



Septal vs. Epicardial Collaterals: Wire Choice and
Technique, Microcatheter and Technique, and
Associated Risks — Case Examples

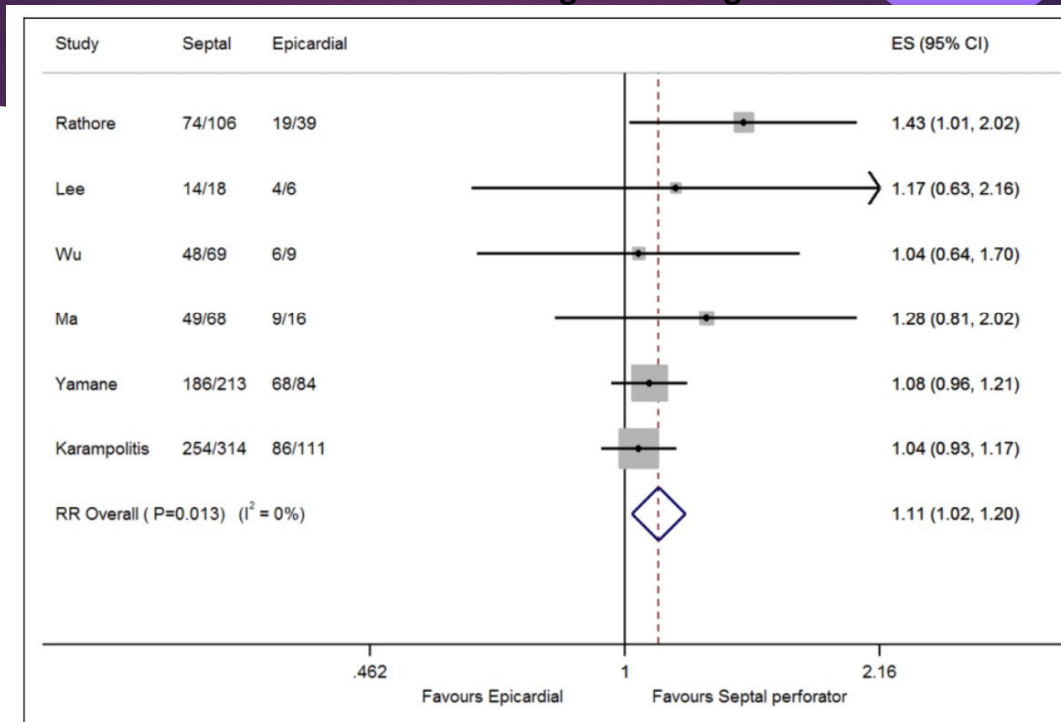
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Retrograde Wiring of Collateral Channels: Meta-Analysis

Successful retrograde wiring

Septal: $n=1670$
Epicardial: $n=495$



Khand A et al., Angiology 2015 Nov

Wires for the collateral passage

Septal

- Sion & Sion Black *0.8 g*
- (Fielder XT-R *0.6 g*)

Epicardial

- SUOH 03 *0.3 g*
- Sion Black *0.8 g*
- (Fielder XT-R *0.6 g*)

