APPAC
ACTUALISATIONS ET PERSPECTIVES EN PATHOLOGIE CARDIOVASCULAIRE
15e édition

Session Tronc Commun

Dans quelles situations, est-il préférable de confier le patient au chirurgien?

Docteur Pierre Meyer
Institut Arnault Tzanck
Saint Laurent du Var

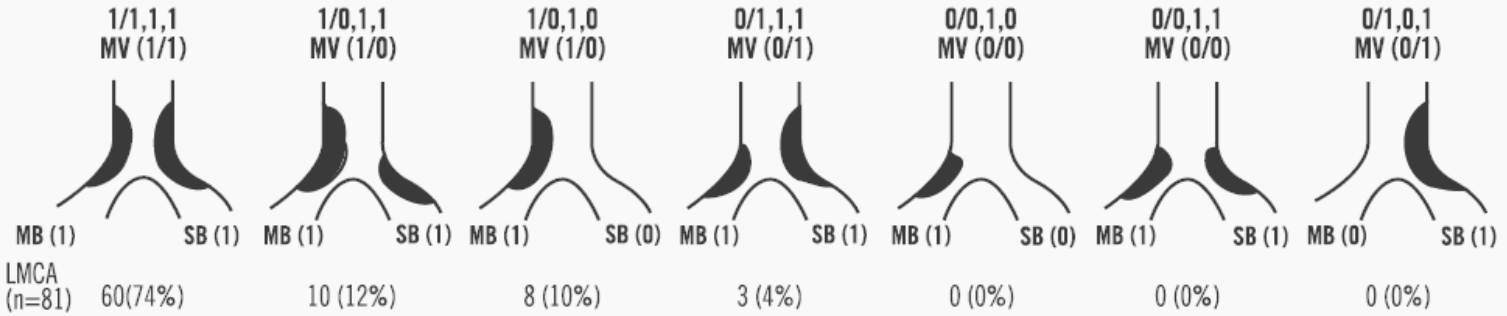
Avec le parrainage de la Société Française de Cardiologie
GACI Groupe Athérome et Cardiologie Interventionnelle de la Société Française de Cardiologie
Collège National des Cardiologues des Hôpitaux
Conseil Français de Réanimation Cardio-pulmonaire
Collège National des Cardiologues Français
STCCCV Société Tunisienne de Cardiologie & de Chirurgie Cardio-Vasculaire

✓Of all subjects undergoing coronary angiography, approximately 4% are found to have left main CAD (more than 75% are located on the distal part)
✓80% of patients with Left main CAD have significant (>70% diameter) stenoses in other epicardial coronary arteries.

Spatial Distribution of Plaque at Distal Left Main Bifurcations

T. Yakushiji et al, Eurointervention 2013

81 distal left main lesions

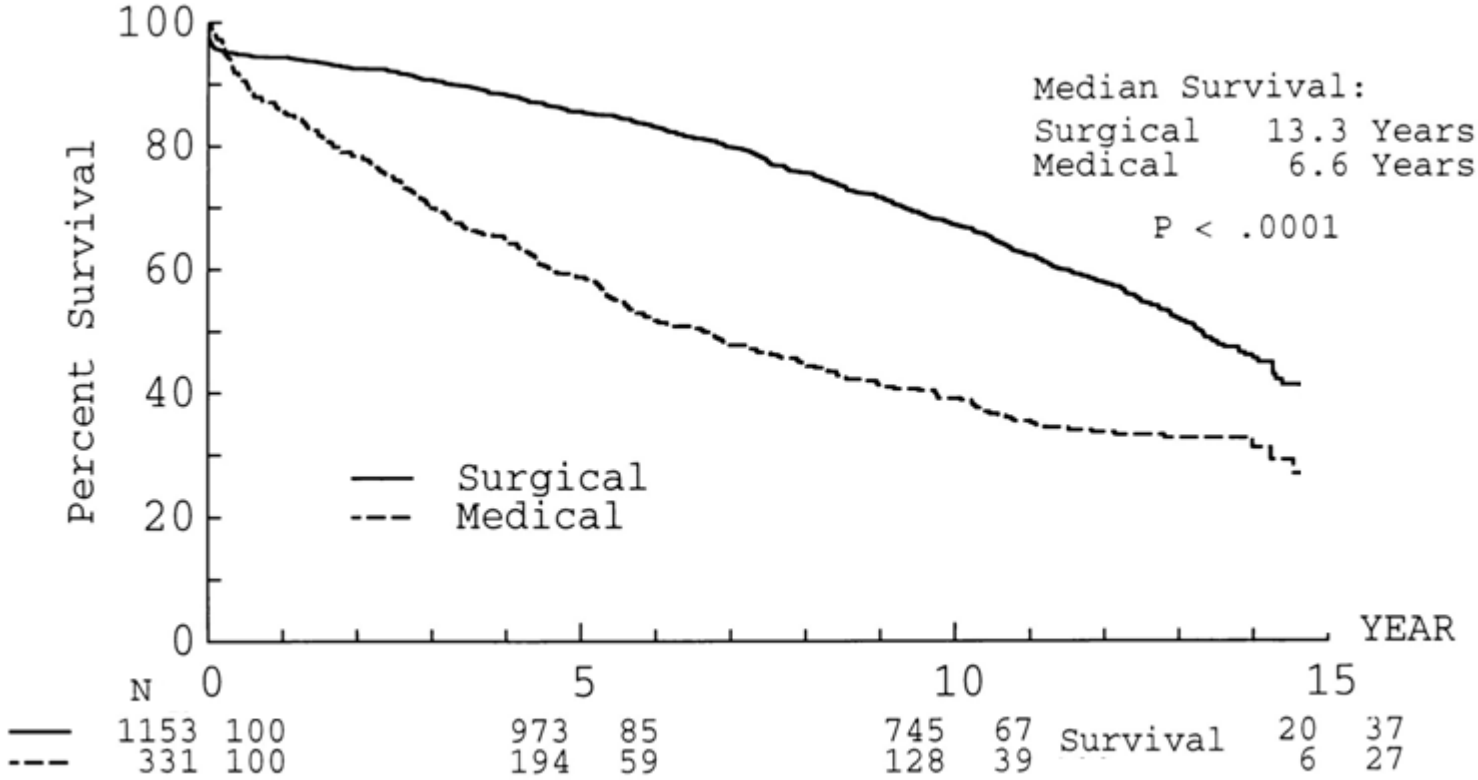


- >90% of LMCA bifurcations had plaque extending from LMCA into the LAD, with 78% extension into the LCX.
- LCX had less plaque and calcium)

CASS Registry : long term survival

Caracciolo EA et al. Circulation. 1995;91:2325–34.

1484 patients with ≥50% LMCA stenosis



CABG remains the traditional gold standard for the treatment of left main significant lesions, according to society guidelines.

Recommandations of PCI indications in stable coronary artery disease

European Heart Journal. March 2005

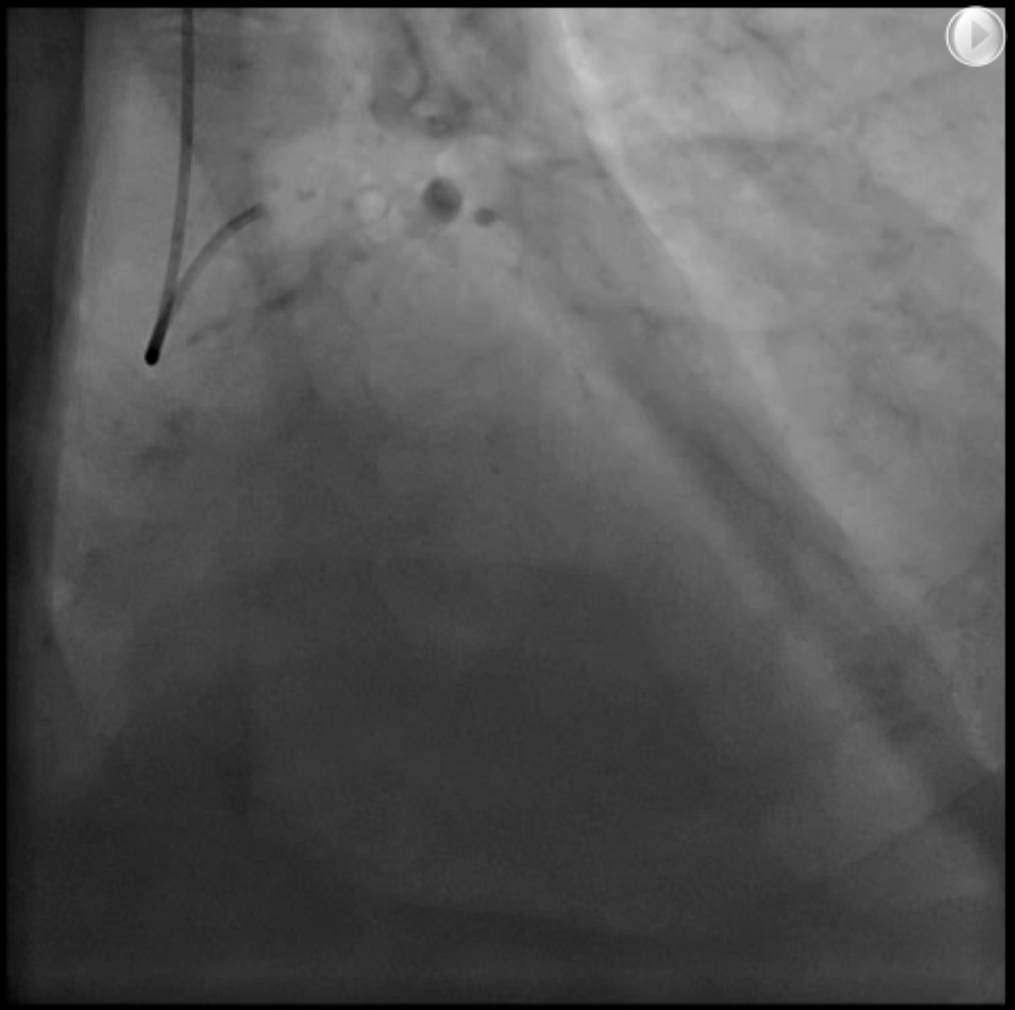
Indication	Classes of recommendations and levels of evidence	Randomized studies for levels A or B
Objective large ischaemia	I A	ACME[a] ACIP[b]
Chronic total occlusion	IIa C	—
High surgical risk, including LV-EF < 35%	IIa B	AWESOME
Unprotected LM in the absence of other revascularization options	IIb C	–
lesions in native coronary arteries		STRESS
Routine stenting of *de novo* lesions in venous bypass grafts	I A	SAVED VENESTENT

