

# Complex Cases with Evolut PRO



**Young-Guk Ko, M.D.**

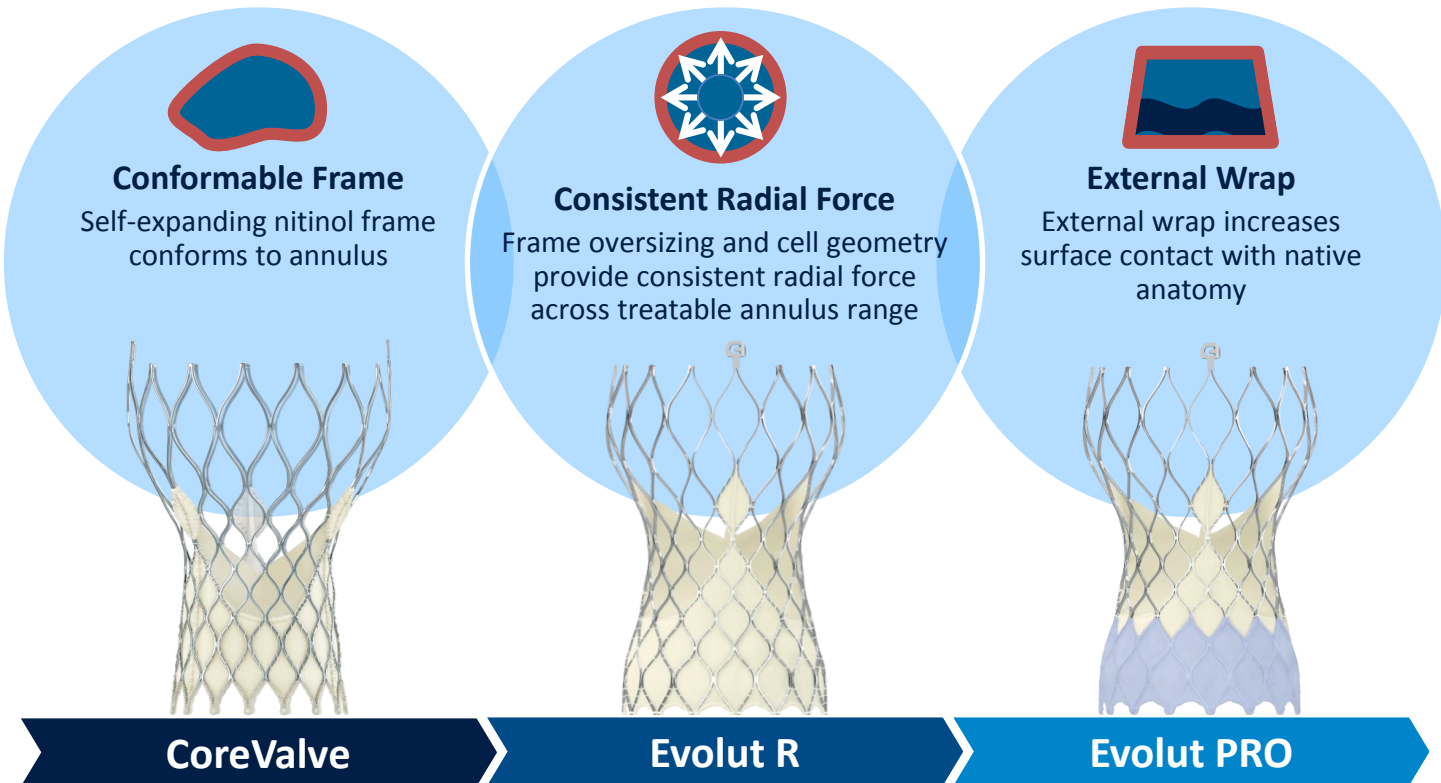
*Severance Cardiovascular Hospital, Yonsei University Health System,  
Seoul, Korea*



# EVOLUT PRO TRANSCATHETER VALVE

## ADVANCED SEALING

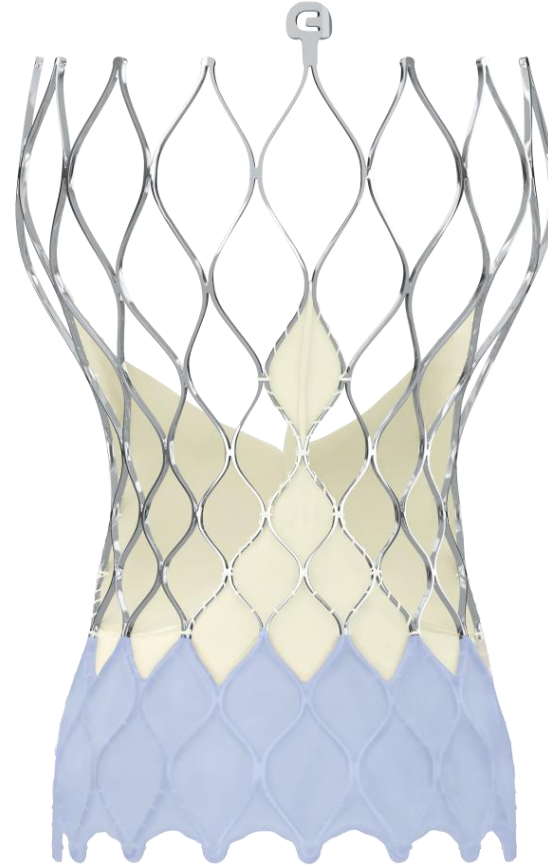
Building on Proven Design for **Advanced Sealing**



# EVOLUT PRO

## WRAP DESIGN AND CONSTRUCTION

- Evolut R TAV with added **external porcine pericardial wrap**
  - Identical frame and inner tissue as Evolut R
  - External wrap covers first **1½ inflow cells** and extended skirt
- Sutures secure inner skirt and outer wrap together to the frame
  - Same number and location of sutures as Evolut R TAV



# LOWEST DELIVERY PROFILE

## 5.5MM ACCESS VESSEL REQUIREMENT

EnVeo R InLine™ Sheath allows treatment of trans-arterial access vessel diameters  $\geq 5.5$  mm across all Evolut PRO valve sizes



# EVOLUT PRO DELIVERY CATHETER SYSTEM

## DELIVERY PROFILE COMPARISON

Lowest delivery profile across all valve sizes with InLine Sheath

Evolut R 23/26/29 mm TAV

Evolut PRO /Evolut R 34 mm TAV

$\geq 5.0$  mm

Treatable Access  
Vessel Diameter

$\geq 5.5$  mm



18 Fr OD

**14 Fr Equivalent**



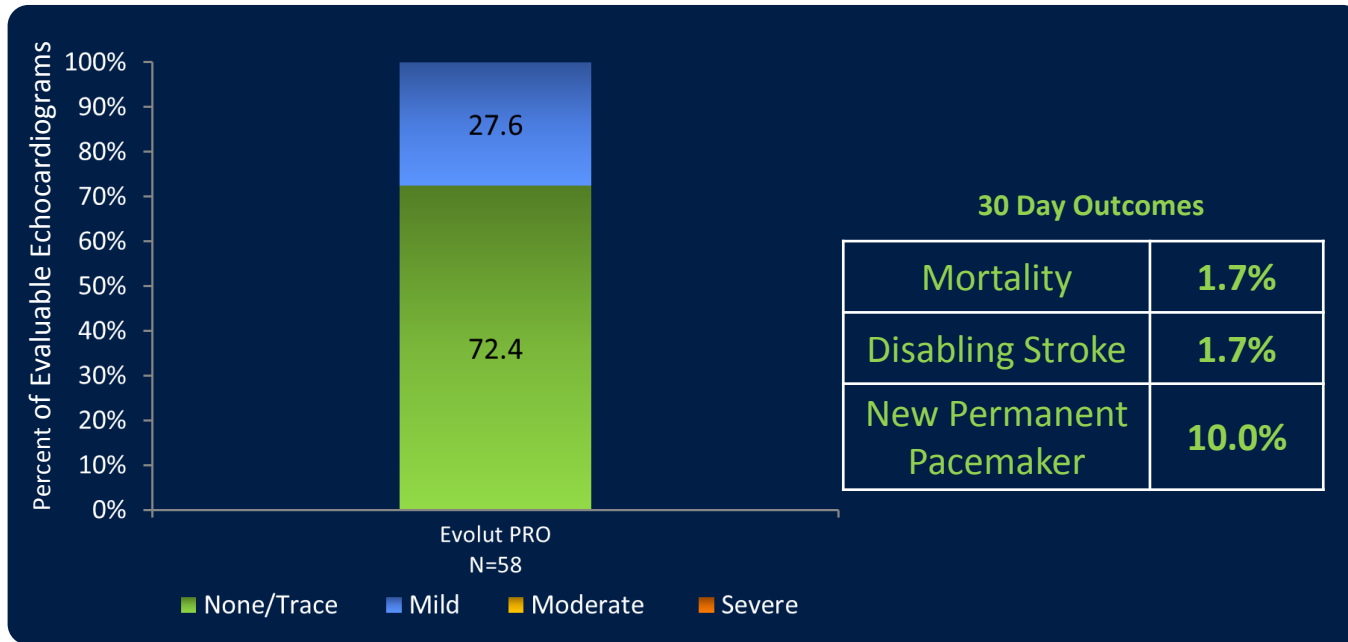
20 Fr OD

**16 Fr Equivalent**

The Evolut System retains its outer diameter as it enters the vessel and remains at this diameter as it is advanced to the annulus.

