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ARTYKUŁ ORYGINALNY / *ORIGINAL ARTICLE*

Outcomes of percutaneous coronary intervention in patients after previous coronary artery bypass surgery

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Abstract

Background: Patients after previous coronary artery bypass grafting (CABG) often require repeat percutaneous revascularisation due to poor patency rates of saphenous vein grafts (SVG) and higher risk of re-CABG. Few data are available to evaluate different percutaneous revascularisation strategies in patients after previous CABG.

Aim: To evaluate outcomes of percutaneous coronary intervention (PCI) in patients after previous CABG, including the effect of treatment on the quality of life and symptoms, and secondly to assess the relation between angiographic factors and treatment outcomes

Methods: This was a prospective observational study which included 78 patients after previous CABG. Following coronary angiography, the patients were assigned to one of three groups: group A (n = 20), PCI of a SVG (PCI SVG); group B (n = 29), PCI of a native coronary artery (PCI NA); group C (n = 29), control group that received medical treatment (MT) only. Duration of follow-up was 12 months.

Results: Compared to MT patients, patients treated with PCI had significantly higher Canadian Cardiovascular Society (CCS) class (2.75 vs. 2.41, p = 0.03) and more frequently had coronary angiography performed due to unstable angina (57% vs. 31%, p = 0.04). Patients in the PCI SVG group had significantly older SVG conduits compared to the PCI NA group (13.4 years vs. 8.2 years, p = 0.005). At 12 months of follow-up, we found a significant improvement in the EQ-5D index of the quality of life, and a significant reduction in CCS class in the PCI SVG group (0.66 vs. 0.7, p = 0.0003, and 2.75 vs. 1.9, p < 0.001, respectively) and in the PCI NA group (0.65 vs. 0.72, p < 0.001, and 2.75 vs. 2.17, p < 0.001, respectively), but no improvement in the MT group. Treatment outcomes did not differ significantly between the three groups (combined endpoint rate 20% vs. 13% vs. 27.5%, p = 0.37). In multivariate analysis, SVG age > 11 years was identified as a significant predictor of poor outcomes in patients treated with PCI after previous CABG.

Conclusions: PCI in patients after previous CABG does not improve prognosis but significantly improves the quality of life and reduces symptom severity.

Key words: percutaneous coronary intervention, coronary artery bypass grafting

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INTRODUCTION

Cardiovascular disease, mostly coronary artery disease (CAD), is a major cause for mortality worldwide. Along with optimal medical treatment, myocardial revascularisation is the mainstay of therapy for CAD. The choice of optimal revascularisation strategy in multivessel CAD is not simple, and symptomatic patients previously treated with coronary artery bypass grafting (CABG) are the most challenging patient group. The rate of venous graft occlusion at 1 year after the surgery is 12–20% and increases to more than 50% after 7 years [1–3]. At the same time, the reoperation risk in this group is 2–4 times higher compared to primary CABG [4, 5].

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According to the 2014 European Society of Cardiology (ESC) guidelines [6], the preferred approach to revascularisation in this group is percutaneous coronary intervention (PCI) of a native coronary artery (PCI NA) if technically feasible (a class IIa, level of evidence C recommendation). It this approach is not feasible or unsuccessful, an alternative treatment option is PCI of a stenosed bypass graft, most commonly saphenous vein graft (PCI SVG) (a class IIa, level of evidence C recommendation). Literature data indicate that PCI SVG is associated with a higher risk of cardiovascular events including recurrent myocardial infarction, and a higher rate of in-stent restenosis compared to conventional PCI [7–10]. Over the last two decades, widespread introduction of drug eluting stents (DES) to routine clinical practice has significantly decreased the rate of PCI SVG complications [11, 12]. Few reports are available in the literature to compare different strategies of percutaneous myocardial revascularisation in patients after previous CABG.

The aim of the study was to evaluate outcomes of PCI in patients after previous CABG, including the effect of treatment on the quality of life, and to assess the relation between baseline angiographic characteristics and treatment outcomes.

