

Long-term Follow up of CABG versus PCI

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Background

FOCUSED UPDATE

2009 Focused Updates: ACC/AHA Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction (Updating the 2004 Guideline and 2007 Focused Update) and ACC/AHA/SCAI Guidelines on Percutaneous Coronary Intervention (Updating the 2005 Guideline and 2007 Focused Update)

Class IIb

1. PCI of the left main coronary artery with stents as an alternative to CABG may be considered in patients with anatomic conditions that are associated with a low risk of PCI procedural complications and clinical conditions that predict an increased risk of adverse surgical outcomes (21,138,139).* (*Level of Evidence: B*)

Background

2011 ACCF/AHA/SCAI Guideline for Percutaneous Coronary Intervention

A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines and the Society for Cardiovascular Angiography and Interventions

Anatomic Setting	COR	LOE
UPLM*		
CABG	I	B
PCI	IIa—For SIHD when both of the following are present	B
	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 of ≤ 22 , ostial or trunk left main CAD)	
	Clinical characteristics that predict a significantly increased risk of adverse surgical outcomes (eg, STS-predicted risk of operative mortality $\geq 5\%$)	

Background

2014 ESC/EACTS Guidelines on myocardial revascularization

Recommendations according to extent of CAD	CABG		PCI	
	Class ^a	Level ^b	Class ^a	Level ^b
Left main disease with a SYNTAX score 23–32.	I	B	IIa	B
Left main disease with a SYNTAX score >32.	I	B	III	B
Three-vessel disease with a SYNTAX score ≤ 22.	I	A	I	B

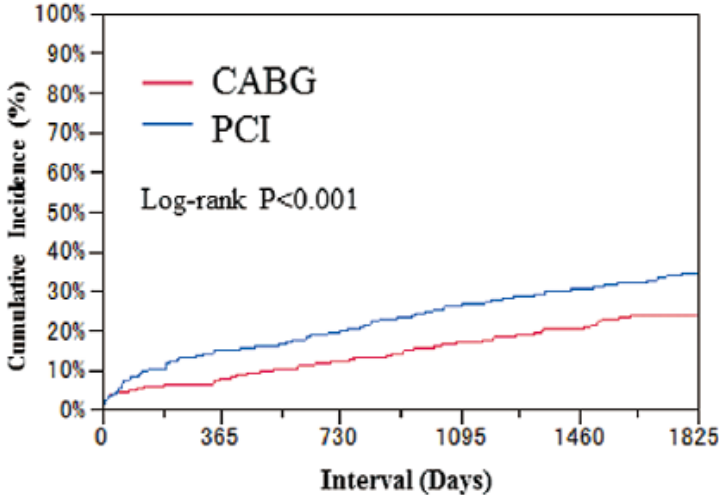
2018 ESC/EACTS Guidelines on myocardial revascularization

Recommendations according to extent of CAD	CABG		PCI	
	Class ^a	Level ^b	Class ^a	Level ^b
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

