

13^{ÈME} CONGRÈS DE PATHOLOGIE
CARDIO-
VASCULAIRE
29-30 SEPTEMBRE & 1 OCTOBRE 2021
HÔTEL SAINT ALEXIS - ÎLE DE LA RÉUNION, FRANCE

Programme de cardiologie générale s'adressant à tous les cardiologues, urgentistes, médecins généralistes, diabétologues et chirurgiens vasculaires de la Réunion



BAV et stimulation post TAVI

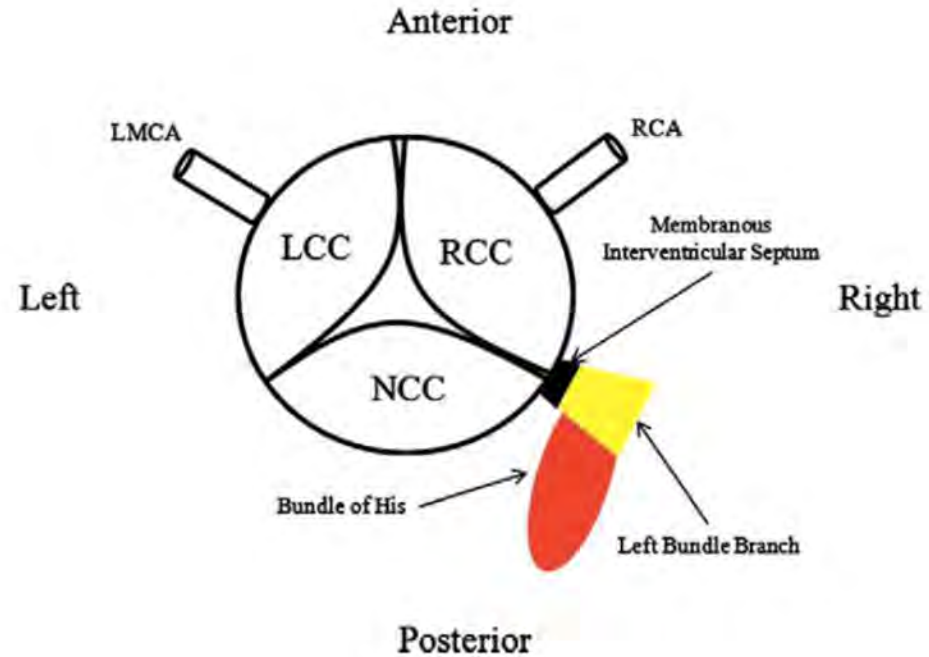
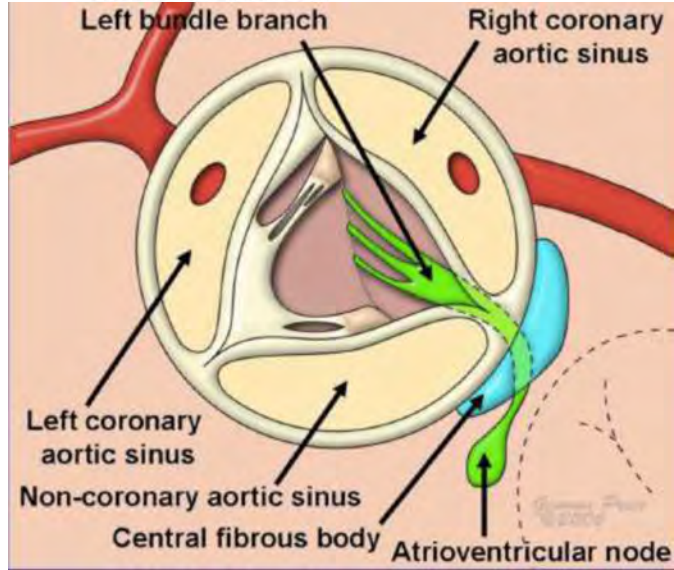
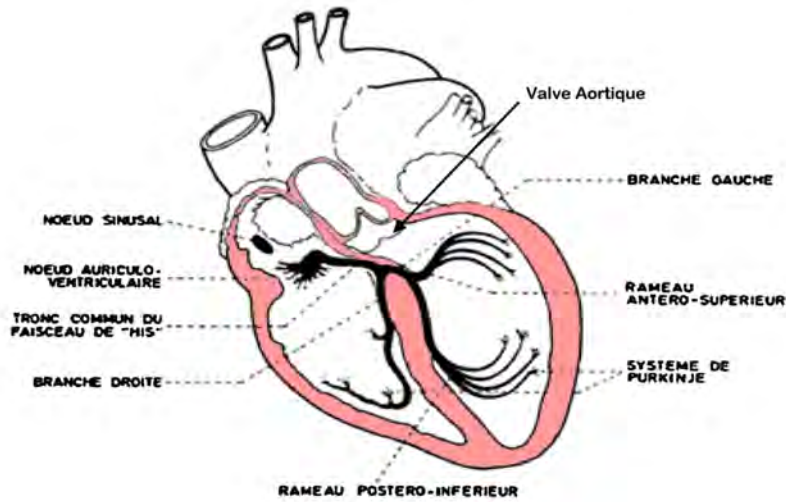
Pascal DEFAYE



UGA
Université
Grenoble Alpes



Am Heart J 2012; 164:664



23mm

26mm

29mm



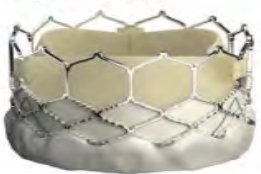
Edwards Sapien Valve



Sapien XT Valve



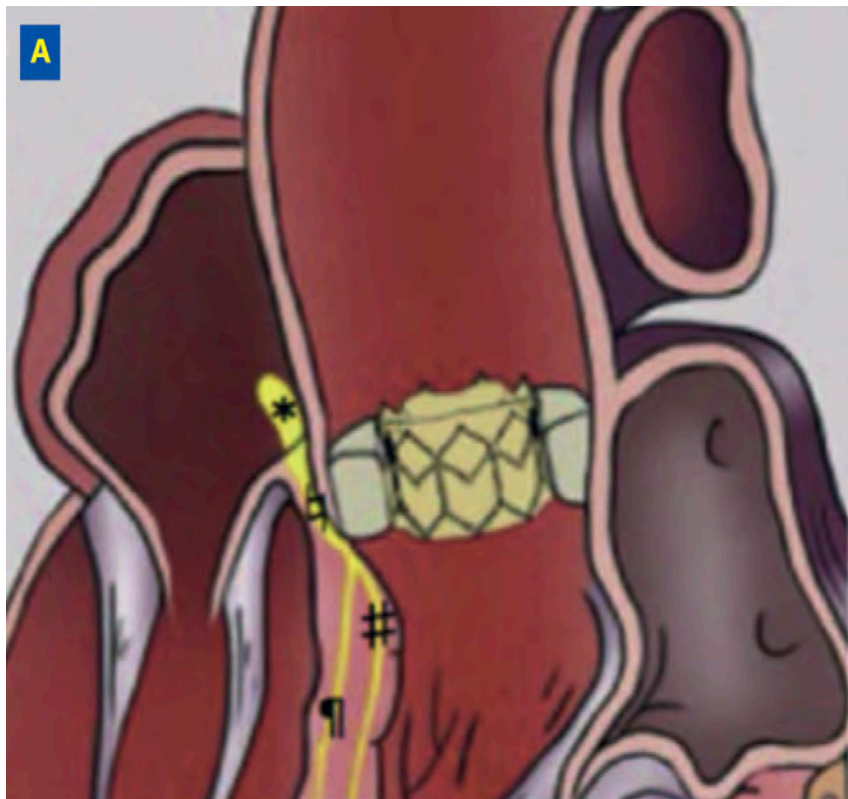
Sapien 3 Valve



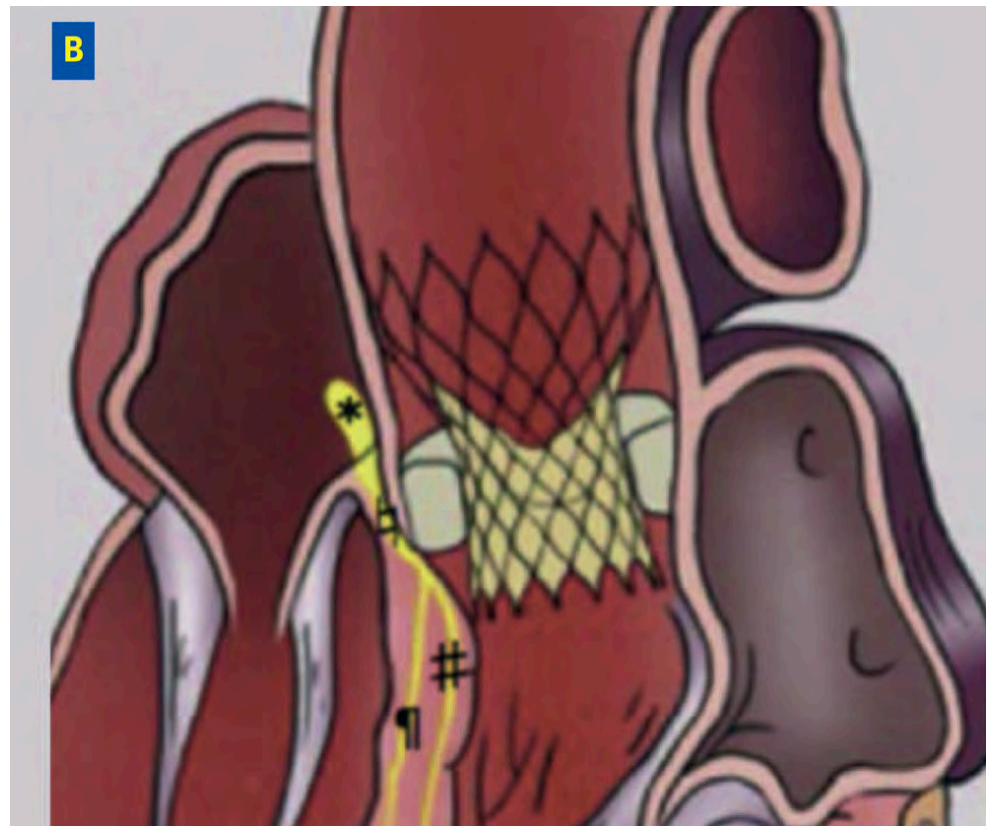
2 prothèses implantées en France:
Sapien, EDWARDS
Corevalve, Evolut R Pro, MEDTRONIC
+ Boston Scientific Accurate Neo
Abbott Portico

