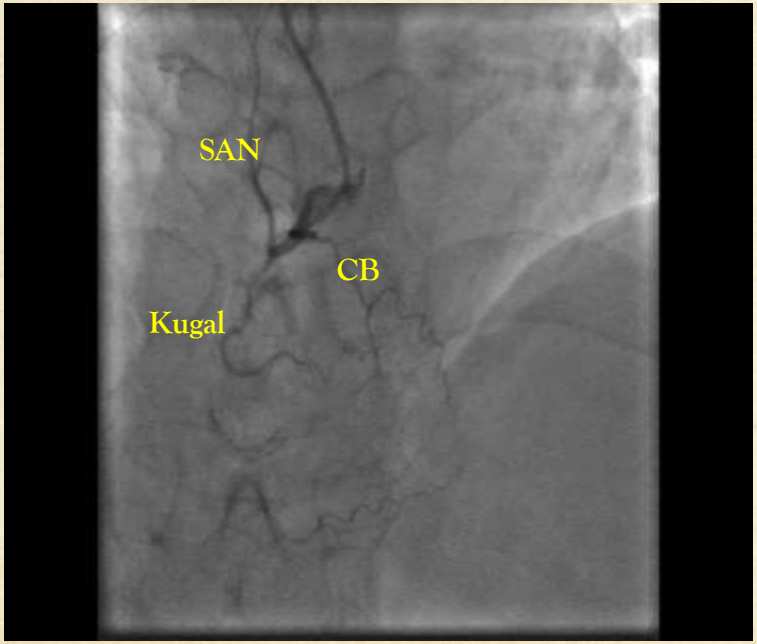


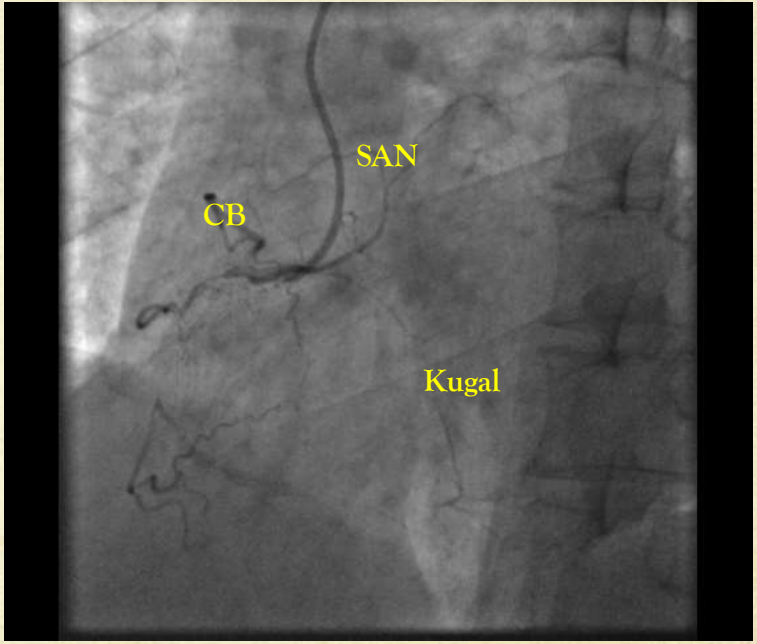
Potential connections



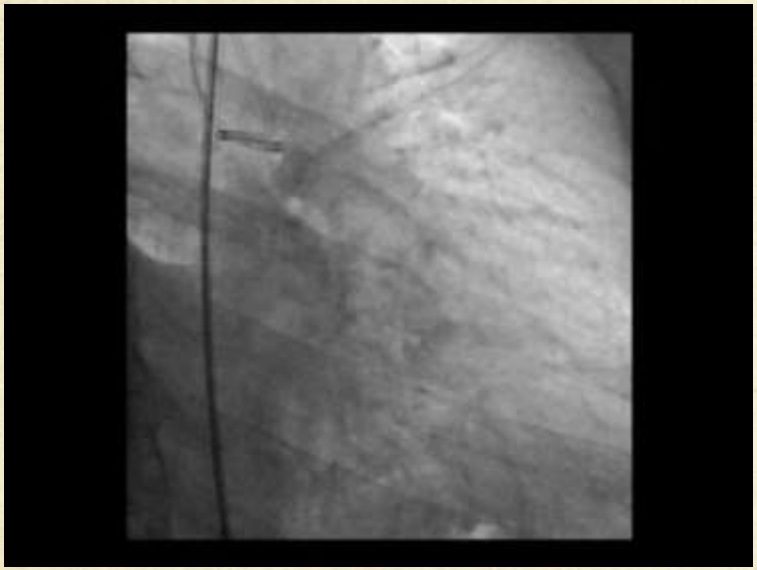
JACC Cardiovasc Imaging 2011;12(4)

