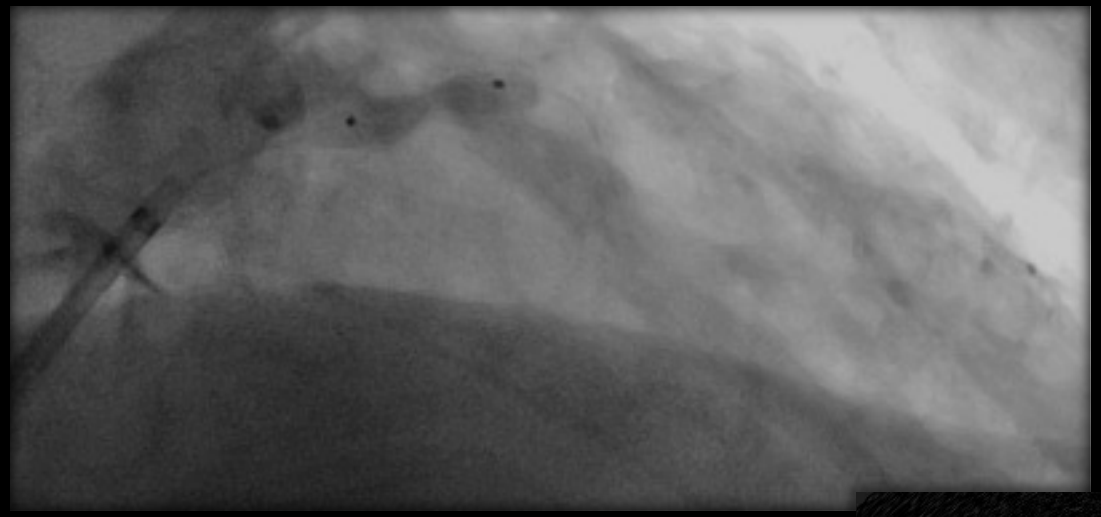
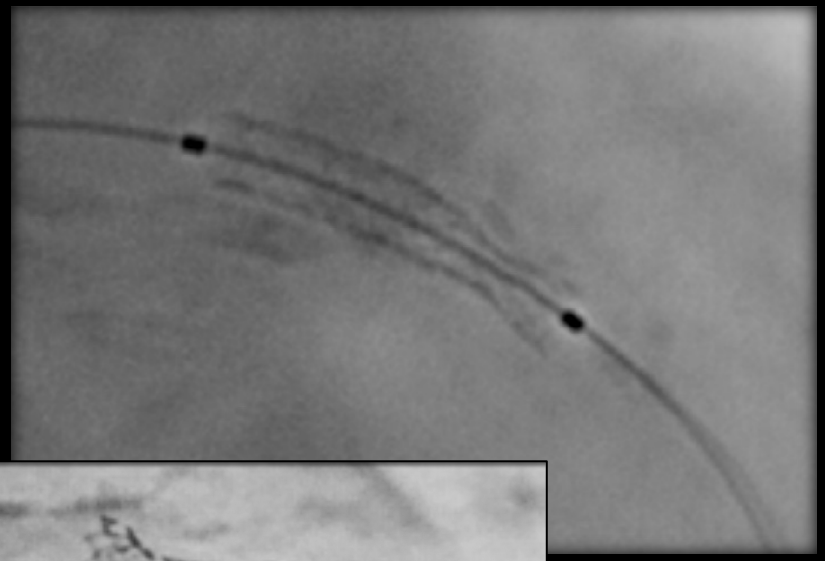
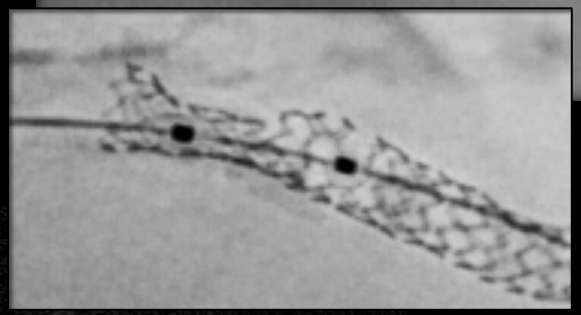
La lésion résistante : « le choix des armes en fonction de l'imagerie"

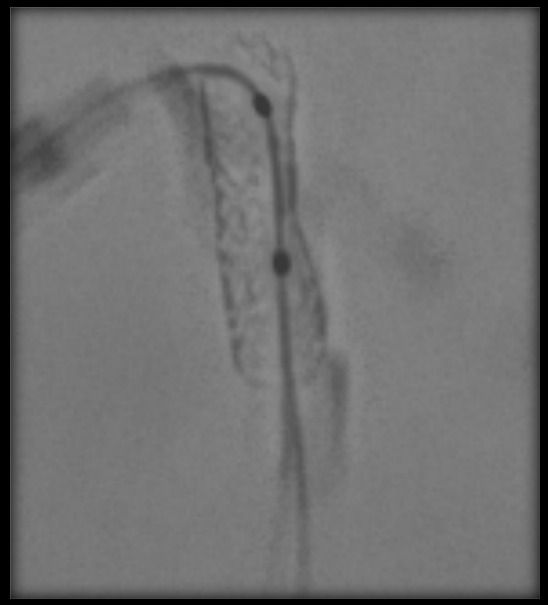
Géraud Souteyrand

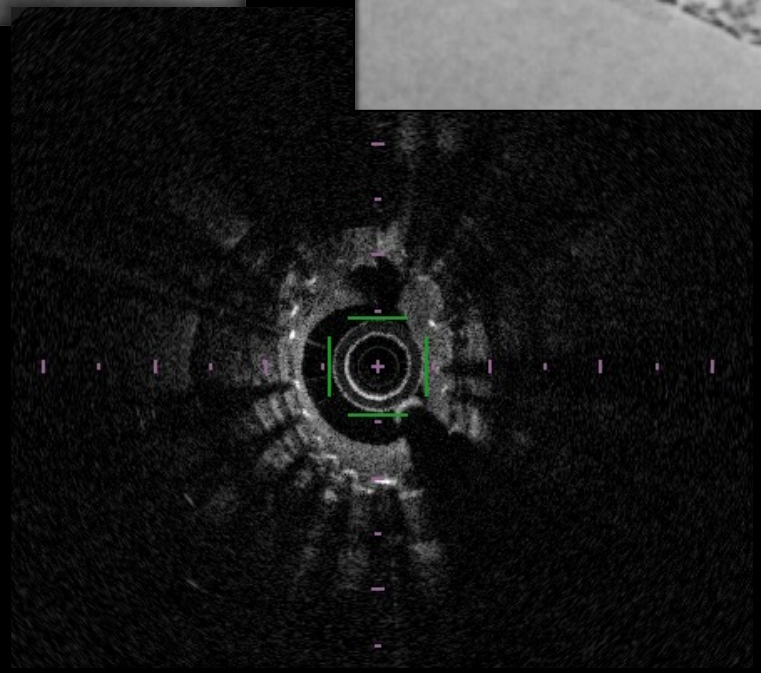
Lésions résistantes ?

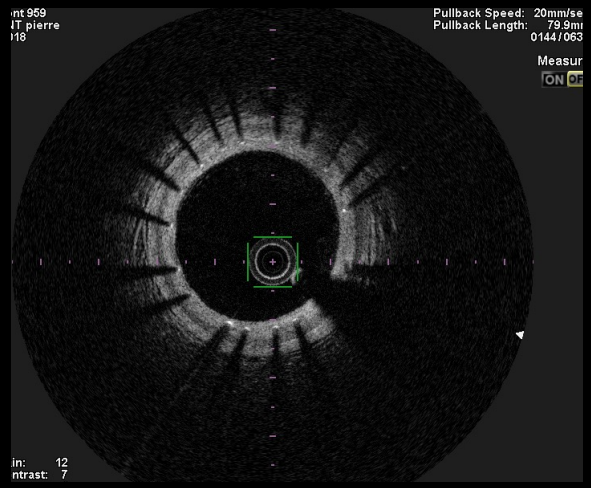




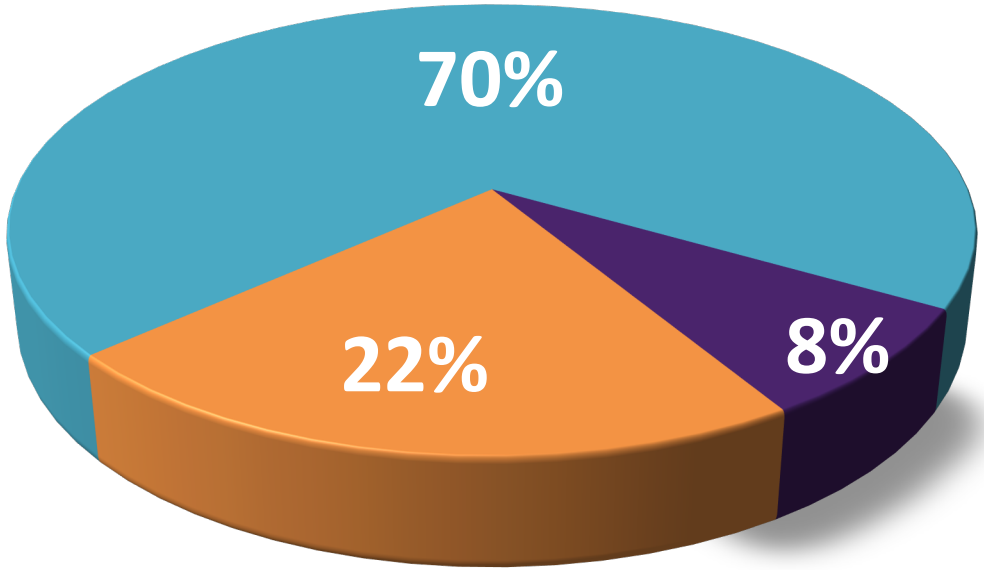








Prévalence des lésions calcifiées



Calcifications modérées & sévères
~30% des angioplasties

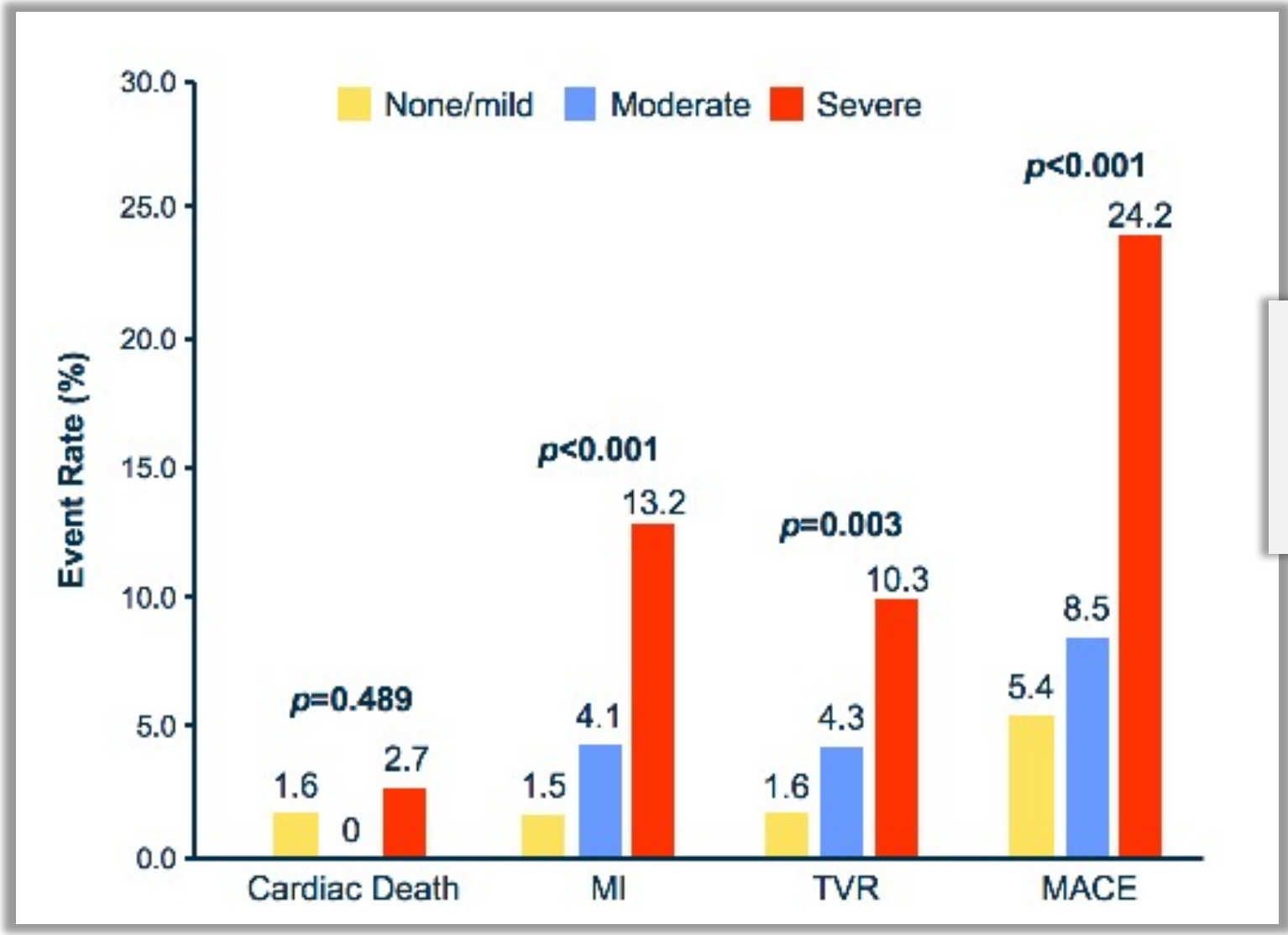
Calcifications sévères
~5%-10% des angioplasties

Pas/ peu Modérées Séveres

1,7M PCI /an en Europe

1. Copeland-Halperin RS. CCI 2017
2. Genereux P. JACC 2014
3. Landes U. CCI 2017

Pronostic des lésions calcifiées

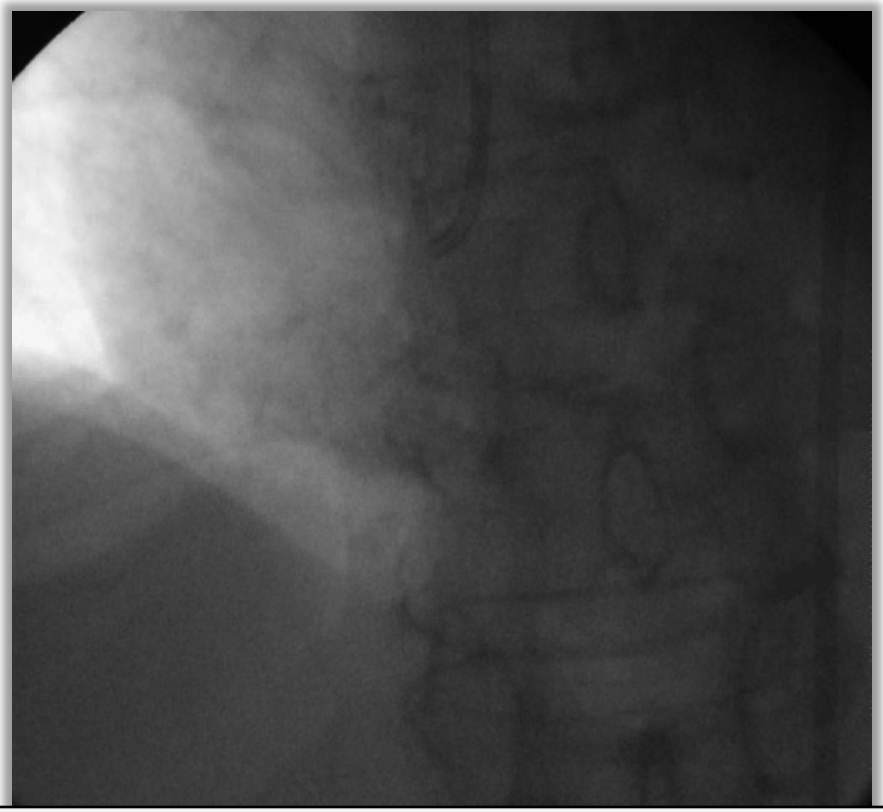


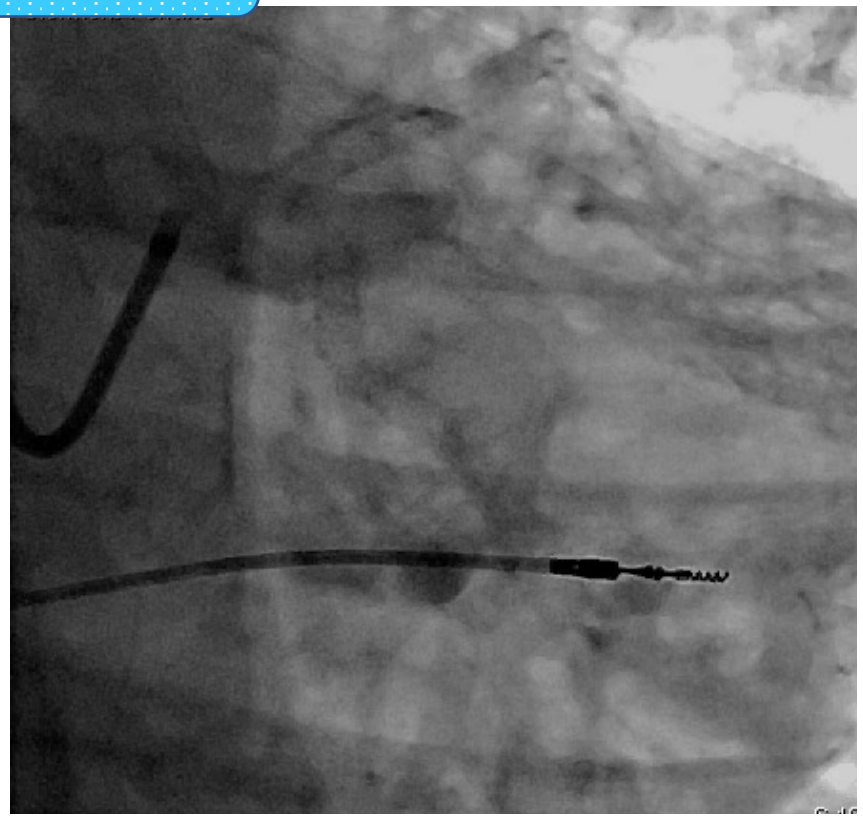
<u>Suivi à 1 an</u>
en fonction des calcifications

Shama CCI

L'imagerie endocoronaire & calcifications

L'angiographie insuffisante?





