SUPPLEMENTAL MATERIAL

Supplement Table 1 Search Strategy June 19th, 2021 (PubMed)

No	Search	Hits
1	((intracoronary) AND (electrocardiogram OR ECG OR EKG)) AND (st segment)	480
2	Search 1; Filters: clinical trials	113

Note: We still screened all the articles' abstracts in case of omission.

Supplement Table 2 Characteristic of included studies.

Studies	Inclusion criteria	Exclusion criteria	Clinical endpoints	Definition of significant ST-segment changes on IC-ECG
Ikenaga, et al. 2018, Japan[10]	Patients with stable angina pectoris who underwent elective PCI for a single, native, de novo coronary lesion and performed FD-OCT and IC-ECG both at baseline and after the procedure in this study.	(i) acute coronary syndrome; (ii) elevated preprocedural cardiac biomarker; (iii) reduced renal function (Estimated glomerular filtration rate <30 mL/min per 1.73m2). Lesion-related exclusion criteria were the vessels within a myocardial	Major adverse cardiac event (MACE), which was defined as cardiac death, MI, repeat revascularization and/or hospitalization for heart failure.	ST-segment elevation on IC-ECG was defined as ST-segment elevation $\geqslant$ 1 mm from baseline.

territory of previous MI, the left main trunk, ostium lesions, extremely tight lesions or tortuous vessels where we expected difficulty in advancing soft-tip guidewire or the FD-OCT catheter, severe calcified lesions needed for debulking device, target vessel reference diameter of ≥4mm expected limitation in FD-

		OCT evaluation and angiographic evidence of coronary dissection or major side branch (>1mm) occlusion after the procedure.		
Wong, et al. 2013, Australia[6]	Patients with acute STEMI who underwent primary-PCI.	patients aged <18 years, previous myocardial infarction in the same territory, contraindications to CMR (e.g., pacemaker implantation or claustrophobia) and	The relationship between intracoronary ST-segment resolution and MVO assessed by CMR 4 days after primary-PCI.	Improvement in IC-ECG ST-segment elevation $\geqslant$ 1 mm immediately upon achieving TIMI 3 flow was defined as intracoronary ST-segment resolution.

		contraindication to gadopentetate dimeglumine (e.g., known hypersensitivity to gadopentetate dimeglumine or creatinine clearance ⩽ 60 mL/min/1.73 m2).		
Hishikari, et al. 2016, Japan[7]	Patients' symptoms of coronary ischemia that were worsening or occurring at rest for more than 10 min within the past 12 hours, unequivocal	(1) age<21 years, (2) STEMI, (3) history of MI, (4) history of PCI, (5) renal insufficiency with a baseline serum creatinine level >1.8 mg/dL (133	In hospital: ventricular arrhythmias, congestive heart failure, cardiogenic shock, and cardiac death. Follow-up: Adverse events included fatal	The ST-segment elevation on the IC-ECG was defined as >0.1 mV elevation compared with the corresponding isoelectric line.

		changes on an admission ECG elevated cardiac biomarkers and no contraindication for PCI	lmol/L), (6) multivessel CAD or left main CAD, (7) patients in whom the absence of significant CAD or culprit lesion could not be identified according to the angiogram, and (8) major (>1.5 mm) side branch occlusion after PCI.	arrhythmias, cardiac death, nonfatal MI, revascularization or congestive heart failure requiring hospitalization.	
Uetani, et al. 2009 Japan[11]		Consecutive patients who underwent apparently successful elective coronary stent implantations. All had	1) emergency coronary angioplasty within 24 h of onset; 2) elevated pre-procedural cardiac	Post-procedure cardiac biomarkers and in hospital major adverse cardiac event, which was	The study defined persistent ST-segment elevation in the IcECG as an ischemic change.

