

# Basics of Peripheral Interventions – A primer for beginners

George Joseph

Professor of Cardiology

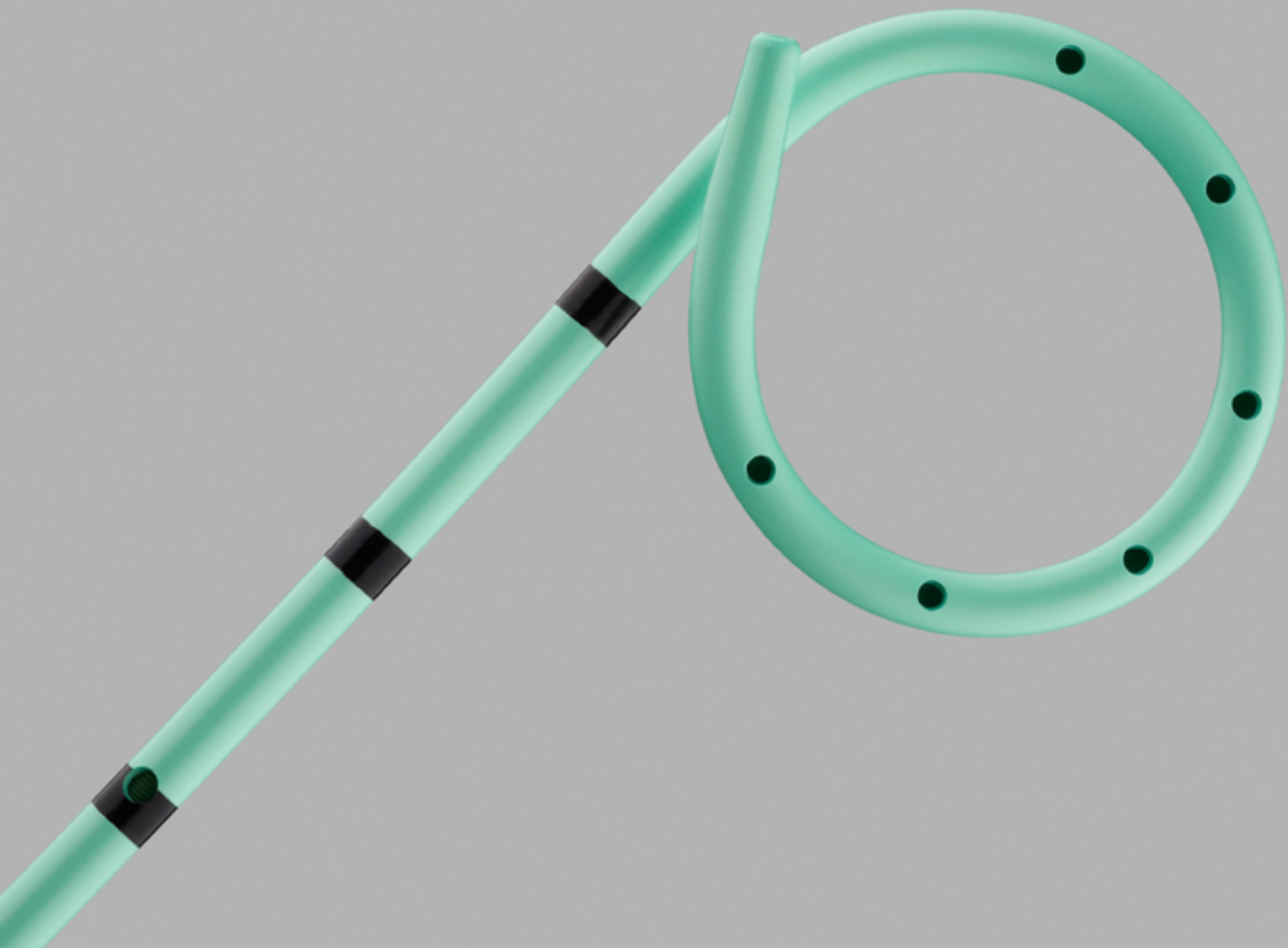
Christian Medical College, Vellore

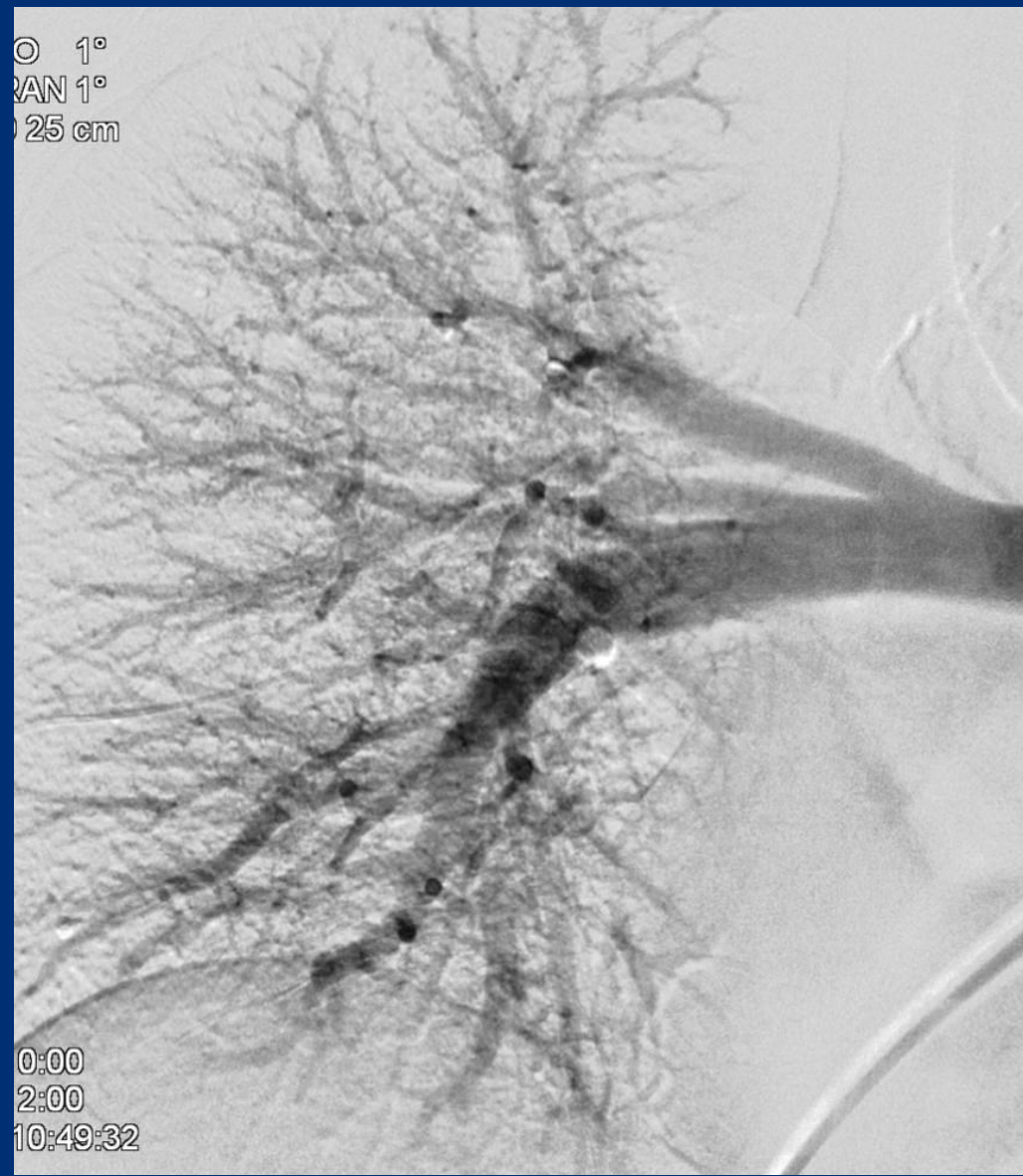
# Strengths

- Already trained in:
  - Use of the catheterization laboratory
  - Vascular access and management
  - Medications used in the lab
  - Anti-coagulation and anti-platelet therapy
  - Hemodynamics, resuscitation, monitoring
  - Diagnostic angiography
  - Interventional skills
  - Patient care from initial OPD visit to follow-up

# Weaknesses

- Poor knowledge of vascular anatomy
- Unable to perform open surgery
- Inadequate training in CT / MRI / peripheral vascular Doppler
- Difference in size and scale (coronary vs peripheral)
- Assumption that what applies to the coronaries will apply elsewhere
- Unwilling to put in time and effort to learn PVI
- Overconfidence
- Cath labs poorly equipped for peripheral work





RPA



LPA



10.09.2009

AP  
view

AP  
view



Lateral  
view



LAO 45  
view





RAO 30  
view



© 31°  
UD 0°  
25 cm

0:00  
3:00  
3:48:43

# Digital Subtraction Angiography

- Inject immediately after screen goes white (masking)
- No breathing / swallowing / moving (easier under GA)
- Practise the drill before actual injection
- If patient unable to co-operate, try pinching nose and closing mouth
- Bowel preparation: bisacodyl (Dulcolax), dimethyl-poly-siloxane (Dimol), charcoal, enema
- Dilution of iodinated contrast to 50% or 70%, rapid injection, larger volume
- CO<sub>2</sub> angiography in abdomen, limbs, veins
- Change masking image (movement before injection)

