

**Supplemental Table 1.** In-hospital mortality within center-volume groups.

| <b>Patients contributed per center</b> | <b>Centers contributing mortality data, n</b> | <b>Non-dialysis deaths, n/N (%)</b> | <b>Dialysis deaths, n/N (%)</b> | <b>Dialysis vs non-dialysis mortality OR (95% CI)</b> | <b>Unadjusted p-value</b> | <b>p-value, Holm</b> |
|----------------------------------------|-----------------------------------------------|-------------------------------------|---------------------------------|-------------------------------------------------------|---------------------------|----------------------|
| ≤400                                   | 36                                            | 19/4957 (0.3%)                      | 1/147 (0.7%)                    | 1.59 (0.18-13.81)                                     | 0.673                     | 0.673                |
| 401-800                                | 12                                            | 20/5424 (0.4%)                      | 3/165 (1.8%)                    | 5.37 (1.51-19.14)                                     | 0.010                     | 0.019                |
| >800                                   | 6                                             | 44/7084 (0.6%)                      | 4/135 (2.9%)                    | 4.70 (1.64-13.47)                                     | 0.004                     | 0.012                |

OR = odds ratio

**Supplemental Table 2. Comparison of the clinical characteristics of dialysis patients who experienced MACE vs. those who did not experience MACE.**

| <b>Variables</b>                       | <b>MACE (n = 13)</b> | <b>No MACE (n = 434)</b> | <b>p-value</b> |
|----------------------------------------|----------------------|--------------------------|----------------|
| Age (years)                            | 67.08 ± 9.81         | 63.20 ± 10.41            | 0.218          |
| Gender, male                           | 76.9% (10)           | 76.7% (333)              | >0.999         |
| Baseline creatinine (mg/dL)            | 5.55 [3.29, 7.73]    | 5.70 [4.01, 7.80]        | 0.941          |
| Body mass index (kg/m <sup>2</sup> )   | 25.26 ± 4.01         | 29.20 ± 6.60             | 0.038          |
| Diabetes mellitus                      | 69.2% (9)            | 70.6% (302)              | >0.999         |
| Hypertension                           | 100.0% (13)          | 93.3% (401)              | >0.999         |
| Dyslipidemia                           | 92.3% (12)           | 87.5% (372)              | >0.999         |
| Smoking, current                       | 33.3% (4)            | 14.7% (60)               | 0.093          |
| Left ventricular ejection fraction (%) | 47.00 ± 12.86        | 44.72 ± 13.56            | 0.676          |
| Family history of CAD                  | 18.2% (2)            | 19.1% (65)               | >0.999         |
| Heart failure                          | 46.2% (6)            | 52.9% (219)              | 0.632          |
| Prior PCI                              | 30.8% (4)            | 63.9% (269)              | 0.020          |
| Prior MI                               | 46.2% (6)            | 41.8% (166)              | 0.755          |
| Prior CABG                             | 30.8% (4)            | 31.7% (132)              | >0.999         |
| Cerebrovascular disease                | 23.1% (3)            | 17.7% (73)               | 0.711          |
| Peripheral arterial disease            | 15.4% (2)            | 29.6% (120)              | 0.362          |
| <b>CAD presentation</b>                |                      |                          | 0.586          |
| Stable angina                          | 58.3% (7)            | 56.0% (228)              |                |
| Unstable angina                        | 0.0% (0)             | 12.5% (51)               |                |
| NSTEMI                                 | 16.7% (2)            | 13.0% (53)               |                |
| STEMI                                  | 0.0% (0)             | 2.0% (8)                 |                |
| No symptoms                            | 25.0% (3)            | 12.5% (51)               |                |
| Nonischemic symptoms                   | 0.0% (0)             | 3.9% (16)                |                |

CABG = coronary artery bypass graft; CAD = coronary artery disease; MACE = major adverse cardiac events; MI = myocardial infarction; NSTEMI = non-ST-segment elevation myocardial infarction; PCI = percutaneous coronary intervention; STEMI = ST-segment elevation myocardial infarction.

**Supplemental Table 3. Comparison of the angiographic characteristics of dialysis patients who experienced MACE vs. those who did not experience MACE.**

