

Device Design Dictates Closure Success – Watchman FLX and other New Generation LAAO Devices

Hong Kong College of Cardiology 28th Annual Scientific Congress
4 July 2020 (Saturday) Atrial Fibrillation & Antithrombotic Symposium

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Closure Success

- Complete sealing without Leak
- Complication-free procedure
- Free from late complications including DRT
- Good long term results

BOSTON SCIENTIFIC RECEIVES FDA APPROVAL FOR WATCHMAN™ LEFT ATRIAL APPENDAGE CLOSURE DEVICE

First-Of-Its-Kind Alternative to Long-Term Warfarin Therapy for Stroke Risk Reduction in Patients with Non-Valvular Atrial Fibrillation

MARLBOROUGH, Mass. (March 13, 2015) / PR Newswire / — Boston Scientific Corporation (NYSE: BSX) has received U.S. Food and Drug Administration (FDA) approval for the WATCHMAN Left Atrial Appendage Closure Device. The WATCHMAN Device offers a new stroke risk reduction option for high-risk patients with non-valvular atrial fibrillation who are seeking an alternative to long-term warfarin therapy. The WATCHMAN Device will be made available to U.S. centers involved in our clinical studies and additional, specialized centers as physicians are trained on the implant procedure.

The WATCHMAN Device is indicated to reduce the risk of thromboembolism from the left atrial appendage in patients with non-valvular atrial fibrillation who are at increased risk for stroke and systemic embolism based on CHADS₂ or CHA₂DS₂-VASc scores, are deemed by their physicians to be suitable for warfarin; and have an appropriate

LEARN MORE ABOUT BOSTON SCIENTIFIC



Boston Scientific
Advancing science for life™

Watch this video to learn more about the WATCHMAN™ Left Atrial Appendage Closure Device

FDA Indications - to reduce the risk of thromboembolism from the left atrial appendage in patients with **non-valvular atrial fibrillation** who are at increased risk for stroke and systemic embolism based on CHADS₂ or CHA₂DS₂-VASc scores, are deemed by their physicians to be suitable for warfarin; and have ***an appropriate rationale to seek a non-pharmacologic alternative to warfarin***, taking into account the safety and effectiveness of the device compared to warfarin.

Device Size Selection - WATCHMAN

Max LAA Ostium

Device Diameter

17 – 19 mm

21 mm

20 – 22 mm

24 mm

23 – 25 mm

27 mm

26 – 28 mm

30 mm

29 – 31 mm

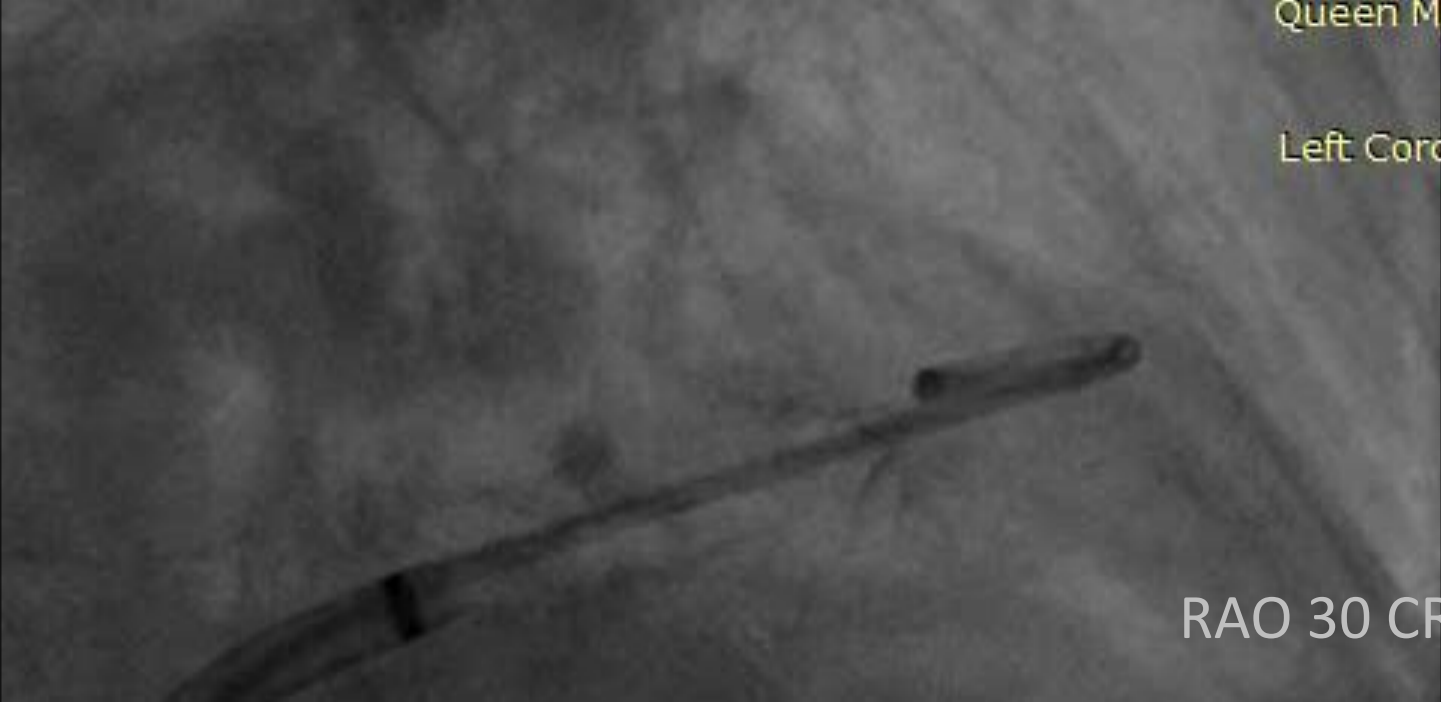
33 mm



Watchman

- minimal functional LAA length at least = device diameter

Queen Mary Hospital
0341-2017
XA
Left Coronary 15 fps



RAO 30 CRAN 20

XA
Left Coronary 15 fps



RAO 30 CAU 20

Im: 1/48
Se: 13

Queen Mary Hospital
0341-2017
XA
Left Coronary 15 fps

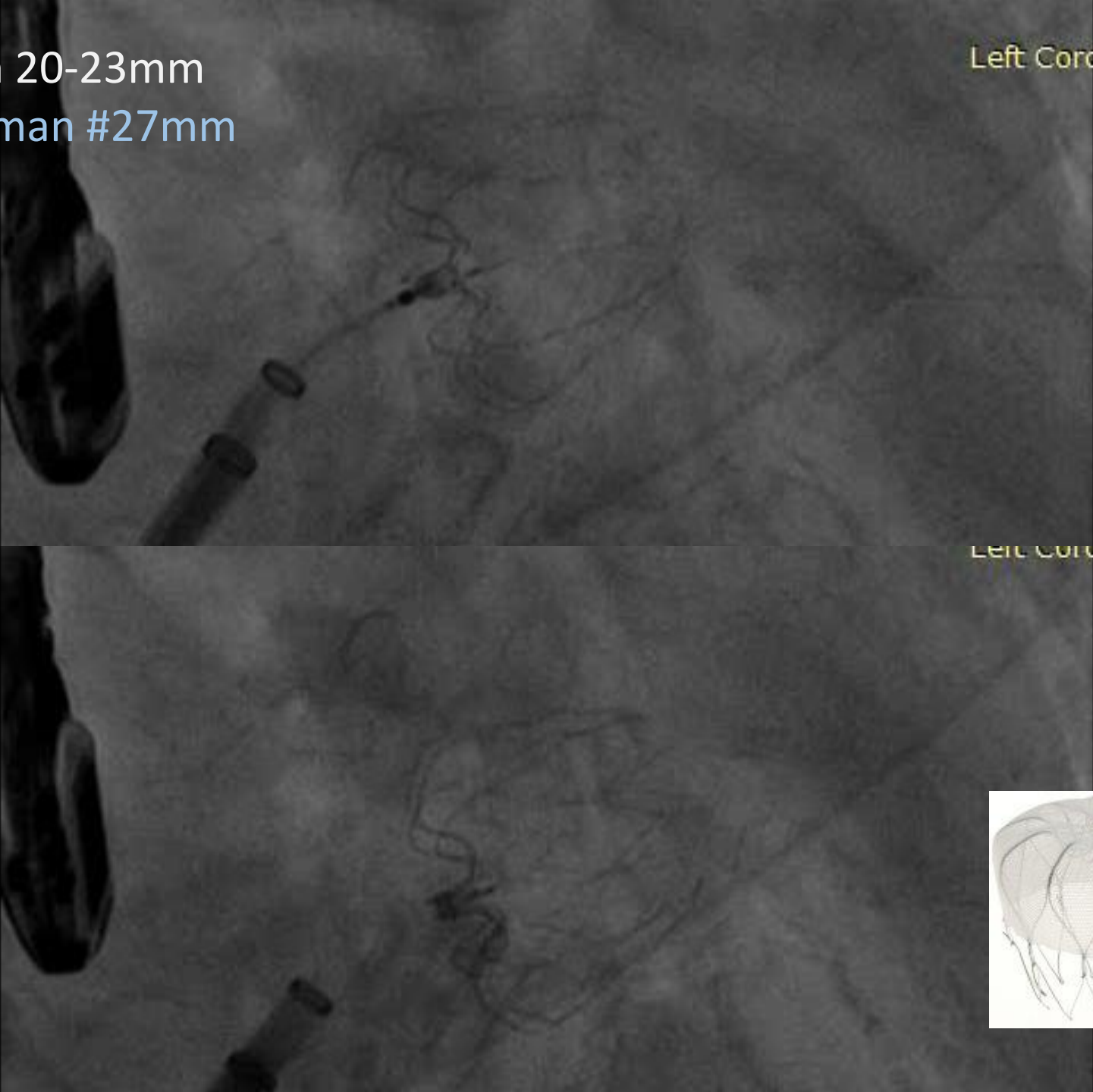


WL: 129 WW: 190 [D]
RAO: 30 CAU: 20

3/10/2017 2:06:05 PM

Ostium 20-23mm
Watchman #27mm

XA
Left Coronary 15 fps

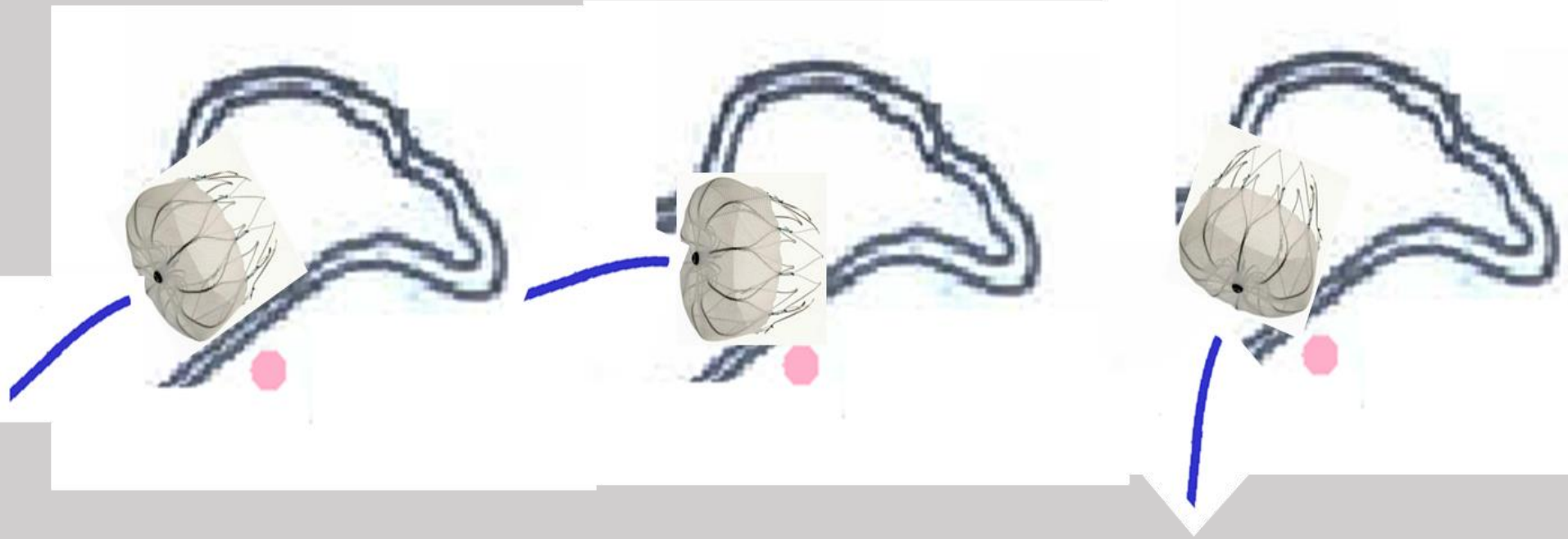


Left Coronary 15 fps

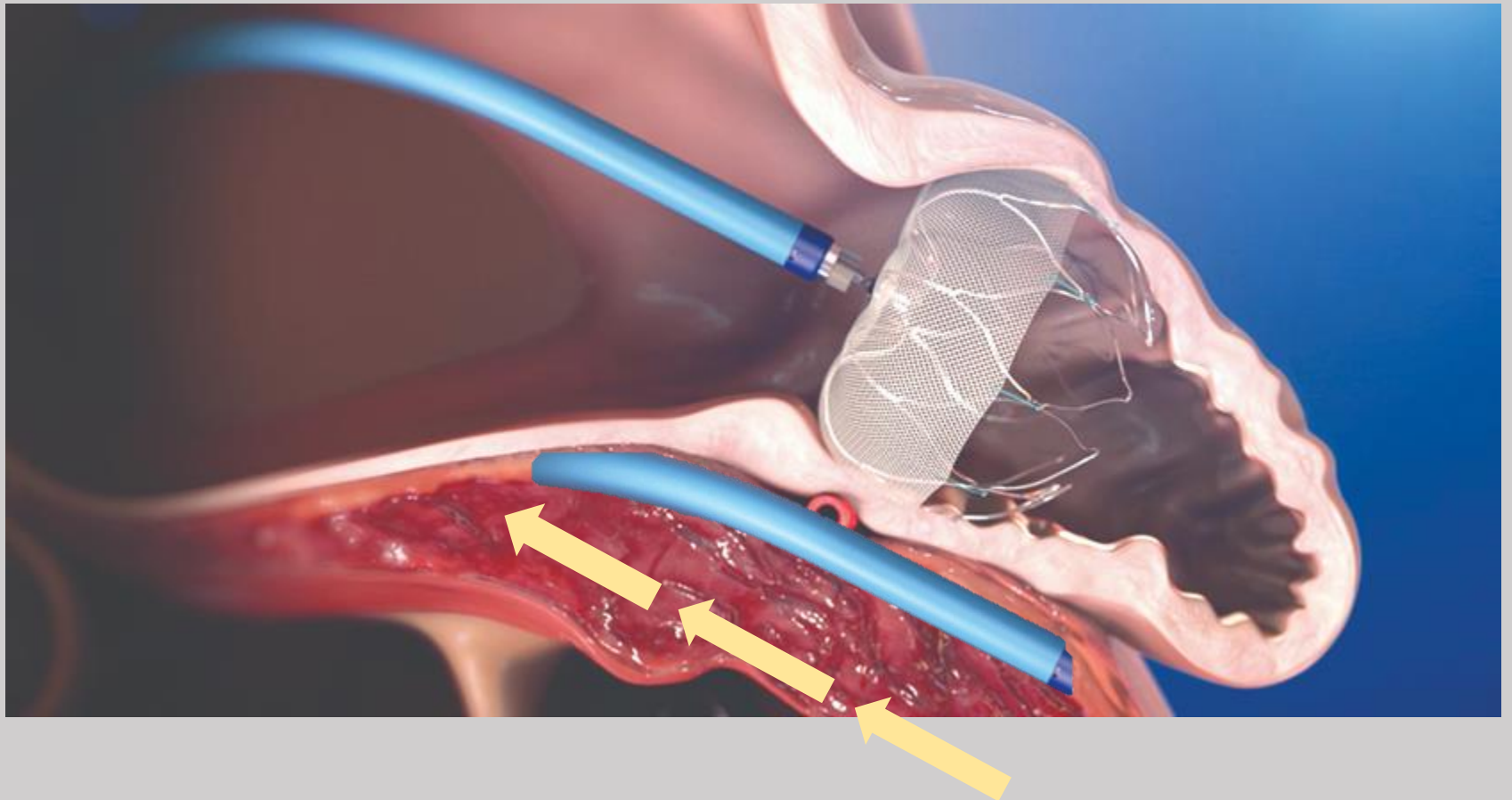


Delivery Sheath – LAA alignment

- Watchman is more forgiving regarding sheath position/orientation



Delivery Sheath – Precautions for Deep Seating with inadequate LAA Depth

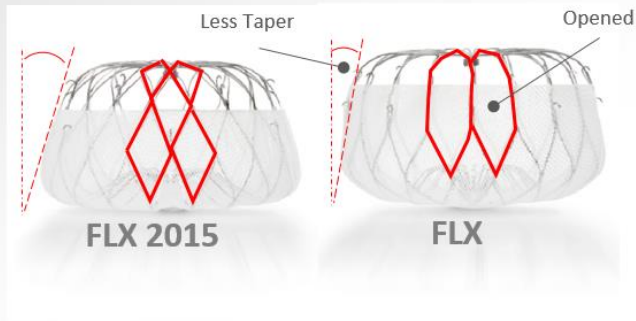


Boston Scientific WATCHMAN FLX

FLX Design Enhancements

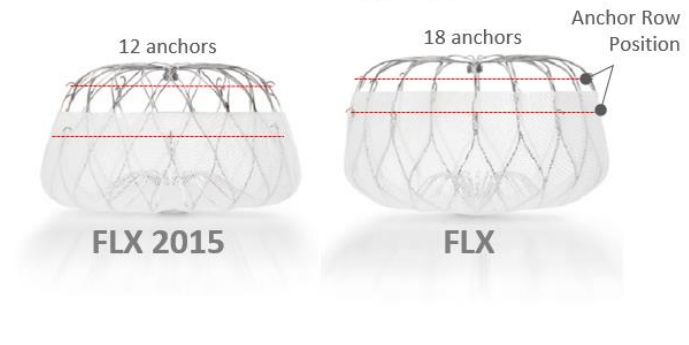
Boston
Scientific

Shape and Architecture



- **Opened strut frame architecture** for enhanced conformability
- **Less taper** angle for uniform apposition through a wider compression range

Anchoring System



- **3X greater overall holding strength**
- **50% more anchors** with new design for more uniform circumferential contact
- Optimized position of anchor rows to provide greater stability throughout range of deployment configurations

WATCHMAN FLX™
LEFT ATRIAL APPENDAGE CLOSURE DEVICE

**18 PRECISION
ANCHORS**



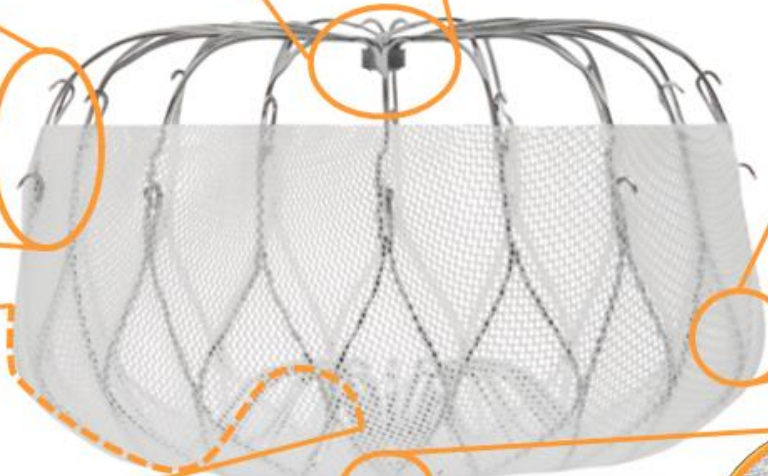
**ATRAUMATIC
CLOSED END**



**18-PAIR LASER
CUT FRAME
DESIGN**



**OPTIMIZED FRAME SHAPE
FOR SMOOTH DELIVERY**



**FLUSH INSERT
WITH REDUCED
METAL EXPOSURE**

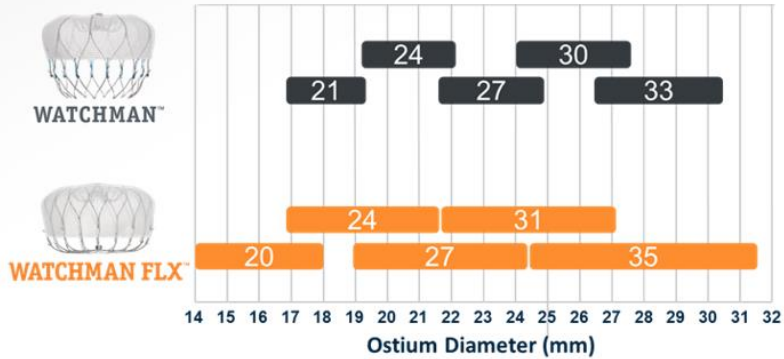
Design Changes from WATCHMAN to WATCHMAN FLX Boston Scientific



Closed distal end with fluoro marker



May be partially recaptured and advanced into LAA



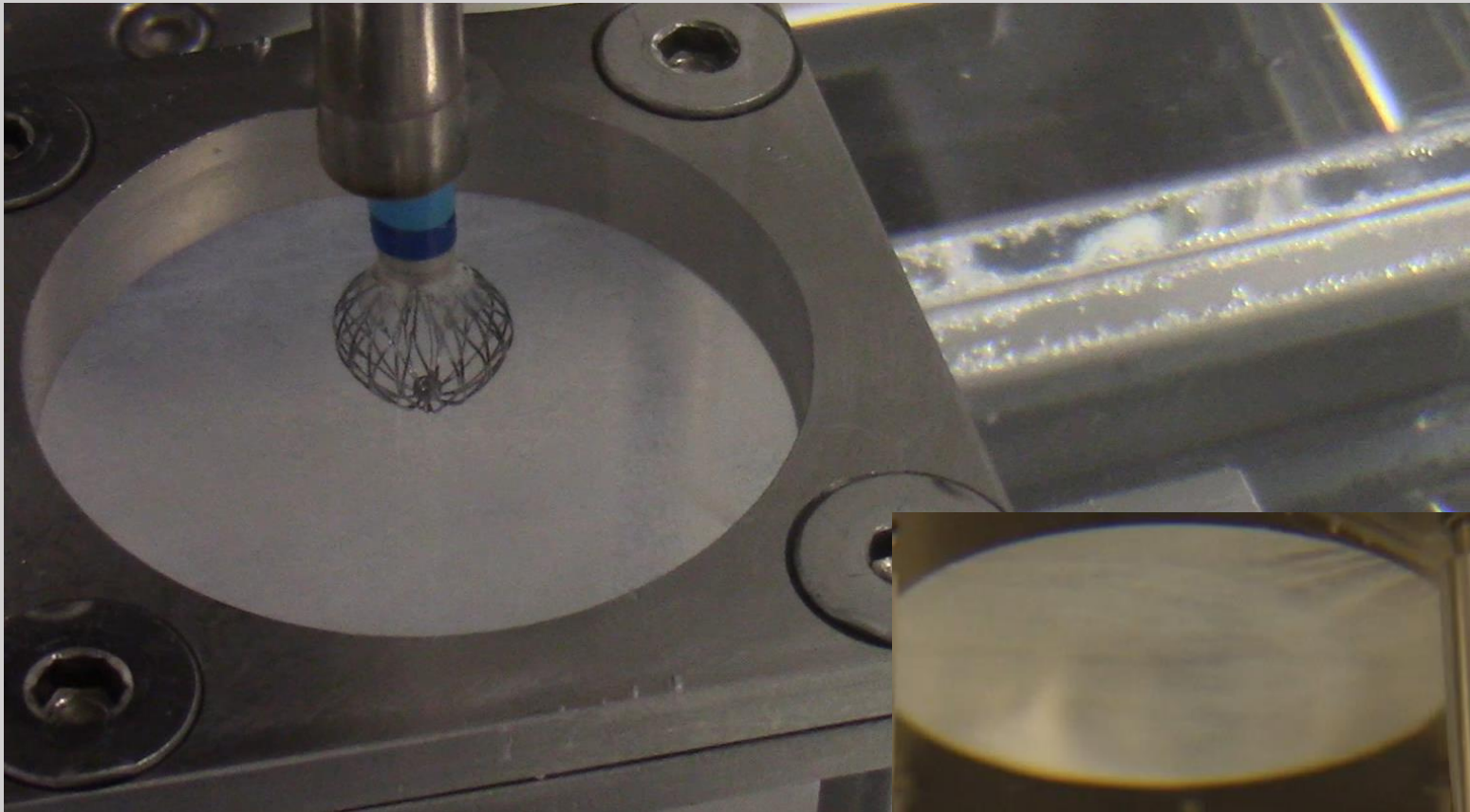
Wider LAA ostium range of 15-31.5mm



WATCHMAN 27mm

WATCHMAN FLX 27mm

Shorter device length



Atraumatic FLX-Ball design and Implantation technique

Watchman FLX has **less metal** –

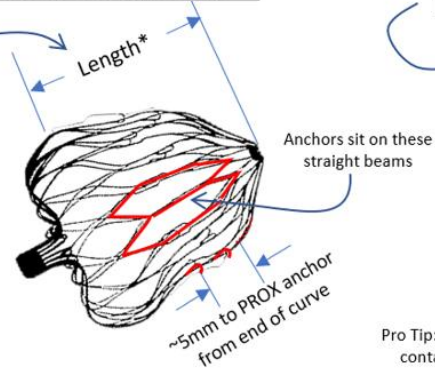
366mm² 24mm FLX device vs 804mm² 25mm AMULET

PASS Release Criteria: SIZE / COMPRESSION

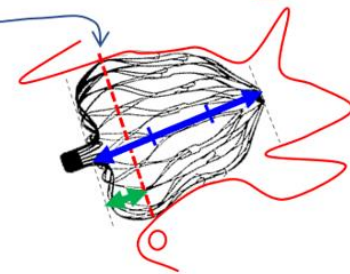
Table 1: FLX Sizing Table	
Max Diameter Range (LAA Os & Device)	Device Size
14.0 - 18.0	20
16.8 - 21.6	24
18.9 - 24.3	27
21.7 - 27.9	31
24.5 - 31.5	35

Table 2: Length Ref. Values	
Approx. Min LAA Length	Implant Length* Range @ (10% - 30%)
10	14-18
12	14-19
13.5	15-20
15.5	16-23
17.5	18-26

Reference Information

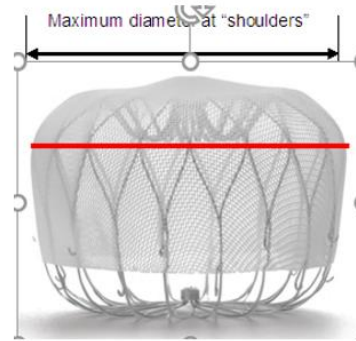
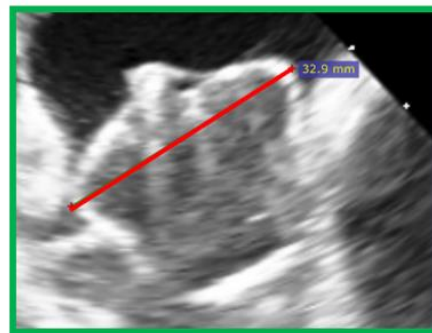
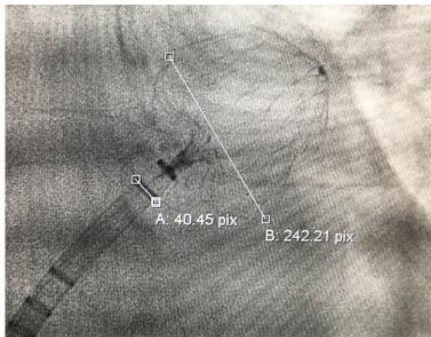


Implant "plane of maximum diameter should be at or just distal to the LAA os, where possible"



Pro Tip: The length of the green dimension line (from face to tissue contact) should not be greater than 1/3 the length of the blue dimension (face to distal end)

