

Most Advanced Strategy for Coronary CTOs

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Wiring Strategy in Retrograde Approach Era

Pre-procedural Examination of Angiogram w/wo MSCT

Antegrade approach

1. Single wire manipulation
2. Parallel wiring
3. IVUS guided wiring

Retrograde approach

1. Wiring through collateral
2. Retrograde wiring
 - Retrograde wire crossing
 - Kissing wire technique
 - Knuckle wire technique
 - CART
 - Reverse CART



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Current Strategy of Single Wire Manipulation

■ Step-up Wire Selection

1. Floppy wire as the 1st wire
- ↓
2. Intermediate or MIRACLE 3
- ↓
3. MIRACLE 6
- ↓
4. MIRACLE 12 or Conquest Family



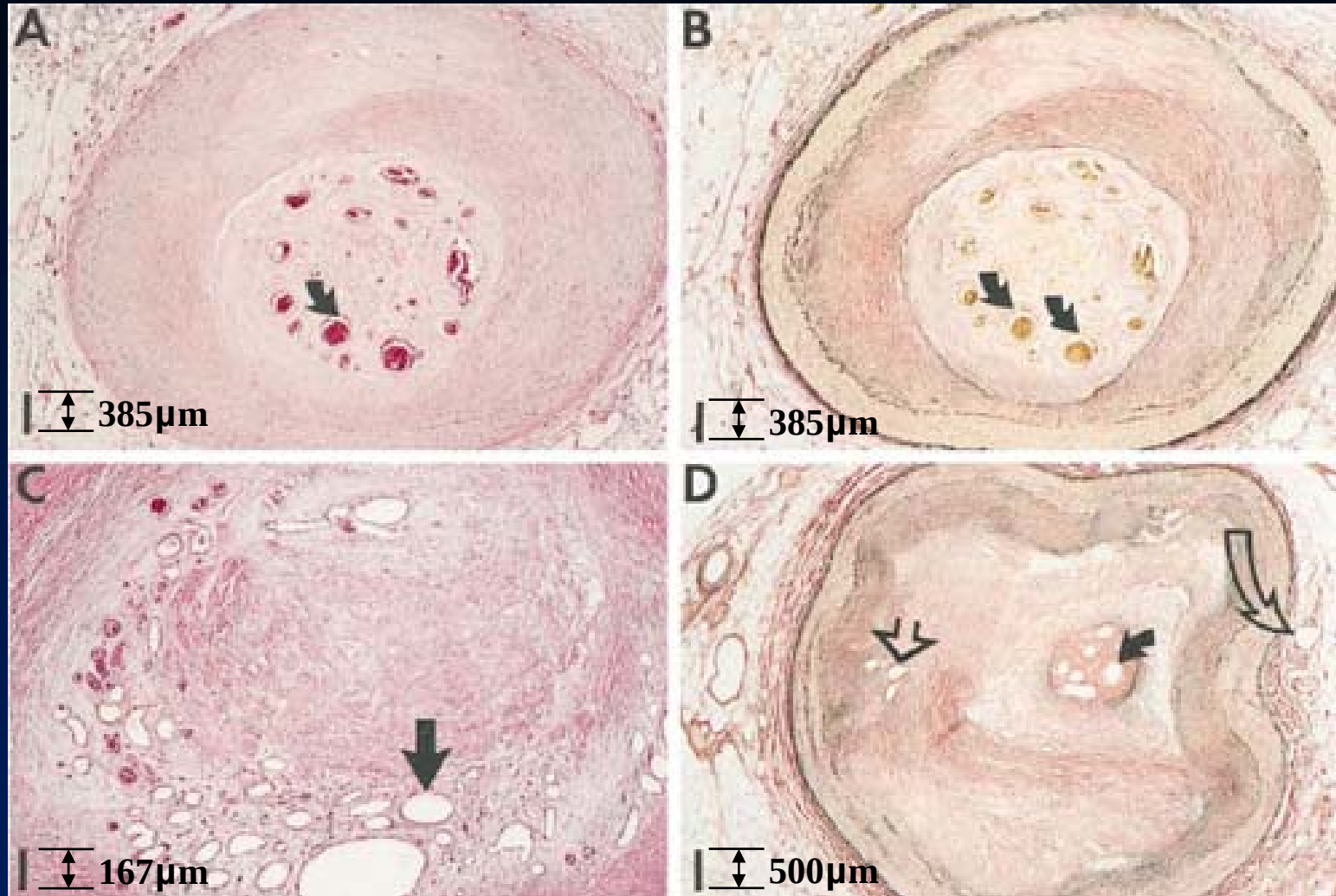
Current Strategy of Single Wire Manipulation

■ Step-up Wire Selection

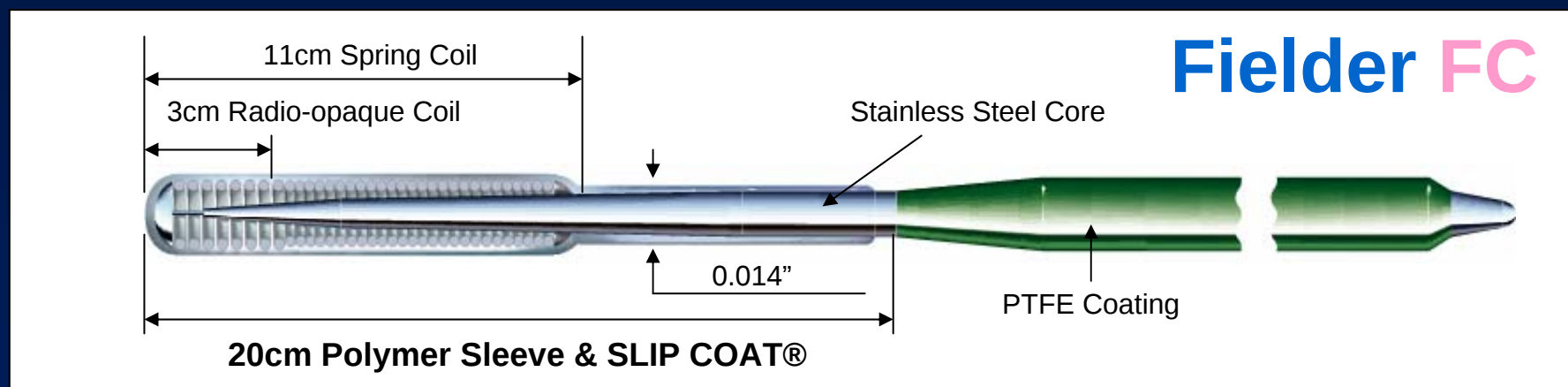
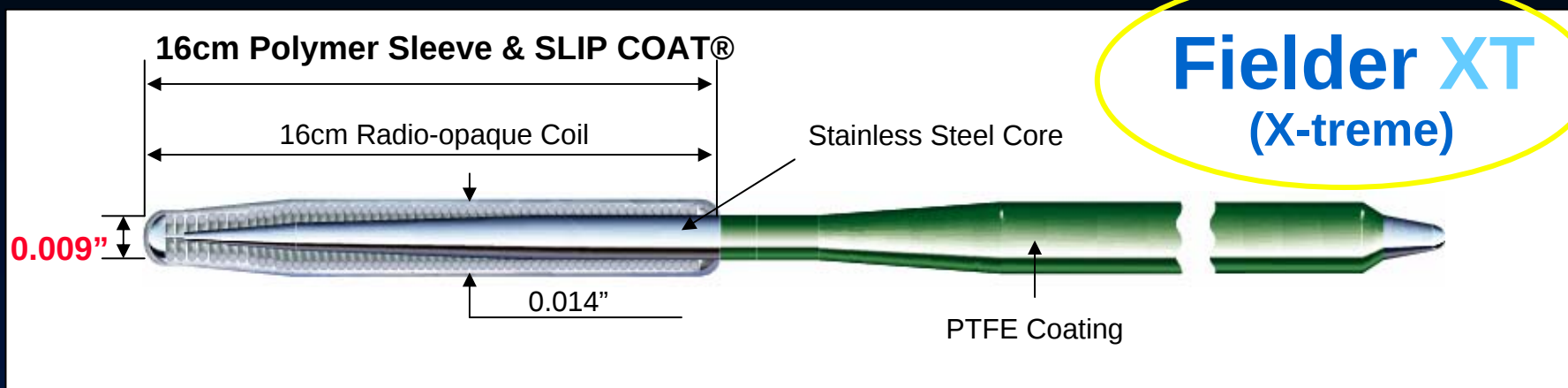
1. Fielder XT (hydrophilic tapered wire)



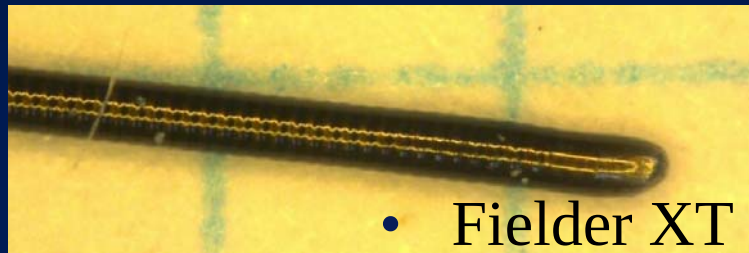
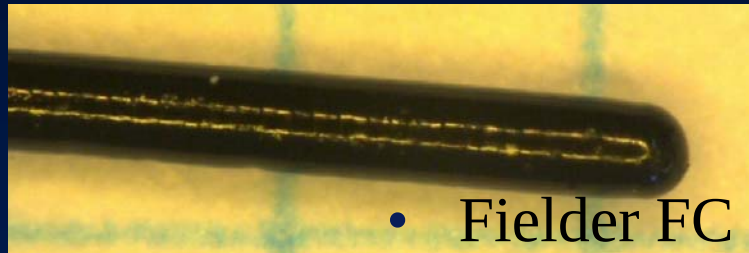
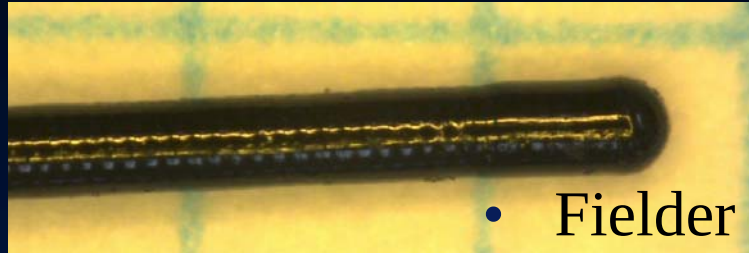
Micro Channels in CTOs