| Variables                             | MACE (n = 13) | No MACE (n = 434) | p-value |
|---------------------------------------|---------------|-------------------|---------|
| <b>CTO target vessel</b>              |               |                   | 0.5     |
| Right coronary artery                 | 69.2% (9)     | 46.8% (195)       |         |
| Left anterior descending              | 15.4% (2)     | 28.1% (117)       |         |
| Left circumflex                       | 15.4% (2)     | 23.5% (98)        |         |
| Left main                             | 0.0% (0)      | 0.2% (1)          |         |
| Other                                 | 0.0% (0)      | 1.4% (6)          |         |
| Interventional collaterals            | 91.7% (11)    | 53.3% (192)       | 0.009   |
| Lesion diameter (mm)                  | 3.11 ± 0.60   | 2.89 ± 0.54       | 0.2     |
| Lesion length (mm)                    | 30.17 ± 14.68 | 32.59 ± 20.78     | >0.9    |
| Proximal cap ambiguity                | 66.7% (8)     | 32.6% (126)       | 0.025   |
| Side branch at the proximal cap       | 90.0% (9)     | 52.9% (185)       | 0.023   |
| Blunt/no stump                        | 91.7% (11)    | 51.9% (210)       | 0.006   |
| Moderate/severe calcification         | 66.7% (8)     | 68.2% (277)       | >0.9    |
| Moderate/severe proximal tortuosity   | 33.3% (4)     | 32.1% (130)       | >0.9    |
| In-stent restenosis                   | 8.3% (1)      | 21.8% (86)        | 0.5     |
| J-CTO score                           | 2.85 ± 0.90   | 2.57 ± 1.14       | 0.4     |
| CASTLE score                          | 2.55 ± 1.37   | 2.05 ± 1.22       | 0.2     |
| PROGRESS-CTO score                    | 1.17 ± 0.83   | 1.32 ± 1.07       | 0.7     |
| PROGRESS-CTO MACE score               | 4.36 ± 1.43   | 2.83 ± 1.62       | 0.003   |
| PROGRESS-CTO Mortality score          | 2.64 ± 1.21   | 2.08 ± 1.08       | 0.12    |
| PROGRESS-CTO Pericardiocentesis score | 3.18 ± 1.17   | 2.09 ± 1.27       | 0.007   |
| PROGRESS-CTO Acute MI score           | 1.22 ± 0.44   | 1.03 ± 0.85       | 0.4     |
| PROGRESS-CTO Perforation score        | 3.82 ± 1.33   | 2.37 ± 1.45       | 0.002   |

CASTLE = Coronary artery bypass grafting history, Age, Stump anatomy, Tortuosity degree, Length of occlusion, and Extent of calcification; CTO = chronic total occlusion; J-CTO = Japanese chronic total occlusion; MACE = major adverse cardiac events; MI = myocardial infarction; PROGRESS-CTO = Prospective Global Registry for the Study of Chronic Total Occlusion Intervention.

**Supplemental Table 4. Comparison of procedural characteristics of dialysis patients who experienced MACE vs. those who did not experience MACE.**

| <b>Variables</b>                      | <b>MACE (n = 13)</b>    | <b>No MACE (n = 434)</b> | <b>p-value</b> |
|---------------------------------------|-------------------------|--------------------------|----------------|
| Technical success                     | 46.2% (6)               | 86.4% (375)              | <0.001         |
| Procedural success                    | 0.0% (0)                | 86.4% (375)              | <0.001         |
| <b>First crossing strategy</b>        |                         |                          | 0.007          |
| Antegrade wiring                      | 53.8% (7)               | 85.9% (373)              |                |
| Antegrade dissection and re-entry     | 0.0% (0)                | 3.0% (13)                |                |
| Retrograde approach                   | 46.2% (6)               | 11.1% (48)               |                |
| <b>Successful crossing strategy</b>   |                         |                          | 0.007          |
| Antegrade wiring                      | 15.4% (2)               | 55.9% (241)              |                |
| Antegrade dissection and re-entry     | 15.4% (2)               | 12.8% (55)               |                |
| Retrograde approach                   | 38.5% (5)               | 18.1% (78)               |                |
| None                                  | 30.8% (4)               | 13.2% (57)               |                |
| Retrograde wiring used                | 84.6% (11)              | 29.5% (128)              | <0.001         |
| Balloon uncrossable CTO lesion        | 30.0% (3)               | 14.1% (49)               | 0.2            |
| Balloon undilatable CTO lesion        | 28.6% (2)               | 12.8% (41)               | 0.2            |
| Number of stents                      | 2.50 ± 1.05             | 2.16 ± 0.94              | 0.4            |
| Procedure time (minutes)              | 249.00 [202.00, 382.50] | 124.00 [86.00, 172.00]   | <0.001         |
| Contrast volume (mL)                  | 350.00 [225.00, 600.00] | 185.00 [130.00, 265.00]  | <0.001         |
| Fluoroscopy time (minutes)            | 102.80 [67.90, 134.00]  | 44.10 [28.00, 67.00]     | <0.001         |
| Patient air kerma radiation dose (Gy) | 2.71 [1.77, 4.13]       | 2.14 [1.08, 3.32]        | 0.2            |