AO 0°  
AUD 0°  
D 25 cm

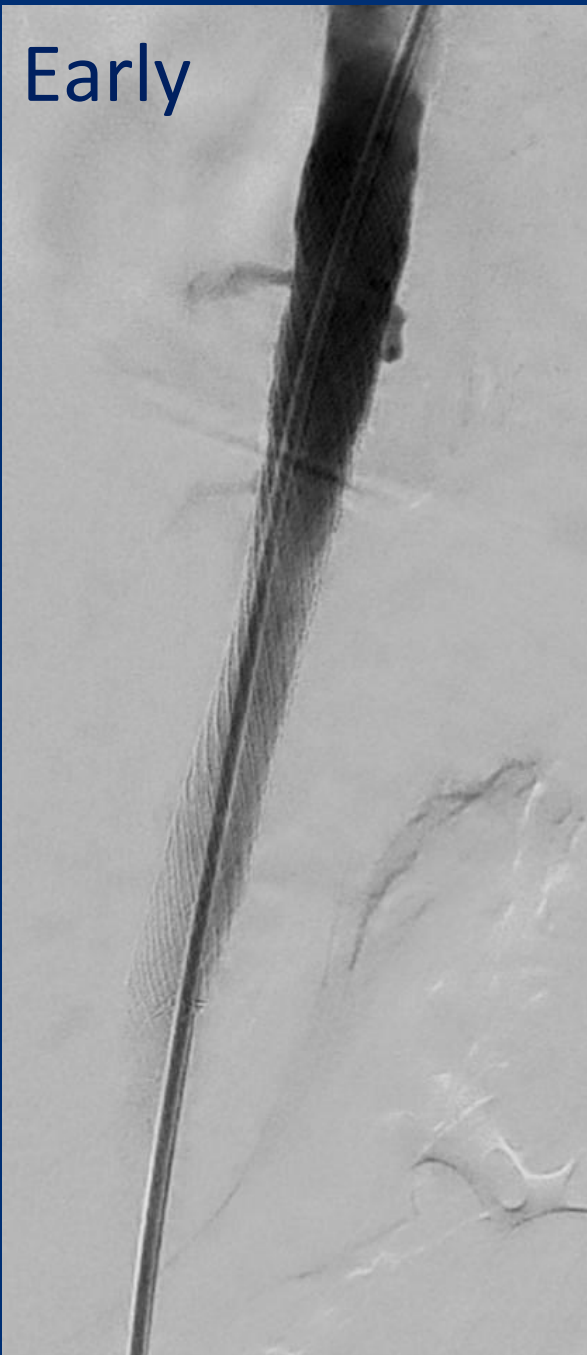


1:67  
2:67  
13:52:47

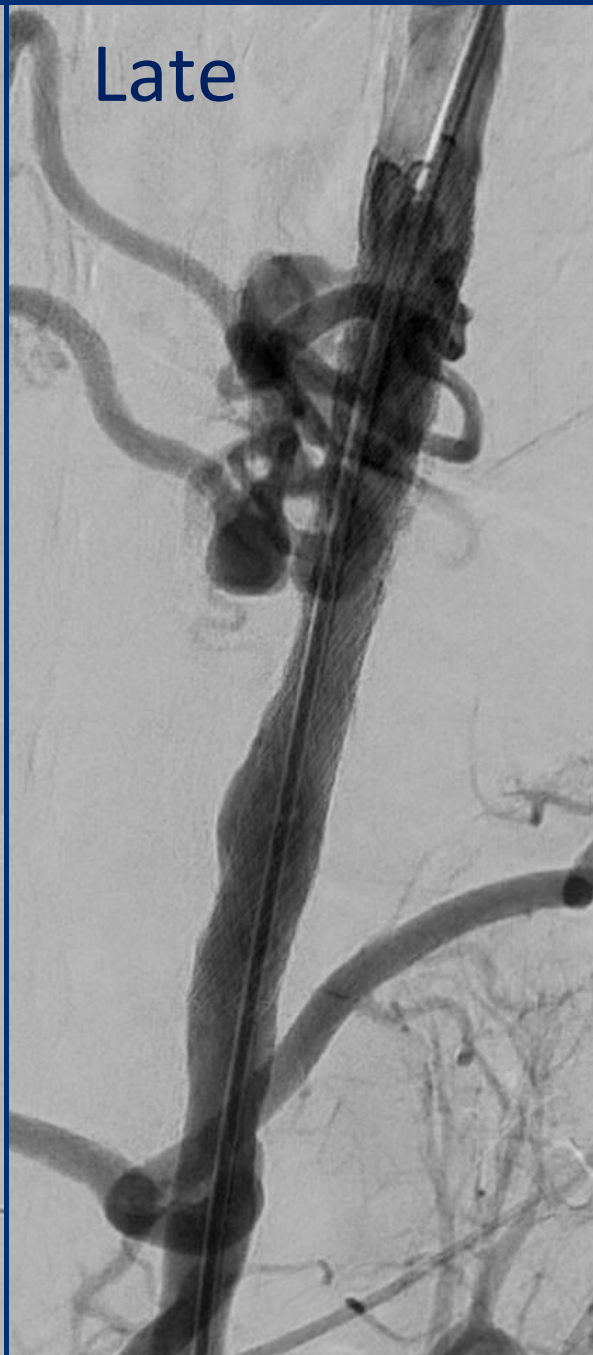
AP Cr 17  
view



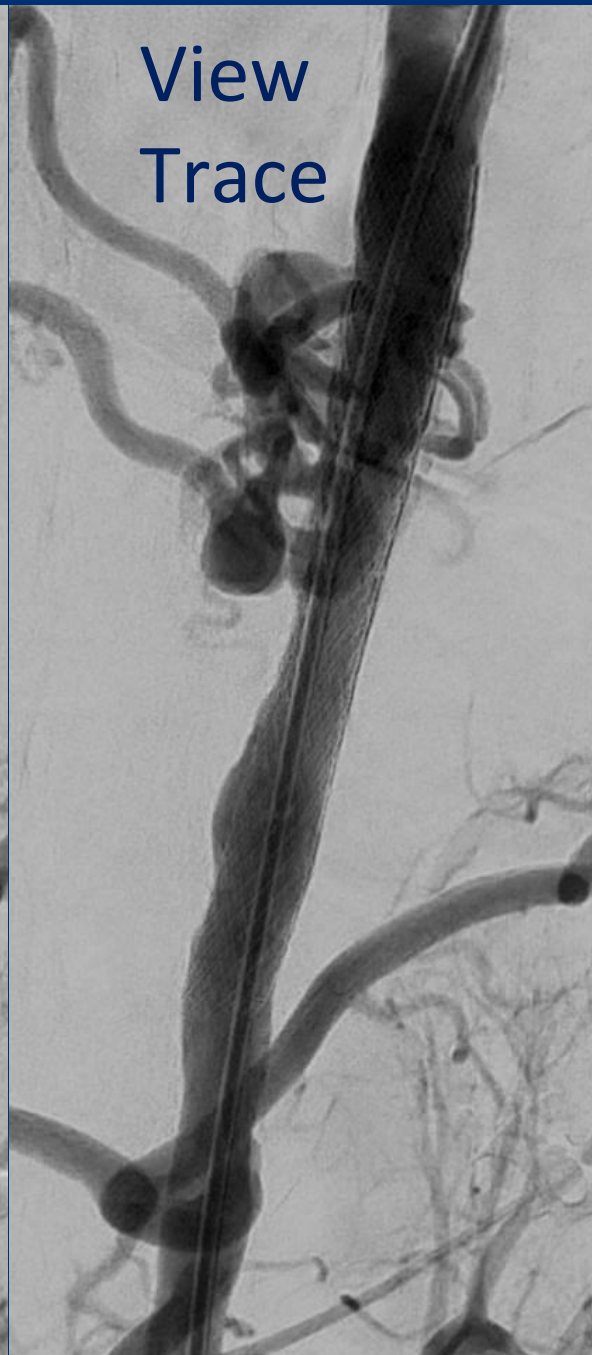
Early



Late

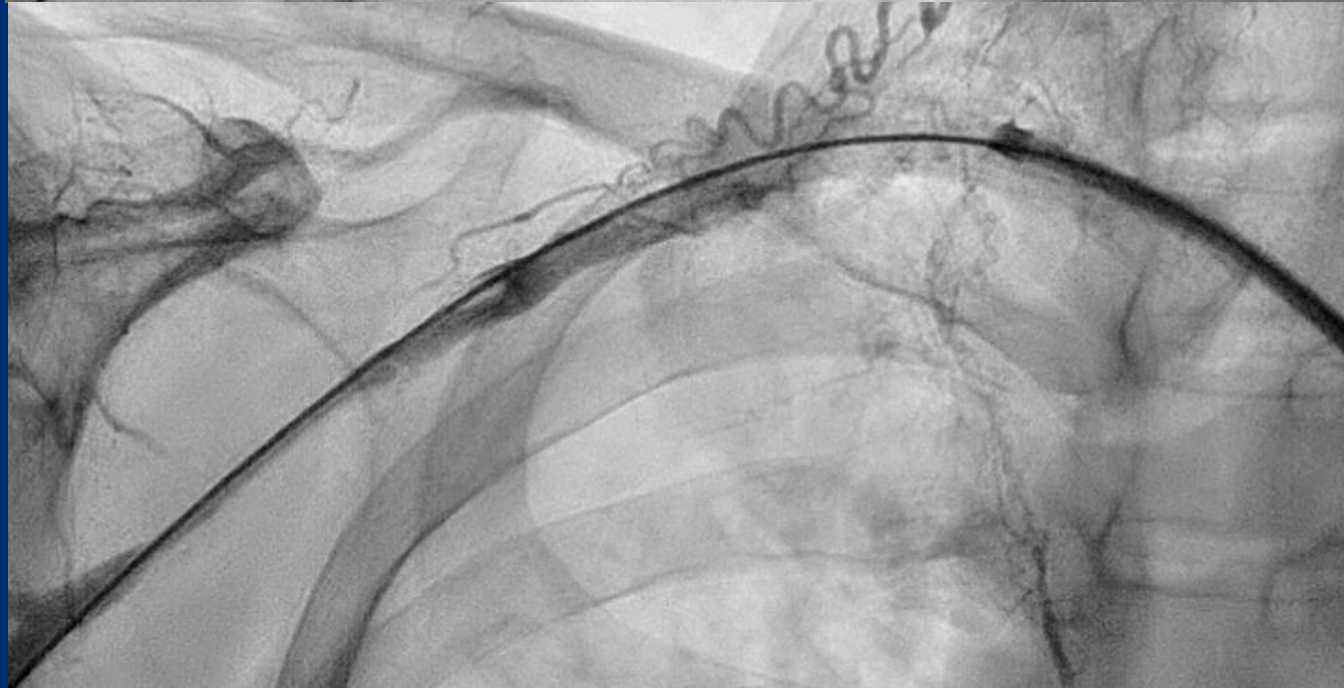


View  
Trace





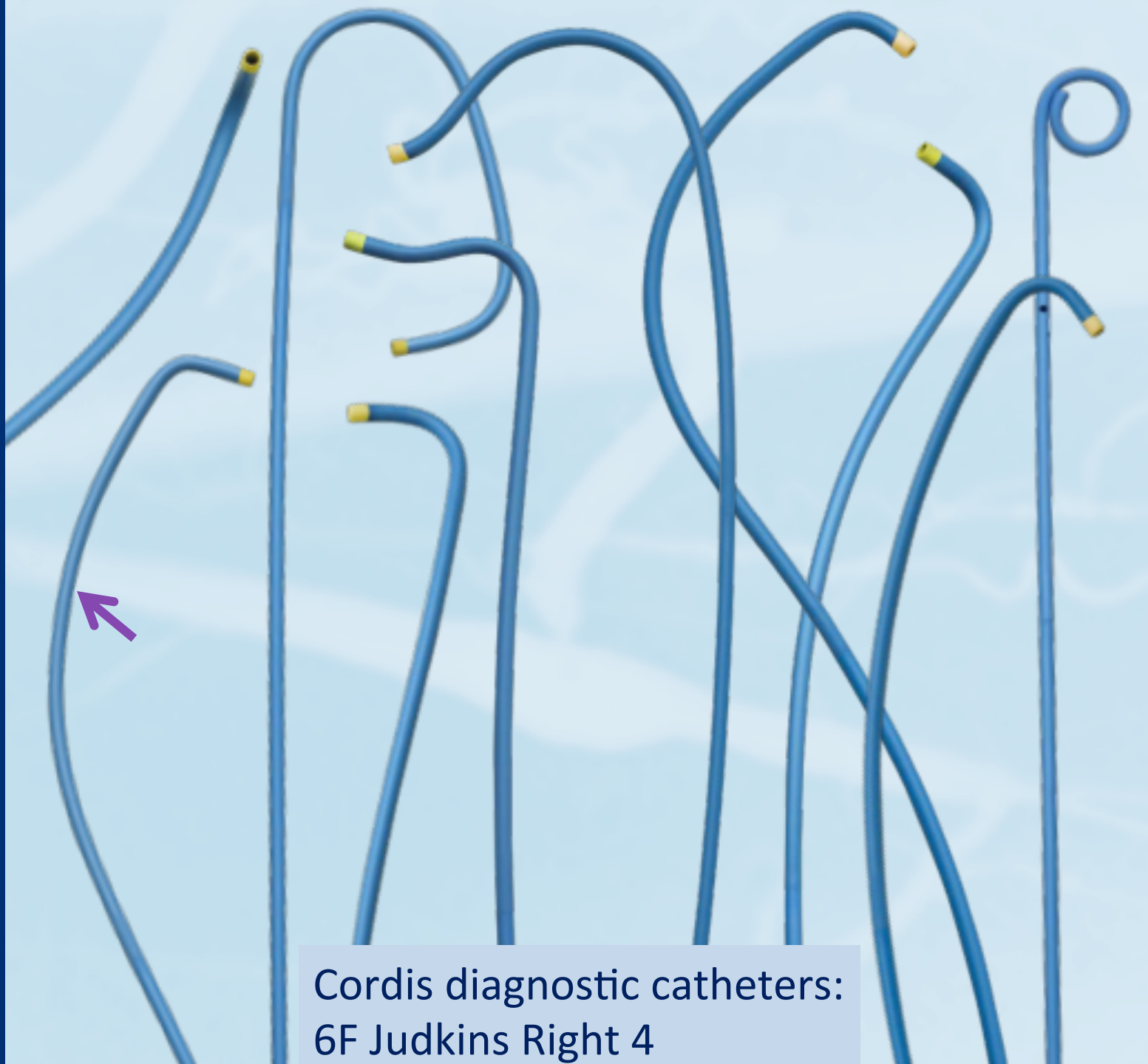
Early



Late



Use of  
View  
Trace

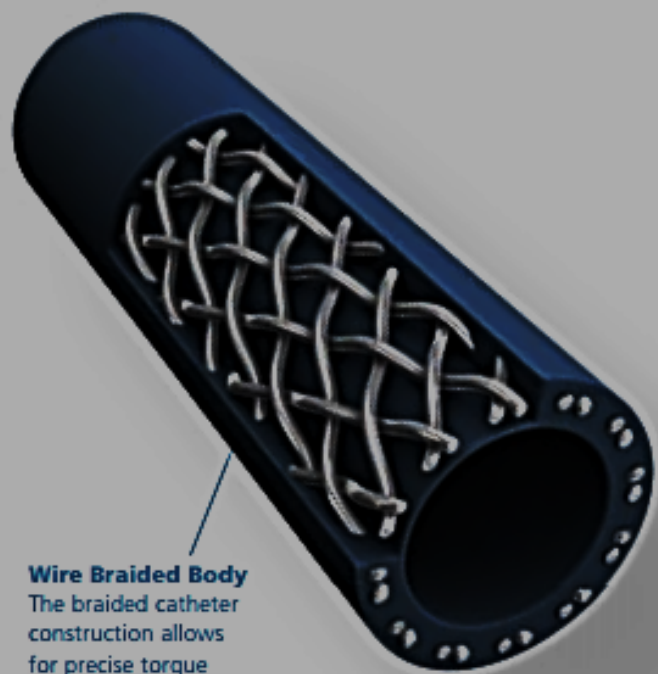


Cordis diagnostic catheters:  
6F Judkins Right 4

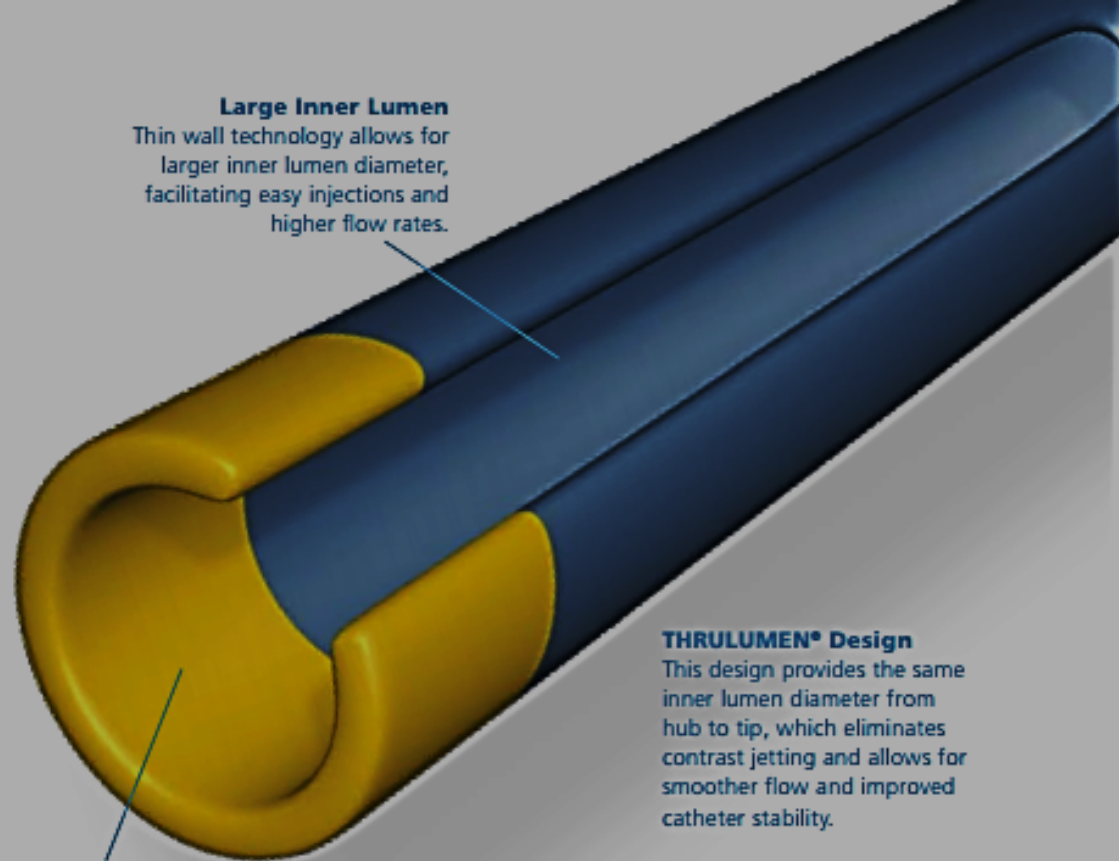


## The Broadest Product Range Available

Cordis diagnostic catheters are the “gold standard” with state-of-the-art technology and 40 years of market leadership behind them. Only Cordis diagnostic catheters feature a radiopaque tip, proprietary Vestan™ Nylon and an extensive selection of shapes and sizes.



**Wire Braided Body**  
The braided catheter construction allows for precise torque control and enhanced pushability.



**Large Inner Lumen**  
Thin wall technology allows for larger inner lumen diameter, facilitating easy injections and higher flow rates.

**THRULUMEN® Design**  
This design provides the same inner lumen diameter from hub to tip, which eliminates contrast jetting and allows for smoother flow and improved catheter stability.

**Radiopaque Tip**  
The radiopaque tip improves visibility to help reduce the risk of vascular damage upon entering tortuous or fragile vessels.

## Product Highlights

- Precise torque control
- Kink-resistant shaft
- Broadest offering:
  - 4 to 7 French
  - Nylon or polyurethane options
  - Many shapes
  - Availability of procedure packs

(See product code inserts for ordering information)

Ketch  
Y-connector  
(Minvasys)  
ID 2.3mm (7F)



Needle (0.018" compatible)



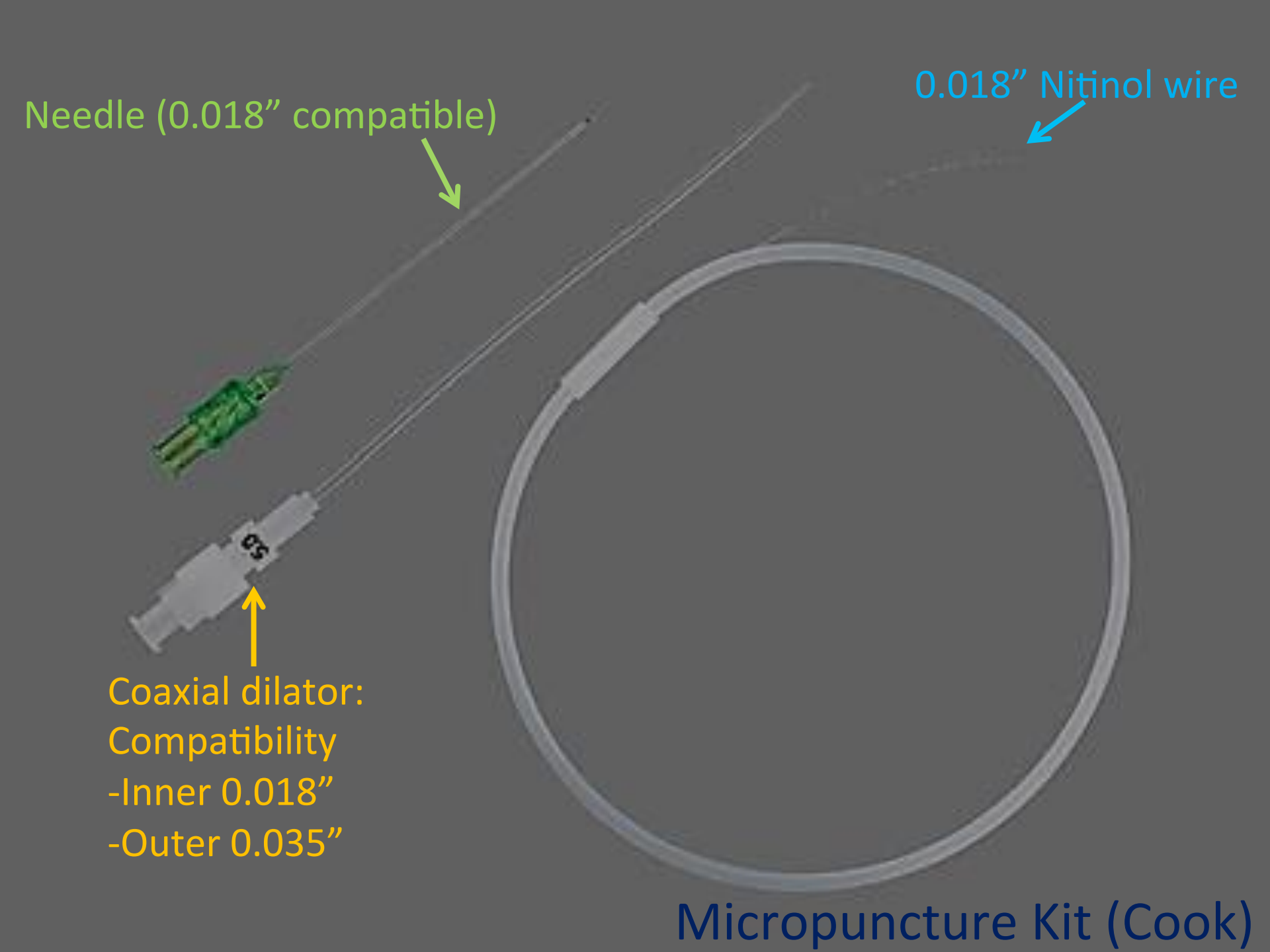
0.018" Nitinol wire



Coaxial dilator:  
Compatibility  
-Inner 0.018"  
-Outer 0.035"



Micropuncture Kit (Cook)





Terumo Interventional Systems | Products | Guidewires | GLIDEWIRE

Guidewires

GLIDEWIRE

GLIDEWIRE BABY-J

# GLIDEWIRE® Hydrophilic Coated Guidewire

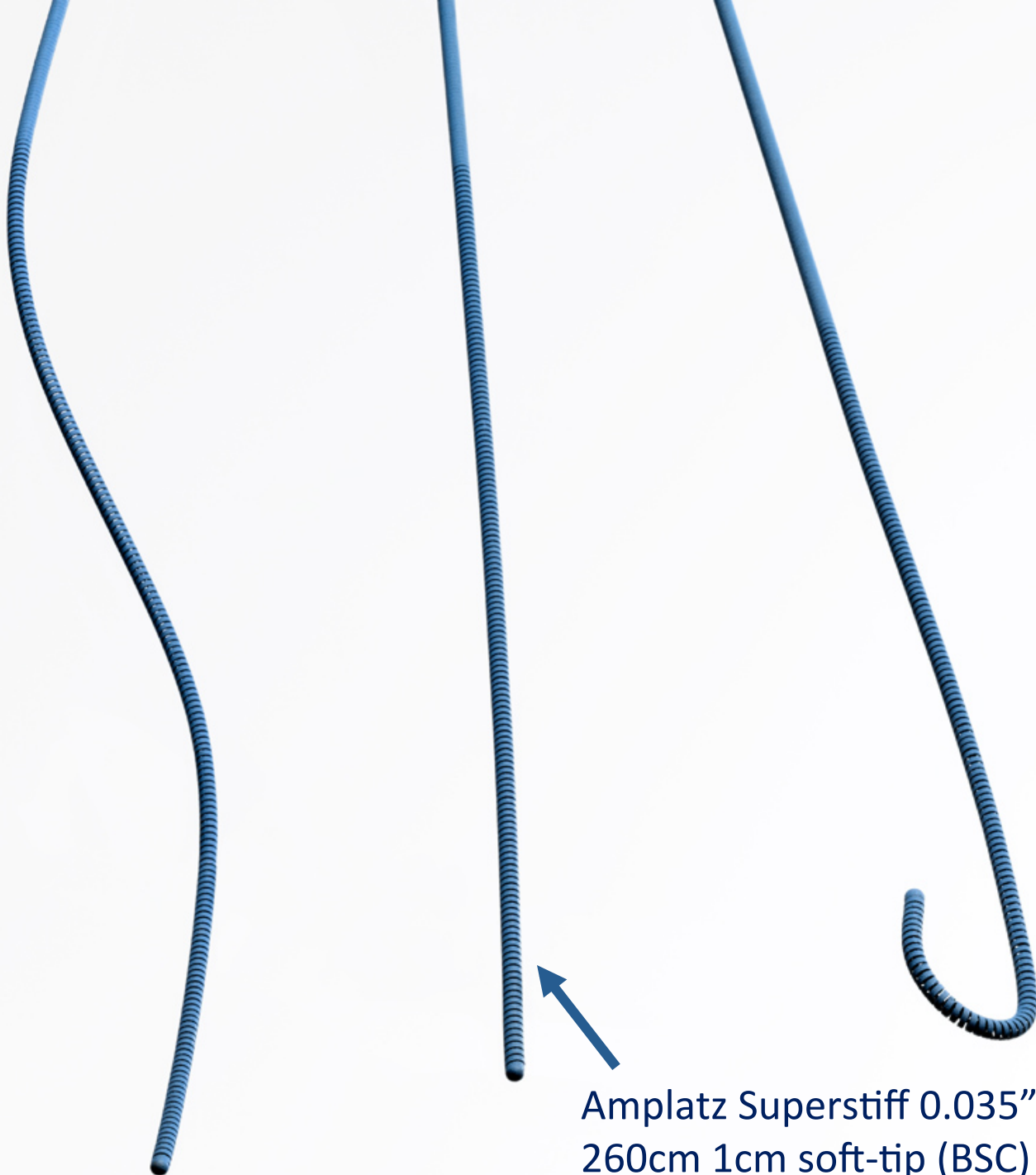
0.035" 260-cm-long angled - Standard and Stiff versions



Olcott Torque Device (Cook)

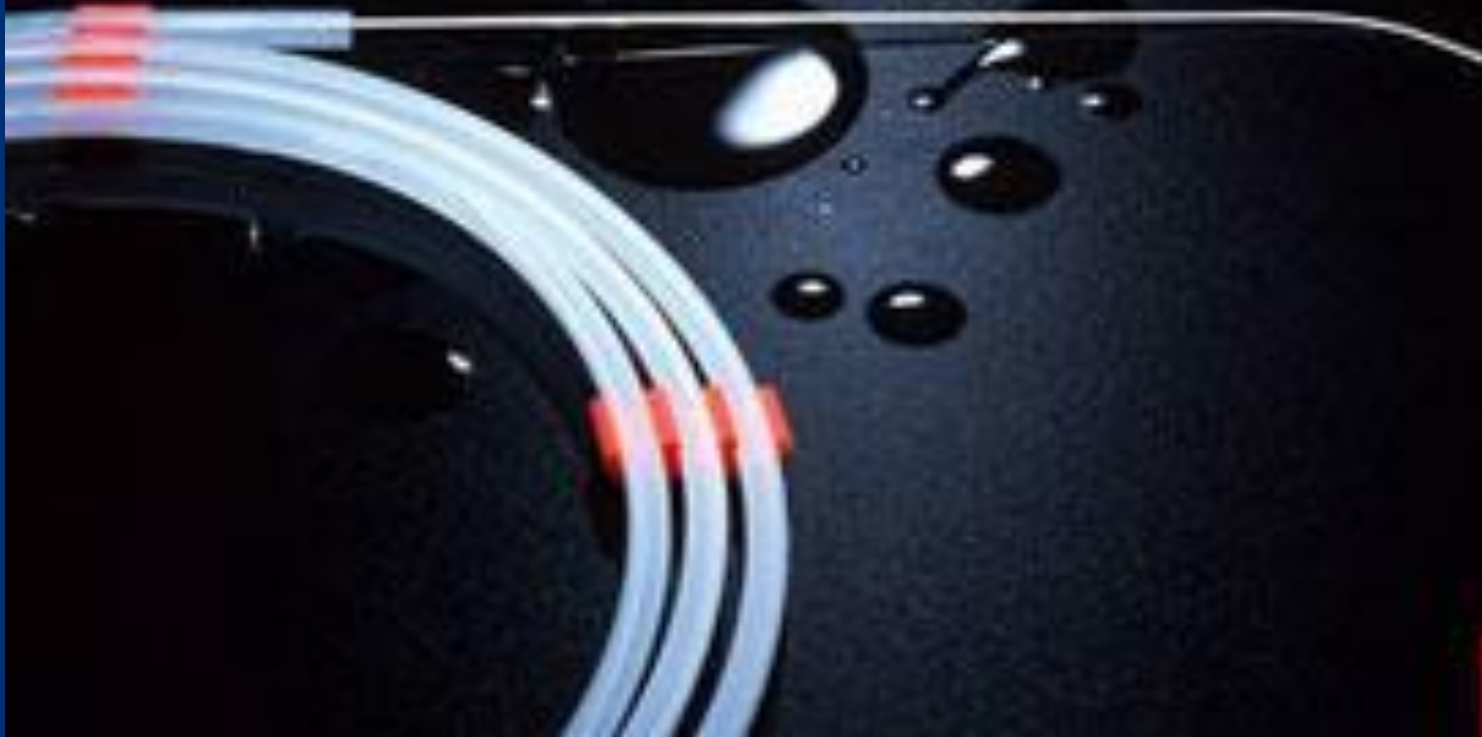
# 'JR-Ketch-Glide' combination

- Most powerful tool in PVI
- 'First-in' almost always
- JR catheter and Glidewire are both steerable
- Angiography possible with Glidewire inside
- 0.014" wire can be sent alongside Glidewire
- 6F JR catheter can be torqued through lesions once Glidewire has crossed



Amplatz Superstiff 0.035"  
260cm 1cm soft-tip (BSC)

