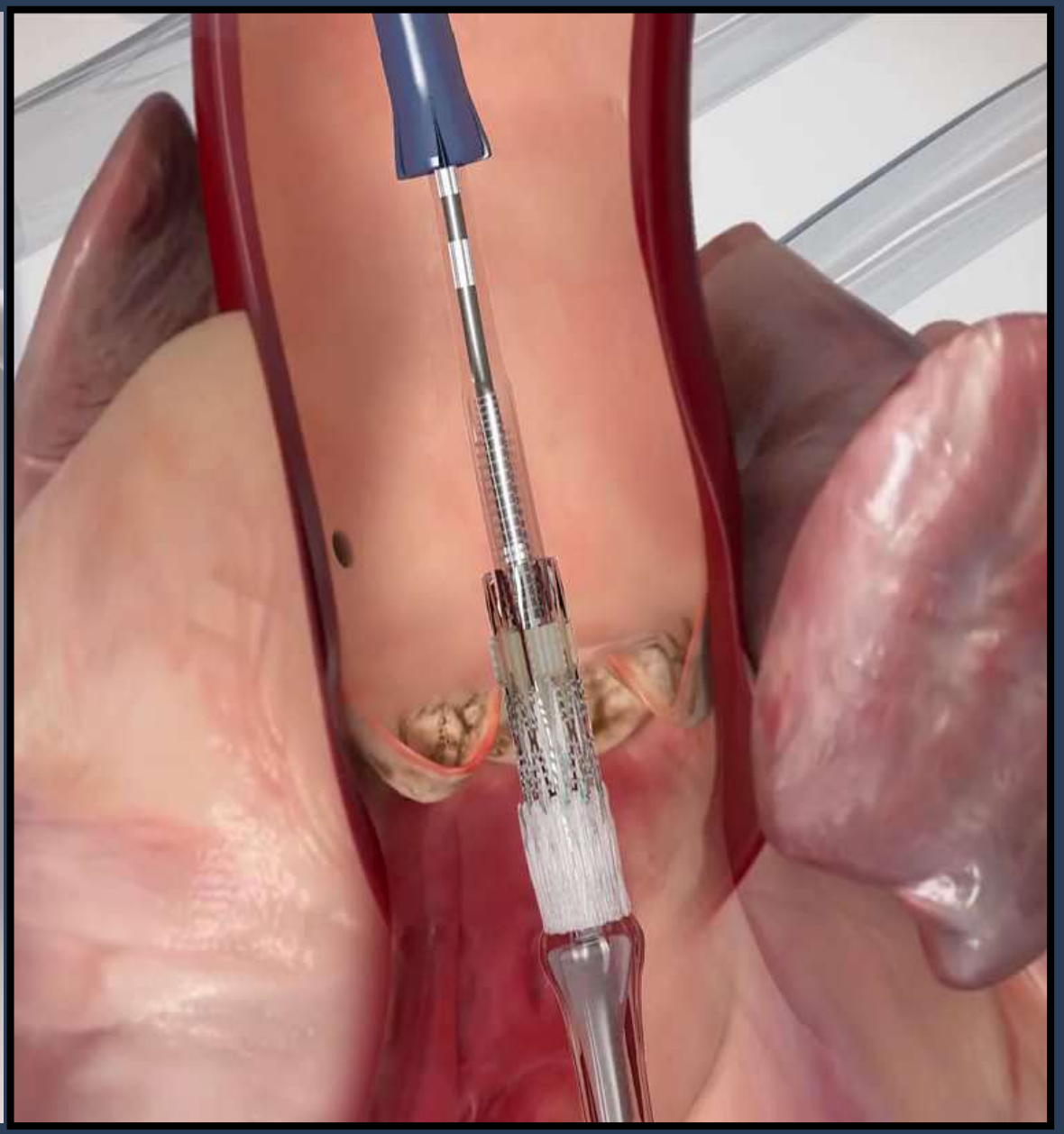
TCTAP 2022

Simultaenous TMVR with MitraClip & TAVR in a Patient

이승용
서울 아산병원



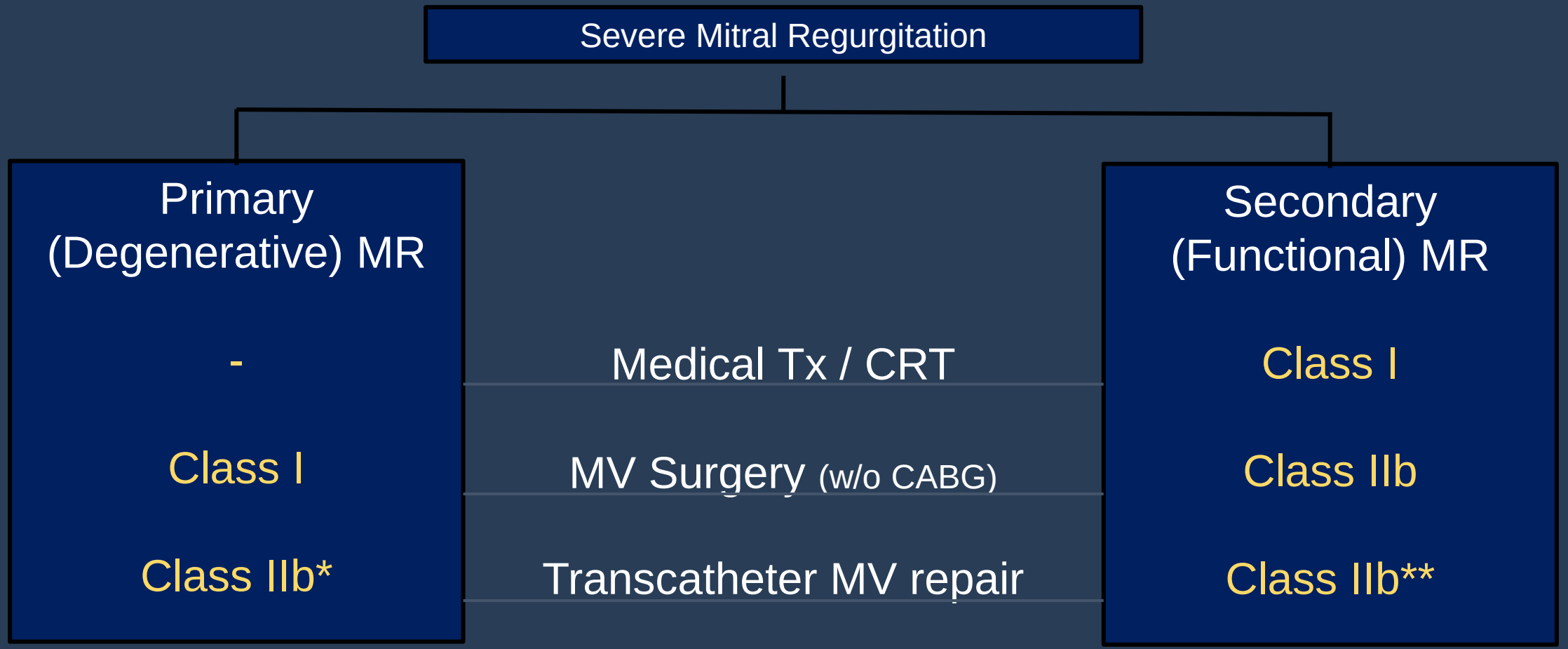

MitraClip®
Transcatheter Mitral Valve Repair

Two Types of Mitral Regurgitation

Degenerative MR: Prolapse/Flail

Functional MR: Ventricular Problem

US / European Valve & HF Guidelines for Treatment of Chronic Symptomatic MR

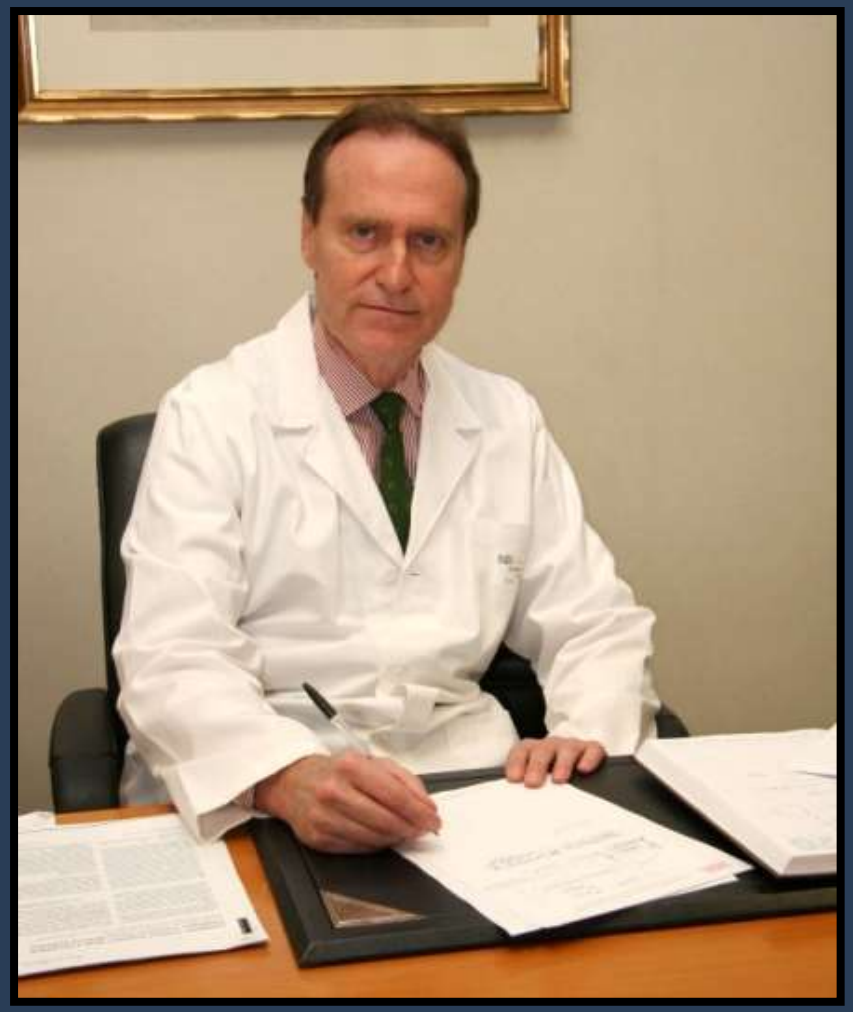


*In non-operable candidates

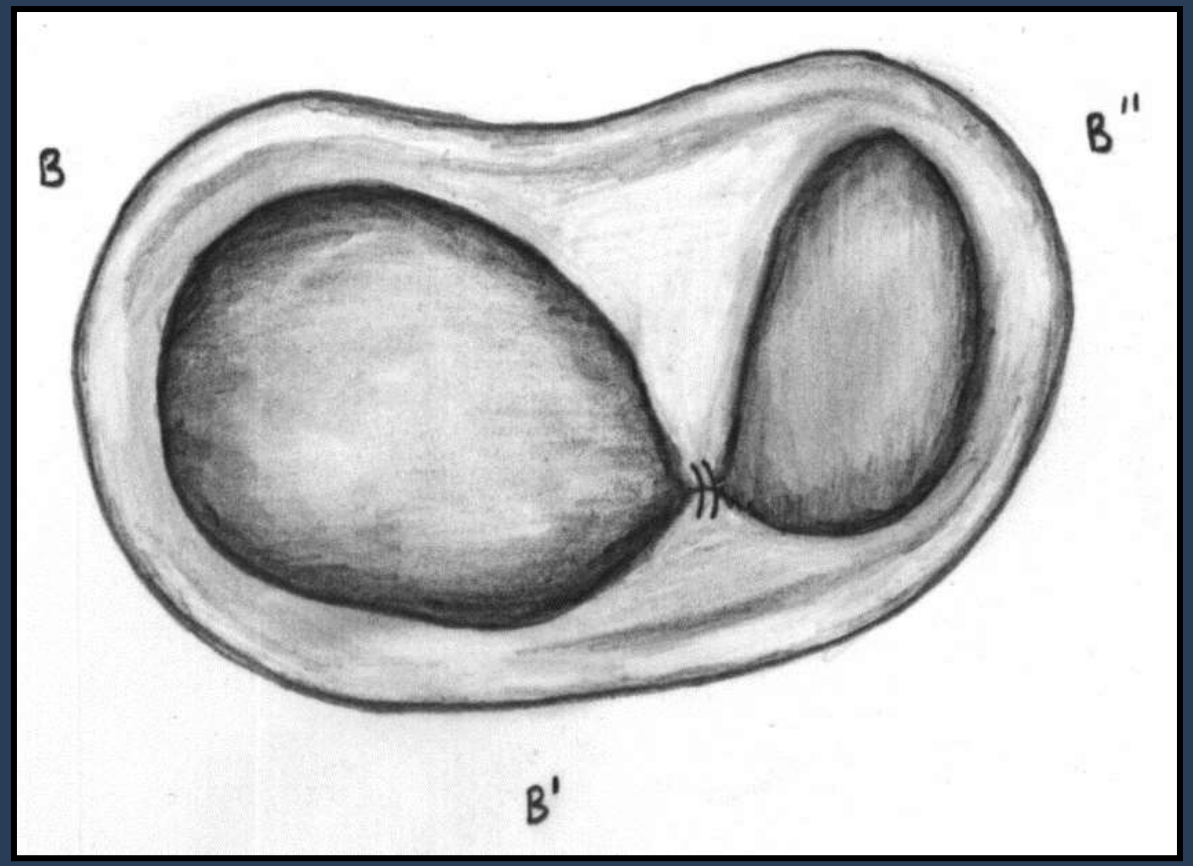
**US HF, EU valve guidelines
Not in the US valve guideline

