Brachytherapy vs DES: Is the Answer in Yet ?

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Brachytherapy

Drug Eluting Sten

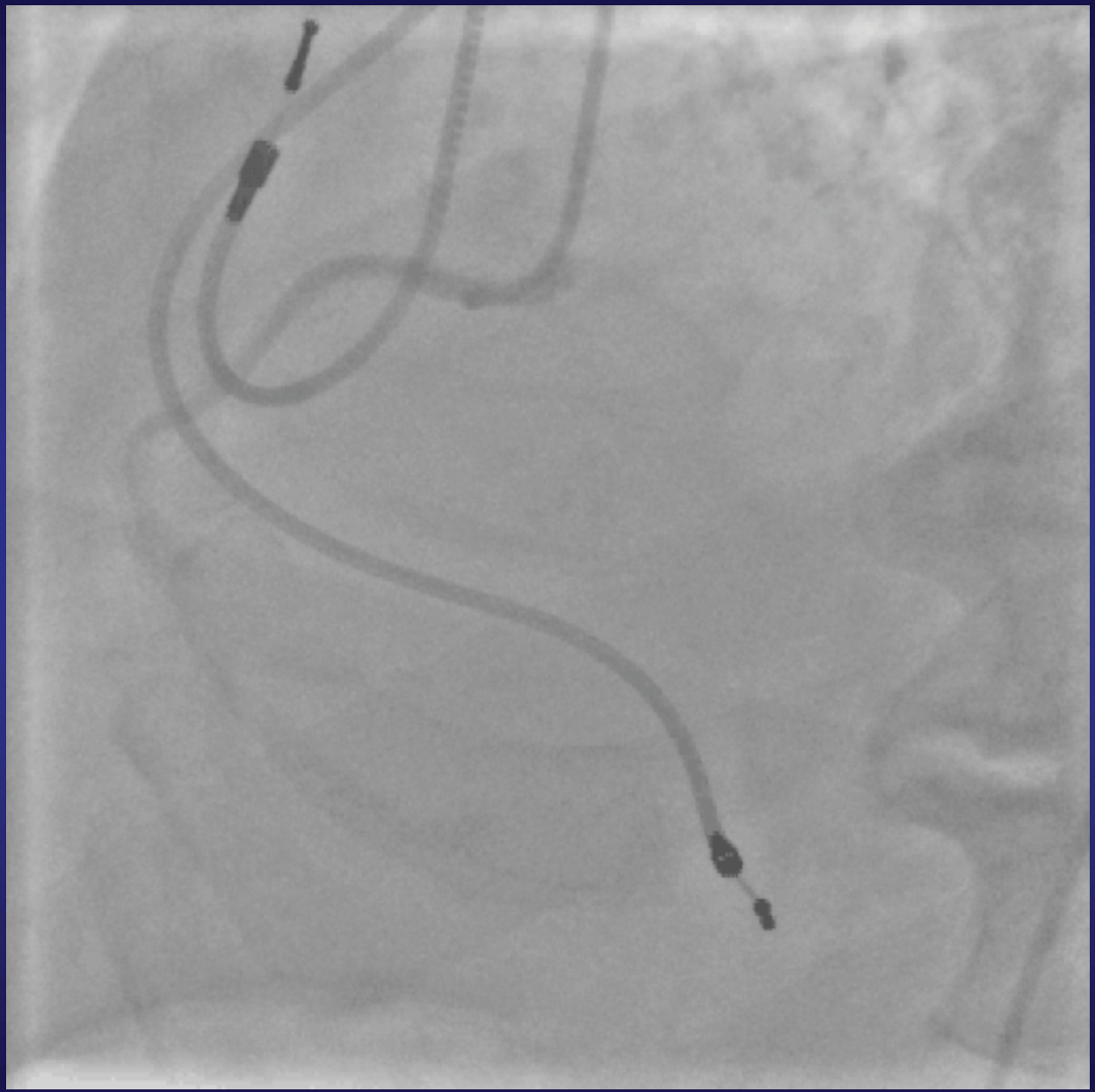
2003 and beyond

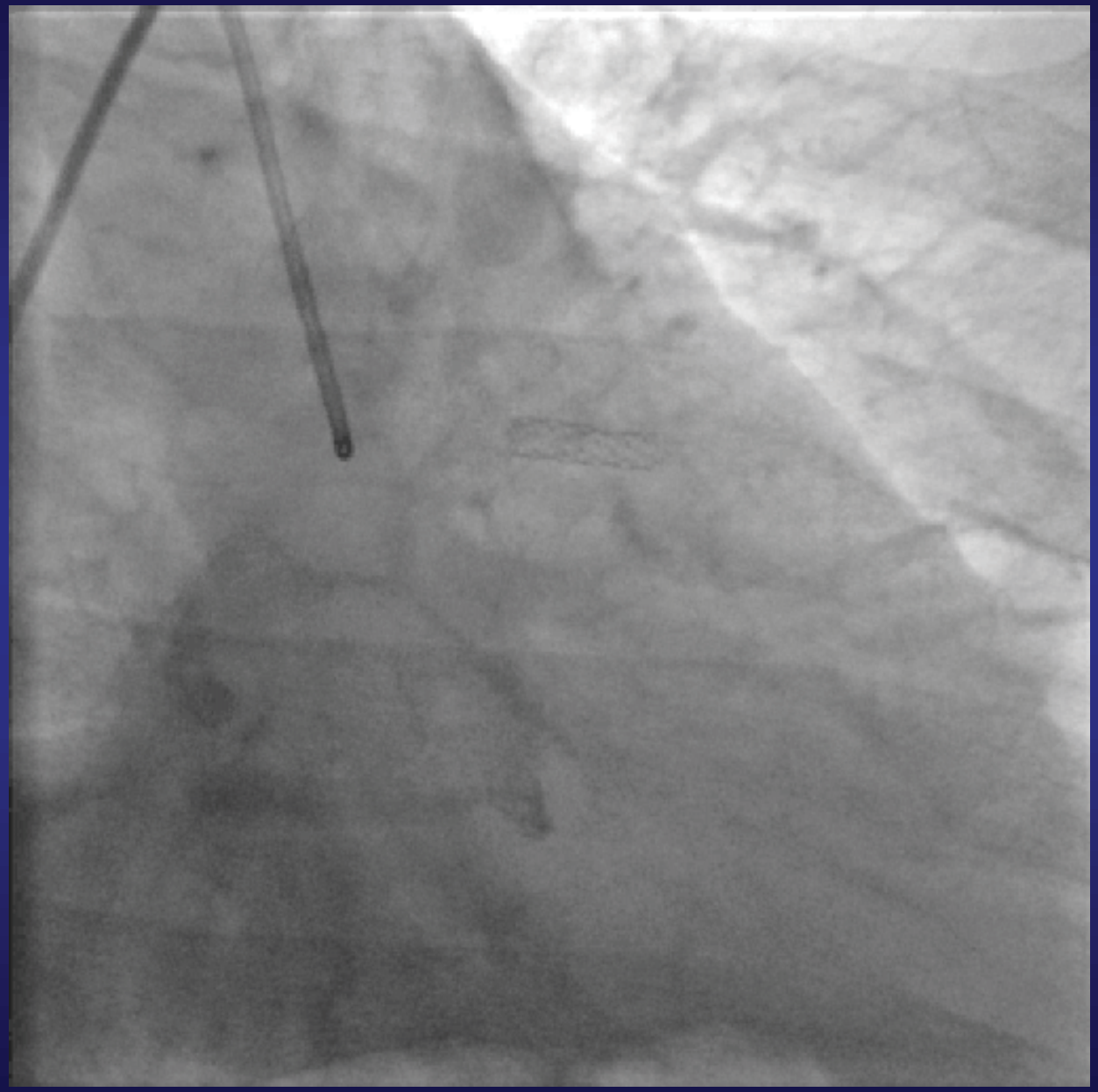
DES vs XRT

- Cost: both expansive
- One may be faster than the other
- One may need more maintenance
- One may be better in one situation than the other
- Bottomline: Performance and head-to-head comparison

DES vs XRT: Clinical Problems

- BMS in-stent restenosis
  - All in-stent
  - Significant out-of-stent restenosis
- Failed brachytherapy
  - Which DES ?
- DES in-stent restenosis
  - Brachytherapy
  - The other DES ?





Top 10 Reasons Why We still Need Intravascular Brachytherapy in ISR

10 We still have the brachytherapy system!

9 DES length has to be longer than the original ste

8 Brachytherapy for ISR is cheaper than DES (pe
case vs per mm, common treatment length 60m

7 Side branch occlusion (snow-plowing) will be common in DES, access will be difficult (double

6 There is little data showing DES is more effectiv
ISR than XRT

Top 10 Reasons Why We still Need Intravascular Brachytherapy in ISR

#5 Is the drug dosage enough for ISR ?

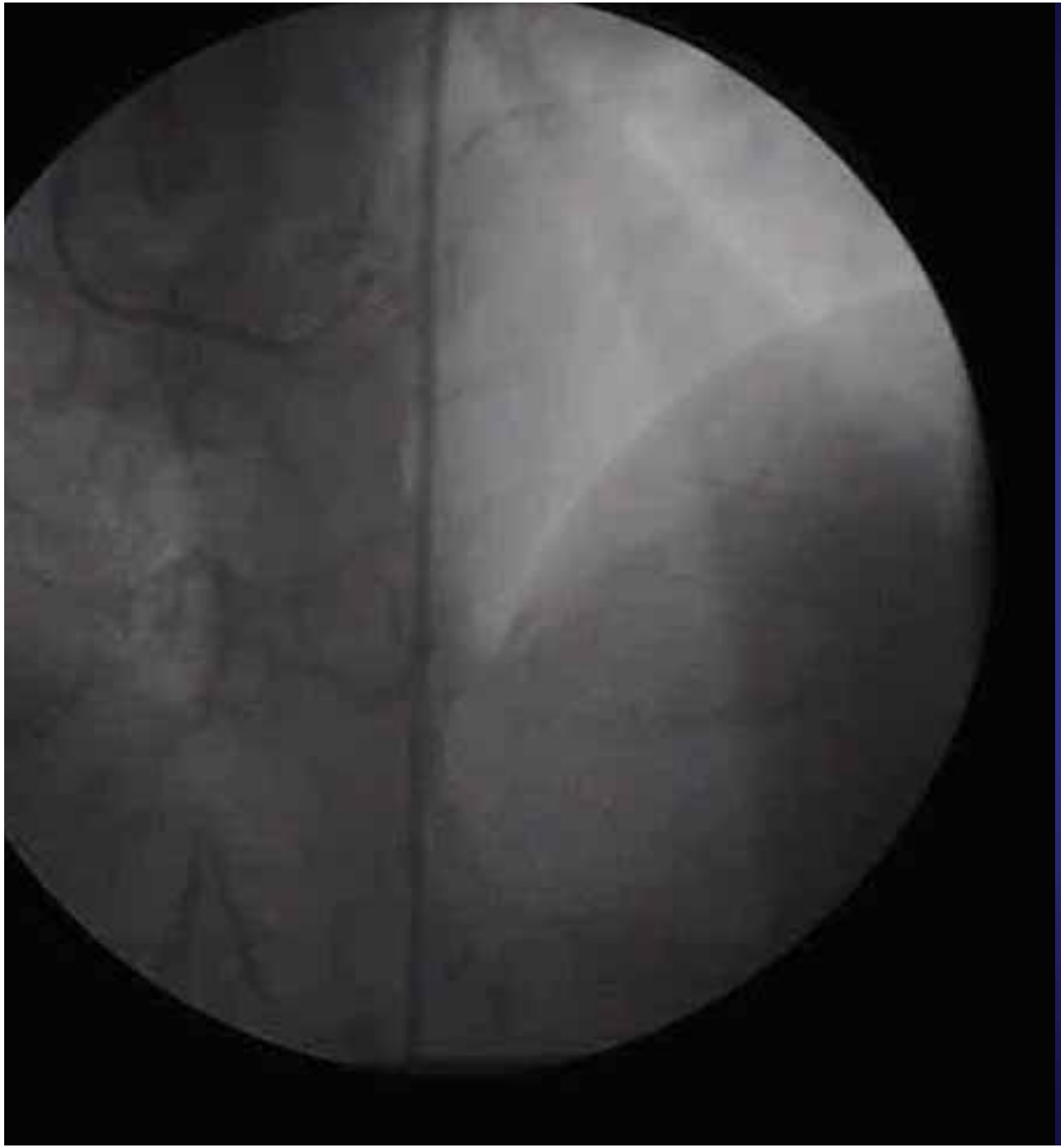
#4 Is multiple DES overlapping a problem in DES

#3 What do you do to those DES with ISR ?

#2 Brachytherapy is now streamlined

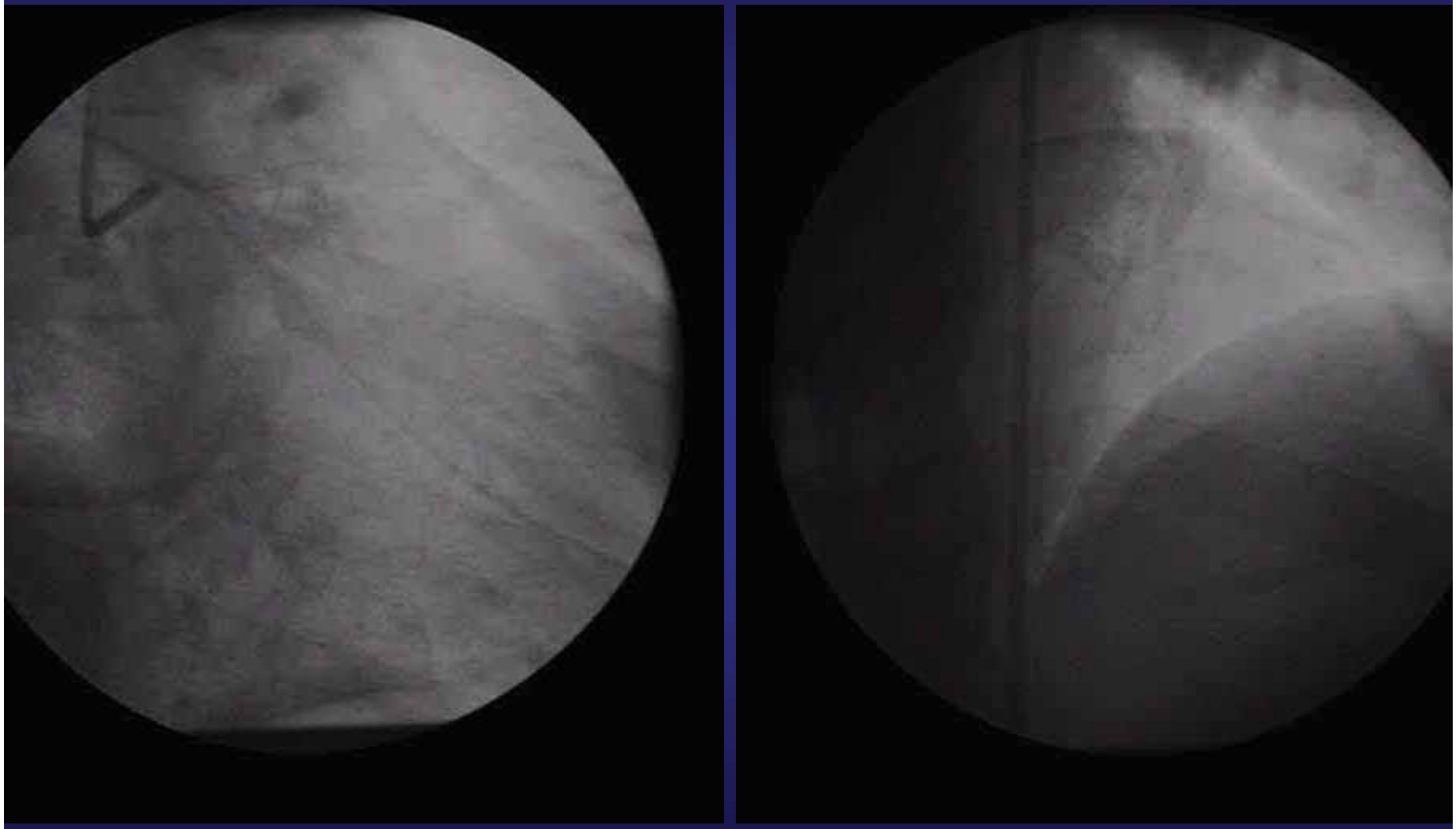
#1 It is a proven effective therapy in the real world

It is a proven effective therapy in the real world (and it is streamlined)

