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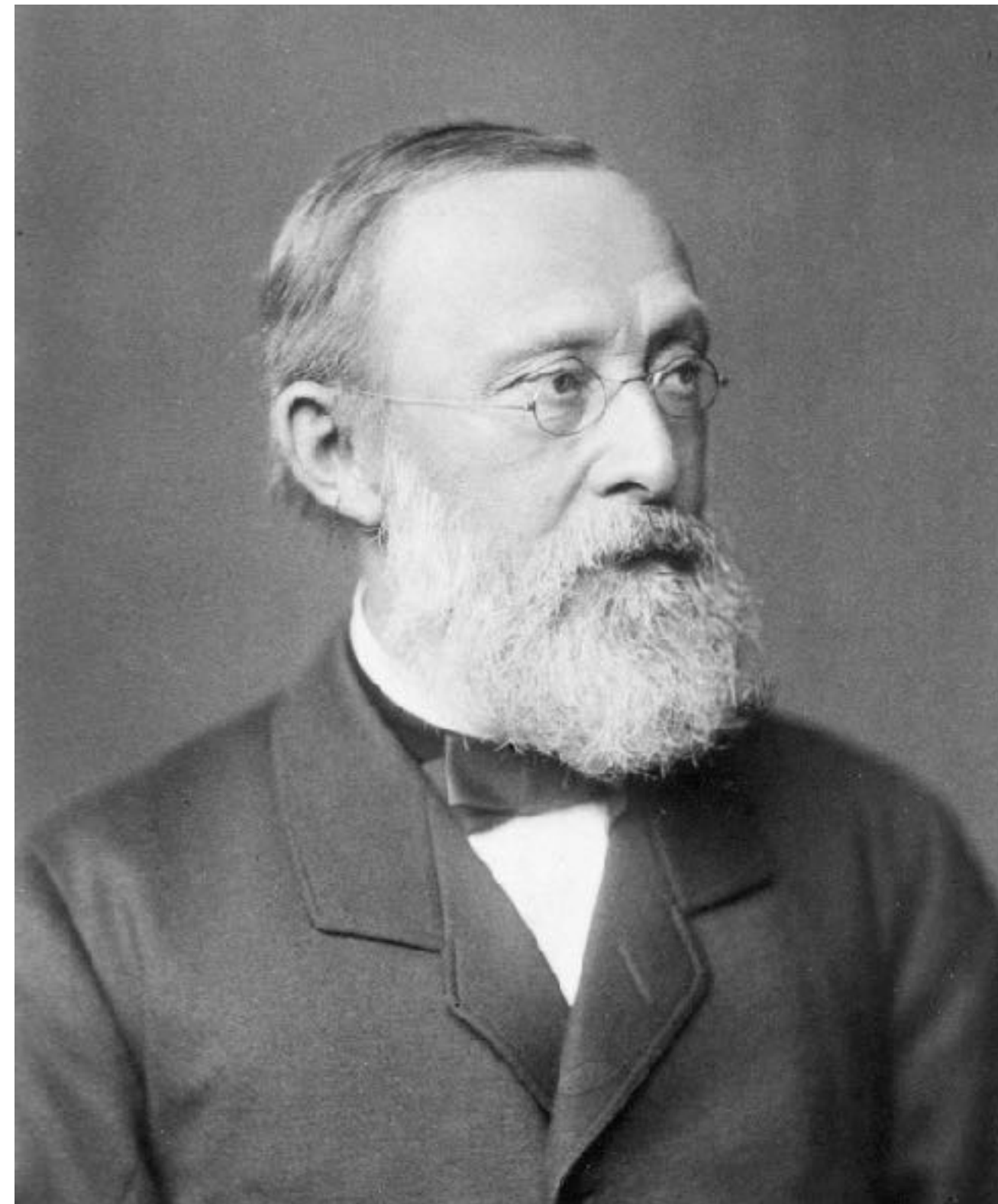
Traitement « classique » des lésions coronaires calcifiées

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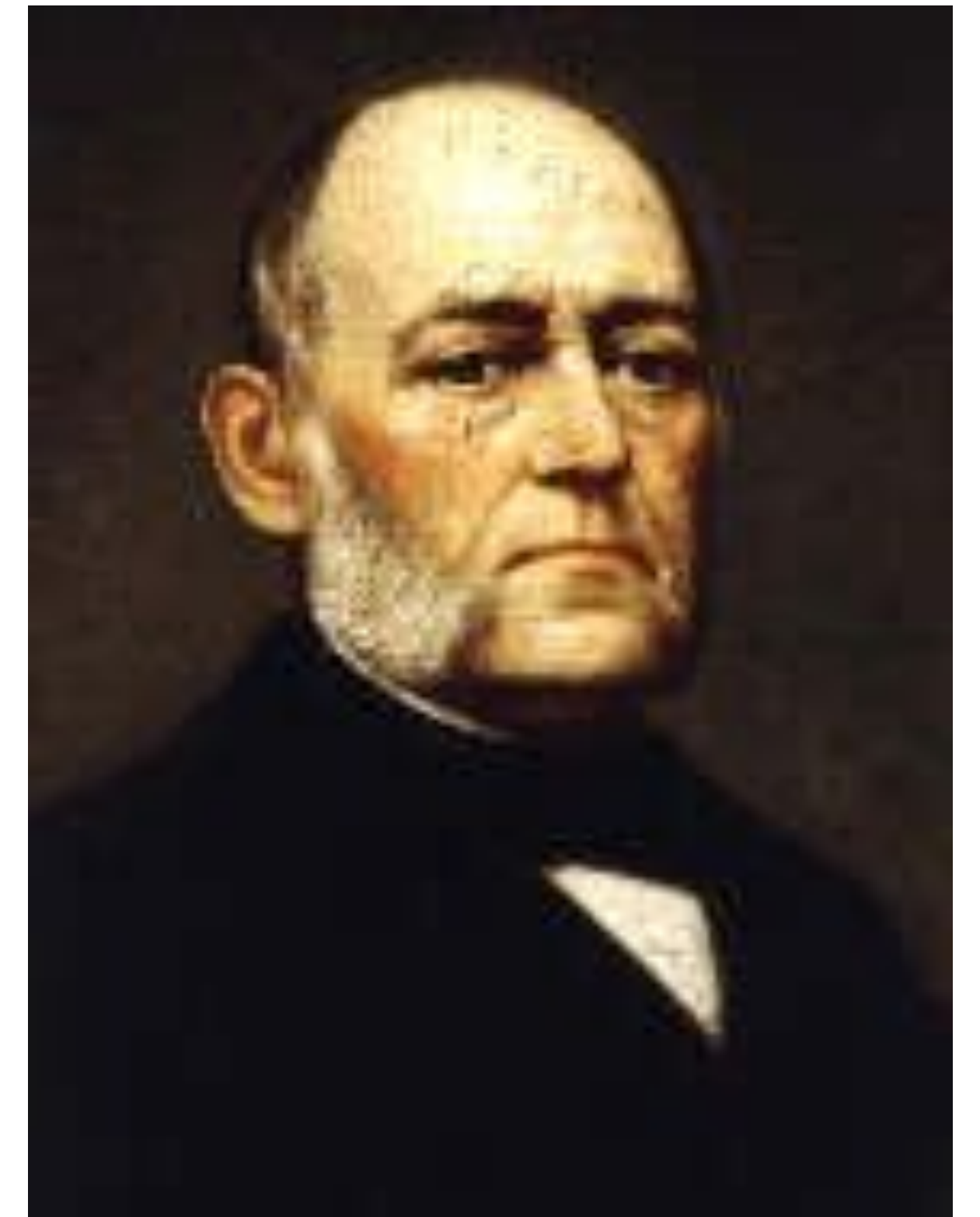
Ceux qui ont décrit les calcifications coronaires