	angina, documented myocardial ischemia, or both.	biomarker; 3) active congestive heart failure; 4) severe lesion characteristics not suitable for soft-tip guidewire; 5) angioplasty with debulking device (directional coronary atherectomy or rotational atherectomy); 6) Thrombolysis In Myocardial Infarction (TIMI) flow grade 1 to 2 of target vessel at the end of	defined as cardiac death and MI.

		procedure; and 7) multivessel stenting in a single procedure.		
Balian, et al. 2005, Italy[8]	Absence of cardiogenic shock, adequacy of echocardiographic window, IRA occlusion (TIMI flow grade 0-1) or patency (TIMI flow grade 2) with a severe (>90%) stenosis, and a successful primary stenting.	Patients with previous AMI, ventricular conduction disturbances on standard ECG, or ventricular pacing were.	Left ventricular ejection fraction and infarct zone wall motion score index.	ST-segment resolution was defined as a ⩾50% decrease of ST-segment elevation compared to the corresponding baseline values.
Yajima, et al. 2001, Japan[9]	Patients with a first episode of anterior myocardial infarction underwent	contraindication of coronary angiogram, >50%	coronary events, clinical outcomes, left ventriculogram	ST-segment elevation on IC-ECG was defined as ST-segment elevation ⩾0.2

	emergency coronary angioplasty within 12 hours of onset.	stenosis in the left main coronary artery, >75% stenosis in another major coronary artery, prior myocardial infarction, cardiogenic shock, cardiomyopathy, and right or left bundle branch block on the ECG.	measurements and myocardial viability	mV from baseline.
Balian, et al. 2006, Italy[12]	Men and women who were at least 18 years old, had normal CK-MB and cardiac troponin I (cTnI) values before the procedure and	Unstable patients, patients with ventricular conduction disturbances on standard ECG or ventricular pacing, and	Adverse events included death, nonfatal MI, or a new coronary revascularization procedure. Major	Intracoronary ST deviation (elevation or depression) was considered significant if ⩾1 mm compared with

	were in stable condition, without angina in the previous 48 hours. Further criteria for inclusion were that the PCI procedure was successful and an optimal final result was obtained.	those who had procedural complications were excluded.	coronary events included death or nonfatal MI.	the corresponding baseline value.
Balian, et al. 2011, Italy[13]	Patients undergoing elective coronary angiography with single-vessel intermediate stenosis (40–70% diameter narrowing) on quantitative assessment were	prior ST segment elevation myocardial infarction, prior coronary revascularization, ostial stenosis, presence of left bundle branch block, non-sinus rhythm or	N/A	Compared to baseline, an IC-ECG ST-segment deviation (elevation or depression) $\geqslant$ 1 mm during adenosine infusion was considered significant.

	considered for this study.	paced rhythm in resting ECG and a contraindication to adenosine infusion. Patients who were taking digitalis or had ST/T wave abnormalities that precluded the interpretation of ischemic ECG were also excluded.			
Abaci, et al. 2003, Turkey[14]	Recent (<1 month) Q-wave MI; angiographically documented regional wall motion abnormality; single,	Patients with poor acoustic window, postinfarction angina, active congestive heart	N/A		Significant ST-segment elevation was defined as a new or worsening ST segment elevation of ⩾

	non-occlusive significant stenosis (⩾ 70% by quantitative measurements) in the IRA; and scheduled revascularization of the IRA for angiographic and clinical reasons.	failure, bundle branch block, atrial fibrillation, valvular disease, significant stenosis in the non-IRA, and collateral filling to the IRA.		0.1 mV at 80 msec after the J-point.
FIESTA. 2018, Bulgaria[5]	Patients with stable or unstable angina were included. The inclusion criterion was angiographic bifurcation lesions in a native coronary artery with	patients with ST-segment elevation myocardial infarction and those with non-cardiac comorbid conditions with a life expectancy of less than	N/A	An ST-segment elevation >1 mm on the IC-ECG was defined as significant ischemia based on the correlation with clinical events

	a diameter ⩾2.5 mm and ⩽ 4.5 mm and an side branch diameter ⩾ 2.0 mm.	one year. In addition, patients with left main coronary artery stenosis, total occlusion, lesion of interest located at an infarct-related artery, subjects with LVEF <30%, subjects with a moderate or severe degree of valvular heart disease or primary cardiomyopathy and patients with bundle branch blocks, and atrial fibrillation/flutter with no	observed in previous studies.

