What to do with patients with high SYNTAX Score ?

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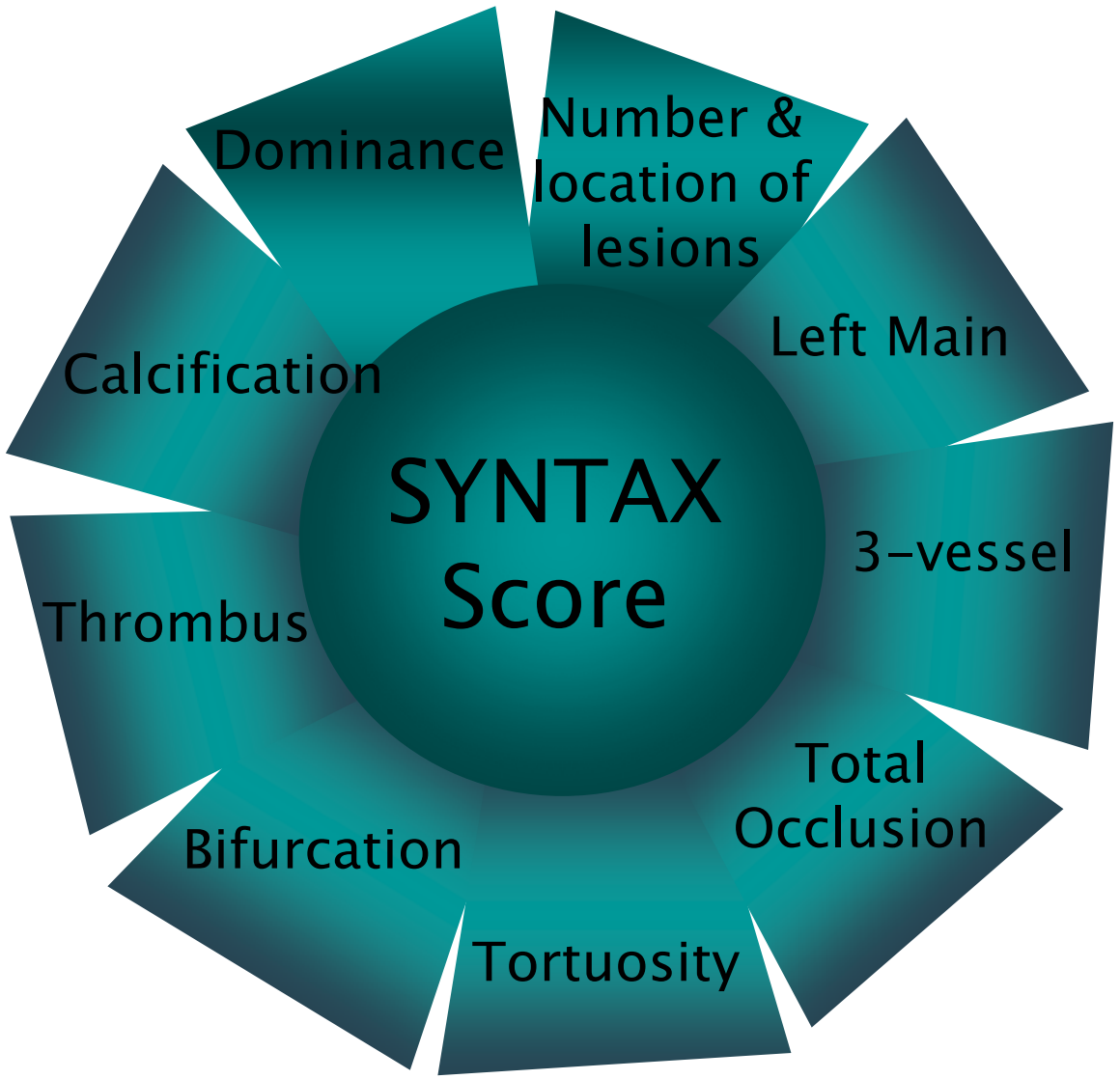
Who are the patients with high SYNTAX Score



Complex anatomy

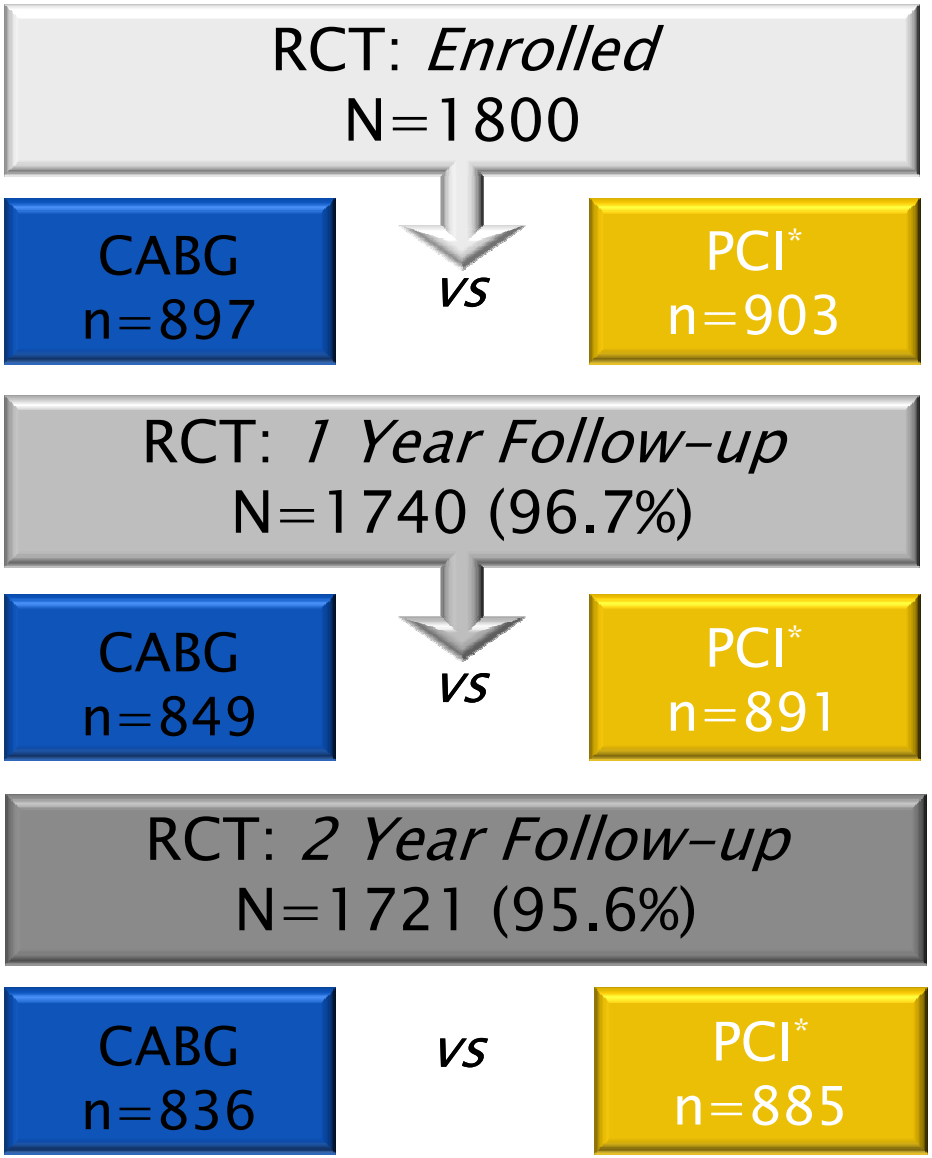
Multivessel disease

Diffuse disease

See Glossary for prescribing information outside the US

Patients in SYNTAX

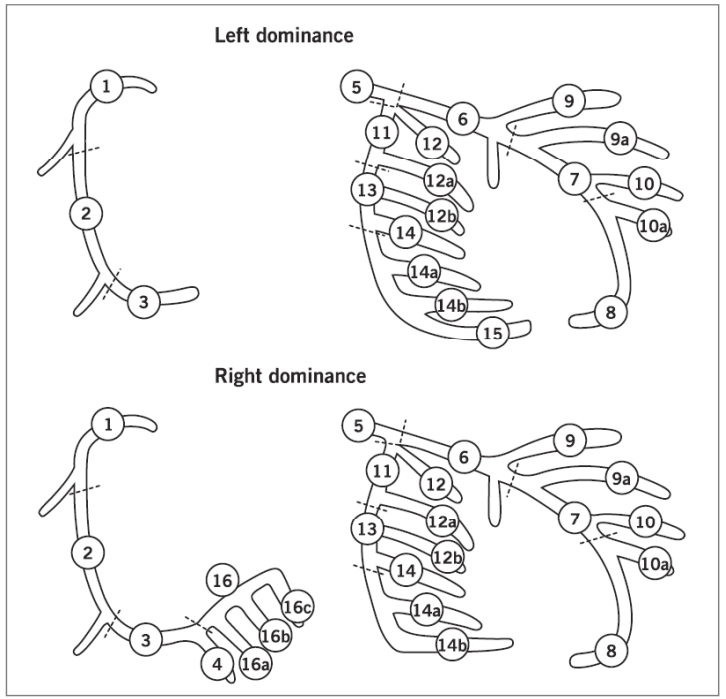
Randomized Controlled Trial Intent-to-Treat

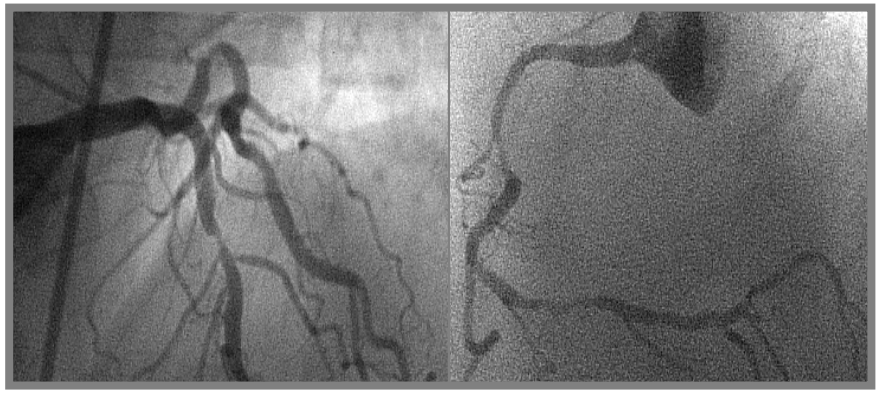


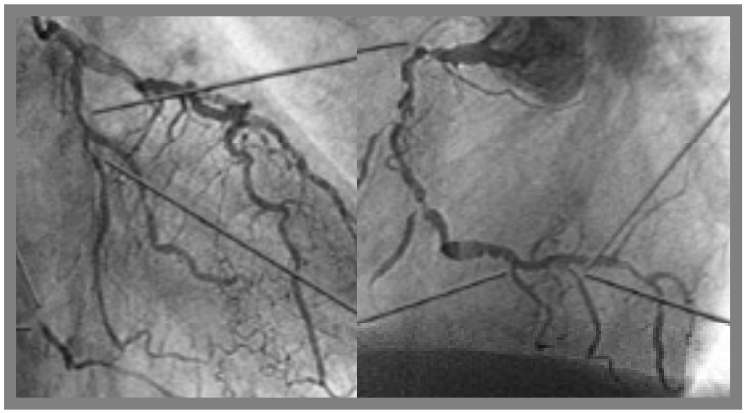
*TAXUS Express

SYNTAX Score

- Anatomic ScoringFor Each Lesion Segment:
  - Location
  - Length
  - Calcification
  - Tortuosity
  - Bifurcation
  - Diffuse Disease
  - Occlusion
  - Thrombus



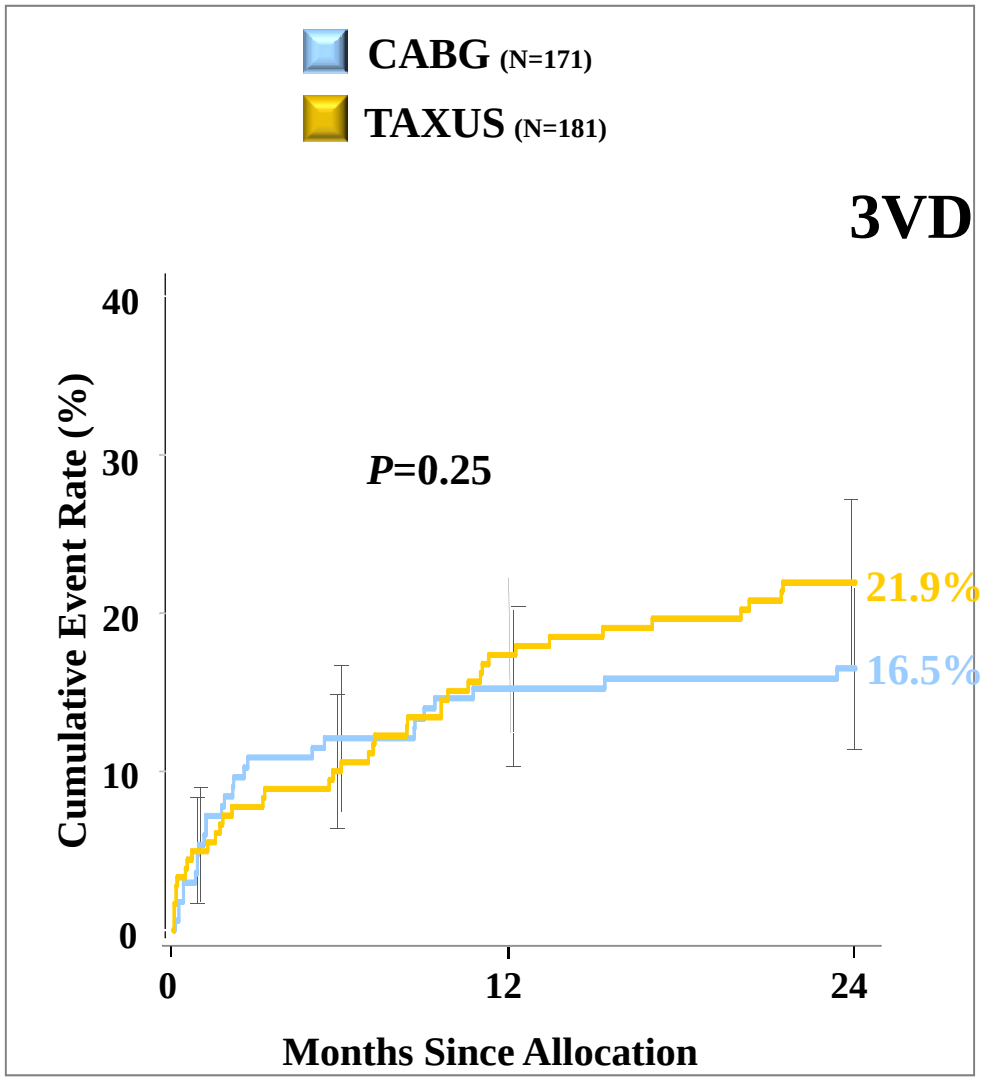




SYNTAX Score :

- ***Low < 22***
- ***Intermediate : 23-32***
- ***High : ≥ 33***

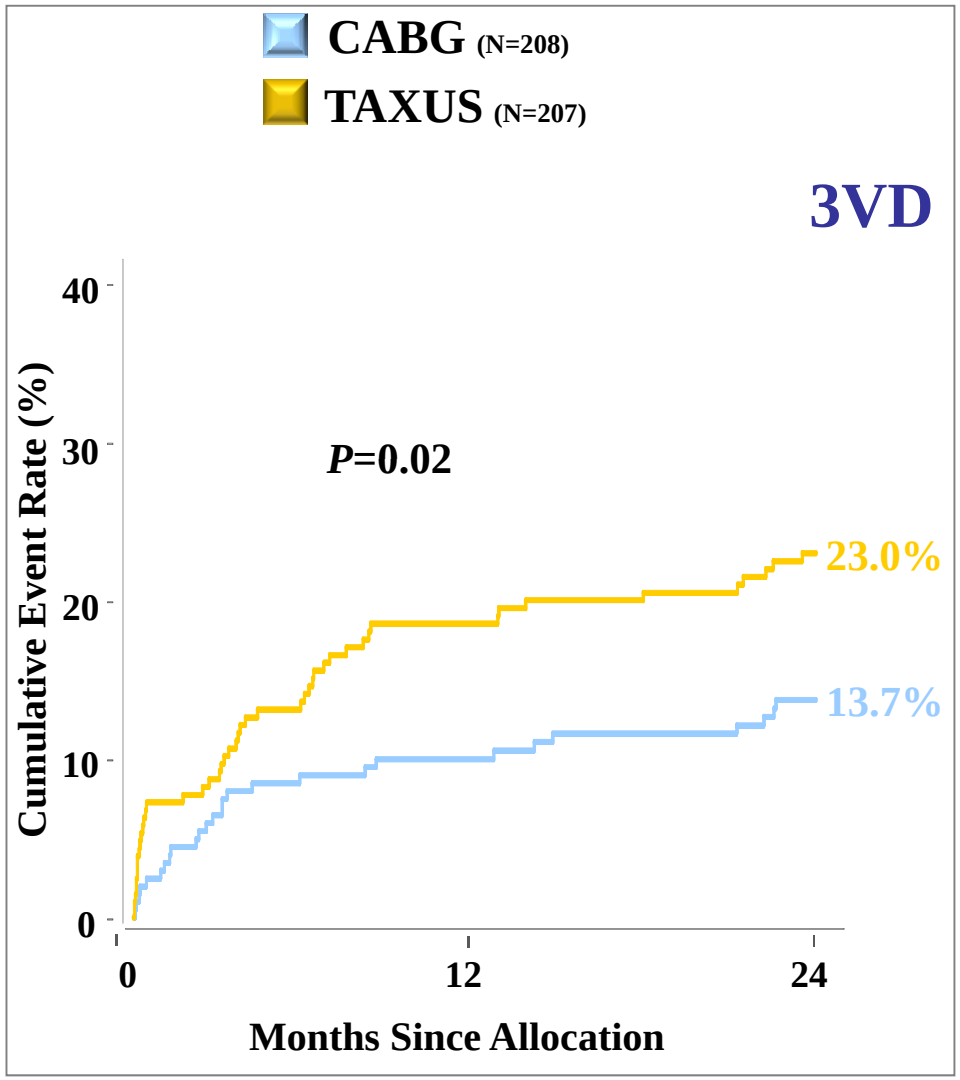
MACCE to 2 Years by SYNTAX Score Tercile Low Scores (0-22)



