



Pôle Cardiovasculaire et Métabolique

Occlusions coronaires chroniques

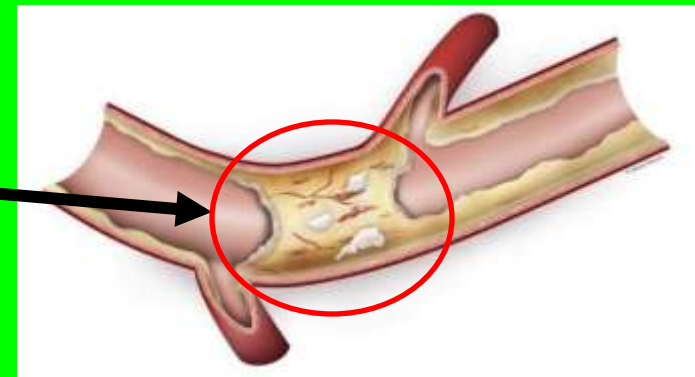
Indications et techniques de revascularisations

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Cardiologie, CHU RANGUEIL

Définition

Occlusion coronaire chronique (CTO)

- Flux TIMI 0 dans le segment occlus
- ≥ 3 mois.



European perspective in the recanalisation of Chronic Total Occlusions (CTO): consensus document from the EuroCTO Club

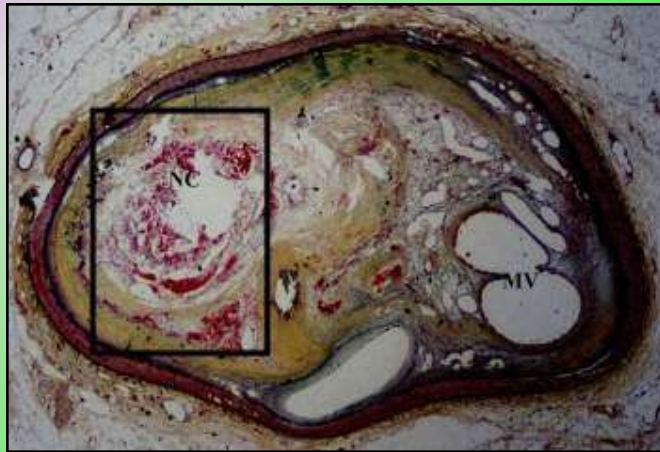
EuroIntervention

Eurointerv. 2007;3:30-43

Percutaneous Recanalization of Chronically Occluded Coronary Arteries: A Consensus Document: Part I

Circulation 2005;112;2364-2372

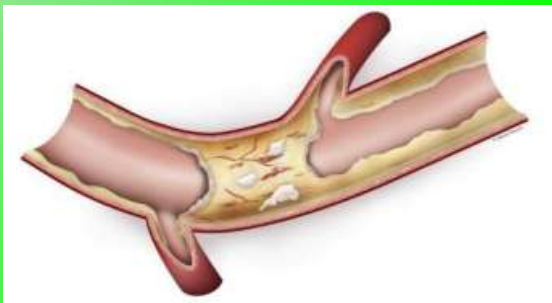
Histologie



Necrotic core, cholesterol, inflammation



Fibrocalcific areas



Microchannels

Srivasta *et al.* JACC 1997;29:955-963



Considérations cliniques

Modes de révélation:

Angor, dyspnée, Syndrome coronaire aigu

Objectifs de la revascularisation:

- mortalité
- signes fonctionnels
- Fraction d'éjection ventriculaire gauche



European perspective in the recanalisation of Chronic Total Occlusions (CTO): consensus document from the EuroCTO Club
EuroInterv.2007;3:30-43



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Viabilité/ ischémie myocardique

Revasculariser du myocarde viable +++

Ventriculographie/ Echocardiographie (Cinétique segmentaire)

IRM myocardique/ Scintigraphie/ Echo de stress



Revascularisation des CTOs

Chirurgie de pontage en première intention si:

- Lésions pluritronculaires complexes
- Occlusions multiples, anciennes
- Occlusion de l'IVA ostio-proximale
- Diabète (insulino-dépendant)
- Insuffisance rénale
- Altération de la fraction d'éjection ventriculaire gauche
- Sténose du tronc commun

Guidelines on myocardial revascularization

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

Table 8 Indications for revascularization in stable angina or silent ischaemia

	Subset of CAD by anatomy	Class ^a	Level ^b	Ref. ^c
For prognosis	Left main >50% ^d	I	A	30, 31, 54
	Any proximal LAD >50% ^d	I	A	30–37
	2VD or 3VD with impaired LV function ^d	I	B	30–37
	Proven large area of ischaemia (>10% LV)	I	B	13, 14, 38
	Single remaining patent vessel >50% stenosis ^d	I	C	—
	IVD without proximal LAD and without >10% ischaemia	III	A	39, 40, 53
For symptoms	Any stenosis >50% with limiting angina or angina equivalent, unresponsive to OMT	I	A	30, 31, 39–43
	Dyspnoea/CHF and >10% LV ischaemia/viability supplied by >50% stenotic artery	IIa	B	—
	No limiting symptoms with OMT	III	C	—

Table 9 Indications for coronary artery bypass grafting vs. percutaneous coronary intervention in stable patients with lesions suitable for both procedures and low predicted surgical mortality

Subset of CAD by anatomy	Favours CABG	Favours PCI	Ref.
IVD or 2VD - non-proximal LAD	IIb C	I C	—
IVD or 2VD - proximal LAD	I A	IIa B	30, 31, 50, 51
3VD simple lesions, full functional revascularization achievable with PCI, SYNTAX score ≤22	I A	IIa B	4, 30–37, 53
3VD complex lesions, incomplete revascularization achievable with PCI, SYNTAX score >22	I A	III A	4, 30–37, 53
Left main (isolated or IVD, ostium/shaft)	I A	IIa B	4, 54
Left main (isolated or IVD, distal bifurcation)	I A	IIb B	4, 54
Left main + 2VD or 3VD, SYNTAX score ≤32	I A	IIb B	4, 54
Left main + 2VD or 3VD, SYNTAX score ≥33	I A	III B	4, 54



Revascularisations des CTO: bénéfiques

➔ Mortalité cardiovasculaire à moyen et long terme

TABLE 1. Long-Term Survival After Attempted Revascularization of CTOs in Unselected Patients Undergoing PCI, Stratified by Procedural Outcome

Study	No. of Patients	Success	Duration of Follow-up, y	Mortality, %		
				PCI Success	PCI Failure	P
Mid America Heart Institute ⁵⁸	2007	1491 (74.4%)	10	26.6	35.0	0.001
British Columbia Cardiac Registry ⁵⁹	1458	1118 (76.7%)	1	10.0	19.0	<0.001
TOAST-GISE ²²	369	286 (77.5%)	6	1.1	3.6	0.13

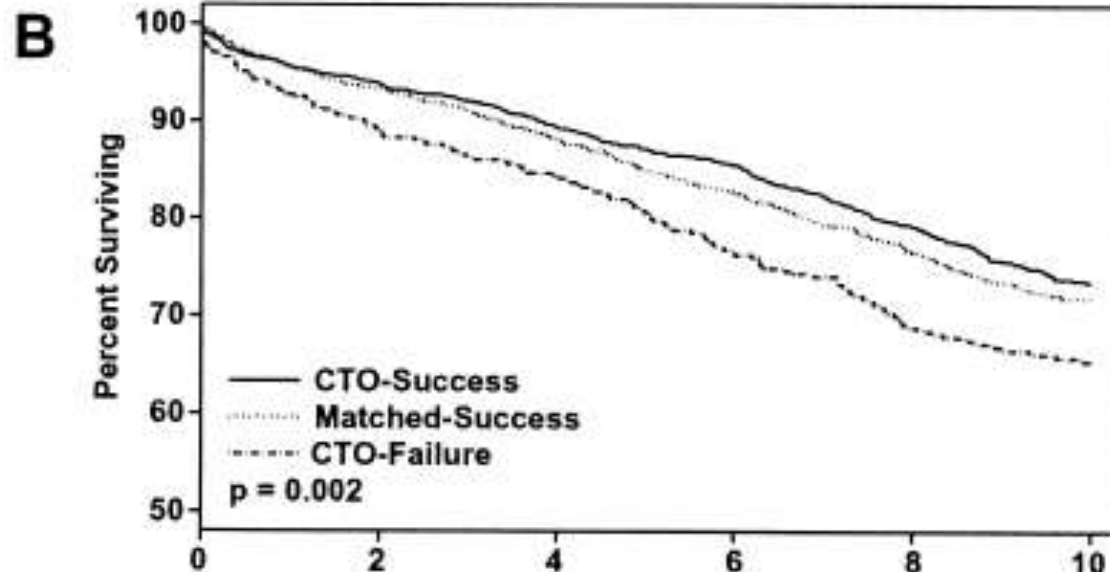
Percutaneous Recanalization of Chronically Occluded Coronary Arteries: A Consensus Document: Part I