# Roadrunner<sup>®</sup> PC Wire Guide



0.014" and 0.018" 300cm

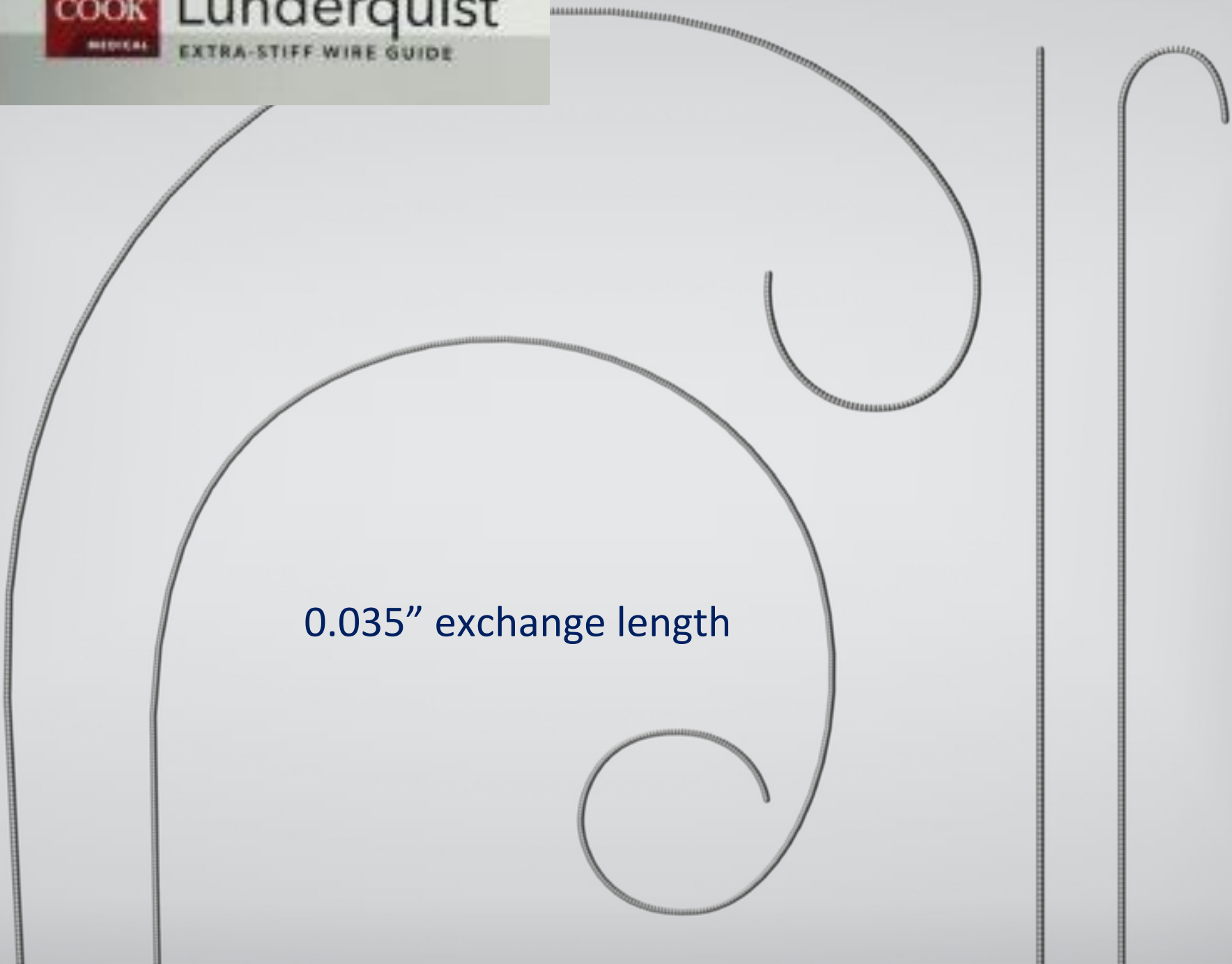


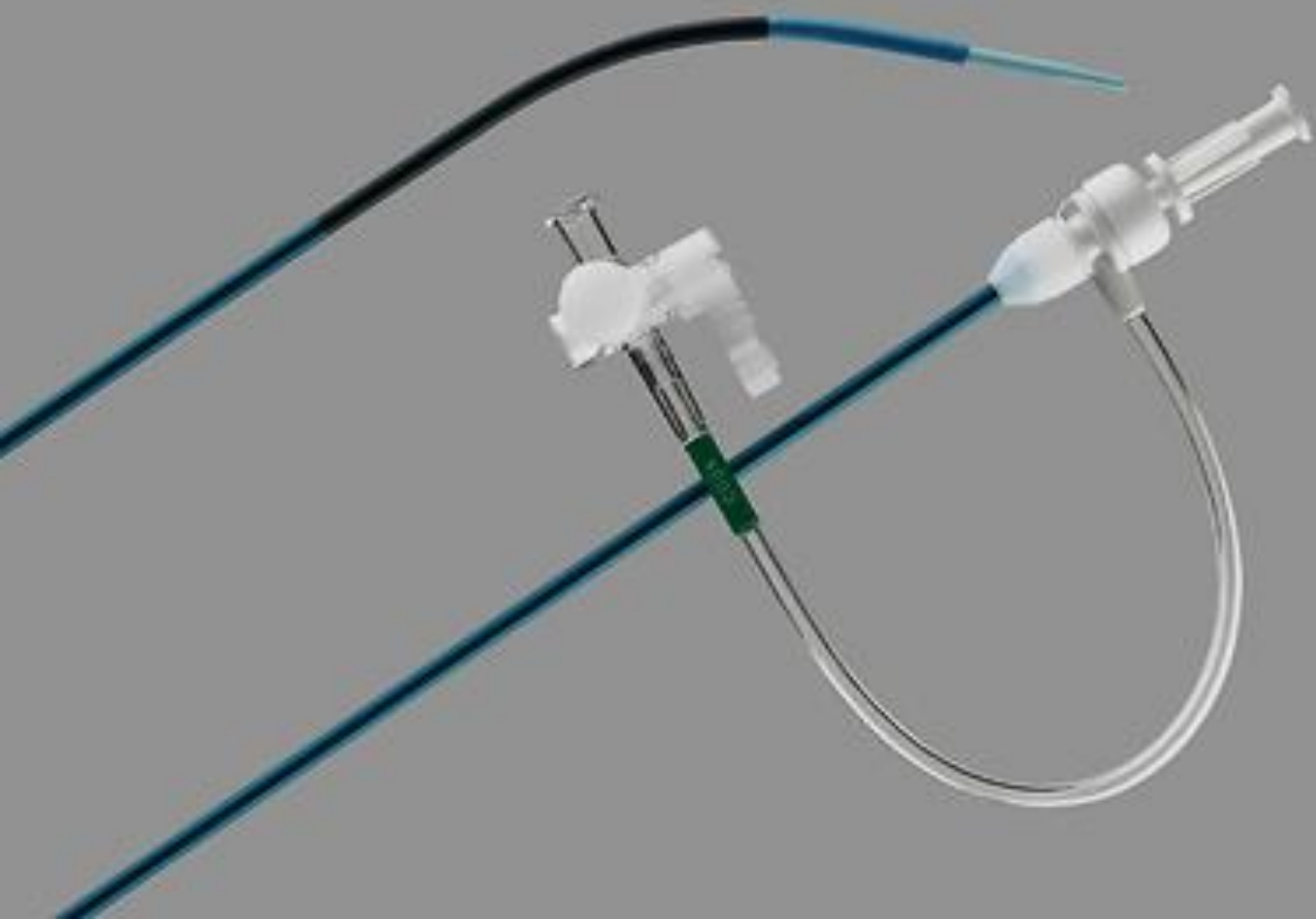


# Lunderquist<sup>®</sup>

EXTRA-STIFF WIRE GUIDE

0.035" exchange length







***Glidecath***<sup>®</sup>  
Hydrophilic Coated Catheter

# CXI Support Catheter

REF CXI-4.0-35-135-P-NS-0

REF G52542

STERILE  
SINGLE USE

**4.0Fr**  
**.035"**



STERILE



2017-07



Rx only

LOT: 2101202

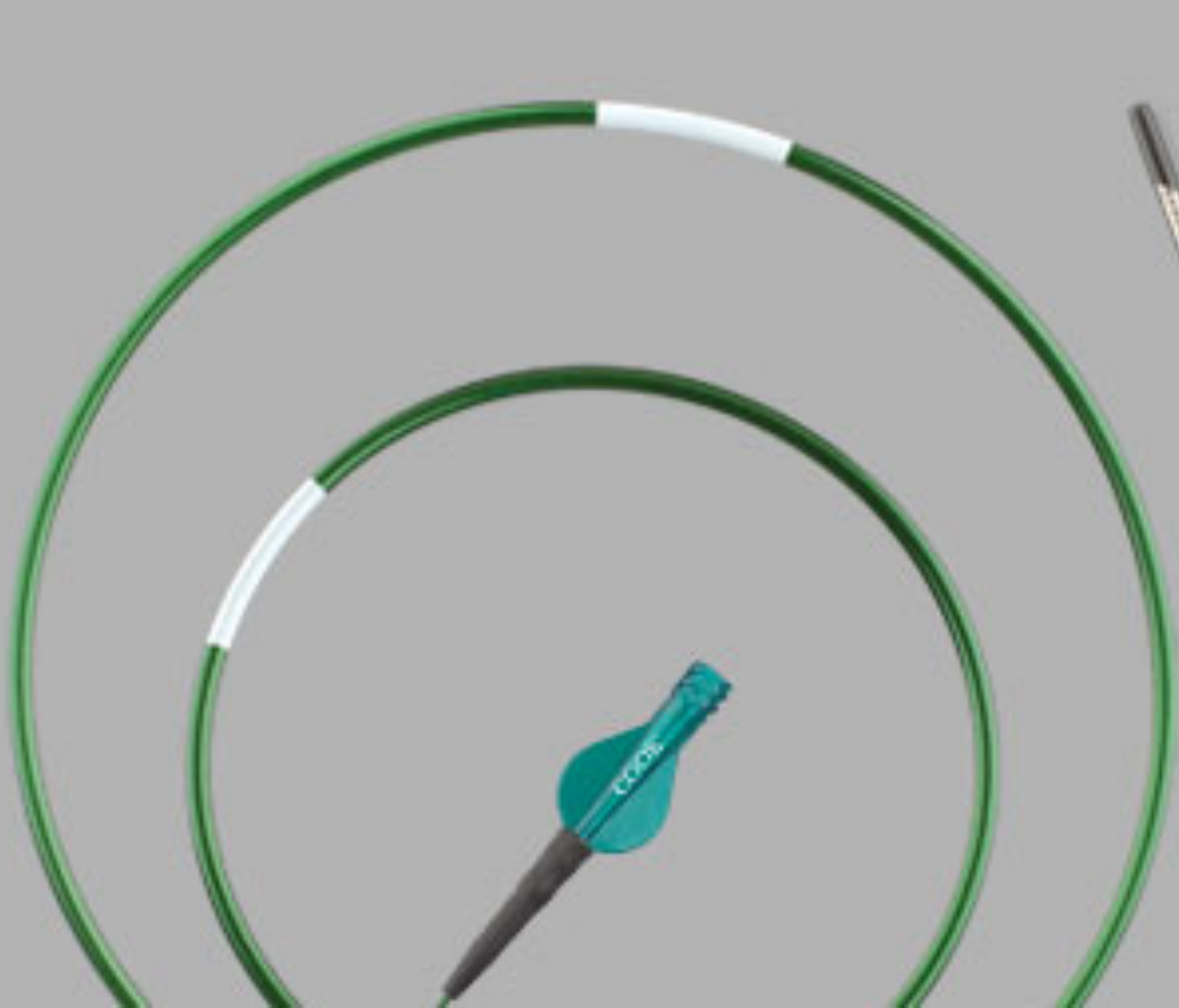


2014-07

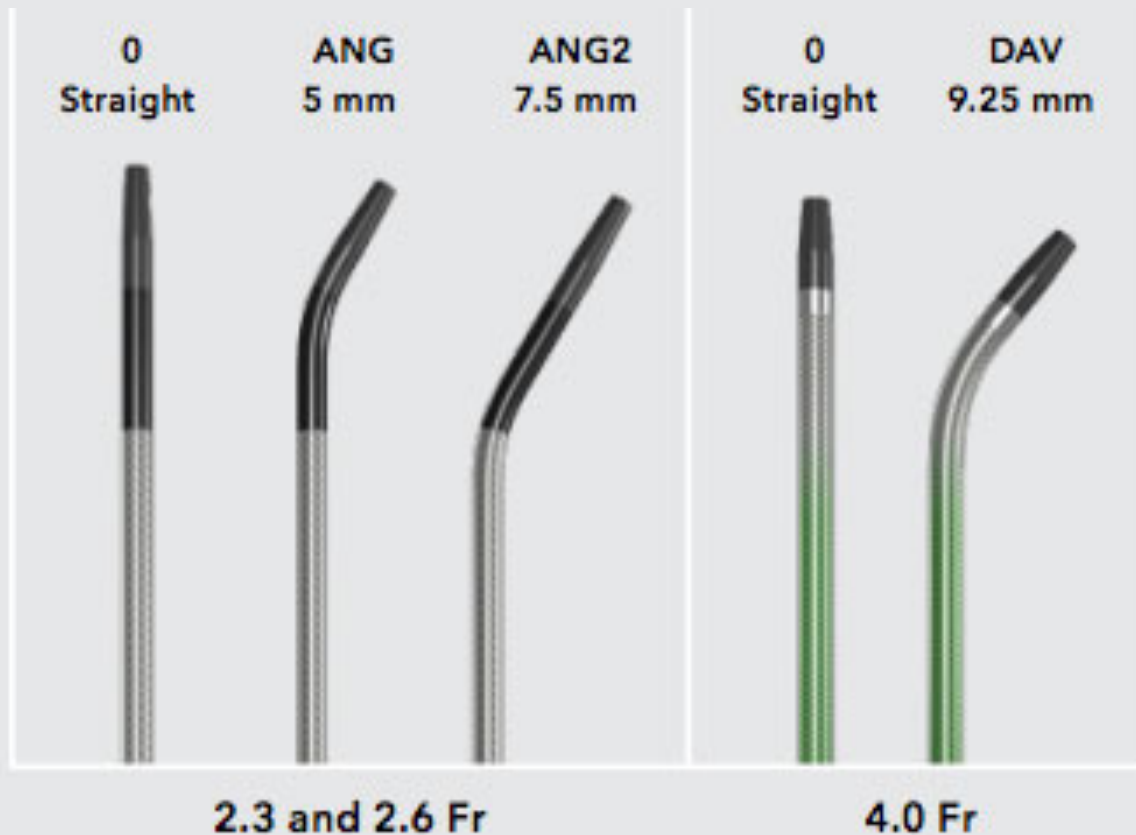
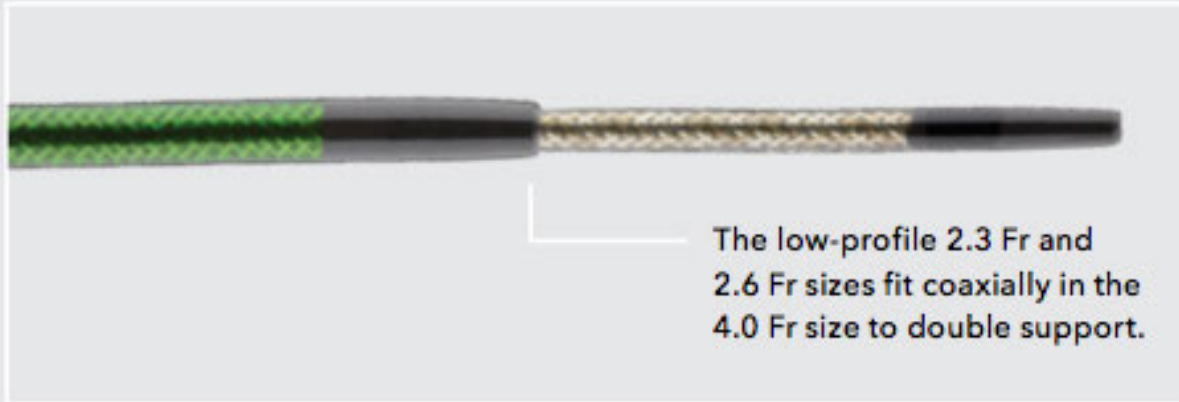


COOK

COOK CXI-4.0-35-135-P-NS-0  
STERILE SINGLE USE



## Coaxial Capability



## Guidewire Compatibility

2.3F – 0.014"

2.6F – 0.018"

4.0F – 0.035"

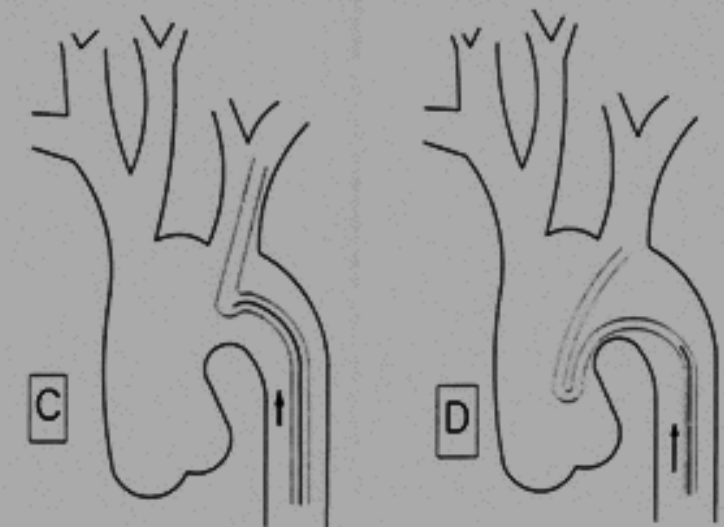
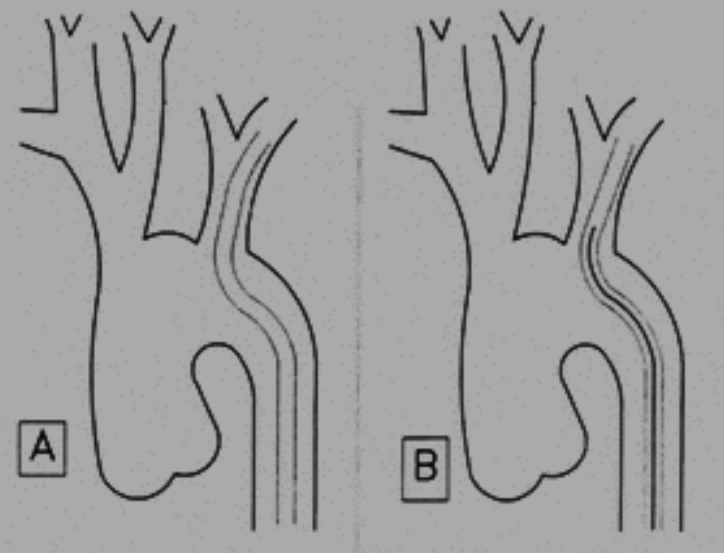


Cobra

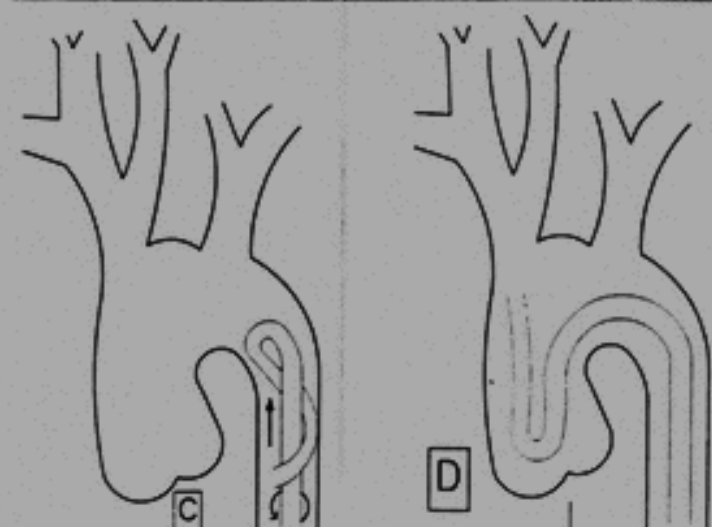
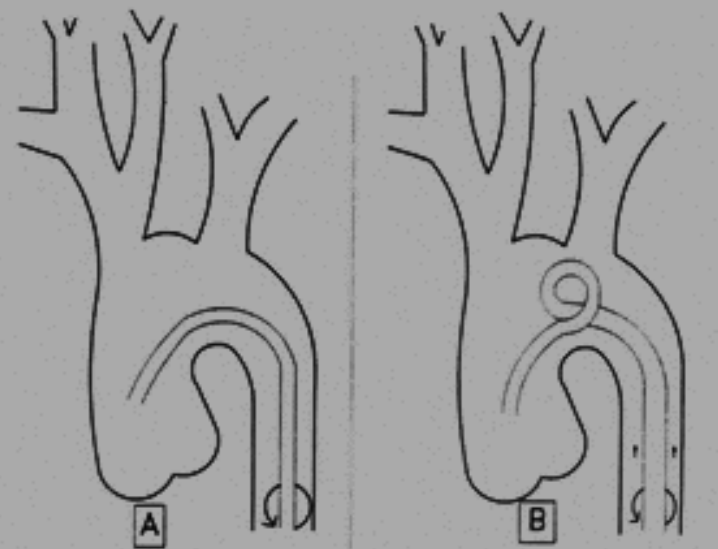
Simmons  
Sidewinder



Van Schie catheters 1-5



**Fig. 1.** Using the left subclavian artery to reform the curve. (A) The catheter tip is in the left subclavian artery with the catheter knee at the origin. (B) The tip of a guidewire is at the catheter knee. (C) Guidewire and catheter are advanced together. (D) With the curve reformed, the guidewire can be removed



**Fig. 2.** Reforming the curve in the descending aorta without a wire (A) The knee of the catheter is over the transverse part of the arch. (B) Scissoring occurs with clockwise rotation. (C) Further rotation results in the catheter tip flipping into the descending aorta. (D) Once the catheter is advanced into the ascending aorta, rotation in the opposite direction opens the catheter shape.



# Recanalizing occlusions

- Try bi-directional approach if feasible
- Check movement of penetrating wire in orthogonal views with target visible fluoroscopically
- Terumo Glidewire (both ends) usually works
- Coronary CTO wires in some situations (eg. renal)

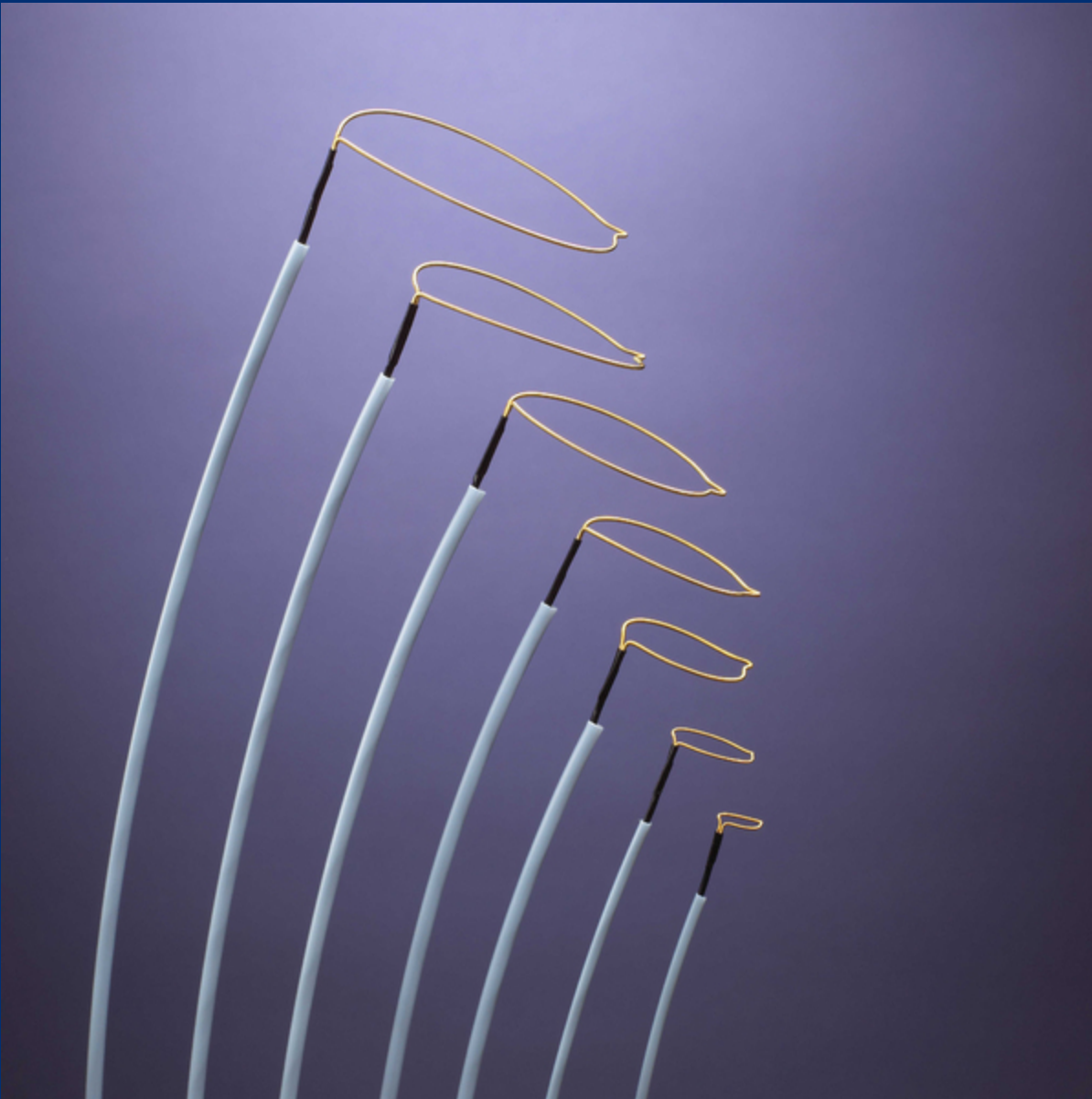
# Astato 30 0.018"

Superior Penetration Ability Maneuverability with Tactile Response



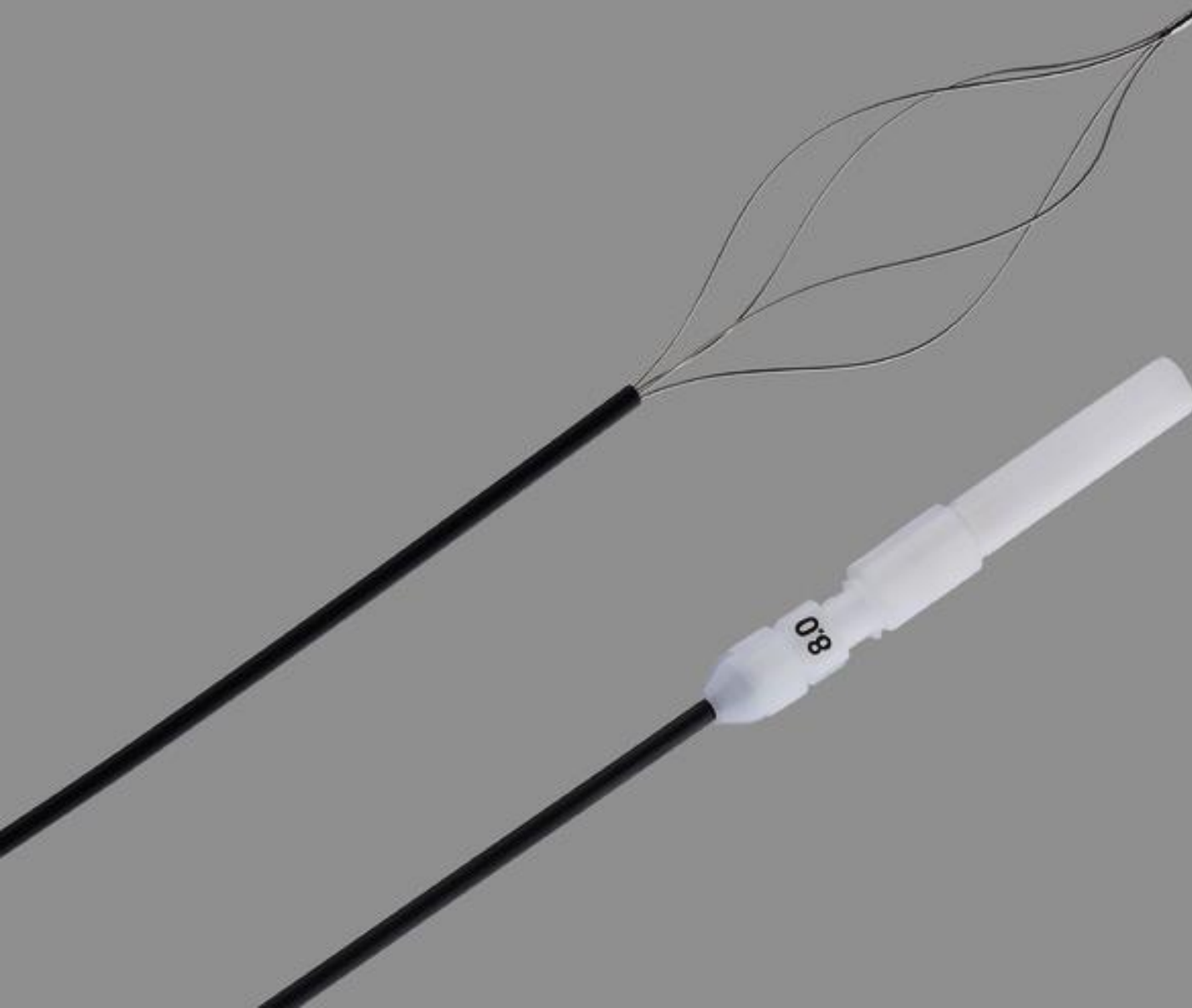
- Tip load ..... 30.0 g
- Tip radiopacity ..... 15 cm
- Total length ..... 180cm, 300cm
- Outer diameter ..... 0.018inch
- Tip outer diameter ..... 0.018inch
- SLIP COAT® hydrophilic coating over the spring coil
- PTFE coating over the shaft

The Astato 30 is high-penetration guide wire specially designed with tapered tip and 30g tip load to break through fibrous caps and calcium deposits. The Astato 30 is the best choice when treating long, complex lesions with severe calcification or tough fibrous tissues.