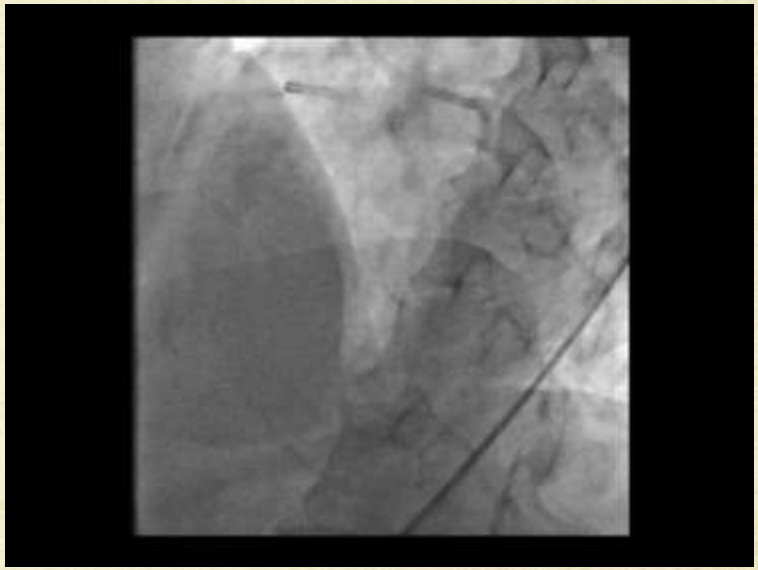
CB, SAN, Kugal



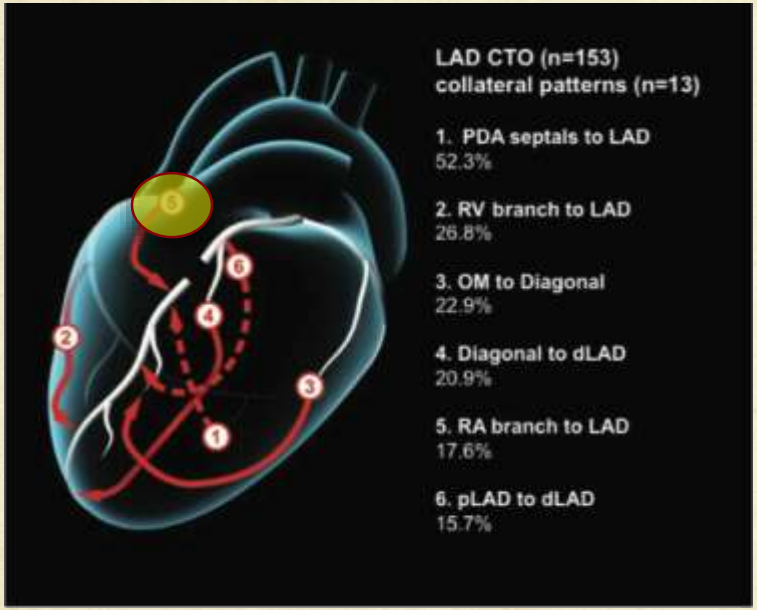


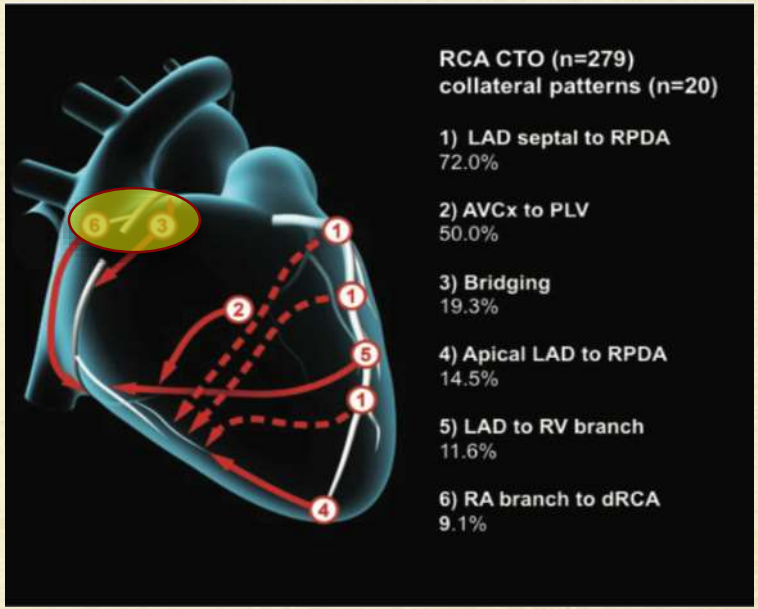
Vieussens ring





CB as collaterals in CTO





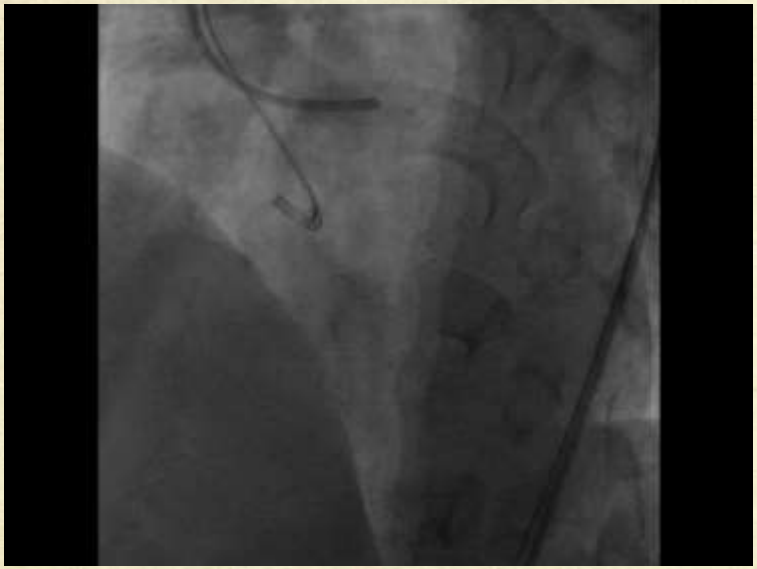
EuroIntervention 2016;11

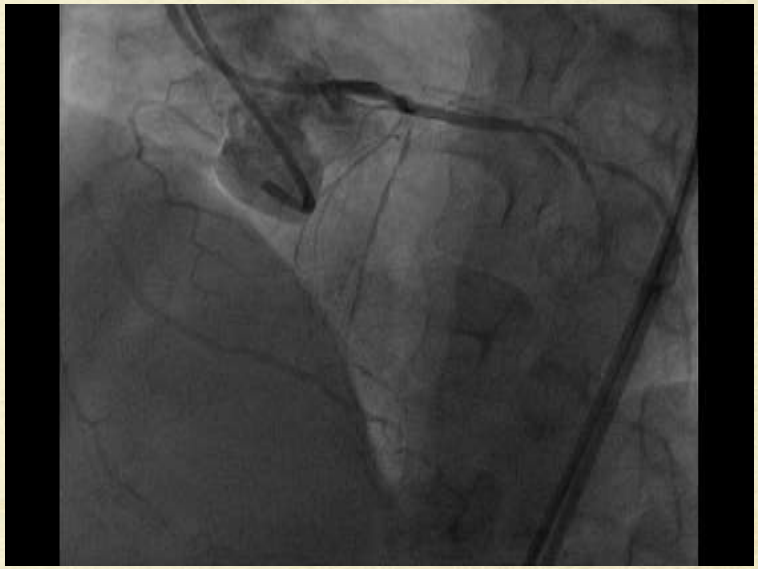
As a savvy CTO interventionist

- Do not forget CB!
- Avoid deep RCA cannulation
- Non-selective angiography
- Be creative and ingenious

