

SUPPLEMENTARY METHODS

Clinical characteristics and covariate assessment

The information on traditional cardiovascular risk factors from the same hospital stay was obtained from the hospital information system. Diabetes was defined as an HbA1c \geq 6.5%. The information on family history of premature coronary artery disease and current smoking status was self-reported and classified as present, absent, or unknown. Standardized enzymatic methods were used for the assessment of laboratory variables, which were automatically imported. Primary discharge diagnoses were also acquired from the hospital information system according to the International Statistical Classification of Disease (ICD 10). Diagnosis of non-ST-segment elevation myocardial infarction was defined as ICD codes I21.4 and I21.9. Diagnosis of ST-segment elevation myocardial infarction was defined as ICD codes I21.0 to I21.3, I22.0 to I22.9, I23.8, I24.0 to I24.1 and I24.8 to I24.9.

Endpoint definition

The primary endpoint variable was all-cause mortality. Information on survival status was acquired from all available hospital records (including partner healthcare facilities) and insurance information. Any ambulatory or inpatient presentation to the West German Heart and Vascular Center, the University Hospital Essen or any partner healthcare facility after the coronary intervention was used for confirmation of survival status. If neither a confirmation of death nor a recurrent presentation to the healthcare provider were available, patients were considered lost to follow-up and excluded from the present analysis.

Echocardiography

LV end-systolic and LV end-diastolic volume were traced manually in apical four- and two-chamber views and the ejection fraction was calculated by biplane Simpson method. LV mass was calculated using the formula recommended by the European Association of Cardiovascular Imaging (1). The RV basal diameter was assessed at end-diastole in the RV focused view. The TAPSE was assessed in apical four-chamber view using M-mode as the displacement of the lateral RV base between end-diastole and end-systole. LA area and volume were measured in the apical four-chamber view. Valvular heart disease was classified as mild, moderate or severe by experienced cardiologists according to the respective European Association of Cardiovascular Imaging recommendations.

Strain analysis

A single experienced reader, blinded to the clinical presentation and outcome of the patients, performed assessment of strain offline at a central core lab using the TOMTEC-Arena 2D Cardiac Performance Analysis software (Philips Healthcare, Best, NL) based on two-dimensional grey-scale echocardiographic images. We used apical two-, three- and four-chamber views for the assessment of LV-GLS and apical four-chamber views for assessing RV-GLS. LA reservoir strain was obtained using two-chamber view according to the recommendations of the TOMTEC-Arena 2D Cardiac Performance Analysis or four-chamber view, if the two-chamber view was unavailable. The beginning of the cardiac cycle was defined by the QRS complex. In case of poor ECG quality, M-Mode was used to define the cardiac cycle, as recommended by the TOMTEC software. The endocardial borders were traced manually at the end-systolic frame and automatically tracked throughout the cardiac

cycle by the software. Adjustments were made manually at the end-diastolic frame, if needed.

SUPPLEMENTARY TABLES

Supplementary table 1: Sensitivity analysis with vs. without multiple imputation: Cox-Regression analysis, depicted per 1 standard deviation of strain measure, adjusted for CVRF and CVRF plus LVEF, TAPSE or LAVI with imputed and with non-imputed values:

		HR [95%-CI]	p-value
adjusted for imputed CVRF*	LV-GLS	1.68 [1.37-2.06]	<0.001
	RV-GLS	1.39 [1.16-1.67]	<0.001
	LA reservoir strain	0.57 [0.47-0.69]	<0.001
adjusted for non-imputed CVRF*	LV-GLS	1.74 [1.39-2.17]	<0.001
	RV-GLS	1.43 [1.16-1.76]	<0.001
	LA reservoir strain	0.58 [0.46-0.73]	<0.001
adjusted for imputed CVRF* and LVEF, TAPSE or LAVI	LV-GLS	1.41 [1.06-1.89]	0.02
	RV-GLS	1.48 [1.03-2.13]	0.04
	LA reservoir strain	0.61 [0.49-0.76]	<0.001
adjusted for non-imputed CVRF* and LVEF, TAPSE or LAVI	LV-GLS	1.62 [1.17-2.23]	0.003
	RV-GLS	1.51 [1.04-2.19]	0.033
	LA reservoir strain	0.61 [0.48-0.78]	<0.001

