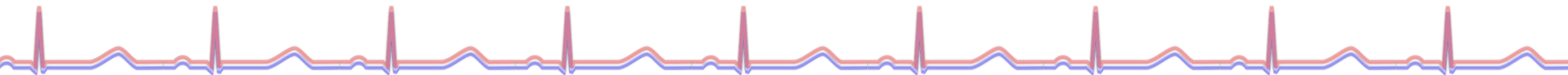


TAVI procedures at University Hospital of Split

Ivica Kristić, MD PhD

Andrija Matetić, MD

Interventional cardiologists





Severe symptomatic aortic stenosis

Intervention is recommended in symptomatic patients with severe, high-gradient aortic stenosis [mean gradient ≥ 40 mmHg, peak velocity ≥ 4.0 m/s, and valve area ≤ 1.0 cm² (or ≤ 0.6 cm²/m²)].^{235,236}

I

B

SAVR is recommended in younger patients who are low risk for surgery (<75 years^e and STS-PROM/EuroSCORE II <4%)^{e,f}, or in patients who are operable and unsuitable for transfemoral TAVI.²⁴⁴

I

B

TAVI is recommended in older patients (≥ 75 years), or in those who are high risk (STS-PROM/EuroSCORE II^f >8%) or unsuitable for surgery.^{197–206,245}

I

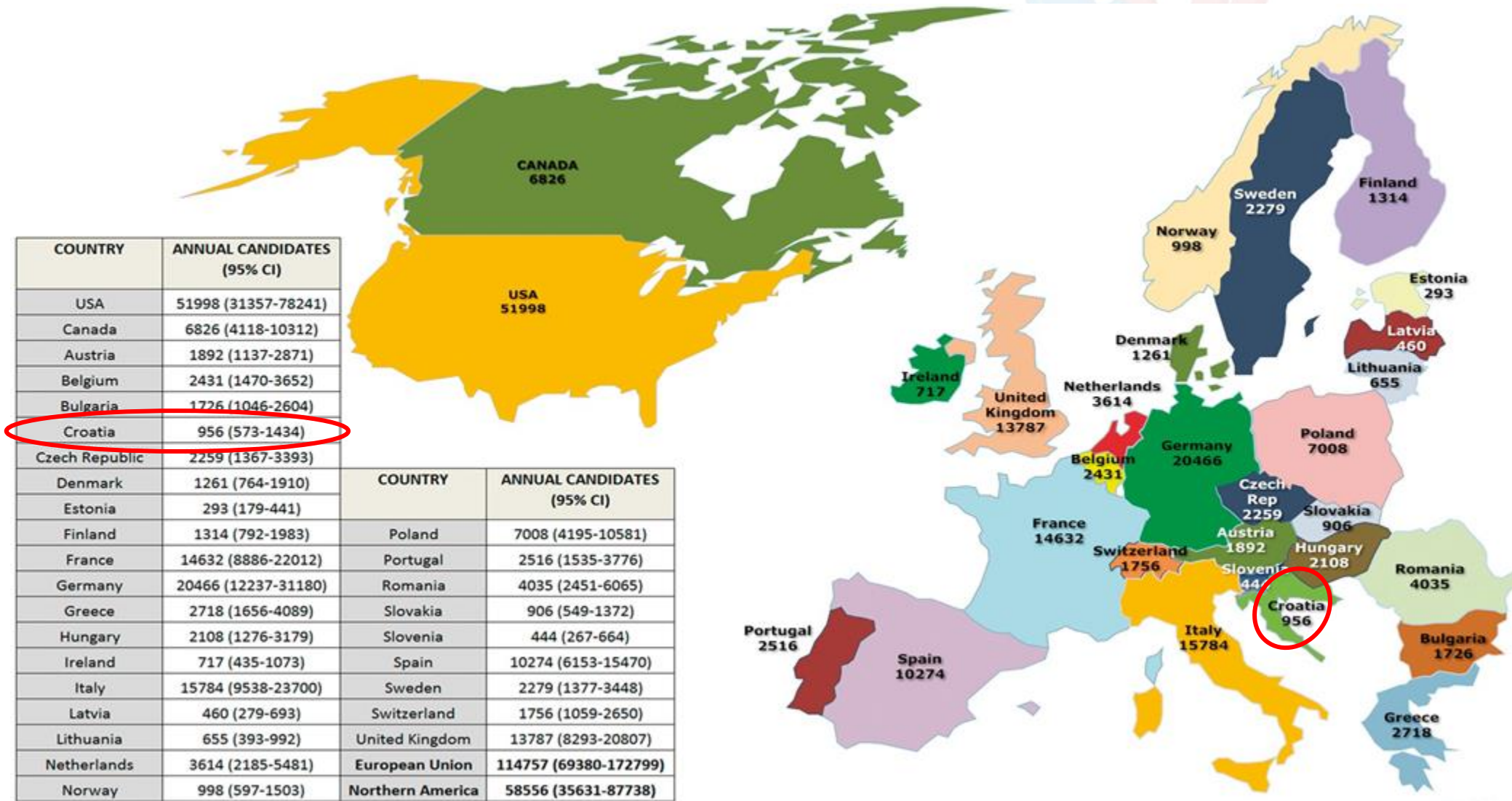
A

SAVR or TAVI are recommended for remaining patients according to individual clinical, anatomical, and procedural characteristics.^{202–205,207,209,210,212 f,g}

I

B

Estimated annual numbers of transcatheter aortic valve implantation candidates in different countries **under current indications (2018)**



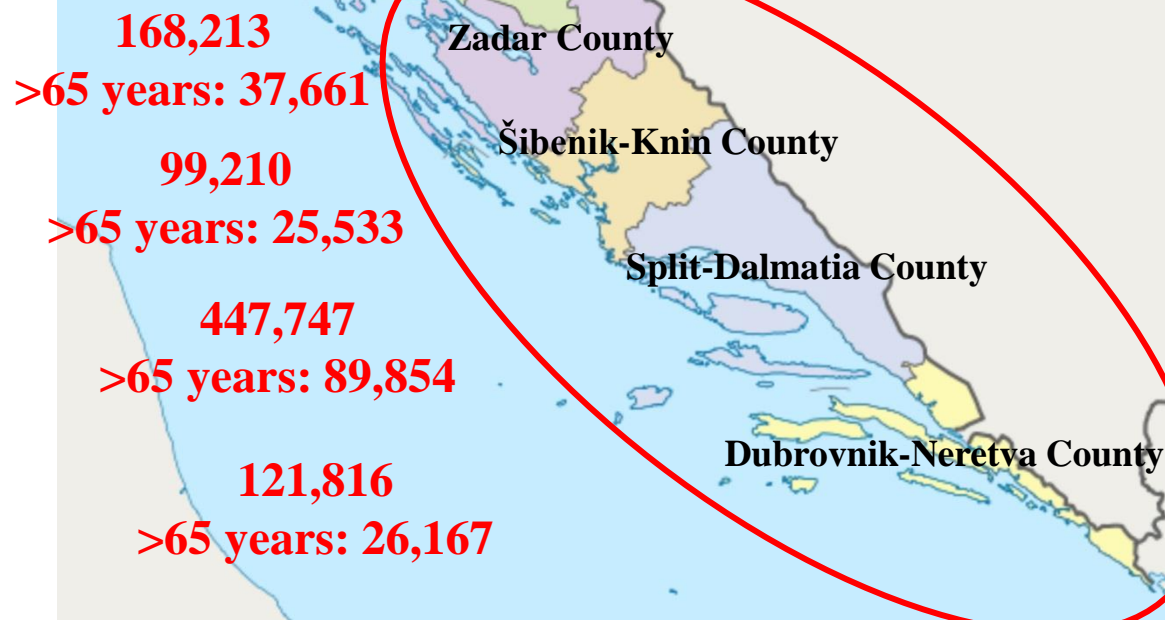
Dalmatia

Local population:

~1,000,000 inhabitants of Croatia

+

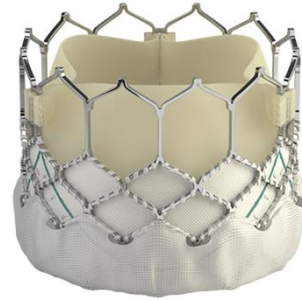
**inhabitants of Bosnia &
Hercegovina**



Where do we stand?



Medtronic Evolut



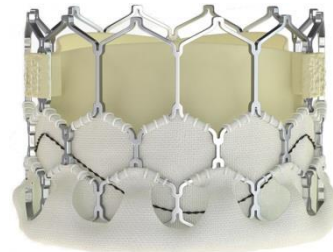
Edwards Sapien



NVT Allegra



Boston Accurate Neo



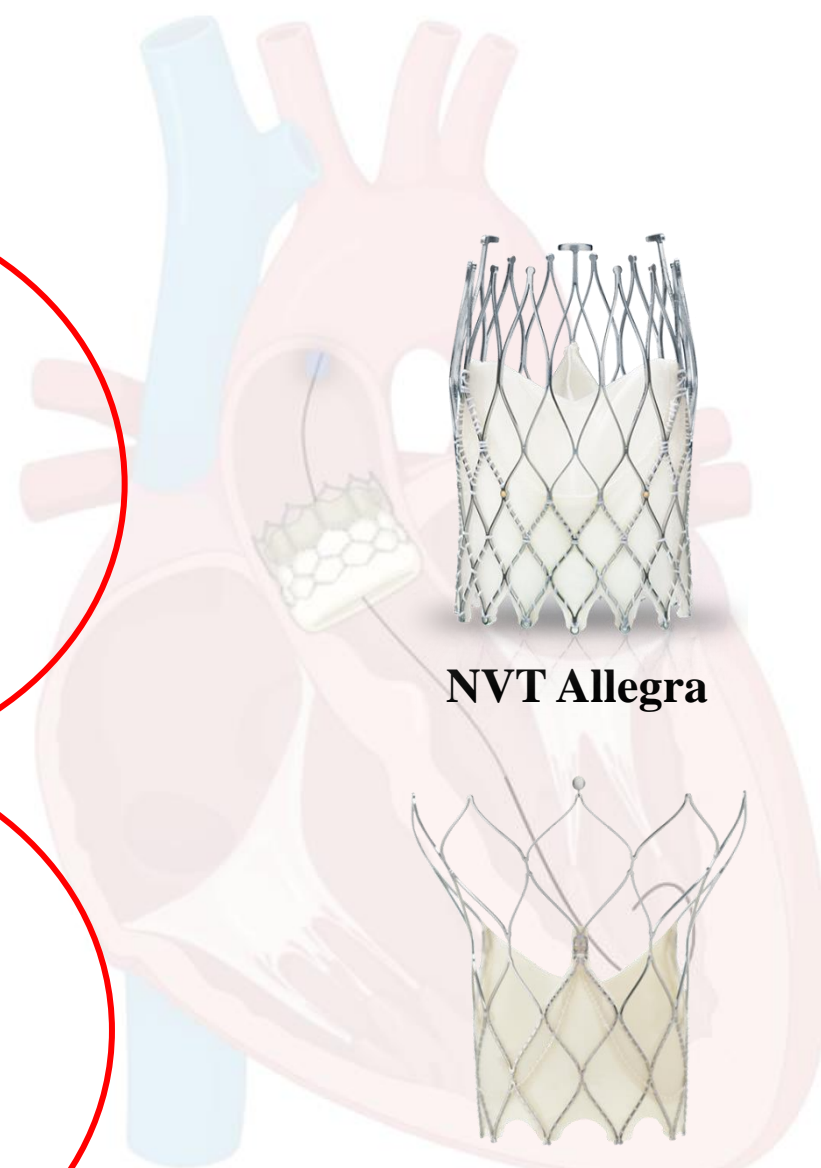
Meril Myval



Abbott Portico

...

...



