

2023

11^{ème}

SÉMINAIRE de CARDIOLOGIE
INTERVENTIONNELLE de TROYES

01 & 02
AVRIL



SALLE DU CONSEIL MUNICIPAL
HOTEL DE VILLE de TROYES



L'interventionnel valvulaire percutané

TAVI et bicuspidie aortique



CHU DE REIMS

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UNIVERSITÉ
DE REIMS
CHAMPAGNE-ARDENNE

Déclaration de conflits d'intérêts

- Bourse de Fellowship : Edwards, Medtronic
- Lecture : Edwards

TAVI

Remplacement valvulaire aortique percutané

- Première procédure en 2002 (Pr Alain Cribier, CHU Rouen)
- >80% procédures par voie fémorale, sous anesthésie locale



*Edwards Sapien Ultra
ballon-expandible*

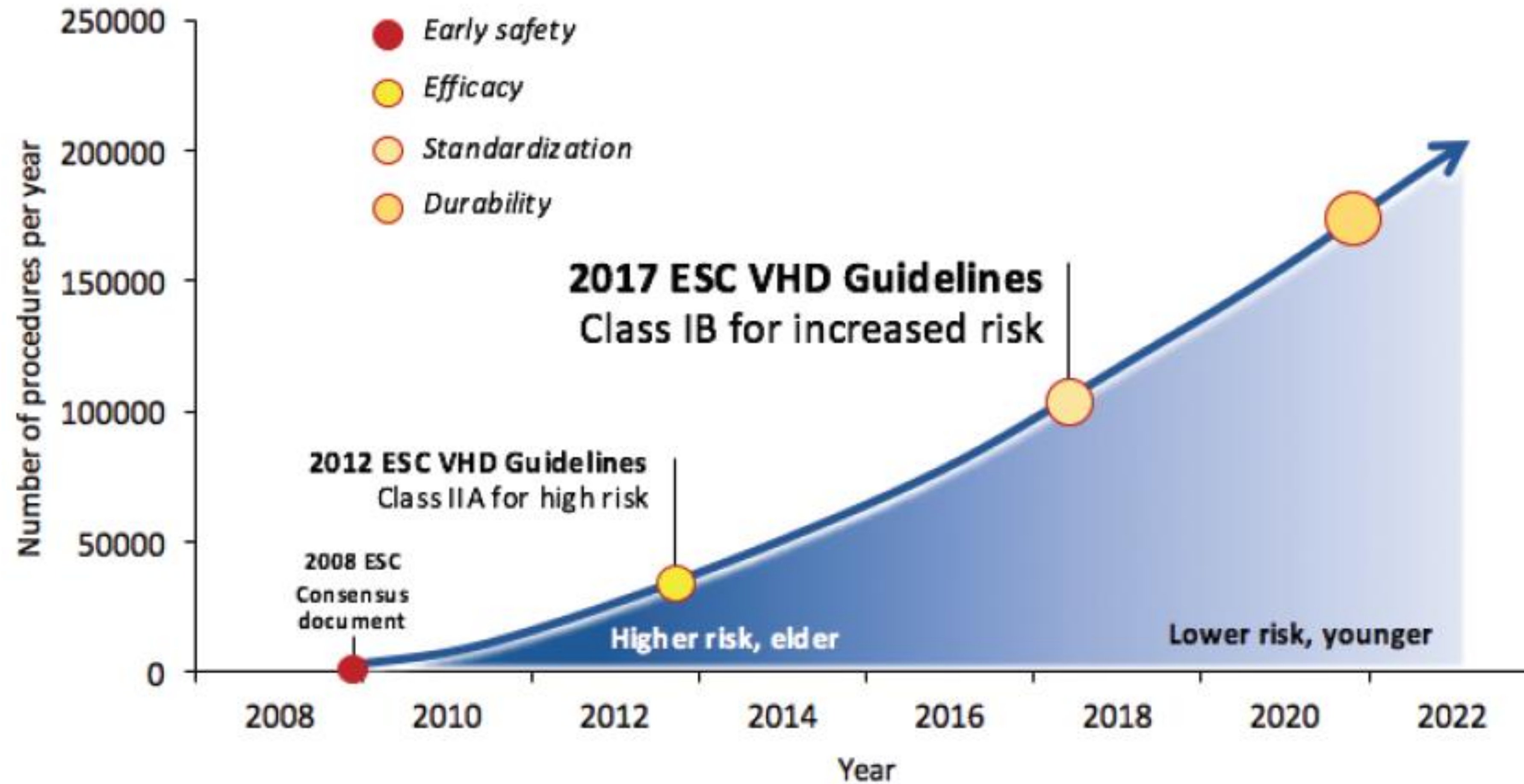


*Medtronic Evolut Pro+
auto-expandible*



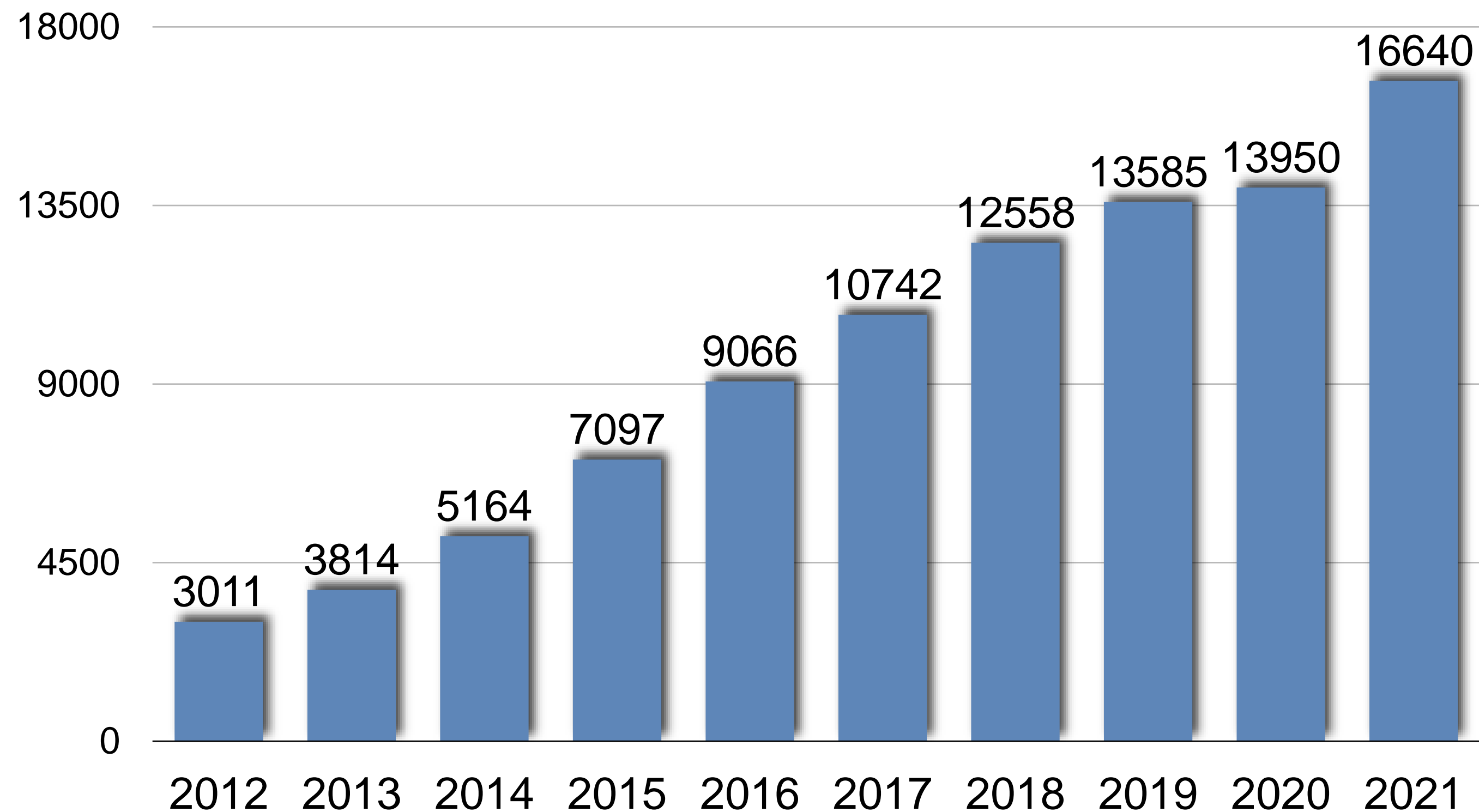
TAVI

Remplacement valvulaire aortique percutané



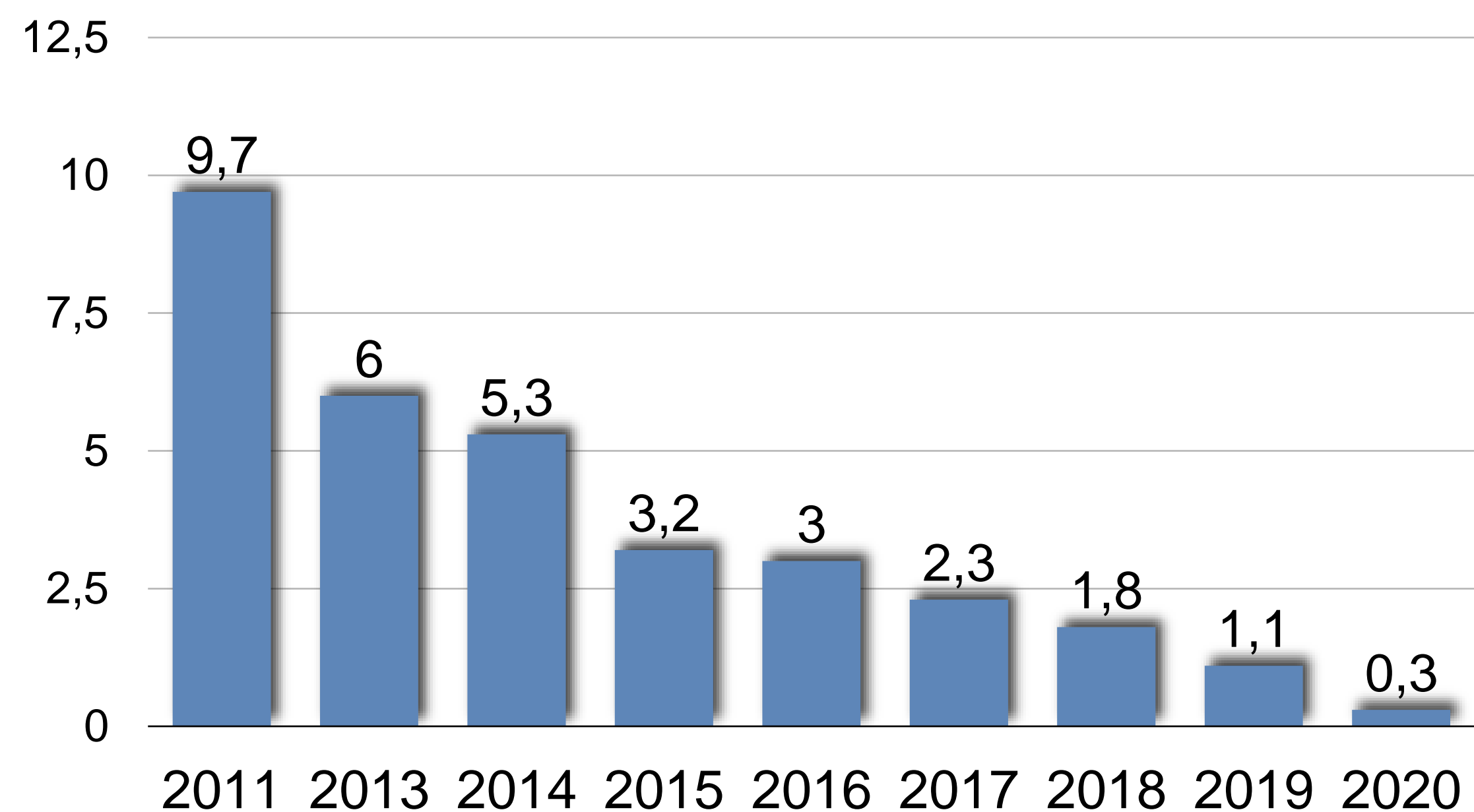
TAVI

Quelques chiffres, en France :



Nombre de procédures TAVI

Données High Tech 2022

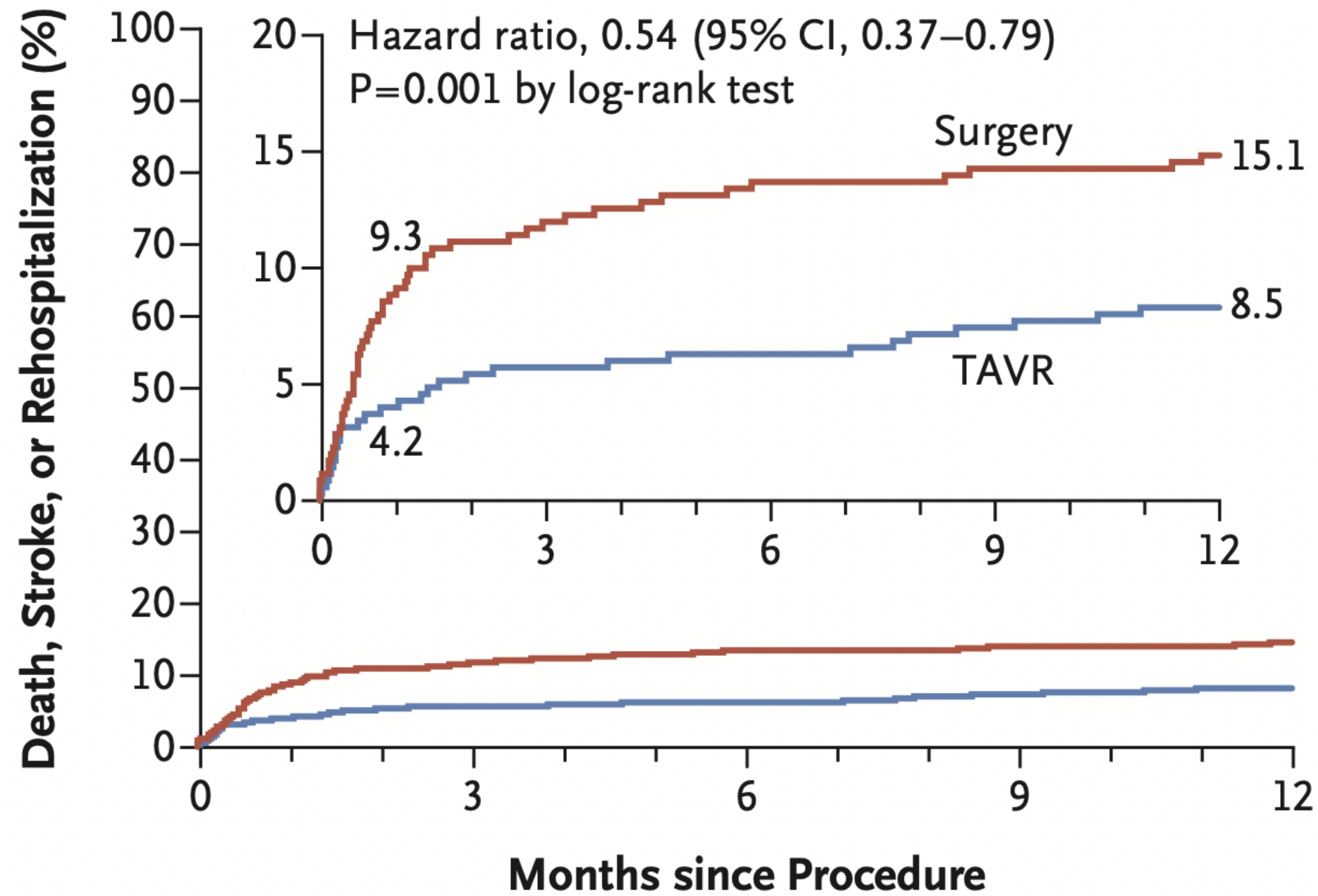


Mortalité procédurale (%)

Données France TAVI

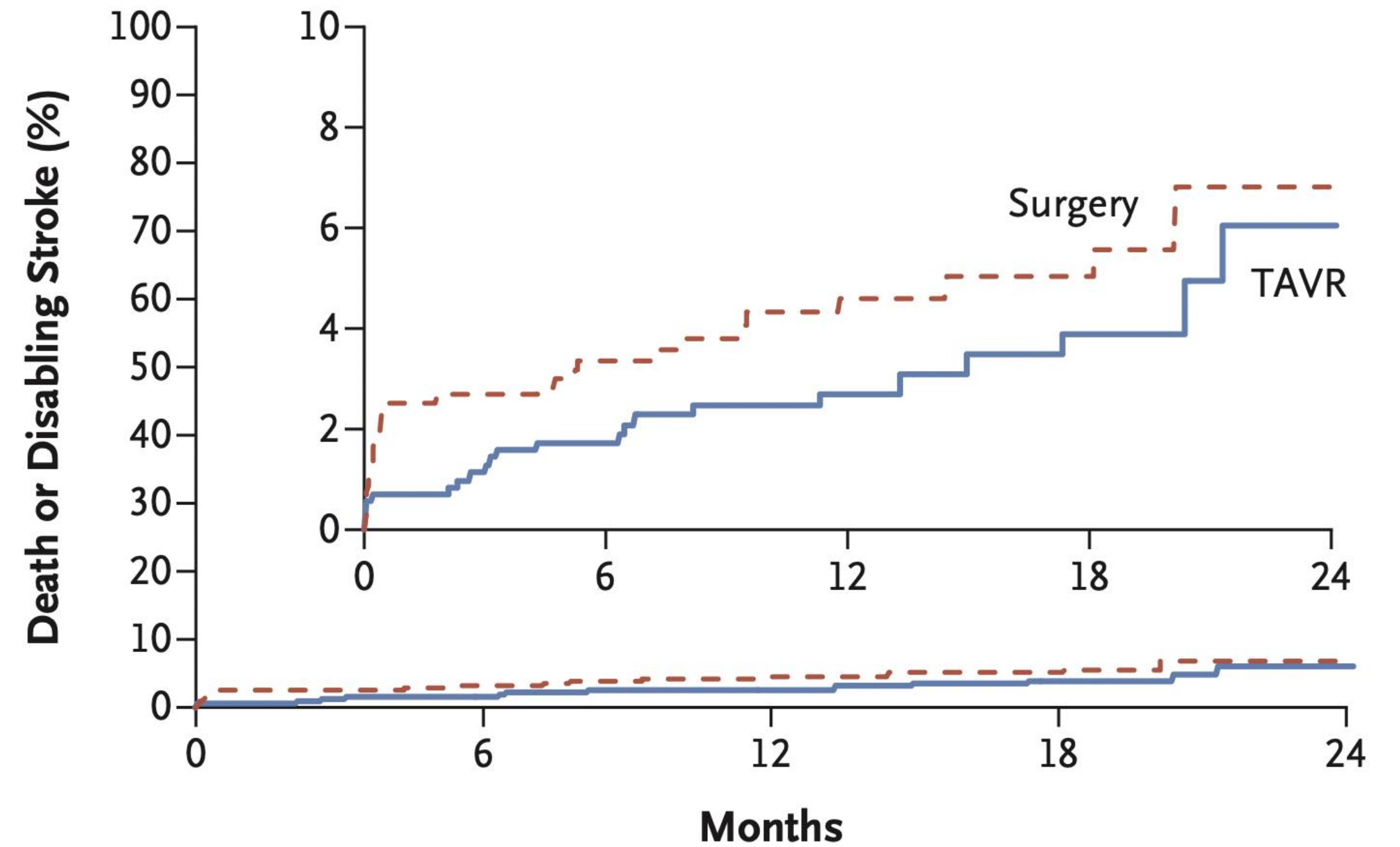
TAVI

Littérature



No. at Risk		0	3	6	9	12
Surgery	454	408	390	381	377	374
TAVR	496	475	467	462	456	451

