NexGen
Polishexperience in ACS

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TCTAP

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 12 Recommendations for revascularization in non-ST-segment elevation acute coronary syndrome

Specification	Class[a]	Level[b]	Ref.[c]
An invasive strategy is indicated in patients with: • GRACE score >140 or at least one high-risk criterion. • recurrent symptoms. • inducible ischaemia at stress test.	I	A	64, 68–70
An early invasive strategy (<24 h) is indicated in patients with GRACE score >140 or multiple other high-risk criteria.	I	A	63, 64, 66, 70–72
A late invasive strategy (within 72 h) is indicated in patients with GRACE score <140 or absence of multiple other high-risk criteria but with recurrent symptoms or stress-inducible ischaemia.	I	A	59, 66, 68
Patients at very high ischaemic risk (refractory angina, with associated heart failure, arrhythmias or haemodynamic instability) should be considered for emergent coronary angiography (<2 h).	IIa	C	—
An invasive strategy should not be performed in patients: • at low overall risk. • at a particular high-risk for invasive diagnosis or intervention.	III	A	59, 68

[a]Class of recommendation.
[b]Level of evidence.
[c]References.

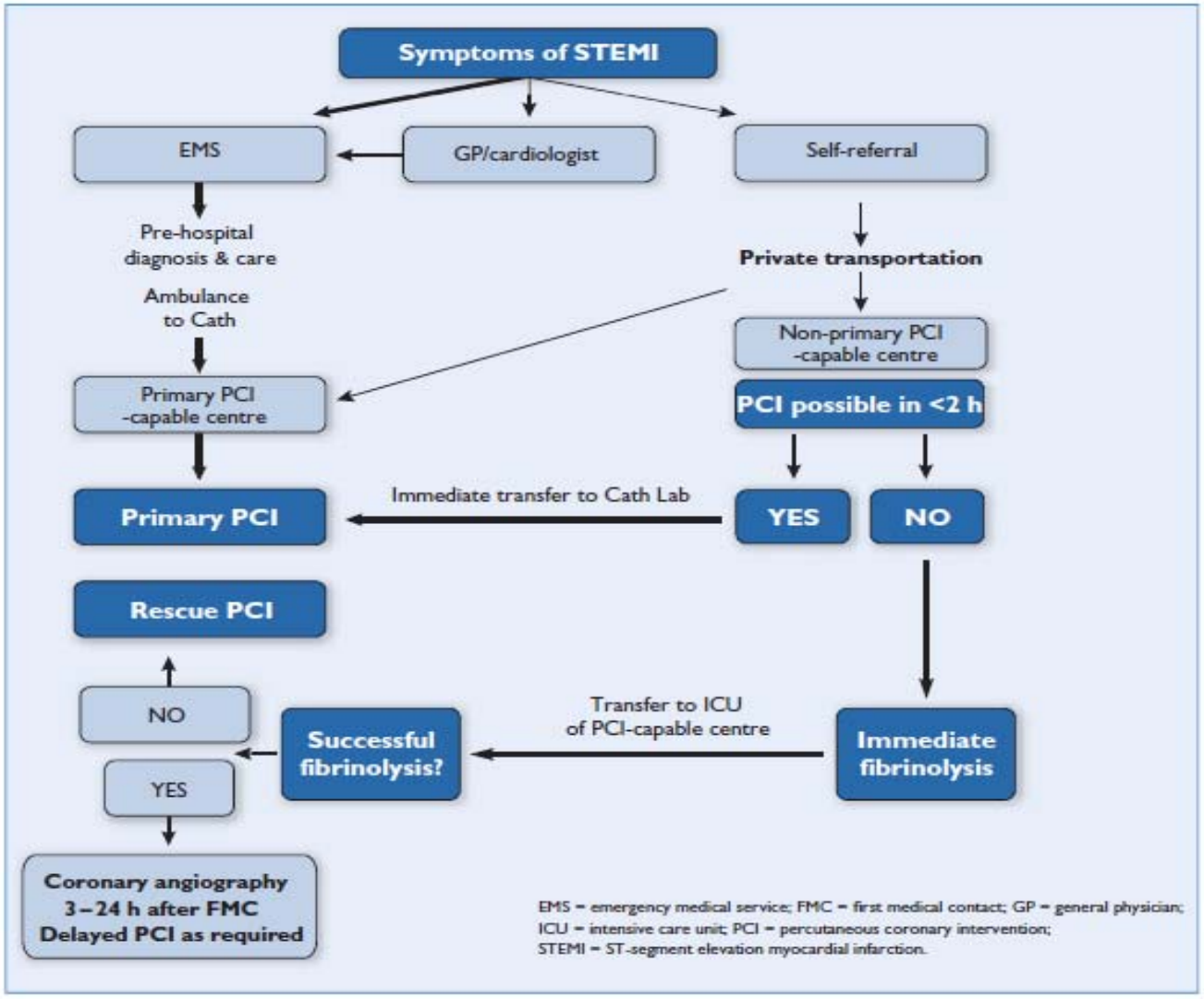
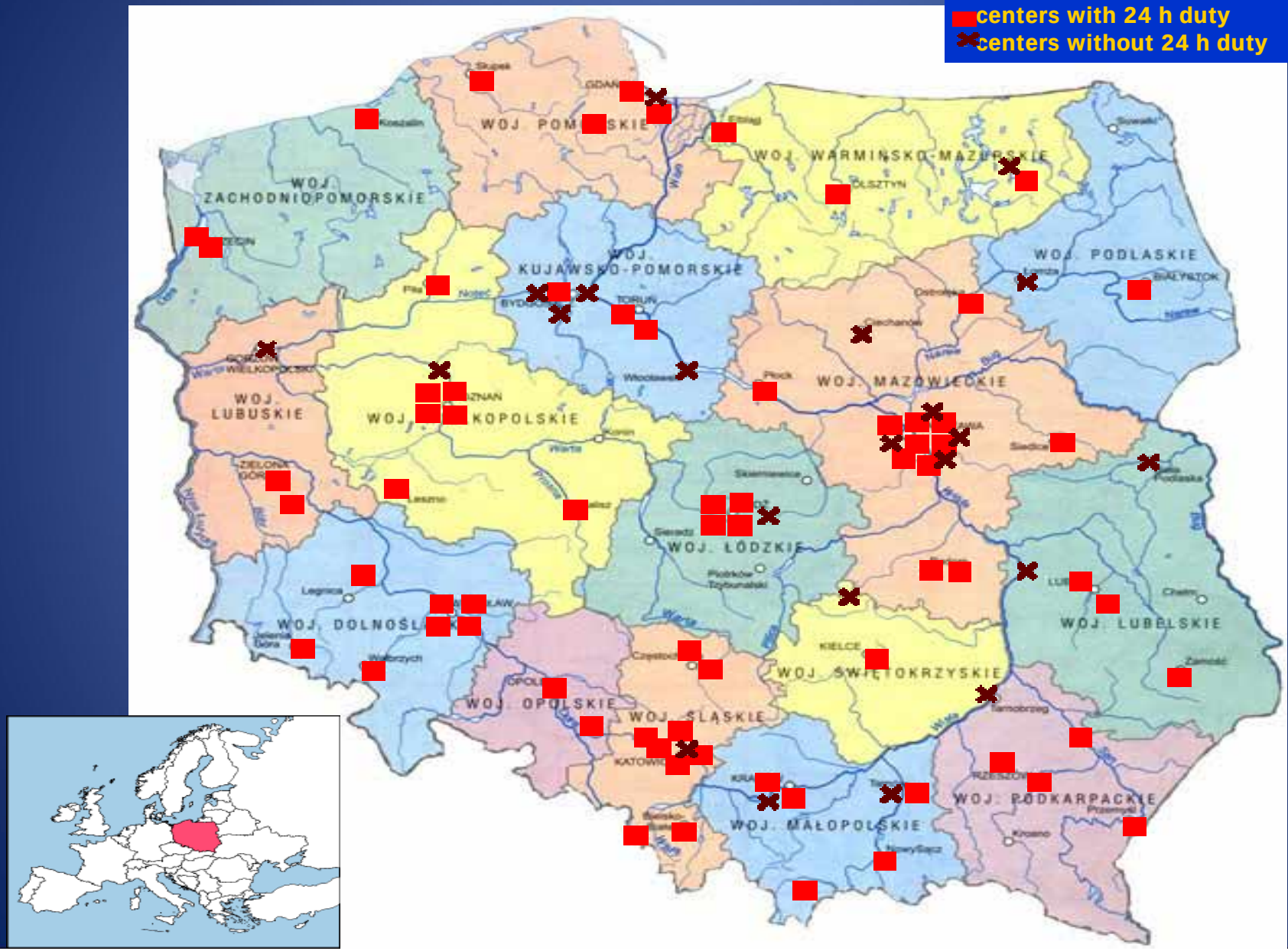