# EVOLUT PRO SYSTEM CLINICAL TRIAL: ADVANCED SEALING

- N=60, Single arm, multicenter registry at 8 US centers



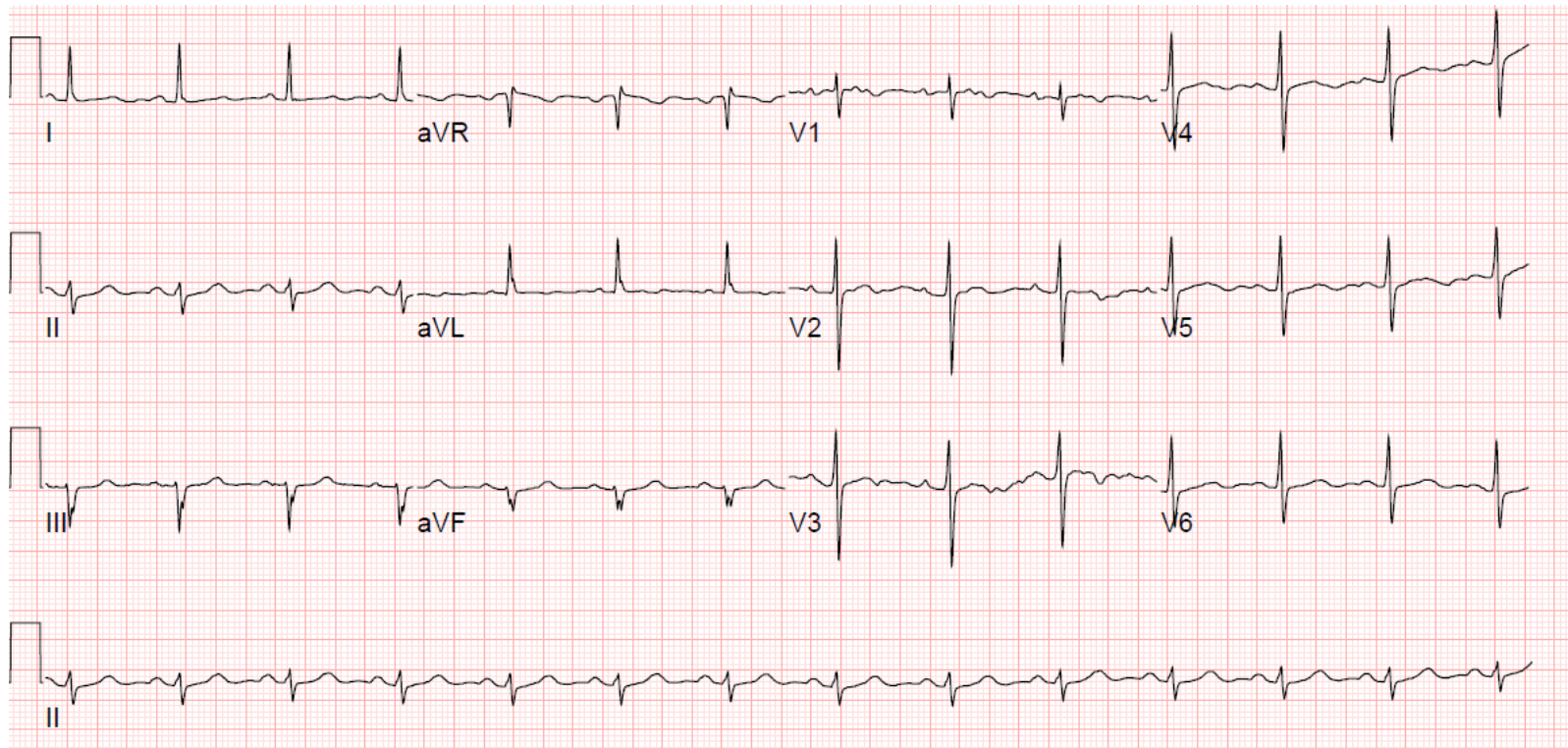
Forrest, et al., ACC, 2017



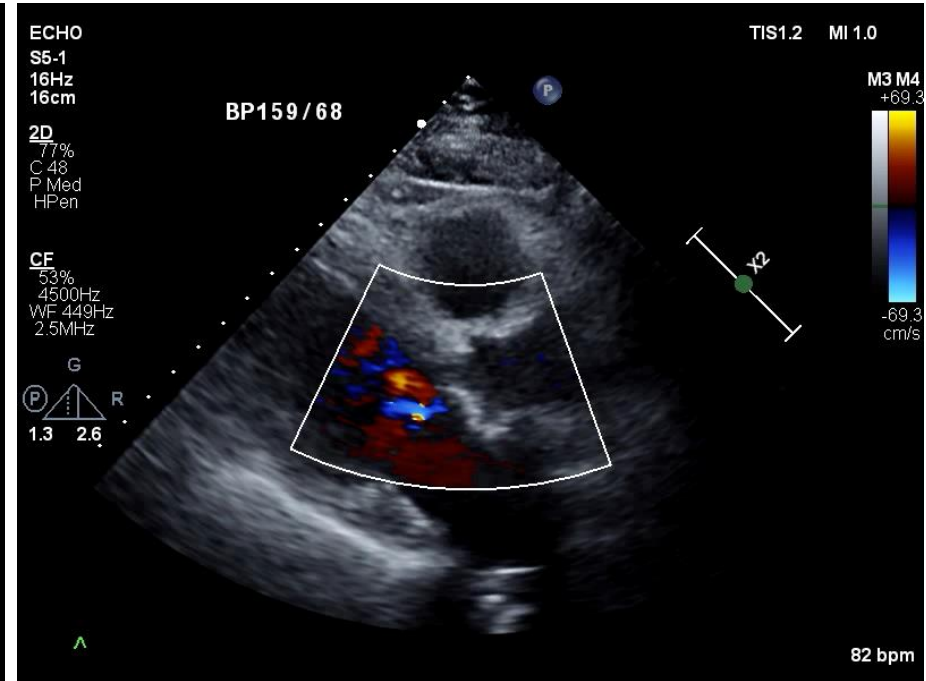
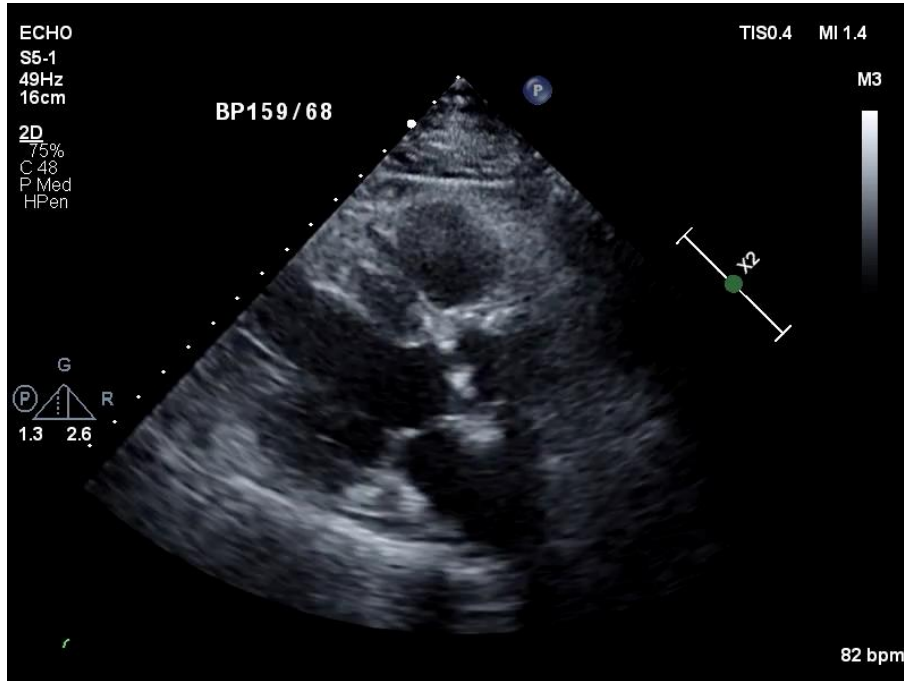
- Sx: DOE (NYHA II~III)
- 151 cm / 66.5 Kg
- PHx: HTN, DM
- STS score: 2.13%
- Euroscore II: 1.60%



# Baseline ECG







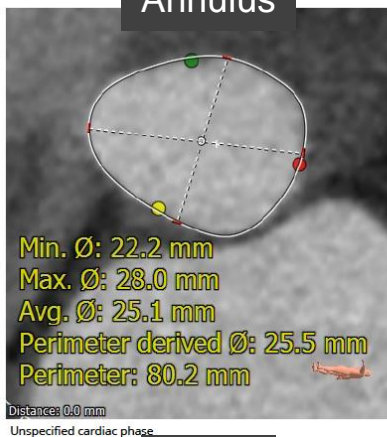
Severe AS (AVA = 0.82cm<sup>2</sup> by CE, PSPG/MSPG = 54/30mmHg)  
EF = 68%



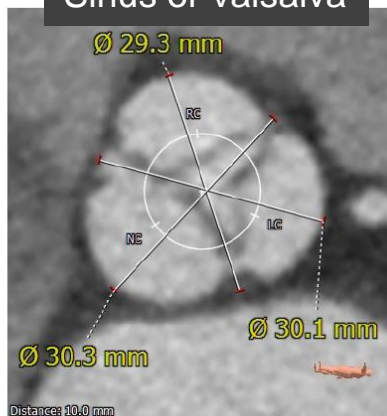
# AV & Aortic Root



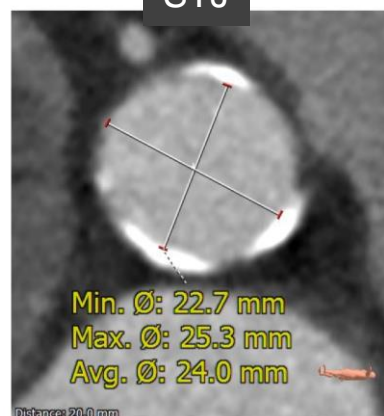
Annulus



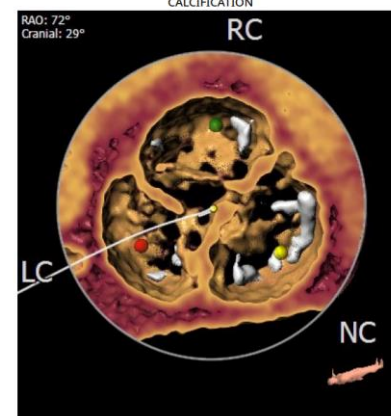
Sinus of Valsalva



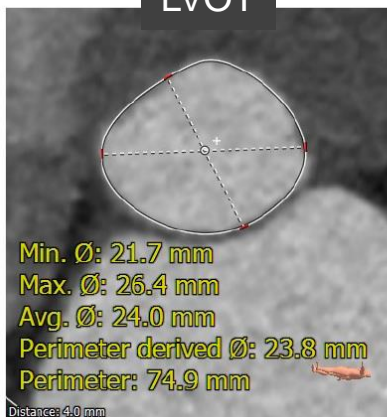
STJ



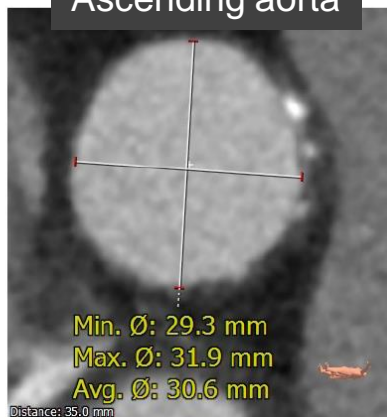
AORTIC VALVE CALCIFICATION



LVOT



Ascending aorta



ANNULUS

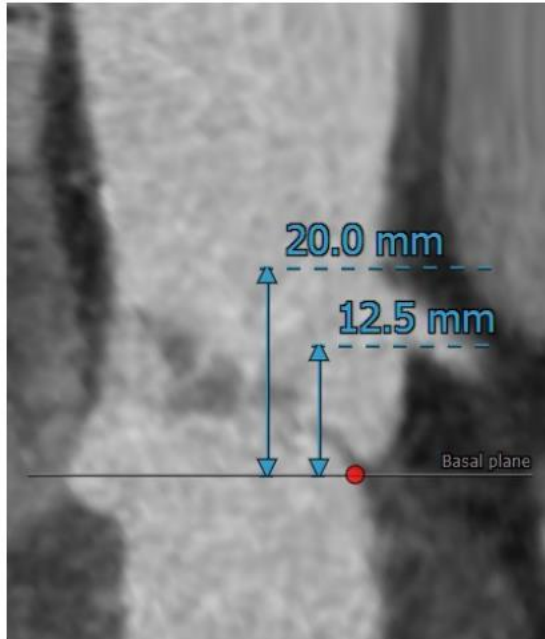
Diameter (mm)	22.2	x	28.0	,	25.1
	Min		Max		Mean
Perimeter (mm)	80.2		Derived Ø (mm)		25.5
Area (mm <sup>2</sup> )	491.3		Derived Ø (mm)		25.0



# Sinus & Coronary Ostia Height



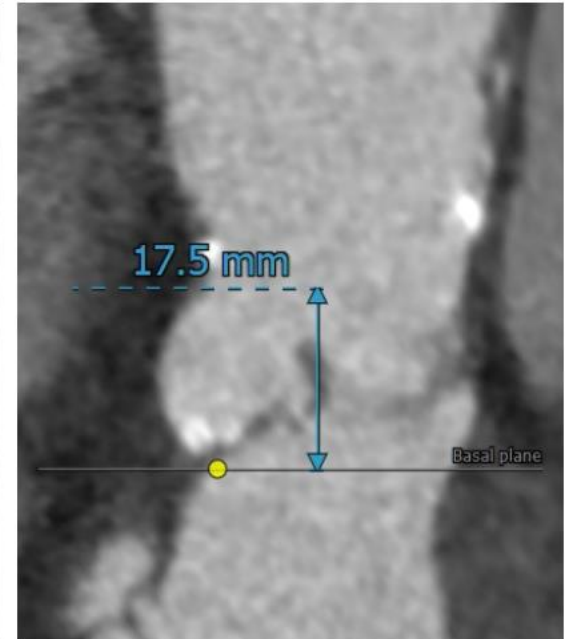
LCC



RCC



NCC



# Coronary Artery



RCA

LAD

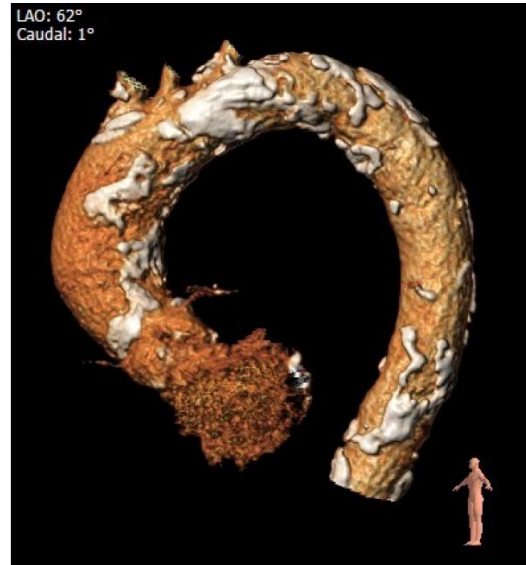
LCX



# Aorta



Severe angulation of ascending aorta







# Iliofemoral Access



# Valve Size



Perimeter = 80 mm  
 Mean annulus diameter = 25 mm

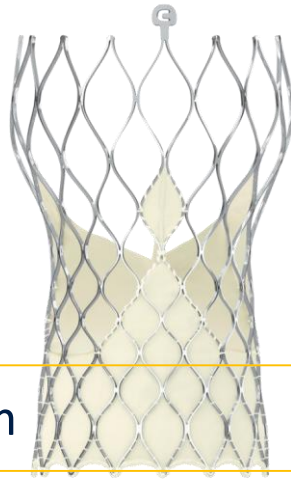
Valve Size Selection	CoreValve® Evolut® R			
				