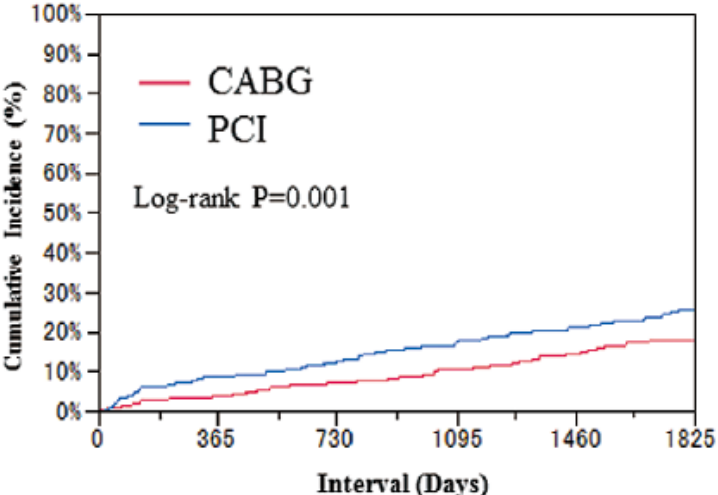
Background

CABG was Associated with Better 5-year Outcome in Japanese ULMCAD Patients

(A) Death/MI/Stroke



(B) All-cause Death



Background

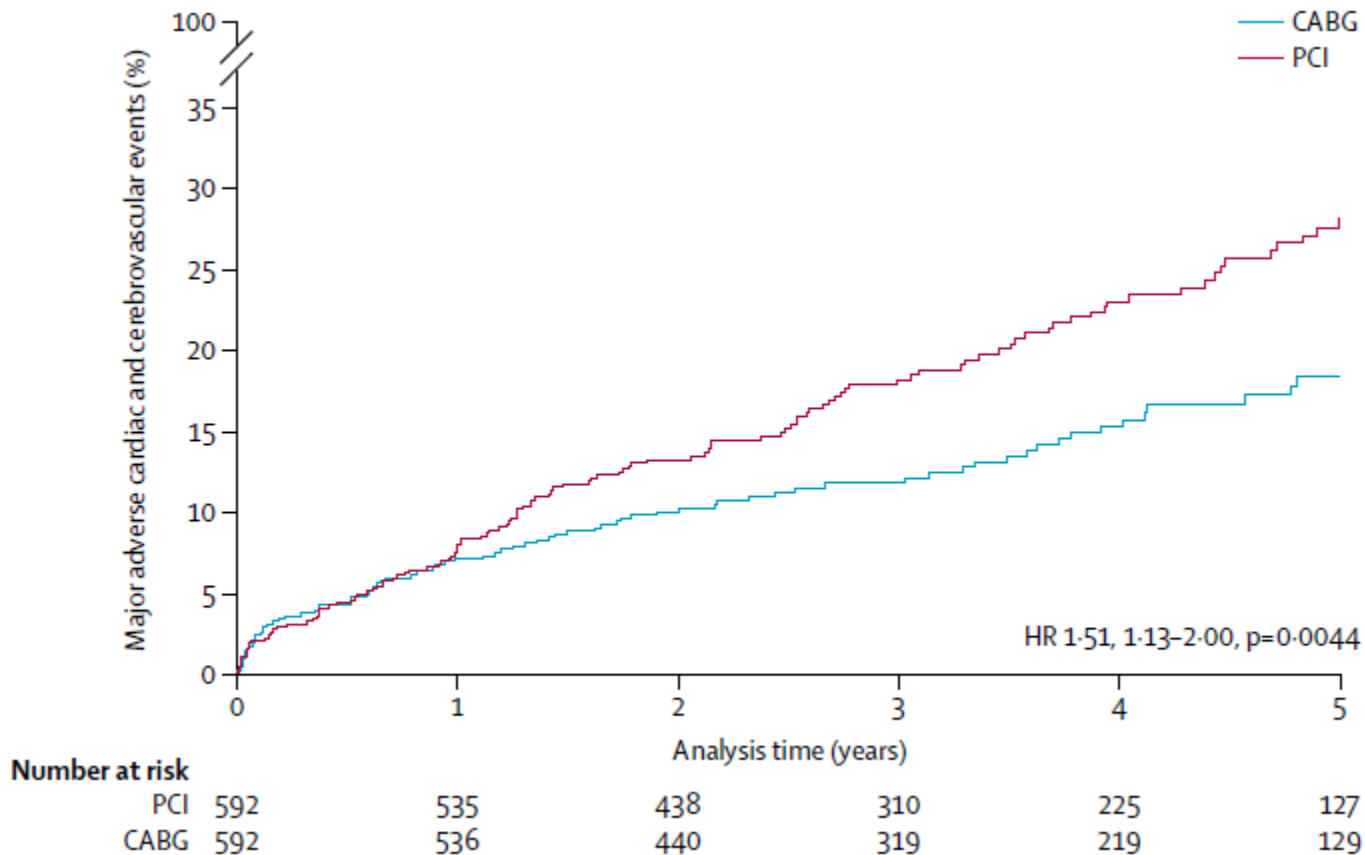
No Difference in MACCE at 5-year in Caucasian ULMCAD Patients

