



安贞医院
ANZHEN HOSPITAL



Application of “All in One” technique In TAVR

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CONVENTIONAL VS. MINIMALIST TAVR

- *General Anesthesia*

- *TEE*

- *Surgical Cut down of groin*

- *Hybrid room*

- *Perfusion in room (pump primed)*

- *4-5 operators scrubbed*

- *Screw in Pacer lead*

- *Longer ICU stay*

- *Longer immobilization*

*Conscious Sedation (CS) or Monitored
Anaesthesia Care (MAC)*

- *2 D echo (TEE available in room)*

- *Percutaneous closure of CFA*

- *Ordinary cathelab*

- *No perfusion in room*

- *2 operators scrubbed*

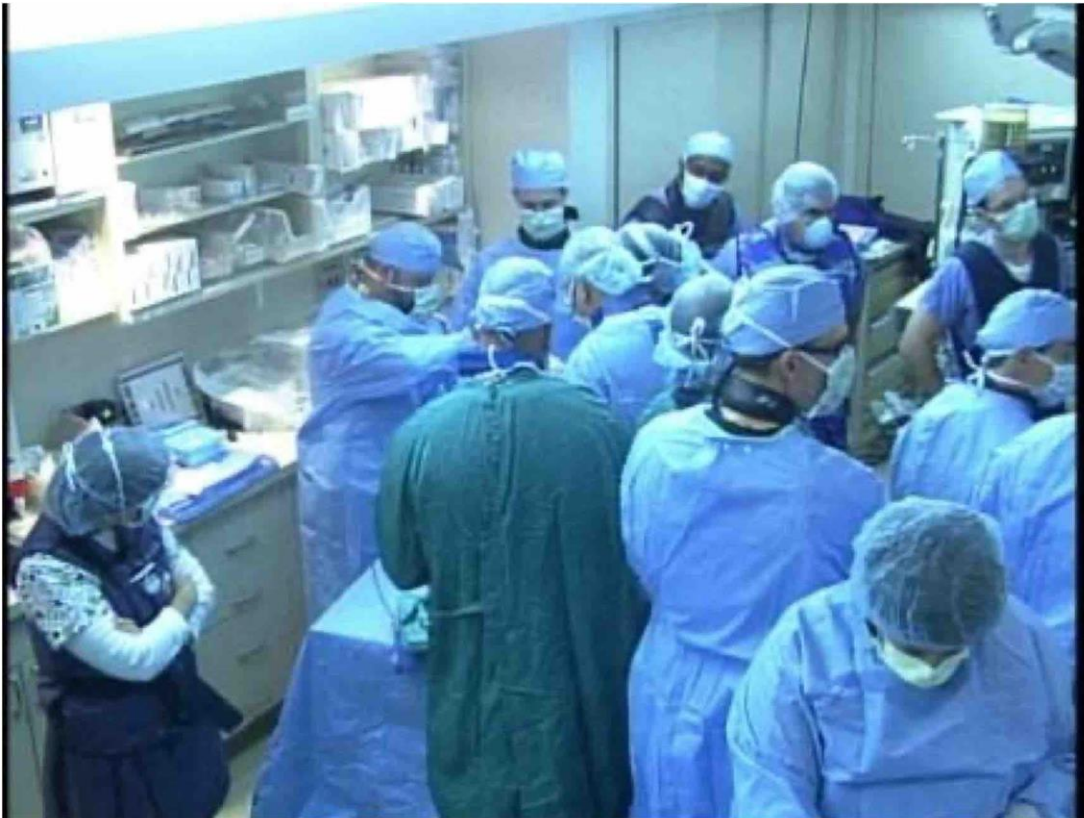
- *Short or No ICU stay*

- *Ambulation in several hours*

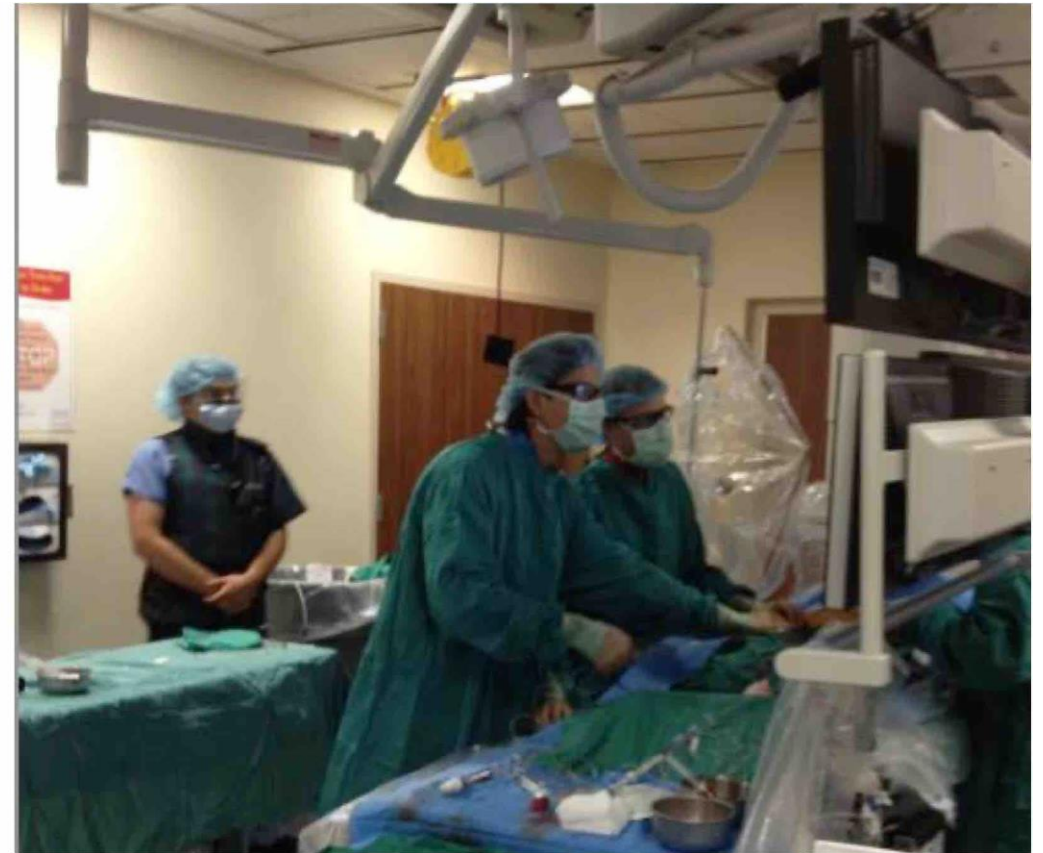
From This

.....

To This



Standard Approach



Versus

Minimalist Approach

Thousands of data showed that show no difference in *Complications, Mortality, Stroke, PVL . Early or Late.*

JACC: CARDIOVASCULAR INTERVENTIONS
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Comparison of Transfemoral Transcatheter Aortic Valve Replacement Performed in the Catheterization Laboratory (Minimalist Approach) Versus Hybrid Operating Room (Standard Approach) Outcomes and Cost Analysis

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JACC: CARDIOVASCULAR INTERVENTIONS CME

Open Access

Research

BMJ Open Is local anaesthesia a favourable approach for transcatheter aortic valve implantation? A systematic review and meta-analysis comparing local and general anaesthesia

Conscious Sedation Versus General Anesthesia for Transcatheter Aortic Valve Replacement

Insights from the National Cardiovascular Data Registry Society of Thoracic Surgeons/American College of Cardiology Transcatheter Valve Therapy Registry

Editorial, see p 2141

Matthew C. Hyman, MD, PhD



International Journal of Cardiology

journal homepage: www.elsevier.com/locate/ijcard



Local and general anaesthesia do not influence outcome of transfemoral aortic valve implantation



Gianni Dall'Ara^{a,1}, Helene Eltchaninoff^{b,2}, Neil Moat^{a,2}, Cécile Laroche^{c,2}, Javier Goicolea^{d,2}, Gian Paolo Ussia^{e,2}, Petr Kala^{f,2}, Peter Wenaweser^{g,2}, Marian Zembala^{h,2}, Georg Nickenig^{i,2}, Thomas Snow^{j,2}, Susanna Price^{a,2}, Eduardo Alegria Barrero^{k,2}, Rodrigo Estevez-Loureiro^{l,2}, Bernard Jung^{m,2}, José Luis Zamorano^{n,2}, Gerhard Schuler^{o,2}, Ottavio Alfieri^{p,2}, Bernard Prendergast^{q,2}, Peter Ludman^{r,2}, Stephan Windecker^{s,2}, Manel Sabate^{t,2}, Martine Gilard^{u,2}, Adam Witkowski^{v,2}, Haim Danenberg^{w,2}, Erwin Schroeder^{x,2}, Francesco Romeo^{y,2}, Carlos Macaya^{z,2}, Genevieve Derumeaux^{aa,2}, Alessio Mattesini^{ab,2}, Luigi Tavazzi^{ac,2}, Carlo Di Mario^{ad,1}, on behalf of the Transcatheter Valve Treatment Sentinel Registry (TCVT) Investigators of the EurObservational Research Programme (EORP) of the European Society of Cardiology

MINIMALIST TAVR-PATIENTS



- ***Excellent outcomes***
- ***Less invasive***
- ***Quick rehabilitation***
- ***Less complications***
- ***Shorter hospitalization***
- ***less costs***

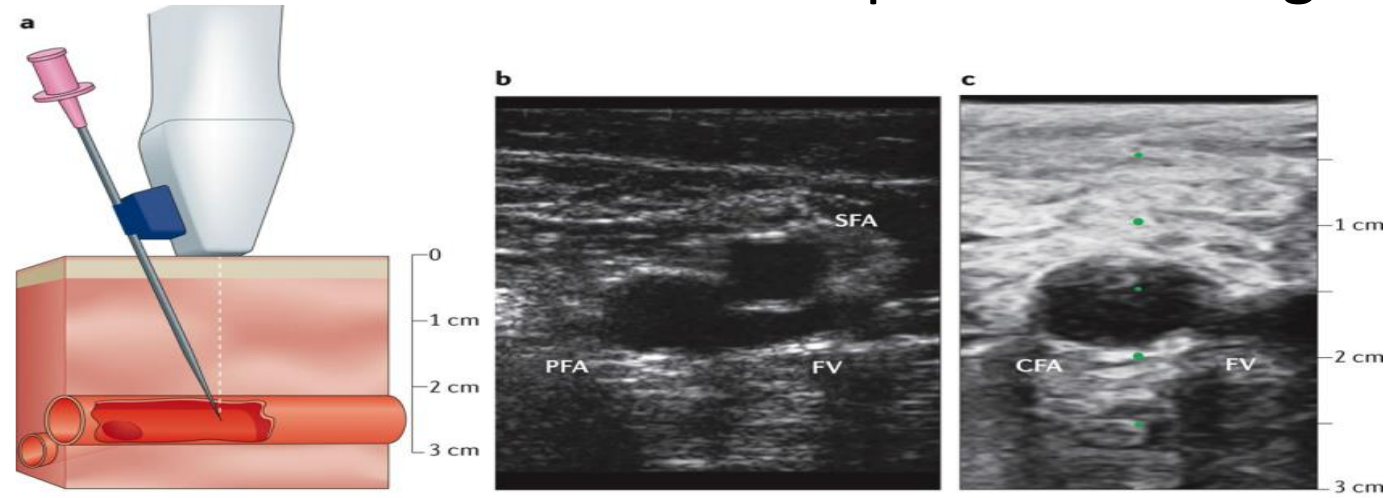
- Local anesthesia +/-conscious sedation
- Transthoracic echocardiogram
- Performed in Cath Lab or Hybrid Room
- Fully percutaneous transfemoral approach
- No additional lines (i.e. jugular)
- No Foley catheter
- ICU care in < 20% of patients
- Early mobilization and next day discharge

Can “minimalist” approach be more minimal?

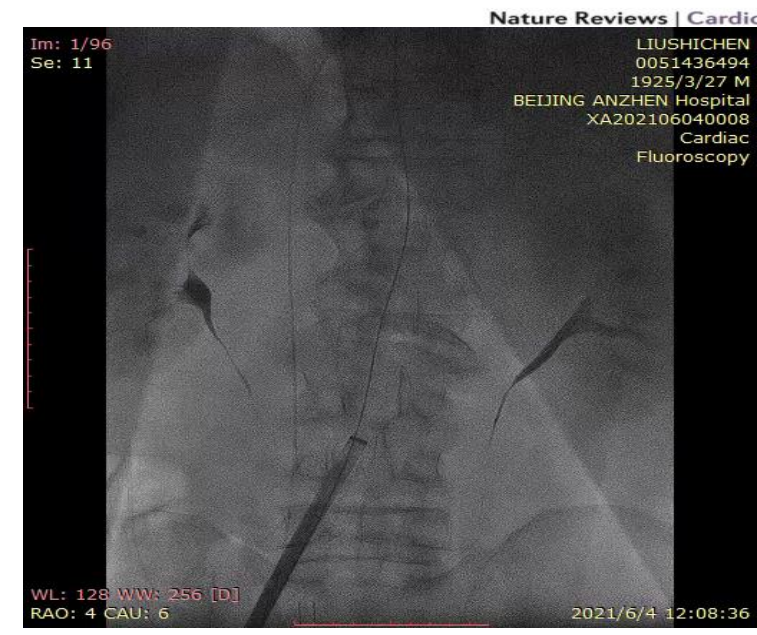
- Between July 2019 to December 2019
- We prospectively evaluated 93 consecutive patients with symptomatic, severe AS who underwent TF-TAVR in FuWai Hospital.
- 42 patients enrolled in the first three months were all under traditional standard procedure.
- 51 patients enrolled in the last 3 months were underwent TAVR with minimalist approach (ultrasound guided puncture, radial artery accessory approach, left ventricular guide wire pacing and no catheterization)

	Traditional standard procedure (n=42)	Minimalist approach (n=51)	P value
Device success (%)	41 (97.6%)	51 (100%)	0.268
All-cause mortality (%)	1 (2.4%)	0	0.268
Periprocedural MI	0	0	--
Major stroke	1 (2.4%)	0	0.446
Major vascular complication	3 (7.1%)	3 (5.9%)	1.000
Conversion to open surgery (%)	0	0	
Coronary obstruction (%)	0	0	
Procedure duration (min)	104.8±20.2	90.1±24.8	< 0.001
Operating room stay time (min)	158.0±52.0	133.0±25.0	< 0.001
X-ray time (min)	21.5±6.6	17.2±6.3	0.009

Precise TAVR access puncture using ultrasound guidance



Check femoral-access hemostasis and to manage eventual access-site complications



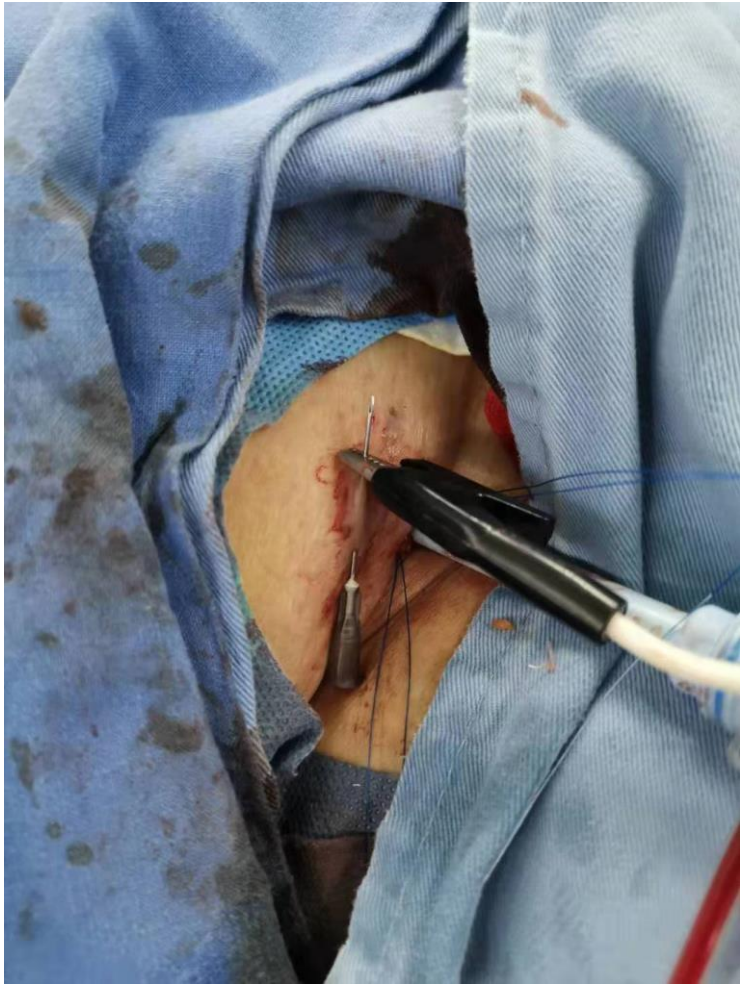
	TF-TF TAVR (N=194)	TRA-TF TAVR (N=217)	P-value
Age	83.47 ± 7.60	82.55 ± 6.19	0.135
Mate %	87 (44.3%)	116(53.5%)	0.031
% Mortality - Log EuroSCORE	15.4 ± 10.2	16.2 ± 10.7	0.429
% Mortality - STS score	5.0 ± 3.0	4.8 ± 3.6	0.571
Contrast media (mL)	107.3 ± 46.9	111.6 ± 44.7	0.342
Fluoro time (min)	16.9 ± 7.2	19.1 ± 7.8	0.003
PDS (Gy.cm ²)	66.4 ± 52.4	72.3 ± 43.9	0.216

