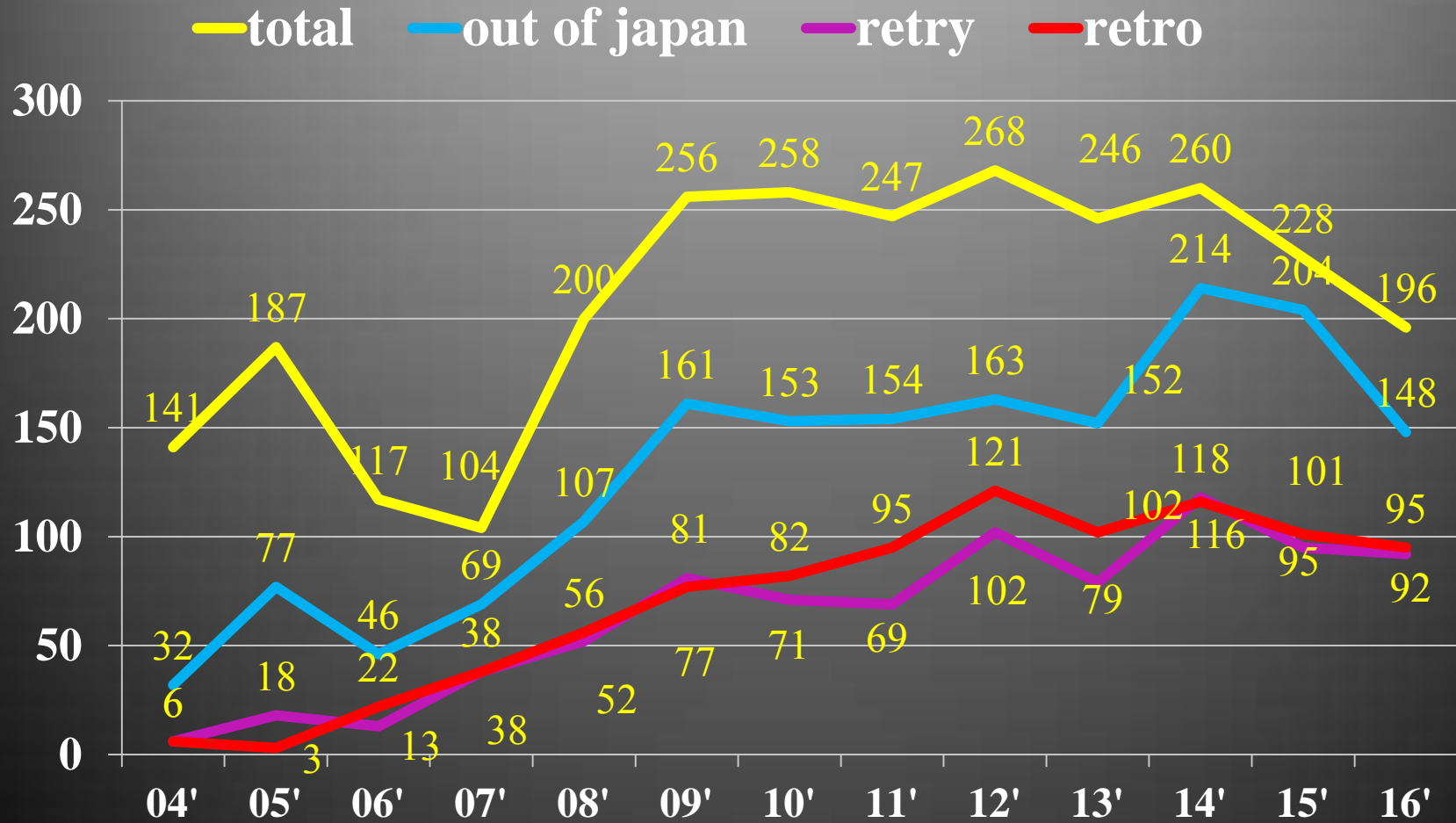


Expert's Concept and Technique -CTO-

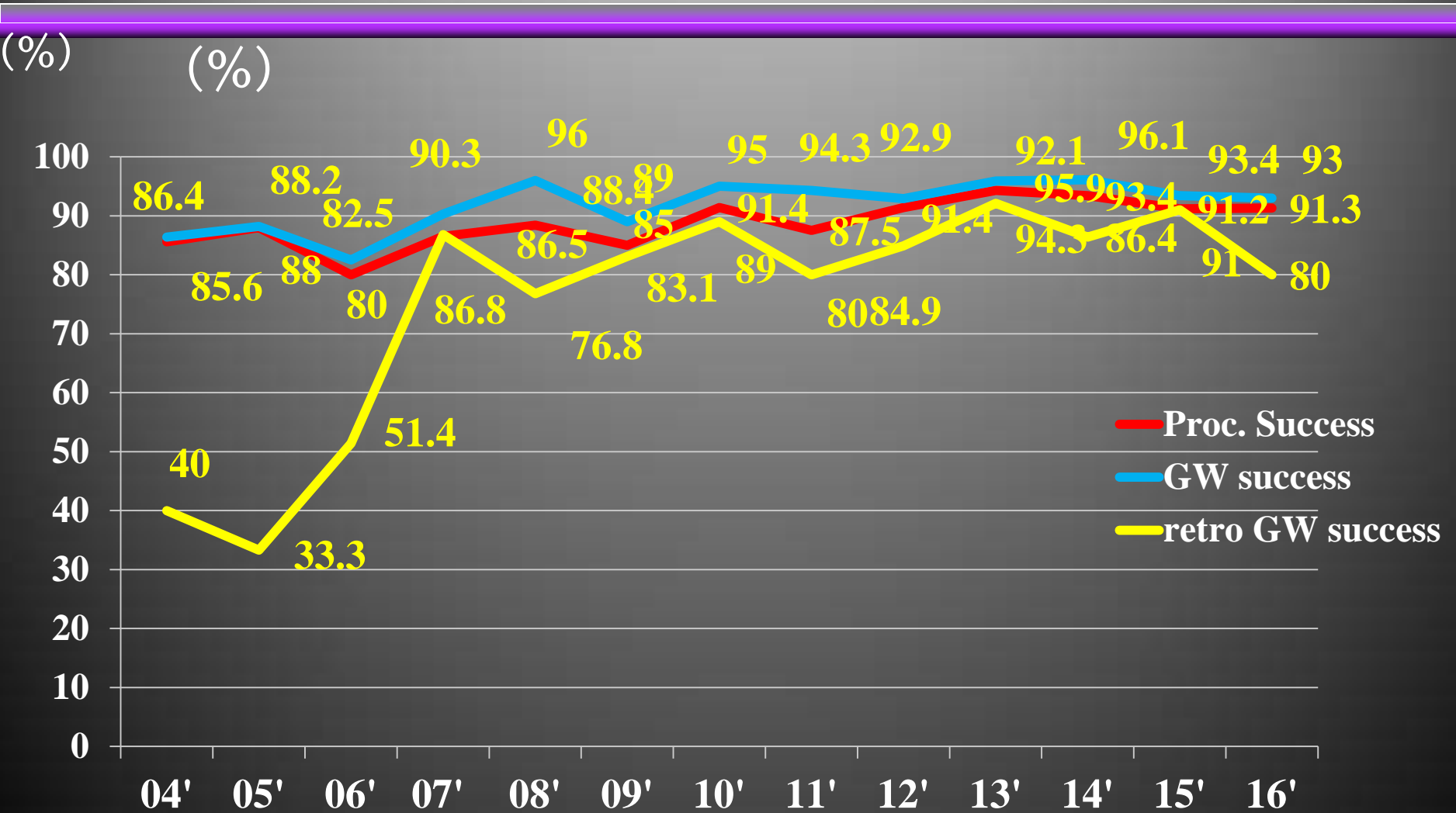
Toshiya Muramatsu

Tokyo General Hospital

