



ÉDITION 2023

1·2·3 FÉVRIER



TAV in TAV : Le futur challenge !

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MARSEILLE·PALAIS DU PHARO





Speaker's name : Bernard Chevalier, Massy

I have the following potential conflicts of interest to report:

Capital: CERC, Colibri

Rare...jusqu'à présent



- BVF=valve related death or reintervention or severe hemodynamic deterioration

- Bioprosthetic valve failure > 5y

Reintervention rate in TAVI cohorts

- Tesla et al 8y 990 pts: 2,5%

133 250 TAVI pts from Medicare

- Sathananthan et al 10 y 235 pts: 2,5%

2012-2017

- Durand et al 7y 1403 pts: 1,9%

0,46% were TAV-in-TAV

- Barbanti et al 8y 286 pts: 4,5%

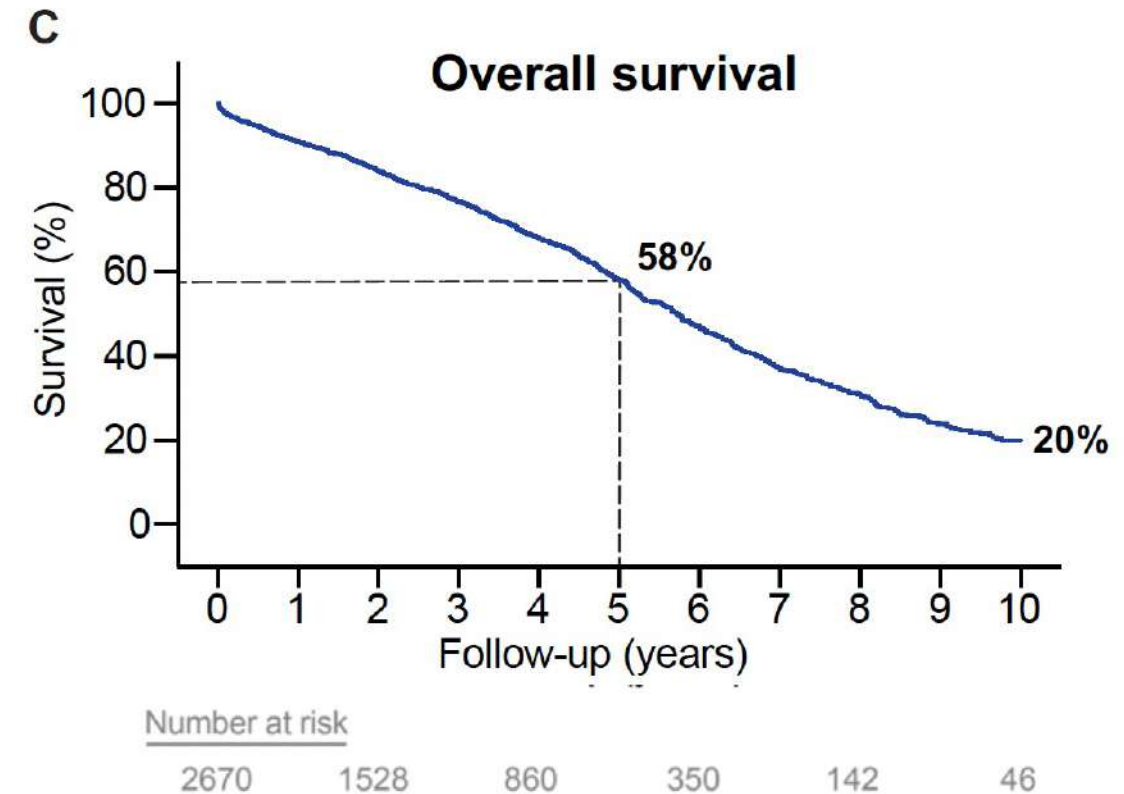
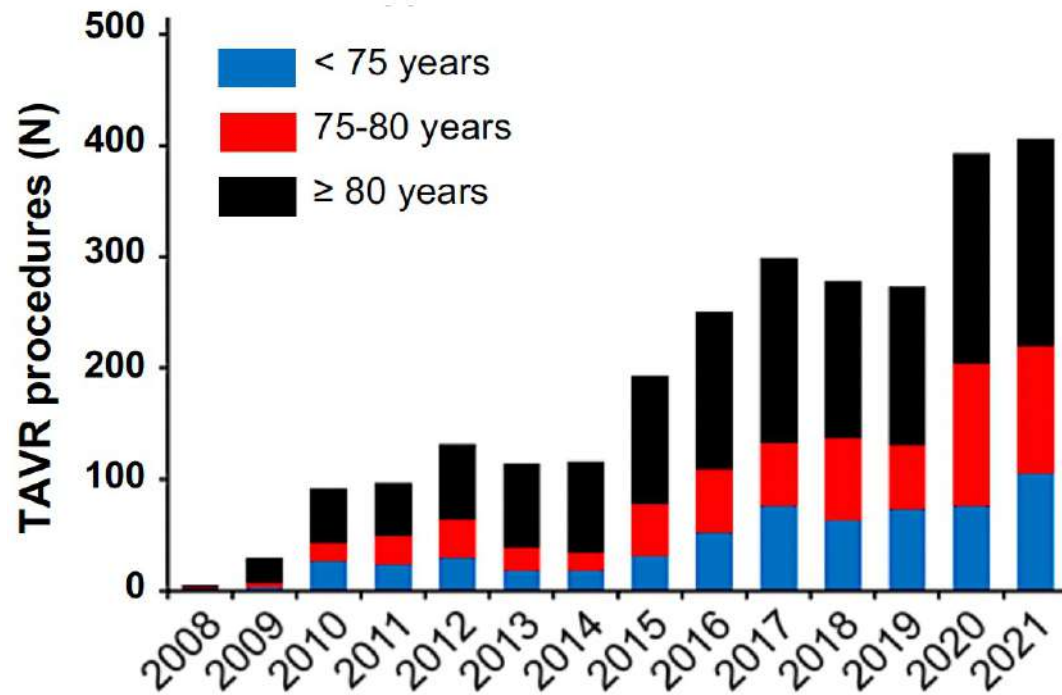
63 876 TAVI pts from Redo-TAVR

2005-2019

0,3% were TAV-in-TAV (excluding bail-out cases)

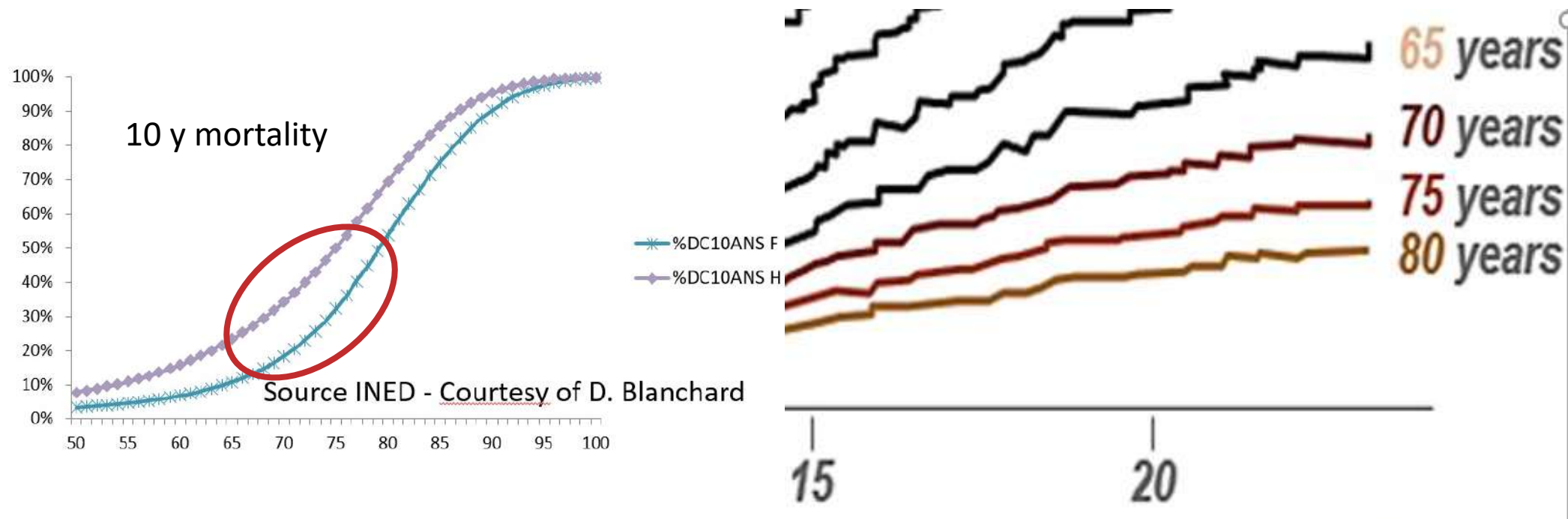
Cofounding factors: Age and risk profile of early TAVI population, 1st gen THV

Mais en future croissance

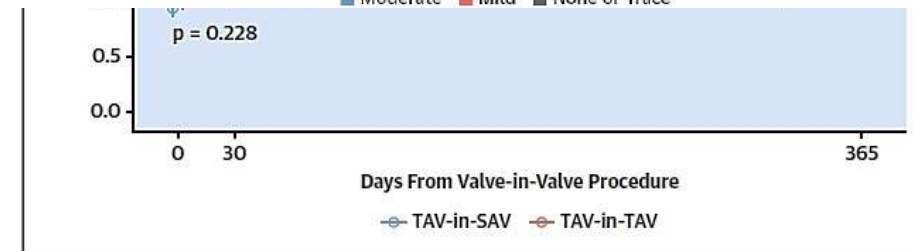
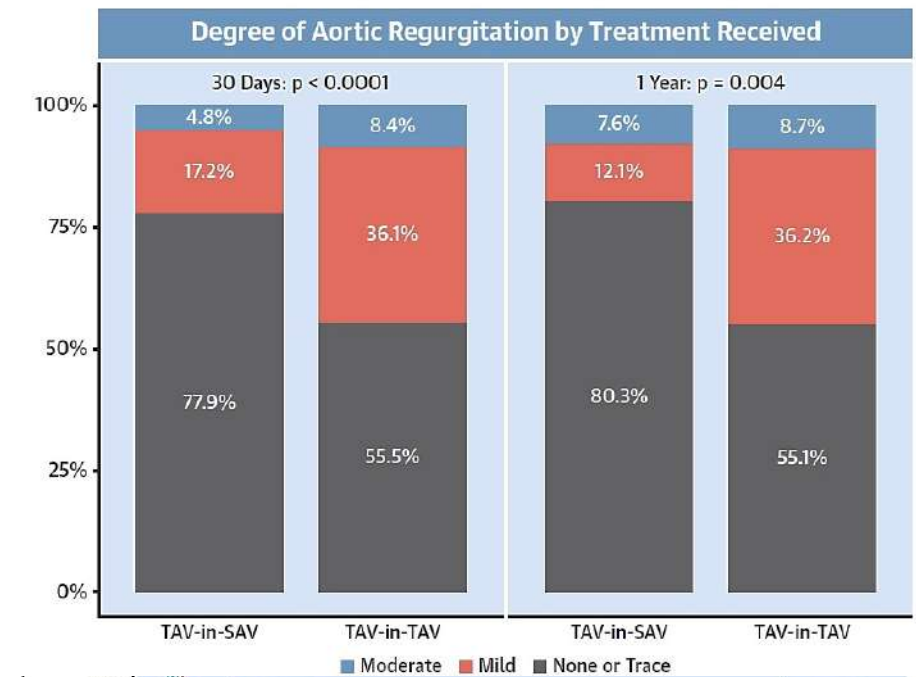
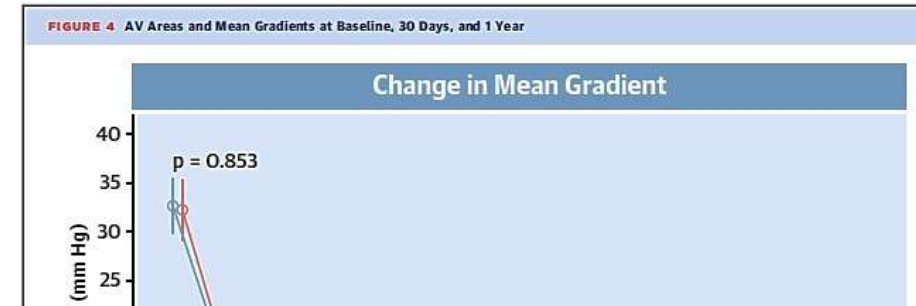
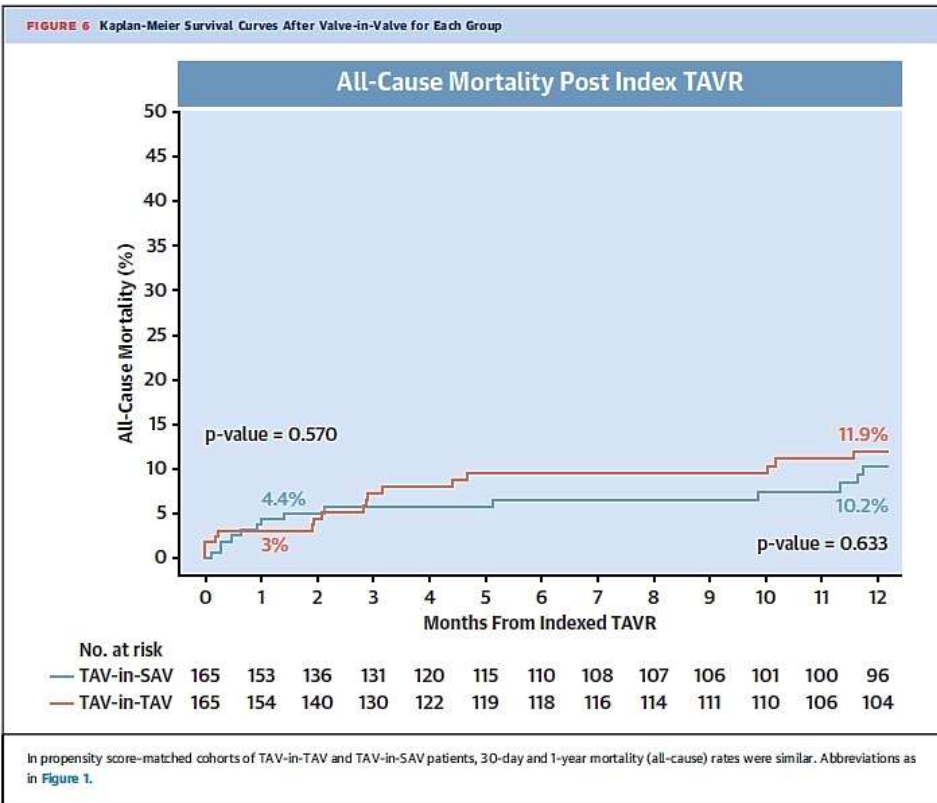




