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Original Article

Feasibility and safety of same-day discharge after percutaneous coronary intervention: a tertiary care center experience

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Abstract: The exponential increase in percutaneous coronary intervention (PCI) and increasing use of the transradial approach has set an ideal scenario for the cost-effective and relatively safe same-day discharge (SDD) policy in various institutes. We hereby report a single-center, prospective, observational study of 628 consecutive PCI patients, who had SDD or had overnight observation followed by next day discharge (NDD). Patients of chronic stable angina (CSA), unstable angina, and acute myocardial infarction (MI) were enrolled in the study. The baseline characteristics, safety, feasibility and 6 weeks of clinical outcomes were assessed in the two groups. Out of the 628 patients, 187 (30%) had SDD, and 358 (57%) had NDD. Transradial access was significantly more in SDD compared to NDD (P<0.001). The syntax score was significantly higher in NDD compared to the SDD (P<0.001). Five patients of NDD had clinical events at 6 weeks of follow-up, while none of SDD had any events. Patients with unstable angina (P = 0.024), MI (P≤0.001), prior PCI (P = 0.037), femoral access (P = 0.012), and high syntax score (P = 0.001) were more frequently discharged on next day. Factors such as CSA (P = 0.991), type of lesion (P = 0.984) and left ventricle ejection fraction (P = 0.535) were not the limiting factors for SDD. The present study demonstrated that SDD is safe and feasible in CSA patients, and a careful pre- and post-procedural risk assessment could enable SDD even in the complex cases.

Keywords: Ambulatory procedure, percutaneous coronary intervention, same-day discharge, transradial, vascular closure device

Introduction

A rising number of percutaneous coronary intervention (PCI) along with the increasing cost of healthcare has led to significant logistic and financial constraints on overburdened healthcare resources, throughout the world [1]. There have been multiple measures to decrease medical care expenditure while maintaining clinical efficacy and patient safety. It is a routine practice to keep post PCI patients overnight to assess the risk of acute stent thrombosis and vascular access site complications [1]. Same-day discharge (SDD), when the discharge date is the same calendar day of PCI, has led to reduced healthcare costs and increased patient satisfaction [2]. PCI performed in patients on out-patient basis with early ambulation and discharge has resulted in increased patient's comfort and satisfaction. The goal of SDD can only be achieved if optimal measures are taken to reduce the risk of cardiac and vascular access site complications. The possibility of the SDD depends on an adequate estimate of the risk of acute target vessel closure, its clinical implications, and prevention of access site complications despite the early ambulation [2]. Multiple studies have demonstrated the safety of SDD in patients undergoing PCI. Most of the complications occur either very early within 6 hours or late after 24 hours of PCI [1-5]. Shortening the post-PCI hospital stay is expected to decrease the costs and optimize the healthcare resource utilization [1-5]. Though transradial PCI favours early ambulation and SDD, there are only a few studies of SDD when vascular closure devices (VCDs) had been used following trans-femoral access.

The practice of SDD is followed by a significant percentage of cardiologists in developed countries [6]. This practice has important implica-

Table 1. The criteria considered for same-day discharge in post-PCI patients

Low-risk clinical criteria
Left ventricle ejection fraction >30% and without heart failure
Hemodynamically stable and without any cardiac arrhythmias
It does not require prolonged anticoagulation following PCI
No renal dysfunction (Serum creatinine <1.2 mg %)
Normal mental status
Favorable angiographic criteria
Successful PCI with the following characteristics
TIMI3 flow in the intervened artery
No coronary dissection or major branch occlusion
No access site complication
Optimal Socio-demographic features
Lives with caregiver
Reliable transportation
Reliable for follow-up

PCI: Percutaneous coronary intervention.

tions in developing countries, where there are limited healthcare resources for a large number of patients. We aimed to assess the safety and feasibility of SDD in consecutive post-PCI patients in this prospective, observational study at our tertiary care center.

Material and methods

The present study was a prospective, un-blinded, single-center observational study. A total of 628 consecutive PCI performed from August 2017 to December 2018 were enrolled in the study. Patients were evaluated for standard clinical parameters, coronary risk factors, demographics, and routine serum biochemical investigations. Eligibility for SDD was evaluated in 628 consecutive PCI patients who had either chronic stable angina (CSA) [7] or acute coronary syndromes such as acute ST-elevation myocardial infarction (STEMI), unstable angina, or non-ST-elevation myocardial infarction (NSTEMI) [8], as already defined. Following PCI, 217 patients were eligible for SDD, while 397 were eligible for next day discharge (NDD) after an overnight observation, based upon the clinical, angiographic, and socio-demographic criteria (**Table 1**). The road distance between our institute and the residence of an individual patient was estimated by Google Maps. The study protocol was approved by institute ethics committee. A written informed consent was taken from all the enrolled patients. The flow diagram about the patient's enrolment and stratification is mentioned in **Figure 1**.

