Too Many Techniques and Appropriate Techniques for Success

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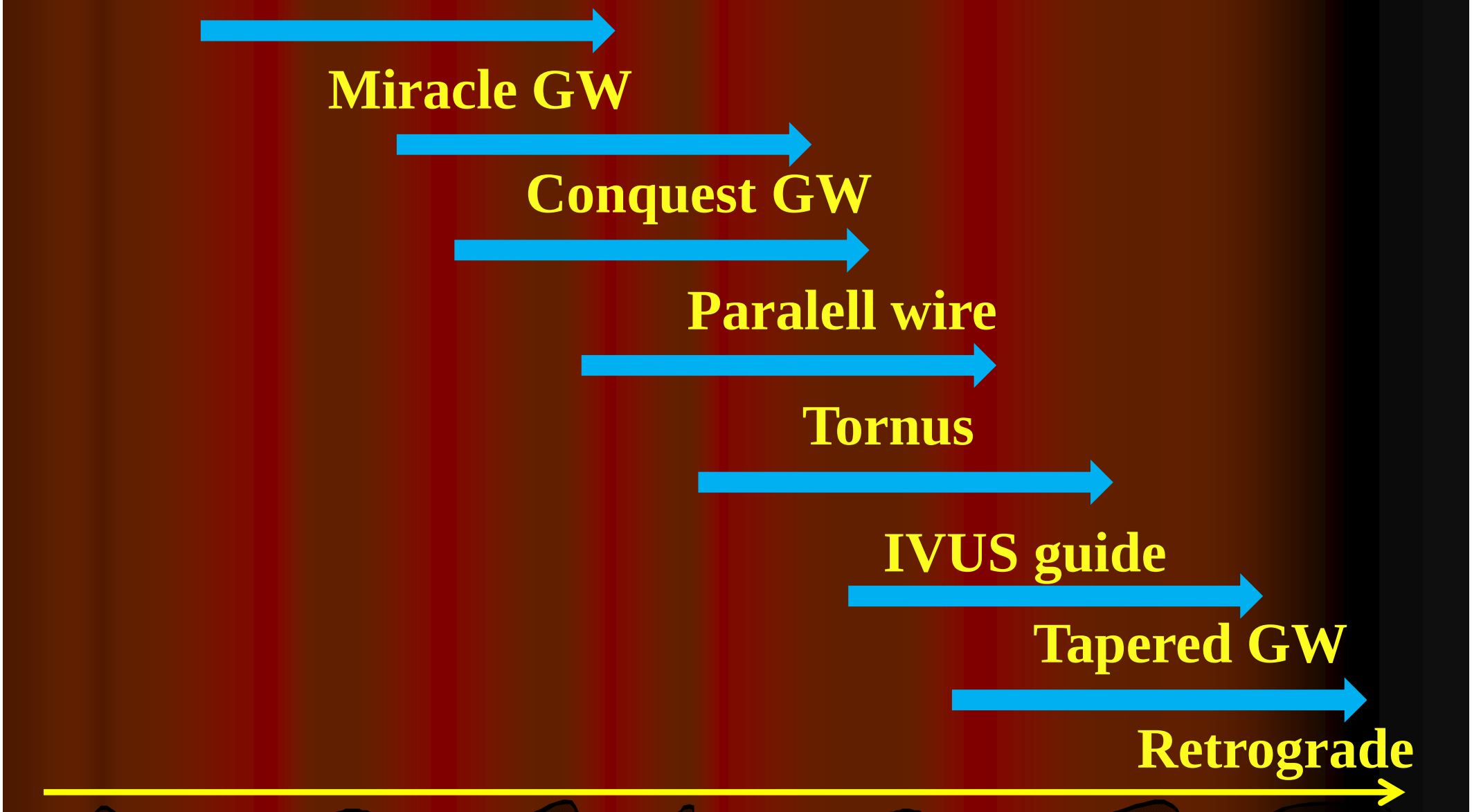
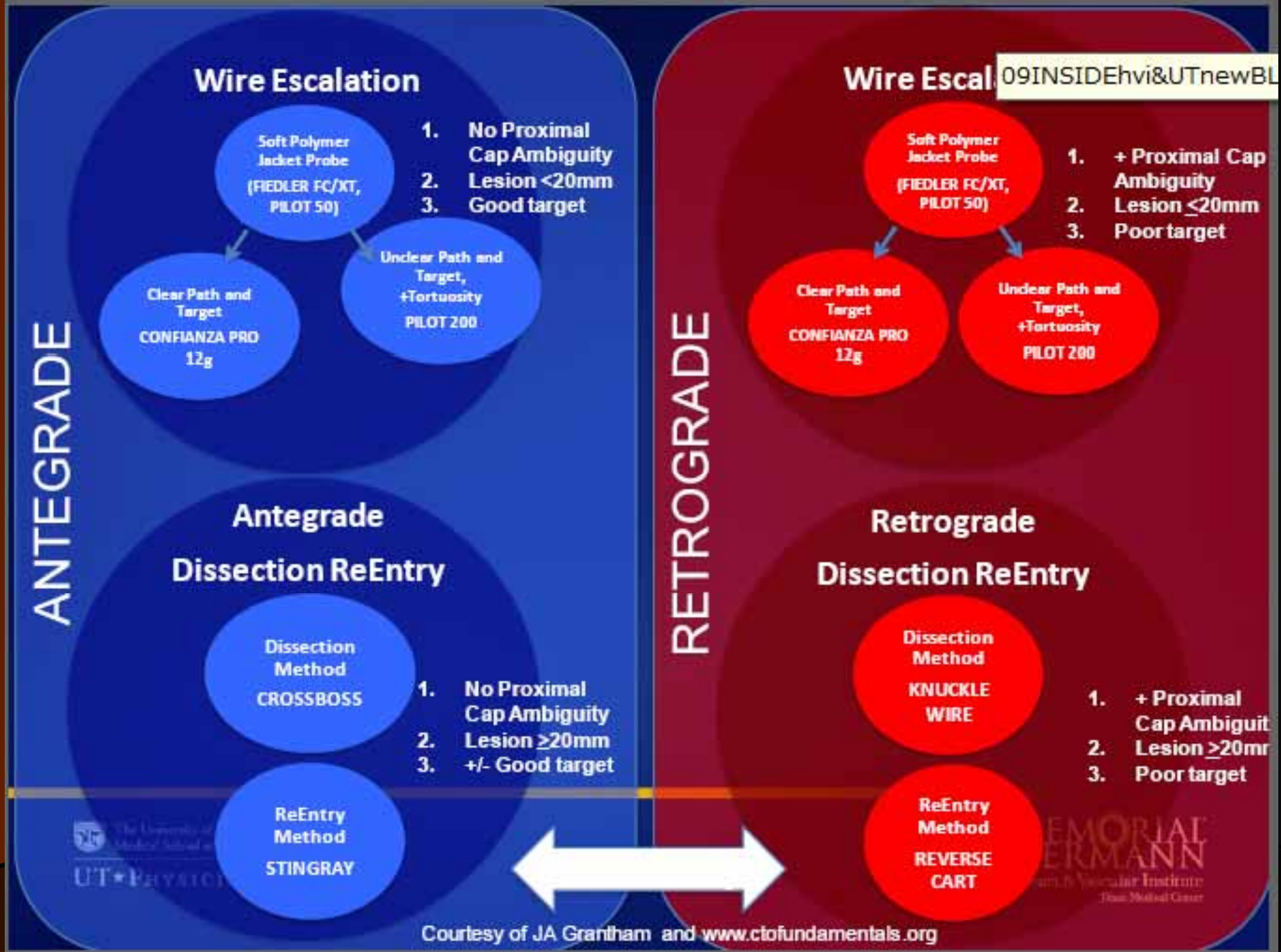
History of PCI for CTO

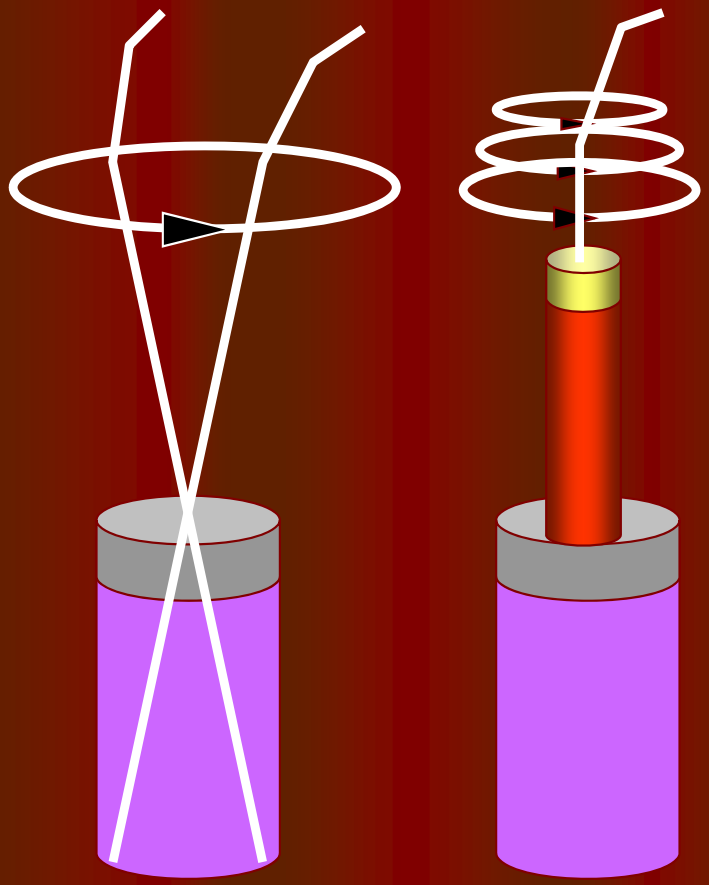



ANTEGRADE
Wire Escalation
Soft Polymer Jacket Probe
(FIEDLER FC/XT, PILOT 50)
1. No Proximal Cap Ambiguity
2. Lesion <20mm
3. Good target
Clear Path and Target
CONFIANZA PRO 12g
Unclear Path and Target, +Tortuosity
PILOT 200
Antegrade
Dissection ReEntry
Dissection Method
CROSSBOSS
1. No Proximal Cap Ambiguity
2. Lesion ≥20mm
3. +/- Good target
ReEntry Method
STINGRAY
RETROGRADE
Wire Escal
09INSIDEhvi&UTnewBL
Soft Polymer Jacket Probe
(FIEDLER FC/XT, PILOT 50)
1. + Proximal Cap Ambiguity
2. Lesion ≤20mm
3. Poor target
Clear Path and Target
CONFIANZA PRO 12g
Unclear Path and Target, +Tortuosity
PILOT 200
Retrograde
Dissection ReEntry
Dissection Method
KNUCKLE WIRE
1. + Proximal Cap Ambiguit
2. Lesion ≥20mr
3. Poor target
ReEntry Method
REVERSE CART
Courtesy of JA Grantham and www.ctofundamentals.org

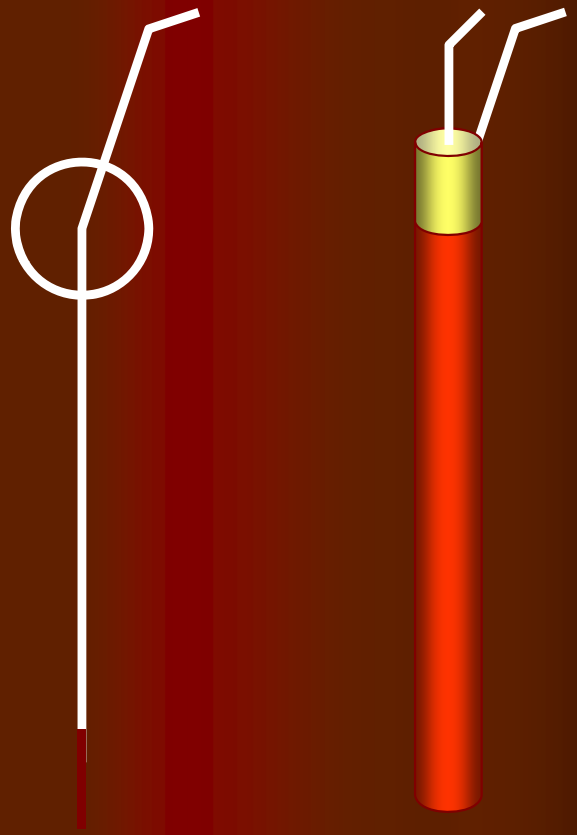
Basic Technique for CTO

1. Contralateral Injection
2. Use of microcatheter
3. Choice of CTO guidewire
4. Side branch technique
5. Pararell wire technique
6. IVUS, MSCT guide
7. Retrograde Approach