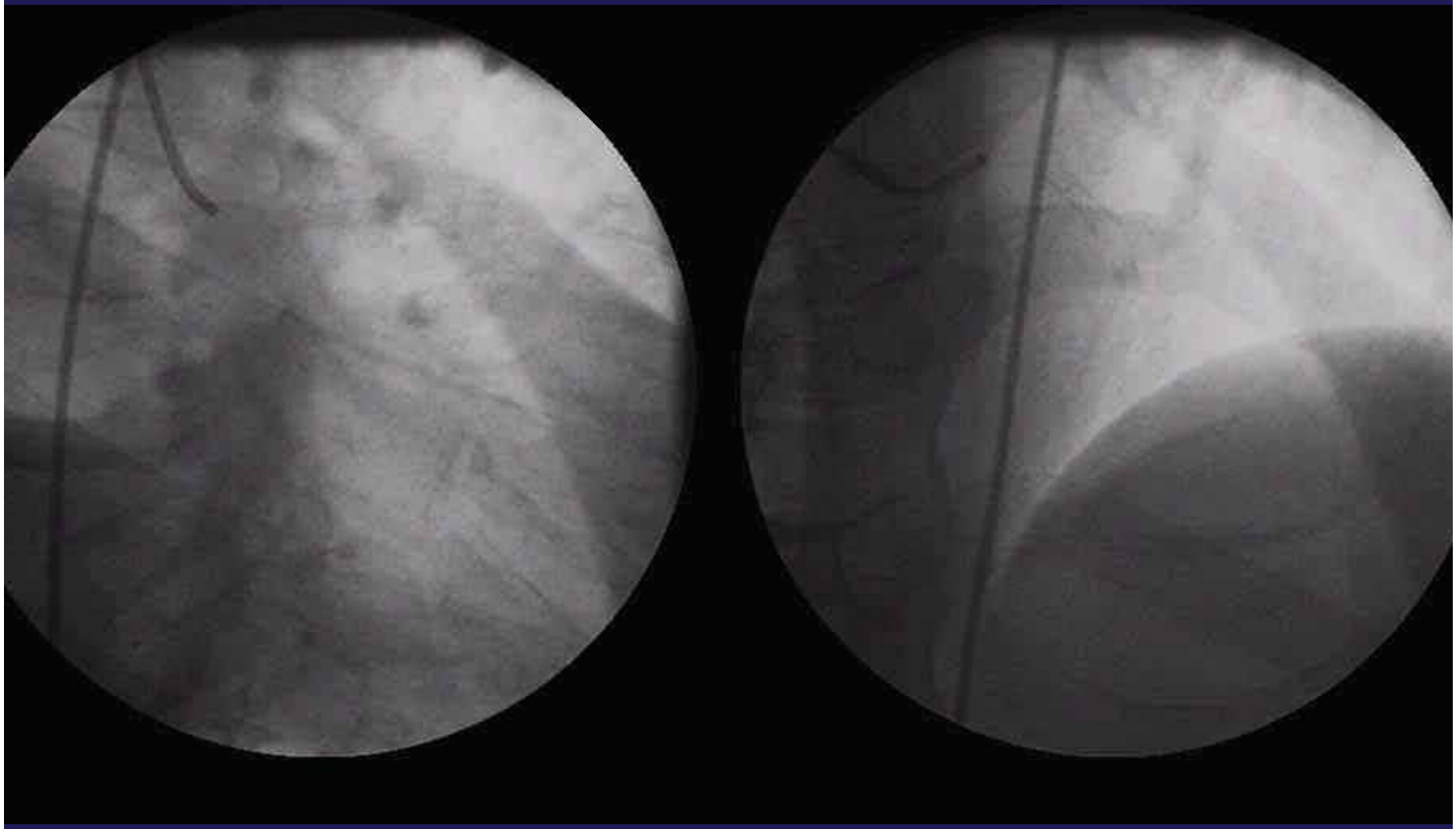


Pre-Brachythera

Post-Brachytherapy



F/U-Brachytherapy



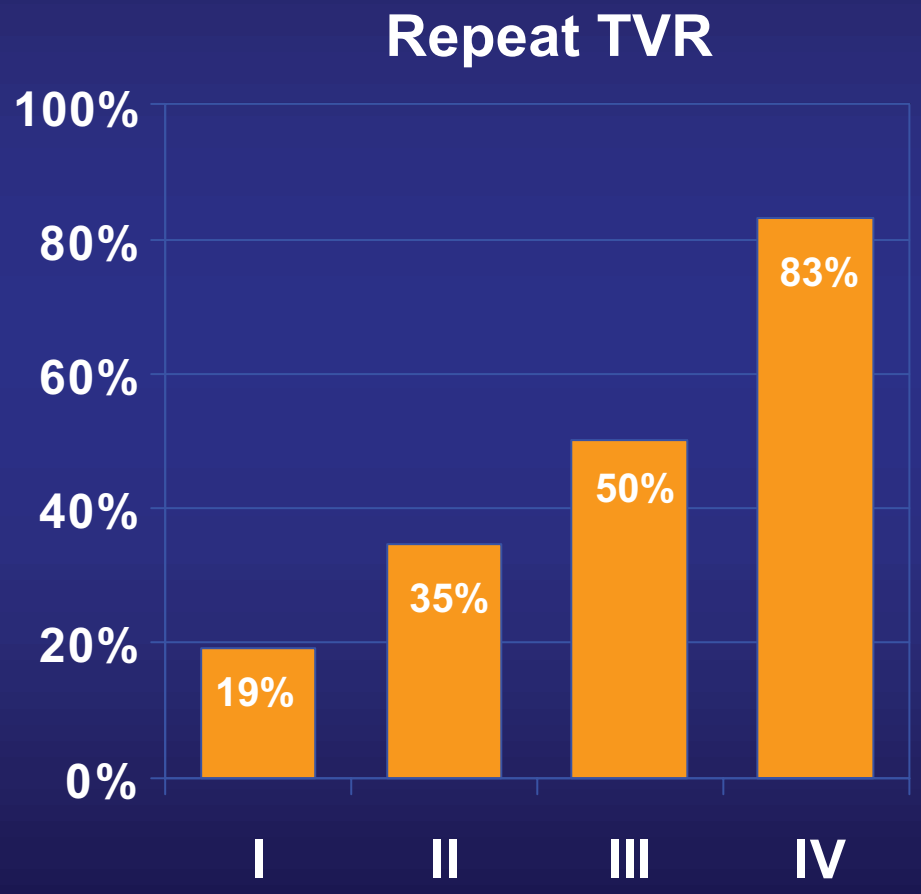
In-Stent Restenosis Patterns and Recurrence Rates

pe I (42%)
)mm lesions

pe II (22%)
)mm Intra-stent lesions

pe III (30%)
)mm proliferative lesions

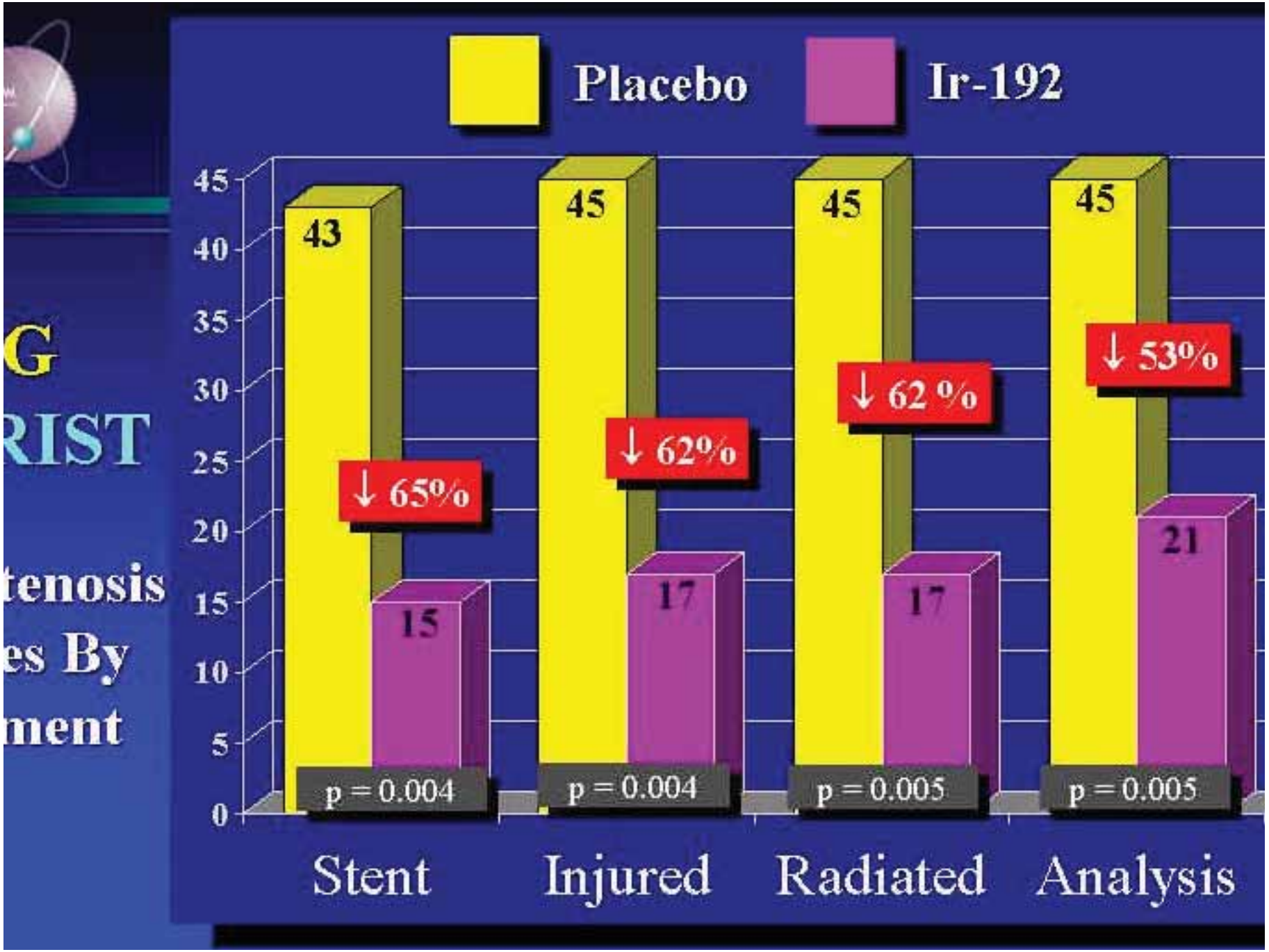
pe IV (6%)
al occlusions



ran R et al. Circulation 1999;100:1872-8.

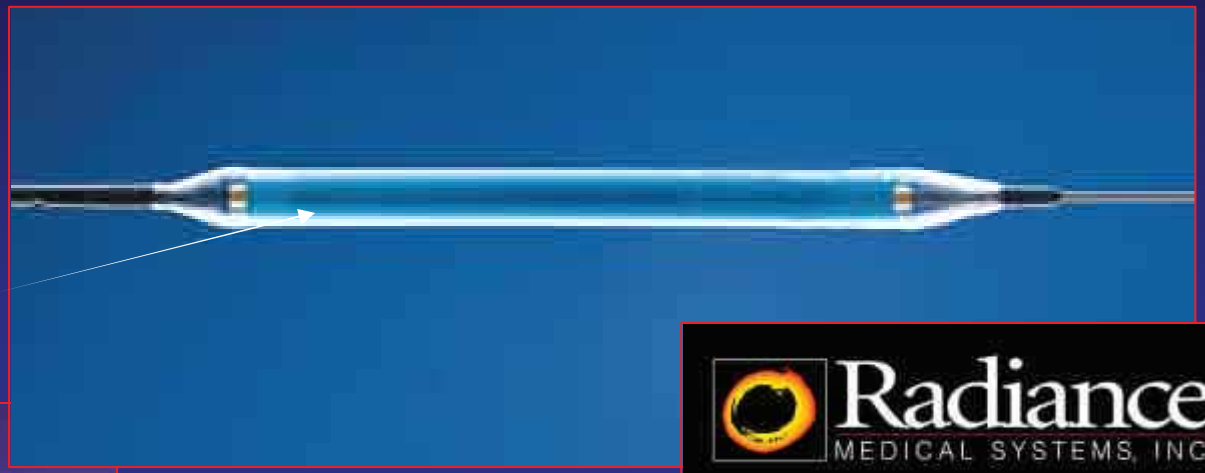
Reported Clinical Trials Using Vascular Brachytherapy For In-Stent Restenosis

TRIAL	Source	Length (mm)	PTS (n)	Restenosis % Placebo	Restenosis % Treated
SCRIPPS	192Ir	15.3	35	70.5	11.1
WRIST	192Ir	23.7	130	58.3	19.0
GAMMA1	192Ir	20.2	252	50.5	21.6
GAMMA2	192Ir	19	125		23.0
LONG WRIST	192Ir	32	120	71.0	32.0
β-WRIST	90Y	20.6	50	---	22.0
START	Sr/90	17	476	42.2	14.2
INHIBIT	P32	17	332	48.0	16.0
BRITE	P32	17	26	---	0.0


Placebo
Ir-192
45
40
35
30
25
20
15
10
5
0
43
45
45
45
↓ 65%
↓ 62%
↓ 62 %
↓ 53%
15
17
17
21
p = 0.004
p = 0.004
p = 0.005
p = 0.005
Stent
Injured
Radiated
Analysis

RDX Balloon Radiation System

Radioactive
Balloon Material
Source: P-32 (beta)



Radiance
MEDICAL SYSTEMS, INC.

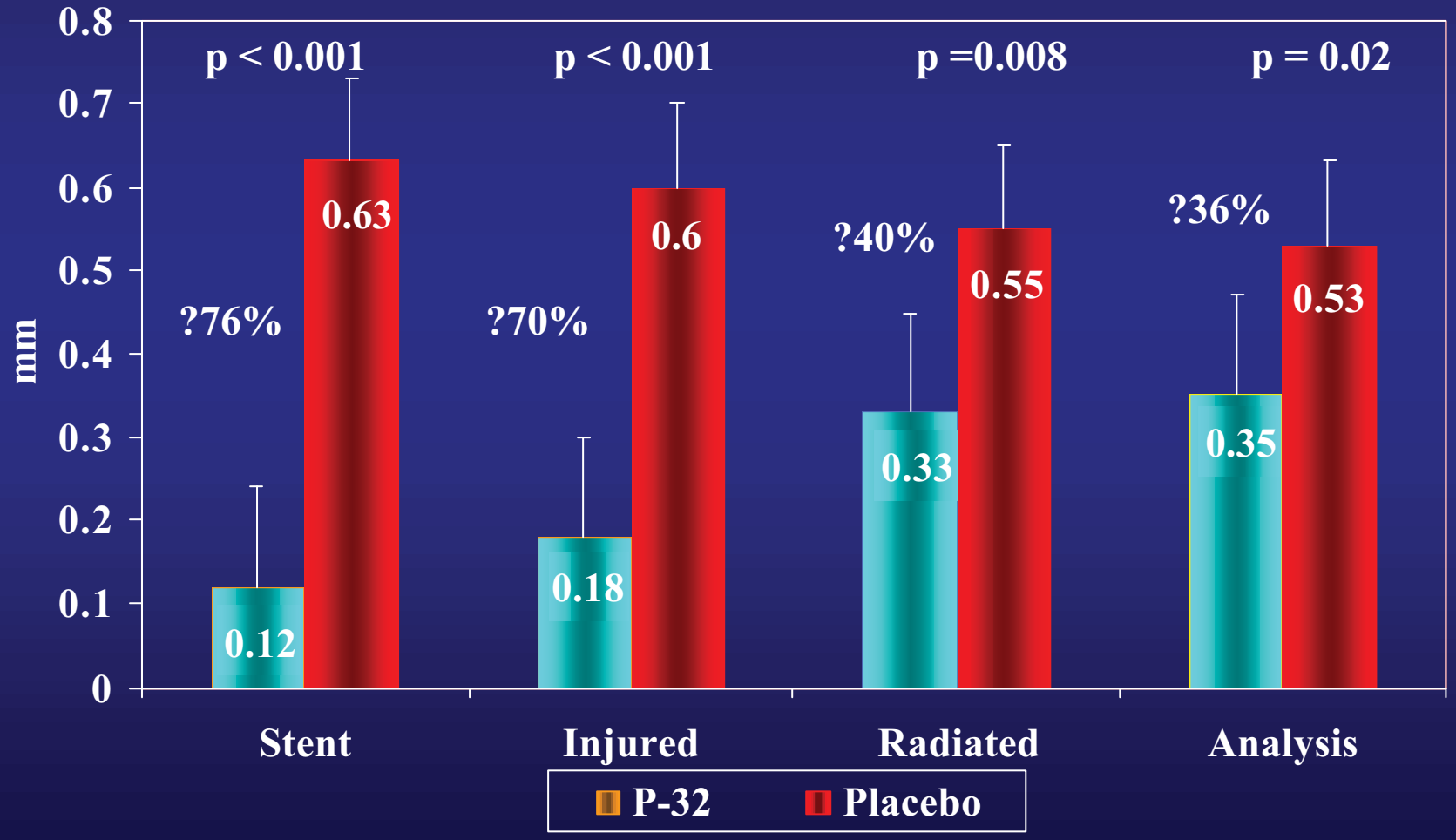
Investigatioal Device

BRITE II Clinical Outcomes to 12 Months

	P-32	Placebo	*P	? %
N (follow up)	309	87		
MI				
Q-wave	1%	0	NS	
Non-Q-wave	3.6%	3.4%	NS	
TVR	27.5%	48%	0.02	? 42%
PCI	21.5%	48%	0.02	? 55%
CABG	7.7%	2.3%	NS	
Death	2%	6%	NS	
Any MACE	35%	59%	0.02	?41%