Edward Jenner



Rudolf Virchow

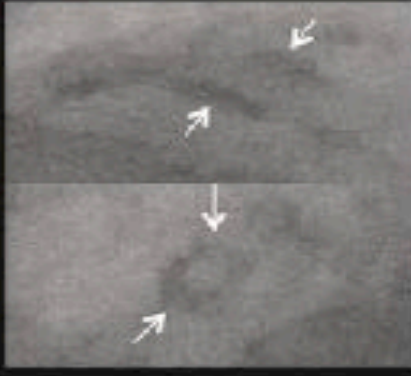
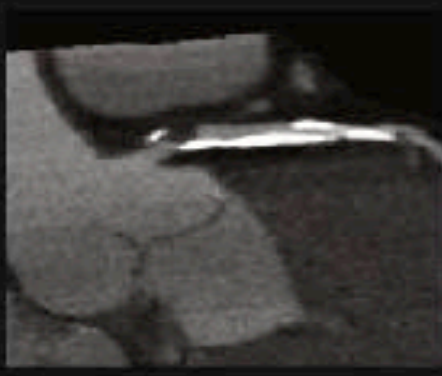
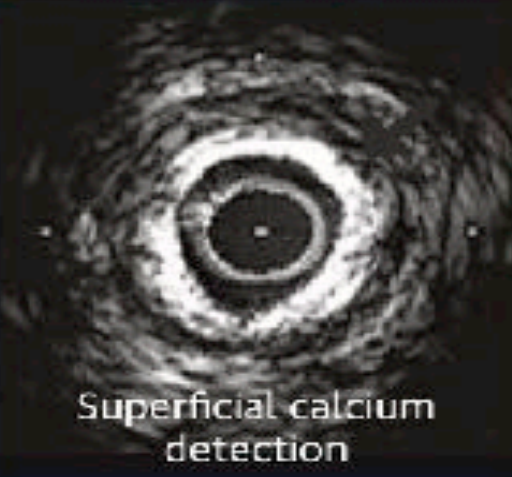
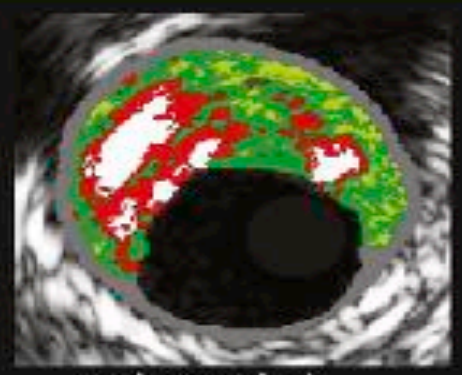
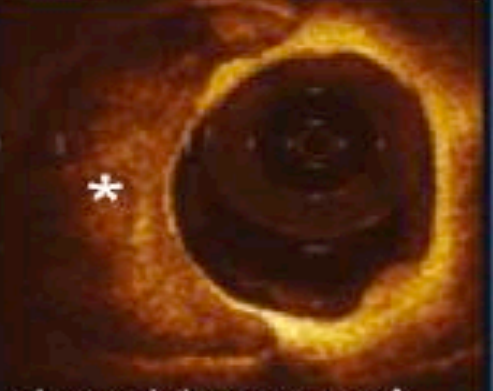
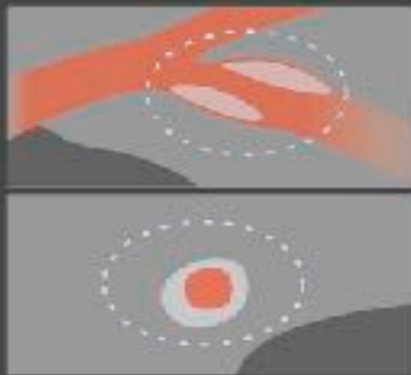
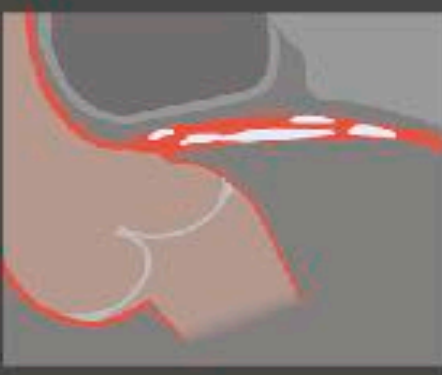
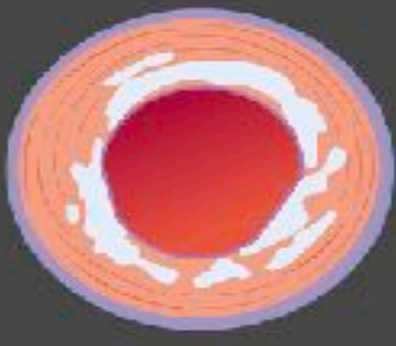

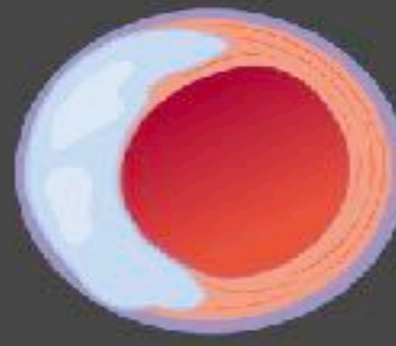


Karl Rokitansky

Calcifications coronaires: plusieurs maladies?