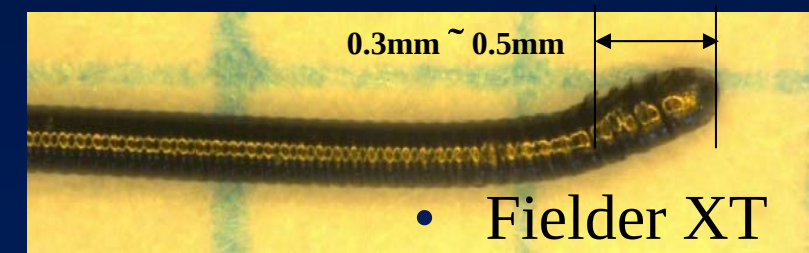
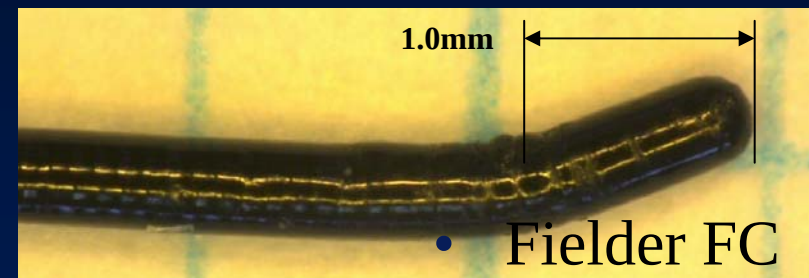
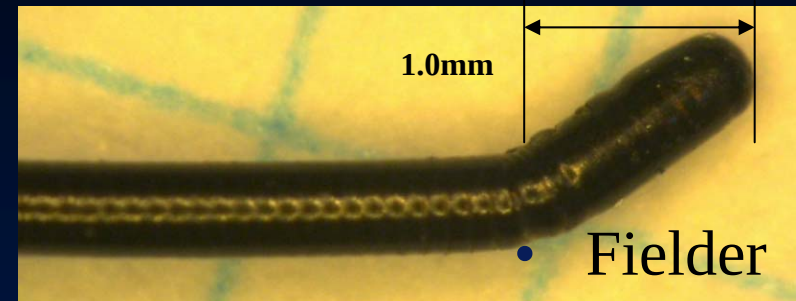
- Histological average size is **200 μm (0.008 inch)**



Before Shaping



After Shaping



X-treme enables precise tip shaping due to **its short soldering tip.**

CTO



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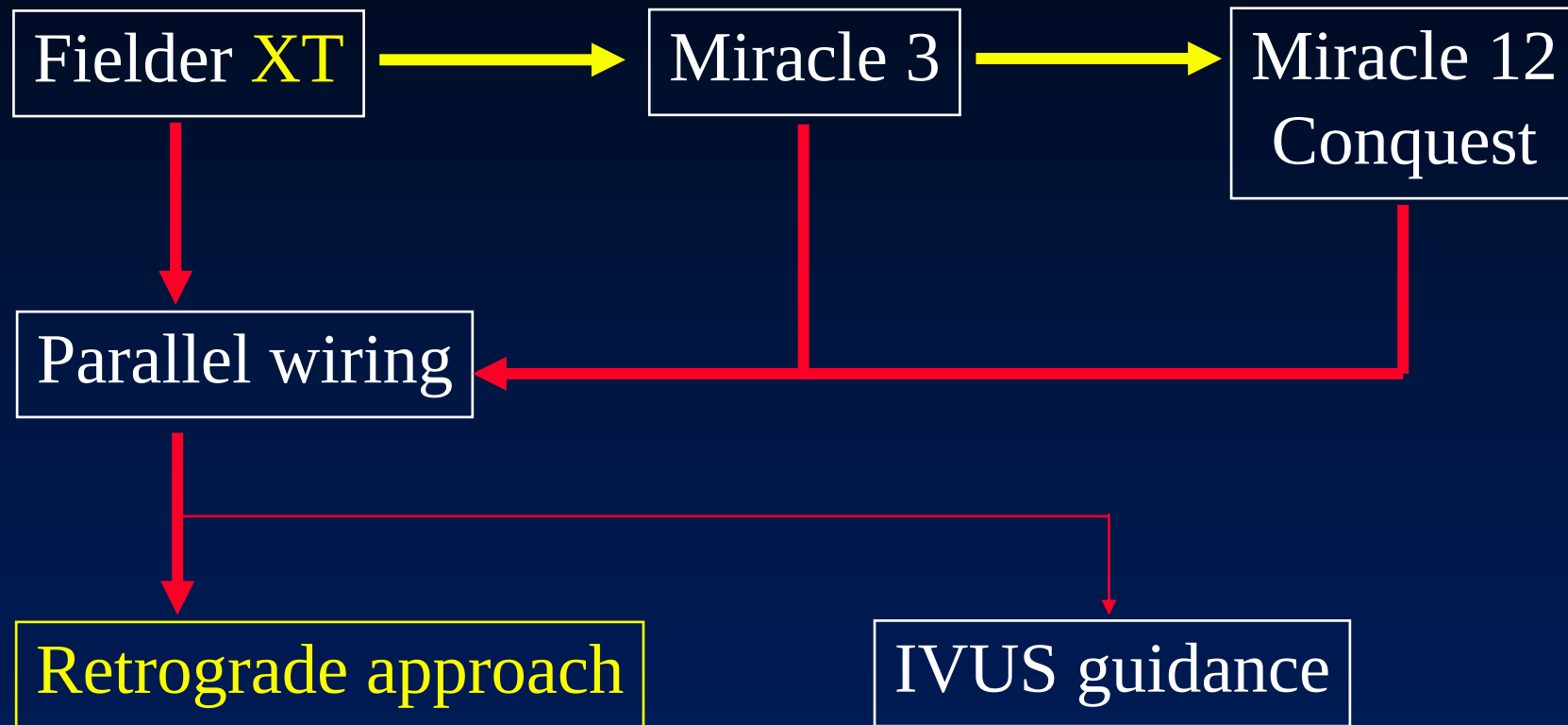
LAD mid CTO



Fielder XT with advanced OTW

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Current Antegrade Strategy for CTO



—————> *No work* —————> *Failure*



Wiring Strategy in Retrograde Approach Era

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 - CART
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Retrograde Approach for Coronary CTO

- Collateral channels

A. bypass graft

Single or bilateral

B. wiring technique

C. septal perforator

Wiring technique
with balloon dilatation

- Retrograde wiring techniques

Retrograde wire crossing

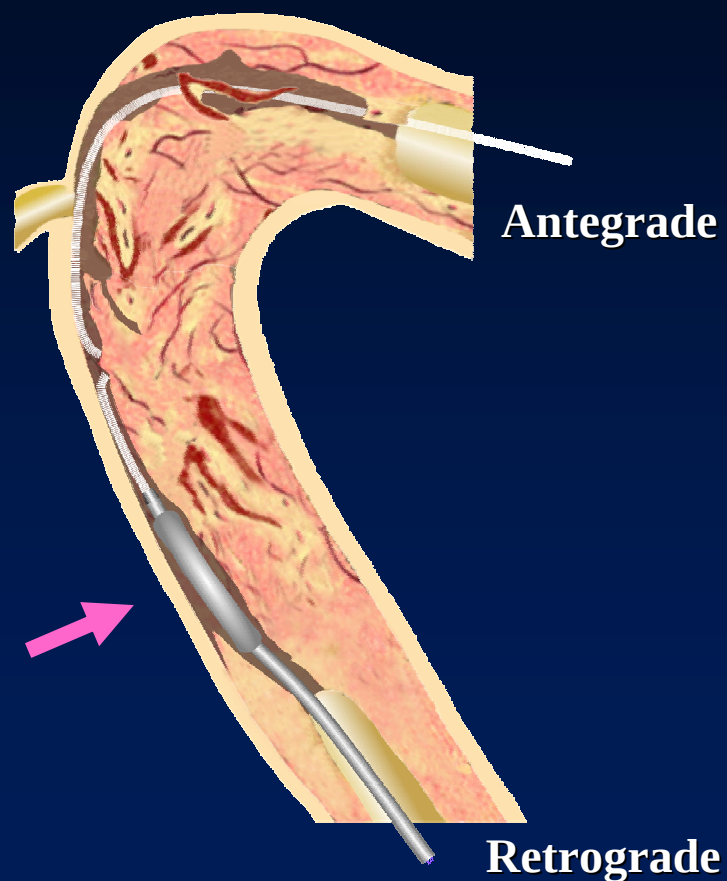
Kissing wire technique

Knuckle wire technique

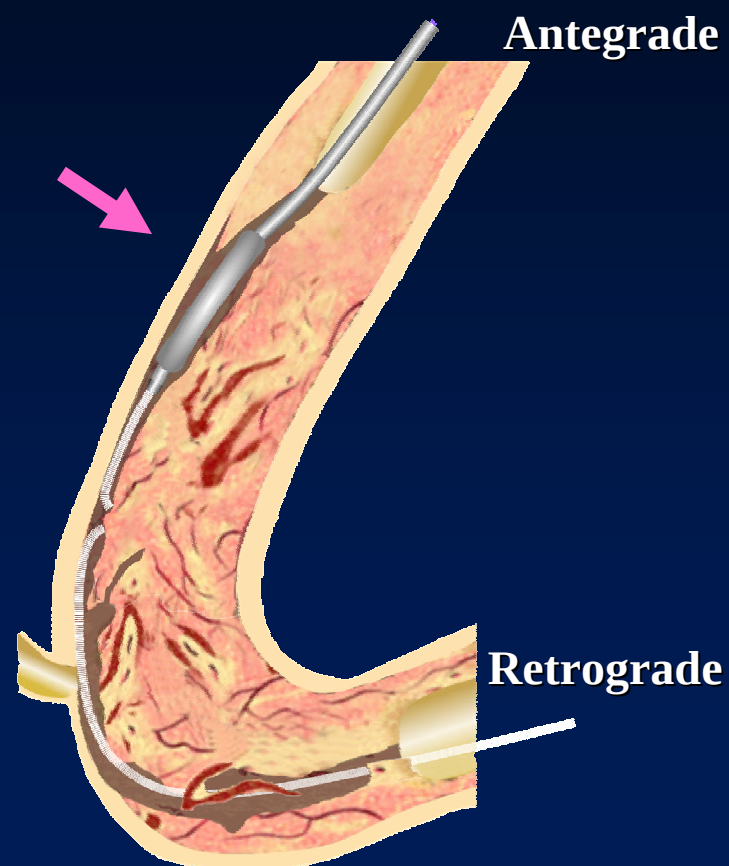
CART technique
(Reverse **CART** technique)