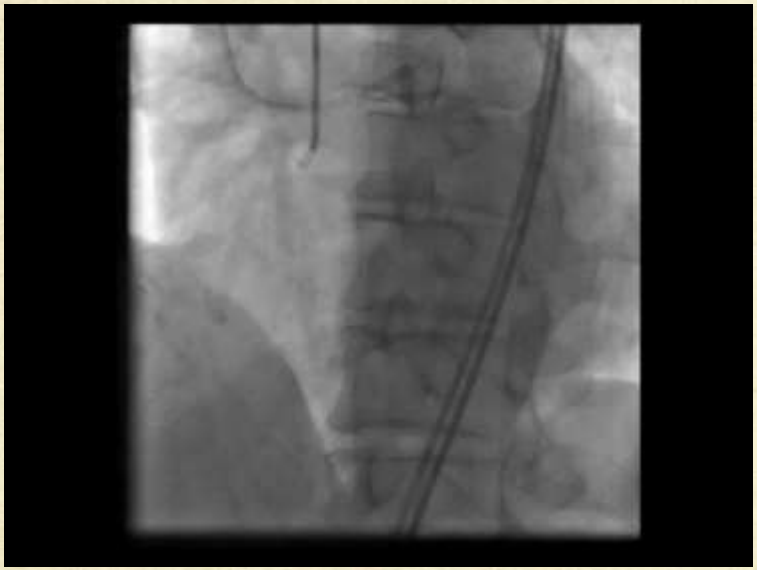
- **If you are not looking for something, you can't find it!**

