



CONTROVERSES ET ACTUALITÉS EN CHIRURGIE VASCULAIRE
**CONTROVERSIES & UPDATES
IN VASCULAR SURGERY**

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MARRIOTT RIVE GAUCHE & CONFERENCE CENTER

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**How to minimize arterial
stress?**

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Disclosure

Speaker name: Yann Gouëffic

have the following potential conflicts of interest to report:

Receipt of grants/research support
Details: Abbott; Bard; Medtronic; Terumo; WL Gore

Receipt of honoraria and travel support
Details: Abbott; Bard; Boston Sc; Cook; Cordis; WL Gore;
Medtronic; Perouse; Spectranetics

do not have any potential conflicts of interest to report

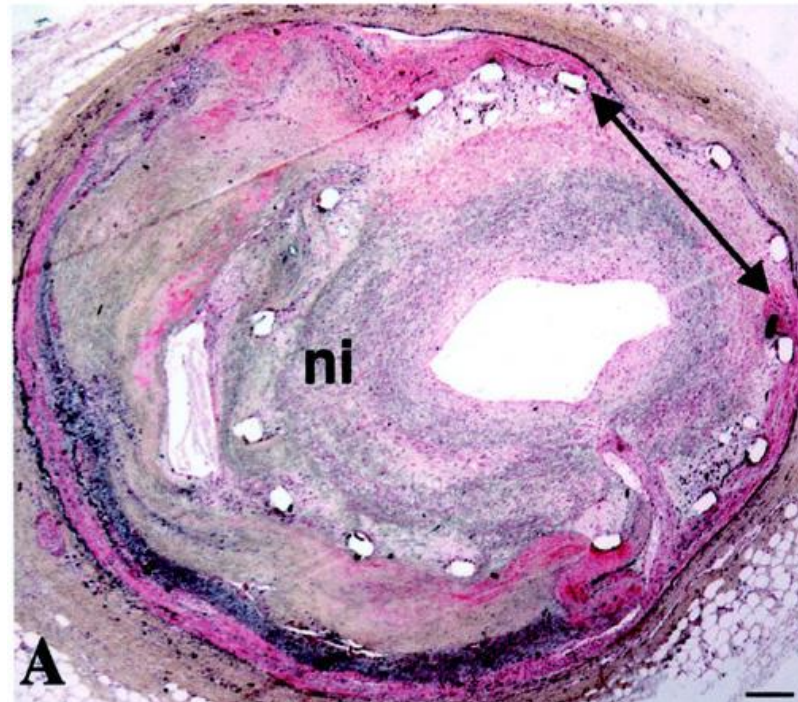


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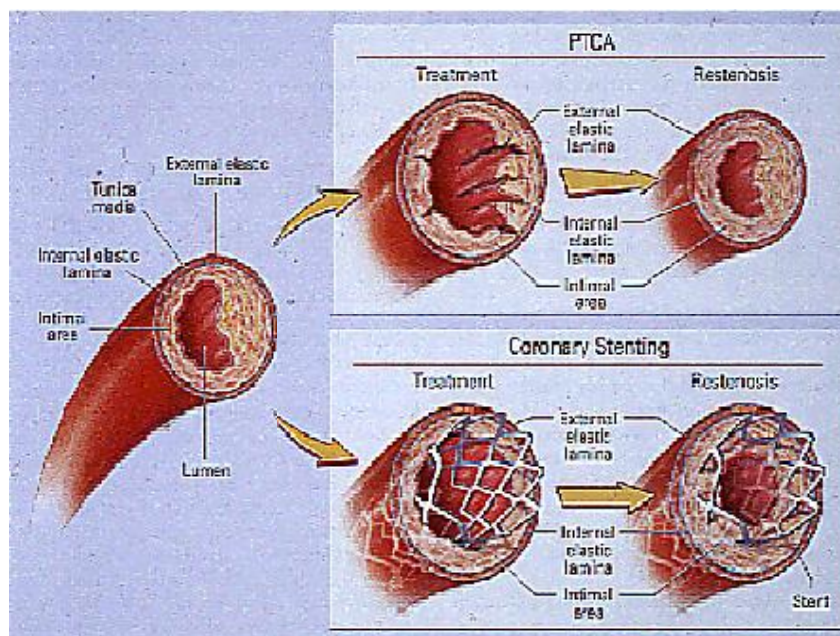
Pr Gouëffic is compensated by and presenting on behalf of Cordis and must present information in accordance with applicable regulatory requirements.