Circulation 2005;112:2364-2372



Revascularisations des CTO: bénéfiques

Mortalité à 10 ans

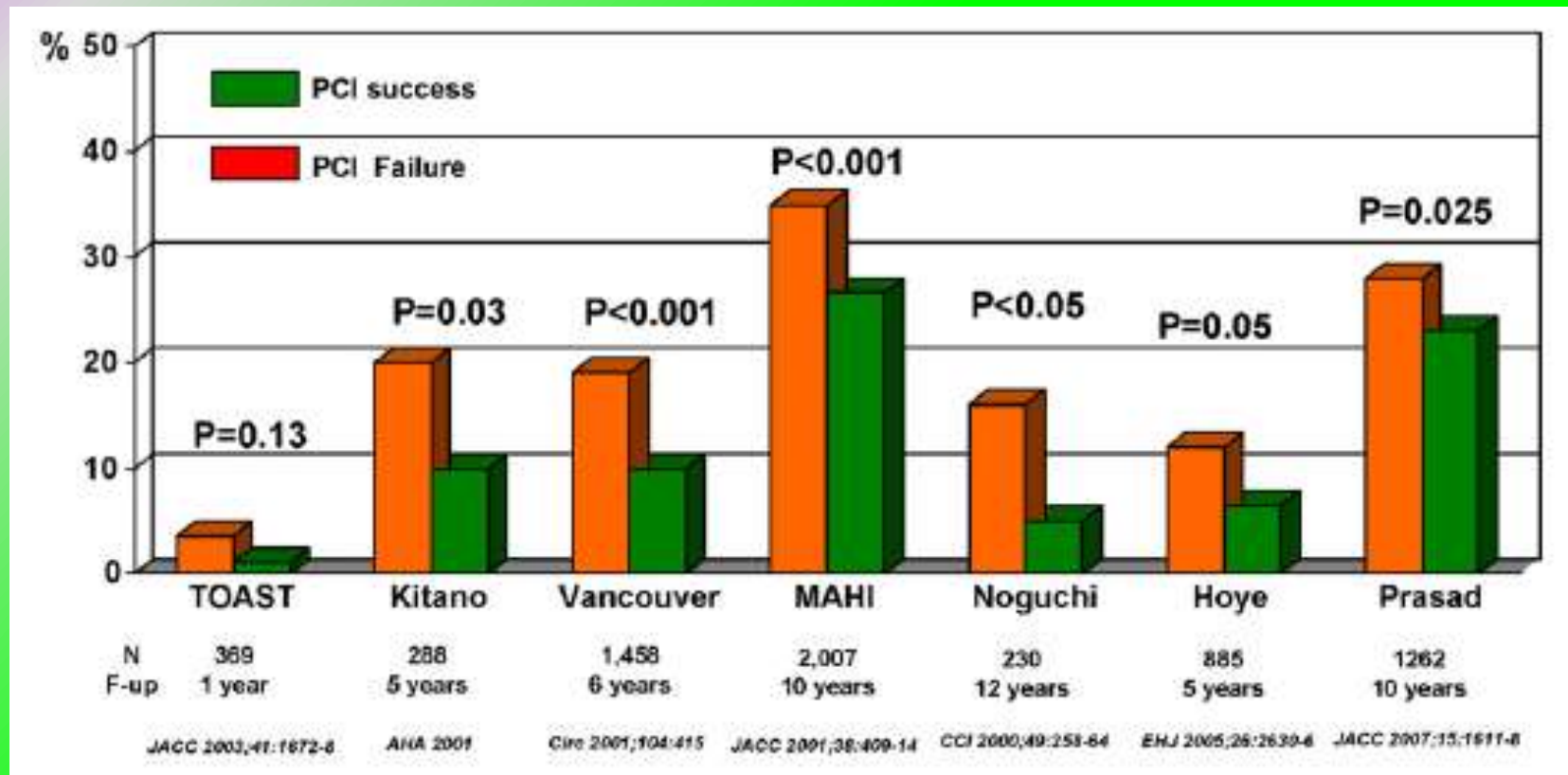


N / %	0	2	4	6	8	10
CTO-S	1491	1208/93.7	1033/89.4	852/85.5	638/79.2	445/73.5
M-S	1888	1497/93.2	1256/88.0	1028/82.7	811/76.6	606/71.9
CTO-F	514	396/89.0	360/84.4	293/76.5	221/68.8	171/65.0

James A. Suero, Steven P. Marso, Philip G. Jones, Steven B. Laster, Kenneth C. Huber, Lee V. Giorgi, Warren L. Johnson, and Barry D. Rutherford
J. Am. Coll. Cardiol. 2001;38:409-414



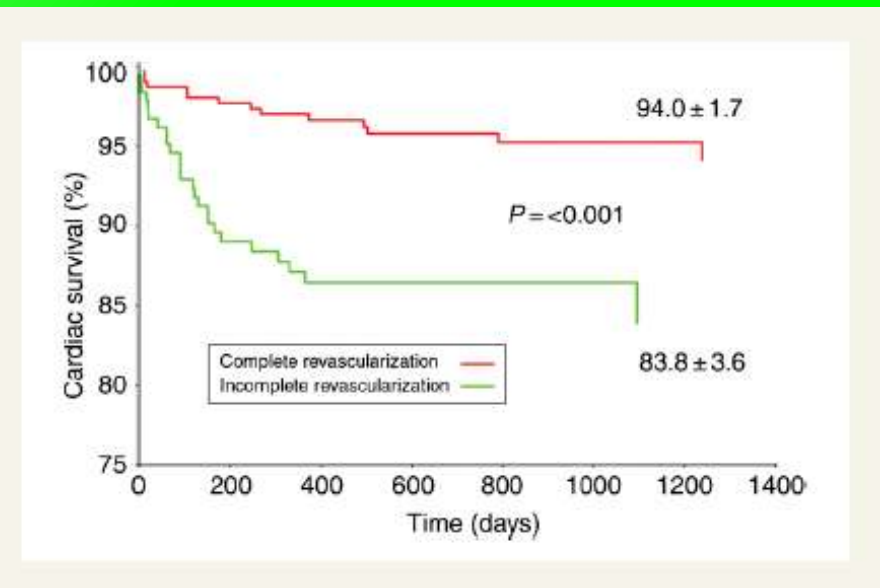
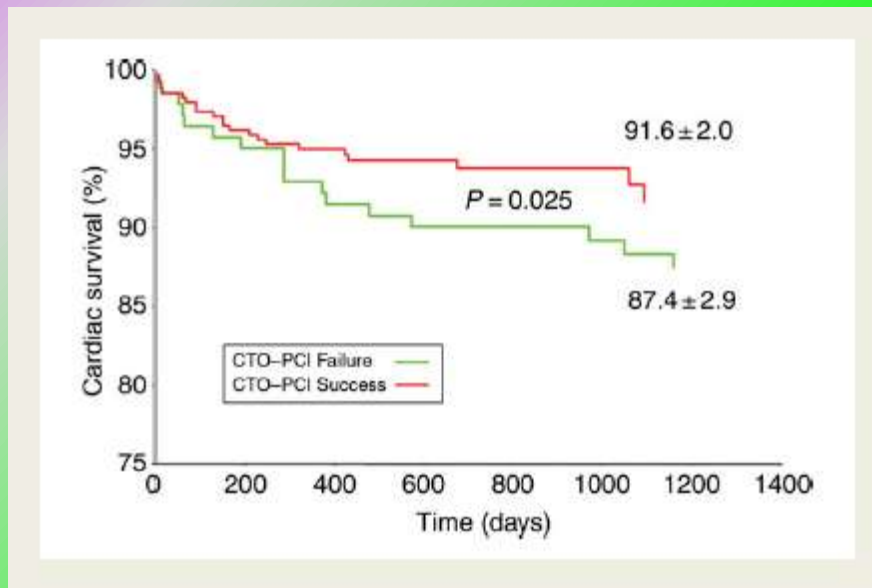
Revascularisations des CTO: bénéfiques





Revascularisations des CTO: bénéfiques

Revascularisation des pluritronculaires avec CTO



CTO-PCI failure, n= 142; CTO-PCI success, n=344.

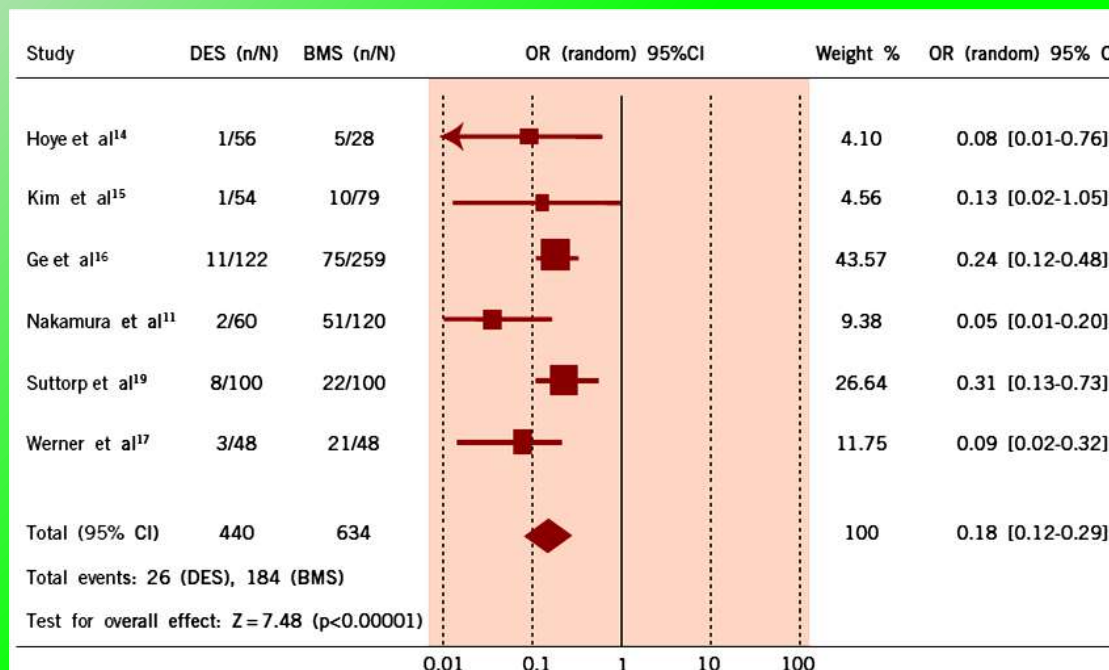
➤ **Mortalité après revascularisation complète, y compris des occlusions chroniques.**

Valenti R *et al.* Eur Heart J.2008:2336-2342



Revascularisations des CTO: bénéfiques

Intérêt des stents actifs: ↘ revascularisation (resténose) vs stents nus:



Hoye *et al.* Eurointervention. 2006

Revascularisations des CTO: risques

➔ Irradiation patient/ opérateur

JACC Vol. 44, No. 11, 2004
December 7, 2004;2259-82

Hirshfeld Jr. et al.
ACCF/AHA/HRS/SCAI Fluoroscopy Clinical Competence Statement

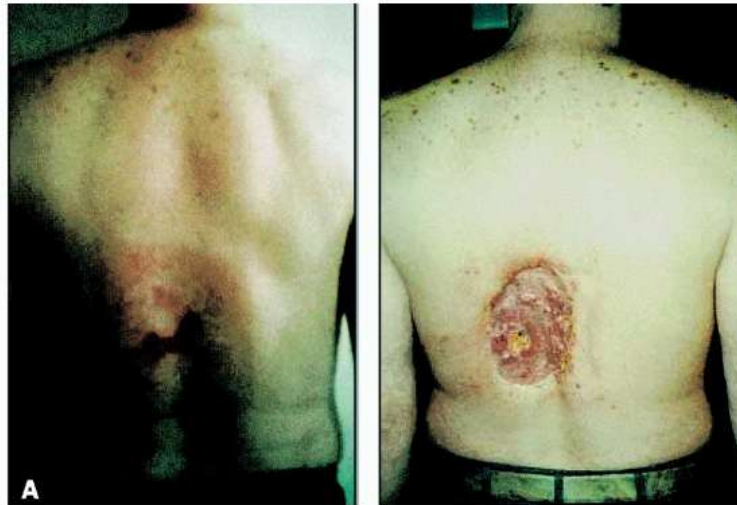


Table 4. Threshold Skin Entrance Doses for Different Skin Injuries

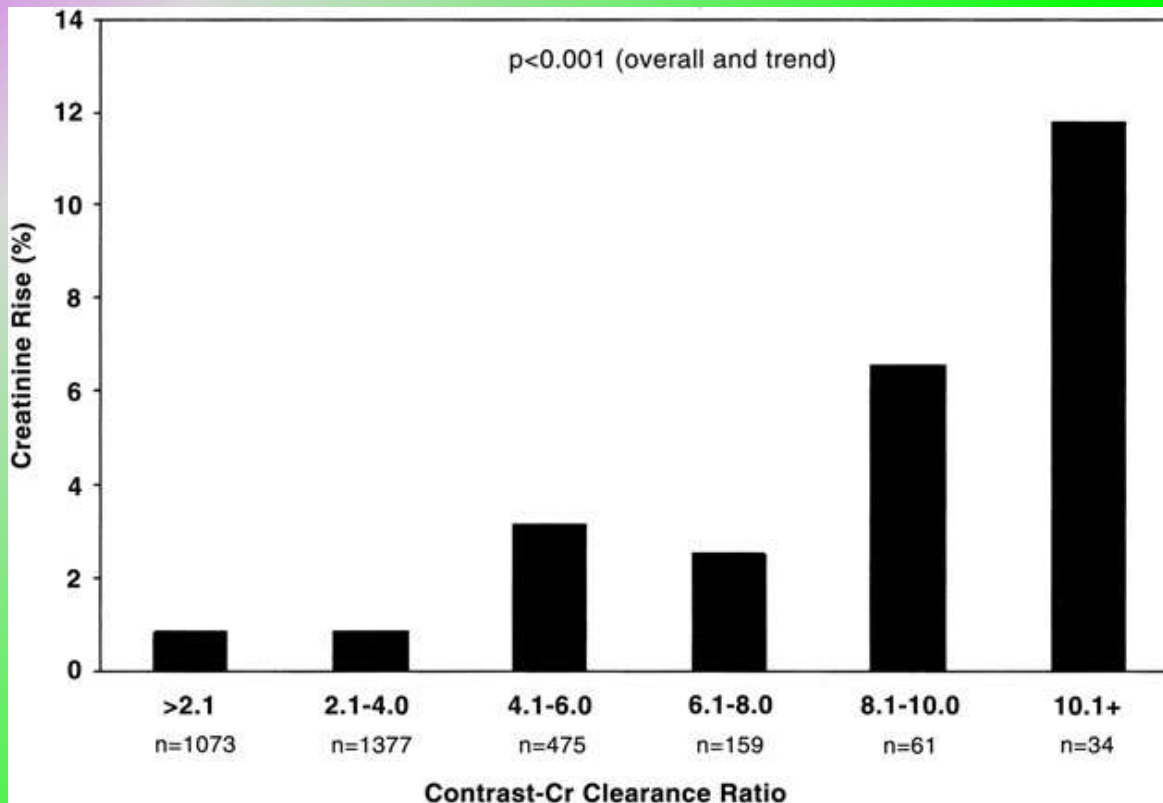
Single-Dose Effect	Threshold (Gy)	Onset
Early transient erythema	2	Hours
Main erythema	6	Approximately 10 days
Late erythema	15	Approximately 6-10 wks
Temporary epilation	3	Approximately 3 wks
Permanent epilation	7	Approximately 3 wks
Dry desquamation	14	Approximately 4 wks
Moist desquamation	18	Approximately 4 wks
Secondary ulceration	24	Greater than 6 wks
Ischemic dermal necrosis	18	Greater than 10 wks
Dermal atrophy (1st phase)	10	Greater than 14 wks
Dermal atrophy (2nd phase)	10	Greater than 1 yr
Induration (invasive fibrosis)	10	*
Telangiectasia	10	Greater than 1 yr
Late dermal necrosis	Greater than 12?	Greater than 1 yr
Skin cancer	Not known	Greater than 5 yrs

Gy = Gray. *No estimate available. Data derived from references 1,4,10-12.



Revascularisations des CTO: risques

➔ injections iodées (risque de néphropathie)



Nephropathy is rare at ratio <4
Very common at ratio > 8



Ratio = Contrast volume/ Clairance créatinine

Laskey et al. JACC 2007



Pôle Cardiovasculaire et Métabolique

Revascularisations des occlusions chroniques

matériels, techniques d'angioplastie



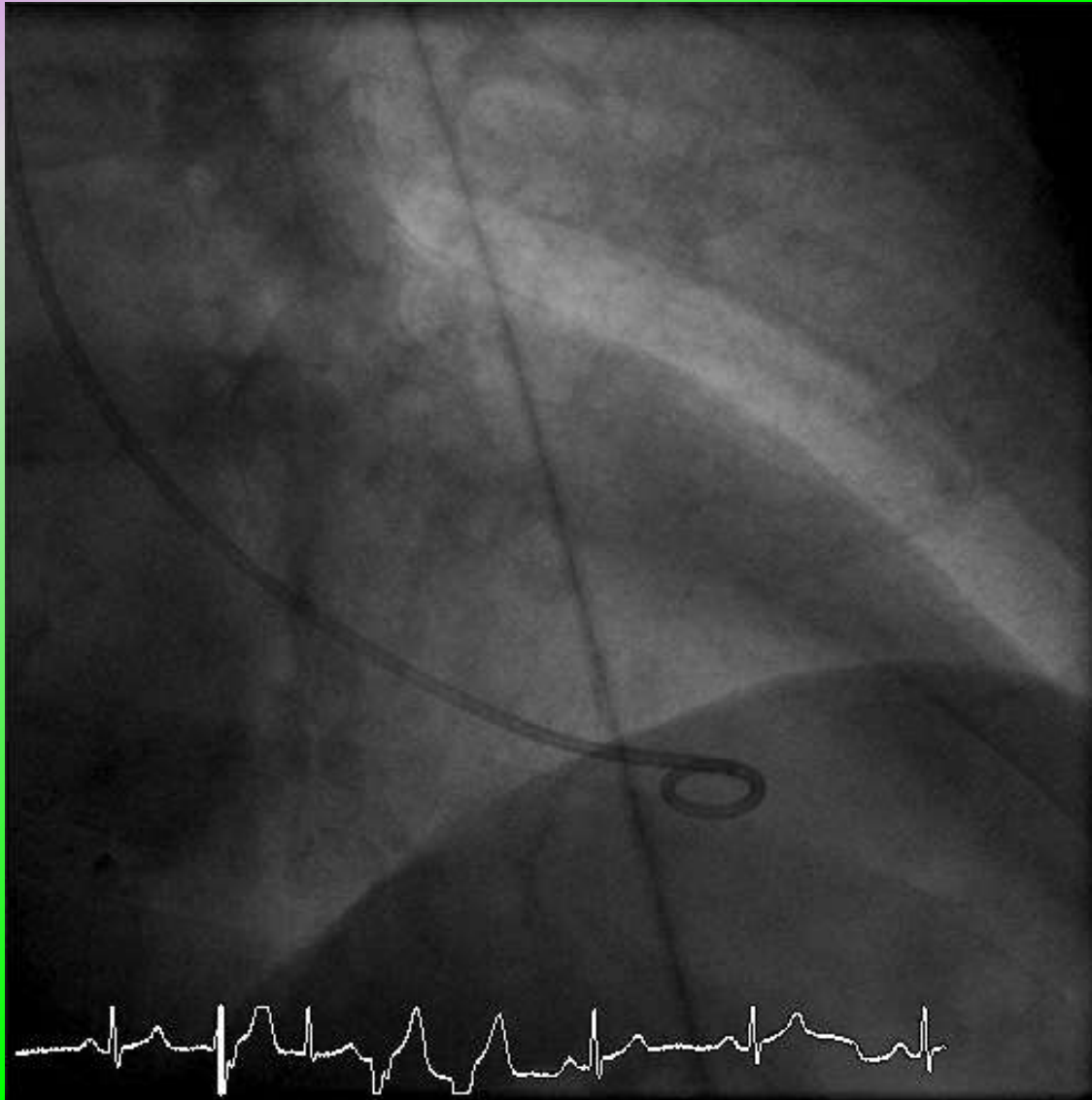
CAS 1

Mr M.-V., 62 ans

- Dyslipidémie, tabagisme actif (40 PA), hérédité coronaire (fratrie).
- Angor depuis 2 ans jamais exploré. Traitement médical.
Aggravation: classe 3 depuis 4 mois



Pôle Cardiovasculaire et Métabolique

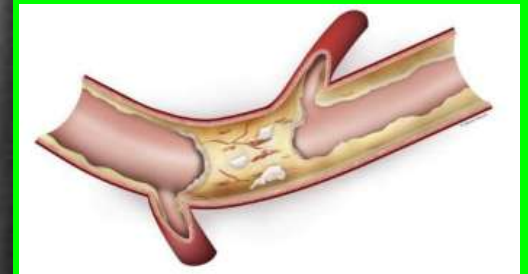
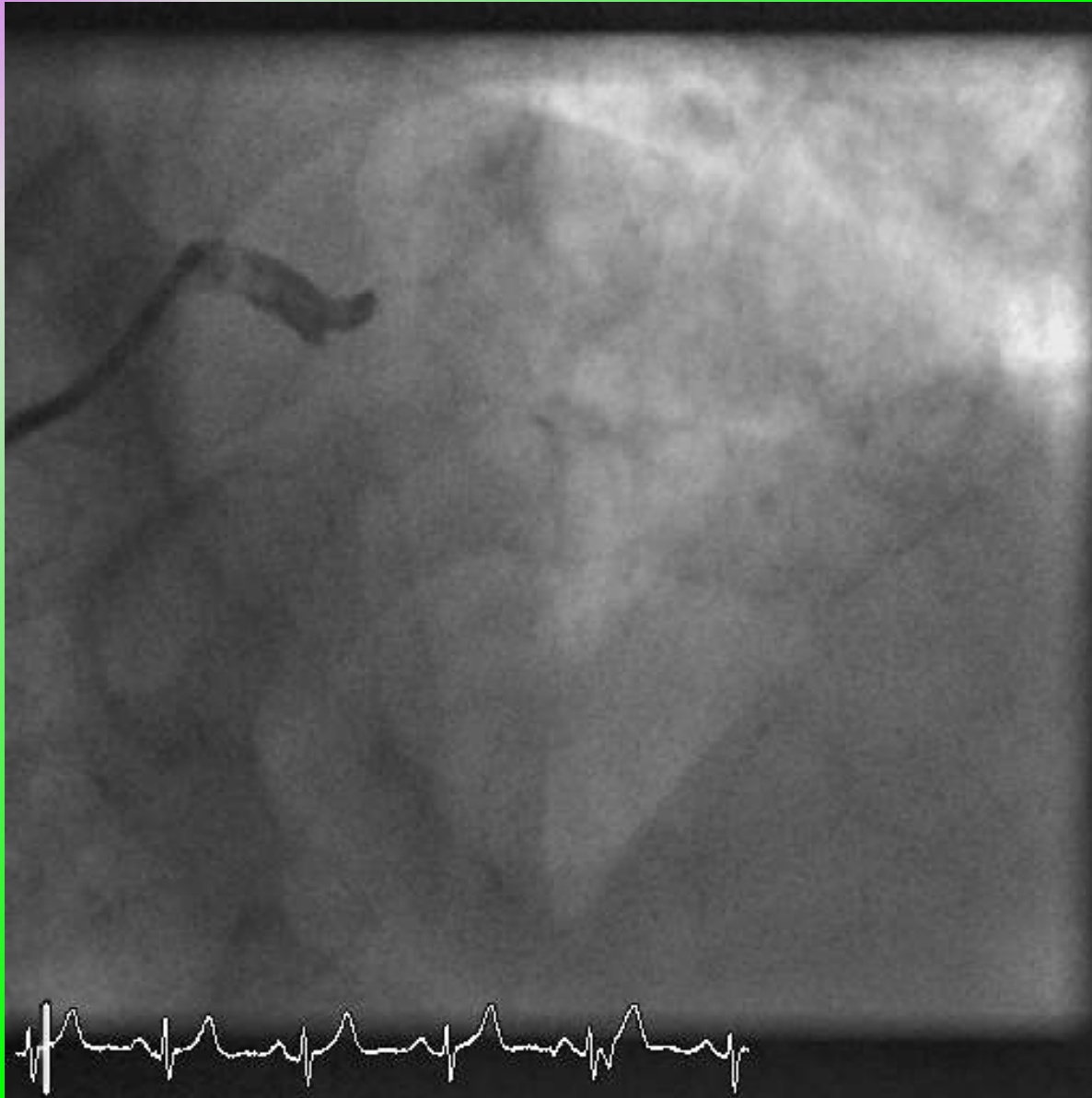