Methodology

The SDD was defined when the date of discharge was the same calendar day, while the NDD was defined when the date of discharge was next calendar day or thereafter following the PCI. The unfractionated heparin (70 IU/kg) was given to all patients during the standard PCI procedure. An additional heparin dosage was given during prolonged interventions such as multivessel PCI, chronic total occlusion, and left main (LM) bifurcation to maintain activated clotting time of >250 seconds. Tirofiban infusion was given depending upon the thrombus load during PCI. The local hemostasis was achieved by using a vascular compression device (TR Band, Terumo Corporation, Tokyo, Japan) and Perclose ProGlide suture based closure device (Abbott Vascular Devices, Redwood City, CA, USA) for all the transradial and trans-femoral PCI, respectively. Patients were shifted to the coronary care unit following the intervention and ambulated after 2 hours and 4 hours of transradial and trans-femoral access, respectively. Patients were reassessed for any clinical symptoms, hemodynamic instability, local hemostasis, electrocardiogram, and echocardiographic changes after 4-6 hours of intervention. Thereafter, a decision was taken for SDD *vs.* NDD, considering various parameters as mentioned in **Table 1**. The duration of hospital stay for the individual patient was calculated by the time difference between heparin administrations during PCI to the discharge time. All patients were provided a telephone number of a research fellow (author-SKS) for any emergency help and routine communication. Patients of SDD were telephonically called on the next day to assess general well-being and any access site complications. All patients were telephonically interviewed at 4 weeks of follow-up and physically attended at 6-weeks of follow-up at out-patients department. The major adverse cardiac and cerebral events (MACCE) were assessed at 6-weeks of follow-up.

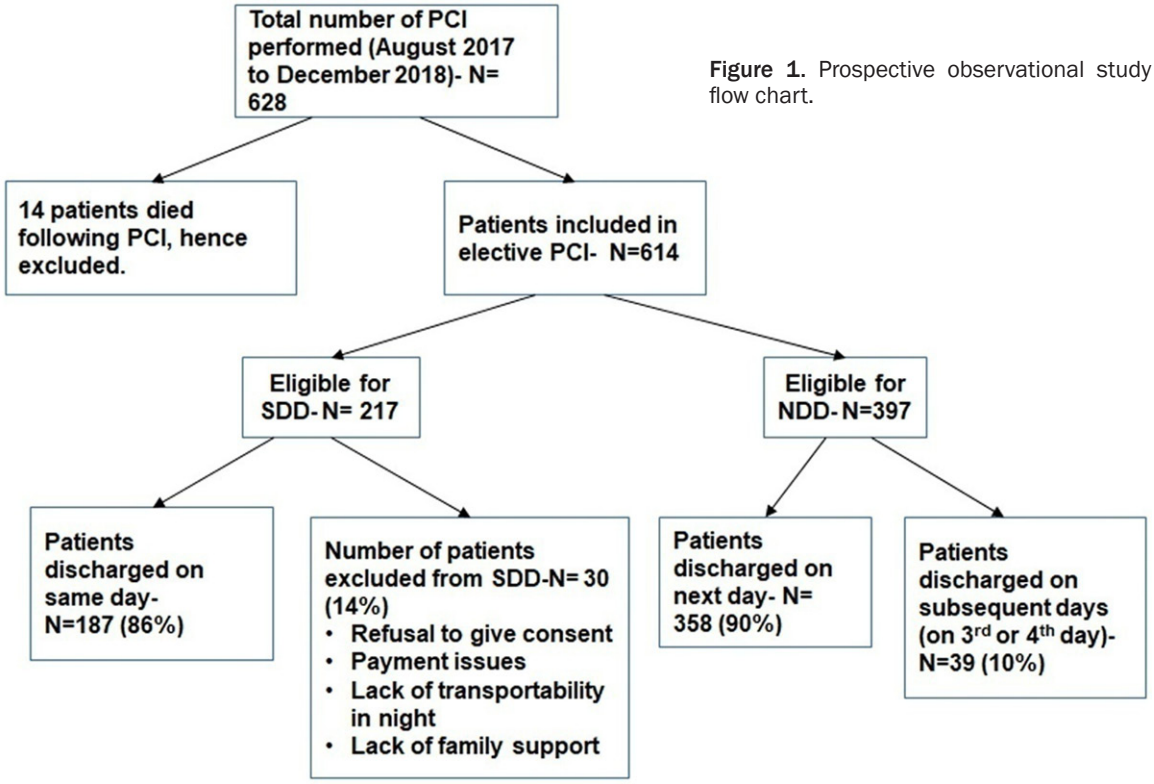

Figure 1. Prospective observational study flow chart.