- Life expectancy versus durability expectancy



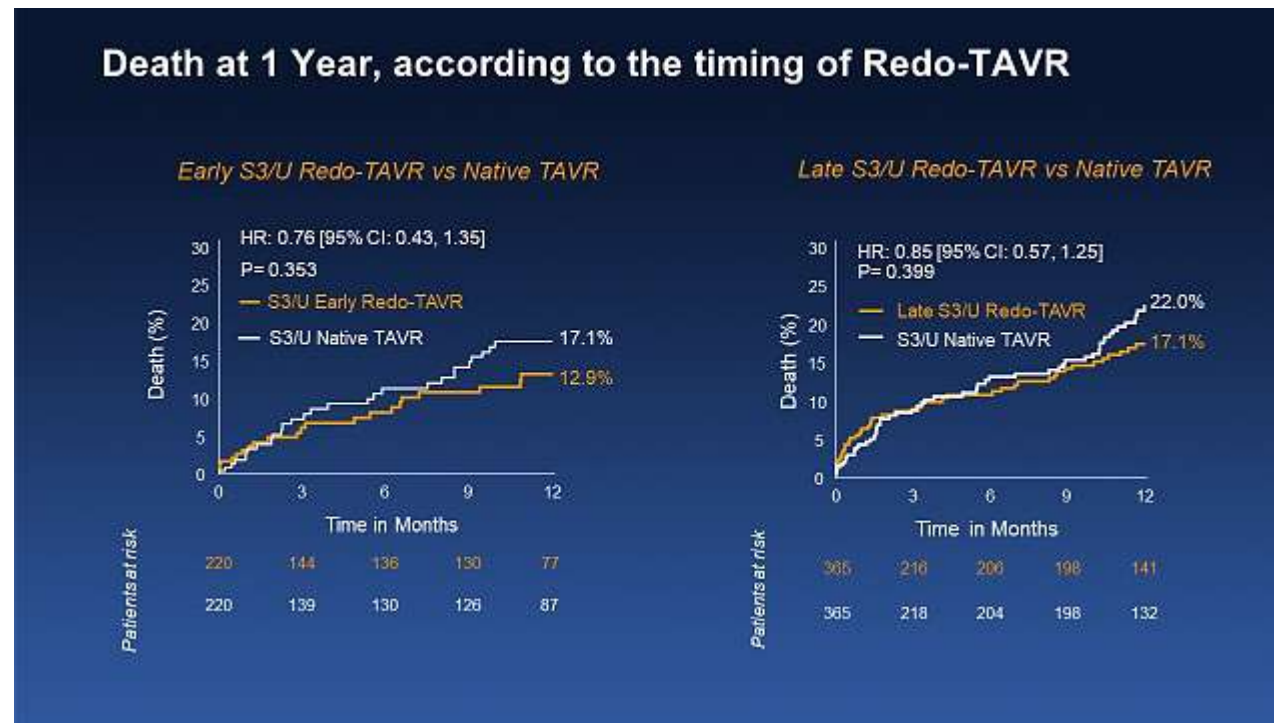
TAV-in-TAV



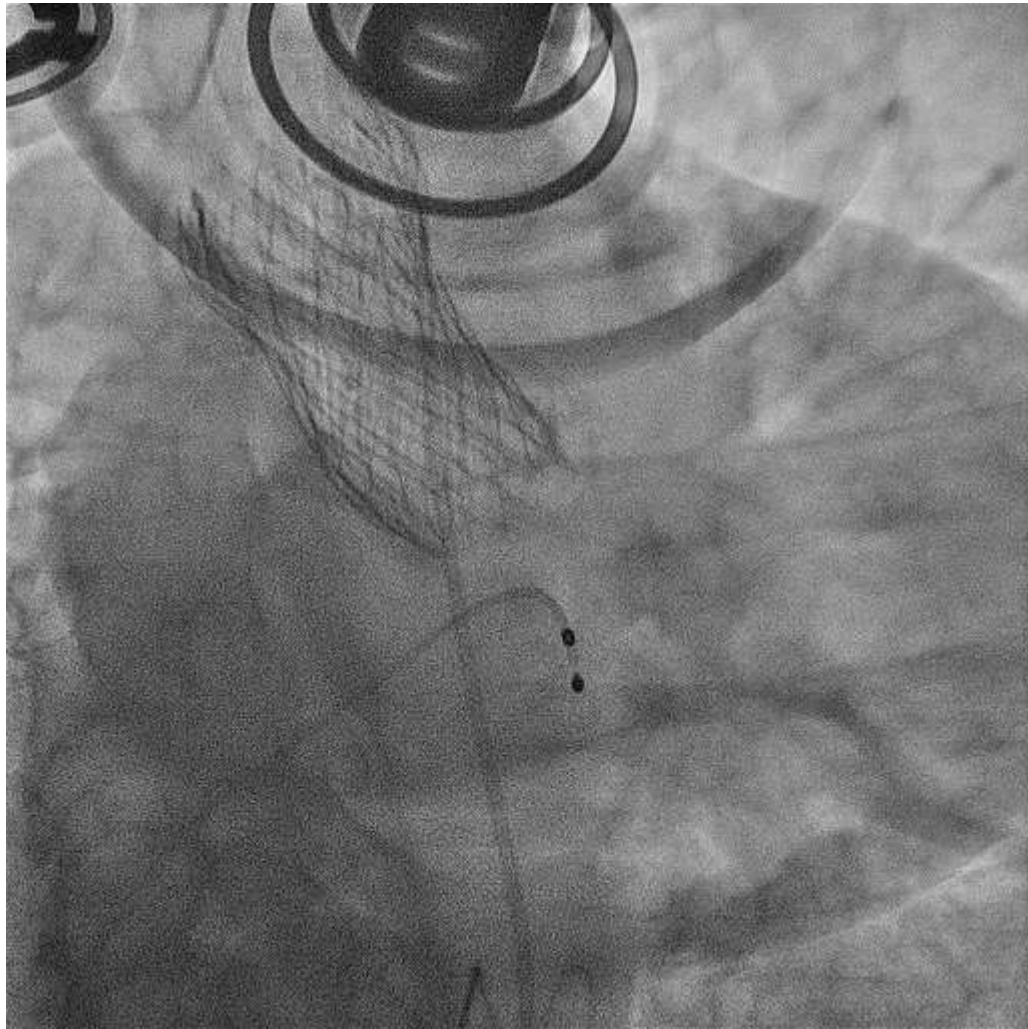
TAV-in-TAV



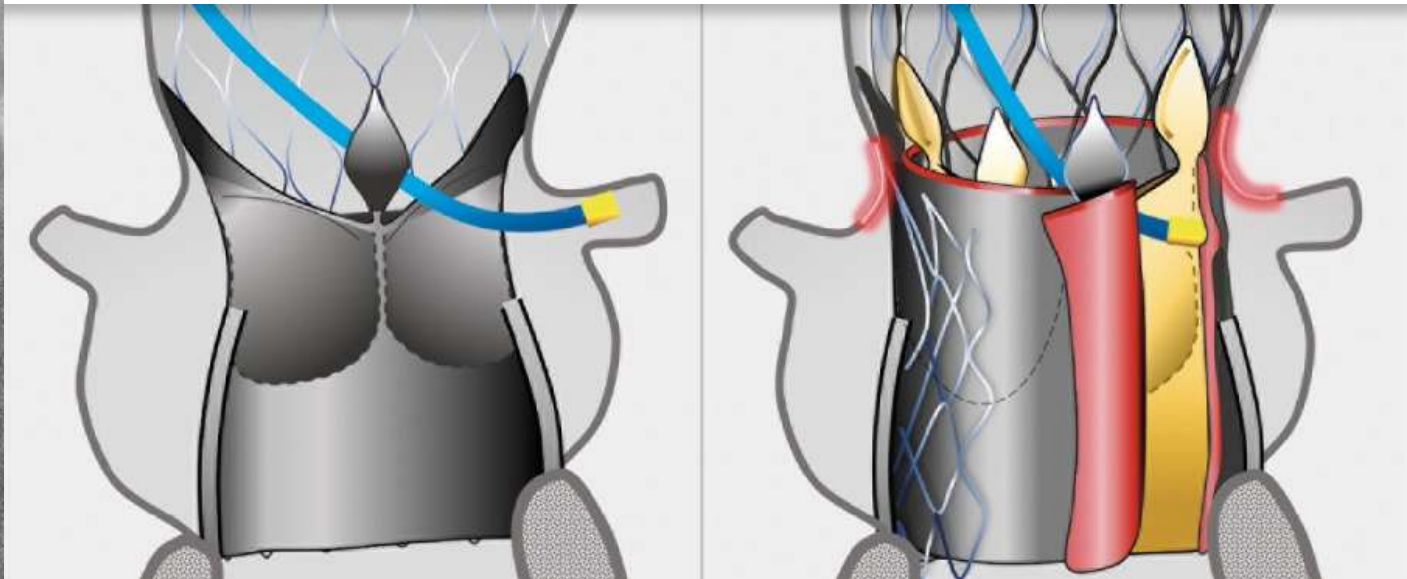
- STS S3/Ultra registry: TAV-in-TAV versus matched de novo TAVI



Interaction avec coronaires



Sequestration des sinus de Valsalva



« Neo-jupe=1° jupe + 1ers feuilletts »

