STEMI合并多支病变和/或CTO的急诊PCI处理原则

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概述

- About 40% to 65% of the patients with ST-elevation myocardial infarction (STEMI) have 1 or more significant stenosis in non-culprit vessels as well as the culprit lesion.
- Current Guidelines: Propose only culprit vessel PCI in STEMI patients
- However, several recent studies presented positive results on complete revascularization in patients with STEMI which is still controversial.

合并CTO或多支血管病变

- 病人多存在陈旧性心肌梗死、糖尿病或多次PCI史
- 部分病人合并心源性休克体征与症状，基础心功能往往较差
- 治疗上亦需积极IABP辅助

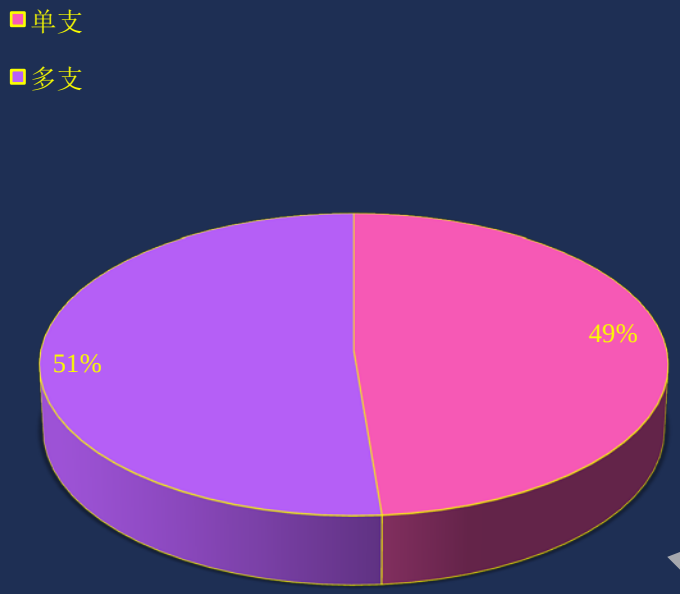
Extent, Location, and Clinical Significance of Non-IRA CAD Among Patients With STEMI

Data on 28,282 patients pooled from 8 randomized trials, 1993-2007.

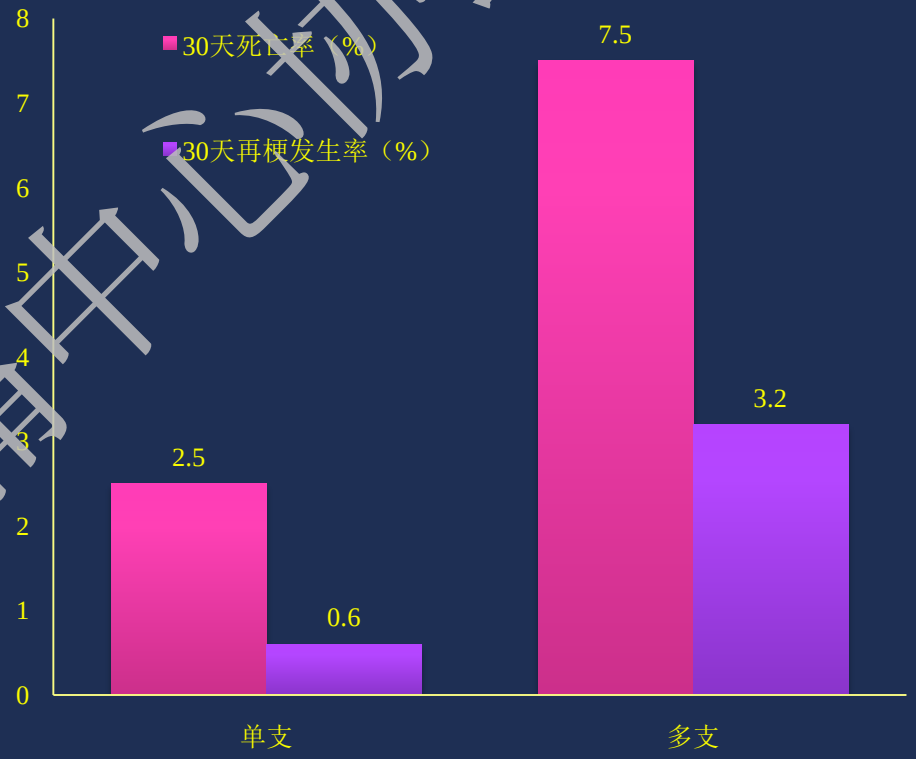
- Slightly more than half of patients (52.8%) had obstructive non-IRA disease, mostly in the LAD (41.2%) and RCA (46.4%)
- After adjustment, patients with non-IRA disease had higher 30-day mortality than those without **(3.3% vs 1.9%; *P* < .001)**
- Mortality finding validated in the Korea Acute MI Registry but not the Duke Databank for Cardiovascular Disease

Implications: Obstructive non-IRA coronary disease is associated with an increase in 30-day mortality in STEMI patients, raising questions about the use of non-IRA interventions in this setting.

Park D-W, et al. *JAMA.* 2014;312:2019-2027.



冠心病病人血管病变情况



死亡率比较

★*M oreno R, Garca E, Sorian o J, et al. Early coronary angioplasty for acute myocardial infarction: predictors of poor outcome in a non-selected population . J Invasive Cardiol, 2001,13: 202-210.*

急诊PCI时非梗死相关血管的处理策略？

- Single-vessel PCI（culprit-only PCI）？
- Multi-vessel PCI（onetime PCI、complete PCI）？

  北美地区该策略的比例为12.6%，
  西欧为10.5%，
  东欧为6.6%，
  澳大利亚和新西兰为6.1%。
- Staged PCI?

“one-time PCI”的局限性

- ACS时全身高凝状态，干预非靶血管后支架内血栓形成风险较高
- 非靶血管干预时如果出现无复流、慢血流，往往恶化血流动力学与临床症状
- 术中造影剂用量增多
- 术中曝光时间增加

Culprit-Vessel vs Multivessel Intervention at the Time of Primary PCI in Patients With STEMI and Multivessel Disease

3,984 consecutive patients treated at 8 tertiary cardiac care centers in London, 2005 to 2011.

	Culprit-Vessel (n = 3,429)	Multivessel (n = 555)	*P* Value
In-Hospital MACE	4.6%	7.2%	.010
In-Hospital Mortality	3.5%	6.1%	.005
1-Year Mortality	7.4%	10.1%	.031

Conclusion: In STEMI patients, culprit-only PCI is associated with better survival at 1 year compared with a multivessel procedure.

Iqbal MB, et al. *Circ Cardiovasc Qual Outcomes*. 2014;Epub ahead of print.

APEX-AMI研究亚组分析

(Assessment of Pexelizumab in Acute Myocardial Infarction)

在2201例合并多支血管病变的STEMI患者中，有217例（9.9%）在接受直接PCI的同时，还接受了非罪犯病变的PCI，其余1984例（90.1%）仅接受梗死相关动脉的PCI。

APEX-AMI试验分次PCI与一次性PCI策略的90天临床结果

	一次性PCI	分次性PCI	*P*值
死亡	12.5%	5.6%	<0.001
死亡、充血性心衰和休克	18.9%	13.1%	0.011

Eur Heart J.2010;Epub ahead of print

HORIZONS - AMI研究亚组分析

3602例STEMI患者中因多支血管病变接受PCI的668例患者分为one-time PCI策略（275例）或分次PCI策略（393例），随访1年比较：

表3. HORIZONS-AMI试验1年随访结果

	单次PCI (n=274)	分次PCI (n=393)	P值
全因死亡率	9.2%	2.3%	<0.0001
再梗死	6.5%	4.7%	0.29
缺血驱动的靶血管血运重建	8.9%	8.1%	0.66
MACE	18.1%	13.4%	0.08
明确的支架血栓形成	5.0%	1.6%	0.01
TIMI严重出血	4.0%	1.3%	0.02

J Am Coll Cardiol. 2011; 58: 704-711

荟萃分析结果亦不支持单次PCI

包括4项前瞻性研究和14项回顾性研究，共纳入40,280例接受直接PCI STEMI合并多支病变的患者。

不同PCI策略的短期死亡率

	OR	95%*CI*	*P* 值
罪犯病变PCI vs. 分次PCI	3.03	1.41～6.51	0.005
多支病变PCI vs. 分次PCI	5.31	2.31～12.21	<0.0001
罪犯病变PCI vs. 多支病变PCI	0.66	0.48～0.89	0.007

J Am Coll Cardiol. 2011;58:692-703

“one-time PCI”的优越性

- 有时识别罪犯血管困难
- 有时AMI为多个罪犯血管
- 非罪犯病变不稳定时，AMI后发生闭塞风险较高，一次干预后可避免再次心梗
- 血流动力学不稳定时，罪犯血管干预后同时干预主要供血血管的非靶病变有可能提高生存率
- 完全性血运重建治疗可能更好地改善急性心肌梗死患者的症状和预后
- 降低手术费用

Primary PCI in Patients with AMI, Resuscitated Cardiac Arrest, and Cardiogenic Shock

266 STEMI patients (63.5% with multivessel disease) with resuscitated cardiac arrest and cardiogenic shock at 5 French centers (1998-2010).

- **Pts with single-vessel disease had increased 6-month survival vs. those with multivessel disease (29.6% vs. 42.3%; *P* = 0.032)**
- **Among multivessel disease patients, 60.9% had culprit-only and 39.1% had multivessel primary PCI**
- **Multivessel PCI resulted in higher 6-month survival (43.9% vs. 20.4%; *P* = 0.0017), driven by less recurrent cardiac arrest and death from shock (*P* = 0.024)**

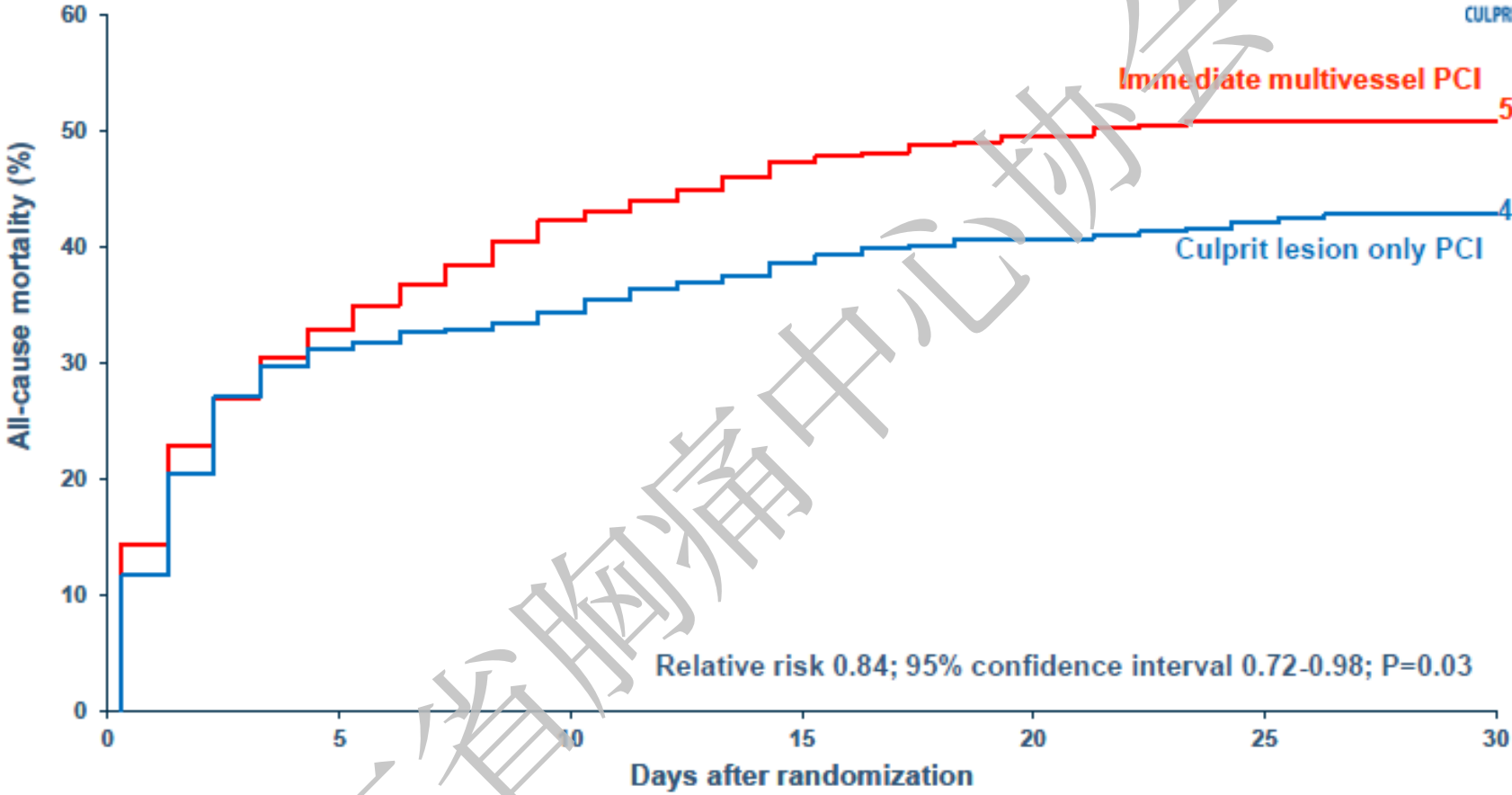
Conclusion: More extensive primary PCI may improve clinical outcomes in STEMI patients with multivessel disease who present with both cardiogenic shock and resuscitated cardiac arrest.

Mylotte D, et al. *J Am Coll Cardiol Intv*. 2013;Epub ahead of print.

UNIVERSITÄT LEIPZIG
HERZZENTRUM

No Evidence of "Initial" Harm with Multivessel PCI

CULPRIT-SHOCK



Number at risk:

Culprit lesion only PCI	344	237	226	211	203	198	193
Immediate multivessel PCI	341	229	197	179	170	166	165

Culprit Shock: No Difference in Cardiac Causes of Death

Cause	Culprit only	Multivessel
Sudden death	11 (7.4%)	12 (6.8%)
Recurrent MI	2 (1.3%)	2 (1.1%)
Refractory Shock	104 (69.8%)	108 (61.4%)

Multivessel PCI did not worsen cardiac outcomes

Culprit Shock
Non-Cardiac Causes of Death

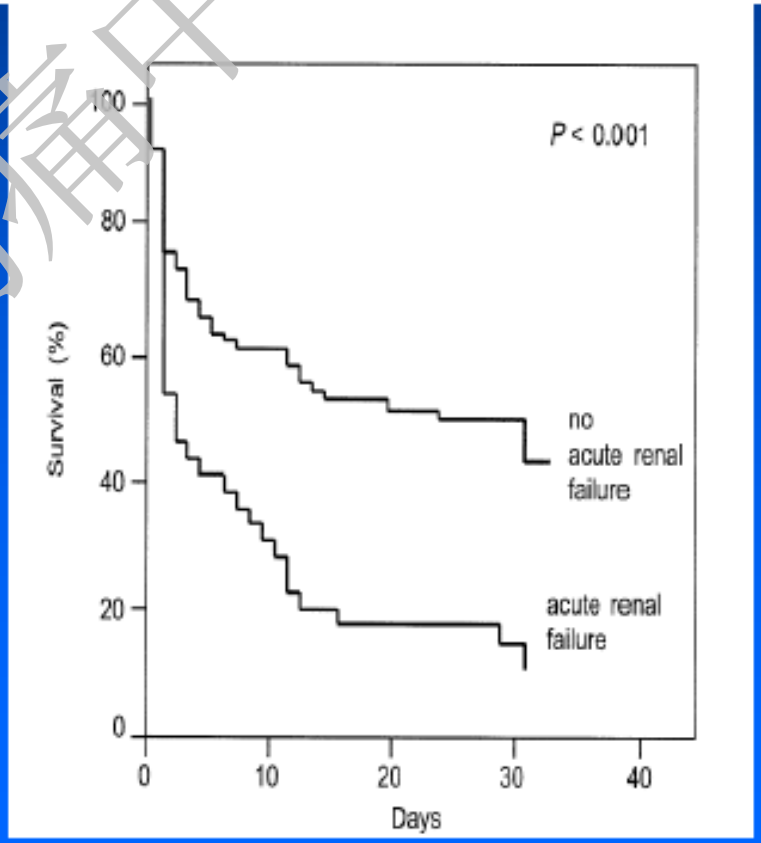
Cause	Culprit only	Multivessel
Brain Injury	11 (7.4%)	25 (14.2%)
Unknown	2 (1.3%)	4 (5.1%)
Other	9 (6%)	12 (6.8%)

Should Cardiac Arrest Patients been Excluded?

Avoiding Excess Contrast Makes Sense

Prognosis of Patients Who Develop Acute Renal Failure during the First 24 Hours of Cardiogenic Shock after Myocardial Infarction

Maria Koreny, MD, Georg Delle Karth, MD, Alexander Geppert, MD, Thomas Neunteufl, MD, Ute Prigninger, MD, Gottfried Heinz, MD, Peter Siostrzonek, MD



My Conclusions from Culprit Shock

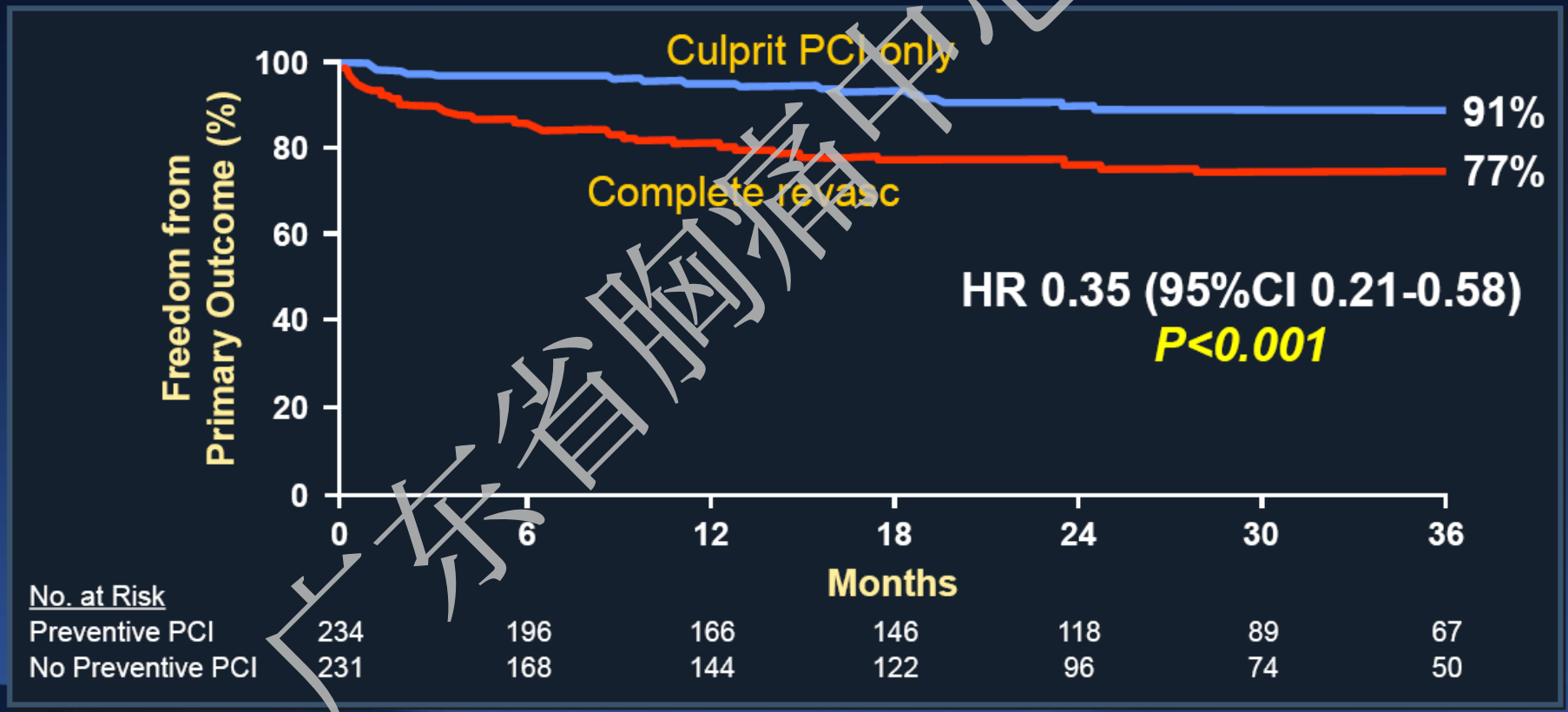
- Amazing trial that will change the management of cardiogenic shock
- Mortality differences may have been due, in part, to anoxic brain injury present at the time of presentation
- Routine multivessel PCI did not reduce inotropic requirement, ICU time or any measure of CHF
- Potential harm: increased time in the lab, risk of renal failure and possibly mortality
- Many unanswered questions for future trials

PRAMI: "Preventative" PCI of Non-culprit Lsns after Culprit Lesion Primary PCI in STEMI

465 non-shock pts at 5 UK sites with MVD; after successful primary PCI randomized to NCL PCI of non-LM DS 50-99% stenoses vs. conservative care

600 pts planned; DSMB stopped trial early after 465 pts enrolled (2008-2013)

Primary endpoint: Cardiac death, MI or refractory angina



Wald DS et al. *NEJM* 2013:on-line

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Median FU 2.3 Years

	Complete revasc (N=234)	Culprit PCI only (N=231)	HR (95%CI)	*P* value
Pre-specified outcomes				
Cardiac death, MI, or refractory angina	21	53	0.35 (0.21-0.58)	<0.001
Cardiac death or MI	11	27	0.36 (0.18-0.73)	0.004
Cardiac death	4	10	0.34 (0.11-1.08)	0.07
Nonfatal MI	7	20	0.32 (0.13-0.75)	0.009
Refractory angina w/o CD or MI	12	30	0.35 (0.18-0.69)	0.002
Secondary outcomes				
Noncardiac death	8	6	1.10 (0.38-3.18)	0.86
Repeat revascularization	16	46	0.30 (0.17-0.56)	<0.001

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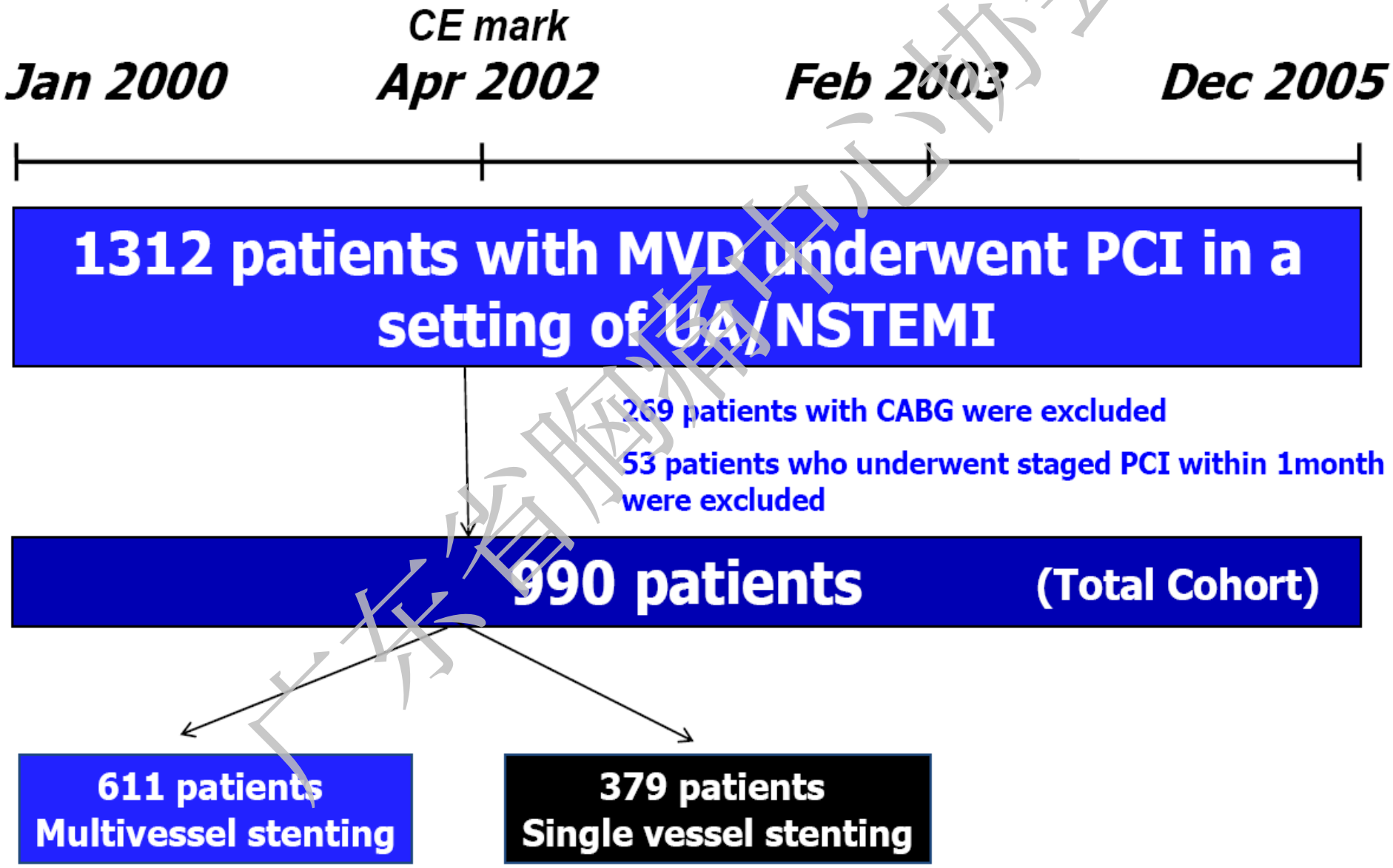
Procedural Details

	Complete revasc (N=234)	Culprit PCI only (N=231)	*P* value
Complications			
Stroke	2	0	0.50
Bleed requiring transfusion or surgery	7	6	0.80
CIN requiring dialysis	1	3	0.37
Total	10	9	0.84
Procedure duration (mins, median)	63 (46-80)	45 (32-60)	<0.001
Contrast volume (mL, median)	300 (210-380)	200 (150-260)	<0.001
Fluoroscopy dose (Gycm^2, median)	90.1 (57.5-135.5)	71.4 (42.4-97.3)	<0.001

Thorax center "real-world" experience
RESEARCH & T-SEARCH registries

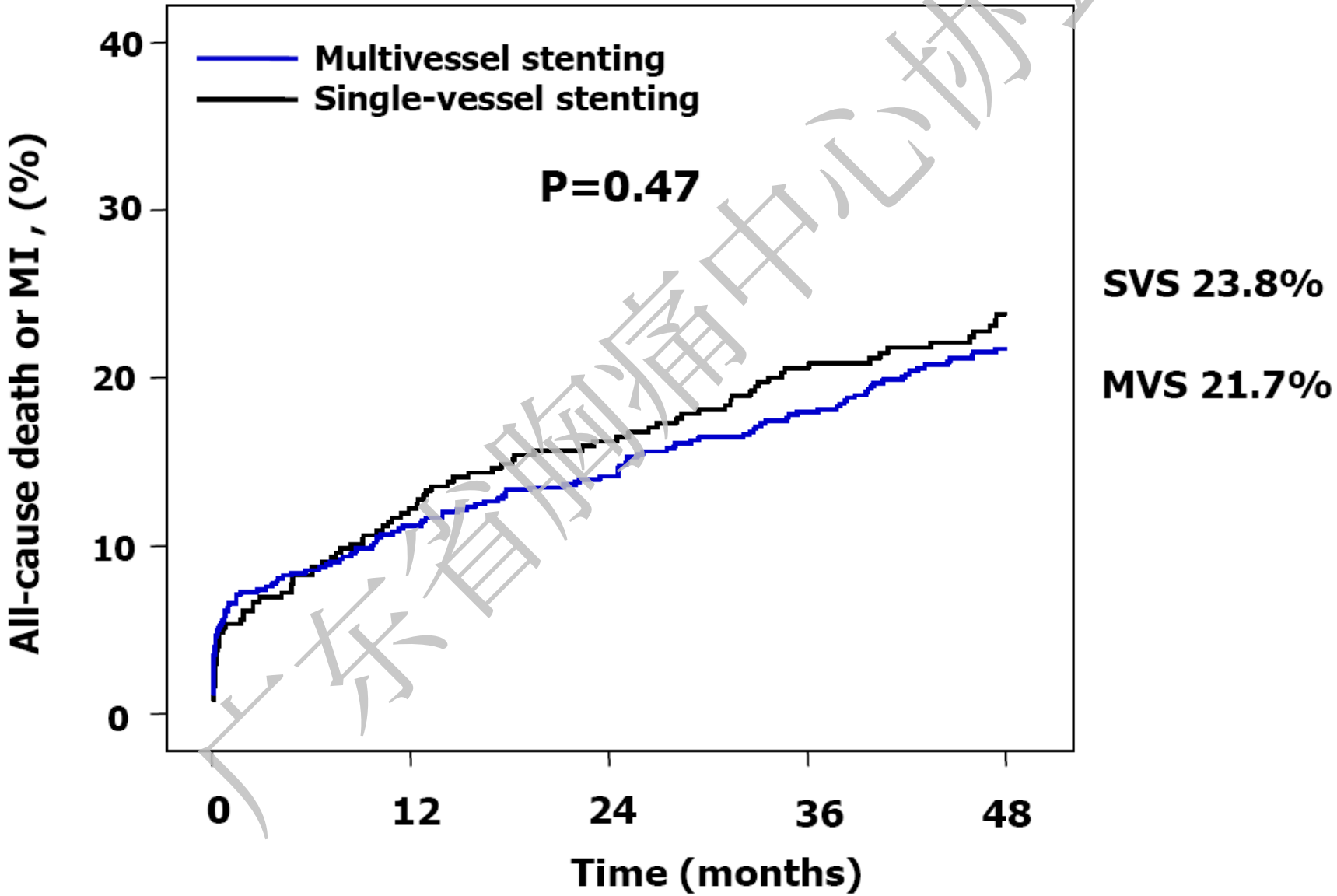


Angiographic/ Procedural details

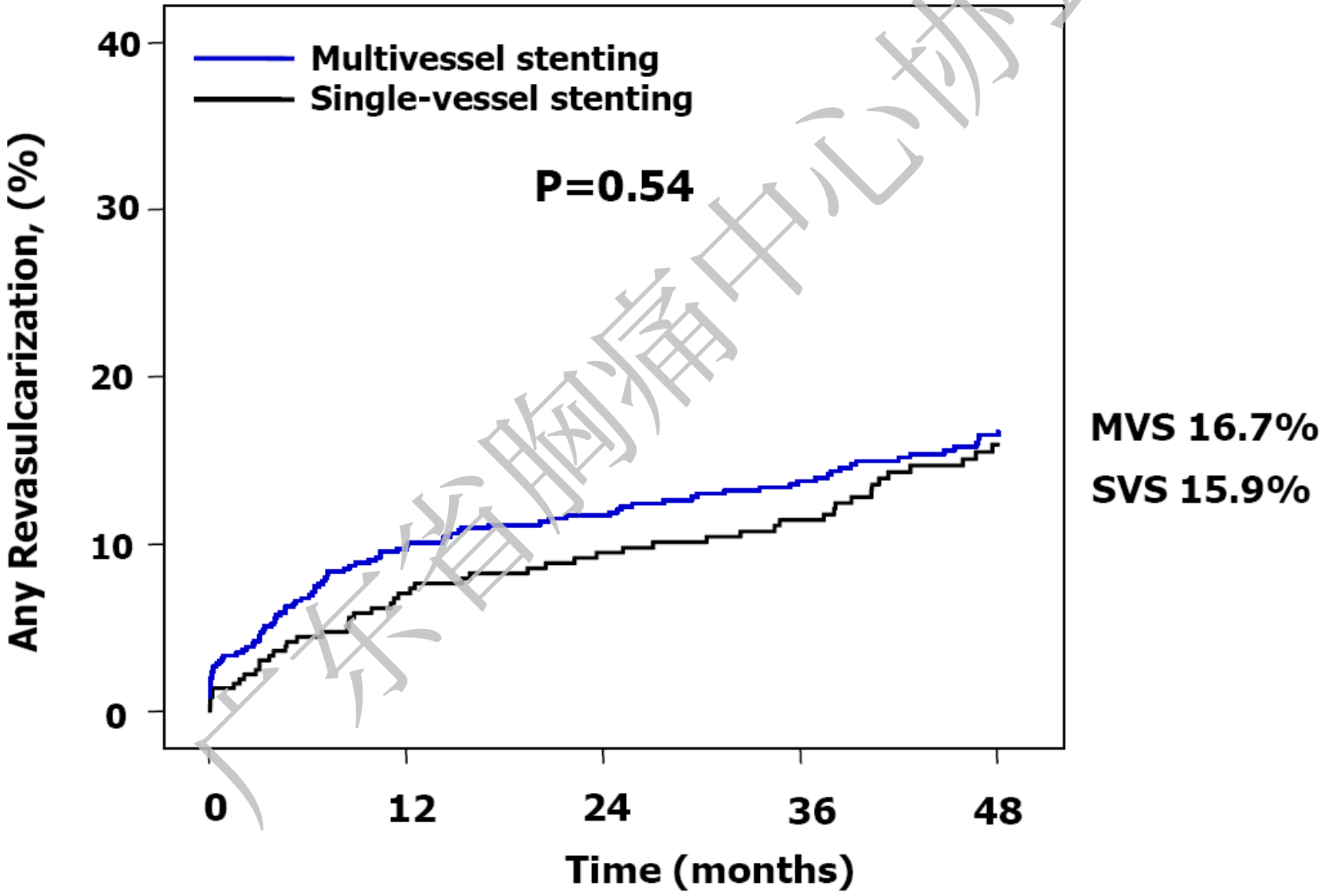
	Single vessel PCI (n=379)		Multivessel PCI (n=611)	p value
*Treated Vessels**				
LAD	43.5	<	77.7	<0.0001
LCx	25.9	<	69.7	<0.0001
RCA	24.0	<	80.1	<0.0001
LM	3.4	<	8.8	0.001
Bifurcation lesion	9.2		11.3	0.34
Lesion type B2 or C	72.3	<	84.3	<0.0001
No. of lesions treated	1.5±0.8	<	2.6±1.0	<0.0001
No. of implanted stents	1.9±1.1	<	3.0±1.6	<0.0001
Total stented length per patient	33.3±23.6	<	52.5±31.7	<0.0001

**expressed as percentage of patients with each vessel type, hence total > 100%*

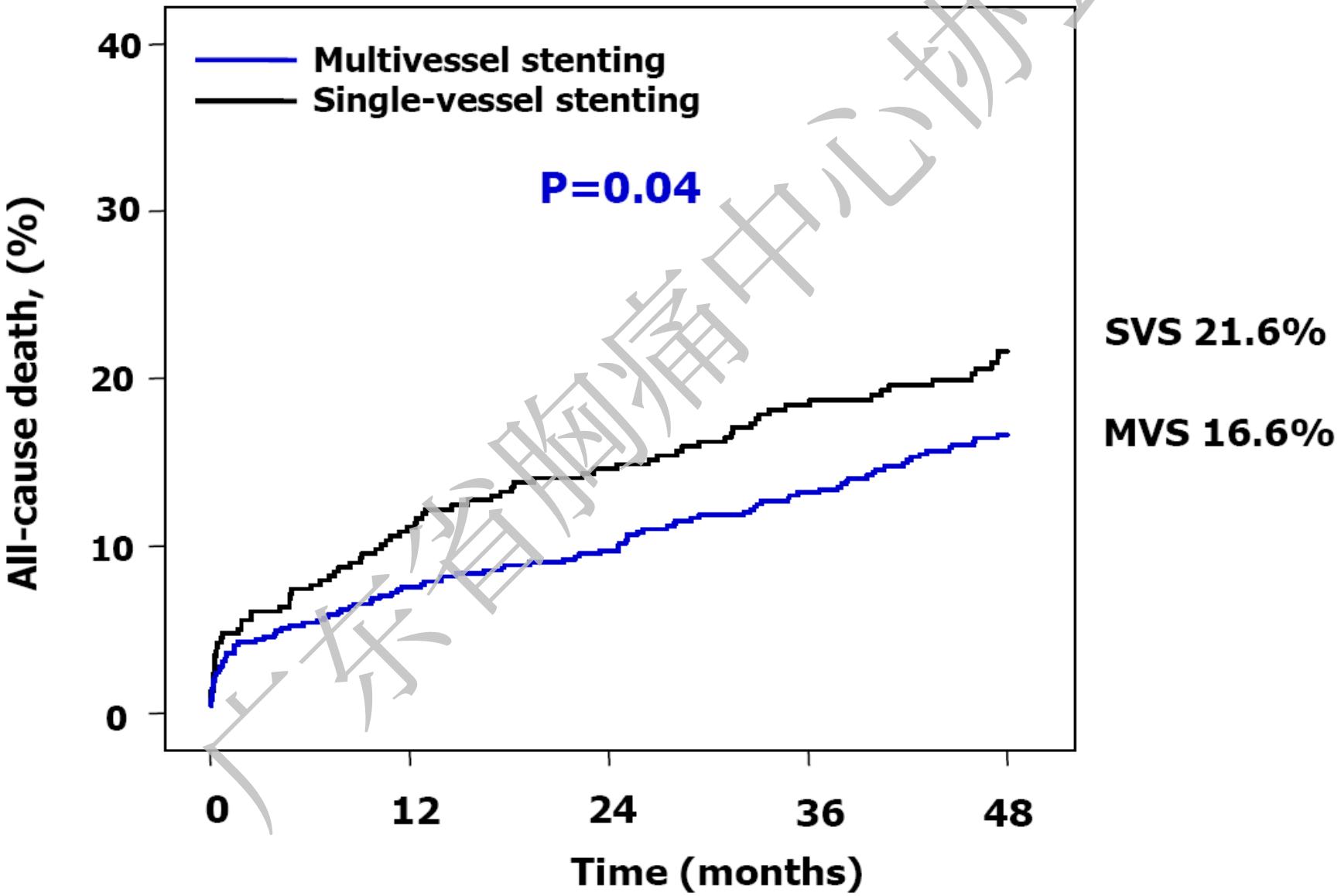
Cumulative incidence of Death or MI up to 4 years



Cumulative incidence of Any revascularization (Both TVR and non-TVR)up to 4 years



Cumulative incidence of all-cause death up to 4 years



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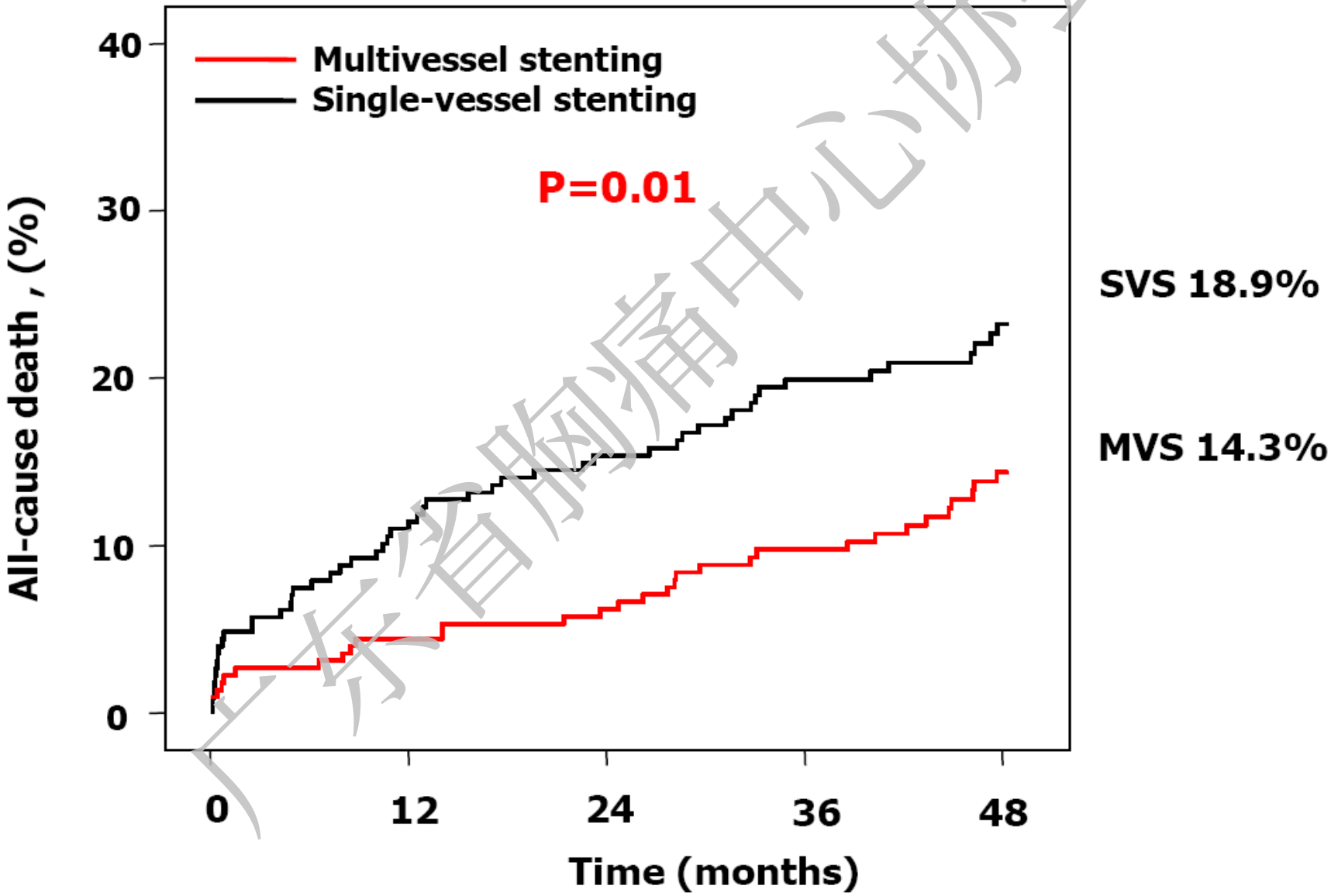


Summary & Conclusions

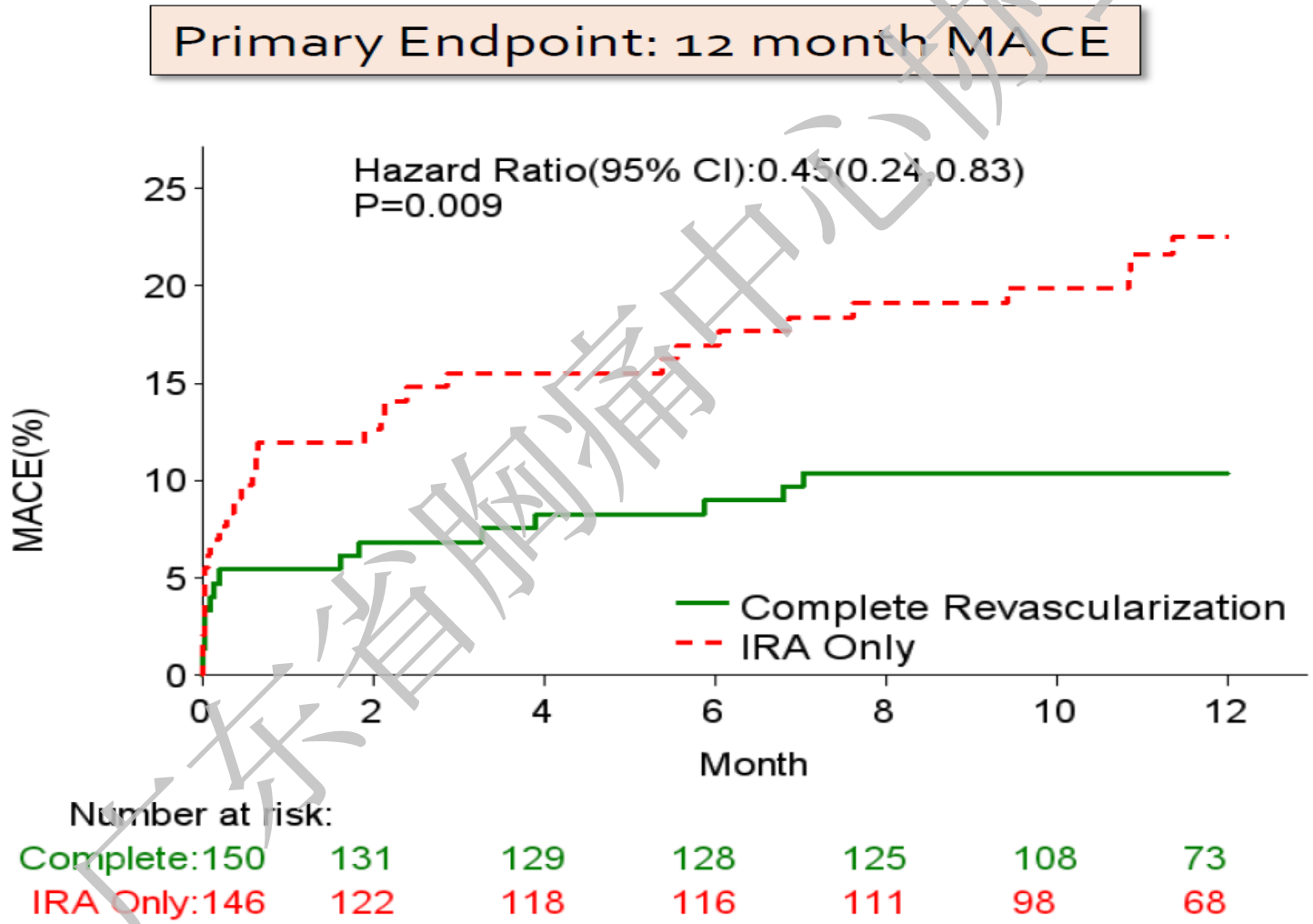
- In this analysis of patients who underwent PCI for the treatment of NSTEMI- ACS, multivessel PCI was associated with a significantly lower rate of all-cause mortality at 4-years before and after propensity score matching, driven by less cardiac mortality in multivessel PCI group.