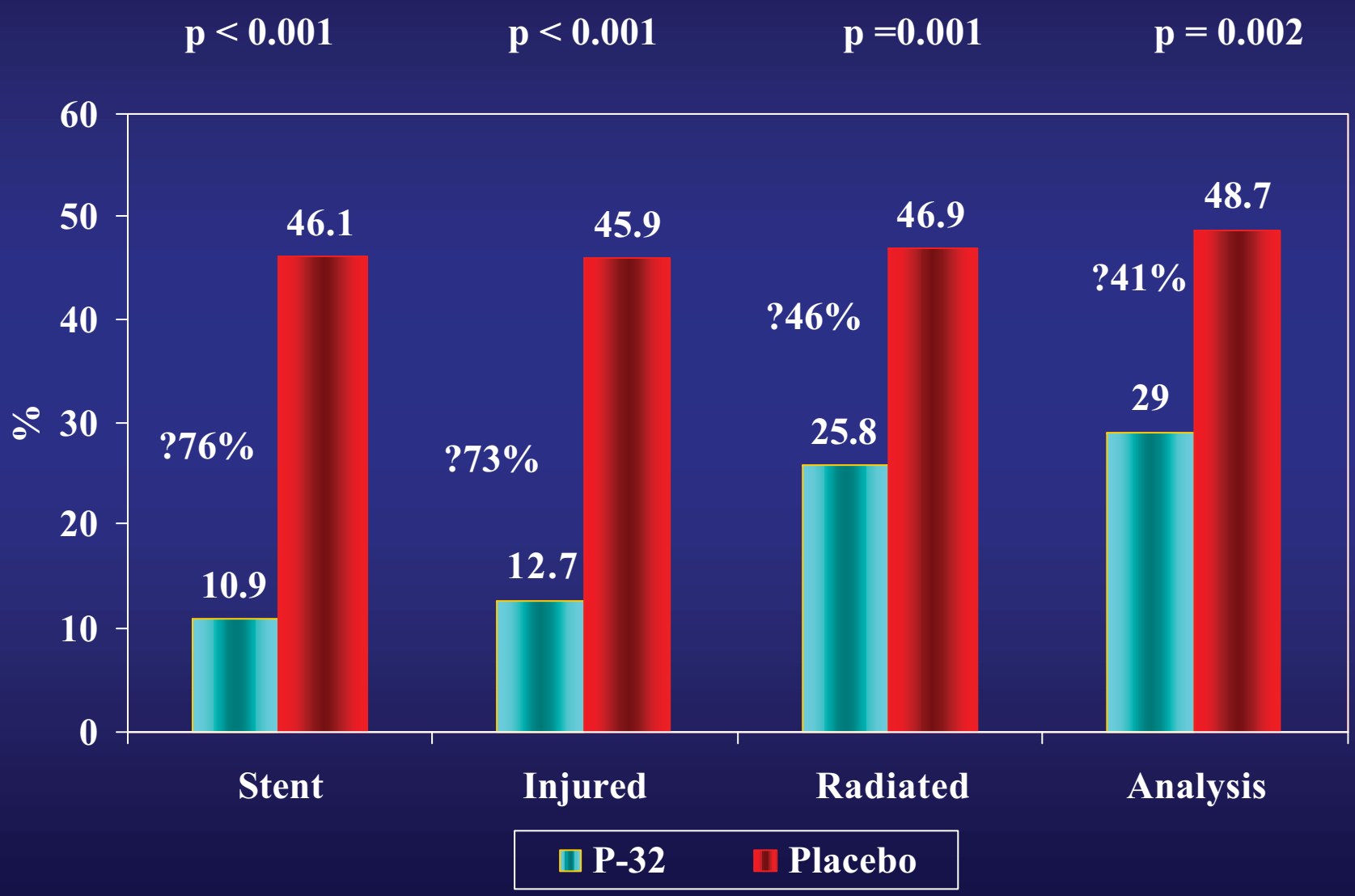
BRITE II

Late Loss By Segment



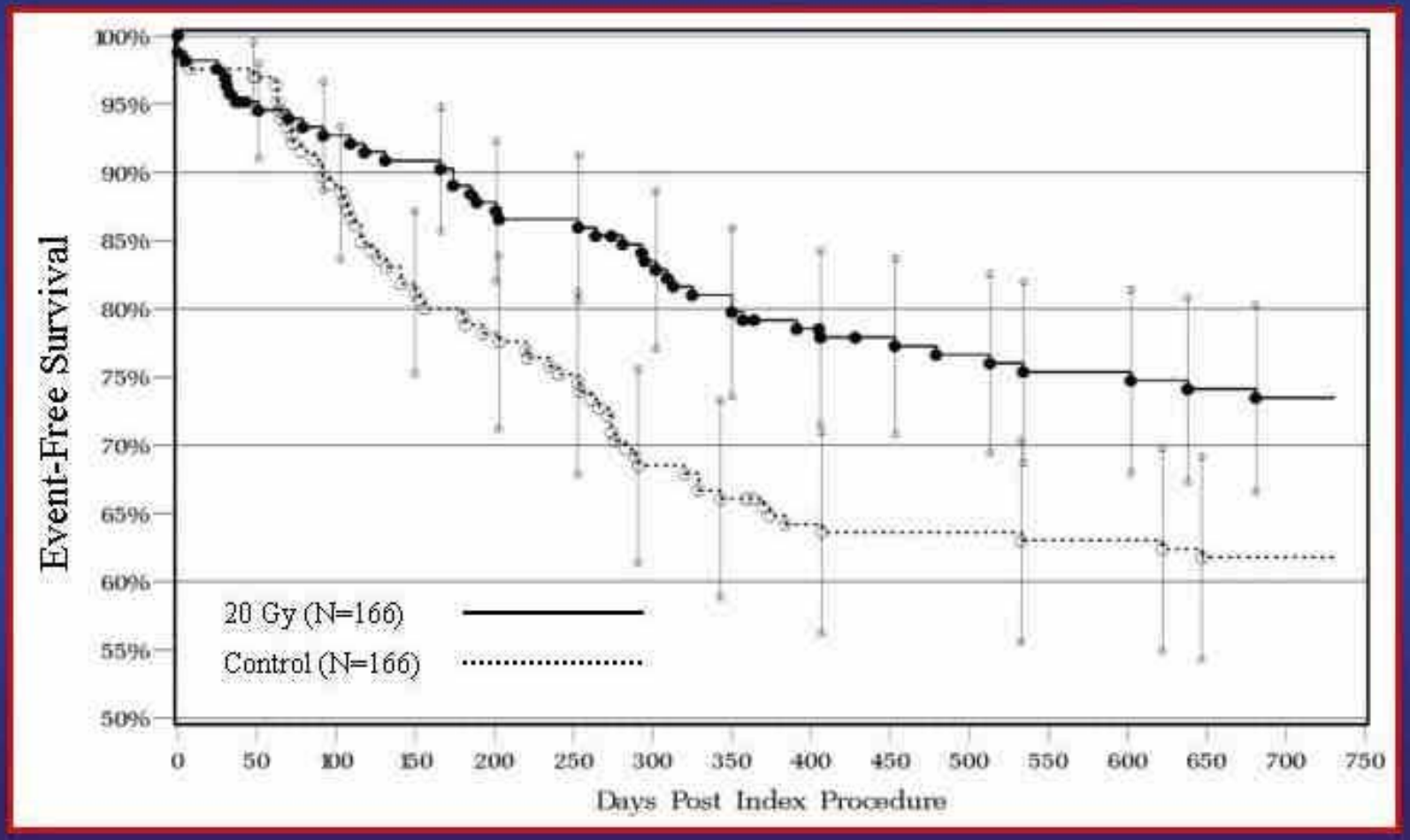
BRITE II

Restenosis Rates by Segment

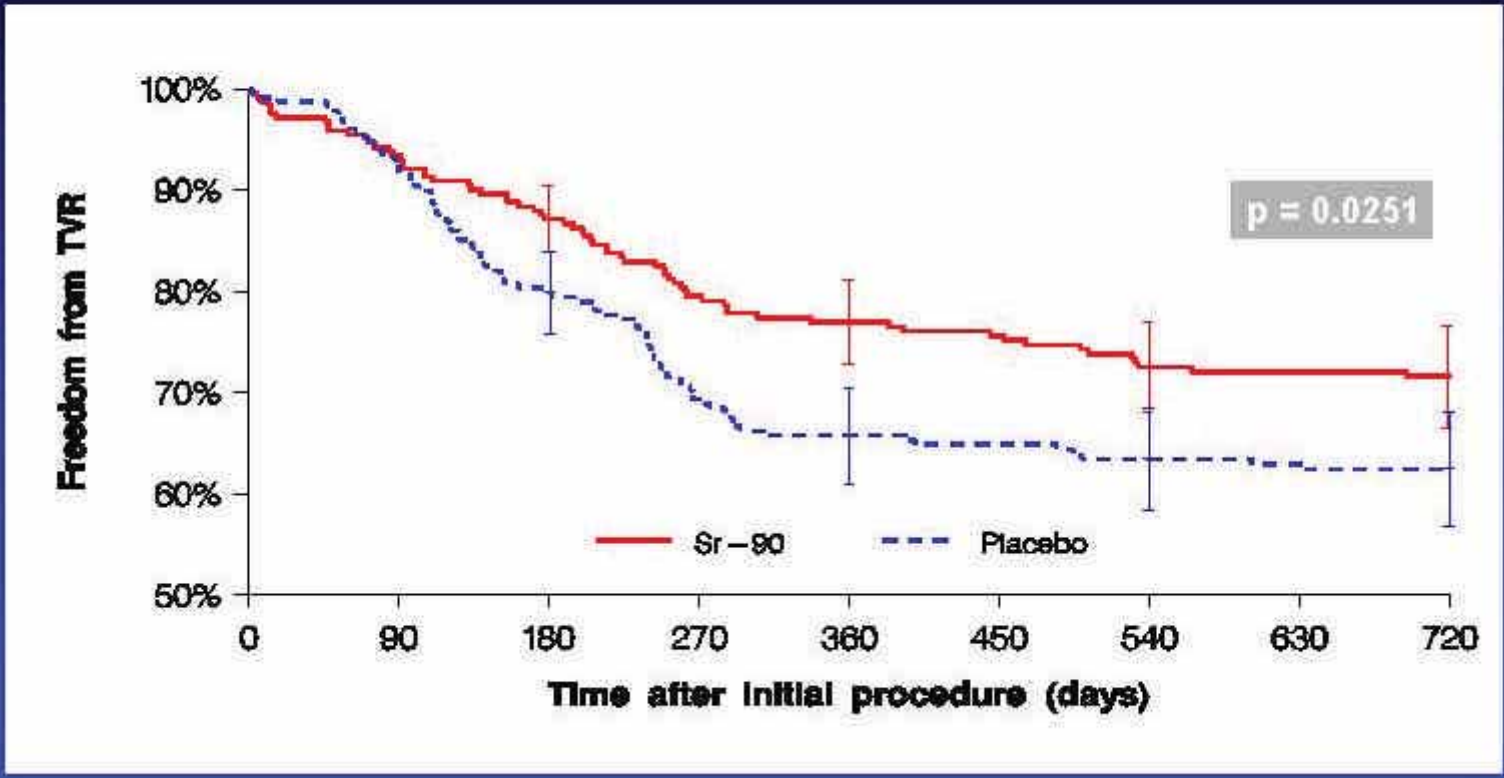


INHIBIT Trial

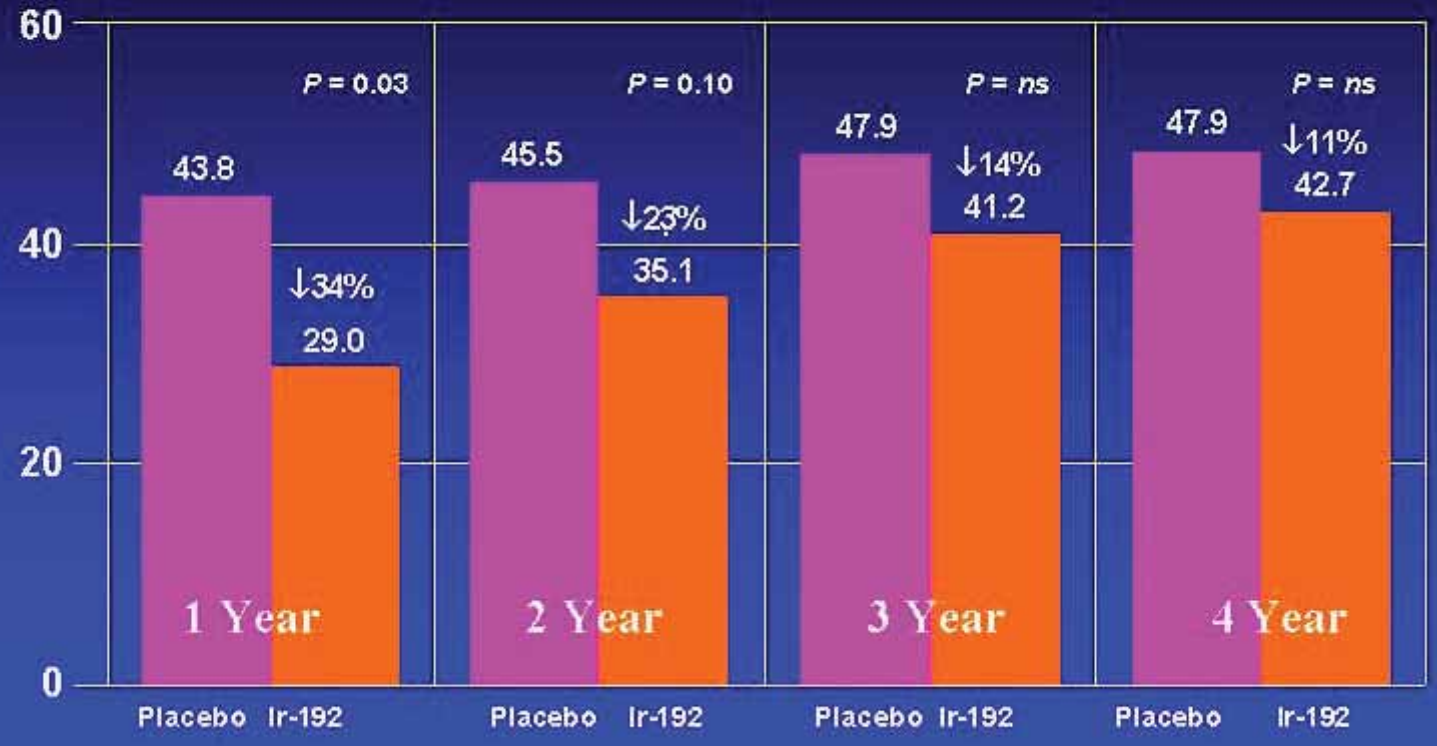
Freedom from MACE (Death, MI, TLR)



START TRIAL
Freedom from TVR - 24 mo.



