YONSEI UNIVERSITY

Sierra feature and benefit in complex lesion

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PCI for complex lesions

- AMI
- CTO
- Diffuse long lesions
- Calcified lesion
- Bifurcation
- Unprotected left main disease
- Small vessel diseases
- Intracoronary thrombus
- Stent thrombosis / In-stent restenosis

All DESs, same?

→ Successful PCI could make the successful outcomes.

→ Easy procedure always leads with a big success after PCI.

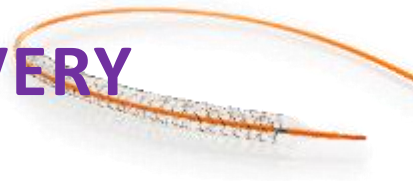
Essential to success?

Essential of DES to successful complex PCI?

1. Deliverability

Best results in diffuse long lesions (tortuous or angulated lesions), CTO, or severe calcification

SIERRA'S NEW STENT DESIGN AND DELIVERY SYSTEM



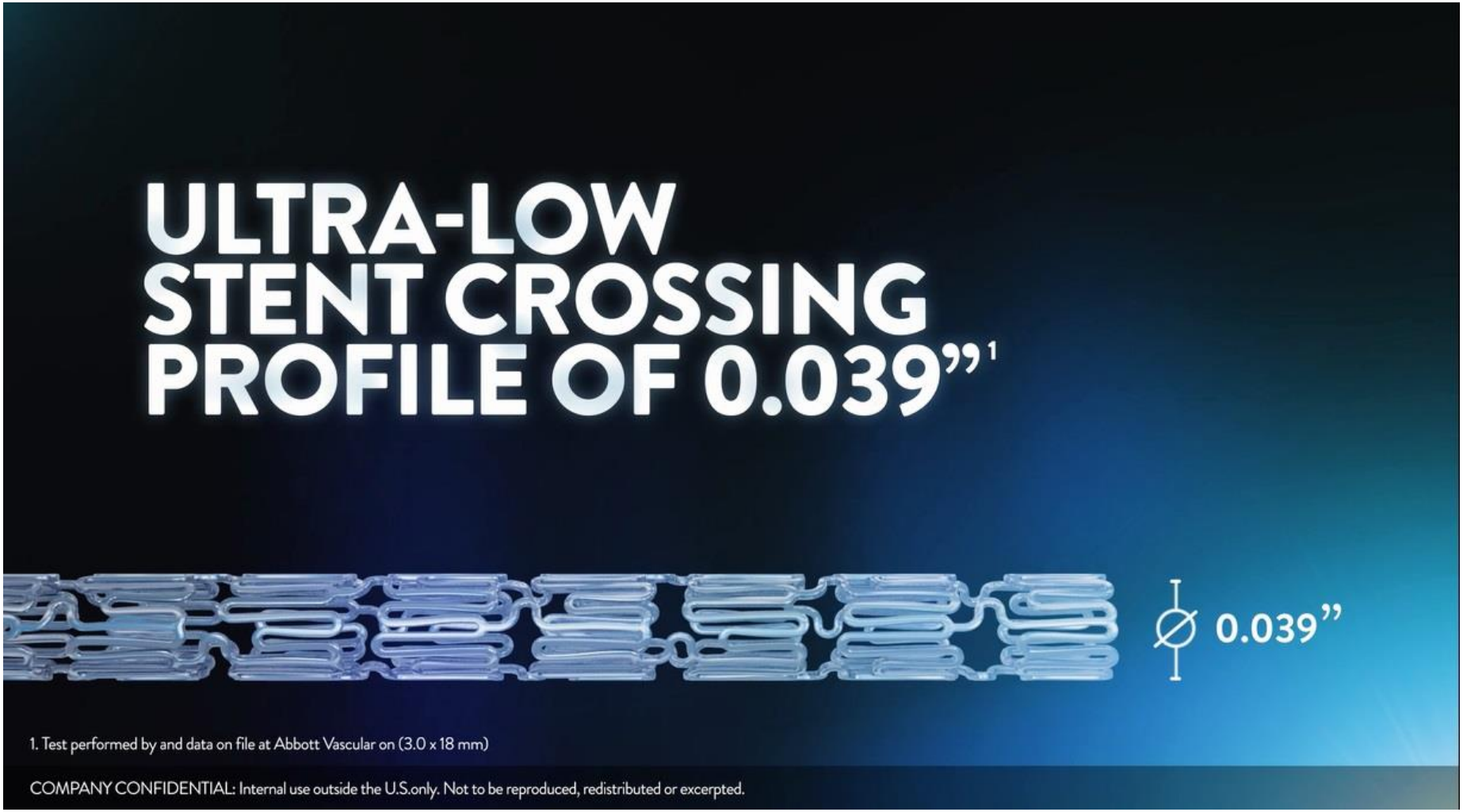
	DELIVERY SYSTEM	BALLOON	STENT DESIGN	DRUG/DOSE	POLYMER/ STENT MATERIAL
XIENCE Alpine	XIENCE Alpine	Multi-Layer balloon	PRIME design	Everolimus 100 µg/mm²	Durable Fluoropolymer/ Cobalt Chromium
XIENCE Sierra	NEW! Improved pushability through a more robust single piece outer member	NEW! Reduced crimped profile through a single layer balloon with stronger material	NEW Design! Smaller crimpled profile & larger post-dilatation expansion achieved by stent pattern modification	↓	↓

Optimized for improved performance in the most difficult lesions

Maintain excellent clinical outcomes

Xience Sierra®

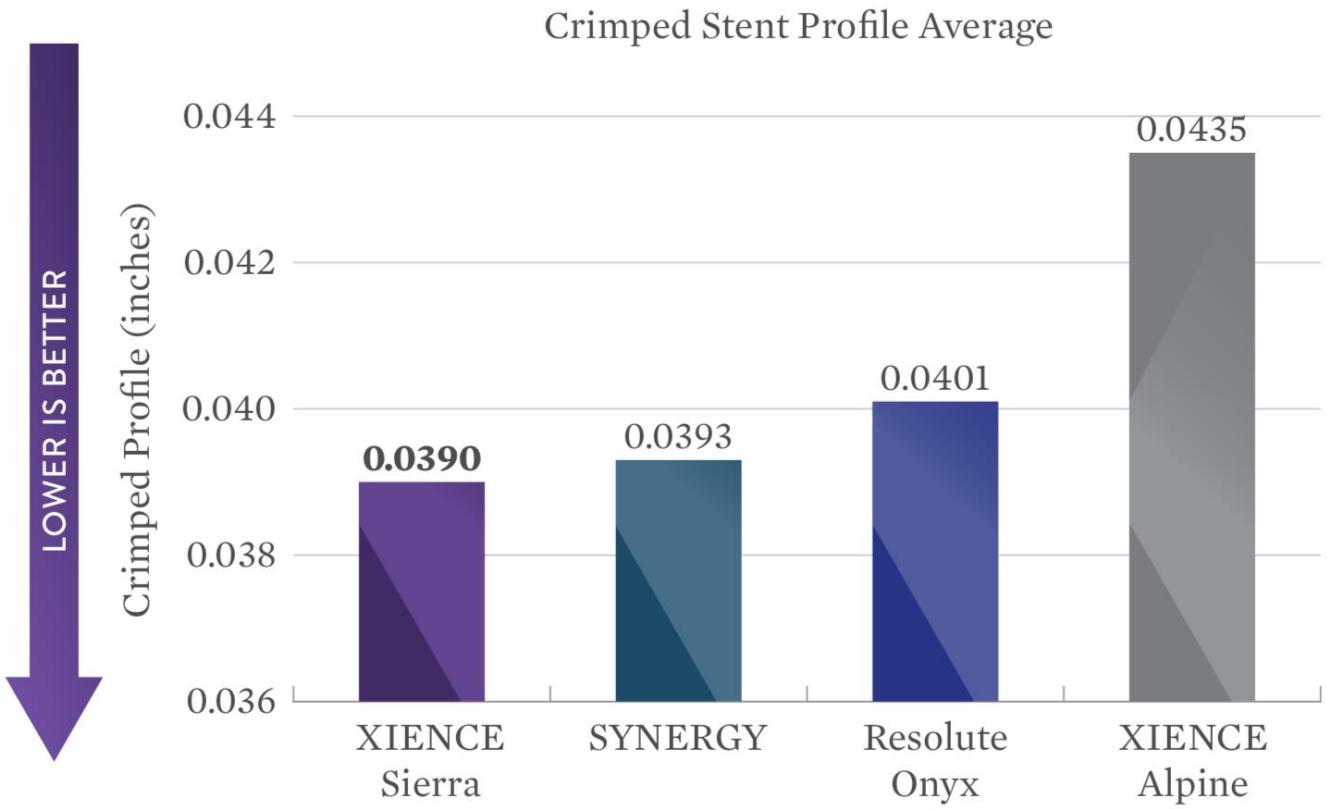
1. SIERRA CROSSING PROFILE



Xience Sierra®

Xience Sierra
DELIVER WITH CONFIDENCE

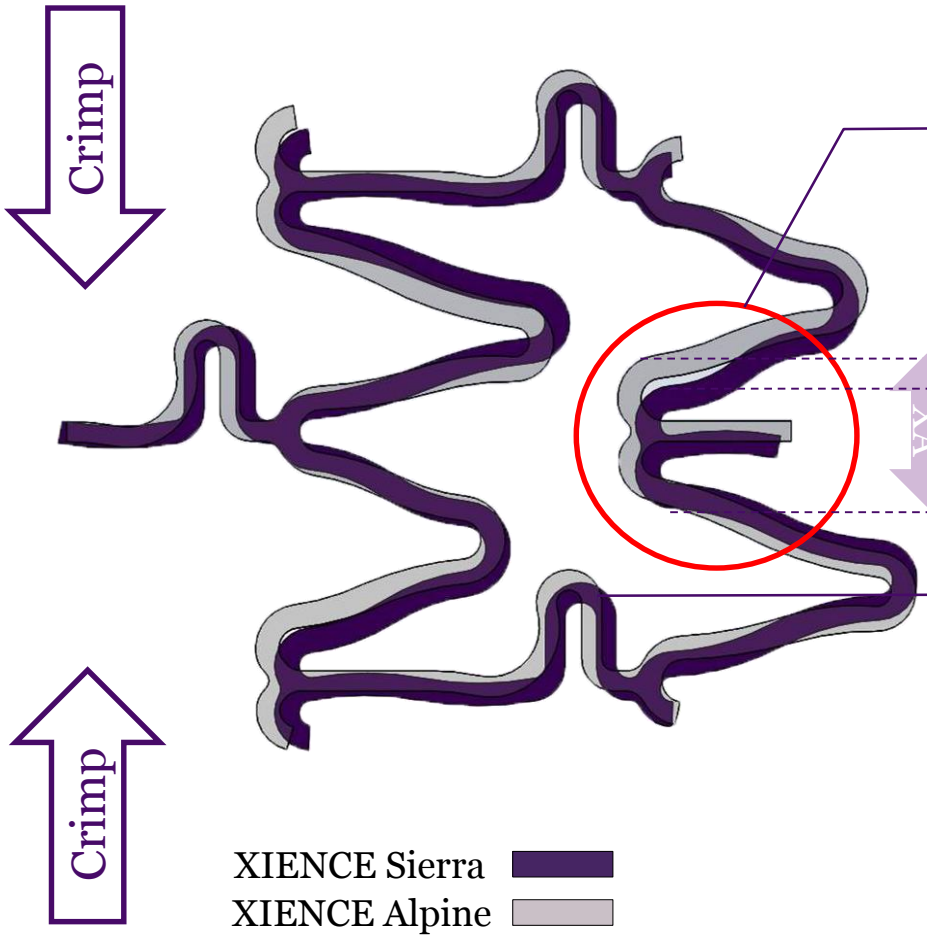
Ultra low stent crimped profile of 0.0390″ for crossing tight lesions enabled by the new stent design and balloon technology[1]



Xience Sierra

1. Stent

STENT DESIGN (6 CREST , 2.25~3.25MM) - REDUCE PROFILE



NEW

“Reduced strut width”

Enables tighter crimp for **Lower profile**

NEW

Optimized “non-linear link”

Enables Smoother flex link
- Smoother cross for calcified lesions

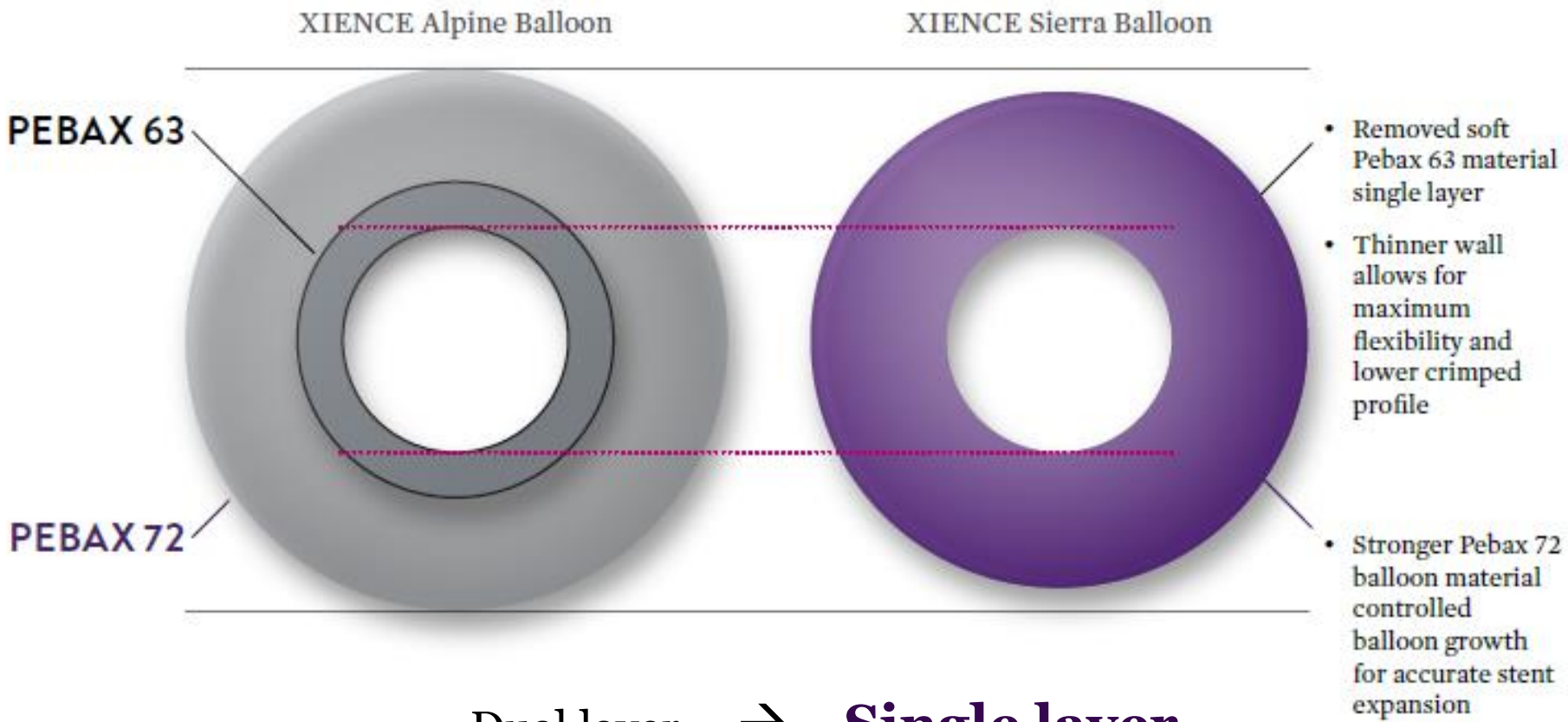
1. Data on file at Abbott.

Xience Sierra®

2. Balloon

THIN & SOFT BALLOON

XIENCE Sierra changed balloon (dual to single layer) **further lowered crimped profile[1] for better crossing and improved flexibility** in challenging anatomy



Dual layer → **Single layer**
(enable to be low profile)

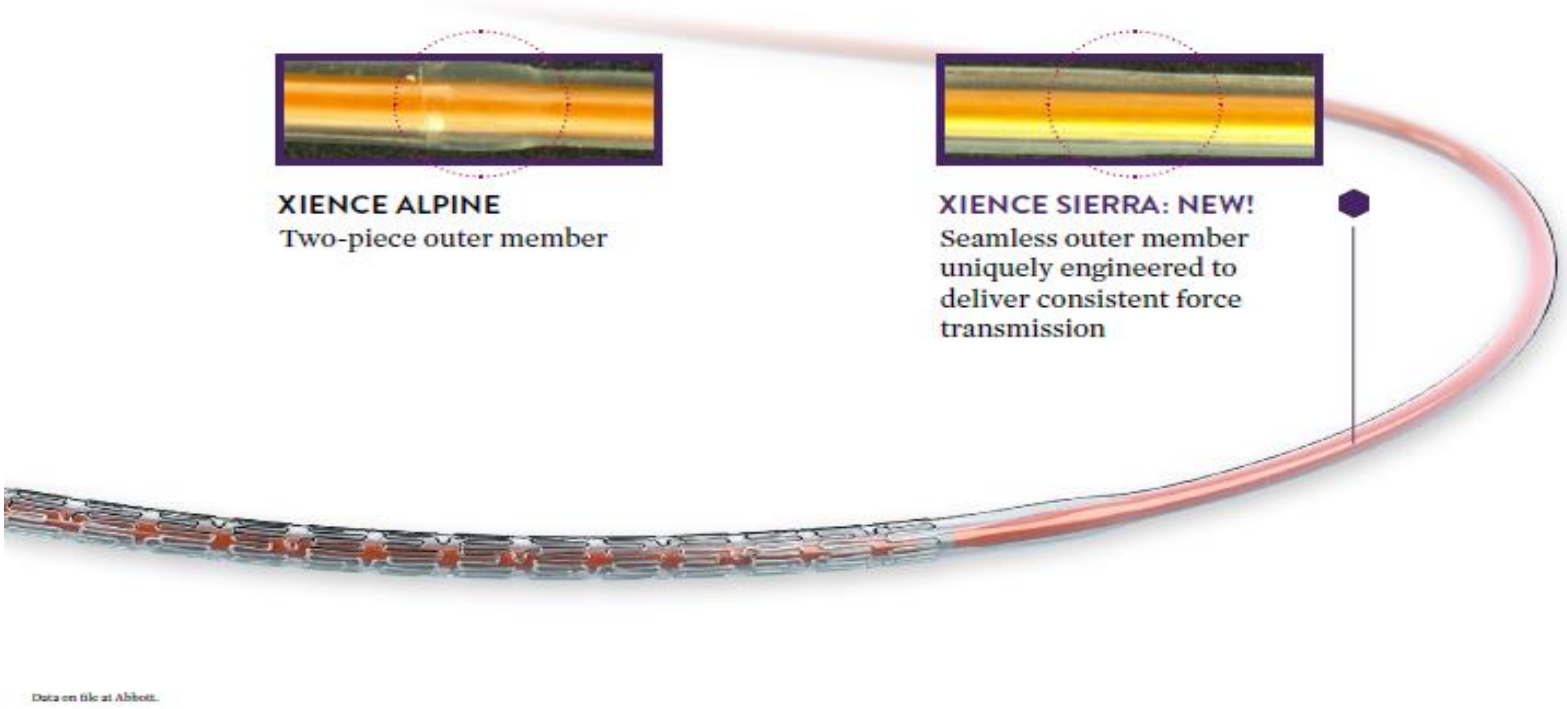
Data on file at Abbott.

