Commento sulle linee guida sulla rivascolarizzazione miocardica: esperienza personale

Prof. Francesco Romeo

Cattedra di Cardiologia

Università degli Studi di Roma- Tor Vergata

The importance of the history

"Young catheterizers and interventional cardiologist should appreciate that interventional techniques were not as easy then as they are today, and they should remember the dictum:

Those who ignore the past are condemned to repeat it"

Michel E. Bertrand MD, FRCP, FESC, FACC

Strength of Recommendation:

Table I Classes of recommendations

Classes of recommendations	Definition
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective.
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure.
Class IIa	*Weight of evidence/opinion is in favour of usefulness/efficacy.*
Class IIb	*Usefulness/efficacy is less well established by evidence/opinion.*
Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful.

Strength of Recommendation:

Table 2 Levels of evidence

Level of evidence A	Data derived from multiple randomized clinical trials or meta-analyses.
Level of evidence B	Data derived from a single randomized clinical trial or large non-randomized studies.
Level of evidence C	Consensus of opinion of the experts and/or small studies, retrospective studies, registries.

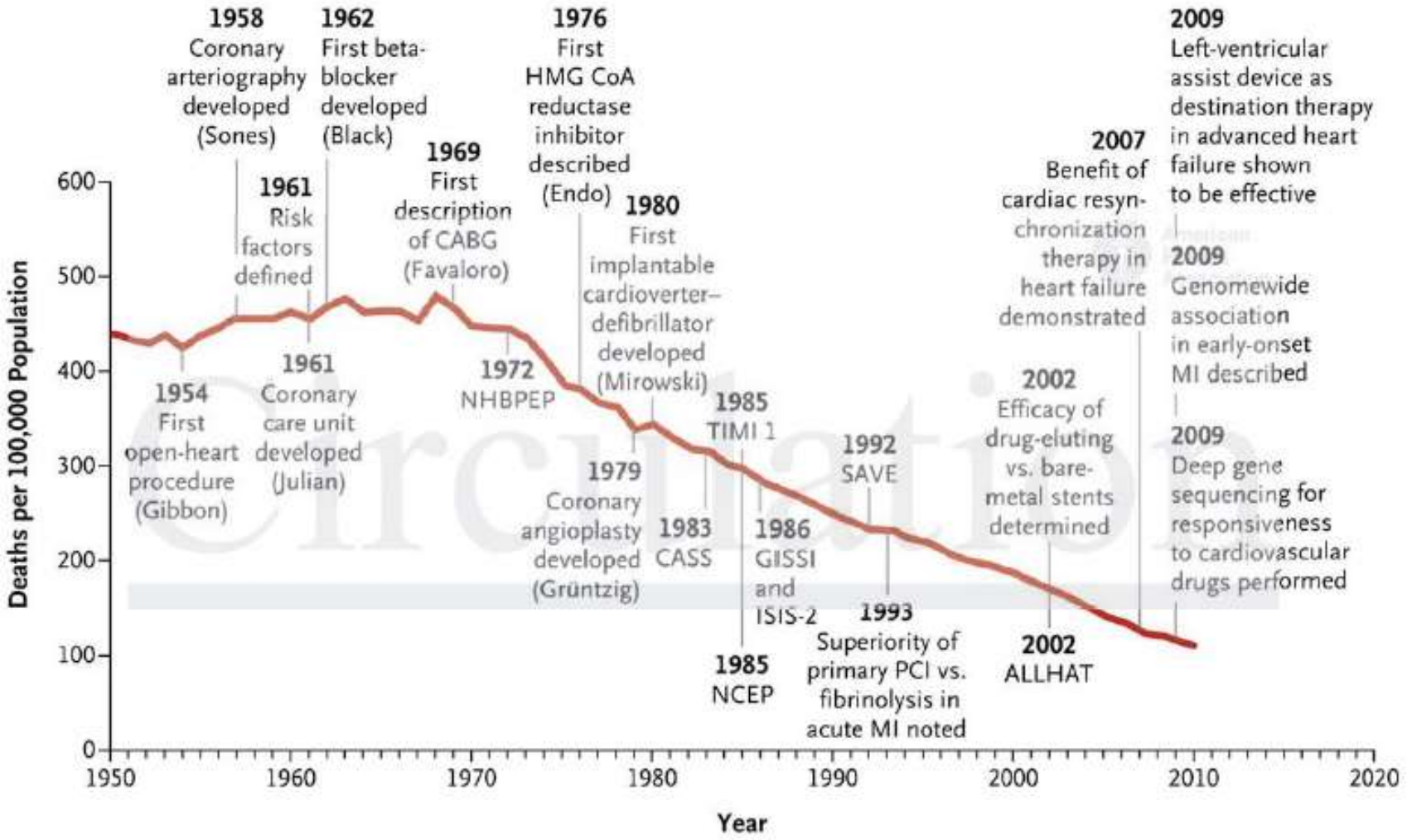
MIND THE GAP !!!

- **Levels of Evidence:**
  1. The type of the primary endpoint in randomized trials (clinical vs. surrogate) is not included
  2. Power calculations are not included
  3. Two small meta-analyses may lead to level A
  4. No definition of a „small“ or a „large“ study
  5. No differentiation regarding the quality of registries
- **Classes of Recommendations:**
  1. Evidence is included in this definition
  2. What is „general agreement“ ?
  3. Class III does not differentiate „not useful“ from „harmful“

MIND THE GAP !!!

1. The current criteria for the assessment of the quality of a clinical study are outdated and no longer sufficient.
2. Therefore the recommendations are inherently subjective and differ between various committees looking at the same data.
3. Therefore we need an adequate, transparent and reproducible system for the quality assessment of clinical trials, so different committees will automatically come to the same assessment.

Decline in Deaths from Cardiovascular Disease in Relation to Scientific Advances

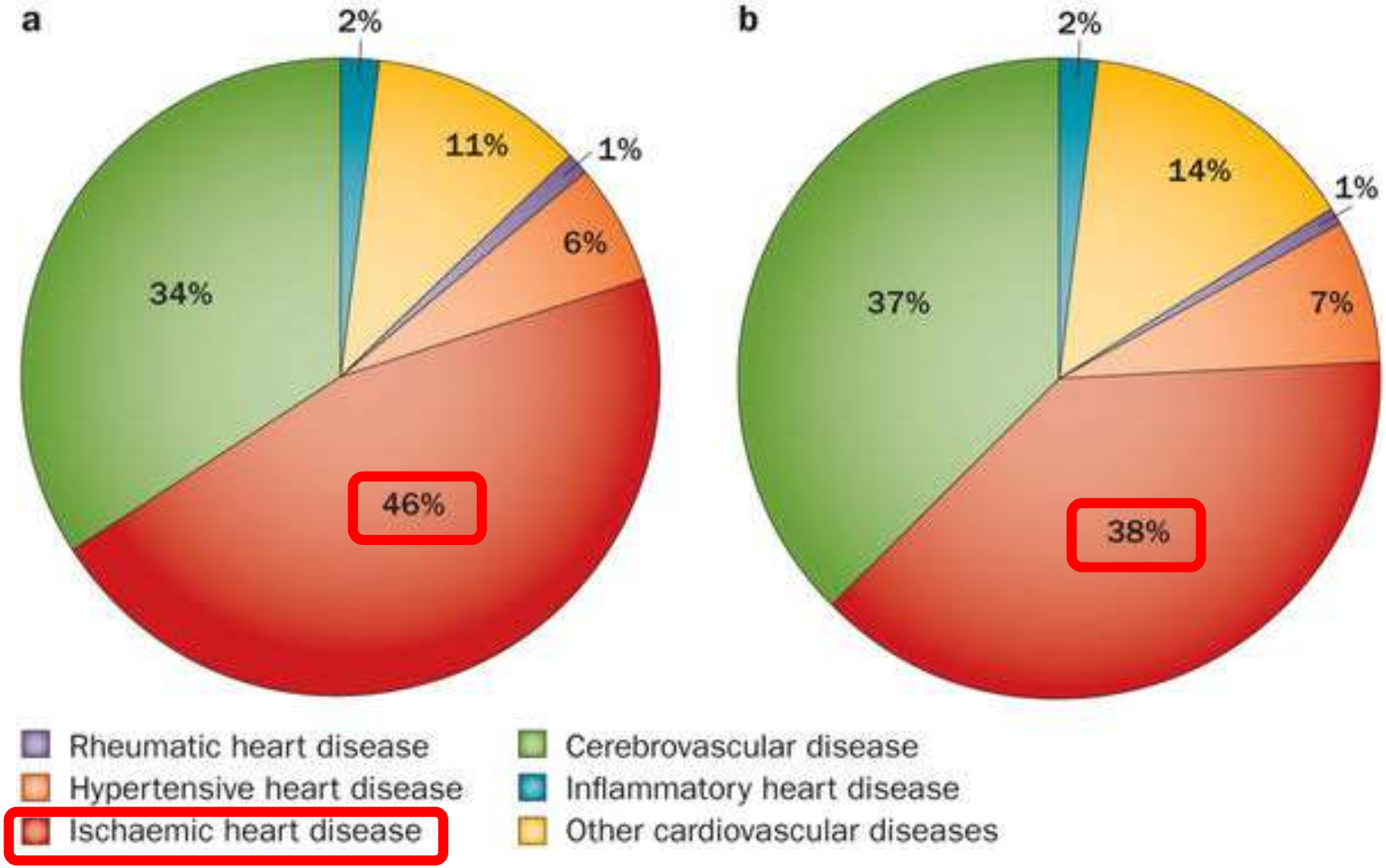


Heart Disease Prevention in Young Women: Sounding an Alarm
Elizabeth G. Nabel

Causes of cardiovascular death

MEN

WOMEN



The evolving epidemiology of acute coronary syndromes

Christian T. Ruff and Eugene Braunwald

Gradual increased incidence of NSTEMI compared to STEMI is associated with lower in-hospital mortality but with a worst prognosis

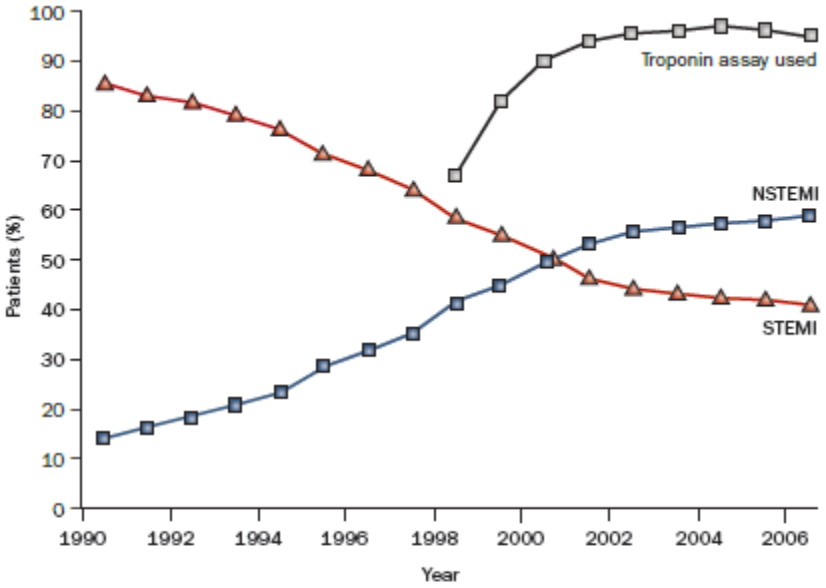


Figure 2 | Prevalence of STEMI and NSTEMI in the National Registry of Myocardial Infarction from 1990 to 2006 and proportion of patients in whom a troponin assay was used to diagnose MI. Abbreviations: MI, myocardial infarction; NSTEMI, non-ST-segment elevation myocardial infarction; STEMI, ST-segment elevation myocardial infarction. Reprinted from the *American Heart Journal*, **156**, Rogers, W. J. *et al.*, Trends in presenting characteristics and hospital mortality among patients with ST elevation and non-ST elevation myocardial infarction in the National Registry of Myocardial Infarction from 1990 to 2006. 1026–1034, Copyright (2008) with permission from Elsevier.

Ruff, C. T. & Braunwald, E. *Nat. Rev. Cardiol.* **8**, 140–147 (2011); published online 21 December 2010; doi:10.1038/nrcardio.2010.199

ESC European Society of Cardiology

European Heart Journal (2018) **00**, 1–33
doi:10.1093/eurheartj/ehy462

EXPERT CONSENSUS DOCUMENT

Fourth universal definition of myocardial infarction (2018)

Kristian Thygesen* (Denmark), Joseph S. Alpert* (USA), Allan S. Jaffe (USA), Bernard R. Chaitman (USA), Jeroen J. Bax (The Netherlands), David A. Morrow (USA), Harvey D. White* (New Zealand): the Executive Group on behalf of the Joint European Society of Cardiology (ESC)/American College of Cardiology (ACC)/ American Heart Association (AHA)/World Heart Federation (WHF) Task Force for the Universal Definition of Myocardial Infarction

Universal definitions of myocardial injury and myocardial infarction

Criteria for myocardial injury

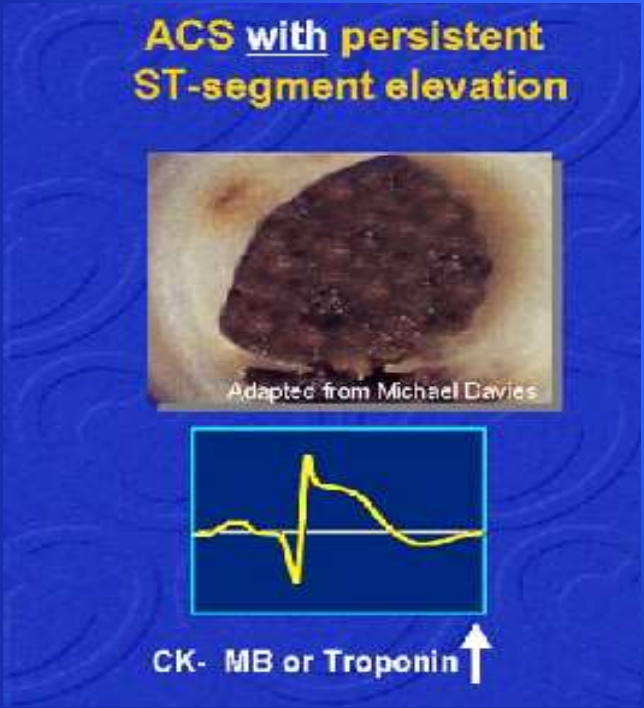
The term myocardial injury should be used when there is evidence of elevated cardiac troponin values (cTn) with at least one value above the 99th percentile upper reference limit (URL). The myocardial injury is considered acute if there is a rise and/or fall of cTn values.

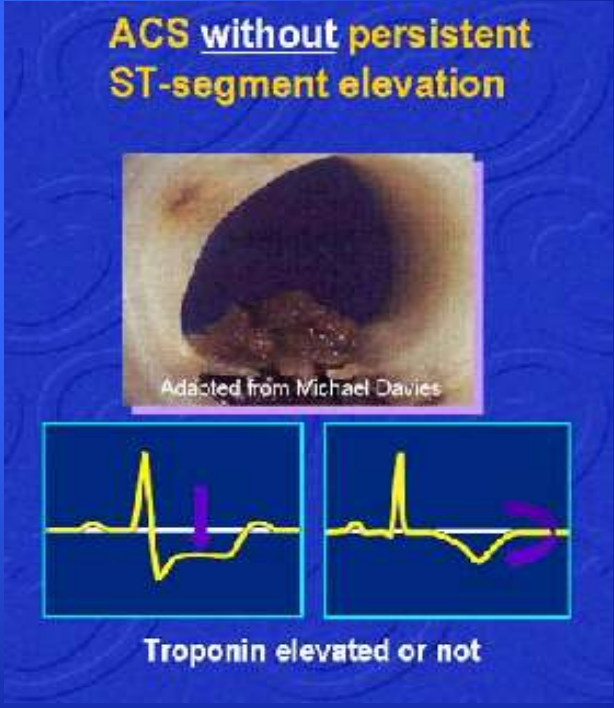
Criteria for acute myocardial infarction (types 1, 2 and 3 MI)

The term acute myocardial infarction should be used when there is acute myocardial injury with clinical evidence of acute myocardial ischaemia and with detection of a rise and/or fall of cTn values with at least one value above the 99th percentile URL and at least one of the following:

- Symptoms of myocardial ischaemia;
- New ischaemic ECG changes;
- Development of pathological Q waves;
- Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality in a pattern consistent with an ischaemic aetiology;
- Identification of a coronary thrombus by angiography or autopsy (not for types 2 or 3 MIs).

Myocardial Infarction is a «thrombotic emergency»





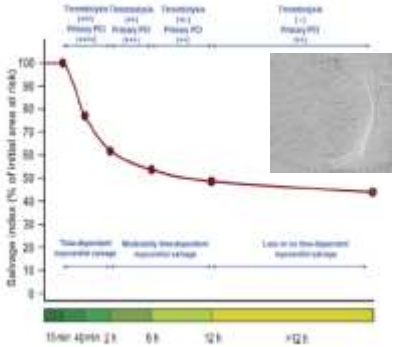
How can we treat a «thrombotic emergency»?

For years, thrombolysis was the treatment of choice in patients with acute myocardial infarction resulting in a significant reduction in mortality in the acute phase.

The introduction in the last decade of primary angioplasty has posed the problem of a correct therapeutic procedure that would allow to use in the best sequence both methods exploiting the advantages of both

PCI is Here to Stay

TIME IS MUSCLE!



- **Reperfusion therapy in a patient with a ST-segment elevation myocardial infarction has time as a cornerstone.**
- **The reduction in mortality achieved in these patients is closely linked to the minutes between the onset of precordial symptomatology and the onset of coronary reperfusion.**

Gibson CM, et al. JACC 2004

Scömig A, et al. Eur. Heart J 2006, 27; 1900-1907

ESC European Society of Cardiology
European Heart Journal (2018) 0, 1–3
doi:10.1093/eurheartj/ehy069

EDITORIAL

Reperfusion delay in patients with high-risk ST-segment elevation myocardial infarction: every minute counts, much more than suspected

William Wijns[1]* and Christoph K. Naber[2]

[1]The Lambe Institute for Translational Medicine and Curam, National University of Ireland Galway, and Saolta University Healthcare Group, Galway, Ireland; and [2]Contilia Heart and Vascular Centre, Department of Cardiology and Angiology, Elisabeth Krankenhaus Essen, Germany

This editorial refers to 'Impact of treatment delay on mortality in ST-segment elevation myocardial infarction (STEMI) patients presenting with and without haemodynamic instability: results from the German prospective, multicentre FITT-STEMI trial', by K.H. Scholz *et al.*, doi:10.1093/eurheartj/ehy004.