Microcatheters for retrograde CTO approach

Septal Crossing

Epicardial Crossing

Rotatable MC

CC 2

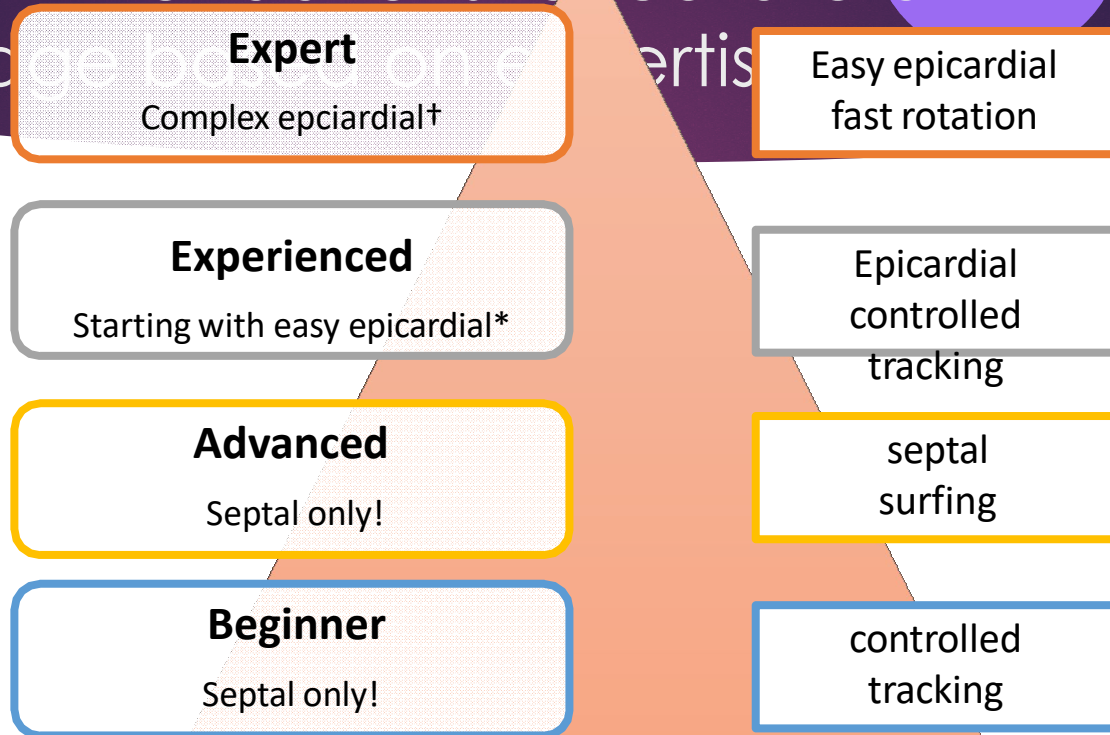
CC 1

Corsair
Turnpike
Mamba
Teleport control

Turnpike LP
Corsair Pro XS
Teleport
Mamba Flex

Finecross
Caravel

Recommendations for collateral passage based on expertise



*CC 2, no tortuosity
† CC 1, tortuosity, any revers bend

Recommendations for collateral passage based on expertise

Expert
Complex epicardial†

Experienced
Starting with easy epicardial*

Advanced
Septal only!

Beginner
Septal only!

controlled tracking

*CC 2, no tortuosity
† CC 1, tortuosity, any revers bend

Recommendations for collateral passage based on expertise

Expert

Complex epicardial†

Experienced

Starting with easy epicardial*

Advanced

Septal only!

Beginner

Septal only!

septal
surfing

*CC 2, no tortuosity

† CC 1, tortuosity, any revers bend

Recommendations for collateral passage based on expertise

Expert
Complex epicardial†

Experienced
Starting with easy epicardial*

Advanced
Septal only!

Beginner
Septal only!

Epicardial controlled tracking

*CC 2, no tortuosity
† CC 1, tortuosity, any revers bend

Recommendations for collateral passage

Expert

Complex epicardial†

Easy epicardial
fast rotation

Experienced

Starting with easy epicardial*

Advanced

Septal only!

Beginner

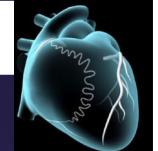
Septal only!

*CC 2, no tortuosity

† CC 1, tortuosity, any revers bend



Controlled Tracking: Analyse the connection



RCA-CTO

Aspirate blood out of the MC before the contrast injection to avoid hydraulic perforation and air embolism

J-channel score: 1

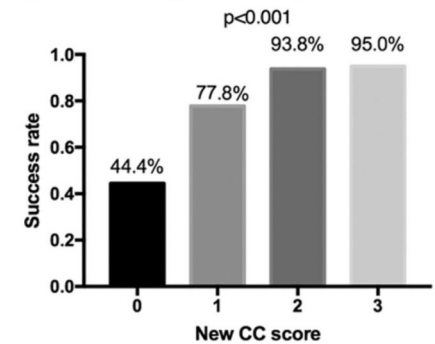
Huang – Score: 1

	Septal	Non septal
CC Vessel Size: <i>Small</i>	2	3
Reverse Bend: <i>Yes</i>	1	1
Continuous Bends: <i>Yes</i>	1	0
Corkscrew: <i>Yes</i>	0	1
Total Score		

Large Collaterals (CC 2): 1 point
No tortuosity: 2 point

- Category of Difficulty (Total Score)
- Easy: 0
 - Intermediate: 1-2
 - Difficult: ≥3

A CC tracking success by new CC score



54,3%

77,8%

What do to if you have no wire control?