2017 ESC/EACTS Valve; 2017 ACC/AHA/HFSA HF; 2017 ACC/AHA Valve

Transcathter Edge to Edge repair
- Mimicking the concept of Alfieri Repair

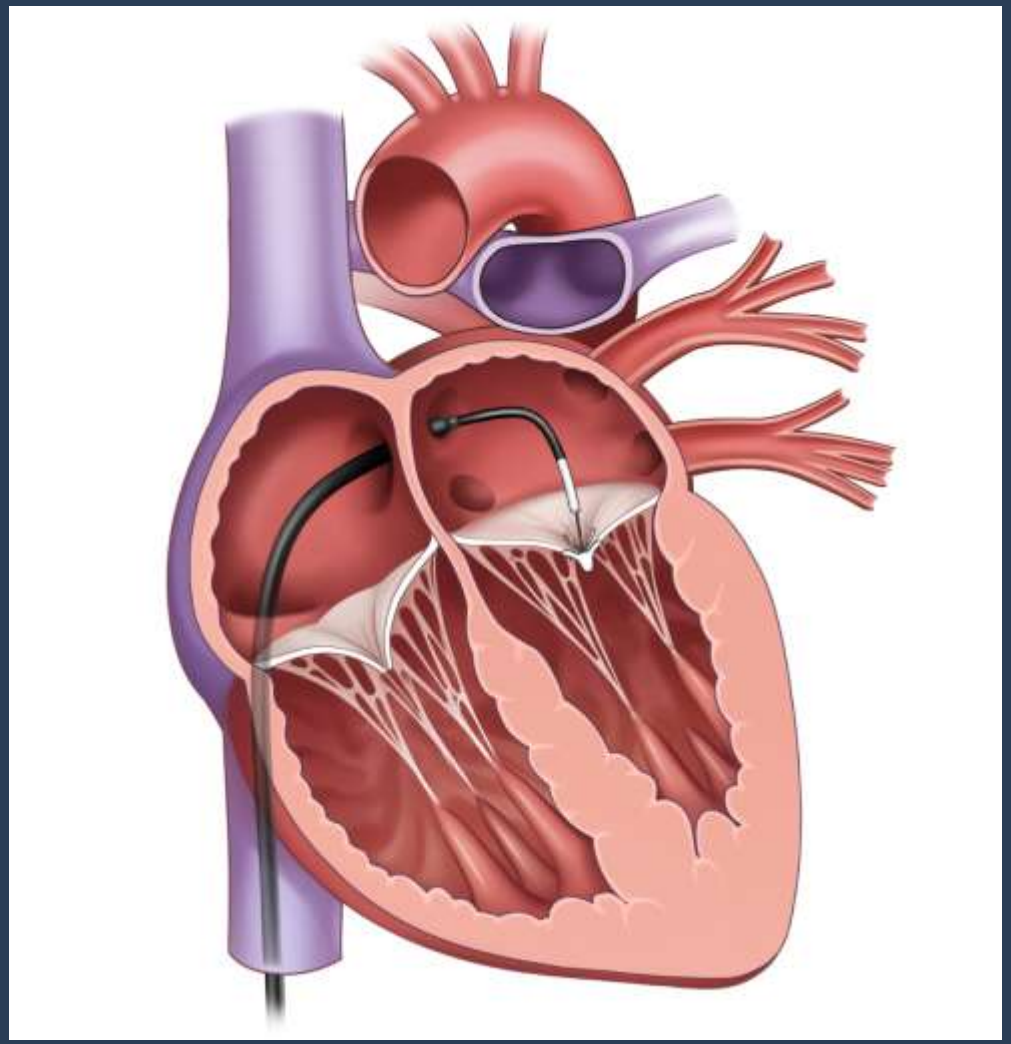


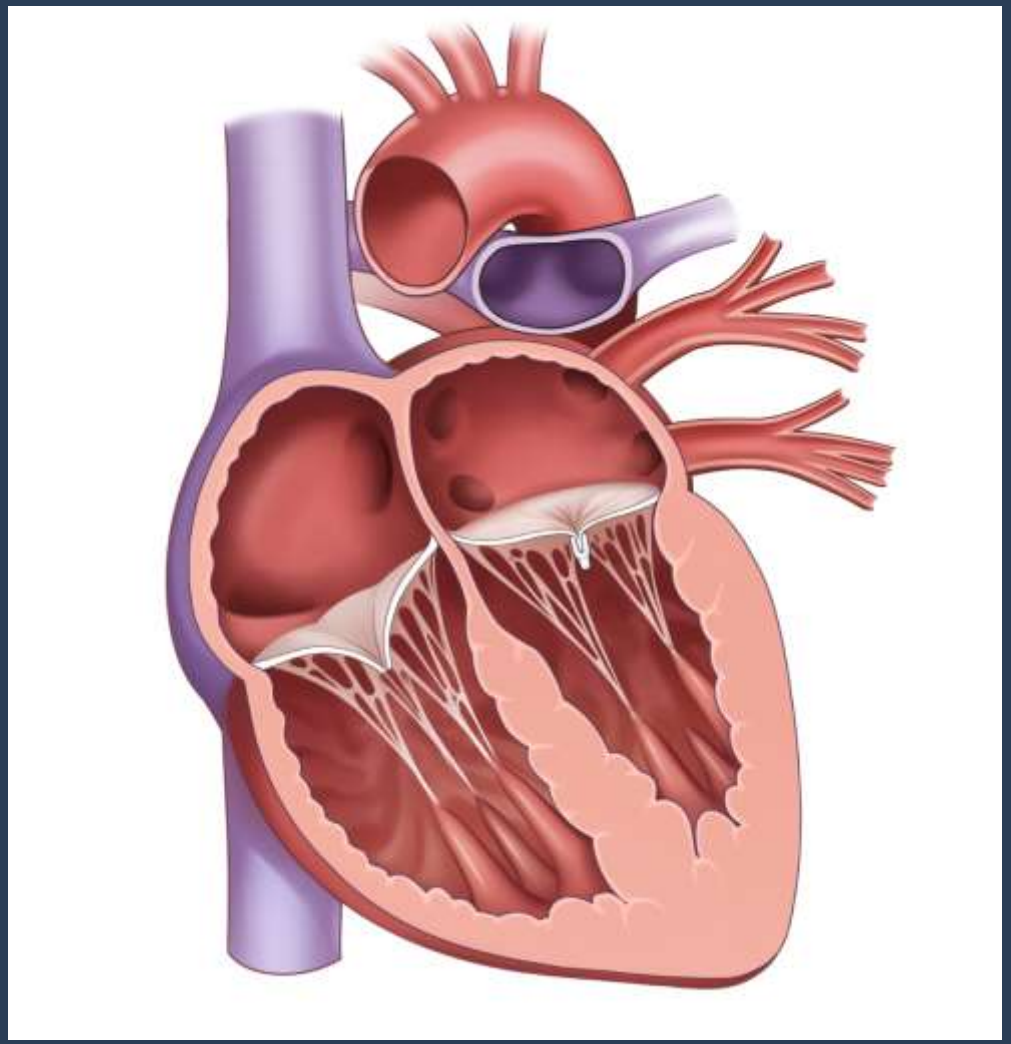
Dr. Ottavio Alfieri



"Alfieri" **Repair**

Mitraclip - Concept





CASE

- 85/F, 155 cm, 49.1 kg, BMI 20.44, BSA 1.45
- Chief complaints
  - dyspnea
- Medical history
  - Gastric cancer s/p op (2020')
  - New onset A.fib
  - Lt. wrist fracture due to slip down (2021.12.26)
  - Severe MR with chordae rupture
- Serum Cr : 1.01 (eGFR 51)
- PFT : FEV_1 69 % / FVC 83 % , FEV1/FVC: 79%
- STS score = 4.178%, Euroscore I = 10.74%, Euroscore II = 3.87%

CASE

- EOA (TTE) = 0.76 cm^2
- Peak / Mean PG = 64/31 mmHg
- V max = 4.0 m/s
- EF = 67 %
- LVOT diameter, TTE: 20.0 mm

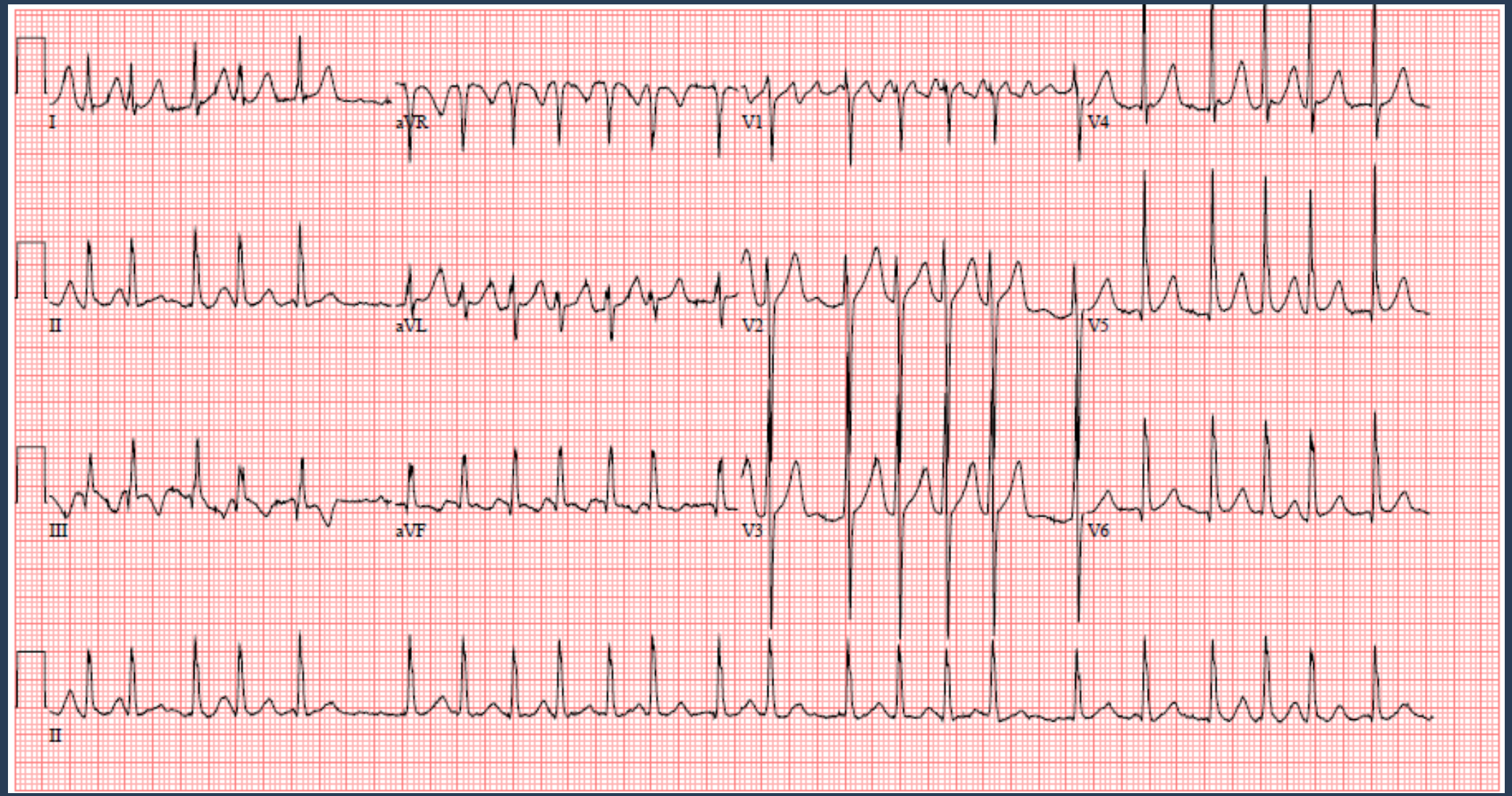
- 1.Severe eccentric MR due to flail motion of posterior middle scallop (P2) with chordae rupture
- 2.Severe degenerative aortic stenosis
- 3.Moderate resting pulmonary hypertension
- 4.Normal LV dimension and systolic function

