

# **ANGIOPLASTIE CORONAIRE ET TAVI**

MORCHED MAROUEN  
CLINIQUE BASSATINE  
SFAX TUNISIE

APPAC 2015

# CLINIQUE BASSATINE 2014

## SFAX

- 1600 coro
- 900 ATL
- 280 acte rythmo
- 30 DMPC
- 10 TAVI
- 200 CEC

# Coronary artery disease in patients undergoing TAVI: why, what, when and how to treat

Giulio G. Stefanini\*, MD; Stefan Stortecky, MD; Peter Wenaweser, MD; Stephan Windecker, MD

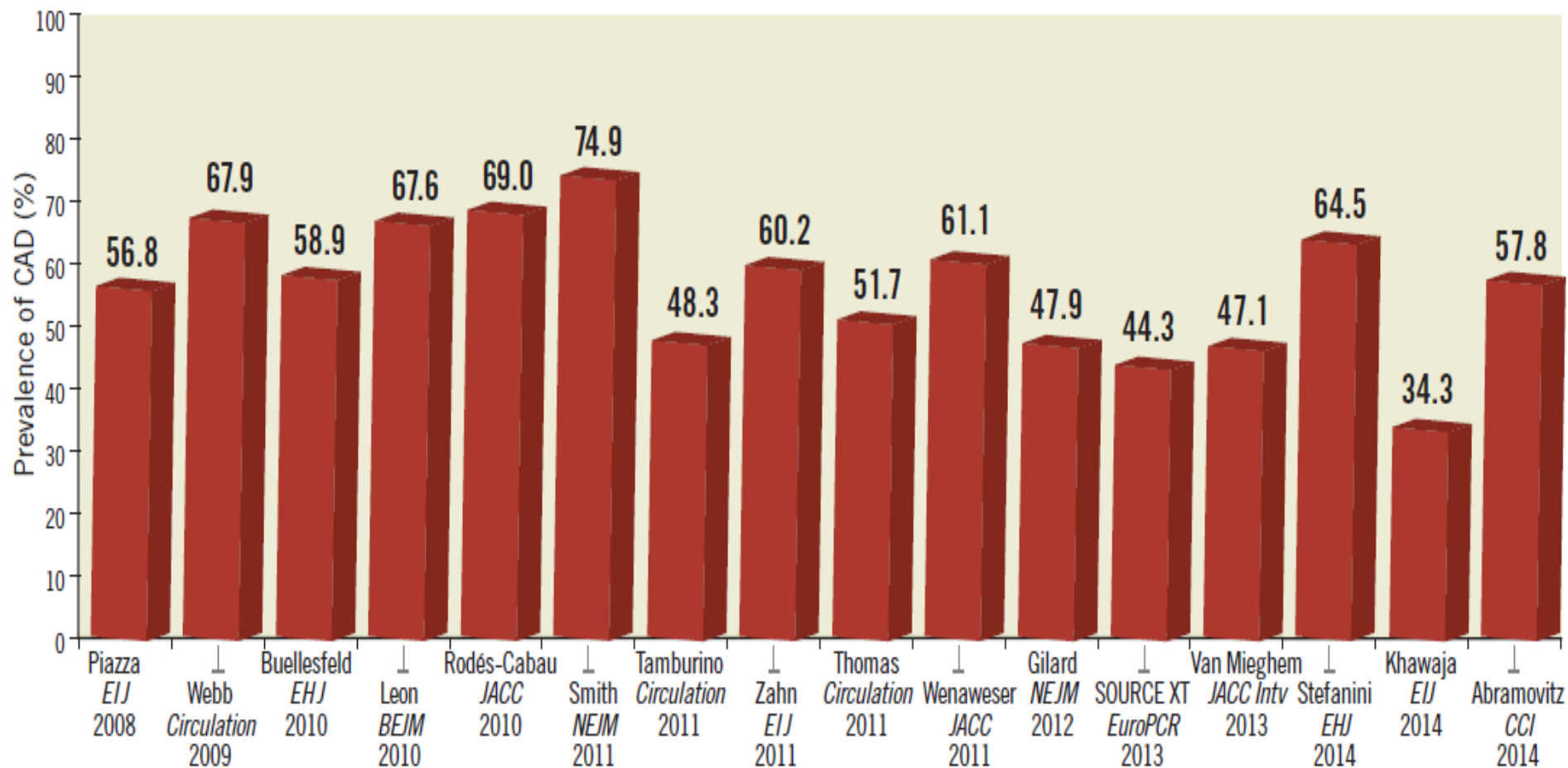


Figure 1. Prevalence of coronary artery disease in patients with aortic stenosis undergoing TAVI.

# Présentation clinique

- Mr AT 79 ans
- ATCD : - HTA,
  - Tabac
  - Diabète
  - Dyslipidémie
  - IRC (clairance = 46ml/mn)
- Symptômes : SCA ( ST- Trop+ ), DE NYHA III
- Episode d'OAP



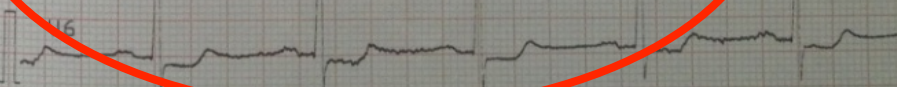
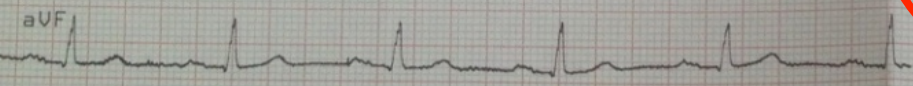
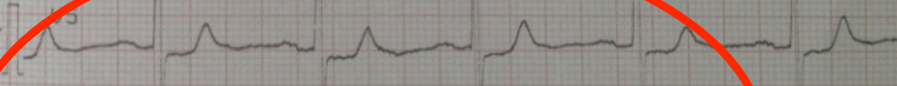
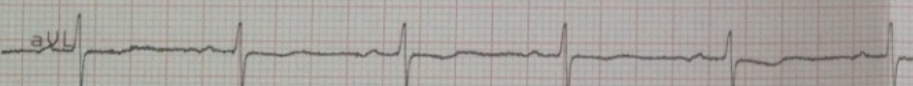
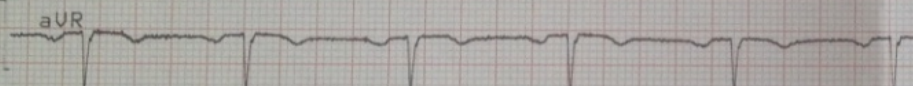
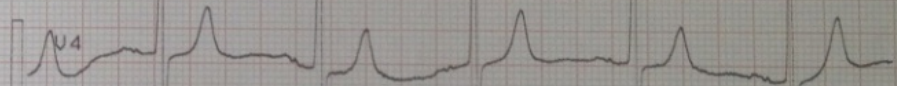
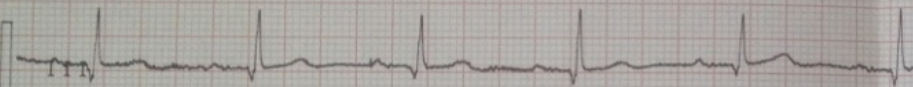
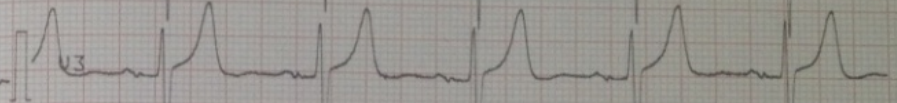
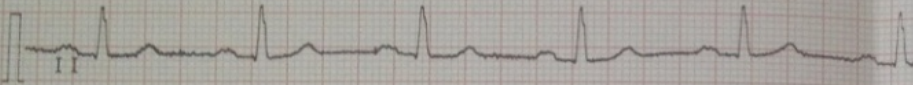
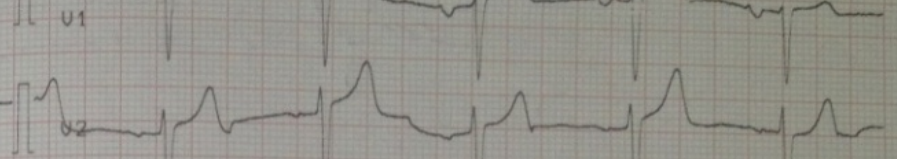
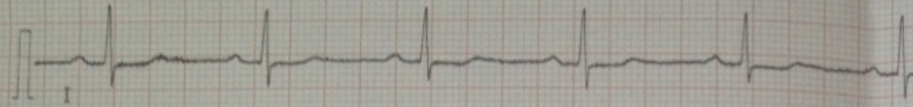
FC: 67/min

10 mm/mV

Janay AbdelRamid : cR. 303

10 mm/mV

FC: 67/min



25 mm/s

F50

Di 01-FEV-15 06:50:28

zdiri

reanimation

AT-2plus 4.14



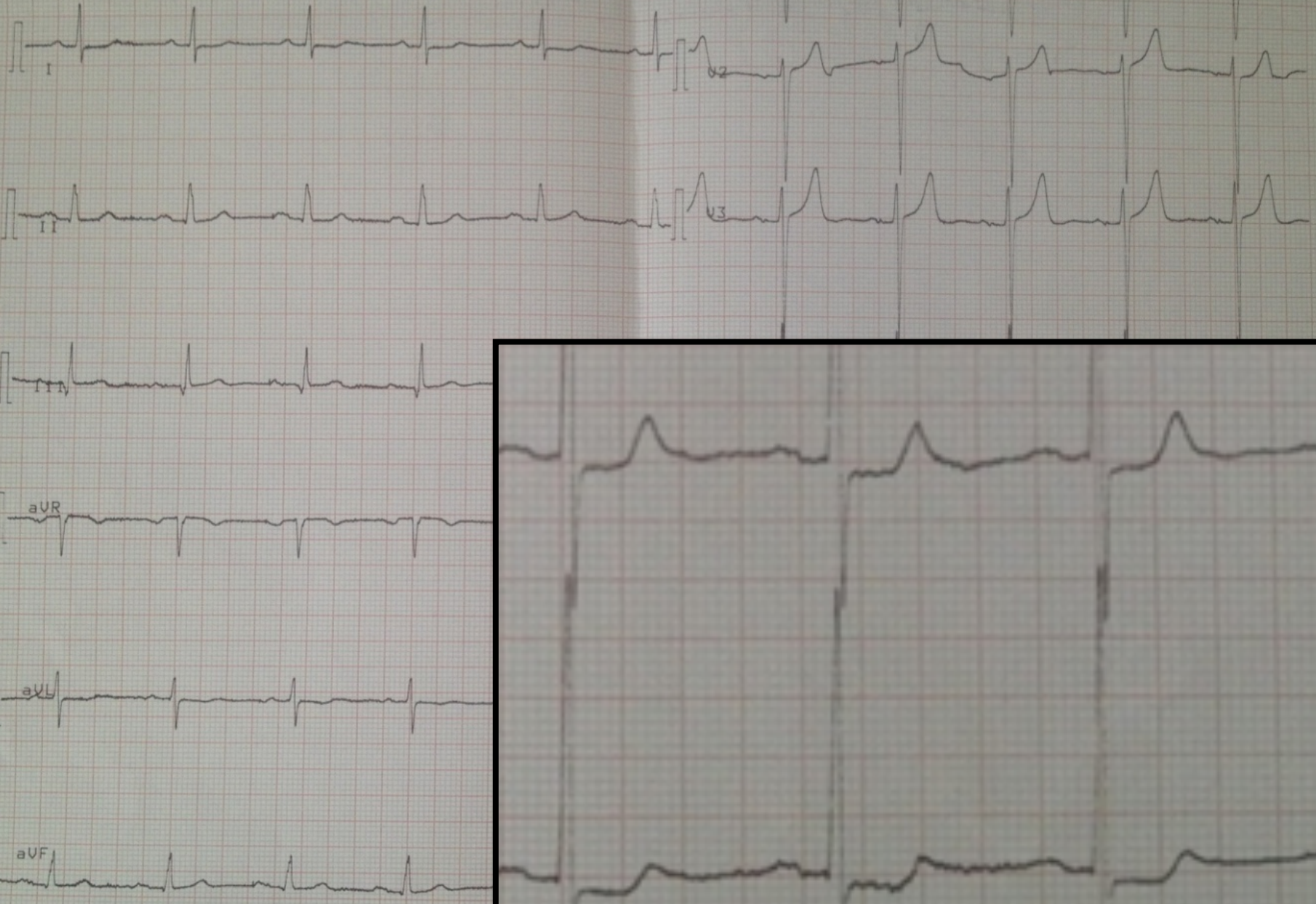
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10 mm/mV

FC: 67/min



25 mm/s

F50

Di 01-FEV-15 06:50:28

zdiri

reanimation

AT-Zplus 4.14

# Echographie TT

- RAC serré: Gradient moy= 59 mmHg  
Gradient max= 92mmHg  
SAo= 0.54 cm<sup>2</sup>  
Diamètre anneau= 24
- Fonction VG normale, FE= 65%
- PAPS= 37 mmHg
- IM minime