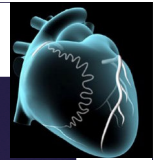
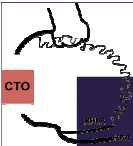
Lesson I:

Try to wire to whole collateral without advancing the MC

Lesson II:

Advance your MC tip towards the wire tip only, if you have no wire control (or reshaping is needed)

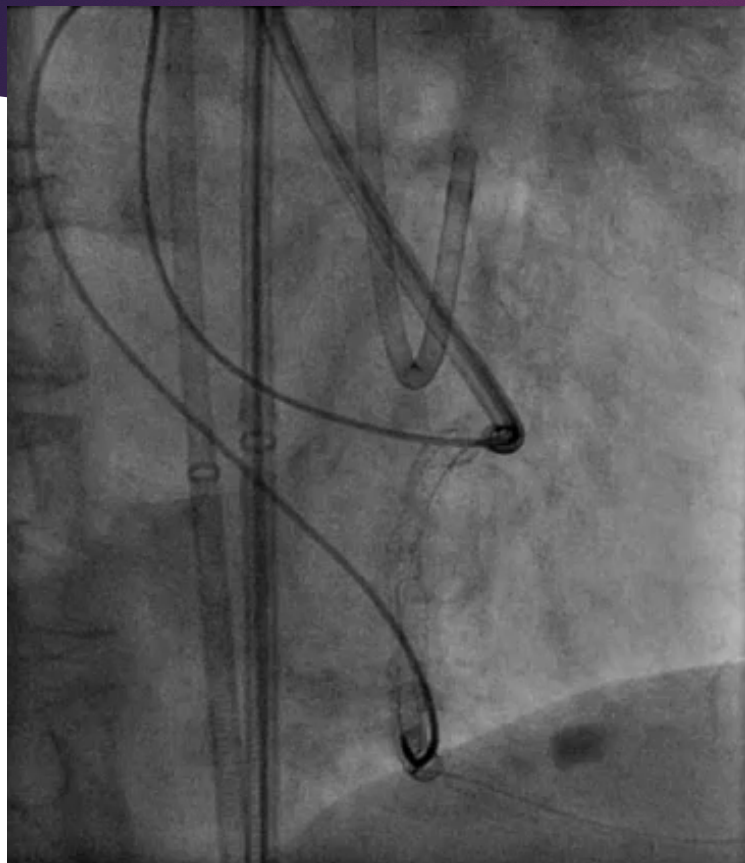
CAVE: MC Prolaps
Attention with Suoh 3





Difficult Collaterals

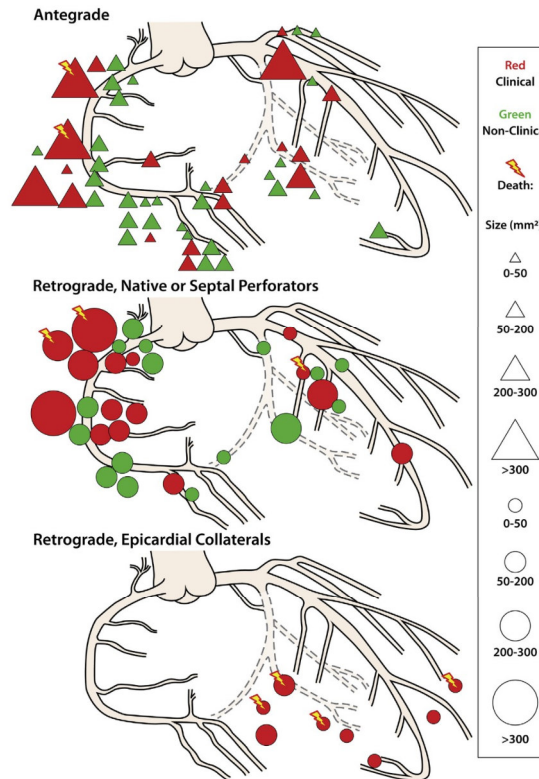
RCA-CTO IC -Type B



Fatal perforation in OPEN CTO

**1000 CTO patients:
4,3% clinical perforation
0.9% fatal perforation**

CENTRAL ILLUSTRATION Summary of Size and Location of Clinical and Nonclinical Perforations From the OPEN-CTO Registry



Hirai, T. et al. J Am Coll Cardiol Intv. 2019;12(19):1902-12.

OPEN-CTO — Outcomes, Patient health status, and Efficiency IN Chronic Total Occlusion hybrid procedures registry.

“The dry tamponade” Epicardial Perforation post- CABG



After surgery



Summary

- Septal wiring is associated with higher success and lower rate on severe complications than epicardial wiring
- Beginners and advanced retrograde operators should focus on septal wiring (controlled tracking, septal surfing)
- Experienced retrograde operators and CTO experts should be able to handle at least easy epicardial connections
- Newer wire and microcatheter development enable much safer collateral passages
- Epicardial damage should be treated immediately to avoid any serious adverse events