Before using any medical device, review all relevant information, including the label and the Instructions For Use.

Why to minimize arterial stress?

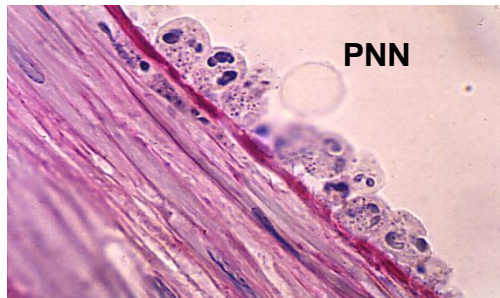


Arterial damage



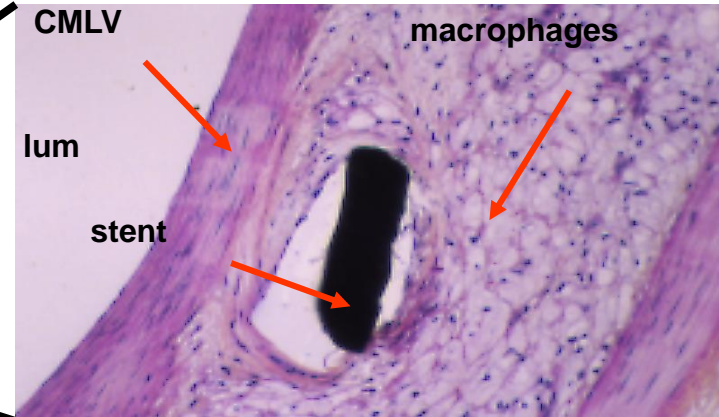
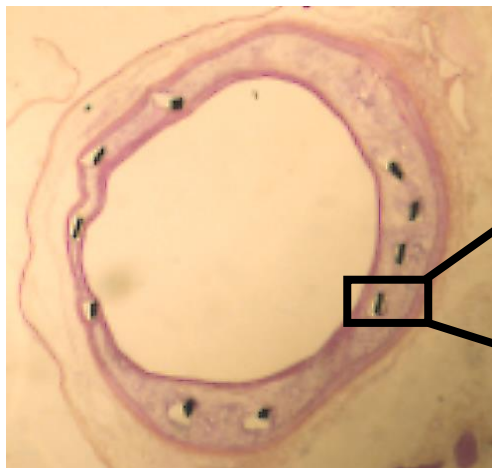
Intimal hyperplasia and inflammation

Day 1



- Over-inflation
- Rupture of the fibrous cap
 - Strut penetration
 - Stent >>> balloon

Day 28

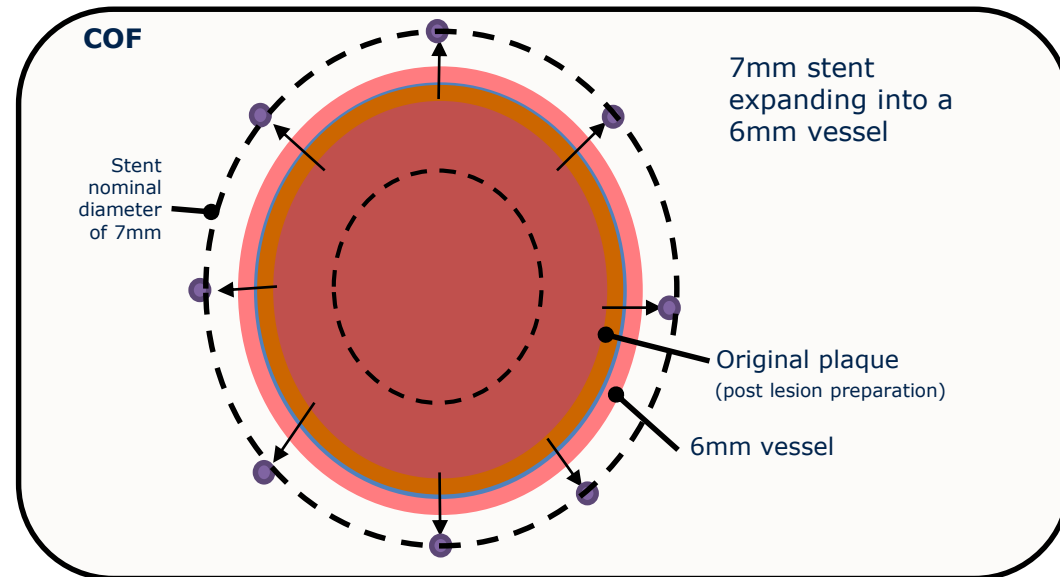




Chronic Outward Force (COF)