		identifiable isoelectric line were excluded.		
Wang, et al. 2011, China[15]	Patients were included if they (1) received elective PCI for single vessel; (2) had unstable angina, which did not onset within 48 hours, with normal CK-MB or troponin T before PCI; (3) had ideal results during the procedure.	Patients were excluded if they (1) had increased CK-MB or troponin T before PCI; (2) had intraventricular block, ventricular escape, and atrial fibrillation found on ECG; (3) had complication occurred during the procedures, including slow flow, no flow, stent thrombosis, acute	N/A	ST deviation (elevation or depression) was considered significant if >0.1 mV compared with the corresponding baseline value.

		coronary occlusion, and perforation.		
Vassilev, et al. 2016, Bulgaria[16]	At least 18 years old, with stable or unstable angina, angiographic bifurcation lesions located in a native coronary artery with diameter of ⩾ 2.5 mm and ⩽ 4.5 mm and side branch with diameter of ⩾ 2.0 mm.	patient with ST-segment elevation myocardial infarction and those with non-cardiac co-morbid conditions with life expectancy <1 year. The following patients were also excluded: 1) left main coronary artery stenosis, 2) total occlusion before occurrence of SB, 3)	N/A	An 0.5 mV ST-segment elevation or depression above or below J-point was accepted as threshold for defining of ischemia occurrence.

lesion of interest located at infarct-related artery, 4) subjects with left ventricular ejection fraction < 30%, 5) subjects with moderate or severe degree valvular heart disease or primary cardiomyopathy, and 6) patients with bundle branch blocks, atrial fibrillation patient with ST-segment elevation myocardial infarction and

those with non-cardiac co-morbid conditions with life expectancy <1 year. The following patients were also excluded: 1) left main coronary artery stenosis, 2) total occlusion before occurrence of SB, 3) lesion of interest located at infarct-related artery, 4) subjects with left ventricular ejection fraction < 30%, 5)

	subjects with moderate or severe degree valvular heart disease or primary cardiomyopathy, and 6) patients with bundle branch blocks, atrial fibrillation/flutter with no identifiable isoelectric line.

PCI, percutaneous coronary intervention. FD-OCT, frequency-domain optical coherence tomography. IC-ECG, intracoronary electrocardiogram. CAD, coronary artery disease. MI, myocardial infarction. STEMI, ST-segment elevation myocardial infarction. MVO, microvascular obstruction. CMR, cardiac magnetic resonance. ECG, electrocardiogram. FFR, fractional flow reserve. IRA, infarct-related artery. TIMI, thrombolysis in myocardial infarction. CK-MB, creatine kinase-myoglobin. LVEF, left ventricular ejection fraction.

Supplement Table 3 Quality assessment adapted from the Newcastle-Ottawa Scale for studies reported clinical outcomes.

Study	Selection				Comparability	Outcome			
	Representativeness of the exposed cohort	Selection of the non-exposed cohort	Ascertainment of exposure	Demonstration that outcome of interest was not present at start of study	Comparability of cohorts on the basis of the design or analysis	Assessment of outcome	Was follow-up long enough for outcomes to occur	Adequacy of follow up of cohorts	Total score
Ikenaga, et al. 2018[10]	✸	✸	✸			✸	✸	✸	6
Wong, et al. 2013[6]	✸	✸	✸		✸✸	✸	✸	✸	8
Hishikari, et al. 2016[7]	✸	✸	✸		✸✸	✸	✸	✸	8
Uetani, et al. 2009[11]	✸	✸	✸		✸✸	✸			6
Balian, et al. 2005[8]	✸	✸	✸			✸	✸	✸	6
Yajima, et al. 2001[9]	✸	✸	✸			✸			4
Balian, et al.2006[12]	✸	✸	✸			✸	✸	✸	6