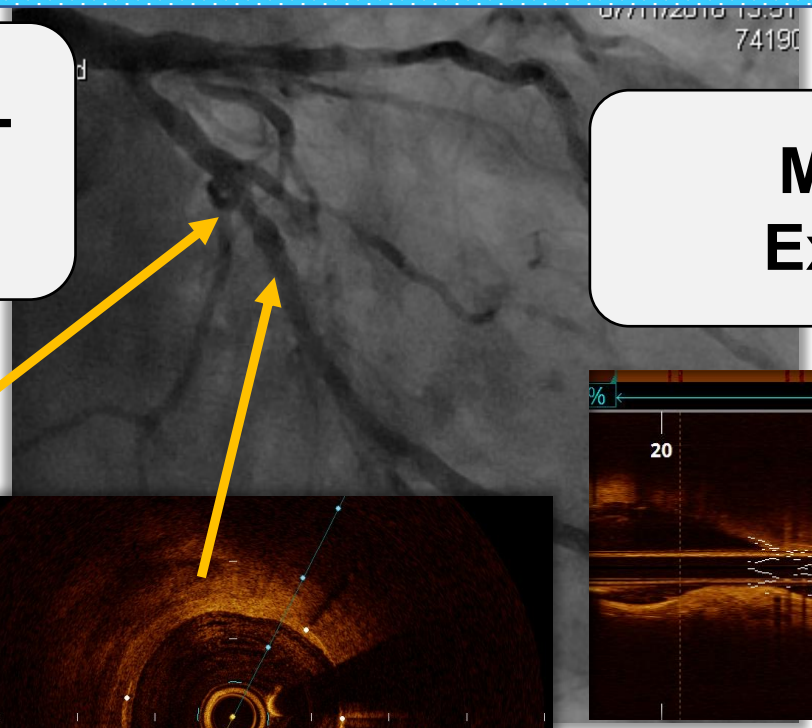
Calcifications modérées : visibles en mouvement, 1 coté du vx

Calcifications sévères : visibles sur image fixe, 2 cotés du vx

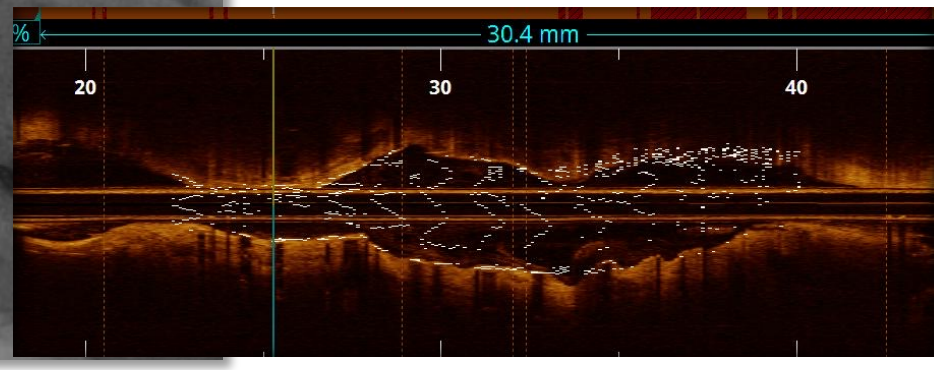
L'imagerie endocoronaire & calcifications

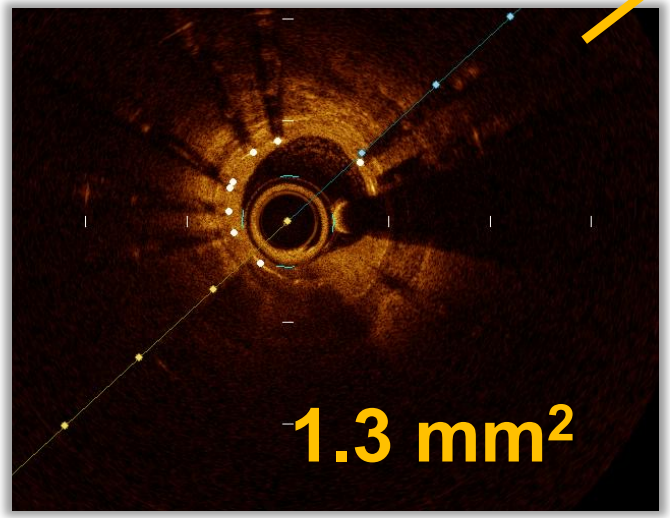
Quel intérêt de l'imagerie ?

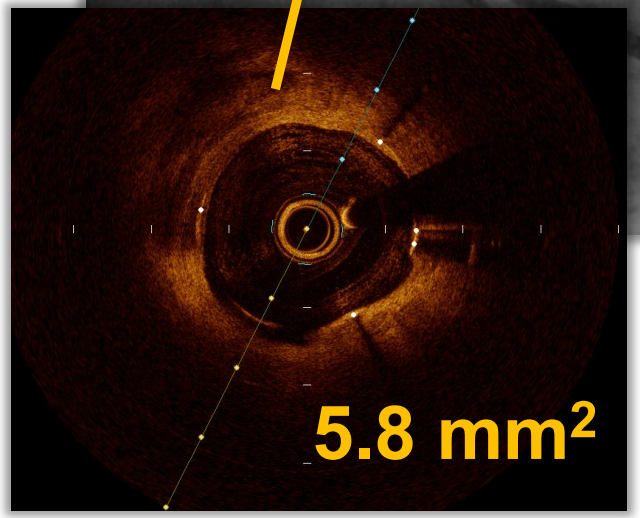
Eviter sous-expansion++
Adapter le traitement



MSA = 1.3mm²
Expansion 34%



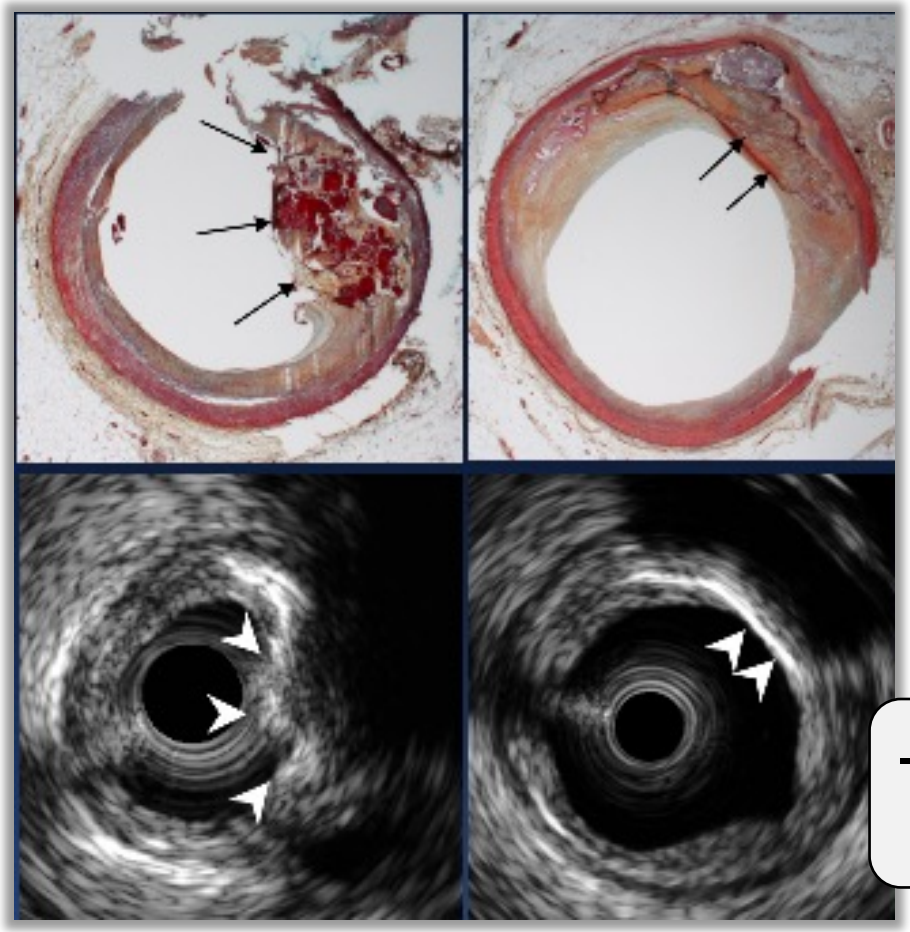


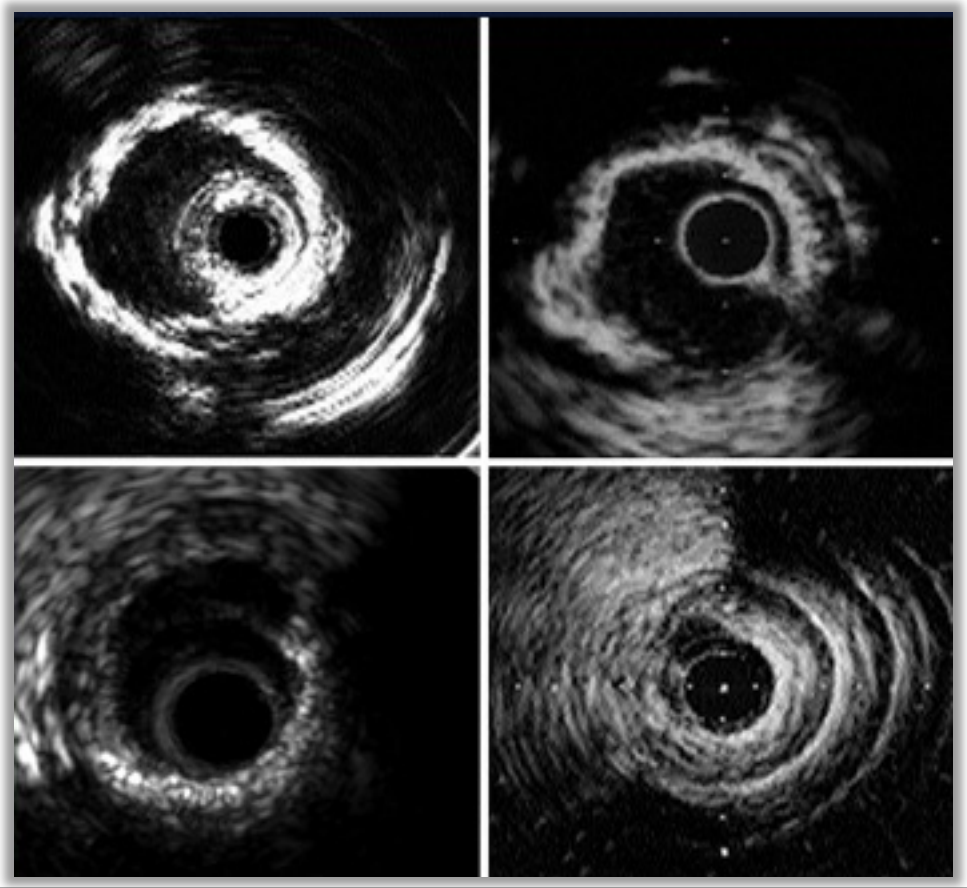


<u>Resténose à 2 ans post-angioplastie Cx</u>

L'imagerie endocoronaire & calcifications

IVUS



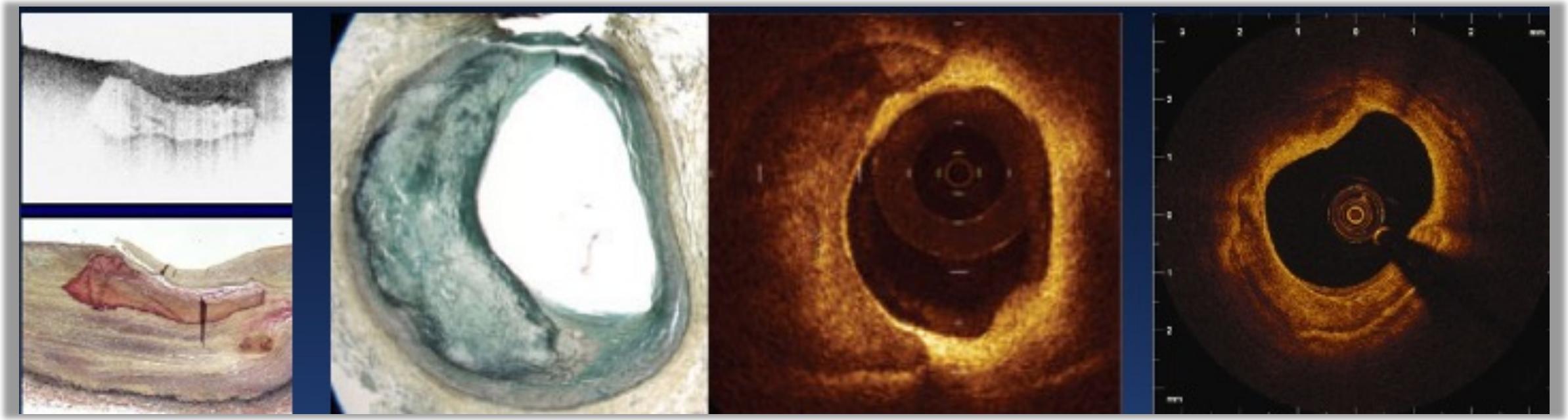


- Pas de pénétration à travers calcifications
- Pas possibilité mesure épaisseur

Lee Am J Cardio 2011

L'imagerie endocoronaire & calcifications

OCT

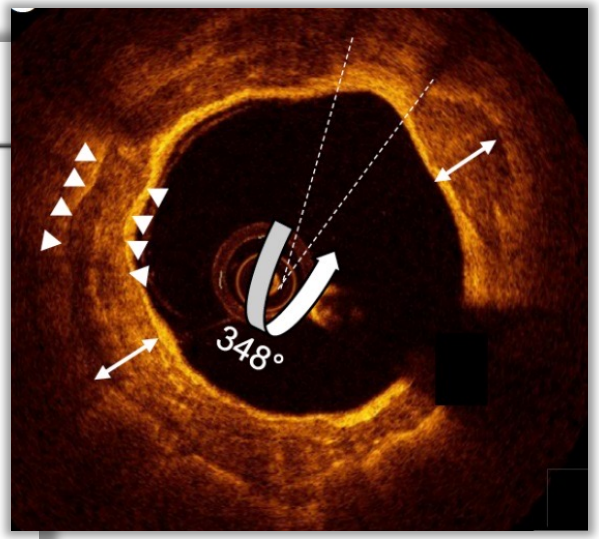


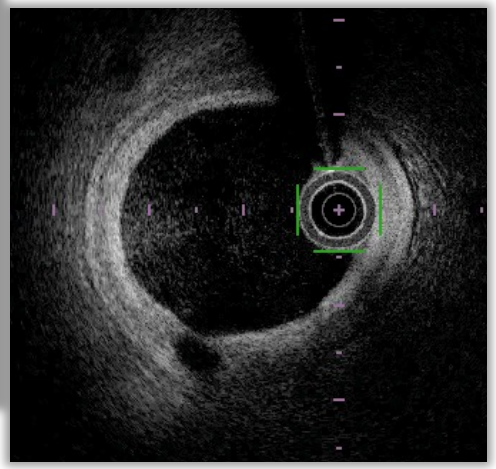
Pénétration signal à travers calcifications

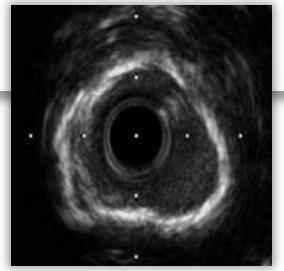
Quelle imagerie ?

