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Are Guidelines Needed for the Performance of Invasive Interventional Procedures for Minimally Invasive Cardiac Surgery?

To the Editor:—One result of the recent increase in popularity of minimally invasive cardiac surgery is that anesthesiologists are increasingly being called on to directly assist in the surgical management of the patient by performing invasive interventional procedures such as placement of a coronary sinus (CS) catheter or pulmonary artery vent. In the August issue of ANESTHESIOLOGY, Abramson and Giannotti report a case of unrecognized, iatrogenic perforation of the right ventricle while attempting to cannulate the CS during preparation for minimally invasive cardiac surgery.¹ Although the technical difficulty and morbidity associated with CS catheter placement are low when performed by experienced personnel,^{2,3} patient care may be compromised when a single anesthetic provider is asked to perform interventional procedures while simultaneously being responsible for patient monitoring and the delivery of a safe anesthetic.

In our institution, the attending anesthesiologist identifies and maintains visualization of the CS with transesophageal echocardiography (TEE) while the cardiac anesthesia fellow manipulates the CS catheter. Simultaneously, a dedicated anesthesia resident is responsible for patient monitoring and anesthetic delivery. Although this may work well in an academic institution, we realize that this level of staffing is not practically feasible or profitable in most circumstances. We contend, however, that patient care may be compromised when a single anesthetic provider is called on to simultaneously perform TEE, cannulate the CS, and deliver anesthesia. Thus, the presence of a second dedicated anesthesia provider during the performance of such invasive interventional procedures may be necessary to ensure quality patient care. We wonder if the American Society of Anesthesiologists and the Society of Cardiovas-

cular Anesthesiologists should consider this issue and formulate practice guidelines regarding patient care during the performance of interventional invasive procedures such as cannulation of the CS for minimally invasive cardiac surgery.

Wilfred R. Lewis, M.D.
Fellow in Cardiac Anesthesia
Charles D. Collard, M.D.
Instructor of Anesthesia
Department of Anesthesia
Brigham & Women's Hospital
Harvard Medical School
Boston, Massachusetts 02115
collard@zeus.bwh.harvard.edu

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Coronary Sinus Catheterization for Minimally Invasive Cardiac Surgery

To the Editor:—For minimally invasive cardiac surgery, the Endocoronary Sinus™ catheter (Heartport, Redwood City, CA) is placed *via* a percutaneous venous introducer and permits delivery of cardioplegic solution into the coronary sinus after the tip of the catheter is positioned in the coronary sinus.¹ Abramson and Giannotti described right ventricular perforation associated with attempted placement of this catheter.² We agree that rapid diagnosis and treatment is important in

this situation; furthermore, we wish to remind clinicians of proper techniques for introduction that should minimize the incidence of the reported complication. The coronary sinus drains into the right atrium; thus, advancement of the catheter into the right ventricle is generally not necessary. Monitoring of distal tip pressure provides a direct indication should the catheter tip be advanced from the right atrium across the tricuspid valve. In this circumstance, prompt withdrawal of

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the catheter back into the right atrium is necessary for rapid placement of the catheter into proper position in the coronary sinus and should also minimize the possibility of the catheter tip contacting the wall of the right ventricle. Imaging with transesophageal echocardiography or fluoroscopy facilitates catheter placement.³ Familiarity with cardiac anatomy and physiology combined with appropriate interpretation of clinical data permit efficient and safe placement of this catheter, typically in approximately 5 min.⁴

Lawrence C. Siegel, M.D.

Vice President, Clinical Affairs
Heartport, Inc.
Redwood City, California
Clinical Associate Professor of Anesthesia
Department of Anesthesia
Stanford University School of Medicine
Stanford, California

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Reducing the Risk of Perforation of the Right Ventricle during Port-Access™ Minimally Invasive Cardiac Procedures

To the Editor:—We read with interest the case report of a perforation of the right ventricle with a coronary sinus catheter during preparation for a Port-Access™ minimally invasive cardiac surgery procedure.¹

It is important for anesthesiologists to be aware of this possibility during the insertion of any catheter within the heart, particularly during Port-Access™ procedures, in which multiple catheters and cannulae are used. However, we would like to clarify several terms used and techniques described in this case report.

The authors refer to a "pulmonary artery stent." Port-Access™ cases do not include the use of stents. Rather, the catheter placed in the pulmonary artery is a *vent* used to decompress the heart. At our institution, we have all but abandoned the use of the Heartport® Endopulmonary Vent™ catheter because with adequate venous drainage, it does not seem to be necessary. Furthermore, it precludes the use of a thermodilution pulmonary artery catheter, which can be valuable in the management of these cases.

We have also reduced significantly the use of the Heartport® Endocoronary Sinus™ catheter during mitral valve procedures because surgeons have developed a technique of placing a retrograde cardioplegia catheter from the surgical field, with the aid of transesophageal echocardiography (TEE). We have found this to be faster than the percutaneous transvenous approach and to reduce the need for fluoroscopy. It also possibly reduces the risk of perforation. During myocardial revascularization procedures, we have also reduced the use of the Heartport® Endocoronary Sinus™ catheter, except in those cases with concomitant aortic regurgitation.

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The authors placed the Heartport® Endopulmonary Vent™ catheter before the Heartport® Endocoronary Sinus™ catheter. We prefer to insert these catheters in the reverse order because coronary sinus catheterization and visualization with TEE and fluoroscopy may be easier when the right atrium is free of other catheters, avoiding multiple, possibly traumatic, attempts.

Finally, in the discussion of their case, the authors refer to "non-pump coronary revascularization." The Heartport® technique always uses extracorporeal circulation.

Rafael A. Ortega, M.D.

Associate Professor of Anesthesiology
raortega@aol.com

J. Fredrik Hesselvik, M.D., Ph.D.

Associate Professor of Anesthesiology
Department of Anesthesiology
Boston University Medical Center
Boston, Massachusetts 02118

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