Procedure time (min) 71.0 ± 24.1 69.5 ± 19.5 0.436

	TF-TF TAVR (N=194)	TRA-TF TAVR (N=217)	P-value
Vascular access site complications	35 {18.0%}	21 (9.7%)	0.014
Major	7 (3.6%)	4(1.8%)	0.362
Minor	28(14.4%)	17(7.8%)	0.038
Bleeding complications	33(17.0%)	20 (9.2%)	0.026
Life-threatening or disabling bleeding	4(2.1%)	4(1.8%)	>0.999
Major bleeding	15 {7.7%}	9 (4.2%)	0.142
Minor bleeding	14 {7.2%}	7 (3.2%)	0.075



- 14 Oct 2019 , FuWai Hospital
- One-stop TAVR+PCI



1254 中国循环杂志 2020 年 12 月第 35 卷第 12 期(总第 270 期)Chinese Circulation Journal, December, 2020, Vol. 35 No.12 (Serial No.270)

病例报告

使用左心室导丝起搏技术行经导管主动脉瓣置换术 + 经皮冠状动脉介入治疗一站式手术一例

刘新民, 宋光远, 滕思勇, 罗彤, 王墨扬, 张洪亮, 王宇彬, 周政, 牛冠男, 钱杰, 吴永健

关键词 左心室导丝起搏技术; 经导管主动脉瓣置换术; 经皮冠状动脉介入治疗

目前我国多家医院相继开展经导管主动脉瓣置换术 (TAVR), 积累了初步经验。TAVR 中进行球囊预扩张、释放瓣膜、球囊后扩张时, 应行快速心室起搏以减少心搏出血量及心排量, 从而减少球囊及瓣膜受到的冲击力, 避免器械滑动。国内常规应用经外周静脉植入临时起搏器起搏右心室以满足术中需要, 该方法存在一定并发症的风险。左心室导丝起搏技术省略经静脉起搏器导线植入, 可以进一步简化 TAVR 手术过程。阜外医院于 2019 年 10 月 14 日顺利完成 1 例采用左心室导丝起搏技术辅助下的经股动脉 TAVR+ 经皮冠状动脉介入治疗 (PCI) 一站式手术, 病例报告如下。

术前喷射样杂音, 向颈部传导。双下肢无水肿。入院诊断: 主动脉瓣重度狭窄、主动脉瓣轻度关闭不全、冠状动脉粥样硬化性心脏病、心功能 III 级 (NYHA 分级)、2 型糖尿病、高脂血症、慢性支气管炎、腔隙性脑梗死。

入院后心电图: 窦性心律, 一度房室阻滞伴不完全右束支阻滞。超声心动图: 左心室舒张末期内径 (LVEDd): 42 mm, LVEF: 65%, 主动脉瓣峰值流速: 4.3 m/s, 峰值跨瓣压差: 74 mmHg, 平均跨瓣压差: 49 mmHg, 主动脉瓣口面积: 0.89 cm²。实验室检查: 白细胞: 6.93 × 10⁹/L, 红细胞: 89 g/L, 血小板: 164 × 10⁹/L, 肌酐: 113 μmol/L, 钾离子: 4.01 mmol/L。CT 检查: 主



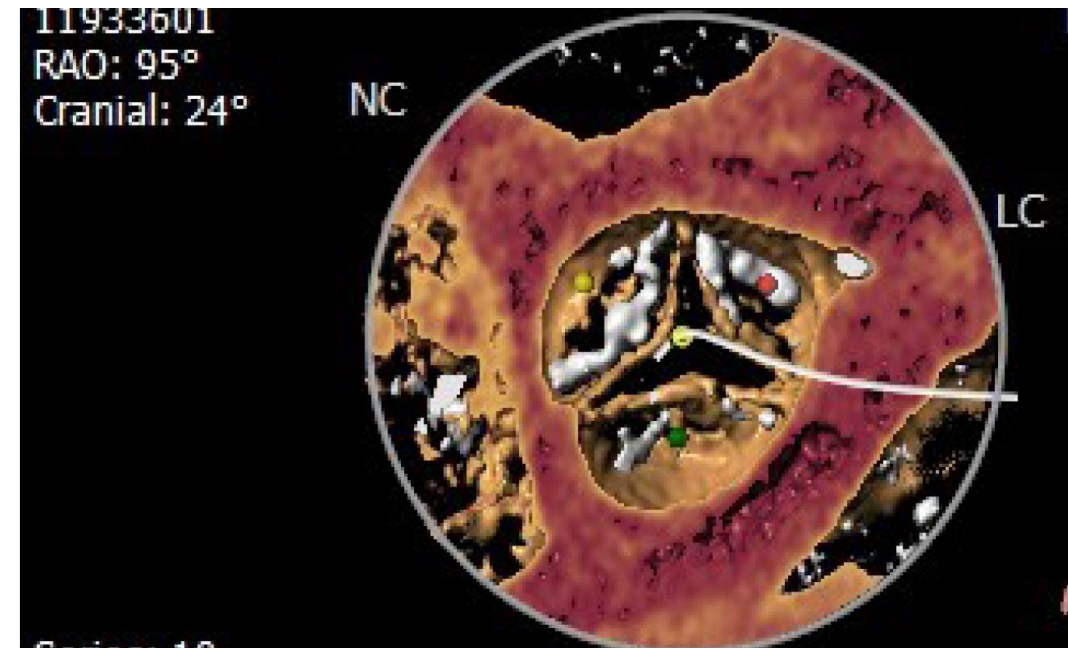
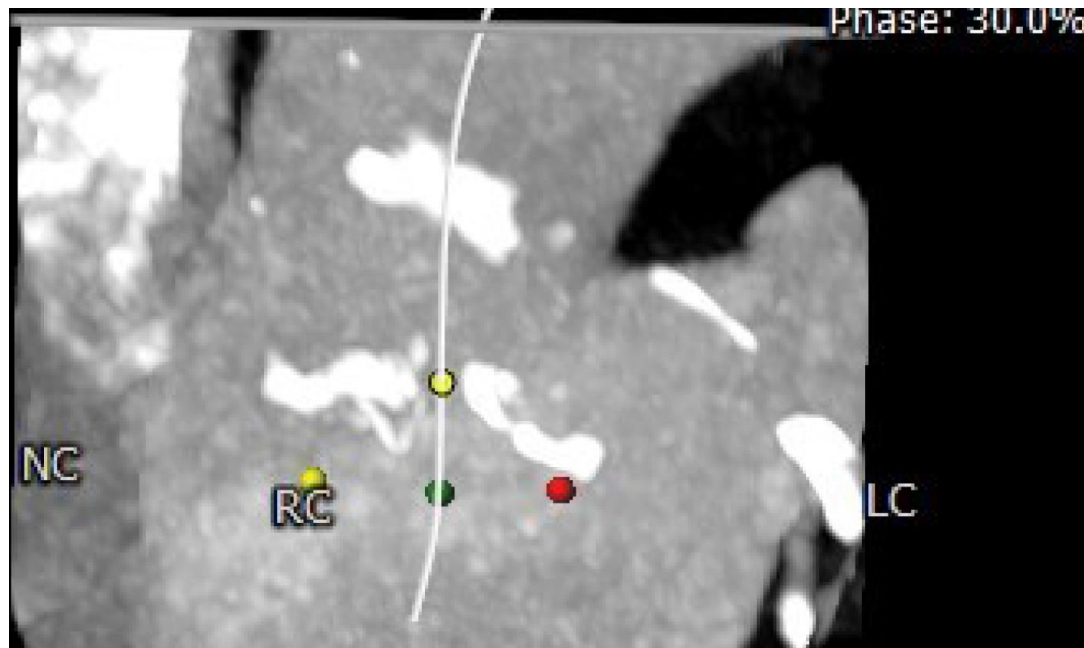
Patient Information	
Age	86
Gender (M/F)	M
NYHA Class	III
Height	172cm
Weight	65kg
BMI	22
Creatinine	67.4umol/L
Hemoglobin	103.0g/L
BP	146/80
HR	59
STS	8.002%

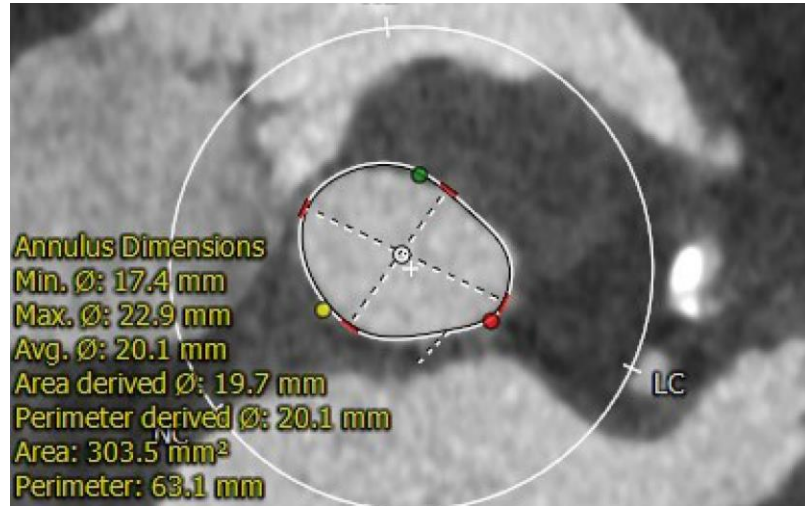
- Clinical History:
2011 Present exertional dyspnea
2019 Clinical symptoms aggravating
Echo showed severe AS
- Medical History:
Type 2 diabetes
CAD
COPD
Hyperlipemia

UCG before Operation

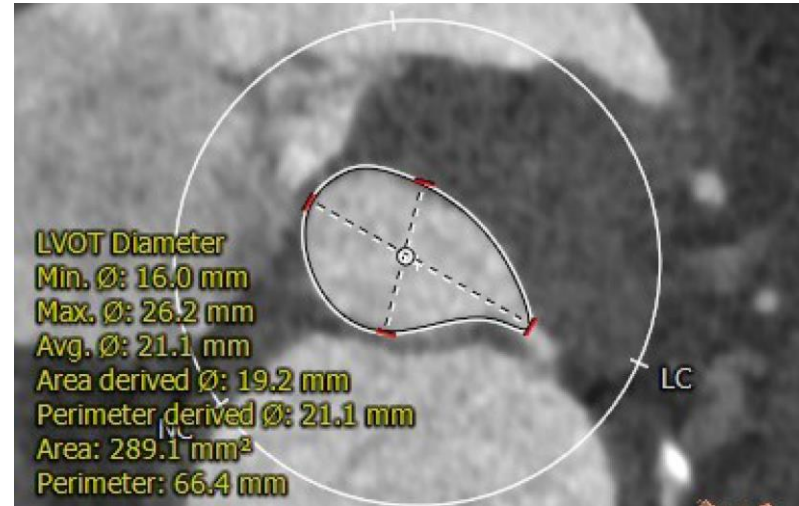
<i>Mean Gradient</i>	<i>49mmHg</i>	<i>Peak Velocity</i>	<i>4.3m/s</i>
<i>LVEDD</i>	<i>42mm</i>	<i>Ejection Fraction</i>	<i>62%</i>