Diagnostic Accuracy	Angiography	IVUS	OCT
Severe LHCC	●●●	●●●	●●●
Mild/Moderate LHCC	●	●●	●●●
Deep calcium	●	●●●	●●
Calcium arch	✗	●●●	●●●
Calcium thickness	✗	✗	●●●
Longitudinal calcium length	✗	●	●●●
Non-homogeneous plaque / Necrotic core	✗	●●●	●

●●● Optimal ●● Moderate ● Modest







De Maria. JACC Interv 2019

Quels outils ?

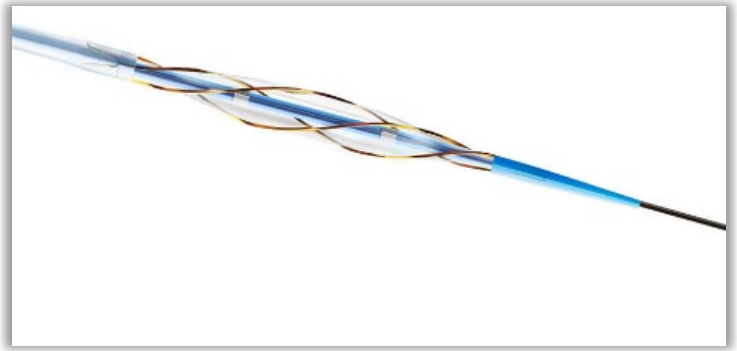
Arsenal thérapeutique ++

Cutting ballon

Ballons non compliants

Ballons très haute pression OPN

Scoring ballon



Athérectomie Rotationnelle

Rotablator™ et ROTAPRO™ Boston Scientific

Indications :

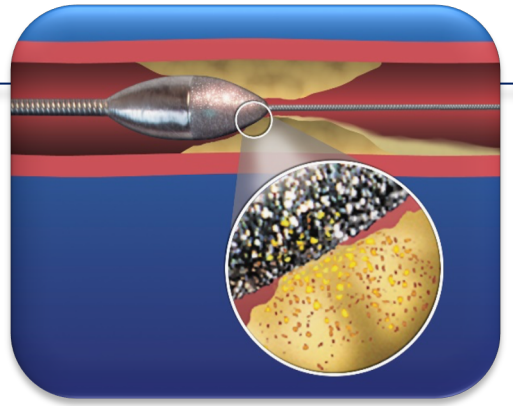
-Préparation des lésions résistantes

-Non franchissement de la lésion au ballon

Fraises diamètres :

1.25 à 2.5mm
(max 2.0 en général)

➢Longueur d'ablation adaptable



Lithotripsie Intra Vasculaire

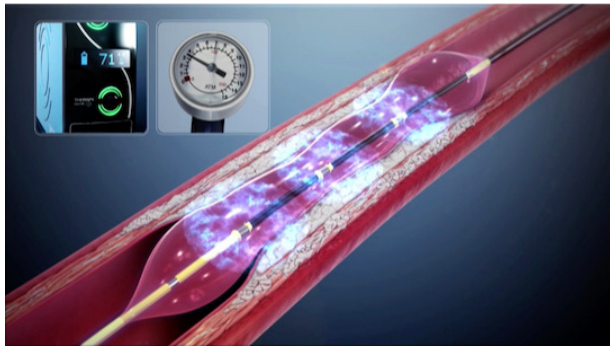
Shockwave IVL

Indications :

- Préparation des lésions résistantes

Ballons diamètres :

2.5 à 4.0mm



➢Longueur traitement 12mm

Athérectomie orbitale

Device Features
- Simple device setup
- Microsecond feedback to changes in loading
- 135cm usable length

On-handle speed control
- Low (80K) and High Speed (120K)

Power on/off switch
- 8 cm axial travel

Electric motor powered handle

Eccentric diamond coated crown

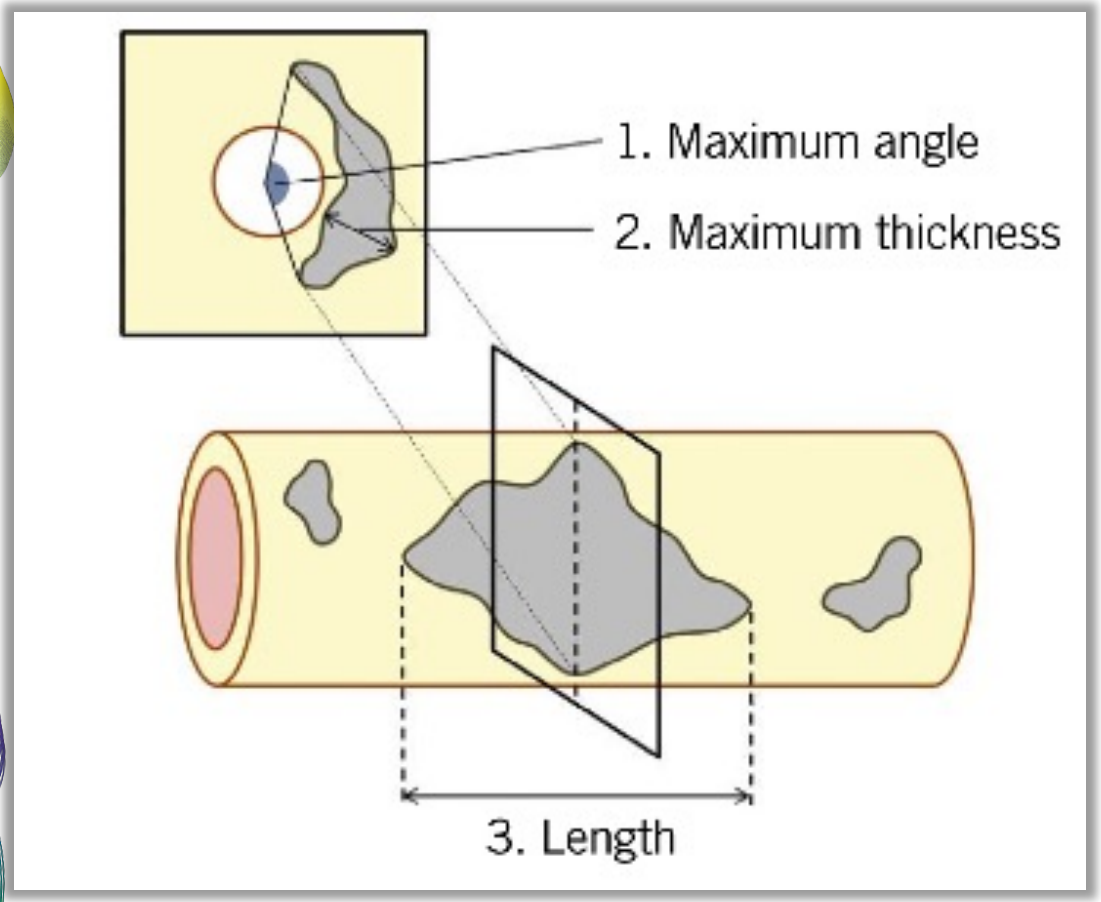
0.012 Viper Wire

6Fr Guide Compatible Saline Sheath

Saline Infusion Pump
- Mounts directly on to an IV pole
- Provides power
- Delivers fluid
- Includes saline sensor

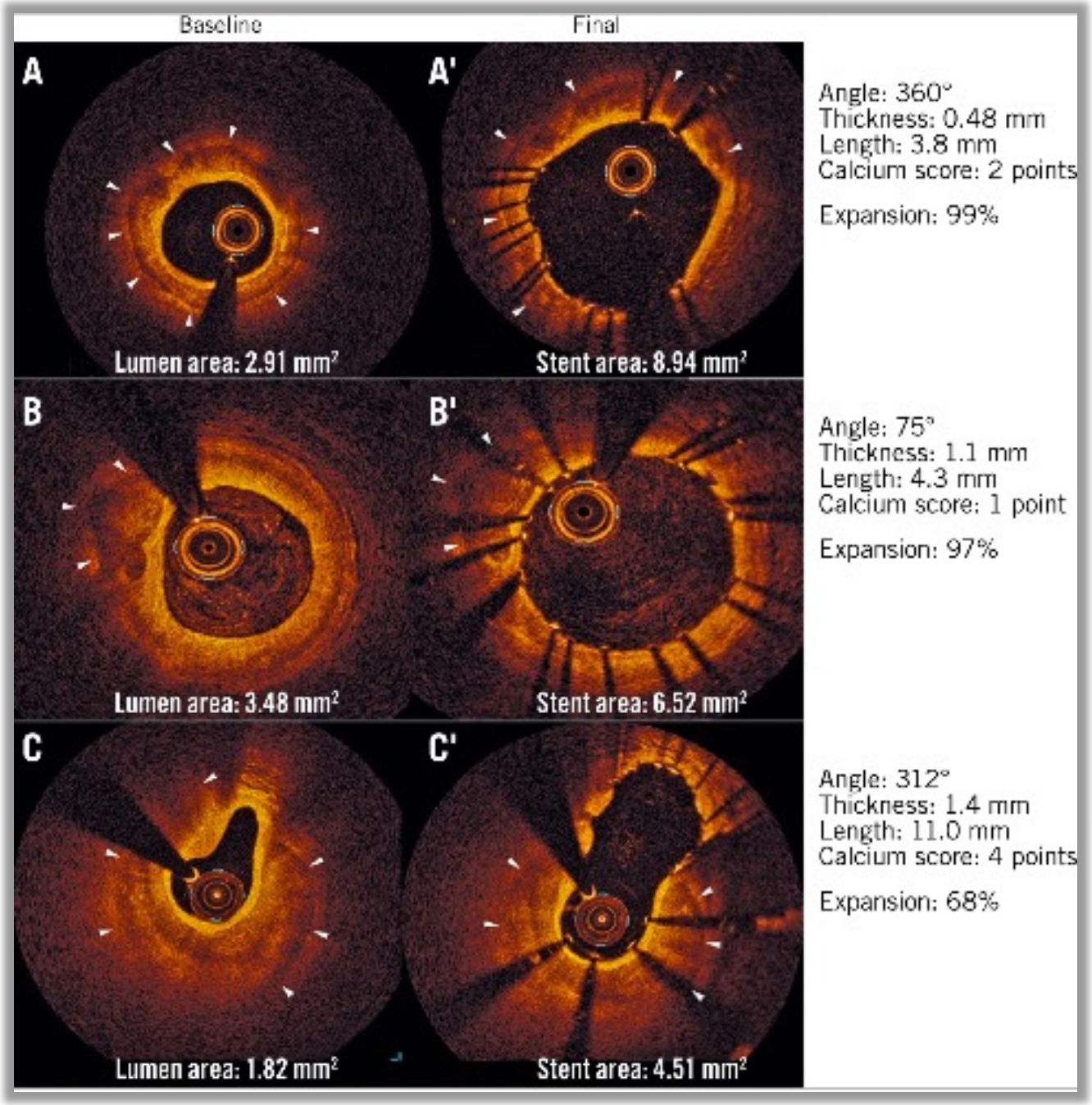
ViperSlide® Lubricant
- ViperSlide reduces friction during operation
- 20ml ViperSlide per liter of saline

OCT quel apport?



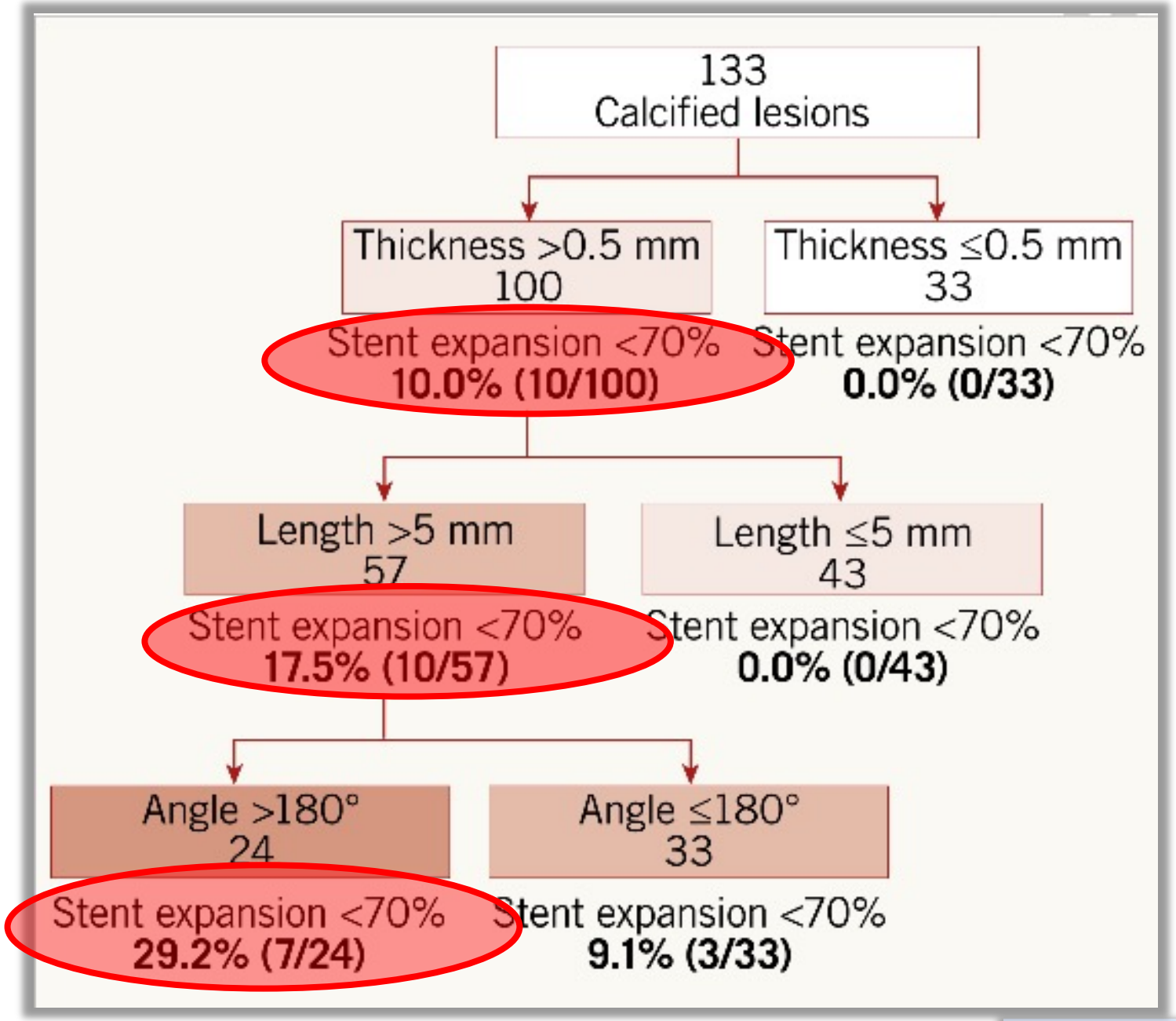
OCT-based calcium score	
1. Maximum calcium angle (°)	≤180° ➡ 0 point >180° ➡ 2 points
2. Maximum calcium thickness (mm)	≤0.5 mm ➡ 0 point >0.5 mm ➡ 1 point
3. Calcium length (mm)	≤5.0 mm ➡ 0 point >5.0 mm ➡ 1 point
Total score	**0 to 4 points**