METHODS

Study group

We performed a prospective observational study of 78 patients after previous CABG treated in the Department and Chair of Cardiology, Medical University of Lodz, in 2011–2014 who underwent coronary angiography for clinical reasons (acute coronary syndrome [ACS], Canadian Cardiovascular Society [CCS] class II–IV stable angina, positive stress test). Following coronary angiography, patients were assigned to one of three groups: group 1 (n = 20) included patients after previous CABG treated with PCI SVG, group 2 (n = 29) included patients after previous CABG treated with PCI NA, and group 3 (n = 29), which served as a control group, included patients after previous CABG who received medical treatment (MT). The decision regarding treatment strategy was made by the operator immediately after coronary angiography based on the clinical scenario (stable CAD or ACS, patient preferences after discussing procedural risk) and anatomical factors (vessel tortuosity, presence of calcifications or thrombi, stenosis or amputation of the native vessel or bypass graft).

Angiographic analysis

Evaluation of baseline coronary angiography included graft age and patency, stent type, diameter, and length, tortuosity of the stented vessel, lesion length, the number of stenoses left without interventional treatment, and collateral vessels in the PCI area.

Evaluation of treatment outcomes

Assessment at baseline and after 12 months included standard physical examination with evaluation of angina severity using the CCS classification and severity of heart failure symptoms using the New York Heart Association (NYHA) classification, standard echocardiographic examination with evaluation of left ventricular ejection fraction (LVEF), treadmill exercise test, 6-minute walk test (6MWT), and measurement of N-terminal B-type natriuretic propeptide (NT-proBNP) level.

Evaluation of cardiovascular events

Deaths, myocardial infarctions, strokes, repeated PCI, in-stent restenosis, and readmissions due to exacerbation of CAD or heart failure were noted during 12 months of follow-up.

Evaluation of quality of life

The EuroQOL five dimensions questionnaire (EQ-5D) was administered to all patients at baseline and after 12 months of follow-up. The EQ-5D questionnaire includes two parts. The first part is descriptive and used for patient self-evaluation of mobility, self-care, usual activities, pain, and anxiety/depression. Patient responses were evaluated using a standardised calculator (available at the questionnaire website) and expressed as the overall score (EQ-5D index). The second part is a visual analogue scale (EQ-VAS) used for patient self-rating of the overall health status from 0 (the worst possible) to 100 (the best possible).

Statistical analysis

Quantitative variables were compared using the Student t test or the Mann-Whitney U test depending on whether a given variable showed a normal distribution. Qualitative variables were compared using the χ^2 test. $P < 0.05$ was considered statistically significant. Univariate analysis was used to identify variables that significantly affected the occurrence of the combined endpoint and were later included in the multivariate model. Receiver-operating characteristic (ROC) curves were also plotted for these variables. Stepwise logistic regression model was used for multivariate analysis. Data were analysed using the MedCalc 12.2.1 software.

RESULTS

Basic demographic characteristics of the study and control groups are shown in Table 1. We found no significant differences between the groups in regard to age, gender distribution, and the rates of most common risk factors. Compared to medically treated patients, patients treated with PCI had significantly more severe angina (CCS score 2.75 vs. 2.41, p = 0.03) and were more frequently referred for coronary angiography due to unstable angina (57% vs. 31%, p = 0.04). Angiographic characteristics of the study and control groups are shown in Table 2. Patients treated with PCI SVG had significantly older grafts (13.4 vs. 8.2 years, p = 0.005) and significantly more occluded venous graft (mean 1.95 vs. 1.55 per patient, p = 0.001) compared to patients treated with PCI NA. An internal mammary artery graft was used in only 65% of

