



UNIVERSITÀ DEGLI STUDI DI TORINO



TURIN  
October  
24<sup>th</sup>-26<sup>th</sup>  
2019

# 31 GIORNATE CARDIOLOGICHE TORINESI

**TAVI in 2019: JUST THE BEGINNING?**



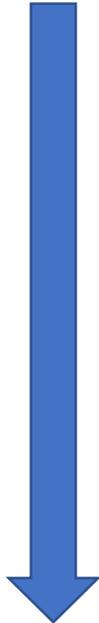
**MAURO CASSESE**  
Cardiac Surgery Department  
IRCCS-SAN PIO FOUNDATION - ITALY



# THE BEGINNING

**Percutaneous transcatheter implantation of an aortic valve prosthesis for calcific aortic stenosis: first human case description**

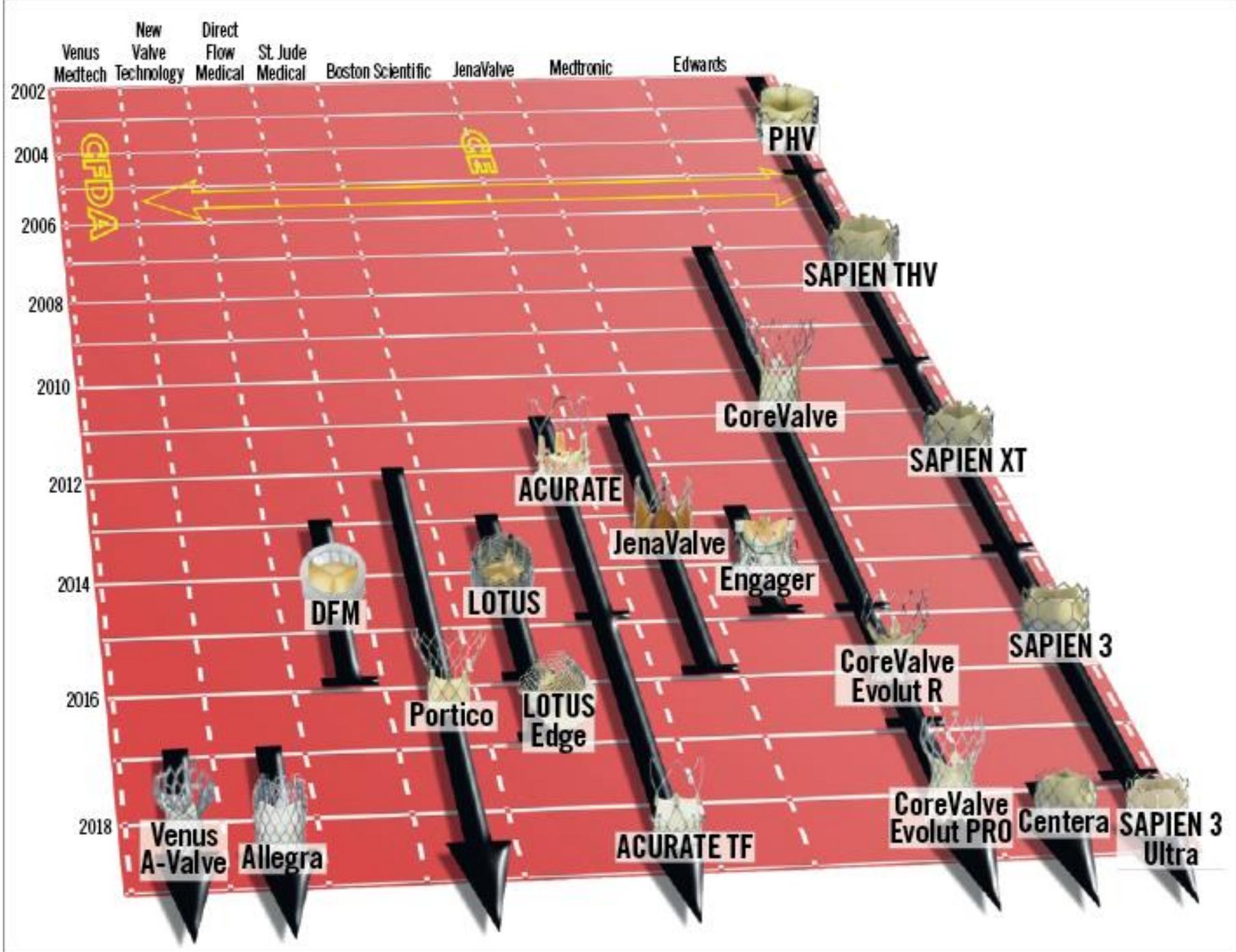
**Circulation. 2002**



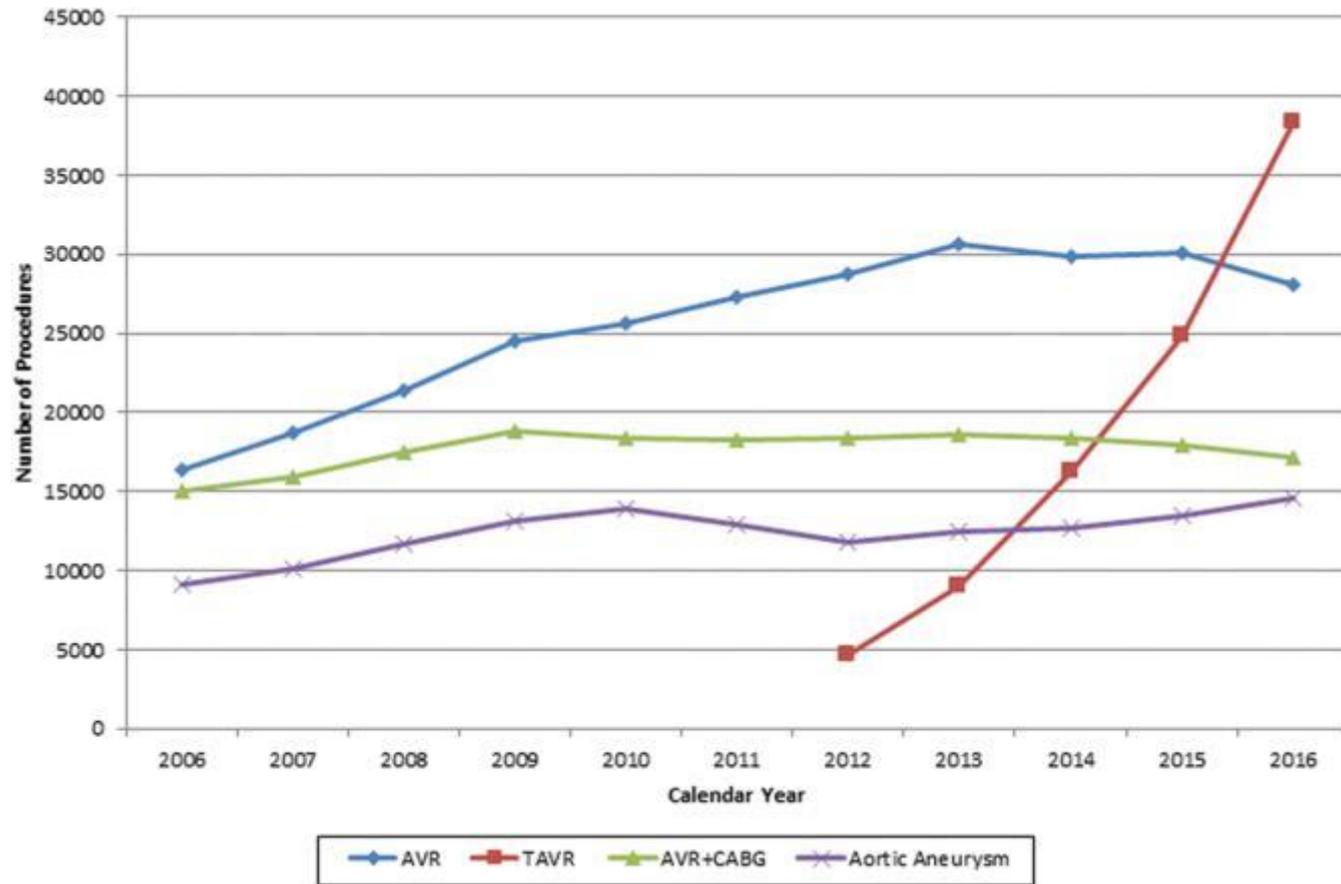
**Development of transcatheter aortic valve implantation (TAVI): A 20-year odyssey**