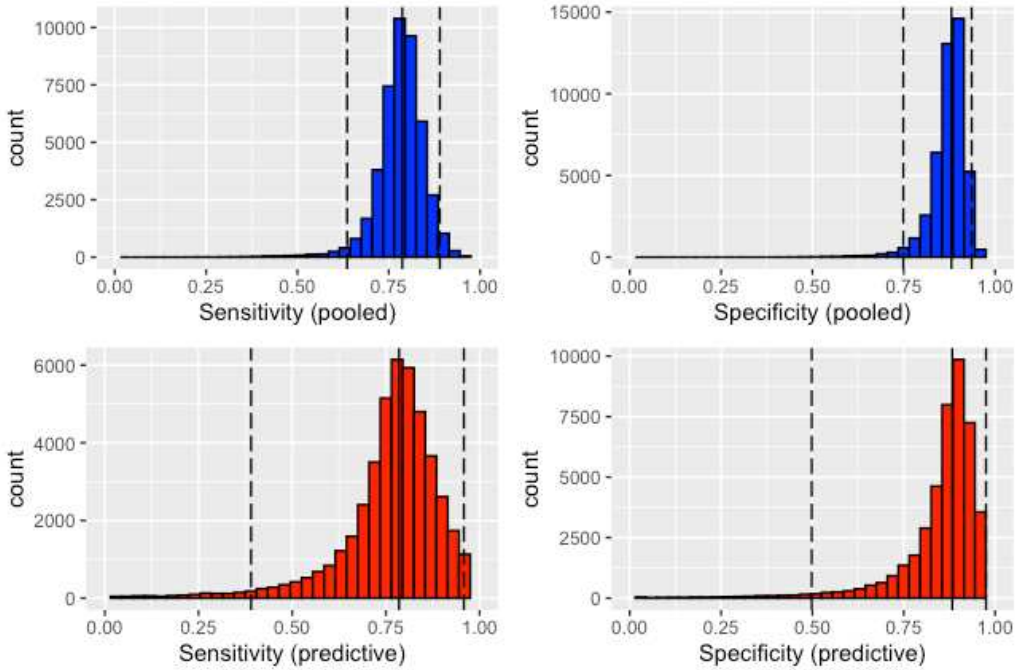
Supplement Table 4 Quality assessment adapted from QUADAS tool for diagnostic studies.

Question	Balian, et al. 2006[12]	Balian, et al. 2011[13]	Abaci, et al. 2003[14]	FIESTA. 2018[5]	Wang, et al. 2011[15]	Vassilev, et al. 2016[16]
1. Was the spectrum of patients representative of the patients who will receive the test in practice?	Yes	Yes	Yes	Yes	Yes	Yes
2. Were selection criteria clearly described?	Yes	Yes	Yes	Yes	Yes	Yes
3. Is the reference standard likely to correctly classify the target condition?	Yes	Yes	Yes	Yes	Yes	Yes
4. Is the time period between reference standard and index test short enough to be reasonably sure that the target condition did not change between the two tests?	Yes	Yes	Yes	Yes	Yes	Yes
5. Did the whole sample or a random	Yes	Yes	Yes	Yes	Yes	Yes

