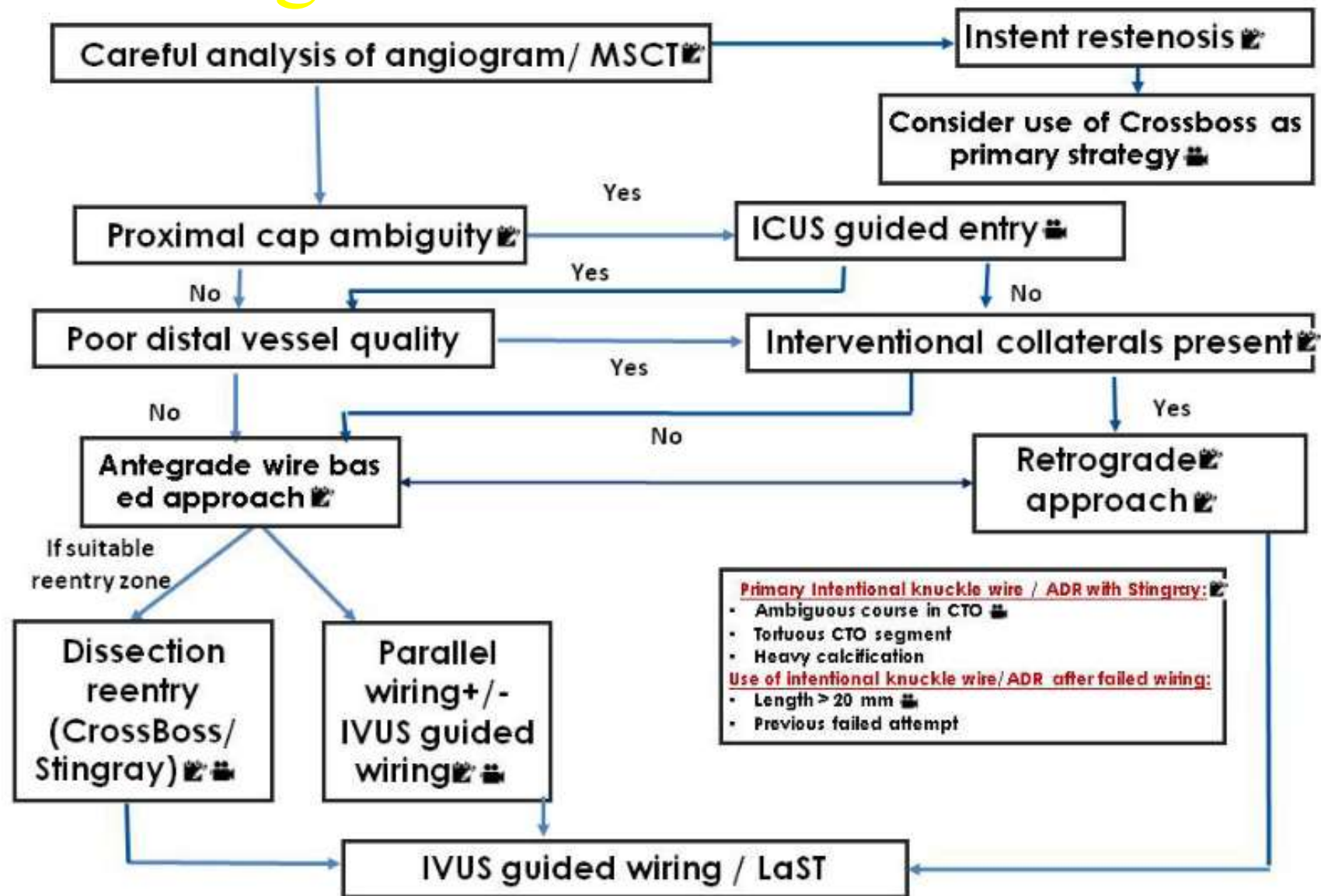


# Ten tips of PCI for CTO

**Toshiya Muramatsu**

**Tokyo General Hospital**

# Algorithm of Asia CTO club

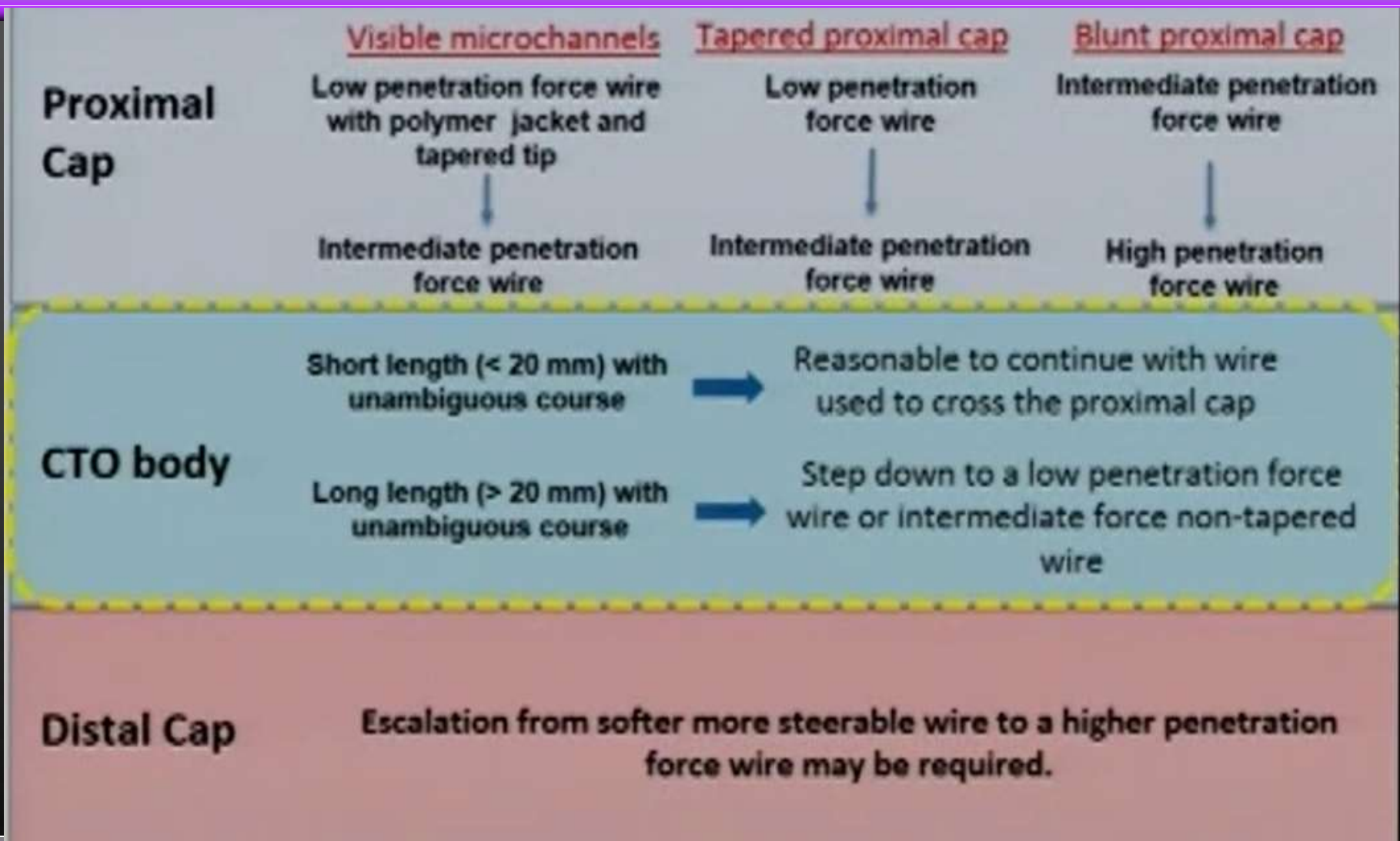


Consider stopping if > 3 hr; 3.7x eGFR ml contrast; Air Kerma > 5 Gy unless procedure well advanced.

# Antegrade approach of CTO

- **Analysis and reading of CTO anatomy**
- **Progress of CTO Guidewire**
  - Polymerjacket Guidewire**
  - New inovative Guidewire**
- **Paralell wire technique**

# Antegrade wire based approach



# Antegrade approach of CTO

- Analysis and reading of CTO anatomy
- Progress of CTO Guidewire
  - Polymerjacket Guidewire
  - New inovative Guidewire
- Paralell wire technique

