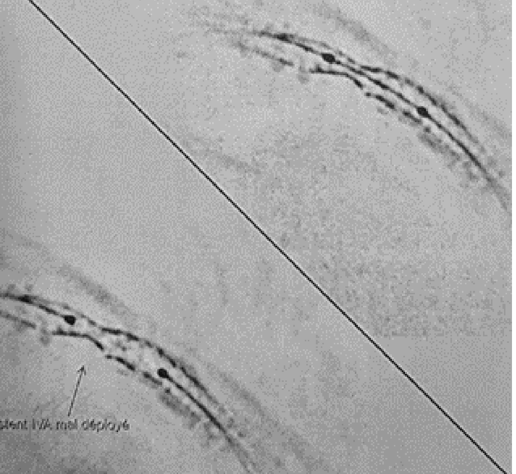
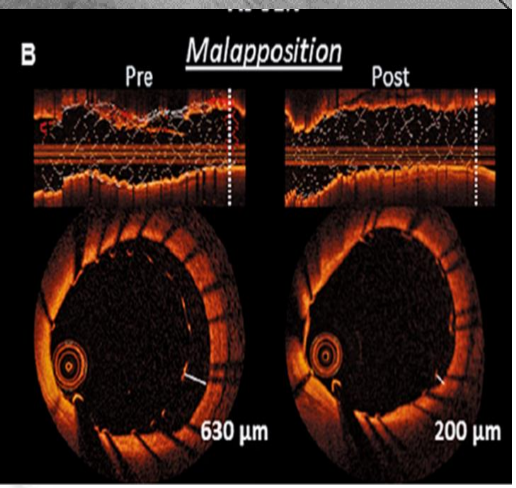




Les outils du cathlab

Comment améliorer le déploiement du stent ?

Dr RANIA HAMMAMI
Service de Cardiologie de SFAX, Tunisie

DÉCLARATION DE LIENS D'INTÉRÊT AVEC LA PRÉSENTATION

Intervenant : Rania HAMMAMI, SFAX, TUNISIE

☑ Je n'ai pas de lien d'intérêt à déclarer

Henry K. Lui, MD

- "There are many parallels between **optimizing stent deployment** and successfully waging a **military battle**"

“Bigger is Better”

53%

of all PCI patients have

COMPLEX LESION

1 in 5

patients undergoing an angiogram have a

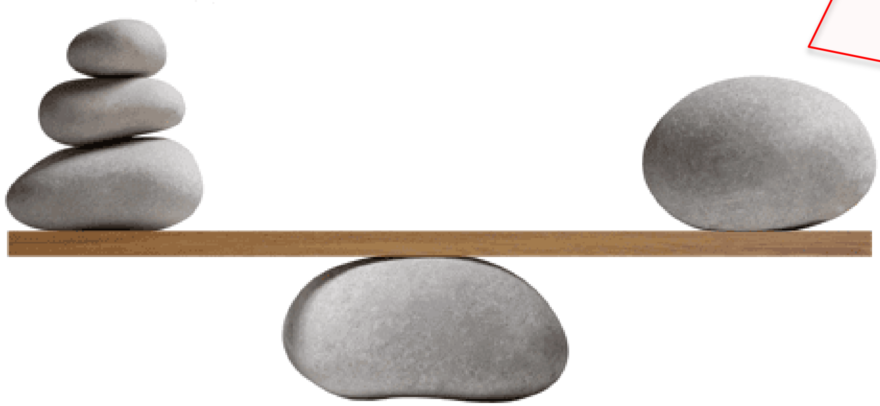
CTO[2]

15%

of patients are at

HIGH BLEEDING RISK

and could benefit from shorter DAPT[3]



Comment définir un stent mal deployé ?

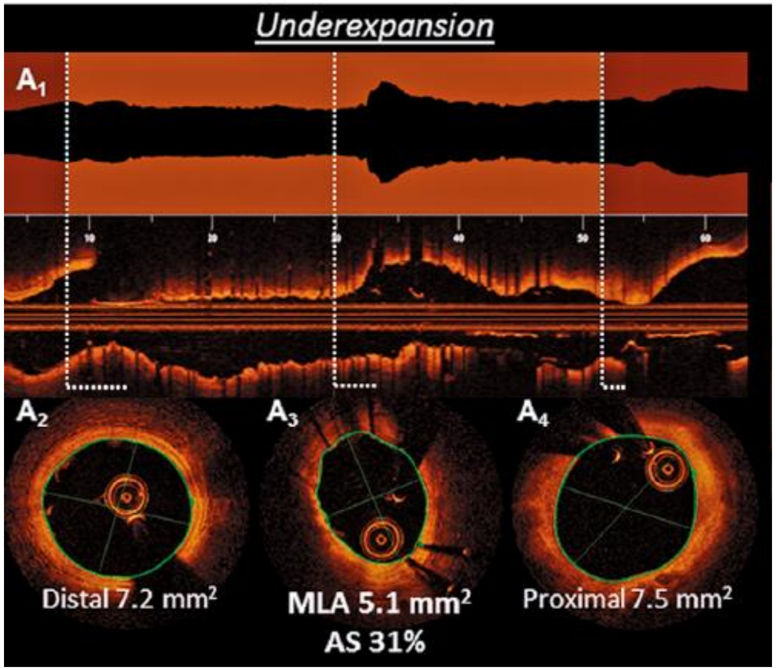
Sous expansion de Stent

≠

Mal apposition de stent

Sous Expansion du stent

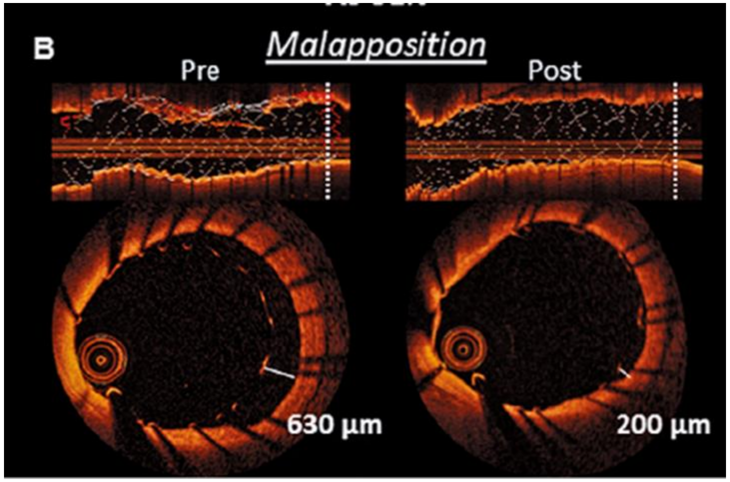
- Surface minimale(SM) du stent **<** **80%** surface de référence prédéfinie (moy Surf prox+surf distale)
- en dehors du TCG, SM<surface absolue de référence
  - **<5,5 mm²** (IVUS)
  - < **4,5mm²**(OCT)



Clinical use of intracoronary imaging. An expert consensus of the EAPCI. EuroIntervention 2018;14:656-677

Malapposition du stent

- Absence de contact de certaines mailles du stent avec la paroi vasculaire en dehors de la naissance d'une collatérale



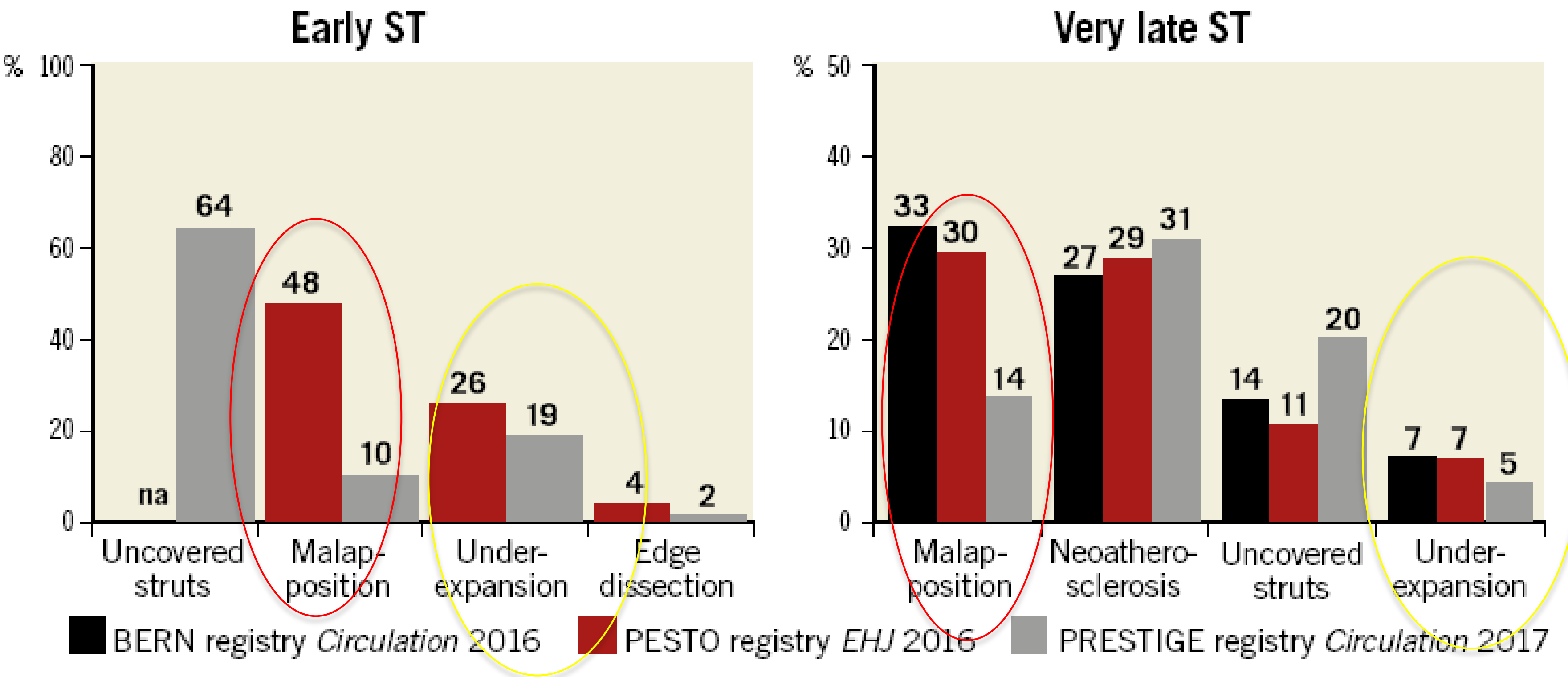
Clinical use of intracoronary imaging. An expert consensus of the EAPCI. EuroIntervention 2018

Malapposition: Classification

- Immédiate (aigue): immédiatement après l'ATL Stent
- Retardée:
  - persistante (malapposition étendue, large)
  - De novo: dans un site ou les struts étaient initialement bien apposés (recoil du stent)

The importance of malapposition in angiographically optimized stenting incontemporaneous interventions. Expert Review of Cardiovascular Therapy, Jun 2018

Les registres de thromboses certaines (BMS, DES) !!!!!



Frequency of presumable causes of early and very late metallic drug-eluting stent thrombosis as assessed in three optical coherence tomography registries.

Study	Imaging modality	cohort	Incidence acute malapposition (%)	Follow up (days)	Mal…		malapposition	
								ST
TaxusII (2005)	IVUS (n=469)	BMS vs Taxus SR vs Taxus MP…	7,9…	[illegible]	[illegible]	[illegible]	…)	0vs2 (number) **(p=NS)**
Horizon-AMI …	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	…0vs0 …umber) …NS)
Tax… VI (201…	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-
Im (2014)	[illegible]	[illegible]	[illegible]	[illegible]	…,2% , p=1	-	-	-
Soeda (2015)	[illegible]	[illegible]	[illegible]	…65	4 vs 4,6% **(p=NS)**	-	-	*
ADAPT-DES (2016)	I… (n…	[illegible]	14%/pts 12,6%/lesion	730	5,2 vs 4,5% **P=NS**	1,7vs1,4% **(p=NS)**	4,1vs3,2% **(p=NS)**	0,65vs0,43% **(p=NS)**
CLI-OPCI (2017)	OCT (n=864)		72,3	302	11 vs 13% P=NS	3,1vs2,7% **(p=NS)**		

ETUDES RANDOMISEES

Pas de différence entre **mal apposition** et **non mal apposition**

MACE

TLR

Thrombose

Clinical Impact of OCT Findings During PCI

The CLI-OPCI II Study

	All Lesions (N ...		...t MACE ...)	p Value
OCT features				
Minimum in-stent lumen area, mm^2				0.025
Maximum in-stent lumen diameter, m...				0.06
Minimum in-stent lumen di...			... 0.5	0.029
Lumen symmetry, %...			1.2 ± 0.2	0.12
In-stent lu...			85.7 ± 22.1	0.91
Distal refe...		...2.3	6.4 ± 2.9	0.001
Proximal re...		7.5 ± 3.2	8.3 ± 3.5	0.016
Malapposition...		0.25 ± 0.24	0.23 ± 0.22	0.32
Malapposition le...	... 4.3	3.1 ± 3.7	3.4 ± 4.4	0.45

Sous expansion de stent: facteur puissant prédictif de thrombose et de resténose

in-stent minim... area <4.5 mm2, dissection >200 µm at the distal stent edge, and reference lumen area <4.5 mm2 at either distal or proximal stent edges were independent predictors of MACE

J Am Coll Cardiol Img 2015;8:1297–305

Pourcentage de stent maldeployé?