Heart Team Discussion

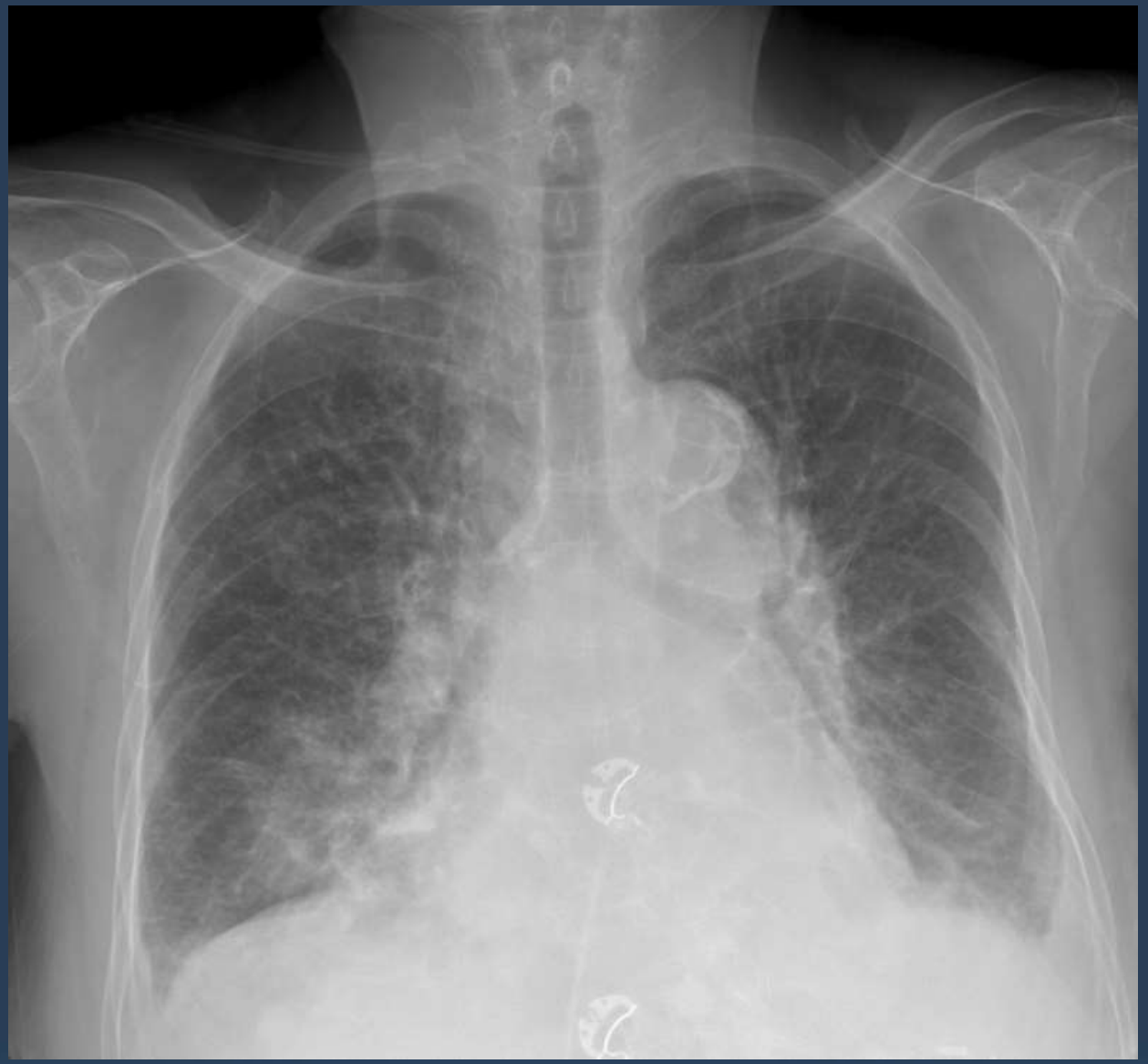
- Old age with frailty
- STS score for Mortality : **4.178%**
- High risk of stroke after surgery

→ Heart team discussion as a candidate for Mitraclip Procedure & TAVR

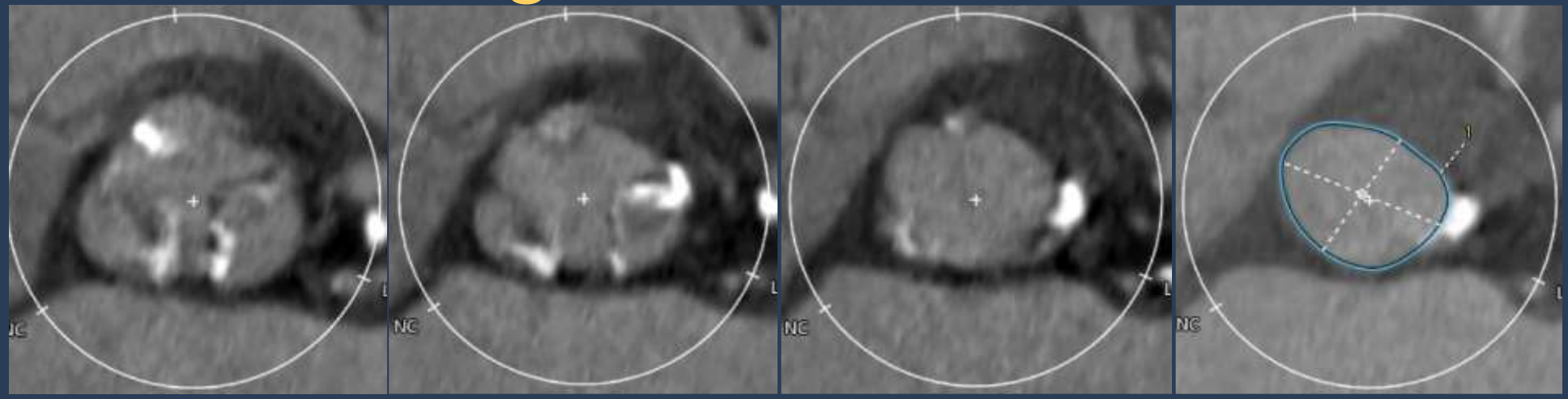
ECG



Chest X-ray



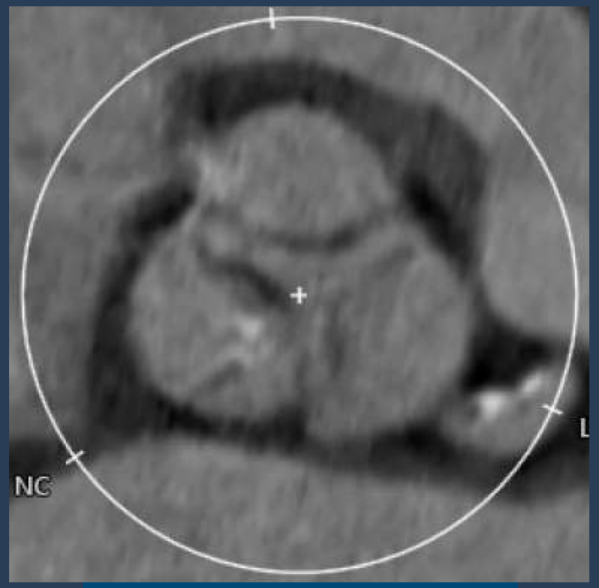
CT findings – Aortic Annulus View



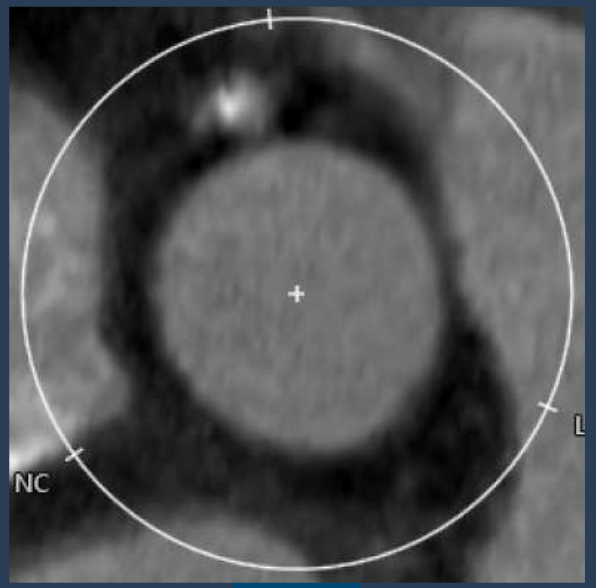
Annulus plane 20%

Aortic Annulus parameters	
Annulus short diameter	18.7 mm
Annulus long diameter	23.6 mm
Annulus mean diameter	21.3 mm
Annulus area	350 mm^2
Annulus area-driven diameter	21.1 mm
Annulus perimeter	67.4 mm
Annulus perimeter-driven diameter	21.5 mm

CT findings – Aortic Valve Complex



Sinus of Valsalva



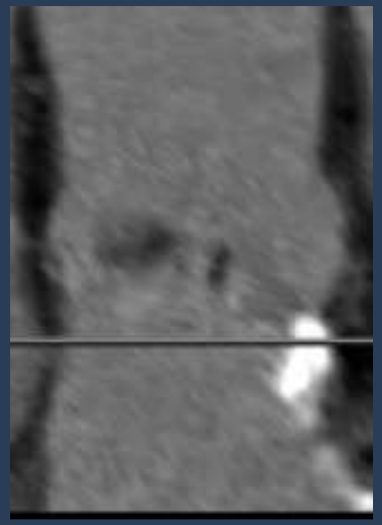
STJ

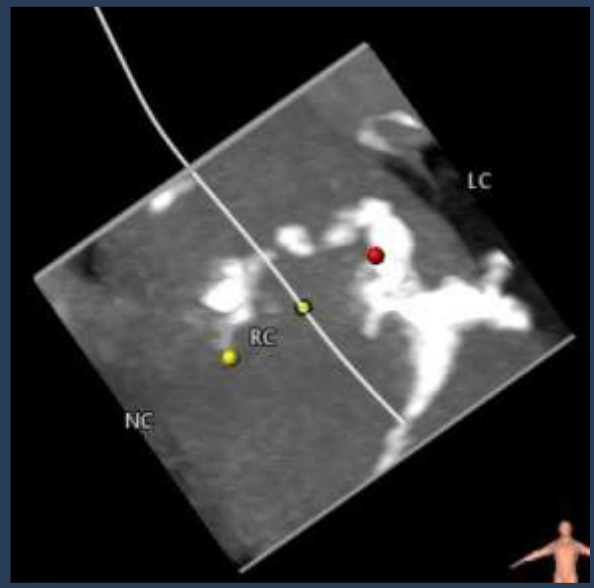
Sinus of Valsalva		STJ	
Area	652 mm^2	Area	560 mm^2
Sinus / Annulus Area Ratio	1.86	STJ/ Annulus Area Ratio	1.60
NCC diameter	26.4 mm	Mean diameter	26.5 mm
LCC diameter	27.0 mm	Height of lowest STJ	22.5 mm
RCC diameter	26.6 mm		