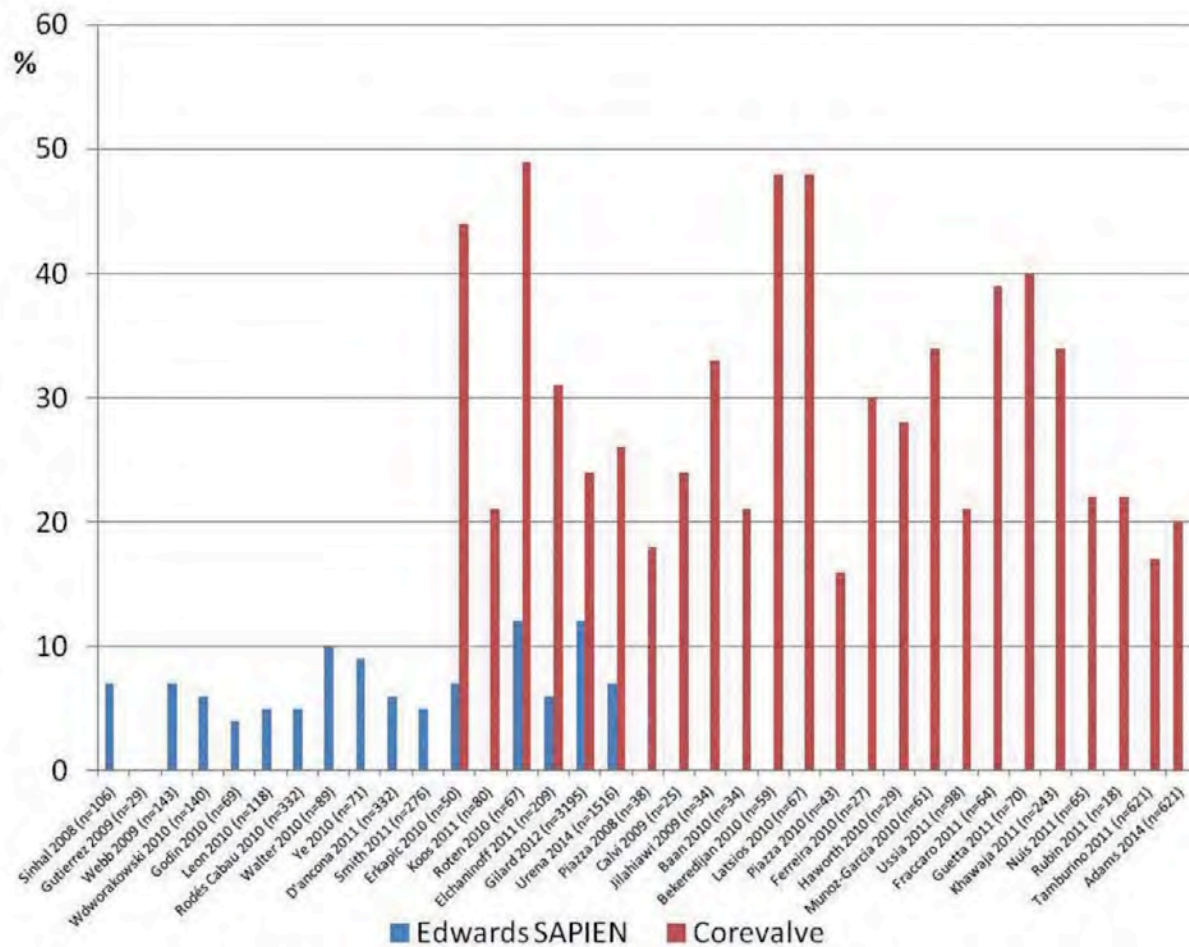


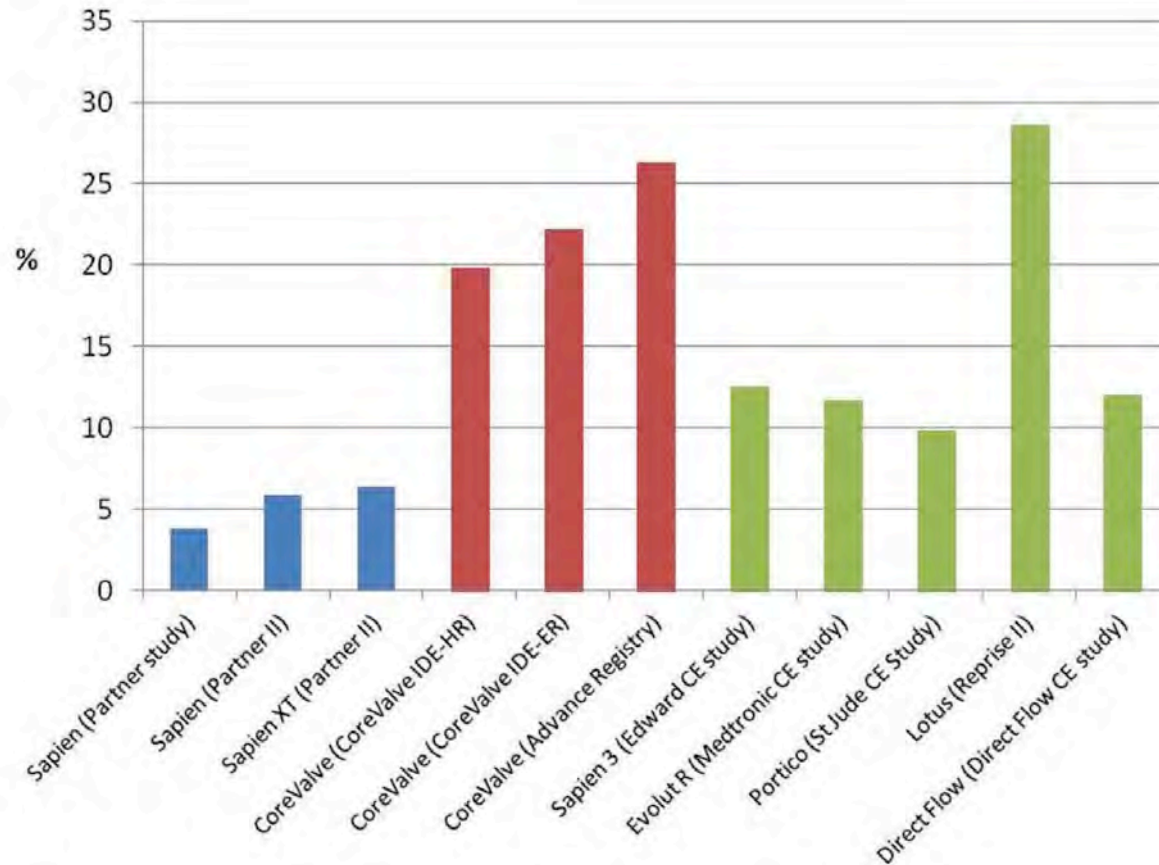
Edwards Sapien™



CoreValve Medtronic™

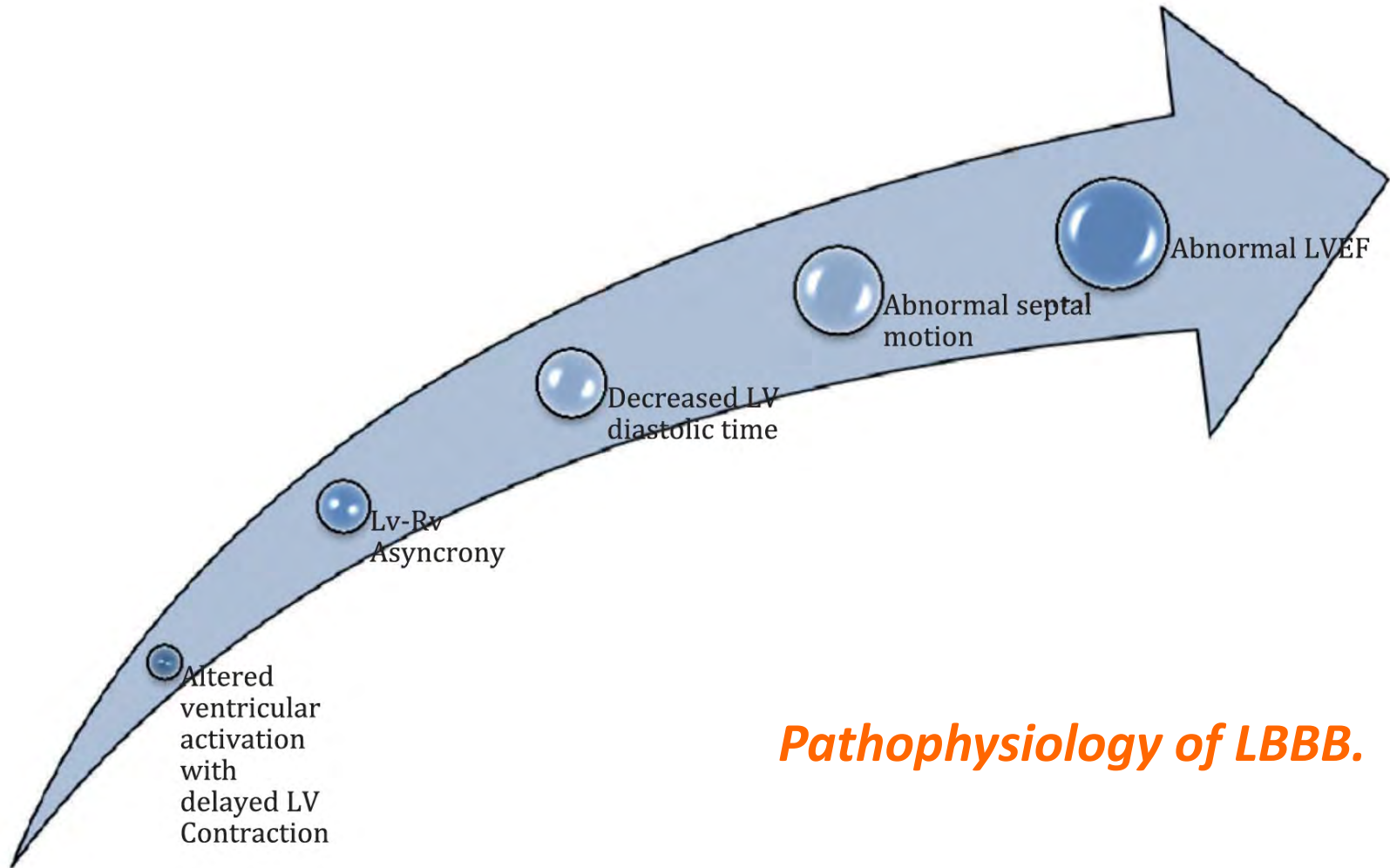




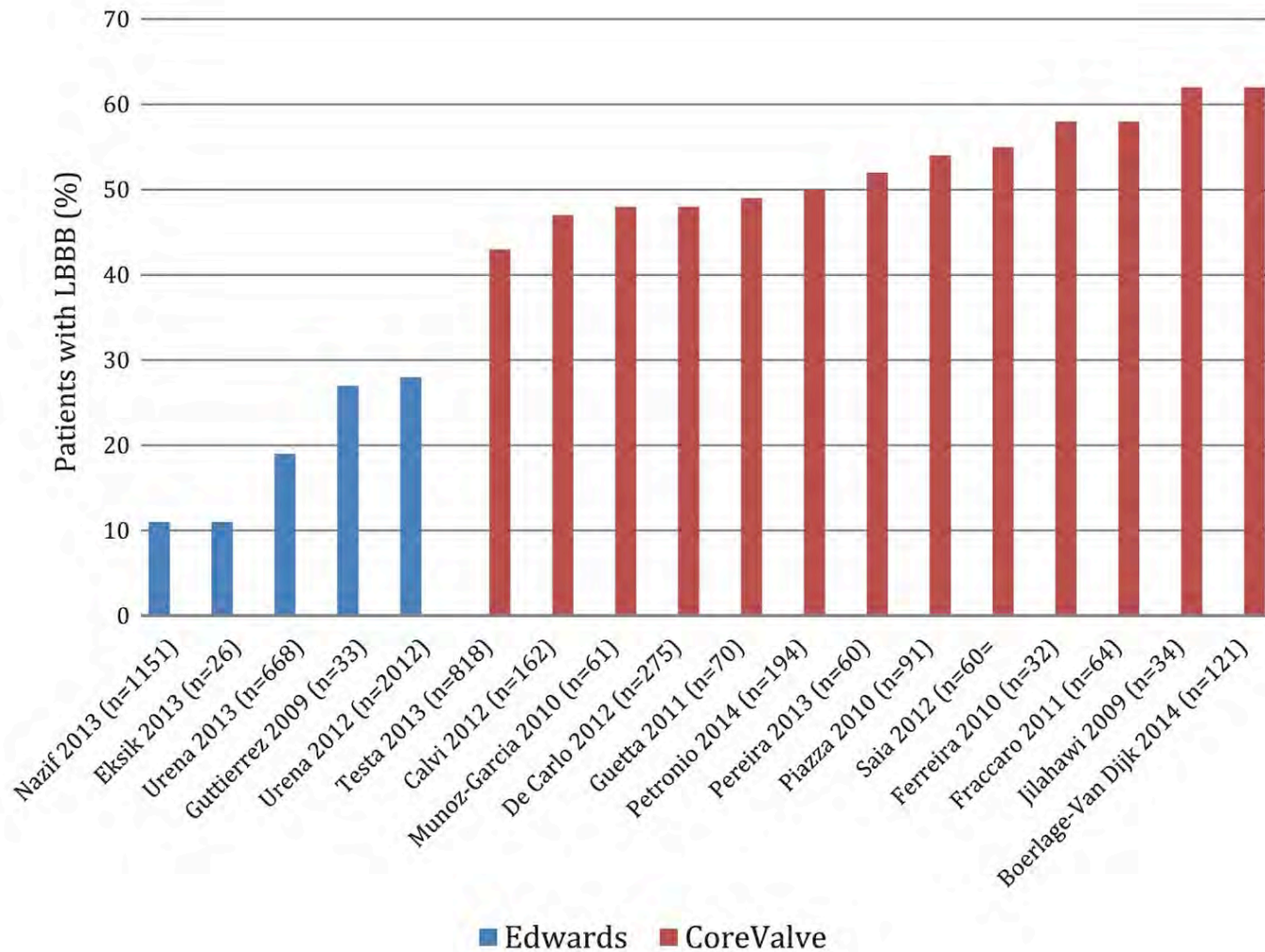


Permanent PM rates with different devices

***EXPERT REVIEW OF MEDICAL DEVICES, 2017
VOL. 14, NO. 2, 135–147***



Pathophysiology of LBBB.



*Incidence of LBBB
post TAVI*

**EXPERT REVIEW
OF MEDICAL DEVICES, 2017
VOL. 14, NO. 2, 135–147**

2020 ACC Expert Consensus Decision Pathway on Management of Conduction Disturbances in Patients Undergoing Transcatheter Aortic Valve Replacement

A Report of the American College of Cardiology Solution Set Oversight Committee

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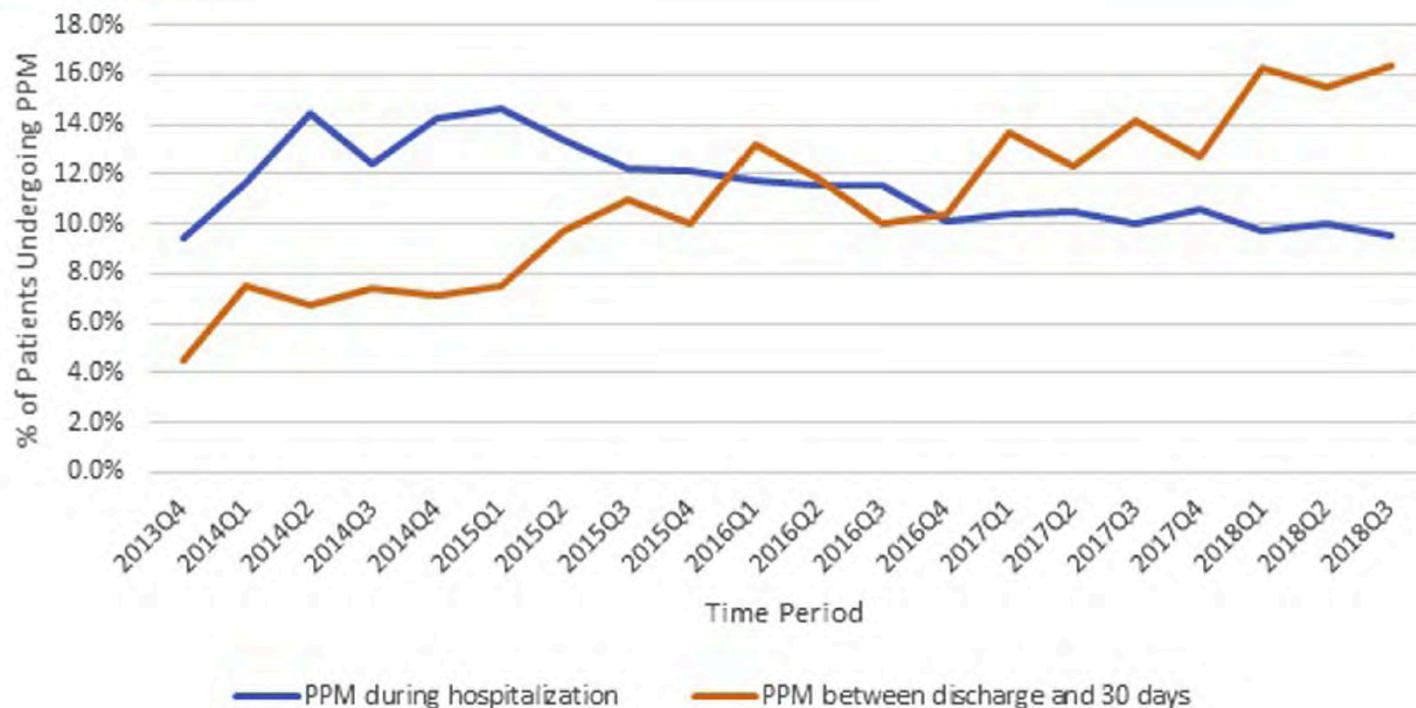