Control guidewire movement

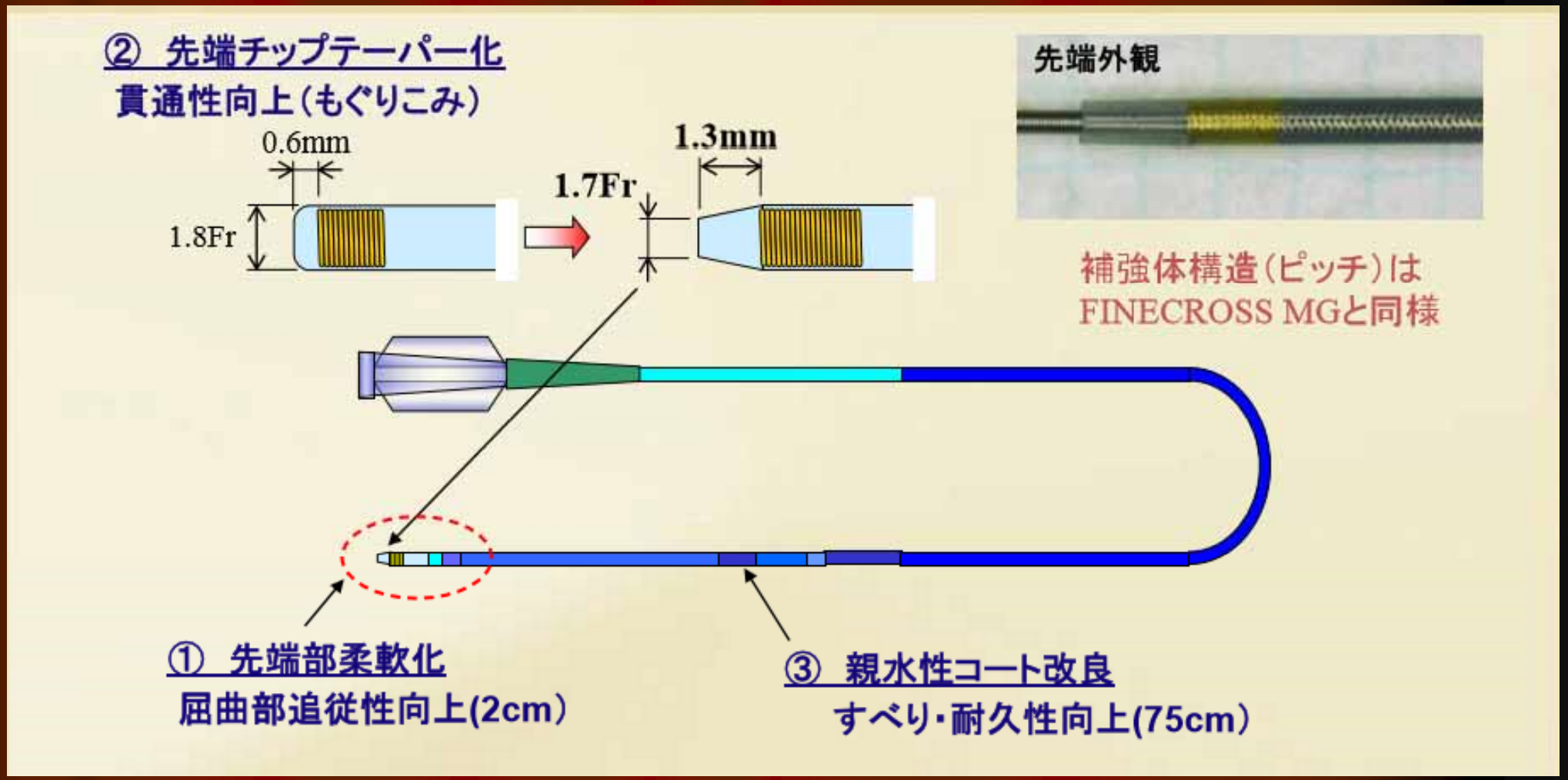


Support to wire manipulation



Cancel a secondary curve

Finecross GT



Pathohistology of CTO vessel

Dia. (inch)	Dia. (μm)	Area (μm²)	Area Ratio	Area Ratio
0.008"	0.203	0.031	0.30	0.74
0.009"	0.229	0.042	0.41	1
0.014"	0.356	0.102	1	2.43

Micro Channel Diameter
(160-230μm, Ave.200μm)

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Importance of Tapering Guidewire

Most of CTO lesion has some microchannel

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1st choice of CTO GW are tapering GW

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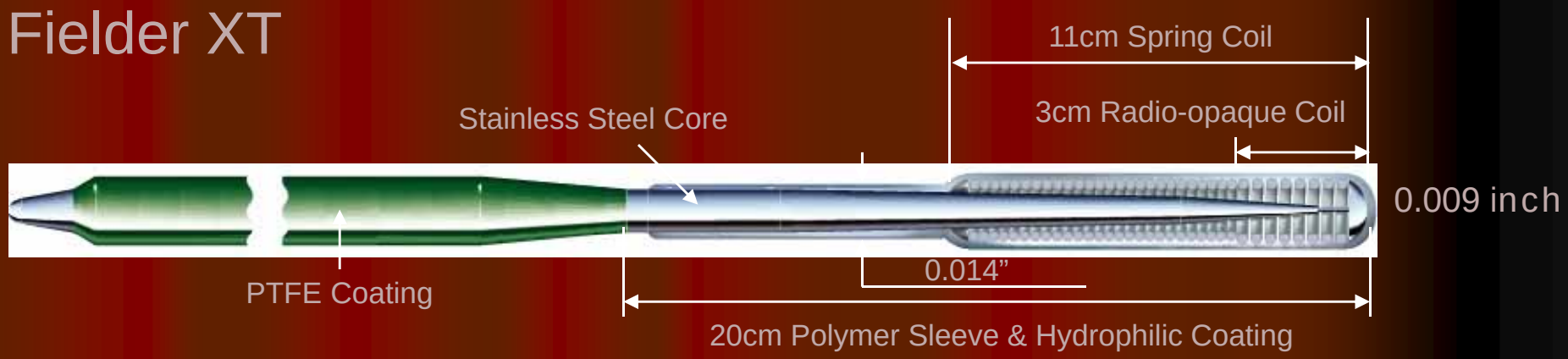
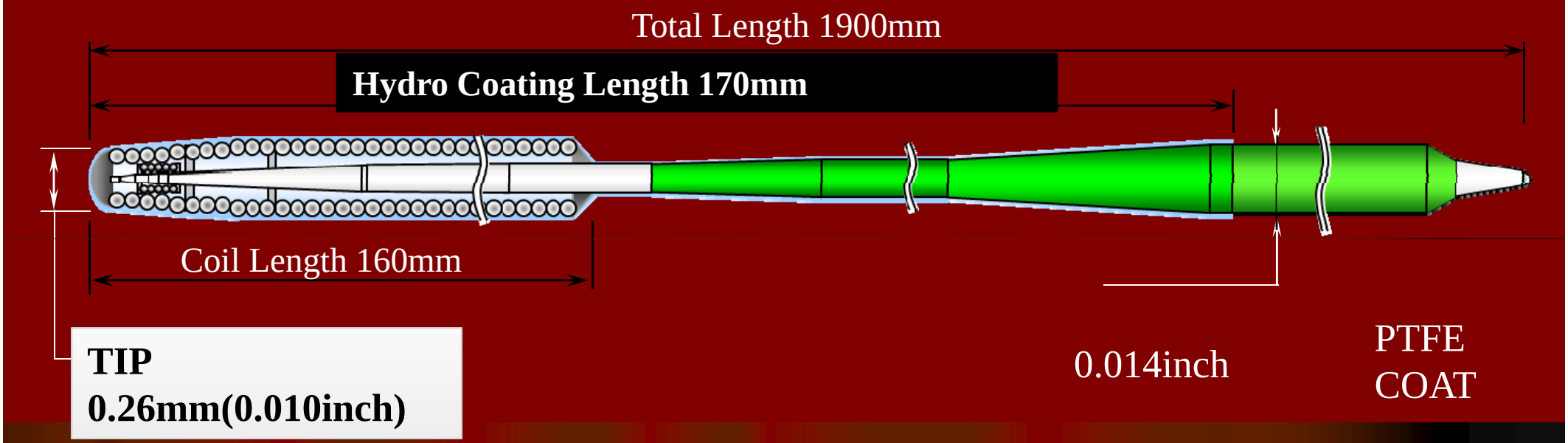
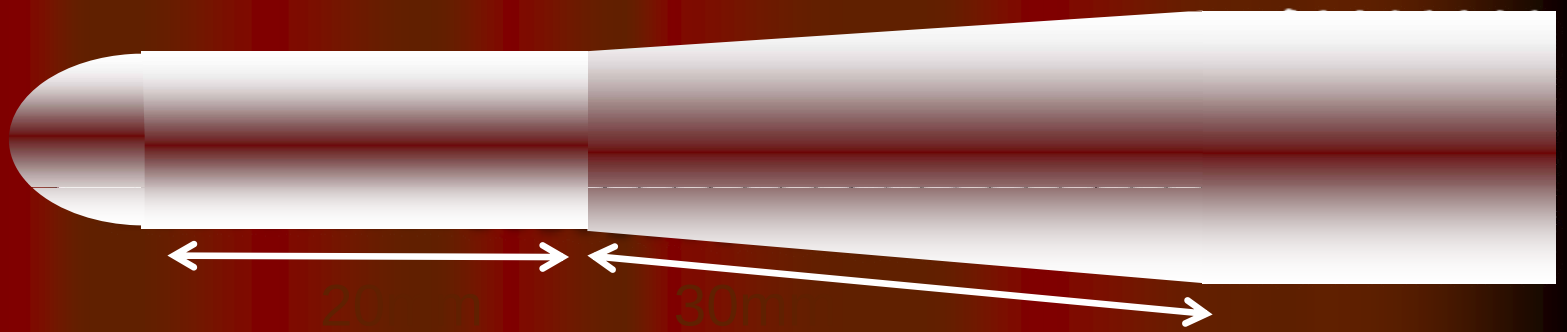
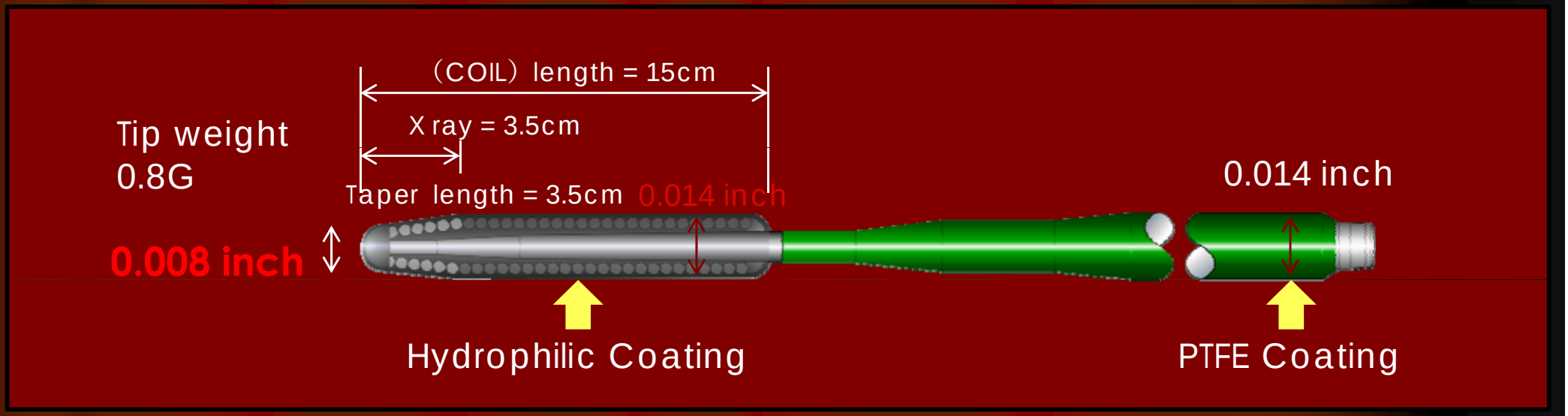


XTA GW


Total Length 1900mm
Hydro Coating Length 170mm
Coil Length 160mm
TIP
0.26mm(0.010inch)
0.014inch
PTFE
COAT