1. 10%
2. 30%
3. 60%

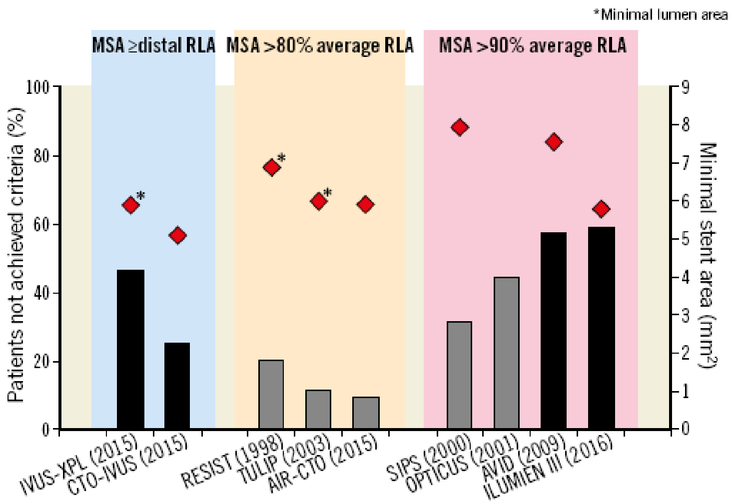
Pourcentage de stent maldeployé après un stenting direct à Pression nominale

1. 10%
2. **30%**
3. **60%**

% IVUS ou OCT

- Les études IVUS: **20-30%** des stents maldeployés ,
- Les études OCT : **60-70%** (resolution axiale10 fois meilleure que IVUS) (**CLI-OPCI+++**)

Interventional Cardiology Review 2017;12(2):81–4.



DES

BMS

.

EuroIntervention 2018;14:656-677

Un stent malapposé à l’état de base , serait il malapposé pour toujours……..

1. Oui
2. Non

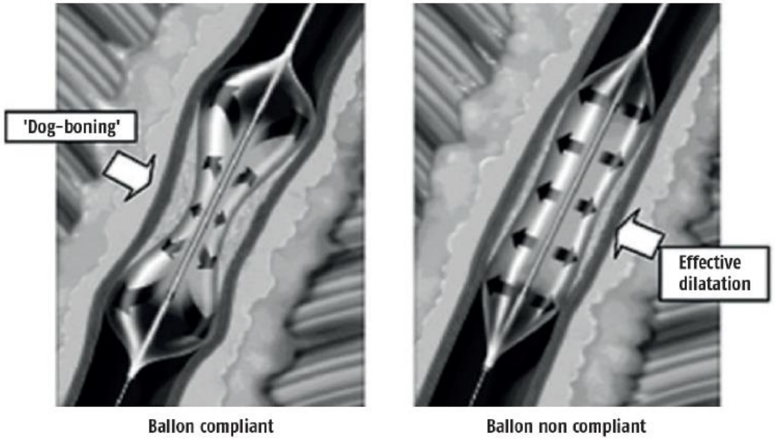
Un stent malapposé à l’état de base , serait il malapposé pour toujours……..

1. Oui
2. Non

Evolution de la mal apposition

- Etudes **OCT** : **31-85%** des struts initialement malapposés, seront bien apposés dans le temps (1,2)
- ETUDES **IVUS (HORIZONS-AMI IVUS**): **40%** d'evolution favorable . (3)
  - Cicatrisation néointimale
  - Hyperplasie tissulaire entre la paroi vasculaire et les mailles du stent

(1)**Circ Cardiovasc Interv. 2014 Feb;7:88-96**
(2)Eur Heart J Cardiovasc Imaging. 2013 Sep
(3) **HORIZONS-AMI trial. Circulation. 2010 Sep 14;122:1077-84**



Stent mal deployé , pourquoi ?

Causes de maldéploiement immédiat de stent

1. Stent sous dimensionné, partie proximale du stent++ en cas de lésions longues : 46% des cas
2. Stent recoil (certains types de stents)
3. Anatomie:Lésions calcifiés, CTO, angulation

Causes de maldéploiement tardif du stent

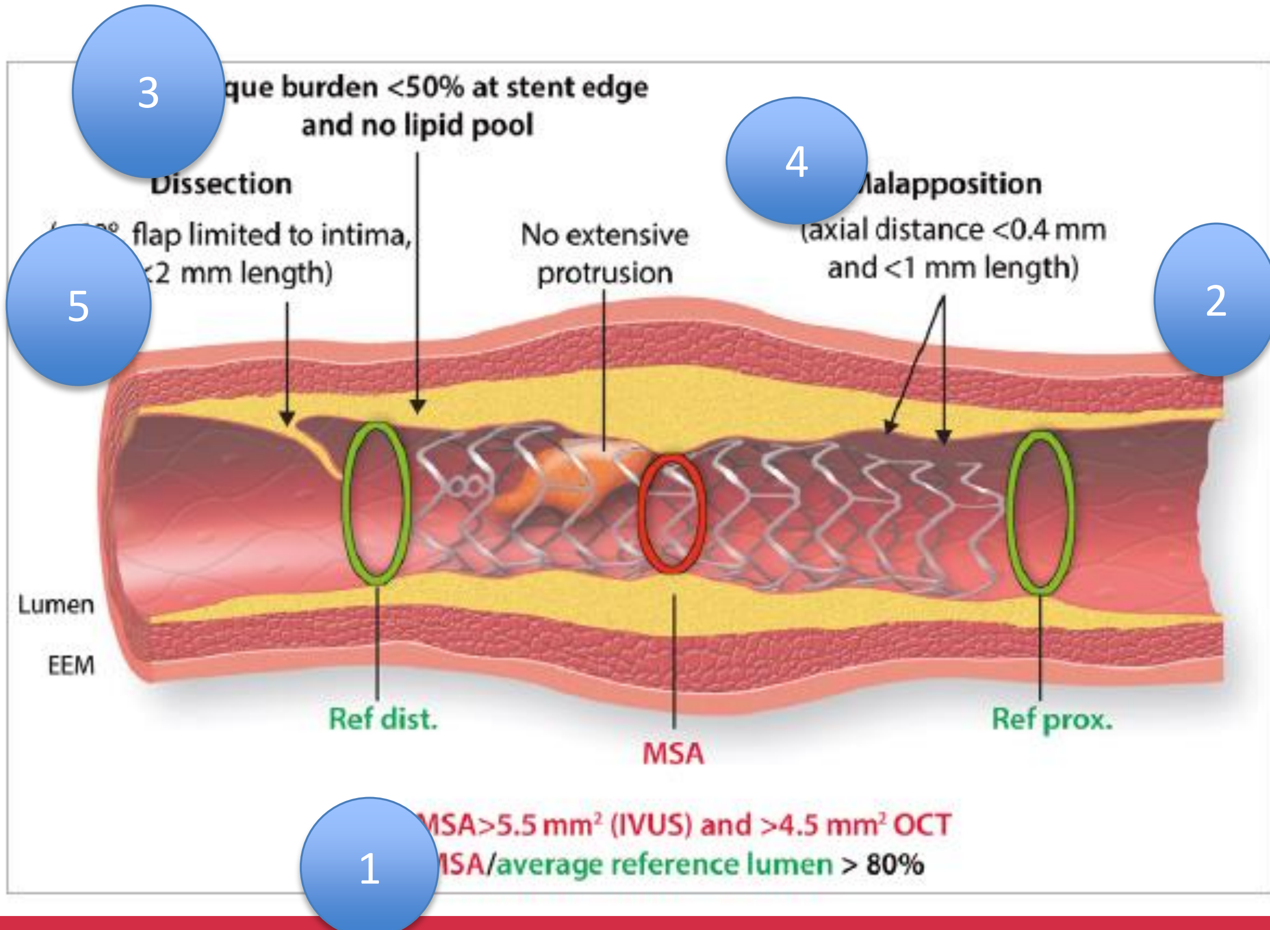
1. Détersion retardée du thrombus> ATL primaire
2. Cicatrisation néointimale inadéquate
3. Remodelage positive “**Glagov effect**”,
4. Modification de la forme du vaisseau circulaire→ ovalaire

Comment diagnostiquer un stent maldeployé ?

Clinical use of intracoronary imaging. An expert consensus of the EAPCI.

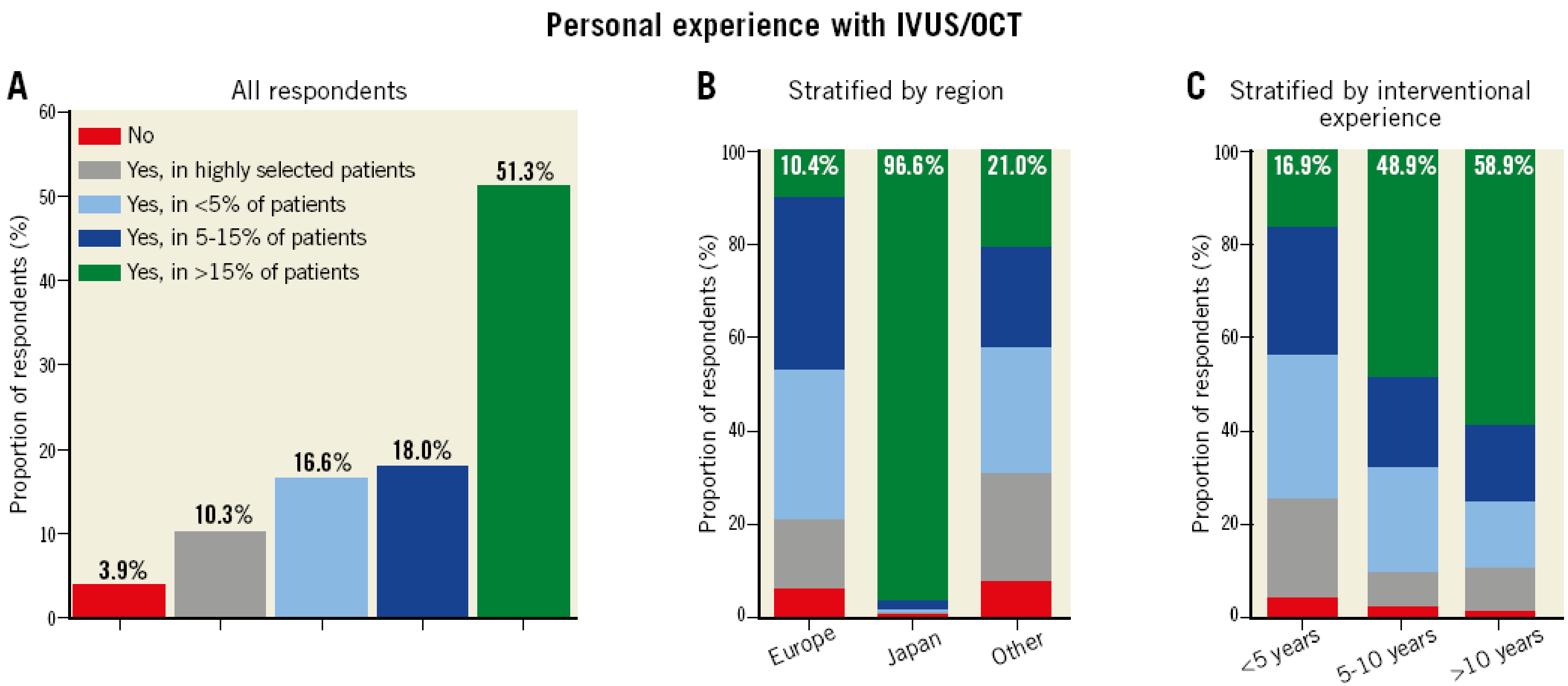
EuroIntervention 2018;14:656-677

Critères d'un déploiement optimal du stent



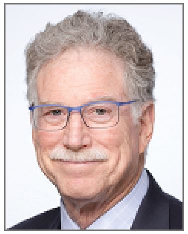
Current use of intracoronary imaging in interventional practice – Results of a European Association of Percutaneous Cardiovascular Interventions (EAPCI) and Japanese Association of Cardiovascular Interventions and Therapeutics (CVIT) Clinical Practice Survey

Konstantinos C. Koskinas[1*], MD; Masato Nakamura[2], MD; Lorenz Räber[1], MD, PhD; Roisin Colleran[3], MD; Kazushige Kadota[4], MD; Davide Capodanno[5], MD, PhD; William Wijns[6], MD, PhD; Takashi Akasaka[7], MD; Marco Valgimigli[1], MD, PhD; Giulio Guagliumi[8], MD; Stephan Windecker[1], MD; Robert A. Byrne[3,9], MD, PhD



EuroIntervention 2018;14:e475-e484, March 2018

Expert consensus on the use of intracoronary imaging to guide PCI: increasing reliance by demonstrating relevance



Morton J. Kern[1,2*], MD, MSCAI, FAHA, FACC

use of IVUS/OCT is not for want of good data. The interventionalist's reticence to incorporate IVUS/OCT into their daily intraprocedural strategy, despite years of supporting evidence, can be seen not only by industry's sales statistics showing <20% global use, but also by a clinical practice survey on the sub-

Euro**Intervention** 2018;14:**613-615**

Stent boost enhancement compared to intravascular ultrasound in the evaluation of stent expansion in elective percutaneous coronary interventions

Mohamed Laimoud *, Yasser Nassar, Walid Omar, Akram Abdelbarry, Helmy Elghawaby

Critical Care Medicine Department-Cairo University, Egypt

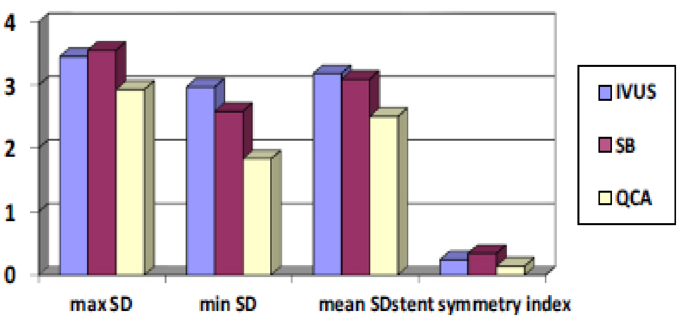
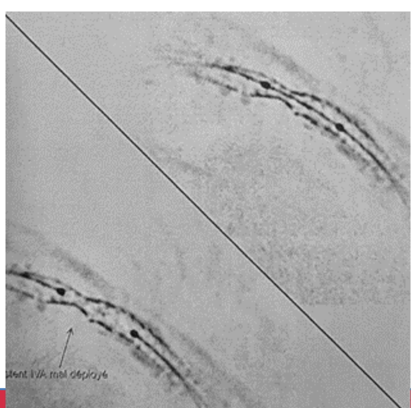


Fig. 1. Stent diameters assessed by IVUS, SB and QCA.

