TAVI & thrombose de valve

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CHU Clermont-Ferrand

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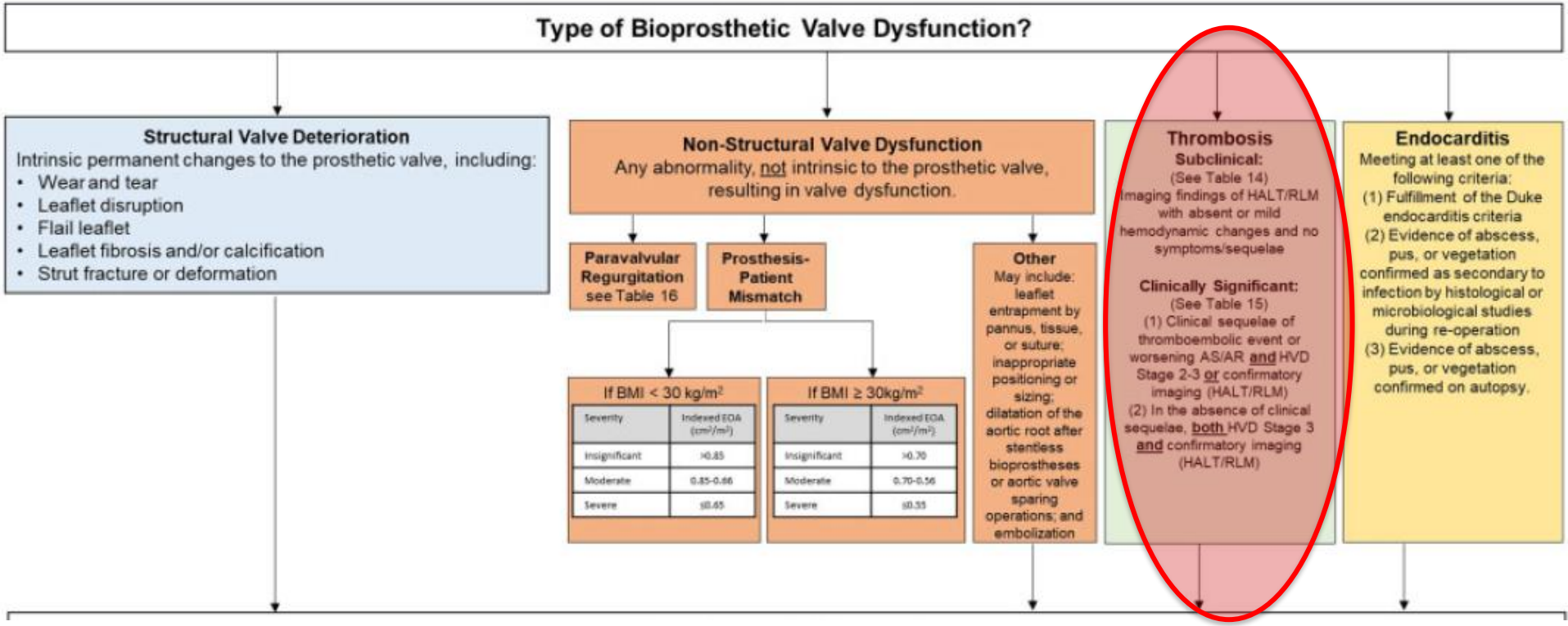
Conflits d'intérêts

Consultant Terumo, Medtronic, Abbott, B Braun, Schockwave

THROMBOSE TAVI



P. GENEREUX. Eur H J 2021

THROMBOSE TAVI

Les questions

Fréquent?

Diagnostic?

Traitement anticoagulant systématique?

THROMBOSE TAVI

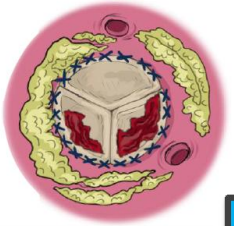
2 entités à différencier

Thrombose sub-clinique

Thrombose clinique

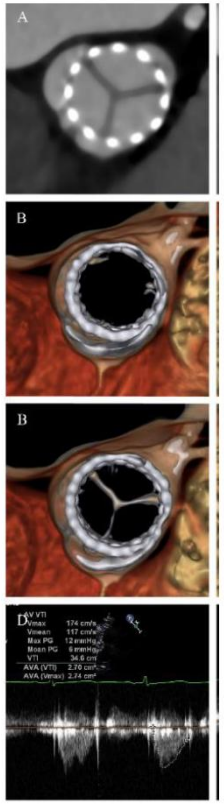
THROMBOSE TAVI

Stages of Bioprosthetic Valve Thrombosis



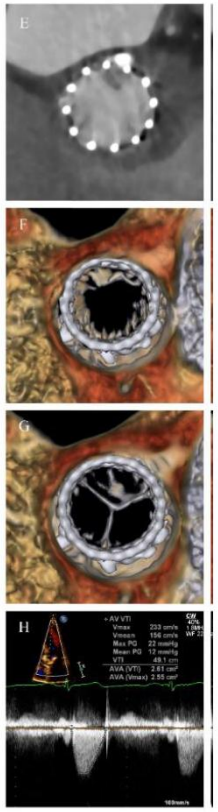
	TTE / TEE	Contrast CT
Subclinical Thrombosis (Stage 1)	- Hypo-echogenic leaflet thickening - Reduced leaflet mobility - Narrowed color Doppler flow	- Hypo-attenuated leaflet thickening (HALT) - Reduced leaflet mobility (RLM)
Clinical Thrombosis Stage 2 (Moderate)	- Increase in mean gradient during FU ≥ 10 mmHg with decrease in AVA≥ 0.3 cm^2 (25%) or decrease in DVI≥ 0.1 (20%)	
Clinical Thrombosis Stage 3 (Severe)	- Increase in mean gradient during FU ≥ 20 mmHg with decrease in AVA≥ 0.6 cm^2 (50%) or decrease in DVI≥ 0.2 (40%)	

Normal

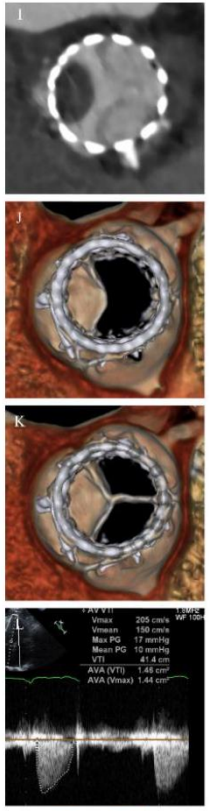


HALT-
RLM-

Subclinical Thrombosis (Stage 1)

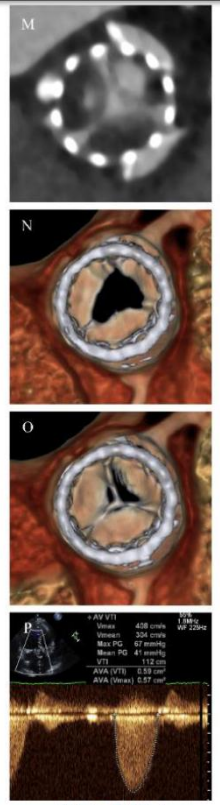


HALT+
RLM-



HALT+
RLM+
No change in **ΔP**

Clinical Thrombosis (Stages 2 – 3)