Severe AS +Mild AR

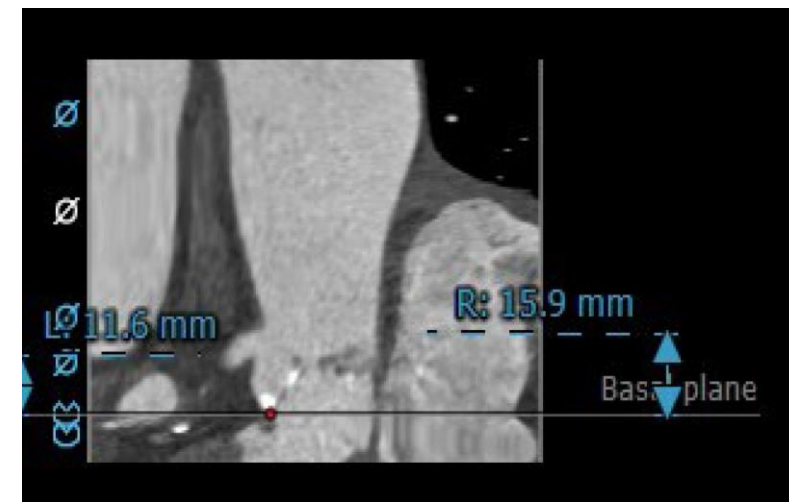




Annulus 17.4*22.9mm Perimeter 63.1mm



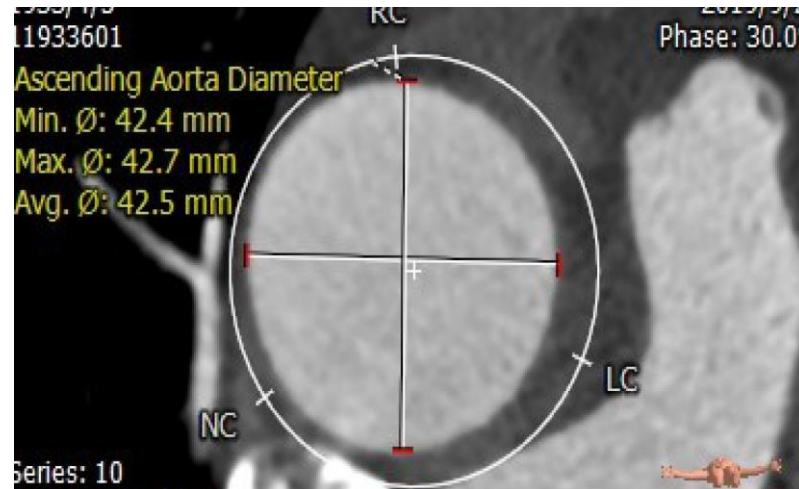
LVOT 16*26.2mm



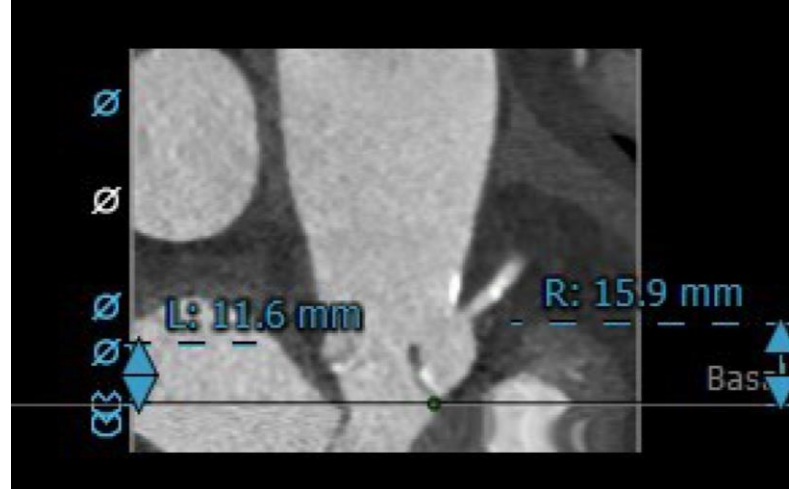
LCA ostial height 11.6mm



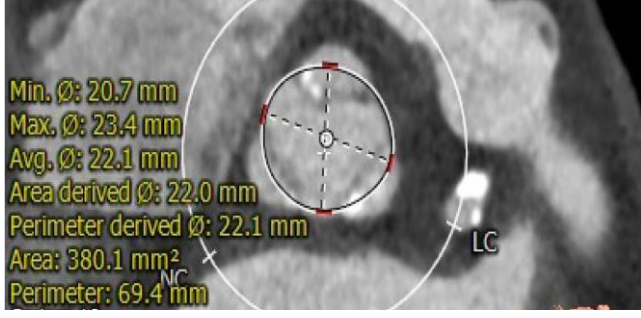
Sinus 28*28.1*30.4mm



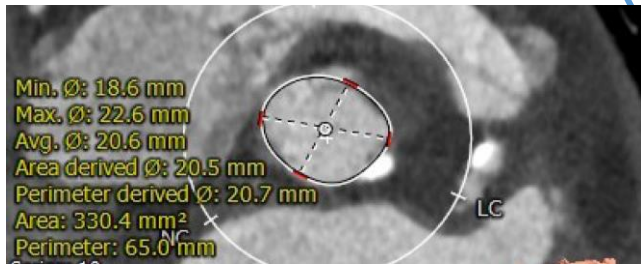
Ascending aorta 42.4*42.7mm



RCA ostial height 15.9mm

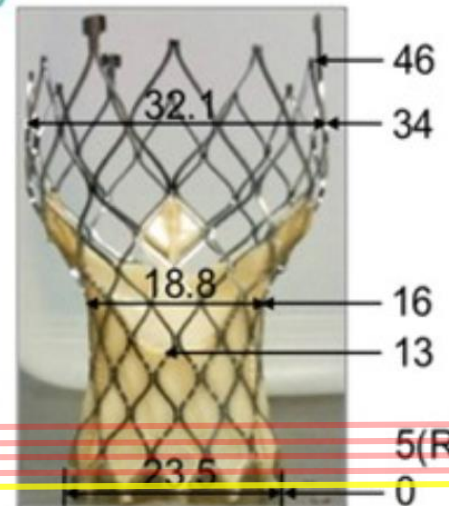


4mm above annulus
20.7*23.4mm
P=69.4mm A=380.1mm²



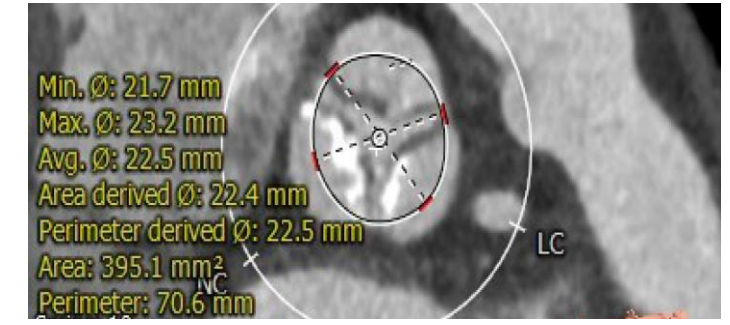
2mm above annulus
18.6*22.6mm
P=65mm A=330mm²

A23

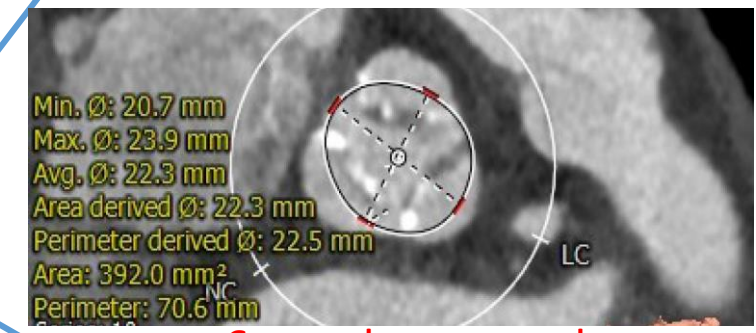


Vanus-A valve

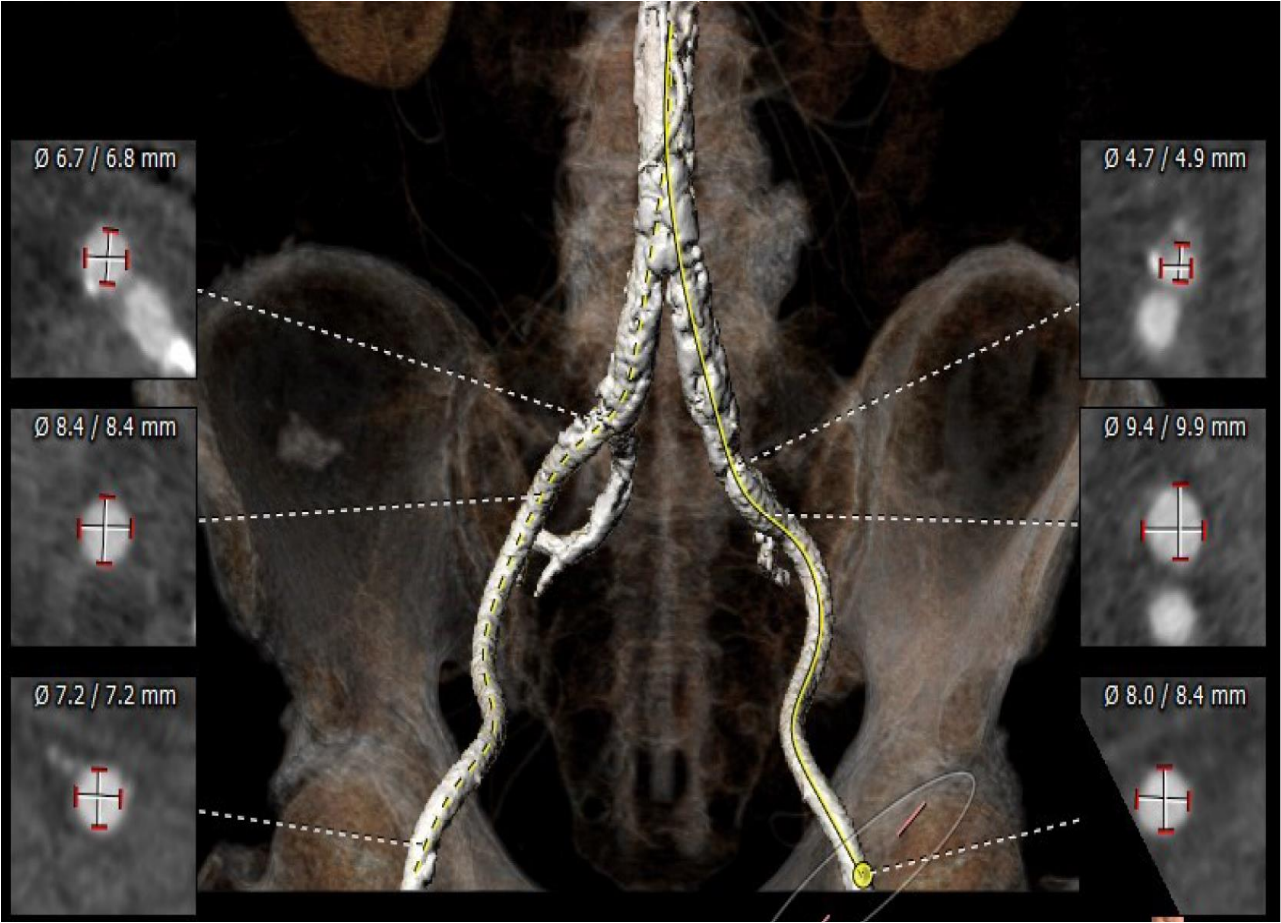
- Annulus Plane
- Multiplane Measurement of Supra Annulus



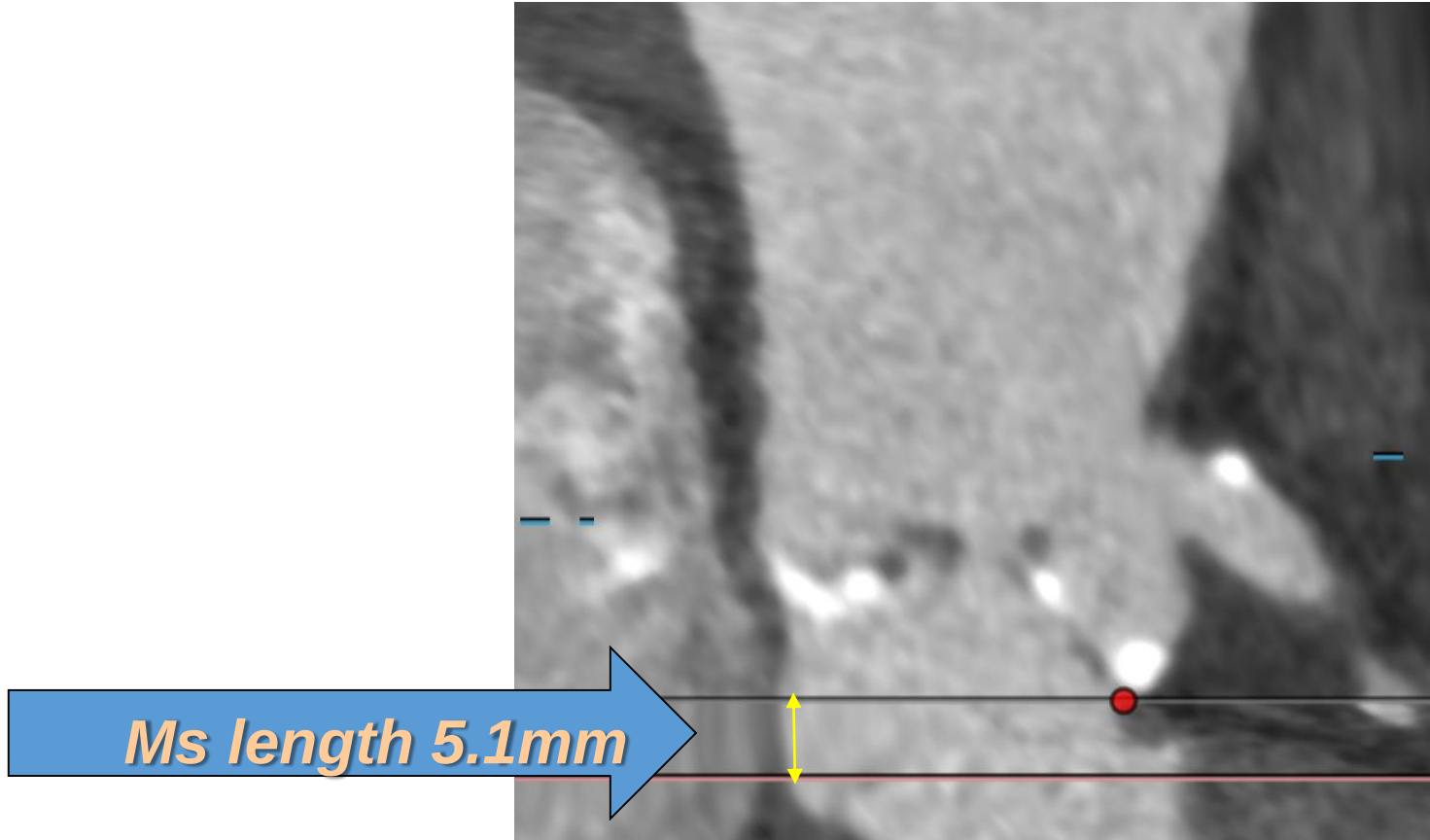
8mm above annulus
21.7*23.2mm
P=70.6mm A=395.1mm²

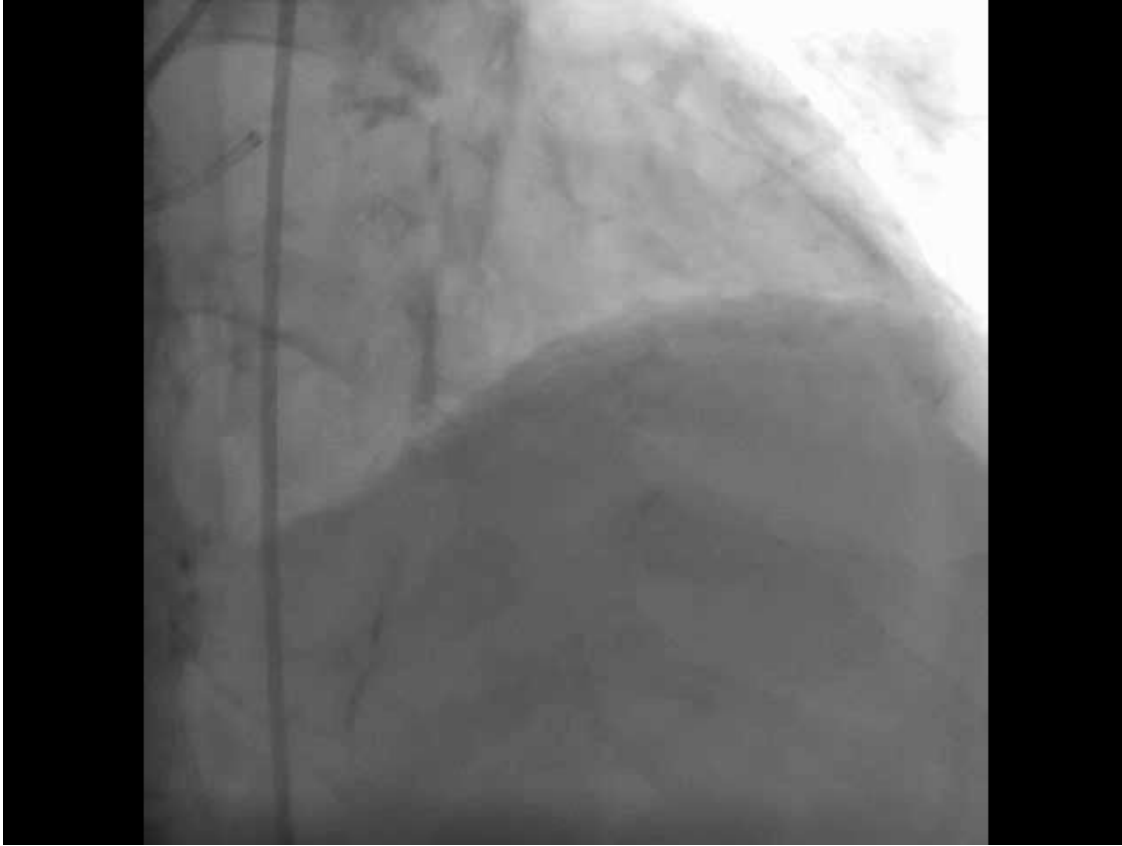


6mm above annulus
20.7*23.9mm
P=70.6mm A=392.0mm²



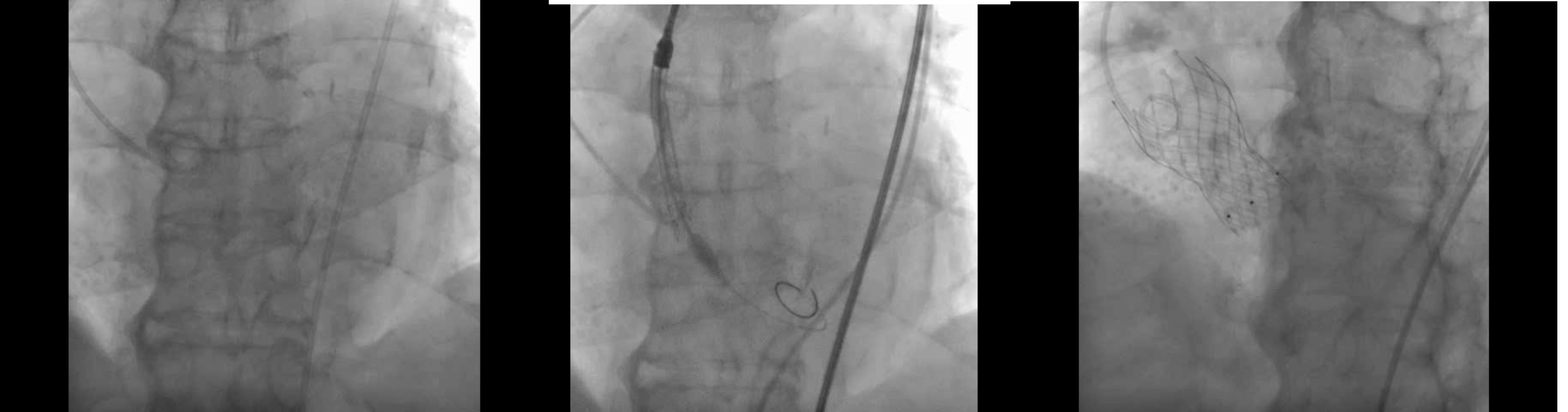
Luminal Diameters			
Right		Left	
Common Iliac	Max: 6.8mm Min: 6.7mm	Common Iliac	Max: 4.9mm Min: 4.7mm
External Iliac	Max: 8.4mm Min: 8.4mm	External Iliac	Max: 9.9mm Min: 9.4mm
Common Femoral	Max: 7.2mm Min: 7.2mm	Common Femoral	Max: 8.4 mm Min: 8.0mm