- However, there were no difference in patient-oriented composite endpoint between two strategies, driven by higher revascularization rate in multivessel treatment group.

- Late increase of revascularization in single vessel strategy warrants longer follow-up.

- Further studies (e.g. Randomized, controlled studies) that examine further the safety and efficacy of multivessel PCI strategy in patients with NSTEMI-ACS are warranted.

ESC 2014 CvLPRIT研究



Contemporary randomised trials

	PRAMI (n=465)	CvLPRIT (n=296)	PRIMULTI (n=627)
No of including centers	5	?	2
No patients pr. center pr. year	19	?	105
Lesion criteria	> 50% DS	> 70% DS or > 50% DS in 2 views	> 50% DS and FFR <0.80 or > 90% DS
Strategy for non-IRA lesions	Immediate	Immediate or staged within index admission	Staged within index admission
Randomisation	After PPCI	"During" PPCI	After PPCI
Age	62 years	65 years	64 years
Bivalirudin or GPIIB/IIIA	79%	83%	97%

DANAMI3-PRIMULTI

近期临床试验

	PRAMI (n=465)	CvLPRIT (n=296)	PRIMULTI (n=627)
Primary endpoint	D/MI/refractory ischaemia	D/MI/HF/isch D R	D/MI/isch D R
Power (80%)	20% reduced to 14% (30% Rx effect)	37% PEP reduced to 22% (40% Rx effect)	18% PEP reduced to 13% (30% Rx effect)
Result	23% reduced to 9% (65% Rx effect)	21% reduced to 10% (55% Rx effect)	22% reduced to 13% (44% Rx effect)
Early Benefit	Yes	Yes	Safe to postpone
Effect on hard endpoints	Yes	No	No

Multivessel coronary disease diagnosed at the time of primary PCI for STEMI: complete revascularization versus conservative strategy. PRAGUE 13 trial

O. Hlinomaz

ICRC, St. Anne University Hospital, Brno, Czech Republic

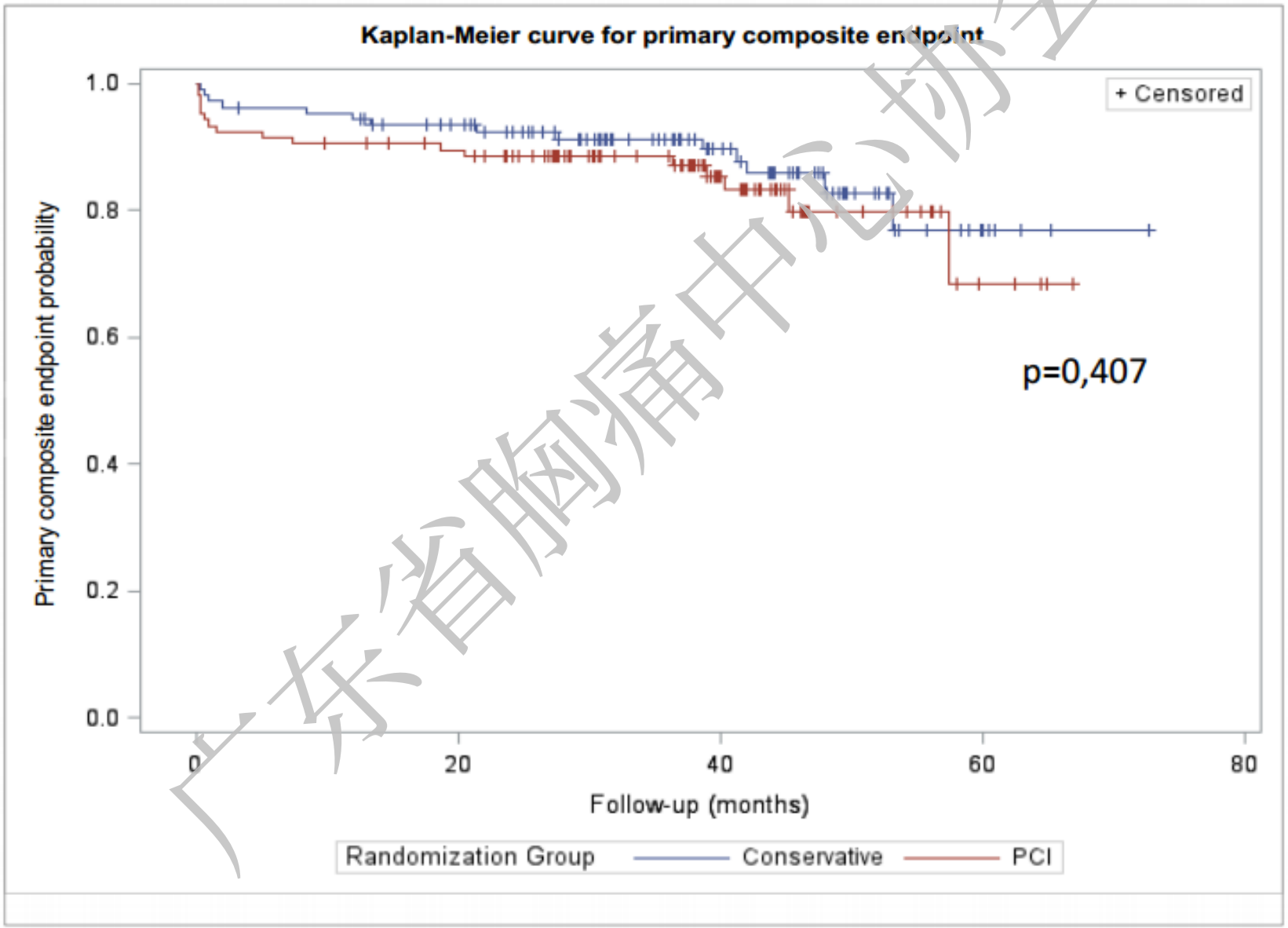
On behalf of the PRAGUE-13 Investigators

L. Groch, K. Polokova, F. Lehar, T. Vekov, R. Petkov, M. Stoynev, M. Griva, J. Sitar, M. Rezek, M. Novak, J. Semenka, N. Penkov, B. Gersh, D. Holmes, G. Sandhu, P. Widimsky

Grant IGA Czech Republic NT11412-5/2010, VAVPI EU Project
NCT01332591

euro PCR 2015

Primary composite endpoint



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Primary composite endpoint

	PCI (n=106)	Conservative (n=108)	Hazard ratio (95% CI)	p-value
All-cause mortality / nonfatal MI / stroke	17 (16,0%)	15 (13,9%)	1.35 (0.66 - 2.74)	0.407
All-cause mortality	6 (5,7%)	7 (6,5%)	0.91 (0.30 - 2.70)	0.859
Nonfatal MI	11 (10,4%)	8 (7,4%)	1.71 (0.66 - 4.41)	0.269
Stroke	0	3 (2,8%)		

4 (3,8%) periprocedural infarctions in PCI group with good prognosis.

Secondary endpoints

	Hazard ratio (95% CI)	p-value
Hospitalization for unstable angina	0.52 (0.19 - 1.40)	0.193
Crossover to another treatment group	0.25 (0.09 - 0.68)	0.006
Revascularization of non-infarct artery	0.51 (0.24 - 1.11)	0.089
Cardiovascular mortality	1.34 (0.30 - 6.01)	0.699
All-cause mortality + nonfatal myocardial infarction + hospitalization for unstable angina	1.03 (0.58 - 1.84)	0.921
All-cause mortality + nonfatal myocardial infarction + revascularization	0.86 (0.53 - 1.40)	0.538
Hospitalization for heart failure	0.68 (0.11 - 4.07)	0.672
Cardiovascular mortality + nonfatal myocardial infarction + revascularization	0.92 (0.56 - 1.53)	0.754

No non-infarct lesion progressed to myocardial infarction during follow-up.
Progression of studied non-infarct lesions was very rare.

euro PCR 2015

Conclusion

This trial found no difference (not even a trend) favouring staged multivessel PCI over culprit-only primary PCI in STEMI.

Larger trials are needed to clarify the revascularization strategy in STEMI patients with multivessel disease.

The Evaluating Xience and left ventricular function in PCI on occlusiOns afteR STEMI (EXPLORE) trial

The impact of PCI for concurrent CTO on left ventricular function in STEMI patients

A randomised multicenter trial

José PS Henriques, MD

Academic Medical Center of the University of Amsterdam, Amsterdam, The Netherlands

R.J. van der Schaaf, Co-PI

Flowchart

304 patients randomly assigned

150 randomized to CTO-PCI

154 randomized to No CTO-PCI

2 withdrew consent

0 withdrew consent

148 CTO-PCI
(1 refusal of CTO-PCI)

154 No CTO-PCI

148 with clinical follow-up

154 with clinical follow-up

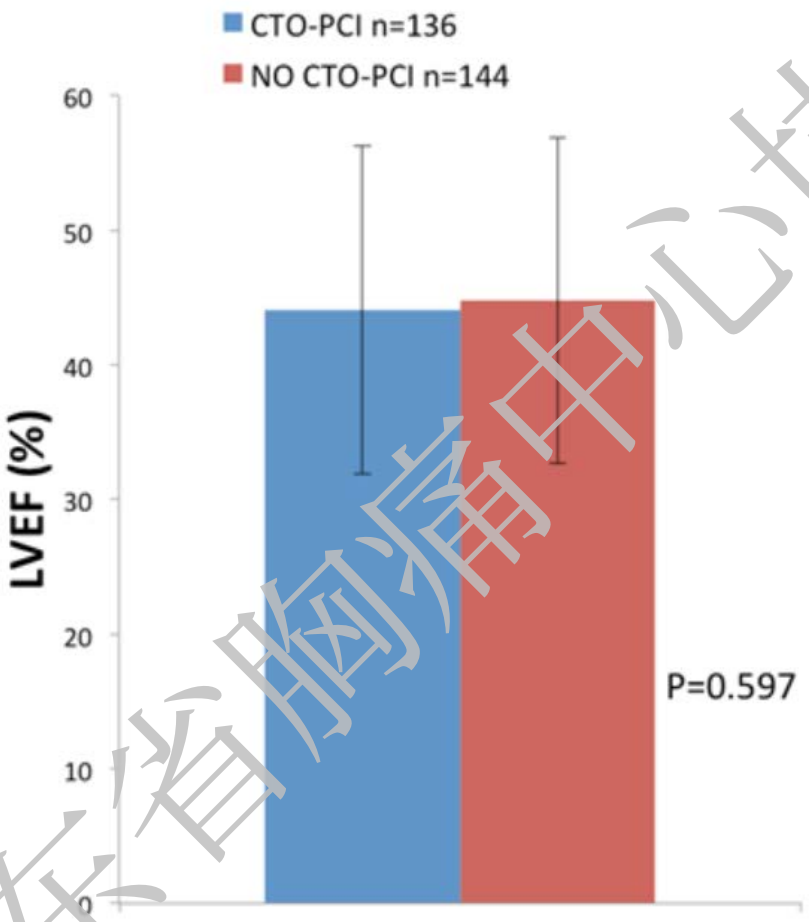
12 primary imaging endpoints not available
6 poor imaging quality
6 Imaging not available

10 primary imaging endpoints not available
5 with poor imaging quality
5 imaging not available

136 analyzed for primary imaging endpoints

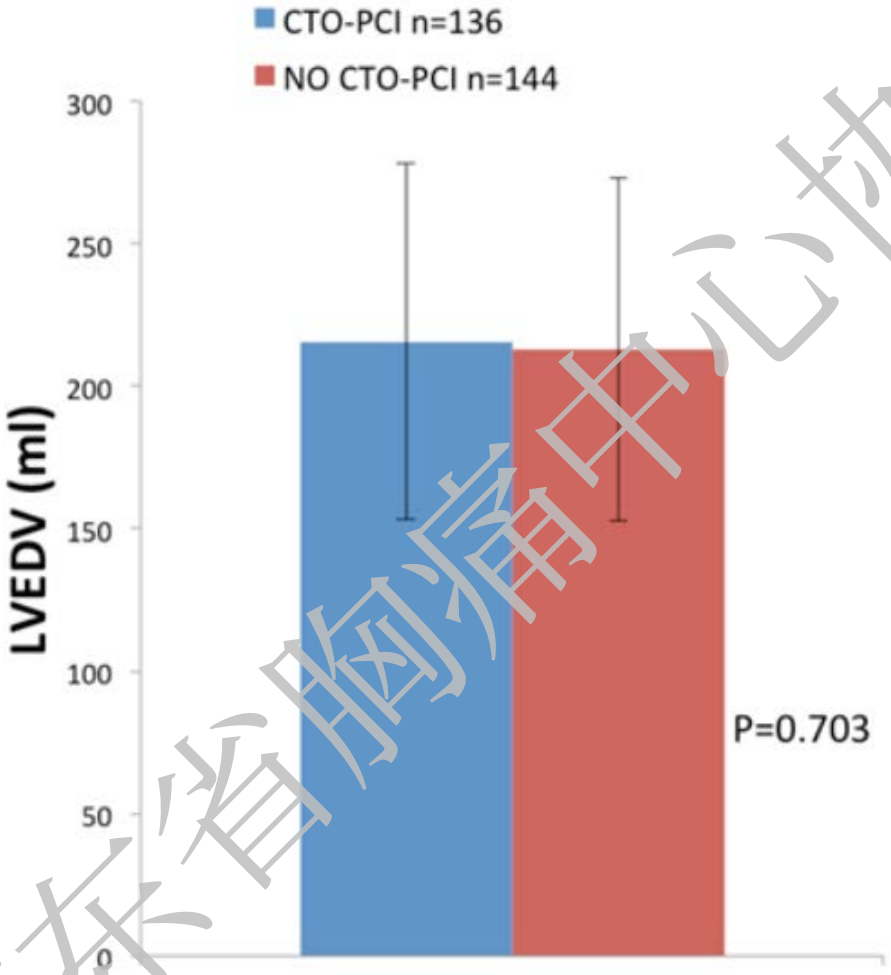
144 analyzed for primary imaging endpoints

Primary Endpoint #1 (LVEF @ 4m)



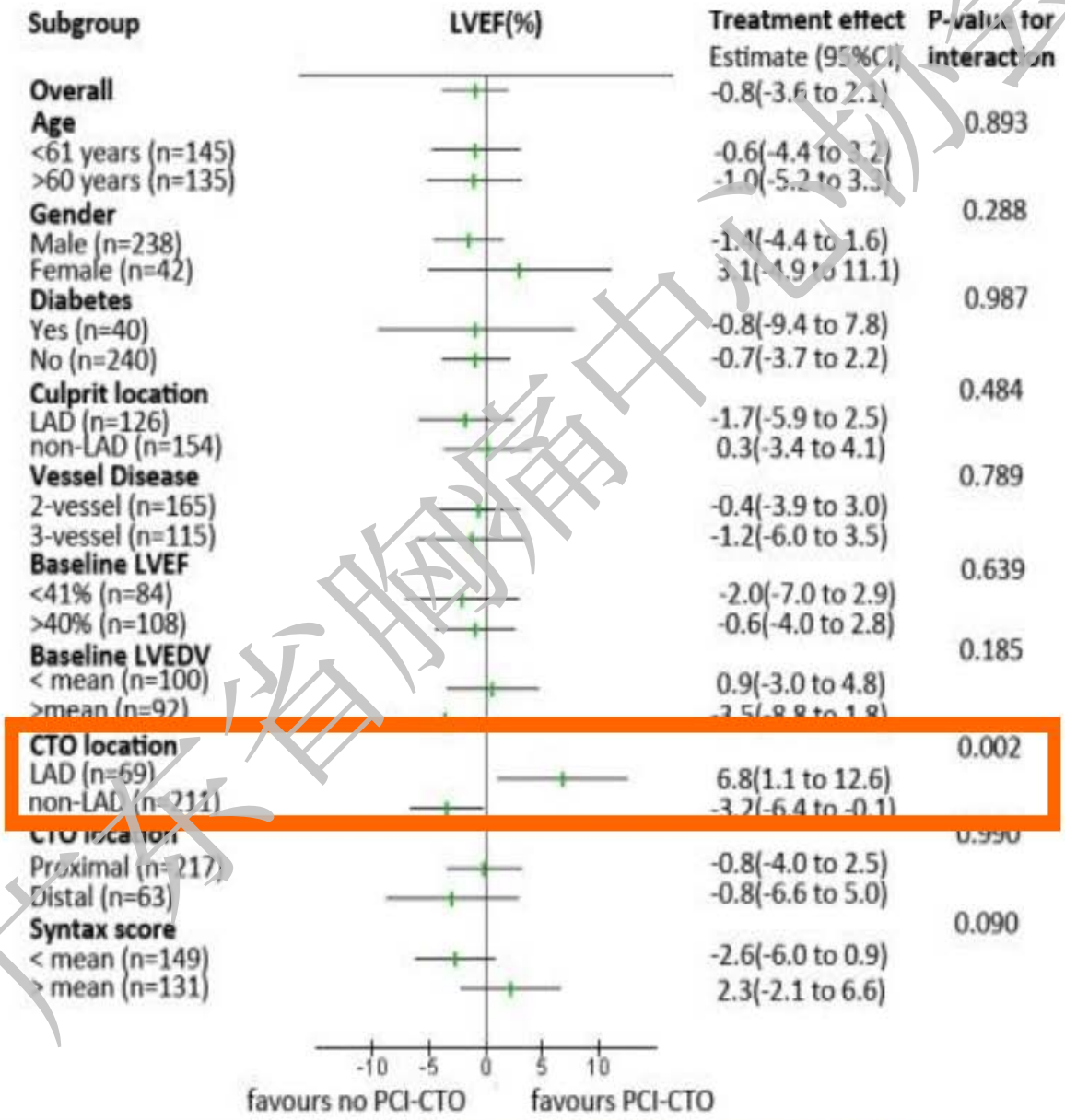
	CTO-PCI (n=136)		No CTO-PCI (n=144)		Difference (95%CI)		p
LVEF (%)	44·1	(12·2)	44·8	(11·9)	-0·8	(-3·6 to 2·1)	0·597

Primary Endpoint #2 (LVEDV @ 4m)

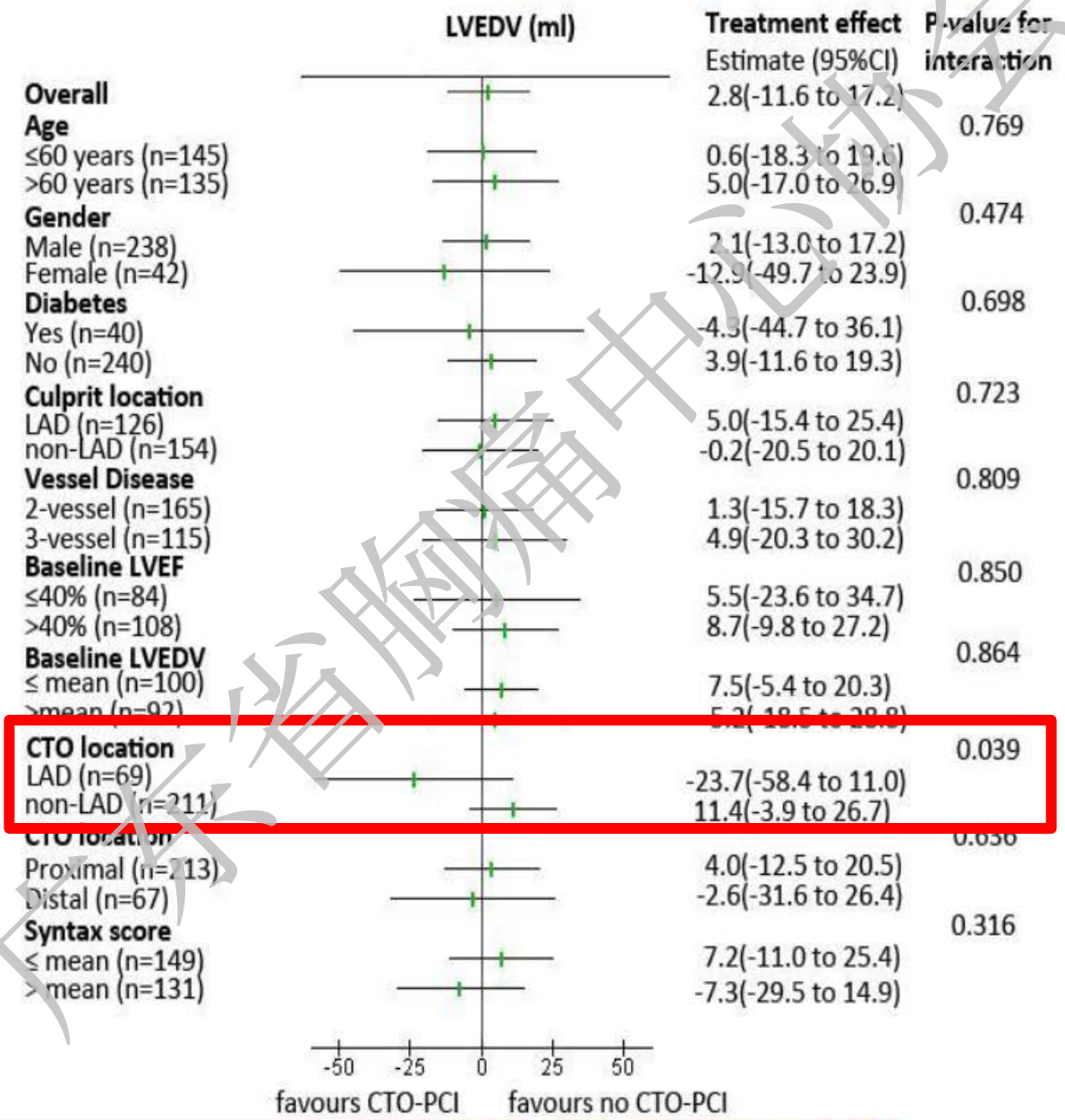


	CTO-PCI (n=136)		No CTO-PCI (n=144)		Difference (95%CI)		p
LVEDV (mL)	215·6	(62·5)	212·8	(60·3)	2·8	(-11·6 to 17·2)	0·703

LVEF – Subgroup analyses



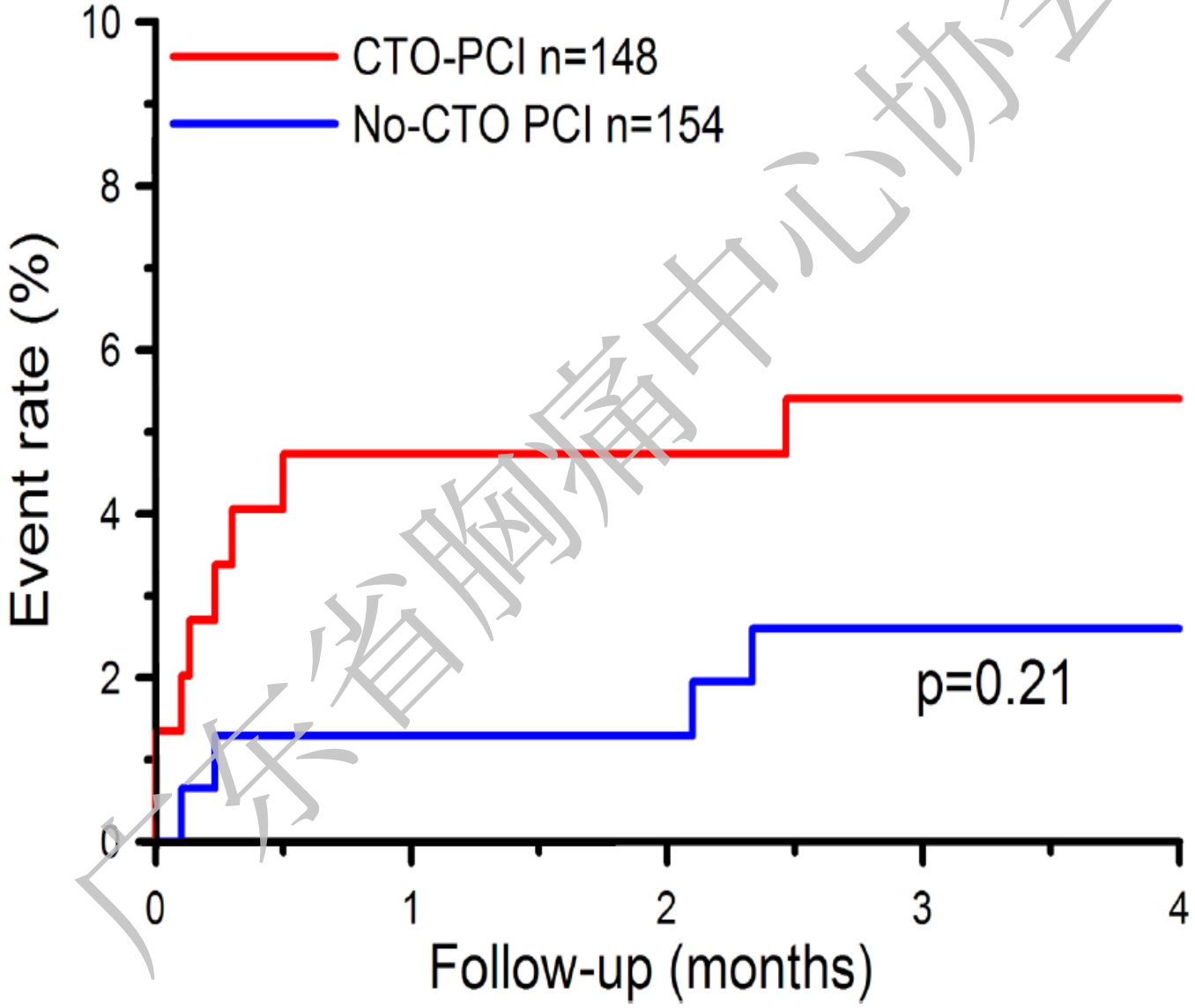
LVEDV – Subgroup analyses



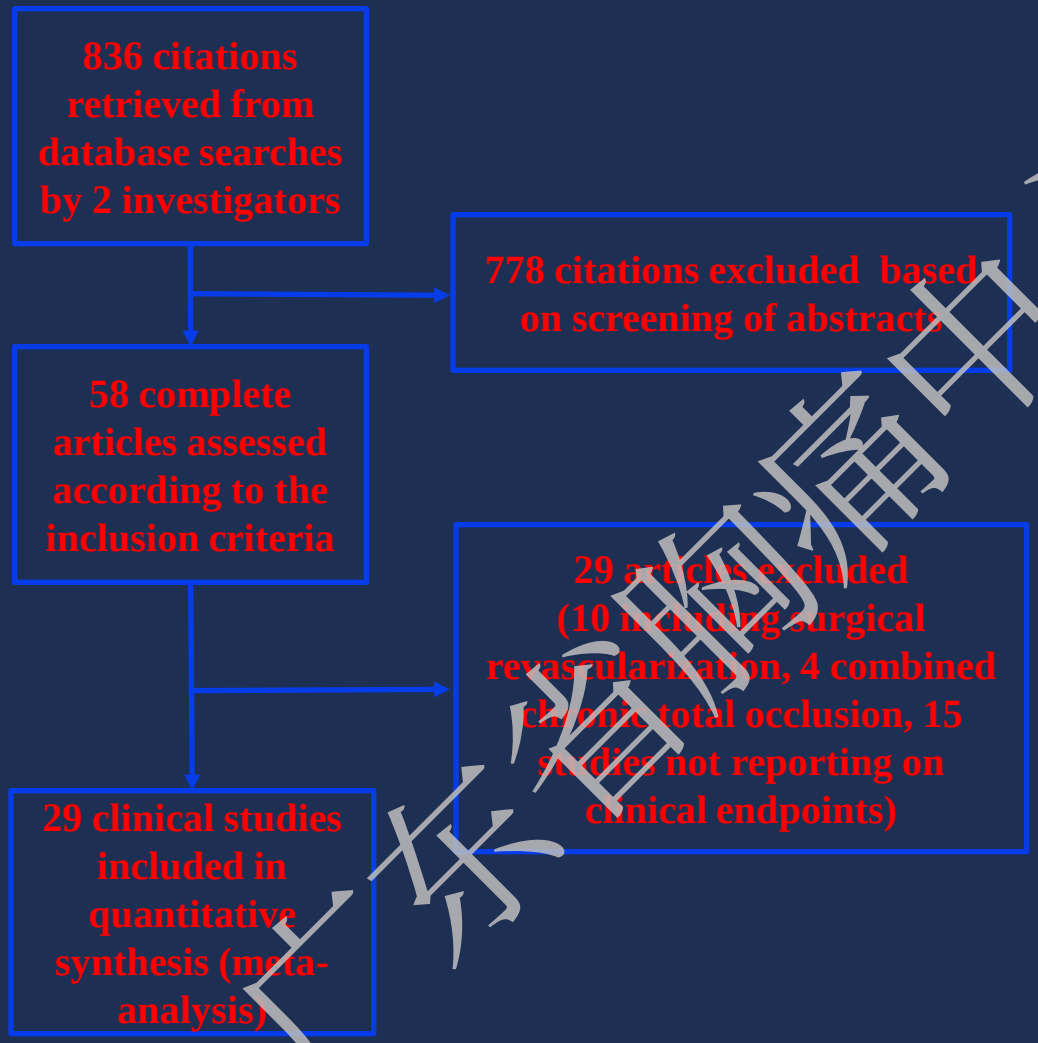
MACE @ 4 months

Major Adverse Cardiac Events (MACE)	CTO-PCI		No CTO-PCI		p
Cardiac death	4	(2·7%)	0	(0%)	0·056
Myocardial infarction (Third Universal definition)	5	(3·4%)	3	(1·9%)	0·494
Periprocedural	4	(2·7%)	1	(0·6%)	0·207
Spontaneous/Recurrent	2	(1·4%)	2	(1·3%)	1·000
CABG surgery	0	-	1	(0·6%)	1·000
MACE	8	(5·4%)	4	(2·6%)	0·212

MACE @ 4 months



Trial Flow Chart



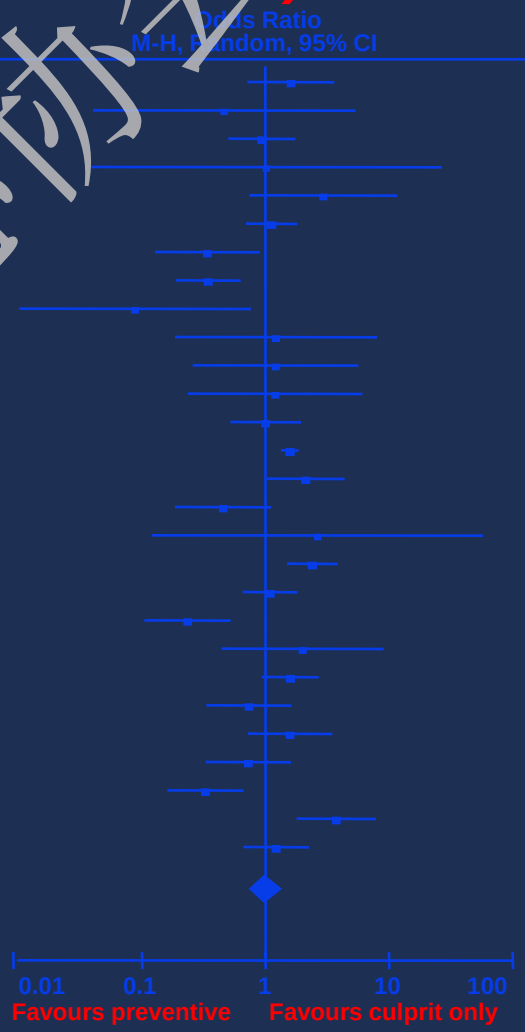
Of the 43,960 patients, 7,937 patients underwent preventive PCI at index procedure or staged PCI during or after hospitalization and 36,023 underwent culprit-only revascularization at the time of index procedure.

All Cause Mortality
(28 studies, 43,868 patients)

Study or Subgroup	preventive Events	Total	control Events	Total	Weight	Odds Ratio M-H, Random, 95% CI	Year	Odds Ratio M-H, Random, 95% CI
Roe et al.	19	79	13	79	4.0%	1.61 [0.73, 3.53]	2001	
Poyen et al.	1	86	2	81	1.0%	0.46 [0.04, 5.23]	2003	
Corpus et al.	17	152	42	354	4.7%	0.94 [0.51, 1.70]	2004	
Di Mario et al.	1	52	0	17	0.6%	1.02 [0.04, 26.19]	2004	
Ijsselmuiden et al.	8	104	3	109	2.4%	2.94 [0.76, 11.42]	2004	
Chen et al.	26	239	112	1145	5.3%	1.13 [0.72, 1.77]	2005	
Kong et al.	5	632	31	1350	3.5%	0.34 [0.13, 0.88]	2006	
Kalarus et al.	14	193	112	605	4.8%	0.34 [0.19, 0.62]	2007	
Rigattieri et al.	1	64	7	46	1.3%	0.09 [0.01, 0.75]	2007	
Khattab et al.	2	25	3	45	1.6%	1.22 [0.19, 7.82]	2008	
Han et al.	3	93	4	149	2.1%	1.21 [0.25, 5.52]	2008	
Qarawani et al.	9	95	2	25	1.9%	1.21 [0.24, 5.96]	2008	
Varani et al.	27	227	18	152	4.6%	1.00 [0.53, 1.90]	2008	
Cavender et al.	246	3134	1321	25802	6.1%	1.58 [1.37, 1.82]	2009	
EUROTRANSFER	11	70	57	707	4.4%	2.13 [1.06, 4.27]	2010	
Politi et al.	10	130	13	84	3.7%	0.46 [0.19, 1.09]	2010	
Dambrink et al.	2	80	0	41	0.7%	2.64 [0.12, 56.35]	2010	
APEX-AMI	27	217	111	1984	5.3%	2.40 [1.53, 3.75]	2010	
Hannan et al.	46	762	28	503	5.1%	1.09 [0.67, 1.77]	2010	
HORIZONS-AMI	9	393	25	2736	4.5%	0.23 [0.11, 0.51]	2011	
Mohamad et al.	6	33	3	30	1.7%	2.00 [0.45, 8.83]	2011	
EHS-PCI	40	82	95	254	5.1%	1.59 [0.96, 2.63]	2012	
KAMIR	9	538	25	410	4.1%	0.74 [0.34, 1.59]	2012	
Cavender et al. (2)	32	43	111	155	4.4%	1.58 [0.74, 3.39]	2013	
PRAMI	12	234	16	231	4.1%	0.73 [0.34, 1.57]	2013	
Myolette et al.	37	66	82	203	4.4%	0.33 [0.17, 0.65]	2013	
ICAS	17	54	24	220	4.3%	3.75 [1.84, 7.66]	2014	
Yang et al.	21	57	85	278	4.8%	1.22 [0.68, 2.20]	2014	
Total (95% CI)		7931		35931	100.0%	1.01 [0.77, 1.32]		
Total events	653		2205					

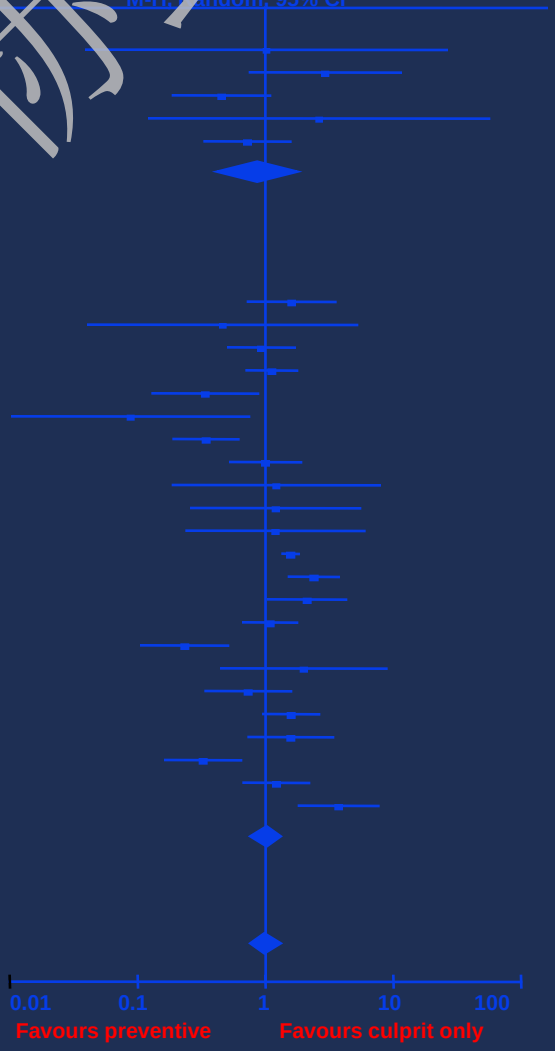
Heterogeneity: Tau² = 0.30; Chi² = 110.94, df = 27 (P < 0.00001); I² = 76%

Test for overall effect: Z = 0.08 (P = 0.94)



All Cause Mortality
(28 studies, 43,868 patients)