Toulouse
Ville de Lumière

EURO-PHARMAT
journées nationales
sur les dispositifs
médicaux

12-13-14
octobre
2010

20^{ème}
édition



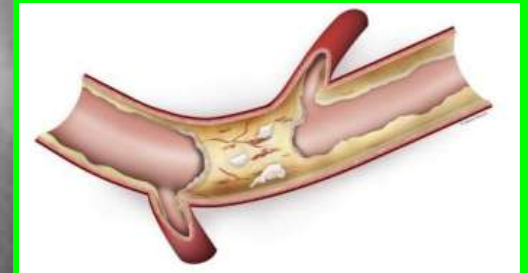
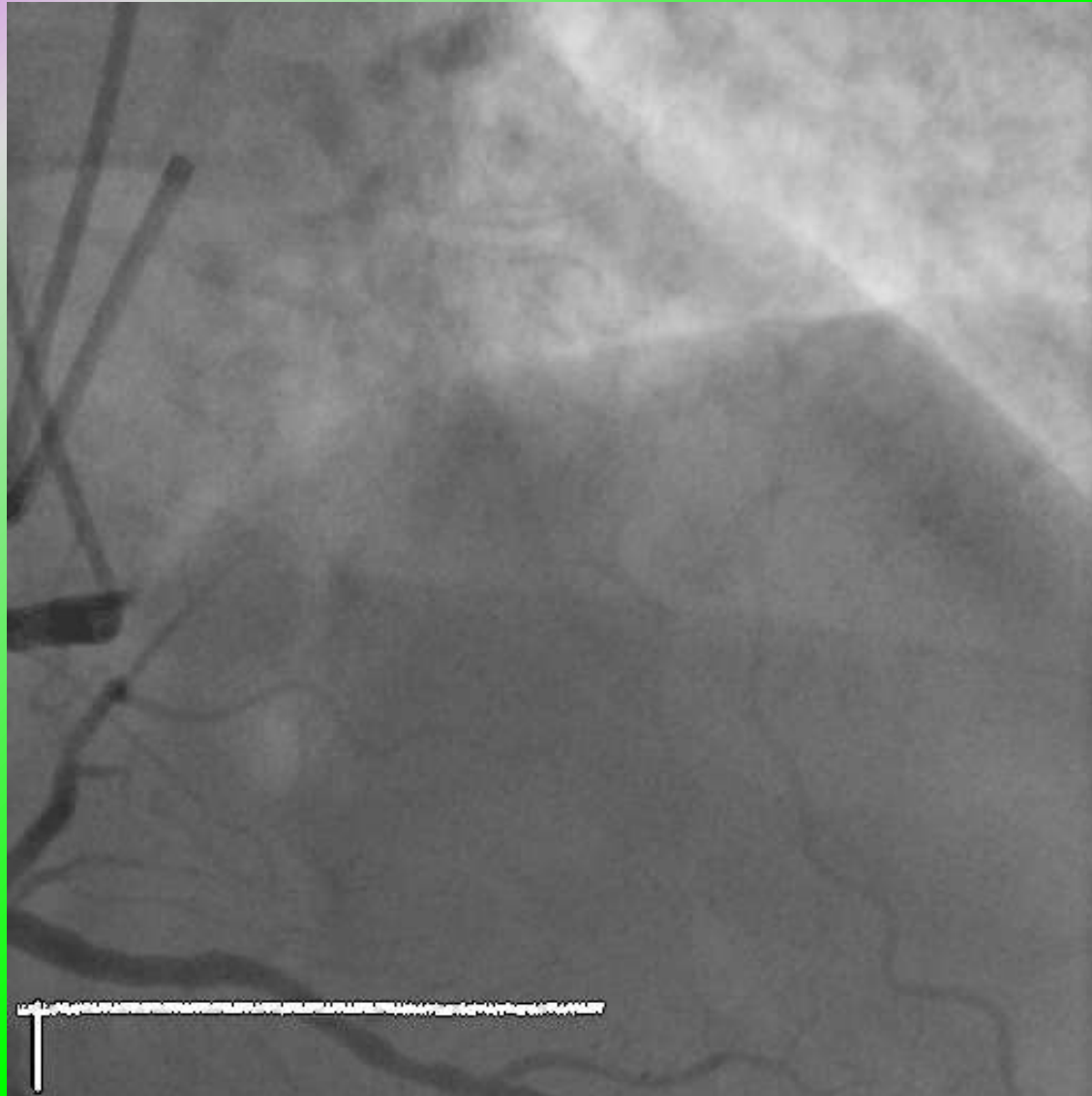


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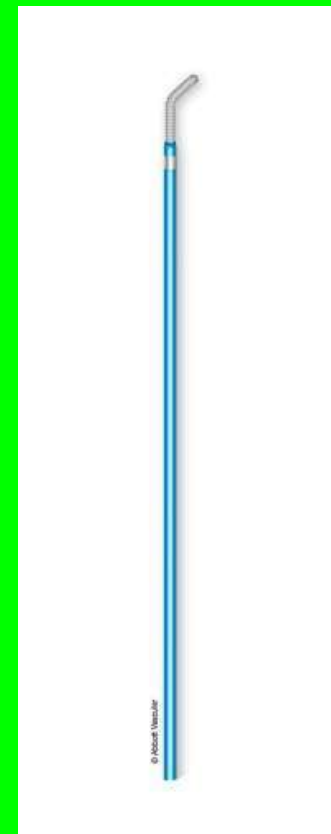
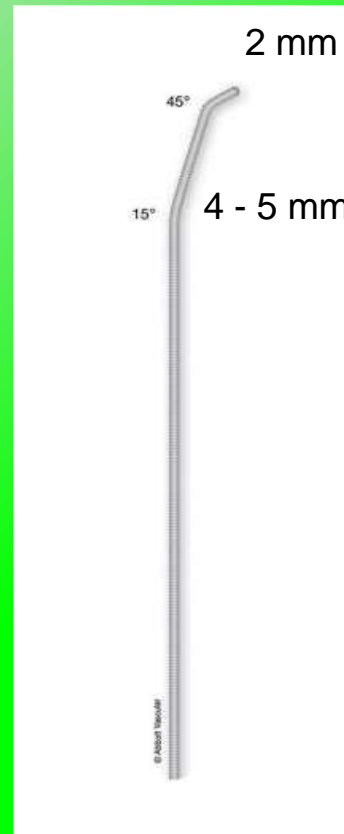
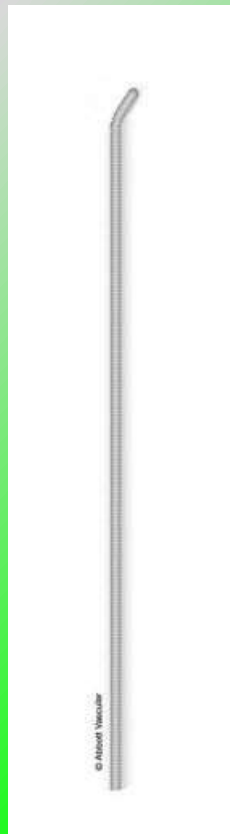




Pôle Cardiovasculaire et Métabolique



Guidewires and microcatheters





ASAHI MIRACLEBROS 3



COATING: **HYDROPHOBIC**

- Tip load: 3.0 g
- Jointless spring coils
- Radiopaque tip length: 11 cm



Product	Art. No.	Diameter [inch]	Length [cm]	Radiopaque Tip Length [cm]	Tip Shape
ASAHI MIRACLEBROS 3	AG14M050	0.014	180	11	Straight
ASAHI MIRACLEBROS 3	AG14M350	0.014	300	11	Straight