Fujino A. Eurointervention 2018



OCT-based calcium score		
1. Maximum calcium angle (°)	≤180° ➡ 0 point >180° ➡ 2 points	
2. Maximum calcium thickness (mm)	≤0.5 mm ➡ 0 point >0.5 mm ➡ 1 point	
3. Calcium length (mm)	≤5.0 mm ➡ 0 point >5.0 mm ➡ 1 point	
Total score	**0 to 4 points**	

Fujino A. Eurointervention 2018



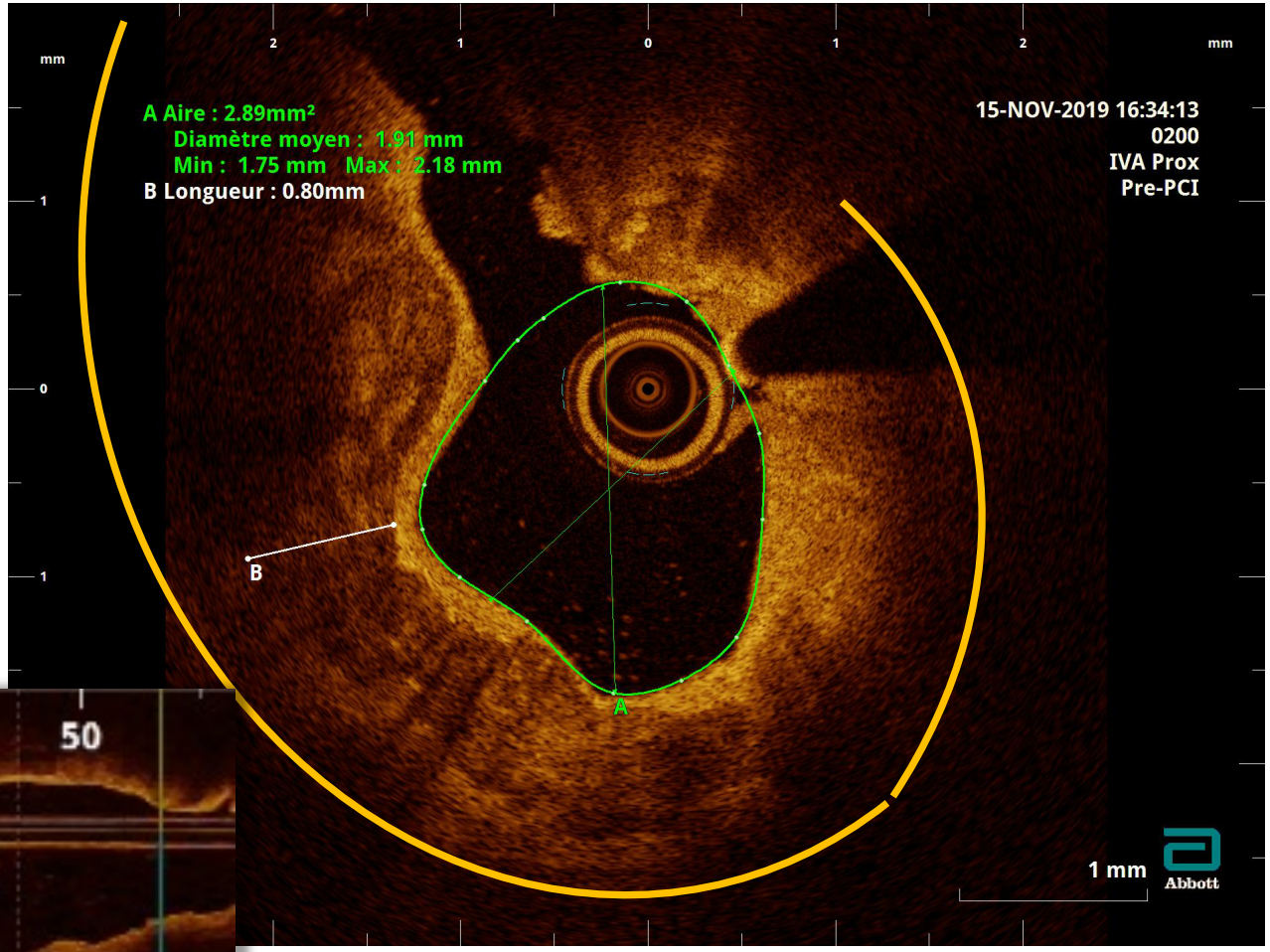
Fujino A. Eurointervention 2018

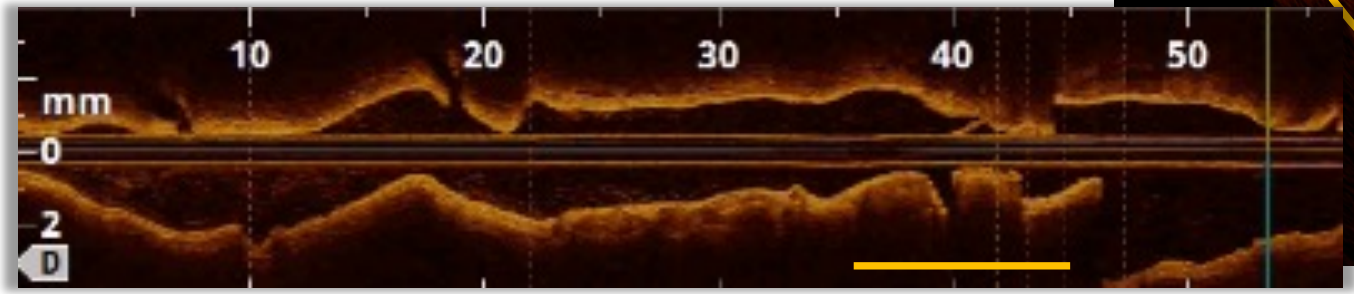
L'imagerie endocoronaire & calcifications

L'angiographie insuffisante?

Patiente de 63ans
SCA troponine +

OCT retrouve calcification ++
→ superficielle/profonde?



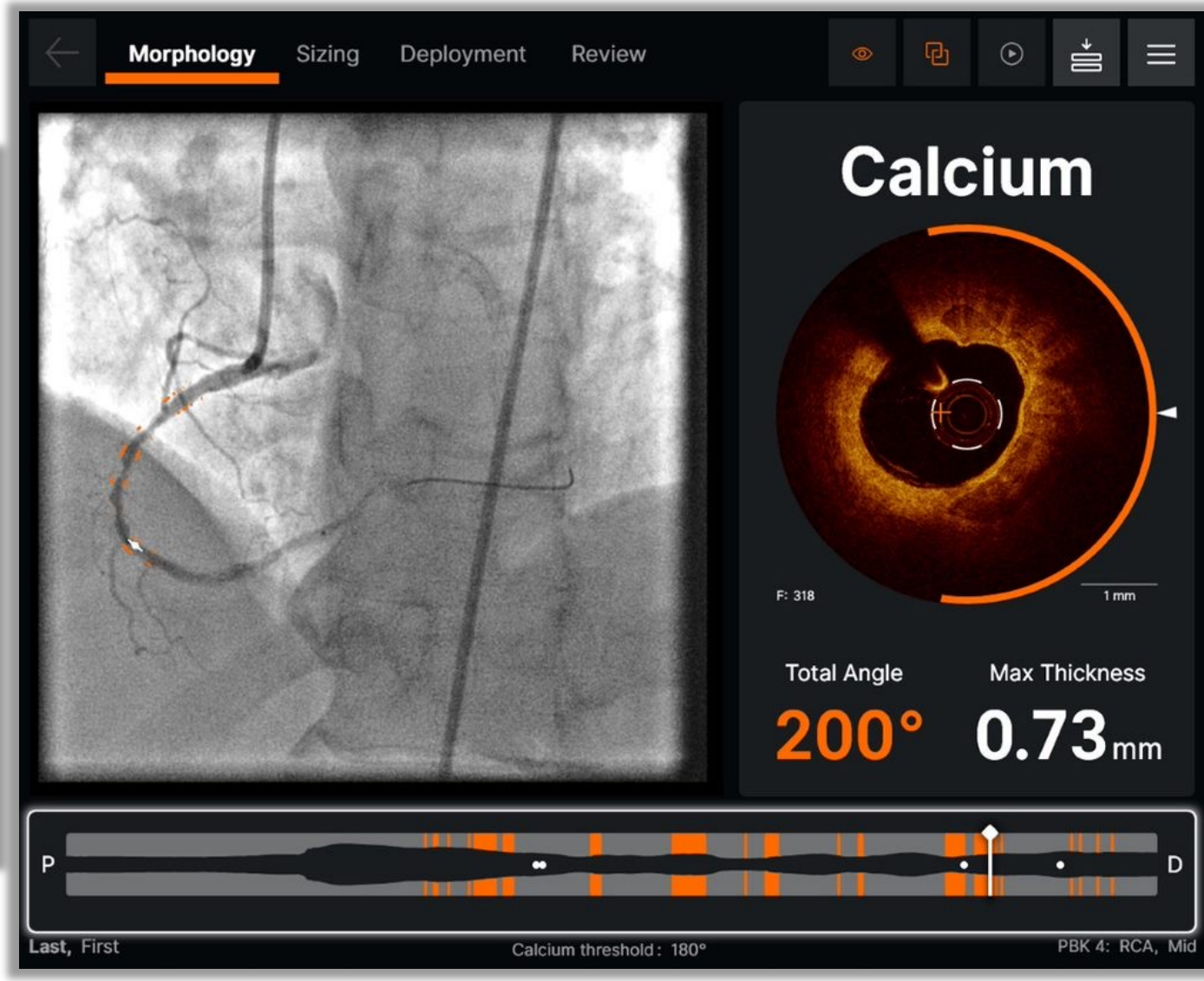


Logiciel ULTREON

Aide au diagnostic

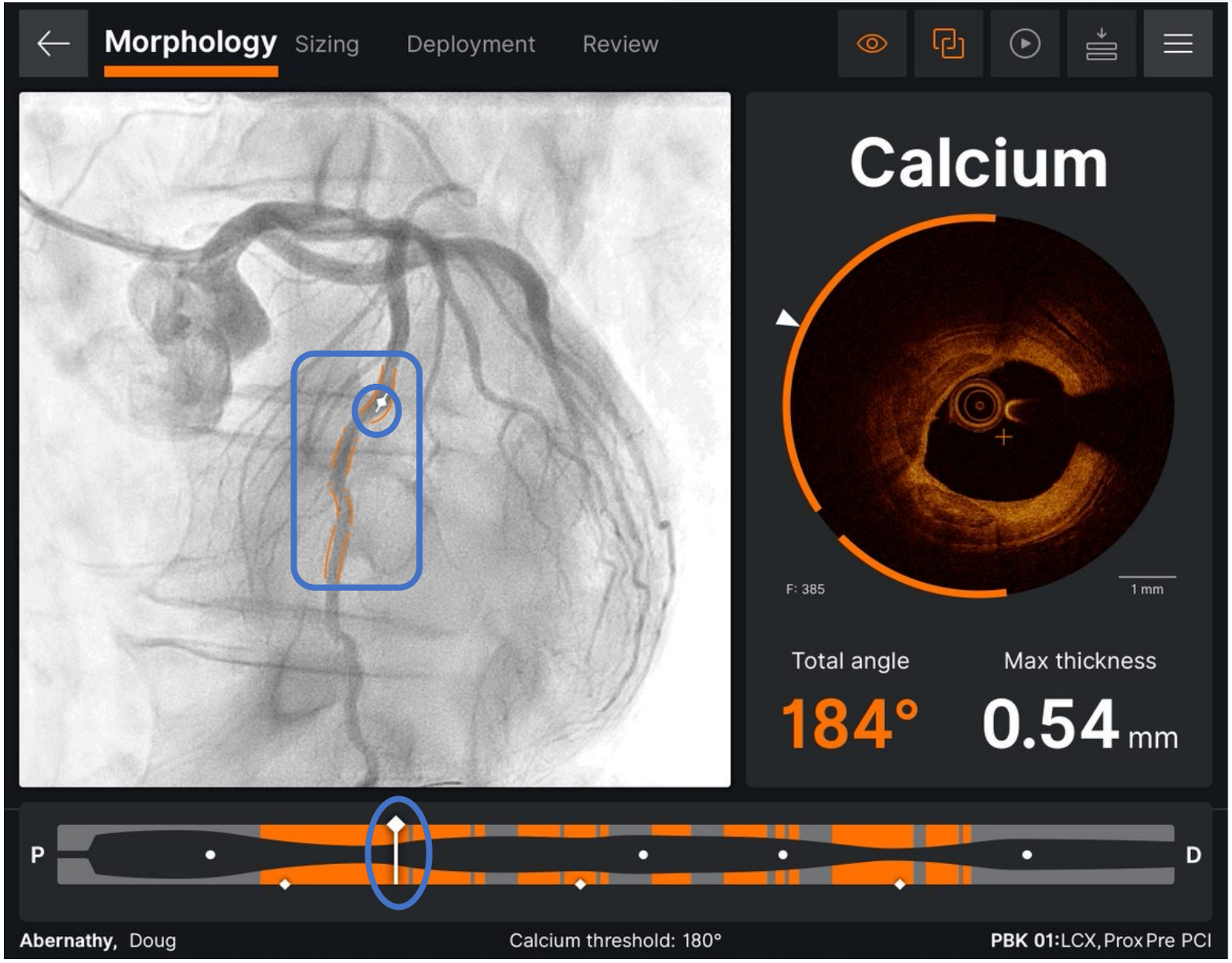
AUTODETECTION DU CALCIUM

- Calcium indiqué en orange
- L'arc orange indique présence calcaire sur la vue sélectionnée
- Arc est calculé si détection calcaire > 60°
- L'épaisseur maximum des calcifications indiqués en blanc