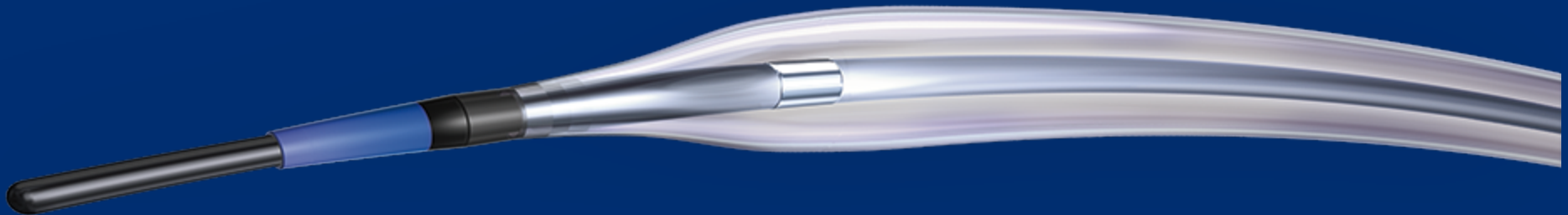
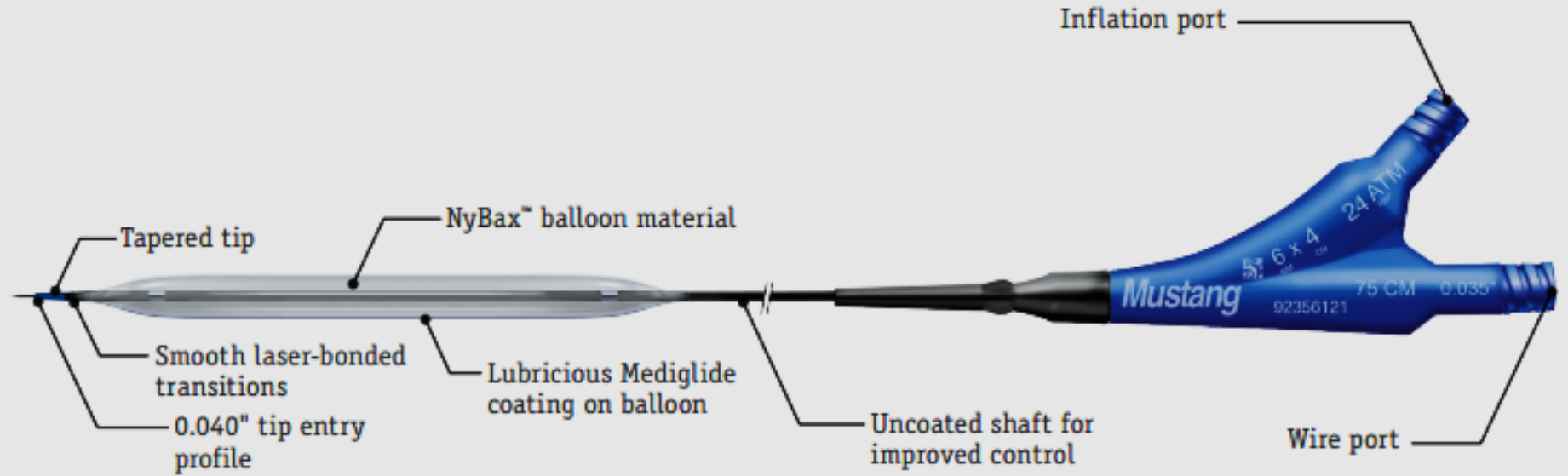


Amplatz  
Gooseneck  
snare

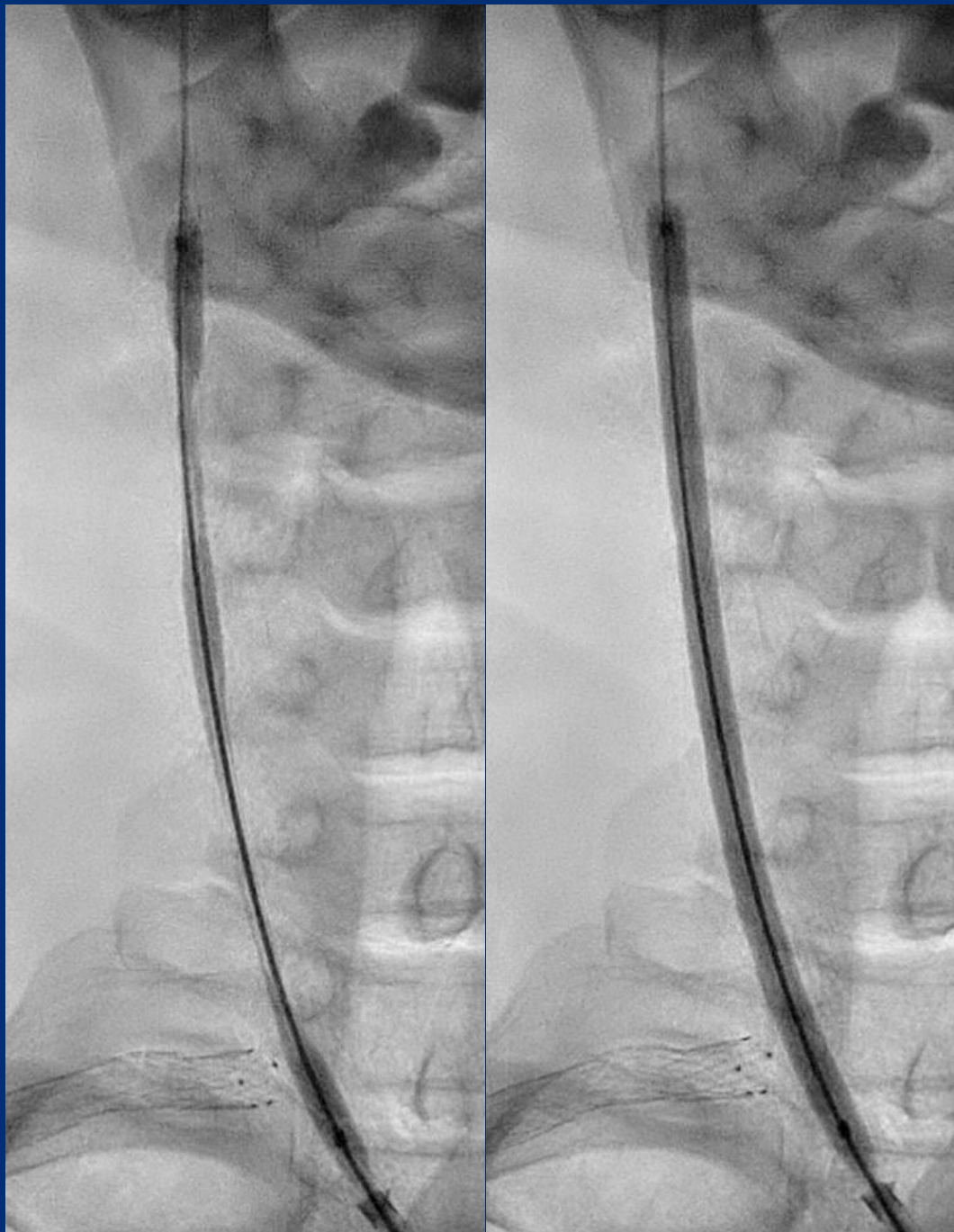
# Dotter Intravascular Retriever Set



# Mustang™ Balloon Dilatation Catheter



Mustang  
balloon  
in RCCA

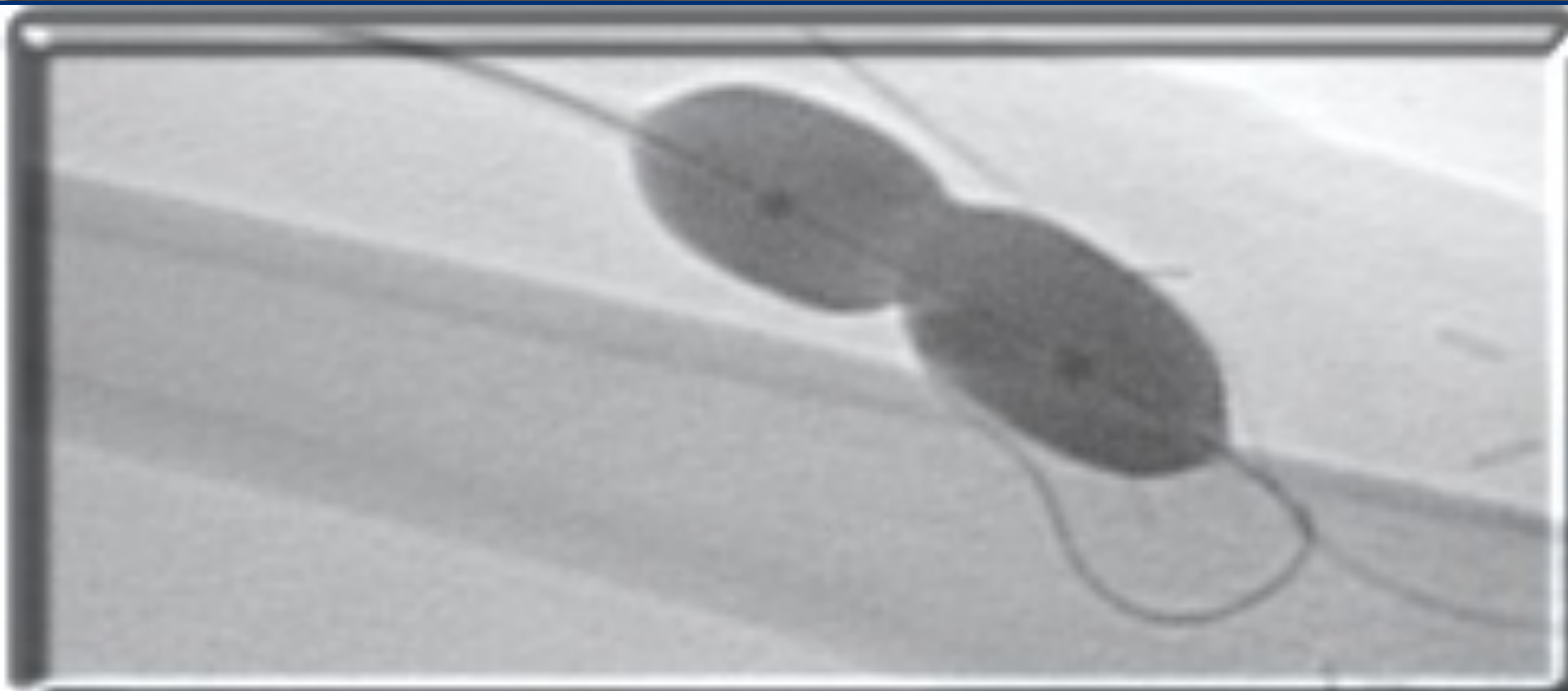
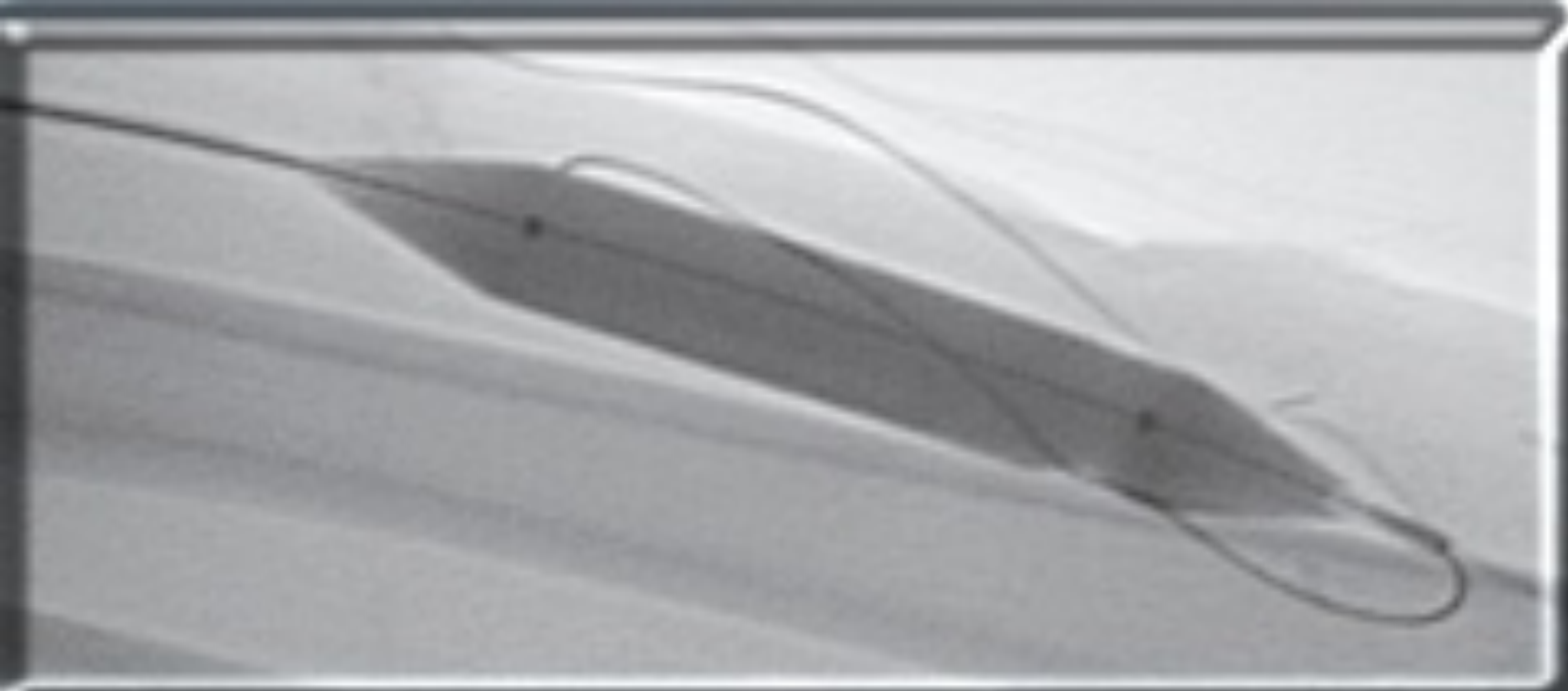


Conquest  
balloon  
(Bard)



Atlas  
balloon  
(Bard)



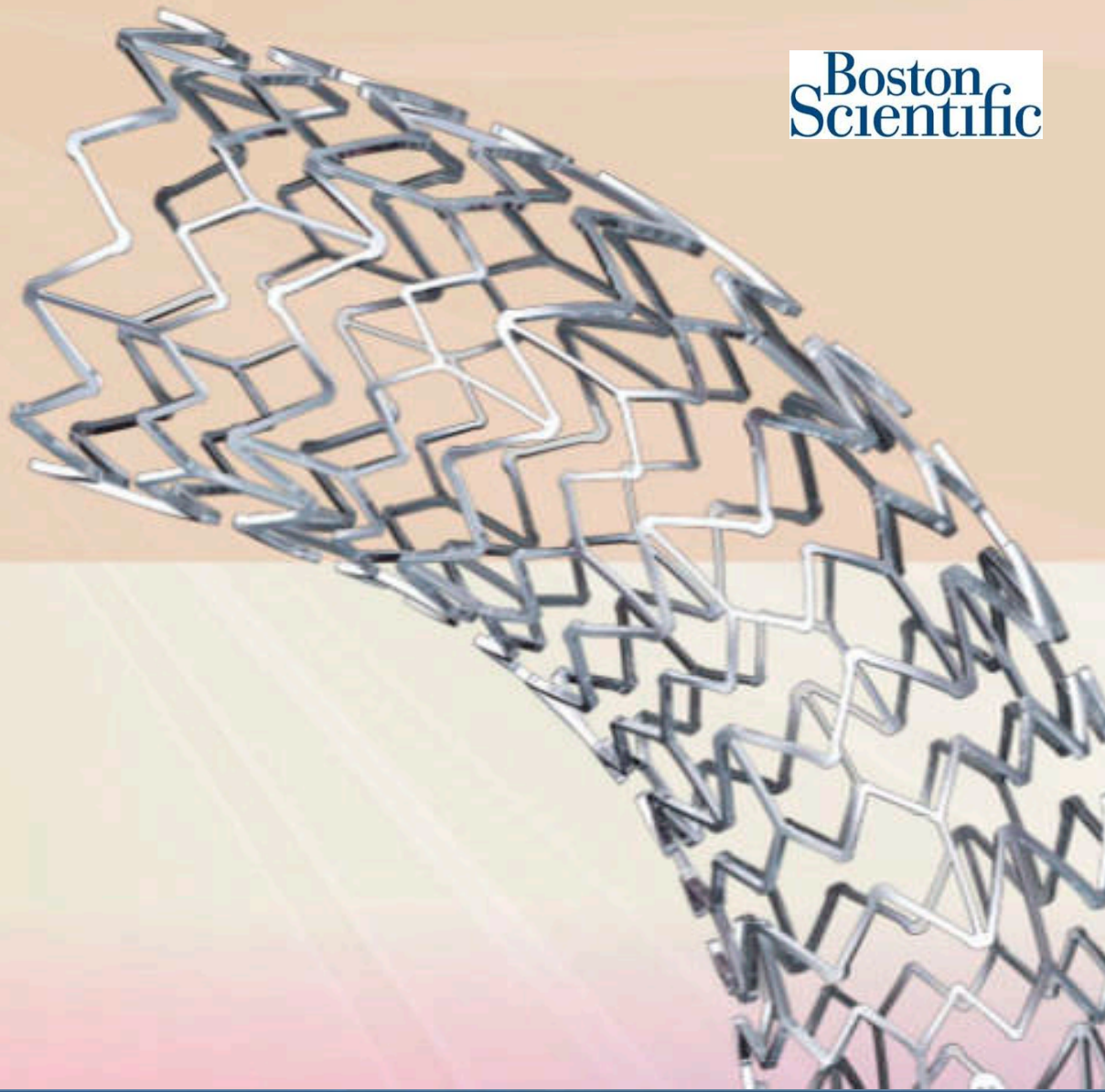




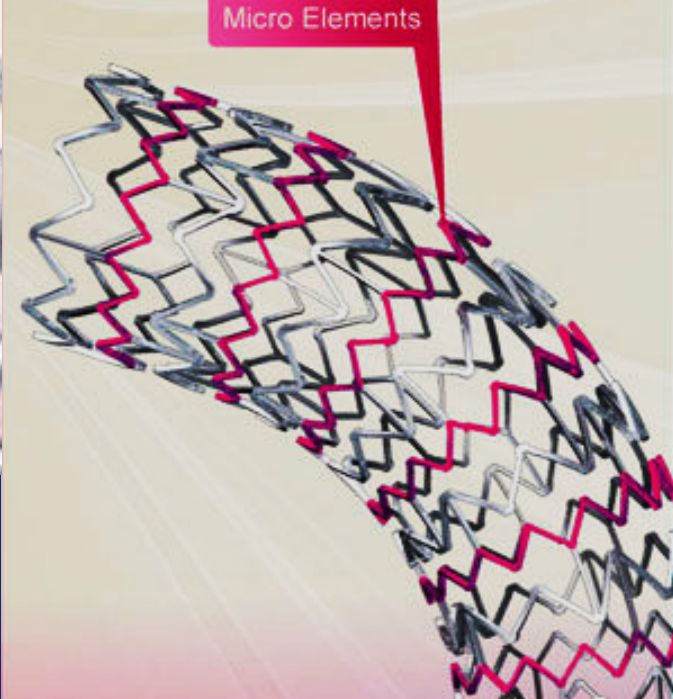
# Recording Gradients

- Have two pressure lines always
- Place a guidewire (0.035" ASS or 0.018" RR)
- Use a 6F or 7F JR or MP guiding catheter
- Attach Ketch and flush entire system well
- Check zeros
- Pull back slowly with both pressures (eg. Aorta and RFA) being displayed in the same range
- Repeat as many times as required during PI

Boston  
Scientific

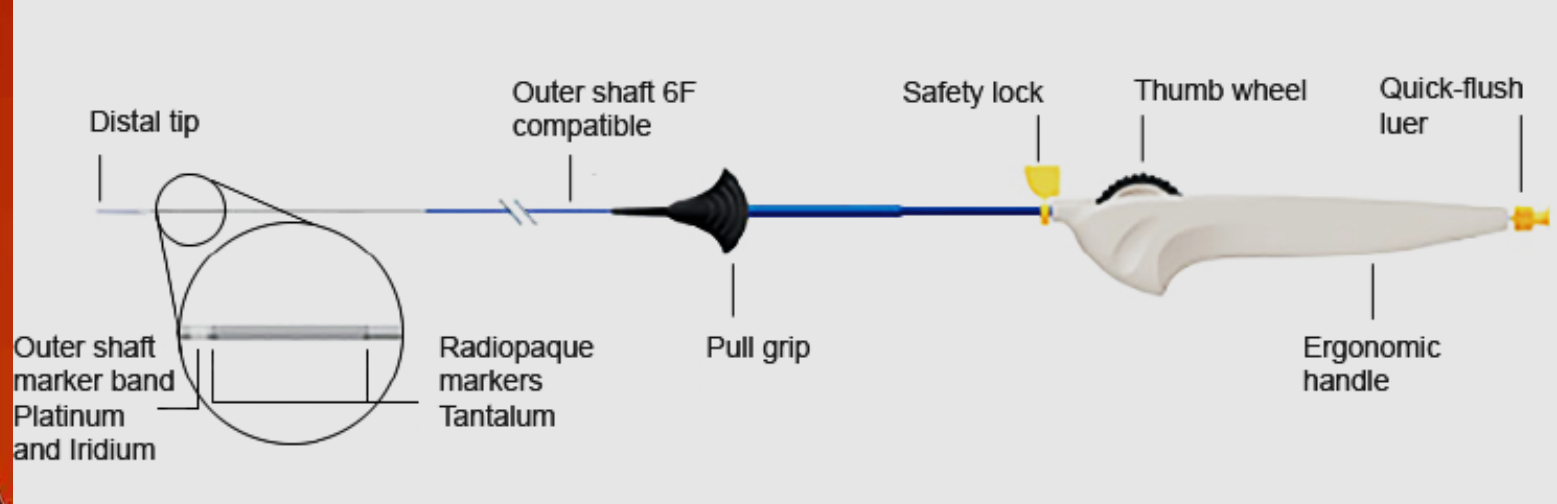
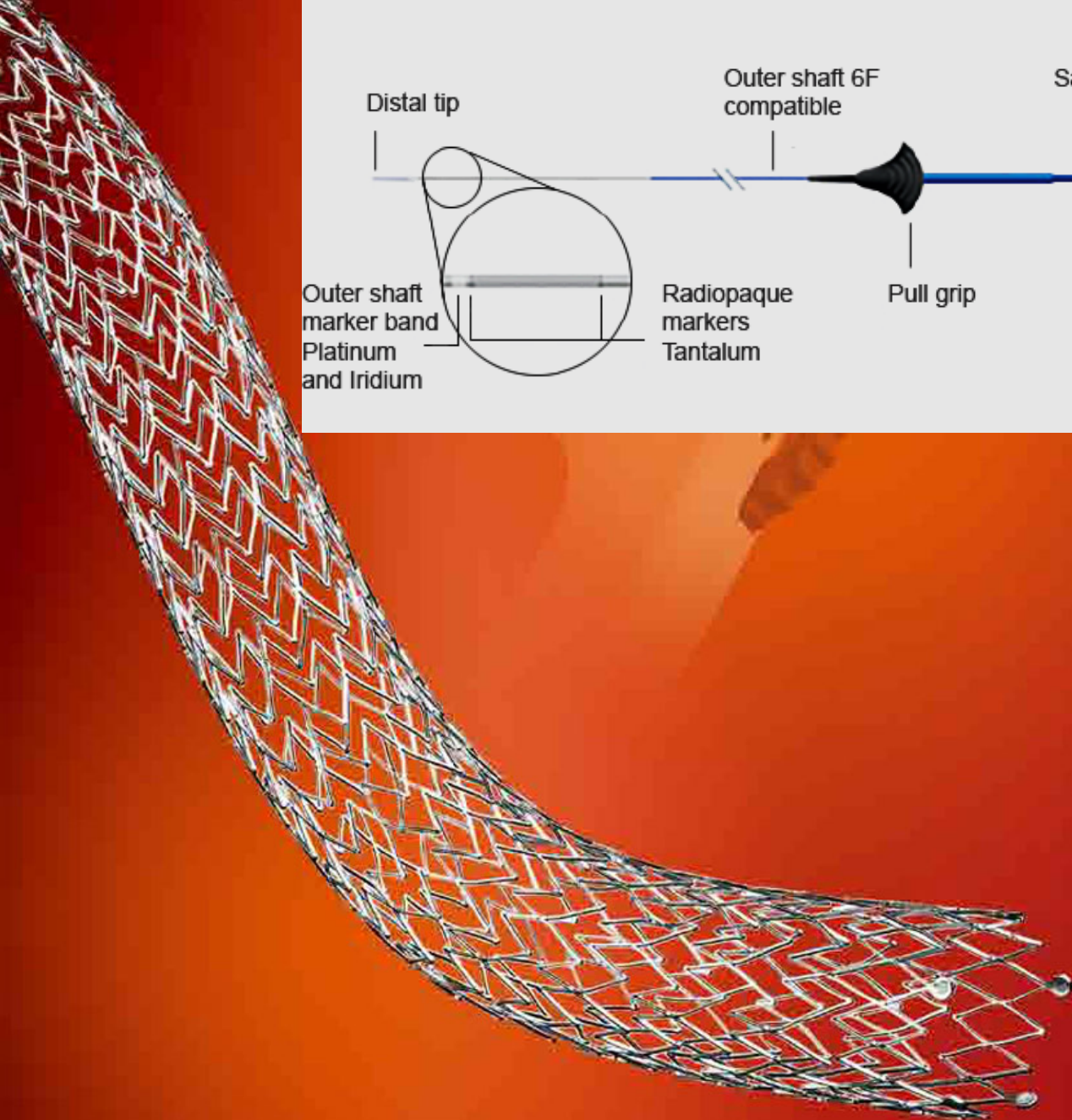