	CABG	PCI	*P* value
Death	5.5%	5.1%	0.85
CVA	1.9%	1.2%	0.57
MI	4.2%	3.9%	0.90
Death, CVA or MI	9.7%	8.4%	0.67
Revasc.	7.6%	17.1%	0.01

Cumulative KM Event Rate ± 1.5 SE; log-rank *P* value

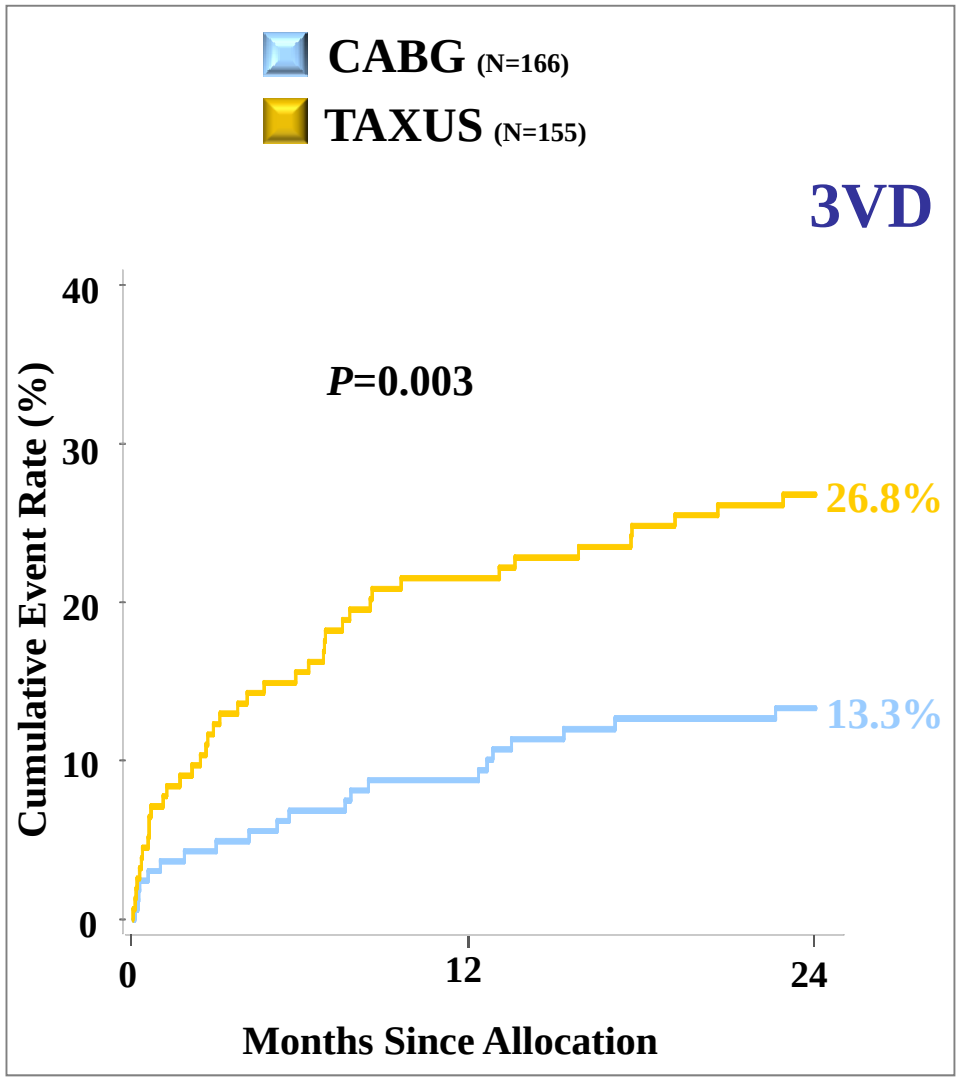
MACCE to 2 Years by SYNTAX Score Tercile Intermediate Scores (23-32)



	CABG	PCI	*P* value
Death	4.1%	6.4%	0.30
CVA	3.1%	2.0%	0.50
MI	2.6%	7.4%	0.03
Death, CVA or MI	8.6%	11.7%	0.29
Revasc.	7.3%	16.1%	0.006

Site-reported Data; ITT population

MACCE to 2 Years by SYNTAX Score Tercile High Scores (≥33)



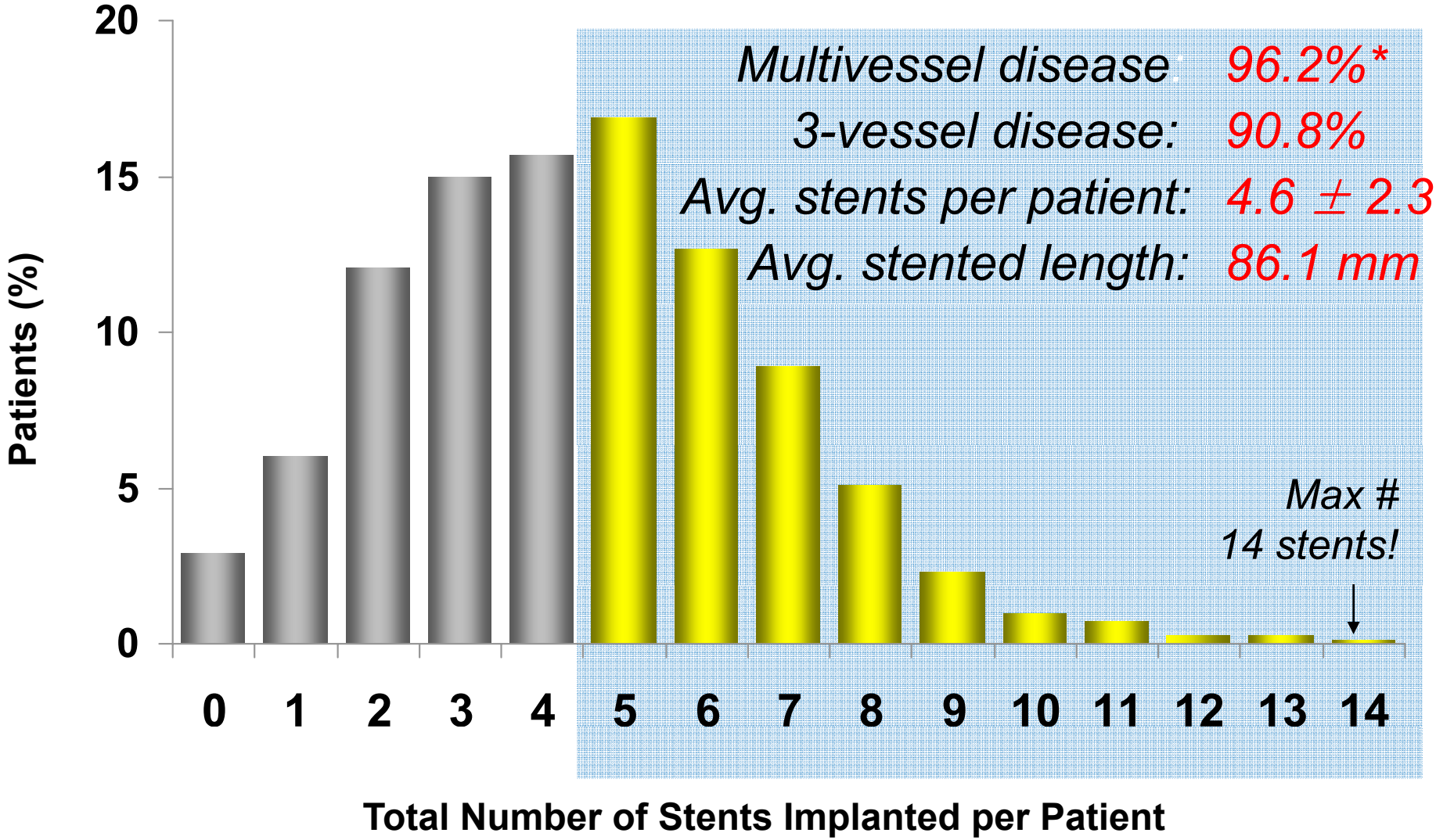
	CABG	PCI	*P* value
Death	2.5%	8.5%	0.02
CVA	1.9%	2.1%	0.95
MI	1.9%	7.2%	0.02
Death, CVA or MI	6.3%	13.7%	0.03
Revasc.	7.7%	19.3%	0.002

Cumulative KM Event Rate ± 1.5 SE; log-rank *P* value

Site-reported data; ITT population

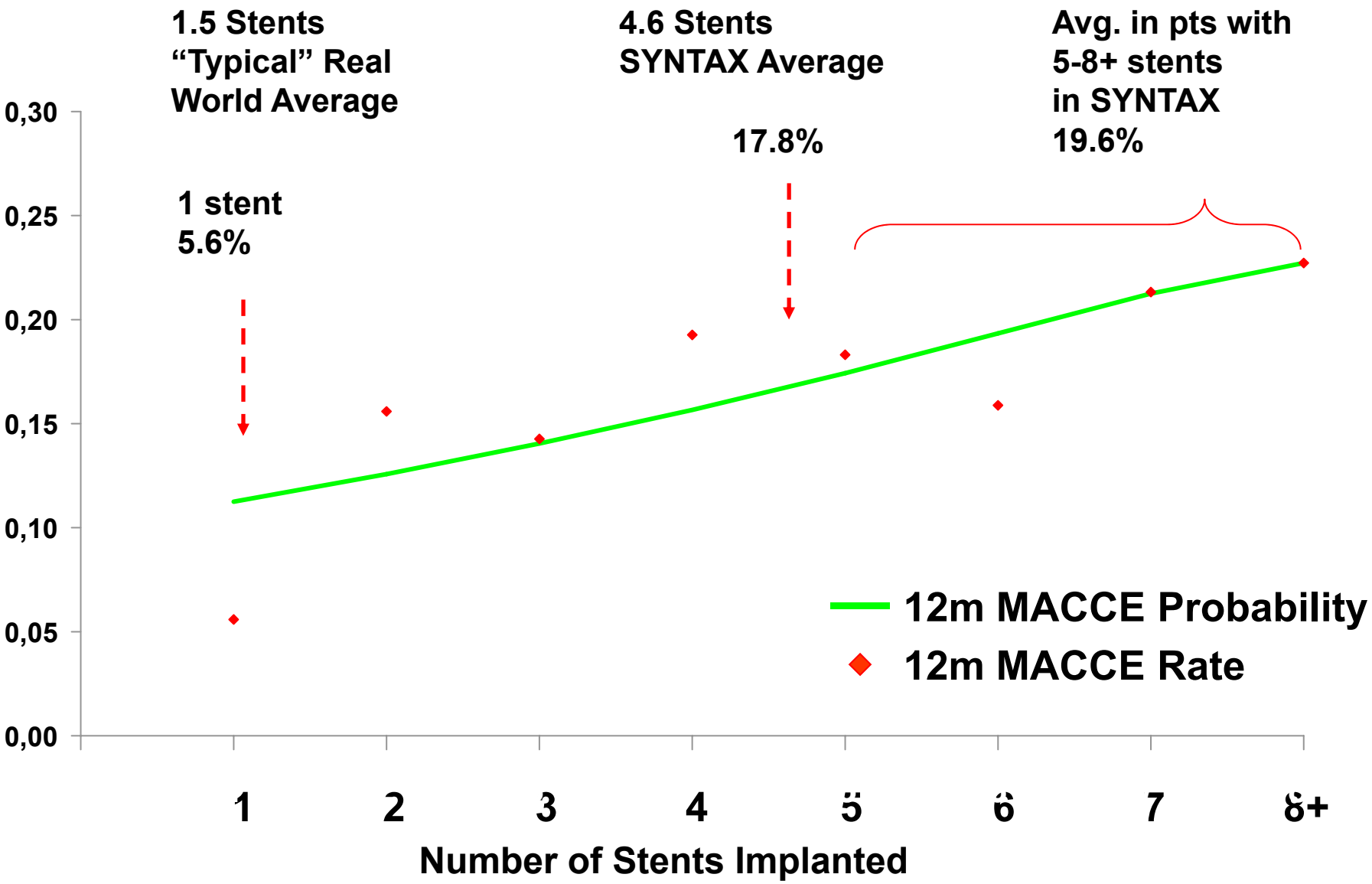
Stent Number and Length Higher in the SYNTAX Trial