Achievements and results

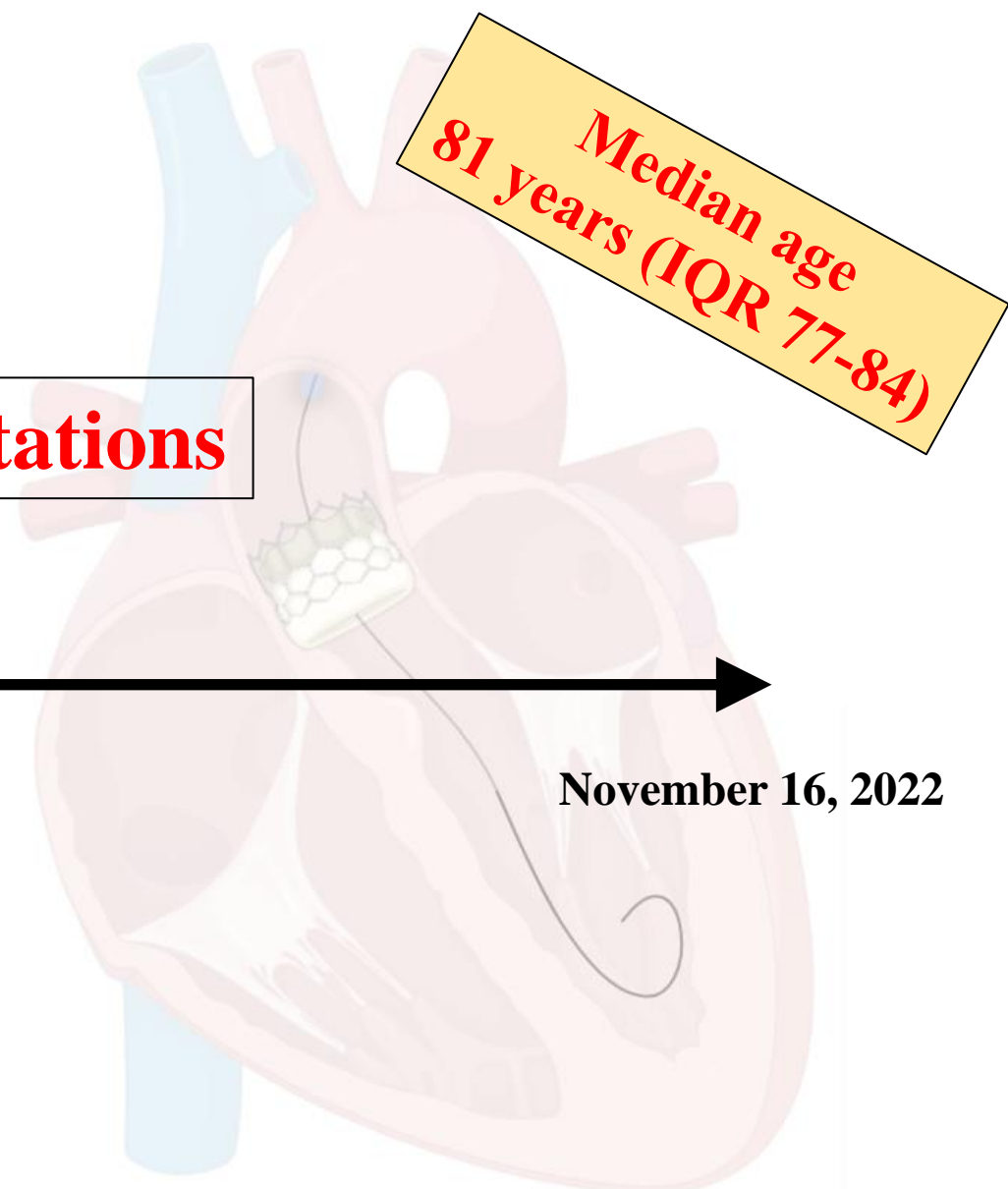
228 valve implantations

**Median age
81 years (IQR 77-84)**

November 8, 2019

November 16, 2022

1,104 days



TAVI procedures

228 valve implantations

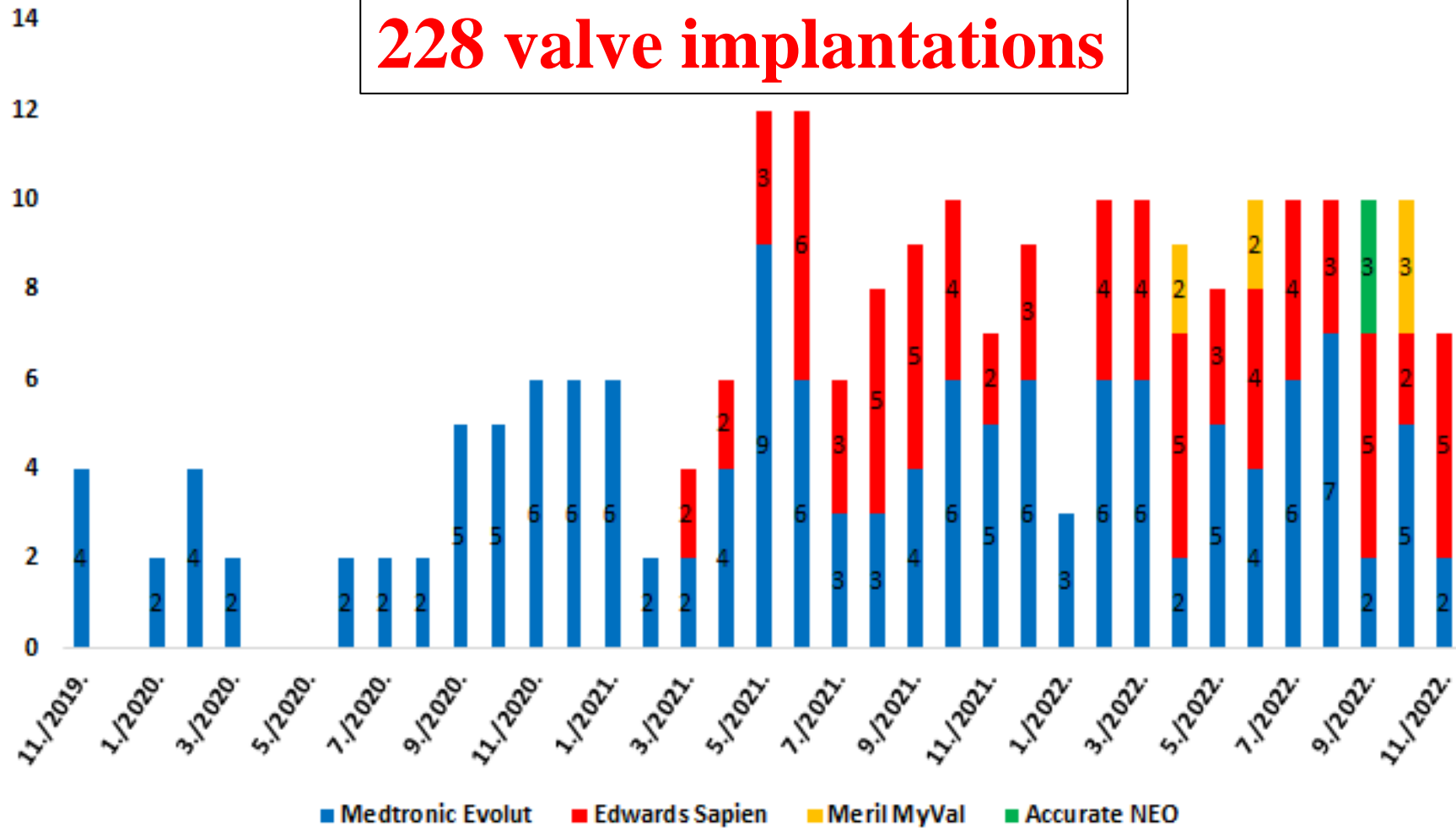


Table 1. Patient characteristics.

| Variables | Sample (N=228) |
|---|----------------|
| Age (years) | 81 (77-84) |
| Sex: | |
| Female | 105 (46.0%) |
| Male | 123 (54.0%) |
| Length of stay (days) | 5 (3-7) |
| Specific valve type: | |
| <u>Evolut</u> | 144 (63.2%) |
| <u>Sapien</u> | 74 (32.5%) |
| <u>MyVal</u> | 7 (3.1%) |
| Accurate NEO | 3 (1.3%) |
| 30-day mortality | 4 (1.8%) |
| Permanent pacemaker rate | 13 (5.9%) |
| Vascular access complication requiring surgery | 6 (2.7%) |
| Stroke rate | 5 (2.2%) |

Data are expressed as median (IQR) and number (percentage).

Abbreviations: None.



Adoption of best procedural strategies

Percutaneous approach

Ultrasound-guided puncture

OTW pacing

Minimal periprocedural analgesedation

Pigtail LV entry

Cusp overlap technique

Suture-based + plug-based vascular closure

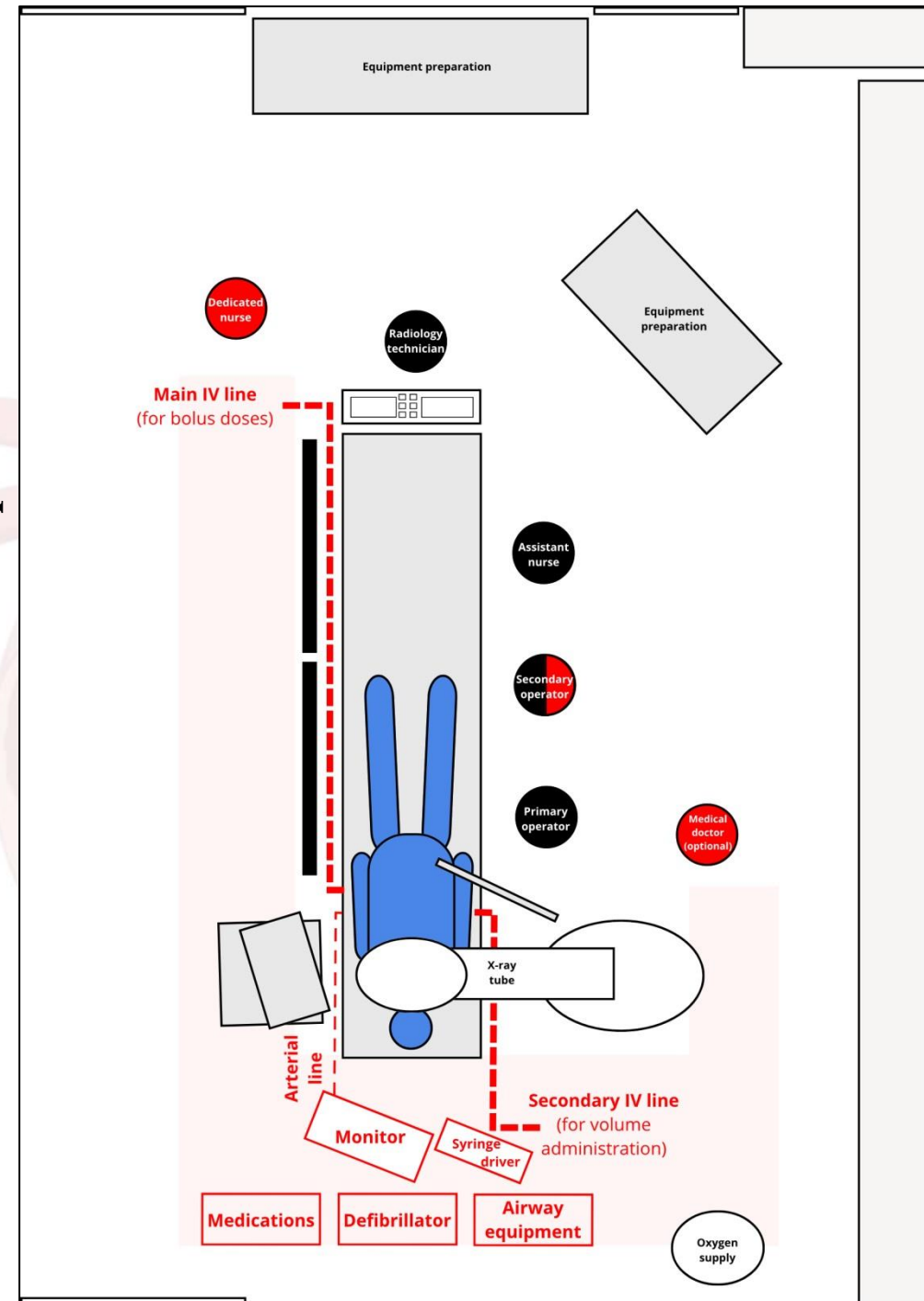
Modified antibiotic prophylaxis



Procedural analgosedation

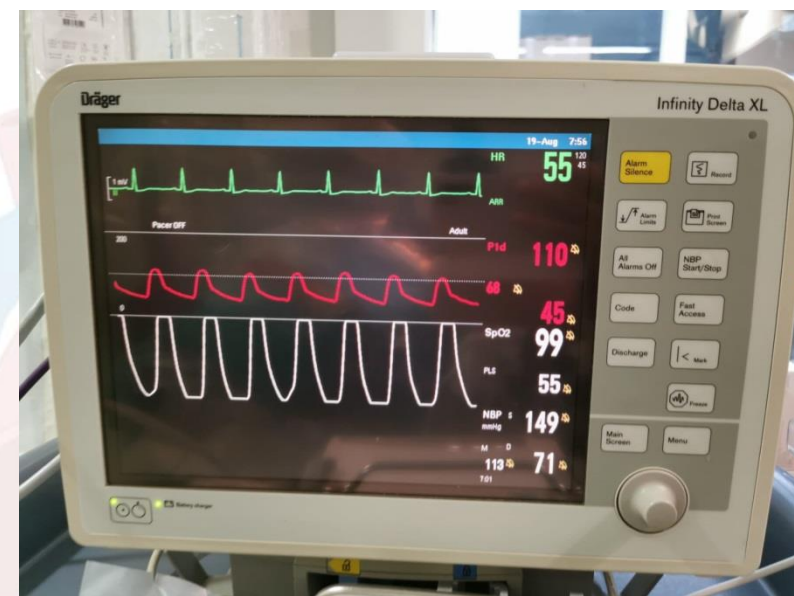
- Following world trends
- Shift from general anesthesia to independent procedural analgosedation:
 - Education of the Team members
 - Educational visits to surgical procedures with the focus on anesthesiological work
 - Equipment preparation
 - CathLab organization

Local CathLab setup

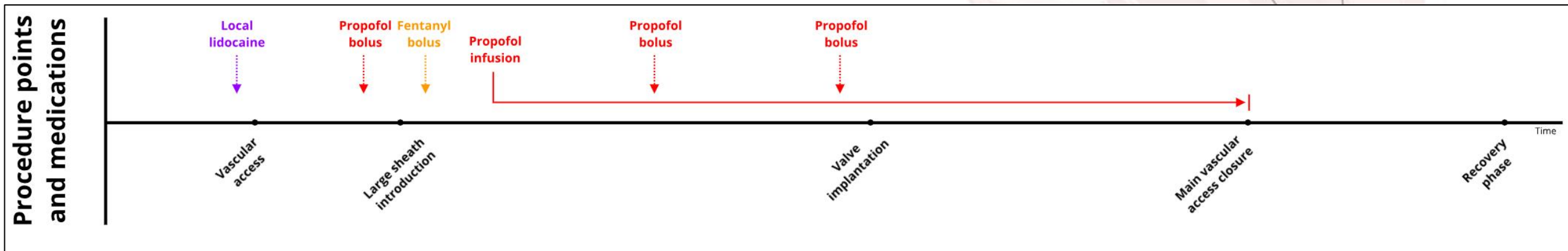


Procedural analgo-sedation

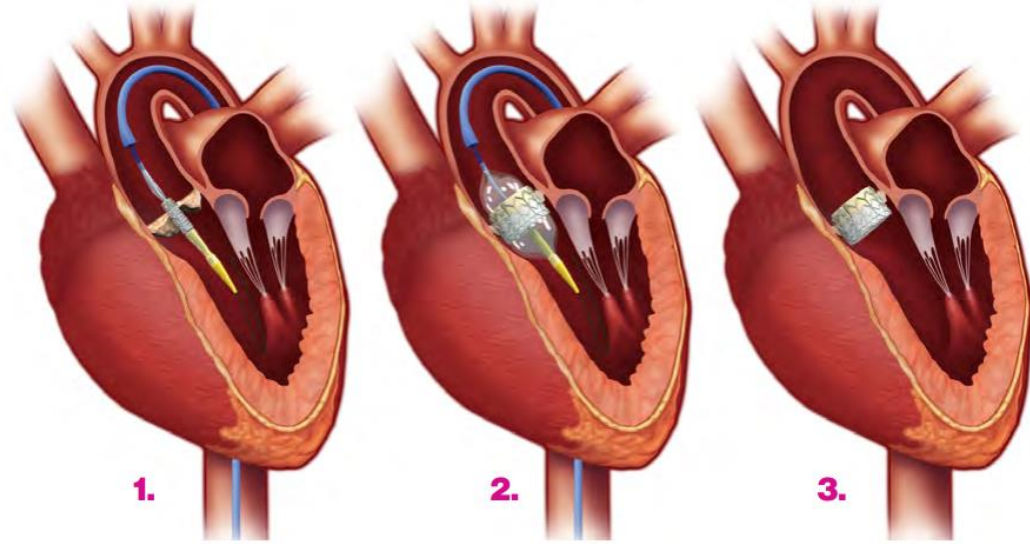
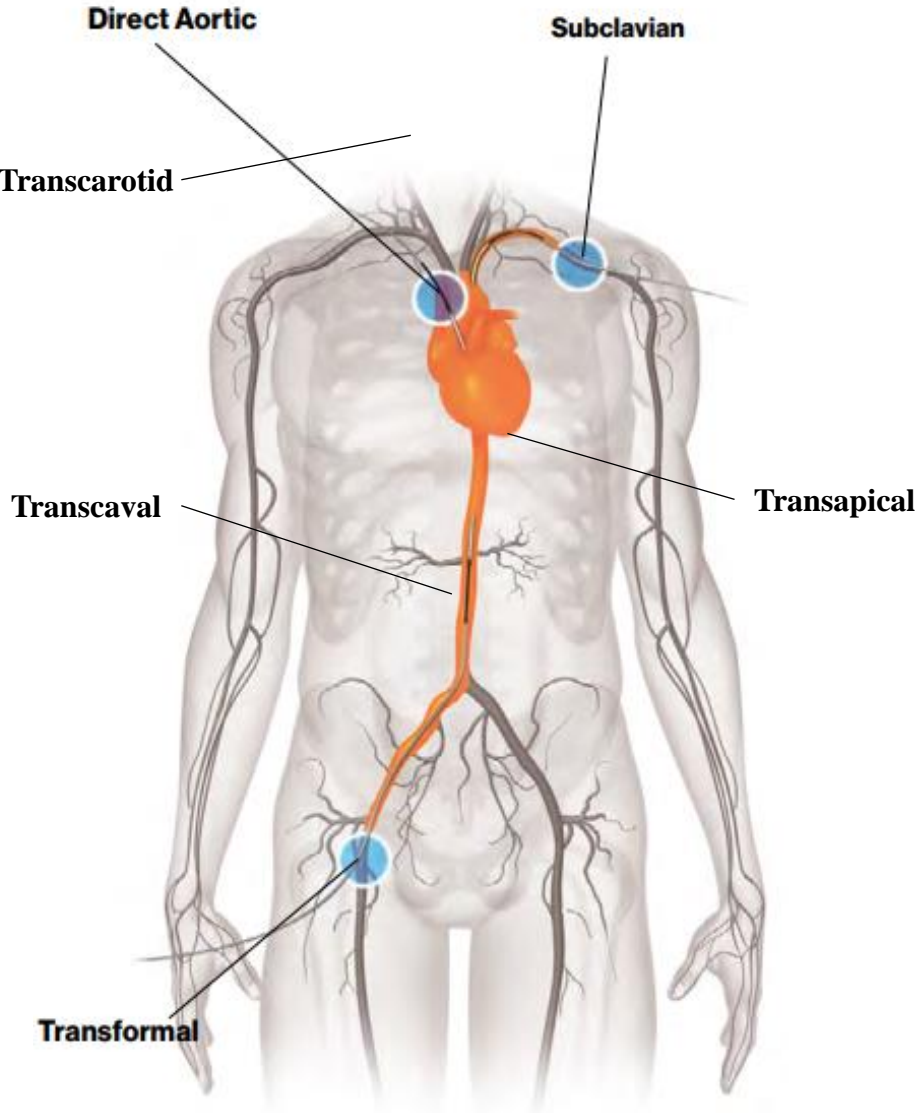
- Final results and benefits:
 - Simplification of the procedure
 - Time gain and less „trauma” for the patient
 - More sense for the needs of the TAVR patient
 - Stronger involvement of the nurses and other medical staff
 - Knowledge broadening