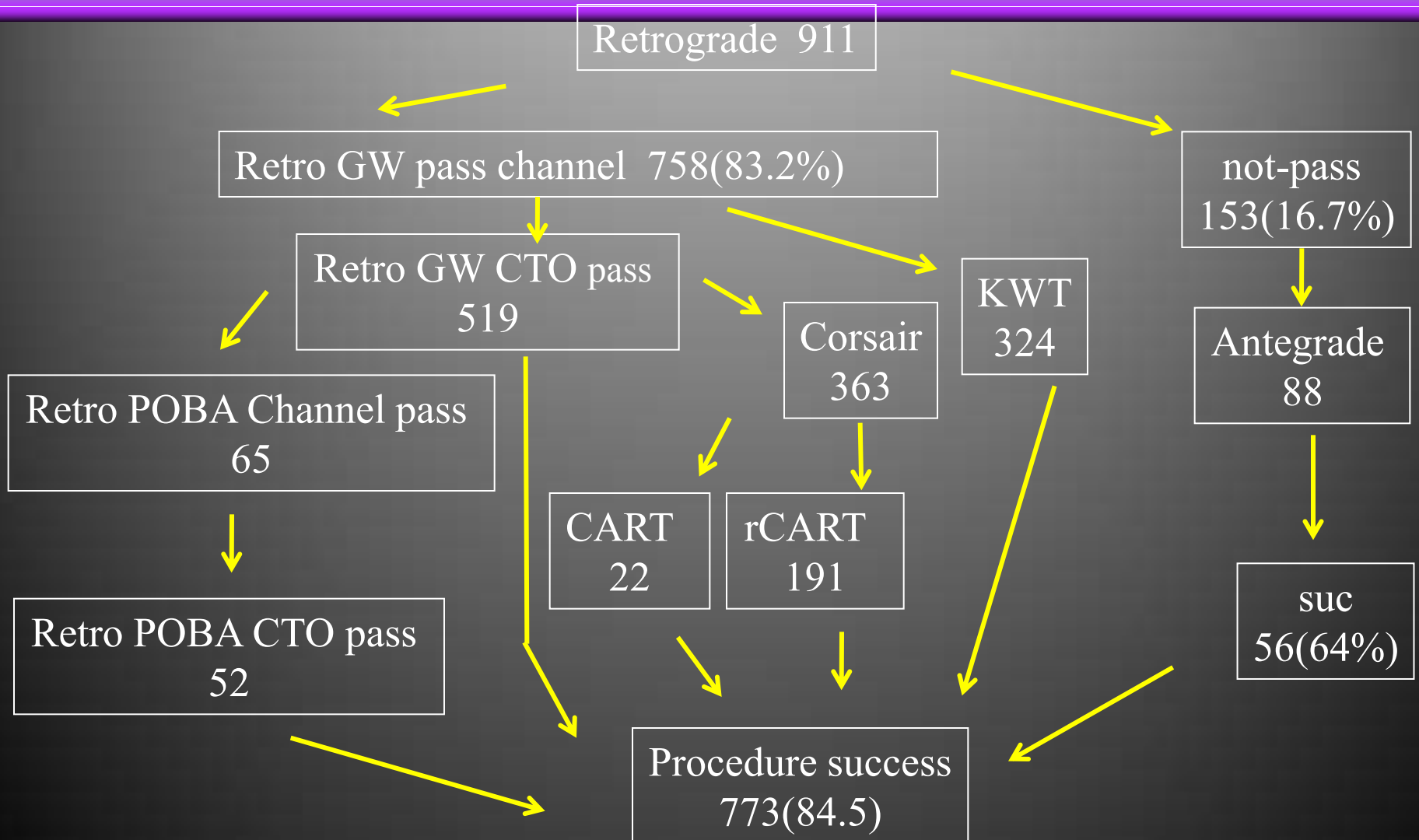
Number of CTO lesion



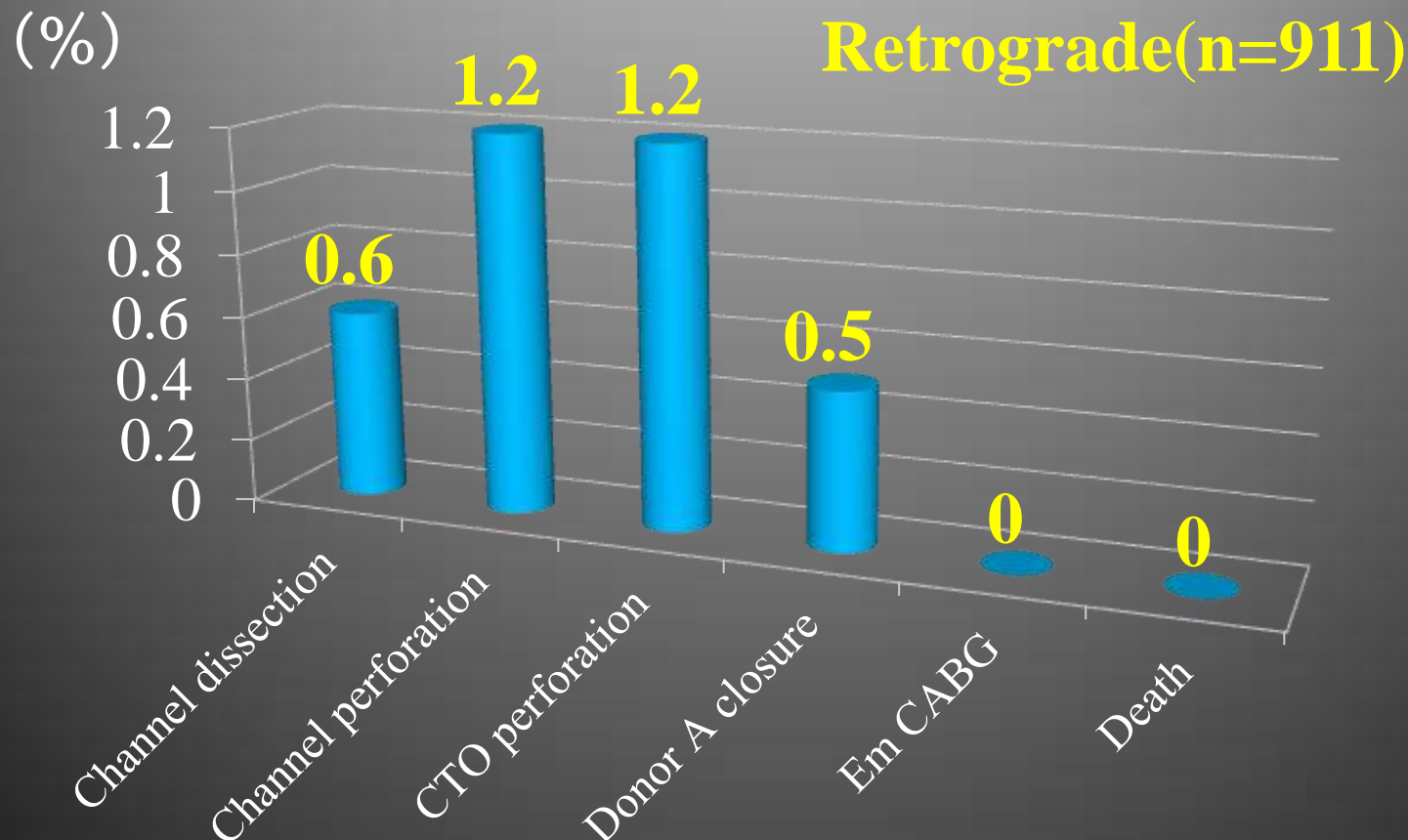
Success rate and retrograde approach for CTO