Controlled drilling

Penetration technique

Sliding technique

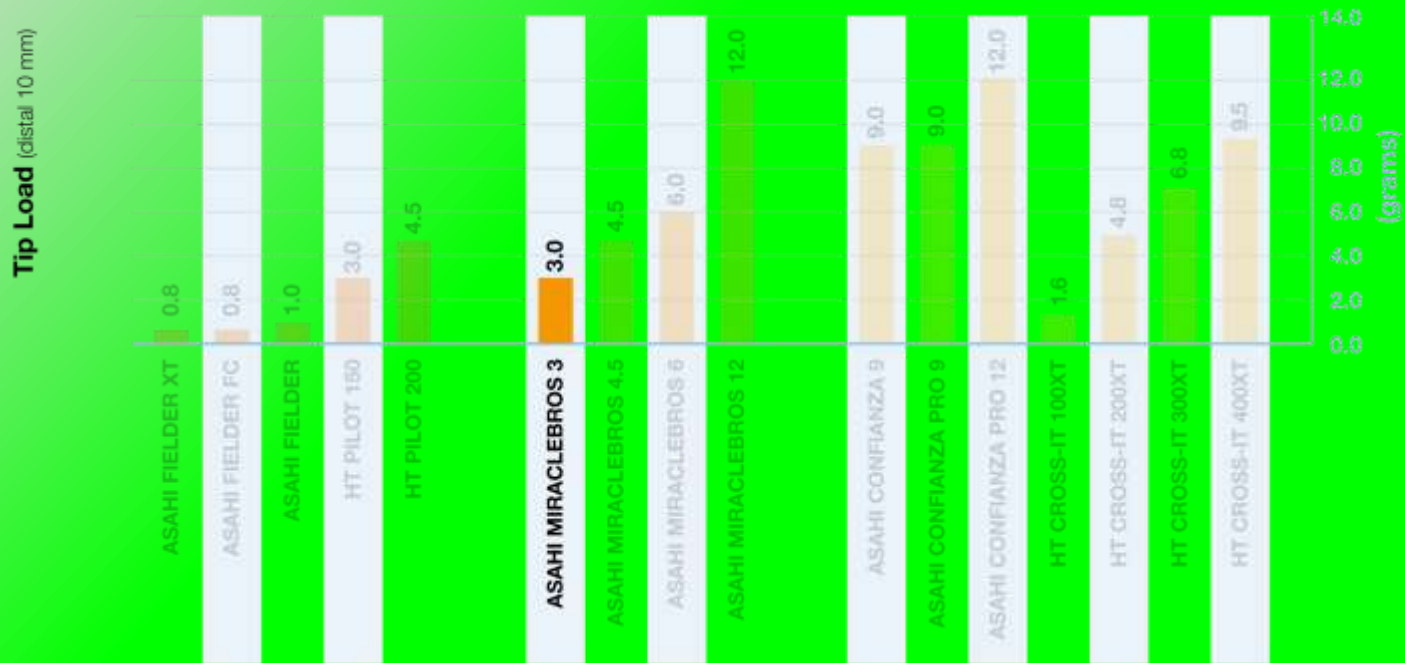
Retrograde approach



ASAHI MIRACLEBROS 3

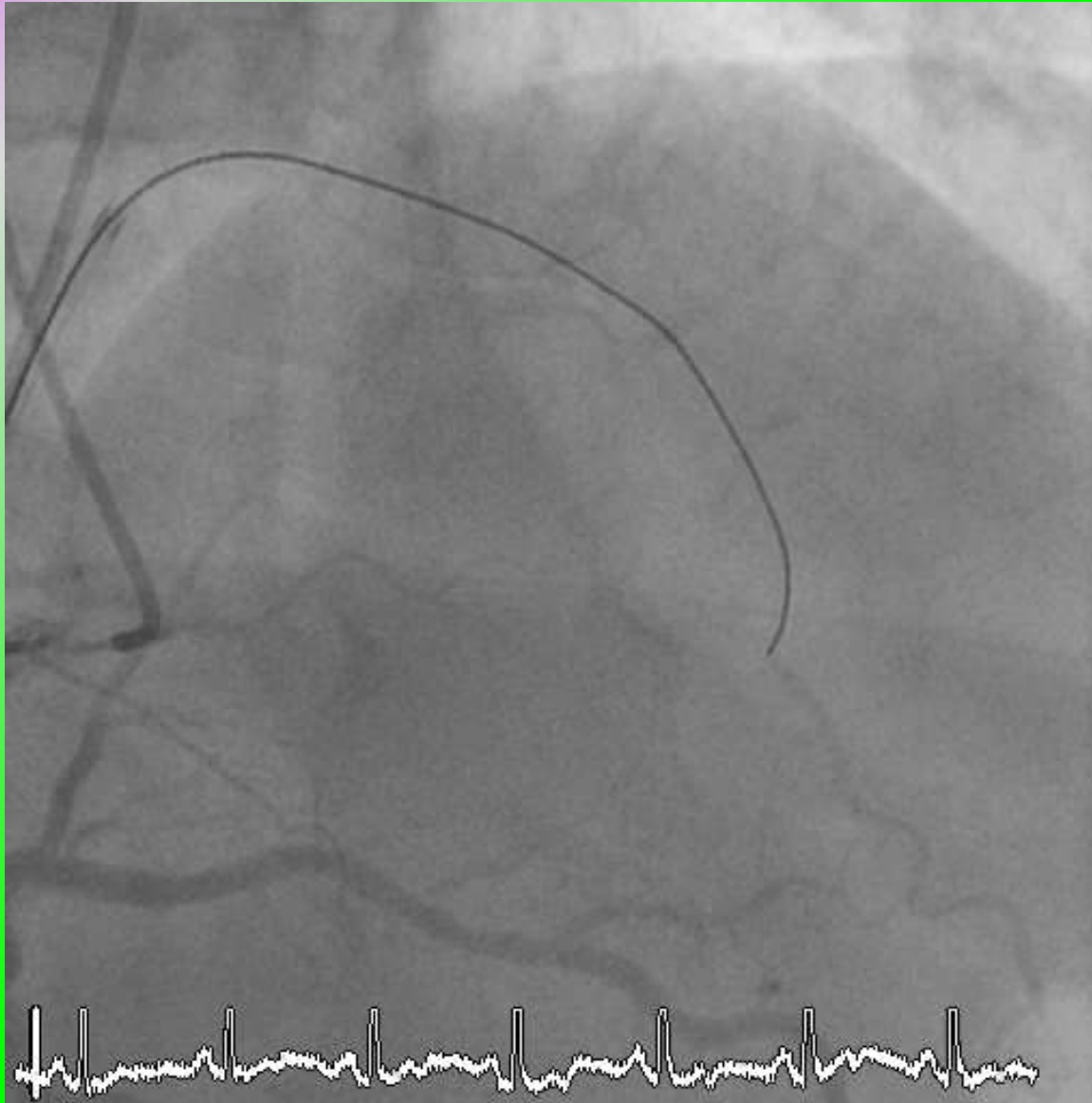


(Force required to buckle the distal 10 mm tip)



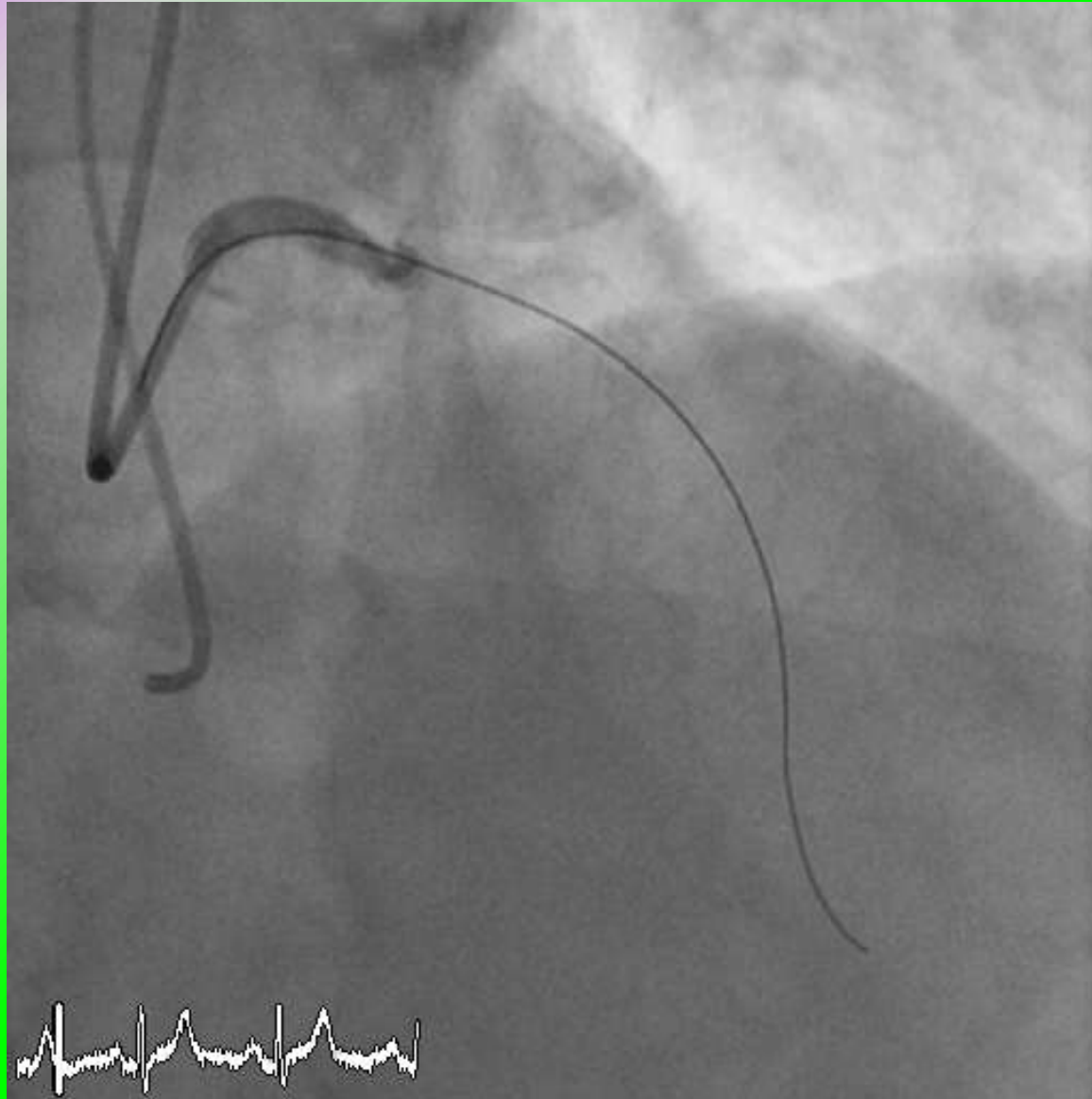


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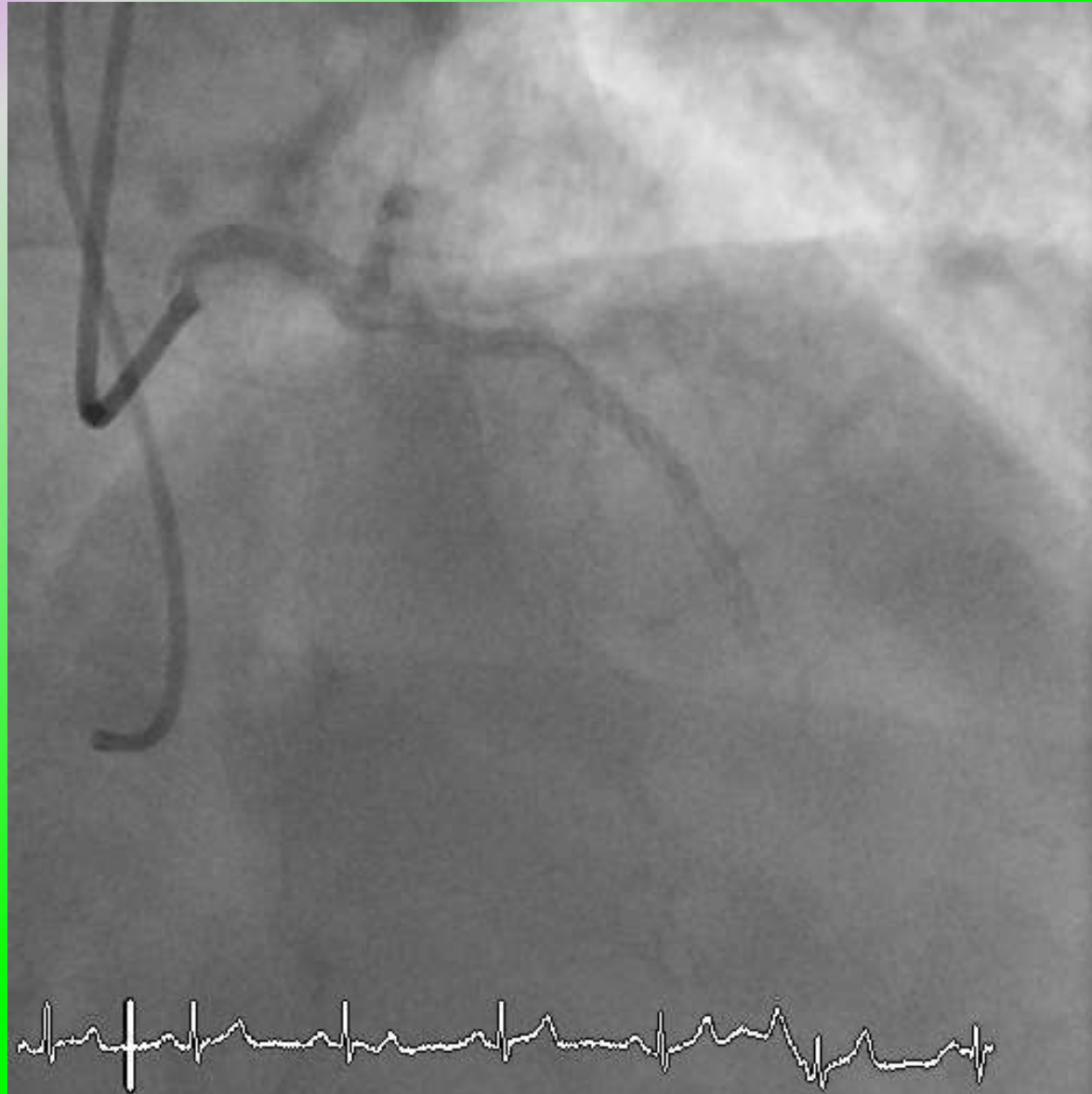