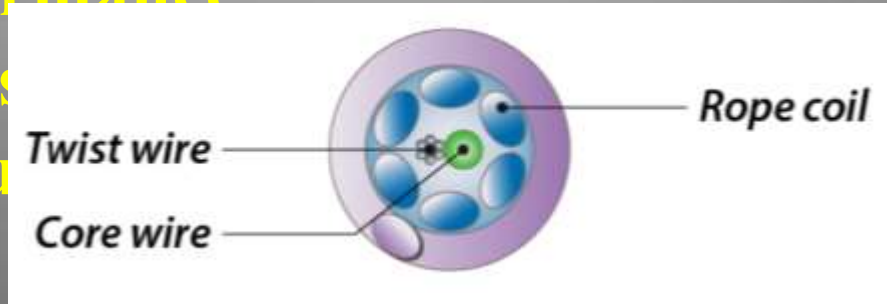
# Characteristics of GW structure

- Shaft performance

Core size

- Coil structure

Rope length



- Tip design

Tapered, tip coating

- Tip load

0.3g~12g

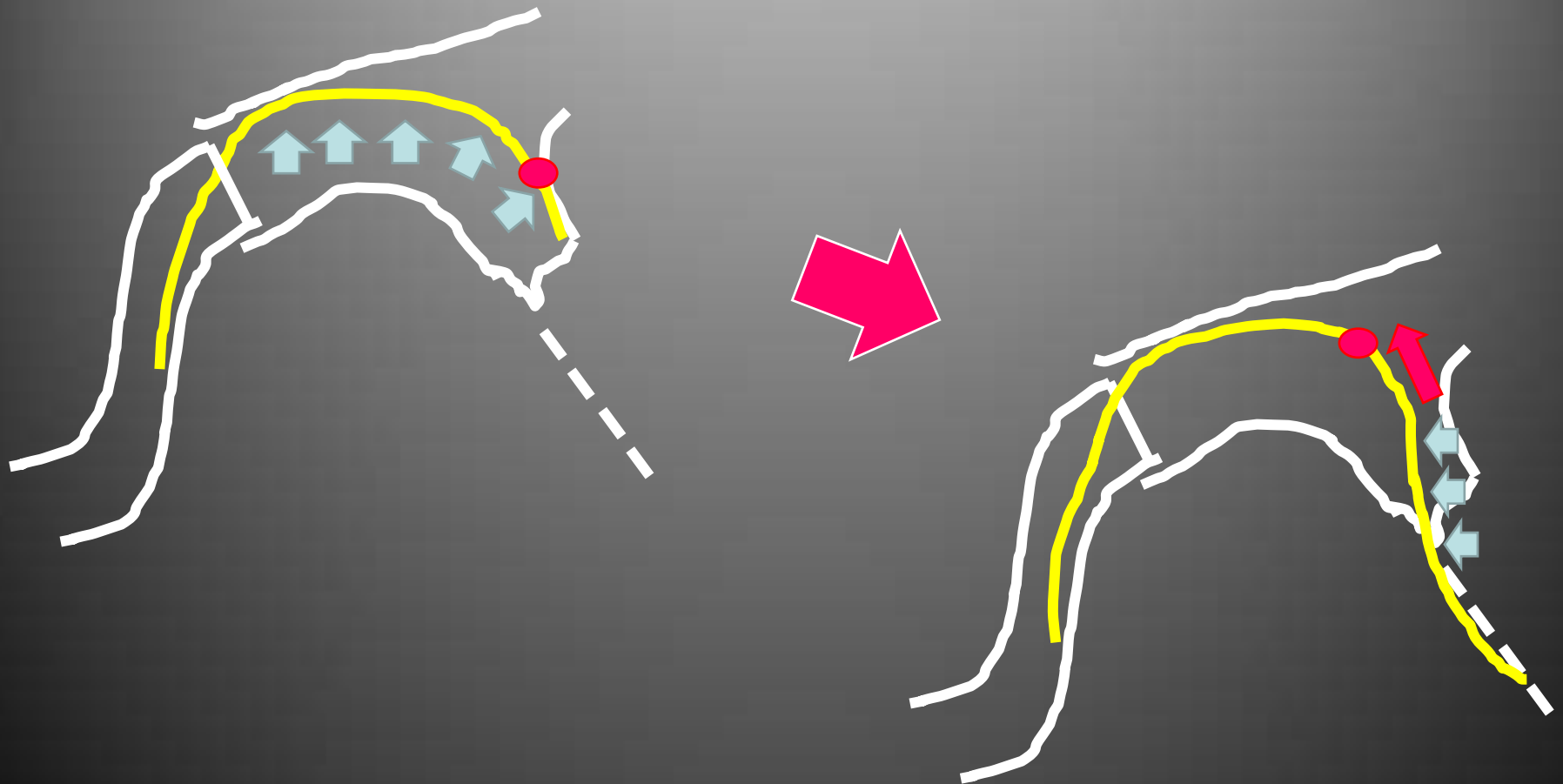
- Coating

hydrophilic, slip coating, silicon coating  
polymerjacket coating

# Role of Polymerjacket wire



# Control of Polymerjacket wire





# Antegrade approach of CTO

- Analysis and reading of CTO anatomy
- Progress of CTO Guidewire
  - Polymerjacket Guidewire
  - New inovative Guidewire
- Paralell wire technique



# ASAHI Gaia Next

PTCA GUIDE WIRE

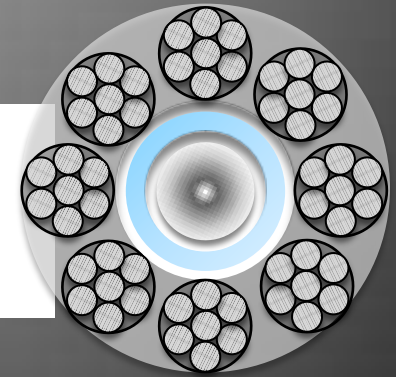
ASAHI Gaia Next in-service Manual ver.1

Document number: AMC-P16055

# Characteristics of Gaia Next

## XTRAND coil

- ✓ Decreased breakage risk within the occlusion
- ✓ Improved resistance in case of trapping into the lesion
- ✓ Increased torque via counter clockwise rotation



ASAHI Gaia Next 1	2.0gf	0.36mm/0.27mm (0.014inch/0.011inch)
-------------------	-------	-------------------------------------

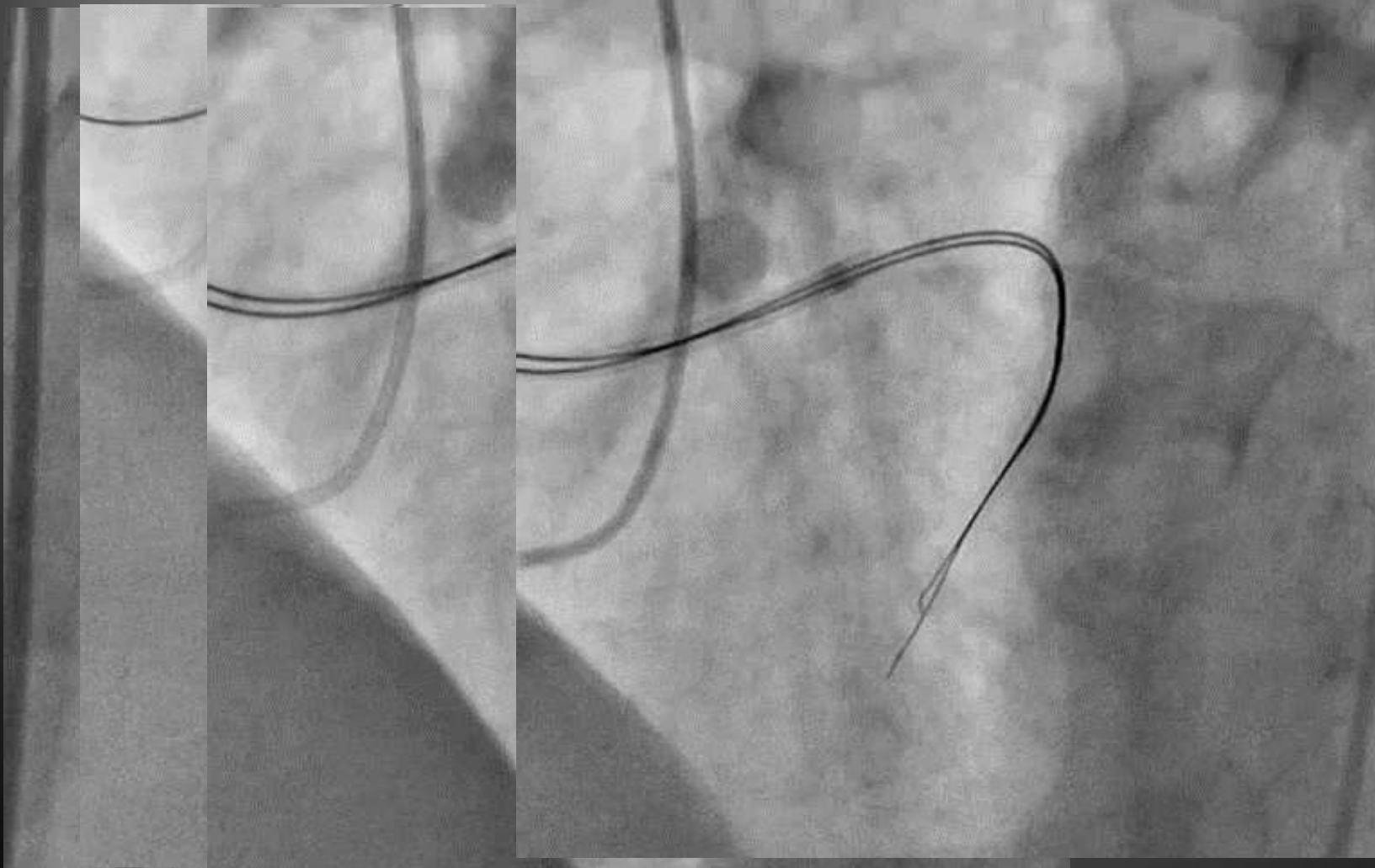
ASAHI Gaia Next 2	4.0gf	0.36mm/0.30mm (0.014inch/0.012inch)
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ASAHI Gaia Next 3	6.0gf	0.36mm/0.30mm (0.014inch/0.012inch)
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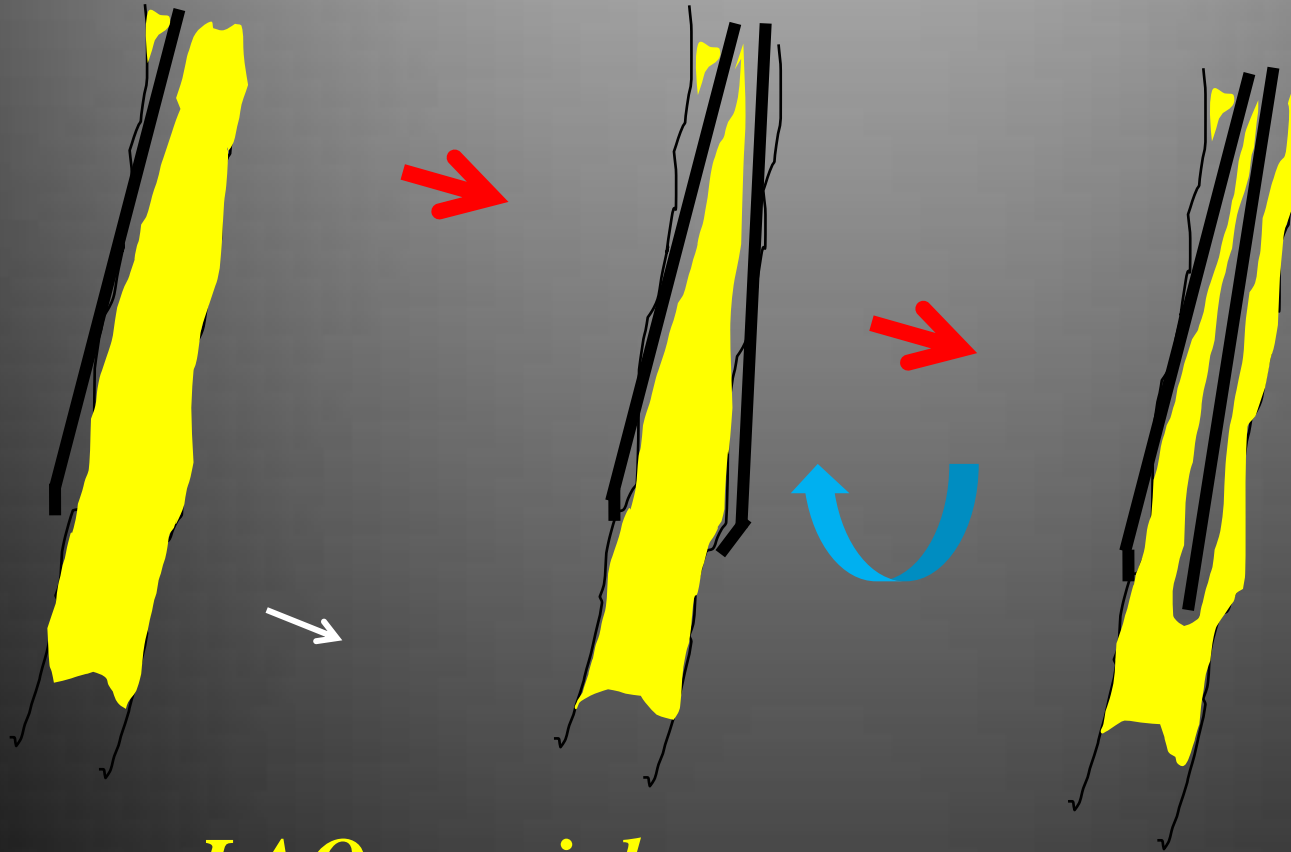
# Antegrade approach of CTO

- **Analysis and reading of CTO anatomy**
- **Progress of CTO Guidewire**
  - Polymerjacket Guidewire**
  - New inovative Guidewire**
- **Paralell wire technique**

