

EDITORIAL COMMENT



# Off-Pump CABG Surgery “No-Touch” Technique to Reduce Adverse Neurological Outcomes\*

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The indications to perform percutaneous coronary intervention (PCI) have expanded with advancements in stent technology. The SYNTAX (Synergy between Percutaneous Coronary Intervention with Taxus and Cardiac Surgery) trial demonstrated that coronary artery bypass grafting (CABG) is the gold standard for patients with higher SYNTAX scores, typically those with left main and 3-vessel disease (1). However, PCI has gained value in patients who have increased risks for CABG surgery and has become a reasonable alternative to those patients who have favorable low risk for PCI and high probability of good long-term outcome. The Society of Thoracic Surgeons predicted risk mortality algorithm score allows measurement of the patient’s surgical risk profile and in combination of the SYNTAX score presents valuable tools in the determination of modality of revascularization. CABG, compared to PCI, in high SYNTAX score patients, will typically provide more complete revascularization but with 2 main limitations: vein graft failure as high as 30% at 1 year (2) and increased risk of stroke at 12 months (1).

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Thus, to minimize the risk of adverse events, different modalities of CABG surgery have been developed. In this issue of the *Journal*, in the network meta-analysis of Zhao et al. (3) the authors compare post-operative outcomes between different

techniques of CABG surgery: an aortic off-pump (or “no-touch” technique) (4), off-pump with the clampless Heartstring device (St. Jude Medical, Saint Paul, Minnesota), off-pump with a partial clamp, and on-pump CABG with conventional aortic cross clamping.

There were 13 studies with 37,720 patients. Using the no-touch technique, the rate of stroke was significantly lower compared to other CABG modalities (from -78% vs. conventional CABG, -66% vs. off-pump CABG with a partial clamp, -52% vs. off-pump CABG with the clampless Heartstring device) along with lower mortality and renal failure. Interestingly, the risk of stroke seemed to be directly related to the extent of aortic manipulation (from lower using the no-touch technique to higher using conventional aortic cannulation and clamping).

As the main drawback of the large meta-analysis, the granularity of the data is lost: It is not possible to determine how many have used intraoperative epiaortic ultrasound, what type of no-touch technique was used to perform the proximal anastomoses, and the completeness of revascularization. Off-pump surgery has plateaued in its use principally because of its increased technical challenges, lower rate of complete revascularization, and lower patency rates compare to on-pump CABG surgery.

Although the debate remains whether off-pump CABG surgery is equal or superior to on-pump CABG surgery, we would suggest that off-pump CABG surgery is just another tool for the surgeon, and the decision to perform the no-touch technique off-pump CABG versus on-pump CABG should be tailored to the patient needs and surgical risk profile. In patients with increased cerebrovascular disease or atherosclerotic disease in the aorta (as demonstrated by computed tomography and intraoperative epiaortic ultrasound), a no-touch technique is probably a

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superior approach compared to conventional on-pump CABG with aortic clamping. In these high-risk patients, completeness of revascularization may be less important than reducing the risk of major adverse neurological outcomes.

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