Concept of **CART** technique

Standard CART



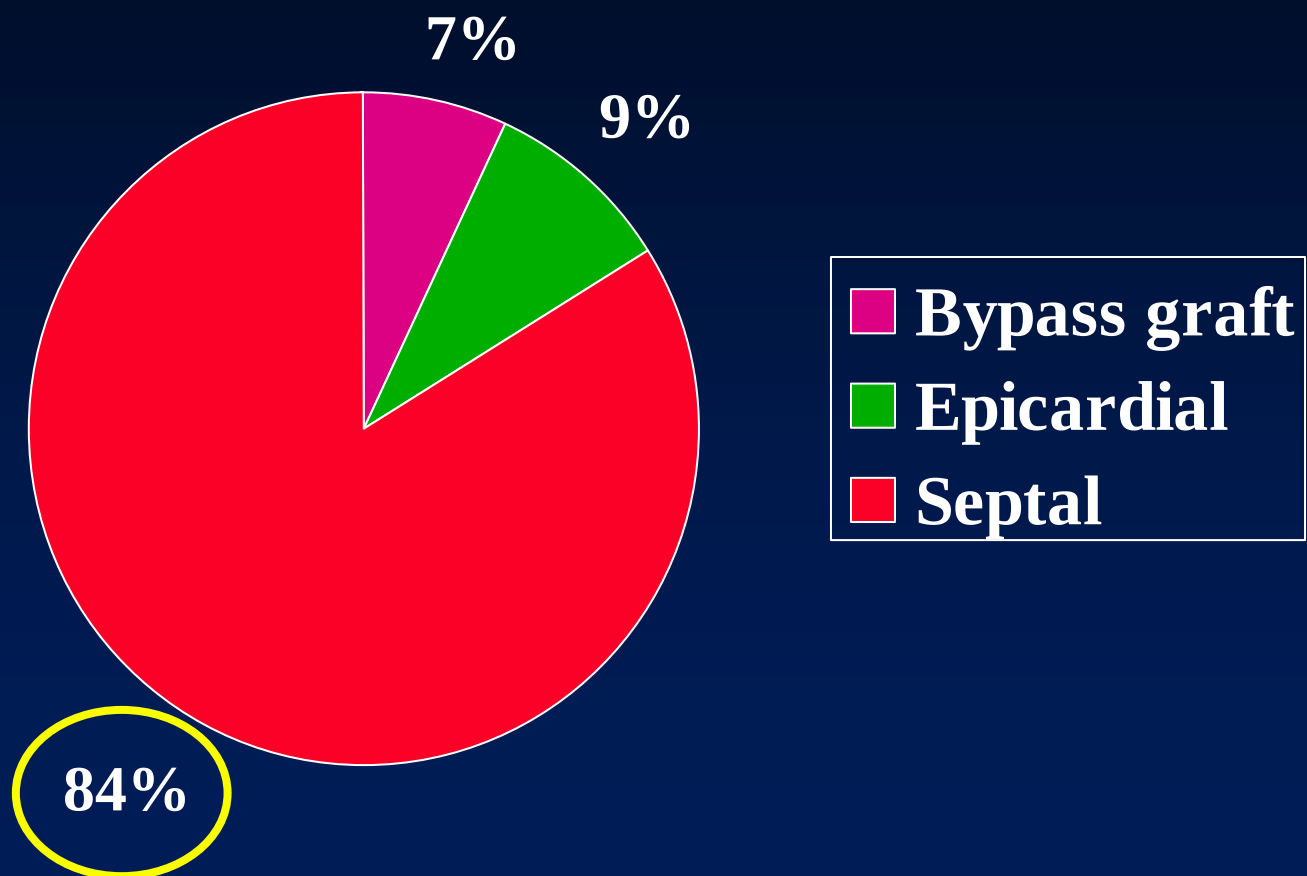
Reverse CART





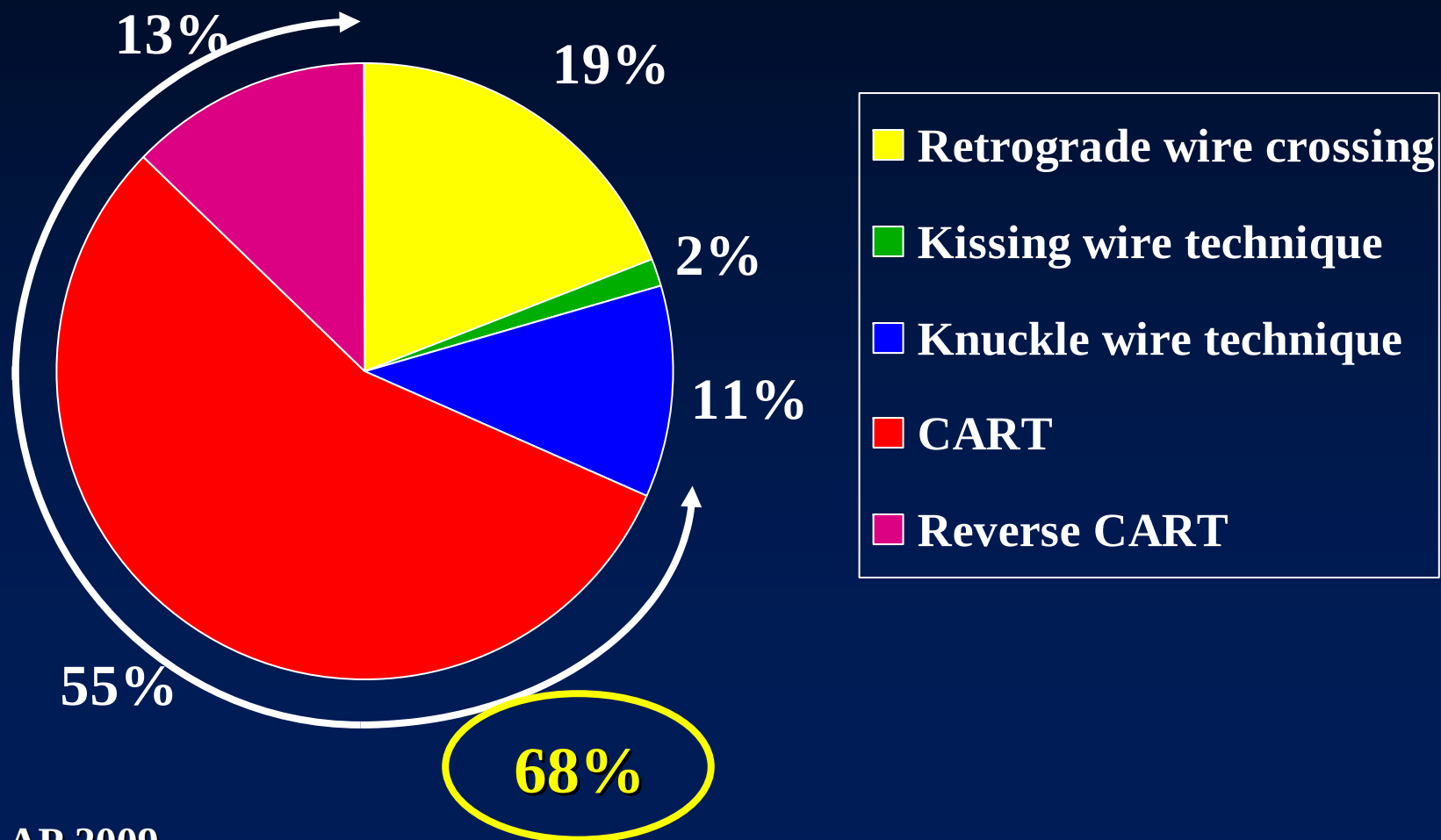
Retrograde Channel

(in the last successful 100 retrograde cases)