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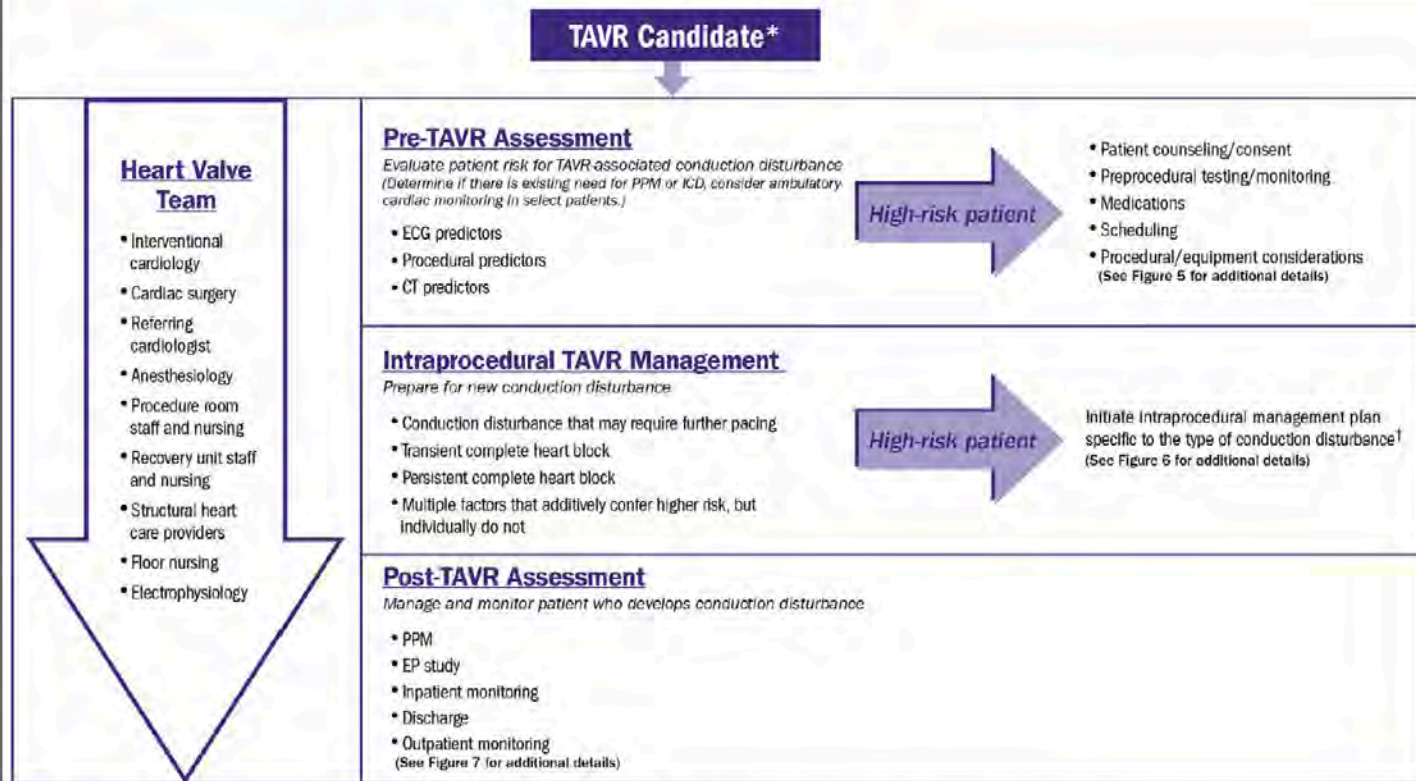
FIGURE 1 Timing of PPM



2020 ACC Expert Consensus Decision Pathway on Management of Conduction Disturbances in Patients Undergoing Transcatheter Aortic Valve Replacement

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FIGURE 2 Management of Conduction Disturbances Outline



* All patients referred for and undergoing TAVR excluding those with an existing pacemaker or ICD.

† Irrespective of the type of temporary lead implanted, all patients should be monitored on a telemetry unit with ability to do emergency pacing if required.

AV, atrioventricular; CT, computed tomography; ECG, electrocardiogram; EP, electrophysiology; LBBB, left bundle branch block; PPM, permanent pacemaker; TAVR, transcatheter aortic valve replacement.