Implantation de valves aortiques par voie percutanée : une odysée de 20 ans

**Alain Cribier**



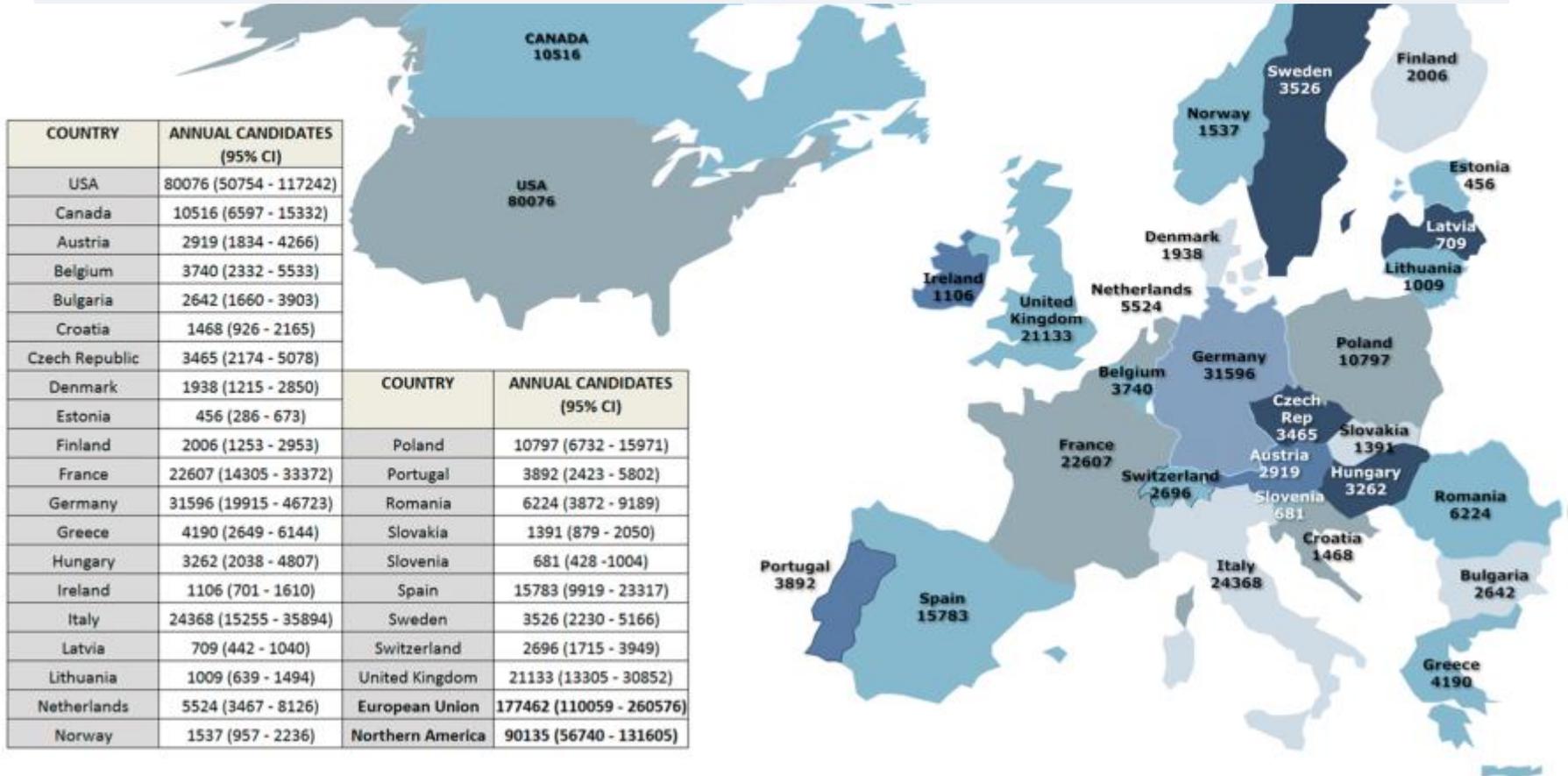
# The Society of Thoracic Surgeons Adult Cardiac Surgery Database: 2018 Update on Outcomes and Quality



**TAVI IS A DESRUPTIVE TECHNOLOGY!**

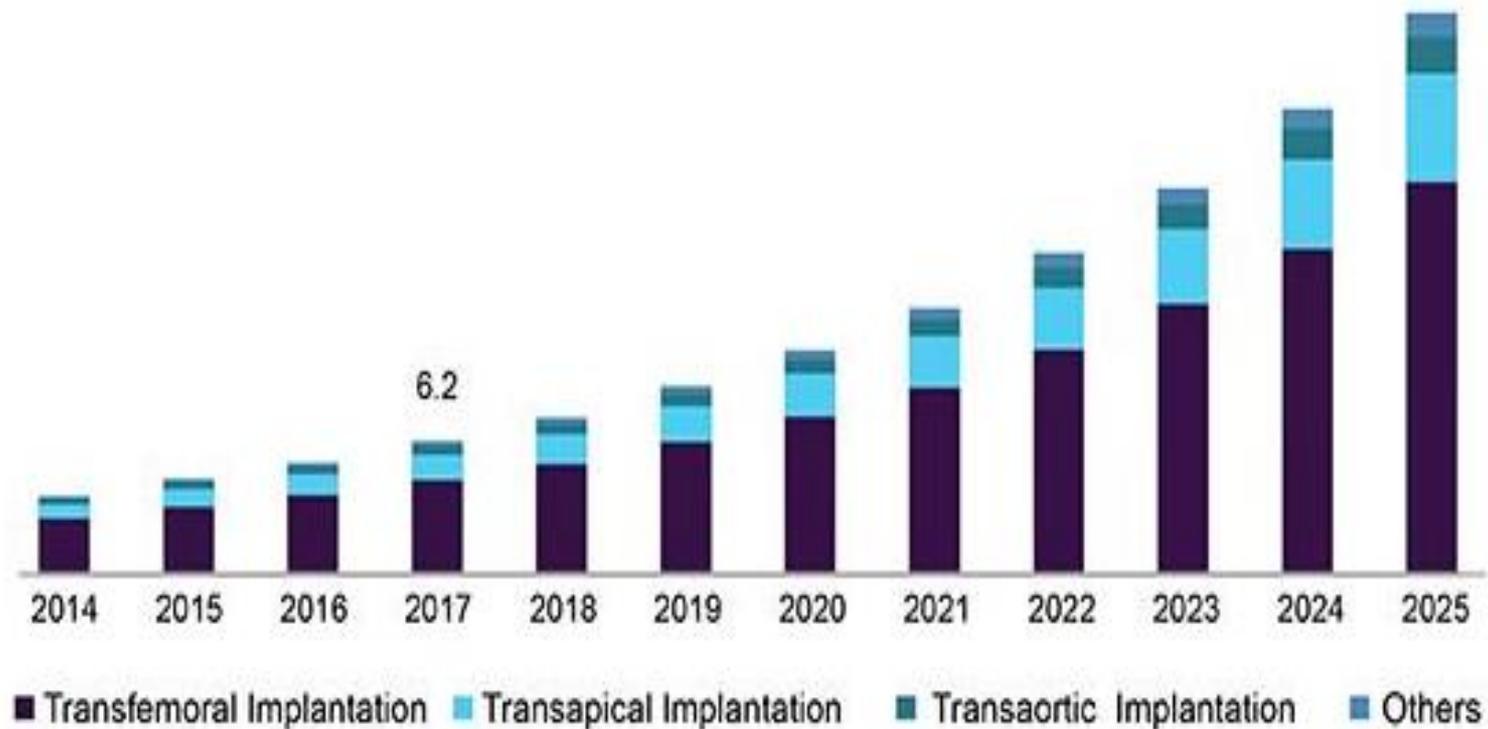
## Conclusion

Currently, approximately 180 000 patients can be considered potential TAVI candidates in the European Union and in Northern-America annually. This number might increase up to 270 000 if indications for TAVI expand to low-risk patients. These findings have major implications for health care resource planning in the 29 individual countries.



Future projections

## Transcatheter Aortic Valve Replacement (TAVR) procedures market size, 2014 - 2025 (USD Billion)



# RELIABILITY

Easy to implant

Good results

Low rate of complications

Short learning curve

Wide range of devices available

# VERSATILITY

- all approaches (TF, TA, Tao, TS, TC and Tc)
- in native valves
  - aortic
  - mitral (valve in MAC)
  - pulmonary
- valve in valve in all positions
- valve in ring
  - mitral
  - tricuspid
- wide size range (areas from 2.50 to 7.40 cm<sup>2</sup>)
- no difference when implanted in bicuspid valves

# MINIMALLY INVASIVE vs MICRO-INVASIVE

## AVR

- ECC/ cardiac arrest
- Surgical trauma
- General anesthesia
- Postoperative Intensive Care
- Discharge 5° p.o. day
- ....