Mean Sinus / Annulus Area Ratio: 1.87 ± 0.33

Mean STJ / Annulus Area Ratio: 1.52 ± 0.36

CT findings – Aortic Valve Complex



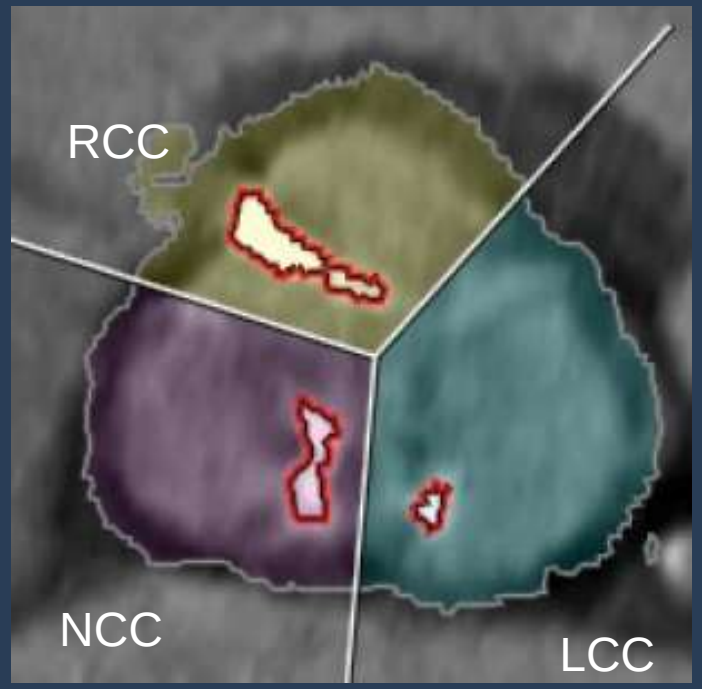


LVOT

LVOT	
Area	329 mm^2
LVOT / Annulus Area Ratio	0.94
Short diameter	17.3 mm
Long diameter	23.1 mm

Mean LVOT / Annulus Area Ratio: 0.95 ± 0.16

CT findings – Aortic Valve Complex



Calcium volume	
NCC	61 mm^3
RCC	68 mm^3
LCC	193 mm^3
Total	323 mm^3

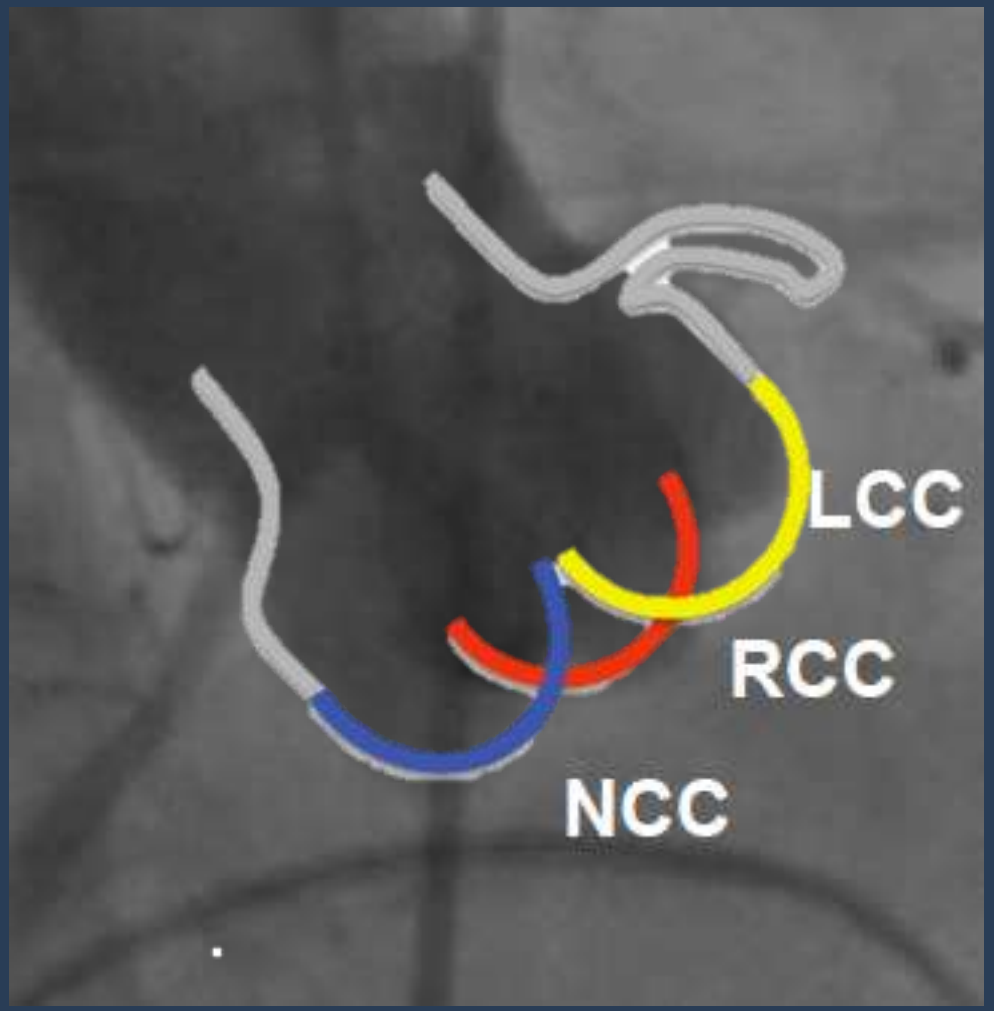
Mean Amount of total Calcium: 356.7 ± 303.8

Sizing for Sapien 3

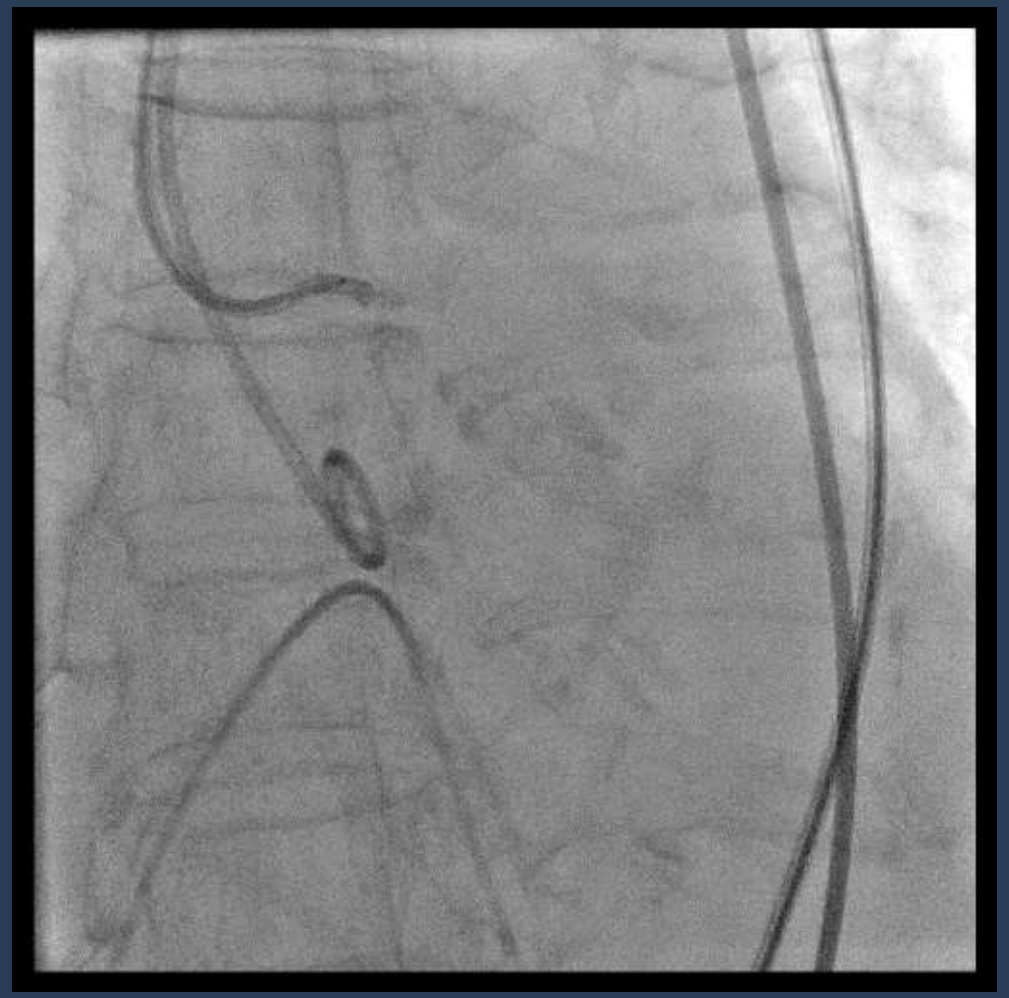
Size	Area Oversize (%)	Perimeter Oversize (%)
20	93.7	95.2
21	103.3	100.0
22	113.4	104.7
23	116.9	106.0
24	127.3	110.6
25	138.1	115.2
26	148.3	119.8

S3 23 (nominal)