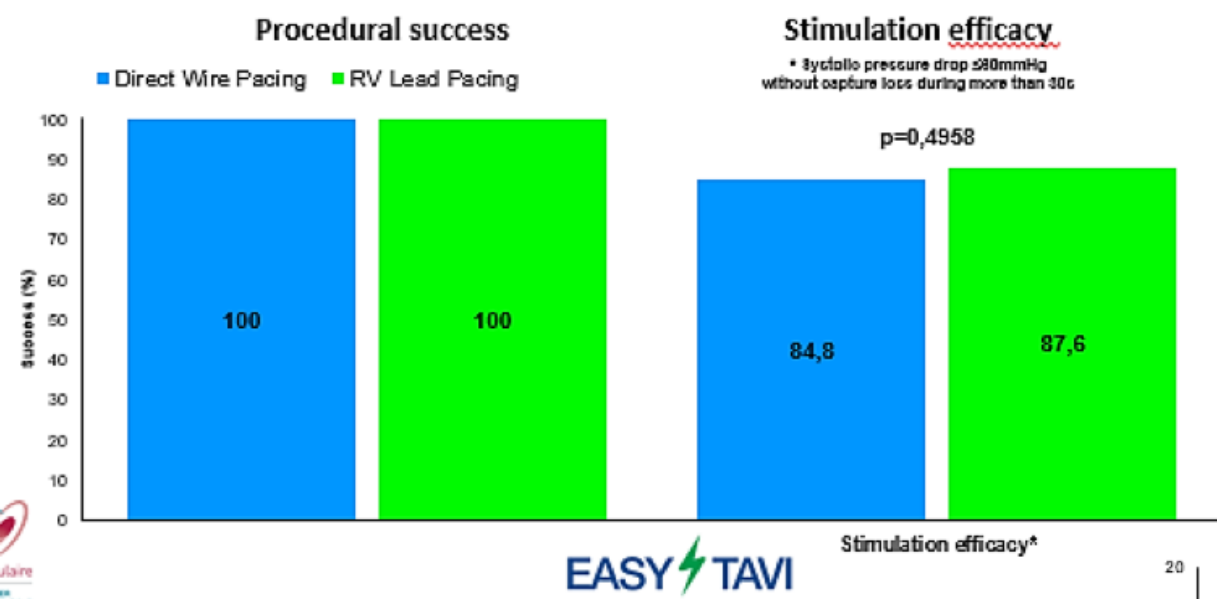
DES 3.0×15mm was implanted into the RCA



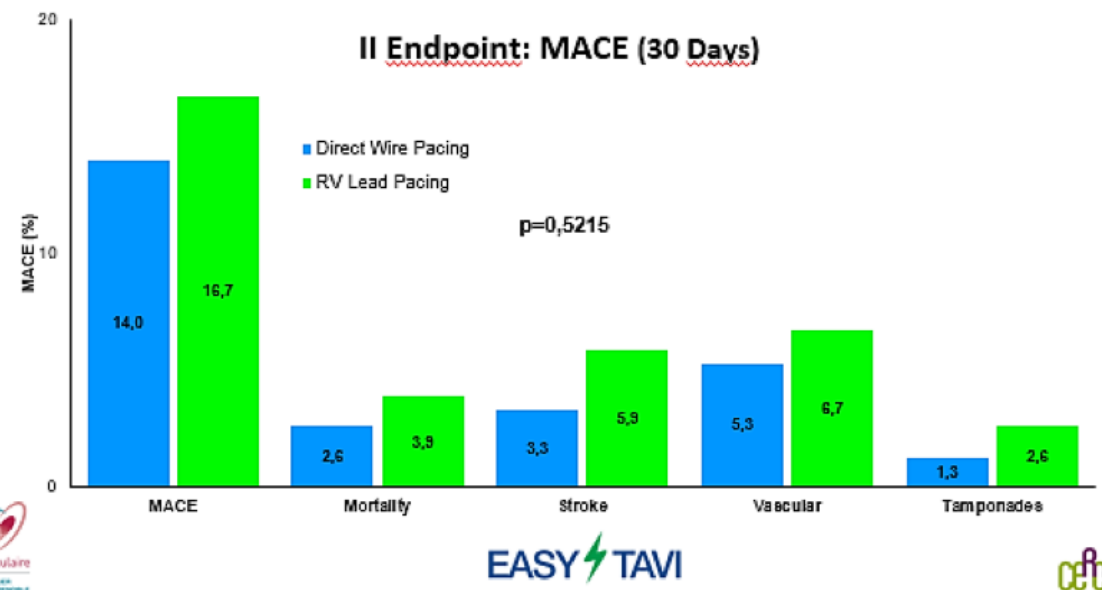
- Balloon predilation NuMed 20mm
- 23mm Venus A

Characteristics	n=13
Age (years)	73.8±8.3
Female	6
BMI (kg/m ²)	23.9±3.6
STS (%)	5.83±2.91
AS	13
Bicuspid aortic valve	3
Self-Expanding Bioprosthesis	13
Effective stimulation	13
Procedure duration (min)	75.9±34.5
Temporary venous pacemaker was required	3
PPMI	1
One-stop TAVR+PCI	2
Vascular complications	1
Other complications	0

II Endpoint: Efficacy



II Endpoint: MACE (30 Days)





21 Jul 2021, Anzhen Hospital

Patient Information	
Age	94
Gender (M/F)	M
NYHA Class	III
Height	177cm
Weight	71Kg
BMI	22.66
BSA	1.87m ²
NT-proBNP	10598pg/ml
Hemoglobin	157g/L
BP	140/100mmHg
HR	85bpm

- Clinical History
2017 Exertional dyspnea
Echo showed severe AS
2020 Clinical symptoms aggravating
Echo showed severe AS
- Medical History:
PCI (LCX)
COPD
Hyperlipemia
Hypertension

UCG before Operation

<i>Mean Gradient</i>	<i>63mmHg</i>	<i>Peak Velocity</i>	<i>5.02m/s</i>
<i>LVEDD</i>	<i>56mm</i>	<i>Ejection Fraction</i>	<i>29%</i>
<i>Severe AS + Moderate AR</i>			