Xience Sierra®

3. Catheter

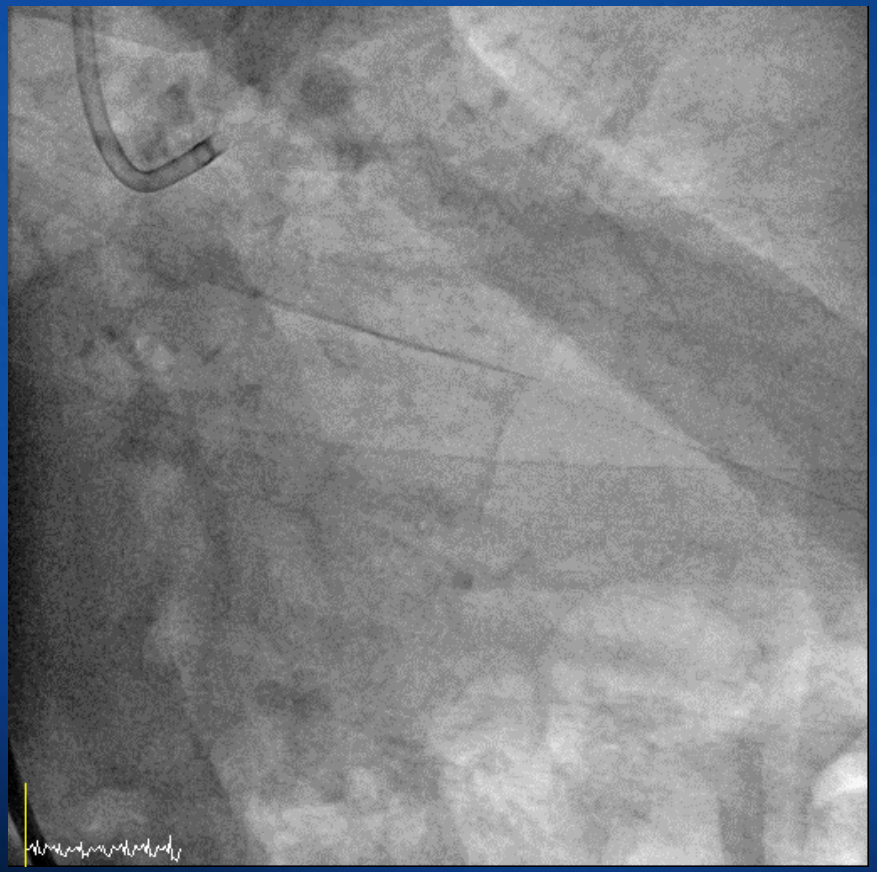
CATHETER TECHNOLOGY

A **single-piece** outer member (→ consistent force transmission) has added pushability and trackability in complex PCI.



Xience Sierra®

Tortuous angulated LCx & diffuse long calcified lesions

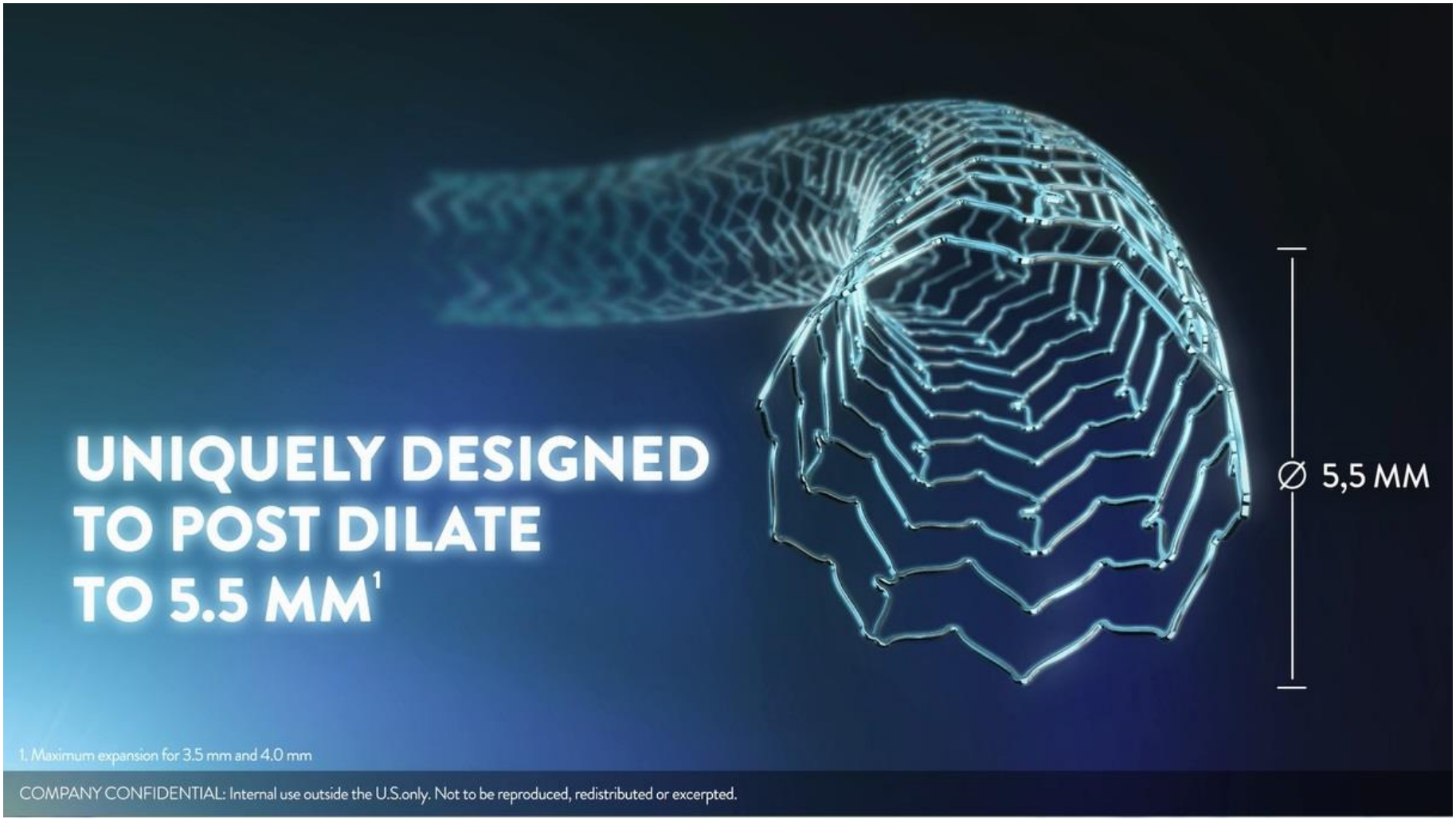


Essential of DES to successful complex PCI?

2. Overcome "Size-discrepancy"

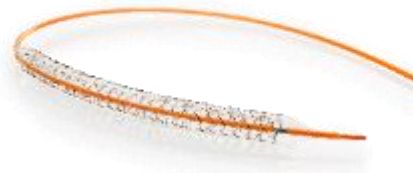
Optimized DES for LM or very long lesions (large & long tapered vessels)

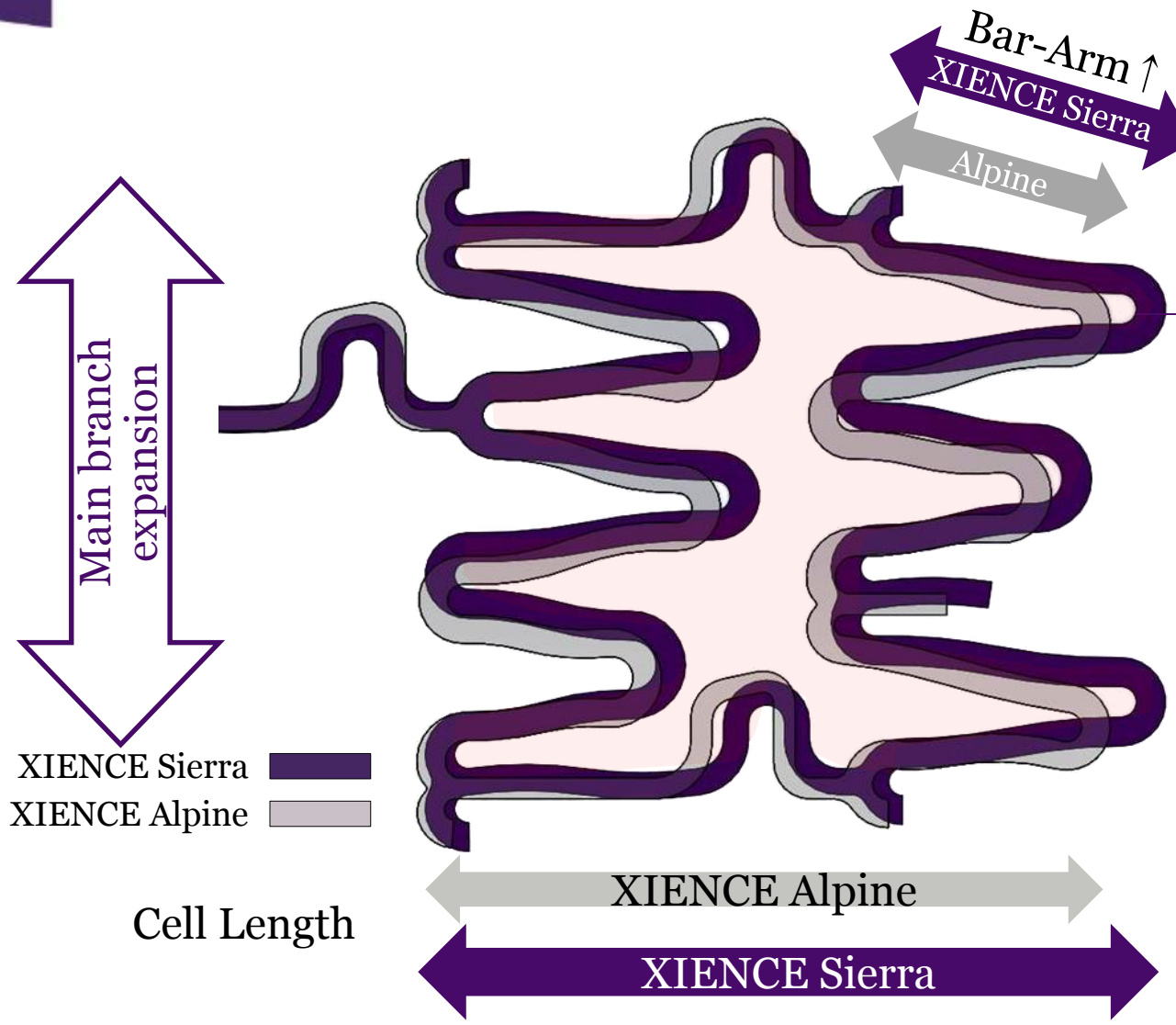
2. MAX EXPANSION LIMIT 5.5MM!



Xience Sierra

STENT DESIGN (9CREST, 3.5~4.0MM) -LARGE EXPANSION DIAMETER





NEW

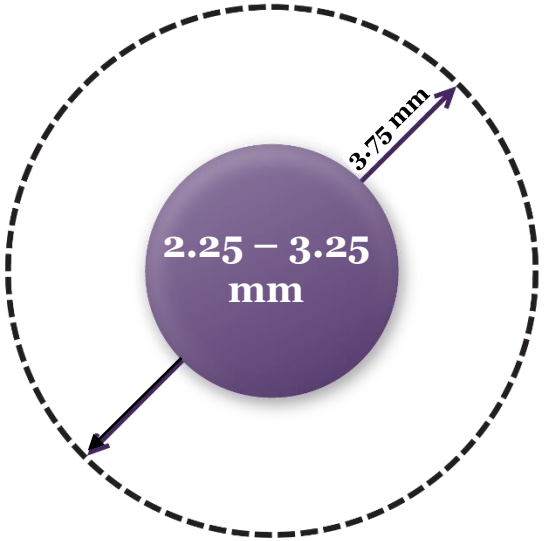
Elongated bar arms

- **Larger expansion range and cell expansion**

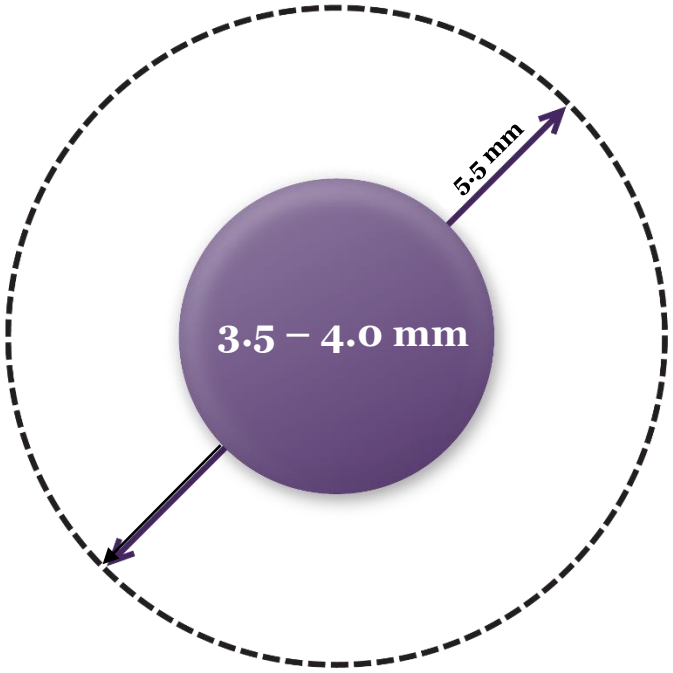
Xience Sierra®

Greater dilation is good.
However, some essential requirements are needed after maximal stent expansion

Sizes: 2.25 – 3.25 → **3.75 mm**



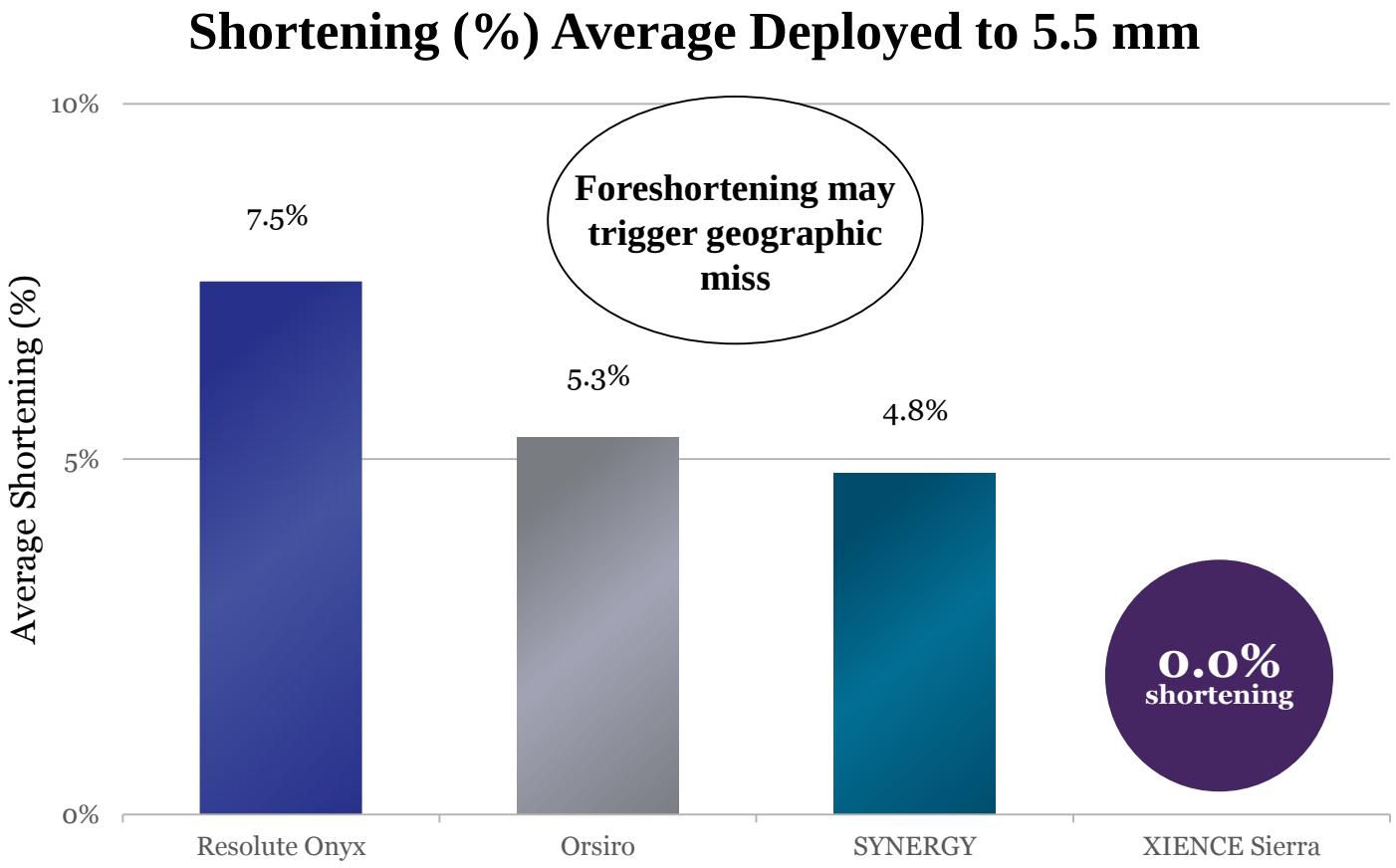
Sizes: 3.5 – 4.0 → **5.5 mm**



Data on file at Abbott. *0% applies to the 4.0x18mm Sierra when post-dilated to 5.5mm

Xience Sierra®

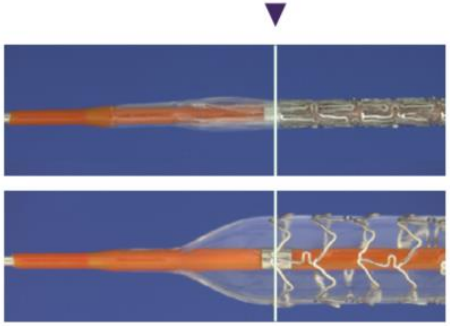
1. Unsurpassed precision in placement with **ZERO shortening** even at max expansion[1]



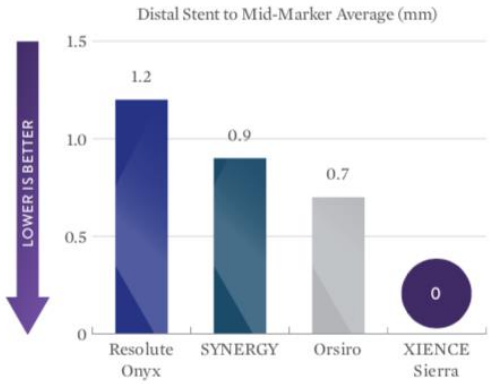
1. Test performed by and data on file at Abbott. XIENCE Sierra Everolimus Eluting Coronary Stent System (4.0 x 18 mm) n=5, SYNERGY Stent System (4.0 x 20 mm) n=5, Resolute Onyx Stent System (4.5 x 18 mm) n=5.