48% of patients received ≥5 stents



*3VD+LM/3VD+LM/2VD+LM/1VD

Linear Increase in MACCE by Number of Stentsin the SYNTAX Trial

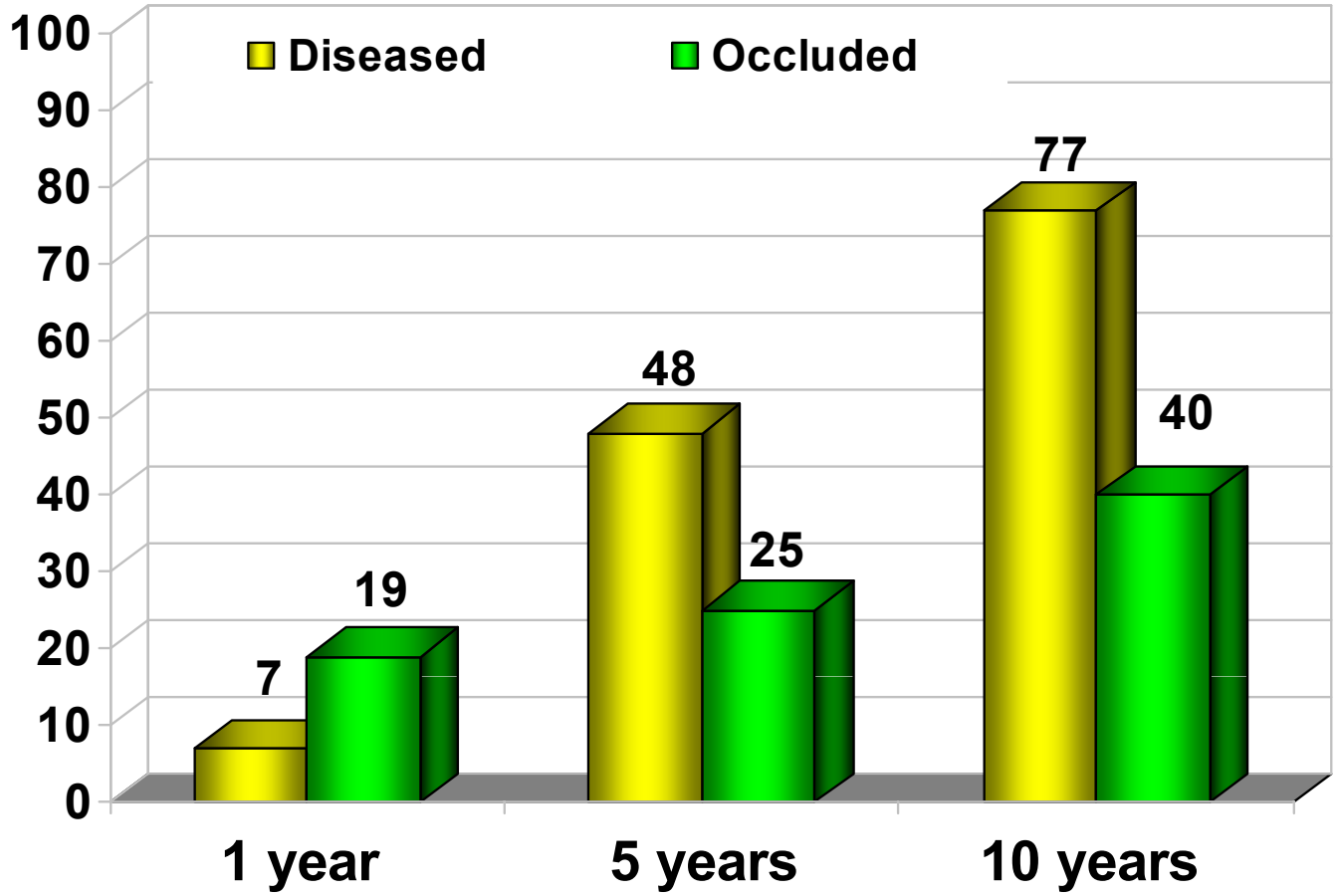


Based on these data : I can conclude at this point my presentation

No discussion : CABG is preferd in patients with high SYNTAX SCORE

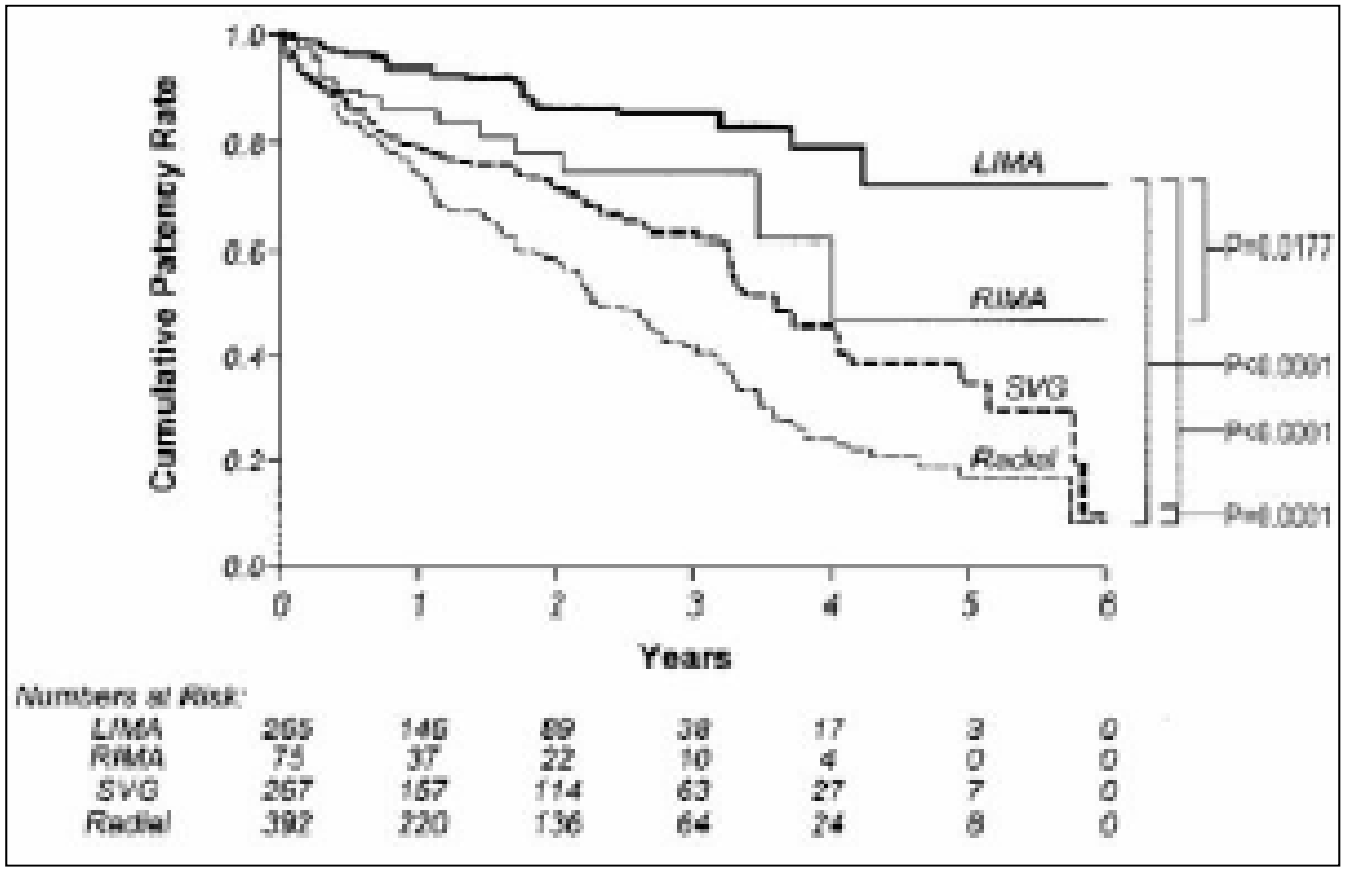
But what about CABG ?

Durability of Saphenous Vein Grafts



Goldman S. J Am Coll Cardiol. 2004

Cumulative patency (<70% stenosis) by type of graft



By 5 years, vein graft patency was less than 40%.
It was even worse for radial artery conduits and not much better for RIMAs!

PCI vs CABG

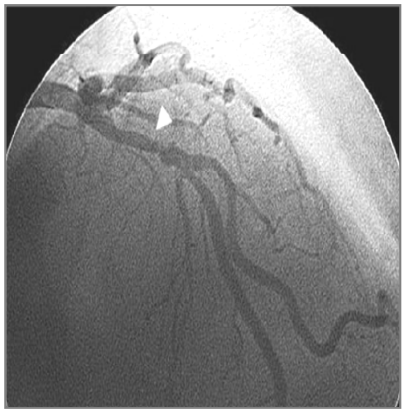
The "Good Face" of PCI

- **Mini-invasivity**
- **Effectiveness of DES**

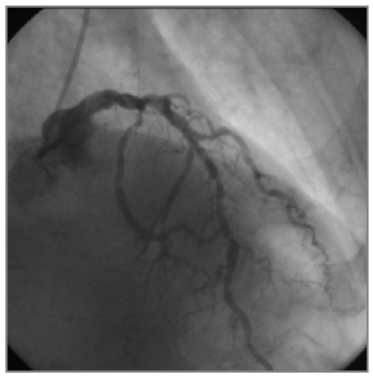
The "Bad Face " of PCI ?

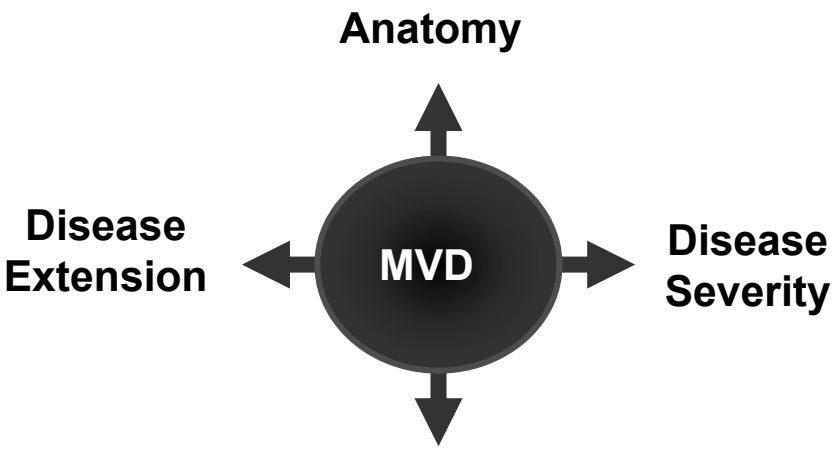
- **Multiple stenting (full metal Jacket)**
- **Stent thrombosis**
- **Syntax Score**

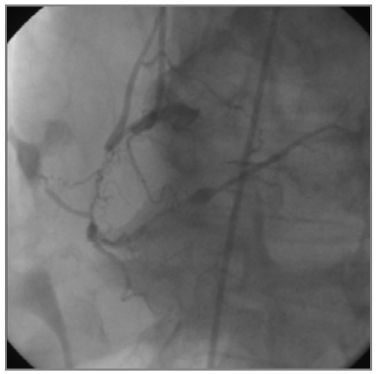
SYNTAX Trial : Not all MV disease are equal….



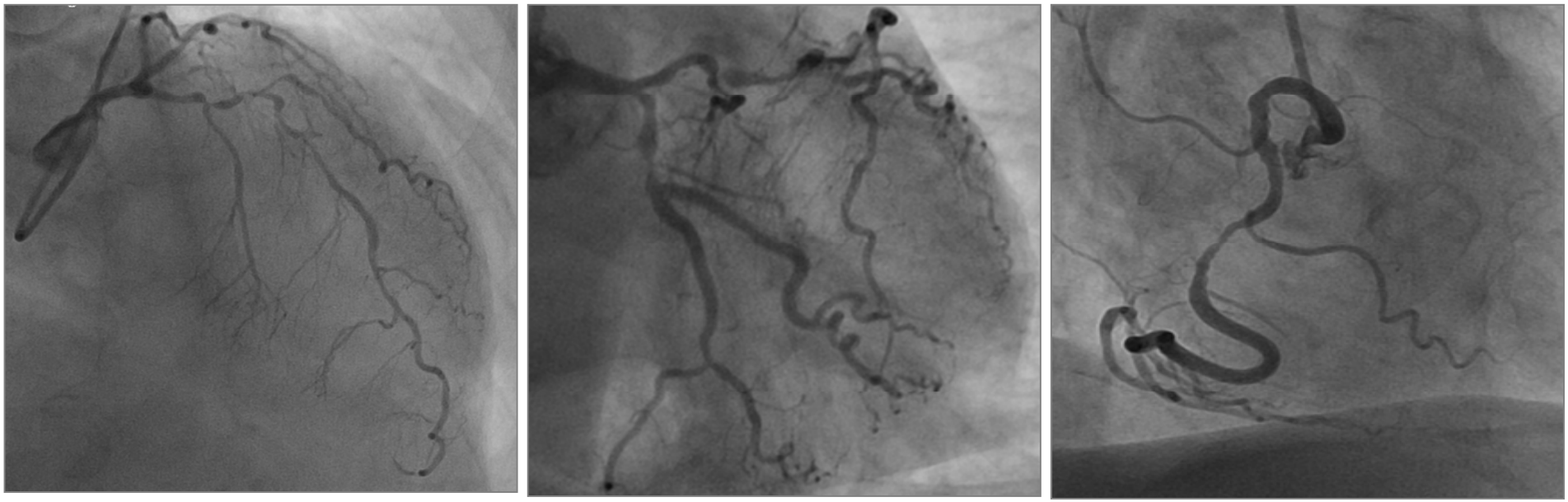
MULTIVESSEL DISEASE Variables







SYNTAX Score Reproducibility in diffuse MV disease :



Operator 1 : SYNTAX SCORE = 33

Operator 2 : SYNTAX SCORE = 22

SYNTAX Score Reproducibility

Catheterization and Cardiovascular Interventions 75:946–952 (2010)

The SYNTAX Score Revisited: A Reassessment of the SYNTAX Score Reproducibility

Scot Garg,[1] MBChB, MRCP, Chrysafios Girasis,[1] MD, Giovanna Sarno,[1] MD, PhD, Dick Goedhart,[2] PhD, Marie-Angèle Morel,[2] BSc, Hector M. Garcia-Garcia,[2] MD, PhD, Marco Bressers,[2] MSc, Gerrit-Anne van Es,[2] PhD, and Patrick W. Serruys,[1*] MD, PhD, on behalf of the SYNTAX trial investigators

Objectives: To reassess the reproducibility of the SYNTAX score. Background: The SYNTAX score appears to have an important role to play in the evaluation of patients with complex coronary artery disease undergoing revascularisation. However, the calculation of the SYNTAX score relies on the subjective assessment of lesions using coronary angiography, and therefore is subject to intra-and inter-observer variability. Methods: The SYNTAX score was calculated in 100 patients randomly selected from the SYNTAX trial, on two occasions 8 weeks apart, by a team made up of three interventional cardiologists. The weighted kappa values were compared with values obtained 1 year previously, when core lab analysts assessed the intra-observer reproducibility amongst the same patient cohort. Results: The mean ± standard deviation difference in SYNTAX score was 2.1 ± 7.6. The respective weighted kappa values for the number of lesions, bifurcation lesions, ostial lesions, and total occlusions were 0.62, 0.36, 0.66, and 0.91 compared with 0.59, 0.41, 0.63, and 0.82 in the previous core lab assessment. The weighted kappa for the intra-observer reproducibility of the SYNTAX score grouped into deciles was 0.54, and according to the terciles ≤22, >22–≤32, >32 was 0.51 both indicating a moderate level of agreement beyond the level of chance. In the previous assessment, the comparative kappa values were 0.45 and 0.53. Conclusions: The SYNTAX score has moderate intra-observer reproducibility when assessed by a team of three interventional cardiologists, which is consistent with a prior evaluation performed by core lab analysts. The scoring of bifurcation lesions remains the main source of inconsistency. © 2010 Wiley-Liss, Inc.

Inter-observer

Number of lesions	**0.62**
Bifurcation lesions	**0.36**
Ostial lesions	**0.66**
CTO lesions	

Intra-observer :

SYNTAx score grouped in deciles : 0.54
SYNTAX Score grouped in terciles: 0.51

Garg S. et al , CCI 2010 ; 75:946-952

SYNTAX Score Reproducibility

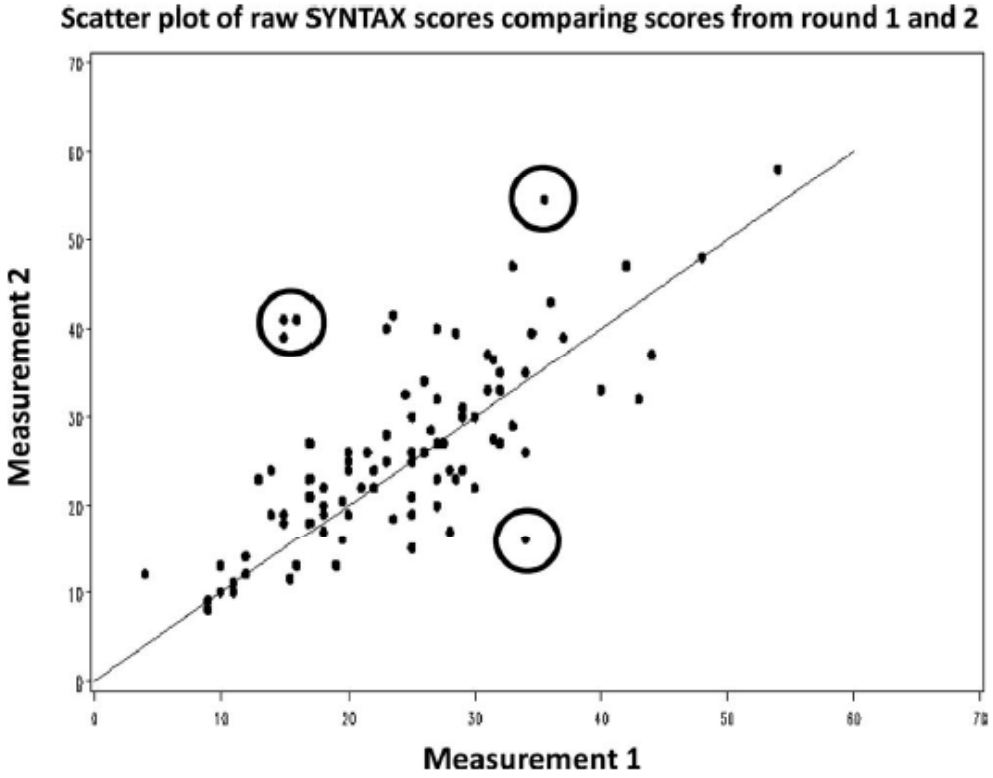
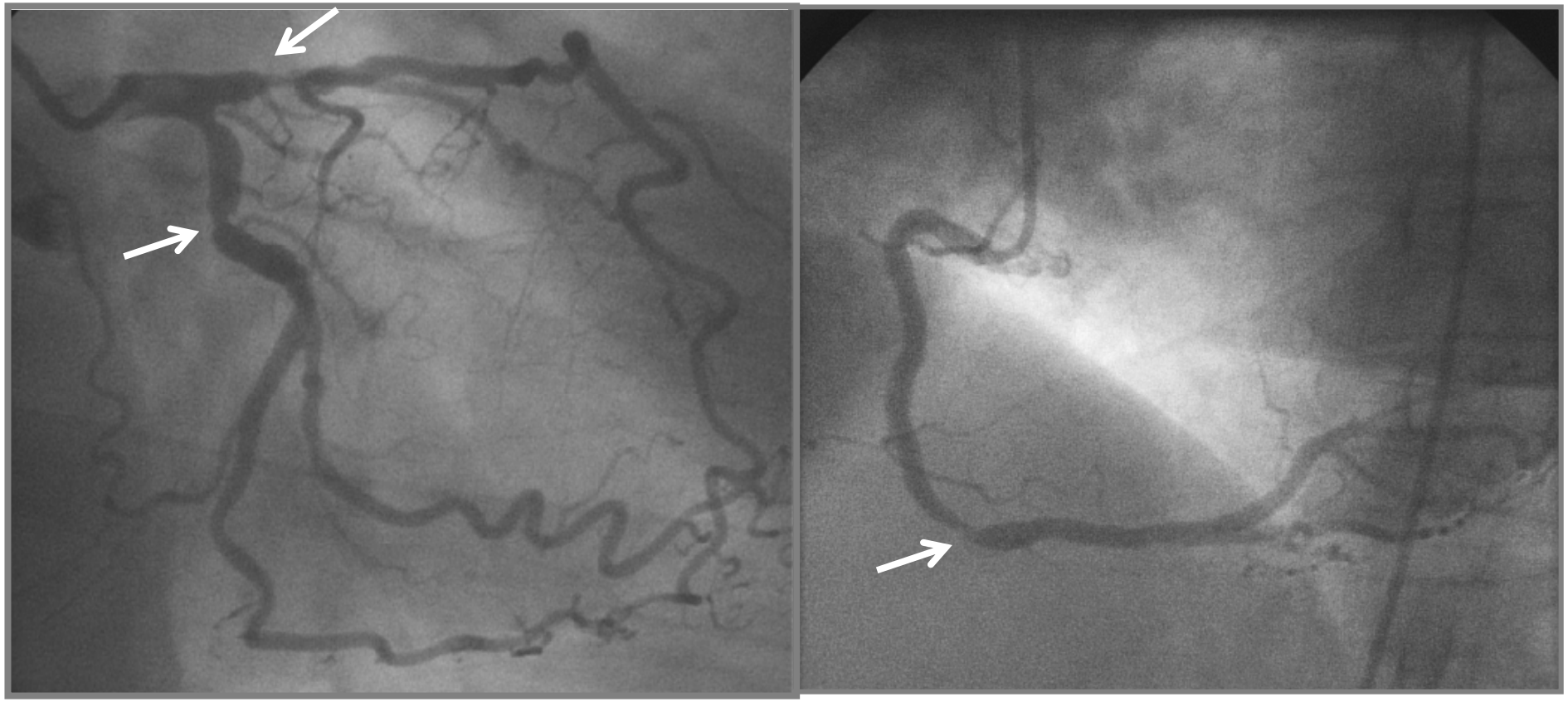


Fig. 1. Five main outliers are observed which on retrospective analysis are mainly caused by discrepancies in selecting the segments involved in bifurcation lesions, particular those involving the distal left main stem.

