Our current strategy is to “perfuse and watch” with the aid of real-time monitoring and diagnostic imaging. As Rescigno and colleagues mentioned, near-infrared spectroscopy (NIRS) is useful for detecting newly developed cerebral malperfusion. Although they recognized an undesirable situation by inflow pressure and NIRS data, the former may not be apparent if the intima breaks at the suture line and pressure elevation is not apparent. Decreased oxygen saturation is likely to be a reliable indicator of an occurrence of something undesirable, whatever the cause.

Once malperfusion is detected, it is necessary to develop an appropriate strategy for restoring cerebral perfusion based on the cause of malperfusion. In this regard, visualization of the “Y-junction” with transesophageal echocardiography can be helpful for correctly pursuing the strategy, because it provides real-time information on morphology and perfusion.

However, the decision can be incorrect, as in our case. Thus, the decision needs to be immediately assessed to avoid further delay in restoring adequate perfusion. This can be achieved by NIRS. If oxygen saturation remains low, other possible scenarios should be considered.

We believe that a sequence of “detection, decision, assessment” is important in the operating room, especially in cases of acute aortic dissection. To minimize “unfortunate events of unknown cause,” it is necessary to fully use the modalities available for obtaining real-time information. This will be another important task for cardiovascular surgeons, as well as surgical skill.

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ENDOSCOPIC TREATMENT OF AIRWAY STENOSIS AFTER LUNG TRANSPLANTATION

To the Editor:

We read with interest the article from Thistlethwaite and colleagues¹ entitled “Airway stenoses after lung transplantation: incidence, management and outcome.”

We agree that silicone stents are extremely useful to complete treatment of posttransplantation airway stenosis after mechanical/laser debridement; they can effectively support the airway during healing and prevent recurrence. The use of this type of stent is particularly indicated for type 1 and 2 stenosis (according to the classification reported by the authors), and they can be easily fenestrated to allow ventilation to the upper lobes when the bronchial stenosis comes across them. However, we have met some difficulties in placing these stents when the stenosis is extremely long and tortuous, encompassing also the airway distal to the anastomosis for a long segment or the peripheral airway (type 3 and 4 stenosis). This is obviously a very small group of patients (in the reported series there are only 3 [15%] patients), but this problem has been certainly met by all the groups performing lung transplantation, and the difficulties in its treatment are evident. When this type of complication occurs, it usually requires several treatments with unsatisfactory results, and permanent stenting is usually indicated. In this situation we have found extremely useful the use of covered expandable metallic stents (Ultraflex; Boston Scientific, Galway, Ireland). They can be easily deployed, completing airway dilatation, and present a better ratio between the thickness of the wall of the stent and the diameter of the stent itself,

allowing a better airflow, especially for small diameters; thus clearance of secretion is improved. Although they are more expensive than silicone stents and clearly more difficult to remove, their use might be preferred in this subset of patients. We have used them in 5 patients without major complications.

Could the authors provide more details about the group of patients with type 3 and 4 stenosis?

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1. Thistlethwaite PA, Yung G, Kemp A, et al. Airway stenoses after lung transplantation: incidence, management, and outcome. *J Thorac Cardiovasc Surg*. 2009;136:1569-75.

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Reply to the Editor:

We appreciate the interest that Drs Anile and Ventura have in the management of lung transplant recipients with distal focal bronchial stenosis (type 3 disease) and diffuse distal stenosis (type 4 disease). This is a complex group of patients to manage, and their airway issues can be challenging.¹

As a high-volume center for bronchial stent placement (for causes other than transplantation), we have been uniformly disappointed with the use of expandable metallic stents. Metallic stents in the airway are expensive and associated with fracture, overgrowth of granulation tissue, and erosion through the tracheobronchial wall. Although the cost of a single metallic stent is low in comparison with the total expense of lung transplantation, cost precludes having a large inventory of these stents available. We currently have an inventory of more than 100 Silastic stents (Hood Laboratories, Pembroke, Mass, and Bryan Corporation, Woburn, Mass). This inventory allows us to find the right stent for almost any airway, to tailor a specific stent to an

individual patient's needs, and to replace/upsized them as needed.