Mack et al. NEJM 2019

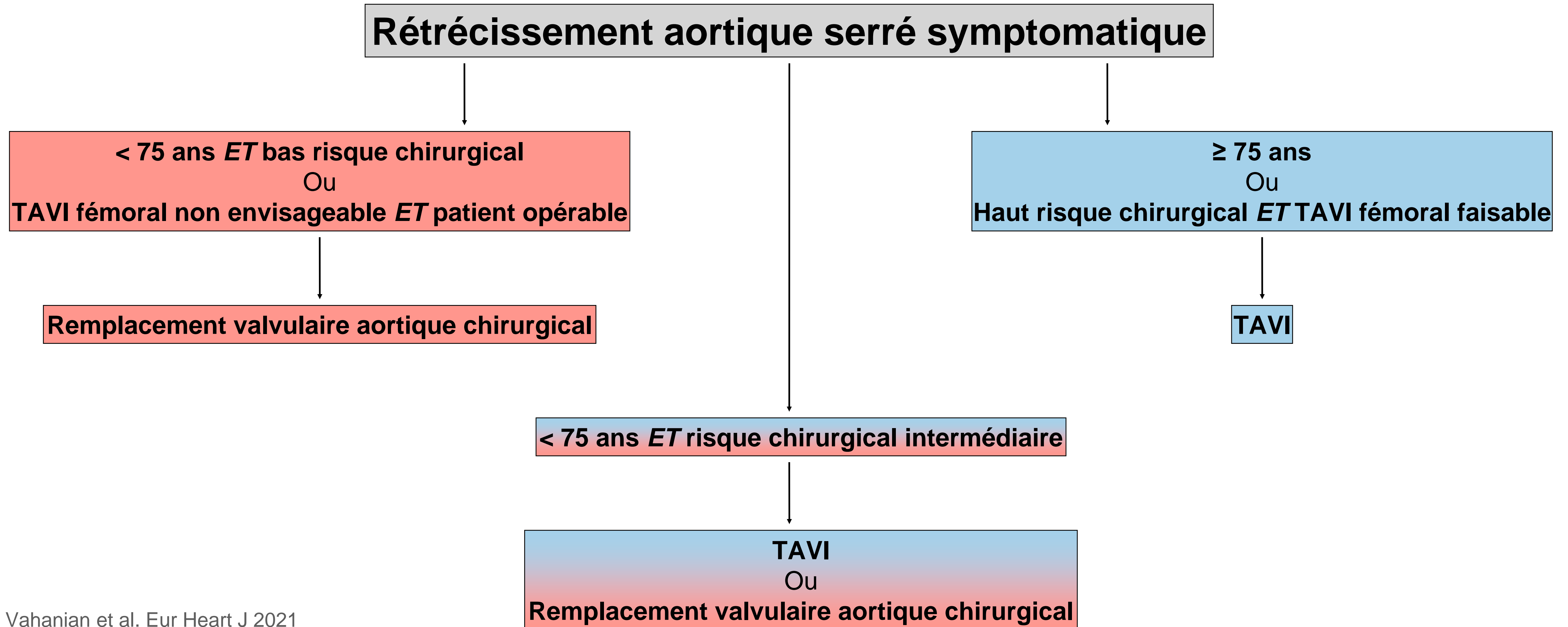


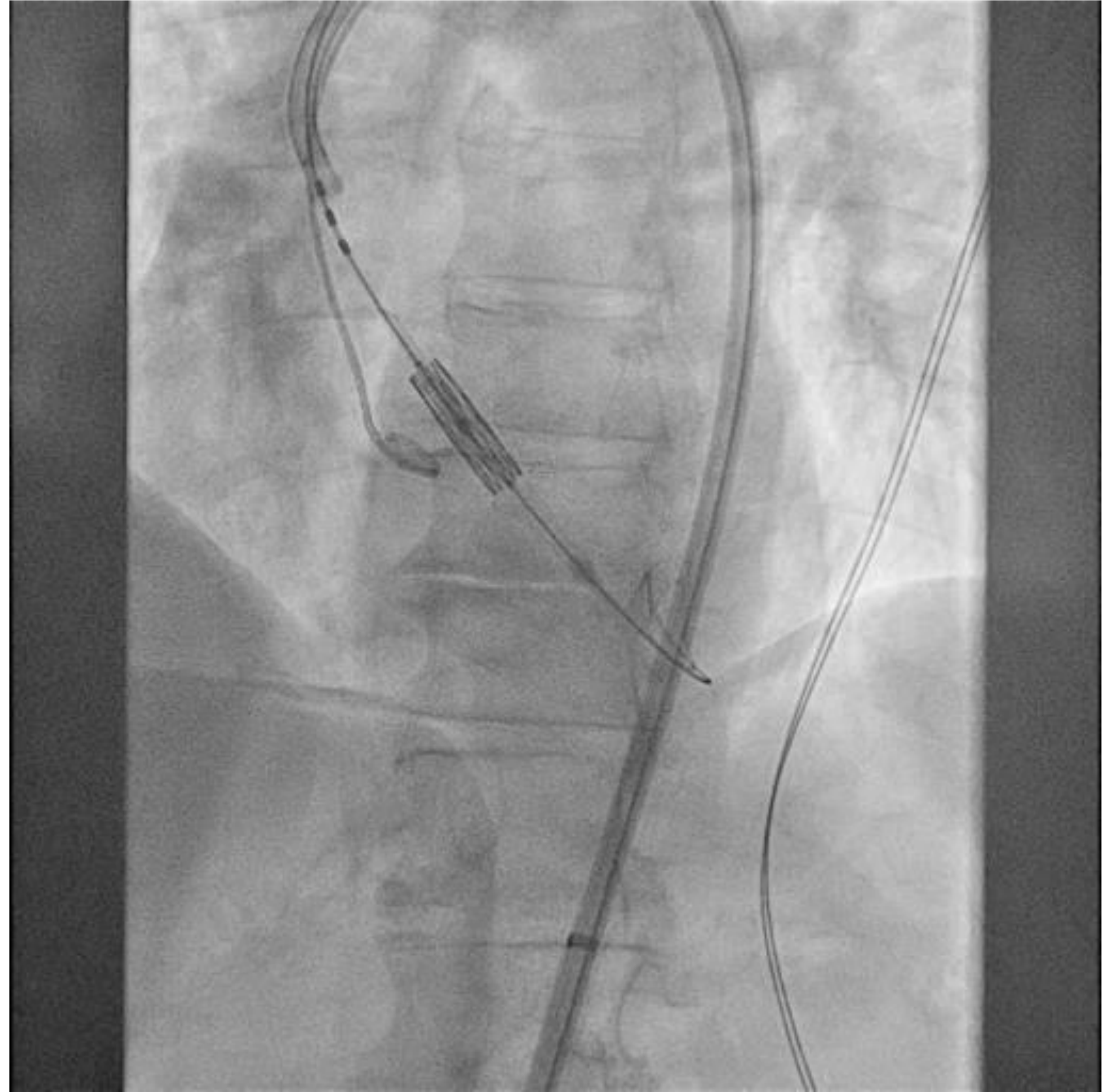
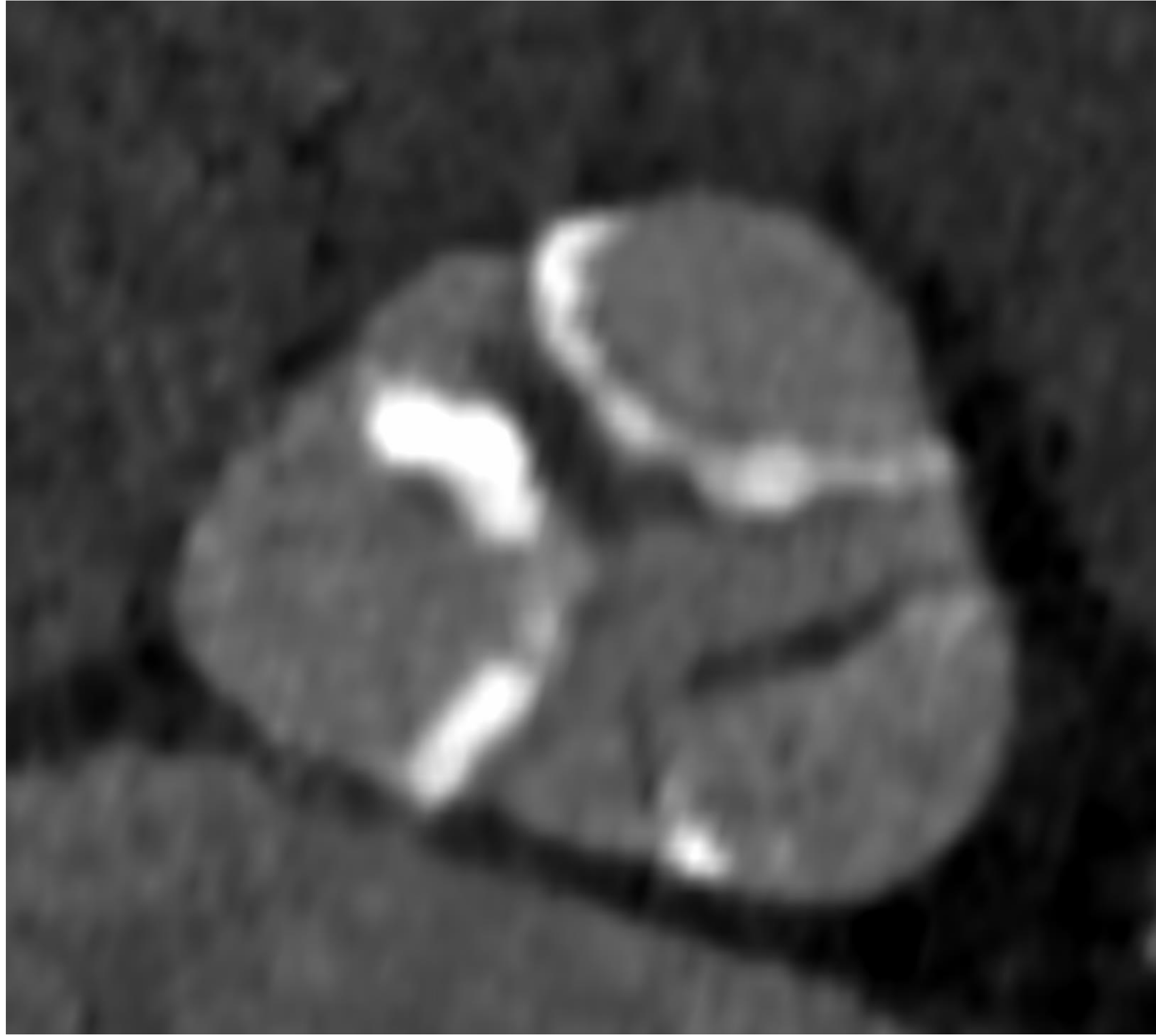
No. at Risk		0	6	12	18	24
Surgery	678	576	366	195	69	
TAVR	725	648	435	233	80	

Popma et al. NEJM 2019

TAVI

Recommandations ESC 2021





TAVI

Population particulière

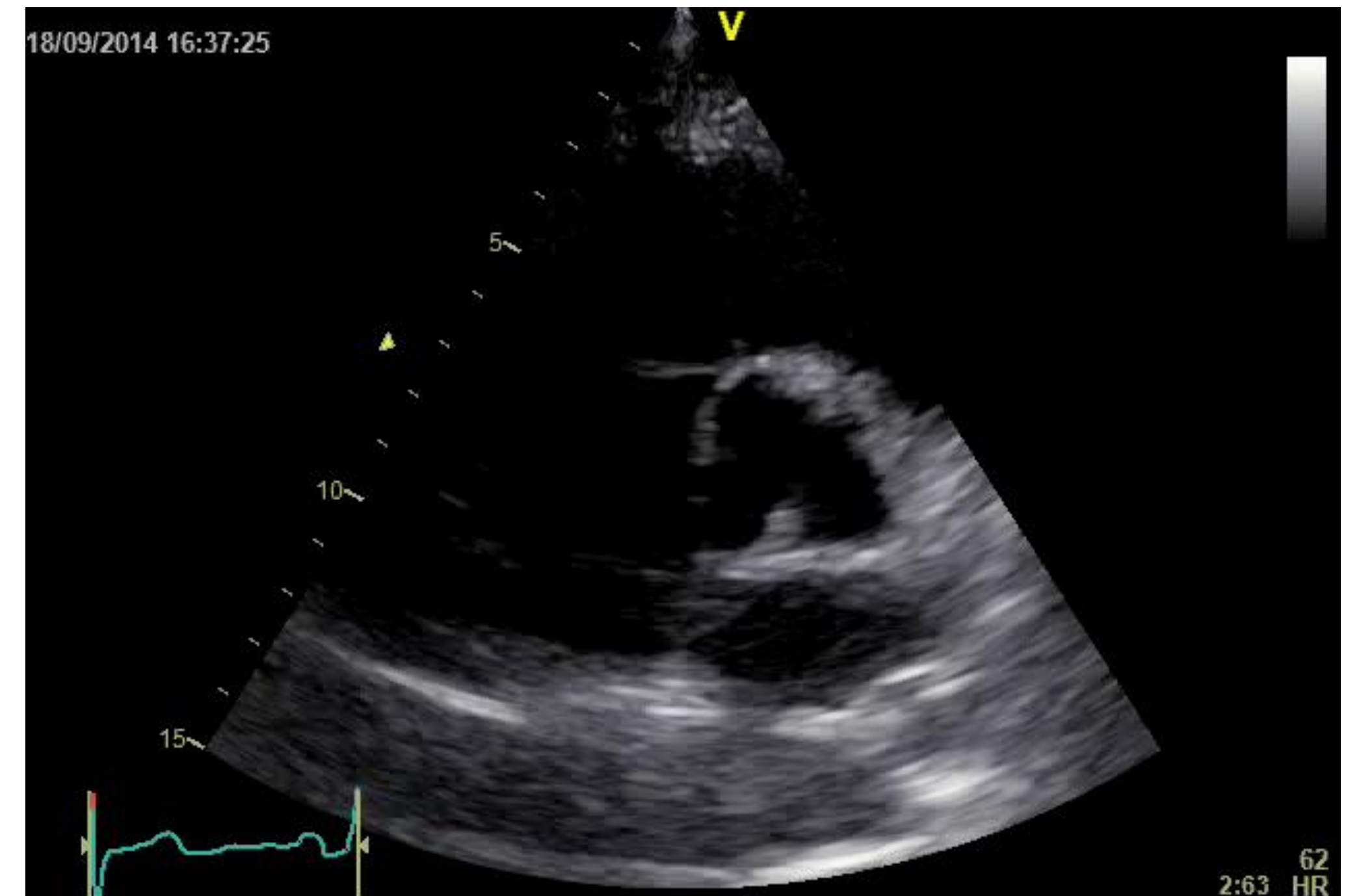
- Recommandations pensées pour le TAVI par voie fémorale avec valve aortique tricuspide
- Quid de la bicuspidie ?



Bicuspidie

Problématique

- Fréquent (0,7-3%)
- \simeq 50% auront intervention valvulaire Ao
- Plus jeunes que tricuspides
- Pourtant :
 - \simeq 10% des patients actuellement traités par TAVI



Bicuspidie

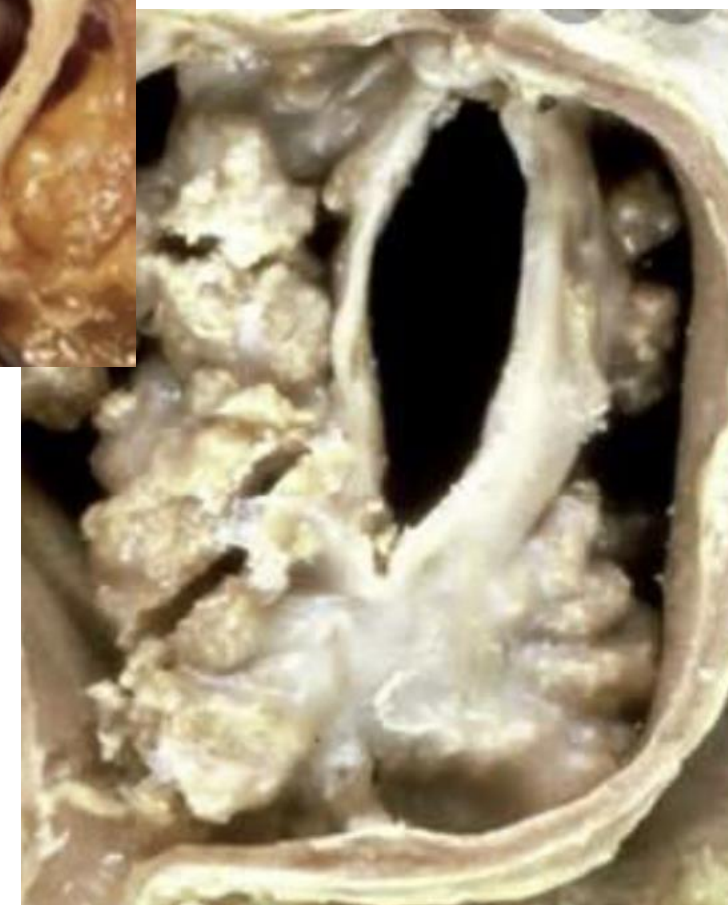
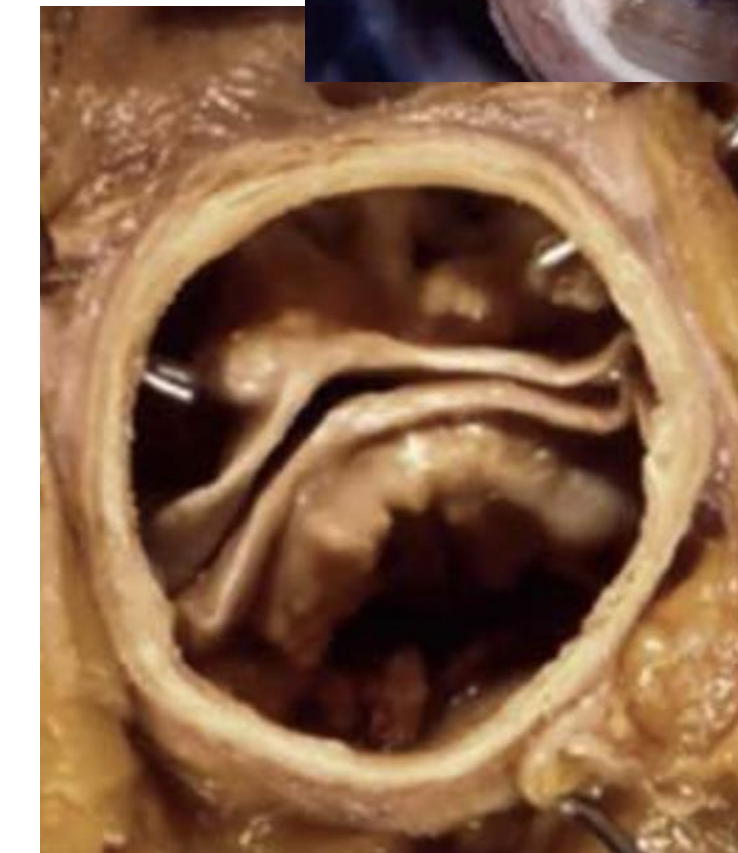
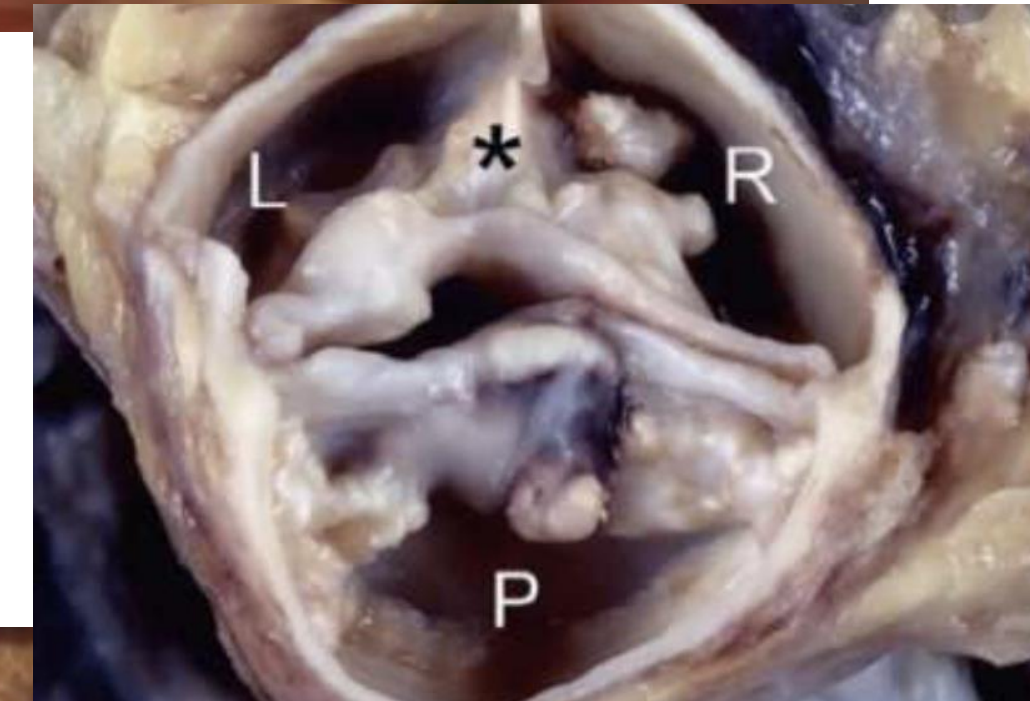
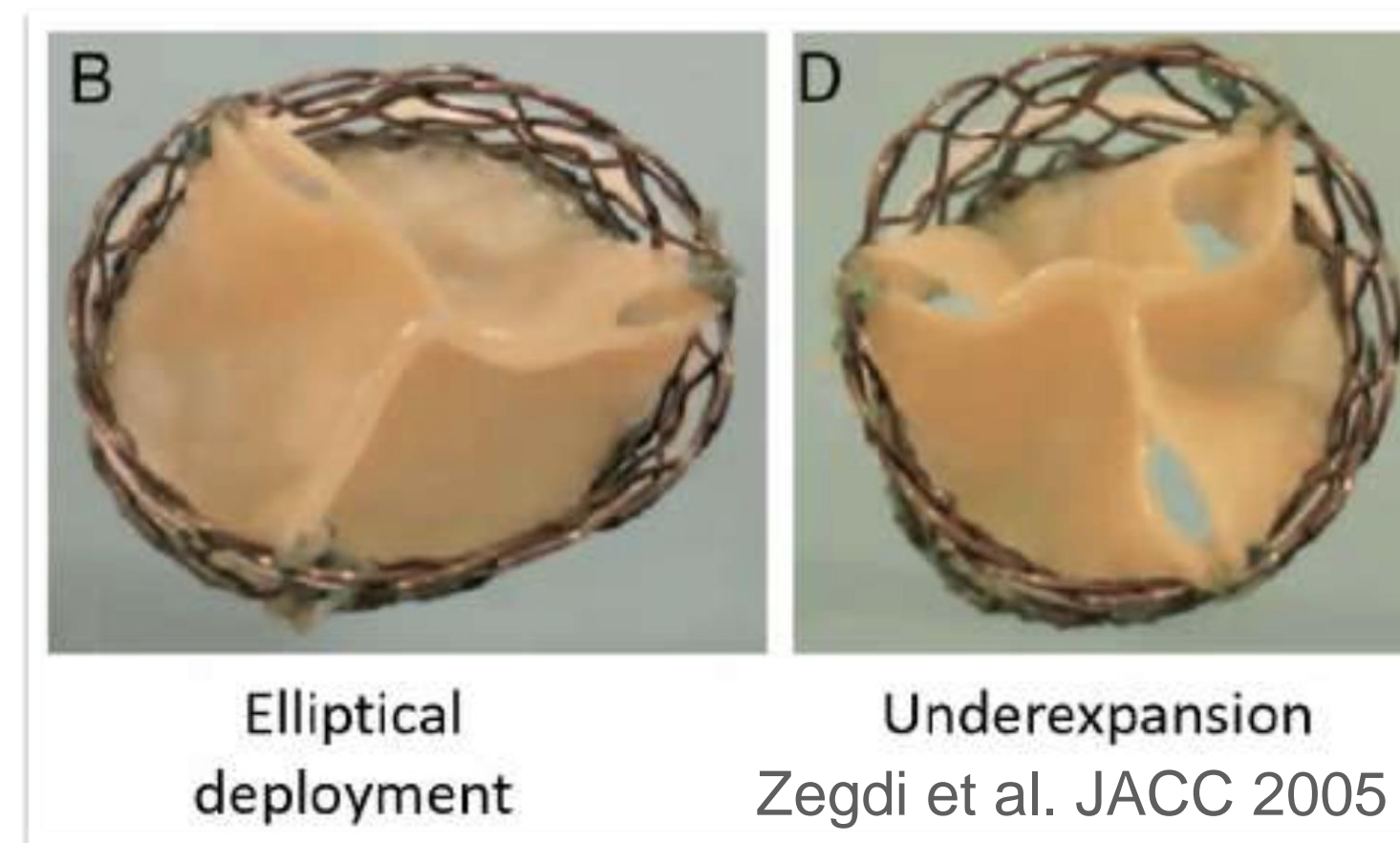
Problématique

Diagnostic difficile

- Jusqu'à 90% de sous-estimation à l'ETT des bicuspidies chez la personne âgée (calcifications)
- Gold standard = angioscanner synchronisé

Grande hétérogénéité anatomique

- Calcifications importantes, de répartitions différentes (excentriques, raphé, chambre de chasse)
 - Rupture d'anneau ? IAo peri-prothétique ?
- Anneau plus large et elliptique :
 - Déploiement elliptique de la valve TAVI ?
 - Sous-expansion : IAo péri-prothétique ?
- Aortopathie associée



Bicuspidie

ESC 2021

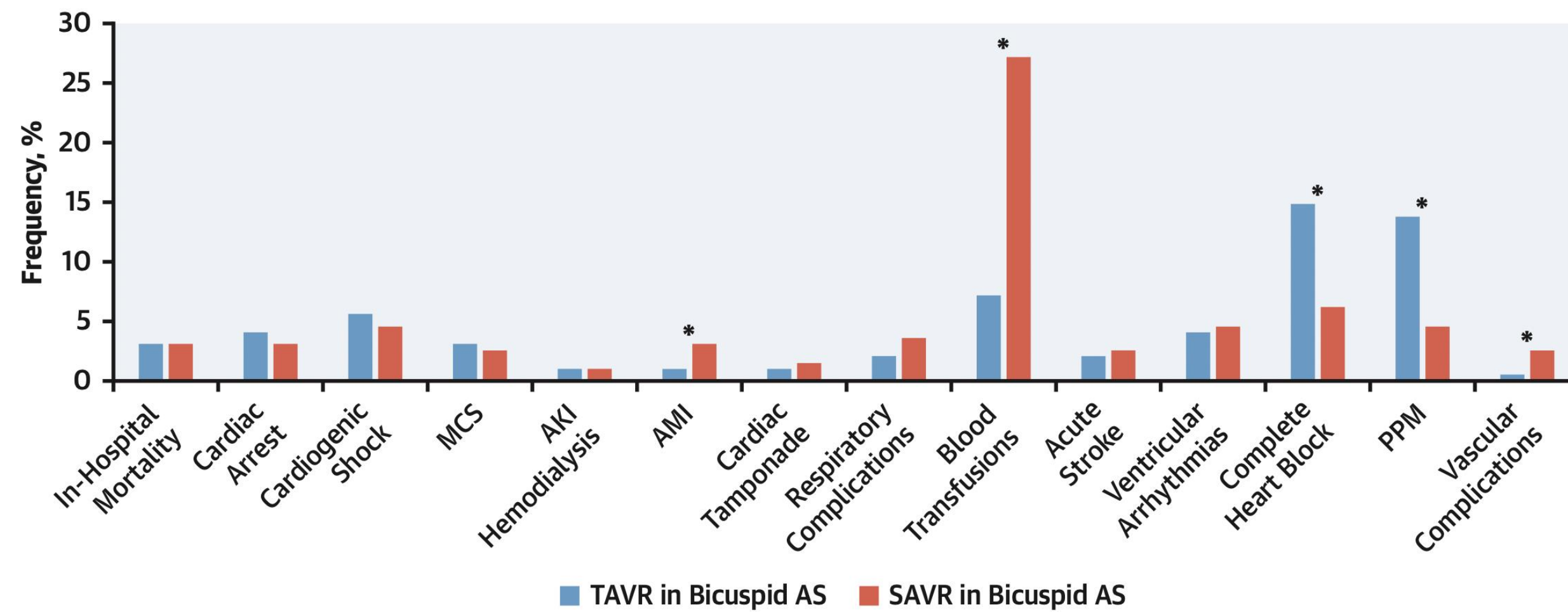
A bicuspid aortic valve is more frequent in younger patients with aortic stenosis. While several registries have reported excellent outcomes of TAVI in patients with a bicuspid valve who were unsuitable for surgery,^{231–233} SAVR remains more appropriate in patients with aortic stenosis affecting a bicuspid valve and in those with associated disease (e.g. aortic root dilatation, complex coronary disease, or severe mitral regurgitation) requiring a surgical approach.