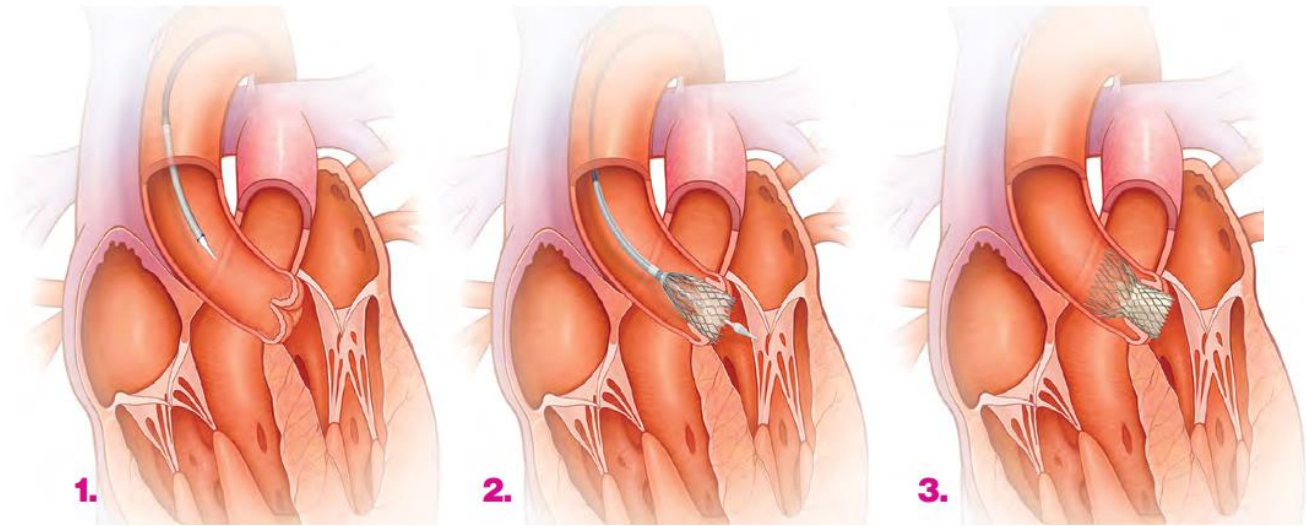
Local protocol



Access Points for TAVR



SAPIEN® Valve Deployment

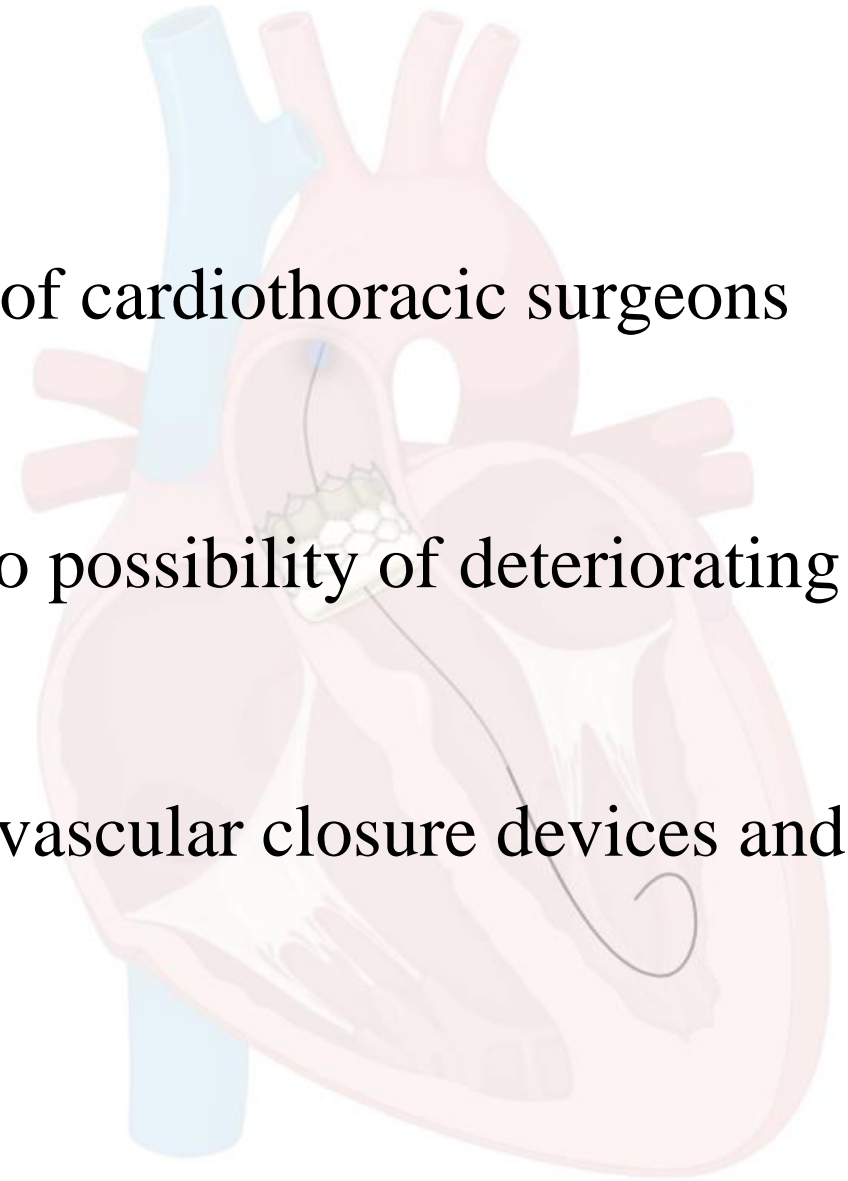


CoreValve® Deployment

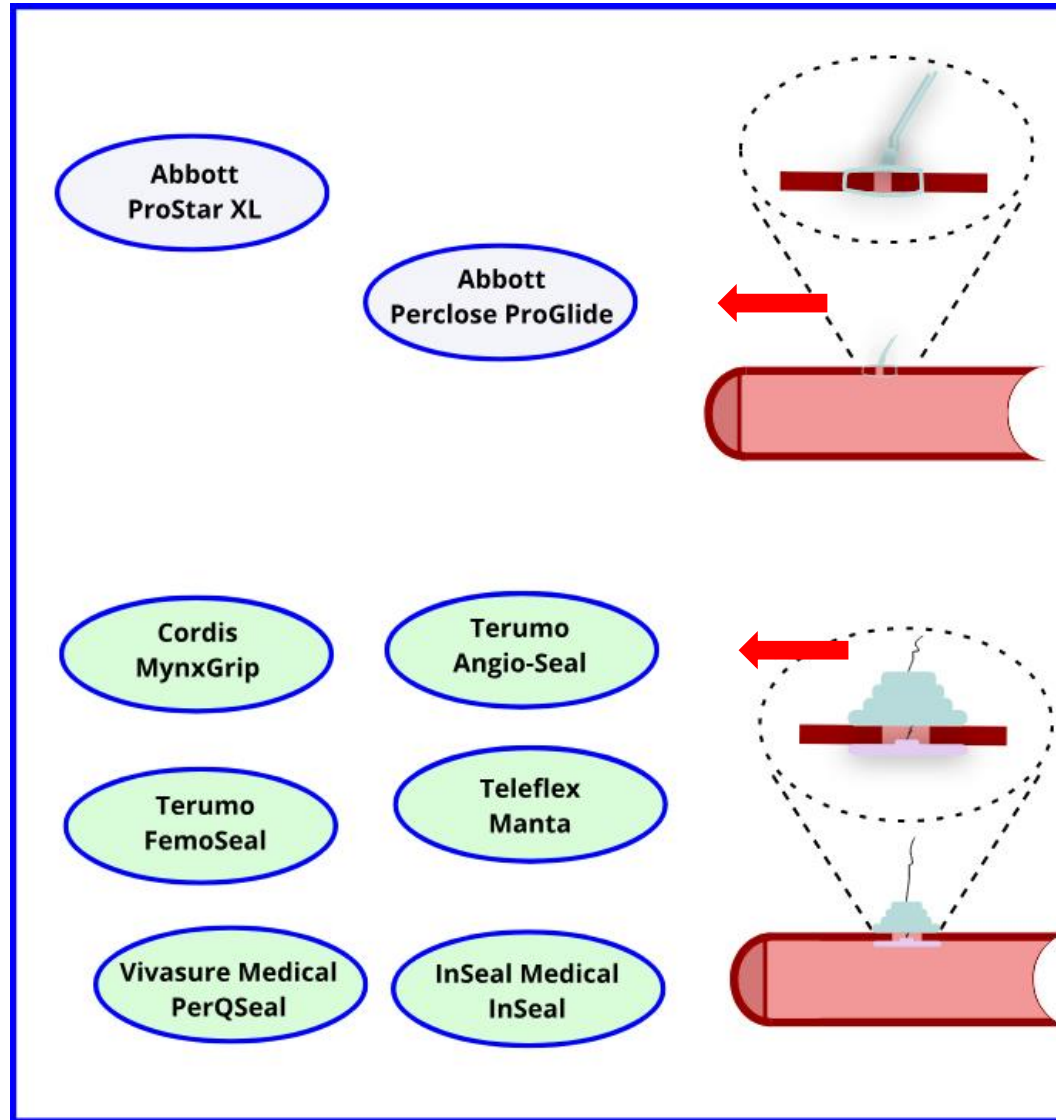


Vascular access

- First procedures were done with the help of cardiothoracic surgeons who enabled a surgical cut down
- Strong caution with vascular access due to possibility of deteriorating complications
- Introduction and familiarization with the vascular closure devices and full percutaneous approach
- Establishment of local protocols



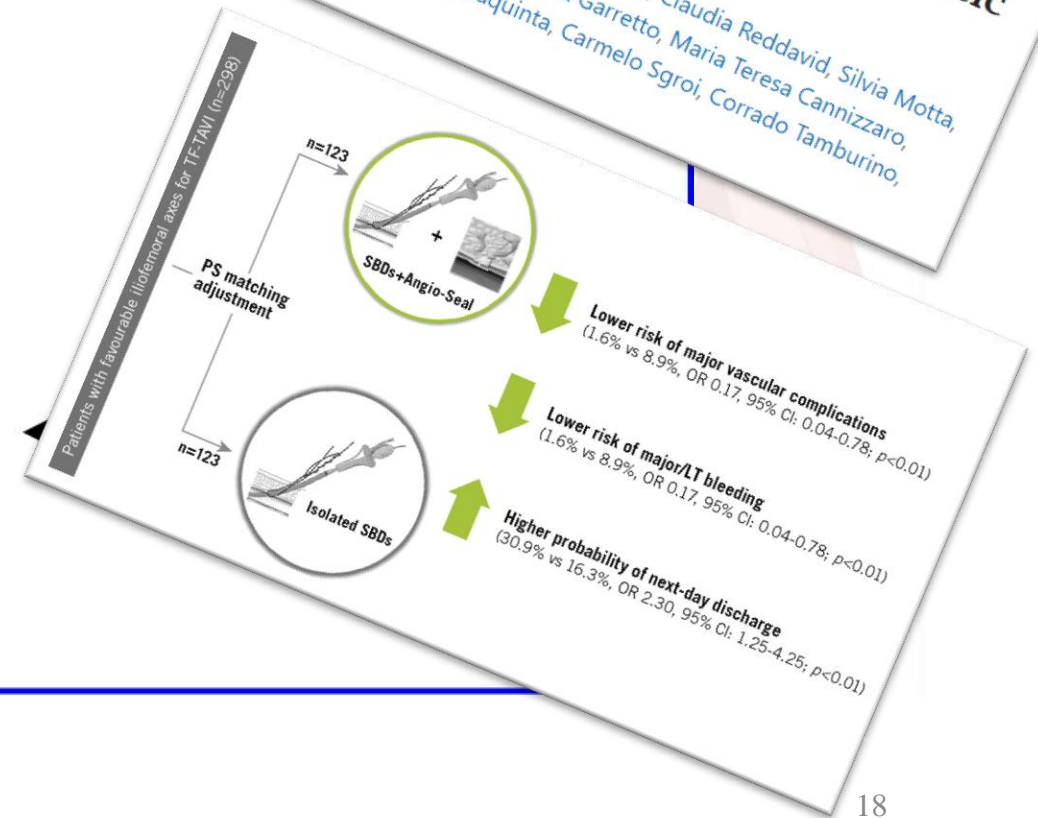
Local protocol



> EuroIntervention. 2021 Oct 20;17(9):728-735. doi: 10.4244/EU-D-20-01125.

An upfront combined strategy for endovascular haemostasis in transfemoral transcatheter aortic valve implantation

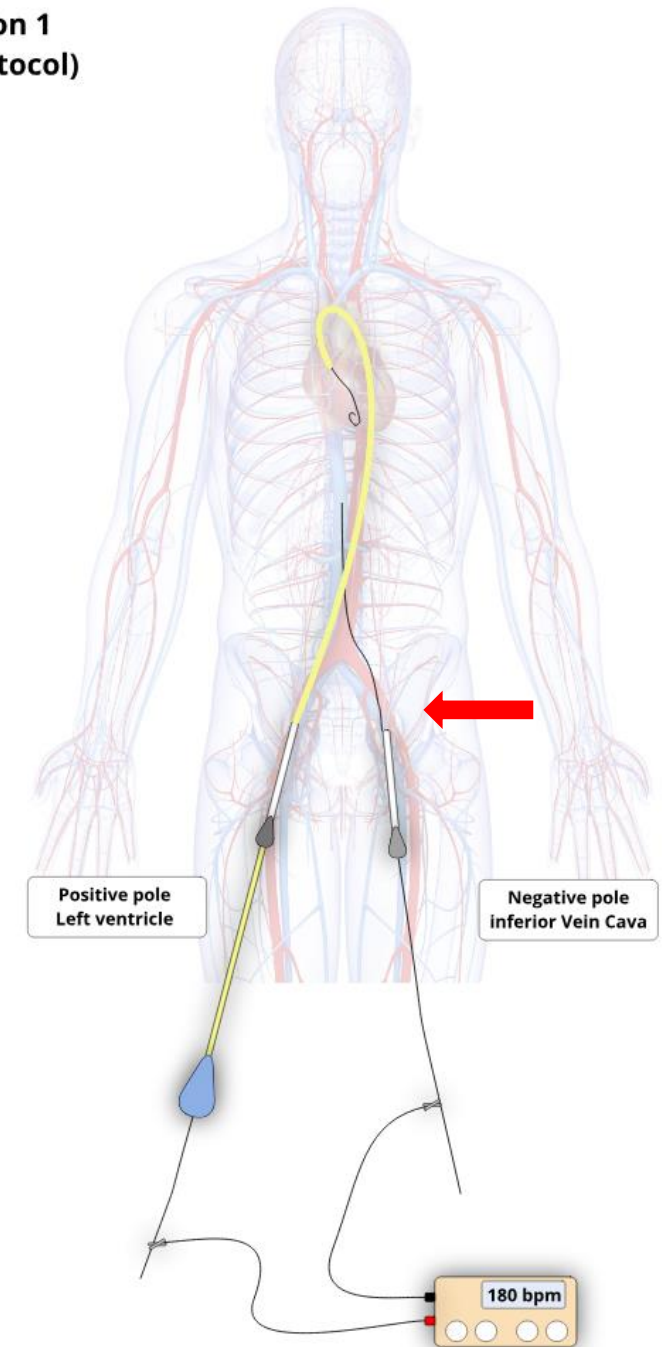
Giuliano Costa ¹, Roberto Valvo, Andrea Picci, Enrico Criscione, Claudia Reddavid, Silvia Motta, Orazio Strazzieri, Wanda Deste, Angelo Giuffrida, Valeria Garretto, Maria Teresa Cannizzaro, Cristina Inserra, Pierfrancesco Veroux, Alessia Giaquinta, Carmelo Sgroi, Corrado Tamburino, Marco Barbanti