Radial force at expansion is also known as **Chronic Outward Force (COF)**.

i.e. the force the stent exerts on the vessel during stent expansion. Oversizing, strut thickness, residual stenosis, tapering... could influence COF





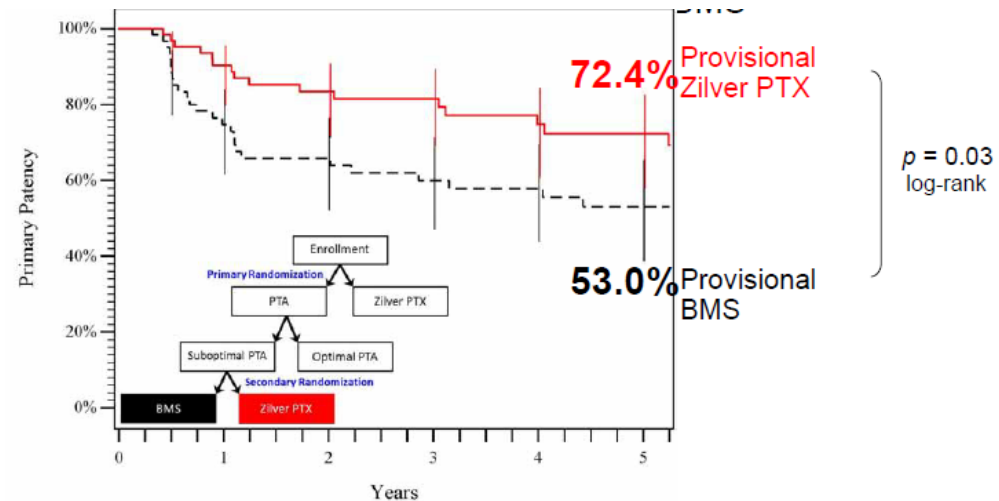
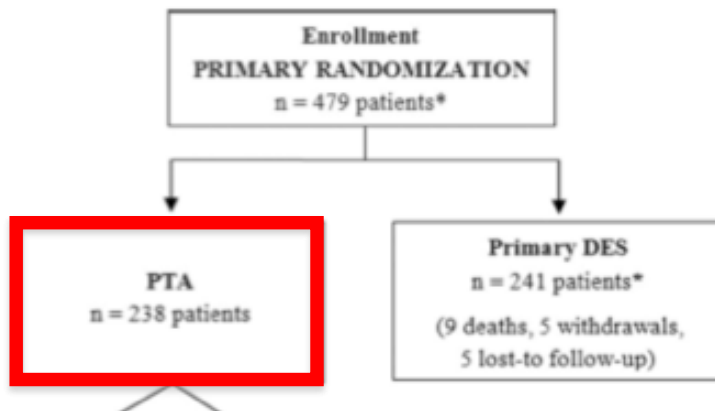
Vessel prep and DCB studies

	IN-PACT SFA	LEVANT 2	ILLUMINATE RCT
Predilatation (%)	96.4	100	100
Number of balloon per lesion (n)	1.4 ± 0.7	1.37 ± 0.50	NA
First treatment balloon maximum pressure (atm)	8.3 ± 2.1	7.8 ± 2.0	NA
Provisional stenting (%)	7.3	2.5	15
Device success (%)	99	88.9	99.5