英
*Length increases with higher compression

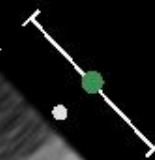
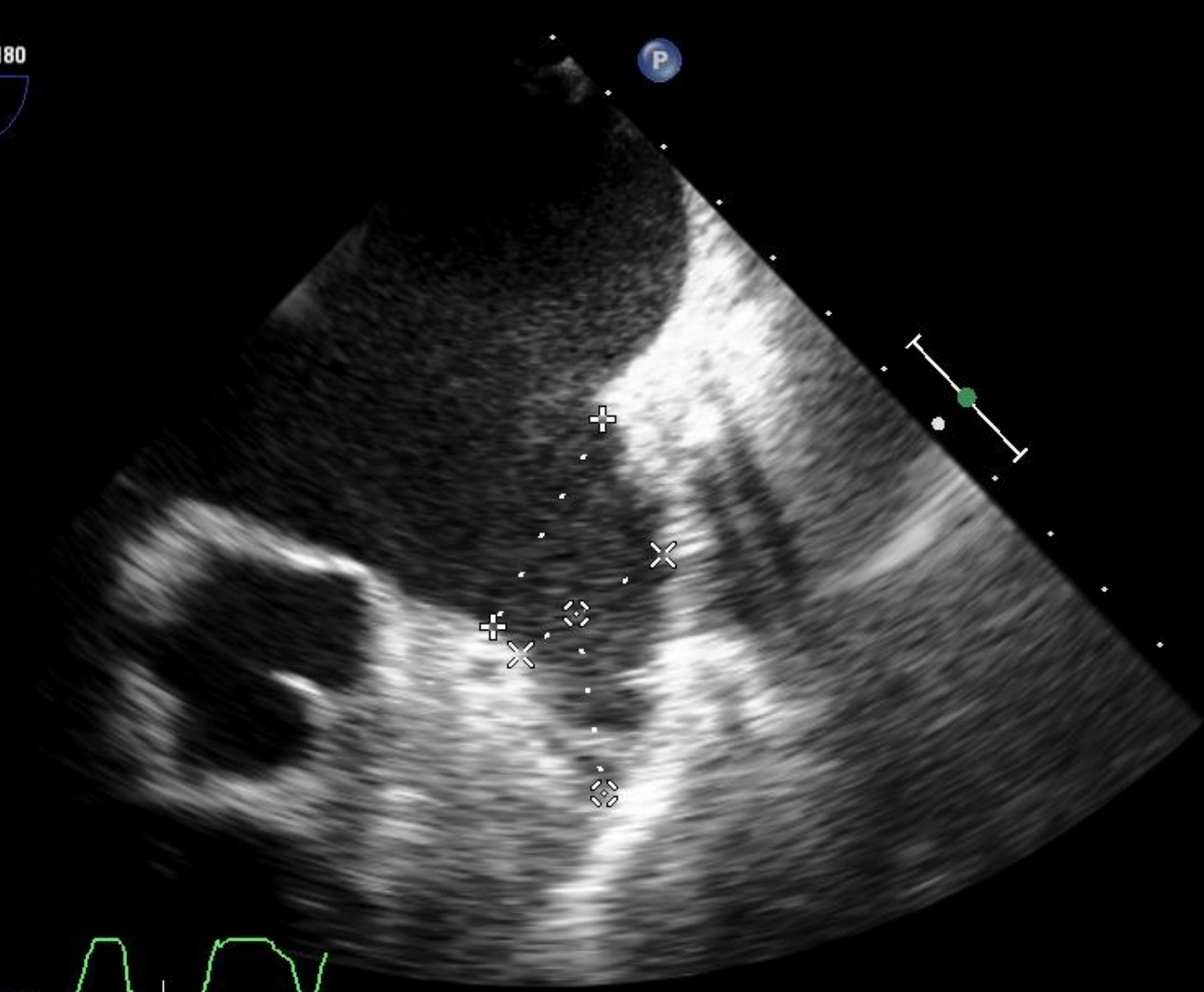


"threaded insert" must be visible when measuring on echo to ensure device was measured at widest cross-section in all angles

FR 50Hz
12cm

M4

2D
68%
C 50
P Off
Gen



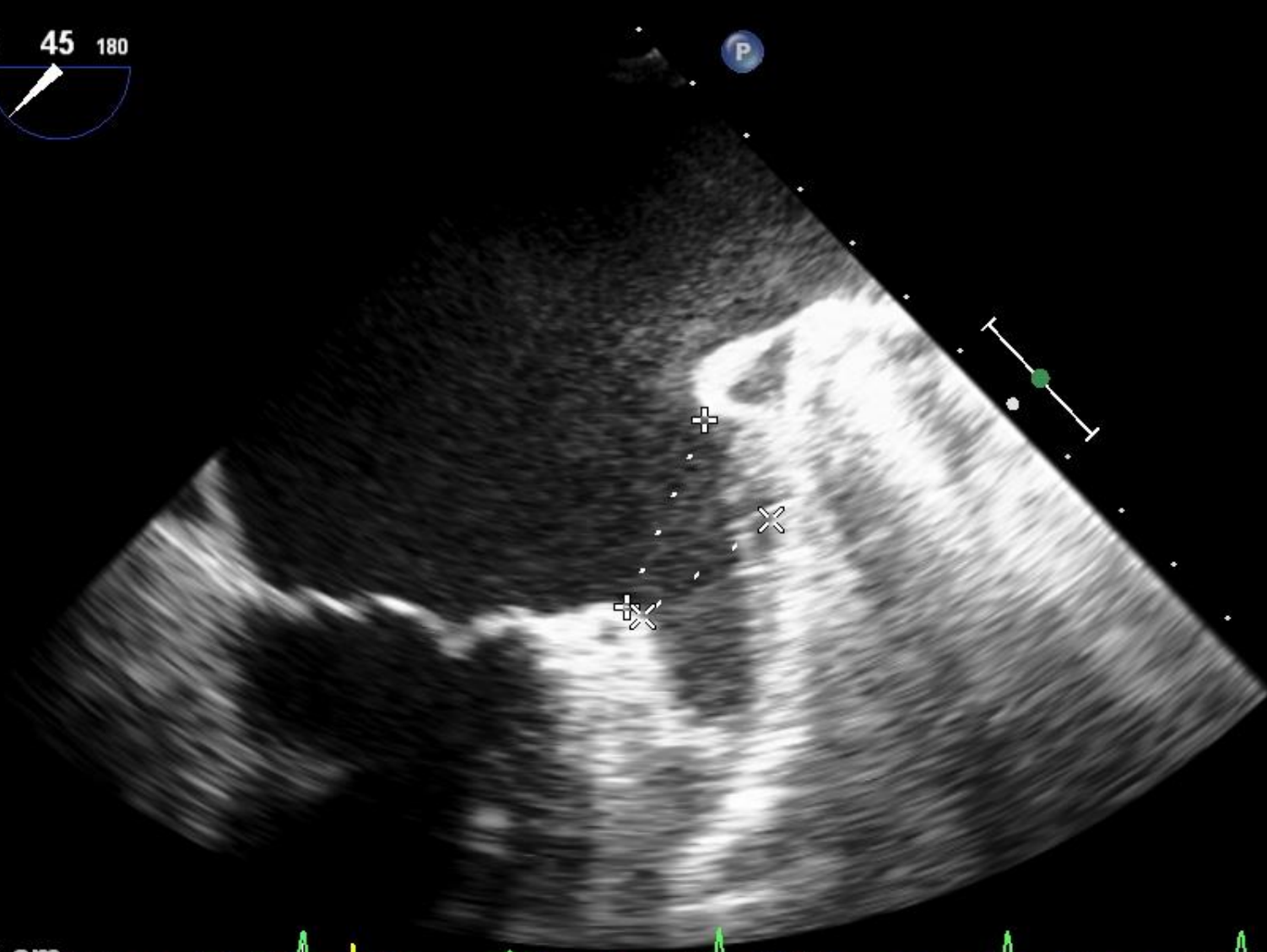
- ◇ Dist 2.33 cm
- × Dist 2.22 cm
- + Dist 3.00 cm



173bpm

FR 50Hz
12cm

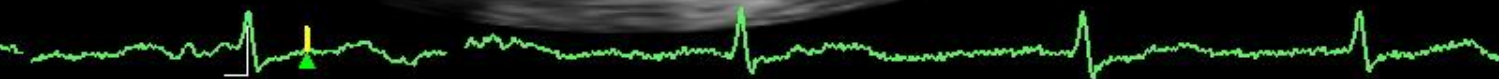
2D
68%
C 50
P Off
Gen



M4



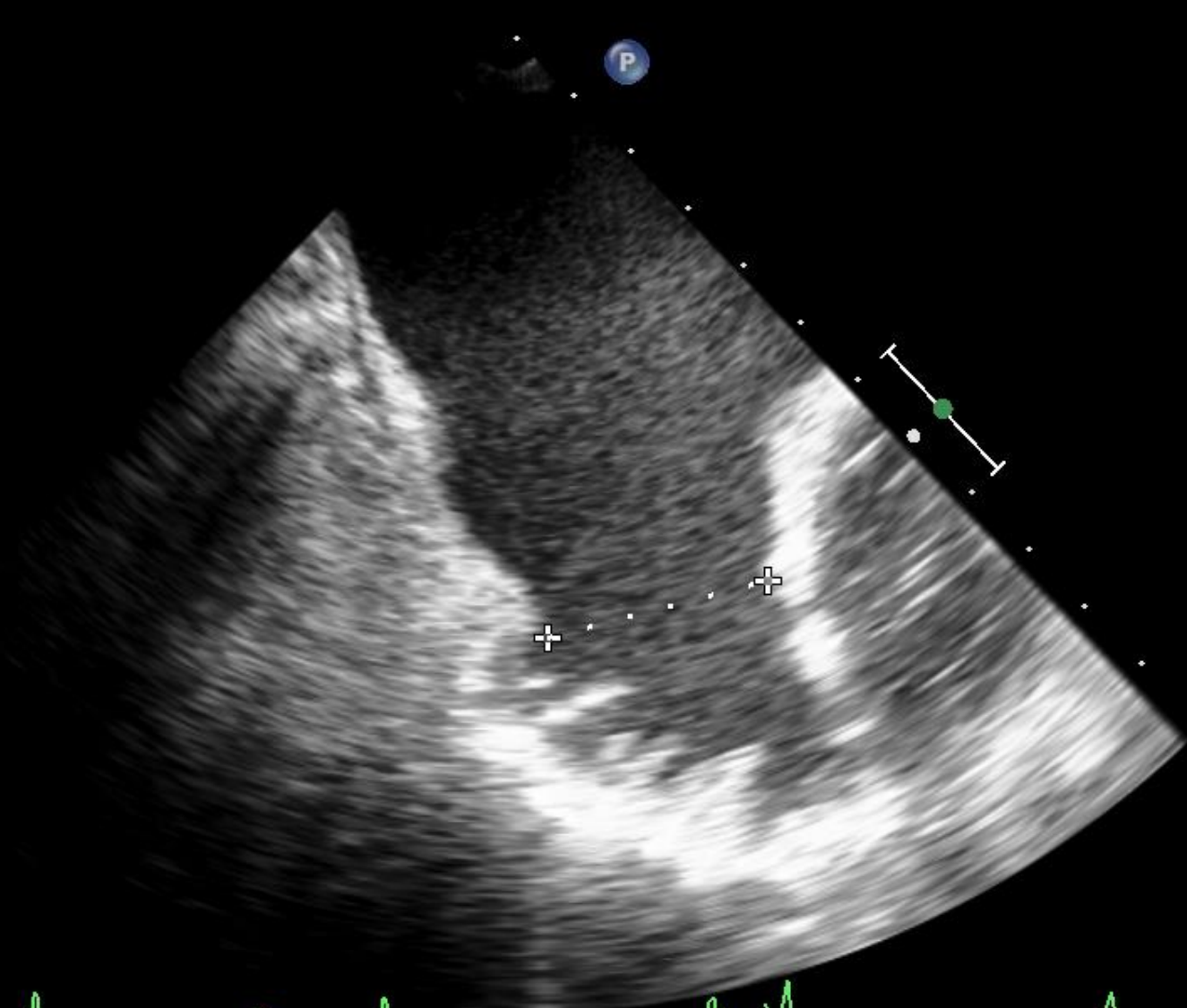
× Dist 2.12 cm
+ Dist 2.67 cm



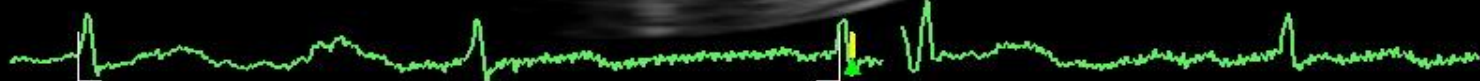
68bpm

FR 50Hz
12cm

2D
68%
C 50
P Off
Gen



Dist 2.83 cm



69bpm

Im: 1/65
Se: 12

Queen Mary Hospital
1736-2019
XA
Left Coronary 15 fps



WL: 129 WW: 190 [D]
RAO: 30 CRA: 20

HPen

Two side-by-side echocardiogram images showing a cross-section of the heart. The left image has a blue 'P' marker at the top and a blue 'G' marker on the left. A dashed line connects the 'P' and 'G' markers. Below the 'G' marker, there is a small diagram with '2.4' and '4.8' labels. The right image has a blue 'P' marker at the top and a blue 'G' marker on the left. A dashed line connects the 'P' and 'G' markers. Below the 'G' marker, there is a small diagram with '2.4' and '4.8' labels. The images show the internal structure of the heart with varying shades of gray and white.

PAT T: 37.0C
TEE T: 38.4C

JPEG

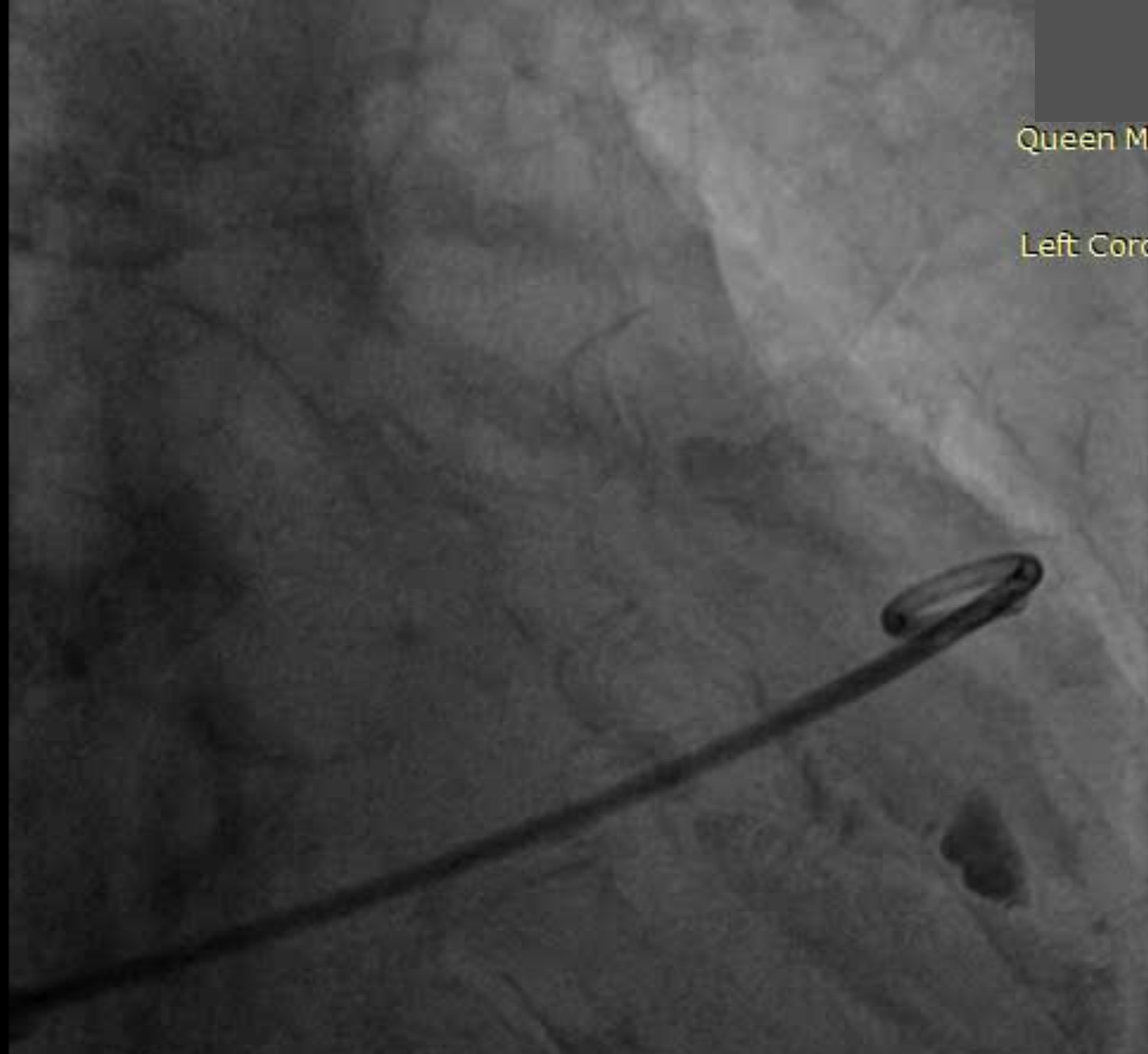
59 bpm

Im: 1/76
Se: 11

Queen Mary Hospital
1736-2019
XA
Left Coronary 15 fps

WL: 129 WW: 190 [D]
RAO: 30 CAU: 20

25/11/2019 10:02:24 am





RAO 30 CRAN 20 Ostium 22mm

RAO 30 CAU 20 Ostium 27mm

Im: 1/97
Se: 21

Queen Mary Hospital
1736-2019
XA
Fluoroscopy

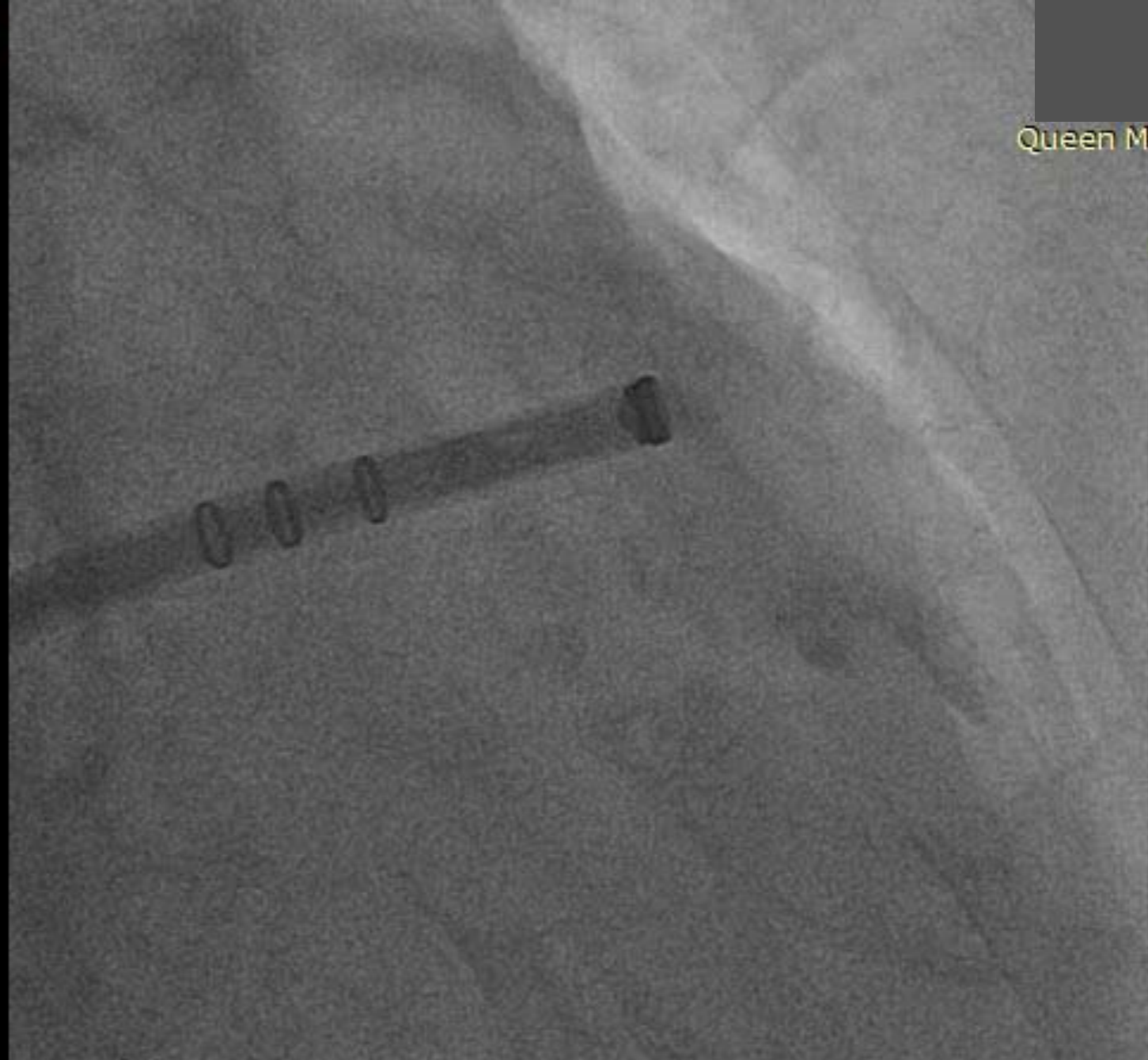


WL: 115 WW: 213 [D]
RAO: 30 CAU: 20

25/11/2019 10:45:16 am

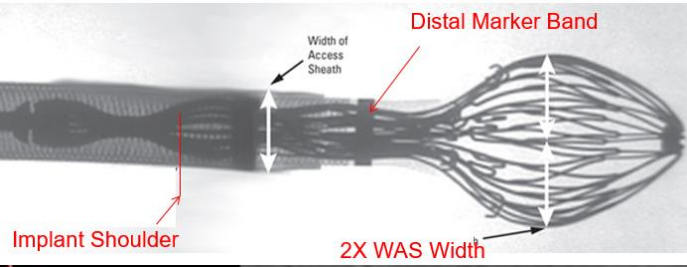
Im: 1/169
Se: 22

Queen Mary Hospital
1736-2019
XA
Fluoroscopy

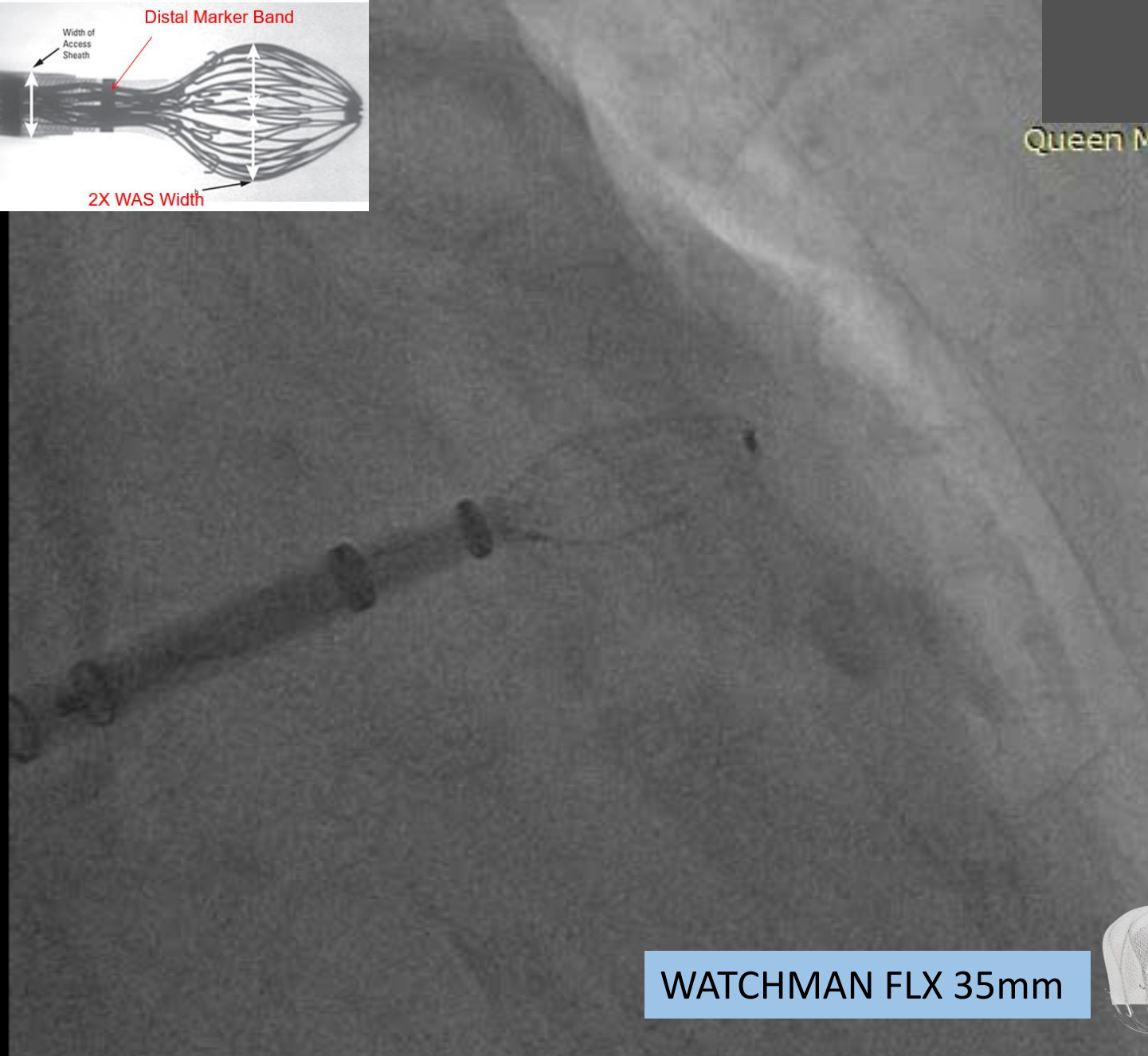


WL: 115 WW: 213 [D]
RAO: 30 CAU: 20

25/11/2019 10:45:26 am



Queen Mary Hospital
1736-2019
XA
Fluoroscopy



WATCHMAN FLX 35mm

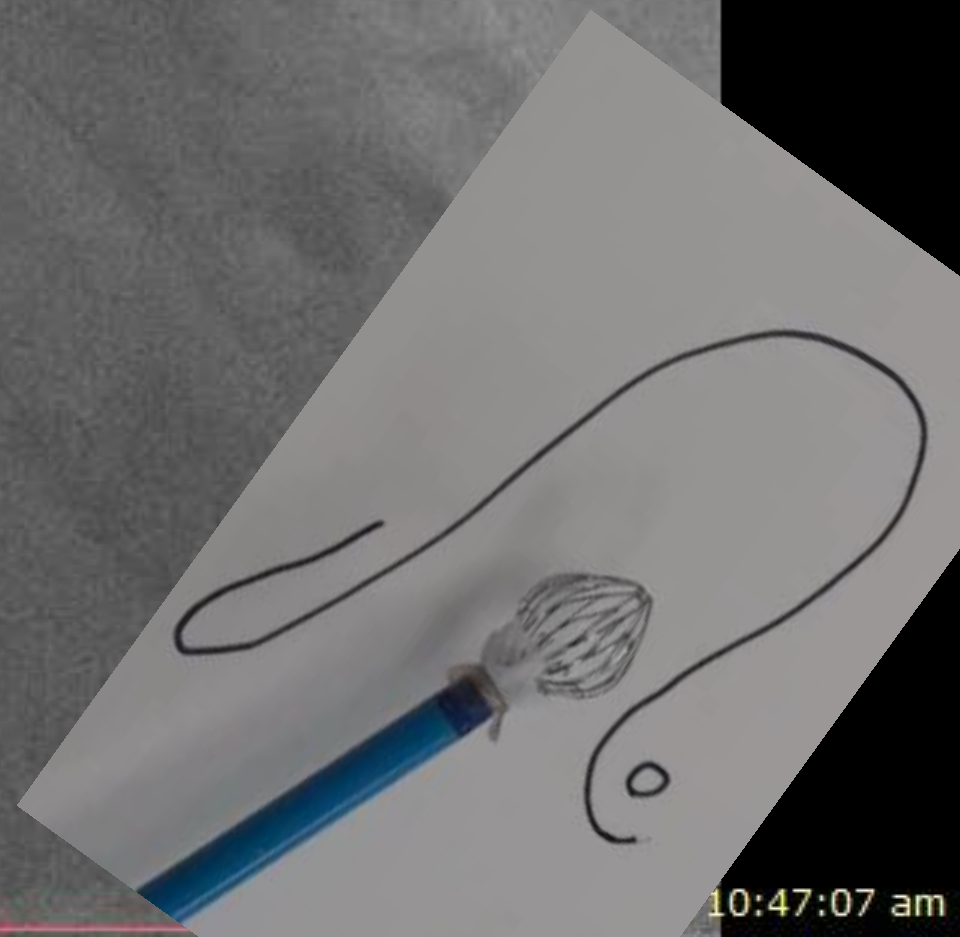
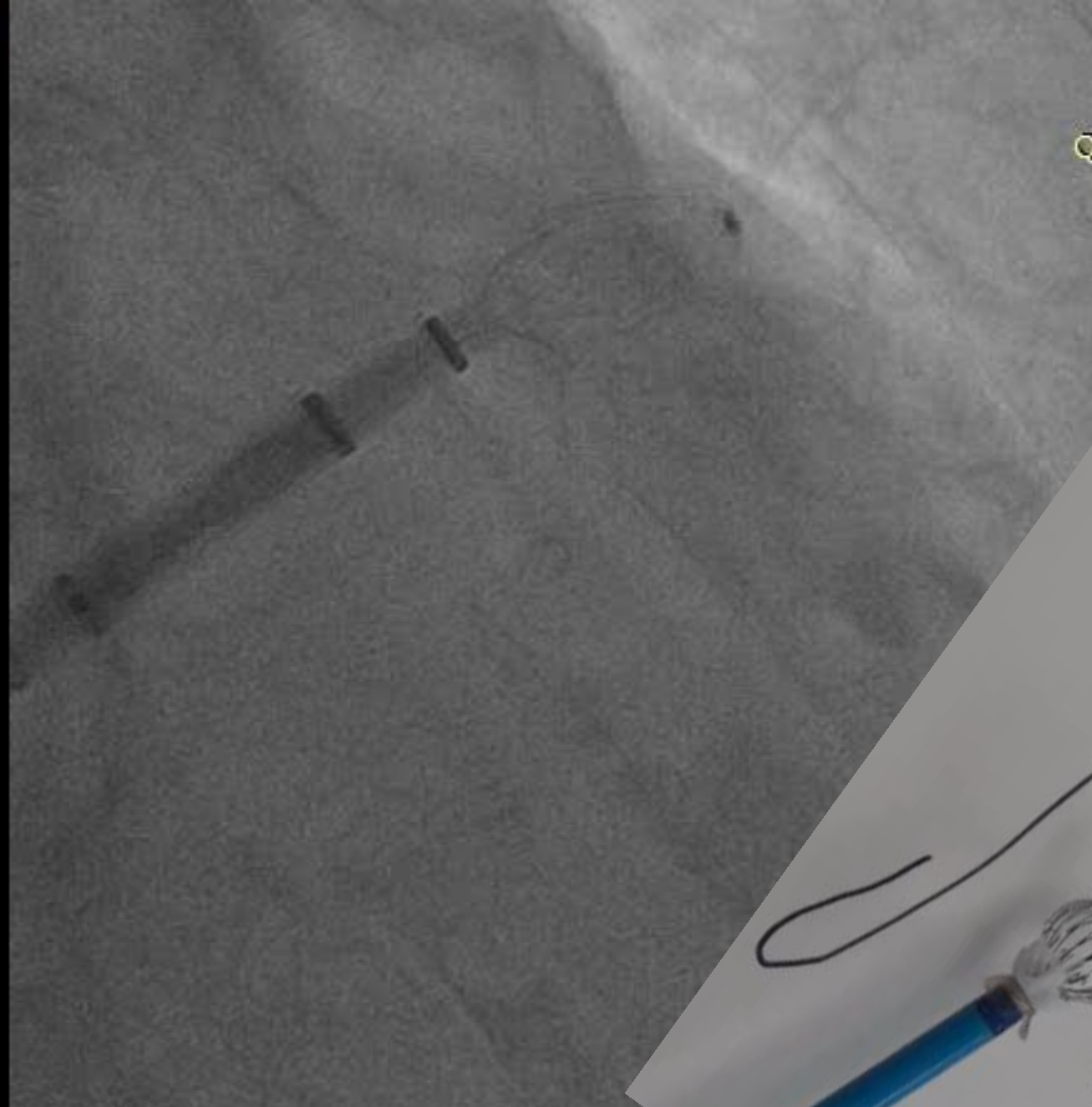


