

Clinical impact and predictors of complete ST-segment resolution after primary percutaneous coronary intervention: a subanalysis of the ATLANTIC Trial



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Background

Achievement of myocardial reperfusion is the main goal in ST-elevation myocardial infarction (STEMI) for improving prognosis. In the ATLANTIC trial (NCT01347580), the frequent early use of aspirin and anticoagulation and the early use of ticagrelor coupled with very short medical contact-to-balloon times represent excellent indicators of optimal treatment of STEMI patients and an ideal setting to explore which factors may influence coronary reperfusion beyond this excellent practice.

Purpose

The study sought to evaluate predictors of complete ST-segment resolution (STR) after percutaneous coronary intervention (PCI) in STEMI patients enrolled in the ATLANTIC trial.

Methods

ST-segment analysis was performed on electrocardiograms (ECGs) recorded at the time of inclusion [pre-hospital (pre-H) ECG], and 1 hour after PCI (post-PCI ECG) by an independent core laboratory. Complete STR was defined as $\geq 70\%$ STR.

Results Complete STR occurred post-PCI in 54.9% (n=800/1456) of patients and predicted lower 30-day composite major adverse cardiovascular and cerebrovascular events (MACCE) (OR 0.35, 95% CI 0.19-0.65; $p < 0.01$) (fig 1), definite stent thrombosis (OR 0.18, 95% CI 0.02-0.88; $p = 0.03$), and total mortality (OR 0.43, 95% CI 0.19-0.97; $p = 0.04$) (fig 2).

Fig 1 MACCE curves in relation to complete vs incomplete STR

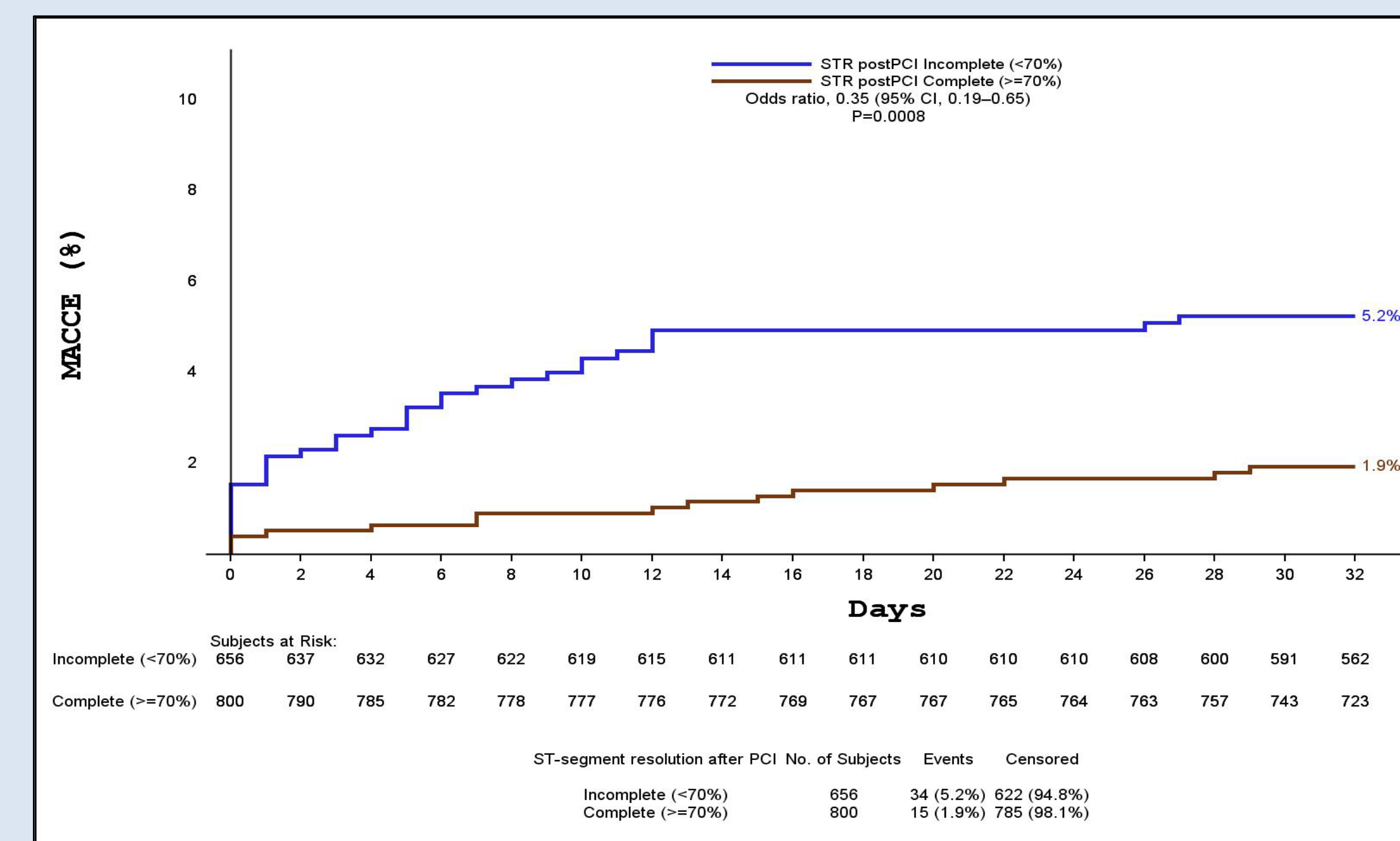
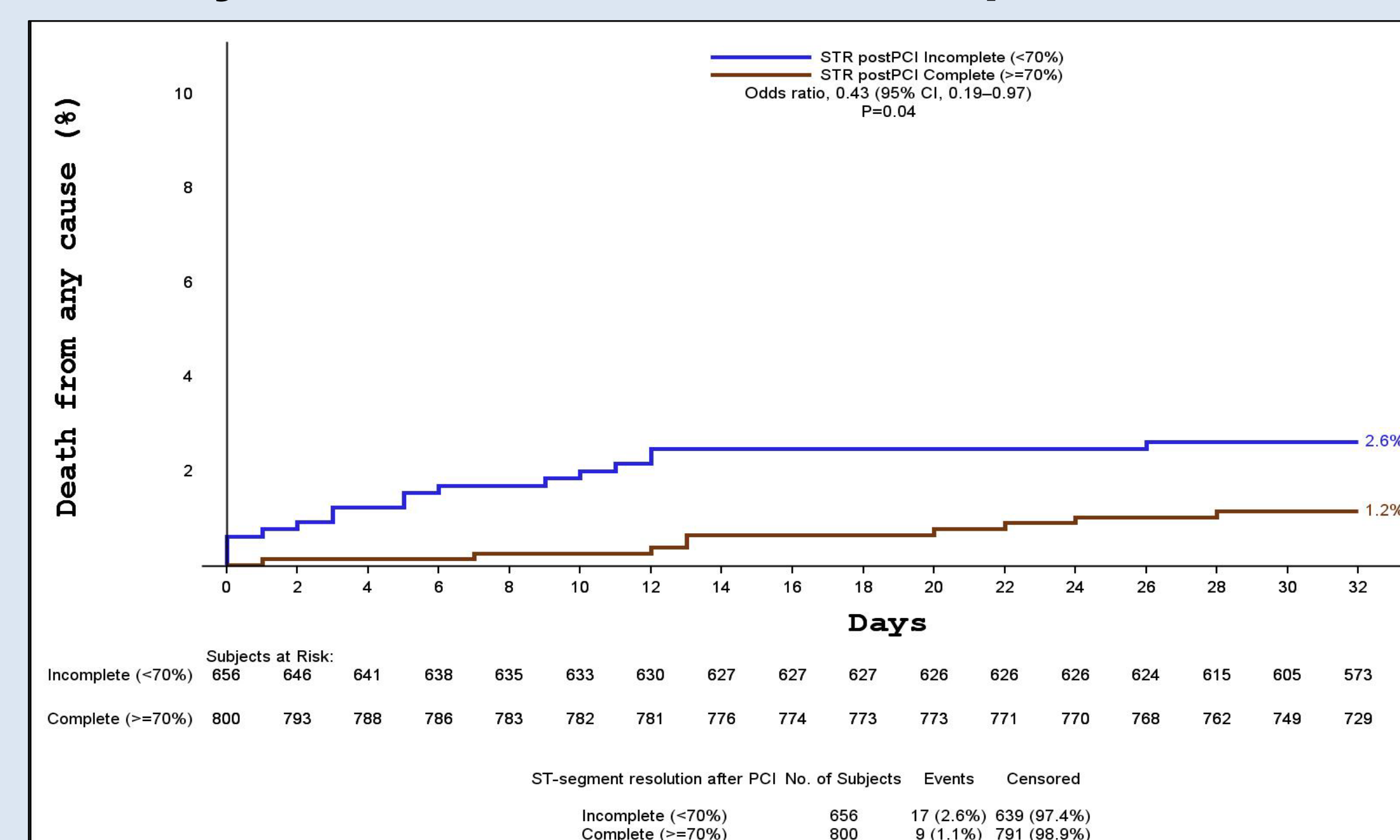