Table 3
Correlations between IVUS, SB and QCA.

Stent diameters	IVUS	SB	P value
Max SD	3.45 ± 0.62	3.55 ± 0.56	0.53
Min SD	2.77 ± 0.53	2.58 ± 0.56	0.07
Mean SD	3.18 ± 0.64	3.09 ± 0.58	0.54
Stent symmetry index	0.24 ± 0.09	0.34 ± 0.09	0.32
	IVUS	QCA	
Max SD	3.45 ± 0.62	2.97 ± 0.59	0.009
Min SD	2.77 ± 0.53	1.88 ± 0.60	0.001
Mean SD	3.18 ± 0.64	2.61 ± 0.50	0.001
Stent symmetry index	0.24 ± 0.09	0.14 ± 0.27	0.001
	SB	QCA	
Max SD	3.55 ± 0.56	2.97 ± 0.59	0.001
Min SD	2.58 ± 0.56	1.88 ± 0.60	0.001
Mean SD	3.09 ± 0.58	2.61 ± 0.50	0.001
Stent symmetry index	0.34 ± 0.09	0.14 ± 0.27	0.001



The Egyptian Heart Journal 70 (2018)

Stent Boost Subtract Imaging for the Assessment of Optimal Stent Deployment in Coronary Ostial Lesion Intervention

Comparison With Intravascular Ultrasound

10 of 58 (17.2%). Eight SBS images showed inadequate stent expansion. SBS predicted inadequate findings of IVUS with 100% specificity and 80% sensitivity, while a significant positive correlation was observed between SBS-MSA and MSA by IVUS with a regression coefficient of 0.95.

Imaging techniques have a primary role during ostial PCI. SBS is a simple and quick method that offers several advantages, enabling improved stent location, adequate stent expansion, and optimal apposition of the struts to the wall. SBS imaging could be conventionally used during ostial PCI, especially in centers where IVUS is not used routinely. (Int Heart J 2015; 56: 000-000)

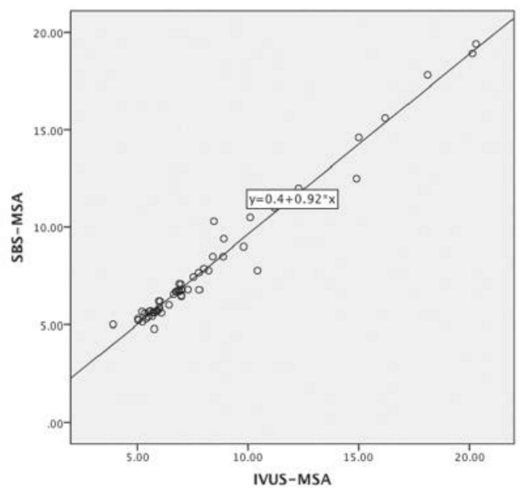


Figure 2. Comparison of the minimum stent area calculated by SBS images and measured by IVUS. There was a significant positive correlation with a regression coefficient of 0.95, $P < 0.001$.

Simple
Quick

Int Heart J 2015; 56:

FFR??

- Registres de la vie réelle: FFR< 0,8 dans 20–30% à la fin d'ATL
  - Maladie athéromateuse diffuse en dehors du stent
  - Maldeployement du stent- dissection à la sortie de stent
- Etudes OCT et IVUS: corrélation entre un seuil bas de FFR et maldeploiement de stent
- Seuil ???:0,86-0,96 selon les études

Comment améliorer le maldeploiement d'un Stent?

1.Evaluation de la lésion

2.Préparation de la lésion

3.Optimisation de l'expansion du stent

1.Evaluation de la lésion

2.Préparation de la lésion

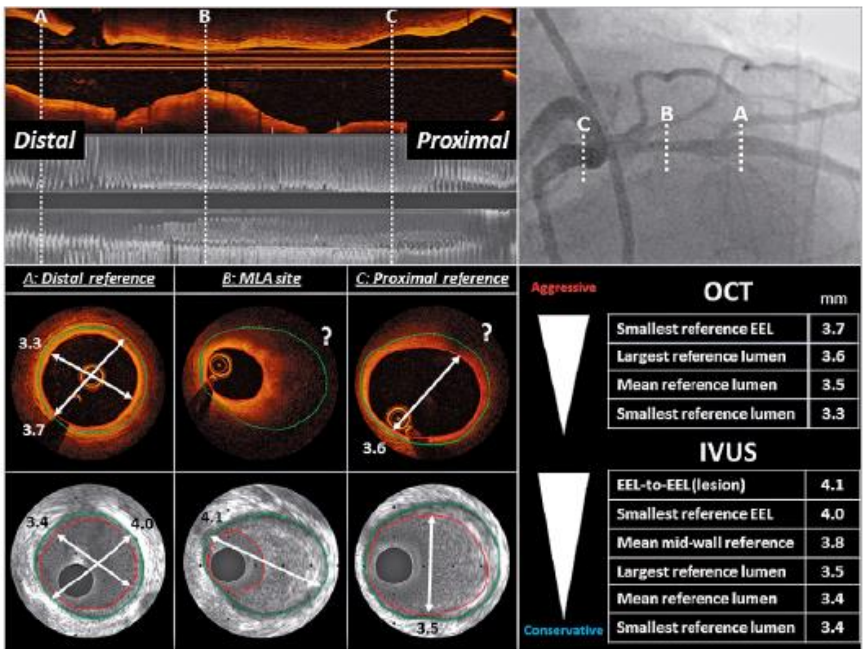
3.Optimisation de l’expansion du stent

The most important element is knowledge of the enemy.

Without this knowledge and understanding, you are fighting blindly

Evaluation de la lesion avec IVUS/OCT

- le diamètre du vaisseau, longueur de la lésion



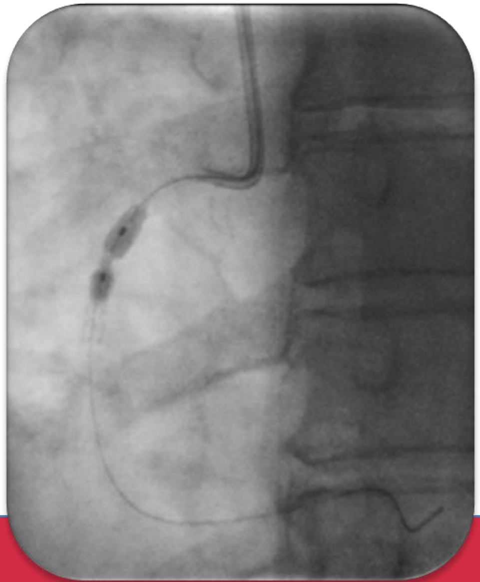
Sizing Optimal du stent

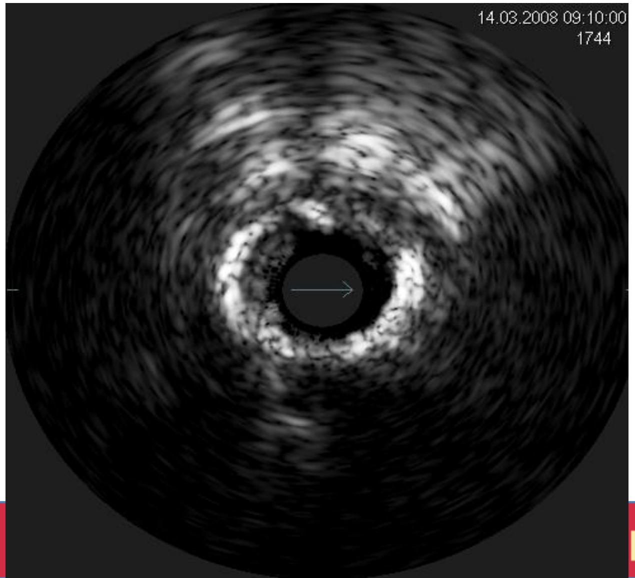
Nature de la lesion avec IVUS/OCT (CA++, lipids)

- OCT >>>>>IVUS
  - Etendue du calcium en circonférence (Arc de calcium Total > 180°
  - épaisseur de calcium > 0,5 mm

➔risque de maldeploiement.