	Favours TAVI	Favours SAVR
Clinical characteristics		
Lower surgical risk	–	+
Higher surgical risk	+	–
Younger age ^a	–	+
Older age ^a	+	–
Previous cardiac surgery (particularly intact coronary artery bypass grafts at risk of injury during repeat sternotomy)	+	–
Severe frailty ^b	+	–
Active or suspected endocarditis	–	+
Anatomical and procedural factors		
TAVI feasible via transfemoral approach	+	–
Transfemoral access challenging or impossible and SAVR feasible	–	+
Transfemoral access challenging or impossible and SAVR inadvisable	+ ^c	–
Sequelae of chest radiation	+	–
Porcelain aorta	+	–
High likelihood of severe patient–prosthesis mismatch (AVA <0.65 cm ² /m ² BSA)	+	–
Severe chest deformation or scoliosis	+	–
Aortic annular dimensions unsuitable for available TAVI devices	–	+
Bicuspid aortic valve	–	+
Valve morphology unfavourable for TAVI (e.g. high risk of coronary obstruction due to low coronary ostia or heavy leaflet/LVOT calcification)	–	+
Thrombus in aorta or LV	–	+
Concomitant cardiac conditions requiring intervention		
Significant multi-vessel CAD requiring surgical revascularization ^d	–	+
Severe primary mitral valve disease	–	+
Severe tricuspid valve disease	–	+
Significant dilatation/aneurysm of the aortic root and/or ascending aorta	–	+
Septal hypertrophy requiring myectomy	–	+

Bicuspidie

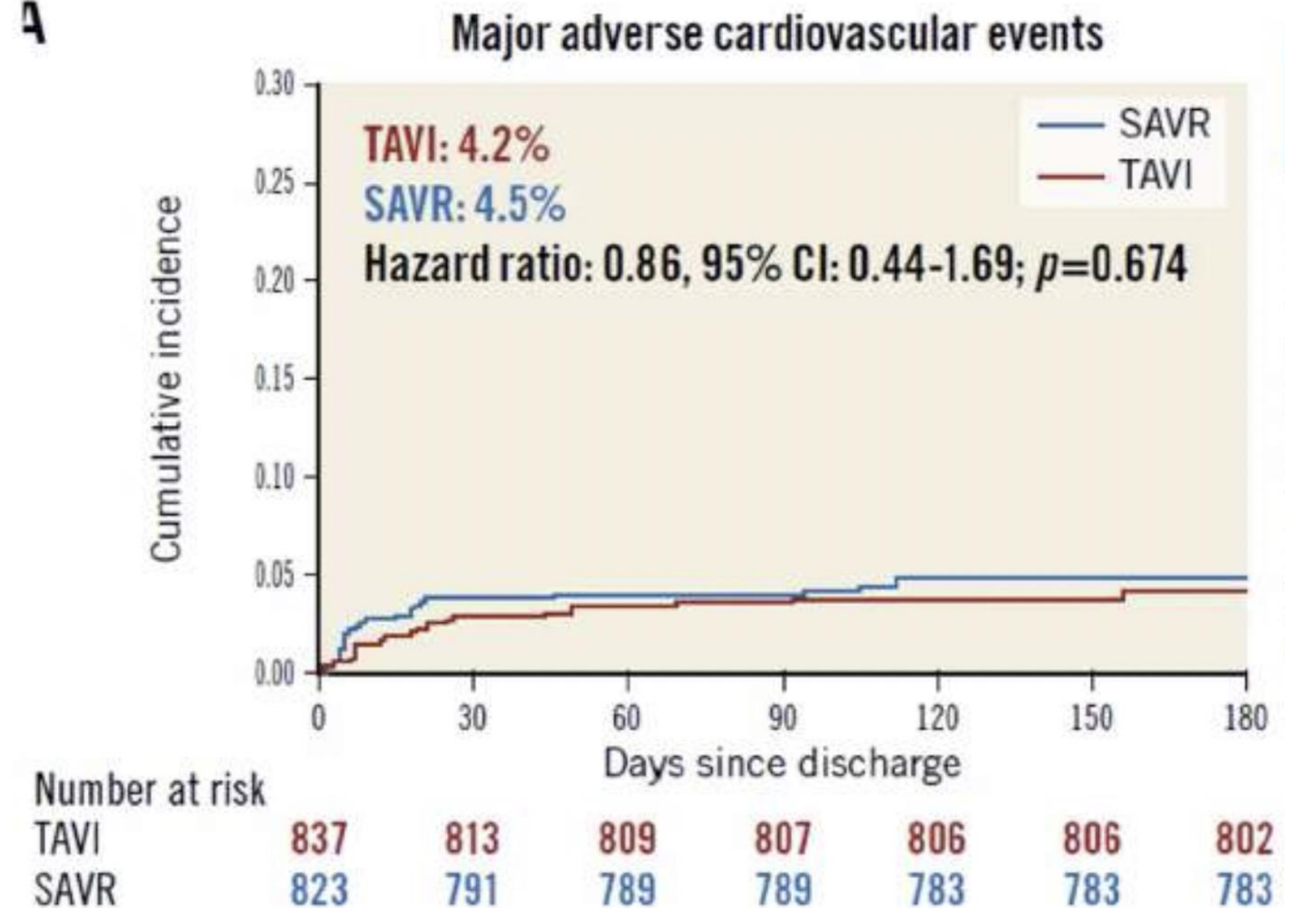
TAVI versus RVA

C Comparative Outcomes in the Matched Cohort of TAVR Versus SAVR in Bicuspid AS



Elbadawi, A. et al. J Am Coll Cardiol Intv. 2019;12(18):1811-22.

A

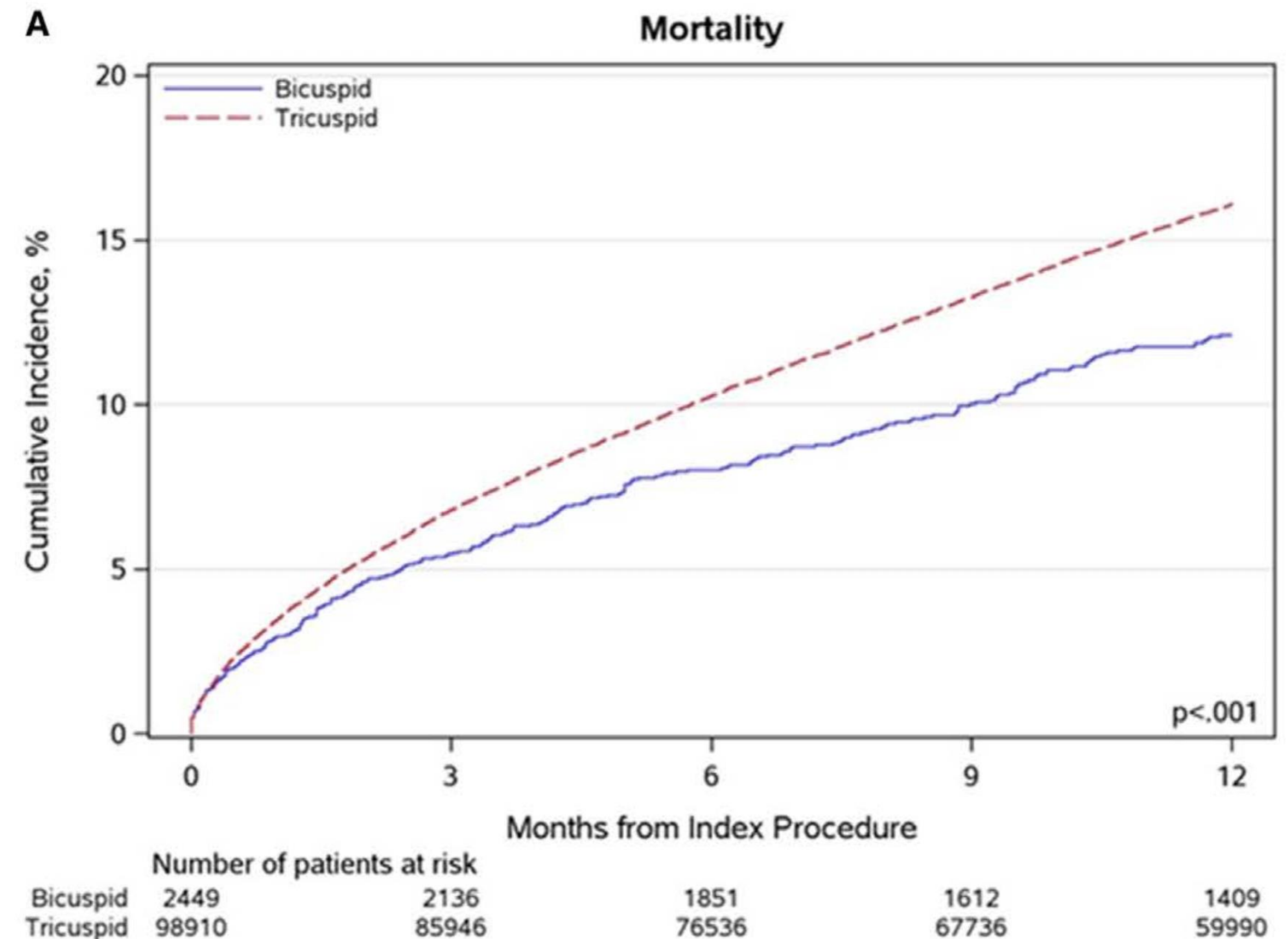


Majmndar et al, Eurointervention 2022

Bicuspidie

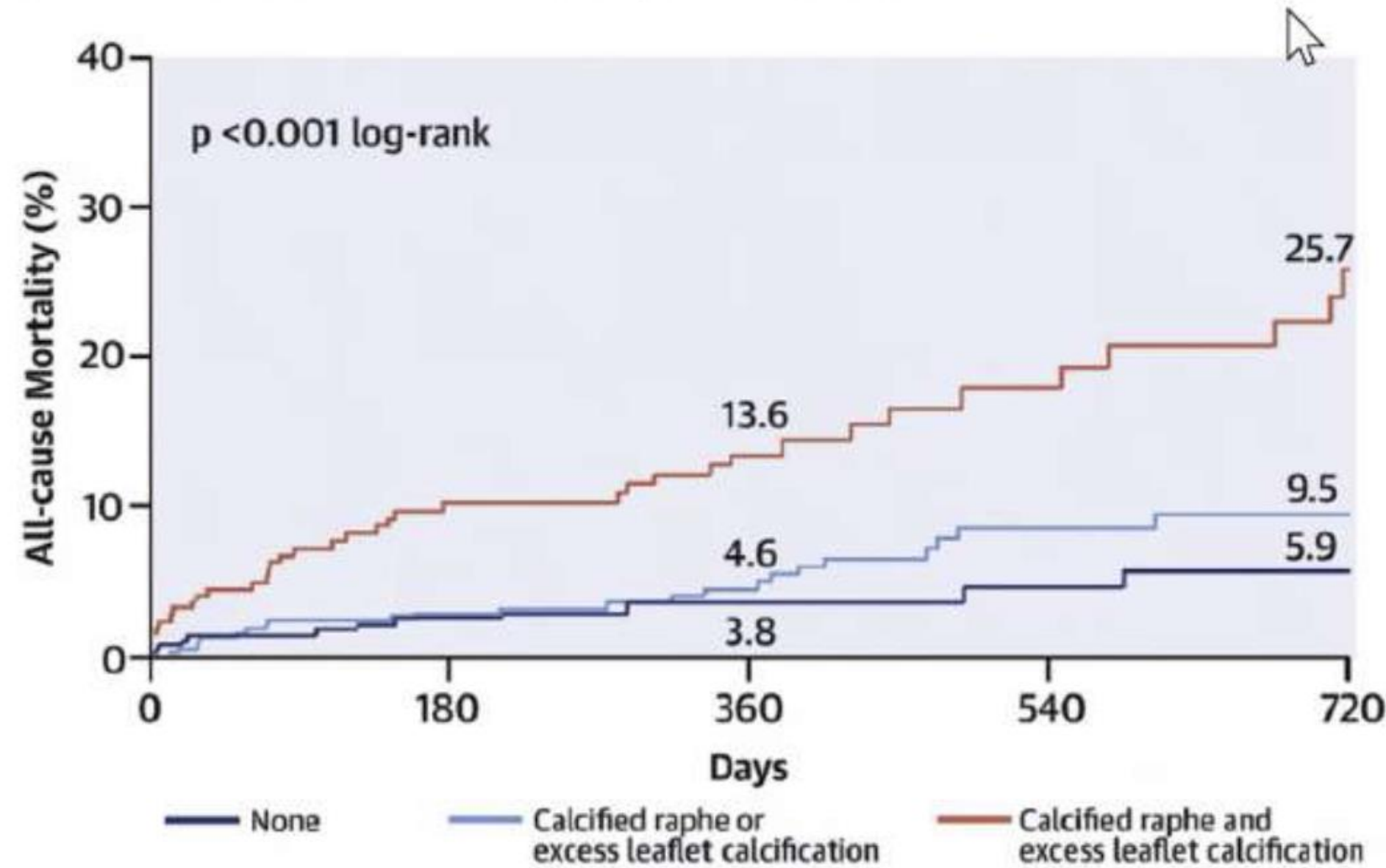
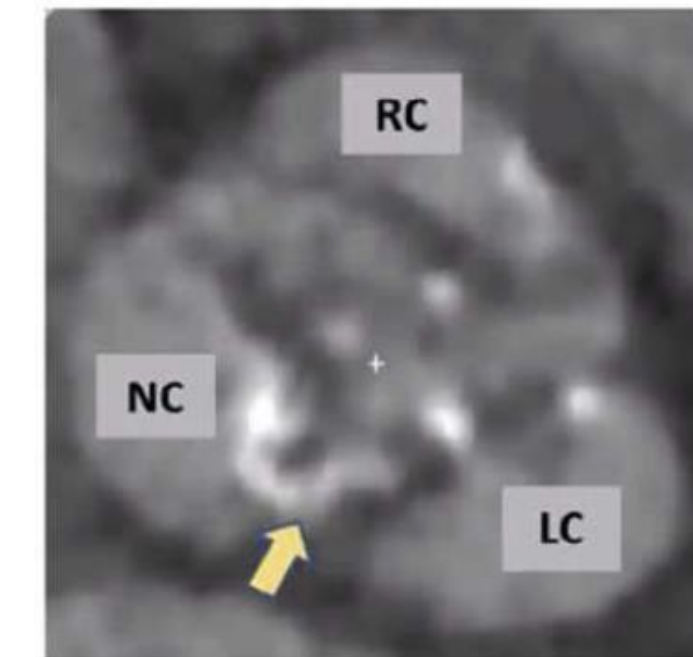
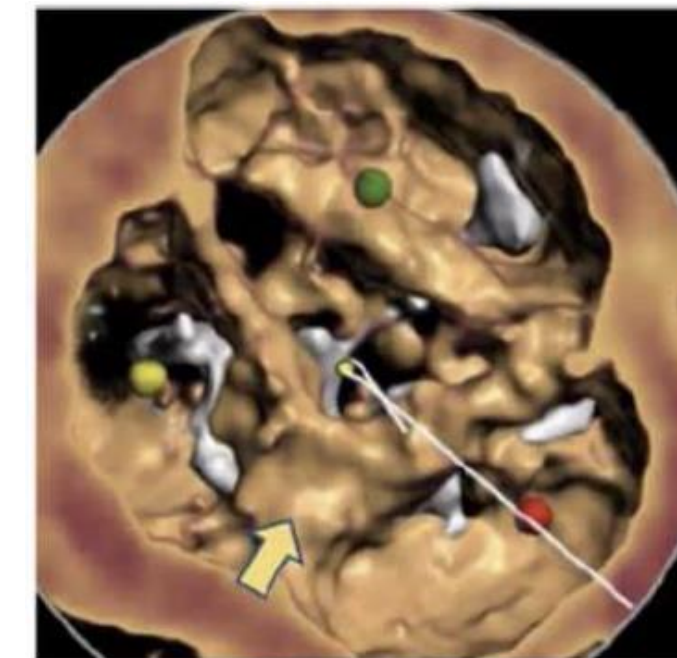
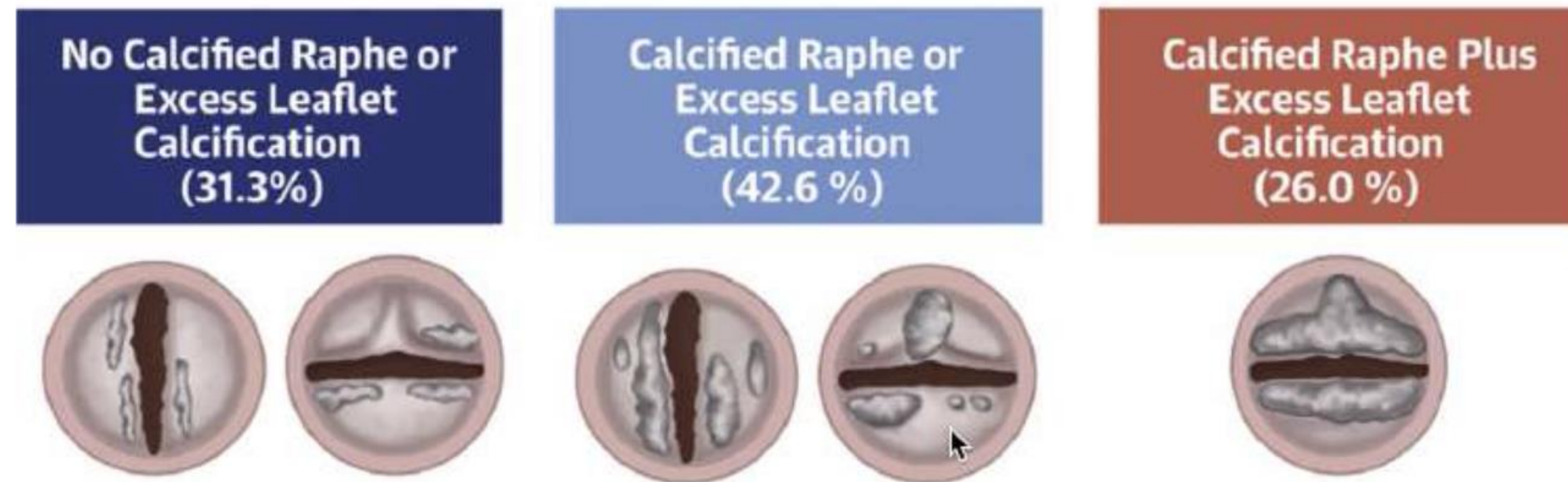
TAVI sur valve bicuspide versus tricuspide

- *AVC, conversion vers une chirurgie à coeur ouvert* : similaire
- *IAo péri-prothétique* : 4,7% versus 3,5%, $p < 0,001$



Bicuspidie

Charge calcique = paramètre pronostic principal



Workflow Assistant

1. Define Centerline
2. Adjust Annulus Plane
3. Measurements

Virtual Valve

Edit Orientation

Custom...

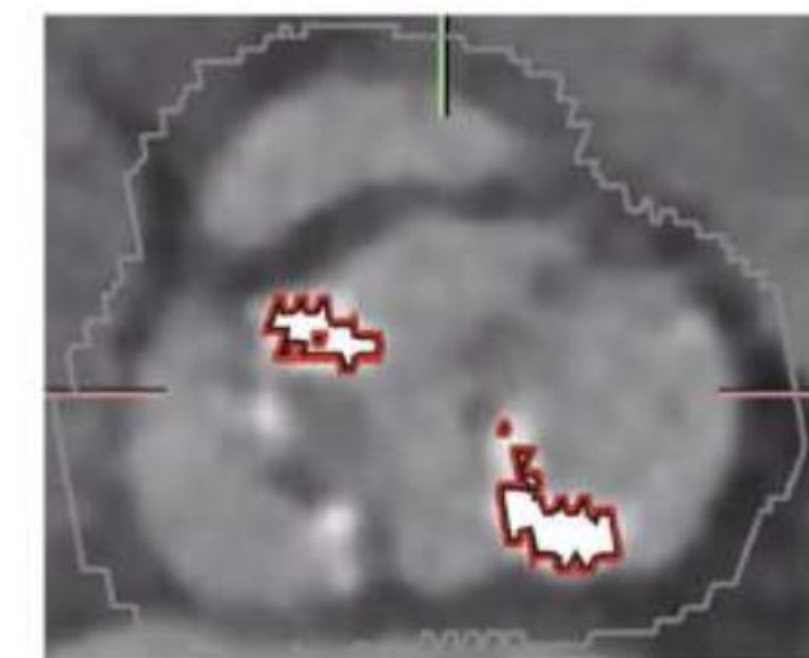
Offset (mm) (0%) 0

Calcium Qtf. (at 61.0%)

Threshold (HU) 850

Min. size (mm³) 0

Score Leaflets Separately



Bicuspidie

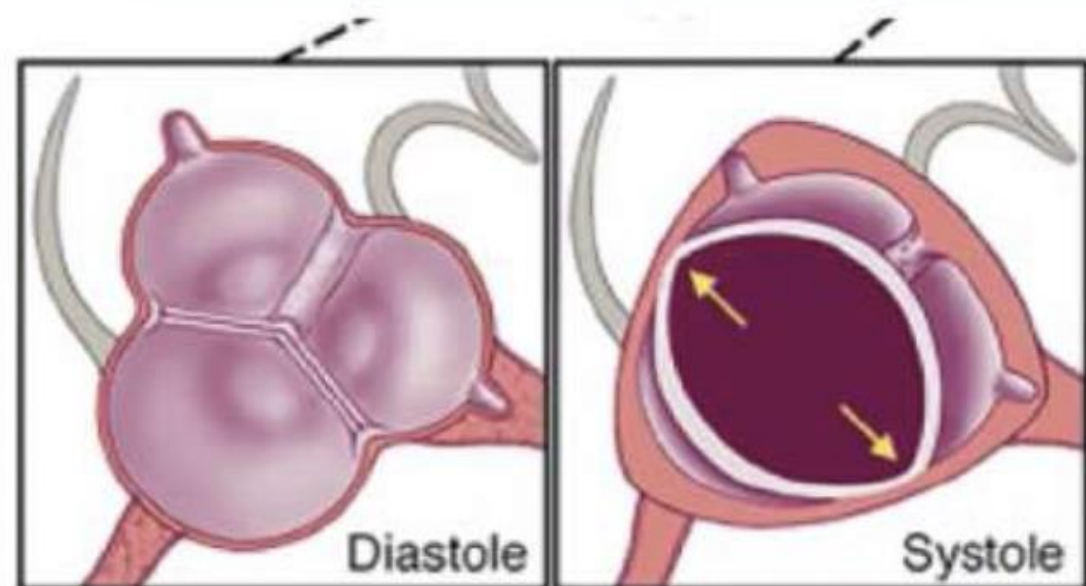
Formes anatomiques

New international consensus statement on nomenclature and classification of BAV

Bicuspid Aortic Valve Types and Phenotypes

Fused BAV (90-95%)

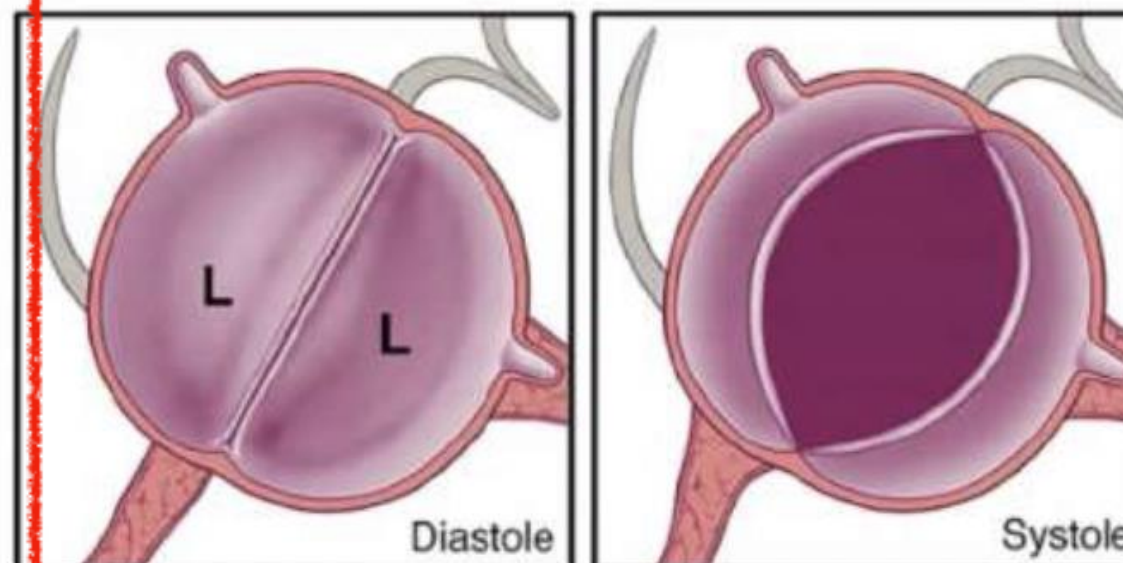
- 3 aortic sinuses
- 2 cusps: Usually different size/shape with asymmetric or symmetric non-fused commissural angle
- 2 commissures
- Raphe: Common, visible or not