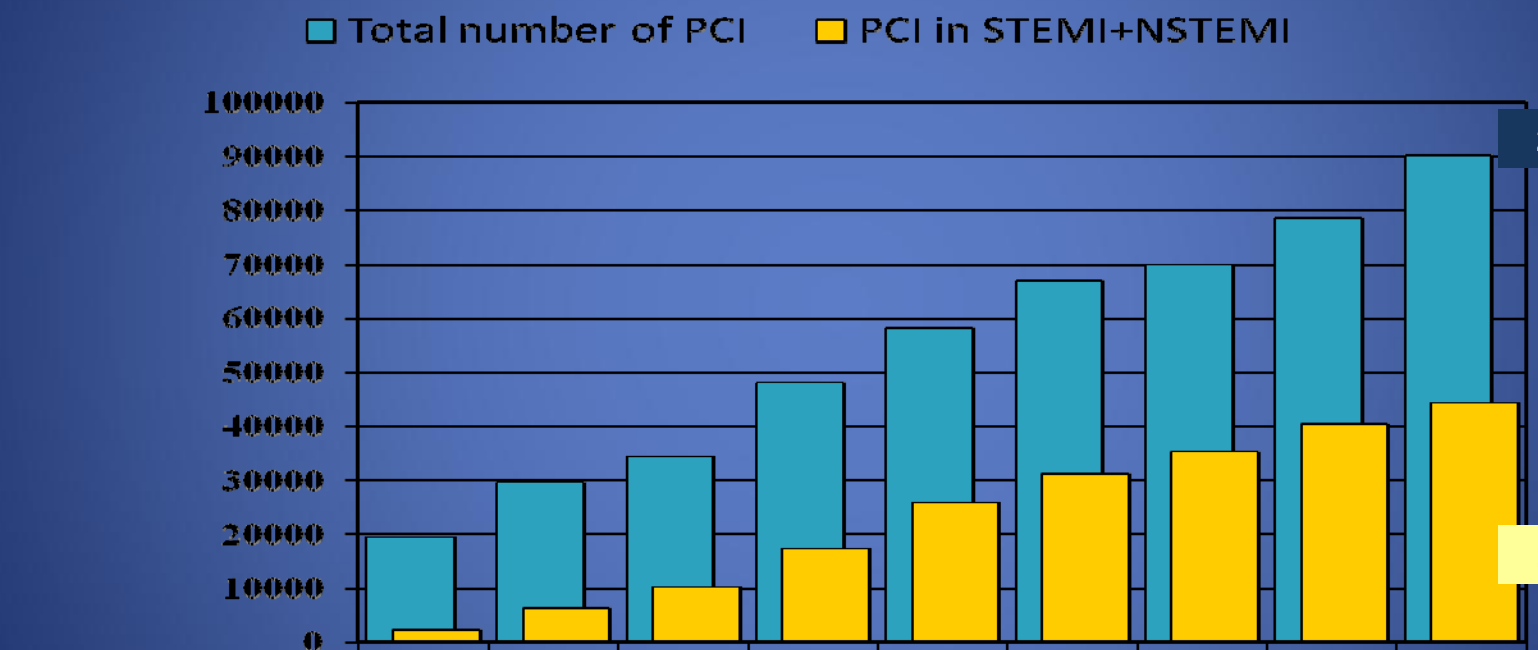
Figure 1 Organization of ST-segment elevation myocardial infarction patient pathway describing pre- and in-hospital management and reperfusion strategies within 12 h of first medical contact.

Polish Cardiac Society
Working Group on Cardiovascular Interventions
Interventional Cardiology in Poland 2009



PCI in Poland 2000-2008

Total PCI / PCIin AMI



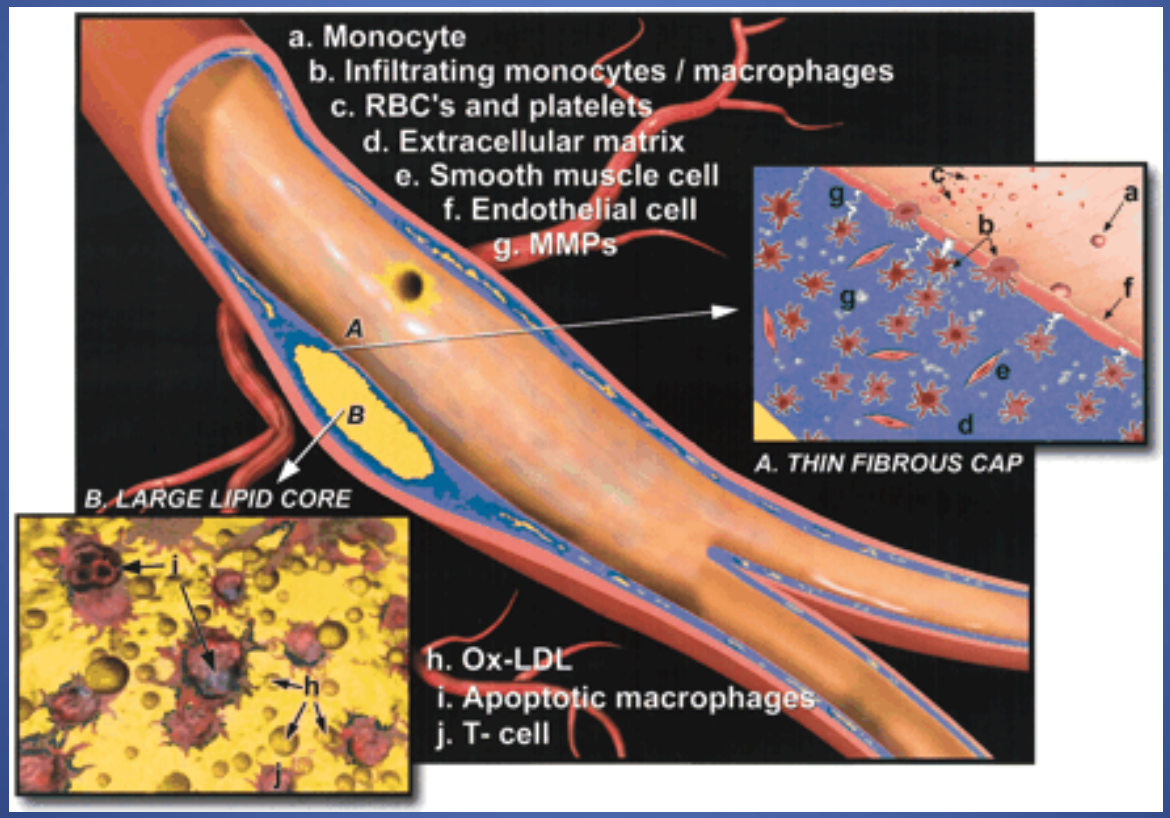
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total number of PCI	19355	29660	34500	48067	58105	66919	69820	78467	90238
PCI in STEMI+NSTEMI	2161	6335	10200	17211	25773	31236	35392	40329	44354

2350 PCI / mln

1155 PCI / mln

Vulnerable plaque

A subset of atherosclerotic plaques particularly prone to physical disruption, producing thrombosis that triggers acute coronary syndromes.



Naghavi, M. et al. Circulation 2003

Goals for treatment of vulnerable plaque

- Improvement of the blood flow
- Expanding lumen and reducing percent diameter stenosis
- Mechanical stabilization of the plaque
- Elimination of thrombus/prevention of thrombus formation
- Promoting healing
- Decreasing of necrotic core size
- Minimizing neointima formation
- Decreasing inflammatory reaction

Potential consequences of plaque compresion

	Potential action:
Fibrous cap rupture Media fracture Lipid core compression/disruption Thrombus disruption	Less traumatic shape/structure of stents struts Size of stent cells Mesh covered stents Balanced force of the balloon/stent system (avoid plaque rupture, preserve morphology of the plaque)
Neointimal formation	Reduced arterial injury Antiproliferative agents
Inflammatory reaction Neovascularization	Reduce injury Antinflammatory agents

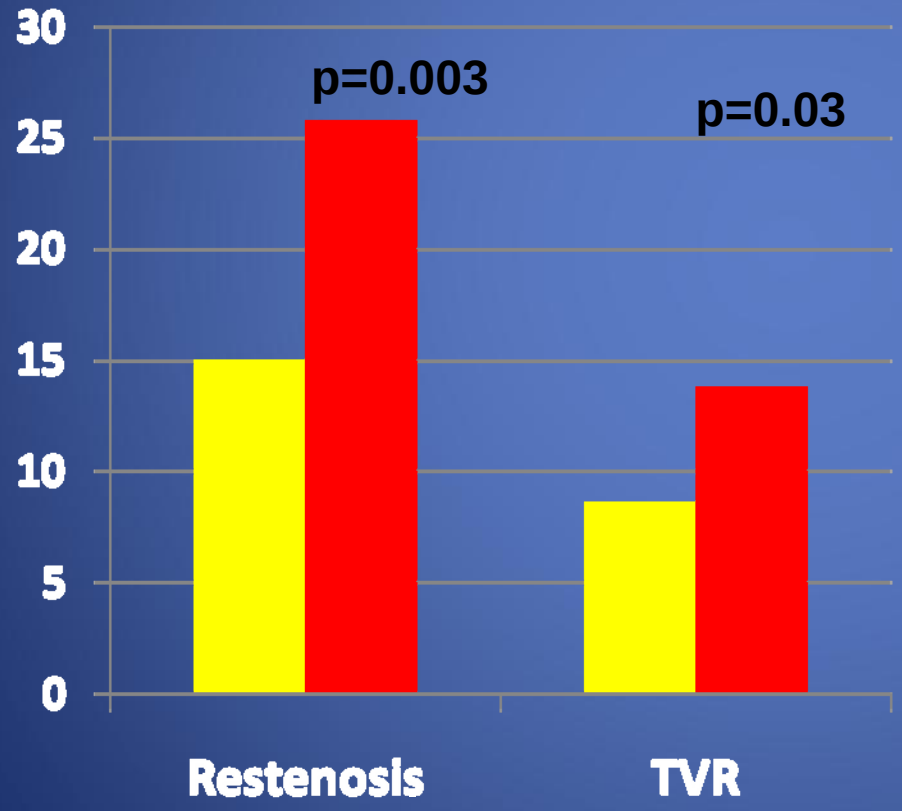
Characteristics of an ideal stent

- Low profile
- Good flexibility
- Low metal : vessel wallarea
- Sufficient radial strength
- Adequate radio-opacity
- Inhibits restenosis
- Biocompatible