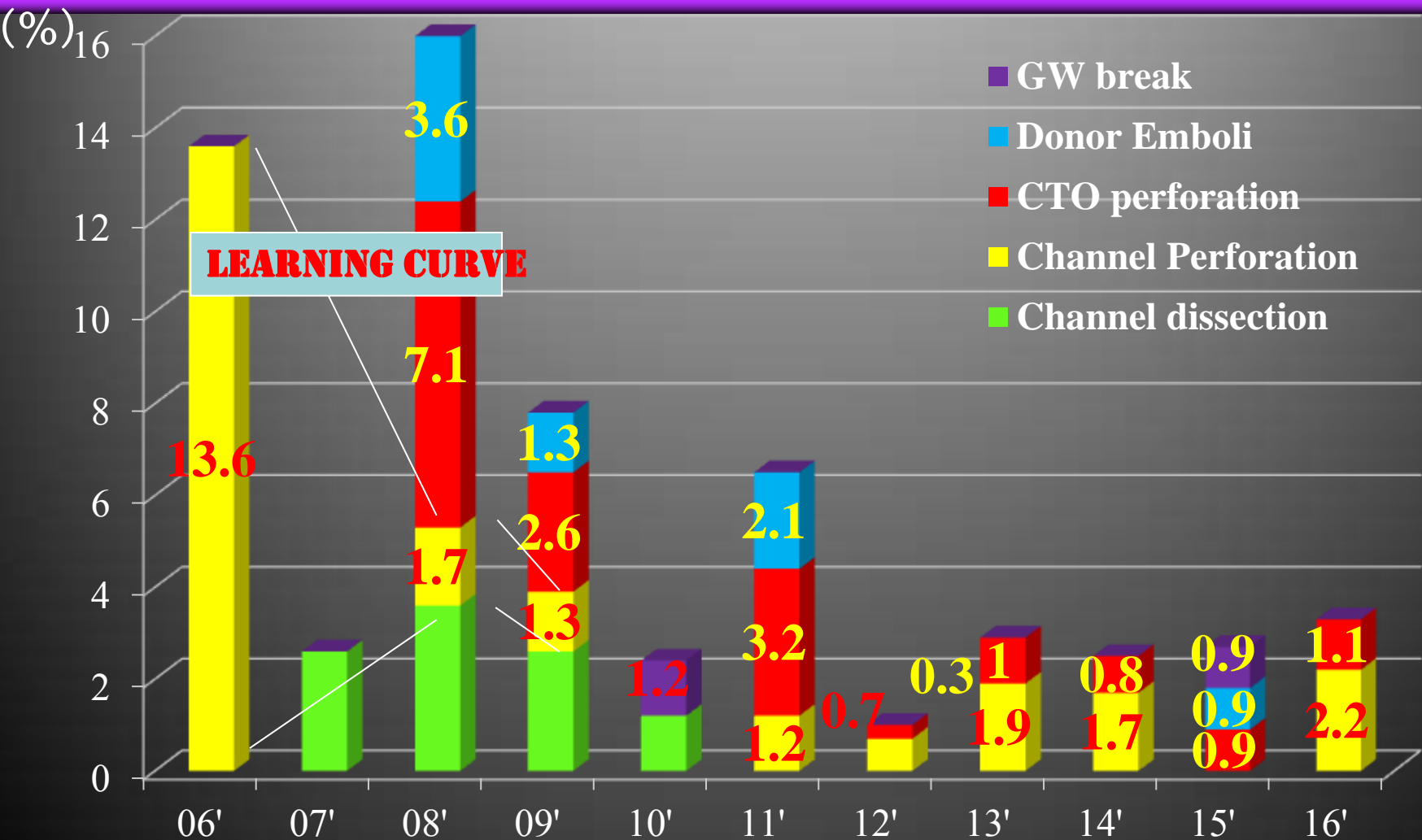
Flow chart of retrograde approach for CTO



Complication of retrograde approach for CTO



Complication of retrograde approach for CTO

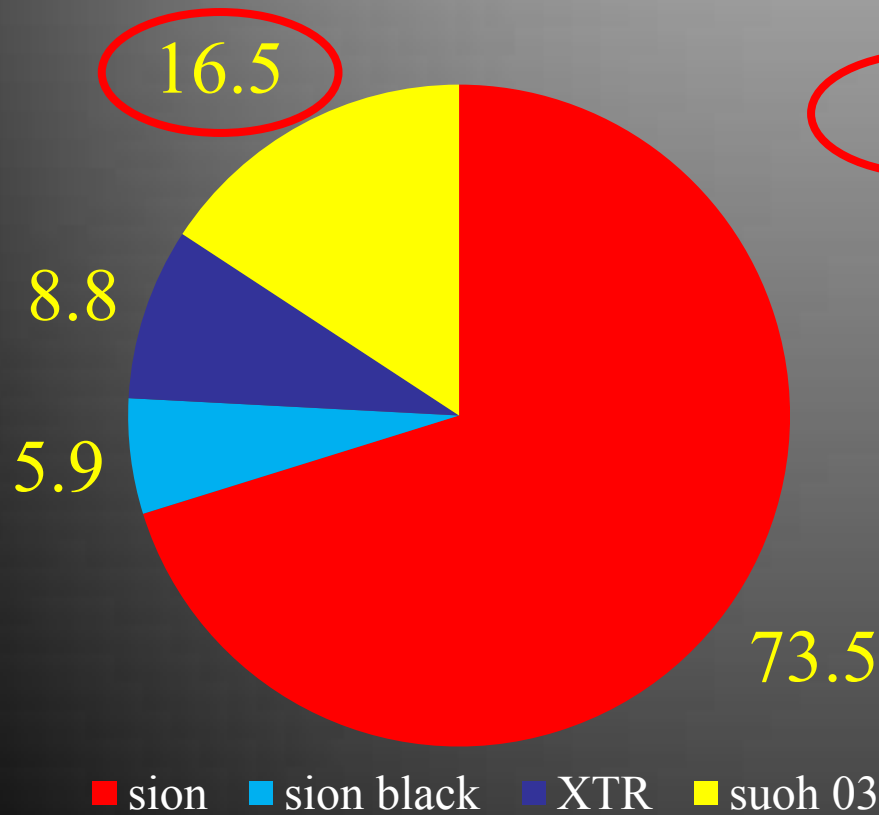


Recent changes of retrograde approach

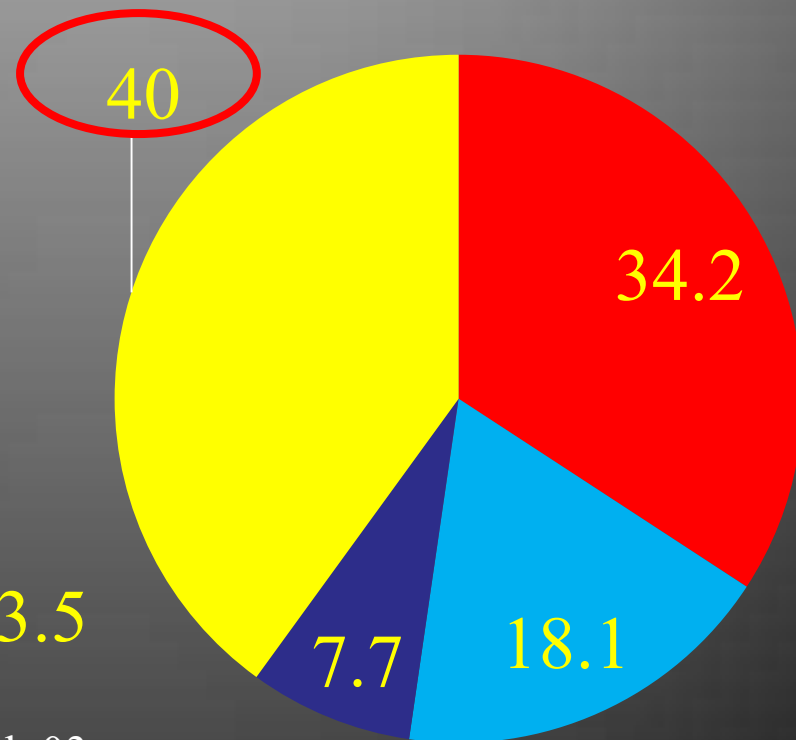
- **New Channel crossing GW**
Suoh 03 GW, Sion black GW
- **More epicardial channel**
How cross tortuous channel
- **How to cross retrogradely**
Knuckle wire technique
- **Contemporary r-CART**
New concept reverse CART
- **Time saving ,Less invasive**
Short time antegrade preparation
Use of Glide sheath