## TAVI

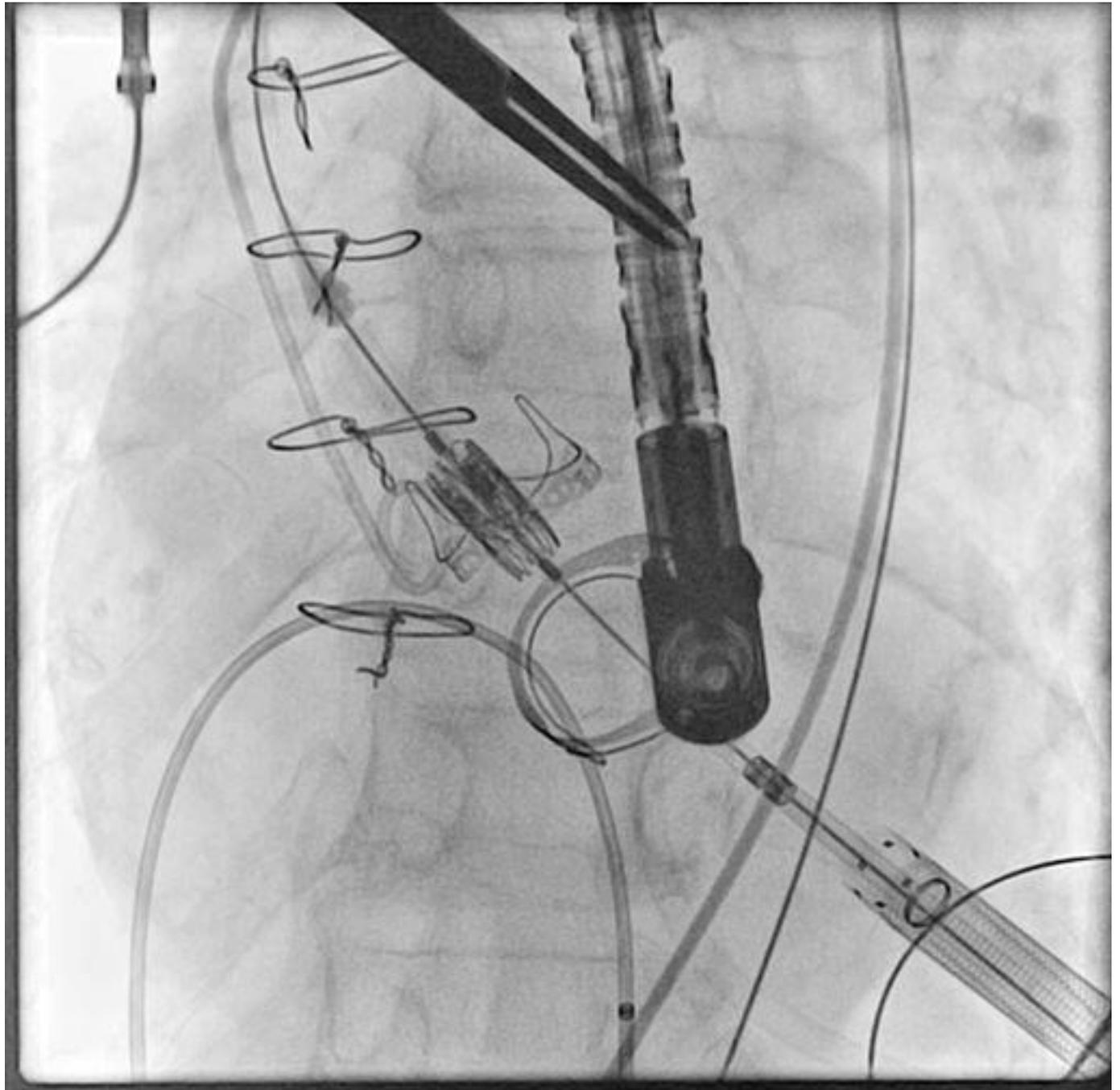
- Rapid pacing
- Femoral access (percutaneous)
- Conscious sedation
- No ICU
- Discharge 2/3° p.o. day
- ....