Baseline Aortogram: Coplanar View

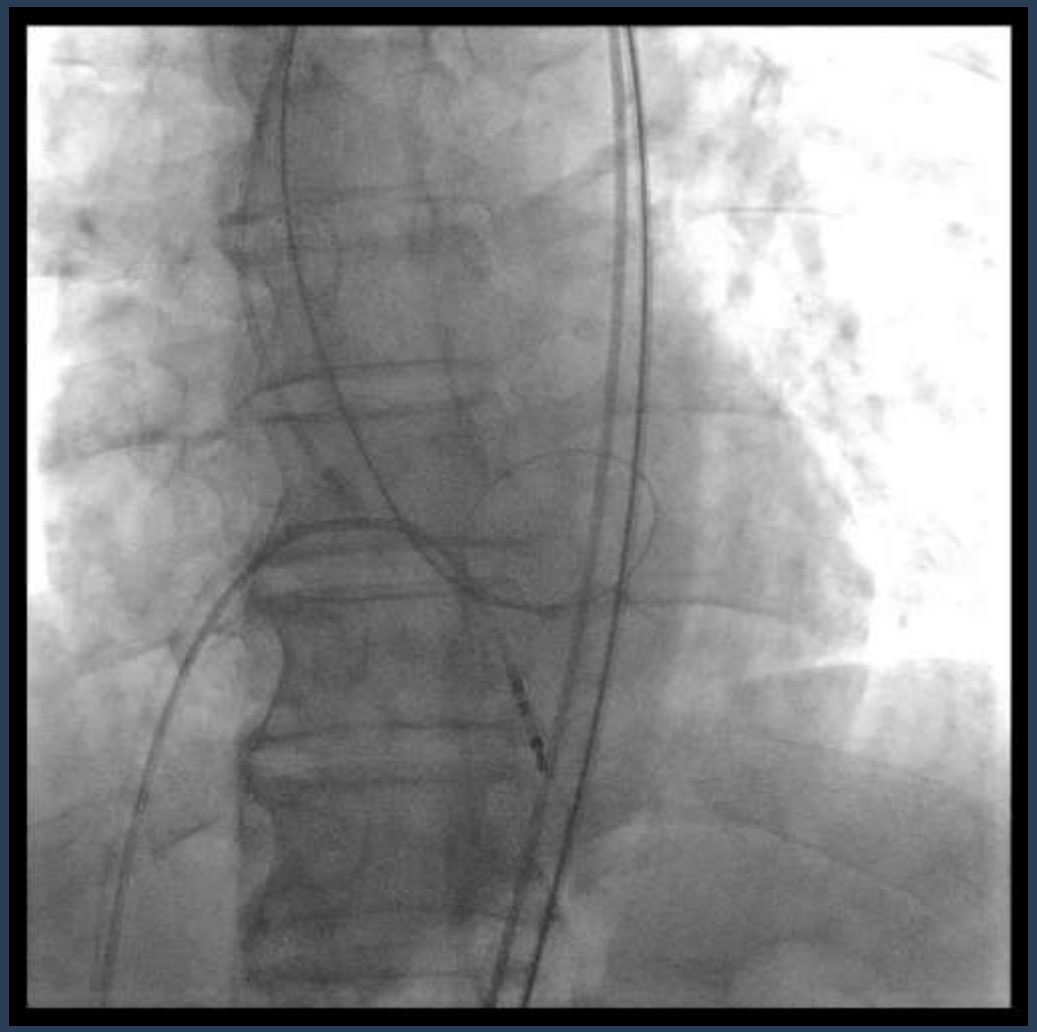


Valve Crossing



Catheter	Wire
AL 1	Teflon straight
AL 2	Ring toque
JR	

LV Support Wire Exchange



LV wire

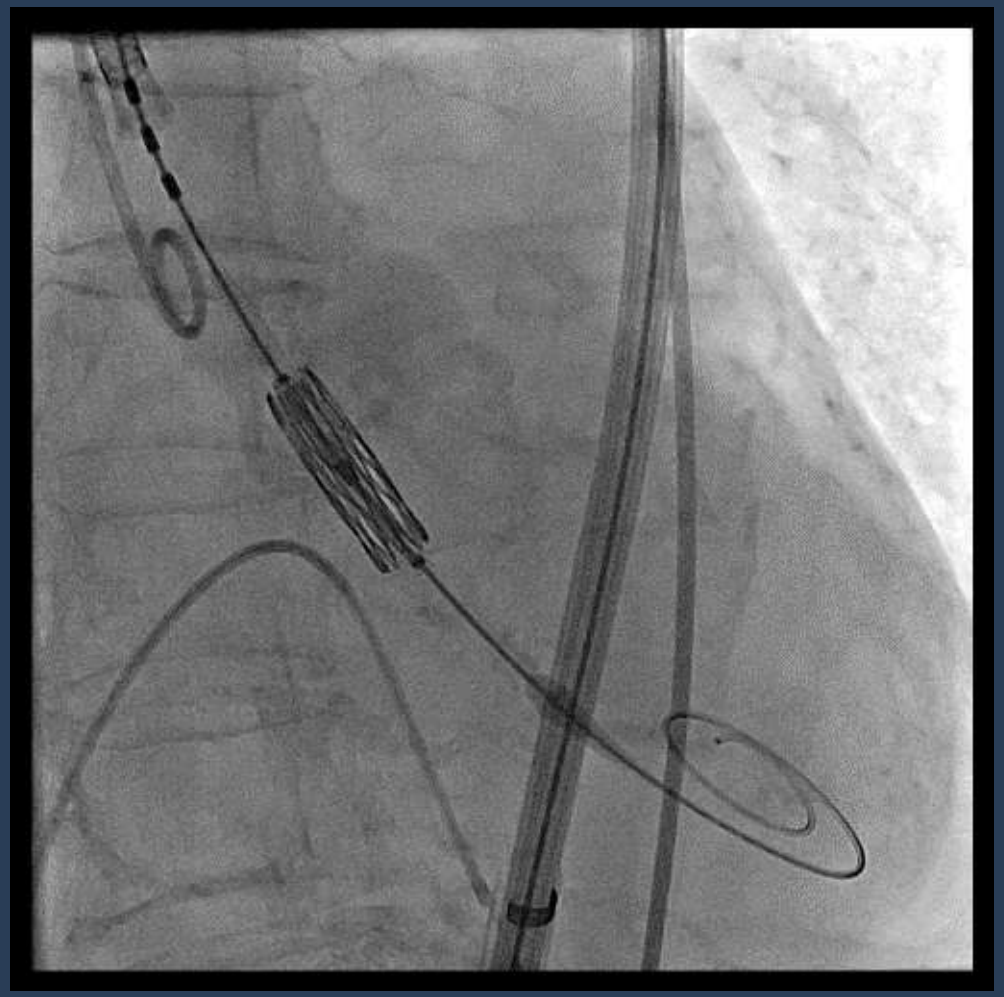
Pre-shaped: Safari^{2TM}

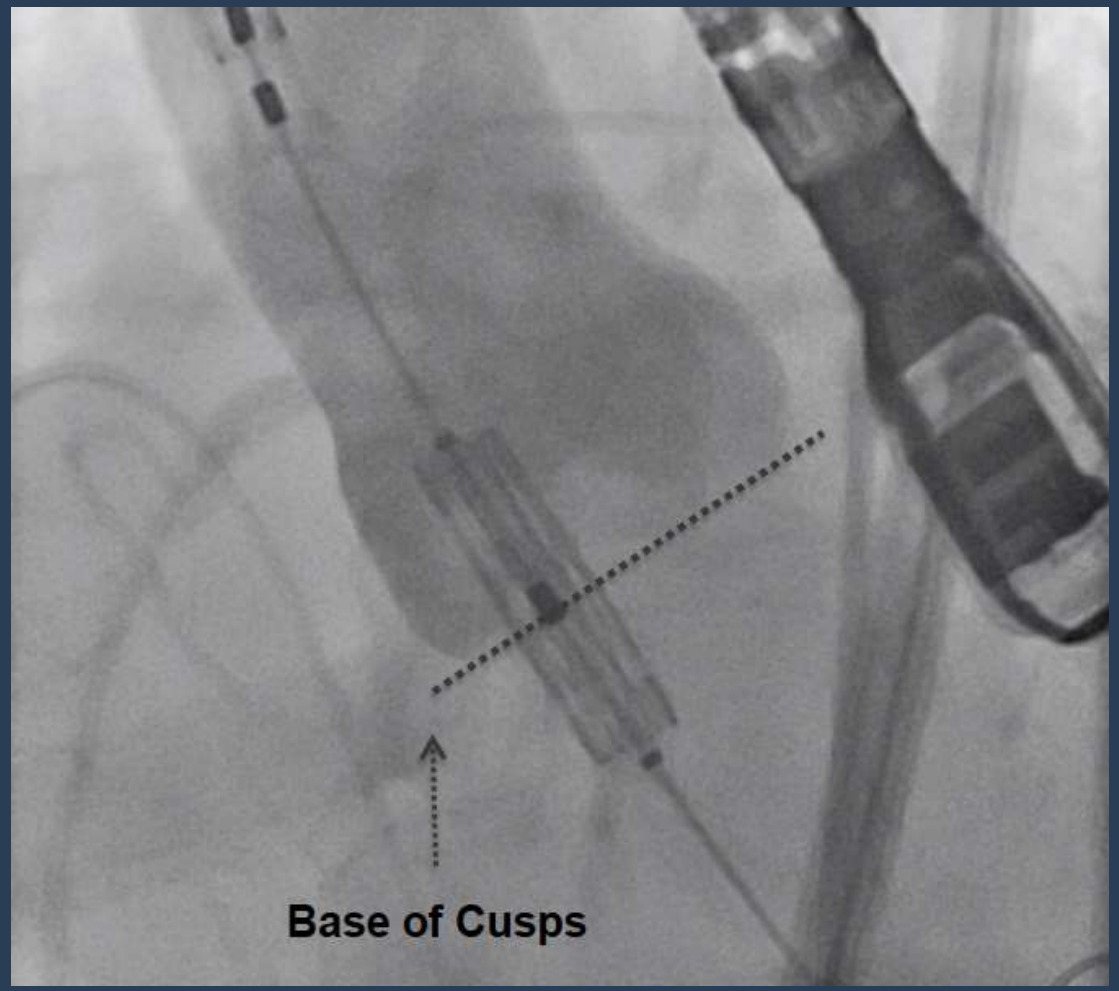
Super stiff

Extra stiff
(Lunderquist)