# *Theory of parallel wire of CTO image*



# *Theory of reconstruction of 3-D CTO image*

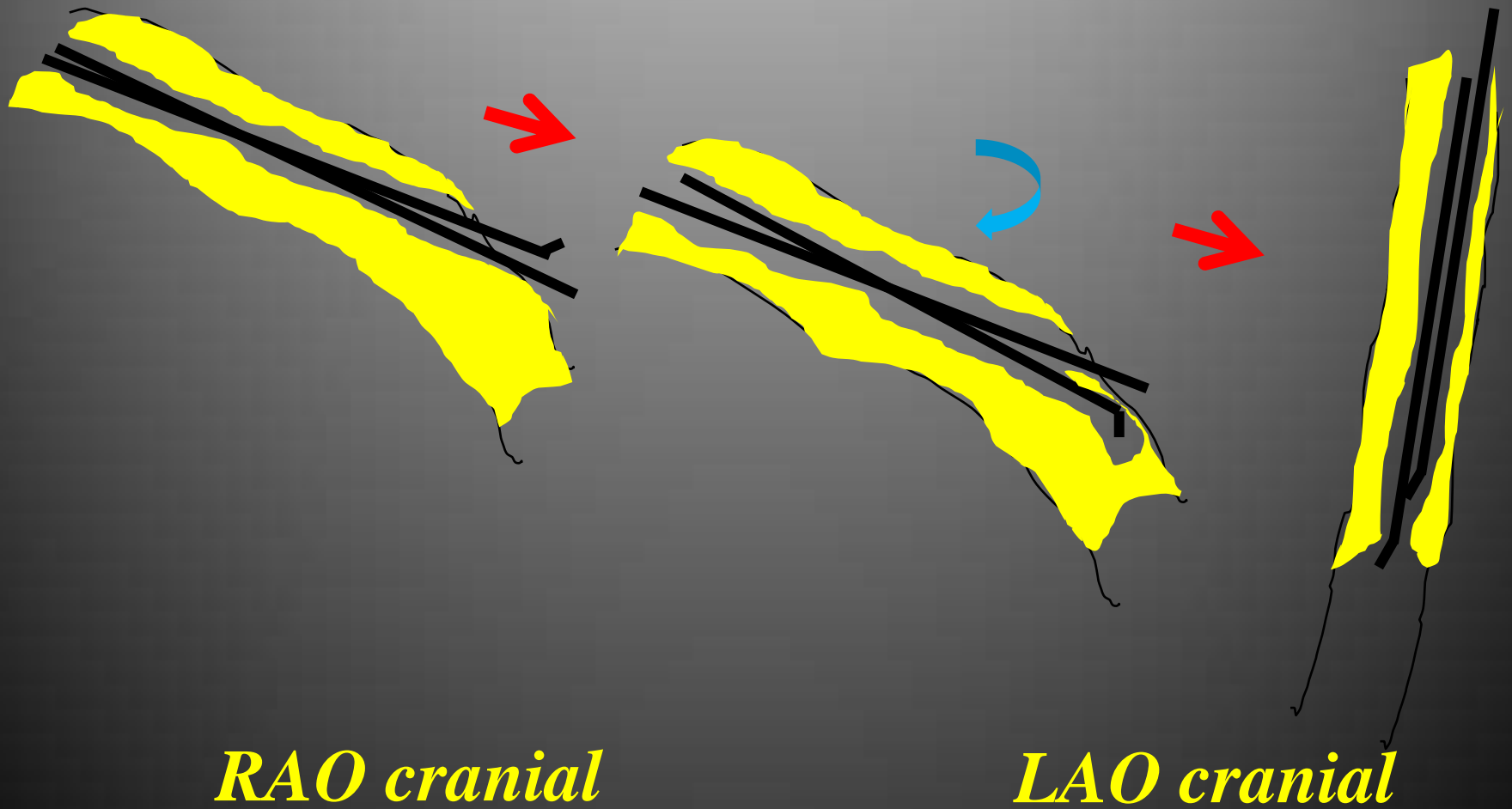


*LAO cranial*

# *Theory of parallell wire of CTO image*



# *Theory of parallel wire of CTO image*

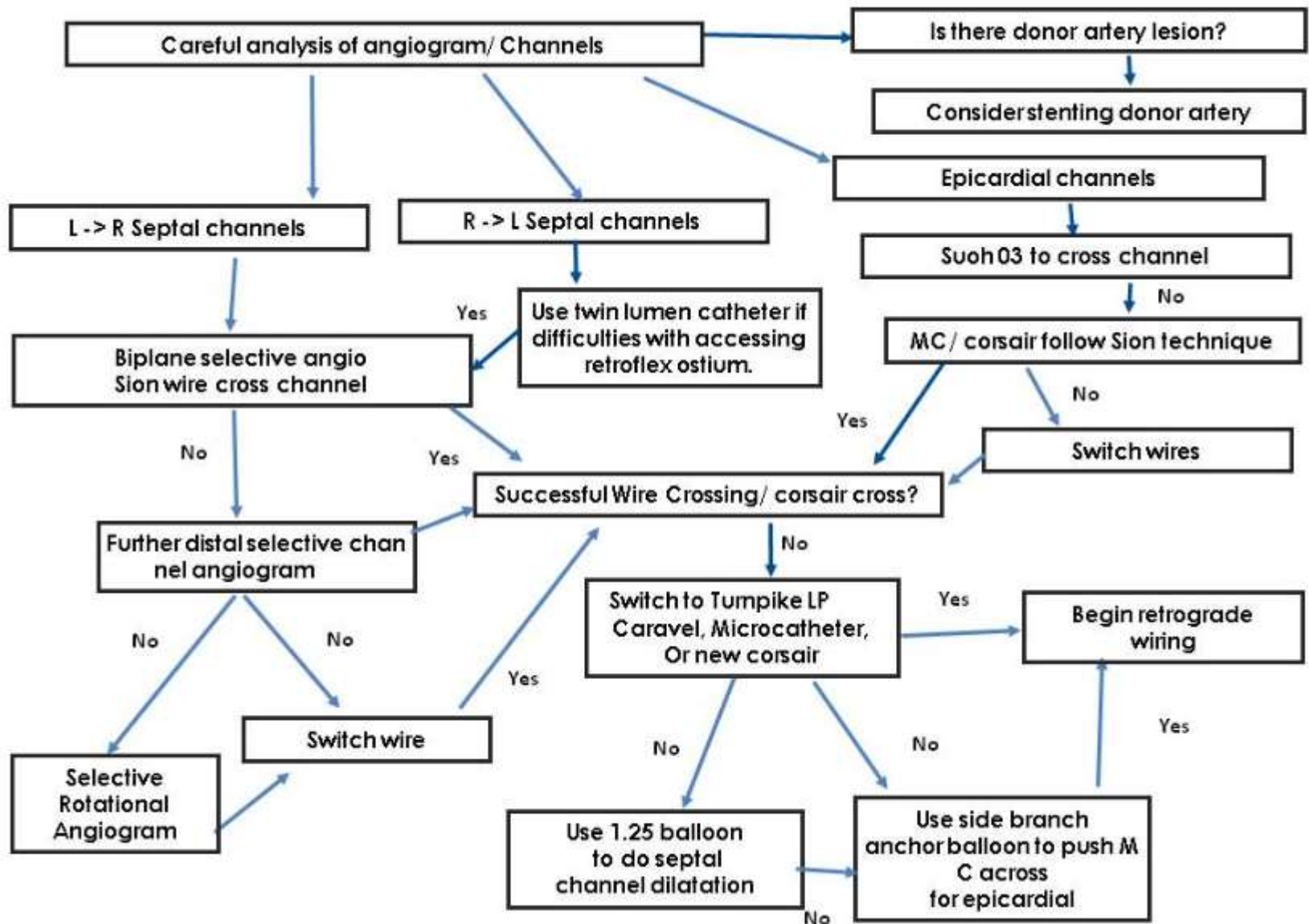




# Retrograde approach of CTO

- **Collateral channel crossing**
  - Septal channel classification**
  - Epicardial channel GW choice**
- **CTO crossing**
  - IVUS evaluation**
  - r-CART**
  - Knuckle wire technique**
- **Subintimal stenting**

# Retrograde Channel crossing



# Retrograde Channel crossing

1<sup>st</sup> choice  
Septal

Careful reading angiogram

2<sup>nd</sup> choice  
Epicardium

Conventional wire into channel ostium

Suoh 03→Sion  
with Caravel, Corsair

Tip injection confirm blood through MC  
by negative pressure

Suoh 03→Sion black  
with Caravel, MC

Not cross

Not cross

cross

Tip injection or Guide injection back MC until main branch

cross

Change GW or another channel

GW cross but MC not cross

Change small MC or another channel

Surfin for tiny straight channel

No surfin

Change sion blue at distal entry point to proximal vessel

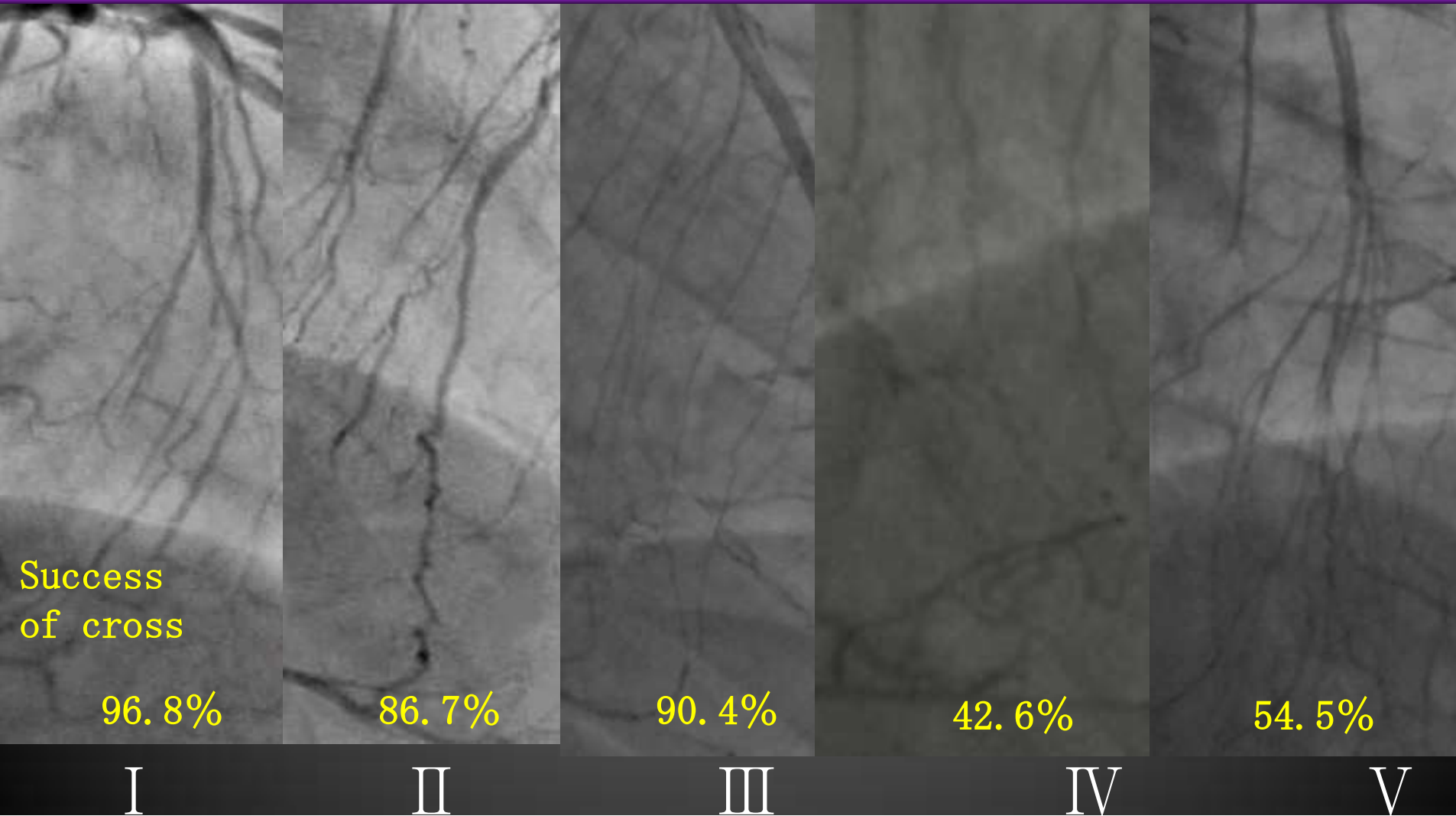
Retrograde CTO cross

# Classification of septal collateral way



	Channel size		V
Channel bent	1mm<	1mm>	
90 degree>	I	III	
90 degree<	II	IV	

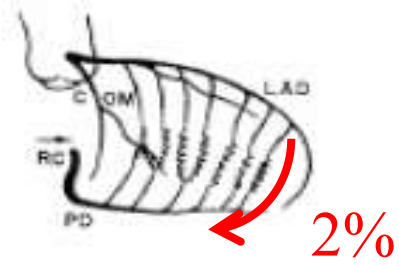
# Classification of septal collateral way