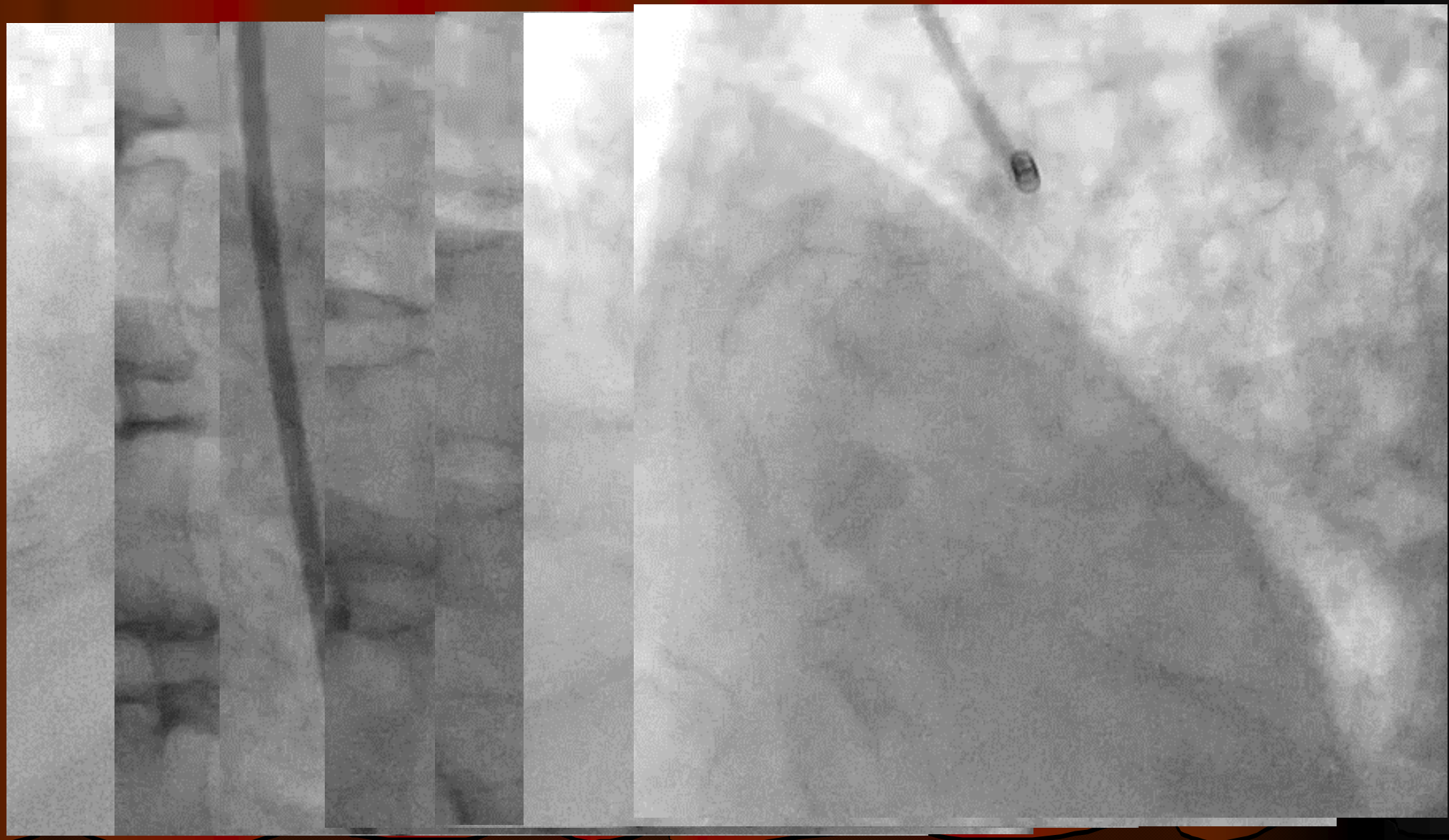

20mm
30mm

Equation .008 GW

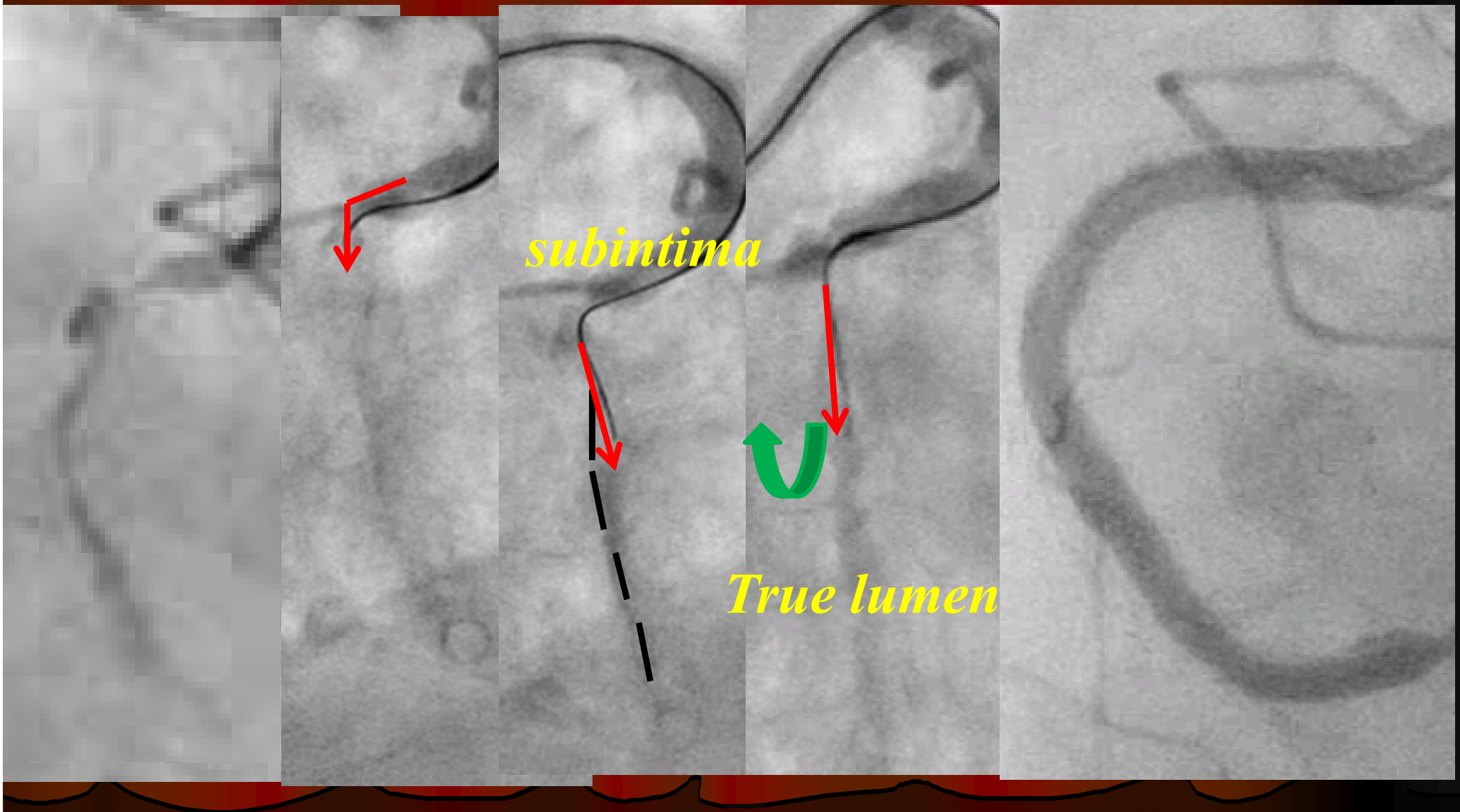


Name	Distal (inch)	length (cm)	Coil length (cm)	X ray (cm)	Polymer length (cm)	Tip weigt (g)	Real tip weight(g)	coating
Equation .008	.008/.014	190	15	3.5	15	0.8	0.8	Hydrophilic
X-treme	.009/.014	190	16	16	16	0.8	0.8	Hydrophilic

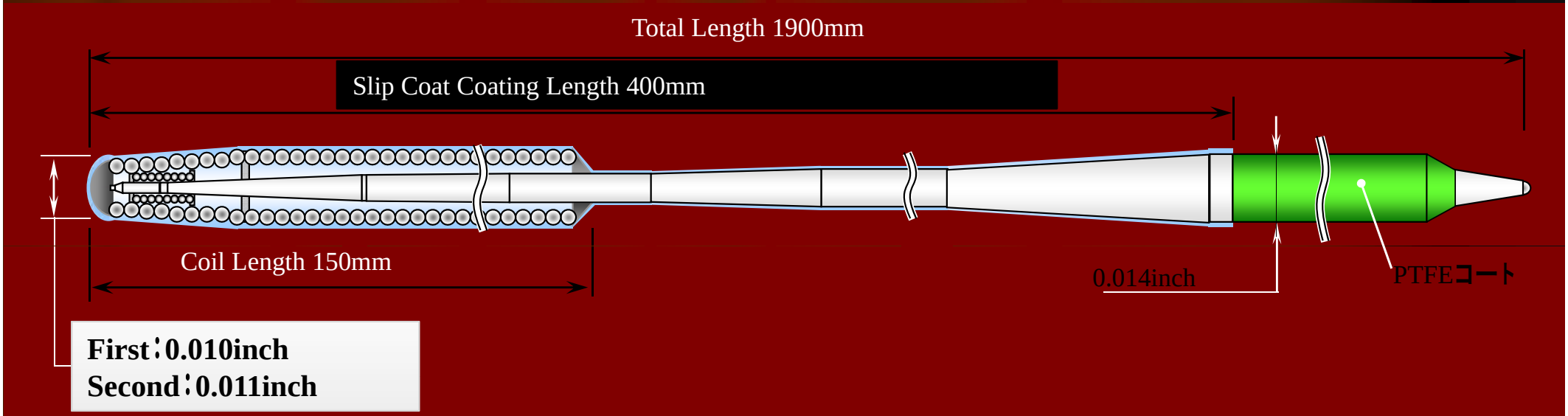
Angled CTO usind Miracle GW



Angled CTO usind Miracle GW



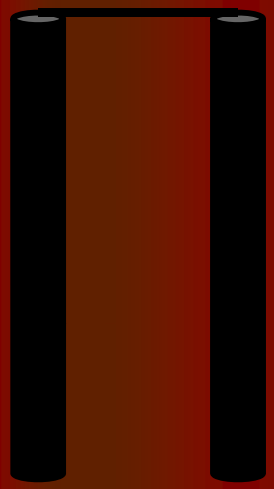
Gaia Guidewire



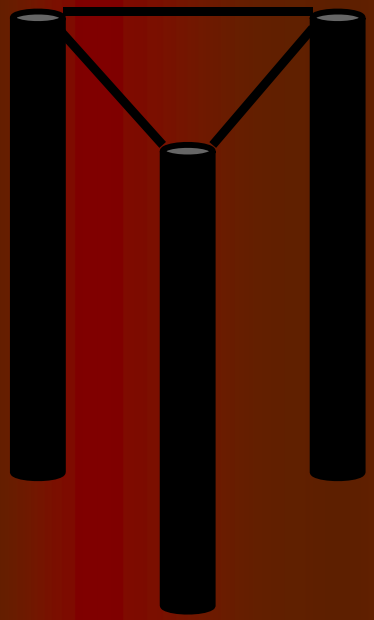
Gaia First	Tip load ：1.5gf
Gaia Second	Tip load ：3.5gf