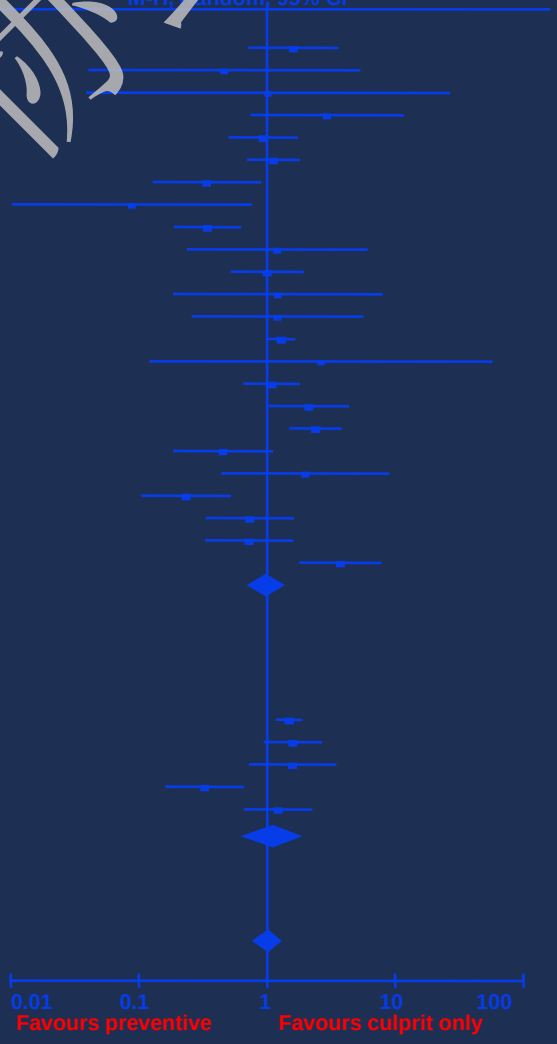
Study or Subgroup	preventive Events	Total	control Events	Total	Weight	Odds Ratio M-H, Random, 95% CI	Year	Odds Ratio M-H, Random, 95% CI
1.4.1 Randomized studies								
Di Mario et al.	1	52	0	17	0.6%	1.02 [0.04, 26.19]	2004	
Ijsselmuiden et al.	8	104	3	109	2.4%	2.94 [0.76, 11.42]	2006	
Politi et al.	10	130	13	84	3.7%	0.46 [0.19, 1.09]	2010	
Dambrink et al.	2	80	0	41	0.7%	2.64 [0.12, 56.35]	2010	
PRAMI	12	234	16	231	4.1%	0.73 [0.34, 1.57]	2013	
Subtotal (95% CI)		**600**		**482**	**11.5%**	**0.89 [0.43, 1.81]**		
Total events	33		32					
Heterogeneity: Tau² = 0.20; Chi² = 5.84, df = 4 (P = 0.21); I² = 32%								
Test for overall effect: Z = 0.33 (P = 0.74)								
1.4.2 Non-randomized studies								
Roe et al.	19	79	13	79	4.0%	1.6[illegible]3.53]	2001	
Poyen et al.	1	86	2	81	1.0%	[illegible]5.23]	2003	
Corpus et al.	17	152	42	354	4.7%	[illegible]1.20]	2004	
Chen et al.	26	239	112	1145	5.3%	1.13 [0.72, 1.77]	2005	
Kong et al.	5	632	31	1350	3.5%	0.34 [0.13, 0.88]	2006	
Rigattieri et al.	1	64	7	46	1.3%	[illegible] [0.01, 0.75]	2007	
Kalarus et al.	14	193	112	605	4.8%	[illegible]0.19, 0.62]	2007	
Varani et al.	27	227	18	152	4.6%	[illegible]0 [0.53, 1.90]	2008	
Khattab et al.	2	25	3	45	[illegible]%	1.22 [0.19, 7.82]	2008	
Han et al.	3	93	4	149	2.1%	1.21 [0.26, 5.52]	2008	
Qarawani et al.	9	95	2	95	[illegible]%	1.20 [0.24, 5.96]	2008	
Cavender et al.	246	3134	1321	25[illegible]	[illegible]%	1.58 [1.37, 1.82]	2009	
APEX-AMI	27	217	111	19[illegible]	5.8%	2.40 [1.53, 3.75]	2010	
EUROTRANSFER	11	70	57	70[illegible]	[illegible]%	2.13 [1.06, 4.27]	2010	
Hannan et al.	46	762	28	503	[illegible]%	1.09 [0.67, 1.77]	2010	
HORIZONS-AMI	9	393	[illegible]	375	[illegible]%	0.23 [0.11, 0.51]	2011	
Mohamad et al.	6	33	[illegible]	[illegible]0	2.1%	2.00 [0.45, 8.83]	2011	
KAMIR	9	538	25	[illegible]08	4.1%	0.74 [0.34, 1.59]	2012	
EHS-PCI	40	82	9[illegible]	[illegible]54	5.1%	1.59 [0.96, 2.63]	2012	
Cavender et al. (2)	32	43	10[illegible]	[illegible]55	4.1%	1.58 [0.74, 3.39]	2013	
Myolette et al.	37	66	82	203	4.4%	0.33 [0.17, 0.65]	2013	
Yang et al.	21	[illegible]	85	278	4.8%	1.22 [0.68, 2.20]	2014	
ICAS	17	[illegible]4	[illegible]4	220	4.3%	3.75 [1.84, 7.66]	2014	
Subtotal (95% CI)		**7[illegible]37**		**35449**	**88.5%**	**1.02 [0.77, 1.36]**		
Total events	62[illegible]		[illegible]303					
Heterogeneity: Tau² = 0.31; Chi² = [illegible]1.59, df = 2[illegible] (P < 0.00001); I² = 78%								
Test for overall effect: Z = 0.15 [illegible] = 0.88)								
Total (95% CI)		**7937**		**35931**	**100.0%**	**1.01 [0.77, 1.32]**		
Total events	658		2335					
Heterogeneity: Tau² = 0.30; Chi[illegible] = 110.94, df = 27 (P < 0.00001); I² = 76%								
Test for overall effect: Z = 0.08 ([illegible] = 0.94)								
Test for subgroup differences: Chi[illegible] = 0.13, df = 1 (P = 0.71), I² = 0%								



All Cause Mortality

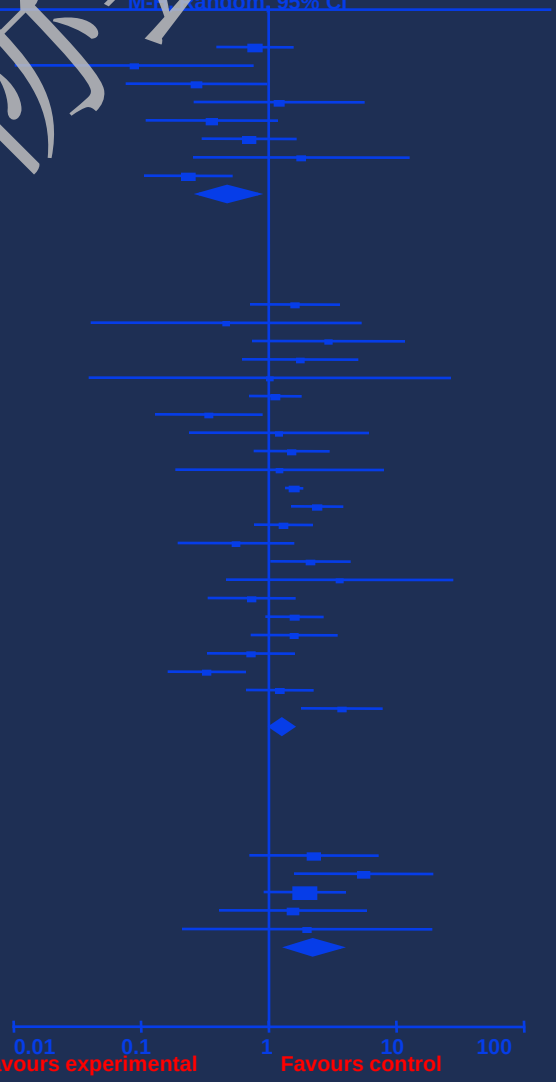
Sensitivity Analysis of Cardiogenic Shock

Study or Subgroup	preventive Events	Total	control Events	Total	Weight	Odds Ratio M-H, Random, 95% CI	Year	Odds Ratio M-H, Random, 95% CI
1.3.1 STEMI without shock								
Roe et al.	19	79	13	79	3.8%	1.61 [0.73, 3.53]	2011	
Poyen et al.	1	86	2	81	0.9%	0.46 [0.04, 5.23]	2003	
Di Mario et al.	1	52	0	17	0.5%	1.02 [0.04, 26.19]	2004	
Ijsselmuiden et al.	8	104	3	109	2.1%	2.94 [0.76, 11.42]	2004	
Corpus et al.	17	152	42	354	4.5%	0.94 [0.51, 1.70]	2004	
Chen et al.	26	239	112	1145	5.1%	1.13 [0.72, 1.77]	2005	
Kong et al.	5	632	31	1350	3.2%	0.34 [0.13, 0.88]	2006	
Rigattieri et al.	1	64	7	46	1.1%	0.09 [0.01, 0.75]	2007	
Kalarus et al.	14	193	112	605	4.6%	0.34 [0.19, 0.62]	2007	
Qarawani et al.	9	95	2	25	1.7%	1.29 [0.24, 6.96]	2008	
Varani et al.	27	227	18	152	4.4%	1.00 [0.53, 1.87]	2008	
Khattab et al.	2	25	3	45	1.3%	1.21 [0.19, 7.82]	2008	
Han et al.	3	93	4	149	1.8%	1.21 [0.25, 5.52]	2008	
Cavender et al.	88	2701	586	23146	5.9%	1.30 [1.03, 1.63]	2009	
Dambrink et al.	2	80	0	41	0.6%	2.64 [0.12, 56.57]	2010	
Hannan et al.	46	762	28	503	5.0%	1.09 [0.67, 1.77]	2010	
EUROTRANSFER	11	70	57	707	4.1%	2.13 [1.06, 4.27]	2010	
APEX-AMI	27	217	111	1984	5.2%	2.39 [1.53, 3.75]	2010	
Politi et al.	10	130	13	84	3.4%	0.45 [0.19, 1.09]	2010	
Mohamad et al.	6	33	3	30	2.2%	2.00 [0.45, 8.83]	2011	
HORIZONS-AMI	9	393	25	275	3.3%	0.23 [0.11, 0.51]	2011	
KAMIR	9	538	25	1106	3.4%	0.74 [0.34, 1.59]	2012	
PRAMI	12	234	16	231	4.2%	0.73 [0.34, 1.57]	2013	
ICAS	17	54	24	201	4.2%	3.75 [1.84, 7.66]	2014	
Subtotal (95% CI)		**7253**		**32484**	**76.5%**	**0.99 [0.74, 1.34]**		
Total events	370		1237					
Heterogeneity: Tau² = 0.31; Chi² = 82.22, df = 23 (P < 0.00001); I² = 72%								
Test for overall effect: Z = 0.04 (P = 0.96)								
1.3.2 STEMI with shock								
Cavender et al.	158	433	737	2654	6.0%	1.49 [1.21, 1.85]	2009	
EHS-PCI	40	82	95	214	4.9%	1.59 [0.96, 2.63]	2012	
Cavender et al. (2)	32	43	101	156	3.9%	1.58 [0.74, 3.39]	2013	
Myolette et al.	37	75	82	103	4.2%	0.33 [0.17, 0.65]	2013	
Yang et al.	21	60	85	278	4.6%	1.22 [0.68, 2.20]	2014	
Subtotal (95% CI)		**684**		**3445**	**23.5%**	**1.13 [0.70, 1.82]**		
Total events	288		1100					
Heterogeneity: Tau² = 0.22; Chi² = 15.17, df = 4 (P = 0.004); I² = 78%								
Test for overall effect: Z = 0.49 (P = 0.63)								
Total (95% CI)		**7937**		**35929**	**100.0%**	**1.03 [0.81, 1.31]**		
Total events	658		2337					
Heterogeneity: Tau² = 0.25; Chi² = 102.60, df = 28 (P < 0.00001); I² = 73%								
Test for overall effect: Z = 0.21 (P = 0.83)								
Test for subgroup differences: Chi² = 0.19, df = 1 (P = 0.66), I² = 0%								



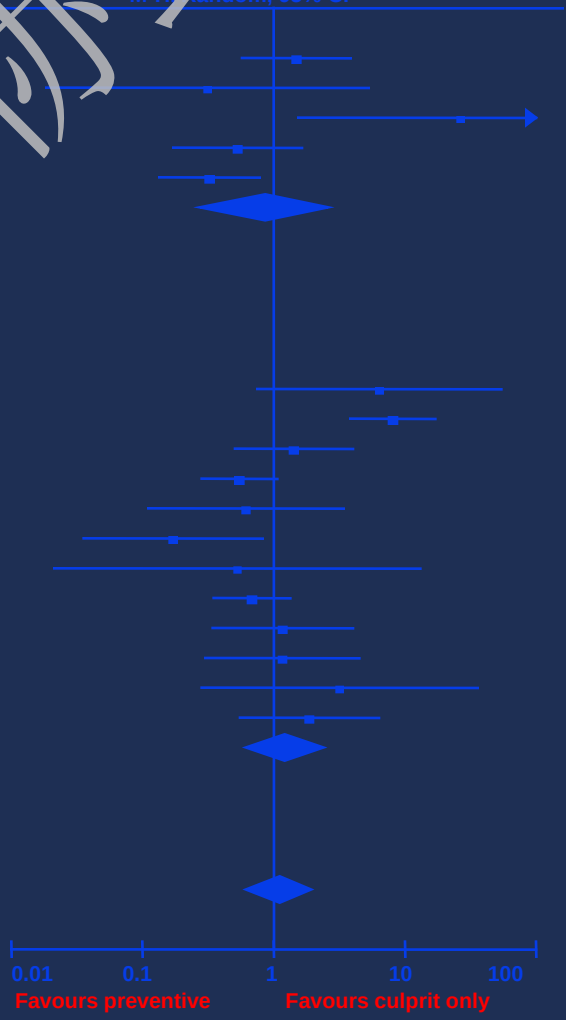
All Cause Mortality by Treatment Strategy

Study or Subgroup	experimental Events	Total	control Events	Total	Weight	Odds Ratio M-H, Random, 95% CI	Year	Odds Ratio M-H, Random, 95% CI
1.2.1 Staged PCI versus Culprit only PCI								
Corpus et al.	12	126	42	354	20.4%	0.78 [0.40, 1.54]	2004	
Rigattieri et al.	1	64	7	46	5.2%	0.09 [0.01, 0.75]	2007	
Varani et al.	3	85	18	152	11.4%	0.27 [0.08, 0.95]	2008	
Han et al.	3	93	4	149	8.8%	1.21 [0.26, 5.52]	2009	
Politi et al.	4	65	13	84	12.3%	0.36 [0.11, 1.16]	2010	
Hannan et al.	10	259	14	259	17.5%	0.70 [0.31, 1.61]	2010	
Mohamad et al.	2	12	3	30	6.1%	1.80 [0.26, 12.4]	2011	
HORIZONS-AMI	9	393	25	275	18.4%	0.23 [0.11, 0.51]	2012	
Subtotal (95% CI)		**1097**		**1349**	**100.0%**	**0.48 [0.28, 0.82]**		
Total events	44		126					
Heterogeneity: Tau² = 0.25; Chi² = 12.78, df = 7 (P = 0.08); I² = 45%								
Test for overall effect: Z = 2.67 (P = 0.008)								
1.2.2 Single Multivessel PCI versus Culprit only PCI								
Roe et al.	19	79	13	79	4.6%	1.6 [0.73, 3.53]	2001	
Poyen et al.	1	86	2	81	0.8%	0.46 [0.4, 5.23]	2003	
Ijsselmuiden et al.	8	104	3	109	2.2%	2.94 [0., 11.42]	2004	
Corpus et al.	5	26	42	354	3.3%	1.77 [0.6, 4.94]	2004	
Di Mario et al.	1	52	0	17	0.5%	1.0 [0.04, 2.19]	2004	
Chen et al.	26	239	112	1145	7.0%	1.11 [0.72, 1.77]	2005	
Kong et al.	5	632	31	1350	3.7%	0.34 [0.13, 0.88]	2006	
Qarawani et al.	9	95	2	25	1.7%	1.20 [0.24, 5.96]	2008	
Varani et al.	24	142	18	152	5.4%	1.51 [0.78, 2.93]	2008	
Khattab et al.	2	25	3	45	1.3%	1.2 [0.19, 7.82]	2008	
Cavender et al.	246	3134	1321	25802	9.3%	1.58 [1.37, 1.82]	2009	
APEX-AMI	27	217	111	1984	7.1%	2.40 [1.53, 3.75]	2010	
Hannan et al.	36	503	28	503	5.6%	1.31 [0.79, 2.18]	2010	
Politi et al.	6	65	13	84	3.3%	0.56 [0.20, 1.55]	2010	
EUROTRANSFER	11	70	57	1	5.3%	2.13 [1.06, 4.27]	2010	
Mohamad et al.	2	7	3	3	1.2%	3.60 [0.47, 27.35]	2011	
KAMIR	9	538	25	1	7.5%	0.74 [0.34, 1.59]	2012	
EHS-PCI	40	82	95	2	8.6%	1.59 [0.96, 2.63]	2012	
Cavender et al. (2)	32	43	101	15	4.7%	1.58 [0.74, 3.39]	2013	
PRAMI	12	234	16	231	4.6%	0.73 [0.34, 1.57]	2013	
Myolette et al.	37	66	3	103	3.2%	0.33 [0.17, 0.65]	2013	
Yang et al.	21	60	2	78	5.9%	1.22 [0.68, 2.20]	2014	
ICAS	17	54	2	2	5.0%	3.75 [1.84, 7.66]	2014	
Subtotal (95% CI)		**6553**		**34815**	**100.0%**	**1.29 [1.02, 1.63]**		
Total events	596		218					
Heterogeneity: Tau² = 0.14; Chi² = 56.21, df = 22 (P < 0.0001); I² = 61%								
Test for overall effect: Z = 2.16 (P = 0.03)								
1.2.3 Single Multivessel PCI versus Staged PCI								
Ochala et al.	0	45	0	44		Not estimable	2004	
Corpus et al.	5	26	12	126	18.5%	2.26 [0.72, 7.09]	2004	
Varani et al.	24	142	3	85	15.9%	5.56 [1.62, 19.07]	2008	
Hannan et al.	37	503	10	259	46.9%	1.92 [0.94, 3.93]	2010	
Politi et al.	6	65	4	65	14.0%	1.55 [0.42, 5.78]	2010	
Mohamad et al.	2	7	2	12	4.8%	2.00 [0.21, 18.69]	2011	
Subtotal (95% CI)		**791**		**591**	**100.0%**	**2.28 [1.39, 3.72]**		
Total events	73		31					
Heterogeneity: Tau² = 0.00; Chi² = 2.62, df = 4 (P = 0.62); I² = 0%								
Test for overall effect: Z = 3.29 (P = 0.001)								
Test for subgroup differences: Chi² = 17.95, df = 2 (P = 0.0001), I² = 88.9%								



Reinfarction
(17 studies, 8,091 patients)

Study or Subgroup	preventive Events	Total	control Events	Total	Weight	Odds Ratio M-H, Random, 95% CI	Year	Odds Ratio M-H, Random, 95% CI
2.2.1 Randomized studies								
Ijsselmuiden et al.	11	104	8	109	7.5%	1.49 [0.58, 3.87]	2004	
Di Mario et al.	1	52	1	17	2.9%	0.31 [0.02, 5.31]	2004	
Dambrink et al.	11	80	0	80	2.8%	26.64 [1.54, 460.35]	2010	
Politi et al.	6	130	7	84	6.9%	0.53 [0.17, 1.64]	2010	
PRAMI	7	234	20	231	7.7%	0.33 [0.13, 0.79]	2013	
Subtotal (95% CI)		600		521	27.8%	0.87 [0.29, 2.67]		
Total events	36		36					
Heterogeneity: Tau² = 0.98; Chi² = 13.03, df = 4 (P = 0.01); I² = 69%								
Test for overall effect: Z = 0.24 (P = 0.81)								
2.2.2 Non-randomized studies								
Roe et al.	6	79	1	79	4.1%	6.[illegible] [0.75, 54.54]	2001	
Corpus et al.	29	152	10	354	8.1%	8.[illegible] [3.84, 17.13]	2004	
Kong et al.	6	632	9	1350	7.2%	1.43 [0.51, 4.03]	2006	
Kalarus et al.	11	193	60	605	8.[illegible]%	0.[illegible] [0.28, 1.07]	2007	
Khattab et al.	2	28	5	45	5.1%	0.62 [0.11, 3.41]	2008	
Qarawani et al.	3	95	4	25	5.[illegible]%	0.17 [0.04, 0.82]	2008	
Han et al.	0	93	1	1[illegible]	2.[illegible]%	0.53 [0.02, 13.13]	2008	
HORIZONS-AMI	18	393	18	275	8.[illegible]%	0.69 [0.35, 1.34]	2011	
KAMIR	4	538	7	1106	6.[illegible]%	1.18 [0.34, 4.03]	2012	
EHS-PCI	3	82	1	74	6.2%	1.17 [0.30, 4.51]	2012	
Myolette et al.	2	66	1	1[illegible]	3.5%	3.19 [0.28, 35.87]	2013	
ICAS	4	54	7	220	6.6%	1.88 [0.56, 6.34]	2014	
Subtotal (95% CI)		2405		4565	72.2%	1.24 [0.62, 2.47]		
Total events	88		133					
Heterogeneity: Tau² = 0.96; Chi² = 43.44, df = [illegible] (P < 0.00001); I² = 75%								
Test for overall effect: Z = 0.61 (P = 0.54)								
Total (95% CI)		3005		5086	100.0%	1.12 [0.63, 1.99]		
Total events	124		169					
Heterogeneity: Tau² = 0.91; Chi² = 59.10, df = 16 (P < 0.00001); I² = 73%								
Test for overall effect: Z = 0.39 (P = 0.70)								
Test for subgroup differences: Chi² = 0.27, df = 1 (P = 0.60), I² = 0%								

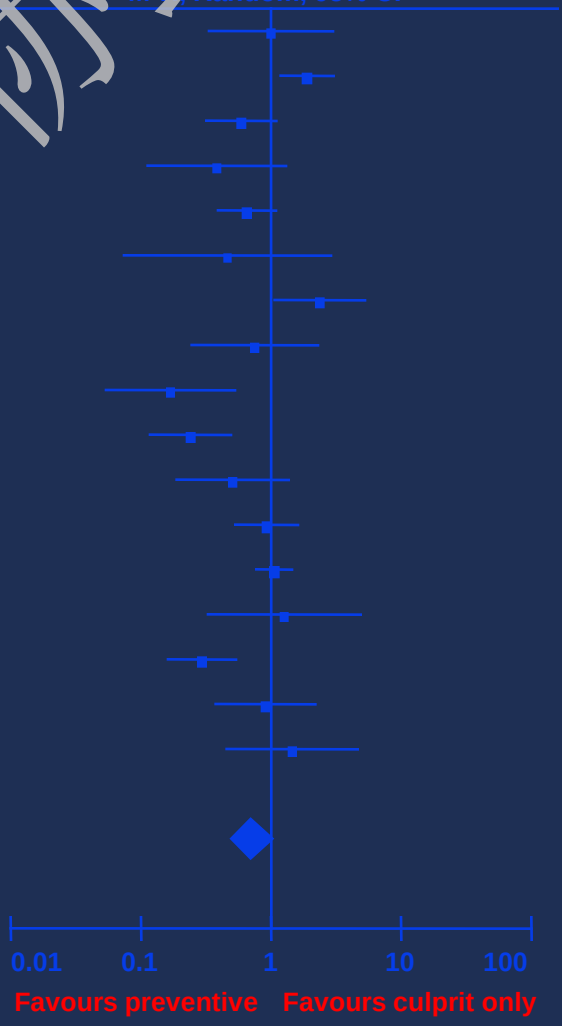


Repeat Revascularization (17 studies, 6,182 patients)

Study or Subgroup	preventive Events	Total	control Events	Total	Weight	Odds Ratio M-H, Random, 95% CI	Year
Roe et al.	7	79	7	79	4.8%	1.00 [0.33, 3.00]	2001
Corpus et al.	38	152	53	354	8.0%	1.89 [1.18, 3.03]	2004
Ijsselmuiden et al.	22	104	34	109	7.2%	0.59 [0.32, 1.10]	2004
Di Mario et al.	9	52	6	17	4.3%	0.38 [0.11, 1.31]	2004
Kalarus et al.	20	193	91	605	7.8%	0.65 [0.39, 1.08]	2007
Rigattieri et al.	2	64	3	46	2.6%	0.47 [0.07, 2.89]	2007
Han et al.	16	93	12	149	6.2%	2.37 [1.07, 5.27]	2008
Khattab et al.	6	28	12	45	4.7%	0.77 [0.25, 2.30]	2008
Qarawani et al.	7	95	8	25	4.6%	0.17 [0.05, 0.53]	2008
Politi et al.	14	130	28	84	6.7%	0.24 [0.12, 0.49]	2010
Dambrink et al.	10	80	9	41	5.2%	0.51 [0.19, 1.37]	2010
HORIZONS-AMI	32	393	24	275	6.4%	0.93 [0.53, 1.61]	2011
KAMIR	66	538	129	1104	7.7%	1.06 [0.77, 1.45]	2012
Myolette et al.	4	66	5	103	3.3%	1.26 [0.33, 4.89]	2013
PRAMI	16	234	42	231	7.3%	0.30 [0.16, 0.54]	2013
ICAS	7	54	31	220	5.8%	0.91 [0.38, 2.19]	2014
Yang et al.	4	68	13	278	4.6%	1.46 [0.46, 4.63]	2014
Total (95% CI)		2415		3767	100.0%	0.72 [0.51, 1.02]	
Total events	280		511				

Heterogeneity: Tau² = 0.23; Chi² = 57.50, df = 16 (P < 0.00001); I² = 72%

Test for overall effect: Z = 1.84 (P = 0.07)

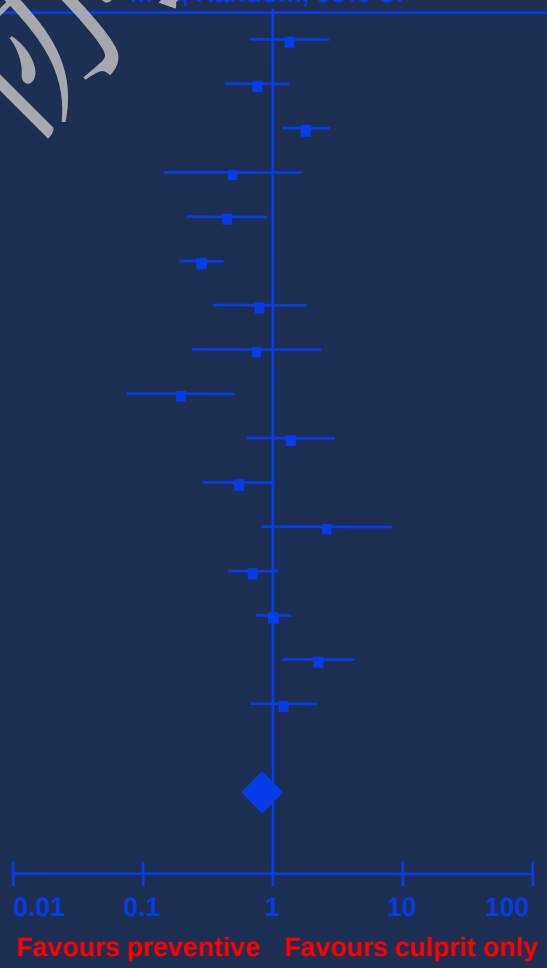


Major Adverse Cardiac Events (16 studies, 7,478patients)

Study or Subgroup	preventive Events	preventive Total	control Events	control Total	Weight	Odds Ratio M-H, Random, 95% CI	Year	Odds Ratio M-H, Random, 95% CI
Roe et al.	27	79	22	79	6.3%	1.35 [0.68, 2.65]	20[illegible]	
Ijsselmuiden et al.	36	108	44	111	6.9%	0.76 [0.44, 1.32]	2004	
Corpus et al.	62	152	98	354	7.5%	1.80 [1.21, 2.68]	200[illegible]	
Di Mario et al.	11	52	6	17	4.2%	0.49 [0.15, 1.6[illegible]	200[illegible]	
Kong et al.	10	632	47	1350	6.3%	0.45 [0.[illegible], 0.8[illegible]	2006	
Kalarus et al.	47	193	322	605	7.6%	0.2[illegible] [0.20, 0.41]	2007	
Rigattieri et al.	19	64	16	46	5.7%	0.79 [0.[illegible], 1.78]	2007	
Khattab et al.	6	28	12	45	4.5%	0.7[illegible] [0.25, 2.30]	2008	
Qarawani et al.	19	95	14	25	5.2%	0.[illegible]0 [0.08, 0.50]	2008	
Han et al.	14	93	17	149	6.0%	1.[illegible]3 [0.64, 2.94]	2008	
Politi et al.	28	130	28	84	6.[illegible]%	0.55 [0.30, 1.02]	2010	
Mohamad et al.	13	33	6	[illegible]	[illegible]%	2.60 [0.84, 8.09]	2011	
HORIZONS-AMI	53	393	50	2[illegible]	[illegible]%	0.70 [0.46, 1.07]	2011	
KAMIR	81	538	165	1106	7.[illegible]%	1.01 [0.76, 1.35]	2012	
ICAS	25	54	[illegible]	[illegible]	6.6%	2.25 [1.22, 4.14]	2014	
Yang et al.	25	60	10[illegible]	2[illegible]	6.8%	1.21 [0.69, 2.14]	2014	
Total (95% CI)		2[illegible]04		4774	100.0%	0.83 [0.59, 1.18]		
Total events	476		1011					

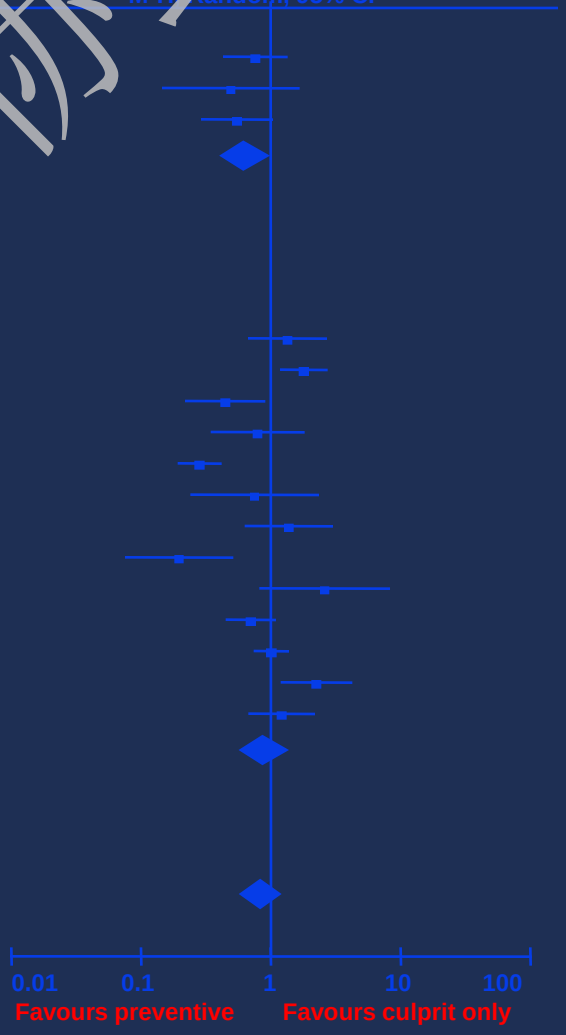
Heterogeneity: Tau² = 0.3[illegible]; Chi² = 84.63, df = 15 (P < 0.00001); I² = 82%

Test for overall effect: Z = 1.02 (P = 0.31)



Major Adverse Cardiac Events (16 studies, 7,478patients)

Study or Subgroup	preventive Events	Total	control Events	Total	Weight	Odds Ratio M-H, Random, 95% CI	Year	Odds Ratio M-H, Random, 95% CI
4.2.1 Randomized studies								
Ijsselmuiden et al.	36	108	44	111	6.9%	0.76 [0.44, 1.32]	2004	
Di Mario et al.	11	52	6	17	4.2%	0.49 [0.15, 1.63]	2004	
Politi et al.	28	130	28	84	6.6%	0.55 [0.30, 1.02]	2010	
Subtotal (95% CI)		290		212	17.7%	0.64 [0.43, 0.94]		
Total events	75		78					
Heterogeneity: Tau² = 0.00; Chi² = 0.80, df = 2 (P = 0.67); I² = 0%								
Test for overall effect: Z = 2.26 (P = 0.02)								
4.2.2 Non-randomized studies								
Roe et al.	27	79	22	79	6.3%	1.35 [0.68, 2.65]	2001	
Corpus et al.	62	152	98	354	7.5%	1.80 [1.21, 2.68]	2004	
Kong et al.	10	632	47	1350	6.3%	0.45 [0.22, 0.89]	2006	
Rigattieri et al.	19	64	16	46	5.7%	0.79 [0.35, 1.78]	2007	
Kalarus et al.	47	193	322	605	7.6%	0.28 [0.20, 0.41]	2007	
Khattab et al.	6	28	12	45	4.3%	0.75 [0.25, 2.30]	2008	
Han et al.	14	93	17	149	5.1%	1.38 [0.64, 2.94]	2008	
Qarawani et al.	19	95	14	95	5.2%	0.20 [0.08, 0.50]	2008	
Mohamad et al.	13	33	6	33	3.9%	2.60 [0.84, 8.09]	2011	
HORIZONS-AMI	53	393	50	275	7.4%	0.70 [0.46, 1.07]	2011	
KAMIR	81	538	165	1116	7.9%	1.01 [0.76, 1.35]	2012	
ICAS	25	54	61	221	6.6%	2.25 [1.22, 4.14]	2014	
Yang et al.	25	60	107	278	6.8%	1.21 [0.69, 2.14]	2014	
Subtotal (95% CI)		2414		4562	82.3%	0.89 [0.59, 1.35]		
Total events	401		933					
Heterogeneity: Tau² = 0.44; Chi² = 81.80, df = 12 (P < 0.00001); I² = 85%								
Test for overall effect: Z = 0.54 (P = 0.59)								
Total (95% CI)		2704		4774	100.0%	0.83 [0.59, 1.18]		
Total events	476		1011					
Heterogeneity: Tau² = 0.38; Chi² = 84.63, df = 15 (P < 0.00001); I² = 82%								
Test for overall effect: Z = 1.00 (P = 0.31)								
Test for subgroup differences: Chi² = 1.37, df = 1 (P = 0.24), I² = 27.0%								



Propensity Score-Matched Pairs analysis: 4 Studies

Conclusions

- Preventive PCI did not show benefit over culprit-only PCI during index procedure or staged PCI in patients with STEMI and multivessel disease supporting the current guidelines.

- Further study is needed to clarify which PCI strategies will have optimal efficacy in STEMI patients with multivessel coronary disease in clinical practice.

2014年ESC/EACTS心肌梗死血运重建指南对于急性STEMI多支病变血运重建策略推荐

- （1）直接PCI应只处理罪犯血管，除非处理完所考虑的罪犯血管后仍然存在心源性休克和持续性心肌缺血症状（IIa类推荐，B级证据）；
- （2）急性STEMI多支病变患者直接PCI术后数天至数周内仍有心肌缺血症状或心肌缺血证据，应考虑多次血运重建处理非罪犯血管（IIa类推荐，B级证据）；
- （3）特定患者可以考虑直接PCI同时处理罪犯血管和狭窄严重的非罪犯血管（IIb类推荐，B级证据）

2013 American guidelines (ACC/AHA)

PCI of a non-infarct artery at the time of primary PCI in patients without hemodynamic compromise is not indicated

PCI is indicated in a non-infarct artery at a time separate from primary PCI in patients who have spontaneous symptoms of myocardial ischemia.

PCI is reasonable in a non-infarct artery at a time separate from primary PCI in patients with intermediate- or high-risk findings on noninvasive testing

O´Gara PT S et al. JACC 2013

经皮冠状动脉介入治疗指南更新

- 对于合并多支病变的STEMI患者，早期研究提示仅对罪犯病变进行干预。
- 对无血流动力学障碍患者，除非合并心原性休克或梗死相关冠状动脉PCI后仍有持续性缺血等情况，不应对其非梗死相关血管进行急诊PCI。
- 2013~2015年间4项随机对照研究（PRAMI试验[39]、CvLPRIT试验[40]、DANAMI 3 PRIMULTI试验[41]和 PRAGUE-13试验[42]）显示，对部分STEMI合并多支血管病变的患者行急诊PCI或择期手术时，干预非梗死相关血管可能有利并且安全。最新荟萃分析[43]结果也提示STEMI合并多支病变患者实施PCI获益的可能性。
- HORIZONS-AMI[44]、REAL[45]等观察性研究以及一项网络荟萃分析[46]提示，择期完成多支PCI的临床获益可能优于直接PCI同时进行非梗死动脉PCI
- 但目前仍缺乏足够的证据证明孰优孰劣。

经皮冠状动脉介入治疗指南更新

非梗死相关动脉PCI			
多支病变的STEMI患者在血流动力学稳定情况下可考虑非梗死动脉PCI，可与直接PCI同时或择期完成	IIb	B	39-42[39][40][41][42]

讨　论

- 再灌注治疗的目的：尽早、充分、持续的3级血流
- 现有的循证医学证据仍然强力支持现有的治疗指南建议，即STEMI的“culprit-only PCI”策略
- 对非靶血管进行PCI可能有益，但大多建议延期、分次进行，即“staged PCI”
- 可能不应当将文献报告的一次性PCI策略的高死亡率，均归咎于在非罪犯血管实施PCI所致
- 治疗决策应取决于非罪犯病变的复杂性及其非梗死相关动脉的供血范围
- 尽可能做非罪犯血管的FFR评估，决定是否需要分次PCI处理
- 随着术者技术、器械和药物的进步，“one-time PCI”有一定合理性，但并非与现行指南背道而驰，然而这种做法仍然具有较高风险。

建　议

1、再灌注治疗的目的仍然是尽早、充分、持续地恢复梗死相关血管的TIMI 3级血流，现有的循证医学仍然强力支持目前的指南建议，即仅梗死相关血管PCI策略，对非梗死相关血管进行PCI可能有益，但大多建议延期、分次进行，治疗决策应取决于非罪犯病变的复杂性及其非梗死相关血管的供血范围

2、随着术者操作技术、介入器械和抗栓药物的不断发展进步，对于合并心源性休克的多支血管病变患者行“one-time PCI”有一定合理性，尤其对于存在明显不稳定狭窄病变，或者存在同时急性闭塞的其它血管，然而这种做法仍然具有较高风险

建　议

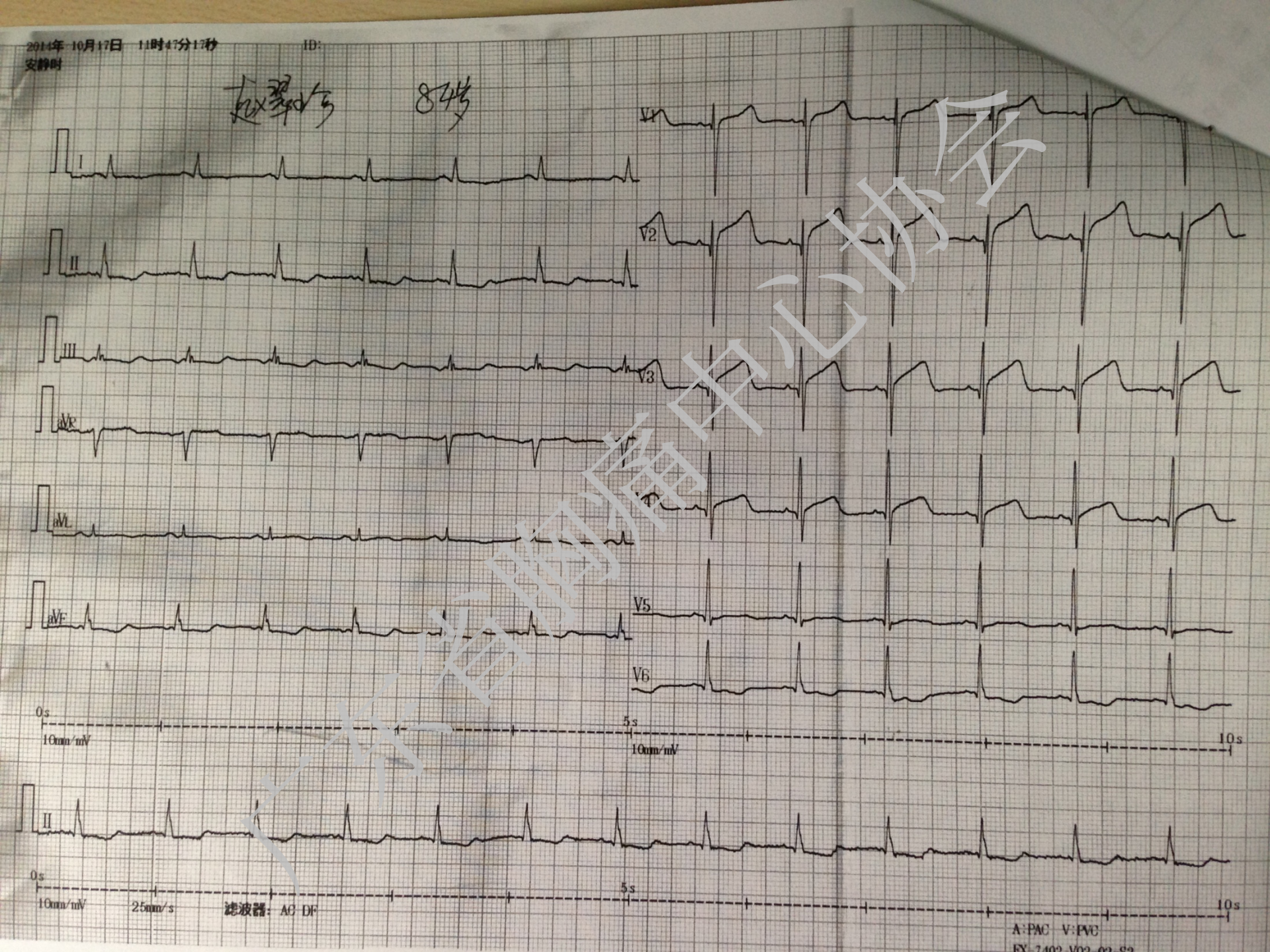
3、部分血流动力学稳定的STEMI患者急诊PCI时进行非梗死相关血管的PCI也是可行的，尤其存在明显不稳定狭窄病变，或者靶血管判断困难时，但需要具备非常丰富的介入治疗经验，且在充分的抗栓基础和冠脉病变并不复杂的前提下