Table 1. Comparison of baseline characteristics of the study and control groups

	Overall (n = 78)	PCI SVG + PCI NA (n = 49)	MT (n = 29)	P (PCI vs. MT)
Age	70.4 ± 8.7	69.8 ± 10.1	71.3 ± 5.8	0.46
Male gender	62 (79.4%)	42 (85.7%)	20 (68.9%)	0.13
Smoking	47 (60.2%)	31 (63.3%)	16 (55.1%)	0.64
Hyperlipidaemia	73 (93.5%)	46 (93.8%)	27 (93.1%)	0.72
Hypertension	73 (93.5%)	45 (91.8%)	28 (96.5%)	0.73
Diabetes type 2	35 (44.8%)	20 (40.8%)	15 (51.7%)	0.48
GFR	70.7 ± 18.7	70.9 ± 19.5	70.4 ± 17.7	0.91
Indication for CAG:				
CAD	27 (34.6%)	10 (20.4%)	17 (58.6%)	**0.0015**
UA	37 (47.4%)	28 (57.1%)	9 (31%)	**0.04**
NSTEMI	11 (14.1%)	8 (16.3%)	3 (10.3%)	0.68
STEMI	3 (3.8%)	3 (6.1%)	0 (0%)	0.45
LVEF	40.1 ± 11	39.6 ± 10.7	40.9 ± 11.5	0.6
CCS class	2.62 ± 0.48	2.75 ± 0.43	2.41 ± 0.5	**0.03**
NYHA class	2.38 ± 0.5	2.36 ±0.48	2.44 ± 0.44	0.54
Medications:				
ASA		48 (97.9%)	26 (89.6%)	0.48
Clopidogrel		49 (100%)	10 (34.4%)	< 0.0001
Beta-blocker		46 (93.8%)	25 (86.2%)	0.67
Statin		46 (93.8%)	27 (93.1%)	0.96
ACEI		43 (87.7%)	26 (89.6%)	0.89

Mean values ± standard deviation or number (percentage) of patients are given. PCI SVG — PCI of a saphenous vein graft; PCI NA — PCI of a native coronary artery; MT — control group that received medical treatment only; ACEI — angiotensin-converting enzyme inhibitor; ASA — acetylsalicylic acid; CAG — coronary angiography; CCS — Canadian Cardiovascular Society; GFR — glomerular filtration rate; LVEF — left ventricular ejection fraction; NYHA — New York Heart Association; CAD — coronary artery disease; UA — unstable angina; NSTEMI — non-ST-elevation myocardial infarction; STEMI — ST-elevation myocardial infarction; PCI — percutaneous coronary intervention

patients in the PCI SVG group compared to 96.5% of patients in the PCI NA group (p = 0.01), while the rate of left internal mammary artery occlusion was low and not different between groups (15.3% vs. 10.7%, p = 0.38). Atherosclerotic lesions in venous grafts were significantly longer compared to those in native coronary arteries (25.6 vs. 20.2 mm, p = 0.02), were treated with longer stents (28 vs. 22.8 mm, p = 0.04), and more frequently required implantation of two stents (30% vs. 6.9%, p = 0.08) (Tables 1, 2).

In both groups treated with PCI, PCI SVG and PCI NA, we noted a significant reduction of the symptom severity as measured by the CCS score (2.75 vs. 1.9, p < 0.001, and 2.75 vs. 2.17, p < 0.0001, respectively) (Fig. 1) and an improvement in the quality of life as measured by the EQ-5D index (0.66 vs. 0.7, p = 0.0003, and 0.65 vs. 0.72, p < 0.0001, respectively) (Fig. 2) and EQ VAS (64.7 vs. 69.3, p = 0.0001, and 64.4 vs. 70.5, p < 0.0001, respectively) (Table 3). In addition, we found a nonsignificant improvement in functional parameters including a reduction of NYHA class, reduced NT-proBNP level, and an increased walking distance by 6MWT in both PCI groups at 12 months. No significant improvement in any of these parameters was noted in the MT group. An improvement in LVEF was not found in any of the groups, and a significant decrease in LVEF was noted in the MT group at 12 months (40.9% vs. 39.3%, p = 0.03) (Table 3).

We found no significant differences in the combined endpoint, mortality, myocardial infarction, and stroke rates between the study group (PCI SVG + PCI NA) and the control group (MT) (Table 4). A higher risk of hospitalisation due to heart failure was found in the control group compared to PCI groups (31% vs. 12.2%, odds ratio [OR] 0.17; 95% confidence interval [CI] 0.05–0.52). We found no significant differences in the cardiovascular event rates between PCI SVG and PCI NA group. A trend was noted for a higher restenosis rate in the PCI SVG group compared to the PCI NA group (35% vs. 13.7%, p = 0.08) (Table 4).

