Safety of same-day discharge in patients with left main percutaneous intervention

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**To the Editors**

Percutaneous coronary intervention (PCI) has developed an established role in the therapy of left main coronary artery disease (LM-CAD). Several landmark studies demonstrate comparable outcomes for left main PCI (LM-PCI) when compared to coronary artery bypass grafting (CABG) in patients with low to moderate complexity [1,2]. LM-CAD is seen in 4–6% of patients undergoing angiography and comprises an estimated 5% of all PCIs performed [3].

Same-day discharge (SDD) among patients undergoing PCI in several other settings has been shown to be both well tolerated and cost-effective [4,5]. The utility of SDD among patients undergoing LM-PCI remains incompletely described in the literature. In our retrospective analysis, we examined all patients undergoing elective LM-PCI at our center and compared clinical outcomes between those discharged the same day and those admitted overnight. We further describe the clinical characteristics of patients who should be considered for SDD. This study was approved by the Ottawa Health Science Network Research Ethics Board (OHSN-REB Protocol #20190224-01H) to evaluate clinical outcomes following revascularization.

The primary endpoint was a composite of death, myocardial infarction (MI), and hospitalization at 30 days. Secondary endpoints were each of the individual components of the primary endpoint. Time-to-first event was assessed using Kaplan–Meier (KM) survival analysis. KM event rates were reported at different time points (i.e. at 5, 10, 15, 20, 25 and 30 days after the start of the observation). KM survival curves were produced to visualize time to first composite event in SDD and overnight admission cohorts.

This single-center study examined data on all patients undergoing revascularization between 12 February 2008 and 18 September 2020. A total of 1536 patients were screened for potential inclusion in our study. Overall, 992 patients underwent LM-PCI with 267 discharged the same day and 724 discharged for at minimum one night. One hundred ninety-four patients in the overnight arm were discharged the same day and 724 admitted for at minimum one night. Nine (3.4%) events occurred in the SDD group necessitating rehospitalization. Of these events, four were bleeding events, one vascular injury, one renal failure and three admissions were related to preexisting valvular dysfunction. Notably, none of these events occurred in the initial 48 h after discharge. Further, only four readmissions were related to postprocedural complications.

This report demonstrates the safety of SDD after LM-PCI in a selected patient population. In our cohort, SDD is not
associated with an increased risk of death, MI or readmission when assessed at 30 days. More specifically, clinician judgment in selecting patients for SDD after LM-PCI is effective in choosing patients at the lowest risk for complications. In the primary data included in this study, patients chosen for SDD after elective LM-PCI were younger, had less renal dysfunction and had less contrast volume used during their case (Table 1). Given that there were zero deaths in this group, it is improbable that meaningful intervention would change clinical outcomes.

Though limited by the retrospective nature of the analysis and selection bias in which patients were discharged, it does reinforce SDD as a viable option for selected patients following LM-PCI. Readmission rates are low

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**Table 1**  Baseline demographics and characteristics of the same day discharge vs. overnight stay