Logiciel ULTREON

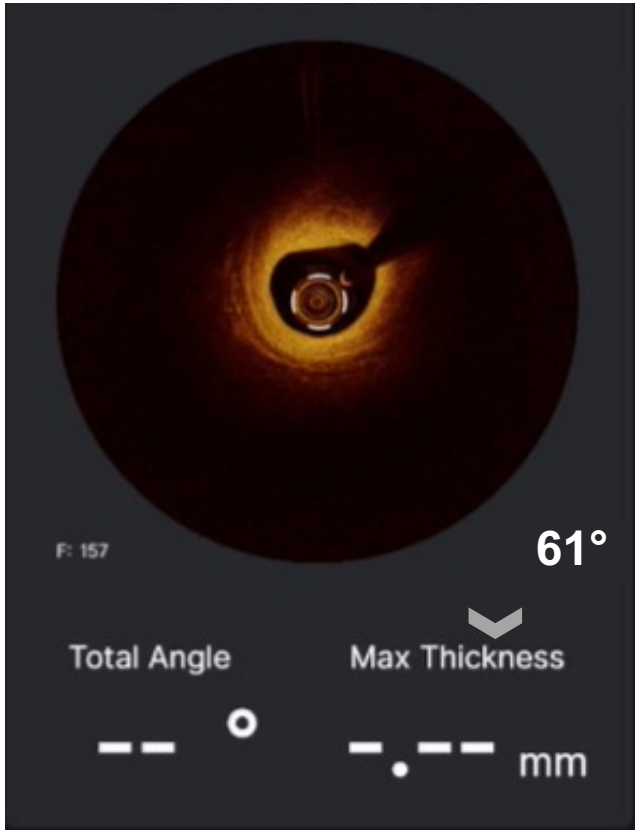
Aide au diagnostic



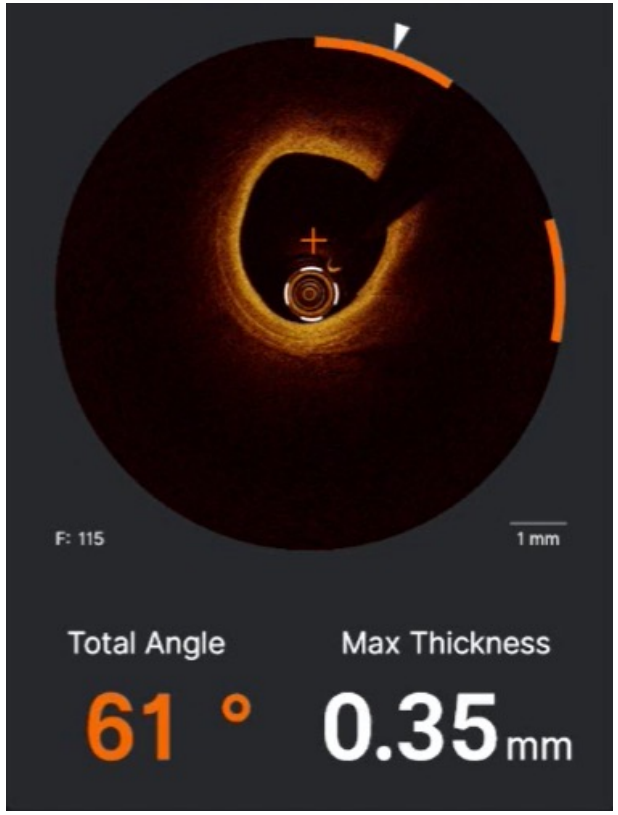
Logiciel ULTREON

Aide au diagnostic

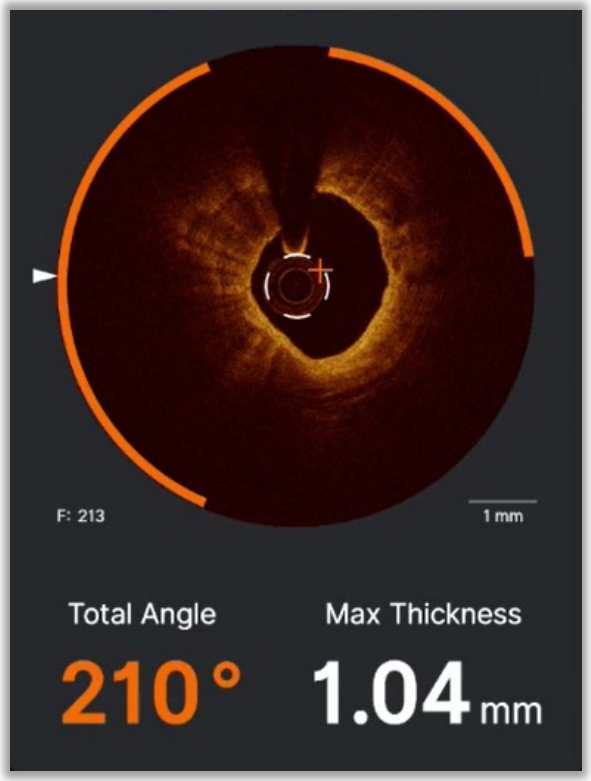
Ø calcifications



Peu de calcifications



Calcifications importantes

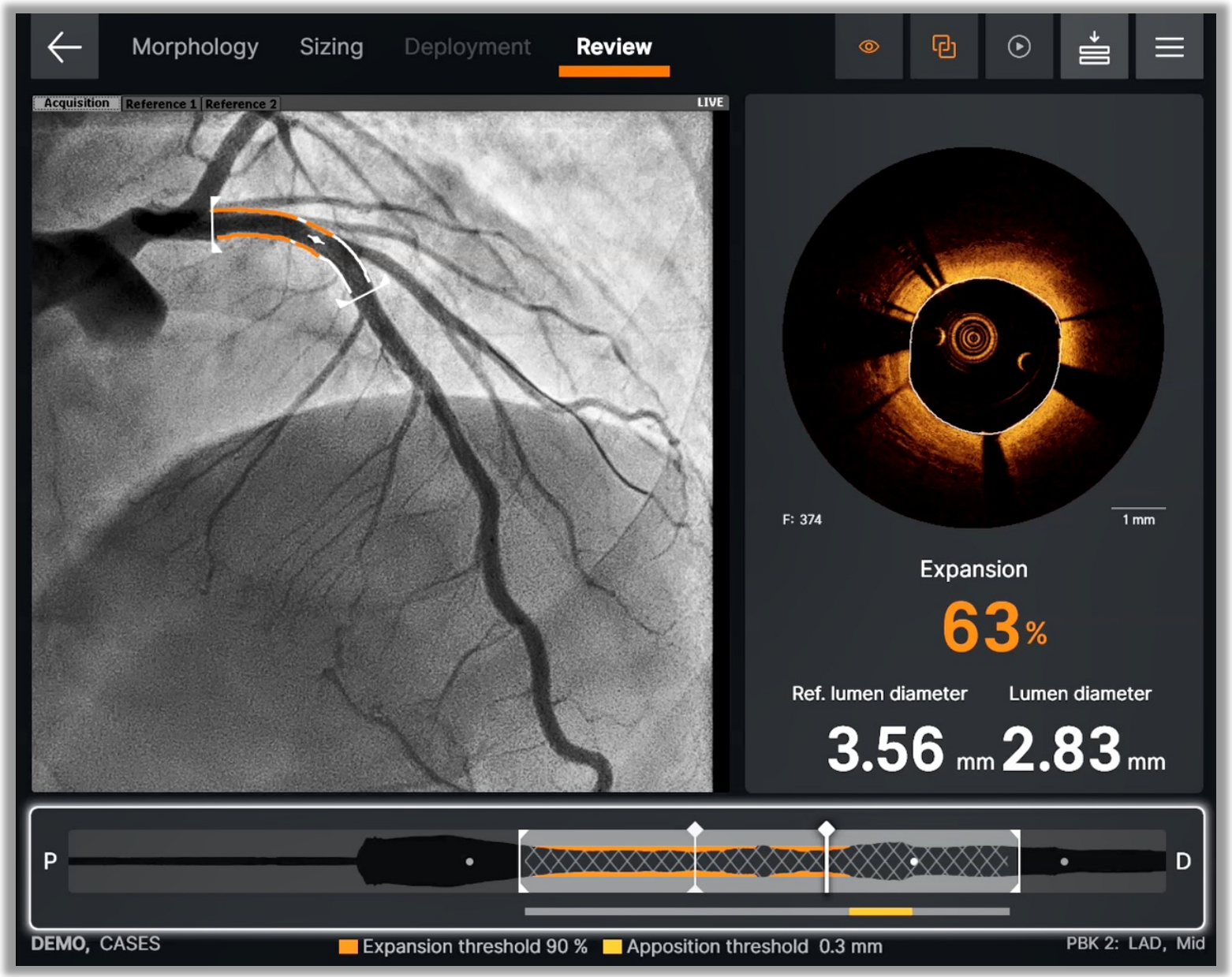


Use clinical judgment to evaluate best strategy for lipid, fibrous, or mixed fibrolipidic plaque

If calcium length is also > 5 mm, consider vessel preparation with NC Balloon; Cutting/Scoring Balloon; Atherectomy, or IVL[1,4]

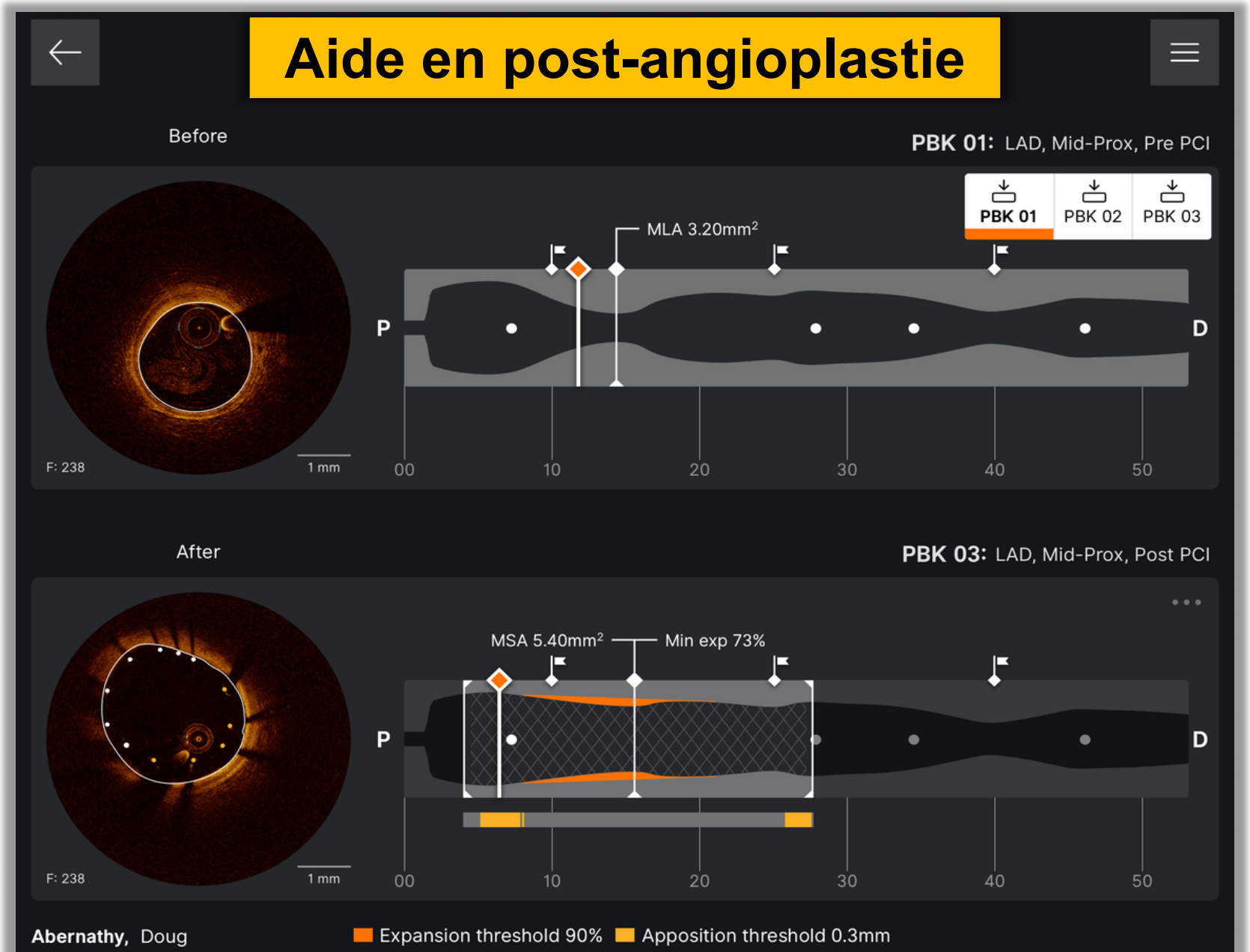
Logiciel ULTREON

Aide en post-angioplastie



Logiciel ULTREON

Comparaison de Pullbacks



Quelle stratégie?

Management of Calcific Coronary Artery Lesions

Is it Time to Change Our Interventional Therapeutic Approach?

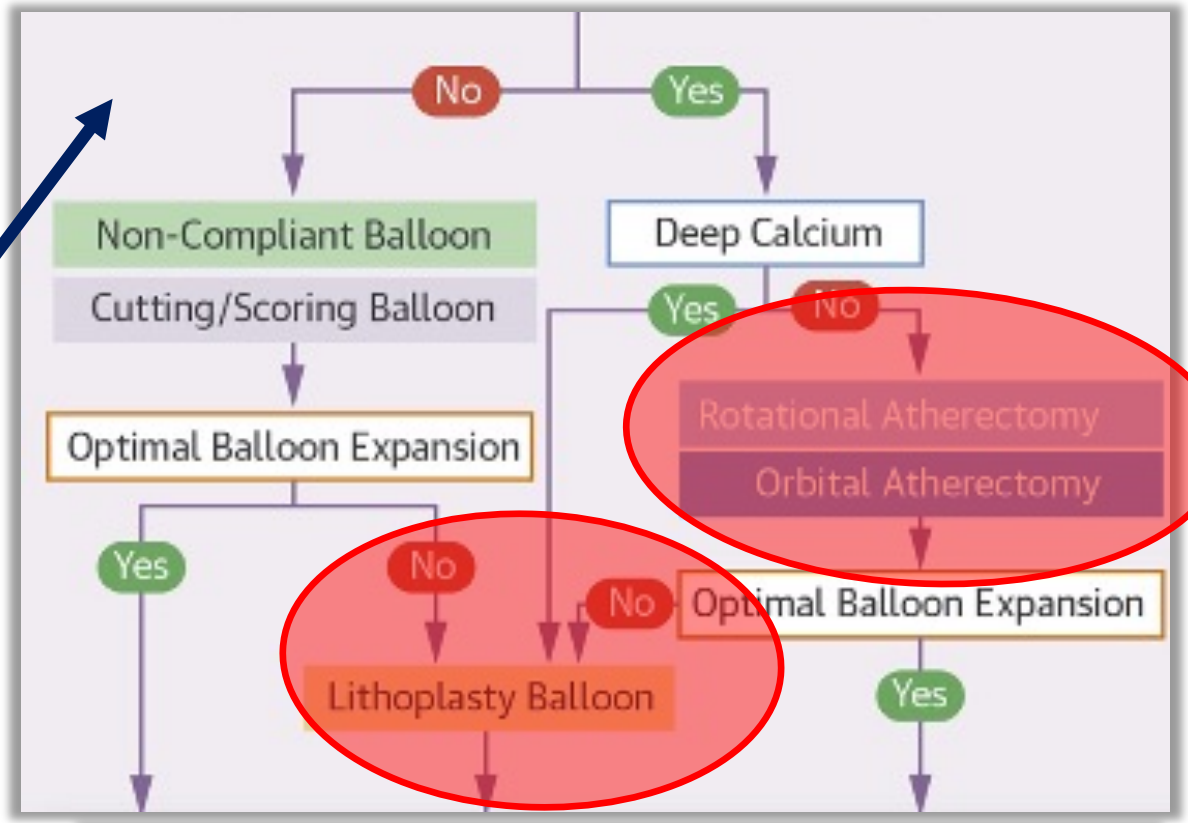
Lésions très calcifiée

Franchissement du ballon? OUI

Pré-dilatation

Intravascular Imaging (OCT > IVUS)