WL: 115 WW: 213 [D]
RAO: 30 CAU: 20

25/11/2019 10:46:22 am

Im: 1/300
Se: 24

Queen Mary Hospital
1736-2019
XA
Fluoroscopy



WL: 115 WW: 213 [D]
RAO: 30 CAU: 20

10:47:07 am

FR 29Hz
12cm

xPlane
69%
69%
50dB
P Off
HPen

M4



PAT T: 37.0C
TEE T: 39.1C

Im: 1/256
Se: 28

Queen Mary Hospital
1736-2019
XA
Fluoroscopy



WATCHMAN FLX 35mm



WL: 115 WW: 213 [D]
RAO: 30 CAU: 20

25/11/2019 10:49:15 am

FR 29Hz
12cm

xPlane
65%
65%
50dB
P Off
HPen

M4



70 bpm

PAT T: 37.0C
TEE T: 38.9C



Im: 1/57
Se: 29

Queen Mary Hospital
1736-2019
XA
Left Coronary 15 fps



WATCHMAN FLX 35mm

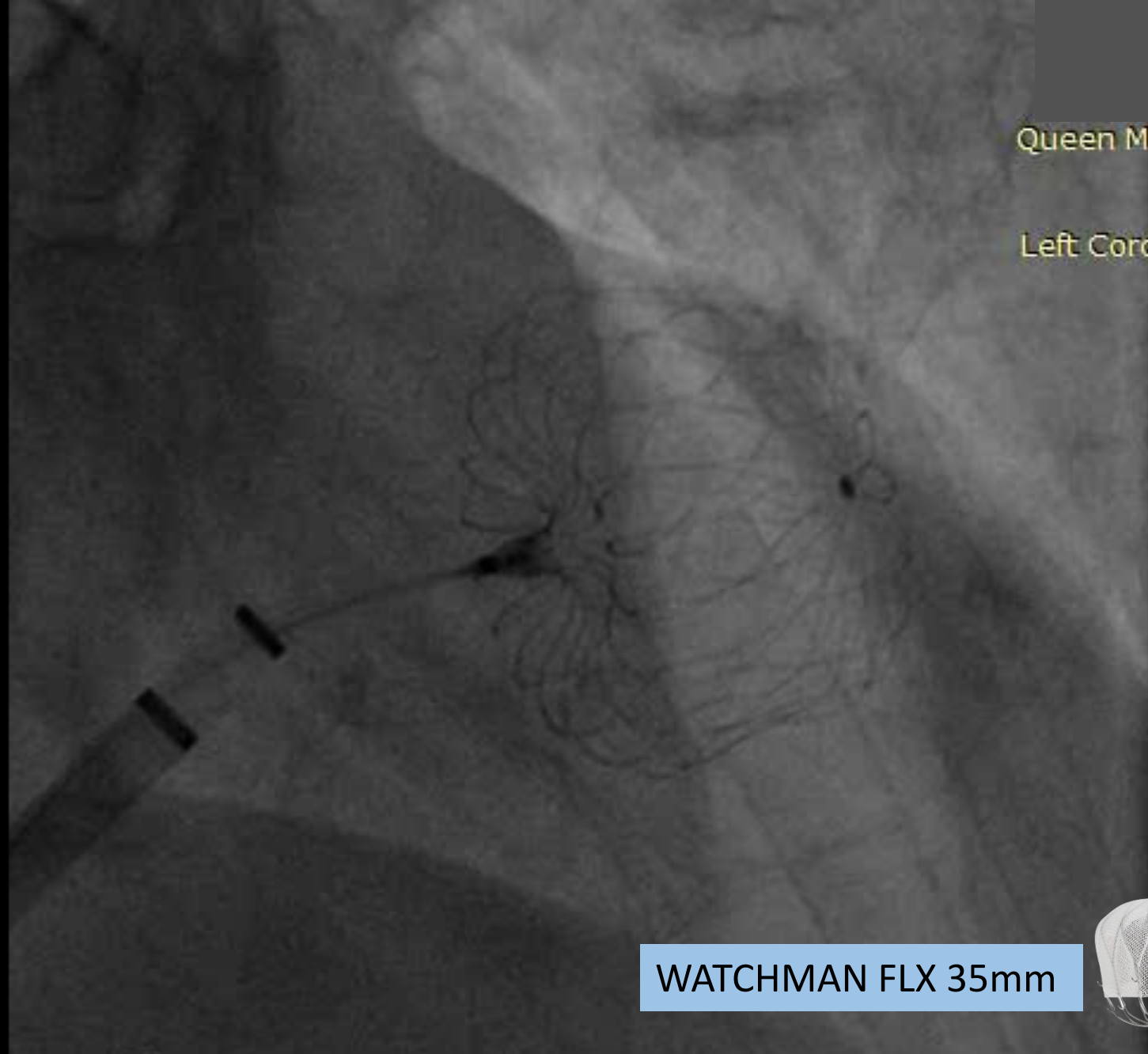


WL: 129 WW: 190 [D]
RAO: 30 CAU: 20

25/11/2019 10:49:49 am

Im: 1/63
Se: 30

Queen Mary Hospital
1736-2019
XA
Left Coronary 15 fps



WATCHMAN FLX 35mm

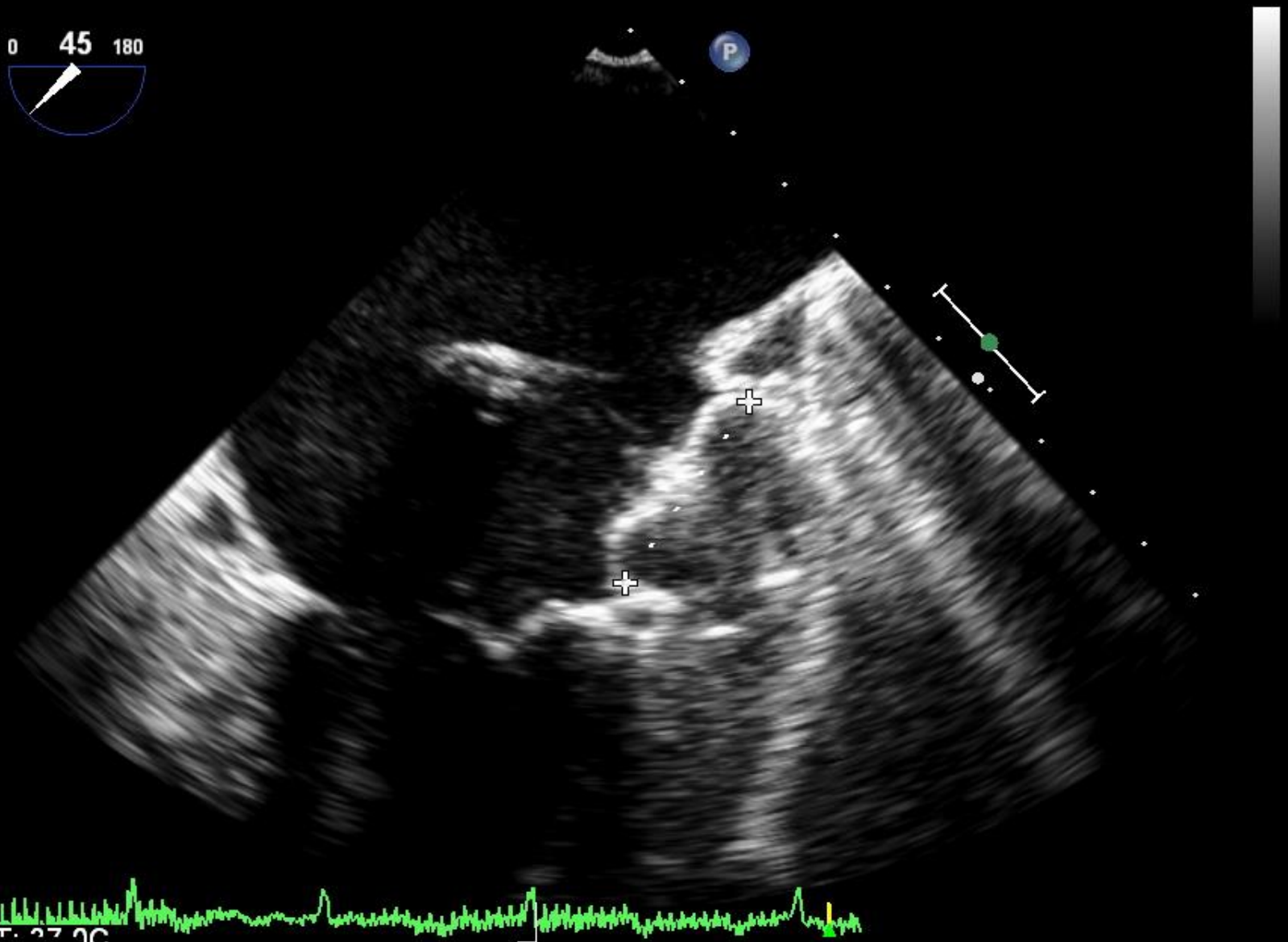


WL: 129 WW: 190 [D]
RAO: 30 CRA: 20

25/11/2019 10:54:11 am

FR 50Hz
12cm

2D
65%
C 50
P Off
HPen



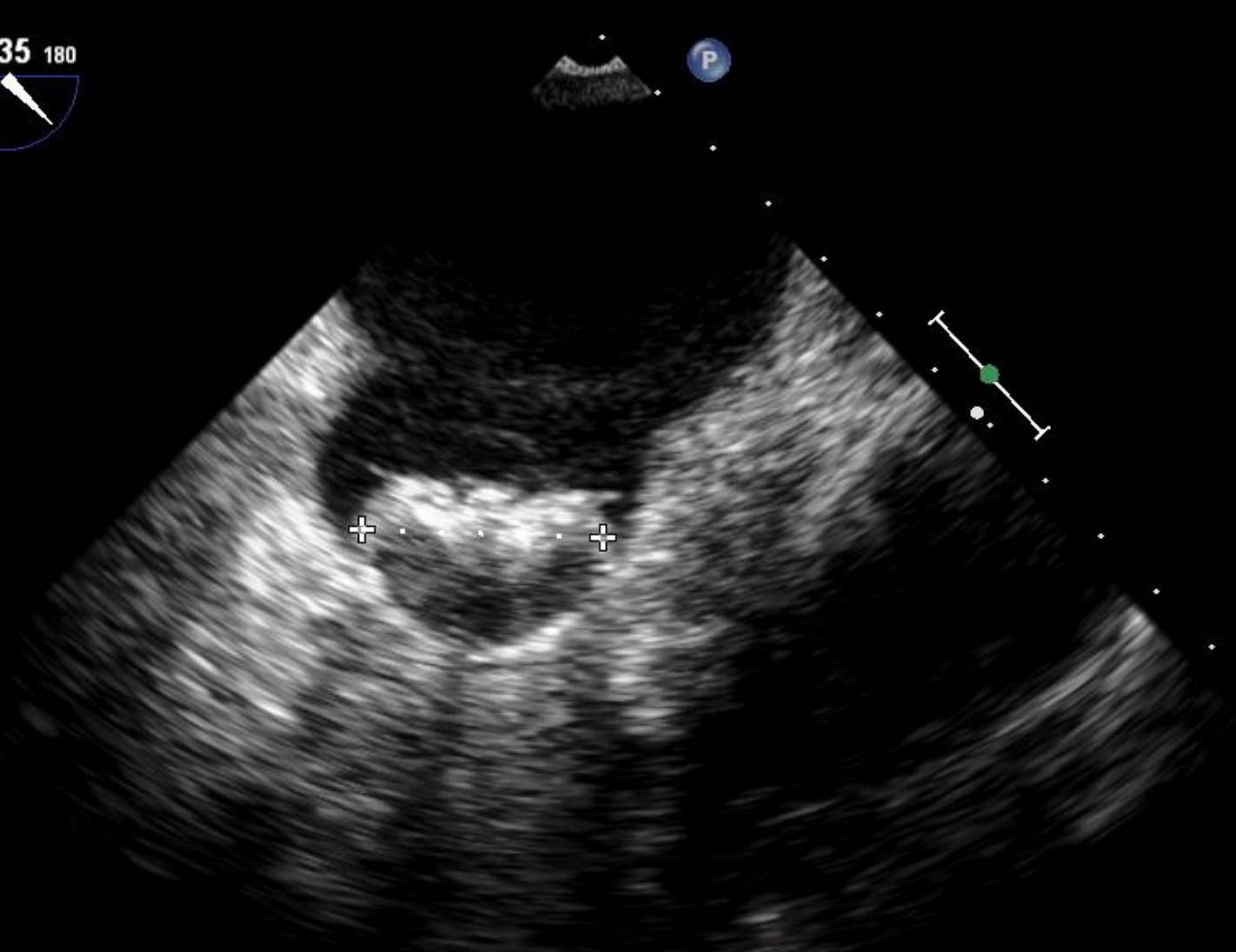
Dist 3.02 cm

31bpm

FR 50Hz
12cm

M4

2D
65%
C 50
P Off
HPen



Im: 1/20
Se: 33

Queen Mary Hospital
1736-2019
XA
Left Coronary 15 fps



WATCHMAN FLX 35mm

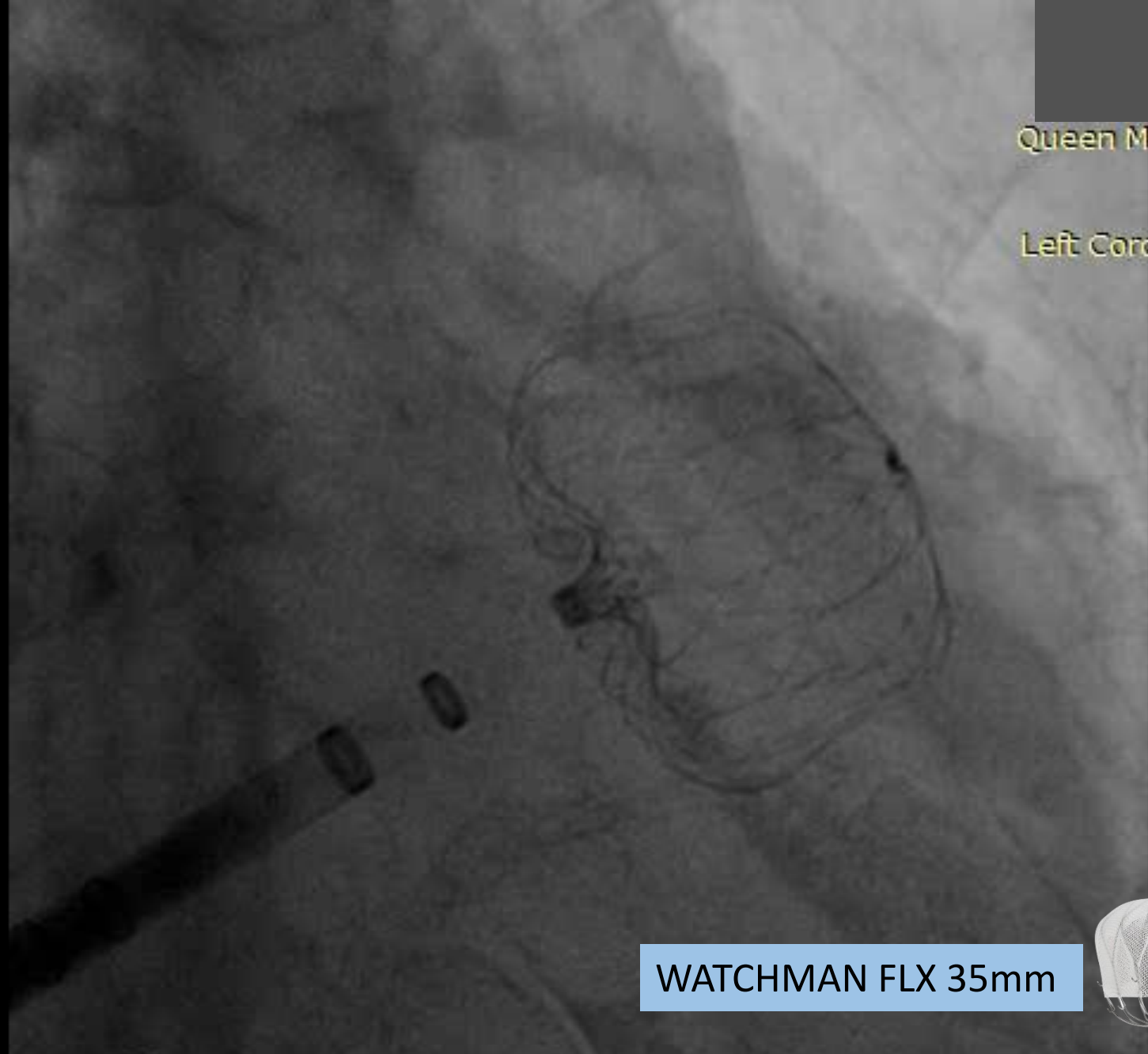


WL: 129 WW: 190 [D]
RAO: 30 CAU: 20

25/11/2019 10:57:04 am

Im: 1/59
Se: 34

Queen Mary Hospital
1736-2019
XA
Left Coronary 15 fps



WATCHMAN FLX 35mm



WL: 129 WW: 190 [D]
RAO: 30 CAU: 20

25/11/2019 10:57:37 am

Im: 1/49
Se: 35

Queen Mary Hospital
1736-2019
XA
Left Coronary 15 fps



WATCHMAN FLX 35mm



WL: 129 WW: 190 [D]
RAO: 30 CRA: 20

25/11/2019 10:57:53 am

FR 29Hz
12cm

xPlane
65%
65%
50dB
P Off
HPen

M4



PAT T: 37.0C
TEE T: 39.4C

JPEG

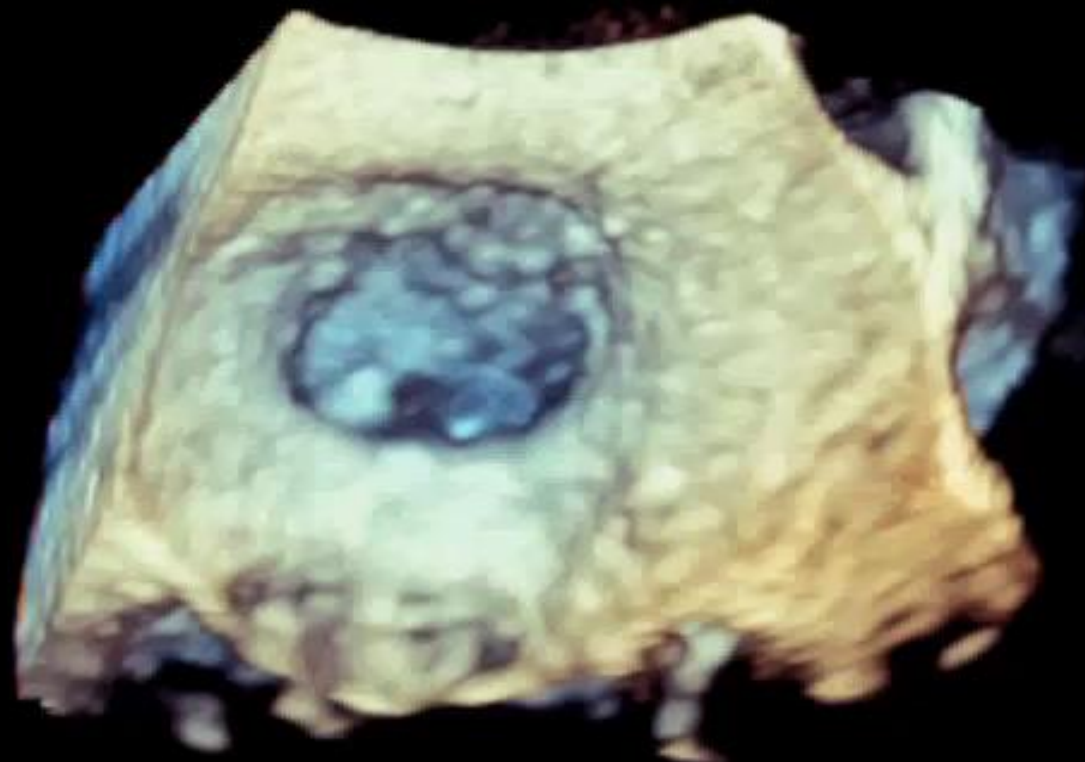
118 bpm

FR 11Hz
9.1cm

3D Beats 1

M4

3D
3D 47%
3D 40dB



JPEG

PAT T: 37.0C
TEE T: 39.2C

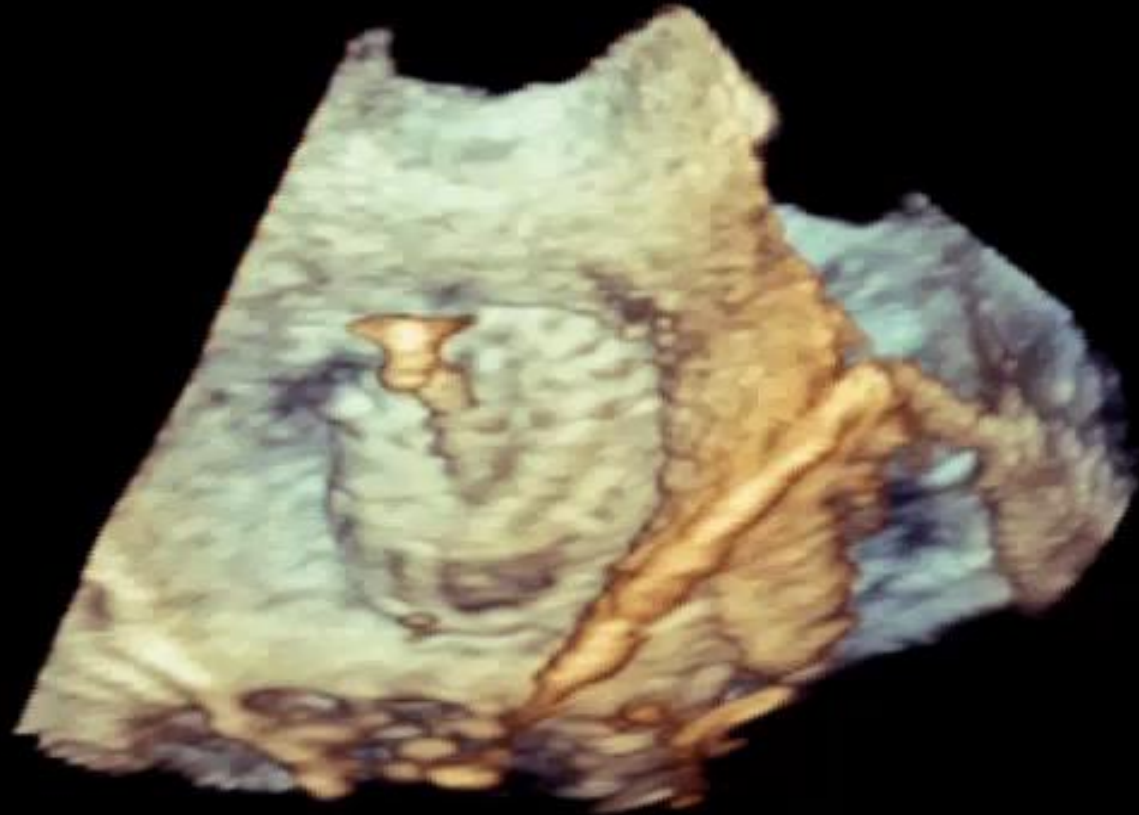
57 bpm

FR 12Hz
9.8cm

3D Beats 1

M4

3D
3D 47%
3D 40dB



JPEG

PAT T: 37.0C
TEE T: 39.4C

51 bpm

FR 12Hz
9.8cm

3D Beats 1

M4

3D
3D 47%
3D 40dB



JPEG

PAT T: 37.0C
TEE T: 39.4C

71 bpm

FR 11Hz
10cm

3D Beats 1

M4

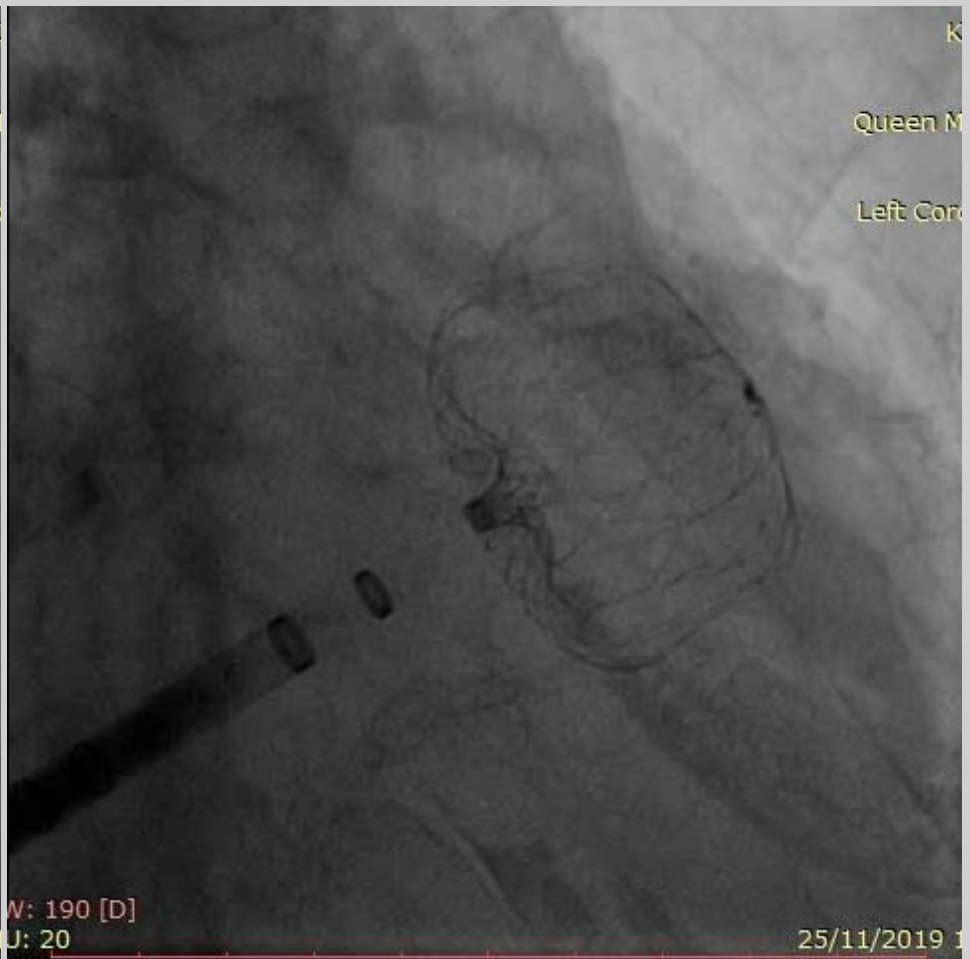
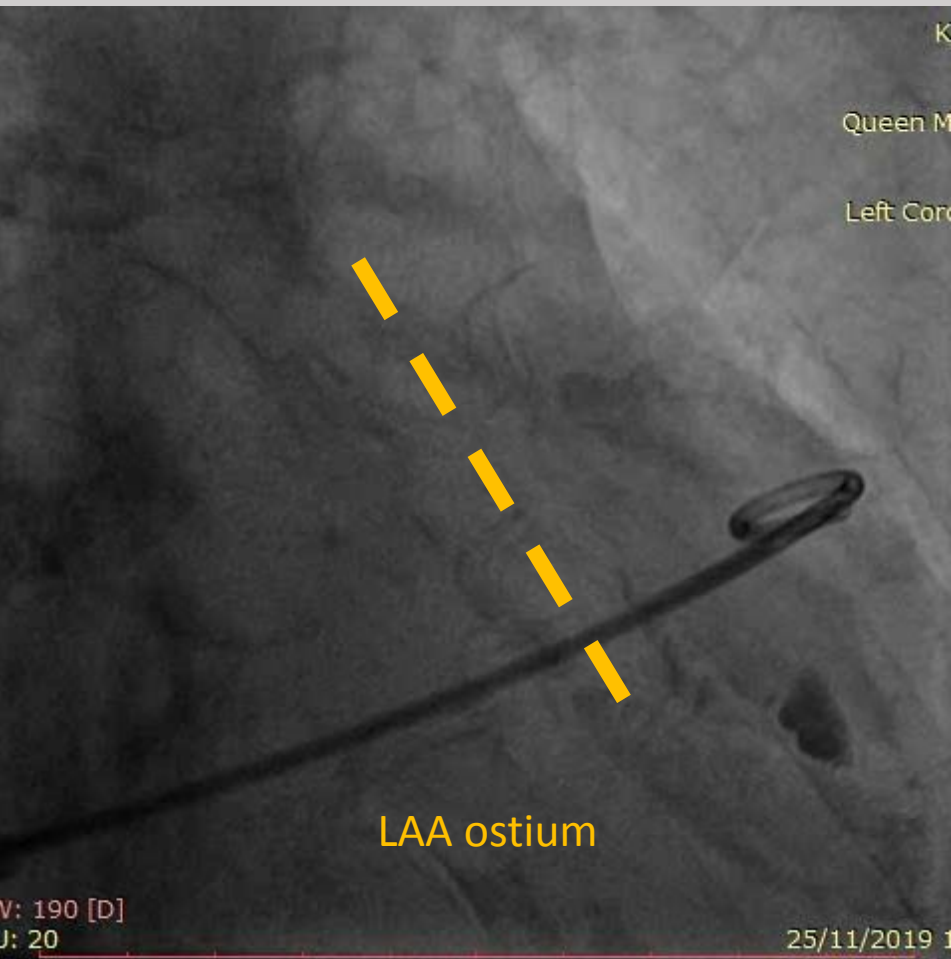
3D
3D 47%
3D 40dB