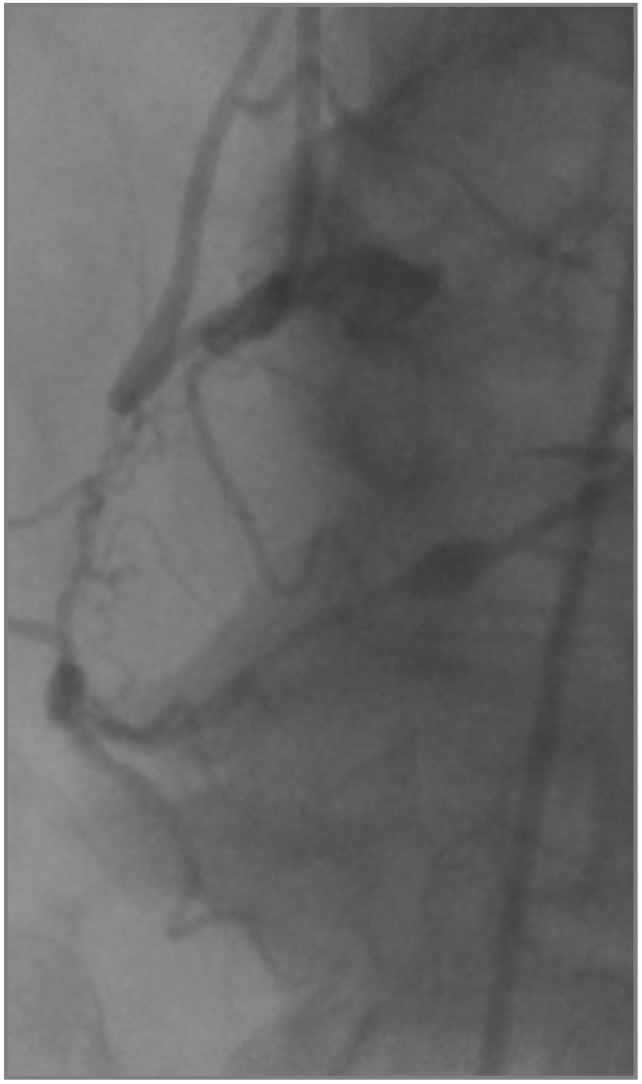
SYNTAX Score & Functional Evaluation is not mandatory for every patient :



SYNTAX Score = 12

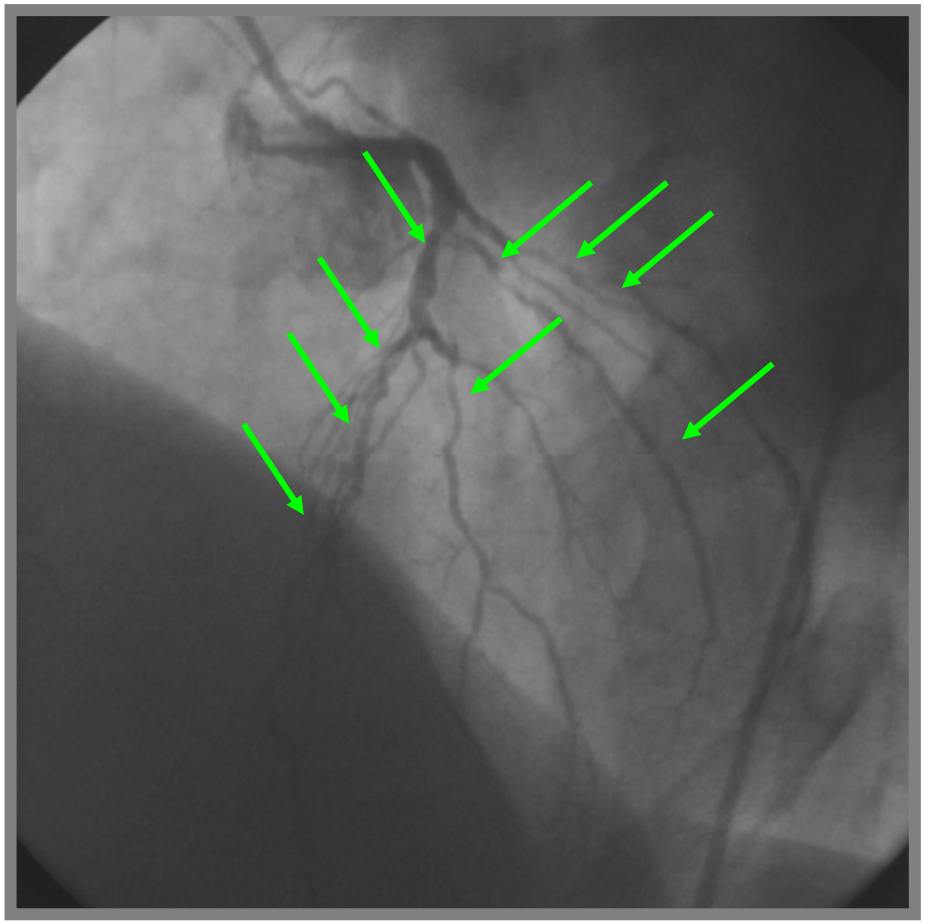
PCI is an excellent option

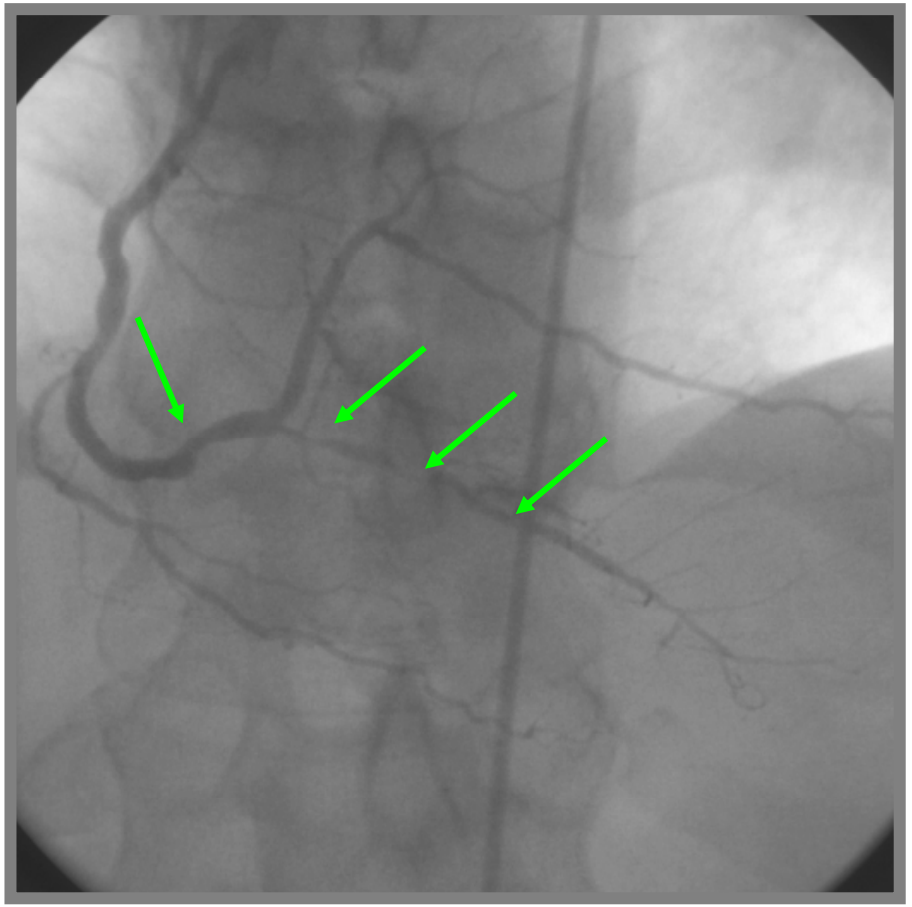
SYNTAX Score & Functional Evaluation is not mandatory for every patient :



SYNTAX Score = 38 , CABG is 1° option

Diffuse Multivessel disease in diabetic patient…



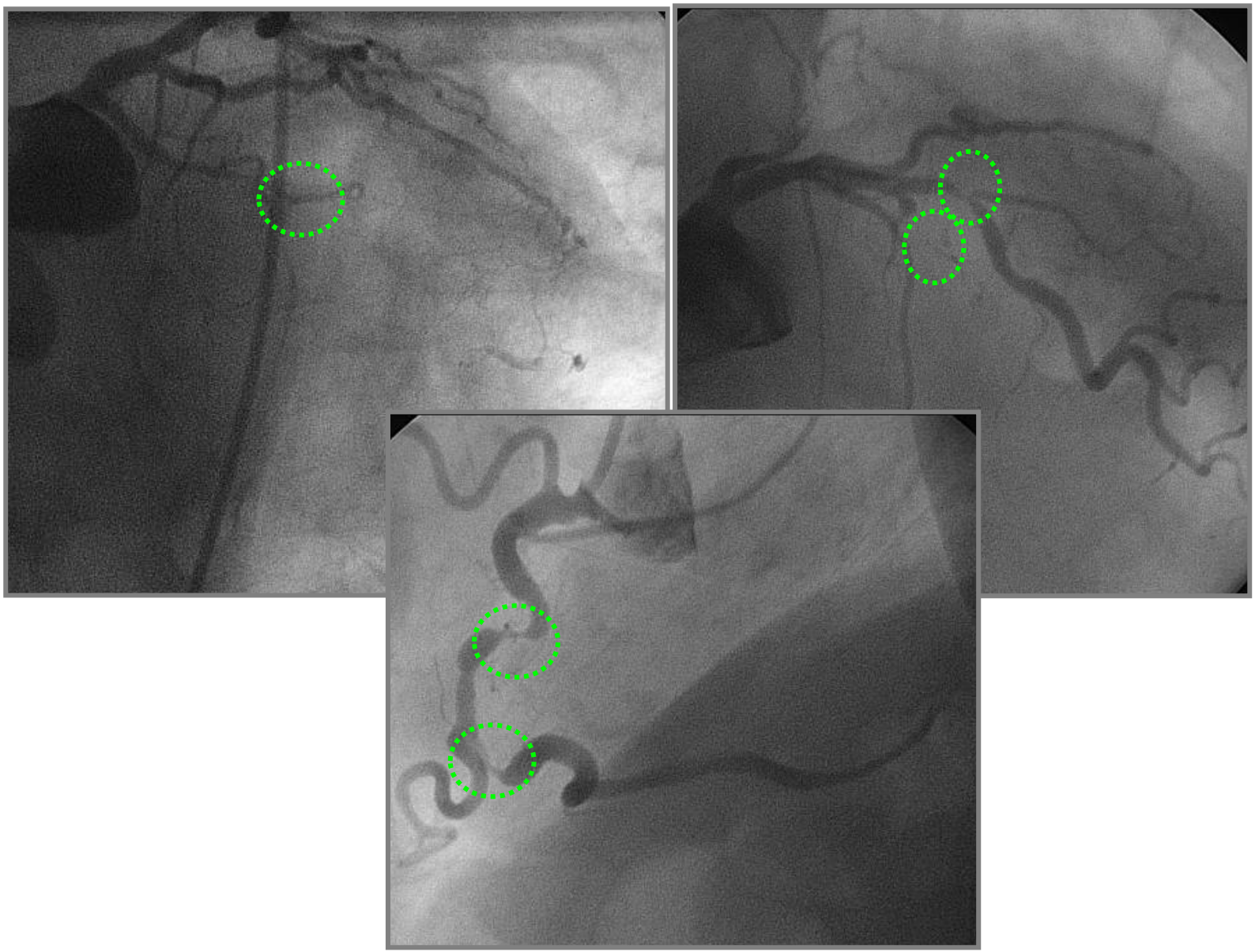


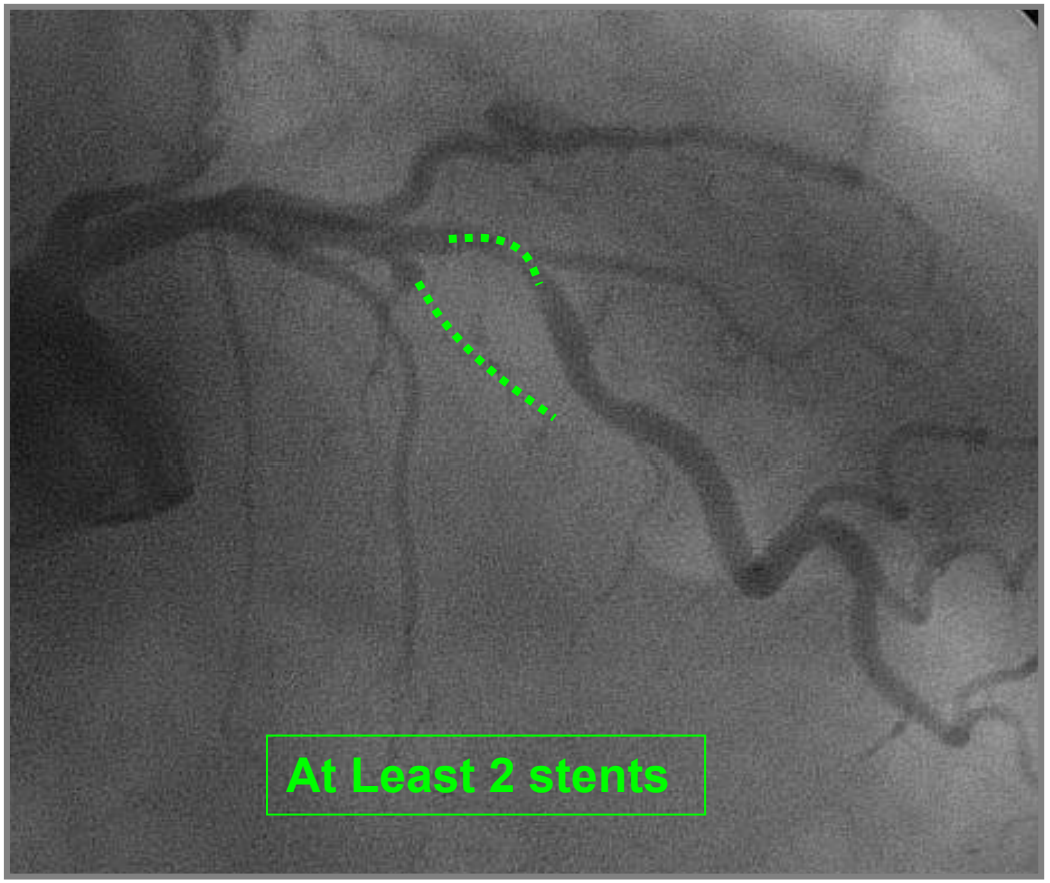
Syntax Score = 47

Is this patient a good surgical candidate ?

