of AF ablation to large numbers of patients, including those with isolated or lone AF.

A. Marc Gillinov, MD
Patrick M. McCarthy, MD
Gosta Pettersson, MD
Bruce W. Lytle, MD
Thomas W. Rice, MD
The Center for Atrial Fibrillation
The Cleveland Clinic Foundation
Cleveland, Ohio

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Reply to the Editor:

Gillinov and colleagues have commented on our article describing esophageal perforation following unipolar radiofrequency ablation of the left atrium. These authors from the Cleveland Clinic have a vast experience in atrial fibrillation ablation techniques and have also reported esophageal injury following unipolar radiofrequency ablation. Although esophageal perforation is an uncommon complication of this procedure, it is also a very serious and potentially lethal one.

We agree with the authors that bipolar and epicardial radiofrequency ablation are promising techniques that may eliminate the possibility of esophageal injury. However, these procedures may carry an increased risk of circumflex artery or coronary sinus injury when creating the lesion line down to the mitral annulus. Ultrasound ablation is another promising technique but very little clinical data is available at this time.

Atrial fibrillation ablation surgery is an area of intense research and marketing activity at this time. We completely agree that the honest reporting of favorable and unfavorable results will ultimately deter-

mine which treatment modality is the most safe and effective.

Nicolas Doll, MD^a
Michael A. Borger, MD, PhD^b
Friedrich W. Mohr, MD, PhD^a
Clinic for Heart Surgery^a
Heart Center
University of Leipzig
Leipzig, Germany
Toronto General Hospital^b
University of Toronto
Toronto, Ontario, Canada
doi:10.1016/S0022-5223(03)00948-6

Atrioesophageal fistula: Is it an unavoidable complication of radiofrequency ablation?

To the Editors:

The article by Doll and colleagues¹ was of great interest. We want to share a similar experience where a patient (1 of 42) died of an atrioesophageal fistula.

Clinical Summary

A 58-year-old female patient with rheumatic valve disease, ostial stenosis of the right coronary artery (RCA), chronic atrial fibrillation, and a dilated left atrium (78 mm) was operated through a median ster-

notomy for the replacement of the aortic and mitral valves with mechanical prostheses, De Vega annuloplasty of the tricuspid valve, bypass graft to the RCA, and a left atrial radiofrequency ablation (RFA) using the Cobra RF System (Boston Scientific, Boston, Mass) with the technique of Melo and colleagues.² The patient was discharged on postoperative day 7 with no complication but paroxysmal atrial fibrillation despite amiodarone.

On the postoperative day 22, she was readmitted with fever, shivering, and numbness of the right arm. Echocardiography revealed a left atrial thrombus. The next day the patient suddenly lost consciousness and was immediately operated for thrombectomy from the left atrial cavity. After easy weaning from cardiopulmonary bypass (CPB), we noted a massive hemorrhage through the nasogastric tube. Esophagoscopy showed a 15-mm laceration on the anterior wall, 33 cm from the incisors. We restored CPB. Air bubbles could be noticed within the left atrium. A fistula between the esophagus and the laceration on the atrial wall between the right and left pulmonary vein orifices was detected. The defect was repaired with pericardial-pledgeted sutures. At the end of the operation the patient was transferred to the

Figure 1. A, The connecting points of 2 overlapping circles (arrows) around right and left pulmonary veins are the stress points receiving twice the dose of RF, thus are the most vulnerable points in the posterior wall of the left atrium neighboring the esophagus. B, Connecting line between 2 circles should be as high as possible to avoid heat injury of the esophagus (the hatched area represents the posterior wall of the left atrium in close neighborhood with the esophagus). RSPV, Right superior pulmonary vein; RIPV, right inferior pulmonary vein; LSPV, left superior pulmonary vein; LIPV, left inferior pulmonary vein.

intensive care unit. Brain computed tomography 24 hours later showed diffuse ischemic lesions in both cerebral hemispheres. The neurologic state of the patient never improved and she died from multiorgan failure on day 20 after the second operation.

Discussion

The primary suspected diagnosis at readmission was infective endocarditis, so heparin and empirical antibiotherapy was instituted. The presence of air bubbles within the left atrium and the finding of diffuse ischemia in both cerebral hemispheres led us to think that the probable cause of cerebral ischemia was the air insufflated during the endoscopy, which embolized to the brain.