Univariate analysis in the study group (PCI SVG + PCI NA, n = 49) identified the following prognostic factors which were significantly associated with the occurrence of the combined endpoint: cigarette smoking (p = 0.05), glomerular filtration rate (GFR) (p = 0.04), LVEF (p = 0.05), graft age (p = 0.04), and the severity of calcifications (p = 0.05). ROC

Table 2. Angiographic characteristics of the study groups

	PCI SVG (n = 20)	PCI NA (n = 29)	MT (n = 29)	P (PCI SVG vs. PCI NA)
Graft age	13.4 ± 6.4	8.27 ± 3.4	9.65 ± 4.36	0.005
Number of LIMA grafts	13 (65%)	28 (96.5%)	25 (86.2%)	0.01
Number of occluded LIMA grafts	2 (15.3%)	3 (10.7%)	1 (4%)	0.38
Number of SVG (overall)	39	45	48	–
Number of SVG per patient	1.95	1.55	1.65	**0.01**
Number of occluded SVG (overall)	28 (71.7%)	27 (60%)	27 (56.2%)	0.37
Number of occluded SVG (per patient)	1.4	0.93	0.93	0.09
Stented vessel	SVG-LCx: n = 8 SVG-RCA: n = 10 SVG-Dg: n = 2	PCI LCx: n = 9 PCI RCA: n = 9 PCI LAD: n = 5 PCI LMCA: n = 6	–	
Type of stent:				
DES	20 (100%)	27 (93.1%)	–	0.76
BMS	0	2		
Stent diameter	3.3 ± 0.27	3.2 ± 0.4	–	0.82
Stent length	28 ± 9.6	22.8 ± 5.8	–	**0.04**
Number of stents				
1 stent	14 (70%)	27 (93.1%)	–	0.08
2 stents	6 (30%)	2 (6.9%)		0.07
Calcifications (grade 0–2)				
Grade 0	1	6	–	0.22
Grade 1	11	21		0.35
Grade 2	8	4		0.06
Vessel tortuosity (grade 0–2)				
Grade 0	13	12	–	0.37
Grade 1	7	16		0.25
Grade 2	0	1		0.88
Vessel diameter	3.3 ± 0.3	3.1± 0.5	–	0.25
Stenosis length	25.6 ± 8.9	20.2 ± 5.2	–	**0.02**
Collateral circulation in the PCI area				
Yes	8	6	–	0.22
No	12	23		
Residual stenosis	14	18	–	0.78
PCI of vessel bifurcation:				
Yes	0	5	–	0.14
No	20	24		

Mean values ± standard deviation or number (percentage) of patients are given. BMS — bare metal stent; DES — drug-eluting stent; Dg — diagonal branch; LAD — left anterior descending artery; LCx — left circumflex artery; LIMA — left internal mammary artery; LMCA — left main coronary artery; RCA — right coronary artery; SVG — saphenous vein graft; rest abbreviation as in Table 1

curves were plotted for the identified quantitative variables (Figs. 3–5).

In multivariate analysis using a stepwise logistic regression model in the study group (n = 49), graft age > 11 years was identified as a significant predictor of the combined endpoint (OR 7.25; 95% CI 1.27–41.1, p = 0.01).

DISCUSSION

Patients after previous CABG with unstable angina or myocardial ischaemia confirmed by noninvasive testing are a challenging clinical population. According to the 2014 guidelines on myocardial revascularisation, PCI is the preferred approach to revascularisation in this group. Few literature data are available

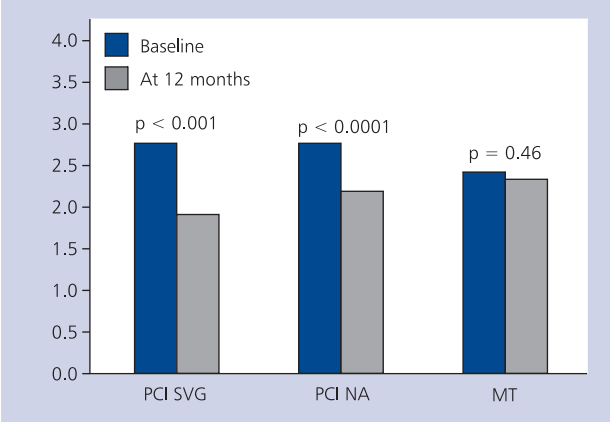

Figure 1. Severity of angina symptoms as evaluated using the Canadian Cardiovascular Society scale at baseline and at 12 months; PCI SVG — percutaneous coronary intervention (PCI) of a saphenous vein graft; PCI NA — PCI of a native coronary artery; MT — control group that received medical treatment only

