1. **Definition of PSM**

The propensity score matching (PSM) is a special statistical method to balance baseline characteristics between different groups, especially for observational studies. It is based on the propensity score, the probability of a subject to receive a treatment conditional on the set of confounders, and achieve the matching process by collapsing all confounders into a single value. Matching patients with a similar estimated PS showed approximate balance for all the confounders (Benedetto U, et al, Eur J Cardiothorac Surg. 2018;53(6):1112-1117.)

Pre matched analysis is the regular multivariate analysis of the overall population, and post matched analysis is the analysis only for post-matched populations.

As the sample size in optimal medical treatment (OMT) group was quite small (n=86), PSM was conducted only between complete and incomplete percutaneous coronary intervention (PCI) group.

**Supplementary Table 1: Adverse events during hospitalization between the complete vs. incomplete PCI groups**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Incomplete PCI (n=327) | Complete PCI (n=145) | P |
| Coronary dissection (%) | 16(4.9) | 0(0.0) | 0.004 |
| Coronary perforation (%) | 6(1.8) | 0(0.0) | 0.184 |

PCI: percutaneous coronary intervention

**Supplementary Table 2: Cox analyses of clinical outcomes between the OMT vs. incomplete PCI groups**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | OMT (n=86) | Incomplete PCI (n=327) | Unadjusted HR (95%CI) | P |
| MACE (%) | 37(43.0) | 100(30.6) | 0.75(0.51-1.09) | 0.131 |
| All-cause death (%) | 5(5.8) | 7(2.1) | 0.39(0.12-1.23) | 0.109 |
| Recurrent MI (%) | 4(4.7) | 13(4.0) | 0.89(0.29-2.72) | 0.834 |
| Repeated revascularization (%) | 7(8.1) | 40(12.2) | 1.58(0.71-3.52) | 0.267 |
| Unstable angina (%) | 21(24.4) | 63(19.3) | 0.83(0.51-1.36) | 0.452 |
| Heart failure (%) | 4(4.7) | 13(4.0) | 0.99(0.32-3.06) | 0.991 |

CI: confidence interval; HR: hazard ratio; MACE: major adverse cardiovascular event; MI: myocardial infarction; OMT: optimal medical treatment; PCI: percutaneous coronary intervention

**Supplementary Table 3: Cox analyses of clinical outcomes among patients with incomplete PCI**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Failed in CTO revascularization (n=270) | Failed in non-CTO revascularization (n=57) | unadjusted HR (95%CI) | P |
| MACE (%) | 84(31.1) | 7(12.3) | 0.39(0.18-0.84) | 0.017 |
| All-cause death (%) | 4(1.5) | 0(0.0) | - | - |
| Recurrent MI (%) | 10(3.7) | 1(1.8) | 0.45(0.06-3.54) | 0.449 |
| Repeated revascularization (%) | 30(11.1) | 4(7.0) | 0.63(0.22-1.78) | 0.381 |
| Unstable angina (%) | 48(17.8) | 3(5.3) | 0.29(0.09-0.93) | 0.038 |
| Heart failure (%) | 8(3.0) | 1(1.8) | 0.68(0.09-5.49) | 0.719 |

CI: confidence interval; CTO: chronic total occlusion; HR: hazard ratio; MACE: major adverse cardiovascular event; MI: myocardial infarction

**Supplementary Table 4: COX multivariate analysis of risk factors for MACEs and unstable angina in** **total population.**

|  |  |  |
| --- | --- | --- |
| Risk factors | HR (95%CI) | P |
| Complete PCI | reference |  |
| OMT | 2.00(1.23-3.27) | 0.005 |
| Incomplete PCI | 1.58(1.04-2.39) | 0.031 |
| CKD stages Ⅲ-Ⅳ | 2.08(1.37-3.15) | 0.001 |

CI: confidence interval; CKD: chronic kidney disease; HR: hazard ratio; MACE: major adverse cardiovascular event; OMT: optimal medical treatment; PCI: percutaneous coronary intervention

Multiple factors including age, male, diabetes mellitus, previous MI, CKD stages Ⅲ-Ⅳ, LVEF, location and number of CTOs was adjusted.

**Supplementary Table 5: Cox analyses of the clinical outcomes stratified by renal function.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | CKD stages Ⅰ-Ⅱ (n=505) |  | CKD stages Ⅲ-Ⅴ(n=53) |
|  | OMT vsComplete PCI | Incomplete PCI vs Complete PCI |  | OMT vsComplete PCI | Incomplete PCI vs Complete PCI |
|  | adjusted HR (95% CI) | p | adjusted HR (95% CI) | p |  | adjusted HR (95% CI) | p | adjusted HR (95% CI) | p |
| MACE (%) | 2.07(1.24-3.48) | 0.006 | 1.43(0.93-2.22) | 0.105 |  | 2.08(0.35-12.20) | 0.419 | 4.39(0.95-20.17) | 0.057 |
| All-cause death (%) | - | - | - | - |  | - | - | - | - |
| Recurrent MI (%) | 0.88(0.21-3.65) | 0.863 | 0.47(0.14-1.57) | 0.218 |  | - | - | - | - |
| Repeated revascularization (%) | 0.98(0.37-2.62) | 0.967 | 1.44(0.75-2.75) | 0.269 |  | - | - | - | - |
| Unstable angina (%) | 2.33(1.45-4.72) | 0.020 | 1.81(1.01-3.23) | 0.046 |  | - | - | - | - |
| Heart failure (%) | 0.99(0.17-5.79) | 0.987 | 1.36(0.37-5.02) | 0.642 |  | - | - | - | - |

CI: confidence interval; CKD: chronic kidney disease; HR: hazard ratio; MACE: major adverse cardiovascular event; MI: myocardial infarction; OMT: optimal medical treatment; PCI: percutaneous coronary intervention; -: not available.