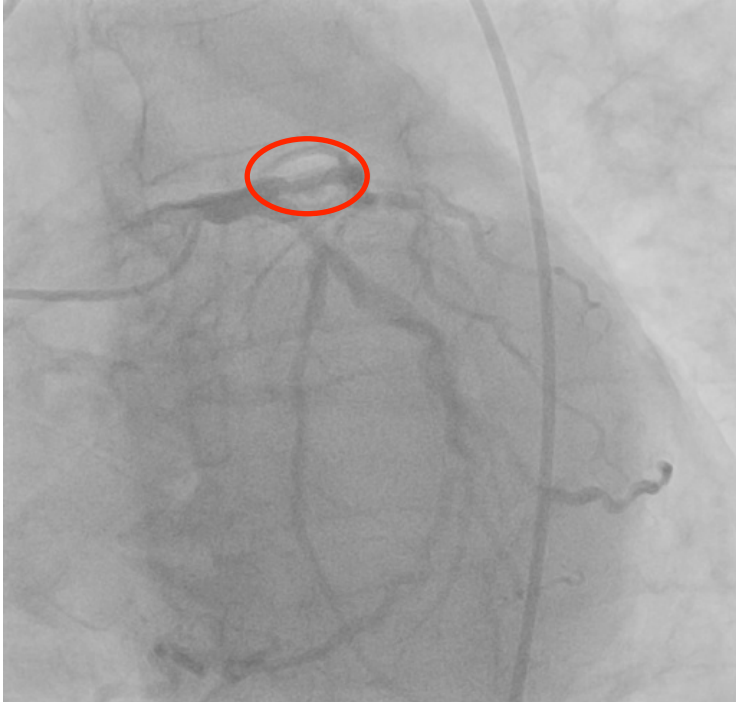
# Echo TSA et MI

- Lésion sévère de la carotide ID : 65%
- Lésion sévère de la carotide IG : 60 %
- Occlusion de la pédieuse gauche

# Coronarographie

- Tronc commun normal
- IVA: sténose serrée IVA proximale et moyenne
- Circonflexe: lésion minime
- Coronaire droite : occlusion chronique , flux

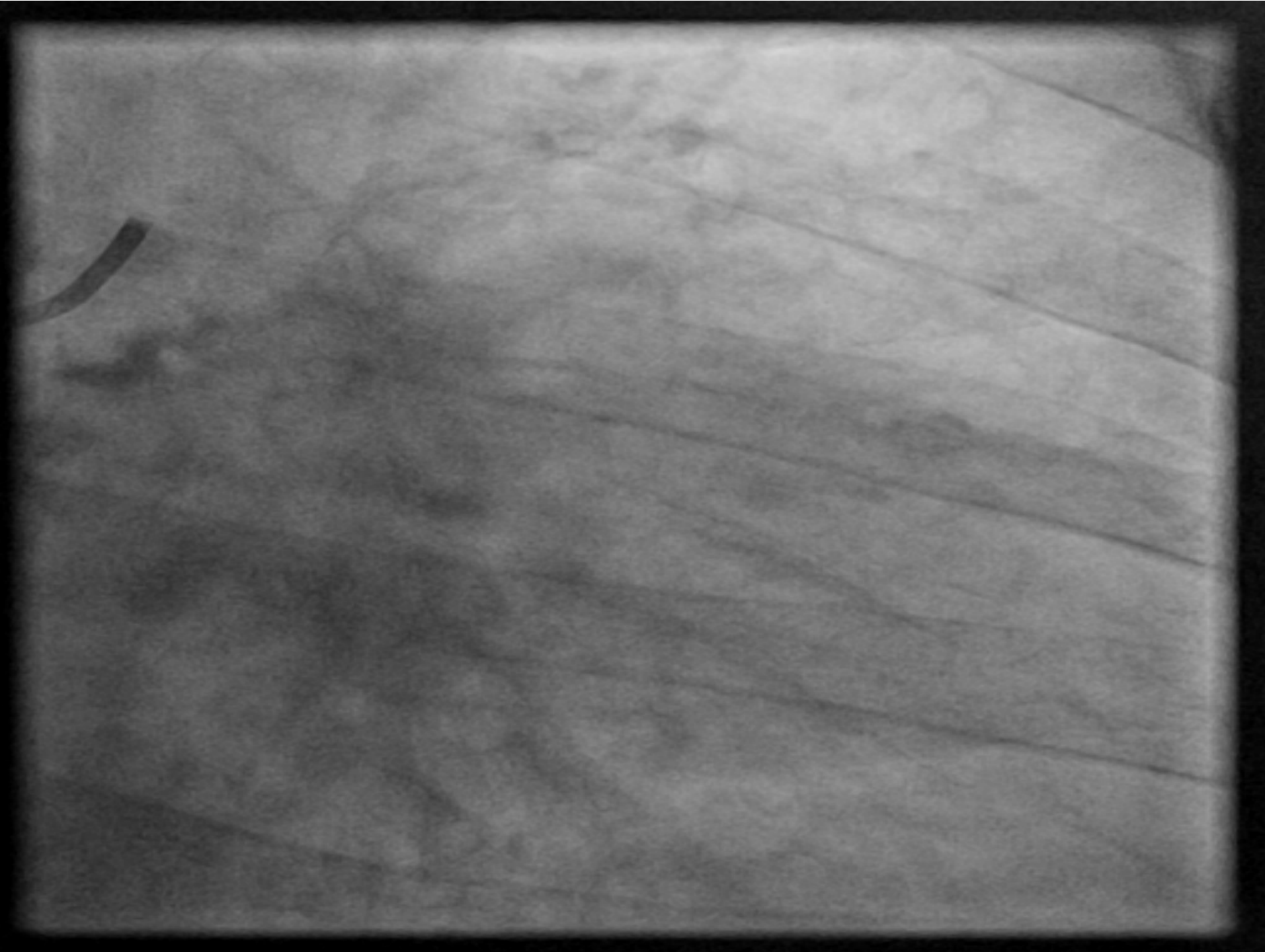
TIMI 0



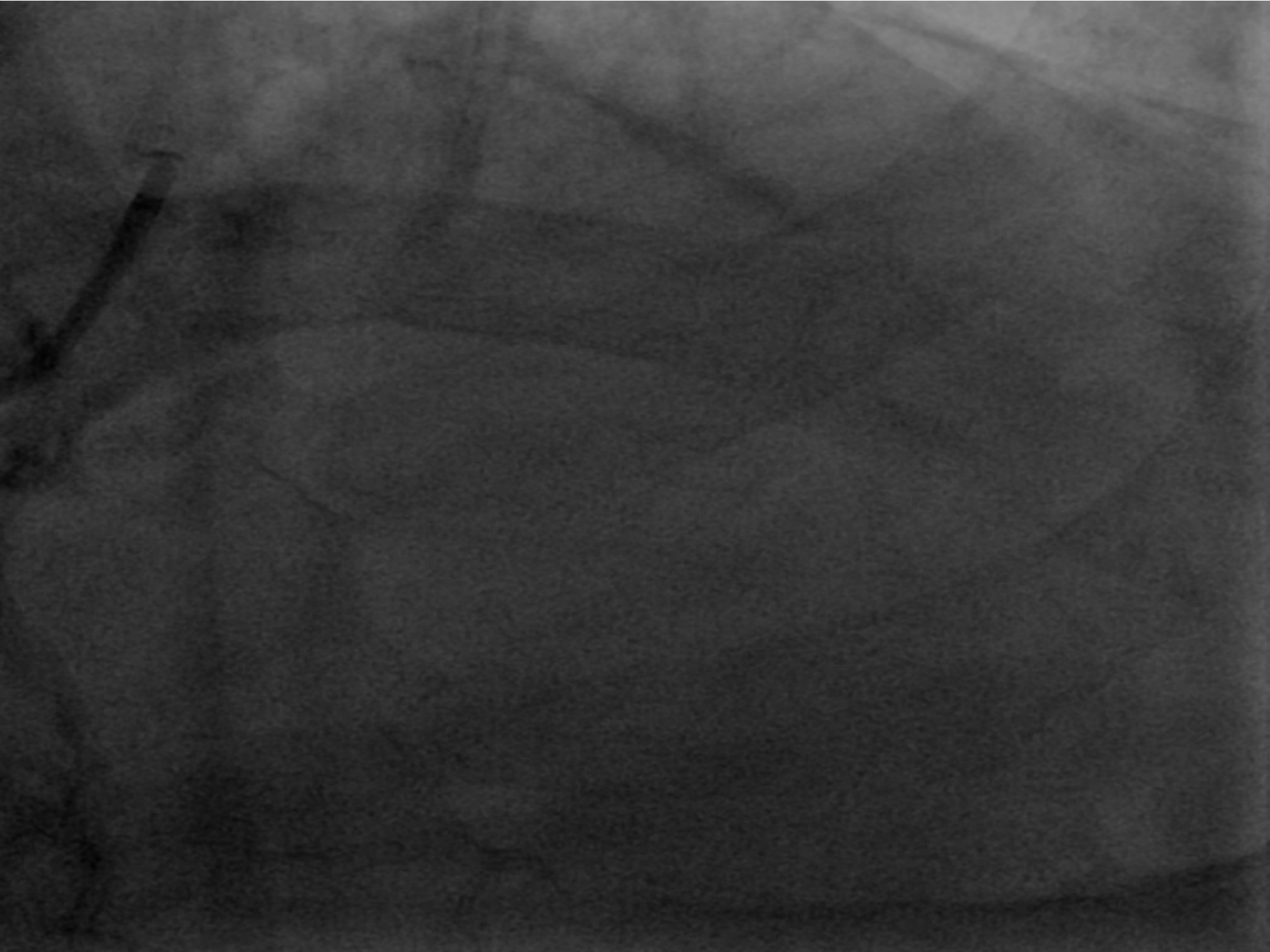
# CORONAIRE DROITE SCANNER













# Evaluation du risque

- Syntax Score = 29
- EuroScore = 22
- Facteur de mauvais pronostic : âge, diabète, statut clinique ( OAP, SCA ), fonction rénale altérée, lésions coronaires, lésions carotides

# STRATEGIE

## Hear team

- Chirurgie: RVA + PAC (EuroScore élevé)
- TAVI : sans ATC ? après ATC ?
- TAVI + ATC même procédure?

ATC préalable?

Revascularisation complète?

CTO?

Stent actif?

Délais ATC-TAVI ?

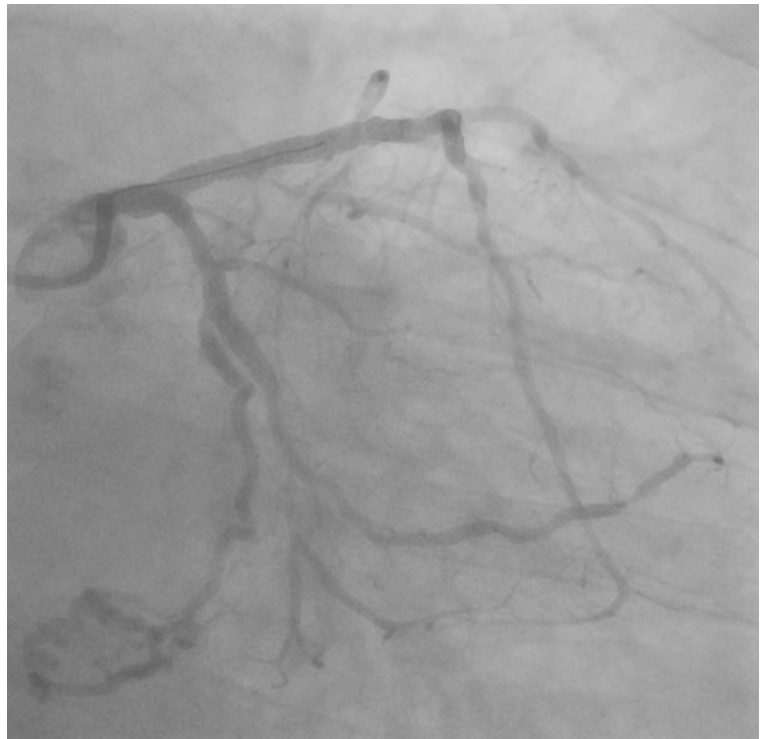
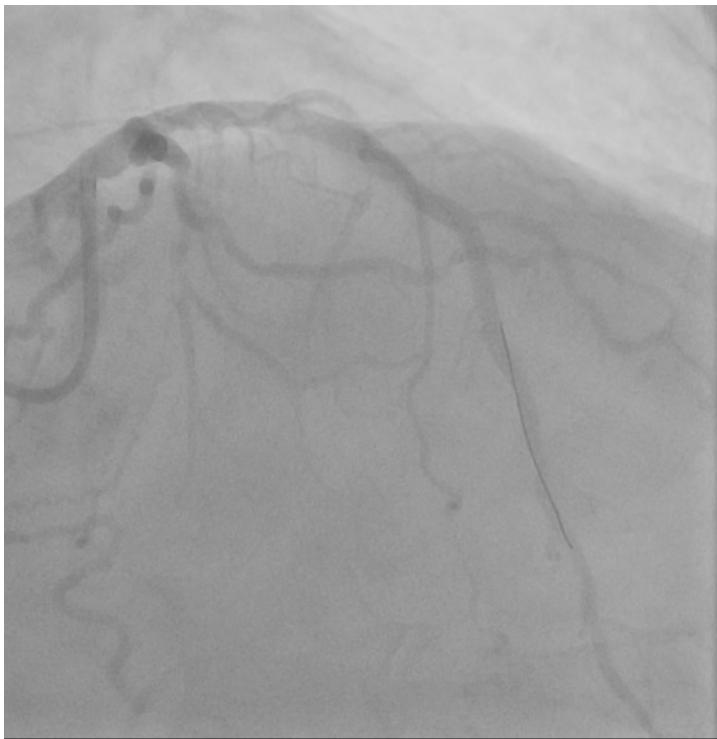
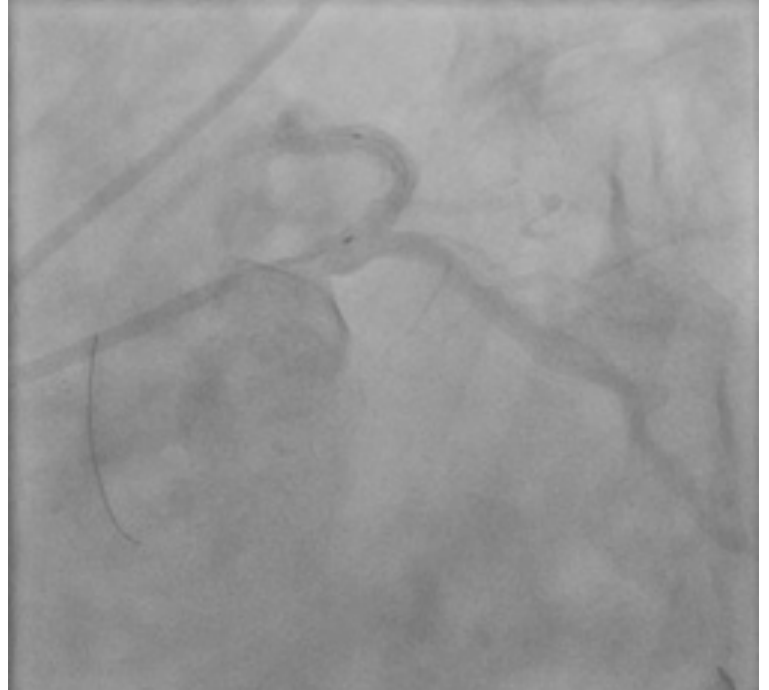
Decision heart team: TAVI après ATC