Annulus 21.5*25.8mm
P 75.4mm, φ 24.0mm



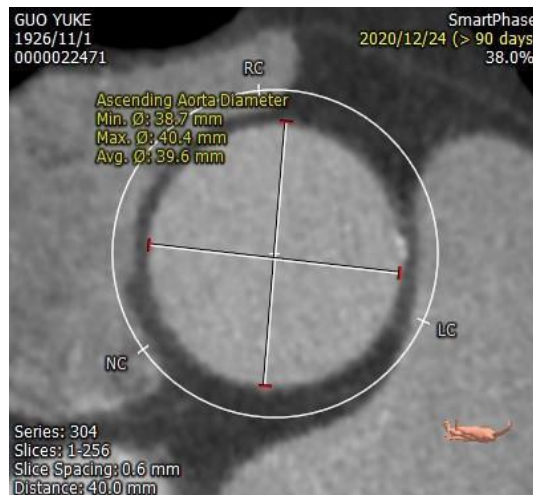
LVOT 20.4*27.0mm
P 75.3mm, φ 24.0mm



SOV
30.8*29.5*29.5mm



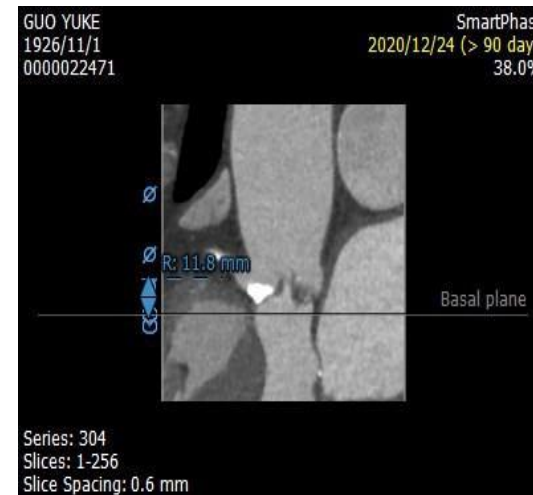
STJ 29.0*31.2mm



AO 38.7*40.4mm



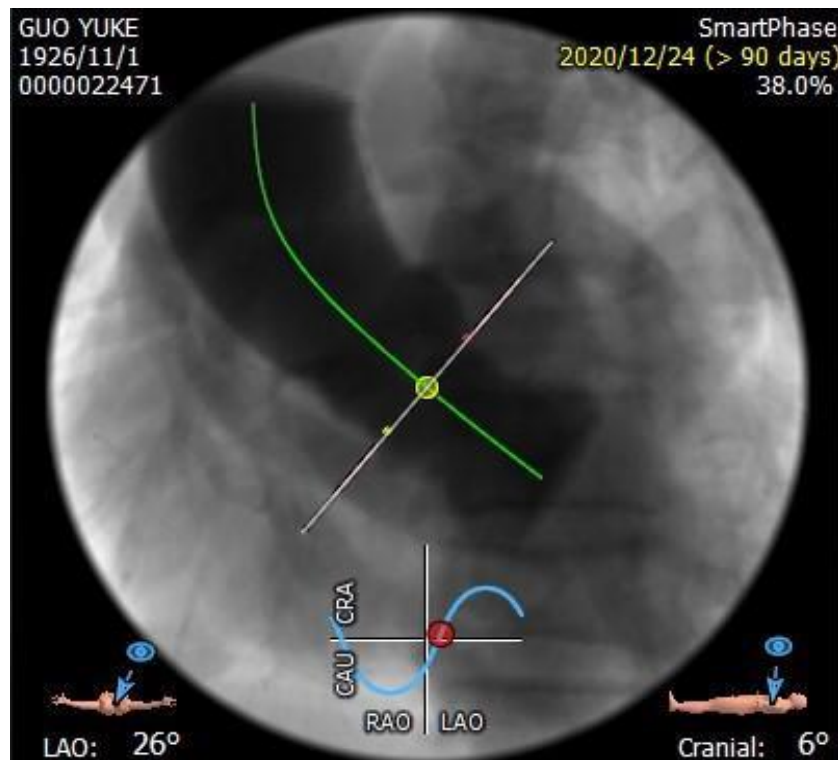
LCA ostial height 14.1mm



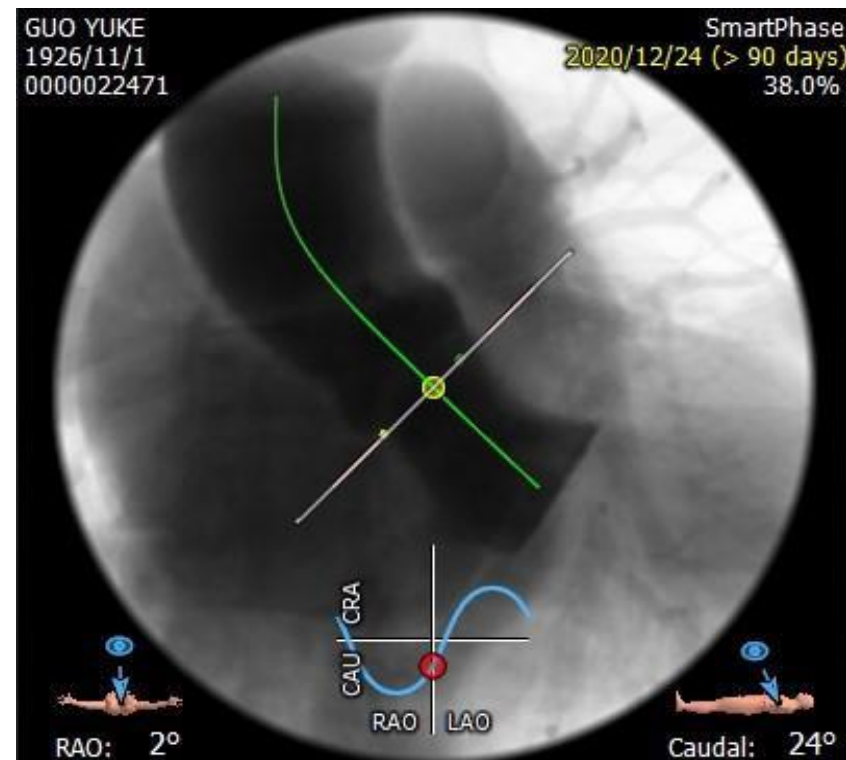
RCA ostial height 11.8mm



MSID 7.1mm

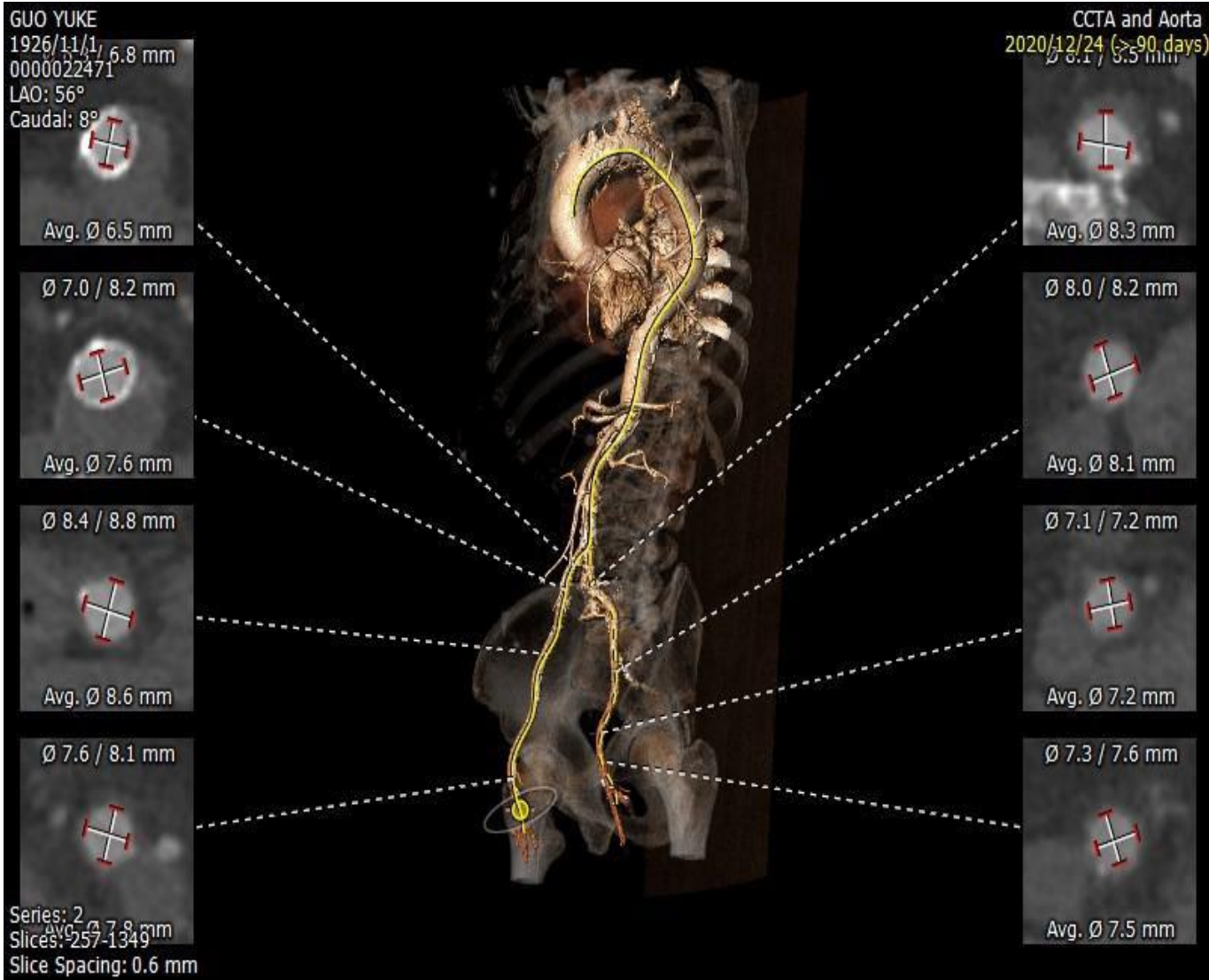


3-cusp coplanar view
LAO 26°
CRA 6°



Cusp overlap
RAO 2°
CAU 24°





Luminal Diameters

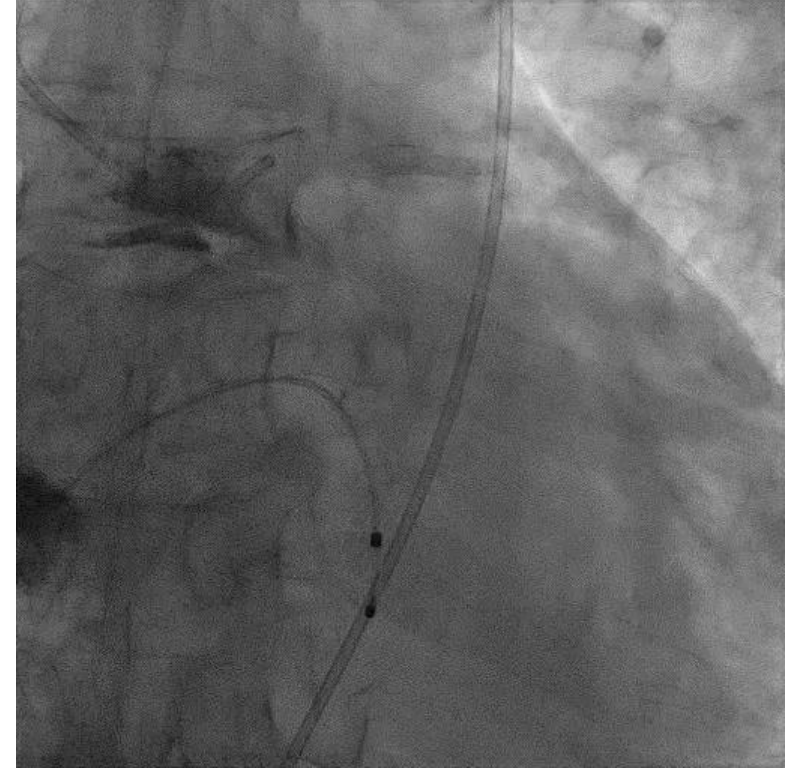
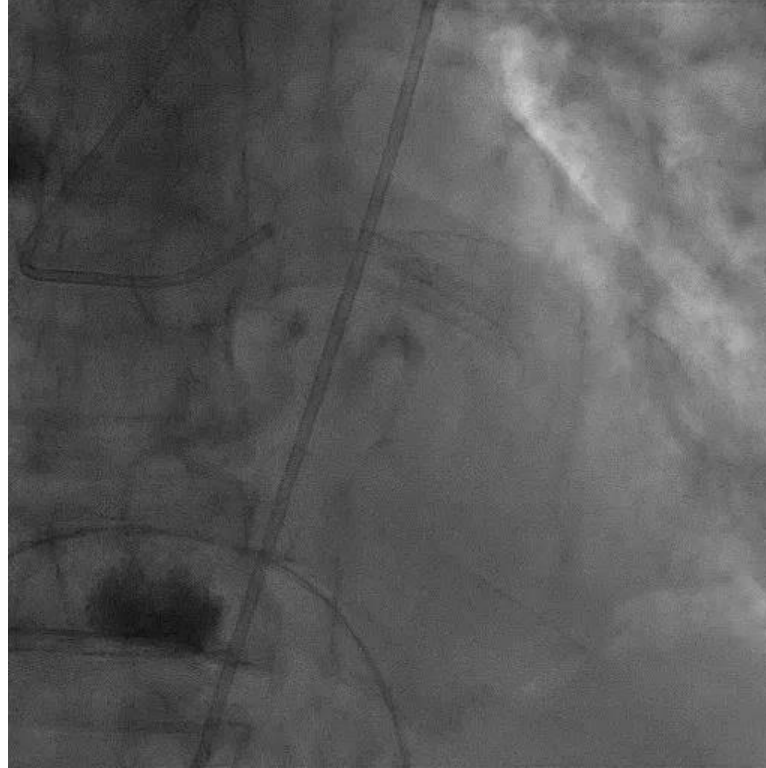
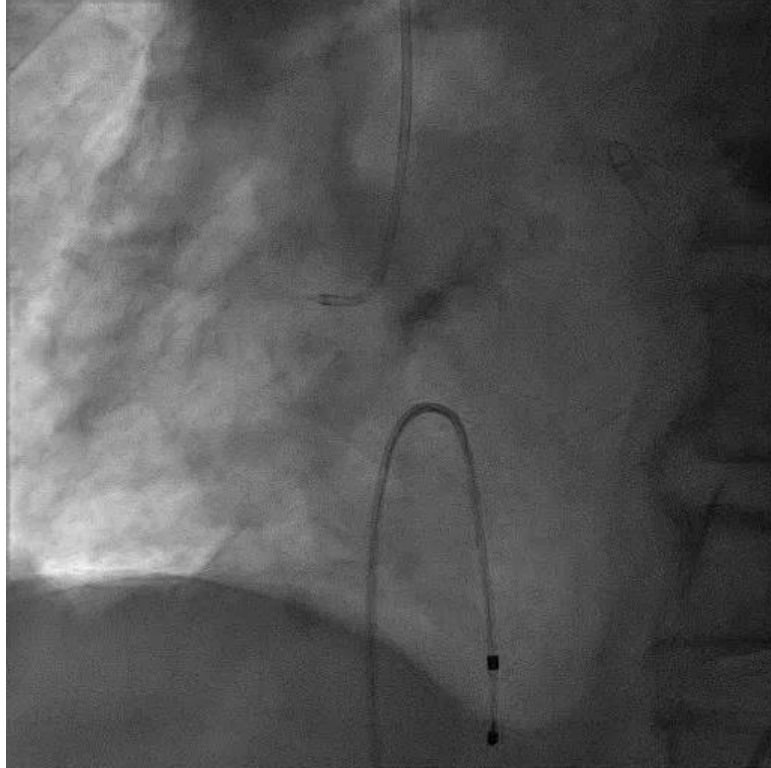
Right		Left	
Common Iliac	Max: 8.2mm Min: 7.0mm	Common Iliac	Max: 8.2mm Min: 8.0mm
External Iliac	Max: 8.8mm Min: 8.4mm	External Iliac	Max: 7.2mm Min: 7.1mm
Common Femoral	Max: 8.1mm Min: 7.6mm	Common Femoral	Max: 7.6 mm Min: 7.3mm