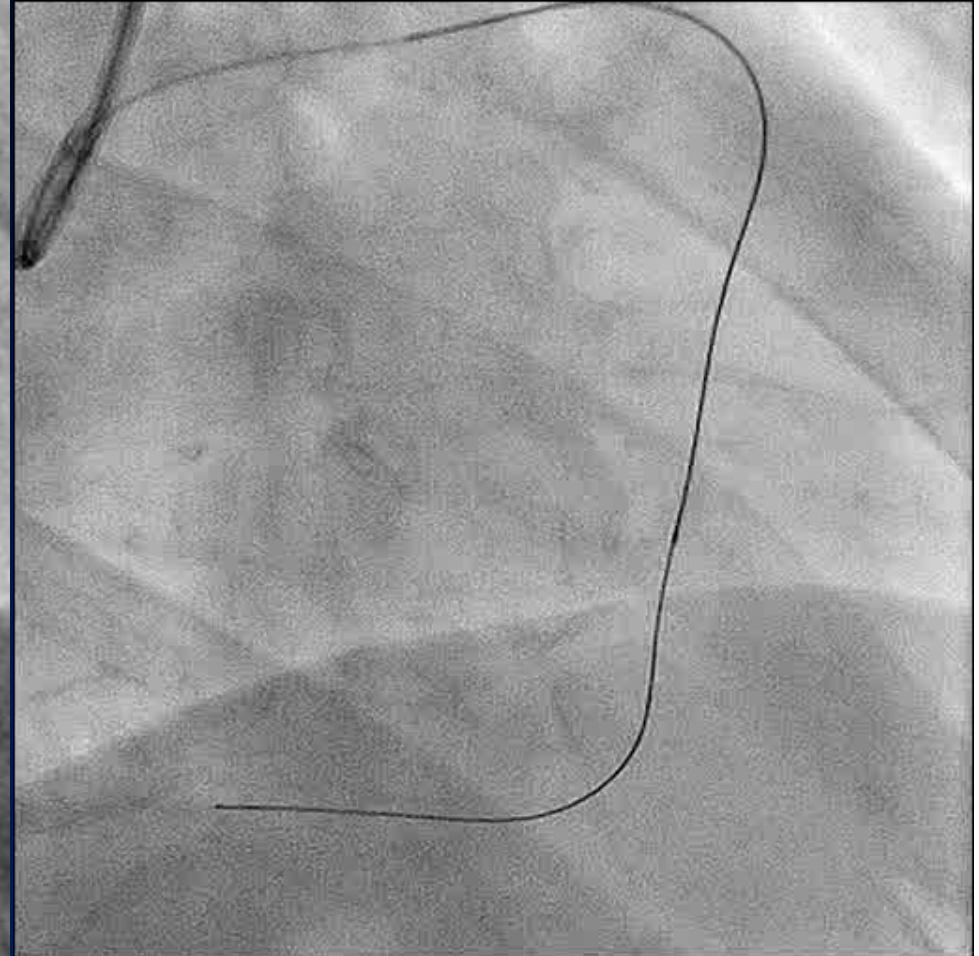
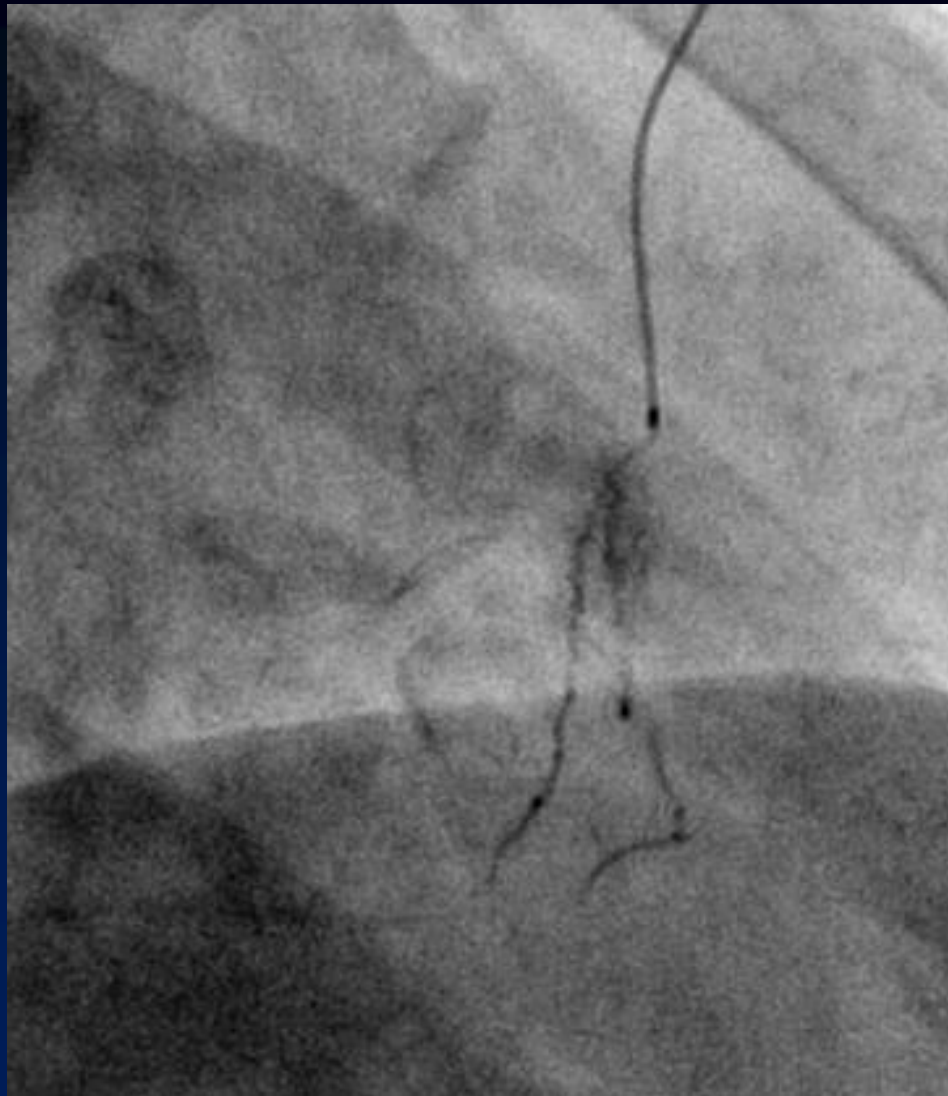




Retrograde Wiring Techniques



CTO



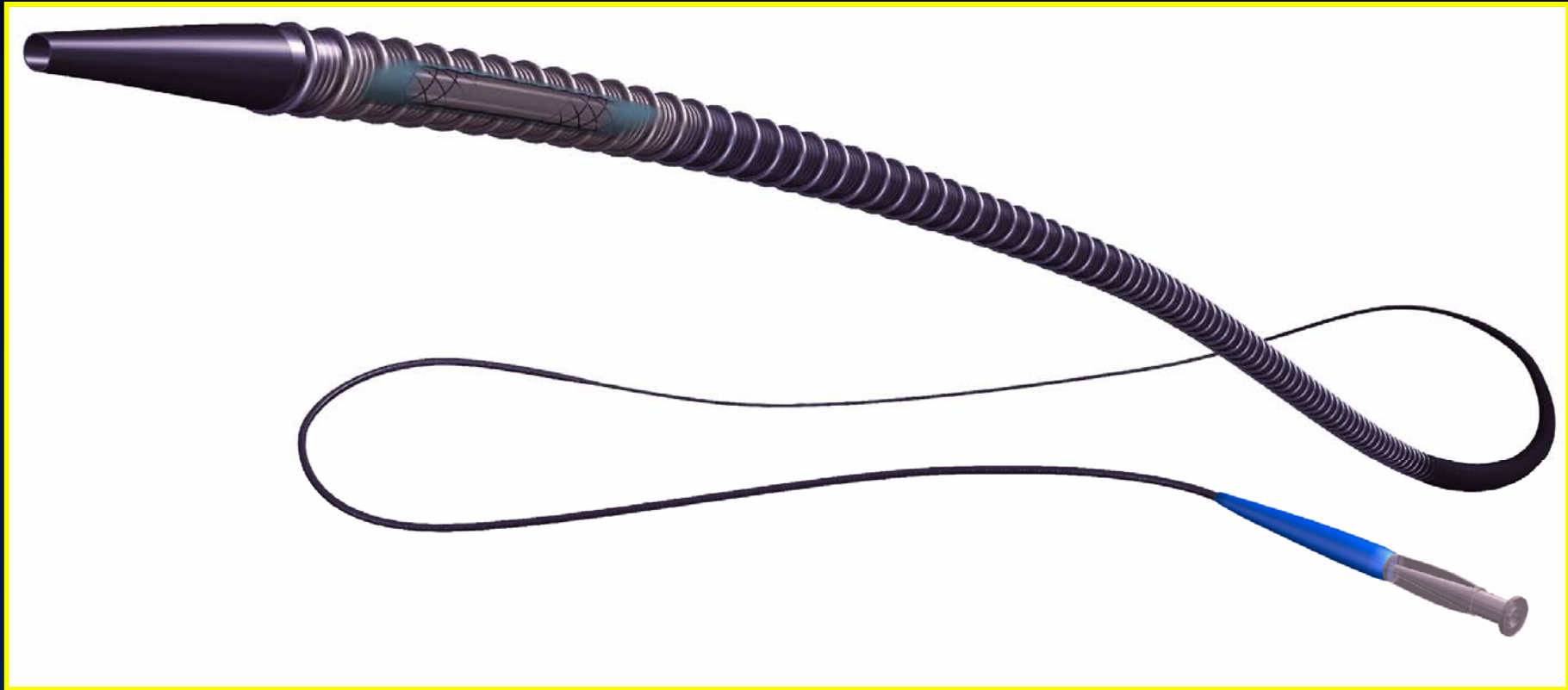
Fielder XT



Limitations of Septal Channel Tracking with CART

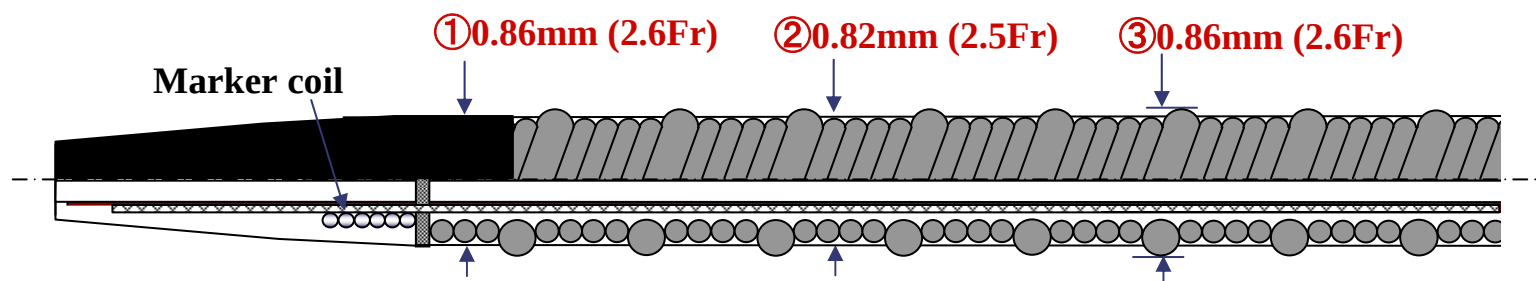
- Dilatation of septal channel is mandatory to advance balloons through septal channel.
- These procedure carry the risk of septal channel perforation and septal hematoma.
- CART requires retrograde balloon access into the occlusion, however, it's sometimes difficult because of complex anatomy even after dilatation of the septal channel.
- Long procedure time always carries the risk of donor artery trouble (thrombus formation, etc).