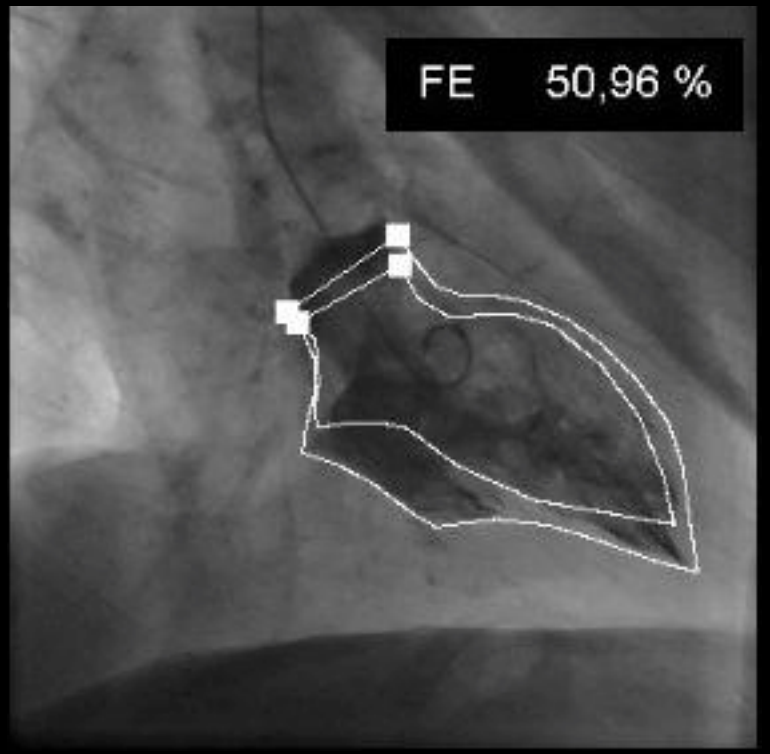
« Stenting for unprotected LM disease should only be considered in the absence of other revascularization options …
Initial datas on the use of drug-eluting stents in unprotected LM disease seem promising »

Mr El…82 ans.

Octogénaire très actif, n’ayant aucune comorbidité. FR : HTA, Dyslipidémie.

Angor d’effort de plus en plus gênant, évoluant depuis quelques mois





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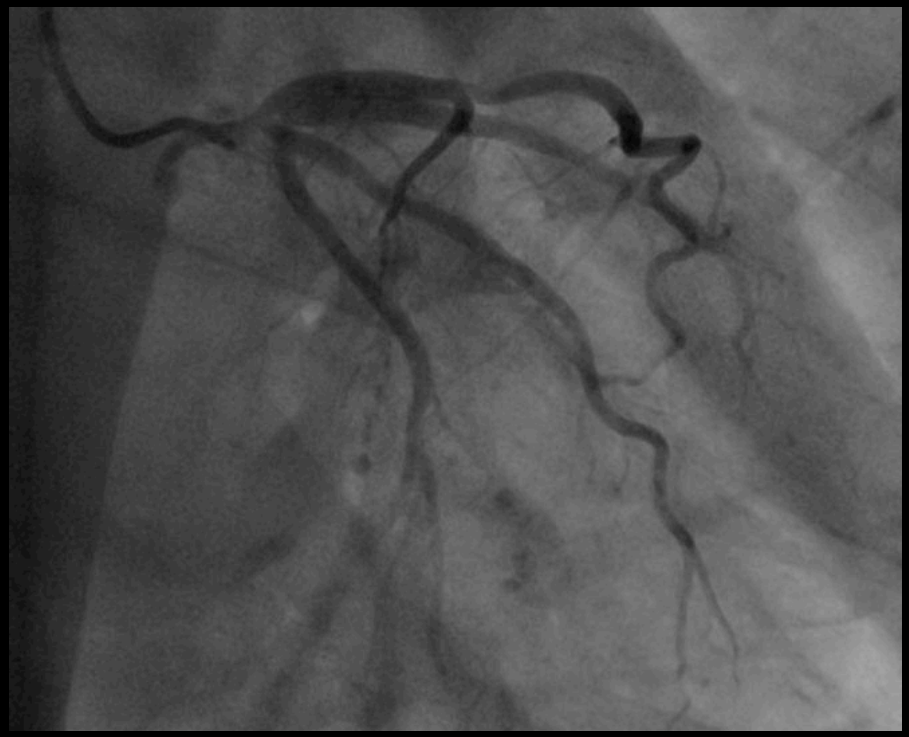
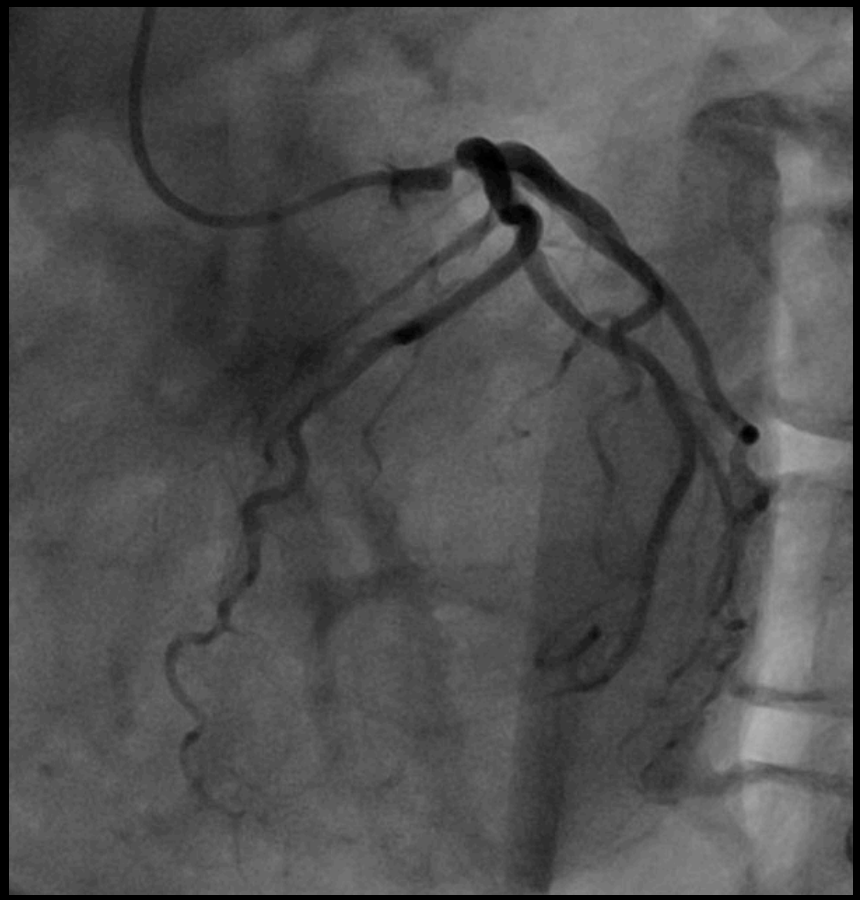
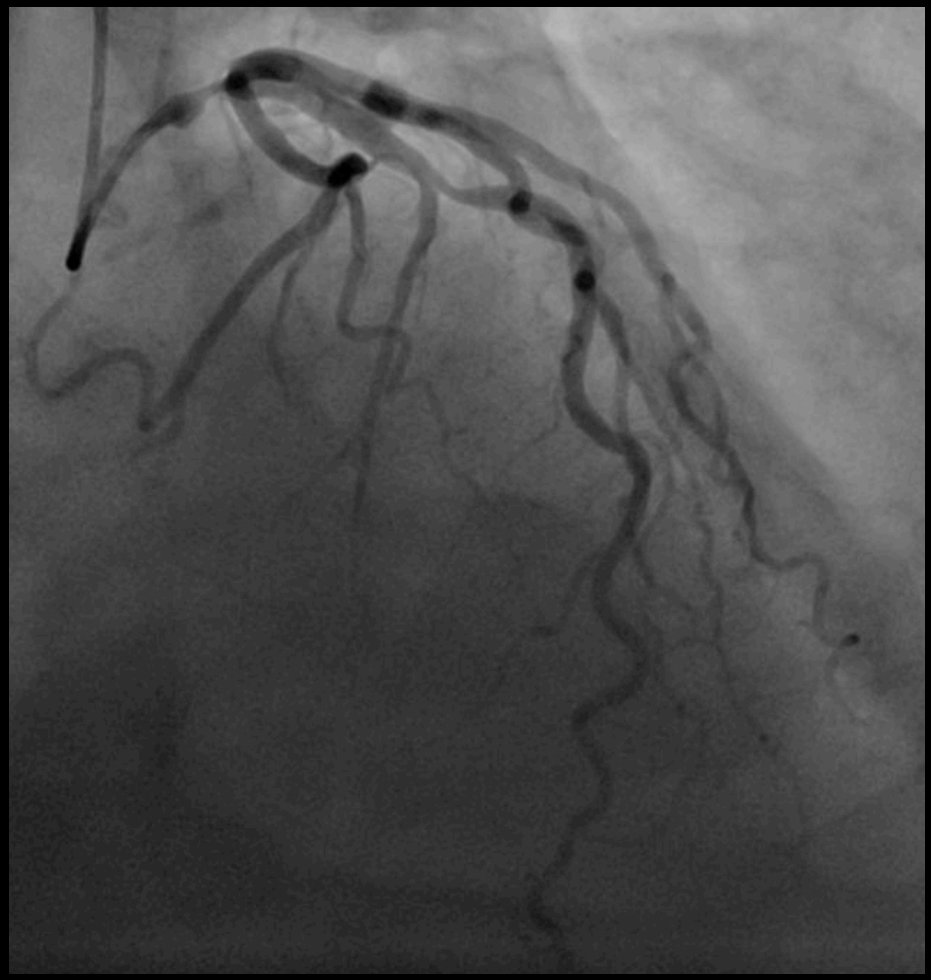