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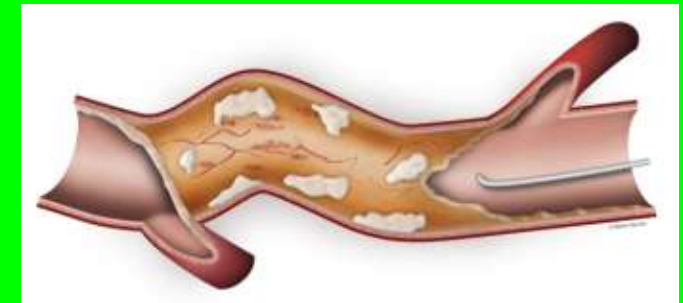
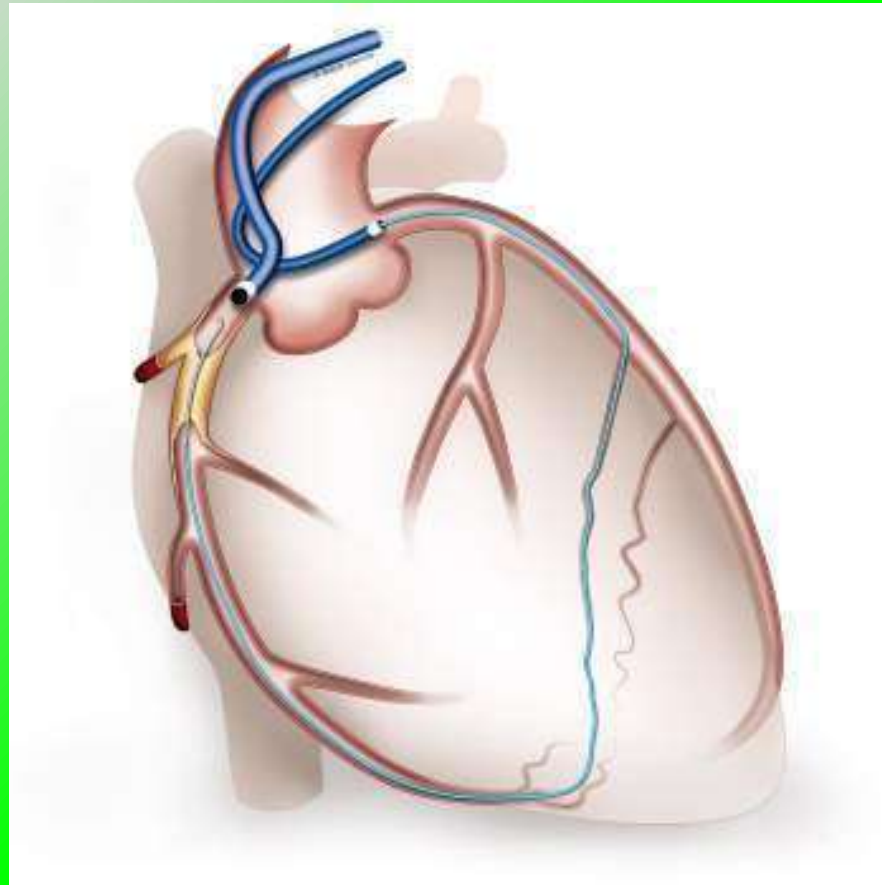




Pôle Cardiovasculaire et Métabolique



Techniques rétrogrades





CAS 2

Mr G., 61 ans

Angor classe 2 fort, sous traitement

Cardiopathie ischémique depuis 2004

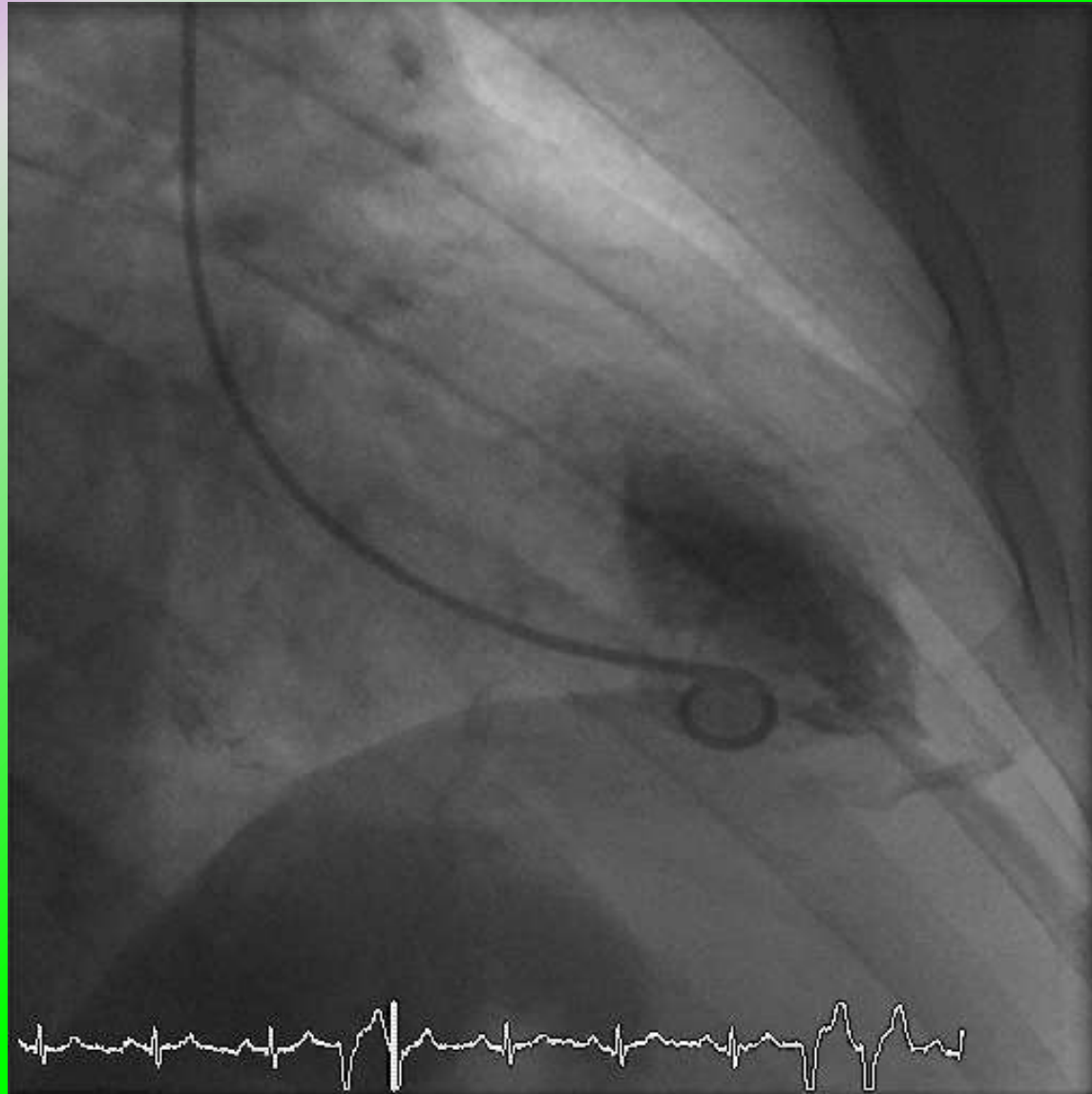
Infarctus inférieur en 2004: angioplastie CD et marginale, avec occlusion IVA2 (traitement médical, refus de chirurgie)

Facteurs de risque cardiovasculaire

Tabac sevré (30PA), Dyslipidémie, hérédité coronaire.