Macro Elements



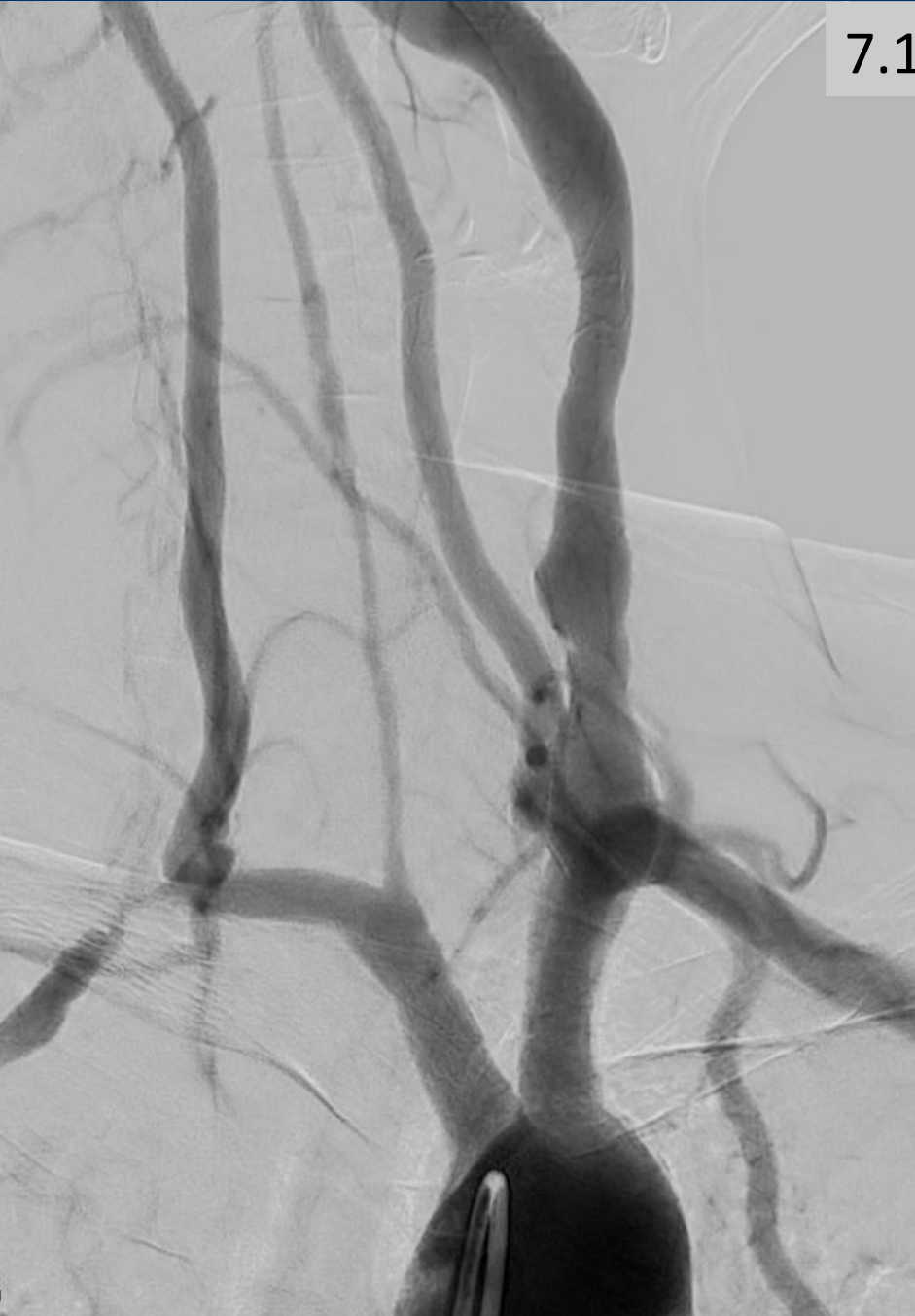
Micro Elements

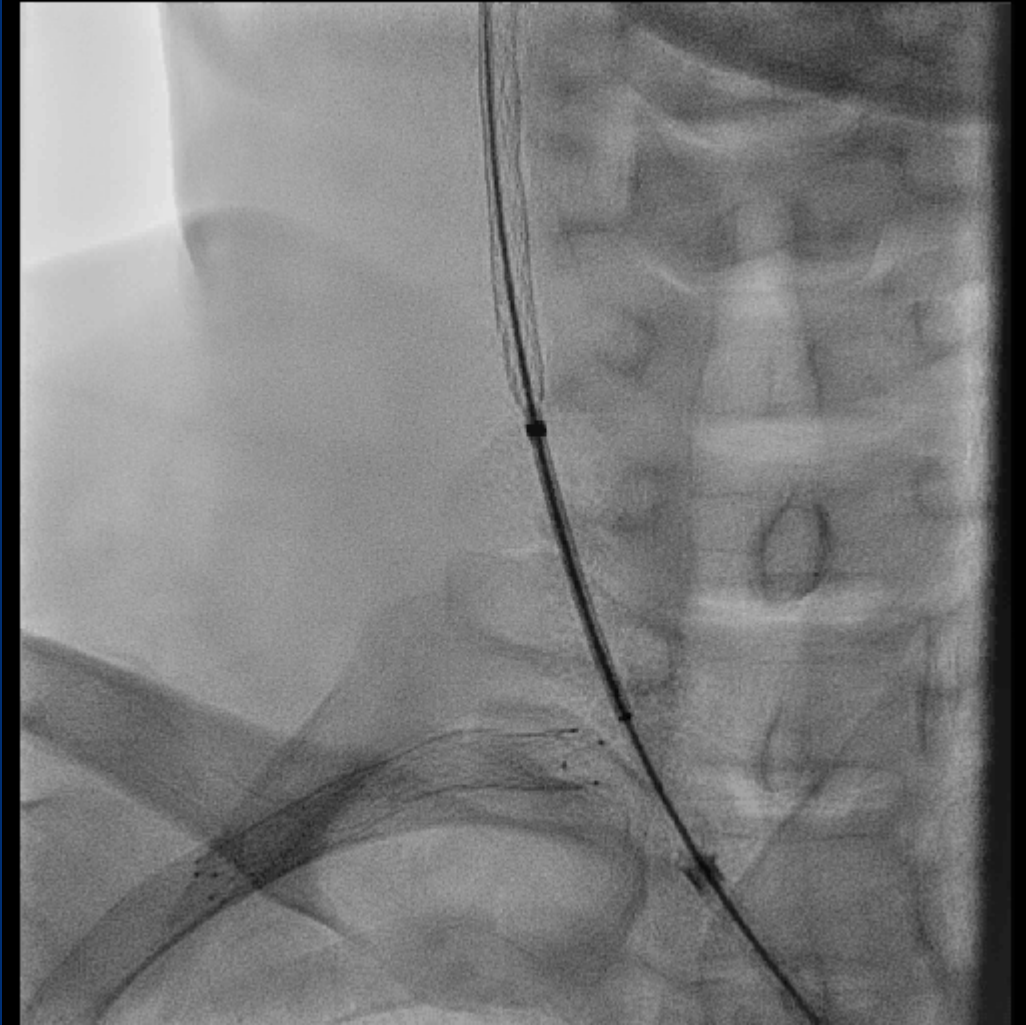
Express™ LD Iliac Premounted Stent System



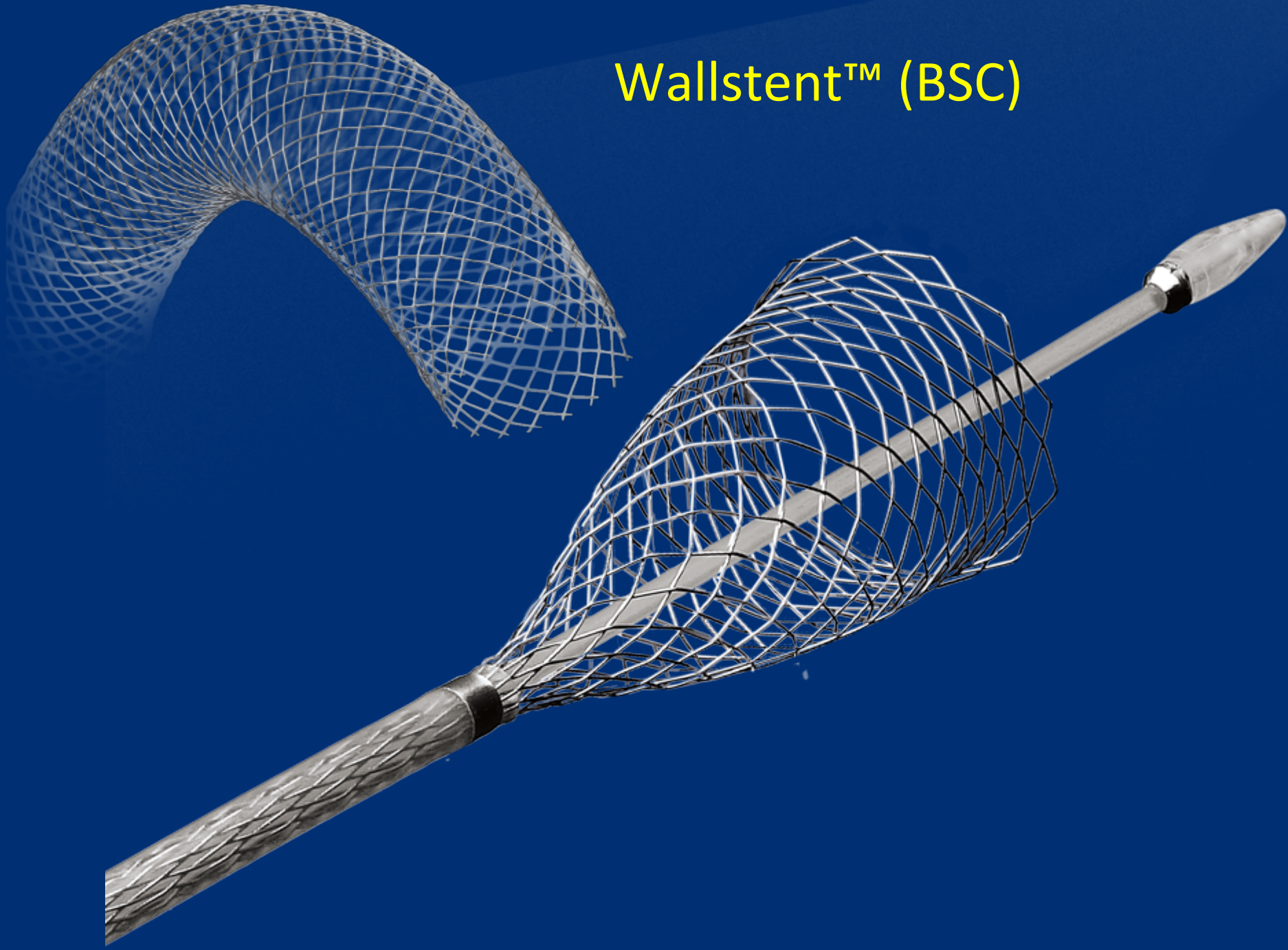
Epic  
balloon-  
expandable  
stent  
(BSC)

7.1.2016





# Wallstent™ (BSC)



Smouldering

Gdt.  
40mmHg

Baseline (2007)

16x90mm  
Wallstent  
14mm  
balloon  
4atm

Gdt.  
5mmHg

2007

Inactive

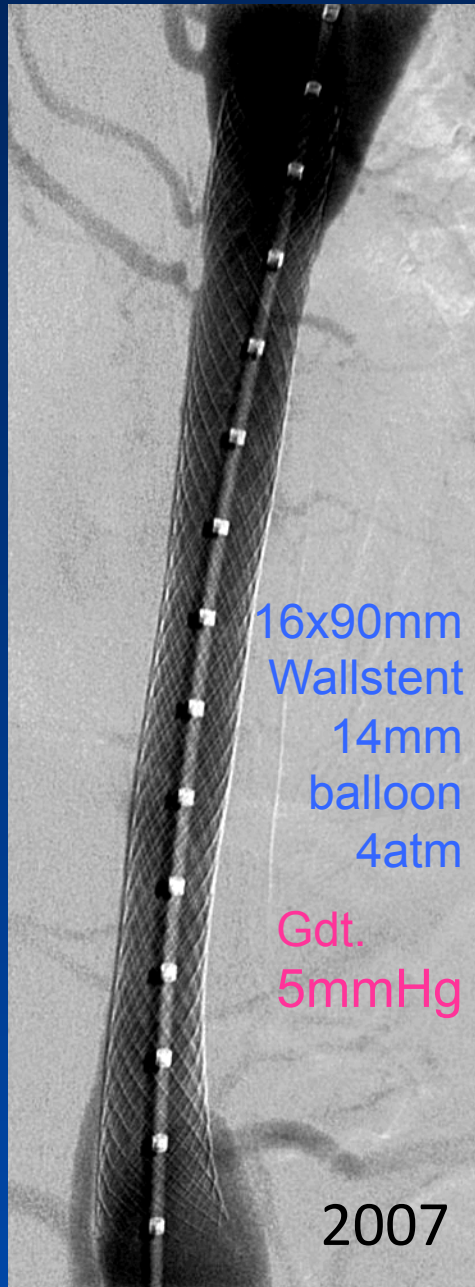
Gdt.  
nil

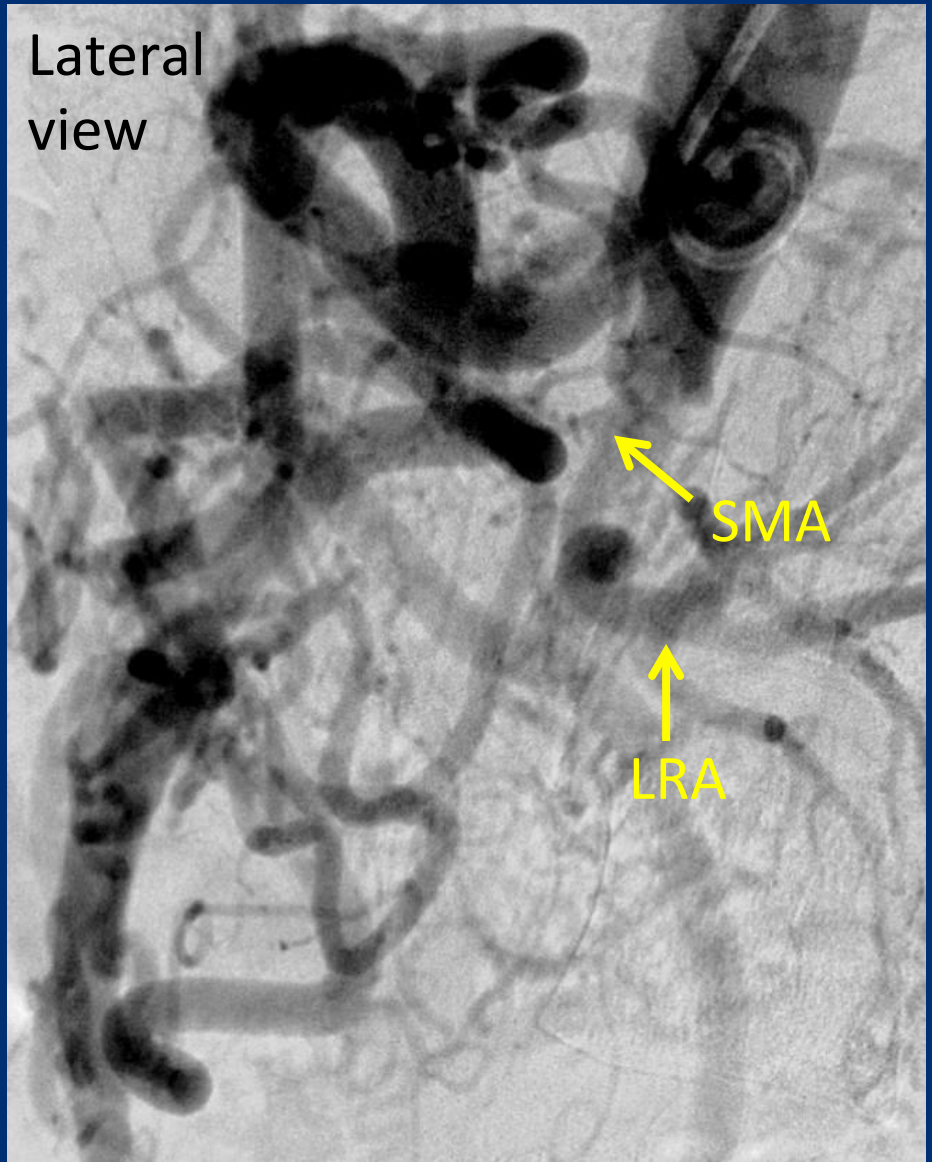
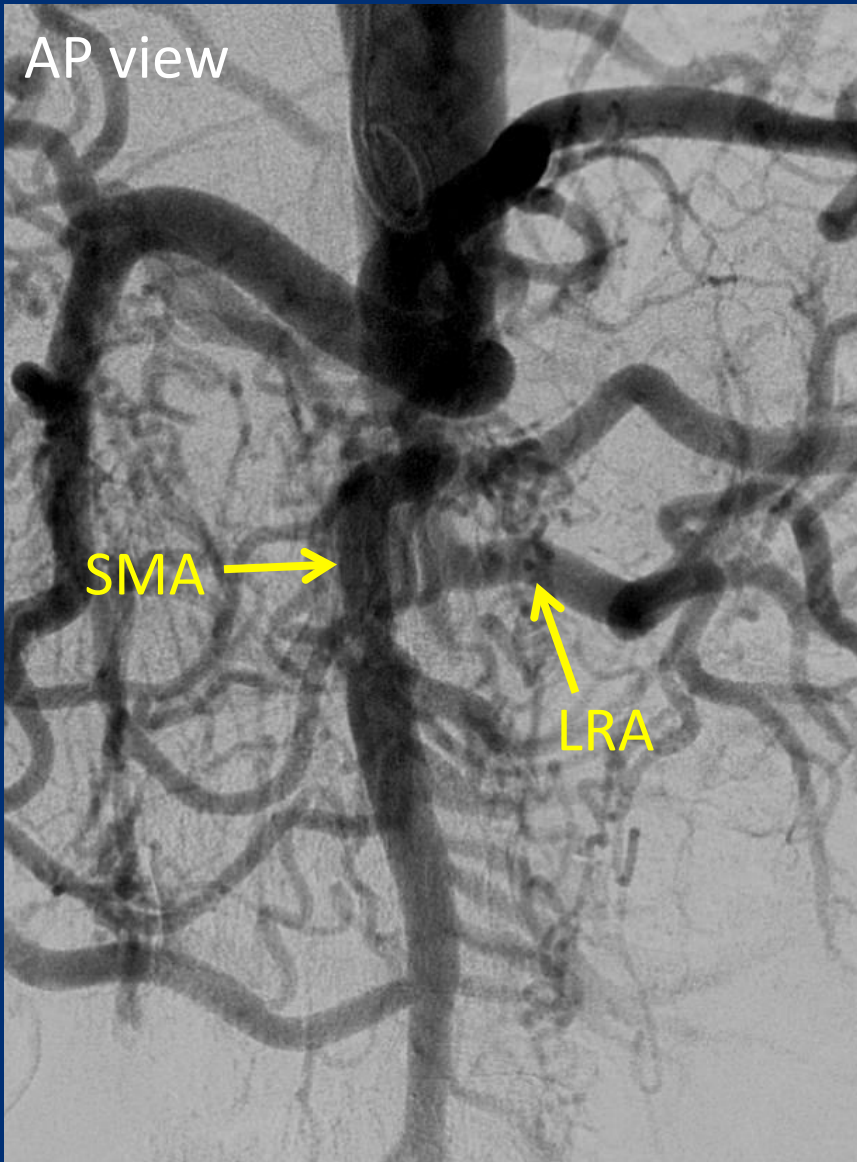
2009

Inactive

Gdt.  
nil

2012

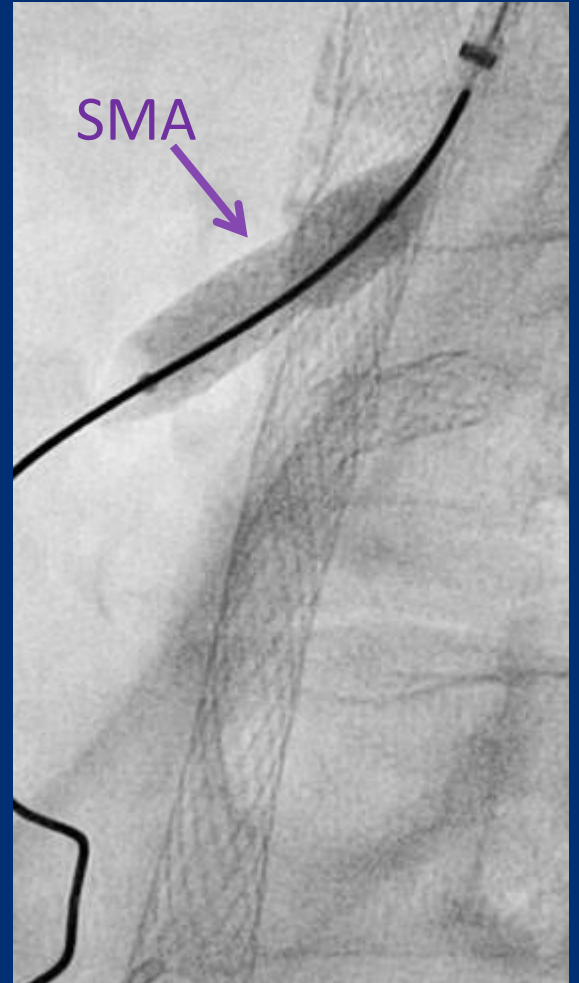
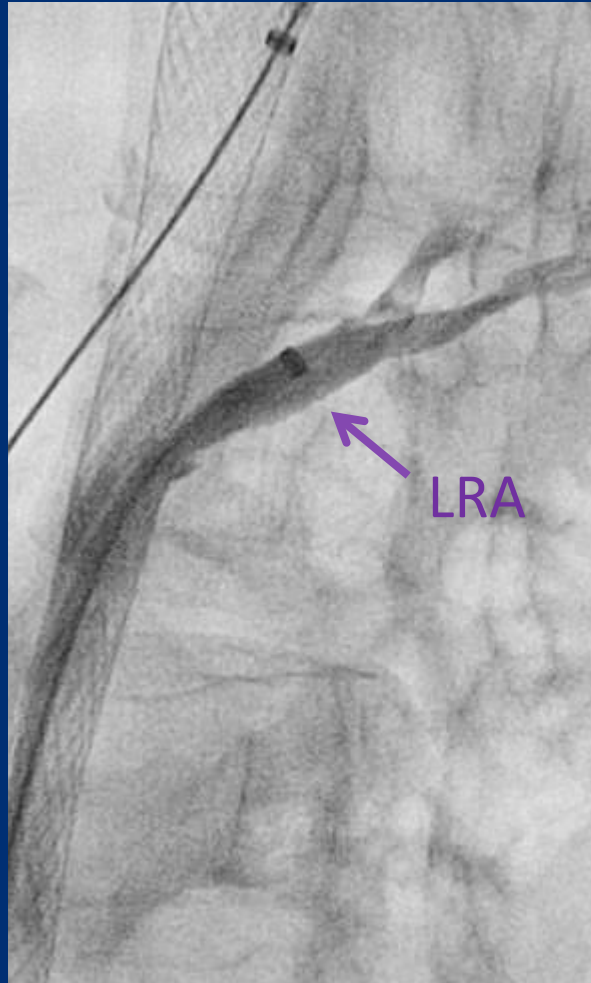