- Calcium Arch > 180°
- Calcium Length > 5 mm
- Calcium Thickness > 0.5 mm



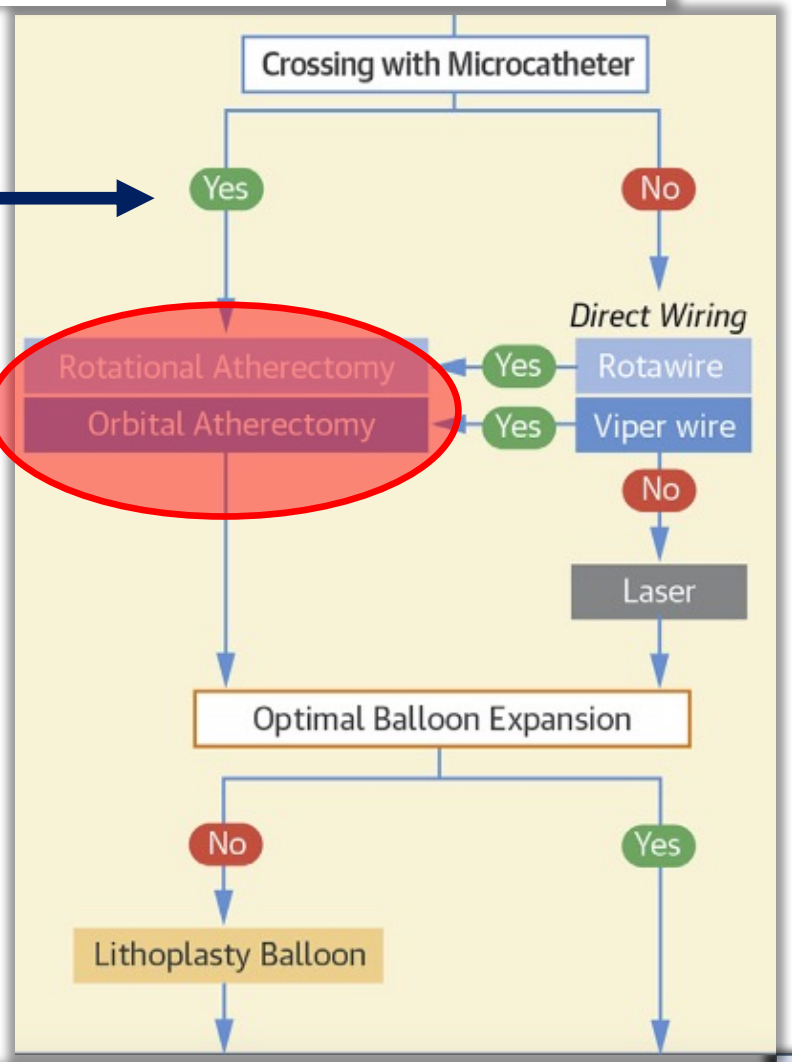
Stenting avec optimisation éventuelle

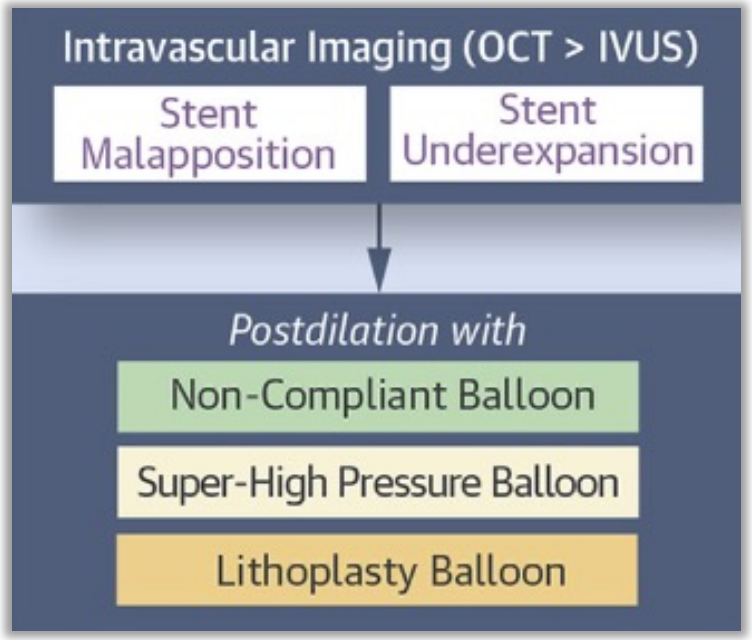
De Maria JL. JACC Interv 2019

Management of Calcific Coronary Artery Lesions

Is it Time to Change Our Interventional Therapeutic Approach?

Franchissement du ballon? NON

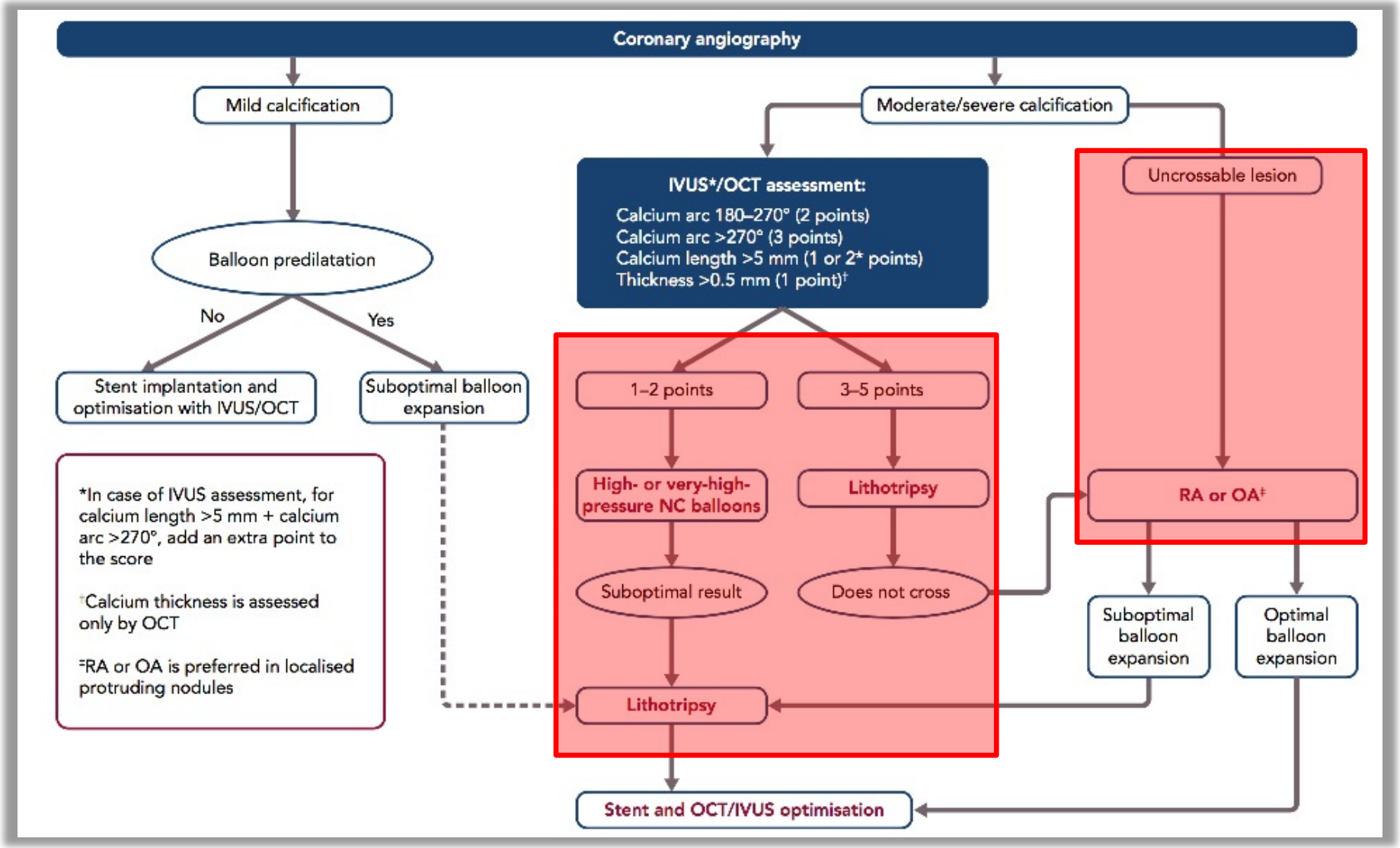




Stenting avec optimisation éventuelle

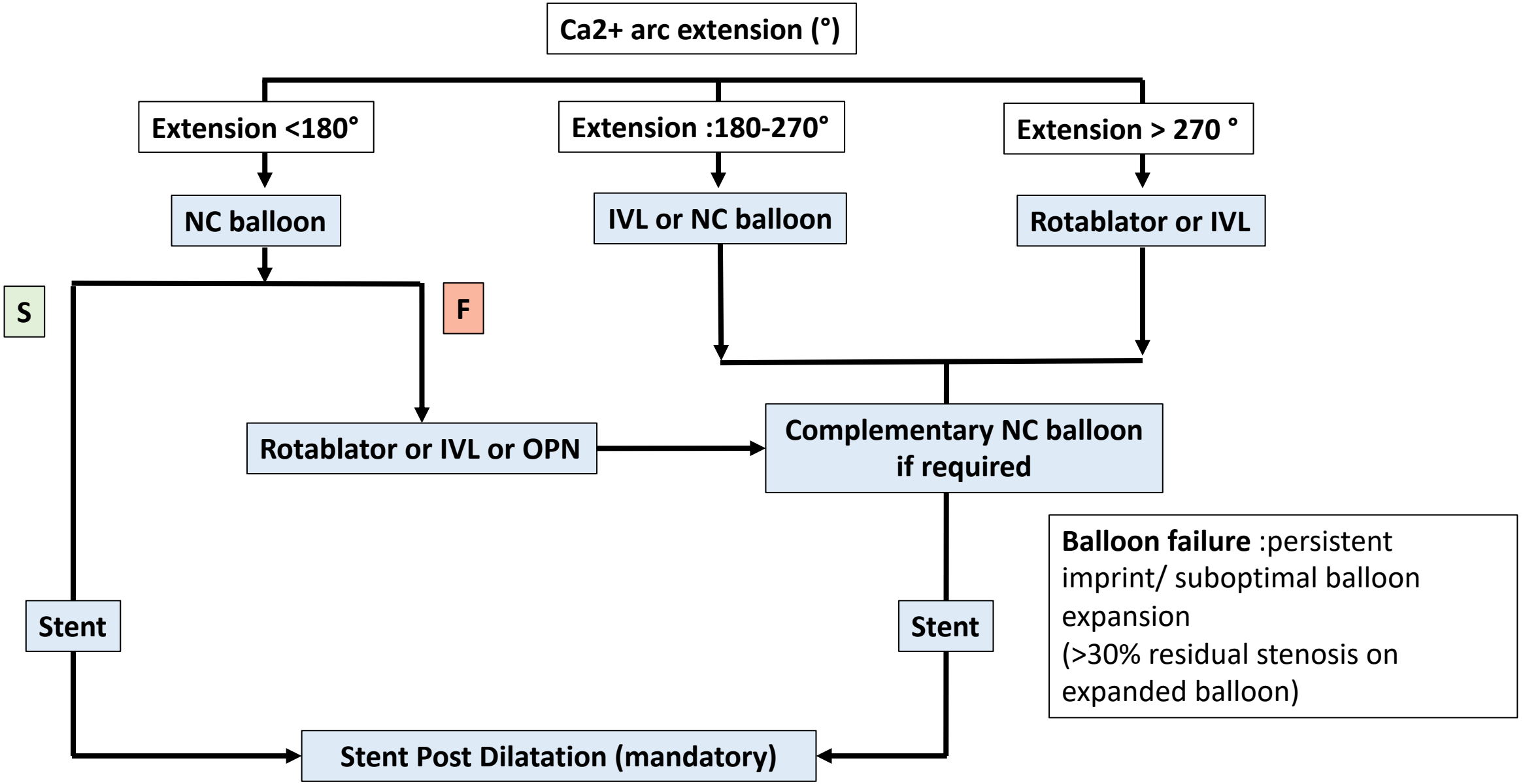
De Maria JL. JACC Interv 2019

Contemporary Approach to Heavily Calcified Coronary Lesions



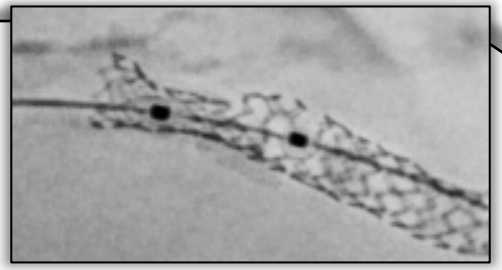
DINI CS. International Cardiology review 2020

The CALIPSO algorithm:

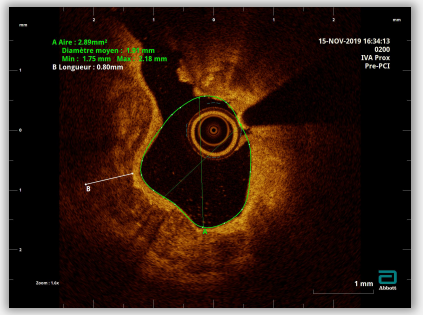


Conclusions

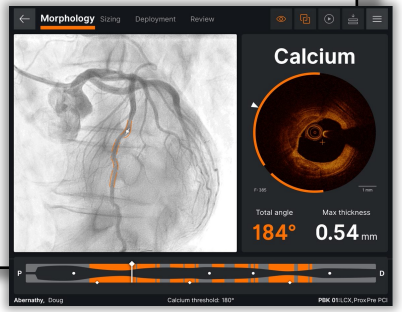
- **Calcifications importantes à détecter**



- **OCT permet stratifier traitement :**
longueur, épaisseur et arc

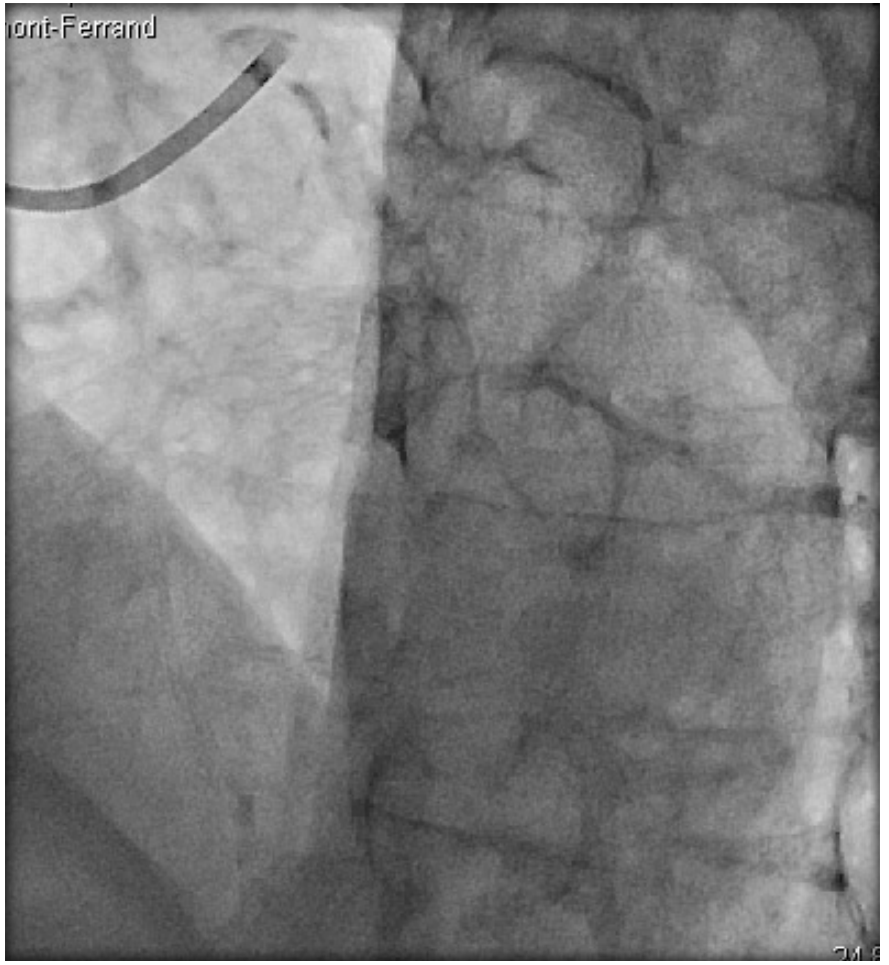


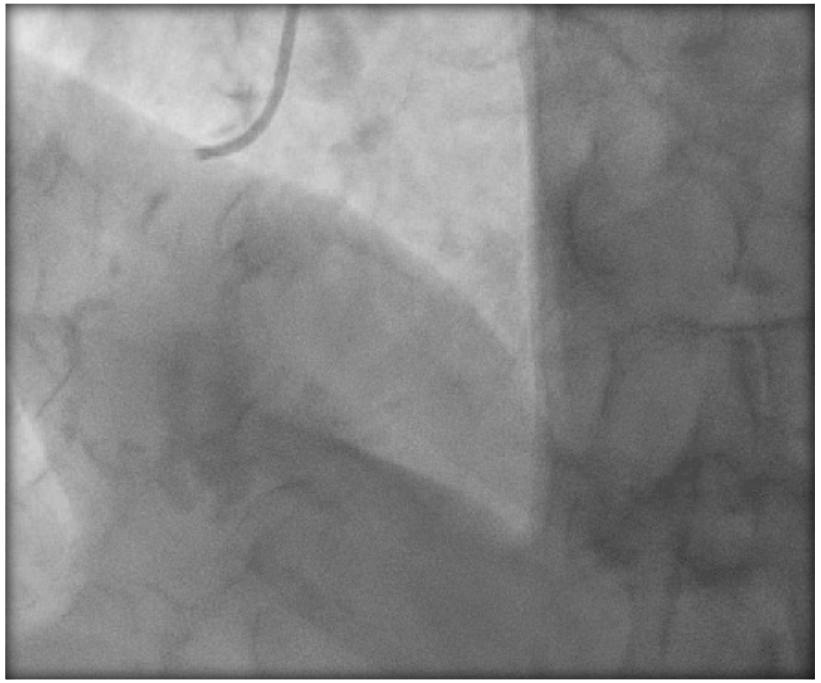
- **Nouveaux outils d'aide en OCT/détection automatique**