Multivessel Disease :

SYNTAX Score : 37

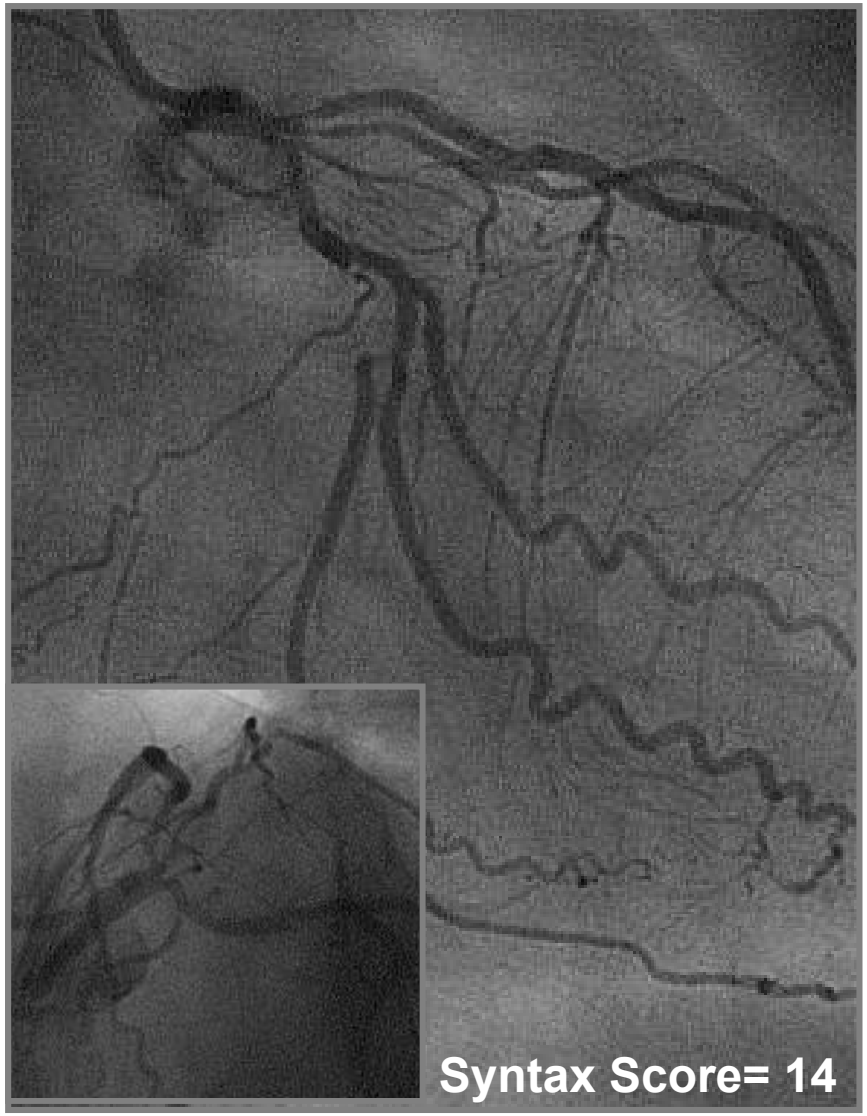


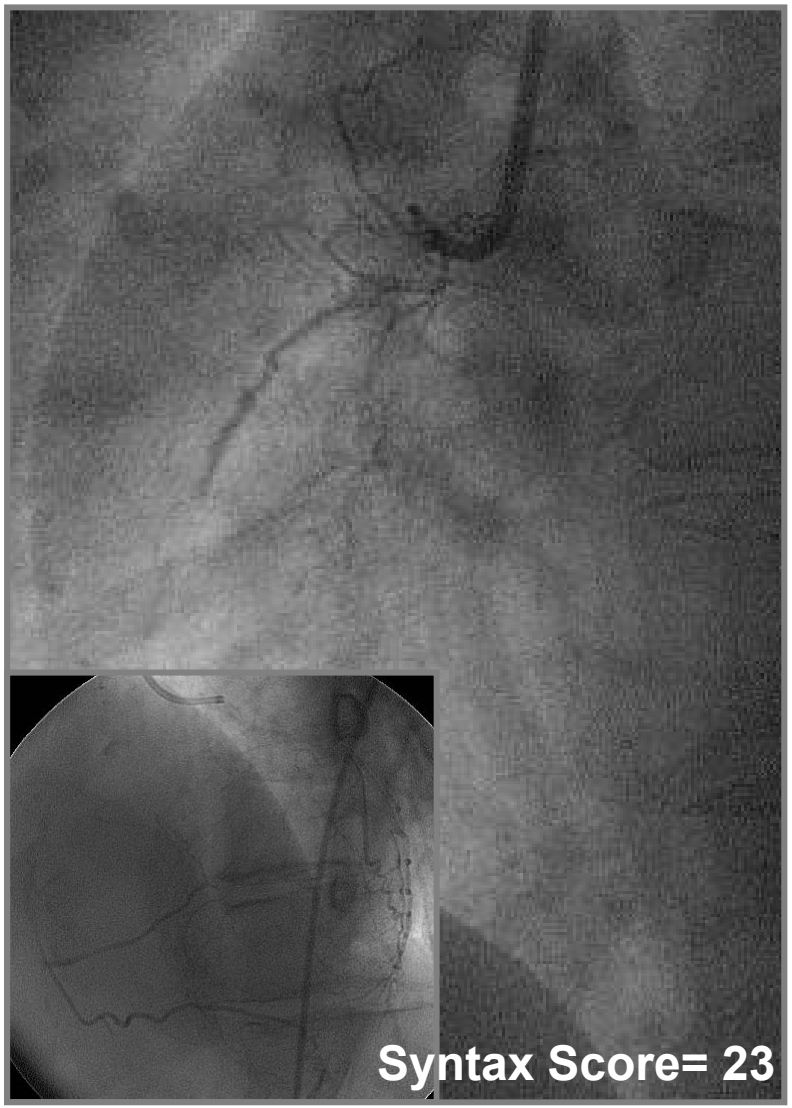


Intention to treat : a total of at least 6 stents …..

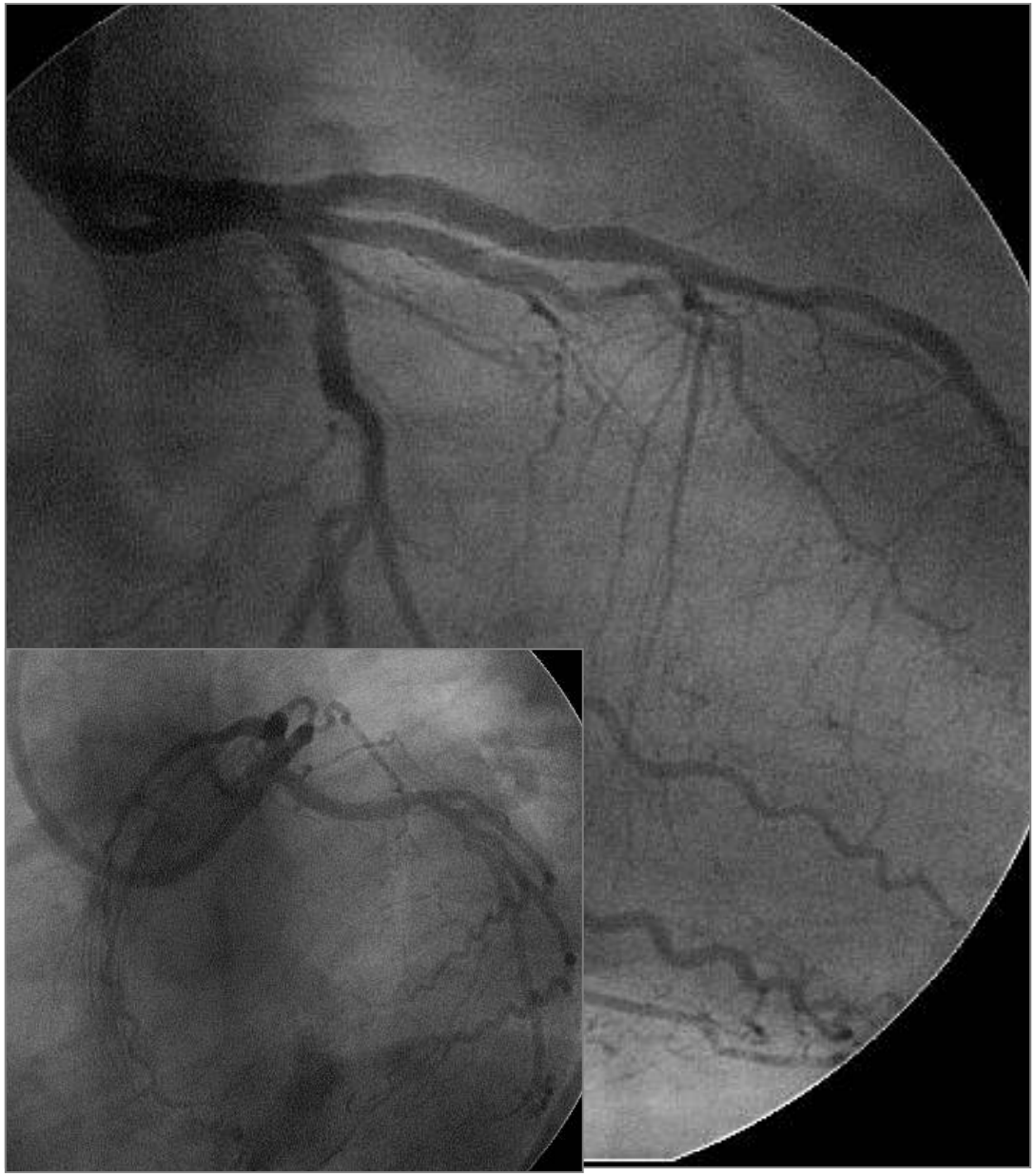
CABG should be the I choice

Multivessel Disease : Total Syntax Score = 37





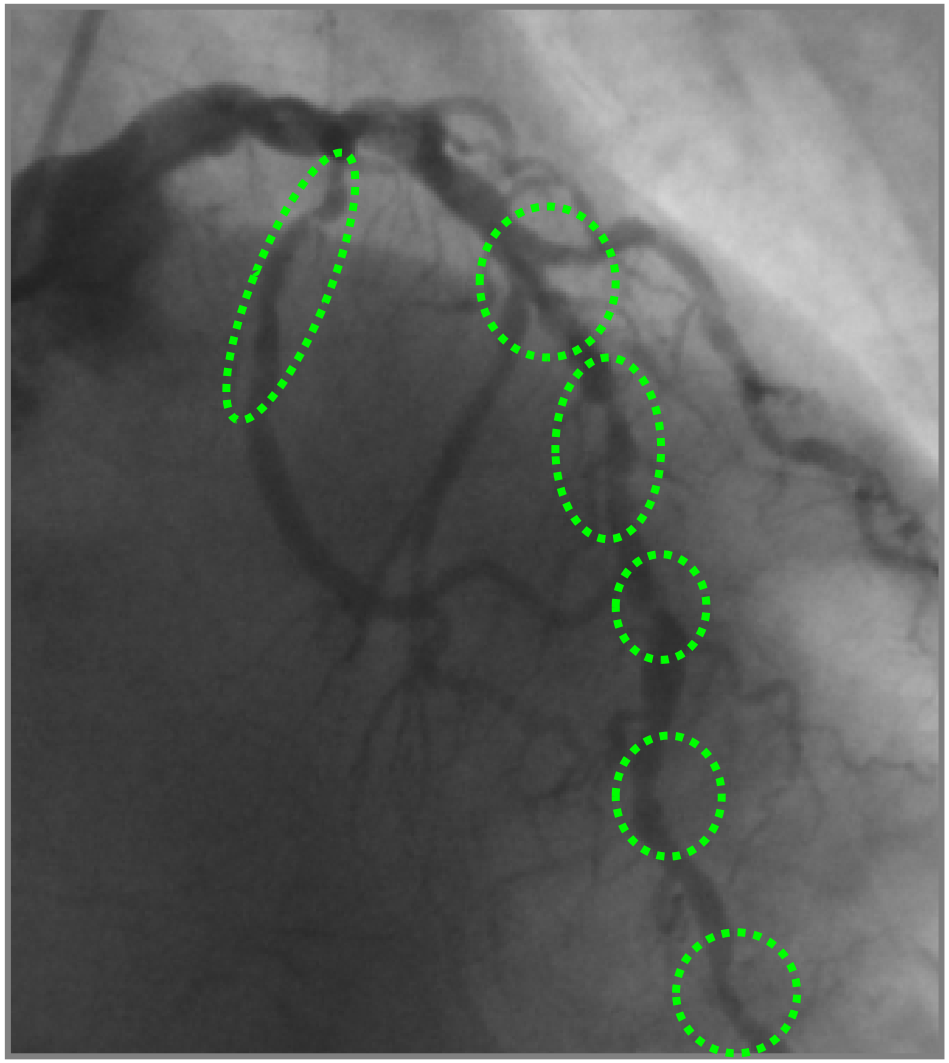
CABG or PCI ? CABG is preferd , but as alternative :



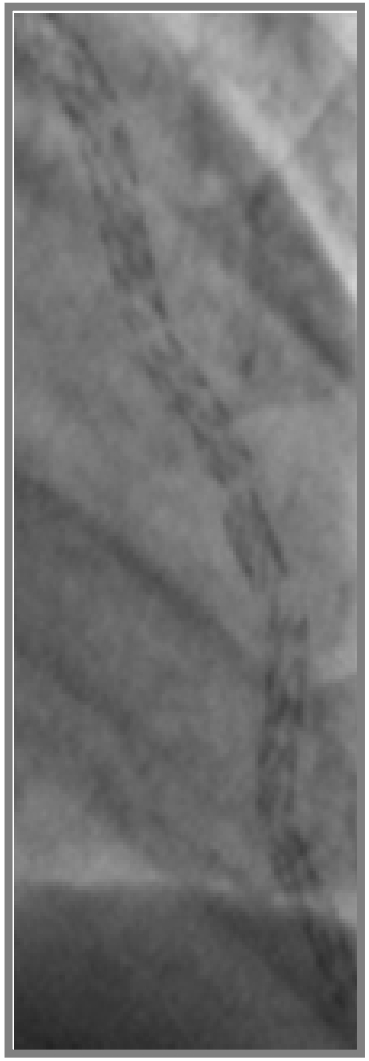
Good Option :

- **PCI on prox LAD and prox LCX (with 2 stents)**
- **No intervntion on RCA**

What is Is it the optimal approach ?

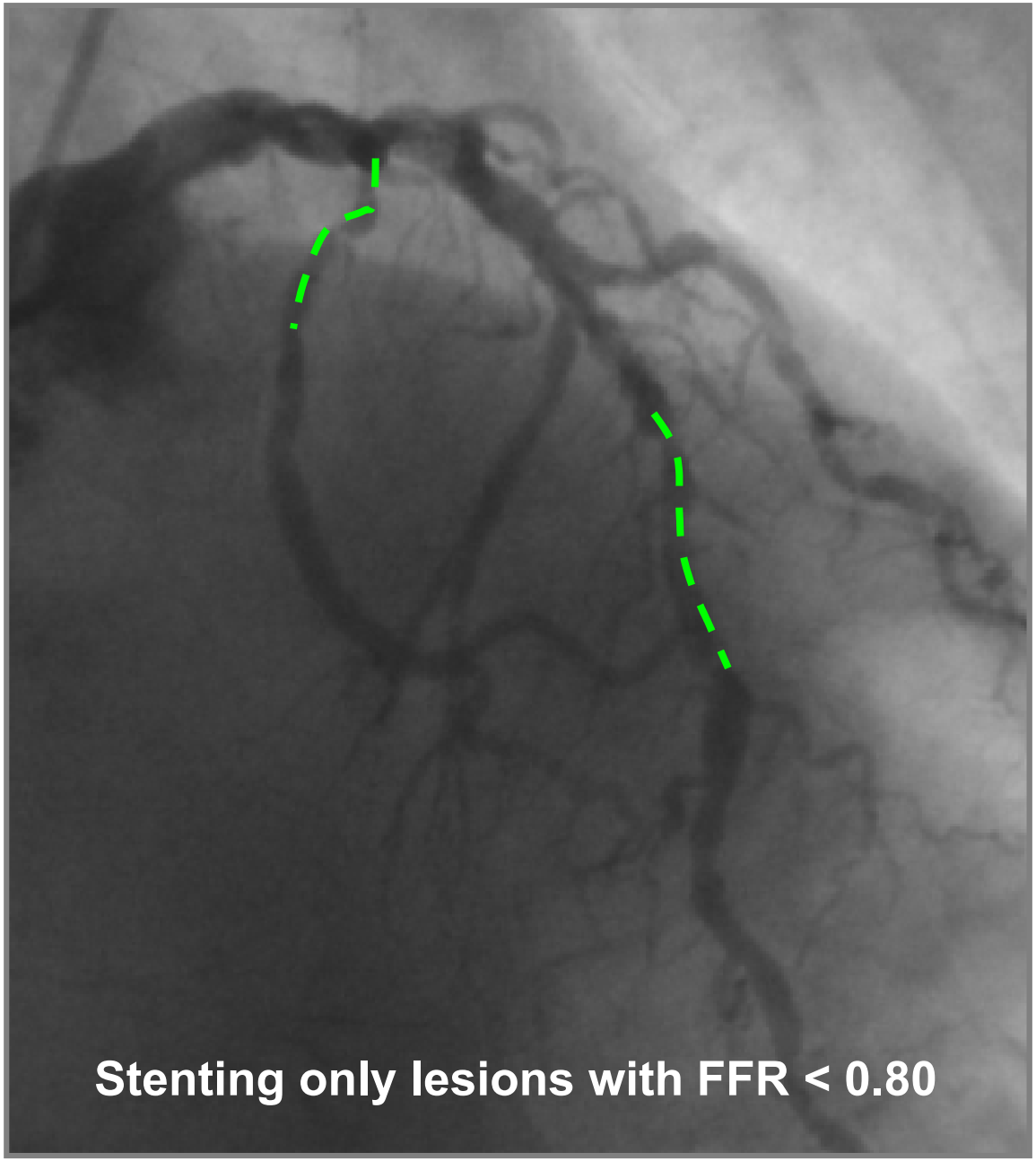


SYNTAX SCORE = 35

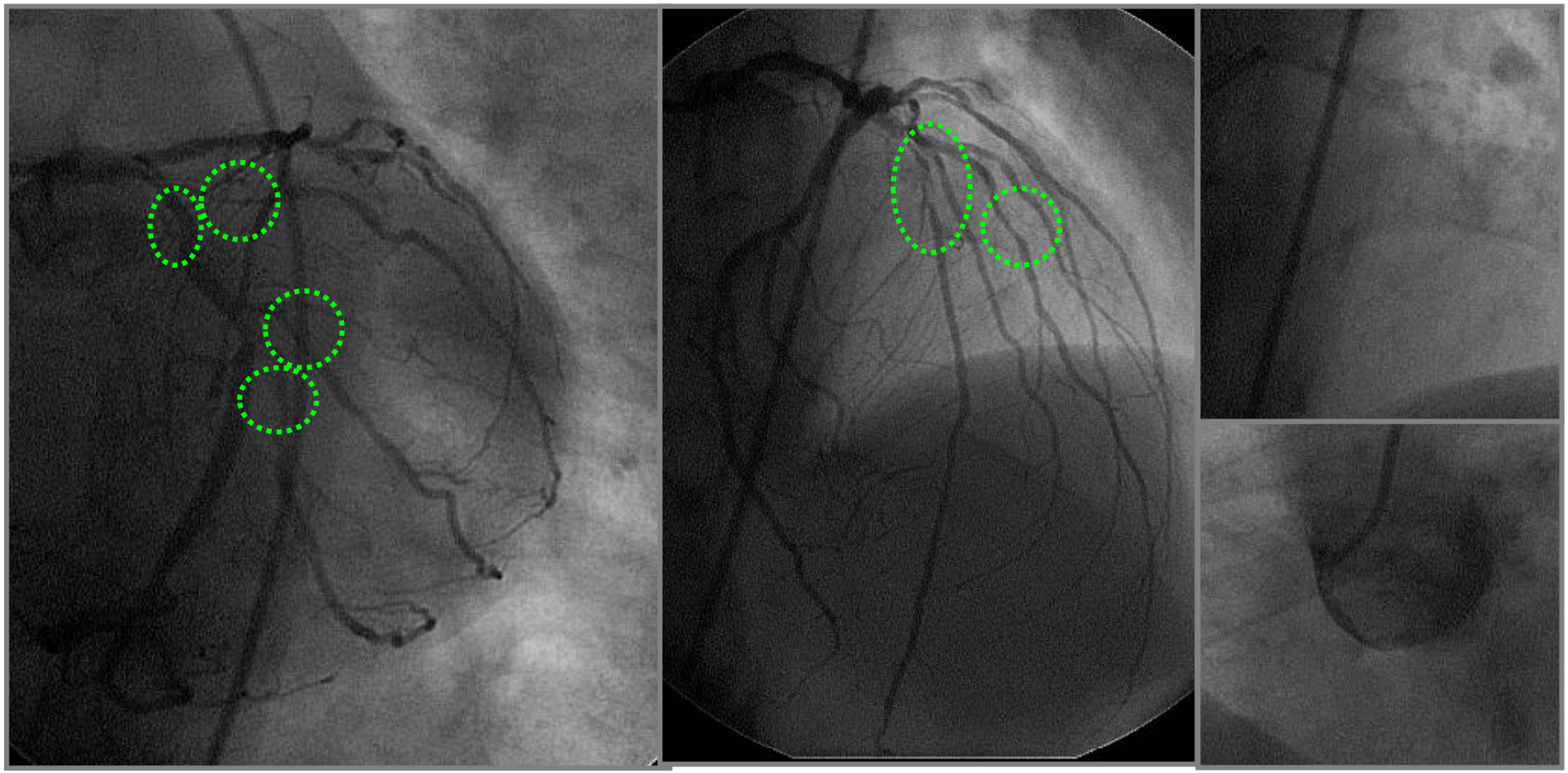


LAD treated with 7 stents !