Channel Dilator



Basic structure is same as Tornus device.

Channel Dilator



- Tapered Soft Tip
- 20cm Screw Head Structure
- Hydrophilic Polymer Coating
- PTFE Inner Layer



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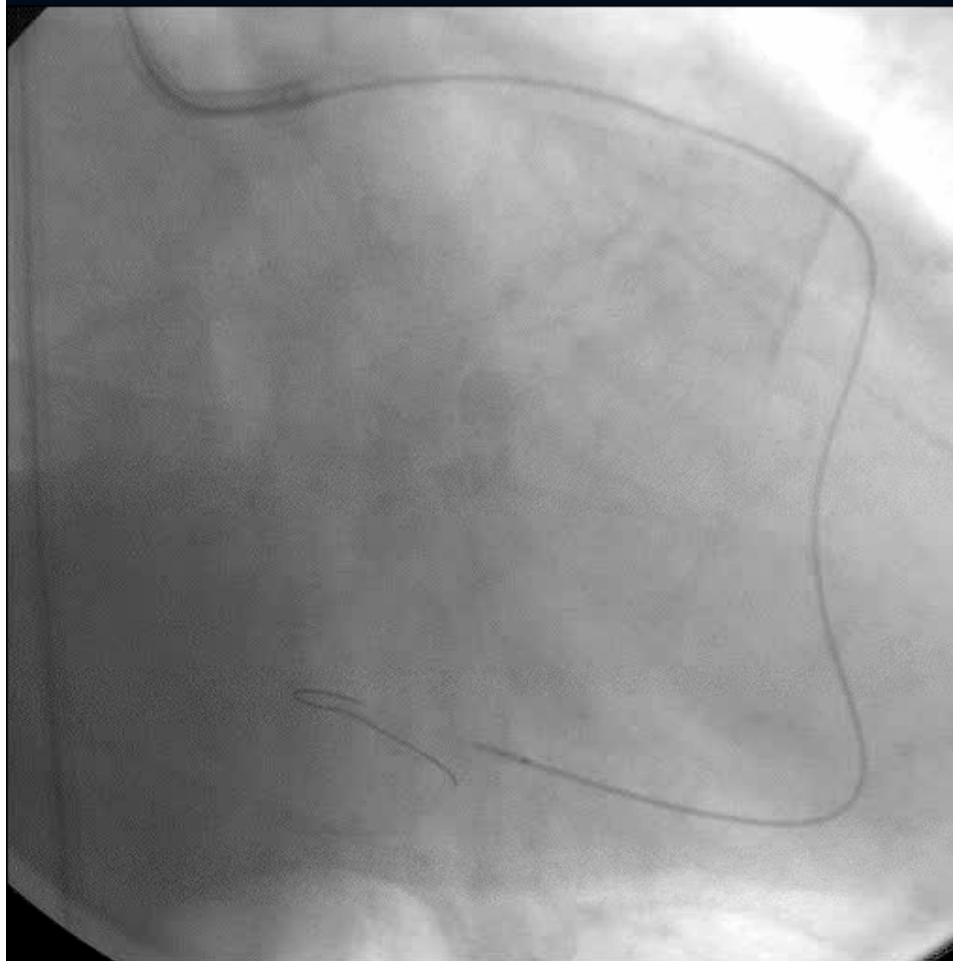
RCA-CTO, Reattempt



