Stenting
in
Unprotected Left Main Coronary Artery
"Long term Follow-up"

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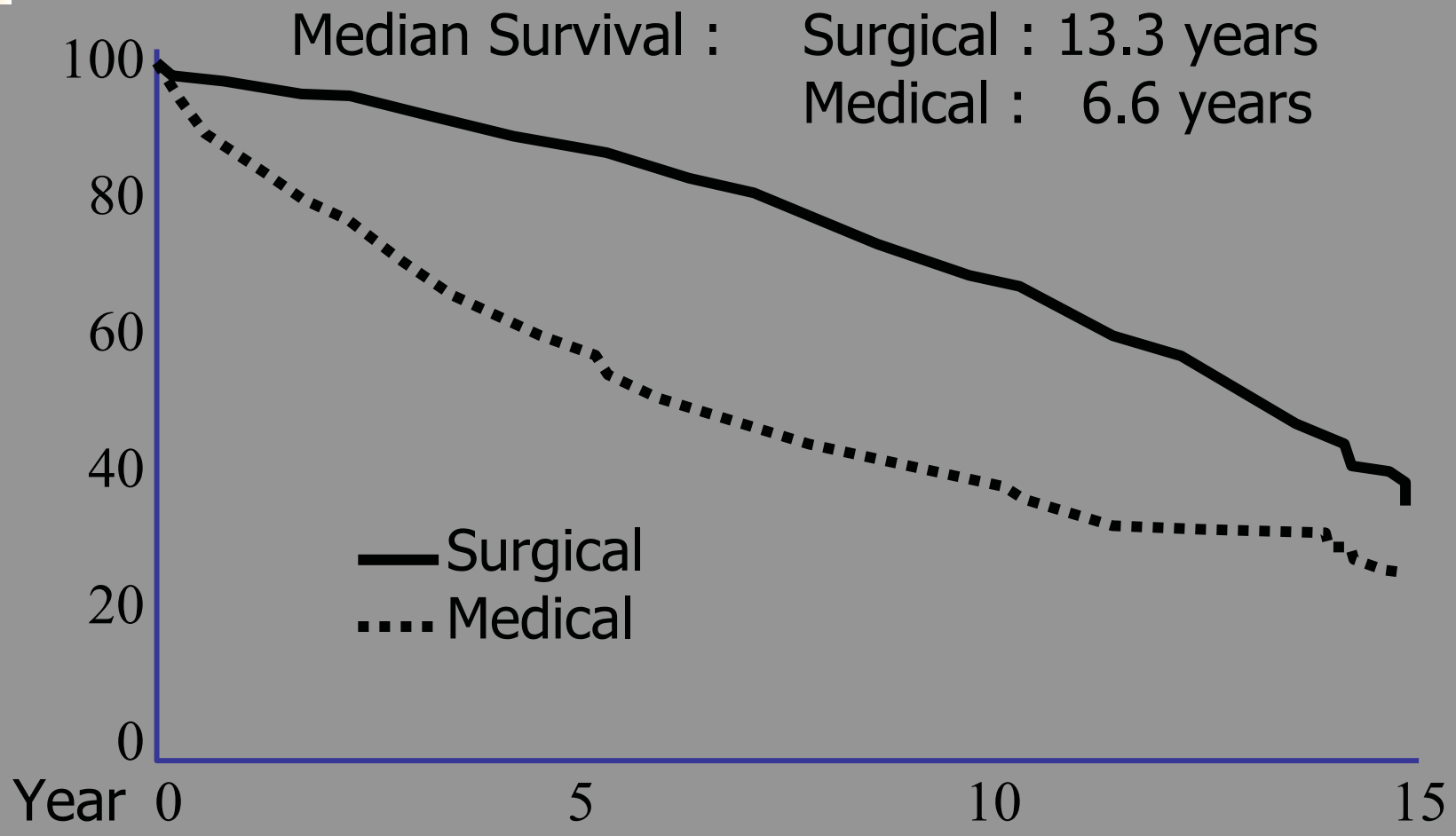
ACC/AHA PCI Guidelines:

Patients with significant LM CAD who are candidates for CABG

« When CABG surgery is a poor option because of high risk due to special considerations or other organ system disease, patients may be appropriately managed with PCI. Under these special circumstances formal surgical consultation is recommended. »

JACC 2001,37:2015-38

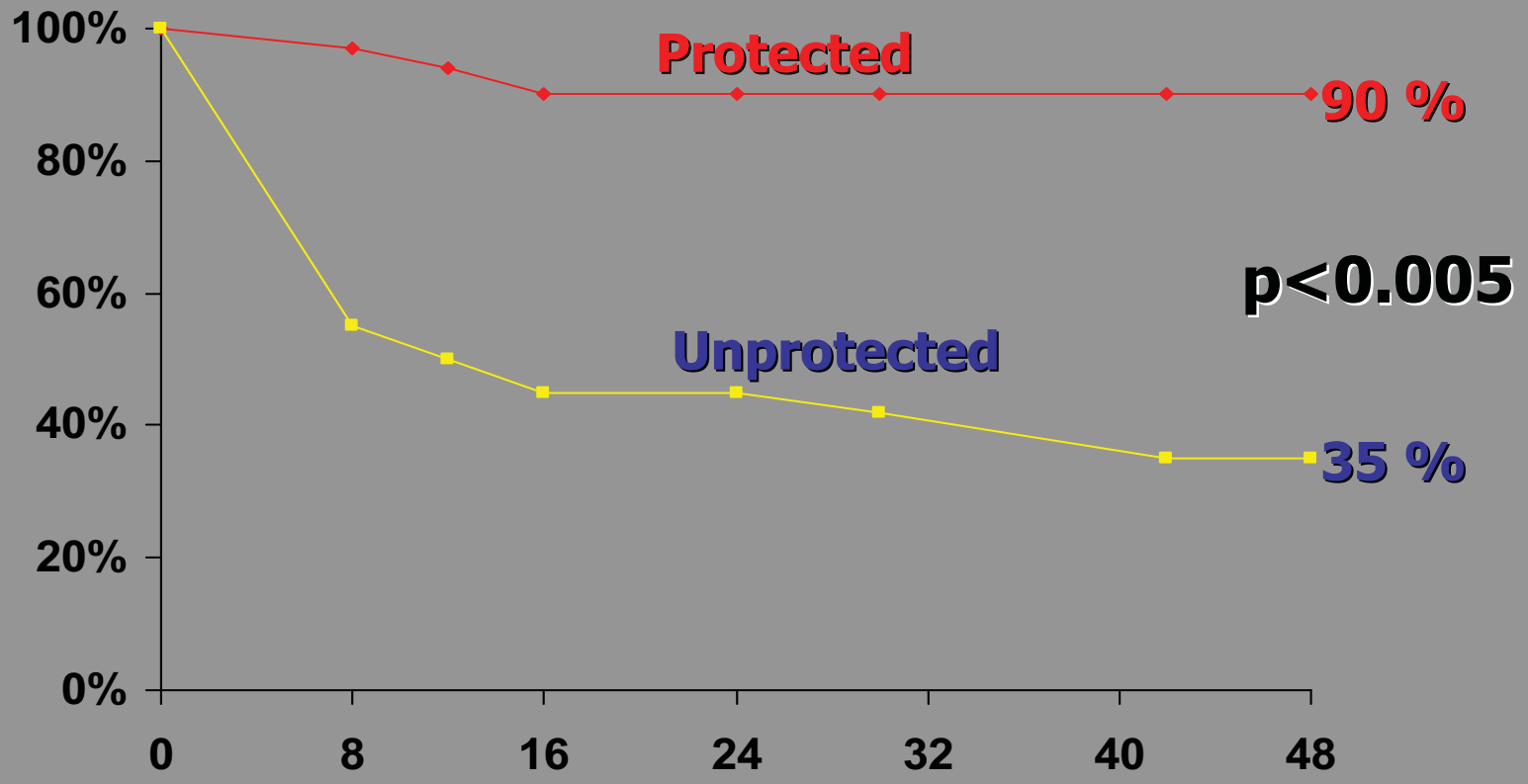
CASS Registry



Left Main Balloon Angioplasty :