Mr El…82 ans. Angor d'effort crescendo



Médiocre état veineux
Stripping bilatéral
Traité par pontage AMIG…IVA
et mammaire libre sur MBG

Asymptomatique à 4 mois. Ergométrie négative en fin de convalescence

MR V…85 ANS

Octogénaire très vif intellectuellement, handicapé par une arthrose ayant nécessité des prothèses de hanches et de genoux, avec reprises multiples….
FR : HTA et dyslipidémie. ATCD d'angioplastie IVA I en 2005 pour SCA. PACE DDD pour BAV
Consulte en urgence pour un angor de novo avec dyspnée évoluant depuis quelques jours.
Insuffisance rénale sévère avec une cl creat à 23 ml.
ECG :stimulé en permanence. Pas d'élévation de troponine sur le bilan d'admission

Coronary artery bypass graft surgery has traditionally been the standard of care, but the introduction of drug-eluting stents and advances in catheter techniques have led to increasing acceptance of percutaneous coronary intervention as a viable alternative to coronary artery bypass graft for unprotected left main disease, particularly in unstable or high surgical risk patients. Based on several clinical studies PCI has been gaining ground

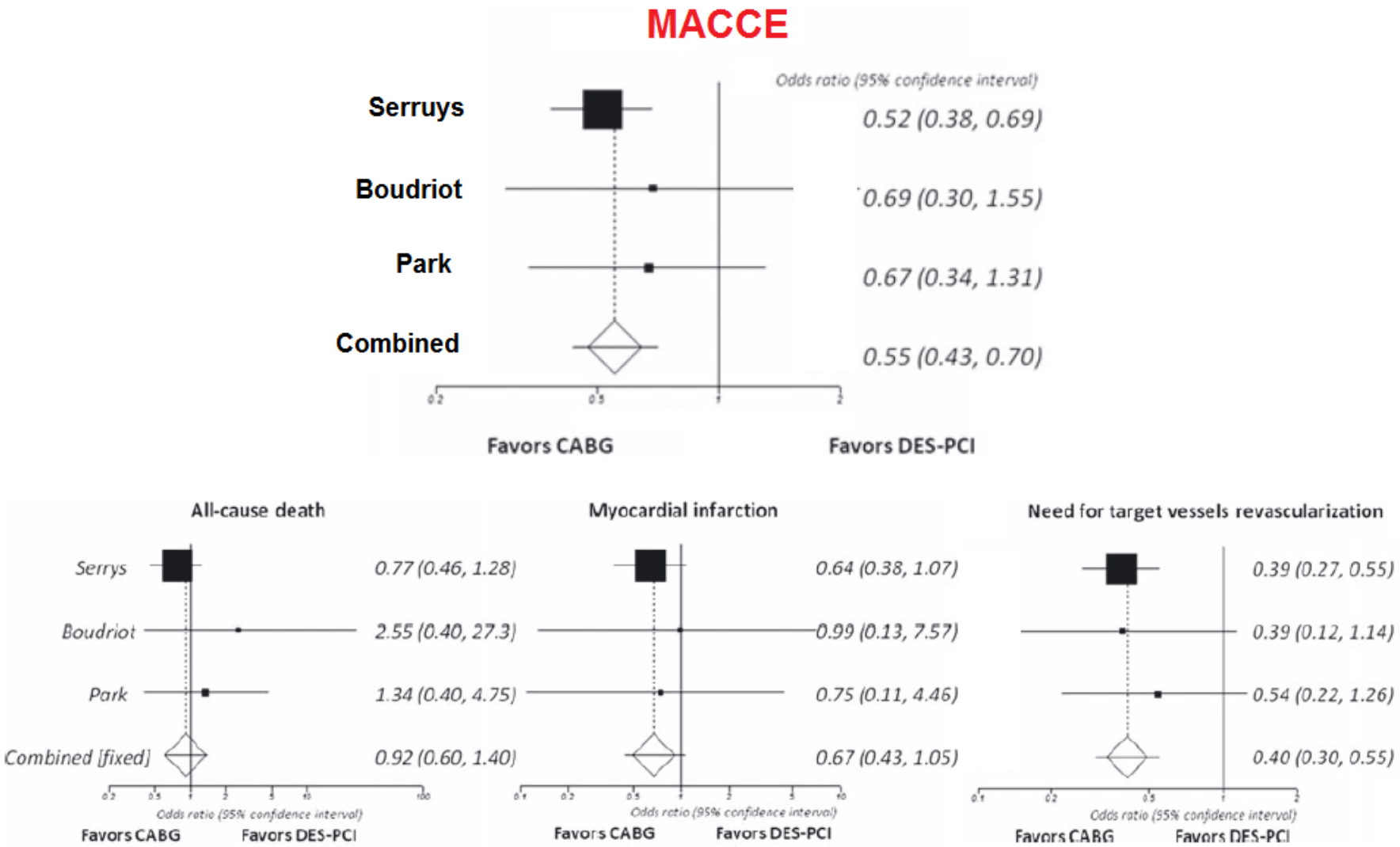
Completed and Planned RCTs of PCI Compared With CABG for the Treatment of Unprotected Left Main CAD

Trial Name	n	Follow-up	Primary Endpoint	Event Rate		p Value	Major Secondary Endpoint	Event Rate		p Value
				PCI	CABG			PCI	CABG	
Boudriot et al.	201	1 yr	Death, MI, TVR	19%	13.9%	0.19*	Death, MI	5.0%	7.9%	0.01*
PRECOMBAT	600	1 yr	Death, MI, TVR, CVA	8.7%	6.7%	0.01*	Death, MI, CVA	3.3%	4.0%	0.83
SYNTAX	705	3 yrs	Death, MI, TVR, CVA	26.8%	22.3%	0.20	Death, MI, CVA	13.0%	14.3%	0.60
EXCEL	2,634	3 yrs	Death, MI, CVA	NA	NA	Noninferiority and superiority	Death, MI, TVR	NA	NA	NA
MILESTONE	1,000	1 yr	Death	NA	NA	Noninferiority	Death, MI, CVA, TVR	NA	NA	NA

1. Cohen DJ, Van Hout B, Serruys PW, et al: Quality of life after PCI with drug-eluting stents or coronary-artery bypass surgery. N Engl J Med 2011;364:1016-1026.
2. Park SJ, Kim YH, Park DW, et al: Randomized trial of stents versus bypass surgery for left main coronary artery disease. N Engl J Med 2011;364:1718-1727.
3. Boudriot E, Thiele H, Walther T, et al: Randomized comparison of percutaneous coronary intervention with sirolimus-eluting stents versus coronary artery bypass grafting in unprotected left main stem stenosis. J Am Coll Cardiol 2011;57:538-545.