Theory and pit hole of Parallel wire

2-D



3-D



Parallel wire is effective method just as 2-D image

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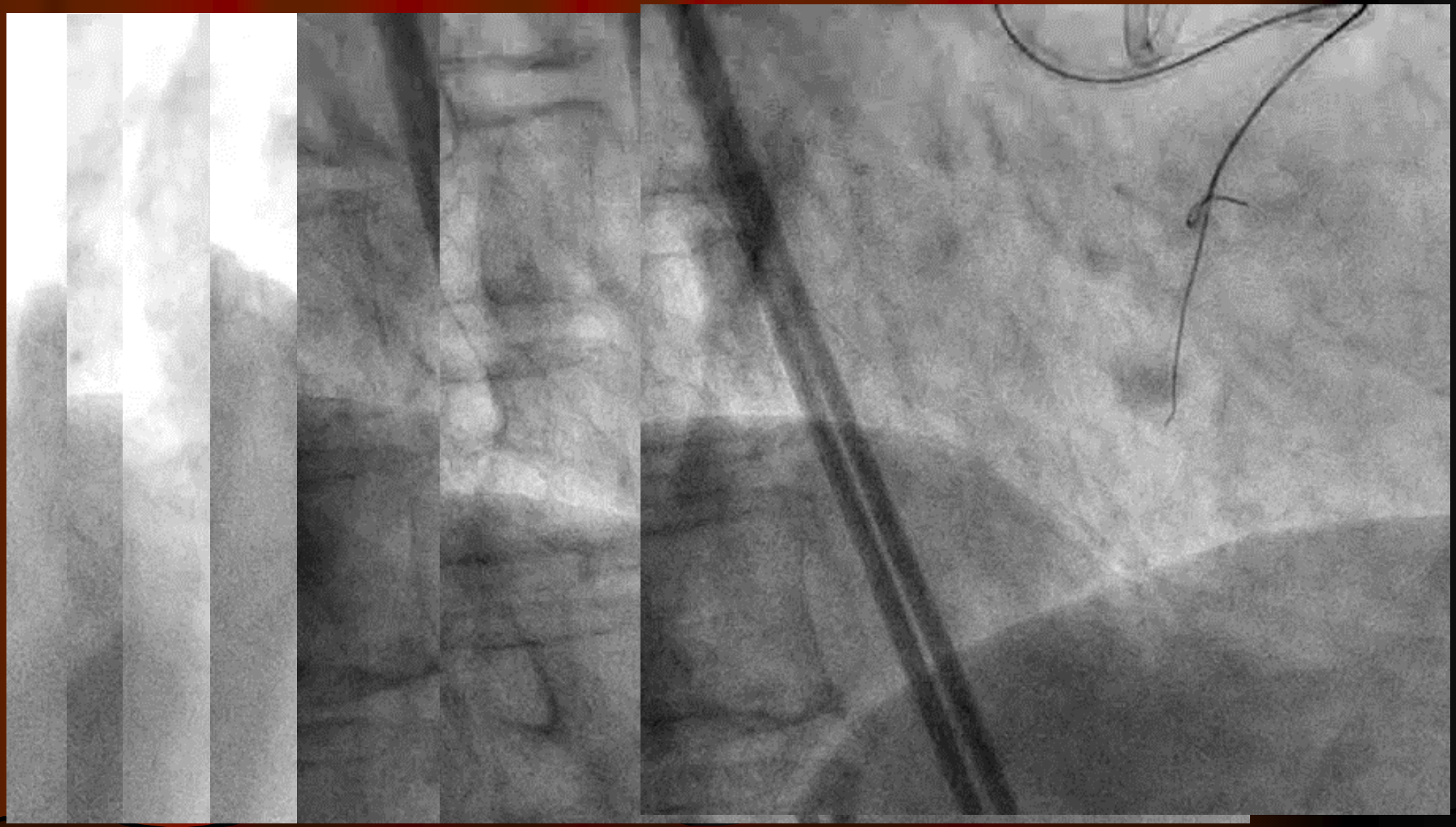
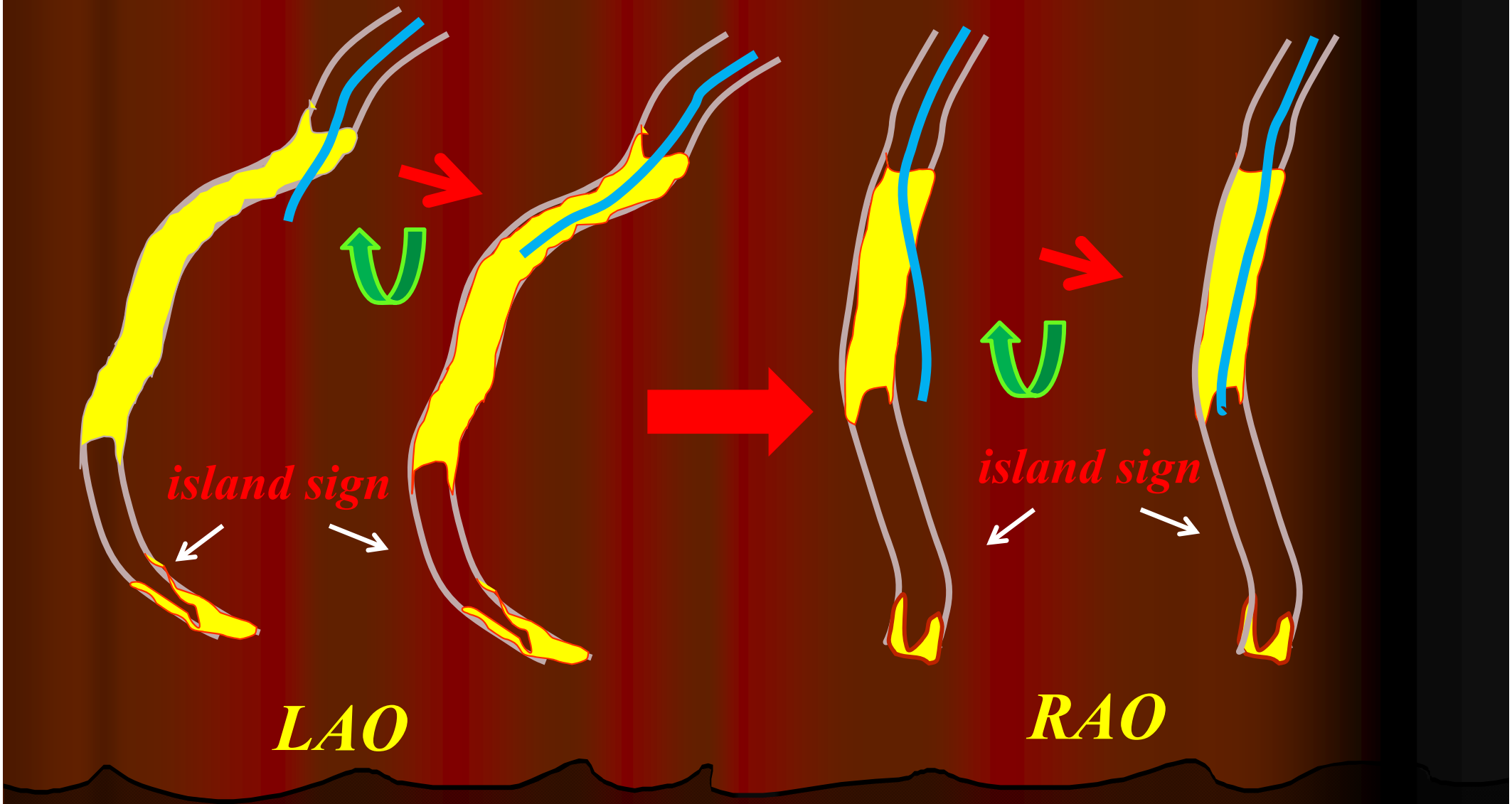
As 3-D CTO image, it should be thought re-construction of CTO based on multi-angled view.

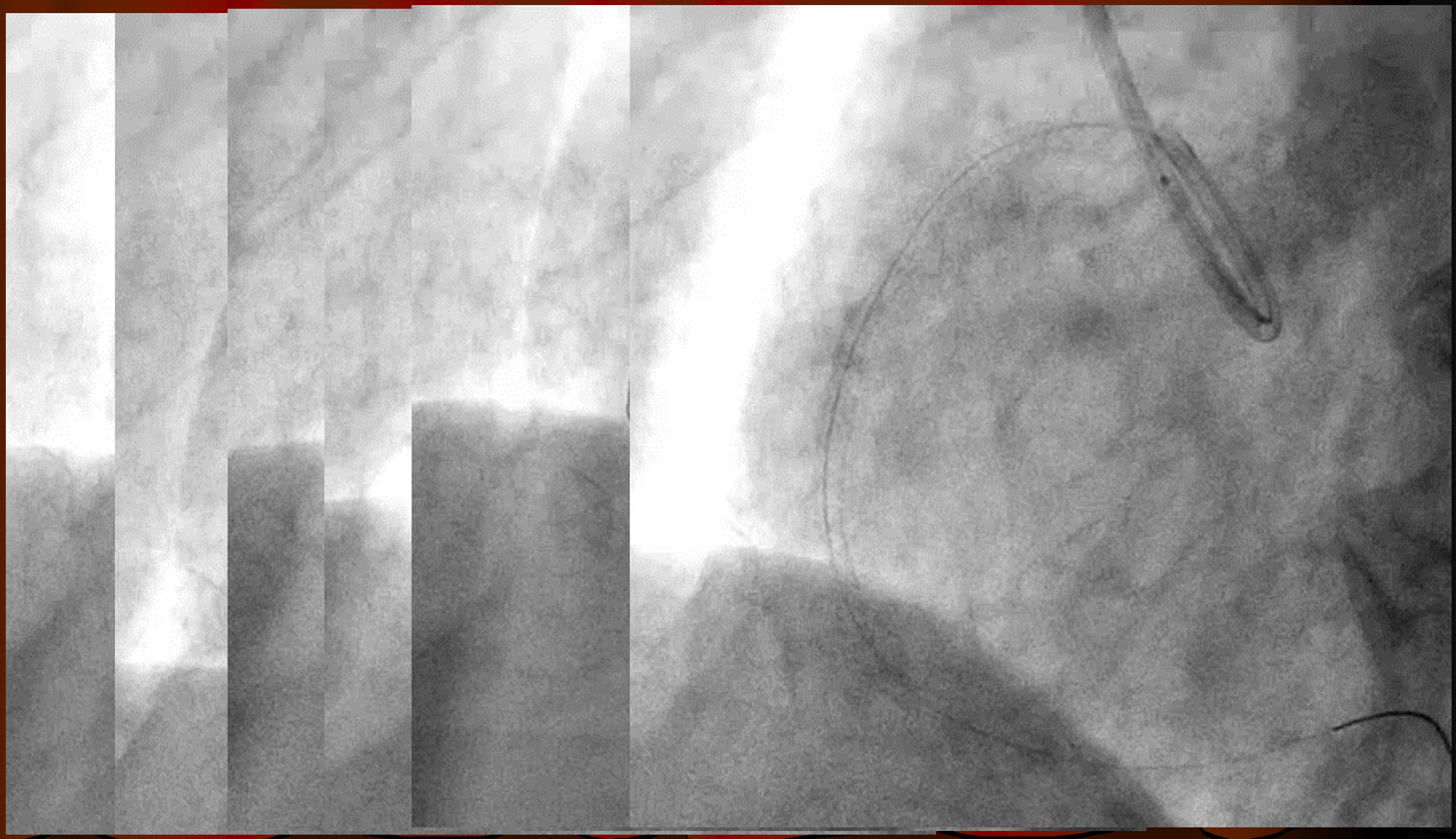
Pararell wire plus island sign for tourtous double CTO



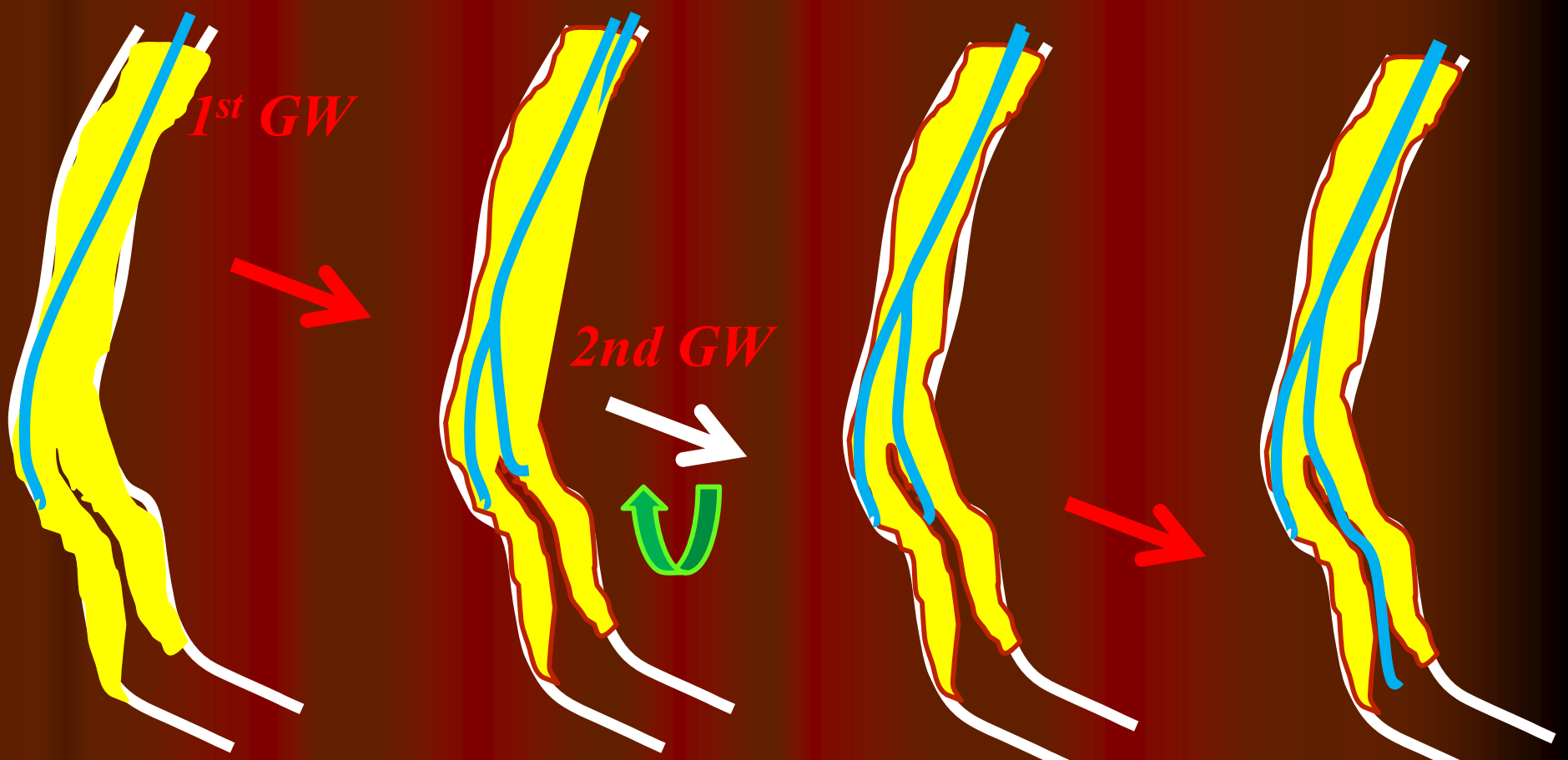
Theory of reconstruction of 3-D CTO image