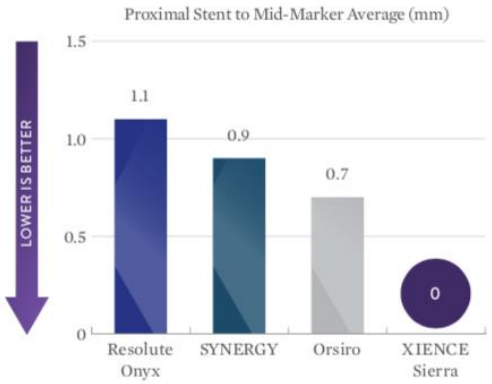
Xience Sierra®

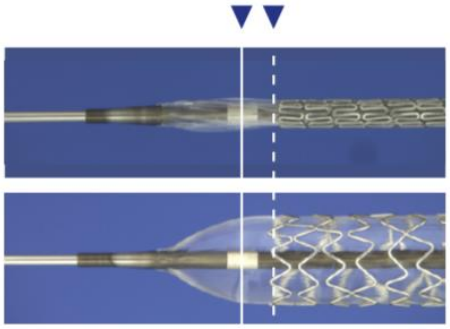
100% accurate mid-marker placement for precise stent placement[1]



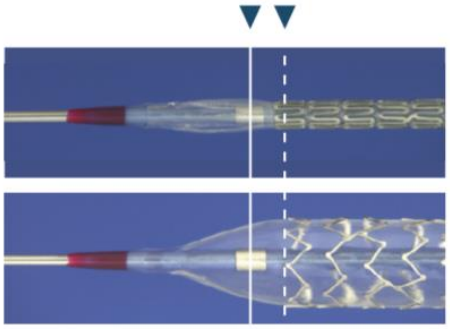
XIENCE Sierra
3.0 x 18 mm



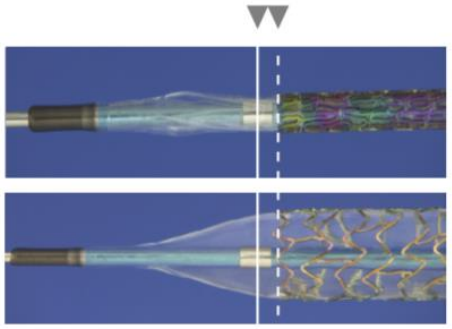




Resolute Onyx
3.0 x 18 mm



SYNERGY
3.0 x 20 mm



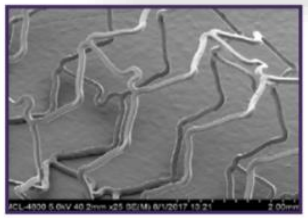
Orsiro
3.0 x 18 mm

1. Data on file at Abbott. XIENCE Sierra Everolimus Eluting Coronary Stent System (3.0 x 18 mm) n=5, SYNERGY Stent System (3.0 x 20 mm) n=5, Resolute Onyx Stent System (3.0 x 18 mm) n=5, Orsiro (3.0 x 18 mm) n=5.

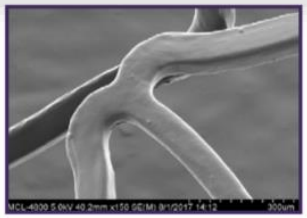
2. Surface coating integrity at max expansion

DELIVER WITH CONFIDENCE

Superior coating integrity even at max expansion[1]

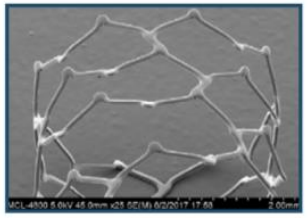


XIENCE Sierra (3.5 x 18 mm)
25x magnification at max expansion of 5.5 mm



XIENCE Sierra (3.5 x 18 mm)
150x magnification at max expansion of 5.5 mm

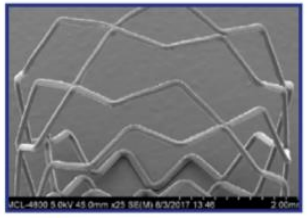
XIENCE Sierra coating remains intact at maximum post-dilatation expansion of 5.5 mm from 3.5 mm



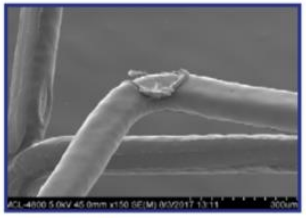
SYNERGY (3.5 x 20 mm)
25x magnification at max expansion of 4.25 mm

SYNERGY (3.5 x 20 mm)
150x magnification at max expansion of 4.25 mm

SYNERGY coating shows multiple cracks with delamination at its max expansion of 4.25 mm from 3.5 mm



Resolute Onyx (3.5 x 18 mm)
25x magnification at max expansion of 4.75 mm

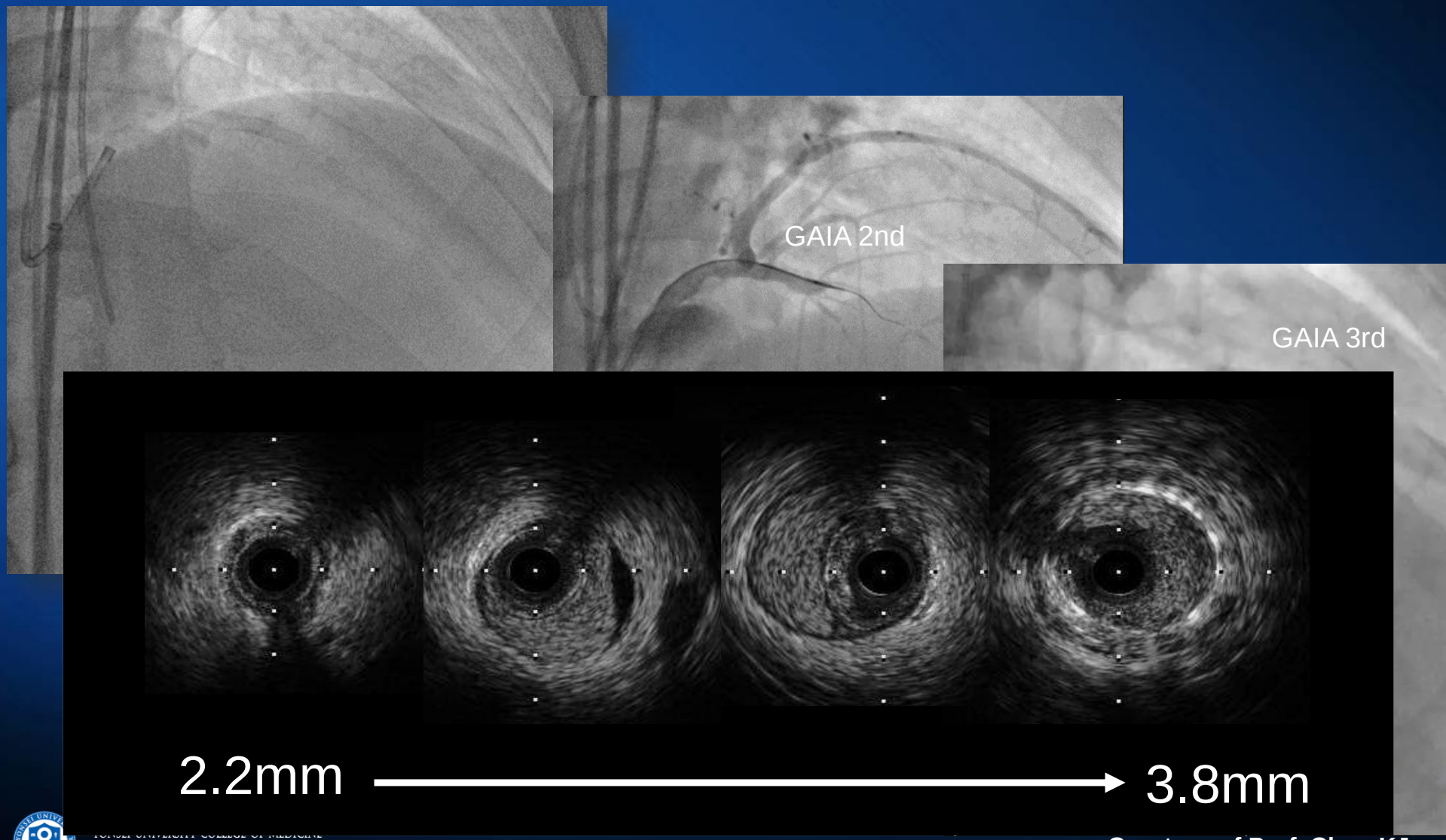


Resolute Onyx (3.5 x 18 mm)
150x magnification at max expansion of 4.75 mm

Resolute Onyx coating peels off and shows exposed metal at its max expansion of 4.75 mm from 3.5 mm

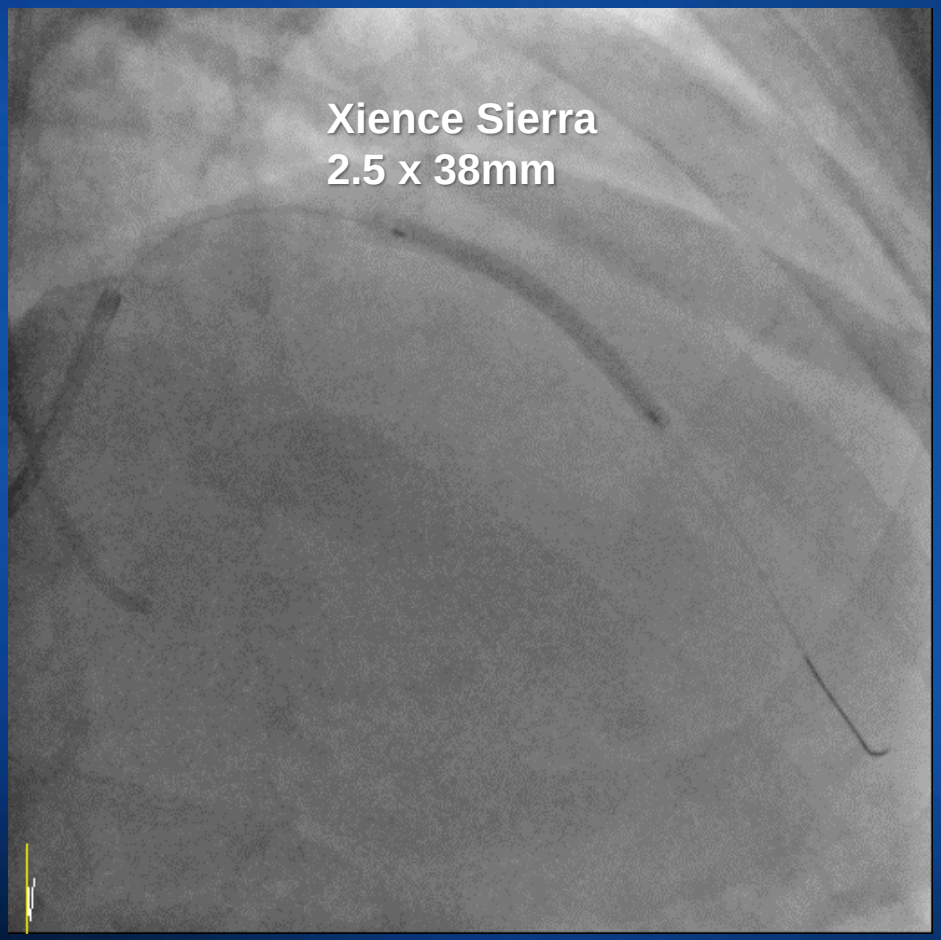
1. Data on file at Abbott.