Rotablator

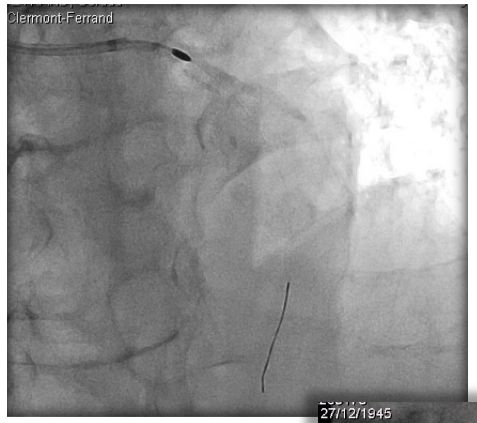
Patient 64 ans
Diabétique, angor au moindre effort



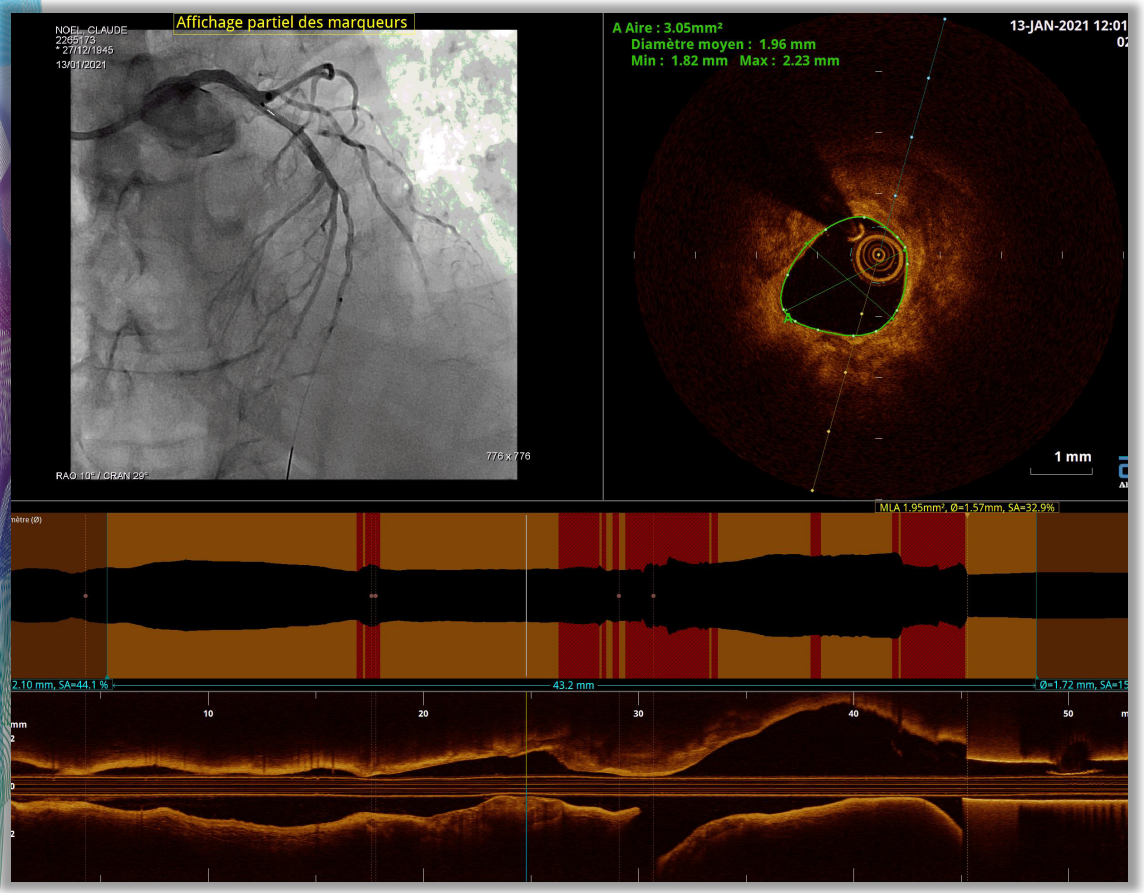


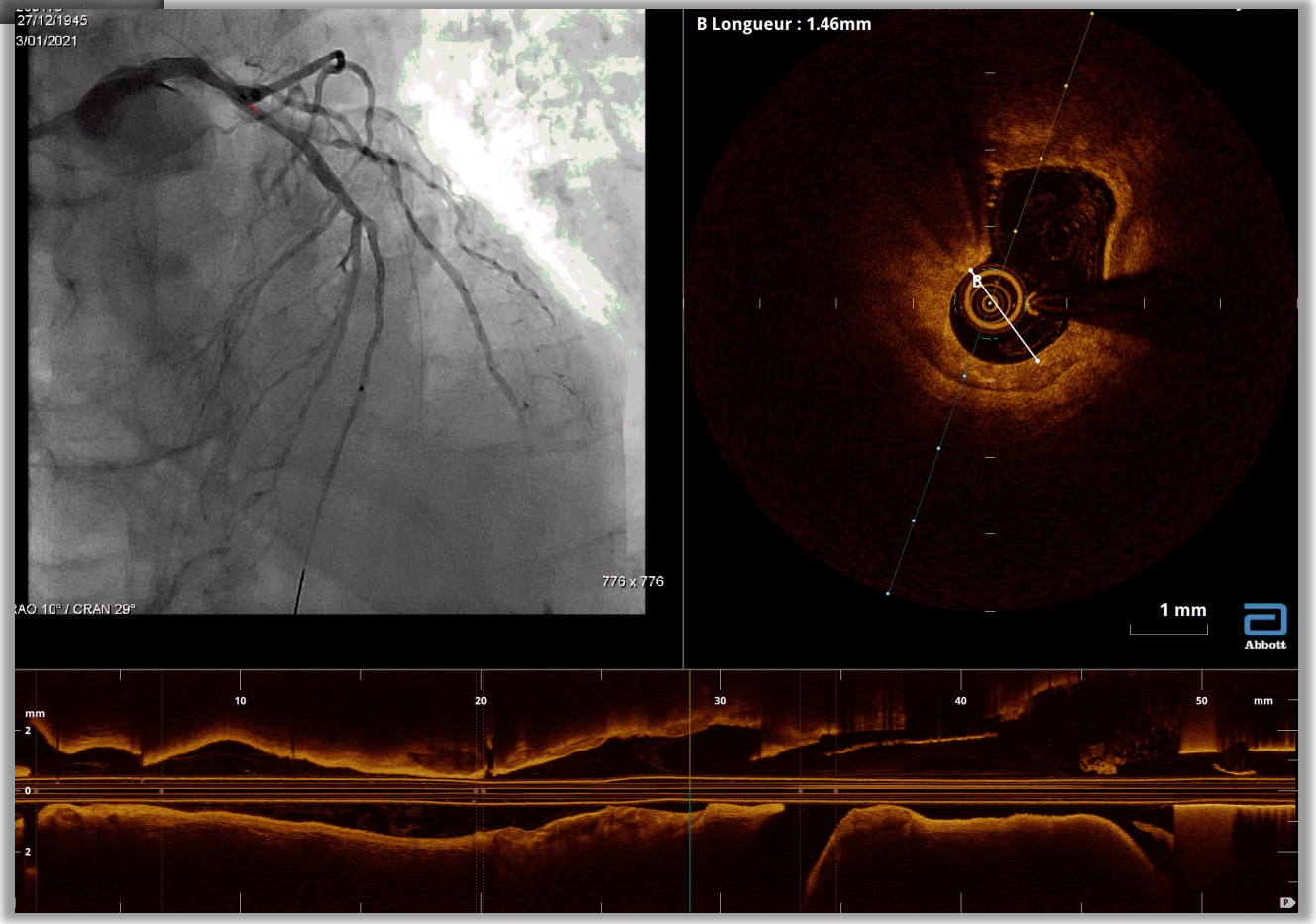
Rotablator

En OCT



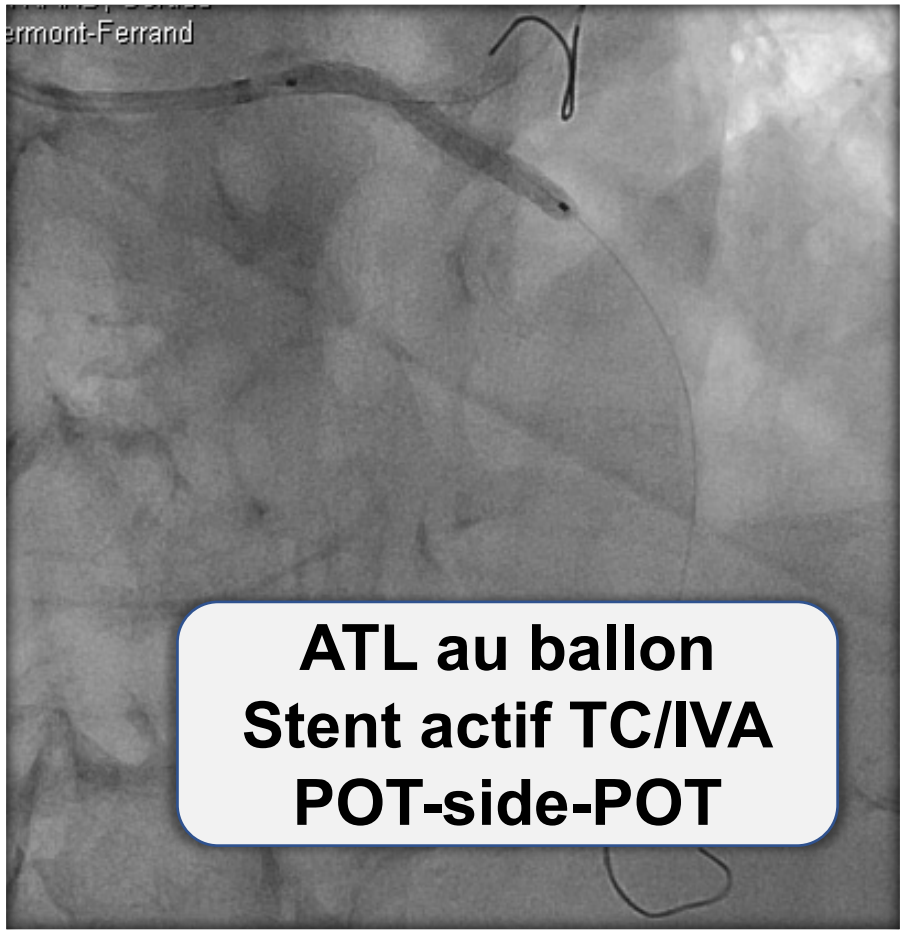
OCT après fraise 1.5mm

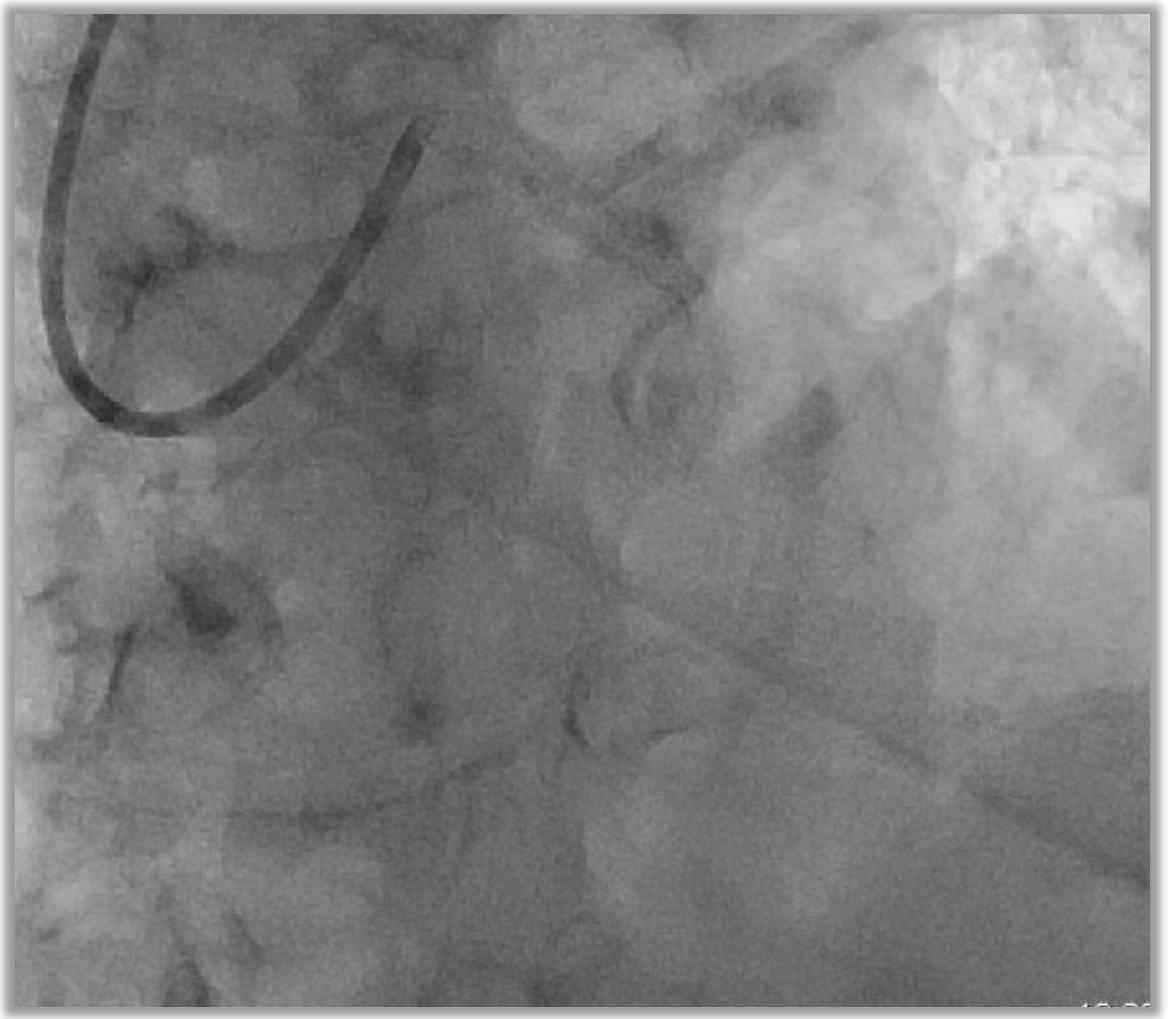




Rotablator

Résultat post stenting





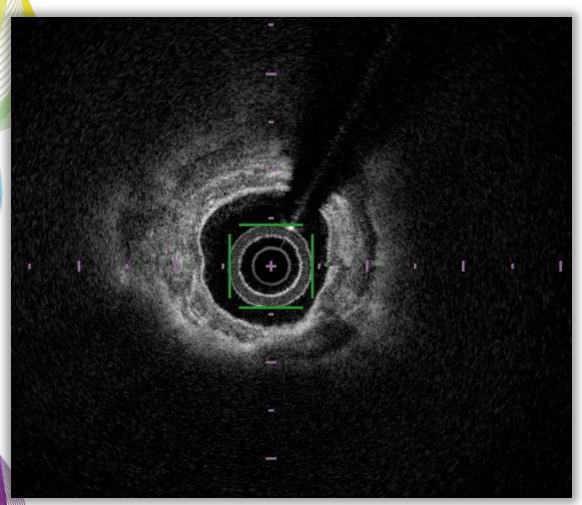
Schockwave

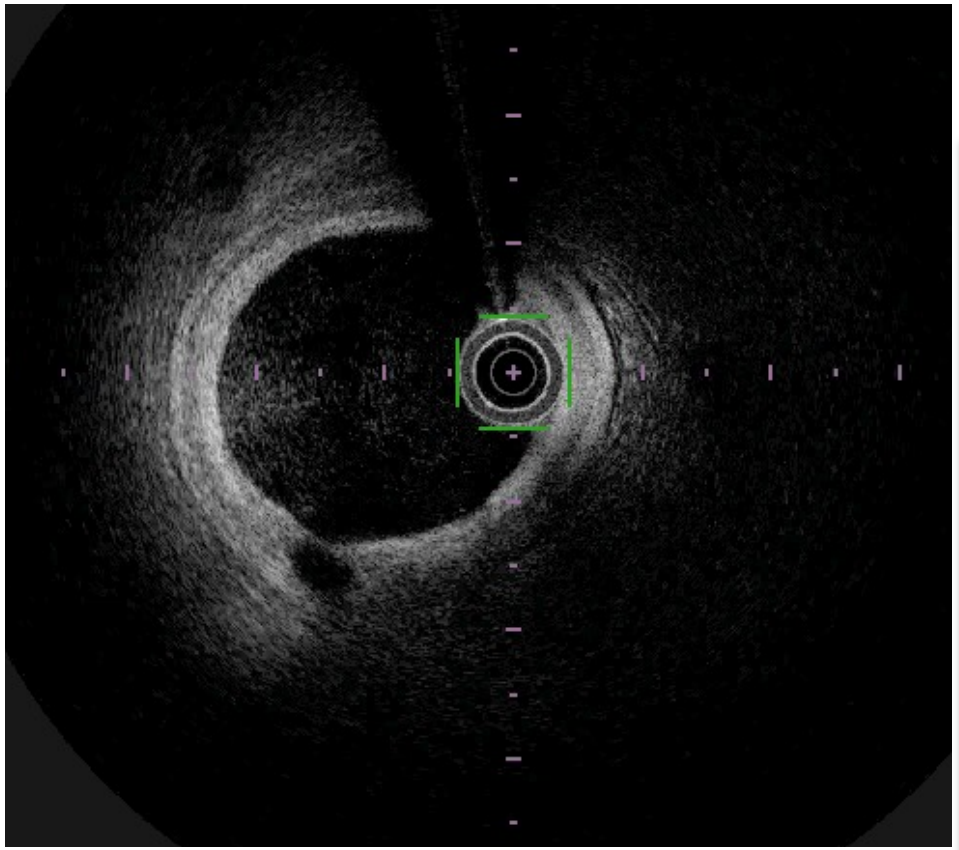
En OCT

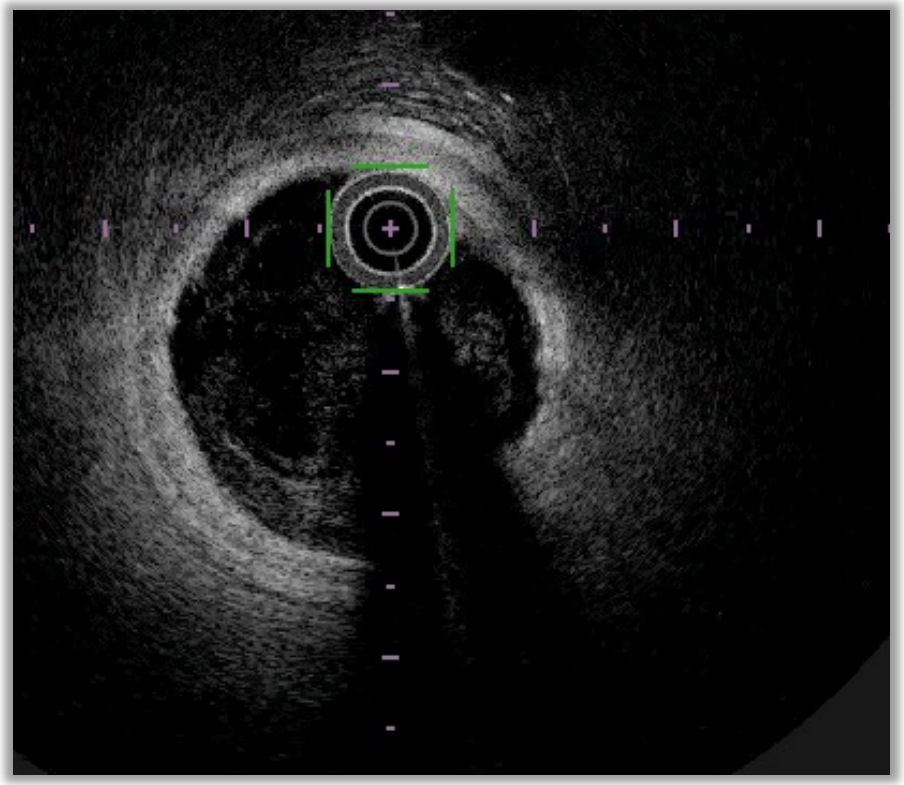
Mettre images angio barquin

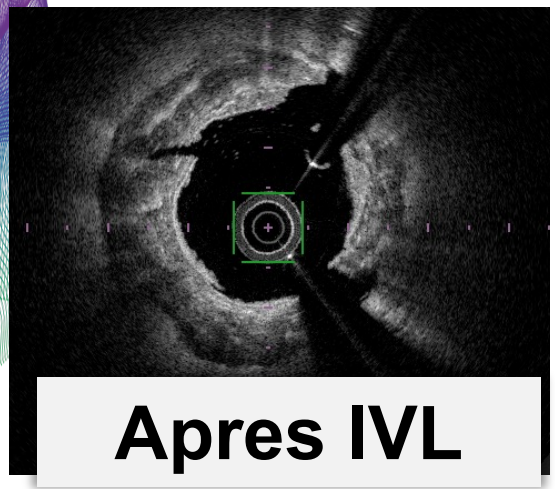