Right renal artery occluded.  
No nephrogram seen

6.3.2013

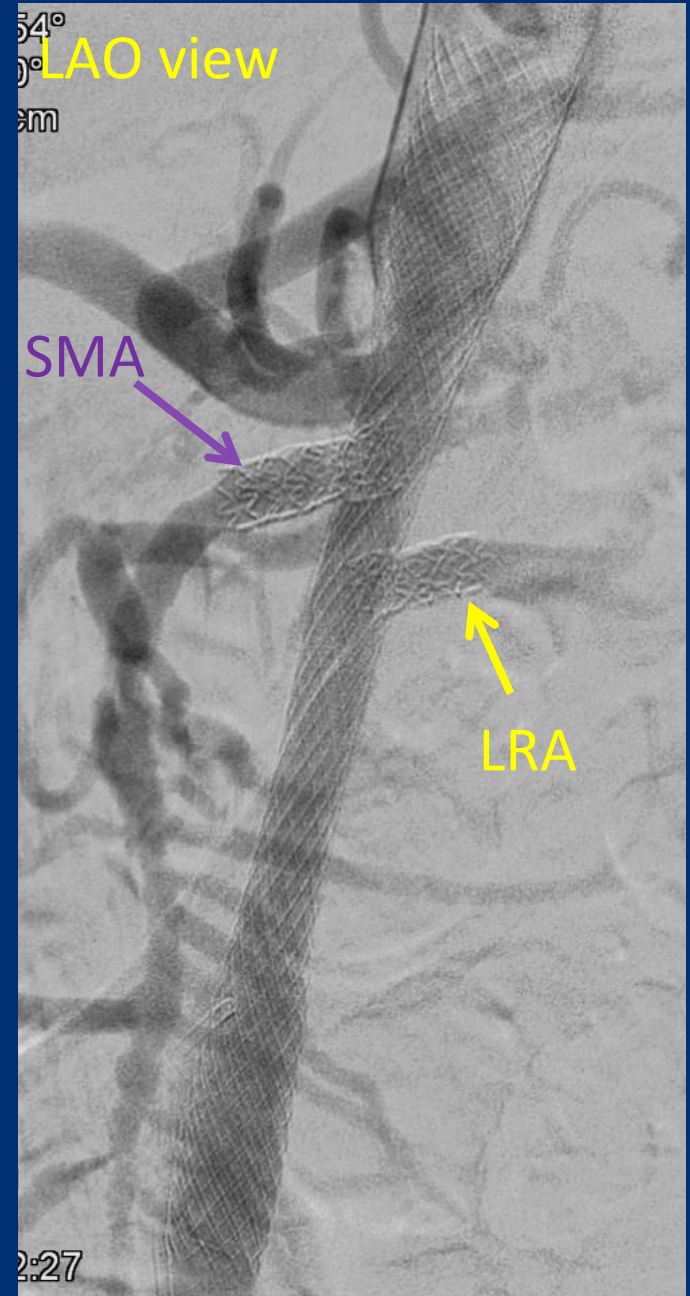
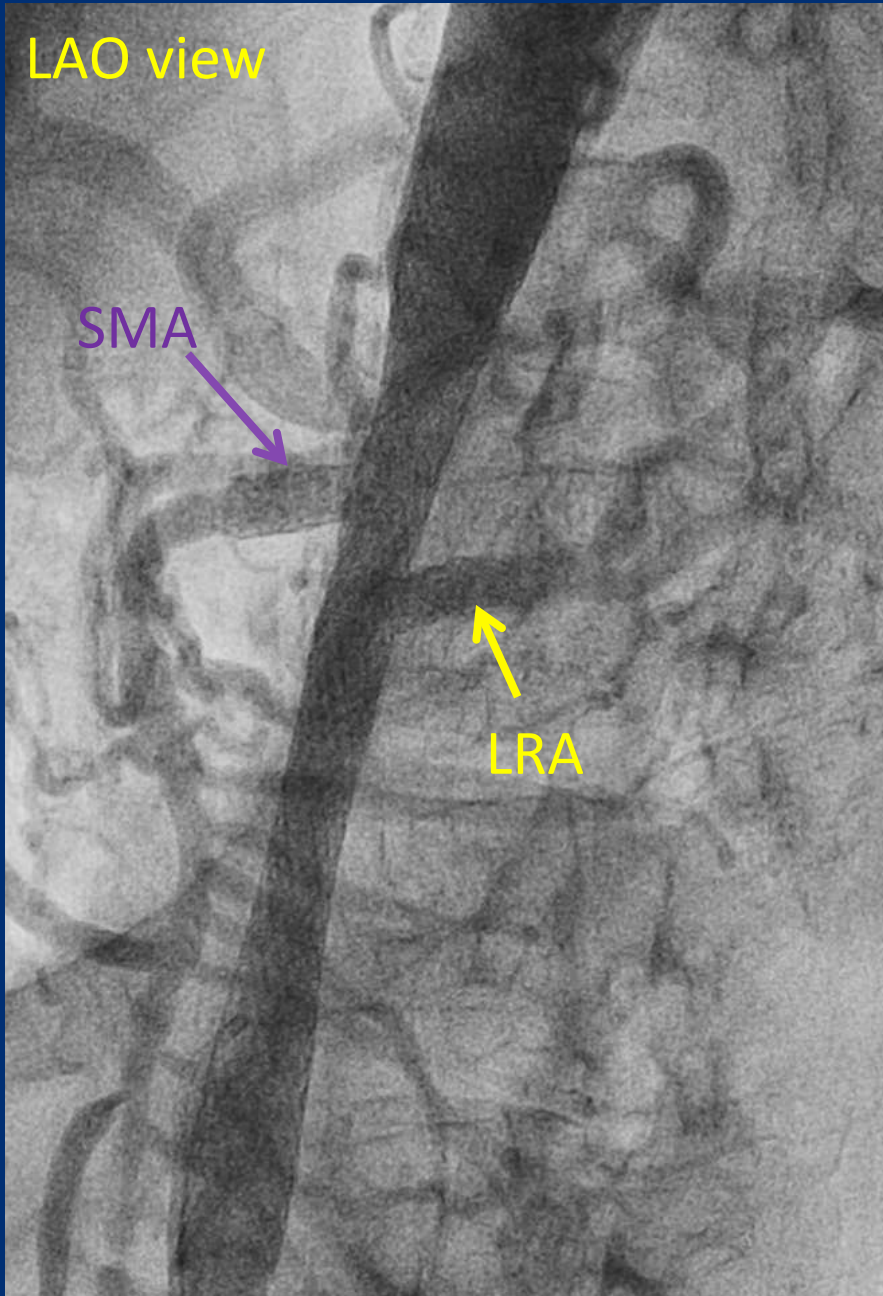




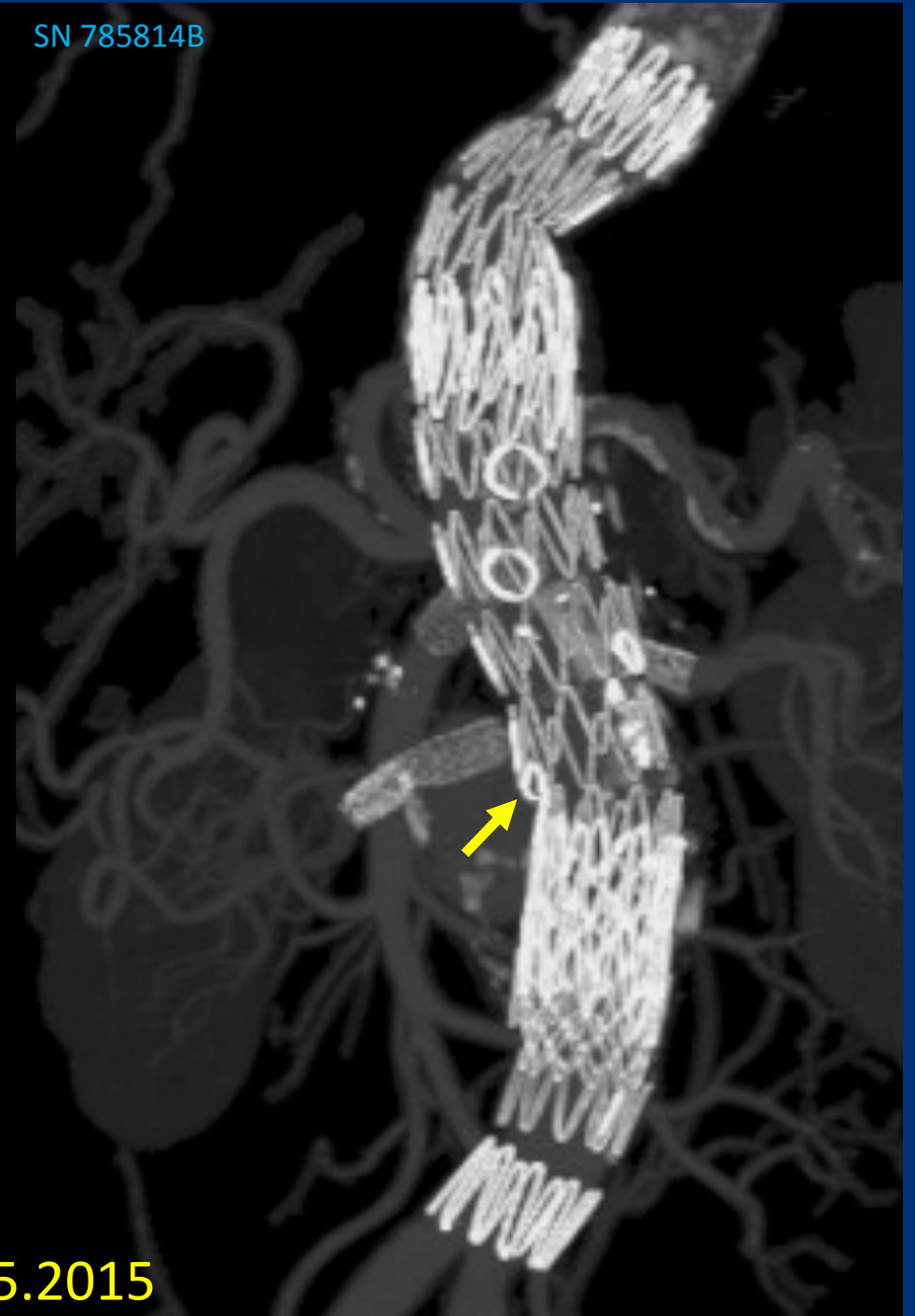
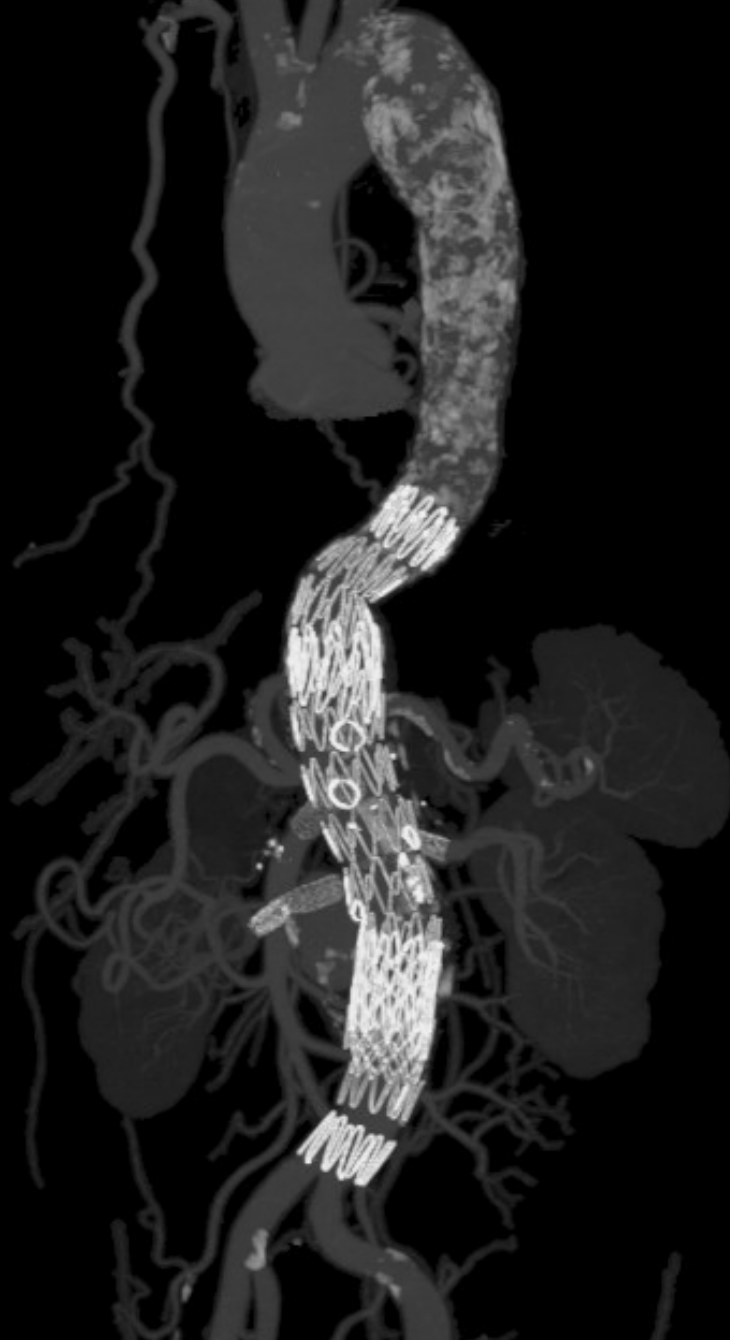
6.3.2013

# Going through Wallstent struts

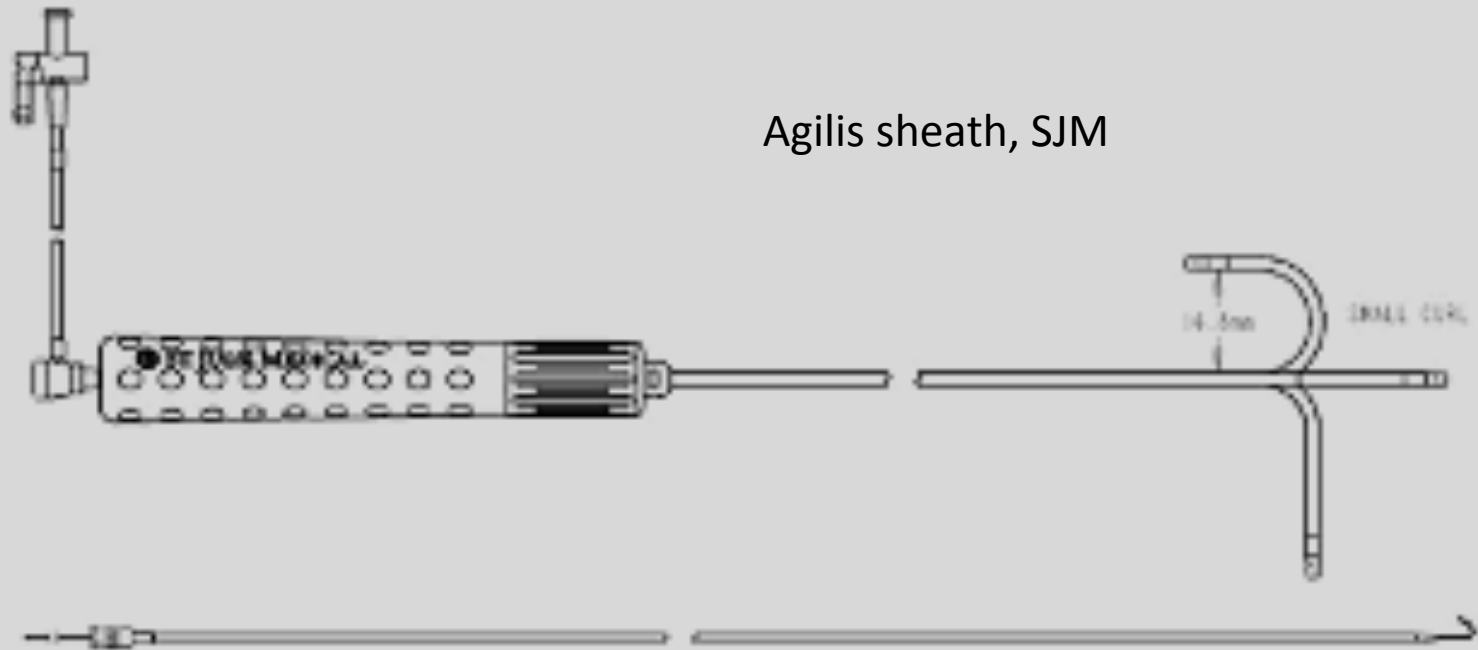
- Glidewire 0.035 inch
- Glide catheter 4F (Vertebral curve)
- Remove Glidewire
- Amplatz Superstiff 0.035 inch 1cm soft tip
- Remove Glide catheter
- Ansel sheath 6F / 7F
- Remove dilator of sheath
- Withdraw sheath after positioning balloon / stent

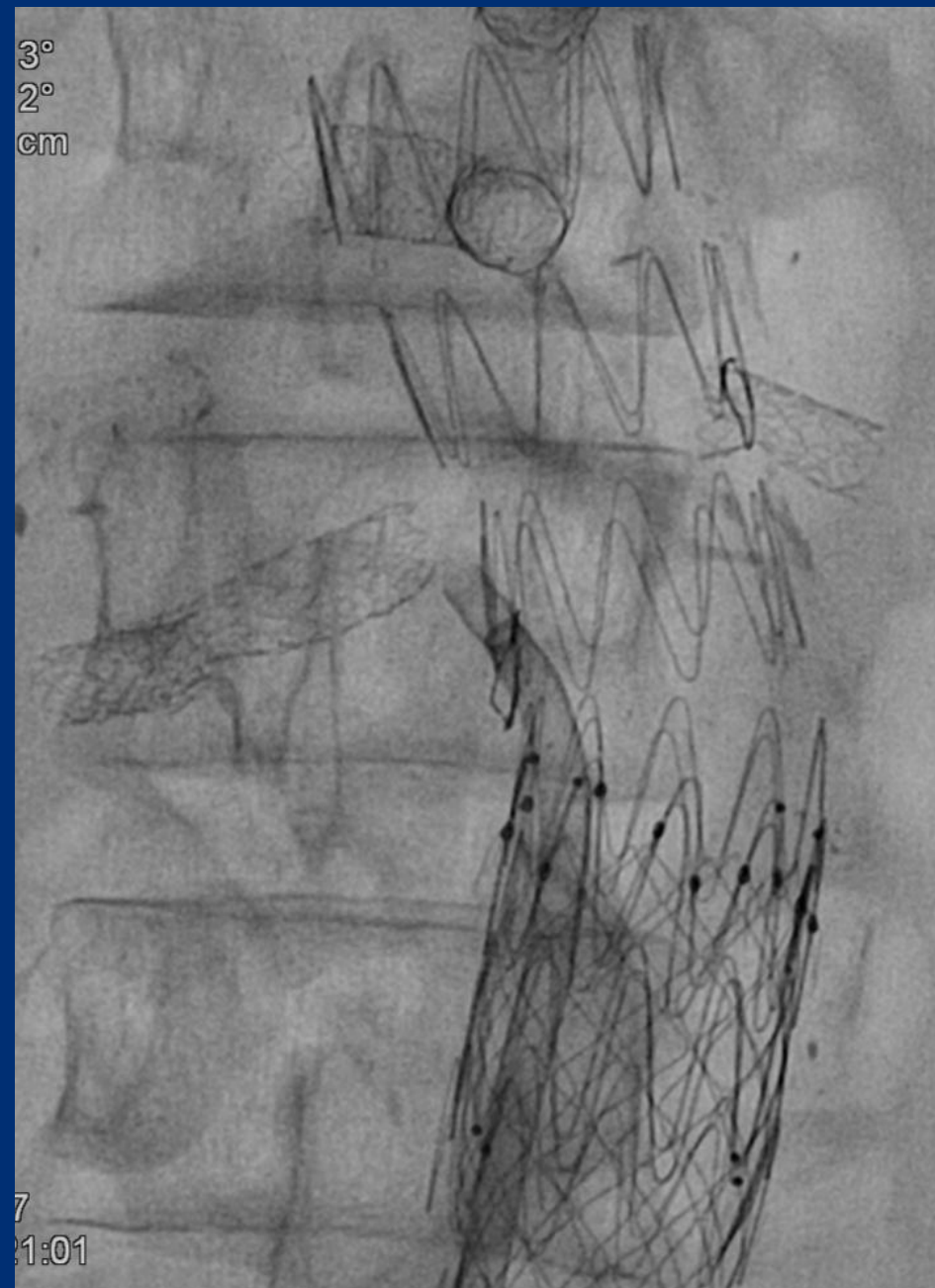
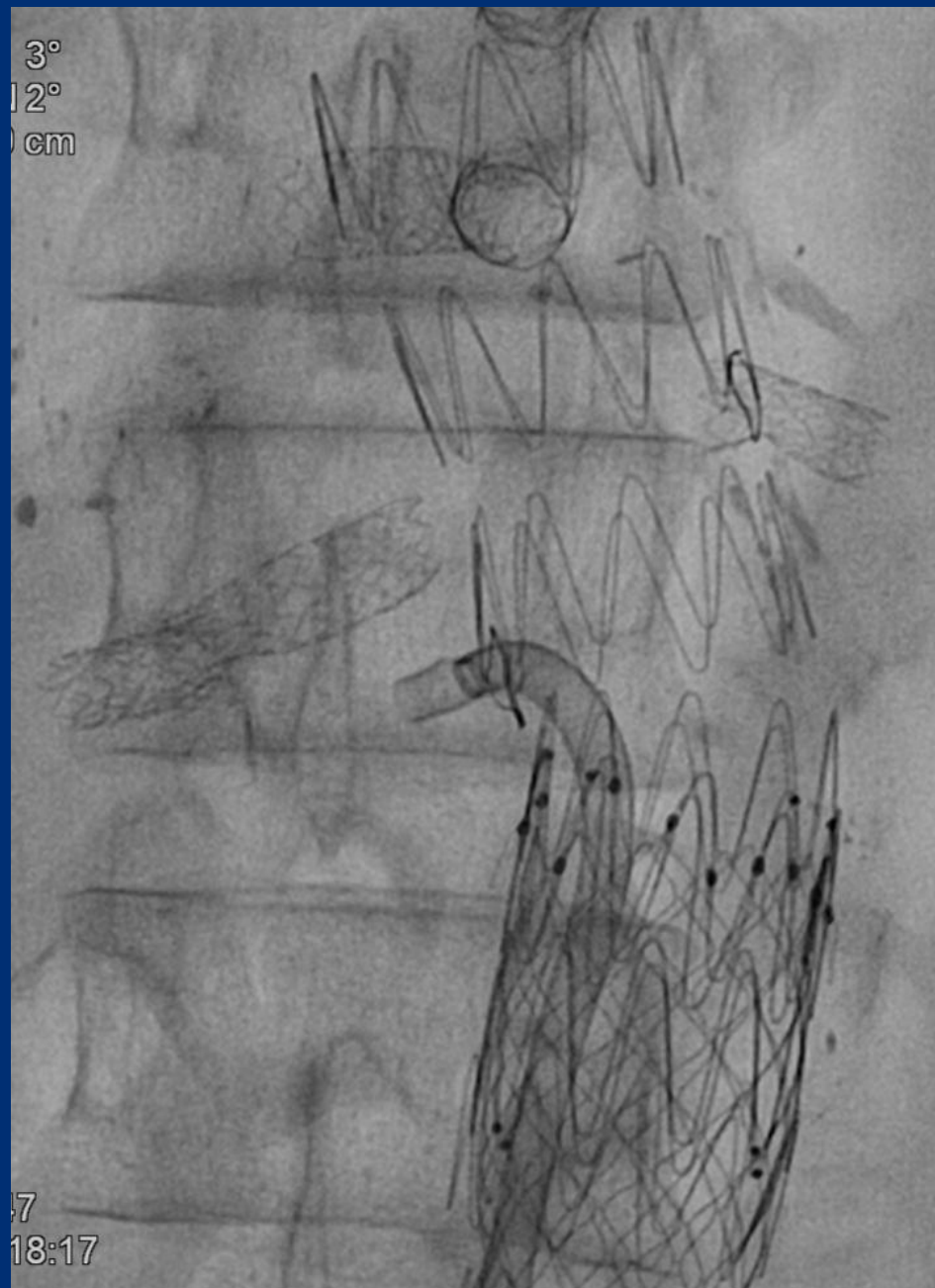


