



Invited Challenging Case Focus Review: Valve-in-Valve Implantation

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Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial Interest /arrangement or affiliation with the organization(s) listed below

Affiliation/Financial Relationship

Company

Grant/ Research Support:

Consulting Fees/Honoraria:

Edwards Lifesciences
(consultant & proctor)

Major Stock Shareholder/Equity Interest:

Royalty Income:

Ownership/Founder:

Salary:

Intellectual Property Rights:

Other Financial Benefit:



Case #1

- 82yo male
- History
 - 21mm homograft (for bicuspid AS) 1991 earlier
 - CABG – RIMA – OM; LIMA-LAD
 - PVD – bilateral carotid intervention;
- Worsening CCS 3 angina
- Severe aortic regurgitation
- LVDD 58mm, LVSD 45mm, LVEF 43%
- Bilateral IMA and native RCA patent
- Redo surgery risk score
 - Logistic EuroScore 1 – 50%;
 - STS PROM – 19%

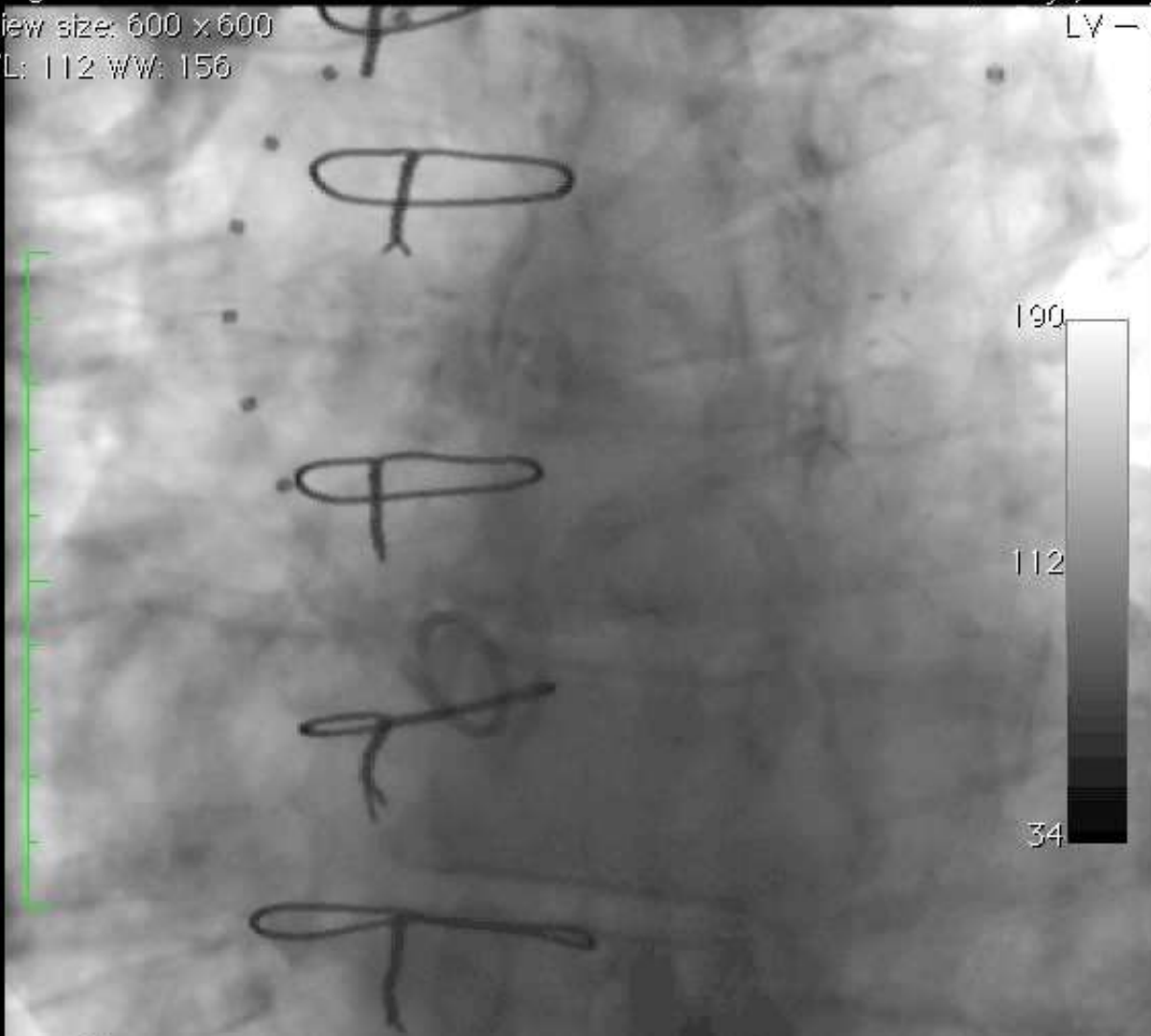
Image size: 512 x 512

View size: 600 x 600

WL: 112 WW: 156

165107 (83 y, 82 y)

LY - LY



Im: 1/101

Zoom: 117% 9.1 -0.2

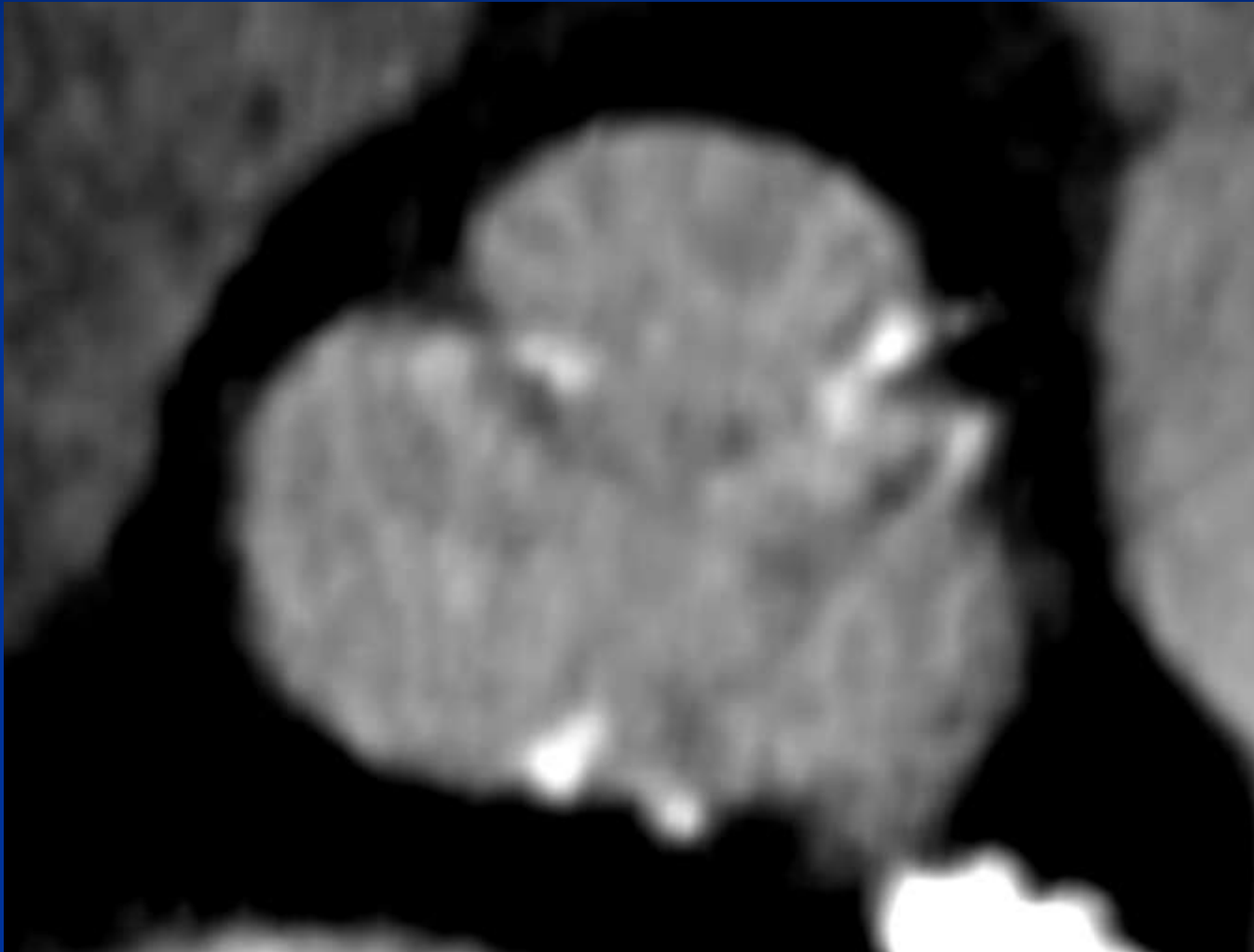
JPEGLossless:Non-hierarchical-1stOrderPrediction