Size	23 mm	26 mm	29 mm	34 mm
<b>Annulus Diameter</b>	18-20 mm	20-23 mm	23-26 mm	26-30 mm
Annulus Perimeter†	56.5-62.8 mm	62.8-72.3 mm	72.3-81.7 mm	81.7-94.2 mm
<b>Sinus of Valsalva Diameter (Mean)</b>	≥ 25 mm	≥ 27 mm	≥ 29 mm	≥ 31 mm
<b>Sinus of Valsalva Height (Mean)</b>	≥ 15 mm	≥ 15 mm	≥ 15 mm	≥ 16 mm



# Evolut R or Pro?



## Evolut R



## Evolut Pro



≥ 5.0 mm

Treatable Access  
Vessel Diameter

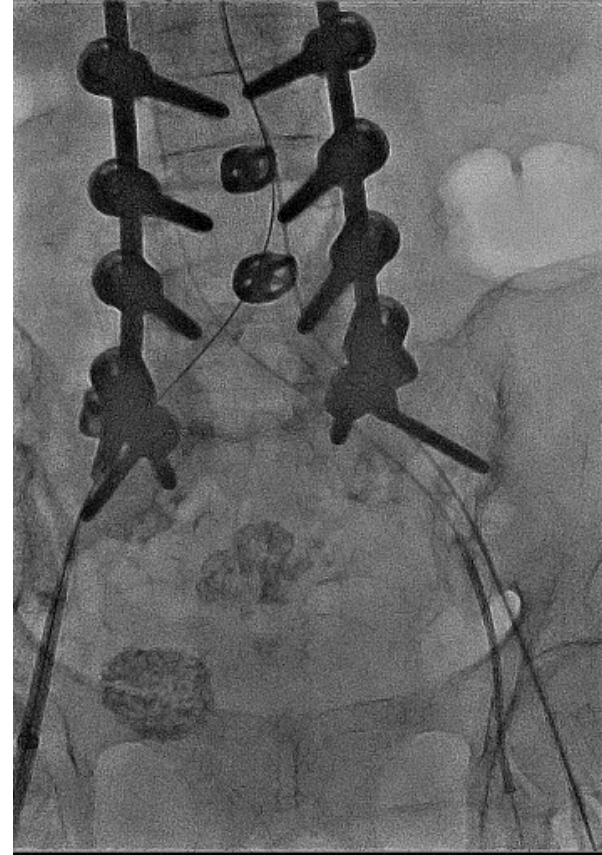
≥ 5.5 mm

Evolut R - 18 Fr DCS		Evolut Pro - 20 Fr DCS	
Evolut R 23/26/29 mm With 18 Fr Cook Sheath	Evolut R 23/26/29 mm With 14 Fr-Equivalent InLine™ Sheath	Evolut Pro 26/29 mm With 16 Fr-Equivalent InLine™ Sheath	TAVR 2.0 26/29 mm With 20 Fr Cook Sheath
<b>18 Fr</b>	<b>18 Fr</b>	<b>20 Fr</b>	<b>20 Fr</b>
22Fr (OD)	18Fr (OD)	20Fr (OD)	23Fr (OD)





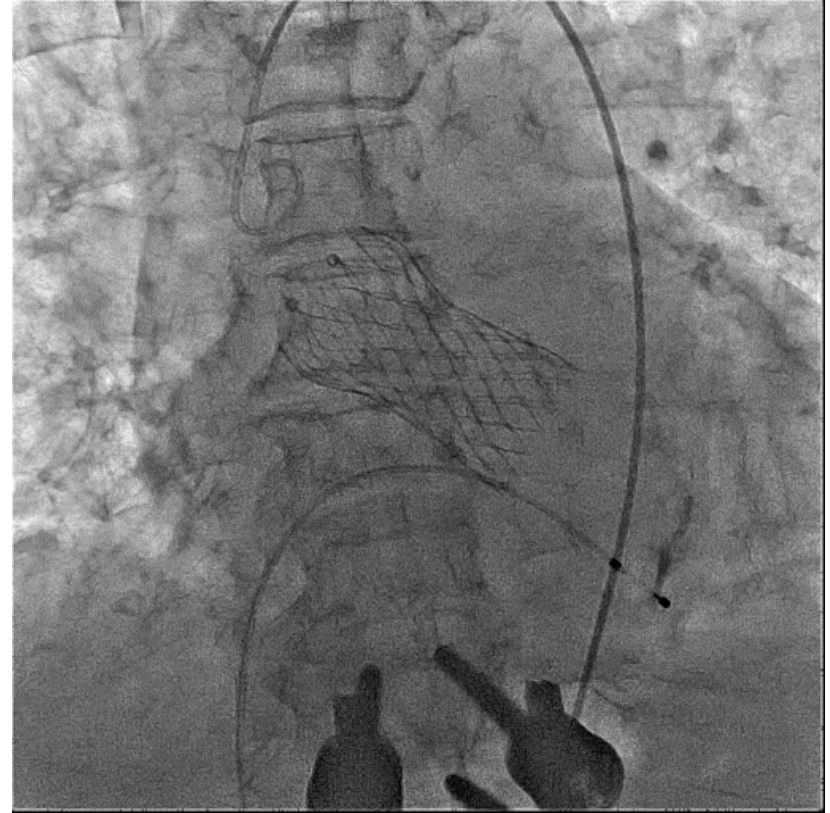
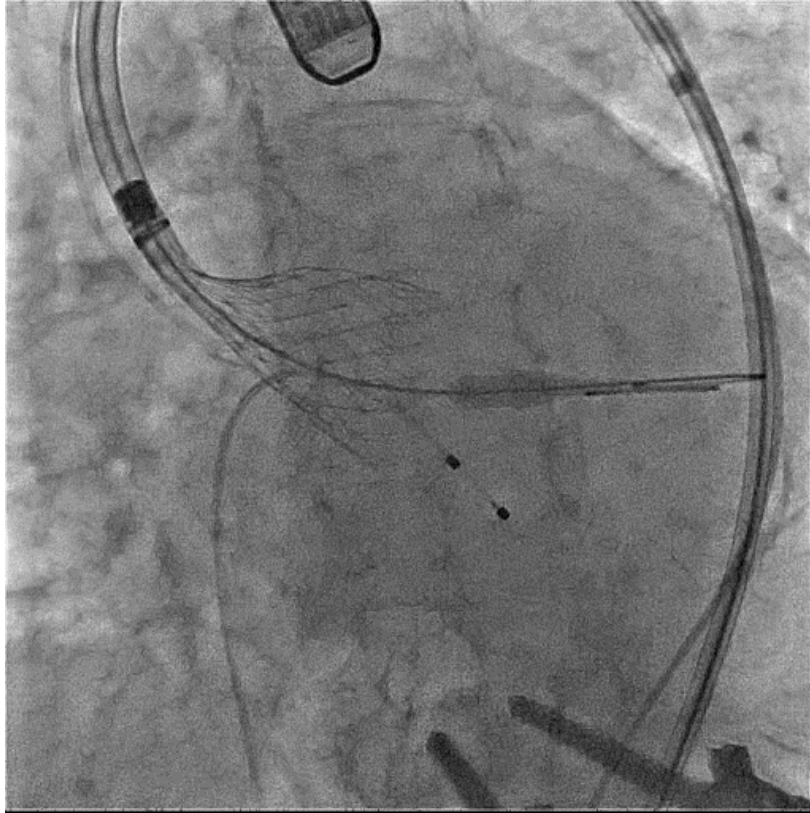
# 18F Sheath Passage Test



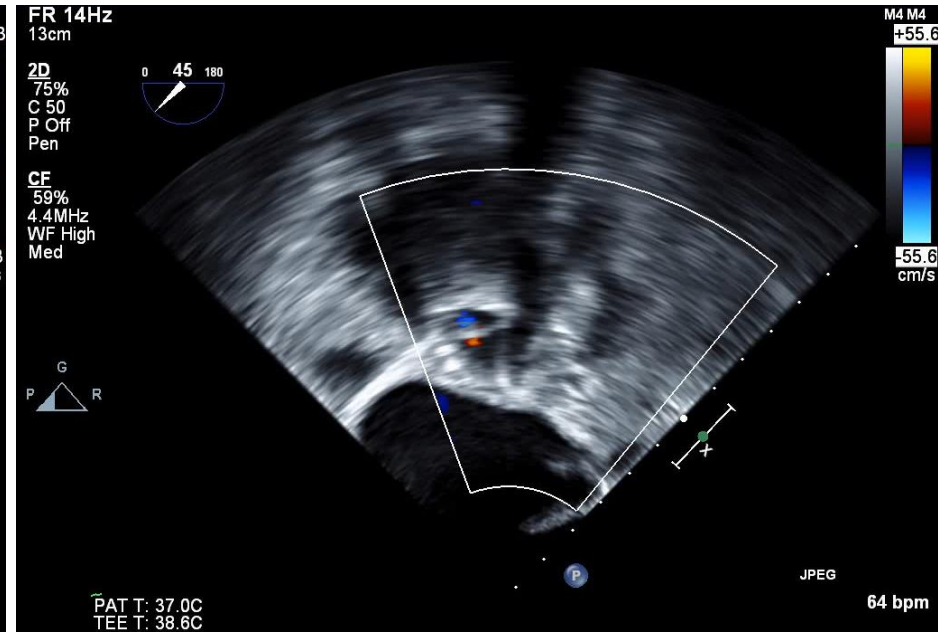
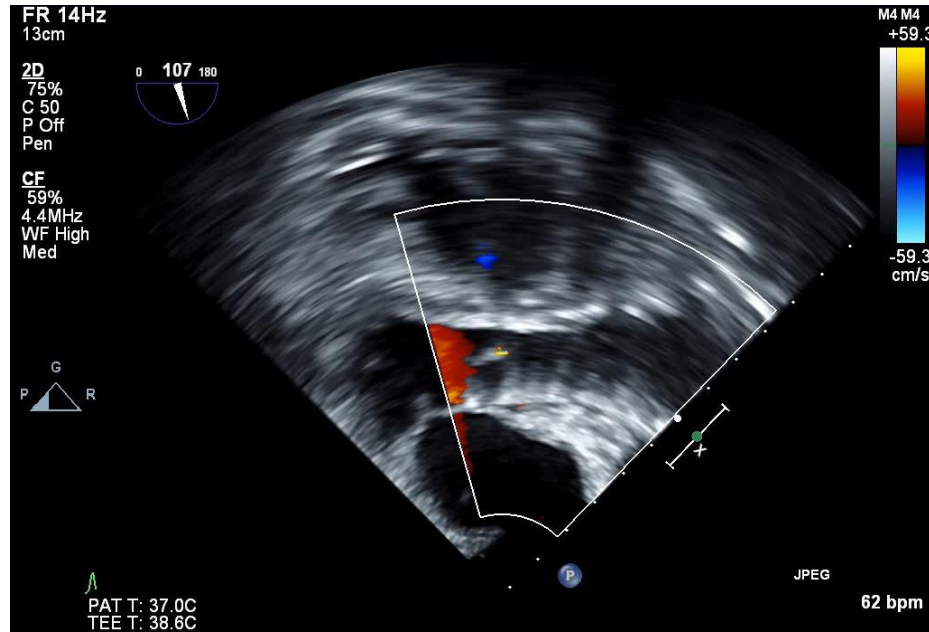
# Valve Delivery