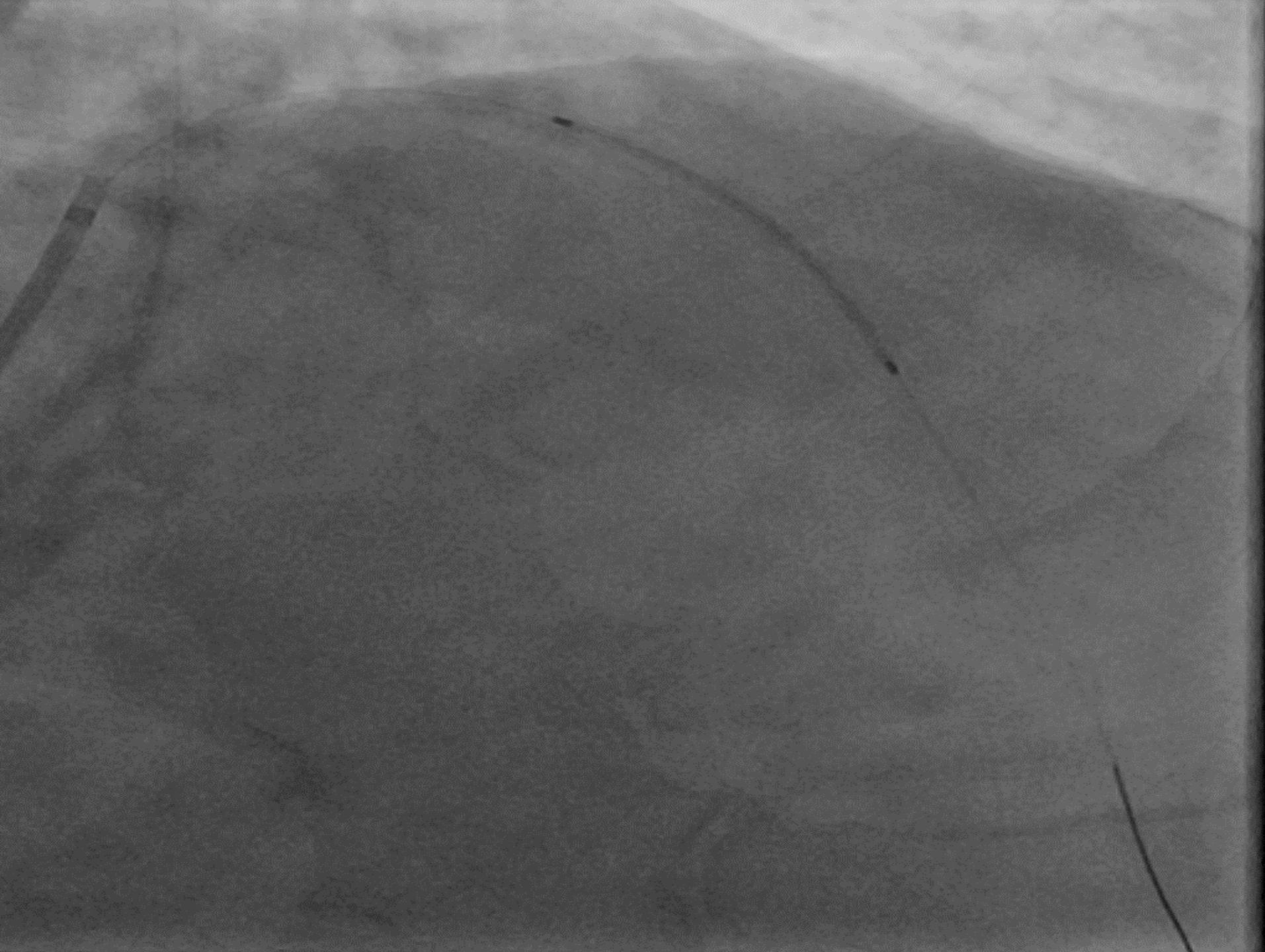
# Choix du heart team

- Scanner aorte: faisabilité , technique TAVI
- Décision: ATC puis TAVI , délais qq semaines, risque rénal, syntax score résiduel faible
- ATC : IVA seule, stents actifs, voie radiale
- TAVI : voie fémorale droite percutanée, Edwards XT 26

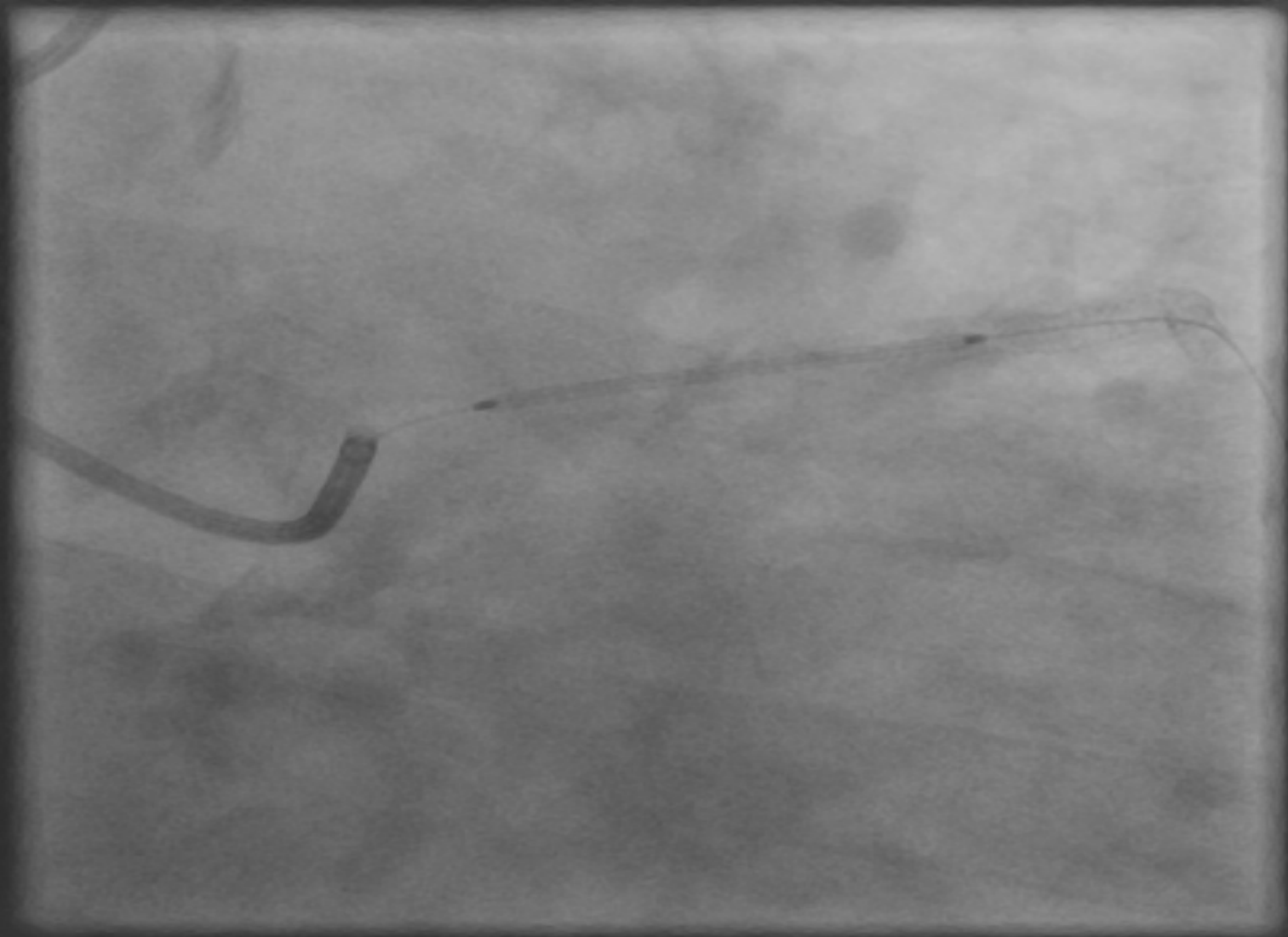
# ATC PROCEDURE

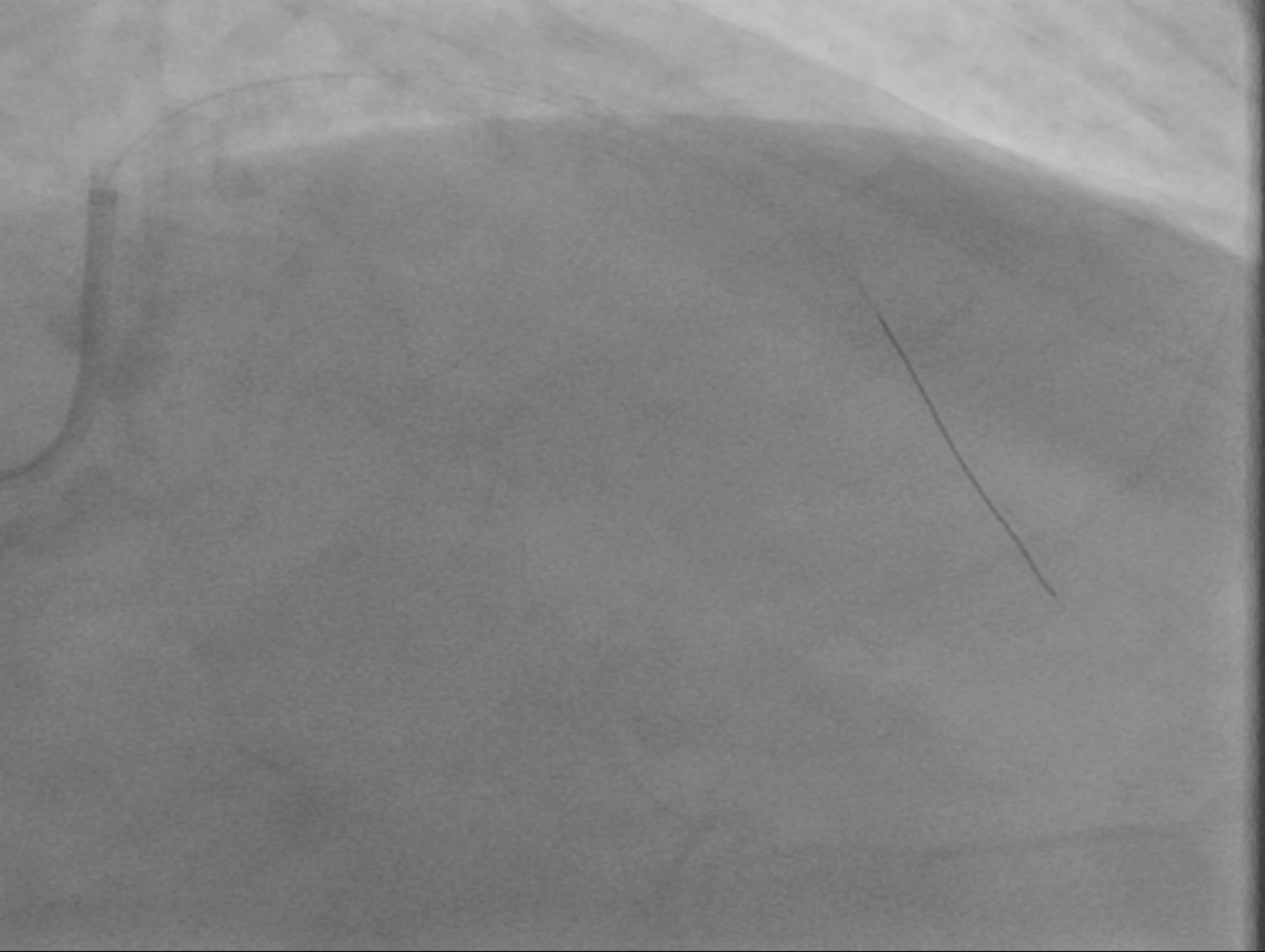
- ATC IVA PROX ET MOYENNE
- CD A REDISUTER APRES TAVI
- VOIE FEMORALE
- PREDILAT IVA II PUIS IVA I
- STENT IVA II XX3/38 PUIS IVA PROX XX 3.5/33  
AVEC CHEVAUCHEMENT