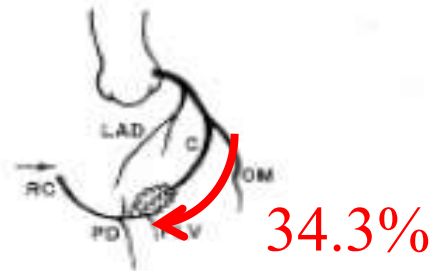
# Retrograde approach of CTO

- **Collateral channel crossing**
  - Septal channel classification
  - Epicardial channel GW choice
- **CTO crossing**
  - IVUS evaluation
  - r-CART
  - Knuckle wire technique
- **Subintimal stenting**

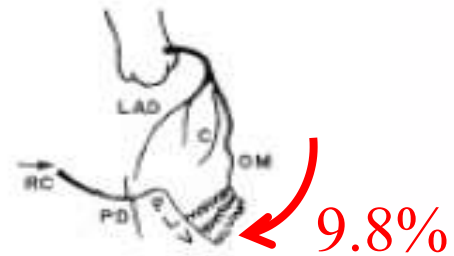
# Epicardial Collateral (RCA)



A. RAO-LC Injection (28)



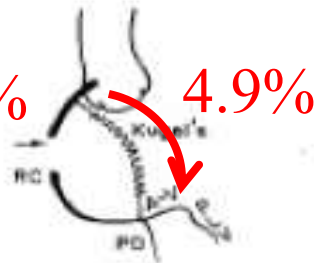
B. LAO-LC Injection (24)



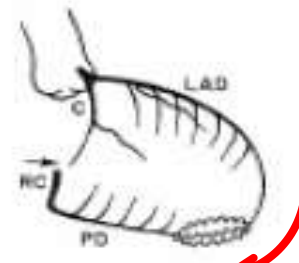
C. LAO-LC Injection (17)



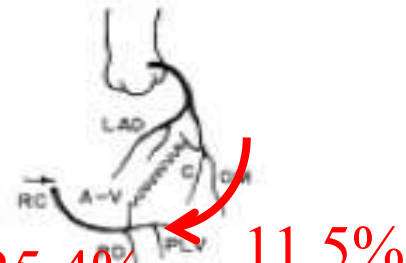
D. RAO-RC Injection (9)



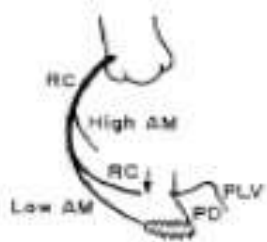
E. LAO-RC Injection (9)



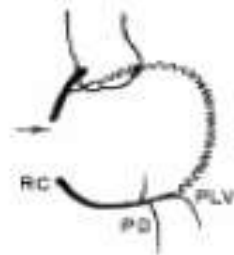
F. RAO-LC Injection (9)