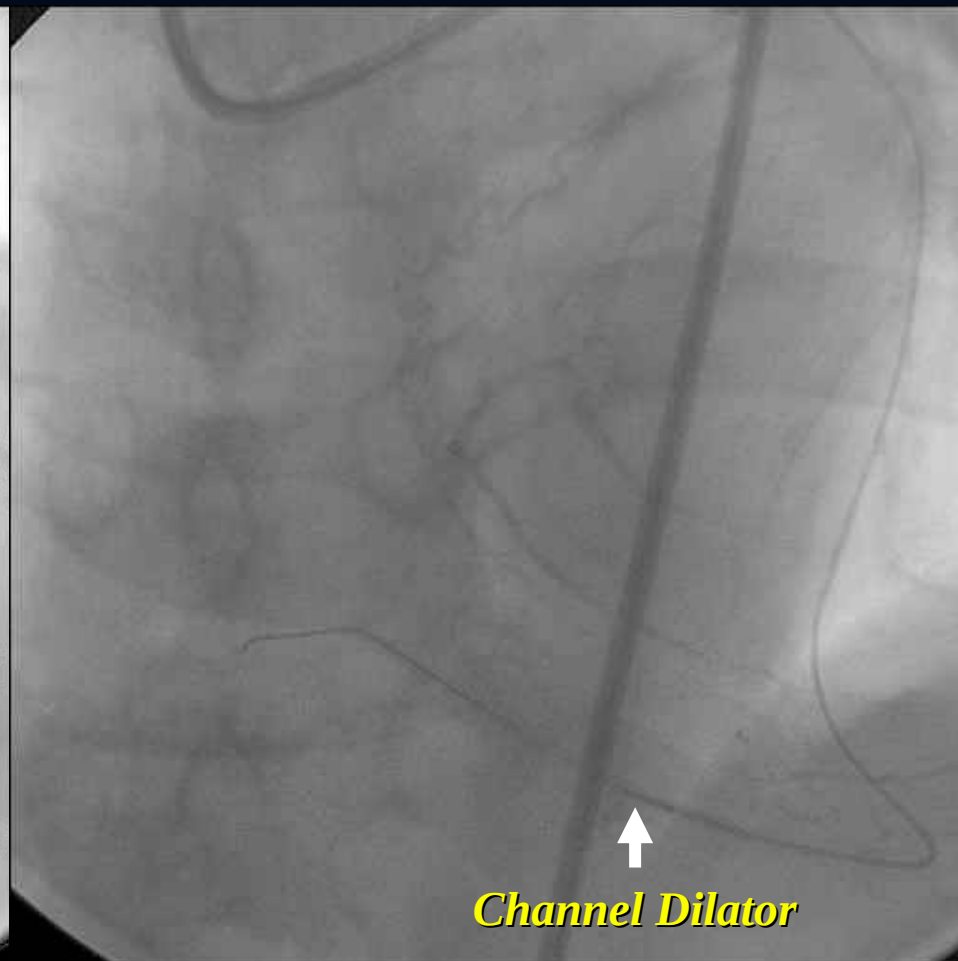
Septal channels

CTO

Reverse CART using Channel Dilator



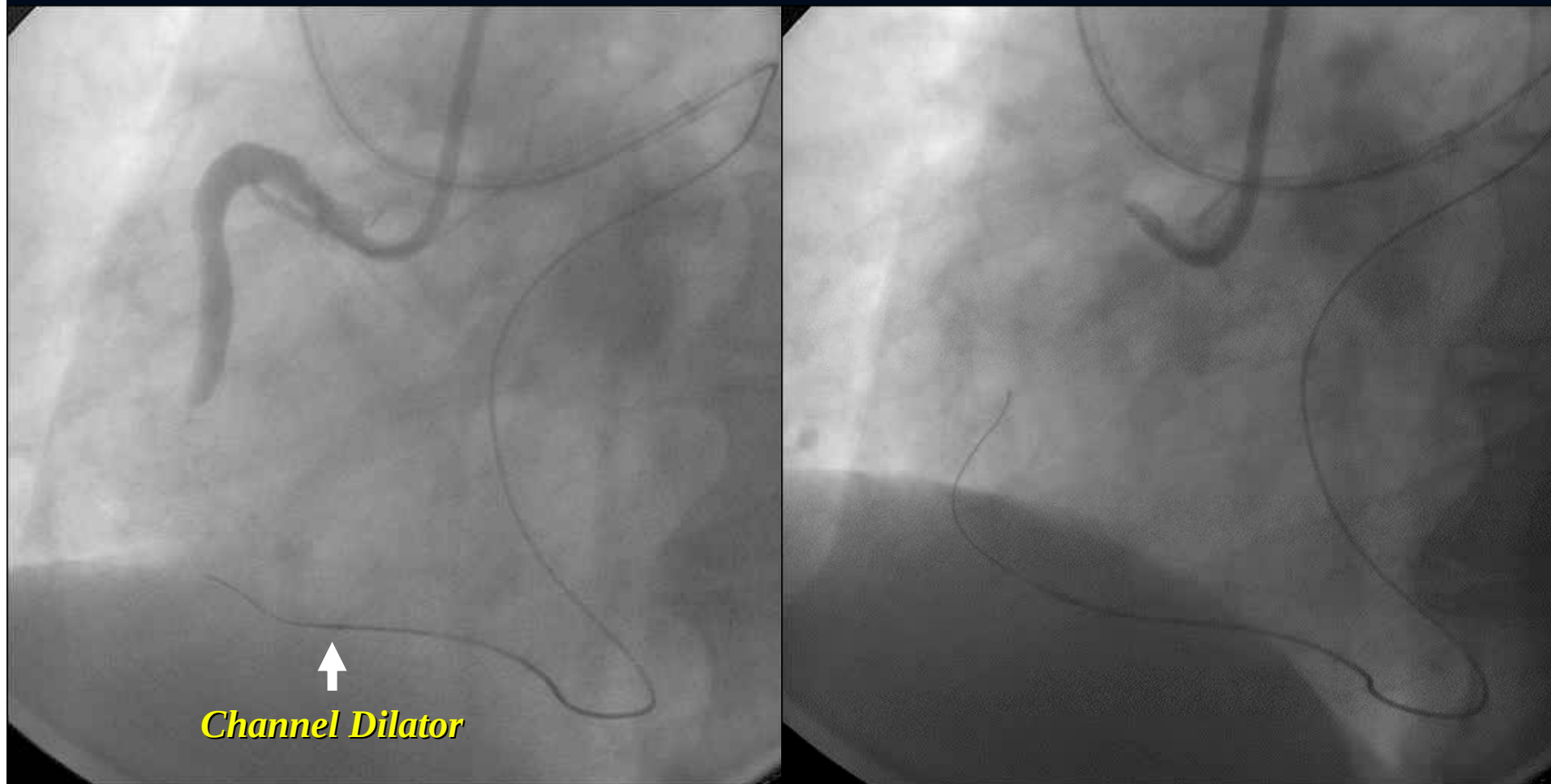
Channel Dilator



Retrograde wiring with Miracle 3

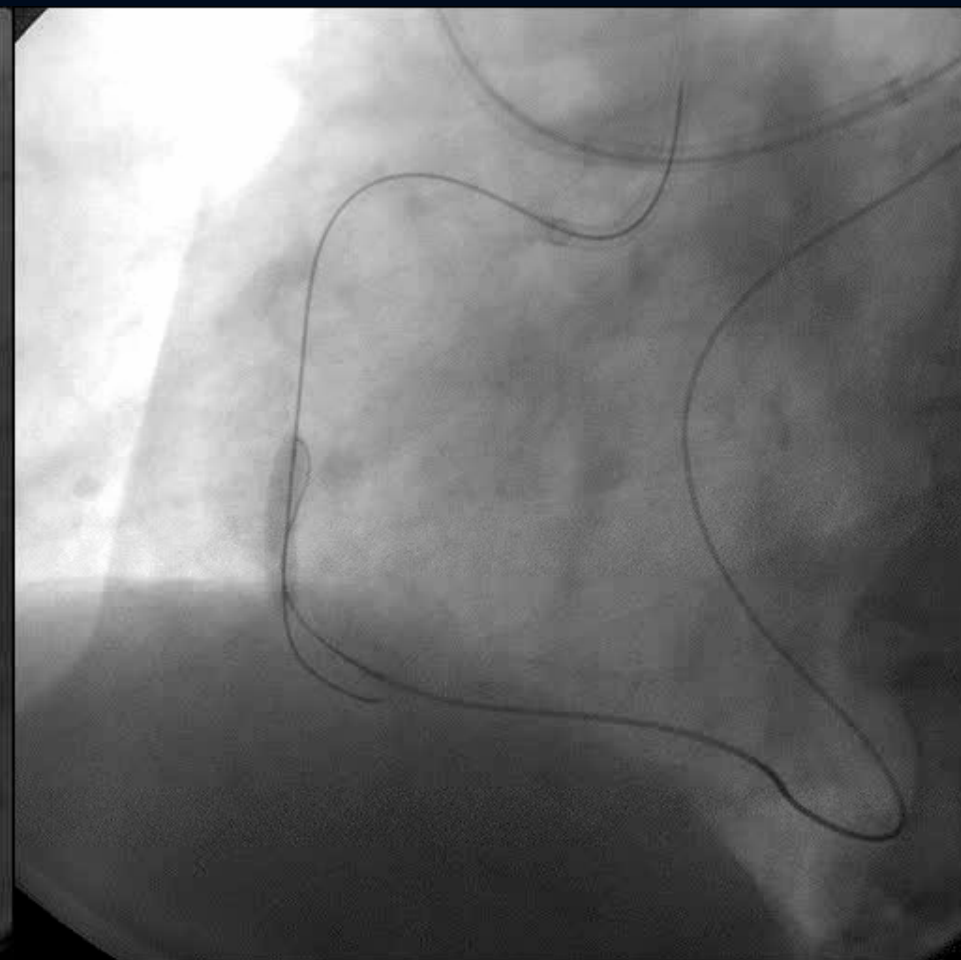
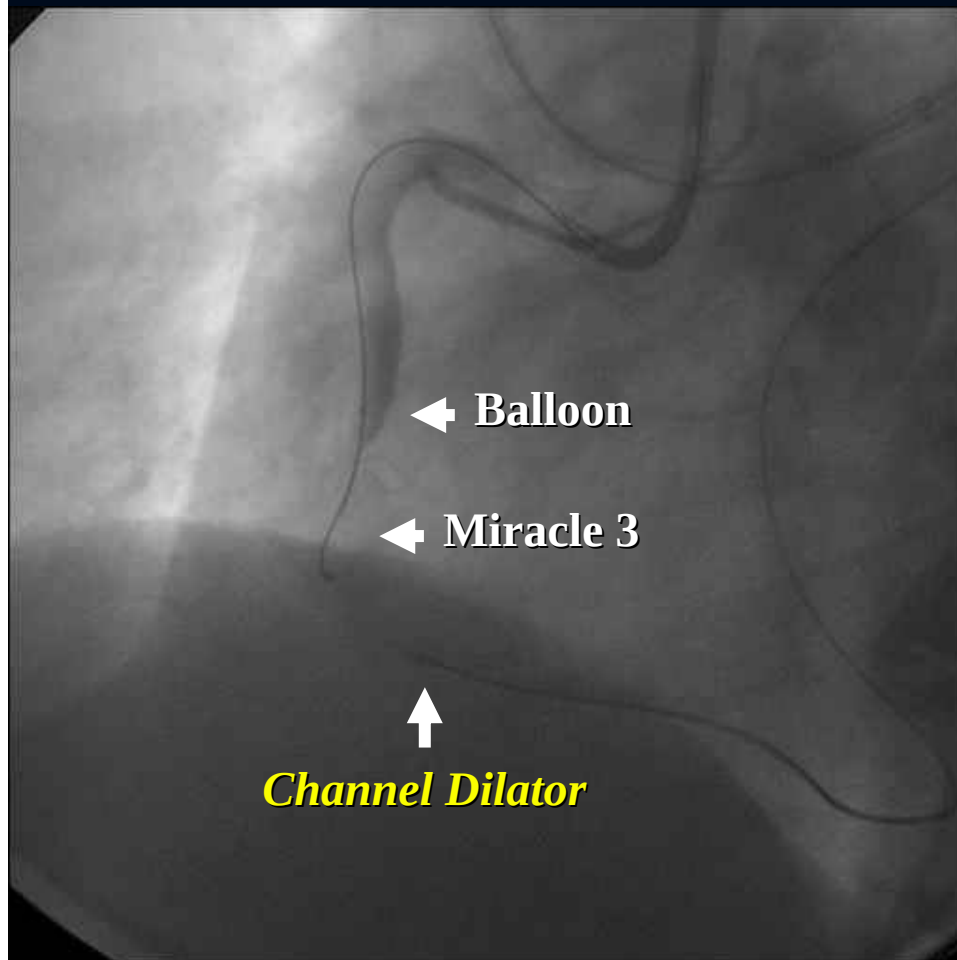
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Reverse CART using *Channel Dilator*



Retrograde wiring supported by *Channel Dilator*

Reverse CART using Channel Dilator



Antegrade wiring

Antegrade 3.0mm ballooning

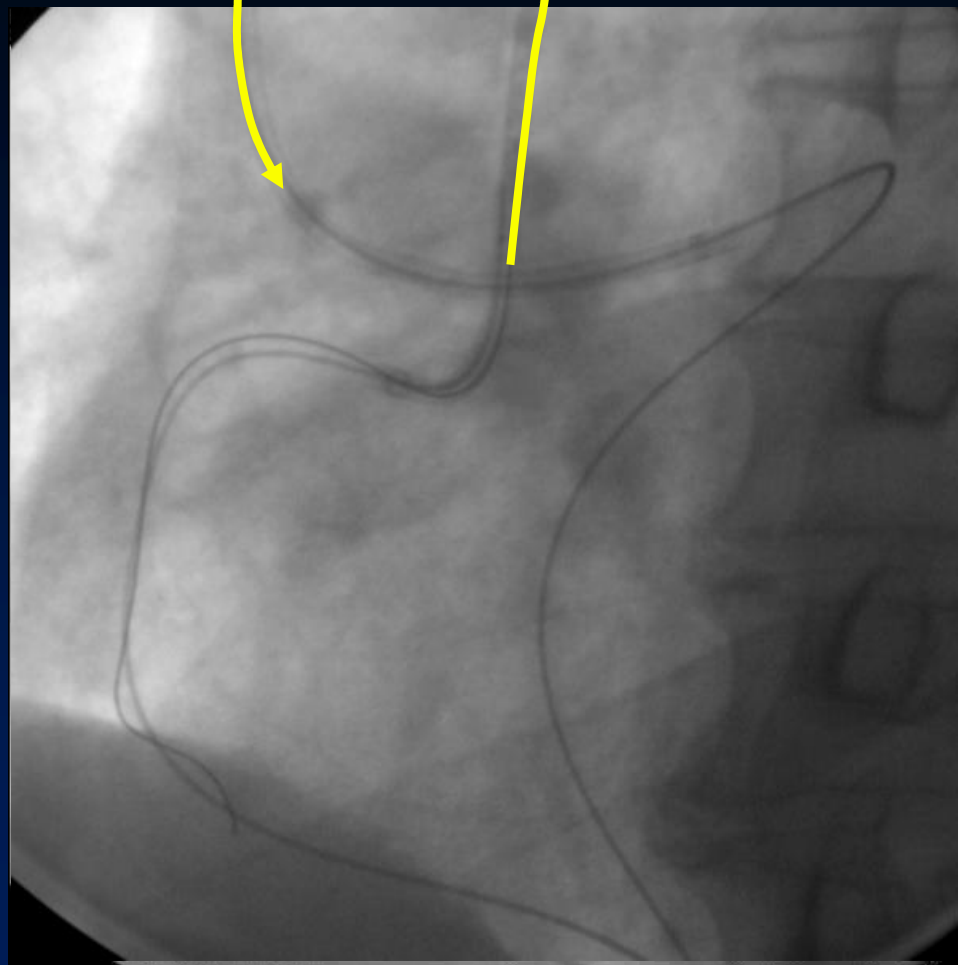
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Rt. Groin