Table 1. Components of MACCE and Stent Thrombosis Incidence Rates at 5 Years in Left Main Patients

Event	PCI (n=357)	CABG (n=348)	Hazard Ratio PCI vs CABG (95 CI)	P Value
MACCE	36.9 (130)	31.0 (103)	1.23 (0.95-1.59)	0.12
All death/stroke/MI	19.0 (67)	20.8 (69)	0.91 (0.65-1.27)	0.57
All death	12.8 (45)	14.6 (48)	0.88 (0.58-1.32)	0.53
Cardiac death	8.6 (30)	7.2 (23)	1.23 (0.71-2.11)	0.46
Stroke	1.5 (5)	4.3 (14)	0.33 (0.12-0.92)	0.03
MI	8.2 (28)	4.8 (16)	1.67 (0.91-3.10)	0.10
Revascularization	26.7 (90)	15.5 (49)	1.82 (1.28-2.57)	<0.001
PCI	21.6 (73)	13.8 (43)	1.67 (1.15-2.43)	0.007
CABG	7.9 (26)	1.7 (6)	4.16 (1.71-10.10)	<0.001
Stent thrombosis/graft occlusion	5.1 (17)	4.4 (14)	1.15 (0.57-2.33)	0.70

Background

CABG was Associated with Better 5-year Outcome in Caucasian ULMCAD Patients



Study Aim

- We sought to compare 10 years outcomes for PCI and CABG in Korean patients with unprotected left main coronary artery disease (ULMCAD).

Methods

- We selected 422 patients with ULMCAD who underwent CABG (n=273) or PCI (n=149) from 1998-2008.
- The patients with left main (LM) lesions were assessed by angiography and diagnosed with a stenosis diameter $\geq 50\%$ in the LM coronary.
- We excluded patients who had undergone an emergency operation.
- We assessed patients for clinical baseline, angiographic characteristics and adverse events.

Methods

- The primary outcome measure was a major adverse cardiac and cerebrovascular event (MACCE) :
all-cause death, non-fatal myocardial infarction (MI), stroke, or target vessel revascularization (TVR).
- Participants were assessed by SYNTAX score to determine the anatomical complexity of coronary artery disease (low ≤ 22 , intermediate 23 to 32, and high ≥ 33) for 10-year MACCE outcomes.

Results: Baseline

	Unadjusted Data			After PSM Data		
	PCI(n=149)	CABG(n=273)	P	PCI(n=97)	CABG(n=97)	P
Age	62.4±10.0	64.0±8.8	0.114	63.8±10.1	64.1±8.6	0.848
Age≥70 years	36(24.2)	61(22.3)	0.672	29(29.9)	24(24.7)	0.420
Male	100(67.1)	183(67.0)	0.986	66(68.0%)	63(64.9%)	0.648
BMI <25.0	84(57.5)	183(67.0)	0.054	56(57.7%)	58(59.8%)	0.771
EF ≤50%	25(16.9)	71(29.5)	0.005	18(18.6%)	23(28.4%)	0.121
Current smoker	39(26.2)	41(15.0)	0.005			
Clinical characteristics						
UA/NSTEMI	135(90.6)	257(94.1)	0.177	90(92.8%)	93(95.9%)	0.268
STEMI	12(8.1)	16(5.9)	0.387	7(7.2%)	4(4.1%)	0.268
Hypertension	75(50.3)	124(45.4)	0.334	51(52.6%)	52(53.6%)	0.886
DM	46(30.9)	89(32.6)	0.716	27(27.8%)	32(33.0%)	0.435
Dyslipidemia	19(12.8)	16(5.9)	0.014			
Prior MI	23(15.4)	0(0.0)	<0.001	0(0.0%)	0(0.0%)	-
Prior stroke	3(2.0)	8(2.9)	0.052	2(2.1%)	4(4.1%)	0.341
Medication						
Aspirin	145(97.3)	129(47.3)	<0.001			
P2Y12 inhibitor	115(77.2)	153(56.0)	<0.001			
ACEI/ARB	78(52.3)	51(18.7)	<0.001			
β-inhibitor	108(72.5)	42(15.4)	<0.001			
Statin	42(28.2)	43(15.8)	<0.001			