Risk Factor	Intimal Calcification	Medial Calcification
Advanced age	Yes	Yes
Diabetes mellitus	Yes	Yes
Dyslipidemia	Yes	No
Hypertension	Yes	No
Male	Yes	No
Cigarette smoking	Yes	No
Renal etiology		
Dysfunction (↓ GFR)	No	Yes
Hypercalcemia	No	Yes
Hyperphosphatemia	Yes	Yes
PTH abnormalities	No	No
Duration of dialysis	No	Yes

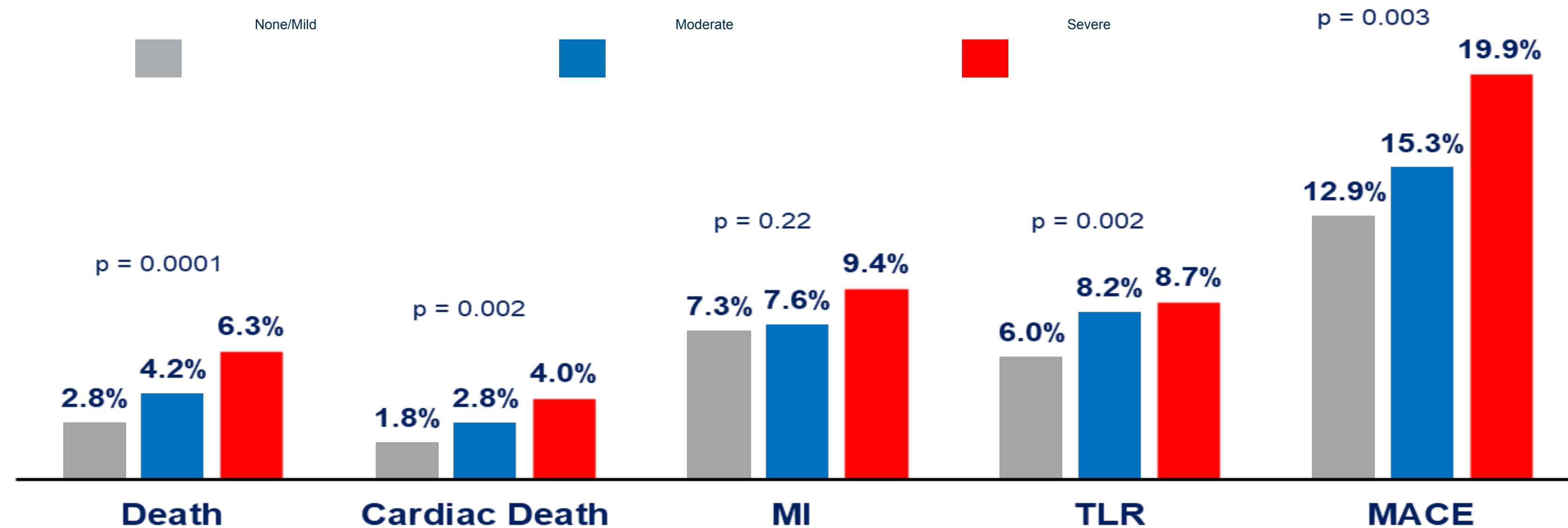
Calcifications coronaires-visualisation

	Coronary Angiography	CT	IVUS	RF-IVUS (IVUS-VH)	OCT
IMAGING MODALITIES			 Superficial calcium detection	 Color coded tissue composition	 Sharp delineation of calcium area is possible
Detection of coronary artery calcium	+	+++	+++	+++	+++++
Localization of coronary artery calcium	+	+++	+++	+++	+++++
Quantification of coronary artery calcium	+	+++	++	+++	+++++
					