Statistical analysis

The measures of central tendency and dispersion of data were calculated using mean and standard deviation for parametric data and median and interquartile range (IQR) for non-parametric data. For the comparison of two independent groups on a continuous variable, a t-test was used. Mann-Whitney U-test was also used to compare categorical variables between two independent groups. The categorical data were expressed in number along with percentages. For comparison of the independent group on a categorical variable, the Chi-square test was used if all the expected values in the contingency table were >5, and Fischer's exact test was used if any of the expected values in the contingency table was <5. For the computation of correlation, Pearson and Spearman correlation coefficient was used for parametric and non-parametric data, respectively, and a *p*-value of <0.05 was considered significant. A Receiver Operating Characteristic (ROC) curve analysis was performed using the pROC package in R. The area under the curve (AUC) was computed to determine the cut-off for syntax score for SDD. All calculations were performed using SPSS® version 17 (Statistical Packages for the Social Sciences, Chicago, IL). The significant factors in the univariate analysis (P<0.05) were explored for the construction of the binomial logistic regression equation. The odds, along with a 95% confidence interval (CI) were computed for the final developed equation.

Results

Patient's enrolment

Out of a total of 628 consecutive PCI performed during the enrolment period, 14 patients who died due to refractory cardiogenic shock or left ventricular failure were excluded (**Figure 1**). Out of the remaining 614 patients, 217 patients were in the SDD group, and 397 patients were in the NDD group. Subsequently, 30 (14%) patients from the SDD group were excluded as they got discharged on the next day because of reasons such as refusal to give consent for SDD, payment issues, lack of transportation during the evening/night hours, and lack of family support. Thirty-nine (10%) patients of the NDD group were excluded as they were discharged later on subsequent days due to clinical instability (hemodynamic instability or left

Table 2. The baseline characteristics of enrolled patients of the two groups

Criteria	Same-day discharge (SDD) (n = 187)	Next-Day Discharge (NDD) (n = 358)	*p*-value
Gender (Female/Male)	27/160	92/266	*0.030*
Ratio	1.0:5.92	1.0:2.89	
Age (years)	58.06 ± 10.04	59.31 ± 10.78	0.178
BMI (Kg/m^2)	25.57 ± 3.75	30.92 ± 5.56	0.524
Hypertension	109 (58.3%)	225 (62.8%)	0.833
Diabetes	68 (36.4%)	180 (50.2%)	0.178
Smoking	48 (25.7%)	92 (25.5%)	0.262
Chronic kidney disease	2 (1.1%)	17 (4.8%)	*0.055*
Peripheral arterial disease	7 (3.7%)	9 (2.5%)	0.242
Clinical diagnosis			
Chronic stable angina	83 (44.4%)	130 (36.3%)	*0.015*
Unstable angina	35 (18.7%)	91 (25.4%)	*0.015*
Myocardial infarction	69 (36.9%)	137 (38.2%)	*0.015*
	NSTEMI - 10 (14.5%)	NSTEMI - 33 (24%)	
	Primary PCI - 0	Primary PCI - 2 (1.5%)	
	Rescue PCI - 0	Rescue PCI - 23 (16.8%)	
	Pharmaco-invasive-59 (85.5%)	Pharmaco-invasive-79 (57.7%)	
Prior CABG	1 (0.5%)	7 (1.9%)	0.267
Prior PCI	22 (11.8%)	78 (21.7%)	*0.045*
Cardiogenic shock	0 (0.0%)	7 (1.9%)	0.078
Investigations			
Hemoglobin (gm/dl)	13.3 ± 1.51	12.87 ± 1.85	*0.004*
Platelet counts (lakhs/microliter)	2.12 ± 0.78	2.15 ± 0.88	0.773
Urea (mg/dl)	32.28 ± 14.29	36.39 ± 19.95	*0.012*
Creatinine (mg/dl)	0.998 ± 0.53	1.09 ± 0.71	0.088
Fasting sugar (mg/dl)	123.73 ± 14.88	120.8 ± 14.03	*0.020*
Hemoglobin A1c	6.79 ± 1.08	6.437 ± 0.90	*0.001*
Cholesterol (mg/dl)	154.16 ± 30.52	134.88 ± 10.75	*0.002*
LDL-Cholesterol (mg/dl)	94.42 ± 24.72	75.38 ± 10.24	*0.003*
HDL-Cholesterol (mg/dl)	34.30 ± 4.73	37.66 ± 4.50	*0.007*
Triglycerides (mg/dl)	146.47 ± 49.97	110.17 ± 14.33	*0.004*
Left ventricle ejection fraction by Echo (%)	49.85 ± 9.90	47.84 ± 10.28	*0.024*
Distance from Hospital (Kilometers)	90.20 ± 78.86	103.40 ± 86.31	0.352