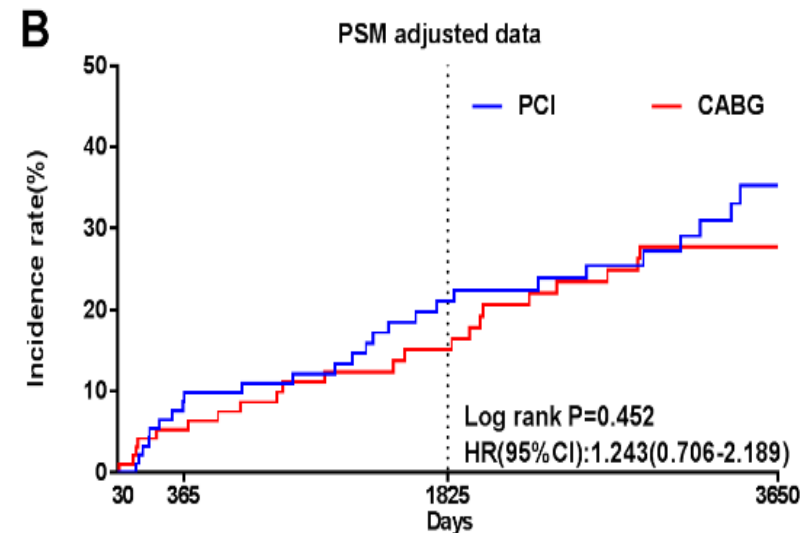
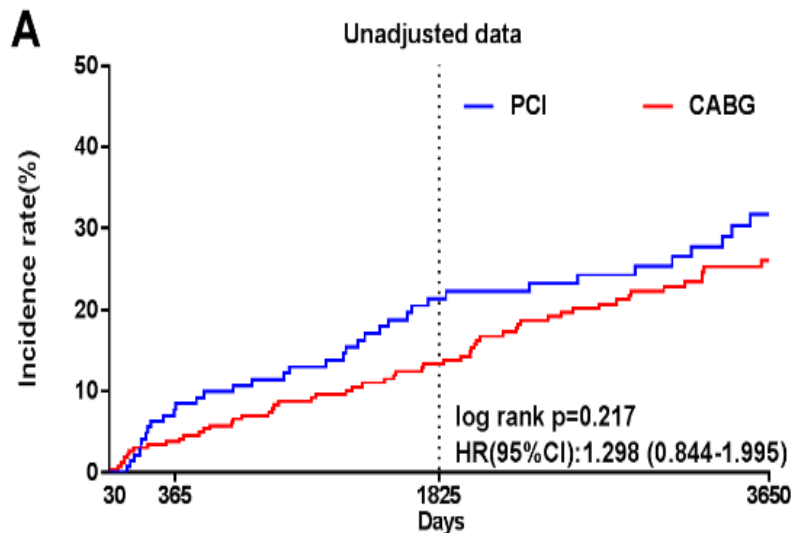
Results: Baseline-continued

	Unadjusted Data			After PSM Data		
	PCI(n=149)	CABG(n=273)	P	PCI(n=97)	CABG(n=97)	P
Anatomical characteristics						
Isolated ULMCAD	19(12.8)	10(3.7)	<0.001	3(3.1%)	5(5.2%)	0.300
ULMCA+1-VD	34(22.8)	21(7.7)		21(21.9%)	13(13.4%)	
ULMCA+2-VD	52(34.9)	59(21.6)		30(30.9%)	39(40.2%)	
ULMCA+3-VD	44(29.5)	183(67.0)		43(44.3%)	40(41.2%)	
SYNTAX score	24.2±8.5	27.2±8.6	0.001			
Low ≤23	60(40.3)	77(28.2)	0.011	31(32.0)	29(29.9)	0.911
Intermediate 23–32	68(45.5)	144(52.7)	0.163	48(49.5)	51(52.6)	
High ≥33	21(14.1)	52(19.0)	0.308	18(18.6)	17(17.5)	
Procedural characteristics						
Total no. of stents	2.0±0.8					
Total stent length	35.8±23.9					
Stent usage	143(96.0)					
DES usage	120(80.5)					
Off- pump	151(55.3)					