Cobaltchromiumstents

- Radial strength - cobalt alloy is about 40-50% stronger then stainless steel
- Enhanced visibility
- Allow low profile stents with good flexibility and curveconformity
- Impact on restenosis
- Biocompatibility and safety- cobalt-chromium alloy

Similar strut configuration
Different strut thickness
Same material



ISAR STEREO-1
n=651

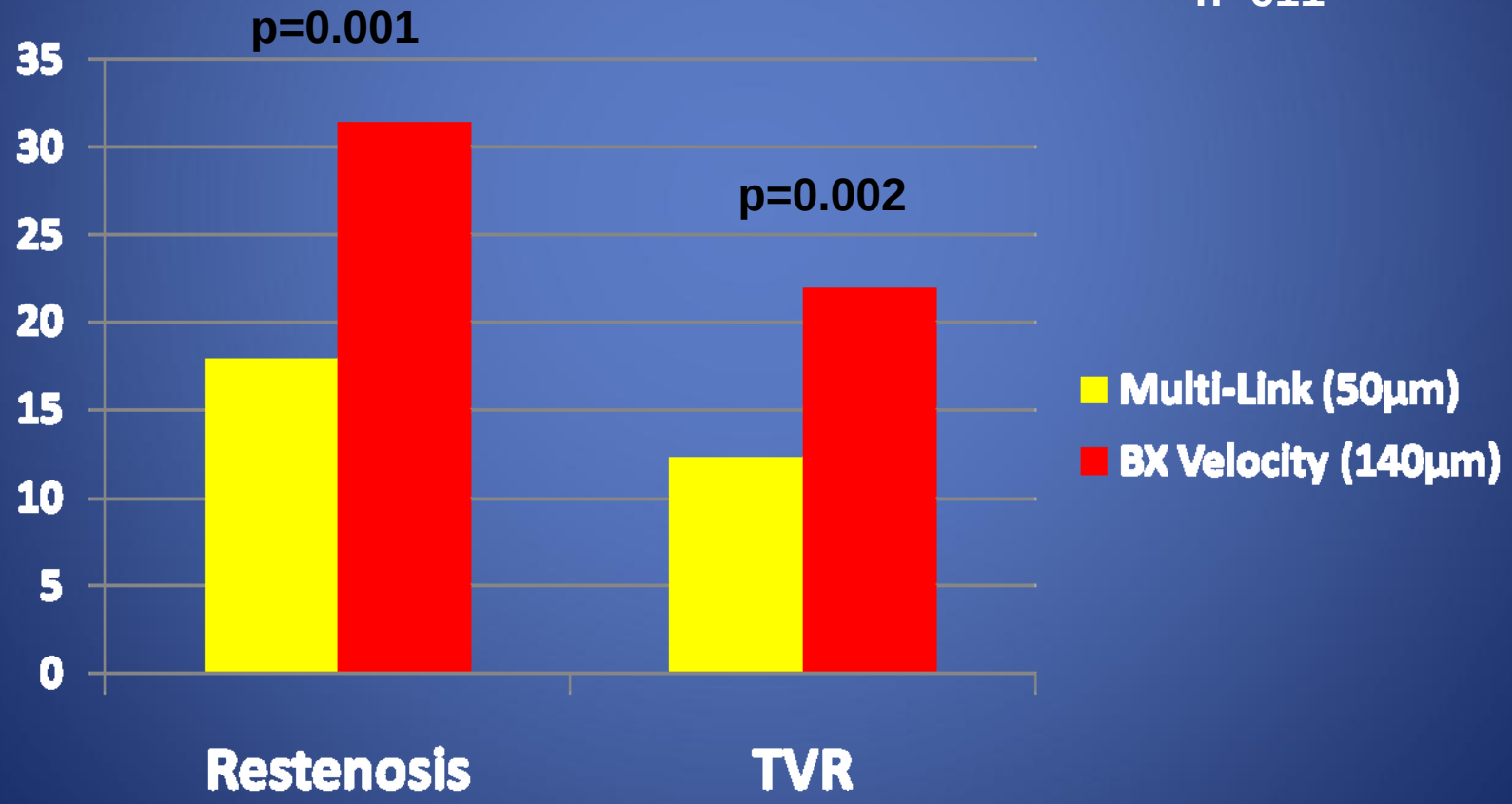
Multi-Link (50µm)

Multi-Link Duet (140µm)

Kastrati et al., Circulation, 2001

Differentstrut configuration
Different strut thickness
Same material

ISAR STEREO-2
n=611



Pache et al.,. J Am Coll Cardiol, 2003

Optimalstentdeployment
Risk of edgedissection

oOptimization of stent deployment during PCI is a key element to obtain most favorable immediate and long-term results'

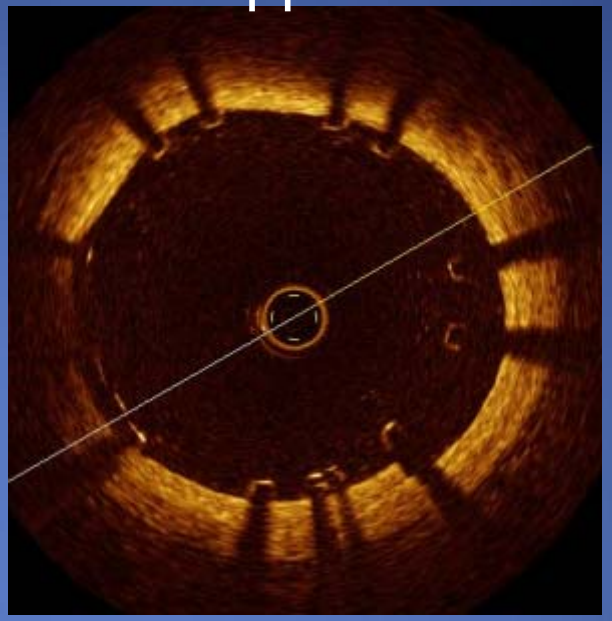
o Suboptimal or incomplete stent expansion is associated with increased restenosis and target vessel revascularization rate

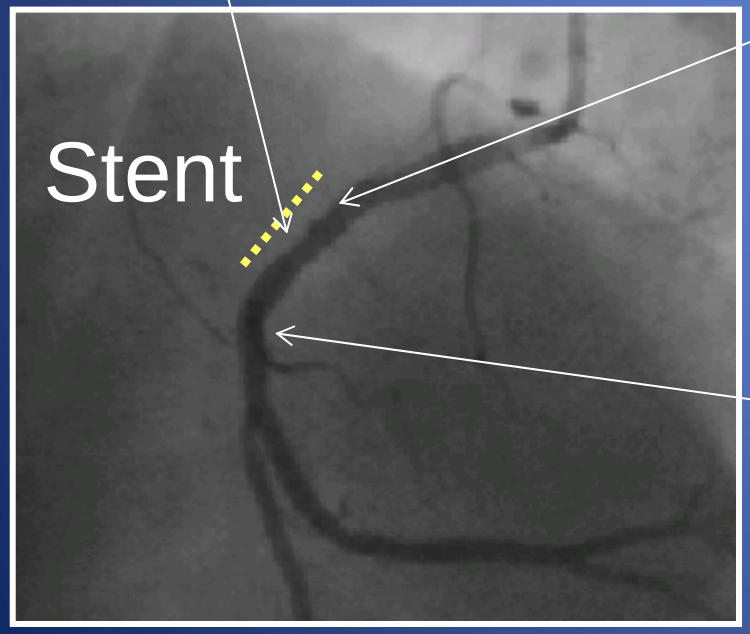
o High-pressure balloon dilation is still necessary to improve the PCI result