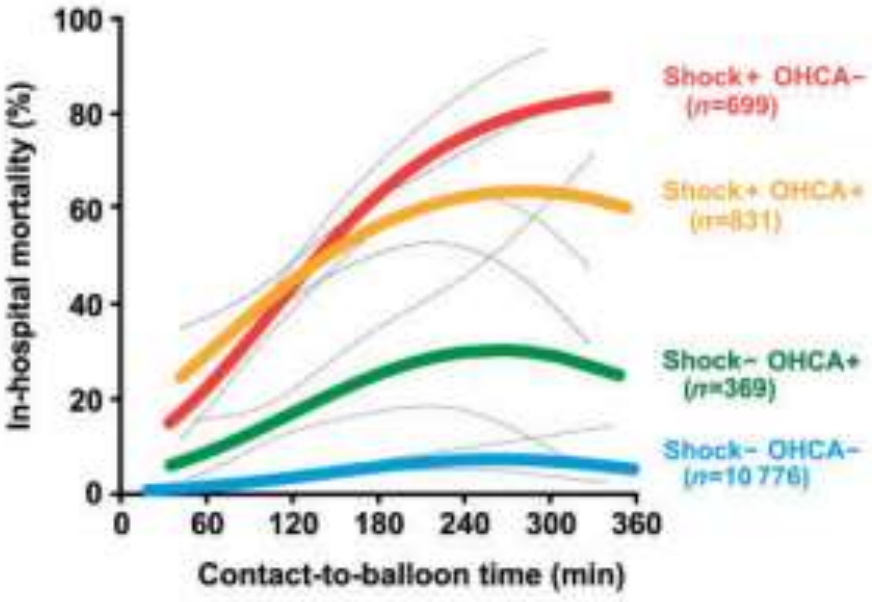


Table 1 Impact of reperfusion delay in high-risk STEMI patients: memorable quotes from the FITT-STEMI trial

Mortality was 3.9% with C2B delay ≤90 min vs. 12.2% with C2B delay >90 min ($P < 0.0001$)
When patients with cardiogenic chock were treated ≤90 min after first medical contact, there was pronounced survival benefit: odds ratio 0.49, 95% confidence interval 0.36–0.66 ($P < 0.0001$)
In cardiogenic shock patients, one additional life could be saved out of five patients treated by reducing the C2B time to ≤90 min
When patients with out of hospital cardiac arrest were treated ≤90 min after first medical contact, there was pronounced survival benefit: odds ratio 0.56, 95% confidence interval 0.38–0.82 ($P = 0.0031$)
In cardiogenic shock patients (no out of hospital cardiac arrest), every 10 min treatment delay results in 3.31 additional deaths per 100 PCI-treated patients
In cardiogenic shock patients with out of hospital cardiac arrest, every 10 min treatment delay results in 2.09 additional deaths per 100 PCI-treated patients
In out of hospital cardiac arrest patients (no cardiogenic shock), every 10 min treatment delay results in 1.34 additional deaths per 100 PCI-treated patients
In stable STEMI patients (no cardiogenic shock, no out of hospital cardiac arrest), every 10 min treatment delay results in 0.34 additional deaths per 100 PCI-treated patients

C2B, contact to balloon; PCI, percutaneous coronary intervention; STEMI, ST-segment elevation myocardial infarction.

Missed Opportunities in Cardiac Arrest

The Promise of 24/7 Ongoing On-Site Interventional Cardiologist Availability

JACC
JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY

JACC VOL. 71, NO. 21, 2018
MAY 29, 2018:2487–94

In order to minimize time to reperfusion, we have adopted, in the last few years at Tor Vergata University Medical Center, a novel management approach whereby an interventional cardiologist is always available on site for emergency revascularization.

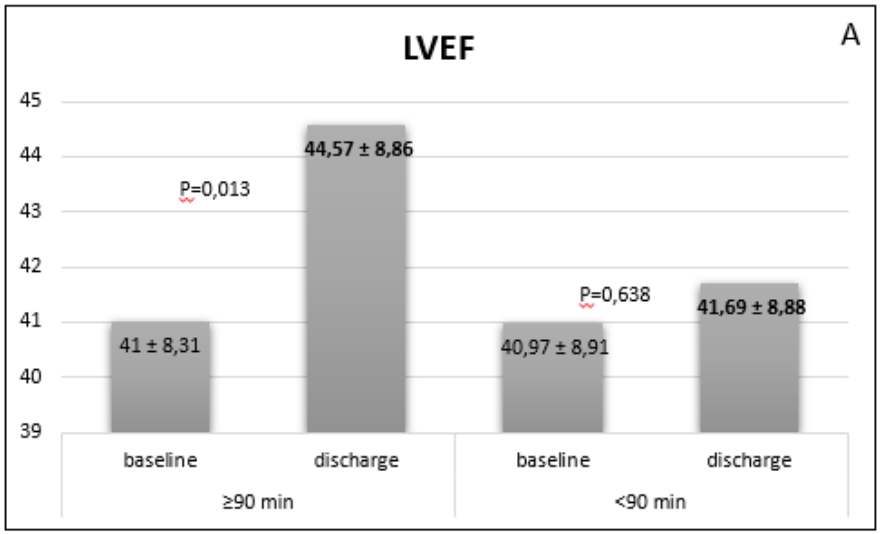
Indeed, this simple strategy has led to remarkable reductions in time to reperfusion (decreasing from 89 to 45 min; $p < 0.05$) and improvements in 1-month mortality (from 8.9% to 3.9%; $p < 0.05$). Although the

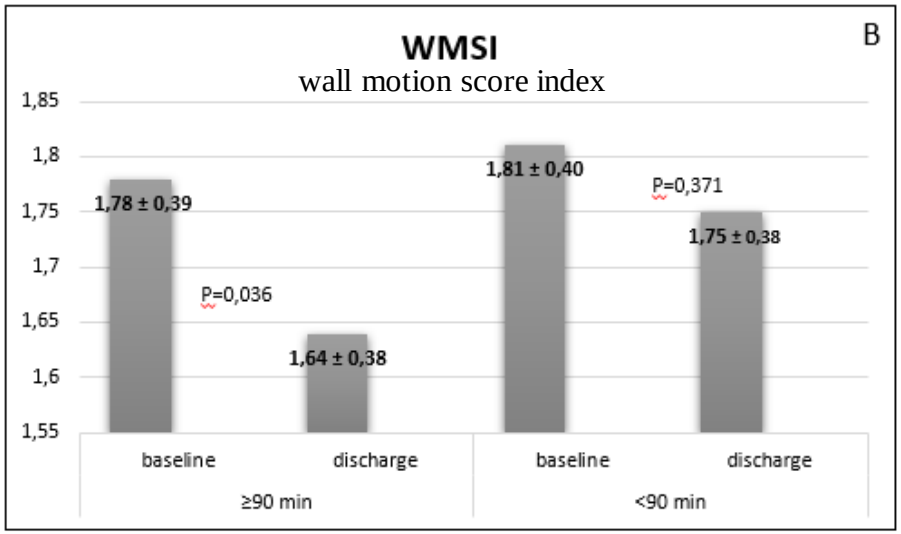
Impact of ischaemic time on ventricular function at discharge

Our experience

141 consecutive patients with STEMI undergoing PCI

Two groups based on the duration of the Door-To-Balloon time (D2B), ≤90 minutes and >90 minutes

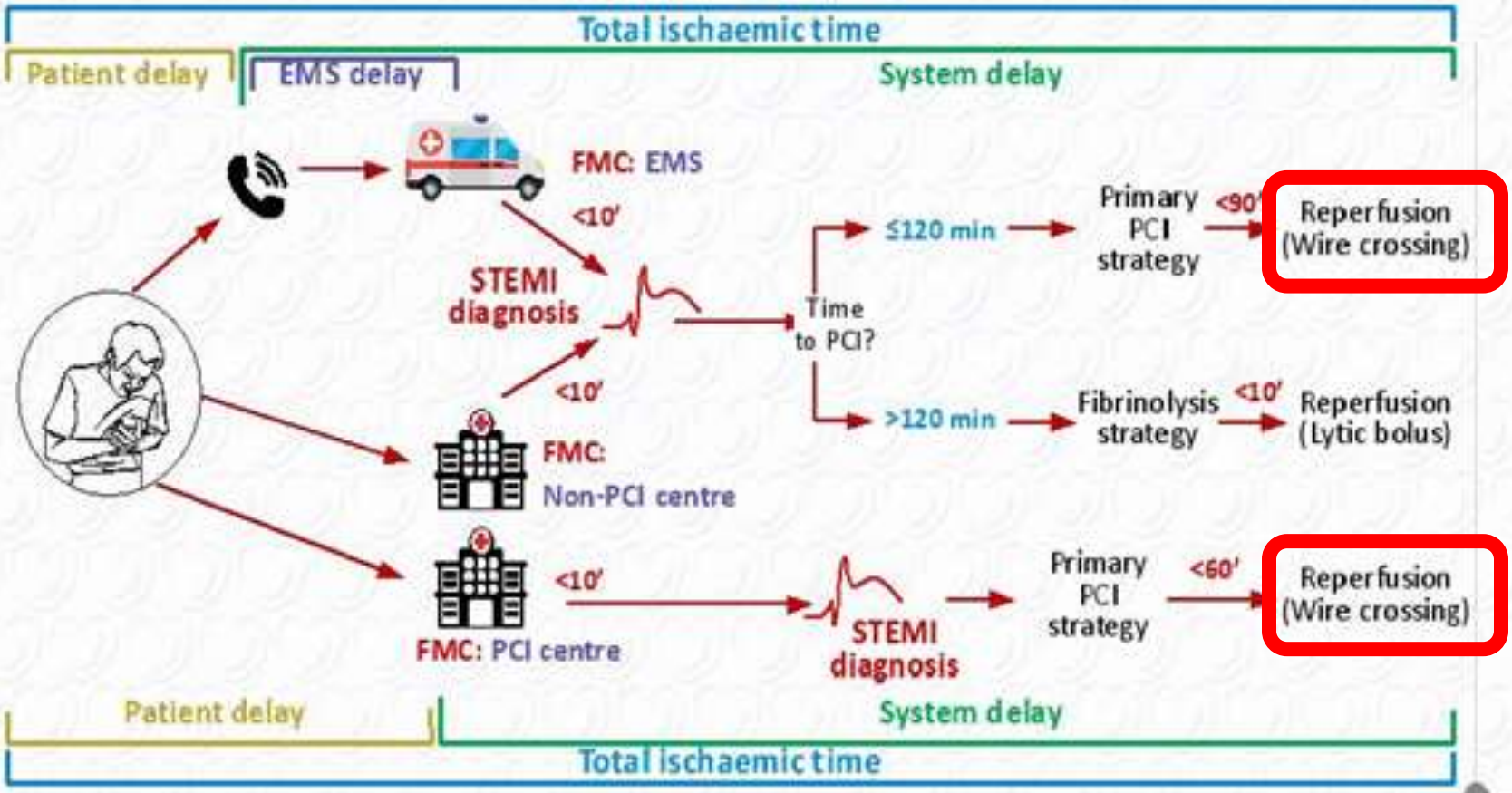




Reducing the duration of precoronary time is critical to reducing the incidence of post-infarct adverse events, such as severe alteration of global and regional left ventricular function

Modes of patient presentation, components of ischaemic time and flowchart for reperfusion strategy selection

ESC
European Society of Cardiology



www.escardio.org/guidelines 2017 ESC Guidelines for the Management of AMI-STEMI (European Heart Journal 2017 - doi:10.1093/eurheartj/ehx095)

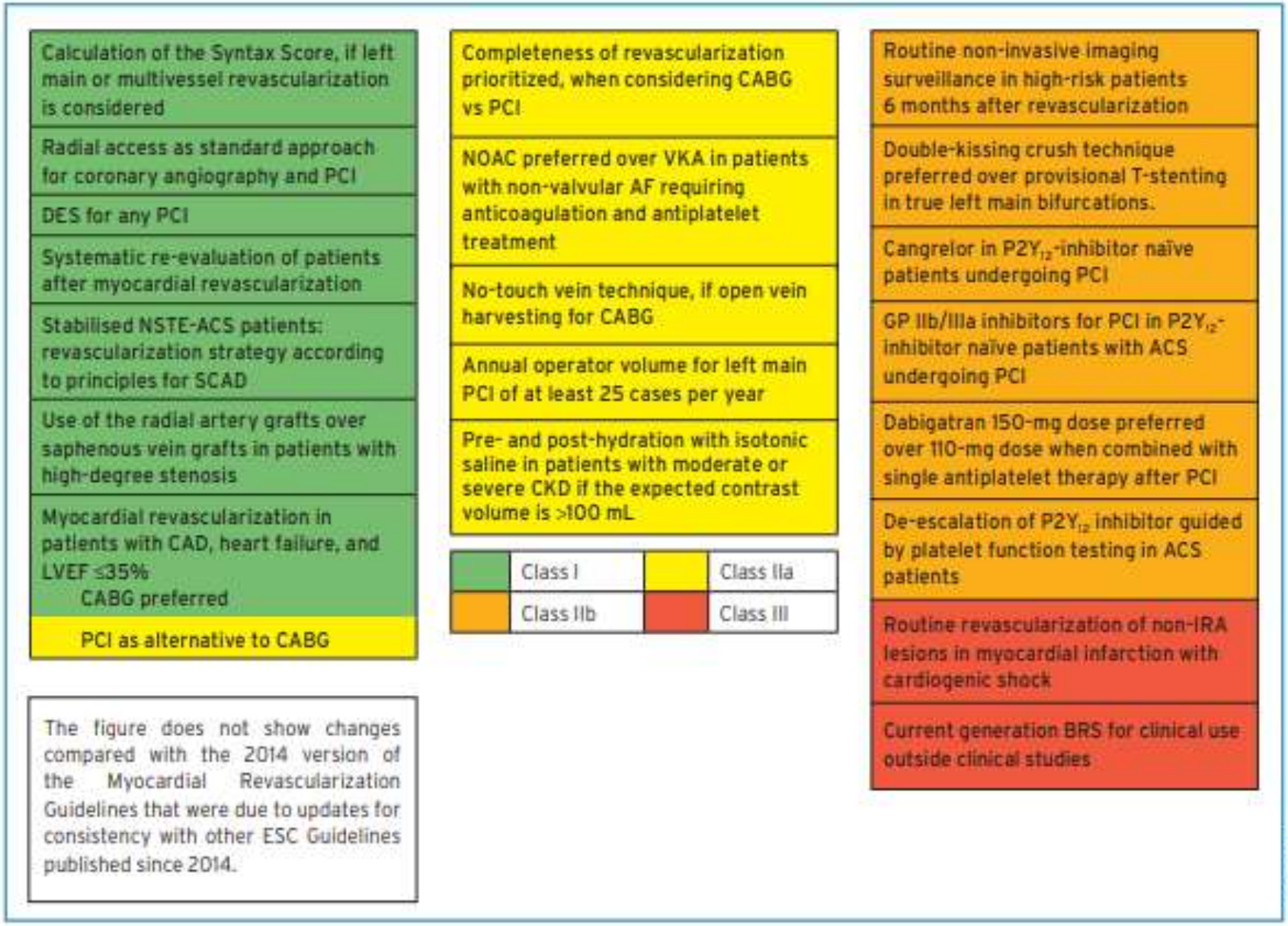
ESC
European Society of Cardiology
European Heart Journal (2019) **40**, 87–165
doi:10.1093/eurheartj/ehy394

2018 ESC/EACTS Guidelines on myocardial revascularization

The Task Force on myocardial revascularization of the European Society of Cardiology (ESC) and European Association for Cardio-Thoracic Surgery (EACTS)

Developed with the special contribution of the European Association for Percutaneous Cardiovascular Interventions (EAPCI)

Nuove raccomandazioni



Quali sono i problemi aperti a cui le Linee Guida hanno tentato di dare una risposta?

- Come trattare lo shock cardiogeno
- DES *vs* BMS
- Accesso radiale vs accesso femorale
- Culptit lesion o rivascolarizzazione completa nello STEMI
- Tempistiche nel trattamento dell'NSTEMI
- Malattia del tronco comune e malattia trivasale
- Direct stenting o tromboaspirazione

«Get out of Dodge»

Dodge City, Kansas, USA was the terminus of a branch trail of the Chisholm Trail over which cattle were driven north from Texas to the railroad.

It became the stereotype frontier town in movie and television Western shows.

Dodge City can be alluded to as a place characterized by lawless or unregulated conflict, particularly involving gun fights

"Kansas has but one Dodge City, with a broad expanse of territory sufficiently vast for an empire; we have only room for one Dodge City; Dodge, a synonym for all that is wild, reckless, and violent; Hell on the Plains."

— A Kansas Newspaper in the 1870's

The CULPRIT-SHOCK Trial

Revascularization in CS: Keep It Simple and Get Out of Dodge

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

PCI Strategies in Patients with Acute Myocardial Infarction and Cardiogenic Shock

H. Thiele, I. Akin, M. Sandri, G. Fuernau, S. de Waha, R. Meyer-Saraei, P. Nordbeck, T. Geisler, U. Landmesser, C. Skurk, A. Fach, H. Lapp, J.J. Piek, M. Noc, T. Goslar, S.B. Felix, L.S. Maier, J. Stepinska, K. Oldroyd, P. Serpytis, G. Montalescot, O. Barthelemy, K. Huber, S. Windecker, S. Savonitto, P. Torremante, C. Vrints, S. Schneider, S. Desch, and U. Zeymer, for the CULPRIT-SHOCK Investigators*

tct2017

October 30, 2017

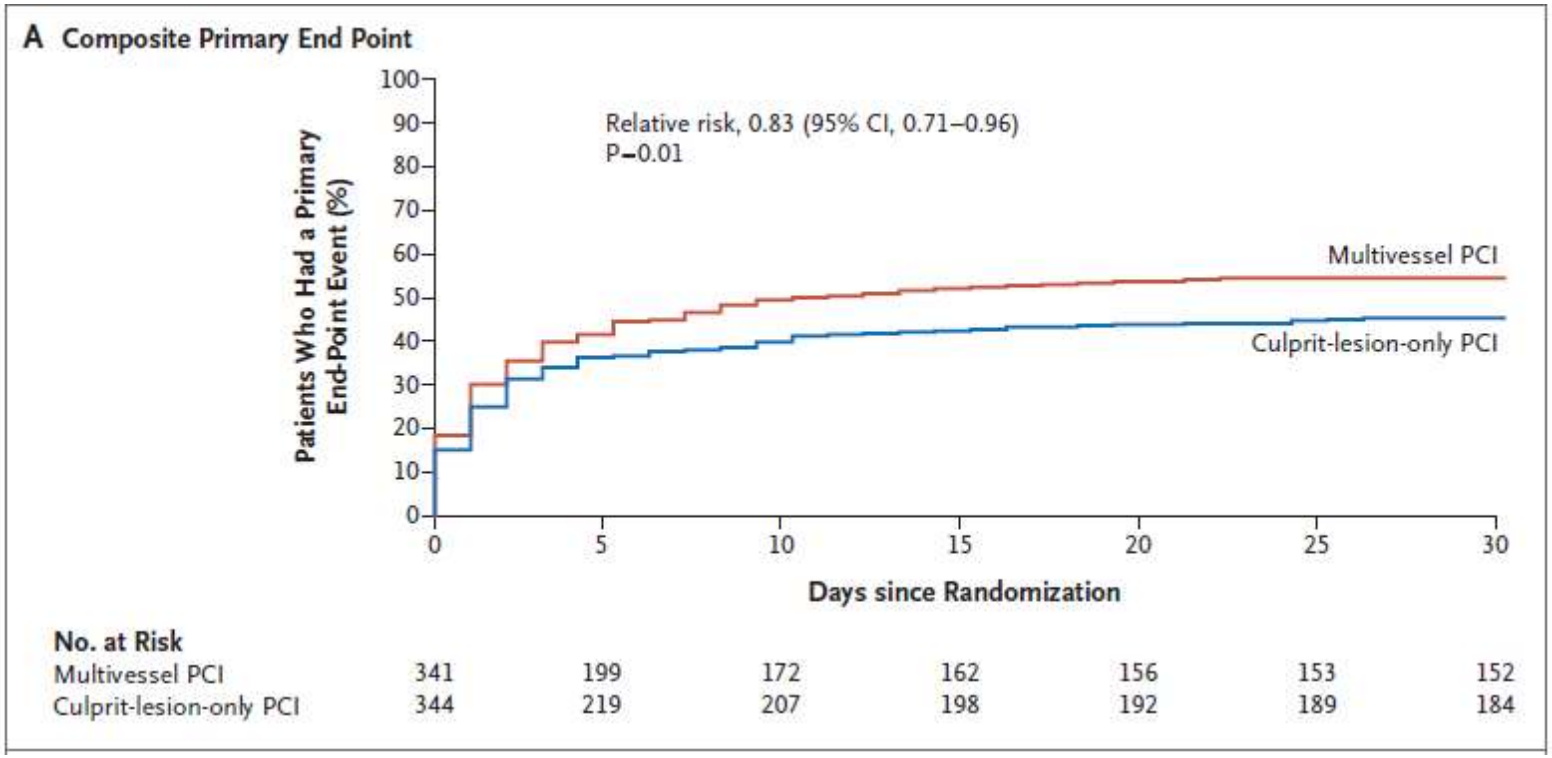
The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

PCI Strategies in Patients with Acute Myocardial Infarction and Cardiogenic Shock

Patients with multivessel CAD and acute myocardial infarction with cardiogenic shock.