After such an experience, we now perform the transverse ablation line between the right and left pulmonary vein orifices as high as possible. In patients with a small left atrial cavity, care should be taken to prevent the overlapping of the 2 circles around the right and left pulmonary vein orifices to avoid extreme thermal injury at any single point on the posterior left atrial wall neighboring the esophagus (Figure 1). We think that temperature and the duration of application of the probe should either be reduced or RFA should be avoided in patients with large thin-walled left atria.

In case of suspicion of an atrioesophageal fistula, no endoscopic intervention should ever be attempted. Although highly lethal, we don't believe that this rare complication should lead to the abandonment of this technique.

Bingur Sonmez, MD
Ergun Demirsoy, MD
Oguz Yilmaz, MD
Istanbul Memorial Hospital
Department of Cardiovascular Surgery
Istanbul, Turkey

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Reply to the Editor:

Sonmez and colleagues presented their experience with a patient who developed atrioesophageal fistula after unipolar radiofrequency ablation. Their patient is similar to a patient that we described in that she died of cerebral air embolism secondary to gas insufflation during gastroscopy. It is important to stress that patients with gastrointestinal bleeding post-radiofrequency ablation should *not* undergo endoscopy. The initial diagnostic test should be computed tomography (CT) of the chest to rule out esophageal perforation.

The case report of Sonmez's group raises 2 more interesting points. The first is that their case occurred after a full sternotomy, as opposed to the right lateral minithoracotomy approach that we used. The second is that the esophageal perforation occurred after using a radiofrequency lesion pattern that was different from our lesion pattern. It is important to note that esophageal perforation can occur with many different techniques and approaches and that surgeons have to be aware of this possibility when performing these procedures.

Nicolas Doll, MD^a
Michael A. Borger, MD, PhD^b
Friedrich W. Mohr, MD, PhD^a
Clinic for Heart Surgery, Heart Center^a
University of Leipzig
Leipzig, Germany
Toronto General Hospital^b
University of Toronto
Toronto, Ontario, Canada
doi:10.1016/S0022-5223(03)01050-X

Authors should list confounding factors and alternative explanations for adverse events seen with new technologies

To the Editor:

Two articles in your February 2003 issue raise concerns about the Symmetry connector (St Jude Medical, St Paul, Minn) for coronary artery bypass surgery. Hornik and colleagues¹ reported 4 of 70 uses and Reuthebuch and colleagues² reported 7 of 77 uses of Symmetry where severe proximal stenosis occurred. Implicit in both articles is a suggestion that the Symmetry device contributed to proximal graft failures. The observations of Hornik and Reuthebuch, however, cannot be regarded as evidence of

such an association for 2 main reasons (neither of which were highlighted in the articles).

1. The practice reported is not typical of that in most cardiac units. For example, in Hornik's group only 18 of 45 patients received internal thoracic artery (ITA) grafts. Also unusual was that none of the 4 patients whose history was detailed received an ITA even though 3 were below 60 years of age and 2 had severely calcified aortas, factors most surgeons would regard as indications for ITA grafting. Also, the 29% conversion rate for their off-pump coronary artery bypass patients is substantially higher than seen in most units. Both reports listed aortic calcification as a principal indication for use of the device. It would not be unreasonable to expect more proximal graft failures in patients with aortic calcification regardless of anastomotic technique. Differences in practice or technique therefore could be an alternative explanation for the proximal failures.
2. The authors have not made any comparisons to patients having surgery using conventional techniques. Proximal graft failure is by no means unique to Symmetry and is well documented using standard techniques.³ Without systematic angiography of all patients, particularly those with aortic calcification, reliable comparisons with standard techniques cannot be made.

As presented, neither report is sufficient to caution against use of the device. Also not considered is the benefit of the technique as it is plausible that morbidity due to aortic calcification or aortic clamping (and by extension the net morbidity and mortality) was reduced by use of the device. Adverse events must be weighed against such benefit, as in at least some cases the benefit of a new technology will outweigh any adverse events. What is required are comparisons between grafts done with Symmetry and those done with standard techniques (preferably with the proximal anastomosis constructed first). Only then can any incremental risk (or benefit) be identified and quantified.

I have never used the Symmetry device and have no special interest in the device or technique; indeed, there may truly be an