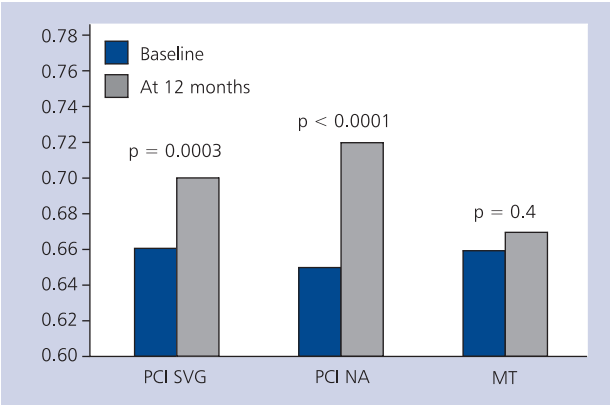

Figure 2. Evaluation of the quality of life at baseline and at 12 months (EQ-5D index); abbreviations as in Figure 1

to compare different PCI strategies in patients after previous CABG. The present study did not show significant differences in the cardiovascular event rates between patients after previous CABG treated with PCI compared to those treated medically (p = 0.23). Also the type of the stented vessel (native artery vs. venous graft) had no significant effect on treatment outcomes (p = 0.84). However, we found an improvement in the quality of life and reduction of symptom severity by the CCS score among patients who underwent percutaneous coronary revascularisation. While no postprocedural improvement of left ventricular function was seen in the revascularisation group, left ventricular function did worsen in the medical treatment group (reduction in LVEF at 12 months, p = 0.03).

Most previous retrospective studies in small patient groups did not show differences in treatment outcomes between patients after previous CABG who underwent PCI

Table 3. Treatment outcomes at 12 months

	PCI SVG (n = 20)		P	PCI NA (n = 20)		P	MT (n = 29)		P
	Baseline	At 12 months		Baseline	At 12 months		Baseline	At 12 months	
CCS class	2.75 ± 0.44	1.9 ± 0.55	**< 0.0001**	2.75	2.17	< 0.0001	2.41	2.31	0.46
NYHA class	2.4 ± 0.5	2.25 ± 0.78	0.47	2.34	2.27	0.58	2.44	2.37	0.54
6MWT	345 ± 81	357 ± 110	0.37	378 ± 83	397 ± 77	0.23	365.1 ± 83	368.1 ± 86.5	0.68
LVEF	38.1 ± 8.6	37.8 ± 10.9	0.75	41.4 ± 12.3	41.37 ± 11.6	0.98	40.9 ± 11.5	39.3 ± 11.6	**0.03**
NT-proBNP	1528 ± 788	1439 ± 855	0.37	1520 ± 655	1087 ± 766	0.49	1162 ± 789	1228 ± 860	0.76
EQ-5D index	0.66 ± 0.04	0.7 ± 0.06	**0.0003**	0.65 ± 0.06	0.72 ± 0.05	**< 0.0001**	0.66 ± 0.08	0.67 ± 0.7	0.4
EQ-5D VAS	64.7 ± 4.7	69.3 ± 7.7	**0.0001**	64.4 ± 6.8	70.5 ± 5.6	**< 0.0001**	64.1 ± 5.6	64.9 ± 6.2	0.22

Mean values ± standard deviation are given. EQ-5D — EuroQOL five dimensions questionnaire; LVEF — left ventricular ejection fraction; 6MWT — 6-minute walk test; NT-proBNP — N-terminal B-type natriuretic propeptide; VAS — visual analogue scale; rest abbreviation as in Table 1