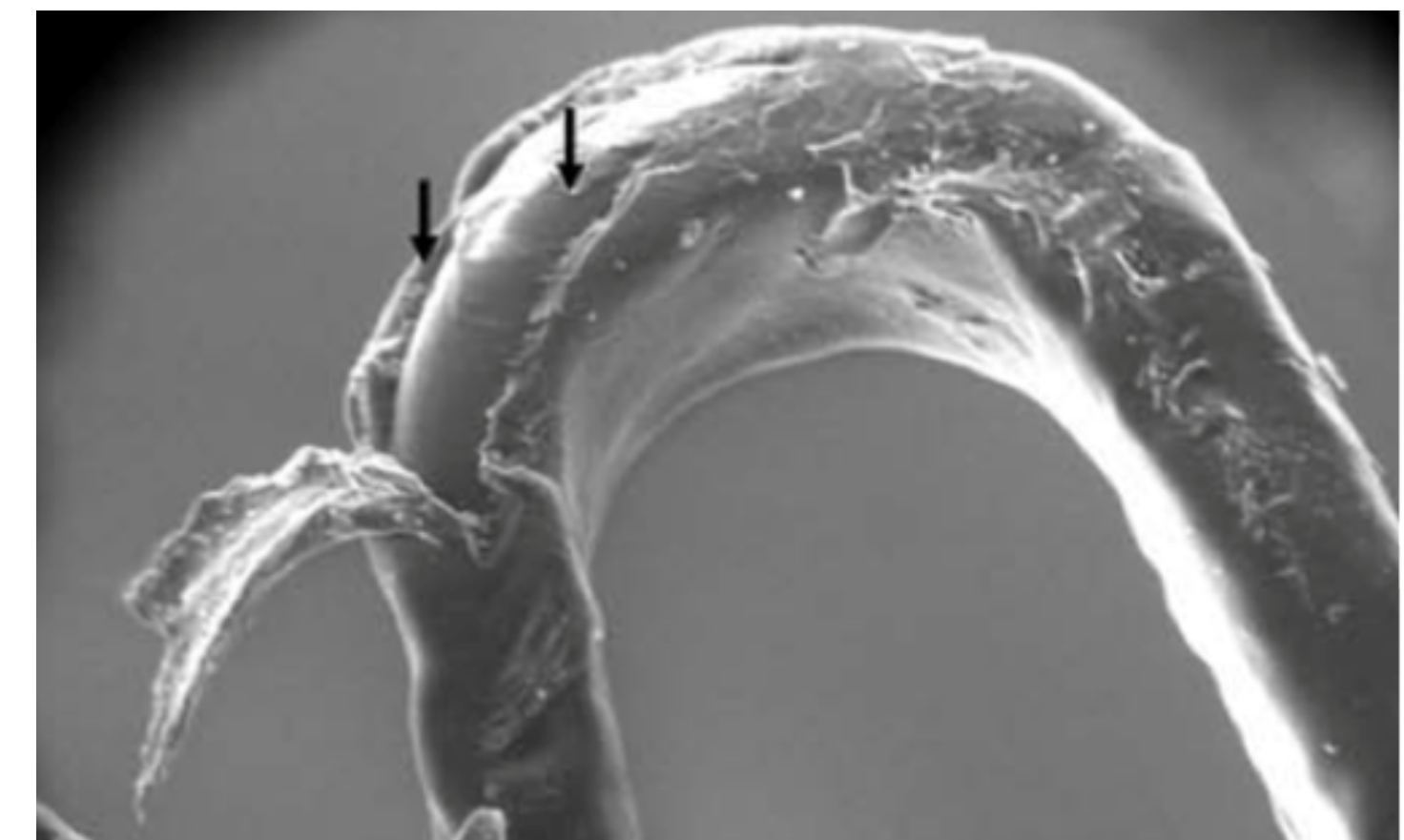
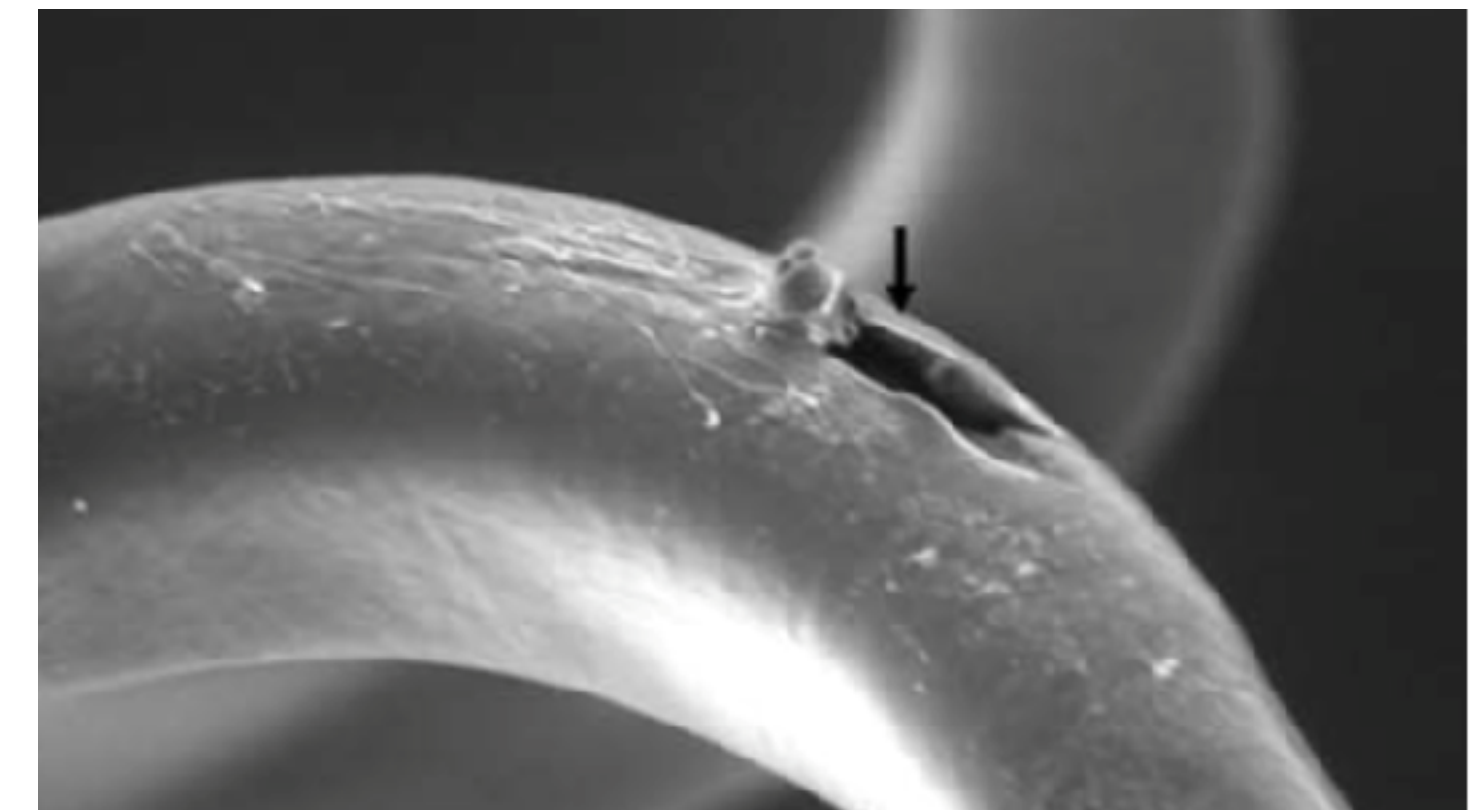
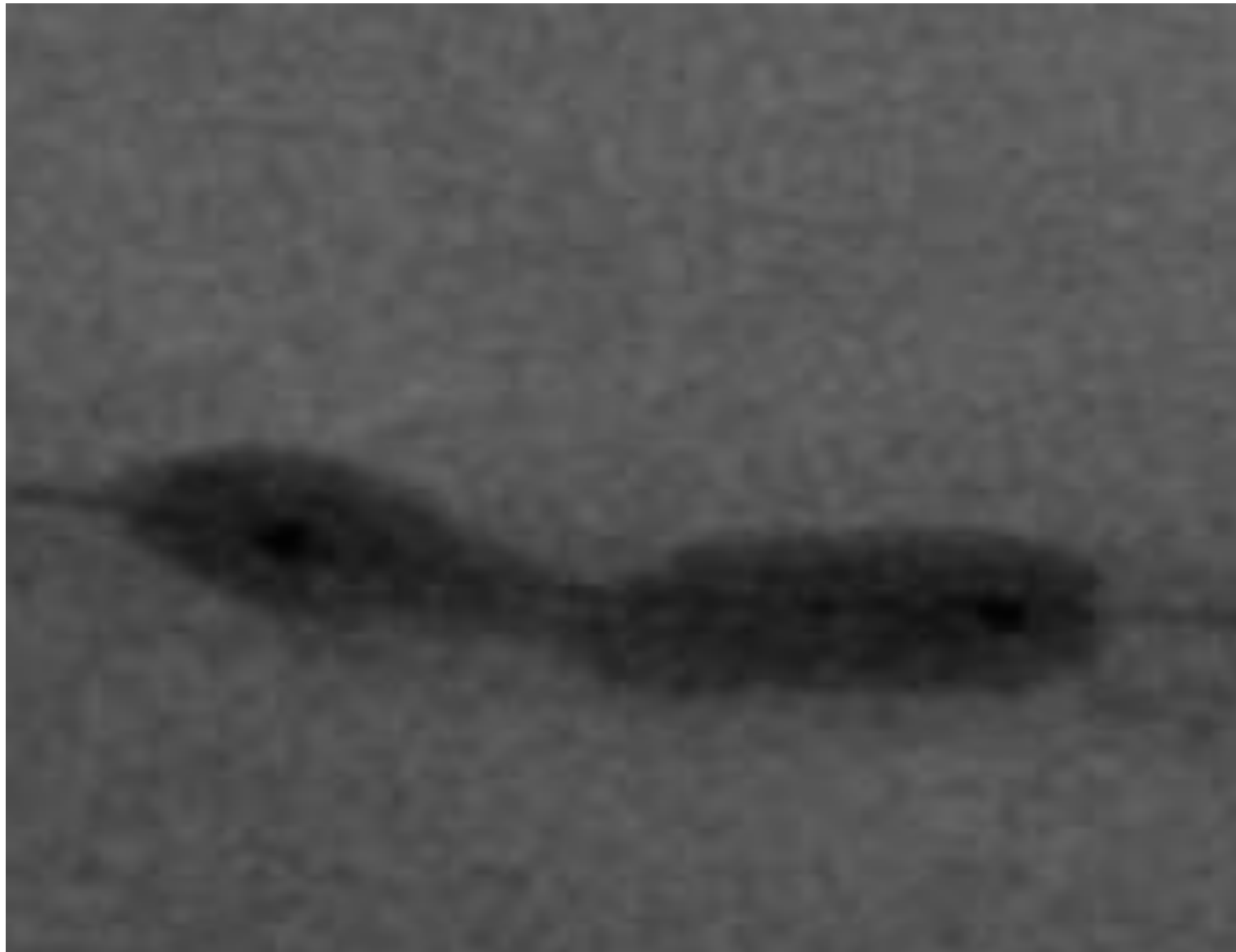
Les calcifications coronaires et l'angioplastie