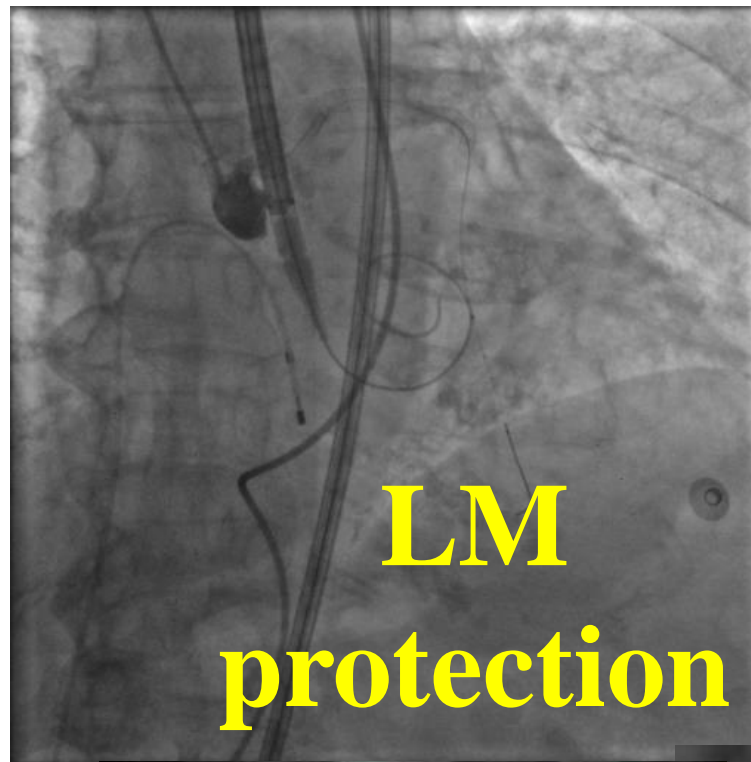
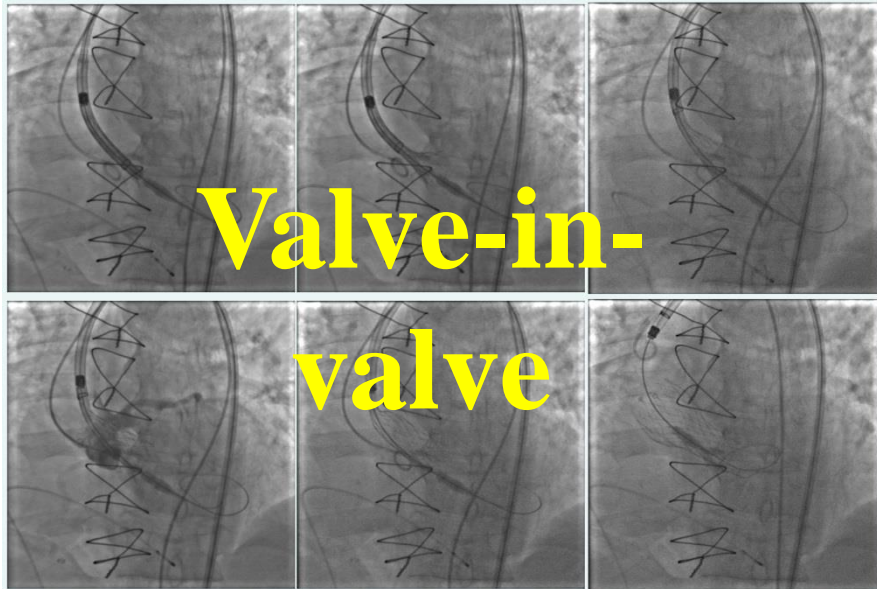
Procedural pacing methods

- Initial procedure were done using a mandatory temporary pacemaker insertion
- After a number of procedure, rapid over-the-wire pacing has been initiated for self-expandable valves
- Local modified protocol was developed...

Local protocol

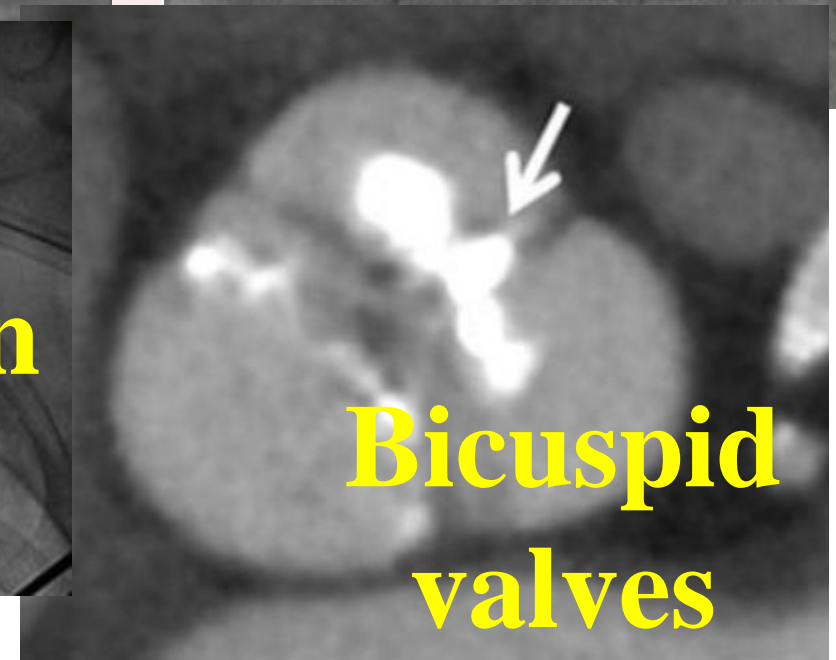
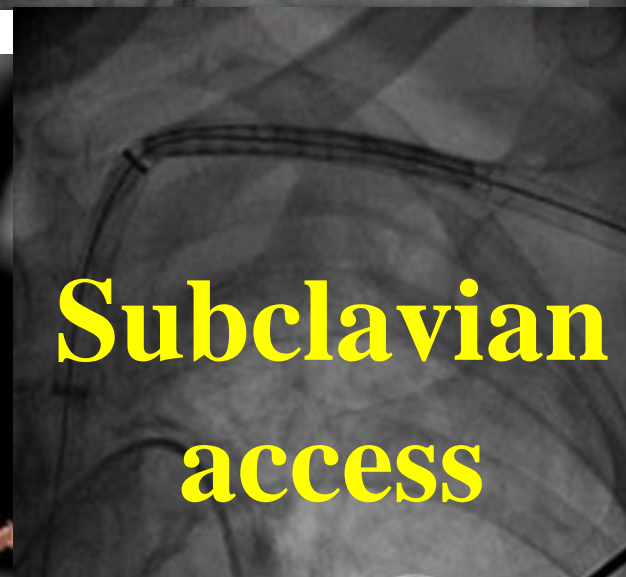
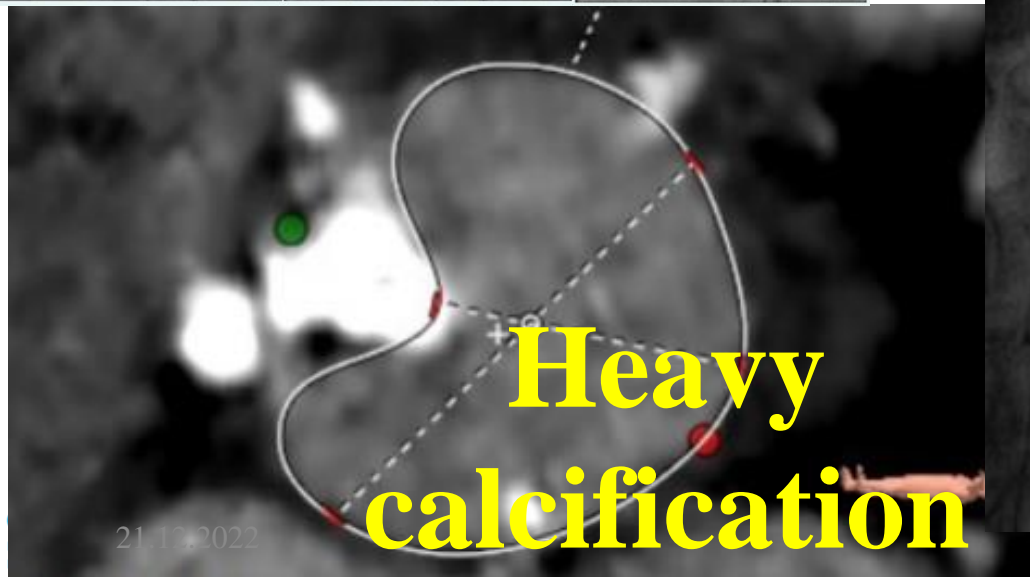


Complex cases



Crack and pave

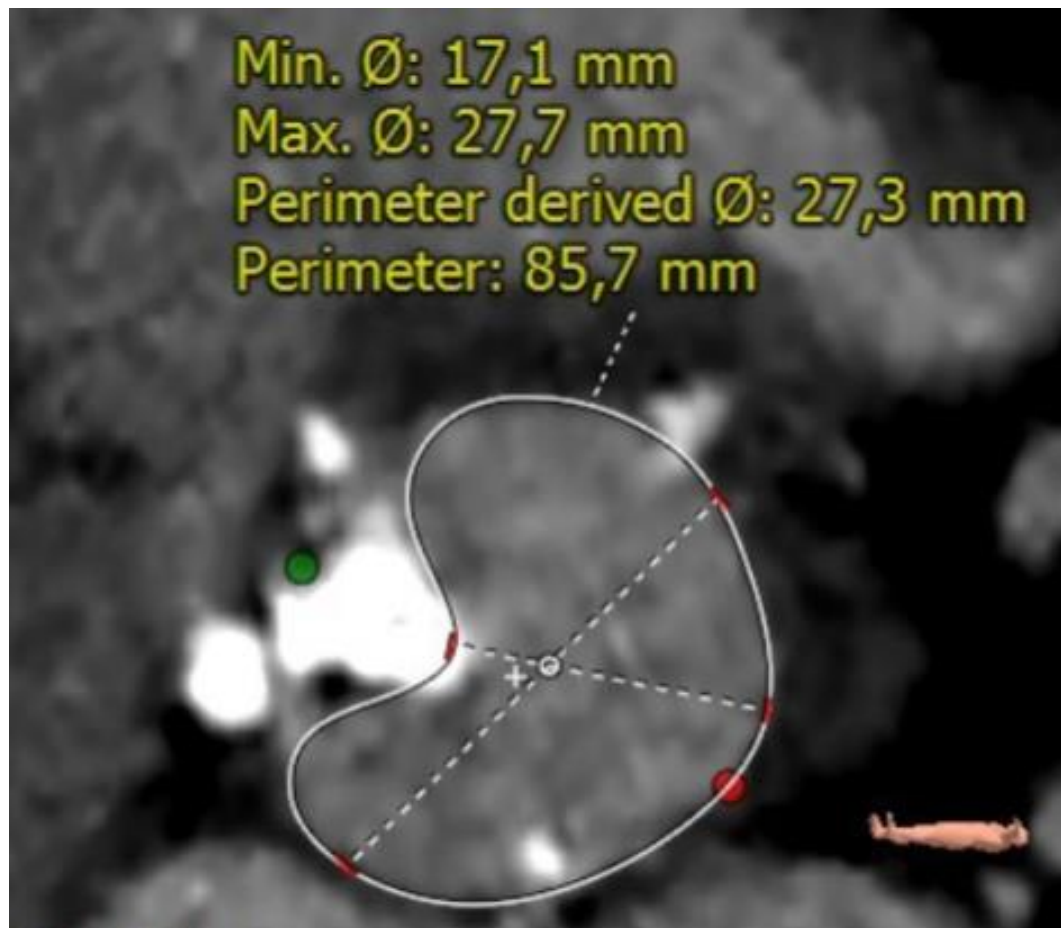
This block shows a fluoroscopic image of a catheter with a large, dark, circular shadow, indicating the use of a large bore catheter for protection. The text 'Crack and pave' is overlaid in yellow.