Gamma One 4 Year Clinical FU: TLR



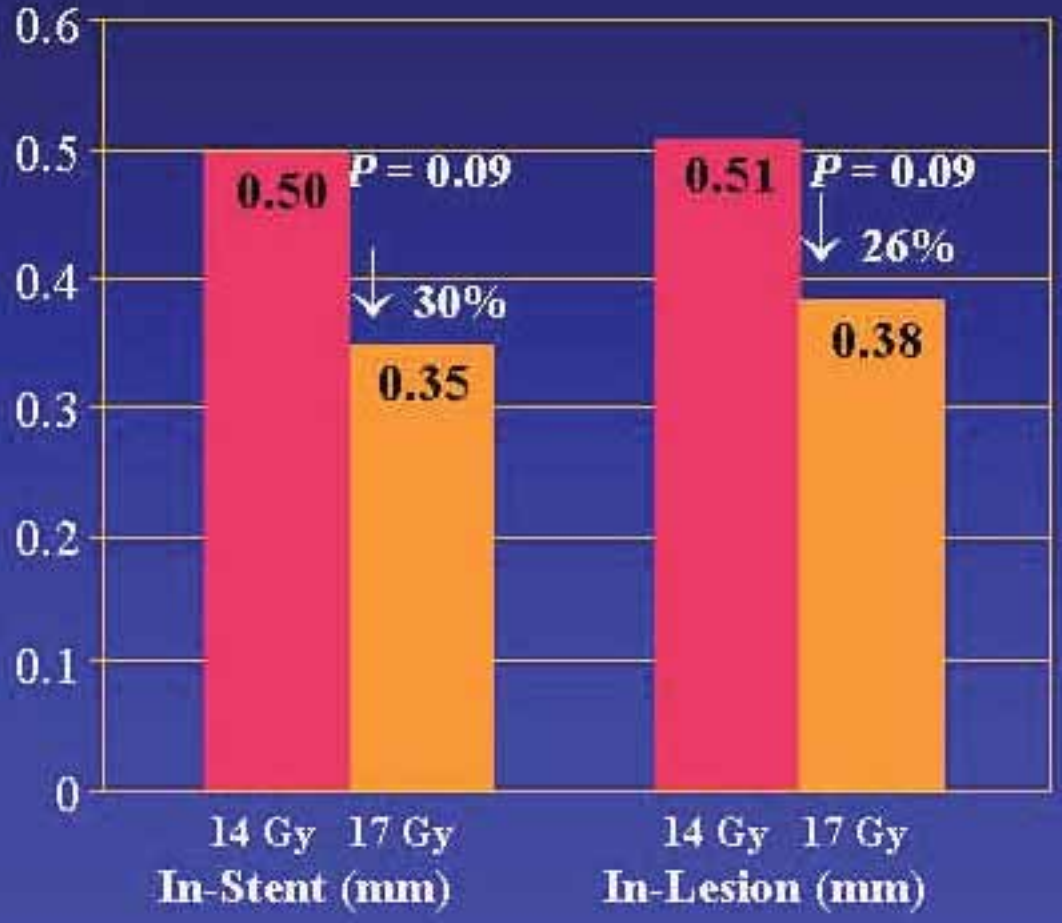
an Brachytherapy Results be Improved

The SCRIPPS IV Randomized Trial

- Double blind randomized trial
- 4 Gy Vs. 17 Gy at 2 mm from the source
- Patients = 358
- Sites: Scripps Clinic and Lenox Hill
- Inclusion criteria: In-stent restenotic native and SV
- Lesions up to 75 mm in length
- Endpoints = Late loss, Restenosis, TLR, TVR, MA

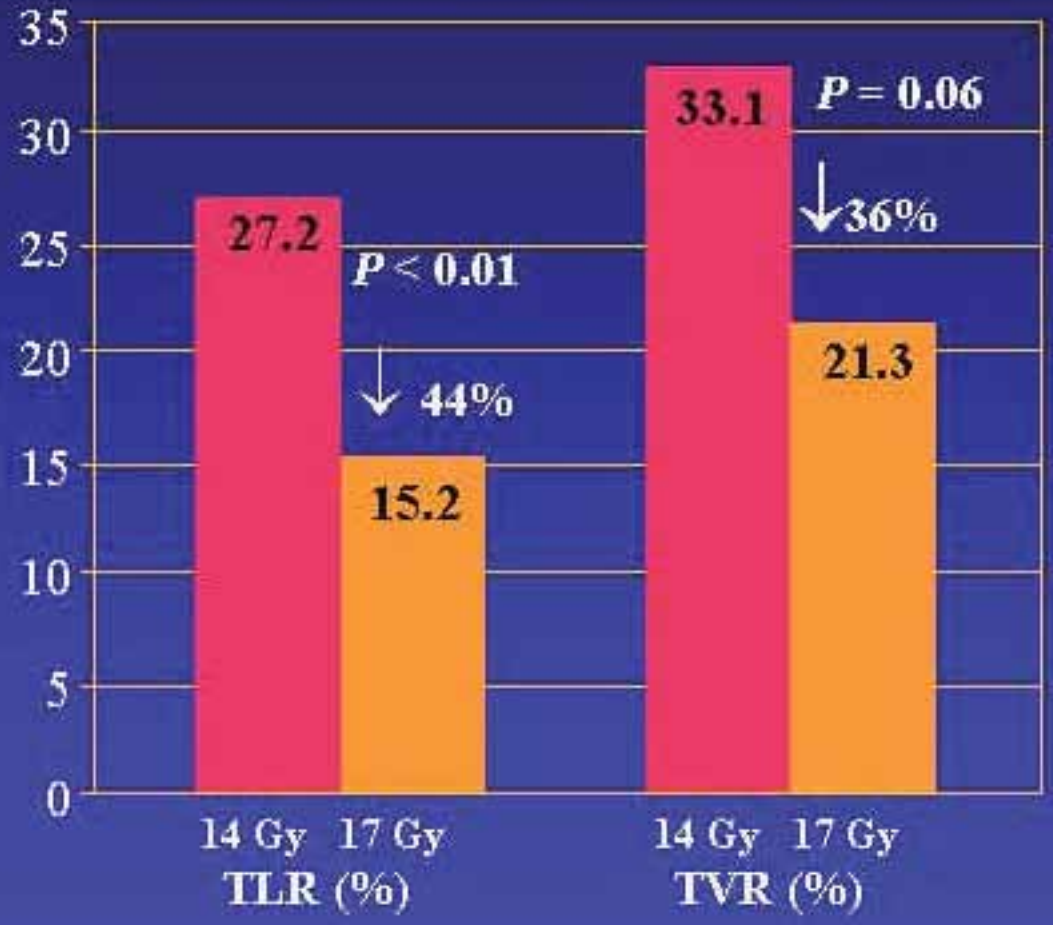
Late Loss

The SCRIPPS IV Randomized Trial



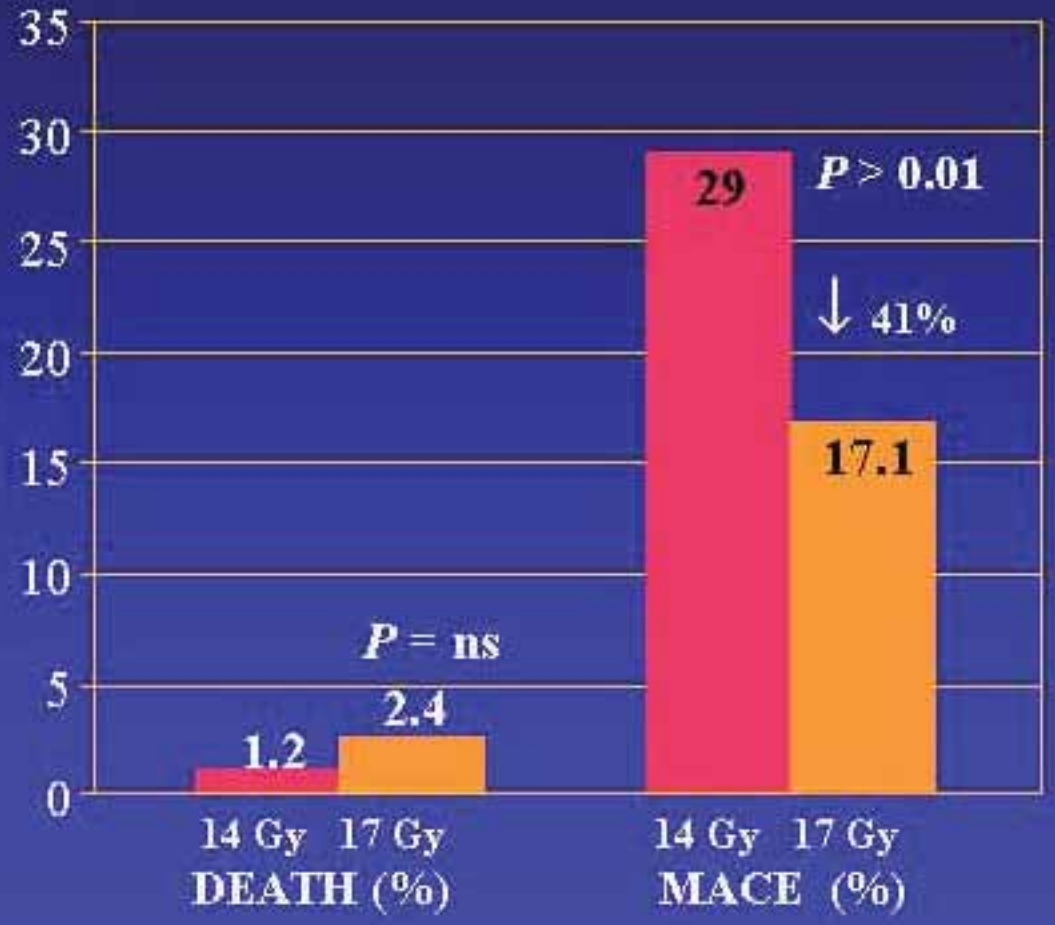
Target Lesion and Vessel Revascularization

The SCRIPPS IV Randomized Trial



Death and MACE

The SCRIPPS IV Randomized Trial



Summary

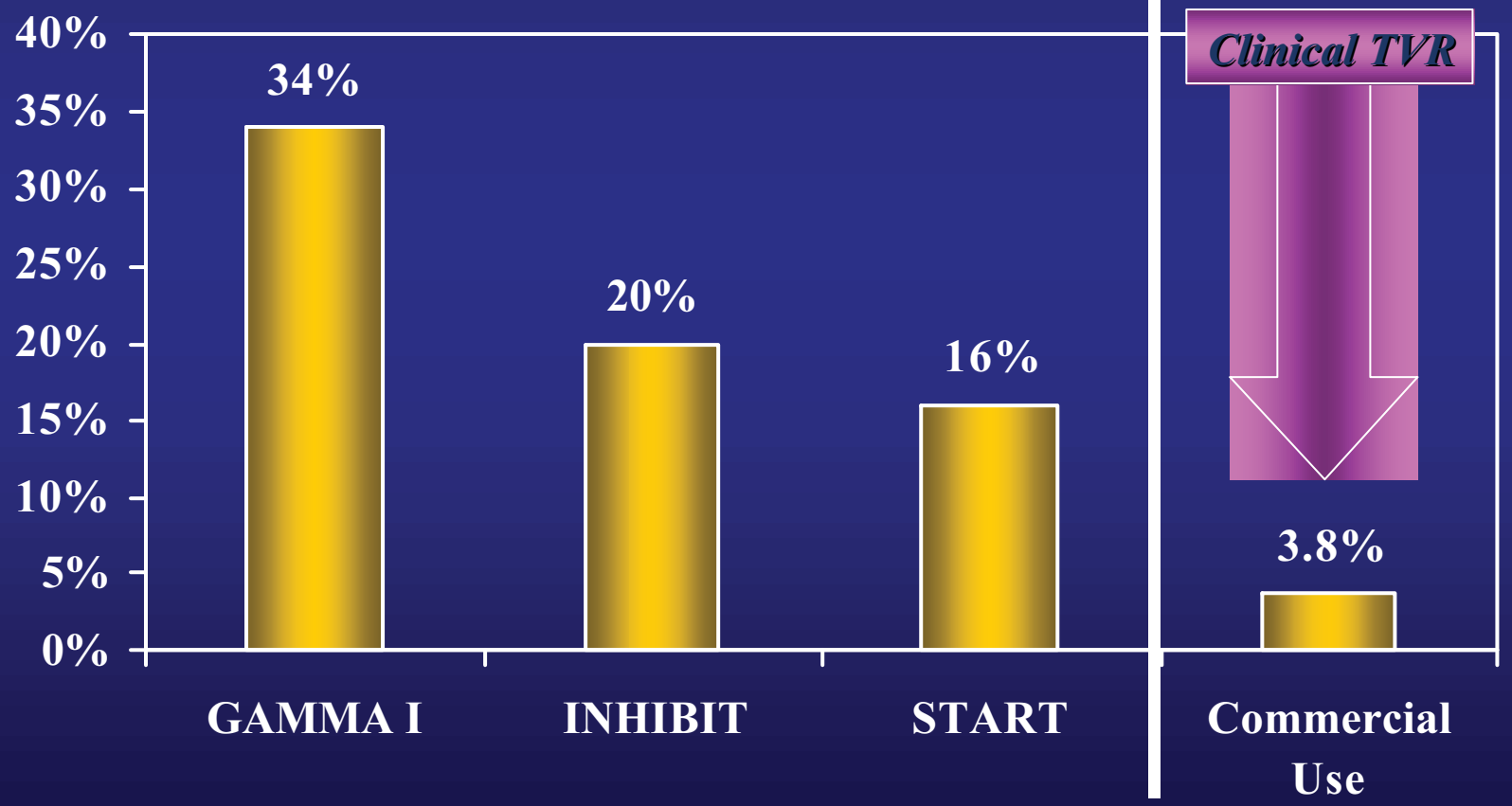
The SCRIPPS IV Randomized Trial

A 21.4% increase in gamma radiation dose (from 14 to 17 Gy) resulted in:

- 18% reduction in restenosis (in-lesion)
- 26% reduction in late loss (in-lesion)
- 44% reduction in TLR
- 36% reduction in TVR
- 41% reduction in MACE
- 75% reduction in total occlusions
- No increase in early or late thromboses

The Efficacy of Vascular Brachytherapy in The "Real World"

Patients	3,695
TVR	140
TVR%	3.8%

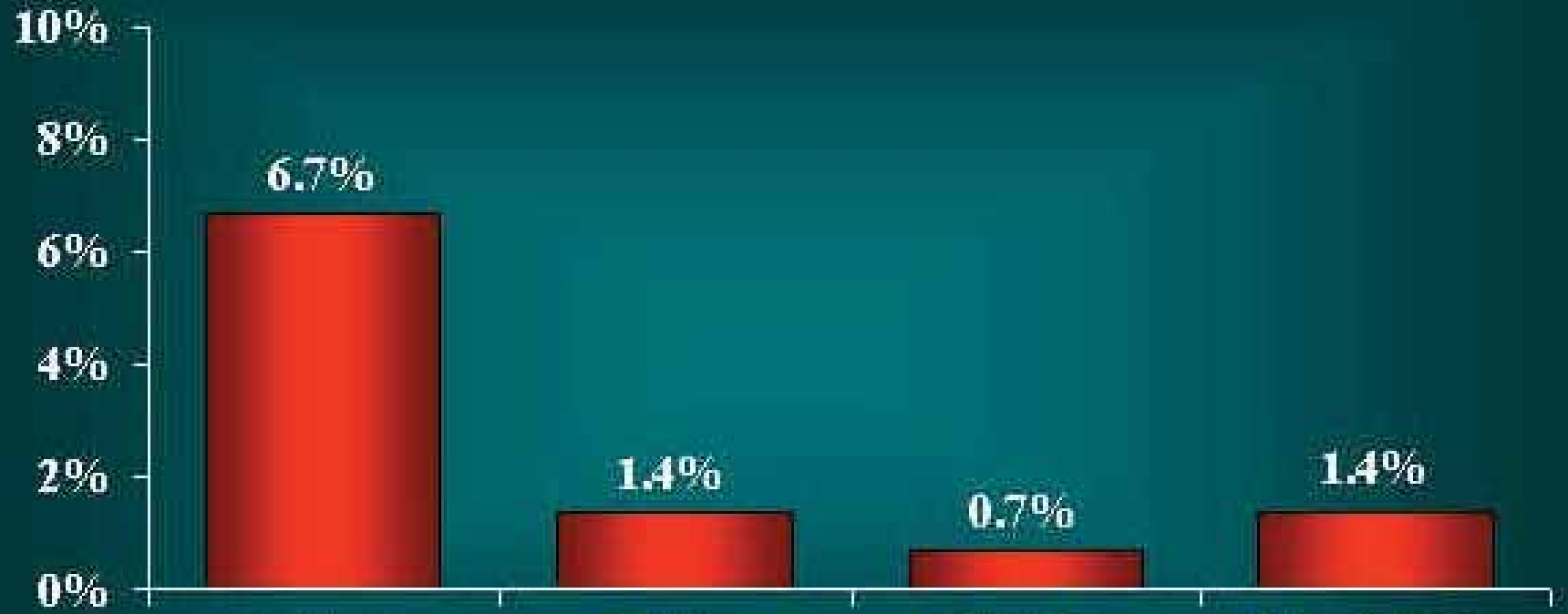


Source: Novoste

Real Life Use of IVB at Stanford

- Over 750 cases done at Stanford (all three beta systems) since approval, 4 days availability a week
- One of the simplest, most predictable procedure
- From end of last balloon to finish, less than 15 minutes
- Mean length 25mm, No complications, No SAT
- Clinical restenosis less than 5%

Distribution of Late Thrombosis*



*Scripps-1, WRIST, and Gamma-1

DES ISR Studies

Outside United States

- *Observational Registries*
  - Sao Paulo, Brazil (Sosa/Abizaid)
  - Rotterdam, the Netherlands (Serruys)
  - Milan, Italy (Colombo)
  - Leuven, Belgium (DeScheerder)
  - TAXUS III (Grube/Serruys)
- *Comparative Registries*
  - Research (Serruys)

DES ISR Studies – Outside U.S.