Right – Left Cusp Fusion
(70-80%)

2-Sinus BAV (5-7%)

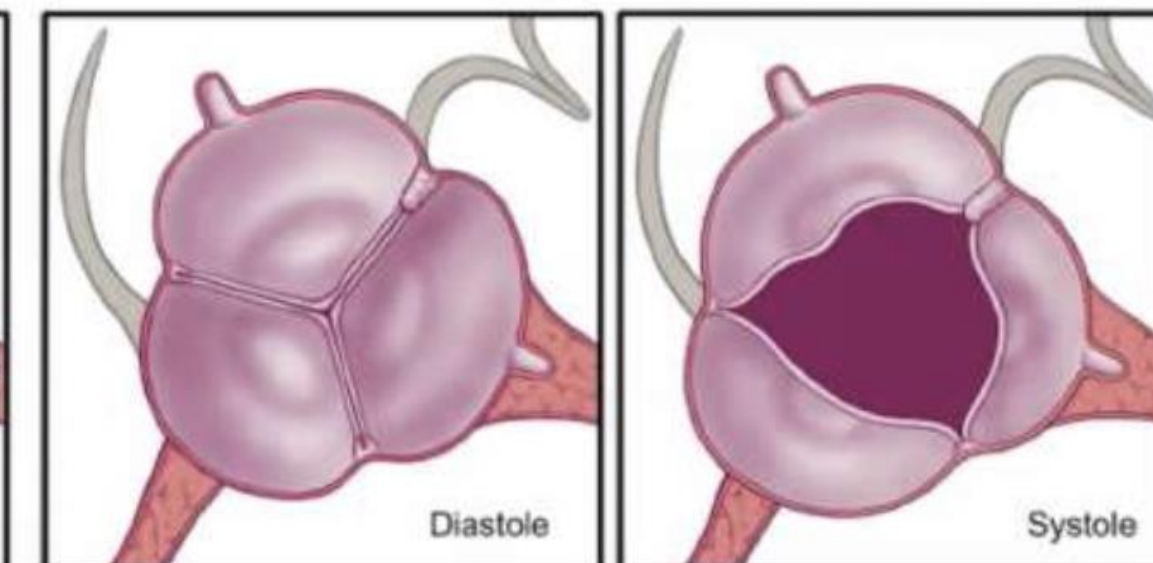
- 2 aortic sinuses
- 2 cusps: Roughly same size/shape with symmetric non-fused commissural angle
- 2 commissures
- Raphe: No



Latero-lateral
(most common)

Partial-fusion BAV (%?) (forme fruste)

- 3 aortic sinuses
- 3 cusps: Usually symmetric
- 3 “apparent” commissures where 2 are normal and the third is fused <50%
- Raphe: Small, mini-raphe

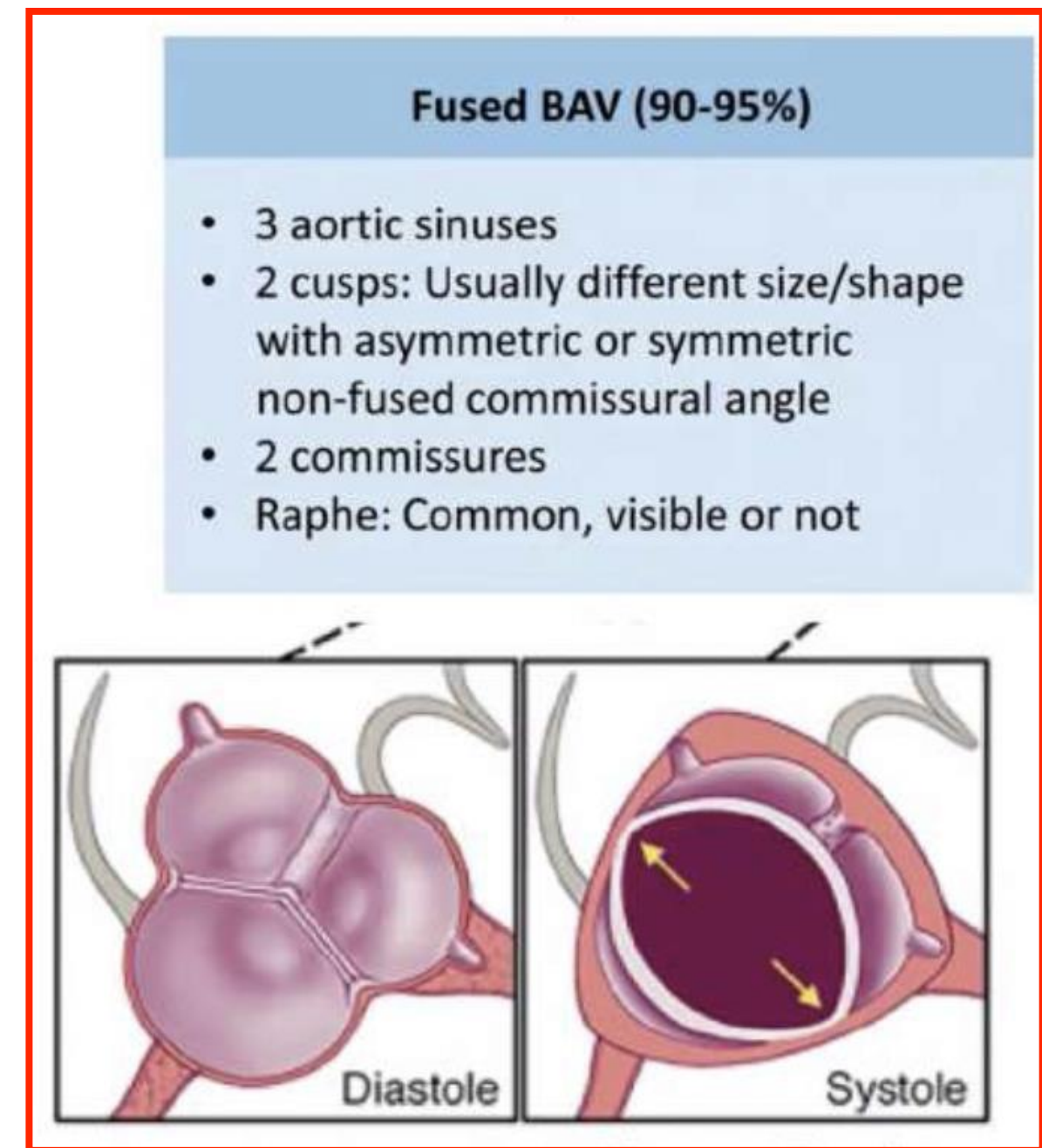


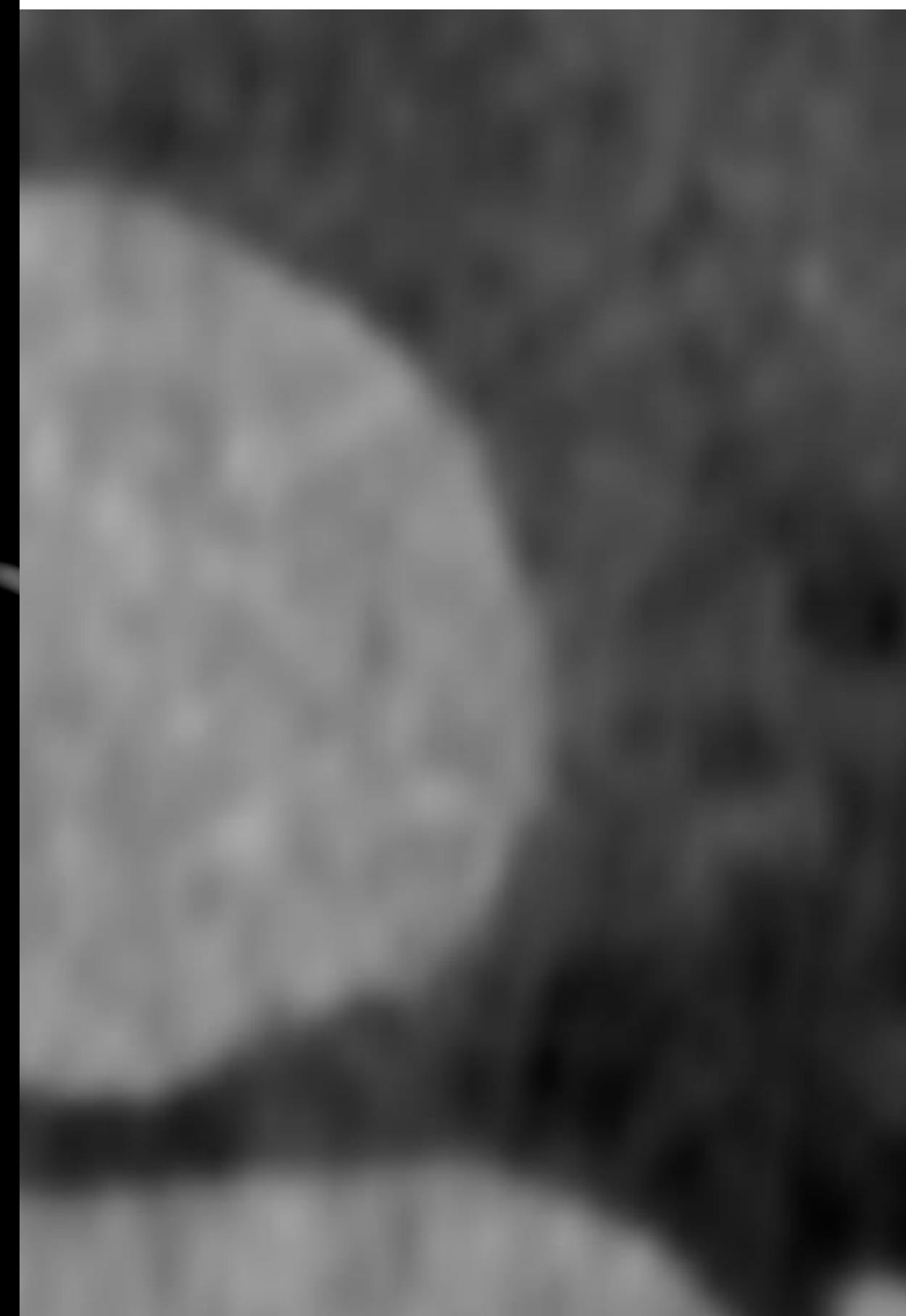
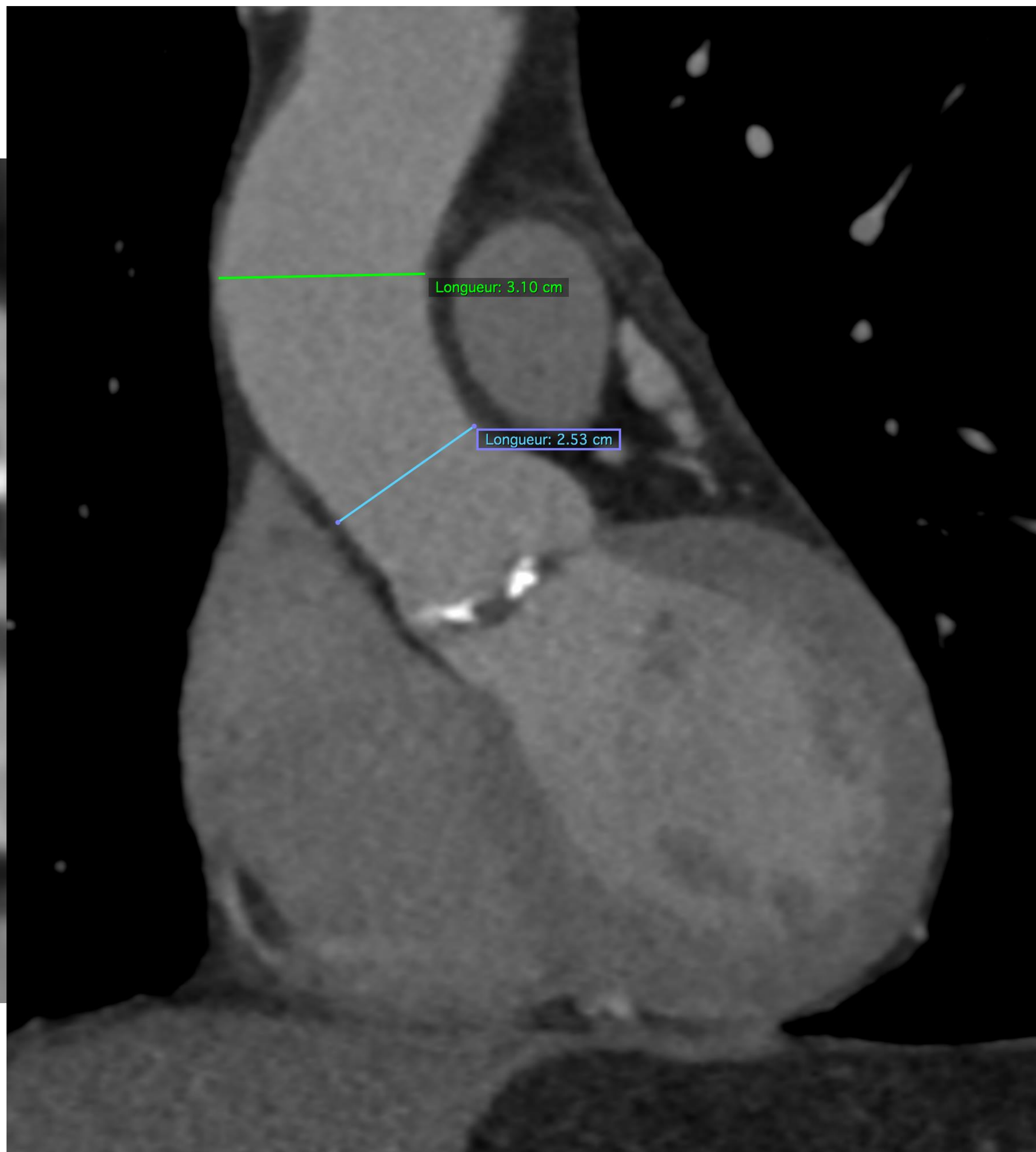
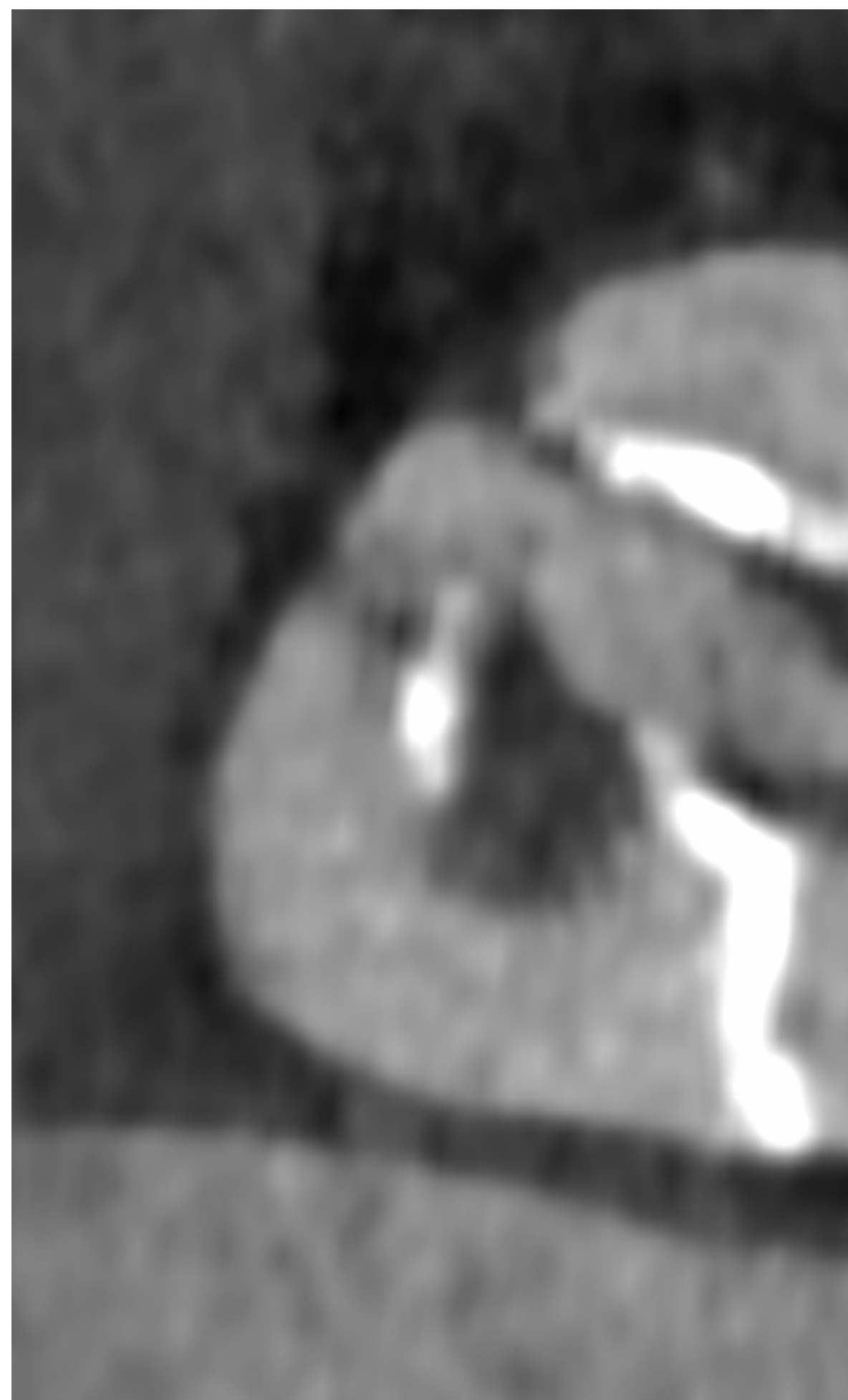
Mr B.

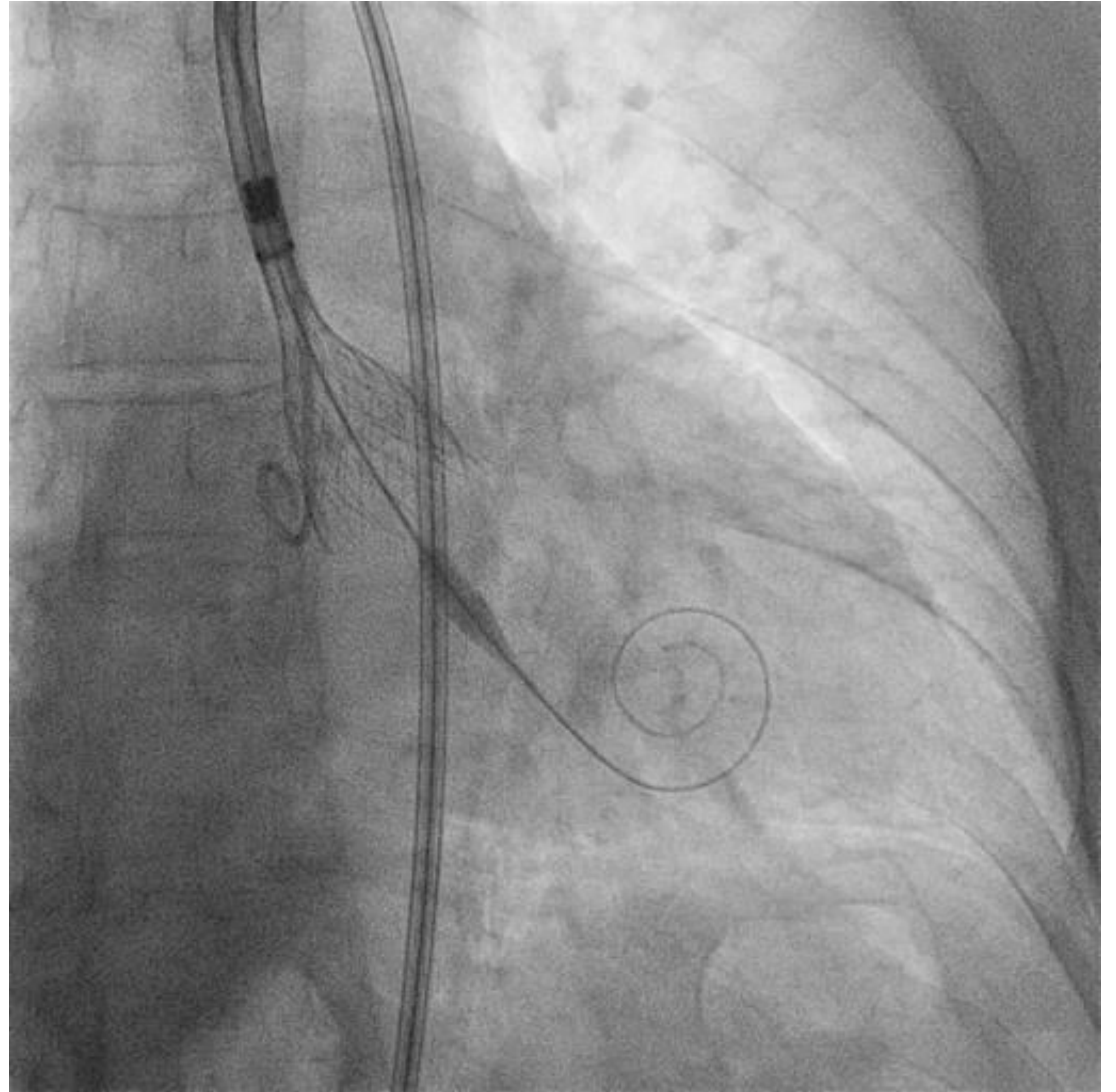
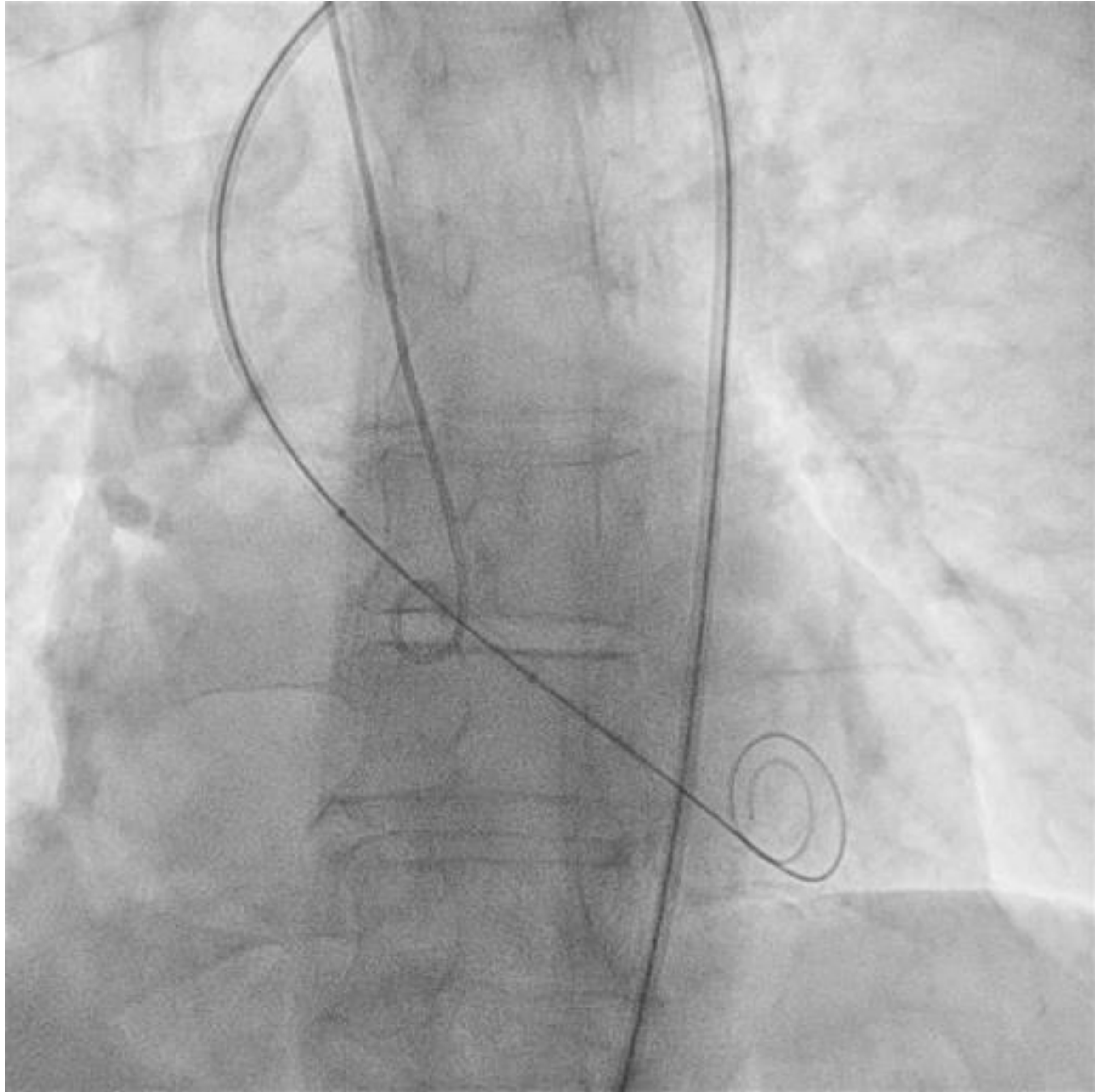
76 ans