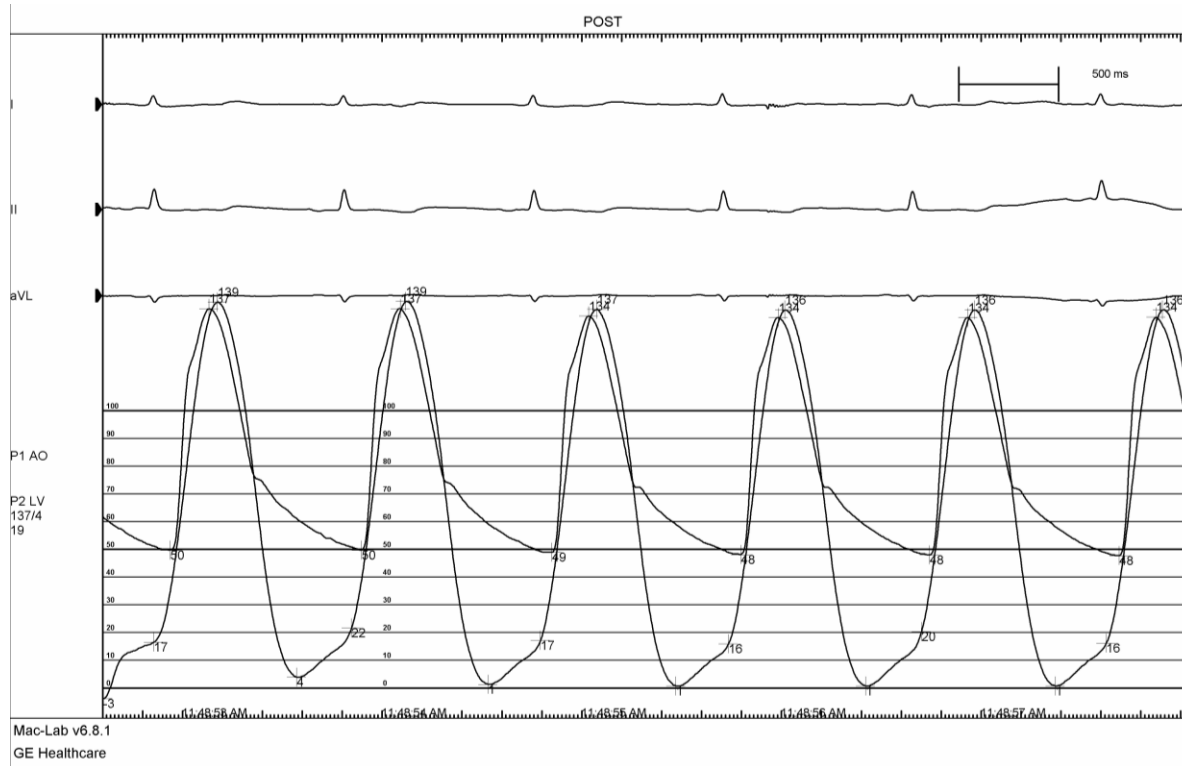
# Valve Deployment



# Post TEE



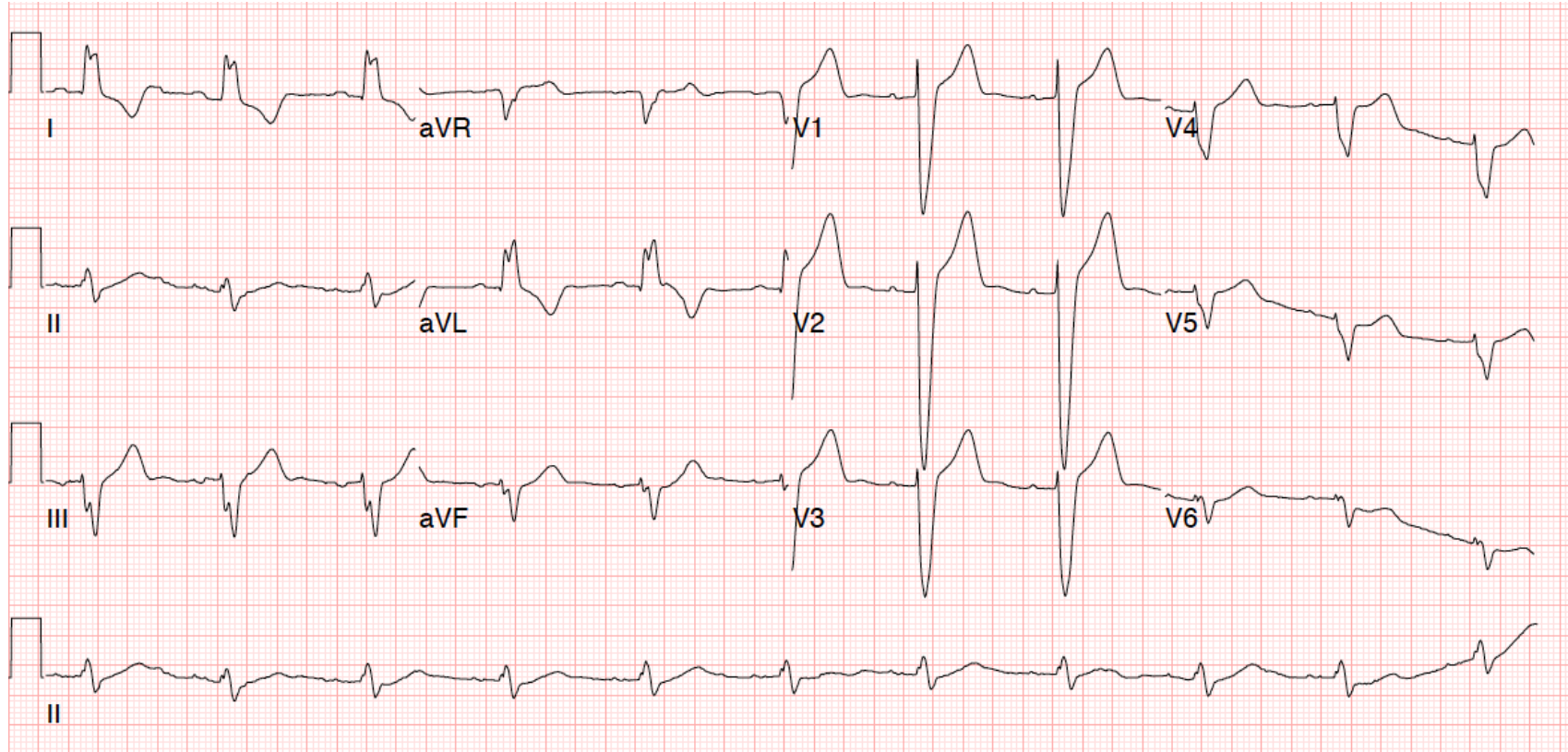
# AR Index



$$\begin{aligned} \text{AR Index} &= (50-17)/139 \\ &= 23.7 \end{aligned}$$



# Post ECG



# Post TAVR Progress



- Post ECG: new LBBB
- Discharged at POD #3
- No adverse clinical event



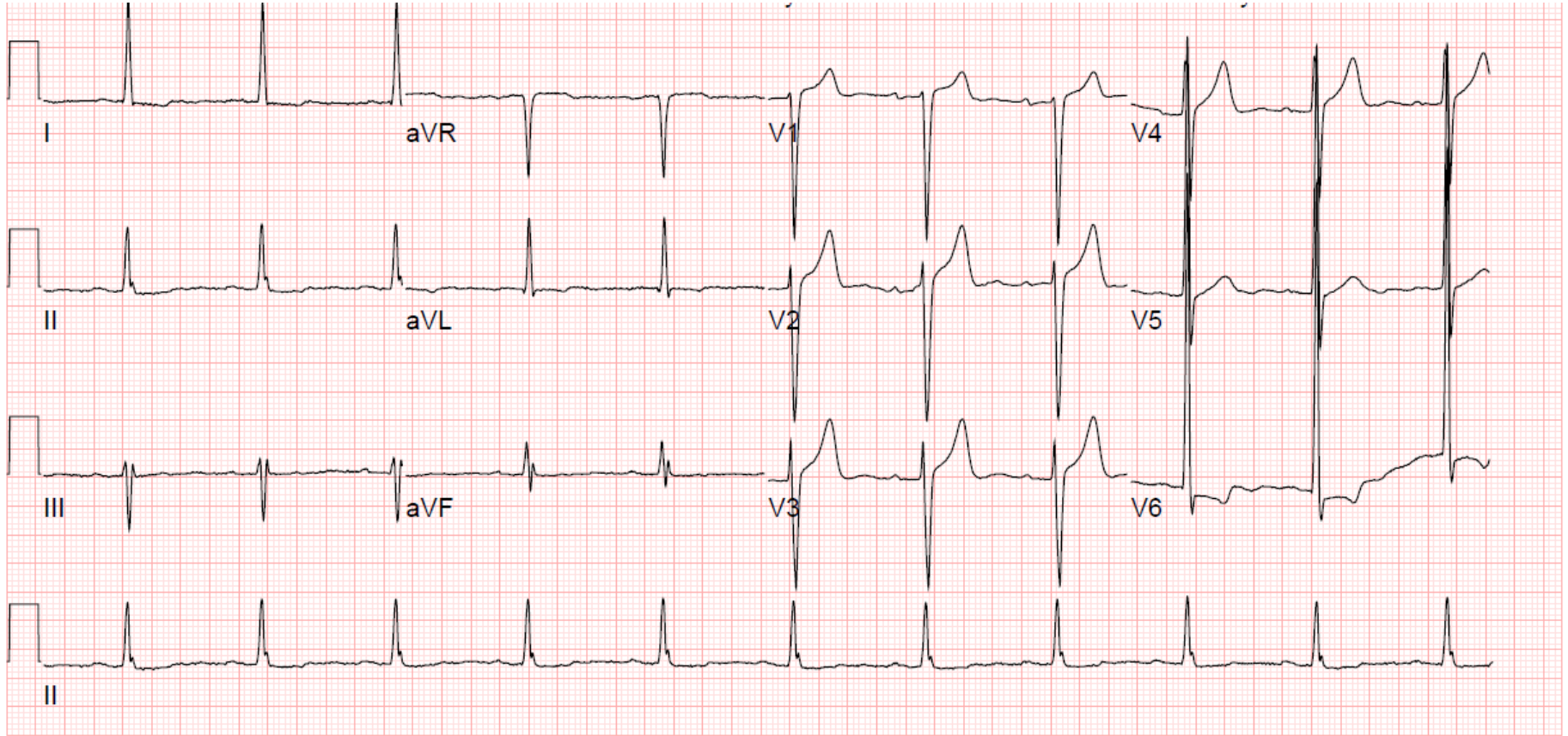


- Sx: DOE (NYHA II)
- 155 cm / 58 Kg
- PHx:
  - HTN
  - CAD (3-VD), S/P PCI (pLAD, LCX, mRCA)
  - CKD (stage 3)
  - Lung ca.
- Cr 1.33 mg/dL, eGFR 51 mL/min/1.73m<sup>2</sup>
- STS score: 3.49 %
- Euro SCORE II: 2.31 %