| Characteristics                                      | Same day            | Overnight           |
|------------------------------------------------------|---------------------|---------------------|
| **Patient characteristics**                          | (N = 267)           | (N = 194)           |
| Age                                                  | 70.9 ± 10.1 [71]    | 73.4 ± 10.8 [75]    |
| Male                                                 | 220 (82.4)          | 134 (69.1)          |
| Current smoking                                      | 53 (19.9)           | 35 (18.0)           |
| Diabetes (type I and II)                             | 93 (34.8)           | 66 (34.0)           |
| Type I                                               | 1 (0.4)             | 1 (0.5)             |
| Type II (diet)                                       | 4 (1.5)             | 2 (1.0)             |
| Type II (insulin)                                    | 23 (8.6)            | 21 (10.8)           |
| Type II (oral agents)                                | 58 (21.7)           | 39 (20.1)           |
| Prior myocardial infarction                          | 113 (42.3)          | 80 (41.2)           |
| Prior cardiac catheterization                        | 234 (87.6)          | 156 (80.4)          |
| Prior PCI                                            | 114 (42.7)          | 64 (33.0)           |
| Prior CABG                                           | 146 (54.7)          | 81 (41.8)           |
| Hypertension                                         | 197 (73.8)          | 138 (71.1)          |
| Peripheral artery disease                            | 43 (16.1)           | 28 (14.4)           |
| Prior CVA                                            | 21 (7.9)            | 15 (7.7)            |
| Dyslipidemia                                         | 219 (82.0)          | 139 (71.6)          |
| Family history of CAD                                | 19 (7.1)            | 12 (6.2)            |
| AF                                                   | 31 (11.6)           | 32 (16.5)           |
| Prior bleeding                                       | 8 (3.0)             | 6 (3.1)             |
| Prior HF                                             | 22 (8.2)            | 33 (17.0)           |
| **NYHA class**                                       |                     |                     |
| 1                                                    | 2 (0.7)             | 3 (1.5)             |
| 2                                                    | 9 (3.4)             | 10 (5.2)            |
| 3                                                    | 4 (1.5)             | 10 (5.2)            |
| 4                                                    | 0 (0.0)             | 8 (4.1)             |
| 5                                                    | 0 (0.0)             | 0 (0.0)             |
| **LVEF**                                             |                     |                     |
| <30%                                                  | 5(1.9)              | 21 (10.8)           |
| 30–45%                                               | 25 (9.4)            | 31 (16.0)           |
| >45%                                                 | 31 (11.6)           | 23 (11.9)           |
| **Contrast volume**                                  | 107.1 ± 134.2 [0]   | 87.2 ± 159.3 [0]    |
| **Creatinine post**                                  | 54.4 ± 79.2 [59]    | 113.5 ± 96.6 [91]   |
| **HGB**                                              | 102.5 ± 57.7 [127]  | 121.5 ± 22.3 [124]  |
| **BMI**                                              | 28.6 ± 5.2 [28]     | 28.6 ± 7.1 [27]     |
| **Lesion**                                           |                     |                     |
| Osital                                               | 24 (9.0)            | 20 (10.3)           |
| Mid                                                  | 6 (2.2)             | 6 (3.1)             |
| Provisional bifurcation                              | 214 (80.1)          | 143 (73.7)          |
| Dedicated bifurcation                                | 20 (7.5)            | 22 (11.3)           |
| Proximal                                             | 3 (1.1)             | 3 (1.5)             |
| Protected LM                                         | 138 (51.7)          | 68 (35.1)           |
| **PCI type**                                         |                     |                     |
| Balloon angioplasty                                  | 33 (12.4)           | 16 (8.2)            |
| Bare metal stent                                     | 8 (3.0)             | 10 (5.2)            |
| First-generation DES                                 | 9 (3.4)             | 18 (9.3)            |
| New generation DES                                   | 217 (81.3)          | 150 (77.3)          |
| Ad hoc PCI                                           | 127 (47.6)          | 75 (38.7)           |
| **Access site**                                      |                     |                     |
| Brachial                                             | 2 (0.7)             | 3 (1.5)             |
| Femoral                                              | 138 (51.7)          | 124 (63.9)          |
| Radial                                               | 125 (46.8)          | 67 (34.5)           |

AF, atrial fibrillation; CABG, coronary artery bypass graft; CAD, coronary artery disease; CVA, cerebrovascular accident; DES, drug-eluting stent; HGB, Hemoglobin; LM, left main; LVEF, left ventricular ejection fraction; NYHA, New York Heart Association; PCI, percutaneous coronary intervention.
with all events occurring after 48 h negating any potential benefit of overnight admission postelective LM-PCI. Patient selection is important in the decision to discharge patients following LM-PCI. Frameworks for SDD after PCI already exist in non-LM-PCI [6]. The results of this study add to the growing global experience with LM-PCI and its safety in a streamlined same-day process.

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**Conflicts of interest**

There are no conflicts of interest.

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Time to event curves same-day discharge vs. overnight hospitalization for the composite primary outcome and individual components. (a) Composite primary outcome; (b) mortality; (c) myocardial infarction; and (d) rehospitalization. Time-to-first event was assessed using Kaplan–Meier (KM) survival analysis. KM event rates were reported at different time points (i.e. at 5, 10, 15, 20, 25 and 30 days after the start of the observation). KM survival curves were produced to visualize time to first composite event in same-day discharge and overnight admission cohorts.