Late results of 127 Acute and Elective Procedures

Actuarial survival of protected and unprotected LM PTCA



J. O'Keefe Am J Cardiol 1988;64

Actual LMCA Surgery Results

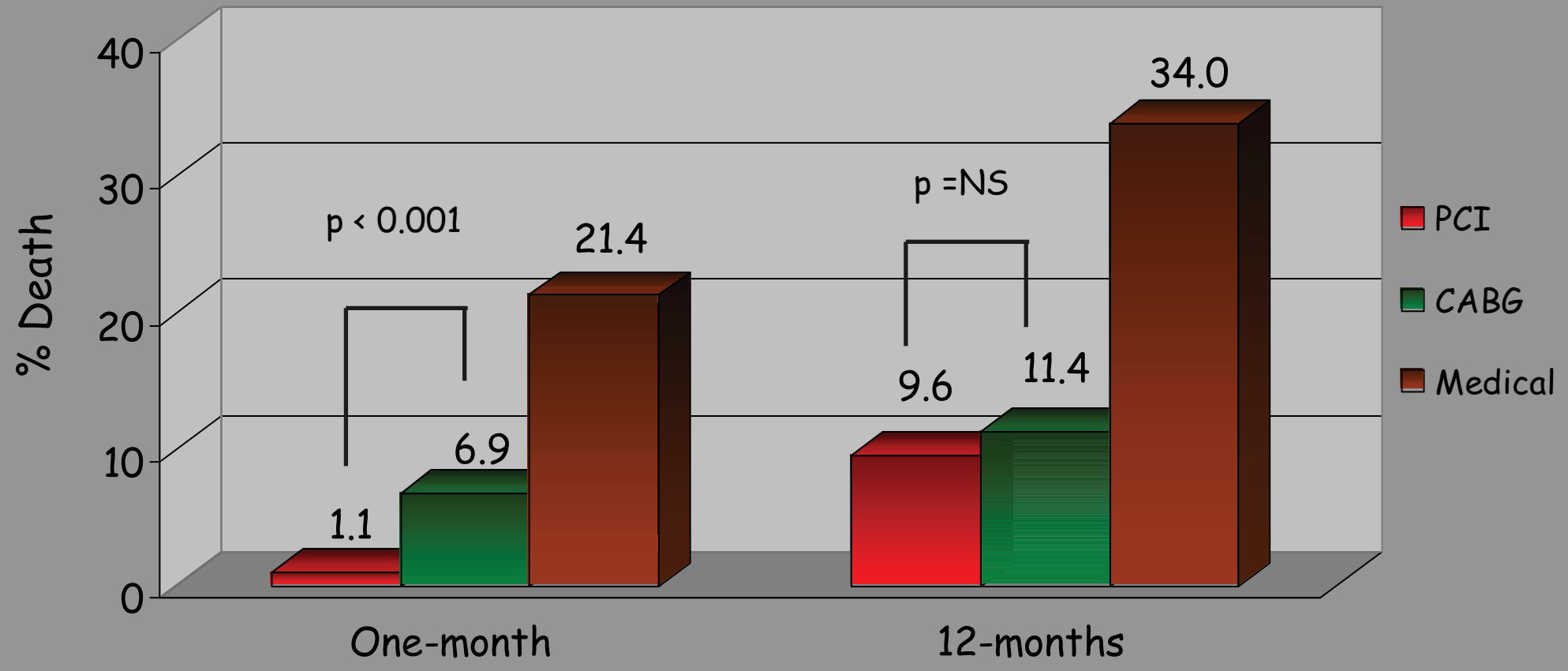
- In MARSEILLE: ???
- In FRANCE: only 2 studies

CABG in isolated LMCA disease: Long term survival

N=106 patients (1982→1998)		
Age	61 ± 10 yrs	
Prior MI	9.2 %	
Ejection fraction	62 ± 13 %	
Graft	2 ± 0.5	
Survival	86.8 %	(4.8 ± 3.5 yrs)
Operative mortality	4.7 %	
Late mortality	8.5 %	(4.6 ± 3.4 yrs)
Recurrent angina	18.5 %	(3.3 ± 2.8 yrs)

R. d'Allonnes Arch Mal Cœur Vaiss 2000; 93 : c-227

French Left Main Registry :Results



Left Main Stenosis :US Surgical Results

- **The US Society of Thoracic Surgery(1997)**
  - **36062 pts**
  - **In-hospital Mortality :** **3.9 %**

ctsnet.org/doc/3037

- **The Cleveland Clinic Foundation :**
  - **1585 pts**
  - **In Hospital Mortality :** **2.3%**
  - **One-Year Mortality**
    - **Overall** **11.3%**
    - **Good surgical candidates** **5.7 %**

Ellis SG, Am Heart J 1998; 12 : 529

Unprotected Left Main PCI

3 different problems

1) Poor surgical candidates *(group1)*

- **absolutely inoperable(contraindicated by surgeons)**
- **relatively inoperable due to a combination of:**
  - **advance age >75 years**
  - **prior heart surgery**
  - **poor LV function <35%**
  - **severe chronic lung disease**
  - **renal failure**
  - **poor distal run off …**

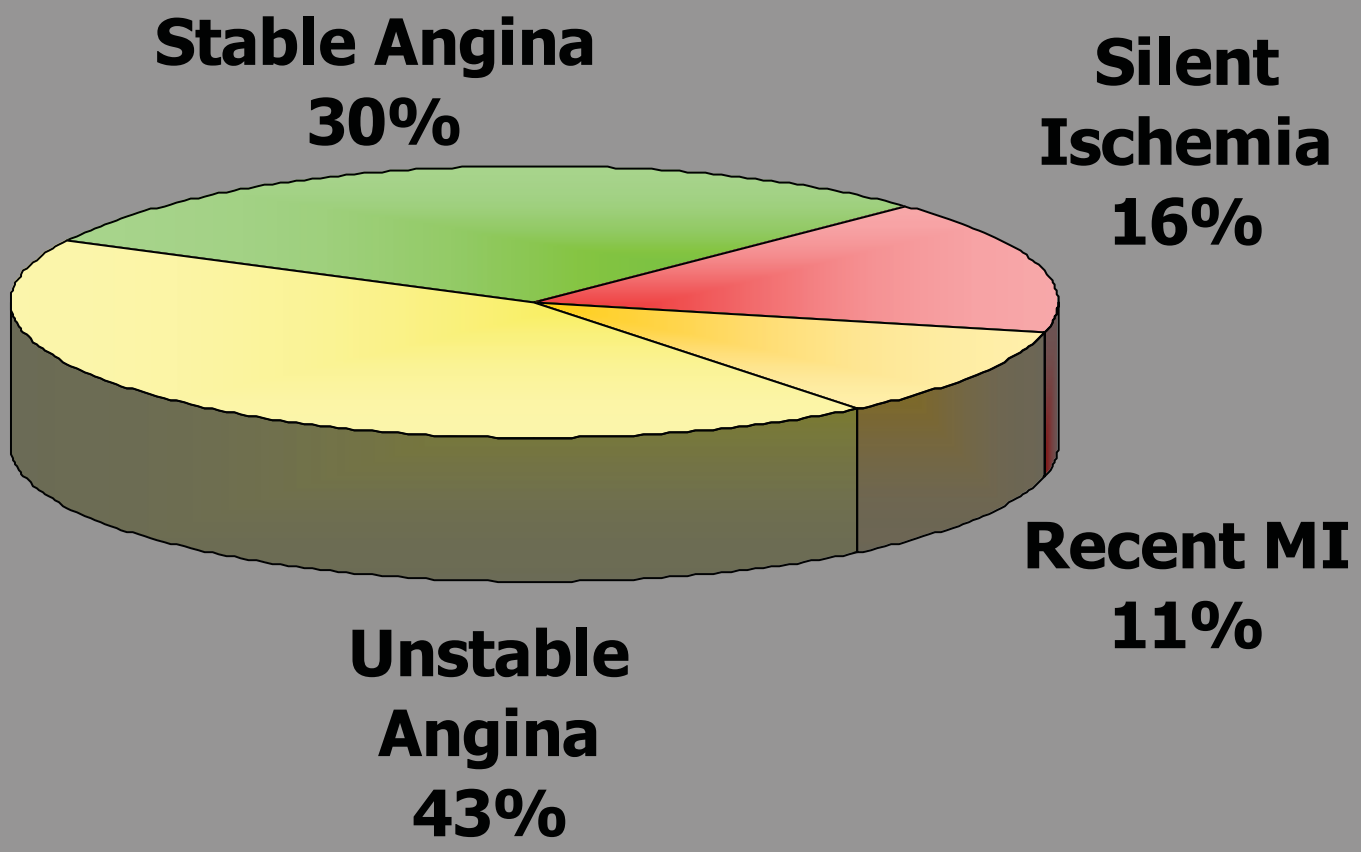
2) Good candidates with ostial or mid LM lesion *(group2a)*

3) Good candidates with complex distal LM lesion *(group2b)*

Unprotected left main stenting: our series

- From January 1993 to June 2003
- 517 patients treated with elective unprotected LMCA stenting