Pararell wire using island sign for toutous CTO



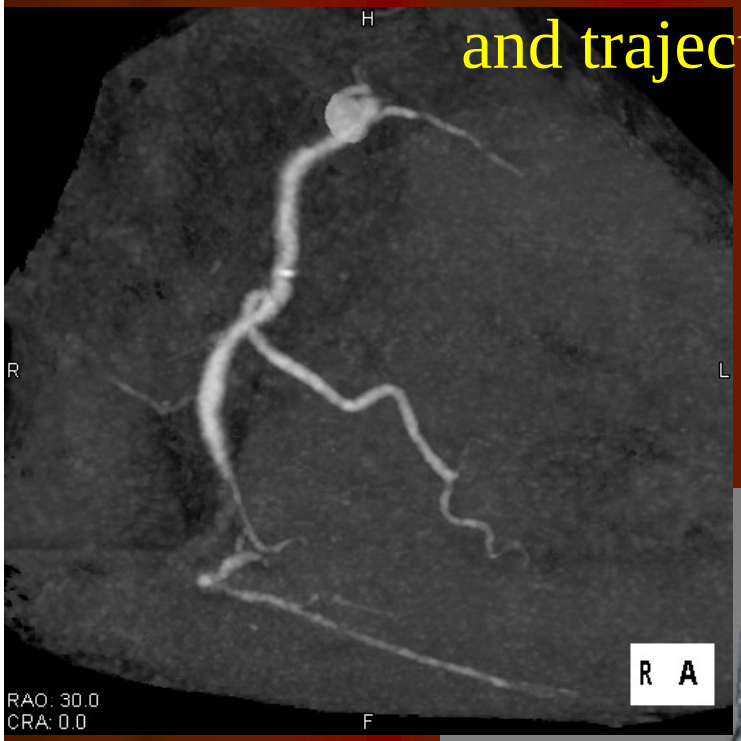
Theory of paralell wire of CTO image

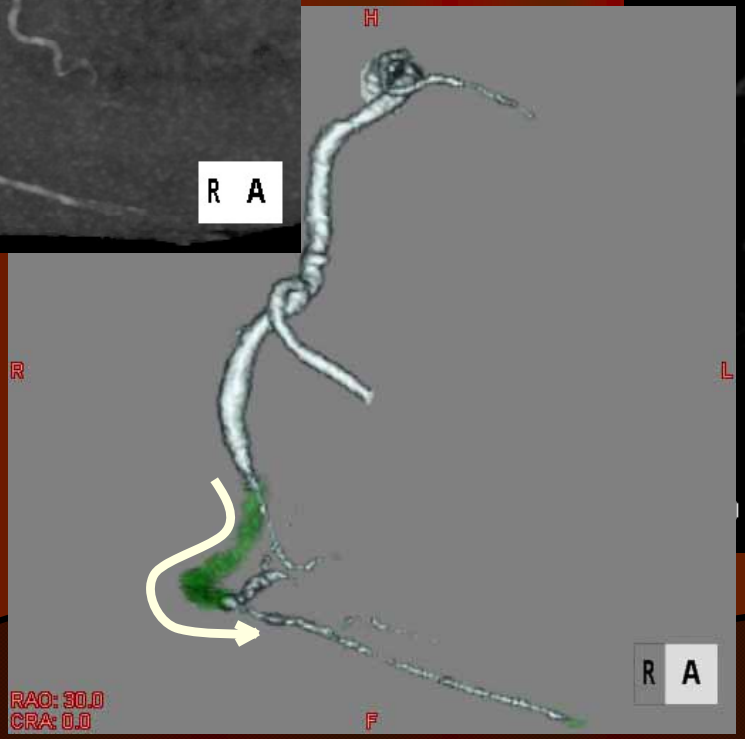


LAO20 cranial

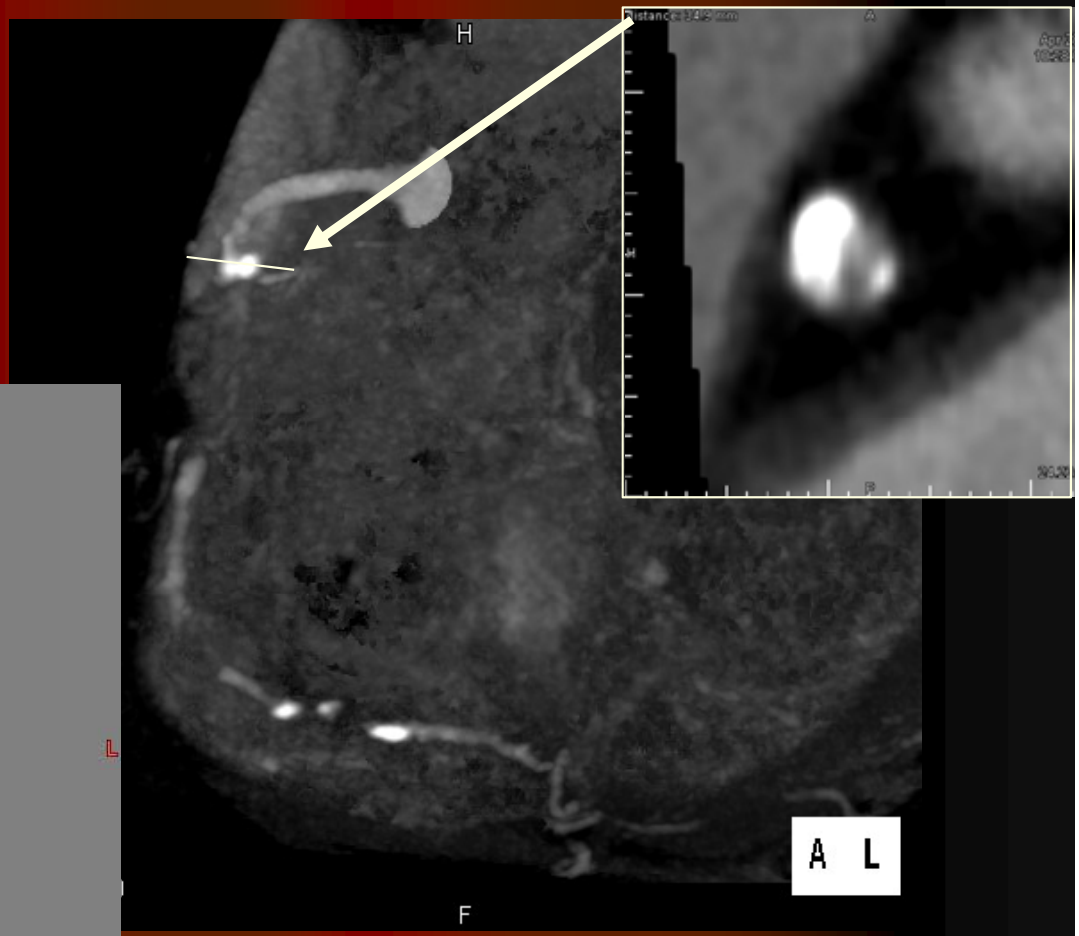
MSCT of CTO

Occlusion morphology, branch points and trajectory

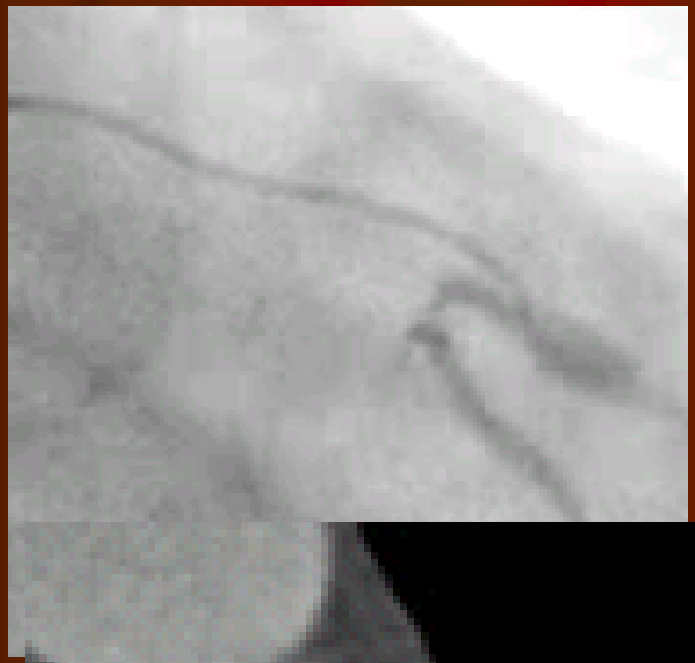


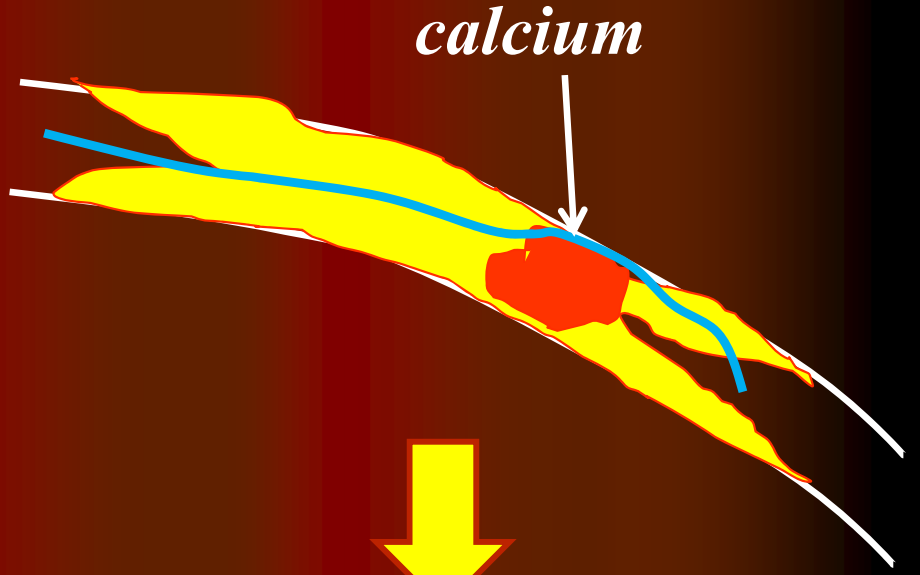


Endoluminal Course and calcification



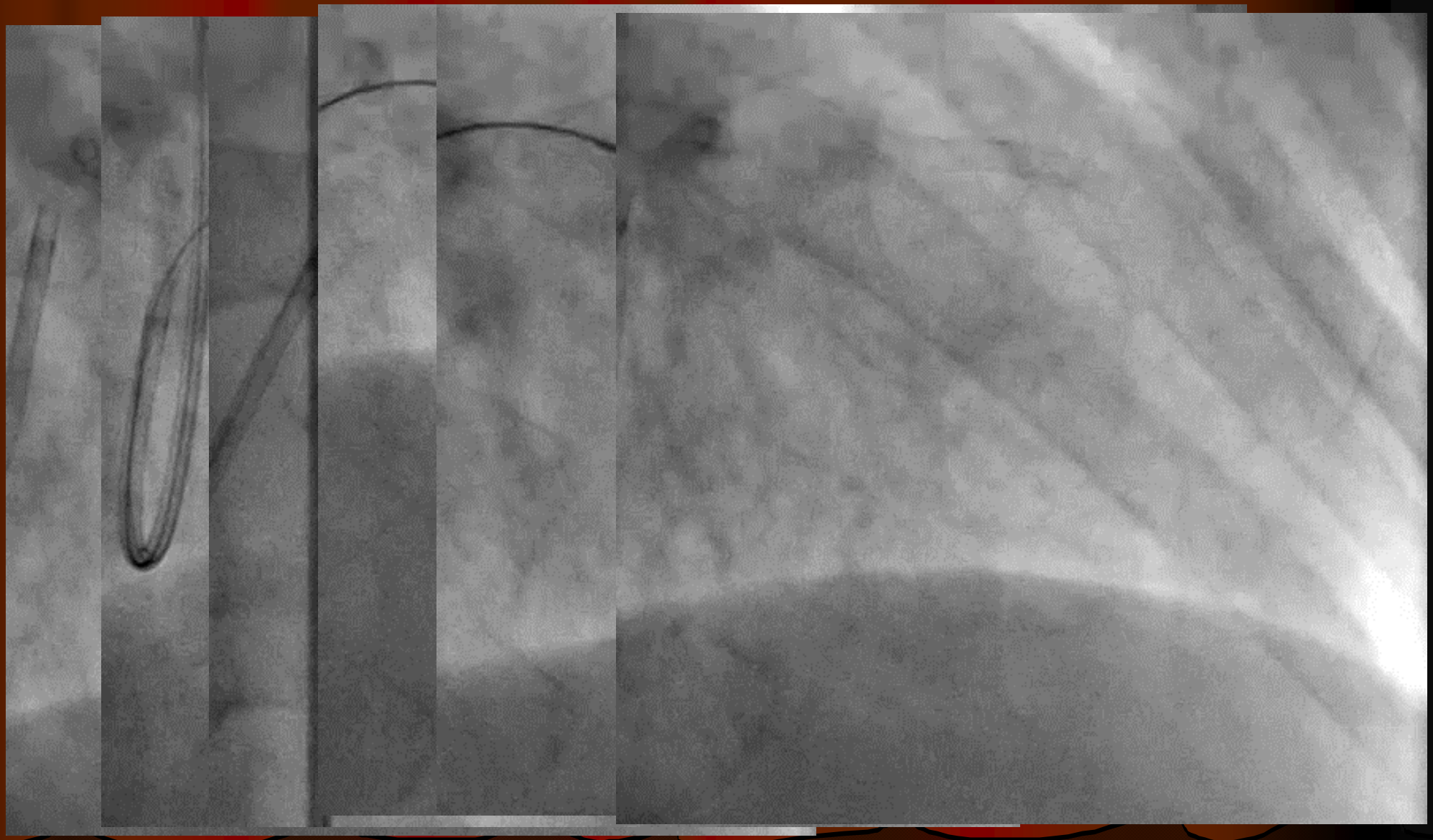
Theory of GW choice based on CT image



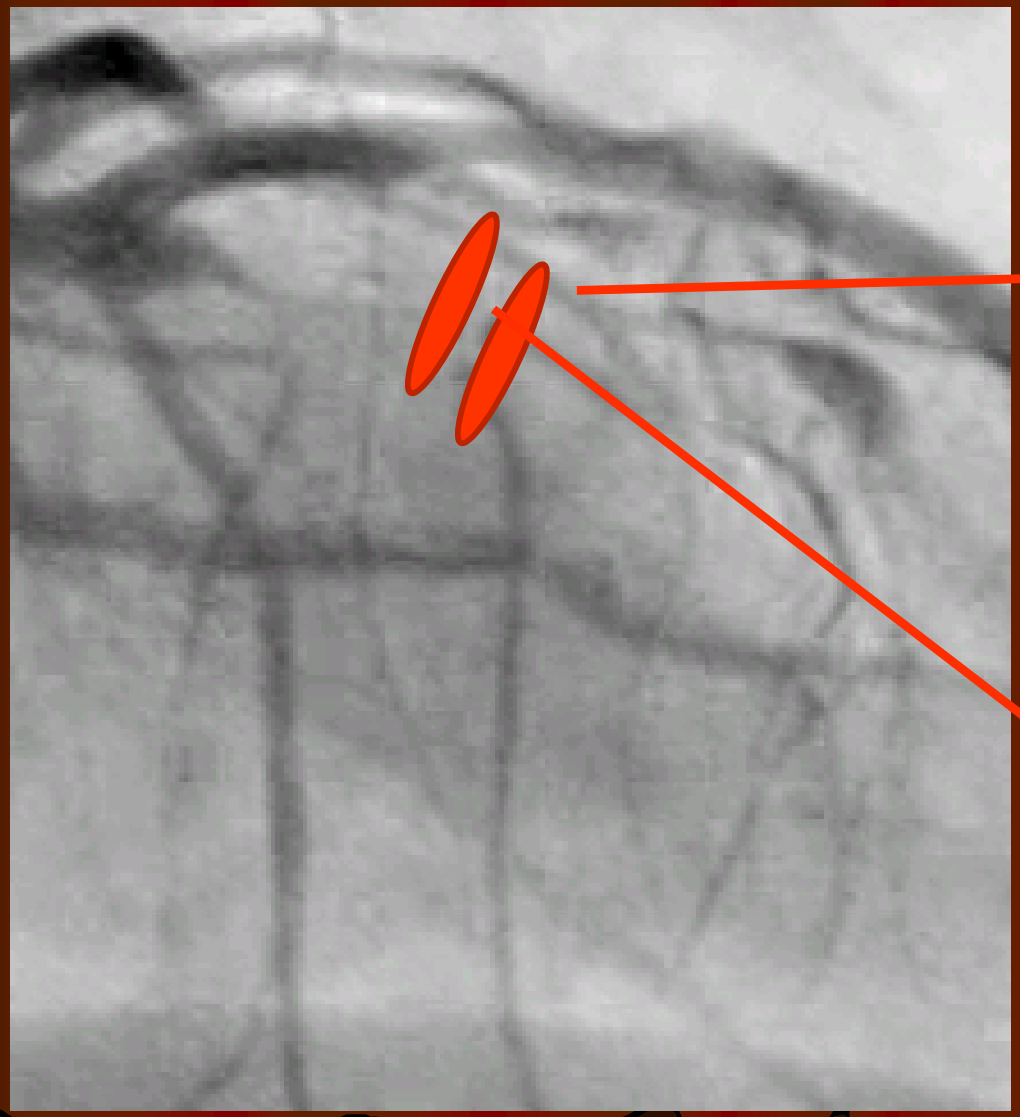