HORIZONS-AMI and ACUITY CORONARY CALCIUM: 1 Yr Outcomes
6855 Patients Enrolled

Target lesion calcification was severe in 402 patients (5.9%), moderate in 1,788 (26.1%), and none/mild in 4,665 (68.1%).



Angioplastie des lésions calcifiées



Moyens « conventionnels » pour traités des lésions calcifiées

Objectif:

Modifier la plaque calcifiée pour permettre un déploiement optimal du stent ou « réparer nos bêtises » quand le stent est sous déployé

Moyens « classiques »:

- ballon très haute pression
- ballons coupants
- rotablateur

Angioplastie des lésions calcifiées

Materiel	distributeur	Prix (euros)	Volume 2018
OPN	Biovass	250 + 150	1600
Angiosculpt	Biotronik	Accords commerciaux	?
Scorflex	Orbus Neich	200-250	564
NSA Alpha	B Braun	?	?
Flextome cutting ballon	Boston	?	?

Ballon OPN

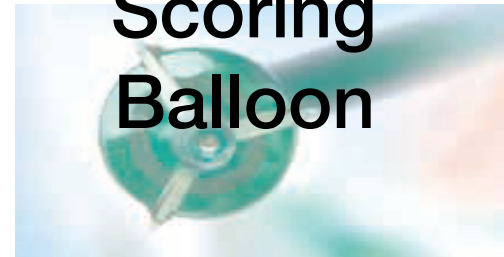
Table 1. OPN balloon compliance chart.

PRESSURE (atm)	OPN NC 2.0	OPN NC 2.5	OPN NC 3.0	OPN NC 3.5	OPN NC 4.0
10	2.0	2.5	3.0	3.5	4.0
20	2.1	2.6	3.14	3.67	4.19
30	2.18	2.7	3.29	3.85	4.37
35	2.2	2.77	3.36	3.91	4.41

Ballons coupants disponibles en France



NSE Alpha
Scoring
Balloon



AngioSculpt[®] PTCA
Scoring Balloon Catheter

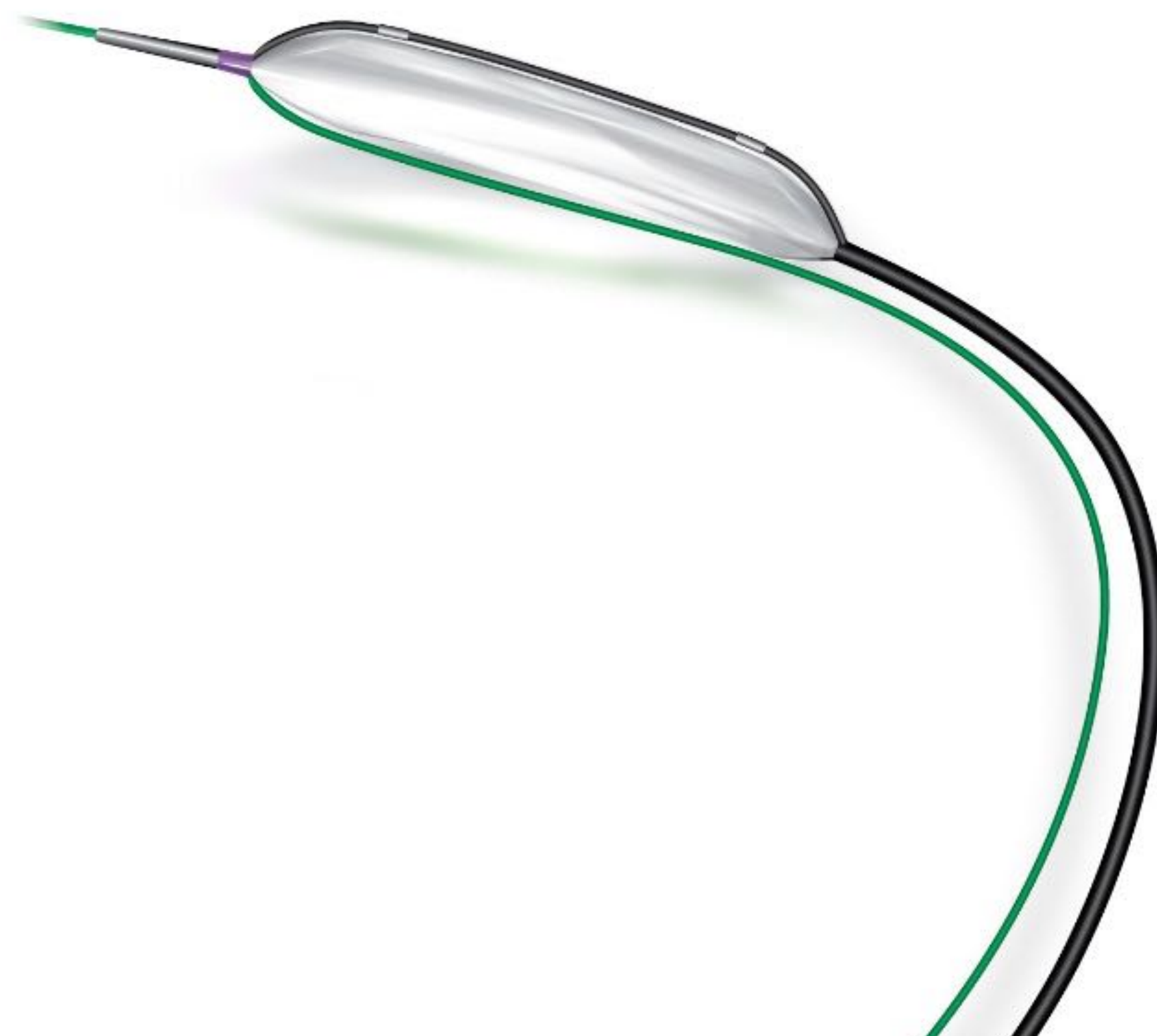


Flextome
Cutting
Balloon



	Dilation Effect	Crossability	MOA
Scoreflex	++	+++	2 metallic wires
Lacrosse NSE	++	++	3 polymer elements
AngioSculpt	+++	+	3 spiral metallic wires
Flextome Cutting Balloon	+++		3 or 4 metallic blades