Fig 2 Mortality curves in relation to complete vs incomplete STR



Post-PCI STR occurred in 57.5% of patients in the pre-H ticagrelor group and in 52.5% of patients in the control group ($p = 0.055$). The degree of STR was significantly greater in the pre-H group (median, 75.0% vs. 71.4%; $p = 0.049$).

In multivariate analysis (table), independent predictors of complete STR were the time from index event to pre-H ECG (OR 0.91, 95% CI 0.85-0.98; $p = 0.01$) and diabetes mellitus (OR 0.6, 95% CI 0.44-0.83; $p < 0.01$); pre-H ticagrelor treatment showed a favourable trend (OR 1.22, 95% CI 0.99-1.51; $p = 0.06$).

Variables	Multivariate Logistic Model [†]		
	N	Odds-ratio (95% CI)	P-value
Ticagrelor Pre-H vs Ticagrelor In-H	1455	1.22 (0.99;1.51)	0.0609
Age (Group ≥ 75 Years vs < 75 Years)	1455	0.94 (0.66;1.34)	0.7507
Chronic Renal Disease (Yes vs. No)	1455	0.57 (0.23;1.40)	0.2229
Diabetes Mellitus (Yes vs. No)	1455	0.60 (0.44;0.83)	0.0018
Use of heparin before pre PCI ECG (Yes vs. No)	1455	1.17 (0.95;1.46)	0.1416
TIMI Risk Score Category (0-2 vs > 6)	1455	2.32 (0.82;6.50)	0.0851
TIMI Risk Score Category (3-6 vs > 6)	1455	2.01 (0.73;5.50)	0.2985
Time from symptoms to Pre-H ECG (mins)	1455	0.91 (0.85;0.98)	0.0078
Transient Ischaemic Attack (Yes vs. No)	1455	0.37 (0.11;1.24)	0.1079

Conclusions Post-PCI complete STR is confirmed to be a valid surrogate marker for cardiovascular clinical outcomes. Coronary reperfusion rates numerically favoured pre-H treatment. In the current era of STEMI reperfusion, patients' delay and diabetes mellitus are independent factors of poor reperfusion and would need specific attention in the future.

Conflict of interest: this study was supported by AstraZeneca

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