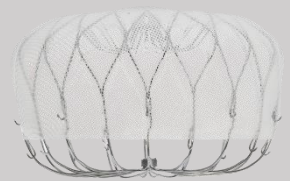
JPEG

PAT T: 37.0C
TEE T: 39.6C

71 bpm



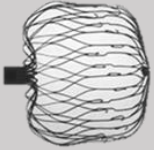
WATCHMAN FLX 35mm



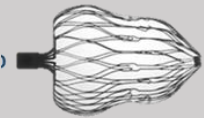
FLX release criteria

Size / Compression

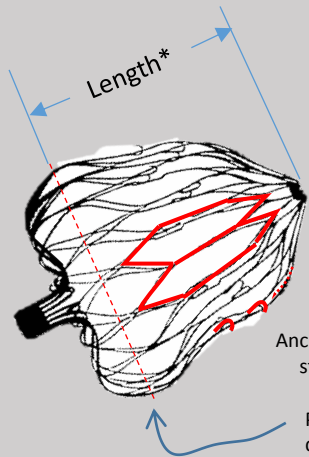
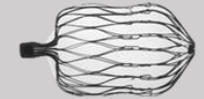
Marshmallow



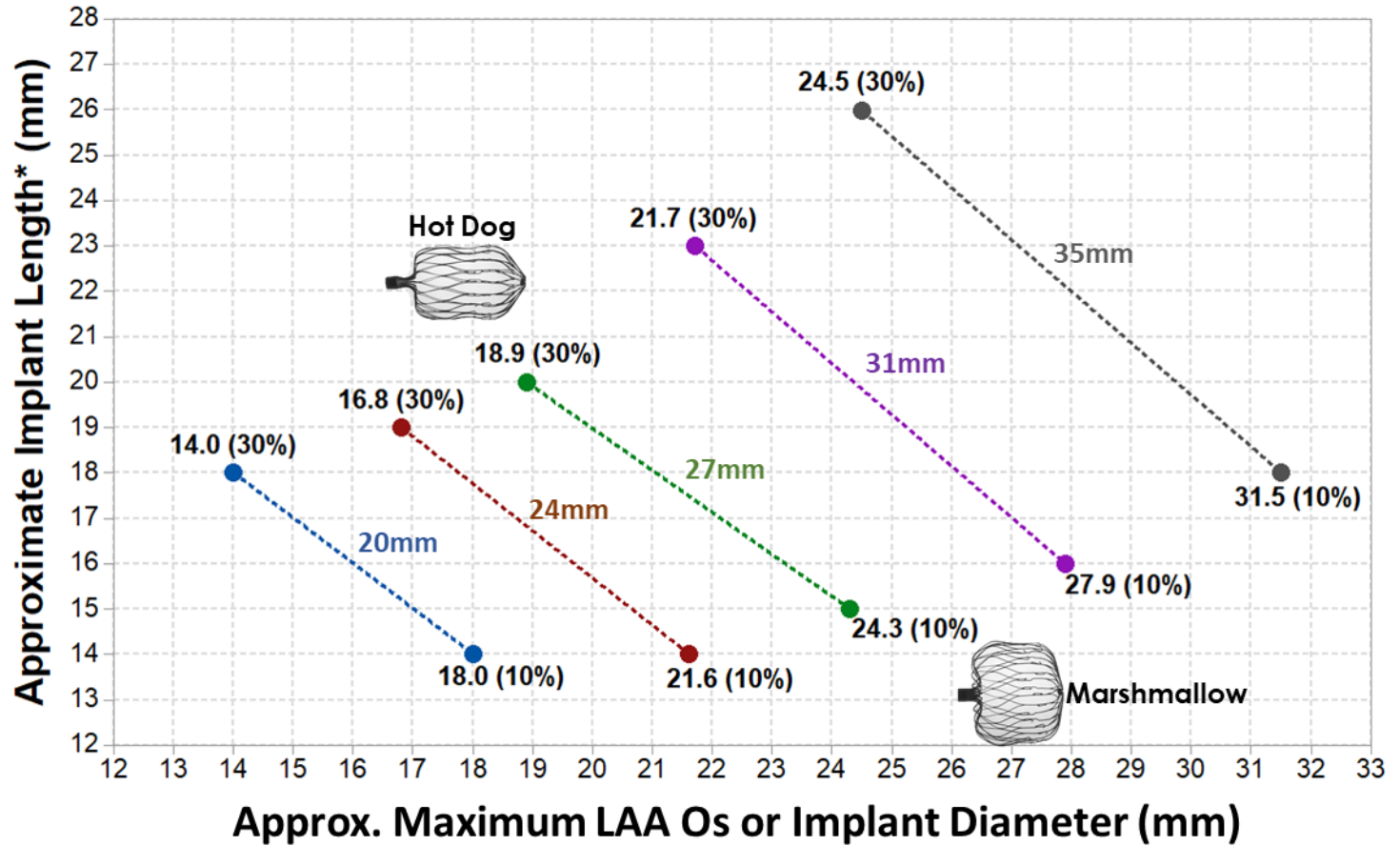
Bell



Hot-Dog



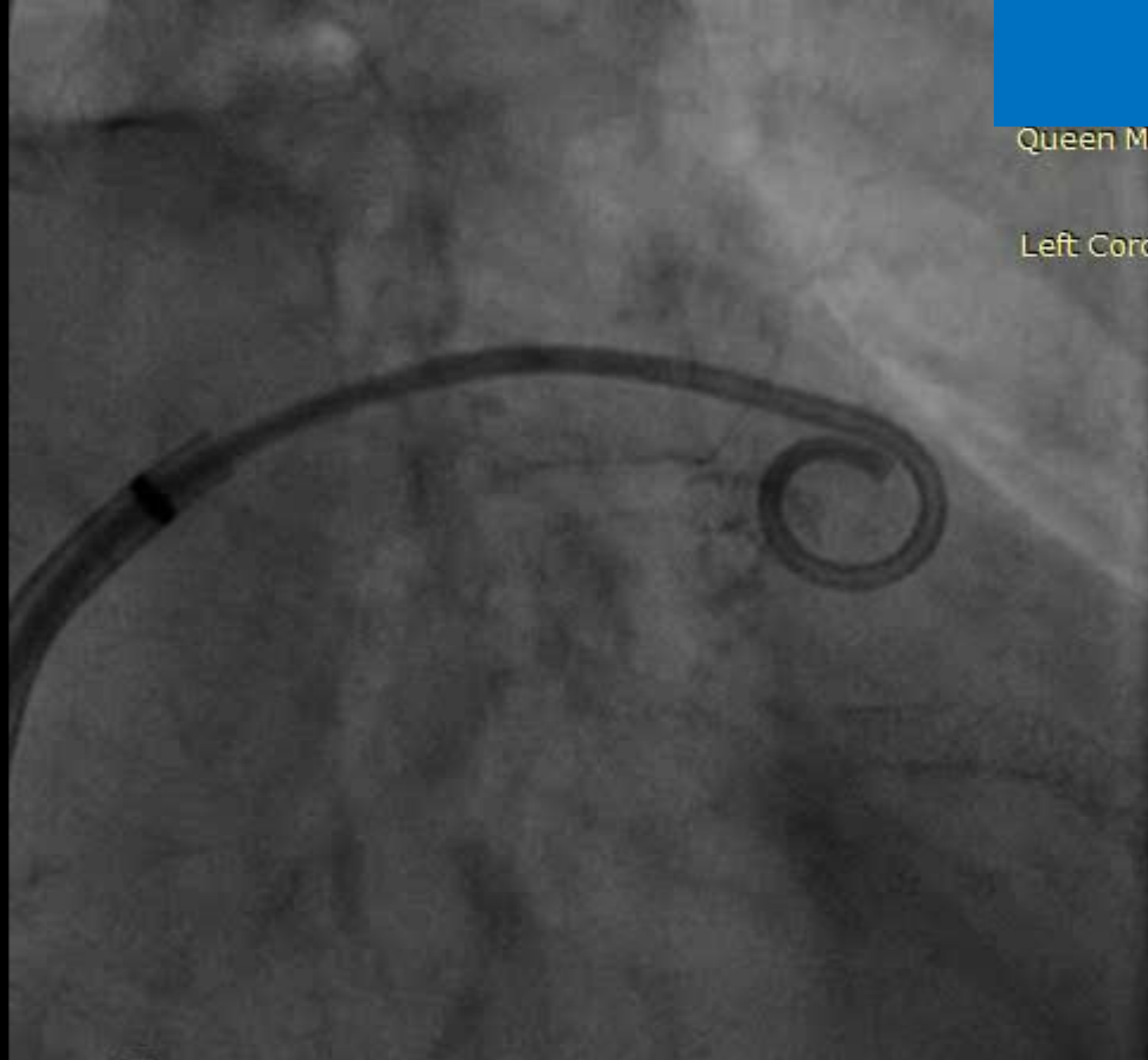
FLX Length vs Implant Diameter



Im: 1/68
Se: 6



Queen Mary Hospital
0720-2020
XA
Left Coronary 15 fps



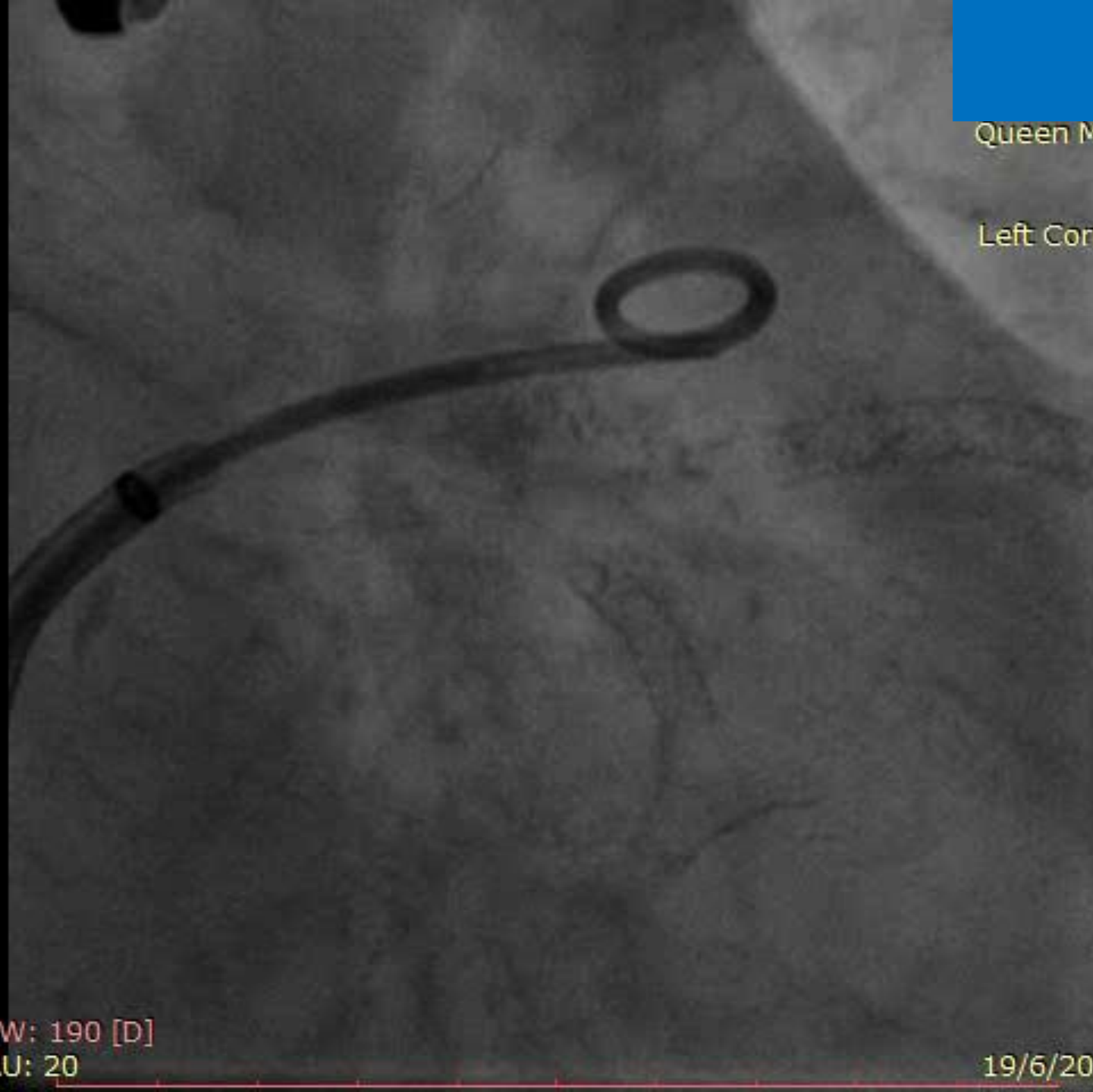
WL: 129 WW: 190 [D]
RAO: 30 CRA: 20

19/6/2020 17:07:19

Im: 1/79
Se: 7



Queen Mary Hospital
0720-2020
XA
Left Coronary 15 fps



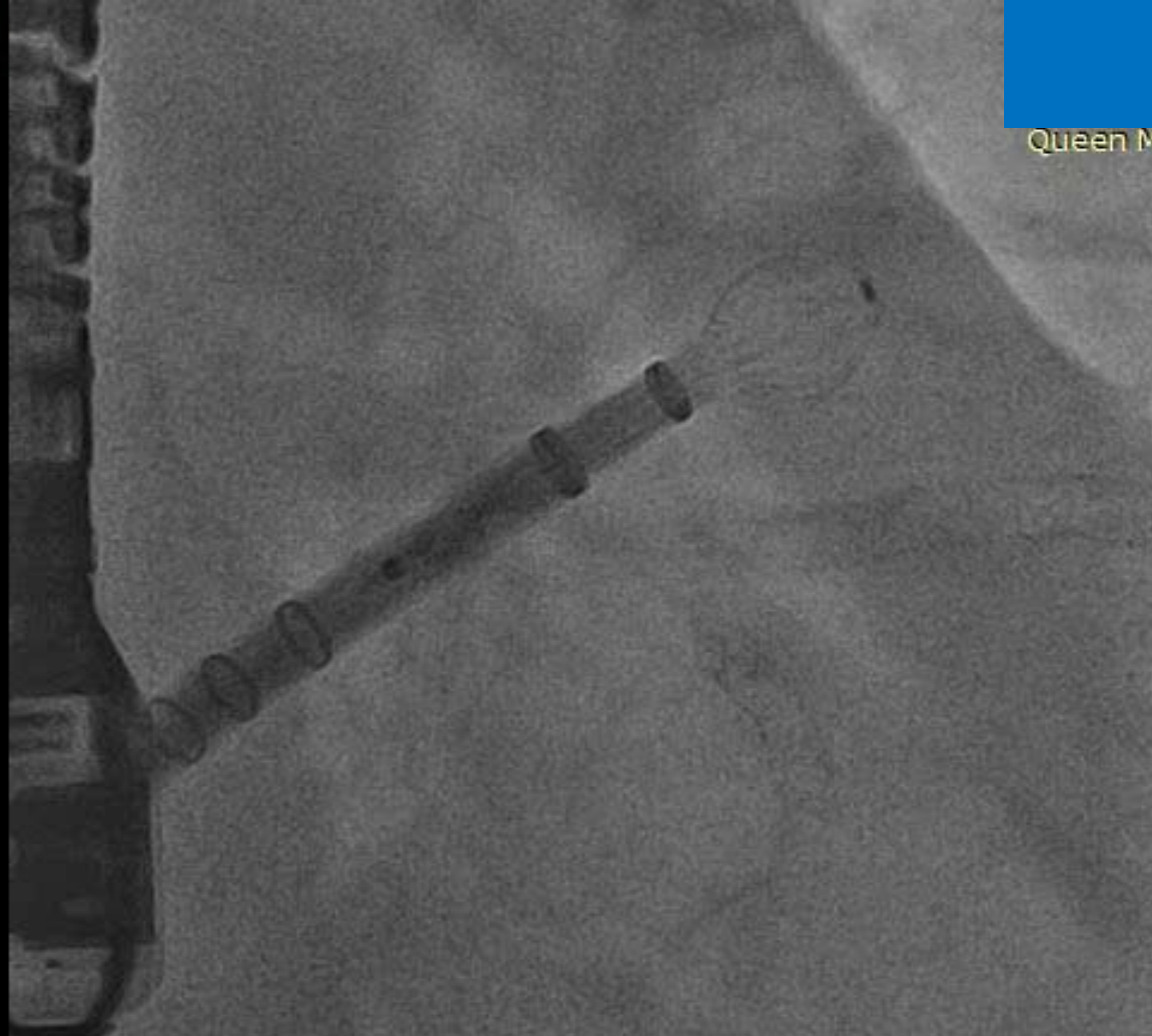
WL: 129 WW: 190 [D]
RAO: 30 CAU: 20

19/6/2020 17:08:07

Im: 1/242
Se: 19



Queen Mary Hospital
0720-2020
XA
Fluoroscopy



WL: 115 WW: 213 [D]
RAO: 30 CAU: 20

19/6/2020 17:25:05

Im: 1/13
Se: 20

Queen Mary Hospital
0720-2020
XA
Left Coronary 15 fps



WATCHMAN FLX 24mm

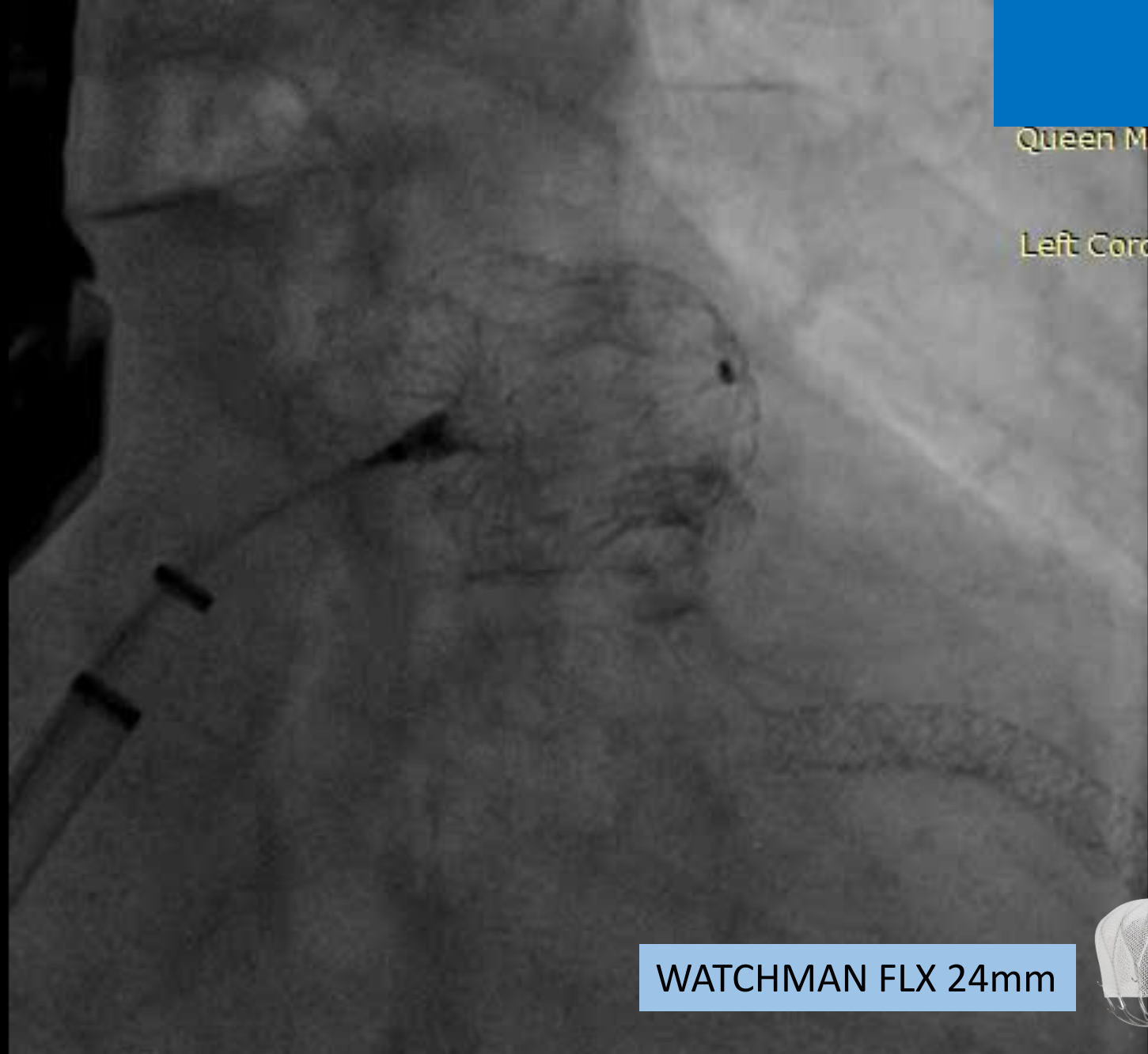


WL: 129 WW: 190 [D]
RAO: 30 CAU: 20

19/6/2020 17:25:25

Im: 1/29
Se: 26

Queen Mary Hospital
0720-2020
XA
Left Coronary 15 fps



WATCHMAN FLX 24mm



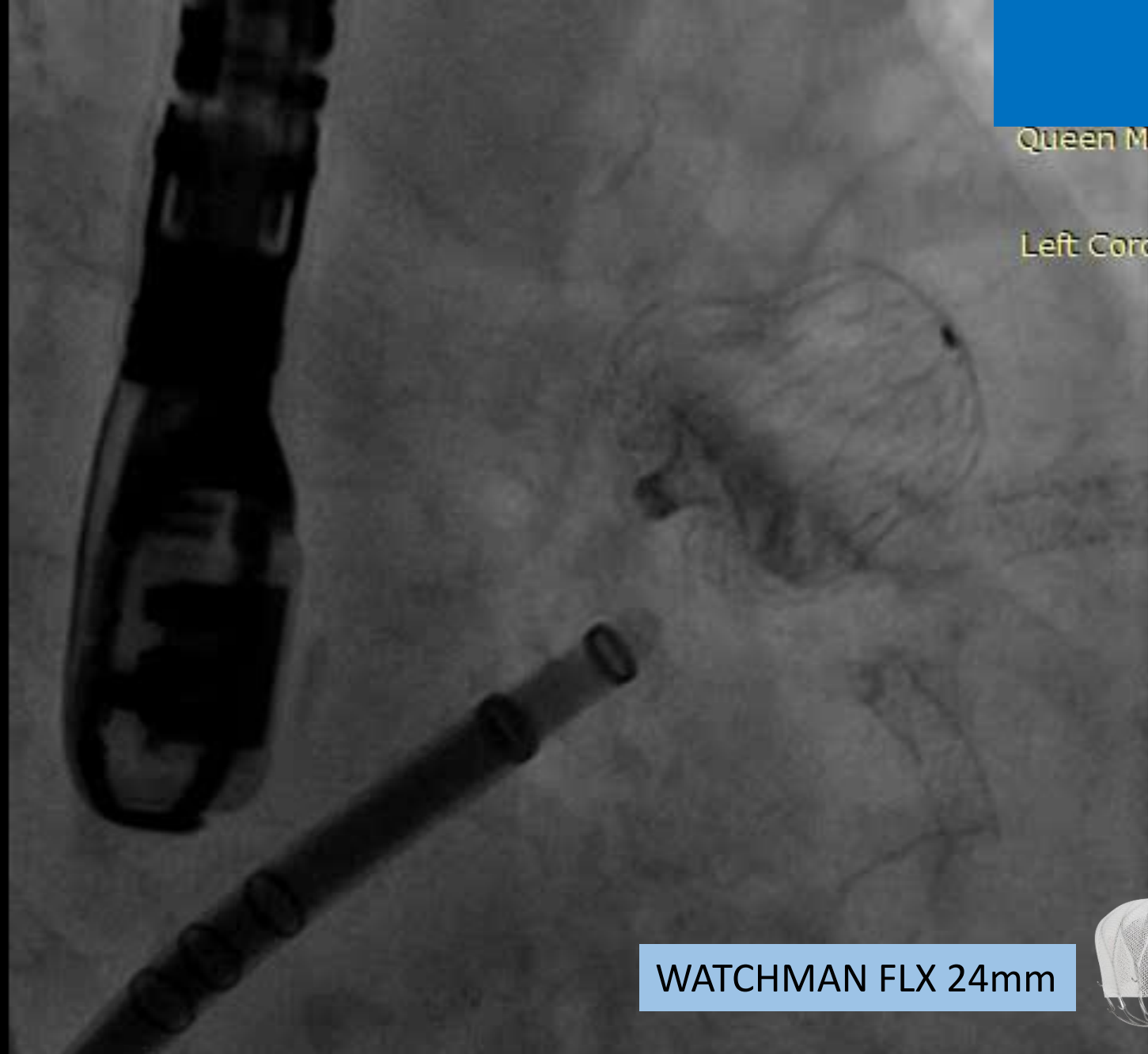
WL: 129 WW: 190 [D]
RAO: 30 CRA: 20

19/6/2020 17:32:43

Im: 1/33
Se: 31



Queen Mary Hospital
0720-2020
XA
Left Coronary 15 fps



WATCHMAN FLX 24mm



WL: 129 WW: 190 [D]
RAO: 30 CAU: 20

19/6/2020 17:35:29

Im: 1/42
Se: 32

Queen Mary Hospital
0720-2020
XA
Left Coronary 15 fps

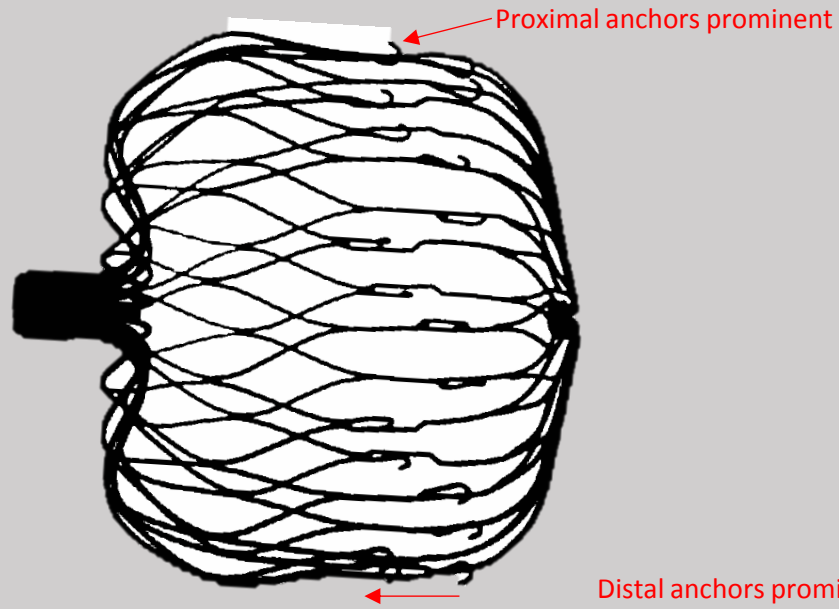


WATCHMAN FLX 24mm

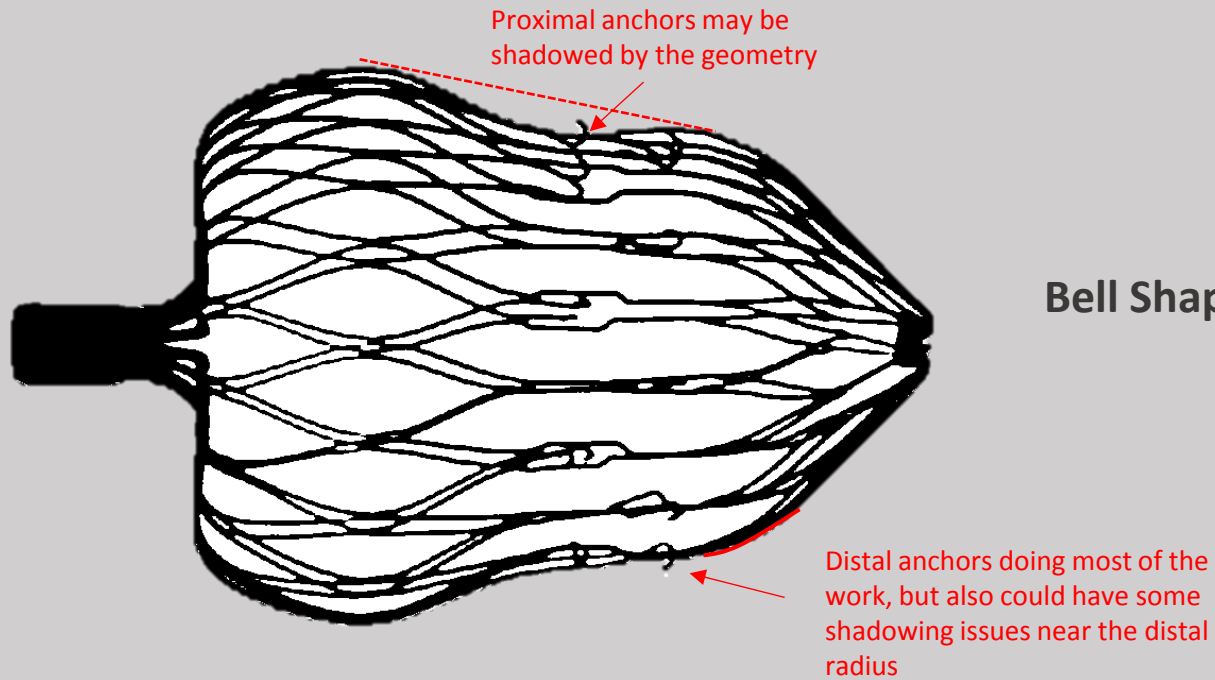


WL: 129 WW: 190 [D]
RAO: 30 CRA: 20