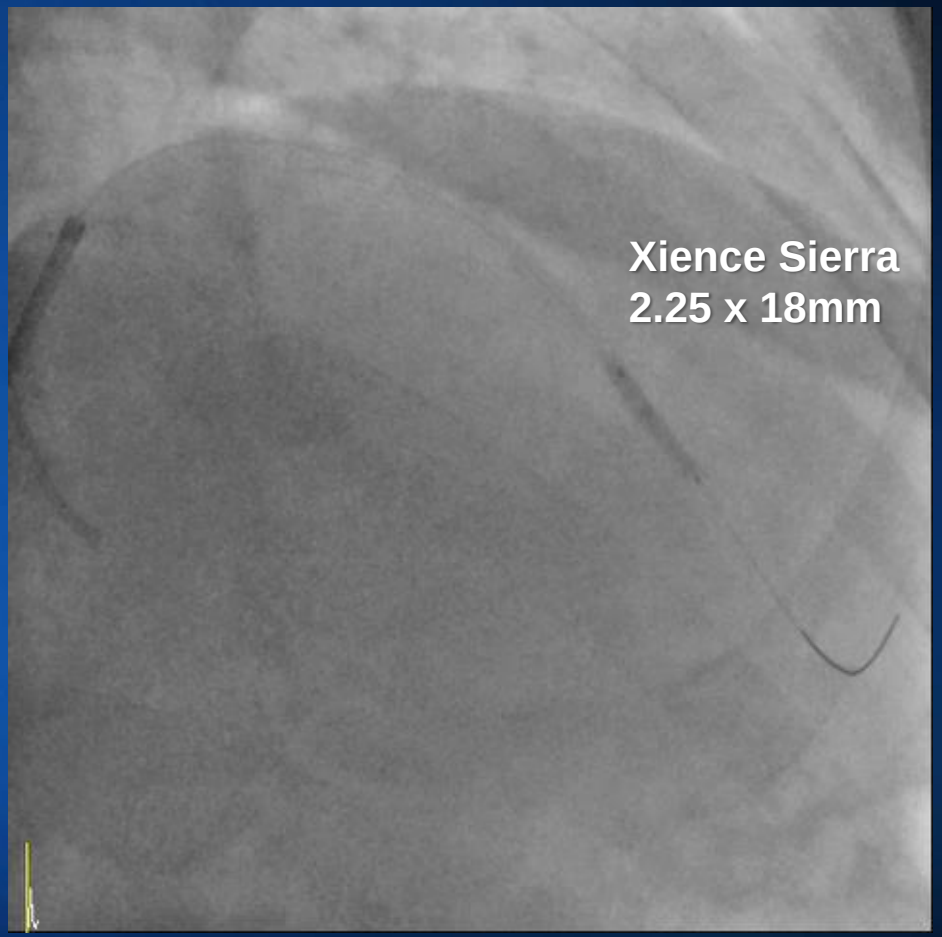
Long stent ISR CTO



Courtesy of Prof. Chun KJ

Relatively small DESs implanted for improving deliverability

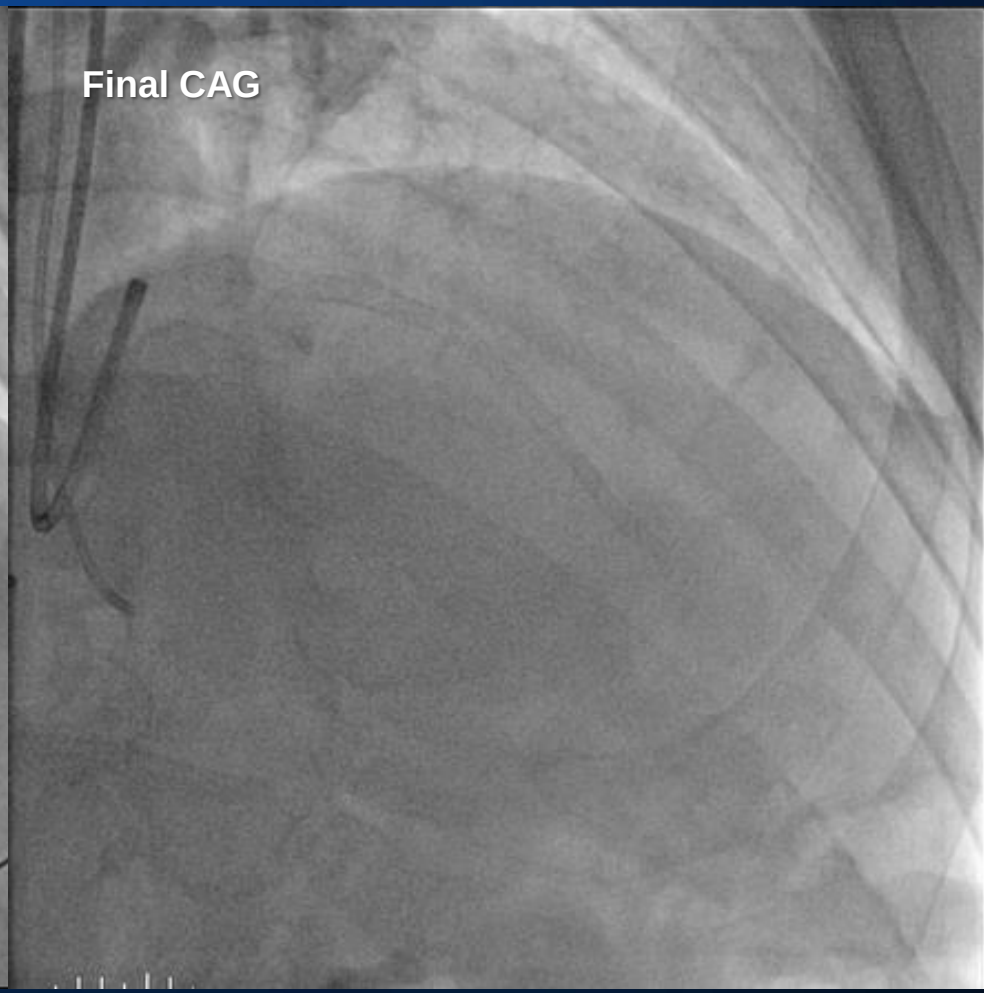




Courtesy of Prof. Chun KJ

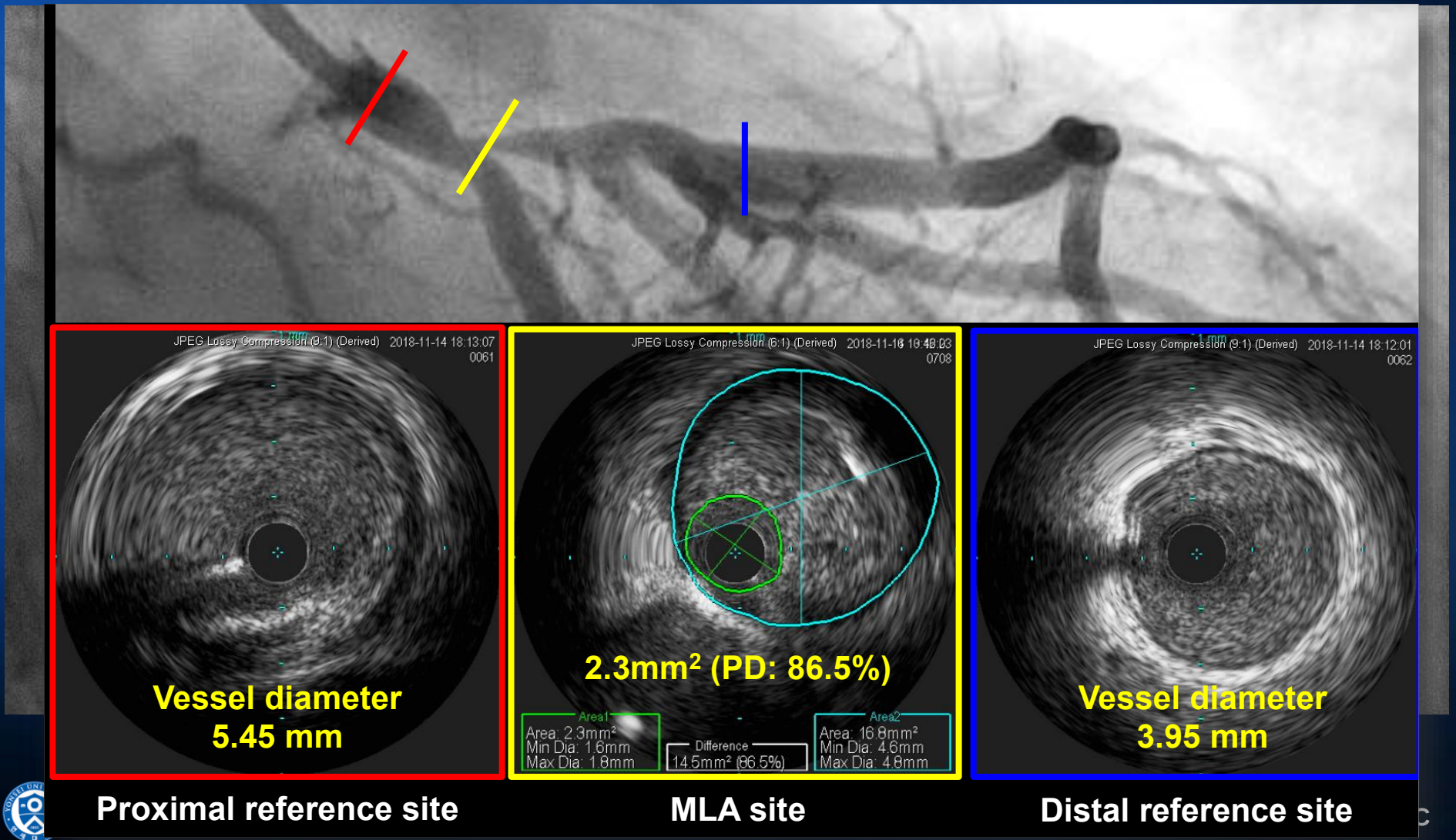
Long tapered LAD lesion with big size difference

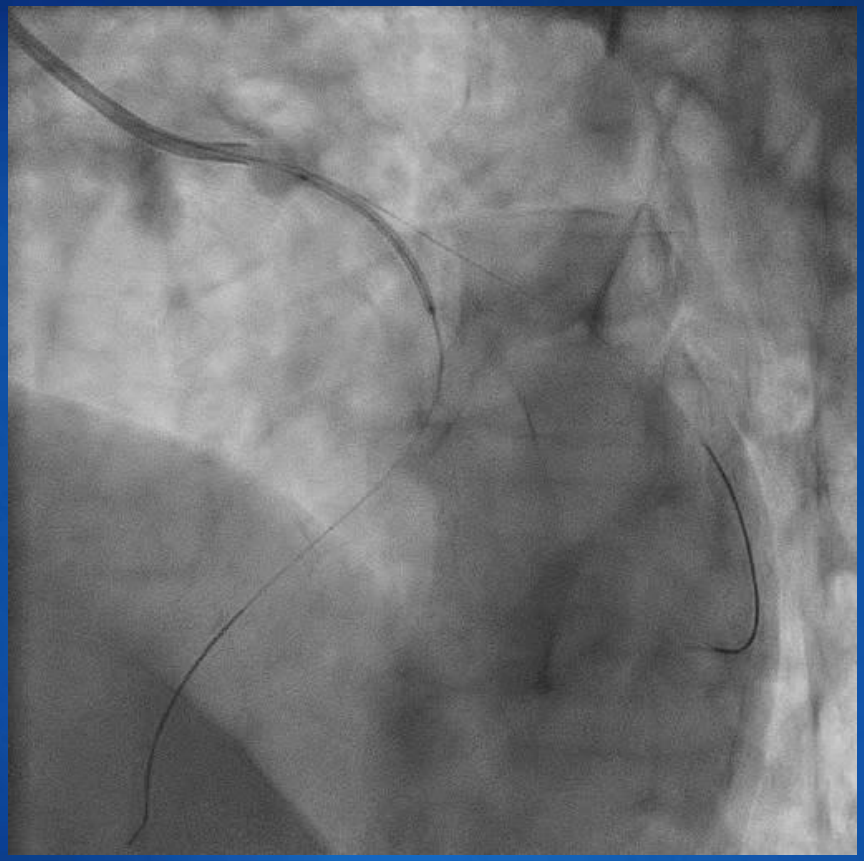
After a small-sized DES implantation, a bigger balloon for post-dilation was chosen to overcome size-discrepancy & obtain stent optimization .



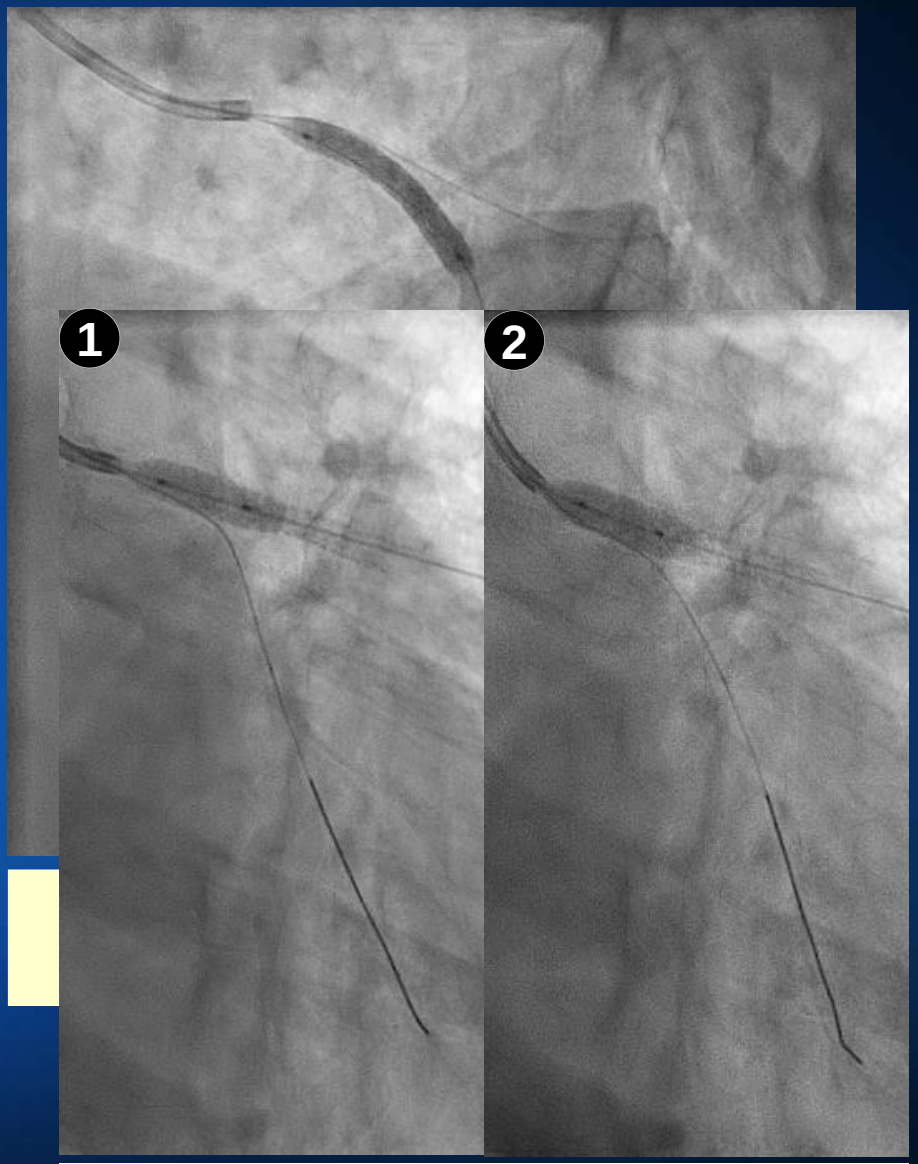
Courtesy of Prof. Chun KJ

True left main bifurcation lesion (MEDINA 1,1,0) extending proximal LAD

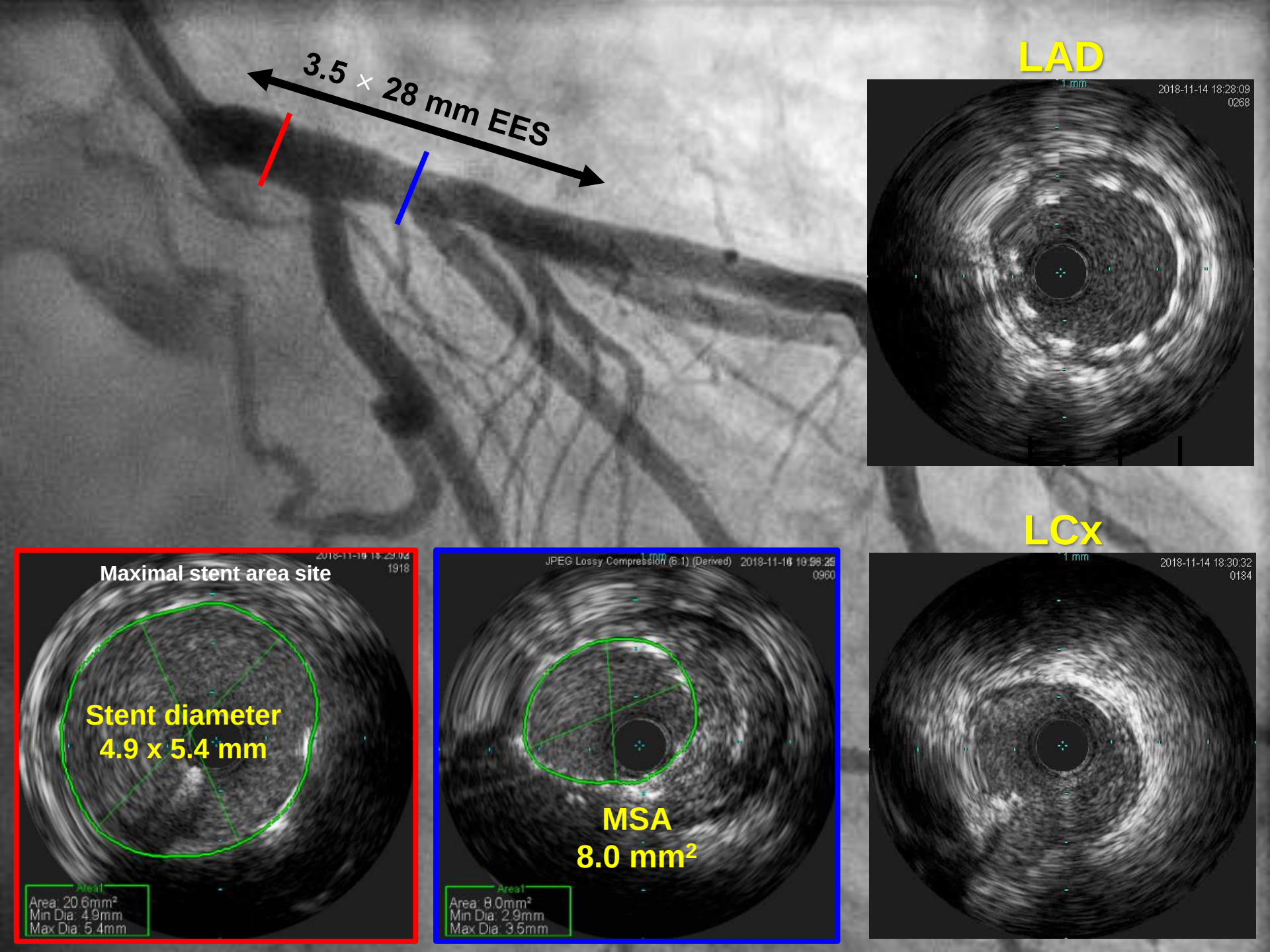




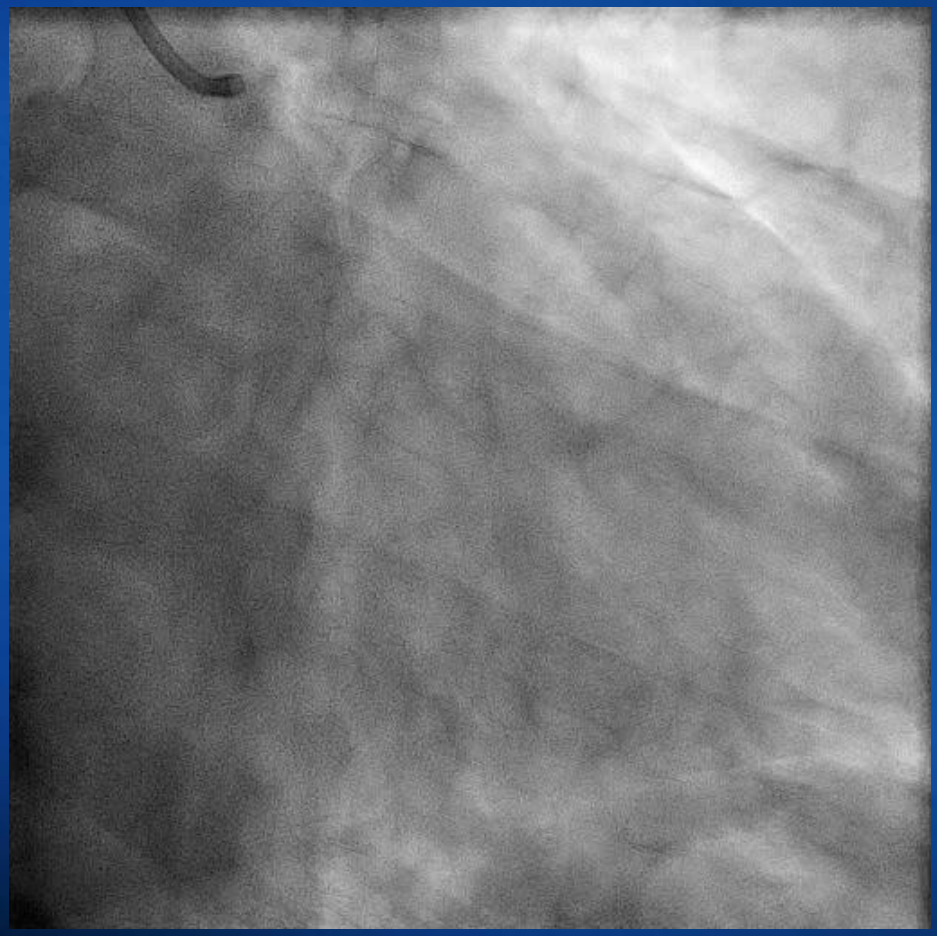
Direct stenting with 3.5 x 28 mm XIENCE Sierra from LM shaft to pLAD

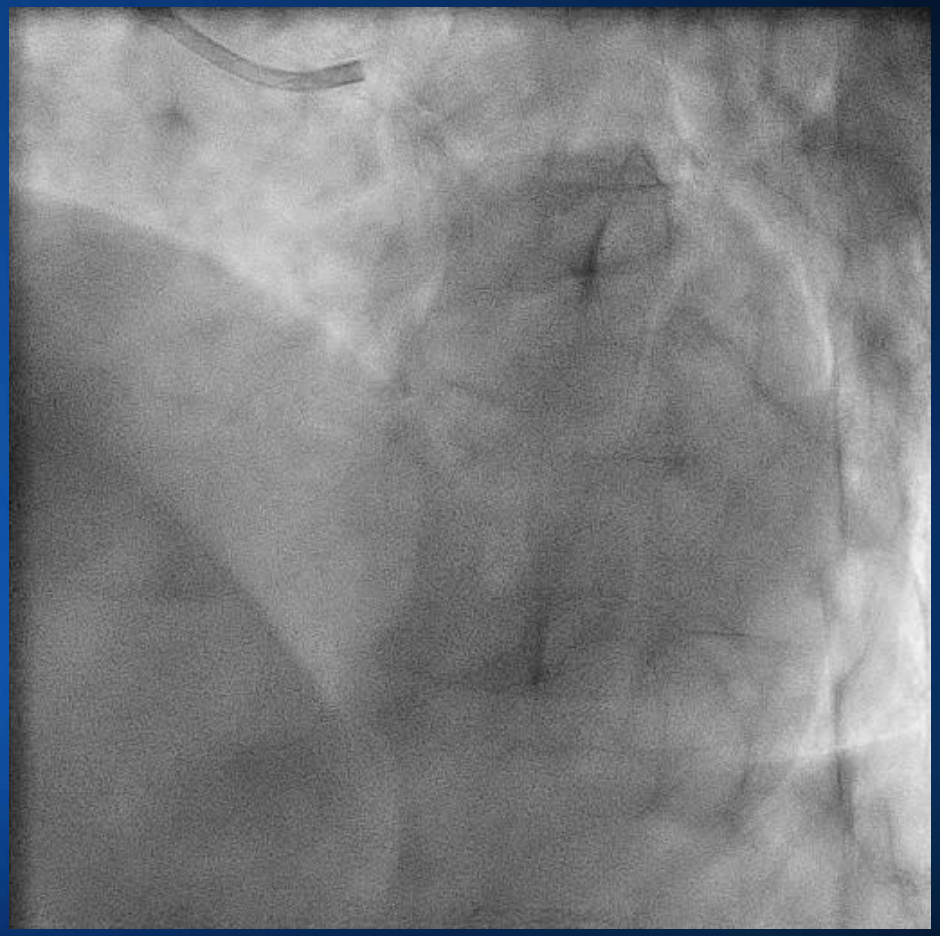


Postdilation with a 5.0 x 12 mm NC balloon after side brance rewiring


3.5 × 28 mm EES
LAD
1 mm
2018-11-14 18:28:09
0268
Maximal stent area site
Stent diameter
4.9 x 5.4 mm
Area: 20.6mm²
Min Dia: 4.9mm
Max Dia: 5.4mm
JPEG Lossy Compression (6:1) (Derived)
MSA
8.0 mm²
Area: 8.0mm²
Min Dia: 2.9mm
Max Dia: 3.5mm
LCx
1 mm
2018-11-14 18:30:32
0184