30-day risk of a **composite of death or severe renal failure was lower among those who initially underwent PCI of the culprit lesion only** than among those who underwent immediate multivessel PCI.



ESC European Society of Cardiology
European Heart Journal (2019) **40**, 87–165
doi:10.1093/eurheartj/ehy394

2018 ESC/EACTS Guidelines on myocardial revascularization

The Task Force on myocardial revascularization of the European Society of Cardiology (ESC) and European Association for Cardio-Thoracic Surgery (EACTS)

Primary percutaneous coronary intervention for myocardial reperfusion in ST-elevation myocardial infarction: procedural aspects (strategy and technique)

Recommendations	Class[a]	Level[b]
Strategy		
Routine revascularization of non-IRA lesions should be considered in patients with multivessel disease before hospital discharge.[211–214]	IIa	A
CABG should be considered in patients with ongoing ischaemia and large areas of jeopardized myocardium if PCI of the IRA cannot be performed.	IIa	C
In cardiogenic shock, routine revascularization of non-IRA lesions is not recommended during primary PCI.[190]	III	B

The «Campeau paradox»

Increasing utilization of radial access may have the unintended effect of leading to more vascular complications for femoral access due to a loss of experience among operators

Lucien Campeau (June 20, 1927 – March 15, 2010) was a Canadian cardiologist. He was a full professor at the Université de Montréal.

He is best known for performing the world's first transradial coronary angiogram.

Campeau was one of the founding staff of the Montreal Heart Institute, joining in 1957.

He is also well known for developing the Canadian Cardiovascular Society grading of angina pectoris.

JACC: CARDIOVASCULAR INTERVENTIONS
VOL. 8, NO. 14, 2015

ISSN 1936-8798/$36.00
PUBLISHED BY ELSEVIER INC.
http://dx.doi.org/10.1016/j.jcin.2015.07.029

The Benefits Conferred by Radial Access for Cardiac Catheterization Are Offset by a Paradoxical Increase in the Rate of Vascular Access Site Complications With Femoral Access

The Campeau Radial Paradox

Lorenzo Azzalini, MD, PhD, MSc,* Kunle Tosin, MD,* Malorie Chabot-Blanchet, MSc,† Robert Avram, MD,* Hung Q. Ly, MD, MSc,* Benoit Gaudet, RN,* Richard Gallo, MD,* Serge Doucet, MD,* Jean-François Tanguay, MD,* Réda Ibrahim, MD,* Jean C. Grégoire, MD,* Jacques Crépeau, MD,* Raoul Bonan, MD,* Pierre de Guise, MD,* Mohamed Nosair, MD,* Jean-François Dorval, MD,* Gilbert Gosselin, MD,* Philippe L. L'Allier, MD,* Marie-Claude Guertin, PhD,† Anita W. Asgar, MD,* E. Marc Jolicœur, MD, MSc, MHS*

The Benefits Conferred by Radial Access for Cardiac Catheterization Are Offset by a Paradoxical Increase in the Rate of Vascular Access Site Complications With Femoral Access

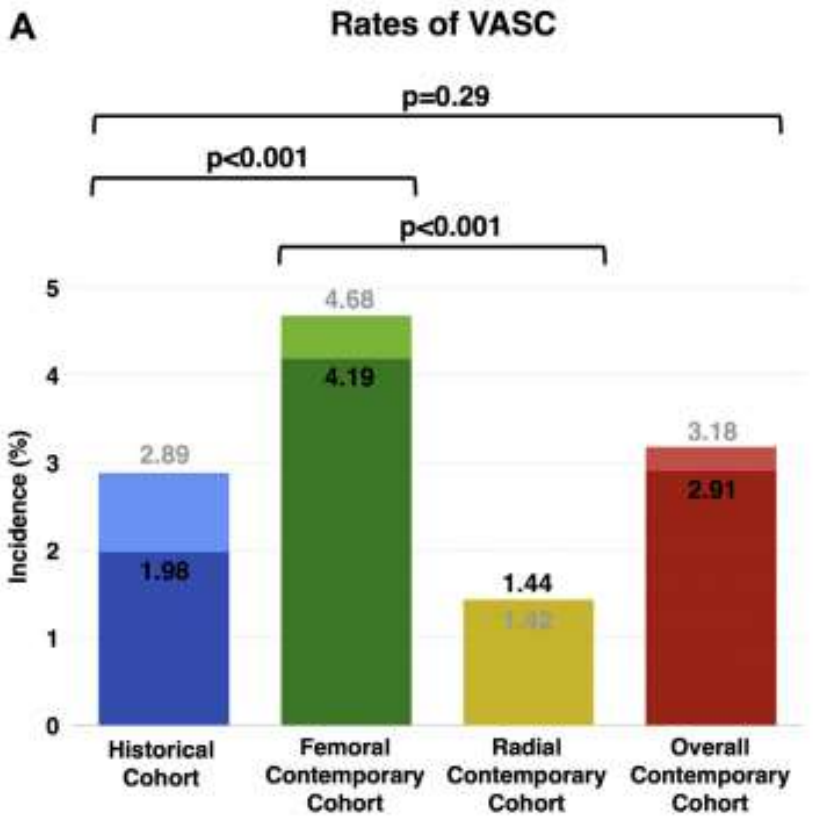
The Campeau Radial Paradox

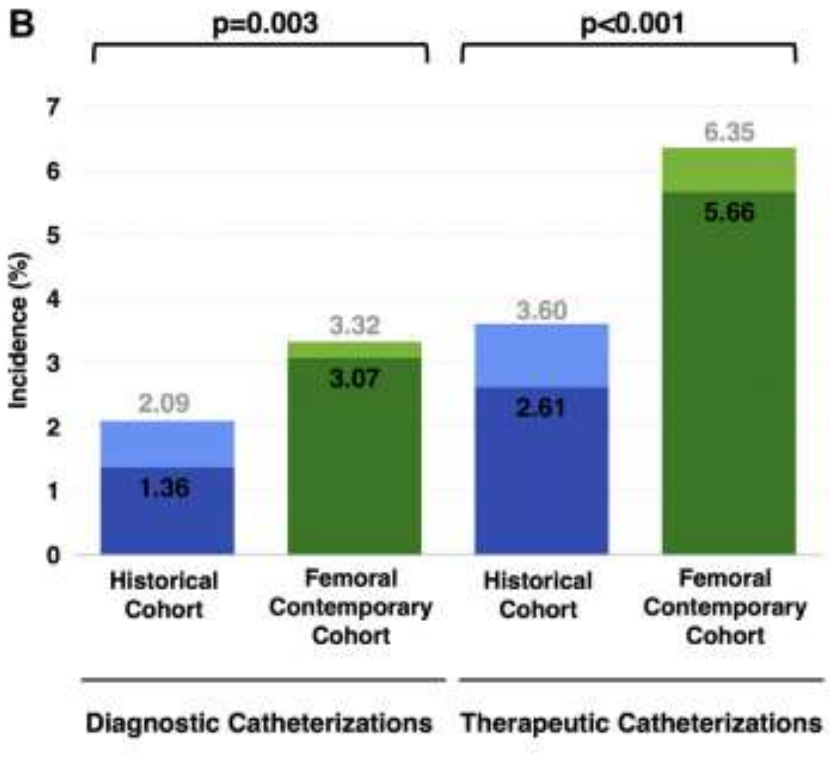
Lorenzo Azzalini, MD, PhD, MSc,* Kunle Tosin, MD,* Malorie Chabot-Blanchet, MSc,† Robert Avram, MD,* Hung Q. Ly, MD, MSc,* Benoit Gaudet, RN,* Richard Gallo, MD,* Serge Doucet, MD,* Jean-François Tanguay, MD,* Réda Ibrahim, MD,* Jean C. Grégoire, MD,* Jacques Crépeau, MD,* Raoul Bonan, MD,* Pierre de Guise, MD,* Mohamed Nosair, MD,* Jean-François Dorval, MD,* Gilbert Gosselin, MD,* Philippe L. L'Allier, MD,* Marie-Claude Guertin, PhD,† Anita W. Asgar, MD,* E. Marc Jolicœur, MD, MSc, MHS*

OBJECTIVES The purpose of this study was to assess whether the benefits conferred by radial access (RA) at an individual level are offset by a proportionally greater incidence of vascular access site complications (VASC) at a population level when femoral access (FA) is performed.

BACKGROUND The recent widespread adoption of RA for cardiac catheterization has been associated with increased rates of VASCs when FA is attempted.

METHODS Logistic regression was used to calculate the adjusted VASC rate in a contemporary cohort of consecutive patients (2006 to 2008) where both RA and FA were used, and compared it with the adjusted VASC rate observed in a historical control cohort (1996 to 1998) where only FA was used. We calculated the adjusted attributable risk to estimate the proportion of VASC attributable to the introduction of RA in FA patients of the contemporary cohort.





RESULTS A total of 17,059 patients were included. At a population level, the VASC rate was higher in the overall contemporary cohort compared with the historical cohort (adjusted rates: 2.91% vs. 1.98%; odds ratio [OR]: 1.48, 95% confidence interval [CI]: 1.17 to 1.89; $p = 0.001$). In the contemporary cohort, RA patients experienced fewer VASC than FA patients (adjusted rates: 1.44% vs. 4.19%; OR: 0.33, 95% CI: 0.23 to 0.48; $p < 0.001$). We observed a higher VASC rate in FA patients in the contemporary cohort compared with the historical cohort (adjusted rates: 4.19% vs. 1.98%; OR: 2.16, 95% CI: 1.67 to 2.81; $p < 0.001$). This finding was consistent for both diagnostic and therapeutic catheterizations separately. The proportion of VASCs attributable to RA in the contemporary FA patients was estimated at 52.7%.

The Benefits Conferred by Radial Access for Cardiac Catheterization Are Offset by a Paradoxical Increase in the Rate of Vascular Access Site Complications With Femoral Access

The Campeau Radial Paradox

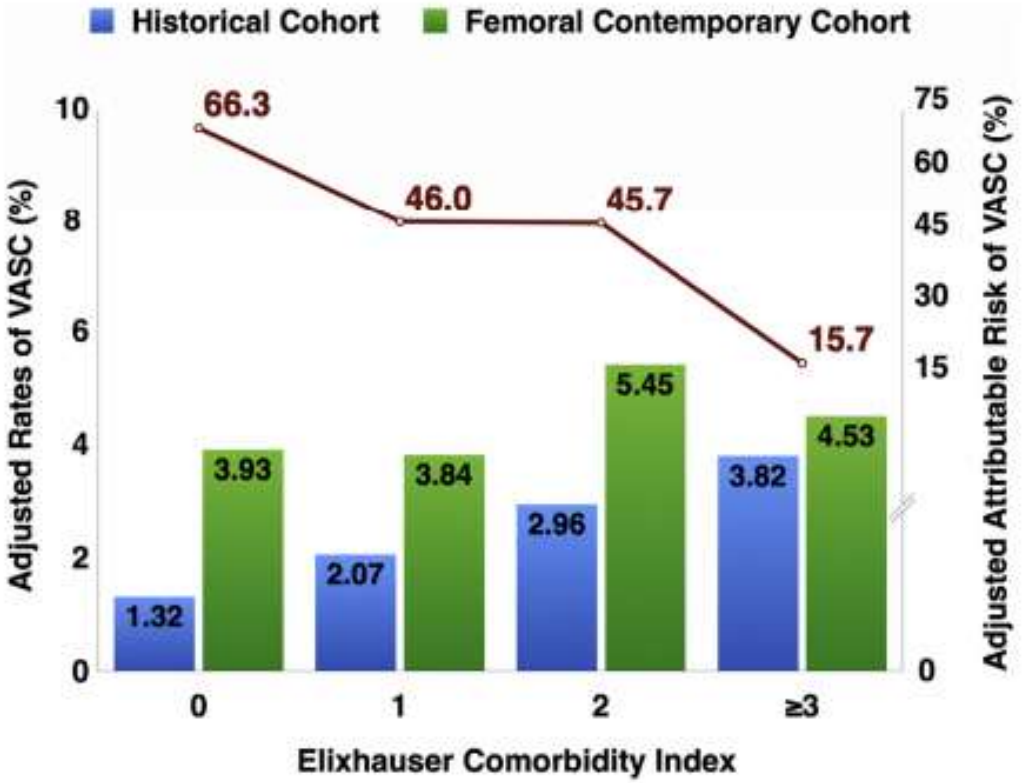
Lorenzo Azzalini, MD, PhD, MSc,* Kunle Tosin, MD,* Malorie Chabot-Blanchet, MSc,† Robert Avram, MD,* Hung Q. Ly, MD, MSc,* Benoit Gaudet, RN,* Richard Gallo, MD,* Serge Doucet, MD,* Jean-François Tanguay, MD,* Réda Ibrahim, MD,* Jean C. Grégoire, MD,* Jacques Crépeau, MD,* Raoul Bonan, MD,* Pierre de Guise, MD,* Mohamed Nosair, MD,* Jean-François Dorval, MD,* Gilbert Gosselin, MD,* Philippe L. L'Allier, MD,* Marie-Claude Guertin, PhD,† Anita W. Asgar, MD,* E. Marc Jolicœur, MD, MSc, MHS*

We estimated that 52.7% of VASCs in contemporary FA patients were attributable to the use of the RA.

This means that, after multivariate adjustment, 52.7% of the VASCs experienced in FA patients of the contemporary cohort are attributable to the emphasis on RA.

Accesso vascolare e comorbidità

FIGURE 3 VASC Stratified by Elixhauser Comorbidity Index



"The risk of a femoral VASC attributable to RA was greatest in patients with the lowest baseline risk of a VASC and in patients with the lowest propensity of undergoing FA, that is, the patients with clinical characteristics for which the operator would usually favor using RA"

Conclusions


The Benefits Conferred by Radial Access for Cardiac Catheterization Are Offset by a Paradoxical Increase in the Rate of Vascular Access Site Complications With Femoral Access

The Campeau Radial Paradox

We observed an increase in the rates of VASCs when FA is performed in a large, all-comer contemporary cohort of patients undergoing diagnostic or therapeutic cardiac catheterizations (where both RA and FA are used) compared with historical control subjects.

This increase of FA-related VASCs at a population level offset the benefit associated with RA at a patient level.

The existence of a radial paradox should be taken into account, and appropriate actions should be taken to improve patient outcomes when FA is required.

Altre evidenze

Change in Hospital-Level Use of Transradial Percutaneous Coronary Intervention and Periprocedural Outcomes

Insights from the National Cardiovascular Data Registry

Steven M. Bradley, MD, MPH; Sunil V. Rao, MD; Jeptha P. Curtis, MD; Craig S. Parzynski, MS; John C. Messenger, MD; Stacie L. Daugherty, MD, MSPH; John S. Rumsfeld, MD, PhD; Hitinder S. Gurm, MD

Circ Cardiovasc Qual Outcomes July 2014

The risk of Femoral Access site bleeding increased as a function of the relative increase in Radial Access adoption: from 6.3% in the very-low adoption group (< 0.001)

Patients undergoing PCI from the femoral route by default radial operators are at high risk of vascular access-site complications

Ihsan M. Rafie, MD; Muez M. Uddin, MD; Nicholas Ossei-Gerning, MD; Richard A. Anderson, MD; Timothy D. Kinnaird, MD

EuroIntervention 2014;9:1189-1194. DOI: 10.4244/EIJV9I10A200

VASC rates of 12.5% with FA among default radial operators in the United Kingdom, where FA is reserved for challenging clinical scenarios, in which both patient- and procedurerelated risk factors for bleeding are highly prevalent.

STEMI: Culptit lesion or complete revascularization in STEMI

GLOBAL CARDIOLOGY SCIENCE & PRACTICE
A Qatar Foundation Academic Journal

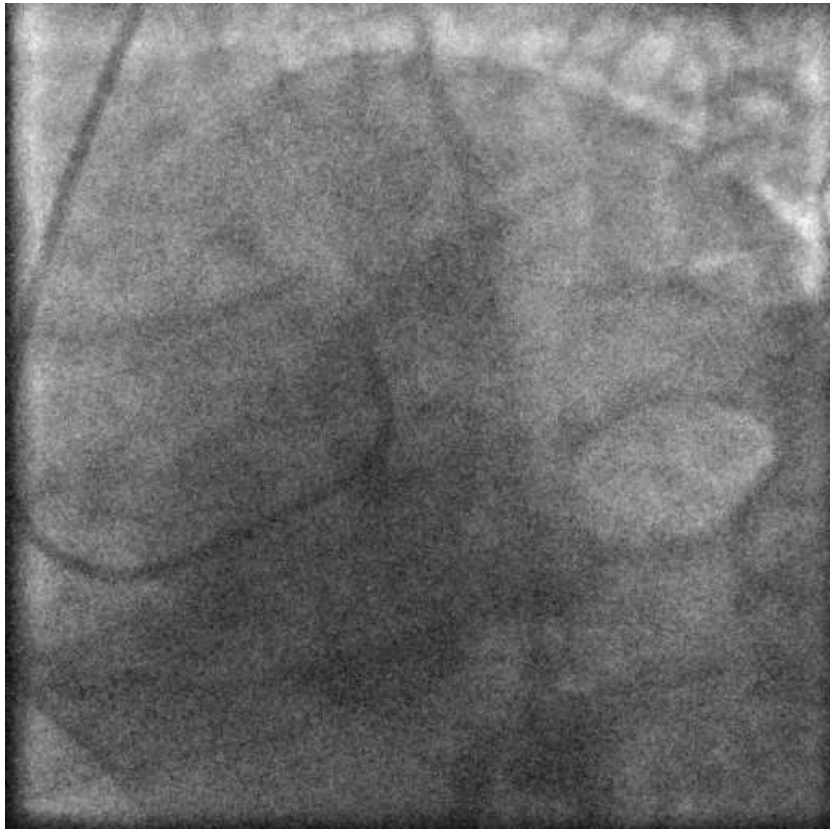
Lessons from the trials

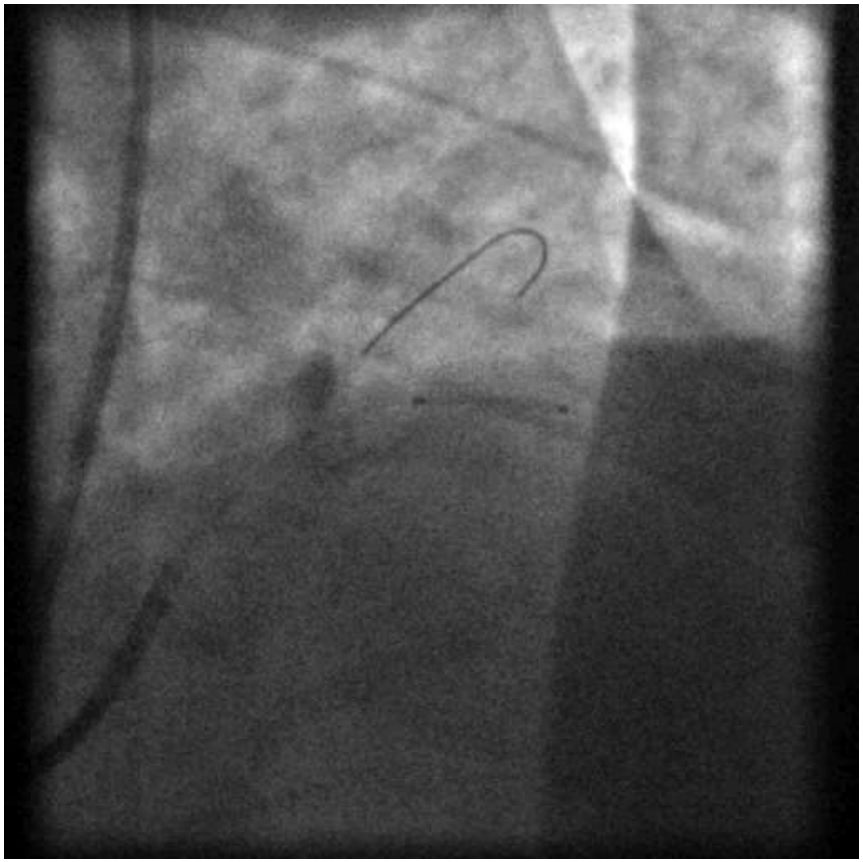
Culprit lesion-only versus complete revascularization in patients with STEMI: Lessons learned from PRAMI, CvLPRIT, and DANAMI-3 PRIMULTI