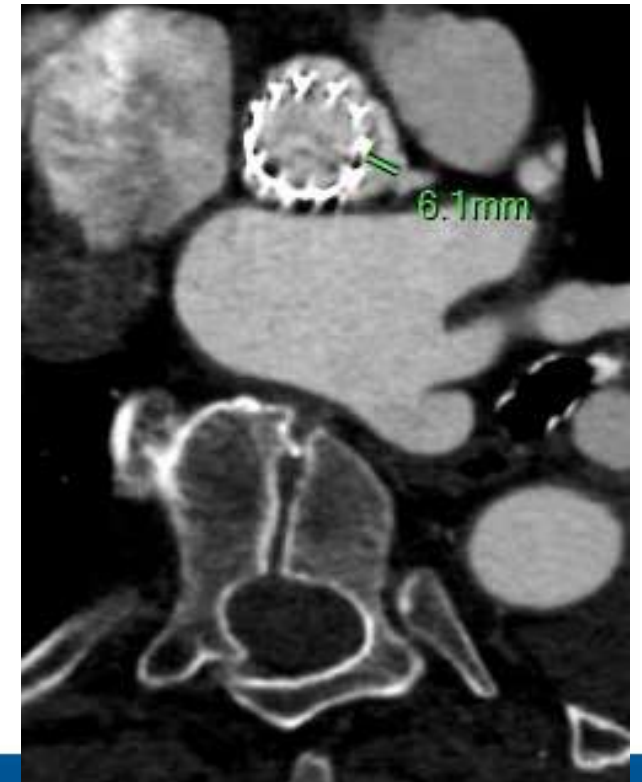
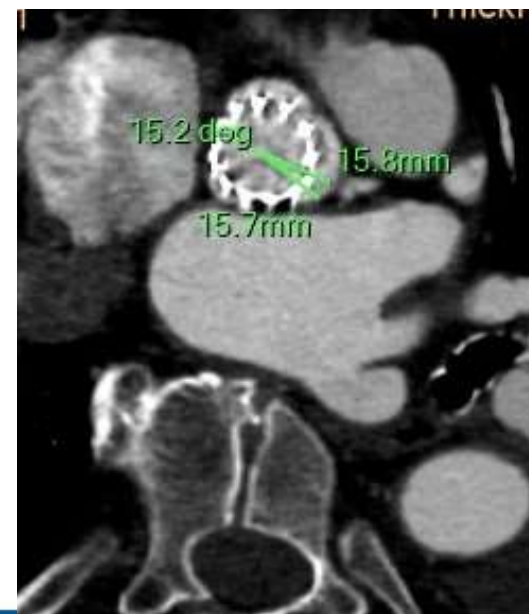
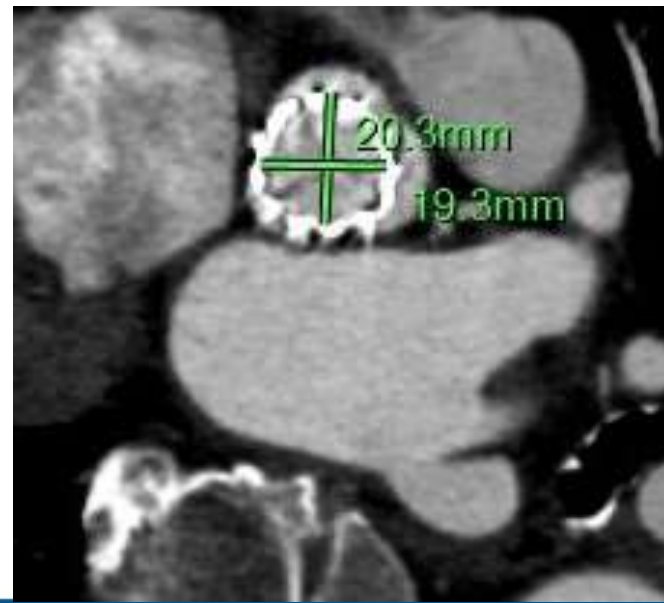
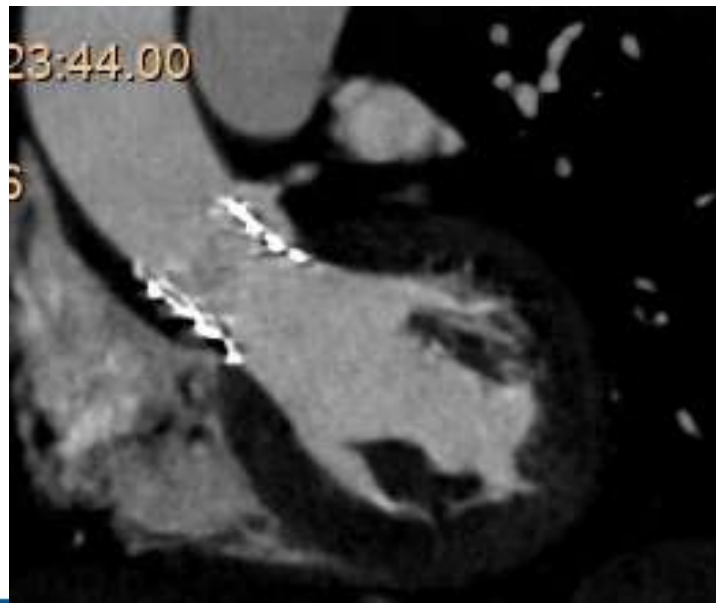
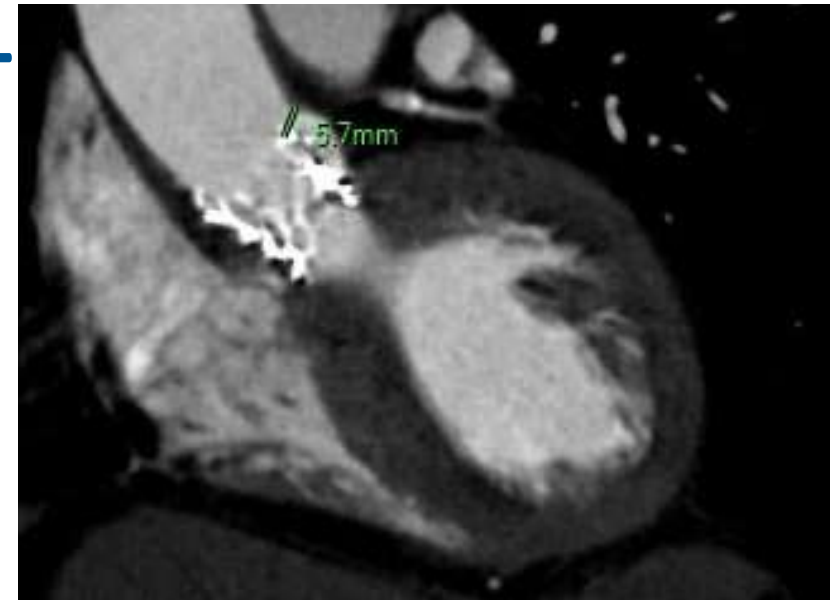
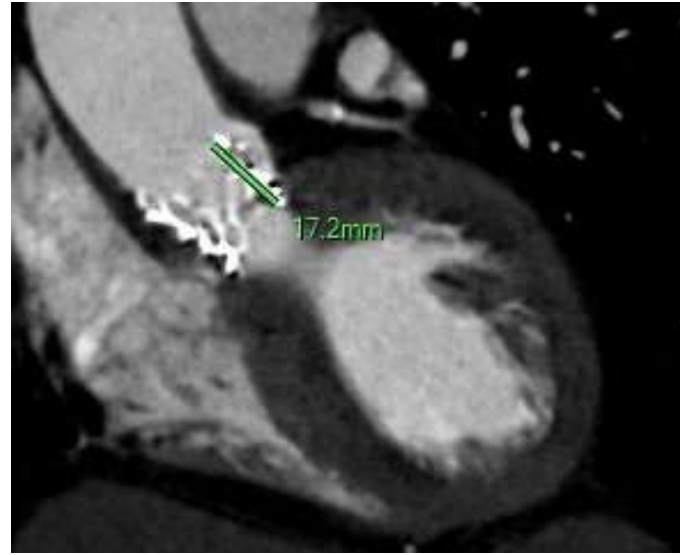
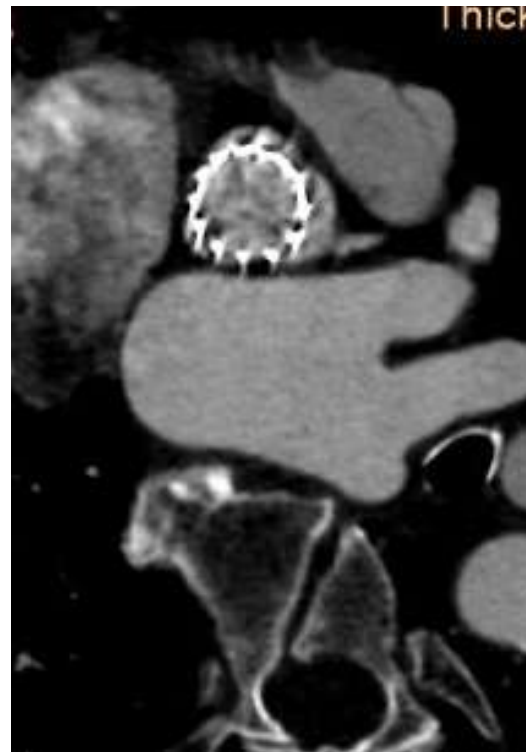
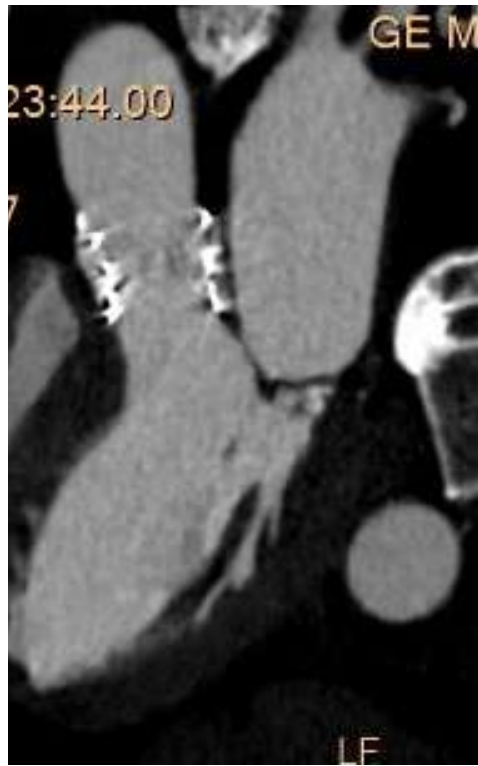
Plan à risque



TABLE 2 The Height of the Neoskirt Created by Various Transcatheter Heart Valve Combination Inside a Sapien XT and Evolut R

Index Valve	Redo Valve	Neoskirt Height (mm)	Index Valve	Redo Valve	Neoskirt Height (mm)	Index Valve	Redo Valve	Neoskirt Height (mm)
23-mm Sapien XT	23-mm S3	16.0	26-mm Sapien XT	26-mm S3	17.4	29-mm Sapien XT	29-mm S3	20.6
	26-mm Evolut R (+4 mm)	20.0		29-mm Evolut R (+4 mm)	22.7			
	26-mm Evolut R (0 mm)	15.4		29-mm Evolut R (0 mm)	18.2			
	26-mm Evolut R (-4 mm)	15.4		29-mm Evolut R (-4 mm)	18.2			
	Small ACURATE (+4 mm)	19.4		Medium ACURATE (+4 mm)	20.7		Large ACURATE (+4 mm)	23.2
	Small ACURATE (0 mm)	15.3		Medium ACURATE (0 mm)	18.0		Large ACURATE (0 mm)	20.3
	Small ACURATE (-4 mm)	15.3		Medium ACURATE (-4 mm)	18.5		Large ACURATE (-4 mm)	20.2
	25-mm Portico (+4 mm)	15.3		29-mm Portico (+4 mm)	18.2			
	25-mm Portico (0 mm)	15.7		29-mm Portico (0 mm)	18.2			
	25-mm Portico (-4 mm)	15.2		29-mm Portico (-4 mm)	18.0			
23-mm Evolut R	20-mm S3 +1 cc (high)	28.0	26-mm Evolut R	23-mm S3 + 1 cc (high)	29.9	29-mm Evolut R	23-mm S3 + 1 cc (high)	27.4
				23-mm S3 (low)	23.5		26-mm S3 (low)	24.5
	23-mm Evolut Pro (+4mm)	26.0		26-mm Evolut Pro (+4 mm)	31.6		29-mm Evolut Pro (+4 mm)	27.3
	23-mm Evolut Pro (0 mm)	22.4		26-mm Evolut Pro (0 mm)	25.4		29-mm Evolut Pro (0 mm)	27.8
	23-mm Evolut Pro (-4 mm)	23.0		26-mm Evolut Pro (-4 mm)	26.8		29-mm Evolut Pro (-4 mm)	26.7