Position: HFS

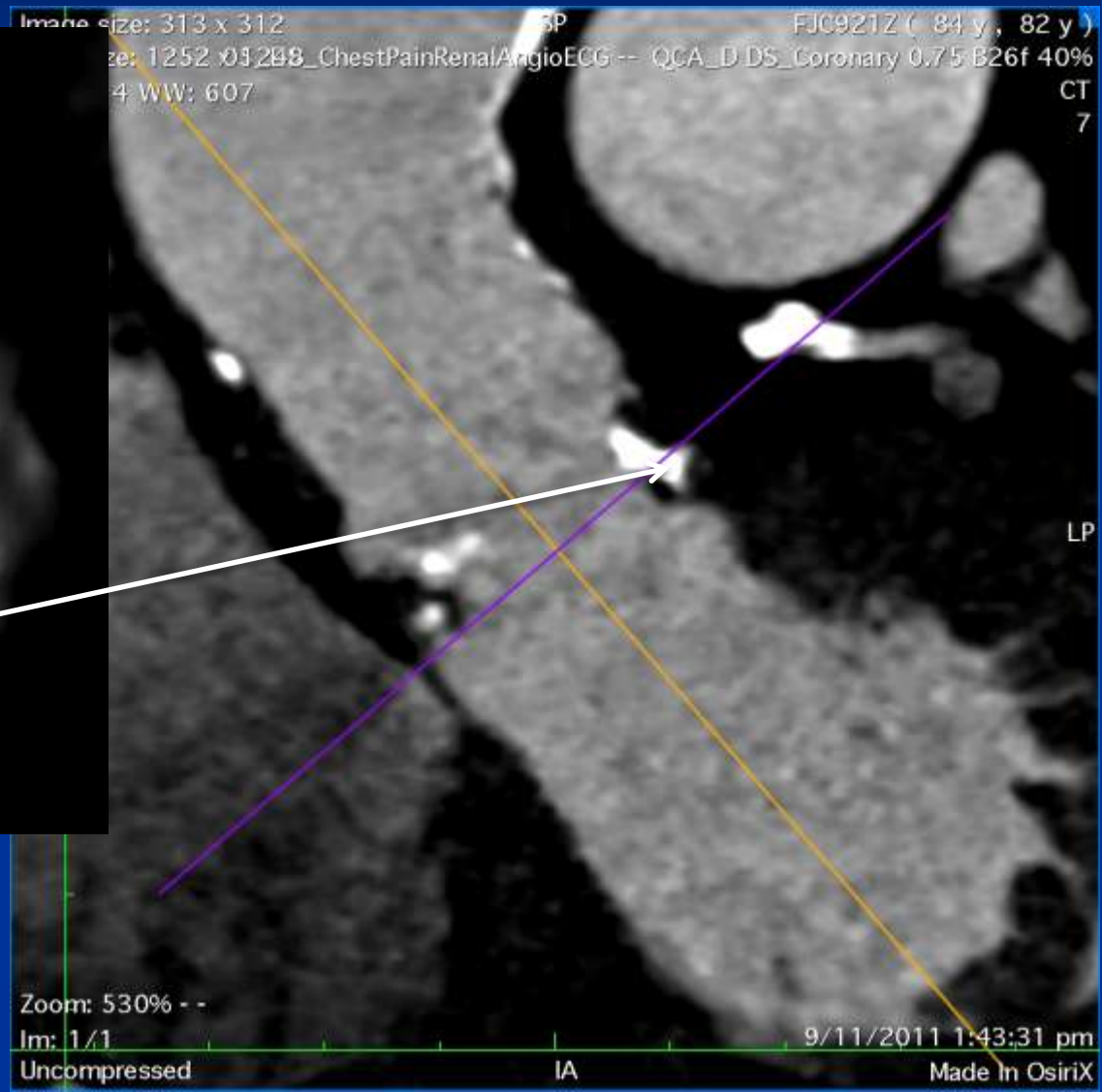
4/11/11 5:45:51 PM

Made In OsiriX

Minimal calcium on valve leaflets & “annulus”