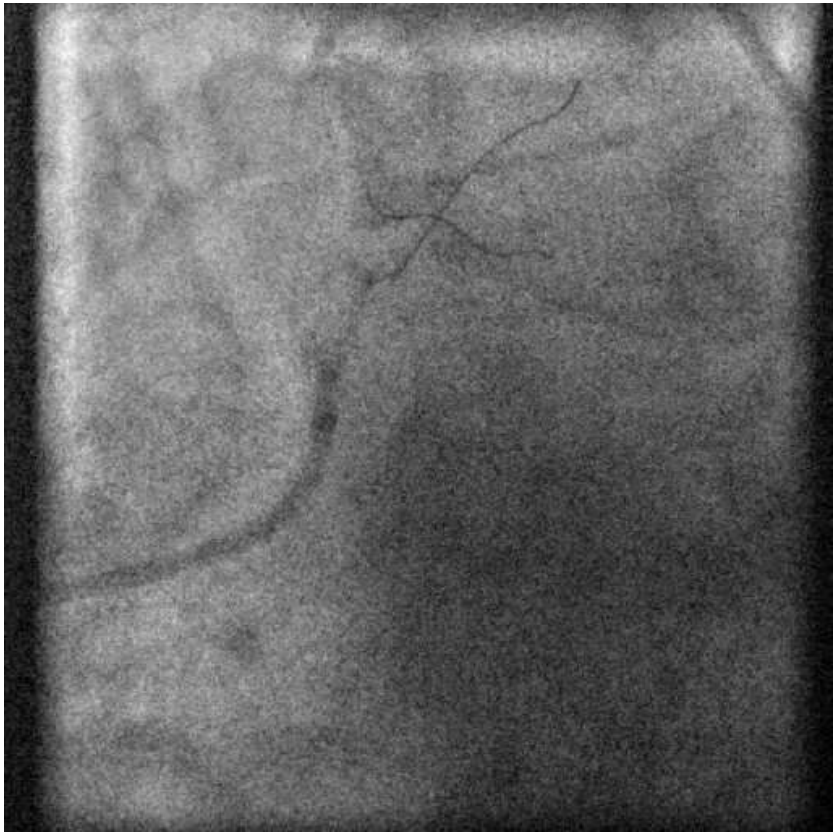
Ahmed Hassan[1,2], Ahmed ElGuindy[1,*], David Antoniucci[3]

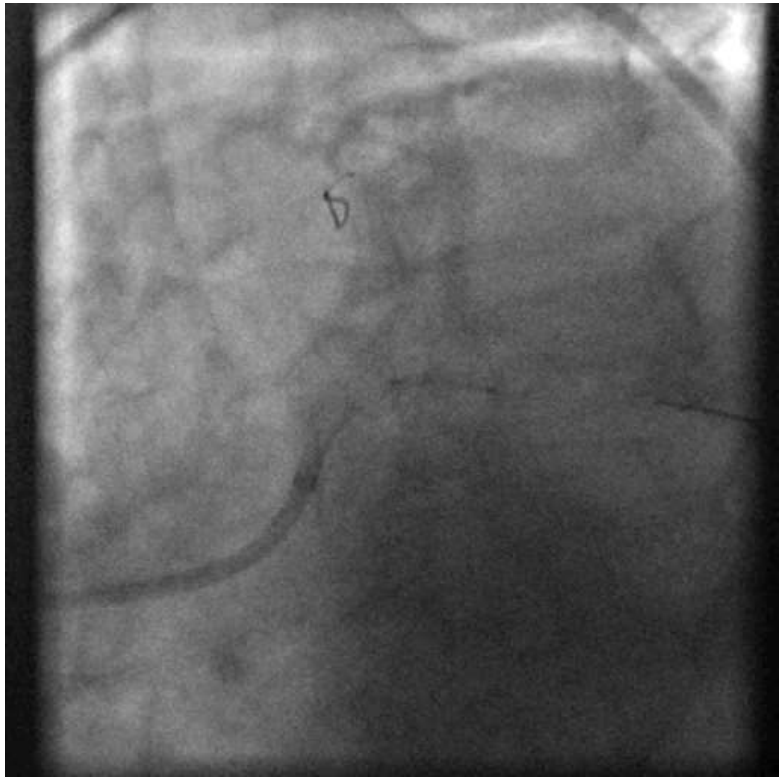
What have we learned?

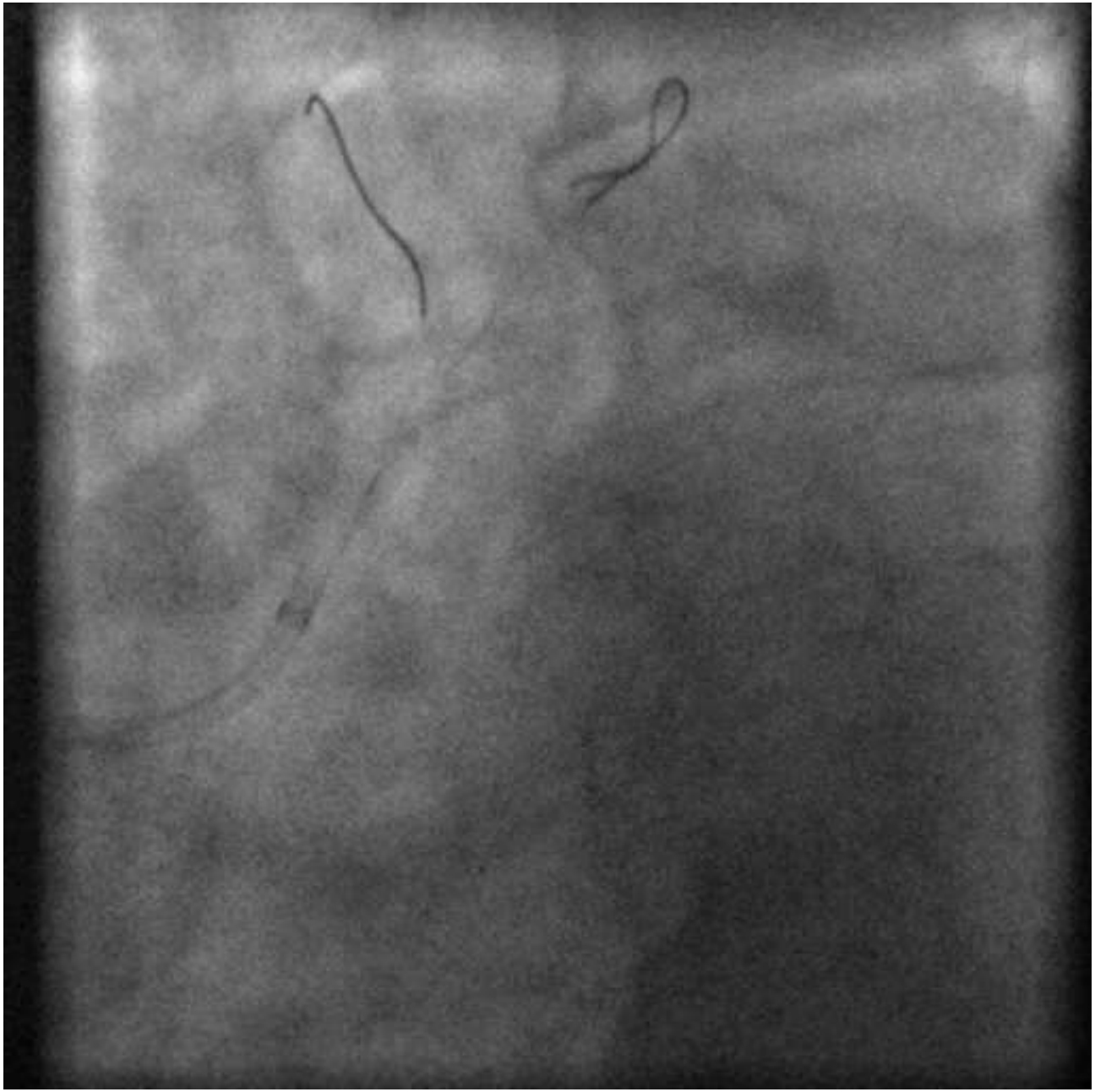
There is growing evidence that complete revascularization during the index admission in patients with STEMI and multivessel disease reduces the risk of future events, essentially repeat PCI. The trials highlighted in this report were not designed to detect difference in mortality and did not address the best time to perform PCI to a non-IRA. There is pressing need for larger randomized studies to verify the impact of multivessel PCI on harder clinical endpoints, define the optimal timing of non-IRA revascularization, and determine the value of functional assessment of non-IRA lesions.











ESC European Society of Cardiology
European Heart Journal (2019) **40**, 87–165
doi:10.1093/eurheartj/ehy394

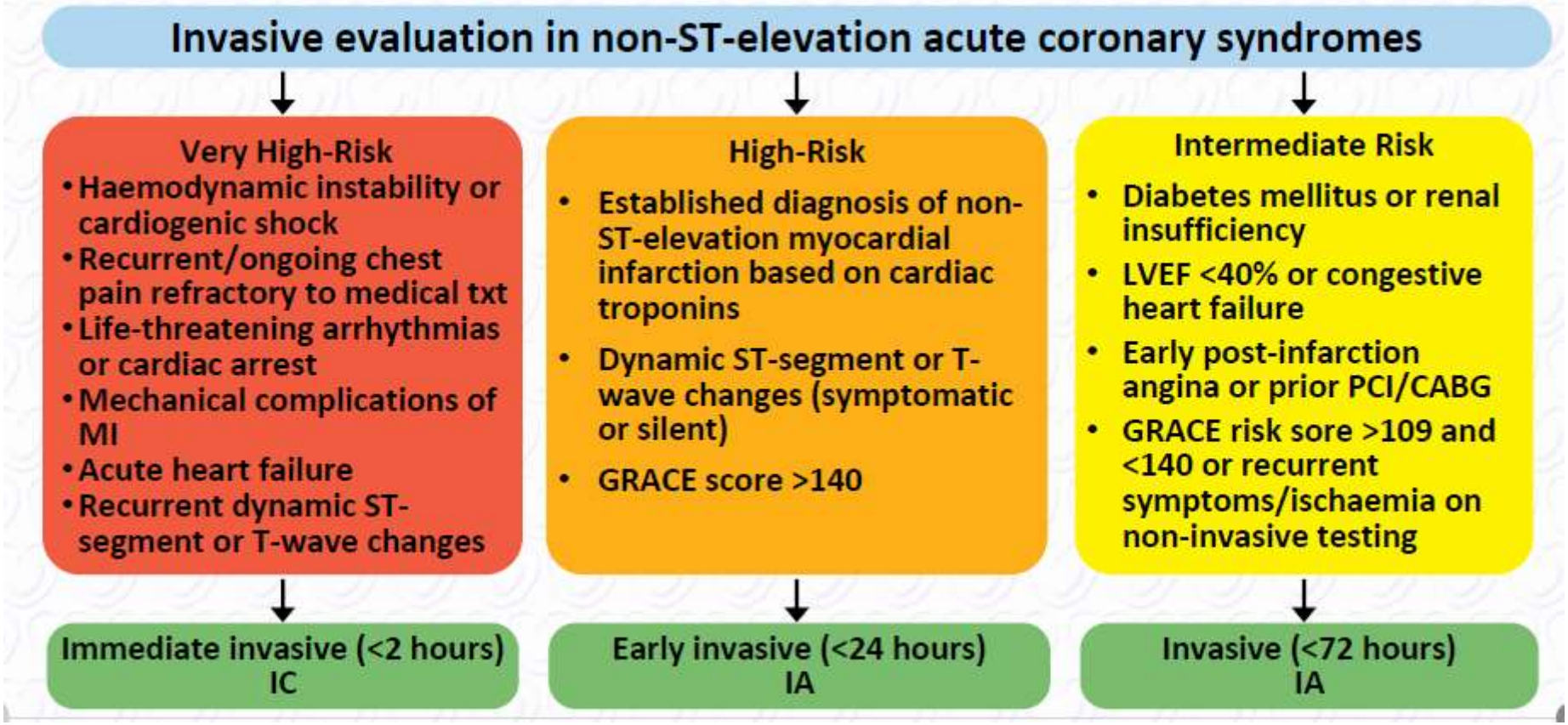
2018 ESC/EACTS Guidelines on myocardial revascularization

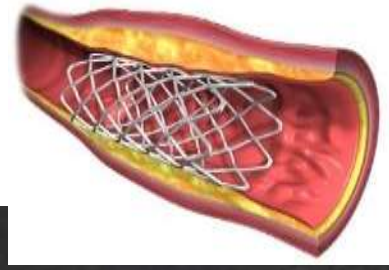
The Task Force on myocardial revascularization of the European Society of Cardiology (ESC) and European Association for Cardio-Thoracic Surgery (EACTS)

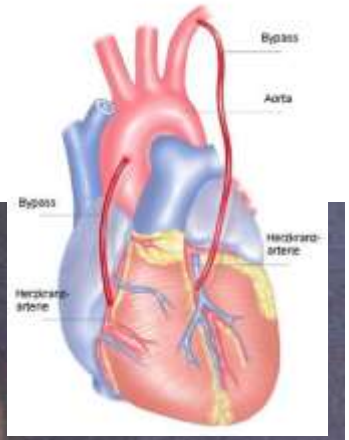
Primary percutaneous coronary intervention for myocardial reperfusion in ST-elevation myocardial infarction: procedural aspects (strategy and technique)

Recommendations	Class[a]	Level[b]
Strategy		
Routine revascularization of non-IRA lesions should be considered in patients with multivessel disease before hospital discharge.[211–214]	IIa	A
CABG should be considered in patients with ongoing ischaemia and large areas of jeopardized myocardium if PCI of the IRA cannot be performed.	IIa	C
In cardiogenic shock, routine revascularization of non-IRA lesions is not recommended during primary PCI.[190]	III	B

Trattamento NSTEMI







Jurr Pool: Die Anatomieprofessoren C. Boekelmann und Jan Six, 1699

Bypass Surgery (CABG) versus PCI (with predominantly DES) in Patients with stable CAD

Subset of CAD by anatomy	Favours CABG	Favours PCI
1VD or 2VD - non-proximal LAD	IIb C	I C
1VD or 2VD - proximal LAD	I A	IIa B
3VD simple lesions, full functional revascularisation achievable with PCI, SYNTAX score ≤ 22	I A	IIa B
3VD complex lesions, incomplete revascularisation achievable with PCI, SYNTAX score > 22	I A	III A
Left main (isolated or 1VD, ostium/shaft)	I A	IIa B
Left main (isolated or 1VD, distal bifurcation)	I A	IIb B
Left main + 2VD or 3VD, SYNTAX score ≤ 32	I A	IIb B
Left main + 2VD or 3VD, SYNTAX score ≥ 33	I A	III B

- In the most severe patterns of CAD, CABG appears to offer a survival advantage as well as a marked reduction in the need for repeat revascularisation.

Recommendation for the type of revascularization in patients with stable coronary artery disease with suitable coronary anatomy for both procedures and low predicted surgical mortality[d]

Recommendations according to extent of CAD	CABG		PCI	
	Class[a]	Level[b]	Class[a]	Level[b]
One-vessel CAD				
Without proximal LAD stenosis.	IIb	C	I	C
With proximal LAD stenosis.[68,101,139–144]	I	A	I	A
Two-vessel CAD				
Without proximal LAD stenosis.	IIb	C	I	C
With proximal LAD stenosis.[68,70,73]	I	B	I	C
Left main CAD				
Left main disease with low SYNTAX score (0 - 22).[69,121,122,124,145–148]	I	A	I	A
Left main disease with intermediate SYNTAX score (23 - 32).[69,121,122,124,145–148]	I	A	IIa	A
Left main disease with high SYNTAX score (≥33).[c 69,121,122,124,146–148]	I	A	III	B
Three-vessel CAD without diabetes mellitus				
Three-vessel disease with low SYNTAX score (0 - 22).[102,105,121,123,124,135,149]	I	A	I	A
Three-vessel disease with intermediate or high SYNTAX score (>22).[c 102,105,121,123,124,135,149]	I	A	III	A
Three-vessel CAD with diabetes mellitus				
Three-vessel disease with low SYNTAX score 0–22.[102,105,121,123,124,135,150–157]	I	A	IIb	A
Three-vessel disease with intermediate or high SYNTAX score (>22).[c 102,105,121,123,124,135,150–157]	I	A	III	A

Unsafe At Any Emissions: Toyota Set To Announce Massive 2010 Prius Recall

Joe Weisenthal | Feb. 8, 2010, 6:56 PM | 694 | 15 Print

Tags: Cars, Toyota, Scandals, Electric Cars

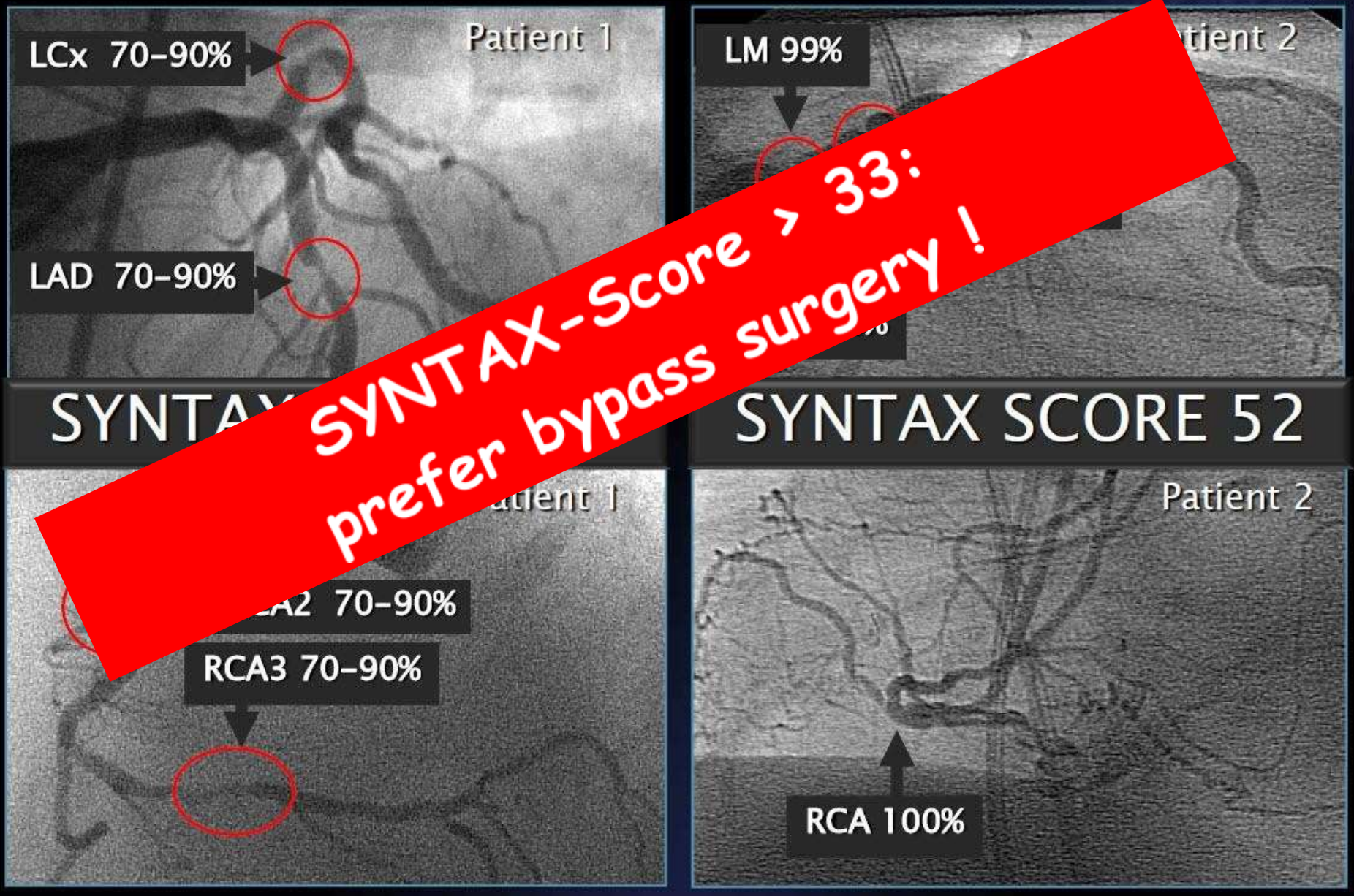
It looks like the manufacturing problems at Toyota are set to whack the company's flagship and forward-thinking line, the Prius.