Meta-analysis of Randomized Controlled Trials on the Treatment of Unprotected Left Main Coronary Artery Disease: One-Year Outcomes with CABG Versus PCI with Drug-Eluting Stent

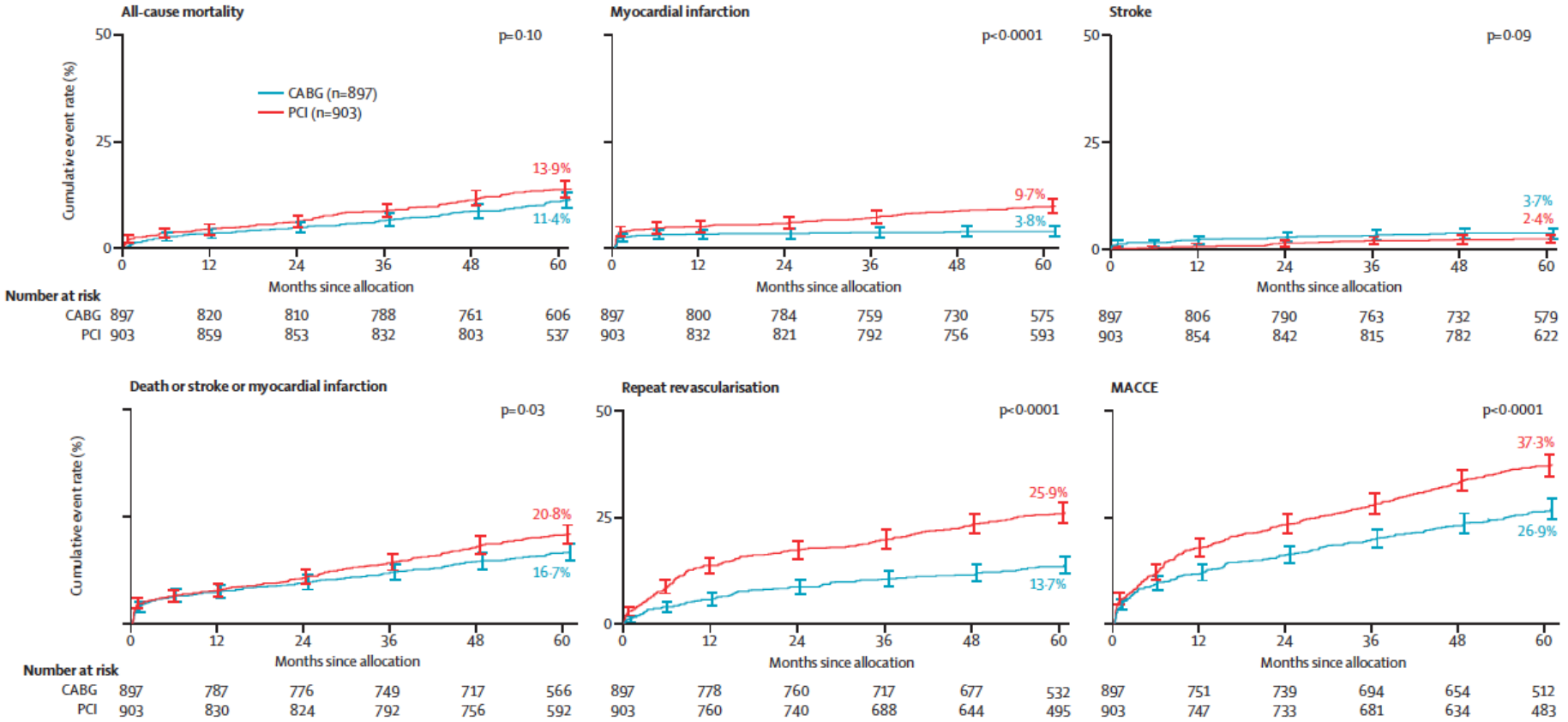
Kajimoto K et al.(Tokyo, Japan) J Card Surg 2012;27:152-157



Lancet 2013 ; 381 : 629-38.

Coronary artery bypass graft surgery versus percutaneous coronary intervention in patients with three-vessel disease and left main coronary disease: 5-year follow-up of the randomised, clinical SYNTAX trial

Friedrich W Mohr, Marie-Claude Morice, A Pieter Kappetein, Ted E Feldman, Elisabeth Ståhle, Antonio Colombo, Michael J Mack, David R Holmes Jr, Marie-angèle Morel, Nic Van Dyck, Vicki M Houle, Keith D Dawkins, Patrick W Serruys



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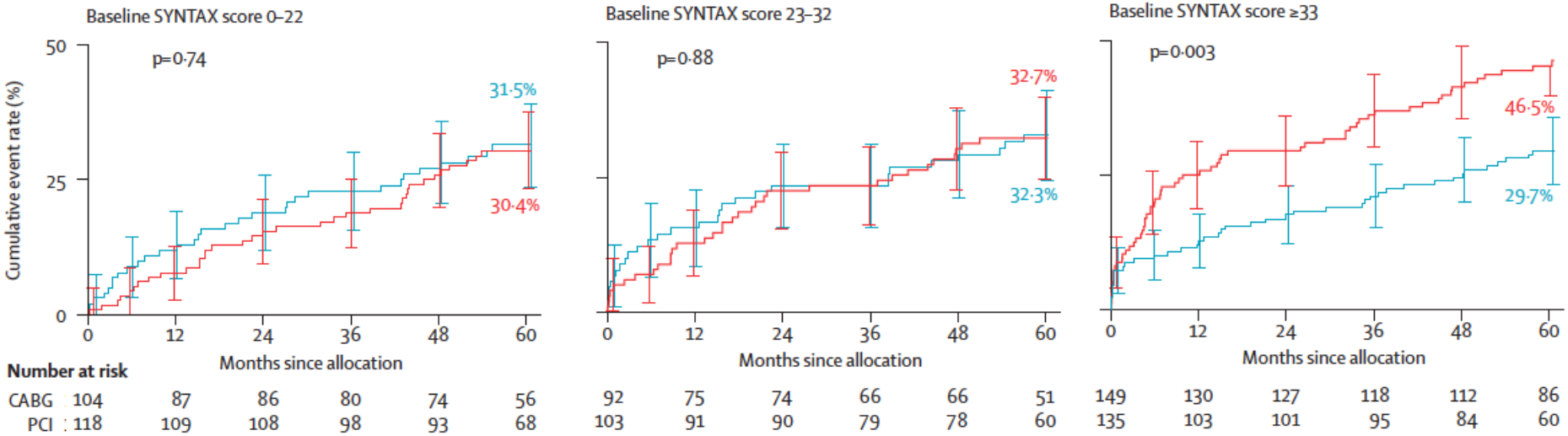
Left Main Coronary disease subgroup. MACCE at 5 years