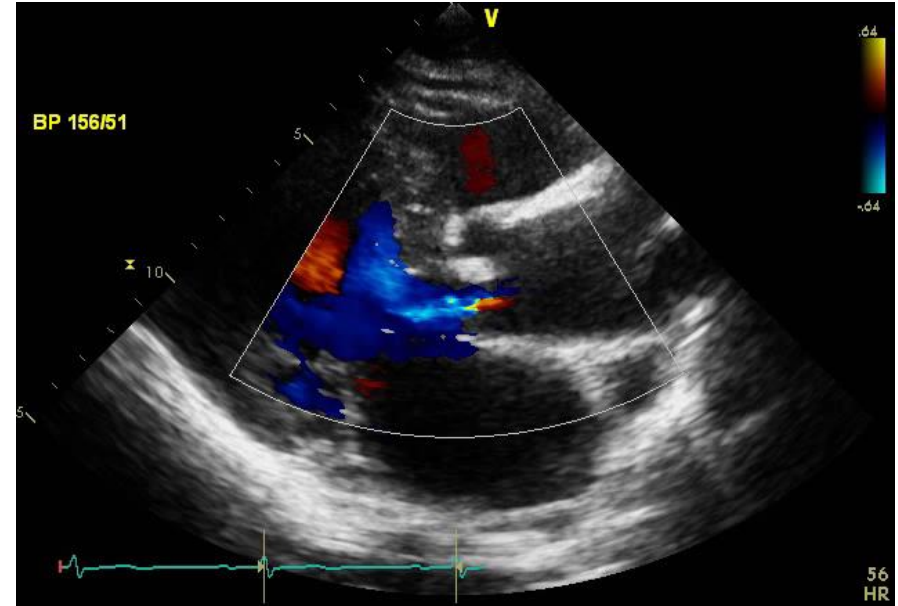




# Baseline ECG



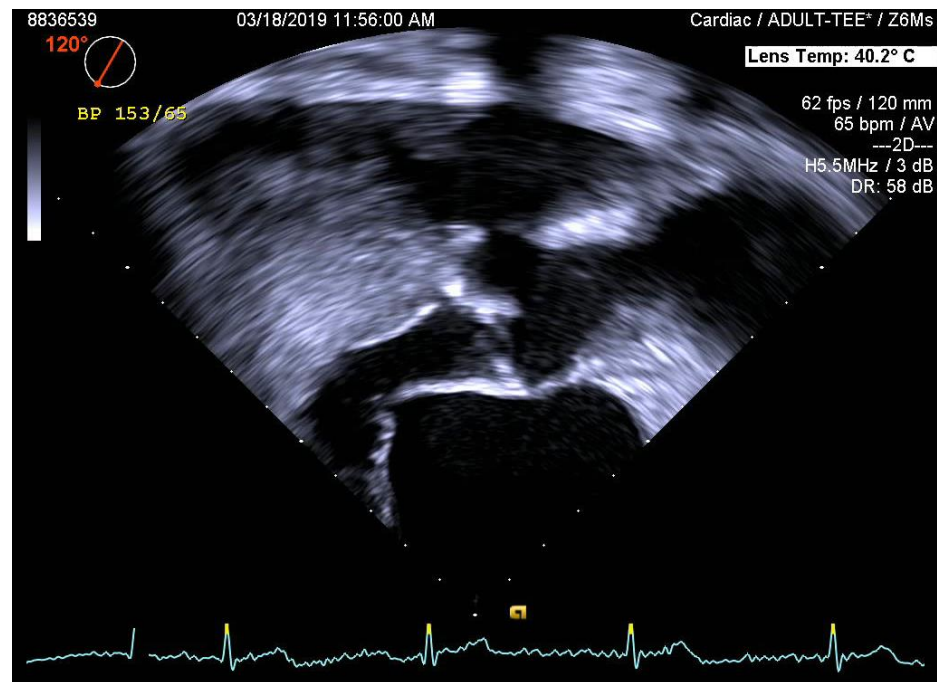
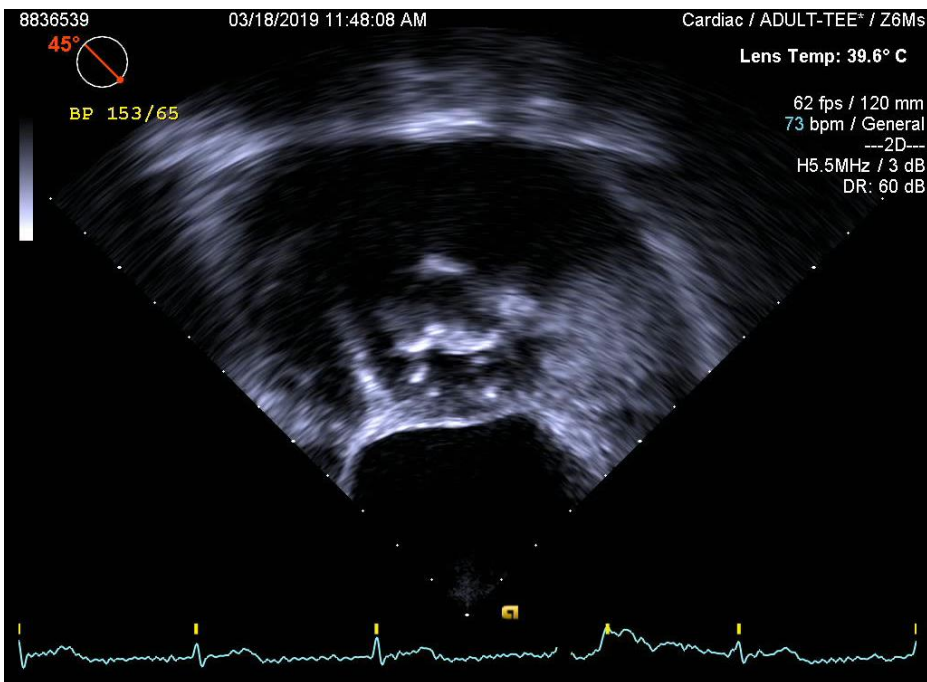
# TTE



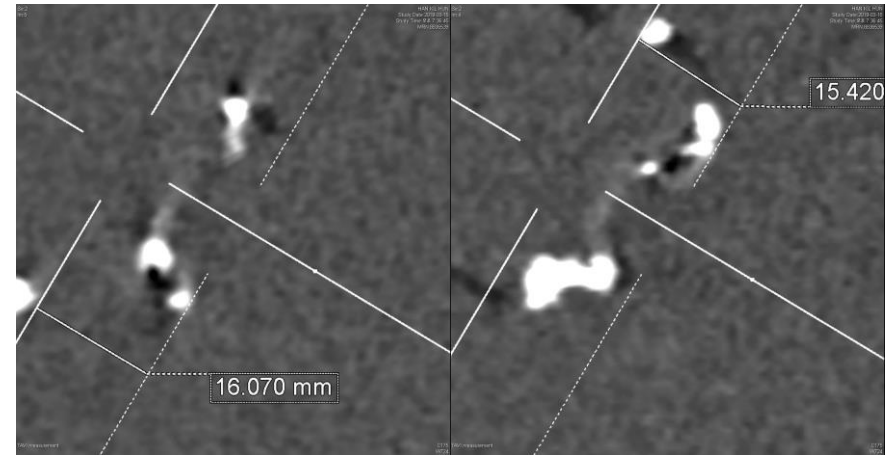
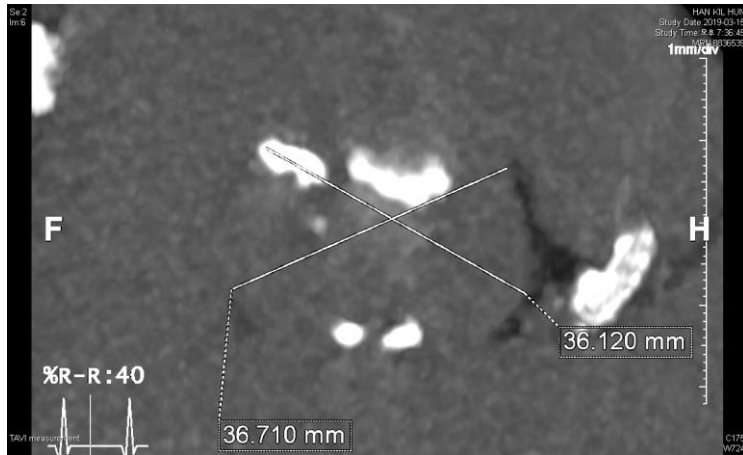
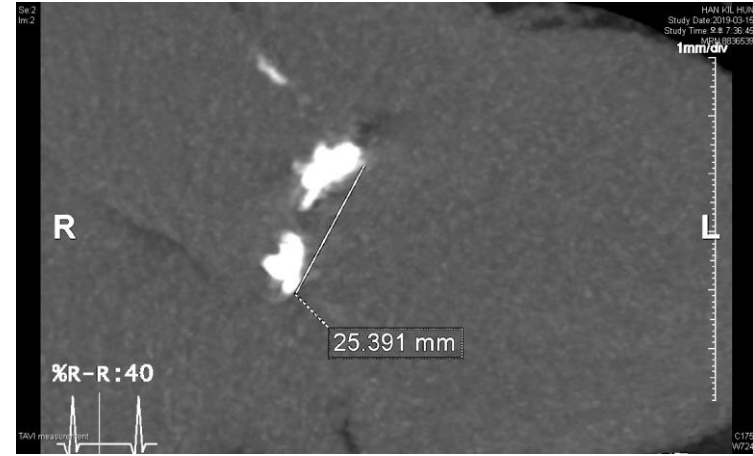
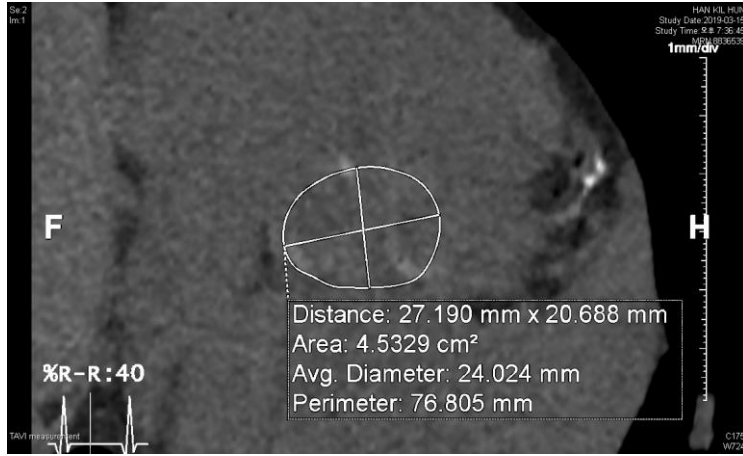
Severe AS and mild AR (GI/IV) due to degenerative change of AV (esp. RCC)  
AVA : 0.64cm<sup>2</sup> by C.E  
PSPG/MSPG : 72/41mmHg  
EF=66%



# TEE



# CT Measurement



# CT Measurement



Aortic valve: tricuspid, severe calcification.