- HTA
- Embolie pulmonaire en 2009, HBP

- FEVG 60%, Gradient moyen 51 mmHg, Vmax 4,4 m/sec, IAo grade 1



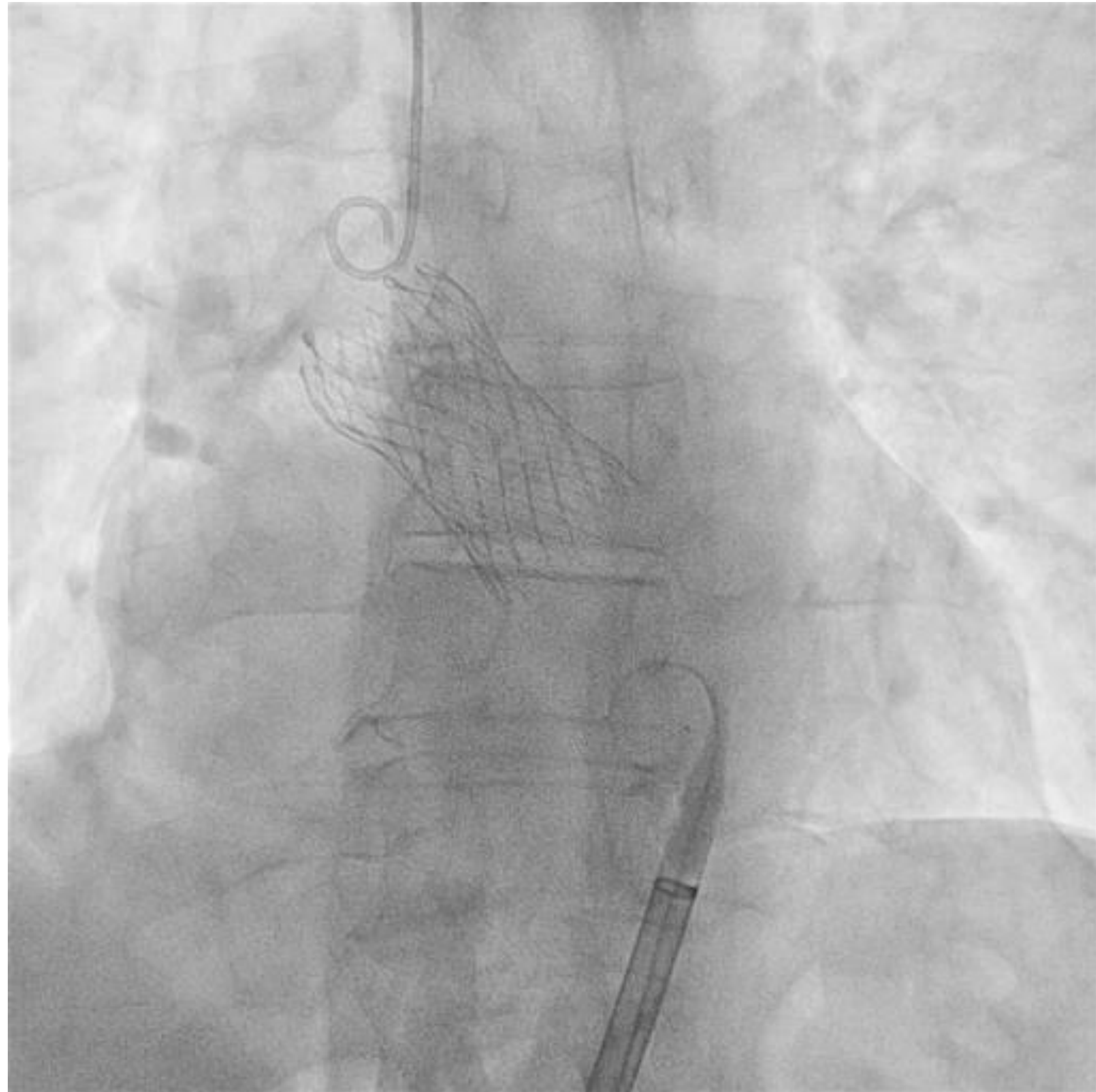




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76 ans

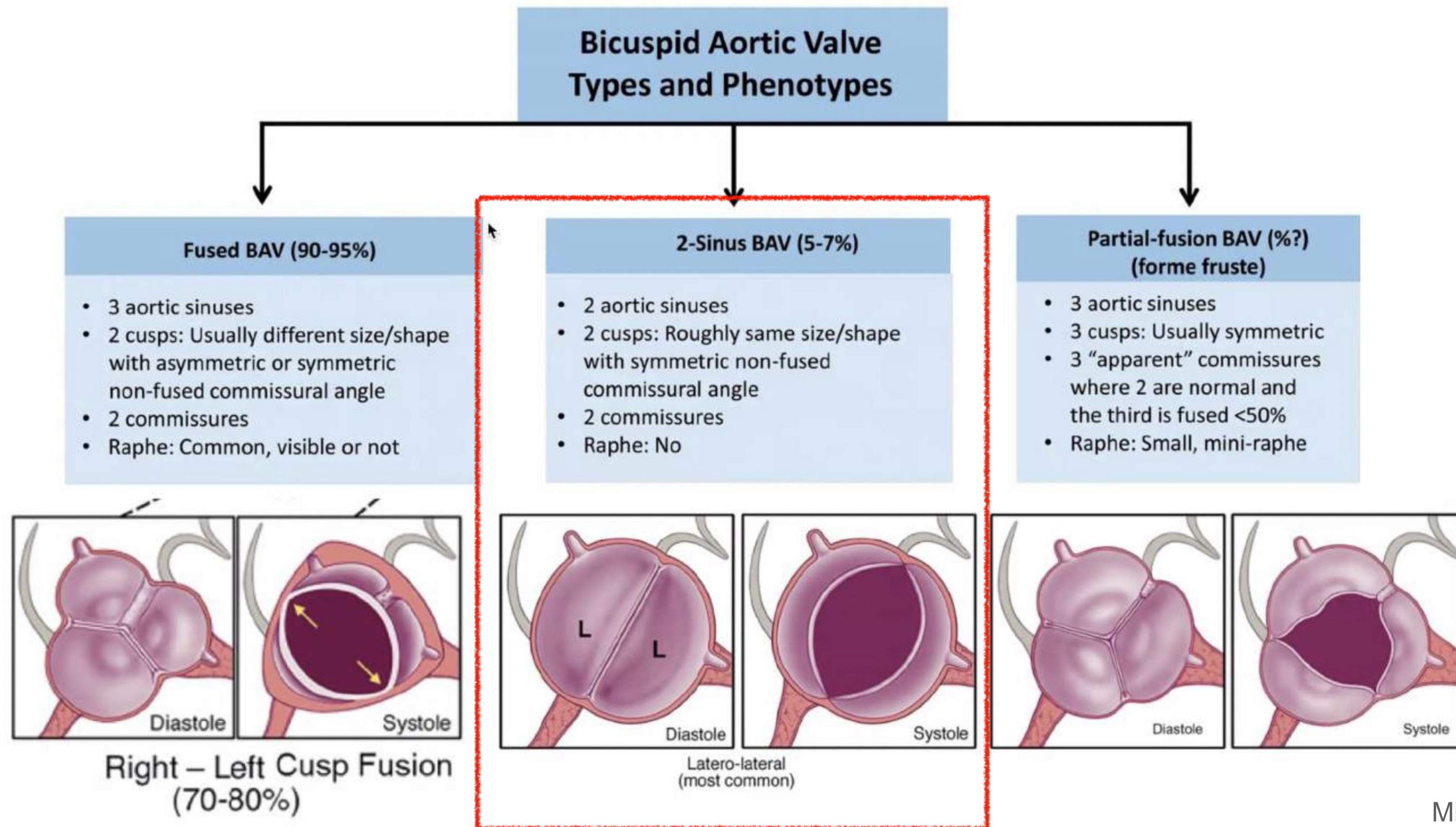
- Evolut Pro 29mm
- Gradient moyen 7 mmHg, Vmax 2 m/sec, pas d'IAo
- His (normal) à J3
- Sortie à J4



Bicuspidie

Formes anatomiques

New international consensus statement on nomenclature and classification of BAV

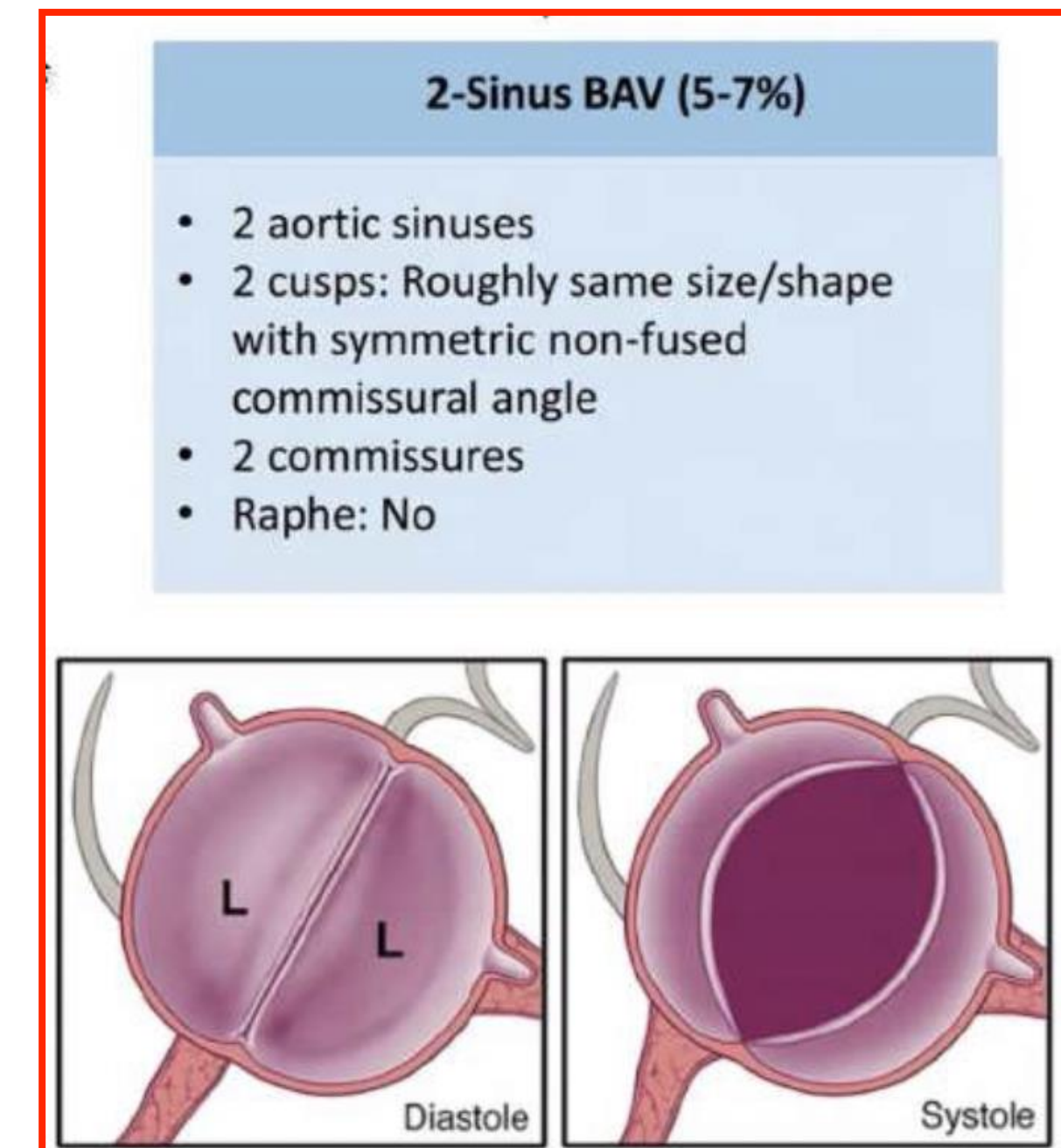


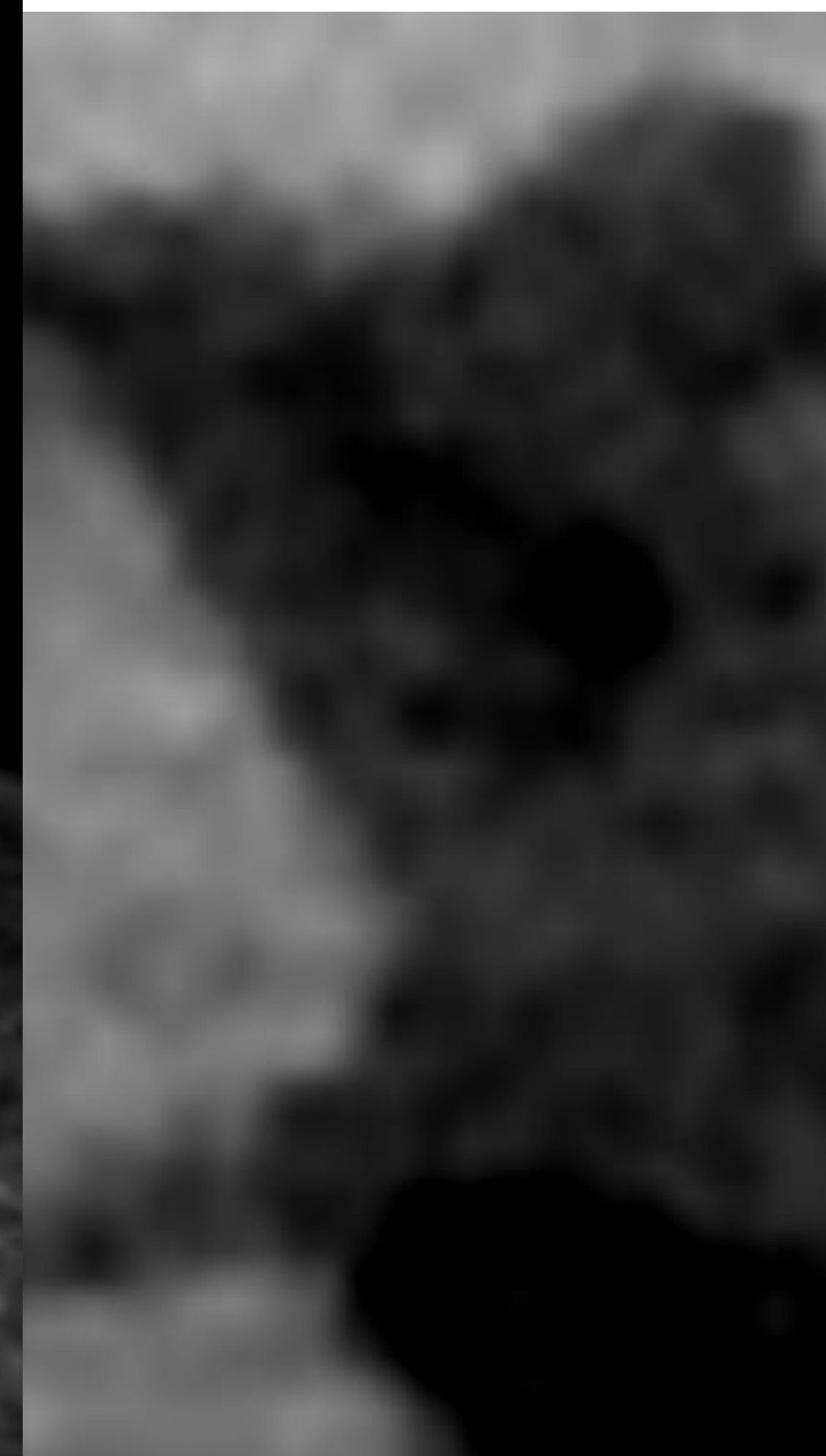
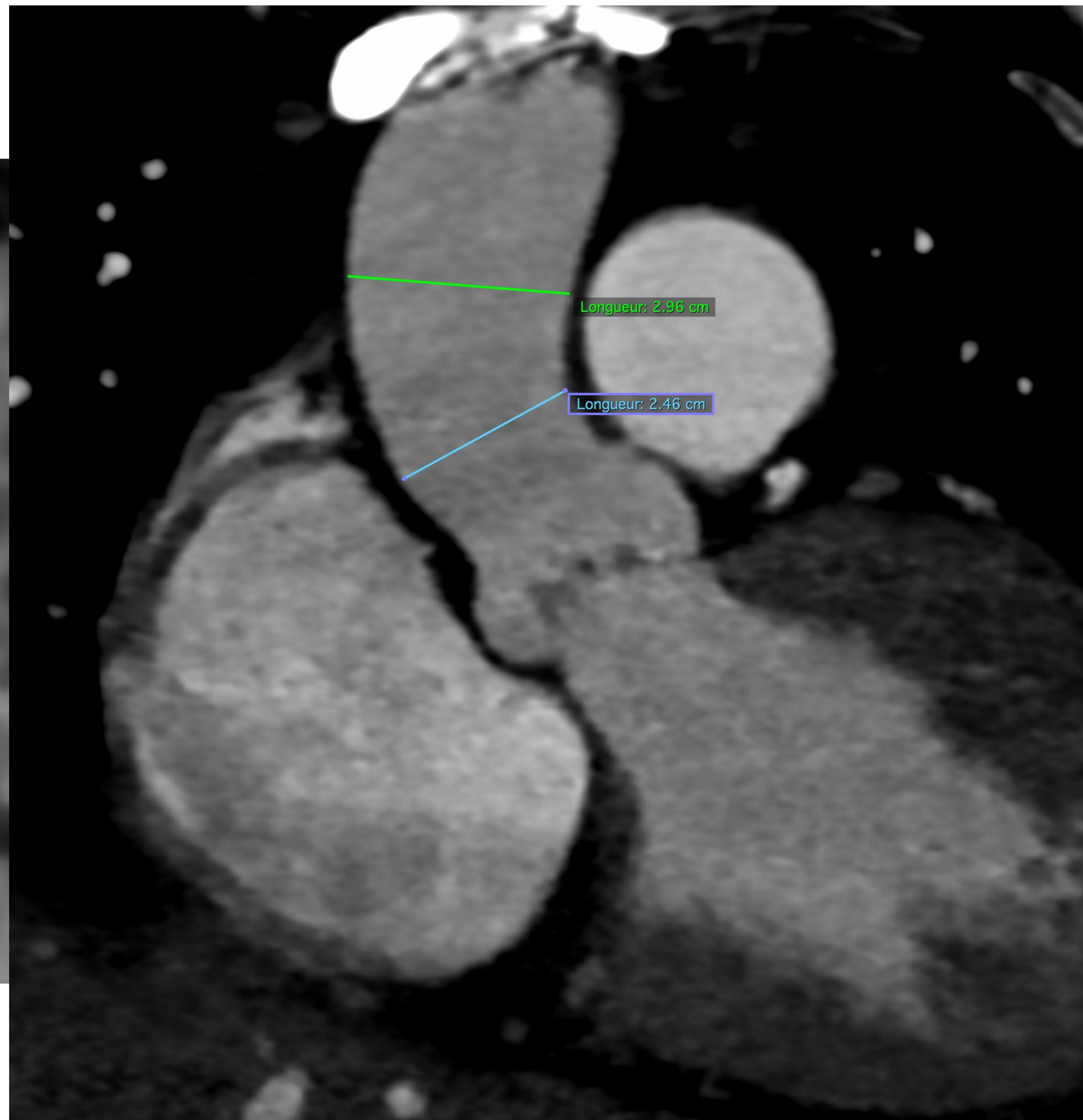
Mme A.

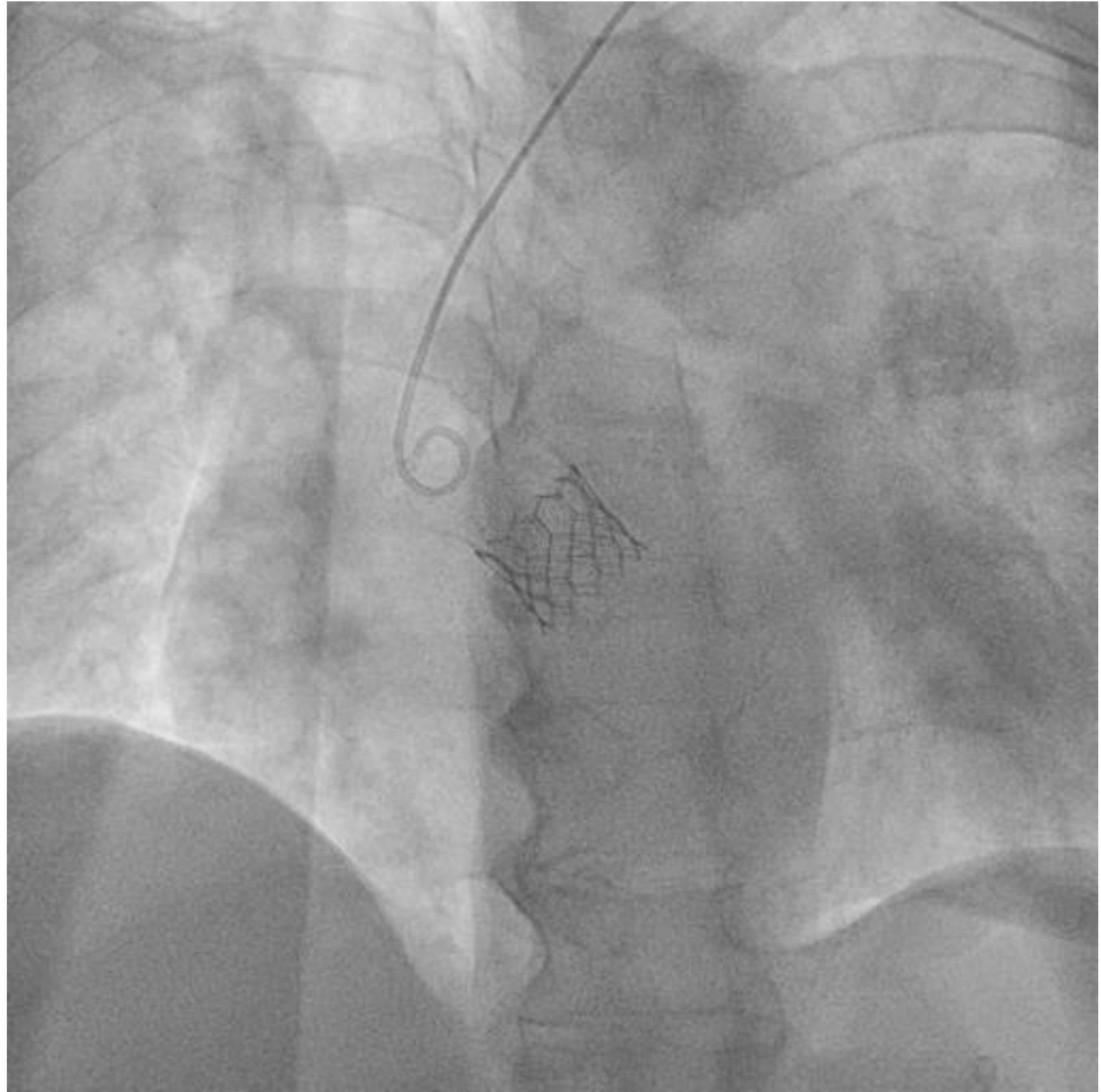
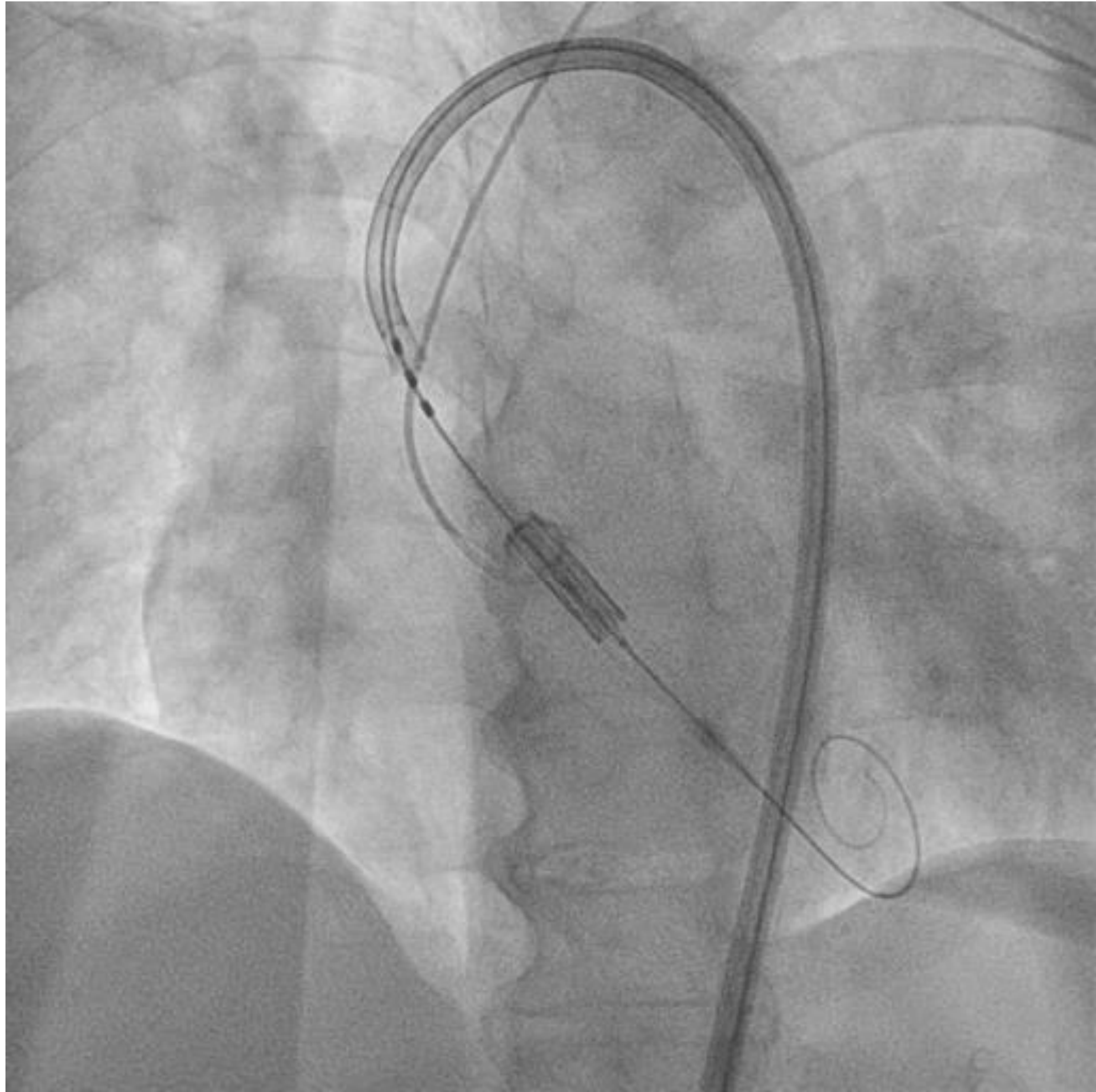
67 ans