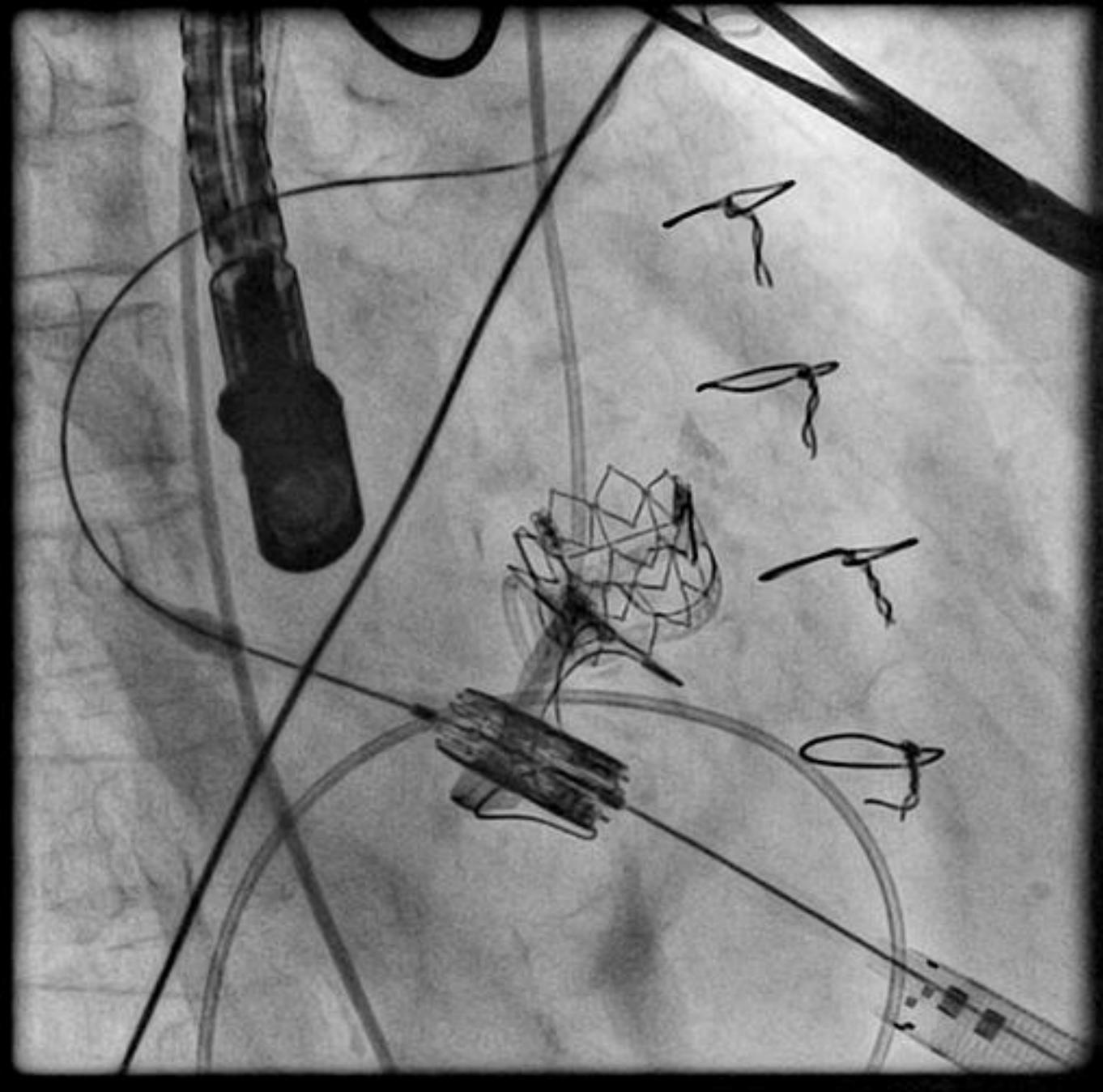
**YEAR 2011**

**One-stop  
Double ViV  
Transapical  
access**

**Edwards Sapien  
XT**

1st aortic ViV



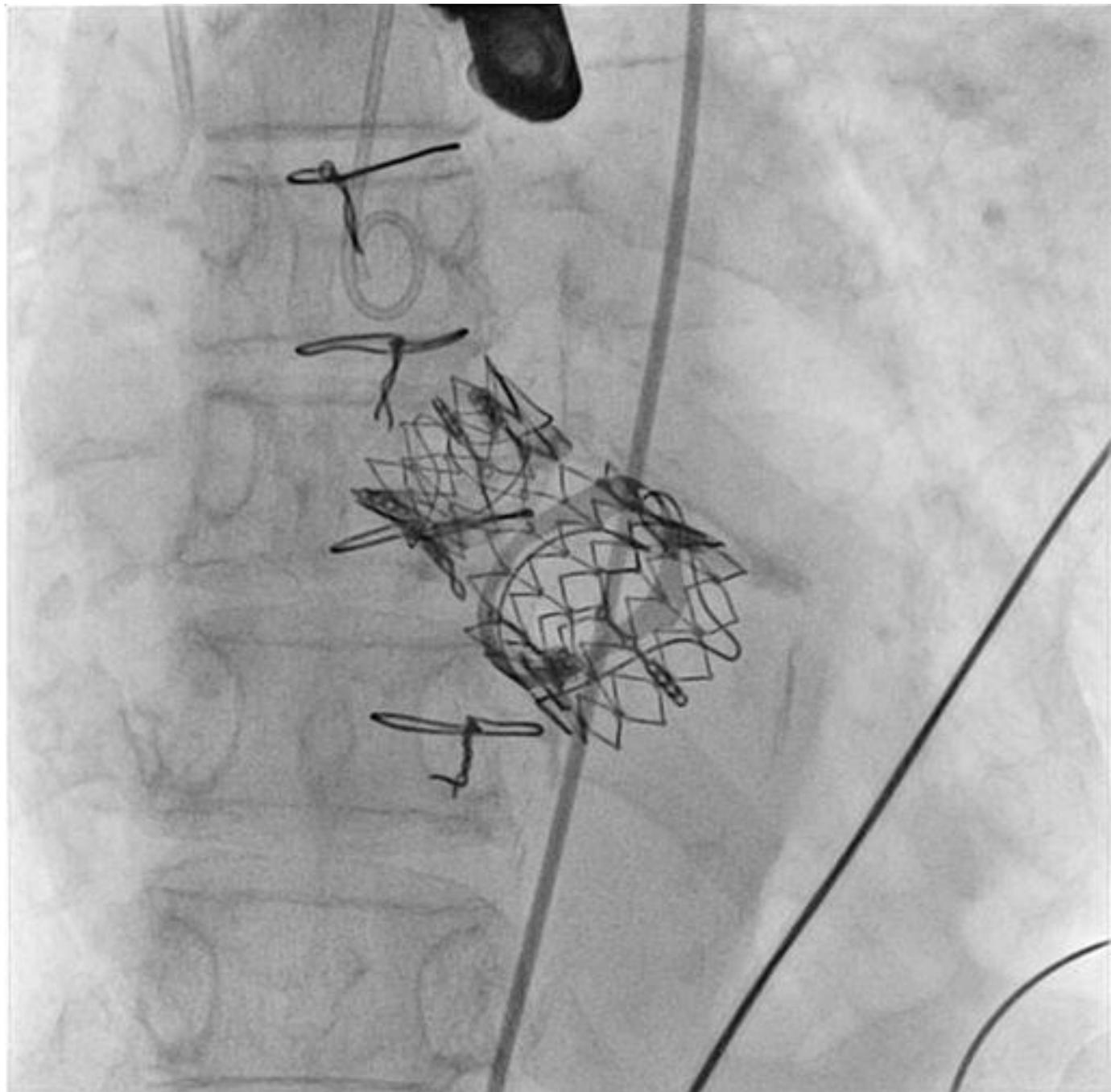


**Double ViV**

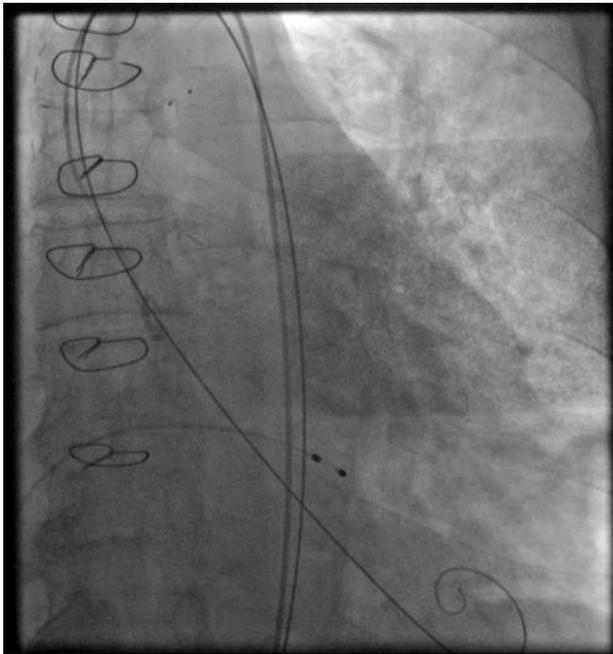
**Edwards Sapien  
XT**

**2nd mitral ViV**

**One-stop  
Double ViV  
ES XT**



Aortic VALVE in VALVE ES XT  
in Freedom Solo (stentless valve)