G. LAO-LC Injection (6)



H. LAO-RC Injection (6)

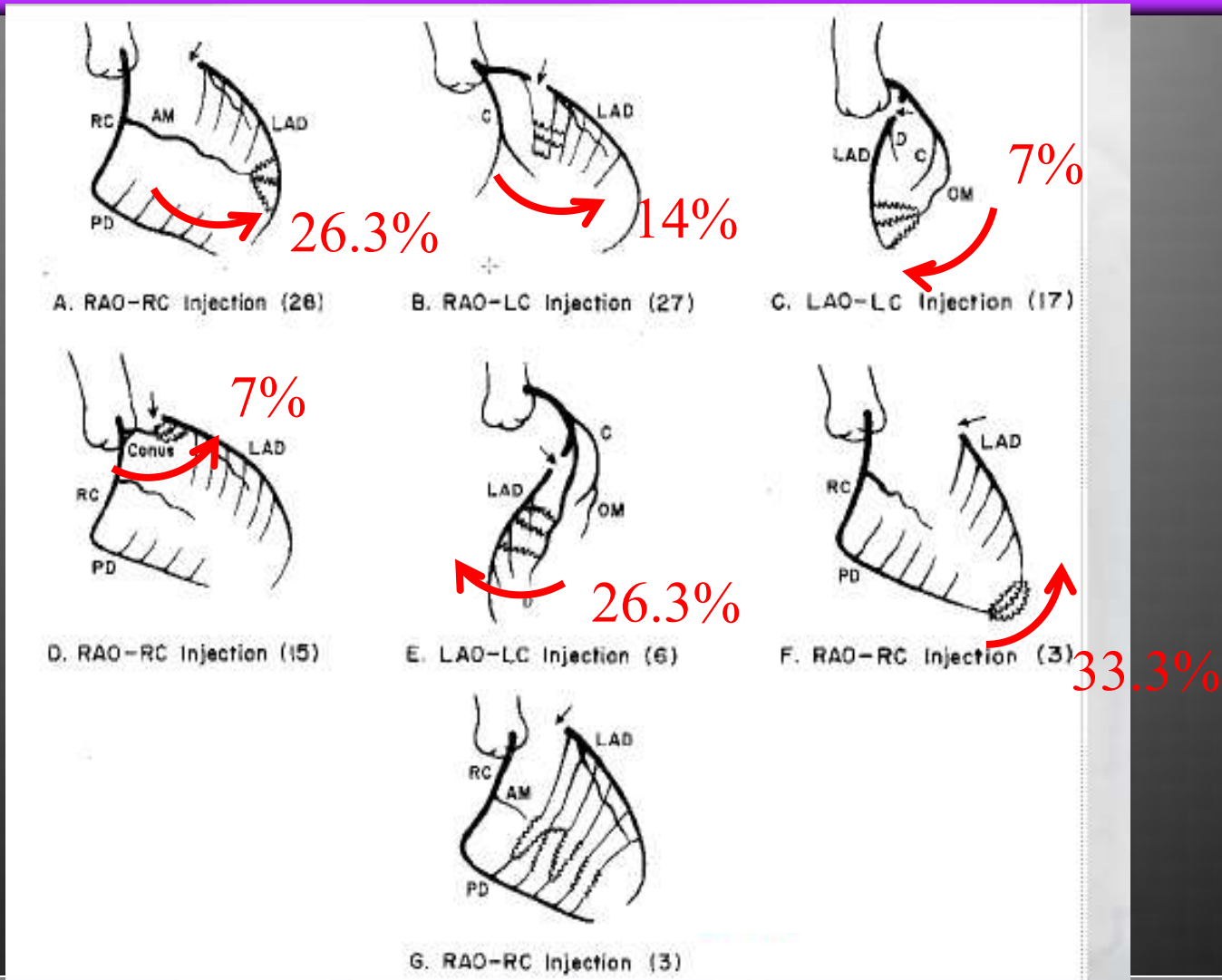


I. LAO-RC Injection (2)



J. LAO-LC Injection (2)

# Epicardial Collateral (LAD)



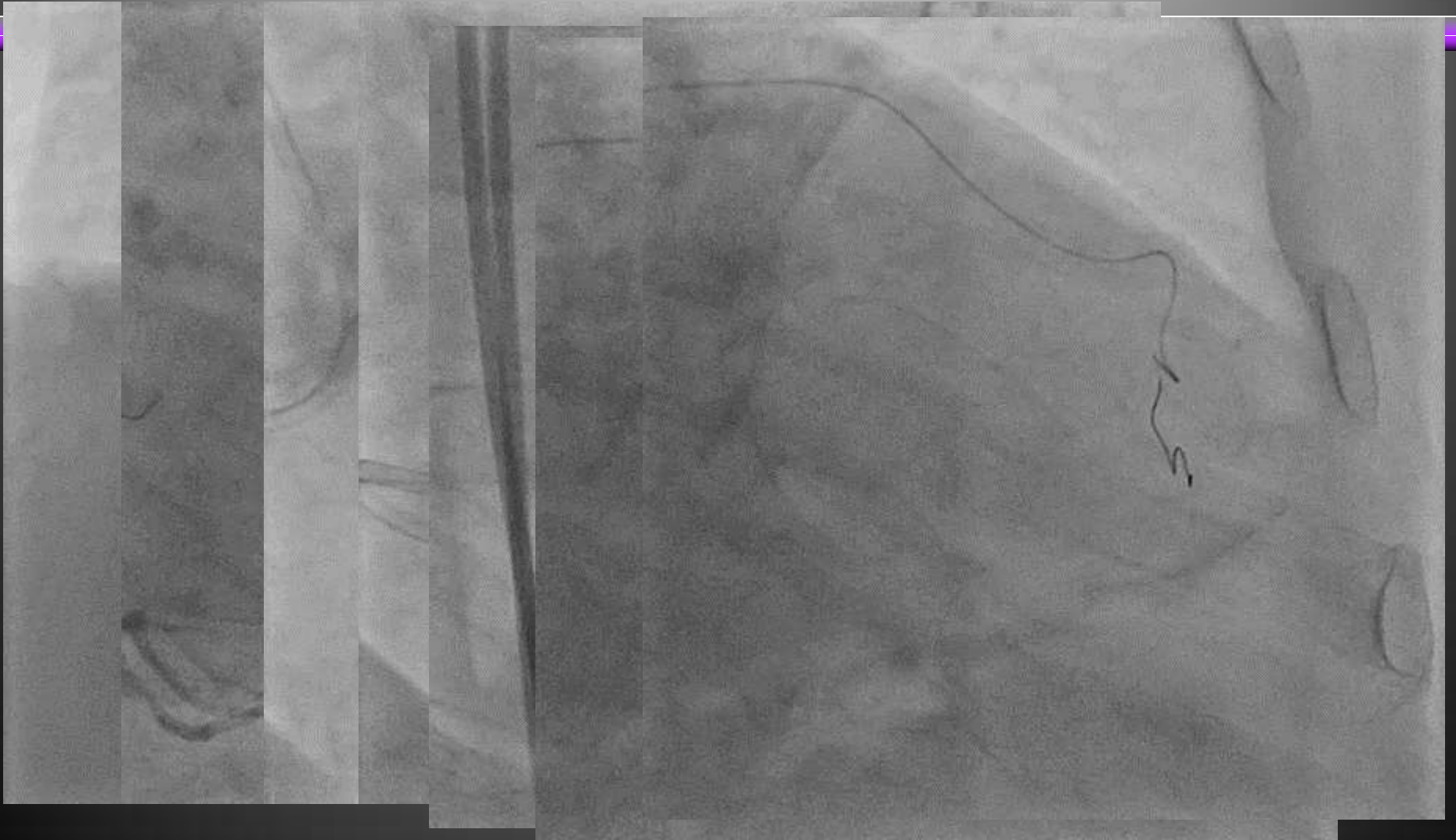


# *Suoh 03 guidewire*

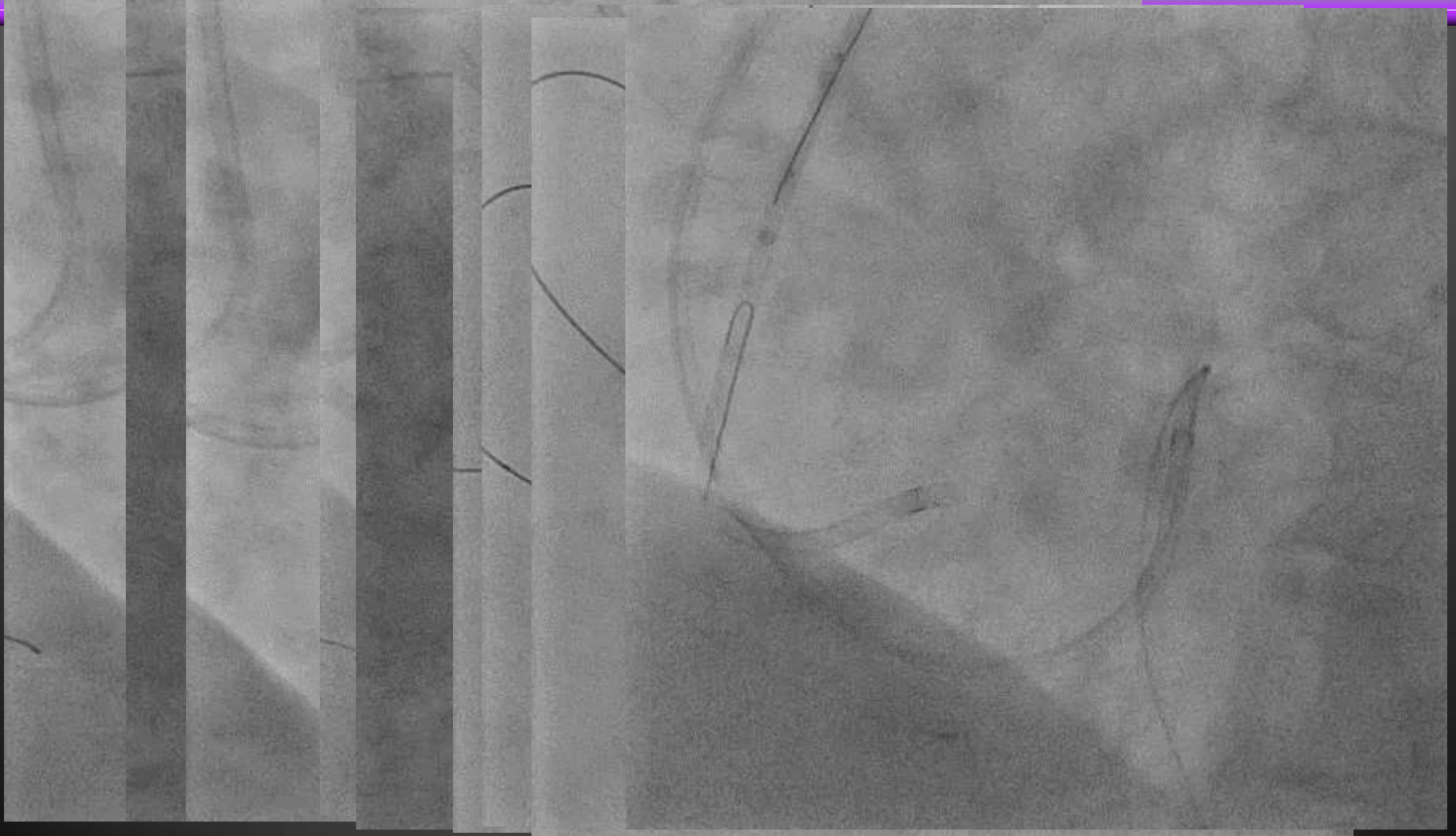


**rope coil / radiopacity 3cm**

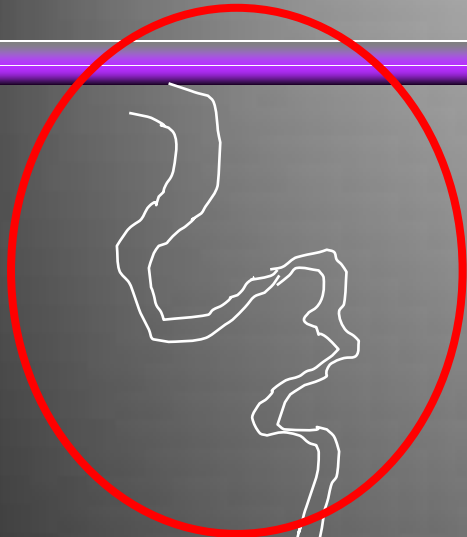
# Case of Suoh 03 GW+Caravell



# Case of Suoh 03 GW+Caravell



*Tokyo General Hospital*

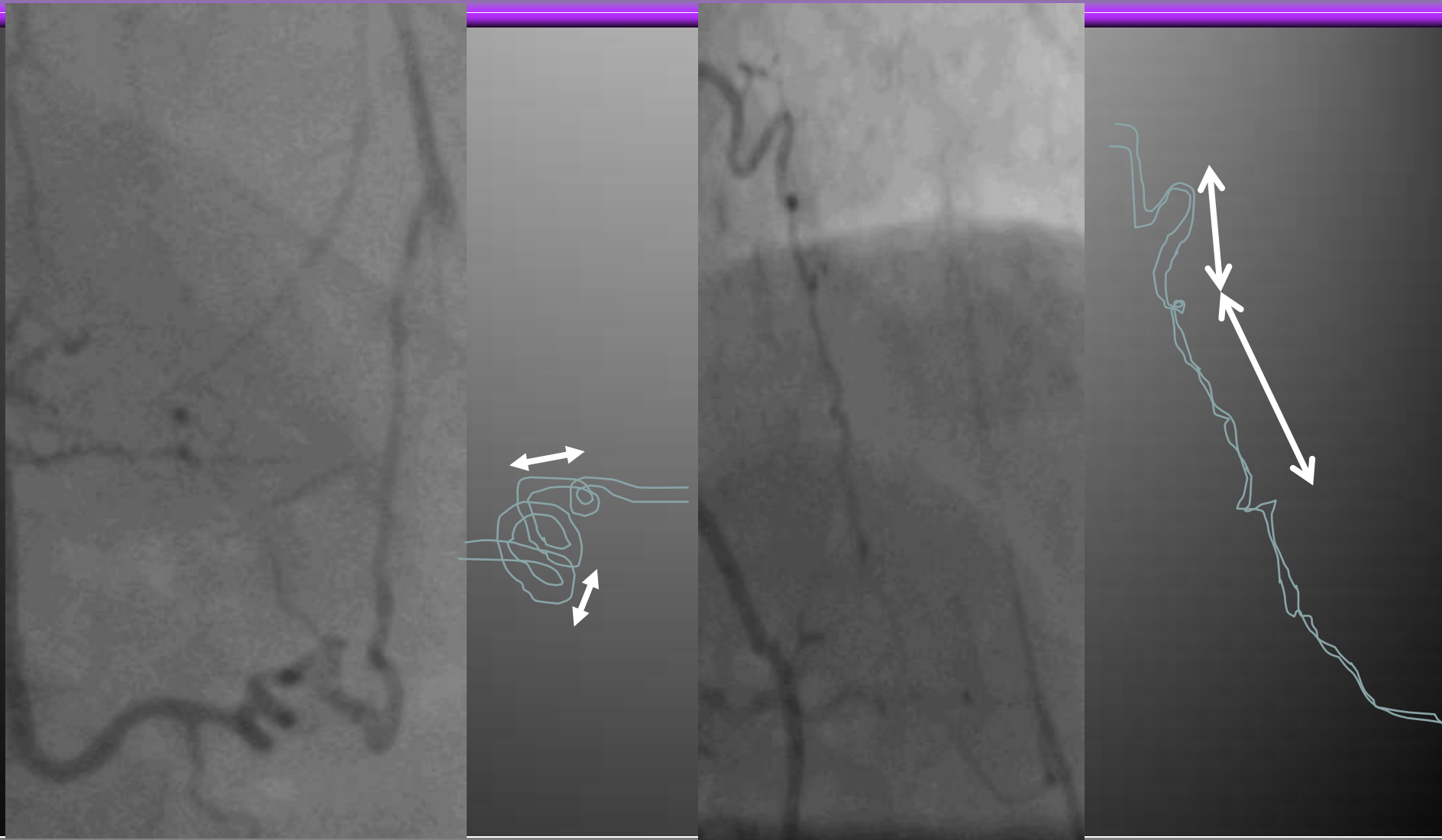