HALT+
RLM+
Increase in **ΔP**

THROMBOSE TAVI

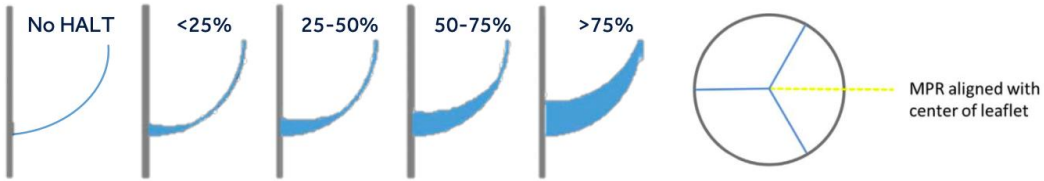
Diagnostic scannographiques

Epaississement (**HALT**) +/- reduction de la mobilité des feuillets (**RLM**)

HALT

Hypoattenuated **L**eaflet **T**hickening

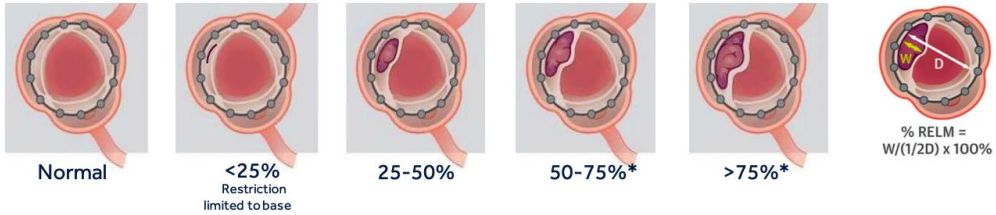
CT (2D MPR or 3D volume-rendering)



RLM

Reduced **L**eaflet **M**obility

CT (2D MPR or 3D volume-rendering) and/or TEE



Jilahawi H. JACC Im 2017
Blanke P. JACC Im 2019

THROMBOSE TAVI

Subclinical leaflet thrombosis in surgical and transcatheter bioprosthetic aortic valves: an observational study

Registres RESOLVE & SAVORY

Entre 2014 et 2017, 931 patients suivis

Scanner dans les suites : 890 interprétables

Délai scanner : 83 jours (33-281)

626 TAVI et 264 patients post chirurgie

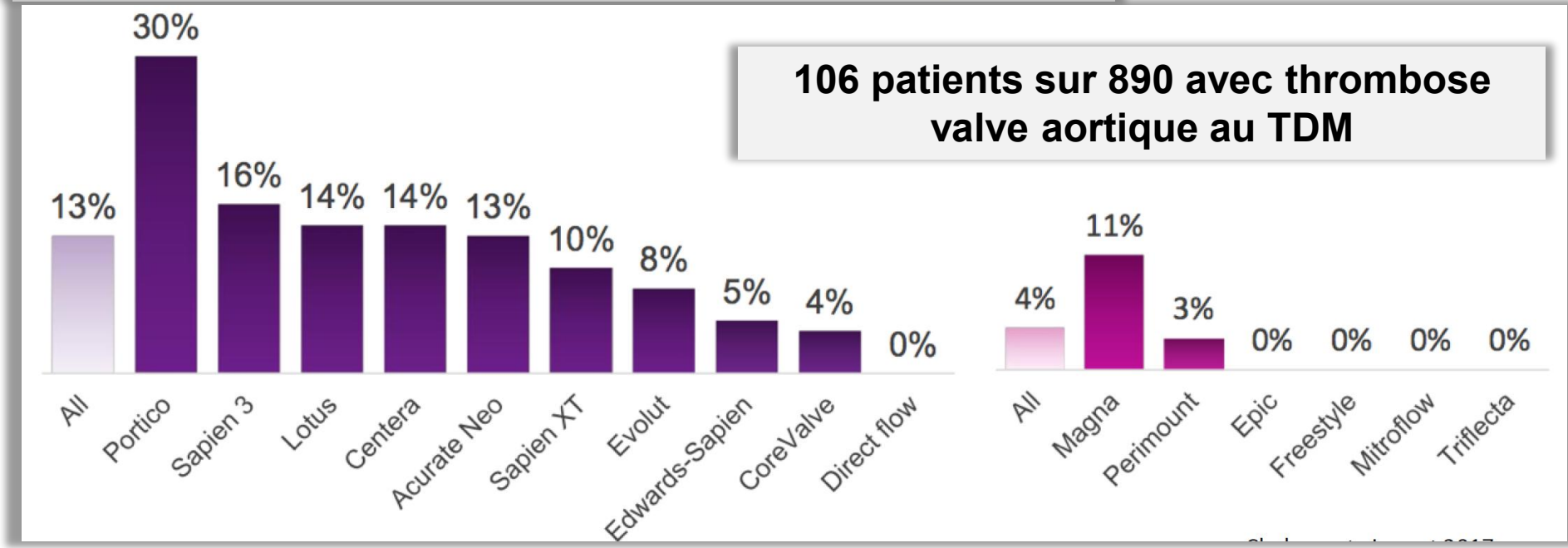
☛ **thrombose infra-clinique :**

- **4% groupe chirurgie : 5/138**
- **13% groupe TAVI : 101/752**

Chakravarty T. Lancet 2017

THROMBOSE TAVI

Subclinical leaflet thrombosis in surgical and transcatheter bioprosthetic aortic valves: an observational study



Chakravarty T. Lancet 2017

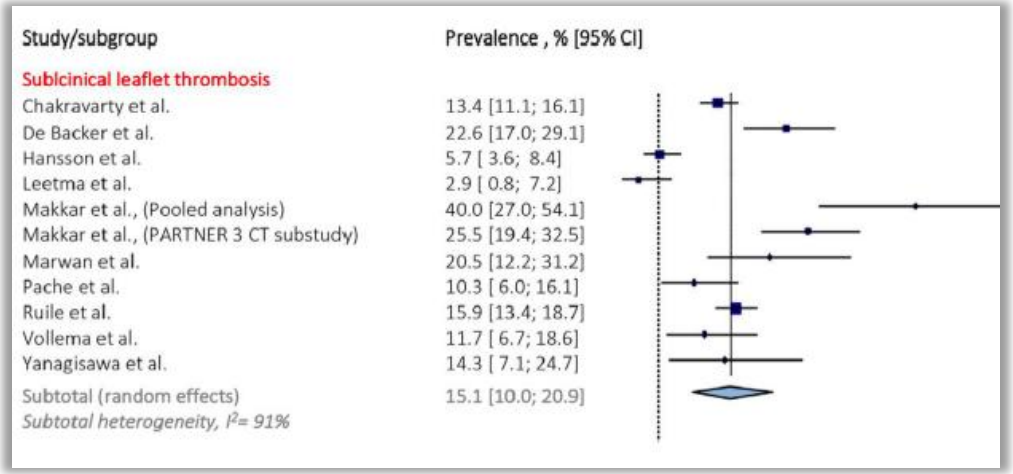
THROMBOSE TAVI

Fréquent?