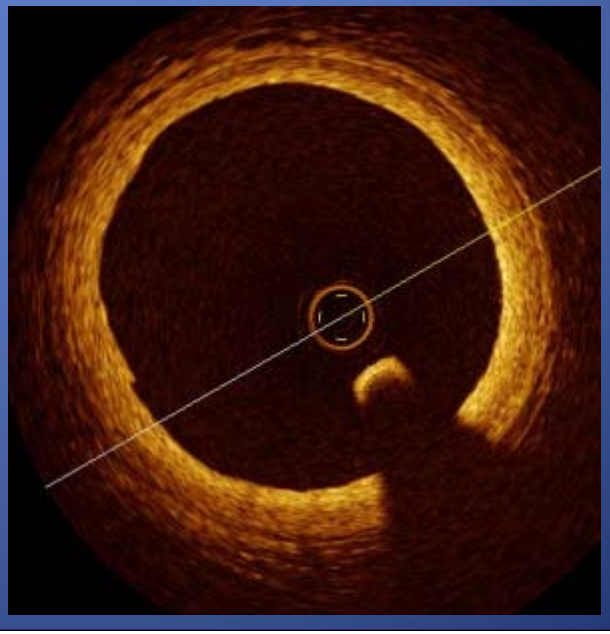
J Am CollCardiolIntv 2008;1:22–31

Plaque prolapse

Underexpansion
Malapposition

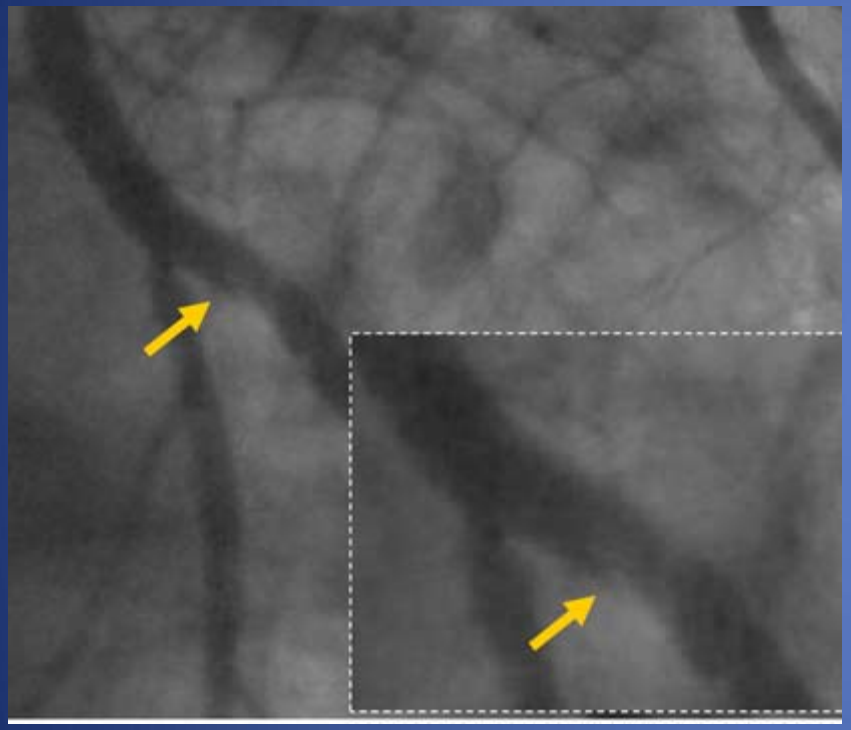


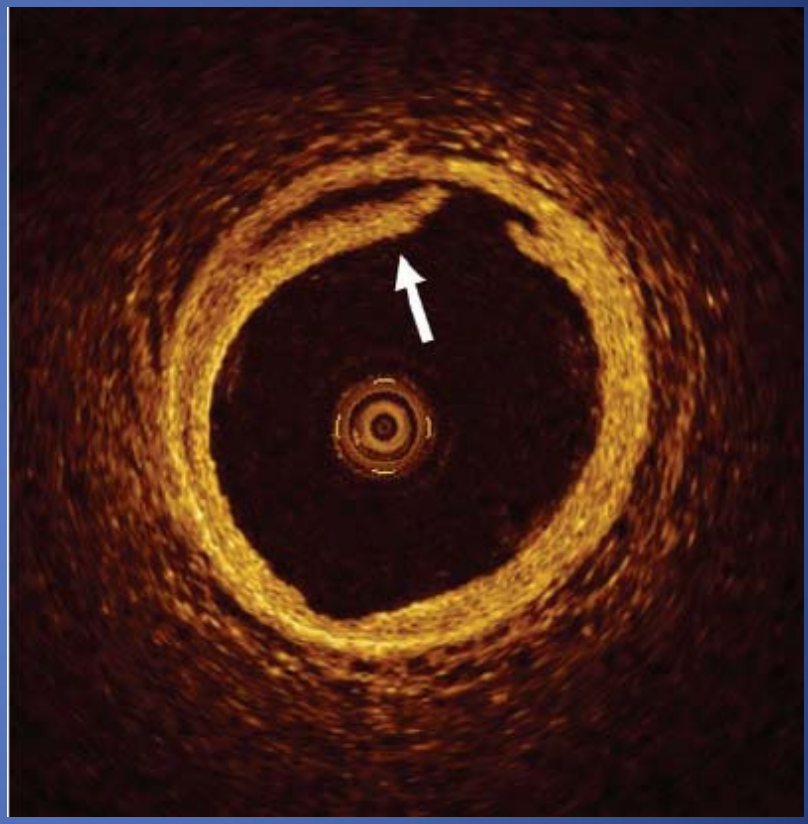




Reference

Edge dissectionin OCT
Relation to plaquetype





	Fibrous	Fibrocalcific	Fibroatheroma	TCFA	Total
Proximal edge	14 (31.1%)	15 (33.3%)	13 (28.9%)	3 (6.7%)	45
Distal edge	40 (55.6%)	16 (22.2%)	11 (15–3%)	5 (6.9%)	72
Total	54	31	24	8	117

Gonzalo eta al. International Journal of Cardiology (2010)

Edge dissectionin OCT

Intra-stent dissection	
Intra-stent dissection visible, n (%)	70 (87.5)
Intra-stent dissection flap	
Intra-stent dissection flap visible, n (%)	69 (86.3)
Number intra-stent dissection flaps, median (IQR)	3 (1.25–6)
Number intra-stent dissection flaps per mm, median (IQR)	0.10 (0.05–0.22)
Intra-stent dissection flap average length (μm), mean (SD)	300 (130)
Intra-stent dissection flap maximum length (μm), mean (SD)	450 (220)
Intra-stent dissection cavity	
Intra-stent dissection cavity visible, n (%)	55 (68.8)
Number cavities, median (IQR)	2 (0–4.75)
Number cavities per mm, median (IQR)	0.07 (0–0.16)
Maximum depth cavity (μm), mean (SD)	340 (170)
Edge dissection	
Edge dissection visible, n (%)	20/76 (26.3)
Length edge dissection flap, mean (SD)	744 (439)

Gonzalo eta al. International Journal of Cardiology (2010)

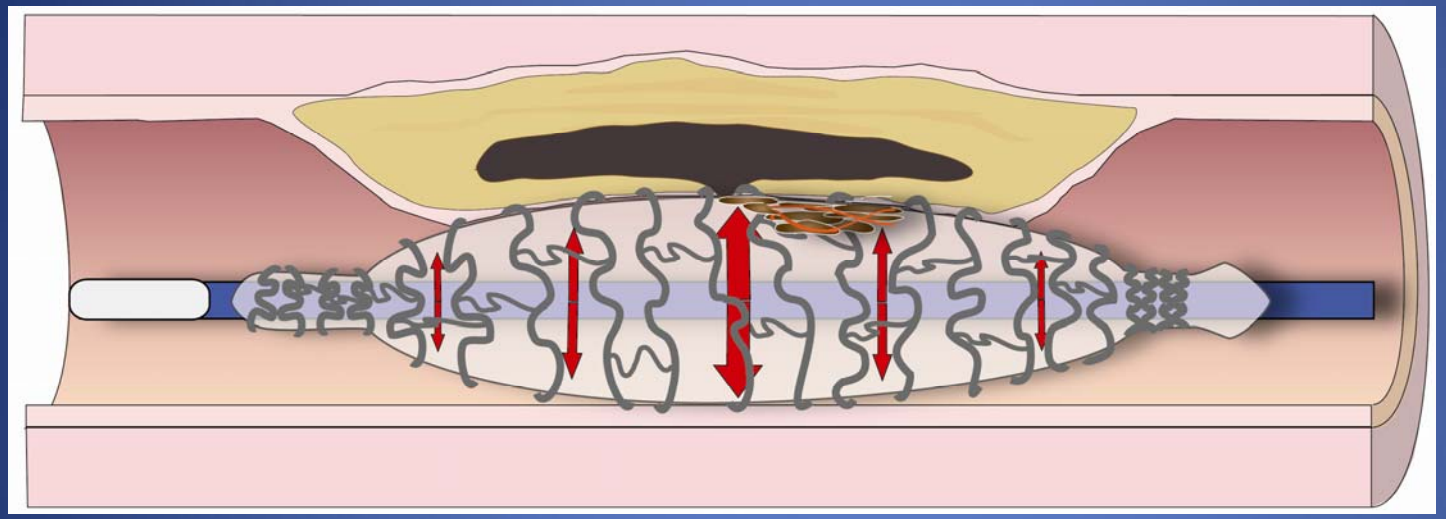
Edge dissectionin OCT
Stablevs. unstablepatients

Intra-stent dissection			
Intra-stent dissection visible, n (%)	41/45 (91.1)	29/35 (82.9)	0.3
Intra-stent dissection flap			
Intra-stent dissection flap visible, n (%)	39/45 (86.7)	30/35 (85.7)	0.9
Number of intra-stent dissection flaps, median (IQR)	3 (2–7)	3 (1–4)	0.3
Number of intra-stent dissection flaps per mm, median (IQR)	0.12 (0.05–0.25)	0.12 (0.04–0.18)	0.3
Intra-stent dissection flap average length (μm), mean (SD)	297 (134)	289 (120)	0.8
Intra-stent dissection flap maximum length (μm), mean (SD)	488 (238)	419 (197)	0.1
Intra-stent dissection cavity			
Intra-stent dissection cavity visible, n (%)	32/45 (71.1)	23/35 (65.7)	0.6
Number cavities, median (IQR)	2 (0–4.5)	1 (0–5)	0.6
Number cavities per mm, median (IQR)	0.07 (0–0.15)	0.04 (0–0.17)	0.8
Maximum depth cavity (μm), mean (SD)	336 (183)	357 (150)	0.6
Edge dissection			
Edge dissection visible, n (%)	9/42 (21.4)	11/34 (32.3)	0.3
Edge dissection length (μm), mean (SD)	860 (579)	650 (277)	0.3

Gonzalo eta al. International Journal of Cardiology (2010)