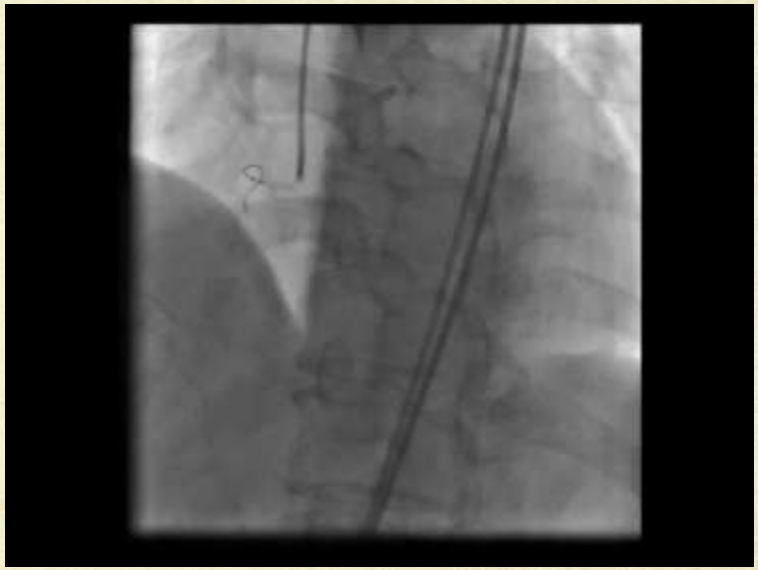
Completely separate CB ostium



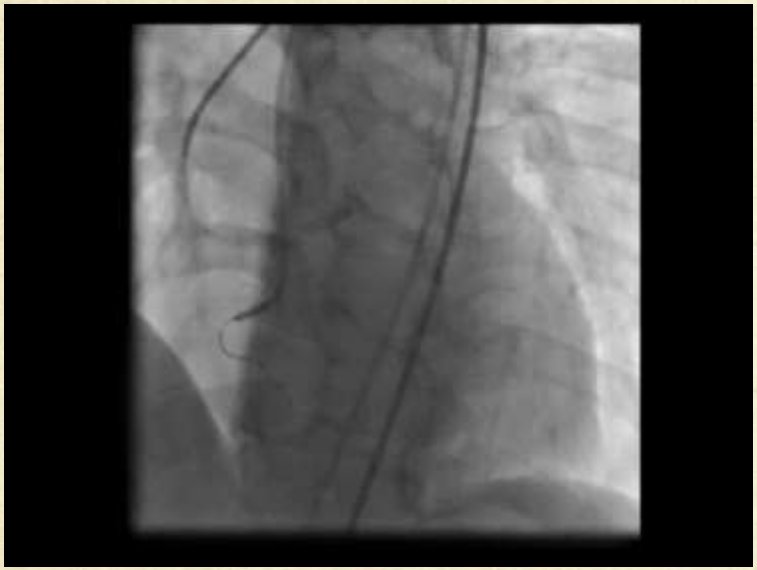


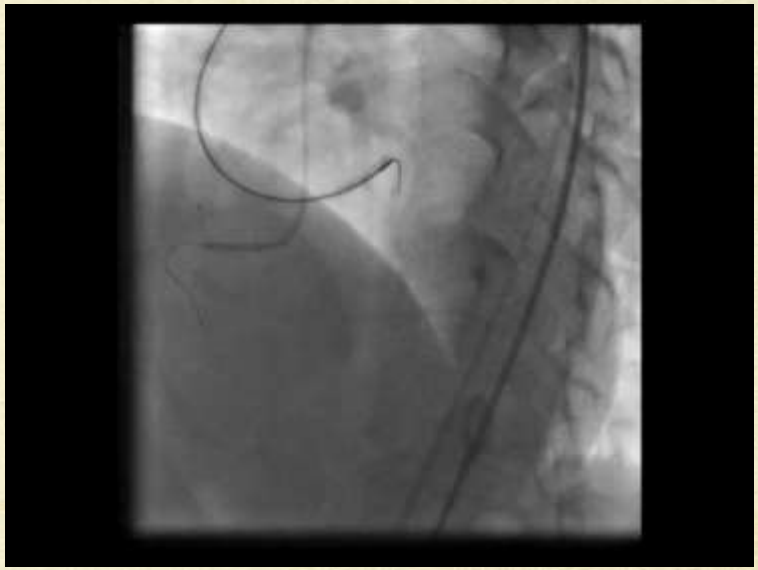
Easily missed CB for LAD CTO





MC trapped in CB for ante wiring





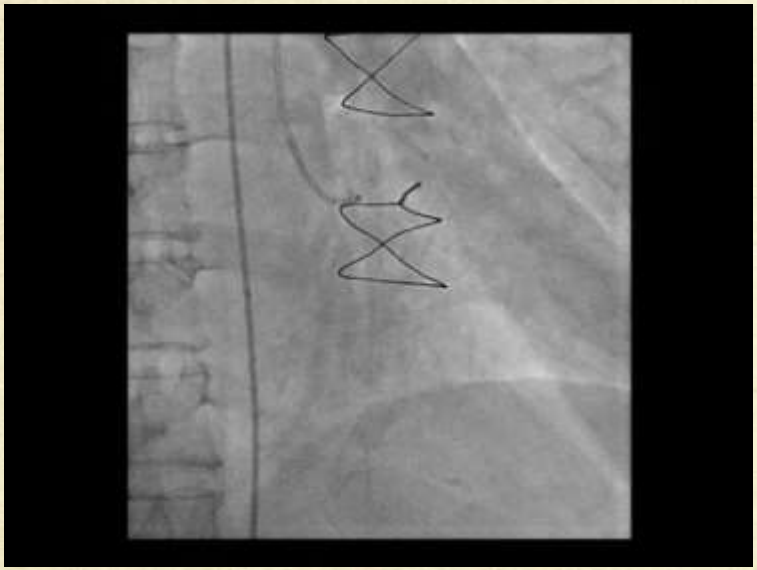
CB usage in CTO PCI

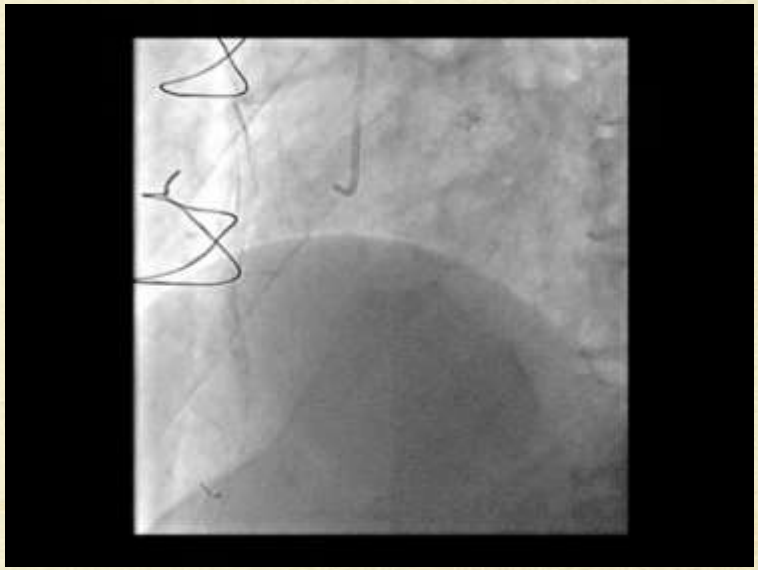
- As collateral for p- or m- LAD CTO, from RCA
  - to left anterior septal branch
  - to epicardial Vieussens ring
- As collateral for m- or m- RCA CTO, ipsilateral from p- RCA
  - to RV branches or PDA
- As collateral for p- RCA CTO, from LAD
  - Very rarely seen
- Serves as anchor for RCA guide system

Advantages of CB as collateral

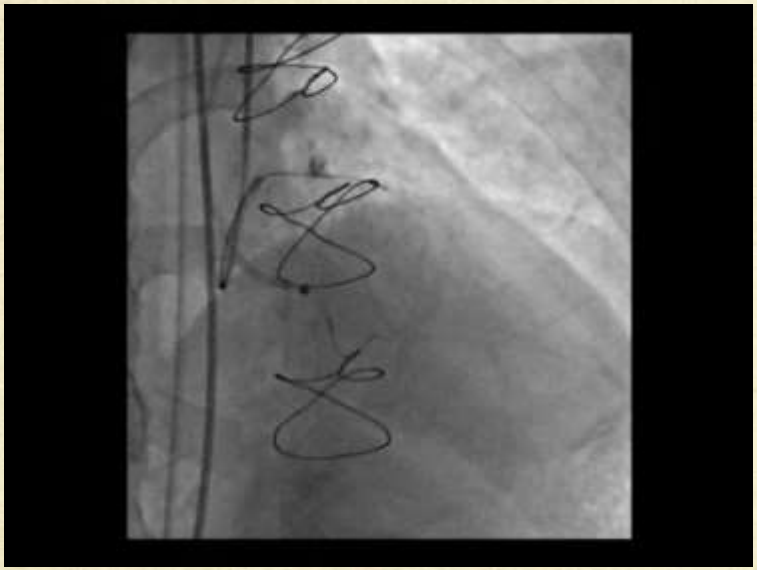
- MC super-selective injection through CB
  - Saves contrast
  - Defines CTO segment clearly
  - Medication administer into distal distal vascular beds
  - Avoid hematoma progression
- Actual tracking CB for retrograde approach
  - May shorten total loop length
  - Less risk of donor vessel territory ischemia
  - Less cardiac cycle interference