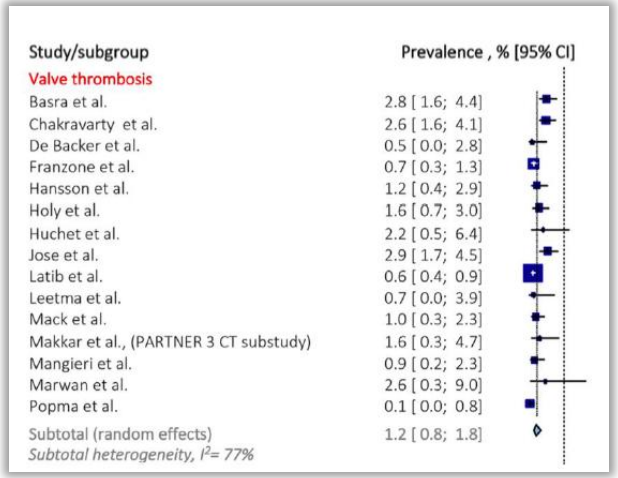
Méta-analyse thrombose de valve après TAVI

20 études (15 observationnelles)

12128 TAVI



Subclinical leaflet thrombosis (SLT) = 15.1%

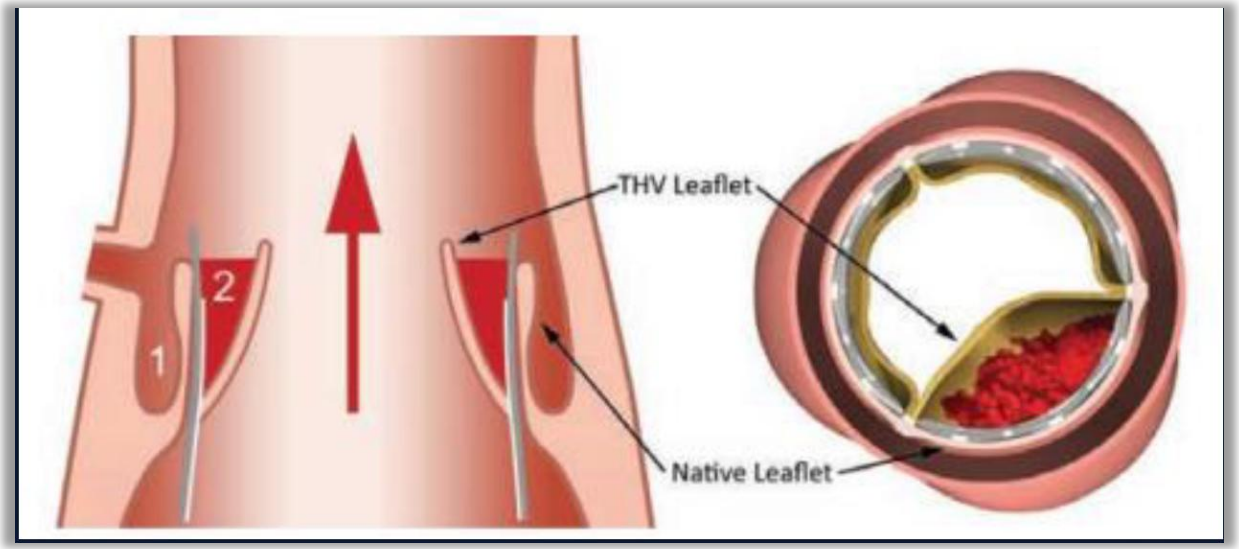


Clinical valve thrombosis = 1.2%

T. RHEUDE. Am J Cardio 2021

Pourquoi plus fréquent après TAVI?

1. Néo sinus
2. Sinus natif

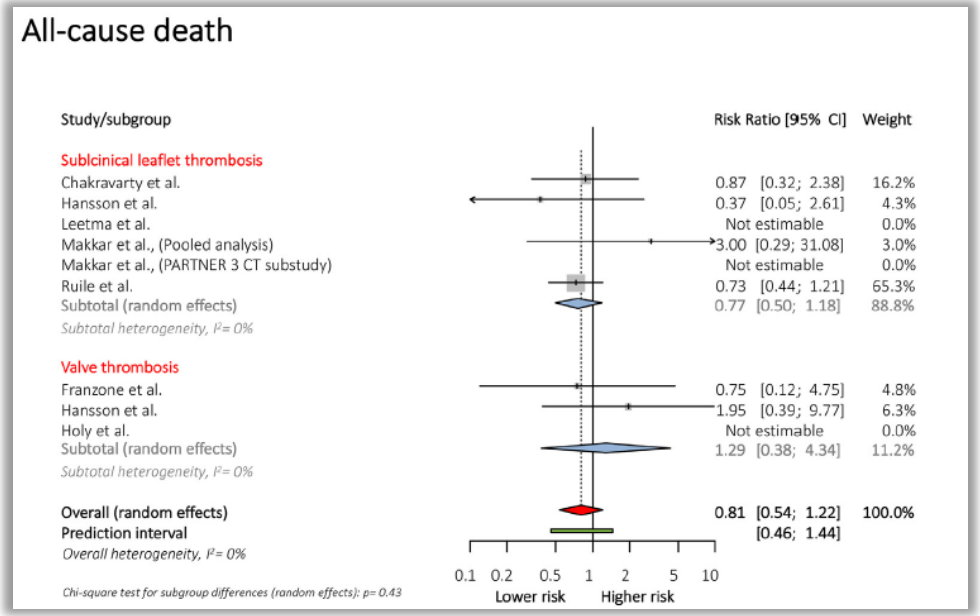


Le néo-sinus entre valve native et feuillet valvulaire du TAVI ou thrombus a été observé