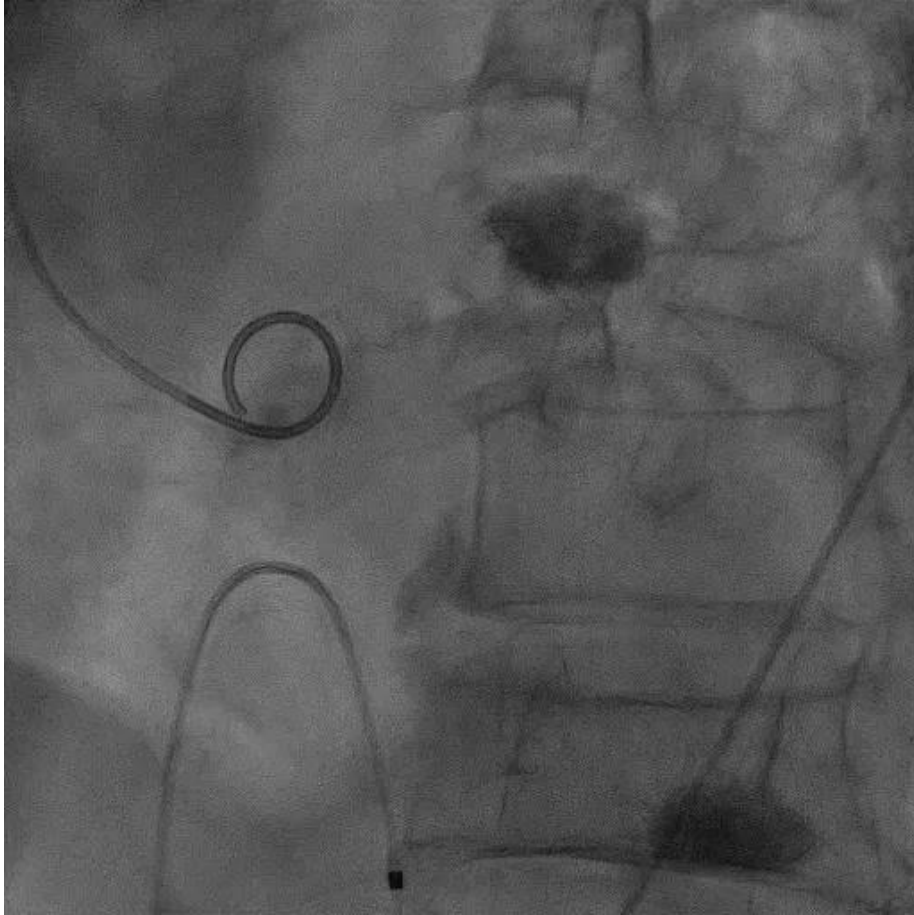
TAVR procedure plan

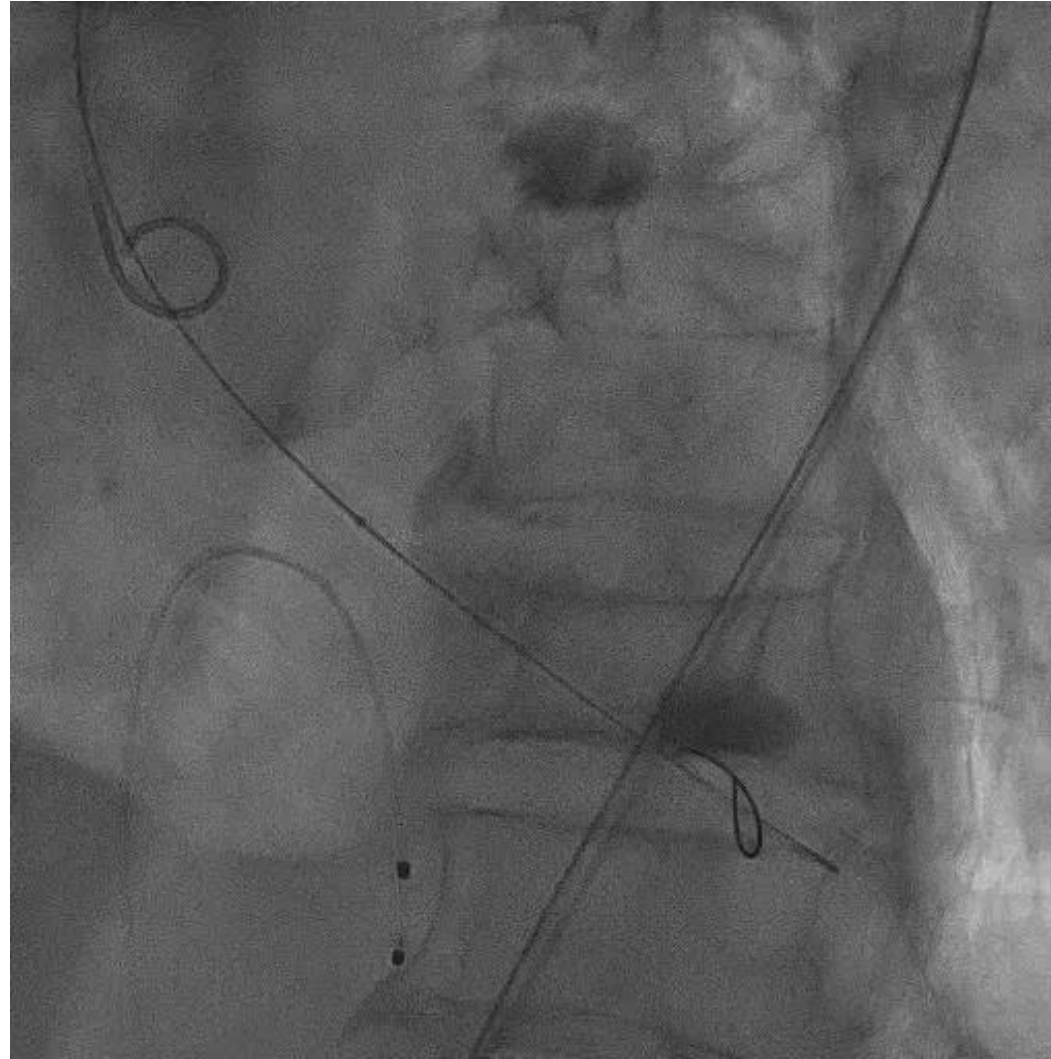
Anesthesia : Local

Approach : Single artery access- Left femoral artery

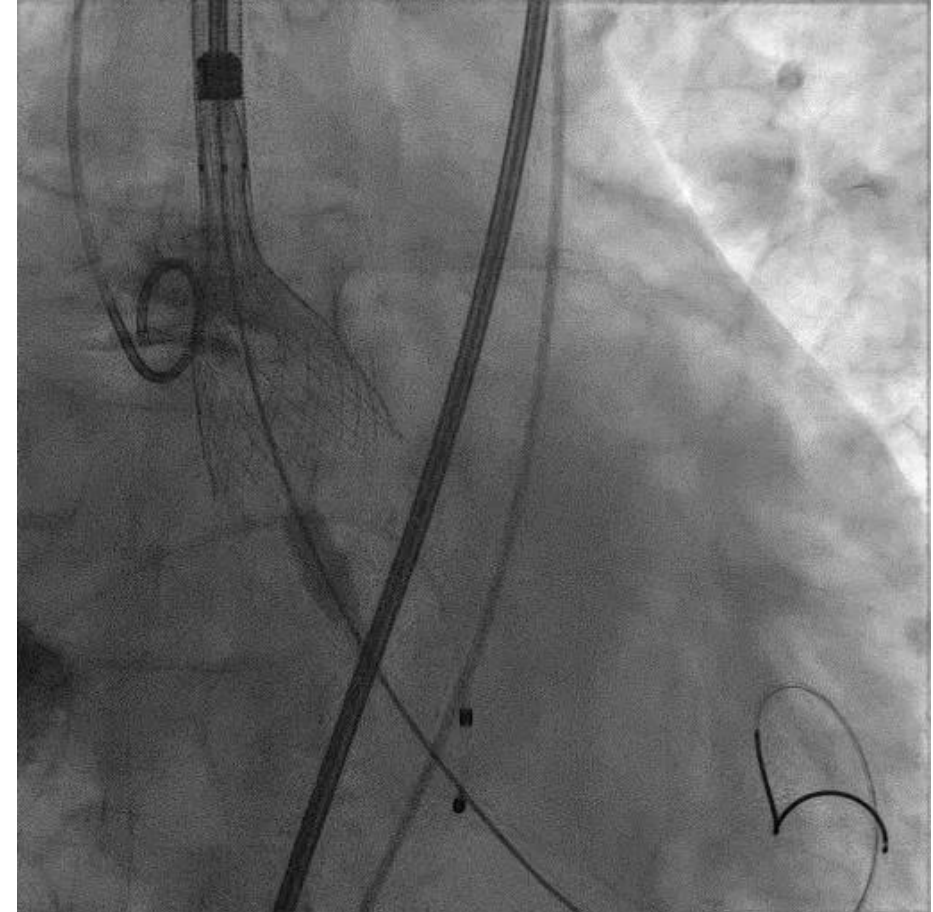
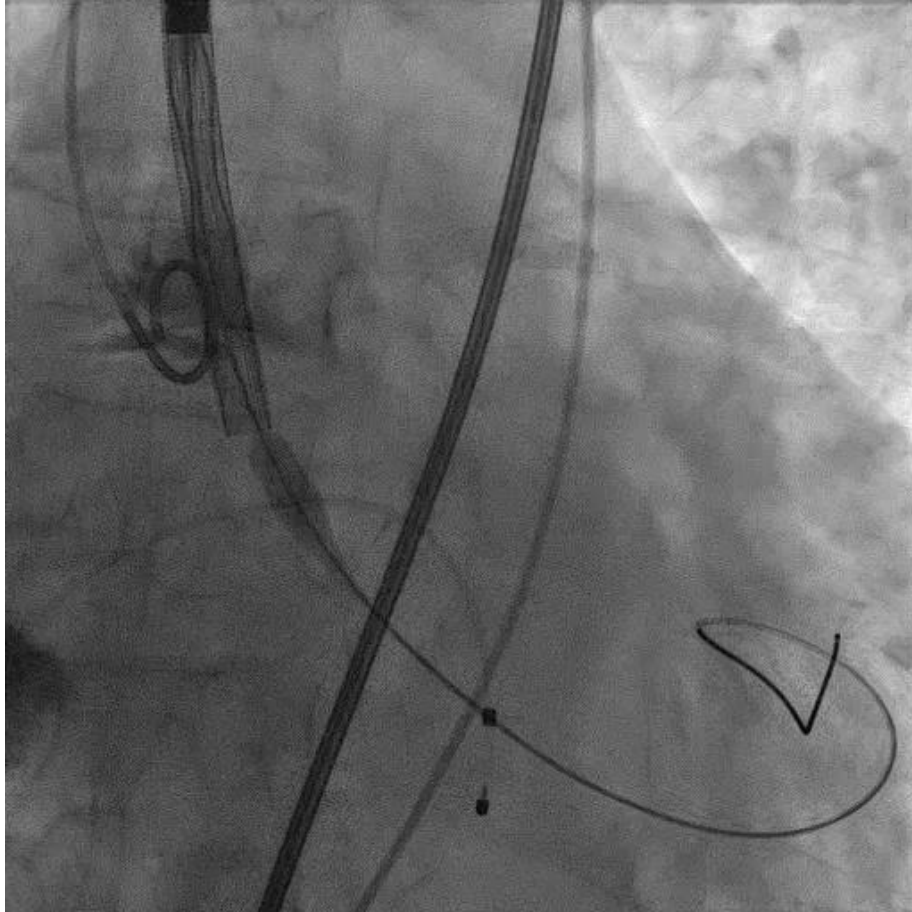
TPM: Right femoral vein



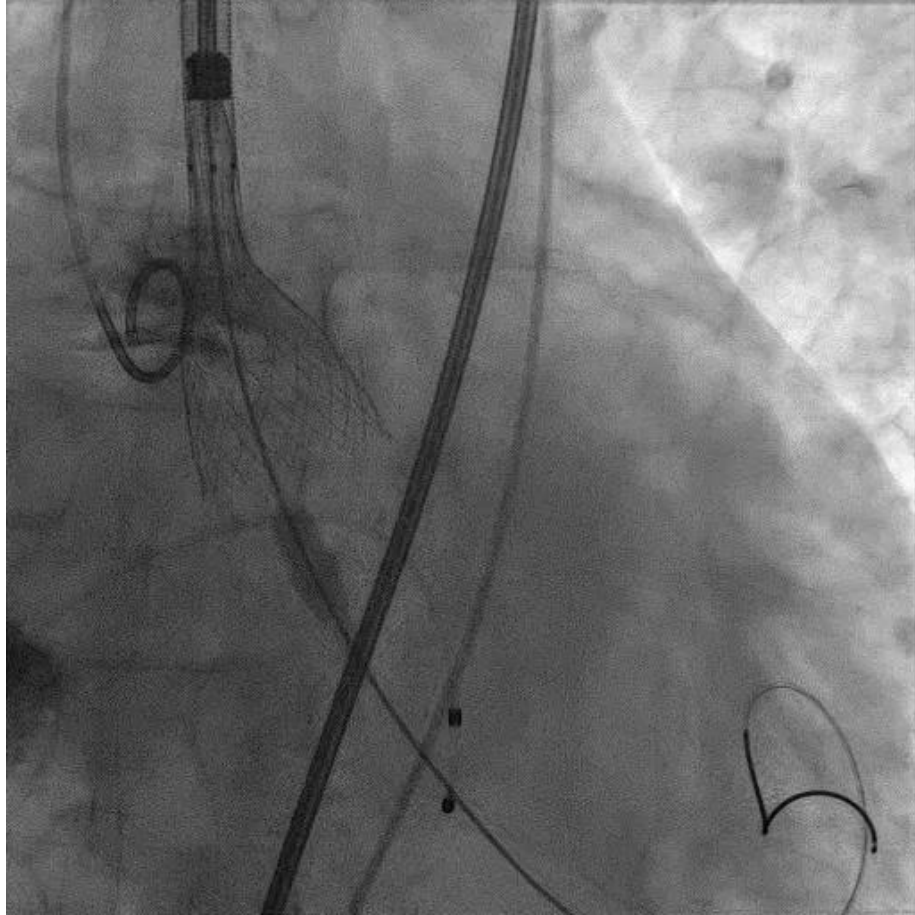


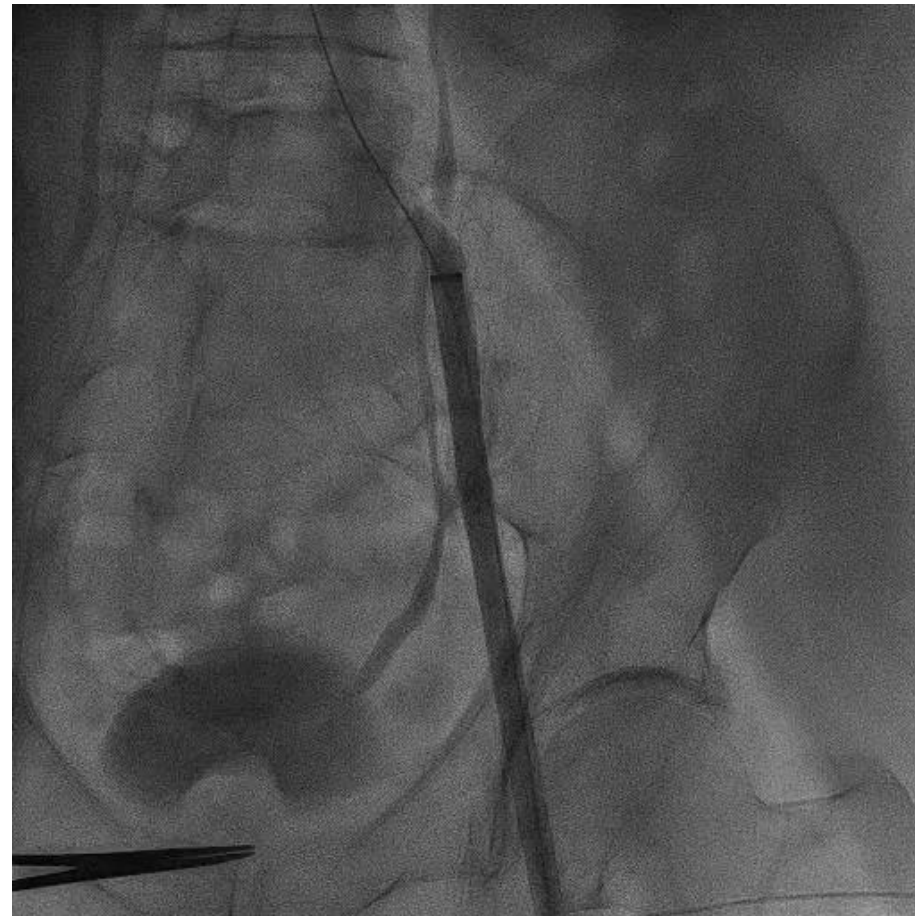
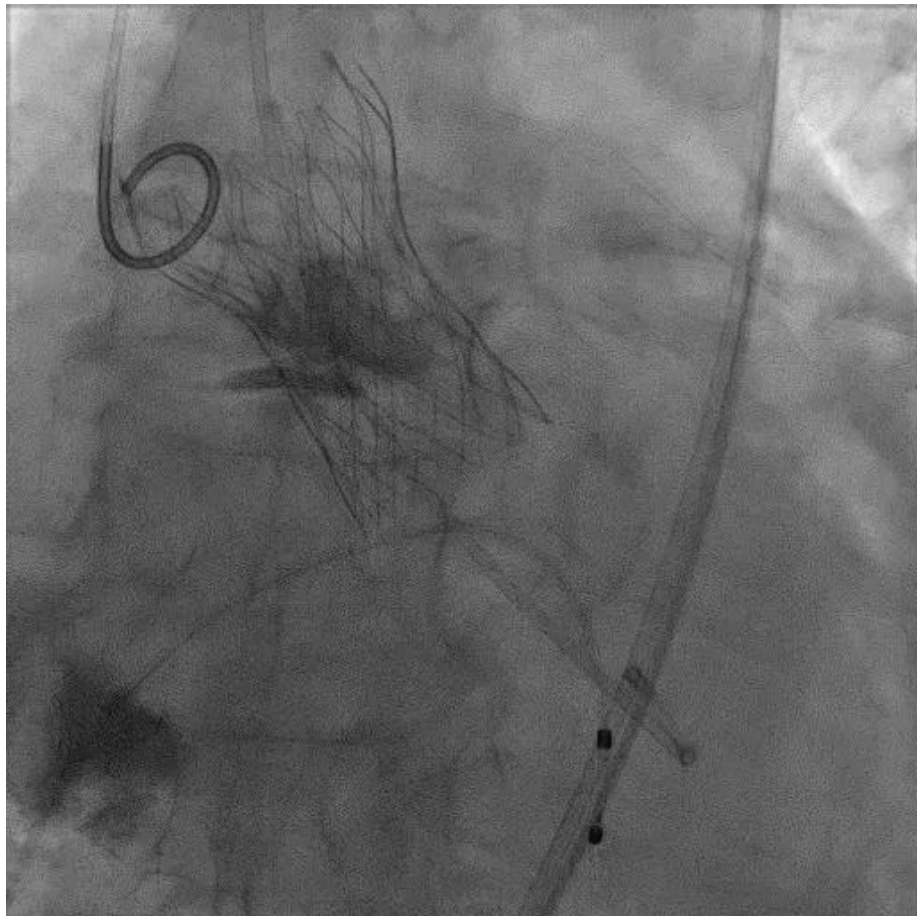