According to CNN, the company will recall the entire 2010 line. Though problems hav known for some time, the compa decided what, exactly, it

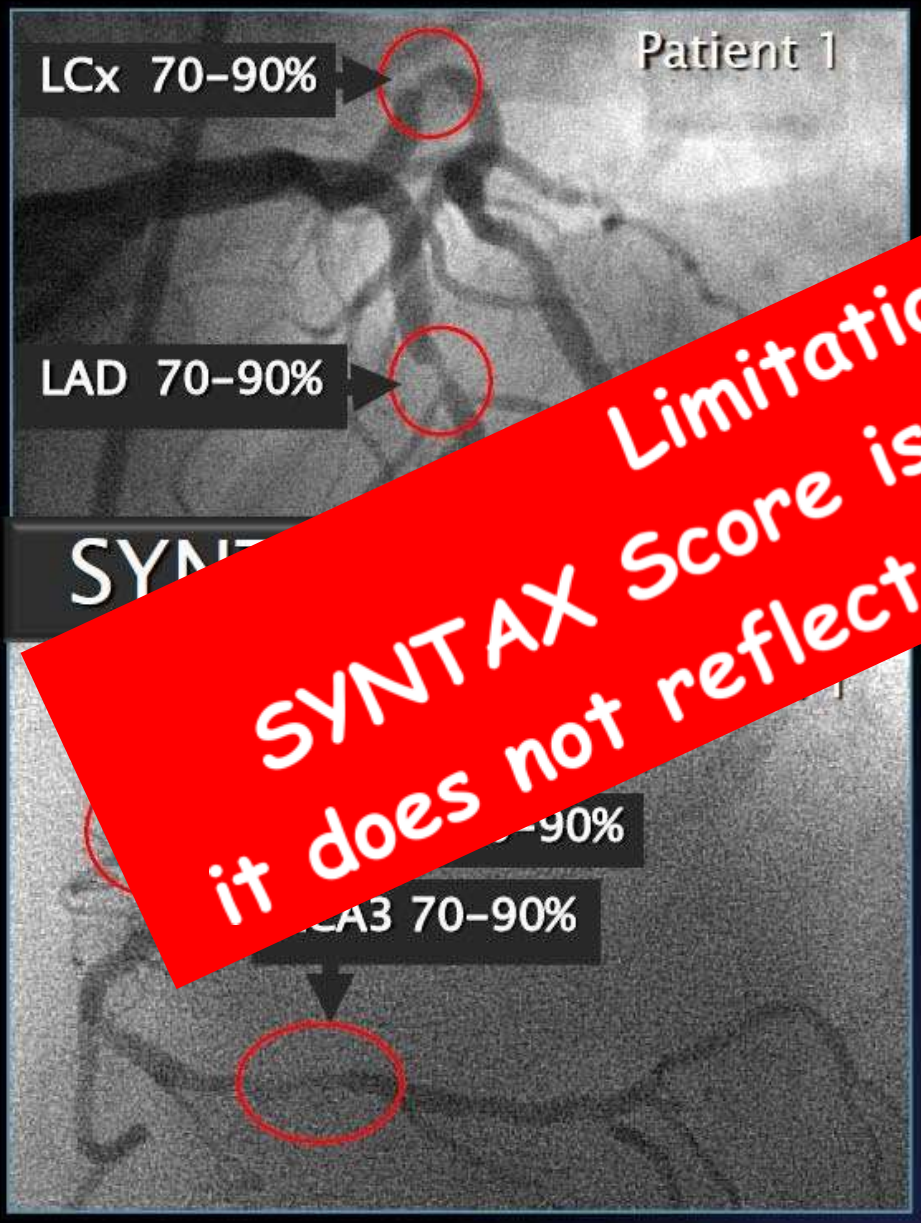
If you're un got to this situation, see ide to Toyota's self-destr

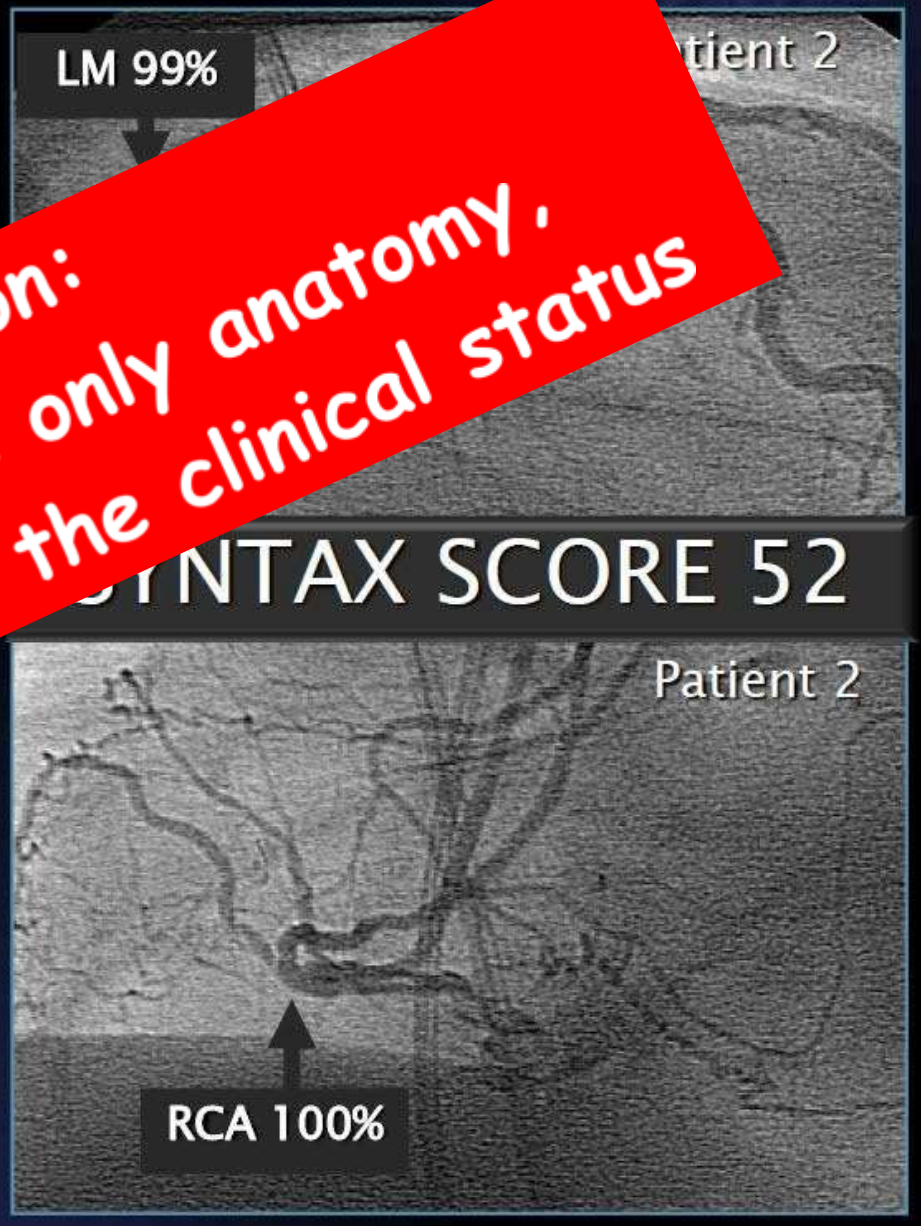
There is no recall action for CABG !

There is '3-vessel disease' and '3-vessel disease'



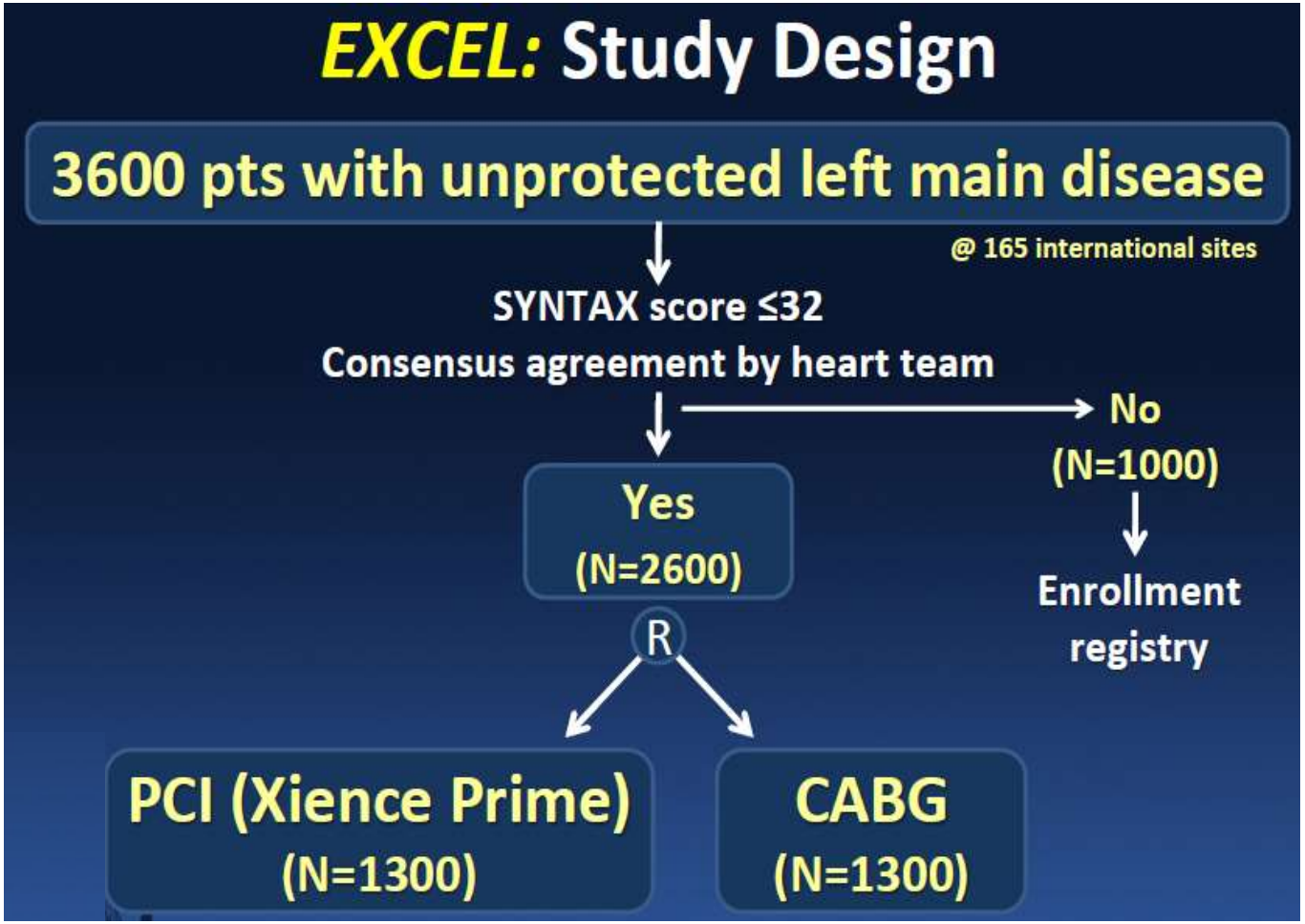
There is '3-vessel disease' and '3-vessel disease'





Limitation:
SYNTAX Score is only anatomy,
it does not reflect the clinical status

Left Main stenting: Where do we stand?



TCT 2016: EXCEL And NOBLE Give Different Answers On Stenting Vs. Surgery For Left-Main Disease

01 Nov 2016 | NEWS

NOBLE found that the five-year risk of major adverse events was higher after stenting compared to coronary bypass surgery to treat unprotected left-main coronary artery disease, while EXCEL found that stenting is safer than surgery in patients with this condition and low anatomic complexity.

$$\text{Coronary flow} = \frac{\text{Perfusion Pressure}}{\text{Resistances} = R1 + R2}$$

Resistance of Epicardial vessel

Resistance of microcirculation

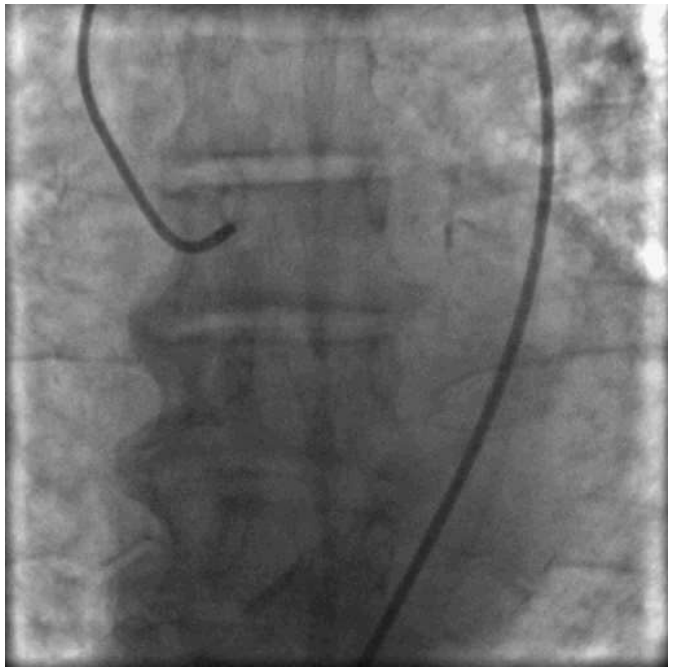
Coronary resistances are directly proportional to the length of the vessel and inversely proportional to the fourth power of the radius

Murray's Law

The **cube of the radius** of the parent artery is **equal** to **the sum of the cubes of the radii** of daughter **vessels**

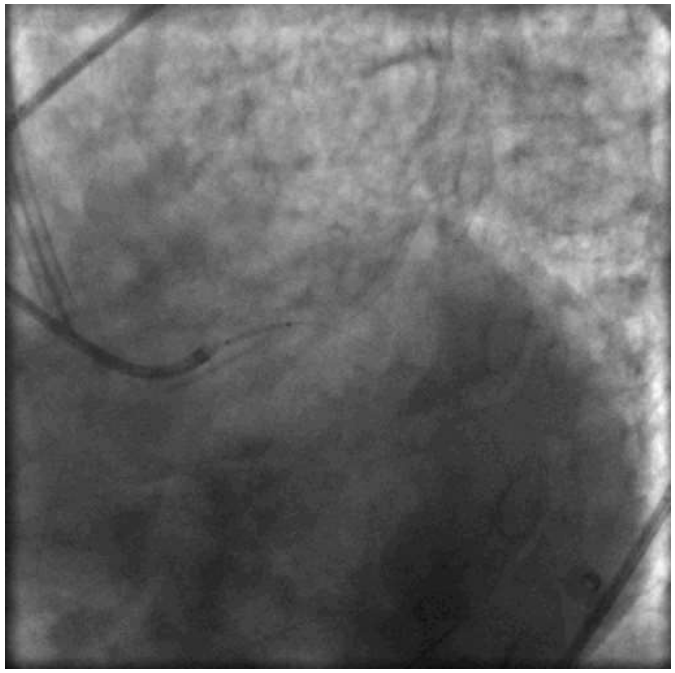
$$r_p^3 = r_{d_1}^3 + r_{d_2}^3 + r_{d_3}^3 + \ldots + r_{d_n}^3$$