Successful IVUS-guided stent optimization via left snuffbox approach



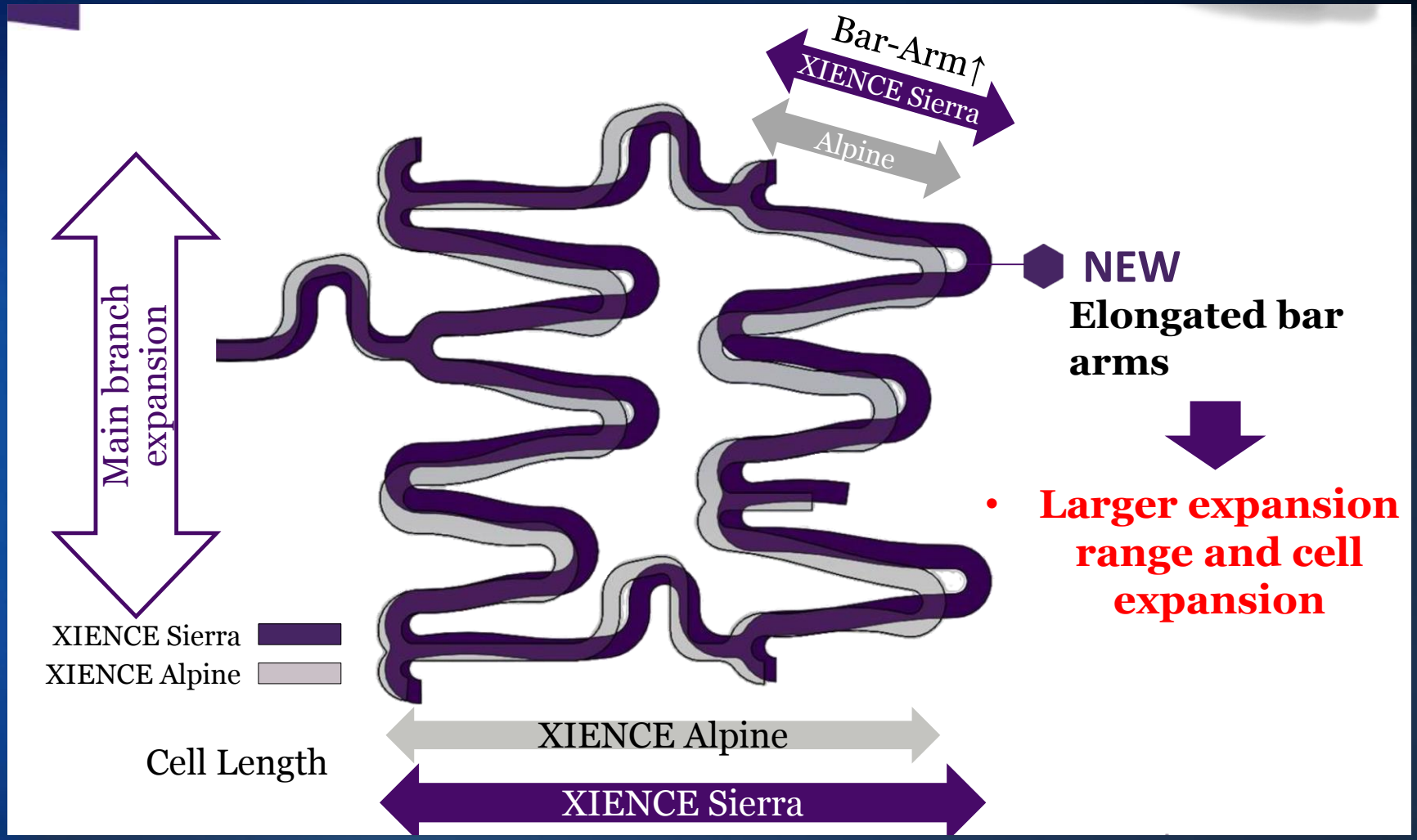


Final CAG

Courtesy of Prof. Kim YC

Essential of DES to successful complex PCI?

3. Easy rewiring & access to side branch after stenting in bifurcation lesions

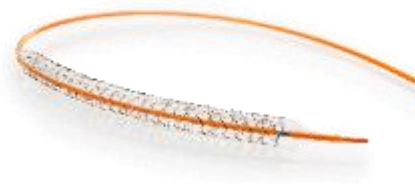


Unique stent design of Sierra

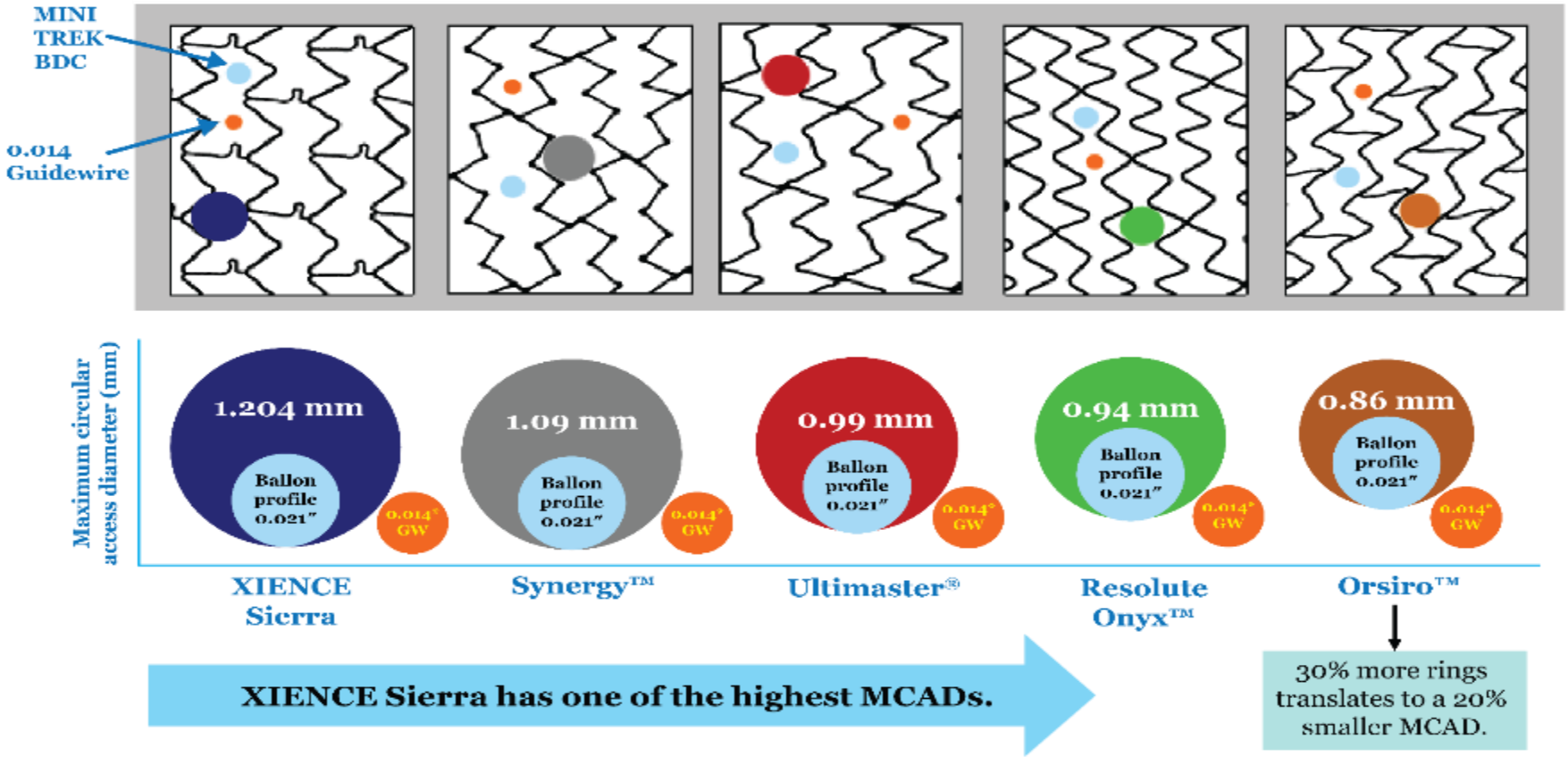
→ **Easy access for side branch**

→ **Optimized stents for various bifurcation techniques**

SIDE BRANCH ACCESS

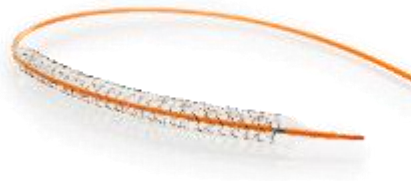


High MCAD (Maximum circular Access diameter) of XIENCE Sierra provides better side branch access

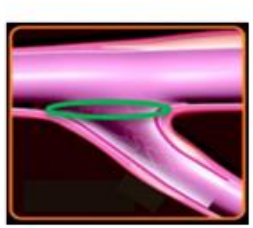


Xience Sierra®

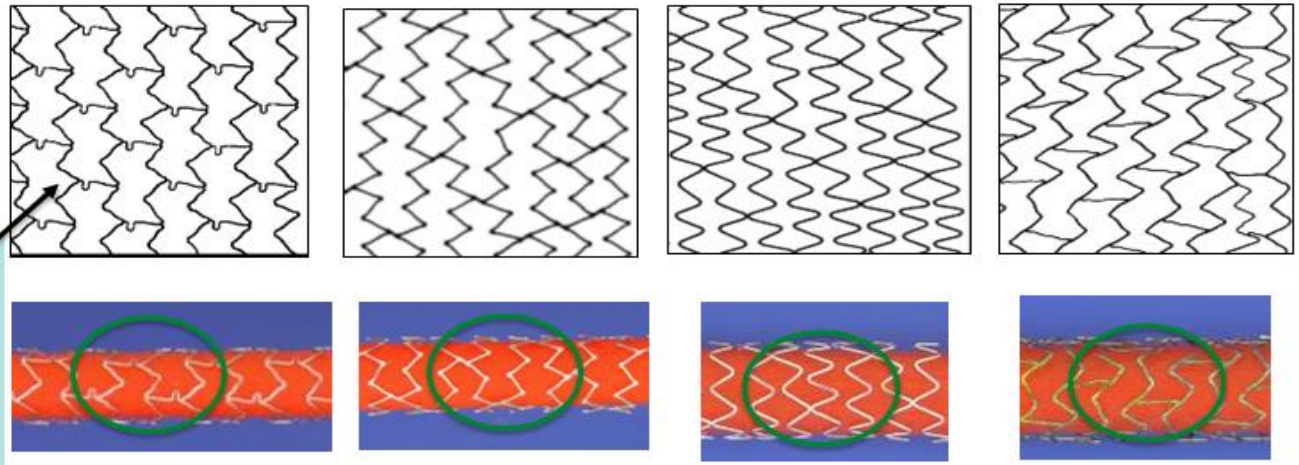
MATAL-TO-ARTERY RATIO



XIENCE sierra has a smaller metal-to–artery ratio, allowing better side branch access



Maximal spacing between rings and least amount of metal in the vessel for minimal occlusion of SB



Metal-to-artery ratio (Probability of GW crossing=100-[metal-to-artery] ratio)	XIENCE (Peak-to-valley) 10.4%	Synergy (Peak-to-peak offset) 14.0%	Resolute Onyx™ (Peak-to-peak) 14.52%	Orsiro™ (Mid-strut link) 12.28%

More rings translates to higher M/A ratio.

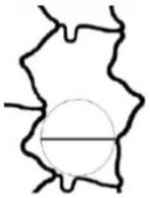
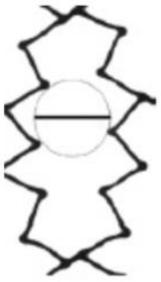
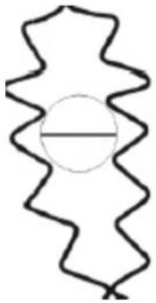
SB: Side branch; GW: Guidewire; M/A ratio: Metal-to-artery ratio.
Data on file at Abbott. Photos on file at Abbott.

Xience Sierra®

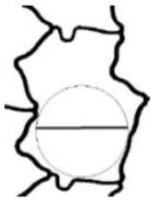
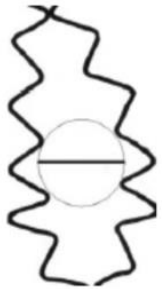
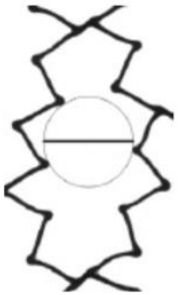
Xience Sierra
DELIVER WITH CONFIDENCE

Superior side branch accessibility with workhorse diameter (3 mm): ideal to treat bifurcation

3.0 mm XIENCE Sierra tested highest in side branch accessibility for 2.5 mm side branch opening

	XIENCE Sierra	SYNERGY	Resolute Onyx
	1.67 mm[1]	1.46 mm	1.45 mm
1. Open up 3.0 mm stent's side branch with a 2.5 mm dilatation balloon			
2. Measure the maximum circular side branch area diameter			

3.0 mm XIENCE Sierra tested highest in side branch accessibility for 3.0 mm side branch opening

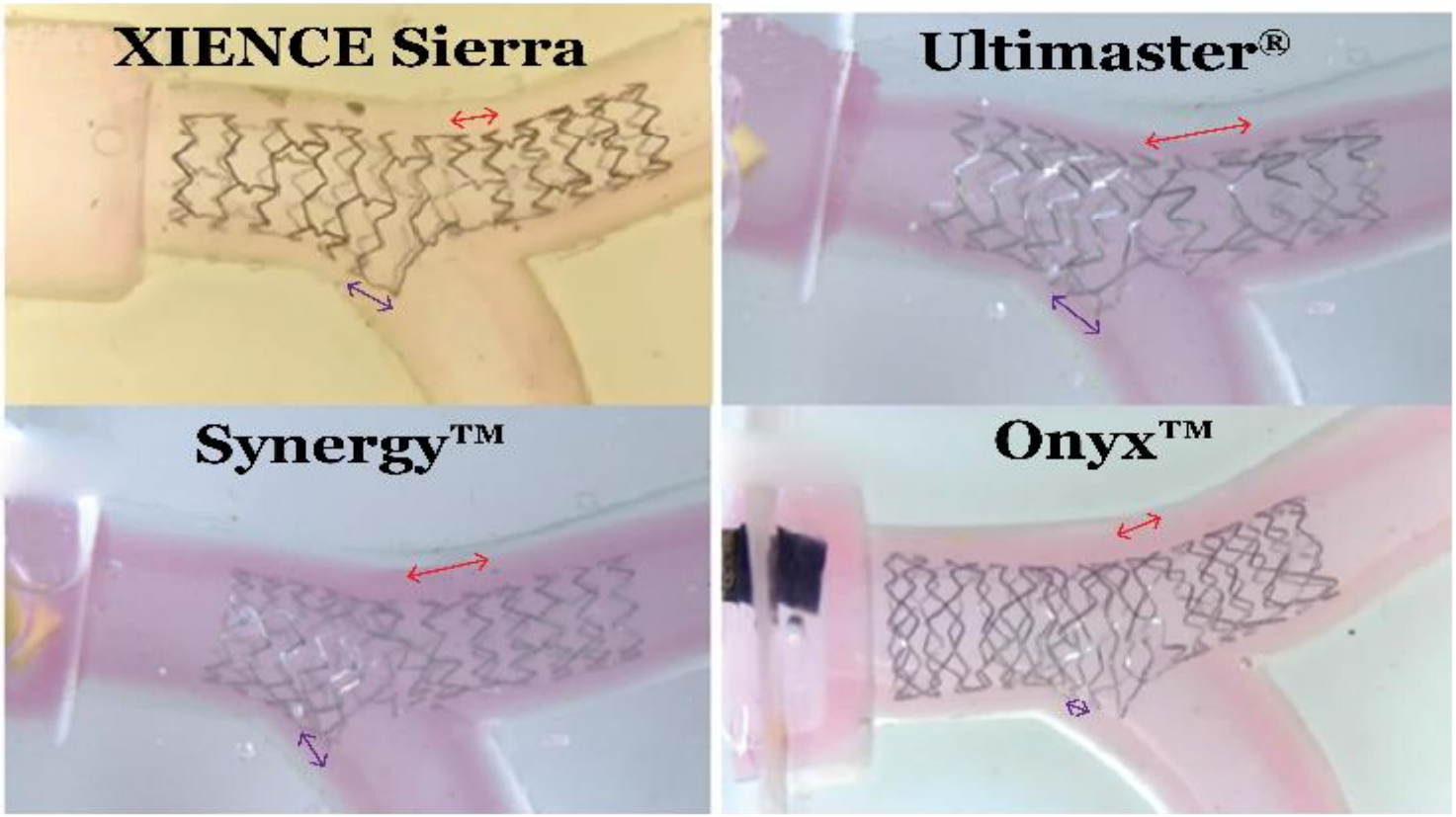
	XIENCE Sierra	Resolute Onyx	SYNERGY
	2.04 mm[1]	1.64 mm	1.62 mm
1. Open up 3.0 mm stent's side branch with a 3.0 mm dilatation balloon			
2. Measure the maximum circular side branch area diameter			

1. Tests performed by and data on file at Abbott. XIENCE Sierra Everolimus Eluting Coronary Stent System (3.0 x 18 mm) n=5, SYNERGY Stent System (3.0 x 20 mm) n=5, Resolute Onyx Stent System (3.0 x 18 mm) n=5.