Vessel prep indirect efficacy data: the Zilver PTX RCT

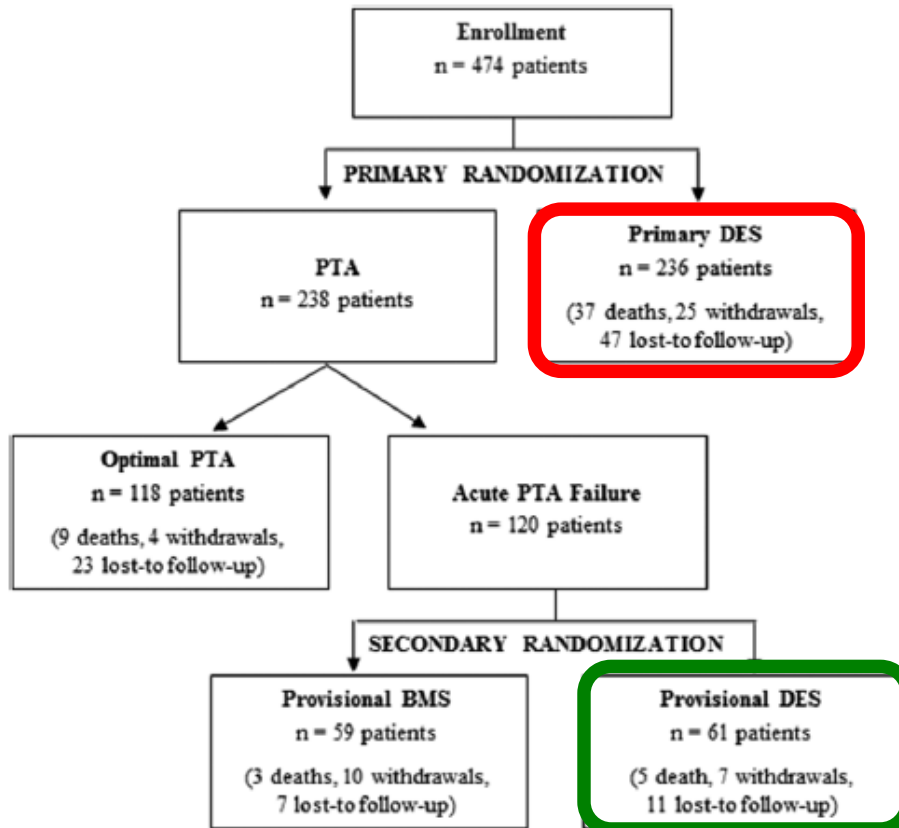
Zilver PTX vs POBA for TASC A/B femoropopliteal lesions
At 5 years, sustained clinical, morphological and hemodynamic outcomes



Dake, Circ Cardiovasc Interv. 2011
Dake, Circulation, 2016



Vessel prep indirect efficacy data: the Zilver PTX RCT



DES
99.7 ± 0.3%
84.4 ± 2.1%
76.3 ± 2.5%
71.5 ± 2.7%
67.4 ± 2.9%
66.4 ± 2.9%

Wo vessel
 prep

Provisional DES
100.0 ± 0.0%
94.7 ± 3.0%
89.1 ± 4.2%
87.2 ± 4.5%
84.9 ± 5.0%
84.9 ± 5.0%

With vessel
 prep



Vessel preparation devices

POBA

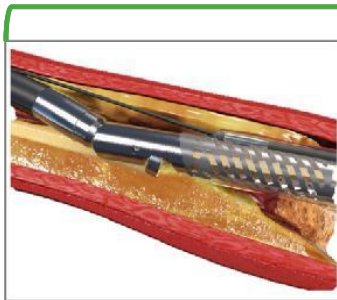
Scoring balloons

(Chocolate[®], Medtronic – VascuTrack[®], Bard)

Atherectomy devices

Mechanical Atherectomy

Laser Atherectomy



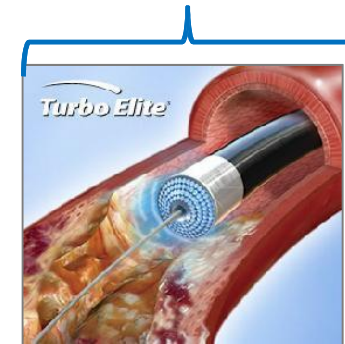
Directional



Orbital



Rotational



Laser

Reliant upon **DIFFERENTIAL HARDNESS** of lesion to *cut, scrape or sand* hardened, calcific atherosclerotic lesions