Types of channel crossing guidewire

2015 n=85



2016 n=92

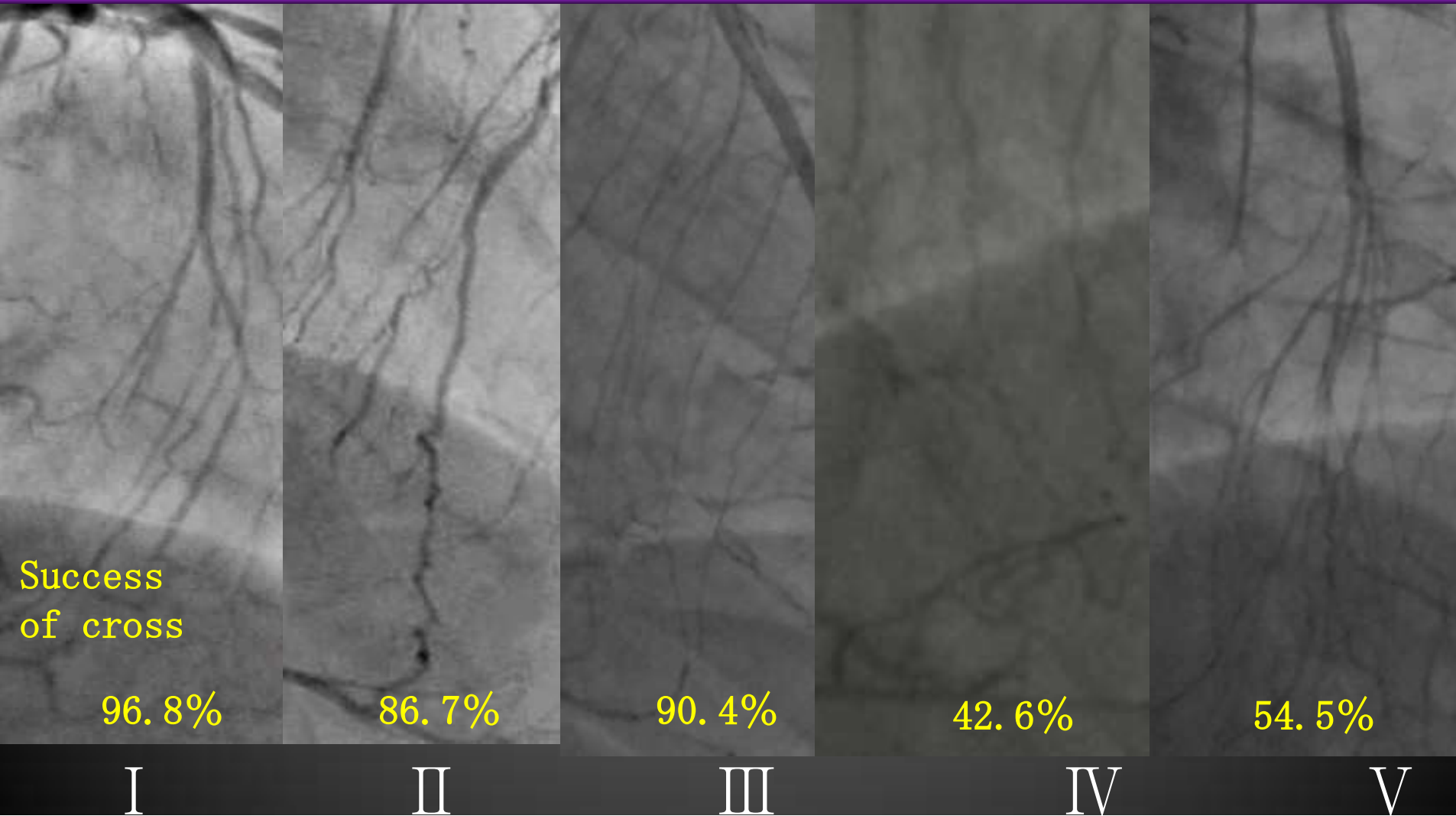


Classification of septal collateral way



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

Classification of septal collateral way

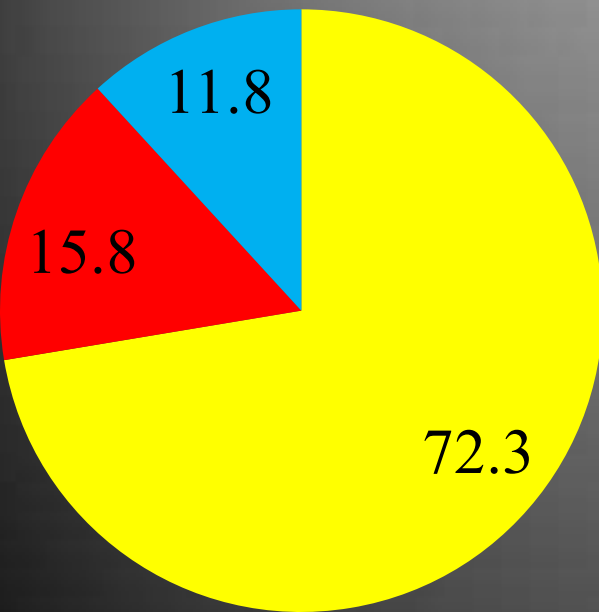


Recent changes of retrograde approach

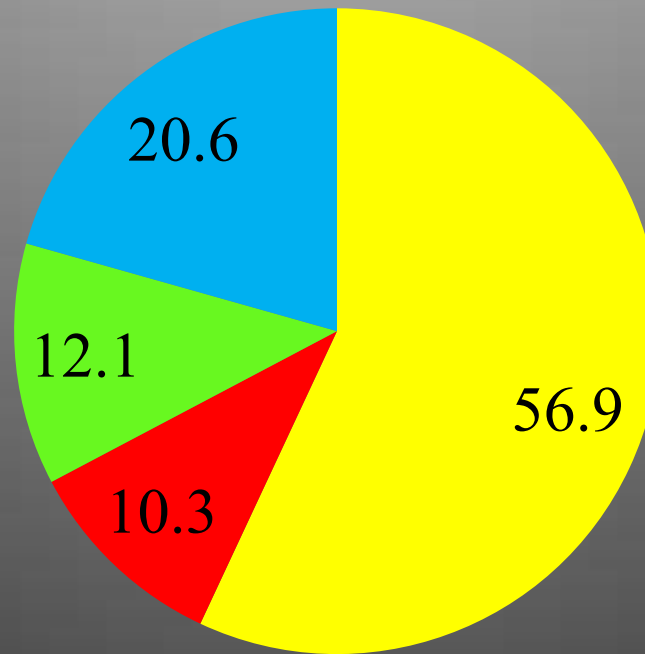
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Types of epicardial channel crossing guidewire

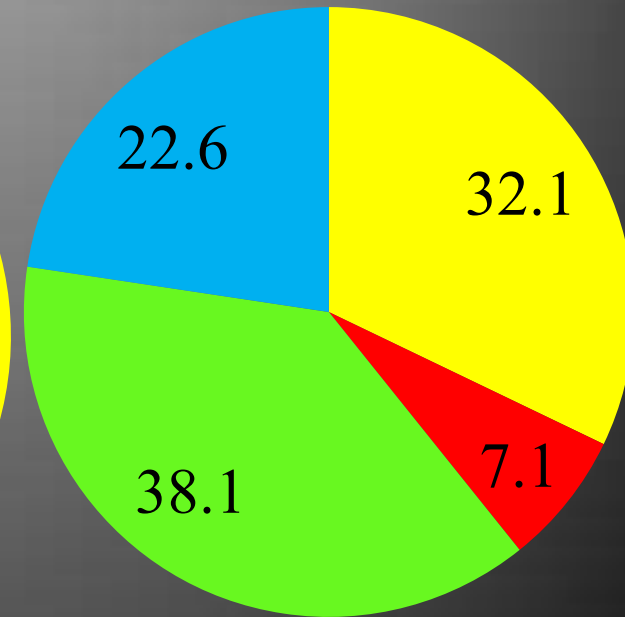
2014 n=55



2015 n=36



2016 n=44



■ sion ■ XTR ■ suoh 03 ■ sion black

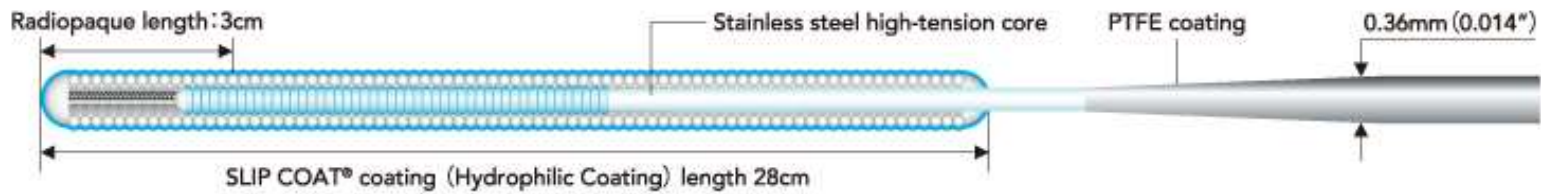
Comparison of channel GW

	XTR	Suoh 03	Sion	Sion black
Tip weight	0.9g	0.3g	0.7g	0.8g
Coating	+	+	+	++
Support	-	+/-	++	+
slippy	+/-	+	+	++
Control	+/-	+	++	+
safty	+/-	++	+	+/-