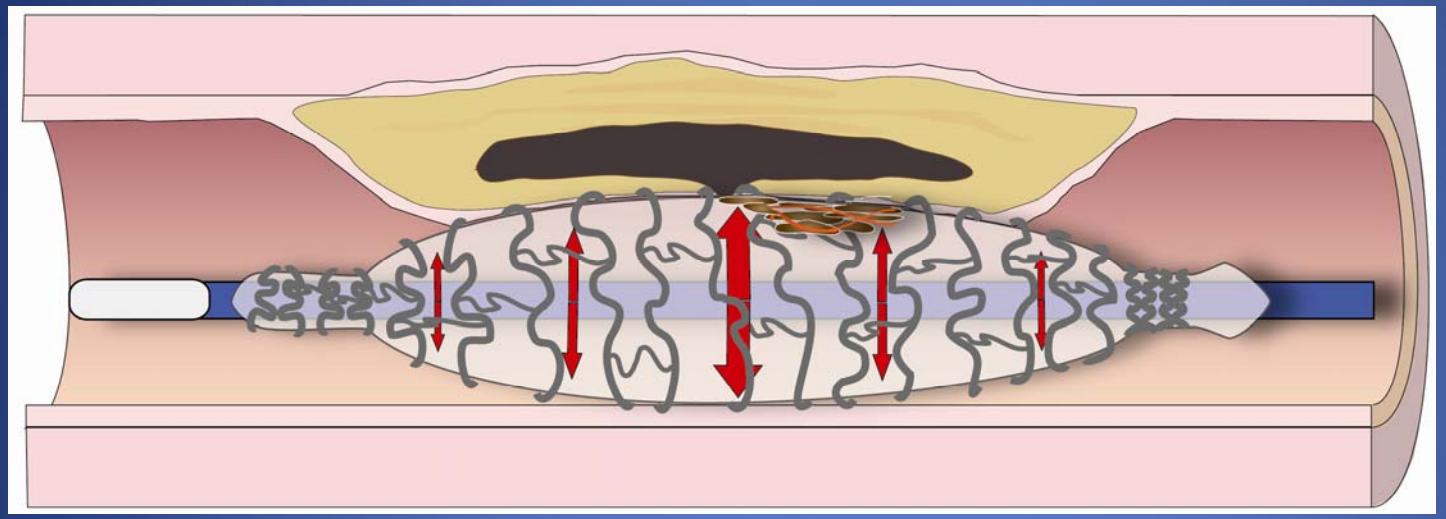
Prevention of edgedissection

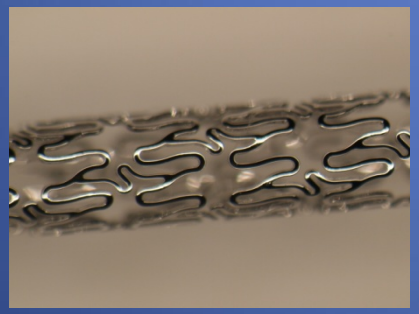
Stagedexpansion



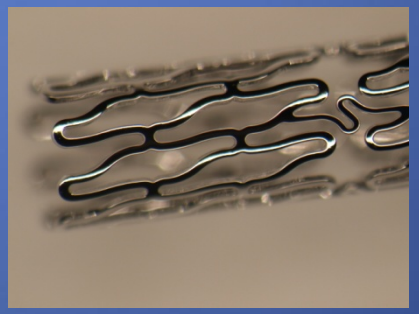
Prevention of edgedissection

Stagedexpansion (NexGen)