- HTA, diabète, obésité morbide
- IRC hémodialyse
- AOMI

- FEVG 60%, gradient moyen 45mmHg







Mme A.

67 ans

- Sapien 3 23mm
- Gradient moyen 8 mmHg, Vmax 2,1m/sec, pas d'IAo
- Sortie à J11

Bicuspidie

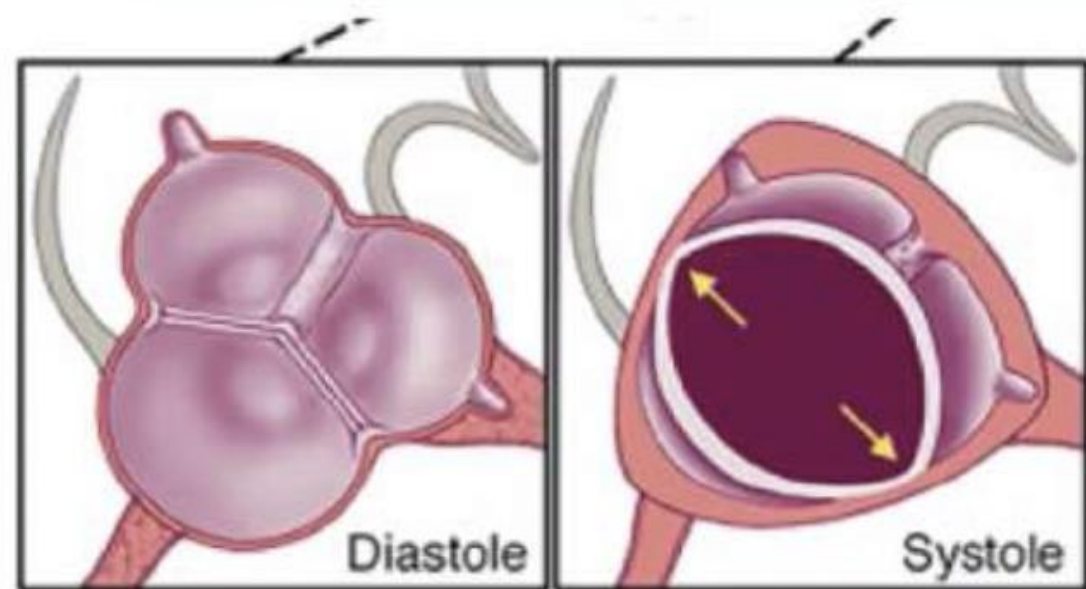
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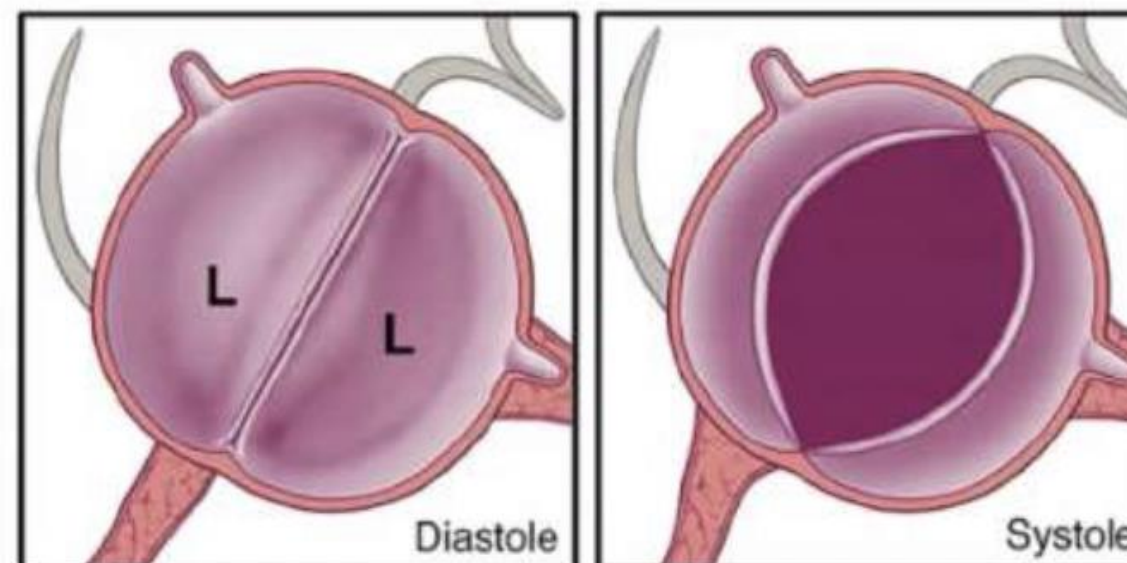
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- 2 cusps: Usually different size/shape with asymmetric or symmetric non-fused commissural angle
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- Raphe: Common, visible or not



Right – Left Cusp Fusion
(70-80%)

2-Sinus BAV (5-7%)

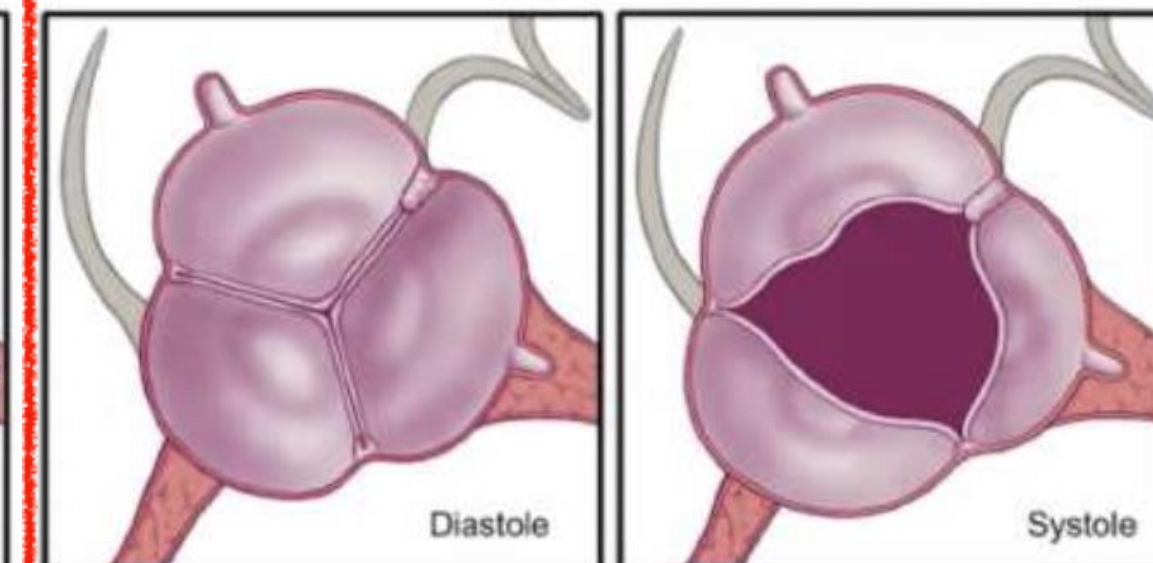
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- 2 commissures
- Raphe: No



Latero-lateral
(most common)

Partial-fusion BAV (%?) (forme fruste)

- 3 aortic sinuses
- 3 cusps: Usually symmetric
- 3 “apparent” commissures where 2 are normal and the third is fused <50%
- Raphe: Small, mini-raphe



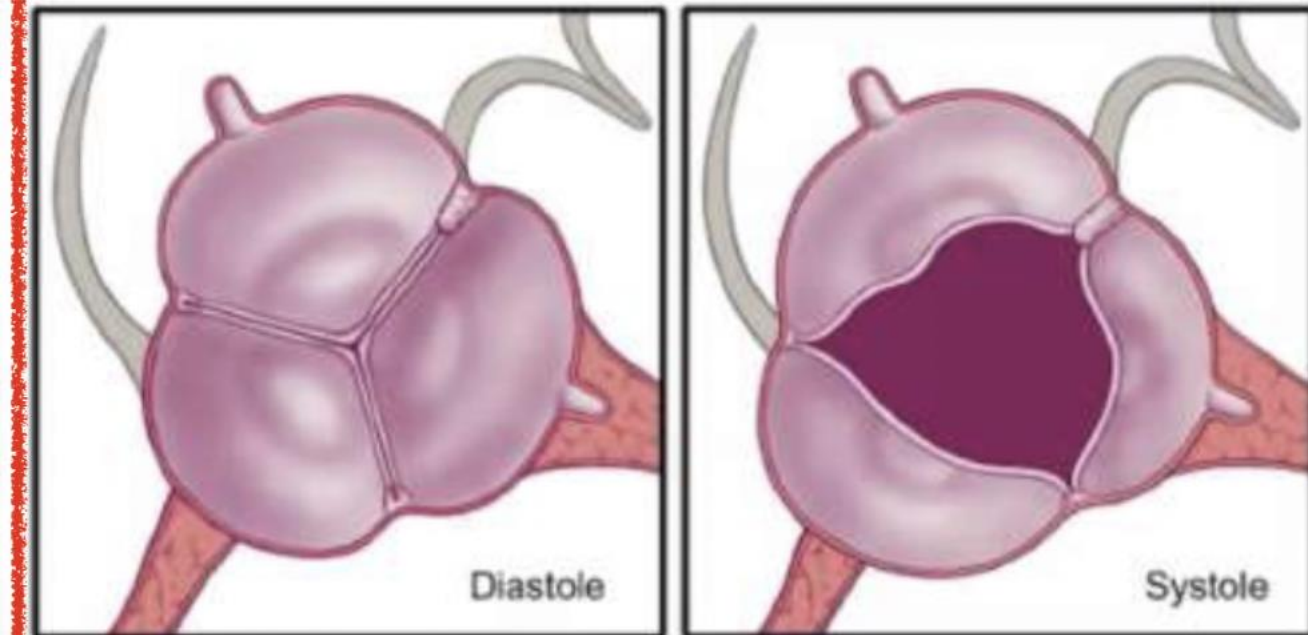
Mme C.

81 ans

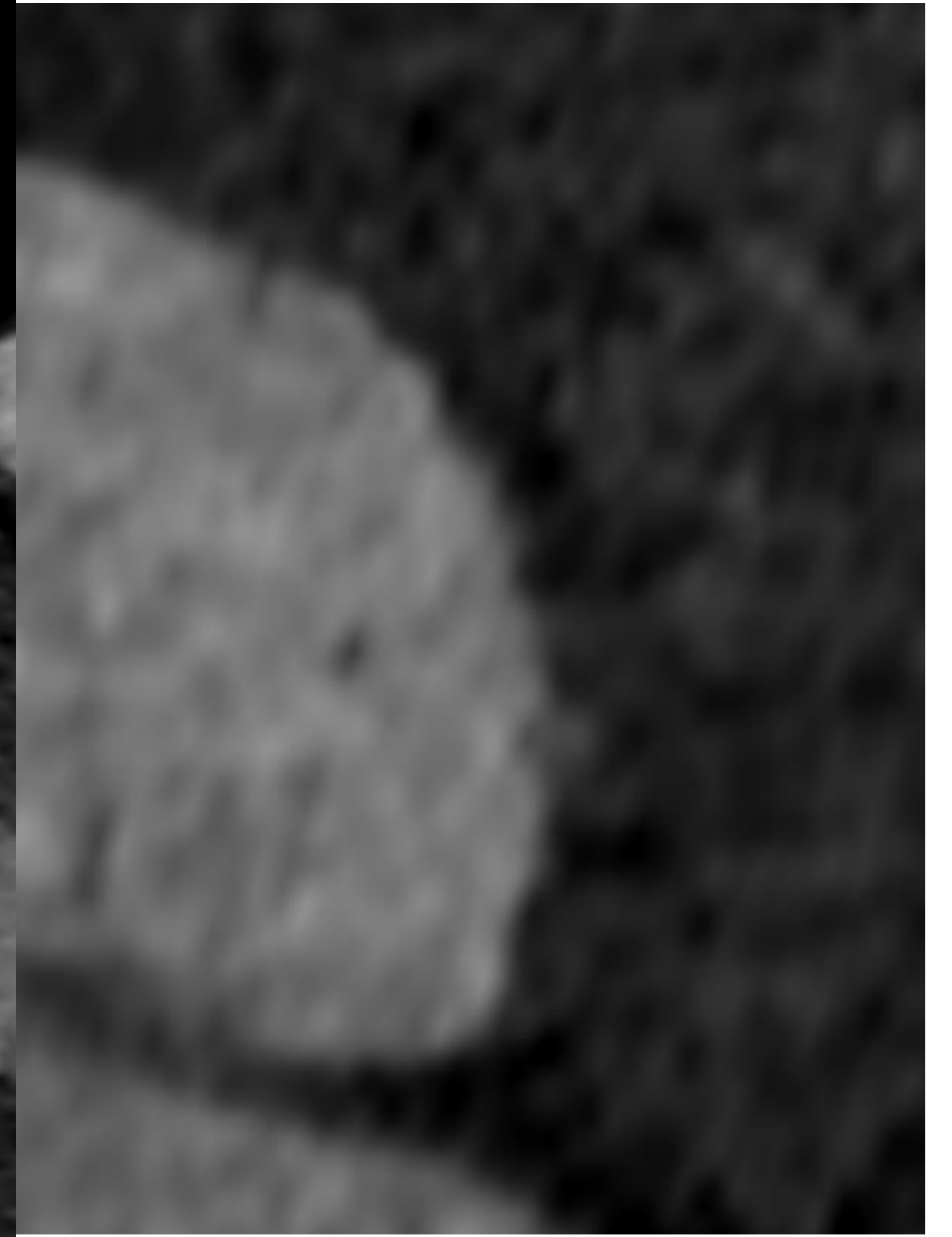
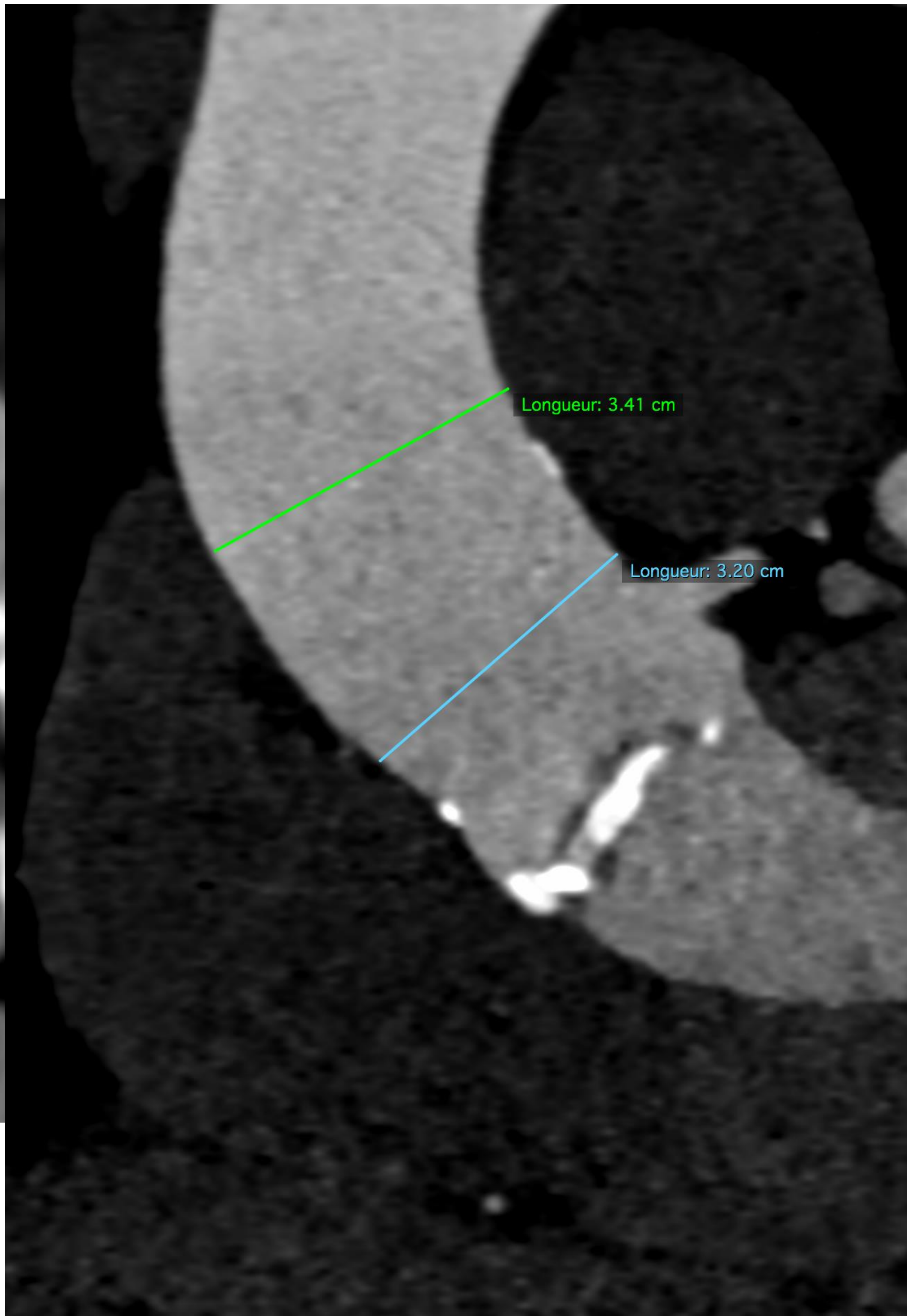
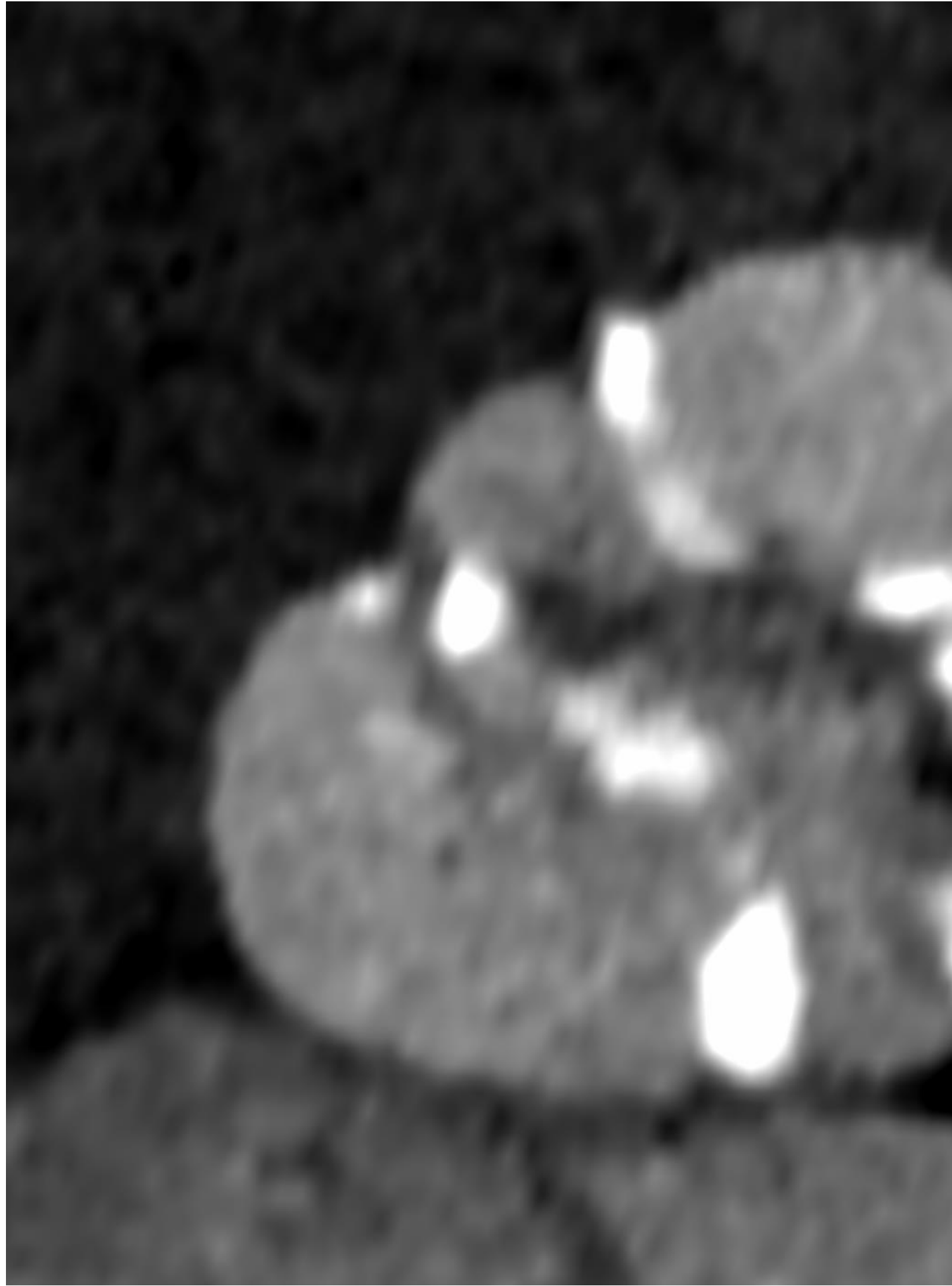
- FA permanente
 - TVP, hypothyroïdie, chondrocalcinose
 - Cholécystectomie, éventration, hallux valgus...
-
- FEVG 60%, gradient moyen 43mmHg, Vmax 4m/sec