PSM; Propensity-Score Matching; Values are n (%) or mean ± SD. BMI, body mass index; UA, unstable angina; NSTEMI, non-ST elevation myocardial infarction; STEMI, ST elevation myocardial infarction; MI, myocardial infarction; CV, cardiovascular; ULMCAD, unprotected left main coronary artery disease; VD, vessel disease; SYNTAX, Synergy Between Percutaneous Coronary Intervention With Taxus and Cardiac Surgery; ACEI, ACE inhibitor; ARB, angiotensin receptor blocker.

Results

10-year MACCE Incidence in CABG and PCI Groups

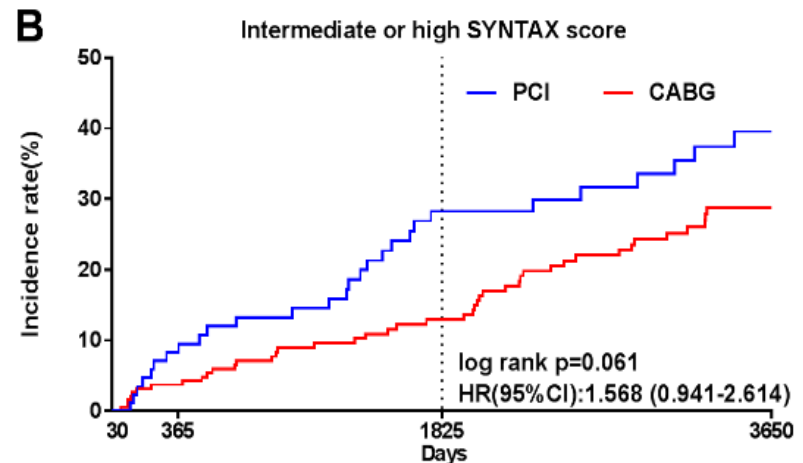
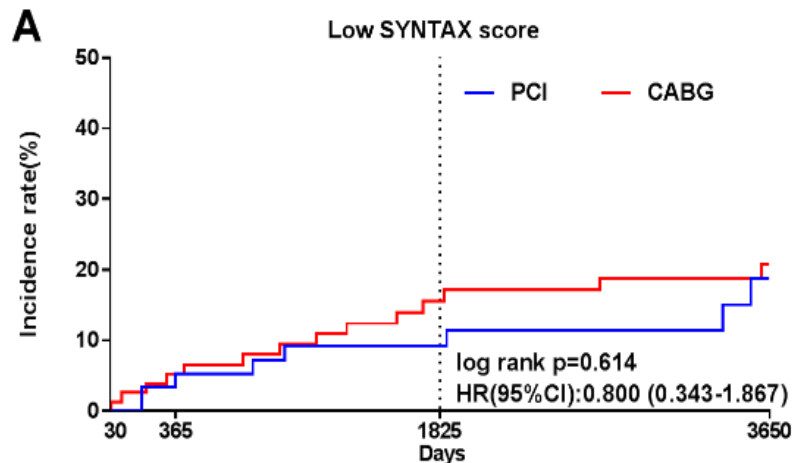


Interval	0 day	1 year	5 years	10 years
CABG group				
N of events		10	32	56
N of patients at risk	273	263	241	217
Incidence		3.7%	11.7%	20.5%
PCI group				
N of events		11	28	37
N of patients at risk	149	138	121	112
Incidence		7.4%	18.8%	24.8%
	Log rank P=	0.102	0.050	0.217

Interval	0 day	1 year	5 years	10 years
CABG group				
N of events		5	14	22
N of patients at risk	97	92	83	75
Incidence		5.2%	14.4%	22.7%
PCI group				
N of events		8	18	26
N of patients at risk	97	89	79	70
Incidence		8.2%	18.6%	26.8%
	Log rank P=	0.397	0.472	0.452

