for organ protection in the cardiac surgery setting. Also, variability patterns for biochemical parameters were obtained, which could be used in future studies of intestinal protection during CPB, with the impact on patient outcome.

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REFERENCES

http://dx.doi.org/10.1053/j.jvca.2014.04.027

Esophageal Perforation After Transesophageal Echocardiography in a Malnourished Patient and Repair With an Esophageal Stent

To the Editor:

We are writing to report a case of esophageal perforation after cardiac surgery. The patient was a 56-year-old male scheduled for elective coronary artery bypass graft and mitral valve repair. He had a background of schizophrenia and hypothyroidism and had reported reduced appetite and significant weight loss in the months preceding surgery, which had not been further investigated. He did not report dysphagia or any other associated symptoms.

A multiplane TEE probe (General Electric Company, Fairfield, CT) was inserted under direct vision after the induction of general anesthesia, following current practice guidelines and in the absence of absolute or relative contraindications. The patient was weaned from cardiopulmonary bypass on milrinone and norepinephrine infusions, and the probe was removed at the end of the procedure, after confirming a good surgical result.

Postoperatively, the patient had high systemic vascular resistance, poor cardiac output and was metabolically acidotic. These parameters improved over the first 24 hours with fluid optimization and vasoactive support. The patient was extubated on the first postoperative day and resumed oral intake. He was discharged to the ward 1 day later with chest drains left in situ because of persistent drainage.

On the third postoperative day, the right chest drain began producing a large amount of straw colored fluid. The patient was readmitted to the Intensive Care Unit (ICU) with respiratory failure, which progressed rapidly and required intubation and ventilation. As the clinical context at that stage was suspicious of an esophageal perforation, he underwent computed tomography of the chest, which revealed a moderate right-sided pleural effusion and a small anterior pneumothorax with several pockets of air adjacent to the esophagus (Fig 1). The gastrografin study showed a significant amount of contrast within the mediastinum at the vertebral level T8/T9.

An esophagogastroduodenoscopy (EGD) that followed identified a round, smooth-edged, small (1 cm) esophageal perforation located at 35 cm from the incisors and a small hiatus hernia. In view of the high risk associated with open surgery, the endoscopic approach was chosen. The defect was closed with a metallic stent (WallFlex, 23 mm × 125 mm, Boston Scientific, Natick, MA) and the mediastinitis treated with thoracoscopically assisted washout of the right hemithorax (Fig 2).

Over the course of the next weeks, the patient was weaned from the ventilator. Fifty days after the cardiac surgery, the EGD showed complete healing of the perforation and the stent was removed.

Fig 1. Computed tomography on the third postoperative day confirms the diagnosis of esophageal perforation.
was removed. The patient was discharged home 69 days after the initial surgery.

The question arises whether diagnosis of perforation in our patient could have been made earlier. The only clinical indication was the epigastric pain, which was not unreasonably attributed to indigestion. We were first alerted to the possibility of intrathoracic hollow viscus injury by a large amount of fluid drained from the chest and by the radiologic presence of hydropneumothorax.

In considering the possible mechanism of the perforation, it should be noted that the Transesophageal Echocardiography (TEE) was inserted without any resistance under direct vision by an experienced echocardiographer. During advancing and withdrawing, the probe was always in the neutral position, and there was no blood on the probe on its removal. Therefore, we suggest that the perforation was not caused by a laceration due to mechanical manipulation but more likely was due to a prolonged pressure effect on the esophageal wall, with the patient’s suboptimal nutritional state possibly contributing to the outcome.

Treatment with the esophageal stent was chosen for the reasons described above. To our knowledge, only one surgical team has reported use of esophageal stents in 3 patients with iatrogenic perforation of the esophagus.

In what now seems like the distant past, measuring the left mainstem bronchial diameter on preoperative chest computed tomographic (CT) scans was recommended as an objective guide to choosing the appropriate double-lumen endobronchial tube (DLT) size for an individual patient. That recommendation was based on the fact that the left mainstem bronchial diameter varied widely among patients and could not be predicted by any formula. During recent discussions with anesthesiologists at our institution and nationally, it was clear that this approach rarely is adopted. During these discussions, most anesthesiologists believed that they could reliably choose the appropriate DLT size based on their clinical experience.

We, therefore, conducted this retrospective study to examine the reliability of clinically estimating the appropriate DLT size at our institution, an academic medical center with multiple anesthesiologists involved in the care of thoracic surgical patients. With internal review board approval, we examined the anesthesia records of 27 patients (ages 18-96) who had undergone thoracic surgery requiring the use of left DLTs (Mallinckrodt Anesthesiology, St Louis, MO) within the previous 12 months. Upon questioning, the anesthesiologists responsible for their care stated that they chose the DLT size based on their clinical experience. Each patient’s demographic characteristics (sex, height, and weight), the size of the DLT used, and the volume of air used to inflate the bronchial cuff (when available in the anesthesia record) were recorded. Measurement of each patient’s left mainstem bronchial diameter by chest CT scans taken close to the time...