BMI: Body mass index, CABG: Coronary artery bypass surgery, HDL: high-density lipoprotein, LDL: low-density lipoprotein, NSTEMI: non-ST-elevation myocardial infarction, PCI: percutaneous coronary intervention.

ventricular failure in 28 patients), and local vascular access site complications (Femoral site n = 5, Radial site n = 6, total n = 11). The final analysis was done with 187 SDD and 358 NDD patients (**Figure 1**).

Baseline characteristics

The baseline characteristics such as mean age, body mass index, and conventional coronary risk factors such as diabetes, hypertension, smoking, and peripheral arterial disease were equally distributed in two groups (**Table 2**). Patients with chronic kidney disease were significantly more in NDD (4.8% *vs.* 1.1%, P<0.05). Patients with CSA were frequently discharged on the same day (44% *vs.* 36%, P<0.015). Those with MI, unstable angina, and prior PCI were more frequently discharged on the next day. A pharmaco-invasive approach was used to treat STEMI patients, who were discharged on the same day. The pharmaco-invasive reperfusion strategy includes the administration of a fibrinolytic agent followed by PCI within 24 hours. The number of STEMI in the SDD and NDD group was 59 and 104, respectively. All the STEMI patients received guideline-directed medical therapy during the hospital stay. The

Table 3. The main angiographic and procedural characteristics

Procedural characteristics		Same-day discharge (SDD) (n = 187)	Next-Day Discharge (NDD) (n = 358)	*p*-value
Vascular access	Radial	159 (85%)	258 (71.9%)	<0.001
	Femoral	28 (15.0%)	100 (28.1%)	
Femoral Sheath	6F	28/28 (100%)	80/100 (80%)	0.007
	7F	0/28	20/100 (20%)	
Type of Lesion	A	0 (0%)	21 (5.8%)	<0.001
	B1	47 (25.1%)	82 (22.9%)	
	B2	6 (3.2%)	55 (15.3%)	
	C	134 (71.7%)	200 (55.8%)	
Target Artery	LAD	61 (32.6%)	116 (32.4%)	0.006
	LCX	28 (15.0%)	34 (9.4%)	
	RCA	36 (19.3%)	51 (14.2%)	
	Multi Vessel	43 (23.0%)	71 (19.83%)	
	LM	3 (1.6%)	21 (5.8%)	
	CTO	15 (8.0%)	59 (16.4%)	
	Graft	-	4 (1.1%)	
Syntax Score		8.93 ± 5.65	10.99 ± 5.76	<0.001
Intracoronary Imaging	IVUS/OCT	6 (3.2%)	50 (13.9%)	0.003
In-stent restenosis lesion		7 (3.7%)	18 (5%)	0.773
Stent Thrombosis lesion		-	1 (0.27%)	
Rotablation		3 (1.6%)	16 (4.4%)	0.158
Thrombus		-	10 (2.7%)	0.035
Tirofiban infusion		6 (3.0%)	11 (3%)	
TIMI 3 Score	3	187 (100.0%)	353 (98.8%)	0.137
	2	-	5 (1.2%)	
Stent Length (mm)		30.10 ± 7.42	29.40 ± 7.10	0.272
Stent diameter (mm)		3.11 ± 0.39	3.13 ± 0.38	0.662
More than 1 stents		57 (30.64%)	166 (38.96%)	0.044
Length of Stay (h)		7.55 ± 1.23	21.08 ± 2.82	<0.001
Fluoroscopy time (min)		6.57 ± 4.57	6.46 ± 4.56	0.778
Radiation Dose (mGy)		416.07 ± 303.22	413.17 ± 295.58	0.912