Clinical Studies Factors

	# pts	study design	DES system
Sao Paulo	25	registry	Cordis/Sirolimus
Rotterdam	16	registry	Cordis/Sirolimus
Leuven	21	registry	Cook/Paclitaxel
Milan	15	registry	Quanam/Paclitaxel
TAXUS III	28	registry	BSC/Paclitaxel

Total = 105 Patients

DES ISR Studies – Outside U.S.

Demographics and Patterns of ISR

	DM	VBT failure	Focal	Diffuse	CTO
ao Paulo	28%	0	40%	60%	0
otterdam	27%	19%	19%	62%	19%
euven	29%	5%	na	na	na
ilan	30%	13%	40%	53%	7%
AXUS III	14%	0	35%	61%	4%

DES ISR Studies – Outside U.S.

Angiographic Results (QCA)

	Late loss (mm)	Restenosis
Sao Paulo	-0.05 ➡ 0.16	4%
Rotterdam	0.26 ➡ 0.51	12.5%
Leuven	na	14.3%
Milan	0.47 ➡ 1.36	13% ➡ 61.5%
TAXUS III	0.54	16%

DES ISR Studies – Outside U.S.

Clinical Outcomes

	Death	MI	TLR	Stent thrombosis
o Paulo	0	0	0	0
tterdam	12.5%	6.3%	12.5%	12.5%
uven	na	na	na	9.5%
an	0	20%	20% ➡ 40%	6.7%
XUS III	0	7.2%	21.4%	0

DES ISR Studies – Outside U.S.

Lessons learned…

- Small observational registries indicate that in "simple" ISR patients, DES results are favorable with excellent short and medium-term safety and efficacy
- In "complex" ISR patients (e.g. VBT failures), clinical outcomes are less favorable and less predictable with ? more frequent SAT
- There is clear evidence of late "catch-up" in some studies (Milan and to a lesser degree in Sao Paulo/Rotterdam)…late FU is essential
- Technique is important, esp. avoidance of inter-stent gaps and full lesion coverage (Leuven and TAXUS III)

Sirolimus-Eluting Stent for Complex In-Stent Restenosis (n = 16)

Degertekin et al JACC 2003; 184-9

Lesion Length (mm)	= 18.4
Lesion Length > 10 mm	= 81.2%
Previous Brachytherapy	= 4 (25%)
Clinical events/Restenosis	= 6/16 (37.5%)
Death	= 2/16 (12.5%) 1 sudden, 1 late-due to CHF
MI	= 1/16 (6%) thrombosis at 7 mos (off Plavix)
Restenosis	= 3/15 (20%) 1 silent occ p brachy, 1 Ht tx

Treatment of ISR in the Real World

Non-randomized, Single Center Registry

Patients = 206 with ISR treated with Cypher stents

6 mos FU = 108 pts

TVR = 7 (6.5%)

» Barragan et al (Marseille, France), AHA 2003

DES for In-Stent Restenosis

Non-randomized, Single Center Registry

- Patients = 126 pts with ISR, Rx' with Cypher stents
- TLR = 5 (4%)
- Restenosis = ?

» Medina et al (Cordoba, Spain) AHA 2003

Research – ISR

Research – ISR

ehran lesion type		Control (n=74)	SES (n=67)
-II	Focal / Diffuse	78.4 %	53.7 %*
I-IV	Proliferative / Total occlusion	21.6 %	46.3 %*
Previous Brachytherapy		6%	25%*

* p=0.002

Mehran et al. Circulation 1999;100:1872-78

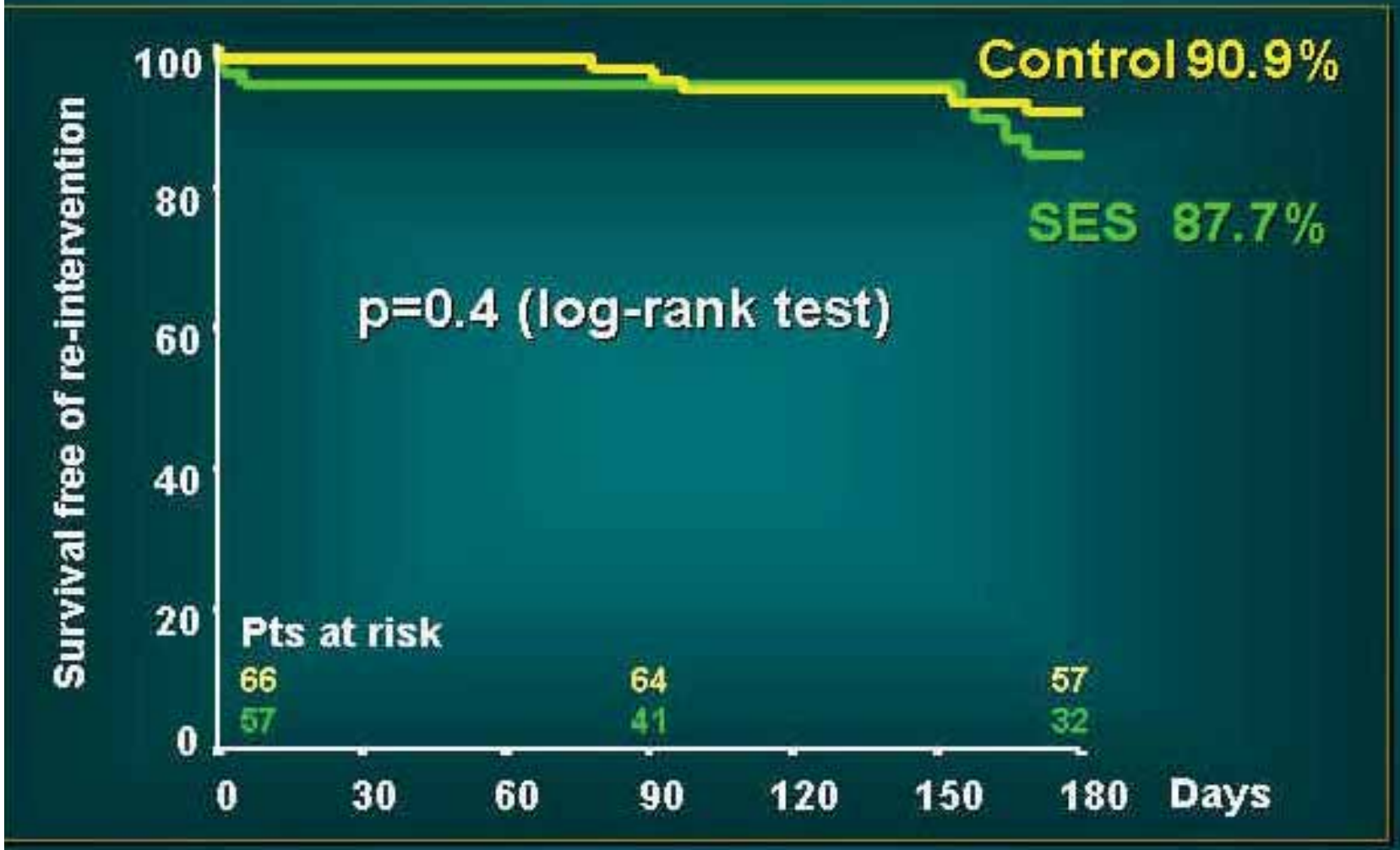
Research – ISR

Clinical Follow-up (6 months)

	Control (n=66)	SES (n=57)	P value
Death, %	1.5	0	1.0
Non-fatal MI, %	1.5	1.8	1.0
Repeat revasc, %	9.1	12.3	0.6
MACE, %	12.1	14.0	0.8

Research – ISR

Survival free of re-intervention



DES ISR Studies

United States

- *Observational Registries*
  - SECURE (Teirstein)
- *Randomized Clinical Trials*
  - SISR (Holmes)
  - TAXUS V – ISR (Stone/Ellis)

SECURE

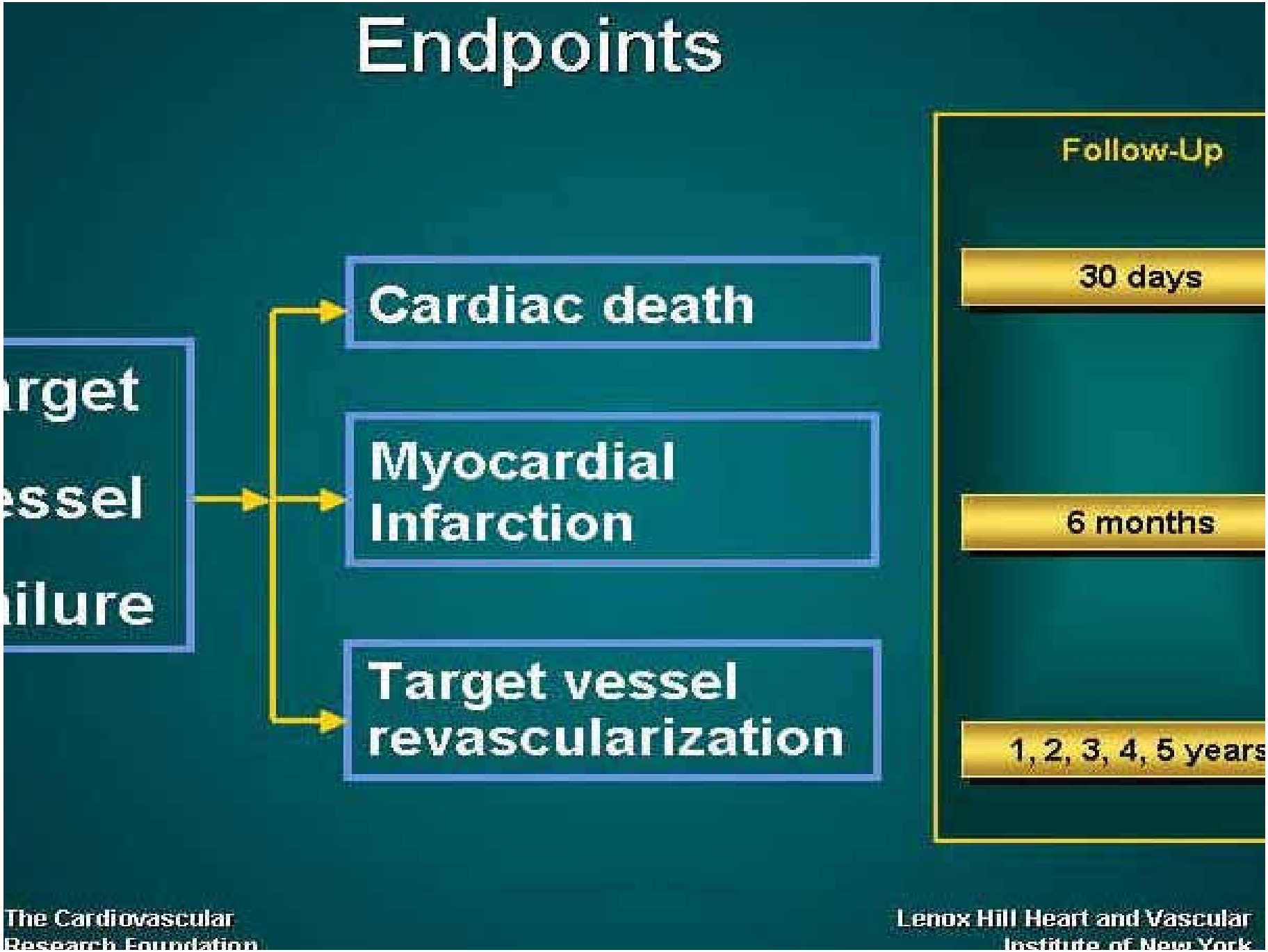
Compassionate" Sirolimus Stenting

Study Objective:

- Multicenter study to allow treatment with the Sirolimus-eluting Bx VELOCITY™ stent in patients with a serious disease or condition for which there is no generally acceptable alternate treatment available

Study Design:

- 250 patients total, angiographic and IVUS follow-up for brachytherapy failure patients
- Primary endpoint of target vessel failure
- First patient enrolled March 13, 2002


Endpoints
rget
essel
ilure
Cardiac death
Myocardial Infarction
Target vessel revascularization
Follow-Up
30 days
6 months
1, 2, 3, 4, 5 years
The Cardiovascular Research Foundation
Lenox Hill Heart and Vascular Institute of New York

SECURE - Patient Demographics

	Sirolimus (%) (n=202 pts)
Male	71.8
Mean age (years)	61.9
Prior MI	45.5
Restenotic target	86.7
Diabetes Mellitus	38.6
Anginal class 3 or 4	56.9
Prior brachytherapy	72.3
Graft as target	20.8

SECURE – Radiation Failure Vs No Radiation

	Radiation Failure* (n=146 pts)	No Radiation Failure (n=56 pts)	P-value
Age (mean)	62.7	60.0	0.17
Diabetes (%)	39.7	35.7	0.60
Ang Class 3/4 (%)	56.2	58.9	0.72
Lesions/pt (#)	1.5	1.7	0.036
Restenotic (%)	98.6	68.3	<0.001
Graft as target (%)	24.3	15.5	0.13

**patients with at least one lesion previously treated with brachytherapy*

SECURE – Events In & Out of Hospital to 6 Months

	Radiation Failure* (n=146 pts)	No Radiation Failure (n=56 pts)	P-value
ean follow-up ays)	147	142	1.00
eath (%)	1.4	1.8	1.00
l (%)	2.7	0	0.58
Q-wave	0.7	0	1.00
Non-Q wave	2.1	0	0.29
ACE (death, MI, LR)	12.3	8.9	0.62

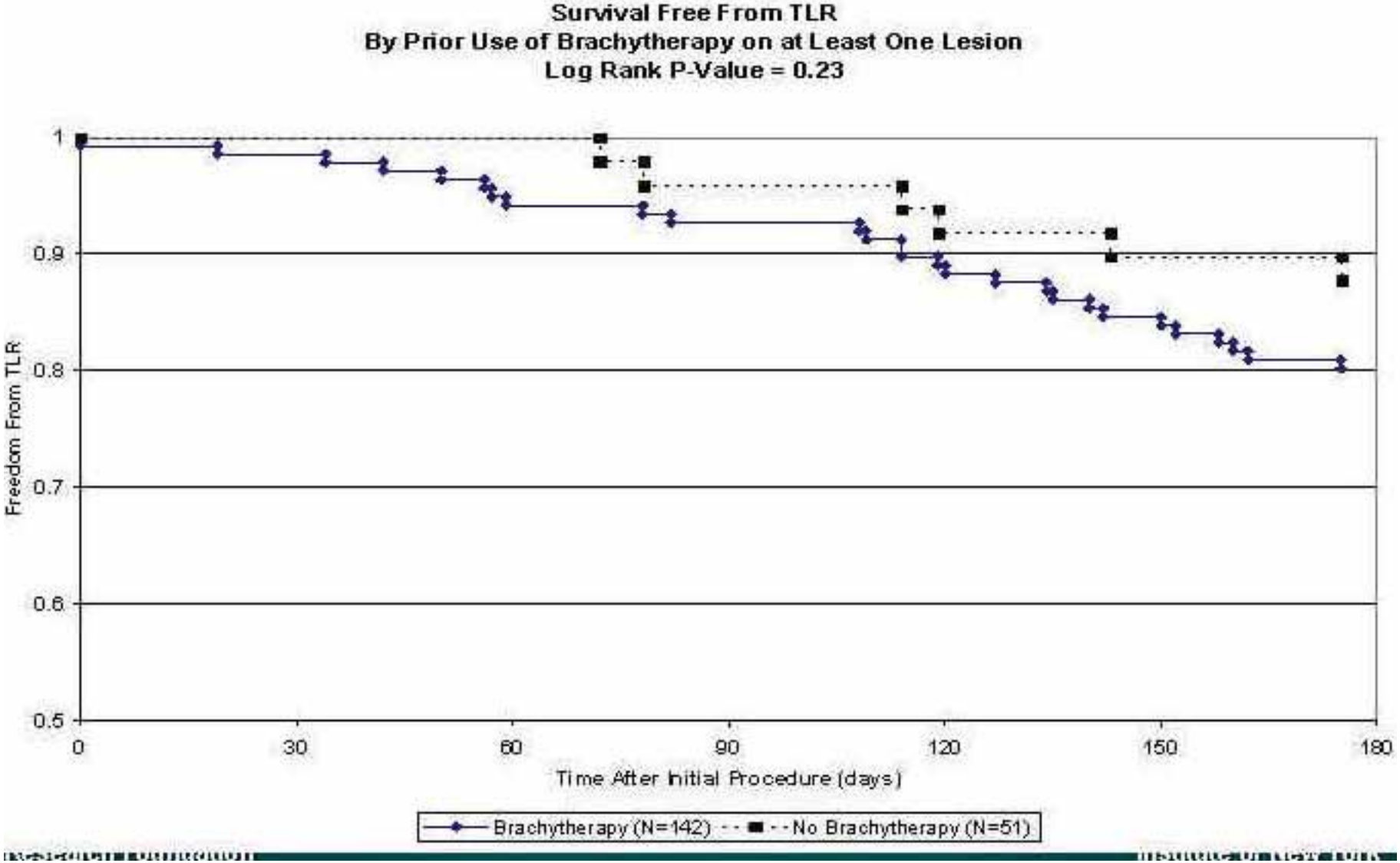
**patients with at least one lesion previously treated with brachytherapy*