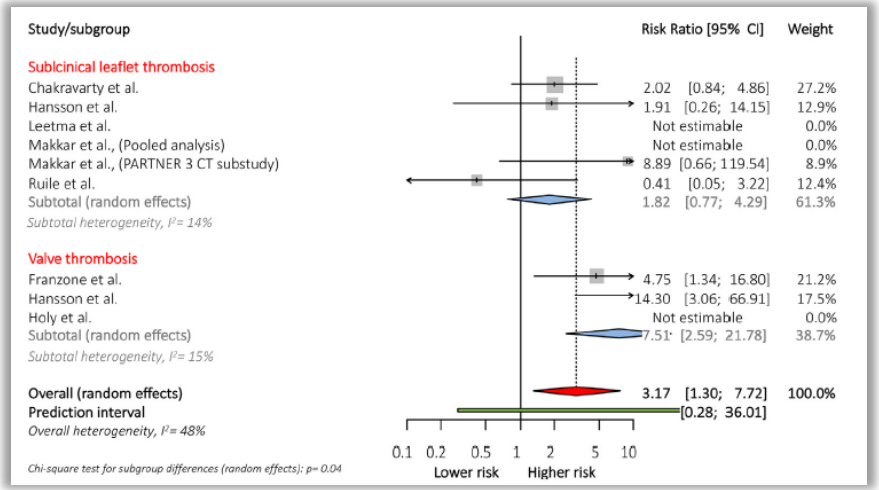
Chakravarty T. Lancet 2017

Méta-analyse thrombose de valve après TAVI

20 études (15 observationnelles)
12128 TAVI

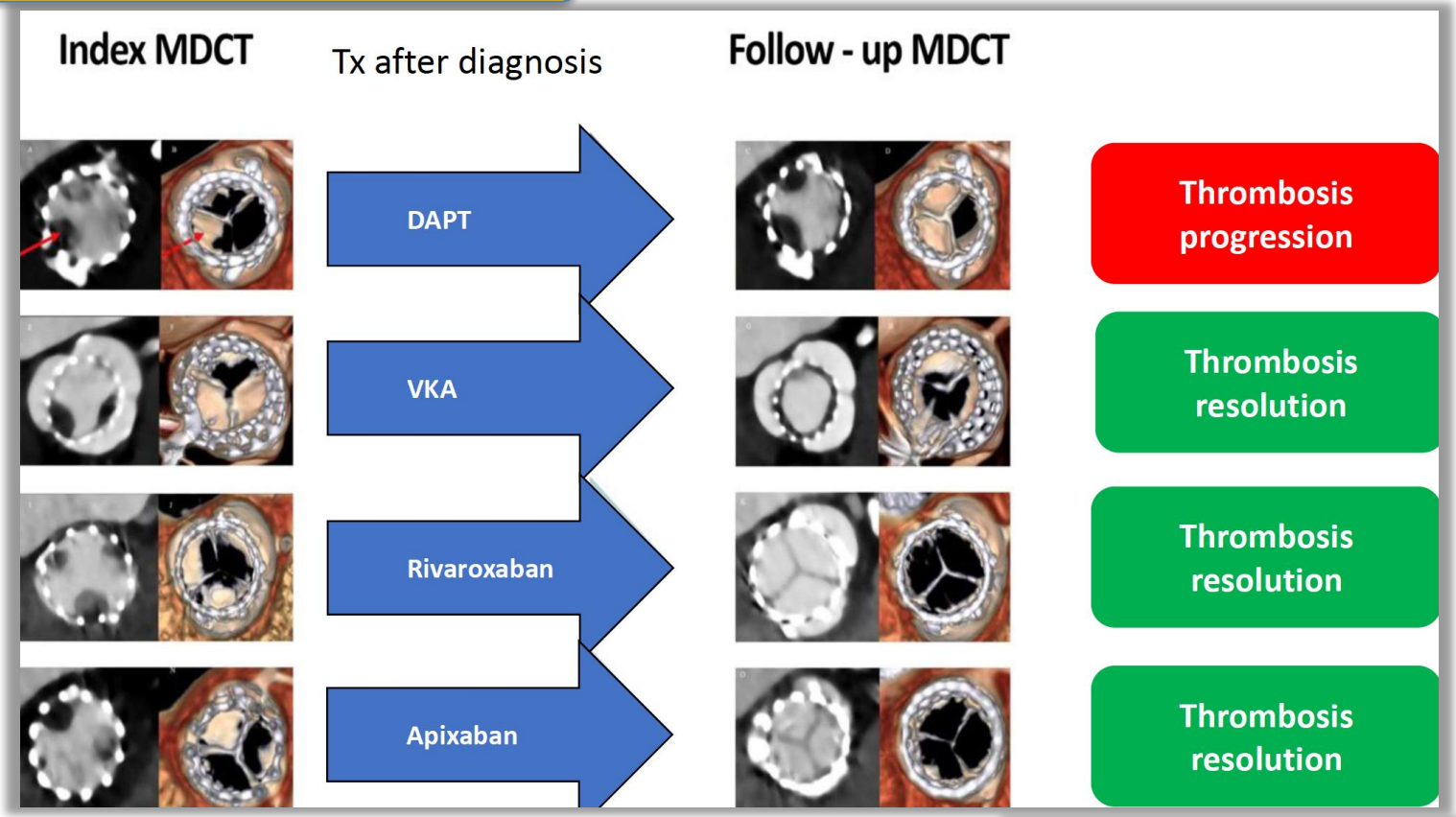


AVC

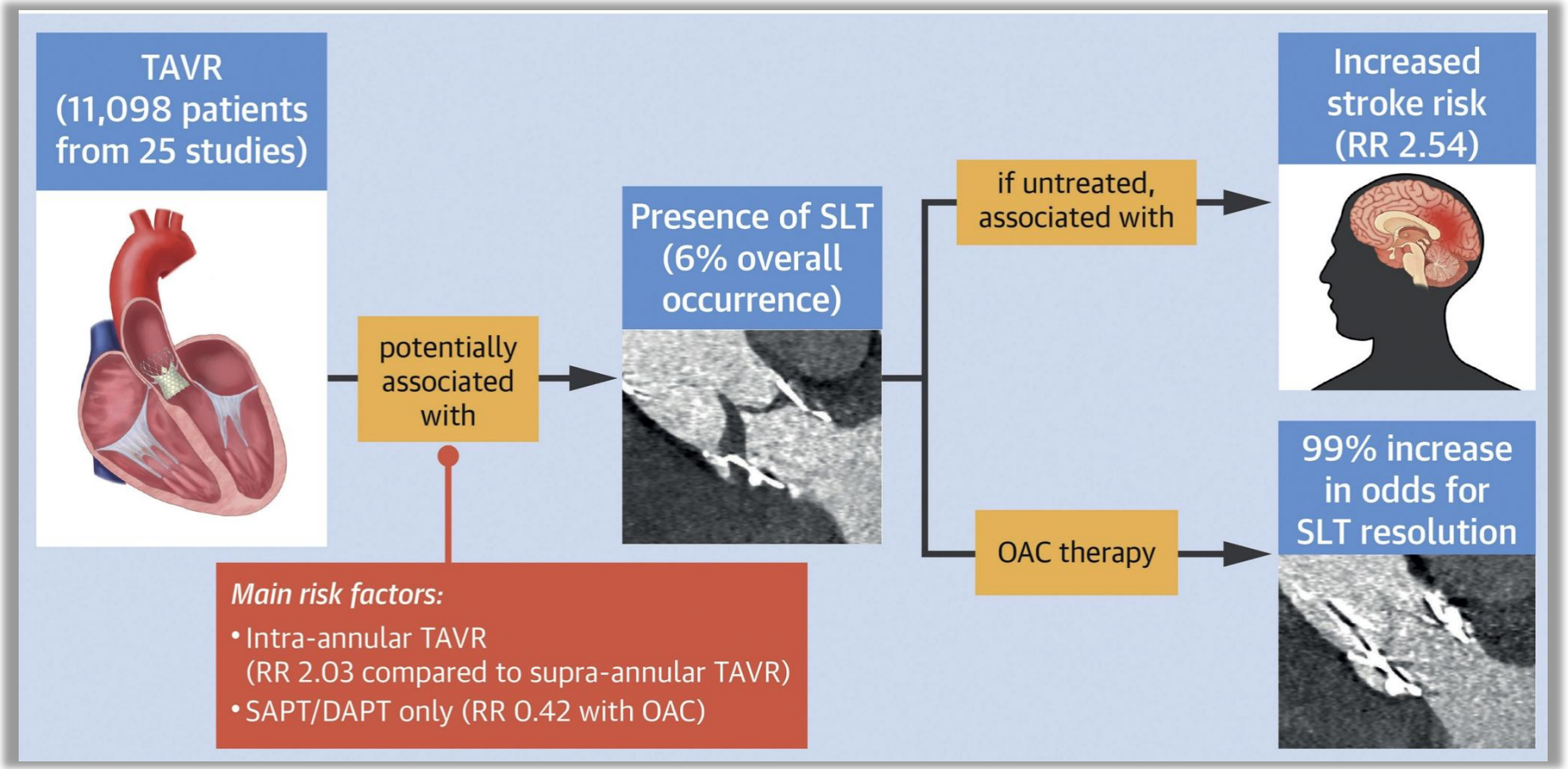


T. RHEUDE. Am J Cardio 2021

Intérêt de l'anticoagulation?