# Procédure TAVI

- Délais cinq semaines après ATL
- Anesthésie locale en salle de cathé
- Voie fémorale droite percutanée
- Valve Edwards XT 26 larguée sous contrôle angiographique seul sans prédilatation
- Post dilatation après contrôle ETT en salle KT
- Fermeture percutanée par Prostar A fémorale
- Contrôle angio après fermeture de l'AFD

I: 162.01 (coi)

Ex: Feb 26 2015

DFOV 15.0 cm  
STND/SS50 No Filter Ph:40%

20.1 mm (2D)

4 L 100 LAO 52 CAU

27.5 mm (2D)

PHR

PLS

0.62/No Lock  
KV 120

0.6mm 0.24:1/0.62sp

ABDELHAMID JARRAYA  
M 14602  
Acc:  
26/02/2015

3D Saved State - Images traitées  
ABDELHAMID JARRAYA 512x512

Oblique

SAR

Mag: 1.45x

A: 25.30 (col)

Ex: Feb 26 2015

DFOV 13.0 cm  
STND/SS50 No Filter Ph:40%

0 L 2 RAO 9 CAU

11.8 mm (2D)

R  
P

L  
A

16.9/MIP No Lock  
KV 120

0.6mm 0.24:1/0.62sp

36cm

Oblique

ABDELHAMID JARRAYA

SRP

L: 32.88 (coi)

Ex: Feb 26 2015

DFOV 13.0 cm  
STND/SS50 No Filter Ph:40%

0 L 49 LAO 31 CRA

I  
R  
R  
A

P  
L  
S

21.2 mm (2D)

16.9/MIP No Lock  
kV 120

0.6mm 0.24:1/0.62sp



50

GRDF1 F01 T01 TORR011

HD MLP NO Cut

Ex: Feb 26 2019

DFW: 59.3 cm  
STND/SR5.0 No Filter Fo:40%

0 L 45 LAO 0 CRA

L

R

No VDI  
KV 120

0.6mm 0.72/170.63cm

I





0: 610.14  
0m: 302  
DEF: 26.0 cm  
STND/S550 No Filter Fc:40K

Ex: Feb 26 2019

BPM: 70



9.4 mm (2D)

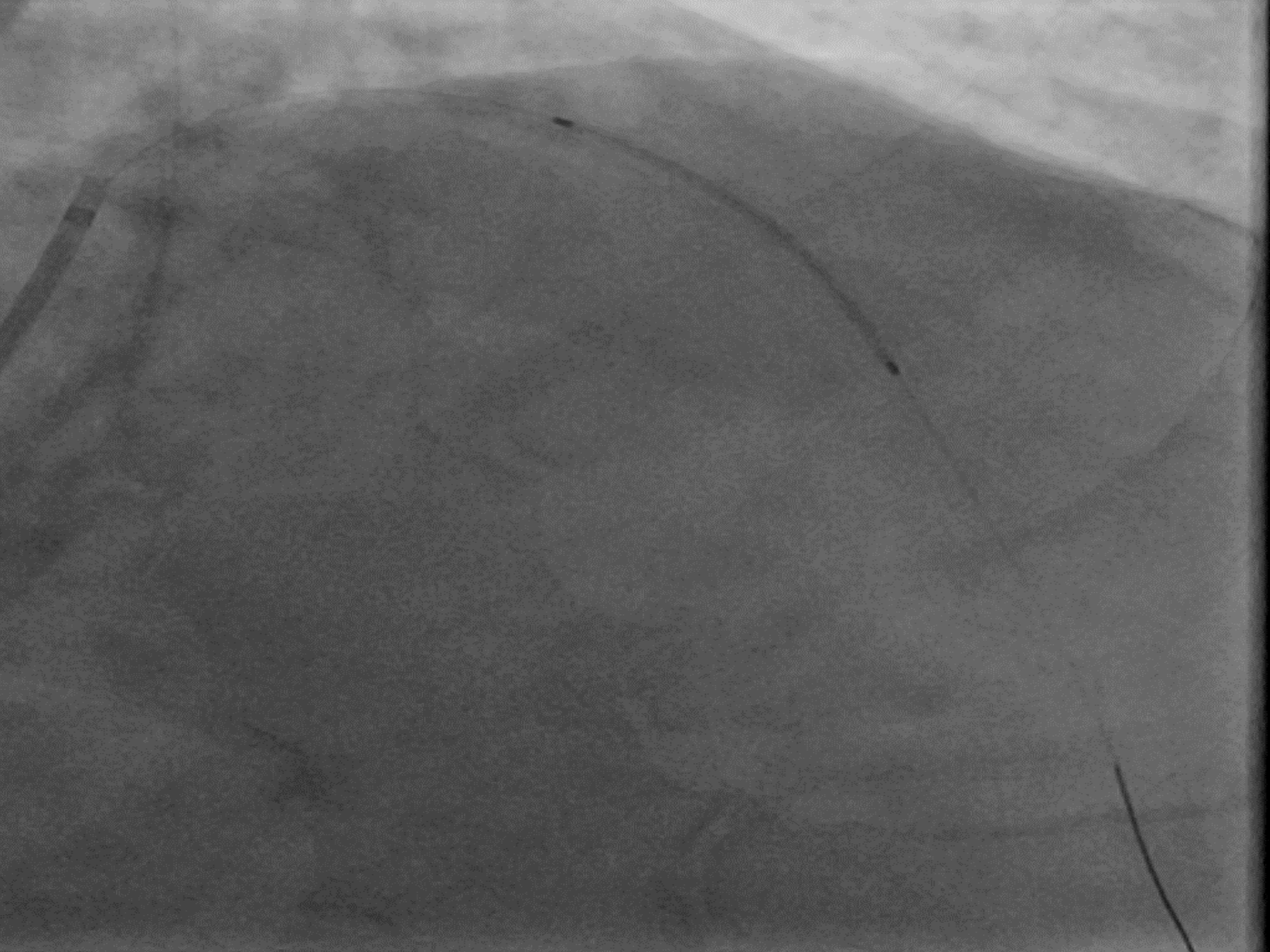
8.4 mm (2D)