FIGURE 5 Pre-TAVR Patient Assessment and Guidance

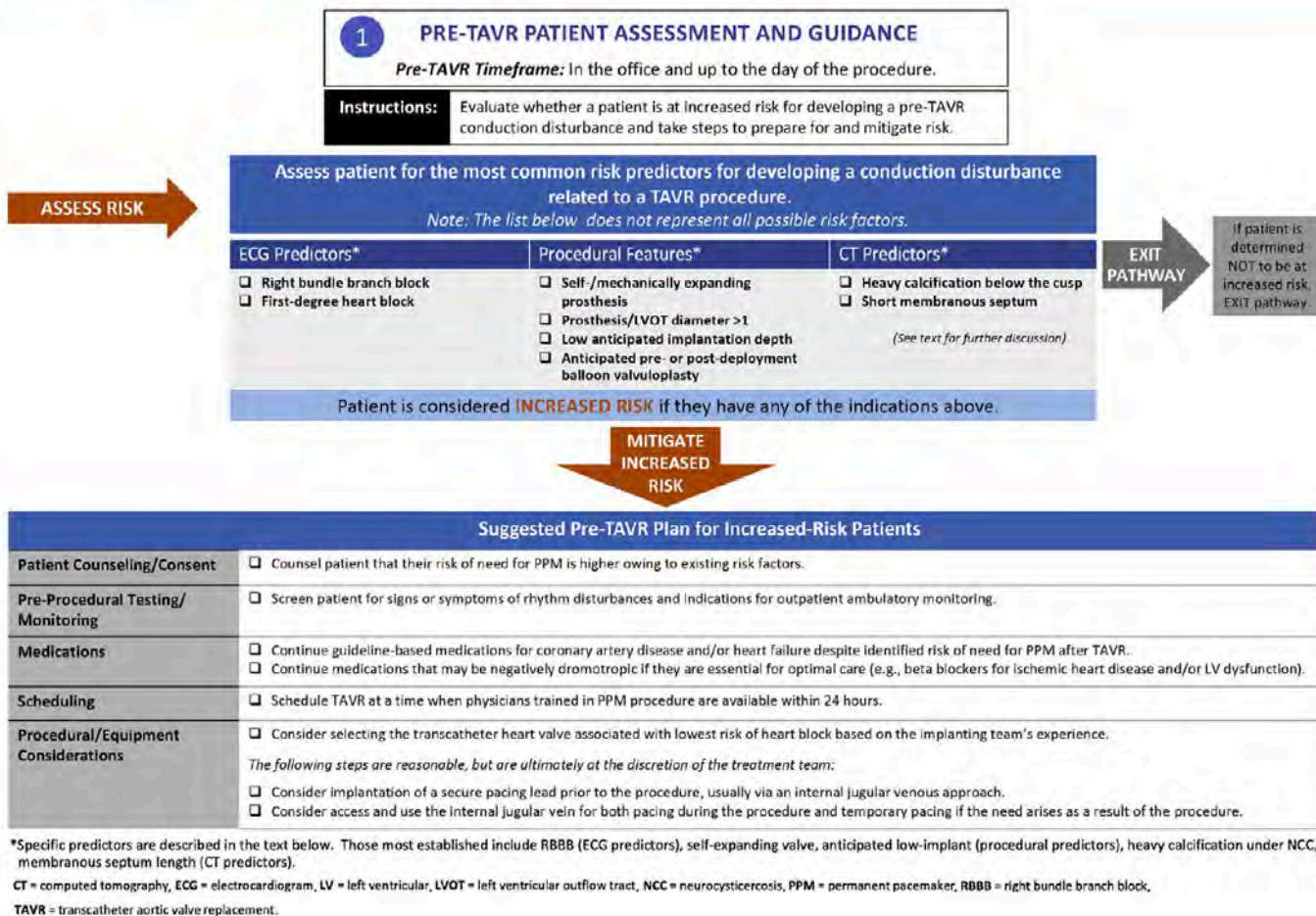


FIGURE 6 Intraprocedural TAVR Management

2

INTRAPROCEDURAL TAVR MANAGEMENT

Intraprocedural TAVR Timeframe: The day of the procedure until completion of procedure.

Instructions: Prepare and plan ahead for management of conduction disturbances if and when they do occur as part of the procedure.

	IF...	THEN →	Suggested Intraprocedural TAVR Plan
PRIOR TO START OF PROCEDURE	Pre-TAVR assessment indicated that patient is at increased risk for conduction disturbances:	→	Continue guideline-based medications for coronary artery disease and/or heart failure despite identified risk of need for PPM after TAVR.
	Patient has increased-risk procedural factors (Figure 5):		Revisit the necessity of a secure pacing lead, internal jugular versus femoral venous access, given increased risk of need for PPM. - Consider implantation of secure pacing lead prior to the procedure, usually via an internal jugular vein. - Access and use the internal jugular vein for both pacing during the procedure and temporary pacing if the need arises as a result of the procedure. Discuss potential for PPM and obtain consent in clinic where feasible.
FOR ALL PATIENTS DURING PROCEDURE		<i>Irrespective of the type of temporary lead implanted, all patients should be monitored on a telemetry unit with ability to do emergency pacing if required.</i>	
DURING AND UNTIL COMPLETION OF PROCEDURE	No new conduction disturbance	→	Temporary pacemaker and venous sheath can be removed before the patient leaves the procedure room.
	Develops conduction disturbance (e.g., LBBB, PR/QRS duration ≥20 msec) that may require further pacing	→	Internal jugular venous access with a secure pacing lead prior to leaving the procedure room is reasonable for patients with new conduction disturbance but ultimately at the discretion of the implantation team.
	Develops transient complete heart block	→	Internal jugular venous access with a secure pacing lead prior to leaving the procedure room is reasonable for patients with transient heart block but ultimately at the discretion of the implantation team.
	Develops persistent complete heart block	→	Internal jugular venous access with a secure pacing lead prior to leaving the procedure room is indicated for patients with sustained heart block.
			It is preferable to separate the procedures so that informed consent can occur, and the procedures can be performed in their respective spaces with related necessary equipment and staff.
	Pre-existing conduction disturbance with indication for PPM	→	It may be reasonable to perform the PPM procedure on the same day as the TAVR procedure if: - PPM is indicated - Informed consent has occurred - Appropriate teams and specialty equipment are available.
	Pre-existing conduction disturbance and a secure pacing lead in place	→	Monitor on a telemetry unit, with temporary pacemaker attached and programmed to provide back-up pacing if required.
	Multiple factors that additively confer increased risk but individually do not	→	Monitor on a telemetry unit, with temporary pacemaker attached and programmed to provide back-up pacing if required.

LBBB = left bundle branch block, PPM = permanent pacemaker, TAVR = transcatheter aortic valve replacement



FIGURE 7 Post-TAVR Management

3

POST-TAVR MANAGEMENT

Post-TAVR Timeframe: From completion of procedure through 30 days post-discharge.

Instructions: Manage and monitor patients who do develop a conduction disturbance.

	IF the Patient Aligns with Any of These Scenarios	THEN →	Suggested Post-TAVR Plan
PPM/ EP STUDY	Symptomatic bradycardia or persistent, complete heart block	→	PPM.
	New, progressive, or pre-existing conduction disturbance that changes post-procedure	→	Monitor, consider EP study and PPM.
	Narrow QRS before and after TAVR	→	EP study and PPM are not indicated.
DISCHARGE	All of the following: ☐ No primary PPM indication ☐ No new 1 st degree or 2 nd degree AV block ☐ No new bundle branch block ☐ No progression in baseline 1 st , 2 nd degree AV block or prolongation of the QRS ≥10%	→	Patient can be considered for early discharge.
	If any of the above are present	→	Telemetry until conduction is stable for ≥48 hours; discharge with an outpatient monitor for ≥14 days.
OUTPATIENT MONITORING	New rhythm disturbance (e.g., atrial fibrillation) OR Progression of baseline conduction disturbance OR For whom the provider feels that monitoring is warranted	→	- Discharge with a monitor for a minimum of 14 days. - Care teams should be resourced to manage outpatient monitoring to identify progressive rhythm issues in a timely manner. - Use monitoring system that is accurate, enables adherence, notifies care team in a timely manner.*

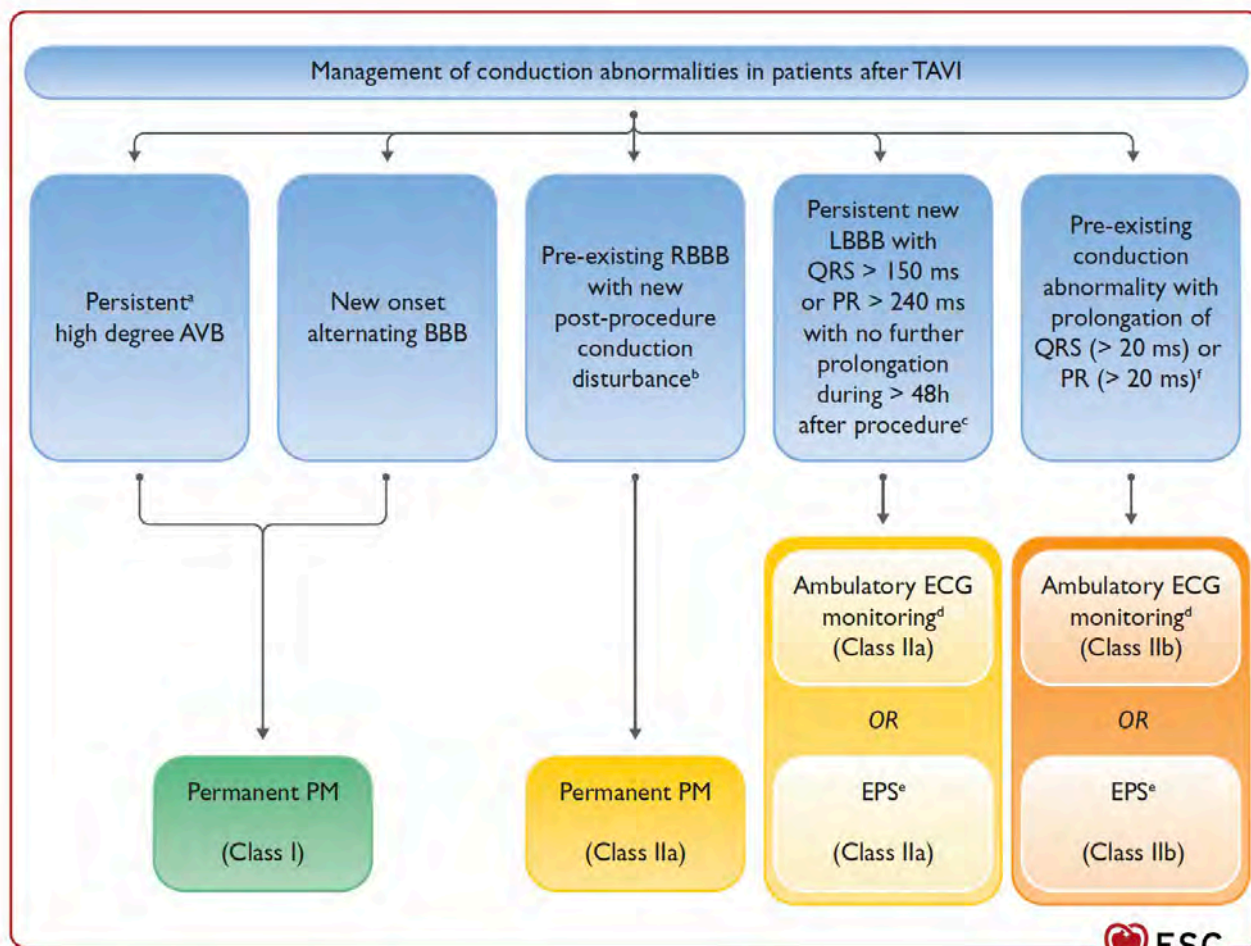
*The monitor should have the capacity to notify care teams quickly in the event of DH-AVB. An AEM or implantable loop recorder would suffice provided it has these attributes.