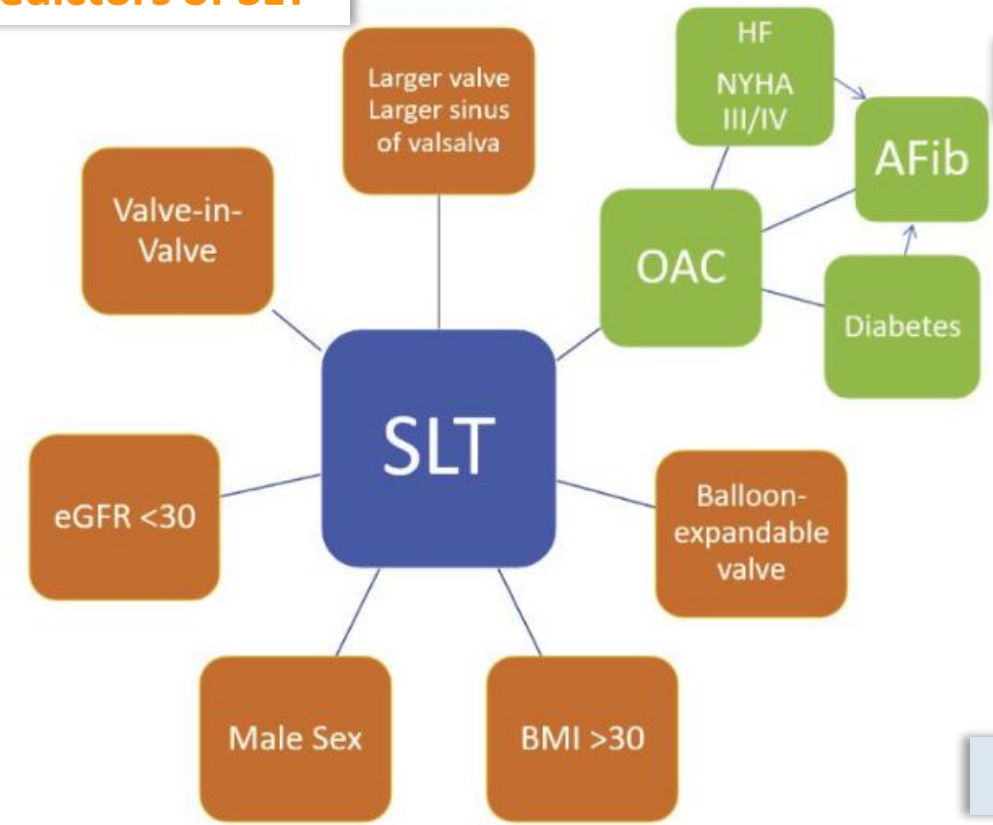
Chakravarty T. Lancet 2017



Bogyi M. JACC Interv 2021

Facteurs associés à thrombose sub-clinique

Positive predictors of SLT



Negative predictors of SLT

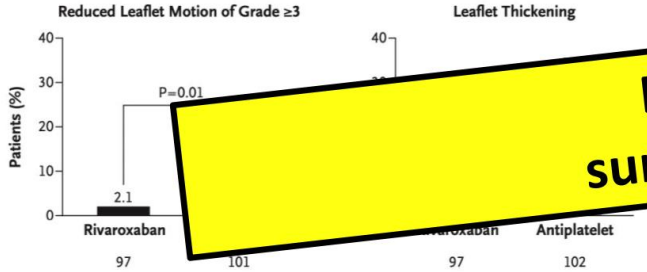
Bogyi M. JACC Interv 2021

Intérêt de l'anticoagulation?