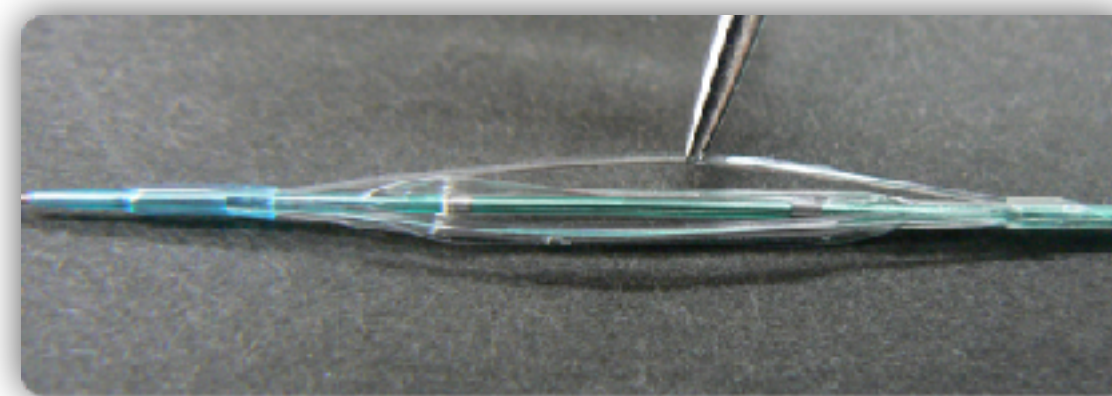
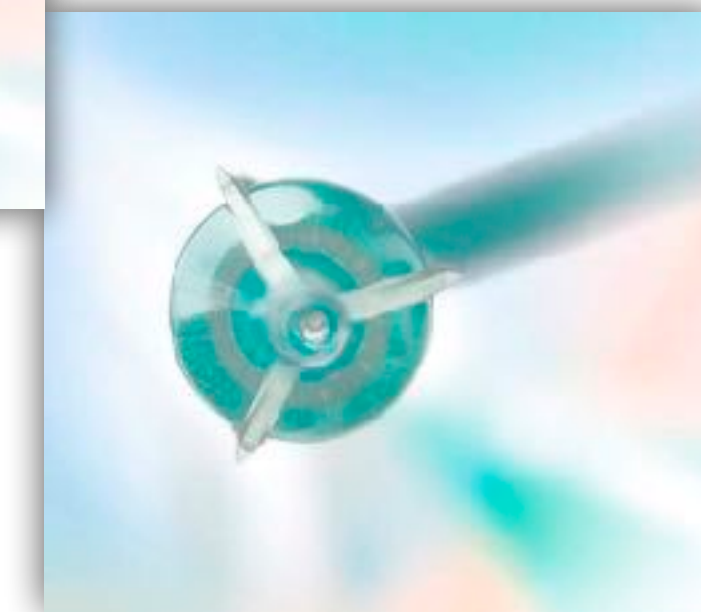
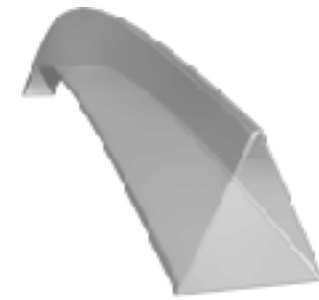
SCORFLEX NC OrbusNeich