Tapering GW couldn't get back into true lumen from false lumen. So, change to stiff GW.

IVUS guide wiring~fing entry point~



IVUS guide wiring~fing entry point~



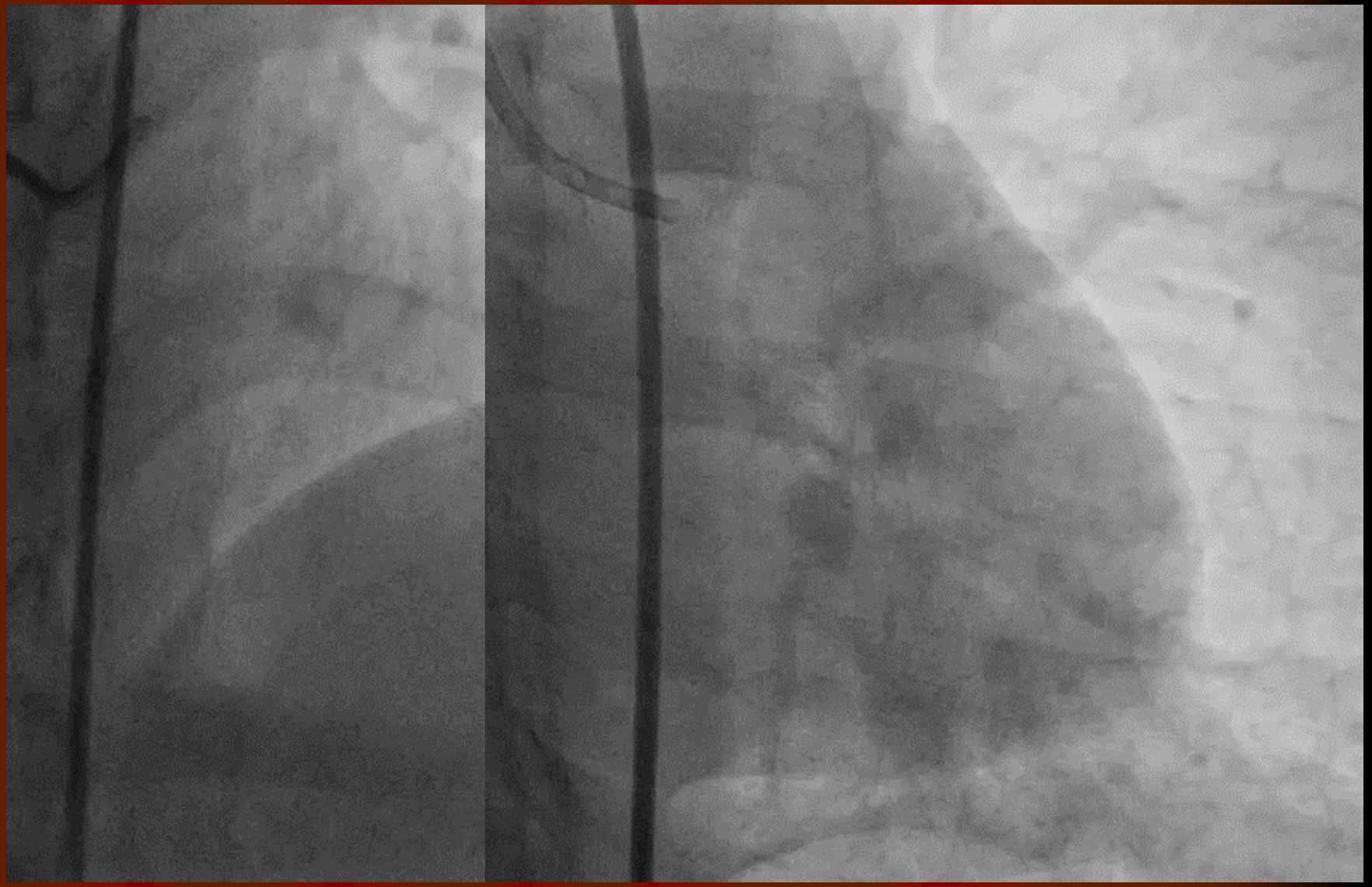
IVUS in side branch

IVUS in main branch

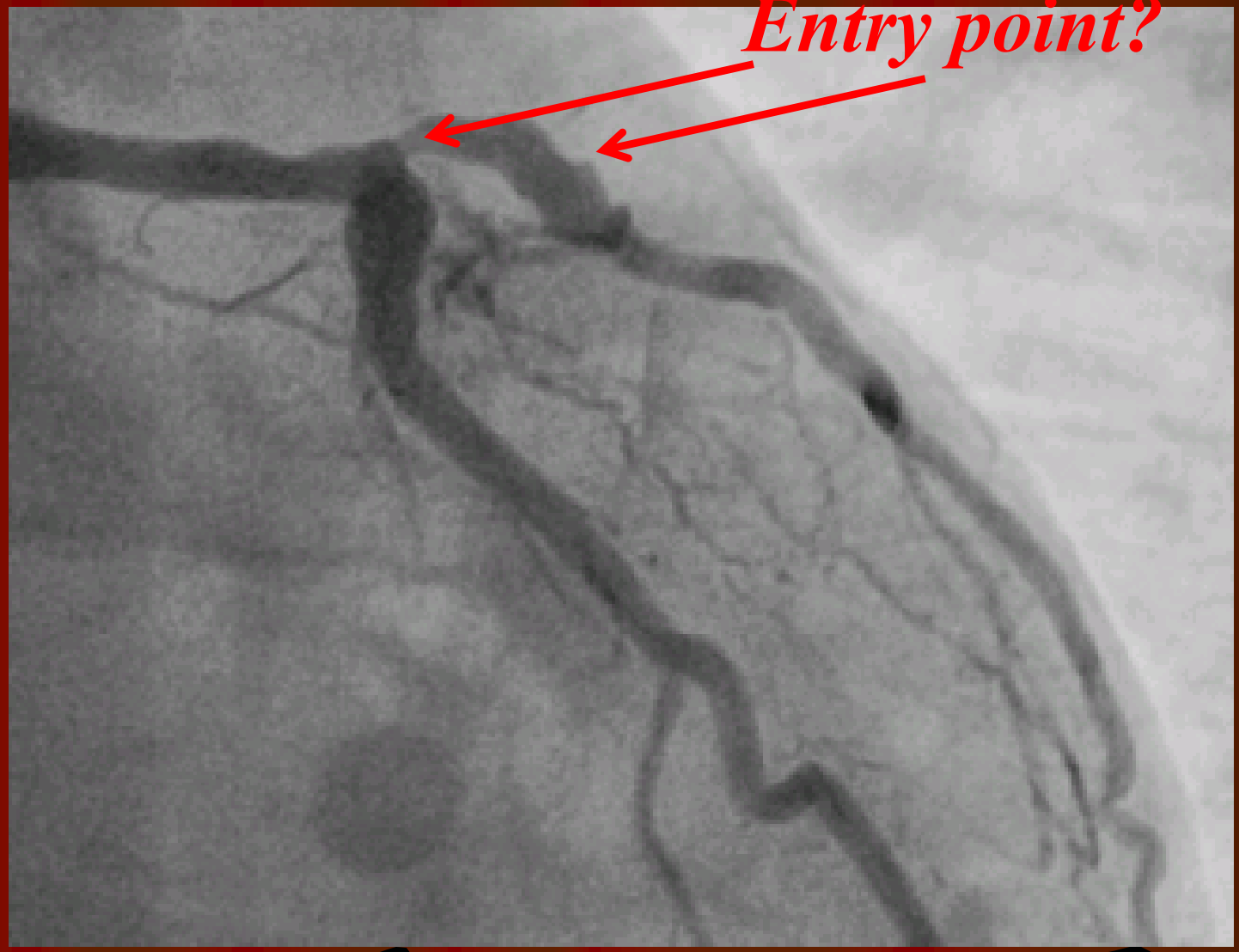
Indication of Retrograde Approach

- Failed Antegrade Approach
- Hopeless Antegrade Approach
  - Unknown Entry Point
  - Long CTO(>40mm)
  - Heavy Calcium
  - RCA Bent Point CTO
  - Ante GW into Subintimal Space
- Good Collaterals
  - Straight, Big, Visible