SIDE BRANCH ACCESS

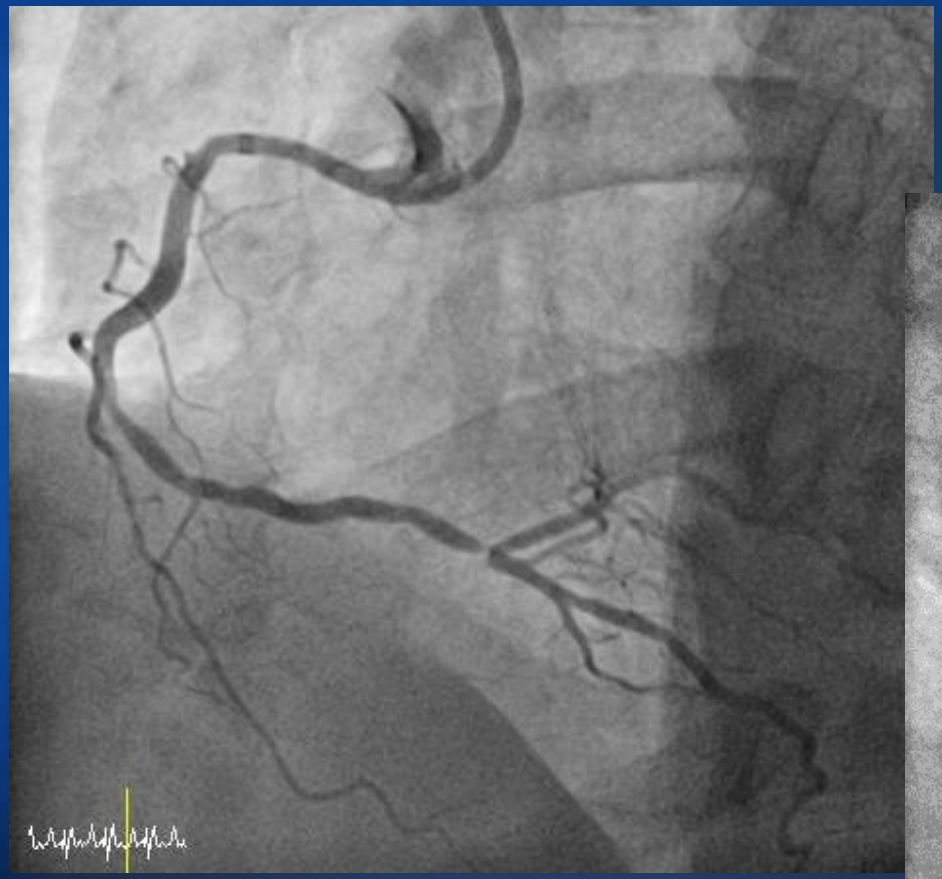
The 3 link design of XIENCE Sierra assures better scaffolding and lesser stent deformation

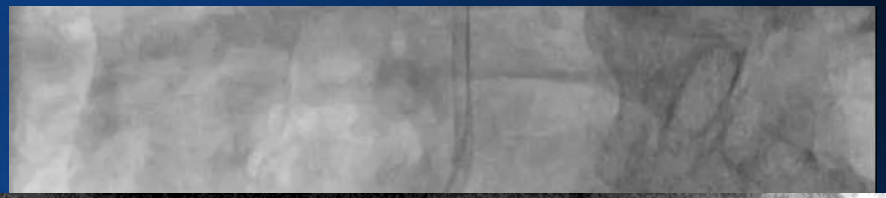
Lesser MB stent deformation with 3-link

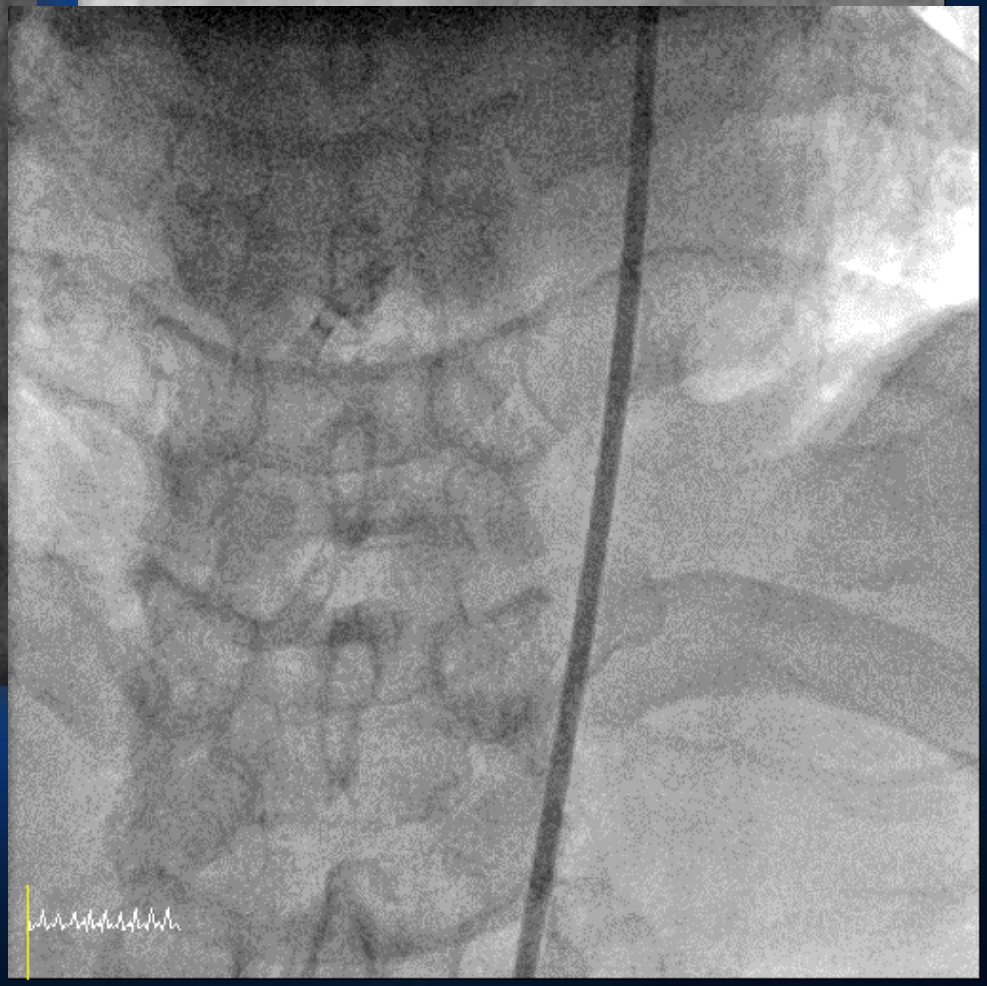


Xience Sierra®

RCA bifurcation





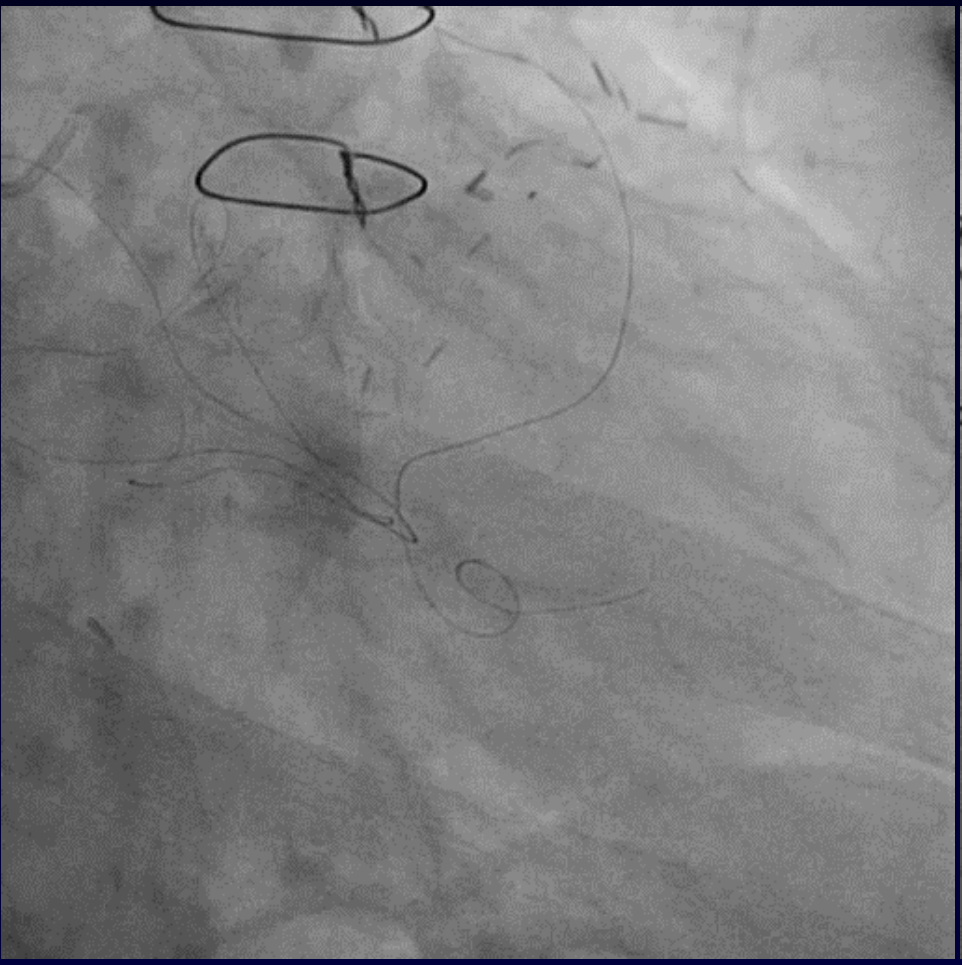


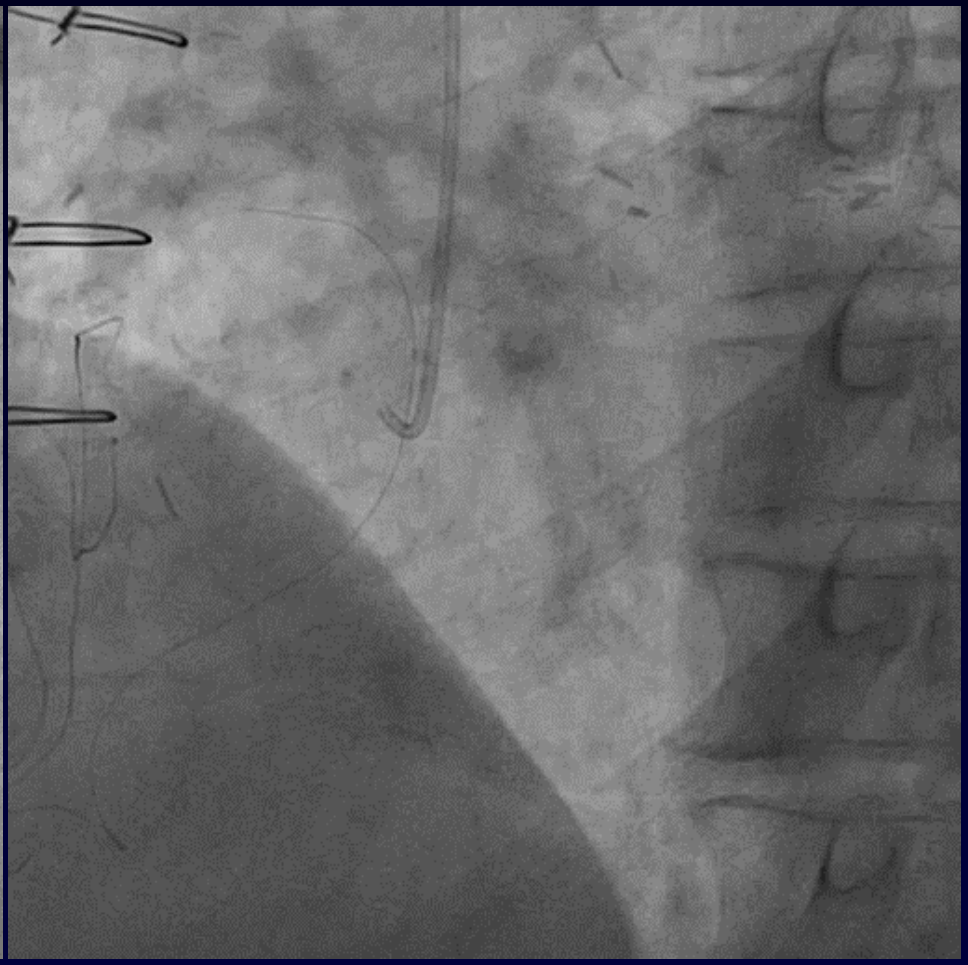
Workhorse DESs for complex lesions

- M / 77
- Diagnosis, Stable angina, s/p CABG due to 3VD
- PHx
  - Stable angina
  - CABG due to 3-vessel diseases (2001-6-13)

  5 grafts (1. LIMA – dLAD, 2.3. Ao - dRCA, PL br. c SVG, 4.5. Ao - Dg, OM br c SVG
- MIBI : Moderate sized, moderate degree, partial reversibility in the anterior wall

Coronary angiography (2019-03-27)

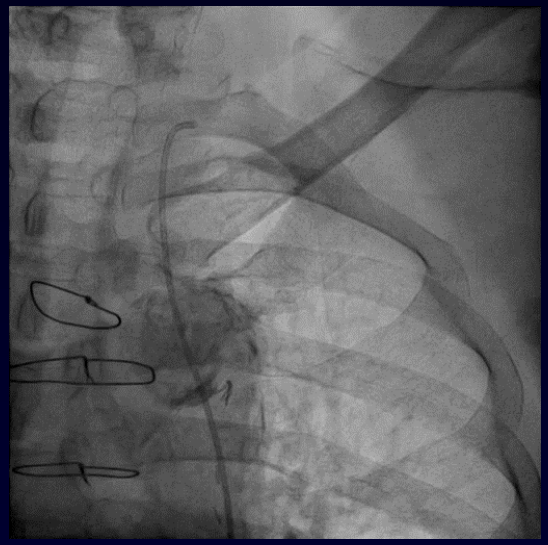




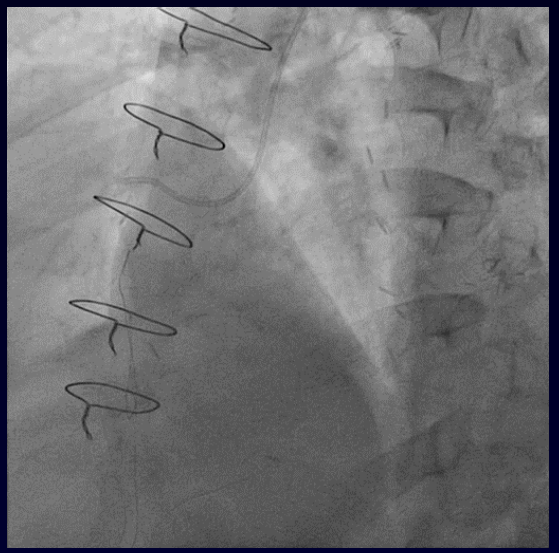
- CTO of p-LAD c severe calcification & fighting flow
- CTO of d-LCX c bridging collateral

- CTO of pRCA

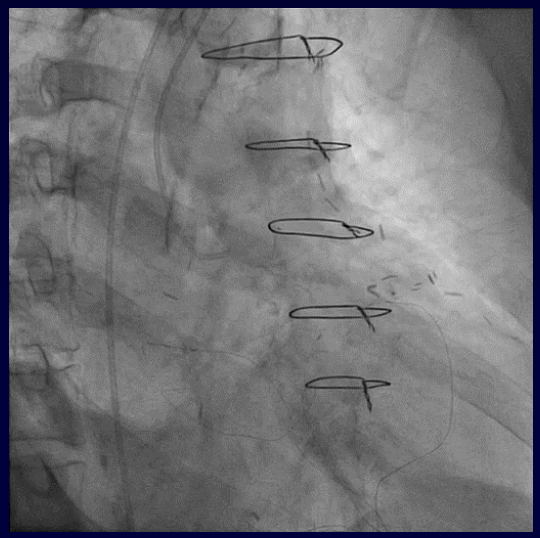
Graft angiography (2019-03-27)