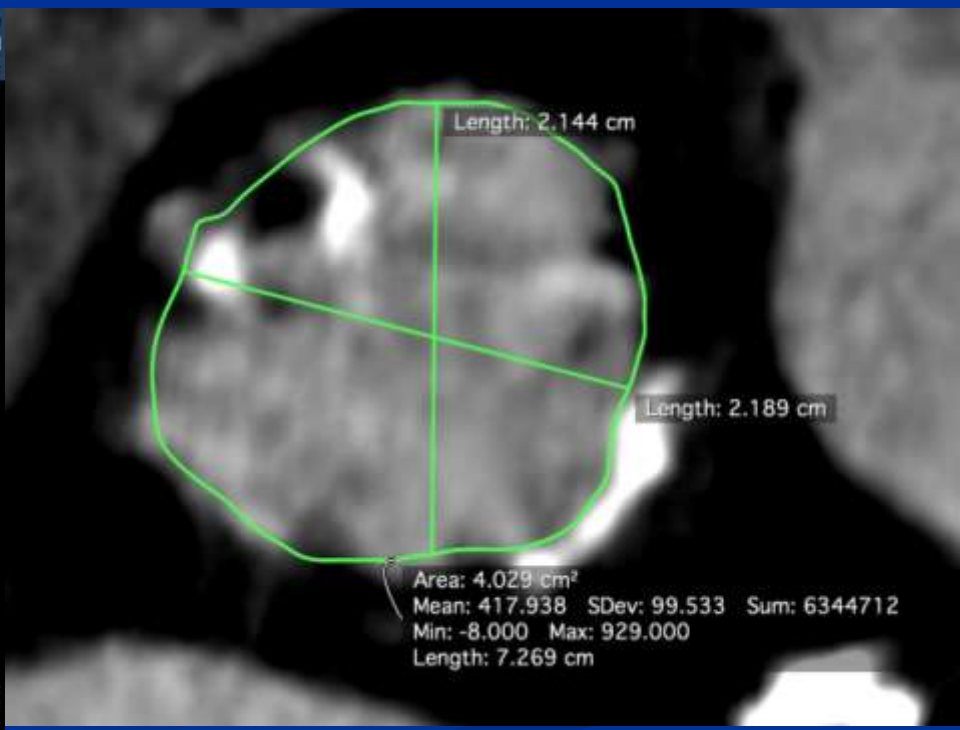


Calcium mainly in sub-annular / LVOT

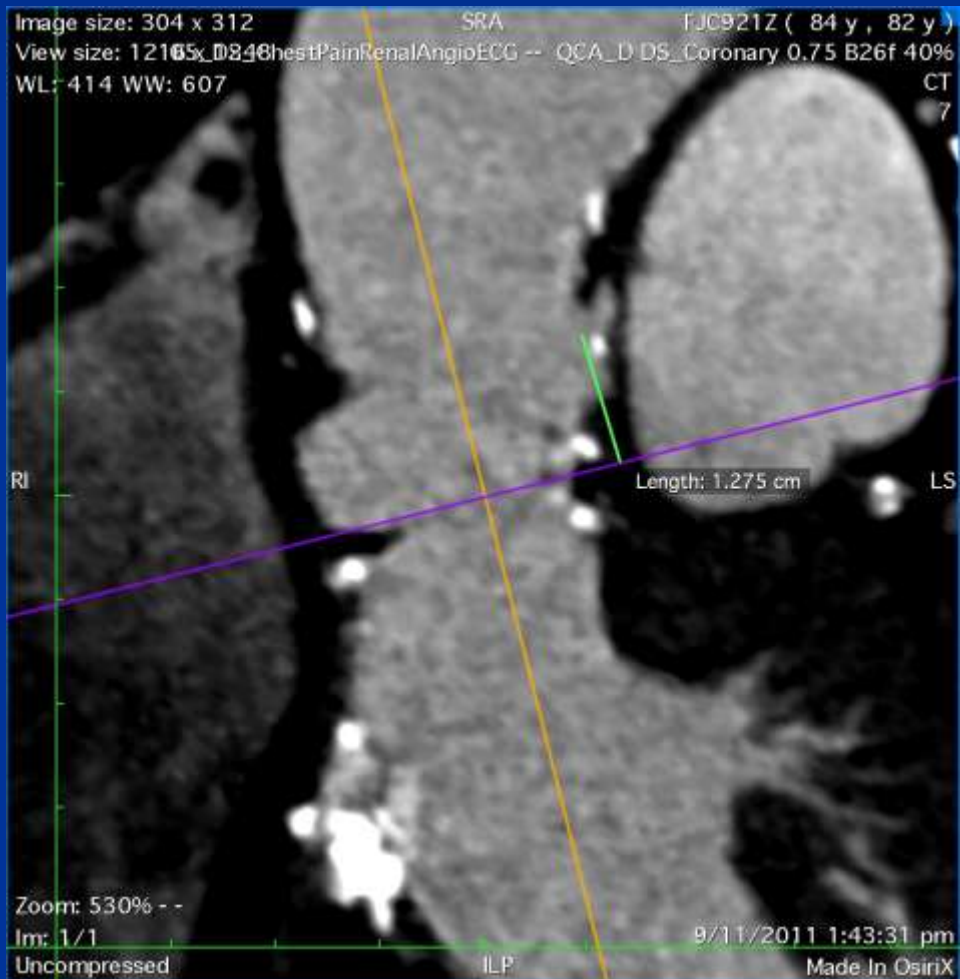


Annulus measure

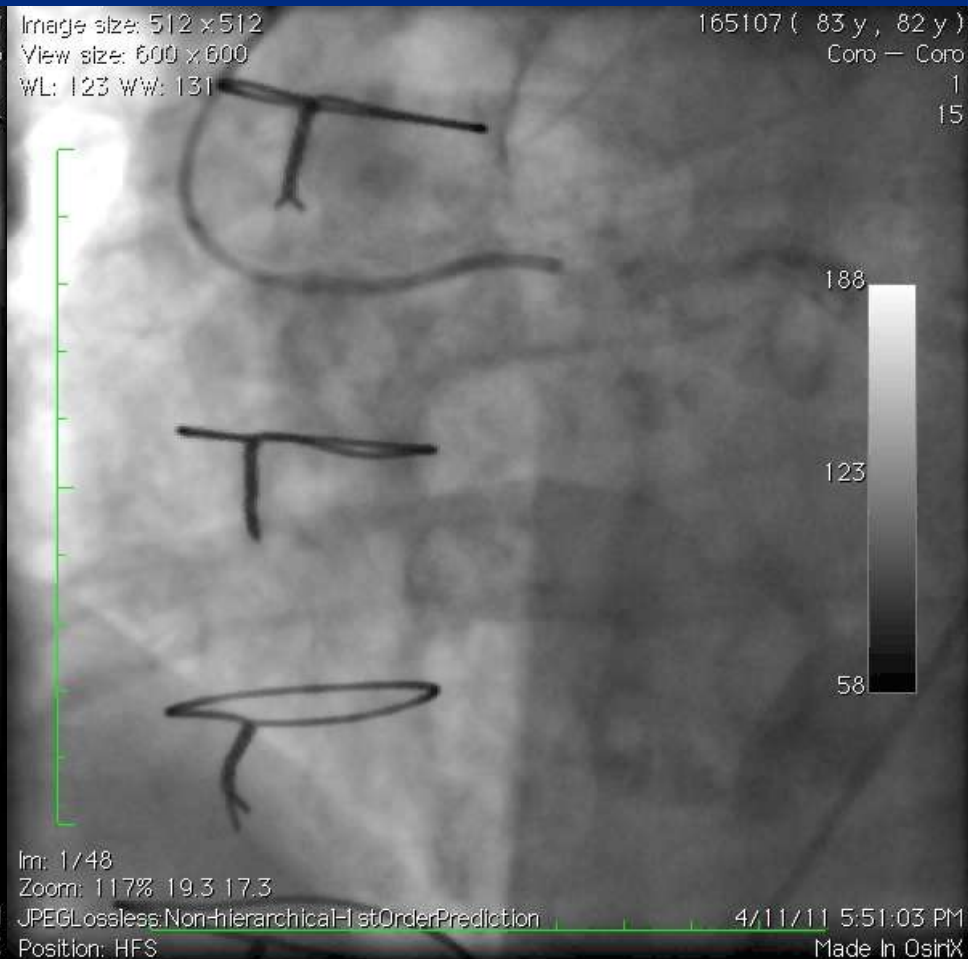
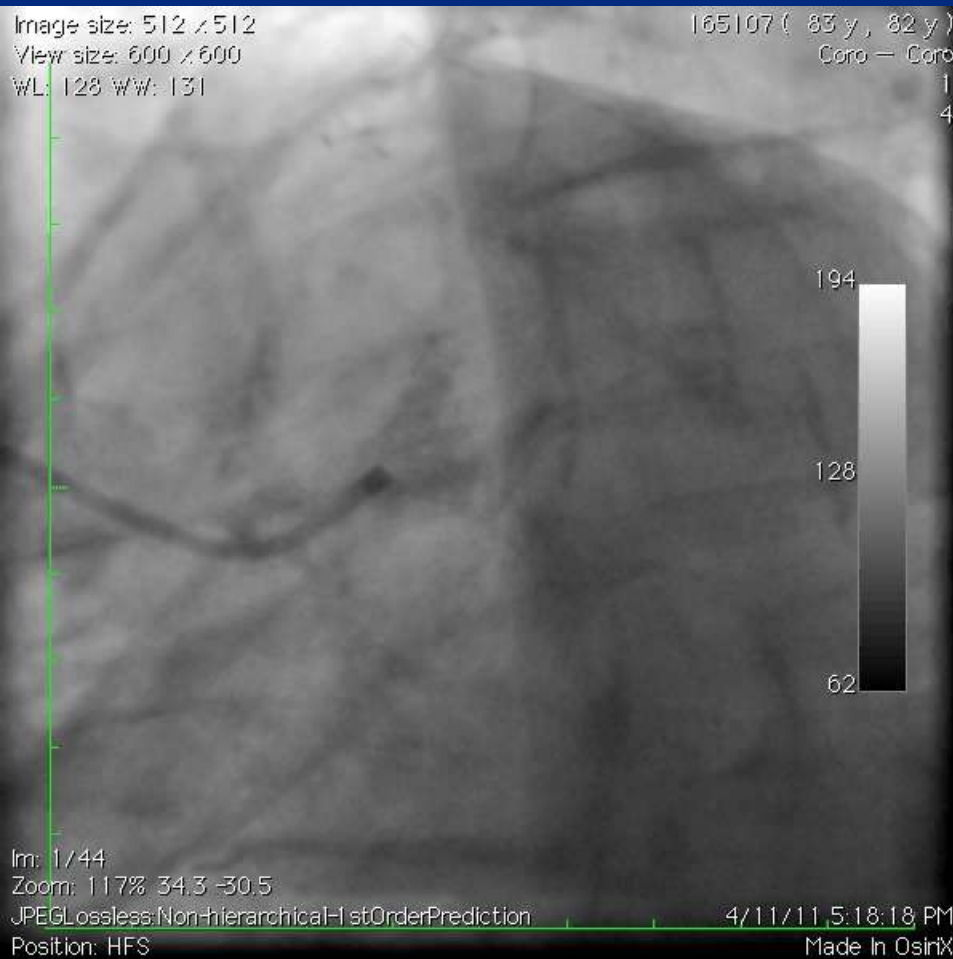
TEE 22; CT Dmean 21.5mm, Perimeter 72



Low lying L coronary



Native Coronary Artery



Technical issues

- Stability – Minimal Ca on leaflets; Severe Ca on LVOT
- Severe AR – “annulus” difficult to visualise
- Low lying left coronary – risk of occlusion
- Anomalous right coronary – potential future difficulty in engagement

Plan

- TF TAVR with 26mm CoreValve
- No balloon predilatation
- Deploy low – aiming for LVOT calcium
 - LVOT Calcium used as main landmark
- Fast pacing during deployment

Image size: 512 x 512

View size: 600 x 600

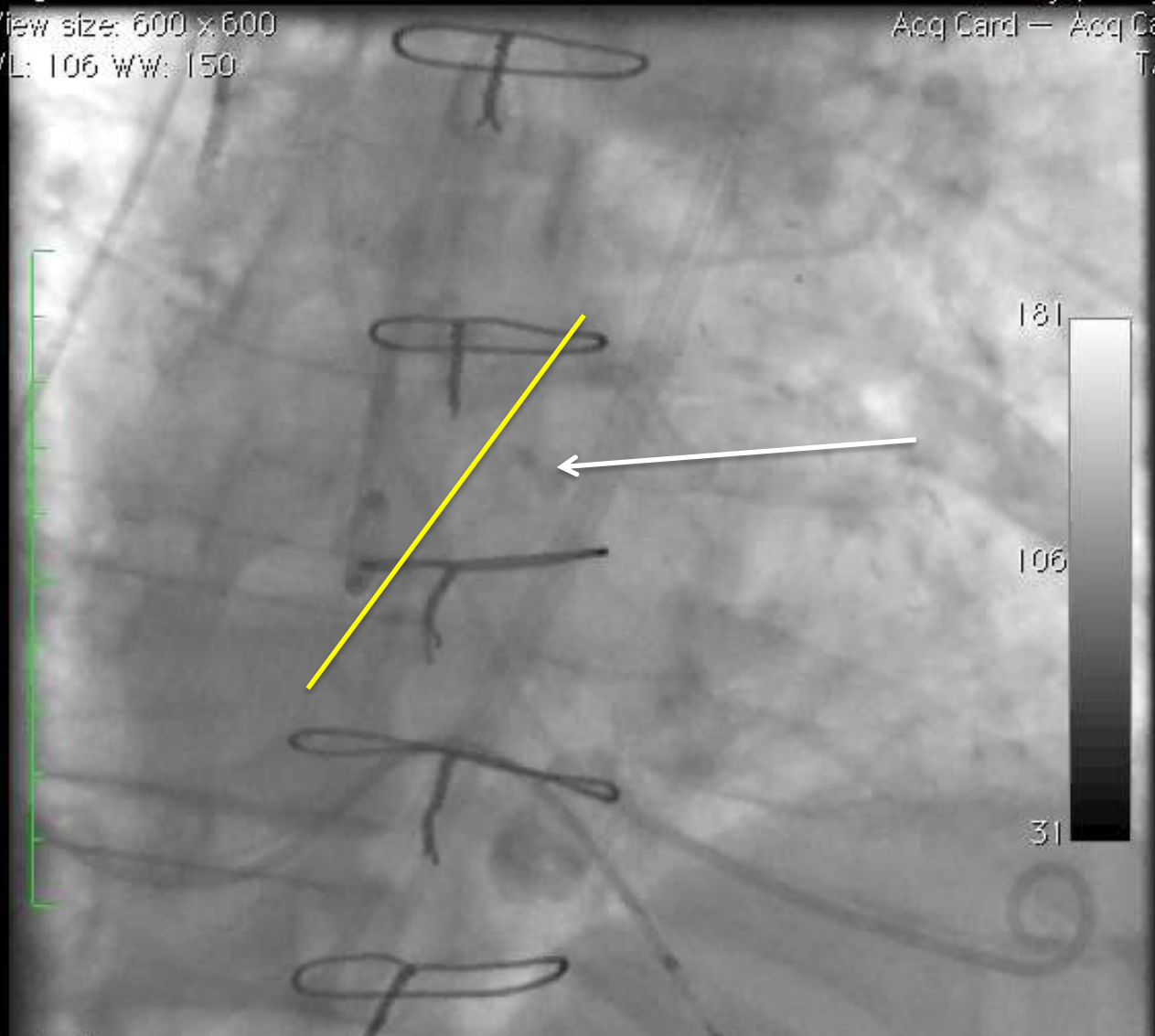
WL: 106 WW: 150

D0057929 (83 y , 82 y)