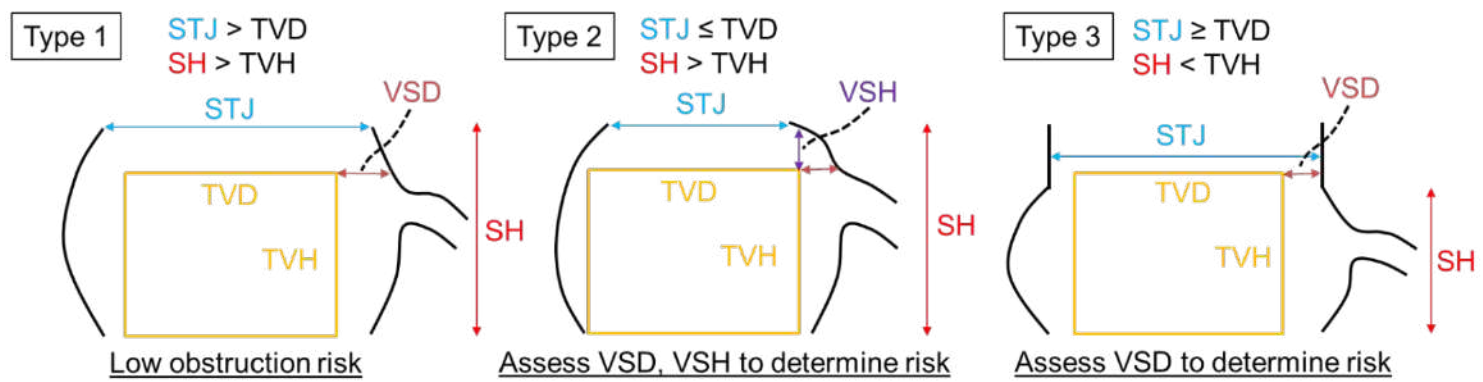
Analyse CT



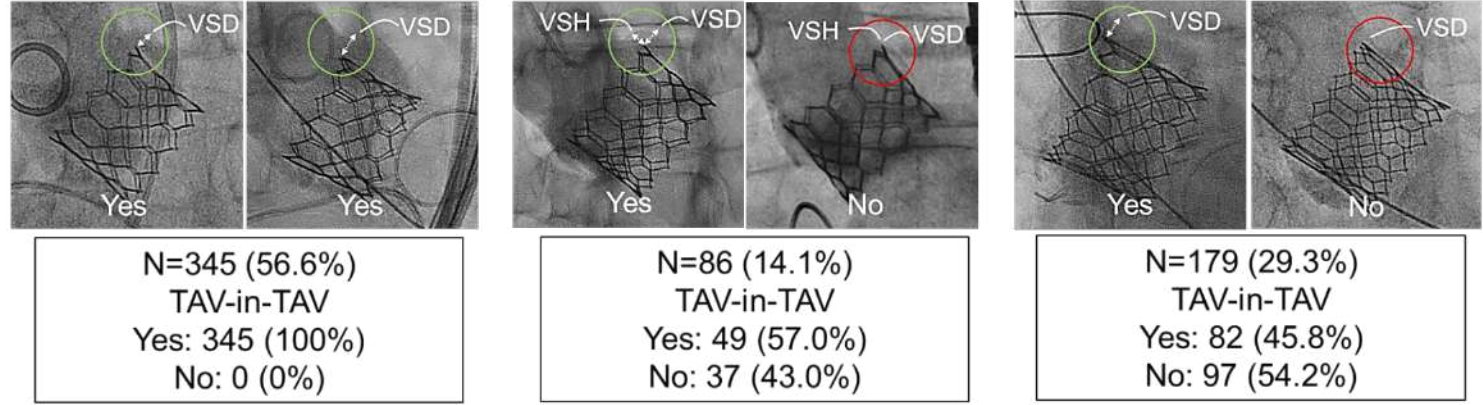
Position de la 1° valve dans la racine



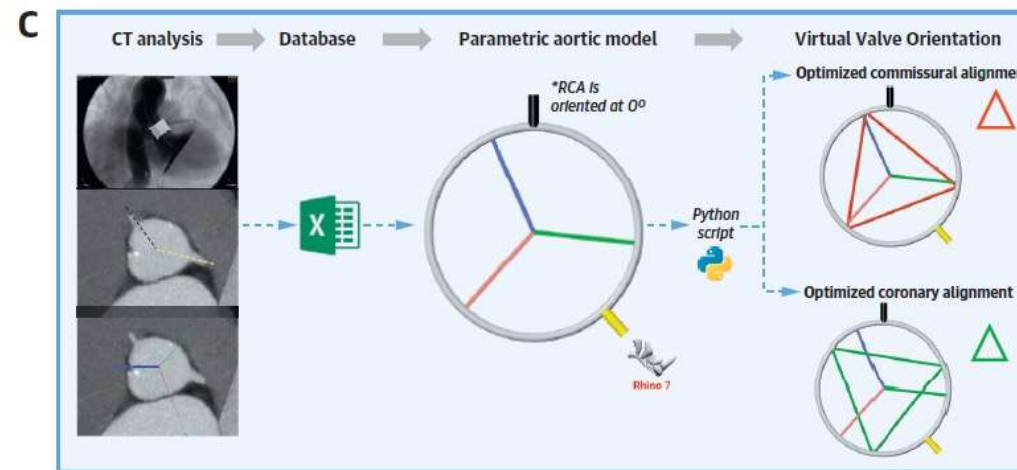
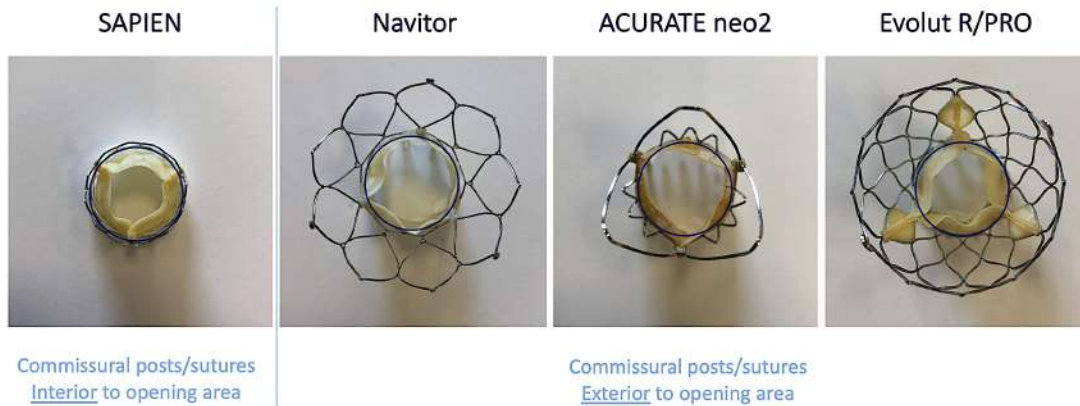
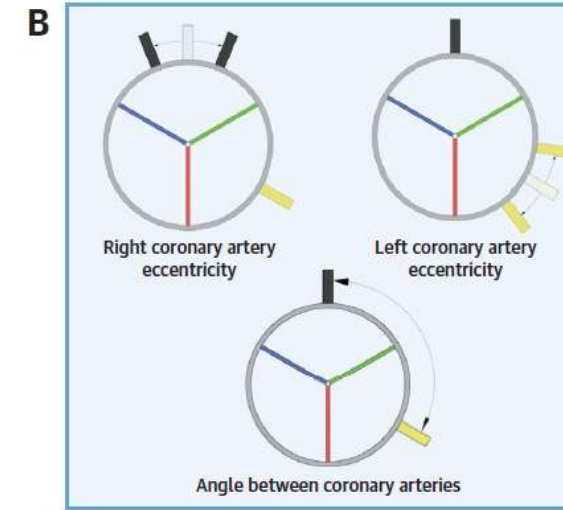
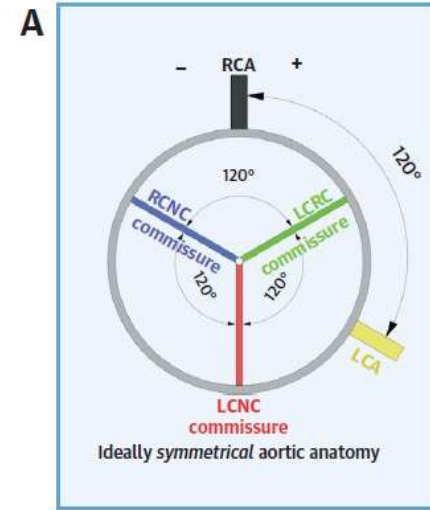
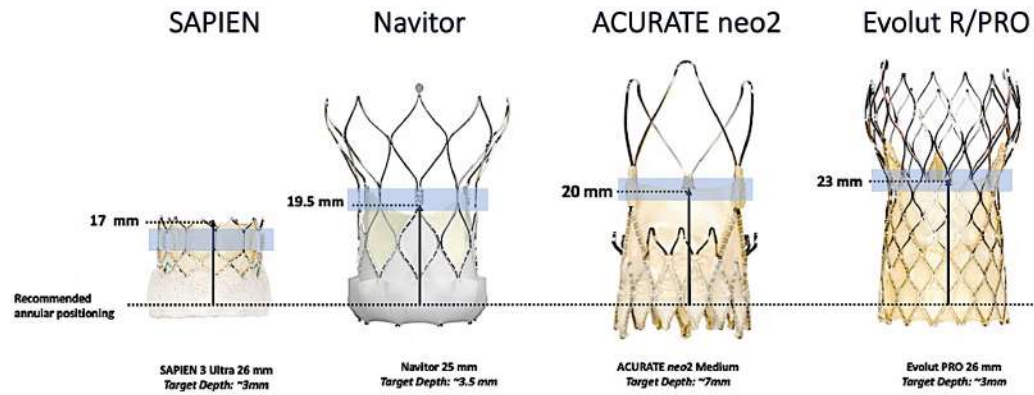
Aortic Root Anatomy Classification on TAV-in-TAV Feasibility