Lt. Groin



CD in GC under trapped wire

→ 300cm Wire

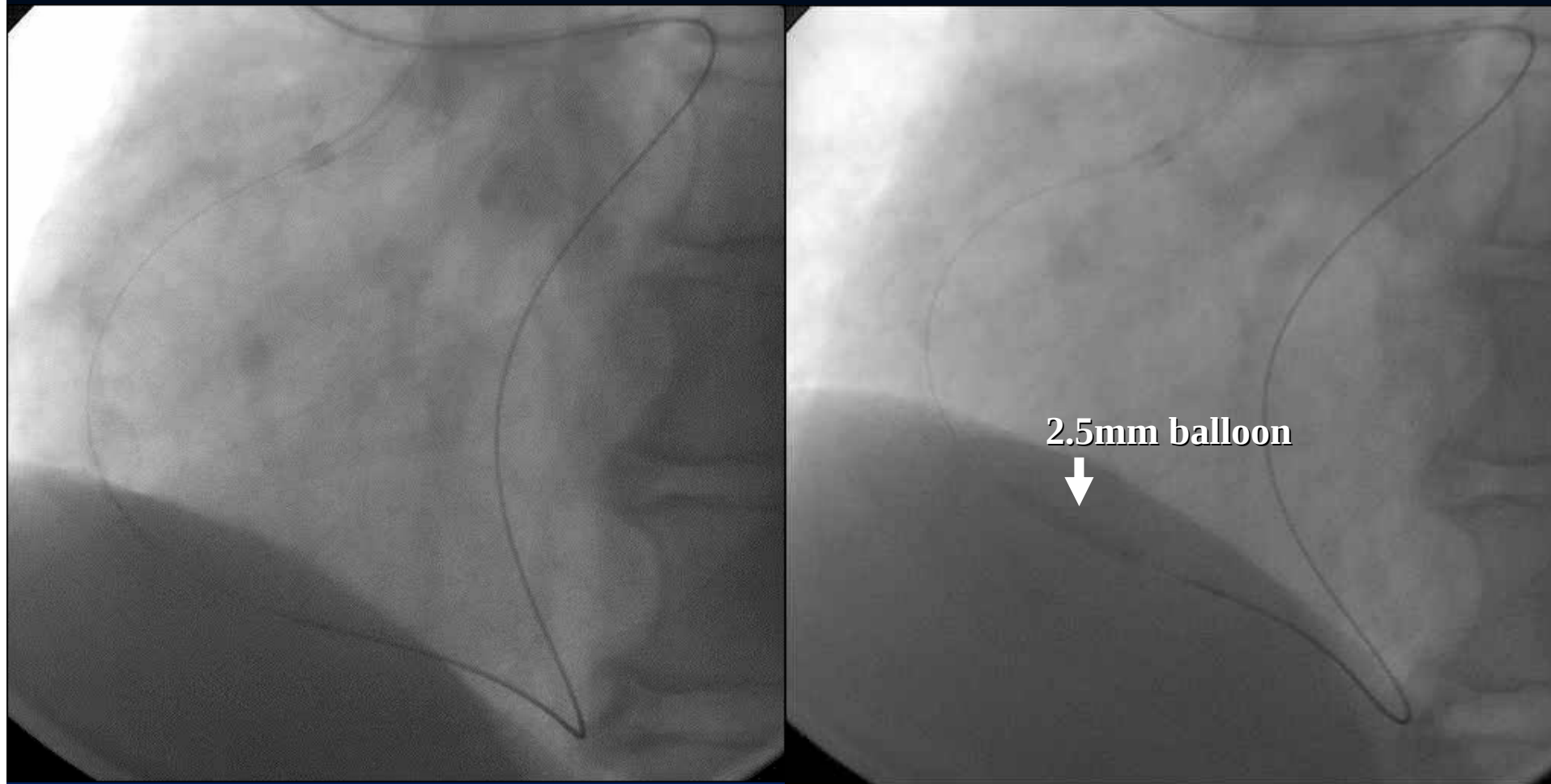
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Use of 300 cm Wire

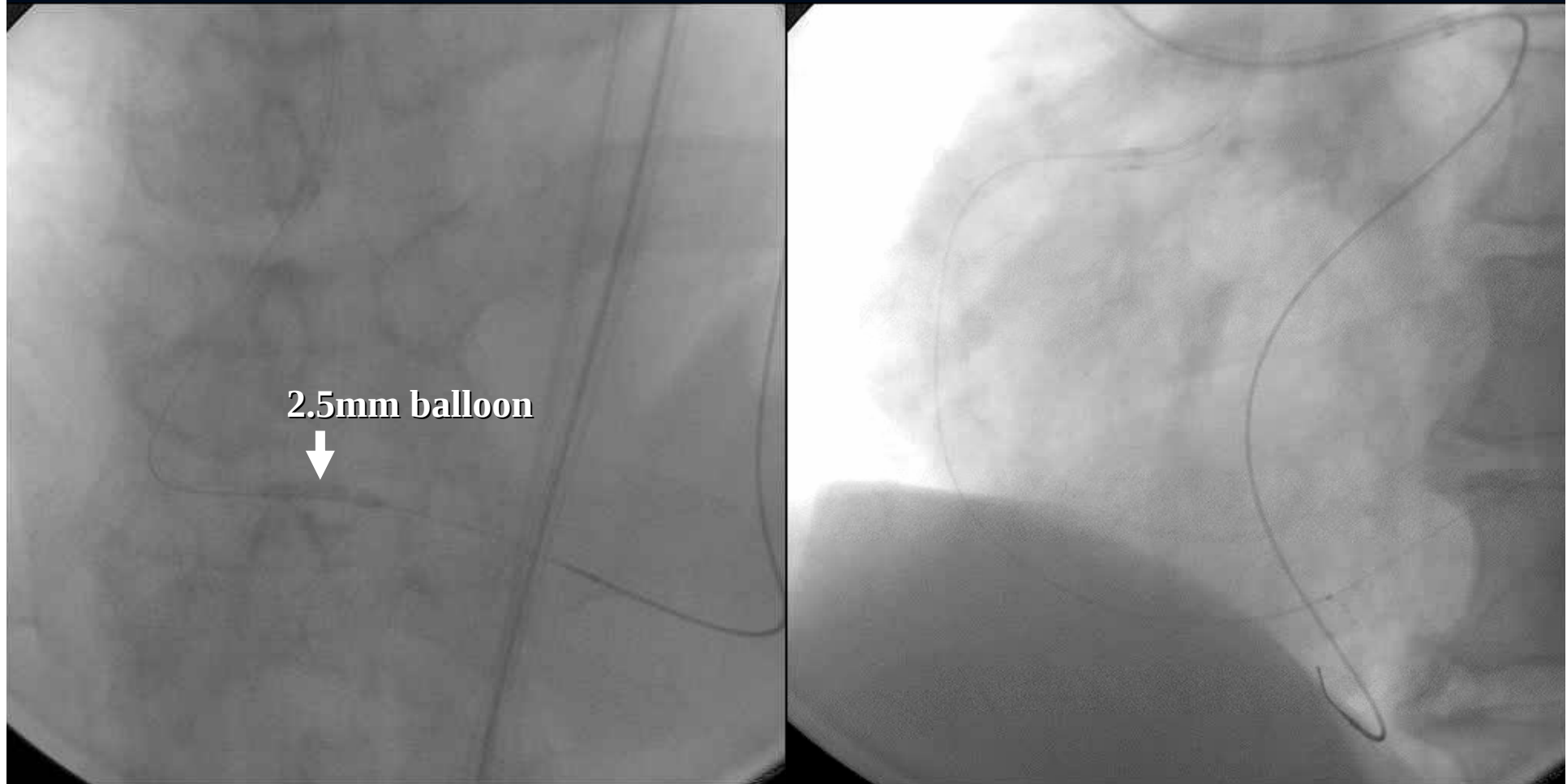


Antegrade ballooning under the reverse 300cm wire

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Use of 300 cm Wire





No injury in the septal channel



The Advantage of Corsair

For Channel Tracking

- Excellent cross-ability through collateral channel
- No need of channel dilatation
- Less channel injury
- Expanded indication for epicardial channel

For Retrograde Wiring of CTO

- Excellent support for wire manipulation
- Good cross-ability into/through the occlusion
- Enabled usage of 300cm wire or snare wire



Registry Data of Corsair



- 2007/9~2008/9
- 2Drs (Kato 2007/9~, Tsuchikane 2008/5~)
- 180 CTO attempted, 176 procedural success (97.8%)
- 124 CTO attempted by retrograde approach
- 114 CTO with successful channel crossing (91.9%)
- Corsair was used in 93 CTO with successful channel crossing



Registry Data of Corsair

- N=93
- Reattempt 61 (65.6%)
- RCA 74 (79.6%), LMT 1, LAD 15, LCx 3
- SVG 2, epicardial 14, septal 77

- Channel crossing success: 90 (96.8%)
- Retrograde procedural success: 92 (98.9%)

- Successful access into CTO with Corsair: 85/90 (94.4%)
- Successful crossing CTO with Corsair: 63/90 (70.0%)



Registry Data of Corsair

Matched Case Controlled Study

■ Control: 93CTO with successful channel crossing before Corsair era

	Control	Corsair	P value
Male	84.9%	86.0%	n.s.
Age (y.o.)	62±9	63±9	n.s.
Prior MI	57.0%	59.1%	n.s.
Prior CABG	9.7%	10.8%	n.s.
Multivessel	67.7%	69.9%	n.s.
HT	60.2%	59.1%	n.s.
DM	38.7%	37.6%	n.s.
HL	54.8%	57.0%	n.s.
H/O smoking	44.1%	47.3%	n.s.