Open cell in mid segment

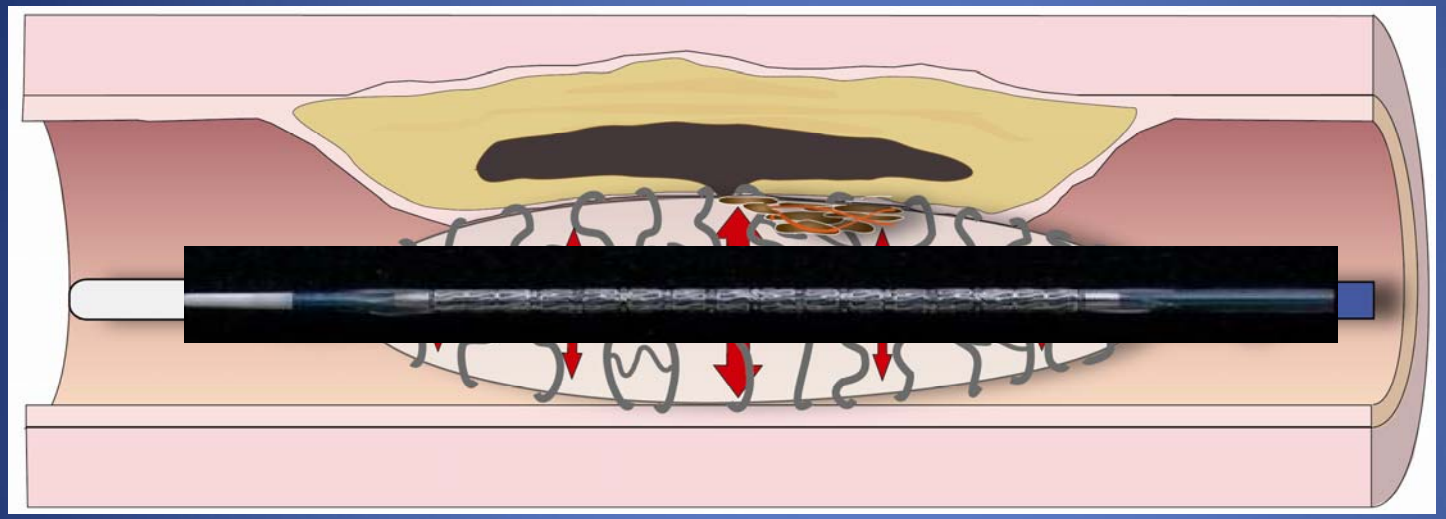


Close cell at edges

Hybrid design

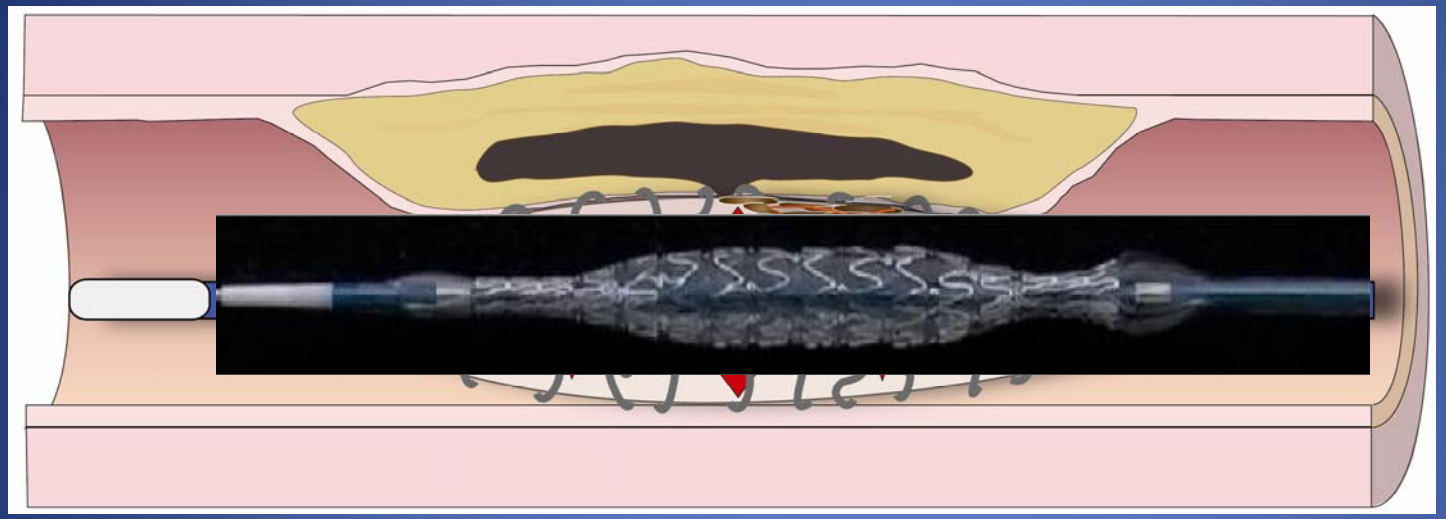
Prevention of edgedissection

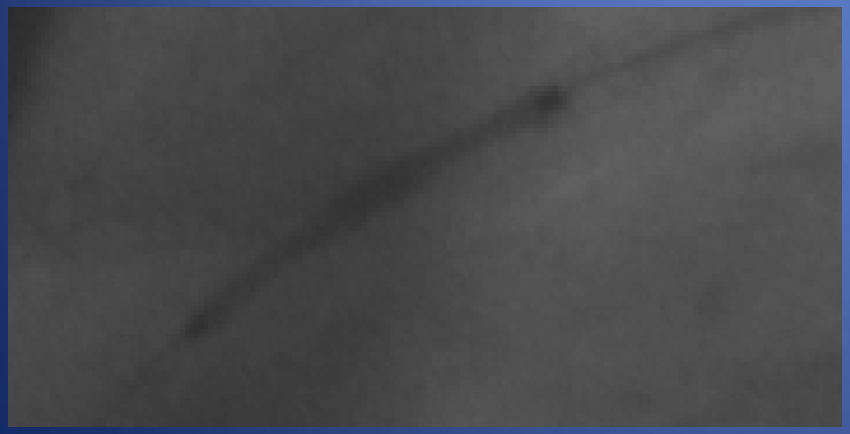
Stagedexpansion

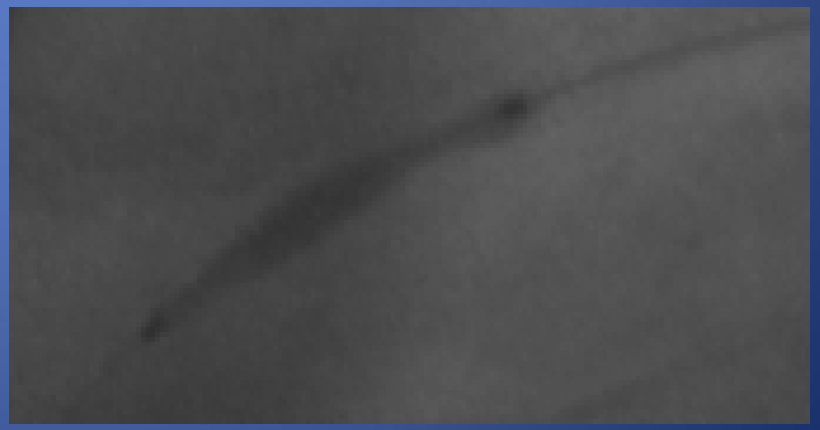


Prevention of edgedissection

Stagedexpansion

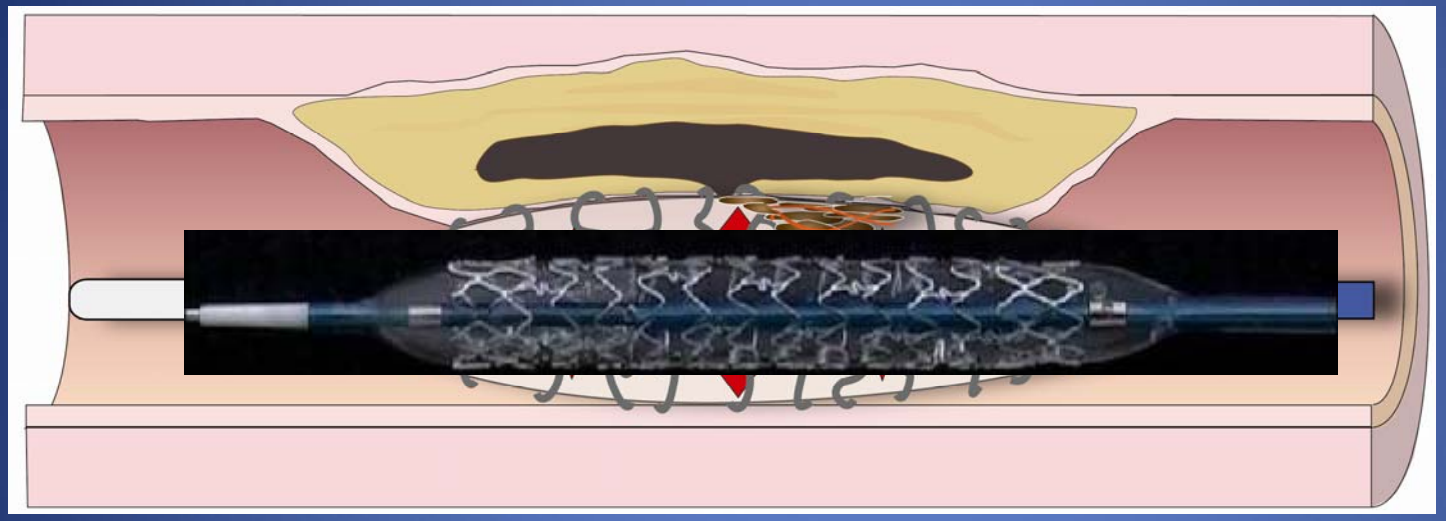


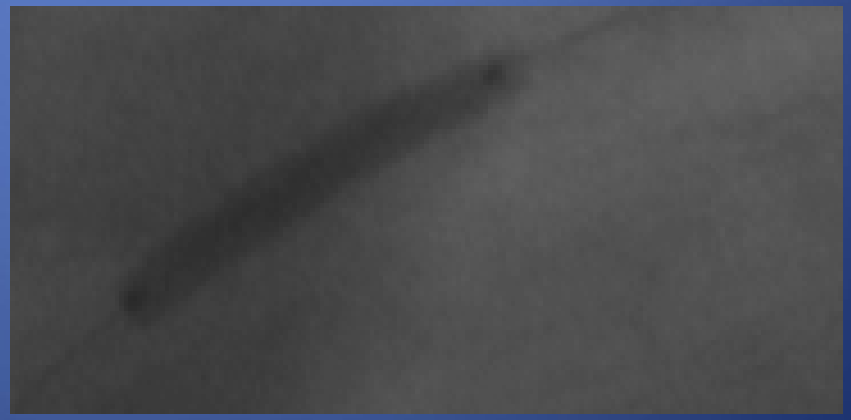




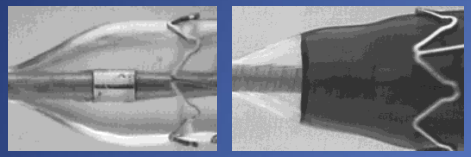
Prevention of edgedissection

Stagedexpansion

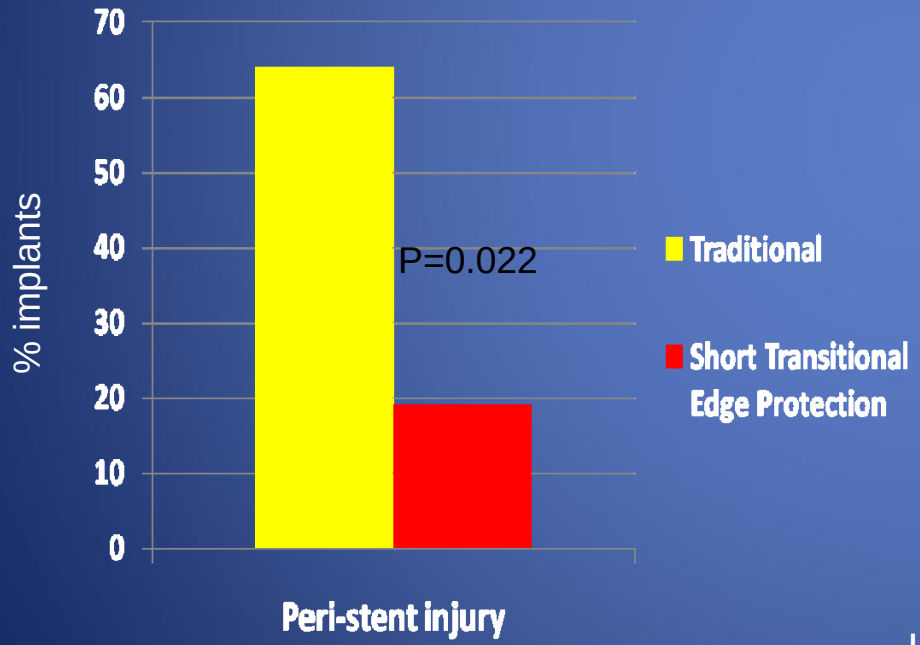


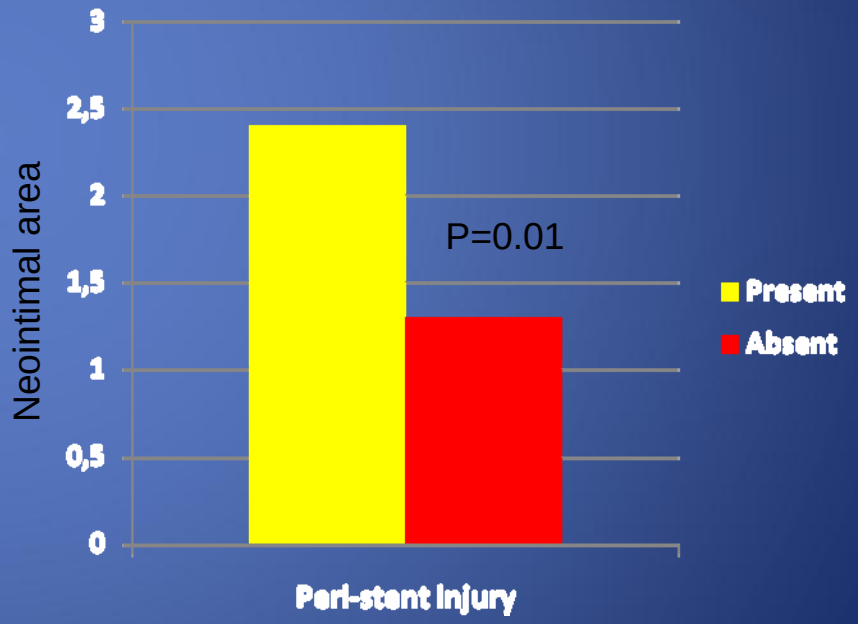


Balloon – relatedvesselinjury
Relation to neointima growth



In-stentvessel injury scores
1.0±0.3 vs.1.0±0.03, *P=0.73*



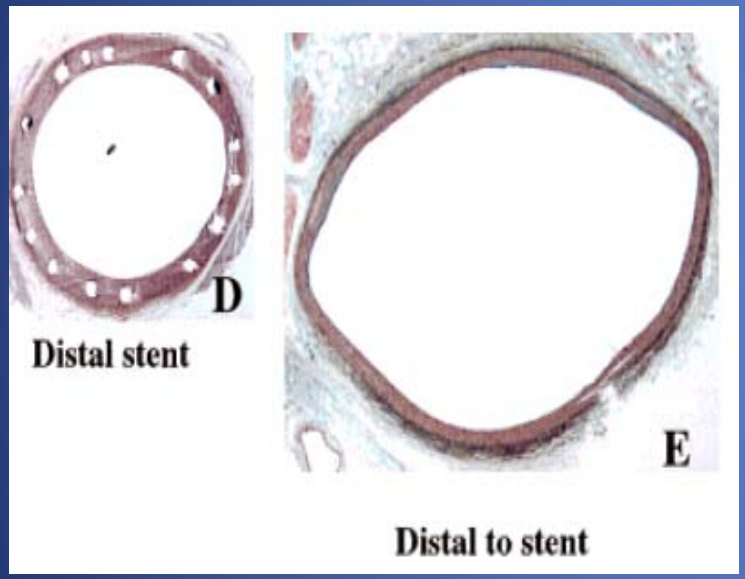


In-stent neointimal hyperplasia and % stenosis vs. severity of peri-stentinjury(r=0.47,P=0.04)