Disruption of napkin ring Ca^{2+}



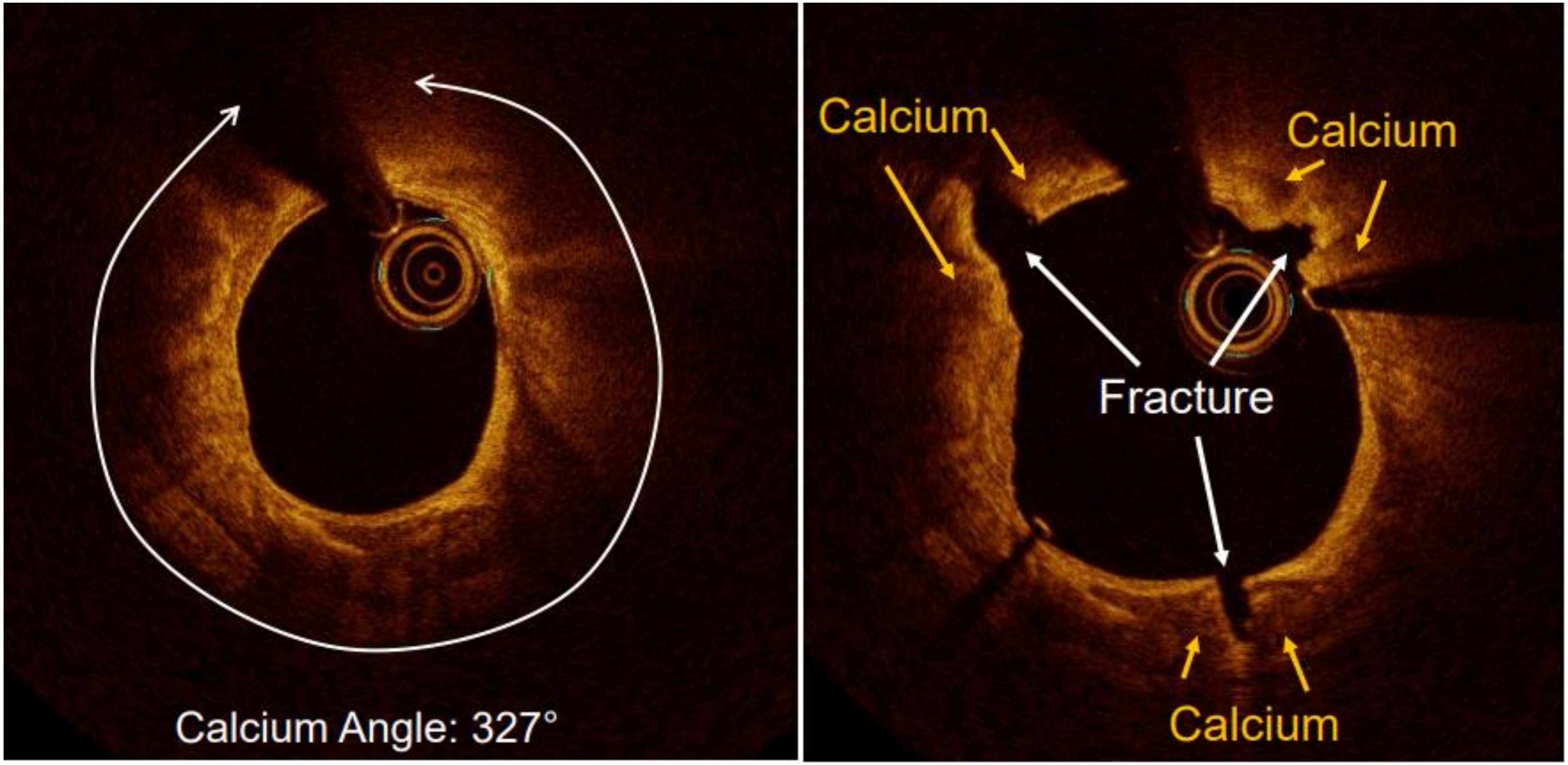


1.Evaluation de la lésion

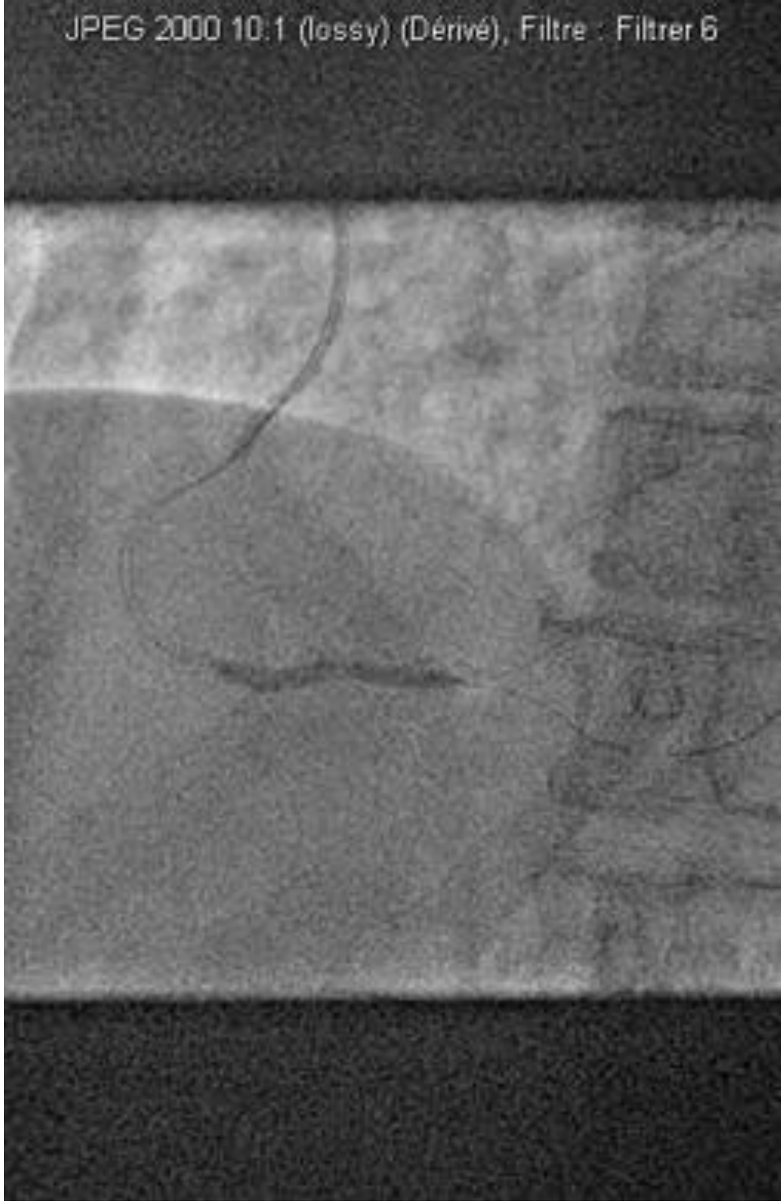
2.Préparation de la lésion

3.Optimisation de l'expansion du stent

Objectif de la préparation ????



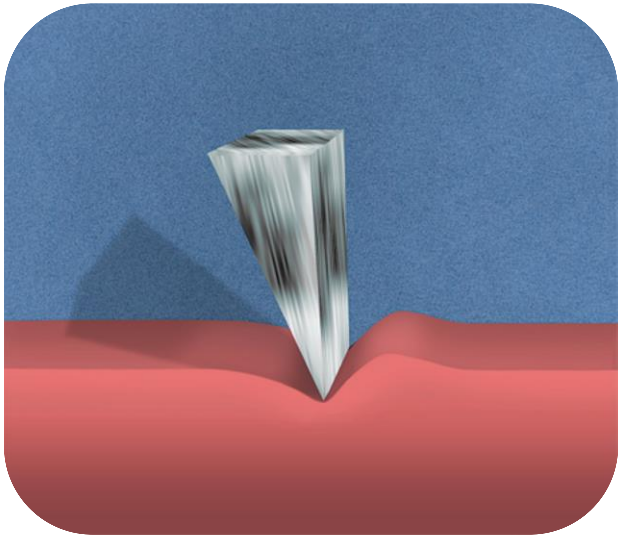
Mais si la Lésion est Toujours **Résistante**

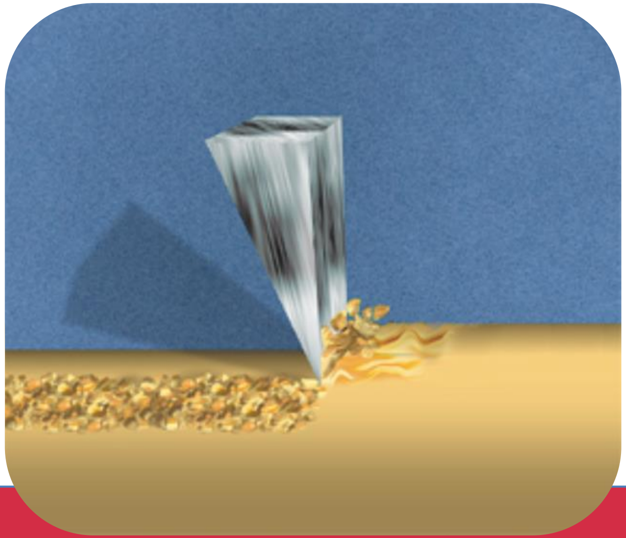


- Le ballon ne s’ouvre pas, parfois glisse
- Perte de parallélisme du ballon,
- persistance d’ l’empreinte avec aspect en sablier.

Pas de Stenting Bien préparer avant la plaque

“Differential cutting”

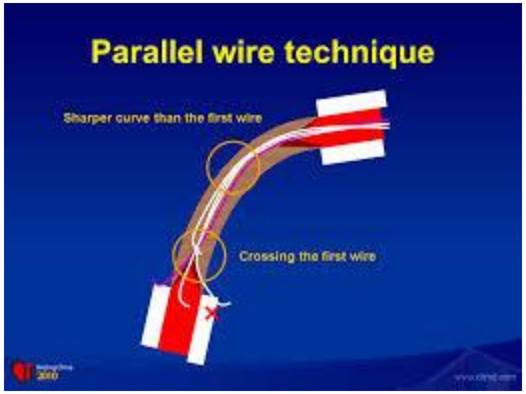




1 Buddy wire technique

- positionnement d'un deuxième guide d'angioplastie parallèle au ballonnet pour exercer une force de cisaillement au niveau de la plaque.

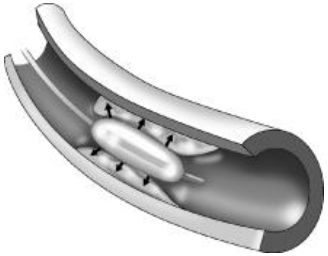
- « **Atheroctomie des pauvres** »



2

Les ballons coupants

- Scoring Ballon: Ballonnet entouré d'un maillage en Nitol
- Cutting Balloon: lames d'athérotome montées sur le ballon →indentation au sein de la plaque en exerçant une force longitudinale qui limite le risque de dissection



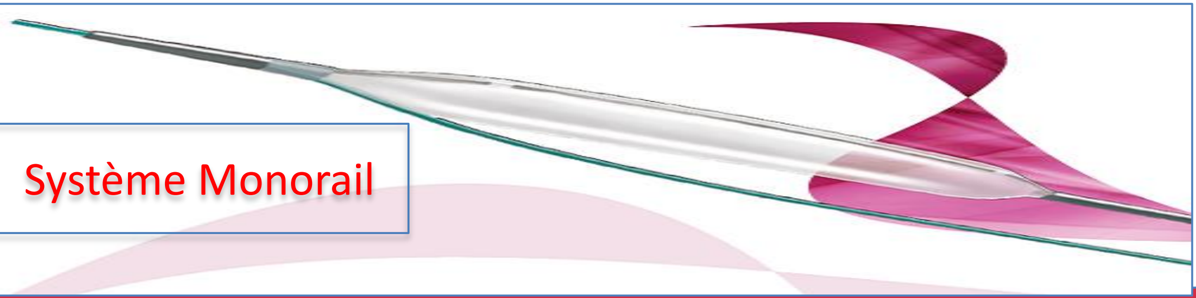
Scoring balloon

Cathéter entouré d’un système entrecroisé de nitinol incisant la lésion pendant l’inflation du ballonnet

Angiosculpt (Angioscore)

Delivre paclitaxel

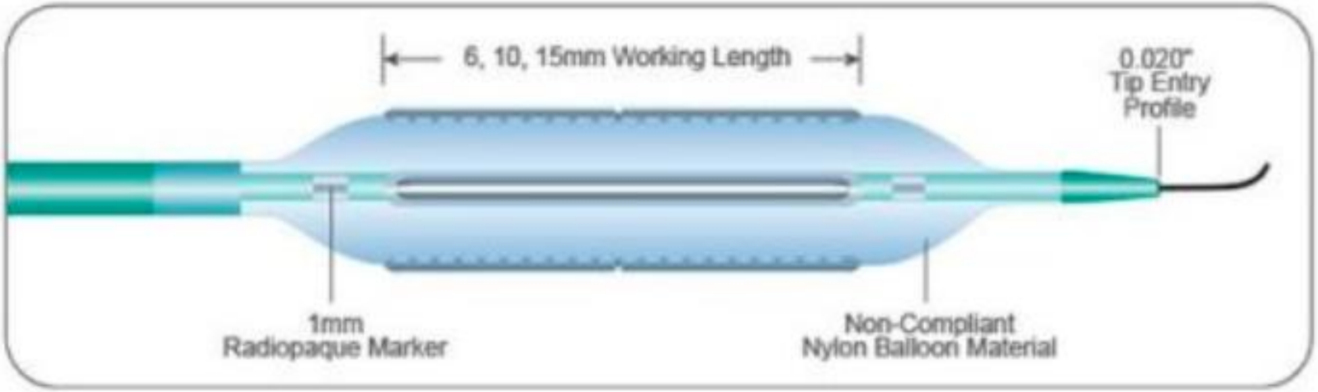
Angiosculpt X (Angioscore)



Système Monorail

Coroflex (orbusNeich)

Cutting Balloon, FLEXTOME™



Profil du CUTTING est relativement médiocre nettement amélioré avec FLEXTOME (Tip à 0.020 ‘’) (Boston)

Wolverine Cutting Balloon Boston Scientific

- Reduce non-functional blade height (portion in the cast pad) to improve profile
- Reduce cast pad height and width to improve profile