Feasibility of TAV-in-TAV in terms of left-main obstruction risk



Situation des commissures/ostia



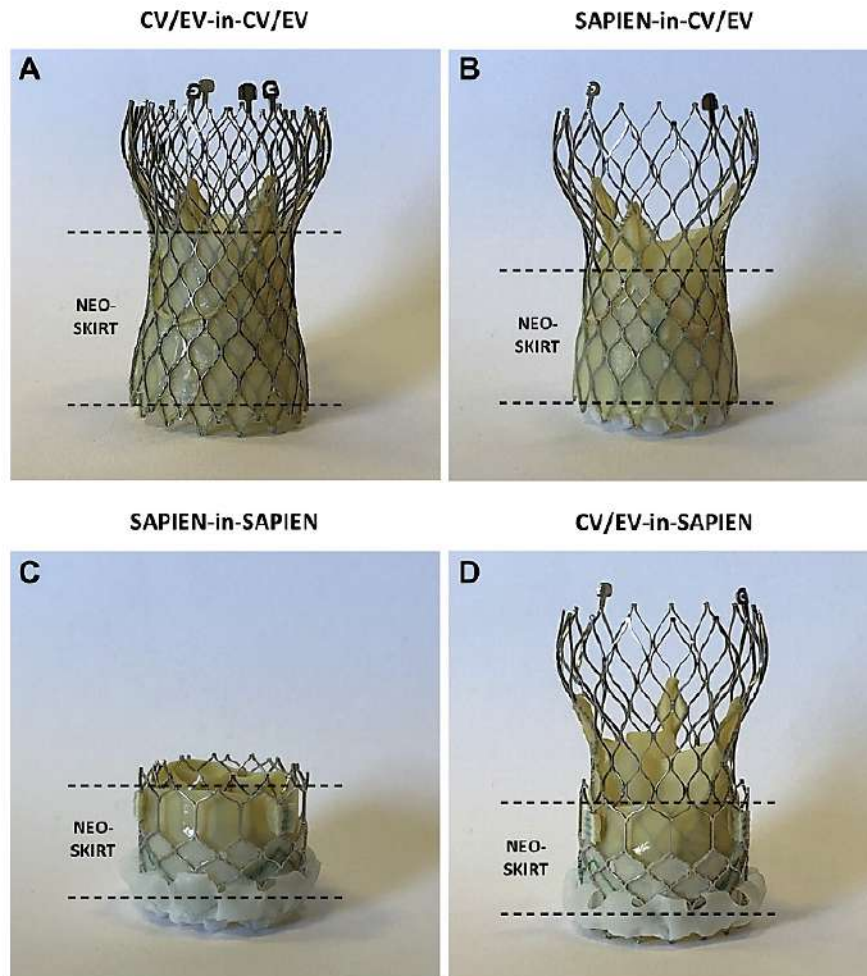
Faisabilité: classification de Tang



Type of aortic root anatomy and THV 1	Coronary access after redo TAVI	Feasibility of coronary re-access after redo TAVI	
Type 1 $CH \geq TVH 1$ 	Type 1A $CH \geq TVH 2$ Access above THV 2 	✓	
	Type 1B $CH < TVH 2$ Access across THV 2 	Type 1B ALIGN Coronary-commissure angle $> 20^\circ$ 	Type 1B MISALIGN Coronary-commissure angle $\leq 20^\circ$
Type 2 $CH < TVH 1$ 	Type 2A $CH \geq TVH 2$ Access across THV 1 	Type 2A ALIGN Coronary-commissure angle $> 20^\circ$ 	Type 2A MISALIGN Coronary-commissure angle $\leq 20^\circ$
	Type 2B $CH < TVH 2$ Access outside THV 1 	Type 2B + VTSTJ ≥ 2 mm 	Type 2B + VTSTJ < 2 mm

Figure 1. Proposed classification on the assessment of feasibility of coronary re-access after redo TAVI. Green panels suggest that coronary re-access would be highly feasible while red panels suggest that it would probably be unfeasible. CH: coronary height; THV: transcatheter heart valve; TVH: transcatheter valve leaflet height; VTSTJ: valve-to-sinonubular-junction height

Dépend du choix de la 1^o valve



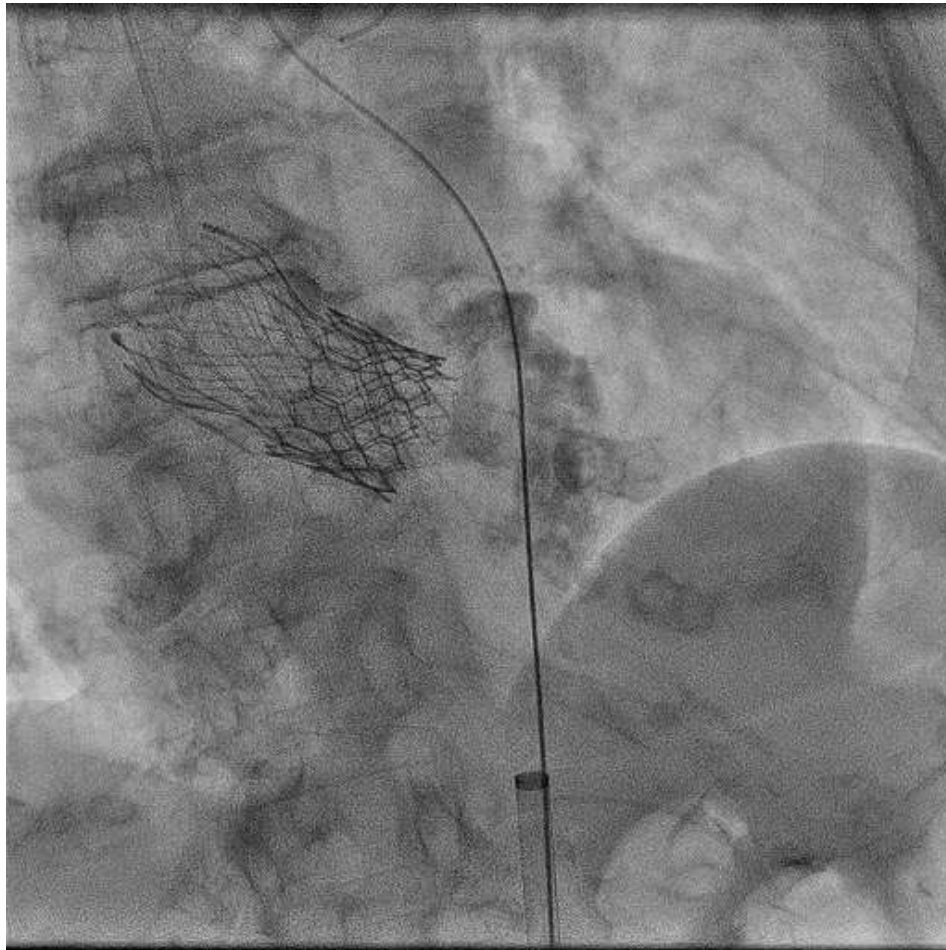
MDCT-identified features of unfavorable coronary access after TAVR-in-TAVR

- (1) Coronary ostium below the top of the neo-skirt
- (2) Distance THV-to-aortic wall < 3 mm* --- if coronary ostium below the top of the neo-skirt
- (3) Distance between stent struts at 'crossing zone' above the neo-skirt < 3 mm*

Incidence of different degrees of unfavorable coronary access after TAVR-in-TAVR

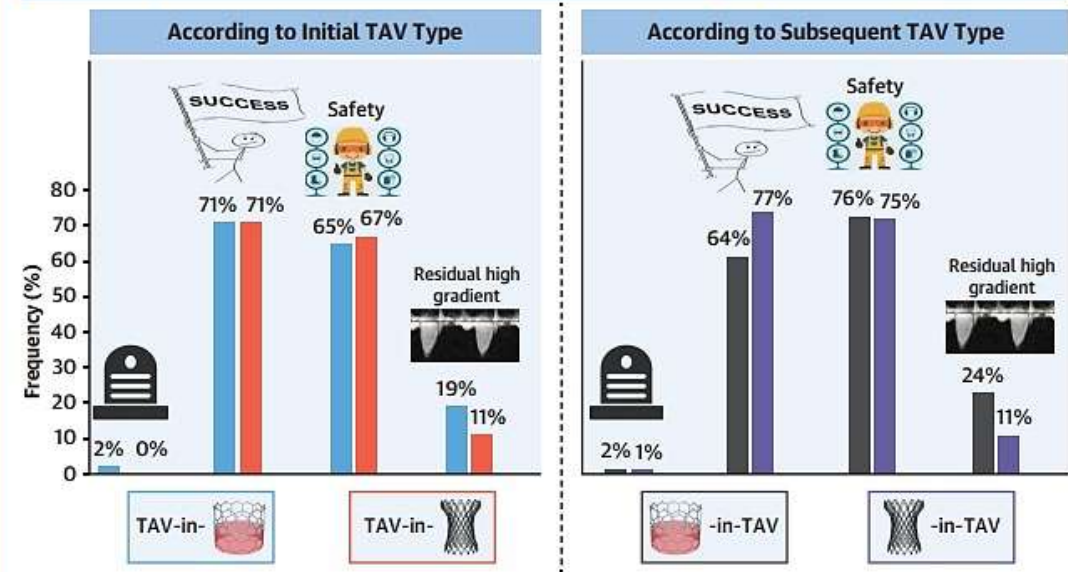
	First THV		p Value
	CV/EV (n = 60)	SAPIEN (n = 30)	
No anticipated interference	5 (8%)	10 (33%)	0.003
At least two interfering factors	39 (65%)	5 (17%)	< 0.001
Impossible coronary access (* < 2 mm)	16 (27%)	3 (10%)	0.069

Role du choix de la 2^o valve



CENTRAL ILLUSTRATION Redo Transcatheter Aortic Valve Replacement Outcomes According to Initial and Subsequent Transcatheter Aortic Valve Type: Balloon Expandable vs Self-Expanding

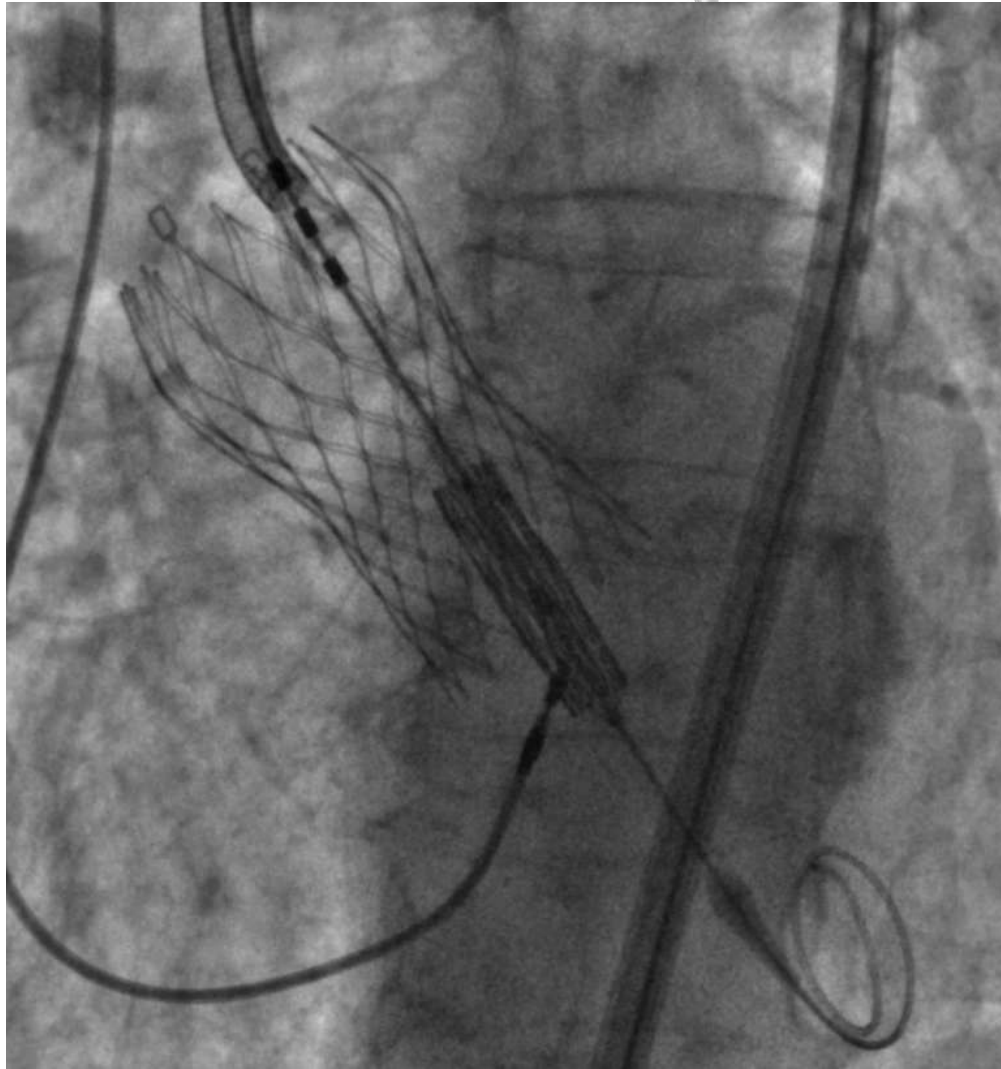
30-Day Outcome of TAV-in-TAV From the Redo-TAVR Registry 2008-2021; N = 221



Landes U, et al. J Am Coll Cardiol Intv. 2022;15(15):1543-1554.

It appears that in a selected group of patients, there was no major difference in redo transcatheter aortic valve replacement (TAVR) outcomes between patients presenting with failed self-expanding transcatheter aortic valves (STAVs) and those presenting with failed balloon-expandable transcatheter aortic valves. Using an sTAV for redo TAVR was associated with lower residual gradients and higher procedural success while maintaining similar safety and mortality at 30 days. These findings should be regarded as hypothesis generating, and further study is desirable. Device success was a composite of freedom from all-cause mortality, freedom from intervention related to the device or to a major vascular or cardiac structural complication (coronary obstruction, annular rupture, or cardiac tamponade), mean gradient < 20 mm Hg, and less than moderate aortic regurgitation. Procedural safety was a composite of freedom from all-cause mortality, all stroke, major bleeding, major vascular complication or cardiac structural complication, acute kidney injury, moderate or severe aortic regurgitation, new permanent pacemaker, surgery or intervention related to the device, and mortality.