SN 785814B



7.5.2015

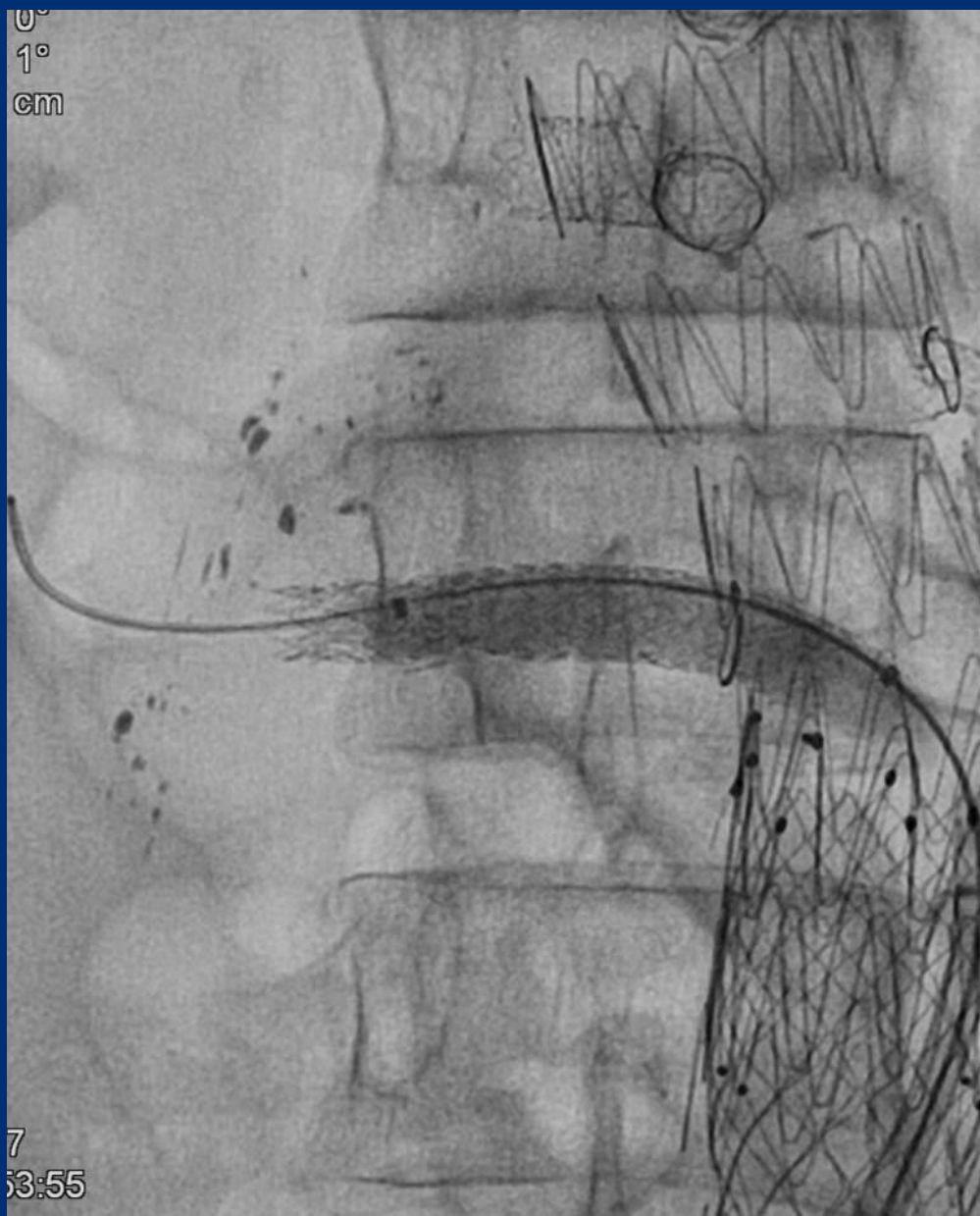




26.8.2015



26.8.2015



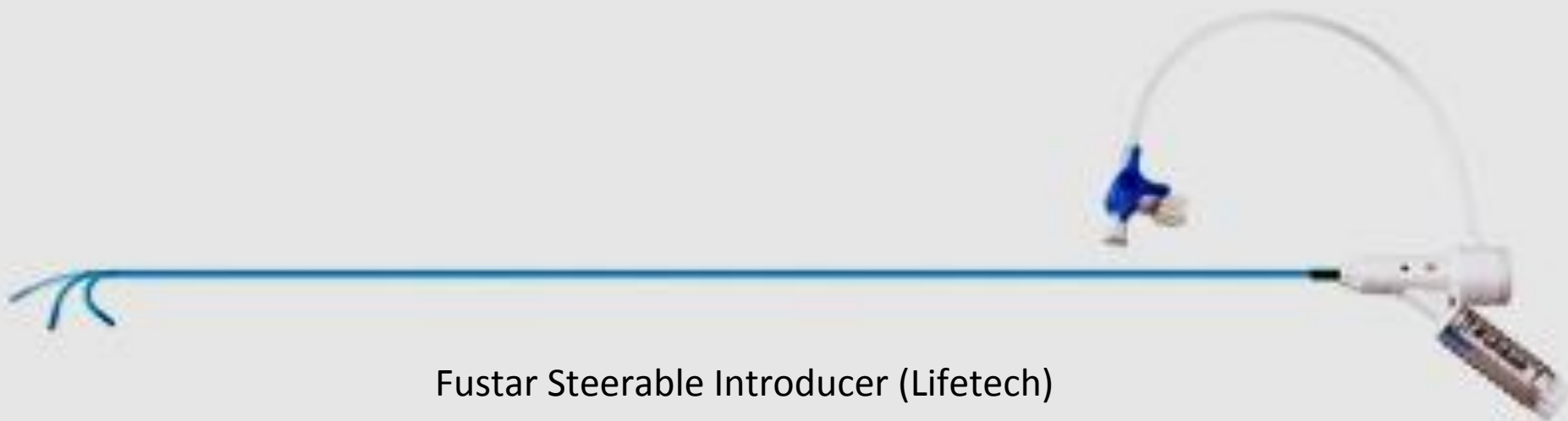
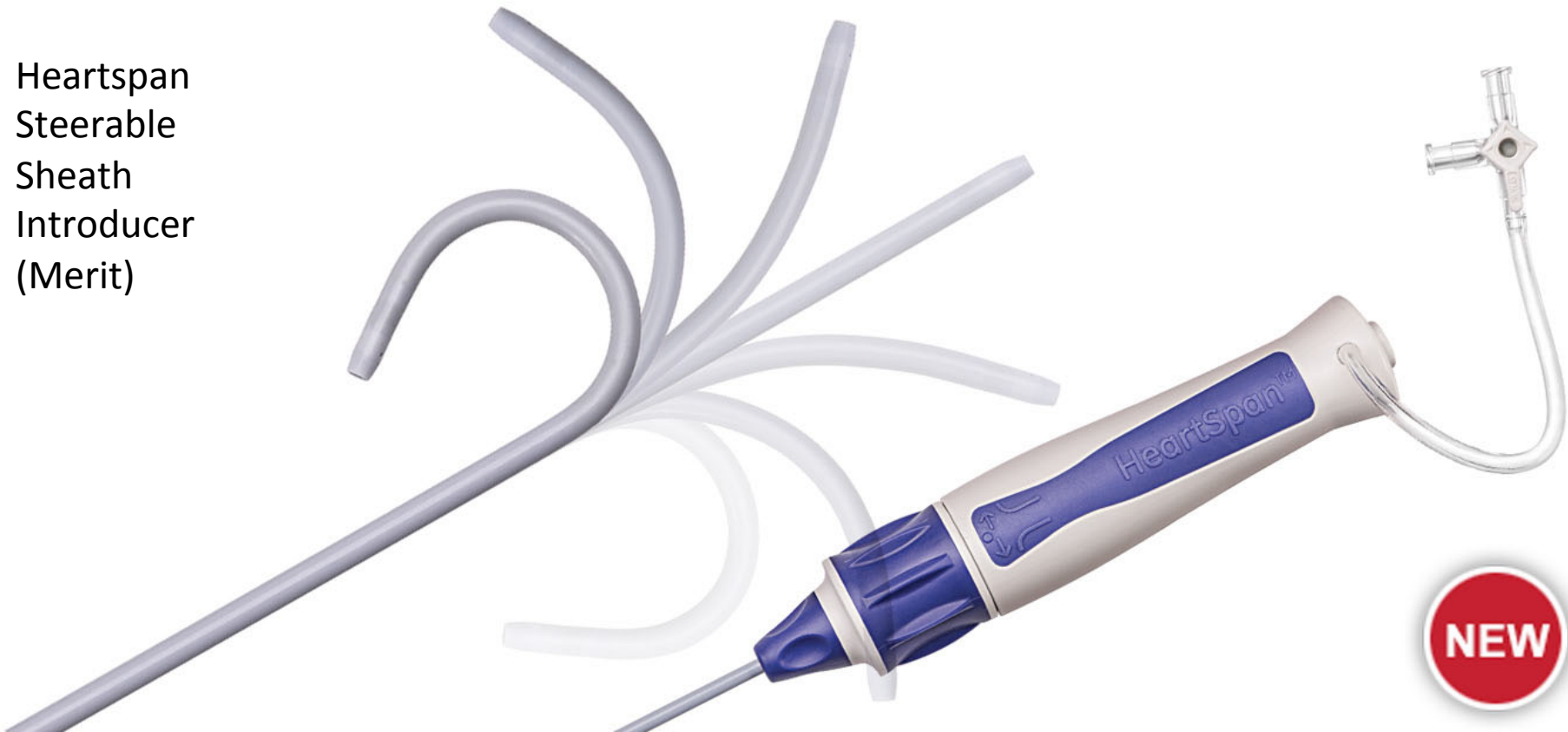
26.8.2015





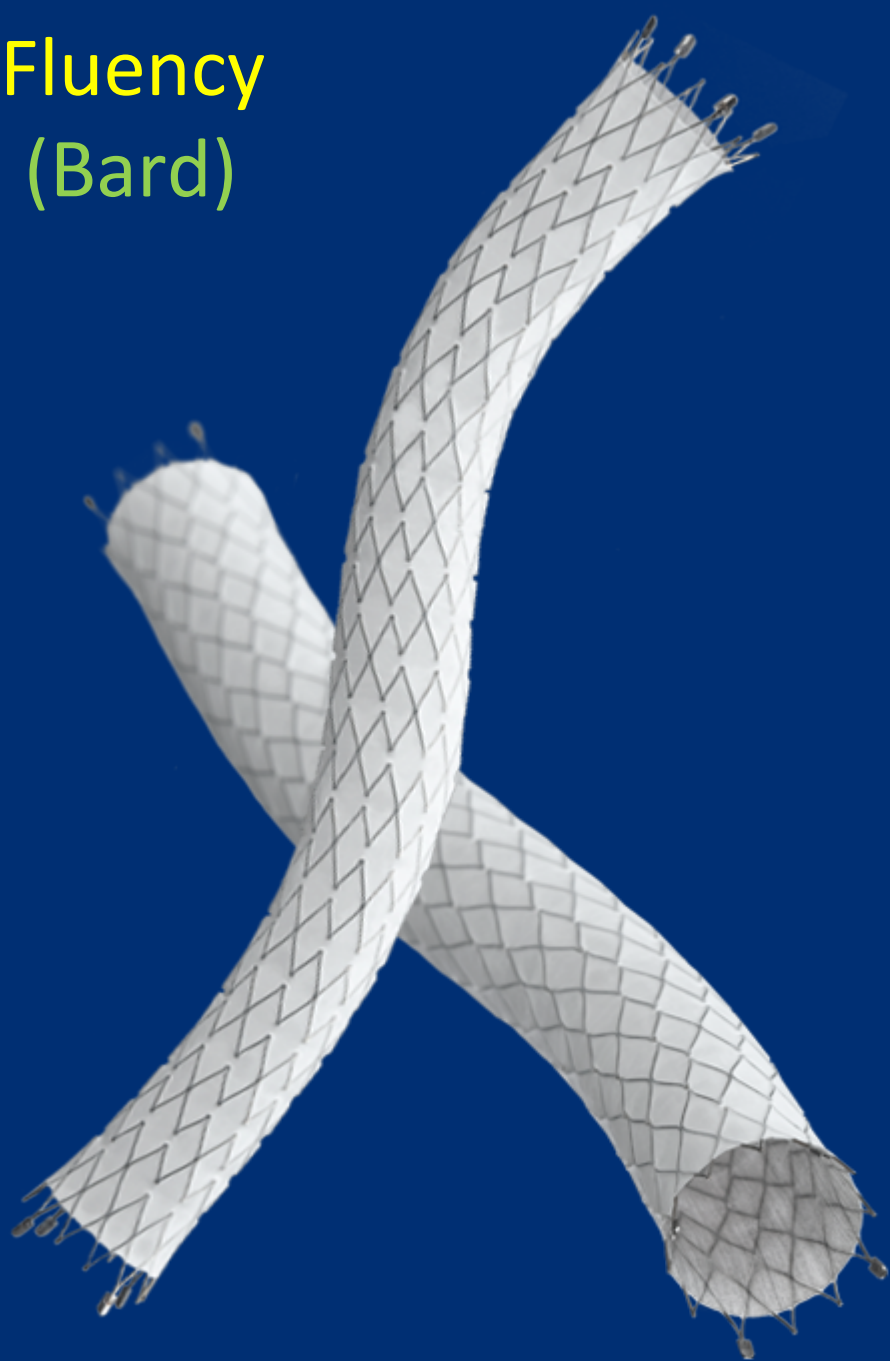
26.8.2015

Heartspan  
Steerable  
Sheath  
Introducer  
(Merit)

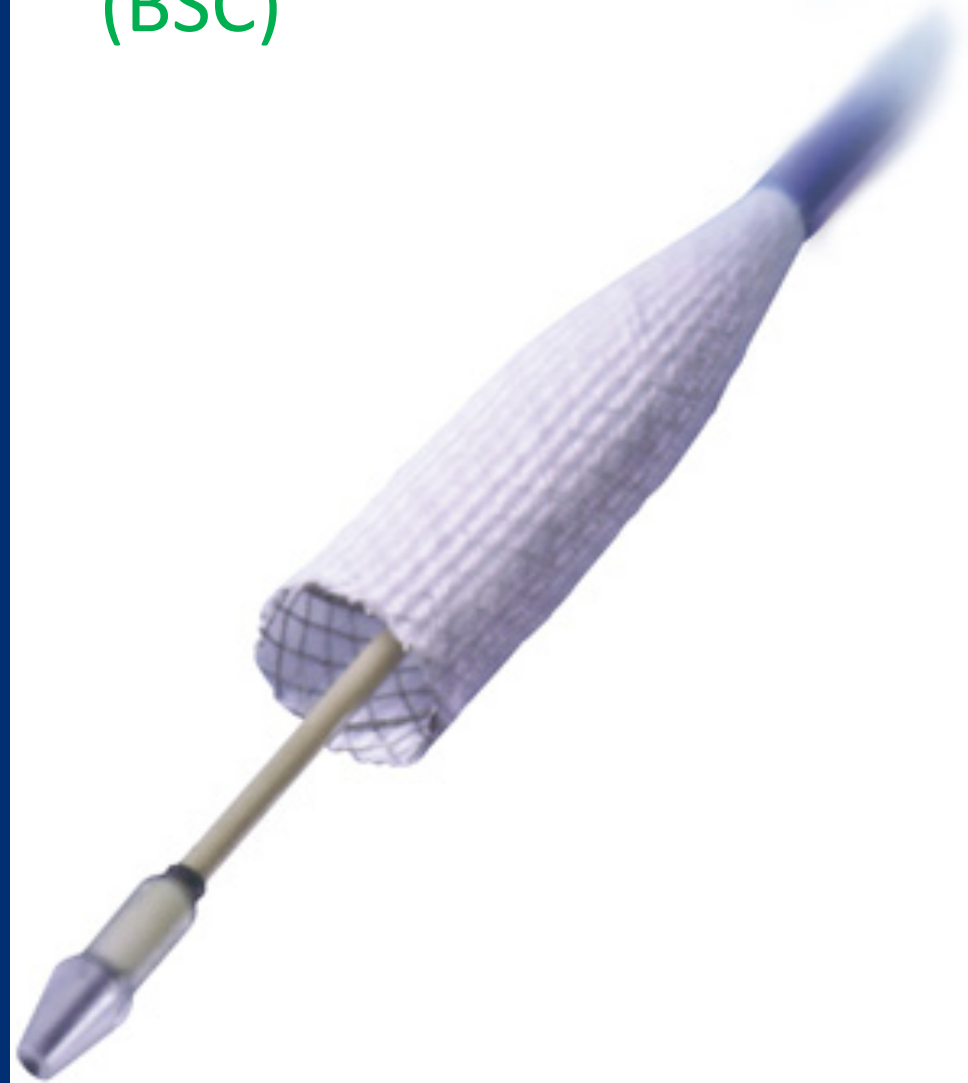


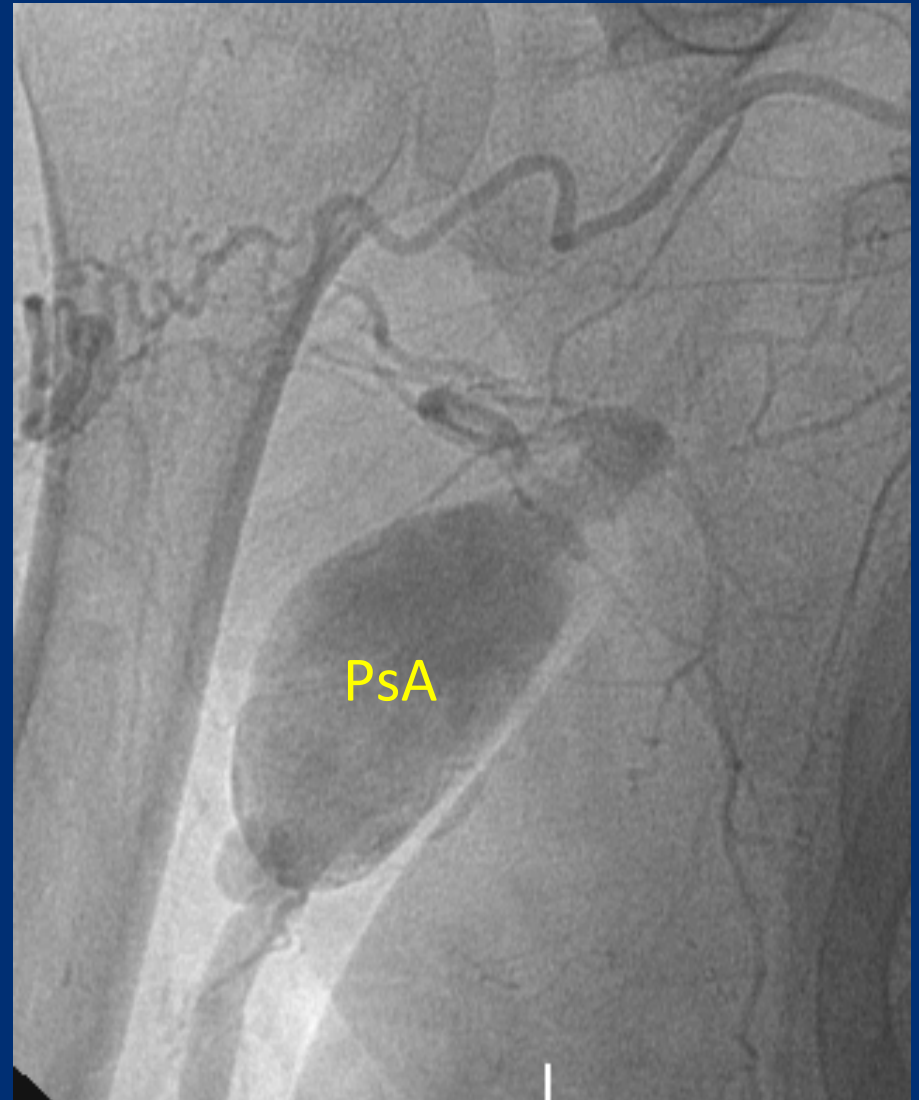
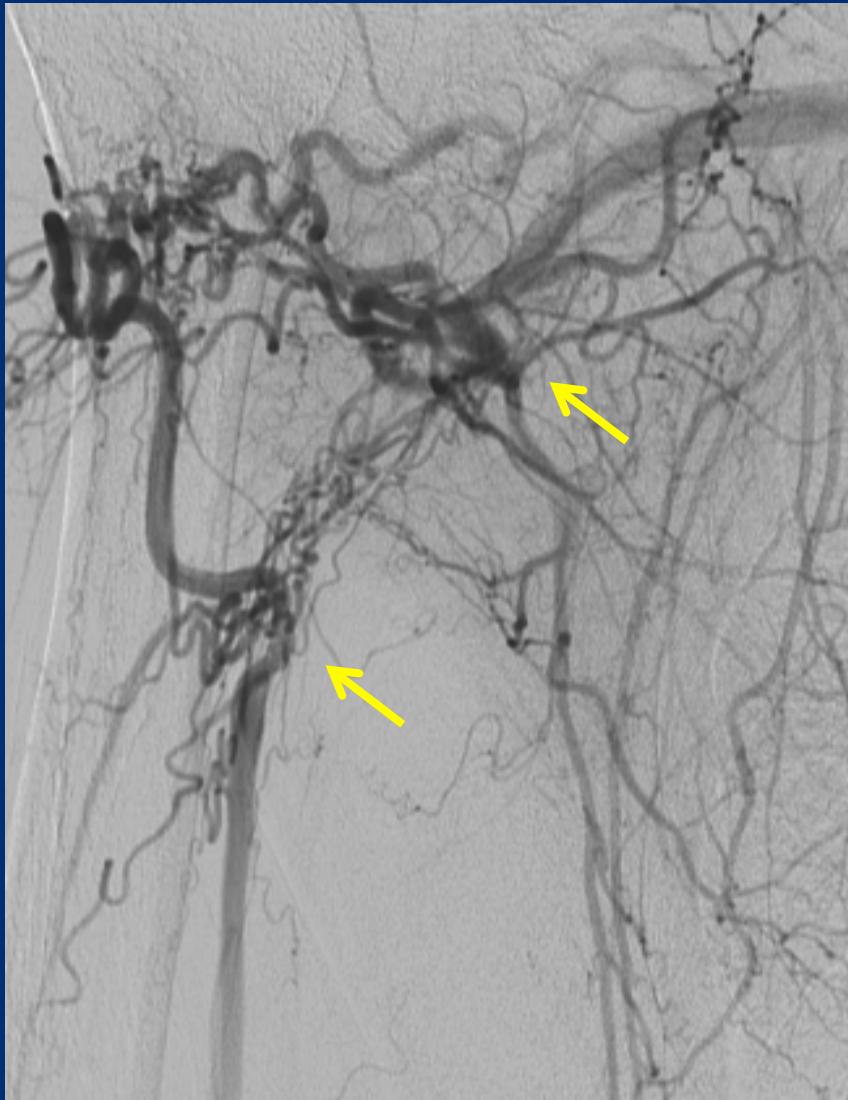
Fustar Steerable Introducer (Lifetech)

Fluency  
(Bard)



Wallgraft  
(BSC)

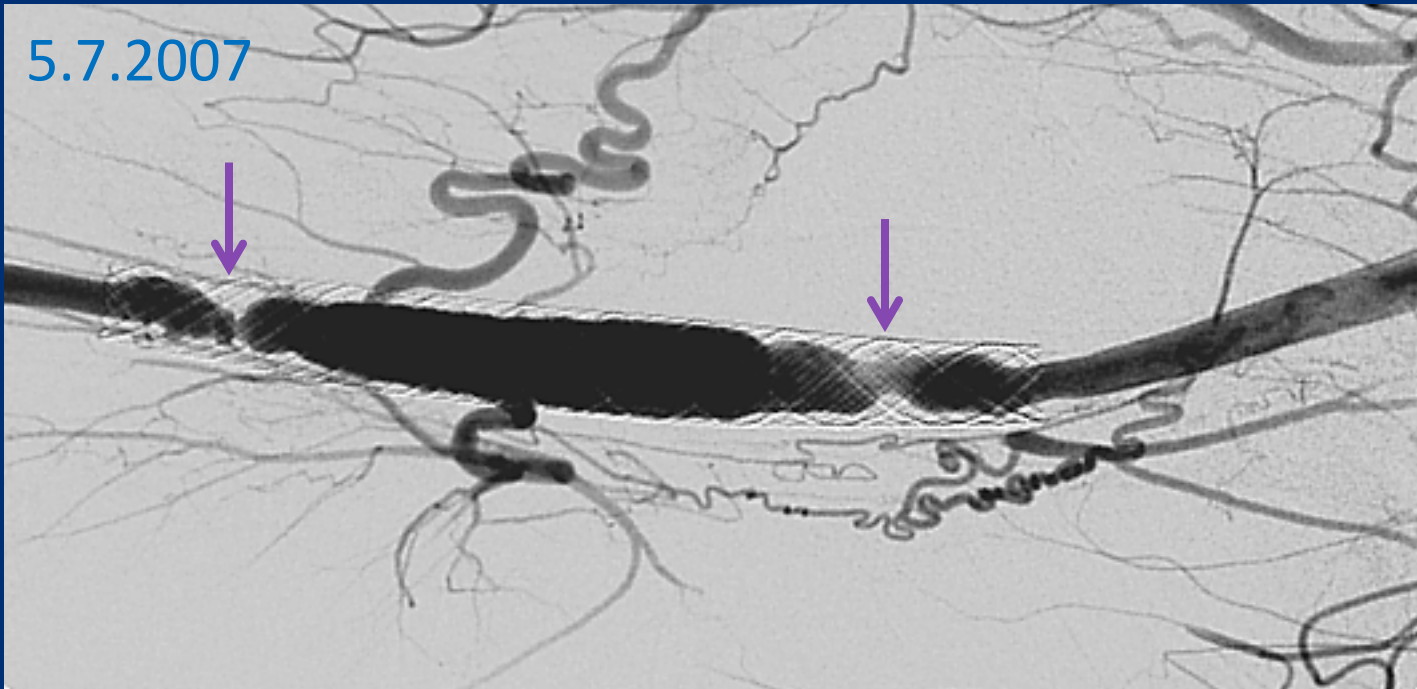




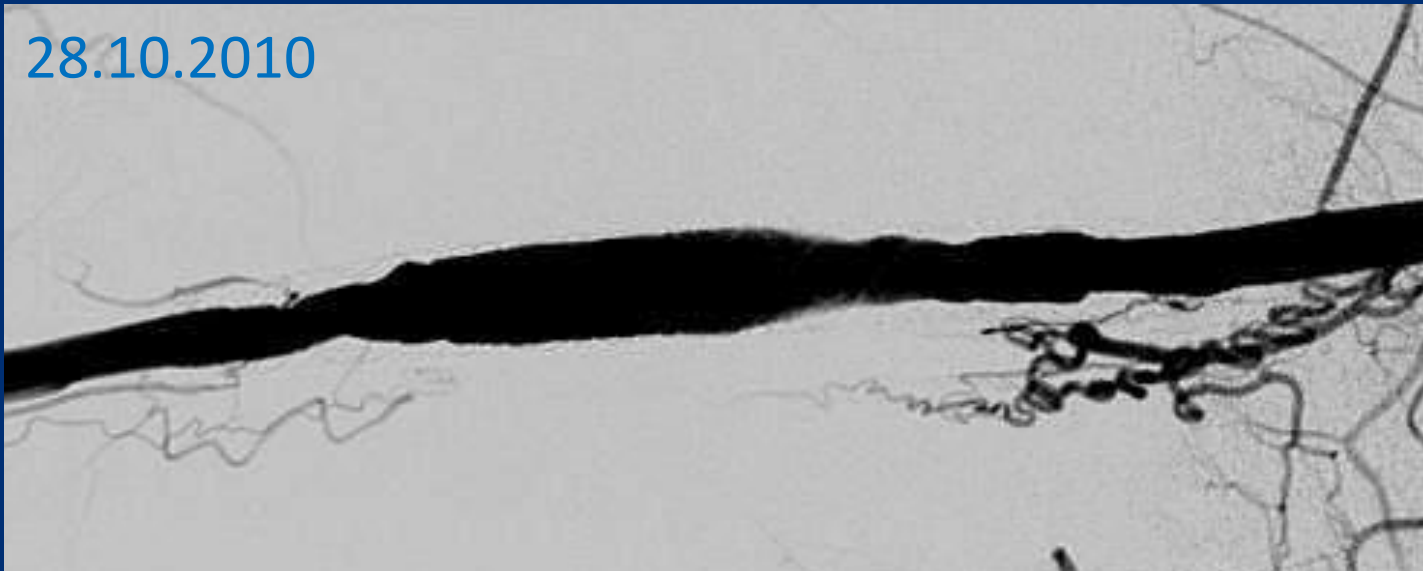
Right axillary artery  
recanalization and  
cutting balloon angioplasty