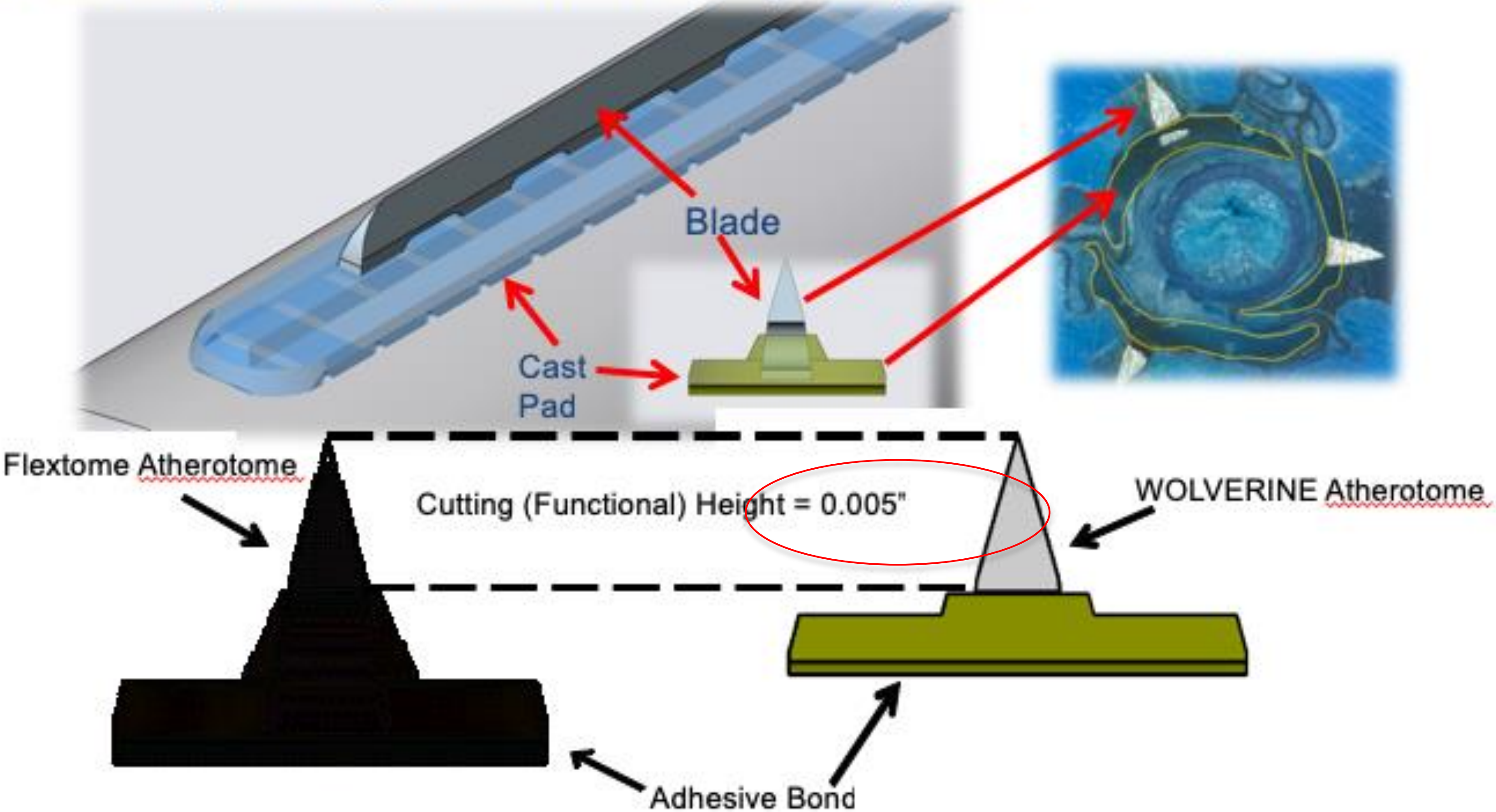


Figure 4: Cross Section of WOLVERINE and Flextome Atherotome

Nonrandomized Comparison of Coronary Stenting Under Intravascular Ultrasound Guidance of Direct Stenting Without Predilation Versus Conventional Predilation With a Semi-Compliant Balloon Versus Predilation With a New Scoring Balloon

Table 5
Quantitative intravascular ultrasound assessment

Variable	Direct (n = 145)	Predilation (n = 117)	AngioSculpt (n = 37)	p Value
Reference segment				
External elastic membrane area (mm^2)	10.8 ± 4.4	10.1 ± 4.3	10.6 ± 6.5	0.4
Luminal area (mm^2)	8.5 ± 2.2	8.0 ± 2.3	9.0 ± 2.9	0.1
Luminal diameter (mm)	3.3 ± 0.7	3.2 ± 0.7	3.6 ± 0.9	0.09
Preintervention lesion site				
External elastic membrane area (mm^2)	11.8 ± 4.6	11.7 ± 4.6	11.6 ± 4.7	1.0
Luminal area (mm^2)	3.0 ± 0.9	2.9 ± 1.0	2.5 ± 0.9	0.02
Minimum luminal diameter (mm)	1.7 ± 0.3	1.7 ± 0.6	1.6 ± 0.3	0.2
Plaque and media area (mm^2)	8.9 ± 3.2	8.6 ± 3.4	8.8 ± 3.5	0.6
Plaque burden (%)	72 ± 10	73 ± 10	76 ± 10	0.08
Postintervention lesion site				
Minimal stent diameter (mm)	2.6 ± 0.4	2.5 ± 0.4	2.8 ± 0.4	0.048*
Minimal stent CSA (mm^2)	6.0 ± 1.7	5.9 ± 1.6	6.8 ± 1.5	0.02*
IVUS/manufacturer-predicted stent diameter (%)	76 ± 10	76 ± 13	88 ± 18	<0.001*
IVUS/manufacturer-predicted stent area (%)	67 ± 16	70 ± 23	88 ± 32	<0.001*

* p Value of AngioSculpt compared with the other 2 groups. There were no differences between the direct stenting and balloon predilation groups.

Am J Cardiol 2007; 100:812– 817

3 L’athéroctomie Rotative

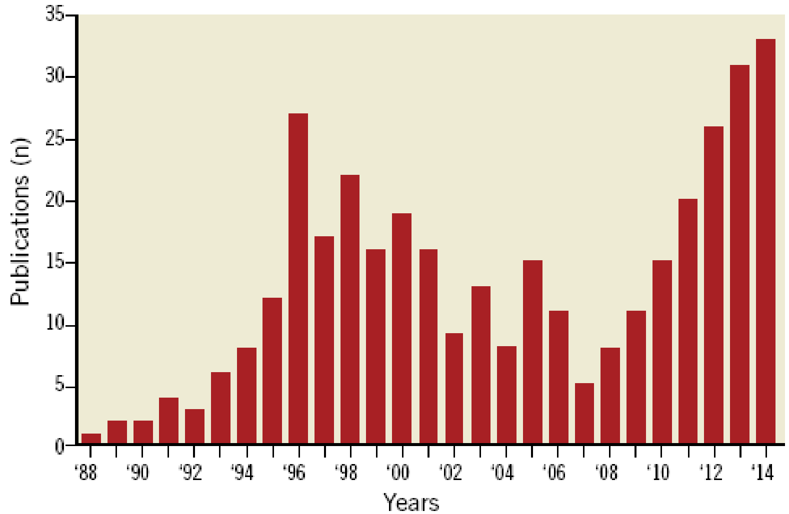
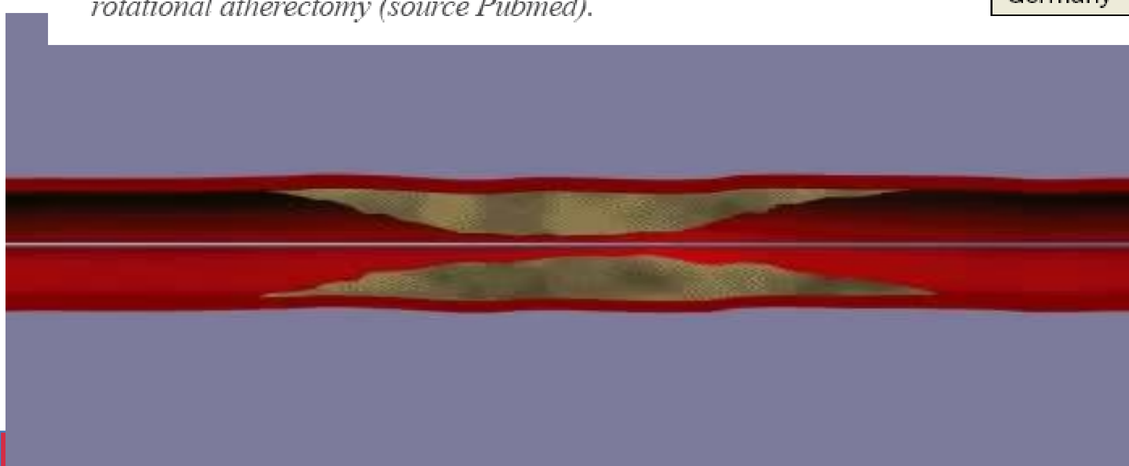


Figure 1. *Number of publications over the years on coronary rotational atherectomy (source Pubmed).*

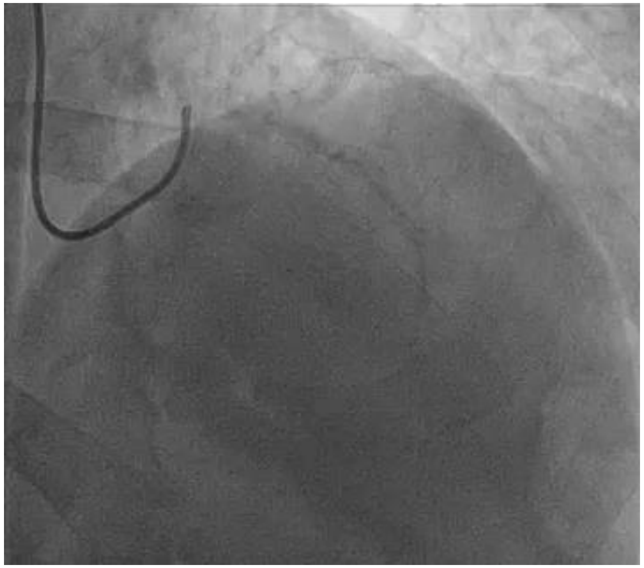
Table 1. Rate of rotational atherectomy as function of total PCI numbers in some EU countries (source Boston Scientific).

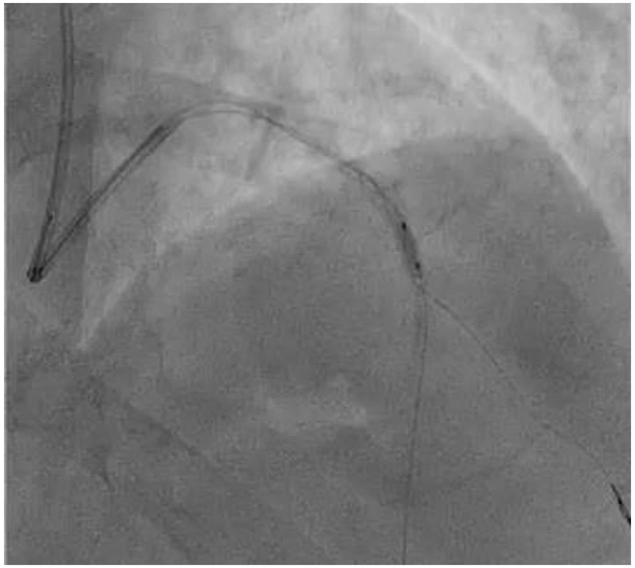
Country	Rate (%)
United Kingdom	3.1
France	2.9
Spain	2.3
Austria	1.8
Portugal	1.5
The Netherlands	1.4
Italy	1.3
Belgium	1.3
Switzerland	1.1
Germany	0.8



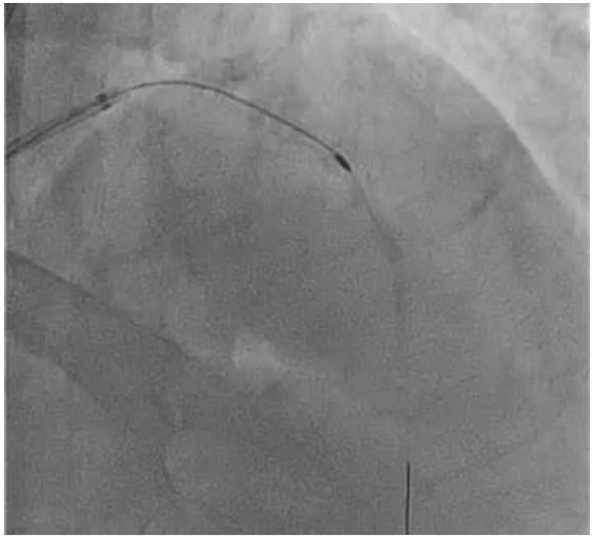
Succès : 95-98%

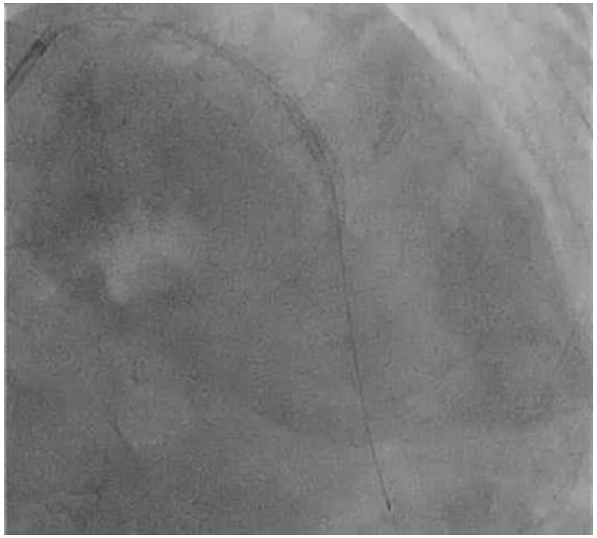
CPC : 5-10%






Frame600





High-Speed Rotational Atherectomy Versus Modified Balloons Prior to Drug-Eluting Stent Implantation in Severely Calcified Coronary Lesions

The Randomized PREPARE-CALC Trial

Table 3. Procedural and In-Hospital Outcome (n=200 Patients)

	MB (n=100)	RA (n=100)	*P* Value
Procedural duration, min	78.5±40.6	88.2±34.9	0.07
Fluoroscopy time, min	19.6±13.4	23.9±12.2	0.03
Contrast amount, mL	230.0±93.8	233.0±109.1	0.83
Large dissection, >5 mm	7 (7%)	3 (3%)	0.33
Perforation	2 (2%)	4 (4%)	0.68
Pericardial effusion	0 (0%)	3 (3%)	0.24
No/slow flow	0 (0%)	2 (2%)	0.49
Final TIMI flow <III	0 (0%)	1 (1%)	0.99
Residual stenosis >20%	2 (2%)	0 (0%)	0.49
Stent failure	4 (4%)	1 (1%)	0.36
Crossover	16 (16%)	0 (0%)	<0.0001
Strategy success*	81 (81%)	98 (98%)	0.0001
Death	0 (0%)	0 (0%)	1.00
MI	1 (1%)	2 (2%)	1.00
Target vessel re-PCI	0 (0%)	0 (0%)	1.00
CABG	0 (0%)	0 (0%)	1.00
Stent thrombosis	0 (0%)	0 (0%)	1.00
Access site complications	5 (5%)	3 (3%)	0.72