19/6/2020 17:35:46

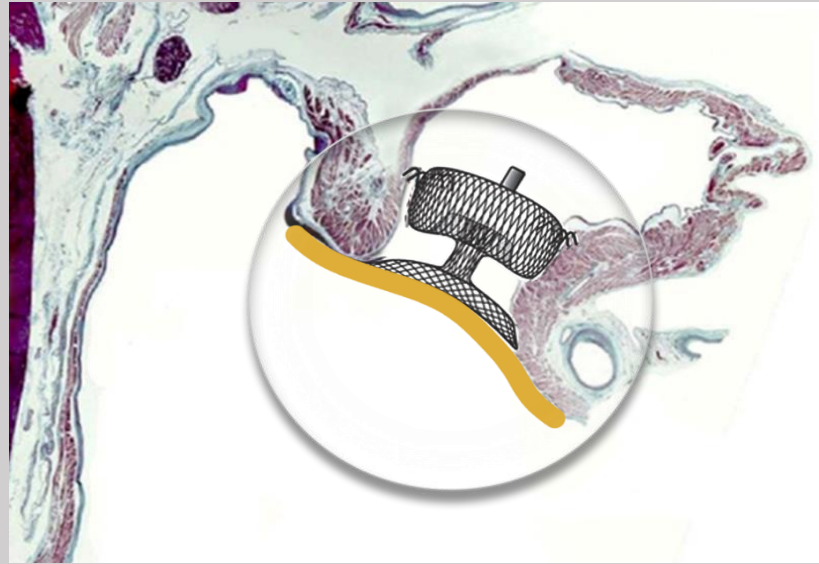


Marshmallow

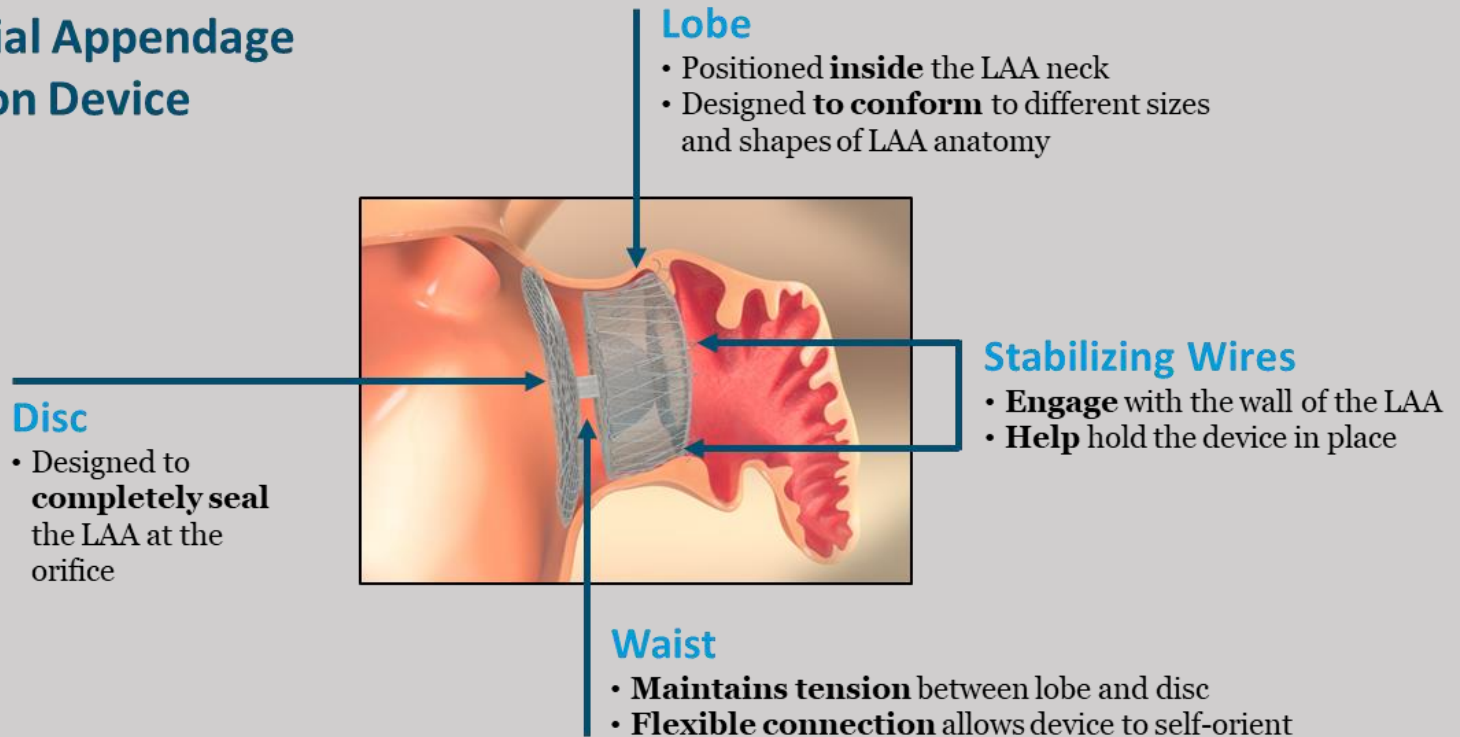


Bell Shape

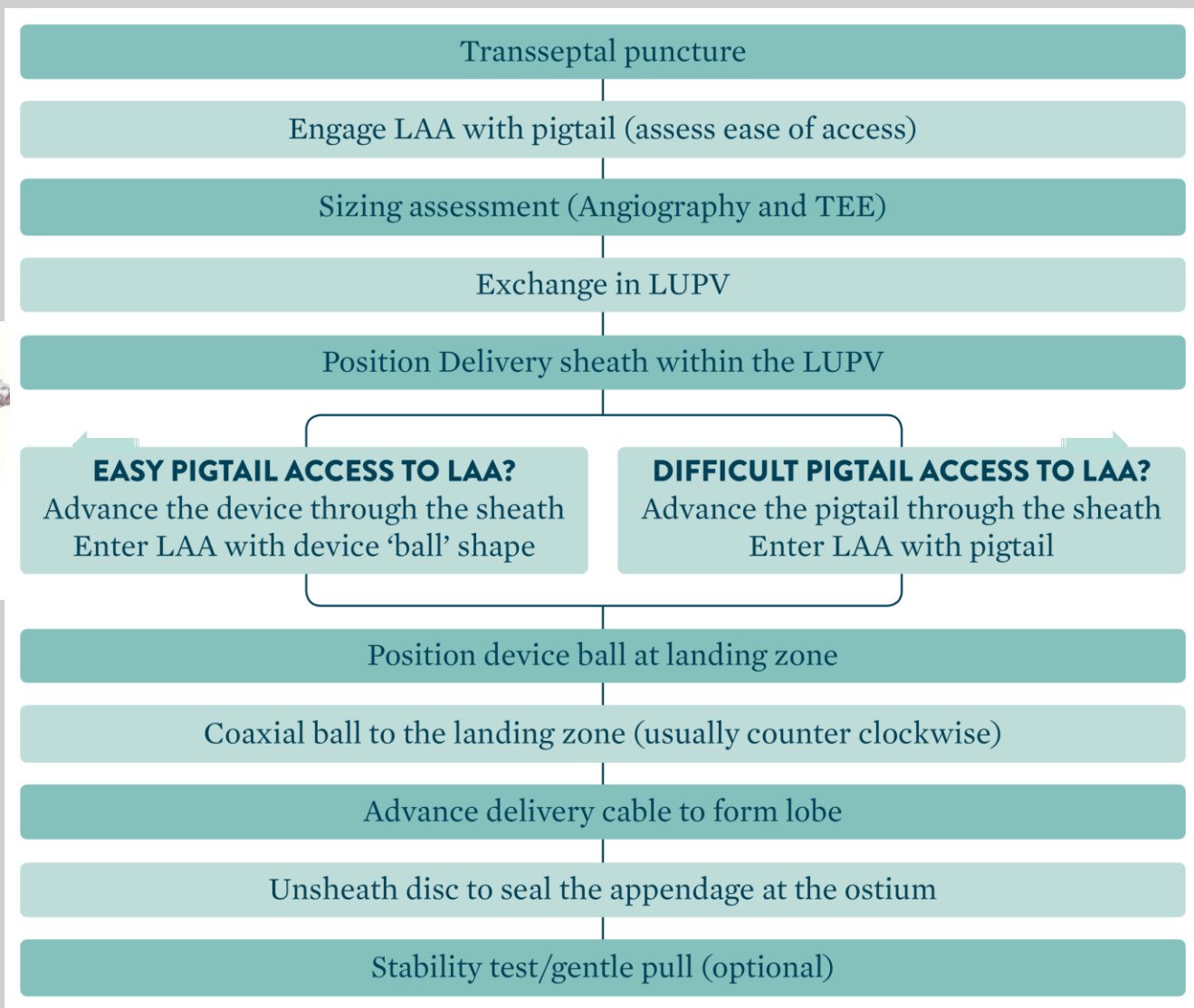
Abbott AMULET



Left Atrial Appendage Occlusion Device

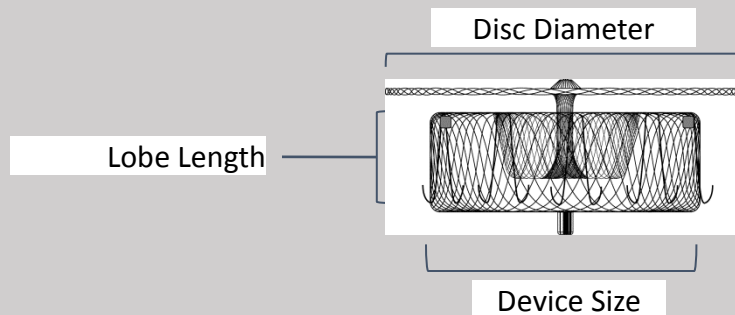


AMULET



Device Size Selection - Amulet

Maximum Landing Zone Width (mm)	Amulet™ Device Size	Lobe Length (mm)	Minimum LAA Depth (mm)	Disc Diameter (mm)	Sheath Diameter
11.0-13.0	16	7.5	≥ 10	22	12 F <i>or</i> 14 F (with adaptor)
13.0-15.0	18	7.5	≥ 10	24	
15.0-17.0	20	7.5	≥ 10	26	
17.0-19.0	22	7.5	≥ 10	28	
19.0-22.0	25	10	≥ 12	32	
22.0-25.0	28	10	≥ 12	35	14 F
25.0-28.0	31	10	≥ 12	38	
28.0-31.0	34	10	≥ 12	41	





Im: 1/57

Seq: 16

Landing Zone 25mm

AMULET #28mm

Queen Mary Hospital

0342-2017

XA

Left Coronary 15 fps

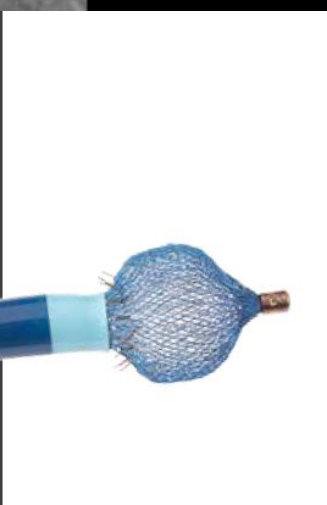
WL: 129 WW: 190 [D]

RAO: 30 CAU: 20

10/3/2017 17:14:25

Im: 1/300
Se: 17

Queen Mary Hospital
0342-2017
XA
Fluoroscopy



WL: 115 WW: 213 [D]
RAO: 30 CAU: 20

Im: 1/300
Se: 18



Queen Mary Hospital
0342-2017
XA
Fluoroscopy

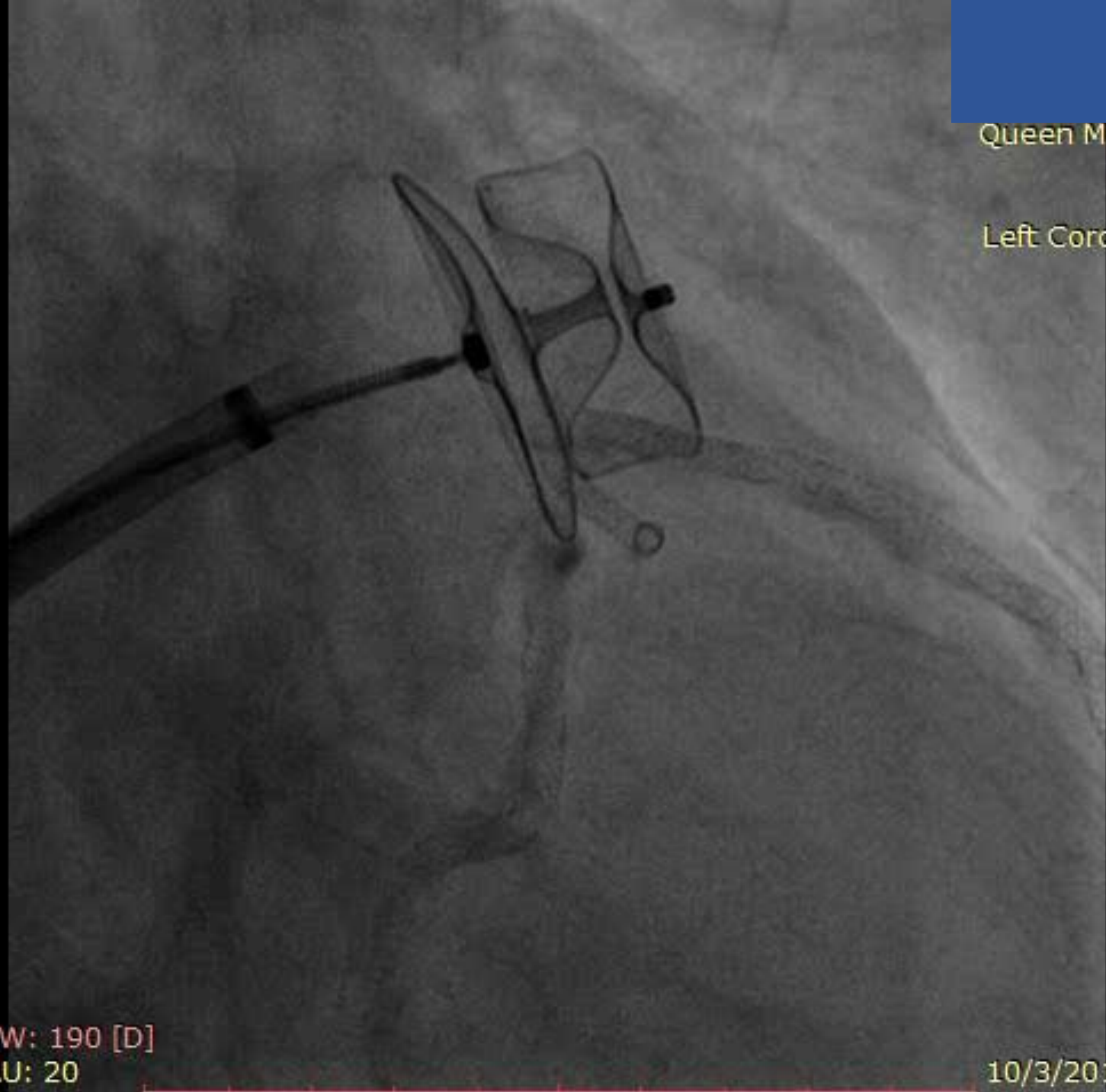


WL: 115 WW: 213 [D]
RAO: 30 CAU: 20

10/3/2017 17:17:21

Im: 1/60
Se: 19

Queen Mary Hospital
0342-2017
XA
Left Coronary 15 fps

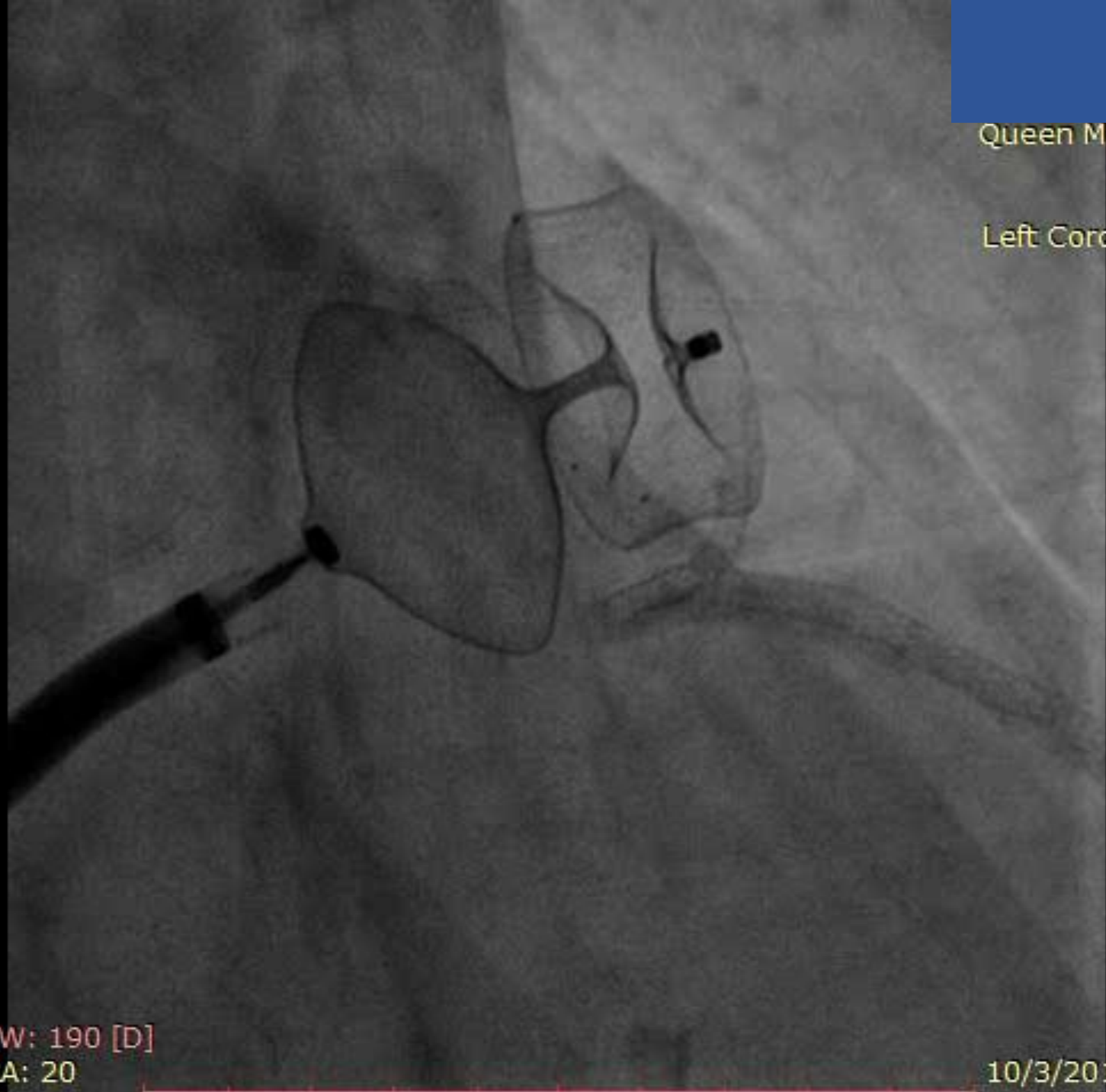


WL: 129 WW: 190 [D]
RAO: 30 CAU: 20

10/3/2017 17:18:13

Im: 1/15
Se: 24

Queen Mary Hospital
0342-2017
XA
Left Coronary 15 fps



WL: 129 WW: 190 [D]
RAO: 30 CRA: 20

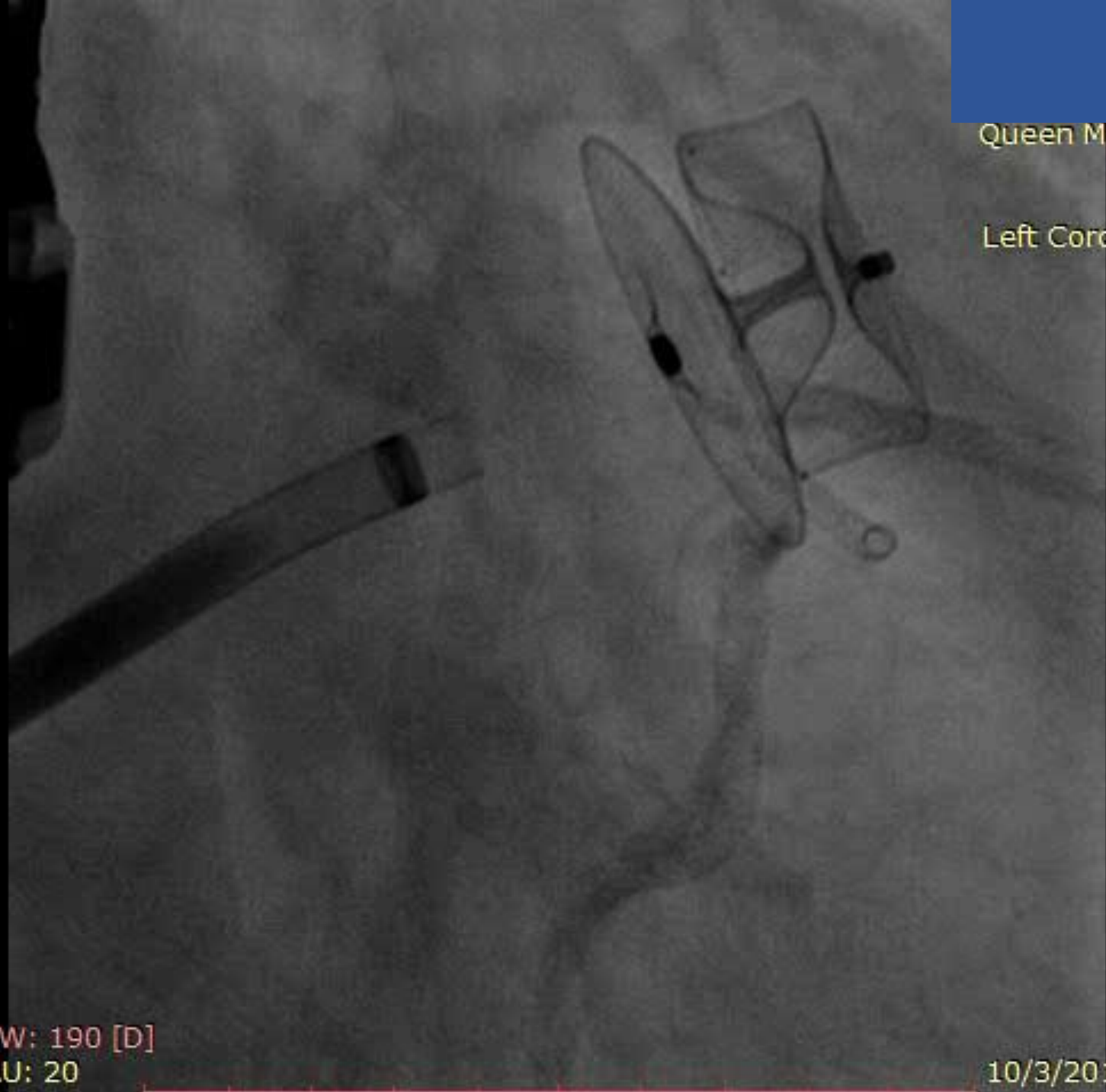
10/3/2017 17:22:25

Im: 1/53
Se: 31

Queen Mary Hospital
0342-2017
XA
Left Coronary 15 fps

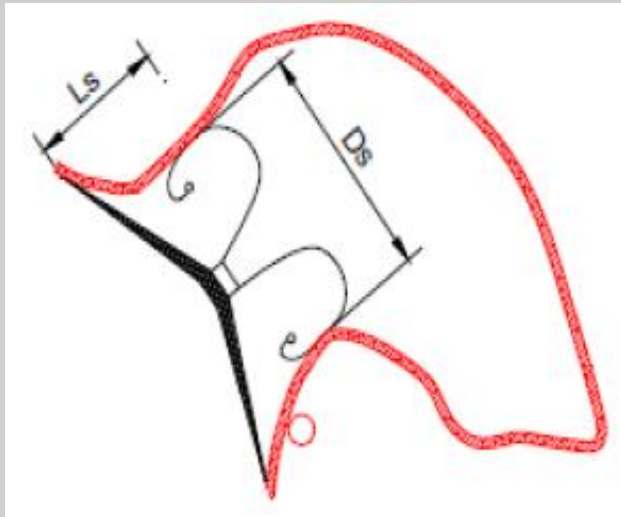
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RAO: 30 CAU: 20