Suoh 03 GW

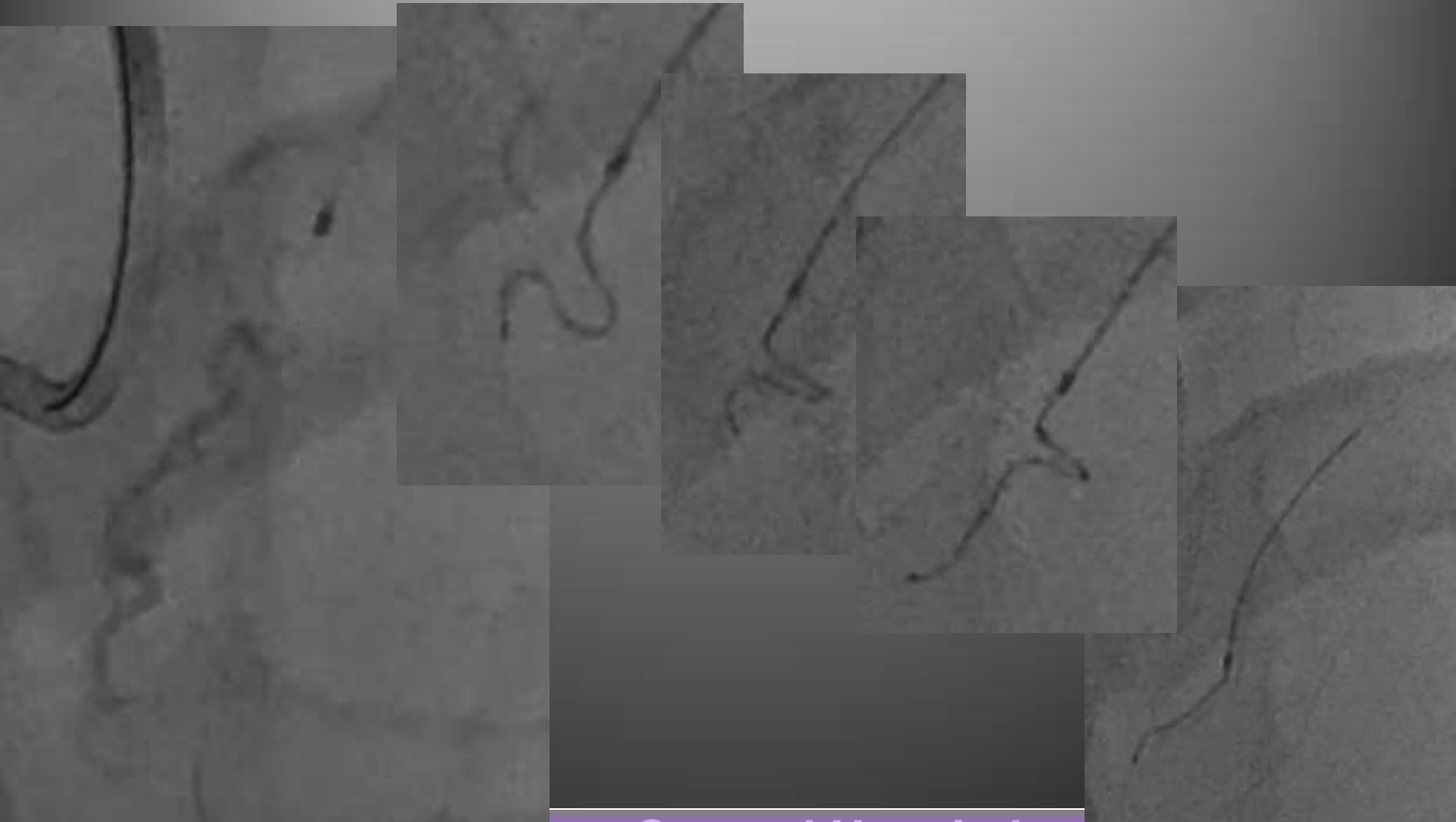
Suoh 03 GW



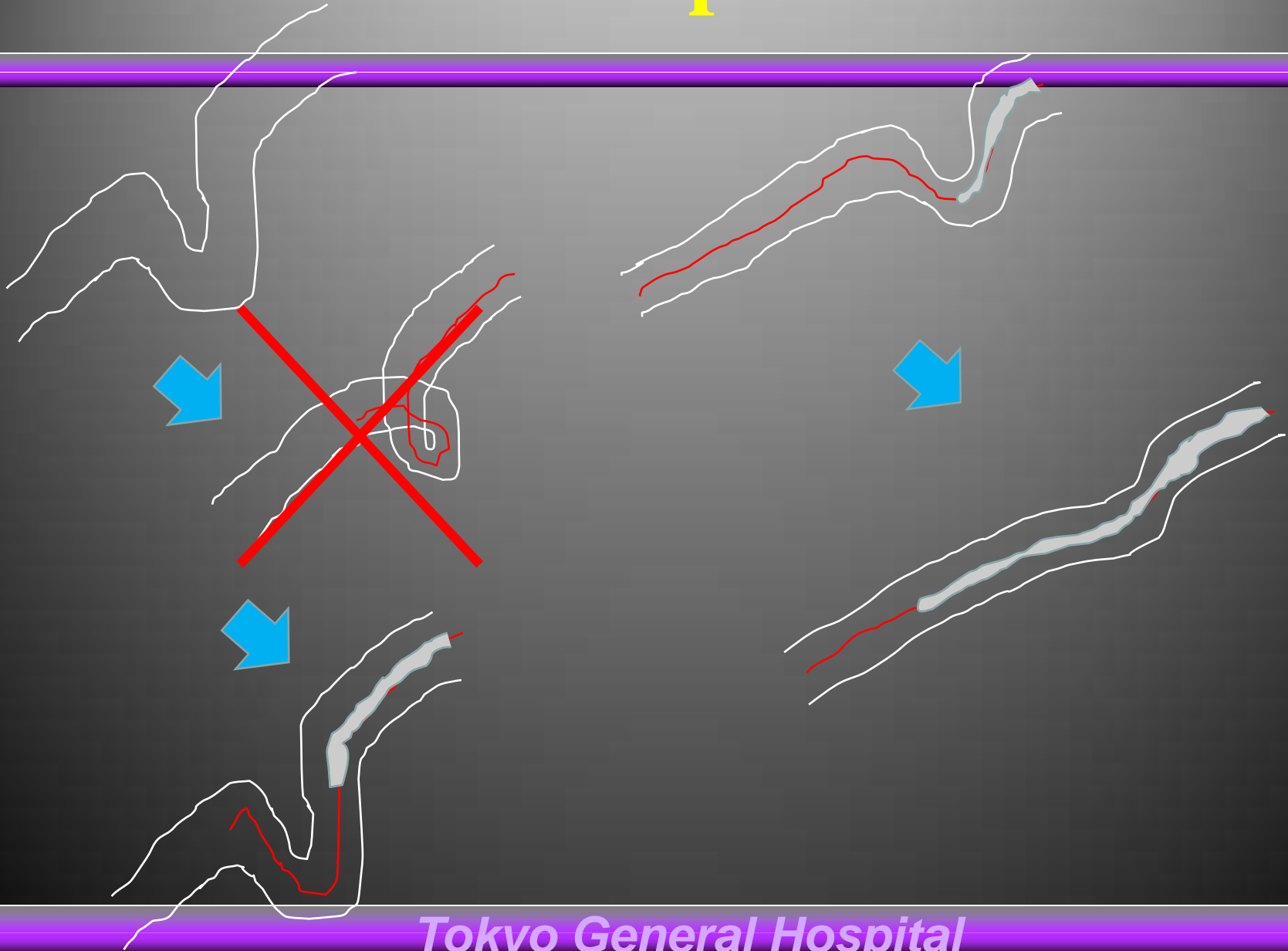
# How to choice epicardial channel



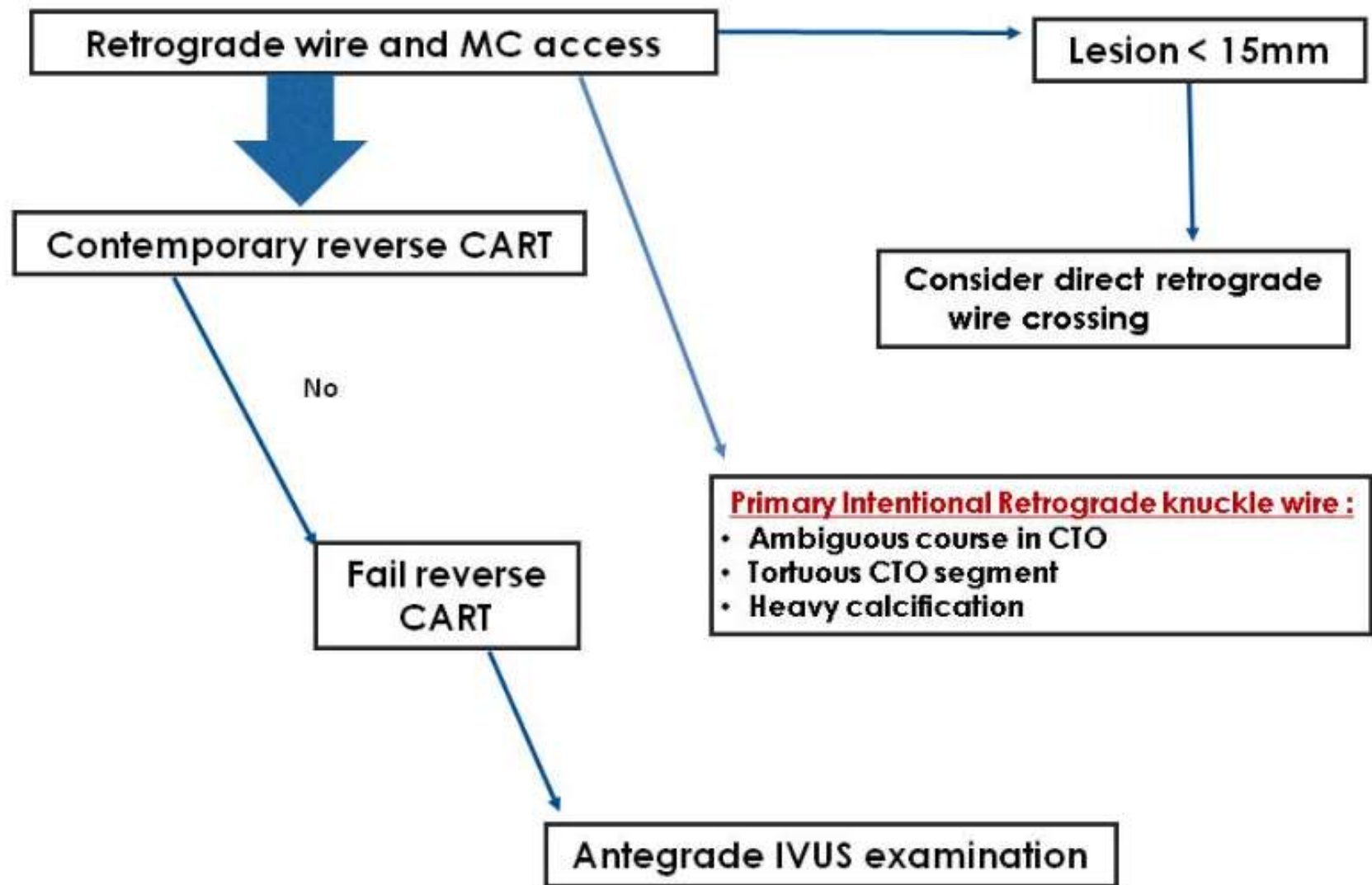
# How to choice epicardial channel



# How to choice epicardial channel

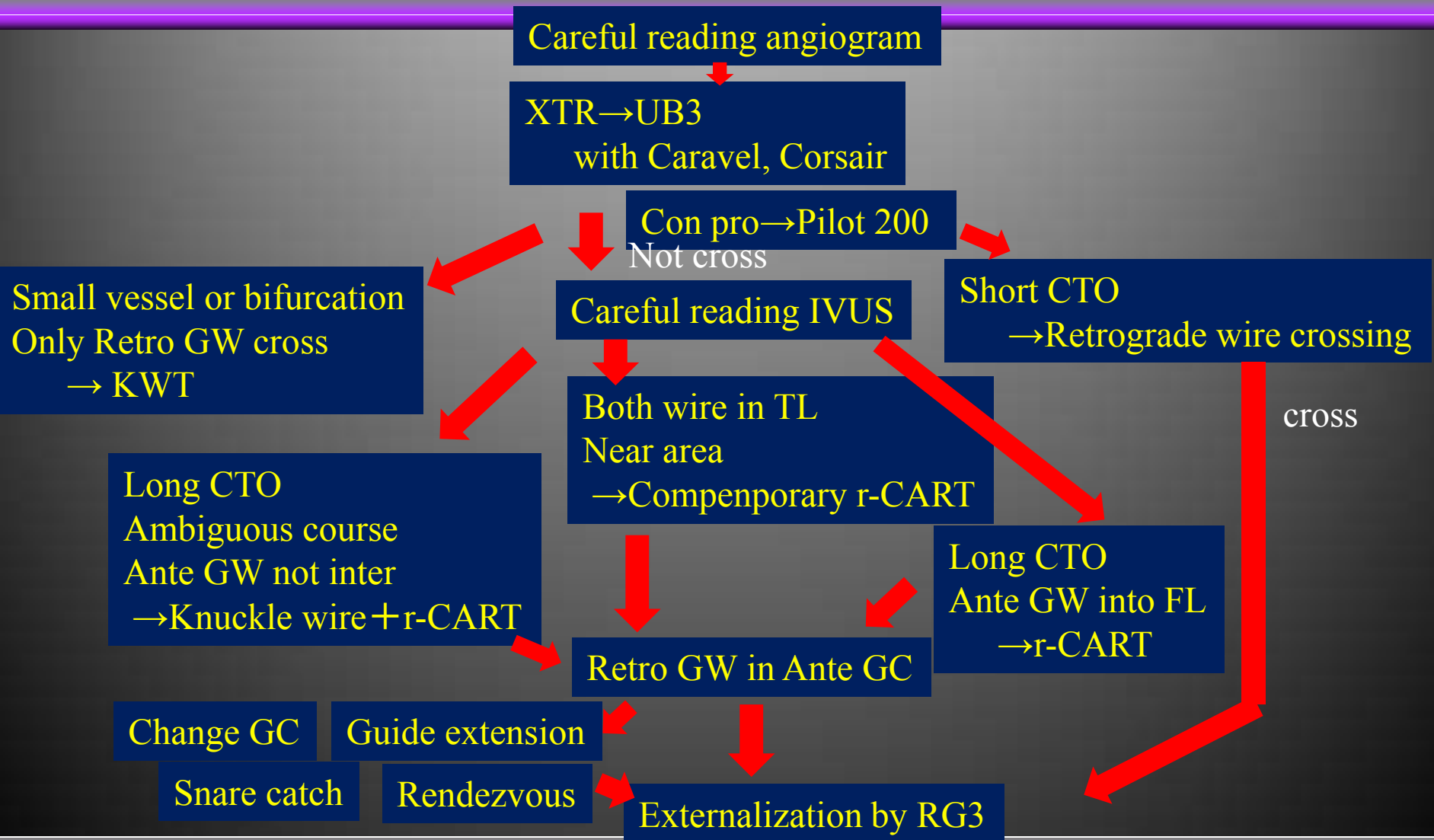


# Retrograde CTO crossing





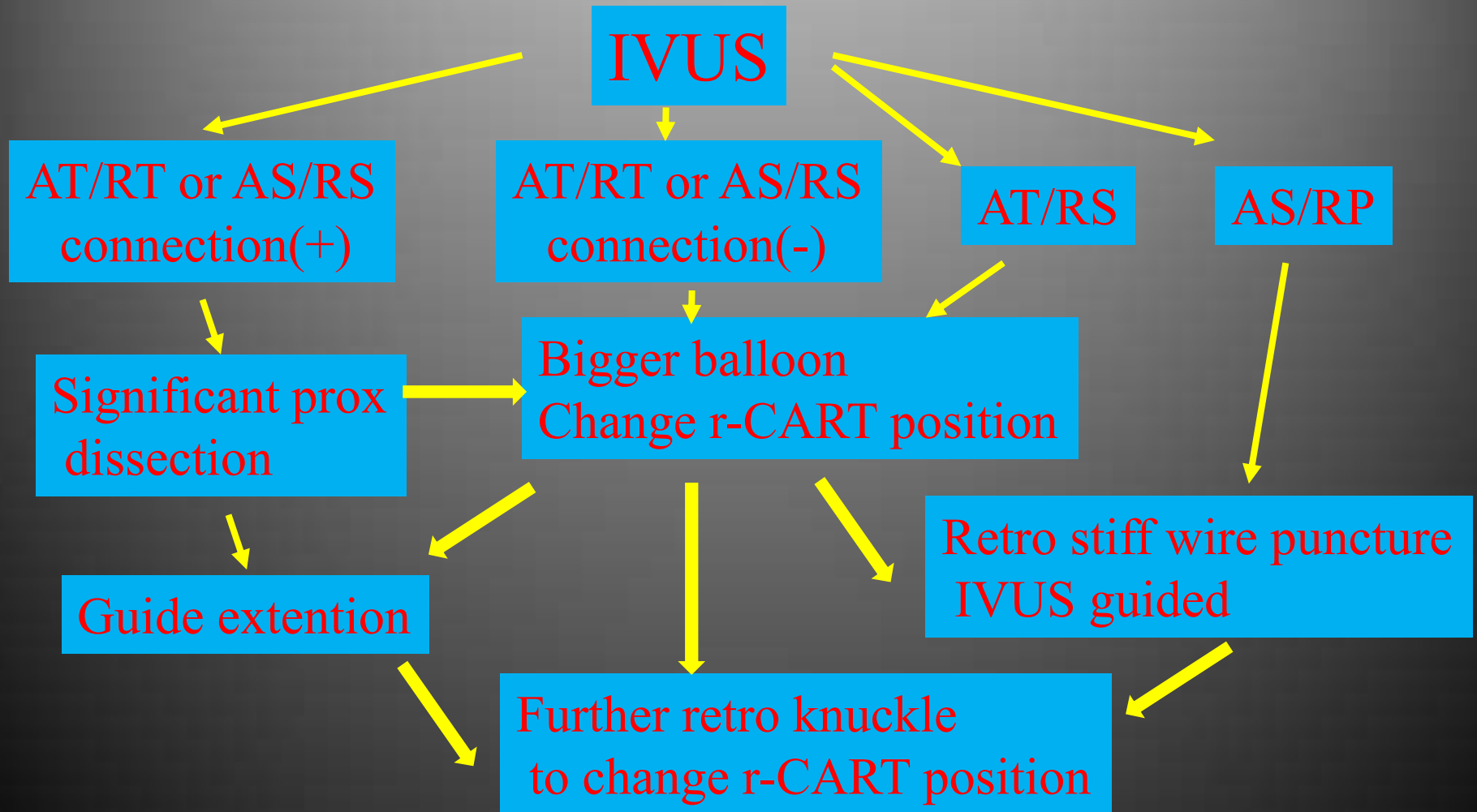
# Retrograde CTO crossing



# Retrograde approach of CTO

- Collateral channel crossing
  - Septal channel classification