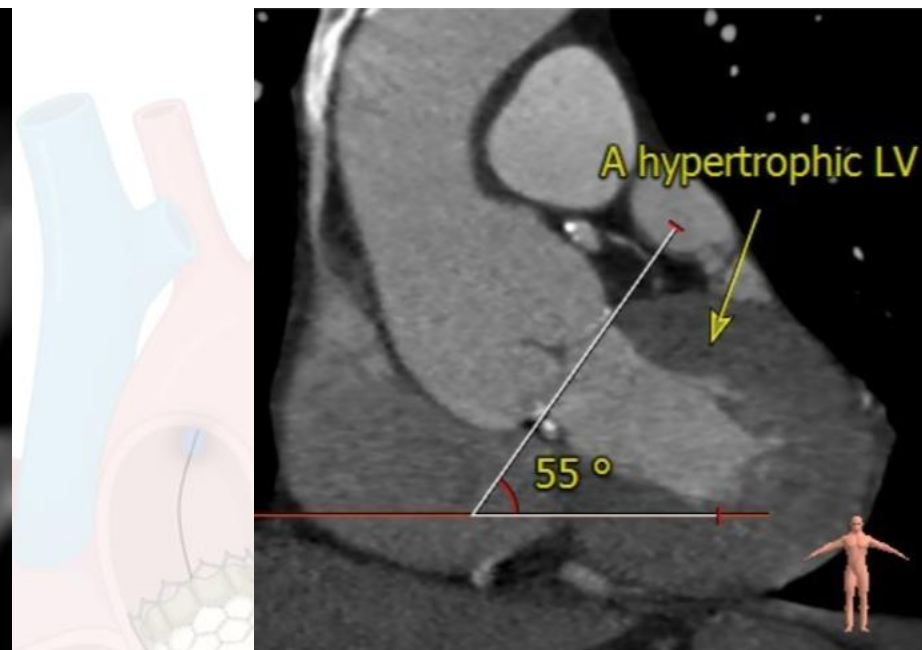
**Bicuspidal
valve

and

Icicle
calcification
w/ significant
calcium
spine**

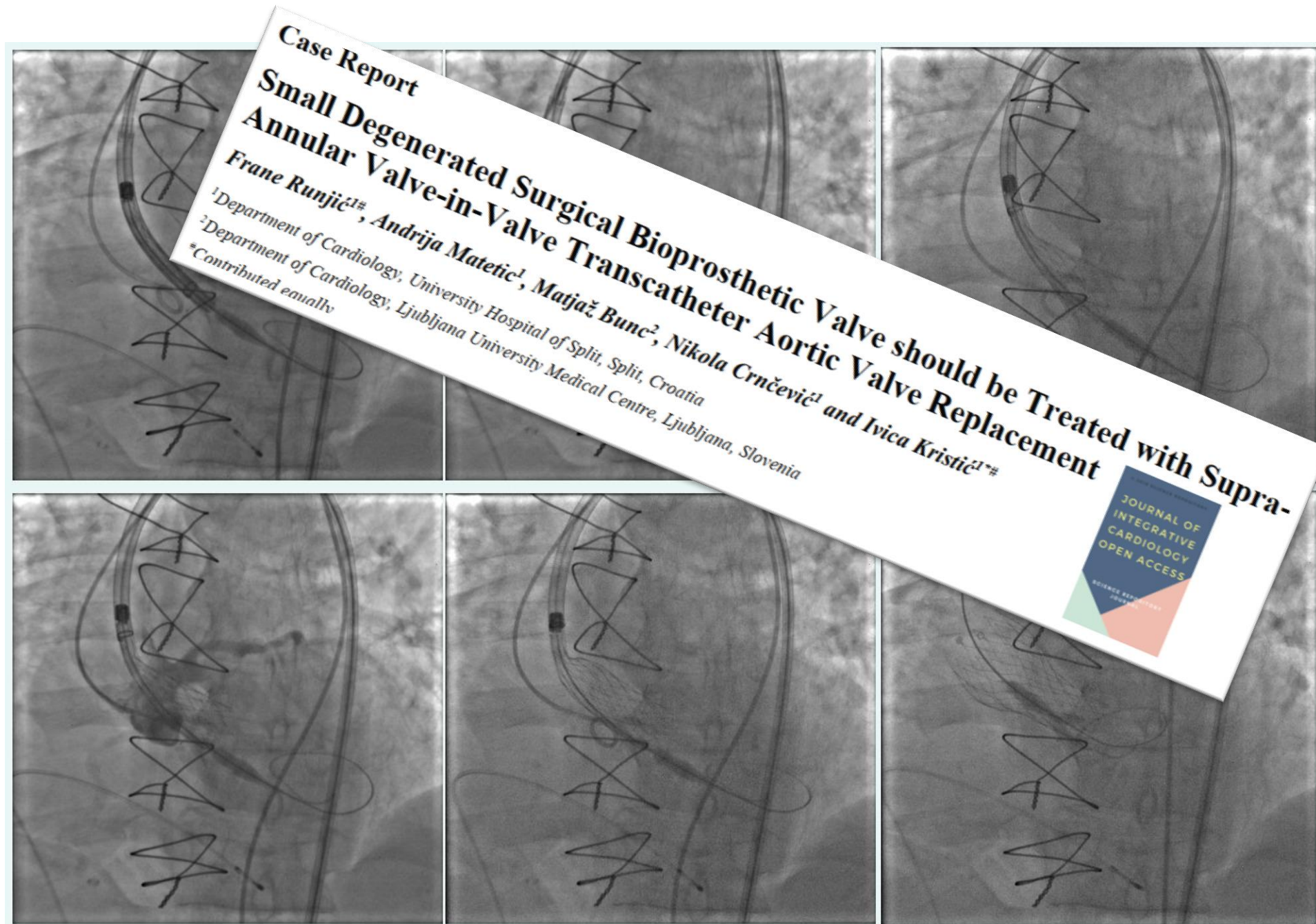


**...and dilated
aorta**



**Steady
enrollment
in complex
procedures**

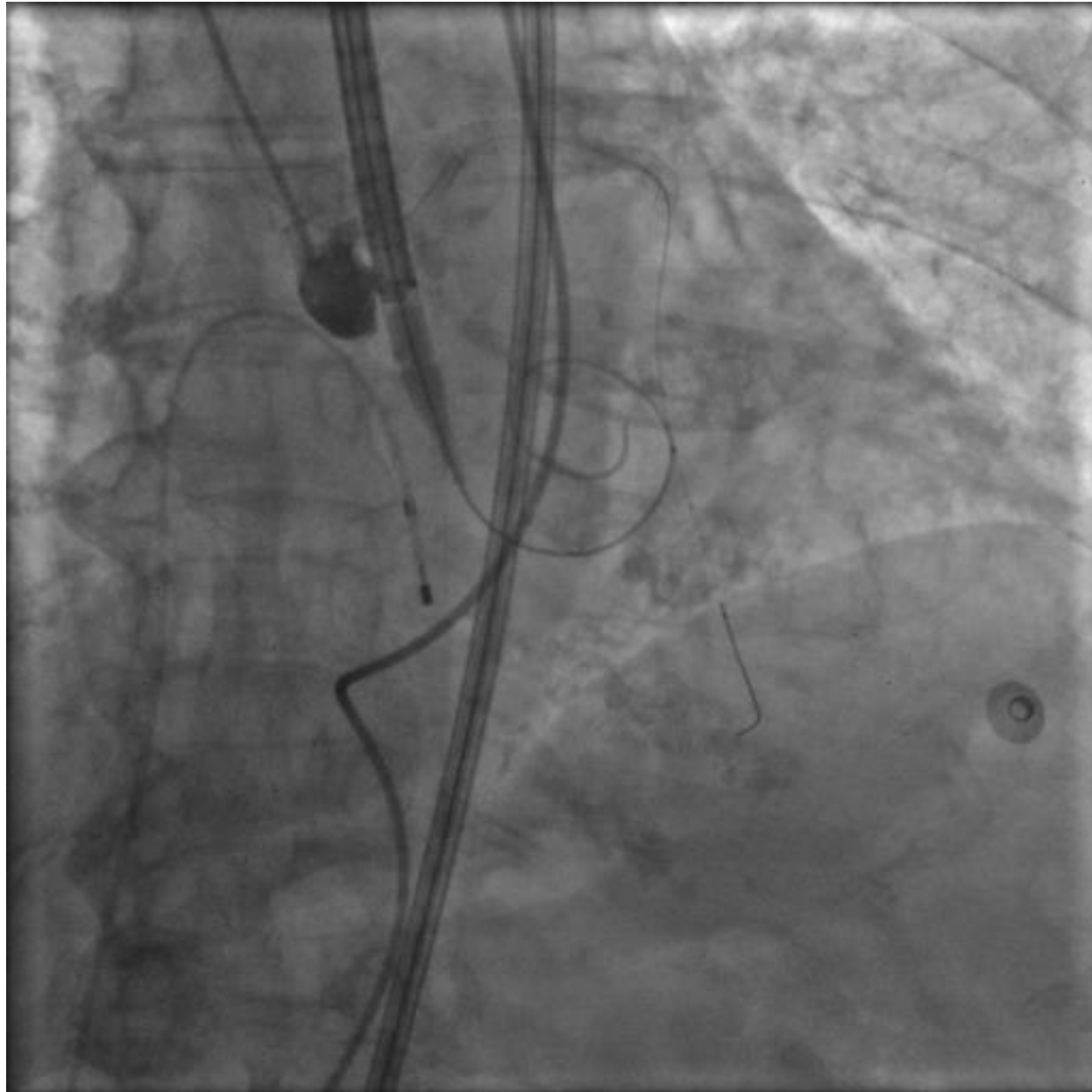
**Valve-in-
valve
PPM Trifecta
21 mm
w/o BVF**



Case Report
Small Degenerated Surgical Bioprosthetic Valve should be Treated with Supra-Annular Valve-in-Valve Transcatheter Aortic Valve Replacement
Frane Runjić^{1#}, Andrija Matetić¹, Matjaž Bunc², Nikola Crnčević¹ and Ivica Kristić^{1#}
¹Department of Cardiology, University Hospital of Split, Split, Croatia
²Department of Cardiology, Ljubljana University Medical Centre, Ljubljana, Slovenia
[#]Contributed equally



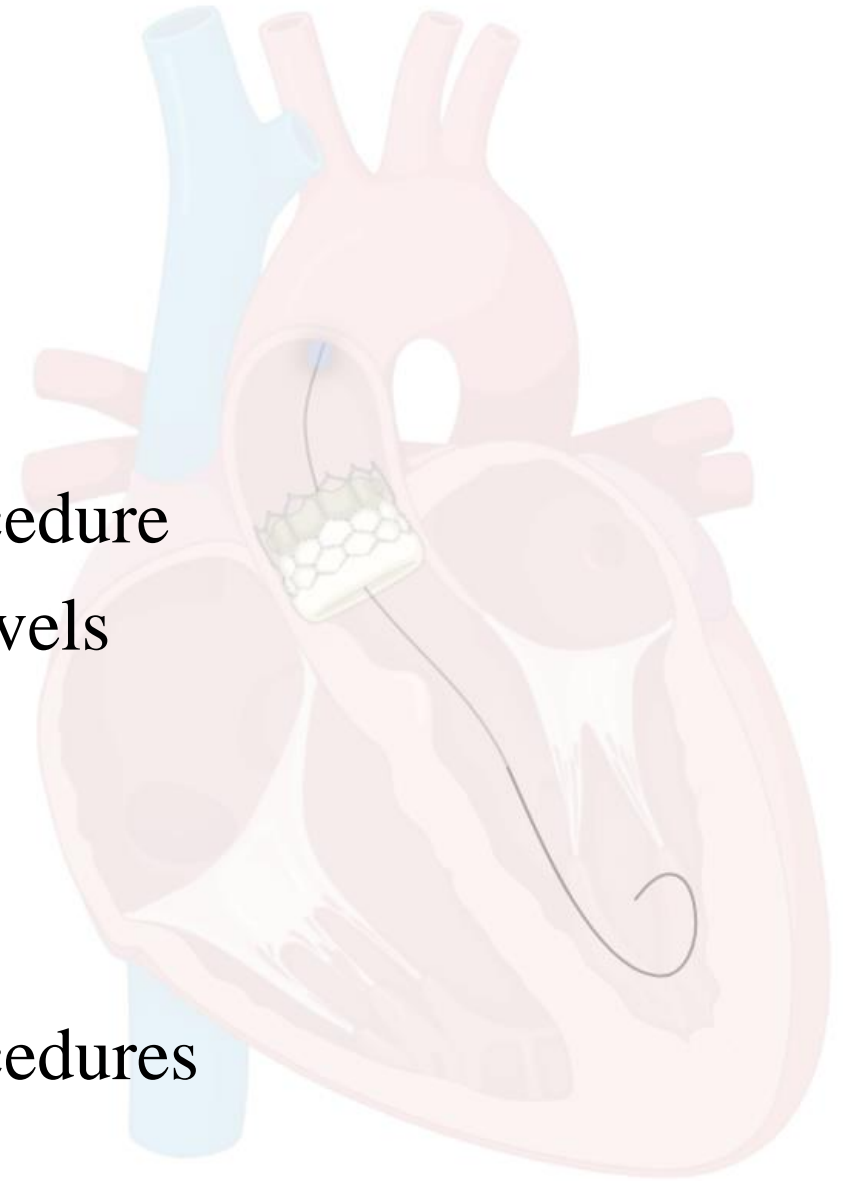
**Several cases
of LM
protection
(snorkel
technique) at
our centre...**



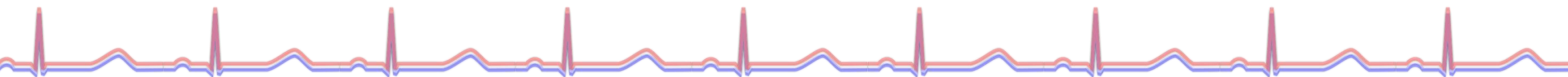
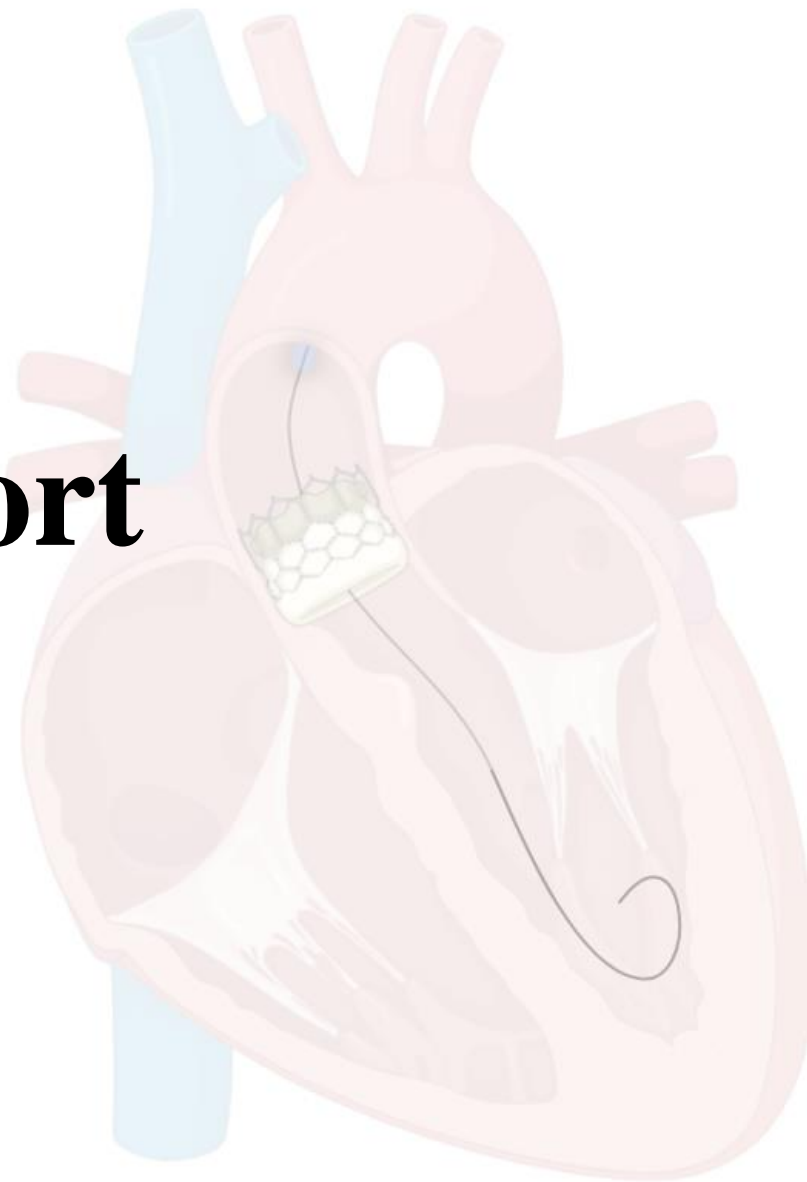
Our future goals

- Introduction of other valves
- Further training of the TAVR team
- Further standardization of the TAVR procedure
- Reduction of complications to residual levels
- Treatment of more complex patients
- Introduction of other access sites