CTO: Chronic total occlusion, IVUS: Intravascular ultrasound, LAD: left anterior descending, LCx: left circumflex, LM: left main, OCT: Optical coherence tomography, RCA: right coronary artery.

mean duration of hospital stay was 1.59 ± 0.5 and 2.60 ± 0.49 days for SDD and NDD in STEMI patients, respectively. Biochemical parameters for diabetic and dyslipidemia were significantly worse in SDD compared to the NDD group. The road distance from our institute to the patient's residence was similar in both the groups (**Table 2**).

Outcomes and follow-up

Patients having transradial access were more in SDD, while those with trans-femoral access were more in NDD (P<0.001) (**Table 3**; **Figure 2**). The transradial access was with 6F sheath in all the patients. The trans-femoral access in 100 NDD patients had 6F femoral sheath in 80% and 7F sheath in remaining 20% of cases. Complex interventions such as PCI of chronic total occlusion, bypass graft lesion, and LM interventions were significantly more in NDD compared to SDD. The syntax score was significantly more in NDD compared to the SDD group (10.99 ± 5.76 *vs.* 8.93 ± 5.65, P<0.001) (**Table 3**; **Figure 3**). The mean stent length (30.10 ± 7.42 mm in SDD *vs.* 29.40 ± 7.10 in NDD, P = 0.272) and stent diameter (3.11 ± 0.39 mm in SDD *vs.* 3.13 ± 0.38 mm in NDD, P = 0.662)

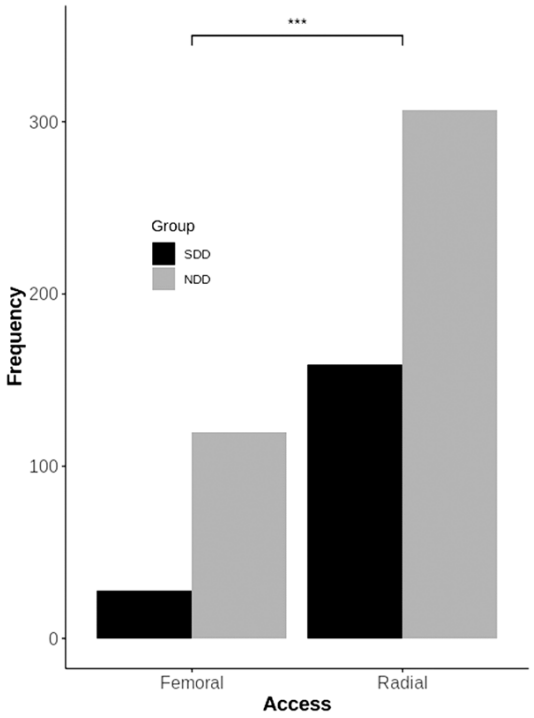

Figure 2. Comparison of arterial access in two groups (***: P<0.001).

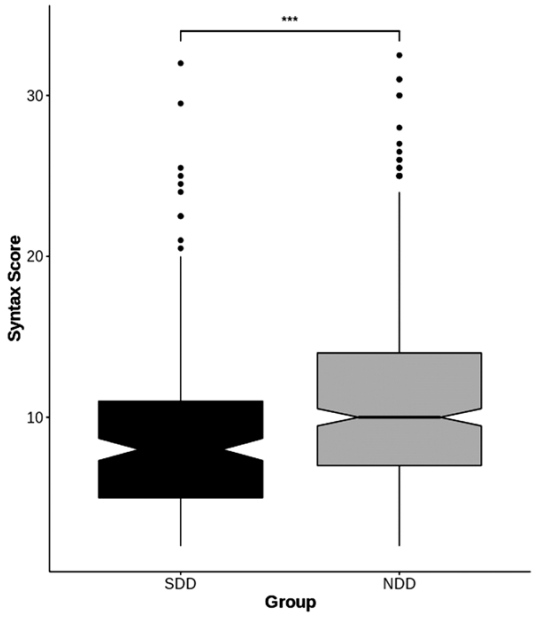

Figure 3. Box-and-Whisker plots showing the comparison of the Syntax score in two groups (***: P<0.001).