Results

10-year MACCE Incidence According to SYNTAX Score

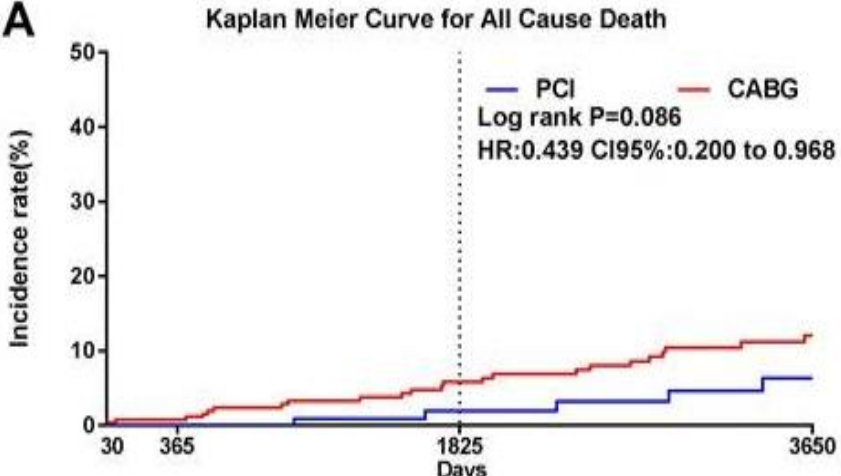


Interval	0 day	1 year	5 years	10 years
CABG group				
N of events		3	10	13
N of patients at risk	77	74	67	64
Incidence		3.9%	13.0%	16.9%
PCI group				
N of events		4	6	9
N of patients at risk	60	56	54	51
Incidence		6.7%	10.0%	15.0%
	Log rank P=	0.474	0.660	0.614

Interval	0 day	1 year	5 years	10 years
CABG group				
N of events		7	22	43
N of patients at risk	196	189	174	153
Incidence		3.6%	11.2%	21.9%
PCI group				
N of events		7	22	28
N of patients at risk	89	82	67	61
Incidence		7.9%	14.7%	31.5%
	Log rank P=	0.130	0.005	0.061

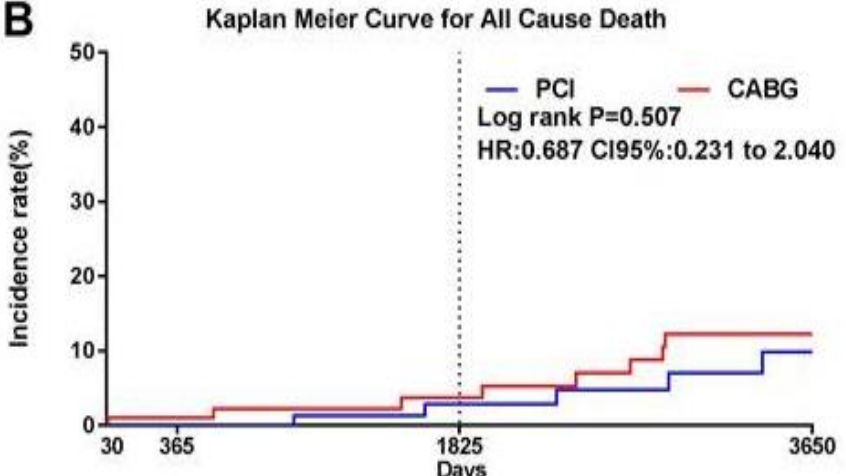
Results

10-year All-cause Death Incidence in CABG and PCI



Interval	0 day	1 year	5 years	10 years
CABG group				
N of events		2	13	23
N of patients at risk	273	271	260	250
Incidence		0.7%	4.8%	8.4%
PCI group				
N of events		0	2	5
N of patients at risk	149	149	147	144
Incidence		0.0%	1.3%	3.4%
		Log rank P=	0.295	0.088
				0.086