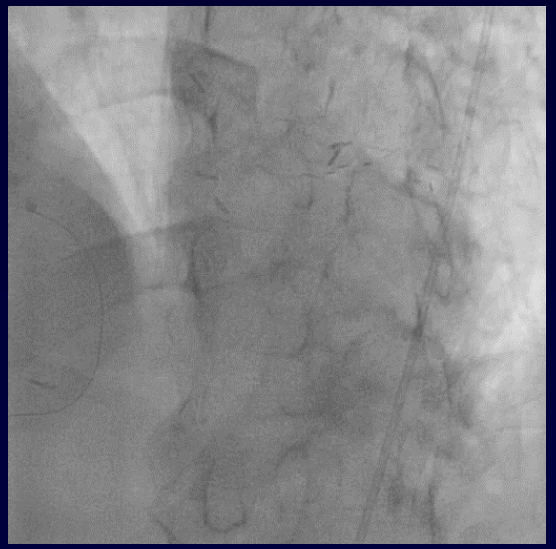


- Total occlusion of LIMA to d-LAD



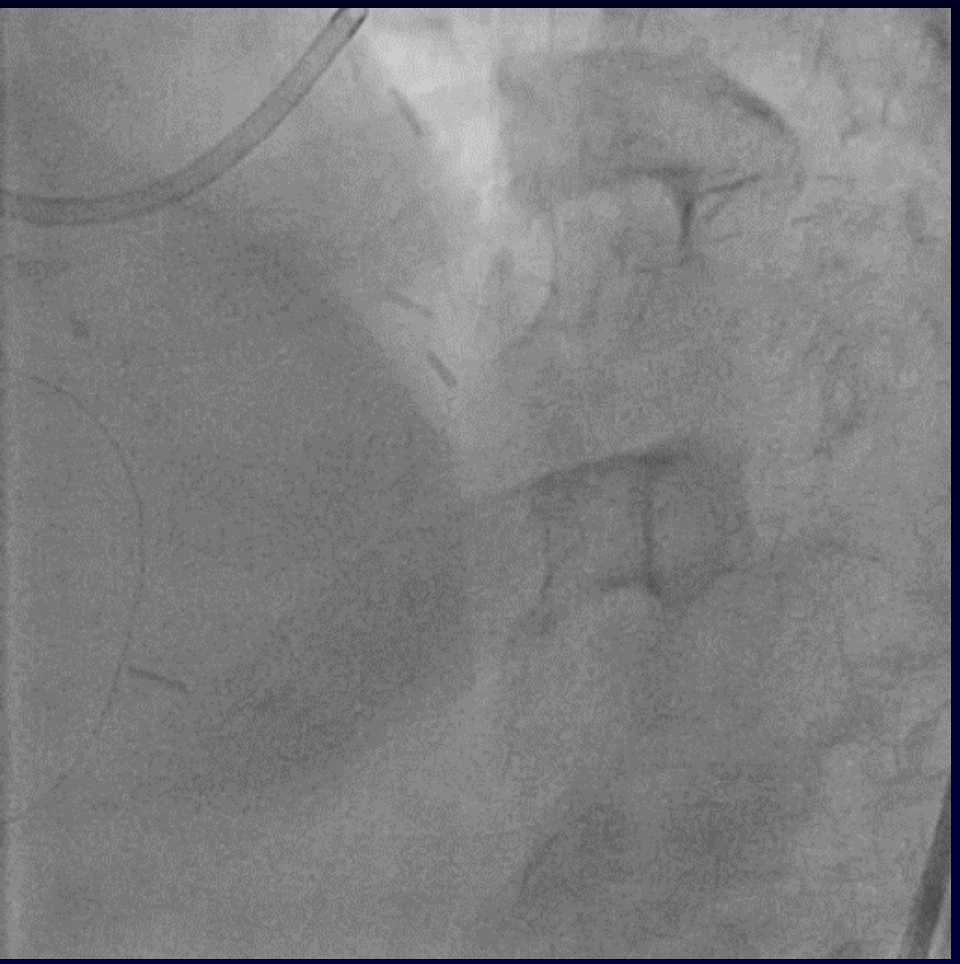
- Patent aorta to d-RCA to PL br. c SVG

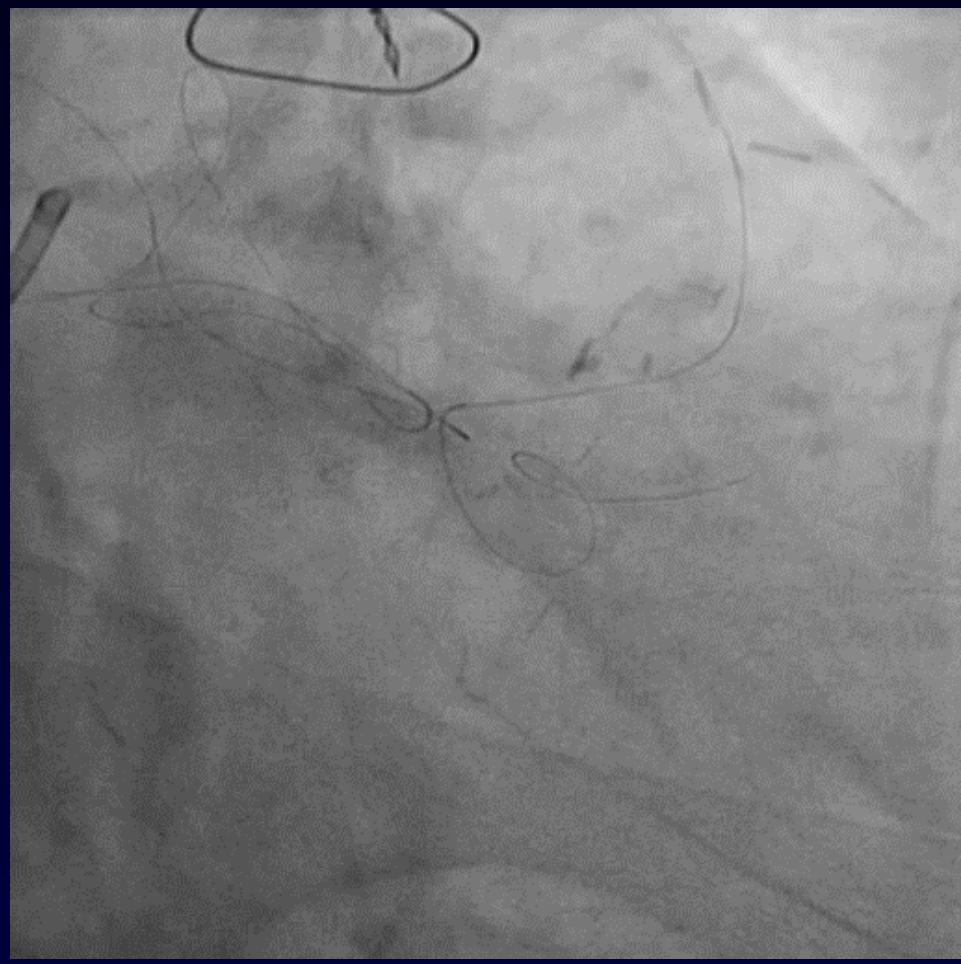




- Patent aorta to DG to OM c SVG

PCI of de-novo LAD-CTO



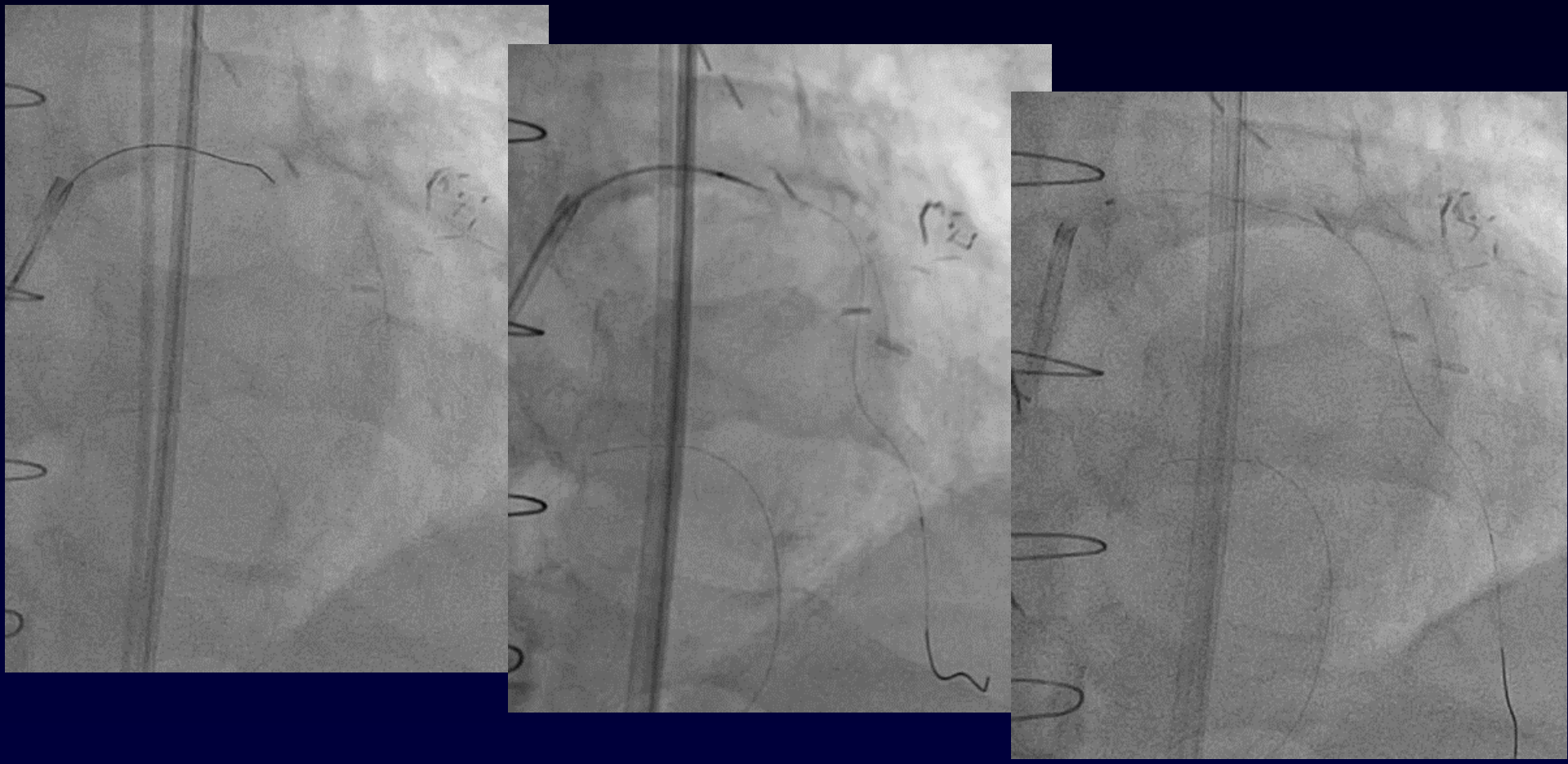


Nearly connected with de-novo LAD lesion, ***"Functional LAD CTO"***

- Lt guiding : XB3.5 7-Fr
- Contralateral Graft angiography – diagnostic catheter

1. *Wiring*

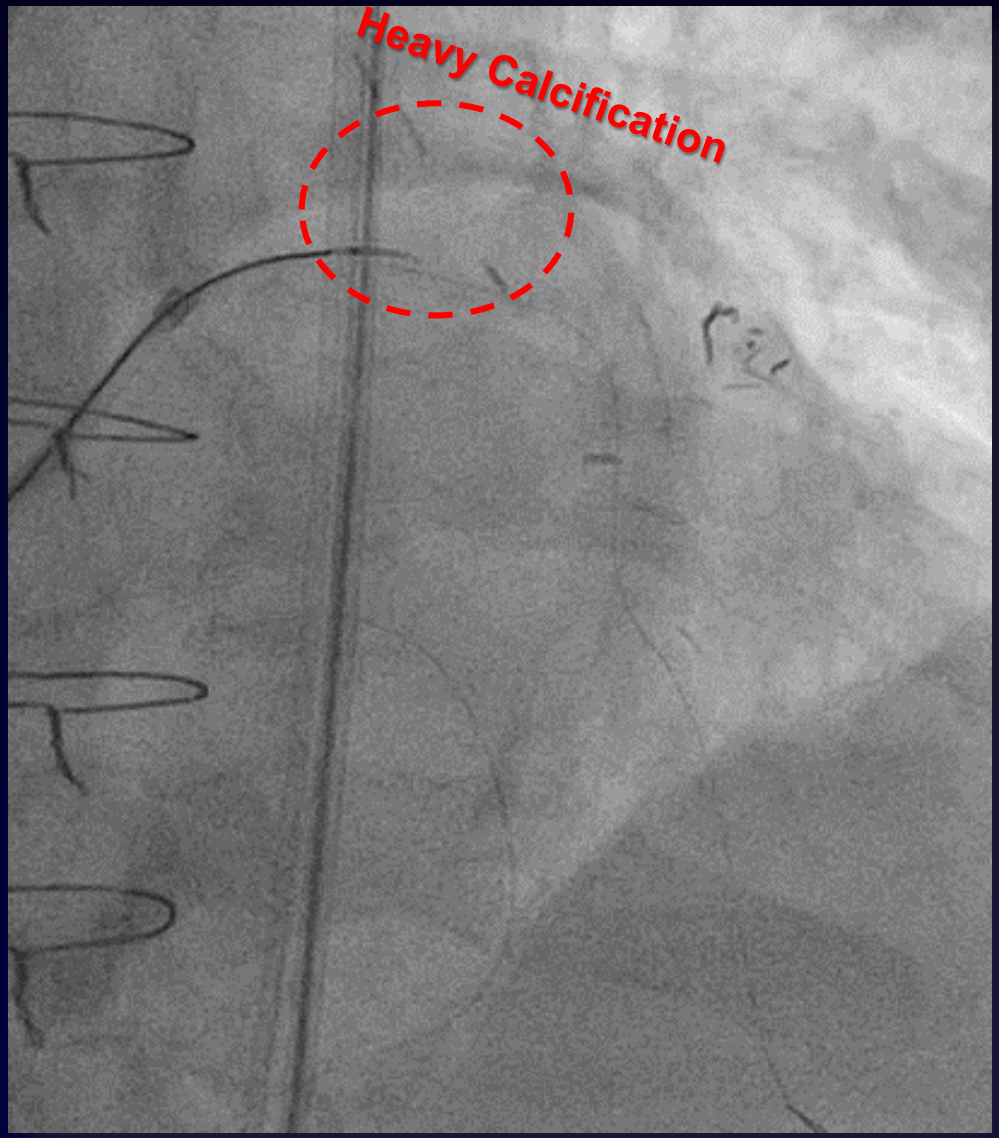
Successful wiring by using soft wire (Pilot®)



However, **Corsair, 1.25-sized balloon & Caravel crossing failed** …

Wire-cracking

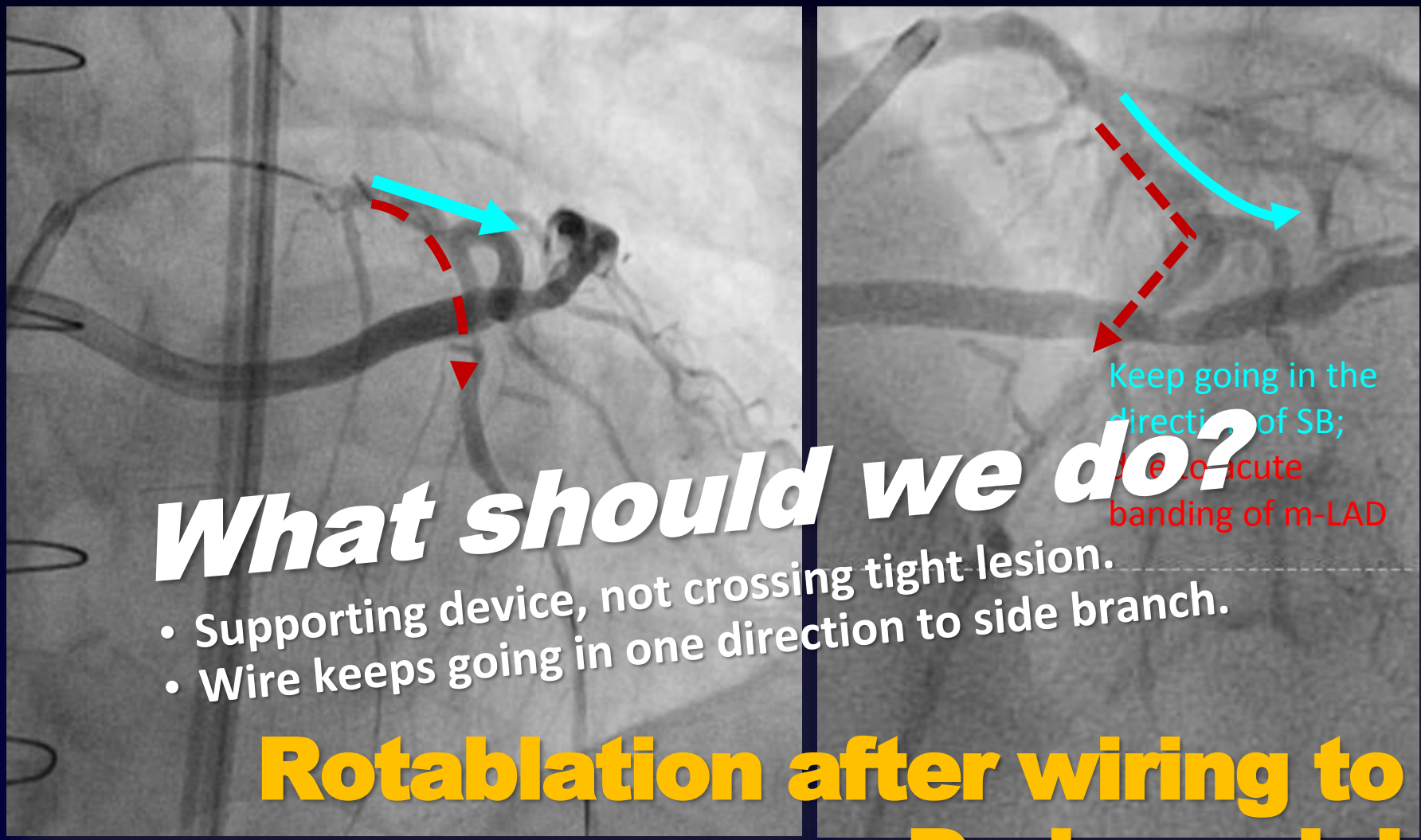
- Additional wires crossing failed …



- Corsair + pilot → Miracle 3 → Miracle 6 → pass failed.
- Caravel + Pilot → miracle 6 → pass failed.

2. Rotablation; *Direct Rota-wire crossing?*

… crossed p-LAD lesion but not to tortuous d-LAD, only to Dx branch.

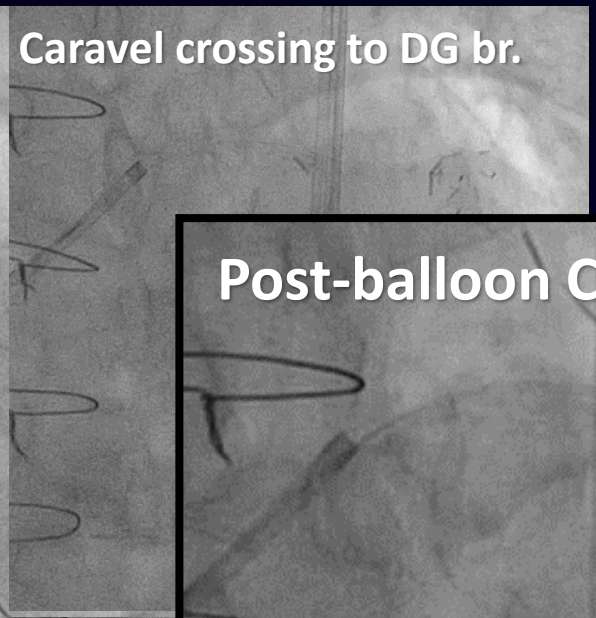


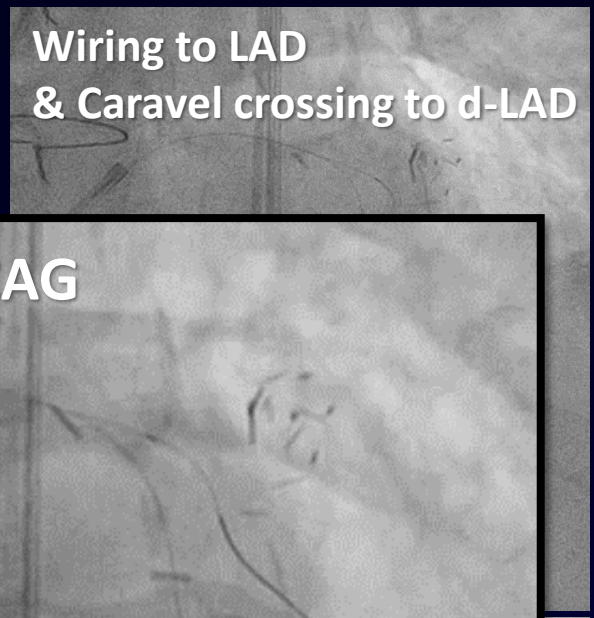
What should we do?

- Supporting device, not crossing tight lesion.
- Wire keeps going in one direction to side branch.

Rotablation after wiring to Dx branch !

Rotablation of LAD after wiring to Dx branch (1.25 burr)





We need the **"Easy stents"**, to be easily delivered and expanded.