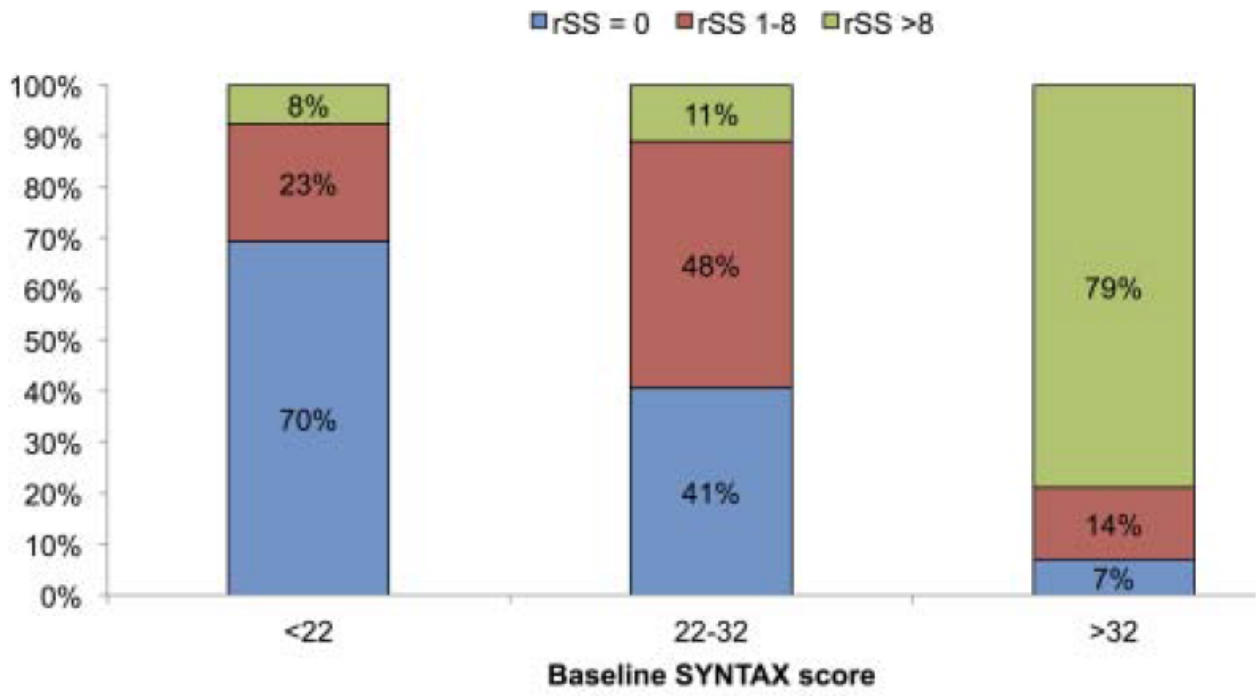
Three-Year Clinical Outcomes in the Subset of Patients with ULMCA Stenosis Enrolled in the SYNTAX Trial

	PCI (%)	CABG (%)	*P*
Tertile I (Syntax score 0–22)			
Death	2.6	6.0	0.21
Stroke	0.9	4.1	0.12
MI	4.3	2.0	0.36
Death/stroke/MI	6.9	11.0	0.26
Revascularization	15.4	13.4	0.69
Tertile II (Syntax score 23–32)			
Death	4.9	12.4	0.06
Stroke	1.0	2.3	0.46
MI	5.0	3.3	0.63
Death/stroke/MI	10.8	15.6	0.29
Revascularization	15.9	14.0	0.75
Tertile III (Syntax score≥33)			
Death	13.4	7.6	0.10
Stroke	1.6	4.9	0.13
MI	10.9	6.1	0.18
Death/stroke/MI	20.1	15.7	0.34
Revascularization	27.7	9.2	<0.001

The final 5-year results of the SYNTAX trial show that surgery remains the standard for patients with complex multivessel disease. However, in patients with less complex disease (ie, left main coronary disease with low or intermediate SYNTAX scores, or three-vessel disease with low SYNTAX scores), PCI is a reasonable alternative treatment to CABG. Treatment advice for an individual patient should take into account patient preferences, as well as the risks and benefits of the respective treatment options.

Objectifying the Impact of Incomplete Revascularization by Repeat Angiographic Risk Assessment With the Residual SYNTAX Score After Left Main Coronary Artery Percutaneous Coronary Intervention

Capodanno D et al. Catheterization and Cardiovascular Interventions 2012

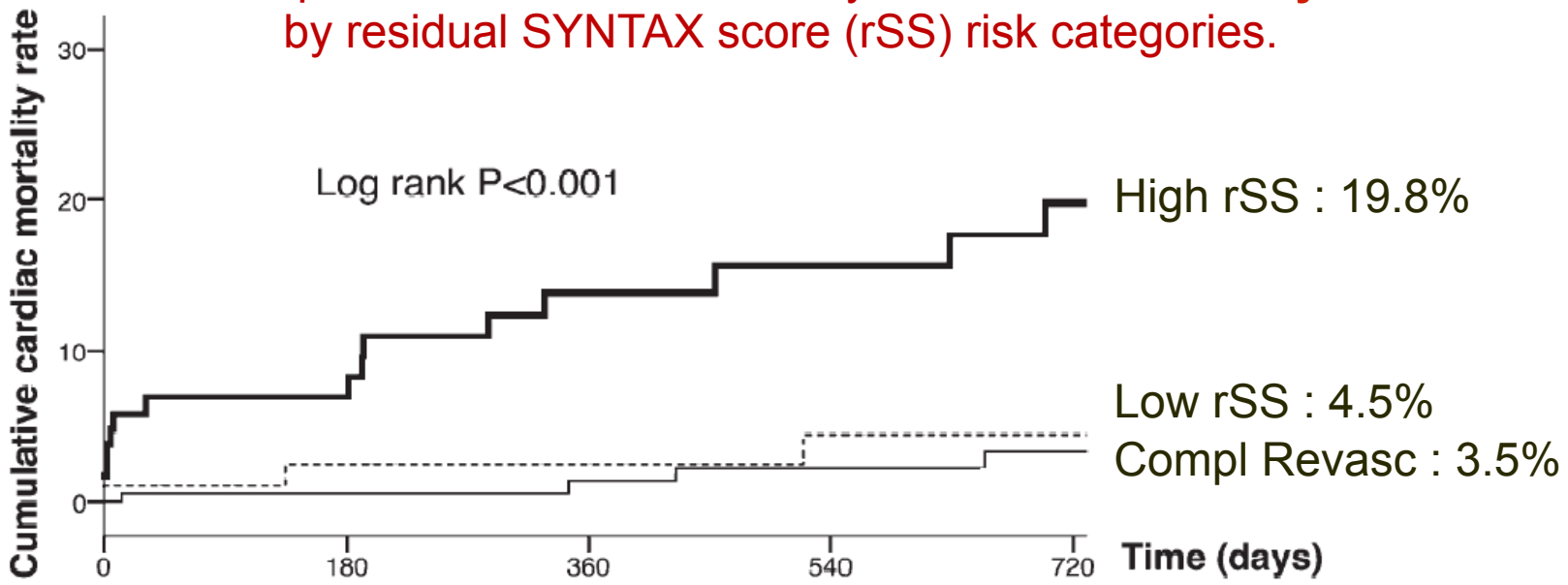


Distribution of completeness of revascularization by residual SYNTAX Score (rSS) based on strata of baseline SS (bSS=.
Complete revascularization was less likely to be achieved in the upper risk groups of the bSS (p < *0.001).*

Risk Assessment With the Residual SYNTAX Score After Left Main Coronary Artery Percutaneous Coronary Intervention

Capodanno D et al. Catheterization and Cardiovascular Interventions 2012

Kaplan–Meier estimates of 2-year **cardiac mortality** by residual SYNTAX score (rSS) risk categories.



CONCLUSIONS

A quantitative assessment of the incompleteness of revascularization following ULMCA PCI by means of the rSS carries a prognostic significance as independent predictor of 2-year cardiac mortality.

ESC/EACTS GUIDELINES

Indications for CABG versus PCI in stable patients with lesions suitable for both procedures and low predicted surgical mortality

Specific recommendations for diabetic patients

CABG should be considered, rather than PCI, when the extent of the CAD justifies a surgical approach (especially MVD), and the patient's risk profile is acceptable.	IIa	B

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 revascularization achievable with PCI, SYNTAX score ≤22	I A	IIa B
3VD complex lesions, incomplete revascularization 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

Formulation of the best possible revascularization approach will often require interaction between cardiologists and cardiac surgeons, referring physicians or other specialists as desirable.

The patient should be informed whether all treatment options are available at the site and whether surgery is offered on site or not.

	Class	Level
The appropriate revascularization strategy in patients with MVD should be discussed by the Heart Team.	I	C

Non-emergent high risk PCI procedures, including those performed for distal left main disease, complex bifurcation stenosis involving large side branches, single remaining coronary artery, and complex chronic total occlusion recanalization, should be performed by adequately experienced operators at centres that have access to circulatory support and intensive care treatment, and have cardiovascular surgery on site.

Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION

Circulation December 6, 2011

American Heart Association®

2011 ACCF/AHA Guideline for Coronary Artery Bypass Graft Surgery : A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines

Developed in Collaboration With the American Association for Thoracic Surgery, Society of Cardiovascular Anesthesiologists, and Society of Thoracic Surgeons

Writing Committee Members, L. David Hillis, Peter K. Smith, Jeffrey L. Anderson, John A. Bittl, Charles R. Bridges, John G. Byrne, Joaquin E. Cigarroa, Verdi J. DiSesa, Loren F. Hiratzka, Adolph M. Hutter, Jr, Michael E. Jessen, Ellen C. Keeley, Stephen J. Lahey, Richard A. Lange, Martin J. London, Michael J. Mack, Manesh R. Patel, John D. Puskas, Joseph F. Sabik, Ola Selnes, David M. Shahian, Jeffrey C. Trost and Michael D. Winniford

Class I

1. **A Heart Team approach to revascularization is recommended in patients with unprotected left main or complex CAD.** ***(Level of Evidence: C)***

Class IIa

1. **Calculation of the STS and SYNTAX scores is reasonable in patients with unprotected left main and complex CAD.** ***(Level of Evidence: B)***

Support for using a Heart Team approach comes from reports that patients with complex CAD referred specifically for PCI or CABG in concurrent trial registries have lower mortality rates than those randomly assigned to PCI or CABG in controlled trials.