Table 4. Occurrence of cardiovascular events in the PCI group (n = 49) compared to the MT group (n = 29)

	PCI SVG + PCI NA (n = 49)	MT (n = 29)	P	Odds ratio (95% CI)
Death	2 (4.1%)	2 (6.8%)	0.59 (NS)	0.57 (0.07–4.3)
MI	4 (8.1%)	4 (13.7%)	0.43 (NS)	0.55 (0.12–2.4)
Stroke	2 (4.1%)	2 (6.8%)	0.59 (NS)	0.57 (0.07–4.3)
Combined endpoint (death + MI + stroke)	8 (16.2%)	8 (27.5%)	0.23 (NS)	0.51 (0.16–1.5)
In–stent restenosis	11 (22.4%)	0	–	–
Repeated PCI	6 (12.2%)	0	–	–
Admission due to CAD	25 (51%)	9 (31%)	0.08 (NS)	2.31 (0.88–6.08)
Admission due to CHF	6 (12.2%)	13 (31%)	**0.008**	0.17 (0.05–0.52)

Numbers (percentages) of patients are given. CI — confidence interval; CHF — congestive heart failure; MI — myocardial infarction; NS — not significant; rest abbreviation as in Table 1

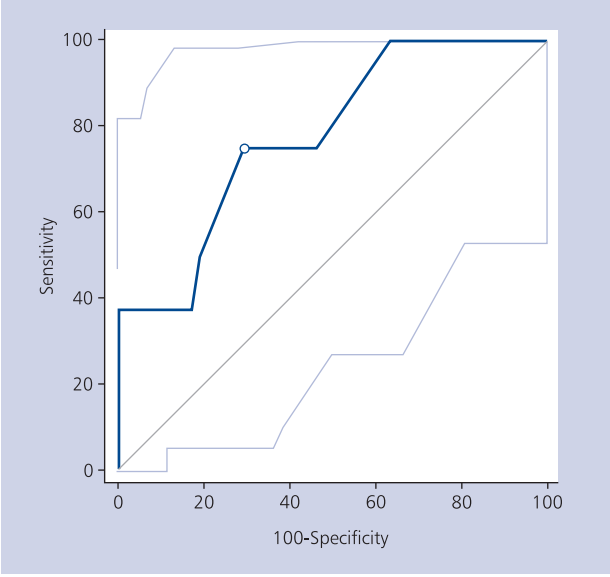

Figure 3. Receiver operating characteristic curve for graft age (univariate analysis). Cut-off: graft age > 11 years; AUC 0.77; SE 0.08; 95% CI 0.63–0.88; p = 0.0016

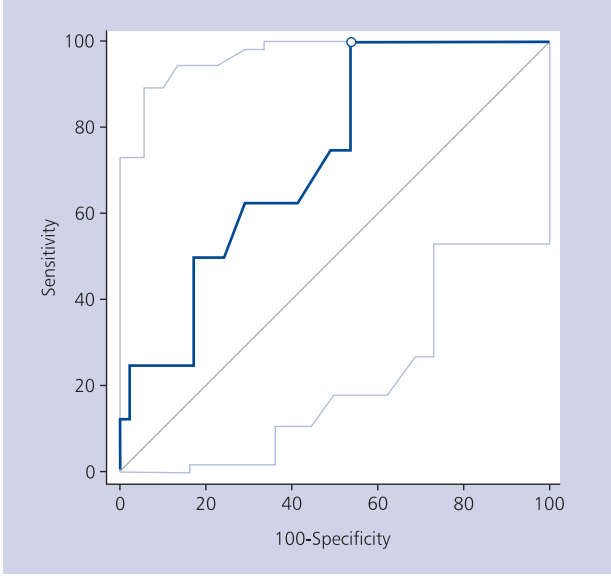

Figure 4. Receiver operating characteristic curve for glomerular filtration rate (GFR) (univariate analysis). Cut-off: GFR ≤ 75; AUC 0.73; SE 0.08; 95% CI 0.58–0.84; p = 0.009