were similar in both the groups. The use of more than one-stent was significantly more in NDD (P = 0.044). The use of intravascular imaging was more in NDD patients because of the complexity of lesion (P = 0.003). Rotablation was performed in 3 (1.6%) and 16 (4.4%) patients of SDD and NDD, respectively (P = 0.158). Among the total 19 rotablation cases, one patient of SDD had transradial access, while the rest of 18 patients had trans-femoral access. The PCI complications such as no-flow (n = 2, 0.46%), significant iatrogenic dissection (n = 2, 0.46%), and ventricular tachycardia (n = 2, 0.46%) were observed in NDD; while none had similar complications in SDD. The fluoroscopy time and radiation dose were comparable in both the groups. The length of hospital stay was significantly more in NDD compared to the SDD group (21.08 ± 2.82 *vs.* 7.55 ± 1.23 hours, P = 0.001). None of the SDD patients had any MACCE or hospital readmission during the 6-weeks of follow-up. Two patients in the NDD group had sudden cardiac death at 4 weeks following PCI. Both the patients were of myocardial infarction with an ejection fraction of <35% and possibly died of ventricular arrhythmias, though acute stent thrombosis could not be ruled out. Three patients of NDD had local femoral access site hematoma, which was conservatively managed. In a multivariate analysis, factors that predicted NDD were unstable angina, MI, prior PCI, femoral access, and high syntax score (**Table 4**). Factors such as CSA (P = 0.991), type of lesion (P = 0.984), chronic kidney disease (P = 0.184) and left ventricle ejection fraction (P = 0.535) were not limiting factor for SDD. The cut-off value of the Syntax score for SDD was 8.5 in ROC curve analysis. The Syntax value of 8.5 had a sensitivity of 59%, specificity of 64%, negative predictive value of 41%, and positive predictive value of 79%. In the ROC plot, the area under the curve was moderate (0.625) (**Figure 4**).

Discussion

The most compelling finding of the present study was a patient-centered approach with prospective risk stratification, which facilitated SDD even in complex PCI and patients with comorbid illness. We found a similar patient and procedural characteristics, including risk profile between the two groups. The SDD approach was safe, and adverse outcomes were not statistically different between the two groups. Similar to an earlier study, there was no increase in adverse events (bleeding, repeat

Table 4. Multivariable analysis for Predictors of next-day discharge after percutaneous coronary intervention

Variable	Odds ratio	95% Confidence interval (CI)	*P*-value
Unstable angina	1.77	1.09-2.93	0.024
Myocardial infarction	2.15	1.43-3.25	<0.001
Femoral access	1.88	1.16-3.11	0.012
Prior PCI	1.78	1.05-3.12	0.037
Syntax score	1.07	1.03-1.11	0.001

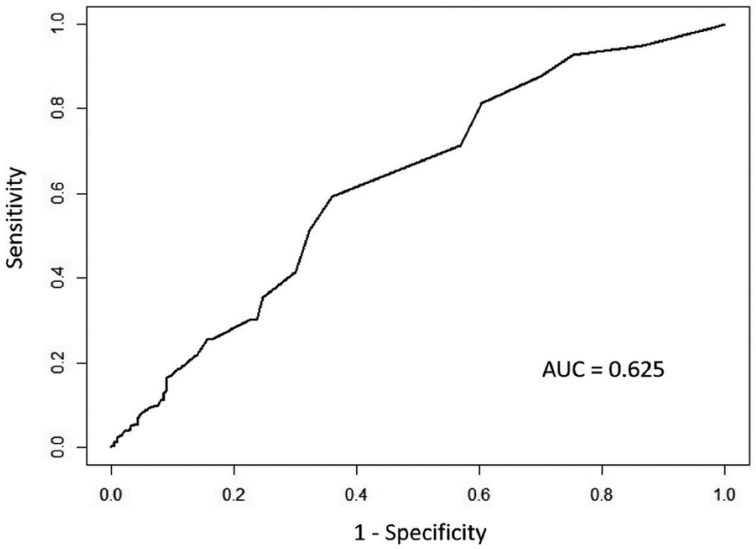

Figure 4. Receiver operator characteristic (ROC) curve of Syntax score, for prediction of same day discharge (AUC: 0.625).

coronary procedures, death, or rehospitalization) among SDD patients as compared with overnight observation [4]. We observed a higher incidence of SDD (30%), whereas, in a multicentre US registry, the initial incidence of SDD for elective PCI in CSA patients was 1.6% in 2008, which later increased to 9.7% in 2016 [9].

