Safety and feasibility of same-day discharge after percutaneous coronary intervention for chronic total occlusion: a single center observational cohort study

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Same day discharge (SDD) after the percutaneous coronary intervention (PCI) has been shown in multiple studies to be safe, cost-effective and preferred by patients [1–3]. However, SDD after chronic total occlusion (CTO)-PCI has not been studied previously and is the focus of this paper. To examine the safety and efficacy of SDD after CTO-PCI, we performed a retrospective cohort study of 144 consecutive patients with CTO’s treated with PCI at a tertiary care center from September 2016 to September 2018. Data on variables were collected according to the definitions and standards of the American College of Cardiology’s National Cardiovascular Data Registry [4]. SDD was defined as having the same day of admission and discharge from the hospital postprocedure, while nonsame day discharge (NSDD) was defined as one or more hospital day stay postprocedure. The primary outcome of major adverse cardiac events (MACEs) defined as a combined endpoint of all-cause mortality, myocardial infarction, stroke and revascularization obtained postprocedure and at 30-days, respectively. The secondary end point for the study was hospital readmission at 24-h and at 30-days, respectively.

The baseline characteristics of the patients are outlined in Table 1. SDD patients were younger (63±11 vs. 67±11 years, \( P = 0.03 \)) and had a higher left ventricular ejection fraction (53±10 vs. 48±14%, \( P = 0.01 \)) compared NSDD patients. Femoral access was used most commonly (130, 90%). Closure device use was ubiquitous unless prohibited due to vascular anatomy. Patients who were not discharged on the same day underwent CTO PCI of more than one vessel compared to those discharged on the same day (30 vs. 17%, \( P = 0.002 \)). Patients requiring a retrograde CTO crossing strategy were more likely to be not discharged the same day (33 vs. 27%, \( P = 0.03 \)). Patients who developed complications (18 vs. 5%, \( P = 0.02 \)) and those who required mechanical circulatory support (93 vs. 1%, \( P = 0.008 \)) higher contrast volume, greater fluoroscopy time and radiation exposure were more likely to be not discharged the same day. Finally, patients whose procedure end time was after 17:00 h (12 vs. 31%, \( P = 0.007 \)) were also more likely to not be discharged on the same day.

The primary outcome of MACE was low both at postprocedure (4, 2.8%) and at 30-days (3, 2.1%), respectively, among all patients. The occurrence of MACE at 24-h (1.7 vs. 3.6%, \( P = 0.64 \)) and 30-days (1.7 vs. 2.4%, \( P = 1.00 \)) was similar among patients with SDD compared to NSDD. The pre-specified secondary outcome of readmission rates was low at 24 h (6, 4.2%) and at 30-days (11, 7.6%), respectively. In an unadjusted analysis readmission at 24 h (5 vs. 3.6%, \( P = 0.69 \)) and at 30 days (5 vs. 9.5%, \( P = 0.36 \)) were similar among SDD and NSDD patients. After adjusting for the two variables that were different in the baseline characteristics between the two groups (age and left ventricular ejection fraction), 24-h readmission rates [odds ratio (OR) = 1.40; 95% confidence interval (CI): 0.26–7.65; \( P = 0.70 \)] and 30-day readmission rates (OR = 0.54; 95% CI: 0.13–2.22; \( P = 0.39 \)) remained similar between the SDD and NSDD groups.

Next, to identify patients who could safely undergo SDD, a univariate analysis was performed. An antegrade CTO crossing strategy and left ventricular ejection fraction more than 50% were found to be predictors of SDD. Older age, PCI of two or more CTO vessels, presence of complications, use of left ventricular assist device, fluoroscopy time more than 30 min and procedure end time after 17:00 h were negatively associated with SDD. Inputting variables from the univariate analysis into a multivariate model- older age (OR = 1.05; 95% CI: 1.01–1.08; \( P = 0.02 \)), PCI of two or more vessels (OR = 5.07; 95% CI: 5.07: 1.46–17.68; \( P = 0.01 \)), fluoroscopy time more than 30 min (OR = 4.28; 95% CI: 1.71–10.71; \( P = 0.002 \)) and procedure end time after 17:00 h (OR = 3.81; 95% CI: 1.28–11.30; \( P = 0.02 \)) were found to be negative predictors of SDD (Fig. 1). This is the first study that establishes the safety and feasibility of SDD after CTO PCI. Younger age, single vessel CTO PCI, antegrade approach to the CTO-PCI and completion of the procedure before 17:00 h were predictors of safe discharge on the same day after CTO PCI.
The significance of this study is the potential application in savings for the healthcare system, if these findings can be confirmed in a randomized control trial.

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Conflicts of interest

There are no conflicts of interest.

References