SVG vs. PCI NA [13–15]. In the study by Varghese et al. [13], patients treated with PCI NA were significantly younger, had younger grafts, and significantly more frequently presented with stable angina compared to patients treated with PCI SVG. No significant differences in the cardiovascular event rates were seen between these two groups at mean 2.5 years of follow-up. In contrast, in the retrospective study of more than 300,000 PCI in patients after previous CABG in the National Cardiovascular Data Registry [16], patients treated with PCI SVG had more comorbidities and more periprocedural complications compared to those treated with PCI NA. In addition, PCI SVG was associated with higher in-hospital mortality compared to PCI NA (OR 1.22, 95% CI 1.12–1.32). Unfortunately, none of these retrospective studies evaluated the effect of PCI on symptom reduction and the quality of life in patients after previous CABG treated with PCI.

Several studies showed that PCI SVG was associated with a higher complication risk and higher mortality compared to PCI of the native coronary arteries in patients without previous CABG [17–19]. In a large registry by Coolong et al. [10] that included nearly 4000 patients, PCI SVG was associated with a 15–20% risk of death, myocardial infarction, or repeated revascularisation. Use of DES during PCI SVG is associated with a lower risk of complications compared to bare metal stents [11, 12, 20]. Introduction of embolic protection devices (EPD) has significantly lower the rate of PCI SVG complications [21]. However, availability and use of these devices remain low. In the registry by Mehta et al. [22] which evaluated more

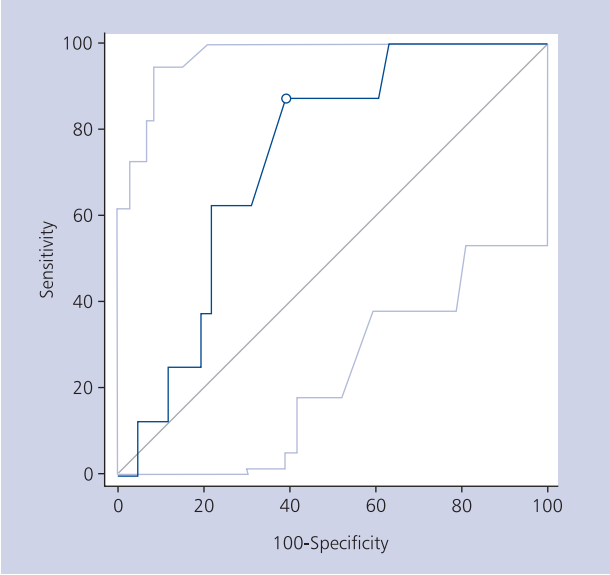

Figure 5. Receiver operating characteristic curve for left ventricular ejection fraction (LVEF) (univariate analysis). Cut-off: LVEF < 39%; AUC 0.73; SE 0.08; 95% CI 0.58–0.84; p = 0.004

than 19,000 patients treated with PCI SVG, EPD was used in only 22% of them. In our study, DES were used in all patients in the PCI SVG group (n = 20) but EPD was not used in any of them which might have potentially affected treatment outcomes and constitutes a study limitation.

In our study, the only predictors of the combined endpoint in univariate analysis were cigarette smoking (p = 0.05), GFR (p = 0.04), LVEF (p = 0.05), graft age (p = 0.04), and severity of calcifications (p = 0.05), while in multivariate analysis using a stepwise logistic regression model, graft age > 11 years was identified as a significant predictor of the combined endpoint (OR 7.25; 95% CI 1.27–41.1; p = 0.01). In the above mentioned registry by Coolong et al. [10], significant predictors of major adverse cardiac events (MACE) at 30 days of follow-up included a high degree of SVG degeneration (p < 0.0001), large atheroma volume (p < 0.0001), patient age (p < 0.01), and cigarette smoking (p = 0.03). In another study [23] that retrospectively evaluated 197 PCI in 91 patients after previous CABG, LVEF < 50% and PCI of more than 1 vessel were identified as significant predictors of MACE at 1 year of follow-up.