VAPORIZES the full-spectrum of PAD lesion morphologies

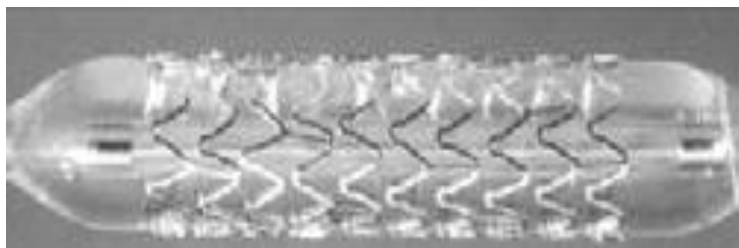


A stent is not just a stent

- ➔ Self expandable, balloon expandable
- ➔ Stent design (tubular, modular, wire)
- ➔ Dimensions (length, width)
- ➔ Geometry (number of struts, strut thickness)
- ➔ Sizing
- ➔ Delivery technique

Balloon versus self expandable stents

Balloon expandable



316L

Cobalt chrome

Self expandable

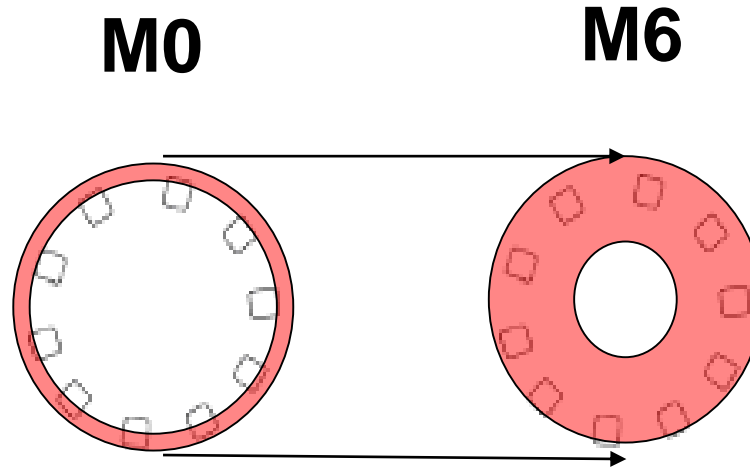


Nitinol



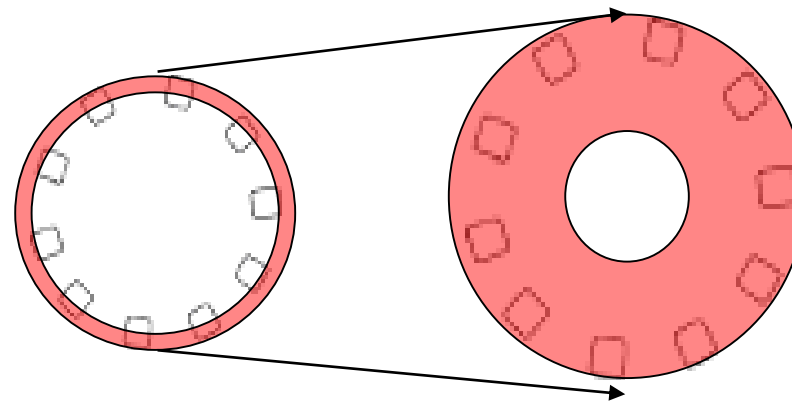
Positive remodeling versus intimal hyperplasia