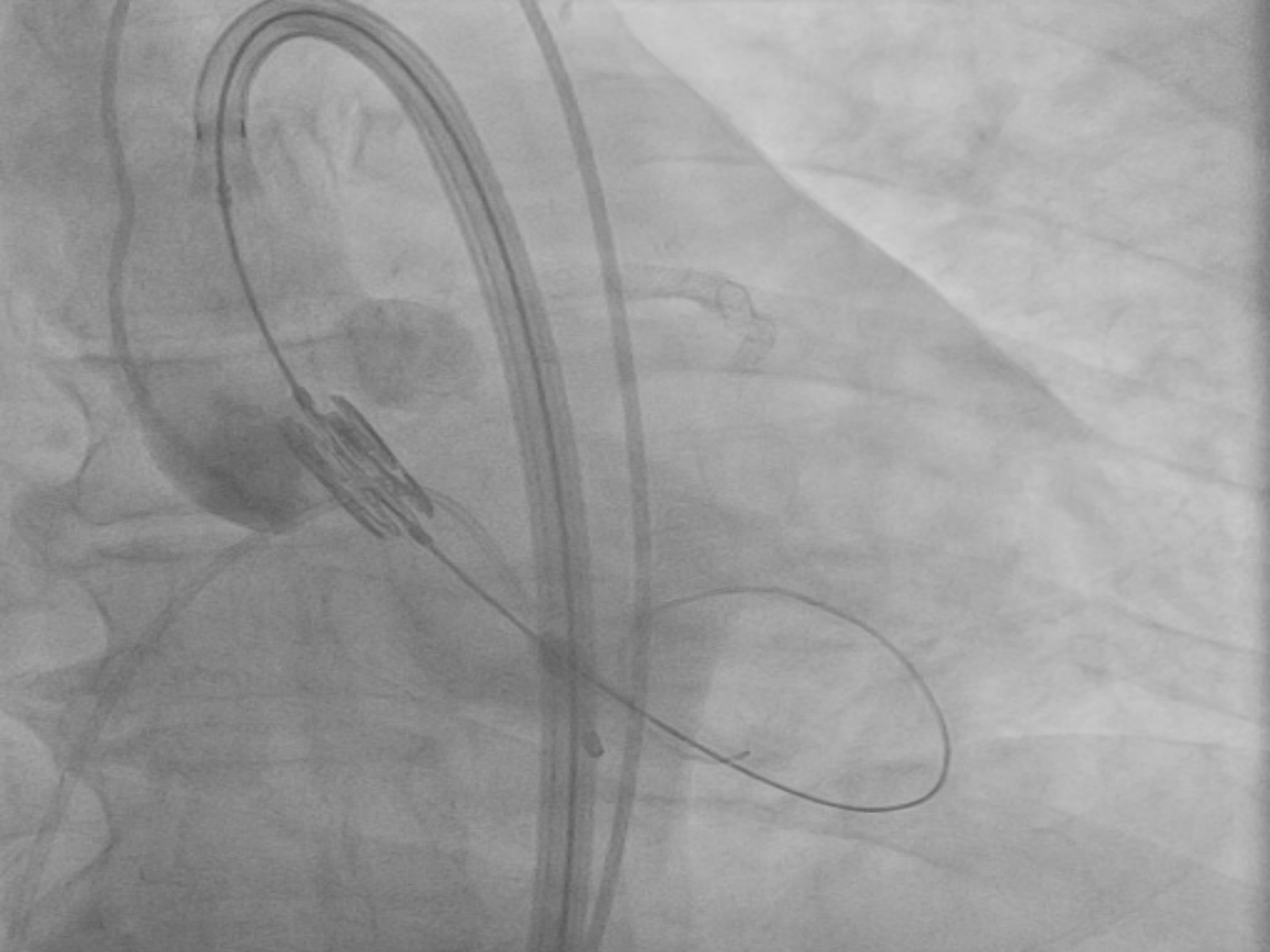
R  
1  
1  
9

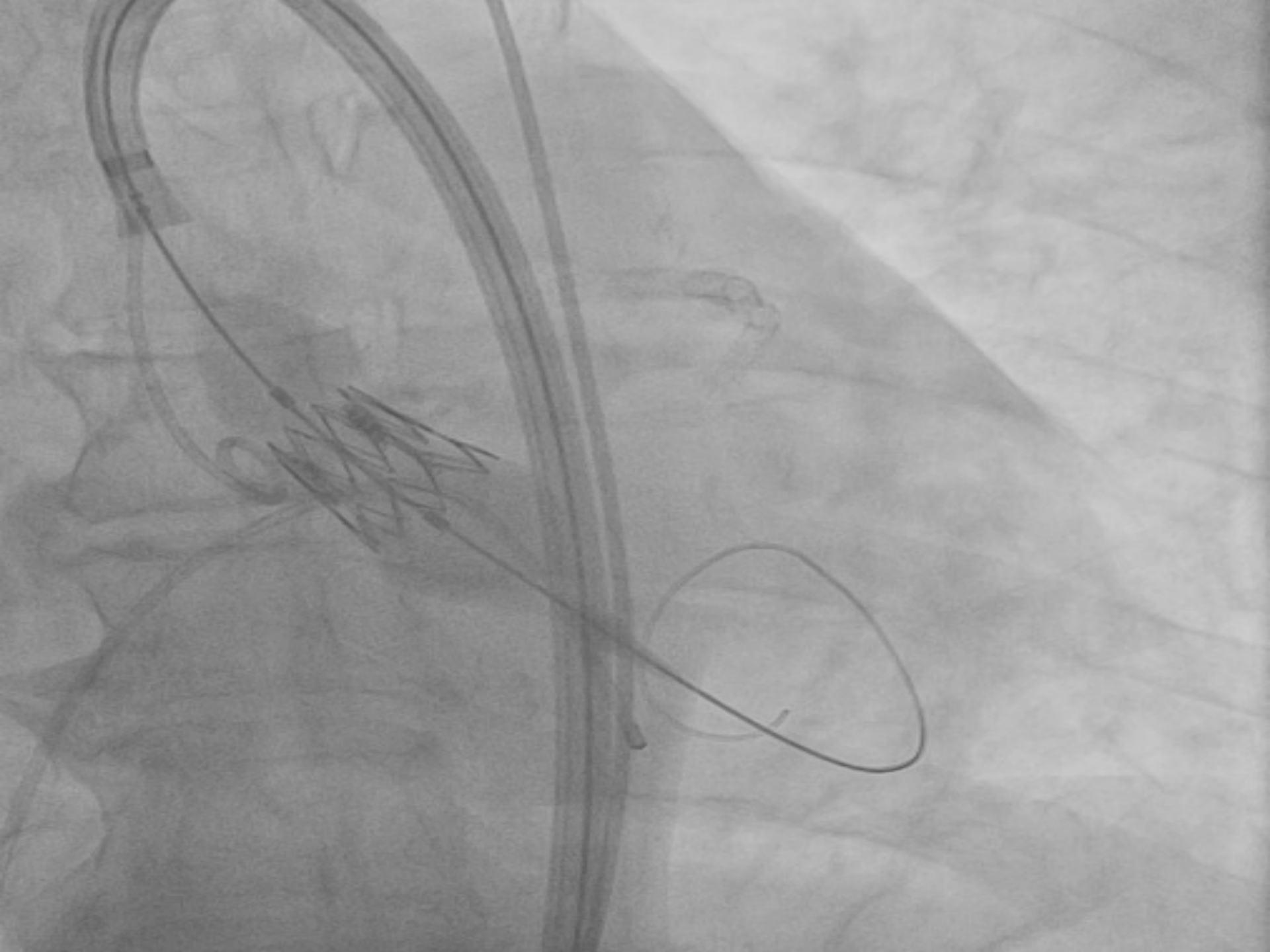
L  
1  
1  
9

0.82  
KV 120

0.6mm 0.34 0.10 0.63sp









**PROSTAR**



# Suites TAVI

- Séjour en USIC 24H
- Sortie à domicile J3
- ACFA J7
- Pace maker J12
- Recul 2 mois : asymptomatique, actif, sans angor
- Traitement: Plavix, Cordarone, Aspégic, Rozuvastatine,  
Corvasal, Lasilix
- Contrôle ETT: gradient moyen = 11mmHg, sans fuite  
paraprothétique



European Heart Journal (2012) **33**, 2451–2496  
doi:10.1093/eurheartj/ehs109

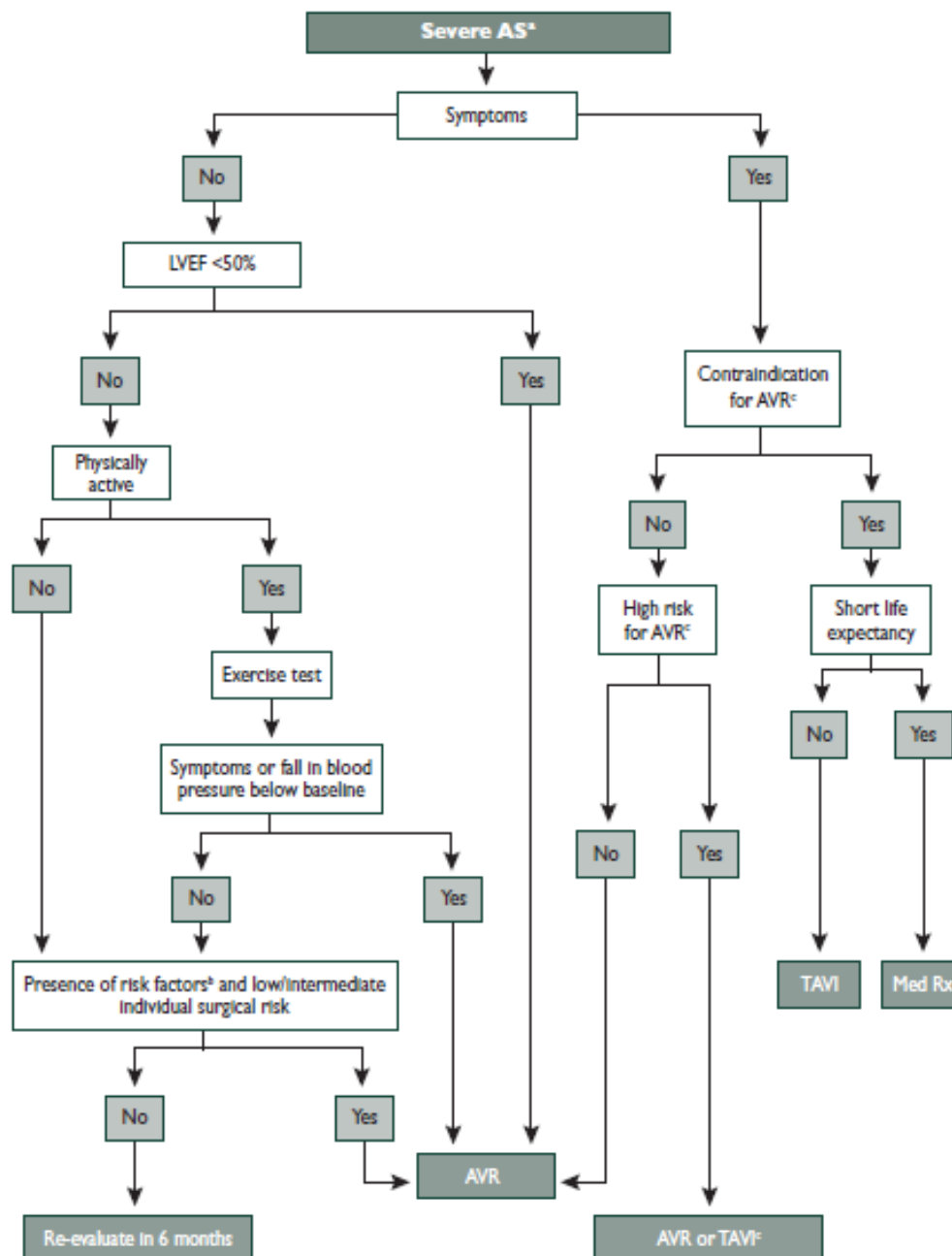
**ESC/EACTS GUIDELINES**



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# Guidelines on the management of valvular heart disease (version 2012)

**The Joint Task Force on the Management of Valvular Heart Disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)**





**Table 11** Recommendations for the use of transcatheter aortic valve implantation

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>	Ref <sup>c</sup>
TAVI should only be undertaken with a multidisciplinary 'heart team' including cardiologists and cardiac surgeons and other specialists if necessary.	I	C	
TAVI should only be performed in hospitals with cardiac surgery on-site.	I	C	
TAVI is indicated in patients with severe symptomatic AS who are not suitable for AVR as assessed by a 'heart team' and who are likely to gain improvement in their quality of life and to have a life expectancy of more than 1 year after consideration of their comorbidities.	I	B	99
TAVI should be considered in high-risk patients with severe symptomatic AS who may still be suitable for surgery, but in whom TAVI is favoured by a 'heart team' based on the individual risk profile and anatomic suitability.	IIa	B	97

## 2014 ESC/EACTS Guidelines on myocardial revascularization: web addenda

**The Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)**

**Developed with the special contribution of the European Association of Percutaneous Cardiovascular Interventions (EAPCI)**

**Authors/Task Force members: Stephan Windecker (ESC Chairperson) (Switzerland)\*, Philippe Kolh (EACTS Chairperson) (Belgium)\*, Fernando Alfonso (Spain), Jean-Philippe Collet (France), Jochen Cremer (Germany), Volkmar Falk (Switzerland), Gerasimos Filippatos (Greece), Christian Hamm (Germany), Stuart J. Head (The Netherlands), Peter Jüni (Switzerland), A. Pieter Kappetein (The Netherlands), Adnan Kastrati (Germany), Juhani Knuuti (Finland), Ulf Landmesser (Switzerland), Günther Laufer (Austria), Franz-Josef Neumann (Germany), Dimitrios J. Richter (Greece), Patrick Schauerte (Germany), Miguel Sousa Uva (Portugal), Giulio G. Stefanini (Switzerland), David Paul Taggart (UK), Lucia Torracca (Italy), Marco Valgimigli (Italy), William Wijns (Belgium), and Adam Witkowski (Poland).**

## 2014 ESC/EACTS Guidelines on myocardial revascularization:

for combined valvular and coronary interventions.

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
<b>Diagnostic modalities</b>		
Coronary angiography is recommended before valve surgery in patients with severe valvular heart disease and any of the following: <ul style="list-style-type: none"> <li>• history of CAD</li> <li>• suspected myocardial ischaemia</li> <li>• LV systolic dysfunction</li> <li>• in men aged over 40 years and in postmenopausal women</li> <li>• <math>\geq 1</math> cardiovascular risk factor for CAD.</li> </ul>	I	C
Coronary angiography is recommended in the evaluation of secondary mitral regurgitation.	I	C
CT angiography should be considered before valve surgery in patients with severe valvular heart disease and low probability for CAD or in whom conventional coronary angiography is technically not feasible or of high risk.	IIa	C
<b>Primary valve intervention and coronary revascularization</b>		
CABG is recommended in patients with a primary indication for aortic/mitral valve surgery and coronary artery diameter stenosis $>70\%$ in a major epicardial vessel.	I	C
CABG should be considered in patients with a primary indication for aortic/mitral valve surgery and coronary artery diameter stenosis 50–70% in a major epicardial vessel.	IIa	C
PCI should be considered in patients with a primary indication to undergo TAVI and coronary artery diameter stenosis $>70\%$ in proximal segments.	IIa	C
PCI should be considered in patients with a primary indication to undergo transcatheter mitral valve interventions and coronary artery diameter stenosis $>70\%$ in proximal segments.	IIa	C
<b>Primary revascularization and non-coronary intervention</b>		
Mitral valve surgery is indicated in patients with severe mitral regurgitation undergoing CABG, and LVEF $>30\%$ .	I	C
Mitral valve surgery should be considered in patients with moderate mitral regurgitation undergoing CABG to improve symptoms.	IIa	B
Repair of moderate-to-severe mitral regurgitation should be considered in patients with a primary indication for CABG and LVEF $\leq 35\%$ .	IIa	B
Stress testing should be considered in patients with a primary indication for CABG and moderate mitral regurgitation to determine the extent of ischaemia and regurgitation.	IIa	C
Aortic valve surgery should be considered in patients with a primary indication for CABG and moderate aortic stenosis (defined as valve area 1.0–1.5 cm <sup>2</sup> [0.6 cm <sup>2</sup> /m <sup>2</sup> to 0.9 cm <sup>2</sup> /m <sup>2</sup> body surface area] or mean aortic gradient 25–40 mmHg in the presence of normal flow conditions).	IIa	C



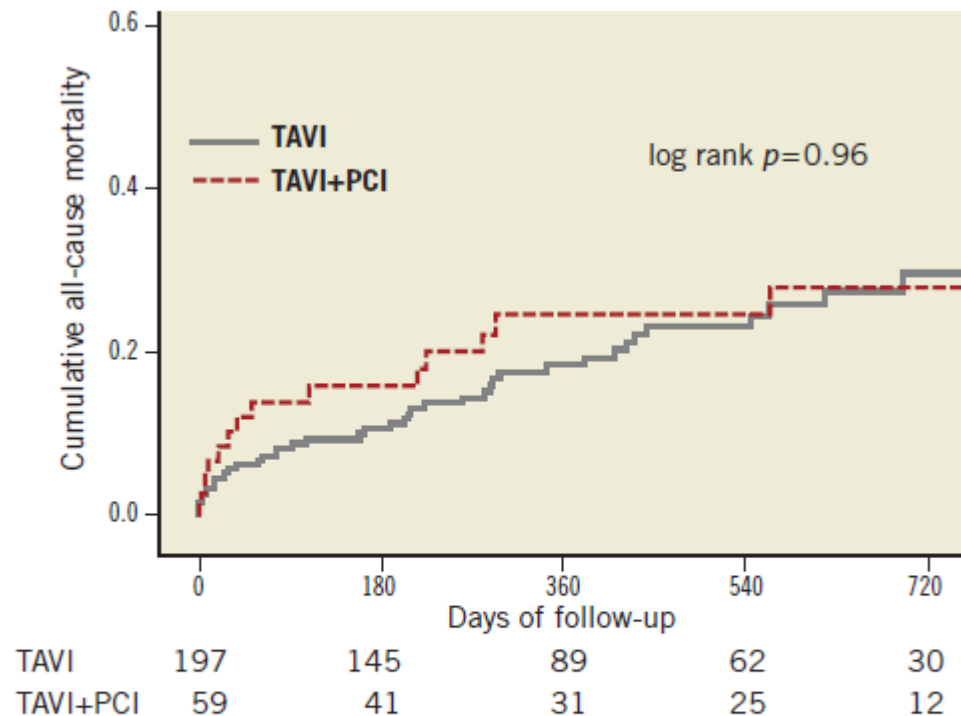
## 2014 ESC/EACTS Guidelines on myocardial revascularization:

for combined valvular and coronary interventions.