Registry Data of Corsair

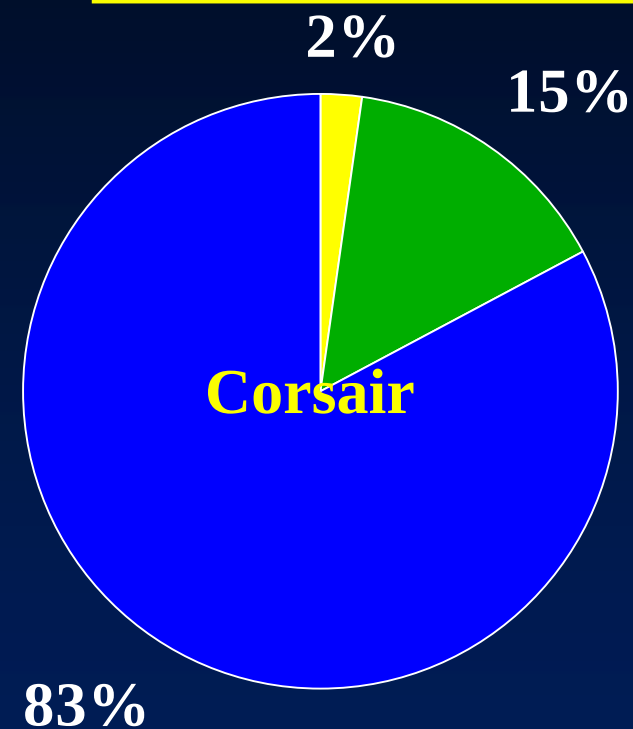
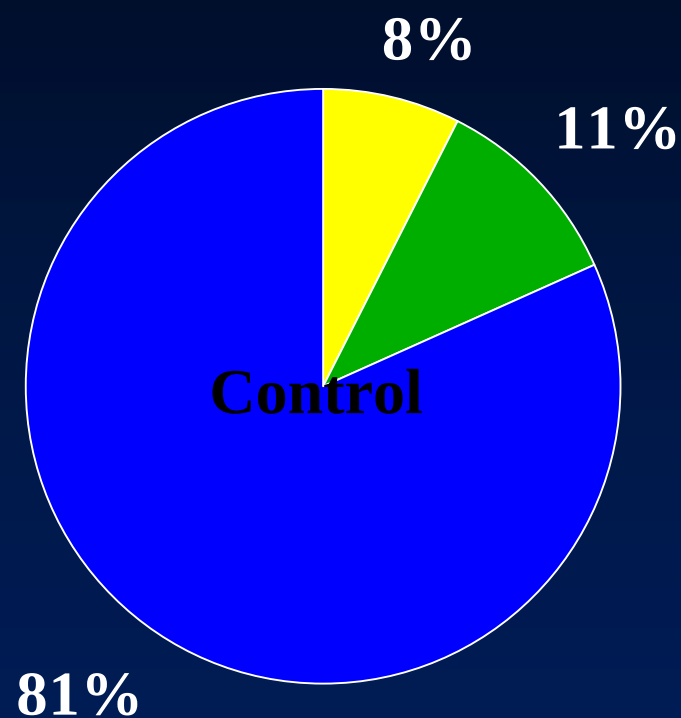
Matched Case Controlled Study

■ Control: 93CTO with successful channel crossing before Corsair era

	Control	Corsair	P value
De novo	96.8%	97.8%	n.s.
Calcified	55.9%	60.2%	n.s.
Vessel tortuosity	31.2%	32.3%	n.s.
Occlusion bend	25.8%	29.0%	n.s.
Reference (mm)	3.02 ± 0.21	3.00 ± 0.23	n.s.
Occlusion length (mm)	30.9 ± 9.8	32.4 ± 10.2	n.s.
Unknown or >1yr occlusive duration	89.2%	91.3%	n.s.



Registry Data of Corsair



SVG



epicardial



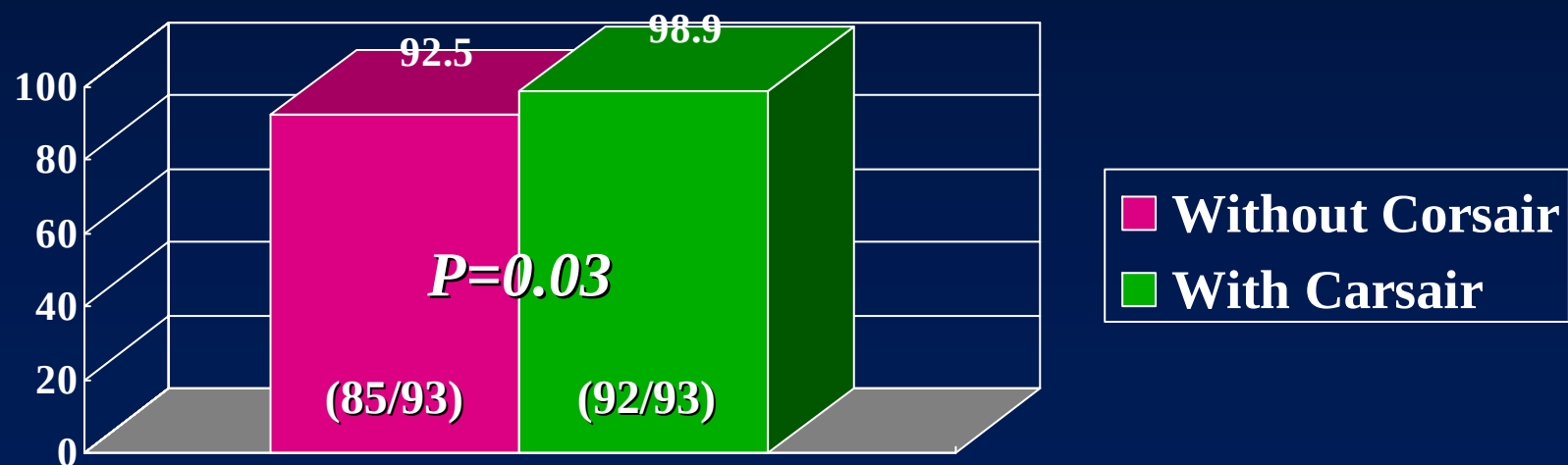
septal



Registry Data of Corsair

Matched Case Controlled Study

■ Procedural success rate





Registry Data of Corsair

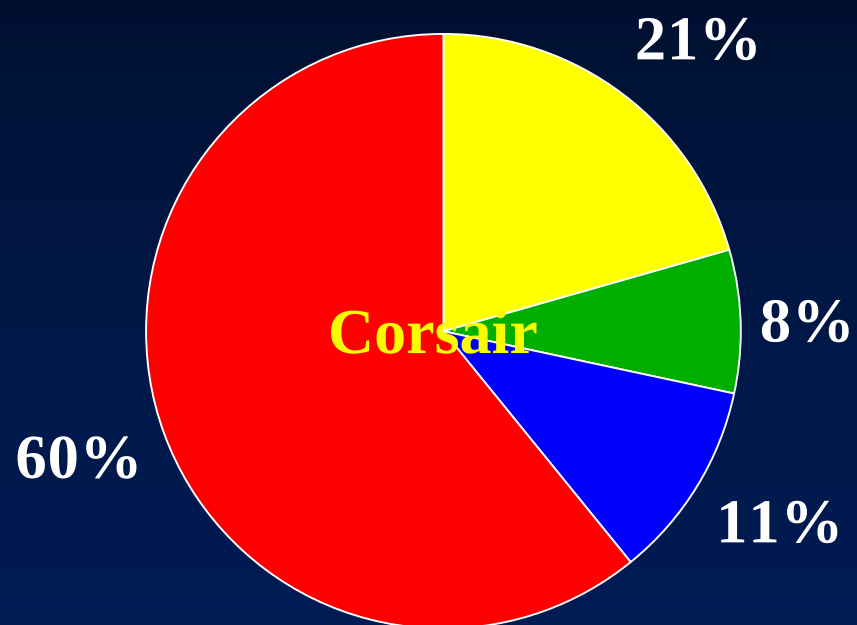
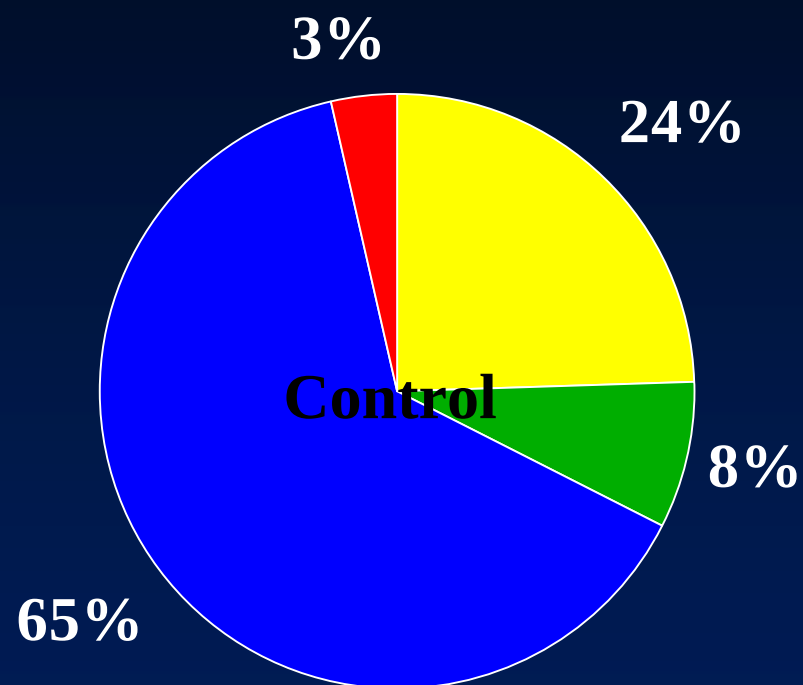
Matched Case Controlled Study

■ Reasons for failure

	Control	Corsair
Catheter not crossed through channel	4	0
Retro-wire not advanced into CTO	4	1



Registry Data of Corsair



 Retrograde wire crossing
 CART

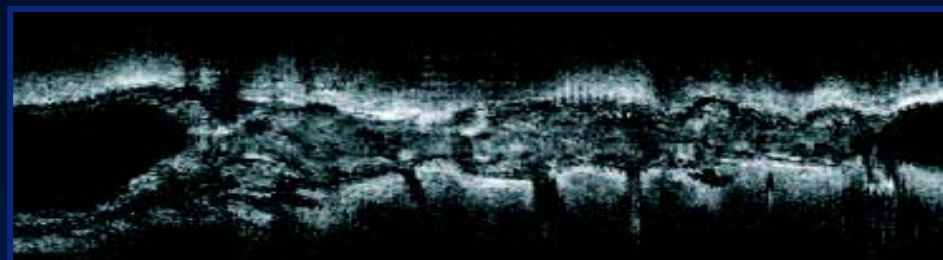
 Bilateral wire alone (kissing, knuckle)
 Reverse CART



Conclusions

- New wire technology enables us to try a new antegrade wiring strategy.
- Development of new CTO device will simplify and facilitate the successful procedure in the retrograde approach.

11th CTO Club



June 12-13, 2009, Toyohashi, Japan

www.cct.gr.jp/ctoclub