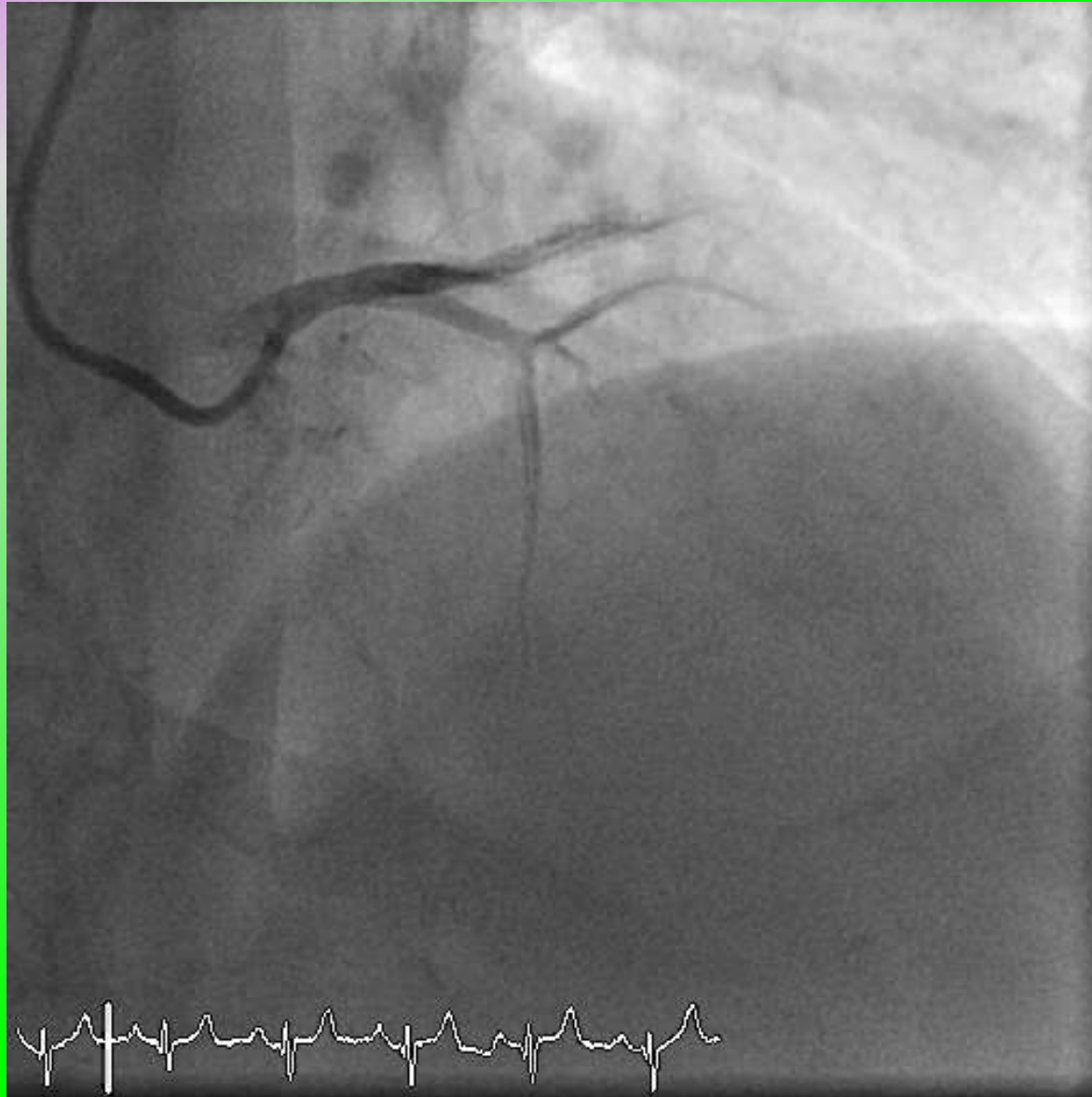
Pôle Cardiovasculaire et Métabolique

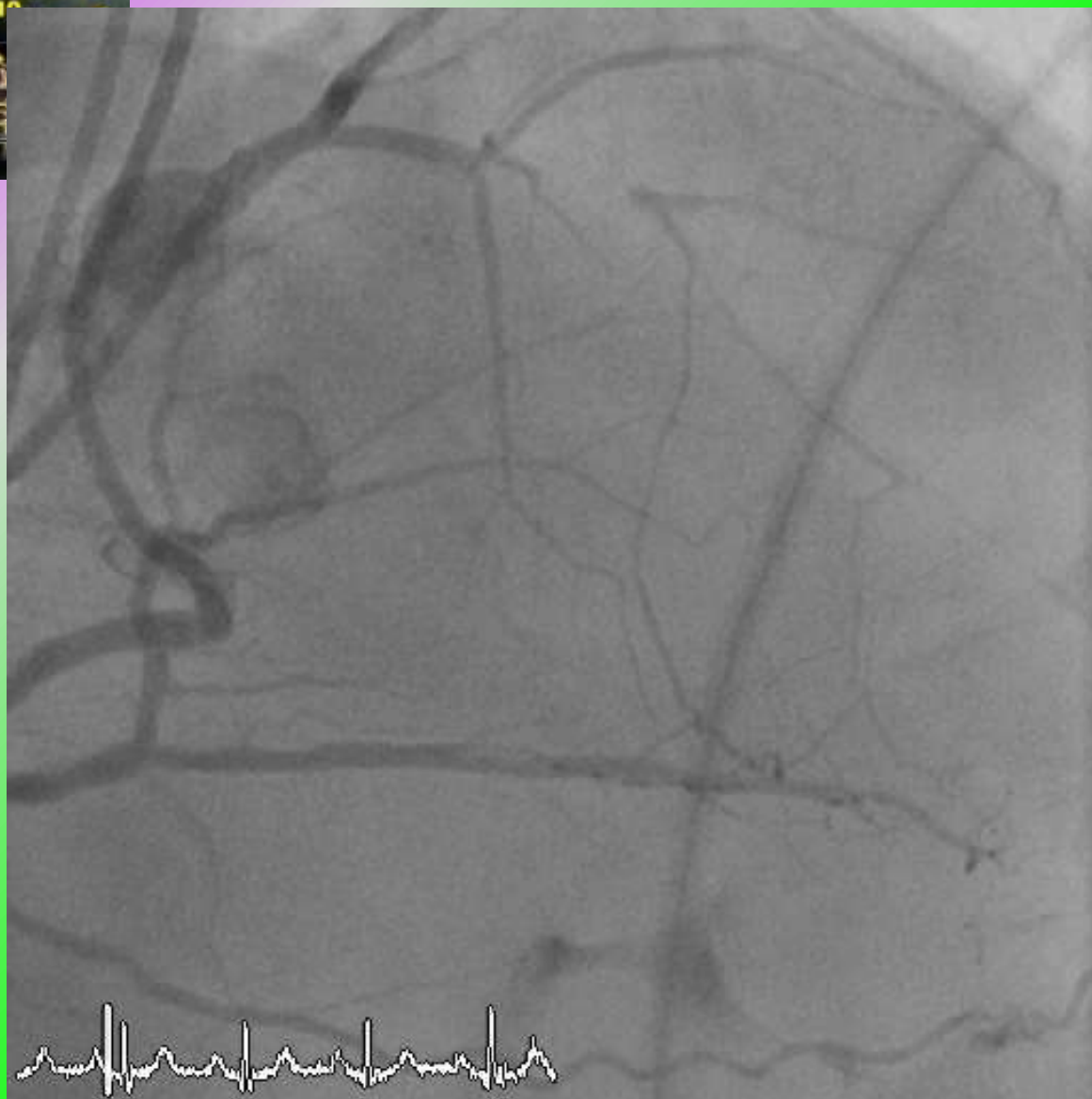






Pôle Cardiovasculaire et Métabolique





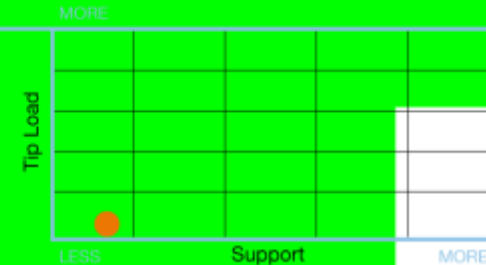
- Chape fibreuse distale plus fine
- Plusieurs collatérales avec septales rectiligne

ASAHI FIELDER XT



COATING: **HYDROPHILIC**

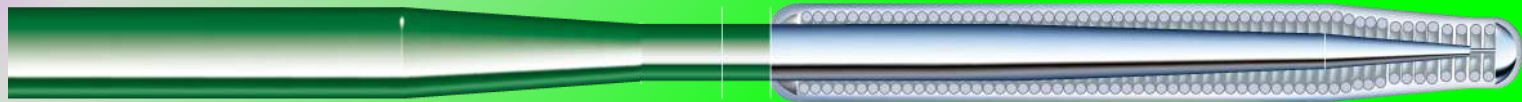
- Tip load: 0.8 g
- Jointless spring coils (16 cm)
- Full polymer cover
- Radiopaque tip length: 16 cm



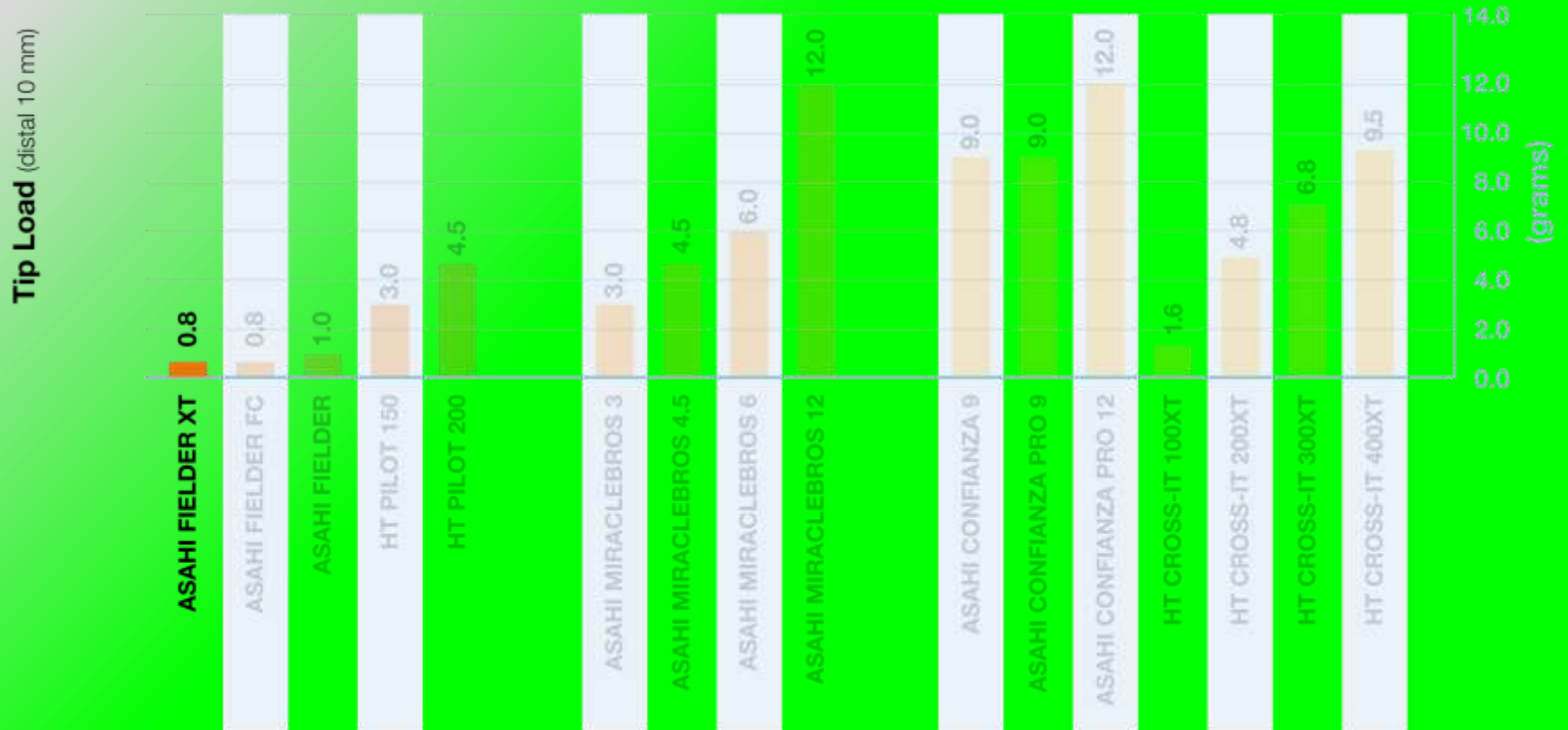
Product	Art. No.	Diameter [inch]	Length [cm]	Radiopaque Tip Length [cm]	Tip Shape
ASAHI FIELDER XT	AGP140002	0.014/0.009	190	16	Straight
ASAHI FIELDER XT	AGP140302	0.014/0.009	300	16	Straight

Hydrophile, extrémité distale effilée

ASAHI FIELDER XT



(Force required to buckle the distal 10 mm tip)