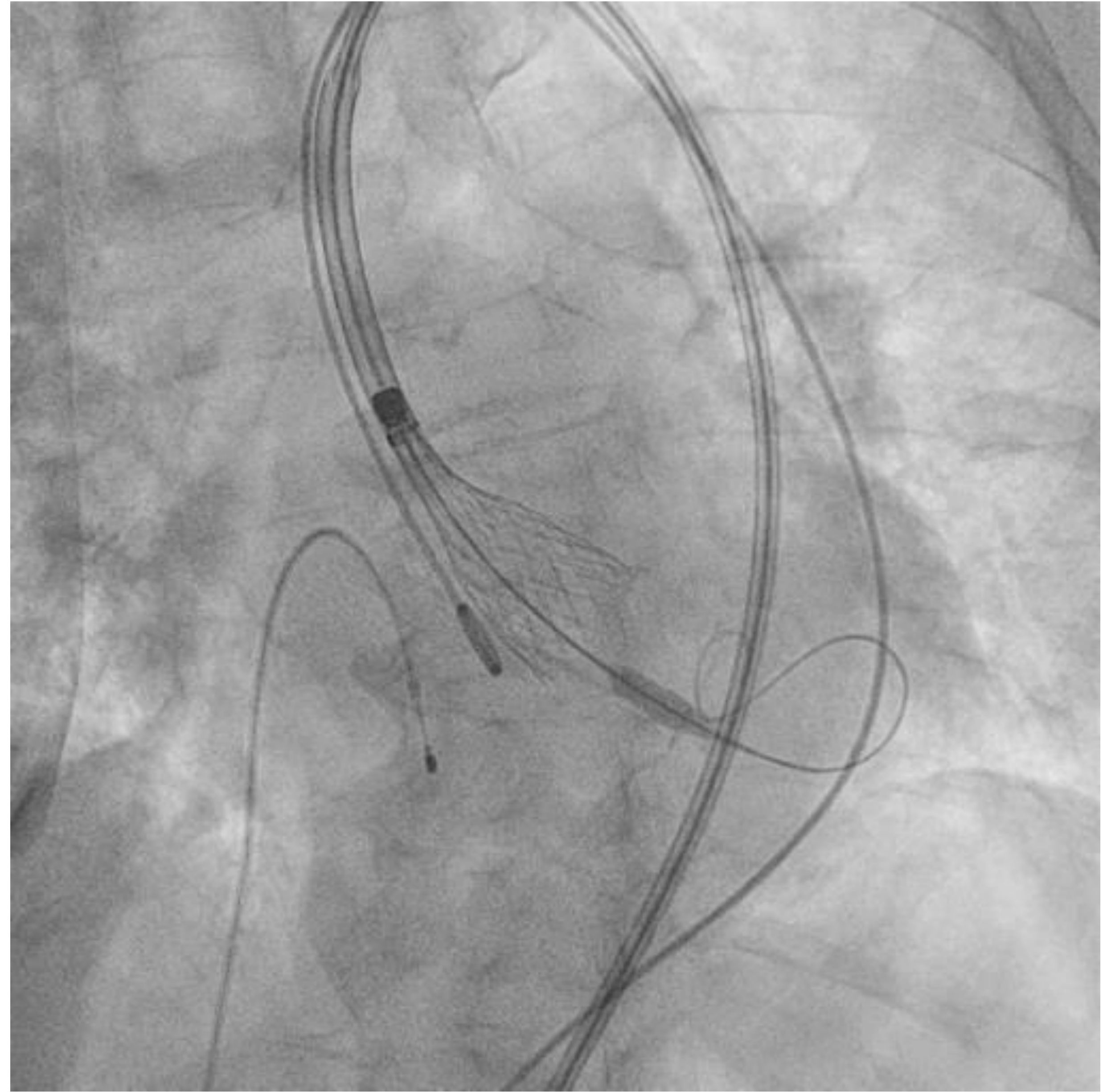
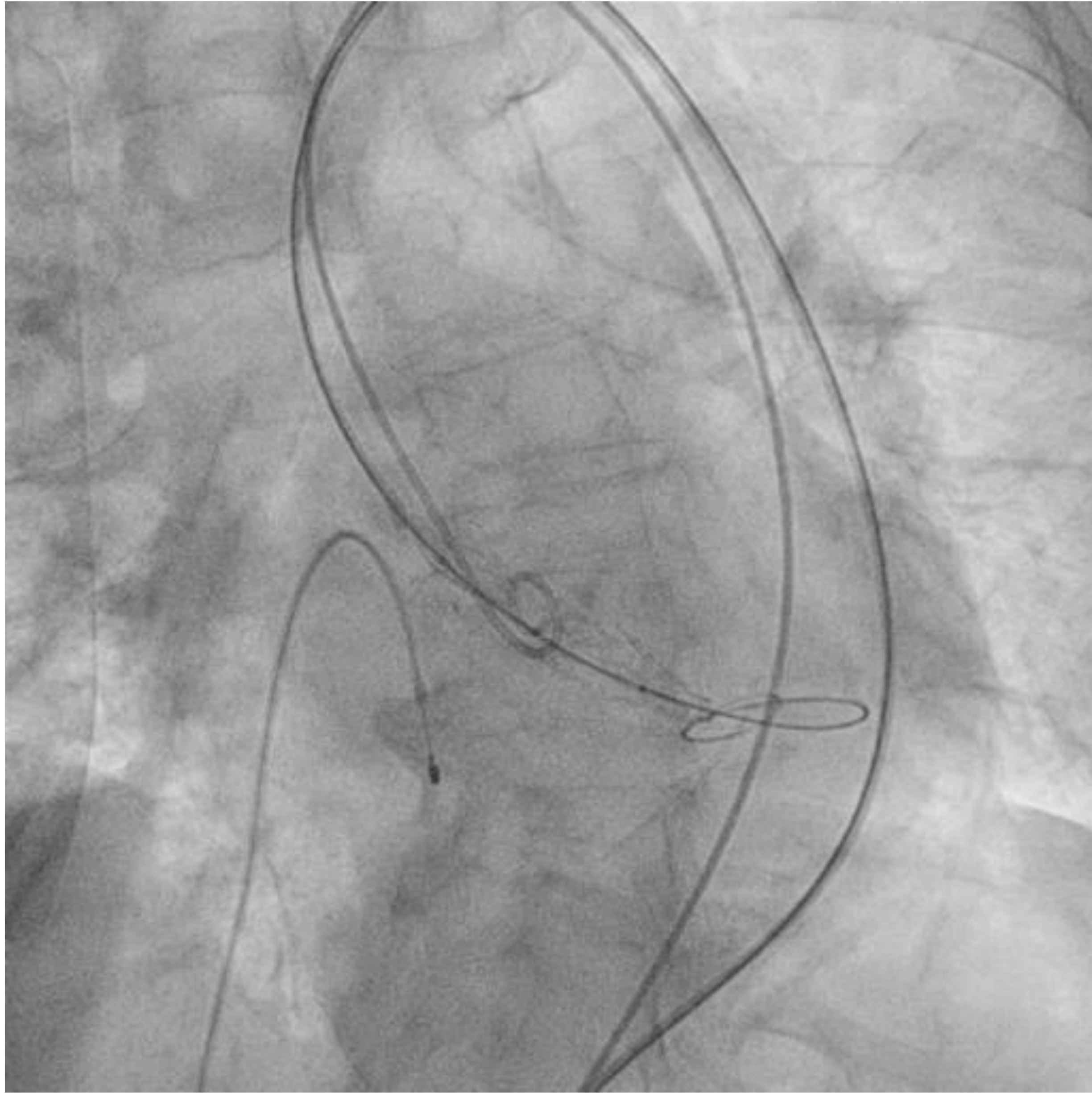
Partial-fusion BAV (%?) (forme fruste)

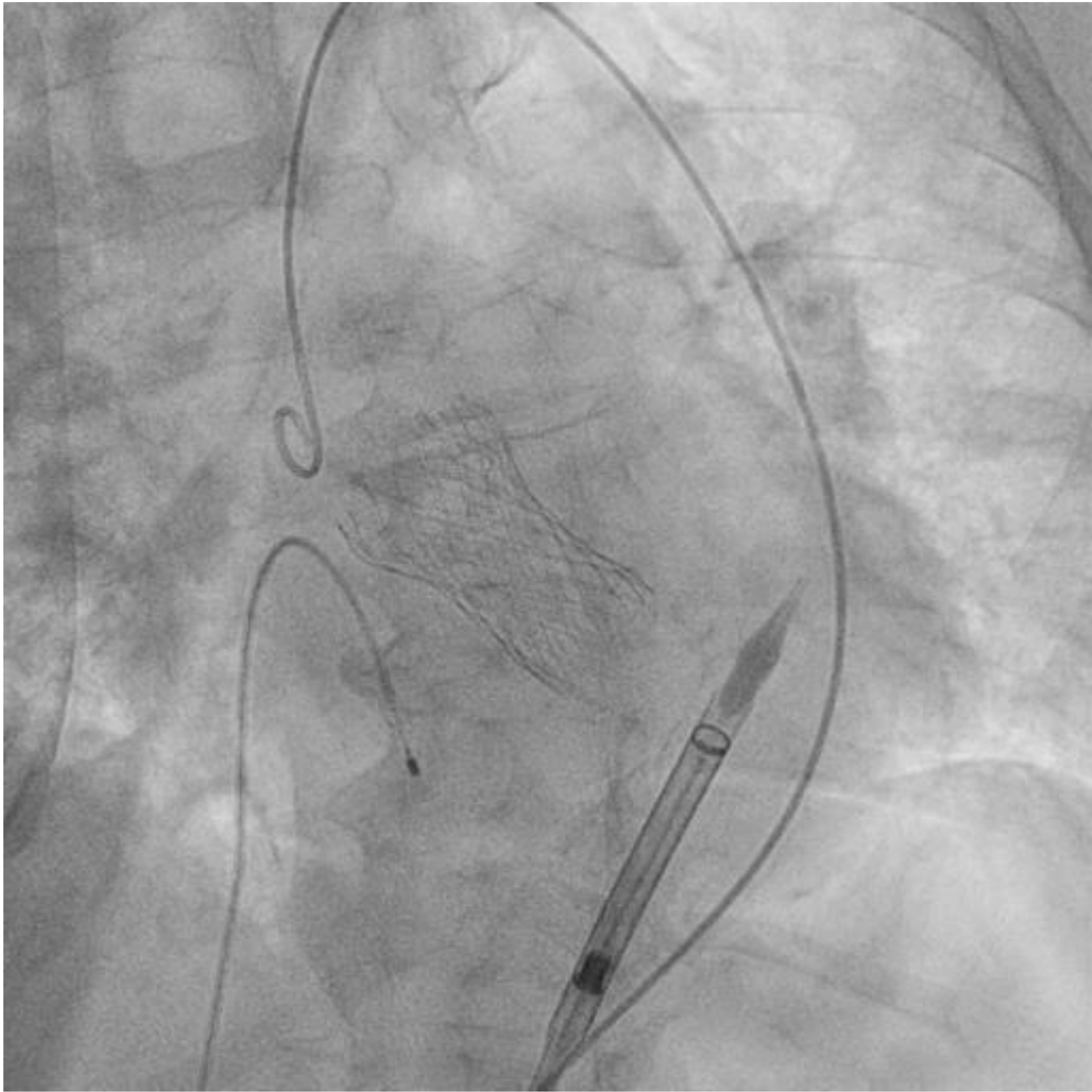
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- 3 cusps: Usually symmetric
- 3 "apparent" commissures where 2 are normal and the third is fused <50%
- Raphe: Small, mini-raphe



Mich







Mme C.

81 ans

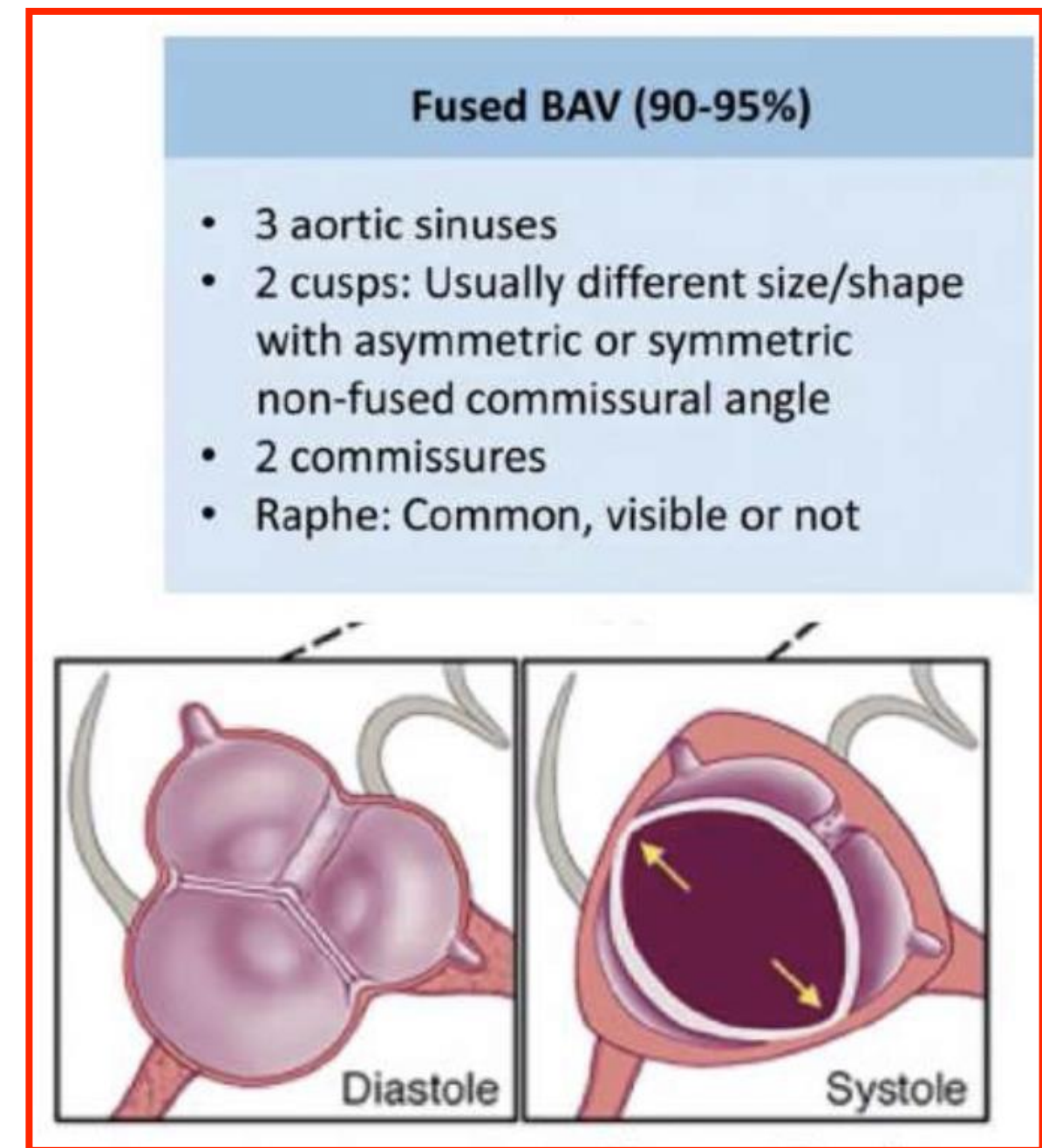
- Evolut Pro 29mm
- Pacemaker à J3
- Gradient moyen 7mmHg, Vmax 1,9m/sec, IAo grade 1
- Sortie à J4

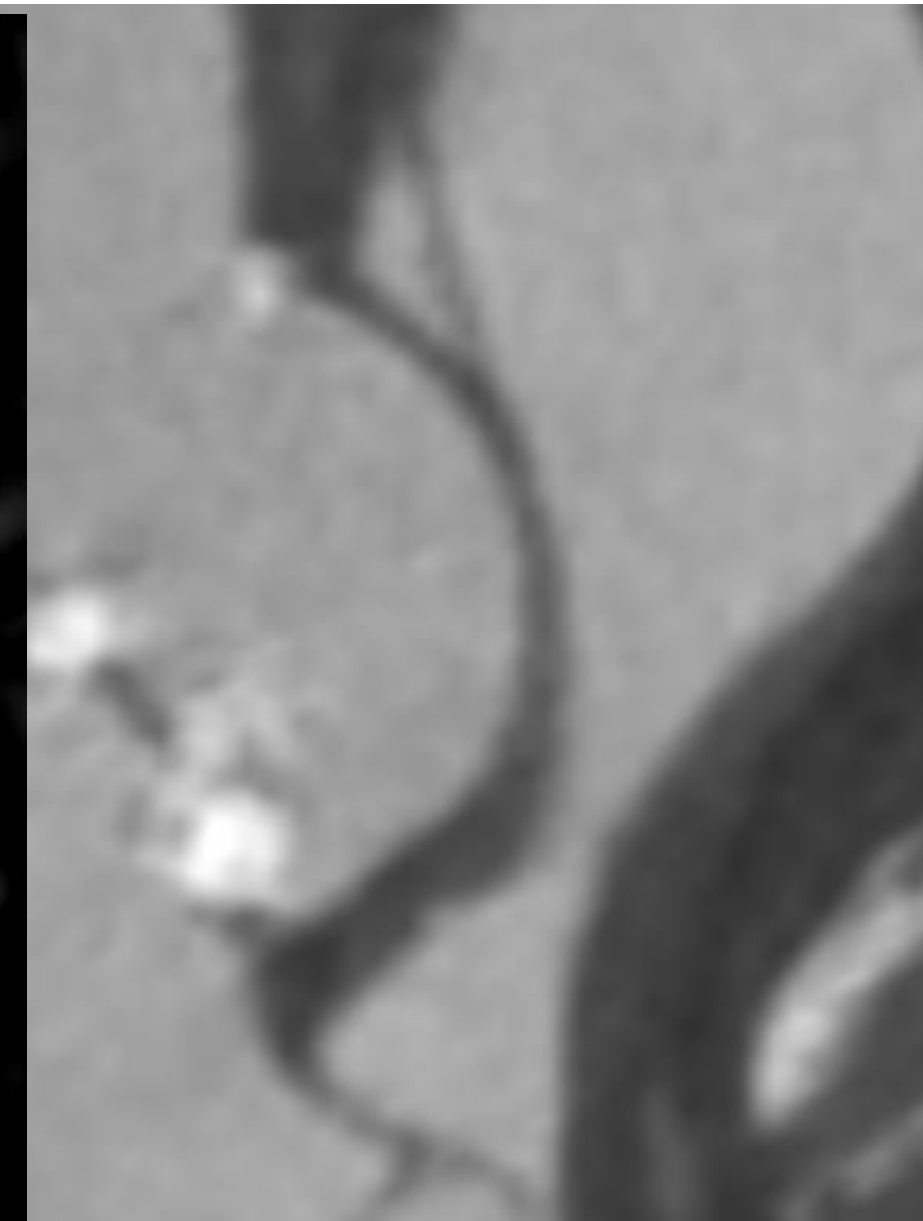
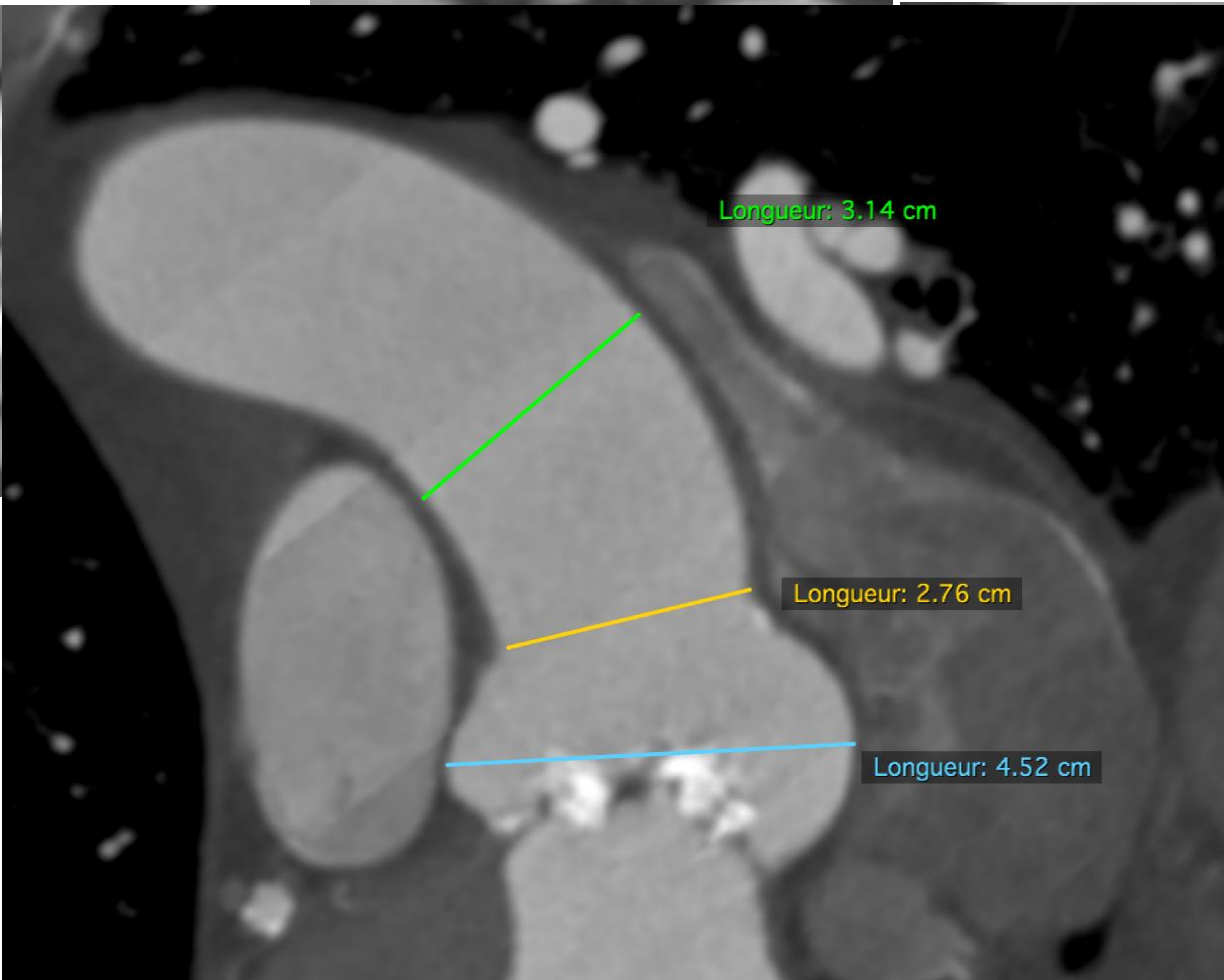
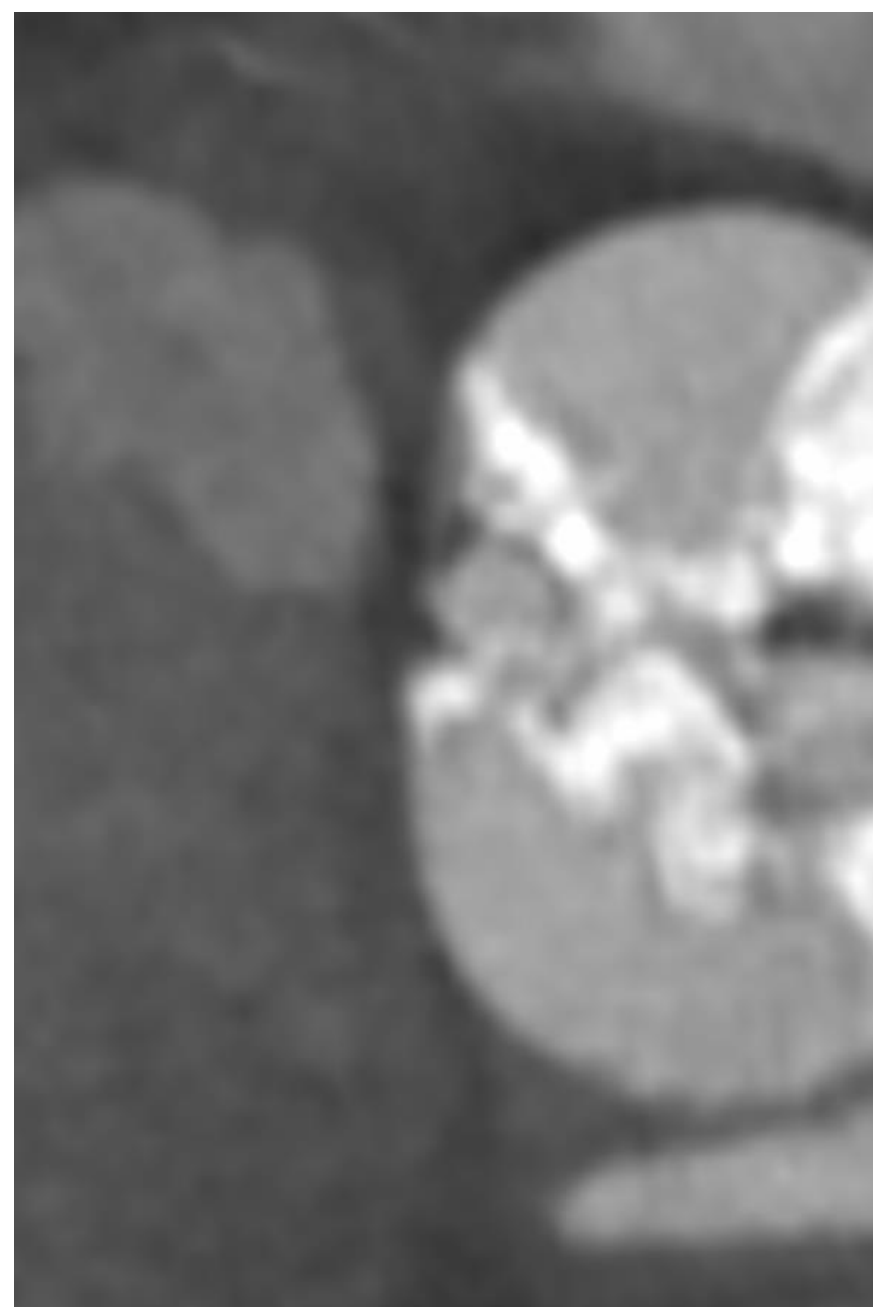
Mr U.