Etudes randomisées anticoagulation ou non

Galileo 4D CT
RCT substudy

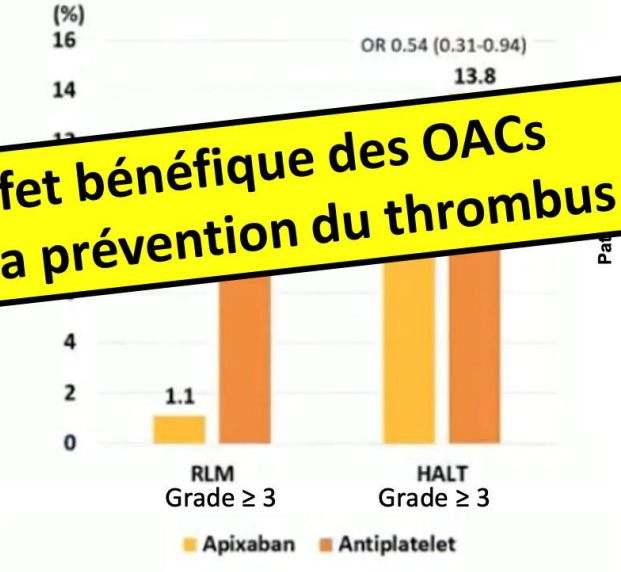
Rivaroxaban (± ASA) vs. DAPT/SAPT



De Backer O et al. NEJM 2020

Atlantis 4D CT (stratum 2)
RCT substudy

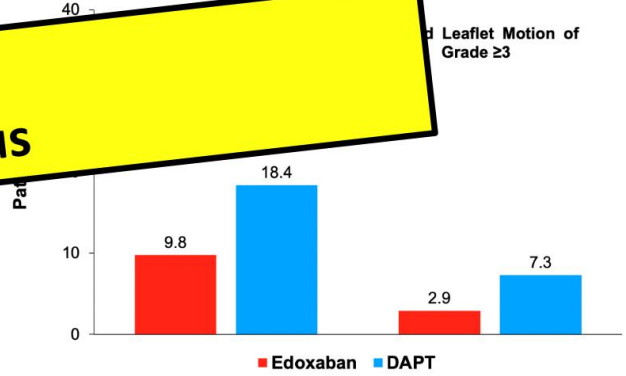
Apixaban vs. DAPT/SAPT



Montalescot G et al. ACC 2021

ADAPT TAVR
RCT

Edoxaban vs. DAPT



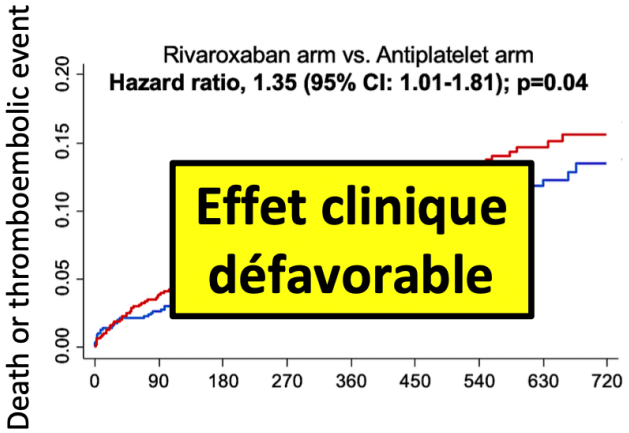
Park DW et al. Circulation 2022

Effet bénéfique des OACs sur la prévention du thrombus

Intérêt de l'anticoagulation?

Galileo

Rivaroxaban (± ASA) vs. DAPT/SAPT

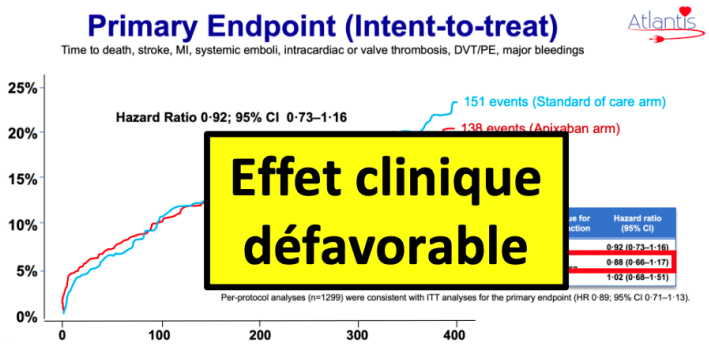


Low dose rivaroxaban ± ASA Increase in life-threatening and disabling bleed

Dangas et al N Engl J Med 2020

Atlantis (stratum 2)

Apixaban vs. DAPT/SAPT

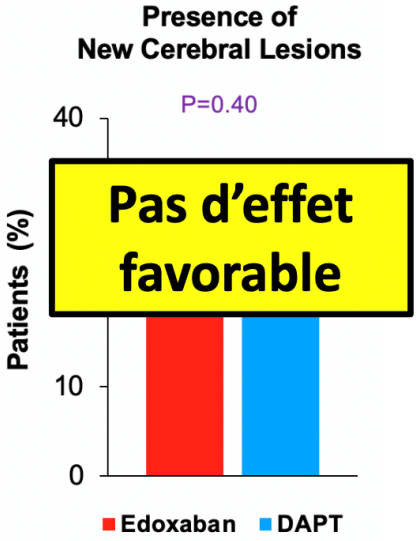


Apixaban associated with increase in the rate of Non CV death

Collet JP et al. ACC 2021

ADAPT TAVR

Edoxaban vs. DAPT



Park DW et al. Circulation 2022

Intérêt de l'anticoagulation?

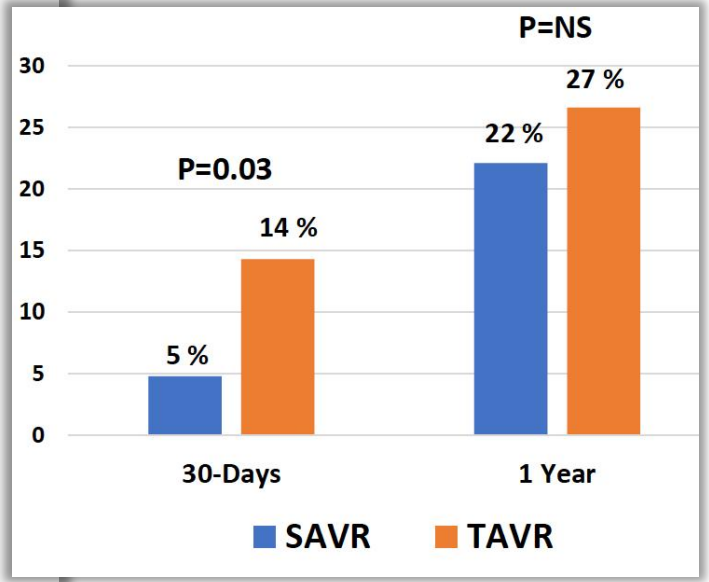
Sous-étude PARTNER 3

Analyse TDM patients bas risque

408 patients chir et TAVI
Prévalence 10% à 30 jours et 24% à 1an

⚠ **50%** HALT disparaissent spontanément sans anticoagulant
20% nouveaux HALT à 1 an

Suivi : pas corrélation HALT/ AVC, IDM et décès à 1 an



Makkar. TCT 2019

THROMBOSE TAVI

2 entités à différencier

Thrombose sub-clinique

Thrombose clinique

THROMBOSE TAVI

De mars 2018 à juillet 2019, inclusion de **54 patients** avec thrombose clinique de TAVI

TAVI implantés de août 2011 à juillet 2019 dans 17 centres français

CHU ROUEN NORMANDIE

Hôpital Pitié Salpétrière

CHU CLERMONT FERRAND CENTRE HOSPITALIER UNIVERSITAIRE

CENTRE HOSPITALIER UNIVERSITAIRE DE NAI

CHU CLERMONT-FERRAND CENTRE HOSPITALIER UNIVERSITAIRE

GHMF L'INSTITUT MUTUALISTE MONTSOURIS

CHRU HÔPITAUX DE TOURS

Hospices Civils de Lyon

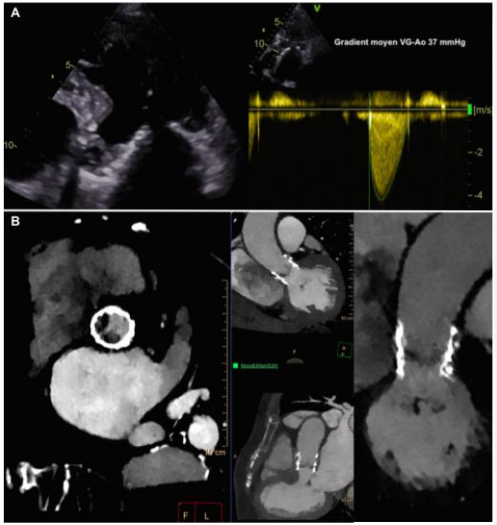
CHU LILLE

T. Mouven CCI 2020

Thrombose clinique

	Thrombosis (n=54)	Control (n=113)	*p* Value
Age (years)	80.2	81.6	0.25
Male	69%	47%	0.009
Anticoagulant treatment before TAVR	5.6%	36.3%	<0.001
Platelet before TAVR (G/L)	142	168	0.021
Valve in Valve	9.2%	<1%	0.014
Femoral access	93%	80%	0.048
Predilatation	57.4%	87.6%	0.021
Prothesis type			0.06
Balloon-expanding (Edwards Sapien)	78%	54%	
Self-expanding (Medtronic Corevalve)	22%	43%	
Mean gradient LV-Aorta mmHg post TAVR	11.8	8.1	<0.001