2011 ACCF/AHA Guideline for Coronary Artery Bypass Graft Surgery : A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines

Developed in Collaboration With the American Association for Thoracic Surgery, Society of Cardiovascular Anesthesiologists, and Society of Thoracic Surgeons

Class I

1. **CABG to improve survival is recommended for patients with significant (≥50% diameter stenosis) left main coronary artery stenosis.** ***(Level of Evidence: B)***

Caracciolo EA, Davis KB, Sopko G, et al. Comparison of surgical and medical group survival in patients with left main coronary artery disease: long-term CASS experience. Circulation. 1995;91:2325–34.

Chaitman BR, Fisher LD, Bourassa MG, et al. Effect of coronary bypass surgery on survival patterns in subsets of patients with left main coronary artery disease: report of the Collaborative Study in Coronary Artery Surgery (CASS). Am J Cardiol. 1981;48:765–77.

Dzavik V, Ghali WA, Norris C, et al. Long-term survival in 11 661 patients with multivessel coronary artery disease in the era of stenting: a report from the Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease (APPROACH) Investigators. Am Heart J. 2001;142:119–26.

Takaro T, Hultgren HN, Lipton MJ, et al. The VA cooperative randomized study of surgery for coronary arterial occlusive disease II. Subgroup with significant left main lesions. Circulation. 1976;54: III107–17.

Takaro T, Peduzzi P, Detre KM, et al. Survival in subgroups of patients with left main coronary artery disease: Veterans Administration Cooperative Study of Surgery for Coronary Arterial Occlusive Disease. Circulation. 1982;66:14–22.

Taylor HA, Deumite NJ, Chaitman BR, et al. Asymptomatic left main coronary artery disease in the Coronary Artery Surgery Study (CASS) registry. Circulation. 1989;79:1171–9.

Yusuf S, Zucker D, Peduzzi P, et al. Effect of coronary artery bypass graft surgery on survival: overview of 10–year results from randomised trials by the Coronary Artery Bypass Graft Surgery Trialists Collaboration. Lancet. 1994;344:563–70.

2011 ACCF/AHA Guideline for Coronary Artery Bypass Graft Surgery : A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines

Developed in Collaboration With the American Association for Thoracic Surgery, Society of Cardiovascular Anesthesiologists, and Society of Thoracic Surgeons

Class IIa

1. PCI to improve survival is reasonable as an alternative to CABG in selected stable patients with significant (≥50% diameter stenosis) unprotected left main CAD with: 1) anatomic conditions associated with a low risk of PCI procedural complications and a high likelihood of good long-term outcome (eg, a low SYNTAX score [≤22], ostial or trunk left main CAD); and 2) clinical characteristics that predict a significantly increased risk of adverse surgical outcomes (eg, STS-predicted risk of operative mortality ≥5%).*(Level of Evidence: B)*
2. PCI to improve survival is reasonable in patients with UA/NSTEMI when an unprotected left main coronary artery is the culprit lesion and the patient is not a candidate for CABG.
   (Level of Evidence: B)
3. PCI to improve survival is reasonable in patients with acute STEMI when an unprotected left main coronary artery is the culprit lesion, distal coronary flow is less than Thrombolysis In Myocardial Infarction grade 3, and PCI can be performed more rapidly and safely than CABG.*(Level of Evidence: C)*

Class IIb

1. PCI to improve survival may be reasonable as an alternative to CABG in selected stable patients with significant (≥50% diameter stenosis) unprotected left main CAD with: 1) anatomic conditions associated with a low to intermediate risk of PCI procedural complications and an intermediate to high likelihood of good long-term outcome (eg, low–intermediate SYNTAX score of <33, bifurcation left main CAD); and 2) clinical characteristics that predict an increased risk of adverse surgical outcomes (eg, moderate–severe chronic obstructive pulmonary disease, disability from previous stroke, or previous cardiac surgery; STS-predicted risk of operative mortality >2%).*(Level of Evidence: B)*

Class III: HARM

1. PCI to improve survival should not be performed in stable patients with significant (≥50% diameter stenosis) unprotected left main CAD who have unfavorable anatomy for PCI and who are good candidates for CABG.*(Level of Evidence: B)*

ACCF/SCAI/STS/AATS/AHA/ASNC/HFSA/SCCT 2012 Appropriate Use Criteria for Coronary Revascularization Focused Update

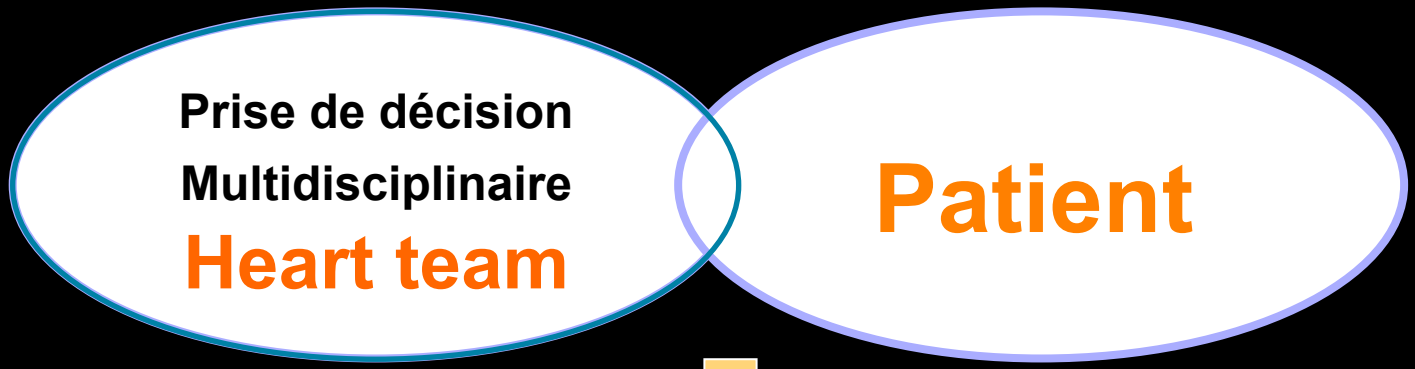
A Report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, Society for Cardiovascular Angiography and Interventions, Society of Thoracic Surgeons, American Association for Thoracic Surgery, American Heart Association, American Society of Nuclear Cardiology, and the Society of Cardiovascular Computed Tomography

Method of Revascularization	CABG	PCI
Two-vessel CAD with proximal LAD stenosis	A	A
Three-vessel CAD with low CAD burden (i.e., three focal stenosis, low SYNTAX score)	A	A
Three-vessel CAD with intermediate to high CAD burden (i.e., multiple diffuse lesions, presence of CTO, or high SYNTAX score)	A	U
Isolated left main stenosis	A	U
Left main stenosis and additional CAD with low CAD burden (i.e., one to two vessel additional involvement, low SYNTAX score)	A	U
Left main stenosis and additional CAD with intermediate to high CAD burden (i.e., three vessel involvement, presence of CTO, or high SYNTAX score)	A	I

Evaluation du risque :

Syntax Score et Euroscore II

ou SYNTAX score II



Données de l'EBM

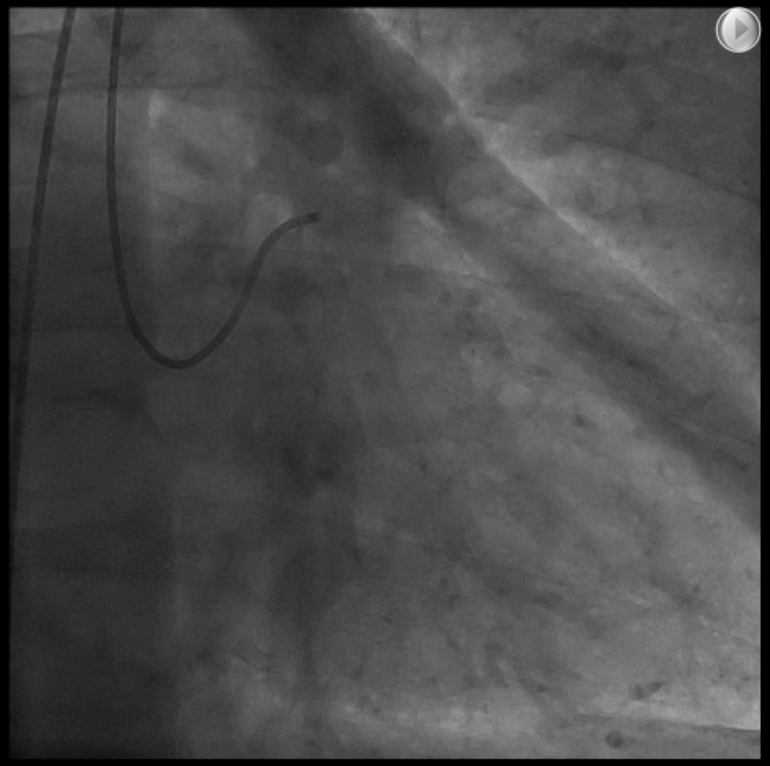
résumées dans les recommandations et les publications plus récentes