**Balloon
expandable**



Radial resistive force ↗
Crush resistance ↗
COF ↘

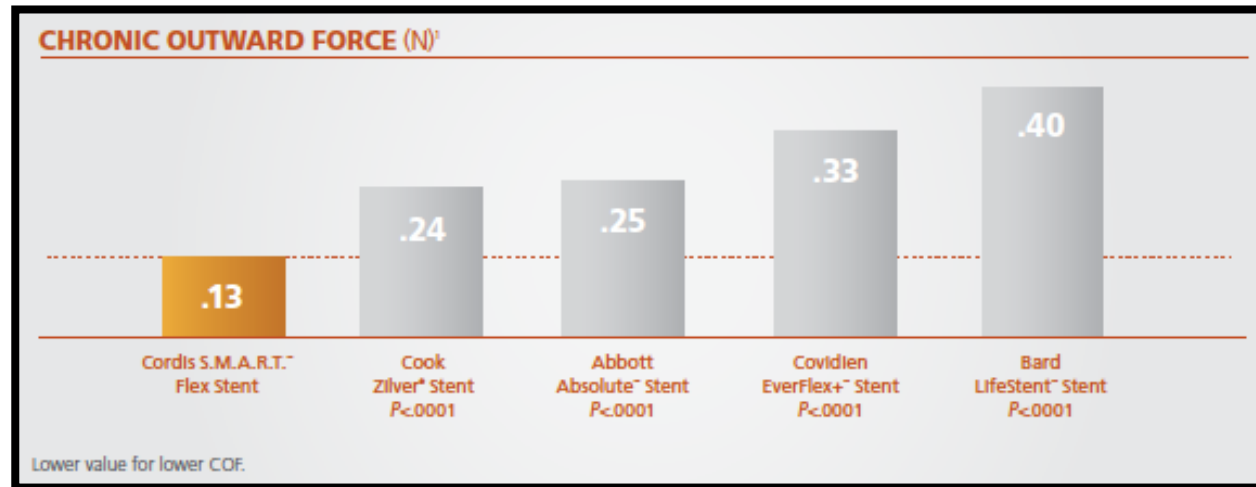
**Self
expandable**



Radial resistive force ↘
Crush resistance ↘
COF ↗



COF varies

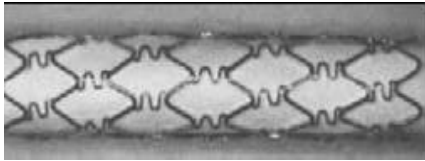


The data provided are based on mechanical and in-vitro testings performed by Cordis Corporation (data on file, Cordis).

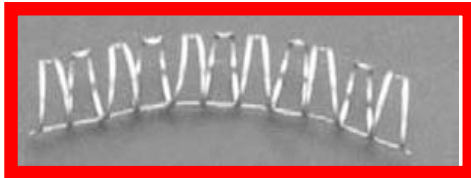


Stent geometry influences radial force

Tubular



Wire

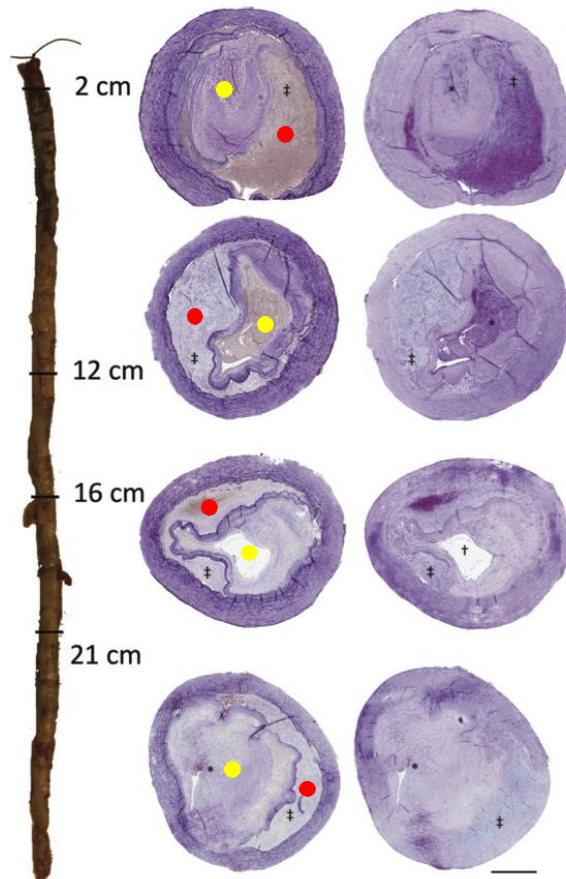


High level of in-stent
restenosis due to the lack
of radial resistive force and
crush resistance