AEM = ambulatory event monitoring, AV = atrioventricular, DH-AVB = delayed high-grade atrioventricular block, ECG = electrocardiogram, EP = electrophysiology, PPM = permanent pacemaker, TAVR = transcatheter aortic valve replacement

Table 10 Predictors for permanent pacing after transcatheter aortic valve implantation

Characteristics	References
ECG	
Right BBB	512–528
PR-interval prolongation	517,521,525,527
Left anterior hemiblock	517,525
Patient	
Older age (per 1-year increase)	529
Male sex	518,519,525,529
Larger body mass index (per 1-unit increase)	529
Anatomical	
Severe mitral annular calcification	512,515
LV outflow tract calcifications	522
Membranous septum length	528,530
Porcelain aorta	531
Higher mean aortic valve gradient	519
Procedural	
Self-expandable valve	512,513,525,529,531
Deeper valve implantation	517,518,520,522,528,532
Larger ratio between prosthesis diameter versus annulus or LV outflow tract diameter	524,529,532
Balloon post-dilatation	519,521,529
TAVI in valve-in-valve vs. native valve procedure	531

Management of conduction abnormalities after TAVI



a. 24-48 h post-procedure. b. Transient high-degree AVB, PR prolongation, or axis change. c. High-risk parameters for high-degree AVB in patients with new-onset LBBB include: AF, prolonged PR interval, and LVEF <40%. d. Ambulatory continuous ECG monitoring for 7 - 30 days. e. EPS with HV > 70 ms may be considered positive for permanent pacing. f. With no further prolongation of QRS or PR during 48-h observation.

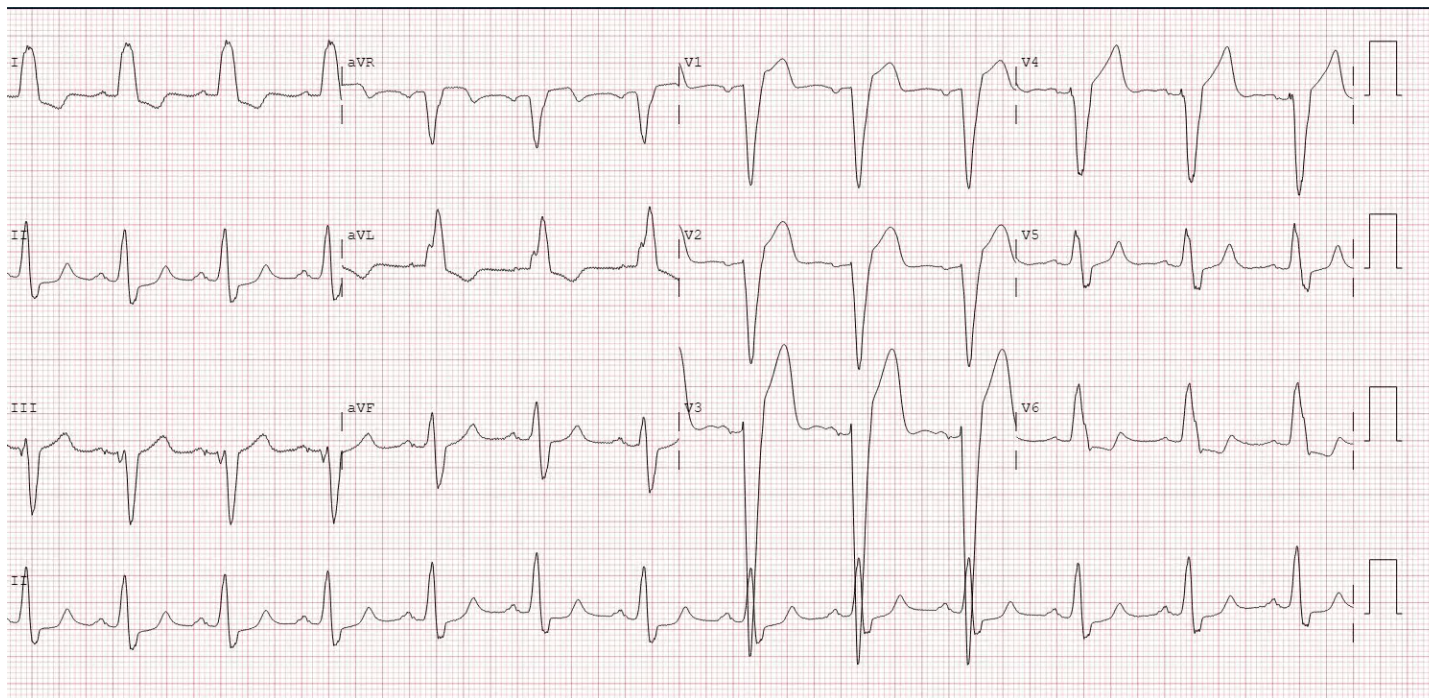
- a Class of recommendation.
 - b Level of evidence.
 - c Immediately after procedure or within 24 h.
 - d Transient high-degree AVB, PR prolongation, or QRS axis change.
 - e Ambulatory continuous ECG monitoring (implantable or external) for 7-30 days.
 - f EPS should be performed >_3 days after TAVI. Conduction delay with HV >_70 ms may be considered positive for permanent pacing.
 - g With no further prolongation of QRS or PR during 48-h observation.
- Note: CRT in patients requiring pacing after TAVI has the same indication as for general patients

Recommendations for cardiac pacing after transcatheter aortic valve implantation

Recommendations	Class ^a	Level ^b
Permanent pacing is recommended in patients with complete or high-degree AVB that persists for 24 - 48 h after TAVI. ⁵⁴⁶	I	B
Permanent pacing is recommended in patients with new-onset alternating BBB after TAVI. ^{533,547}	I	C
Early ^c permanent pacing should be considered in patients with pre-existing RBBB who develop any further conduction disturbance during or after TAVI. ^d	IIa	B
Ambulatory ECG monitoring ^e or EPS ^f should be considered for patients with new LBBB with QRS >150 ms or PR >240 ms with no further prolongation during the >48 h after TAVI. ^{536,537,548}	IIa	C
Ambulatory ECG monitoring ^e or EPS ^f may be considered for patients with a pre-existing conduction abnormality who develop prolongation of QRS or PR >20 ms. ^g	IIb	C
Prophylactic permanent pacemaker implantation is not indicated before TAVI in patients with RBBB and no indication for permanent pacing.	III	C

Mr M..Gabriel , né en 1942

- RA serré gradient moyen 47 mm Hg, surface 0,65 cm², FE=55%,
- BBG connu



QRS : 175 ms
PR 194 ms

25/02/2021 : TAVI Edwards SAPIEN 3 26 mm / BBG inchangé

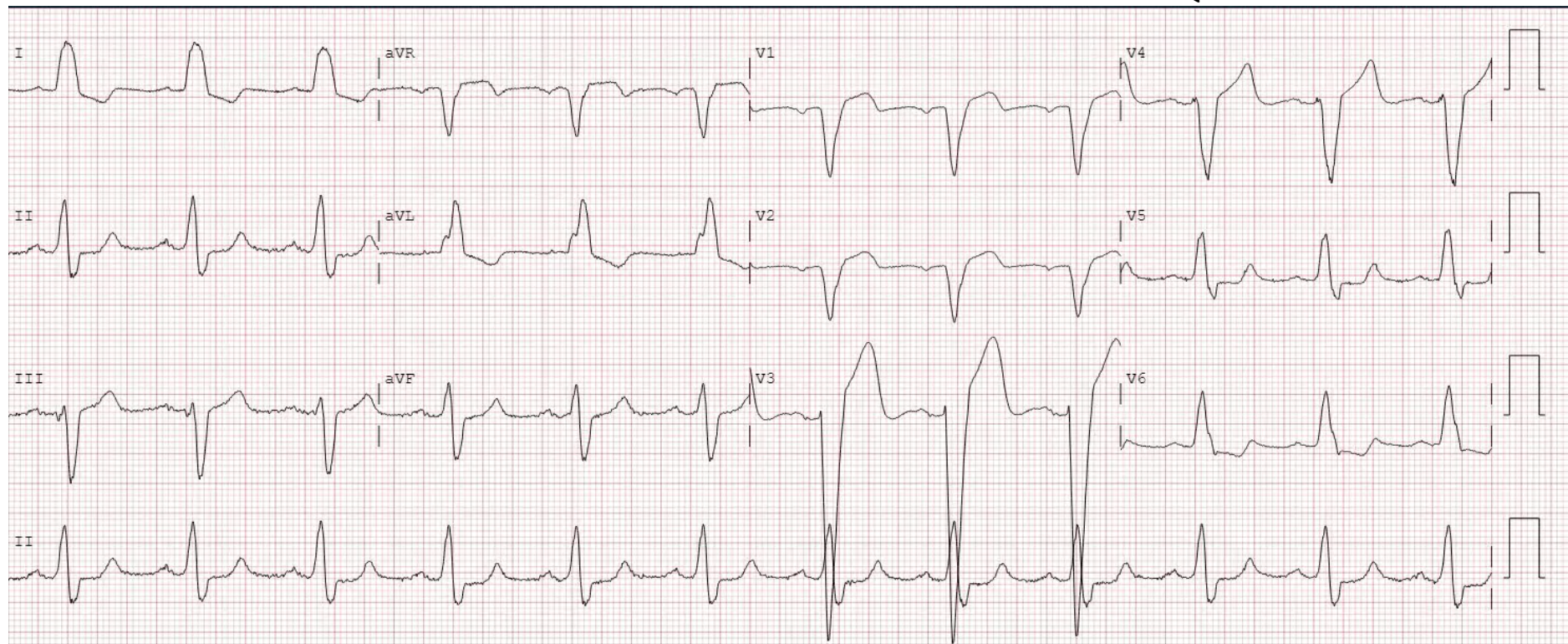
Mr M..Gabriel , né en 1942

26/2/2021

J+1 post TAVI

PR : 194 ms

QRS : 179 ms



ECG Post TAVI

CAT????