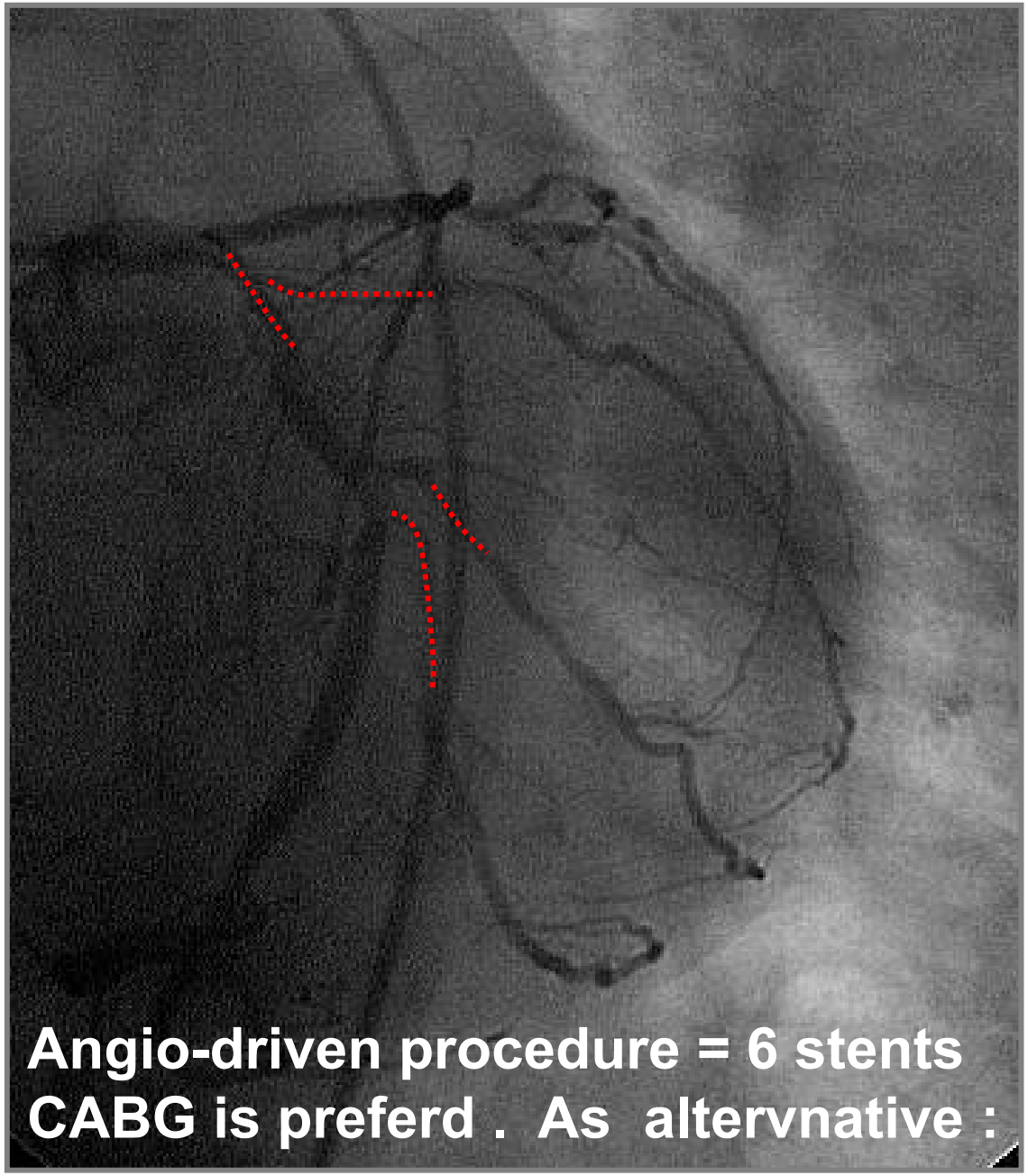
Certainly is not the optimal ....

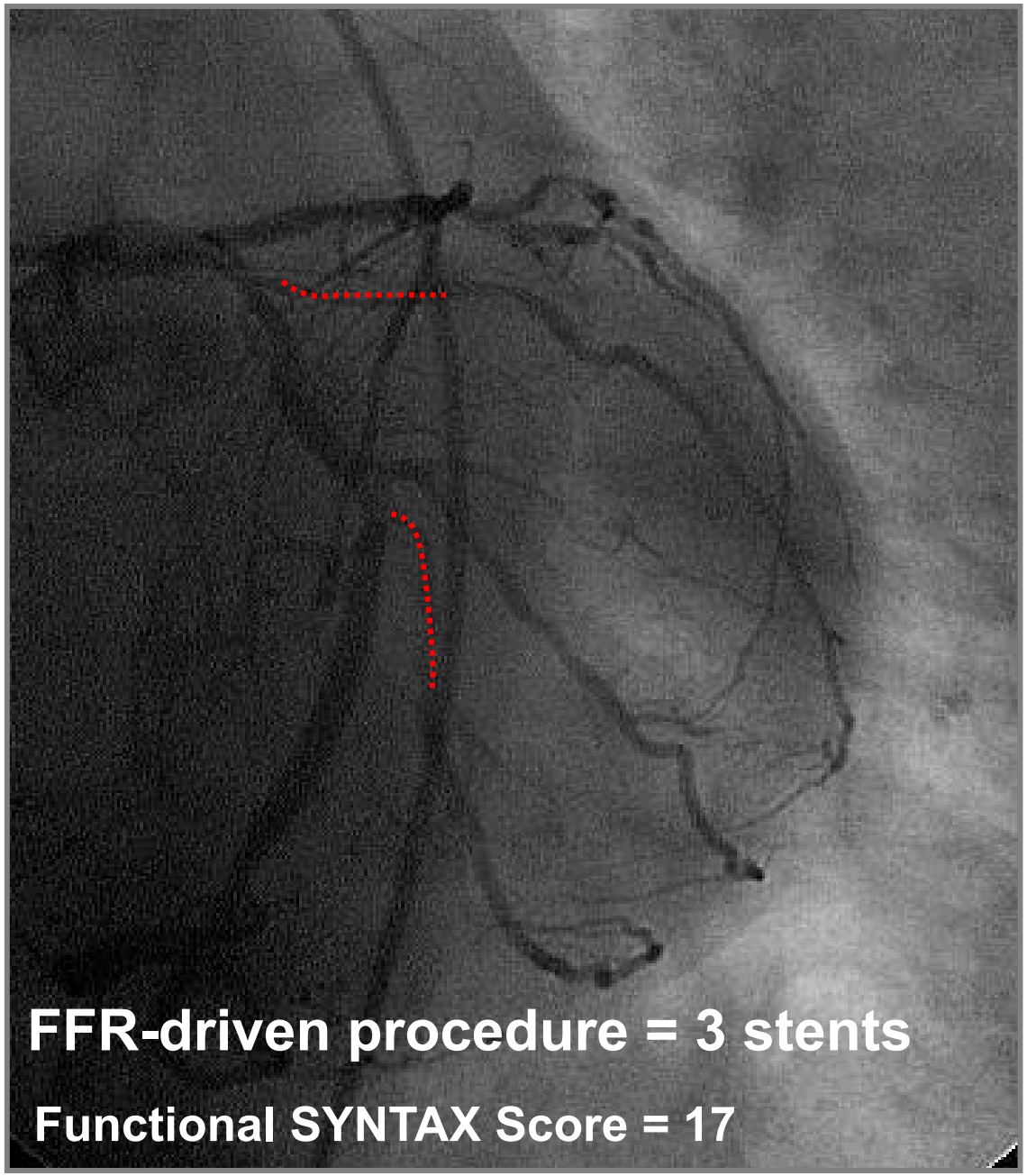

Stenting only lesions with FFR < 0.80

The use of Functional Evaluation (FFR) during MVD PCI reduce the number of stents and MACE ..



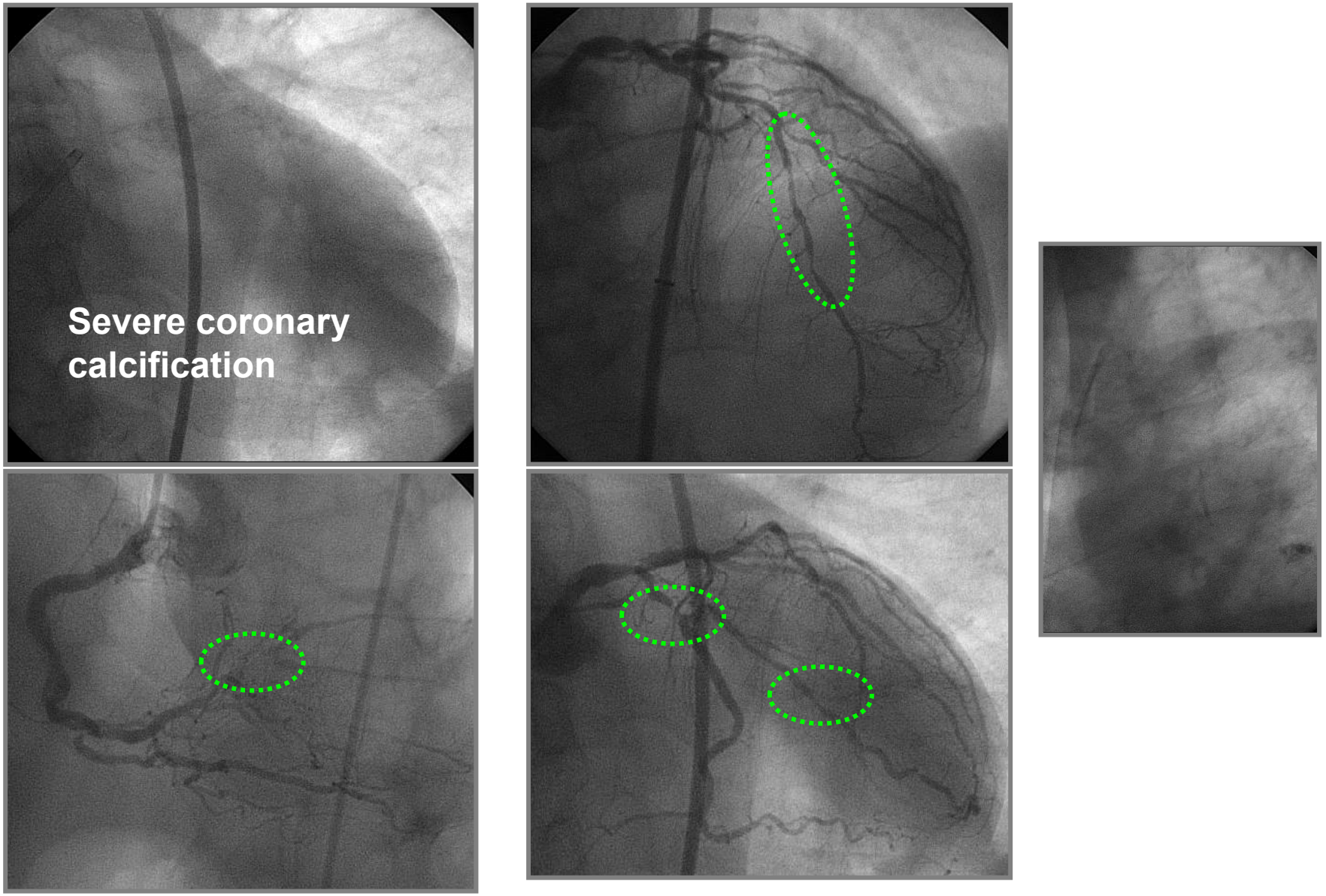
SYNTAX Score = 38


Angio-driven procedure = 6 stents
CABG is preferd . As altervnative :

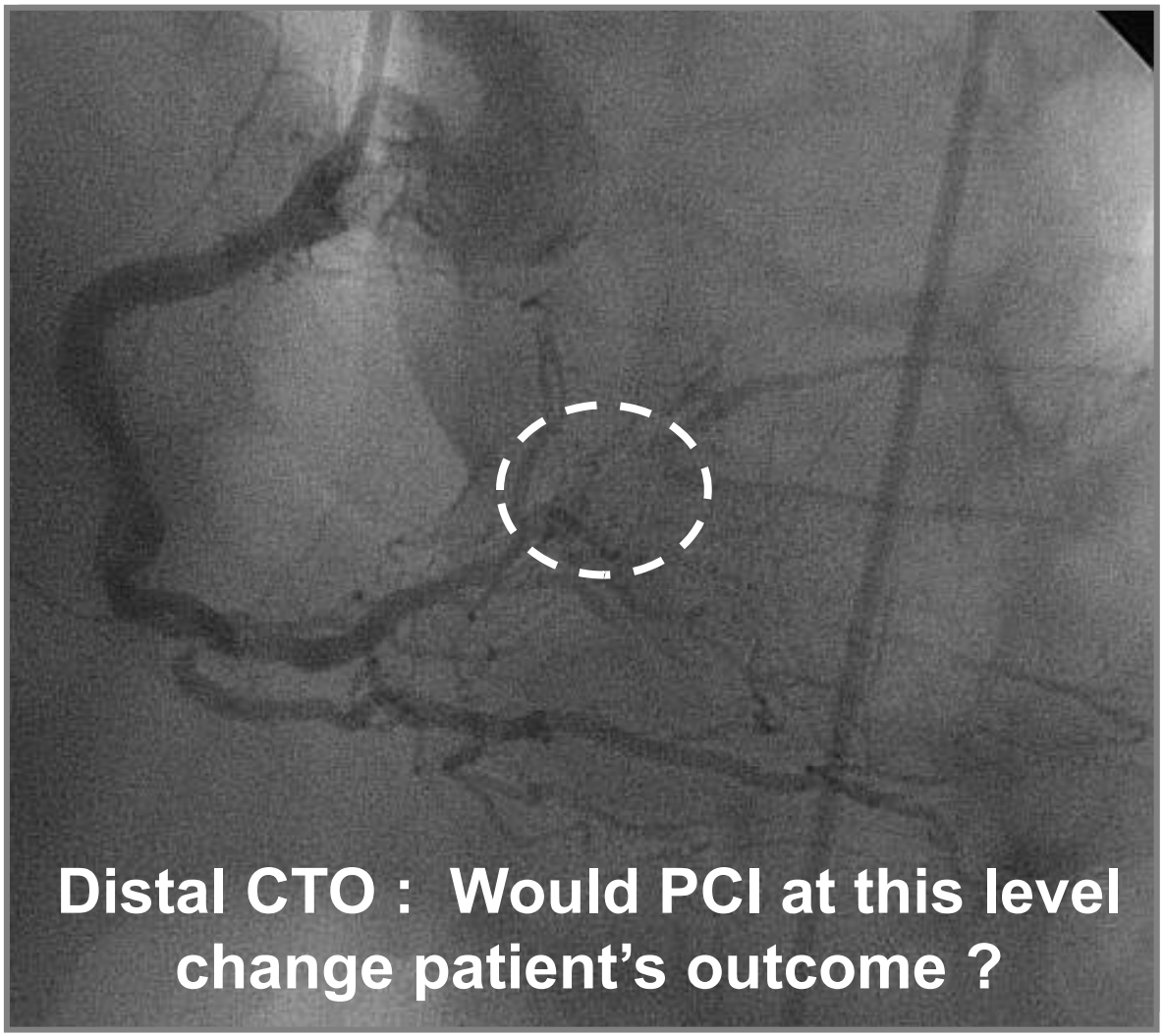

FFR-driven procedure = 3 stents
Functional SYNTAX Score = 17

Multivessel Disease

SYNTAX SCORE = 46



CABG ? Or PCI LCX and med LAD ?