Modular



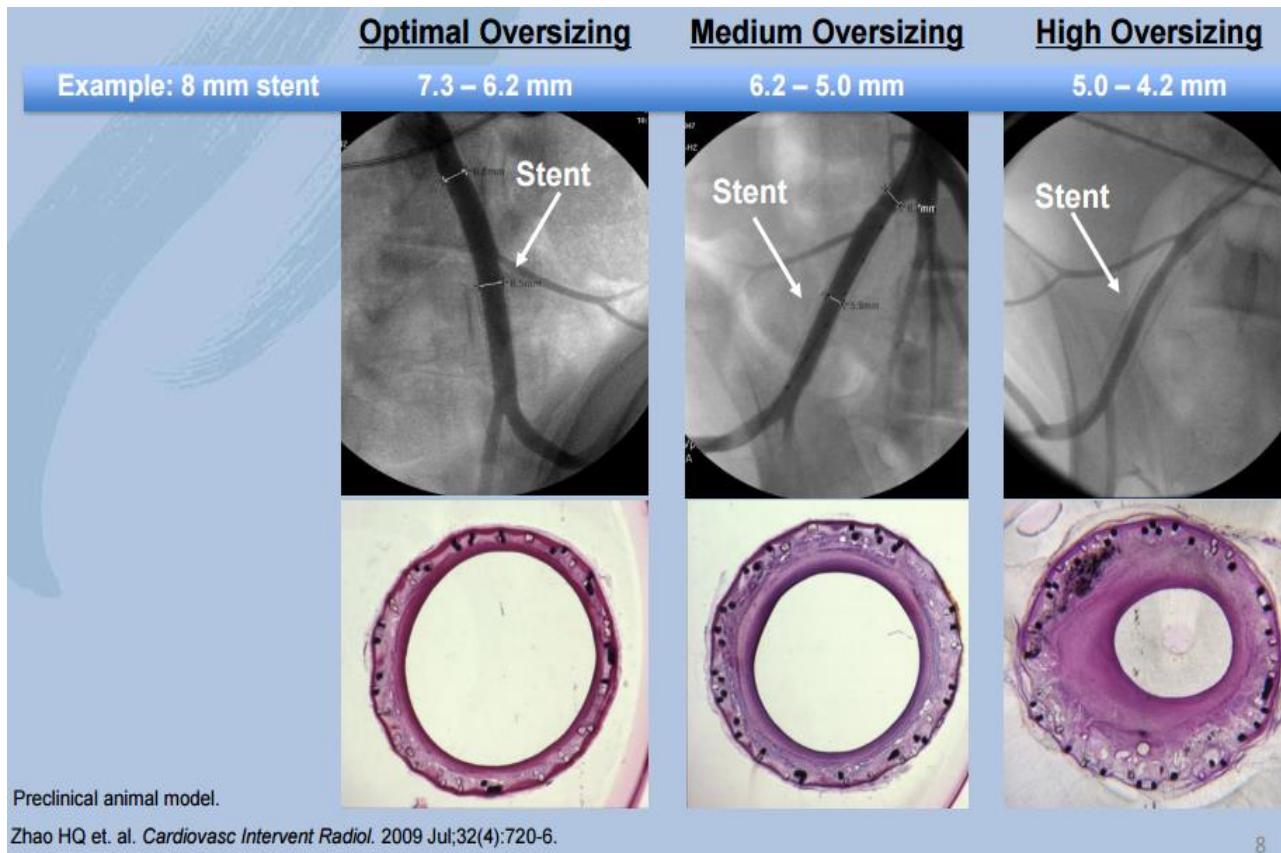
Scaffolding is required to prevent elastic recoil



- The true lumen (●) of the superficial femoral artery is still open at 12 cm distance
- Dissection of the arterial wall located between the internal elastic lamina and the atherosclerotic plaque (●)
- The newly formed route in the arterial wall was filled with thrombus at all levels
- Reobstruction began at the distal part of the artery

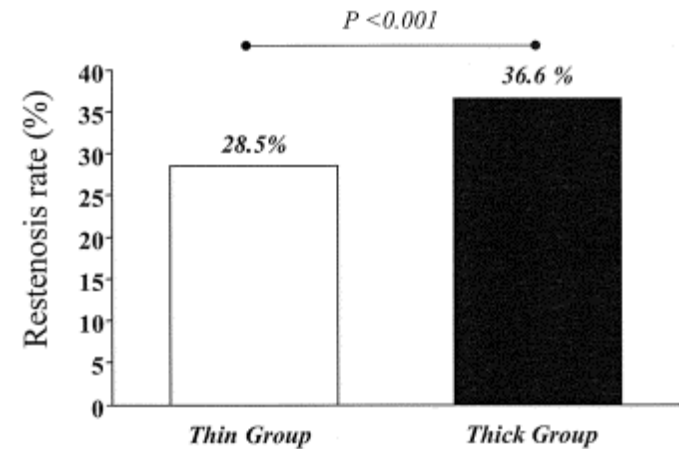
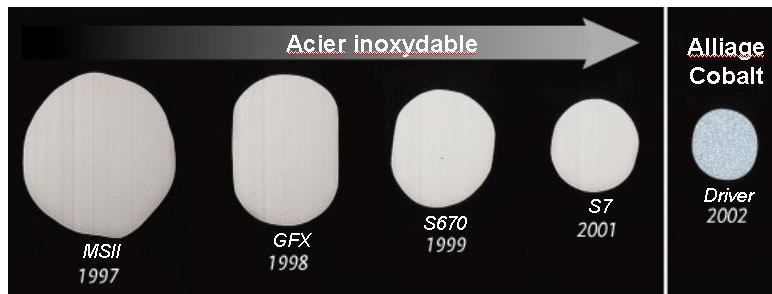


