Risk factors for MACE following noncardiac surgery for patients with coronary stents

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Emergency surgery and advanced cardiac disease are risk factors for major adverse cardiac events (MACE) after noncardiac surgery in patients with recent coronary stent implantation, according to a study published by *JAMA*. The study is being released early online to coincide with its presentation at the American College of Surgeons 2013 Annual Clinical Congress.

"Approximately 600,000 percutaneous coronary stent procedures are performed annually in the United States. Twelve to 23 percent of these patients undergo noncardiac surgery within 2 years of coronary stent placement," according to background information in the article. Noncardiac surgery after recent coronary stent placement is associated with increased risk of adverse cardiac events. Delaying necessary noncardiac surgery can pose a clinical dilemma for a large number of patients. "Guidelines recommend delaying noncardiac surgery in patients after coronary stent procedures for 1 year after drug-eluting stents (DES) and for 6 weeks after bare metal stents (BMS). The evidence underlying these recommendations is limited and conflicting."

Mary T. Hawn, M.D., M.P.H., of the University of Alabama at Birmingham, and colleagues conducted a study to determine risk factors for adverse cardiac events in patients undergoing noncardiac surgery within 24 months of coronary stent implantation. The study included 41,989 Veterans Affairs (VA) and non-VA operations performed within 2 years of a coronary stent implantation between 2000 and 2010. The researchers examined the association between timing of surgery and

stent type and major adverse cardiac events (MACE). The primary outcome for the study was a composite 30-day MACE rate of all-cause mortality, heart attack, and cardiac revascularization.

Within 24 months of 124,844 coronary stent implantations (47.6 percent DES, 52.4 percent BMS), 28,029 patients (22.5 percent) underwent noncardiac operations resulting in 1,980 MACE (4.7 percent). The time from stent placement to surgery was associated with MACE for surgery in the first 6 months after the stent procedure, but not for surgery more than 6 months after the stent procedure. The 3 factors most strongly associated with MACE were nonelective surgical admission, having a heart attack in the 6 months preceding surgery, and a revised cardiac risk index score (comprising independent variables that predict an increased risk for cardiac complications) greater than 2.

MACE rate was 5.1 percent for BMS and 4.3 percent for DES. Stent type was not associated with MACE for surgeries more than 6 months after stent placement.

A case-control analysis of 284 matched pairs of patients found no association between cessation of antiplatelet therapy and MACE.

The authors note that there are several considerations that need to be given to these findings, including that the study sample comprised primarily older male patients, thus limiting the generalizability to women or younger men; the clinical factors that influenced stent selection were largely unavailable so they could not be accounted for in the models, and, accordingly, the results could be confounded by those factors; and many patients underwent more than 1 percutaneous coronary intervention (procedures such as balloon angioplasty or stent placement used to open narrowed coronary arteries) procedure during the dates of the study, which could result in misclassification bias for time from stent placement to surgery.

"How should the findings by Hawn et al and other recent studies influence the approach for patients who need surgery after stents?" asks Emmanouil S. Brilakis, M.D., Ph.D., and Subhash Banerjee, M.D., of the VA North Texas Health Care System, Dallas, in an accompanying editorial.

"The approach for patients with BMS should not change; these patients usually can undergo surgery within 6 weeks after coronary stent implantation with very low risk of stent thrombosis. For patients with DES, surgery performed at least 6 months after DES implantation appears to carry low risk for stent thrombosis, especially with contemporary, second-generation DES, which have more biocompatible, durable polymer coatings. Hence, nonurgent operations should be postponed until 6 months after stent implantation."

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