Acq Card — Acq Card

TAV

0



Im: 1/38

Zoom: 117% -3.2 4.8

JPEGLossless:Non-hierarchical-HistOrderPrediction

Position: HFS

16/11/11 2:11:48 PM

Made In OsirX

Image size: 512 x 512

View size: 600 x 600

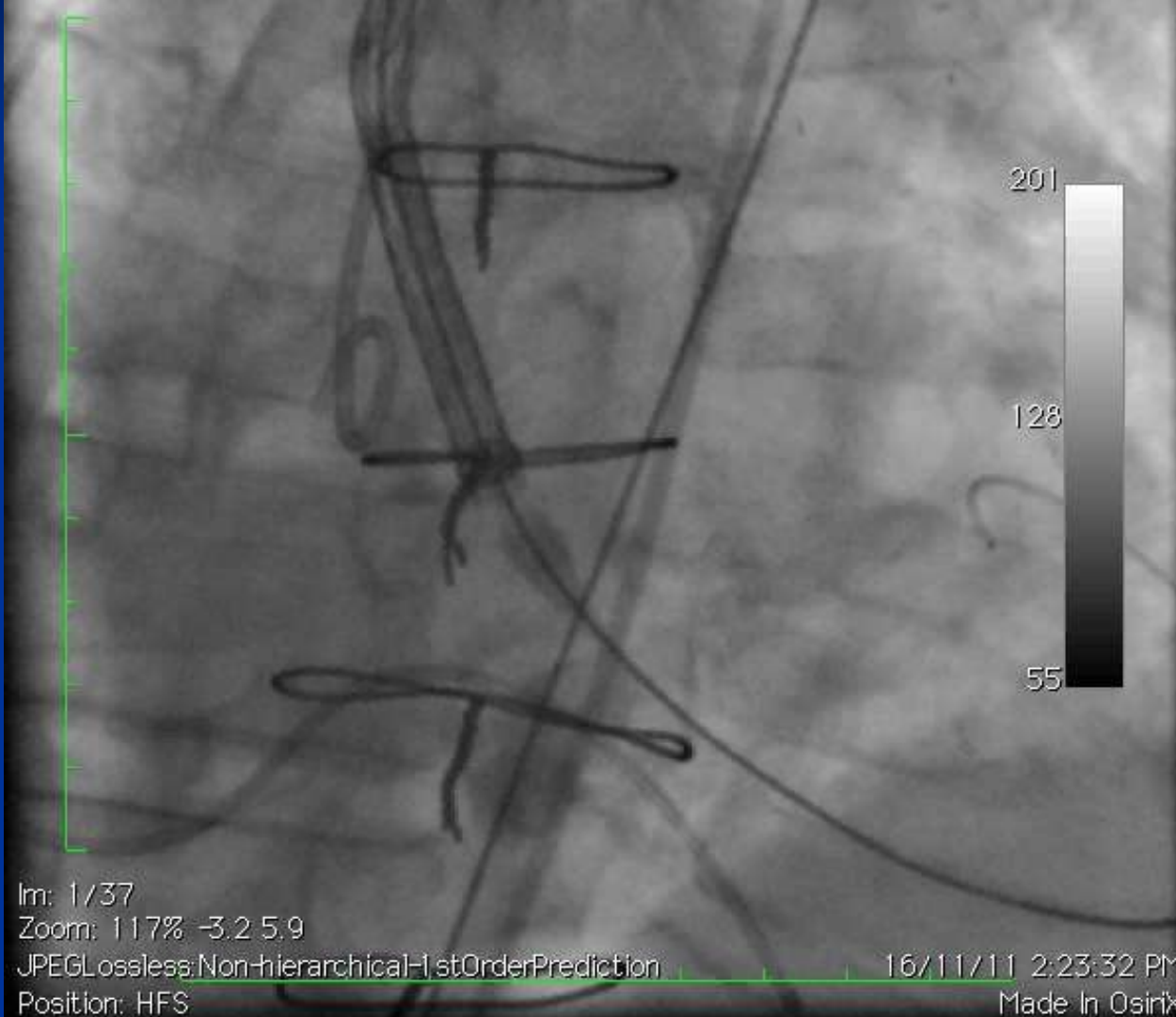
WL: 128 WW: 146

D0057929 (83 y , 82 y)

Coro 140 - Coro 140

TAV

0



Im: 1/37

Zoom: 117% -3.2 5.9

JPEGLossless:Non-hierarchical-1stOrderPrediction

Position: HFS

16/11/11 2:23:32 PM

Made In Osirix

Image size: 512 x 512

View size: 600 x 600

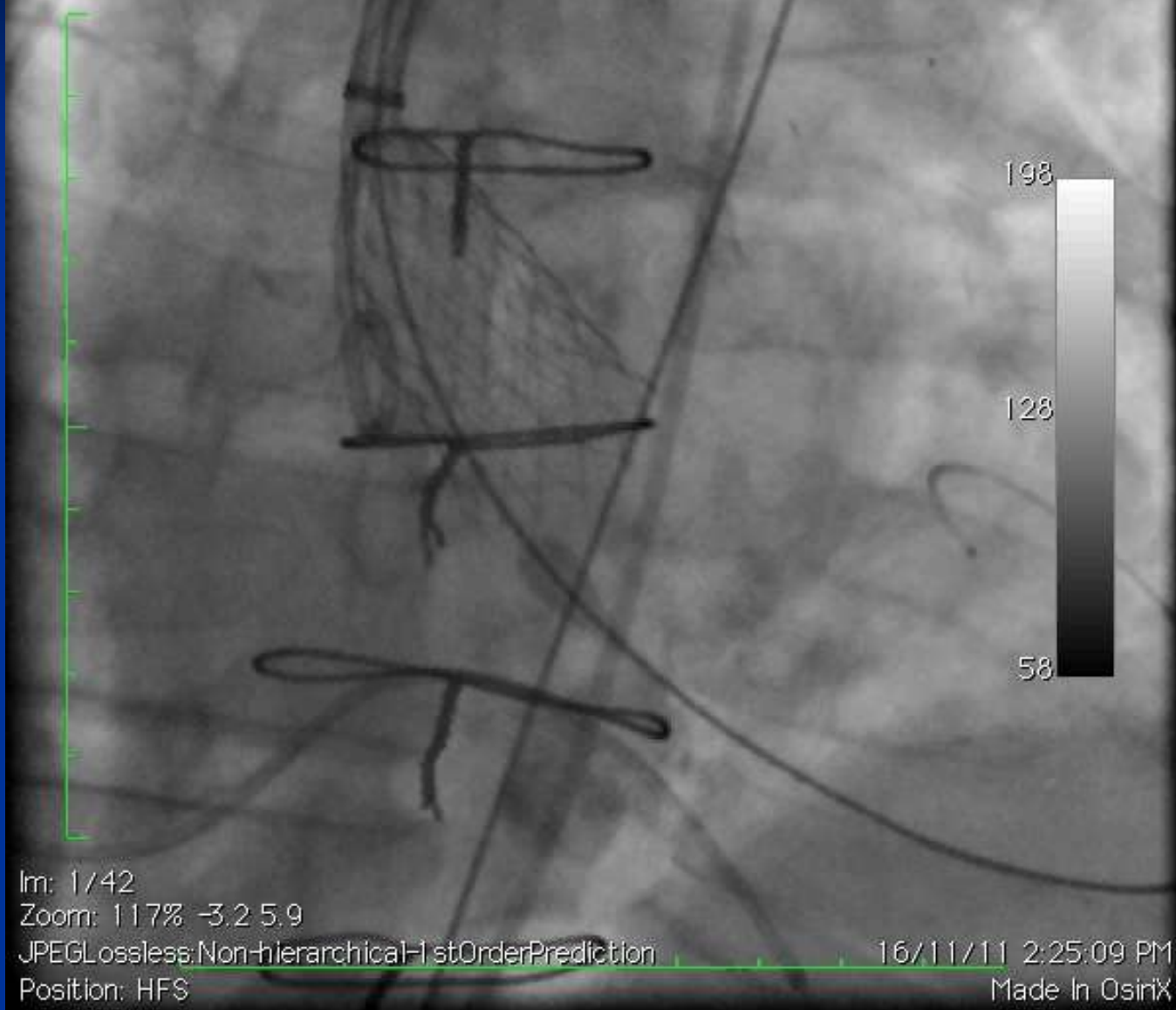
WL: 128 WW: 141

D0057929 (83 y , 82 y)

Coro 140 - Coro 140

TAY

0



Im: 1/42

Zoom: 117% -3.2 5.9

JPEGLossless:Non-hierarchical-1stOrderPrediction

Position: HFS

16/11/11 2:25:09 PM

Made In OsiriX

Image size: 512 x 512

View size: 600 x 600

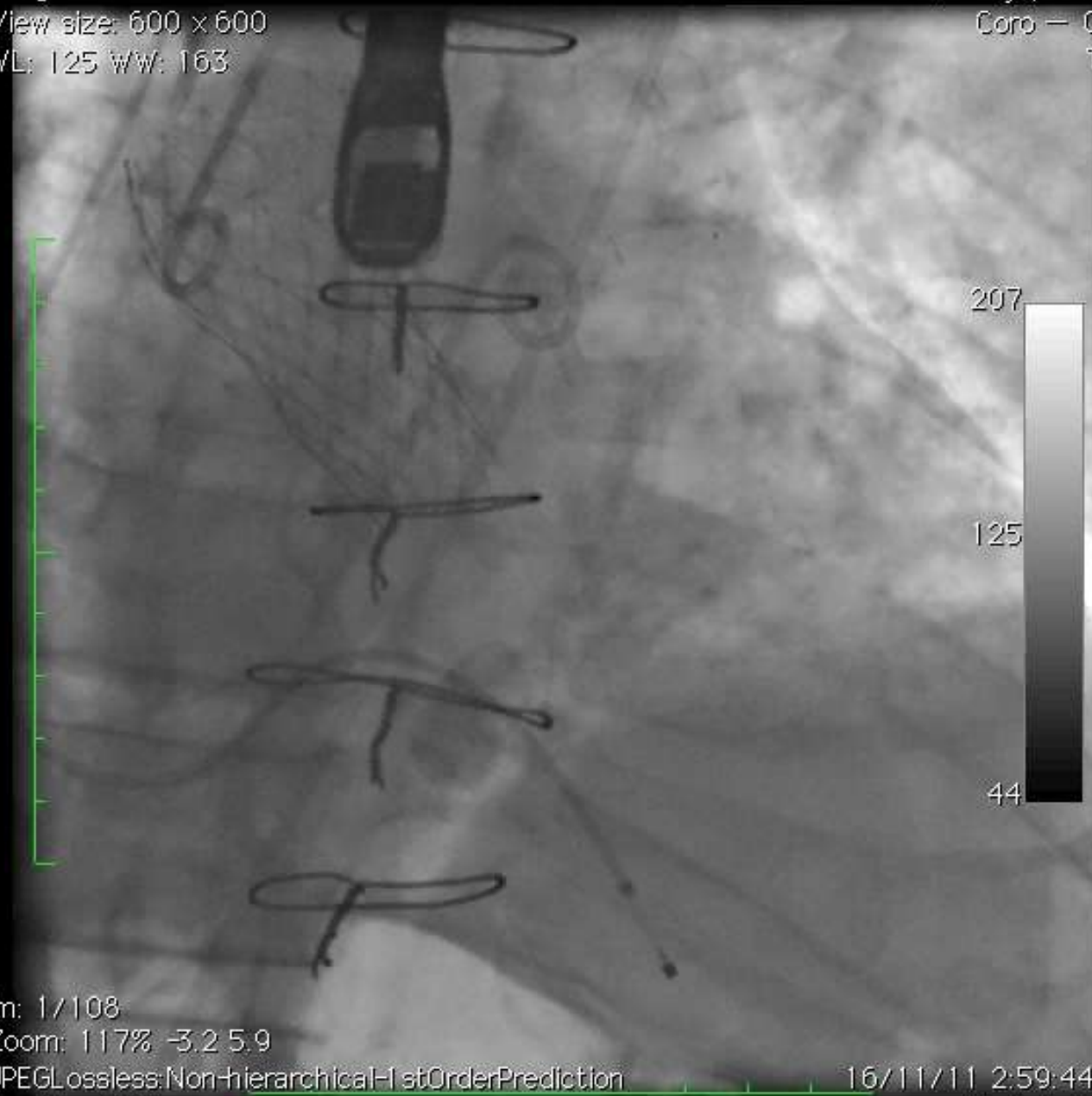
WL: 125 WW: 163

D0057929 (83 y , 82 y)