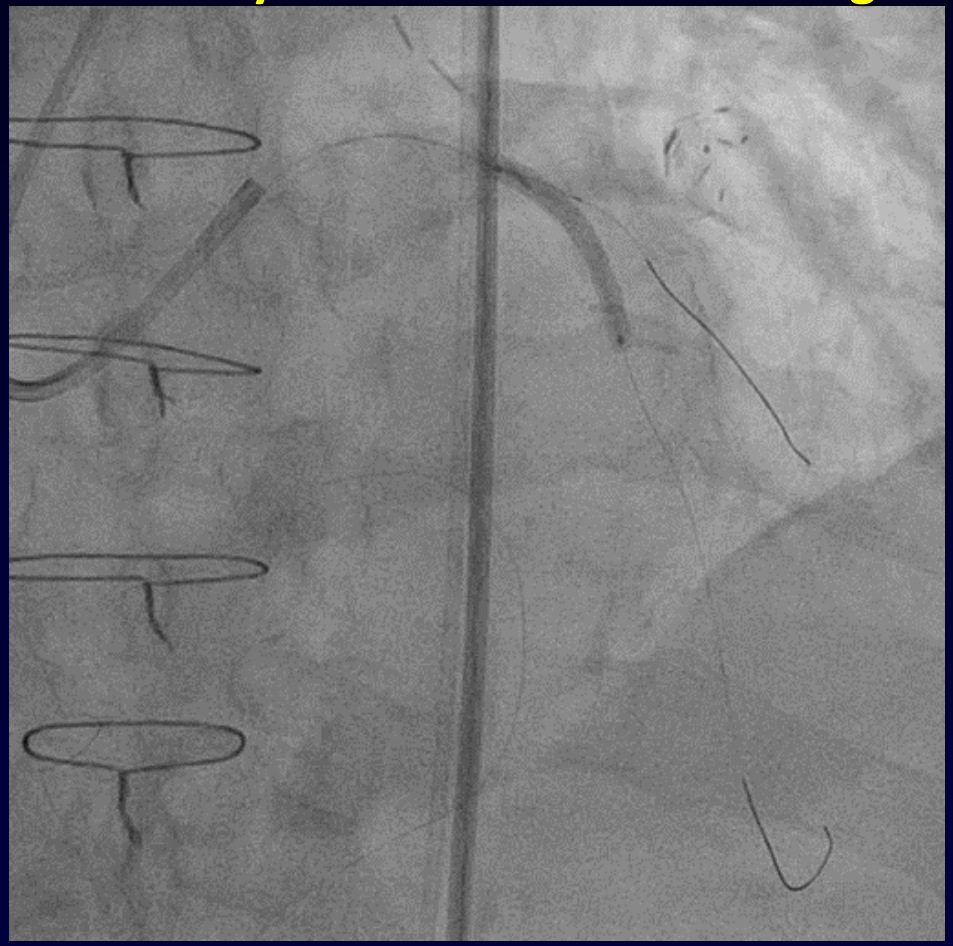
All members including operator were fully exhausted … could not afford to do other things.

3. Stenting

Successful 2 Xience Sierra stents overlapping

→ Easy delivery & good expansion

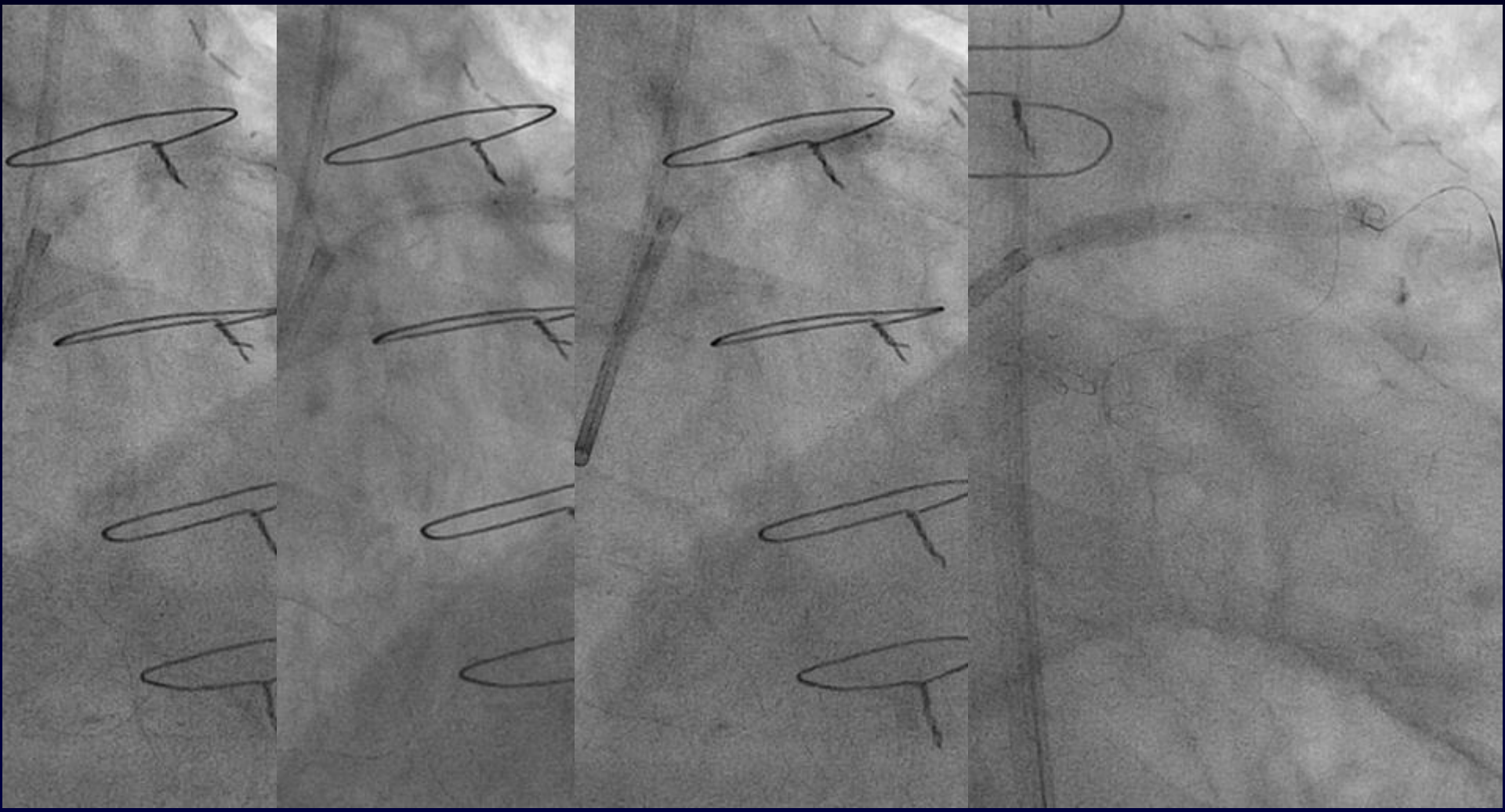
→ Easy size selection considering vessel size discrepancy



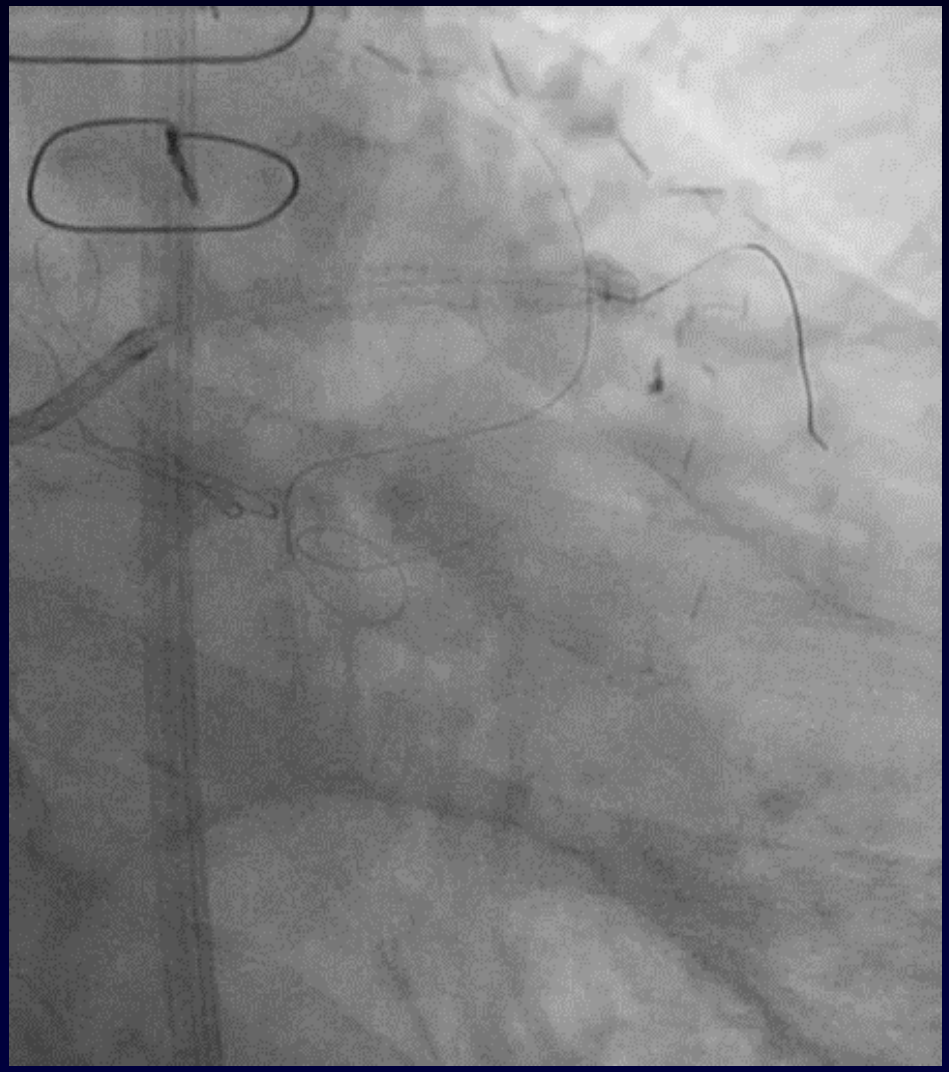
- m-LAD stent (Sierra 3.0 x 28mm)
- p-LAD stent (Sierra 3.5 x 23mm)

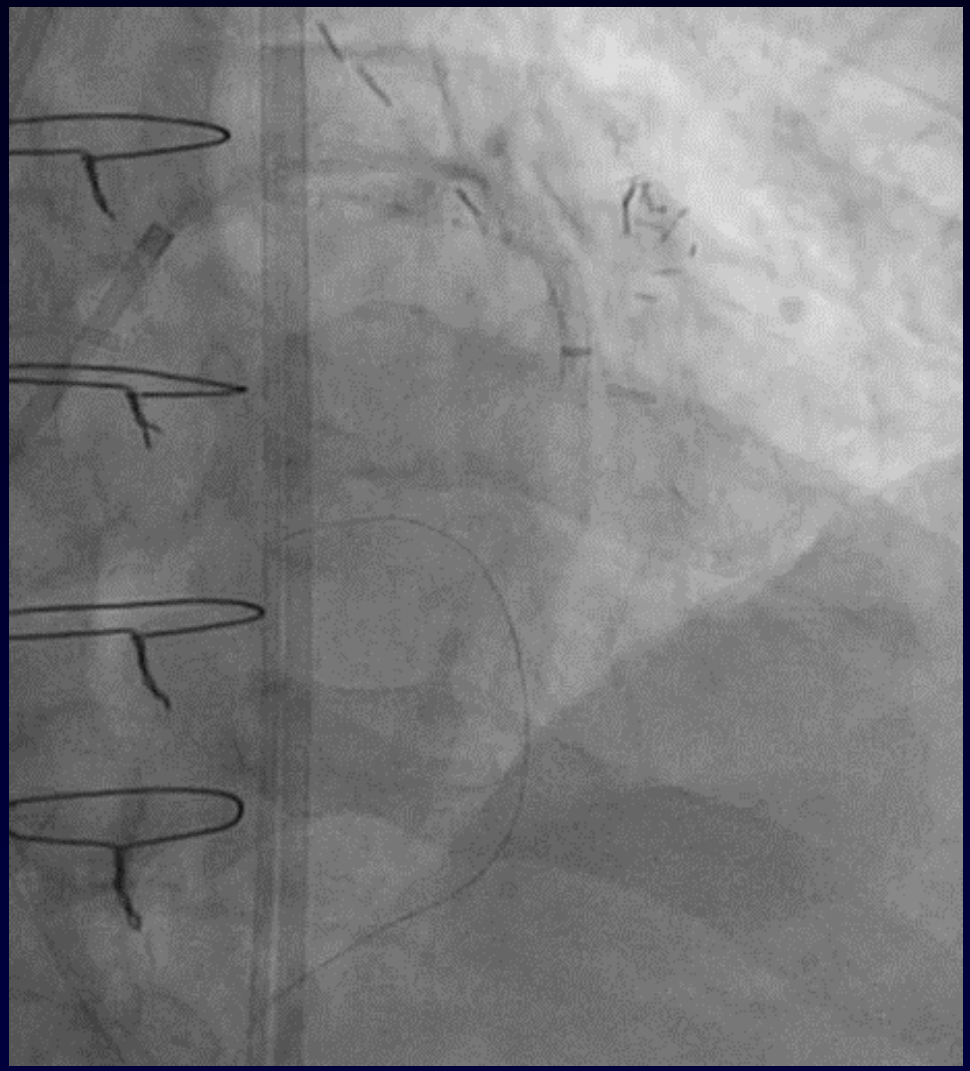
4. Adjuvant ballooning

(NC balloon 3.5x15, up to 26 atm)



5. Final CAG





XIENCE Sierra for complex lesions

… optimized DESs for various complex lesions

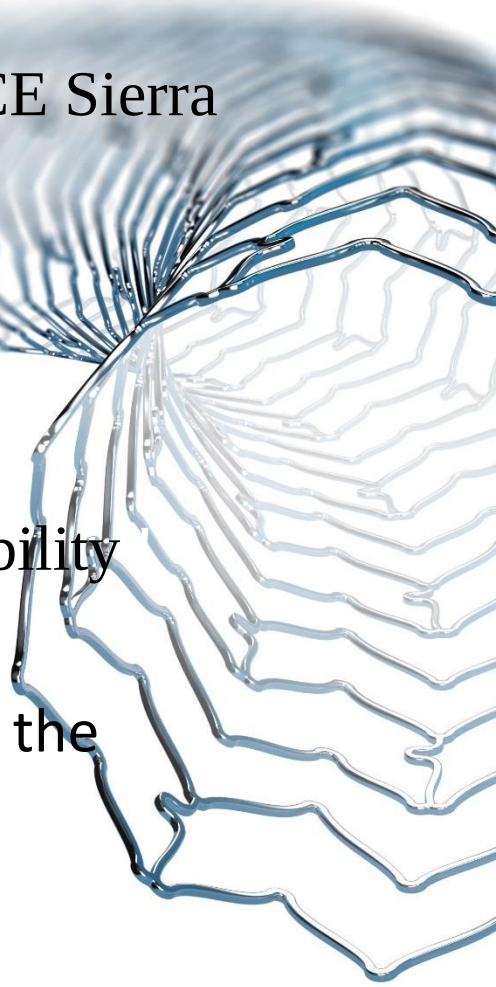
LARGE AND LONG CALCIFIED VESSELS

BIFURCATION

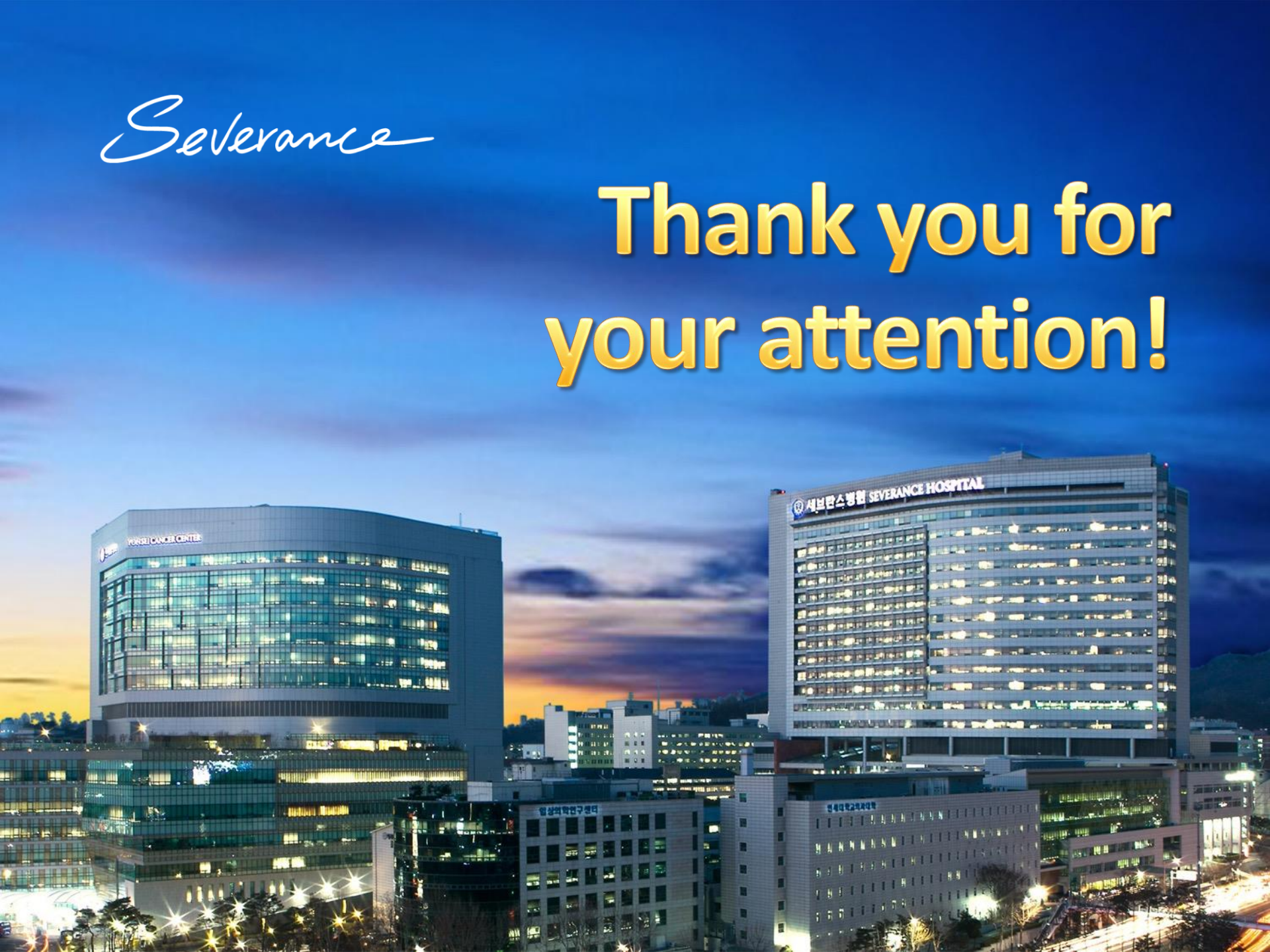
HIGHLY CALCIFIED LESIONS

- Slim, but Bigger ! thinner and wider XIENCE Sierra
  - **Single stent can cover from small vessel to larger LM with post-dilation**

- Easy & Safe procedure! Superior deliverability
  - **Time-saving, radiation-dose reduction**
  - **Cost-reduction for patients & hospital** (fee for the further uses of balloons, wires, and stents)



Xience Sierra


Severance
Thank you for your attention!
YONSEI CANCER CENTER
세브란스병원 SEVERANCE HOSPITAL