10/3/2017 17:29:23

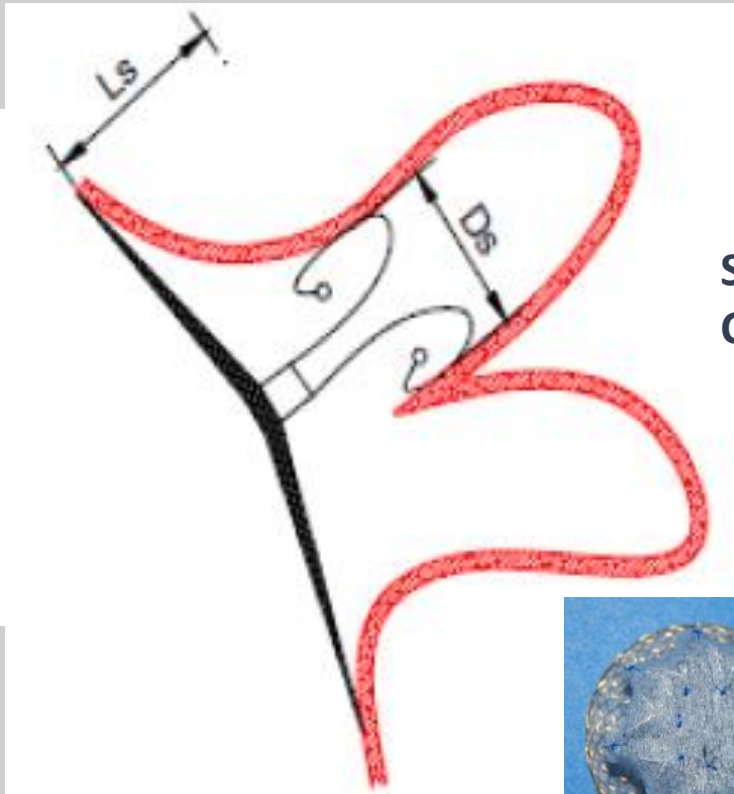


Special LAA Morphology

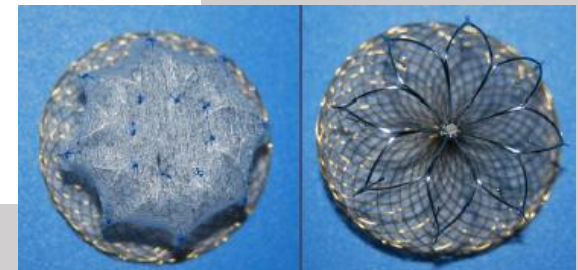
- Small LAA
- LAA with multiple lobes and restrictive septum
- Special design of **L**Ambre **D**evice



Size: 16-36mm
Cover 4-6mm larger



Size: 16-26mm
Cover 12mm larger



Im: 1/57
Se: 3

Queen Mary Hospital
1139-2018
XA
Left Coronary 15 fps

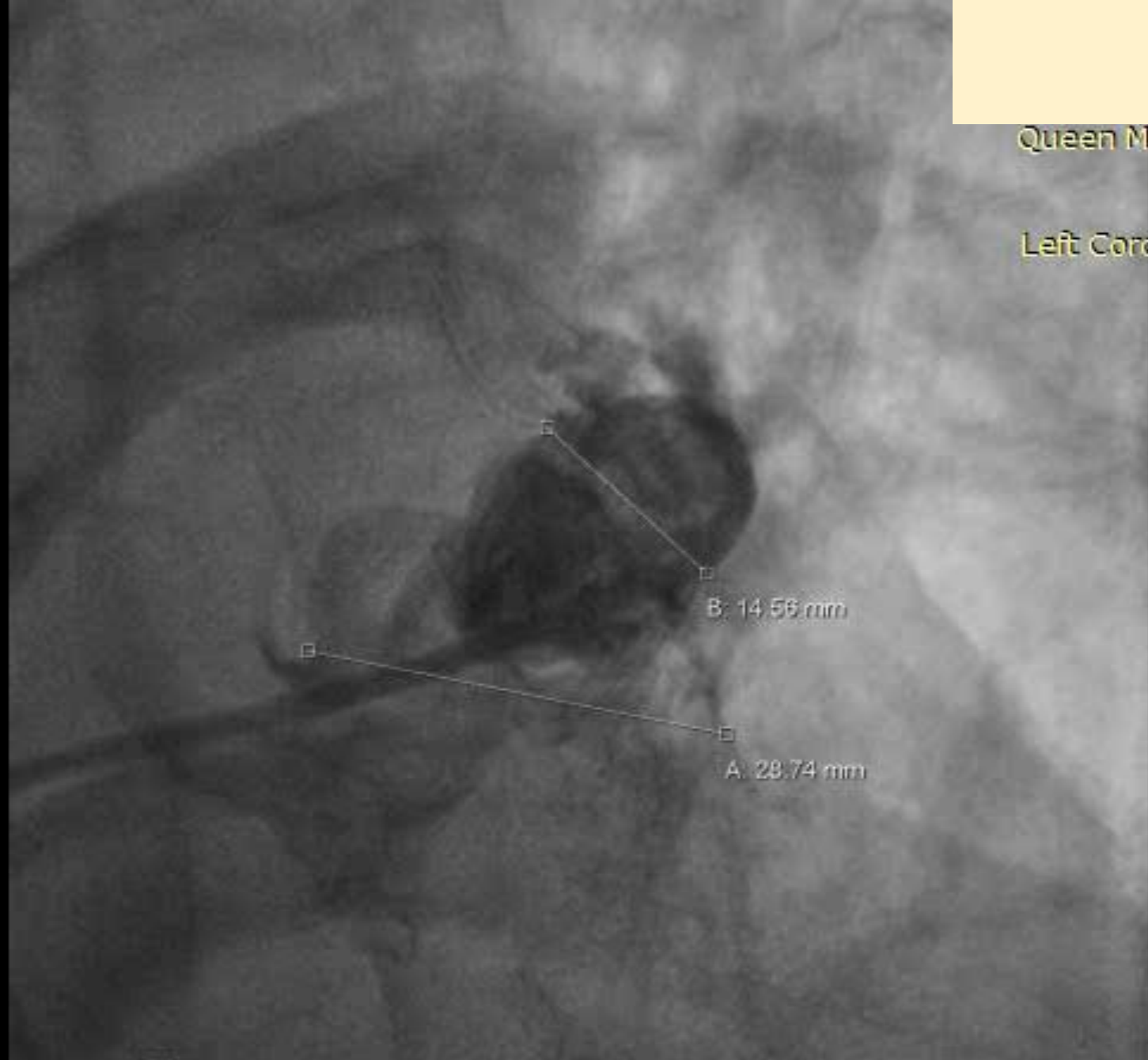


WL: 129 WW: 190 [D]
RAO: 30 CRA: 20

31/8/2018 12:28:26 PM

Im: 1/1
Se: 3

Queen Mary Hospital
1139-2018
XA
Left Coronary 15 fps



B: 14.56 mm

A: 28.74 mm

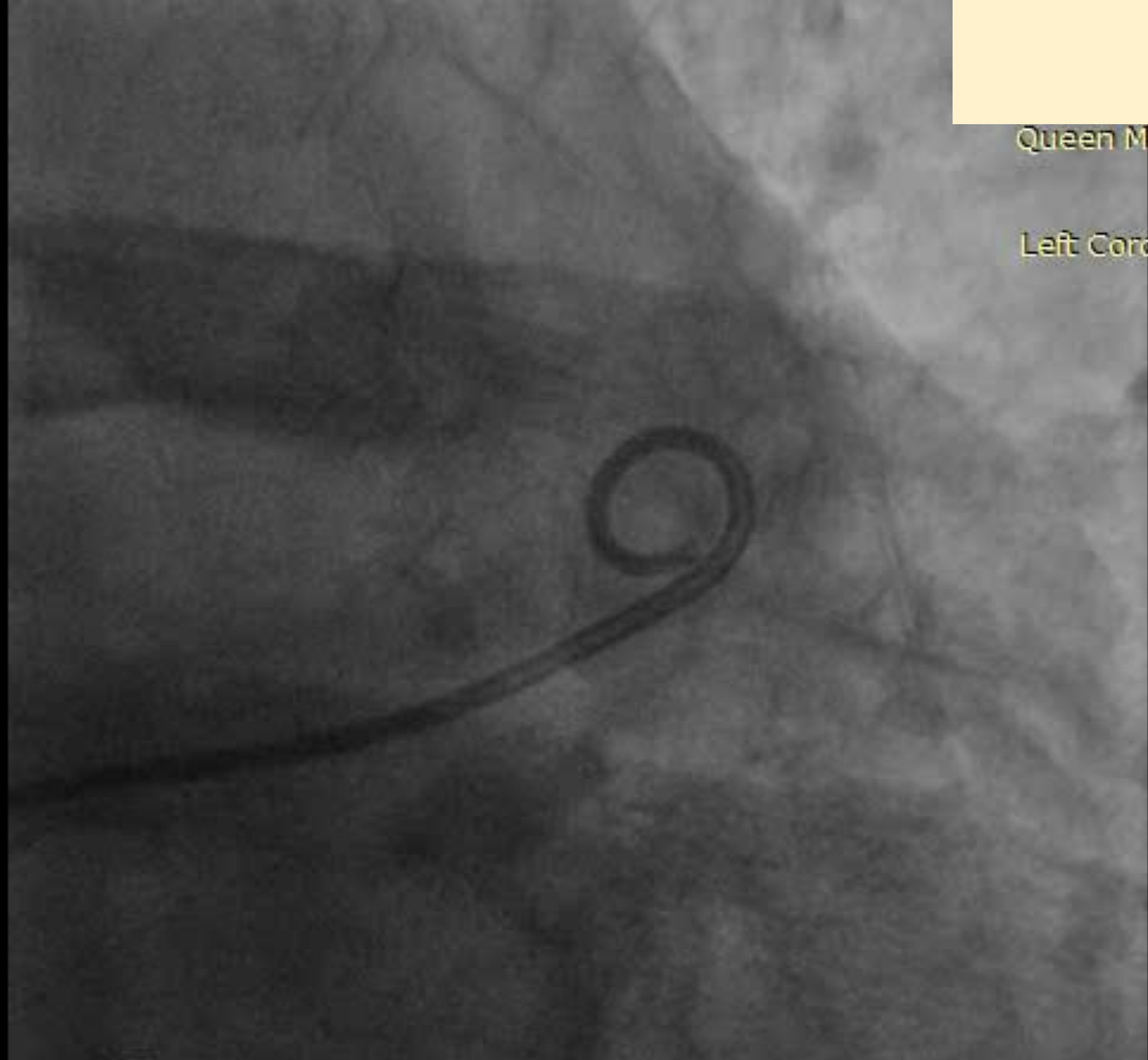
WL: 512 WW: 1024 [D]

CF: 0.1294 mm/pix

31/8/2018 12:28:26 PM

Im: 1/63
Se: 4

Queen Mary Hospital
1139-2018
XA
Left Coronary 15 fps

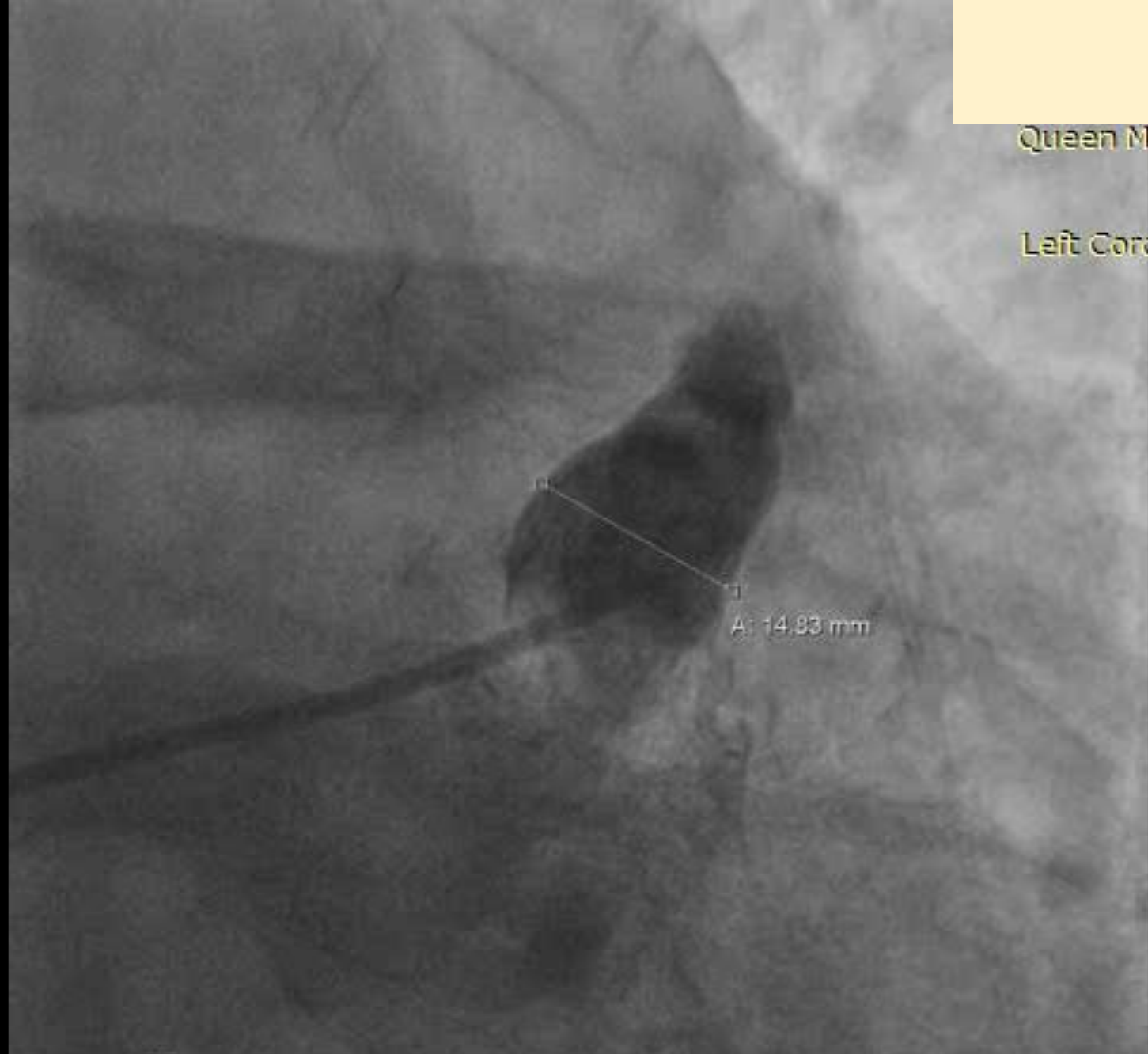


WL: 129 WW: 190 [D]
RAO: 30 CAU: 20

31/8/2018 12:29:32 PM

Im: 1/1
Se: 4

Queen Mary Hospital
1139-2018
XA
Left Coronary 15 fps

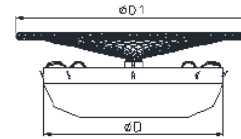
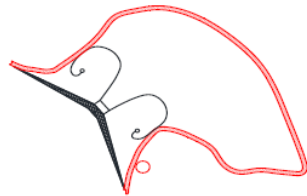
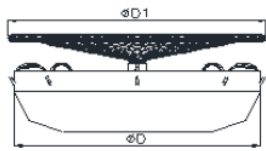


WL: 512 WW: 1024 [D]

CF 0.1304 mm/pix

31/8/2018 12:29:32 PM

Device Sizes and Corresponding Delivery Systems of LAMBRE



Cat.	Diameter of Umbrella(mm)	Diameter of Cover(mm)	Delivery system
LT-LAA-1622	16	22	8F-900 9F-900
LT-LAA-1824	18	24	10F-900
LT-LAA-2026	20	26	9F-900
LT-LAA-2228	22	28	10F-900
LT-LAA-2430	24	30	
LT-LAA-2632	26	32	
LT-LAA-2834	28	34	
LT-LAA-3036	30	36	
LT-LAA-3236	32	36	
LT-LAA-3438	34	38	
LT-LAA-3640	36	40	

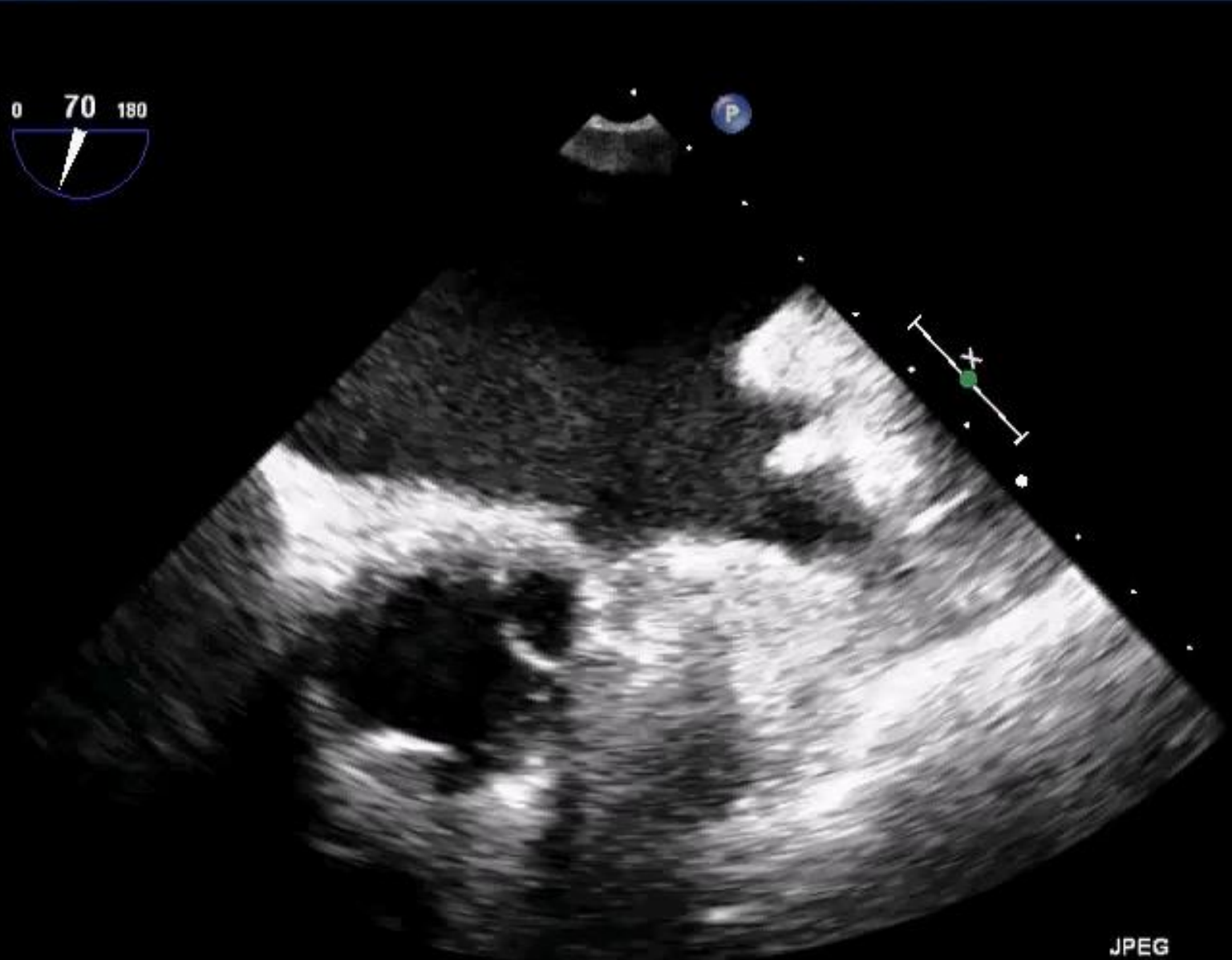
Cat.	Diameter of Umbrella(mm)	Diameter of Cover(mm)	Delivery system
LT-LAA-1630	16	30	9F-900 10F-900
LT-LAA-1832	18	32	
LT-LAA-2032	20	32	
LT-LAA-2234	22	34	10F-900
LT-LAA-2436	24	36	
LT-LAA-2638	26	38	

FR 50Hz
11cm

2D
69%
C 50
P Off
HGen



M4



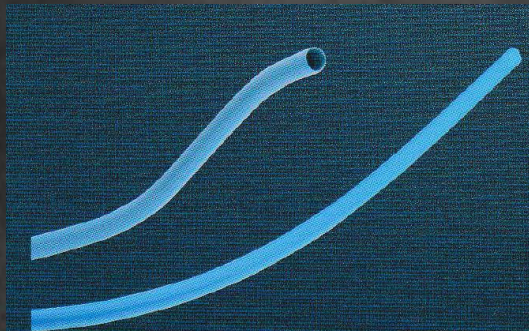
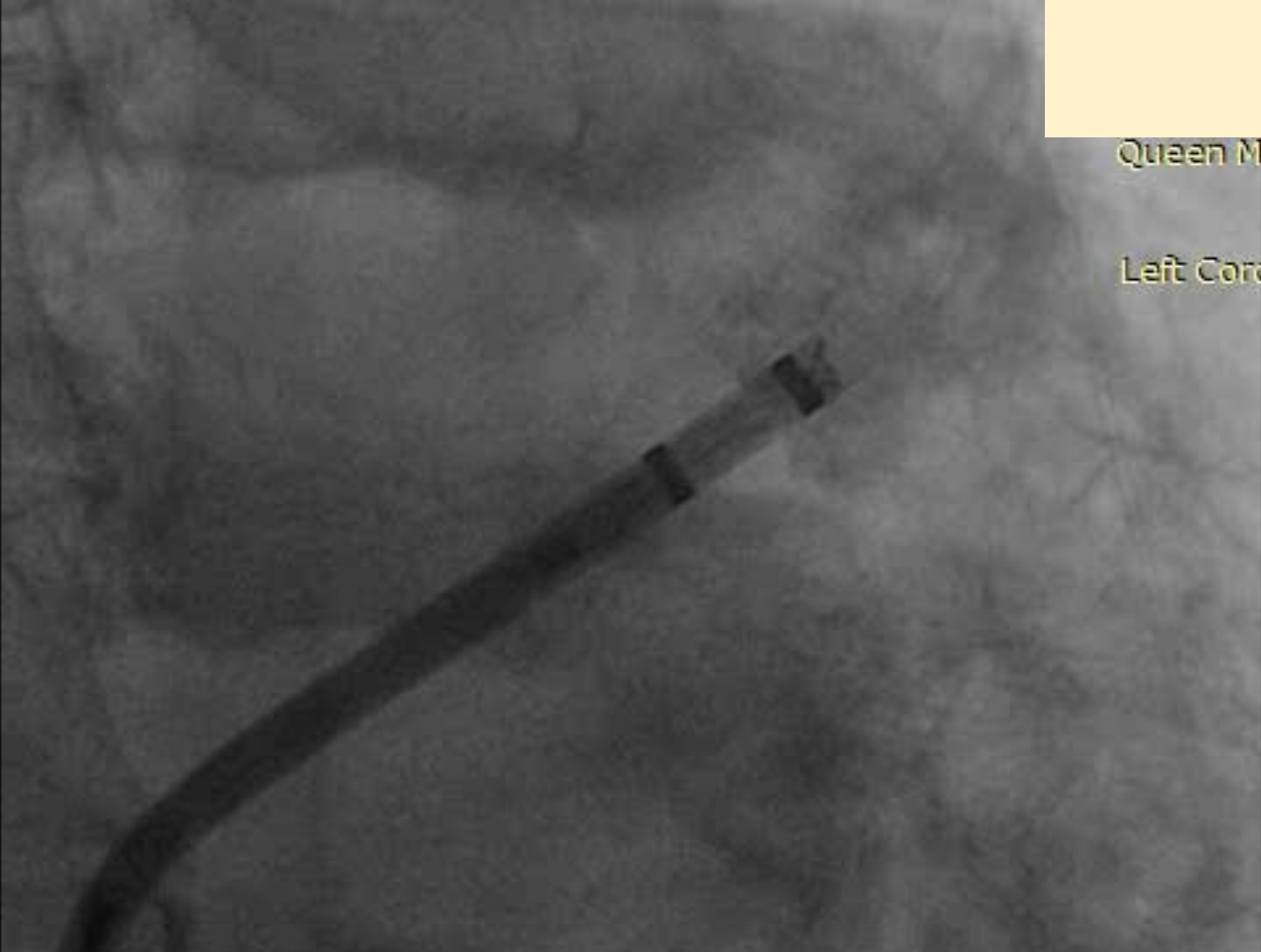
JPEG

PAT T: 37.0C
TEE T: 39.1C

72 bpm

Im: 1/25
Se: 26

Queen Mary Hospital
1139-2018
XA
Left Coronary 15 fps



The delivery system

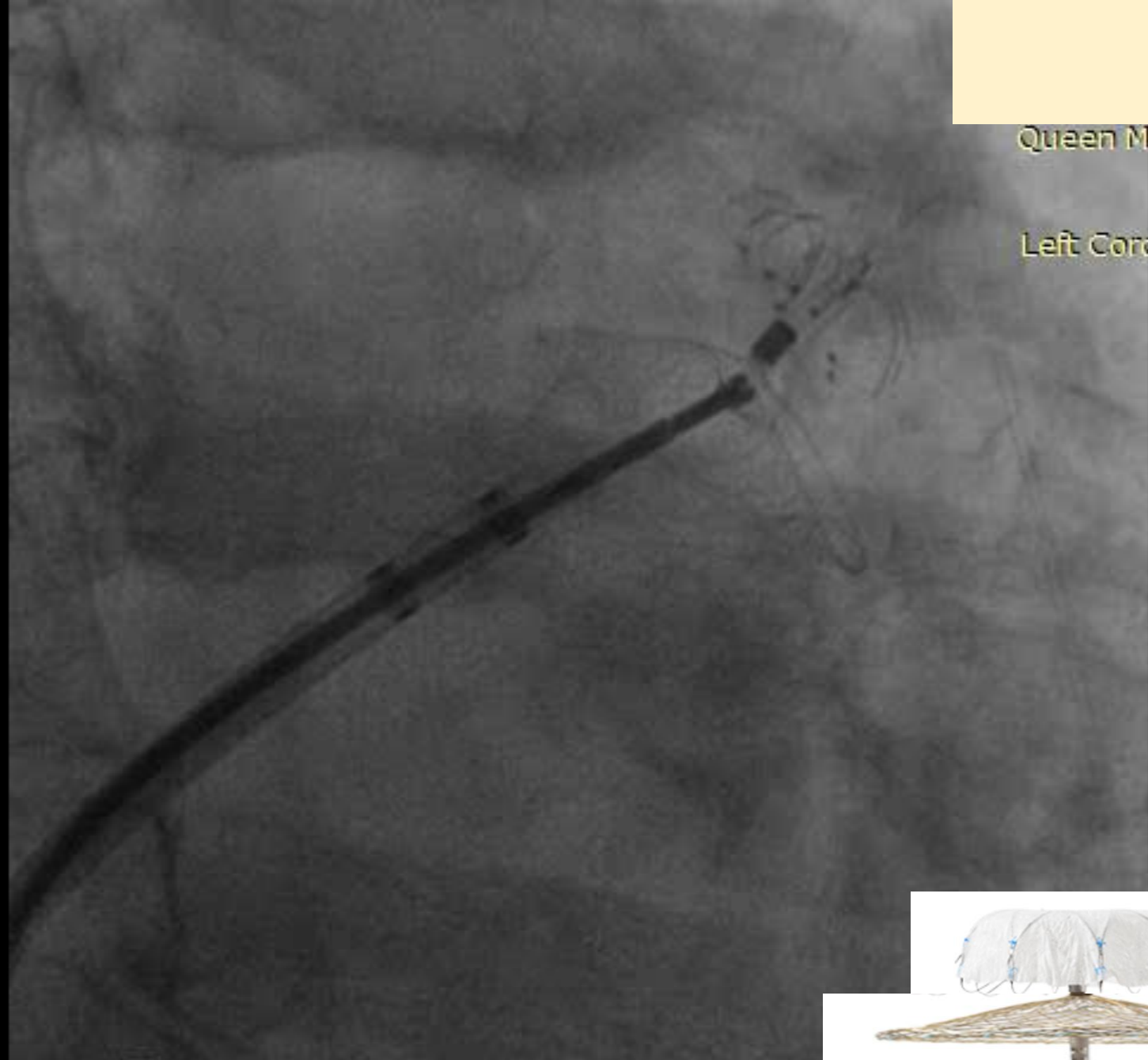
- double curves (45° X 30°) of distal tip
- single curve (45°) of distal tip