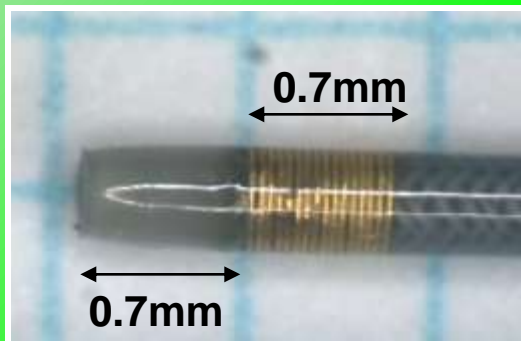
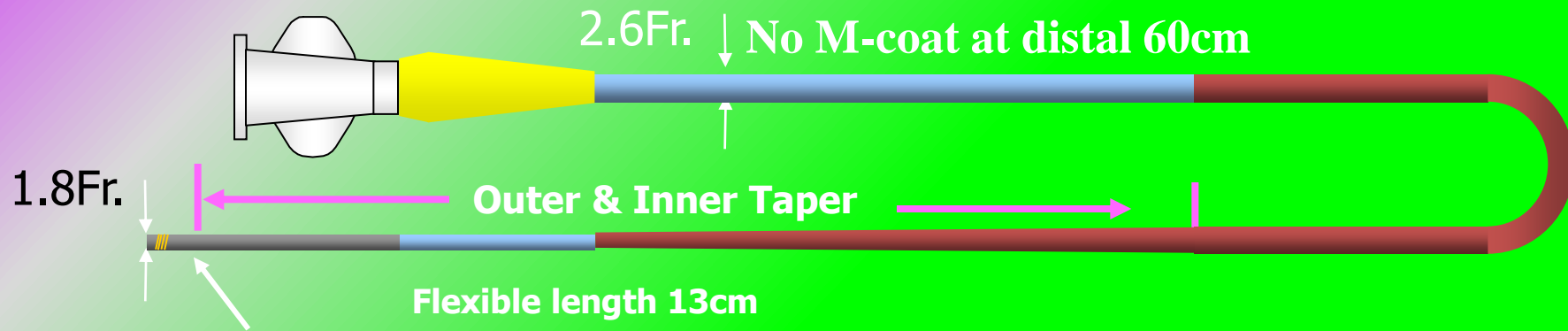


Microcathéters



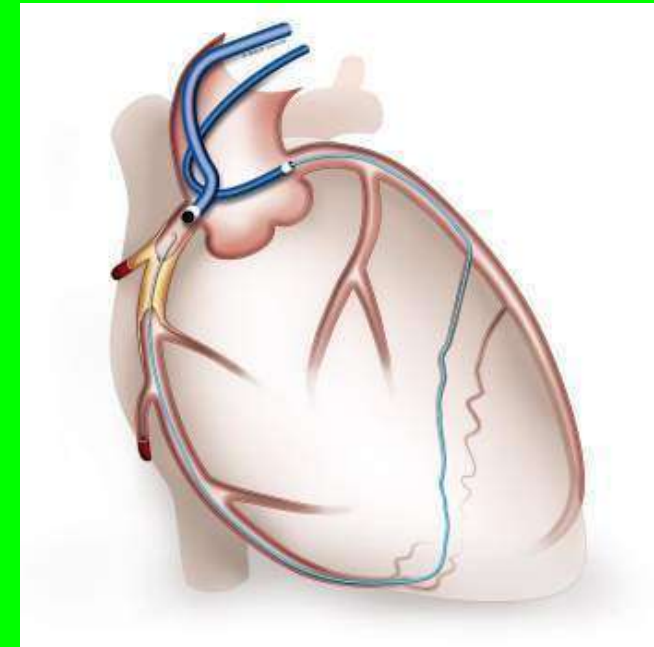
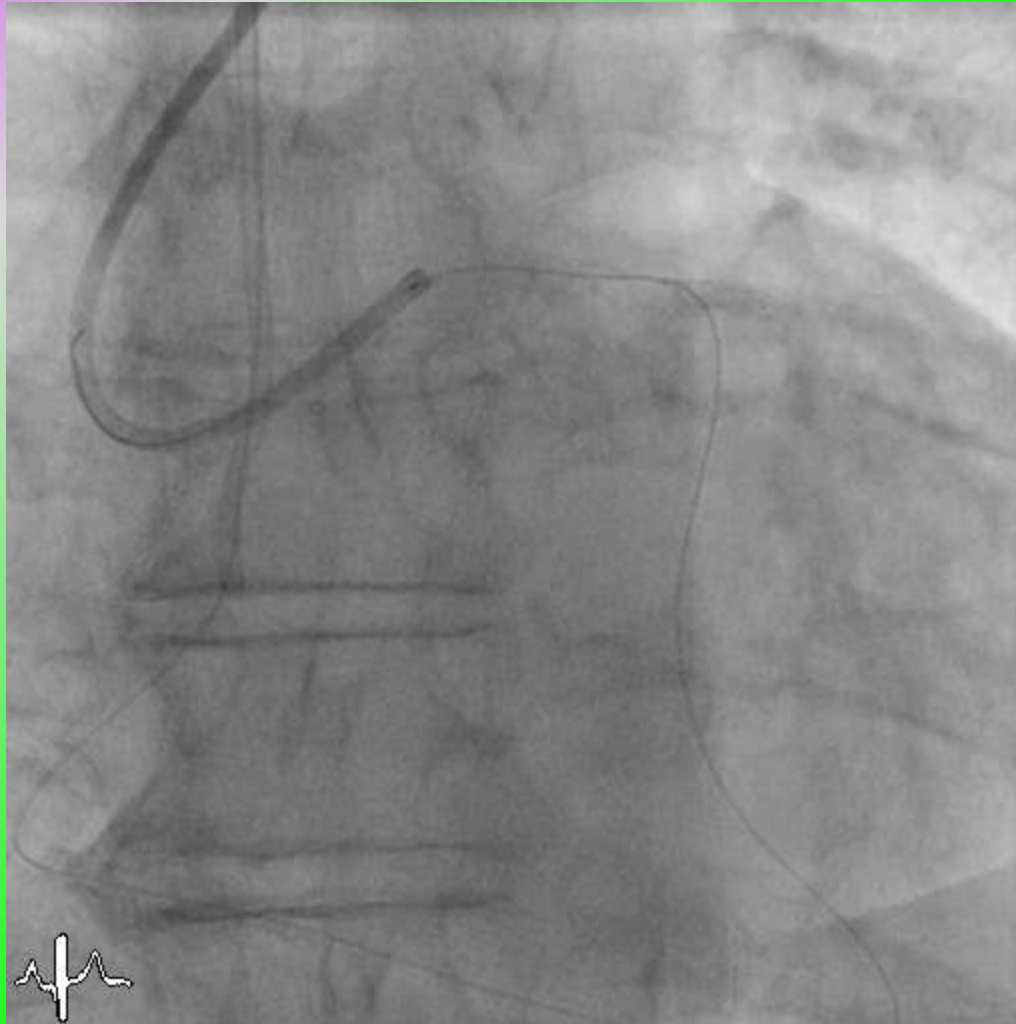
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FINECROSS MG



Gold marker length
0.7mm





Franchissement rétrograde jusqu'au cathé guide gauche:

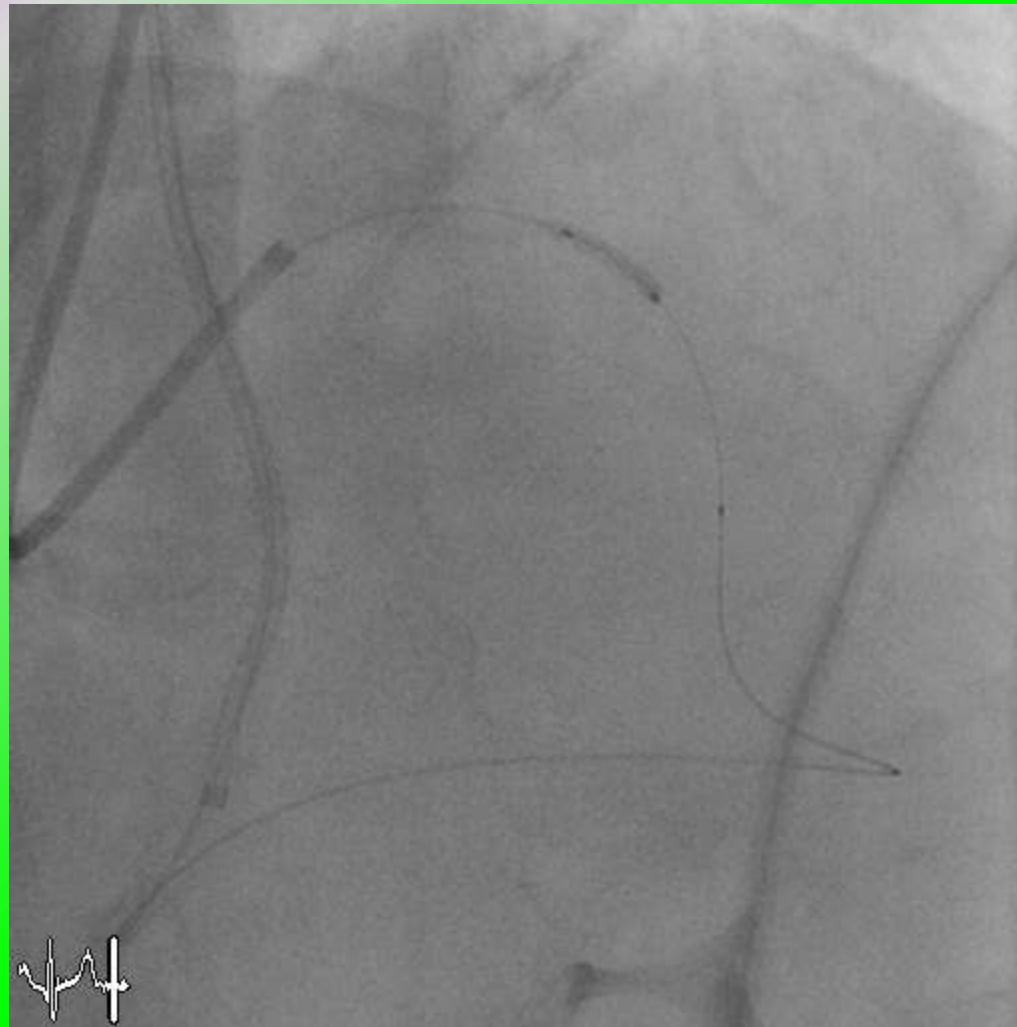
- guide Fielder XT
- Microcathéter



Pôle Cardiovasculaire et Métabolique



Echange de guides: Fielder 190 cm/ BMW 300cm



- Dilatation par franchissement antérograde du ballon
- Microcathéter dans la branche septale



Stent actif Cypher® (3x18mm)





Pôle Cardiovasculaire et Métabolique





Conclusion

Intérêt de la revascularisation + +

- Angioplastie et pontage n'ont pas les mêmes indications.
- Amélioration mortalité, FEVG et diminution des symptômes