4、如果非梗死相关血管为CTO病变，不管是否合并心源性休克，考虑到此时急诊PCI干预的成功率与可行性，仍建议延期、分次进行为主

5、对于目前随机对比试验结果的理解，由于样本量小、入选标准与真实世界的差异，目前仍然不宜主要采用一次干预策略

病例1

- 患者女、84岁
- 间断胸痛1年，持续不缓解8小时
- 既往高血压病史
- 入院血压120/70，心率75
- 入院诊断：急性前壁心肌梗死


2014年 10月17日 11时47分17秒
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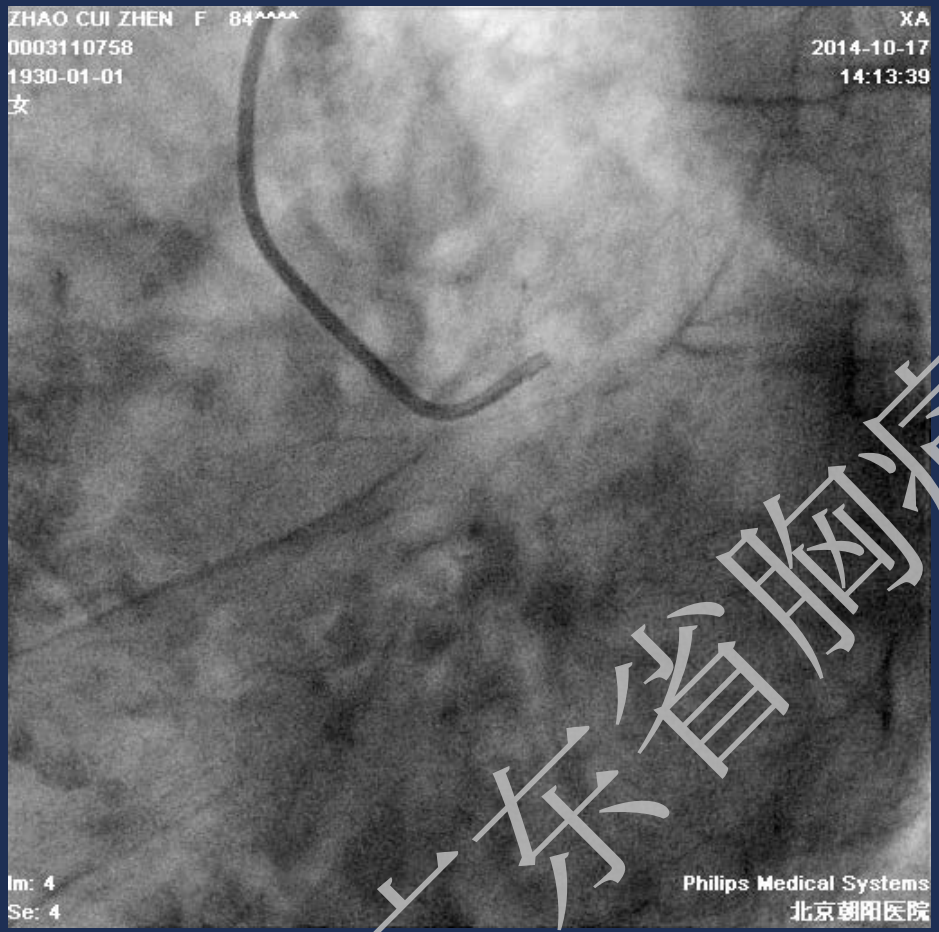
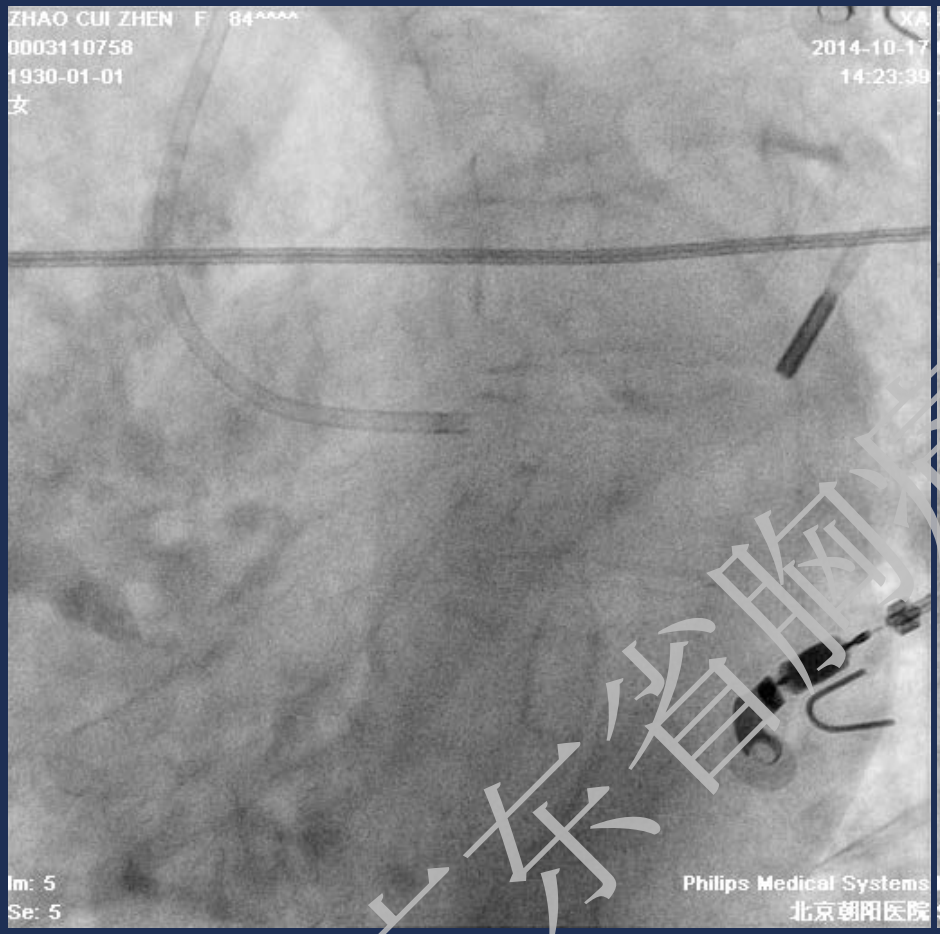
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
0s
5s
10s
10mm/mV
10mm/mV
II
0s
5s
10s
10mm/mV
25mm/s
滤波器: AC DF
A:PAC V:PVC
EX-7402 V02.02.S2

急诊CAG

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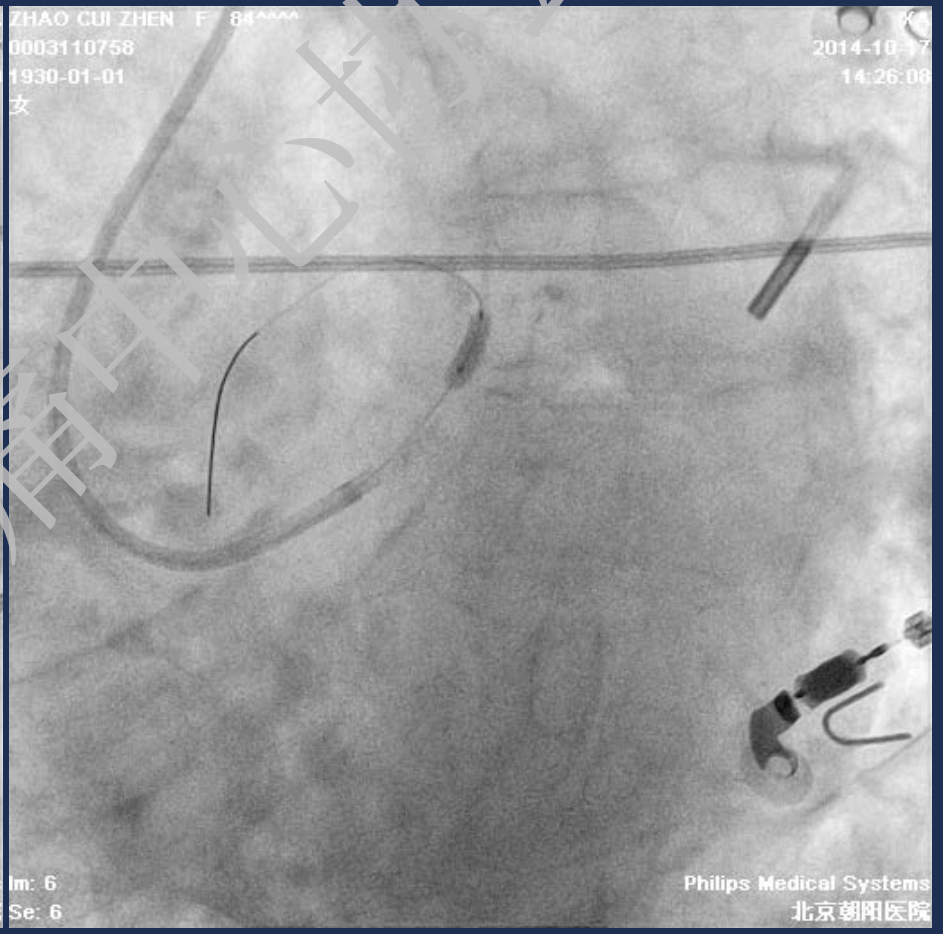
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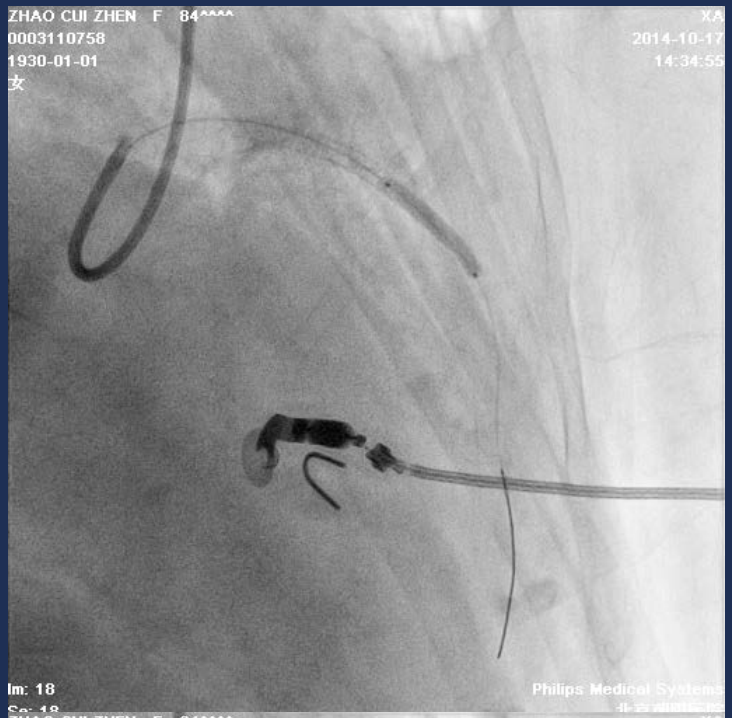

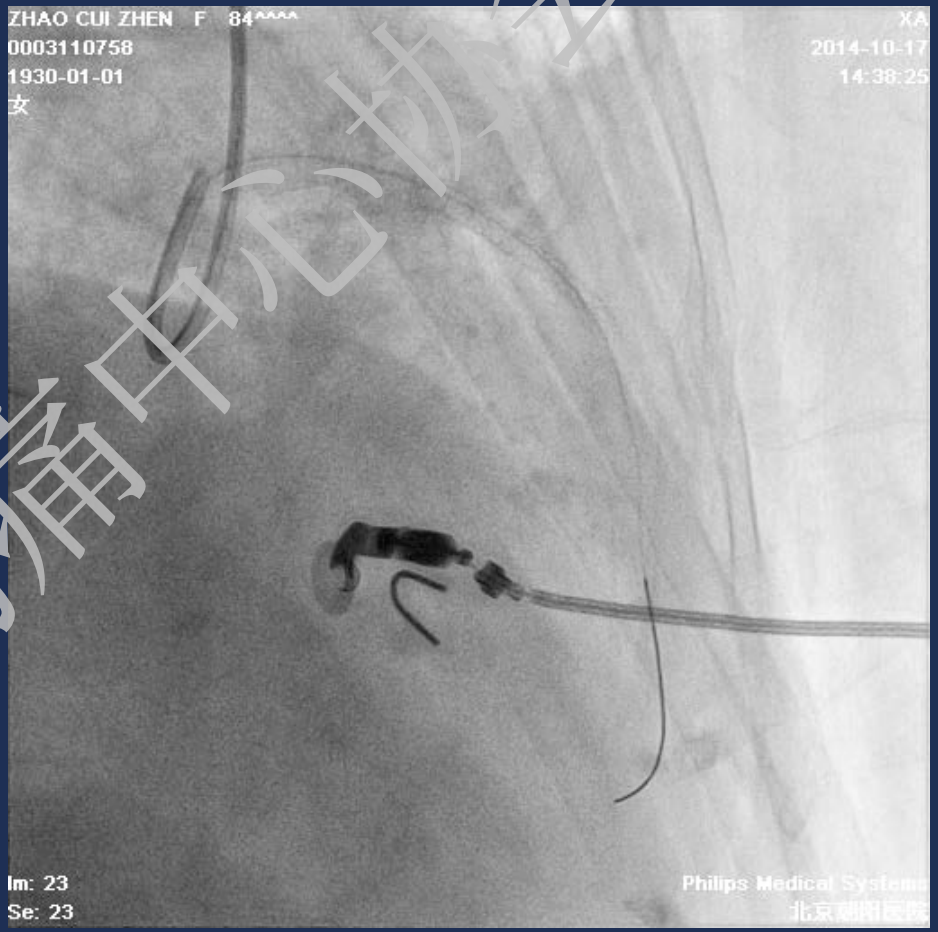

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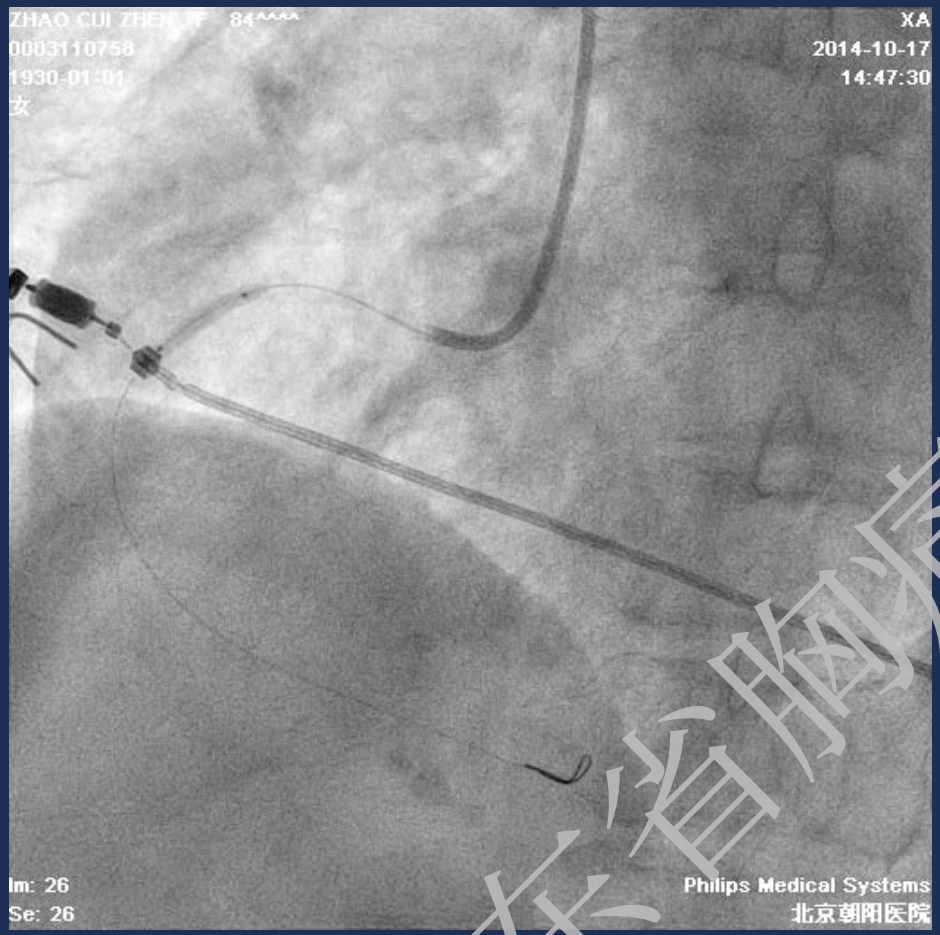
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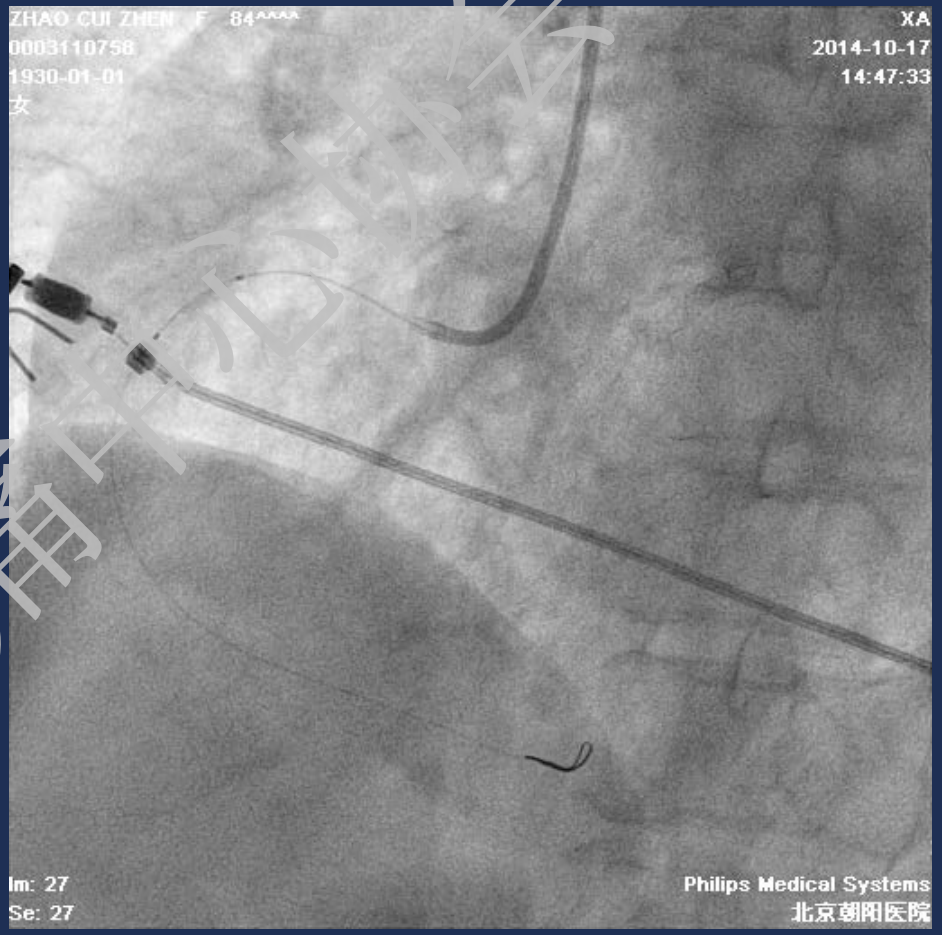
北京朝阳医院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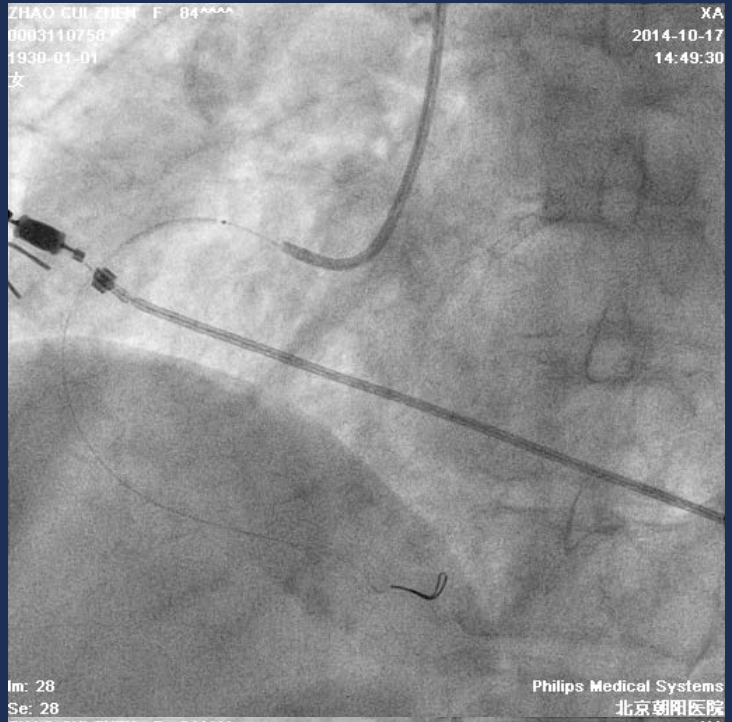
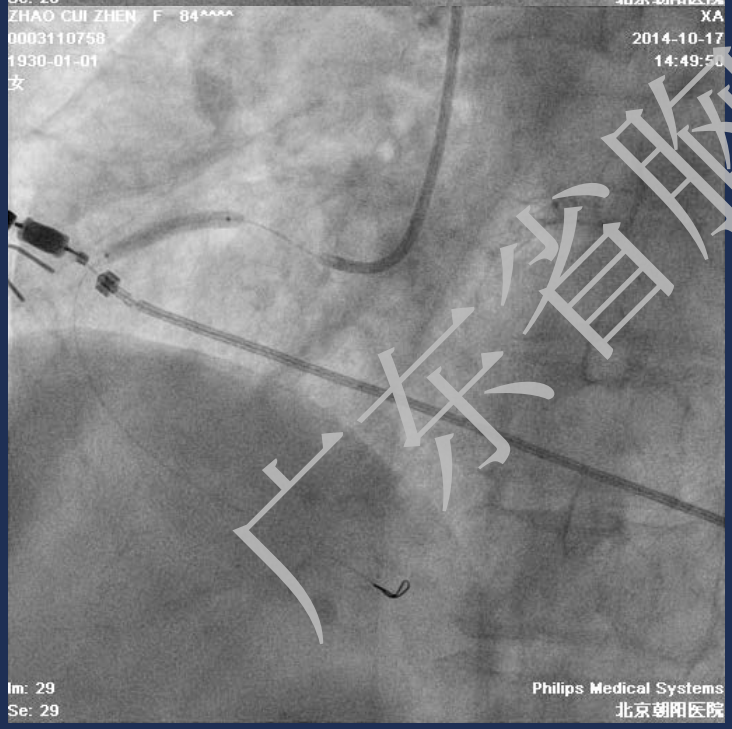
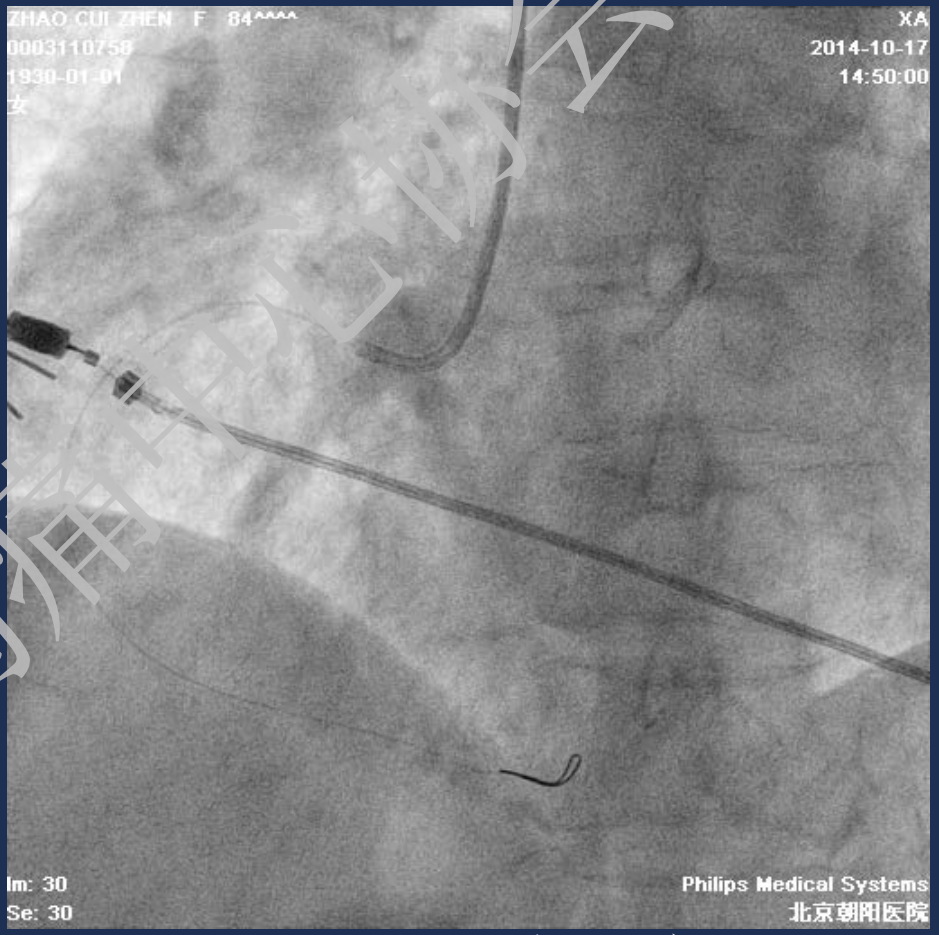
北京朝阳医院







3.0×23mm（14atm）

用时：40分钟

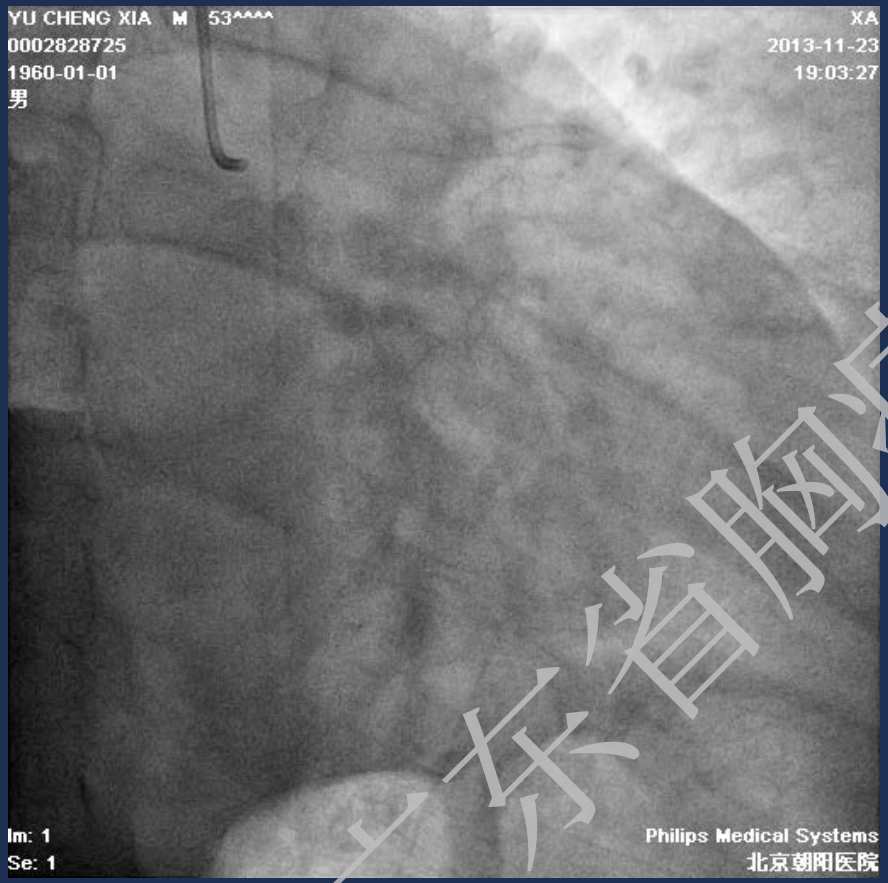
造影剂：200ml

病情转归

- 术后患者胸痛减轻
- 心电图ST段回落
- 第7日拔除IABP
- 第10日转入普通病房
- 第14日出院
- 随访2月，无明显不适

病例2

- 53岁男性
- 急性前壁心肌梗死
- 既往高脂血症病史
- 3年前因UAP于LAD支架1枚
- 停用波立维2年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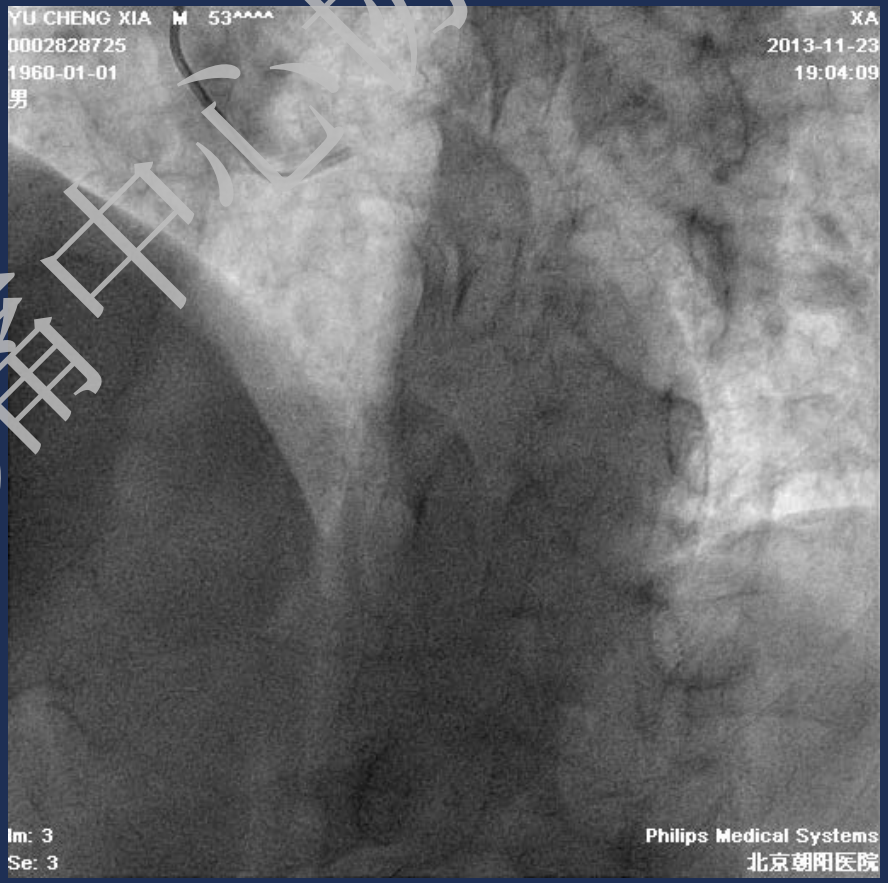
Philips Medical Systems
北京朝阳医院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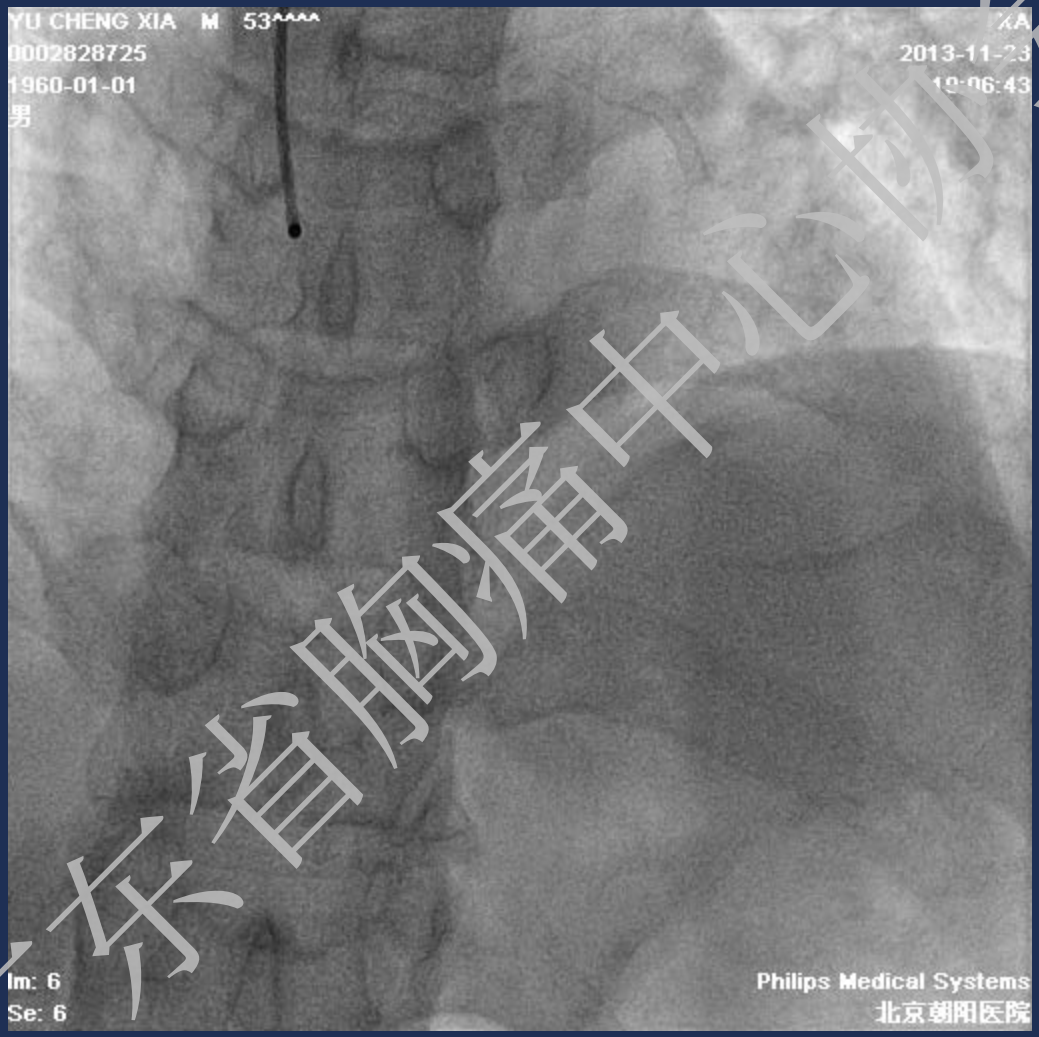
北京朝阳医院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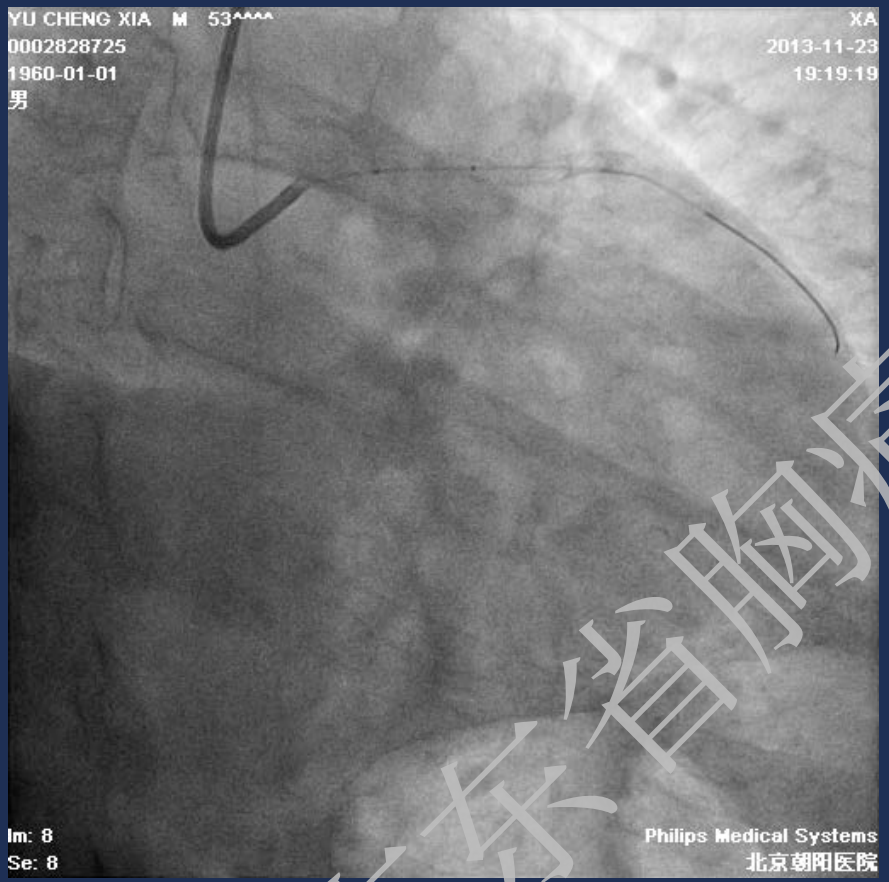
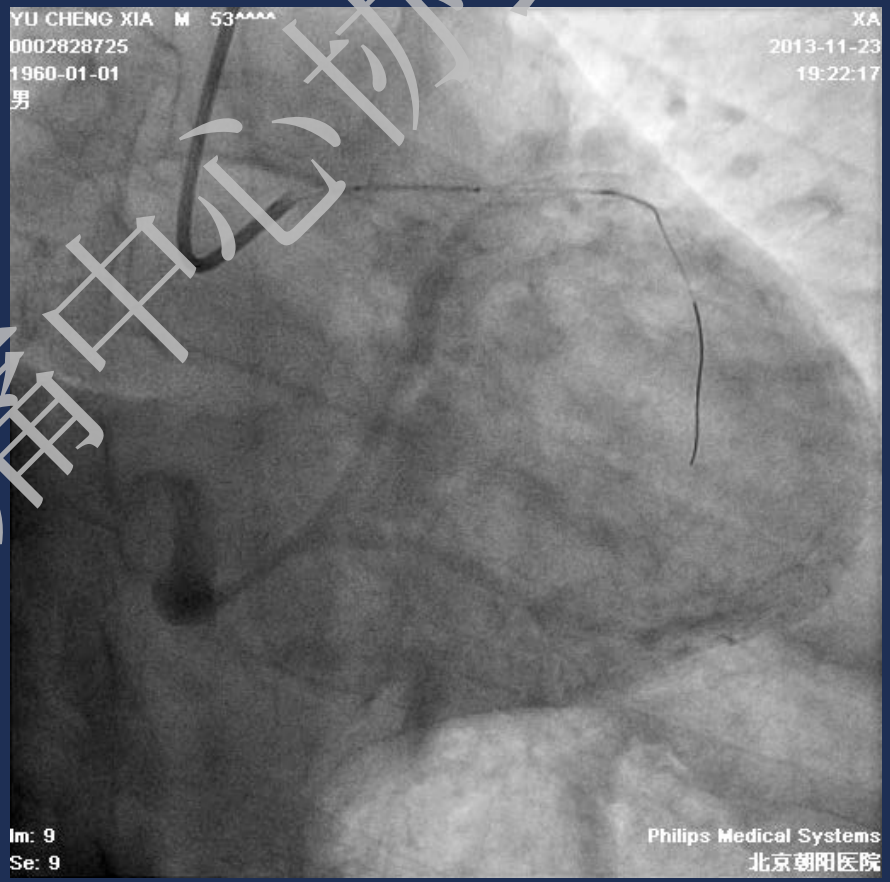
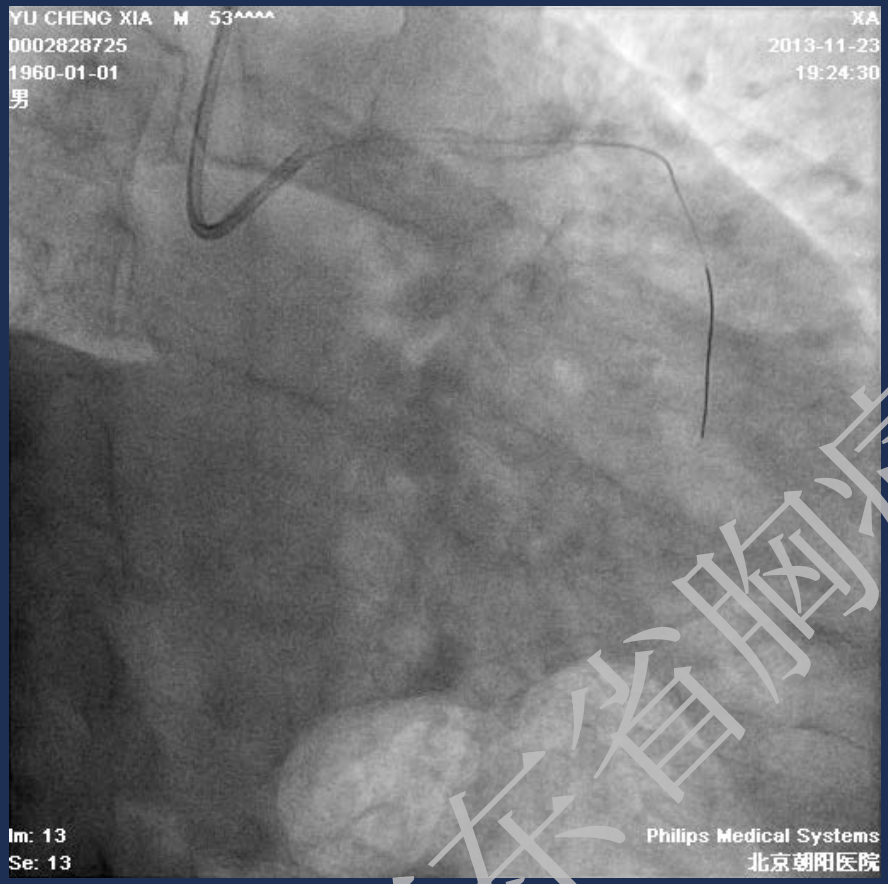
北京朝阳医院