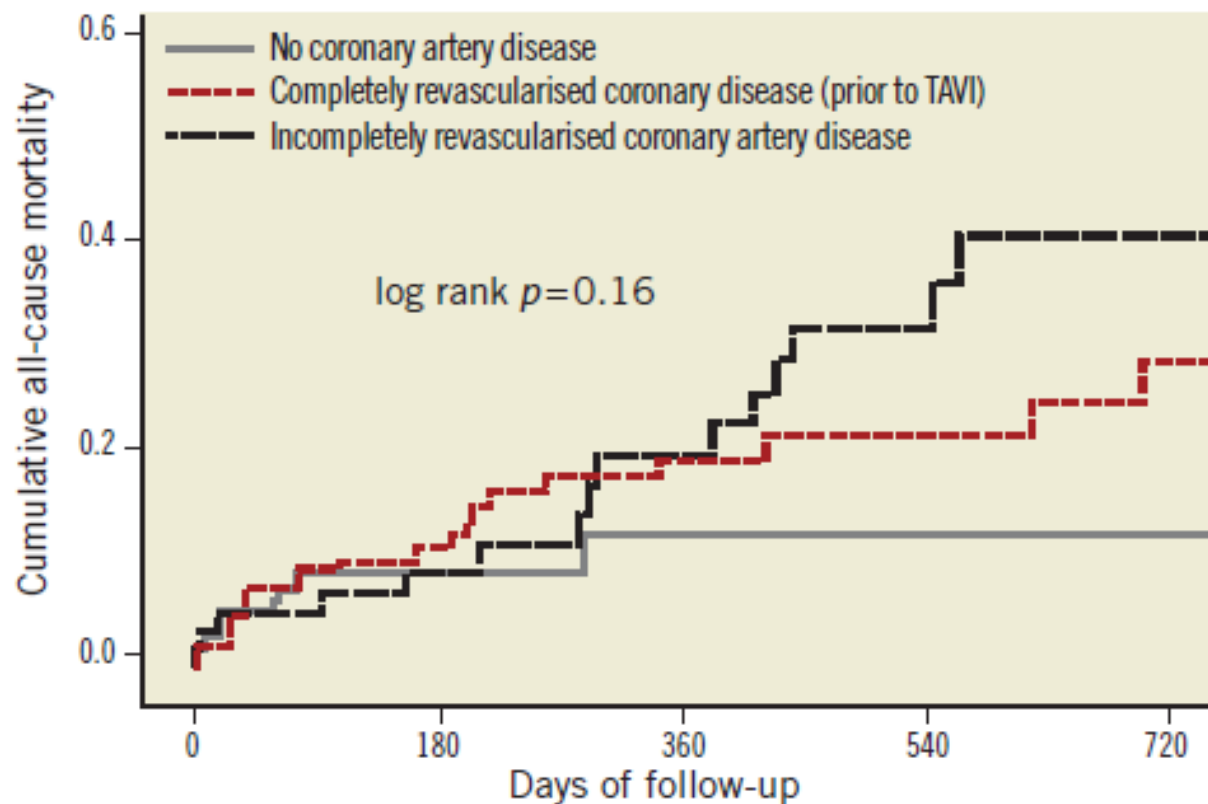
Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
<b>Diagnostic modalities</b>		
Coronary angiography is recommended before valve surgery in patients with severe valvular heart disease and any of the following: <ul style="list-style-type: none"> <li>• history of CAD</li> <li>• suspected myocardial ischaemia</li> <li>• LV systolic dysfunction</li> <li>• in men aged over 40 years and in postmenopausal women</li> <li>• ≥1 cardiovascular risk factor for CAD.</li> </ul>	I	C
Coronary angiography is recommended in the evaluation of secondary mitral regurgitation.	I	C
CT angiography should be considered before valve surgery in patients with severe valvular heart disease and low probability for CAD or in whom conventional coronary angiography is technically not feasible or of high risk.	IIa	C
<b>Primary valve intervention and coronary revascularization</b>		
CABG is recommended in patients with a primary indication for aortic/mitral valve surgery and coronary artery diameter stenosis >70% in a major epicardial vessel.	I	C
CABG should be considered in patients with a primary indication for aortic/mitral valve surgery and coronary artery diameter stenosis 50–70% in a major epicardial vessel.	IIa	C
PCI should be considered in patients with a primary indication to undergo TAVI and coronary artery diameter stenosis >70% in proximal segments.	IIa	C
transcatheter mitral valve interventions and coronary artery diameter stenosis >70% in proximal segments.	IIa	C
<b>Primary revascularization and non-coronary intervention</b>		
Mitral valve surgery is indicated in patients with severe mitral regurgitation undergoing CABG, and LVEF >30%.	I	C
Mitral valve surgery should be considered in patients with moderate mitral regurgitation undergoing CABG to improve symptoms.	IIa	B
Repair of moderate-to-severe mitral regurgitation should be considered in patients with a primary indication for CABG and LVEF ≤35%.	IIa	B
Stress testing should be considered in patients with a primary indication for CABG and moderate mitral regurgitation to determine the extent of ischaemia and regurgitation.	IIa	C
Aortic valve surgery should be considered in patients with a primary indication for CABG and moderate aortic stenosis (defined as valve area 1.0–1.5 cm <sup>2</sup> [0.6 cm <sup>2</sup> /m <sup>2</sup> to 0.9 cm <sup>2</sup> /m <sup>2</sup> body surface area] or mean aortic gradient 25–40 mmHg in the presence of normal flow conditions).	IIa	C

# Impact of coronary artery disease and percutaneous coronary intervention on outcomes in patients with severe aortic stenosis undergoing transcatheter aortic valve implantation

Peter Wenaweser<sup>1†</sup>, MD; Thomas Pilgrim<sup>1†\*</sup>, MD; Enio Guerios<sup>1</sup>, MD; Stefan Stortecky<sup>1</sup>, MD; Christoph Huber<sup>2</sup>, MD; Ahmed A. Khattab<sup>1</sup>, MD; Alexander Kadner<sup>2</sup>, MD; Lutz Buellesfeld<sup>1</sup>, MD; Steffen Gloekler<sup>1</sup>, MD; Bernhard Meier<sup>1</sup>, MD; Thierry Carrel<sup>2</sup>, MD; Stephan Windecker<sup>1</sup>, MD



**Figure 3.** Kaplan-Meier survival analysis up to two years of follow-up for patients undergoing TAVI only, and patients undergoing staged or concomitant revascularisation.

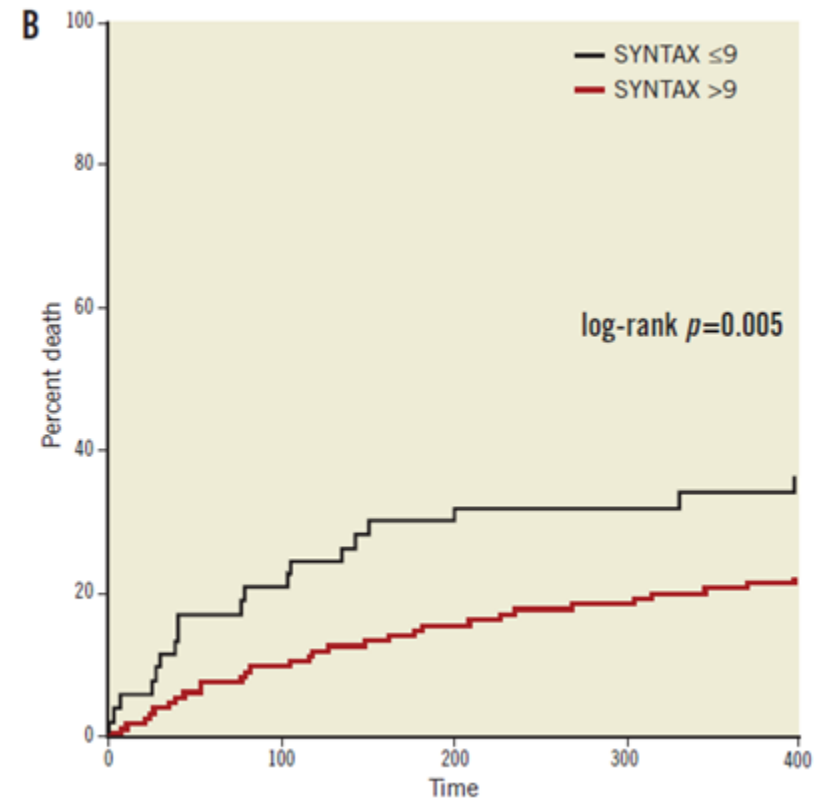
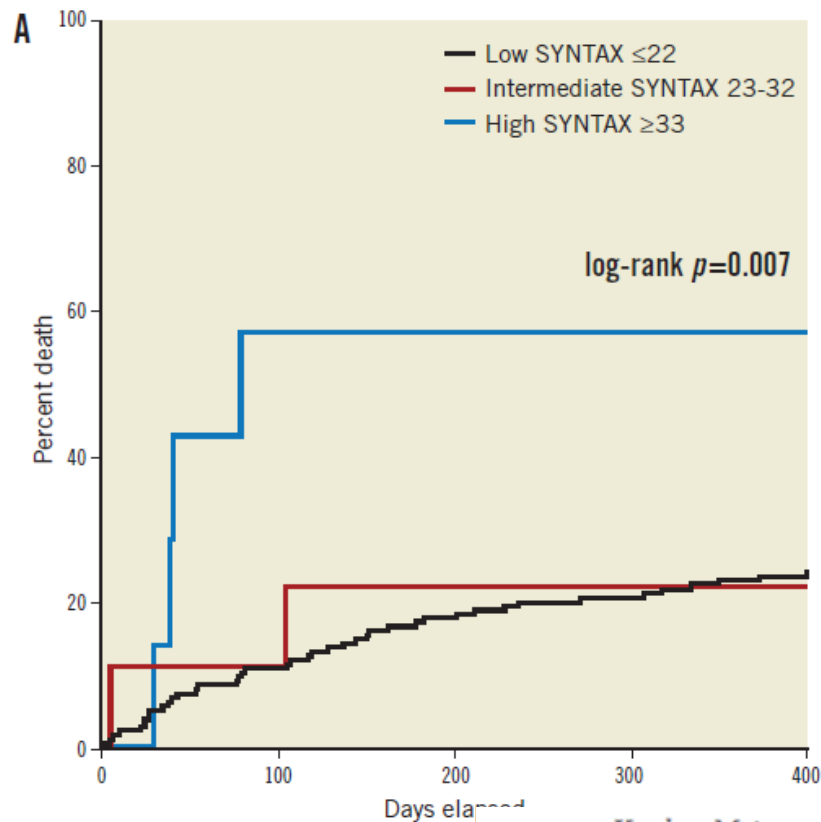


No CAD	89	68	42	30	18
Complete revasc.	53	38	21	16	3
Incomplete revasc.	55	39	26	16	9

**Figure 4.** *Kaplan-Meier survival analysis up to two years of follow-up for patients undergoing isolated TAVI without CAD, completely revascularised CAD prior to TAVI, or incompletely revascularised CAD.*

# The effect of coronary artery disease defined by quantitative coronary angiography and SYNTAX score upon outcome after transcatheter aortic valve implantation (TAVI) using the Edwards bioprosthesis

Muhammed Zeeshan Khawaja<sup>1,2\*</sup>, MBBS; Kaleab N. Asress<sup>1,2</sup>, MA, BA, BCh; Hari Haran<sup>2</sup>, MBBS;