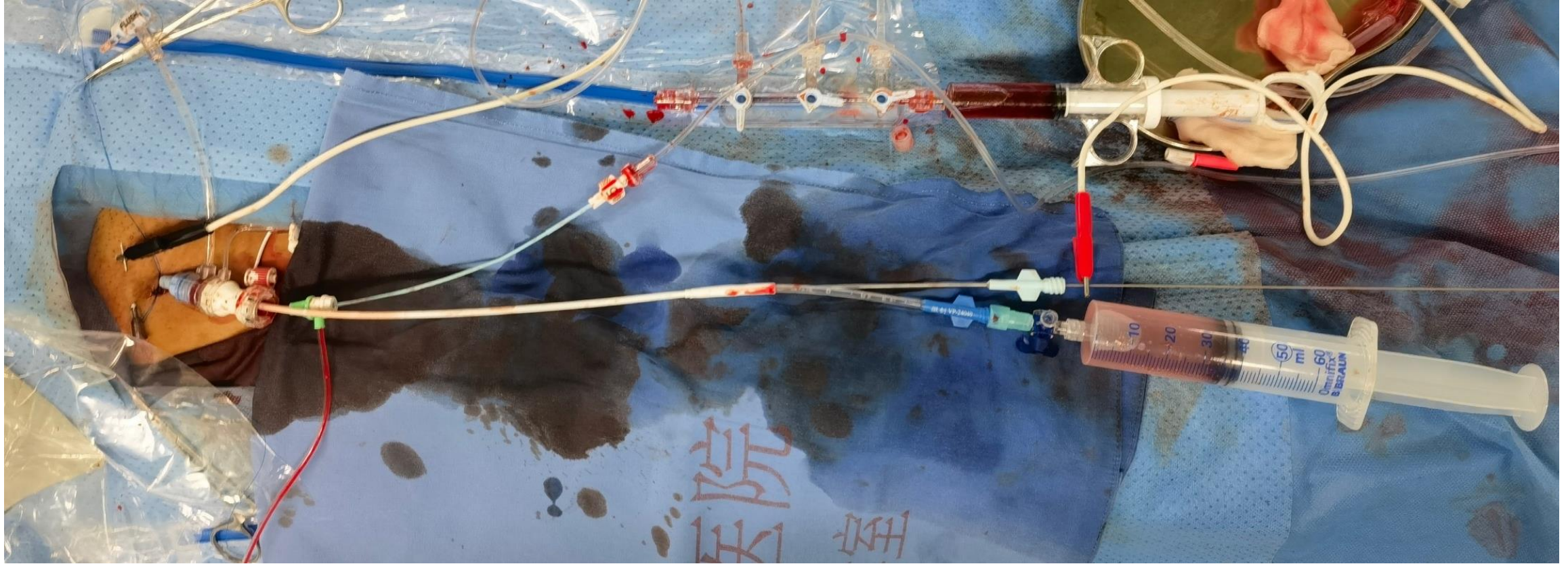
Balloon predilatation NuMed 20mm



Taurus Elite 23







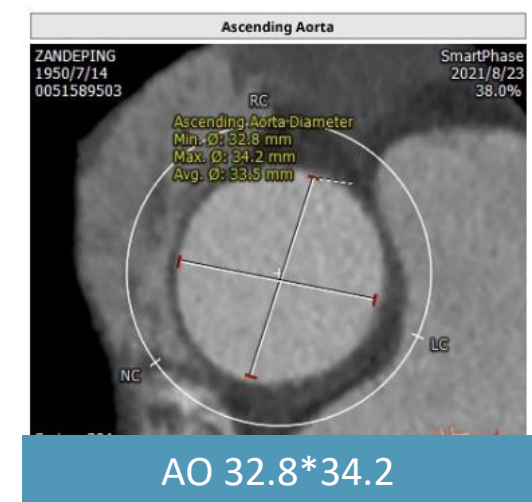
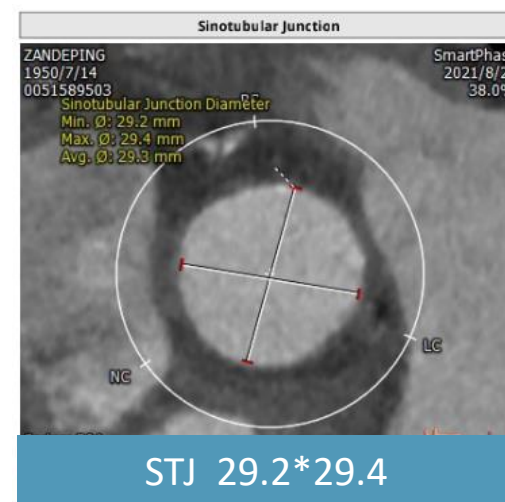
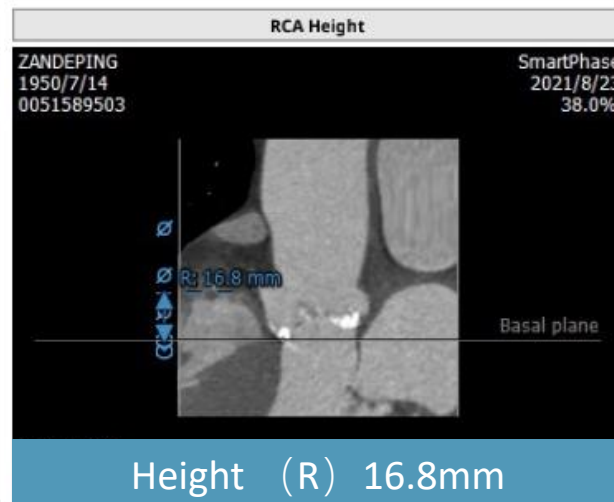
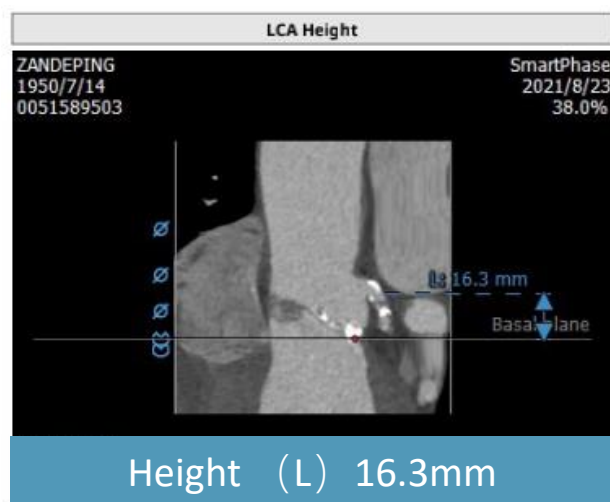
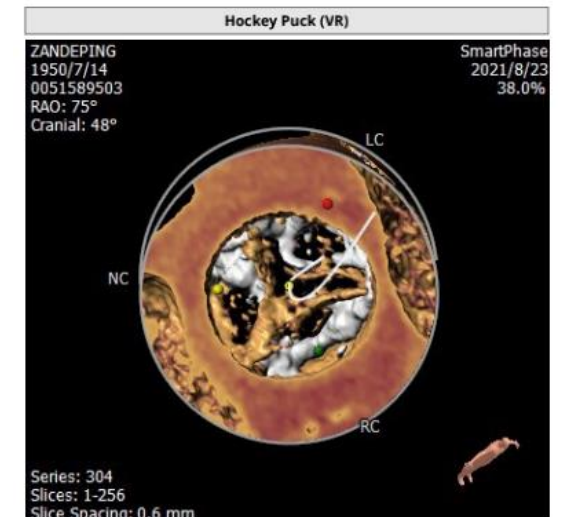
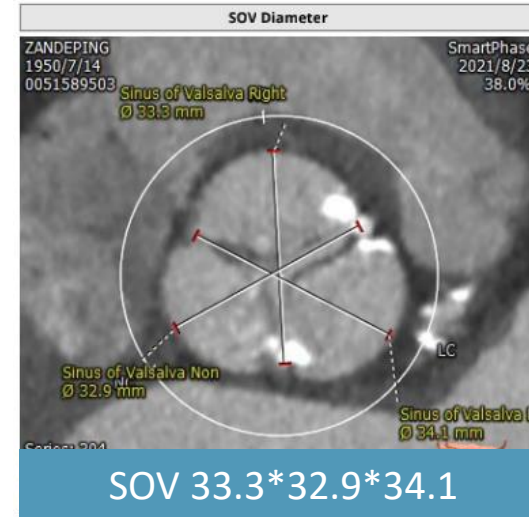
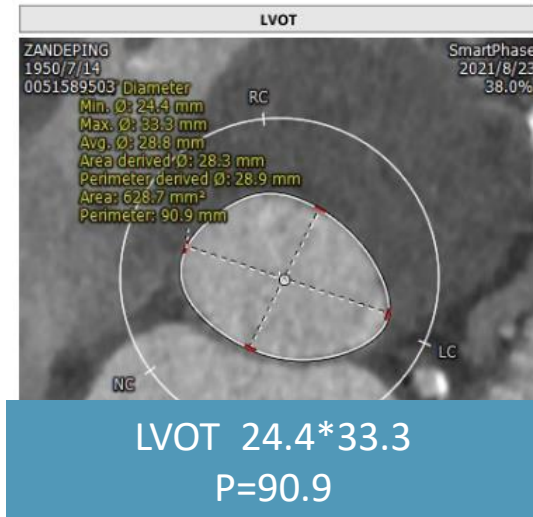
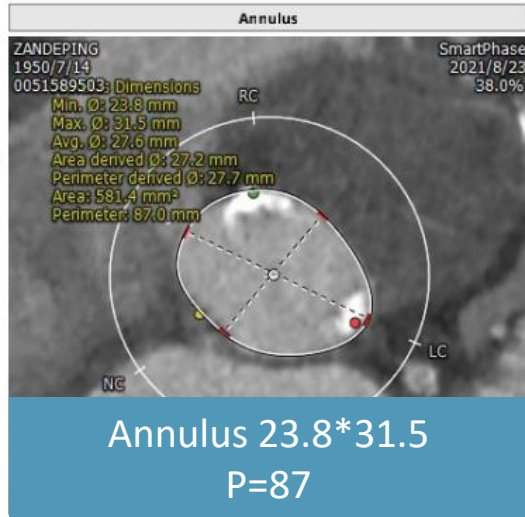
25 Aug 2021, Anzhen Hospital

Patient Information	
Age	71
Gender (M/F)	M
NYHA Class	II
Height	165cm
Weight	66Kg
BMI	24.2
Creatinine	78.5 umol/L
Hemoglobin	106 g/L
BP	118/55
HR	70
STS	5.172%

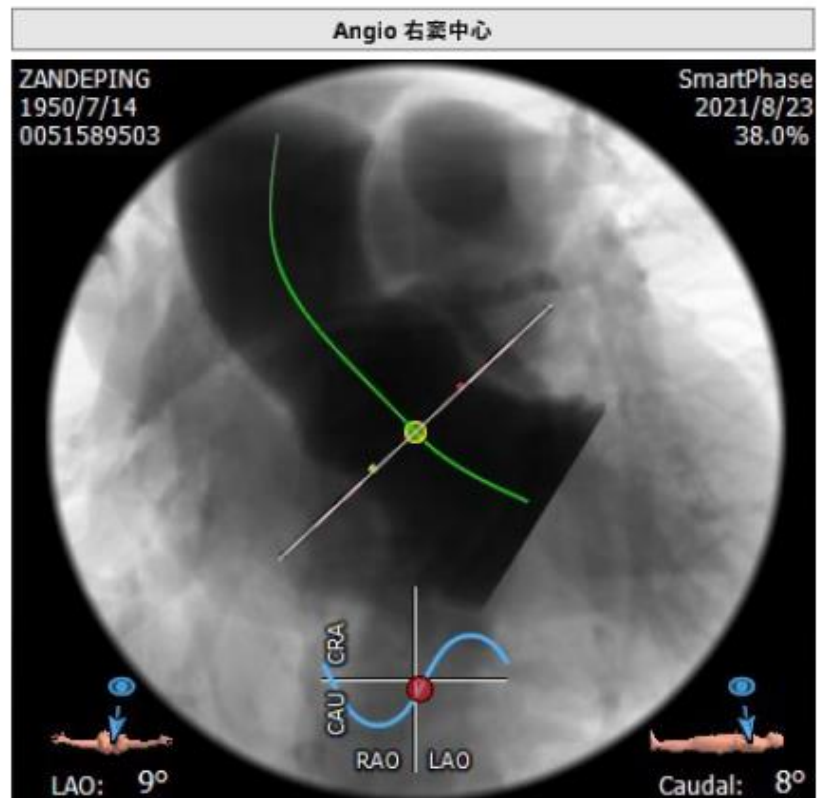
- Clinical History
2021 *Paroxysmal chest pain*
Echo showed severe AS
- Medical History:
Type 2 diabetes
Diabetic Nephropathy
Hyperlipemia
Hypertension

UCG before Operation

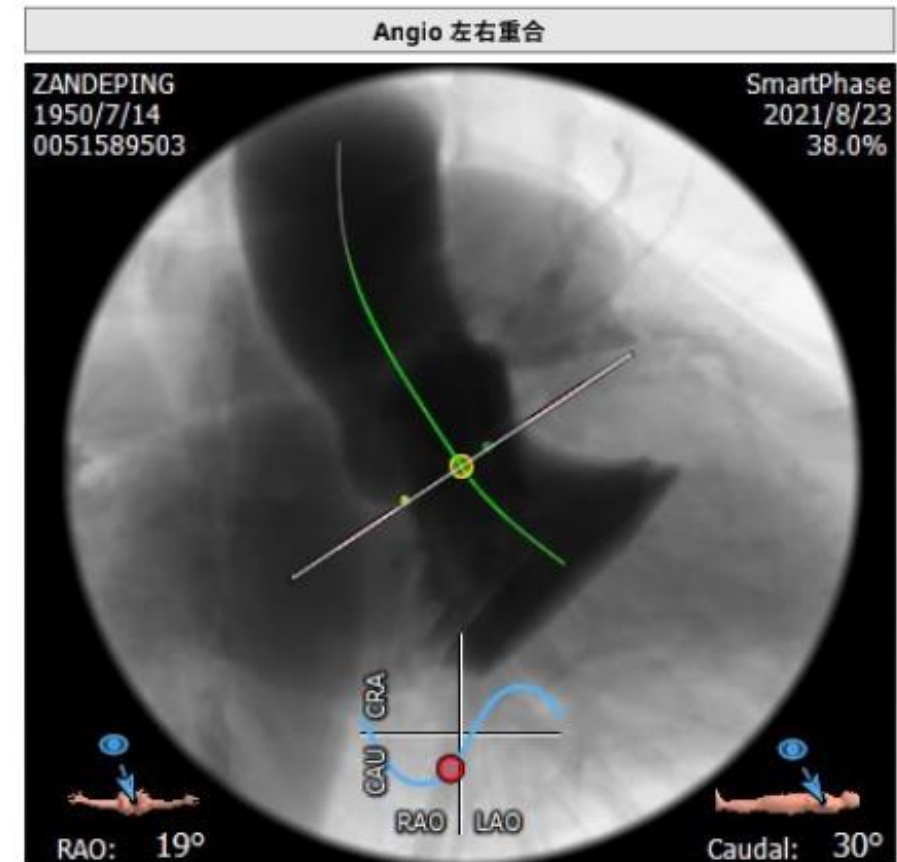
<i>LVEDD</i>	<i>58mm</i>	<i>Ejection Fraction</i>	<i>55%</i>
<i>LVESD</i>	<i>39mm</i>	<i>Mean Gradient</i>	<i>49mmHg</i>
<i>Severe AS + Moderate AR, Mild MR, Mild TR</i>			



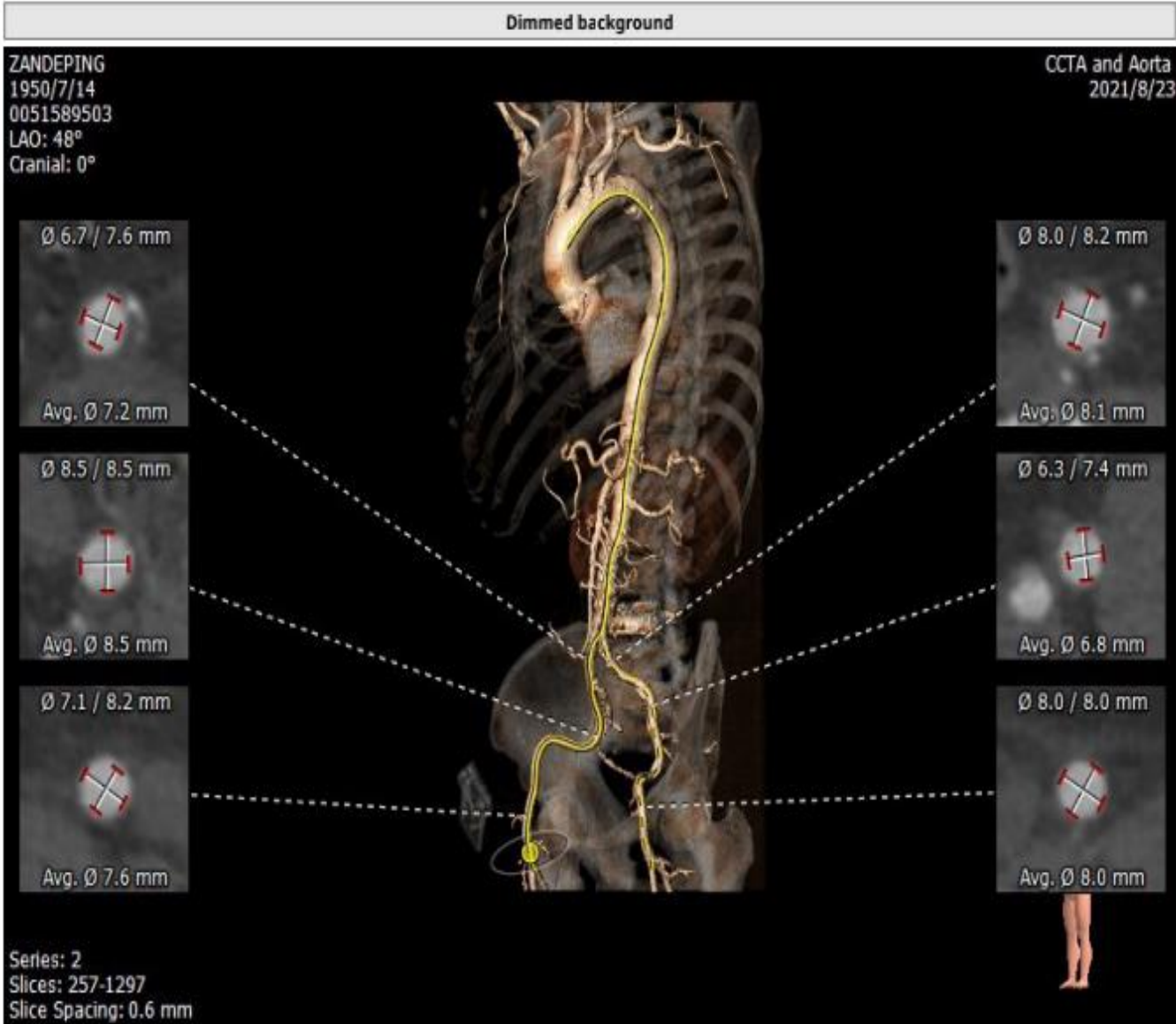




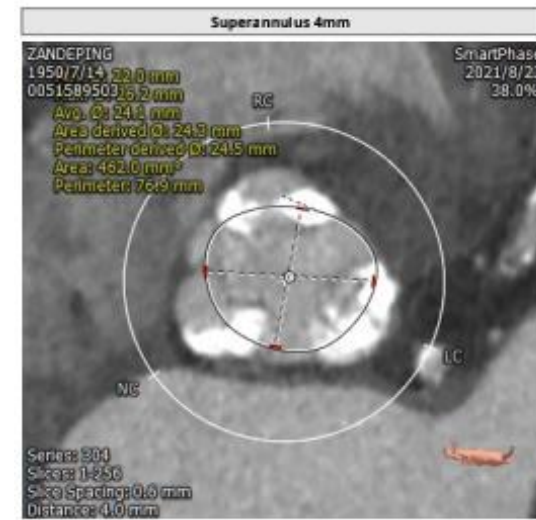
3-cusp coplanar view
LAO 9°
CAU 8°



Cusp overlap
RAO 19°
CAU 30°



Luminal Diameters			
Right		Left	
Common Iliac	Max: 7.6mm Min: 6.7mm	Common Iliac	Max: 8.2mm Min: 8.0mm
External Iliac	Max: 8.5mm Min: 8.5mm	External Iliac	Max: 7.4mm Min: 6.3mm
Common Femoral	Max: 8.2mm Min: 7.1mm	Common Femoral	Max: 8.0mm Min: 8.0mm