-Annulus: 27.2x 20.7mm(average 24.0mm), Area =4.5 cm<sup>2</sup>, Perimeter = 76.8mm

-Sinus of valsalva: L 36.1mm x R 36.7mm x N 35.1mm

-Sinotubular junction: 37mm

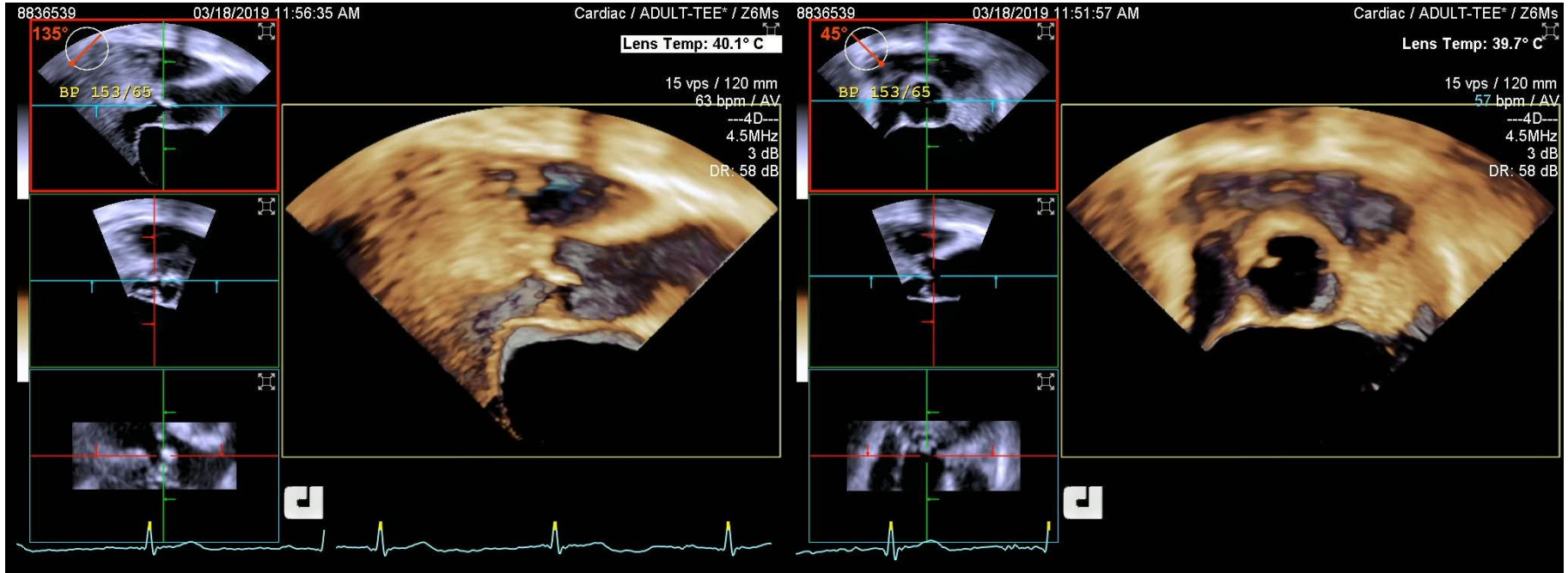
-Ascending aorta : 42.6mm

-Coronary ostial height: Lt 15.4mm; Rt 16.1mm

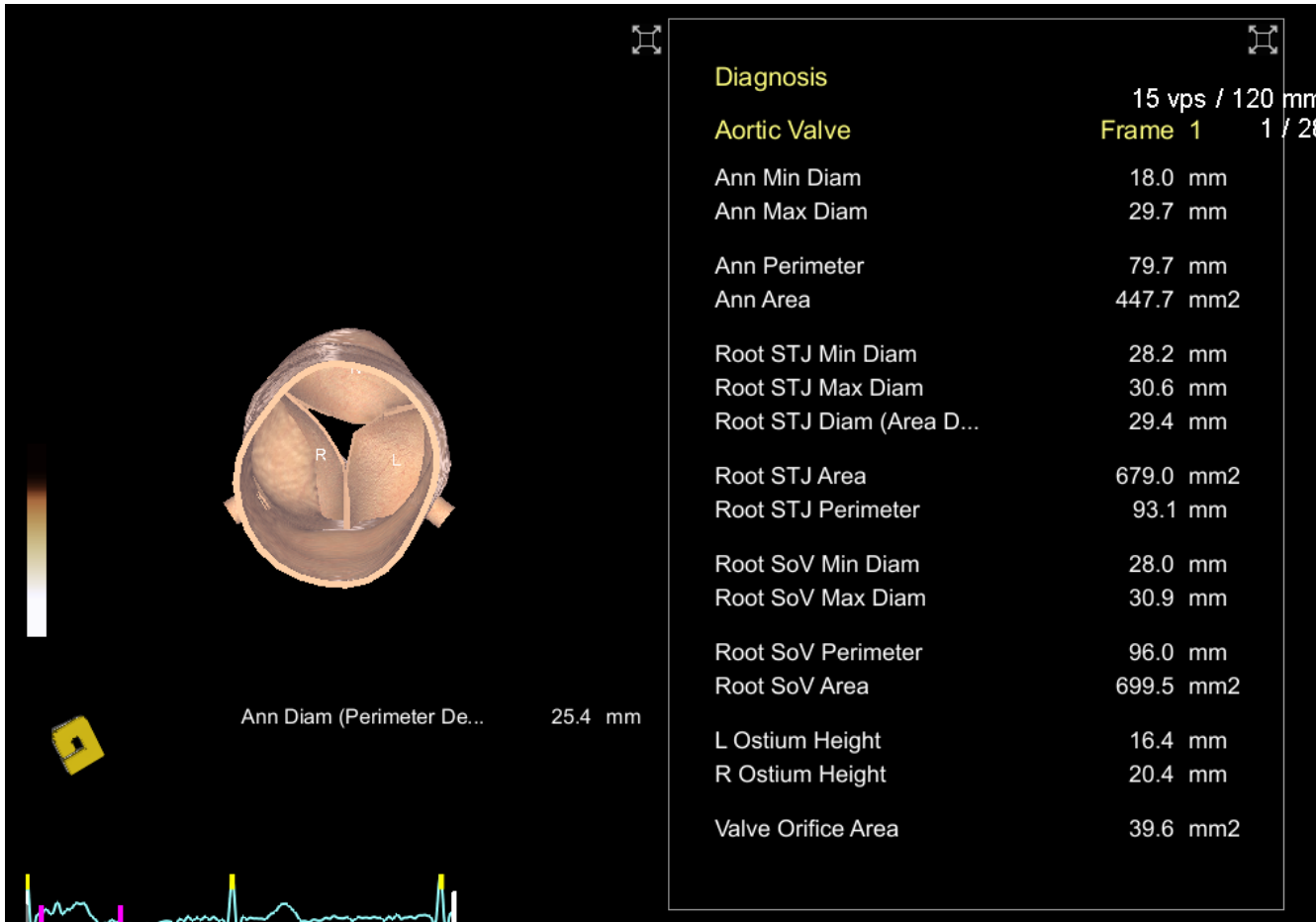
-Iliofemoral artery: multifocal calcification.



# 3-D TEE







# 3-D TEE Measurement



# Valve Size



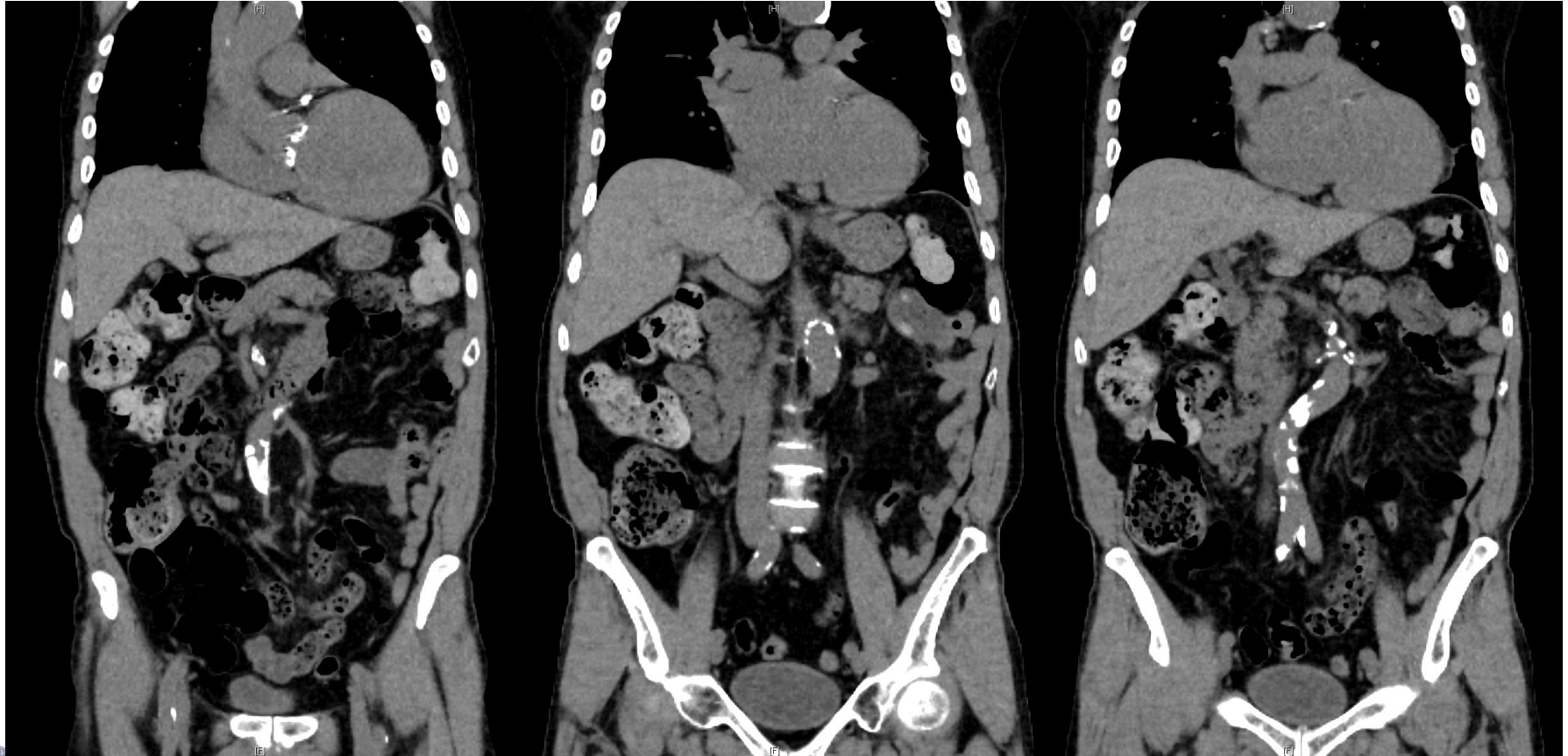
Perimeter = 77~80 mm  
 Mean annulus diameter = 24 mm

Valve Size Selection	CoreValve® Evolut® R			
				
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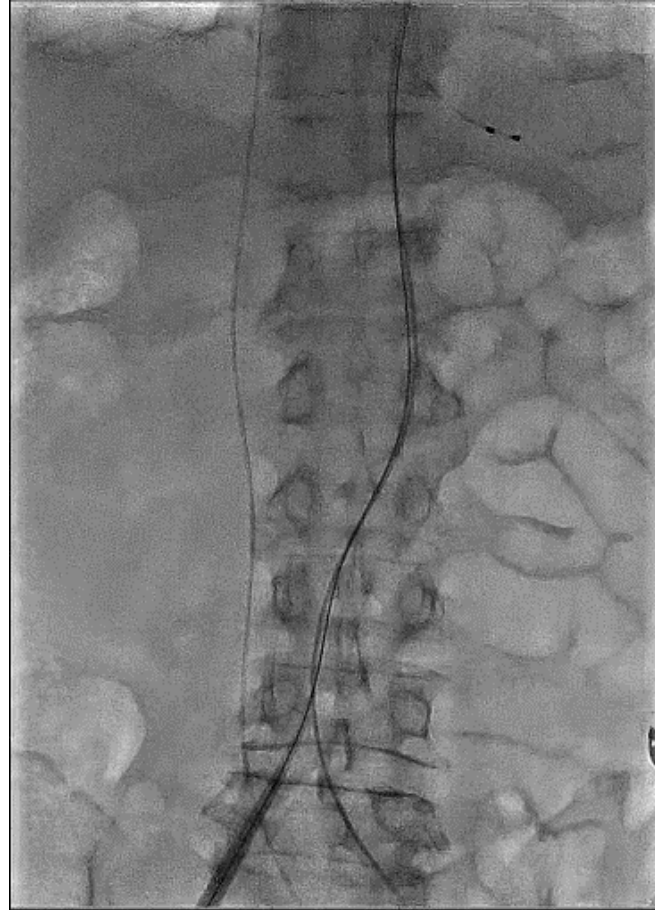