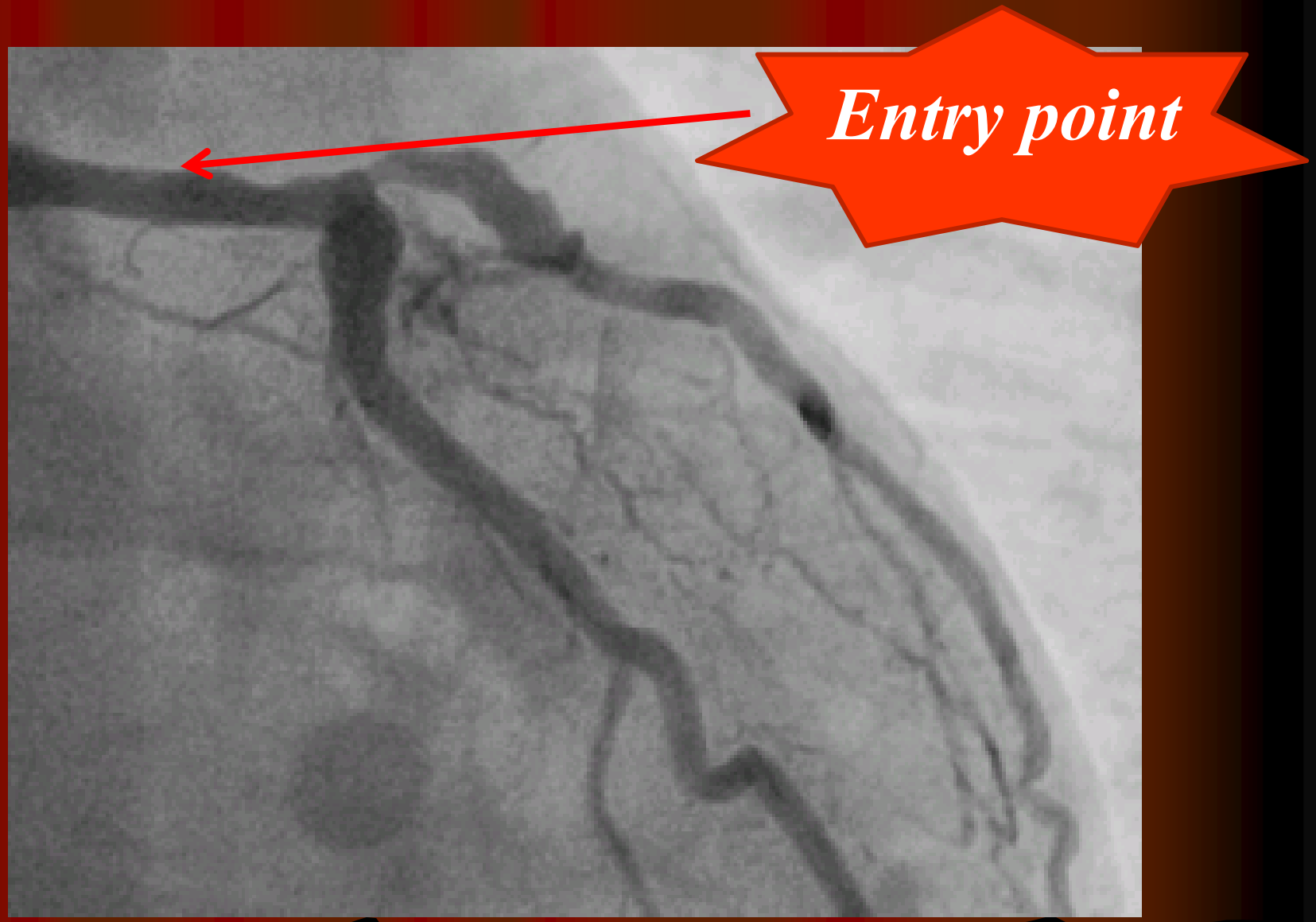
Unknown entry point



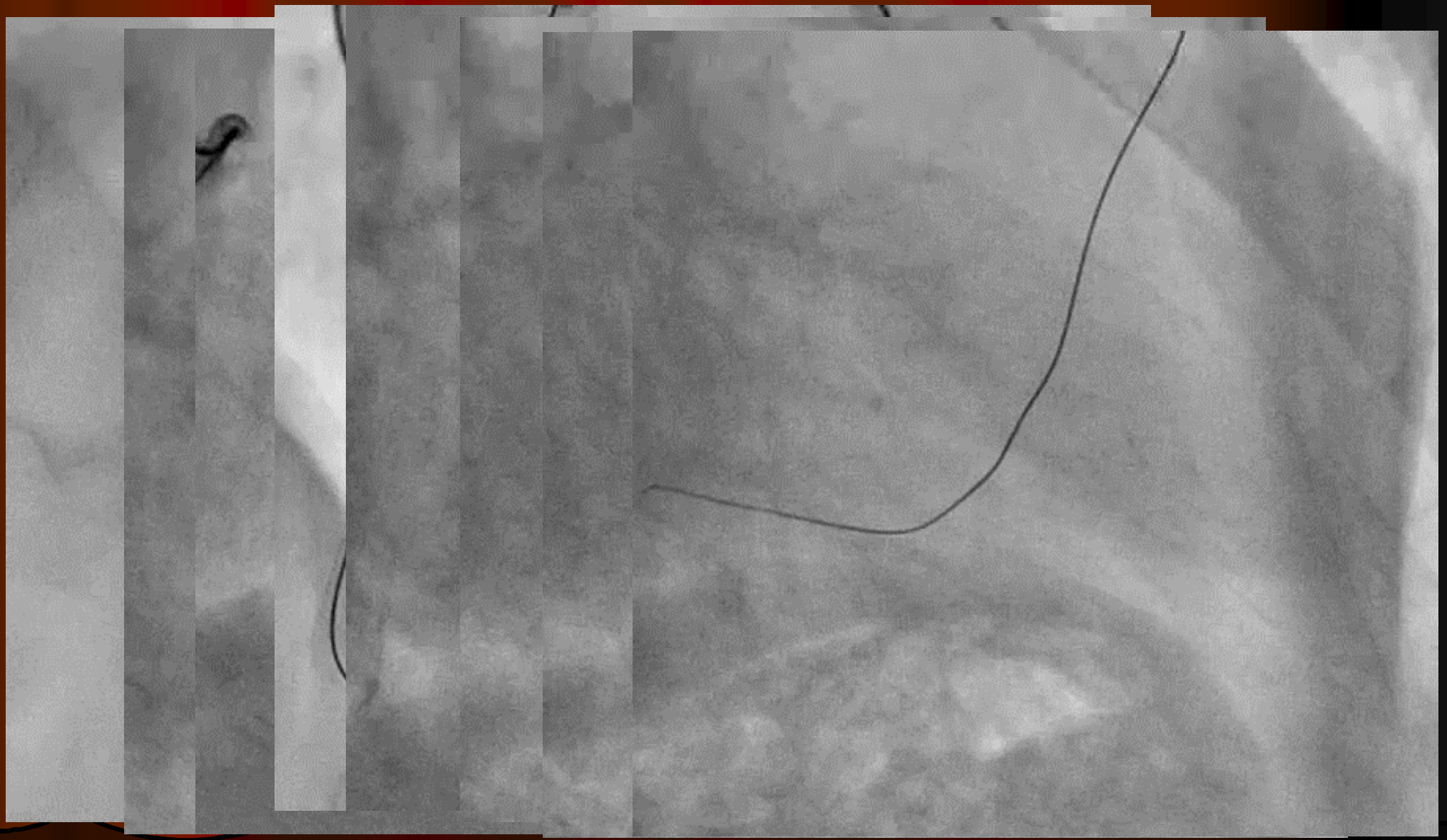
Unknown entry point



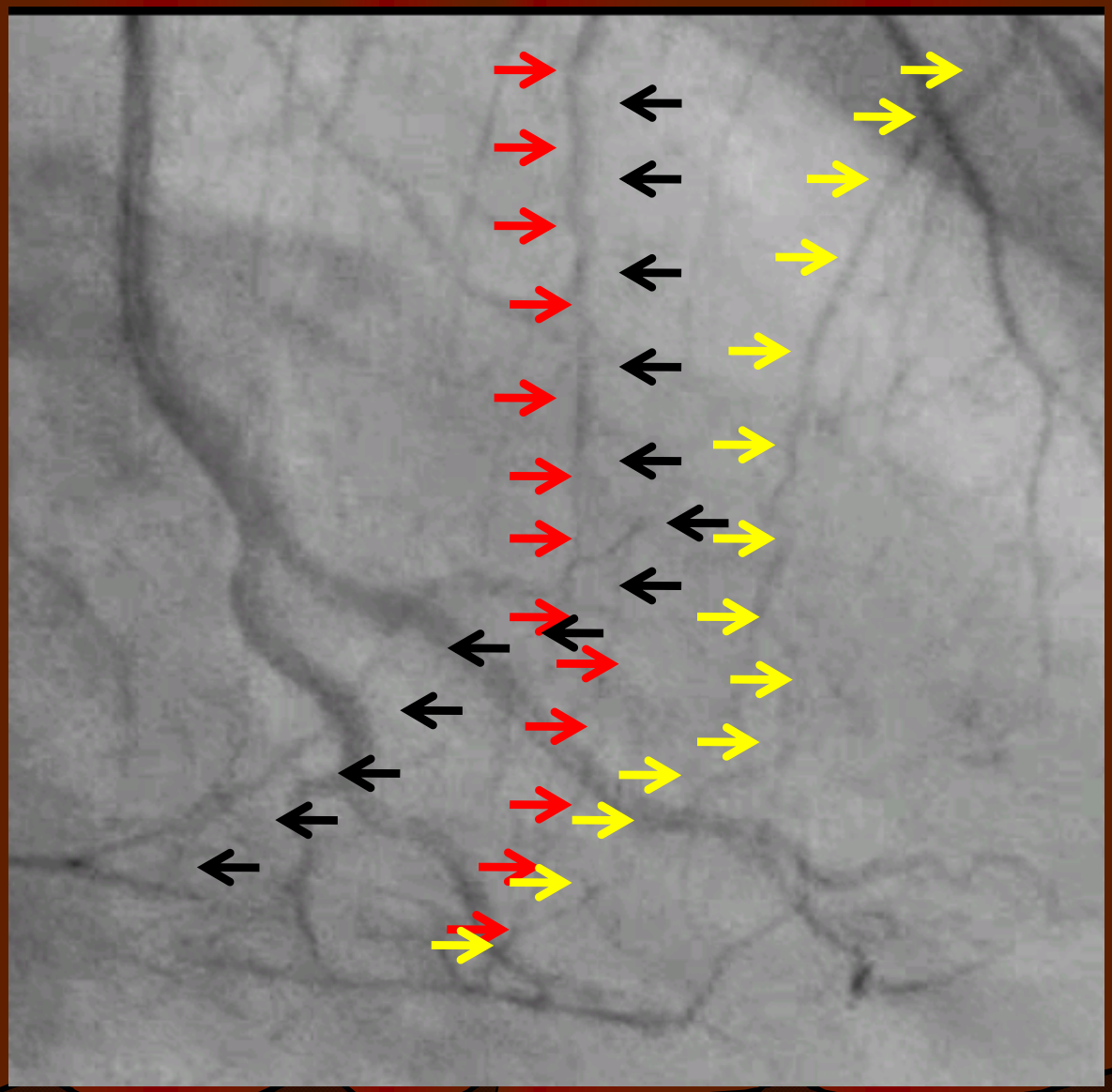
Epicardial approach


Entry point

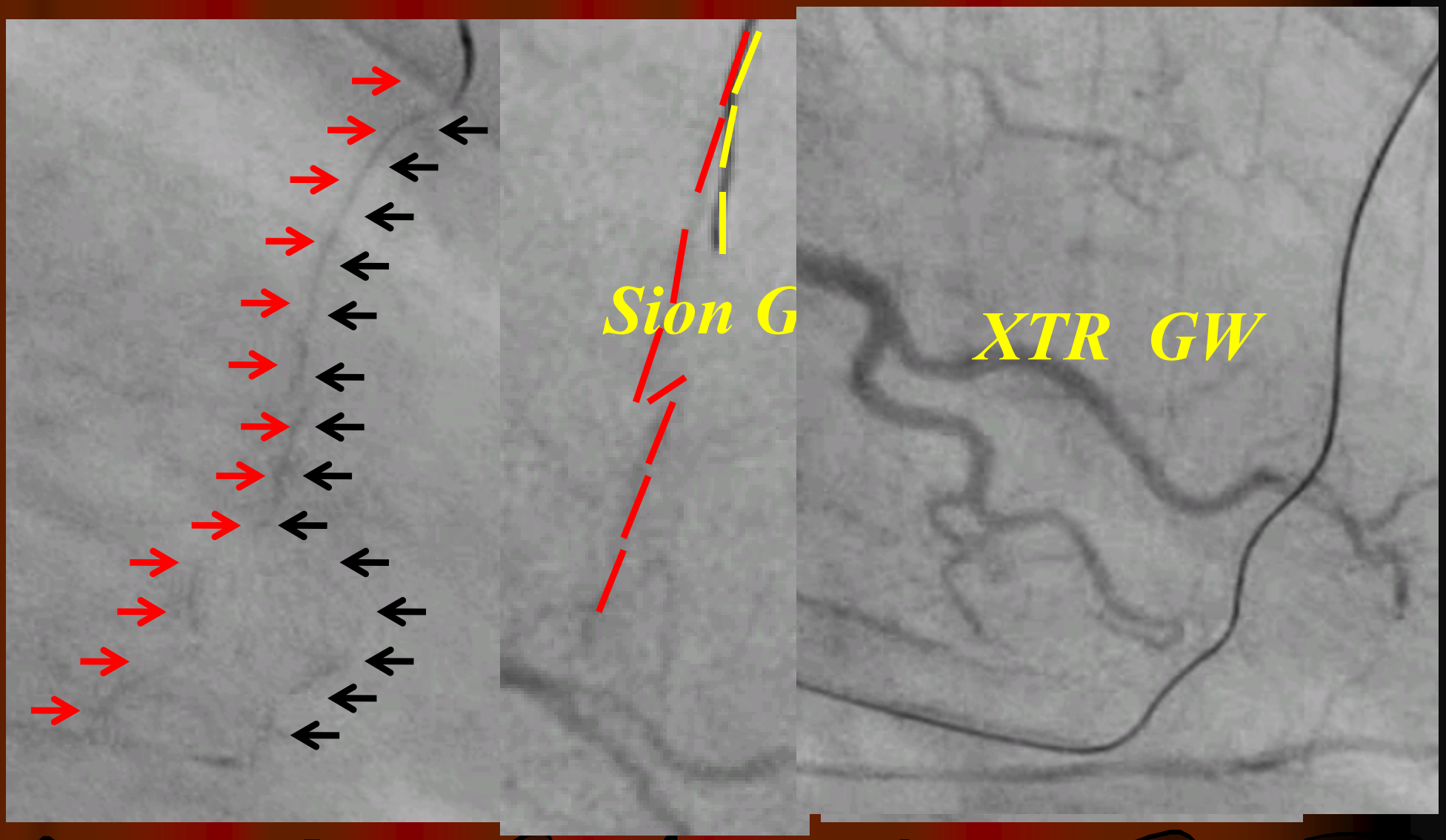
Complex r-CART case



Selection of septal collaterals

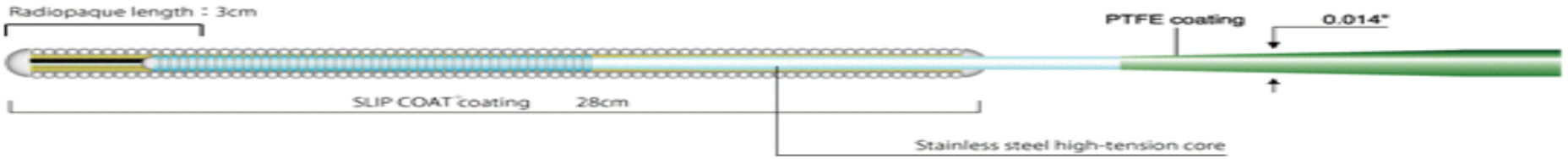


Tough channel crossing by Sion+XTR GW



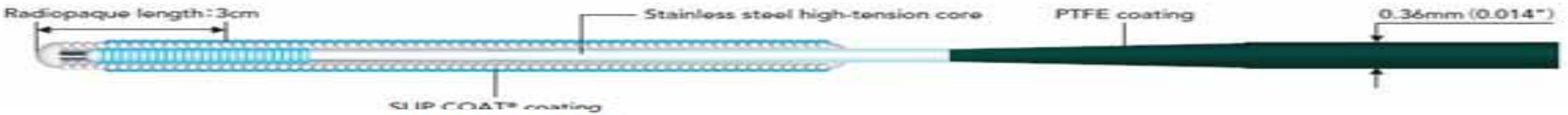
Sion series GW

ASAHI SION
PTCA GUIDE WIRE



- Tip Load 0.7g
- Radiopacity 3cm
- Coil 28cm
- Diameter 0.014inch
- Length 175cm

ASAHI SION blue
PTCA GUIDE WIRE

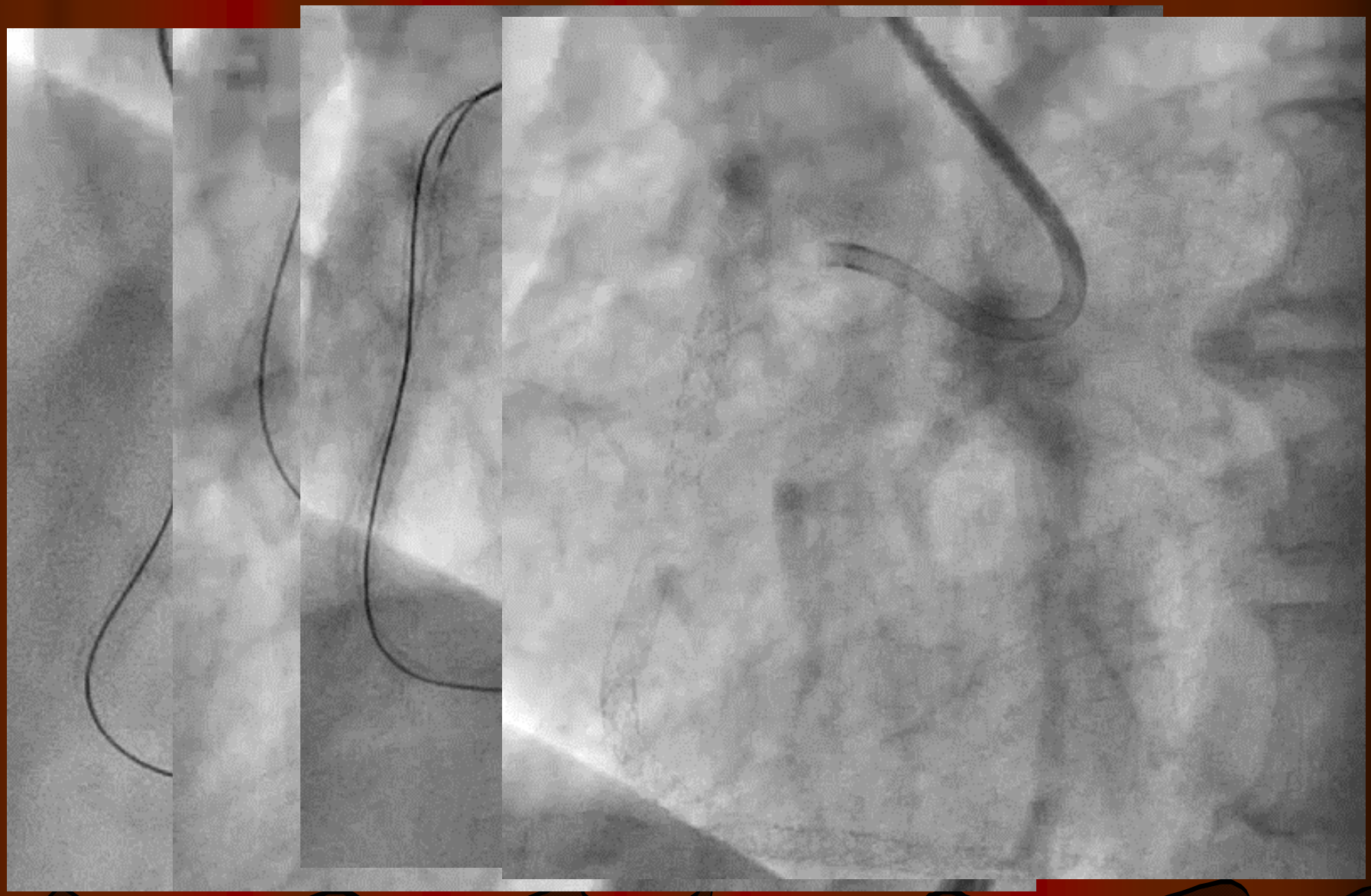


- Tip Load 0.5g
- Radiopacity 3cm
- Coil 20cm
- Diameter 0.014inch
- Length 175cm

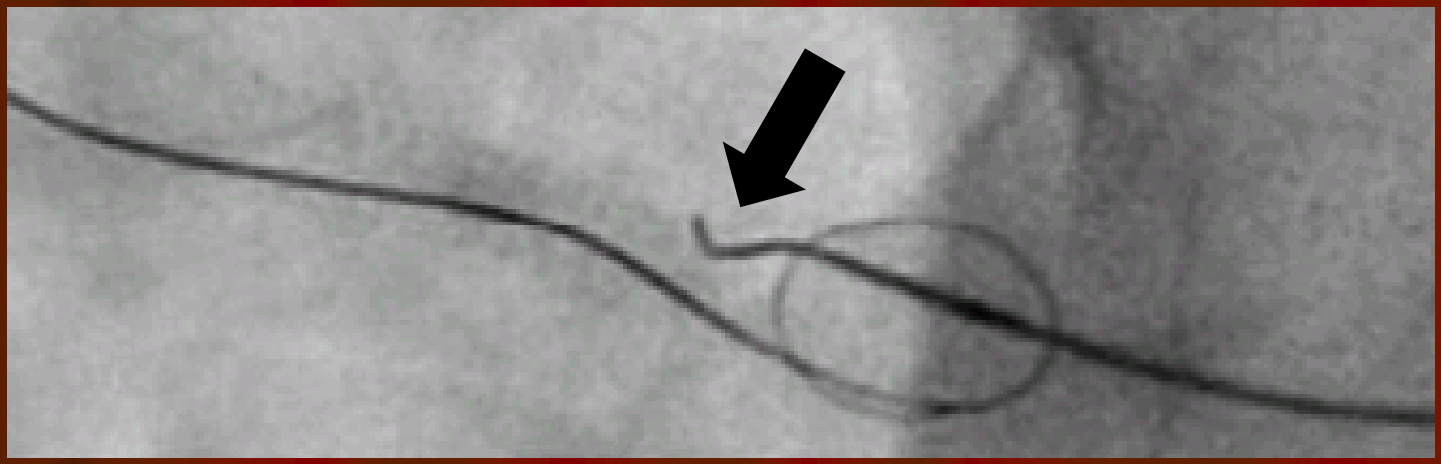