*Adjustment for CVRF is defined as age, sex, systolic blood pressure, LDL-cholesterol, smoking status, diabetes, and family history of premature cardiovascular disease

CVRF= cardiovascular risk factors; GLS= global longitudinal strain; LA= left atrium; LAVI= left atrial volume index; LV= left ventricle; LVEF= left ventricular ejection fraction; RV= right ventricle; TAPSE= tricuspid annular plane systolic excursion

Supplementary table 2: Cox-Regression analysis, depicted per 1 standard deviation of strain measure, unadjusted and adjusted for CVRF and severe aortic stenosis, mitral regurgitation and tricuspid regurgitation

		HR [95%-CI]	p-value
adjusted for CVRF*	LV-GLS	1.68 [1.37-2.06]	<0.001
	RV-GLS	1.39 [1.16-1.67]	<0.001
	LA reservoir strain	0.57 [0.47-0.69]	<0.001
adjusted for CVRF* and severe aortic stenosis, mitral regurgitation and tricuspid regurgitation	LV-GLS	1.64 [1.33-2.01]	<0.001
	RV-GLS	1.38 [1.15-1.66]	<0.001
	LA reservoir strain	0.59 [0.49-0.72]	<0.001

*Adjustment for CVRF is defined as age, sex, systolic blood pressure, LDL-cholesterol, smoking status, diabetes, and family history of premature cardiovascular disease

CVRF= cardiovascular risk factors; GLS= global longitudinal strain; LA= left atrium; LV= left ventricle; RV= right ventricle

Supplementary table 3: Patient characteristics stratified by STEMI vs. NSTEMI

	Overall (n= 1409)	NSTEMI (n= 970)	STEMI (n= 439)	p-value
Clinical Characteristics				
Age (years)	64.4±13.5	66.0±13.4	60.9±13.2	<0.001
Male gender (n (%))	1252 (75.3)	723 (74.5)	338 (77.0)	0.322
BMI (kg/m ²)	27.6±4.6	27.8±4.8	27.1±4.4	0.008
Systolic blood pressure (mmHg)	134.9±22.9	136.2±22.5	132.0±23.4	0.002
Family CAD history (n (%)), n=1055	248 (23.5)	177 (23.6)	71 (23.3)	0.911
LDL-cholesterol (mg/dl)	111.7±40.4	110.5±40.0	114.4±41.1	0.099
Diabetes (n (%))	183 (13.0)	142 (14.6)	41 (9.3)	0.006

Current smoking (n (%)), n=1054	252 (23.9)	145 (19.3)	107 (35.2)	<0.001
	Strain analysis			
LV-GLS (%), n=1078	-15.5±5.3	-15.5±5.5	-15.4±5.0	0.875
RV-GLS (%), n=1073	-18.1±5.5	-17.7±5.7	-18.8±5.0	0.002
LA reservoir strain (%), n=1369	20.5±9.2	20.1±9.7	21.3±8.0	0.012
	Cardiac size and function parameters			
LVEF (%), n=1315	49.0±12.0	49.1±12.4	48.8±11.1	0.686
LVEDV (ml), n=1319	108.9 (87.7- 141.8)	107.3 (87.2- 142.1)	111.0 (90.7- 140.4)	0.381
LVESV (ml), n=1315	52.6 (38.0- 76.5)	52.1 (37.2- 76.1)	53.2 (40.7- 77.0)	0.190
TAPSE (mm), n=824	20.6±5.7	20.4±5.8	21.2±5.4	0.047
RVEDD (cm), n=1355	3.8±0.7	3.8±0.7	3.7±0.7	0.016
LA-volume (ml), n=1388	71.0±30.2	73.3±30.2	65.7±29.6	<0.001
LA-volume index (ml/m ² BSA), n=1388	36.4±15.6	37.7±15.4	33.5±15.7	<0.001
E (cm/s), n=1355	78.5±24.8	78.3±25.7	79.0±22.8	0.578
A (cm/s), n=1250	74.9±22.9	76.7±23.3	71.0±21.7	<0.001
e' (cm/s), n=1318	9.0±3.2	8.8±3.2	9.3±3.1	0.008
sysPAP (mmHg), n=1156	37.3±9.6	37.8±10.0	36.2±8.7	0.004
LVM-Index (g/m ²), n=1049	136.0±47.0	139.1±48.5	129.4±43.3	0.001