SECURE – Events In & Out of Hospital to 6 Months

	Radiation Failure* (n=146 pts)	No Radiation Failure (n=56 pts)	P-value
ean follow-up ays)	147	142	1.00
LR (%)	11.6	5.4	0.29
VR (%)	11.6	5.4	0.29
ent thromb <30 ys (%)	0.7	0	1.00
ent thromb >30 ys (%)	1.4	0	0.56

*patients with at least one lesion previously treated with brachytherapy

SECURE – Target Lesion Revascularlization Radiation Failure Vs No Radiation



DES ISR Studies – United States

Lessons from SECURE…

In an "ultra-complex" group of "no option" patients with recalcitrant ISR (usually despite previous VBT):

- Sirolimus DES therapy resulted in favorable short and medium-term clinical outcomes with infrequent stent thrombosis and reduced overall TLR/TVR events (6 mos FU of eligible subgroup)
- ISR after failed VBT, was associated with a higher 6 mos TLR and TVR (21% and 25%), and although benefited from DES, still represents a challenging patient cohort
- Many technique and adjunctive pharmacology issues require further refinement

SECURE – Events In & Out of Hospital to 6 Months

193 patients with 6 month follow-up

	Radiation Failure* (n=142 pts)	No Radiation Failure (n=51 pts)	P-value
R (%)	19.0	11.8	0.24
R (%)	19.7	11.8	0.20
F (%)	21.8	11.8	0.12
ent thromb <30 days (%)	1.4	0	1.00
ent thromb >30 days (%)	1.4	0	1.00

**patients with at least one lesion previously treated with brachytherapy*

SECURE – 8 Month QCA

Lesions with previous brachytherapy

	Sirolimus (%) (n=56 lesions)
In-stent Binary Restenosis (%)	33.9
In-lesion Binary Restenosis (%)	37.5
In-stent Late Loss (mm)	0.81
In-lesion Late Loss (mm)	0.63

SECURE - Conclusions

Early evidence indicates:

- Sirolimus stents will be an effective therapy for most brachytherapy failure patients
- In this high restenosis risk population, results following sirolimus stenting are not as consistently favorable as in non-brachytherapy failure patients
- Continued follow-up is required before final late thrombosis and late restenosis rates are known.

In-stent Restenosis Registry

rolimus-Eluting Cypher™ Stent to treat IS

N = 41 patients
ISR
Vessel size: 2.5–3.5mm
1 or 2 - 18mm Cypher™ stent

- Open-label safety study with the Cypher™ stent
- All patients received Aspirin (325 mg) + Clopidogr
  (75 mg, 60 days)

In-stent Restenosis Registry

Endpoints

- 30-day, 4-month, 1-year, up to 5-year MACE
- 4-month, 1-year FU QCA & IVUS

Sites	Patients
Inst. Dante Pazzanese, Sao Paulo	n = 25
Thoraxcenter, Rotterdam	n = 16

Independent Core Labs

QCA by Brigham and Women's, Boston

IVUS by Cardialysis, Rotterdam

Patterns of In-stent Restenosis

	Brazil n=25	Netherlands n=16
Focal 	10 (40%)	3 (19%)
Diffuse 	8 (32%)	4 (31%)
oliferative 	7 (28%)	5 (31%)
al Occlusion 	0 (0%)	3 (19%)

1-year Clinical Events

	Brazil N=25	Rotterdam N=16	Pooled N=41
Death	0 (0%)	2 (12.5%)	2 (4.9%
MI	0 (0%)	1 (6.3%)	1 (2.4%
TLR	0 (0%)	2 (12.5%)	2 (4.9%
Restenosis	1 (4%)	2 (12.5%)	3 (7.3%

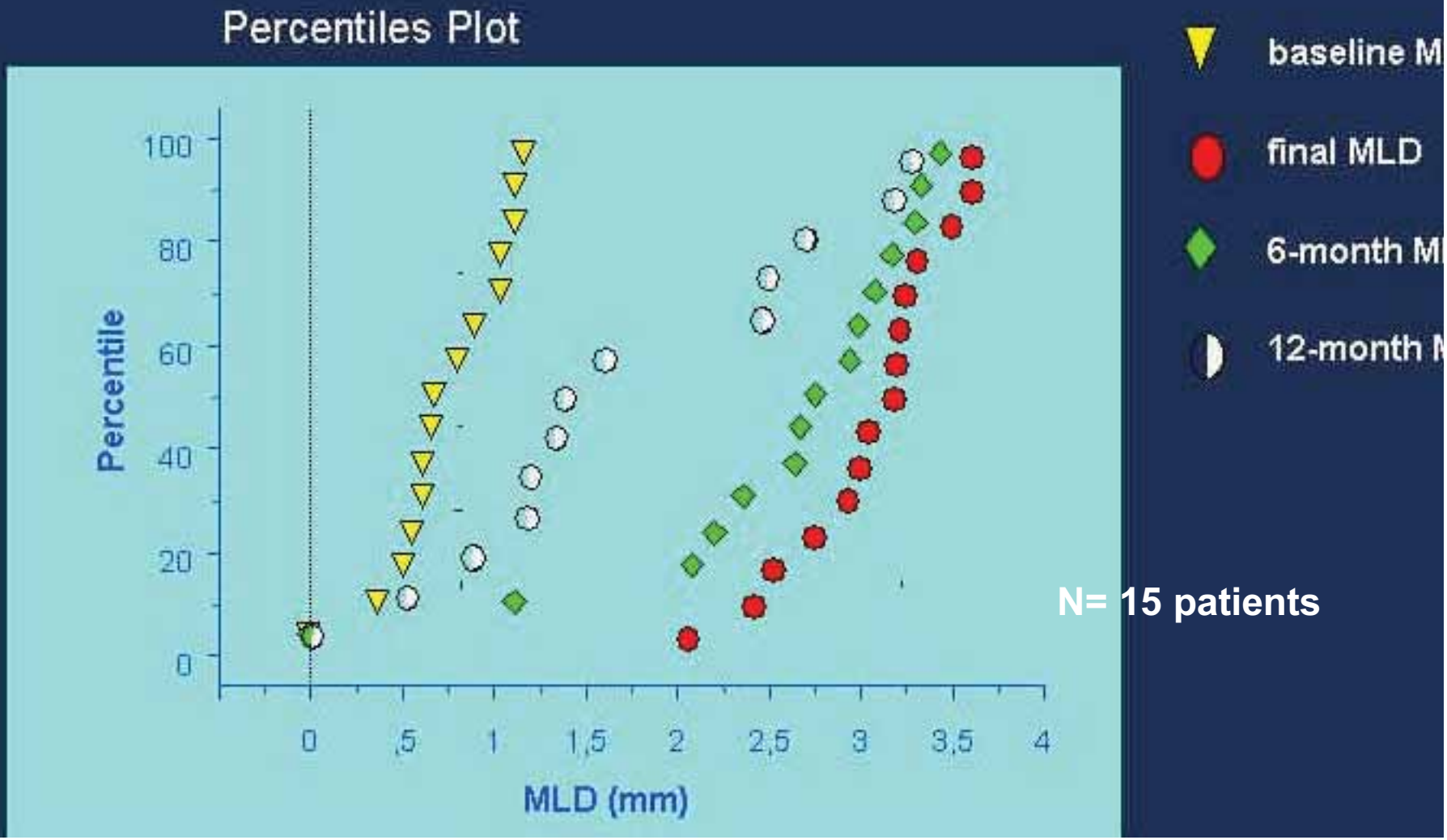
First clinical experience with a paclitaxel-derivate eluti polymer-stent system implantation for in-stent resteno immediate and long term clinical and angiographic out

Baseline Clinical Characteristics

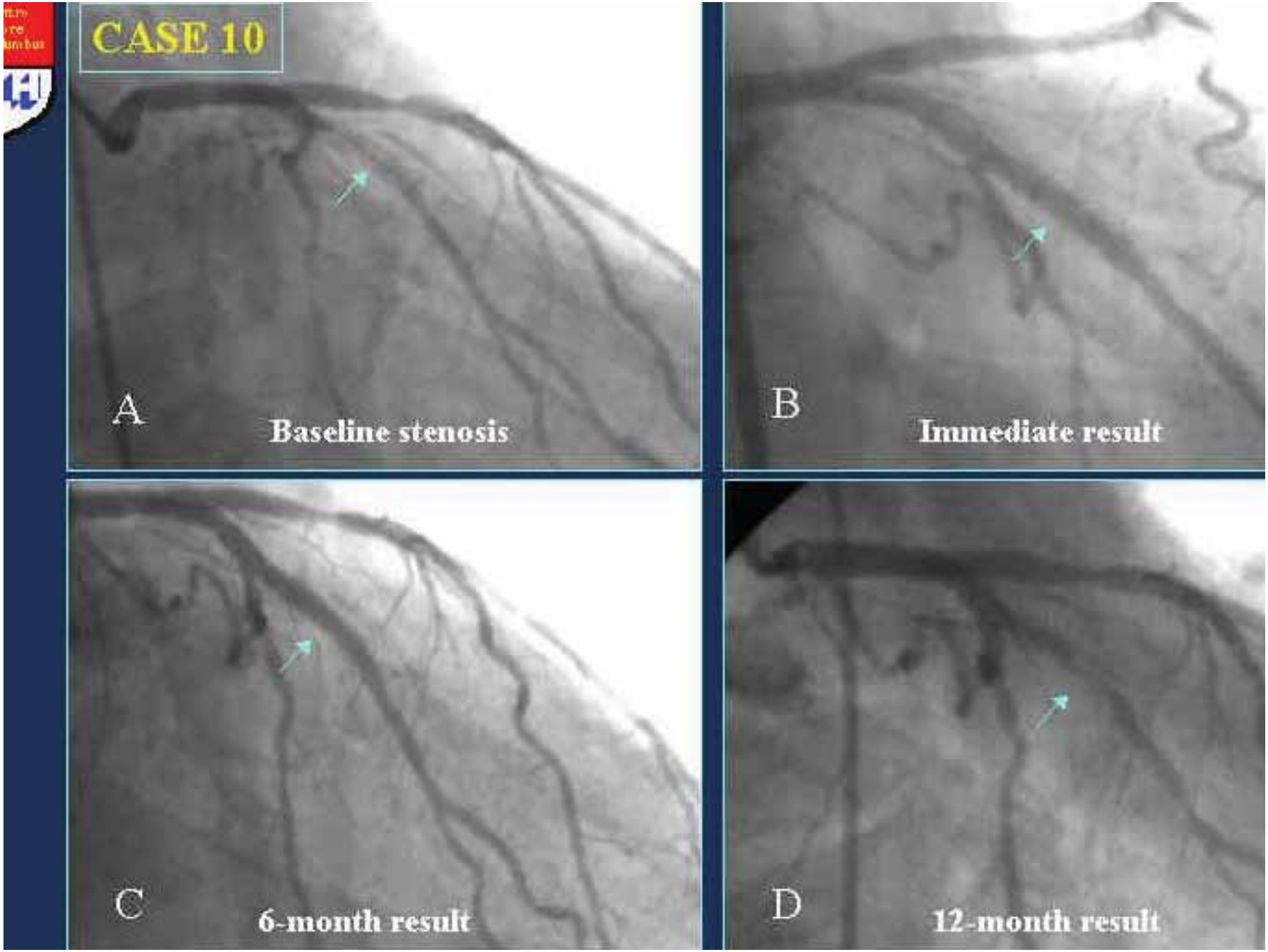
Variable	*N. (%)*	*Variable*	*N. (%)*
Patients	15	1 vessel disease	6 (40)
Age (yrs)	58.8	2 vessel disease	4 (27)
Male sex	13 (86.6)	3 vessel disease	5 (33)
Family history		Prior MI	7 (46.6)
for CAD	5(30)	Prior CABG	5 (33)
Diabetes	5 (30)	Prior brachytherapy	2 (13)
Hyperchol.	14 (93.3)	EF	54.6 ±7.1
Hypertension	11 (73.3)	Asymptomatic	3 (20)
Current Smoke	1(6.6)	Stable	5 (30)
		Unstable	7 (46.6)

Paclitaxel (with Polymer) Stent to treat ISRS.

MLD Percentiles baseline, at 6 and 12 months angiograp



N= 15 patients


CASE 10
A
Baseline stenosis
B
Immediate result
C
6-month result
D
12-month result

TAXUS III

Non-randomized, 2 Center Registry

- Patients = 28 with ISR treated with Taxus stents
- TVR = 6 (21.4%) but 3 pts had no restenosis
- Restenosis = 4 (16%)

» Tanabe et al Circulation 2003; 107:559-564

Clinical and Angiographic follow

Quantitative Coronary Angiograp

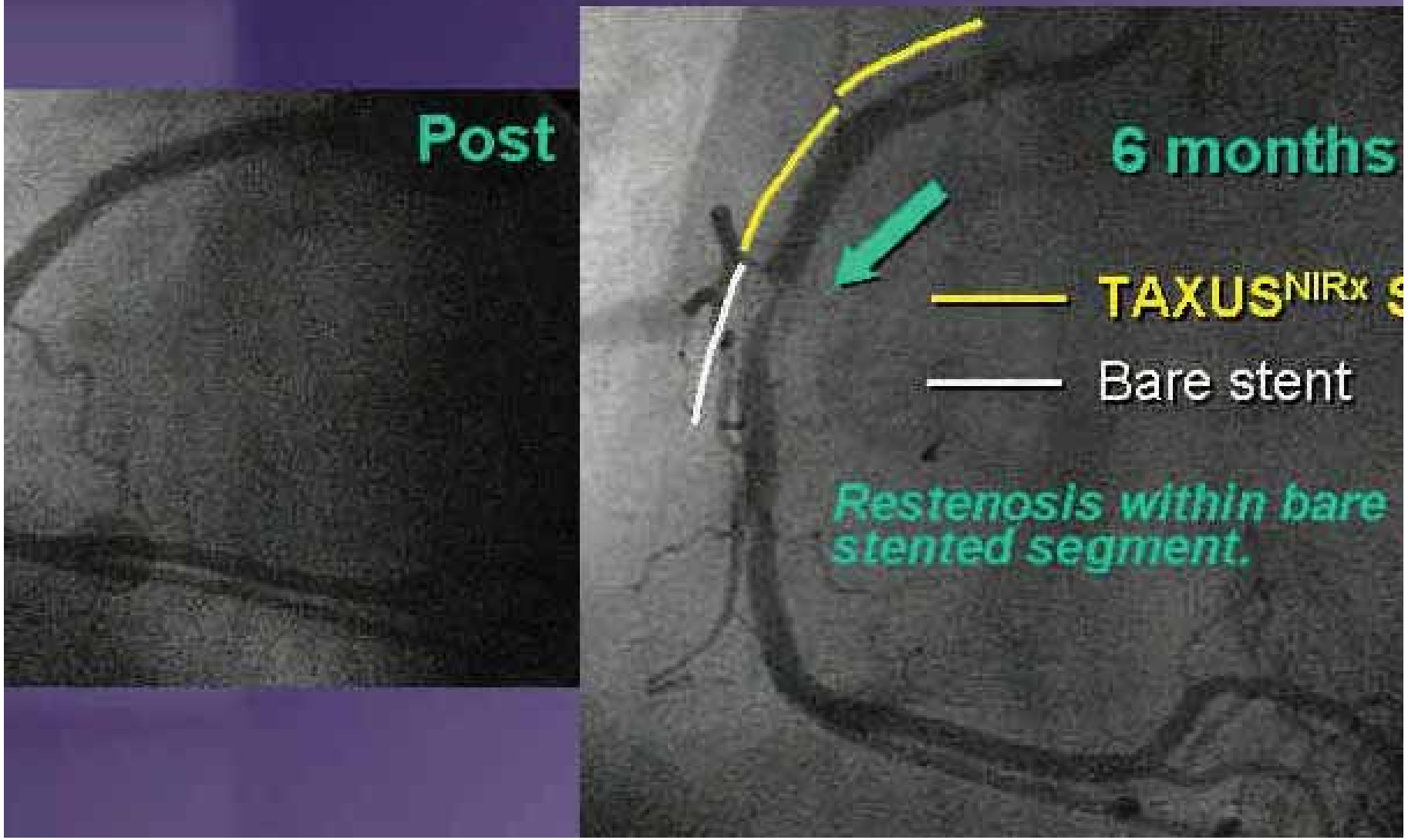
ISR Classificat

Baseline Mehran Classification	n / %
IA (gap)	0 (0%)
IB (margin)	3 (10.7%)
IC (Focal)	6 (21.47%)
ID (Multifocal)	1 (3.67%)
II (diffuse intrastent)	13 (46.4%)
III (proliferative)	4 (14.3%)
IV (total occlusion)	1 (3.6%)