- Introduction of other structural heart procedures



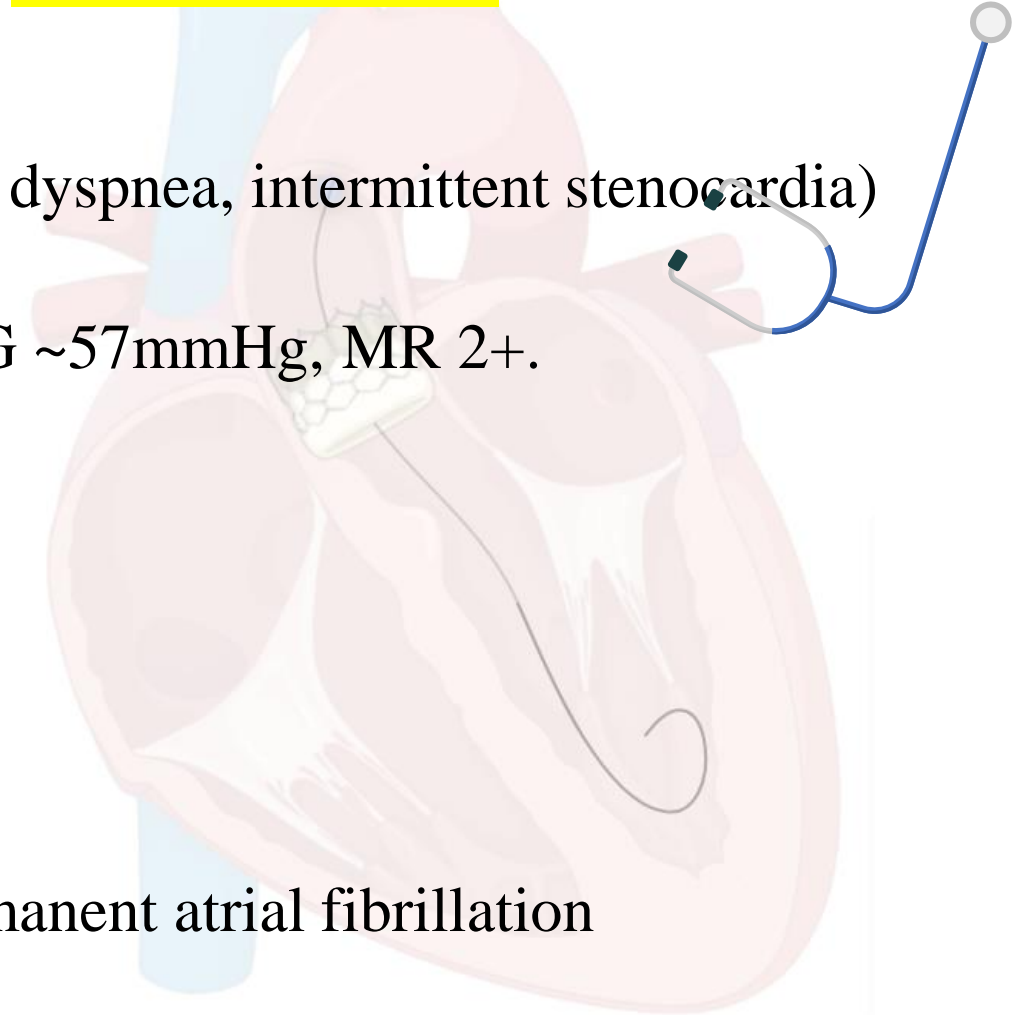
Case report

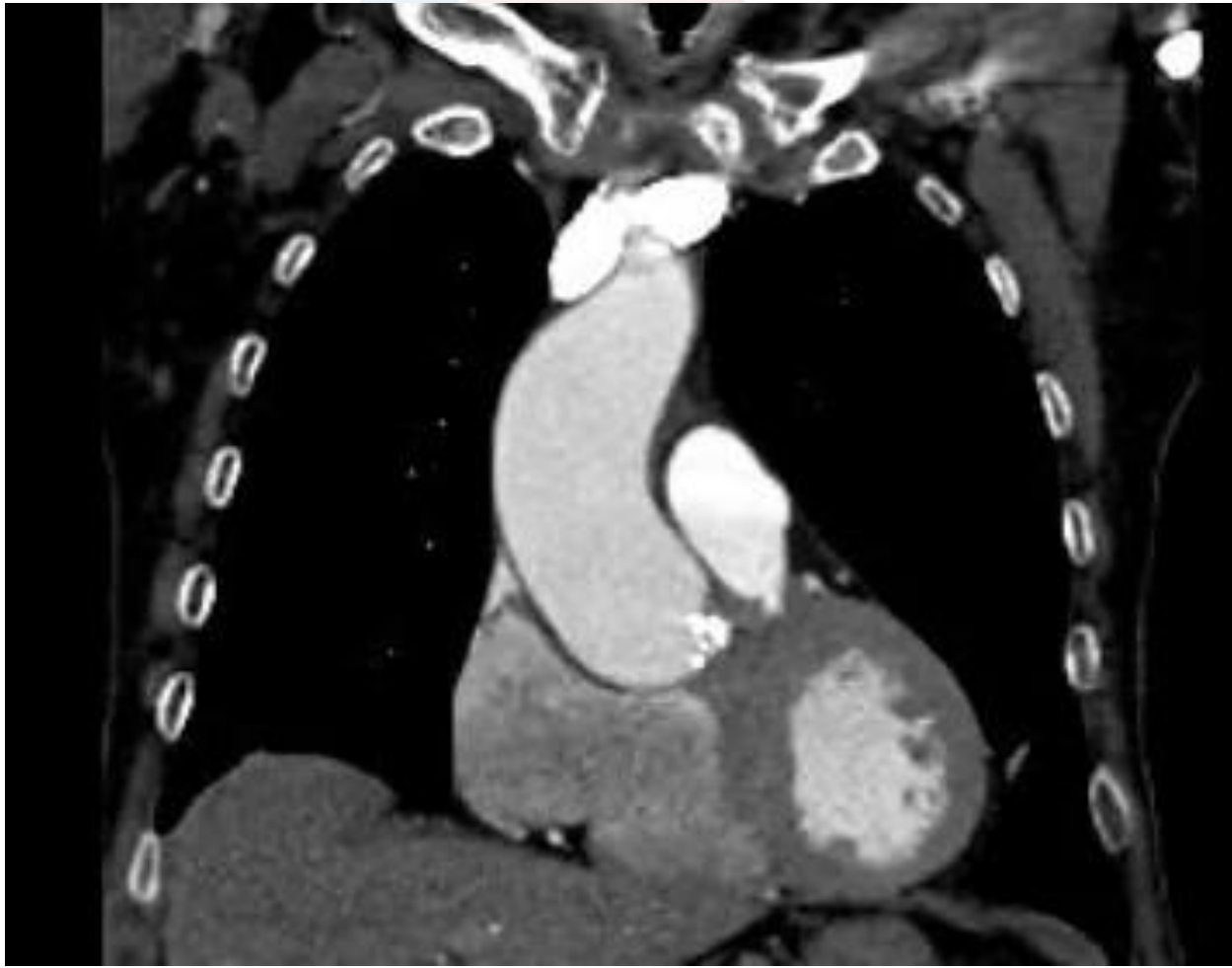


♂ 83 years

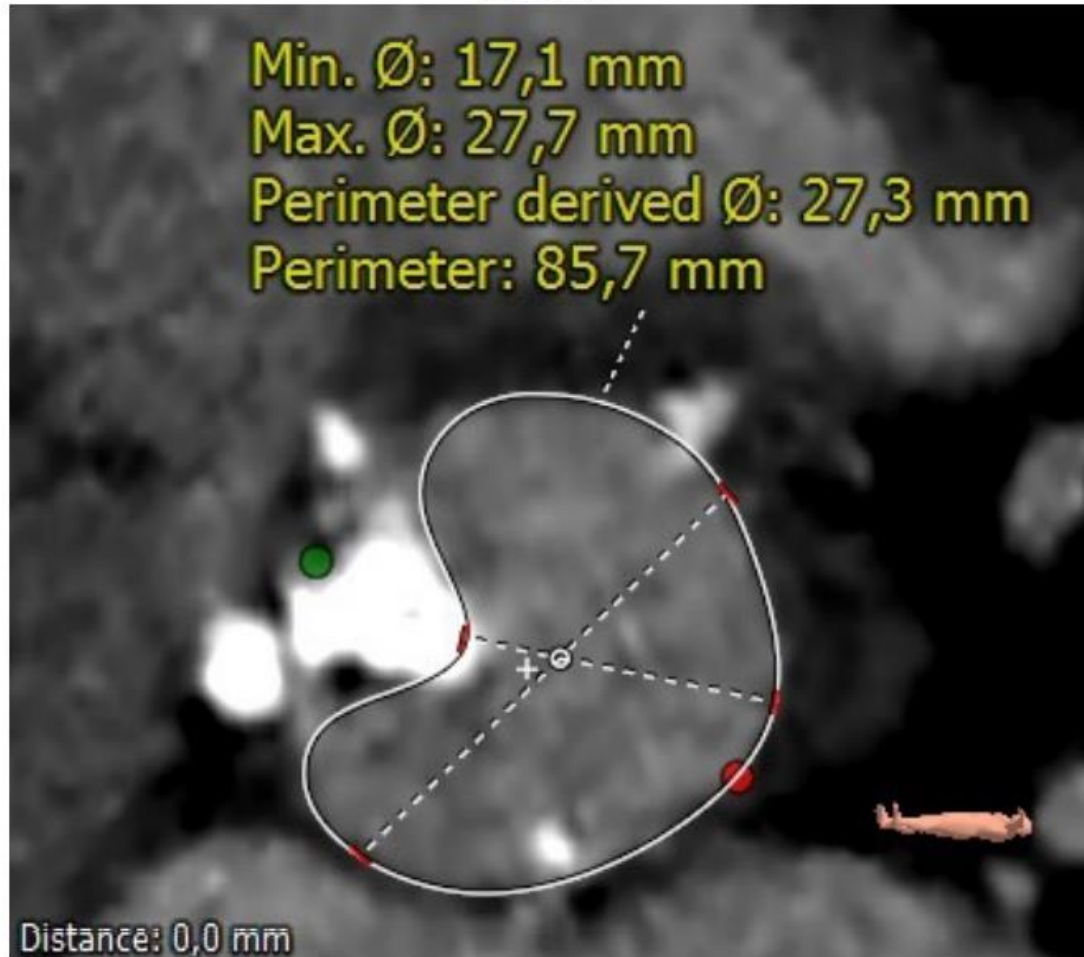
Transfemoral
TAVI feasible

- Symptomatic severe aortic stenosis (progressive dyspnea, intermittent stenocardia)
- ECHO: LVEF ~65%, AV-V_{max} ~5.04 m/s, MPG ~57mmHg, MR 2+.
- Aortopathy
- Bicuspid aortic valve (Sievers 0)
- Coronary angiography: non-significant changes.
- Comorbidities: hypertension; dyslipidemia; permanent atrial fibrillation (CHA₂DS₂VASc 4; HAS-BLED 2)

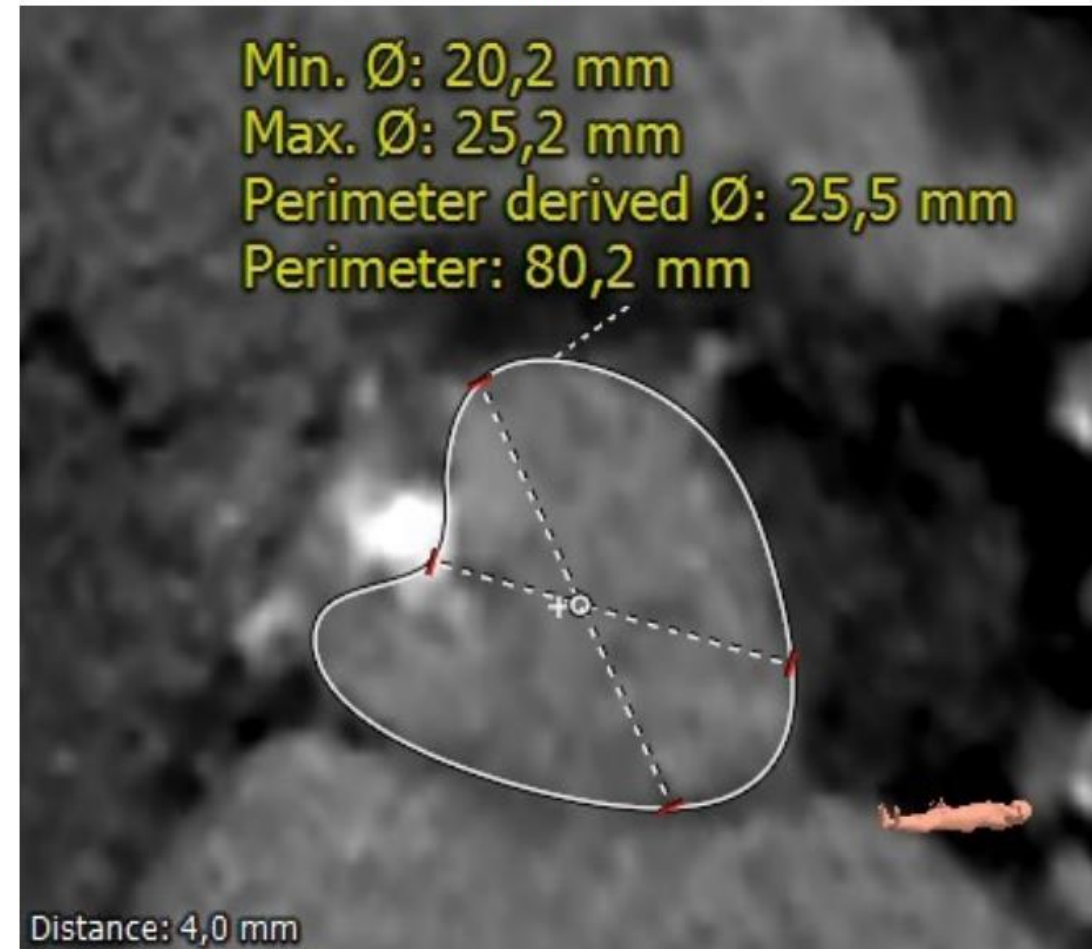




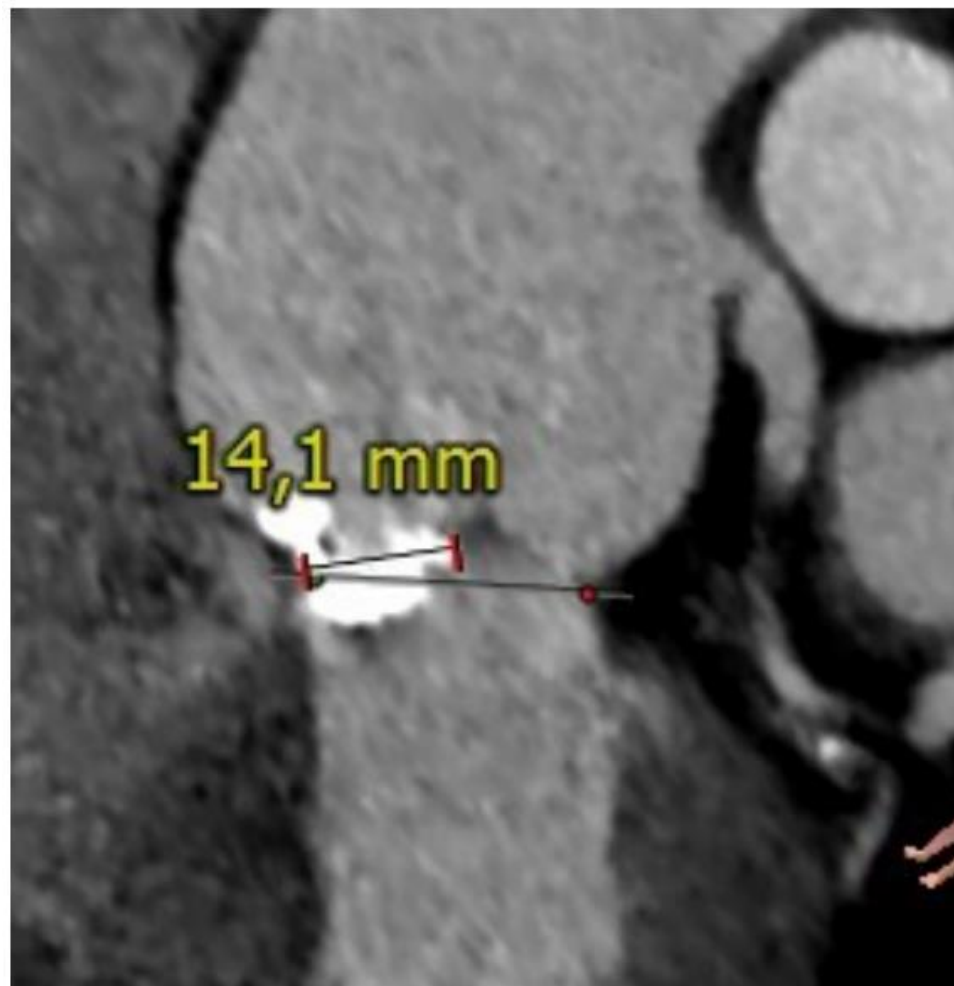
ANNULUS



LVOT

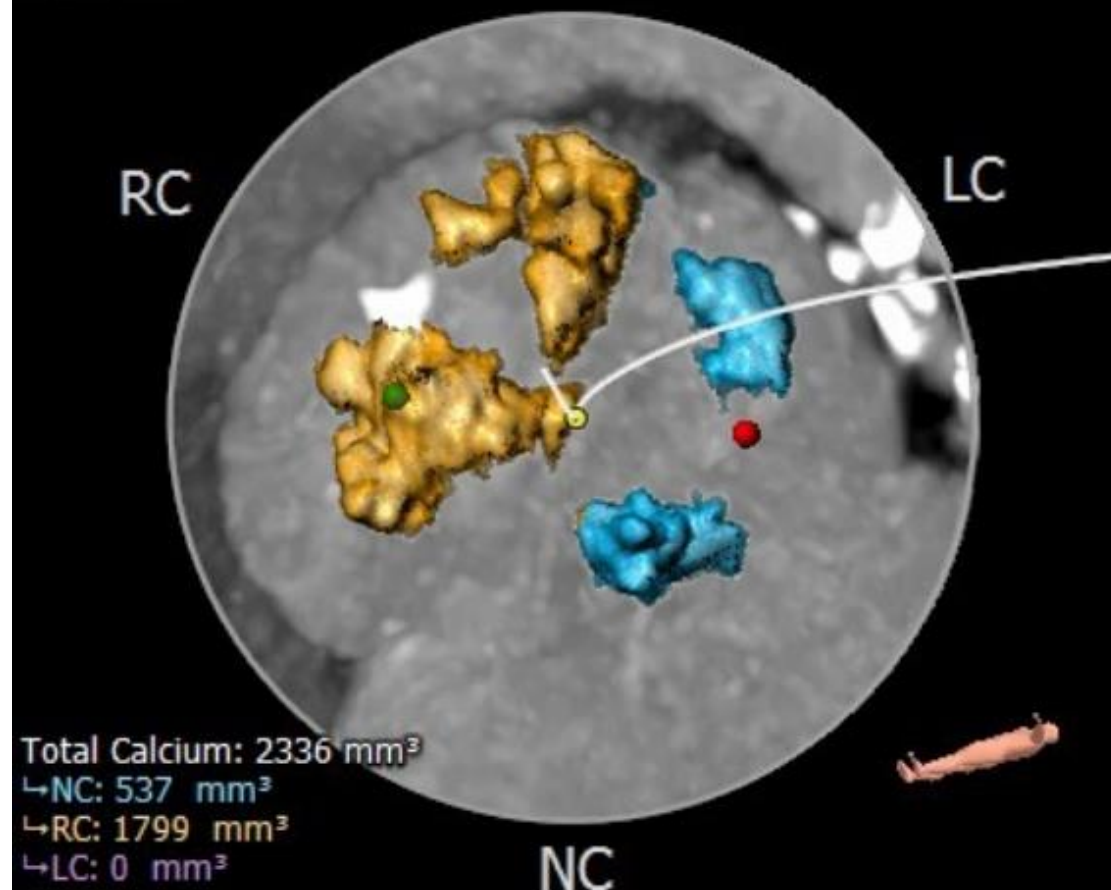


Annulus calcification (below RCC)



Ca Quantification

LAO: 101°
Caudal: 33°

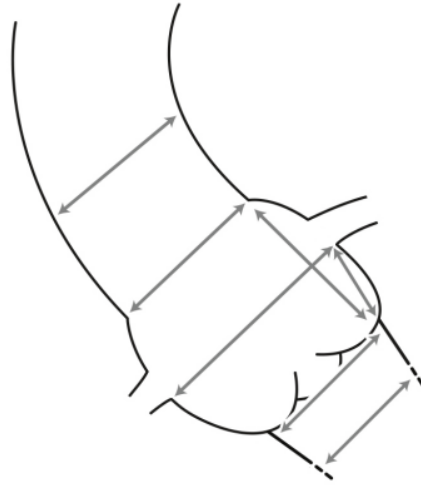


ANNULUS

| | | | | | |
|-------------------------|-------|---|----------------|---|------|
| Diameter (mm) | 17,1 | x | 27,7 | , | 22,4 |
| | Min | | Max | | Mean |
| Perimeter (mm) | 85,7 | | Derived Ø (mm) | | 27,3 |
| Area (mm ²) | 458,6 | | Derived Ø (mm) | | 24,2 |