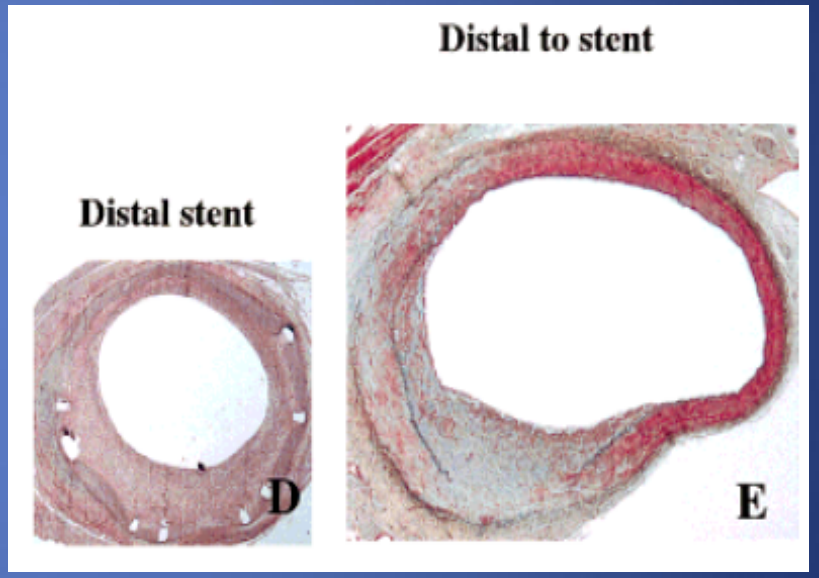
Carter et al. CCI 2000:51:112–119

Balloon – relatedvesselinjury
Relation to neointima growth

short transitional edge protection balloon



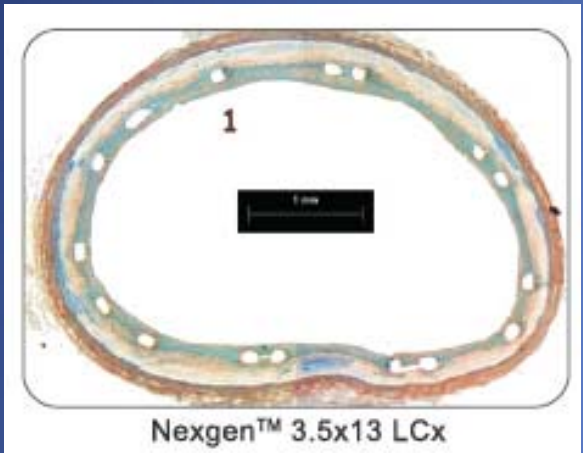
conventional balloon



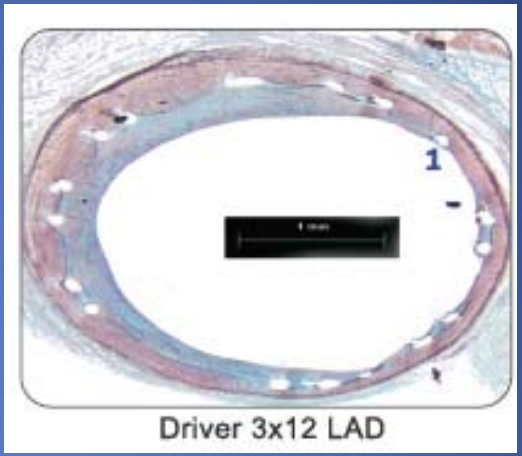
Carter et al. CCI 2000:51:112–119

NexGenvs. Driver inporcinecoronaryarteries

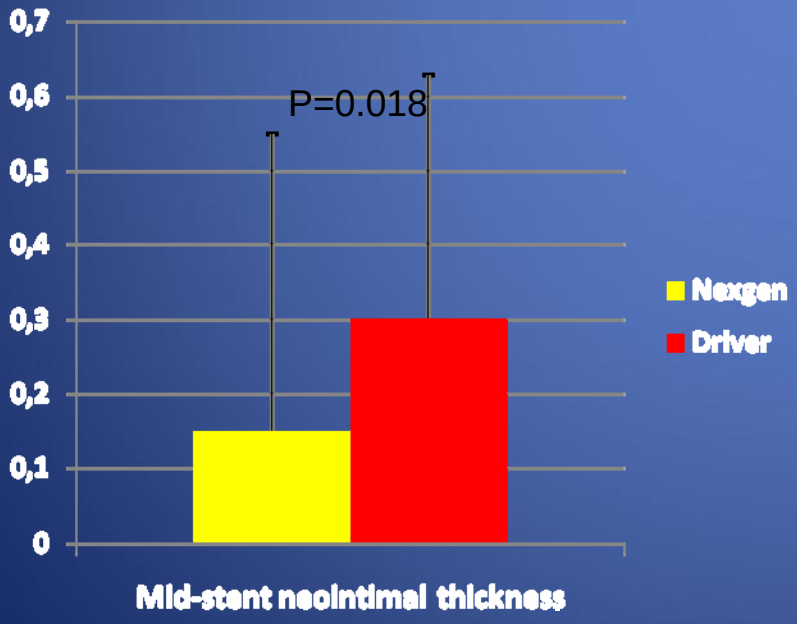
28-Day comparison

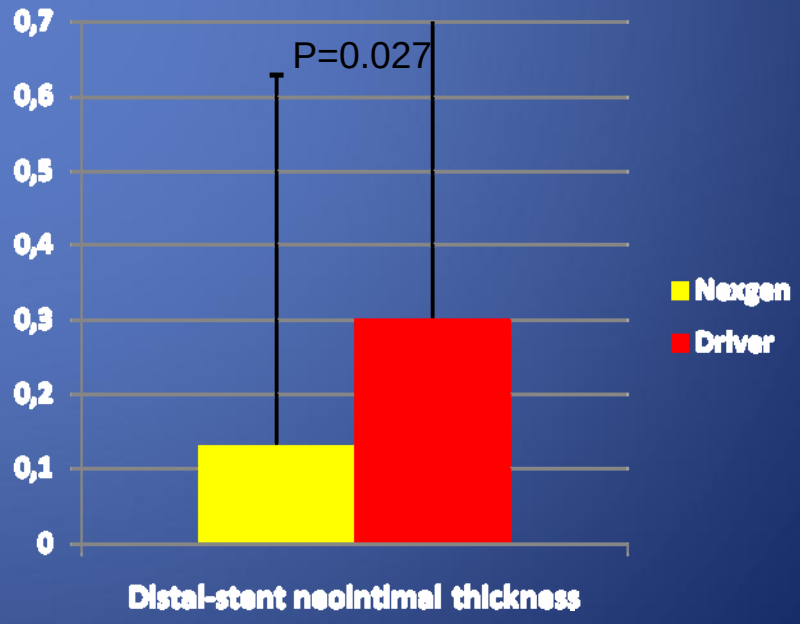


Nexgen™ 3.5x13 LCx



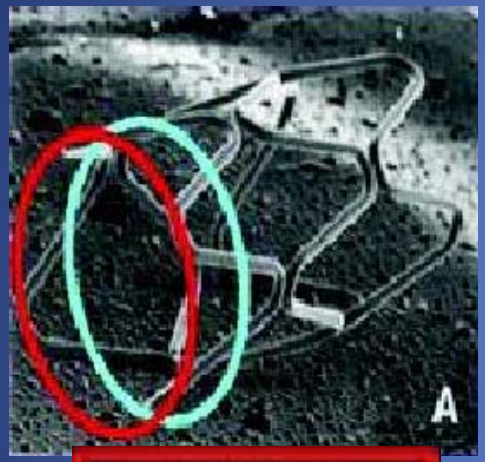
Driver 3x12 LAD

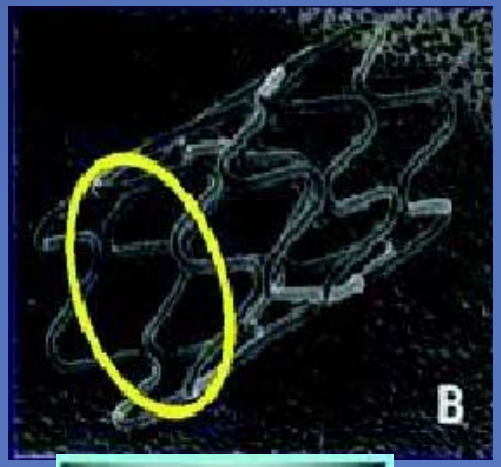


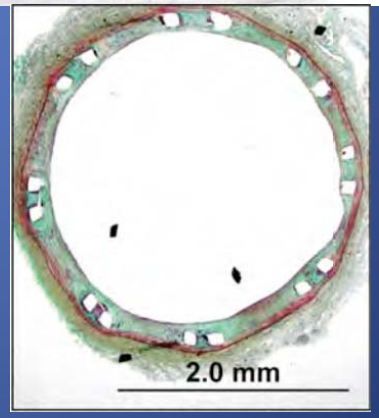


Prevention of edgedissection
Vesselwallsupportatthestentedge

More Cells per Diameter







Data on file

Impairedendothelialization

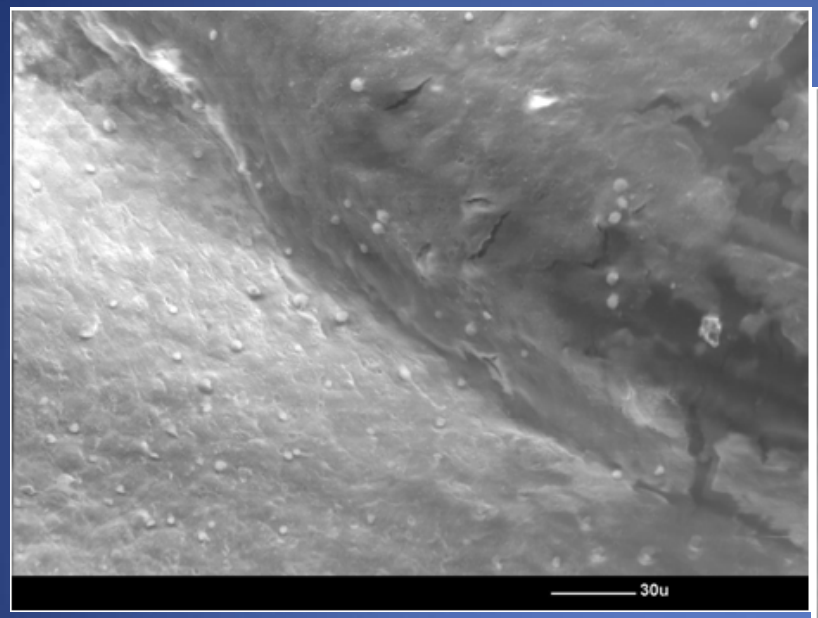
Mostcommon location of uncovered stent struts:

