anastomoses were performed without collateral flow from the coronary arteries.

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12/8/60674

Reply to the Editor:

The suggestion by Dr. Takao and his group that the bronchial mucosal blood flow is reduced in the left main-stem bronchus relative to the right is fascinating and a significant contribution. Since the publication of our article, titled "Anastomotic Pitfalls in Lung Transplantation," we have accrued additional patients from whom to draw conclusions.

A total of 133 patients have undergone single (SLT) or double (DLT) lung transplantation (61 SLT, 72 DLT) and have survived 1 to 50 months. Of these, 15 patients (6 SLT, 9 DLT; 11%) have had significant bronchial anastomotic complications. The method of lung transplantation and suture of or wrapping of anastomoses were not

significant risk factors. Patients underwent 41 procedures (range one to nine per patient) involving insertion of 23 silicone rubber stents (range one to five per patient). Sixteen of 23 stents required adjustment because of distal migration and obstruction of the upper lobe. Among DLT recipients, left-sided problems were significantly more common than right (7 versus 2; $p = 0.0117$); two patients had bilateral problems. Strictures in five patients were débrided with the neodymium-yttrium-aluminum-garnet laser on 12 occasions. Stents placed in four patients who died were functioning well at the time of death. Among the 11 survivors, three patients had temporary stents (6 to 15 days); two are well (7 months and 2 years) and one has a stable 40% stenosis. Five patients received long-term stents (160 to 507 days); four are well (4 to 10 months) and one required repeat stenting at 3 months. Three patients were managed with laser débridement alone. Five patients were discharged after transplantation only after stenting for symptomatic relief.¹

On the basis of these data, it would appear that the left main-stem bronchial anastomosis is at greater risk of abnormal healing, and Takao's finding of a reduced blood flow may indeed have significance. Because all bronchi are trimmed to within 5 to 10 mm of the upper lobe branch, it is not likely that length of donor bronchus is the cause for the higher prevalence on the left for stenosis or dehiscence. It would be of additional interest if the group at Papworth Hospital could perform these studies on bronchial mucosal blood flow during the operation as opposed to later in the course, when effects of reduced blood flow may be more significant. It would be important if revascularization of bronchial arteries could be shown to increase bronchial mucosal blood flow to near normal. It would also be of interest to know what impact the now rarely performed omental or pericardial fat wrap might have on blood flow. This group is to be congratulated for their pioneering efforts in this area, and we look forward to limiting the risk of bronchial anastomotic pitfalls based on surgical maneuvers backed up by objective data such as bronchial mucosal blood flow.

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Bidirectional inferior vena cava-pulmonary artery shunt

To the Editor:

In the May 1994 issue of this JOURNAL (1994;107:1367) I read a letter to the Editor written by Luisi, Murzi, Bernabei, Vanini, and Biagini concerning bidirectional

inferior vena cava–pulmonary artery shunt. The authors claim to have performed the first bidirectional cavopulmonary shunt in 1972.

In the interest of ethics and accuracy, I must dispute their claim. I devised and first performed the procedure in 1968, and subsequently I published the first results in *Thorax* (1972;27:111-5).

I appreciate the increased consideration given to bidirectional cavopulmonary shunt in the recent years. Many patients on whom I operated in that initial period are still alive and doing satisfactorily with only that procedure. Therefore I believe that, in many cases, a mild cyanosis, absence of right heart failure, and a single operation are preferable to multiple procedures, often accompanied by untreatable right heart failure, hepatomegaly, and ascites.

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12/8/61480

Retransplantation in heart-lung recipients with obliterative bronchiolitis

To the Editor:

We read with great interest the report by Adams and associates in the February 1994 issue of the *JOURNAL* (1994;107:450-9) discussing the results of retransplantation procedures (25 heart-lung between 1986 and 1990 and 9 single lung between 1988 and 1992) in 34 heart-lung recipients with obliterative bronchiolitis. Twenty-nine (85%) patients were receiving mechanical ventilatory support, 31 (91%) required enteral nutrition, and all except one were in the hospital before their retransplantation procedure. Poor early and long-term results were reported especially in the group receiving a second heart-lung transplant. Similar overall results were found in a combined North American–European multicenter series of 63 lung retransplantations.¹

These suboptimal results question the merits of using scarce donor organs in patients who would otherwise not qualify for a primary heart-lung or lung transplant. The need for prolonged ventilatory support (more than 2 or 3 days) remains a relative contraindication to heart-lung and lung transplantation at some centers, including ours.^{2,3} There is concern about postoperative infection owing to the colonization of the airway during the period of mechanical ventilation and also about respiratory muscle deconditioning during this time. Mechanical ventilation does not represent a “bridge” to lung transplantation, and these patients are in an essentially moribund condition. In addition, profound malnutrition and the effect of chronic immunosuppression add considerably to the risk of this type of operation. Efforts should therefore be directed at performing transplantation when the patient is in a more optimal preoperative condition.

We recognize that there are no other therapeutic options for patients with end-stage obliterative bronchiolitis after heart-lung transplantation. The allocation of another heart-lung block to these patients represents inequitable organ allocation especially when up to three other patients could benefit from these donor organs. The

procedure of repeat heart-lung transplantation carries an unacceptable early mortality, consumes excessive hospital resources including those of the blood bank, and fails to deliver an adequate quality of life at long-term follow-up. Only three of the 25 patients who underwent a second heart-lung transplantation were fully rehabilitated in New York Heart Association functional class I at the time of this report.

The results of single lung transplantation in this group are superior to those of repeat heart-lung transplantation. The prospects for acceptable long-term survival and rehabilitation appear much better although the reported experience is small. We have performed two such procedures without a successful long-term outcome. We agree with the authors that single lung transplantation appears to be the preferred surgical option, but we do not believe that it represents optimal usage of available donor organs.

Instead of pursuing retransplantation as the definitive treatment of obliterative bronchiolitis after heart-lung or lung transplantation, efforts should be directed toward prevention of this complication by improving the available immunosuppressive agents and also toward new pharmacologic therapies. In the future, pulmonary xenotransplantation may provide additional donor organs for these terminally ill patients.

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Aortic and aortic-mitral annular enlargement

To the Editor:

The article by Kawachi, Tominaga, and Tokunaga¹ refers to two methods, namely, a patch enlargement of the aortic root into the anterior leaflet of the mitral valve with aortic valve replacement and an enlargement of mitral and aortic annuli by patching both rings with double valve replacement, both as Manouguian's technique. The epithet Manouguian's technique is a mistake and needs correction.

The first technique should be called Rastan-Manouguian to give the proper credit to the proper originators. The second one must be called Rastan's technique only and purely, because it was Dr. H. Rastan who developed the concept, tested it, first applied it clinically, and refined