We have several practical tips for stenting of type 3 and 4 bronchial stenoses:

1. We have found that stenting of the subsegmental airways does not benefit the patient. Thus, we limit our stenting to the bronchial and segmental airways.
2. We calibrate the size of stent to be placed based on the size of the rigid bronchoscope that we are able to insert in the portion of bronchus affected. For example, if we are able to cannulate the affected bronchus with a 10-mm rigid bronchoscope, we would size the proximal portion of the stent to 10 to 12 mm.
3. For difficult and long stenoses, we often dilate the bronchus/segment and insert as large a stent as possible. In 2 to 3 months, we remove the stent and replace it with a larger diameter stent. This can be done sequentially to maximally dilate the affected area.
4. For distal left-sided problems, we routinely place the stent over the bifurcation of the upper and lower lobes and cut a small circular segment out of the stent using a 6-mm dermal punch (Acuderm, Fort Lauderdale, FL). This stent contouring maintains the integrity of the stent while allowing for ventilation of the upper lobe, which would otherwise be obstructed.
5. For distal right-sided problems, we use step-down stents of various configurations (Hood Silastic 2-Step Stents with Posts and Mesh: Hood Laboratories). A step-down stent is one in which the proximal diameter is larger than the distal diameter, with tapering of the stent diameter in between. Step-down stents allow coverage down to the level of the superior segment of the lower lobe and right middle lobe, while maintaining patency and coverage of the anastomosis and proximal mainstem bronchus. We usually cut a 6-mm dermal

punch hole in the stent for the right upper lobe to allow ventilation to this lobe. The right upper lobe orifice is often variable in its position, so we have not found stents with premade orifices effective for use.

6. While inserting Silastic stents, we have found that it is important to place the hole for a lobar orifice corresponding to the print on the metallic applicator (Dumon-Harrell applicator: Bryan Corporation). This configuration allows for easy rotation of the stent (clockwise for right bronchial stents, counterclockwise for left bronchial stents) into the appropriate position as it is deployed. After stent deployment, we then often put a flexible bronchoscope through the rigid bronchoscope into the stent while using rigid forceps to manipulate the hole into its most optimal position.

Our experience has been that bronchoscopic surveillance and sequential "up-size" stenting for distal long-segment stenoses is an effective way to permanently increase luminal diameter over a long length of airway.

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QUALITY IMPROVEMENT PROGRAM DECREASES MORTALITY AFTER CARDIAC SURGERY

To the Editor:

We read with interest the article by Stamou and colleagues,¹ who showed that a quality improvement program de-

creased mortality after cardiac surgery in a large cohort, using a risk-adjusted methodology. Most importantly, outcomes improved mostly due to fewer cardiac-related deaths. Moreover, there was a lower relative decline in mortality among patients with diabetes than among those without diabetes, indicating the influence of patient individual factors on outcomes. Finally, they conclude that future quality improvement programs should focus on high-risk patients, which they misclassified as those with diabetes. It would be more appropriate if the authors provide information about severity scores widely available in the literature instead.

Quality improvement programs follow institutional or regional/national initiatives. Although the latter are important to monitor and foster improvement of outcomes, the former are fundamental to develop a sustained and cost-effective system locally. Because processes of care vary widely among cardiac surgery programs, there are no "recipes" that can be universally applied, due to system-based particularities. Core components of the quality improvement program described by Stamou and colleagues¹ are important, but such programs should be presented in a problem-based approach. It would be interesting to know the problems responsible for the initial unfavorable outcomes. That would potentially guide other cardiac surgery centers in implementing similar programs. Moreover, information about the financial impact (investment and savings) of those programs is crucial, particularly in times of world economic crisis.

In Brazil, results of cardiac surgery are not as good as in developed countries.² Reasons are multiple, but certainly include different patient profiles, social problems, limited resources, and poorly developed hospital operating systems and integrated patient care. In our center, multimodal strategies were added, aiming for team building and a more organized and integrated hospital system. No substantial resource