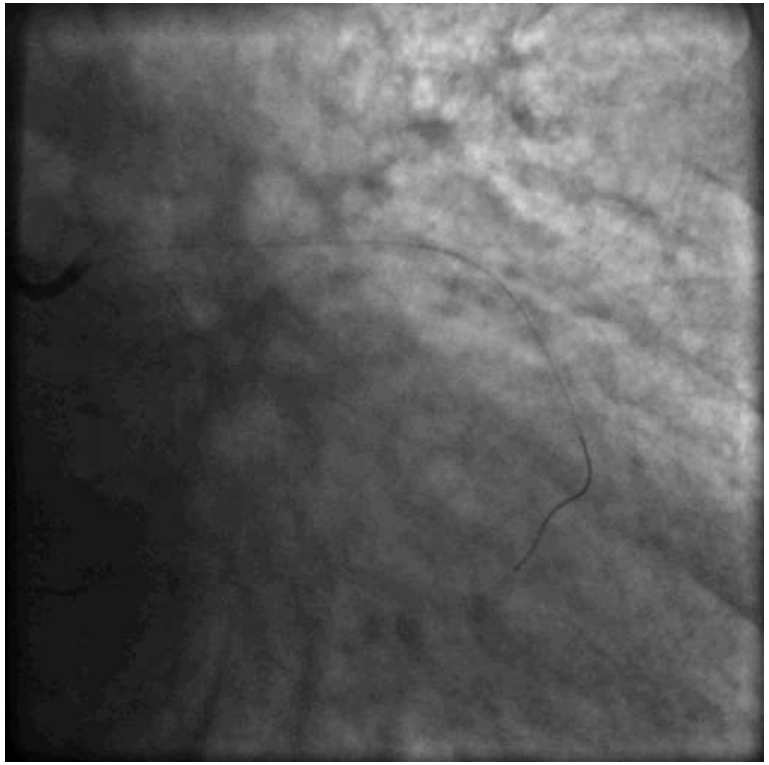
FIRST INJECTION



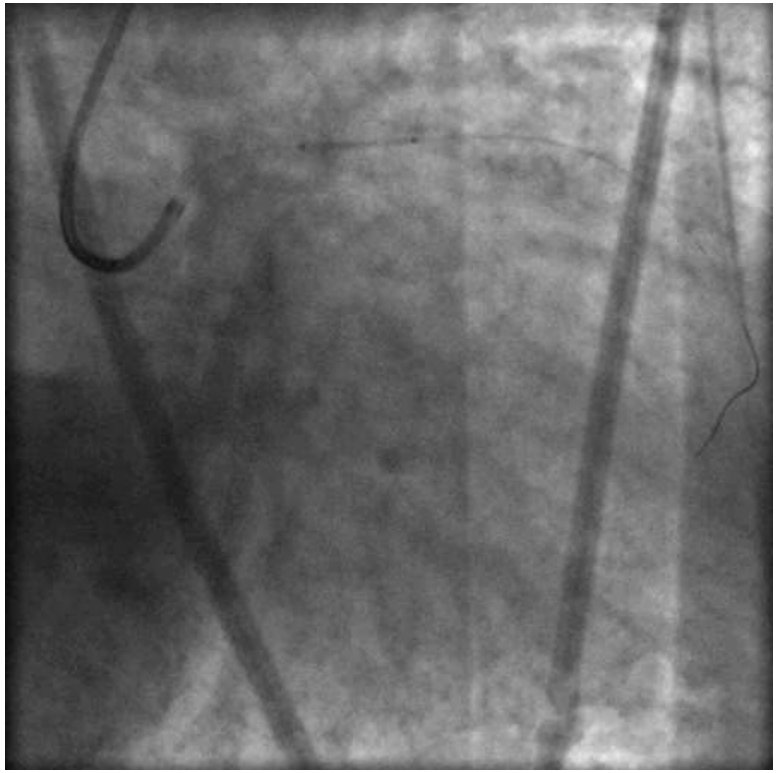
1

LEFT MAIN PCI

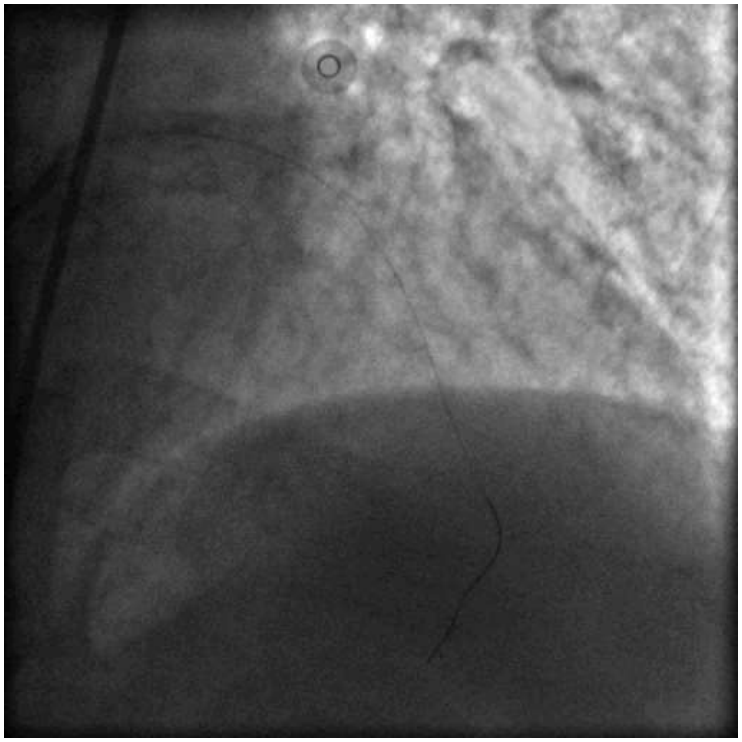


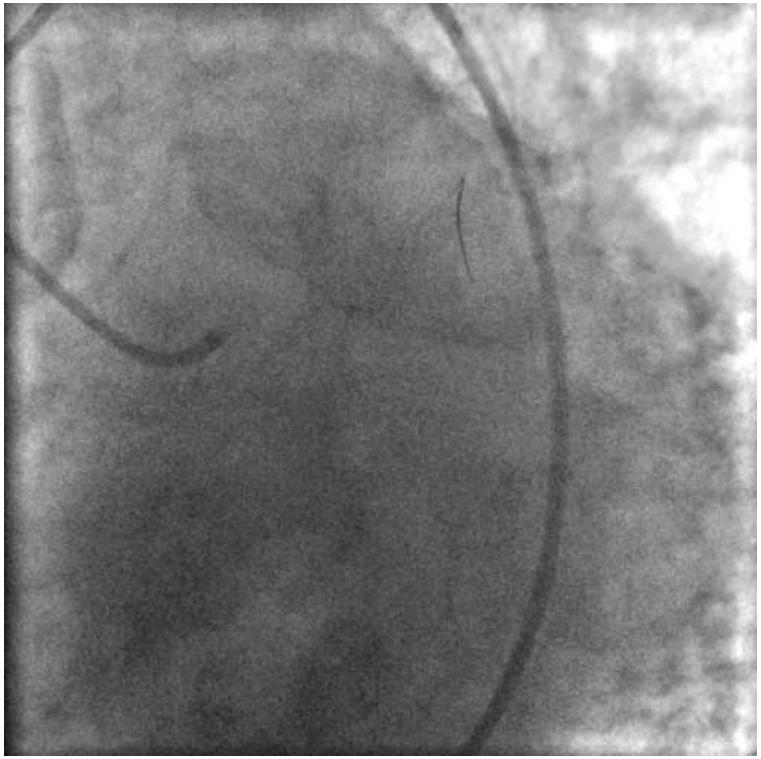


LAD



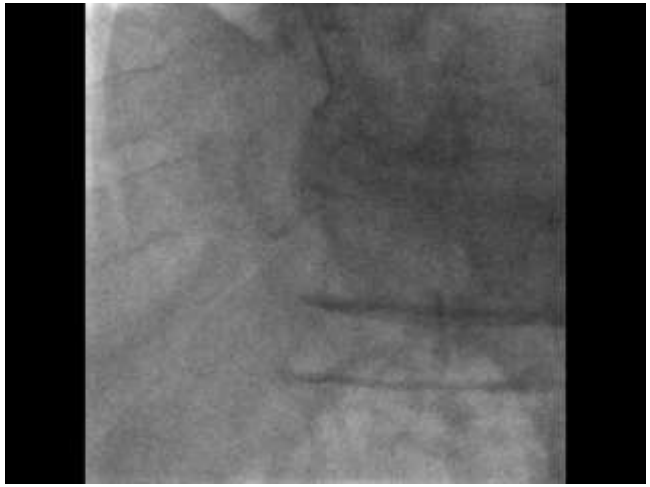
LAD PCI

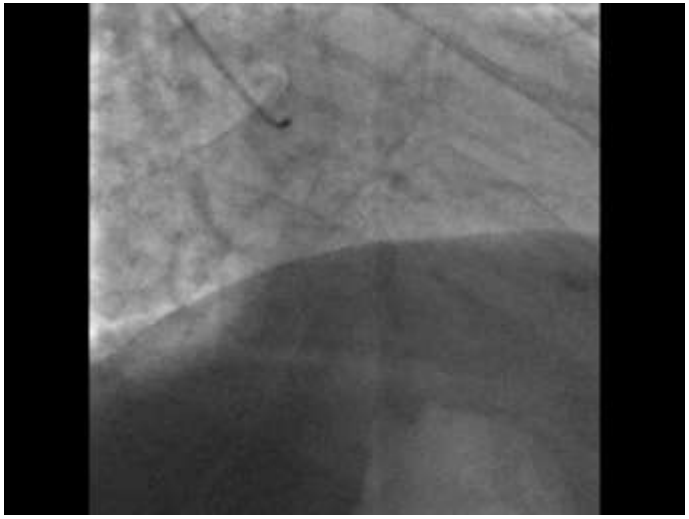


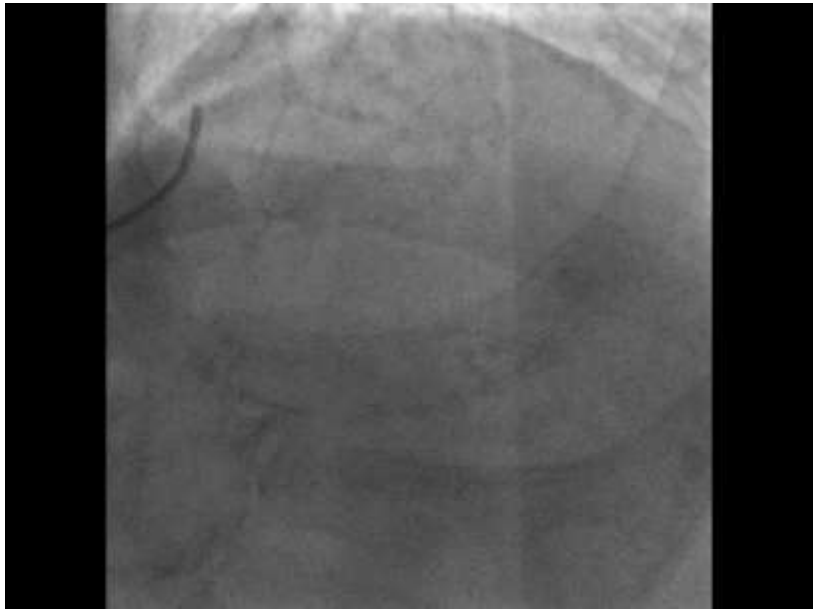


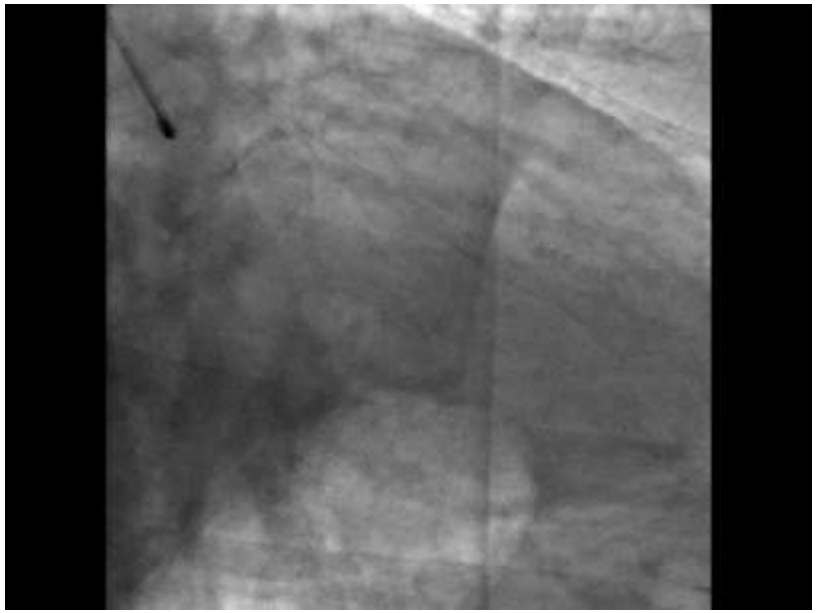
FINAL RESULT

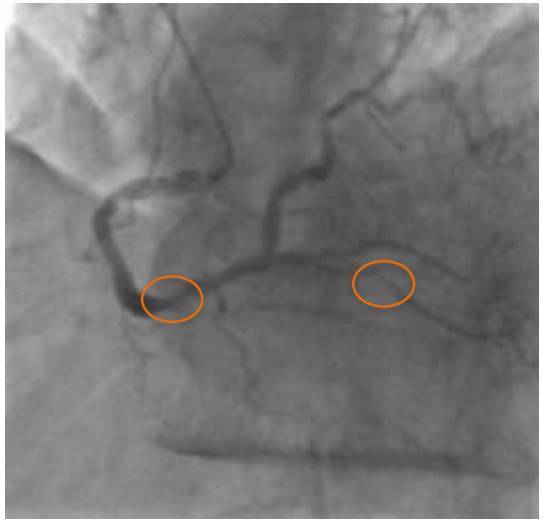
2

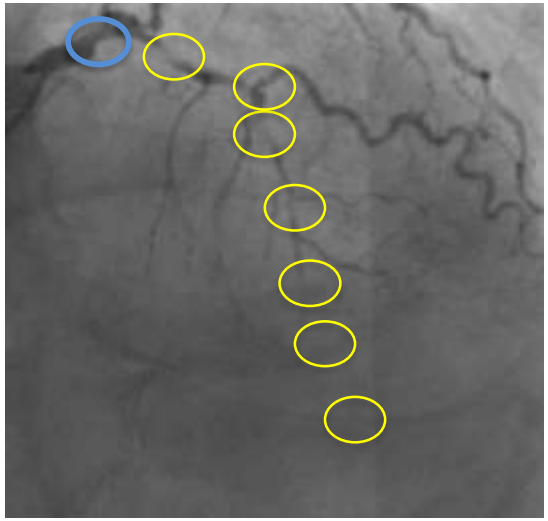


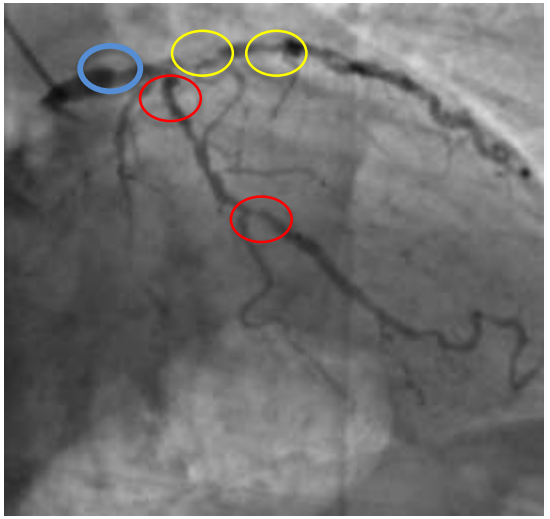












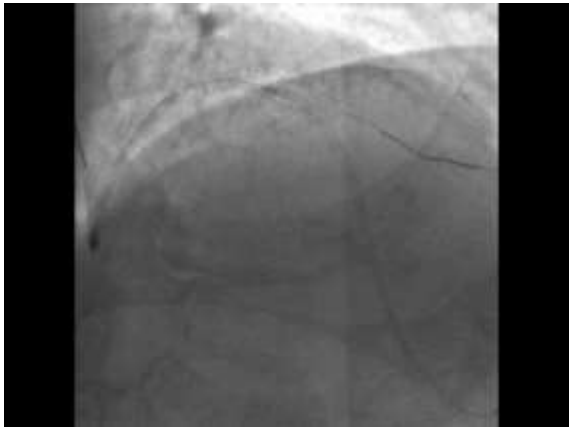
Wiring LAD: Sion Blue
Protection Diag: BMW

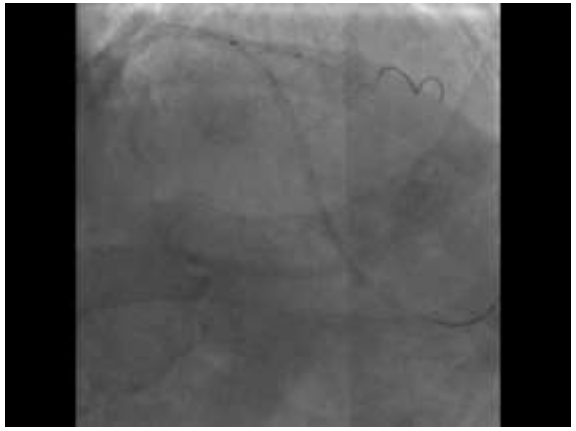
POBA:
1.5/12 mm
2.0/20 mm

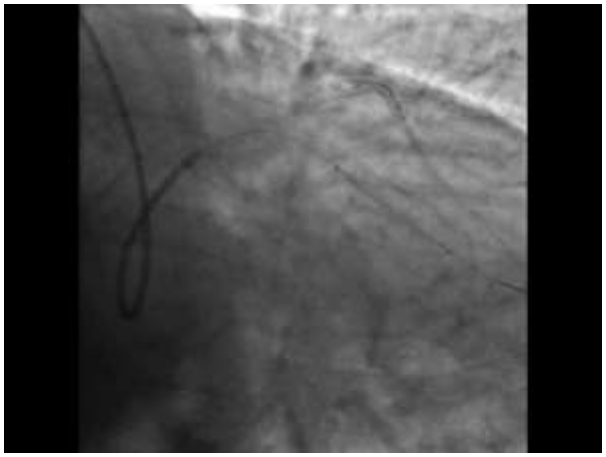
Shock Wave 2.5/12 mm
Shock Wave 2.75/12 mm

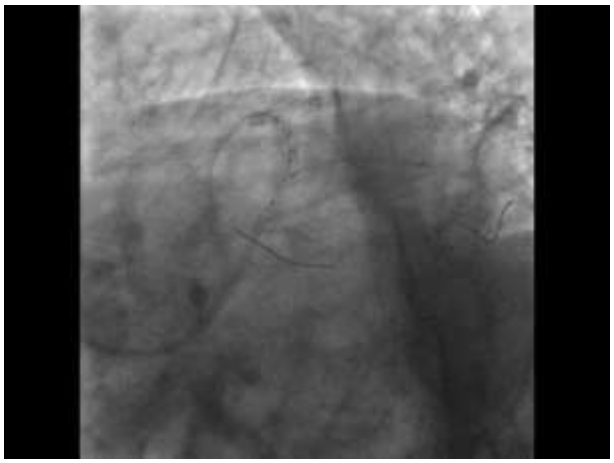
IVA (EES):
2.5/30 mm
3.0/28 mm
3.5/22 mm

DB (EES):
2.75/26 mm

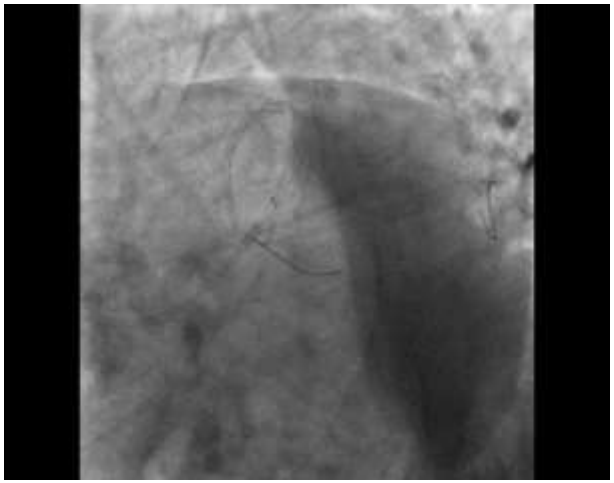




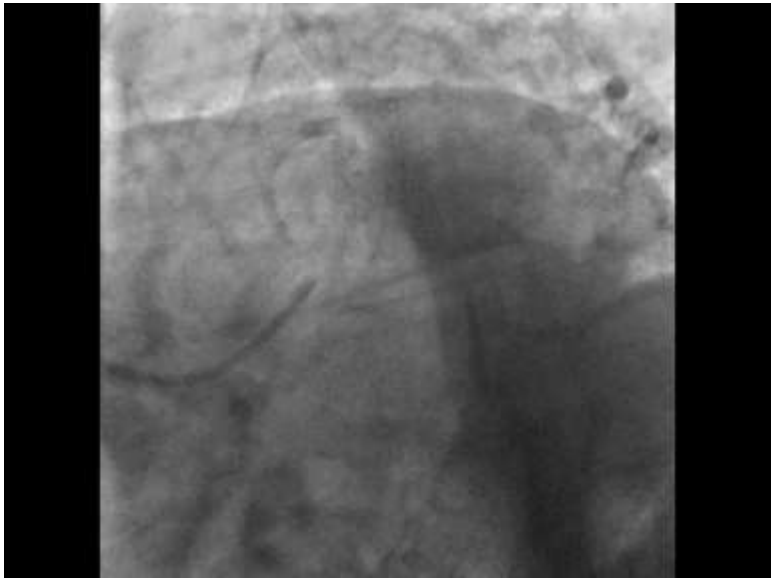




Cx (EES):
3.5/38 mm
3.5/22 mm

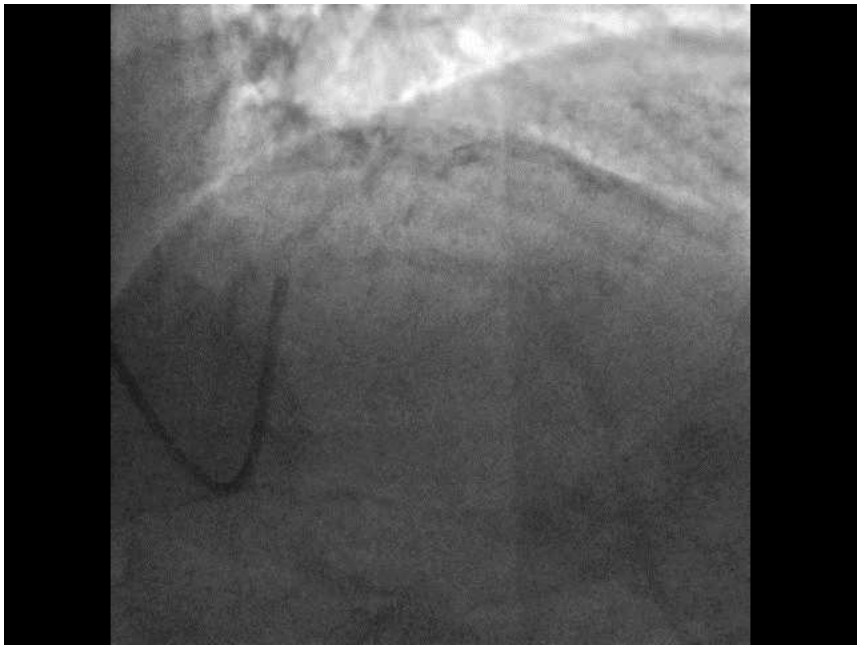


LM-IVA (EES):
4.0/30 mm



18 MONTHS AFTER CCT PERFORMED

22 MONTHS AFTER…
No more hospitalization
No more angina



Trattamento percutaneo vs chirurgico in pazienti con malattia stabile

Recommendation for the type of revascularization in patients with stable coronary artery disease with suitable coronary anatomy for both procedures and low predicted surgical mortality[d]