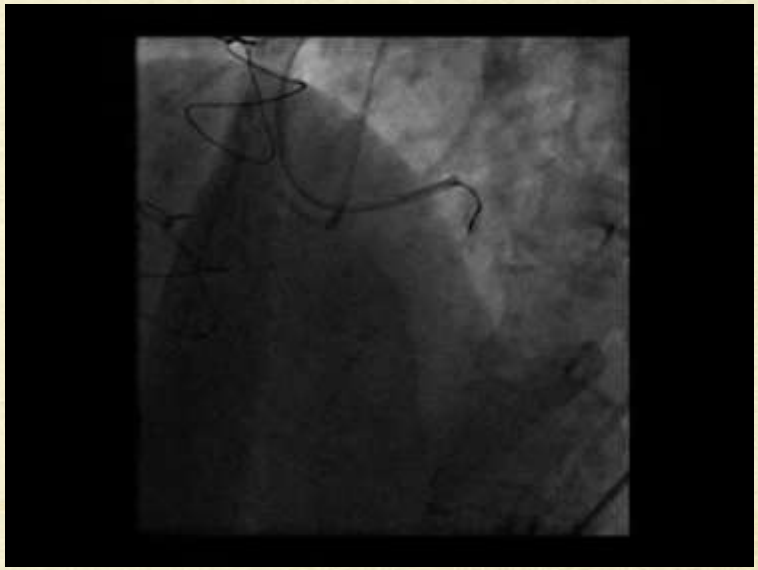
LAD CTO



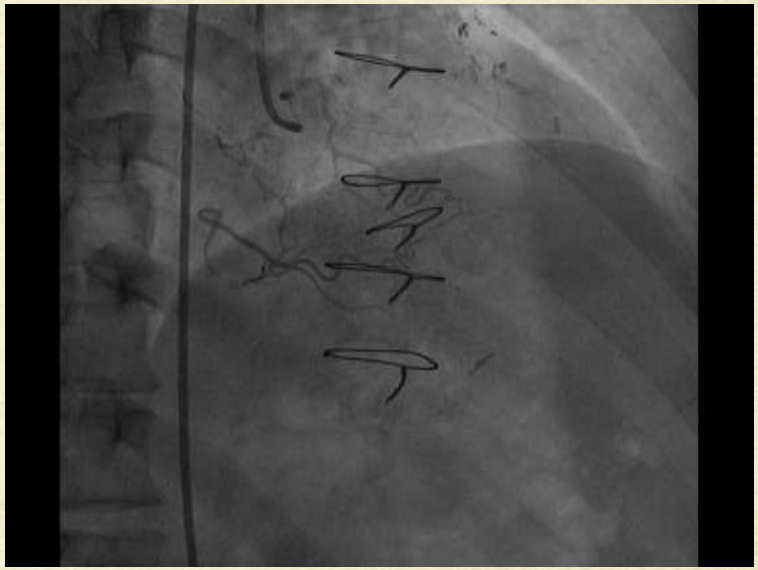


MC injection defines CTO clearly

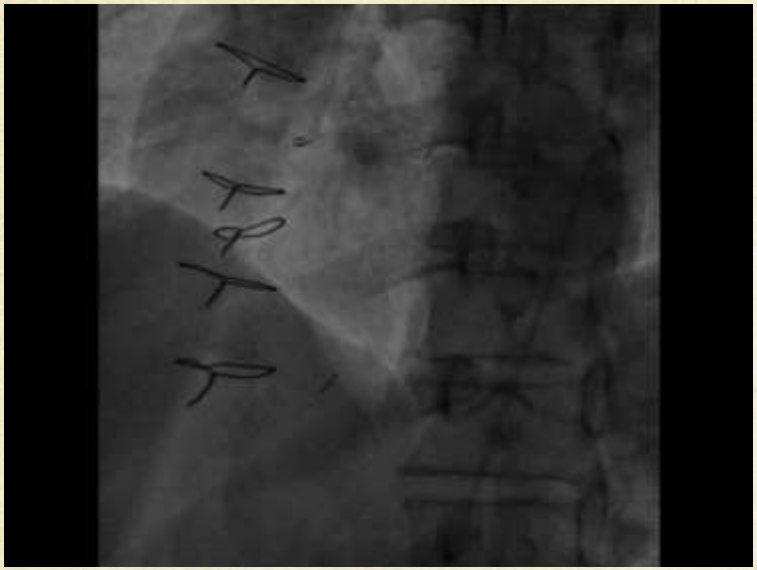


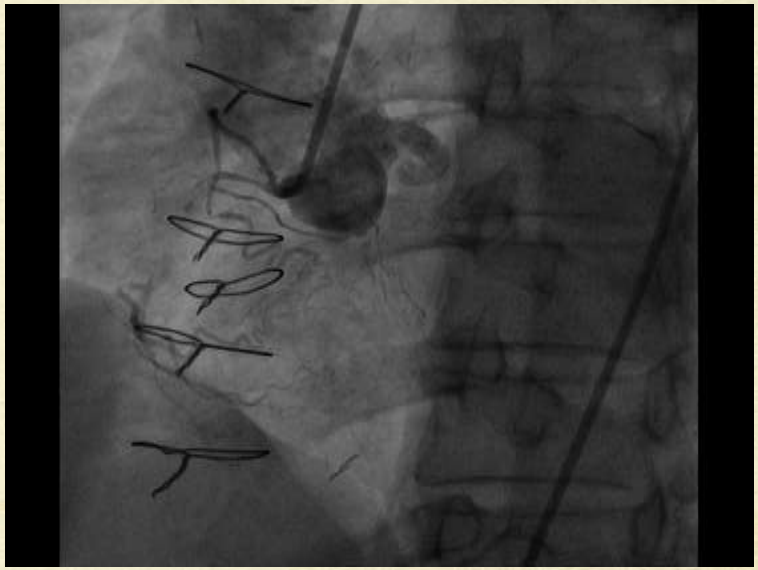


CB for RCA CTO