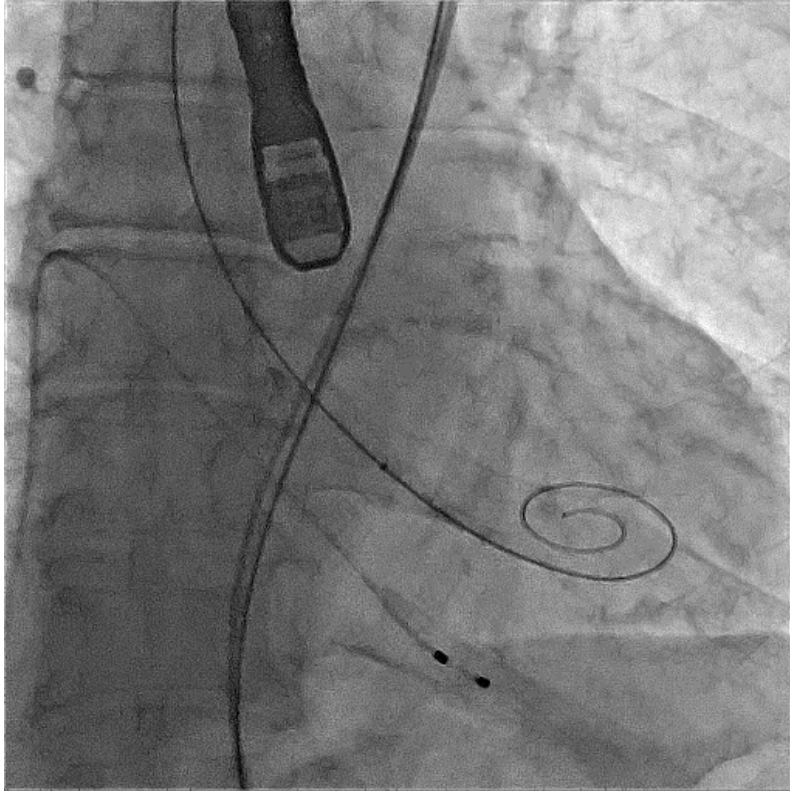
# Iliofemoral Vascular Route



# Vascular Access Route



# Predilation

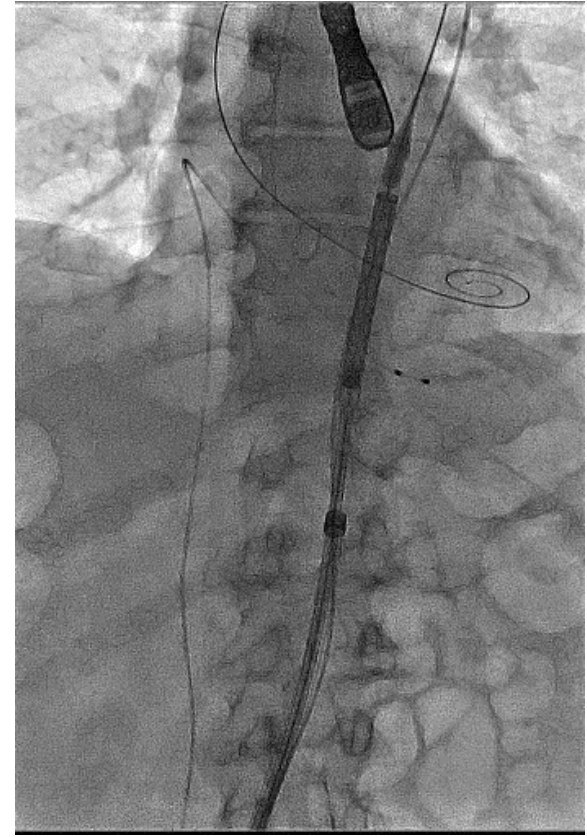
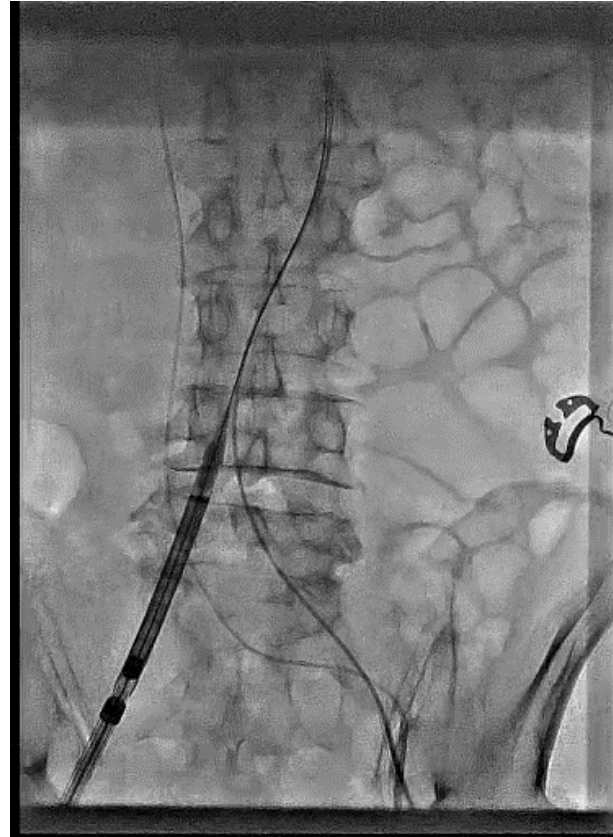


Predilation:  
Z-med balloon 20 mm

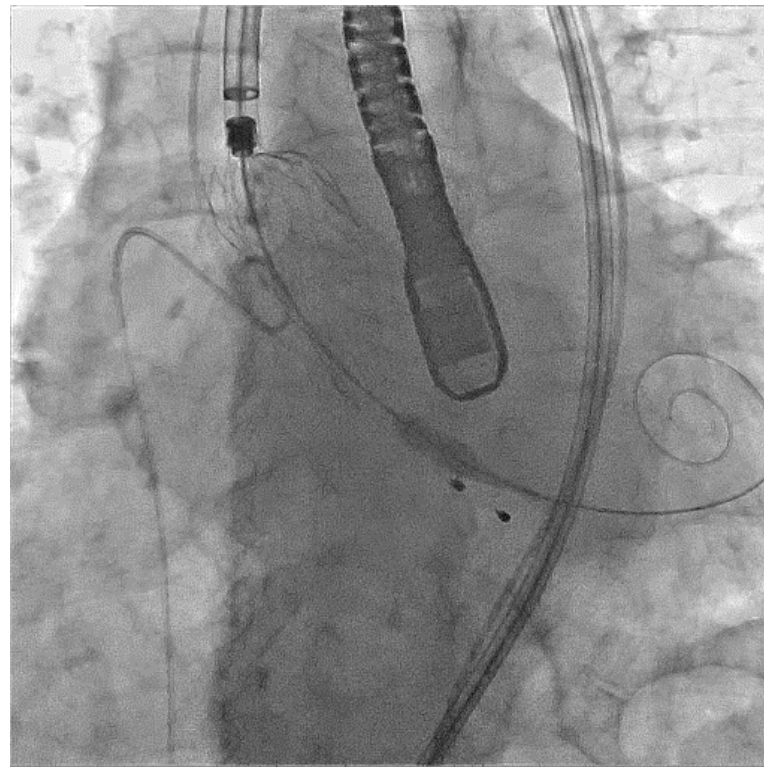
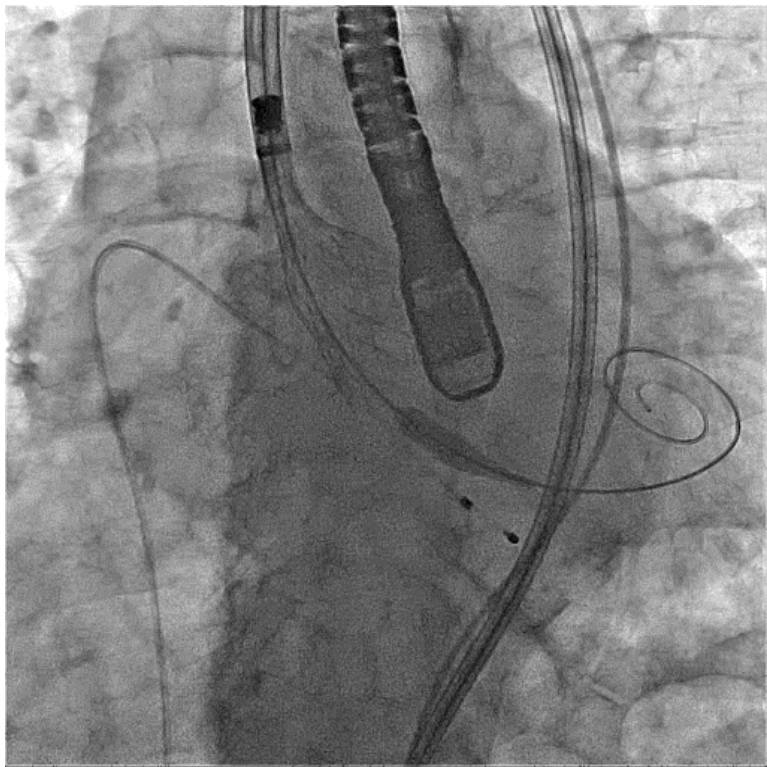
# Vascular Access Route