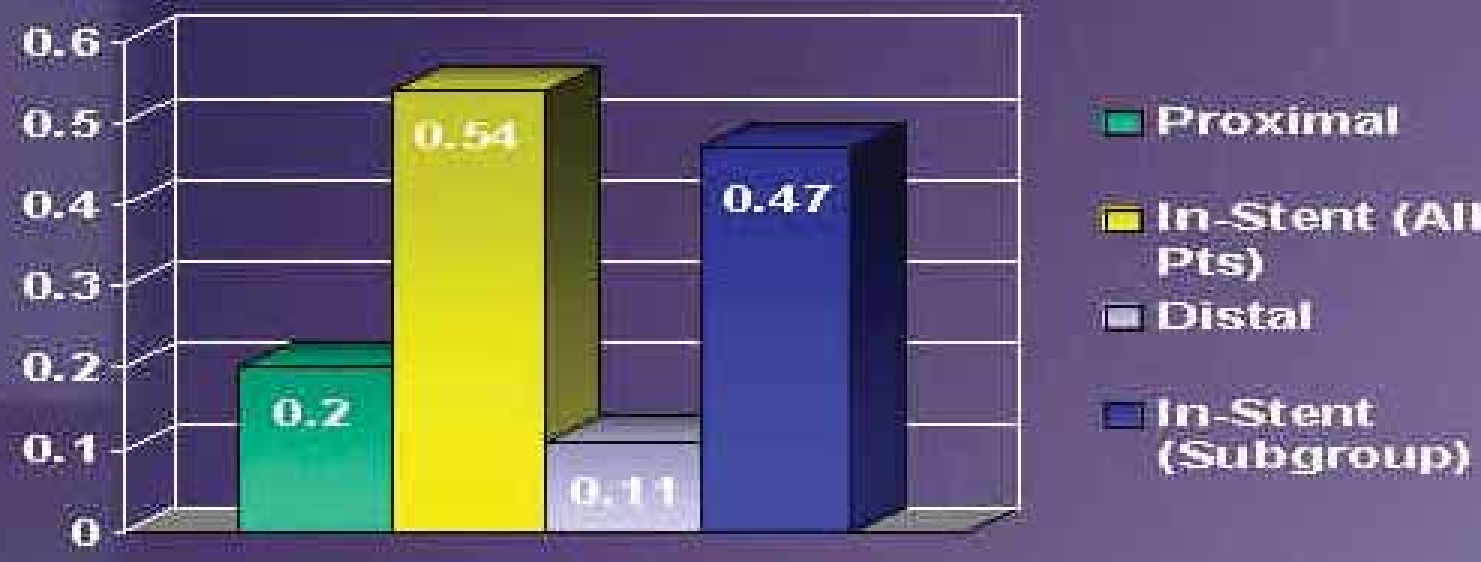
Major Adverse Cardiac Eve

	30 Day (n / %)	6 Month (n / %)	P-valu
eath	0	0	NS
-Wave MI	0	0	NS
on Q-Wave MI	1 (3.6)	1 (3.6)	NS
LR	0	6 (21.4)	NS
ABG	0	1 (3.6)	NS
-Month MACE	0	8 (29)	NS

Stent Mismatch by Angiograp



Late Lo



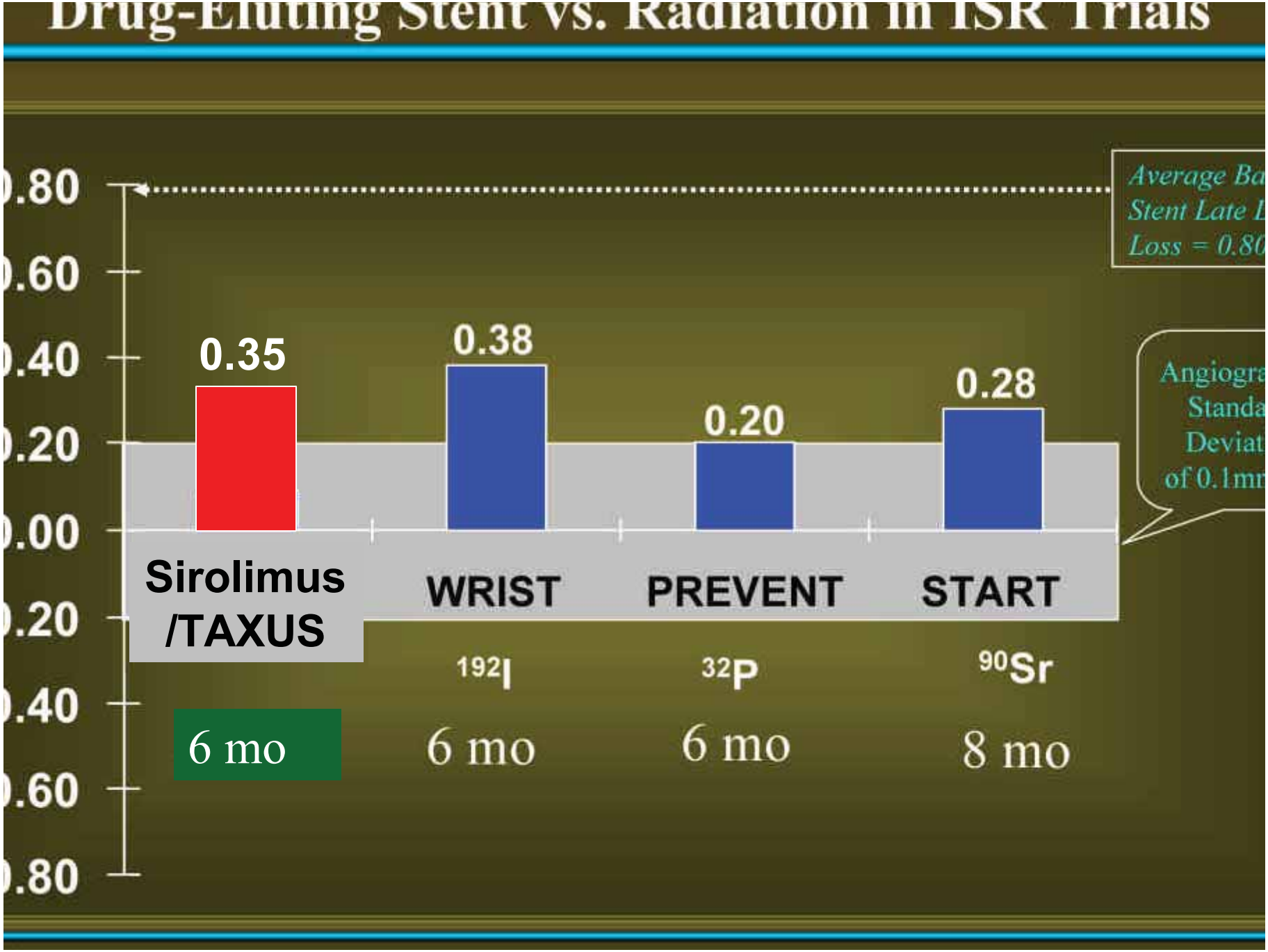
Proximal	In-Stent All Patients	Distal	In-Stent Subgroup
0.20 ± 0.40	0.54 ± 0.51	0.11 ± 0.33	0.47 ± 0.48

There is little data showing DES is more effective than brachytherapy in ISR (how many stents do we deliver to treat a 32mm ISR ?)

Is multiple DES overlapping a problem ? Potentially

Brachytherapy vs Drug Eluting Stents for In stent Restenosis

	Radiation	DES
	> 1500	70
R	15-20%	0% vs 30+%
AT	1-2%	0% vs 20%
dge	Coverage	Longer stent
B Loss	some	problematic
	per case	per mm


Drug-Eluting Stent vs. Radiation in ISR Trials
.80
.60
.40
.20
.00
.20
.40
.60
.80
0.35
0.38
0.20
0.28
Average Ba
Stent Late L
Loss = 0.80
Angiogra
Standa
Deviat
of 0.1mm
Sirolimus /TAXUS
WRIST
PREVENT
START
192I
32P
90Sr
6 mo
6 mo
6 mo
8 mo

DES vs Brachytherapy in ISR

- Randomized trial of patients with ISR
- Include all comers, select patients that can be treated with both, keep registry of non-randomized (major side branch, long lesions requiring more than 2 stents)
- Follow-up: cost, TLR, TVR and vessel failure

TAXUS-V ISR Features

88 pts with ISR of bare metal stents randomized to TAX

s. any FDA approved beta brachytherapy system (Guid

Galileo™ or Novoste Beta-Cath™)

Primary endpoint is 9-month ischemic TVR

Sequential non-inferiority and superiority testing

- NI: iTVR = 20%, δ=10%, 10% attrition $\Rightarrow$ 83% power
- Superiority: TVR 20% vs. 10%, 10% attrition $\Rightarrow$ 80% power

Cypher™ SISR

A Multicenter, Randomized Study of the Sirolimus-Eluting Bx Velocity® Balloon Expandable Stent vs. Intravascular Brachytherapy in the Treatment of Patients with In-Stent Restnotic Coronary Artery Lesions

Inclusion: ***Lesion length*** ≤ 45 mm
RVD ≥ 2.75 mm and ≤ 3.5 mm

P.I. Dr. Holmes

N= 400 patients
In-stent restenotic coronary lesions

Randomized

CYPHER™ Stent
n = 266

Brachytherapy (gamma/beta)
n = 133

Endpoints ***1ry:*** TVF @ 9 months
Angiographic: all patients @ 6 mos.
IVUS: 5-7 center substudy @ 6 mos.

SISR Sneak Preview

Scripps Clinic Recruitment = 38

- Patients at six month FU = 31
  - DES = 22
  - Brachy = 9 (5 Galileo; 4 Gamma)
- TVR =