  - Epicardial channel GW choice
- CTO crossing
  - IVUS evaluation
  - r-CART
  - Knuckle wire technique
- Subintimal stenting

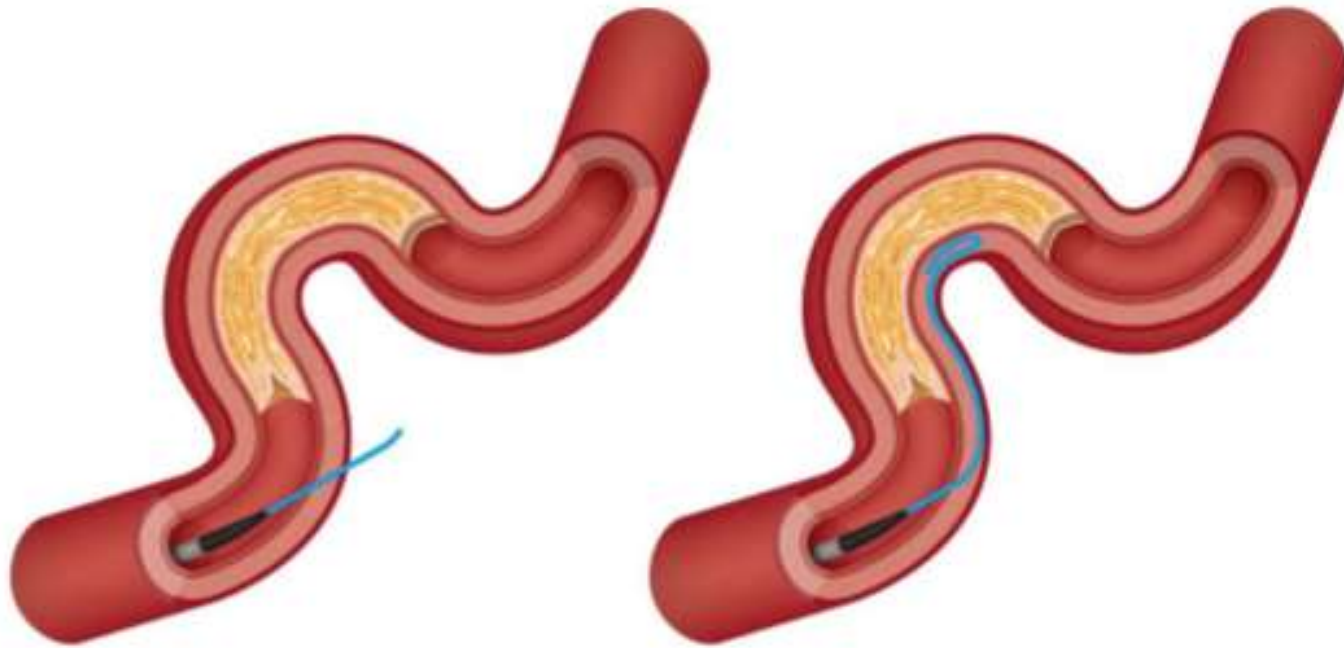
# Algorithm after r-CART failed



# Retrograde approach of CTO

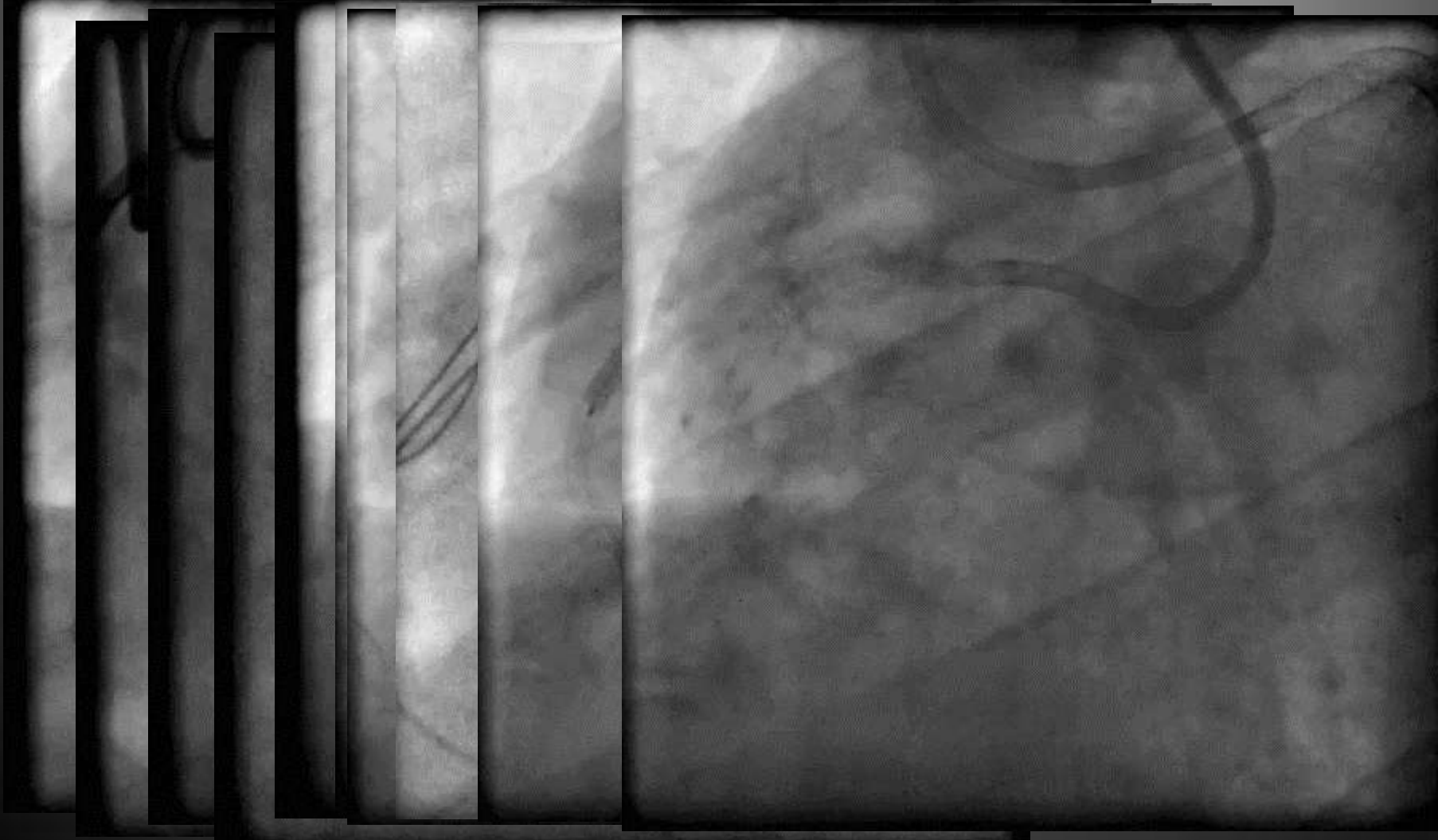
- **Collateral channel crossing**
  - Septal channel classification
  - Epicardial channel GW choice
- **CTO crossing**
  - IVUS evaluation
  - r-CART
  - Knuckle wire technique
- **Subintimal stenting**