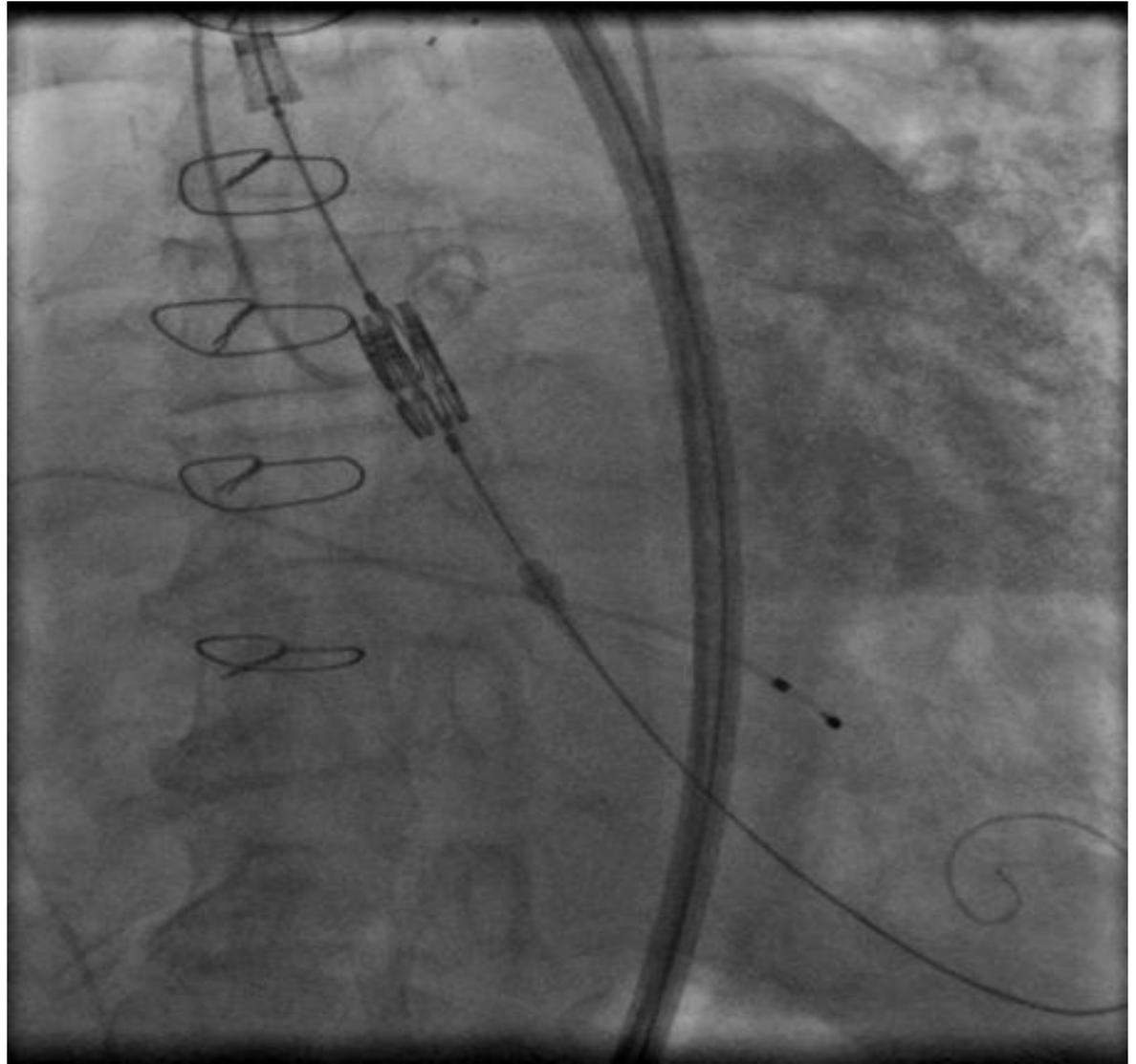
3° redo AVR

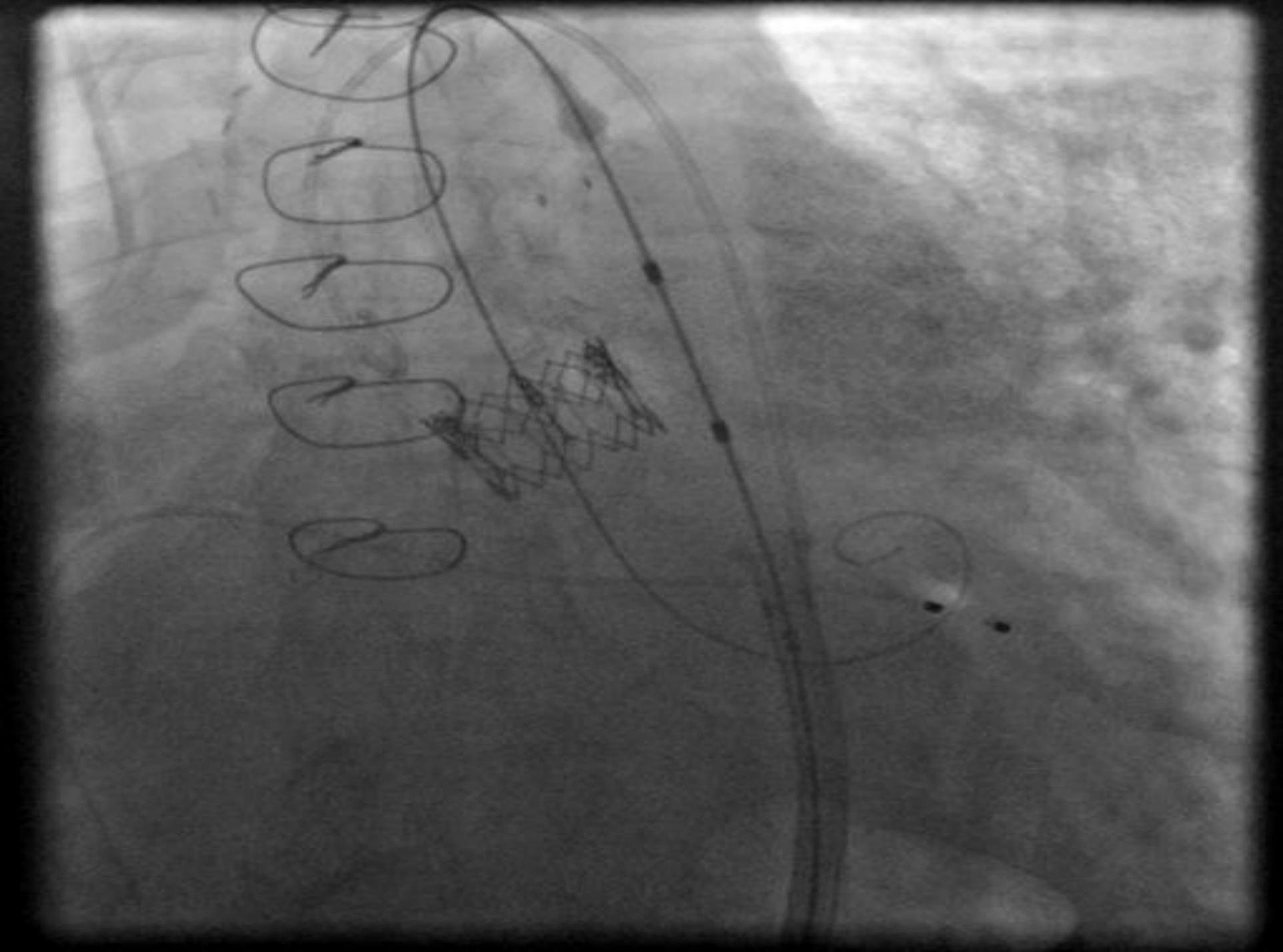
**No Ca++**

AR 4+

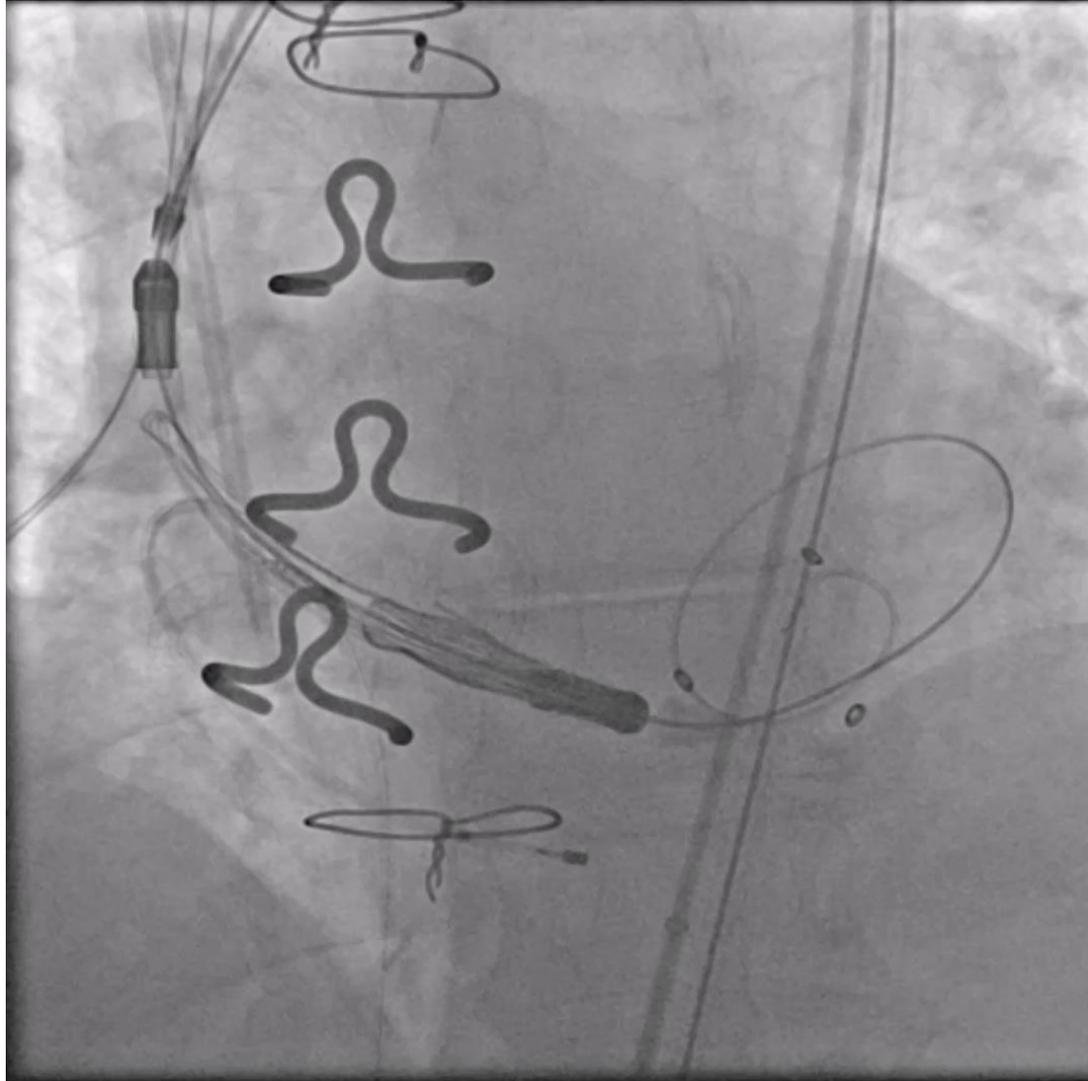
EF 25%

**YEAR 2014**





# Acurate Neo B.S. Symetis L for pure aortic regurgitation



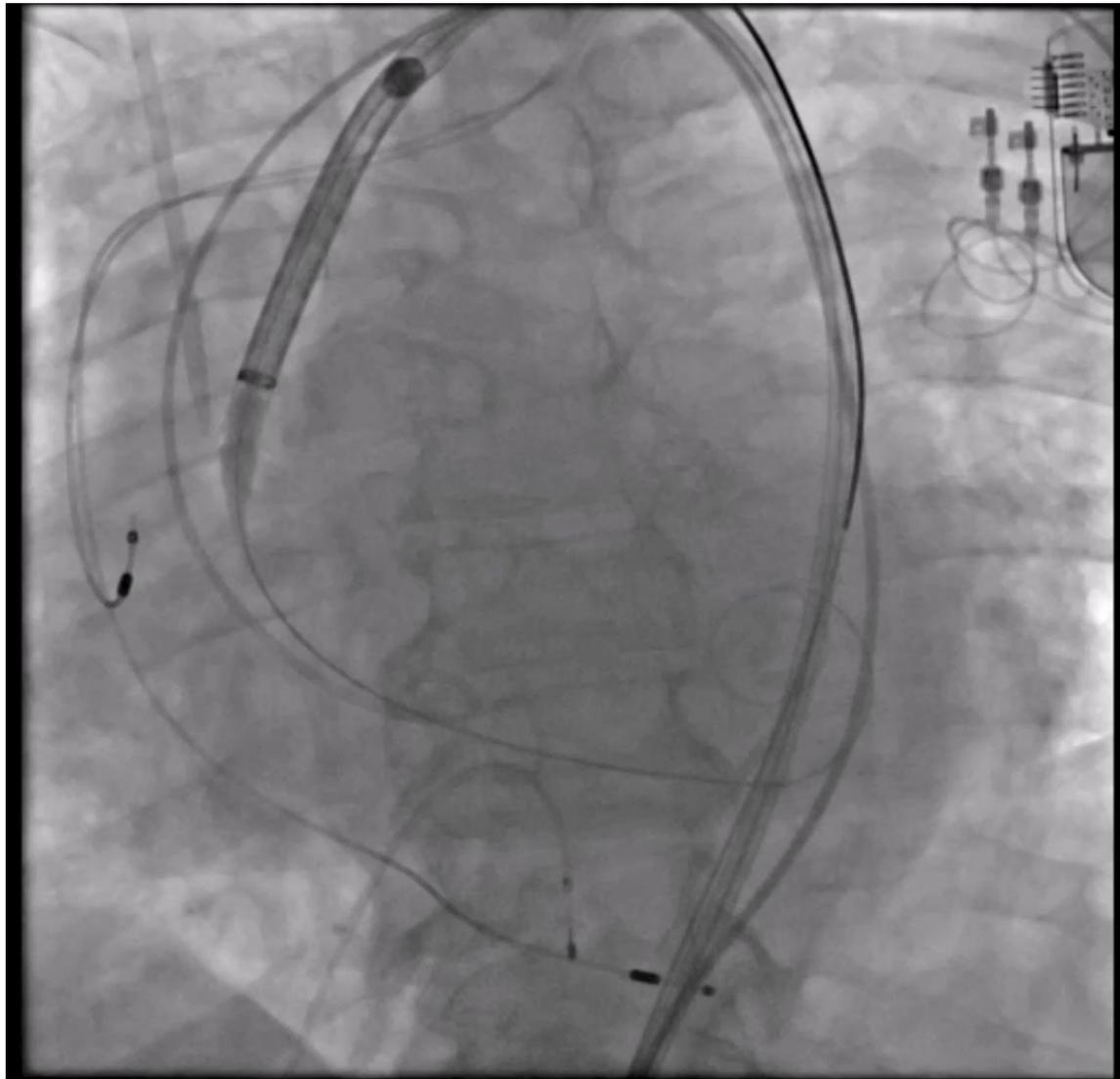
**YEAR 2016**

**YEAR 2019**

CoreValve 34

Pure aortic  
regurgitation

No calcium  
Horizontal  
aorta





ES 3  
implantation in  
pt with  
destrocardia

**YEAR 2016**

# Valve in valve «CoreValve 23» in Magna 21 ECMO assisted Chimney technique



**YEAR 2019**

**One-stop  
double ViV  
