monary bypass and serious complications, particularly when the nadir hematocrit decreased to less than 22%.

In these 3 studies, the age, weight, seriousness of the disease, previous cerebrovascular accident, duration of circulatory arrest, and percentage of emergency surgery were completely different. Therefore, it might be very difficult to compare the results and determine an appropriate hematocrit level during cardiopulmonary bypass, especially for surgical cases using deep hypothermic circulatory arrest. Regarding the backgrounds of the patients, our study group was considered to be the best candidates for hemodilution during cardiopulmonary bypass. Transfusion has been proven to be an effective therapy for hemodilutional anemia. However, this therapy may cause severe adverse effects. Although there were no adverse effects in our study group, we agree with Dr Jonas that a prospective randomized study should be performed not only in adults, but also in children with simple congenital heart defects to determine the appropriate hematocrit level that improves a patient's chance for the most favorable outcome.

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References

1. Ootaki Y, Yamaguchi M, Yoshimura N, Oka S, Yoshida M, Hasegawa T. Efficacy of a criterion-driven transfusion protocol in patients having pediatric cardiac surgery. *J Thorac Cardiovasc Surg.* 2004;127:953-8.
2. Jonas RA, Wypij D, Roth SJ, Bellinger DC, Visconti KJ, du Plessis AJ, et al. The influence of hemodilution on outcome after hypothermic cardiopulmonary bypass: results of a randomized trial in infants. *J Thorac Cardiovasc Surg.* 2003;126:1765-74.
3. Habib RH, Zacharias A, Schwann TA, Rordan CJ, Durham SJ, Shah A. Adverse effects of low hematocrit during cardiopulmonary bypass in the adult: should current practice be changed? *J Thorac Cardiovasc Surg.* 2003;125:1438-50.

doi:10.1016/j.jtcvs.2004.10.038

Extrapleural pneumonectomy for malignant mesothelioma: Should pericardium be resected routinely?

To the Editor:

We read with interest the article by Sugarbaker and colleagues¹ in the July issue of the *Journal*. This study reports their extensive experience with the management of complications occurring after extrapleural pneumonectomy (EPP) done mainly for malignant mesothelioma. It is clear from the Sugarbaker article that technical complications might arise from the resection and replacement of the pericardium with a patch, such as size mismatch, improper insertion and suturing, or inadequate fenestration. Three percent of their patients had cardiac arrest, 2.7% had constrictive physiology caused by inflammatory epicarditis, 3.6% had tamponade, and 44.2% had atrial fibrillation.

Although we recognize the importance of Sugarbaker's work in studying specific complications of EPP and reporting the largest series to date, we would like to emphasize a particular technical point that might prove useful in some patients. Recently, we have been surprised that some patients with stage I or II malignant mesothelioma receiving induction chemotherapy before EPP presented at the operation with a pericardium macroscopically free of disease. In those patients we have taken random biopsy specimens of the pericardium and have preserved them. Histopathology confirmed the absence of pericardial invasion in all patients. In such patients with a macroscopically normal pericardium, we suggest taking frozen sections of the pericardium and preserving them if the frozen sections are negative. Although we do agree that pericardium has to be resected in most patients with malignant pleural mesothelioma, it is likely that with the adoption of induction chemotherapy before EPP² and refinement of diagnostic techniques, such as positron emission tomography and computed tomography, more patients will be operated on with the possibility of preserving their native pericardium, thereby reducing the incidence of cardiac complications, reducing the operative time, and facilitating the anchorage of the diaphragmatic patch.

We would also like to mention that chylothorax is another potential complication of EPP, with a recent article reporting an 18.7% incidence.² Although no postoperative chylothorax has been reported in the series by Sugarbaker et al,¹ we would like

to re-emphasize the importance of prophylactic thoracic duct ligation during right-sided procedures.

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References

1. Sugarbaker DJ, Jaklitsch MT, Bueno R, Richards W, Lukanich J, Mentzer SJ, et al. Prevention, early detection, and management of complications after 328 consecutive extrapleural pneumonectomies. *J Thorac Cardiovasc Surg.* 2004;128:138-46.
2. Weder W, Kestenholz P, Taverna C, Lardinois D, Jerman M, Stahel RA. Neoadjuvant chemotherapy followed by extrapleural pneumonectomy in malignant pleural mesothelioma. *J Clin Oncol.* 2004;22:3451-7.

doi:10.1016/j.jtcvs.2004.11.034

Reply to the Editor:

The primary goal of extrapleural pneumonectomy in mesothelioma is to perform a complete macroscopic cytoreduction. Routine pericardiectomy is an important step in achieving this goal. The issue of pericardial resection and reconstruction from the morbidity standpoint is a higher atrial fibrillation rate, the risk of cardiac herniation from a poorly constructed patch, tamponade from a tight patch, and epicarditis.

Our high rate of atrial fibrillation compared with that seen in other reports that use similar resection of the pericardium stems from our policy of monitoring all patients with telemetry until discharge from the hospital. Opening the pericardium is only one of the multiple causes of atrial fibrillation. Entry into the pericardium with multiple random biopsies would also result in a higher atrial fibrillation rate or at least not a significant decrease in those rates.

Cardiac herniation or tamponade from a poorly done pericardial reconstruction would be avoided by not resecting the pericardium. These are not common events, however, and were more prevalent during our earlier experience. However, from an oncologic perspective, it would not be prudent to risk a good cytoreduction, even in the setting of a few negative random biopsy specimens. It is this group of patients with early disease that would benefit the most from the most aggressive surgical intervention.