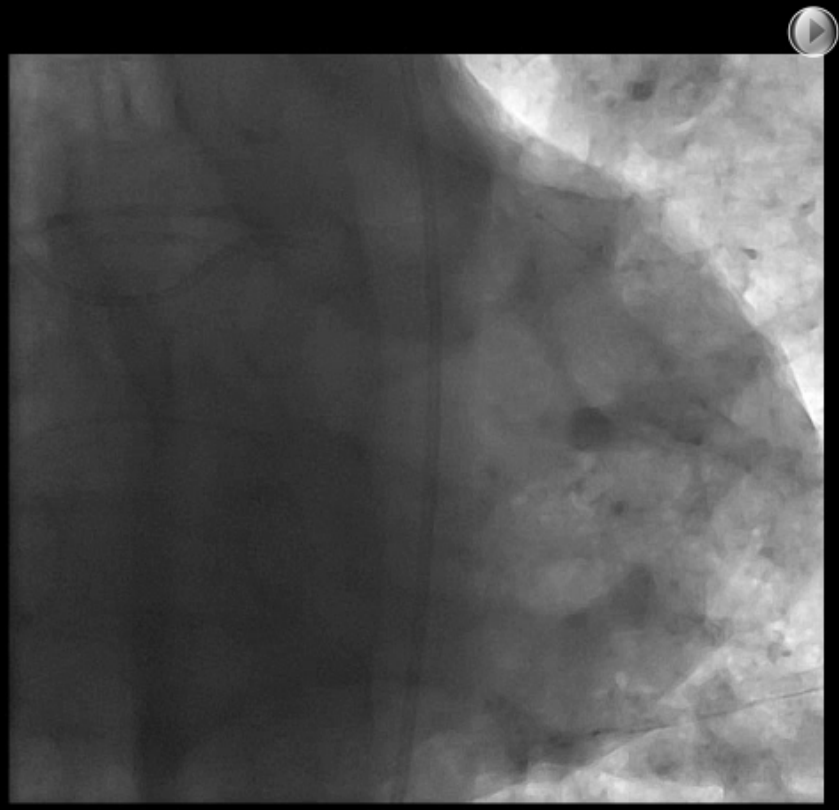
Expérience de l'équipe médico-chirurgicale

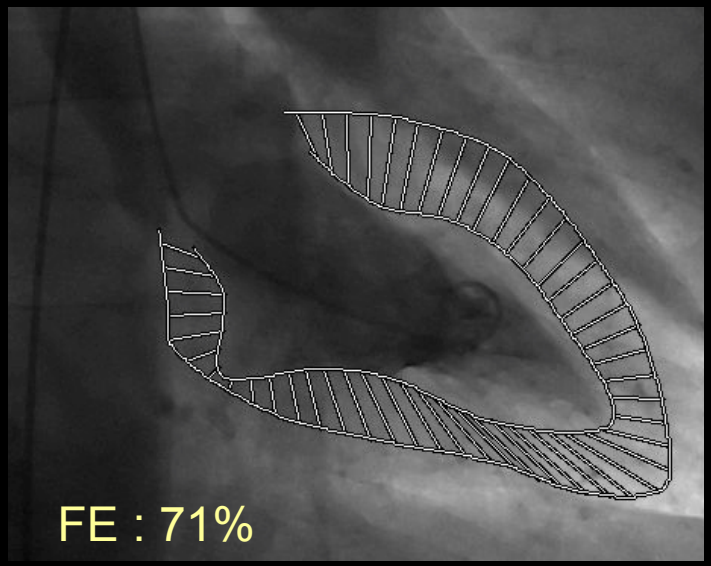
Choix thérapeutique

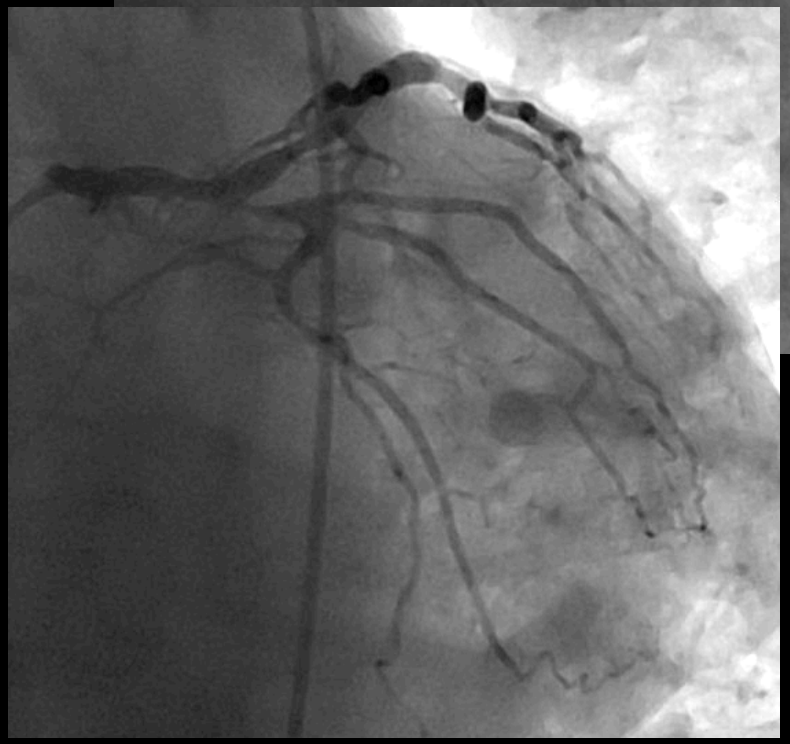
éclairé par une information objective prenant en compte le profil psychologique et le contexte social

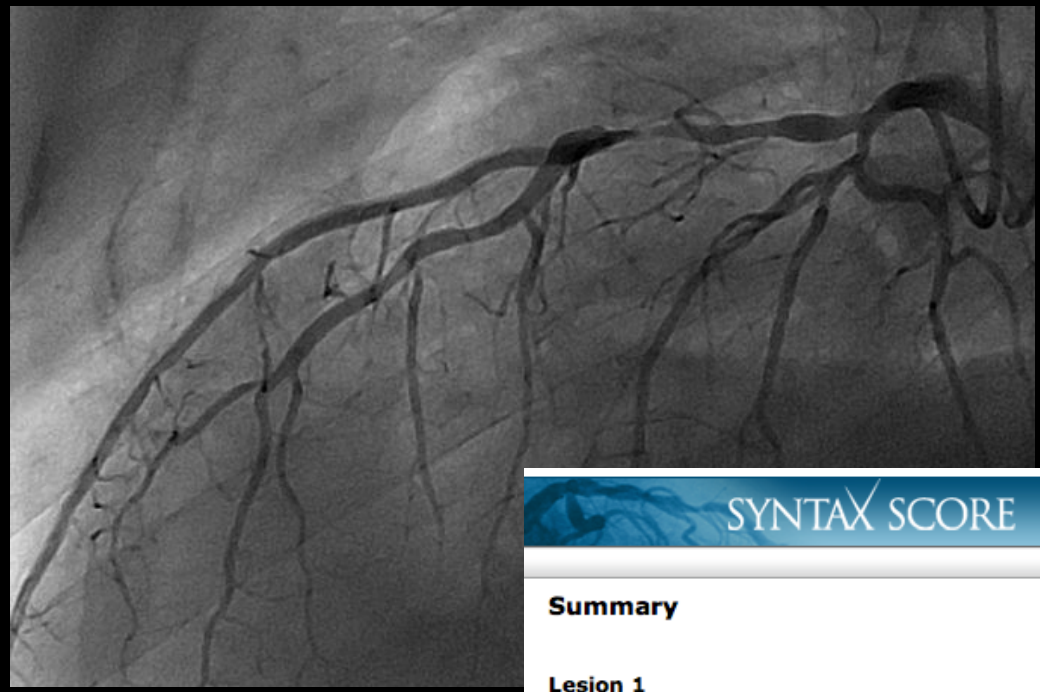
Mr R…52 ans. Infarctus postérieur traité par angioplastie primaire de la droite à H1 en 2006. Réseau gauche infiltré, sans lésion critique à l'époque.
Arrêt du tabagisme. Dyslipidémie traitée. HIV + sous trithérapie.
Fin 2012 : angor classe II. Ergo + 120W.