Separate CB take-off





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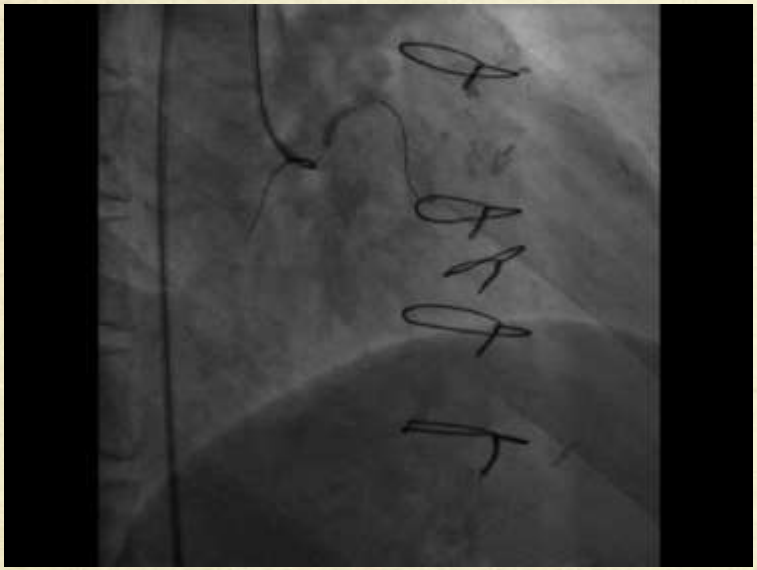
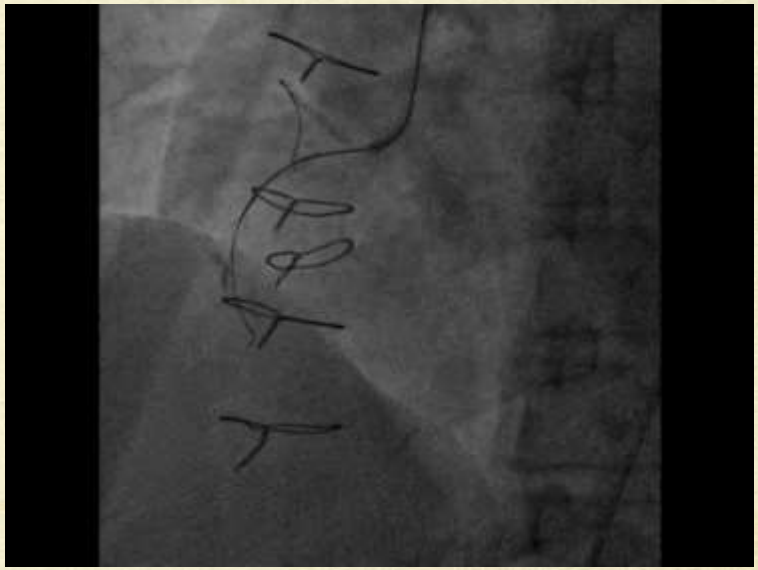
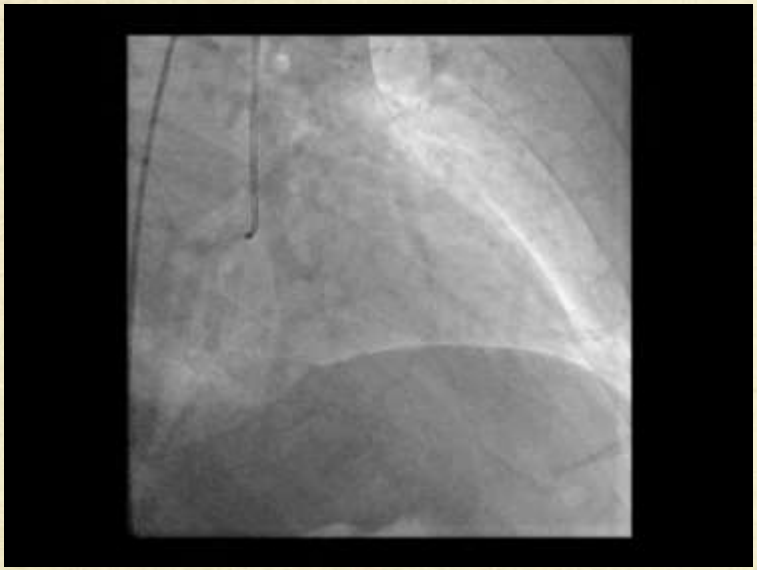
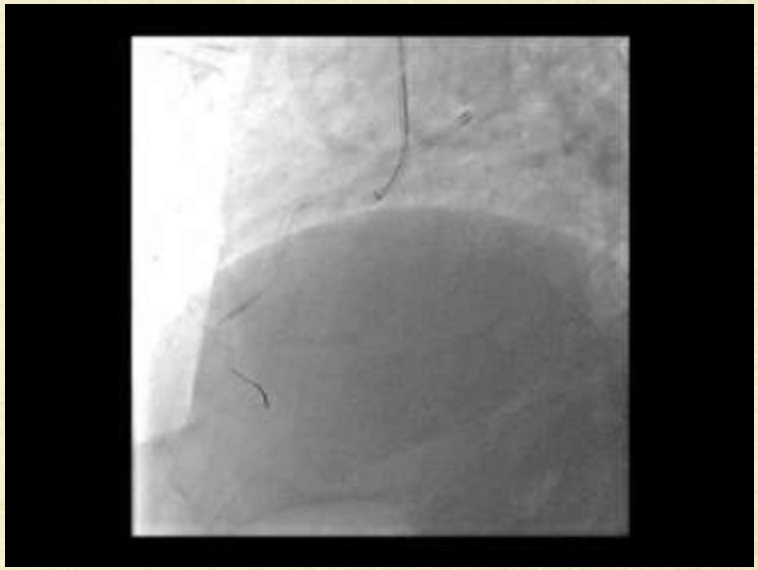