Sion black

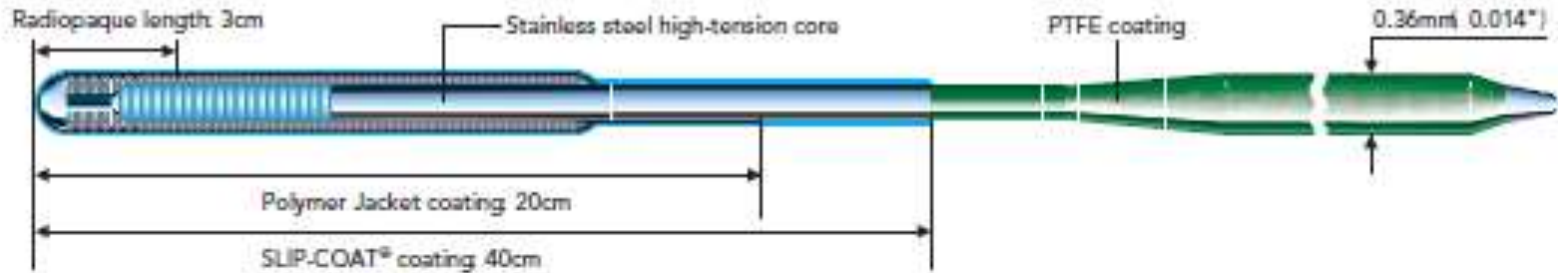
■ Structure

Sion guidewire



■ Structure

Sion black guidewire



Case of sion black guidewire



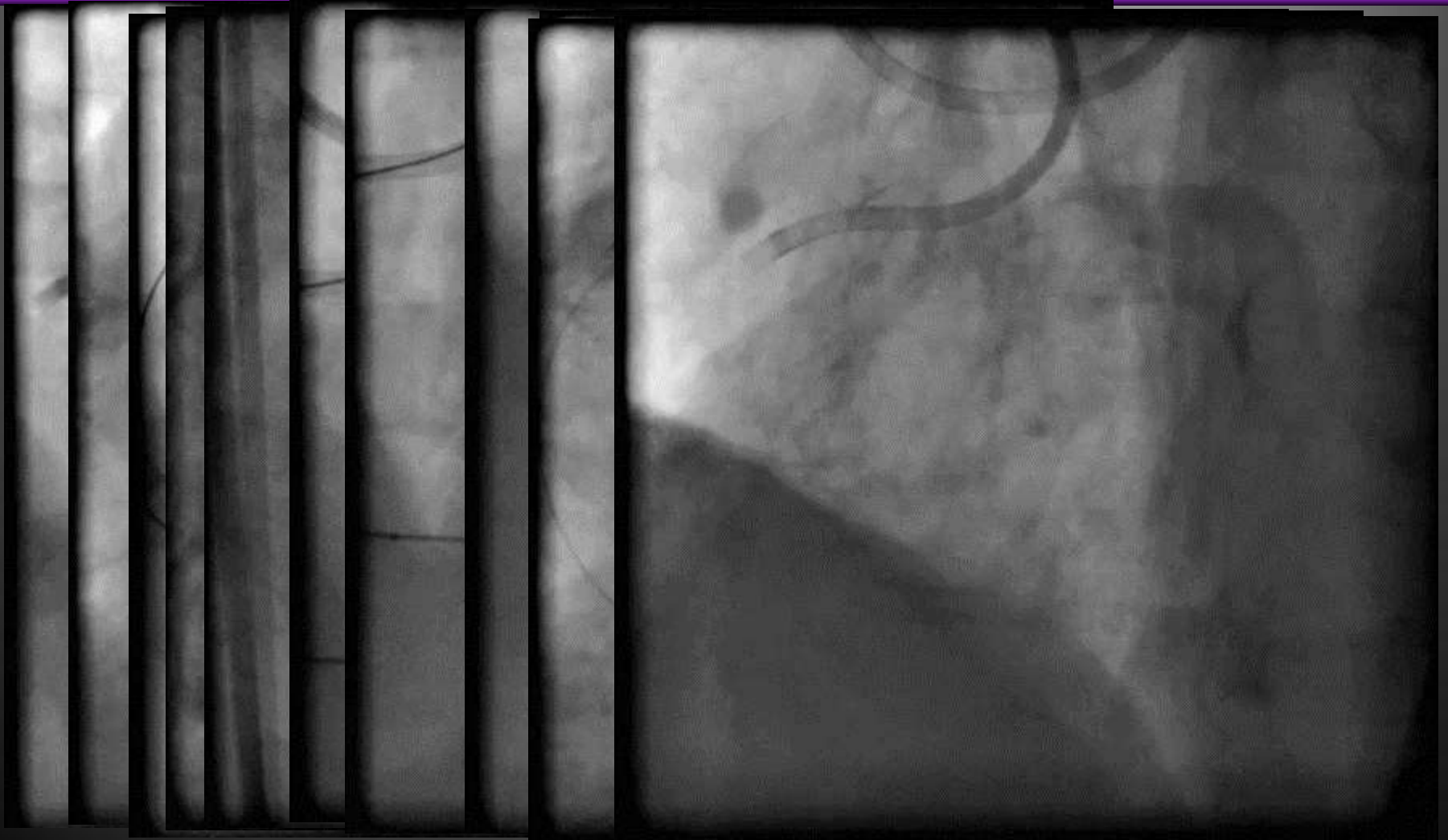
Tokyo General Hospital

Suoh 03 guidewire



rope coil / radiopacity 3cm

Change GW through tiny channel



Tokyo General Hospital

Change GW through tiny channel



Sion Black GW

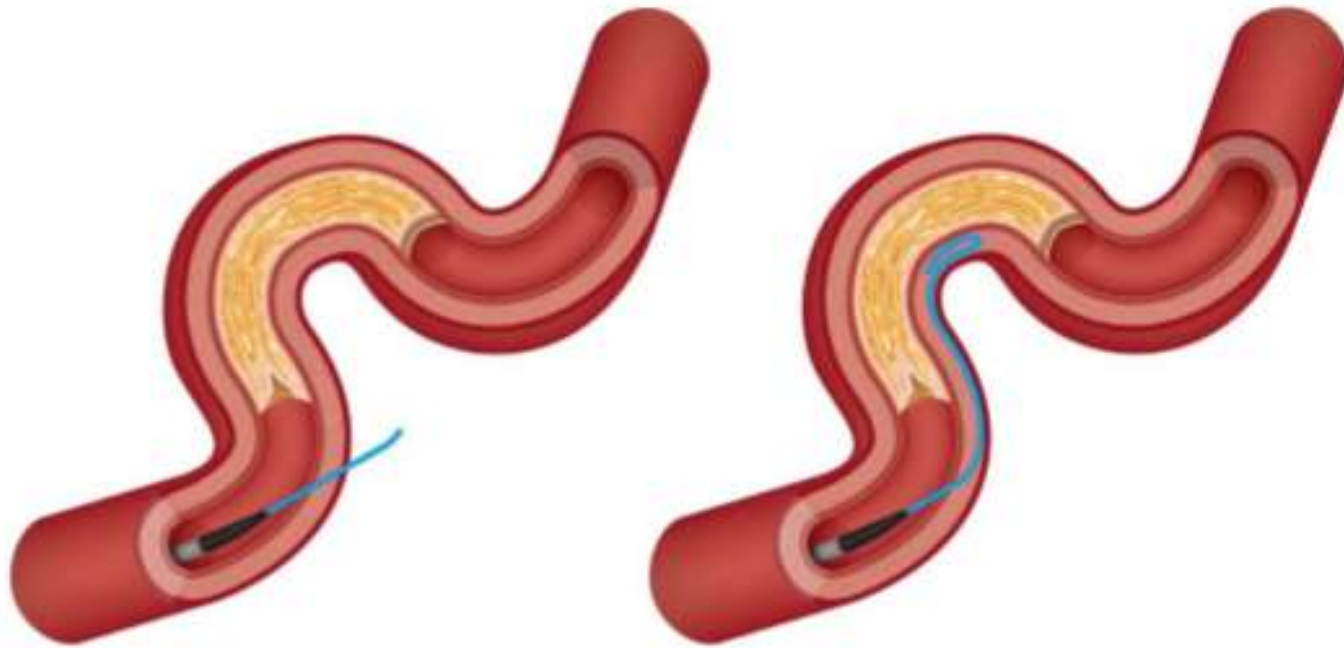


Suoh 03 GW

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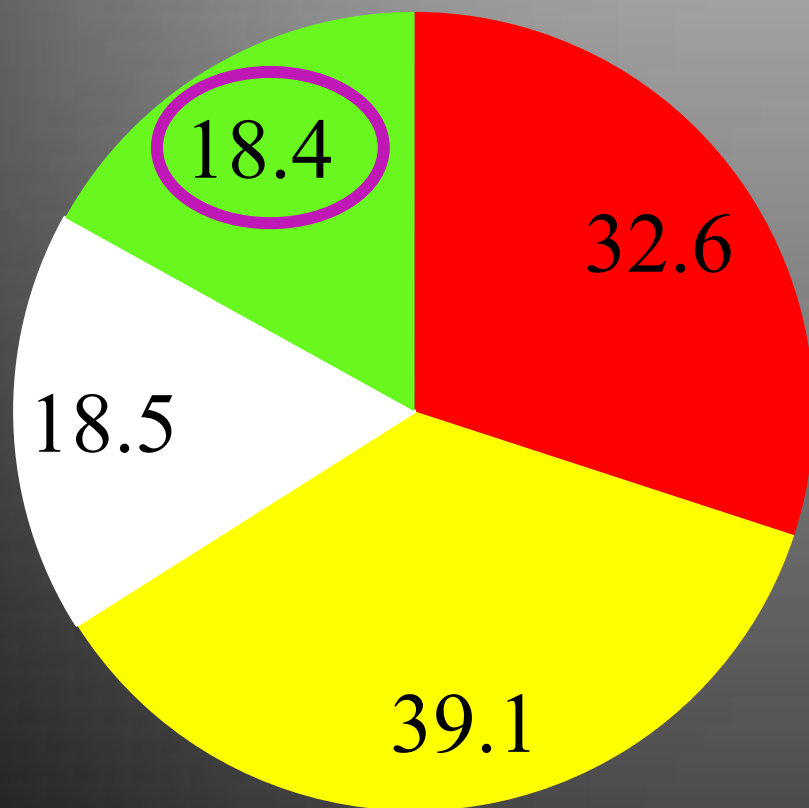
Straight vs. Knuckled wires



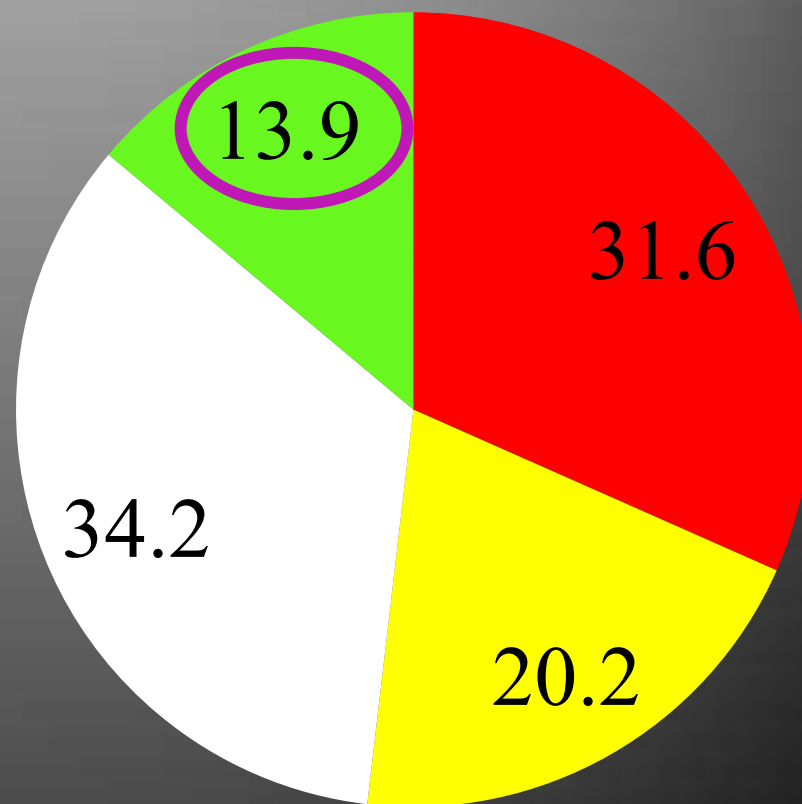
Illustrations from 'A Guide to Mastering Retrograde CTO PCI' / www.ctoibooks.com

Strategies of retro CTO crossing

2014 n=102



2015 n=85



■ Retro GW ■ KWT ■ r-CART ■ Knuckle

Key issue of knuckle wire technique

- **Use of knuckle GW**
XTR GW, Fielder FC GW
- **Timing of knuckle wire**
Long CTO, Both GW into subintima
- **How to make it**
More than 90 degree bent of GW tip
- **How to advance**
Support microcatheter