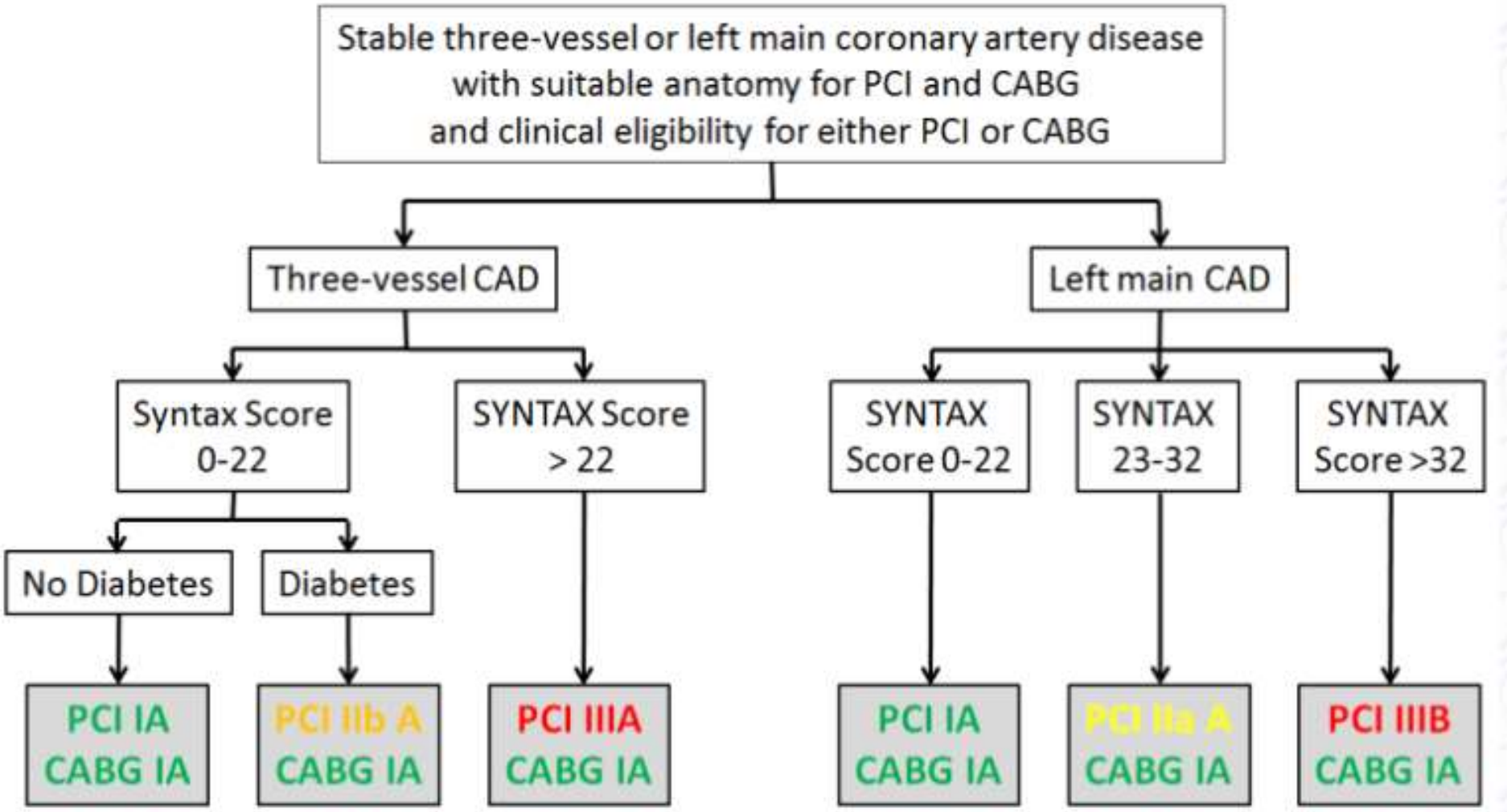
Recommendations according to extent of CAD	CABG		PCI	
	Class	Level	Class	Level
One-vessel CAD				
Without proximal LAD stenosis.	IIb	C	I	C
With proximal LAD stenosis.	I	A	I	A
Two-vessel CAD				
Without proximal LAD stenosis.	IIb	C	I	C
With proximal LAD stenosis.	I	B	I	C
Left main CAD				
Left main disease with low SYNTAX score (0-22).	I	A	I	A
Left main disease with intermediate SYNTAX score (23-32).	I	A	IIa	A
Left main disease with high SYNTAX score (≥33).[a]	I	A	III	B

[a] PCI should be considered, if the Heart Team is concerned about the surgical risk or if the patient refuses CABG after adequate counselling by the Heart Team.

Trattamento percutaneo vs chirurgico in pazienti con malattia trivasale

Recommendations according to extent of CAD	CABG		PCI	
	Class	Level	Class	Level
Three-vessel CAD without diabetes mellitus				
Three-vessel disease with low SYNTAX score (0-22).	I	A	I	A
Three-vessel disease with intermediate or high SYNTAX score (>22).[a]	I	A	III	A
Three-vessel CAD with diabetes mellitus				
Three-vessel disease with low SYNTAX score (0-22).	I	A	IIb	A
Three-vessel disease with intermediate or high SYNTAX score (>22).[a]	I	A	III	A

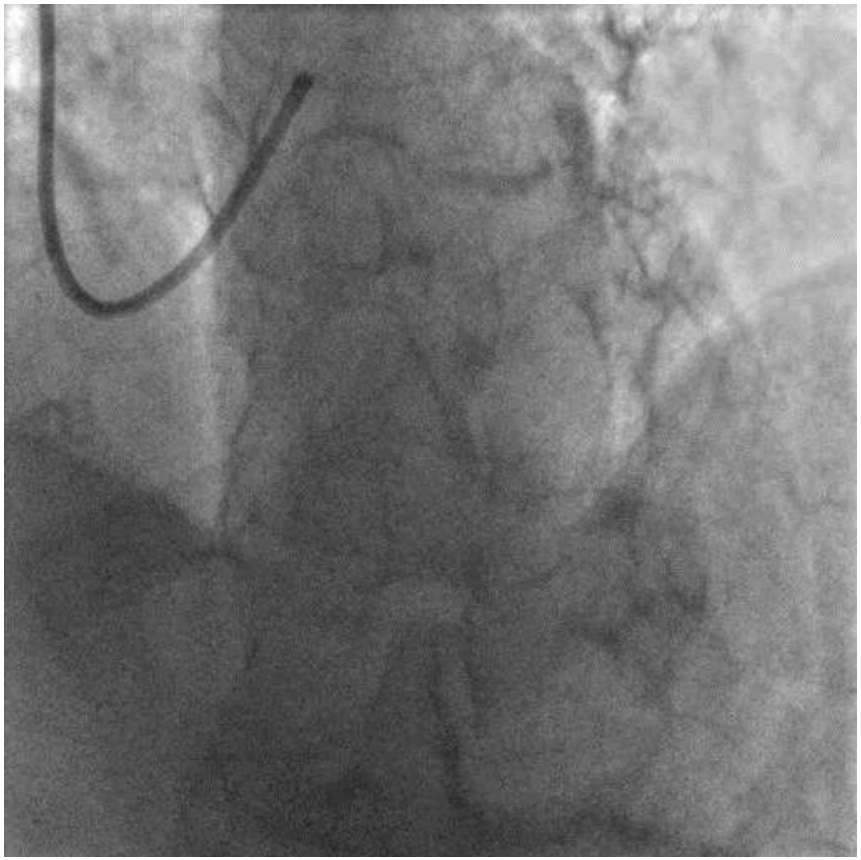
Trattamento percutaneo vs chirurgico in pazienti con malattia stabile

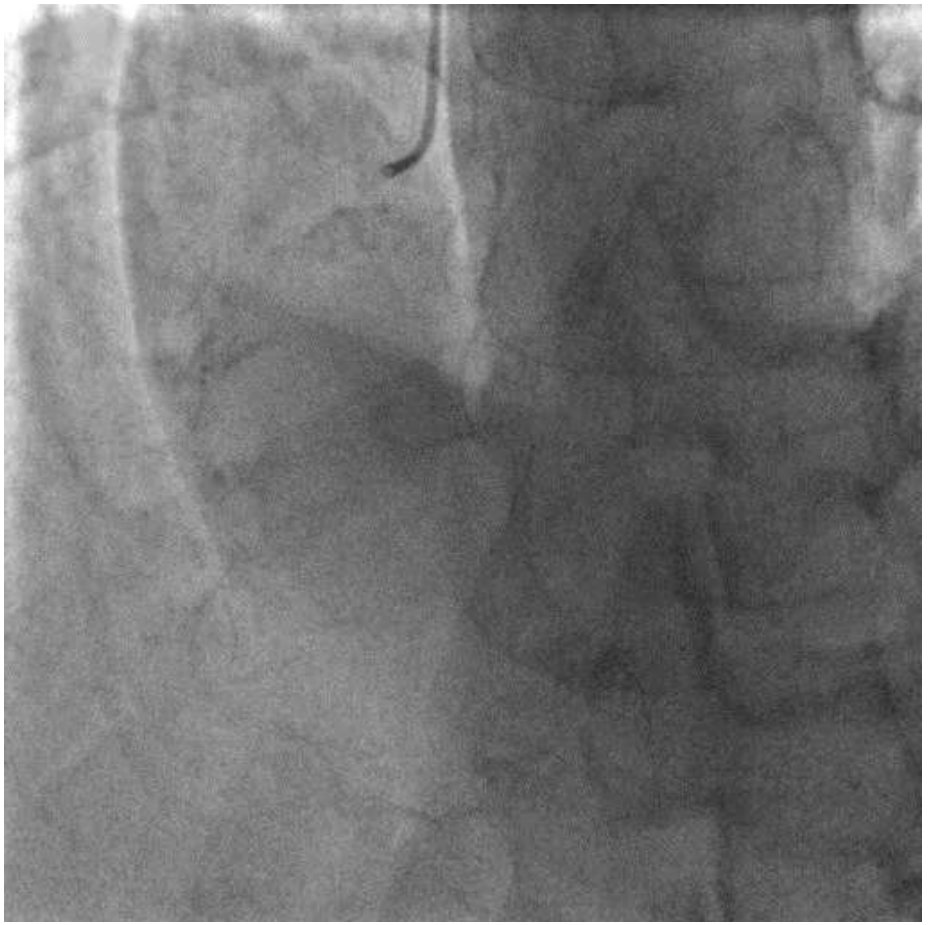


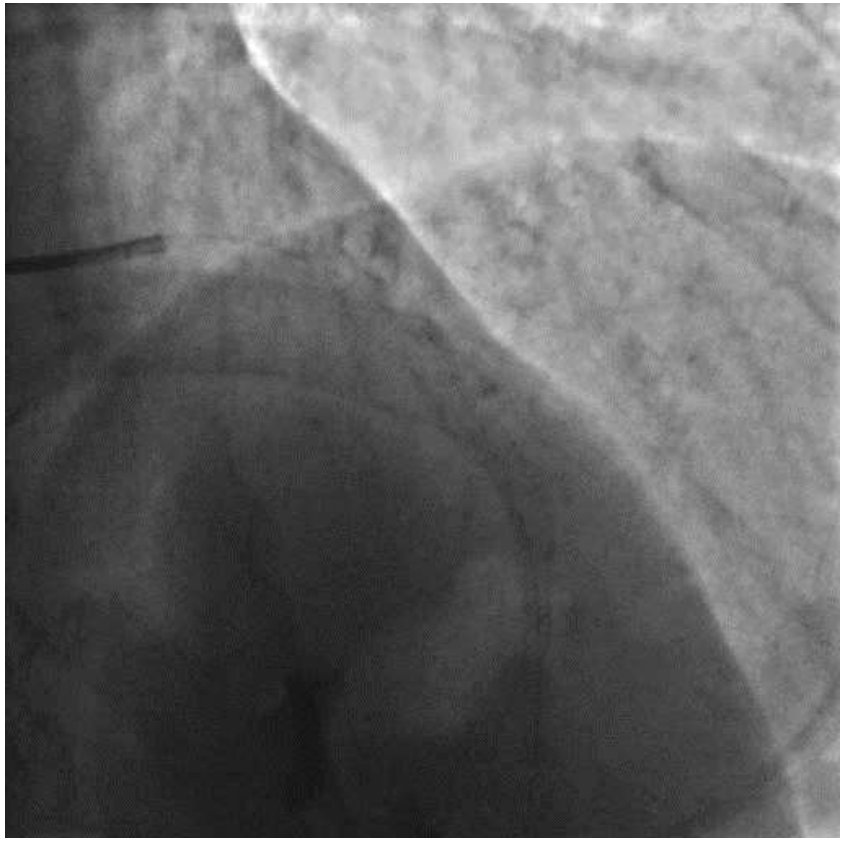
Trattamento percutaneo vs chirurgico

FAVOURS CABG	FAVOURS PCI
Clinical caracteristics - Diabetes. - Reduced LV function (EF ≤35%). - Contraindication to DAPT. - Recurrent diffuse in-stent restenosis.	**Clinical caracteristics** - Presence of severe co-morbidity (not adequately reflected by scores). - Advanced age/frailty/reduced life expectancy. - Restricted mobility and conditions that affect the rehabilitation process.
Anatomical and technical aspects - MVD with SYNTAX score ≥23. - Anatomy likely resulting in incomplete revascularization with PCI. - Severely calcified coronary artery lesions limiting lesion expansion.	**Anatomical and technical aspects** - MVD with SYNTAX score 0-22. - Anatomy likely resulting in incomplete revascularization with CABG (e.g. no conduit, small severely diseased vessels). - Severe chest deformation or scolliosis. - Sequelae of chest radiation. - Porcelain aorta.[a]
Need for concomitant interventions - Ascending aortic pathology with indication for surgery. - Concomitant cardiac surgery.	

3







STEMI: thromboaspiration *vs* direct stenting

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 APRIL 9, 2015 VOL. 372 NO. 15

Randomized Trial of Primary PCI with or without Routine Manual Thrombectomy

S.S. Jolly, J.A. Cairns, S. Yusuf, B. Meeks, J. Pogue, M.J. Rokoss, S. Kedev, L. Thabane, G. Stankovic, R. Moreno, A. Gershlick, S. Chowdhary, S. Lavi, K. Niemelä, P.G. Steg, I. Bernat, Y. Xu, W.J. Cantor, C.B. Overgaard, C.K. Naber, A.N. Cheema, R.C. Welsh, O.F. Bertrand, A. Avezum, R. Bhindi, S. Pancholy, S.V. Rao, M.K. Natarajan, J.M. ten Berg, O. Shestakovska, P. Gao, P. Widimsky, and V. Džavík, for the TOTAL Investigators*

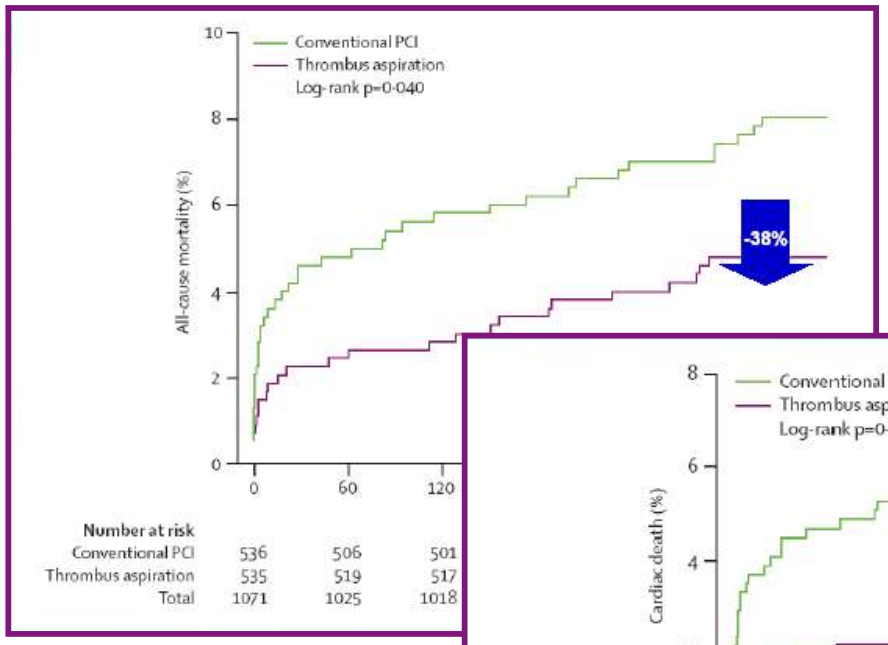
Thrombus Aspiration during Primary Percutaneous Coronary Intervention
TAPAS Trial

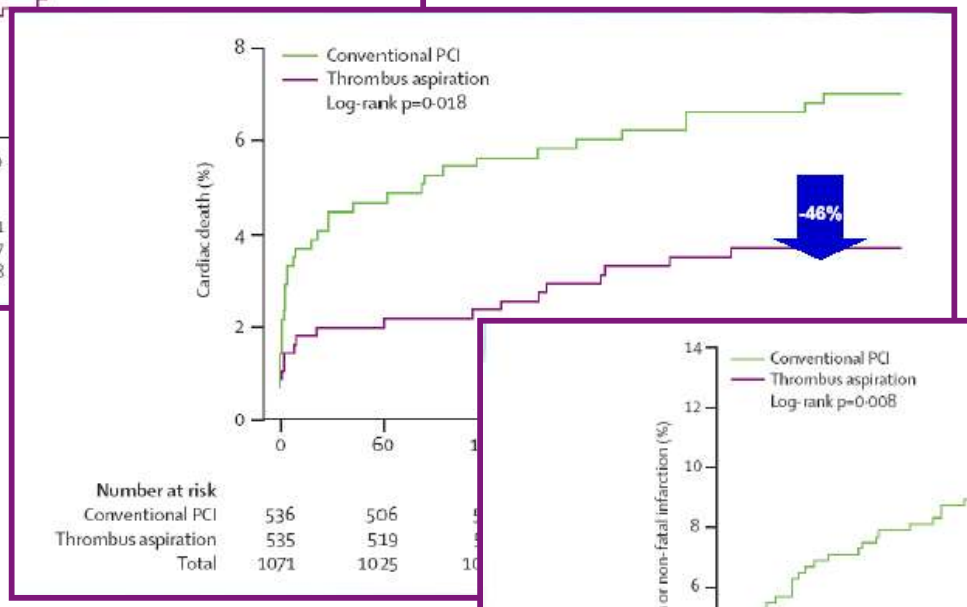
Tone Svilaas, M.D., Pieter J. Vlaar, M.Sc., Iwan C. van der Horst, M.D., Ph.D., Gilles F.H. Diercks, M.D., Ph.D., Bart J.G.L. de Smet, M.D., Ph.D., Ad F.M. van den Heuvel, M.D., Ph.D., Rutger L. Anthonio, M.D., Ph.D., Gillian A. Jessurun, M.D., Ph.D., Eng-Shiong Tan, M.D., Albert J.H. Suurmeijer, M.D., Ph.D., and Felix Zijlstra, M.D., Ph.D.