Schockwave

En OCT





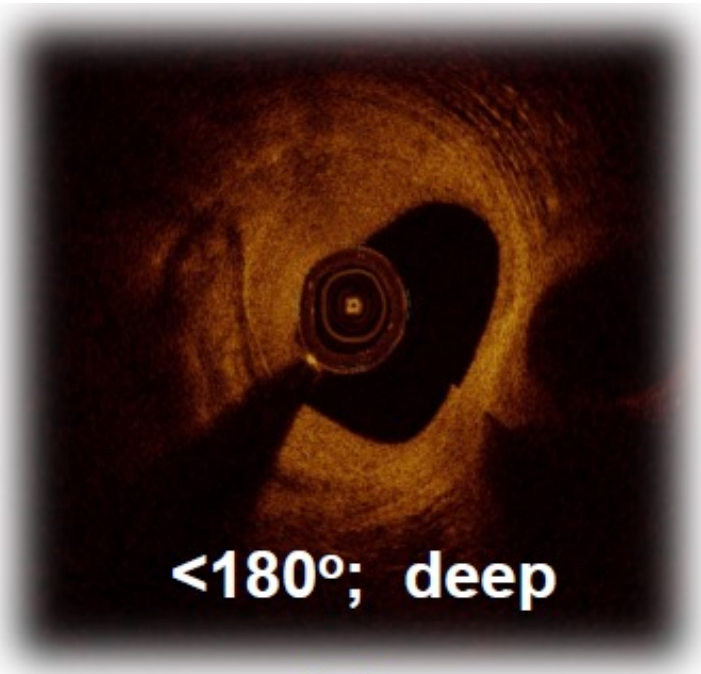


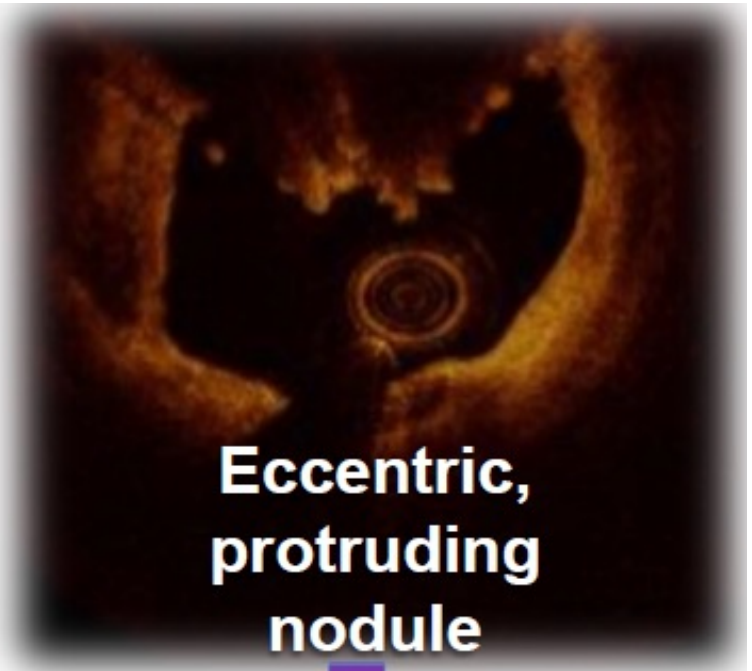


Apres IVL

Lésion Cx calcifiée

Post lithotripsie



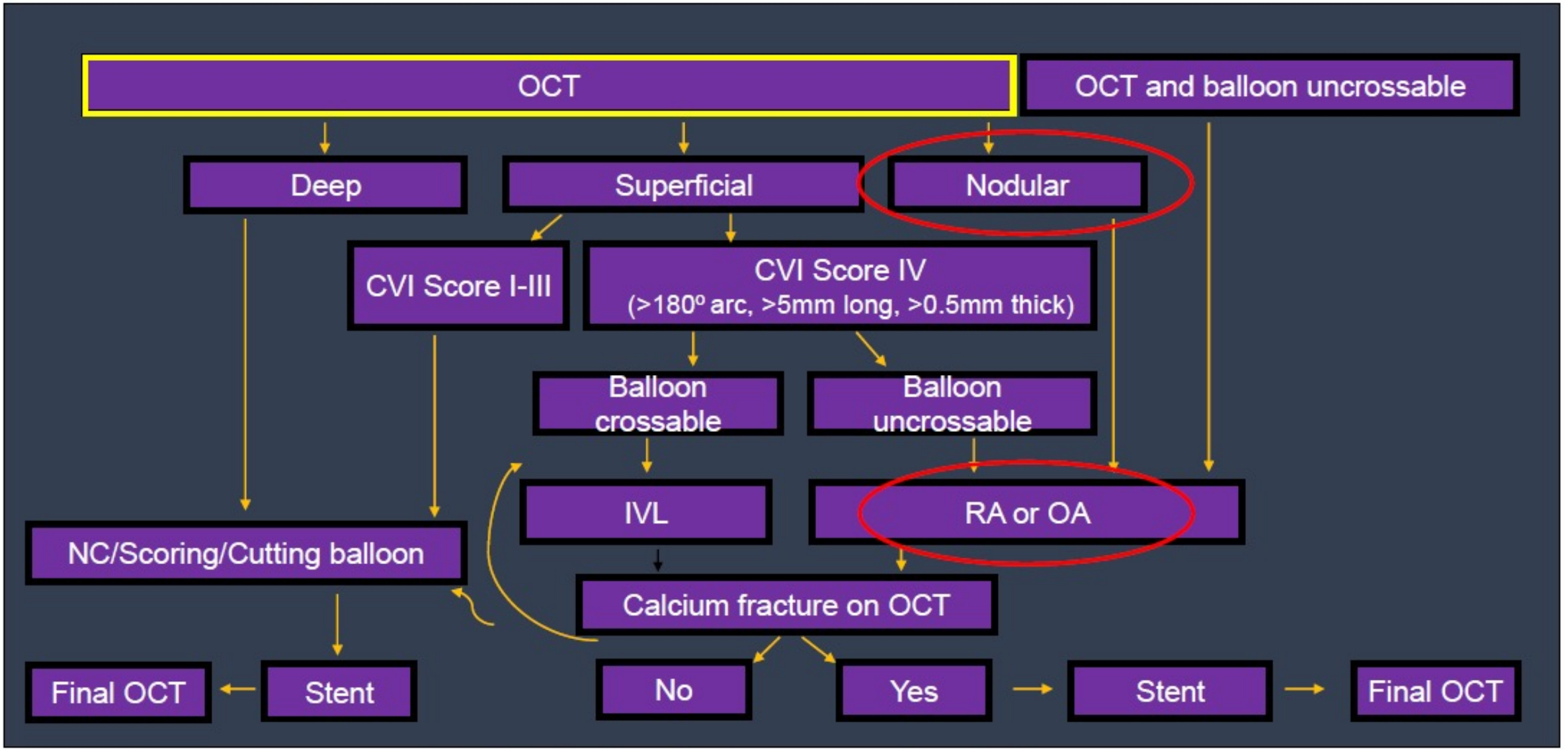


NC/SCORING/CUTTING

ROTATIONAL/ORBITAL/
LITHOTRIPSY/EXCIMER
LASER

Orbital +++
Rotational Atherectomy

Prescriptive Algorithm for Treatment of Calcified Lesions



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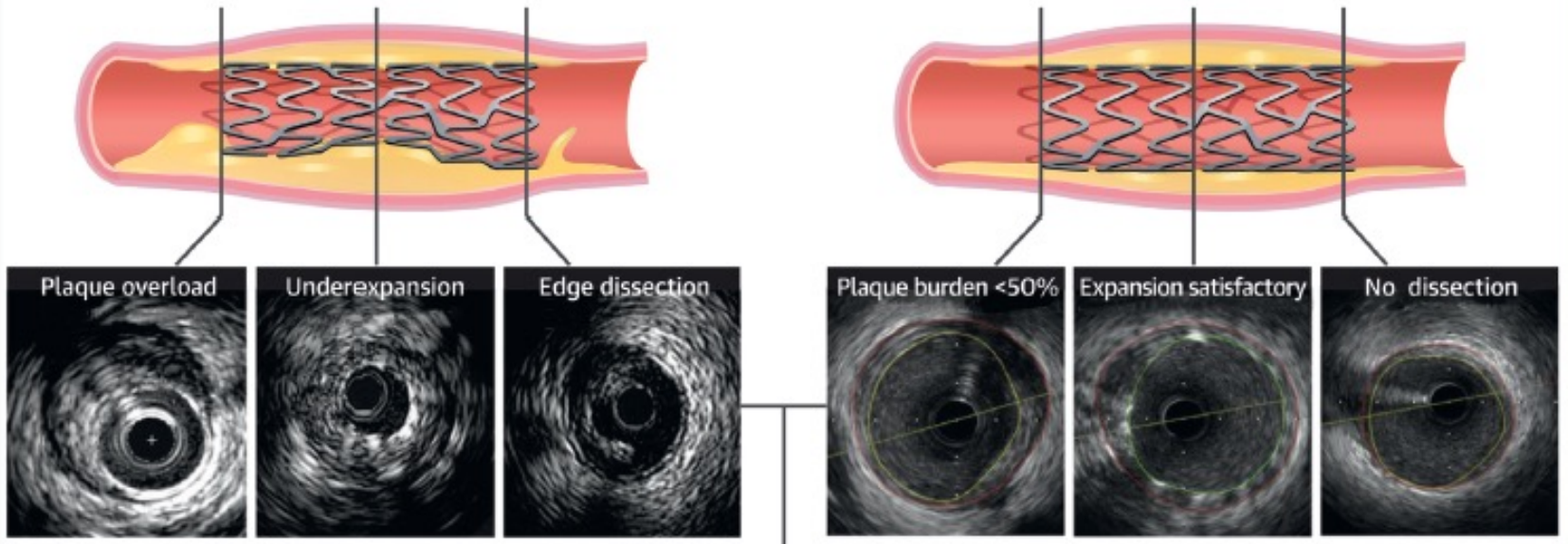

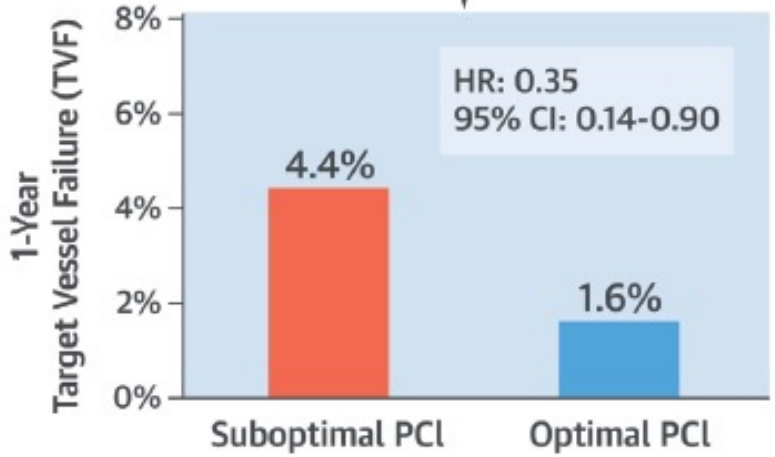

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