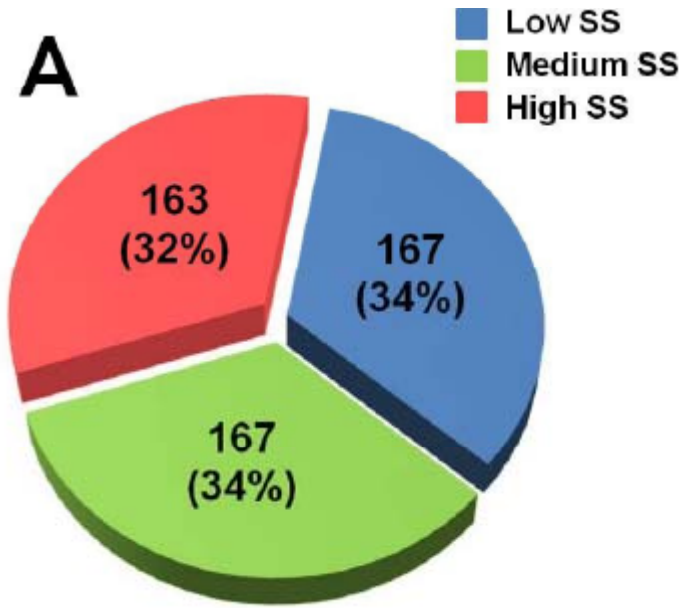


Functional SYNTAX = 23
FFR –Guided PCI is a good option .

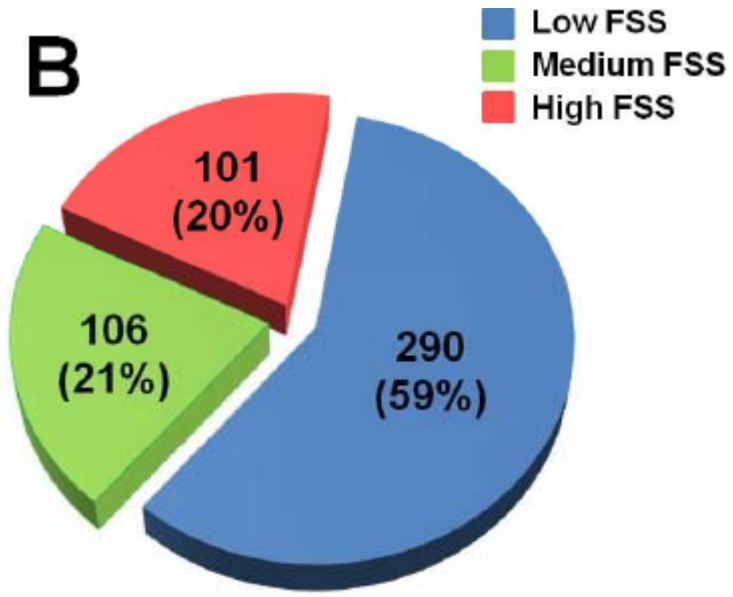
Functional SYNTAX Score

- 497 patients , FFR-guided arm of FAME Study
- 2-3 vessel disease
- Angio Syntax Score : Conventional fashion
- Functional (FFR) Syntax Score : counting only the lesions with FFR < 0.80

Angio SYNTAX



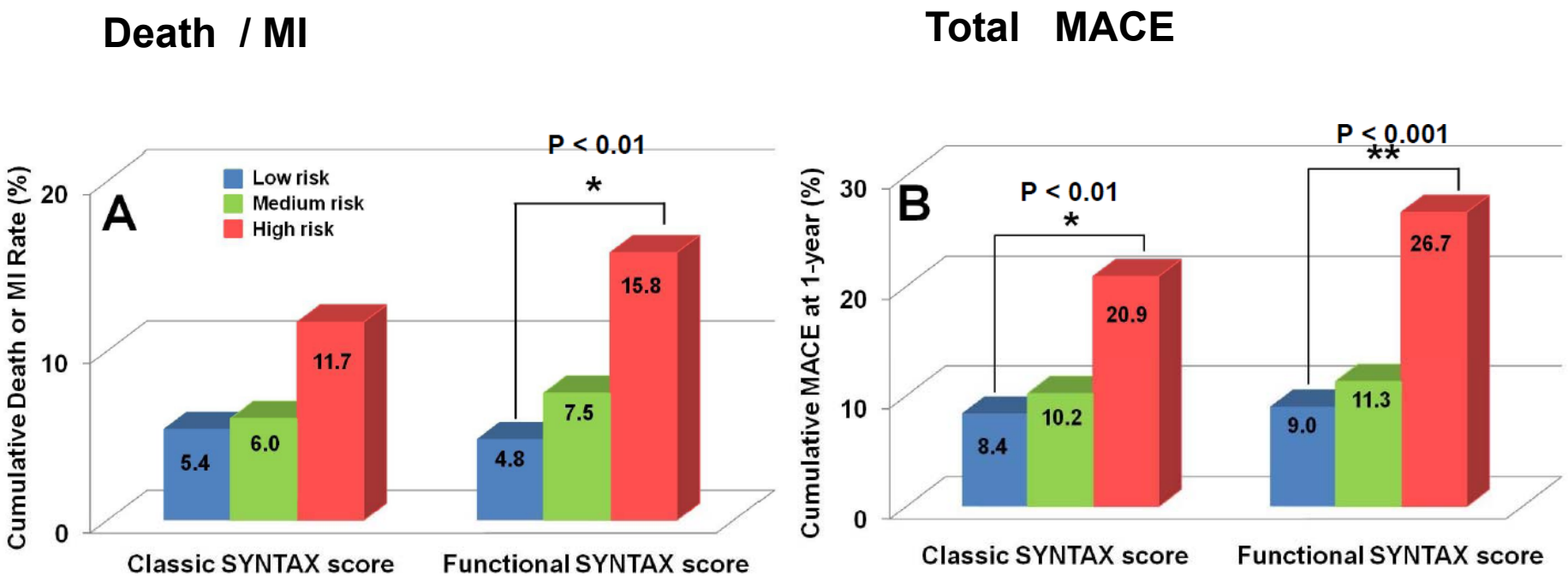
Functional (FFR) SYNTAX



FFR reclassifies > 30% !

Fearon WF et al , TCT-MD 2011

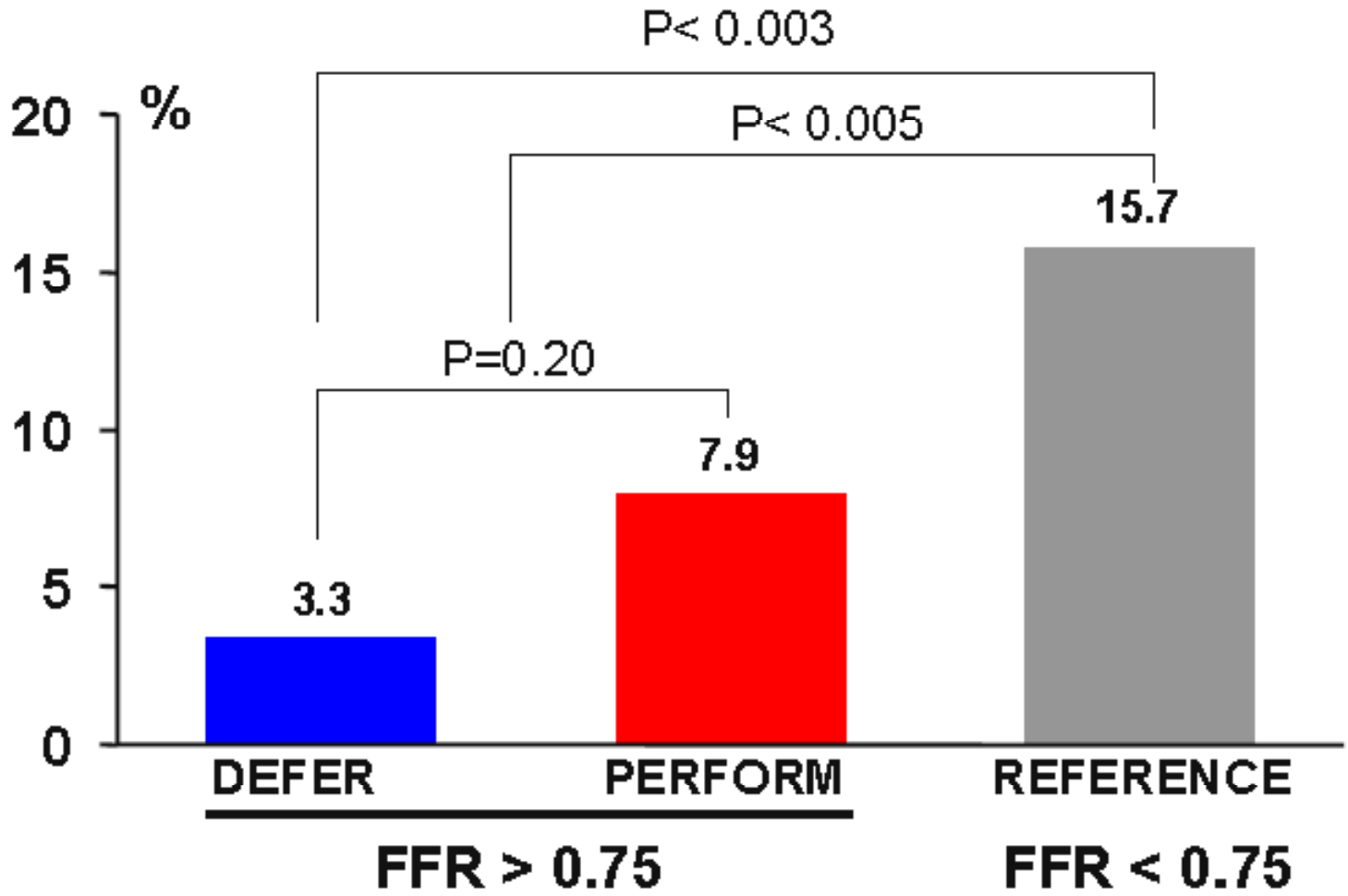
Funtctional SYNTAX Score desciminates Risk of Death/MI and Risk of Total MACE



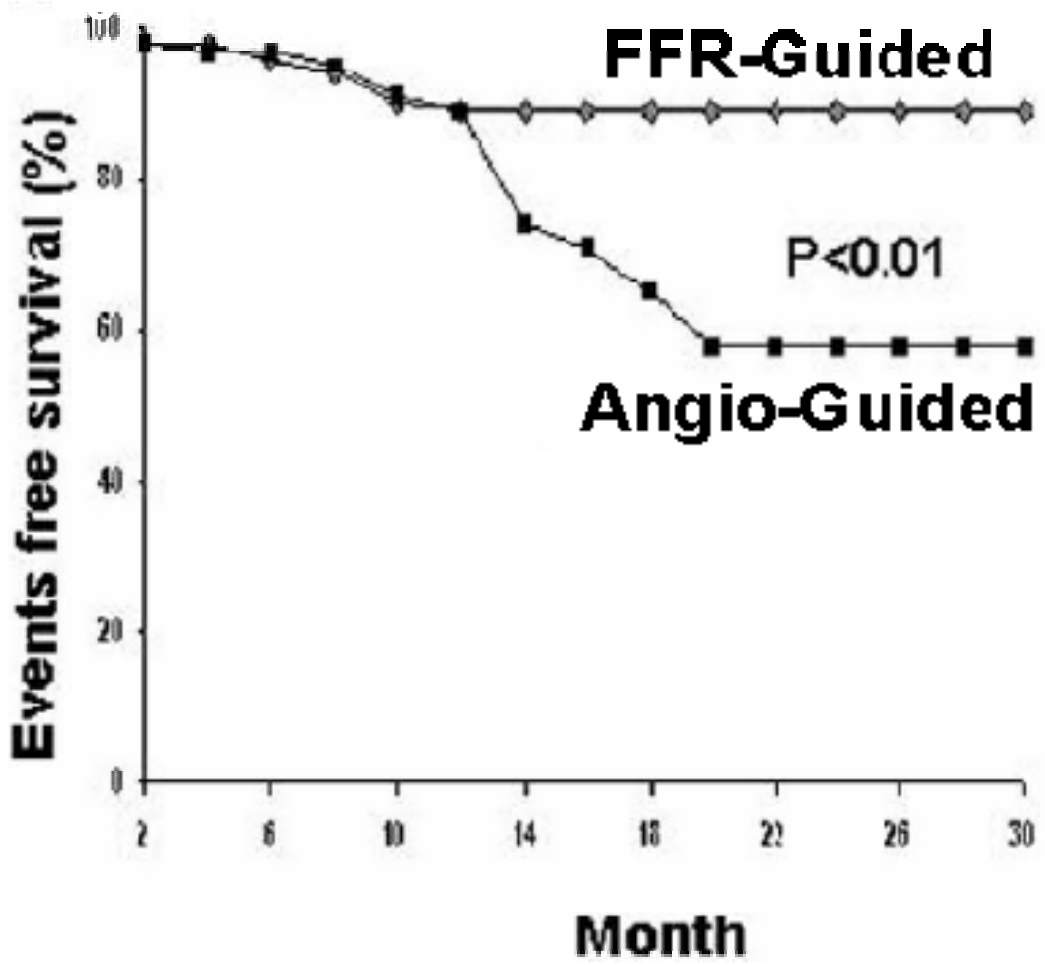
Fearon WF et al , TCT-MD 2011

Is it safe to defer treatment ?

DEFER Study : 5-year Follow-up (Death / MI)