Stent oversizing (high COF) increase ISR





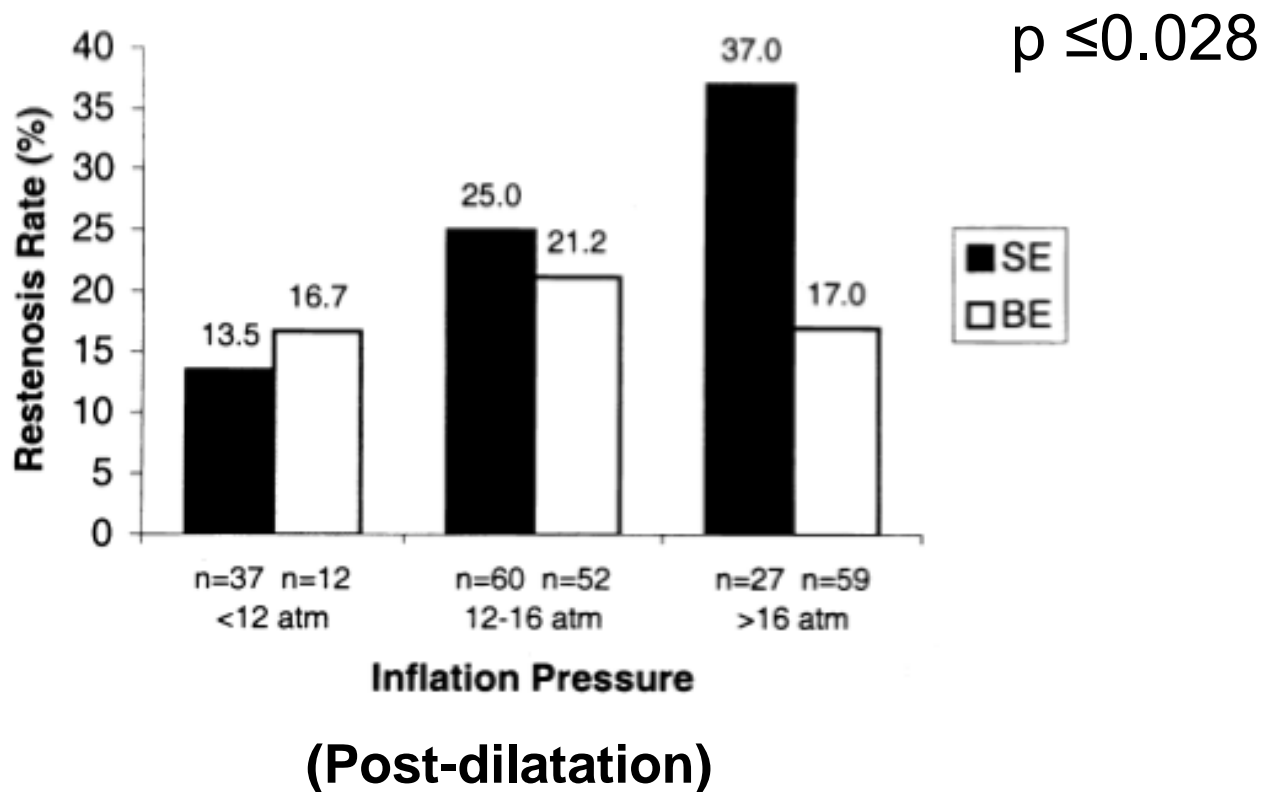
Struts thickness



Briguori, J Am Coll Cardiol, 2002



Balloon remodeling





Take home message

- **Low COF, and sufficient radial force** are essential properties of modern nitinol stents
- To maximize the clinical results of low COF stents, **vessel preparation is recommended**
- No oversizing, gentle remodeling may minimize the risk of restenotic response.