银艺 3.5 ×15mm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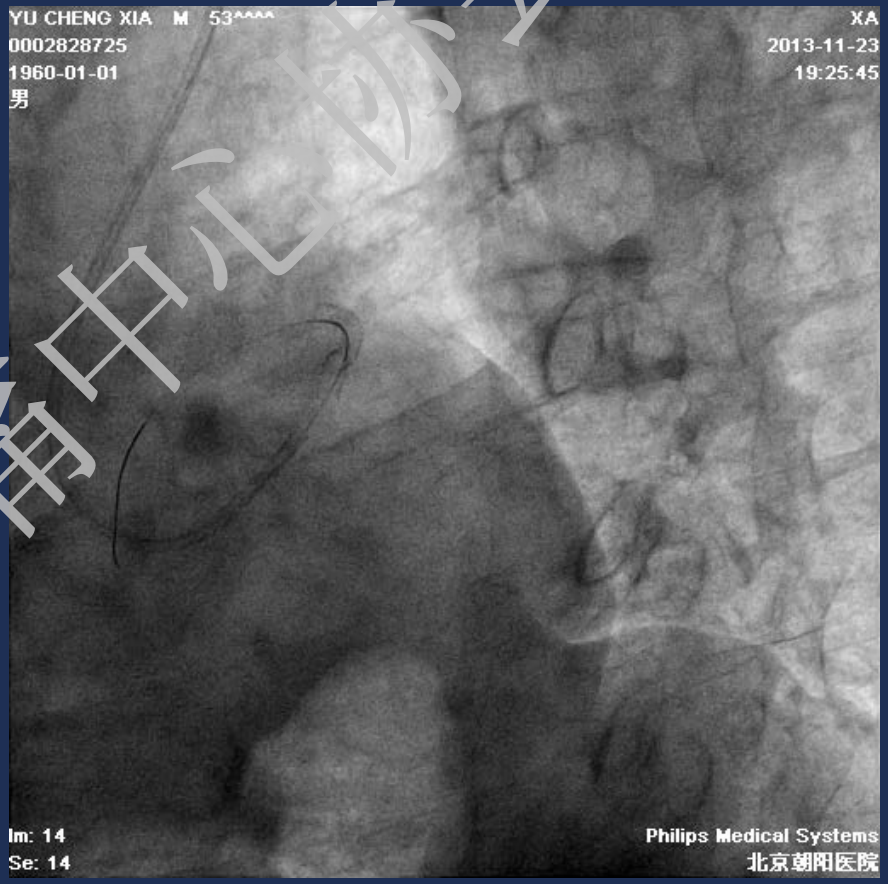
Philips Medical Systems
北京朝阳医院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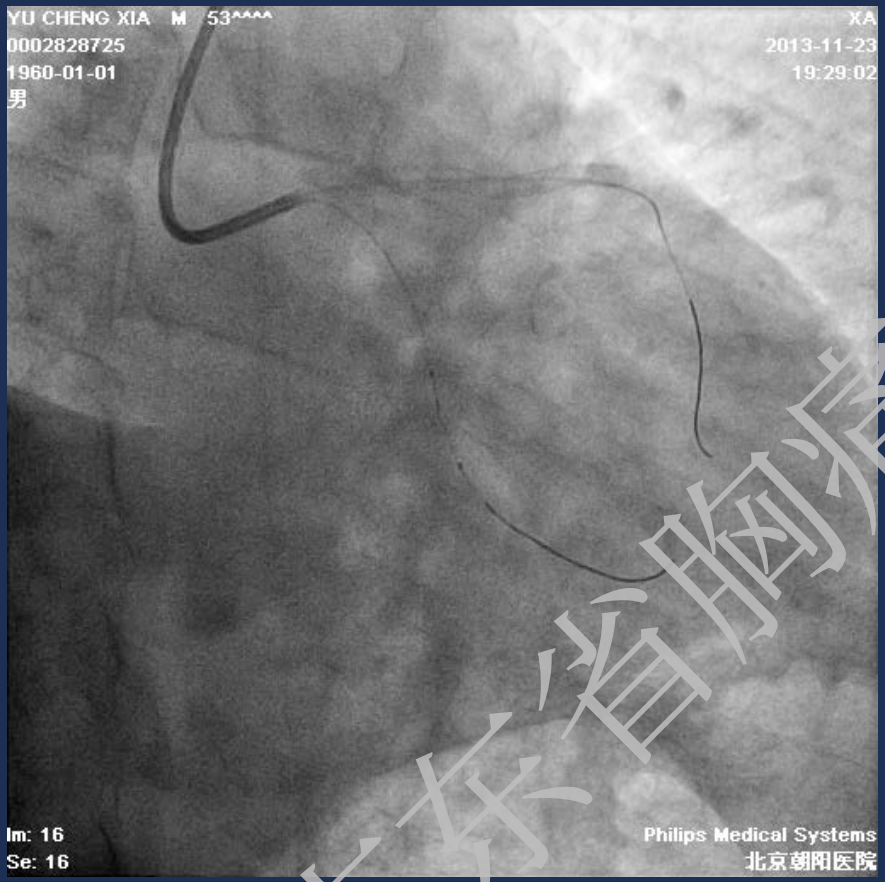
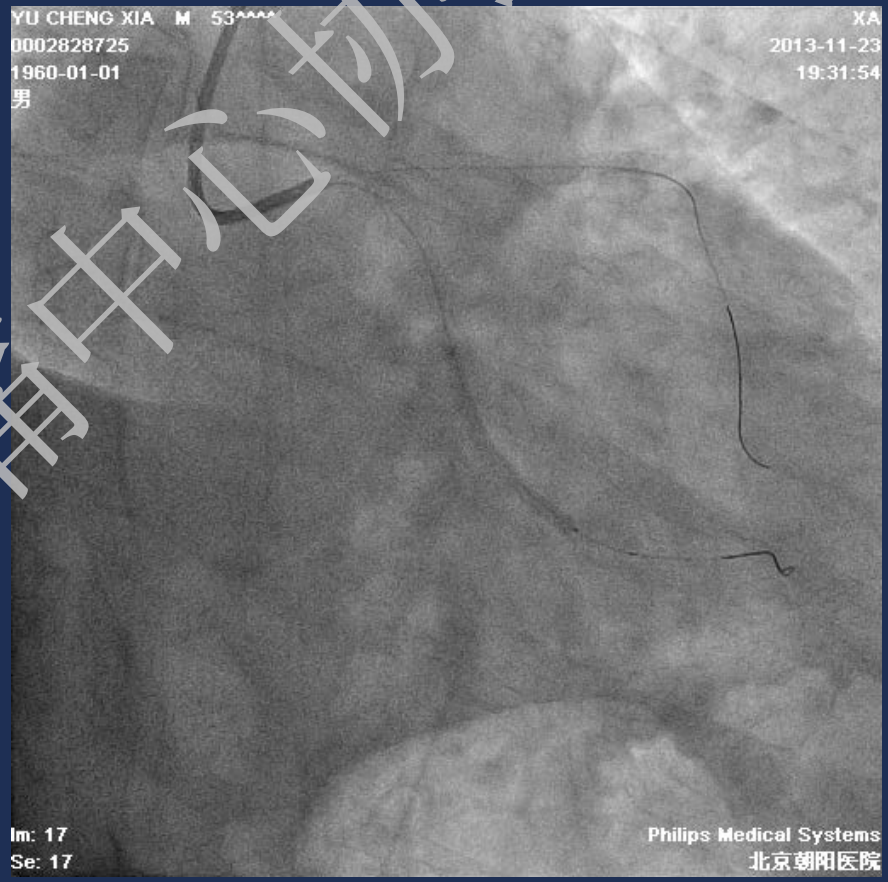
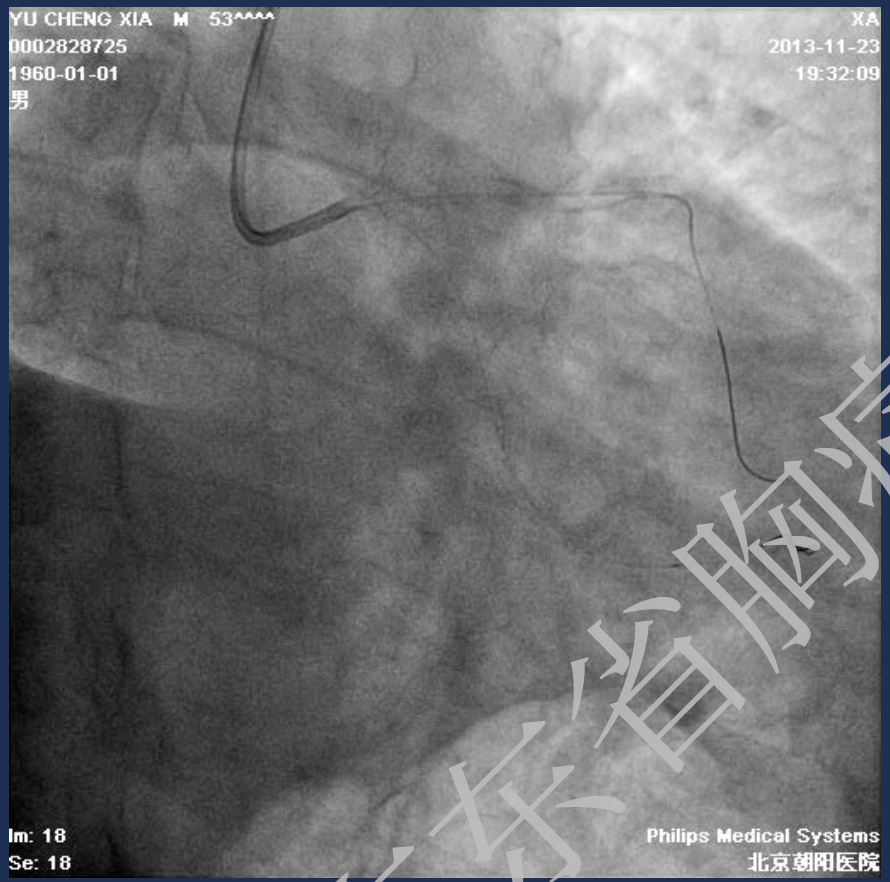
Philips Medical Systems
北京朝阳医院





银艺 2.75 ×18mm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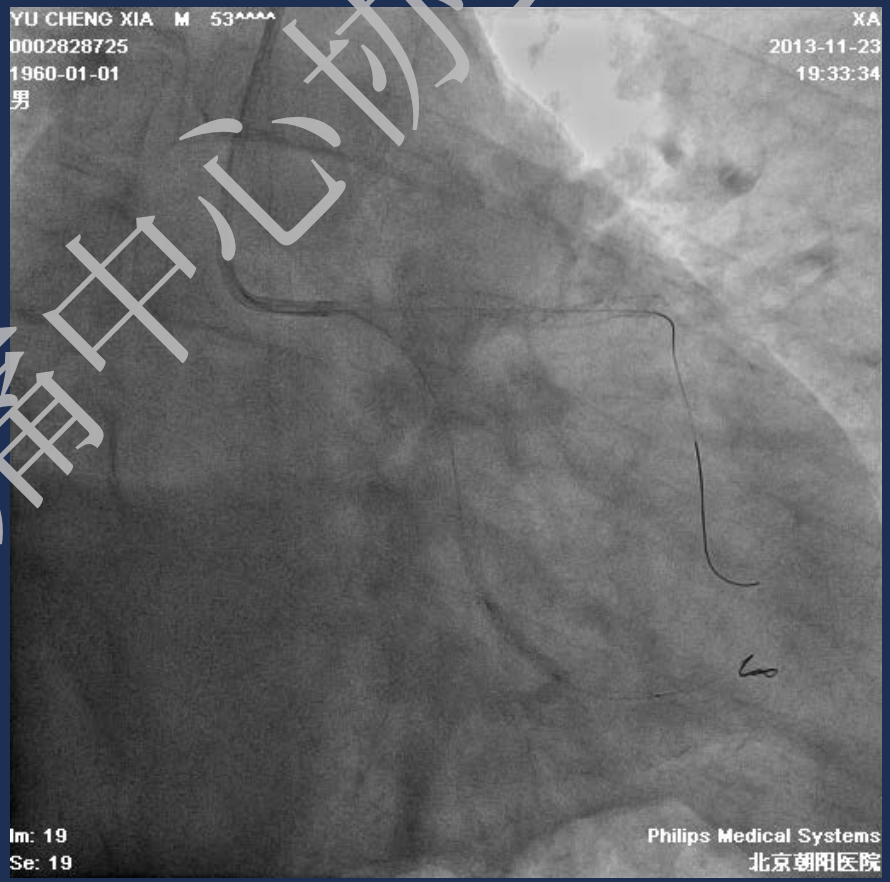
Philips Medical Systems
北京朝阳医院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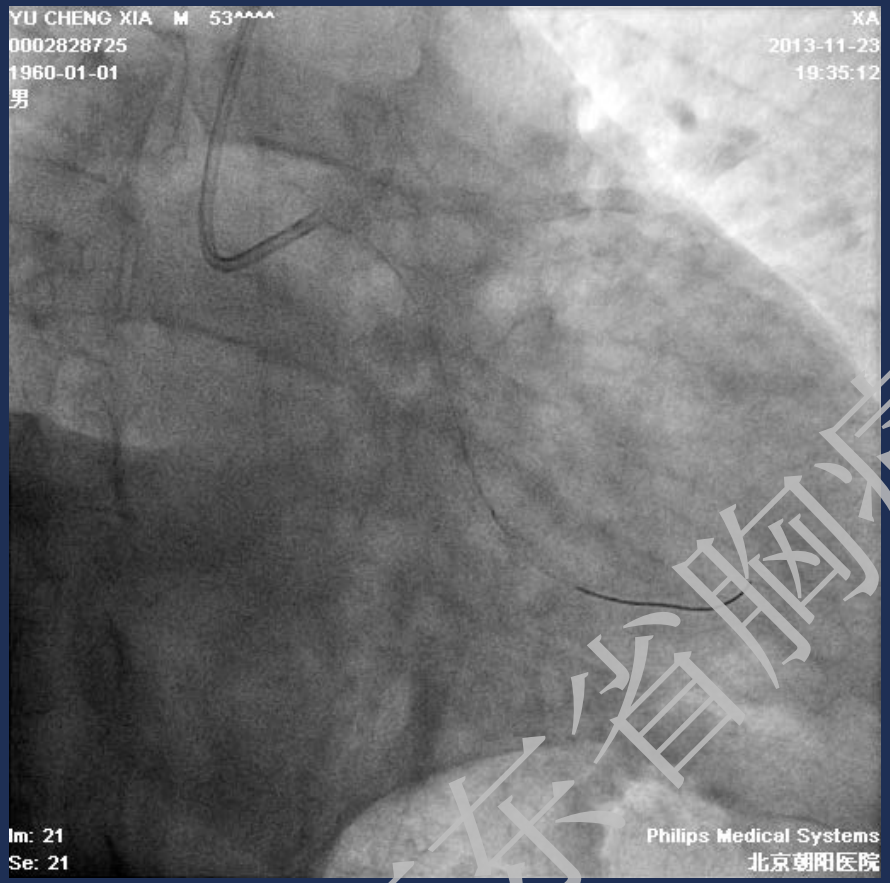
Philips Medical Systems
北京朝阳医院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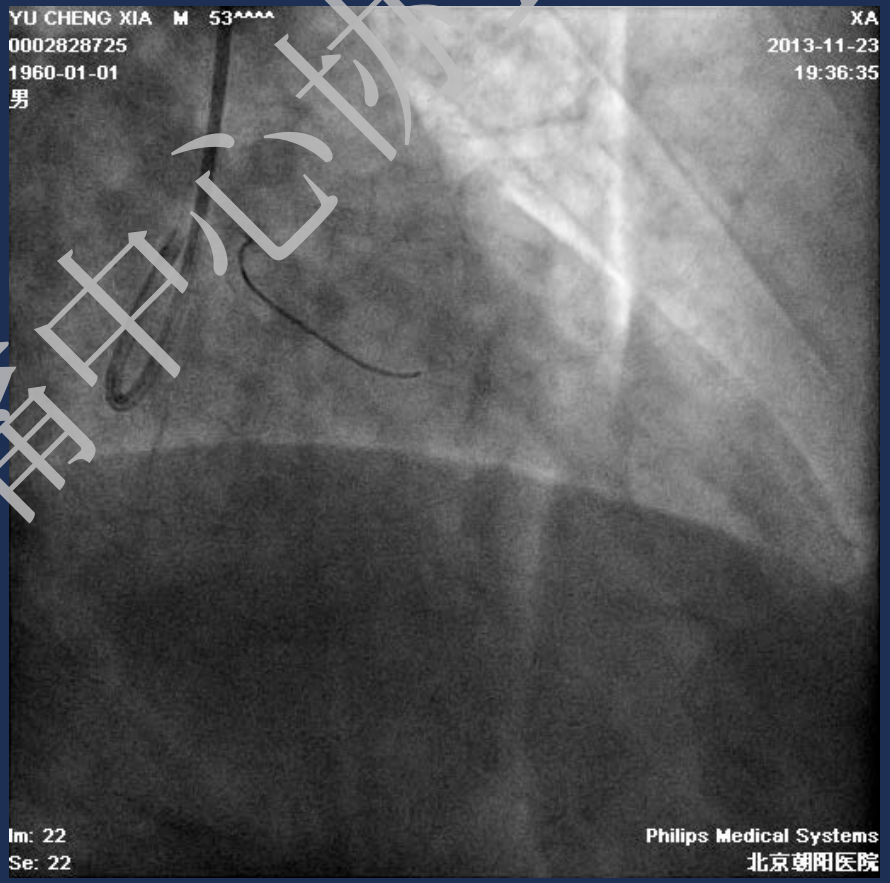
Philips Medical Systems
北京朝阳医院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XA
2013-11-23
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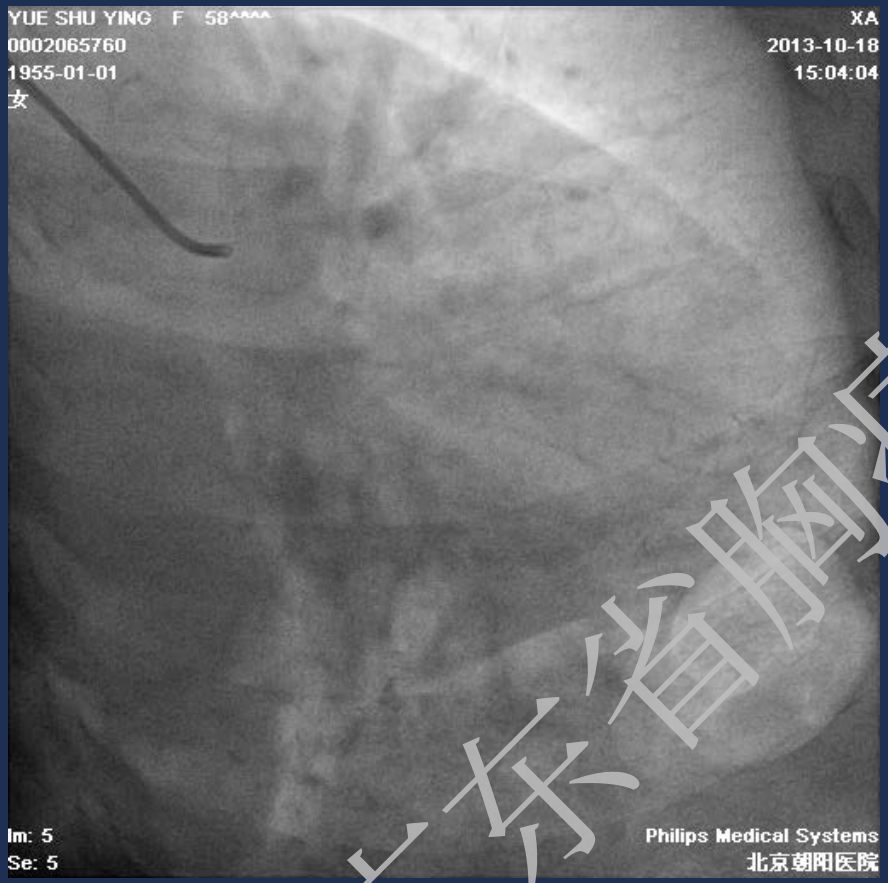
Se: 22
Philips Medical Systems
北京朝阳医院

病情转归

- 术后收入CCU
- 2日后病情稳定转入普通病房
- 7日后好转出院

病例3

- 58岁女性
- 急性NSTEMI
- 既往高血压病史
- 心电图：V3-V6、I、aVL导联T波低平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女
XA
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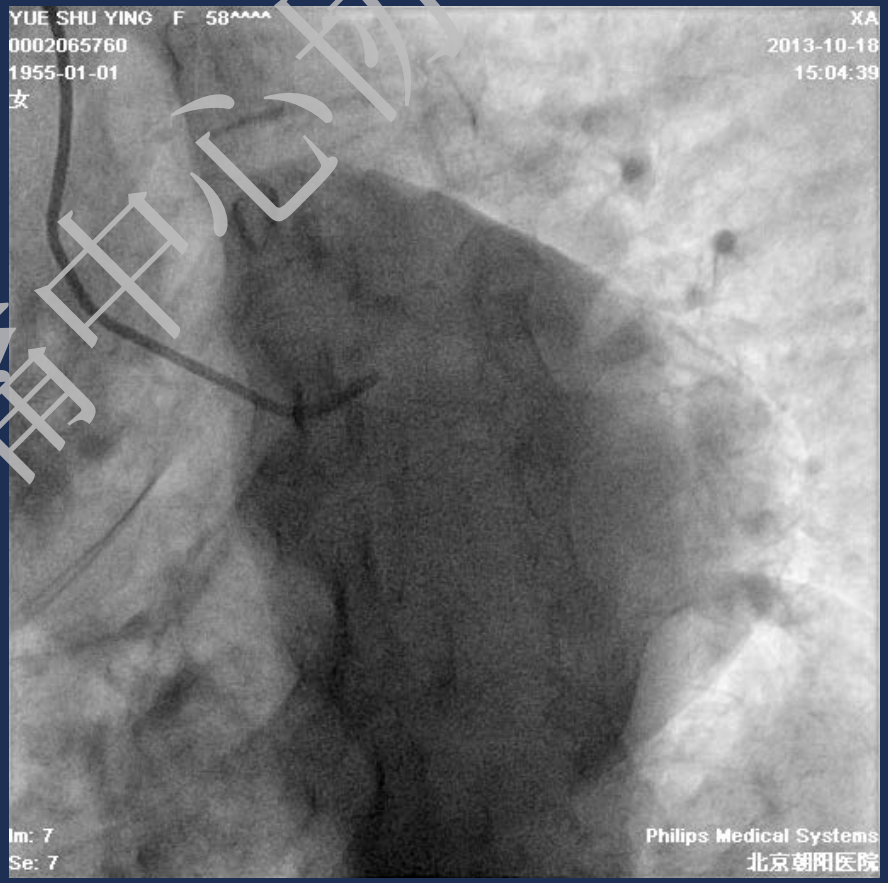
Philips Medical Systems
北京朝阳医院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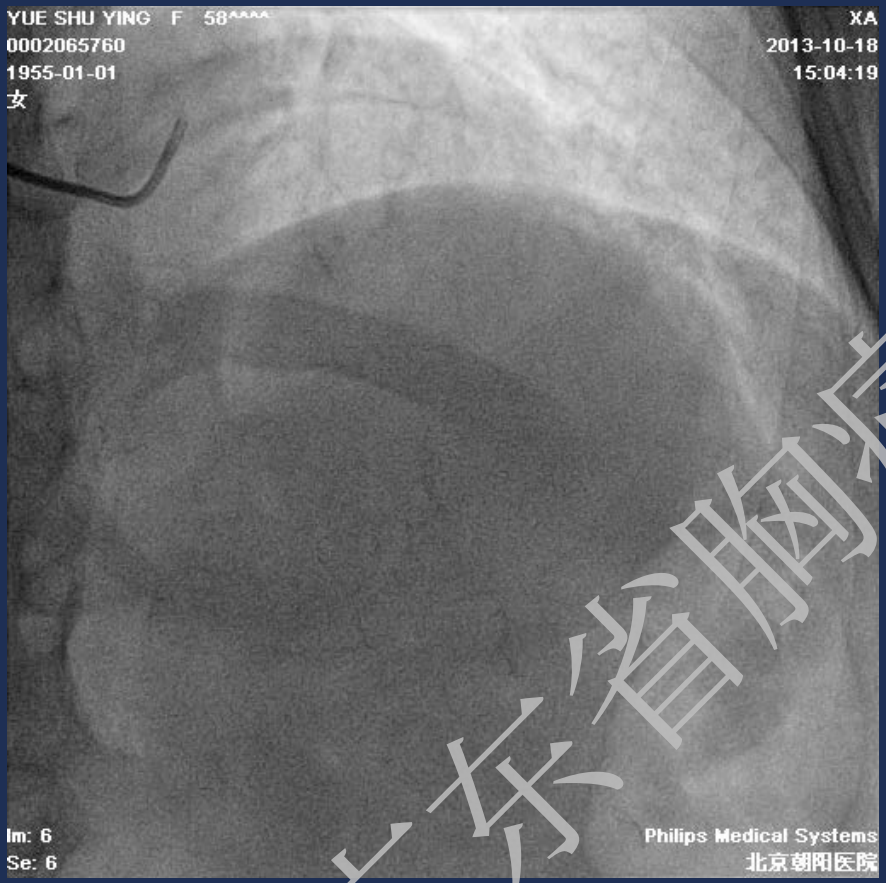
Philips Medical Systems
北京朝阳医院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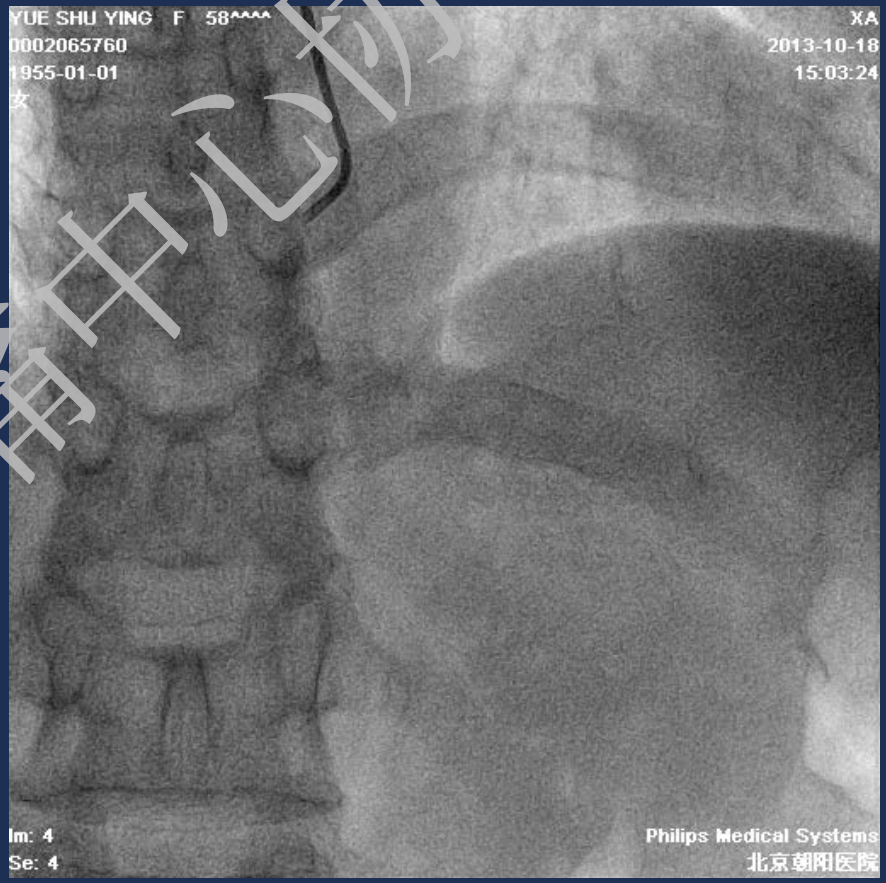
Philips Medical Systems
北京朝阳医院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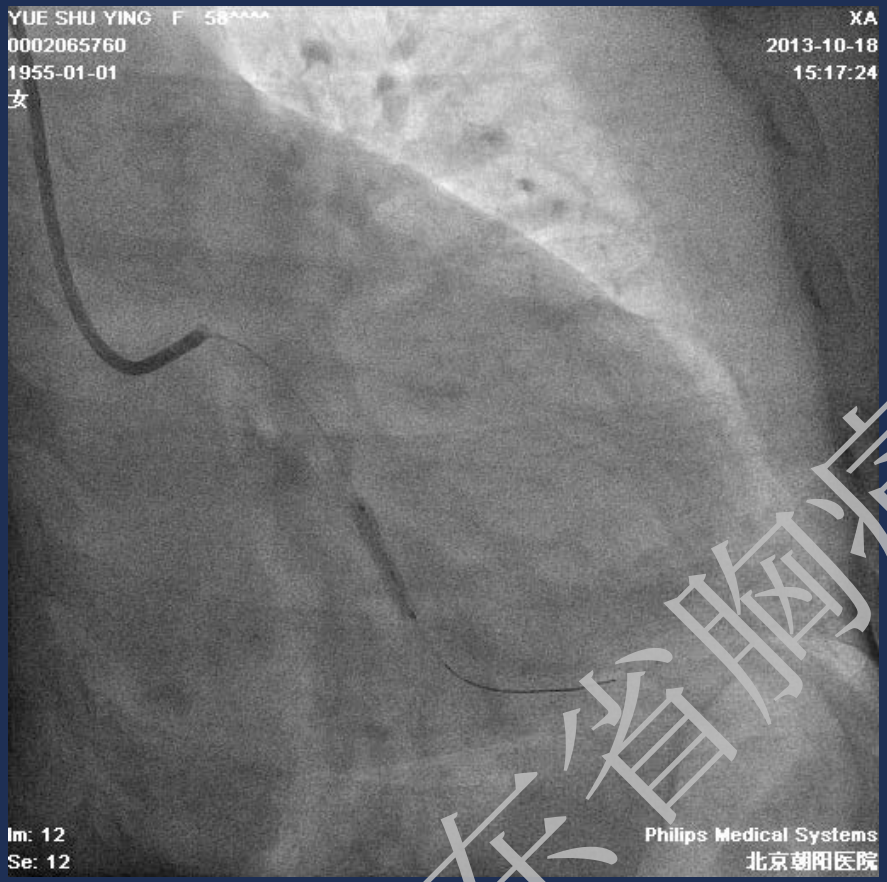
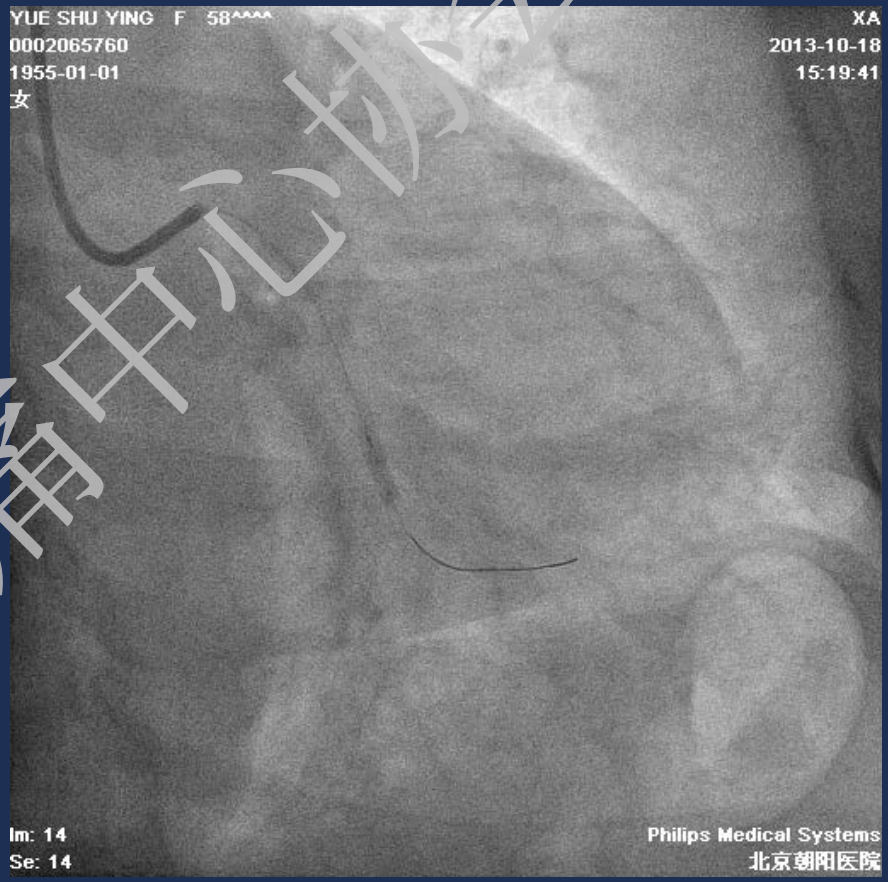
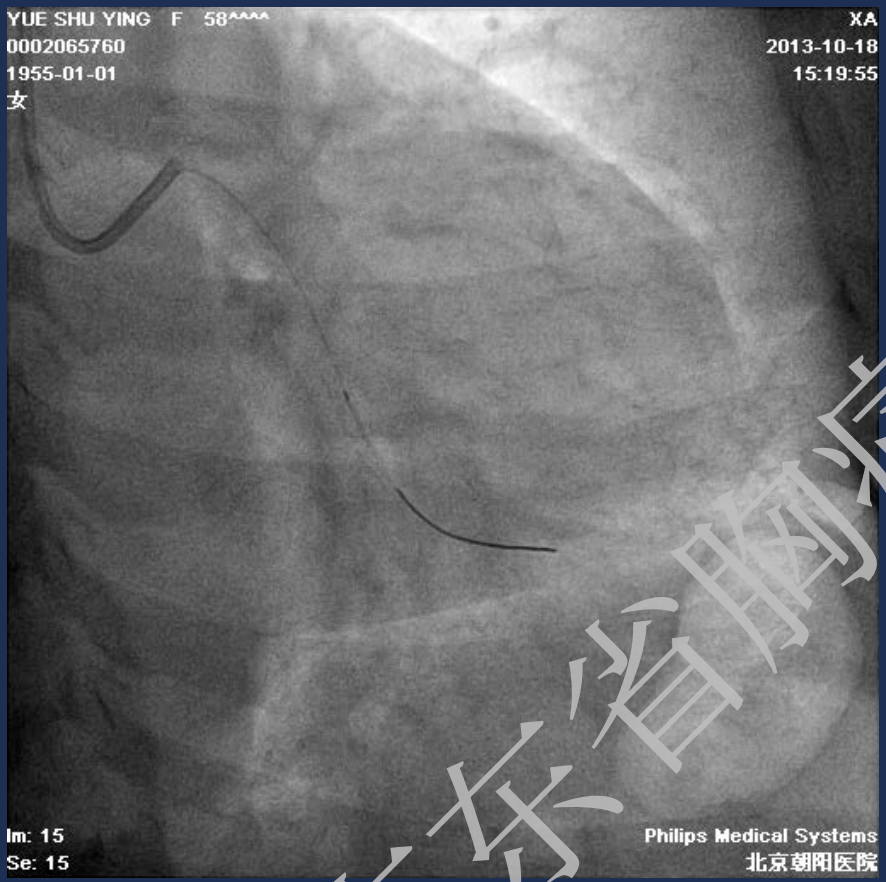
Philips Medical Systems
北京朝阳医院





Resolute 2.75 ×14mm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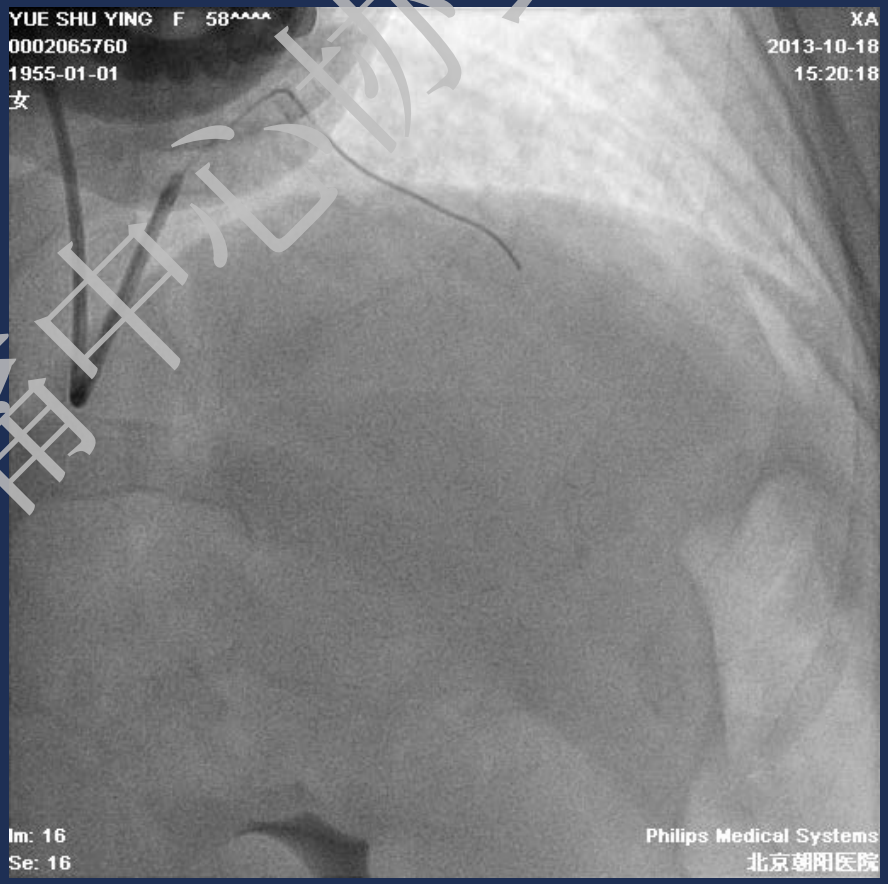
Philips Medical Systems
北京朝阳医院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1955-01-01
女
XA
2013-10-18
15:20:18
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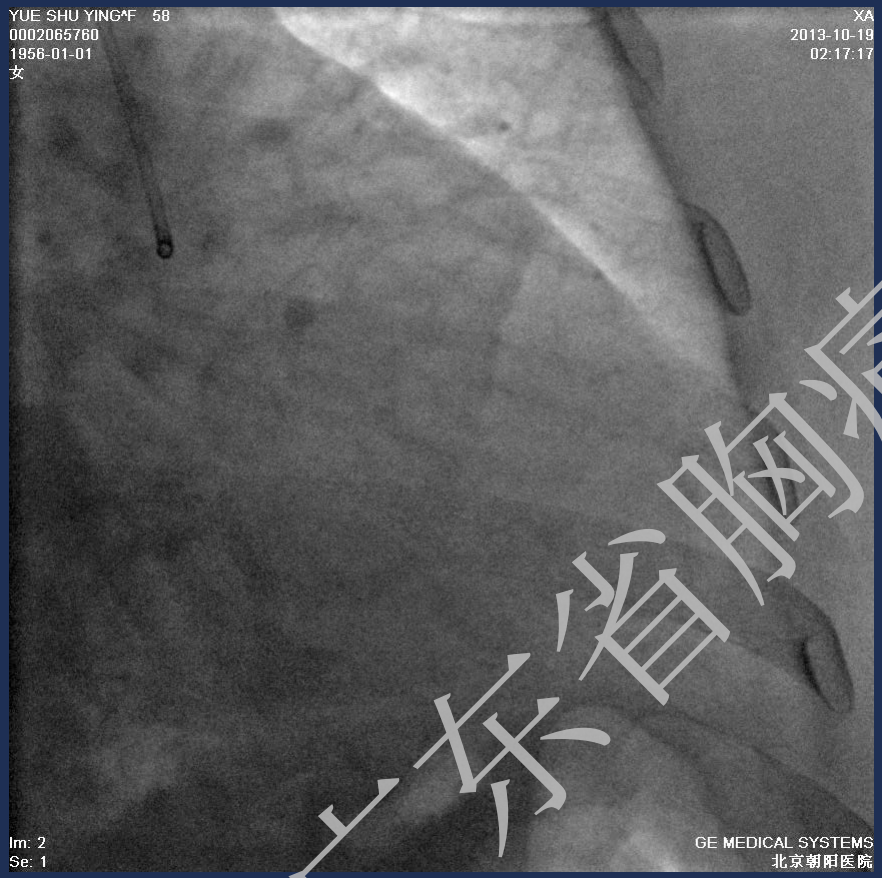
Se: 16
Philips Medical Systems
北京朝阳医院

病情变化

- 术后6小时诉胸痛，给予硝酸甘油后略有缓解，但之后仍频繁胸痛
- 心电图示V1-V5导联ST段压低
- 后出现血压降低，由155/95mmHg下降至90/65mmHg，伴有一过性意识障碍，经升压、补液后逐渐缓解
- 后在IABP辅助下行急诊CAG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0002065760
1956-01-01
女
XA
2013-10-19
02:17:17
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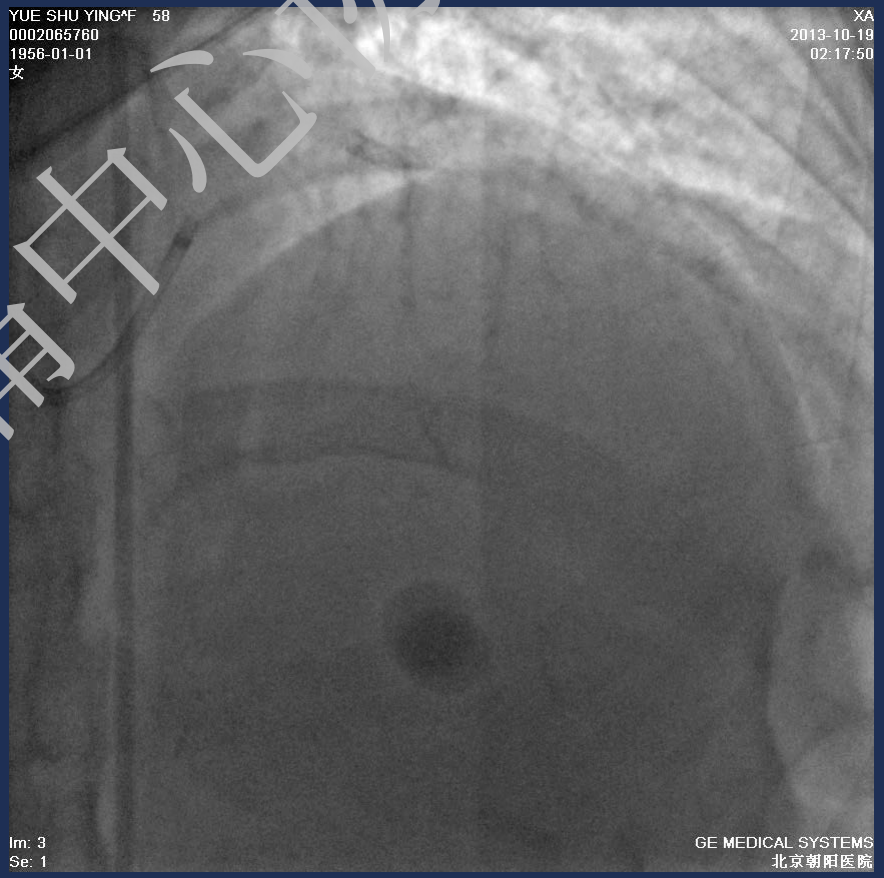
Se: 1
GE MEDICAL SYSTEMS
北京朝阳医院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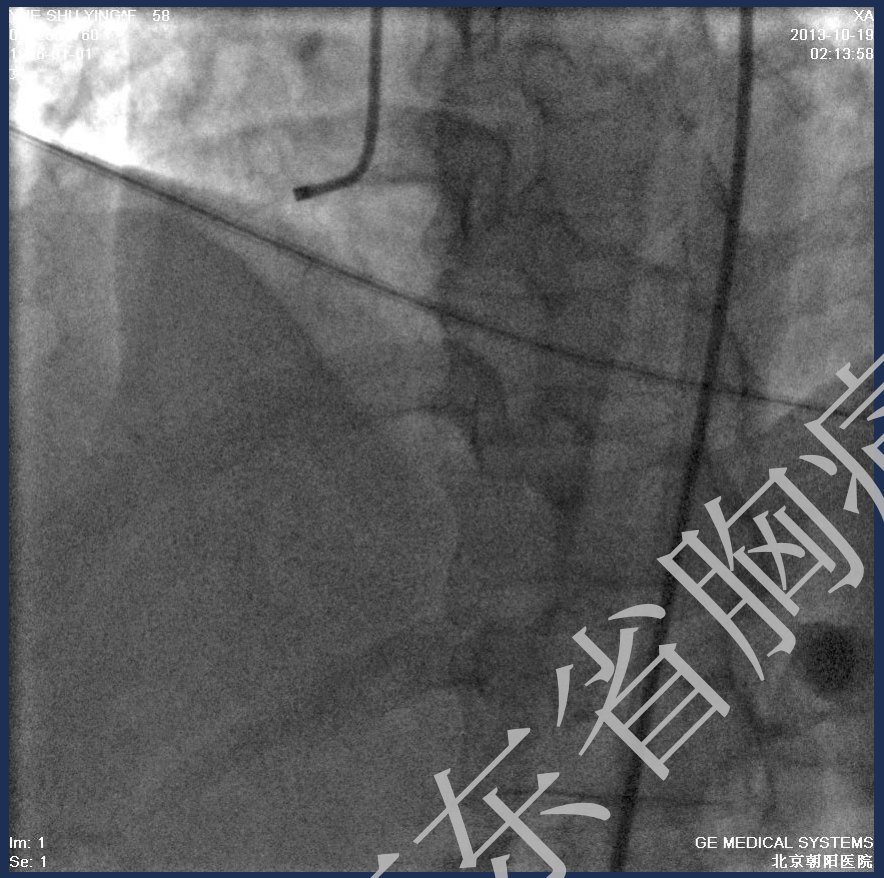
GE MEDICAL SYSTEMS
北京朝阳医院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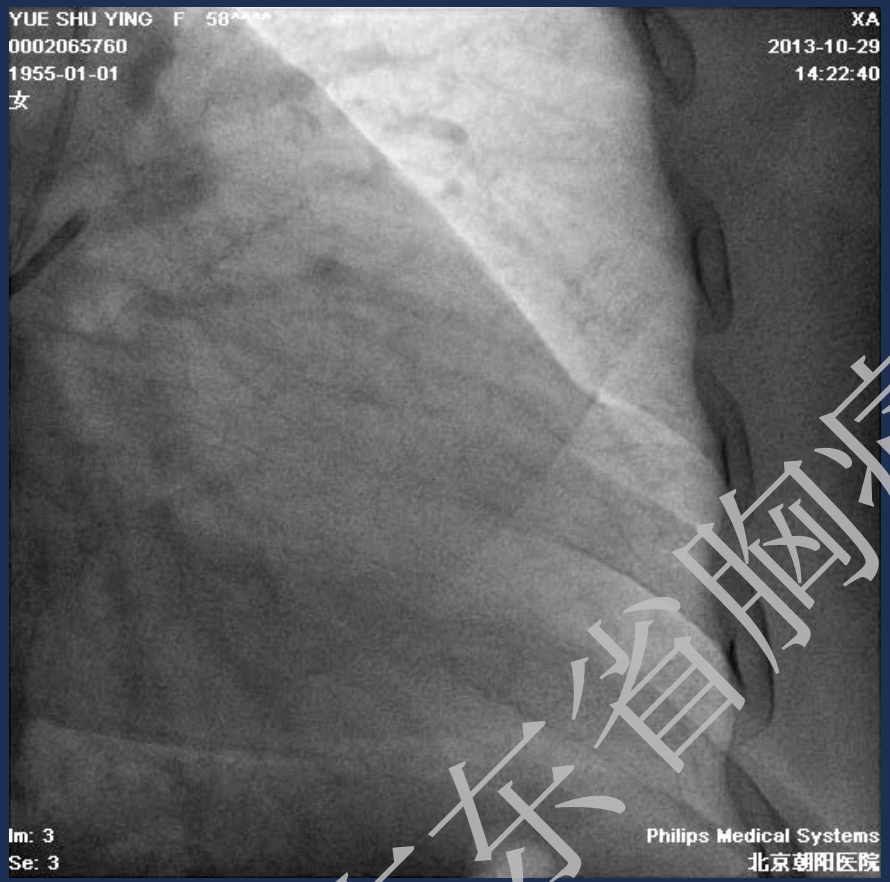
GE MEDICAL SYSTEMS
北京朝阳医院