FE : 71%





HOME euroSCORE SCORING CALCULATOR REFERENCES

euroSCORE interactive calculator

Patient related factors			Cardiac related factors		
Age [1] (years)	52	0.03	NYHA	I	0
Gender	male	0	CCS class 4 angina [8]	no	0
Renal impairment [2] *See calculator below for creatinine clearance*	normal (CC >85ml/min)	0	LV function	good (LVEF > 50%)	0
Extracardiac arteriopathy [3]	no	0	Recent MI [9]	no	0
Poor mobility [4]	no	0	Pulmonary hypertension [10]	no	0
Previous cardiac surgery	no	0	**Operation related factors**		
Chronic lung disease [5]	no	0	Urgency [11]	elective	0
Active endocarditis [6]	no	0	Weight of the intervention [12]	isolated CABG	0
Critical preoperative state [7]	no	0	Surgery on thoracic aorta	no	0
Diabetes on insulin	no	0			
EuroSCORE II	0.50 %				

***Euro*SCORE II**

Note: This is the 2011 EuroSCORE II

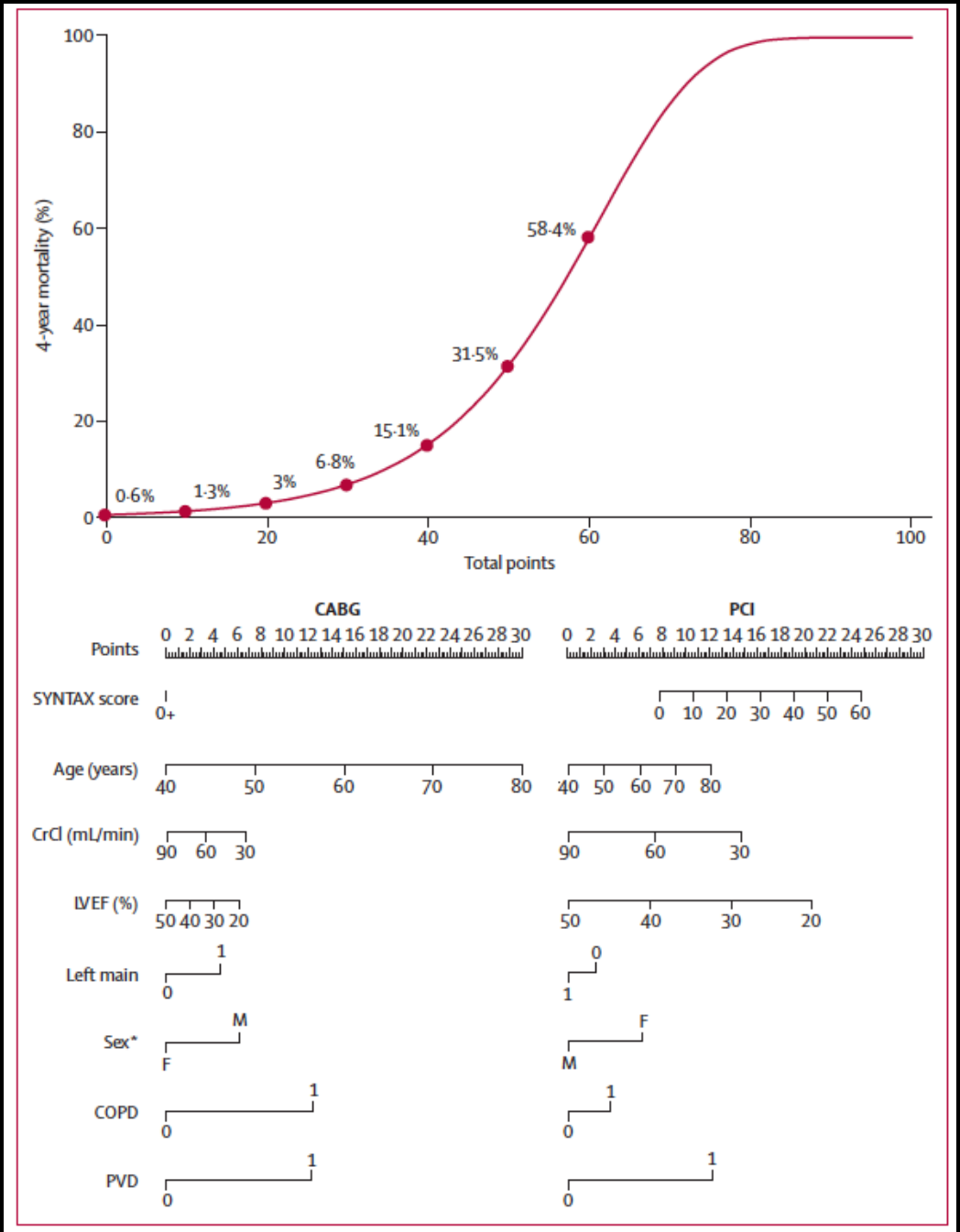
Calculate Clear

Risque chirurgical : 0.5%

SYNTAX SCORE

Summary

Lesion 1	
(segment 5): 5x2=	10
(segment 6): 3.5x2=	7
(segment 11): 1.5x2=	3
Bifurcation Type: Medina 1,0,1:	2
Angulation <70є	1
Sub total lesion 1	*23*
Lesion 2	
(segment 6): 3.5x2=	7
(segment 7): 2.5x2=	5
(segment 9): 1x2=	2
Bifurcation Type: Medina 1,0,0:	1
Angulation <70є	1
Length >20 mm	1
Sub total lesion 2	*17*
Lesion 3	
(segment 16): 0.5x2=	1
Sub total lesion 3	*1*
TOTAL:	***41***



Angioplastie :

1. Syntax Score : 19 pts
2. Age : 4 pts
3. Tritronc : 3 pts

Total 26 pts
Mortalité à 4 ans 5%

Chirurgie :

1. Syntax Score : 0 pt
2. Age : 9 pts
3. Left main : 5 pts
4. Tritronc : 0 pts
5. Sexe masculin : 6 pts

Total : 20 pts
Mortalité à 4 ans : 3 %

Traitement réalisé après discussion en Heart Team et avec le patient : mono pontage mammaire sur l'IVA. (marginale jugée trop grêle pour recevoir un pontage satisfaisant)
ATC Cx à distance si besoin

Catheterization and Cardiovascular Interventions 80:245–246 (2012)

Editorial Comment

Unprotected left main disease: Surgery, Stents, or Both?

Calin V. Maniu and Emmanouil S. Brilakis

Hybrid revascularization may offer the best of both worlds: the excellent patency and durability of the left internal mammary to left anterior descending, combined with PCI using drug-eluting stents of the now "protected" left main artery, thus avoiding the use of saphenous vein grafts…

However, there are unresolved questions and concerns about the use of the hybrid revascularization :

1. could the technical difficulties and risks associated with combined surgery and PCI tip the balance in favor of traditional CABG?
2. when a stent is placed restoring antegrade flow, could the patency of the LIMA be decreased ?

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NEWS AND VIEWS

Time for Coronary Artery Bypass Grafting to Make a Comeback?

David Taggart

La stratégie thérapeutique la plus pertinente pour chaque patient atteint d'une lésion du tronc est cruciale et doit faire l'objet d'une discussion d'équipe avant d'être expliquée au patient.

Editorial Comment

Left Main Coronary Intervention: Are We Moving Too Quickly Without the Appropriate Evidence Base?

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CORONARY ARTERY DISEASE
Core Curriculum

Revascularization of Unprotected Left Main Coronary Artery Disease: Strategy Selection and Systematic risk Assessment

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Conclusions

- En dehors du contexte de l'urgence, un patient affecté d'une lésion du tronc commun justifie une évaluation soigneuse du risque d'une revascularisation par angioplastie et par chirurgie.
- La discussion multidisciplinaire est essentielle pour arrêter la stratégie thérapeutique la plus pertinente afin d'assurer au patient les meilleures chances de survie à long terme.
- Le patient doit être orienté vers des pontages s'il est affecté d'une lésion du tronc à laquelle s'ajoutent des lésions complexes siégeant sur les lits d'aval, et d'autant qu'il est diabétique, qu'il s'agit d'une femme, que sa fonction gauche est altérée…
- Lorsque on décide d'opter pour l'angioplastie, elle doit être réalisée avec les meilleurs stents actifs du moment, en privilégiant, si possible, l'implantation d'un stent unique.