Fielder XTR GW

- Tip size 0.010inch
- Polymer coat

Difficult chanel connect ante and retrograde GW



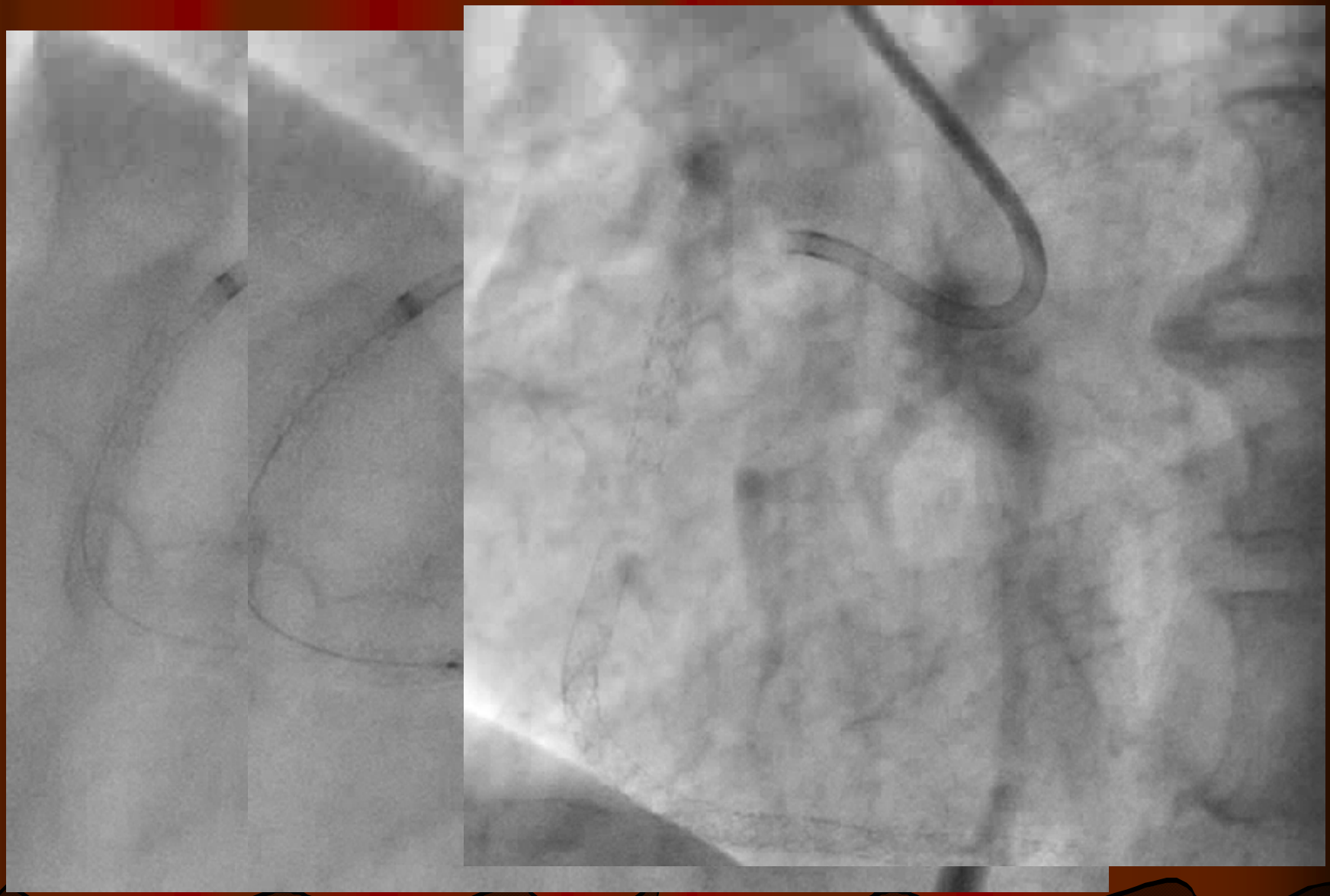
Change GW more slippery one



Pilot 200g GW→Sion GW

Pro. Time 225min
Contrast 400ml
Radiation 4.7Gr

DES inplantation



Conclusion

1. PCI to CTO has improved the rate of an initial success to about 90% by the progress of treatment technology, devices and strategy.
2. Technically, Suitable guidingcatheter and guidewire are important to success for CTO.
3. New guidewire and microcatheter was developed for advanced CTO
4. MSCT, IVUS guide technique is useful in the case of complicated CTO lesion.
5. Retrograde approach is most impact technique in cases of failed antegrade approach.