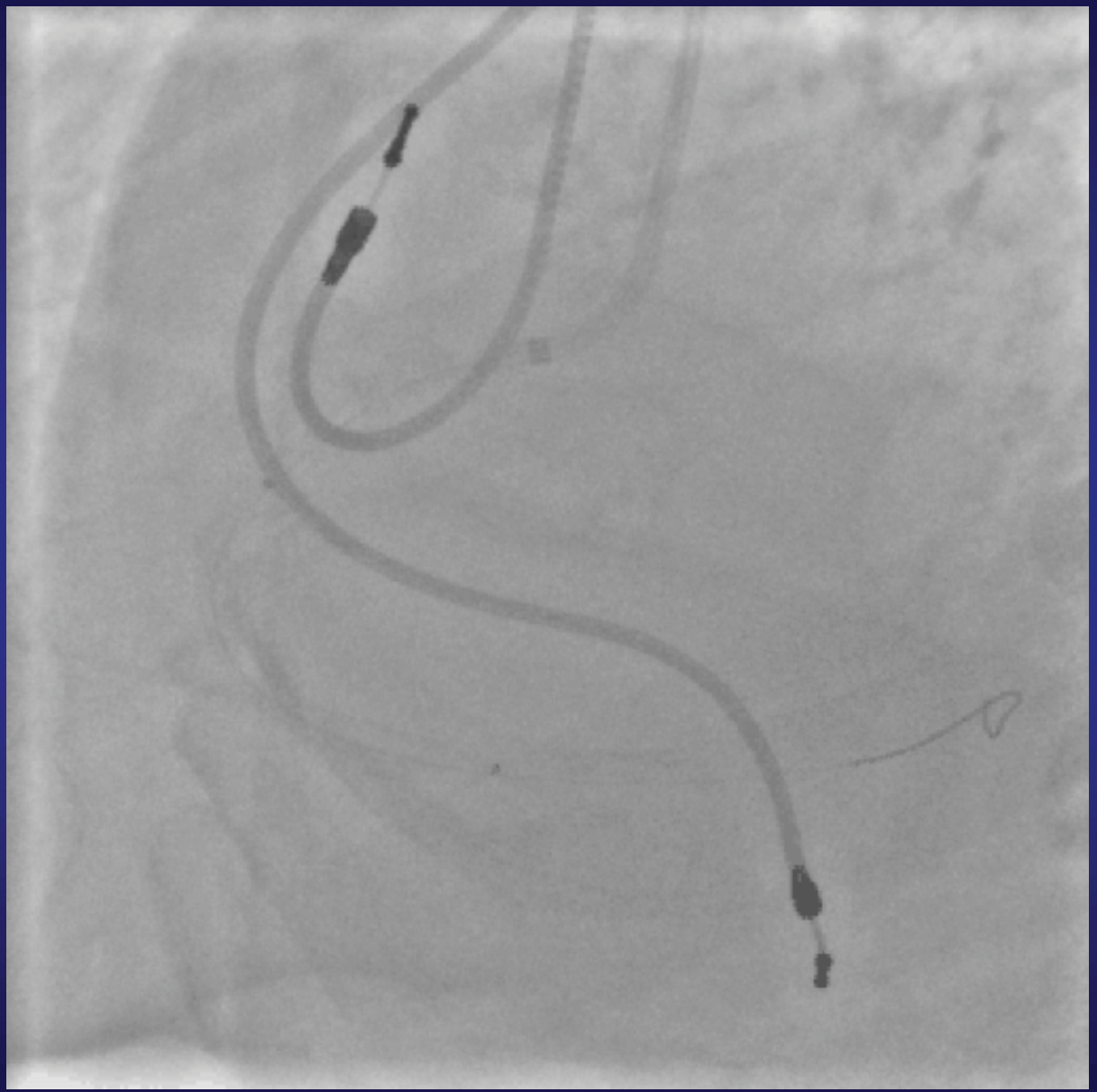
SISR Sneak Preview

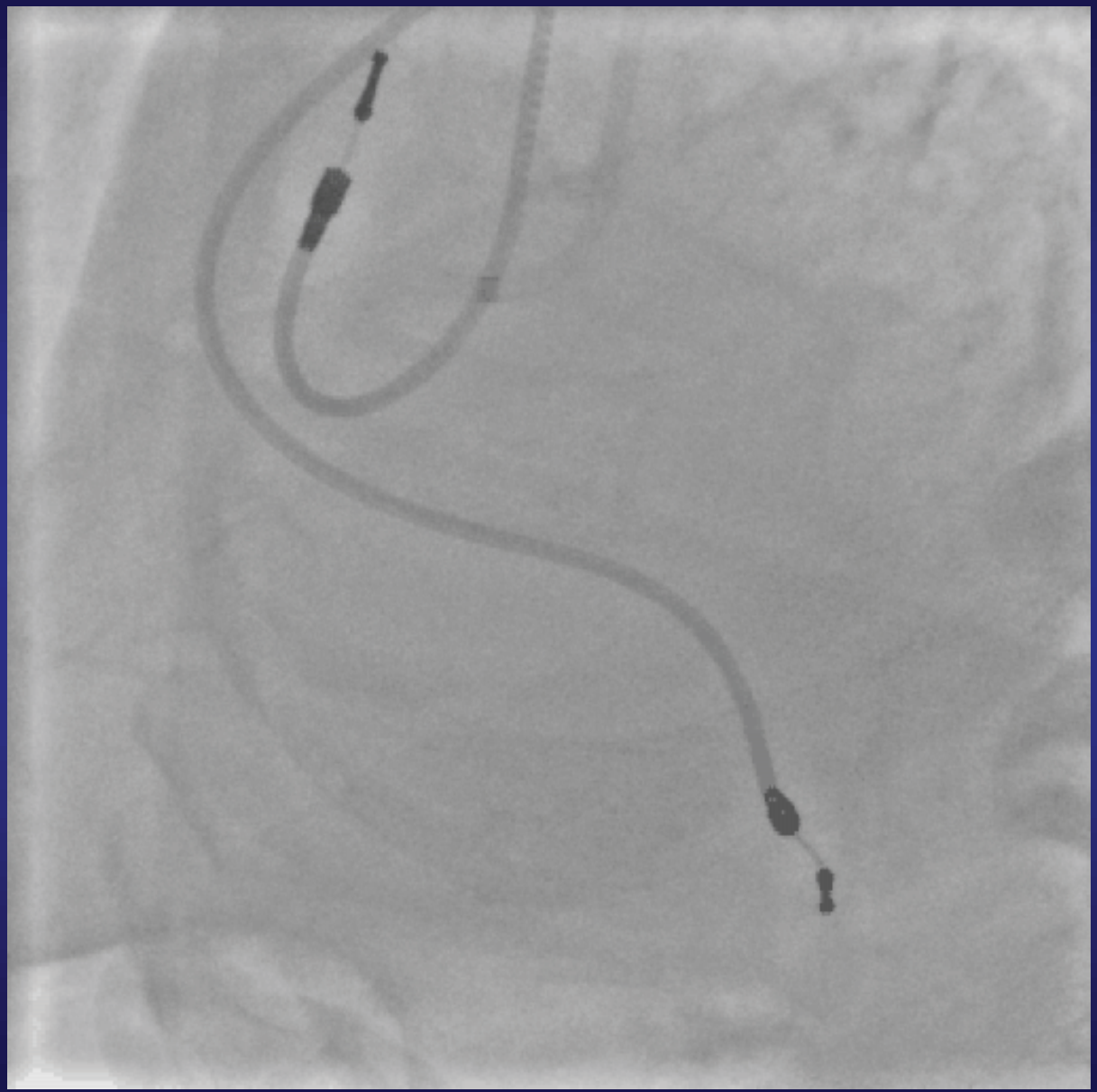
Scripps Clinic Recruitment = 38

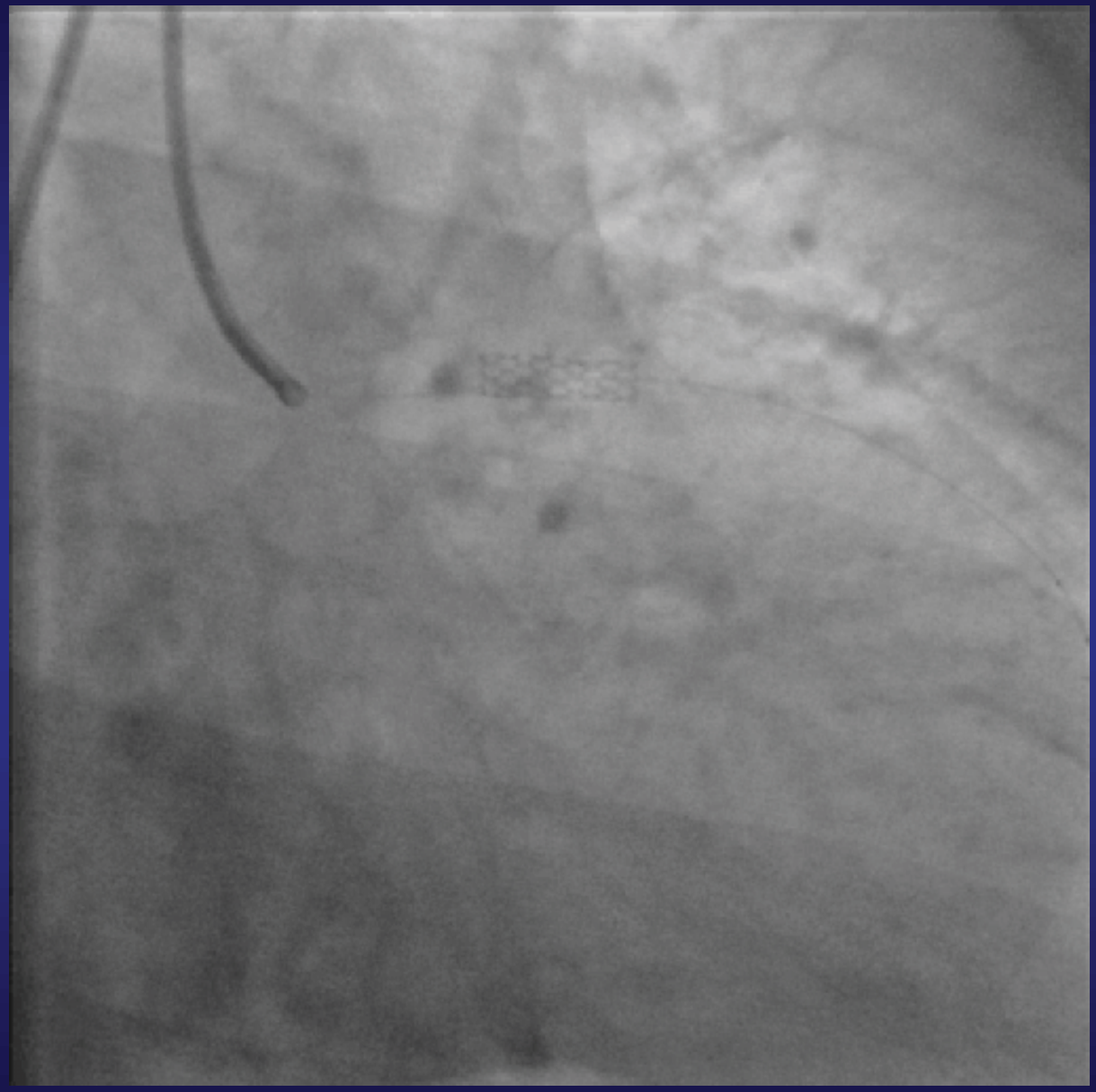
- Patients at six month FU = 31
  - DES = 22
  - Brachy = 9 (5 Galileo; 4 Gamma)
- TVR
  - DES 5/22 (23%) vs Brachy 0/9 = 0; p = 0.2
    - 4/22 (18%) had TLR, 1/22 had new lesion distal to stent
- Repeat Restenosis
  - DES 5/22 (23%) vs Brachy 0/9 = 0; p = 0.2

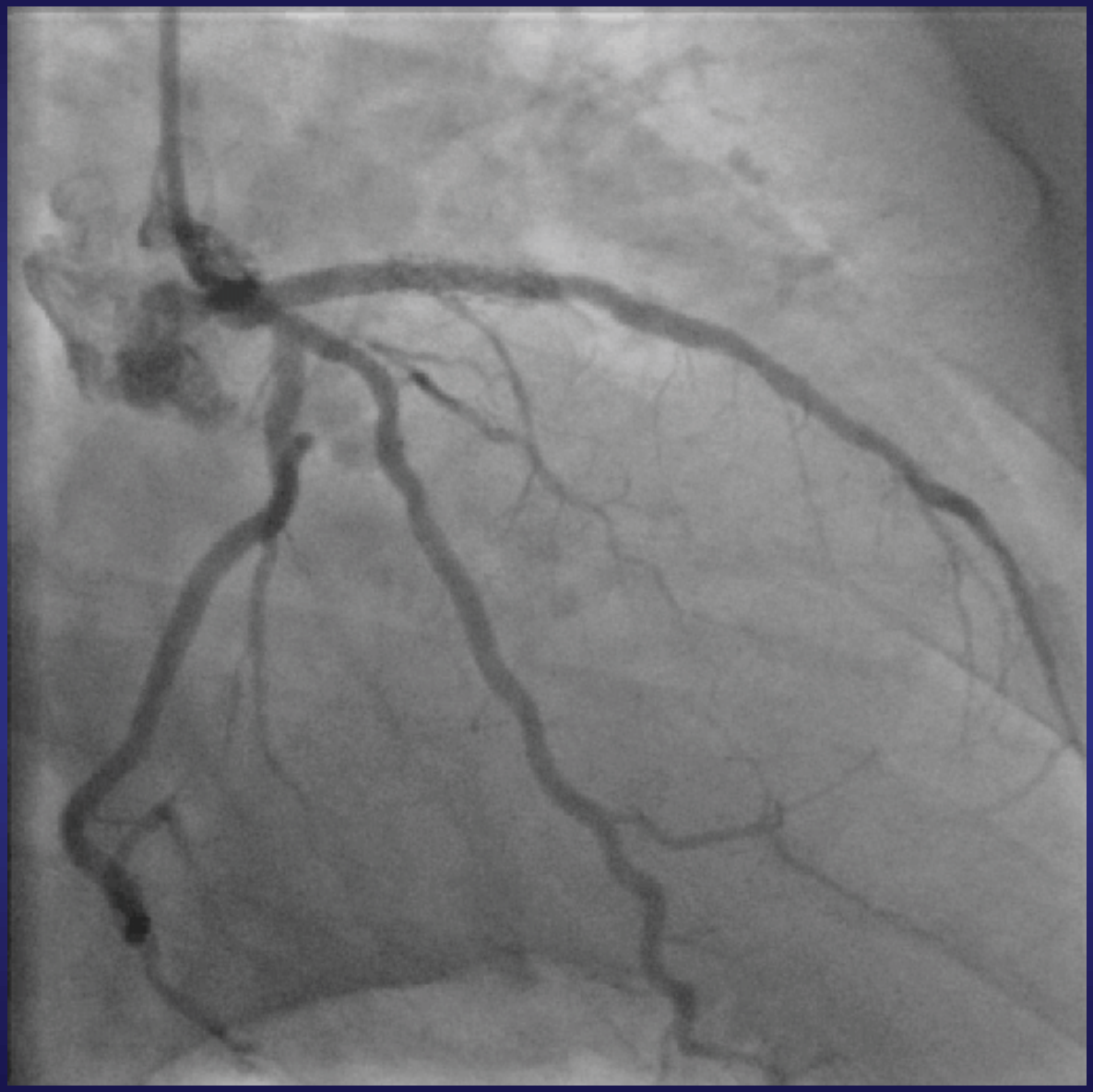
In-Stent Restenosis Trials

ISR-Feas	US ISR-Feas	TROPICAL	SISR	ISR-Barragan
Brazil & Netherlands	US	Europe	US	Europe
Two-center, non-randomized	Single center, non-randomized	Multicenter, (12 sites), non-randomized	Multicenter (26 sites)	Single-center, non-randomized,
Feasibility trial for use of the CYPHER™ Stent in in-stent restenotic lesions	Feasibility trial for use of the CYPHER™ Stent in in-stent restenotic lesion, IDE study	Feasibility trial for the CYPHER™ Stent use in in-stent restenotic lesions	CYPHER™ Stent vs. intravascular brachytherapy for use in in-stent restenotic lesions	The use of the CYPHER™ Stent for in-stent restenosis
41	8	160	400	23
2-year follow-up at TCT 2003	Patients at 1-2 year visit	Enrollment started in Q4 2002	Enrollment started in Q1 2003	8-month data at ACC 2003









DES vs XRT: Clinical Problems

- BMS in-stent restenosis
  - All in-stent
    - DES and XRT can both be effective, XRT may be more effective
    - Late outcome of DES less known
    - Economics, side branch, ostial, delivery
  - Significant out-of-stent restenosis
    - DES to achieve better acute result
  - Which DES ?
    - Not known
- Failured brachytherapy
    - Higher risk, avoid thrombosis
  - Which DES ?
    - Not known
- DES in-stent restenosis
    - POBA for focal lesion
    - DES for missed lesions
    - Brachytherapy for diffuse disease

Only Commercially Available System Left !!

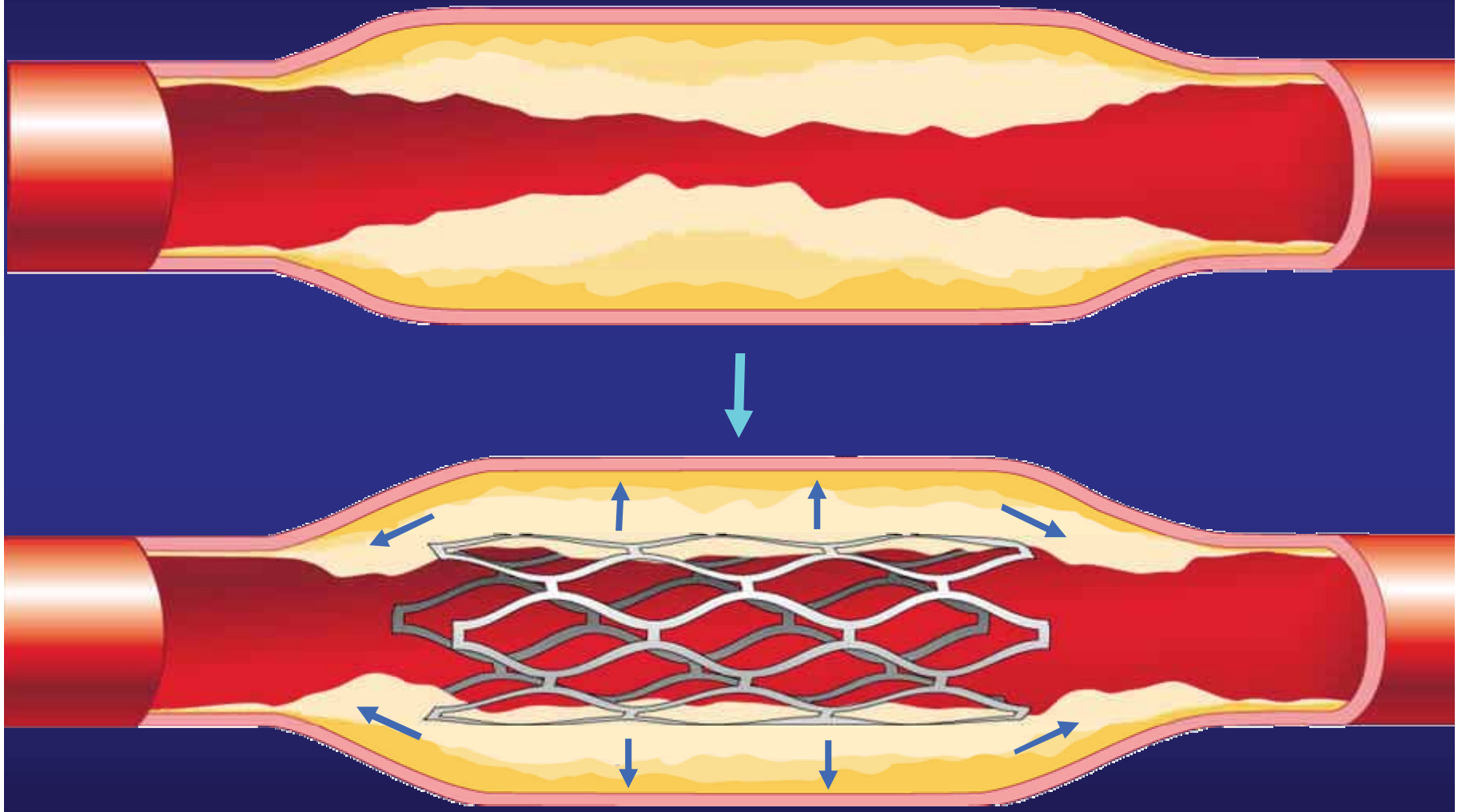
Roles of Brachytherapy vs DES in ISR

- In-Stent Restenosis (BMS)
  - Brachytherapy for majority of patients
  - DES for edge stenosis or analysis segment restenosis
- In-Stent Restenosis (Vein Grafts)
  - Brachytherapy
- In-Stent Restenosis (DES)
  - POBA for focal lesion
  - DES for missed lesions
  - Brachytherapy for diffuse disease

What are the potential problems with treating ISR with DES ?

- Plaque Extrusion
- Long stent in long ISR
- Dosage enough ?
- Multiple stents

DES: “conservation of mass”



... mechanical extrusion axially & longitudinally

hould We Replace Brachytherapy with DES?

Pros and Cons

o

- Brachytherapy adds an extra 30 minutes to the procedure (at least!)
- DES is a *MORE LOCAL* treatment!
- Re-radiation may be risky…therefore, you only get one shot so why not start with a DES?
- Late results of brachytherapy show significant late restenosis

Con

- DES may not be as effective as Brachytherapy
- DES is usually more expensive than brachytherapy
- Late results of DES for ISR are unknown!

Will Late Failure also be a Problem for Drug Eluting stents?

No: -DES are more effective

-DES are used for de novo disease…less aggressive

Yes: -Some pts are resistant to "cell cycle inhibitors"

(i.e. SECURE)

-All anti-proliferative treatments will eventually fail!

DES ISR Studies

What needs to be improved…

- Safety and efficacy in most complex lesion and patient cohorts…VBT failures, CTO lesions, "ultra-diffuse" lesions (> 45 mm length)
- What is the optimal adjunctive pharmacotherapy? …bivalirudin vs. heparin, + IIb/IIIa platelet inhibitors, duration of Plavix therapy (3 mos, 6 mos, 12 mos, or lifelong)
- Can you use alternative (different) DES systems after DES failure? (Sirolimus ⟷ Paclitaxel)
- Optimal timing, sequence, and relative safety/efficacy of DES vs. VBT (esp. long-term safety of DES after failed VBT)…if DES = VBT, which Rx first?

DES ISR Studies

What needs to be improved…

- The "truth" about late "catch-up" (delayed restenosis)… which patients, how severe, possible solutions… obviously, there must be more rigorous late FU in these patients
- And of course, the economic impact can be prohibitive when multiple stents are required (probably still cost-effective vs. alternatives)