Clinical data

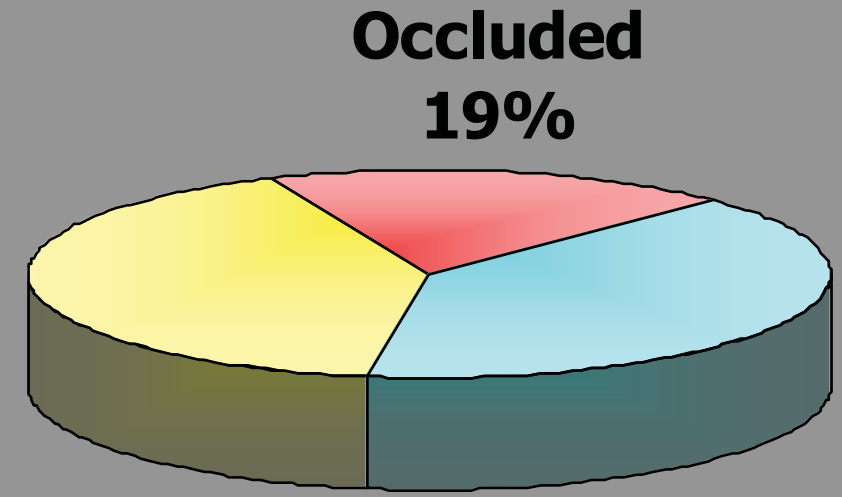


Clinical data : N=517

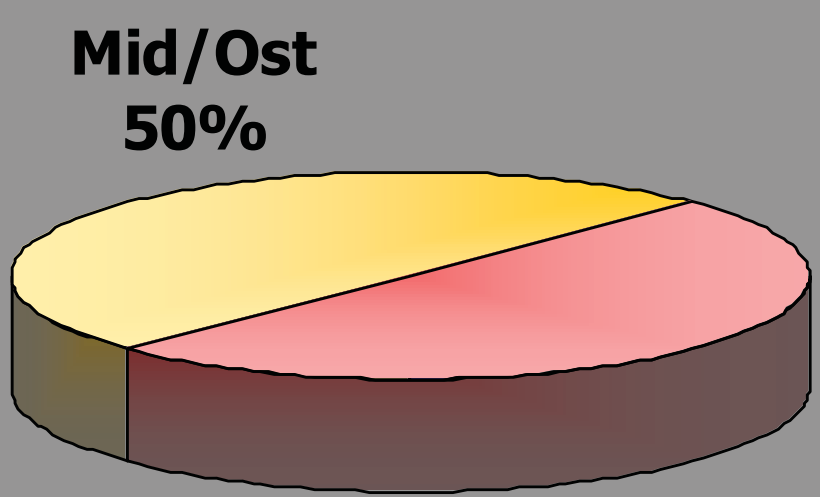
	Poor candidates n=218	Good candidates n=299	p
Age	76.6 ± 9.9	67.0 ± 10.3	< 0.01
Male %	75.2	82.6	ns
Prior CABG %	7.8	0	< 0.05
Prior MI %	30.3	11.7	< 0.01
LVEF %	51.3 ± 17.6	66.3 ± 11.1	< 0.001

Angiographic data

N=517



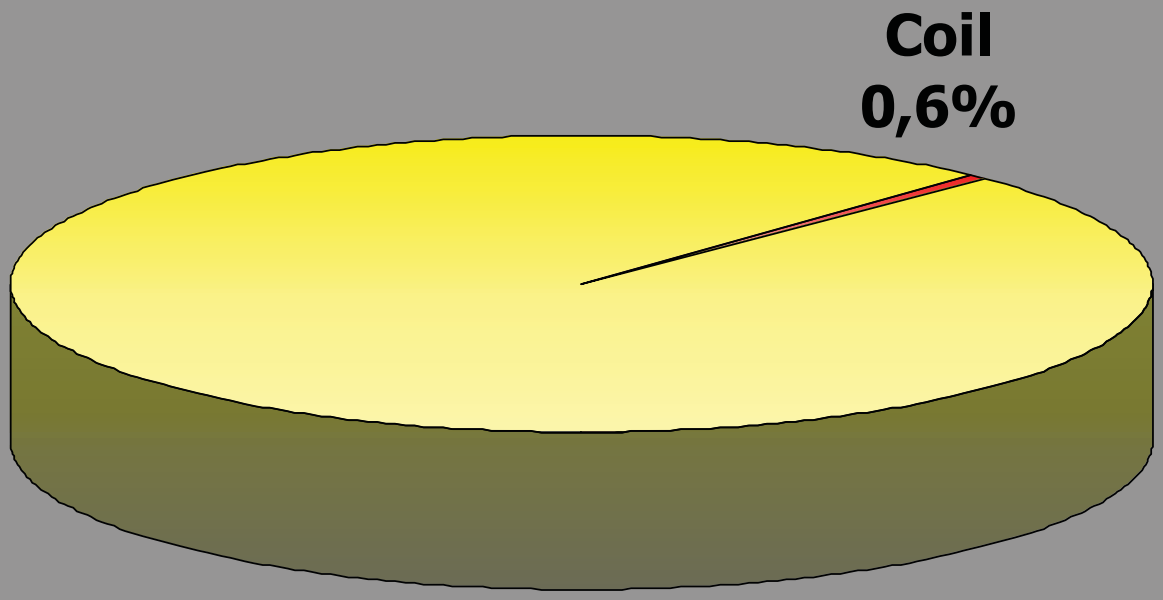
RCA Status



LM Lesion

Technical data

* 806 stents (1.56 / LMCA)



* Femoral approach :99%

* Rotablator : 6.4%

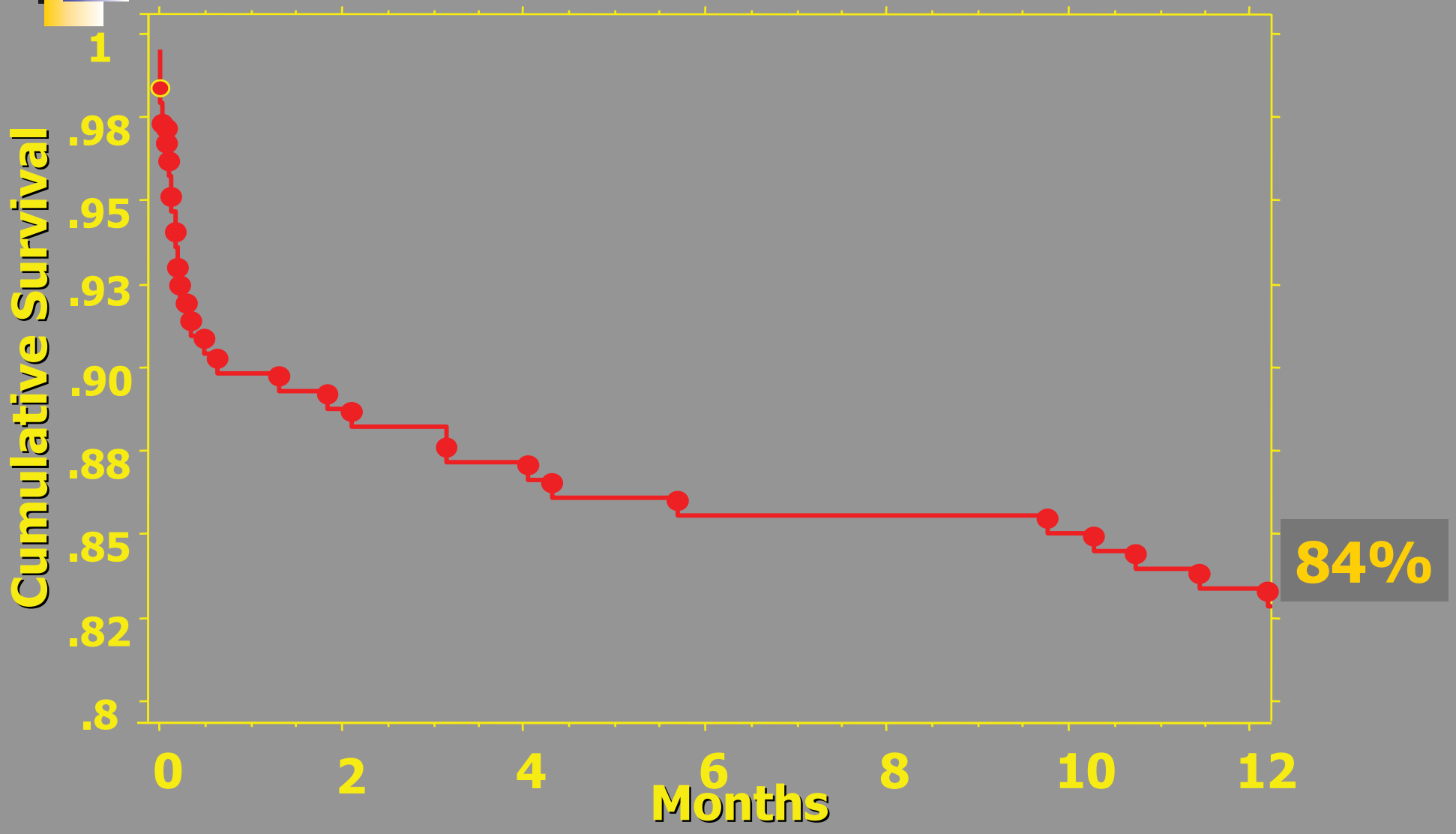
Technical data

- **Ticlopidine : 2 x250 mg D_{ay}-3 $\rightarrow$ D_{ay} 30**
- **Clopidogrel : 450 mg LD J-2 + 2 x75 mg -> Day 30**
- **Anti-GP 2b/3a : 8 %**
- **Direct stenting : 18 %**
- **IVUS : 0 %**
- **IABP : 0 %**
- **CPS : 0.2 %**

POOR CANDIDATES: Group 1 (187 pts) F/U 1 YEAR

- Death: 31 (16.5 %)
- Non fatal qMI: 4 (2.1 %)
- TVR: 22 (11.7 %)
  - Re-PTCA 17
  - CABG 5