Coro - Coro

TAY

0



Im: 1/108

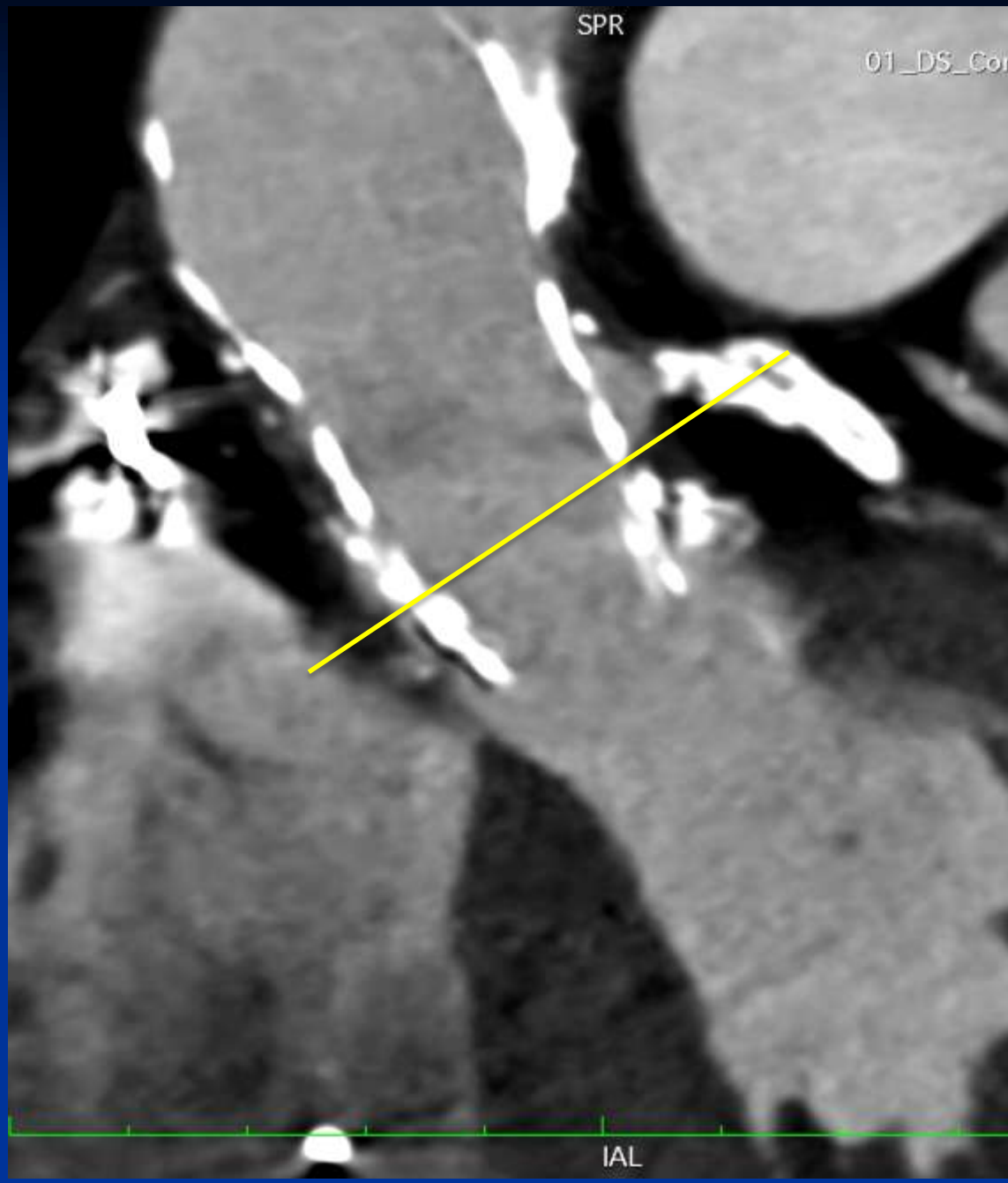
Zoom: 117% -3.2 5.9

JPEGLossless:Non-hierarchical-HistOrderPrediction

Position: HFS

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Case #2

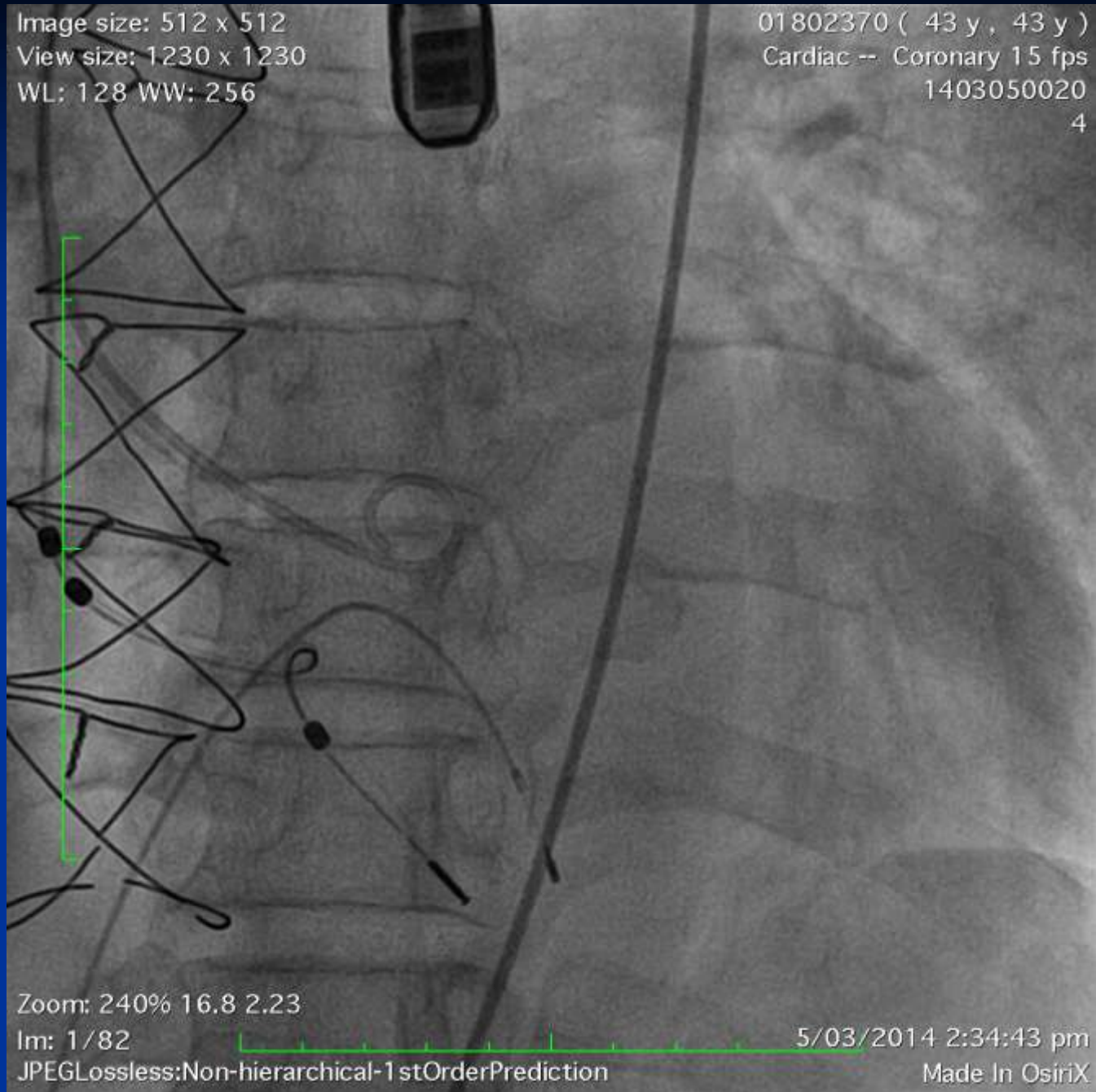


고려대학교의료원
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- 44yo male
- Background
 - Behcet disease
 - St Jude Mechanical AVR 2005
 - Redo AVR 2007 due to PVL - 23mm homograft
- NYHA 3 CCF
- Severe AS; Moderate AR
- Normal LV function
- Heart team – prohibitive for redo-surgery