8-10 Fr. small delivery sheath

WL: 129 WW: 190 [D]
RAO: 30 CAU: 20

Im: 1/47
Se: 31

Queen Mary Hospital
1139-2018
XA
Left Coronary 15 fps

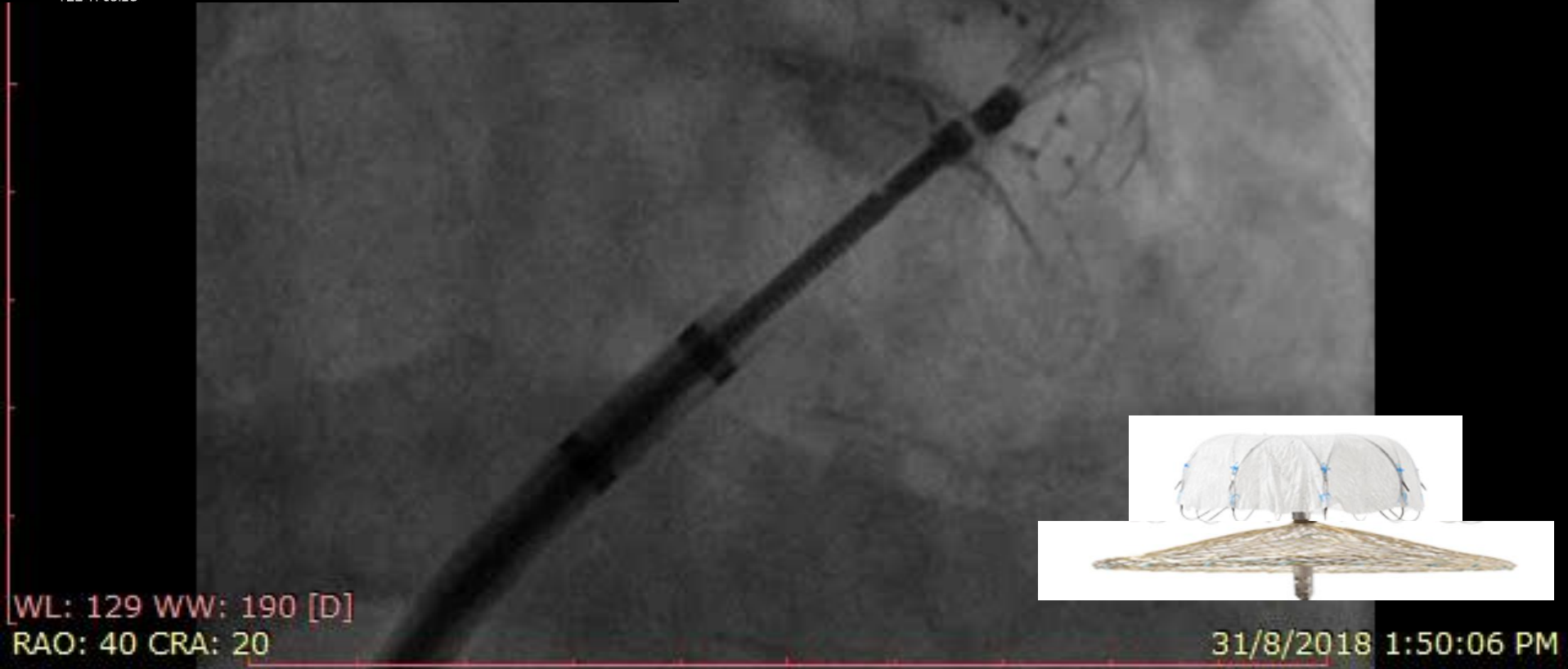


WL: 129 WW: 190 [D]
RAO: 30 CAU: 20

31/8/2018 1:47:24 PM

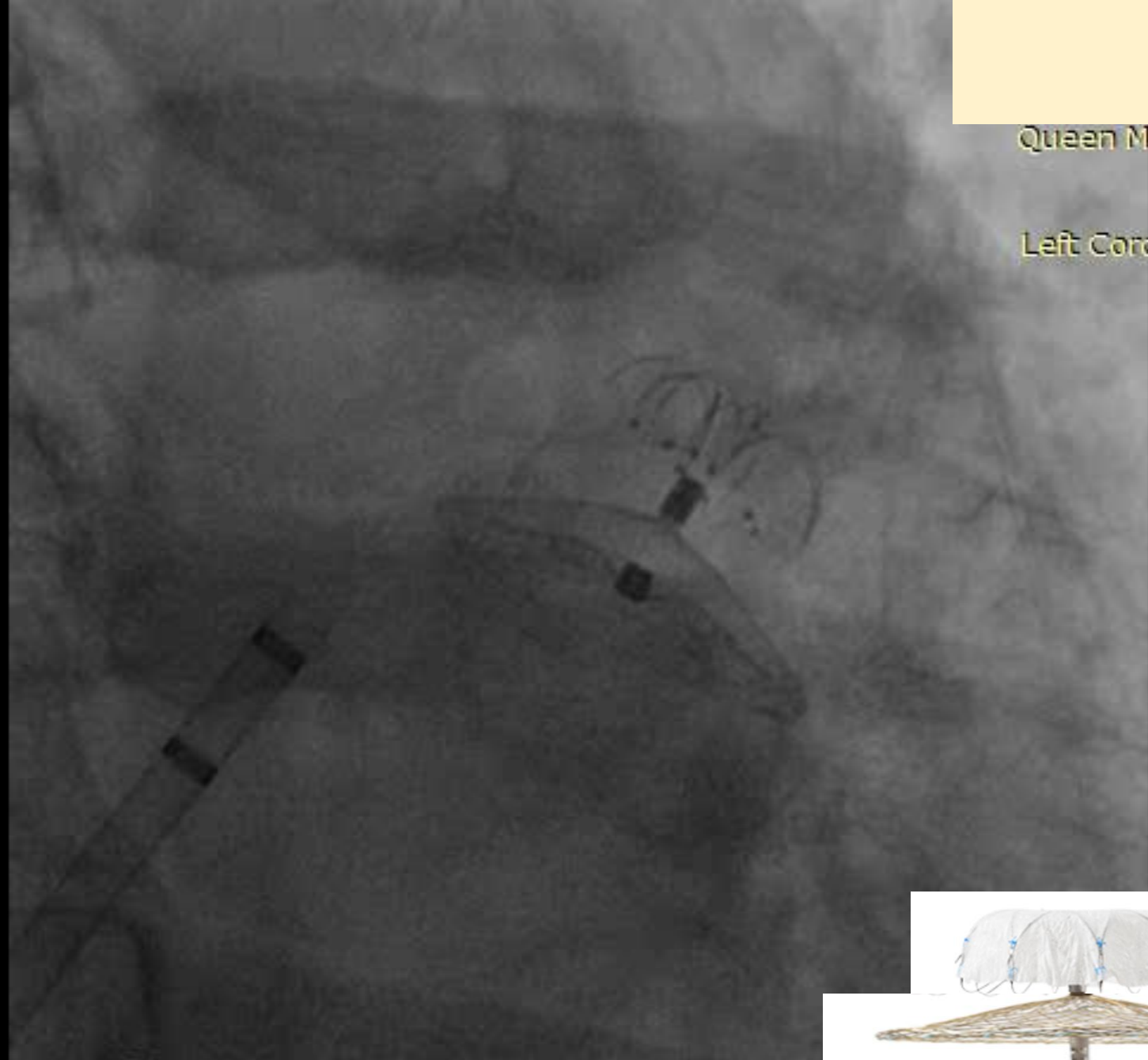


Queen Mary Hospital
1139-2018
XA
Left Coronary 15 fps



Im: 1/67
Se: 41

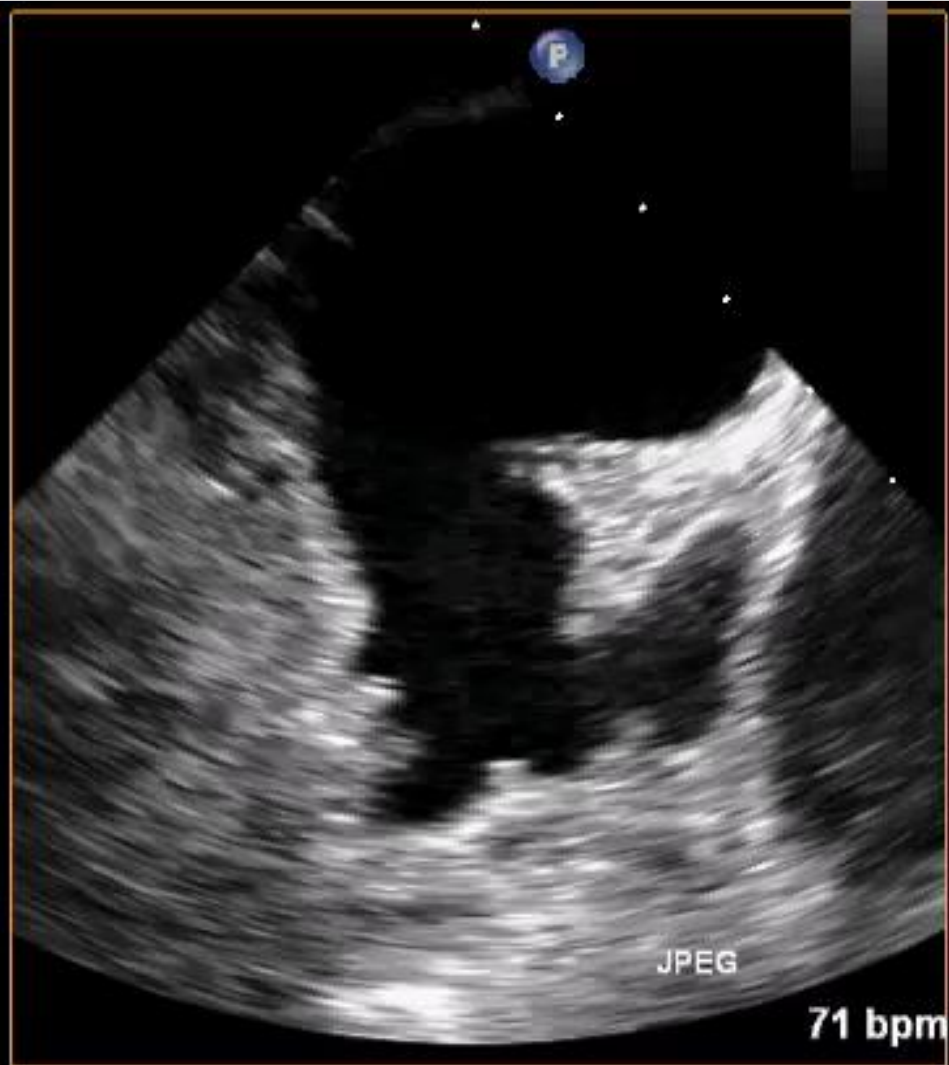
Queen Mary Hospital
1139-2018
XA
Left Coronary 15 fps

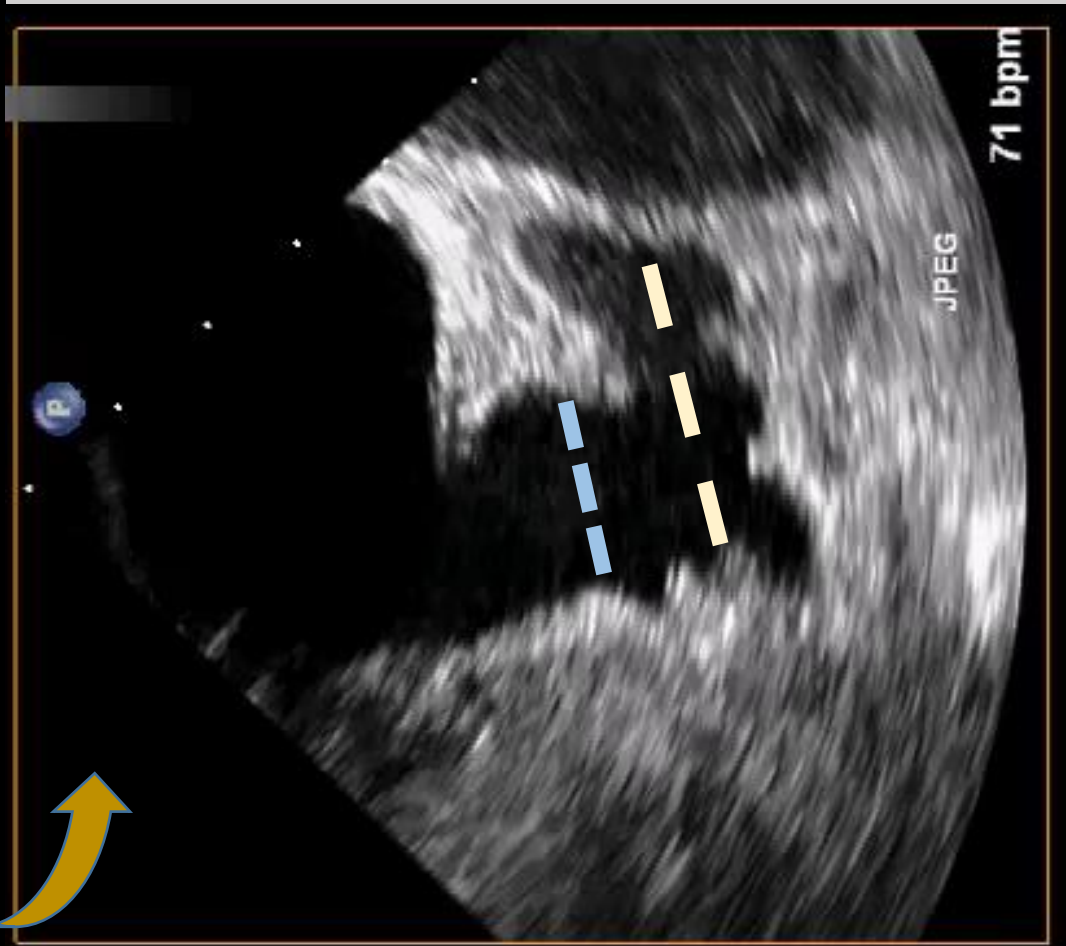
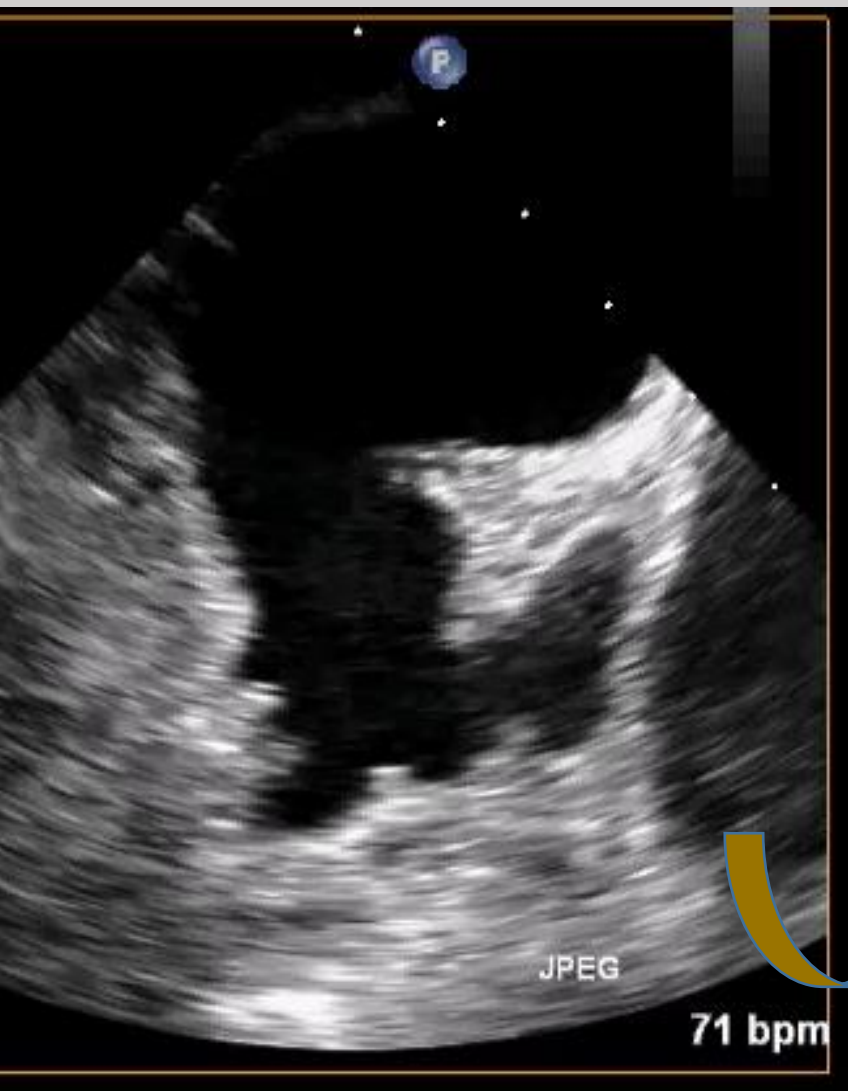


WL: 129 WW: 190 [D]
RAO: 30 CAU: 20

31/8/2018 1:53:58 PM

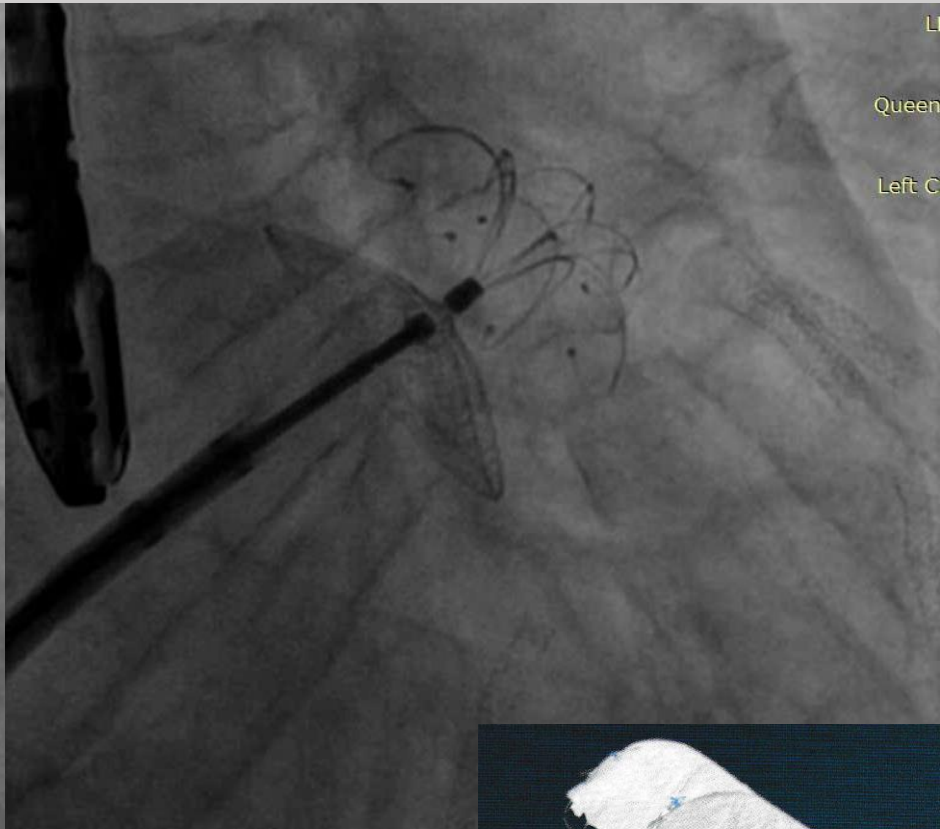
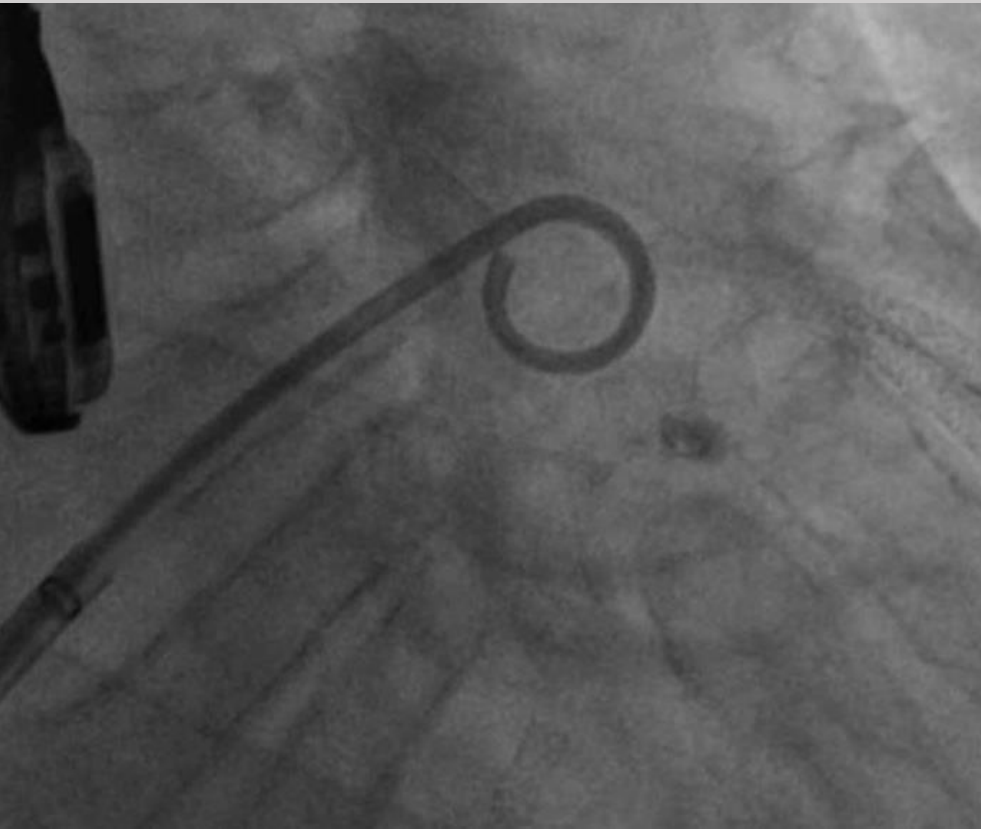
- ACP/LAMBRE in poor defined landing zone/chicken wing anatomy with short neck – **Sandwich technique**
 - overcome challenging anatomies
 - extreme chicken wing type
 - secured position
 - forgiving extreme angles





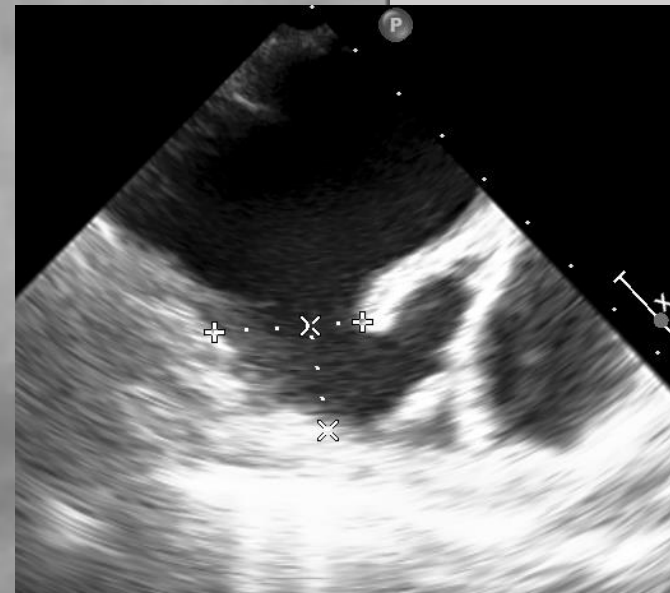
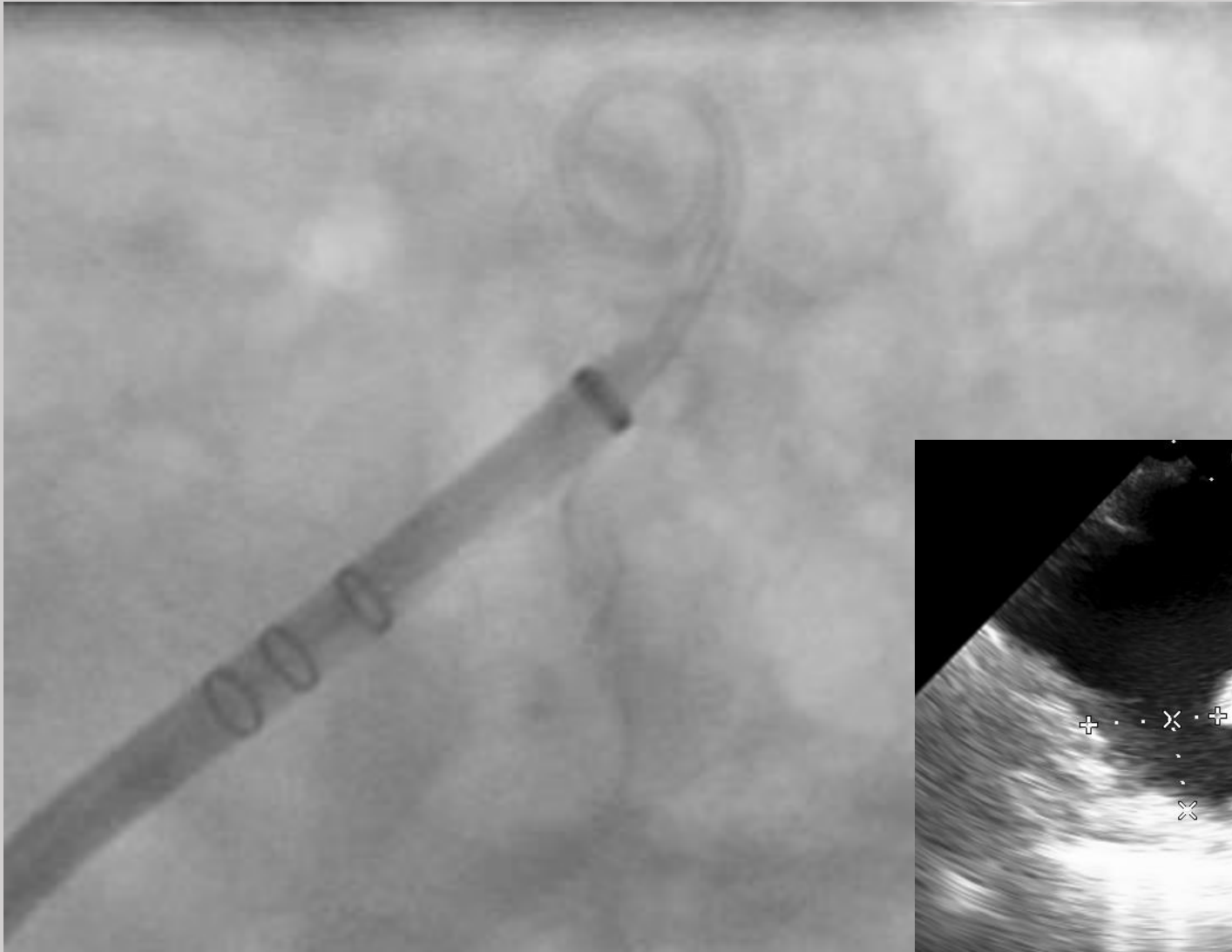
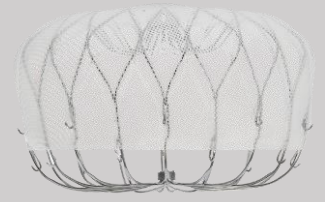
TEE 135 correlates with RAO 30 CRAU 20