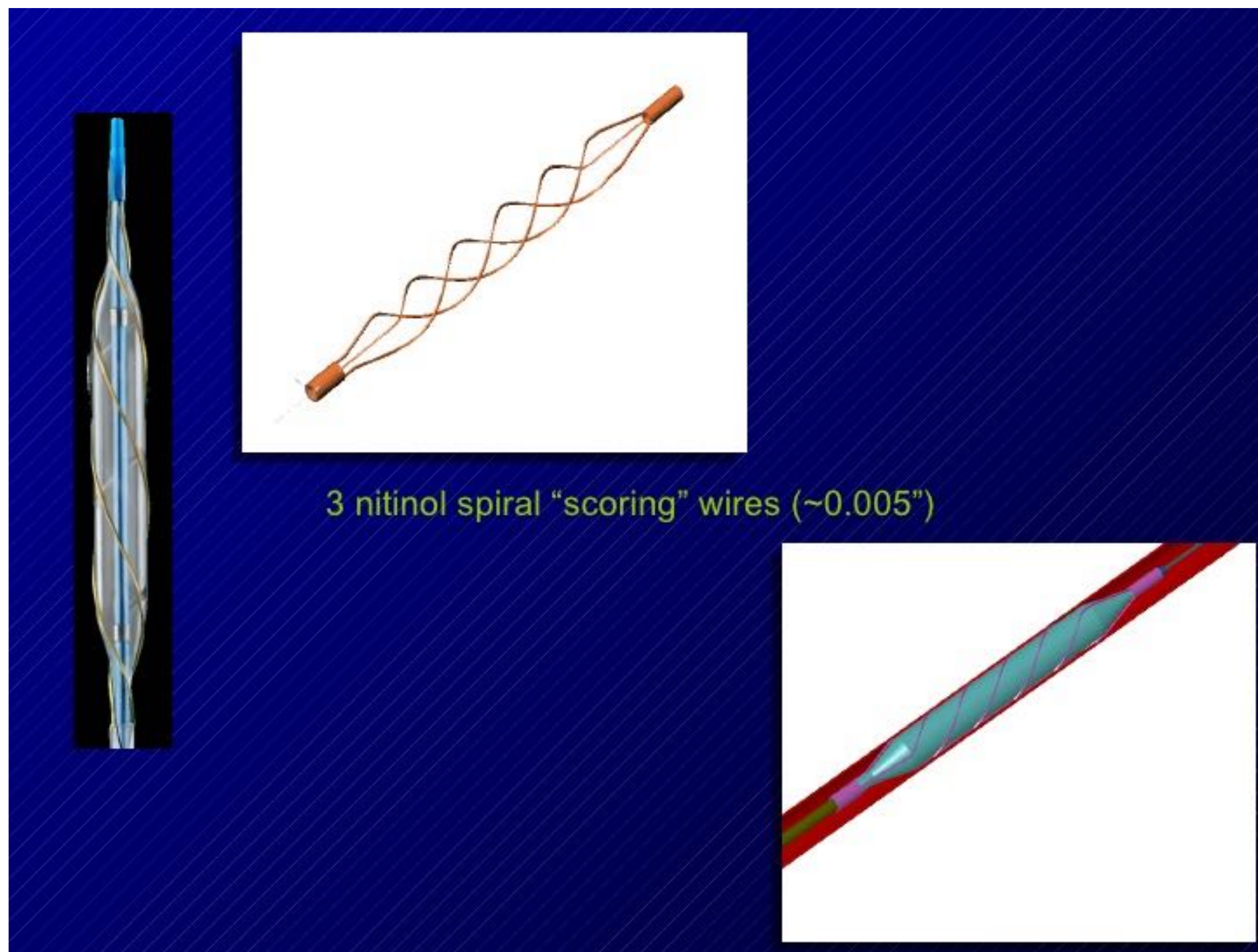
NSE Alpha – B Braun

Design features

- 3 triangle shaped scoring elements
- Rolled up in balloon folding for small profile
- Resistant Nylon material



Angiosculpt



Wolverine™ Cutting Balloon™ Préparation des Lésions Complexes

- Resténoses intra-stent – Eviter le glissement du dispositif
 - ▶ Les lésions avec une composition néo-intimale hyperplasique, présentent une plus grande résistance à la dilatation et entraîne un glissement des dispositifs^{1,2}
 - ▶ Le mécanisme d'action unique du cutting ballon permet une dilatation contrôlée en prévenant le glissement du dispositif³

- Lésions Ostiales et de Bifurcation* - Eviter le basculement de la plaque
 - ▶ Ce type de lésions complexes présentent un haut risque de recoil et de basculement de plaque
 - ▶ Le Cutting Balloon™ dilate avec succès en réduisant le recoil élastique⁴ et permet plus de compression de plaque avec glissement minimal et moins d'étirement du vaisseau^{5,6,7}

- Lésions fibreuses - Changer la compliance de la plaque
 - ▶ Les lésions résistantes ont une concentration plus importante d'élastine et de fibres musculaires
 - ▶ Les athérotomes (lames microchirurgicales) du Cutting Balloon™ entaillent sans forcer les plaques fibreuses apportant une stratégie unique et simple de dilatation des lésions résistantes par rapport aux ballons conventionnels¹⁵

Rotablateur



Sous utilisation du Rotablateur ?

Table 1. Rate of rotational atherectomy as function of total PCI numbers in some EU countries (source Boston Scientific).

Country	Rate (%)
United Kingdom	3.1
France	2.9
Spain	2.3
Austria	1.8
Portugal	1.5
The Netherlands	1.4
Italy	1.3
Belgium	1.3
Switzerland	1.1
Germany	0.8

Rotablateur – évolution de la technique

Table 2. Contemporary rotational atherectomy.

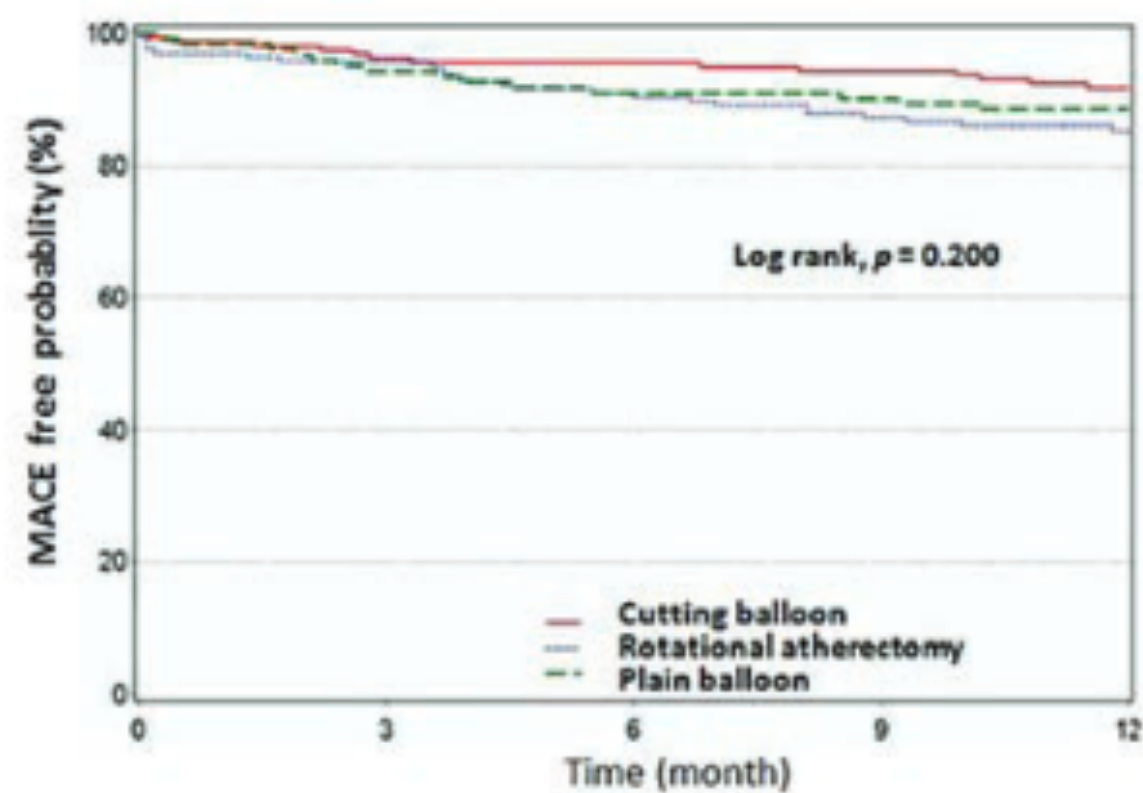
	Traditional	Contemporary
Arterial access	Femoral 8 Fr	Radial (6-7.5 Fr) or femoral (6-8 Fr), depending upon burr size requirement and operator experience
Guiding catheter	Judkins catheters	Single curve with strong support. Operator preference but stable catheter position required
Guidewire	Floppy rotawire or extra support rotawire for aorto-ostial lesions	Rotawire placement not always straightforward. Use of regular wire placement, with exchange using microcatheter placement often required
Burr size	Debulking up to 0.7 vessel ratio	Plaque modification with small burrs (1.25 mm to 1.5 mm) as initial strategy is default position. A step-up approach is encouraged to limit debris size and complications
Ablation speed	180,000 to 200,000 rpm	Plaque modification usually achieved at low speeds (135,000 to 180,000 rpm) to reduce risk of complications
Temporary pacemaker	Always for dominant RCA and left main PCI	Smaller burrs at lower speeds have led to lower incidence of transient heart block. Many operators use atropine to treat, avoiding any complications of temporary pacemaker placement
Rotablation flush	Rotablation cocktail with verapamil, nitrates and heparin in saline recommended	Rotablation cocktail with verapamil, nitrates and heparin in saline recommended