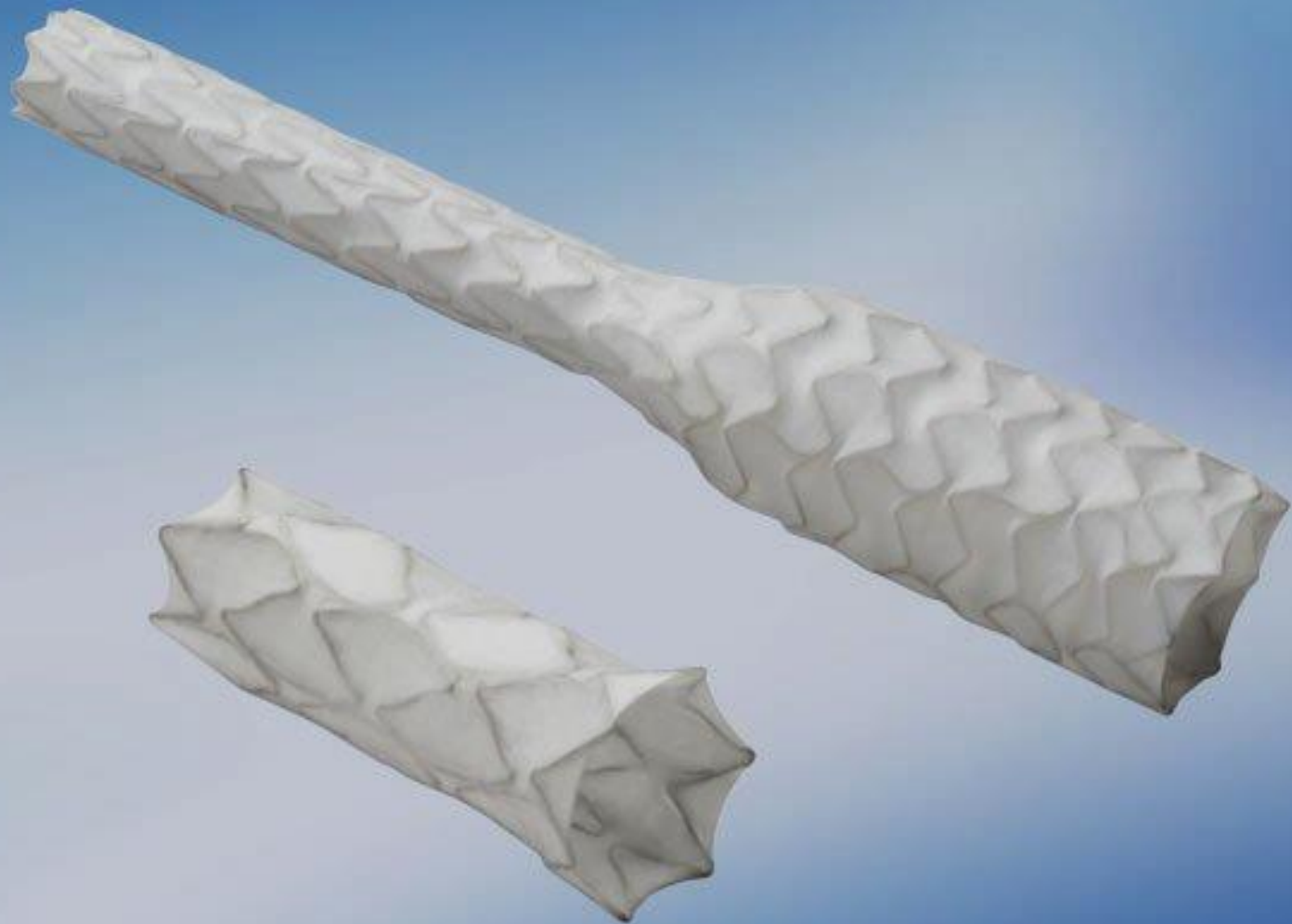
25.6.2003

5.7.2007

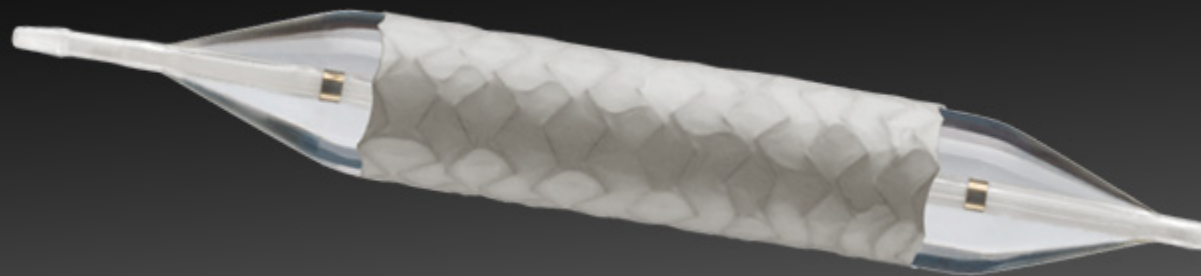


28.10.2010

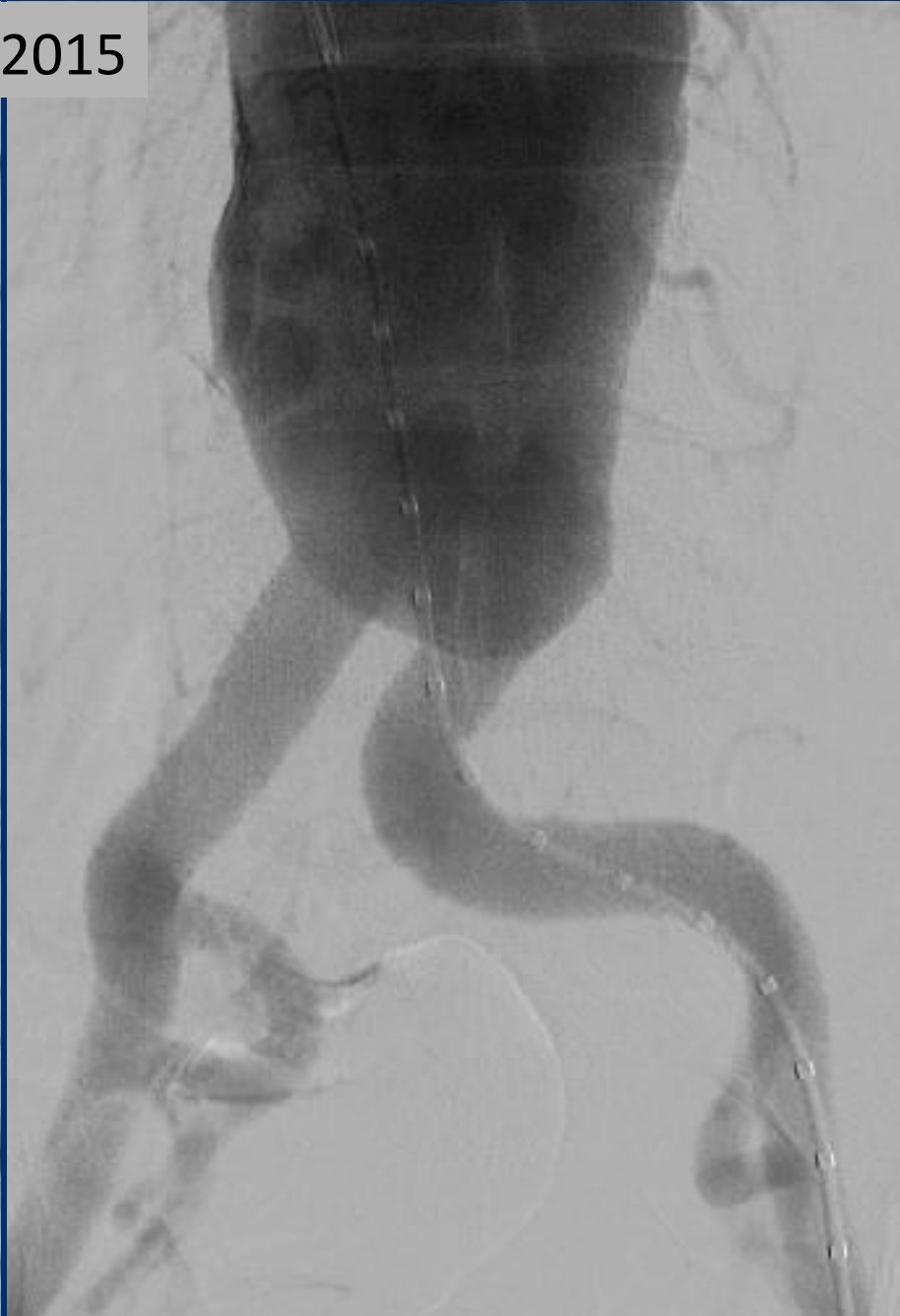
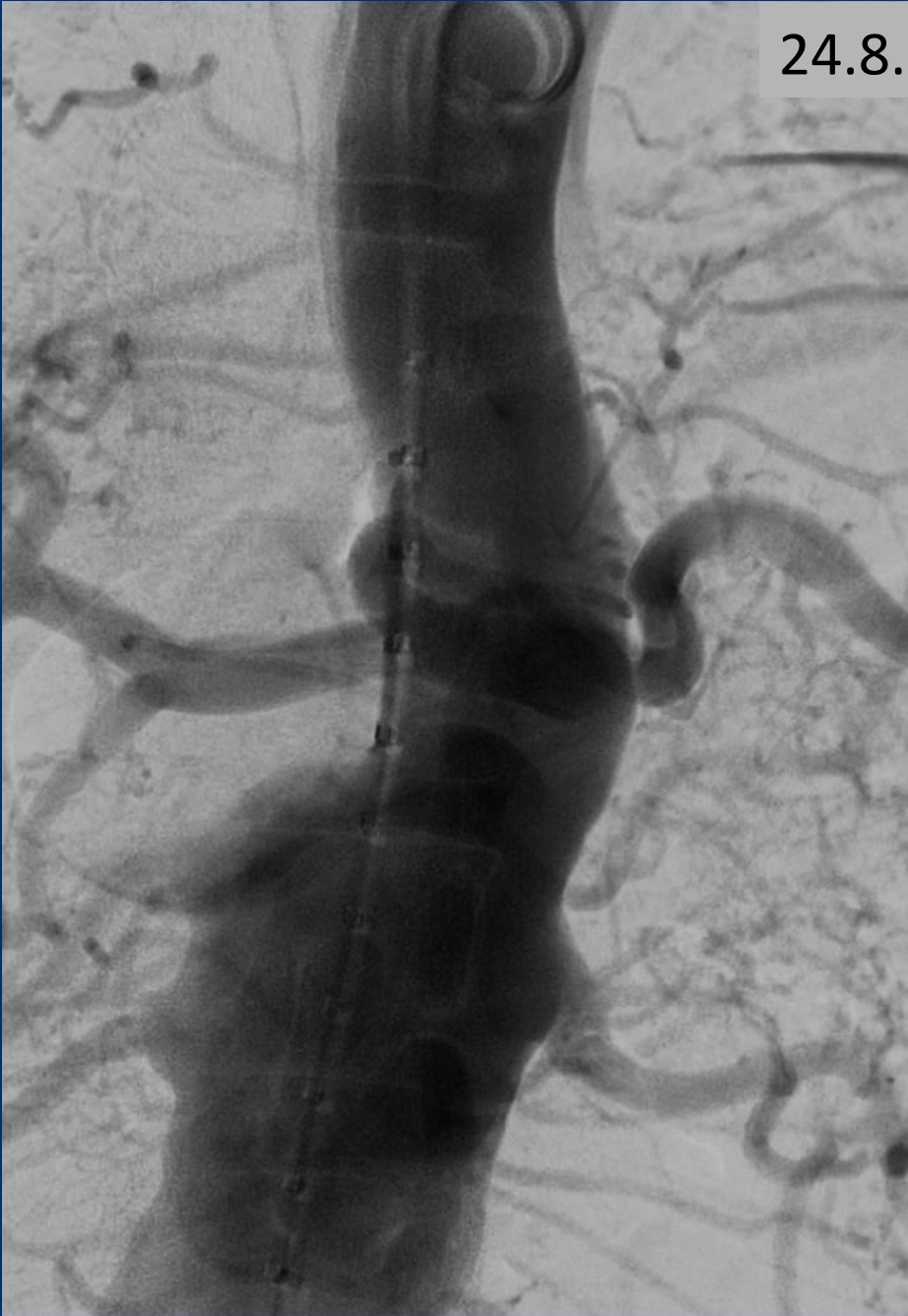


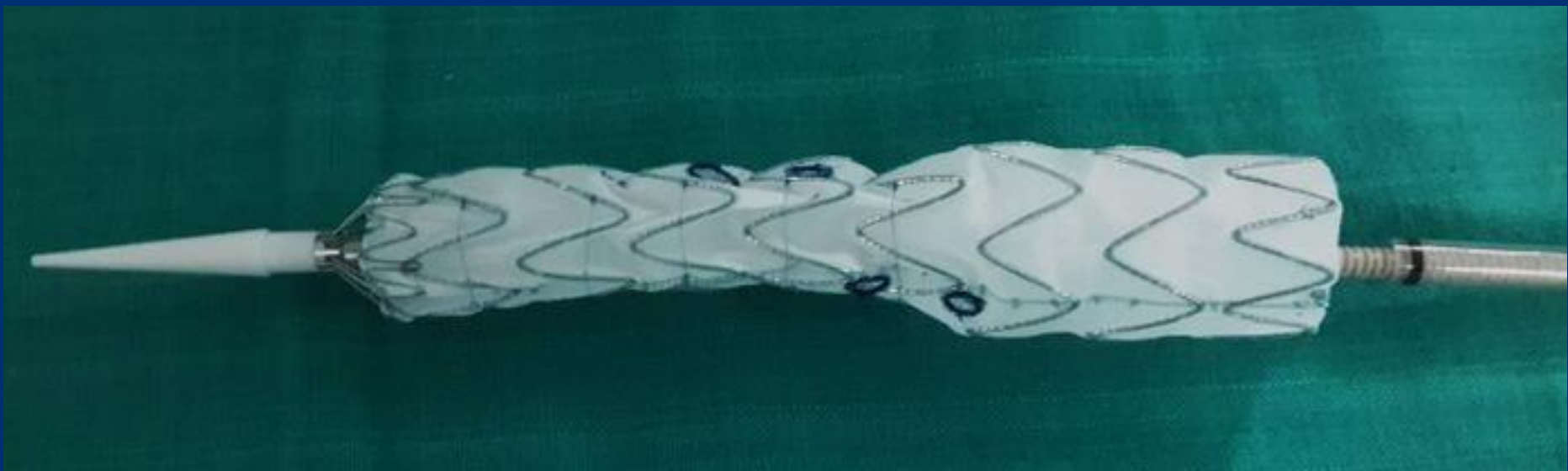
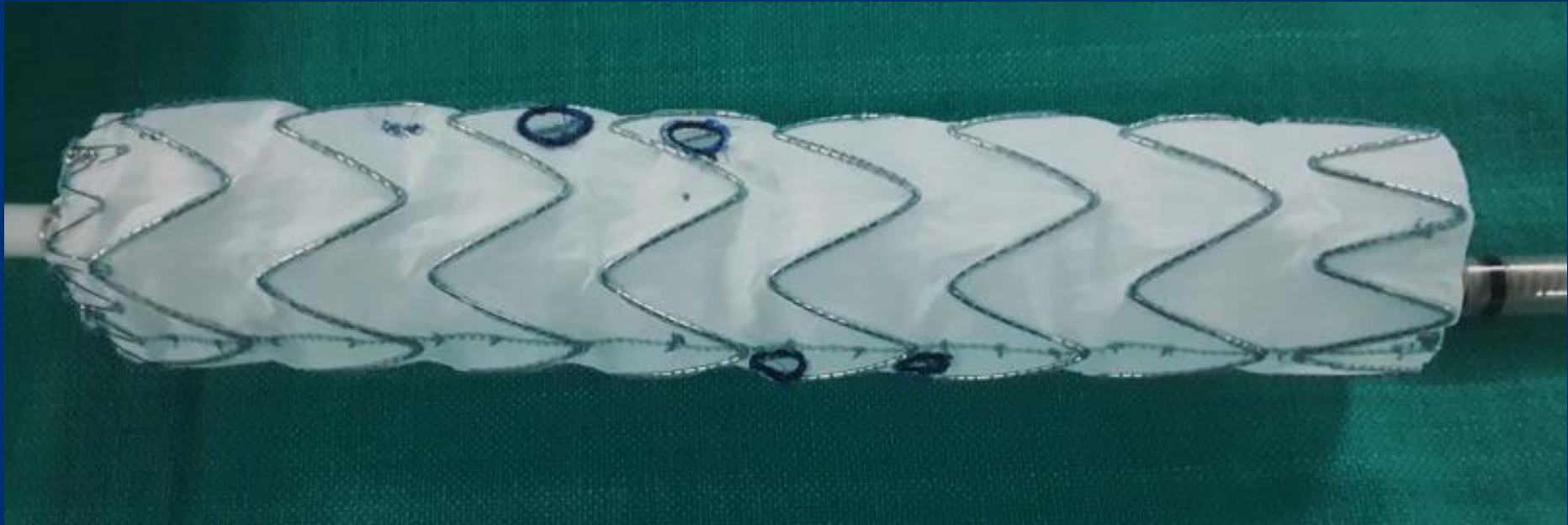


 **ATRIUM**  
MAQUET GETINGE GROUP



24.8.2015





25.8.2015



27.8.2015





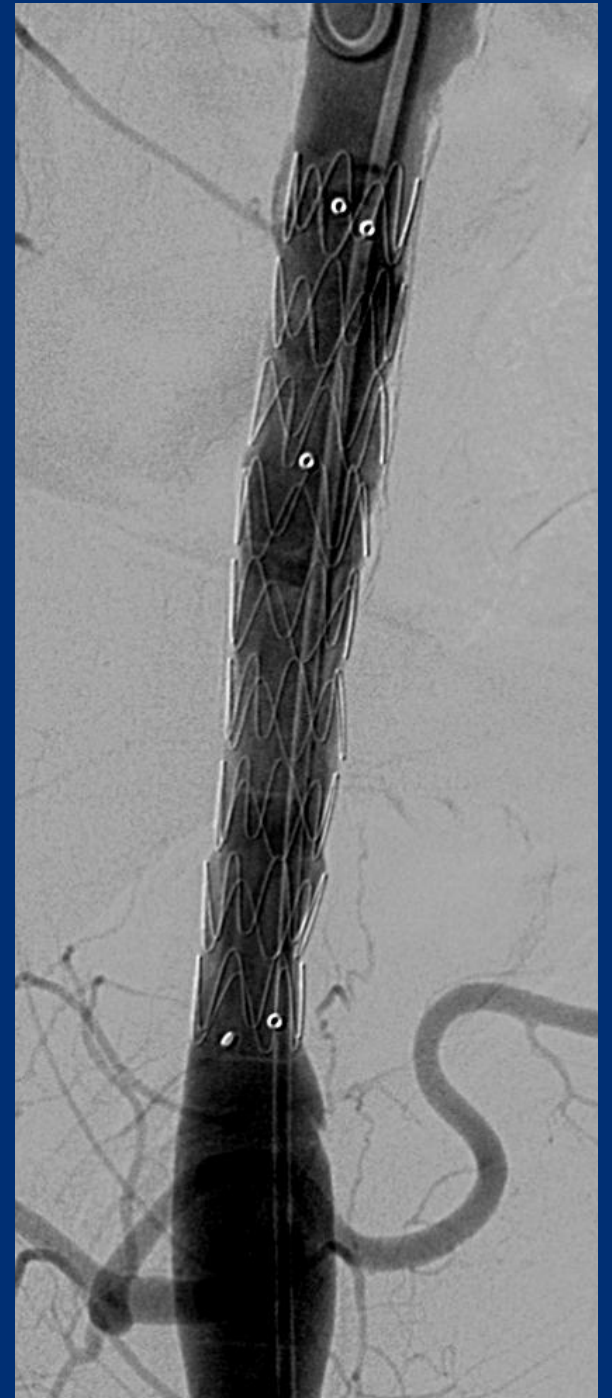
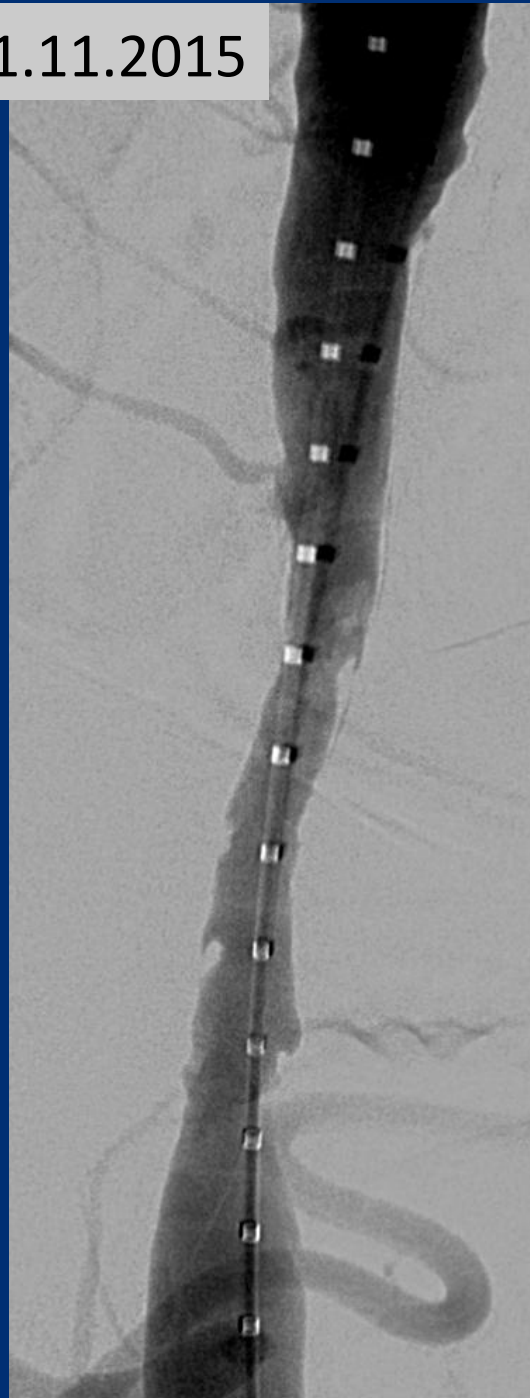
CP covered stent (Numed)



**Endurant  
Aortic tube  
and Iliac limb  
(Medtronic)**

RB 983045F

11.11.2015



# Starting off

- Read
- Attend courses / conferences
- Watch cases being done
- Do a fellowship in vascular interventions
- Invest in a full range of equipment
- Start with simple cases
- Get help from seniors / proctors
- Collaborate with vascular surgeons

# Sustaining the program

- Be readily available
- Study all your cases before and after intervention
- Learn from your mistakes
- Document and follow-up all your cases
- Present your cases / publish them
- Build a vascular interest group
- Avoid turf battles – strive for excellence

# The future

- The future is endovascular
- Demands for services will increase given:
  - Aging of population
  - Diabetes
  - Better paying capacity / insurance
- Vascular interventionalist
- Cardiologists uniquely positioned to meet this need

*Thank you for your attention*