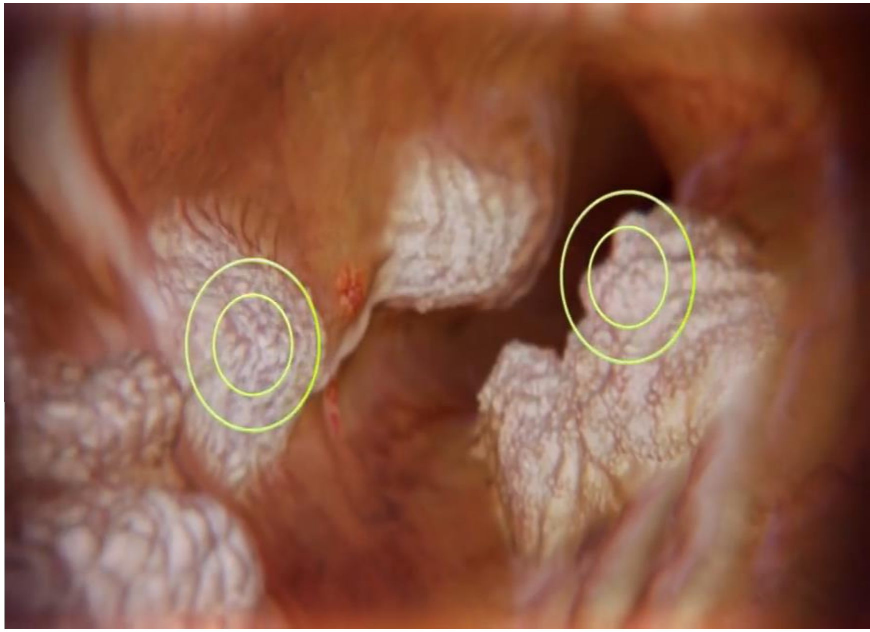
Table 4. Baseline Quantitative Coronary Angiography Data (n=278 Lesions)

	MB (n=136)	RA (n=137)	*P* Value
Before procedure			
Lesion length, mm	20.16±11.88	20.86±12.30	0.63
Reference vessel diameter, mm	3.08±0.47	3.10±0.49	0.84
Minimal lumen diameter, mm	1.07±0.34	1.15±0.35	0.07
Diameter stenosis, %	65.18±9.53	63.43±9.80	0.16
Severe calcification*	100 (73.0%)	104 (76.5%)	0.46
Immediately after procedure			
Minimal lumen diameter, mm			
In-stent	2.81±0.47	2.85±0.43	0.56
In-segment	2.58±0.53	2.62±0.67	0.61
Diameter stenosis, %			
In-stent	12.34±5.14	12.62±5.36	0.63
In-segment	17.12±7.39	17.58±7.31	0.59
Acute gain, mm			
In-stent	1.74±0.45	1.70±0.42	0.45
In-segment	1.50±0.51	1.47±0.64	0.61

4 Athérectomie Orbitale

Diamondback 360 Coronary Orbital Atherectomy System (Cardiovascular Systems, Inc., St. Paul, MN)

- the pilot ORBIT I trial, ORBIT II:
- no randomised trial directly comparing head-to-head OA to RA



Succès :

98%

CPC :

20%

5

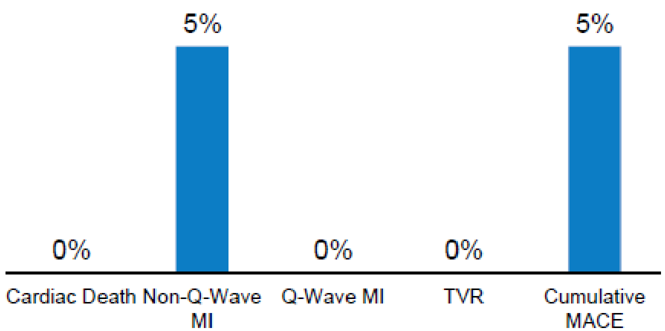
Shockwave balloon: Intravascular Lithotripsy (IVL), DISRUPT CAD I

Procedural Angiographic Complications

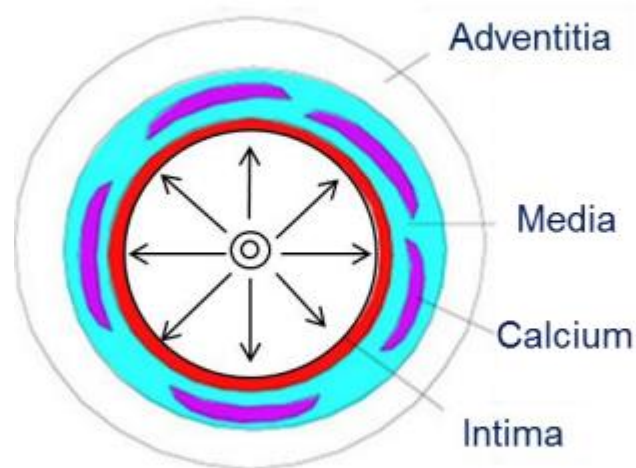
	Final N = 60
Dissection	
None	100% (60)
A to C	0.0%
D to F	0.0%
Perforation	0.0%
Abrupt Closure	0.0%
Slow flow	0.0%
No reflow	0.0%

Angiographic core lab adjudicated

Freedom from 30-day MACE: 95%



CEC adjudicated



DISRUPT CAD II study en cours

How to Select your Arm ?

- Plaque soft
- Difficulté de dérivabilité (lésion très serrée, tortueuse….)

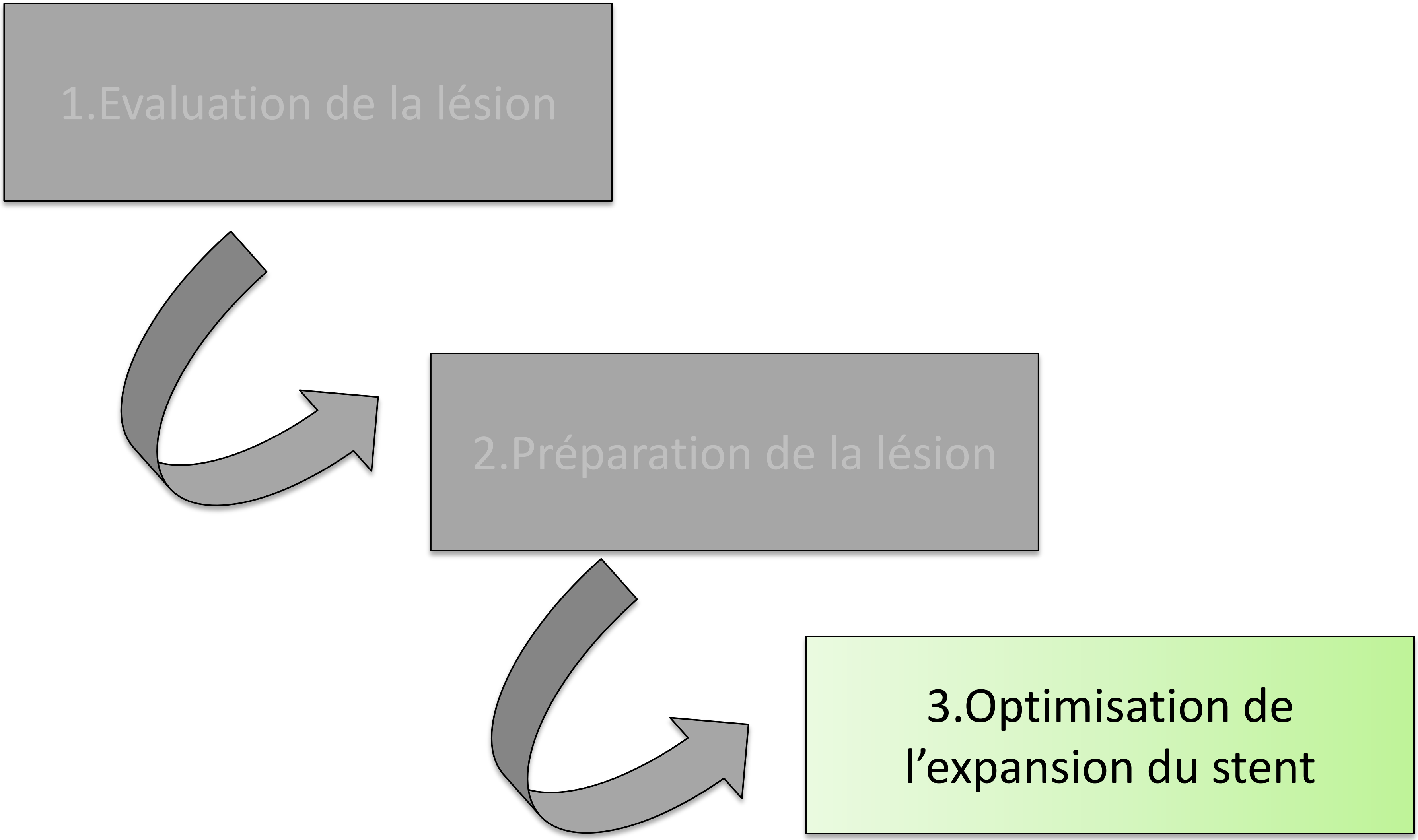
→ Ballons classiques

- Artère de petit calibre
- Calcifications modérées
- Bifurcation, ostiale

→ Ballons coupants

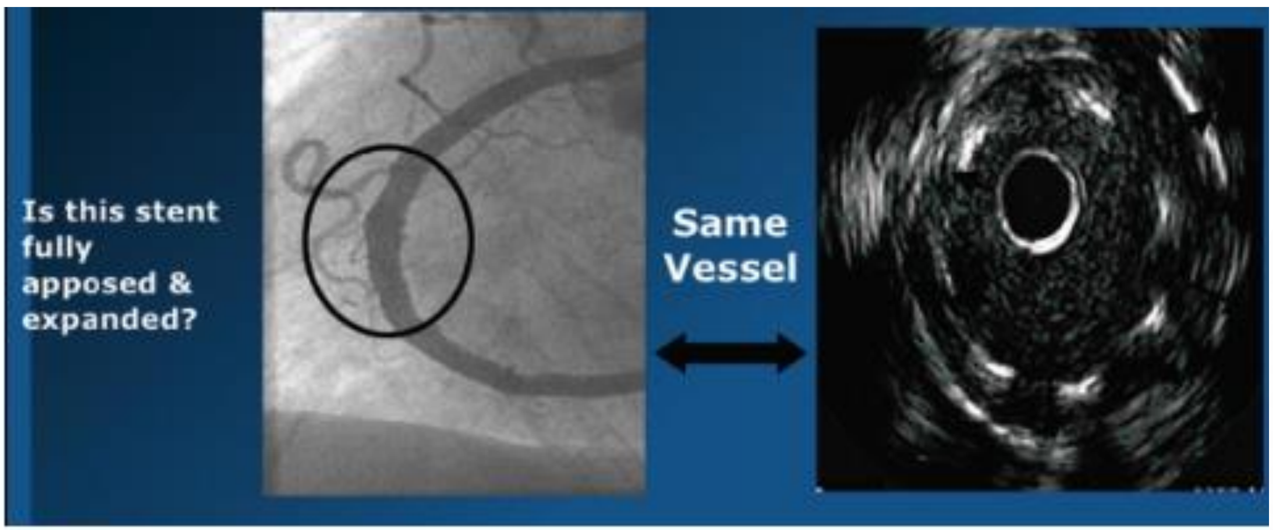
- Calcifications diffuses circulaires

→ Rotablator


1.Evaluation de la lésion
2.Préparation de la lésion
3.Optimisation de l'expansion du stent

1. Ballon non compliant « classique »

- débuter par un ballon sous-dimensionné avec des inflations maximales, répétées et prolongées



Durée d'inflation?