- **Avoid complication**
Try to introduce same line as antegrade GW
Don't inject dye
Don't insert side branch and injury area which created by stiff GW

Retrograde long knuckle wire

Im: 1/129
Se: 1

Im: 1/121
Se: 1

Im: 1/46
Se: 1

Im: 1/121
Se: 1

Im: 1/121
Se: 1

HWANG JIAN-REN
000233020D
1953/01/03 M
VGHTC-CATH02
92123171
Cardiac
Left Coronary 15 fps(fine)

WL: 113 WW: 113
LAO: 53

WL: 113 WW: 113
LAO: 53

WL: 113 WW: 113
LAO: 53

WL: 113 WW: 227 [D]

WL: 59 CAU: 17

LAO: 59 CAU: 17

2016/10/07 18:19:31

2016/10/07 18:17:03

Retrograde long knuckle wire

Im: 1/225
Se: 1

Im: 1
Se: 1

Im: 1/13
Se: 1

Im: 1/225
Se: 1

HWANG JIAN-REN
000233020D
1953/01/03 M
VGHTC-CATH02
92123171
Cardiac
Fluoroscopy

WL: 128 WW: 25
LAO: 50

WL: :
LAO: :

WL: 113 WW: 2
RAO: 25 CAU: 2

WL: 128 WW: 256 [D]
LAO: 50

2016/10/07 18:42:39

Retrograde long knuckle wire

Im: 1/186
Se: 1

Im: 1/60
Se: 1

HWANG JIAN-REN

HWANG JIAN-REN
000233020D
1953/01/03 M
VGHTC-CATH02
92123171
Cardiac
Left Coronary 15 fps(fine)

