Literature Reviews

Prognostic significance of multiple previous percutaneous coronary interventions in patients undergoing elective coronary artery bypass surgery.

M, Leyh R, Massoudy P, et al. Circulation 2006;114[suppl I]:I441-I447.

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Abstract Excerpt

There is a question of whether multiple percutaneous coronary interventions (PCI) lead to increased perioperative risk during coronary artery bypass graft surgery (CABG). This study compared 2626 consecutive patients undergoing first-time isolated CABG (group 1) to 360 patients who had single PCI (group 2) and 289 patients who had multiple PCI sessions (group 2) prior to CABG. Statistical analysis revealed that multiple PCI sessions prior to CABG was associated with increased in-hospital mortality and major adverse cardiac events (MACEs). The authors conclude that patients with a history of multiple PCI sessions prior to CABG were at increased perioperative risk of morbidity and mortality.

Reviewer's Comments

The number of patients undergoing PCI has risen dramatically in recent years and as techniques and experience have improved, more complicated lesions and multiple stenting procedures are being performed on patients. However, PCI is not effective in all patients, and despite multiple interventions, some of these patients present for surgical revascularization after stenting procedures. This study is the first to identify that patients who have had multiple PCI sessions are at risk for increased perioperative mortality and major adverse cardiac events (including perioperative myocardial infarction and low cardiac output syndrome). Multiple theories are postulated, including more coronary endothelial injury secondary to stent placement, compromised collateral blood flow secondary to multiple stent placement, and increased surgical difficulty with respect to more distal anastamoses on target vessels (targets need to be distal to stent placement) where vessel diameter may be smaller.

There are several limitations to this study. First, it is retrospective in design and the results may be influenced by bias. Most patients also had bare-metal stents, not drug-eluting stents. Additionally, all results are from a single medical center, and therefore results may not be applicable to all institutions. There is also no evidence of increased stent thromboses in patients undergoing previous PCI. Finally, there were some statistical differences between groups. Ejection fractions were similar, but patients with multiple PCI sessions had more previous myocardial infarctions and hyperlipidemia than their counterparts who had had no previous PCI. Neither one of these factors through multivariable and univariable analyses were found to be statistical risk factors for worse outcomes, however.

Overall, this study confirms what many practitioners probably have already known: patients with multiple PCI sessions have higher perioperative risk. Proving this with data may lead to patients and practitioners opting for earlier CABG rather than repeated PCI sessions for patients at risk for multiple revascularization attempts. Additionally, as the scope of our practice changes, and more of our CABG patients have previous PCI sessions, we need to be even more vigilant in attempting to reduce perioperative risks for these patients. Finally, with the rise of drug-eluting stents being used, patients who have had these placed need to be evaluated for surgical outcomes after CABG.