Image size: 512 x 512
View size: 1230 x 1230
WL: 128 WW: 256

01802370 (43 y , 43 y)
Cardiac -- Coronary 15 fps
1403050020
4



Zoom: 240% 16.8 2.23

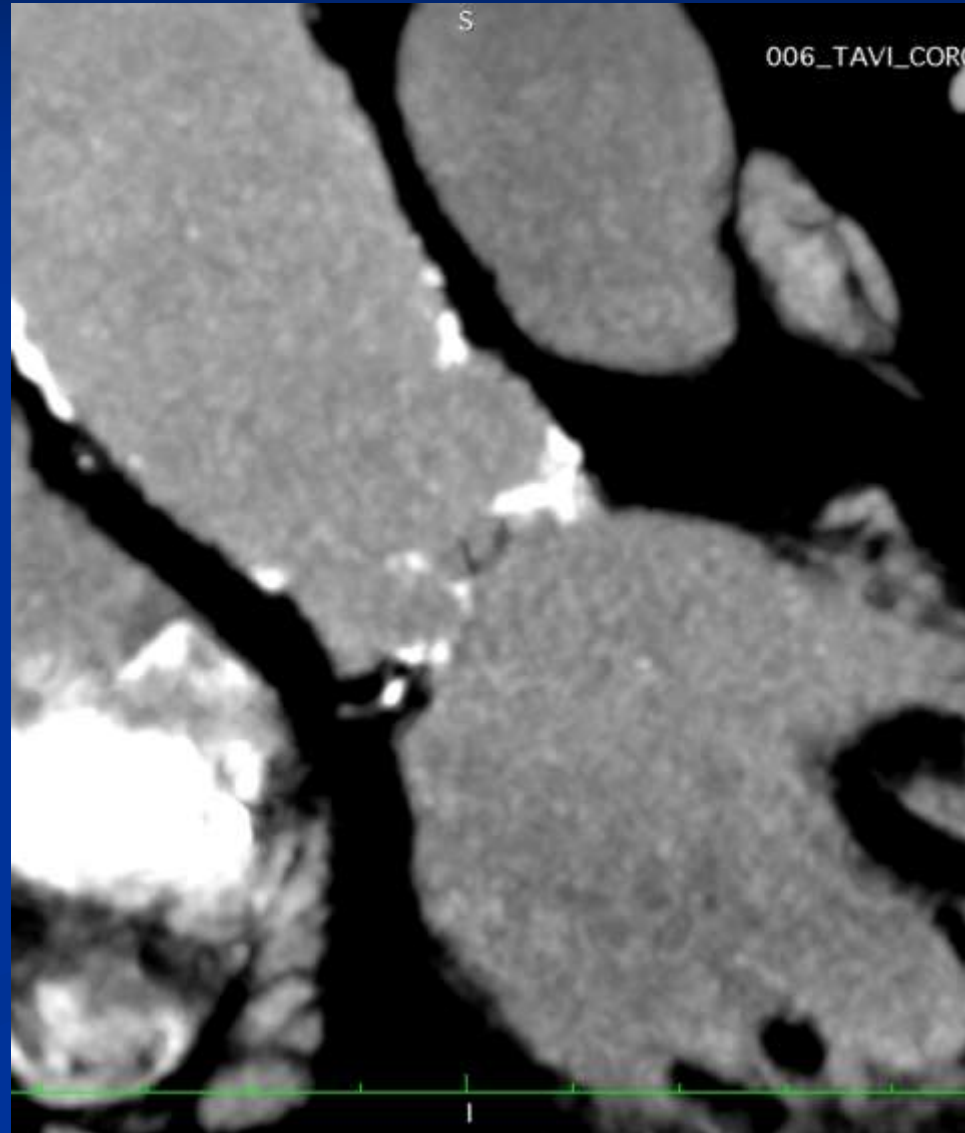
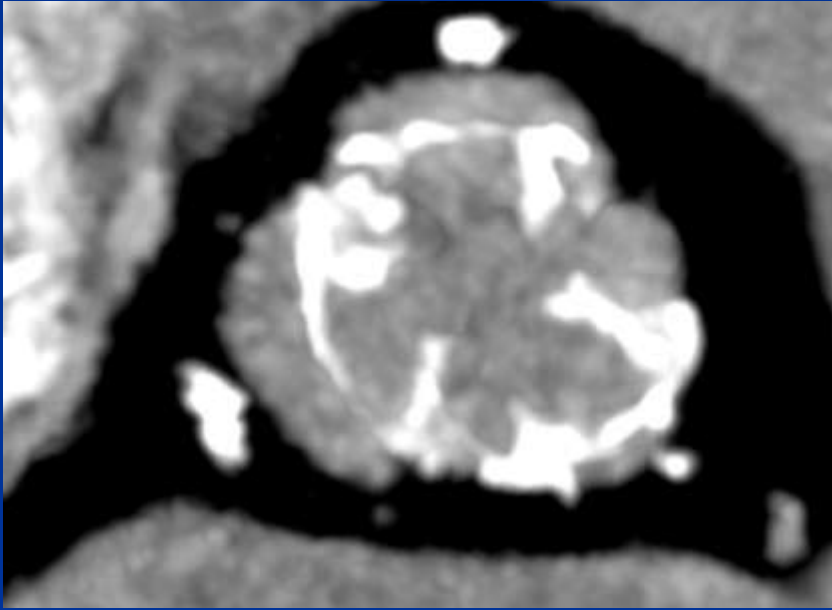
Im: 1/82

JPEGLossless:Non-hierarchical-1stOrderPrediction

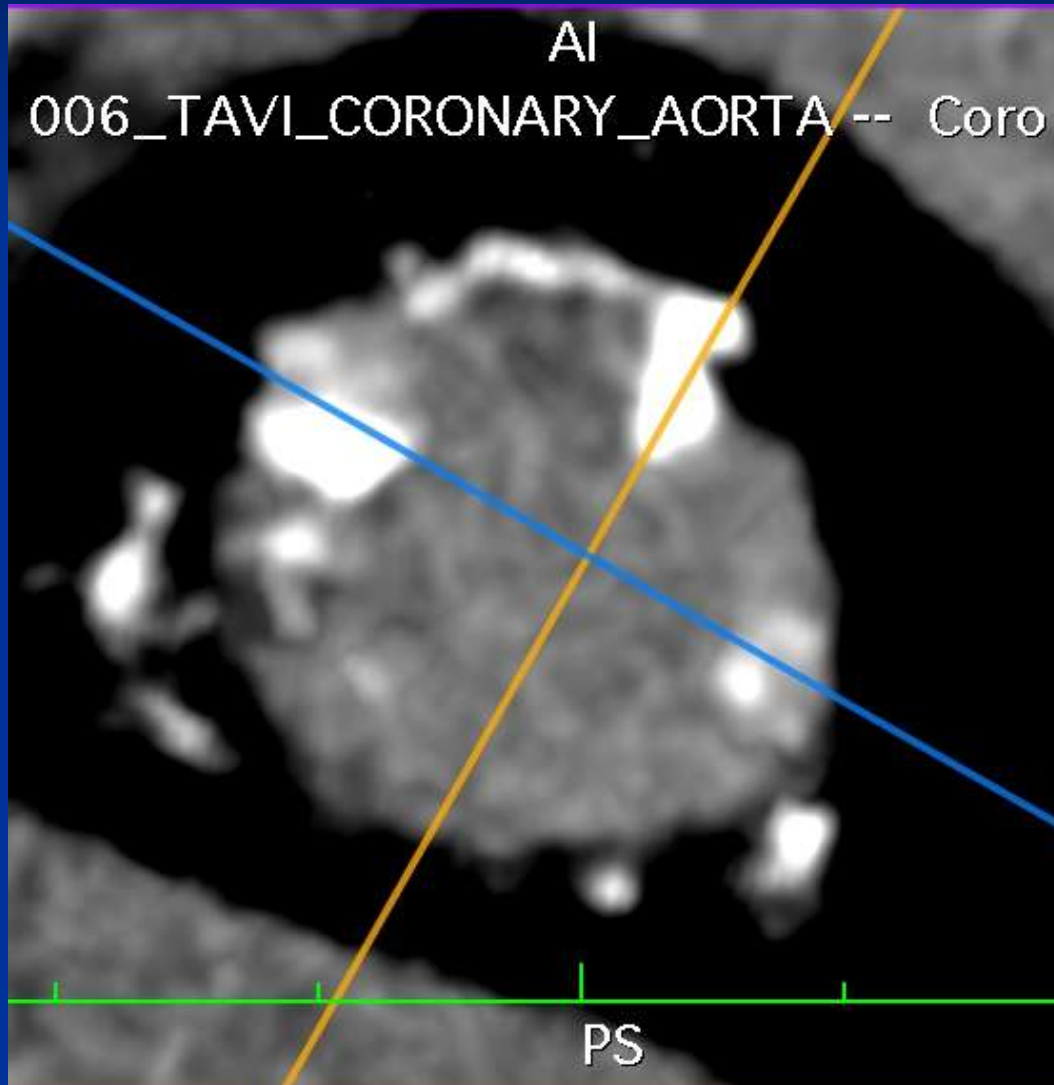
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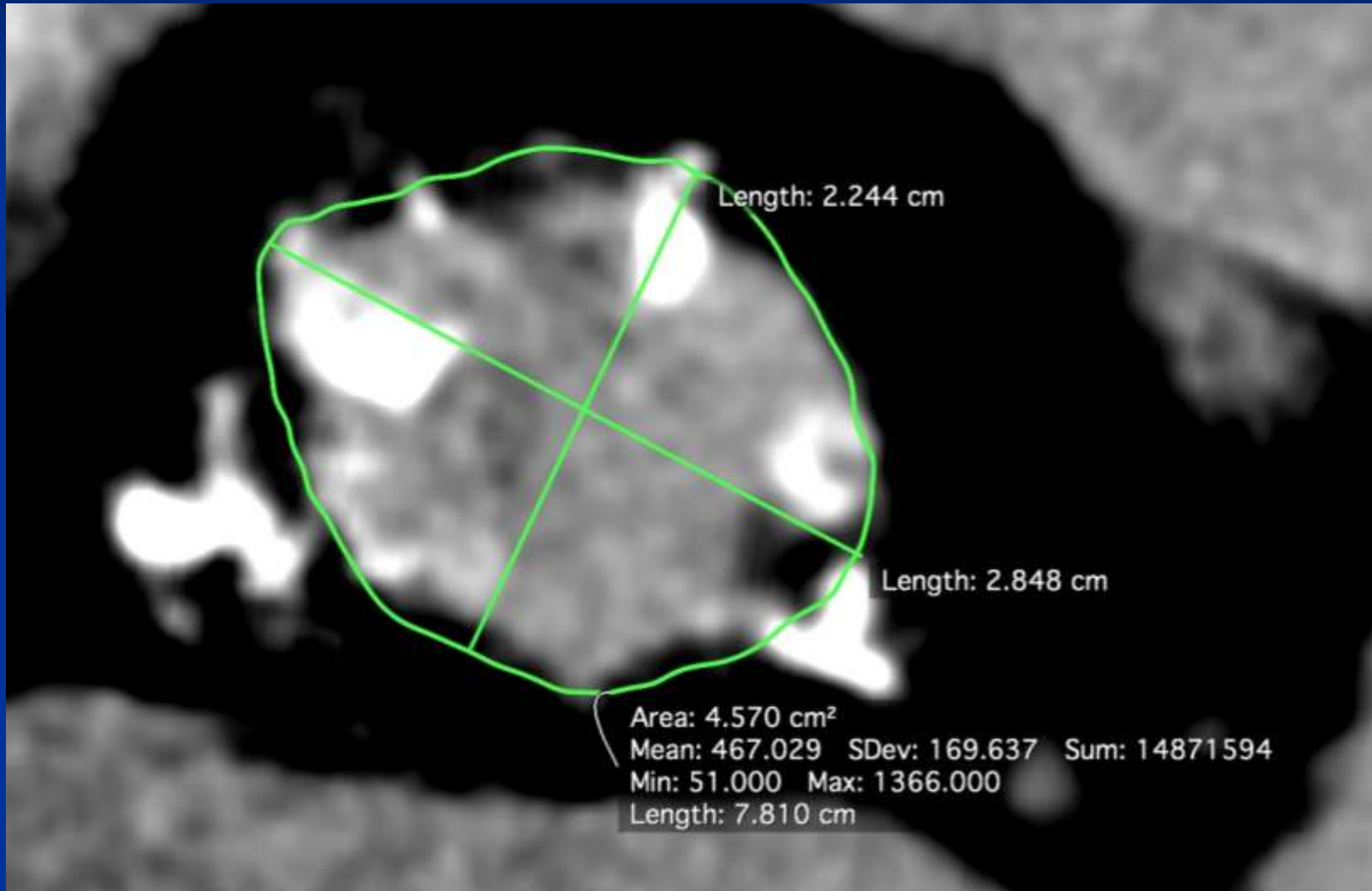
Adequate calcium on leaflets and annulus