POOR CANDIDATES: Group 1
1 YEAR SURVIVAL



Unprotected left main PCI

Clinical Outcome in Poor Surgical Candidates

	Pts	FU	Stent	Death	TVR
Tan (2001)	71	12	65 %	49 %	33.7%
Karam (1998)	39	8	100 %	14 %	5.1%
Sharma (2000)	72	9	100 %	6.4 %	8 %
Our series	187	12	100 %	16 %	11.7%

GOOD CANDIDATES: Group2a (140 pts)

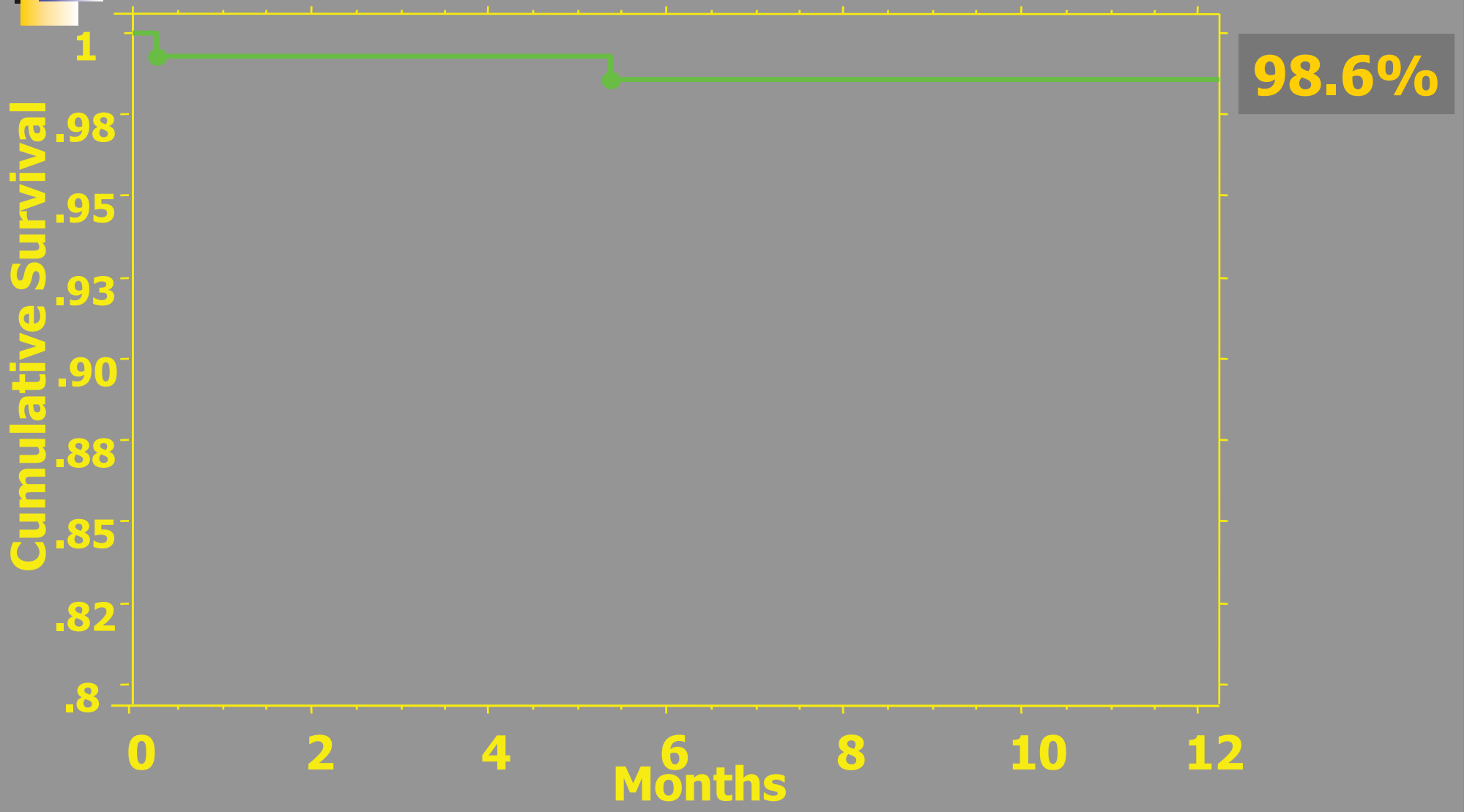
F/U 1 YEAR

Death	**1.4 %**
Cardiac	1(sat?)
Non cardiac	1(cancer)
Non fatal q MI	**0**
TVR	**10.7%**
Re-PTCA	8.6%
CABG	2.1%
All revascularization	**23.6%**
Re-PTCA	15.0%
CABG	8.6%

Mean Age (65.2 ± 10.9 y)

GOOD CANDIDATES: Group2a

1 YEAR SURVIVAL



98.6%

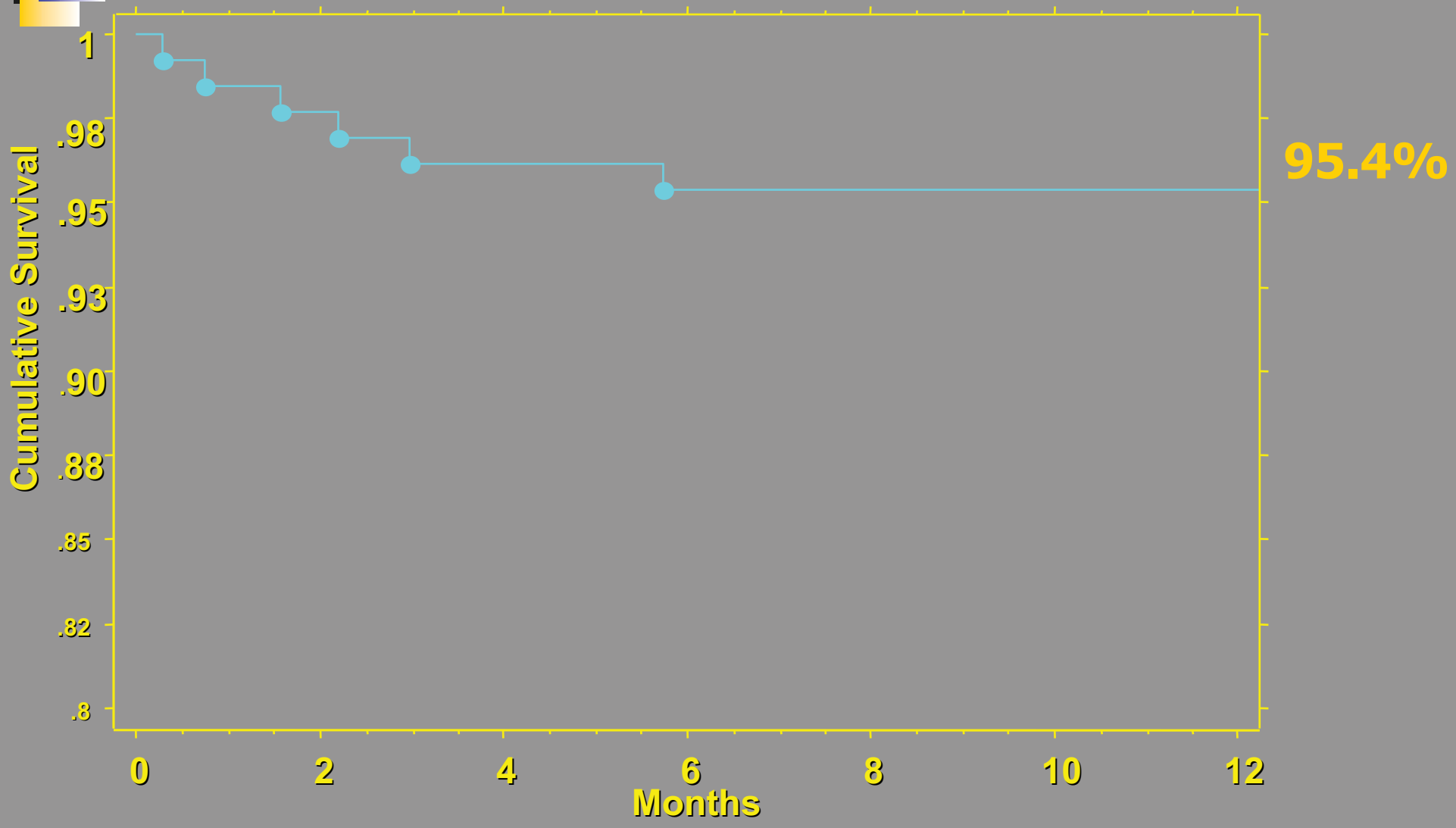
GOOD CANDIDATES: Group2b (131 pts)