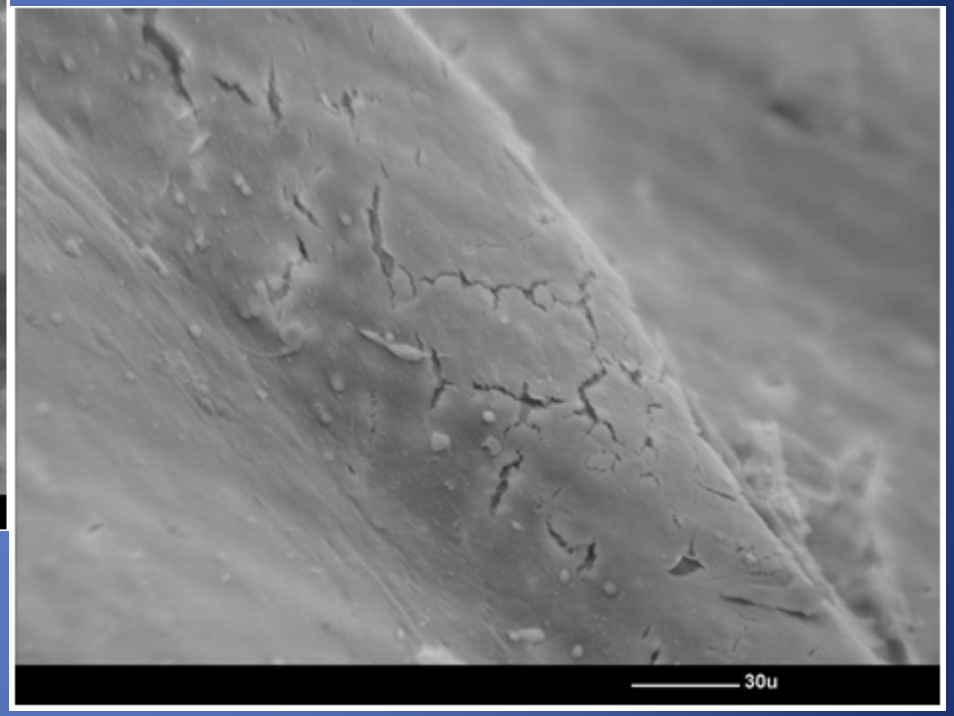
- Middlesection
- Stent overlap
- Penetrationinto the necrotic core of plaques
- Malapposition,
- Bifurcations
- Hypersensitivity reactions

CircCardiovascIntervent 2008;1;7

Endothelialization of NexGen

7-day SEM





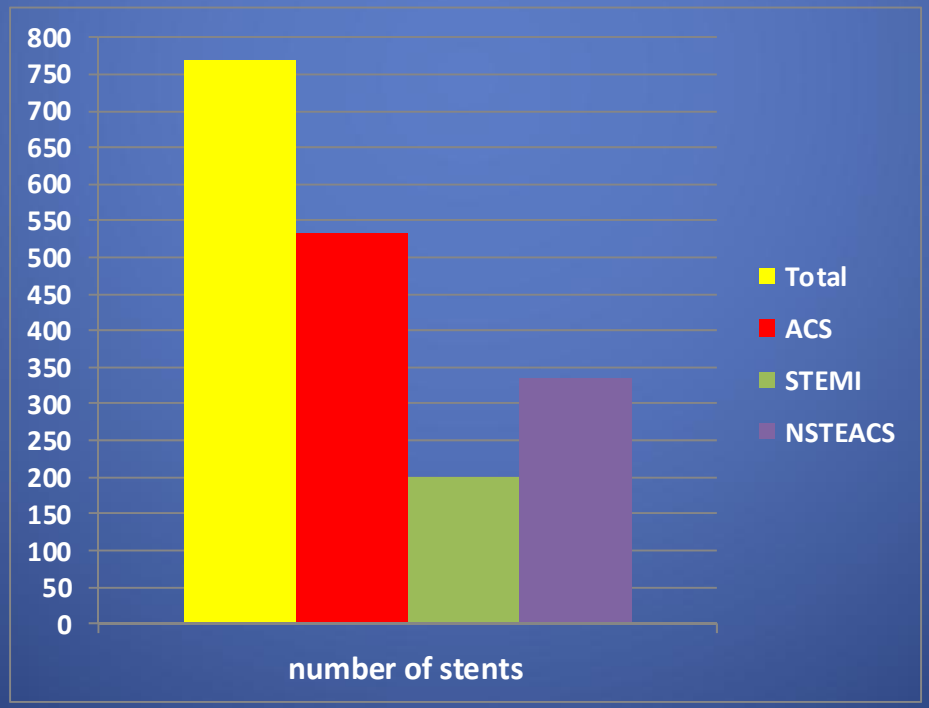
NexGen 3x13. LCx

Data on file

NexgenPolishexperience

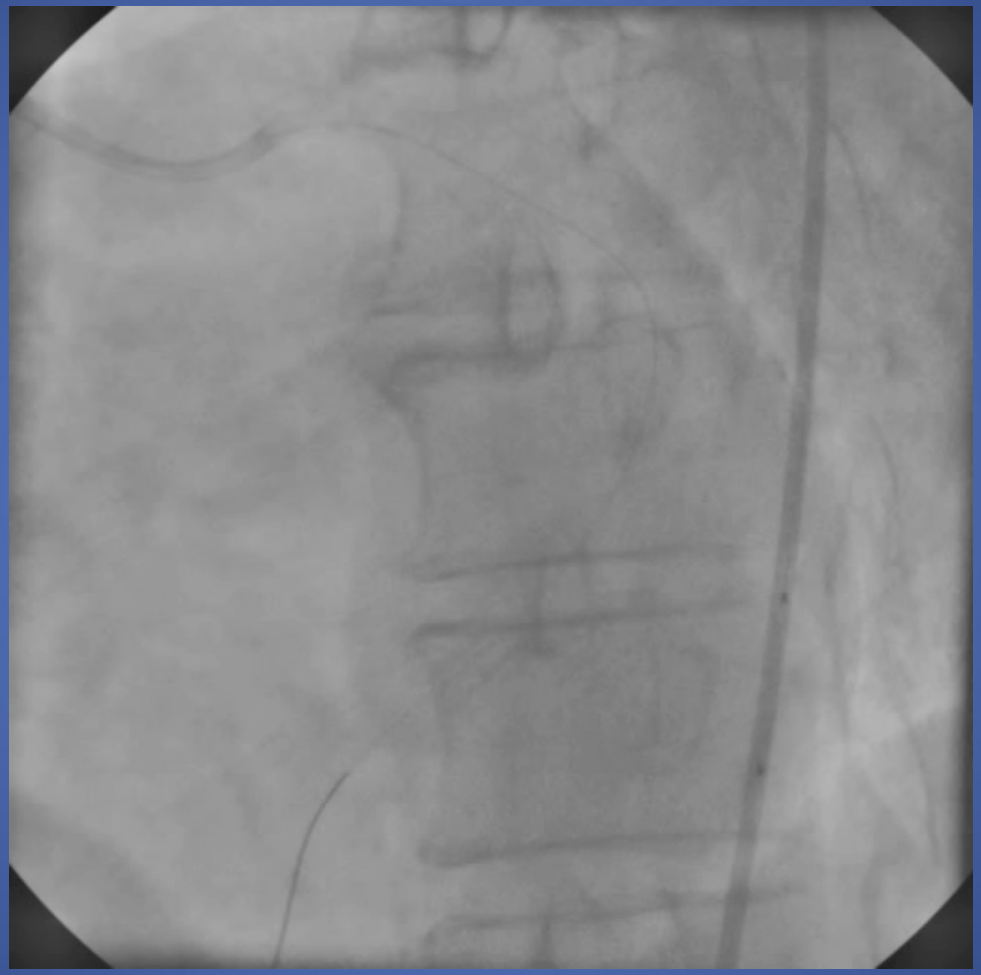
American Heart of Poland, 10 cathlabs

- Total 770 NexGenstents
- 535 pts with ACS (201 STEMI, 334 NSTE-ACS)
- 100% procedural success, no in-hospital death
- No cases of stentthrombosisuptp 6 months
- Prospective registry of NexGen in progress



IiJ29

Final angio



- After thrombectomy and stenting: LAO/Caudal

IiJ29 Kasprzyk - sekwencja 13
Ilona i Janek, 2010-09-19

NexGen

Experiencemainlyinacutecoronarysyndromes

- Gooddeliverability
- No dissections
- No stent thrombosis