YUE SHU YING^F 58
0002065760
1956-01-01
女
XA
2013-10-19
02:22:17
Im: 5
Se: 1
GE MEDICAL SYSTEMS
北京朝阳医院

- 因未见明显支架内急性血栓形成，未PCI干预
- IABP辅助2日，病情稳定
- 复查心肌酶未见再度升高
- 10日后择期干预LAD病变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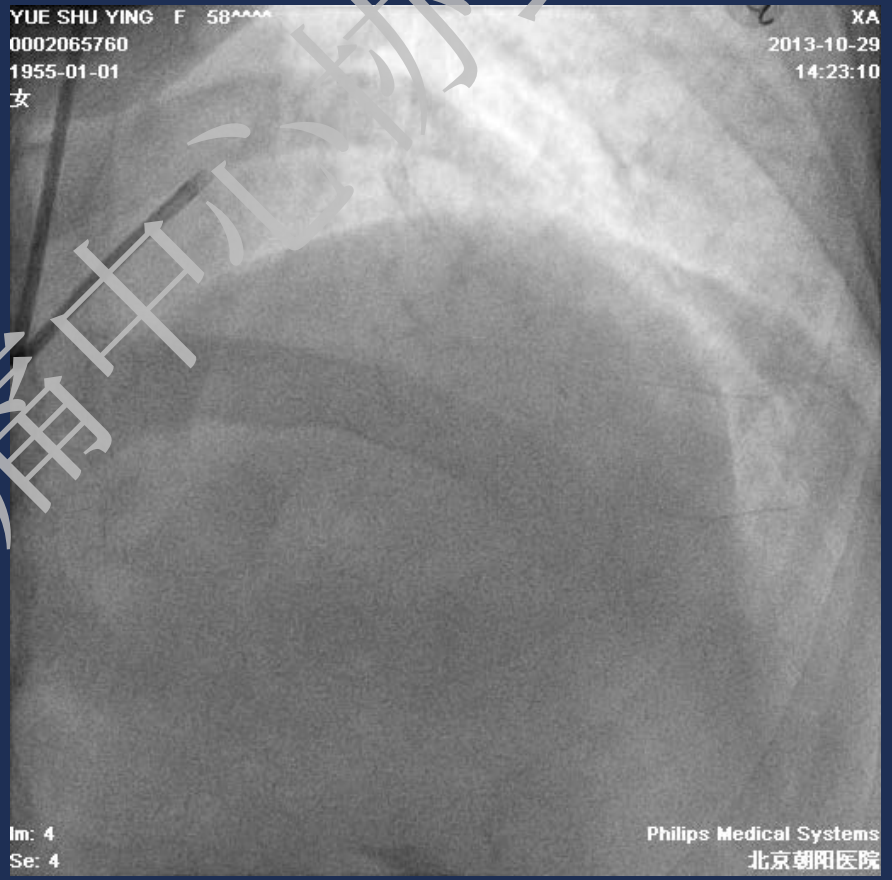
Philips Medical Systems
北京朝阳医院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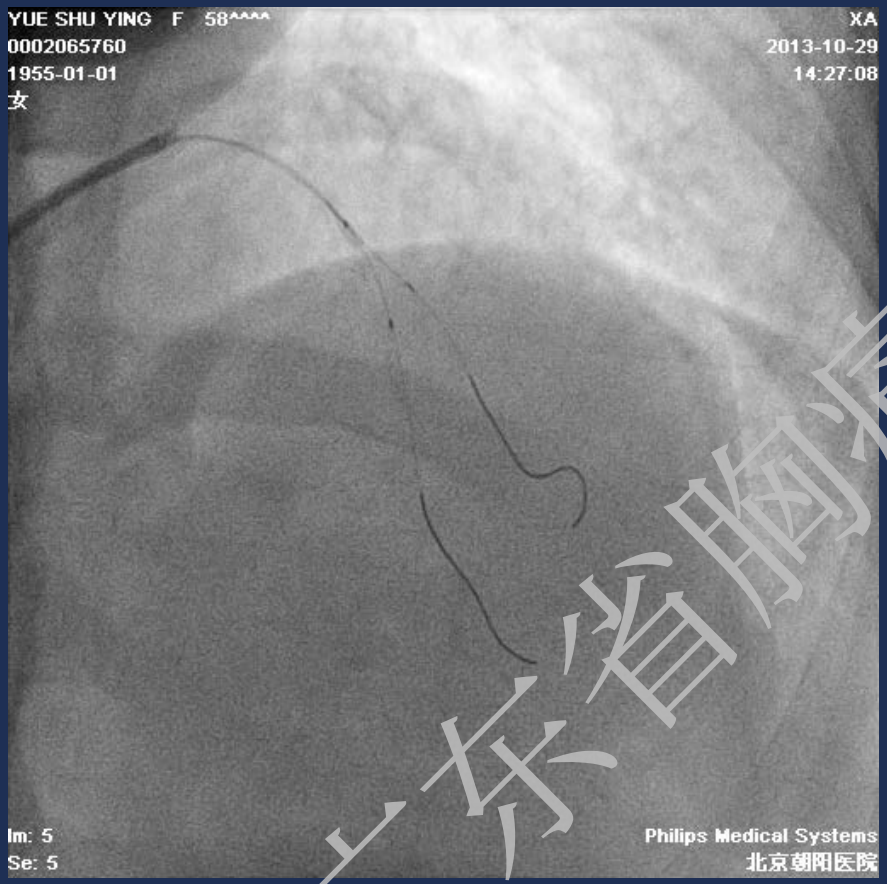
Philips Medical Systems
北京朝阳医院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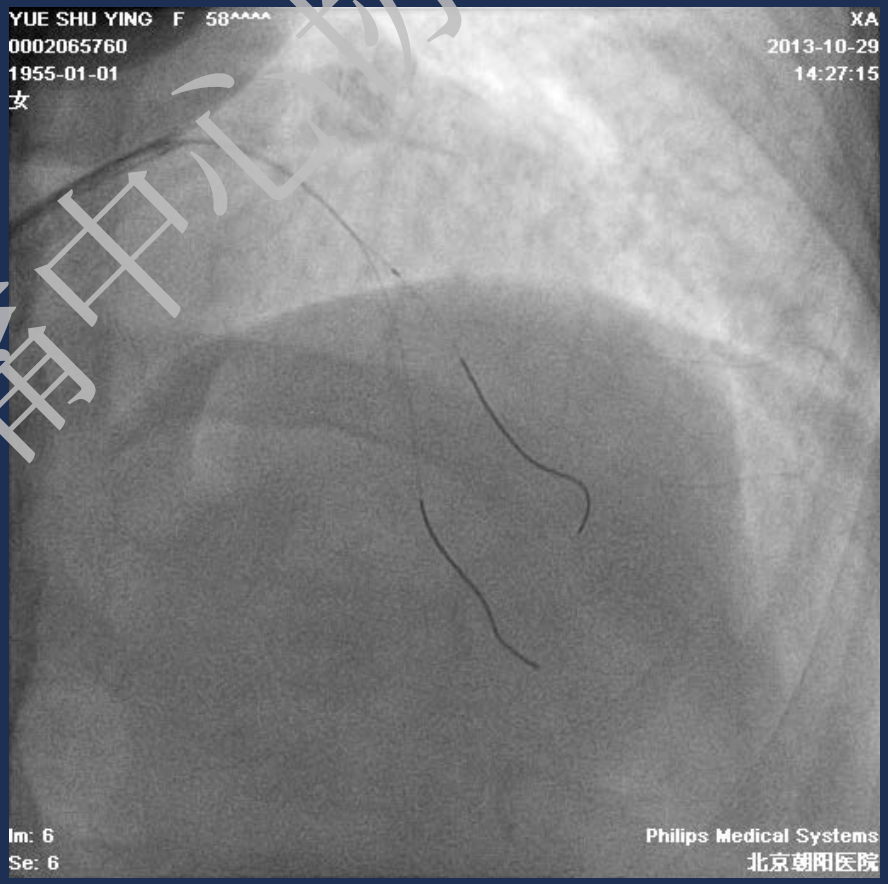
Philips Medical Systems
北京朝阳医院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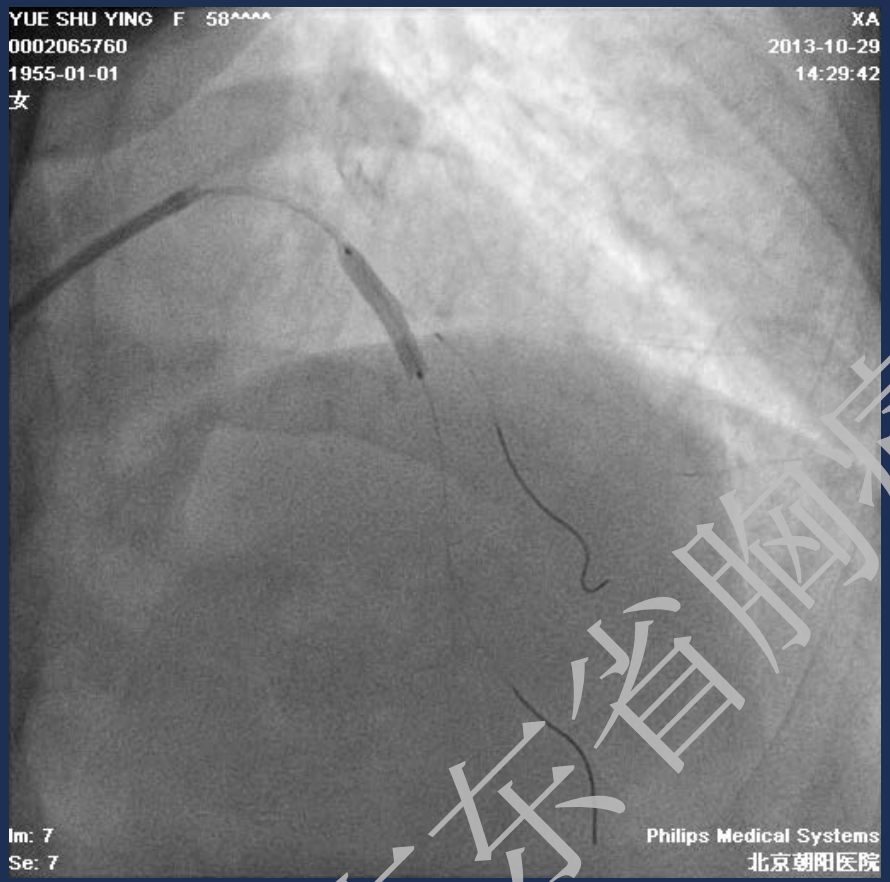
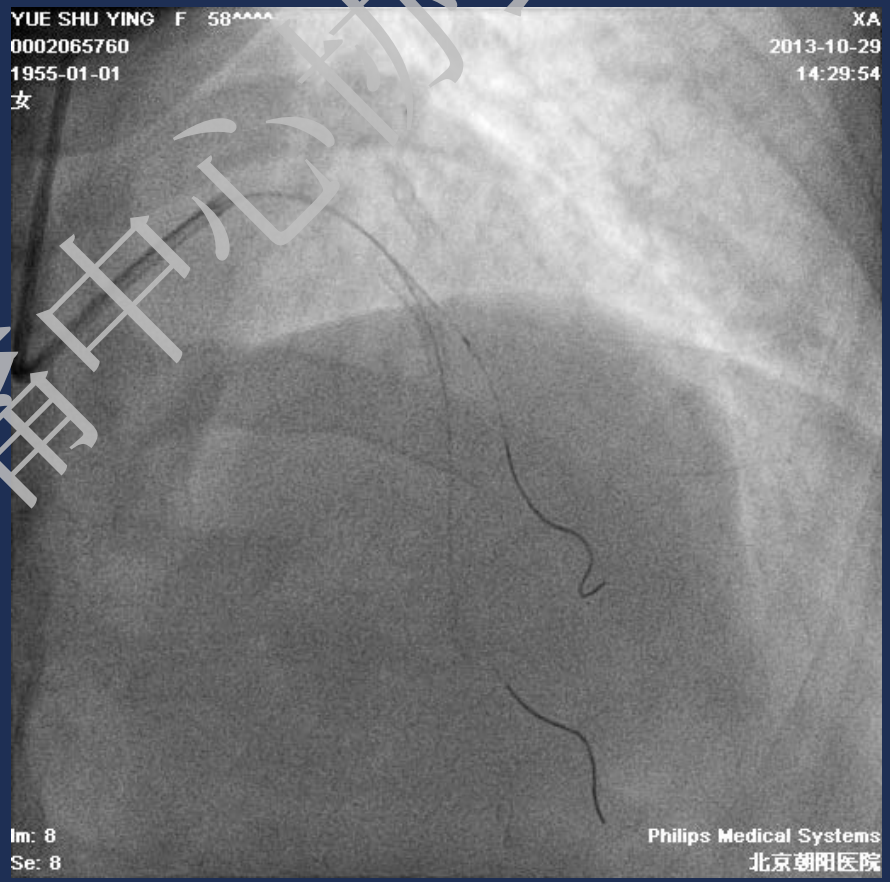
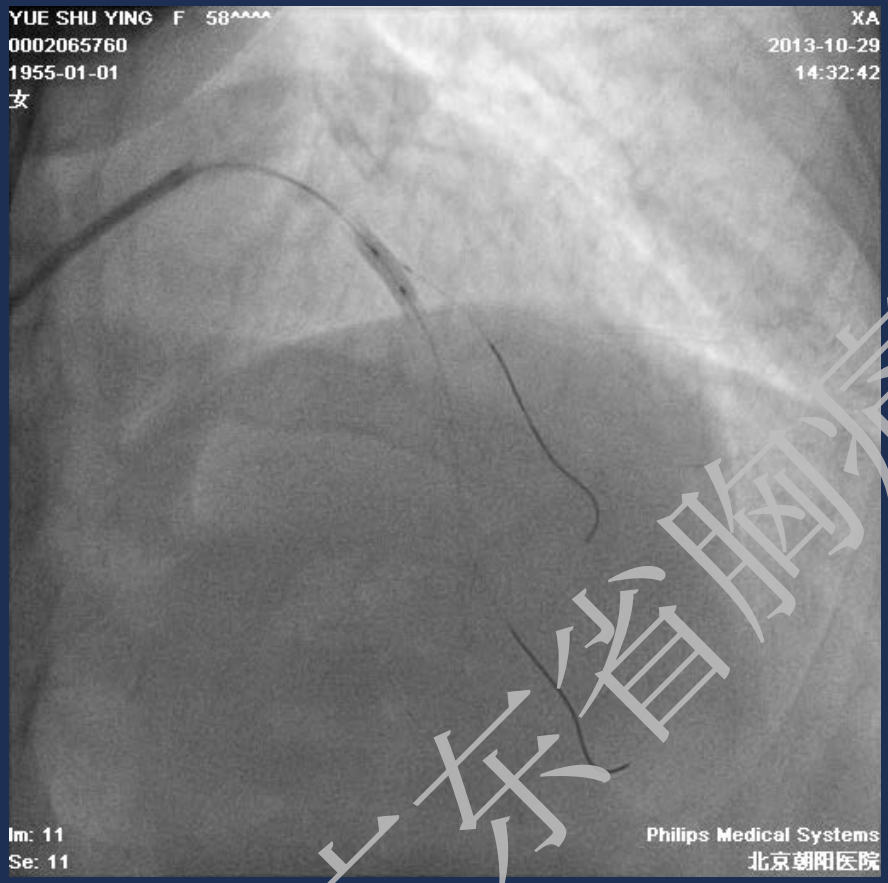
Philips Medical Systems
北京朝阳医院





Resolute 3.0 ×18mm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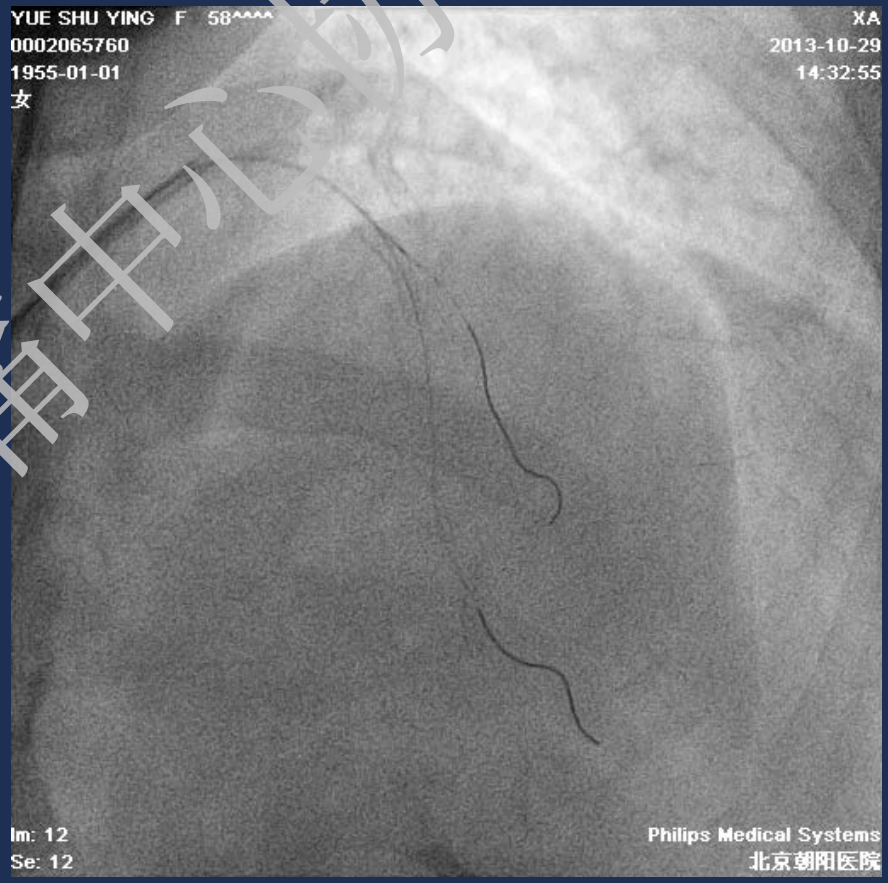
Philips Medical Systems
北京朝阳医院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XA
2013-10-29
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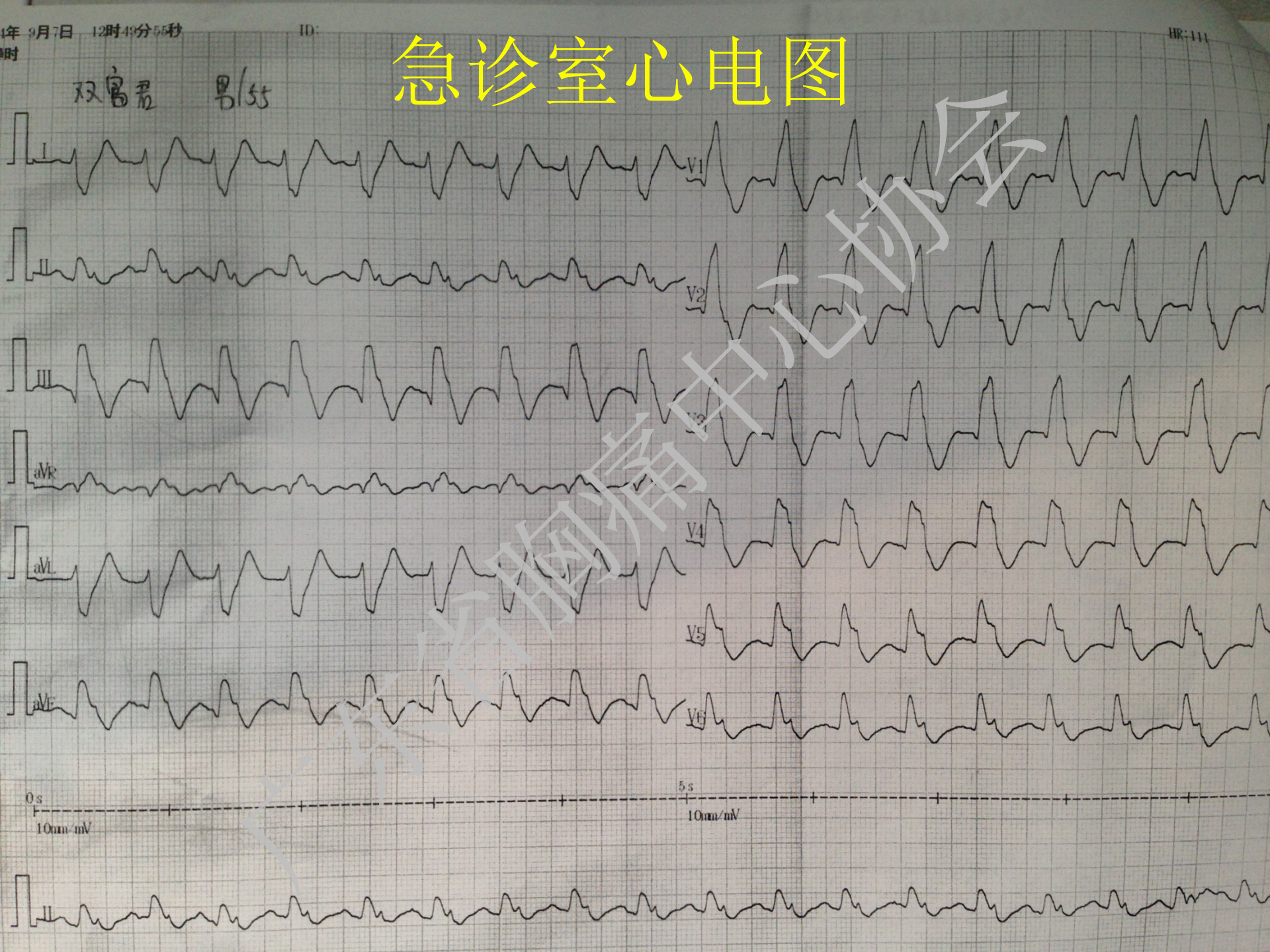
Philips Medical Systems
北京朝阳医院

病例4

- 男，55岁
- 突发胸闷、胸痛10小时
- 既往高血压、糖尿病史、吸烟
- 入院P 92次/分、BP 80/60mmHg
- cTNI 5.43ng/ml、血肌酐161.8umol/l

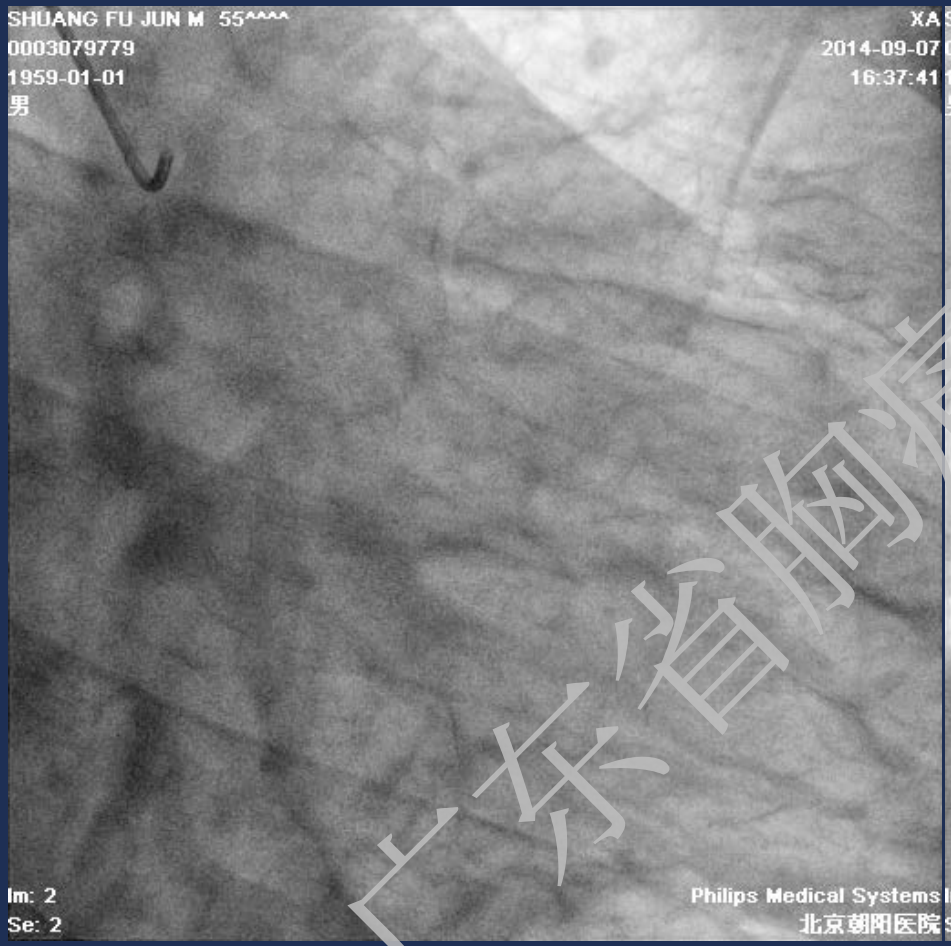
急诊室心电图

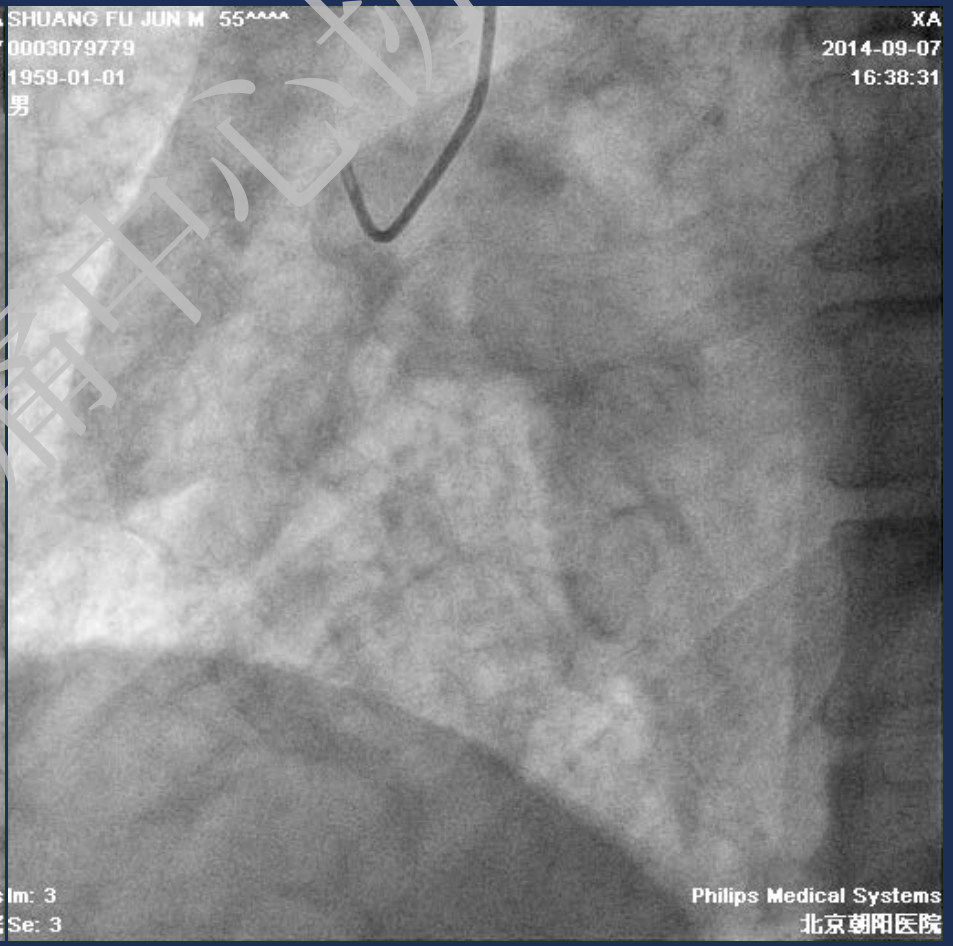

年 9月7日 12时43分55秒
ID:
HR:111
双富君 男/55
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
0 s
10mm/mV
5 s
10mm/mV
II

入院诊断

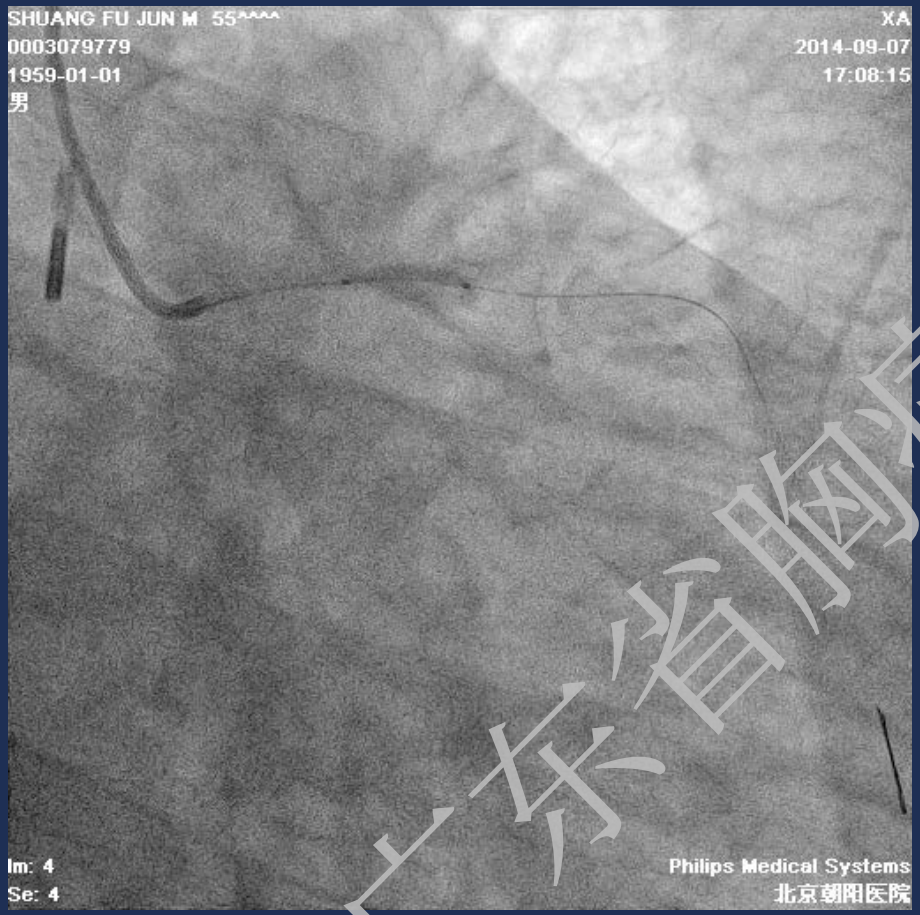
- 非ST段抬高型心肌梗死
  心功能KillipⅣ级
- 心律失常
  完全性右束支传导阻滞
- 高血压2级极高危组
- 2型糖尿病
- 肾功能不全

