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Anesthesiology 2009; 110:1–1

Practice Alert for the Perioperative Management of Patients with Coronary Artery Stents

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A Report by the American Society of Anesthesiologists Committee on Standards and Practice Parameters

PRACTICE Alerts are consensus-based reports that address specific aspects of patient management, patient care, and patient safety.

This Practice Alert reviews published recommendations that address the perioperative management of surgical patients with recently implanted coronary artery stents. The intent of the Alert is to provide the anesthesiologist with information about (1) the increased risk of perioperative myocardial infarction and death in these patients and (2) the relation between antiplatelet therapy and acute perioperative stent thrombosis.

A major concern after successful coronary artery stent placement is the potential for acute stent thrombosis, with subsequent myocardial infarction and death.[1] To prevent stent thrombosis in the nonsurgical setting, cardiologists typically recommend dual antiplatelet therapy after coronary stent placement. Dual therapy typically consists of a combination of aspirin and thienopyridine.

Premature discontinuation of dual antiplatelet therapy in patients with coronary artery stents who are scheduled to undergo surgery increases the risk of stent thrombosis, myocardial infarction, and death. This opinion was issued as a 2007 Science Advisory by the American Heart Association (AHA), American College of Cardiology (ACC), Society for Cardiovascular Angiography and Interventions, American College of Surgeons, and American Dental Association.[2] This opinion is also supported by the ACC/AHA Guidelines on Perioperative Cardiovascular Evaluation and Care for Noncardiac Surgery.[3]

When Surgery Can Be Postponed

The 2007 Science Advisory and the 2007 ACC/AHA Guidelines make similar recommendations about postponing elective surgery in patients with new coronary stents.

A. The 2007 Science Advisory recommends that elective procedures for which there is significant risk of perioperative or postoperative bleeding should be deferred until an appropriate course of *thienopyridine* therapy has been completed. The course of thienopyridine therapy associated with this recommendation is as follows:

   Bare-metal stents: minimum of 1 month
   Drug-eluting stents: 12 months after implantation if the patient is not at high risk of bleeding

B. The 2007 ACC/AHA Guidelines do not recommend elective noncardiac surgery within the following time periods after stent implantation when *thienopyridine* therapy or *aspirin and thienopyridine* therapy need to be discontinued perioperatively:

   Bare-metal stents: 4–6 weeks
   Drug-eluting stents: 12 months

When Surgery Cannot Be Postponed

If the course of thienopyridine therapy must be *interrupted* in patients with new coronary stents, both the 2007 Science Advisory and the 2007 ACC/AHA Guidelines recommend that *aspirin therapy be continued* throughout the perioperative period, if possible. In addition, both the 2007 Science Advisory and the 2007 ACC/AHA Guidelines recommend that thienopyridine therapy should be *restarted as soon as possible* after the procedure.

Other Considerations

Anticoagulants and antiplatelet agents with *short* half-lives have been suggested as a way to bridge the gap between discontinuation of antiplatelet therapy and surgery. Both the 2007 Science Advisory and the 2007 ACC/AHA Guidelines considered the current evidence for risk and benefits and jointly concluded that there is no evidence that warfarin, antithrombotics, or glycoprotein IIb/IIIa agents reduce the risk of stent thrombosis after discontinuation of oral antiplatelet agents.

In addition, the 2007 ACC/AHA Guidelines recommend that consideration should be given to continuing dual antiplatelet therapy perioperatively beyond the recommended time frame in any patient at high risk for stent thrombosis. Even after thienopyridine has been

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Submitted for publication October 24, 2008. Accepted for publication October 24, 2008. Supported by the American Society of Anesthesiologists under the direction of James F. Arens, M.D., Chair, Committee on Standards and Practice Parameters. Approved by the House of Delegates on October 22, 2008.

Address reprint requests to the American Society of Anesthesiologists: 520 North Northwest Highway, Park Ridge, Illinois 60068-2573. This Practice Alert, as well as all published ASA Practice Parameters, may be obtained at no cost through the Journal Web site, www.anesthesiology.org.

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discontinued, serious consideration should be given to continuation of aspirin antiplatelet therapy perioperatively in any patient with a drug-eluting stent.

Summary of Recommendations from the 2007 Science Advisory and the 2007 ACC/AHA Guidelines

- *Premature discontinuation* of dual antiplatelet therapy in patients with new coronary stents is associated with an *increased risk of life-threatening stent thrombosis* in the perioperative period. The time period for this risk is 4–6 weeks for bare-metal stents and 12 months for drug-eluting stents.
- Recommendations about the *timing of elective surgery* in patients with new coronary stents are given in slightly different ways by the 2007 Science Advisory and the 2007 ACC/AHA Guidelines. The 2007 Science Advisory states that elective procedures for which there is a significant risk of perioperative or postoperative bleeding should be *deferred* until patients have completed an appropriate course of thienopyridine therapy. The 2007 ACC/AHA Guidelines state that elective noncardiac surgery is *not recommended* when thienopyridine therapy or thienopyridine and aspirin therapy *needs to be continued* during the perioperative period. For both recommendations, the prescribed period of thienopyridine therapy or thienopyridine and aspirin therapy is a minimum of 1 month or 4–6 weeks for bare-metal stents and 12 months for drug-eluting stents.
- *If surgery cannot be deferred* and thienopyridine therapy must be *interrupted* in patients with new coronary stents, *aspirin should be continued* if possible. The thienopyridine should be *restarted as soon as possible* after the surgical procedure.
- Consideration should be given to continuing dual antiplatelet therapy perioperatively beyond the recommended time frame in any patient at high risk for stent thrombosis. Even after thienopyridine has been discontinued, serious consideration should be given to continuation of aspirin antiplatelet therapy perioperatively in any patient with a drug-eluting stent.

References

1. Iakovou I, Schmidt T, Bonizzoni E, Ge L, Sangiorgi GM, Stankovic G, Airoldi F, Chieffo A, Montorfano M, Carlino M, Michev I, Corvaja N, Briguori C, Gerckens U, Grube E, Colombo A: Incidence, predictors, and outcome of thrombosis after successful implantation of drug-eluting stents. JAMA 2005; 293:2126–30

2. Grines CL, Bonow RO, Casey DE, Gardner TJ, Lockhart PB, Moliterno DJ, O'Gara P, Whitlow P: Prevention of premature discontinuation of dual antiplatelet therapy in patients with coronary artery stents: A science advisory from the American Heart Association, American College of Cardiology, Society for Cardiovascular Angiography and Interventions, American College of Surgeons, and American Dental Association, with representation from the American College of Physicians. Circulation 2007; 115:813–8

3. Fleisher LA, Beckman JA, Brown KA, Calkins H, Chaikof E, Fleischmann KE, Freeman WK, Froehlich JB, Kasper EK, Kersten JR, Riegel B, Robb JF: ACC/AHA guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery: Executive summary. Circulation 2007; 116:1971–96