LVOT

| | | | | | |
|-------------------------|-------|---|----------------|---|------|
| Diameter (mm) | 20,2 | x | 25,2 | , | 22,7 |
| | Min | | Max | | Mean |
| Perimeter (mm) | 80,2 | | Derived Ø (mm) | | 25,5 |
| Area (mm ²) | 432,2 | | Derived Ø (mm) | | 23,5 |



Max Ascending Aorta Diameter (mm)

43,9

Sinotubular Junction Diameter (mm)

41,6 x 42,5
Min Max

Sinus of Valsalva Diameter (mm)

48,5 X X
LCC RCC NCC





Sinus of Valsalva Height (mm)

49,2 50,6 X
LCC RCC NCC

Coronary Ostia Height (mm)

29,5 41,9
Left Right

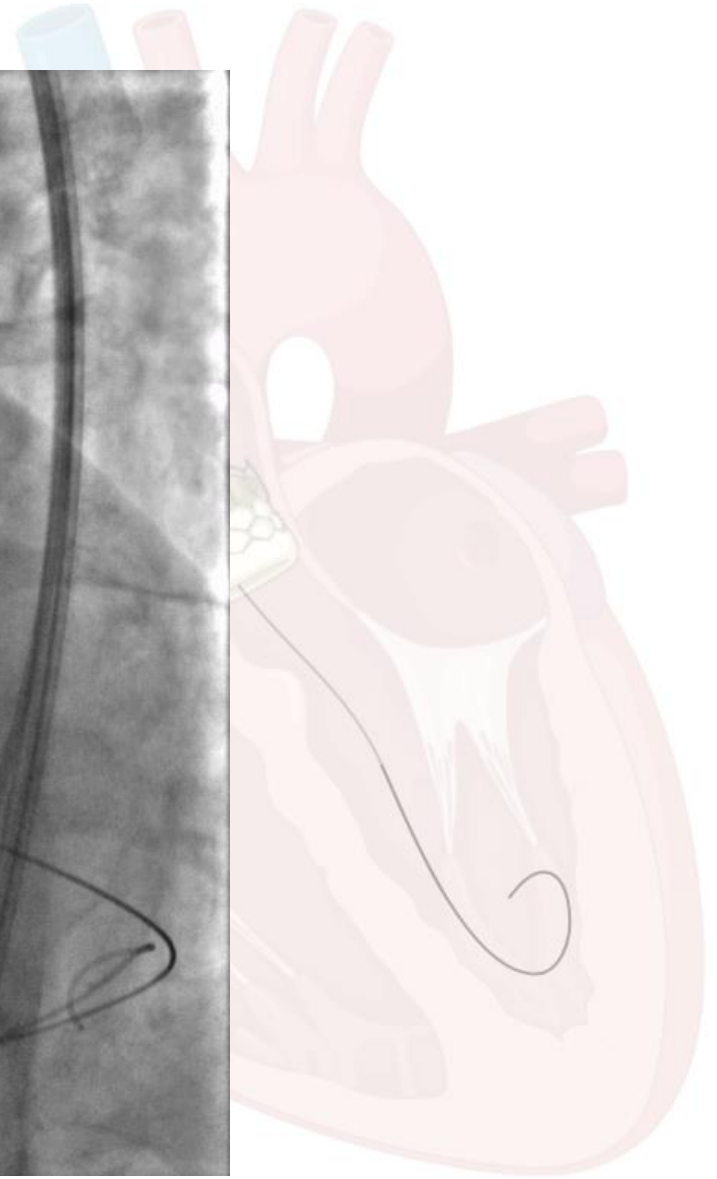
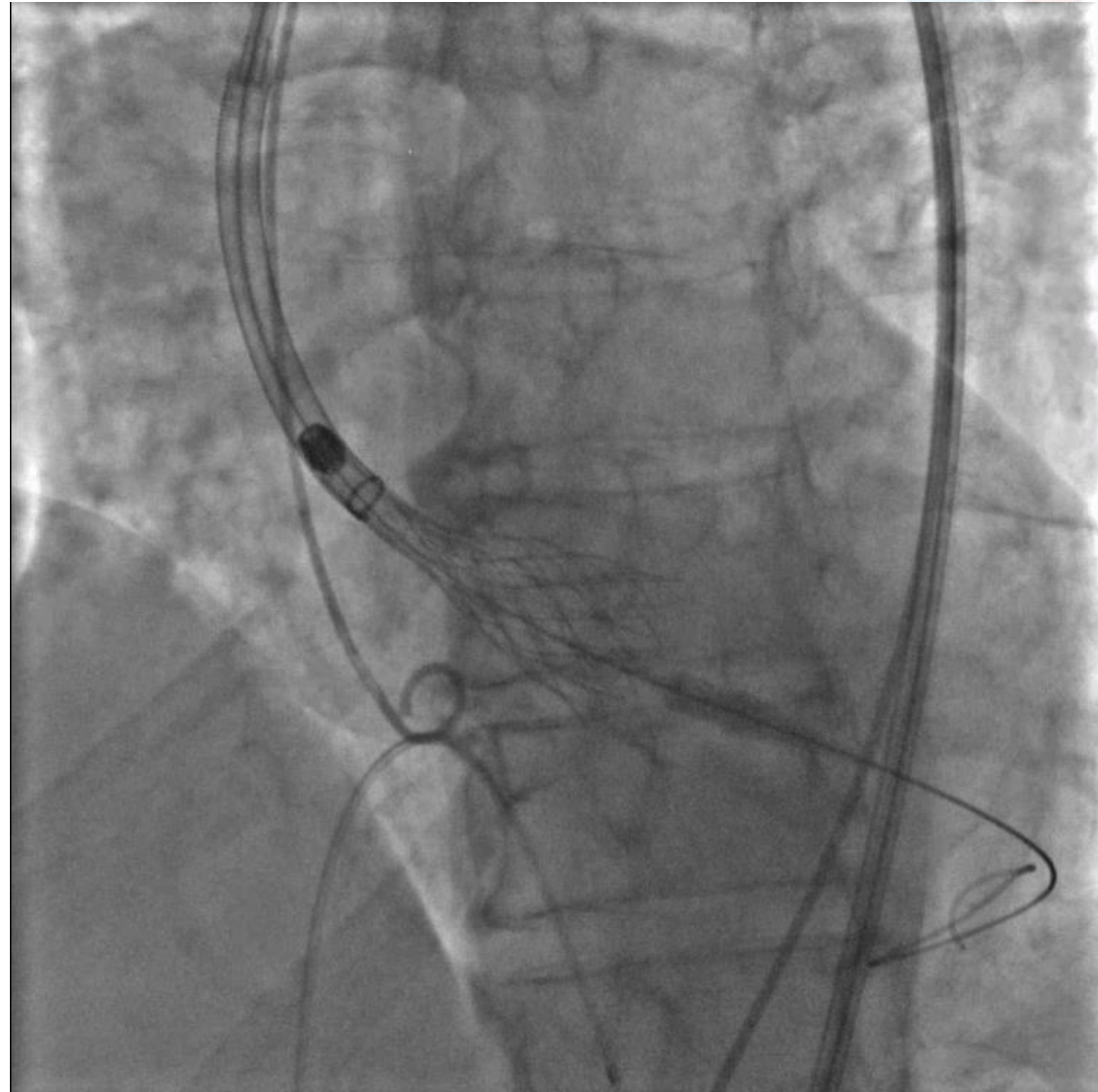
Patient Evaluation Criteria

| Valve Size Selection | CoreValve® Evolut® R | | | |
|-----------------------------------|---|---|---|---|
| |  |  |  |  |
| Size | 23 mm | 26 mm | 29 mm | 34 mm |
| Annulus Diameter | 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 |
| Sinus of Valsalva Diameter (Mean) | ≥ 25 mm | ≥ 27 mm | ≥ 29 mm | ≥ 31 mm |
| Sinus of Valsalva Height (Mean) | ≥ 15 mm | ≥ 15 mm | ≥ 15 mm | ≥ 16 mm |

Predilatation
25x40 mm



**Implantation
of
Evolut R 34**



Evolut R 34

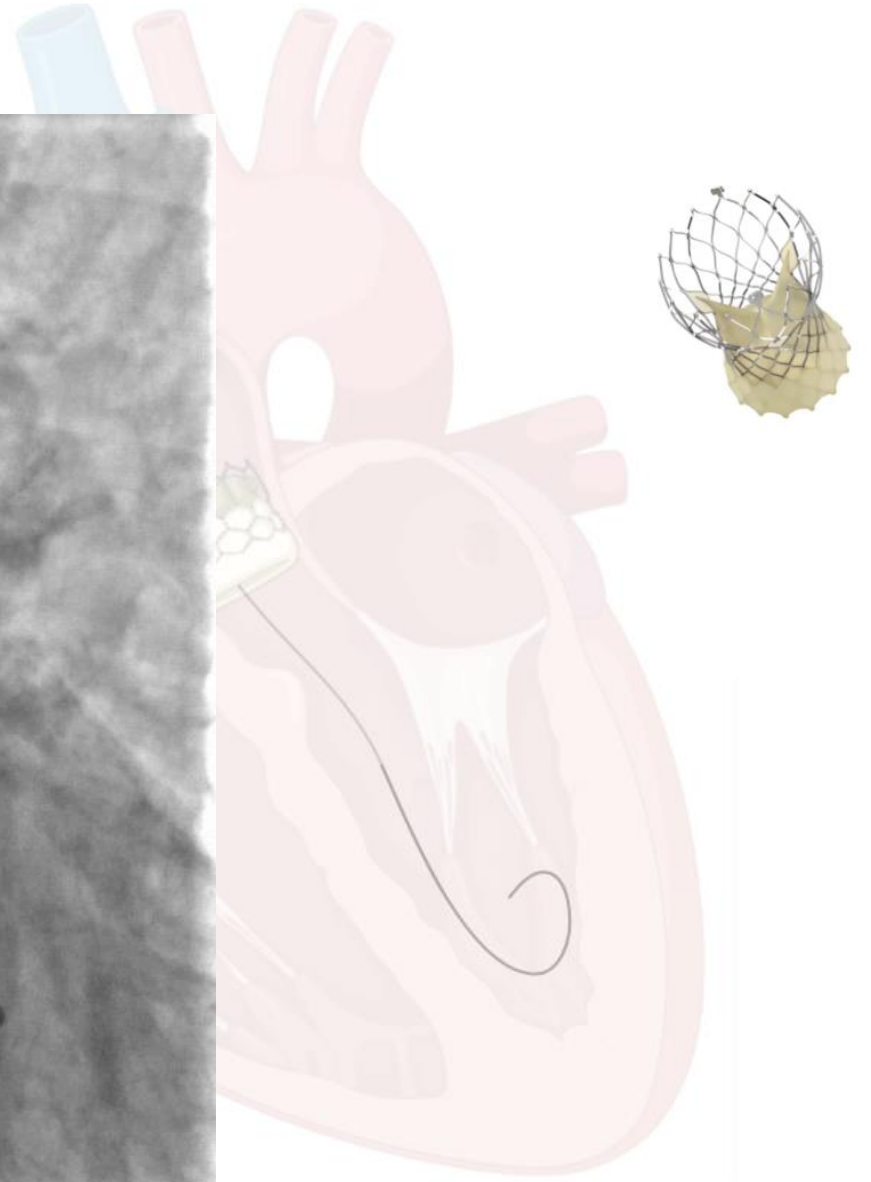
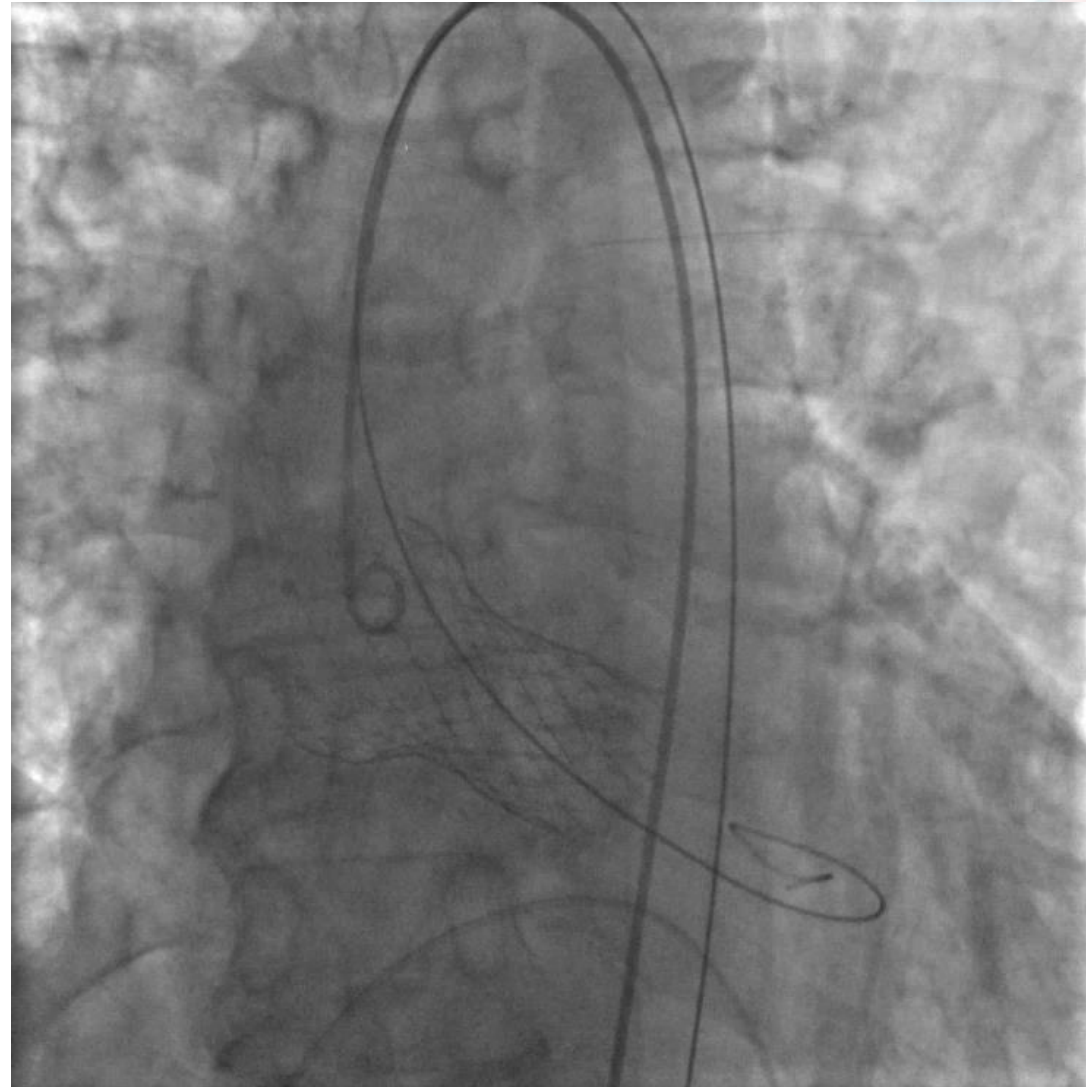
**Team decision to
perform postdilatation**

(26x40 mm)

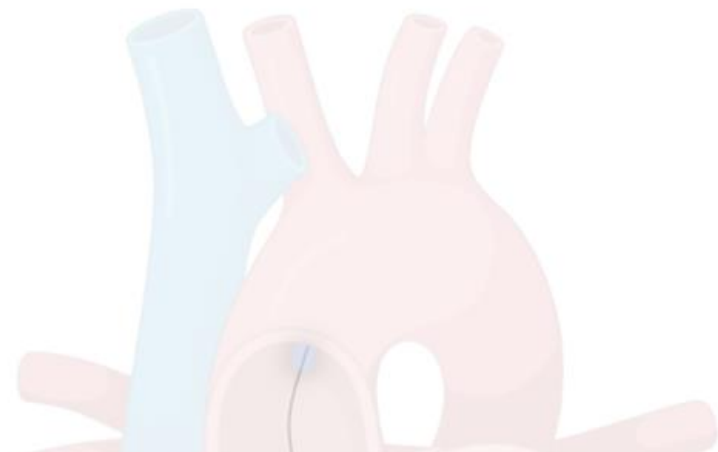


Evolut R 34

Final result



Few hours later...