Rotablateur – expérience PSR CI-Fd (2011-2018)

	100% (328)
Artères coupables	
TC	12,8% (42)
IVA	41,2%(135)
CX	21,6%(71)
CD	37,8%(124)
Taille de l'introducteur (F)	
6	71,6%(235)
7	23%(77)
8	4,8%(16)
Abord Artériel	
Radial	45%(146)
Fémoral	55%(182)
Taille de la Fraise mm	
1,25	31%(102)
1,5	40%(133)
1,75	19%(65)
2	9%(30)
2,25	2%(6)
Deux fraises	5,7%(19)
Durée moyenne de fraisage	50 sec
Succès Angioplastie	94%(311)

Année	Angioplastie	Rota	%	Complications	%
2011	978	17	1,7	2	11,7
2012	1021	17	1,6	2	11,7
2013	1011	21	2	1	4,7
2014	1069	33	3	1	3
2015	1112	53	4,7	2	3,7
2016	1151	60	5,2	2	3,3
2017	1044	55	5,2	3	5,4
2018	994	72	7,2	1	1,3

Une technique meilleure que l'autre?



Number at risk	0	3	6	9	12
Cutting balloon	157	151	150	148	133
Rotational atherectomy	164	157	149	143	122
Plain balloon	121	114	110	109	96

FIGURE 1. Kaplan-Meier curve for major adverse cardiac events at 1-year follow-up in patients treated with rotational atherectomy, plain old balloon angioplasty, and cutting balloon angioplasty.

- 737 patients
- 874 lésions
- Lésions très calcifiées
- Rota 264 pts
- Cutting ballon 253 pts
- ballon classique 220 pts

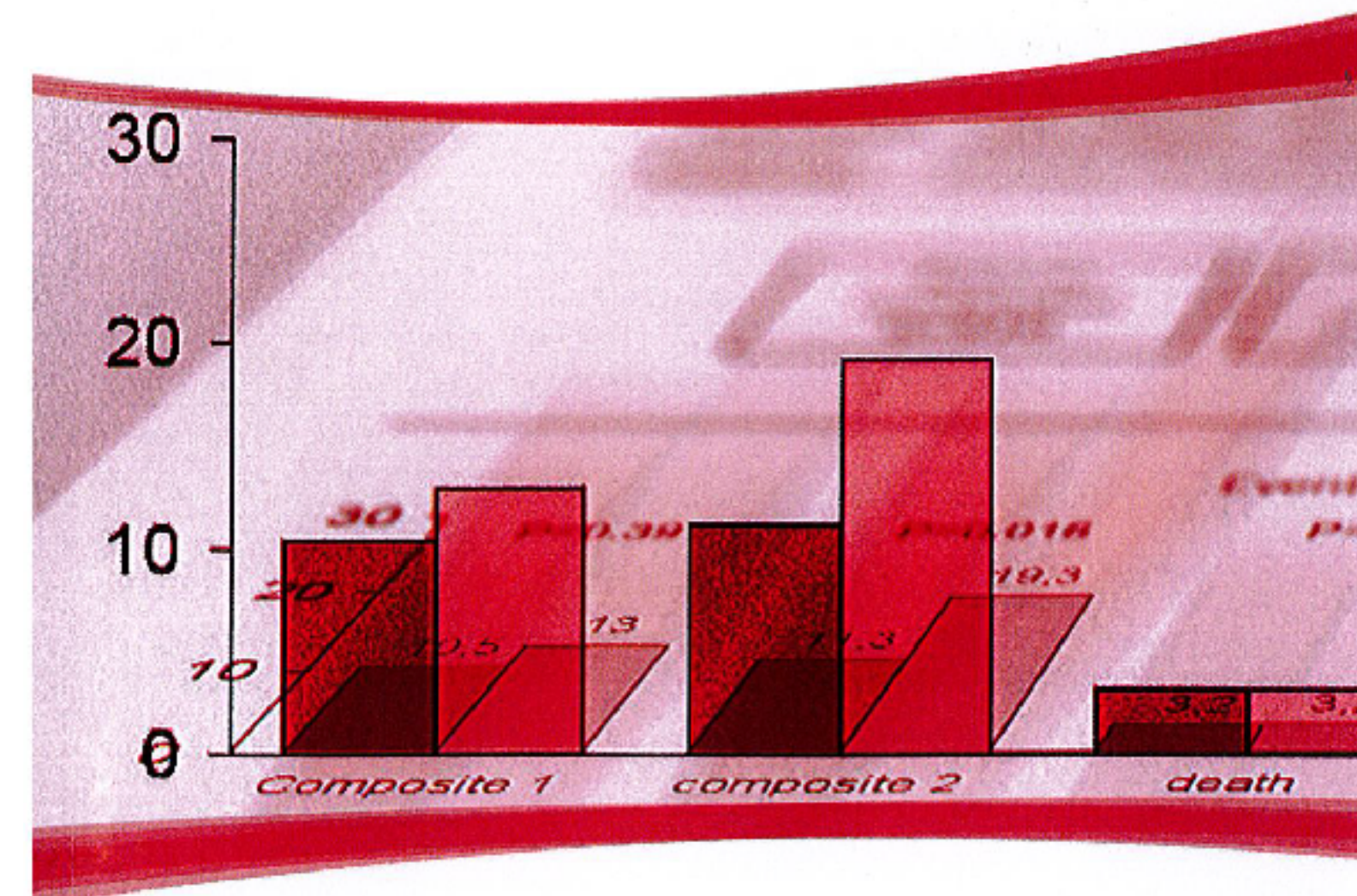
“Conclusion. A strategy of lesion preparation with RA, POBA, or CBA in HCCL may be associated with similar clinical out-comes in patients undergoing percutaneous intervention with DES. The RA group had a trend toward greater MACE, death, and TLR”.

Etudes randomisées
concernant le traitement
des lésions calcifiées?

Randomised trials 2019

Interventional cardiology 2014-2019

EDITORS: Pim J. de Feyter, Robert Byrne



in collaboration with
EuroIntervention
www.eurointervention.org

Conclusions

- **Plusieurs outils « classiques » pour traiter des lésions calcifiées**
- **Probablement sous utilisés**
- **Niveau des preuves faible**
- **Absence de remboursement spécifique**
- **Place des nouvelles modalités d'imagerie endo coronaire?**
- **Comparateurs pour des nouvelles technologies?**

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Merci pour votre attention