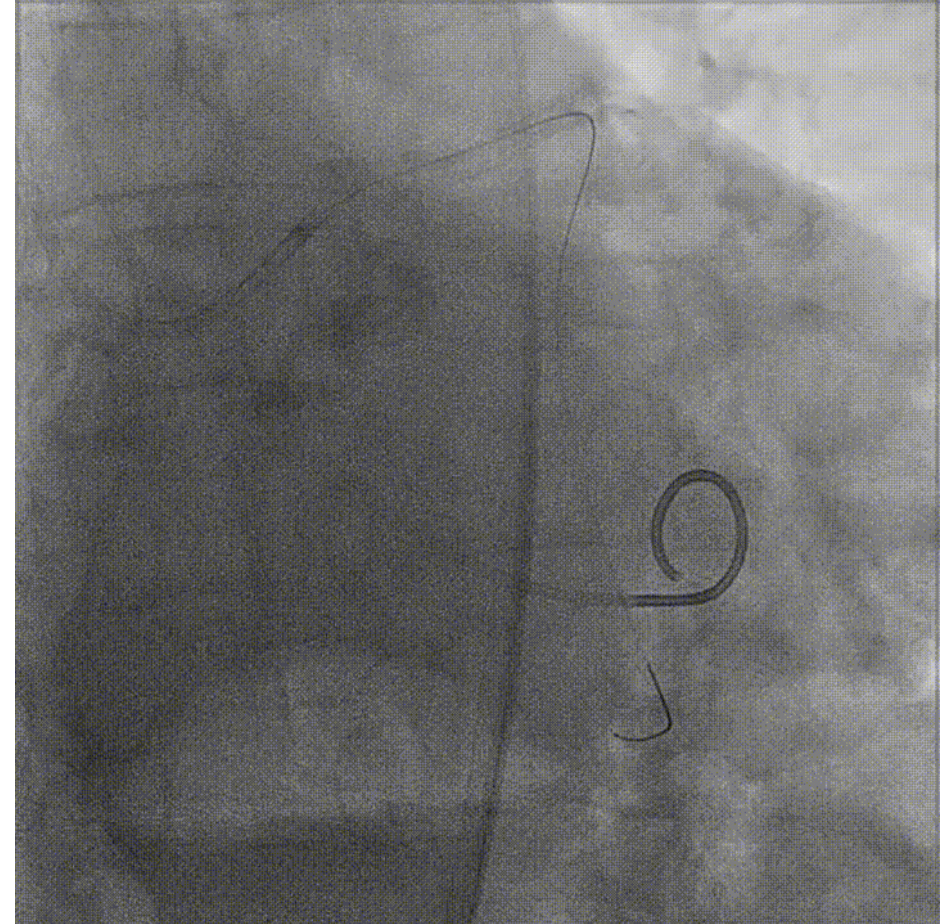
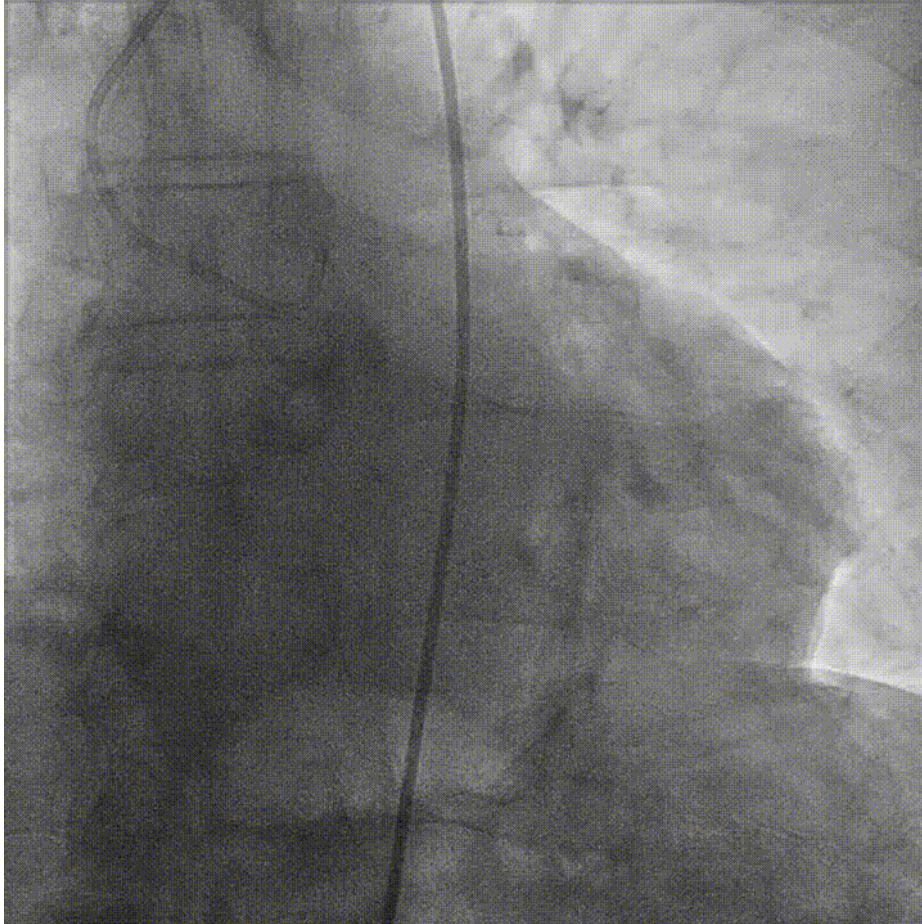


TAVR procedure plan

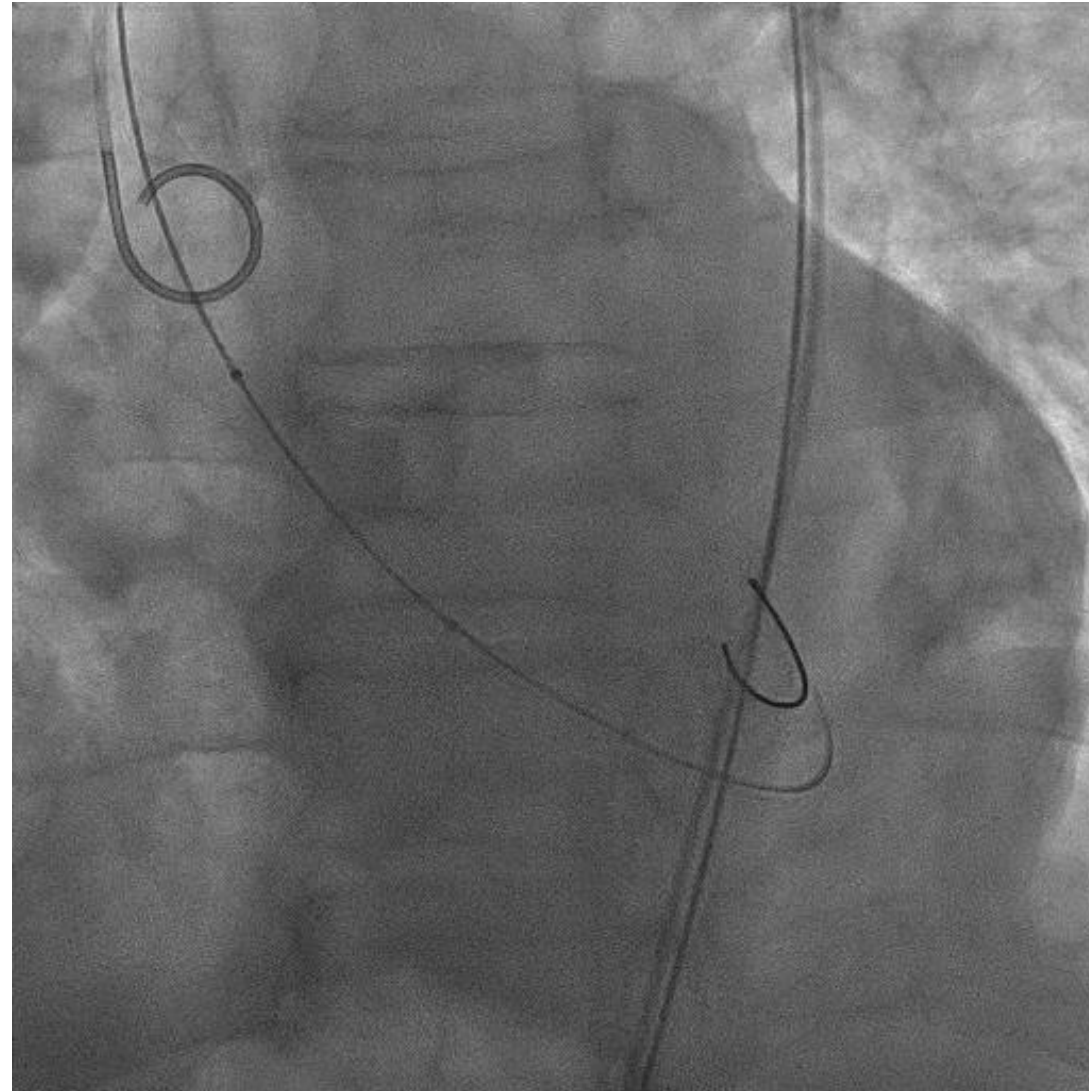
Anesthesia : MAC

Approach : “All in one” -Right femoral artery

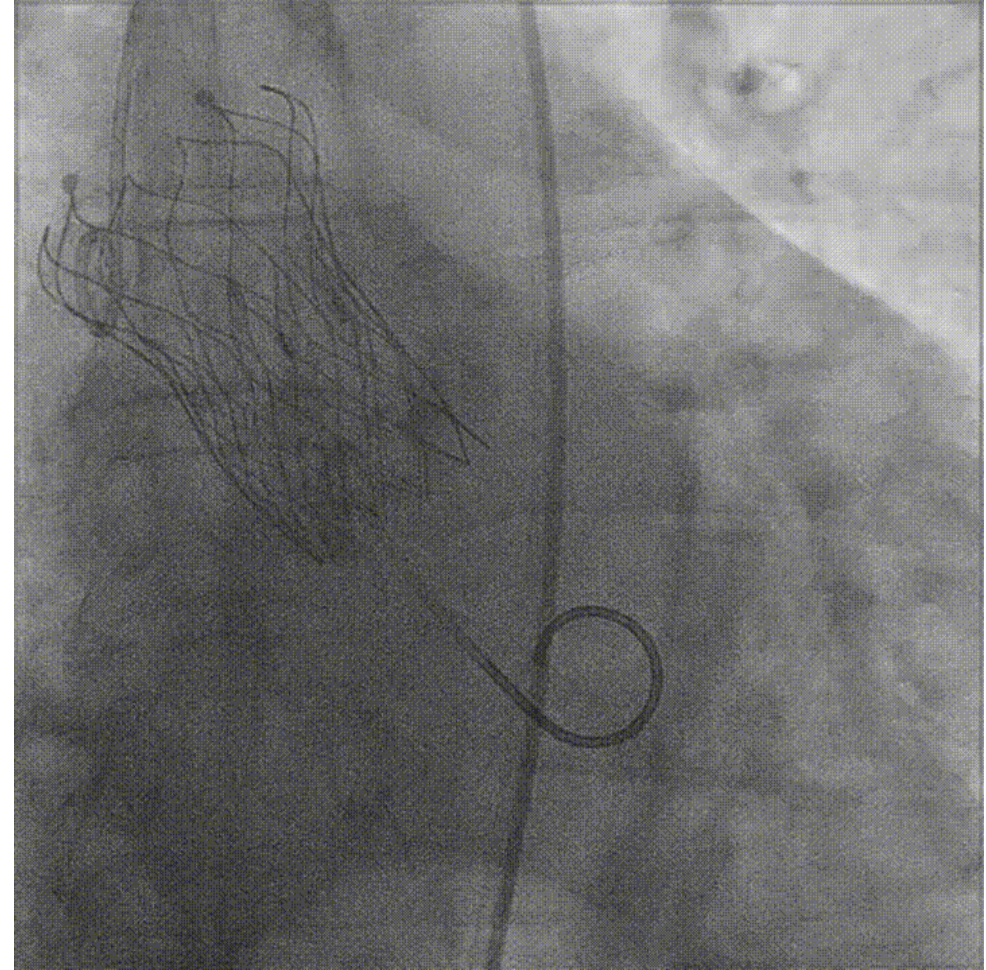
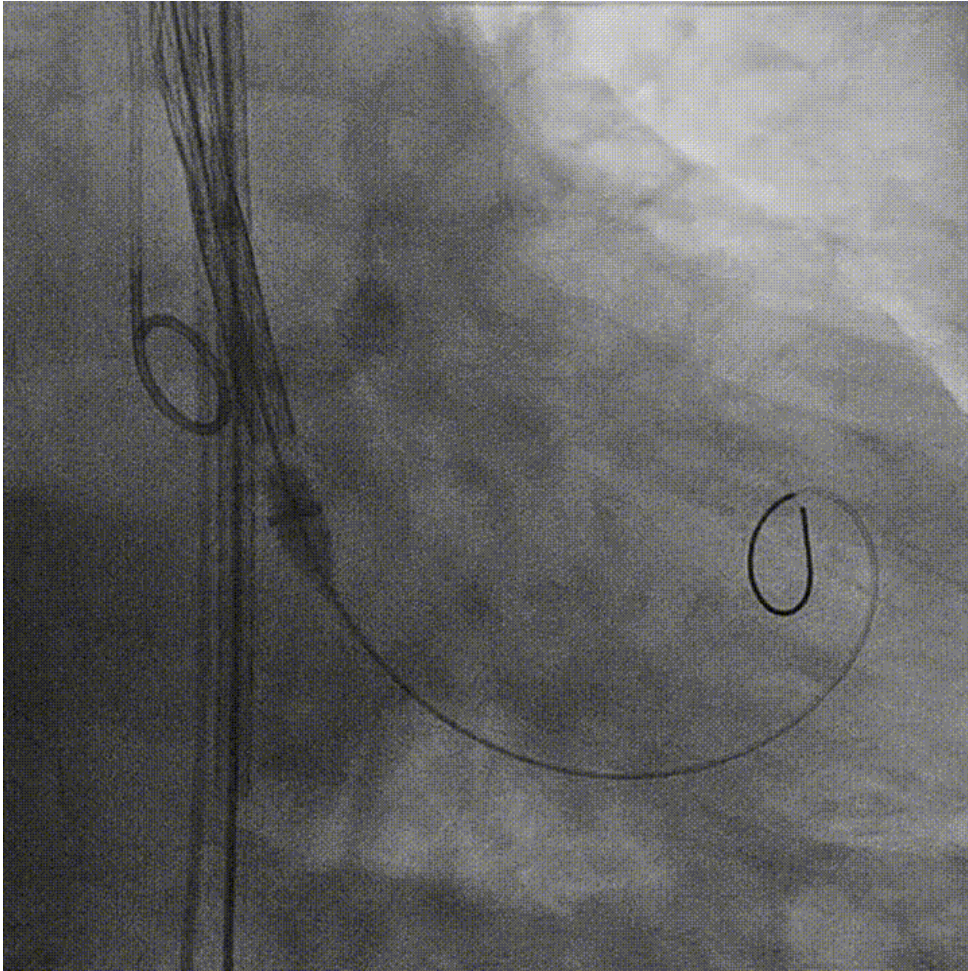
TPM: Left Ventricular Guidewire Pacing



DES 3.5×33mm was implanted



Balloon predilatation NuMed 20mm



Vita Flow 27mm

Characteristics	n=30
Age (years)	72.6±9.7
Female	14
BMI (kg/m ²)	22.66±2.82
STS (%)	4.73±3.1
AS	26
AR	4
Self-Expanding Bioprosthesis	30
Single vascular technique	3
One-stop TAVR+PCI	3
VIV	1
Other complications	0
PPMI	0

- There is a wide spectrum in the practice for TF-TAVR
- The best method for TF-TAVR is still being explored
- Simplification in each procedural step should be encouraged
- “All in one” technique aims at minimizing the invasiveness of TF-TAVR
- Less puncture, less complication



安贞医院
ANZHEN HOSPITAL



Thank you