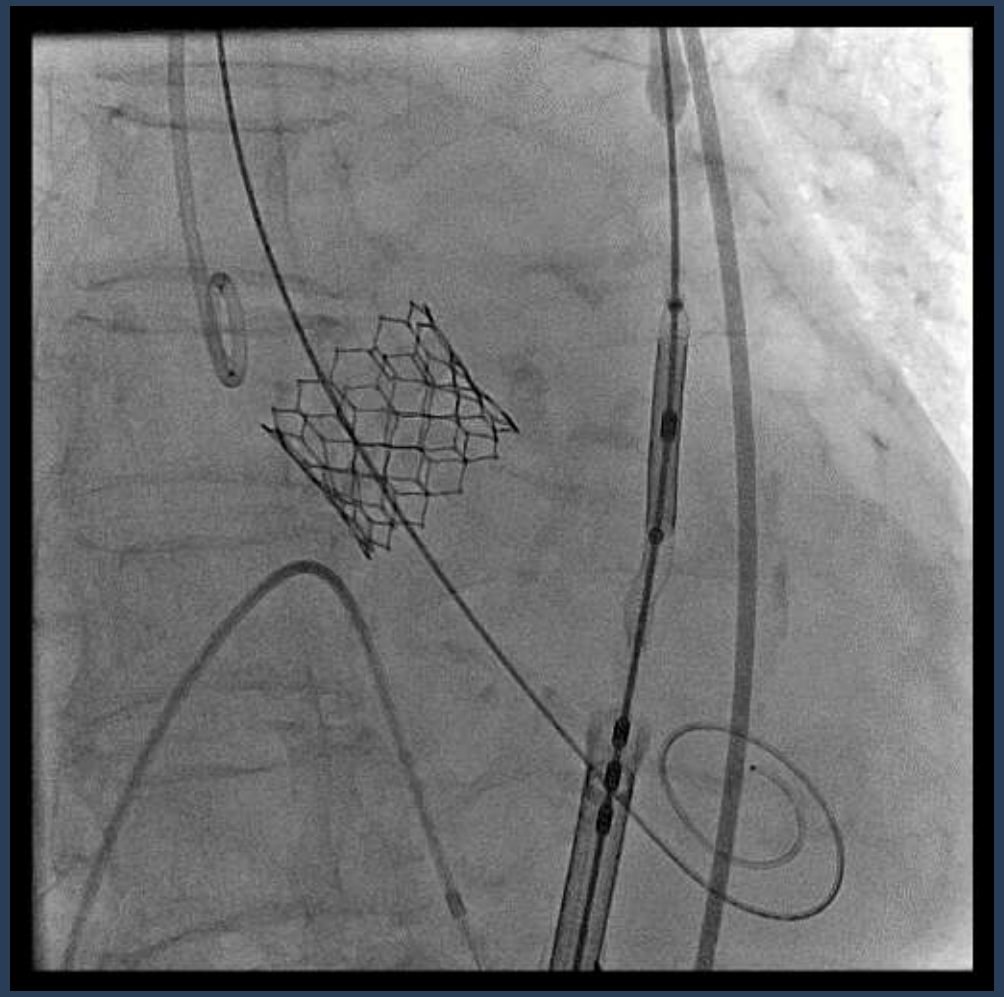
Valve Positioning and Implantation

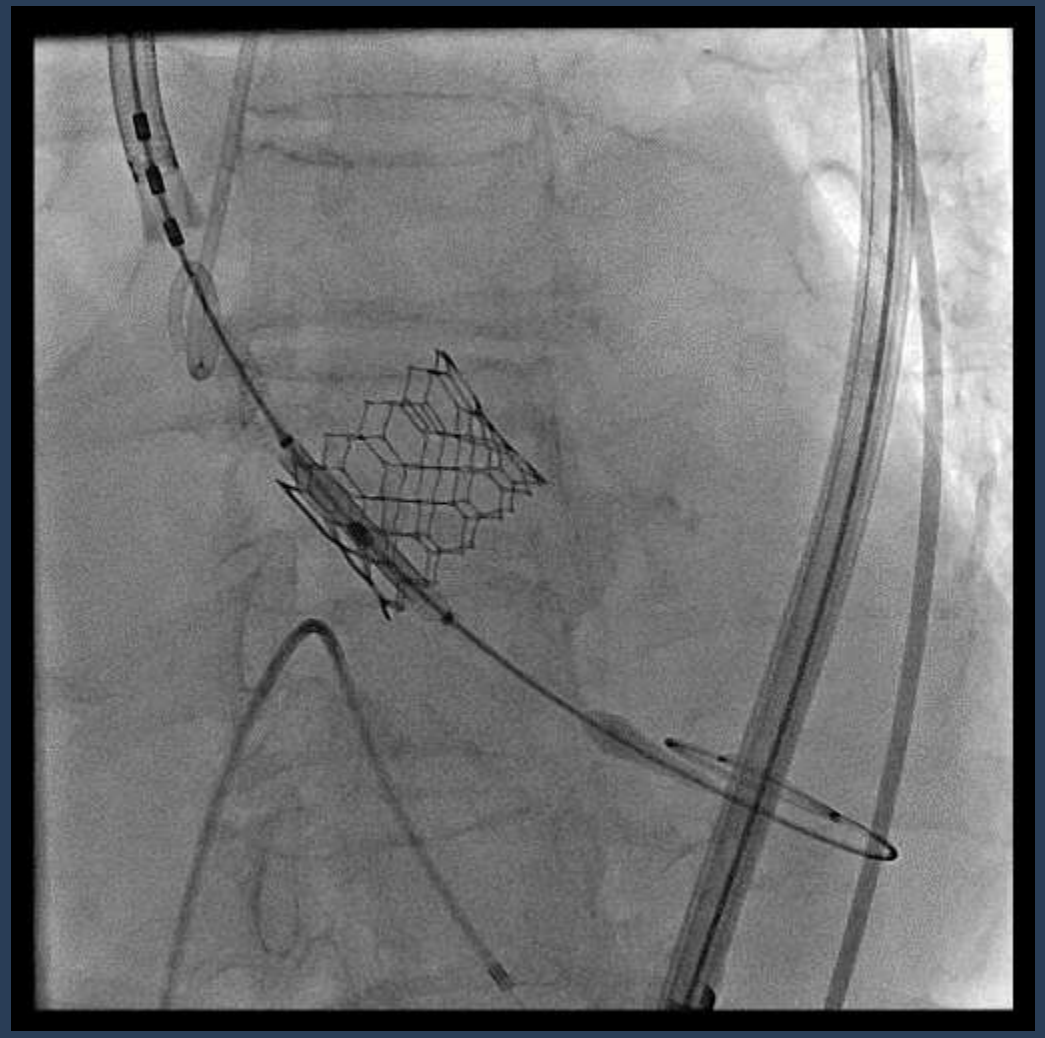
Bottom of Center Marker at Base of Cusps