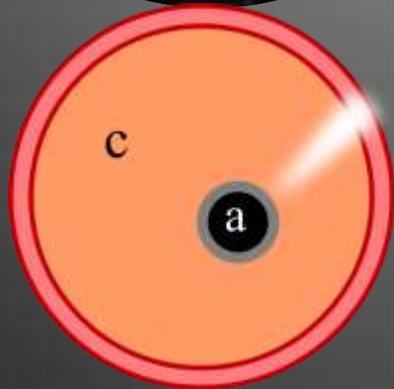
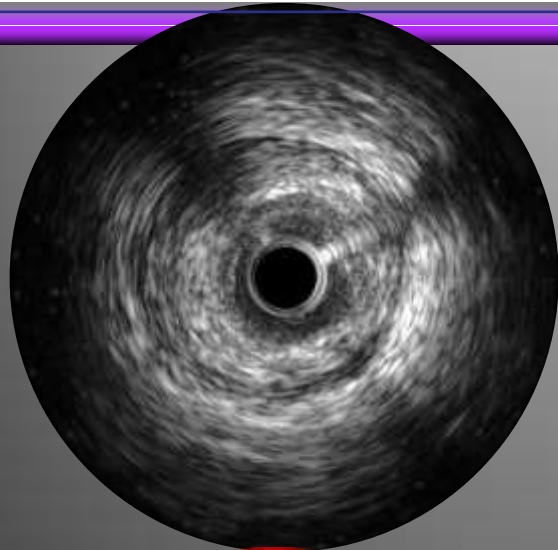
WL: 128 WW: 5
LAO: 50

WL: 113 WW: 227 [D]
LAO: 50 CRA: 15

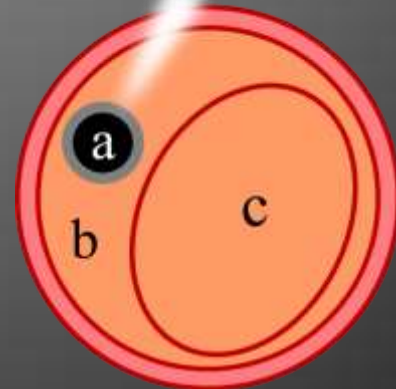
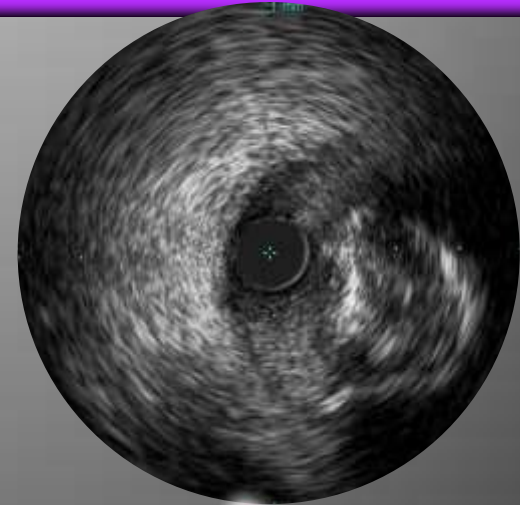
2016/10/07 18:57:04

IVUS Image

Intimal vs. Sub-Intimal Tracking



Intimal Plaque Tracking

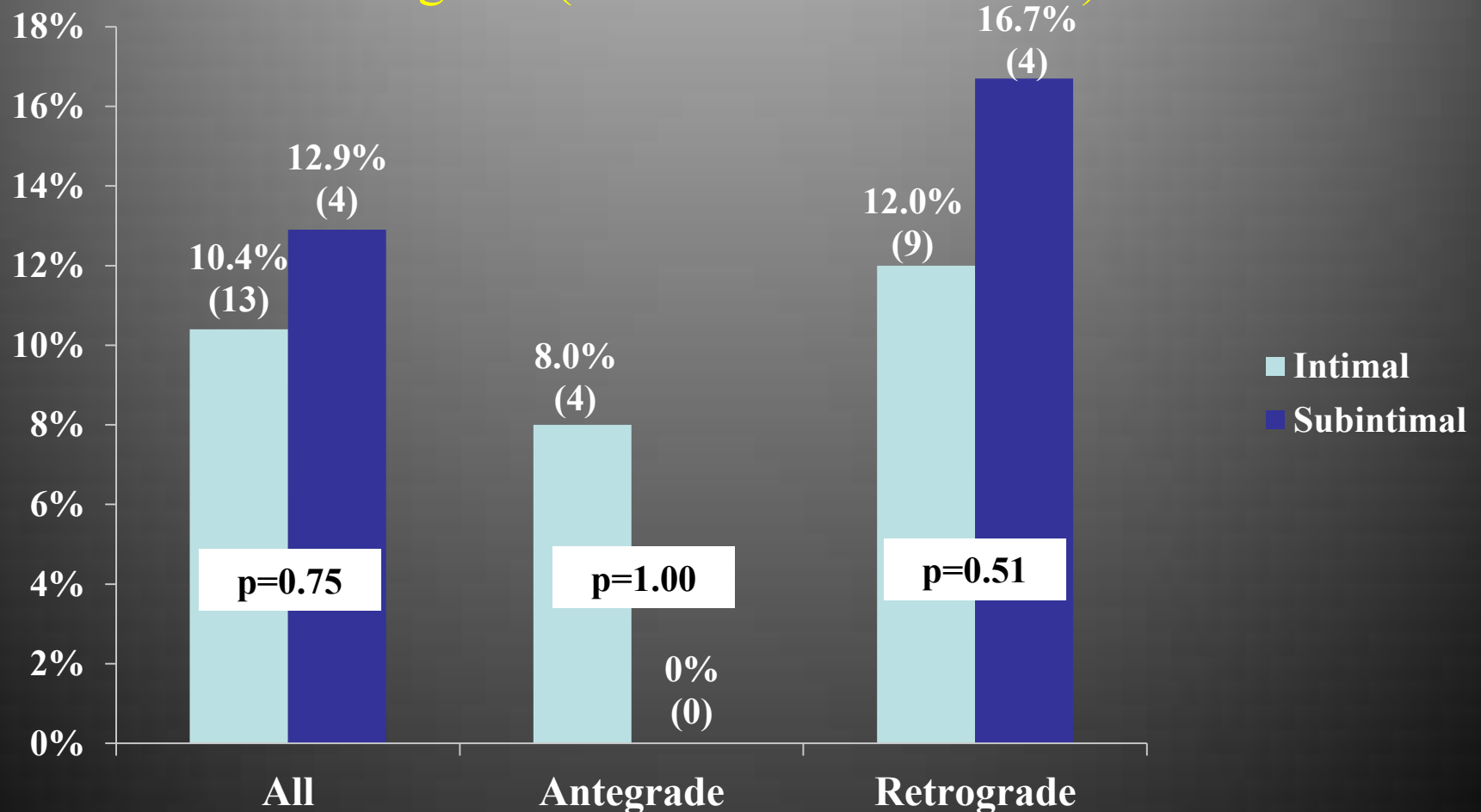


Sub-Intimal Tracking

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

TVR at 12 months

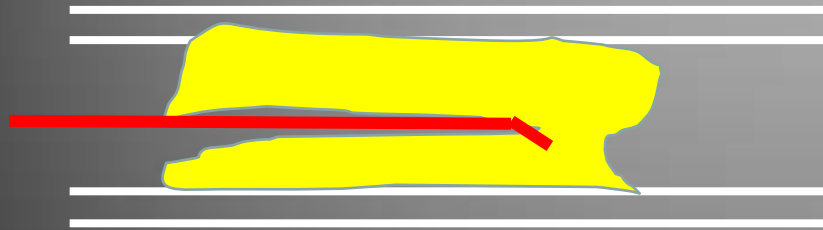
Antegrade (Intimal vs. Sub-intimal)
Retrograde (Intimal vs. Sub-intimal)



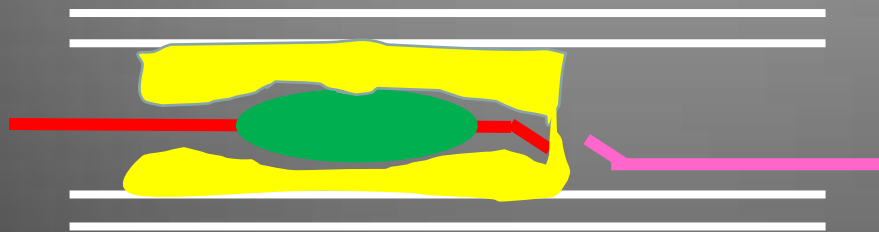
Recent changes of retrograde approach

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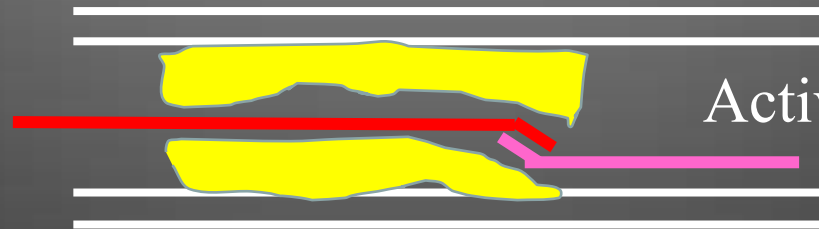
Concept of contemporary r-CART