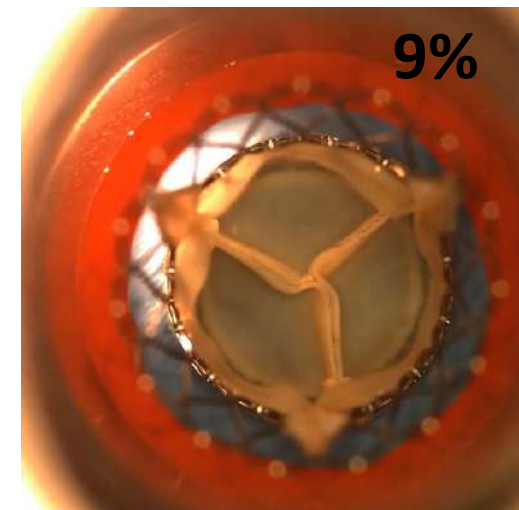
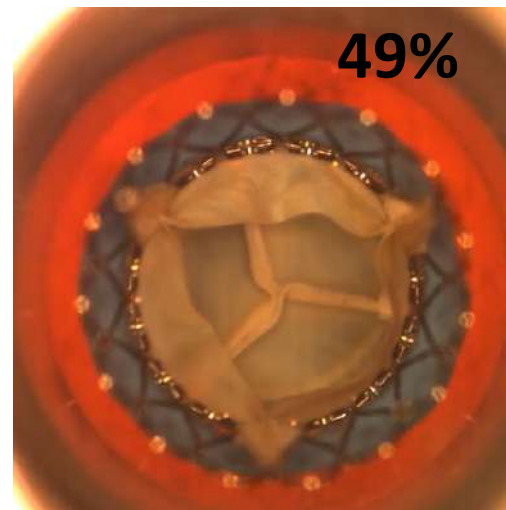
Position de la S3 si Evolut/Acurate



S3 Outflow at Node 5

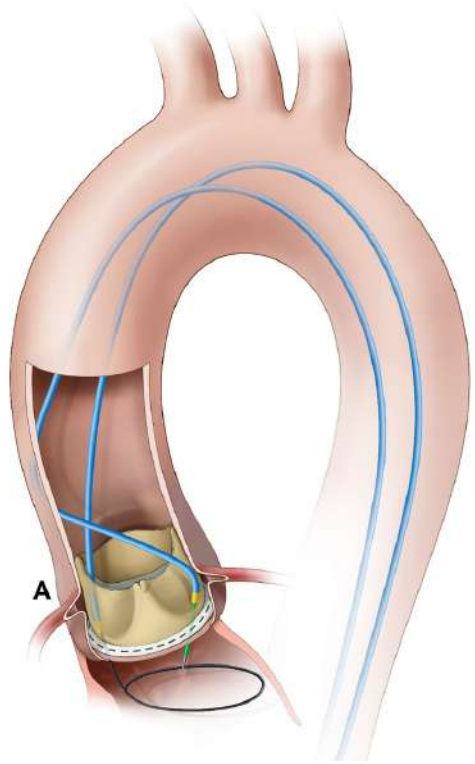


S3 Outflow at Node 6

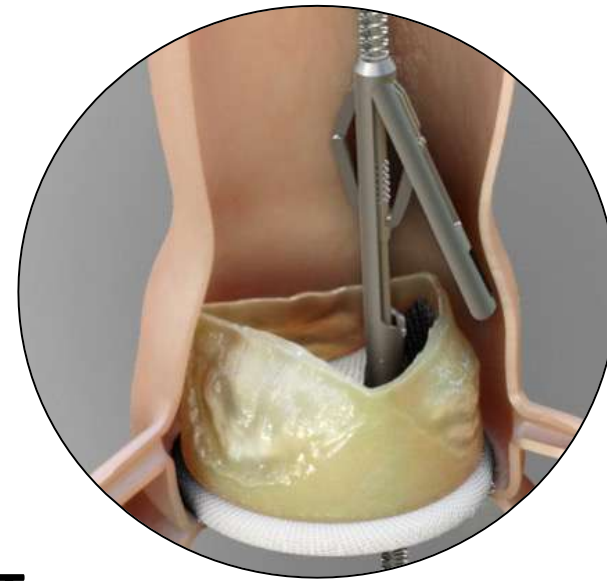
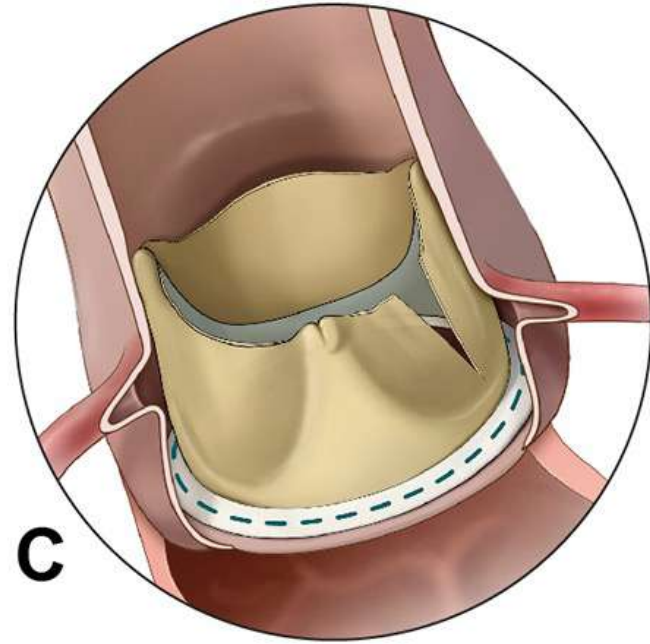
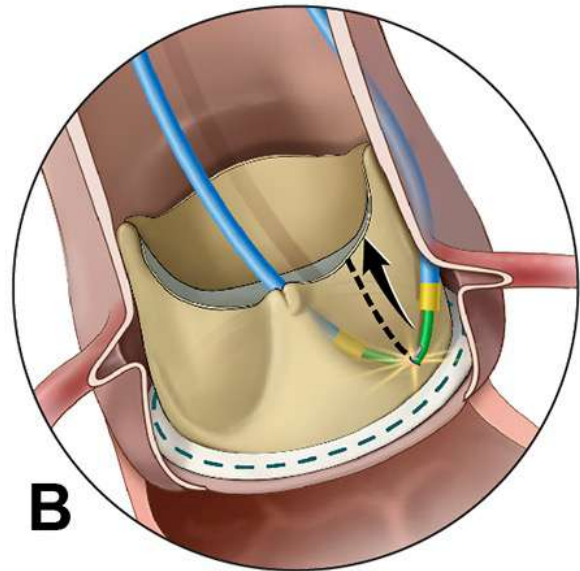


Leaflet overhang: 81%

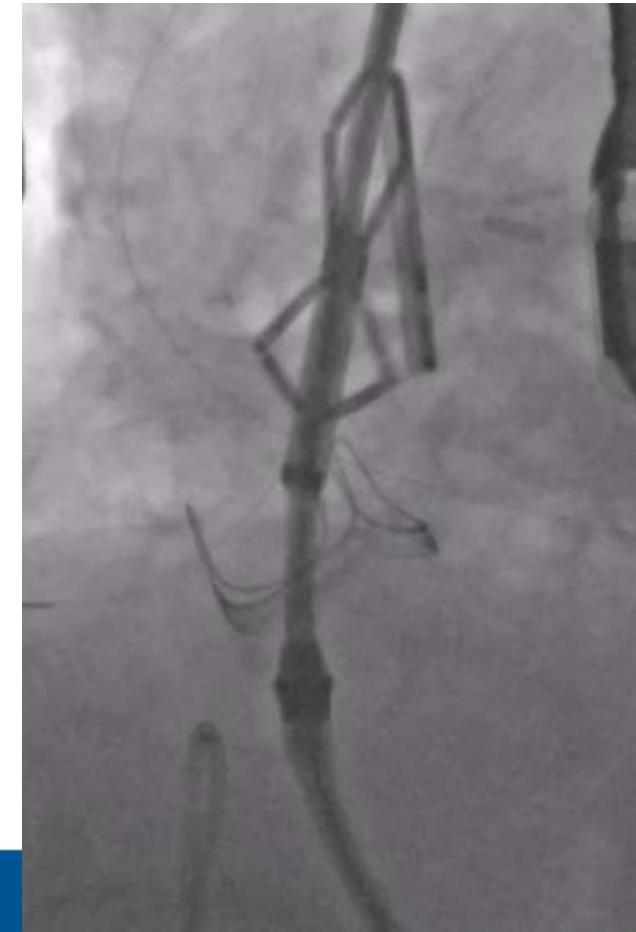
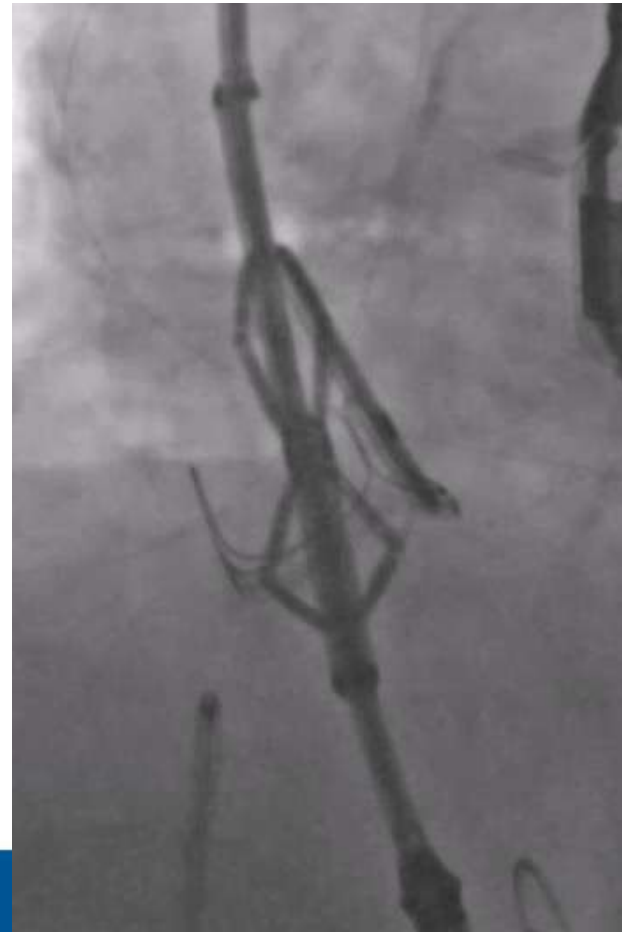
Laceration



BASILICA



SHORTCUT



Et la chirurgie?