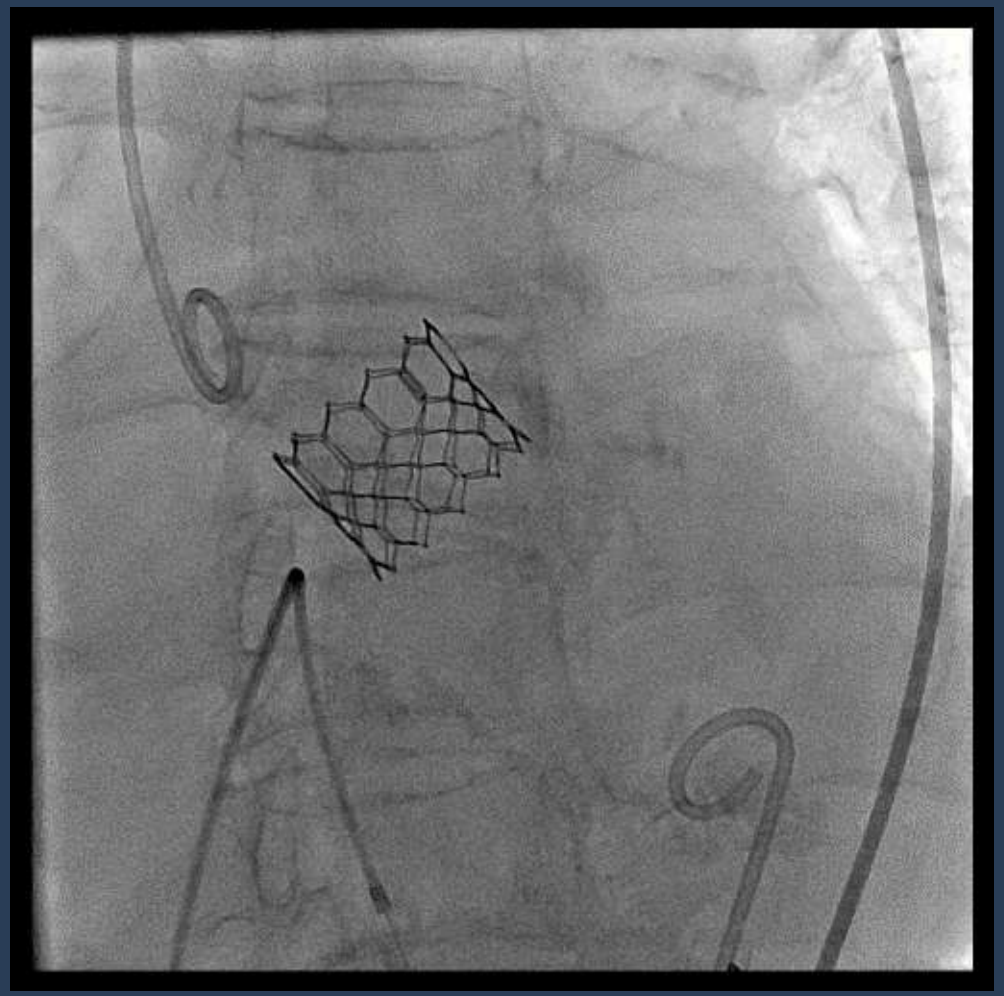
Post angiogram & Post balloon

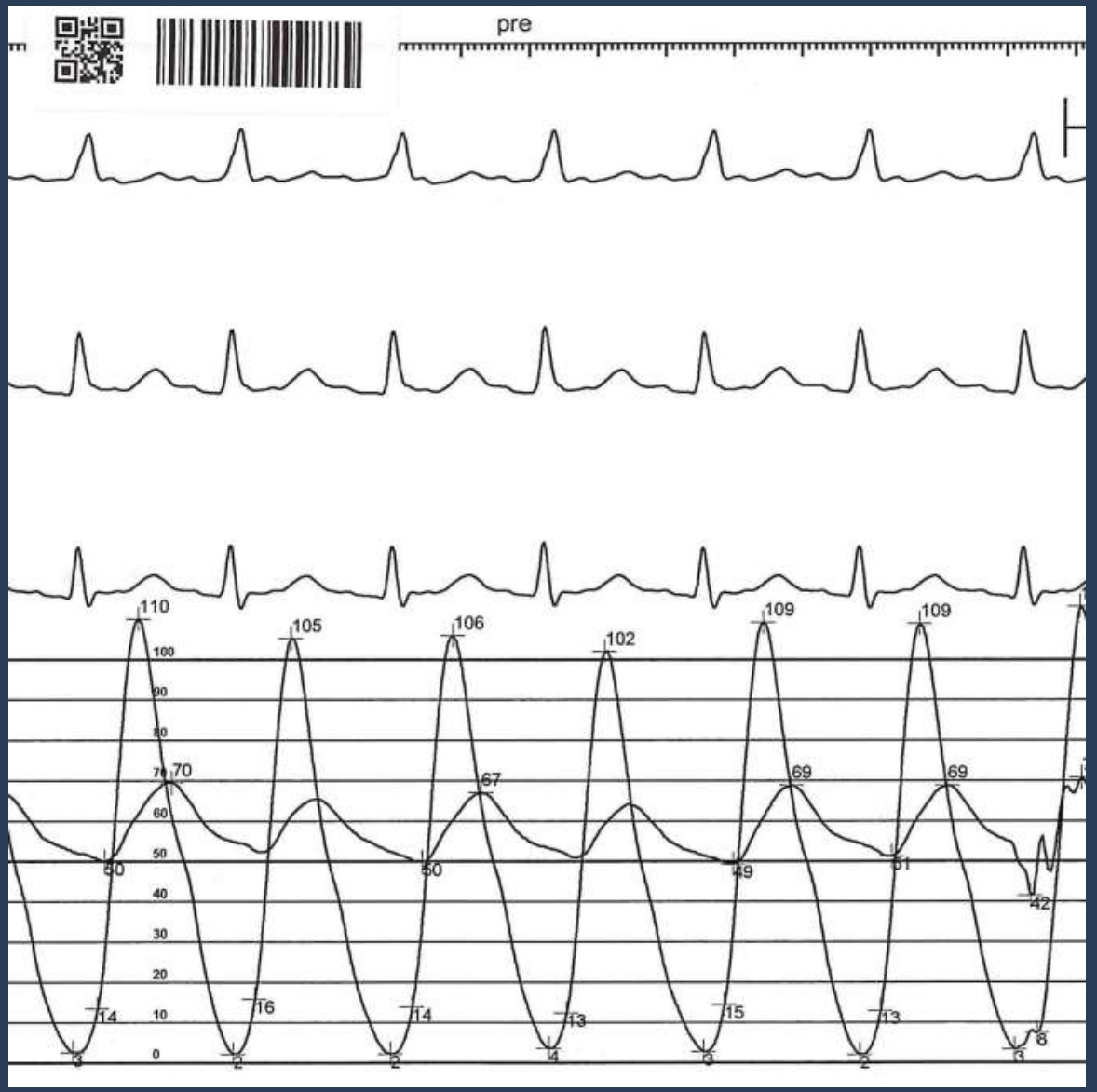




+1cc Overfill

Final Angiogram

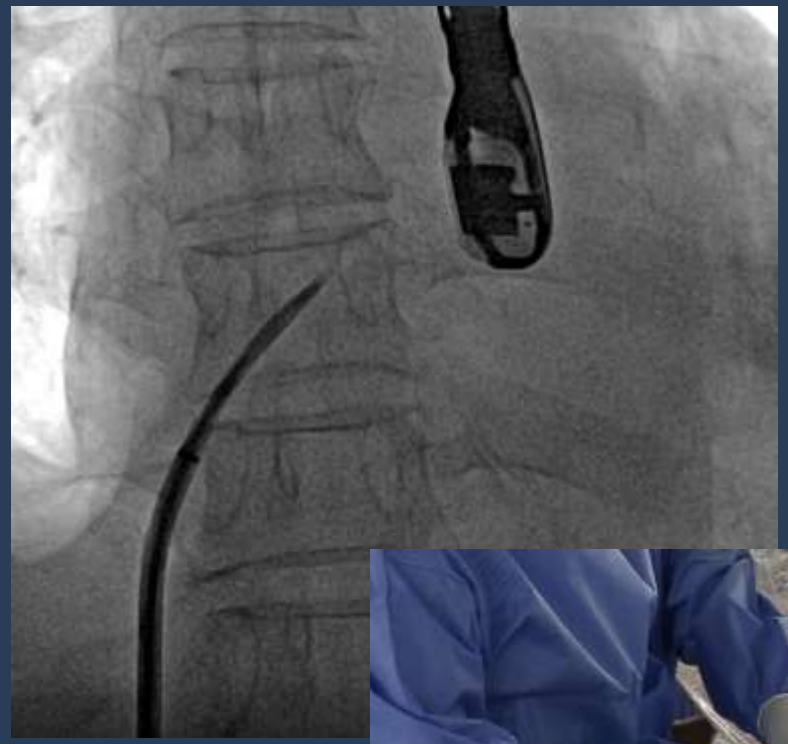



pre

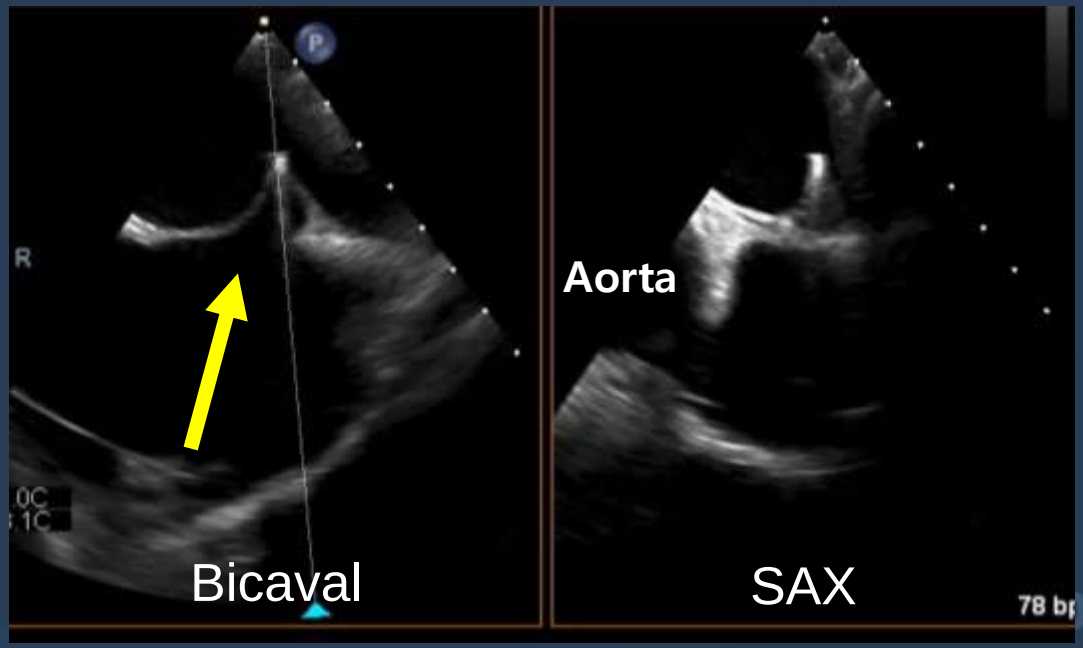

final

Steerable Guide Catheter & Rt. femoral venous access

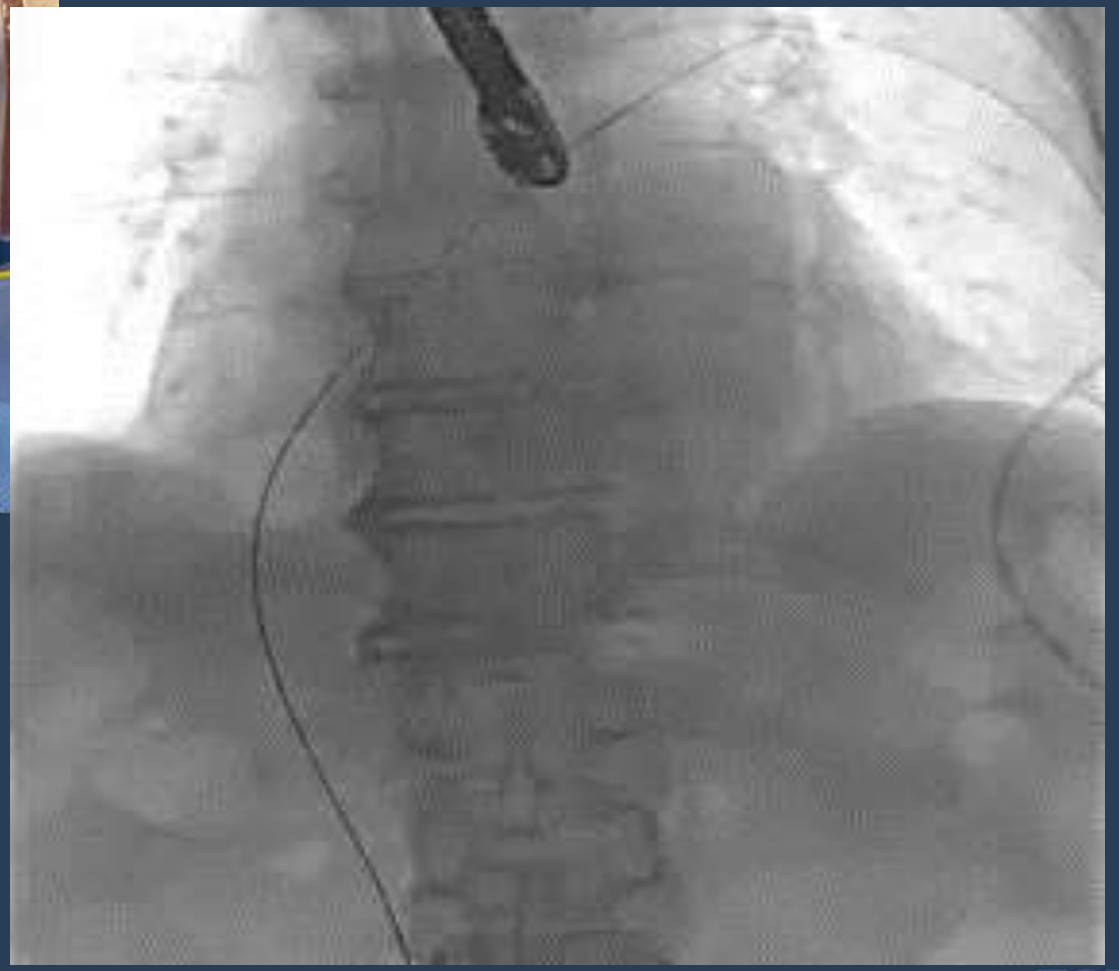
Trans-septal Puncture



- SL1.0 sheath + BRK (RF needle)
- Tenting at posterior/mid-superior aspect of fossa ovalis
- We used a Bovie for safe & stable puncture.
- Puncture from 40-45 mm from mitral valve annulus
- Heparinization & ACT monitoring per 20 min after puncture

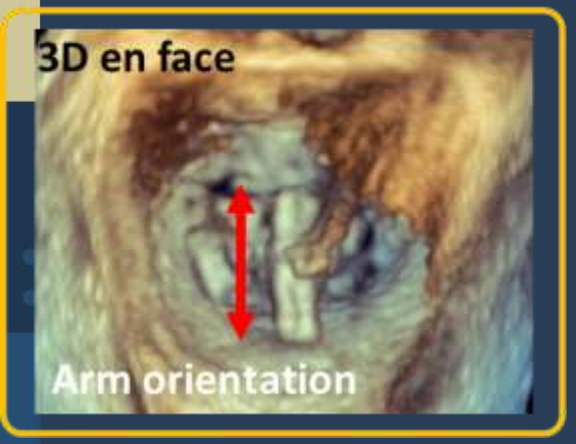


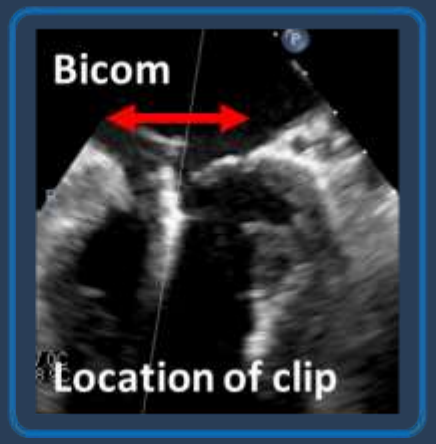
Steerable Guide Catheter into LA

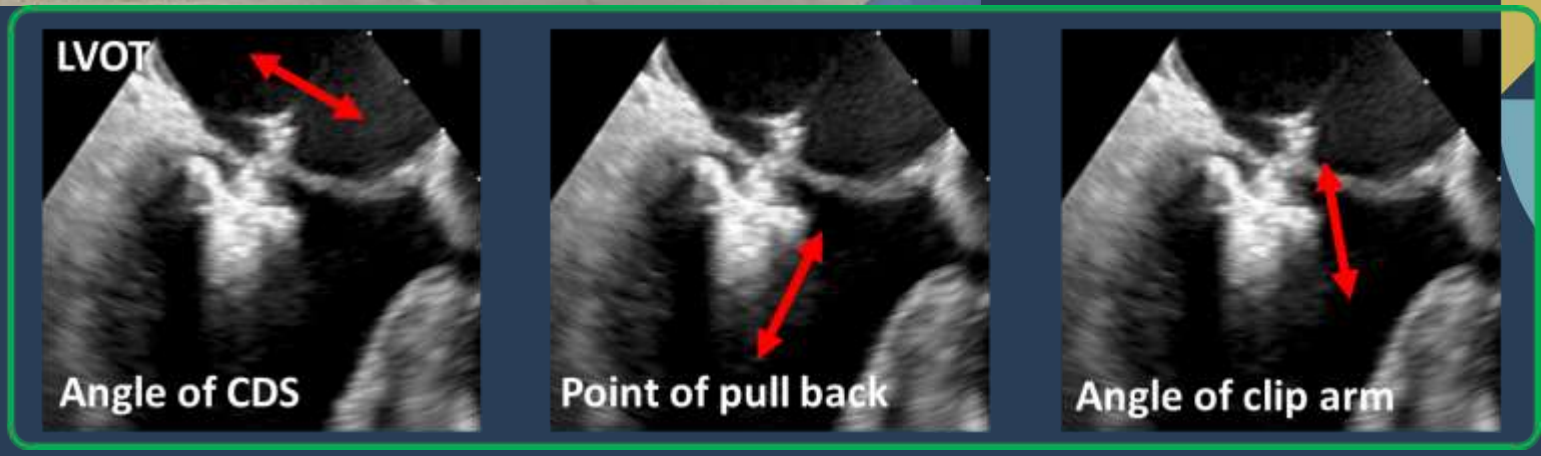


Clip Delivery System Preparation (XTW)