LVOT



Annulus sizing D_{mean} 25mm; CSA 457mm²; Perimeter 78mm

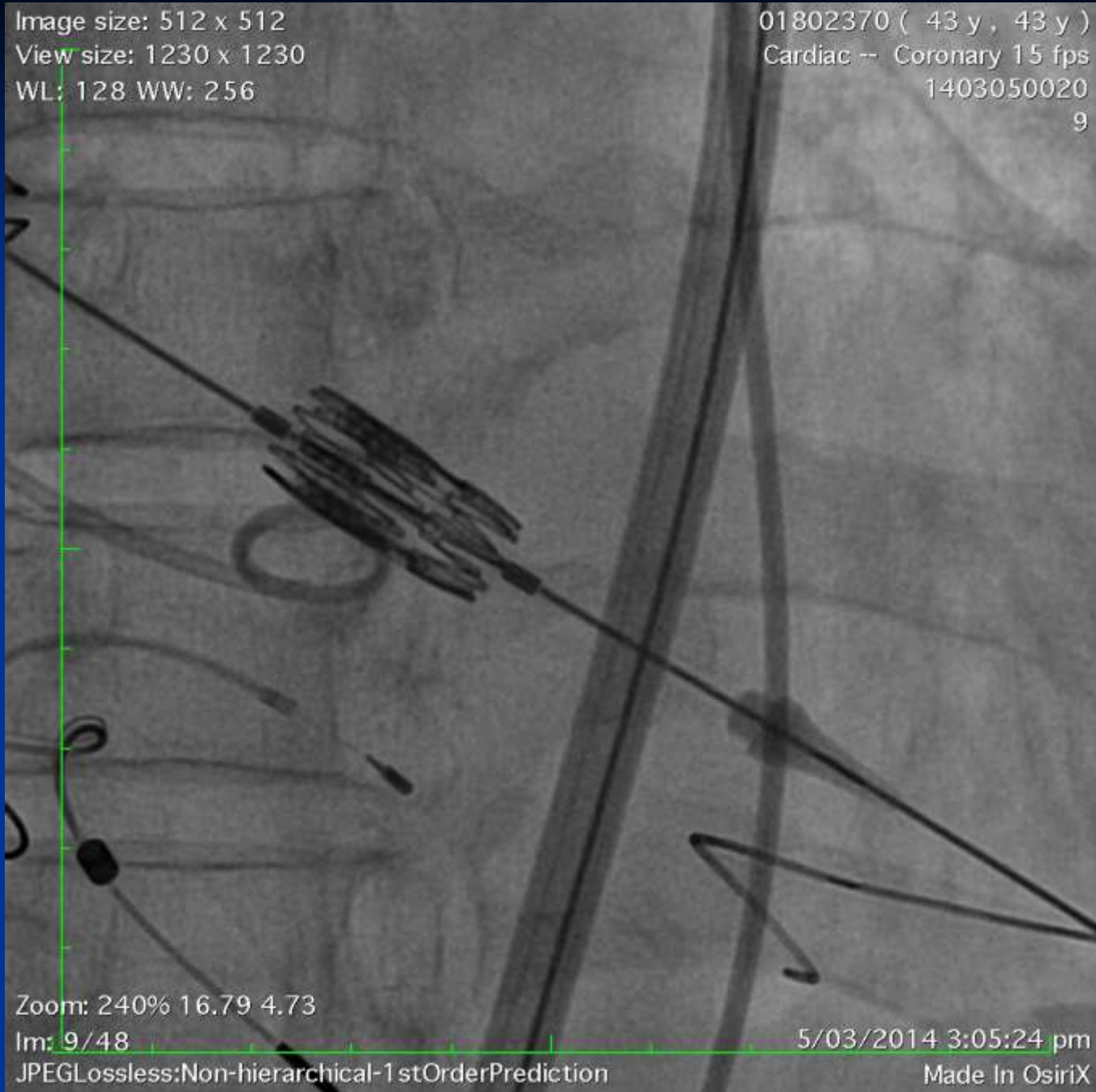


Plan

- TF TAVR with 26mm SAPIEN XT
 - Undervolume 2ml due to borderline annulus size
- Pre-valvuloplasty
- Standard position with landmark using Ca over leaflet / annulus

Image size: 512 x 512
View size: 1230 x 1230
WL: 128 WW: 256

01802370 (43 y , 43 y)
Cardiac -- Coronary 15 fps
1403050020
9



Zoom: 240% 16.79 4.73

Im: 9/48

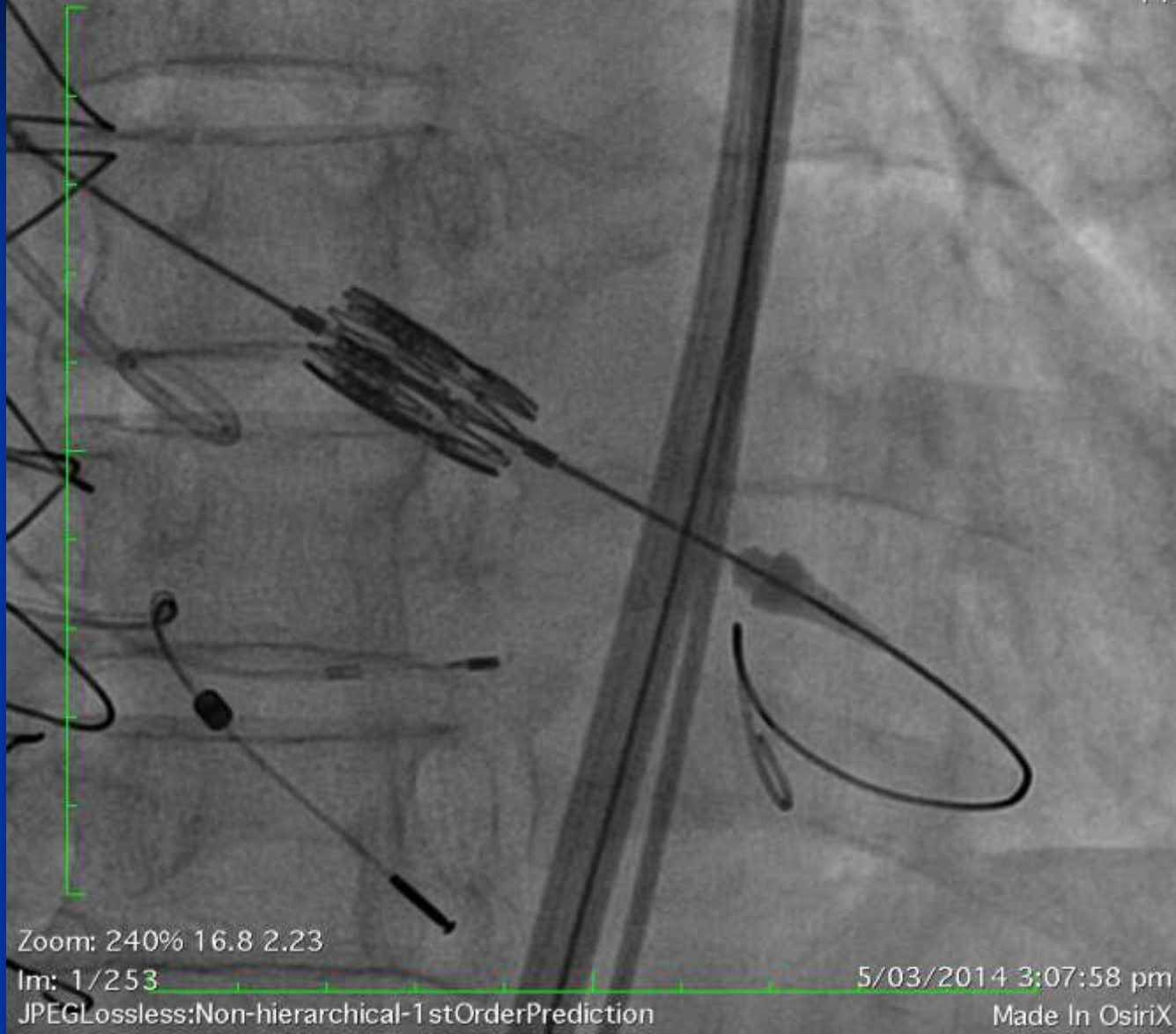
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JPEGLossless:Non-hierarchical-1stOrderPrediction