## Straight vs. Knuckled wires

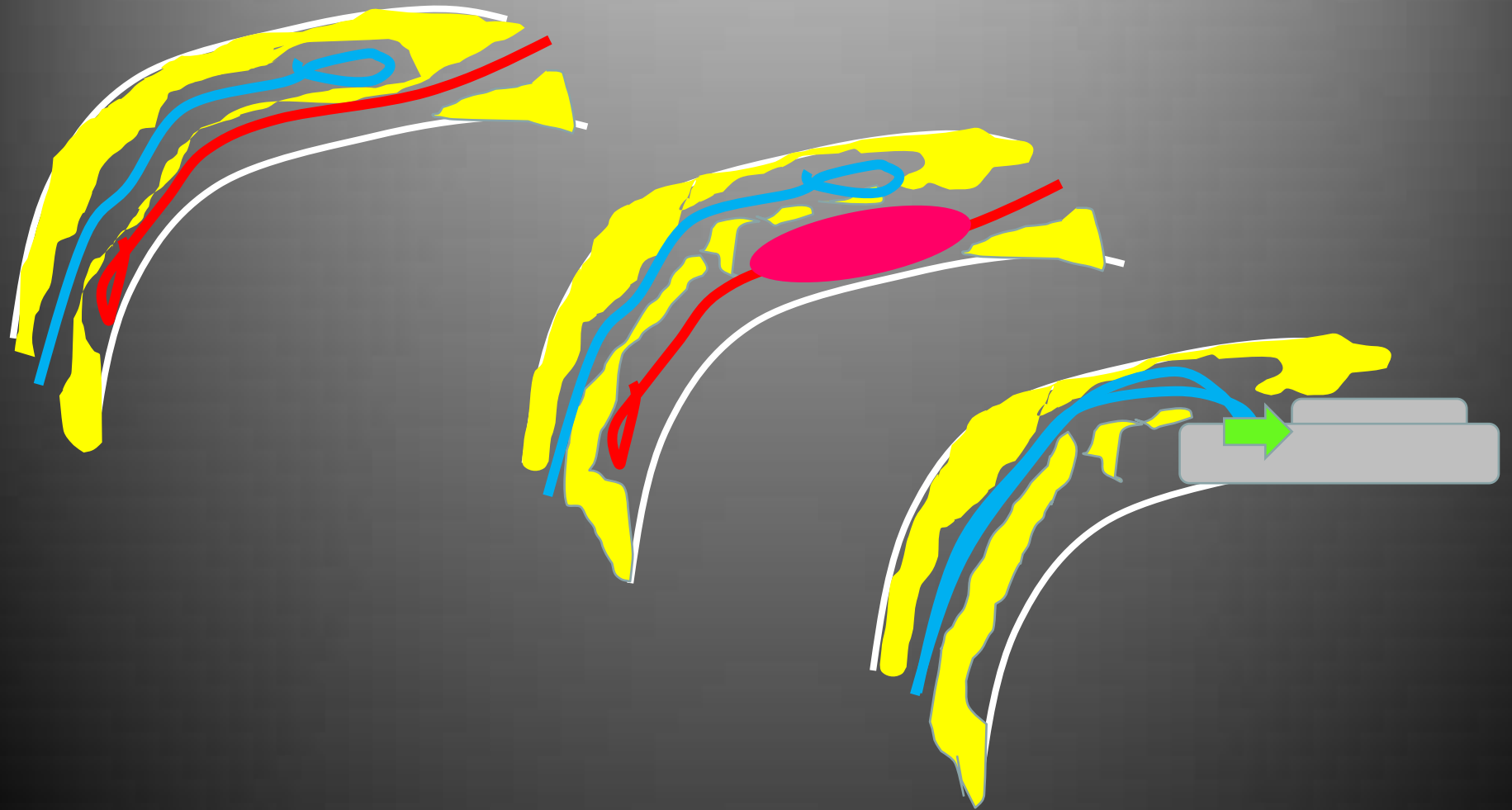


Illustrations from 'A Guide to Mastering Retrograde CTO PCI' / [www.ctoibooks.com](http://www.ctoibooks.com)

# *knuckle wire+guide extention method*



# *knuckle wire+guide extention method*



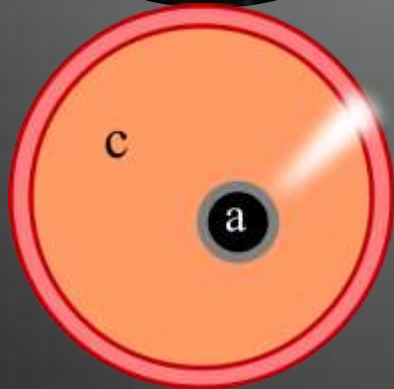
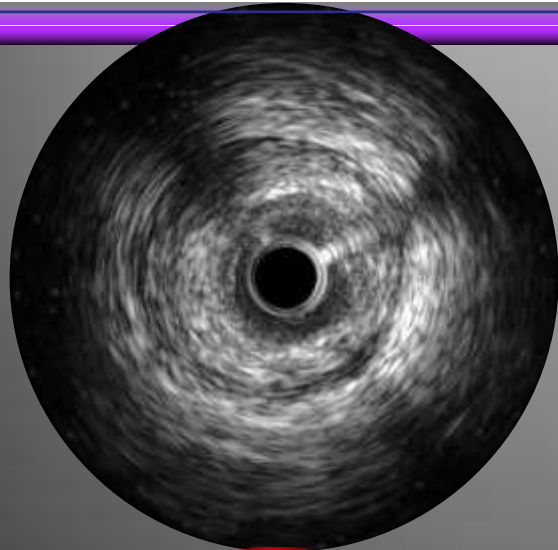
# Retrograde approach of CTO

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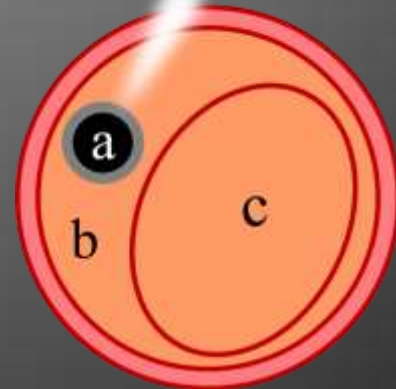
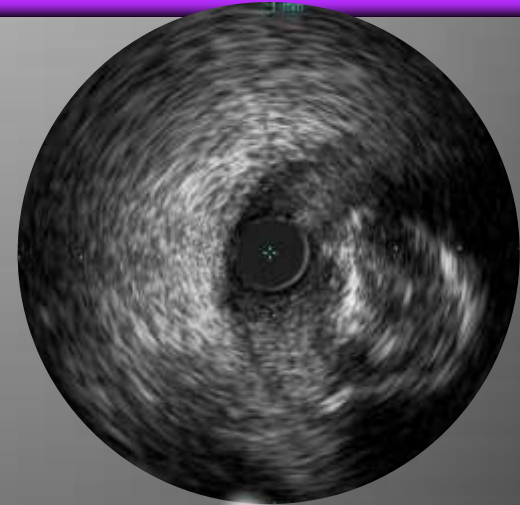


# IVUS Image

## Intimal vs. Sub-Intimal Tracking



**Intimal Plaque Tracking**

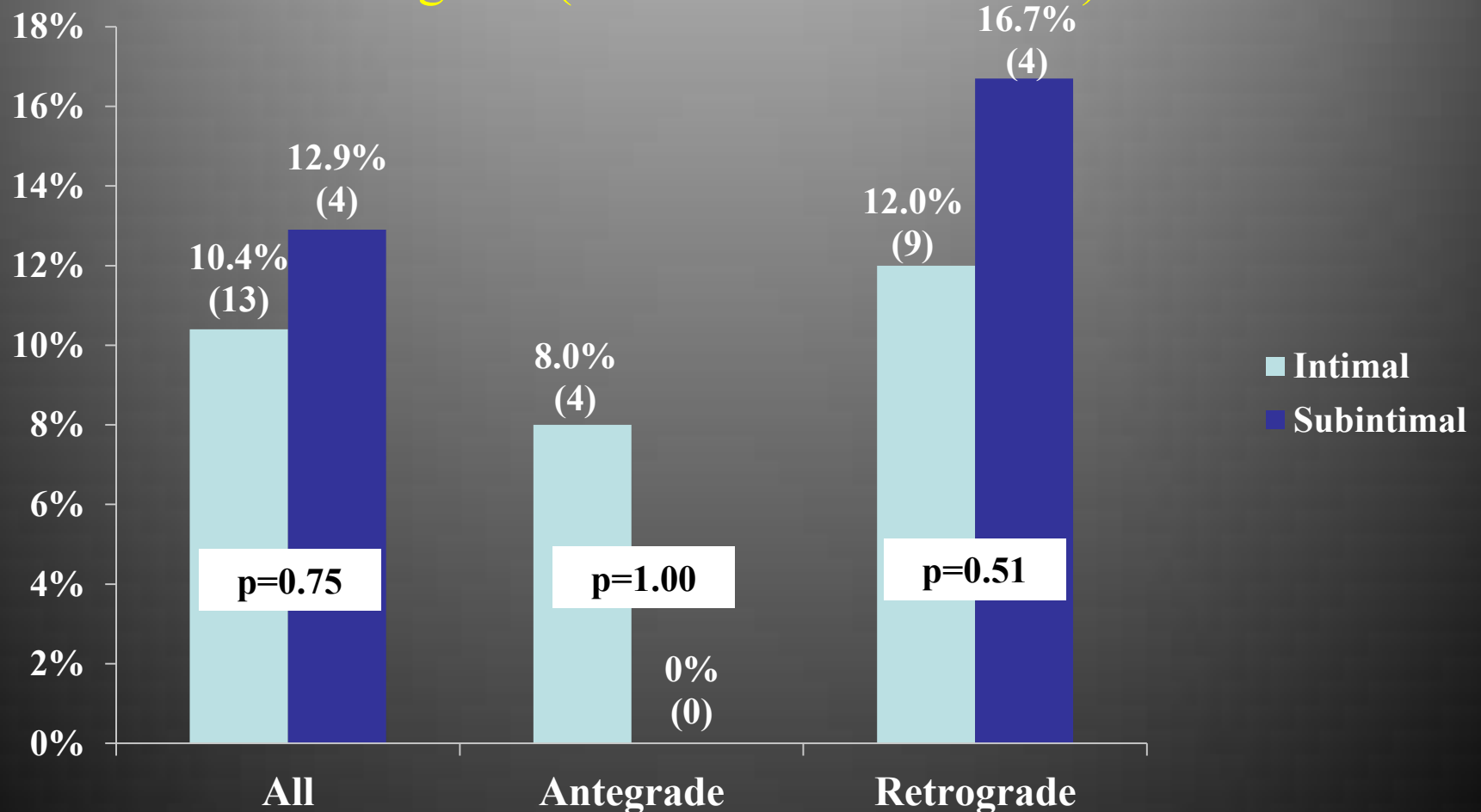


**Sub-Intimal Tracking**

a = IVUS catheter , b = Sub-Intimal space, c = the Intimal Plaque

# TVR at 12 months

Antegrade (Intimal vs. Sub-intimal)  
Retrograde (Intimal vs. Sub-intimal)



A photograph of a baseball player in a white New York Yankees uniform, holding a trophy. The player is looking directly at the camera with a serious expression. The background is blurred, showing a stadium setting. The text "Remember failure and humiliation!" is overlaid in yellow, italicized font across the middle of the image.

*Remember failure and humiliation!*

*Tokyo General Hospital*