EXPLANT Registry

Surgical EXPLANTation After TAVR Failure: The EXPLANT-TAVR International Registry
42 Centers, 269 Patients

Index TAVR Procedure

2009 - 2020



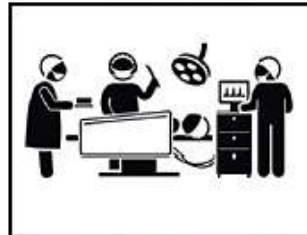
Median Time:
11.5 months
(interquartile
range 4 - 32)

50.9% Balloon-Expandable
49.1% Self-Expanding / Mechanically Expandable



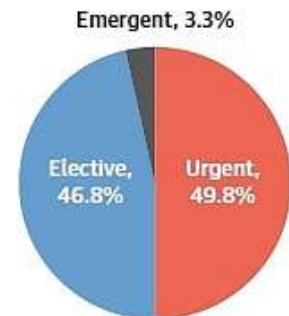
Surgical Explantation

2009 - 2020

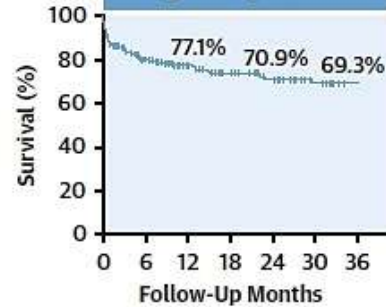


Median Follow-up:
6.7 months
(interquartile
range 1 - 19)

86.6% Aortic Valve Replacement
13.4% Root Replacement

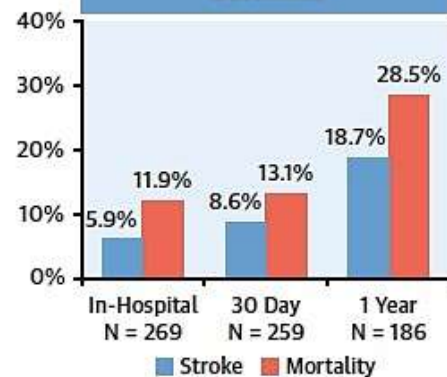


Overall Survival After Surgical Explantation

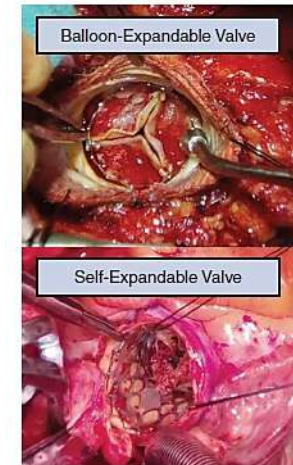


No. at risk:
259 135 90 67 55 43 35

Outcomes



1683 TAVR-Explants from 10 Studies

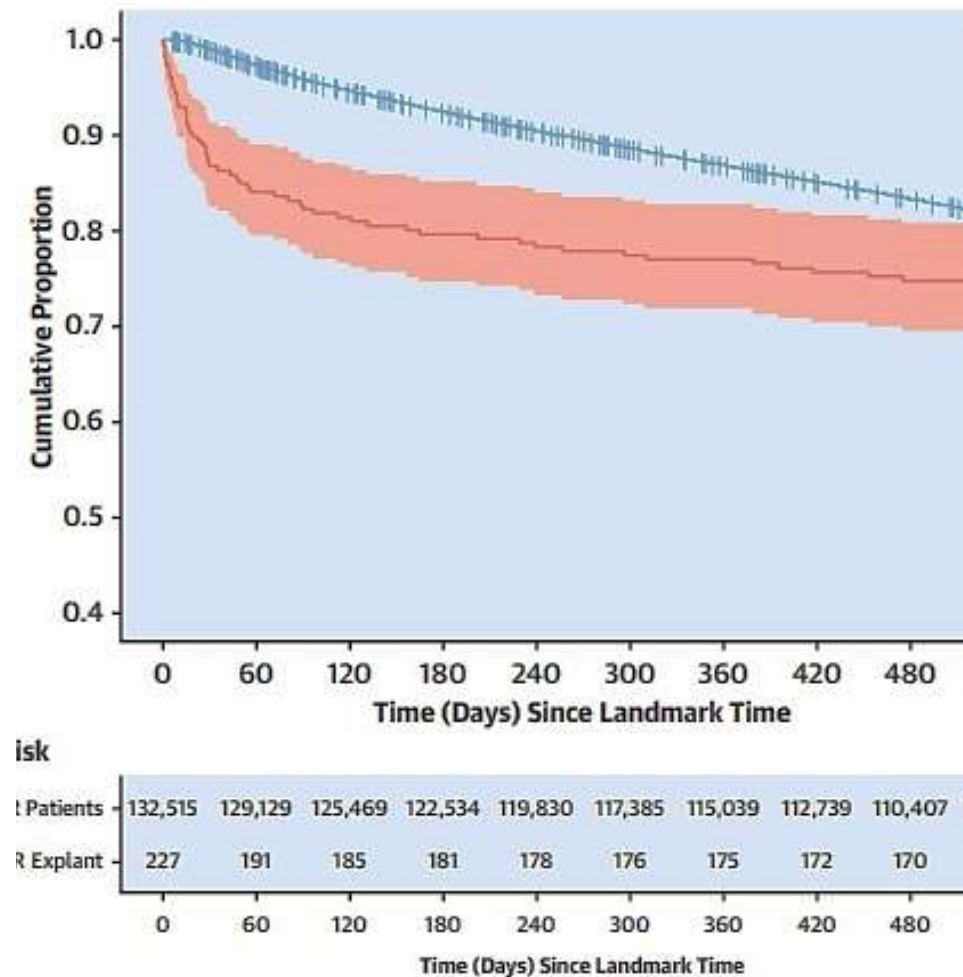


TAVR-Explant Frequency: 0.4%
Interval from Implant to Explant: 345 days
Balloon-Expandable Device: 60%
Self-Expandable Device: 40%
Concomitant Procedure Rate: 53%
Aortic Repair Rate: 29%
30-Day Mortality: 16.7%

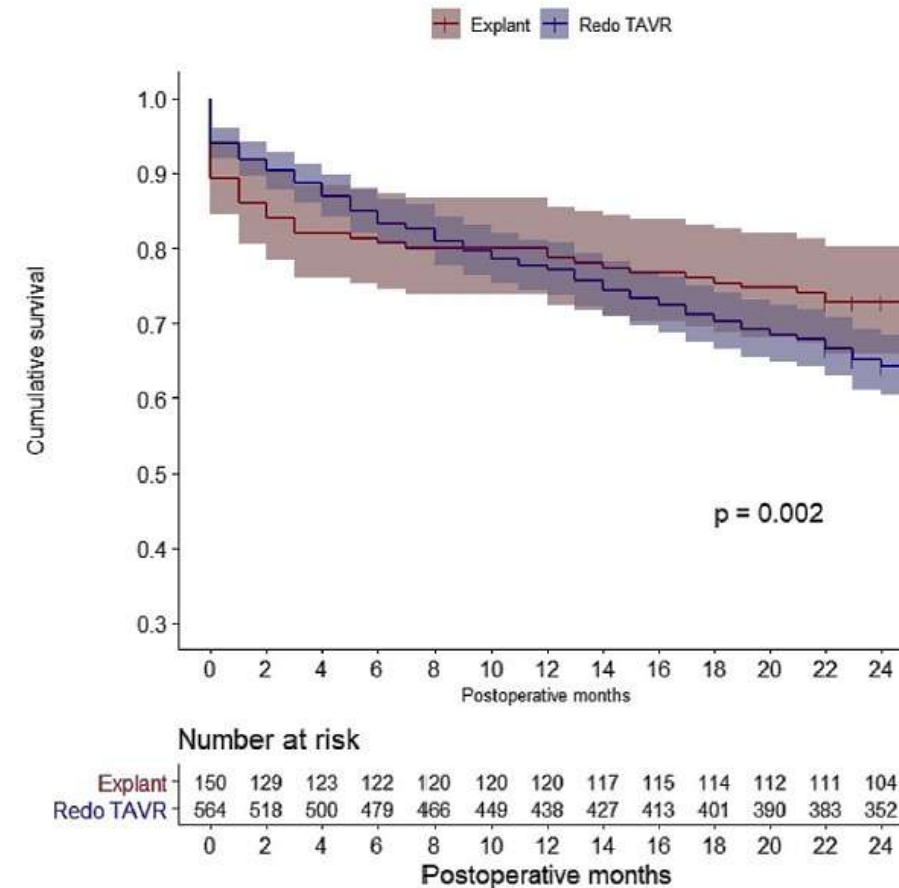
Aortic root repair	18.8 (7.9-29.7)	1521
SVD	27.7 (4.8-50.5)	1501