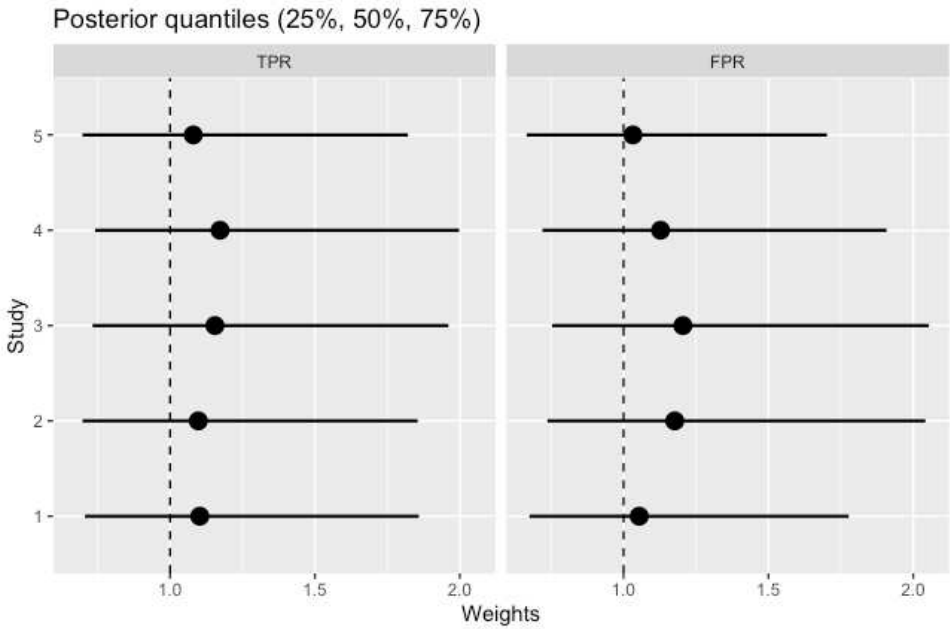
selection of the sample, receive verification using a reference standard of diagnosis?						
6. Did patients receive the same reference standard regardless of the index test result?	Yes	Yes	Yes	Yes	Yes	Yes
7. Was the reference standard independent of the index test (i.e. the index test did not form part of the reference standard)?	Yes	Yes	Yes	Yes	Yes	Yes
8. Was the execution of the index test described in sufficient detail to permit replication of the test?	Yes	Yes	Yes	Yes	Yes	Yes
9. Was the execution of the reference standard described in sufficient detail to permit its replication?	Yes	Yes	Yes	Yes	Yes	Yes
10. Were the index test results interpreted	Yes	Yes	Yes	Unaware	Unaware	Unaware

without knowledge of the results of the reference standard?						
11. Were the reference standard results interpreted without knowledge of the results of the index test?	Unaware	Unaware	Unaware	Unaware	Unaware	Unaware
12. Were the same clinical data available when test results were interpreted as would be available when the test is used in practice?	Yes	Yes	Yes	Yes	Yes	Yes
13. Were uninterpretable/ intermediate test results reported?	Yes	Unaware	Yes	Unaware	Unaware	Unaware
14. Were withdrawals from the study explained?	Yes	Unaware	Unaware	Yes	Unaware	Unaware

Supplemental Figures and Figure Legends



Supplement Figure 1 Posterior distributions for the pooled sensitivity and specificity and their predictive posteriors. The pooled sensitivity and specificity (upper) were 0.78 (95% credibility intervals 0.64-0.89) and 0.87 (95% credibility intervals 0.75-0.94), respectively. And predictive posterior sensitivity and specificity (lower) were 0.76 (95% credibility intervals 0.39-0.96) and 0.85 (95% credibility intervals 0.50-0.98), respectively.



Supplement Figure 2 Posterior distributions of the component weights of the diagnostic studies. Study 1: Balian, et al, 2011; Study 2: FIESTA, 2018; Study 3: Balian, et al, 2006; Study 4: Wang, et al, 2011; Study 5: Vassilev, et al, 2016. The posterior probabilities of studies were almost centered at 1.0, providing no evidence that any of the studies gave conflict of evidence in relation to the sensitivity or specificity. TPR, true positive rate; FPR, false positive rate.