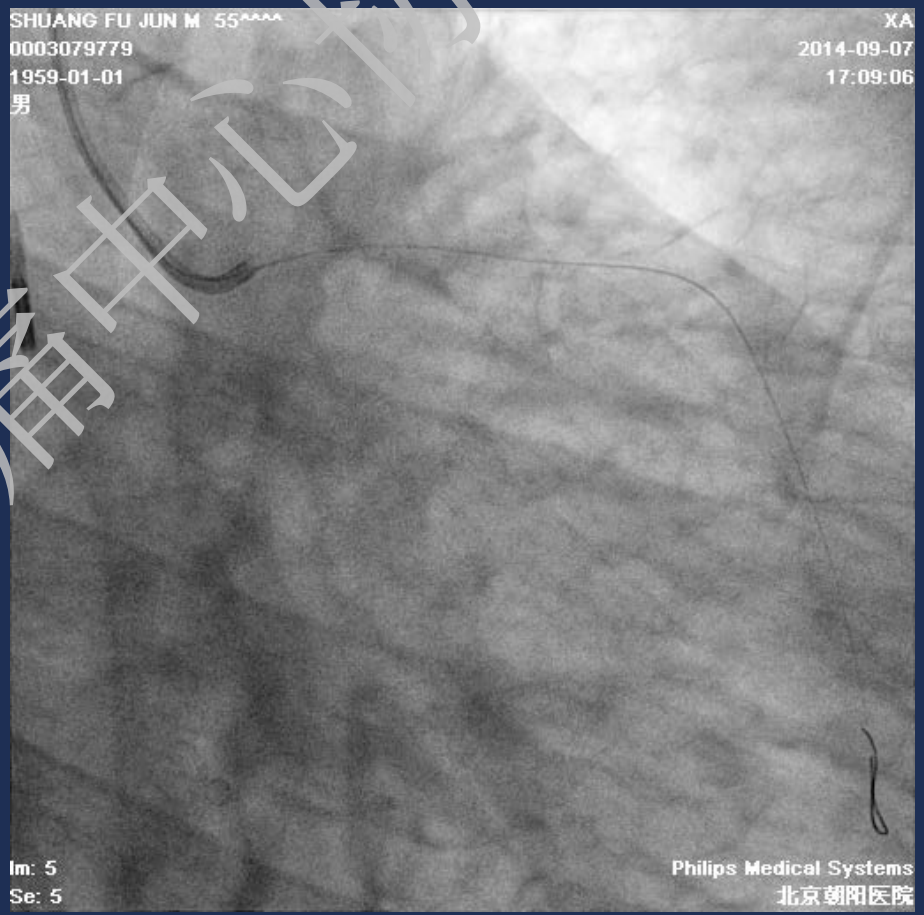
急诊CAG



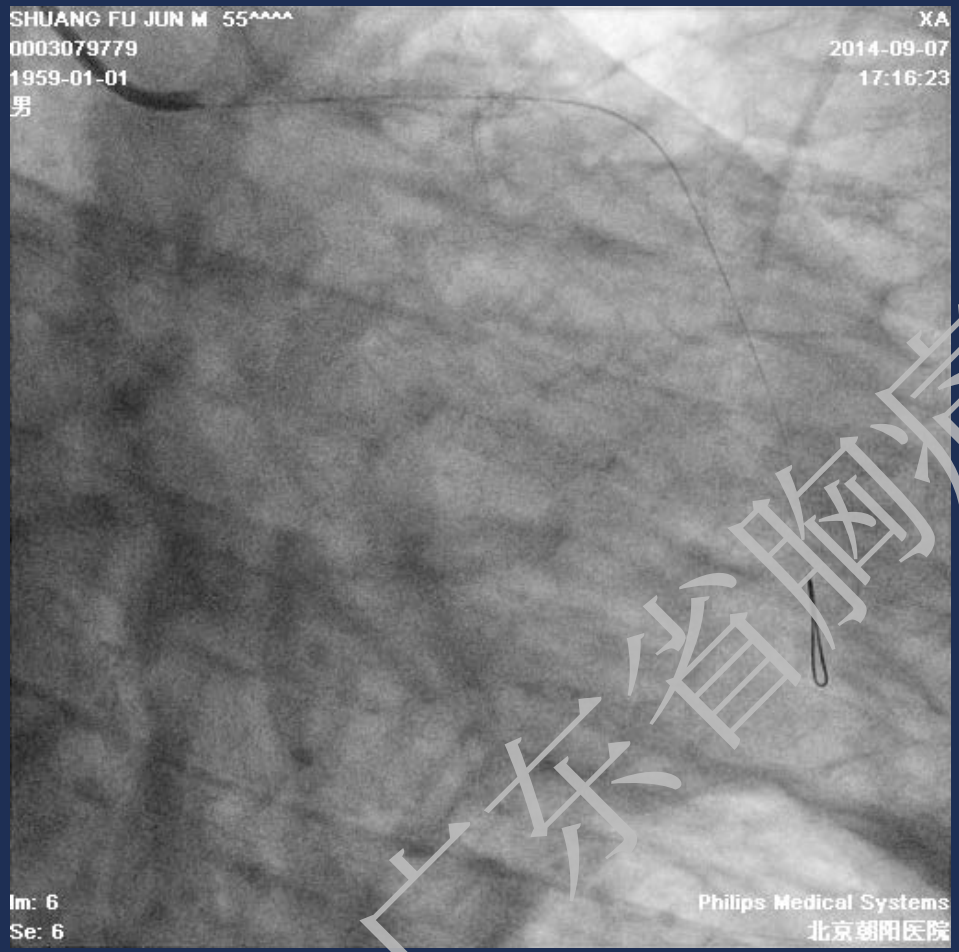


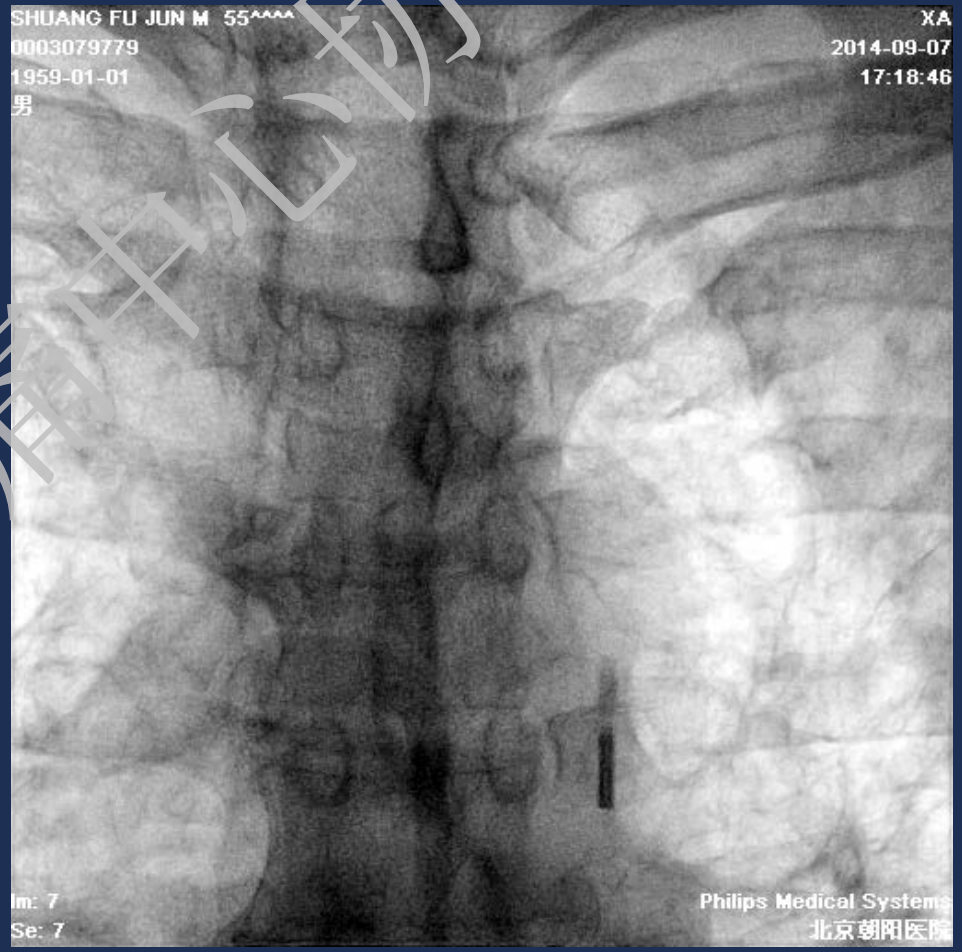
急诊PCI





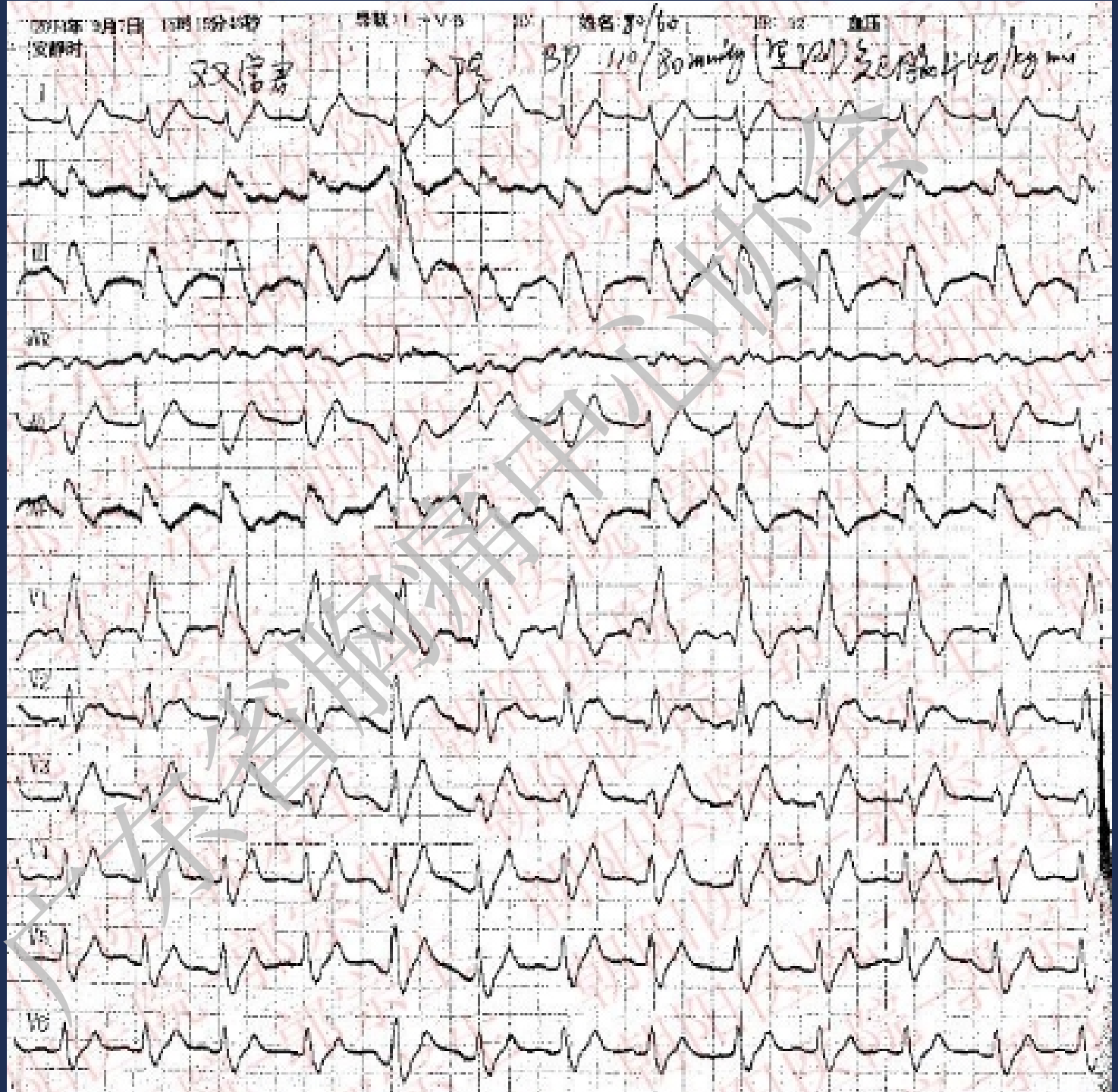
急诊PCI

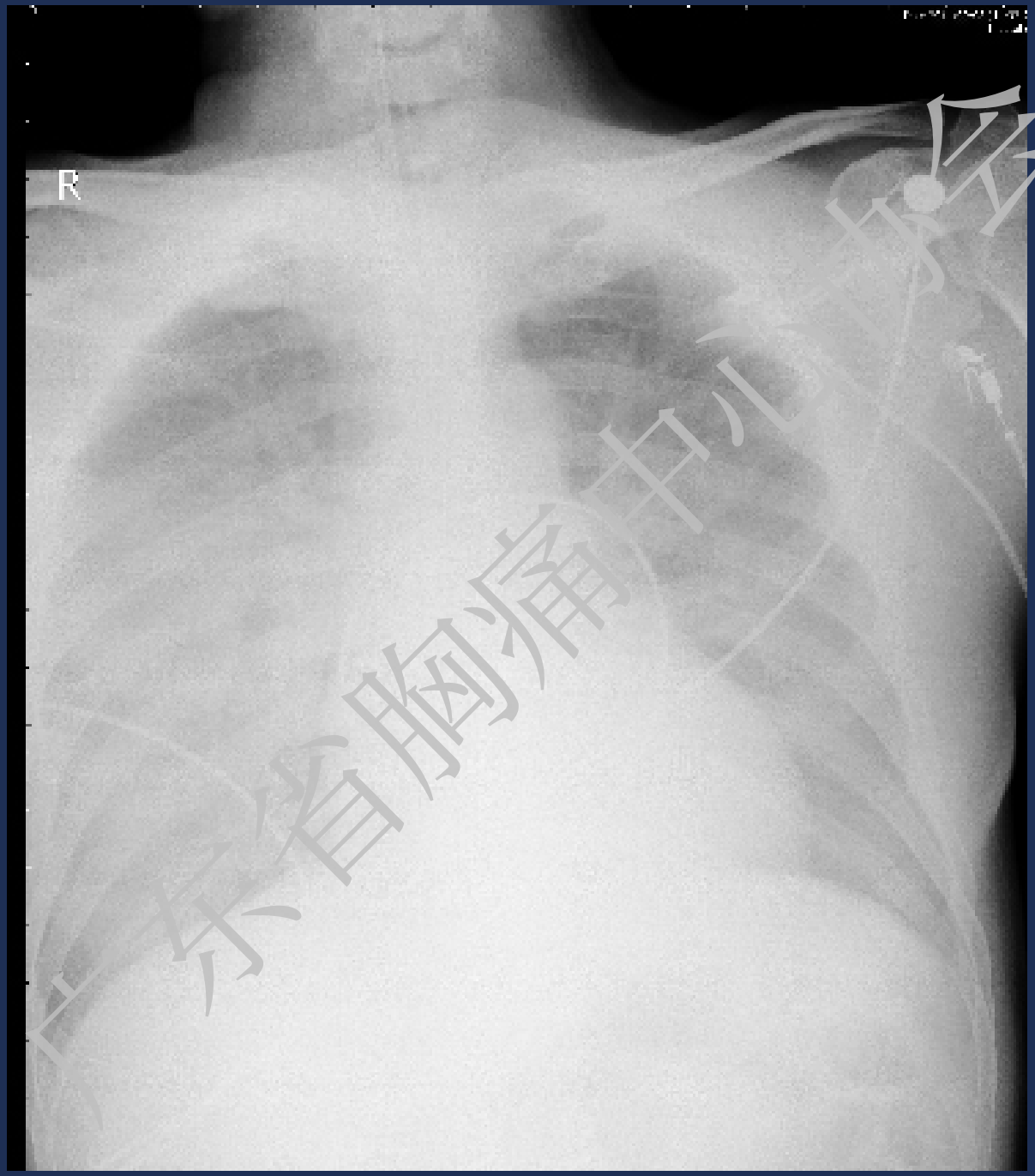




EXCEL 3.0 ×36mm（16atm）

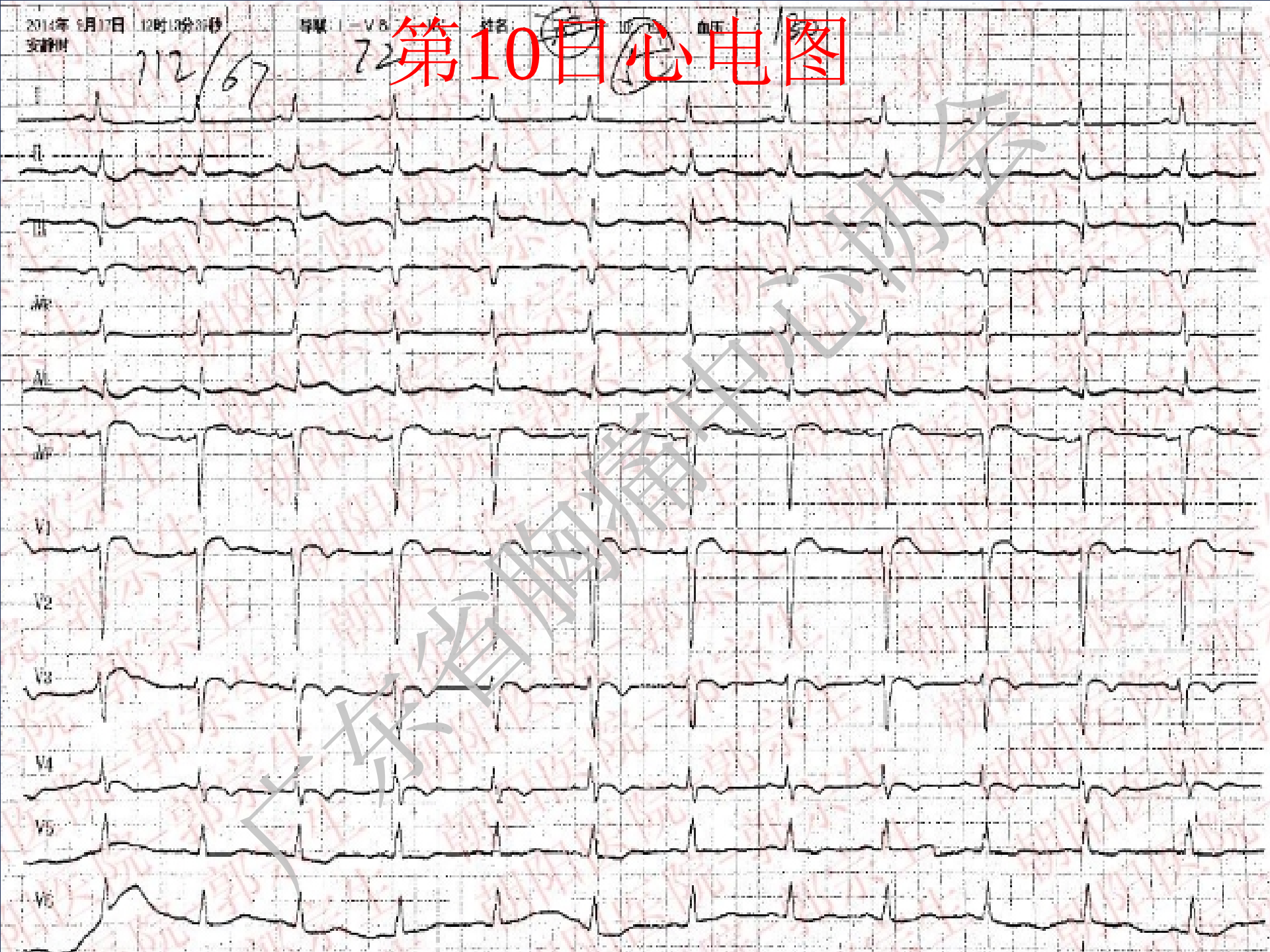
术后心电图



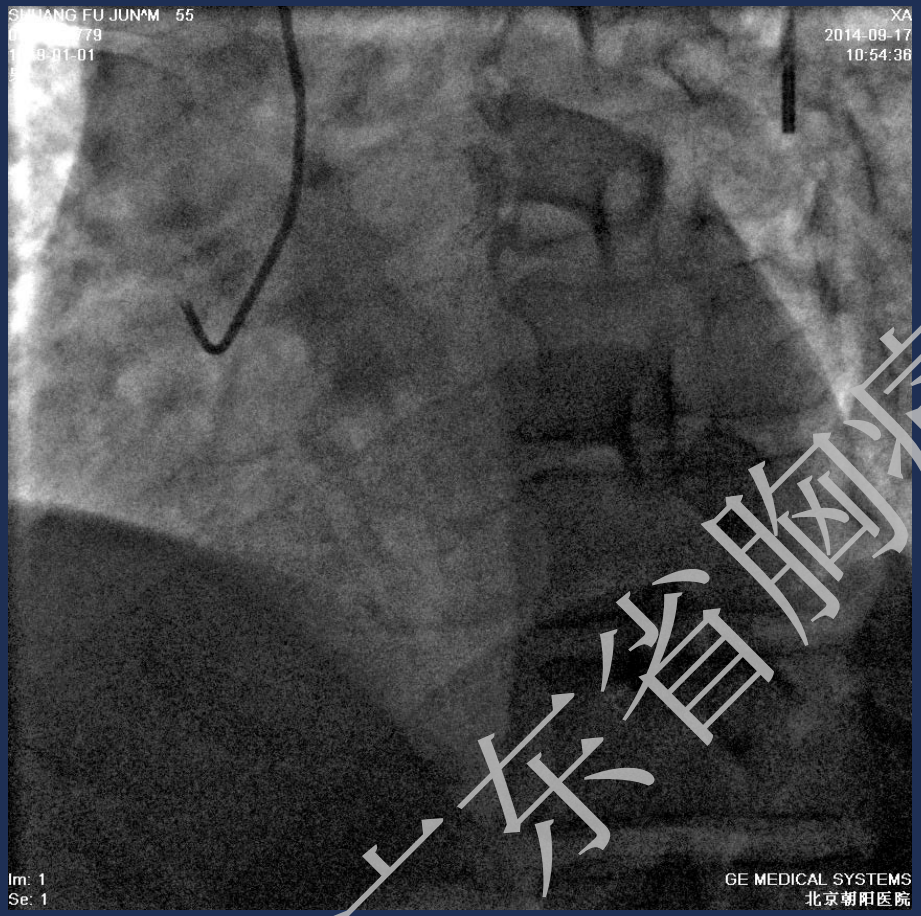


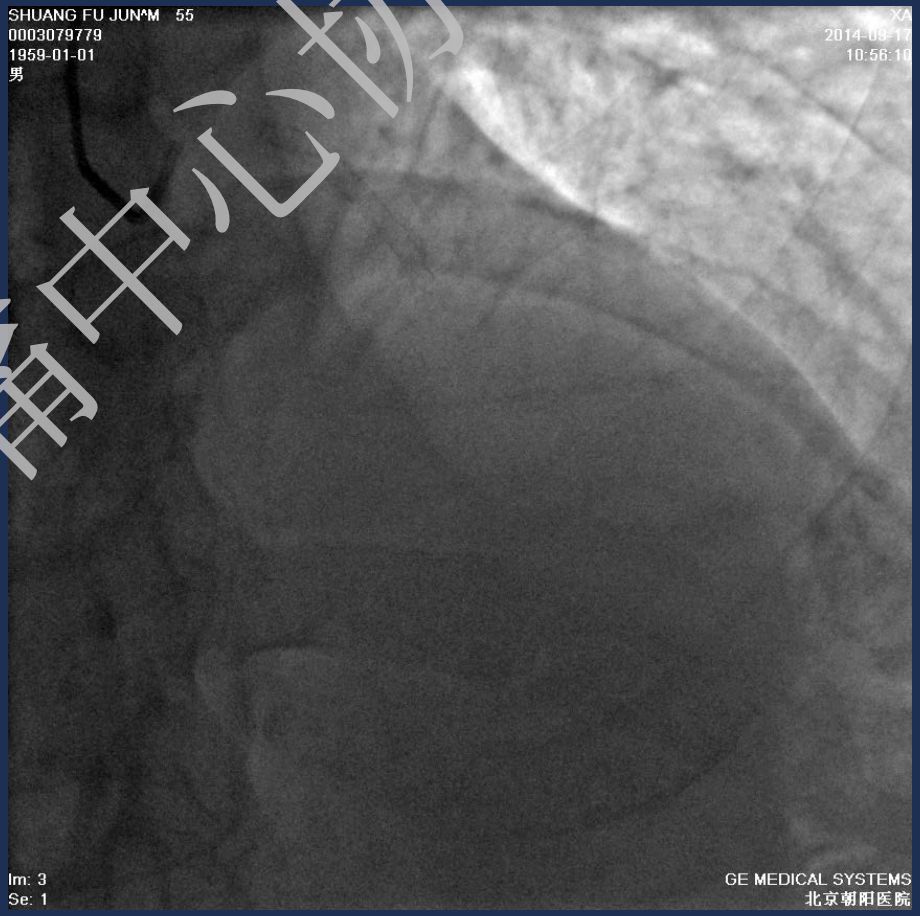
病情转归

- 术后当晚出现急性左心衰发作，出现意识模糊、呼吸浅慢，无创呼吸机无法改善血氧，给予气管插管、碳酸氢钠、多巴胺等应用，病情逐渐缓解
- 第二日拔出气管插管，无创呼吸机应用，IABP继续辅助，病情继续好转，血压逐渐稳定、血肌酐逐渐下降
- UCG：室间隔及左室前壁、下壁、后壁心肌运动幅度及收缩期增厚率明显减低，左室侧壁运动减低，EF34%，左室舒张末内径59mm。
- 第10日在IABP辅助下干预LCX病变


第10日心电图
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
广东省胸痛中心协会

择期PCI





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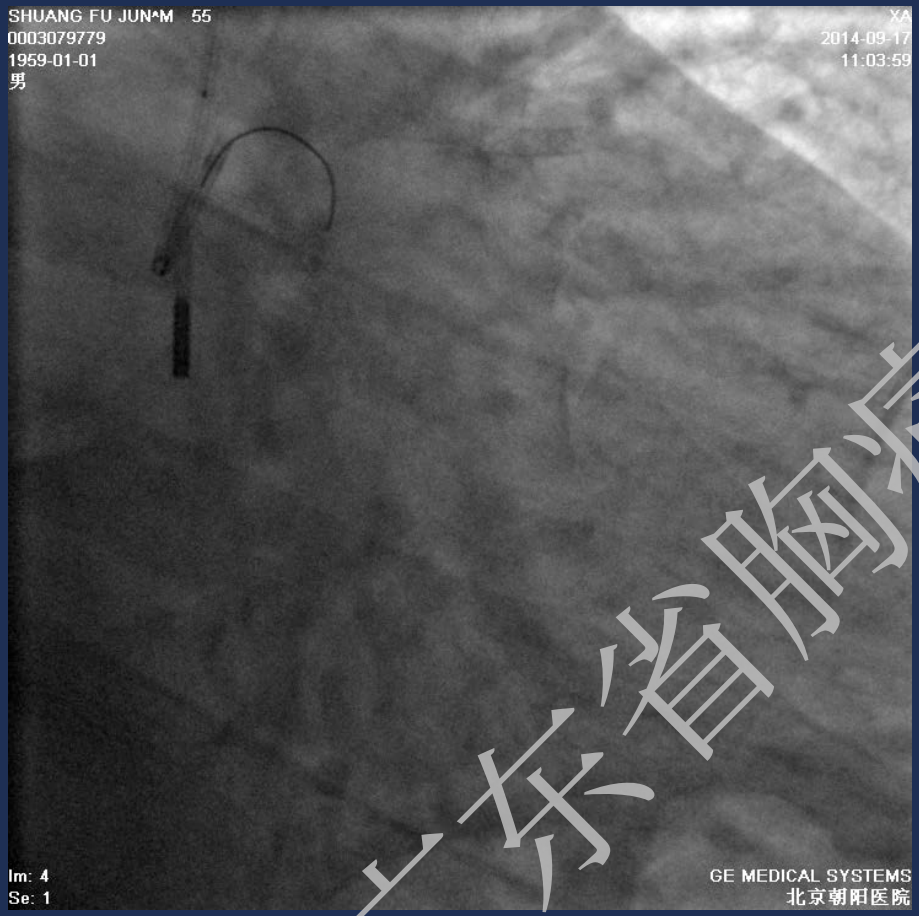
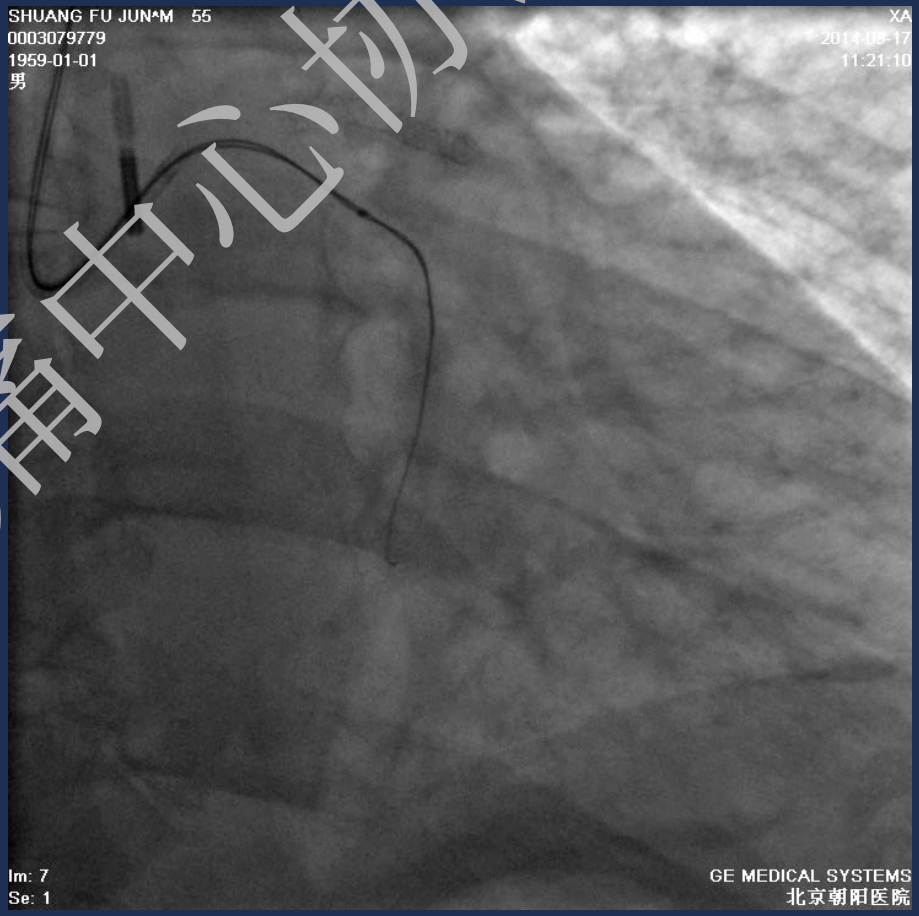
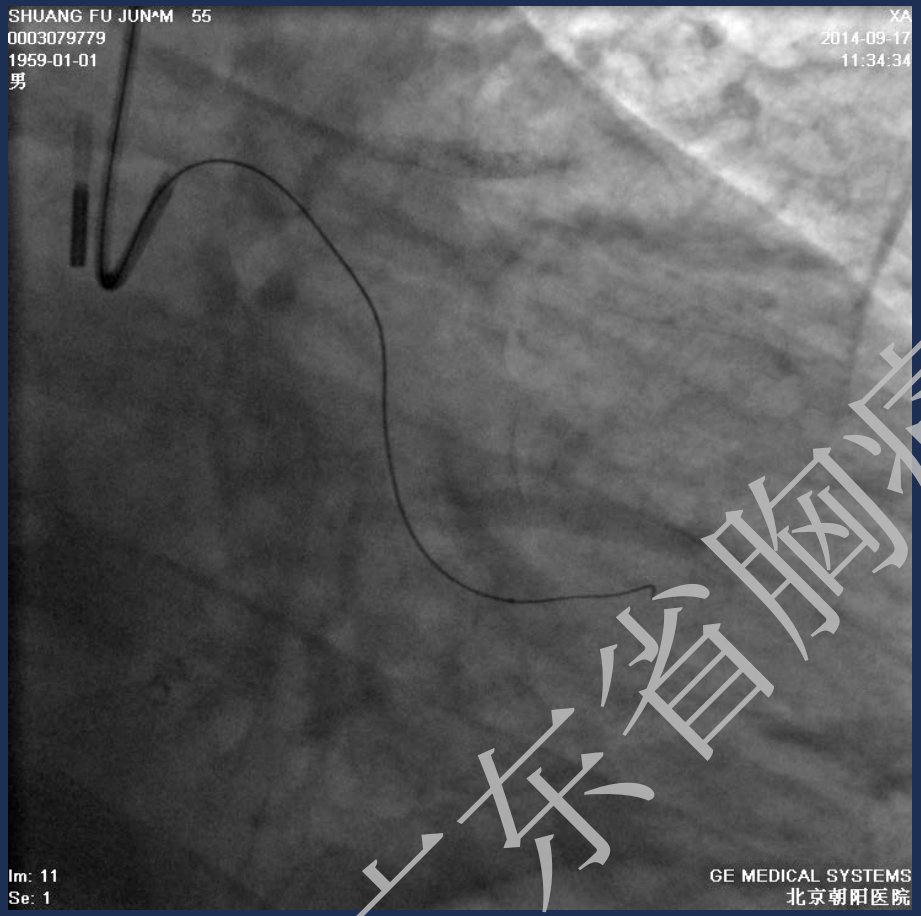
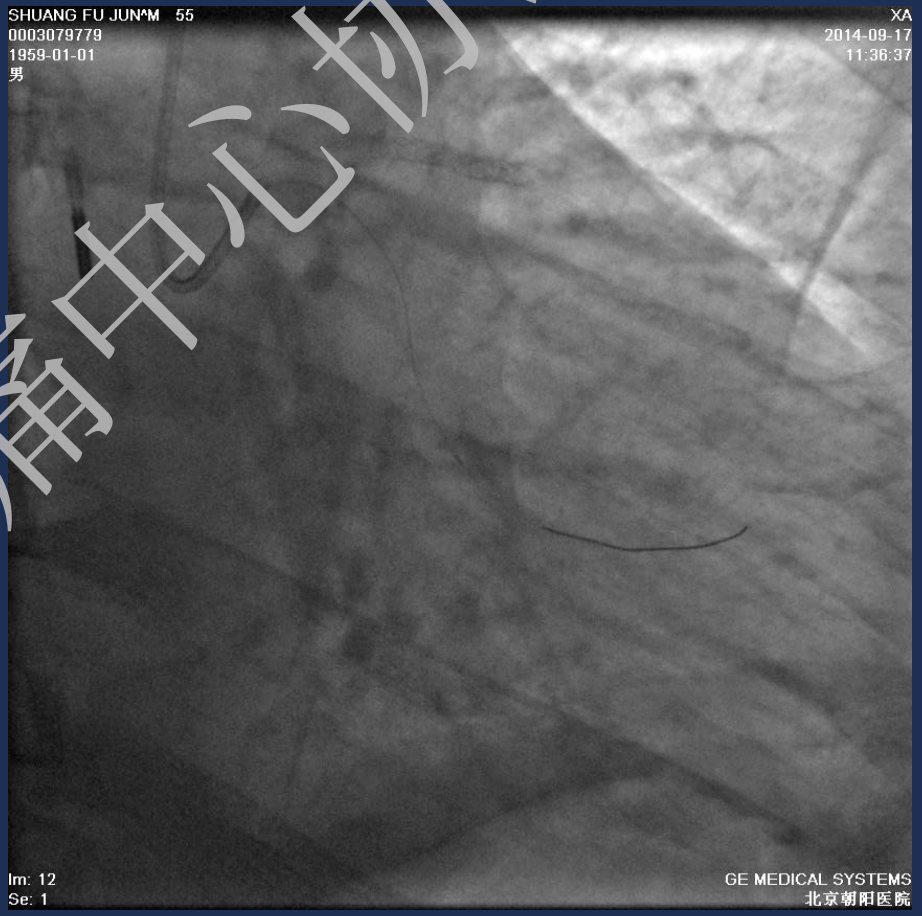




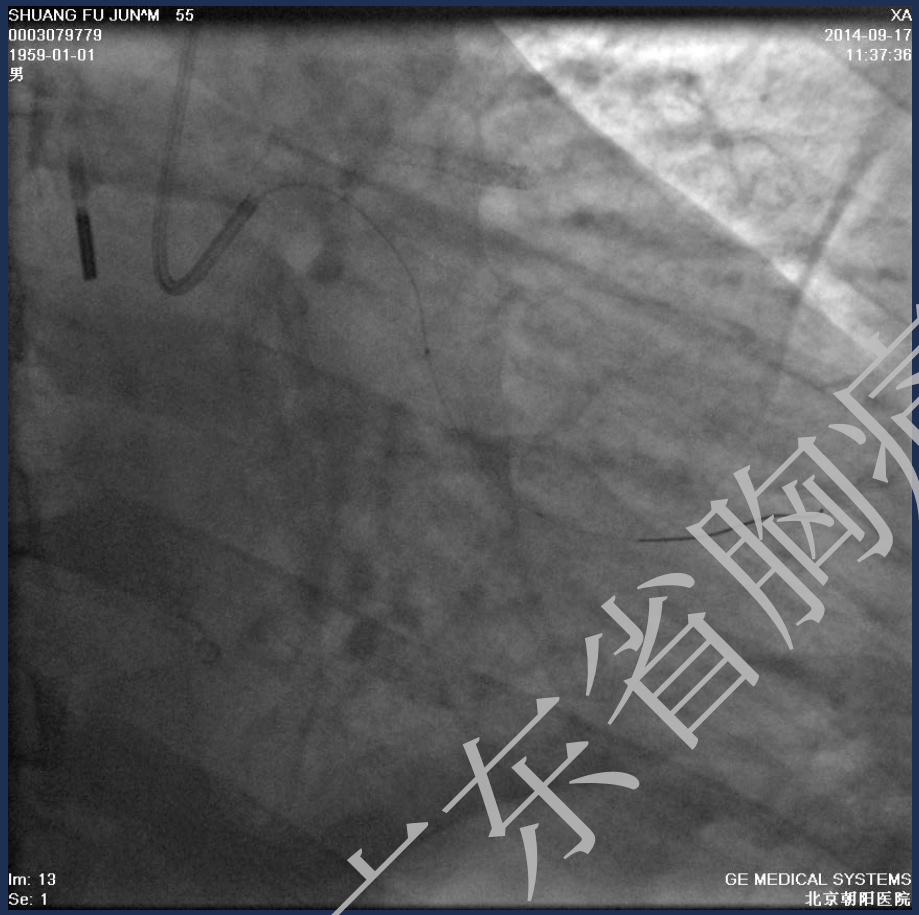
EBU 3.5
FINCROSS
BMW、Rinato、Conquest pro

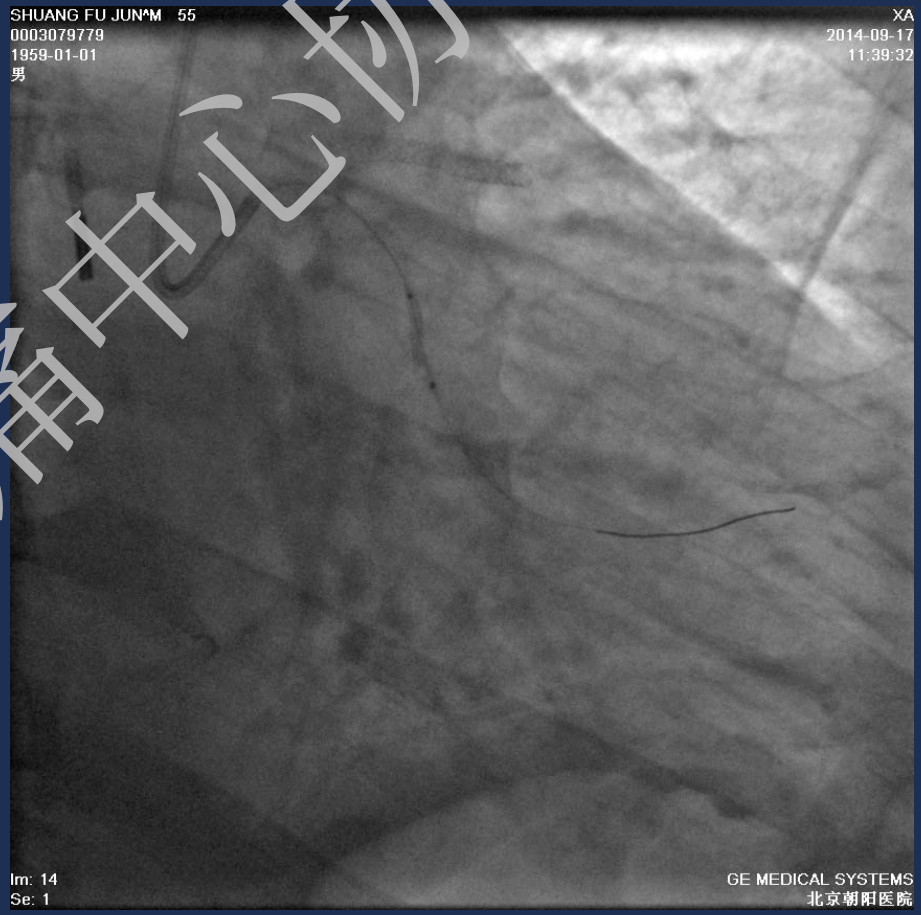
择期PCI





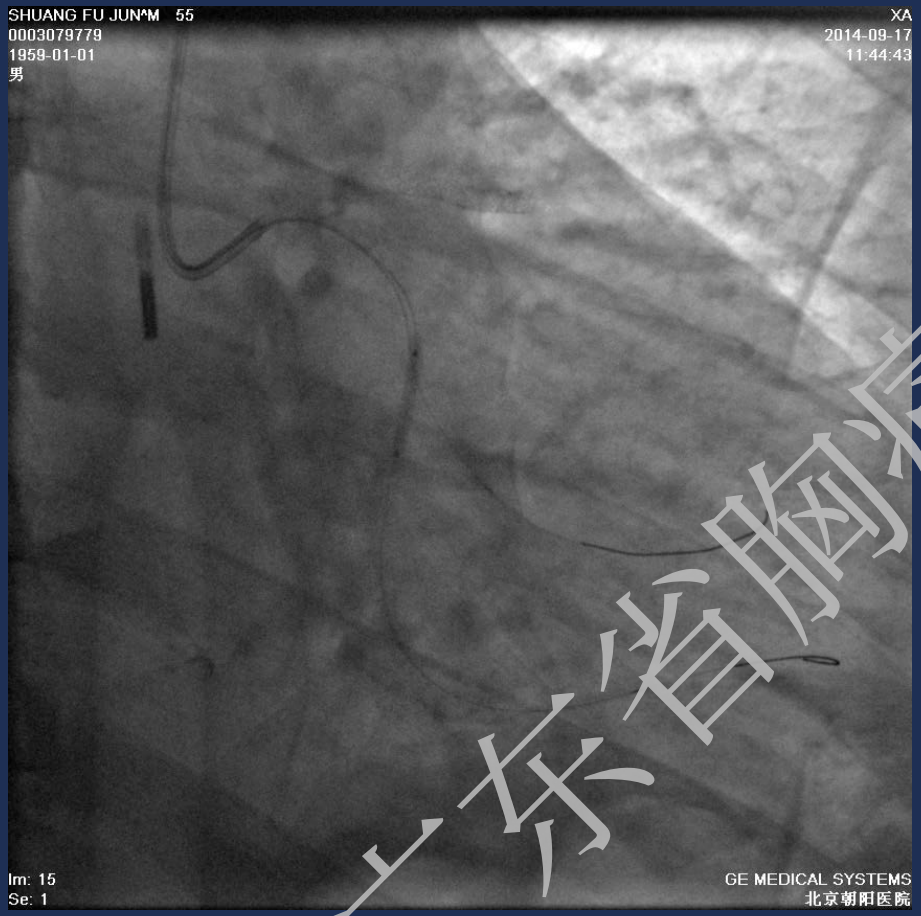
择期PCI

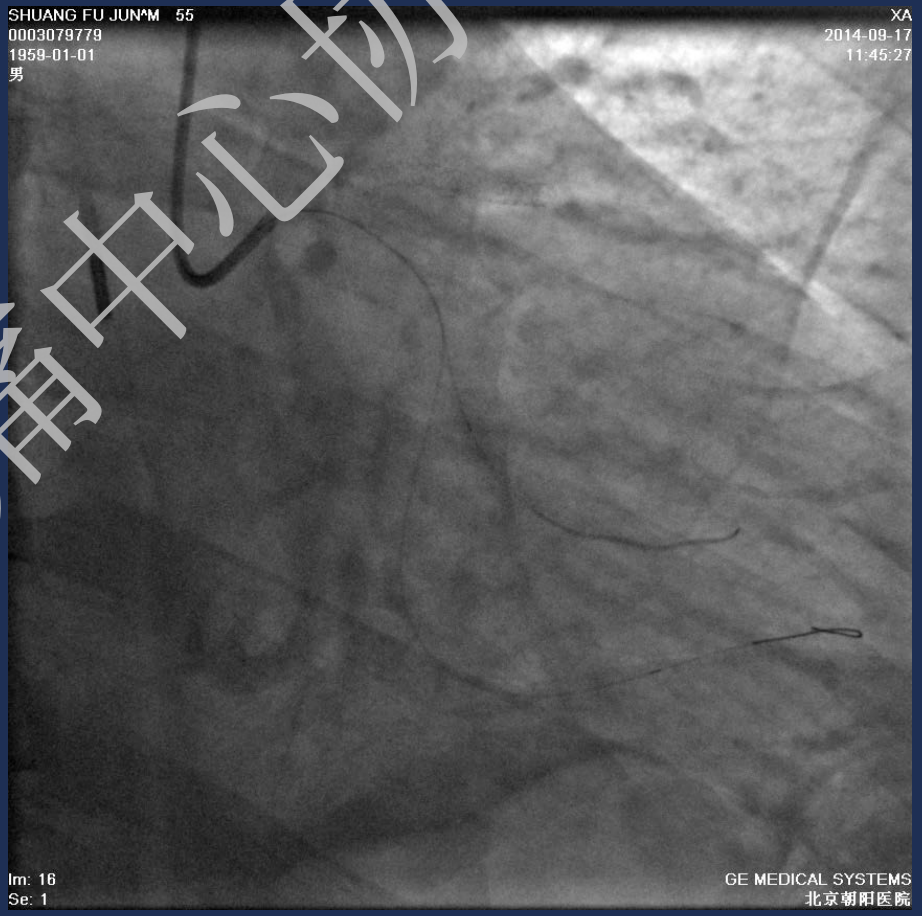




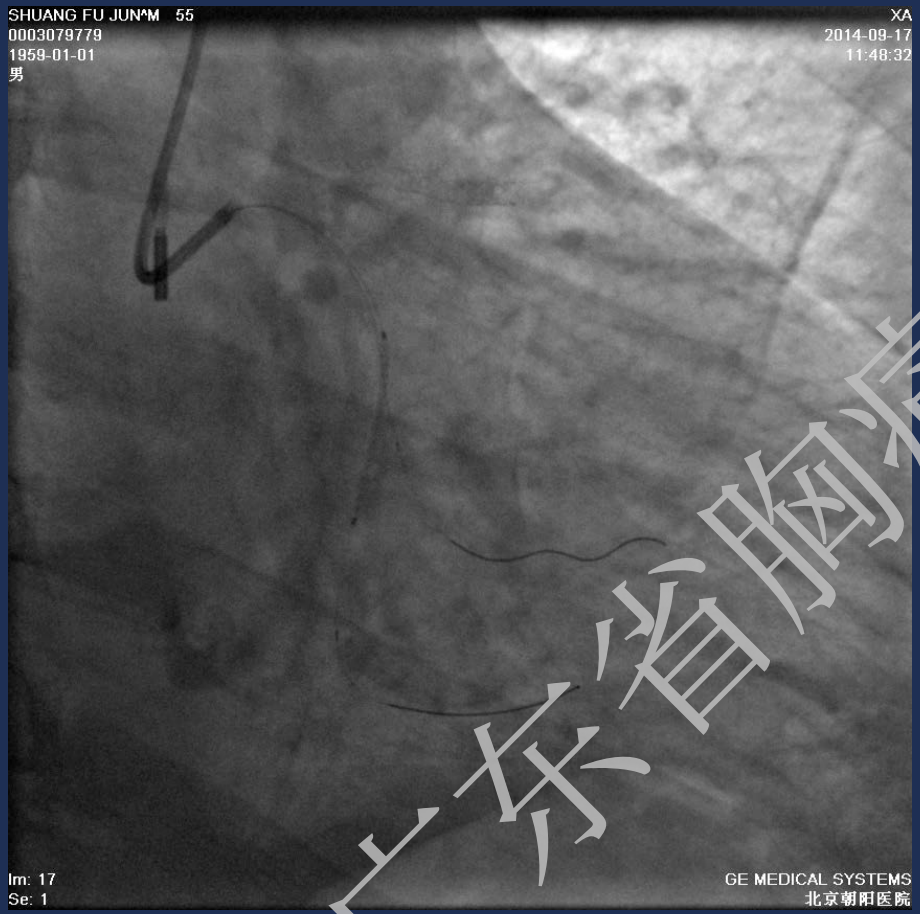
Sprinter 1.5 ×15mm（16atm）
Sprinter 2.0 ×15mm（16~18atm）