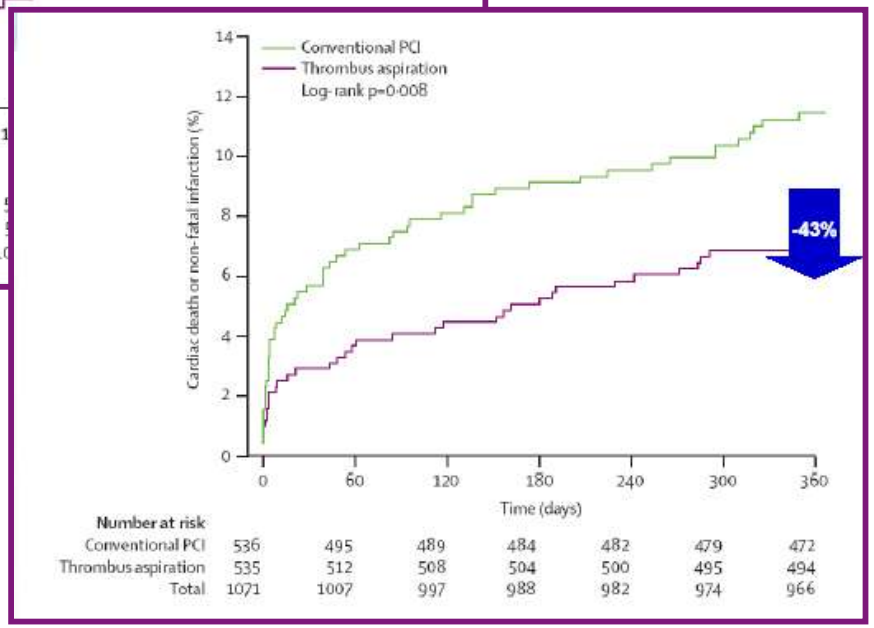
N Engl J Med 358(6):557-567
February 7, 2008

The NEW ENGLAND JOURNAL of MEDICINE

One year follow up







All cause mortality: 38% reduction

Cardiac death: 46% reduction

Cardiac death/MI: 43% reduction

Vlaar et al. Lancet 2008;371:1915-20.

Conclusions

- Routine thrombus aspiration in PPCI is safe, well validated and associated with important clinical benefits
- These benefits appear to be independent of the presence of visible thrombus
- Retrieval of acute atherothrombotic material may be developed as a useful research tool.
- There as yet no corresponding data in NSTEMI patients (but equally no proof of harm)
- Other more complex approaches are not supported by currently available evidence

European Heart Journal (2008) **29**, 2909–2945
doi:10.1093/eurheartj/ehn416

Management of acute myocardial infarction in patients presenting with persistent ST-segment elevation

Table 13 Recommendations for prevention and treatment of no-reflow

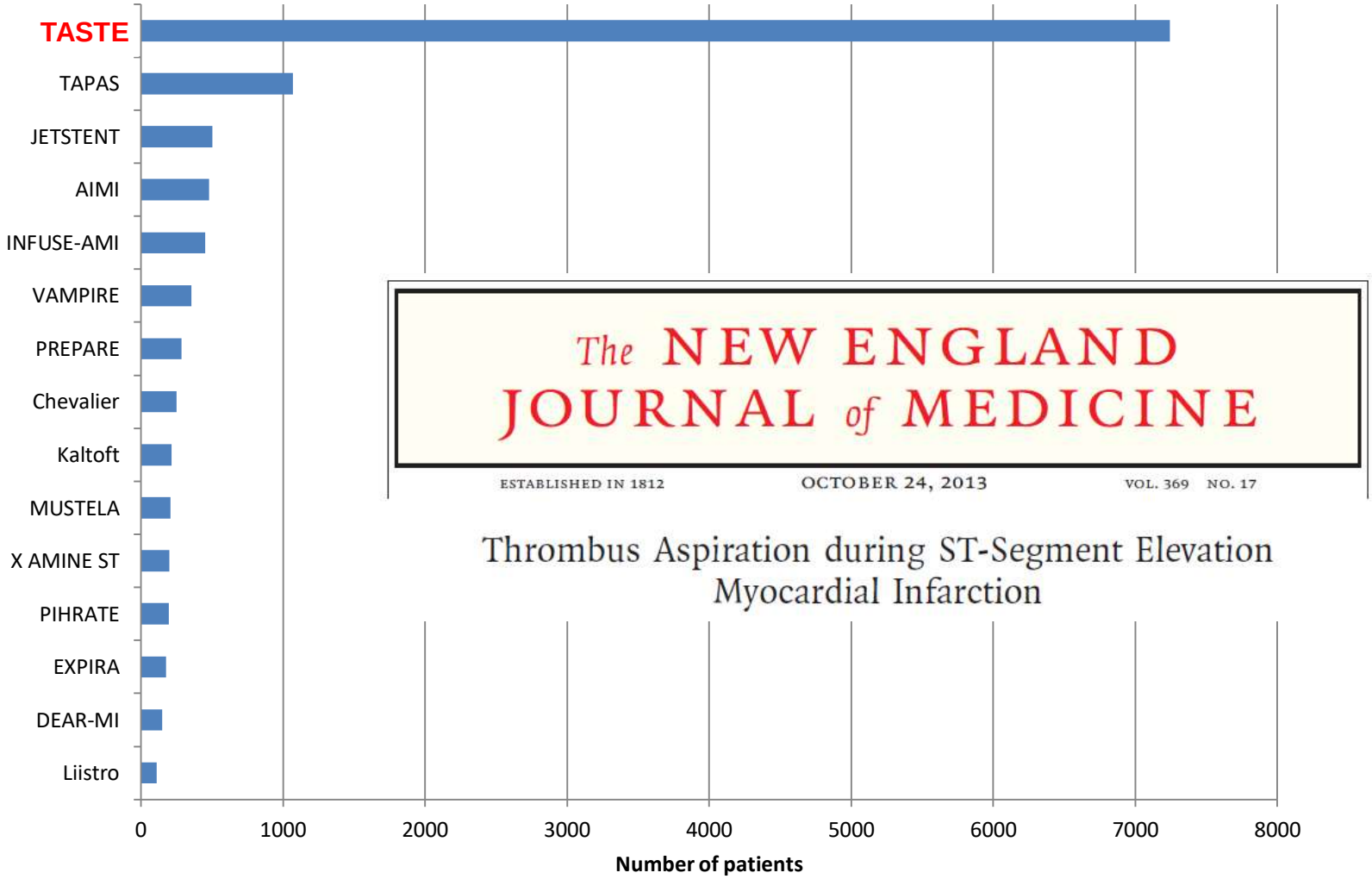
Recommendations	Class[a]	Level[b]
Prevention		
Thrombus aspiration	IIa	B
Abciximab 0.25 mg/kg bolus and 0.125 µg/kg/min infusion for 12–24 h	IIa	B
Treatment		
Adenosine: 70 µg/kg/min i.v. over 3 h during and after PCI	IIa	
Adenosine: intracoronary bolus of 30 during PCI		
Verapamil: intracor during PCI	IIb	C

Manual catheter thrombus aspiration should be considered during PCI of the culprit lesion in STEMI.

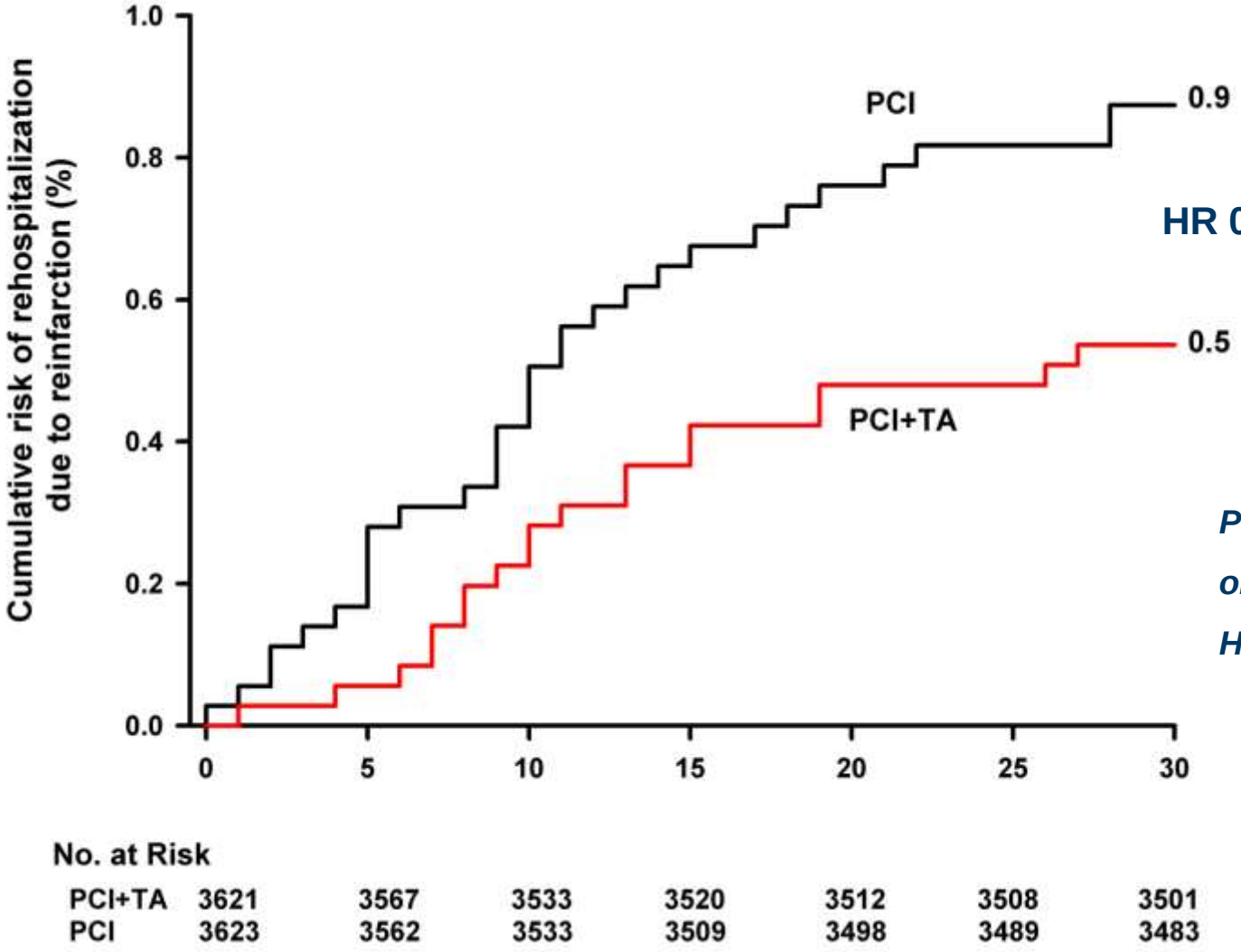
IIa A

tive devices that allow immediate suction are potentially more useful. There is evidence of benefit for direct catheter aspiration of thrombus in STEMI.[204–206] The TAPAS trial assigned 1071 patients to catheter-based thrombus aspiration (Export aspiration catheter) followed by primary PCI or conventional primary PCI.[207]

TASTE and previous studies



Reinfarction at 30 days



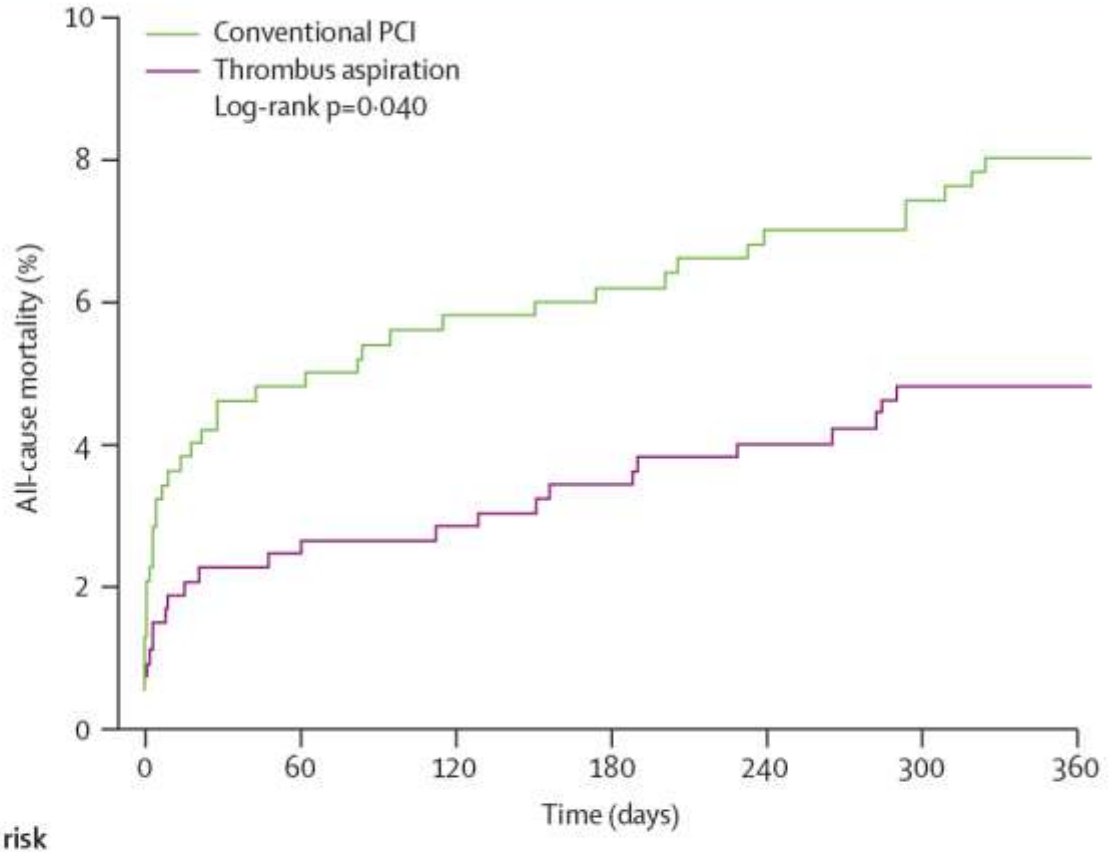
HR 0.61 (0.34 - 1.07), P=0.09

Per protocol analysis based on actual treatment:

HR 0.67 (0.36 - 1.20), P=0.19

TASTE

TASTE vs. TAPAS

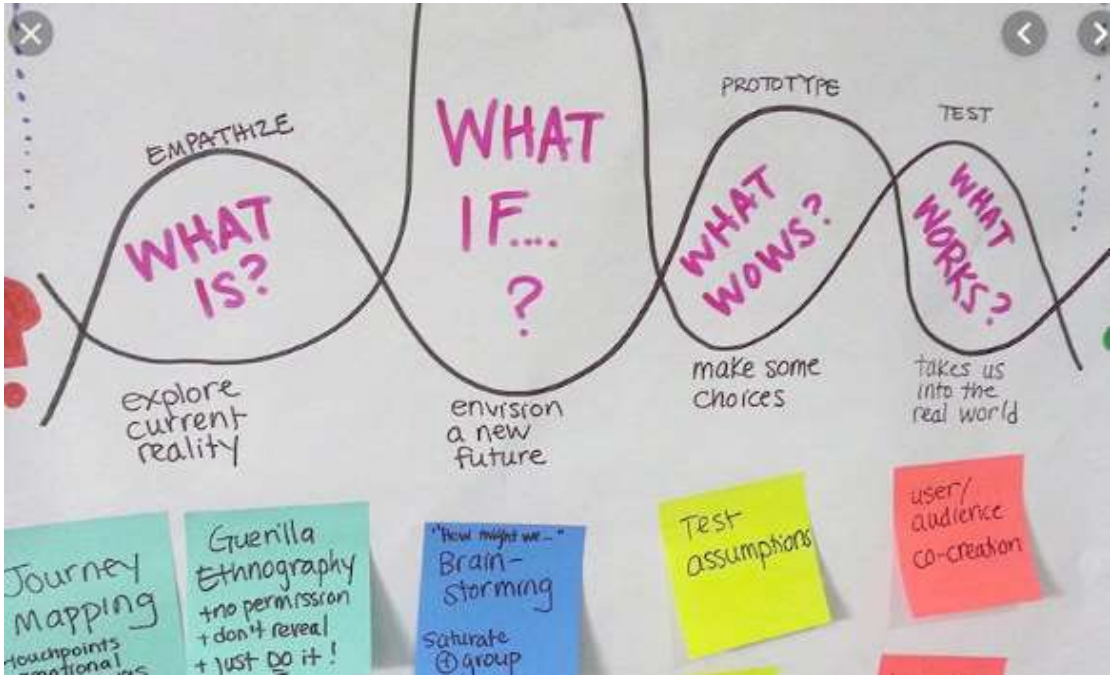


Number at risk							
Conventional PCI	536	506	501	499	495	494	489
Thrombus aspiration	535	519	517	514	510	506	505
Total	1071	1025	1018	1013	1005	1000	994

TASTE

Before TAPAS…

Thinking OFF LABEL



71° Congresso Nazionale della
Società Italiana di Cardiologia
Roma, 11-13 dicembre 2010

Prevenzione e trattamento del no-reflow

- Cattedra di Cardiologia
- Università "Tor Vergata" Roma
- Prof. F. Romeo

Prevenzione del no-reflow

- Ridurre il tempo precoronarico
- Ridurre i tempi intraprocedurali
- **Stenting diretto per evitare l'embolizzazione distale**
- **Non usare di default il tromboaspiratore**
- Evitare danno da riperfusione (inibitori IIb/IIIa, adenosina)

Ripristinare prima possibile il normale flusso sanguigno

miglior "trombolitico"

ESC European Society of Cardiology
European Heart Journal (2018) **00**, 1–96
doi:10.1093/eurheartj/ehy394

2018 ESC/EACTS Guidelines on myocardial revascularization

Technique		
Routine use of thrombus aspiration is not recommended.[223–226,228]	III	A

Don’t waste time to do thrombus aspiration

No Flow!

No Hope!!!!!

CONCLUSIONI

- Le novità delle linee guida ESC/EACTS 2018 sulla rivascolarizzazione miocardica recepiscono gli avanzamenti scientifici che negli ultimi 4 anni si sono resi disponibili nel trattamento della malattia coronarica

- Nella malattia coronarica stabile, le linee guida indicano di preferire una rivascolarizzazione completa per il miglioramento dei sintomi e della sopravvivenza.

- Nelle sindromi coronariche acute si sottolinea l'indicazione a trattare la lesione culprit nella procedura in urgenza, rimandando il trattamento delle altre lesioni critiche ad una successiva procedura.

- La cardiologia interventistica rappresenta un'opzione terapeutica non inferiore e, spesso, anche superiore alla chirurgia per la maggior parte dei pazienti