Made In OsiriX

Image size: 512 x 512
View size: 1230 x 1230
WL: 128 WW: 256

01802370 (43 y , 43 y)
Cardiac -- Coronary 15 fps
1403050020
14



Zoom: 240% 16.8 2.23

Im: 1/253

JPEGLossless:Non-hierarchical-1 stOrderPrediction

5/03/2014 3:07:58 pm

Made In OsiriX

Image size: 512 x 512
View size: 1230 x 1230
WL: 128 WW: 256

01802370 (43 y , 43 y)
Cardiac -- Coronary 15 fps
1403050020
18



Zoom: 240% 16.8 2.23

Im: 1/88

5/03/2014 3:17:21 pm

JPEGLossless:Non-hierarchical-1stOrderPrediction

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- Aortic valve replacement with homograft was introduced ~30 years ago
- Good performance for 10 years then significant rate of degeneration
- Most common mode of degeneration is incompetence
 - Thinning / tearing / perforation
- Common pathology
 - Severe calcification of root / ascending aorta / sub-annular
 - Minimal calcium over aortic valve leaflets
- Redo-surgery often technically challenging and presents high risk of mortality and morbidity

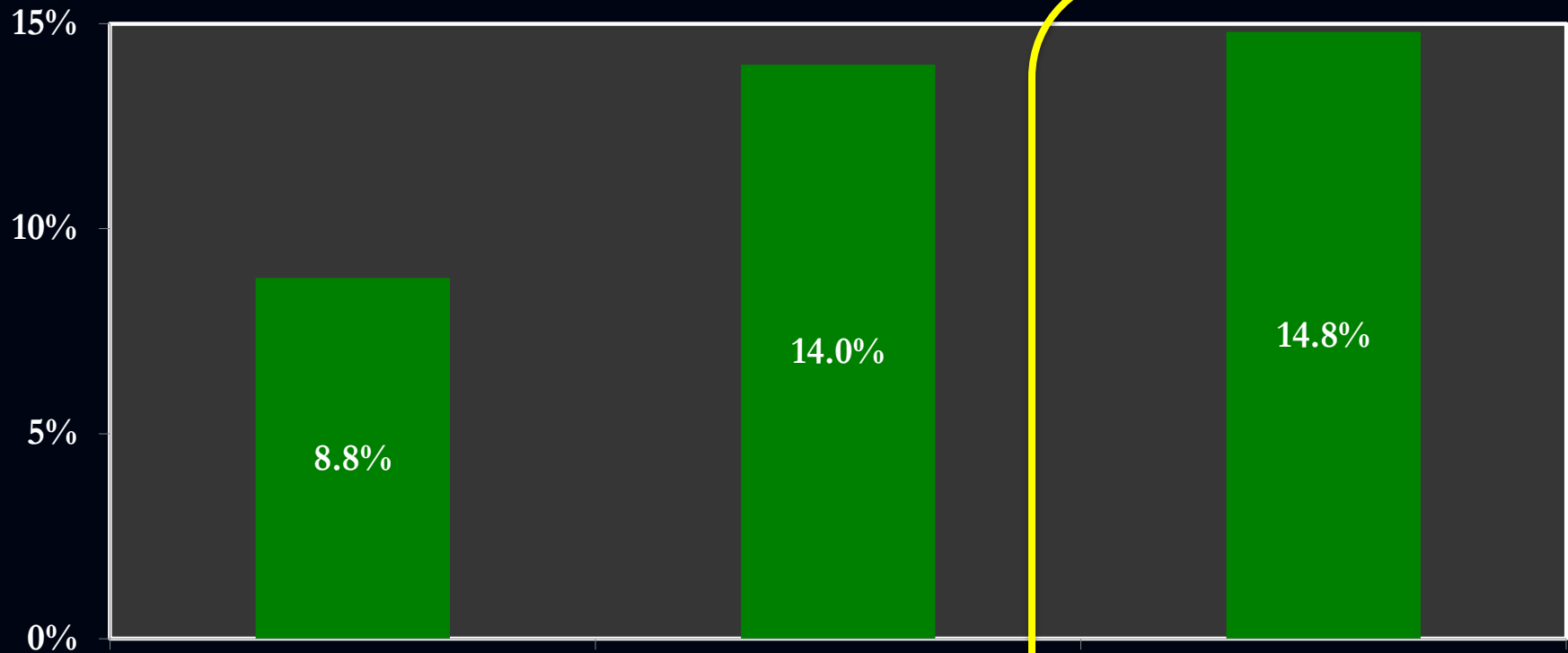
**Transcatheter Aortic Valve Replacement for Degenerative Bioprosthetic Surgical Valves:
 Results from the Global Valve-in-Valve Registry**

Danny Dvir, John Webb, Stephen Brecker, Sabine Bleiziffer, David Hildick-Smith, Antonio Colombo, Fleur Descoutures, Christian Hengstenberg, Neil E. Moat, Raffi Bekeredjian, Massimo Napodano, Luca Testa, Thierry Lefevre, Victor Guetta, Henrik Nissen, José-María Hernández, David Roy, Rui C. Teles, Amit Segev, Nicolas Dumonteil, Claudia Fiorina, Michael Gotzmann, Didier Tchetché, Mohamed Abdel-Wahab, Federico De Marco, Andreas Baumbach, Jean-Claude Laborde and Ran Kornowski

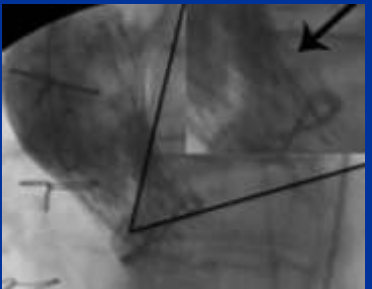
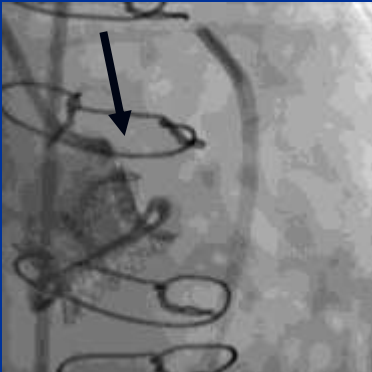
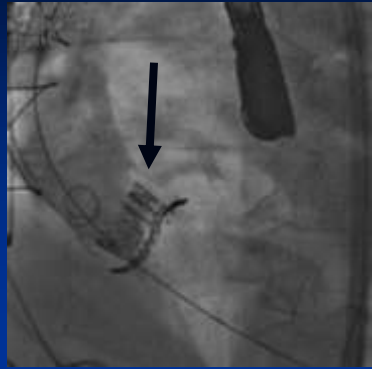
Appendix 2. Degenerated bioprostheses included in the Global Valve-in-Valve Registry

	Stented (n= 155)		Stentless (n= 47)		
	n	%	n	%	
Carpentier Edwards (Edwards Lifesciences, Irvine, CA)	61	39.4	Homograft	14	29.8
Mitroflow (Sorin Group Inc, Vancouver, Canada)	39	25.2	Biocor (St. Jude)	10	21.3
Mosaic (Medtronic, Minneapolis, MN)	15	9.7	Cryolife O'Brien (Cryolife International, Atlanta, GA)	6	12.8
Epic (St. Jude Medical, St. Paul, MN)	13	8.4	Freestyle (Medtronic)	4	8.5
Hancock (Medtronic)	13	8.4	Freedom (Sorin)	4	8.5
Others	14	9.0	Toronto SPV (St. Jude)	4	8.5
			Prima (Edwards)	2	4.3
			Others	3	6.4

Device Malpositioning

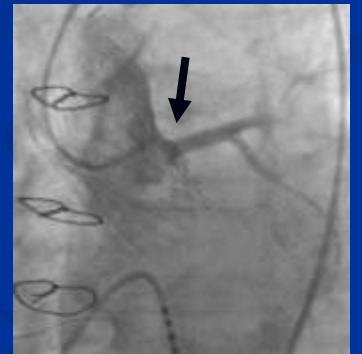
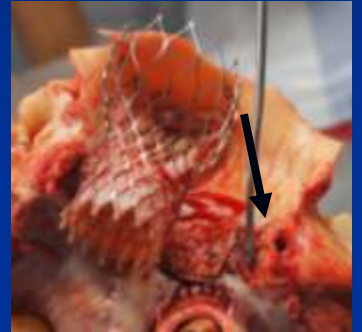


Ostial Coronary Obstruction



Incidence – 0.7%

- Sorin Mitroflow
- Sorin Freedom Stentless
- CryoLife O'Brien Stentless
- Mosaic



Technical challenges in VIV for Homograft

- Severely calcified but distribution of calcium not similar to native aortic valve stenosis
 - Requires careful review of CT and aortography
 - Commonly requires lower implant to anchor on subannular calcium (may be more suited for CoreValve)
- Commonly associated with severe regurgitation
 - Problematic for aortography
 - Identify other landmarks eg. location of L main
 - Double pigtail
 - Location of calcium

Thank you...



"You need a heart valve replacement. We have staff going down to a nearby farm to look for a donor."