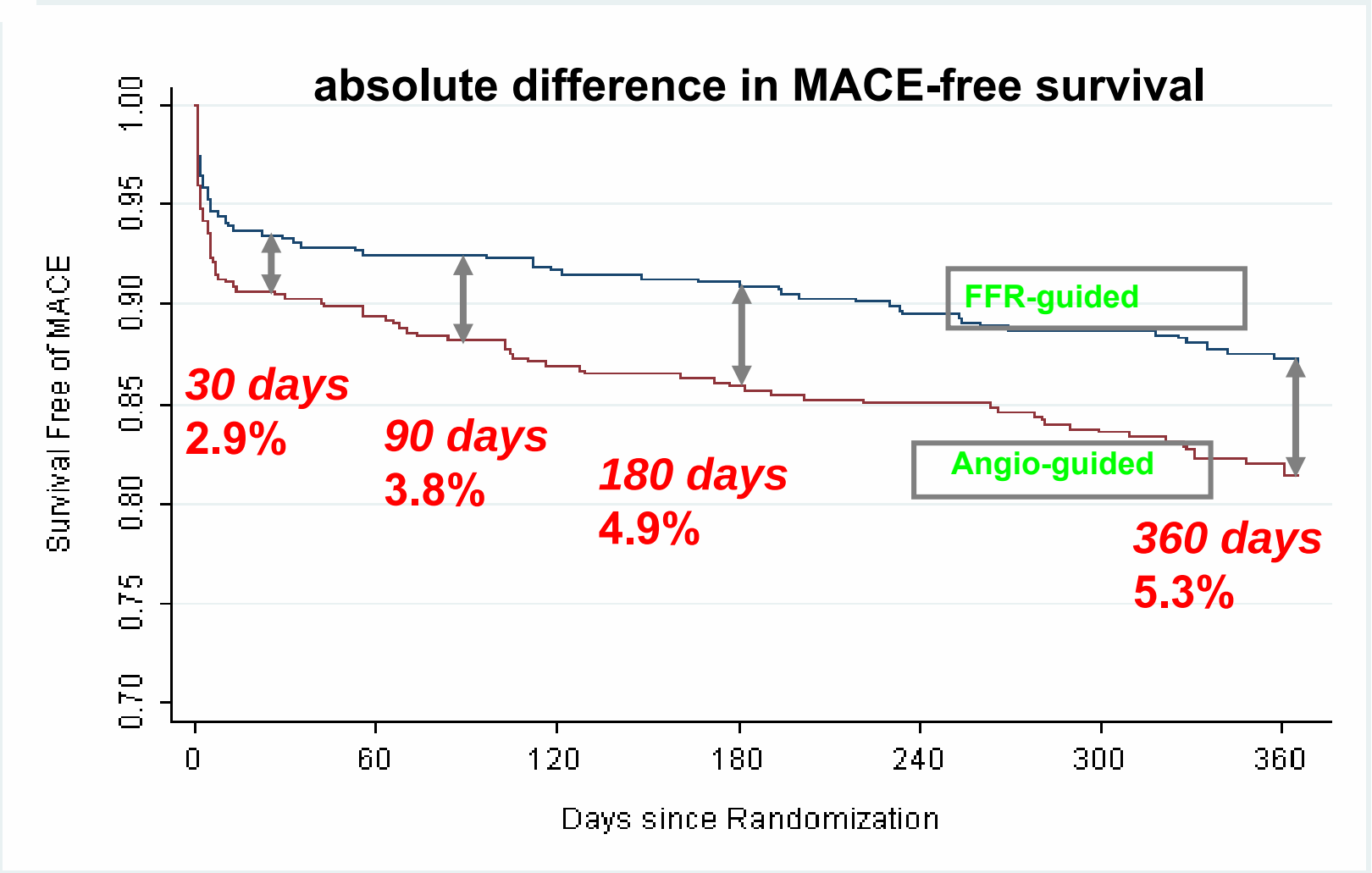


FFR-Guided PCI in Multivessel Disease

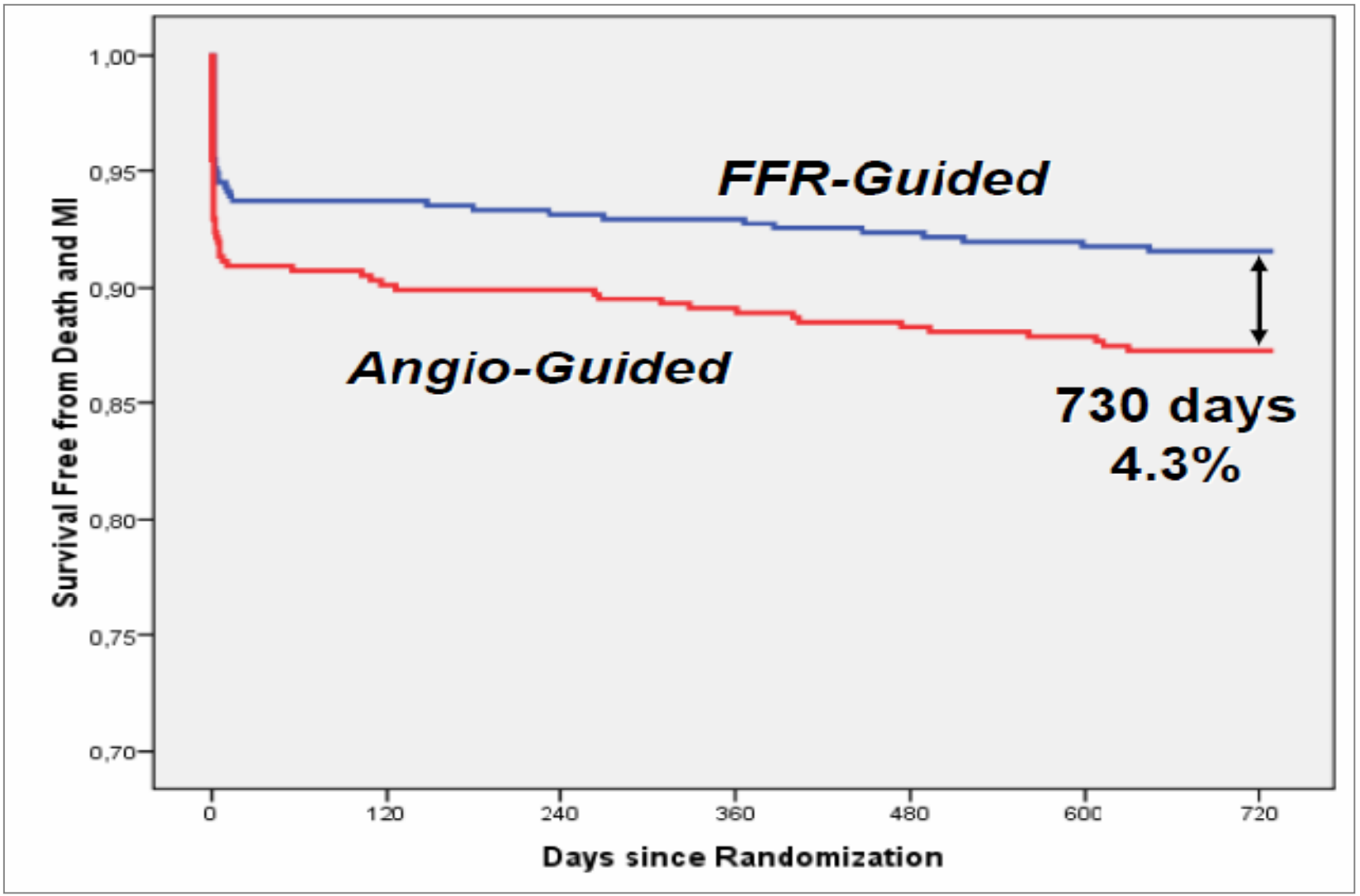


Wongpraparut et al , AJC 2005; 96:877-884

FAME study: Event-free Survival



FAME study: 2-year Event-free Survival



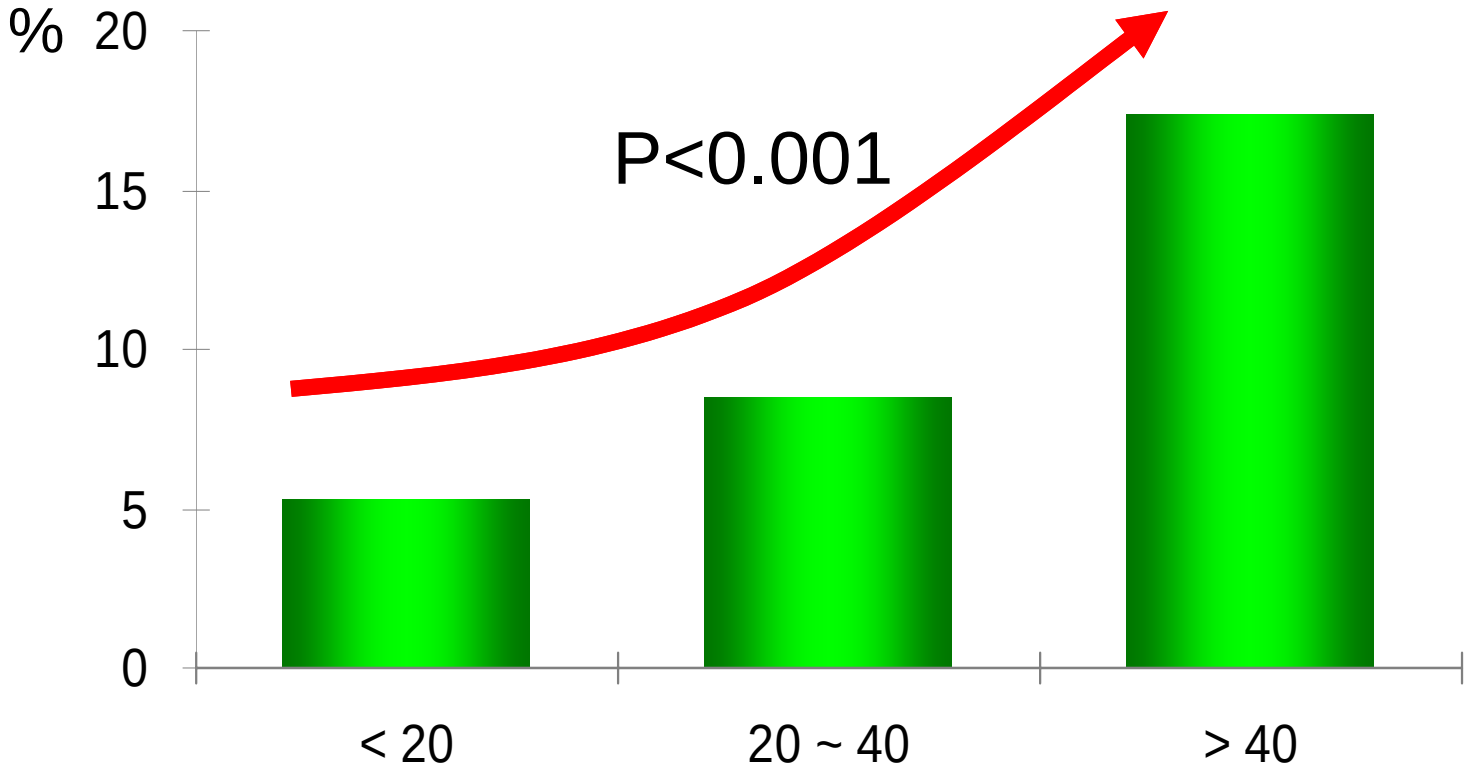
Stent length / Number of stent

&

restenosis – stent thrombosis

Stent Length is Independent Predictor of Restenosis.

Lee CW et al. Am J Cardiol 2006;97:506-511



Multivariate Predictors of In-Segment Restenosis after SES

RESEARCH Registry

	OR	95% CI	p
ISR	**4.16**	**1.63-11.01**	**<0.01**
Ostial lesion	**4.84**	**1.81-12.07**	**<0.01**
DM	**2.63**	**1.14-6.31**	**0.02**
Stent length	**1.42**	**1.21-1.68**	**<0.01**
Ref diameter	**0.46**	**0.24-0.87**	**0.03**
LAD	**0.30**	**0.10-0.69**	**<0.01**

Lemos PA et al. Circulation 2004;109:1366-1370

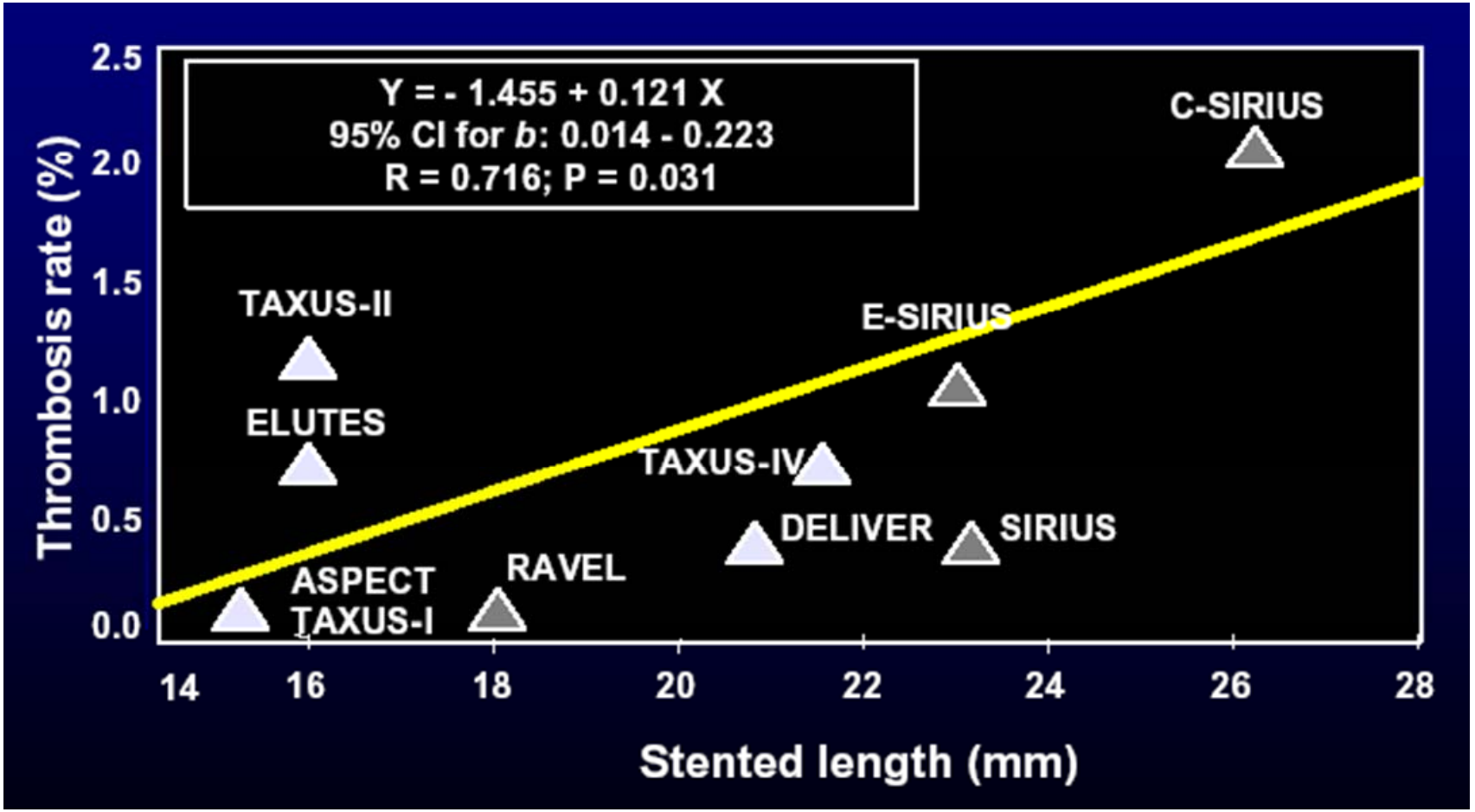
Full Metal Jacket.

Ielasi, Colombo et al. Ital J Inv Cardiol 2009; 3 Suppl: 111

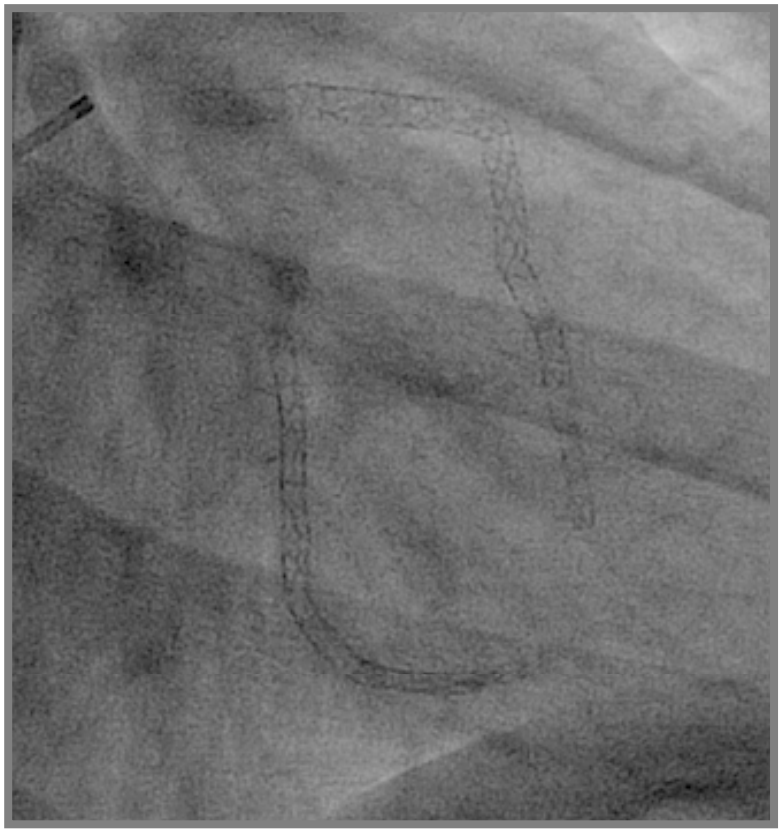
- **658 full metal jacket lesions (≥60mm) in 617 patients.**
- **33% DM, 33 had prior PCI, 33% CTO.**
- **39 months mean follow up (2 yr in 91% pts).**
- **Mortality 7.3%**
- **MI during follow up: 3.5%**
- **TLR: 23.4%**
- **Stent thrombosis (Def or Probable): 2.6% (10/17 while on DAP).**

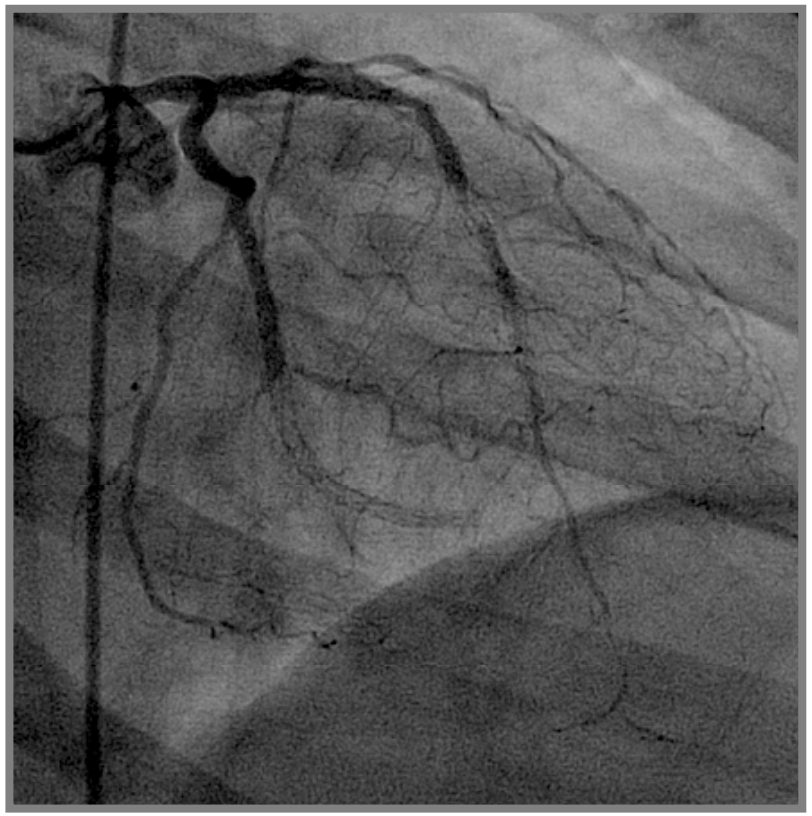
DES Thrombosis and Length

R. Moreno et al. JACC 2005;45:954-9



When long / multiple stents have restenosis …. re-PCI difficult and uneffective treatment





and CABG is not anymore an option …

PRACTICAL CONCLUSIONS

MVD with high SYNTAX Score CABG should be considered as first choice paricularly when :

- Patients
- > 1 clinic
- Inexperie
- Other cardiac surgery indications

Attempt PCI if:
- **CABG contraindicated**
- **Patient/family and cardiac surgeon agree on PCI**

MVD

CABG favored, but PCI is a good alternative especially if FFR-guided

unfa

A " functional SYNTAX Score " (FFR) can be more appropriate to select patients with MVD for a more appropriate treatment option

Thank You for Your Attention