SAV-in-TAV

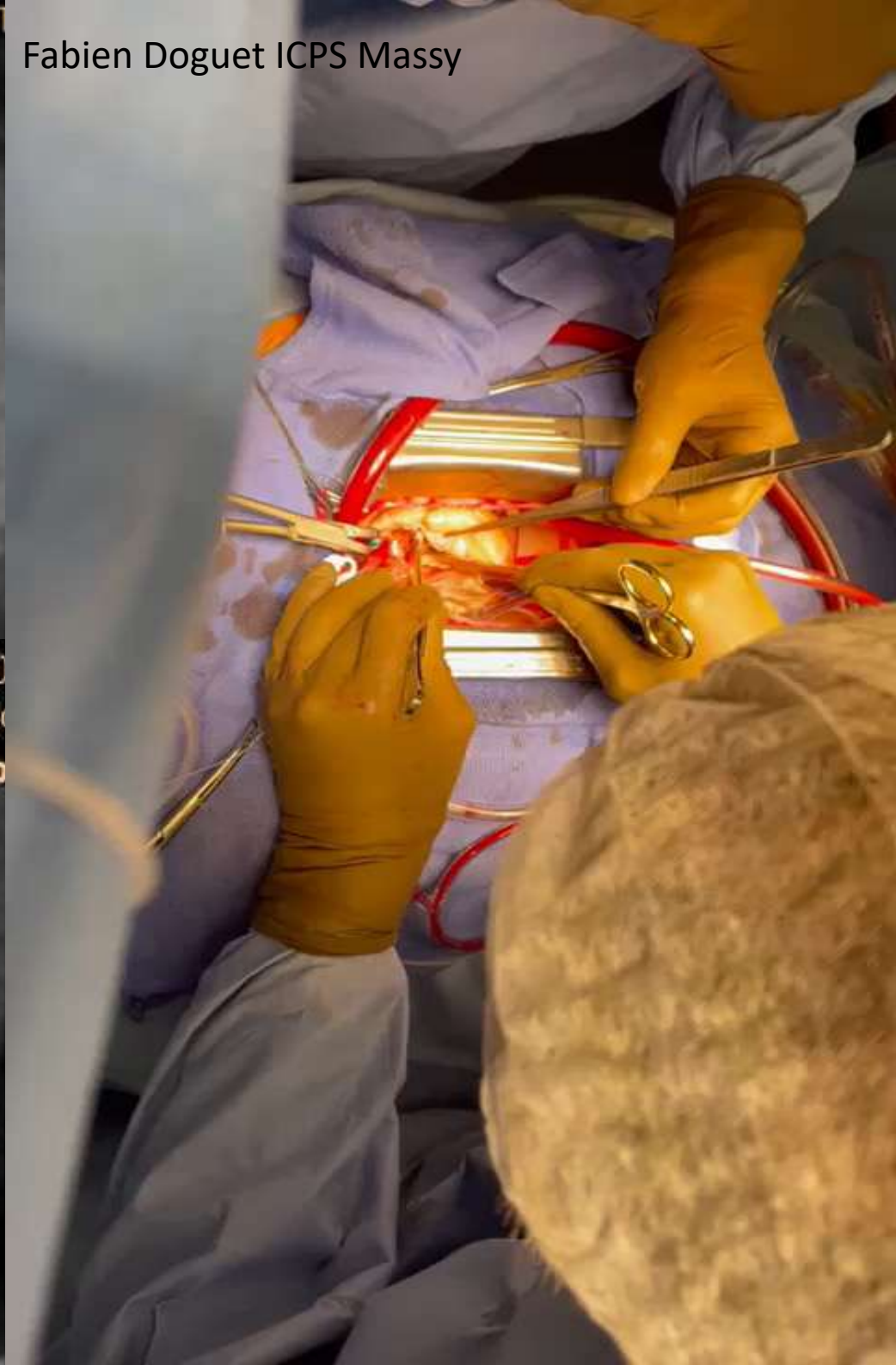
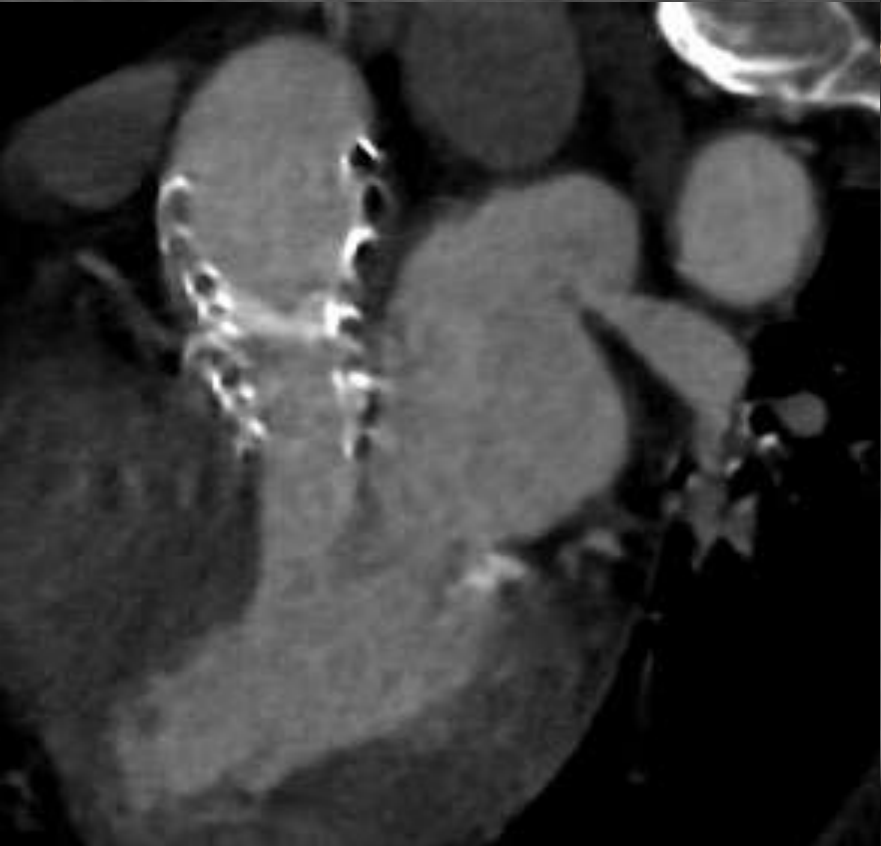
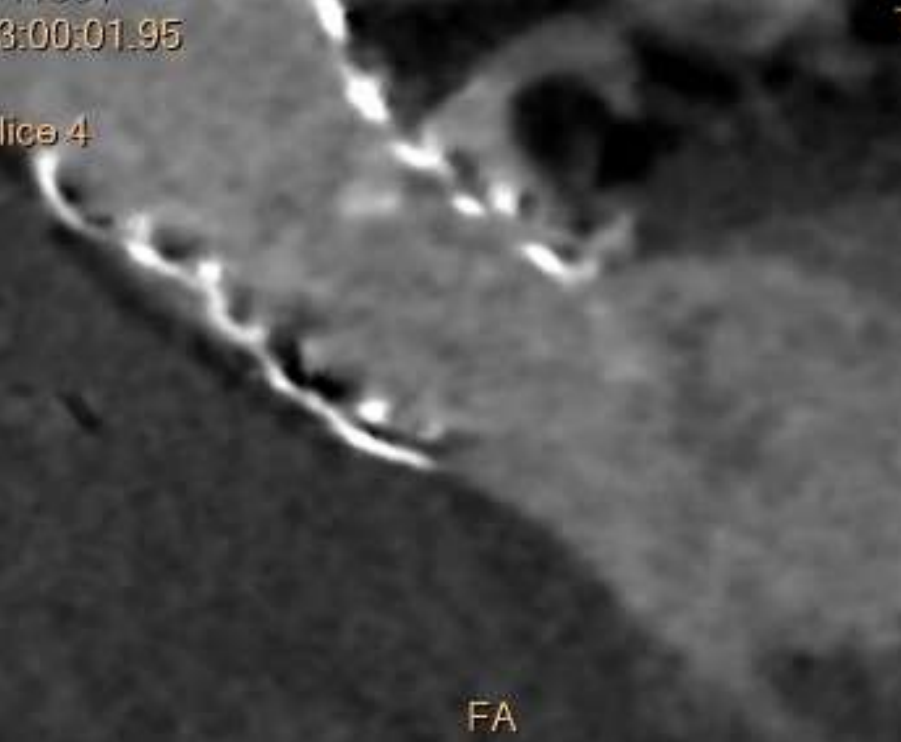
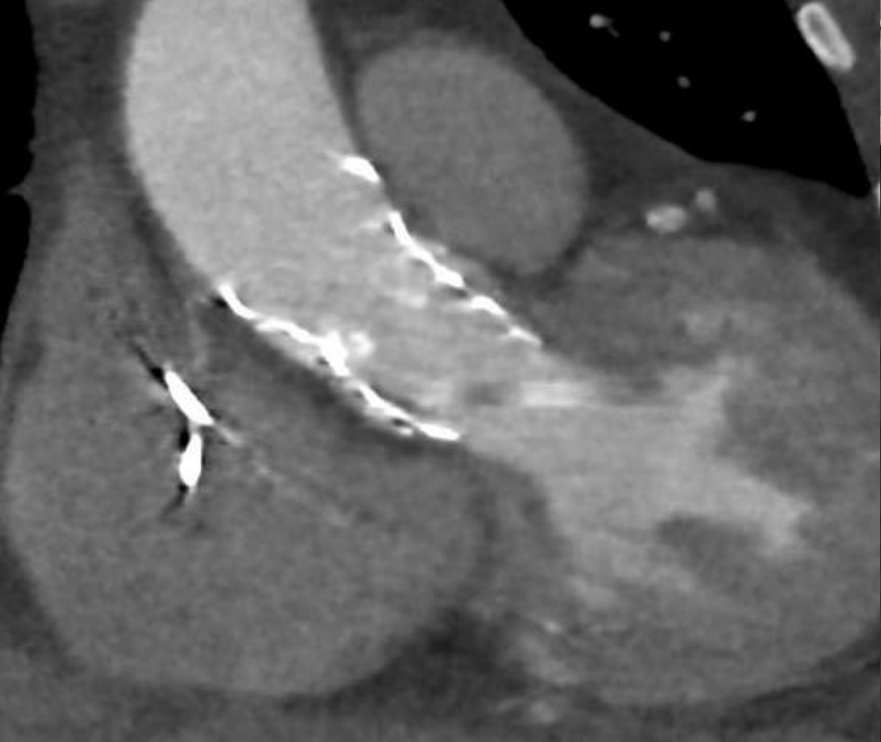
Versus no intervention



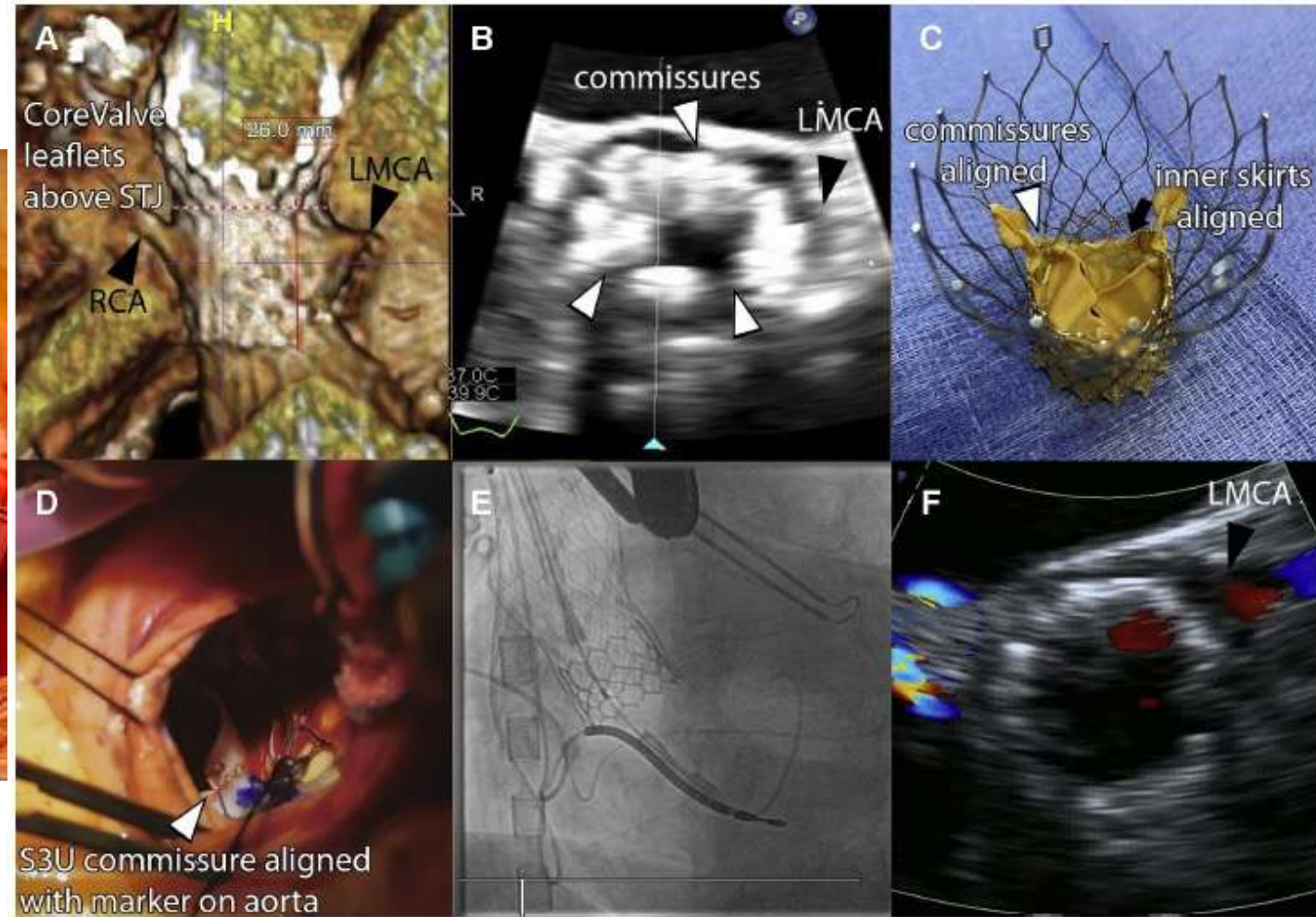
Versus TAV-in-TAV



**In STS TAV Explant registry mean experience was 1 case per cardiac surgeon
Most of explants patients in the 1st year post-TAVI**



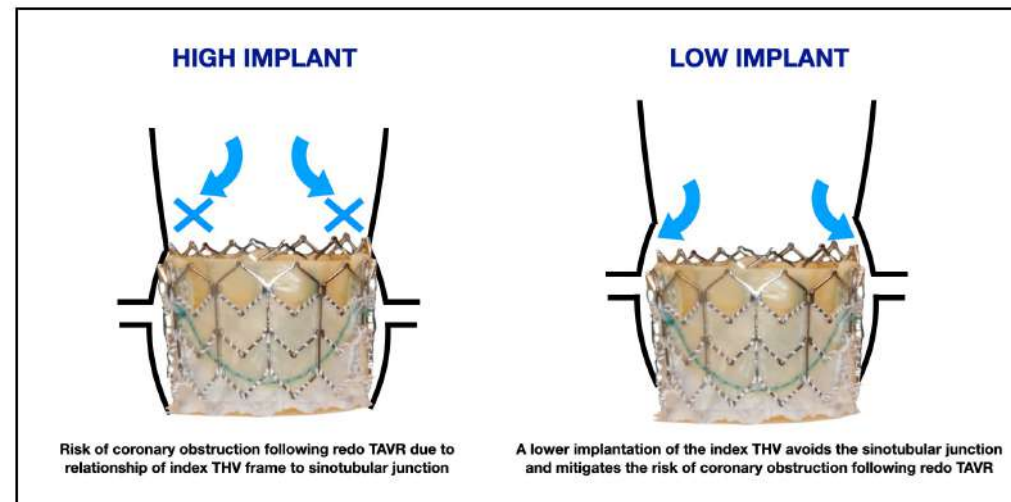
Alternative à l'explantation totale



Thérapie à l'échelle d'une vie



- Quand espérance de vie > durabilité attendue
 - Privilégier une valve intrannulaire à stent court
 - **Arrêter d'implanter très haut pour garder les options futures**



- Valves auto-expansibles semblent donner de meilleurs résultats en 2° intention (avec plus de difficultés si la 1° valve était de même nature)
- Nouvelles techniques (explantation partielle / Shortcut)

Que retenir?

Une problématique encore rare....



- Déficit de données cliniques sur TAV in TAV et SAV in TAV
- Analyse CT est cruciale pour évaluer la faisabilité qui va dépendre du choix de la valve n°1, de son implantation, et du choix de la valve n°2 et de son implantation
- Garder (pour l'instant) les techniques exotiques (Cheminée, Basilica) aux candidats non-chirurgicaux
- Anticiper le redo-TAVI chez les patients low-risk:
 - Selection de la valve, niveau implantation, alignement coronaire