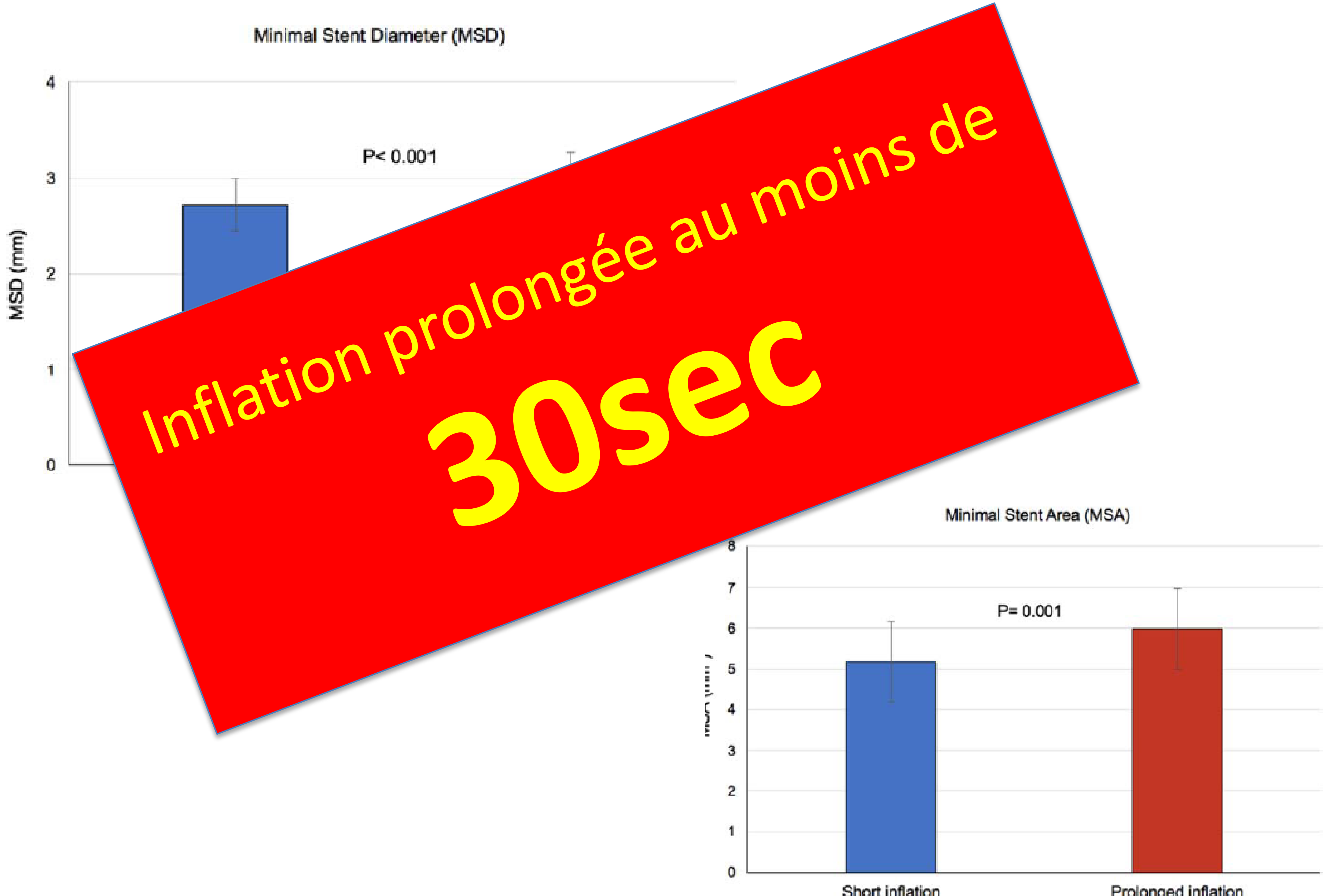
Improved stent expansion with prolonged compared with short balloon inflation: A meta-analysis

Marwan Saad, MD[1,2] | Mahesh Bavineni, MD[3] | Barry F. Uretsky, MD[1,4] | Srikanth Vallurupalli, MD[1,4]

TABLE 1 Baseline demographics of the included studies

Study (citation number)	Year	Patients (n)	Age (years)	Male (%)	HTN (%)	DM (%)	Smoker (%)	Prior MI (%)	ACS (%)	Imaging modality	Inflation time (sec)[a]
Ann et al. [17][b]	2014	18	57	94	59	18	77	6	59	OCT	5.9/30
Cook et al. [16]	2014	12	65	92	83	75	17	25	67	OCT	28/206
Hovasse et al. [19]	2013	150	70	85	58	29	17	12	36	QCA, DSE	5/25
Saha et al. [22]	2013	74	66	NR	NR	NR	NR	NR	NR	QCA	10/60
Iwamoto et al. [20][b]	2012	29	71	67	80	39	24	27	72	IVUS	5/40
Asano et al. [18]	2009	92	66	79	71	28	28	26	40	IVUS	10/60
Kawasaki et al. [21][b]	2009	40	68	78	83	45	35	25	NR	QCA, IVUS	20/60

Catheter Cardiovasc Interv. 2018



Catheter Cardiovasc Interv. 2018

A Novel Stent Inflation Protocol Improves Long-Term Outcomes Compared with Rapid Inflation/Deflation Deployment Method

Srikanth Vallurupalli,[1,2] MD, Srikanth Kasula,[2] MD, Shiv Kumar Agarwal,[2] MD, Naga Venkata K. Pothineni,[2] MD, Amjad Abualsuod,[2] MD, Abdul Hakeem,[1,2] MD, Zubair Ahmed,[1,2] MD, and Barry F Uretsky,[1,2*] MD

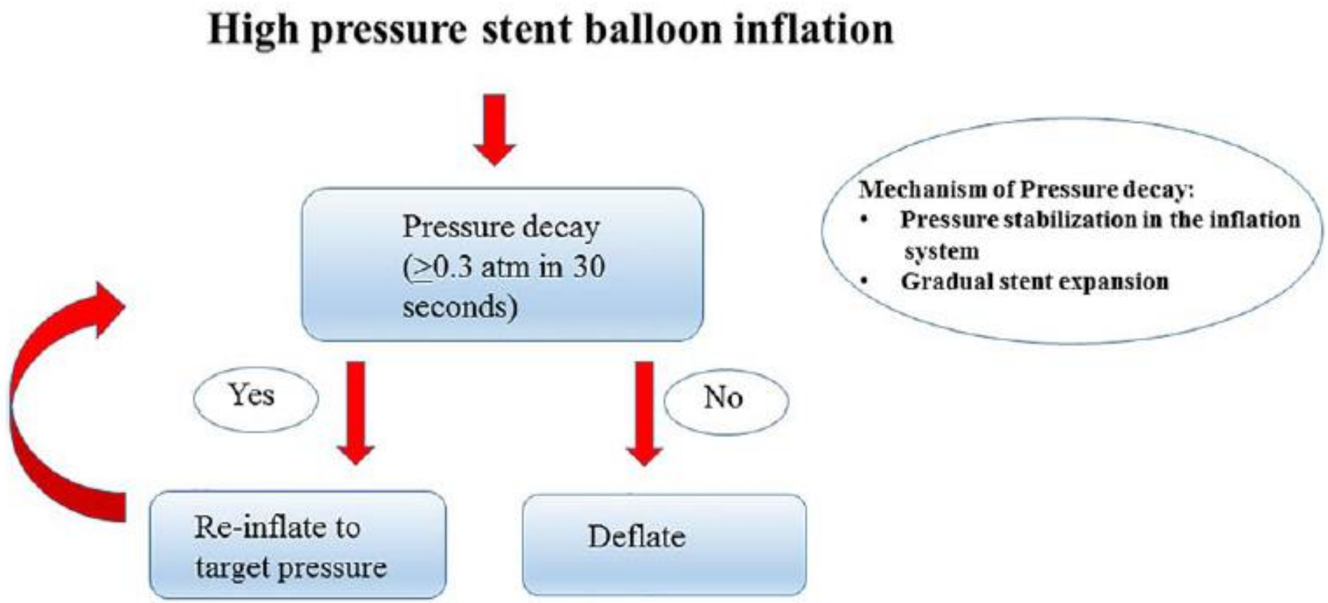


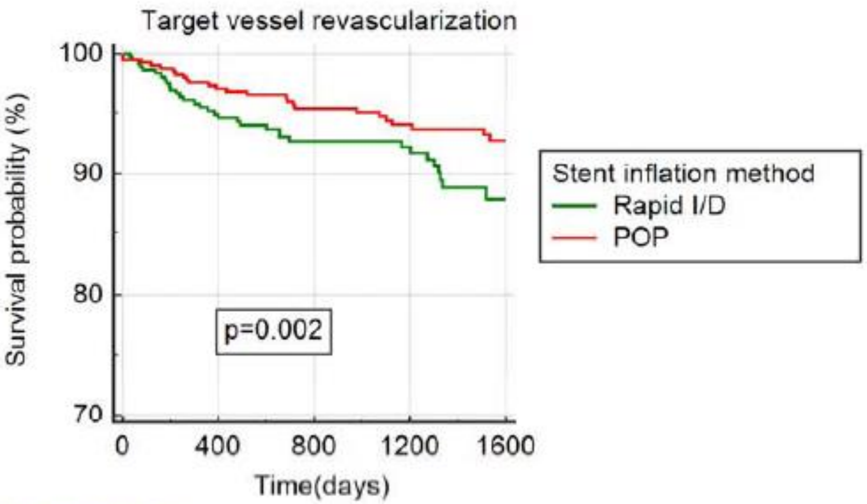
Fig. 1. Flowchart describing the Pressure Optimization Protocol (POP) method.

pressure stability is achieved for 30 s

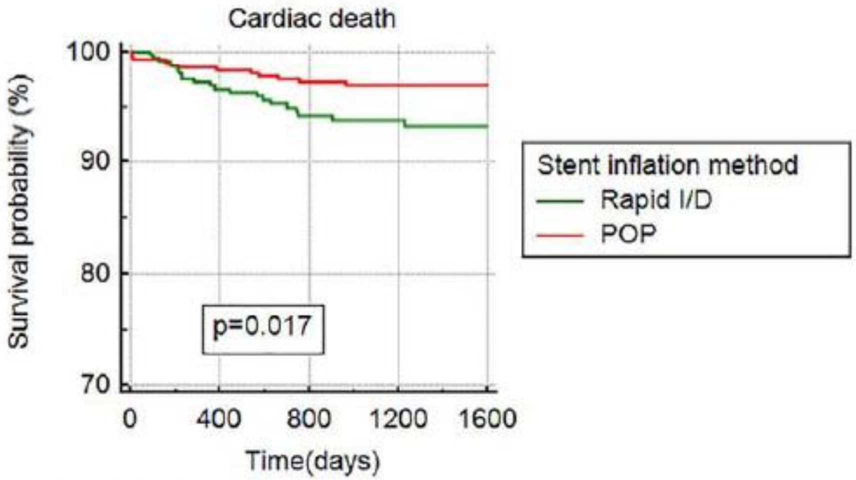
Catheterization and Cardiovascular Interventions (2017)

TABLE II. PCI Characteristics

	Rapid I/D	POP	*p* value
Stents per lesion	1.38 ± 0.2	1.44 ± 0.2	0.2
Bare metal stents (%)	25.6	22.6	0.4
Inflation pressure (atm)	17.1 ± 4.3	15.8 ± 5.9	<0.0001
Inflation time (s)	18.4 ± 16.6	104.7 ± 46	<0.0001
Postdilation (%)	54.3	13.8	<0.0001



Number at risk
Group: Rapid I/D
376 316 249 183 64
Group: POP
414 393 319 266 178



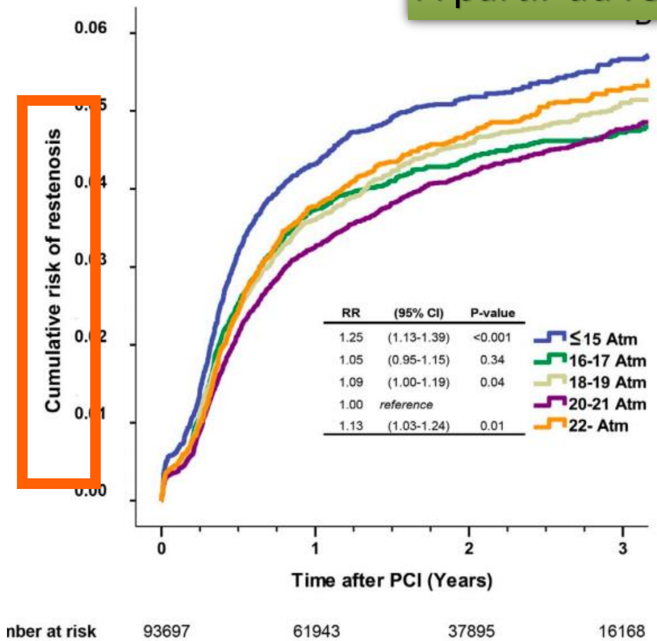
Number at risk
Group: Rapid I/D
376 316 249 183 64
Group: POP
414 393 319 266 178

Pression d'inflation?

Effect of Stent Inflation Pressure and Post-Dilatation on the Outcome of Coronary Artery Intervention. A Report of More than 90 000 Stent Implantations

Ole Fröbert[1]*, Giovanna Sarno[2], Stefan K. James[2], Nawsad Saleh[3], Bo Lagerqvist[2]

A partir du registre suédois de 2008 à 2012



- ✤ **Augmentations des risques de resténose + thrombose**
  - ✤les bassesP < 15 atm et
  - ✤les très hautes pressions >20 atm

PLoS One. 2013;.