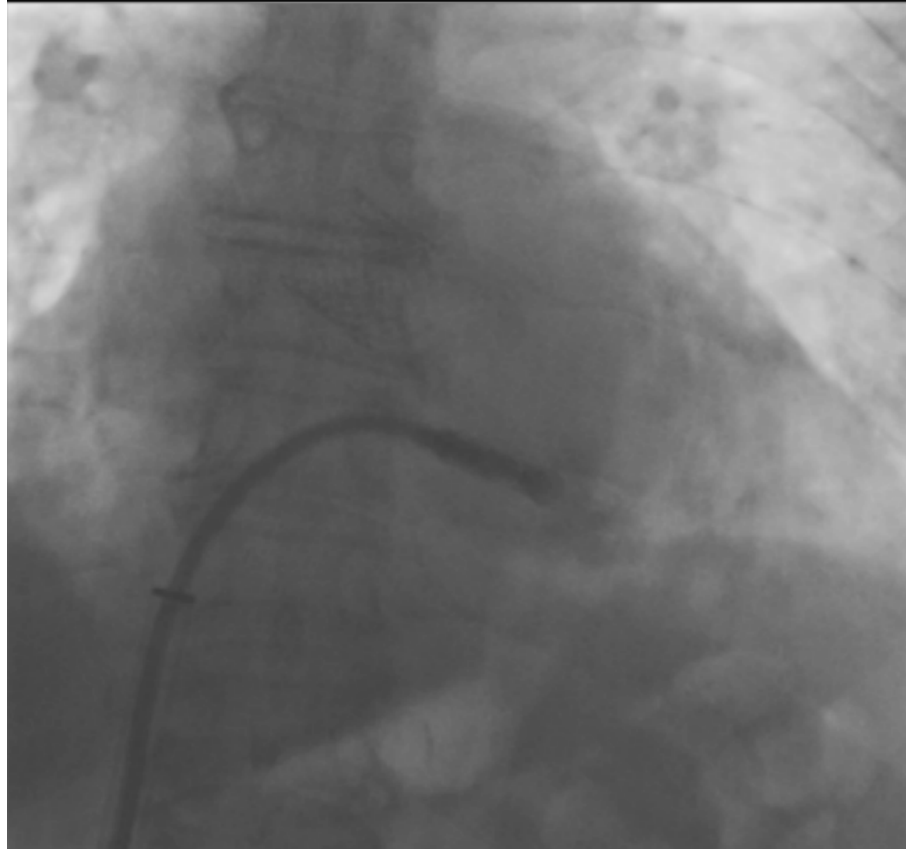
Mr M..Gabriel , né en 1942

Septembre 2021 : hospitalisation détresse respiratoire aigu post Covid en réanimation

Vacciné 3 doses Covid Pfizer mais LMNH/ chimiothérapie avec agranulocytose post chimiothérapie

