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**Background:** As compared with incomplete revascularization, complete revascularization (CR) achieved by percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG) confers a clinical benefit in left main and/or multi-vessel coronary disease. This study aimed to evaluate the 3-year clinical outcomes after a staged PCI strategy (staged procedures to achieve CR within 3 months post the initial procedure) compared to culprit-lesion PCI and CABG for the treatment of complex de novo left main disease (LMD). **Methods:** A total of 144 consecutive patients with high SYNTAX score and low surgical risk LMD were included in the retrospective analysis. Among them, 21 (14.6%) patients underwent staged PCI, 64 (44.4%) patients underwent culprit-lesion PCI only, and 59 (41.0%) patients underwent CABG. Major adverse cardio-cerebral events (MACCE) regarding death, myocardial infarction (MI), stroke, and target vessel failure (TVF) during 3-year follow-up were collected. **Results:** The 3-year MACCE was significantly increased in staged and culprit-lesion PCI groups, compared to that of the CABG group (29% vs. 31% vs. 13%,  $p=0.012$ ), mainly driven by TVF. However, the composite of death/stroke/MI occurred significantly less frequently in the staged PCI and CABG groups, compared to that of the culprit-lesion PCI group (2% vs. 3% vs. 9%,  $p=0.027$ ). **Conclusion:** For patients with complex LMD, there is a higher incidence of MACCE in patients undergoing PCI compared to patients undergoing CABG. However, a staged PCI strategy so as to achieve CR improves the composite of death/stroke/MI.