BMI= body mass index; BSA= Body surface area; CAD= chronic coronary artery disease; GLS= global longitudinal strain; LA= left atrium; LDL= low density lipoprotein; LV= left ventricle; LVEDV= left ventricular end diastolic volume; LVEF= left ventricular ejection fraction; LVESV= left ventricular end systolic volume; LVM-Index= left ventricular muscle mass; NSTEMI= non-ST-segment elevation myocardial infarction; RV= right ventricle; RVEDD= right ventricular end-diastolic diameter; STEMI= ST-segment elevation myocardial infarction sysPAP= systolic pulmonary artery pressure

Supplementary table 4: Cox-Regression analysis for the GRACE-Score and GRACE-Score plus each strain measurement depicted per 1 standard deviation of GRACE-Score and strain measure, respectively

	HR [95%-CI]	p-value
Univariate analysis		
GRACE-Score	1.43 [1.21-1.69]	<0.001
LV-GLS	1.72 [1.42-2.09]	<0.001
RV-GLS	1.49 [1.25-1.78]	<0.001
LA reservoir strain	0.52 [0.43-0.62]	<0.001
Multivariable analysis including the GRACE-Score and LV-GLS in one model		
GRACE-Score	1.43 [1.17-1.76]	<0.001
LV-GLS	1.68 [1.37-2.04]	<0.001
Multivariable analysis including the GRACE-Score and RV-GLS in one model		
GRACE-Score	1.49 [1.23-1.80]	<0.001
RV-GLS	1.46 [1.22-1.75]	<0.001
Multivariable analysis including the GRACE-Score and LA reservoir strain in one model		
GRACE-Score	1.33 [1.12-1.58]	0.001
LA reservoir strain	0.54 [0.44-0.66]	<0.001

GLS= global longitudinal strain; LA= left atrium; LV= left ventricle; RV= right ventricle"

Online table 1: Information regarding the segment of the culprit lesion stratified by Survivors vs. Non-Survivors (no cases with segment 10 were reported)

segment of the culprit lesion	Overall	Survivors	Non-Survivors	p-value
1 (n (%))	68 (4.8)	61 (0.05)	7 (0.04)	0.789
2 (n (%))	147 (10.4)	134 (0.1)	13 (0.1)	0.320
3 (n (%))	59 (4.2)	55 (0.04)	4 (0.03)	0.262
4 (n (%))	13 (0.9)	12 (0.01)	1 (0.01)	0.680

5 (n (%))	65 (4.6)	57 (0.05)	8 (0.05)	0.791
6 (n (%))	237 (16.8)	207 (0.2)	30 (0.2)	0.464
7 (n (%))	122 (8.7)	113 (0.1)	9 (0.1)	0.152
8 (n (%))	19 (1.3)	16 (0.01)	3 (0.02)	0.533
9 (n (%))	11 (0.8)	10 (0.01)	1 (0.01)	0.817
11 (n (%))	89 (6.3)	80 (0.1)	9 (0.1)	0.715
12 (n (%))	64 (4.5)	52 (0.04)	12 (0.1)	0.053
13 (n (%))	34 (2.4)	30 (0.02)	4 (0.03)	0.930
14 (n (%))	6 (0.4)	5 (0.004)	1 (0.01)	0.677

REFERENCES

1. Lang RM, Badano LP, Mor-Avi V, et al. Recommendations for cardiac chamber quantification by echocardiography in adults: an update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging. *J Am Soc Echocardiogr.* 2015;28(1):1-39.e14.