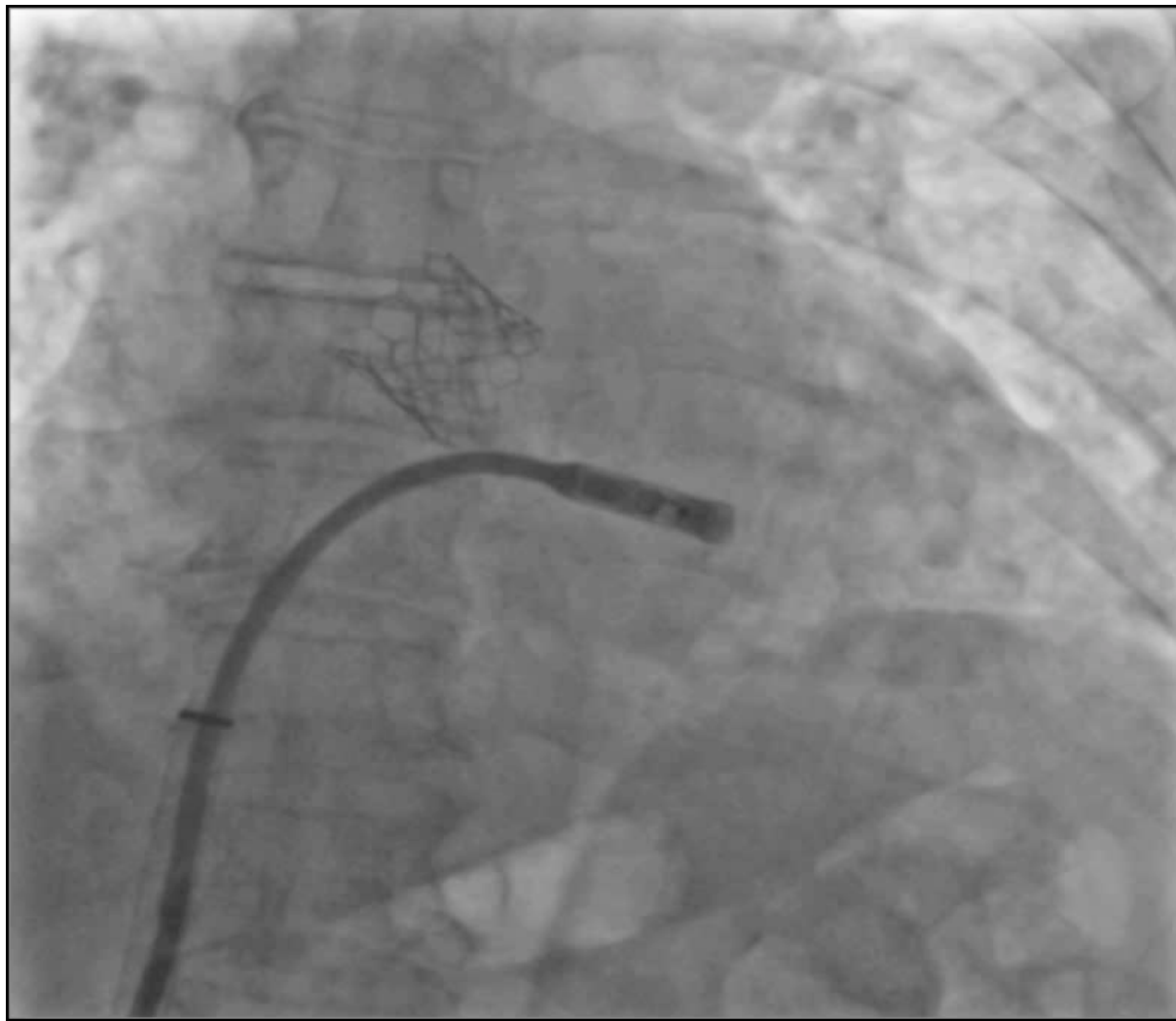
ACR sur BAV III

Décision de mise en place d'un PM

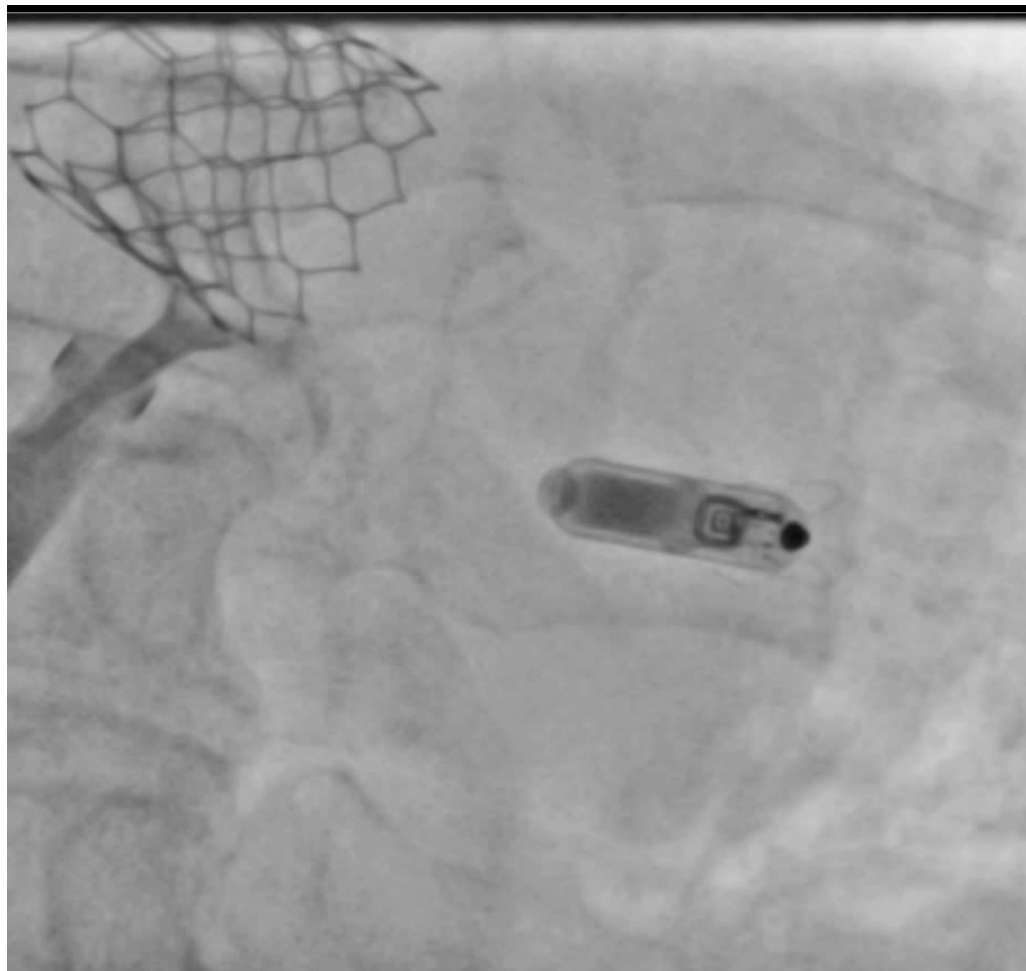


Micra VR

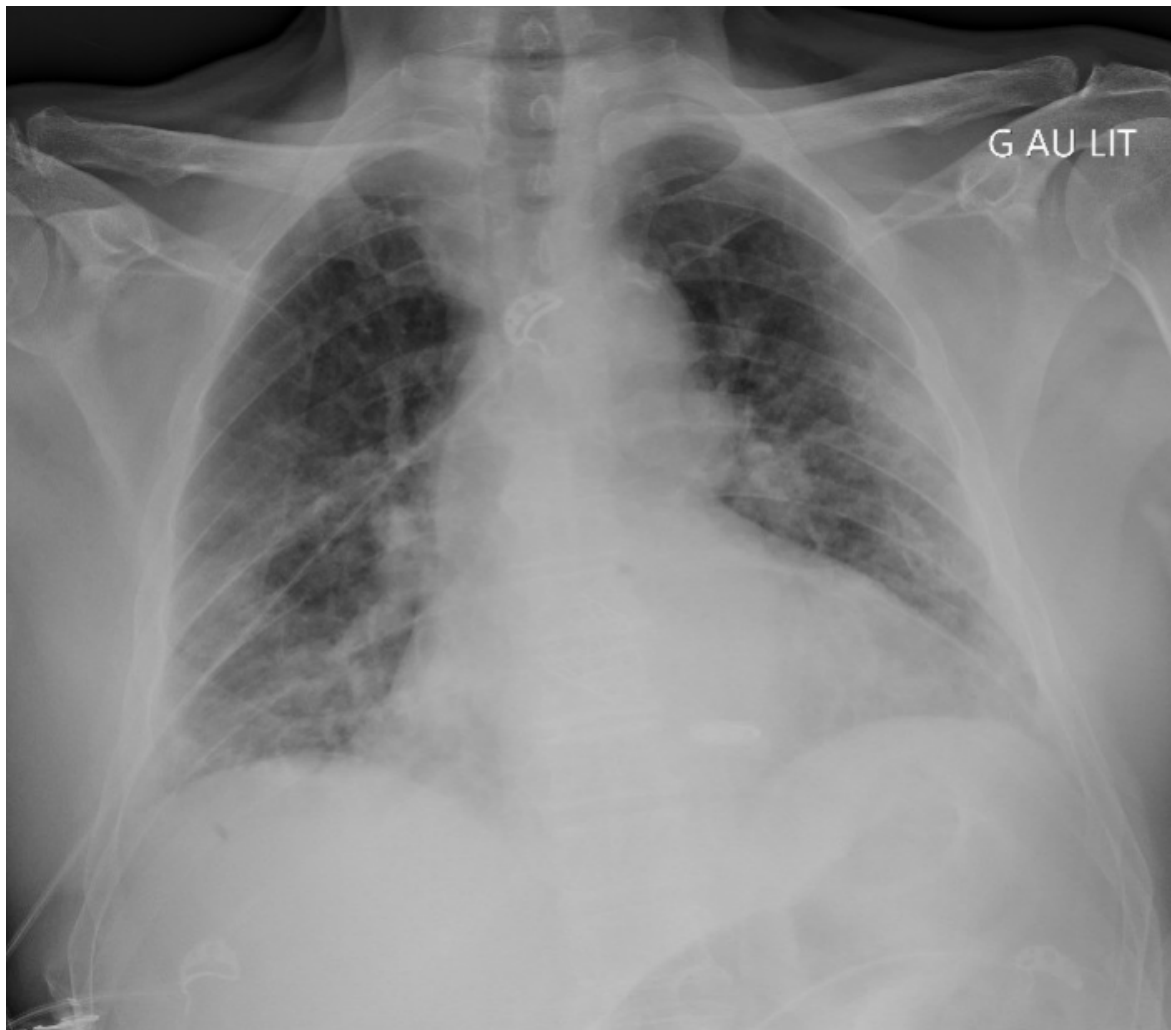
09/09/2021



Mr M.. Gabriel
9/9/21



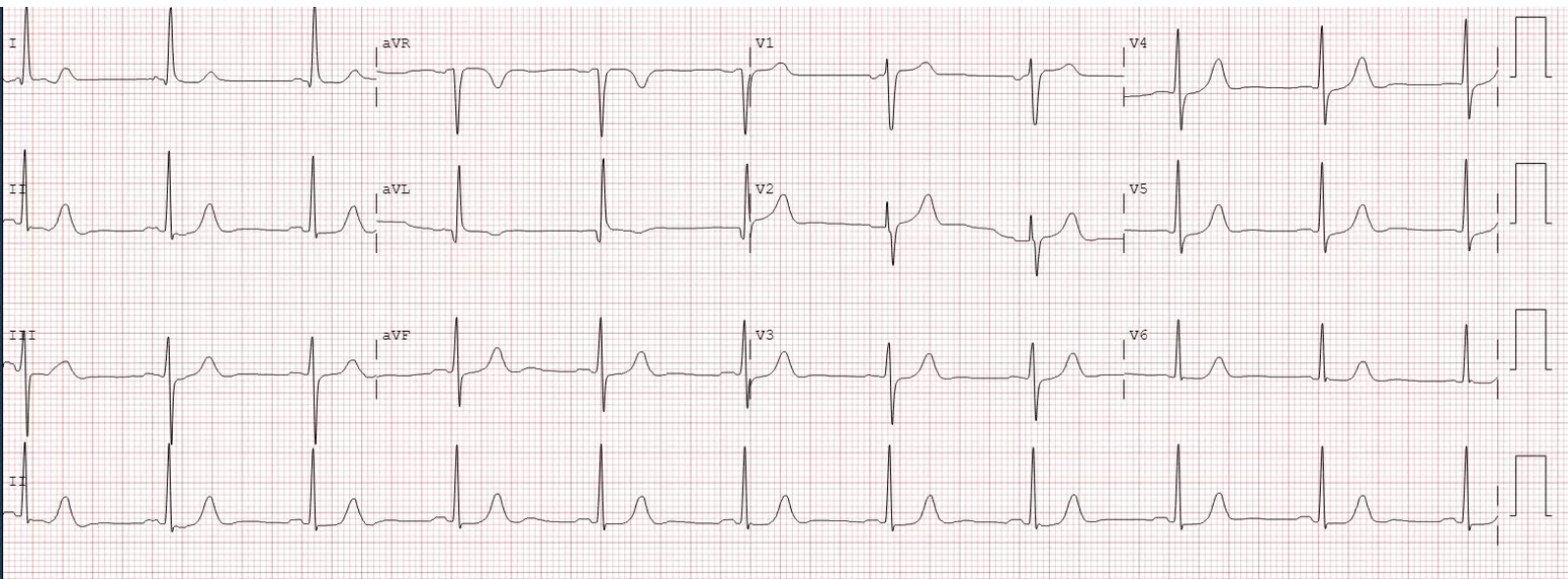
Mr M.. Gabriel
9/9/21



Mr M.. Gabriel
9/9/21

Mme M.. V.. Denise, née en 1926

- Autonome à domicile
- RA serré, gradient moyen 58 mm Hg, FEVG normale
- TAVI le 11/08/1921, Edward Sapien 3 23 mm



Pré TAVI

Post TAVI

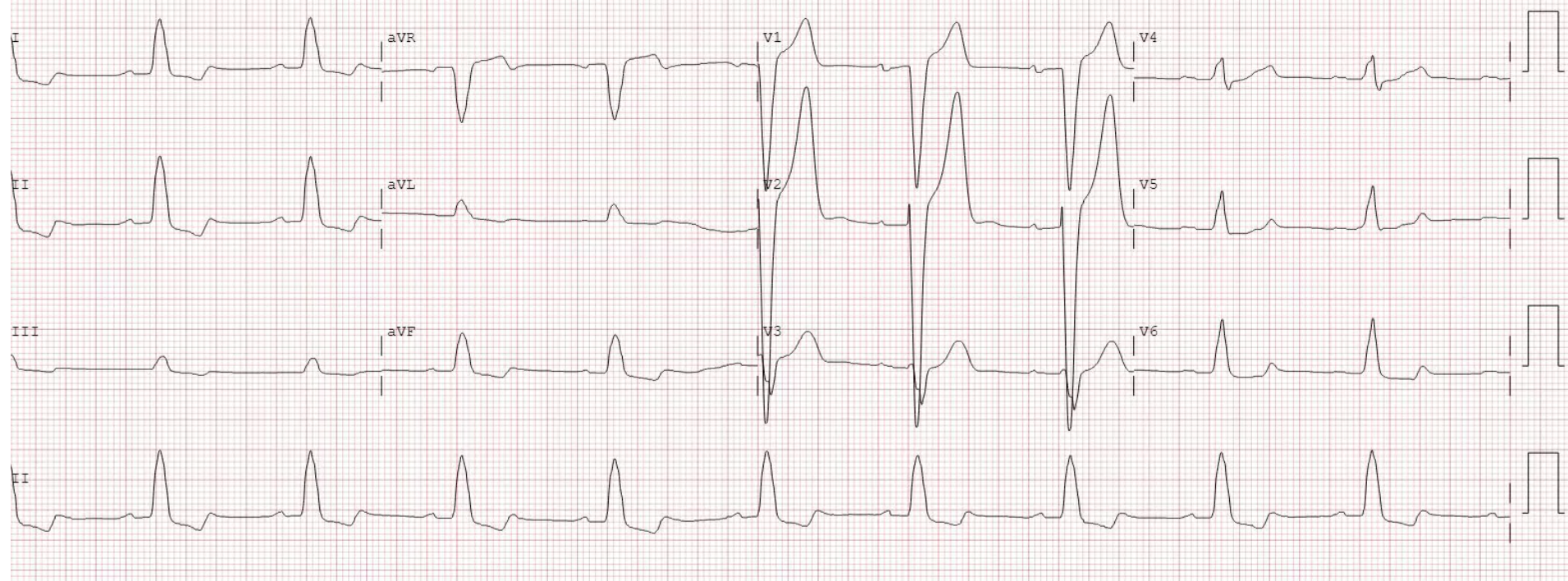
16/08/2021

PR : 212 ms

QRS : 150 ms

Mme M.. V.. Denise, née en 1926

- Autonome à domicile
- RA serré, gradient moyen 58 mm Hg, FEVG normale
- TAVI le 11/08/2021, Edward Sapien 3 23 mm