Limitations of the study

This was a prospective observational study performed in a relatively small group of patients after previous CABG, and thus statistical analysis of mortality differences between study subgroups was not possible. The study was not randomised, with patient assignment to specific groups left at the operator's discretion, which introduces a possibility of selection bias and constitutes a potential study limitation. According to the current ESC guidelines [6], percutaneous intervention in the native vessel was the preferred approach. Also patients with ACS were more frequently treated with PCI instead of receiving medical treatment only. Such an approach might have affected study results but it reflects current guidelines and clinical practice. In addition, EPD was not used in any patient in the PCI SVG group, which might have potentially affected treatment outcomes in this study.

CONCLUSIONS

1. PCI in patients after previous CABG does not improve prognosis but significantly improves the quality of life and reduces symptom severity as evaluated by the CCS scale.
2. Graft age > 11 years is a significant predictor of poor treatment outcomes in patients undergoing PCI after previous CABG.

Conflict of interest: *none declared*

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Ocena skuteczności leczenia angioplastyką przezskórną pacjentów po przebytym pomostowaniu aortalno-wieńcowym

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Streszczenie

Wstęp: Z powodu wysokiego odsetka niedrożności pomostów żylnych i wysokiego ryzyka reoperacji pacjenci po uprzednio przebytym pomostowaniu aortalno-wieńcowym (CABG) są często kwalifikowani do ponownej rewaskularyzacji za pomocą przezskórnej interwencji wieńcowej (PCI). W piśmiennictwie istnieje mało danych porównujących różne strategie PCI u pacjentów po przebytym uprzednio CABG.

Cel: Celem niniejszej pracy była ocena skuteczności leczenia za pomocą PCI pacjentów po przebytym CABG, ocena wpływu terapii na jakość życia oraz szczegółowa analiza zależności między wyjściowym obrazem angiograficznym a efektami leczenia.

Metody: Było to prospektywne badanie obserwacyjne, które objęło 78 pacjentów po przebytym CABG. Po koronarografii chorych przydzielano do jednej z trzech grup: grupa A obejmowała 20 leczonych za pomocą PCI pomostu żylnego (PCI SVG), grupa B — 29 leczonych za pomocą PCI natywnej tętnicy wieńcowej (PCI NA), grupa C (grupa kontrolna) — 29 osób poddanych farmakoterapii (grupa MT). Okres obserwacji wyniósł 12 miesięcy.

Wyniki: U pacjentów leczonych PCI, w porównaniu z chorymi stosującymi tylko farmakoterapię, stwierdzono wyjściowo istotnie statystycznie większe nasilenie objawów dławicy w skali *Canadian Cardiovascular Society* (CCS) (2,75 *vs*. 2,41; p = 0,03) oraz znamiennie częściej byli kwalifikowani do koronarografii z powodu rozpoznania niestabilnej dławicy piersiowej (57% *vs*. 31%; p = 0,04). Chorzy z grupy PCI SVG mieli znamiennie starsze pomosty żylne od pacjentów z grupy PCI NA (13,4 *vs*. 8,2 roku; p = 0,005). Po okresie 12 miesięcy stwierdzono znamienną poprawę w zakresie jakości życia (EQ-5D) oraz objawów dławicy w skali CCS w grupie PCI SVG (odpowiednio 0,66 *vs*. 0,7; p = 0,0003 i 2,75 *vs*. 1,9; p < 0,001) oraz PCI NA (odpowiednio 0,65 *vs*. 0,72; p < 0,001 i 2,75 *vs*. 2,17; p < 0,001) w porównaniu z brakiem poprawy w grupie MT. Nie zaobserwowano istotnych statystycznie różnic w częstości występowania zarówno głównego złożonego punku końcowego, jak i zgonu, zawału serca, udaru mózgu między grupami PCI SVG, PCI NA oraz MT. W analizie wieloczynnikowej grupy badanej zidentyfikowano wiek pomostów > 11 lat jako istotny czynnik prognostyczny dla wystąpienia złożonego punktu końcowego (OR 7,25; 95% CI 1,27–41,1; p = 0,01).

Wnioski: Zabieg PCI u pacjentów po przebytym uprzednio CABG nie poprawia rokowania, ale znamiennie polepsza jakość życia i redukuje nasilenie objawów w skali CCS.

Słowa kluczowe: przezskórna interwencja wieńcowa, pomostowanie aortalno-wieńcowe

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