Few of the initial studies had enrolled only CSA [2, 5] and simpler lesion for SDD (**Table 5**) [10-12]. Later, studies had also evaluated its safety and feasibility in unstable angina and NSTEMI patients [3, 13-15]. In the present study, we even enrolled STEMI, along with stable and unstable angina patients. Kim et al. and Falcone et al. enrolled only type A and B lesion for SDD [12, 16] while we had 72% type C lesion in SDD patients, which was similar to the study by Amin, et al. [3]. Two meta-analyses of randomized and observations studies [17, 18] had shown no difference in mortality, myocardial infarction, access site complications, and major adverse cardiac events (MACE) between the two groups of CSA patients.

The present study included a high percentage of patients with multivessel disease and chronic total occlusions, which is the true representative of real-world practice. Our observations showed that severe coronary lesions and complex PCI are not the limiting factors for SDD, as observed by a few other studies [2-5]. The majority of patients were of CSA and had simpler lesions for SDD in various studies [10-16]. We had PCI optimization with imaging in 3.2% and 13.9% of SDD and NDD patients, respectively. As imaging could demonstrate certain PCI complications such as stent edge dissection, stent under expansion, or mal-apposition, its use has helped in favorable clinical outcomes [19-22]. Most of the earlier studies had chosen femoral access in their SDD patients [11-16], whereas the study of Amin et al. had transradial access in 42% and 4.5% of SDD and NDD patients, respectively [3]. The present study had transradial access in 85% of SDD patients. The local hemostasis following trans-femoral access was achieved either manually [11, 13] or by VCDs [12-16] by other authors, while all of our transfemoral patients had ProGlide suture-based VCD. Earlier studies had used either double suture Prostar plus device [15], or Mynx, Angioseal, and ProGlide VCD [16]. Globally, there is an increasing trend for radial compared to femoral access for all types of PCI, because of certain advantages such as less access site complication, patient-friendly, early mobility, and cost-effectiveness [23, 24]. The SDD in low-risk patients with transradial access is a safe and feasible strategy [2, 6]. In a meta-analysis of radial versus femoral access for primary PCI, it was found that radial access was associated with a 2-fold reduction in the odds of death and a 1.5-fold

Table 5. Various published studies about same-day discharge (SDD)

Study	Sample size	Access site	Inclusion Criteria	The time duration of SDD discharge	Findings
Bertrand et al. (EASY) [9]	Total-1005 NDD-501 SDD-443	TR	Successful TR-PCI with abciximab bolus	4-6 h post-PCI	● No difference in 30-day clinical events ● 88% of patients assigned to SDD were discharged home the same-day
Heyde et al. (EPOS) [10]	Total-1453 NDD-653 SDD-800	TF without VCD	● Elective planned PCI ● Home factors allowed SDD	4 h post-PCI	● No difference in 24-h safety endpoint between groups ● 81% of patients assigned to SDD were discharged home the same-day
Slagboom et al. [11]	Total-644 NDD-269 SDD-375	TF without VCD and TR	● Stable or unstable angina ● 6F equipment	4-6 h post-PCI	● SDD PCI safe either TR or TF ● A larger proportion of TR discharged due to fewer access site complications ● 38% received only balloon angioplasty ● No difference in safety outcomes after 24 hr and 1 month follow up
Kim et al. (ABCD-PCI) [12]	Total-298 NDD-148 SDD-150	TF with VCD	● Elective PCI ● Type A or B coronary lesions	3 h post-PCI	No difference in safety outcomes after 7 days Significant (79% vs 49%) patient preference for SDD
Clavijo et al. [13]	Total-100 NDD-50 SDD-50	TF with VCD	● Stable and unstable angina or NSTEMI with troponin T<1 ng/ml. ● Lives <60 min of car distance from the hospital	6 h post-PCI	● No differences in clinical outcomes at one year follow up ● Similar patient satisfaction scores ● SDD associated with $1200 cost savings per patient
Carere et al. [14]	Total-100 SDD-50 NDD-50	TF with or without VCD	● Elective or urgent PCI where the operator felt SDD was reasonable	11.15 ± 6.22 h (from the sheath removal)	● 8F Prostar suture closure facilitated earlier discharge (7.1 vs. 15.5 h) ● 20% hematoma rate in both the groups ● Followed up for 8, 24 and 72 h
Falcone et al. [15]	Total-44 NDD-21 SDD-23	TF with VCD	● <75 years of age ● Type A or B lesion	3 h post-PCI	● No significant differences in local site complications ● No difference in adverse events at 7 and 30 days
A meta-analysis of randomized trials. Bundhun et al. [16]	Total-3081 SDD-1598 NDD-1483	TR TF with or without VCD	● Stable CAD and ACS	10 h post-PCI	● 30-days mortality, myocardial infarction (MI), and MACE were not different between the two groups
Meta-analysis (randomized and observational studies) Brayton et al. [17]	Total-16770 SDD-11161 NDD-5609	TR TF with or without VCD	● Stable CAD and ACS	6 h post PCI	● 30-days death, MI, Target lesion revascularization were not different in two groups
Index study	Total-628 SDD-187 NDD-358	TR and TF with VCD	Stable and unstable angina, acute MI. The operator's judgment about SDD is reasonable. LVEF >30%	7.55 ± 1.23 h post-PCI	No difference in 24-h and 6 weeks of safety outcomes between the groups. 86% of patients assigned to SDD were discharged home the same-day