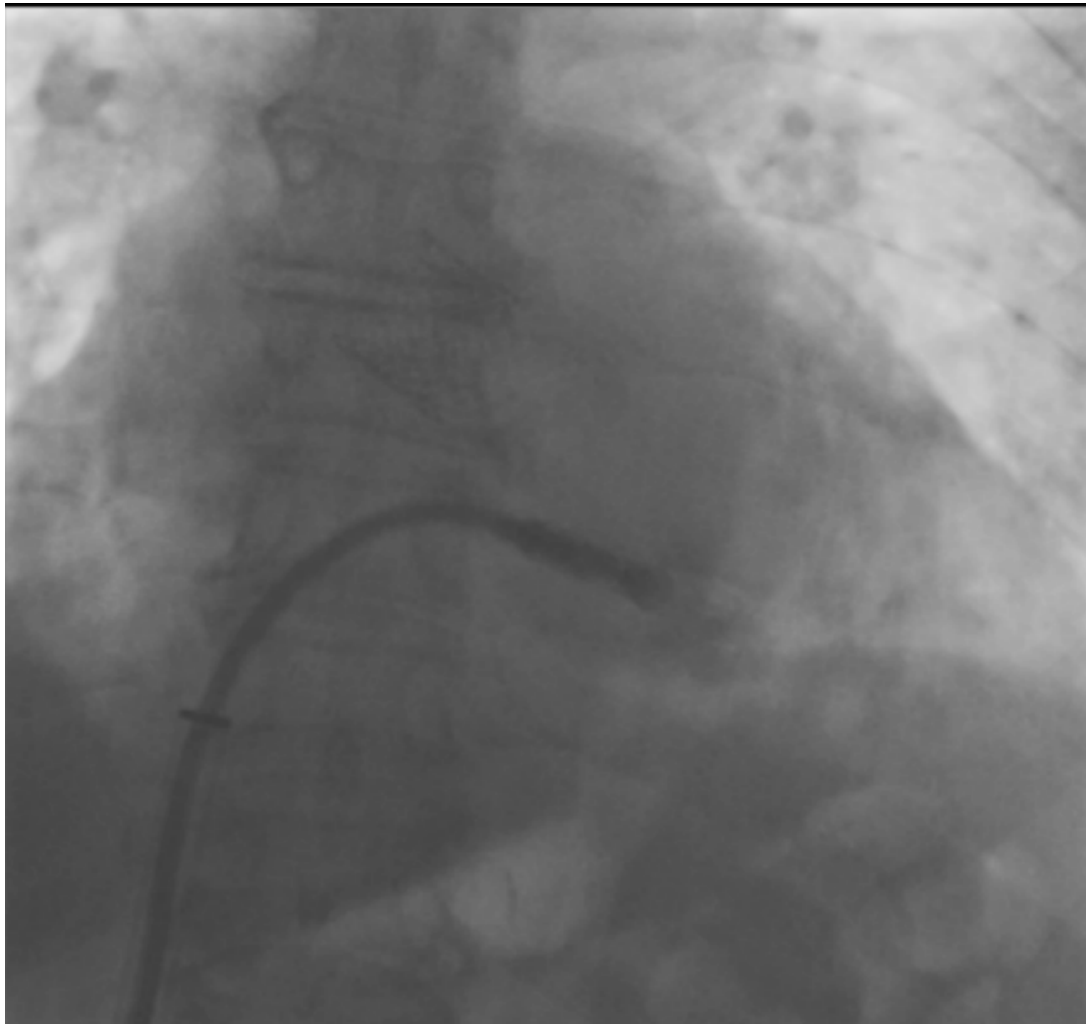


Troubles de conduction sévères avec alternance BBG/BBD puis BAV complet

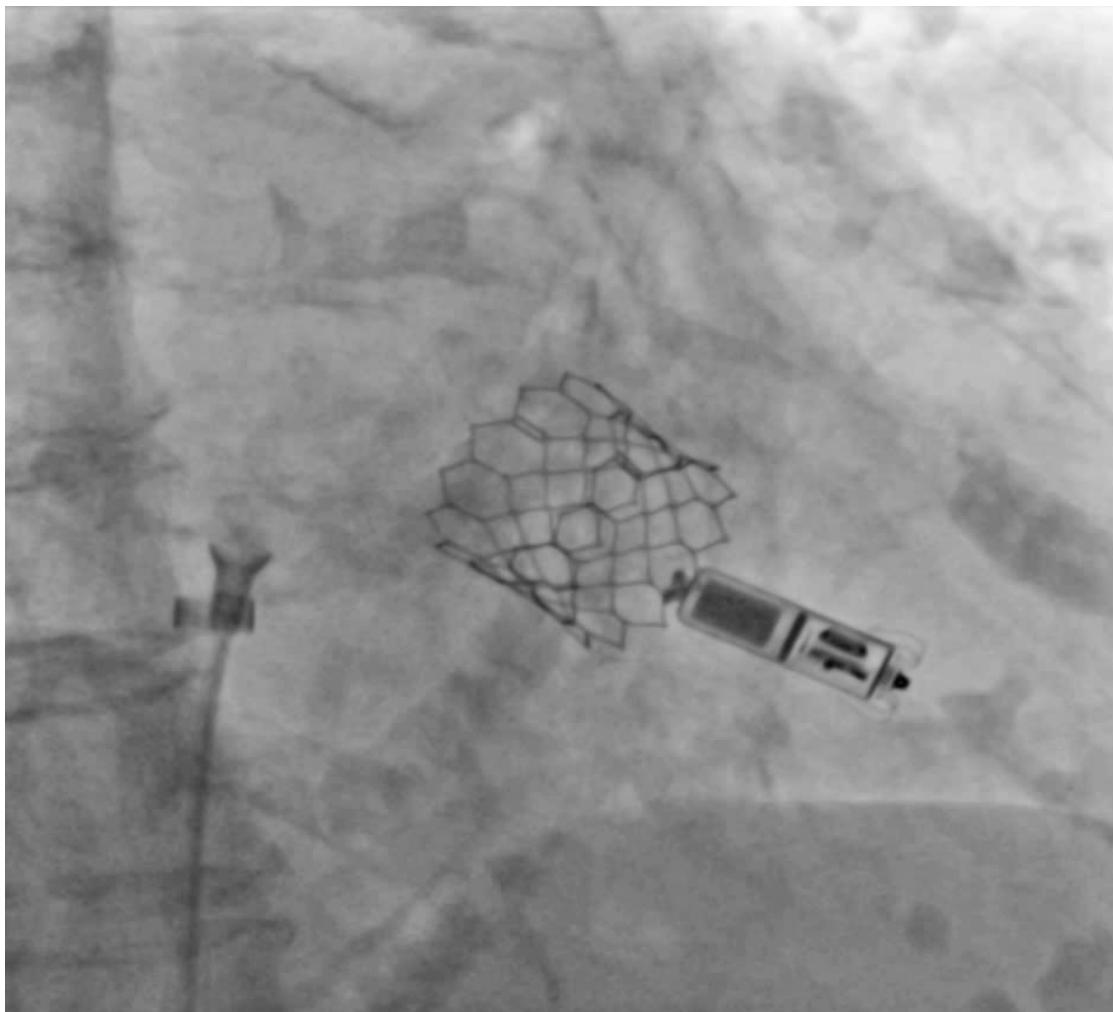
Persistance 2/1 sous isuprel



Décision implantation leadless Micra 16/08/2021



Mme M..V.. Denise
Micra 16/08/2021

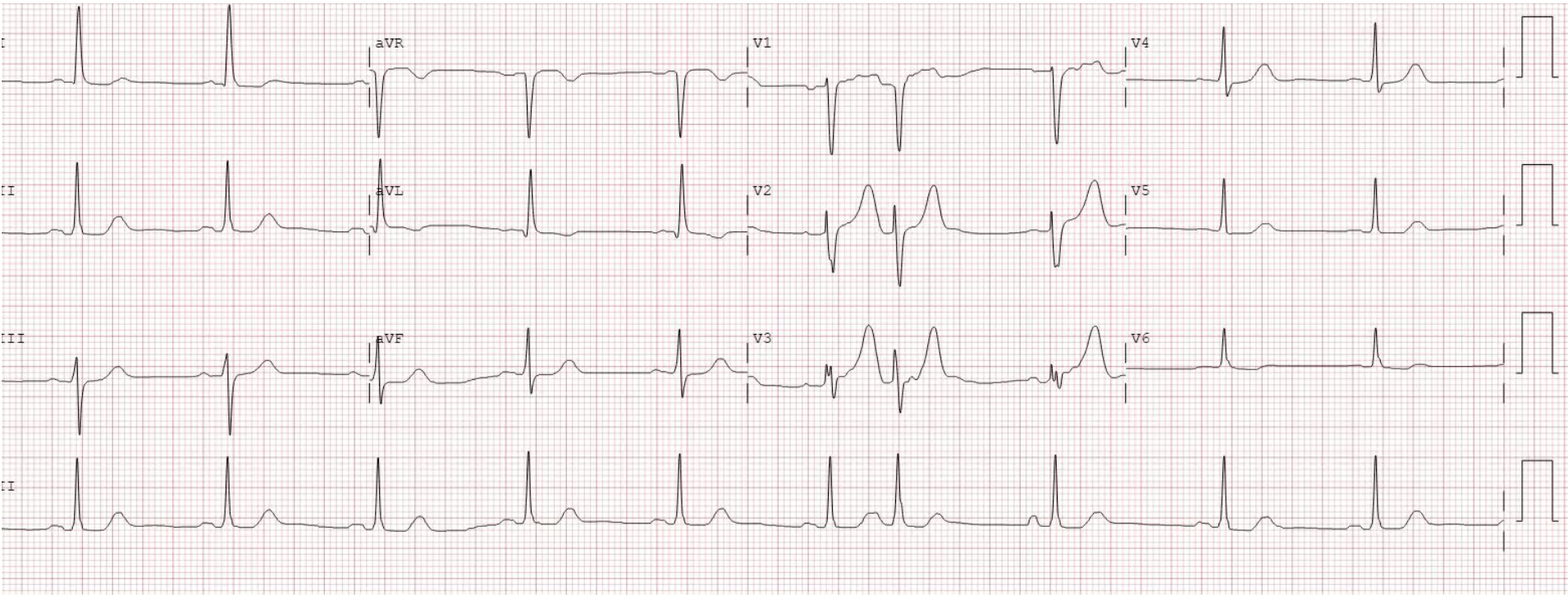


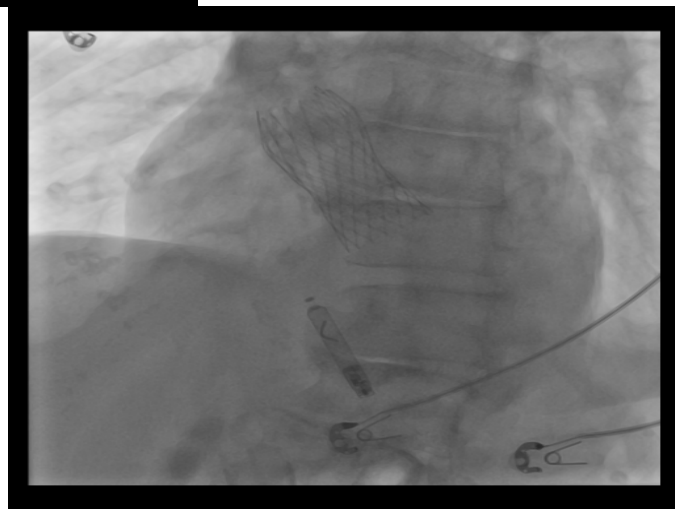
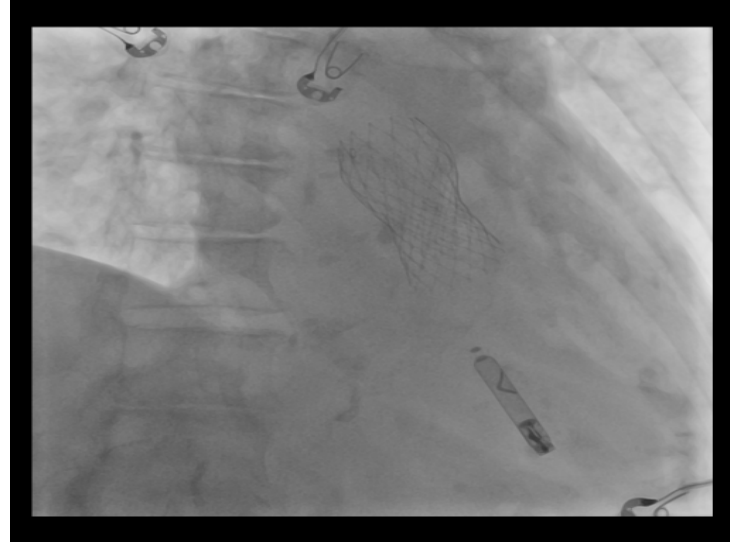
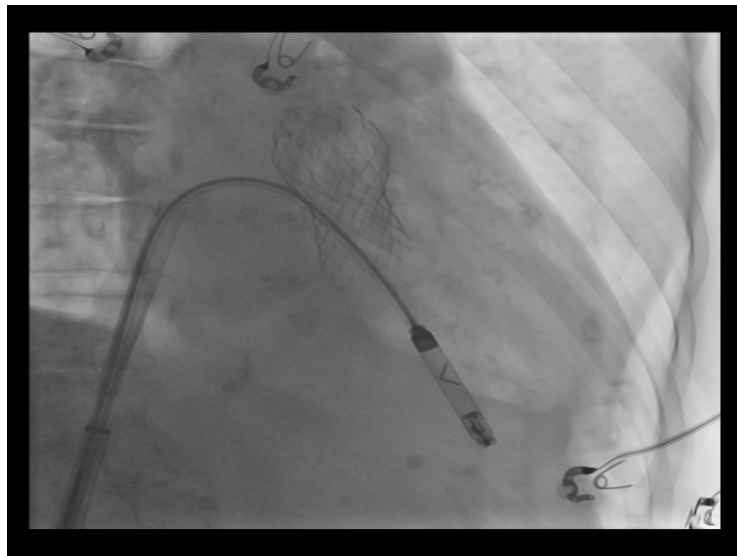
Mme M..V.. Denise
Micra 16/08/2021

Mme M..V.. Denise
Micra 16/08/2021

ECG 15/9/2021

M+1 post leadless





- ✓ Taux de PM post TAVI stable : 20%, Pas de diminution avec nouvelles générations de prothèses
- ✓ BBD : indicateur le plus fort pré-TAVI de BAV complet
- ✓ Mais pas d'indication prophylactique en cas de BBD pré TAVI

- ✓ Discussion : survenue d'un BBG post TAVI : >150 ms ou $PR > 240$ ms
 - recommandation Holter prolongé (ou ILR) ou EEP avec $HV > 70$ ms : PM

- Place du "leadless" dans les indications de PM post TAVI

- ✓ Les troubles de conduction et les PM affectent négativement la FEVG

- ✓ Discordance sur morbi-mortalité associée