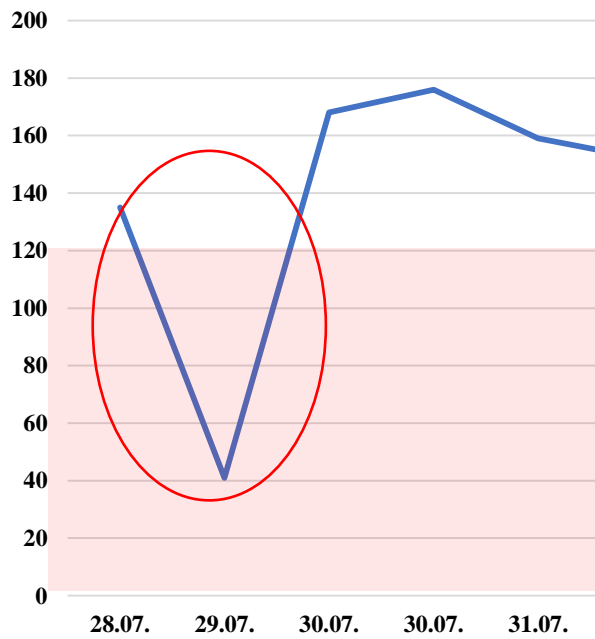


Delayed hypotension

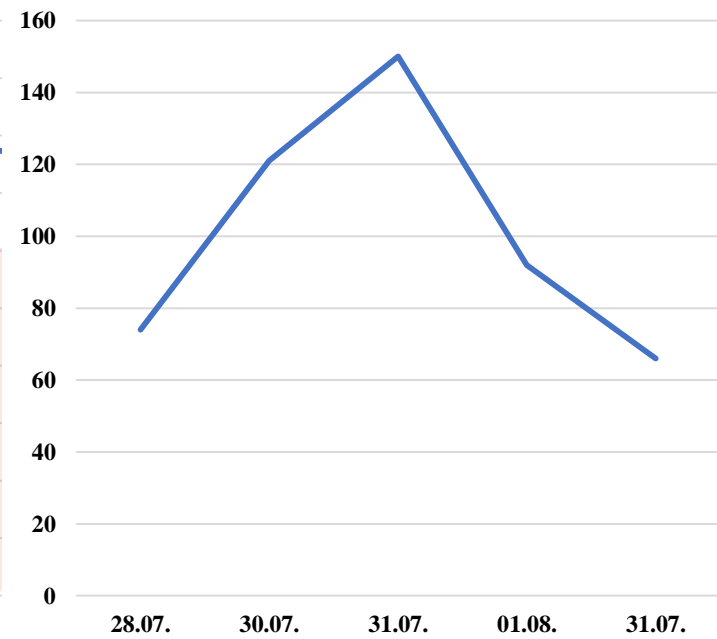
ECHO: Moderate pericardial effusion

↑ Allgower index

Hemoglobin



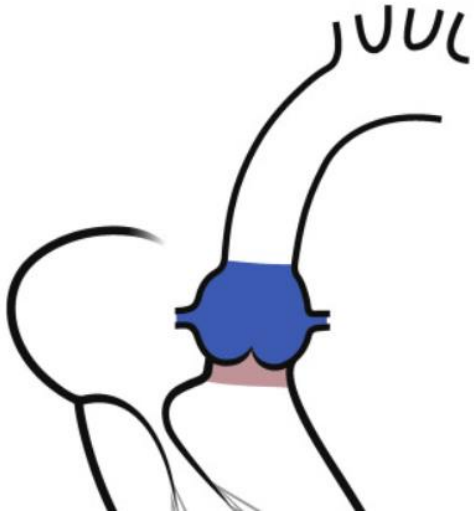
Creatinine





Emergent CT aortography:

- Hematopericardium (up to 16 mm)
- Implanted valve is in direct contact to aortic wall near RCA, with consequent intimal injury and type A aortic dissection that spreads to the level of brachiocephalic trunk.
- Pleural effusion billateral (45 HU - hemorrhagic)



Surgical consultation:

„At the moment of examination, the patient is hemodynamically and respiratory stable.

Imaging data has been reviewed.

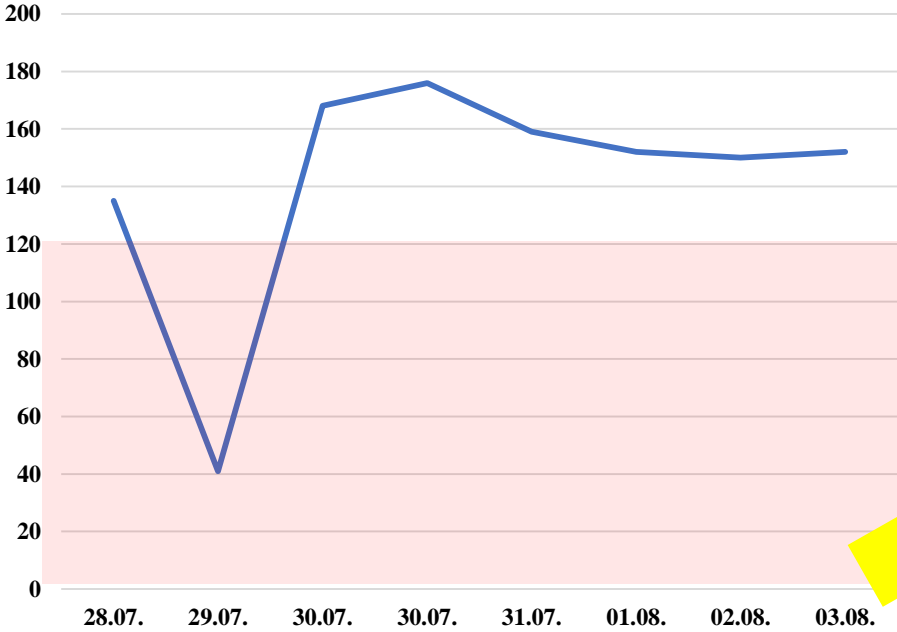
It is recommended to continue watchful waiting with the administration of Octaplex.

Surgical control if necessary.”

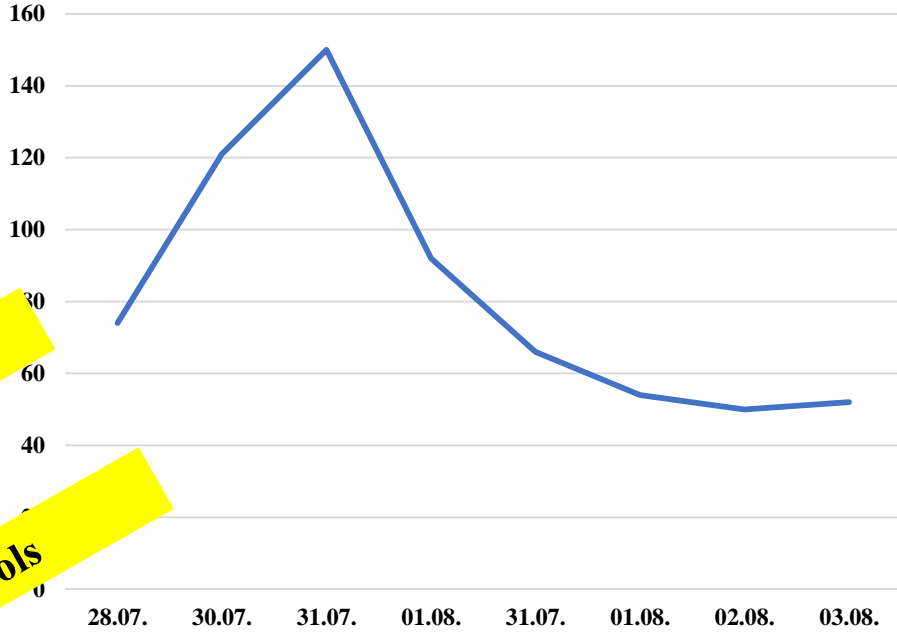
After the initial blood transfusion, the patient is constantly stable.



Hemoglobin



Creatinine

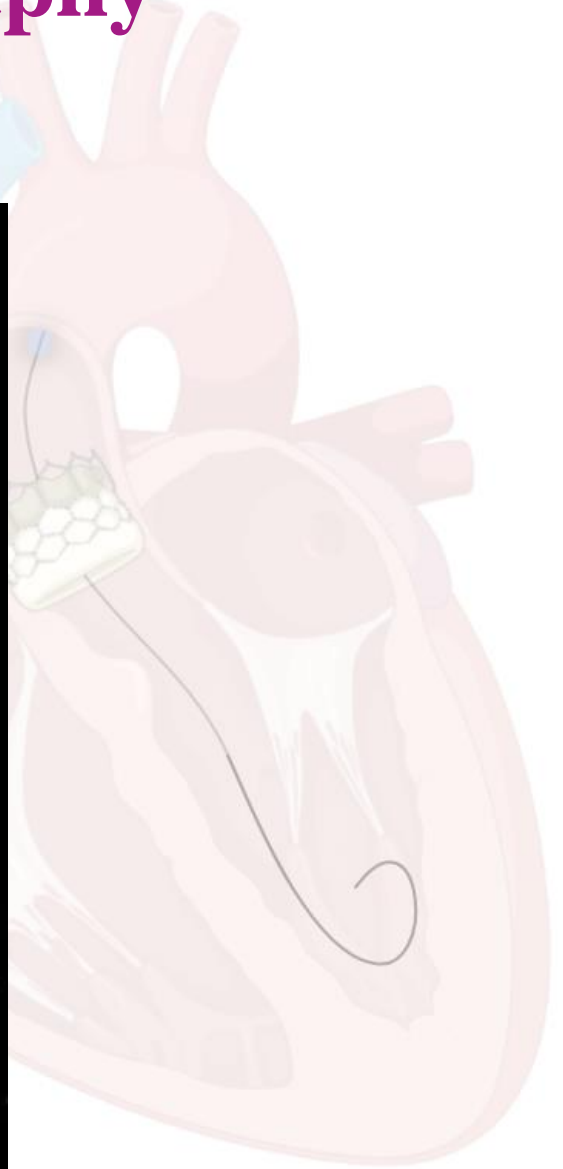
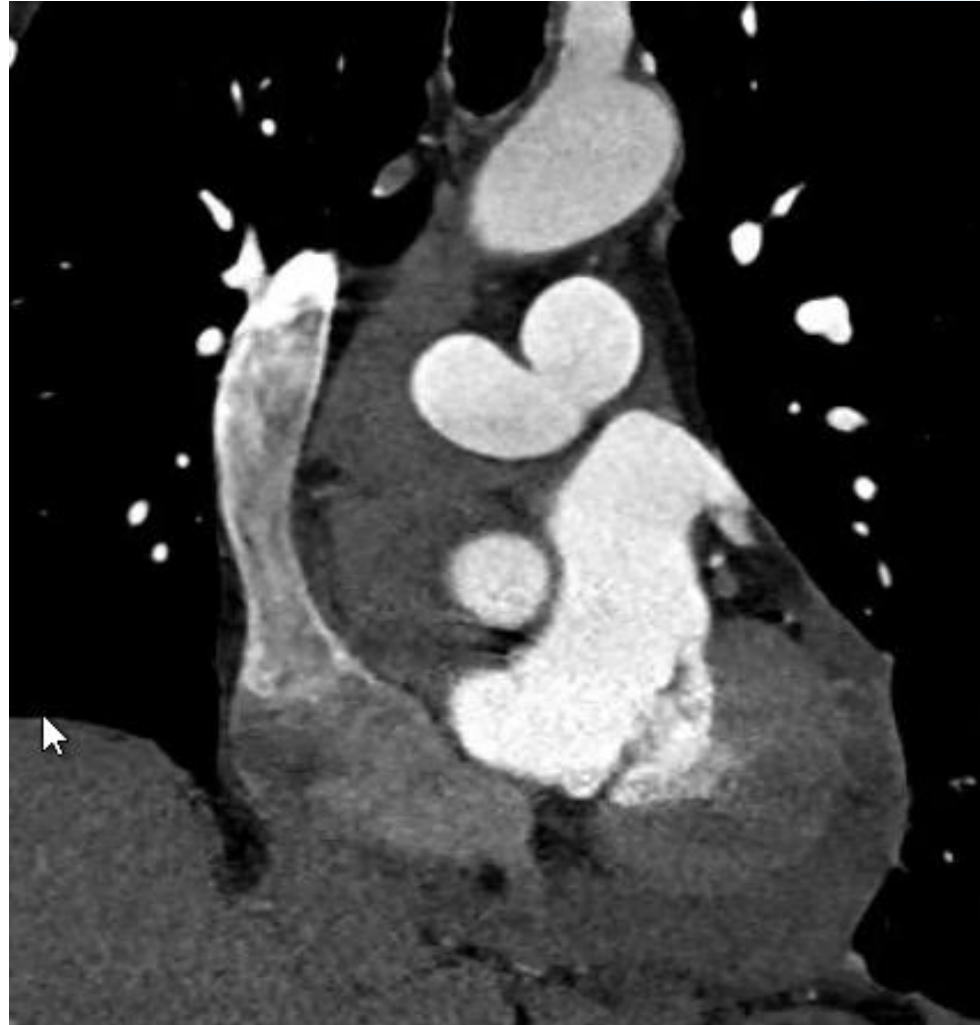


...

ECHO controls
BP regulation
CBC controls

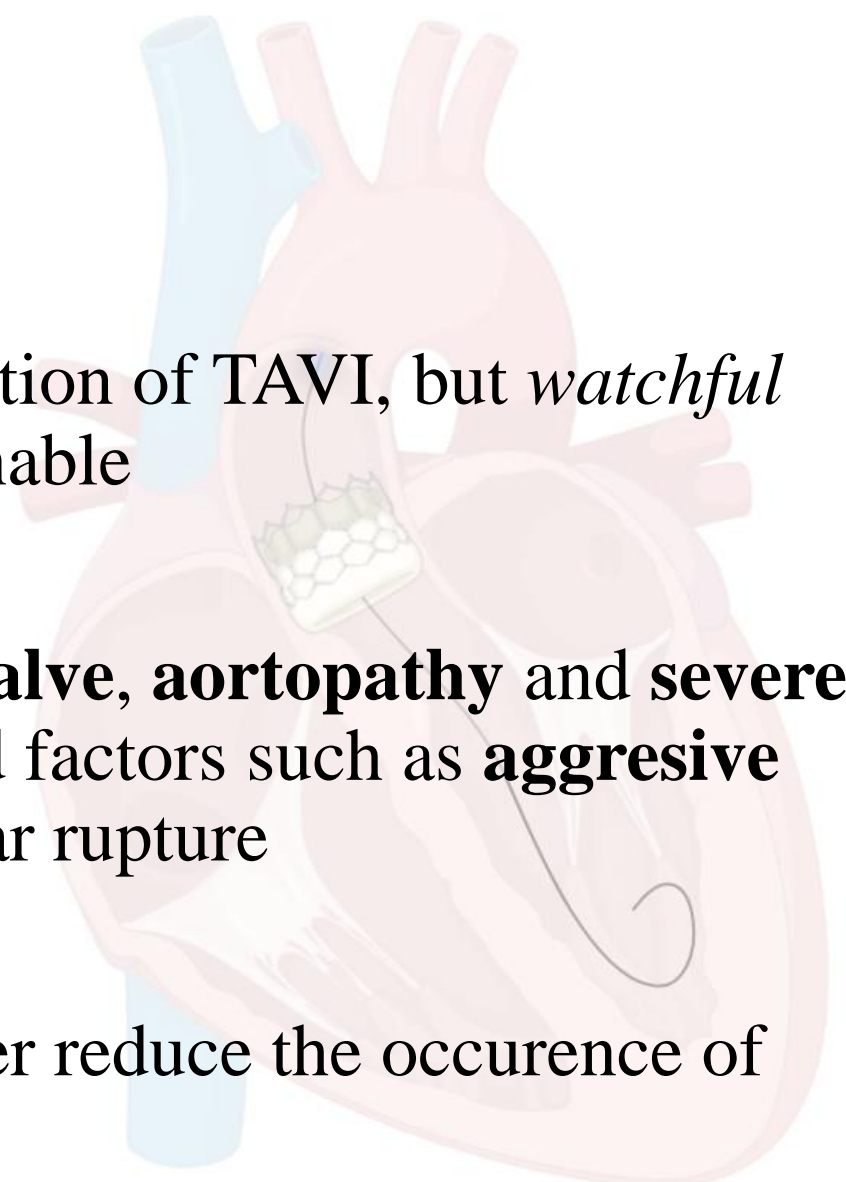


Controlled MSCT aortography (after ~2 weeks)



Summary

- Annular rupture is a devastating complication of TAVI, but *watchful waiting* in selected patients may be reasonable
- Patient-related factors such as **bicuspid valve**, **aortopathy** and **severe calcification**, as well as procedure-related factors such as **aggressive postdilatation**, increase the risk of annular rupture
- Increased awareness is important to further reduce the occurrence of this devastating event





Welcome to Split