Thrombose clinique



Thrombosis (n=54)	
Median time from procedural to diagnosis (days)	169.5
Acute	7.4%
Sub acute	31.5%
Late	24.1%
Very late	37.0%
Asymptomatic	25.9%
Severe complications (Heart failure, cardiogenic shock, cardio embolic events)	31.5%
Mean gradient LV-Aorta (mmHg)	38.4
CT performed	70.4%
Treatment at time of diagnosis	
Aspirine only	61.1%
Dual antiplatelet therapy	27.7%
Anticoagulant	5.55%

Mouyen T. CCI 2020

Thrombose clinique

Multivariate analysis using a logistic regression model	OR	95% IC	*p* Value
Male	2.25	0.85 - 5.97	0.10
BMI > 30 kg/m^2	3.35	1.19 - 9.42	0.02
Hemoglobin > 15 g/dL	2.98	0.74 - 11.4	0.12
Thrombocytopenia < 150 G/L before TAVR (G/L)	9.96	3.26 - 30.4	< 0,001
Creatinine clearance < 60 mL/min	4.84	1.71 - 13.7	0.003
LVEF < 40% before TAVR	2.91	0.74 - 11.3	0.12
No predilatation	5.67	1.91 - 16.8	0.002
Anticoagulant treatment at discharge	0.12	0.02 - 0.53	0.005
Mean transvalvular gradient > 10 mmHg immediately post TAVR	3.36	1.28 - 8.82	0.01

Mouyen T. CCI 2020

Thrombose clinique

Suivi 2 ans

96% normalisation gradient moyen sous traitement anticoagulant

7% thrombose dans les 3 jours post-procédure

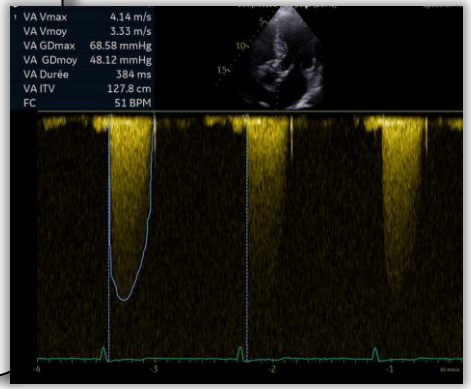
1 patient nouvelle thrombose après arrêt du traitement (sur 4)

Mouyen T. CCI 2020

Thrombose clinique

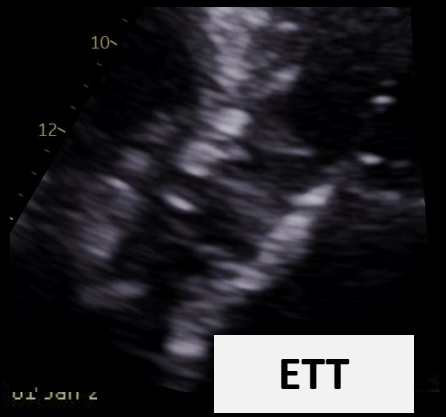
Mr C. 82 ans
IDM latéral sur occlusion Cx en 1999
Rao serré en 2021. FE 45%.
8/2021 TAVI Edwards® 26mm par voie fémorale droite

Evolution simple.
Sortie à J2 gradient moyen 9mmHg



A 3 mois dyspnée d'effort
ETT gradient moyen à l'ETT à 45mmHg

Scanner thoracique

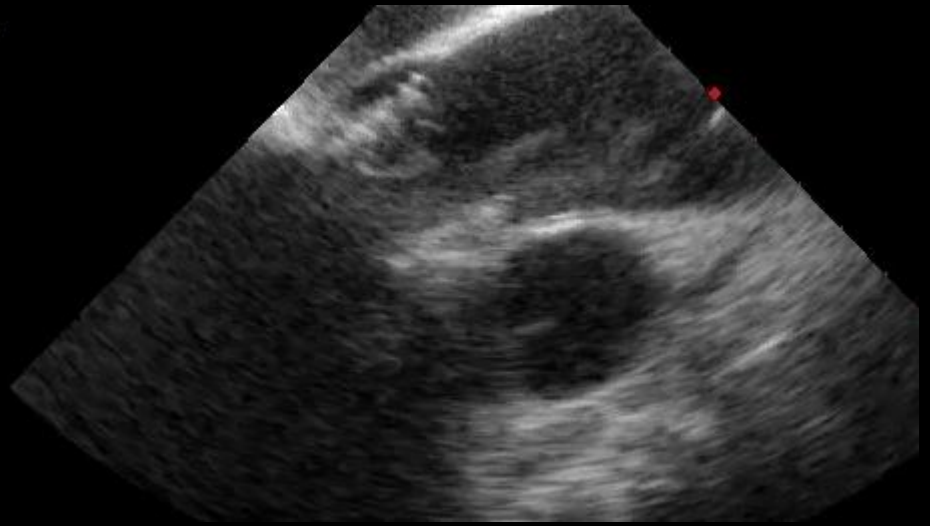


ETT

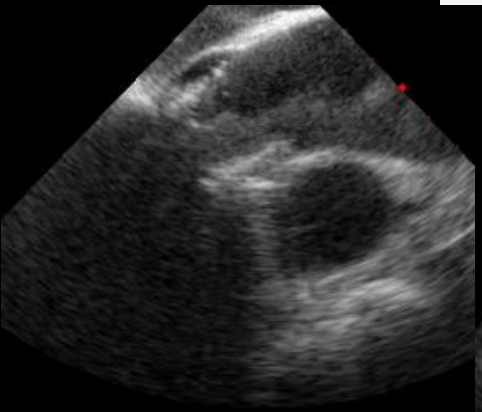
Echographie intracardiaque

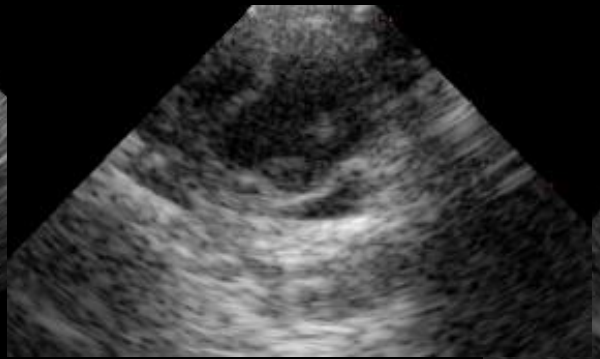
Mis sous apixaban

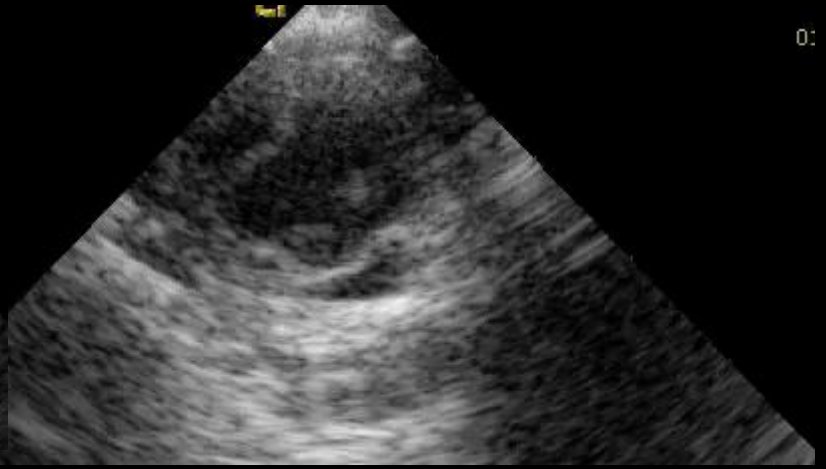
Contrôle à 6 semaines
Gradient moyen VG-aorte à 12mmHg