F/U 1 YEAR

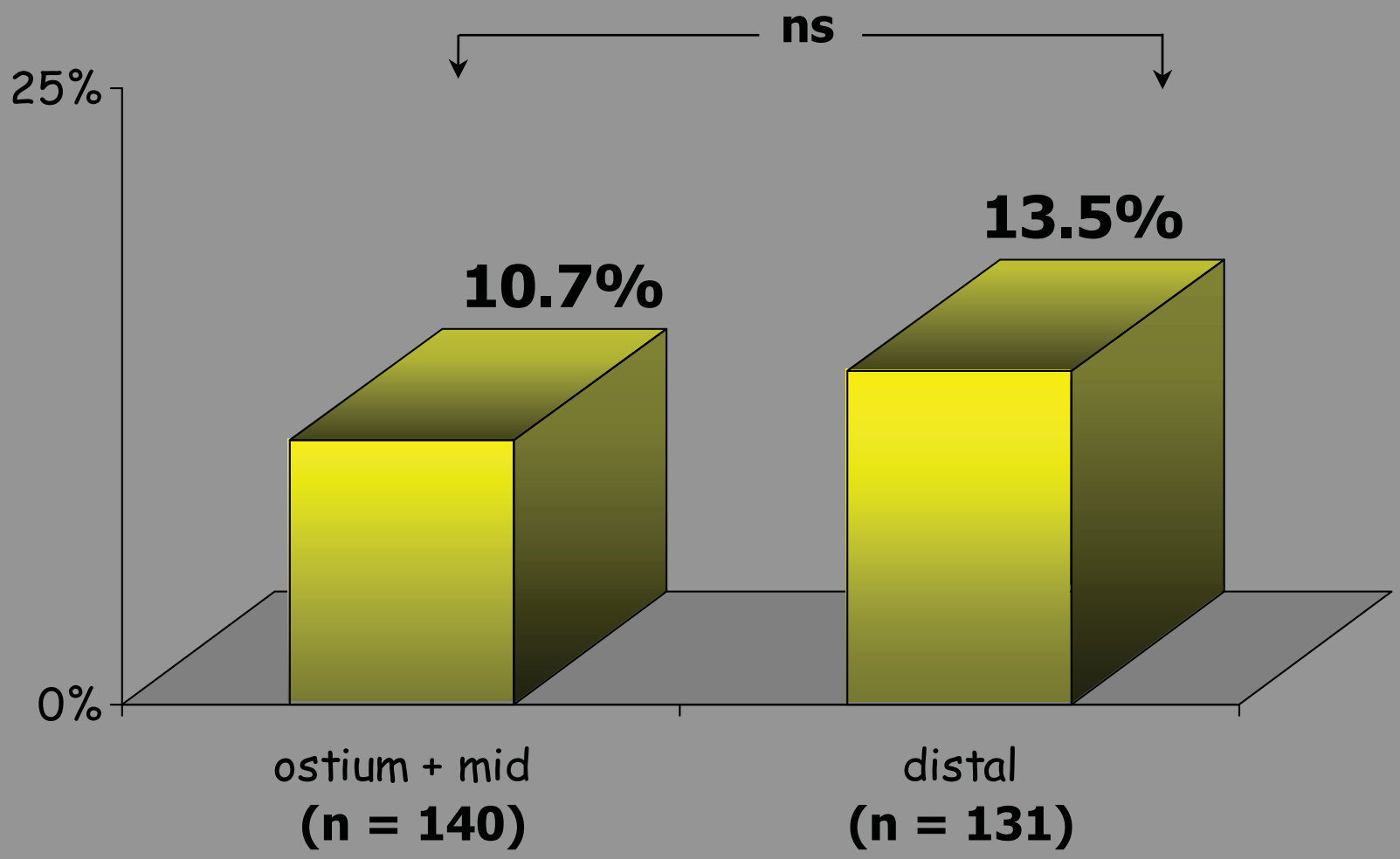
Death	**4.6 %**
Cardiac	4 (3.1%)
Non cardiac	2
Non fatal q MI	**0 %**
TVR	**13.5%**
Re-PTCA	6.1%
CABG	7.4%
All revascularization	**25.1%**
Re-PTCA	13 %
CABG Mean Age (68.5 ± 9.1 y)	12 %

GOOD CANDIDATES: Group2b

1 YEAR SURVIVAL



GOOD CANDIDATES (Group 2) : 1 YEAR TVR



GOOD CANDIDATES: Group2 (271 pts)

All DEATH at 1 YEAR = 2.9%

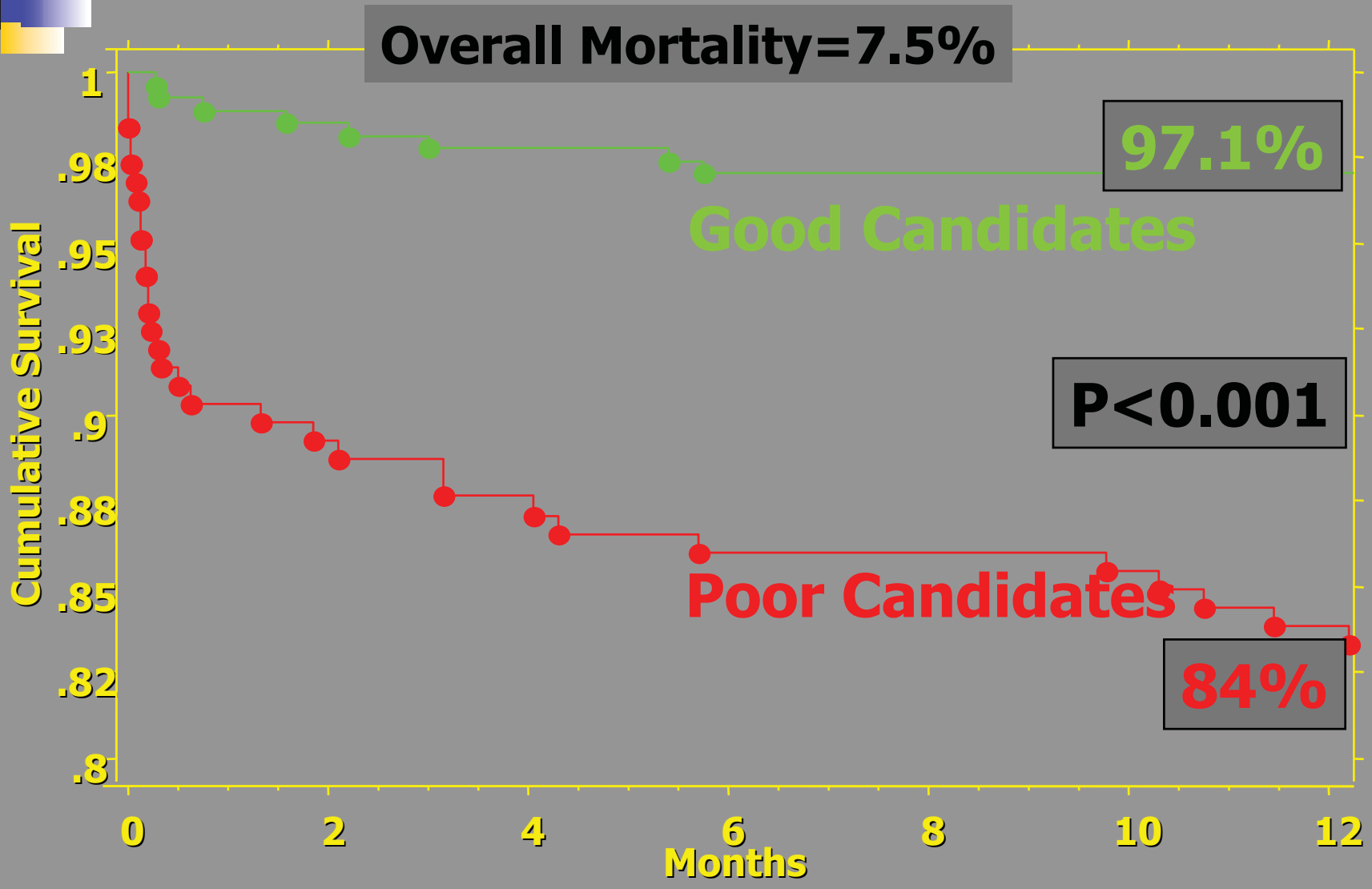
	Age (y)	Delay (m)	Location	Cause
♀	66	5	Ostial	Cancer
♀	75	0.5	Distal	SAT (Day 4)
♀	75	3	Distal	MI
♀	54	2	Distal	VF
♂	58	6	Distal	Suicide
♀	60	0.3	Distal	SAT ?
♂	60	2	Distal	GI Bleeding
♀	57	0.3	Ostial	SAT?