ES 3**

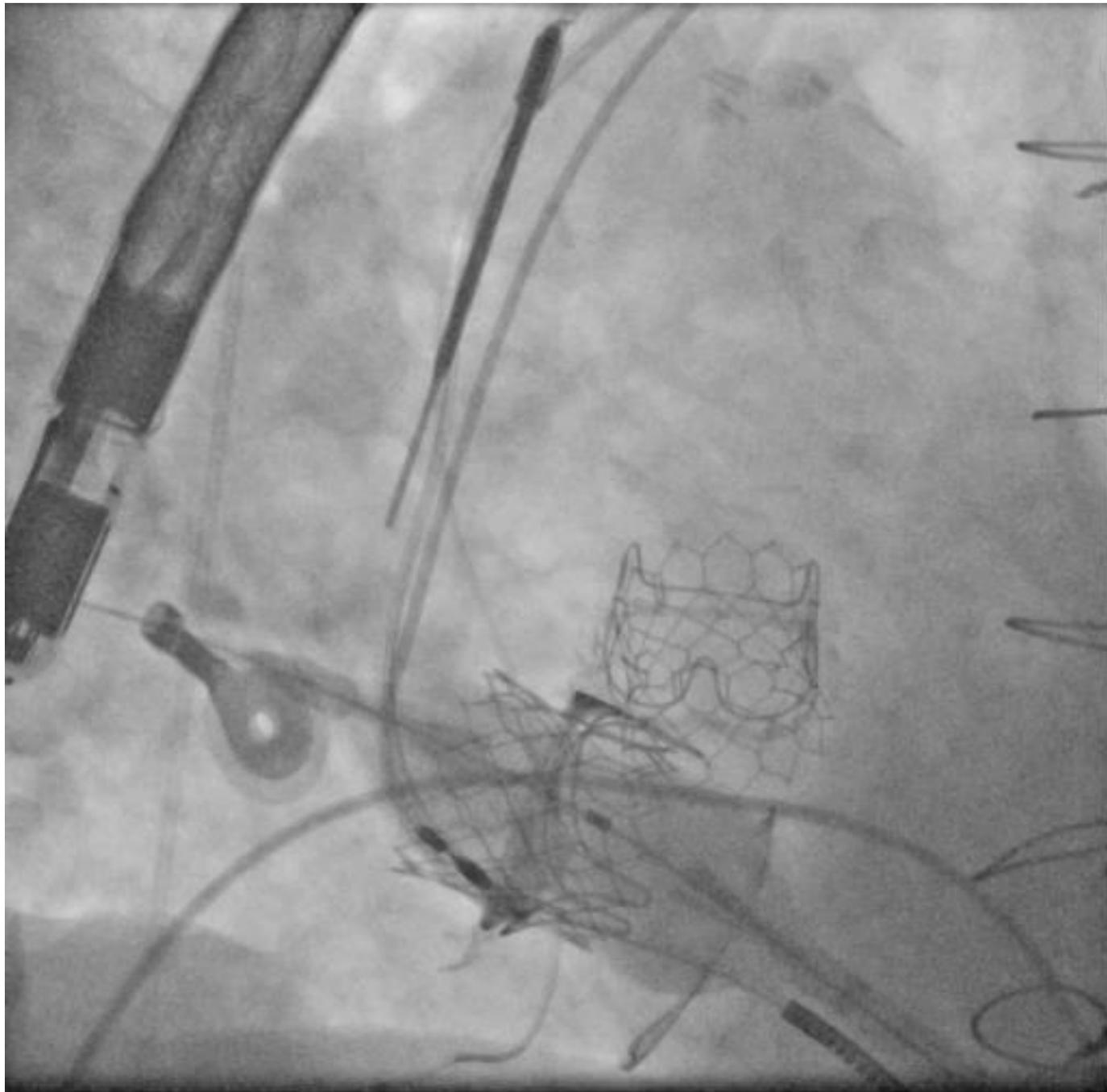
1st mitral ViV



**YEAR 2017**

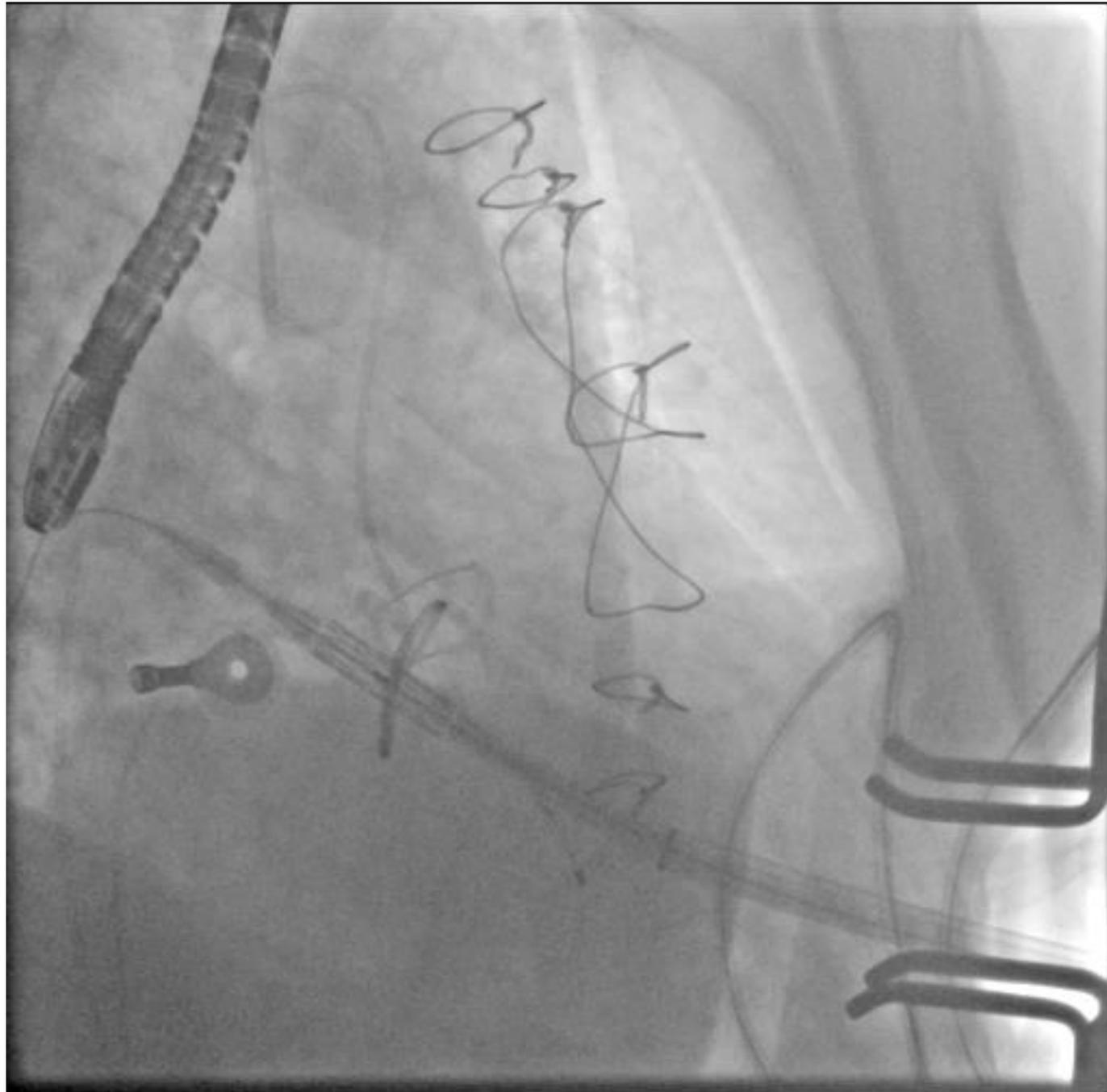
## Double ViV

2° aortic ViV and  
post-dilatation of  
mitral



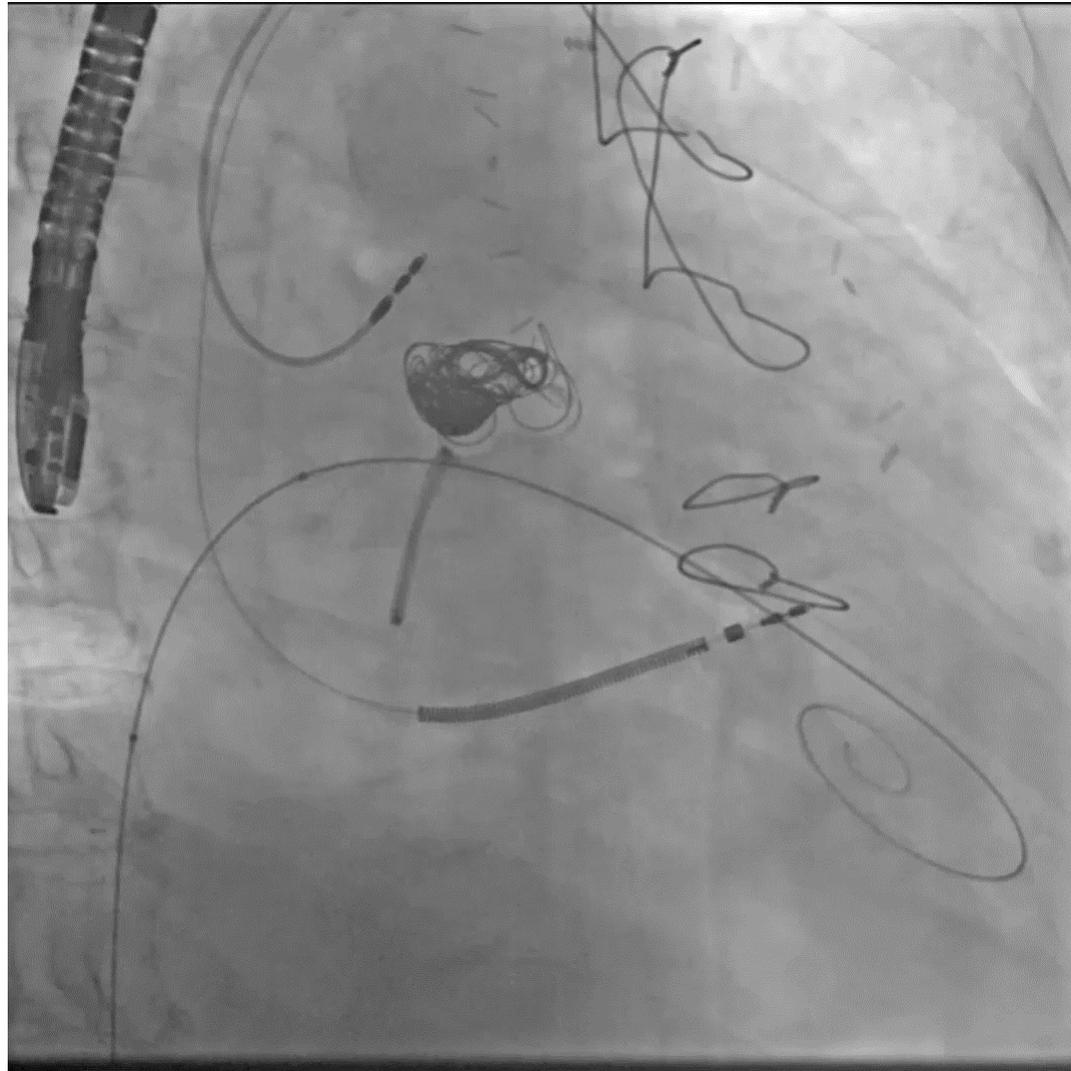
# Transapical mitral Valve in Ring ES3

Carpentier  
Physio 2



**YEAR 2016**

# TRANS-SEPTAL Mitral Valve in Ring (ES3)

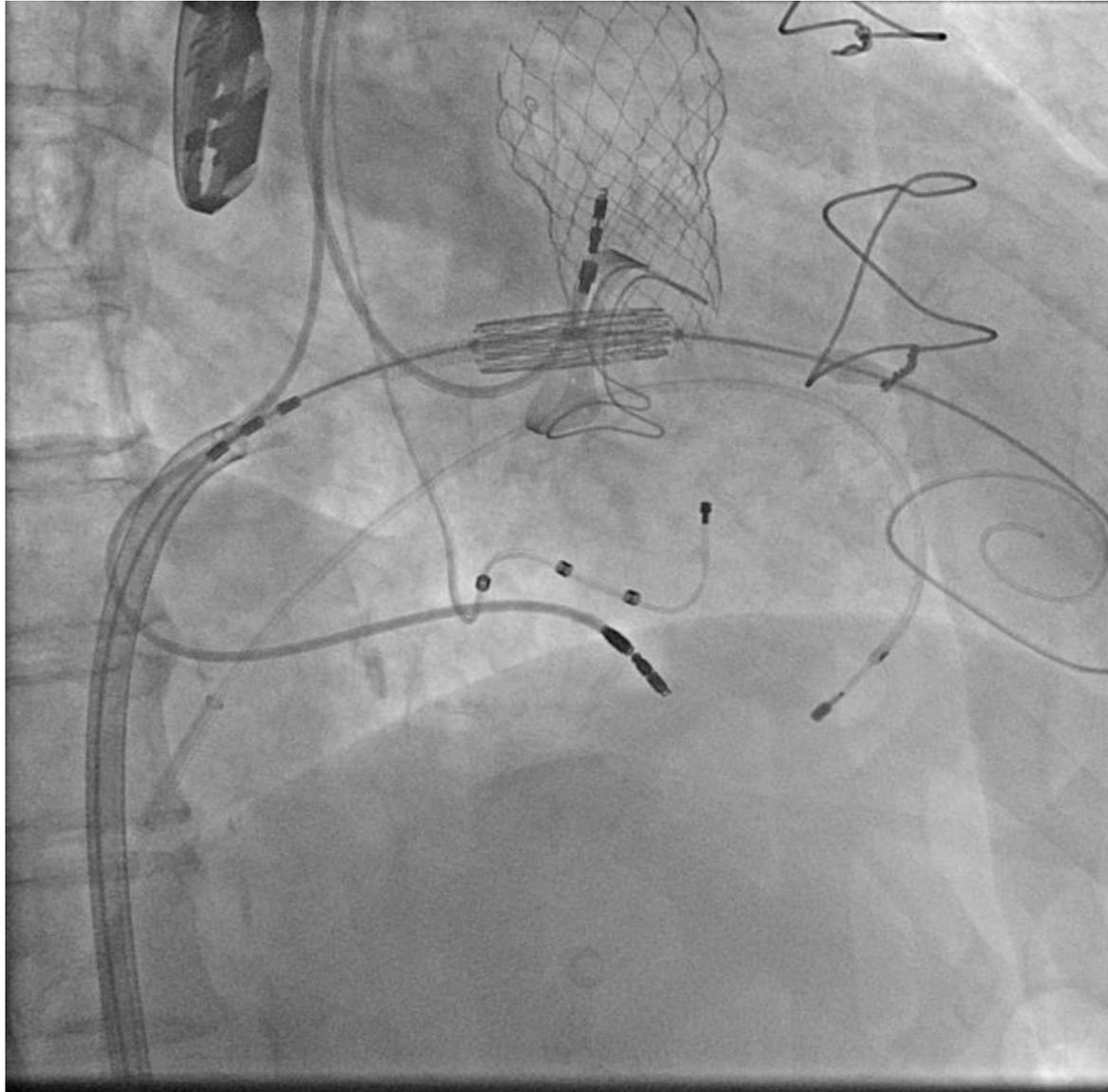


Carpentier Physio 1

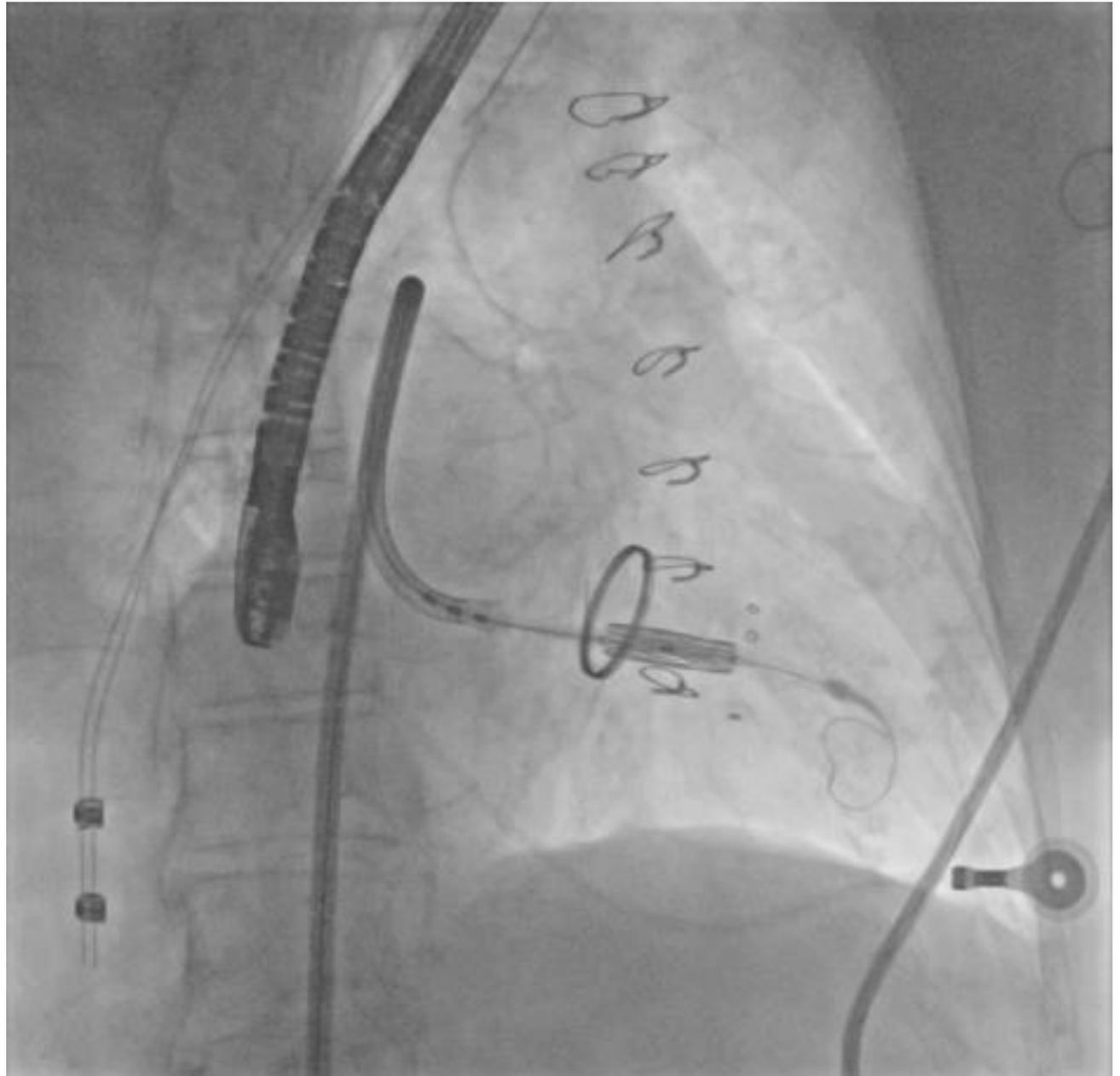
**YEAR 2019**

# TRANSEPTAL Mitral Valve in Valve

- **Double Valve Implantation**
- CoreValve  
+  