ACS: acute coronary syndrome, CAD: coronary artery disease, MACE: major adverse cardiovascular events, MI: myocardial infarction, NDD: next-day discharge, PCI: percutaneous coronary intervention, SDD: same-day discharge, TF: transfemoral access, TR: transradial access, VCD: vascular closure device.

reduction in the odds of MACE in STEMI patients [25]. We prefer transradial PCI in most of the cases unless there was a need for 7F access or radial access was not available because of the previous catheterization. In the present study, femoral access was used in 15% and 28% of SDD and NDD, respectively. Transfemoral access was one of the variables to have NDD in the present study. The discharge time for SDD was 4-6 hours in most of the studies [10, 11, 13, 14], while the mean discharge time in the present study was about 8 hours. Carere et al. had a mean discharge time of 11 hours after transfemoral access [15]. Our findings correlate with prior studies of SDD in patients with trans-femoral access and VCDs [12, 14-16, 26]. We could discharged 80% of patients assigned to SDD, similar to other's observation [9, 10]. The distance of >50 km from hospital to patient's residence was shown as a limiting factor for SDD [5], while in another study, a home distance of >60 minutes road drive was excluded for SDD [27]. However, the mean home distance in our study was similar and comparable in both the groups, suggesting that the distance was not a limiting factor for SDD.

We did not find a significant difference in safety outcomes of two groups at 6 weeks of follow-up, similar to other studies [12, 14, 16]. Two meta-analyses also confirmed the safety of SDD in terms of adverse events, such as mortality, myocardial infarction, major bleeding, blood transfusion, repeated revascularization, and rehospitalization [17, 18]. None of the 187 SDD patients in the present study had local site vascular complications, stent thrombosis, rehospitalization, repeat PCI, or mortality. While out of 358 NDD patients, 3 had femoral site hematoma, and 2 had sudden cardiac death, possibly because of ventricular arrhythmias. The multivariate analysis revealed that patients with unstable angina, myocardial infarction, femoral access, prior PCI, and higher syntax score had NDD. Factors like CSA, type of lesion, chronic kidney disease and left ventricle ejection fraction were not the limiting factor for SDD. A patient-centered approach and careful peri-procedural risk assessment enabled SDD even in complex cases. The cut-off value of the syntax score for SDD was 8.5, above which patients were discharged on the next day. Our study builds on prior studies that a patient-centered approach and careful peri-procedural risk assessment enable a better informed and cognizant approach to SDD despite femoral access and complex PCI.

Limitations

A selection bias could not be ruled out in this non-randomized trial. Certain techniques such as intravascular imaging, rotablation, and local hemostasis with VCD are known to alter the clinical outcomes, hence the results of the present study should not be extrapolated to other centers, where these techniques are not frequently used. We did not assess the cost-effectiveness of SDD v/s NDD. Results of large randomized trials can help to implement the practice of SDD in a different subset of patients based on clinical presentation, the complexity of the lesion, and associated comorbidities.

Conclusion

The present study demonstrated that SDD is safe and feasible in CSA patients, having transradial access. Those with complex PCI and trans-femoral access preferably discharged on the next day; however, selected patients can have SDD after peri-procedural risk assessment. The increased use of radial access and the use of VCD for femoral access make it feasible to have SDD without any increase in access site complications. The triage of post PCI patients for overnight observation depends upon various clinical, procedural, and socio-demographic criteria. We speculate that a strategy of SDD in most of the PCI cases will ease the patient burden on various health care centers and improve their cost-effectiveness.

Disclosure of conflict of interest

None.

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