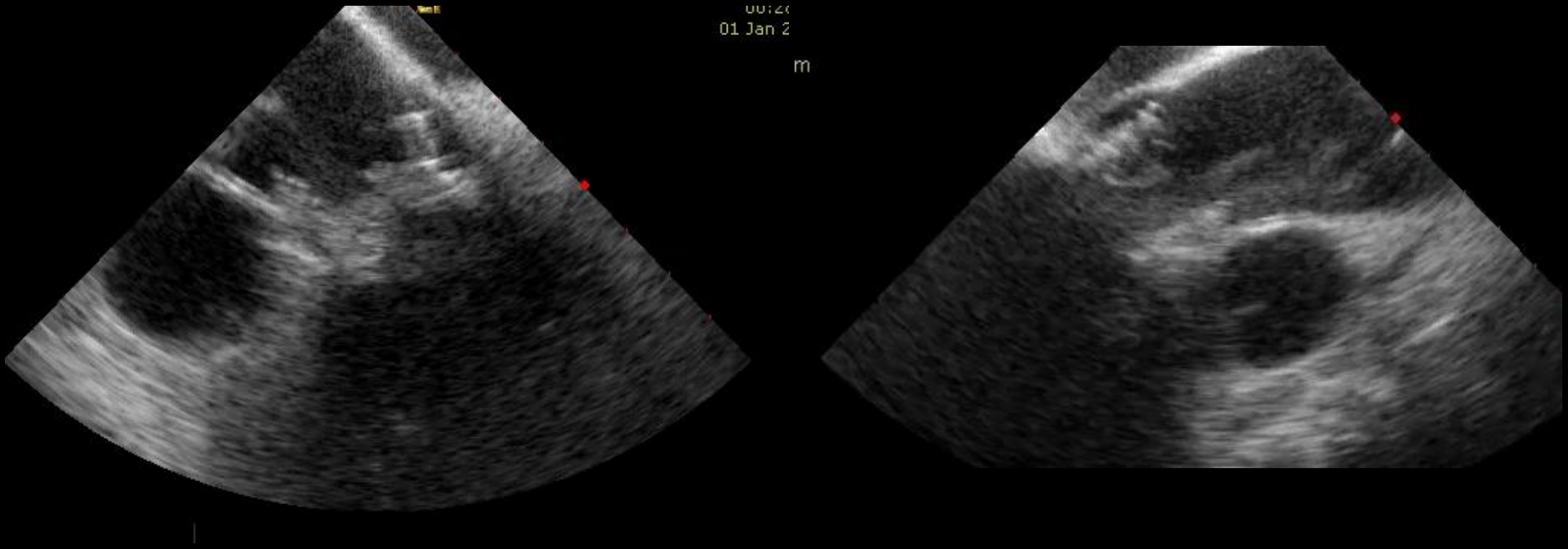
Echographie intracardiaque





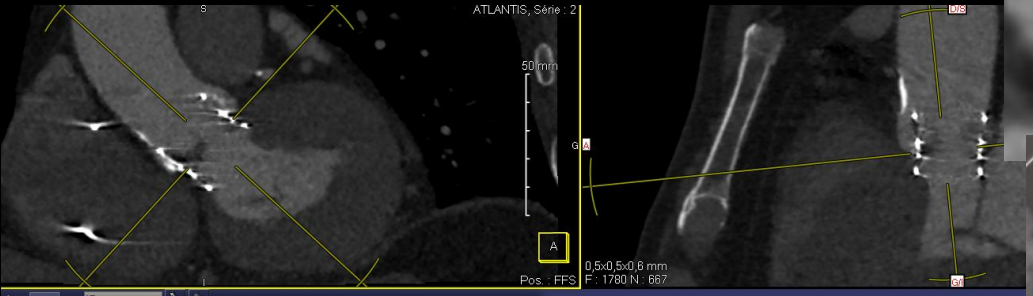


Echographie intracardiaque

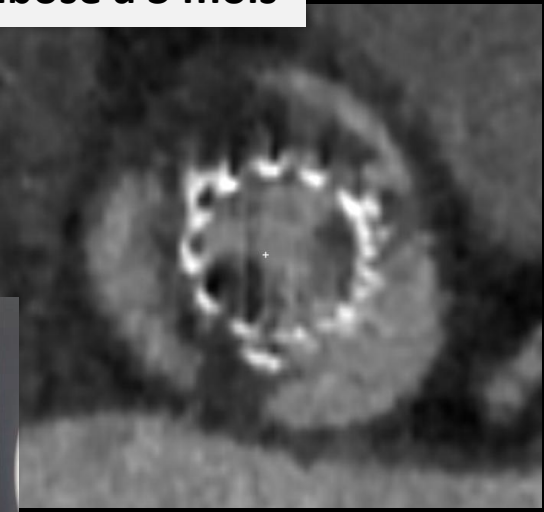


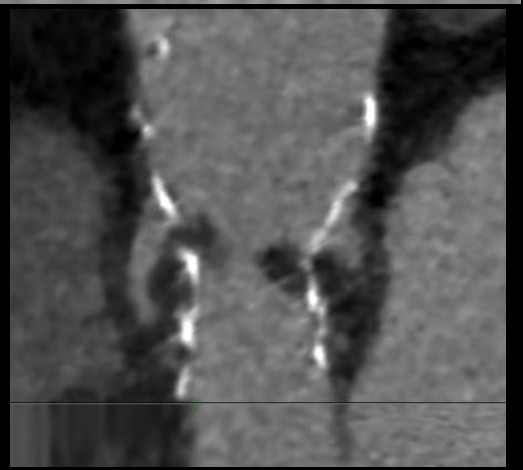
thromboses à CT-FD

Mr P thrombose à 1 mois



Mr C. TAVI VIV thrombose à 3 mois





Conclusions

Thomboses sub-cliniques fréquentes

ø d'intérêts d'un traitement anticoagulant systématique

Penser au scanner centré sur la valve devant ⬆ gradient à l'ETT

Questions en suspens

Certains patients mauvaise réponse aux NACO

Traiter certains patients de manière préventive?

Rôle du scanner systématique?

Etude POPULAR TAVI