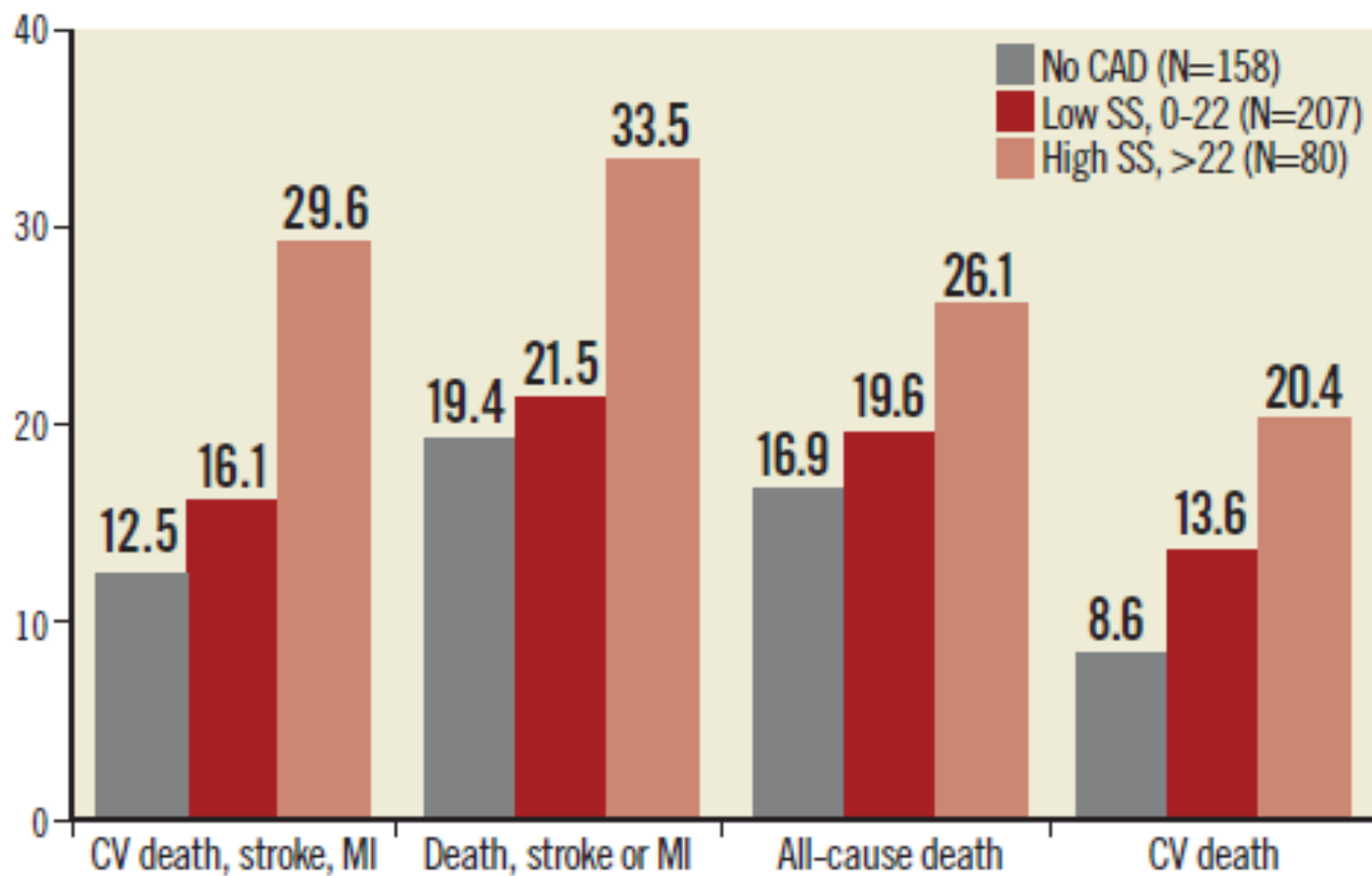
*Kaplan-Meier curves showing the effects of complexity of coronary artery disease anatomy according to SYNTAX risk group (A), and the effects of a SYNTAX score  $>9$  upon cumulative mortality (B).*

## Impact on daily practice

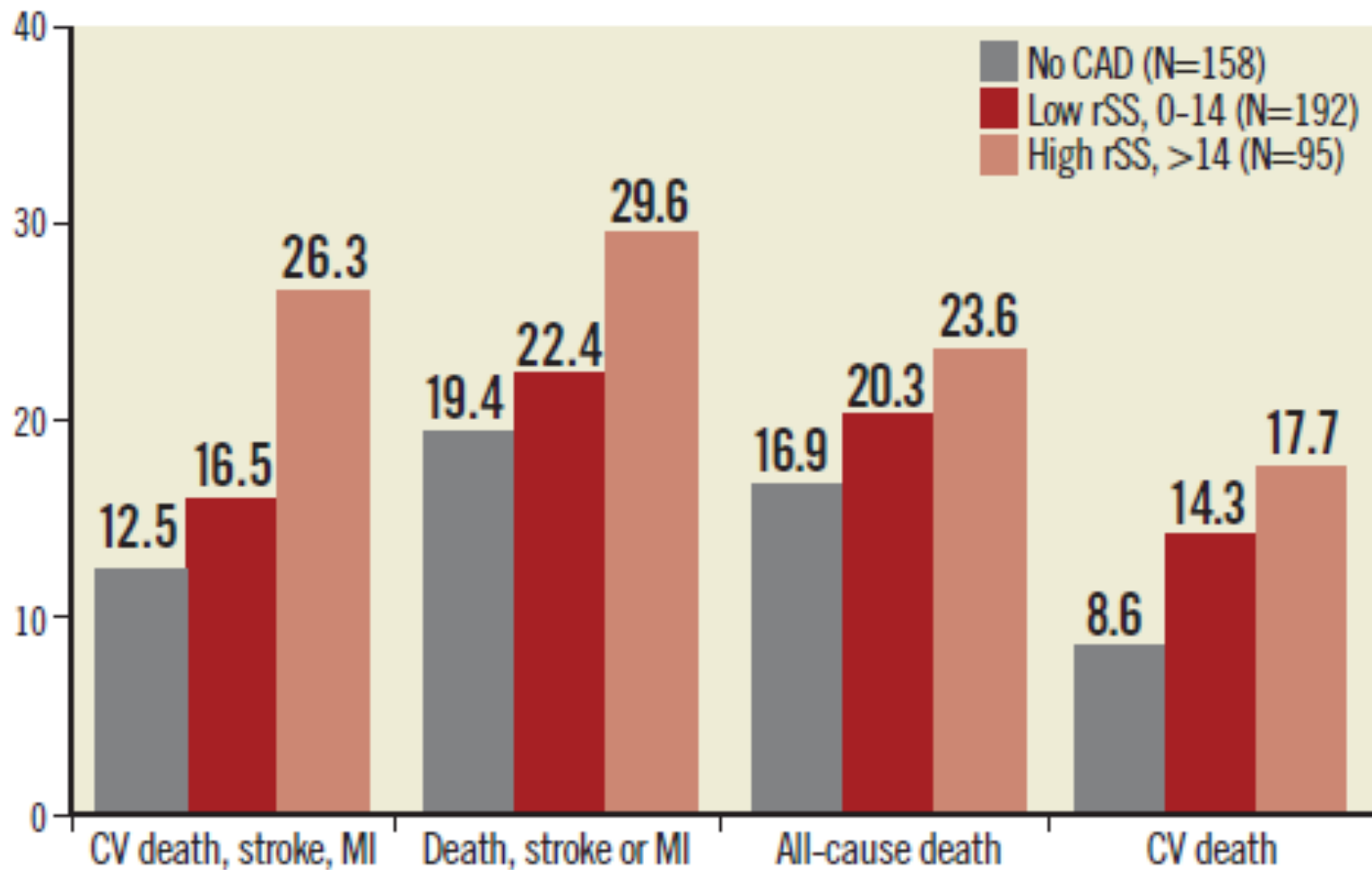
Our data suggest that the angiographic significance of coronary artery disease using a “real-world” threshold of 70% does not affect mortality in patients undergoing TAVI. However, more complex coronary artery disease, as described by SYNTAX score, increases the risk of death. This should perhaps be taken into account in the “Heart Team” decision-making process. Whether patients should undergo percutaneous intervention prior to TAVI will be addressed in the ongoing ACTIVATION trial.



*One-year outcomes in patients treated with TAVI according to baseline SYNTAX score. One-year outcomes in patients treated with TAVI according to coronary artery disease (CAD) severity quantified with the use of the SYNTAX score (SS) assessed at baseline. CV: cardiovascular; MI: myocardial infarction. Data from the Bern TAVI Registry<sup>15</sup>.*



*One-year outcomes in patients treated with TAVI according to residual SYNTAX score. One-year outcomes in patients treated with TAVI according to residual coronary artery disease (CAD) severity quantified with the use of the SYNTAX score (SS) assessed after coronary revascularisation. CV: cardiovascular; MI: myocardial infarction. Data from the Bern TAVI Registry<sup>15</sup>.*

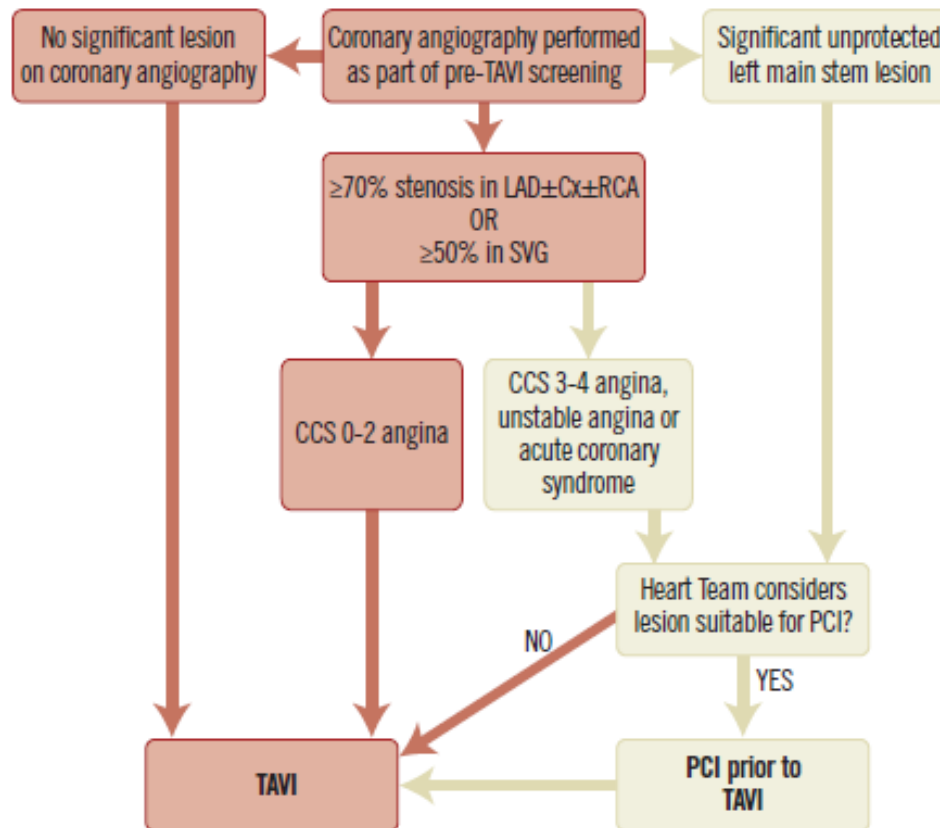


# Coronary artery disease in patients undergoing TAVI - why not to treat

Muhammed Z. Khawaja<sup>1,2</sup>, MBBS, MRCP; Simon R. Redwood<sup>1,2</sup>, MBBS, MD, FRCP; Martyn Thomas<sup>2\*</sup>, MBBS, MD, FRCP

1. King's College London, British Heart Foundation Centre of Research Excellence, Cardiovascular Division, The Rayne Institute, London, United Kingdom; 2. Guy's & St Thomas' Hospitals NHS Foundation Trust, London, United Kingdom

*An algorithm to manage coronary artery disease in patients undergoing TAVI.*



# The percutaneous coronary intervention prior to transcatheter aortic valve implantation (ACTIVATION) trial: study protocol for a randomized controlled trial

Muhammed Zeeshan Khawaja<sup>1,2\*†</sup>, Duolao Wang<sup>3†</sup>, Stuart Pocock<sup>4†</sup>, Simon Robert Redwood<sup>1,2†</sup> and Martyn Rhys Thomas<sup>2†</sup>

## Abstract

**Background:** Current guidelines recommend treatment of significant coronary artery disease by concomitant coronary artery bypass grafting (CABG) in patients undergoing surgical aortic valve replacement. However there is no consensus as to how best to treat coronary disease in high-risk patients requiring transcatheter aortic valve implantation (TAVI).