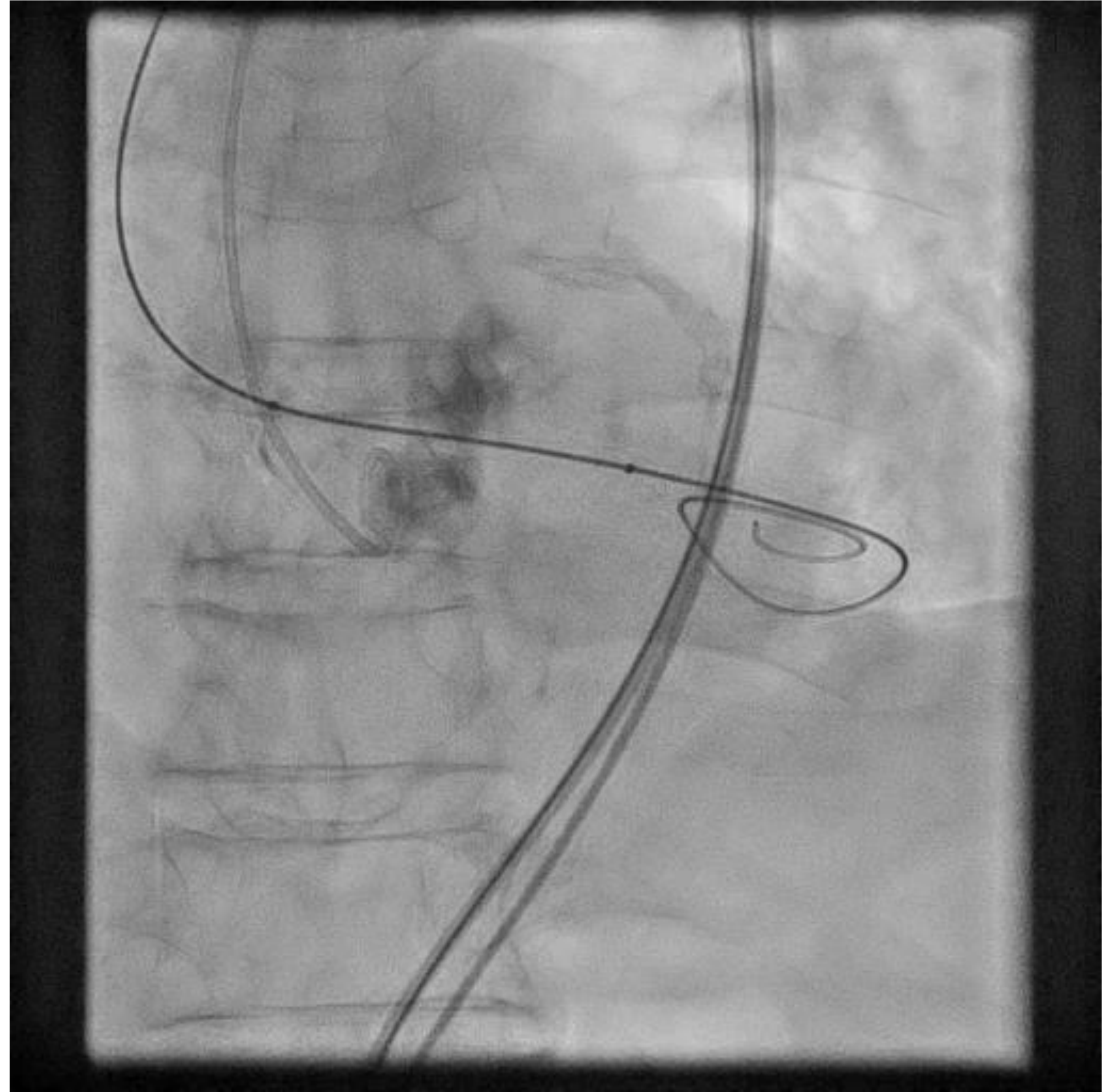
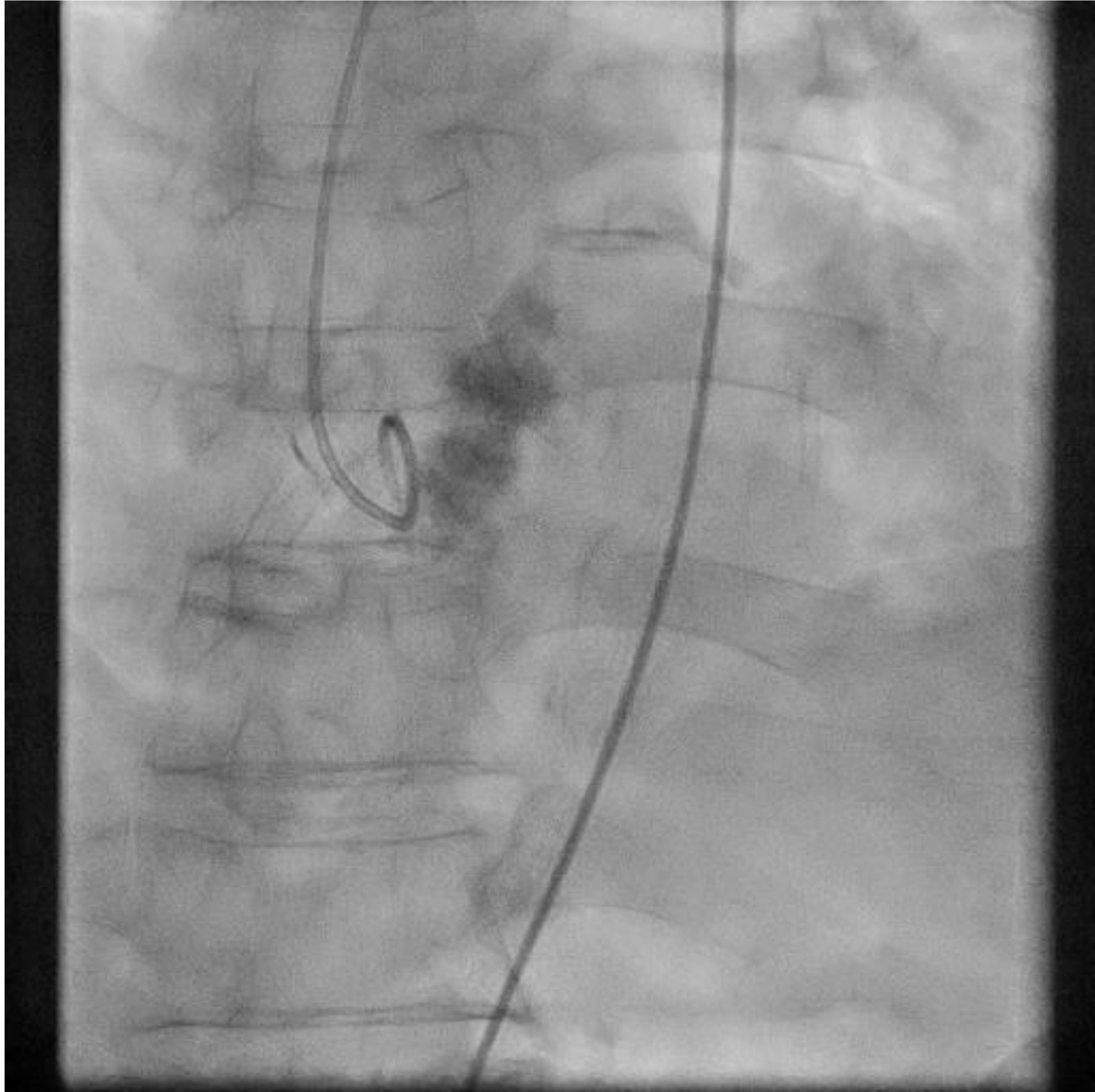
86 ans

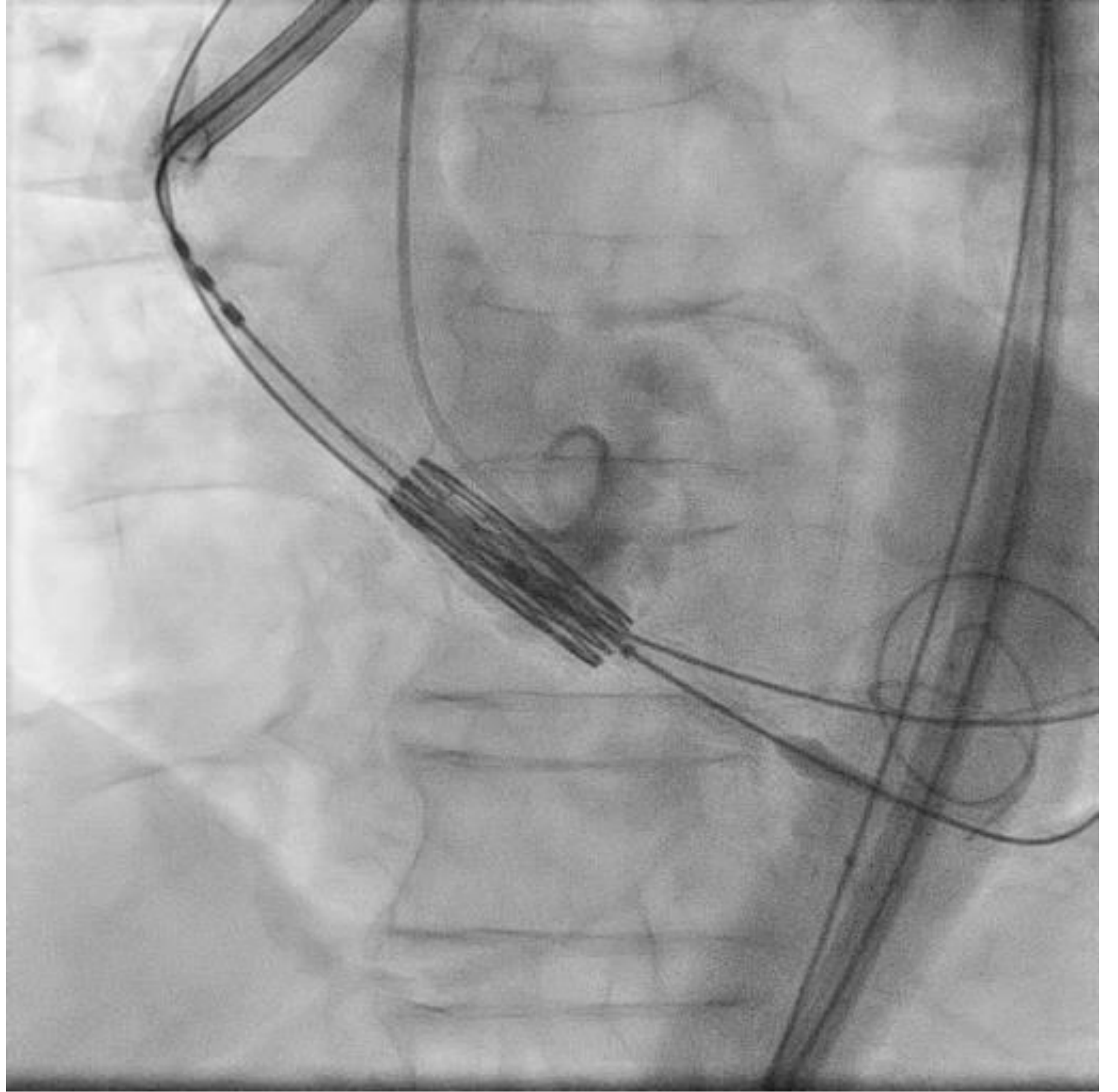
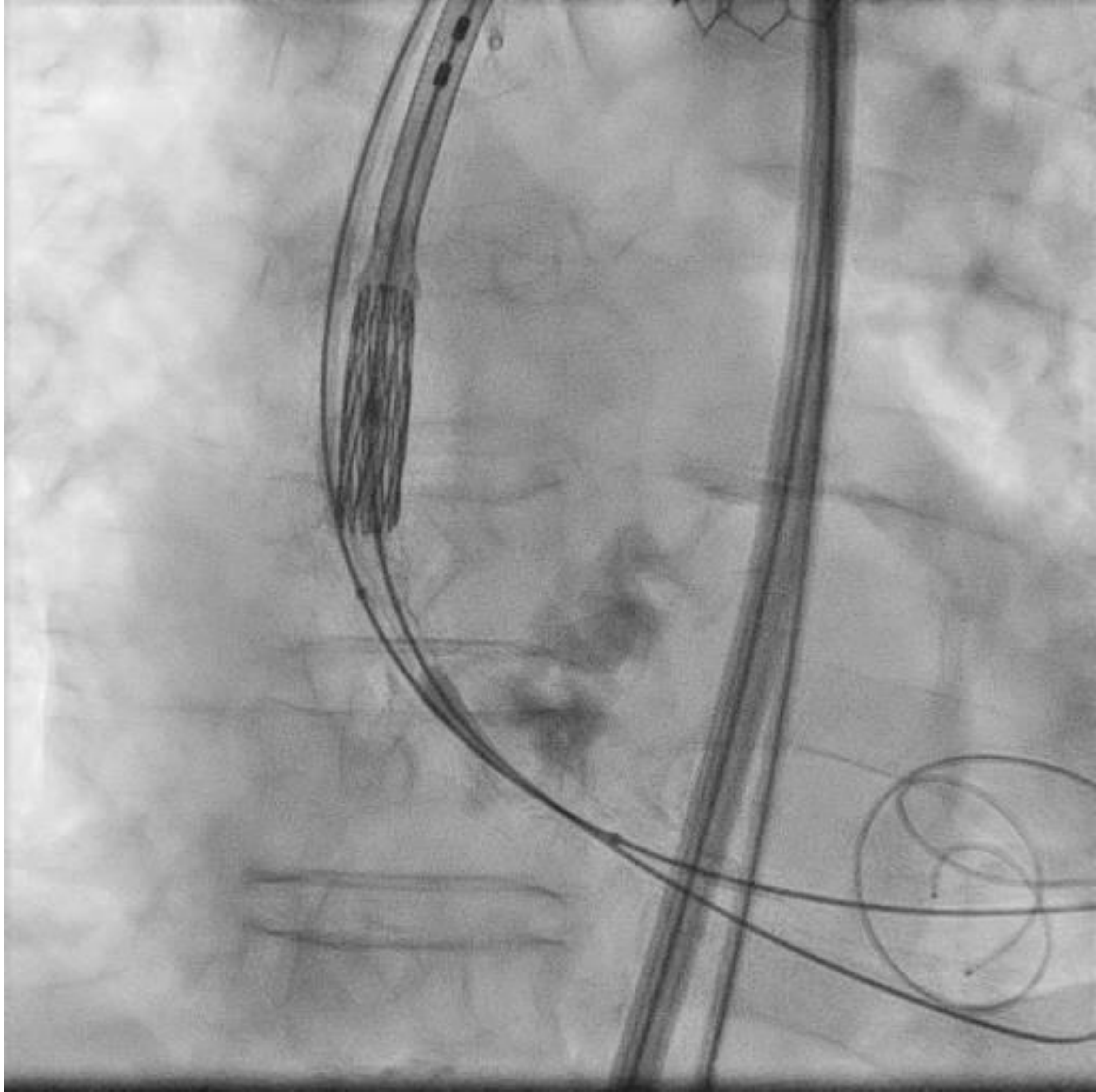
- Bucheron retraité
- Adénome de prostate
- Embolie pulmonaire sous AVK

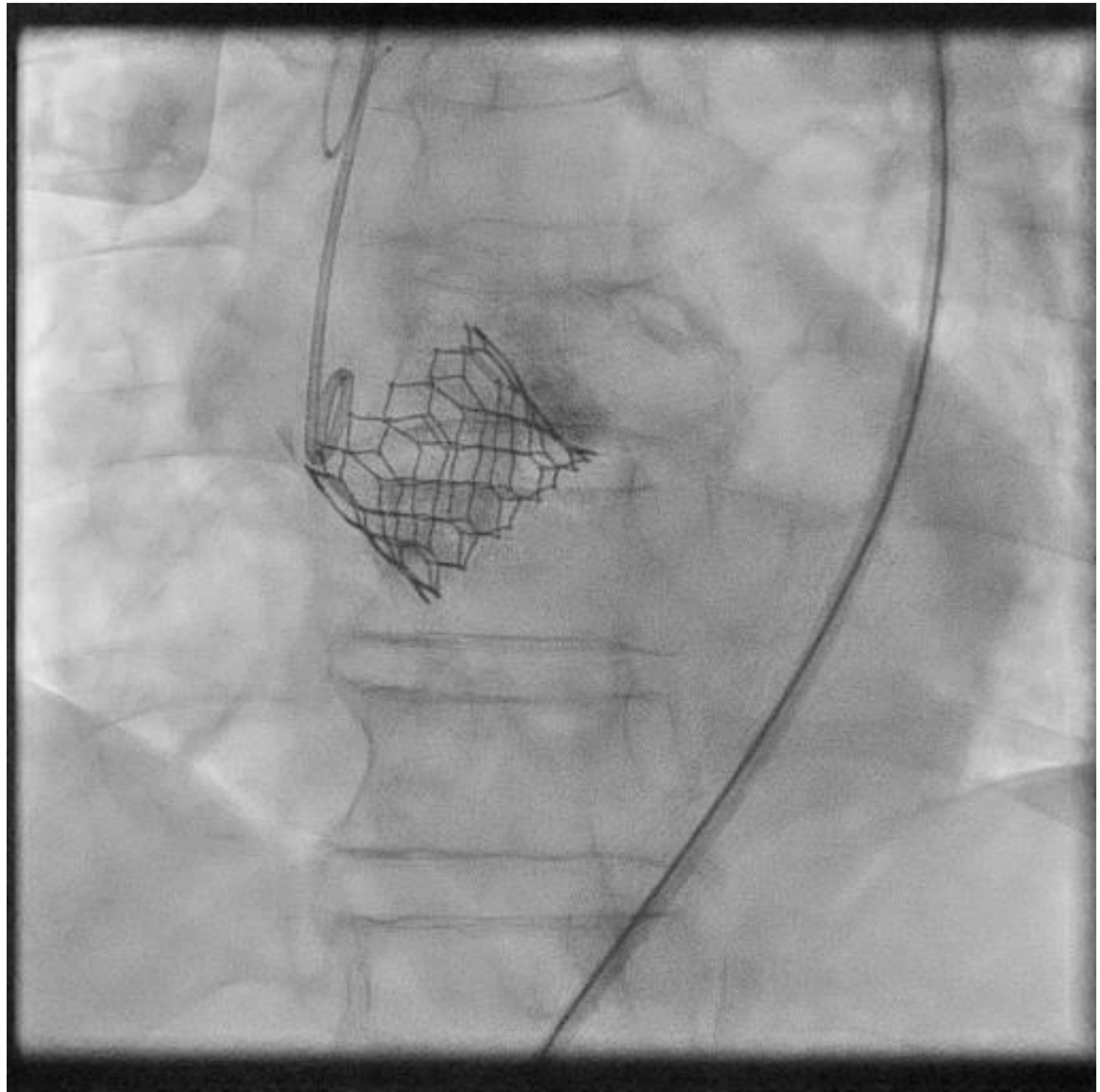
- FEVG 50%, gradient moyen 57mmHg, Vmax 4,7m/sec











Mr. U

86 ans

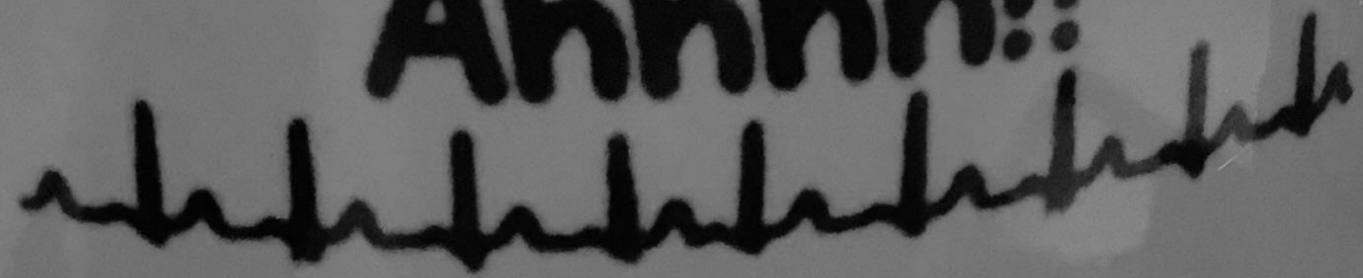
- Sapien 3 29mm
- Post-procédure immédiat : gradient moyen 5mmHg, IAo péri-prothétique grade 2
- H2 post-procédure : tamponnade sur rupture d'anneau -> décès

Conclusions

TAVI sur valve bicuspide

- Faisable et sécuritaire
- Formes à risque identifiables au scanner
- Mortalité à un an similaire à la chirurgie et au TAVI sur valve tricuspide
- Risque majoré de fuite para-valvulaire
- Nécessité d'un essai randomisé

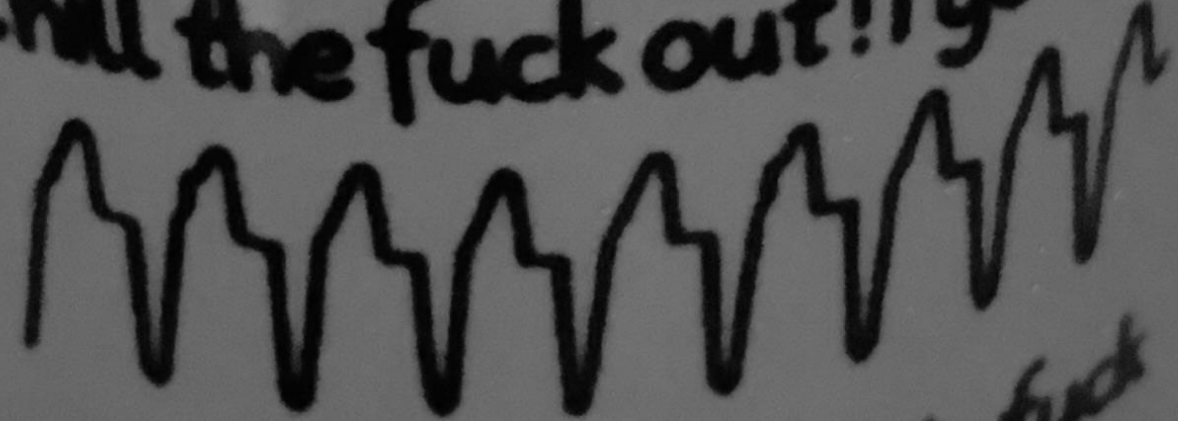
Ahhhh!!



We're good...



Chill the fuck out! i got this!



Oh fuck oh fuck oh fuck

Well shit