Unprotected left main PCI

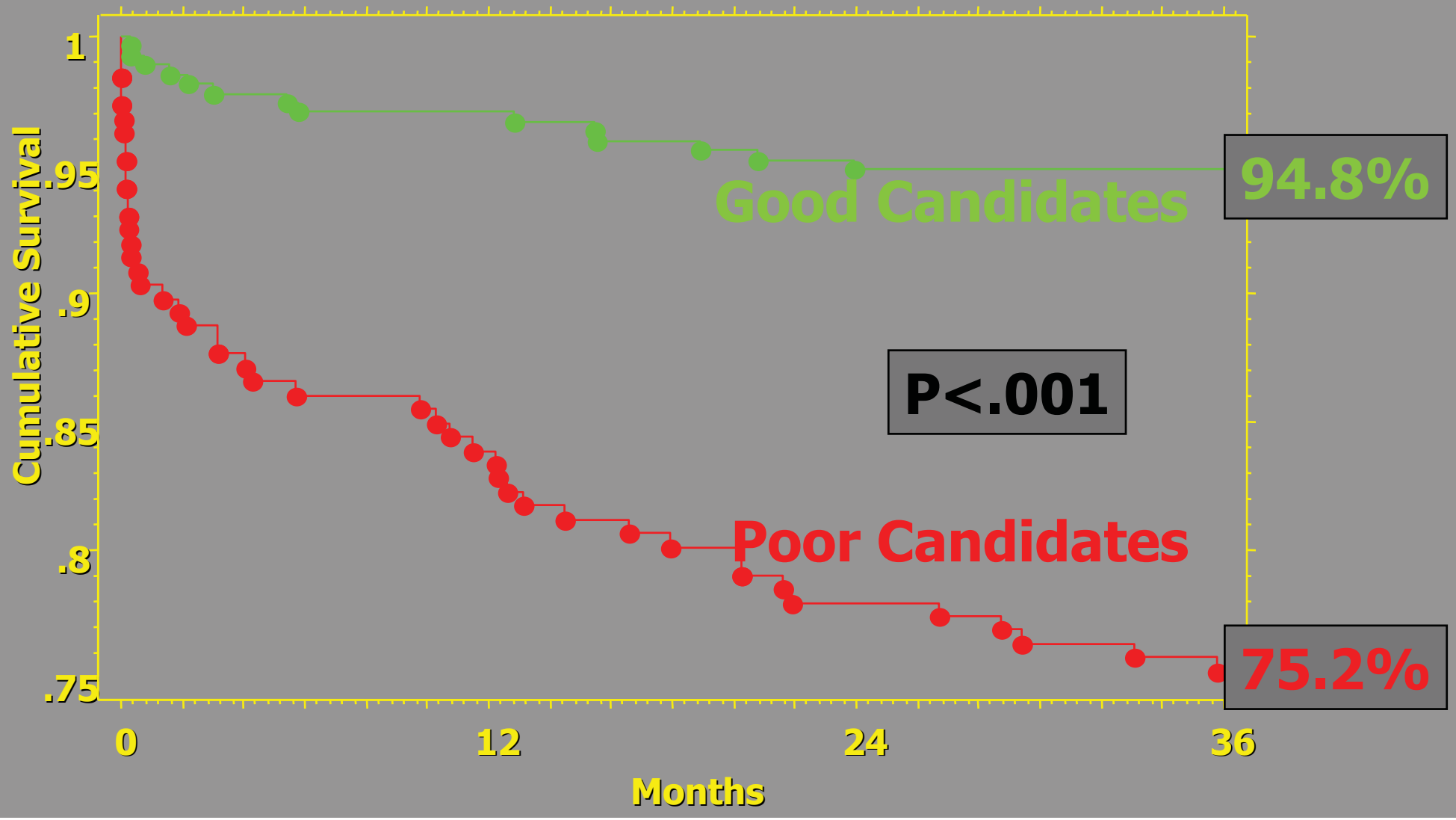
Clinical Outcome in Good Surgical Candidates

	Pts	FU	Stent	Death	TVR
H.Nishikawa(2000)	162	12	48%	12%	20%
A.Black(2001)	53	6	100%	3.8%	7.5%
W.Tan (2001)	89	12	76%	3.4%	24%
SJ Park (2001)	127	12	100%	3.1%	15%
Our Series	271	12	100%	2.9%	12%

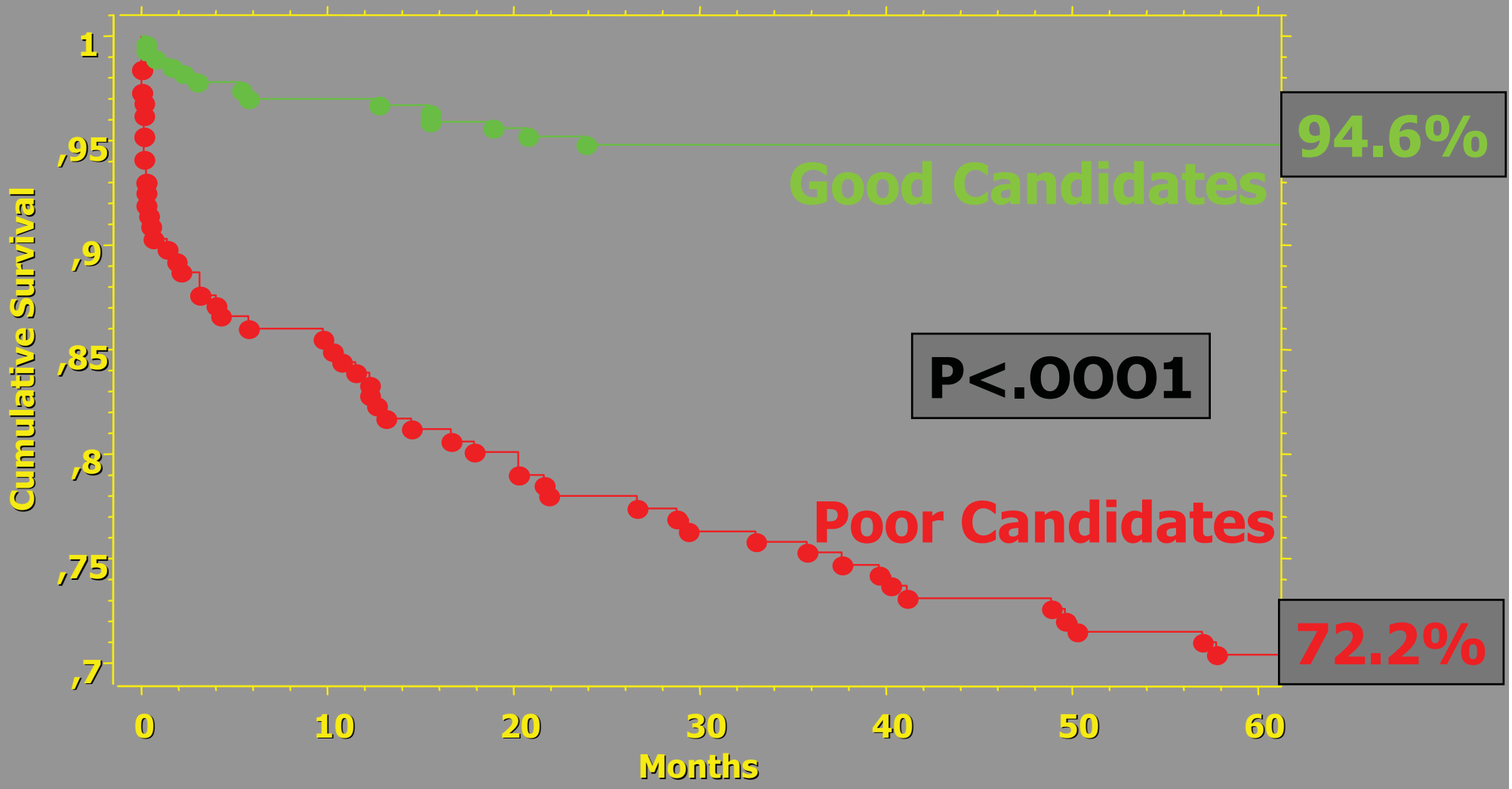
1 YEAR SURVIVAL : All PTS (517)



3 YEAR SURVIVAL : 237 PTS



5 YEAR SURVIVAL



SIROLIMUS STENT IN LMCA

N=17 Patients

Mean FU :2.5+2.4 months(1-10)

Death	0
MI	0
TLR	0
All revascularization	1(5.8%)
Re-PCI	1
CABG	0

CONCLUSION

Left main coronary stenting provides acceptable immediate and long-term (1, 3 & 5 years) outcomes for patients considered as good surgical candidates.

These results compete with those of bypass surgery.

Stenting appears also to be an acceptable technique for "poor surgical candidates".

A tremendous hope is pending with new drug eluting stents.

Left Main coronary Stenting

Multivariate Predictors of Death at One Year

Predictors	Coefficient	p-value
Age > 75 yrs	-1,726	<0,0001
Unstable Angina	-0,794	0,0103
LVEF < 50%	-2,228	<0,0001
3 Vessel Disease	-0,849	0,0056
Distal LMCA	-0,89	0,7606

French Left Main Registry

- Prospective observational registry on LM stenosis
- Consecutive patients with on-line inclusion
- 11 active French centers
- 1 year Follow-up
- Acute Mi and cardiogenic shock excluded
- Inclusion, Mai 2001 - June 2002