• Sapien3 29



**TRICUSPID ViV  
ES3**  
(in MOSAIC 29)



# Pulmonary valve implantation

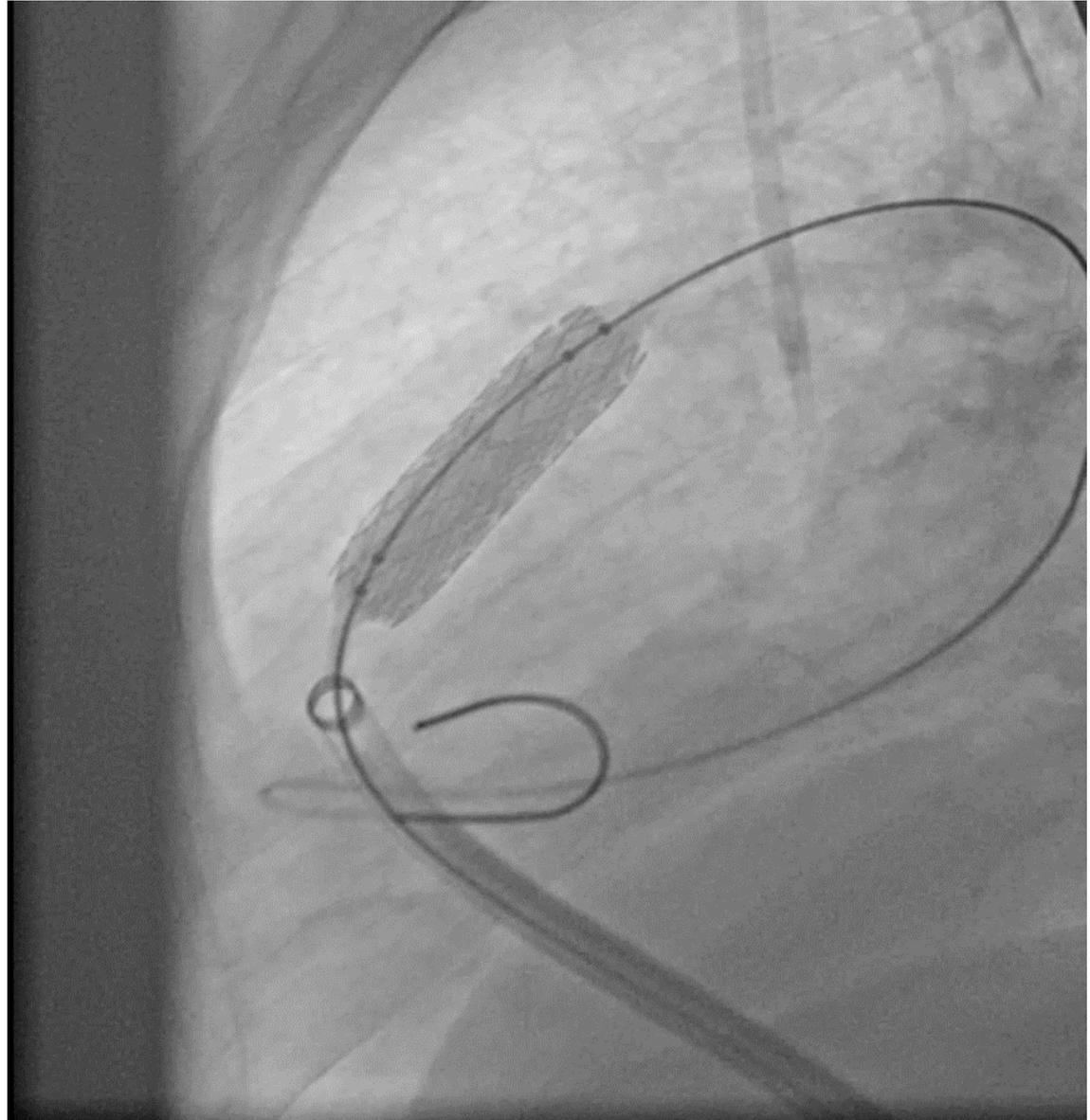
64y  
Pulmonary  
valve stenosis

Crystal balloon  
for sizing 23 x 45

Andrastent 43mm

BiB balloon 24 x 45

SapienXT 26



# UNSOLVED QUESTIONS

- 10-year follow up of both studies will help determine if the benefits of TAVI will be lasting and durability of transcatheter prosthesis
- TAVR is associated with more mild or greater PVLeaks, more new LBBB and a higher incidence of PM requirements: whether these outcomes have adverse long-term effects in low-risk patients (especially in younger population) is unclear.
- Conclusions of these trials are not generalizable to **high-risk anatomies** of (coronaries, anulus and STJ but also femoral-iliac)) and **bicuspid aortic valves** (and dilated aorta)
- Young population (<60y) is still best treated by surgery with very low operative risk
- Asymptomatic severe AS and moderate AS with symptoms of heart failure ???

# 40-yrs history of valves replacements

**STARR ball-cage  
mitralica**

**CORE-VALVE  
aortica**

**MAGNA  
Tricuspidalica +  
valve in valve S3**