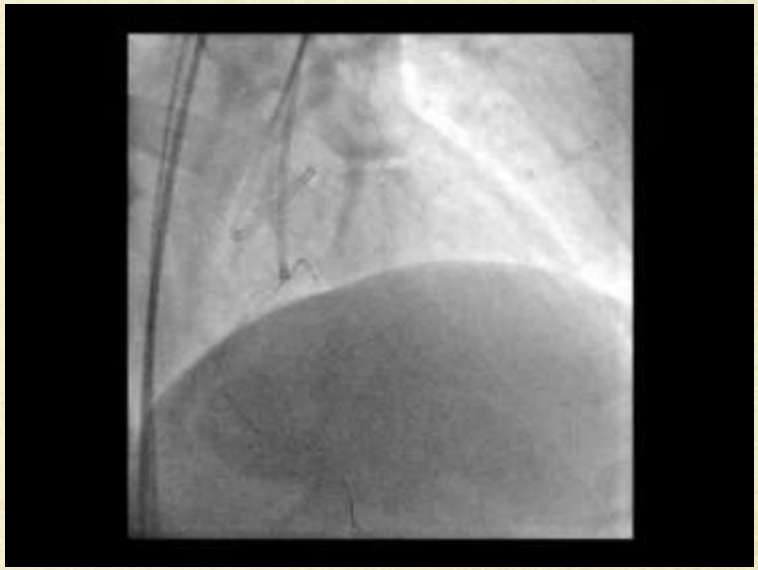


CB for LAD CTO

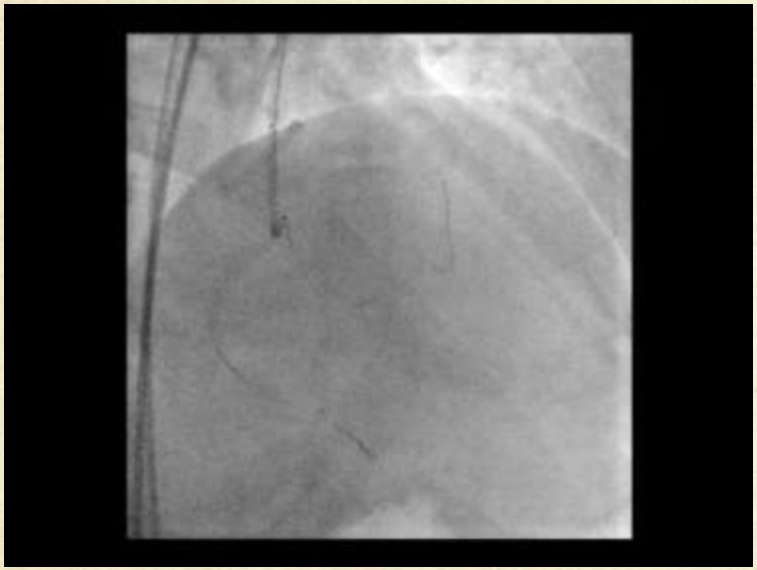


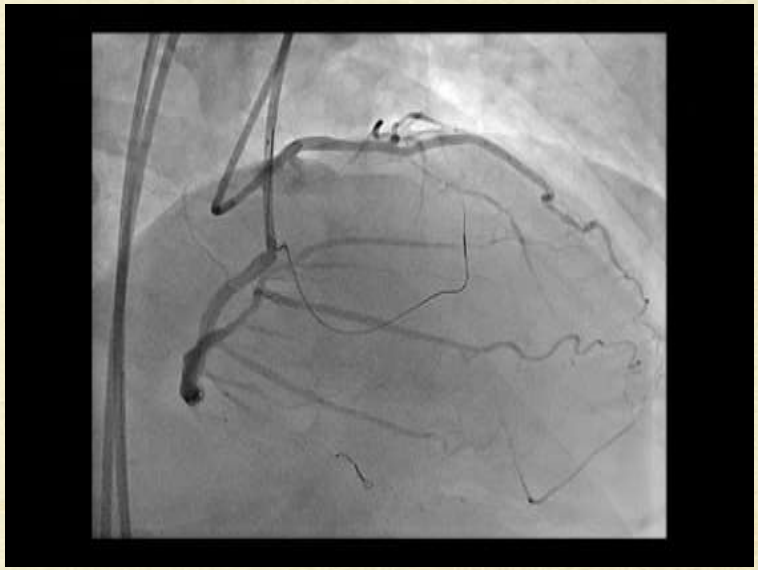


Finecross and Suoh03

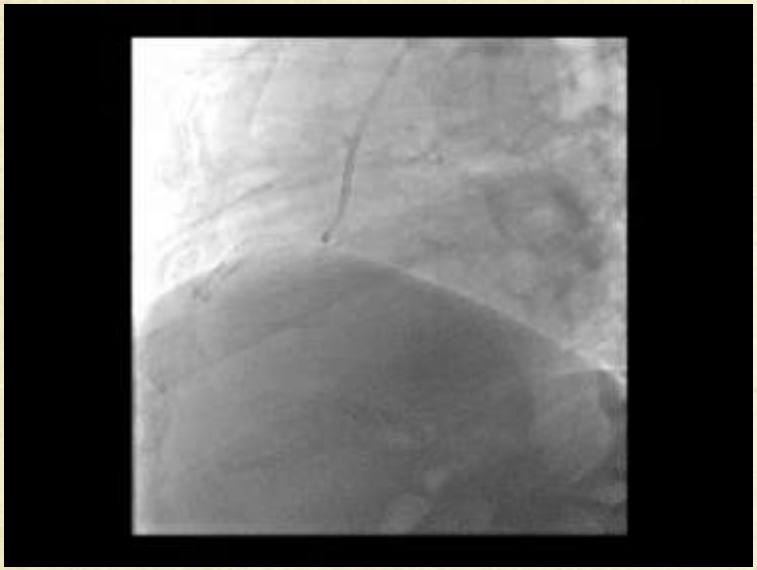


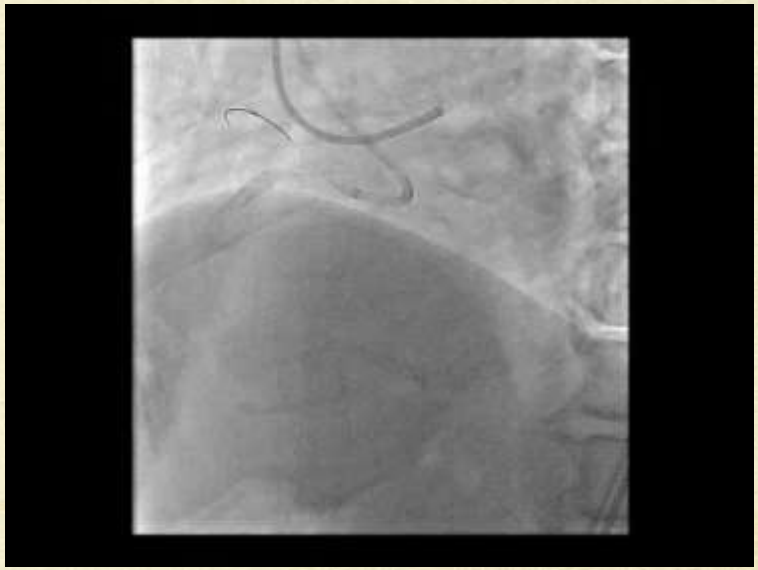
Caravel followed and ready





The power of anchor!





Supports wiring and IVUS

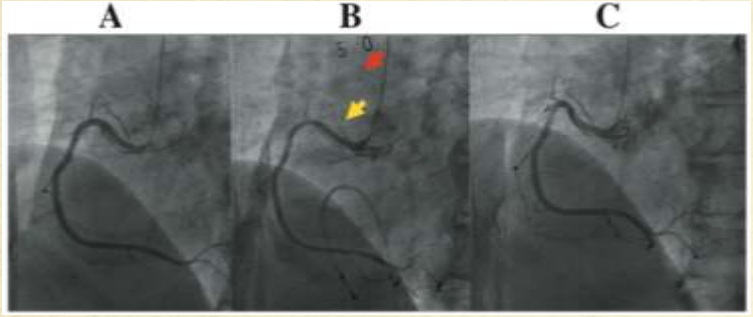
Concerns of CB blockage

- Impaired perfusion to RVOT, causing chest pain and/or hypotension
- May lead to Brugada-like V1 STE
  - VF has been reported in acute CB closure
  - Conus ischemia may potentiate VF in patients with Brugada syndrome
- But in our experience these are mostly insignificant
- Detect and manage CB perforation just as you would do for any epicardial channel

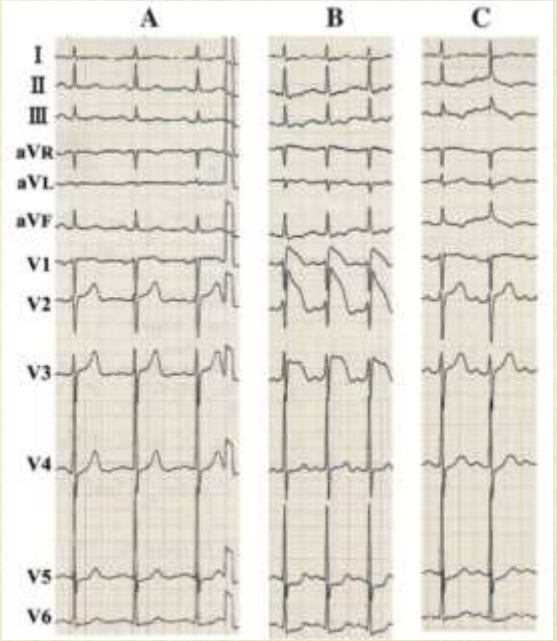
Conclusions

- CB existence is common, but often forgotten or neglected
- It may provide excellent interventional opportunities and facilitate success with efficiency
- A savvy CTO interventionists should always remember and ally with his/her dear friend:
- Conus branch!

CB spasm and ECG changes



- But this is very very rare!
- Clinical significance???



Int Heart J 2010;51

Table 1B. LAD CTO collateral pathways and interventional suitability.

Collateral pathway	Prevalence (%) (n=153 CTOs)	Interventional suitability (%) (n=123 collaterals)	Levin prevalence (%) (n=70 vessels)
PDA-LAD	52.3	80.6	4.3
RV-LAD	26.8	14.3	40.0
OM-D	22.9	3.8	24.3
D-dLAD	20.9	36.4	8.6
RA-LAD	17.6	18.2	X
pLAD-dLAD	15.7	62.5	38.6
PDA-apical LAD	13.1	7.7	4.3
Bridging	11.1	0	X
Conus-LAD	5.9	28.6	21.4
PLV-LAD	3.9	0	X

Table 1A. RCA CTO collateral pathways and interventional suitability.

Collateral pathway	Prevalence (%) (n=275 CTOs)	Interventional suitability (%) (n=287 collaterals)	Levin prevalence (%) (n=74 vessels)
LAD septal-PDA	72.0	76.8	37.8
AVCx-PLV	46.9	16.9	40.5
Bridging	19.3	0	X
Apical LAD-PDA	14.5	76.2	12.2
LAD-RV	11.6	23.5	2.7
RA or SN-dRCA	9.1	0	14.9
OM-PLV	8.4	14.3	23.0
OM-RPDA	8.0	35.3	X
RV-RPDA	5.8	0	8.1
LAD septal-PLV	5.1	50	X
D-PLV	4.0	20	X
D-RPDA	2.9	14.3	X
Conus-RV	1.8	16.7	X
pRV-dRV	X	X	12.2