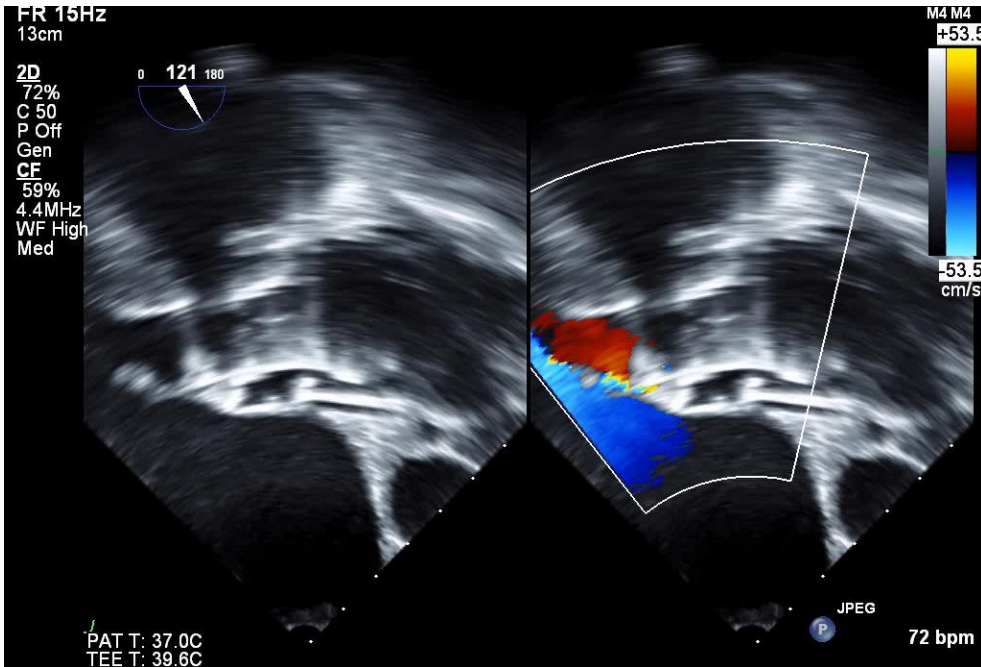
Evolut Pro  
29 mm



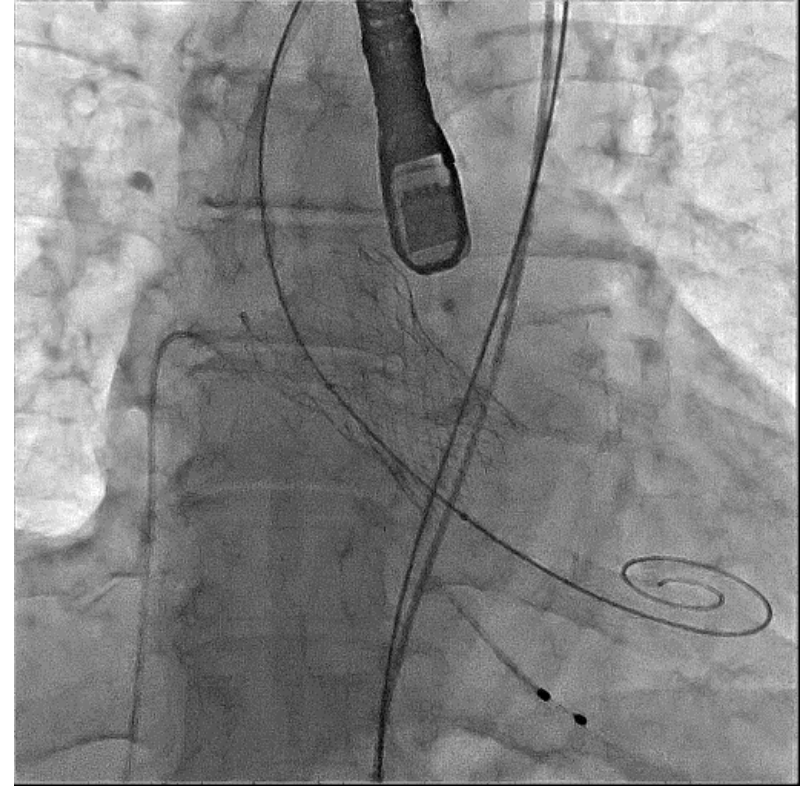
# Evolut Pro 29 mm



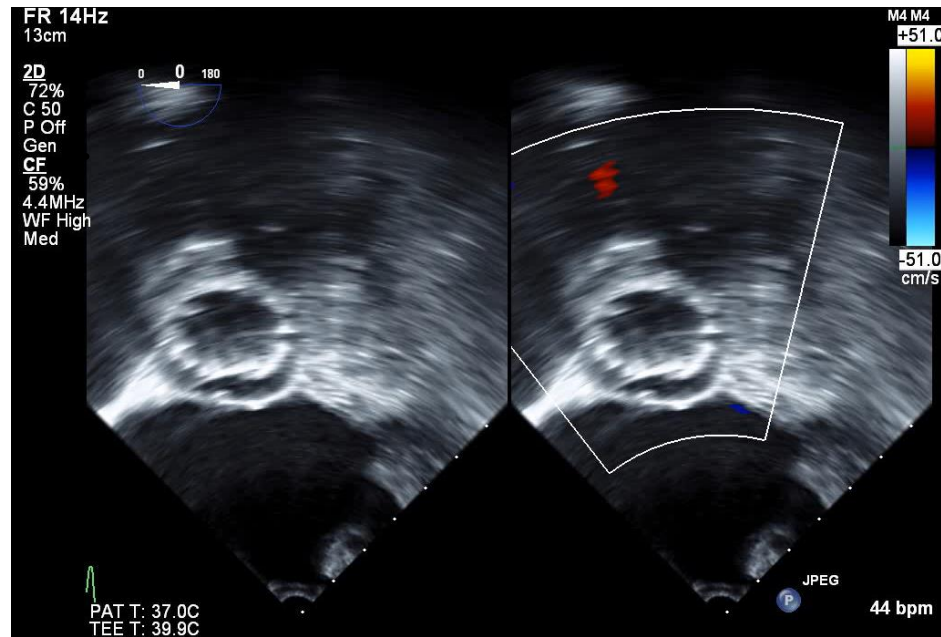
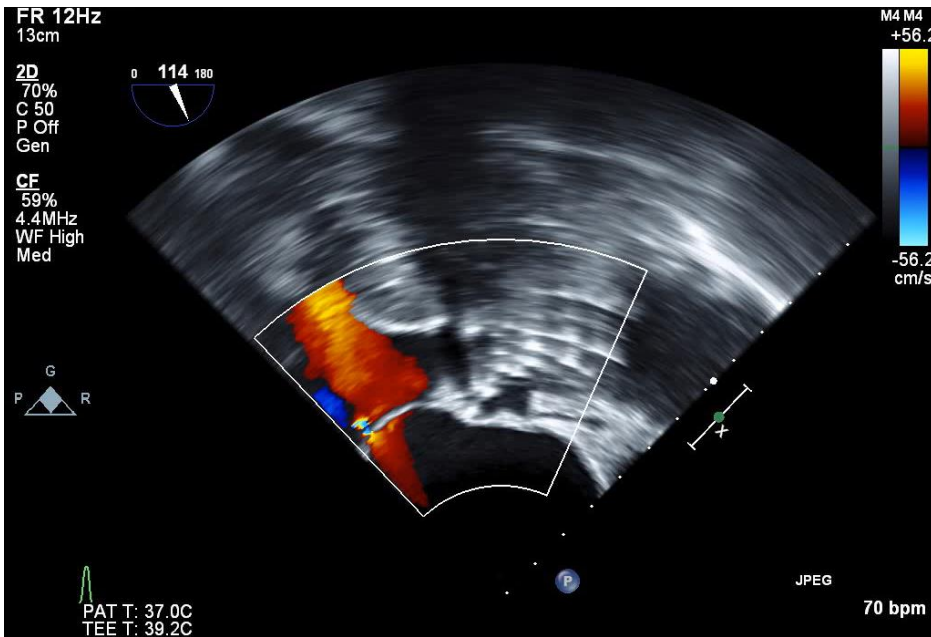
# TEE after Valve Implantation



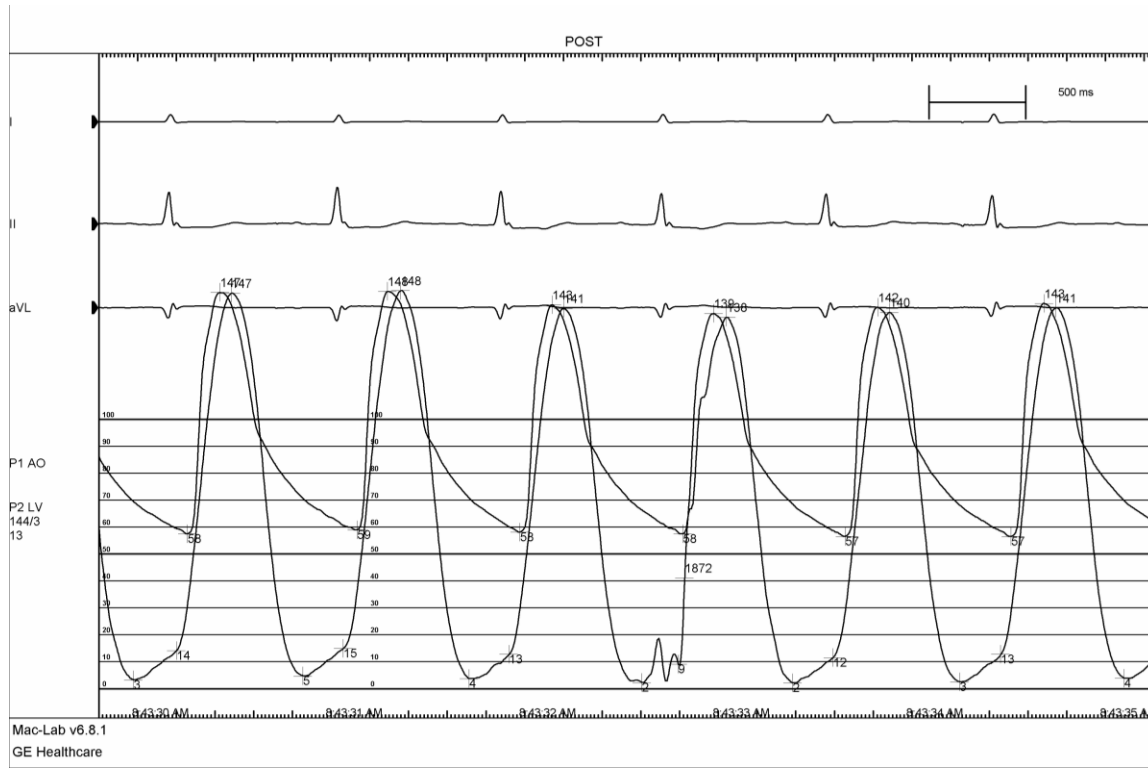
Post-dilation Z med 24 mm



# TEE after Postdilatation



# AR Index



$$\begin{aligned} \text{AR Index} &= (58-14)/147 \\ &= 30 \end{aligned}$$



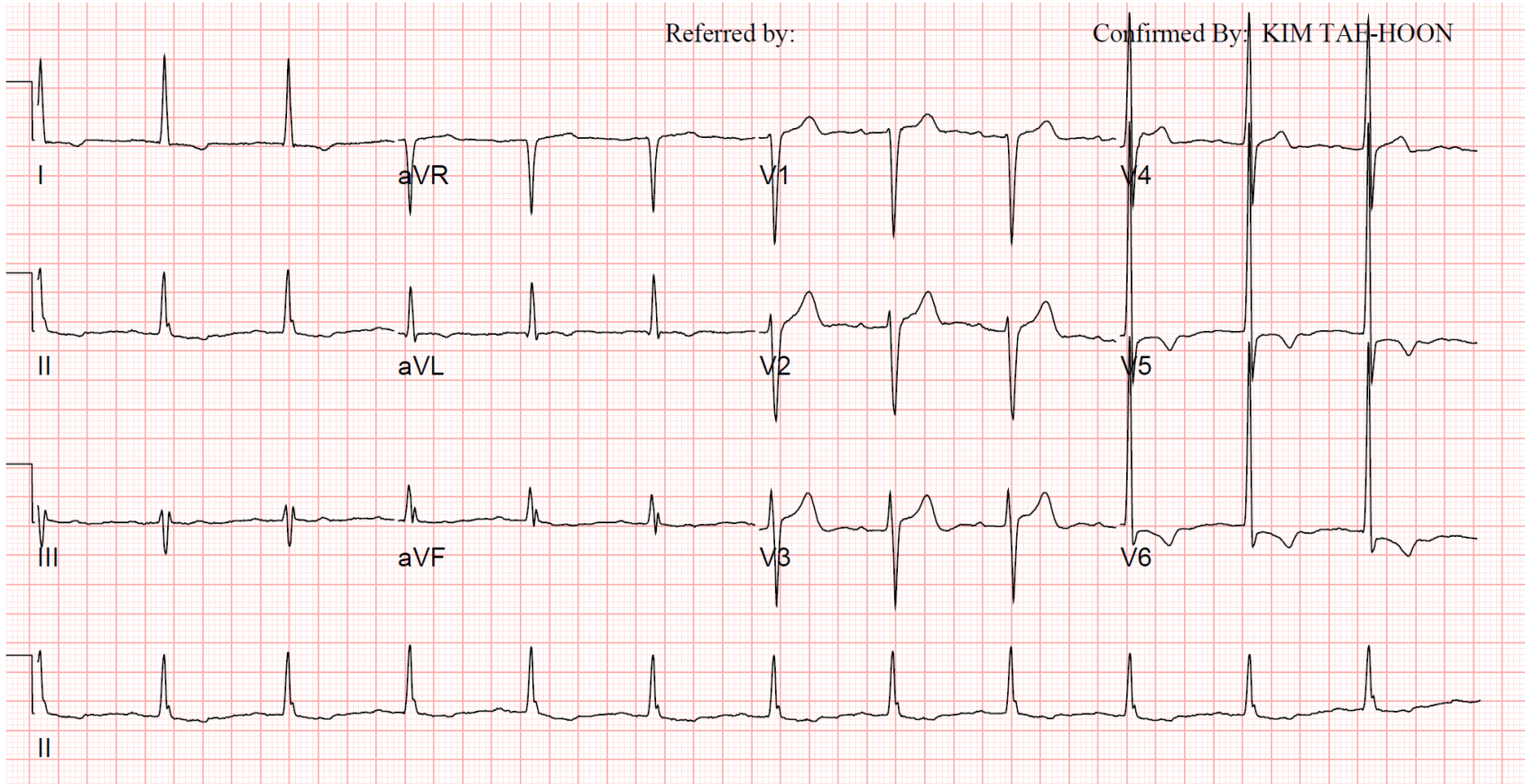


# Post ECG



Referred by:

Confirmed By: KIM TAE-HOON



# Post TAVR Progress



- No adverse clinical event
- Discharged at POD #3
- Post ECG: no change
- Total contrast volume 100 cc
- Lab at discharge: Cr 1.13 (eGFR 61 mL/min/1.73)



# Take Home Messages



- Evolut Pro has all advantages of Evolut R system with minimal increase in outer diameter (18 => 20 Fr).
- Evolut Pro with pericardial wrap further reduces the risk of paravalvular leak.
- Evolut Pro can be considered as the first choice device in patients with vascular access > 5.5 mm.



**Thank You for Your Attention!**