择期PCI



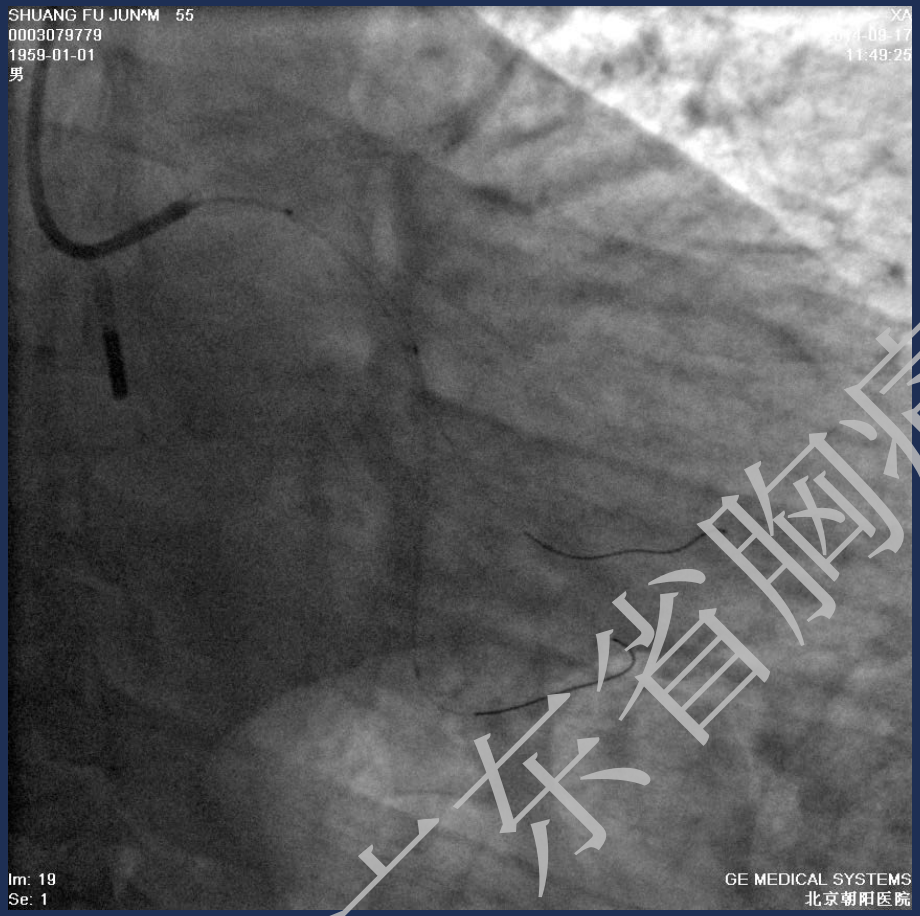


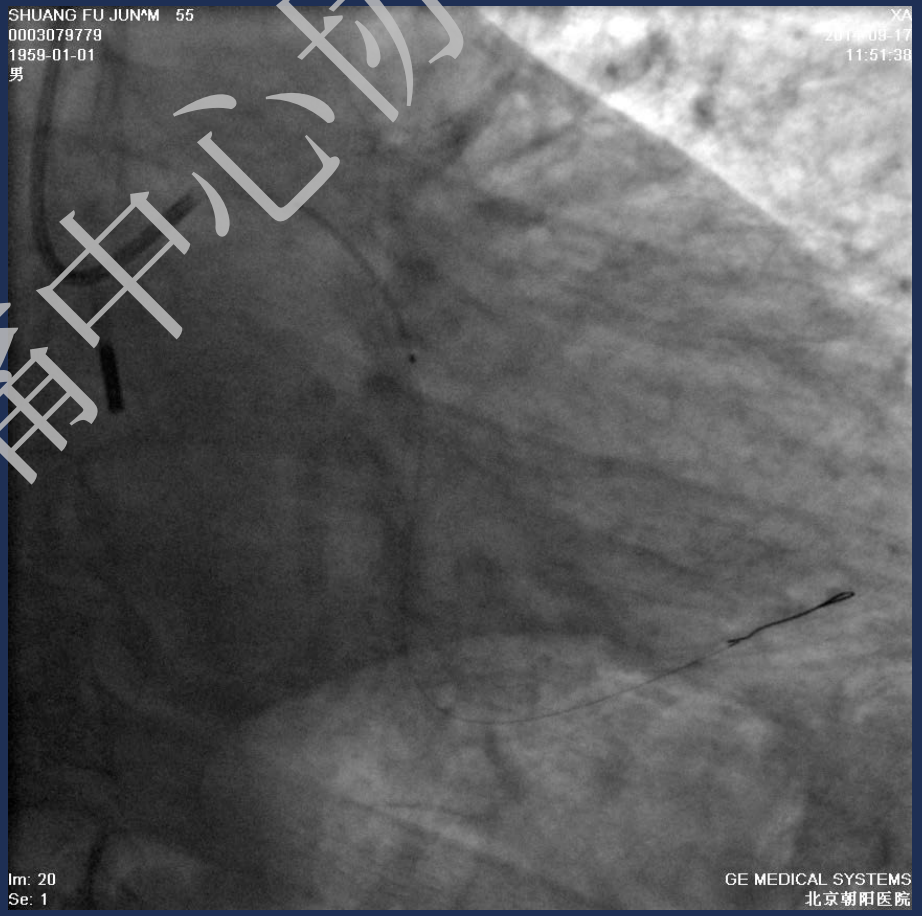
择期PCI



EXCEL 2.75 ×24mm

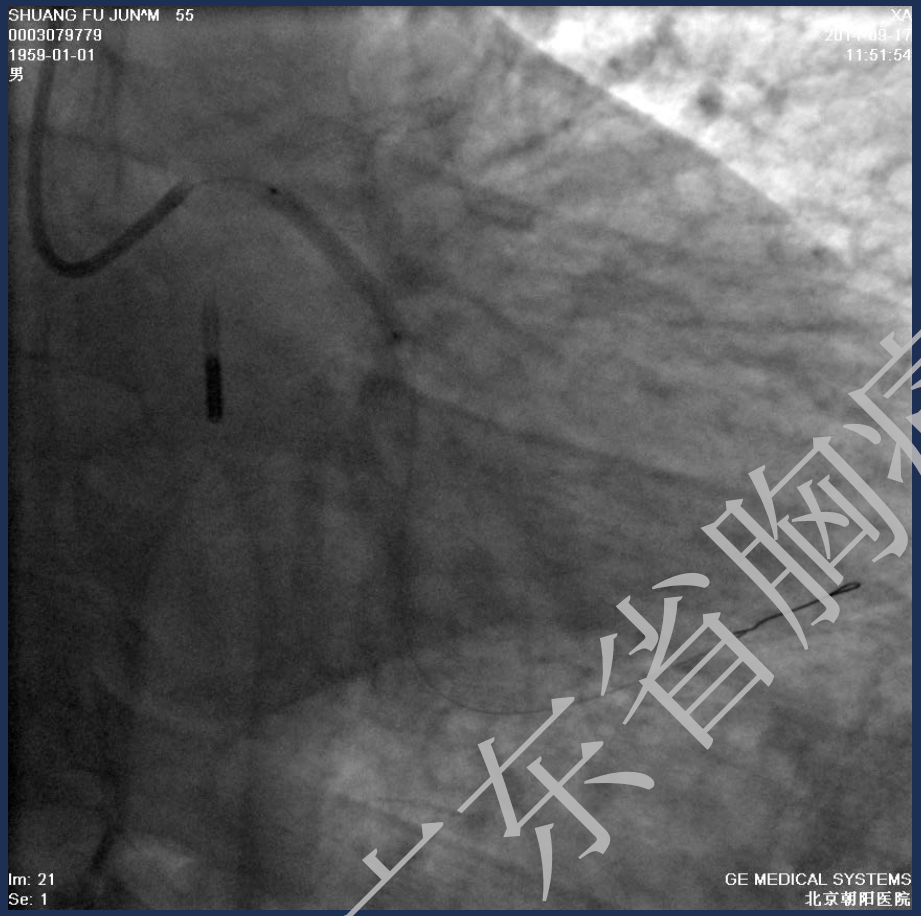
择期PCI

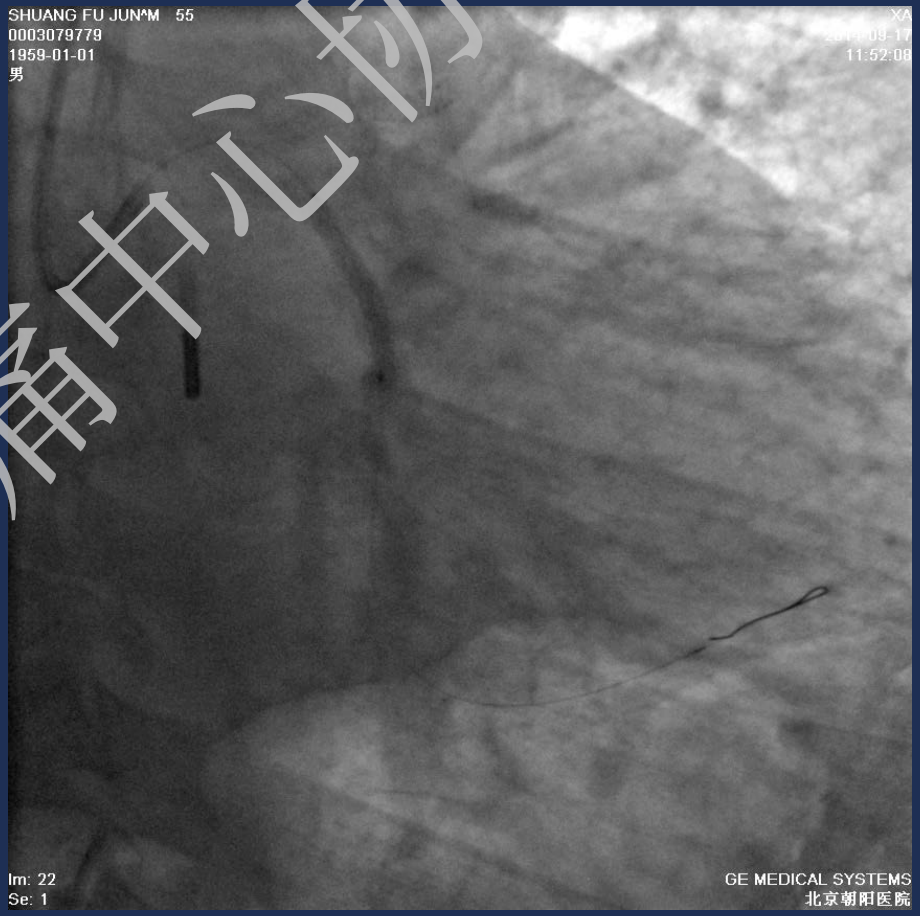




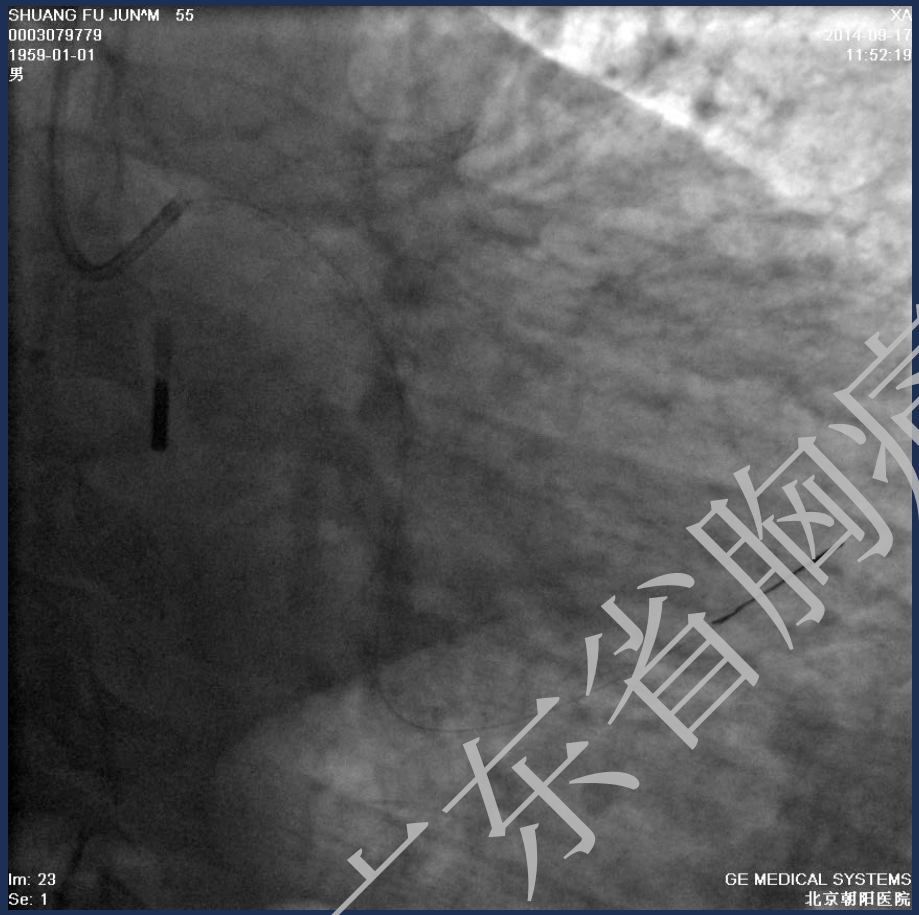
EXCEL 3.0 ×24mm

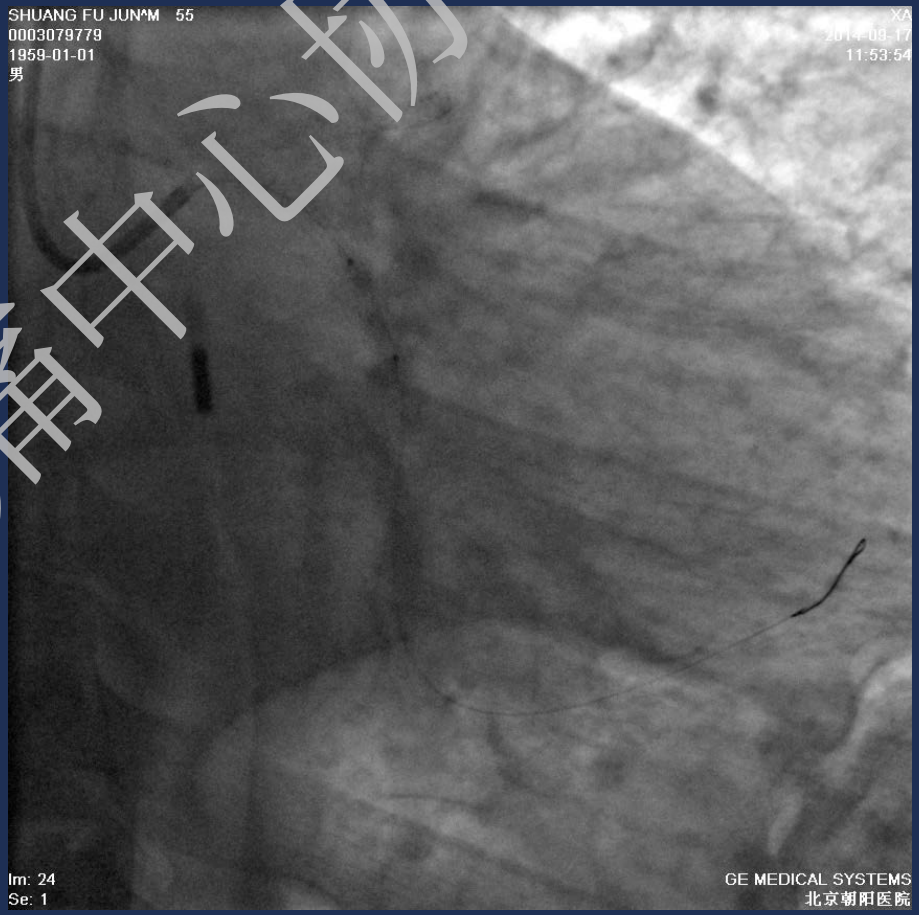
择期PCI



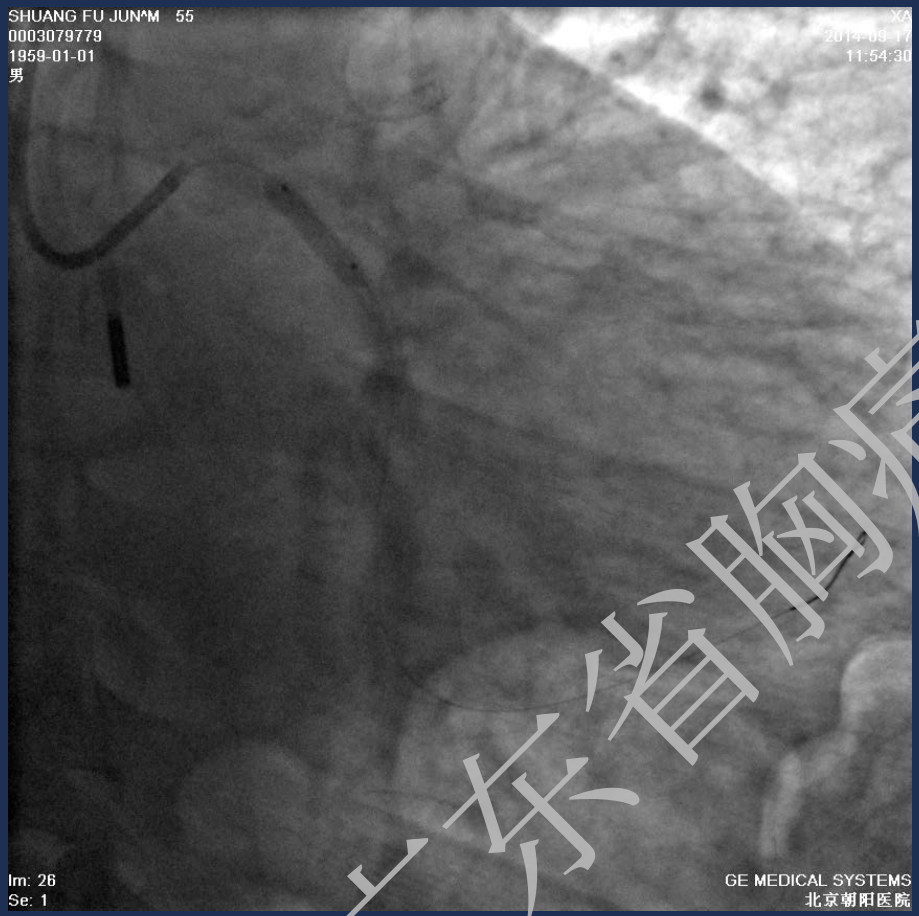


择期PCI



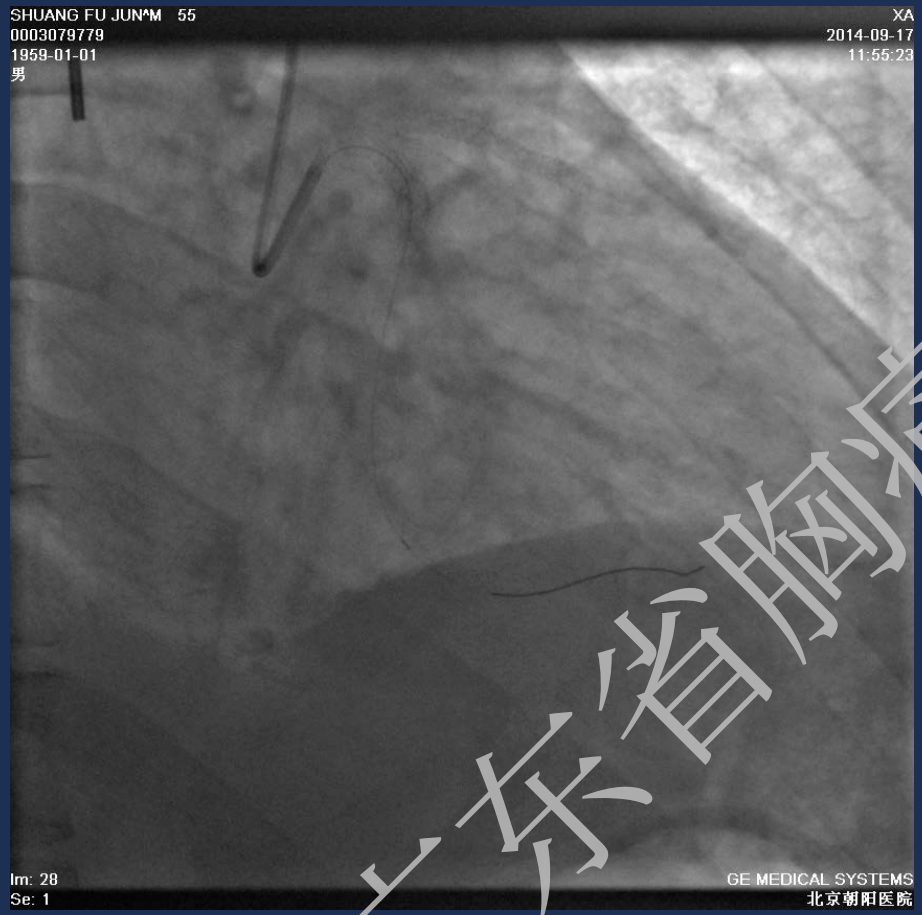


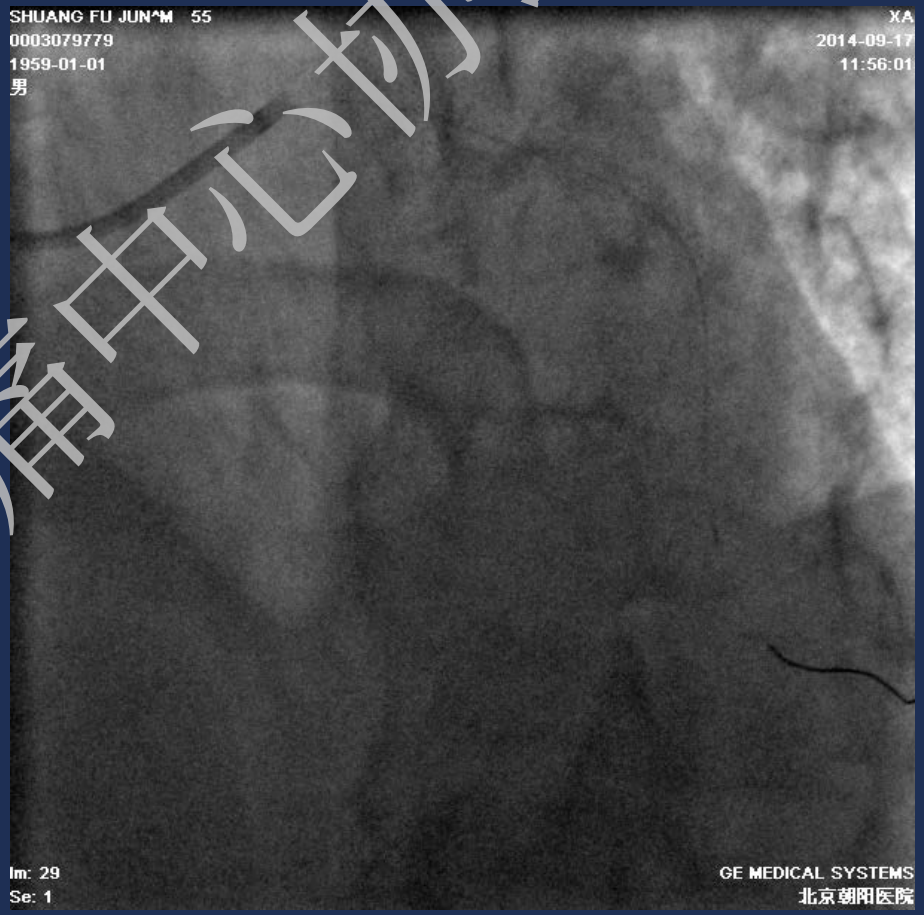
择期PCI



NC Sprinter 3.5 ×15mm（12~18atm）

择期PCI

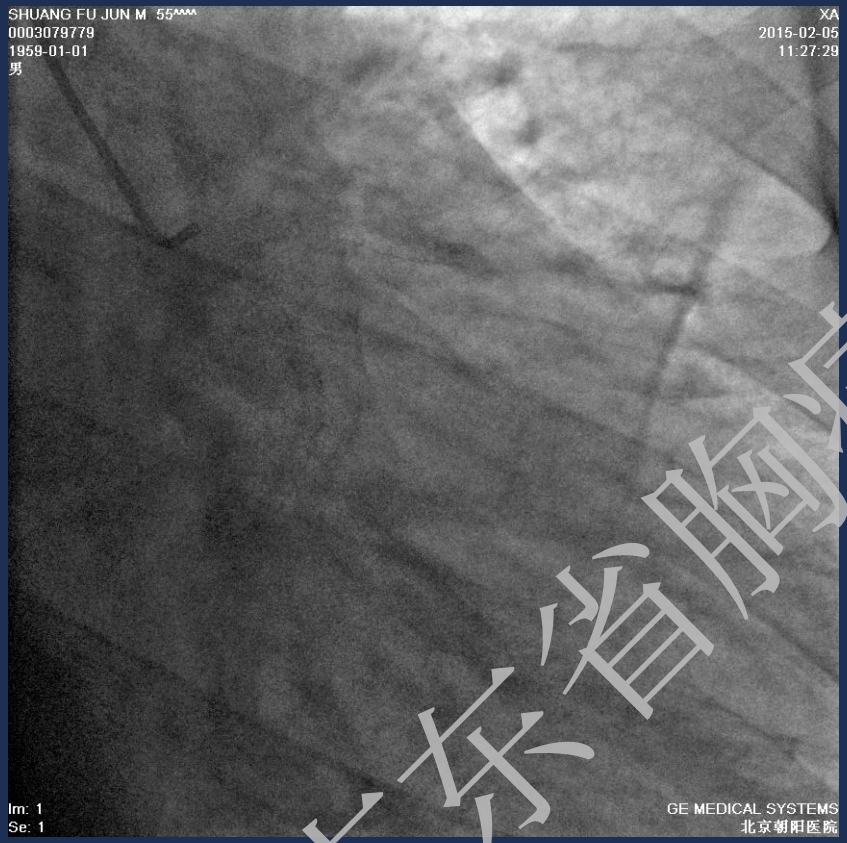


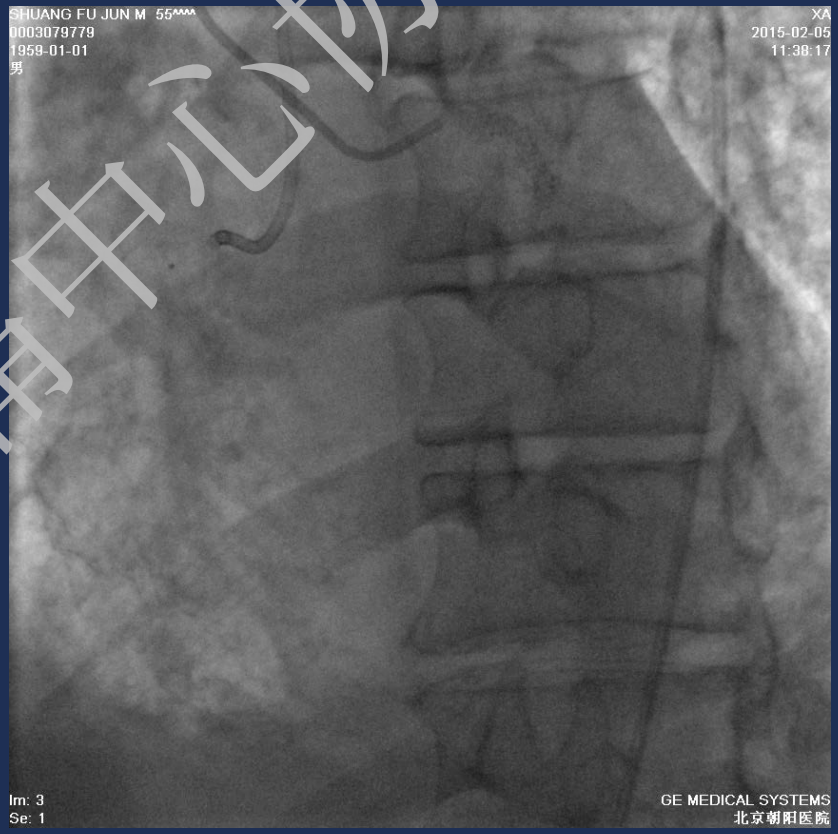


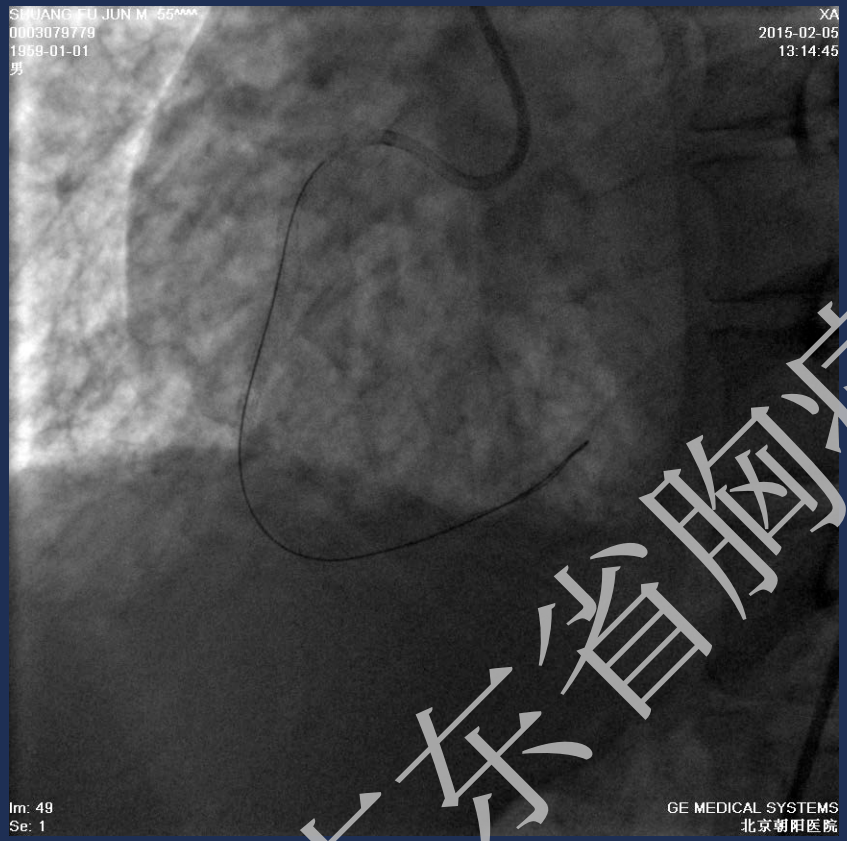
病情转归

- 术后病情稳定
- 2日后拔出IABP，转入普通病房
- 5日后出院
- 随访2月，活动耐量良好
- 半年后干预RCA病变

择期PCI



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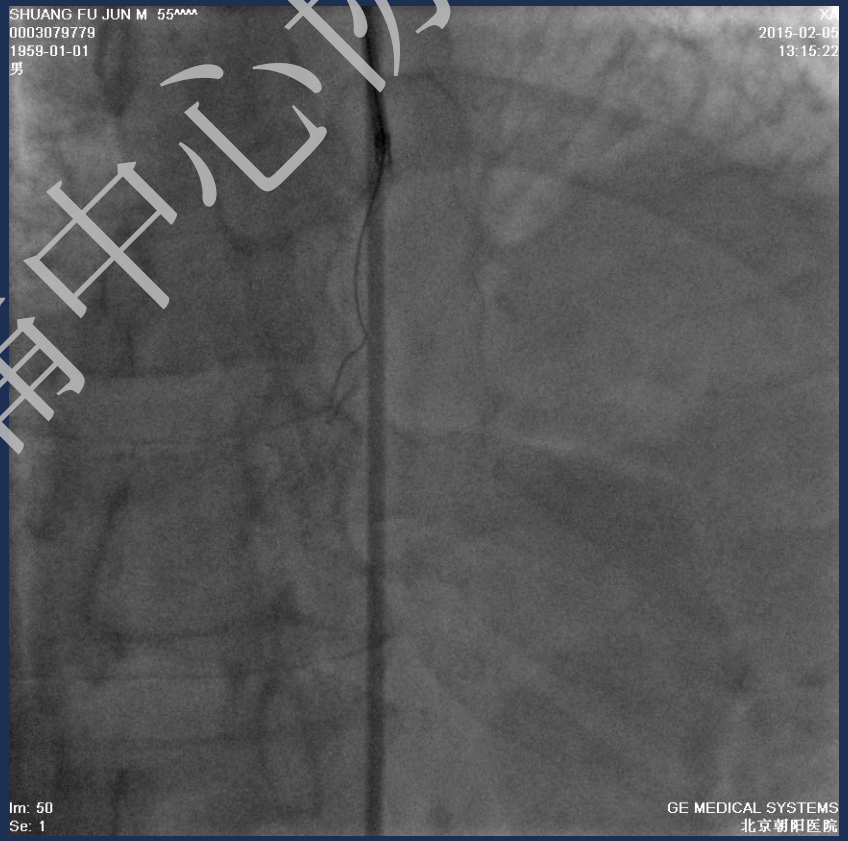
0003079779
1959-01-01
男
XA
2015-02-05
13:14:45
Im: 49
Se: 1
GE MEDICAL SYSTEMS
北京朝阳医院


SHUANG FU JUN M 55^^^^
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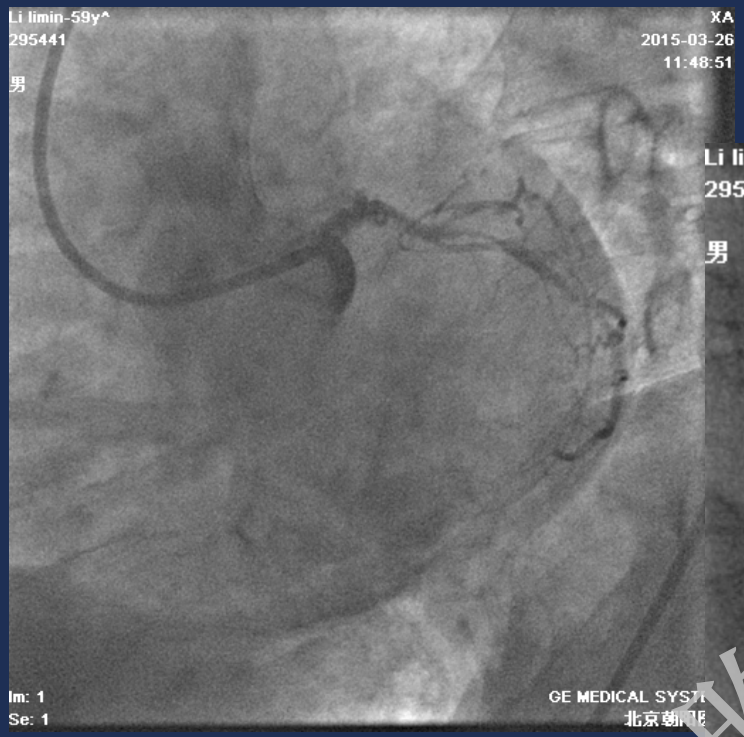
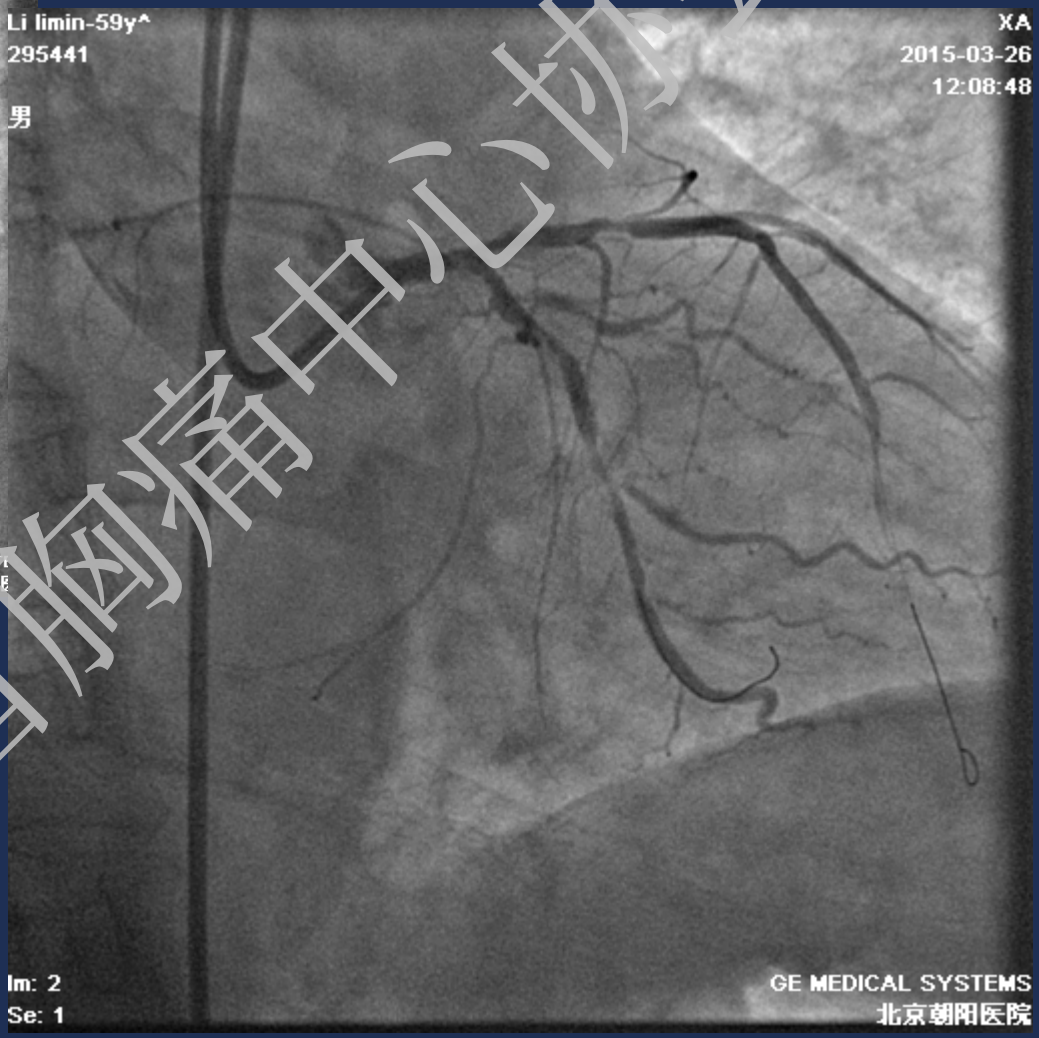
男
XA
2015-02-05
13:15:22
Im: 50
Se: 1
GE MEDICAL SYSTEMS
北京朝阳医院

病例5

- 急性广泛前壁心肌梗死
- 急诊PTCA后一次PCI
- 病人死于导管室


Li limin-59y^
295441
男
XA
2015-03-26
11:48:51
Im: 1
Se: 1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XA
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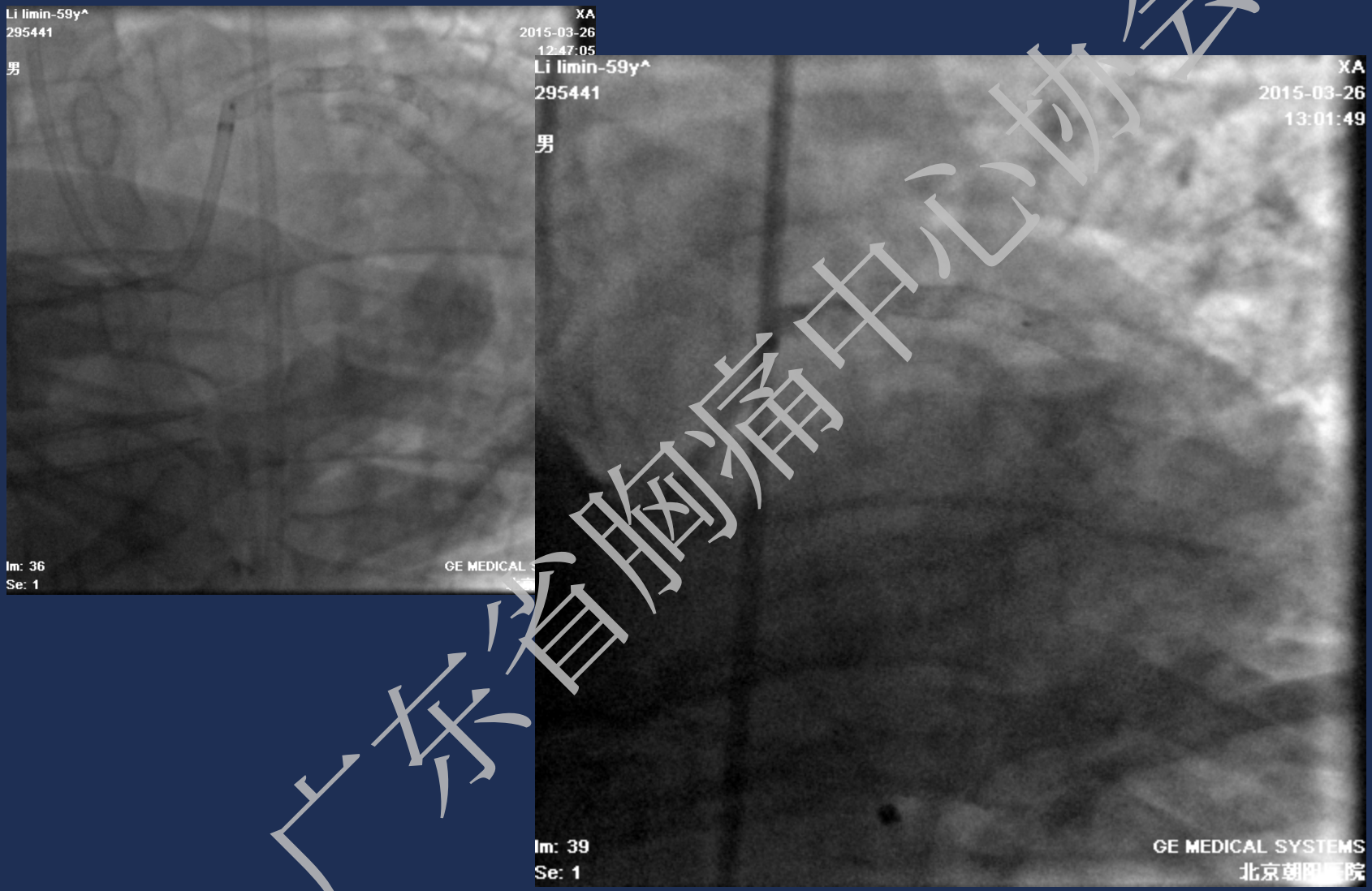
12:08:48
Im: 2
Se: 1
GE MEDICAL SYSTEMS
北京朝阳医院


Li limin-59y^
295441
男
XA
2015-03-26
12:47:05
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Se: 1
GE MEDICAL
Li limin-59y^
295441
男
XA
2015-03-26
13:01:49
Im: 39
Se: 1
GE MEDICAL SYSTEMS
北京朝阳医院

- 安全·
- 有益
- 个体化

谢谢！

广东省胸痛中心协会