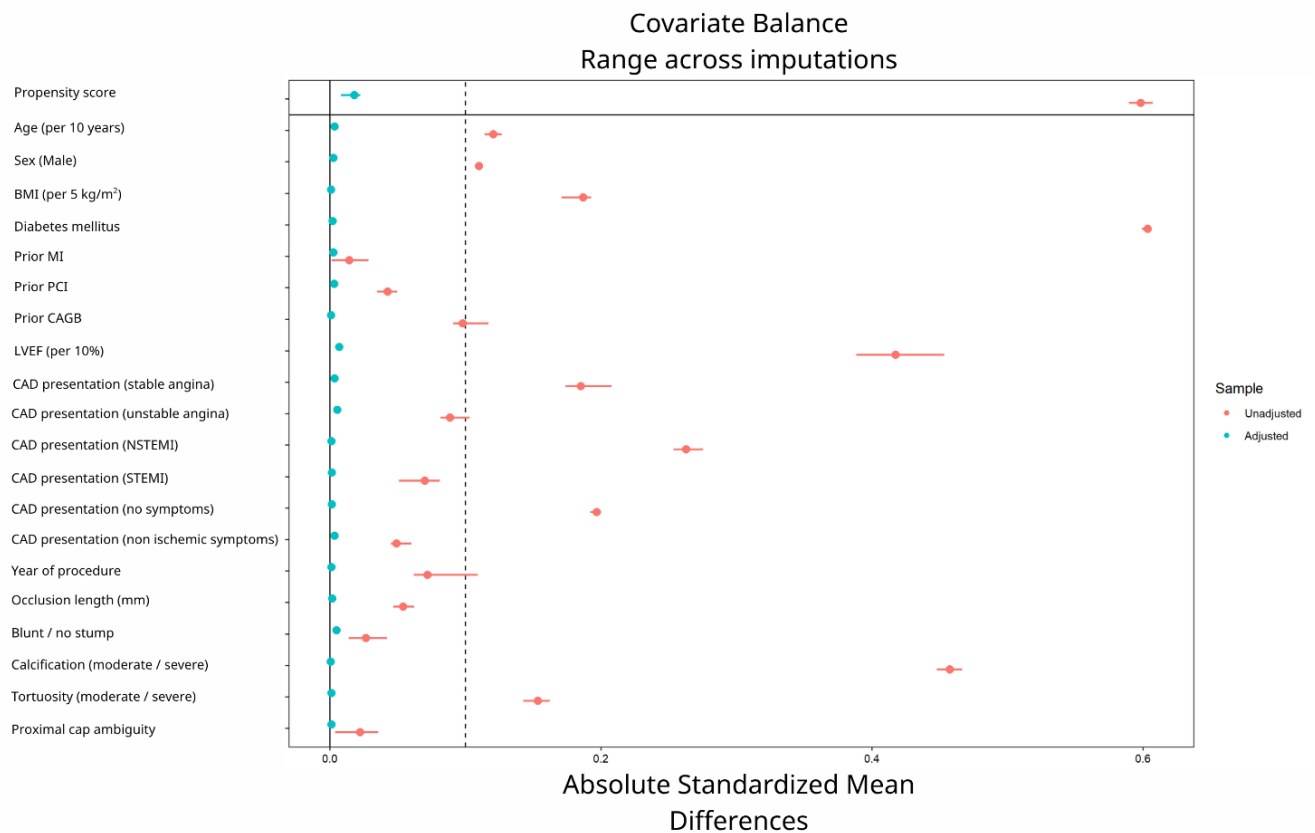
CTO = chronic total occlusion; MACE = major adverse cardiac events.

**Supplemental Table 5. Outcomes after PCI of dialysis patients who experienced MACE vs. those who did not experience MACE.**

| <b>Variables</b>    | <b>MACE (n = 13)</b> | <b>No MACE (n = 434)</b> | <b>p-value</b> |
|---------------------|----------------------|--------------------------|----------------|
| Elective pVAD       | 7.7% (1)             | 2.5% (11)                | 0.3            |
| Urgent pVAD         | 23.1% (3)            | 0.7% (3)                 | <0.001         |
| Perforation         | 30.8% (4)            | 3.9% (17)                | 0.002          |
| Dissection/Thrombus | 7.7% (1)             | 0.7% (3)                 | 0.11           |
| Repeat PCI          | 0.0% (0)             | 0.0% (0)                 | —              |
| <b>MACE</b>         |                      |                          |                |
| Death               | 61.5% (8)            | 0.0% (0)                 |                |
| Acute MI            | 30.8% (4)            | 0.0% (0)                 |                |
| Stroke              | 0.0% (0)             | 0.0% (0)                 |                |
| Emergency CABG      | 7.7% (1)             | 0.0% (0)                 |                |
| Pericardiocentesis  | 30.8% (4)            | 0.0% (0)                 |                |

CABG = coronary artery bypass graft; MACE = major adverse cardiac events; MI = myocardial infarction; PCI = percutaneous coronary intervention; pVAD = percutaneous ventricular assist device.

**Supplemental Figure. Covariate balance before and after adjustment across imputed datasets.**



BMI = body mass index; MI = myocardial infarction; PCI = percutaneous coronary intervention; CABG = coronary artery bypass graft; LVEF = left ventricular ejection fraction; CAD = coronary artery disease; NSTEMI = non ST-elevation myocardial infarction; STEMI = ST-elevation myocardial infarction