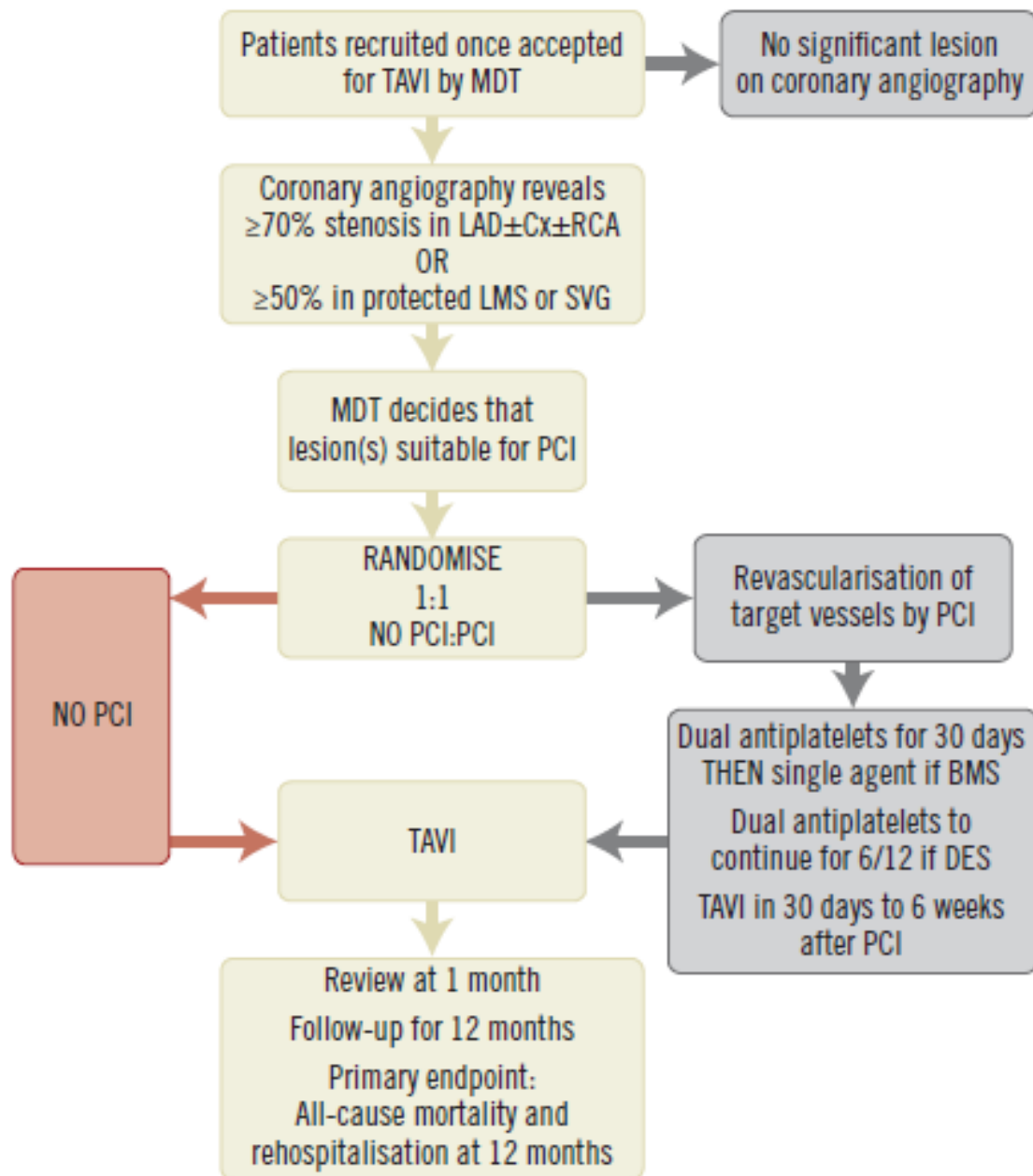
**Methods/Design:** The percutaneous coronary intervention prior to transcatheter aortic valve implantation (ACTIVATION) trial is a randomized, controlled open-label trial of 310 patients randomized to treatment of significant coronary artery disease by percutaneous coronary intervention (PCI - test arm) or no PCI (control arm). Significant coronary disease is defined as  $\geq 1$  lesion of  $\geq 70\%$  severity in a major epicardial vessel or 50% in a vein graft or protected left main stem lesion. The trial tests the hypothesis that the strategy of performing pre-TAVI PCI is non-inferior to not treating such coronary stenoses with PCI prior to TAVI, with a composite primary outcome of 12-month mortality and rehospitalization. Secondary outcomes include efficacy end-points such as 30-day mortality, safety endpoints including bleeding, burden of symptoms, and quality of life (assessed using the Seattle Angina Questionnaire and the Kansas City Cardiomyopathy Questionnaire).

In conclusion, we hope that using a definition of coronary artery disease severity closer to that used in everyday practice by interventional cardiologists - rather than the 50% severity used in surgical guidelines - will provide robust evidence to direct guidelines regarding TAVI therapy and improve its safety and efficacy profile of this developing technique.

**Trial registration:** ISRCTN75836930, <http://www.controlled-trials.com/ISRCTN75836930> (registered 19 November 2011).

**Keywords:** Transcatheter aortic valve implantation, Percutaneous coronary intervention, Aortic stenosis, Coronary

## The structure of the ACTIVATION randomised controlled trial of PCI prior to TAVI



# TAKE HOME MESSAGES

- Maladie coronaire + TAVI : 35 – 75 %
- Guidelines 2014: ATC si lésion sup70% segment proximal, artère principale si TAVI envisagé (classe IIa, niveau c)
- Absence de preuves solides en faveur de l'ATC systématique avant TAVI sur la mortalité
- SyntaxScore élevé est associé à une surmortalité après TAVI
- Essai ACTIVATION : première étude randomisée comparant TAVI+ATC à TAVI seul chez des patients candidats au TAVI ayant des lésions coro



MERCI



































Oblique

ABDELHAMID JARRAYA

AIL

I: 161.99 (coi)

Ex: Feb 26 2015

DFOV 13.0 cm  
STND/SS50 No Filter Ph:40%

4 L 100 LAO 52 CAU

433.0 mm<sup>2</sup>



PHR

PSR

0.62/No Lock  
KV 120

0.6mm 0.24:1/0.62sp

PSR

3D

ABDELHAMID JARRAYA

SPR

Volume Rendering No cut

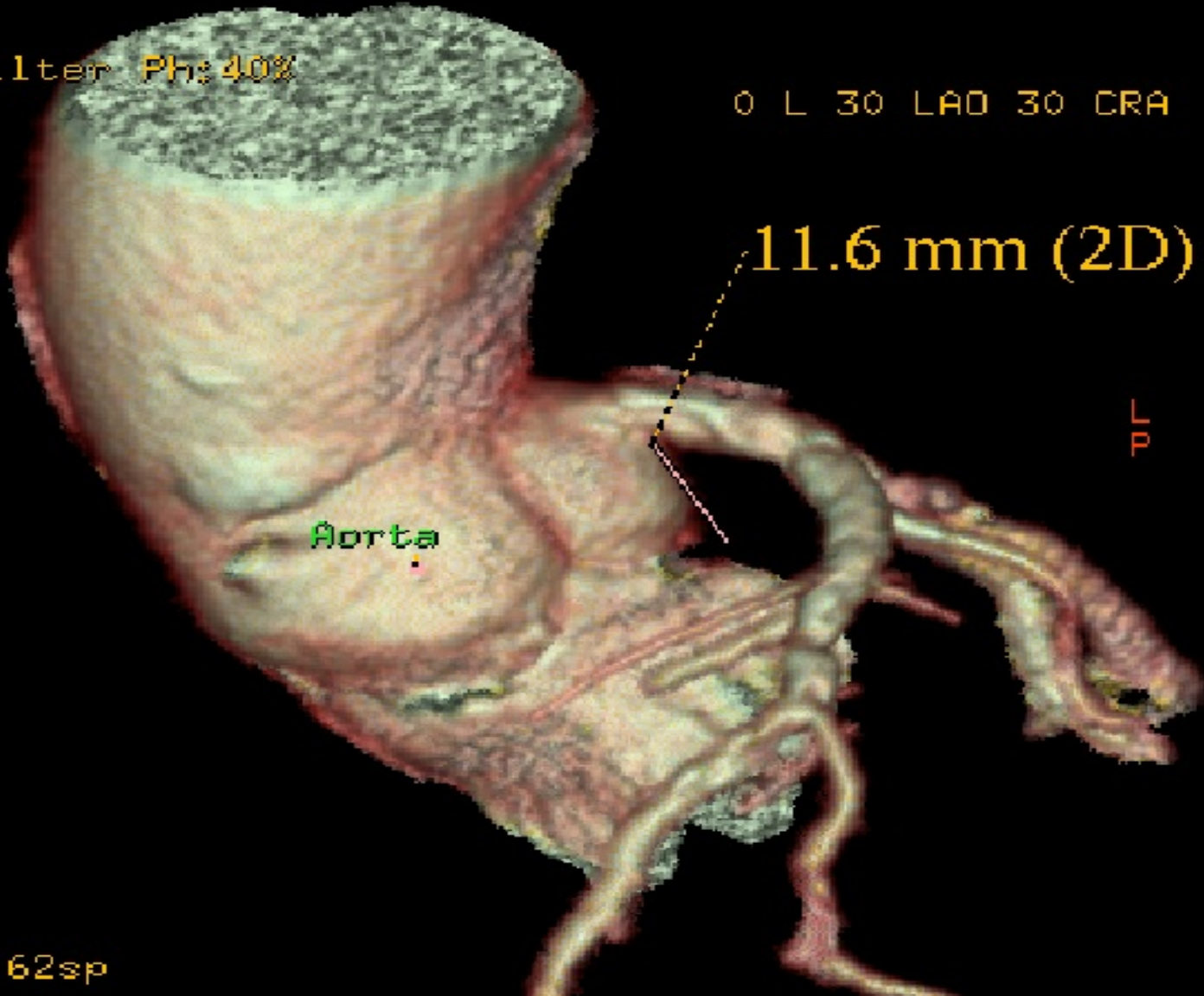
Ex: Feb 26 2015

DFOV 13.0 cm  
STND/SS50 No Filter Ph: 40%

0 L 30 LAO 30 CRA

DR

PL



Aorta

11.6 mm (2D)

No VOI  
kV 120

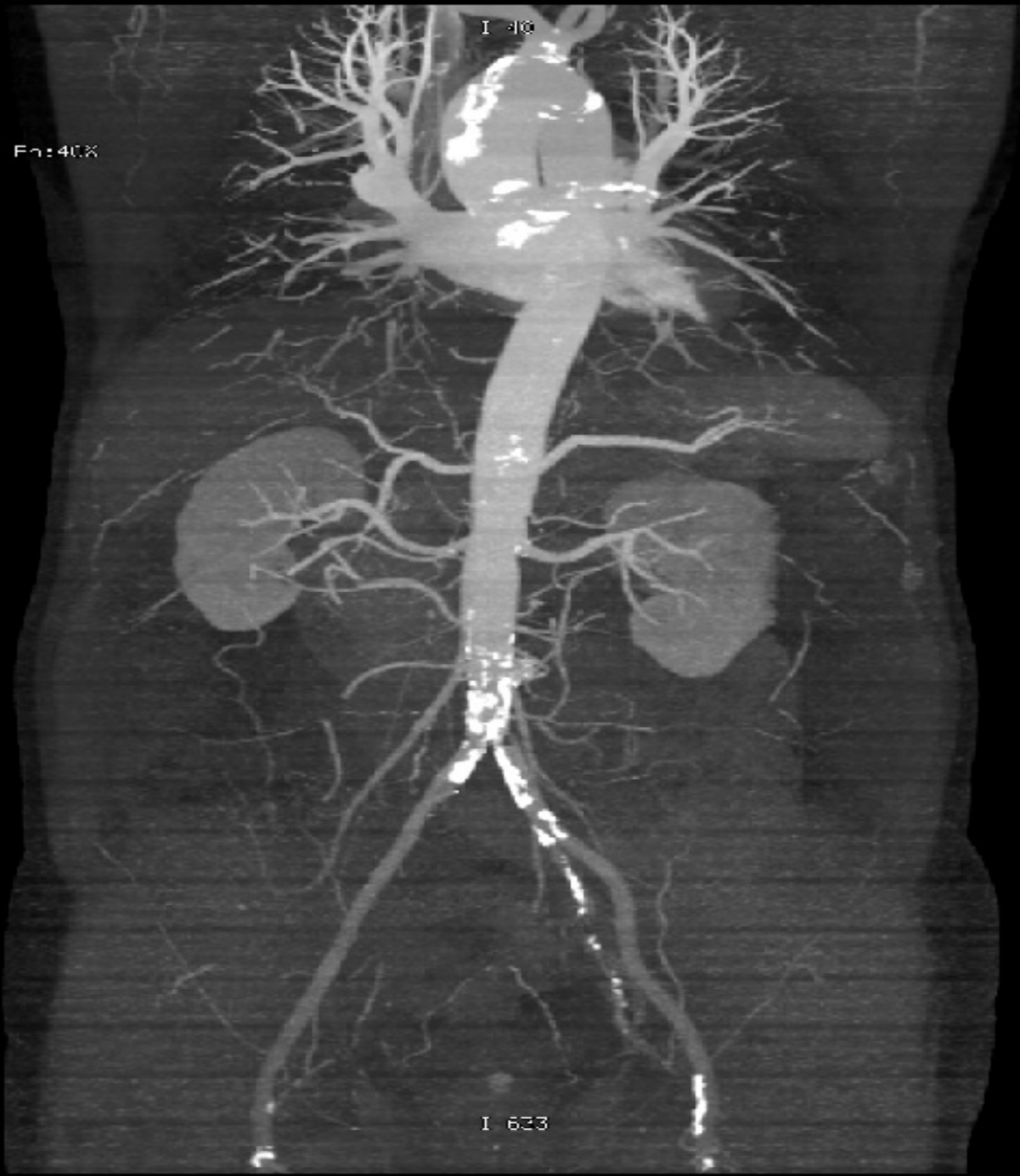
0.6mm 0.24:1/0.62sp

HD MIP No Cut

Ex: Feb 26 2019

DFW: 59.3 cm  
STND/SRSD No Filter Fps:40X

C L O LAO O CRA



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L  
R

No VDI  
kV 120

0.6mm 0.72x170.63cm

I 633