T.Lefevre TCT 2003

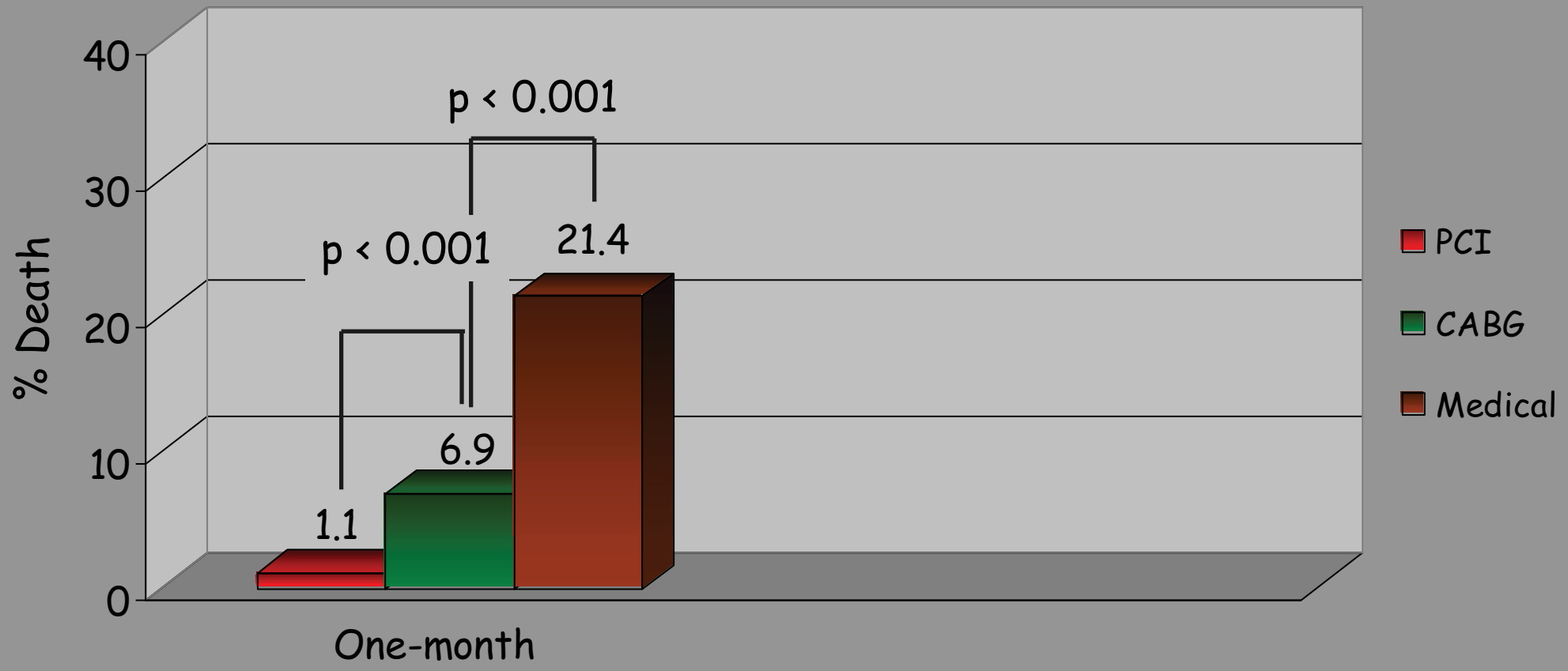
Profile Risk and Treatment Choice

	Stent	CABG	Medical
Pts	192	230	57
Good Cd	52%	81% *	19%
Poor Cd	44%	14% *	62%
Contra-In	4%	5%	19%*

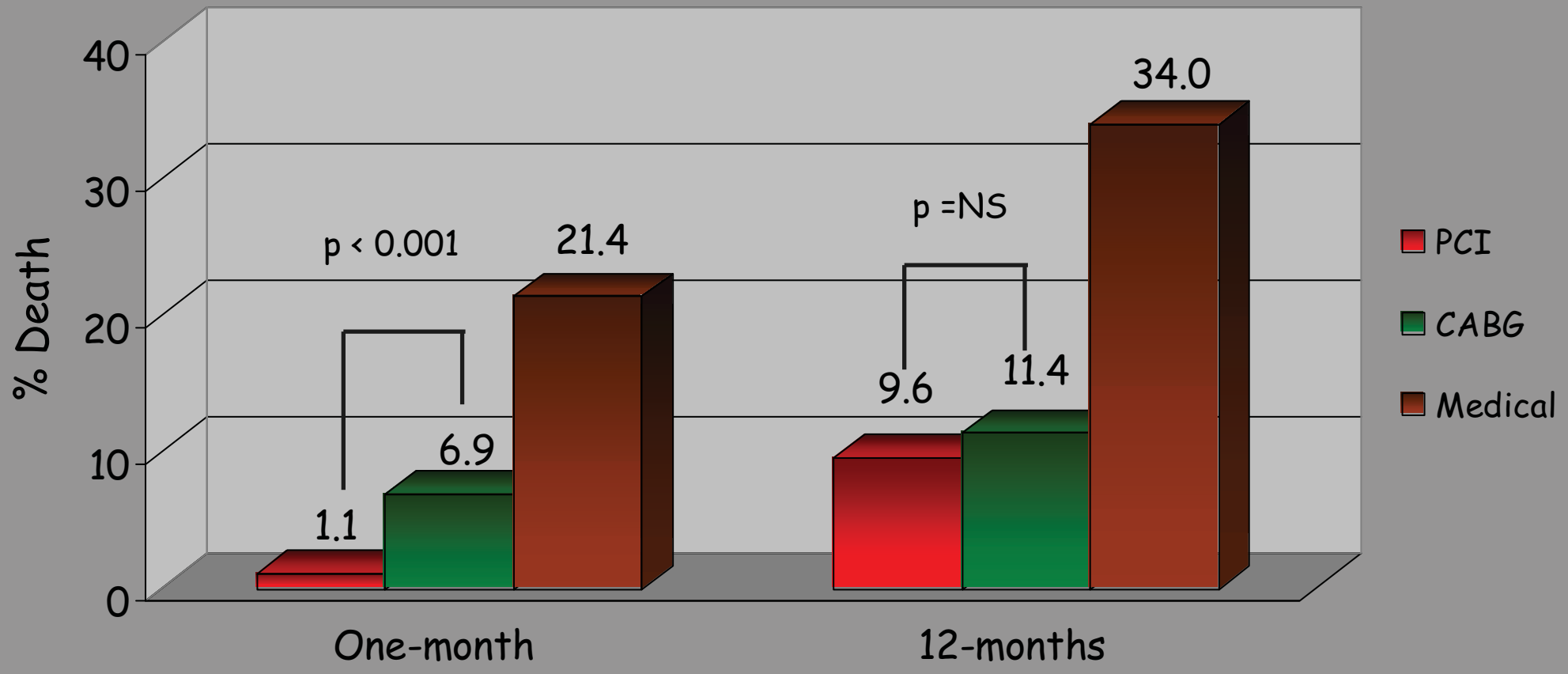
Poor candidate = age > 75 years, severe pulmonary failure, renal failure, severe peripheral disease, previous CABG, previous stroke, EF < 30%, ...