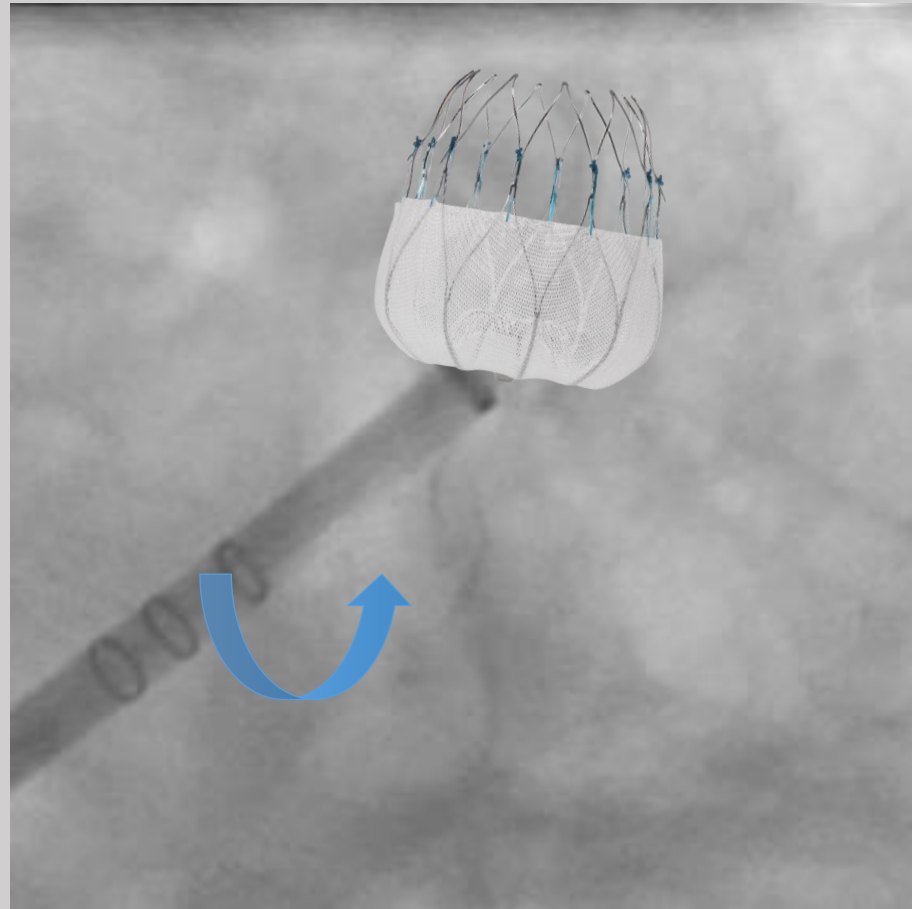




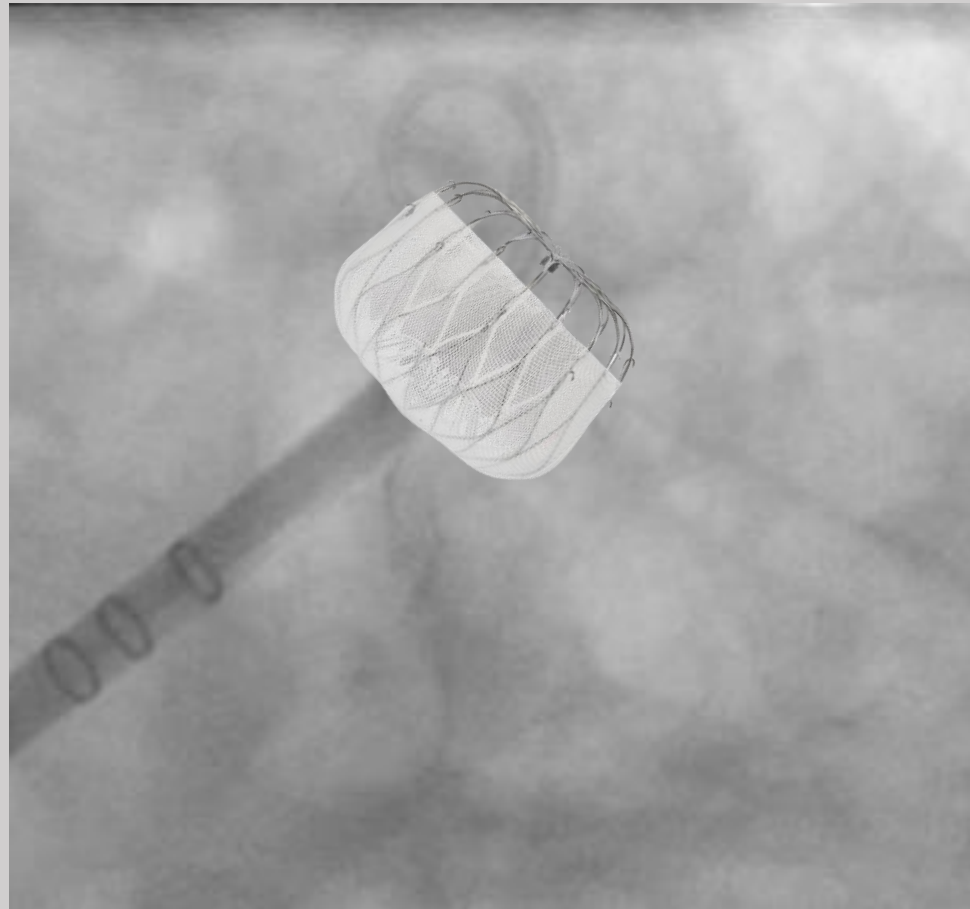
L
Queen
Left C

Watchman FLX – Anterior Chicken Wing Anatomy



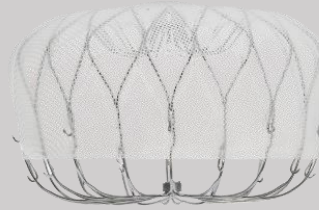


Watchman



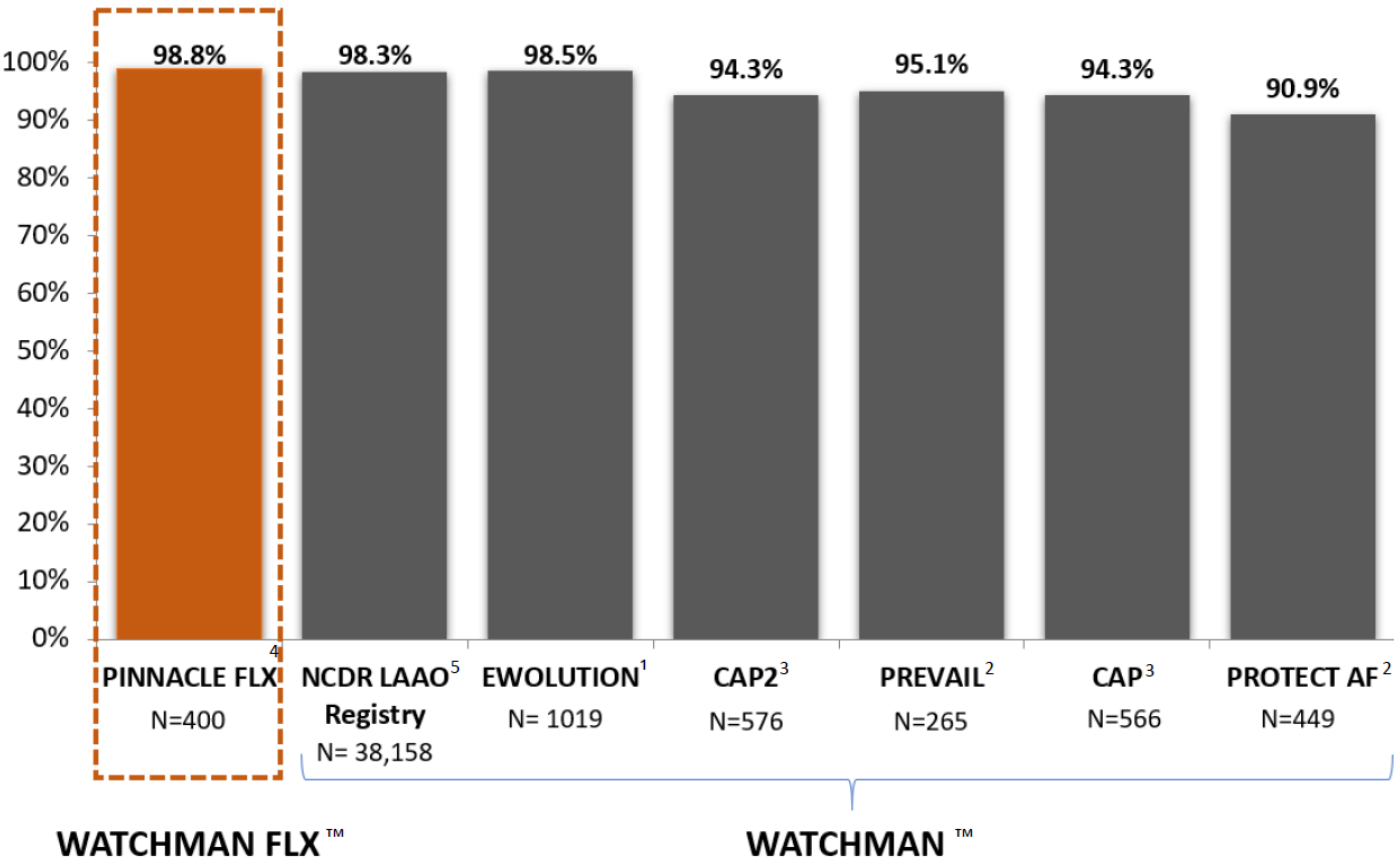
Watchman FLX

PINNACLE FLX Study



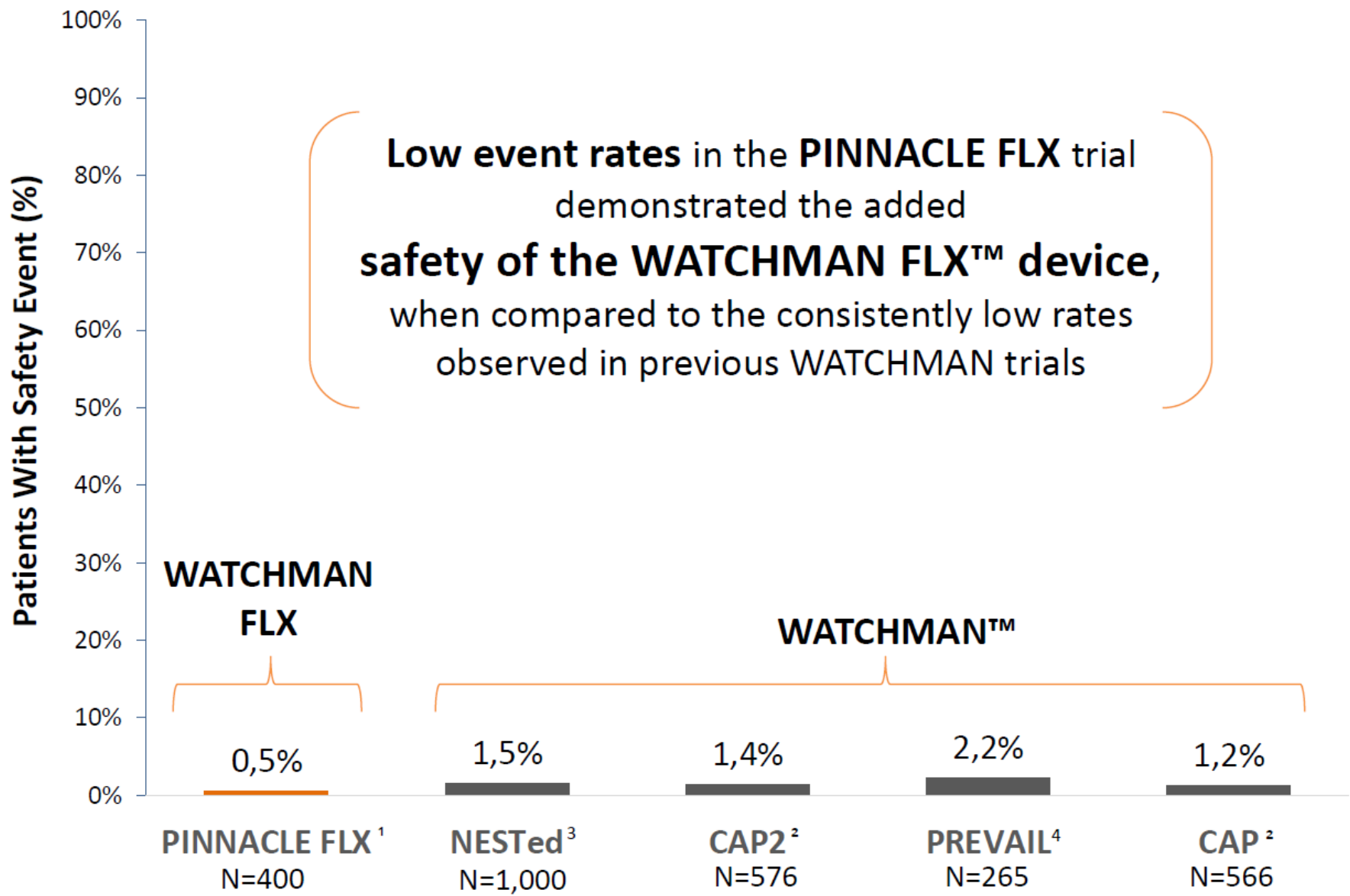
A US-only IDE to evaluate the safety and efficacy of the new WATCHMAN FLX™ Device

Study Design	Single arm non-randomized study design <ul style="list-style-type: none">• DOAC + ASA Post-implant• Non-inferiority to performance goal based on current generation WATCHMAN™
Enrollment	400 Patients at 29 U.S sites, 58 roll-in subjects (2 per site)
Objective	To establish the safety and effectiveness of the WATCHMAN FLX Left Atrial Appendage Closure (LAAC) Device for patients with NVAf who are eligible for anti-coagulation therapy to reduce the risk of stroke.
Follow-Up	45 d (+TEE), 6 mon., 12 mon. (+TEE), 18 mon., and 24 mon.
Antithrombotic	DOAC + ASA 45 day, Clopidogrel + ASA until 6 mon, ASA indefinitely

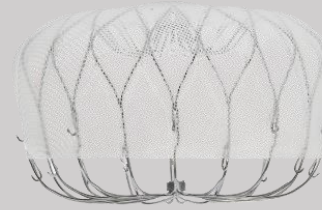


PINNACLE FLX showed procedure success consistent with recent WATCHMAN studies*



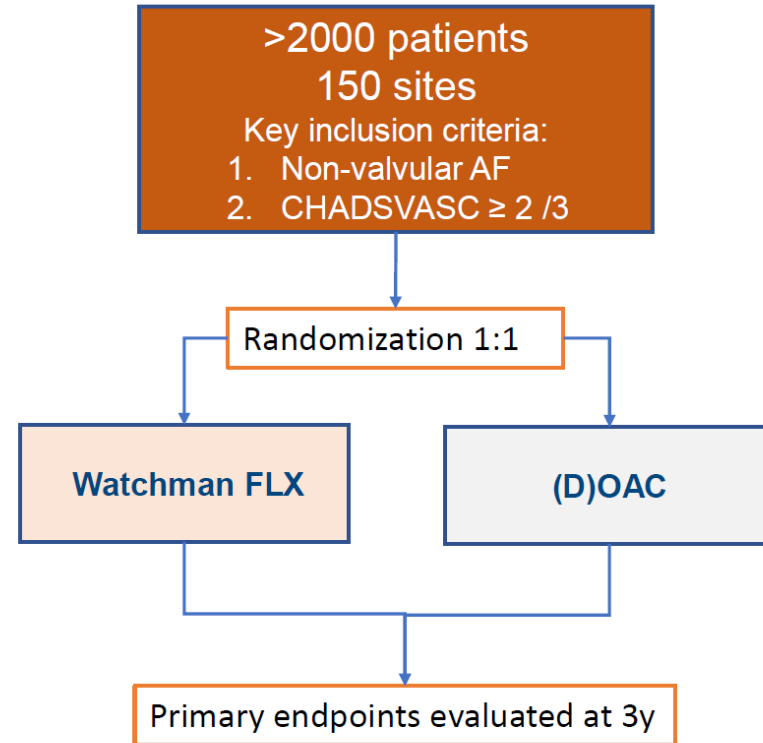


CHAMPION-AF Study

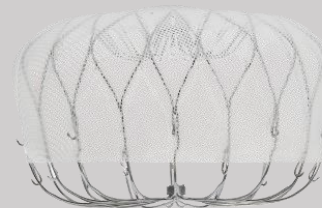


WATCHMAN FLX vs Contemporary OAC

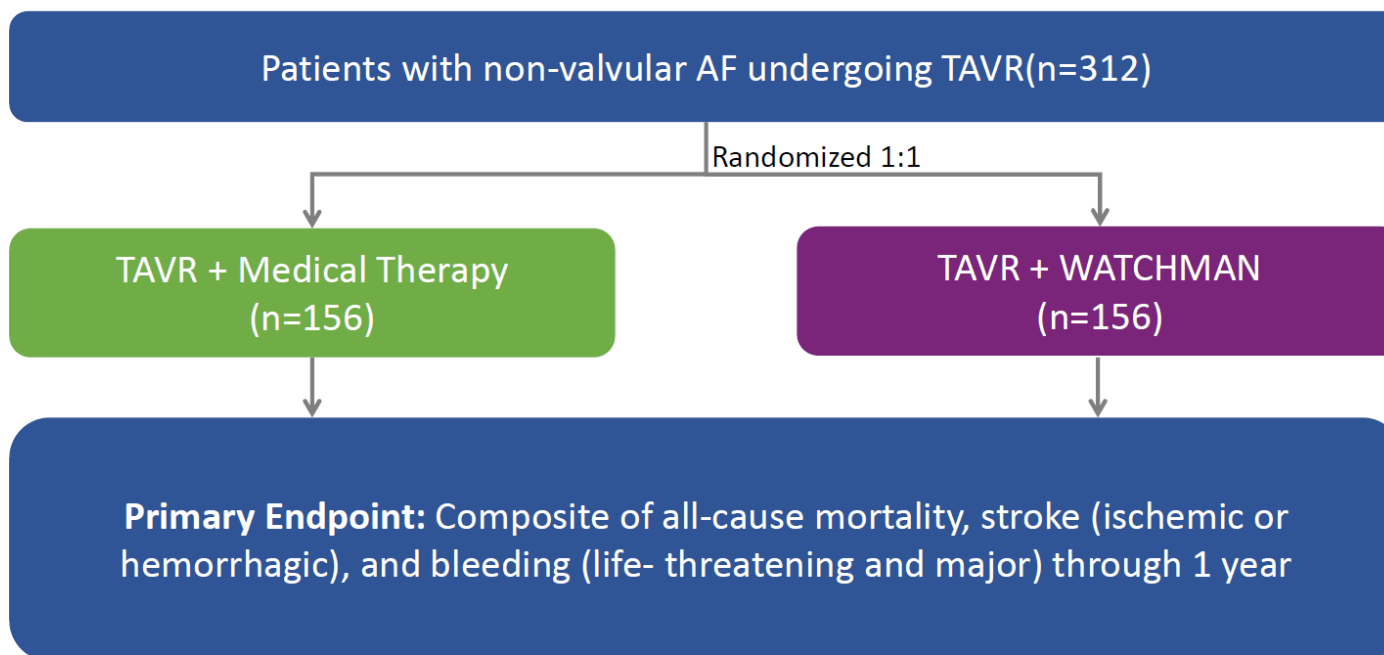
- Global Multicenter Randomized Clinical Trial
- >2000 patients
- Up to 150 Global Centers
- Randomized 1:1
 - Next Generation WATCHMAN FLX
- vs
- Market Approved DOAC or warfarin
- Inclusion Criteria; CHADSVASC $\geq 2/3$
- Co-Chairman
 - Dr. Marty Leon
 - Dr. Ken Ellenbogen
- Study Co-PI's
 - Dr. Saibal Kar
 - Dr. Shephal Doshi
- Anticipated FPI 2H 2020



WATCH-TAVR Study



Investigator-Sponsored Research evaluating the safety and effectiveness of LAA occlusion with the Watchman Device in NVAF patients undergoing TAVR.



CATALYST Study

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ABBOTT ANNOUNCES FIRST-OF-ITS-KIND TRIAL TO ASSESS NEW THERAPY OPTION FOR PEOPLE AT RISK OF STROKE

- The CATALYST trial will examine Abbott's Amplatzer™ Amulet™ device compared to non-vitamin K oral anticoagulants, the current standard in attempting to lower stroke and bleeding risks for patients with atrial fibrillation



 [Photos \(1\)](#)

ABBOTT PARK, Ill., Feb. 3, 2020 /PRNewswire/ -- Abbott (NYSE: ABT) today announced that the U.S. Food and Drug Administration (FDA) has approved a new trial designed to assess its Amplatzer™ Amulet™ Left Atrial Appendage Occluder for people with atrial fibrillation (AF) – a condition in which the normal rhythm of the heart's upper chambers is disrupted and becomes erratic – who are at risk of stroke. The CATALYST trial is the first-ever clinical trial comparing the effectiveness of a

LAA Closure Devices – Checklist

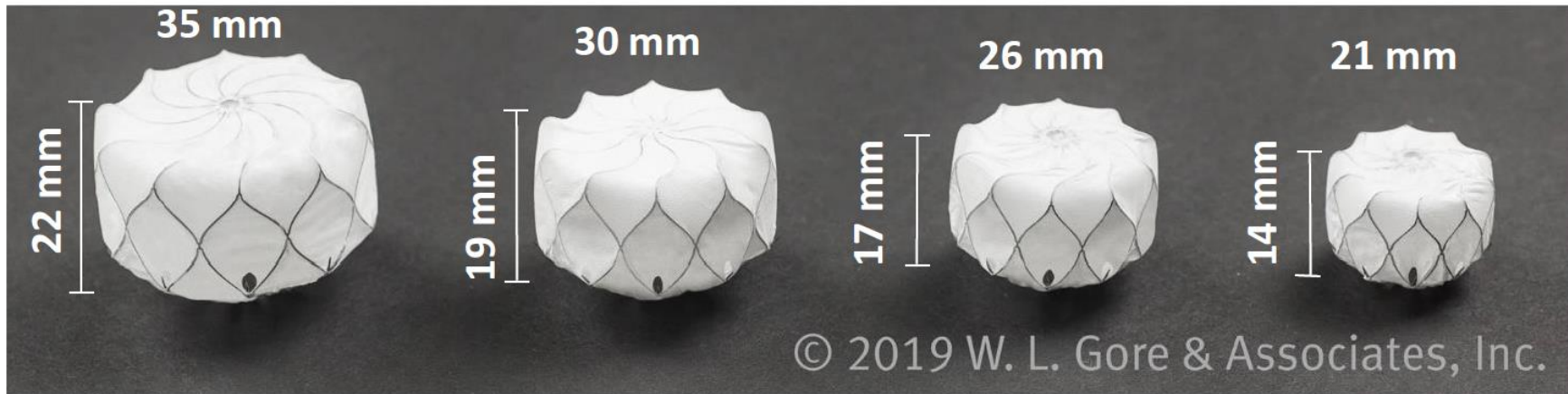
Device Name	Company	Design	Device Sizes	Approval Status
Endocardial Devices				
PLAATO	Appriva Medical Inc.	Single-lobe occluder; nitinol cage; ePTFE membrane; hooks	15, 18, 20, 23, 26, 29, and 32 mm (14-F sheath)	Removed from market
WATCHMAN	Boston Scientific	Single-lobe occluder; nitinol frame; PET membrane; hooks	21, 24, 27, 30, and 33 mm (14-F sheath)	CE mark
ACP	St. Jude Medical	Lobe and disk (polyester mesh in both); nitinol mesh structure; stabilizing wires	16, 18, 20, 22, 24, 26, 28, and 30 mm (9, 10, and 13-F sheaths)	CE mark
Amulet	St. Jude Medical	Lobe and disk (polyester mesh in both); nitinol mesh structure; stabilizing wires	16, 18, 20, 22, 25, 28, 31, and 34 mm (12- and 14-F sheaths)	CE mark
WaveCrest	Coherex Medical	Single-lobe occluder; nitinol frame; polyurethane foam and ePTFE membrane; retractable anchors	22, 27, and 32 mm	CE mark
Occlutech LAA Occluder	Occlutech	Single-lobe occluder; nitinol wire mesh; stabilizing loops; nanomaterial covering	15, 18, 21, 24, 27, 30, 33, 36, and 39 mm (12- and 14-F sheaths)	Clinical trial evaluation
Sideris Transcatheter Patch	Custom Medical Devices	Frameless detachable latex balloon covered with polyurethane		Clinical trial evaluation
LAmbre	Lifetech	Lobe and disk; nitinol; PET membrane; distal barbs anchors	16 to 36 mm (7- to 10-F sheaths)	Clinical trial evaluation
Pfm	Pfm Medical	Dual disk (distal anchor, variable middle connector, proximal disk); nitinol frame	(8- and 9-F sheaths)	Pre-clinical trial evaluation
Ultrasept	Cardia	Lobe and disk; nitinol frame; Ivalon covering; distal anchors	16, 20, 24, 28, and 32 mm (10-, 11-, and 12-F sheaths)	Clinical trial evaluation
Epicardial Devices				
Lariat	SentreHeart	Endocardial and epicardial approach: magnetically-assisted snare over balloon in LAA	14-F epicardial sheath	FDA approval CE mark
AtriClip	AtriCure	Surgical approach: parallel clip with polyester mesh	35, 40, 45, and 50 mm	FDA approval CE mark
Aegis	AEGIS Medical Innovations	Epicardial subxiphoid approach: electrodes guide navigation to LAA and tissue capture		Clinical trial evaluation
Cardioblade Closure System	Medtronic	Epicardial approach: silicone band covered by polyester fabric		Pre-clinical trial evaluation
<p>ACP = Amplatzer Cardiac Plug; CE = Conformité Européene; ePTFE = expanded polytetrafluoroethylene; FDA = Food and Drug Administration; LAA = left atrial appendage; PET = polyethylene terephthalate; PLAATO = Percutaneous Left Atrial Appendage Transcatheter Occlusion.</p>				

GORE® CARDIOFORM LAA Occluder

- Soft, conformable, with flat atrial surface
- Open distal end for minimal elongation when compressed
- Retractable anchors allow for full retrieval with low forces

CBAS® Heparin Surface

- The CBAS® Heparin Surface is utilized to bind heparin molecules to the ePTFE via a proprietary covalent end-point attachment mechanism



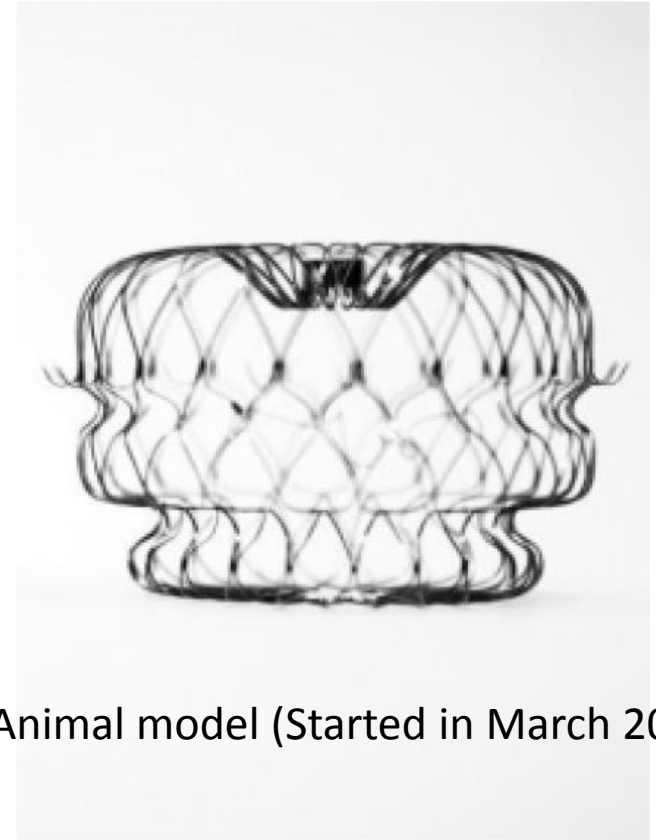
Cormos LAA Occluder

Two types

- Type I with disc
- Cormos-LAA-Occluder *MATRIX*



- Type II without disc
- Cormos-LAA-Occluder *RUBIN*



In vivo study: Animal model (Started in March 2019)
FIM 6/2020

Conclusion

- Advances in device design facilitate LAA closure
- Implantation techniques, safety precautions and procedural experiences remain as the basis for closure success
- Eg. **Watchman FLX** – new design features further optimize closure efficacy and safety
- Ongoing clinical trials – eg. PINNACLE FLX, CHAMPION AF, CATALYST



Hong Kong Ocean Park Marriott Hotel

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LKS Faculty of Medicine
The University of Hong Kong
香港大學李嘉誠醫學院



瑪麗醫院
Queen Mary Hospital



HONG KONG VALVE
HEART TEAM CONFERENCE

HONG KONG VALVE 2019

7-8TH SEPTEMBER 2019

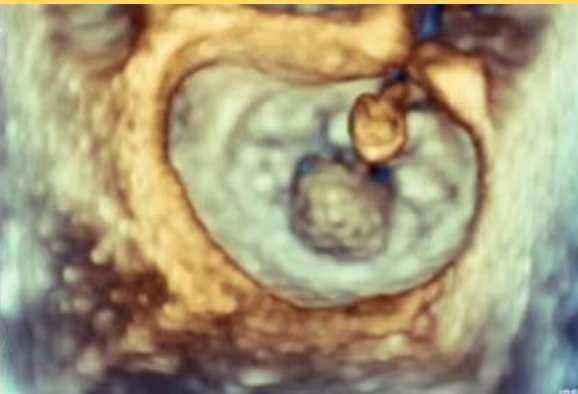
Thank you!



See you on 17-18 Oct 2020!



HONG KONG VALVE
HEART TEAM CONFERENCE



Conference Secretariat
hkvalve@hku.hk
<http://hkvalve.org>