2. Les ballons à haute pressions

- Ballon NC, revêtu d'une **double couche** ➔expansion homogène du ballon sans effet de « *dog boning* »
- la surdilatation des berges de la lésion est évitée ➔ moins de risque de large dissection voire de rupture
- **Profile Tip d'entrée de 0.016"** :meilleur franchissement de la lésion.
- Extrêmement NON COMPLIANT. Peut être Inflaté à **35 atm**

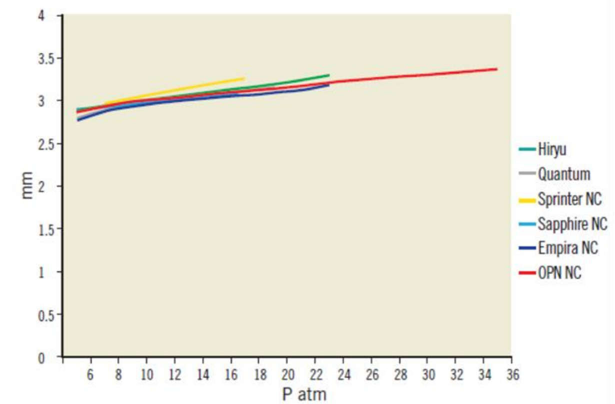


Figure 1. Ballonnet OPN NC. **a)** Construction en double couche **b)** Deux marqueurs en platine pour toutes les tailles **c)** Coating du ballon et du cathéter pour améliorer le franchissement **d)** Profil d'entrée de 0,016"

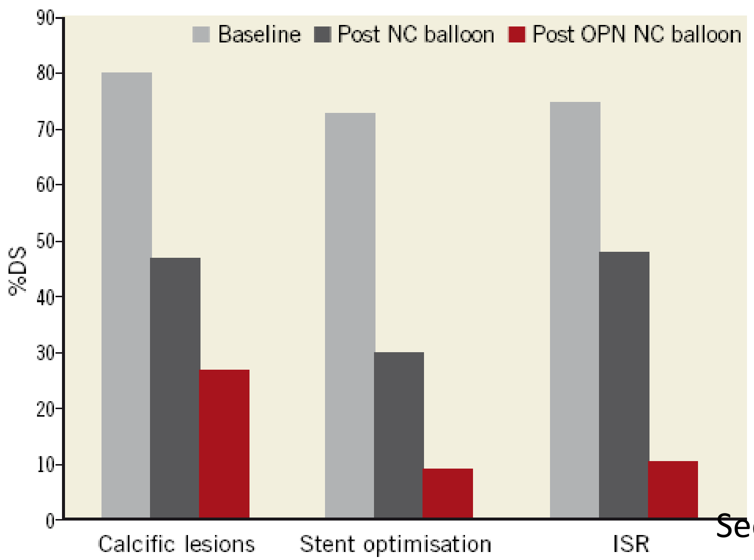
Very high-pressure dilatation for undilatable coronary lesions: indications and results with a new dedicated balloon

Très peu de publications concernant les OPN

Table 4. QCA analysis.

	Baseline	Post NC balloon	Post OPN NC balloon	*p*-value
RD (mm)	2.6±0.8	–	–	<0.001
MLD	0.7±0.3	1.7±0.8	2.4±0.9	
% DS	73.6±9.9	41.1±15.8	20.2±14.9	<0.001
Lesion length (mm)	11.9±6.4	–	–	
Acute gain (mm)	–	1.1±0.7	1.9±0.8	<0.001
Incremental gain (mm)	–	–	0.8±0.4	

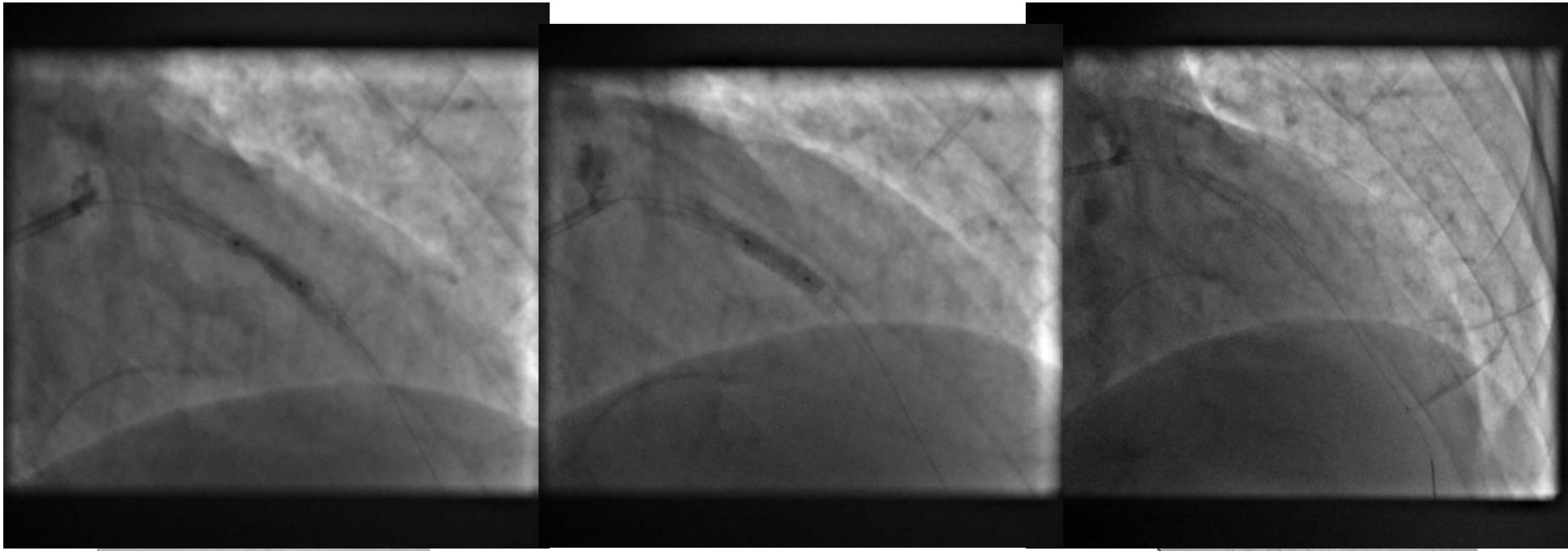
iameter

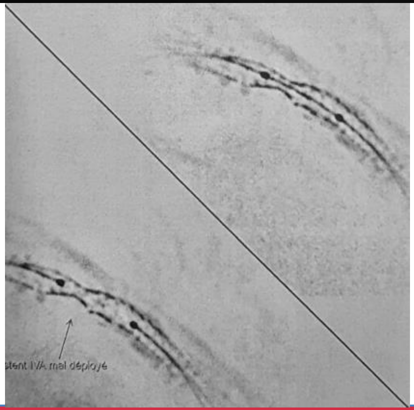


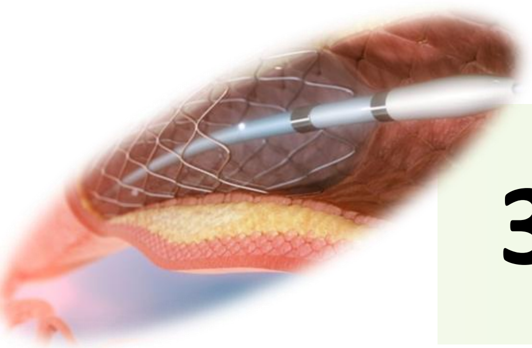
- ✓ Plus grande série publiée
- ✓ 91 patients avec OPN
- ✓ Succès de procédure : 92 %
- ✓ Aucun MACE hospitalier signalé

Secco GG and al. Very high-pressure dilatation for undilatable coronary lesions: indications and result s with a newdedicated balloon. EuroIntervention. 2016 Jun 20;12(3)

Angor D’effort Réfractaire ++
Un Mois après, une Deuxième Procédure utilisant Deux Ballons OPN 3.0*10mm et 3.5*10 mm inflaté è 35 atm







3. Le laser endocoronaire

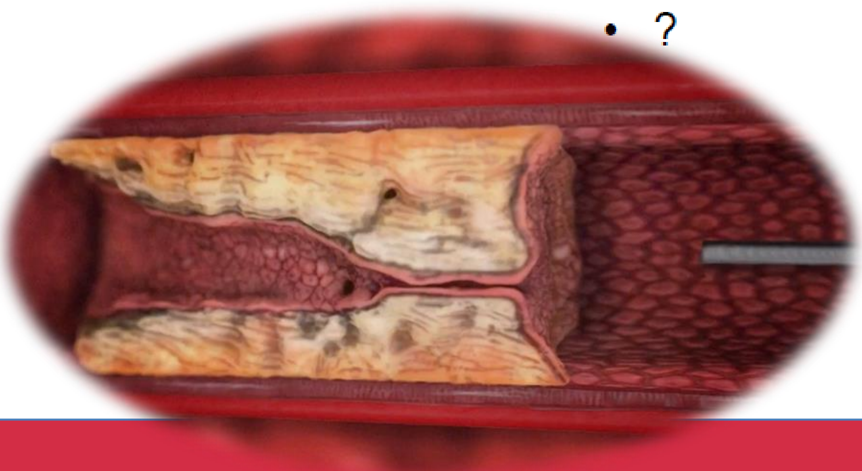
Indications for ELCA – Then and Now

1991

- Balloon wont cross
- Diffuse disease
- In-stent restenosis
- Thrombus removal
- ?

2016

- Balloon wont cross
- Diffuse disease
- In-stent restenosis
- Thrombus removal
- Under-deployed stents



Excimer Laser LEsion Modification to Expand Non-dilatable sTents: The ELLEMENT Registry☆

Azeem Latib [a,b,1], Kensuke Takagi [a,b,1], Giuliano Chizzola [c], Jonathan Tobis [d], Vittorio Ambrosini [e], Giampaolo Niccoli [f], Gennaro Sardella [g], Maria Elena DiSalvo [h], Pietro Armigliato [i], Marco Valgimigli [j], Giandomenico Tarsia [k], Gabriele Gabrielli [l], Lawrence Lazar [d], Diego Maffeo [c], Antonio Colombo [a,b,*]

- 28 patients.
- Rate succes: 27 cases (**96.4%**),
- ↗in MSD by QCA (1.6 ± 0.6 mm at baseline to 2.6 ± 0.6 mm post-procedure) and MSA by IVUS (3.5 ± 1.1 mm2 to 7.1 ± 1.9 mm2).
- Periprocedural MI occurred in 7.1%, transient slow-flow in 3.6% and ST elevation in 3.6%.

A. Latib et al. / Cardiovascular Revascularization Medicine 15 (2014) 8–12

4. L’athérectomie rotative

STENT ABLATION

Rotational atherectomy has been successfully applied to cases of suboptimally expanded stents. This procedure has a high risk of burr lodging and should be discouraged. This situation should be prevented with optimal lesion preparation before stent implantation. When it occurs, rotablation of an underexpanded stent should be considered with extreme caution in highly experienced hands, preferably with surgical back-up.

EuroIntervention 2015;11:30-36

European expert consensus on rotational atherectomy

WILEY Journal Of Interventional Cardiology

Long-term outcomes of rotational atherectomy of underexpanded stents. A single center experience

Marco Hernández-Enríquez MD[1,2] | Francisco Campelo-Parada MD[2] | Thibault Lhermusier MD, PhD[2] | Frédéric Bouisset MD[2] | Jérôme Roncalli MD, PhD[2] | Meyer Elbaz MD, PhD[2] | Didier Carrié MD, PhD[2] | Nicolas Boudou MD[2]

TABLE 4 Overview of published reports about stentablation

Authors	n	Follow-up	Comments
Koyabasi et al[7]	1	3 months	First case report, IVUS confirmed good post-stentablation expansion. FU-angiography discarded restenosis
Medina et al[12]	2	6 months	IVUS and GP IIb/IIIa inhibitor were used used in one case, no MACE mentioned.
Fournier et al[13]	1	5 months	No restenosis in FU-angiography, no MACE mentioned.
Mokkaberi et al[15]	1	No	STEMI with presence of thrombus and intracoronary dissection. Good acute outcome.
Herzum et al (2005)[16]	1	No	Direct stenting in STEMI. Good acute outcome.
Akin et al[8]	1	6 months	FU-angiography revealed 25% restenosis, no MACE mentioned.
Lee et al[9]	1	18 months	IVUS confirmed good post-stentablation expansion. FU-angiography discarded restenosis. No MACE mentioned.
Vales et al[10]	1	2 years	Angina free. No FU-angiography.
Kawata et al[11]	1	6 months	Three times restenosis due to US stent, IVUS confirmed good post-stentablation expansion. Transient ST elevation but no other complications. FU-angiography discarded restenosis.
Devidutta et al[4]	1	6 months	Acute stent thrombosis due to underexpanded stent, IVUS showed 5% residual stenosis after stentablation, GP IIb/IIIa inhibitor was used. No FU angiography. No MACE mentioned
Frisoli et al[14]	1	NS	RA of three-overlapped stent layers. IVUS and FFR confirmed good result.
Édes et al[17]	12	6 months	100% procedural success. No in-hospital MACE but adverse events present in every case. FU-MACE in 50% of patients and 25% of them were death. No IVUS used. No FU-angiography.
Ferri et al[18]	16	12 months	87.5% Procedural success. No in-hospital detah or MACE. 26.6% MACE. TLR 13.3% and one non-cardiac death. 56.3% IVUS.
Present paper (2017)	11	26 months	90.9% procedural success. No in-hospital MACE. No mortality and 90.1% free from MACE in FU. No IVUS used. FU angiography in 6 patients and negative stress test in 3.

Take Home messages

- Connaissez et Préparez bien votre lésion !

- Evitez d'intervenir sur le stent !

Battre son adversaire par knock-out; (K.O)