* p<0.001

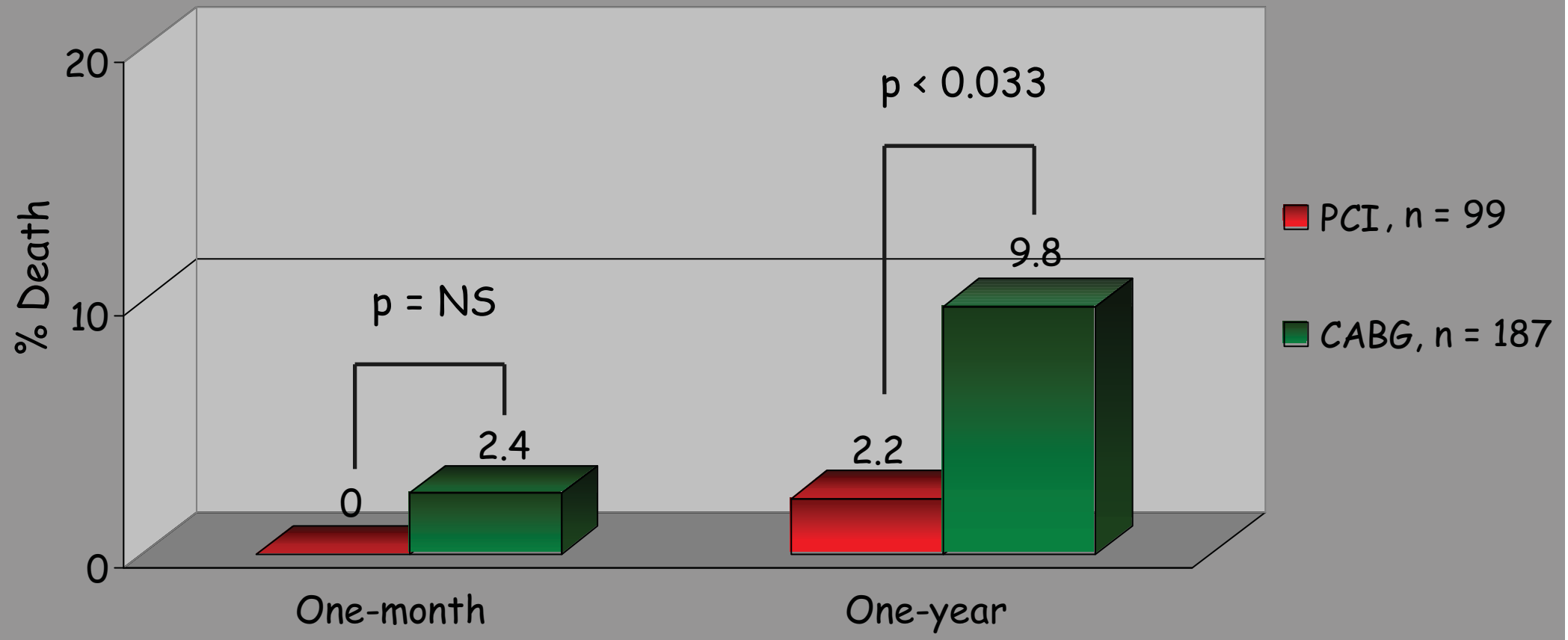
French Left Main Registry :Results



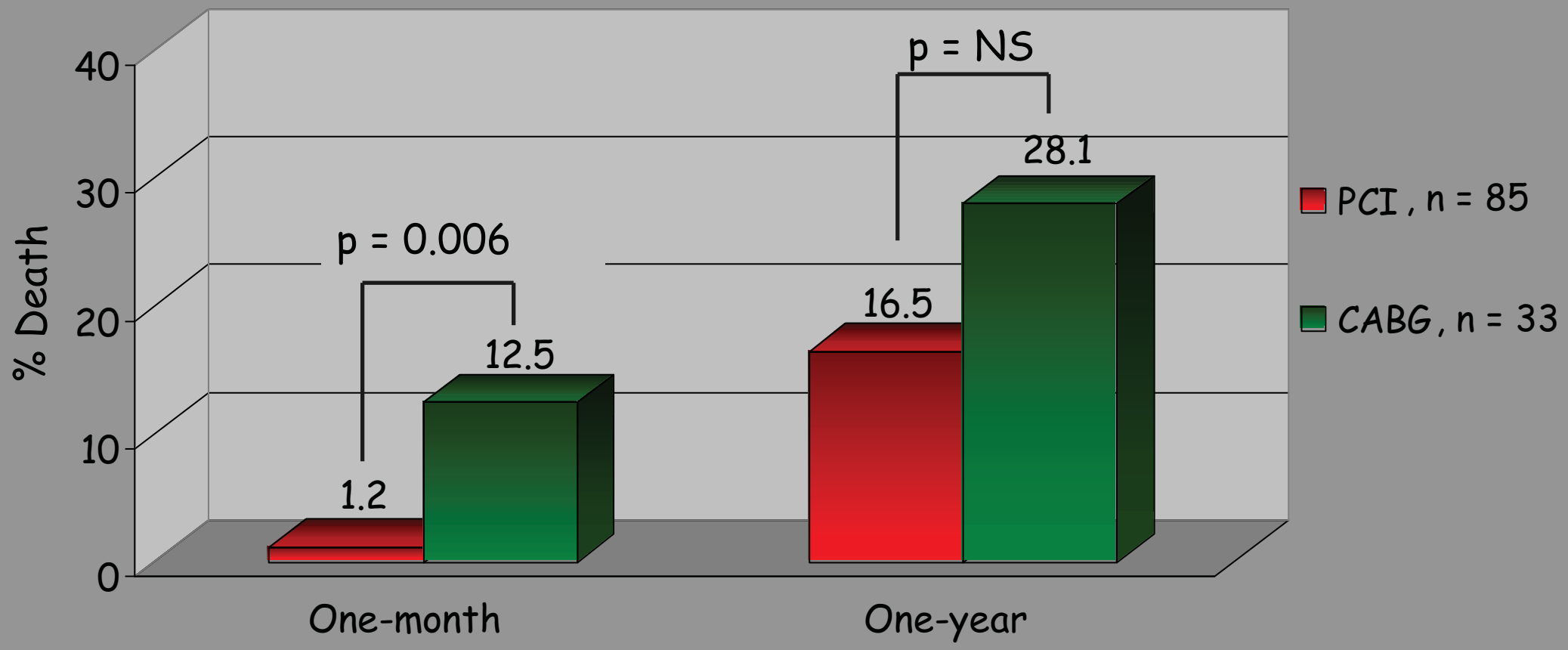
French Left Main Registry :Results



Good Candidates for Surgery



Poor Candidates for Surgery



Improvements of PCI clinical results ?

① Prevention of restenosis

-Debulking pre-stenting ?

-Rapamycine (RAVEL & SIRIUS) ?

-Taxol ?

② Prevention of SAT(good C. + ,poor C. +++)

Clinical detection of thienopyridine resistant patients with:

-Standart ADP aggregometry

-P-Selectine analysis

-VASP Phosphorylation analysis

Stenting for Unprotected LMCA

Effect of Debulking Before Stenting?

216 patients(age = 56±11yrs ; normal LVEF)

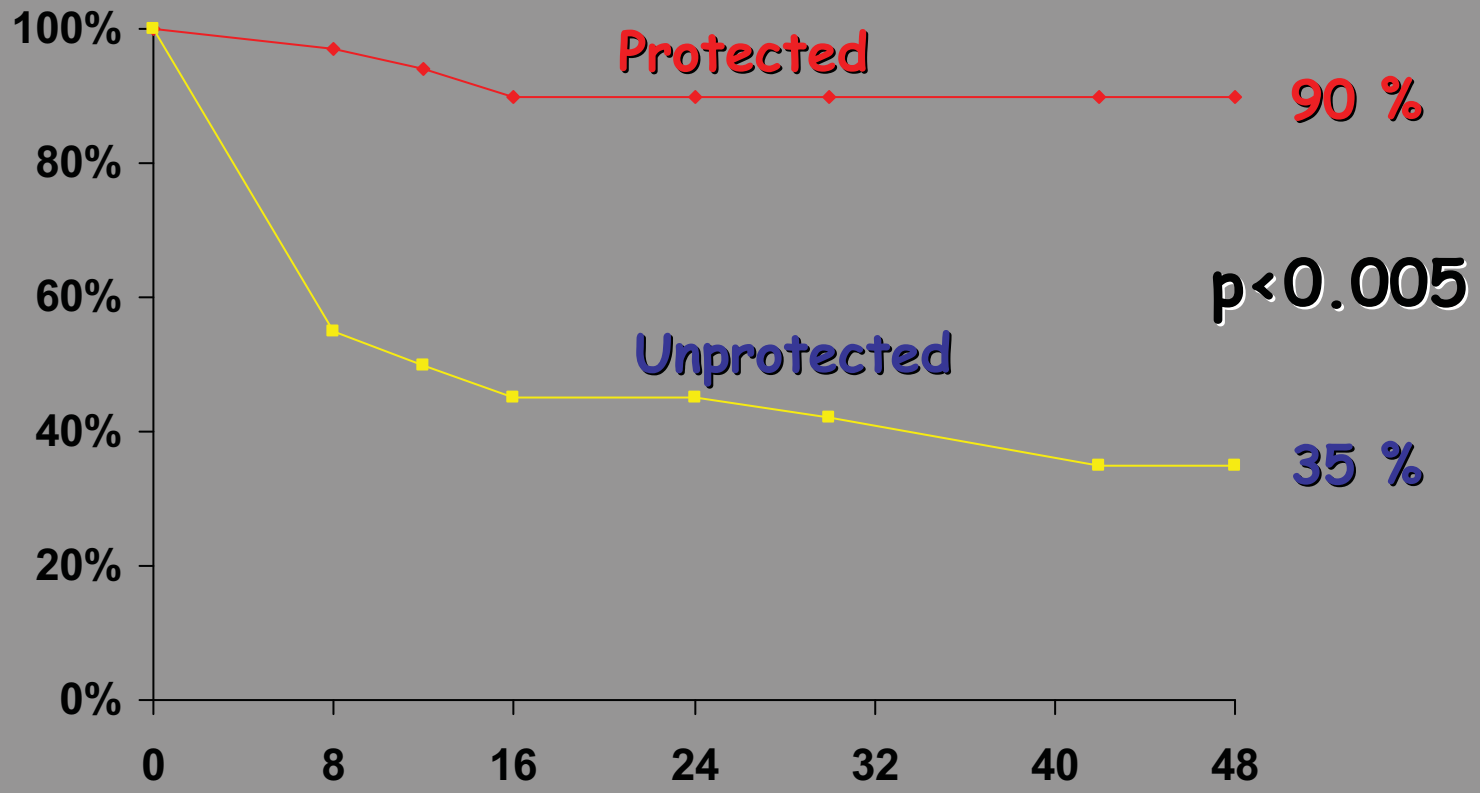
		6 Month Angiographic Restenosis	
Debulking	n=71	17%	p=0.08
Non-debulking	n=145	29.2%	
Overall		24.8%	

SJ Park. CCT 2002 Kobe

Left Main PTCA :

Late results of 127 Acute and Elective Procedures

Actuarial survival of protected and unprotected LM PTCA



J.O ' Keefe Am J Cardiol 1988;64

Angiographic data

- 3 vessel disease: 56%
- 2.1 lesions treated by patient
- Complete revascularisation: 68%

Stenting of Unprotected Left Main Coronary Stenosis

S.J PARK (A.C.C. 2000)

100 Patients / Follow-Up 20.1 ± 13.4 Months

Distal	38 %
Debulking	66 %
Stent thrombosis	1 %
Death	1 cardiac 3 non cardiac
Angiographic Restenosis	15.8 %
TVR	11 %
Event Free Survival	81.5 ± 4.7 %

- Finally, AHA/ACC guidelines point out that left main stenosis is not an indication for coronary angioplasty
- But what's to be done with non surgical patient ???