(A) Unadjusted 10-year all-cause mortality

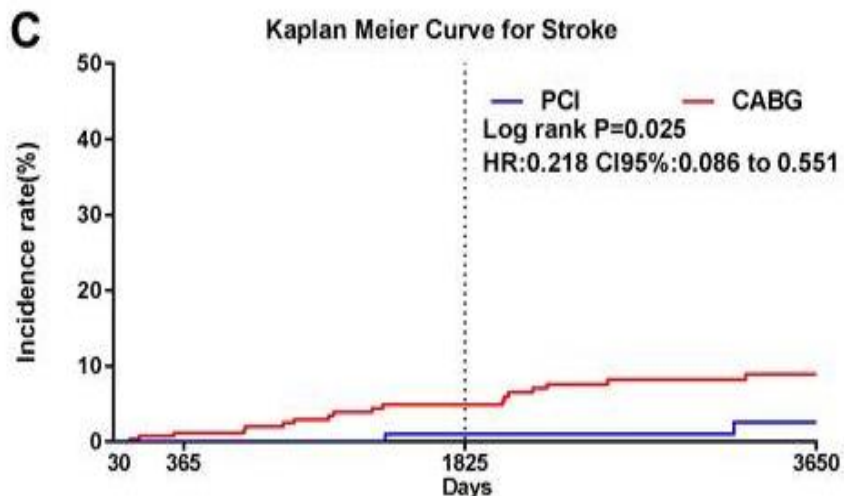


Interval	0 day	1 year	5 years	10 years
CABG group				
N of events		1	3	8
N of patients at risk	97	96	94	89
Incidence		1.0%	3.1%	8.2%
PCI group				
N of events		0	2	5
N of patients at risk	97	97	95	92
Incidence		0.0%	2.1%	5.2%
		Log rank P=	0.320	0.660
				0.507

(B) Adjusted 10-year all-cause mortality

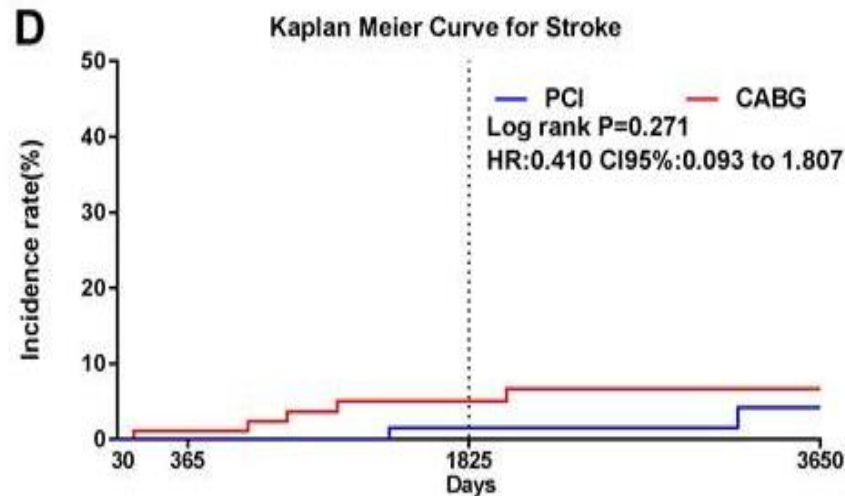
Results

10-year Stroke Incidence in CABG and PCI Groups



Interval	0 day	1 year	5 years	10 years
CABG group				
N of events		3	11	18
N of patients at risk	273	270	262	255
Incidence		1.1%	4.0%	6.6%
PCI group				
N of events		0	1	2
N of patients at risk	149	149	148	147
Incidence		0%	0.7%	1.3%
	Log rank P=	0.201	0.054	0.025