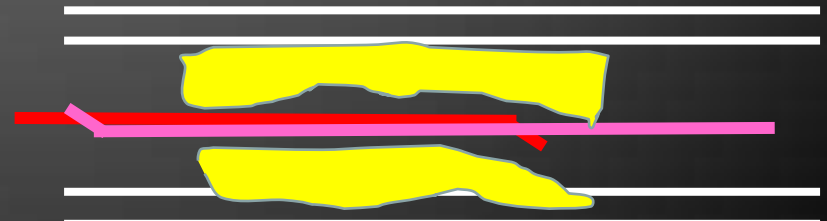
Antegrade GW advance
in the CTO true lumen



Antegrade ballooning in
CTO in the plaque using
small balloon



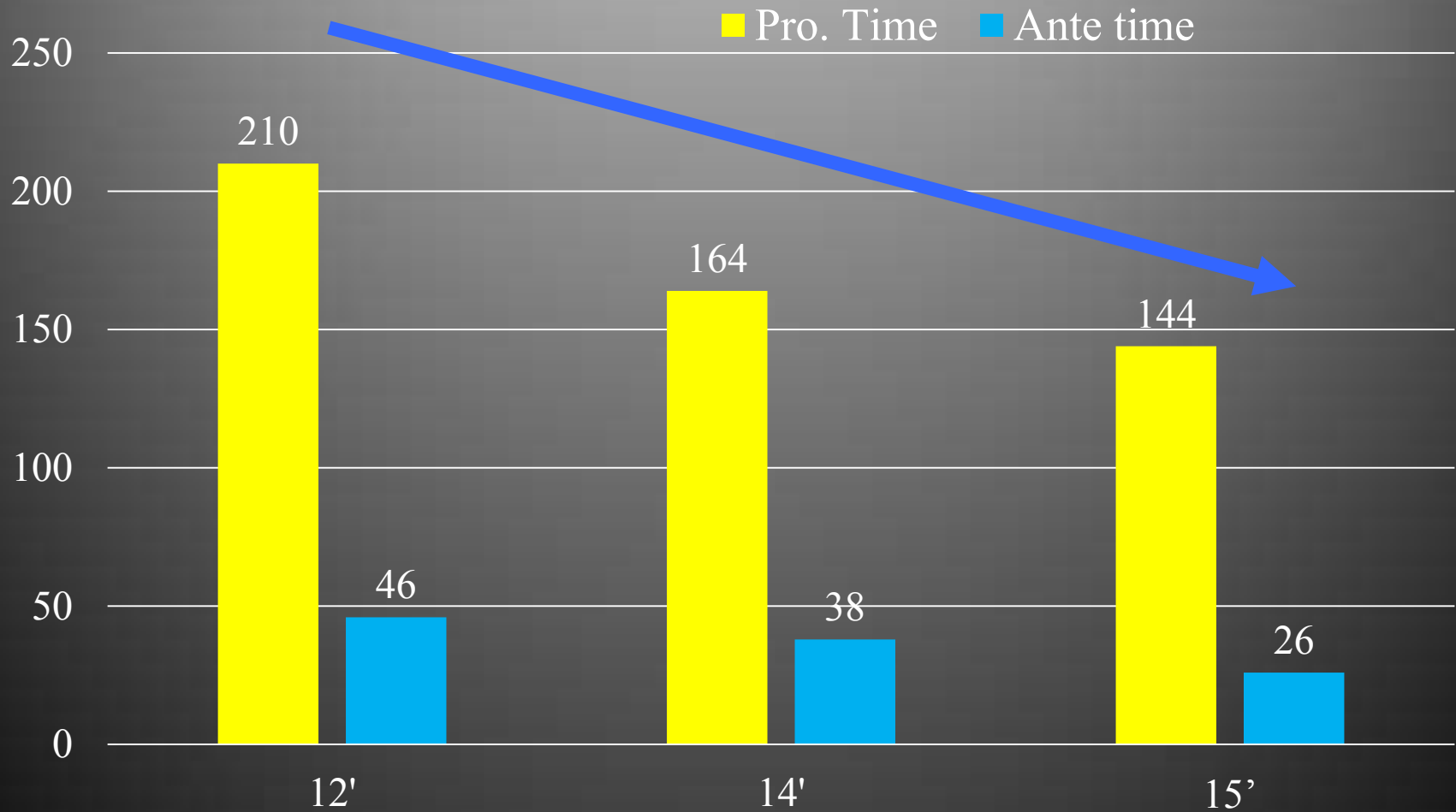
Active controlled wiring
by Gaia series GW



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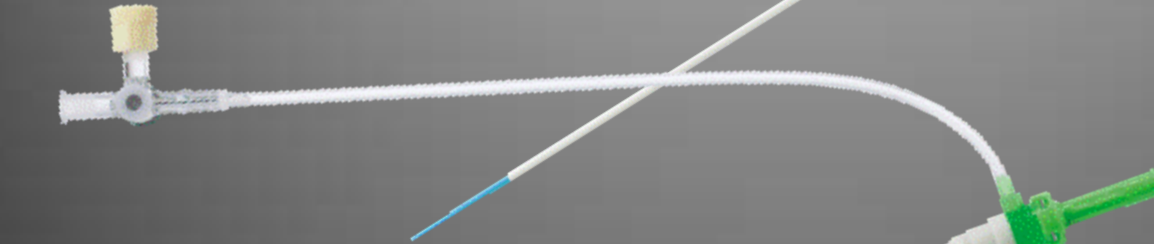
Recent changes of Procedure time



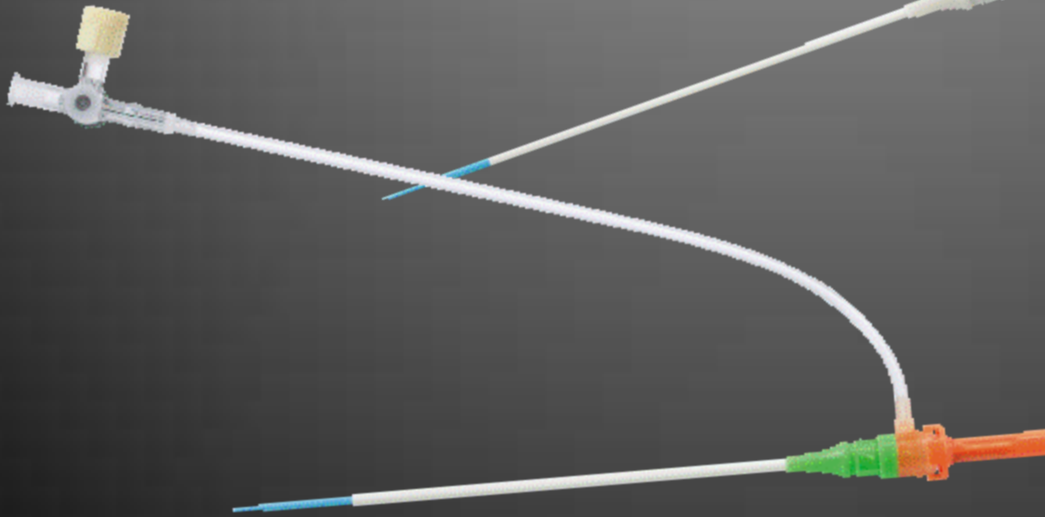
New Glide Sheath



5Fr
Less invasiveness



6Fr
Daily Practice



7Fr
Complex PCI



Tokyo General Hospital

Conclusion

1. **New light weight GW is promising to cross tortuous collateral channel**
2. **It is important how to overcome tortuous epicardial channel**
3. **Contemporary r-CART is new concept**
4. **Knuckle wiring is helpful for calcified, long, bent CTO lesion**
5. **Less invasive strategy will be needed**