Clip Positioning under TEE guidance





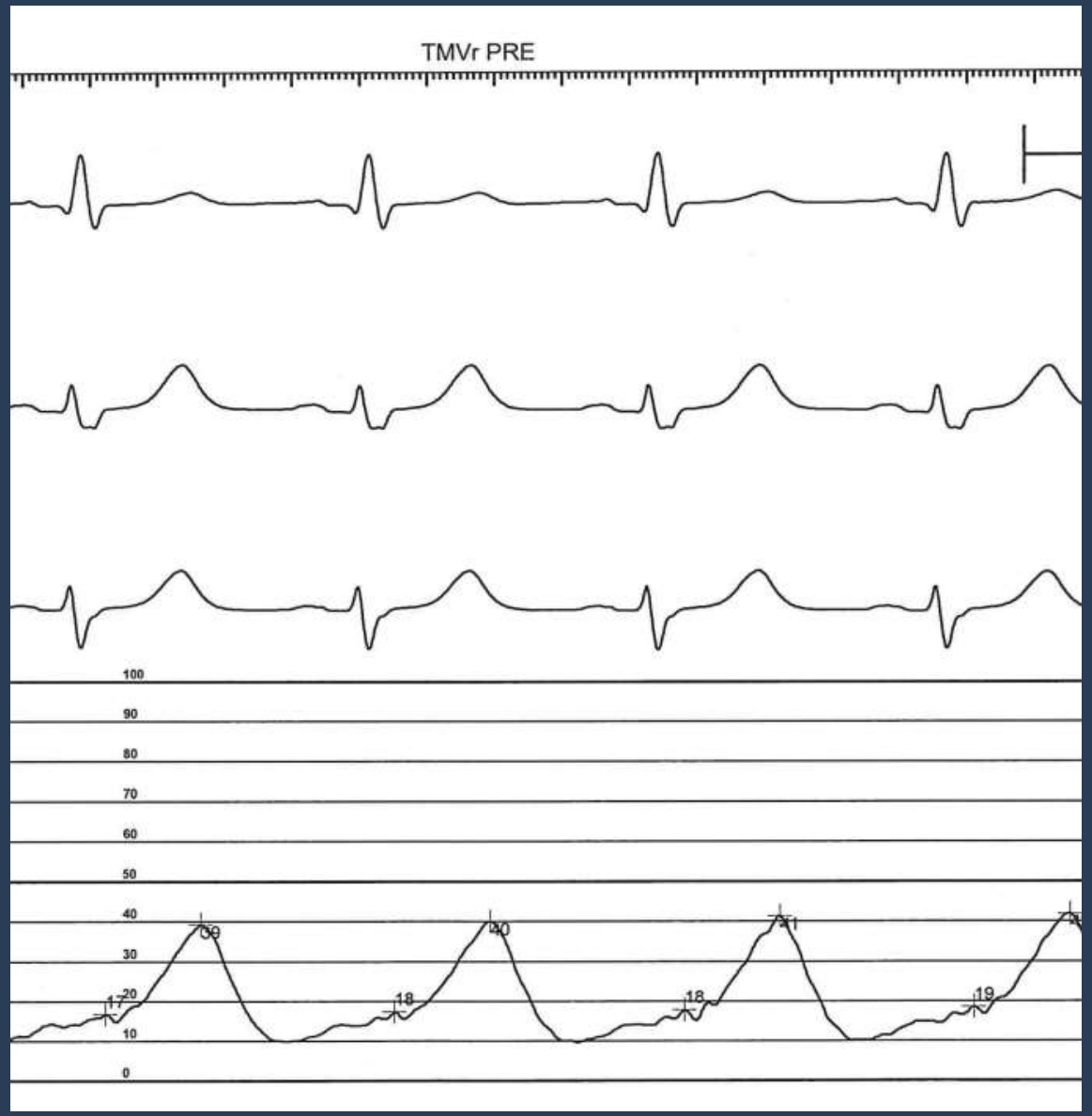


On Courtesy of Dr. Takashi Matsumoto

Clip Grasp & Clip Deployment

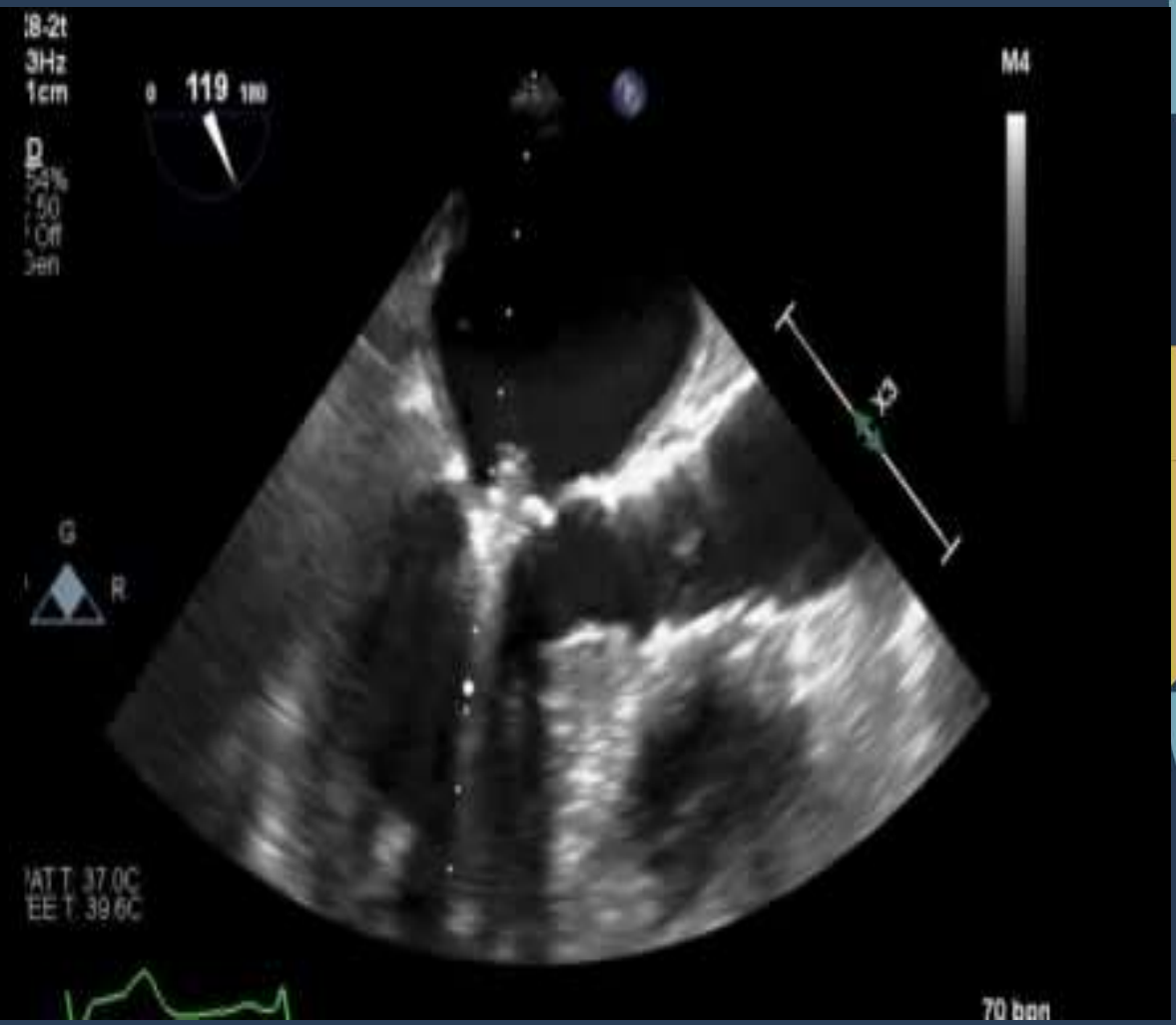
Final Result

- Disclose potential

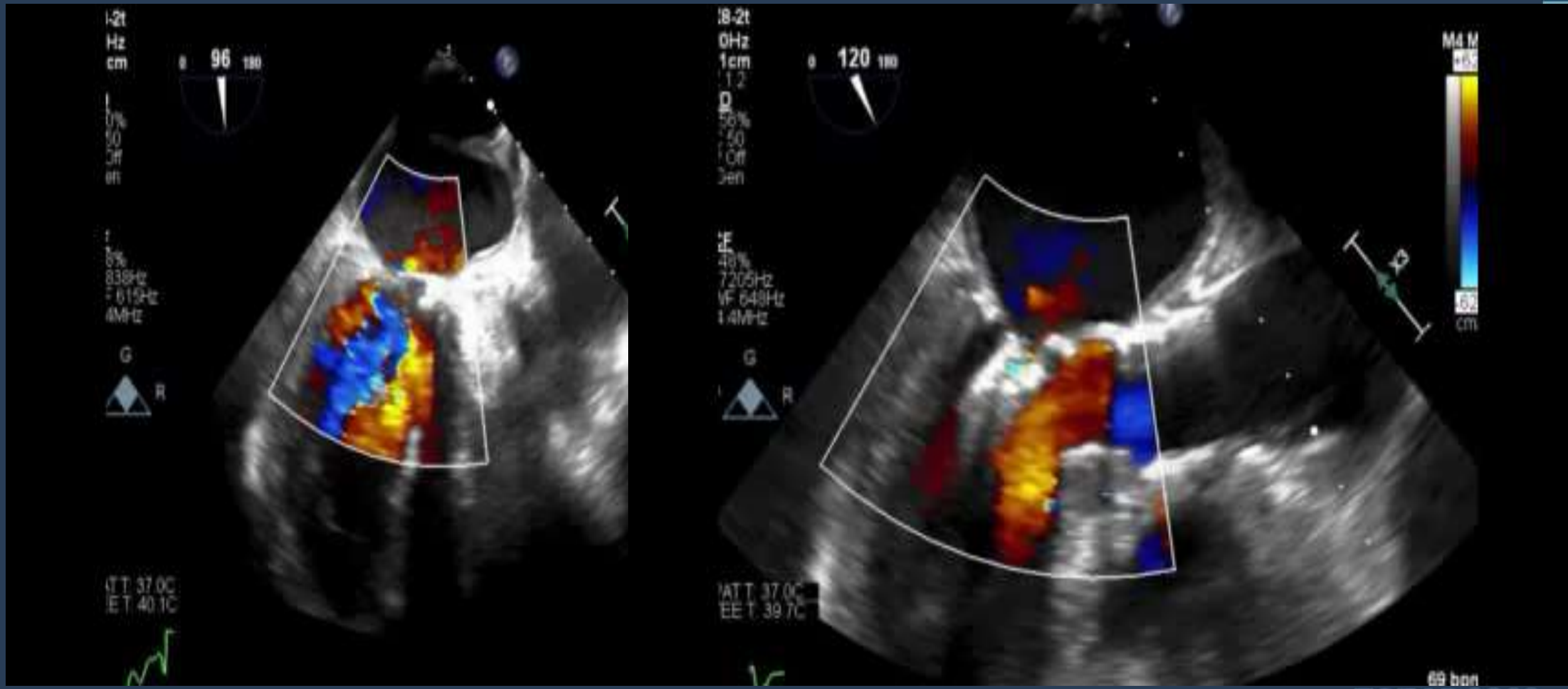

TMVr PRE
100
90
80
70
60
50
40
30
20
10
0
17
18
18
19


TMVr Post
100
90
80
70
60
50
40
30
20
10
0
13
11
11
11

Echo before / after Mitraclip



Echo before / after Mitraclip



2017 KFDA Approval of Mitraclip for Degenerative MR

- 승모판 수술에 경험이 있는 전문의사 **(Cardiac Surgeon)** 와 승모판 질환에 경험있는 전문의사 **(Cardiologist)** 를 포함하는 하트팀이 승모판 수술에 위험이 있다고 판정한 퇴행성 승모판막 폐쇄부전증 **(MR ≥ Grade III)** 환자를 경피적인 방법으로 증상을 감소시키는 목적으로 쓰인다.

2020 KFDA Approval of Mitraclip for Functional MR

- 가이드라인에 따른 약물치료 **(GDMT)** 를 최대 허용치료 실시한 환자에서,
- 심부전 및 승모판 질환의 평가 및 치료에 경험이 있는 하트팀의 판정에 따라,
- 최대 허용 **GDMT** 에도 불구하고 증상과 **MR** 중증도가 지속되는
- 좌심실박출률 **(LVEF) ≥ 20%** 및 **≤ 50%** 이고
- 좌심실 수축기말직경 **(LVESD) ≤ 70mm** 인 환자에 대해
- 증상성의 중등도-중증 **(moderate-to-severe)** 또는 중증**(severe)** 이차성 (또는 기능적) 승모판 역류 **(MR ≥ Grade III,** 미국 심초음파학회 기준) 를 치료하기 위해 사용된다.

- **1.Severe eccentric MR due to flail motion of posterior middle scallop (P2) with chordae rupture**
- **2.Severe degenerative aortic stenosis**

하지만 이환자가 만약에 **Funtional MR** 이였다면 어떻게 치료할까요**?**

Summary

- With an advancement of transcatheter device and techniques, more and more previously undertreated high-risk AS & MR patients can be treated safely and effectively.

- Appropriate Candidate Selection by Heart Team is important.

- Multidisciplinary heart team collaboration is essential for the best patient outcome.

- Interventional therapy for valvular heart disease is rapidly evolving. Please Keep your eyes on the future!

Thank you for your attention