(C) Unadjusted 10-year stroke incidence

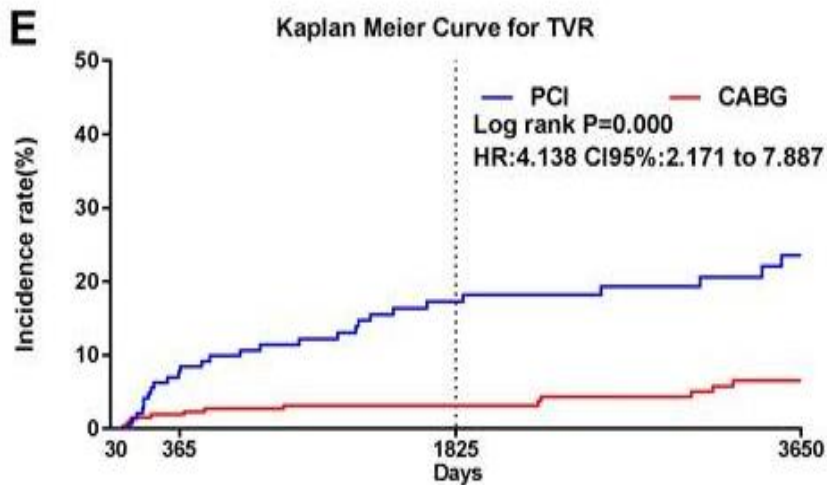


Interval	0 day	1 year	5 years	10 years
CABG group				
N of events		1	4	5
N of patients at risk	97	96	93	92
Incidence		1.0%	4.1%	5.2%
PCI group				
N of events		0	1	2
N of patients at risk	97	97	96	95
Incidence		0.0%	1.0%	2.1%
	Log rank P=	0.315	0.175	0.271

(D) Adjusted 10-year stroke incidence

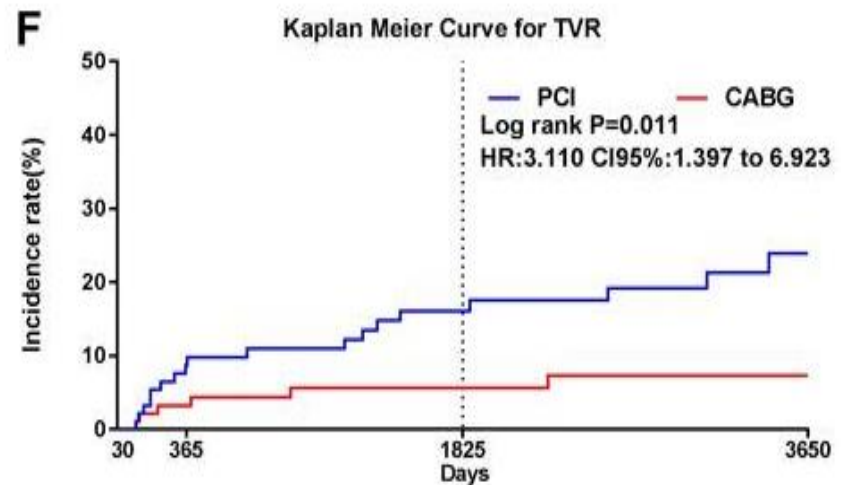
Results

10-year TVR Incidence in CABG and PCI Groups



Interval	0 day	1 year	5 years	10 years
CABG group				
N of events		5	8	13
N of patients at risk	273	268	265	260
Incidence		1.8%	2.9%	4.8%
PCI group				
N of events		11	23	28
N of patients at risk	149	138	126	121
Incidence		7.4%	15.4%	18.8%
	Log rank P=	0.005	0.000	0.000

(E) Unadjusted 10-year TVR incidence



Interval	0 day	1 year	5 years	10 years
CABG group				
N of events		3	5	6
N of patients at risk	97	94	92	91
Incidence		3.1%	5.2%	6.2%
PCI group				
N of events		8	14	18
N of patients at risk	97	89	83	79
Incidence		8.2%	14.4%	18.6%
	Log rank P=	0.128	0.038	0.011

(F) Adjusted 10-year TVR incidence

Conclusions

- In patients with ULMCAD, PCI was similar to CABG for long-term outcomes at our single center registry data;
- Although there was a higher TVR rate in the PCI group, PCI was non-inferior to CABG in terms of MACCE incidence.

Limitations

- Single center and limited number patients;
- Most of the surgical patients were followed-up by the cardiac surgery department.

Thank you for your attention!