output, hypoperfusion) may very well have occurred or been exacerbated intraoperatively. It may be that observational studies with additional intraoperative data elements may be as effective in enhancing our knowledge base about the relationship between temperature and outcomes in patients undergoing coronary artery bypass surgery.

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SPONTANEOUS RUPTURE OF THE DIAPHRAGM: A DIAGNOSTIC ENIGMA

To the Editor:

We read with great interest the recent article by Losanoff and colleagues¹ on spontaneous rupture of the diaphragm (SRD), a rare condition accounting for less than 1% of diaphragmatic ruptures.² Delayed or inaccurate diagnosis remains its most challenging feature with a number of reports of inadvertent perforation of the stomach or bowel from tube thoracostomy after its wrongful interpretation on chest radiograph as pneumothorax or pleural effusion.

The difficulty in achieving early, accurate diagnosis is partly due to the sometimes innocuous cause of SRD and the nonspecific symptoms and signs associated with its occurrence. In addition, there is often a symptom-free interval between the precipitating events and the presenting symptoms, thus further complicating the diagnosis. Coughing, vaginal delivery, vomiting,

massage, and dynamic physical exercise are recognized etiologic factors. Static sporting activity (Pilates) has also recently been reported as a cause of SRD.³

Plain chest radiograph and in some cases routine computed tomography (CT) scans are easily misinterpreted, as was the case in a child who presented with SRD after pertussis.⁴ A barium meal gives the diagnosis, but this investigation is often only resorted to once there is a high index of suspicion and in addition provides limited information to aid treatment. Contrast-enhanced coronal multiplanar reformatted images of multidetector CT scans has been shown to be an optimum diagnostic tool.⁵ This modality facilitates detection of the typical collar sign between the body of the stomach in the abdominal cavity and the herniated gastric fundus. Furthermore, by identifying the degree of enhancement in the herniated bowel, a decision on the operative approach to management can be made. The intraabdominal approach is chosen as the optimal operative method for rupture of the diaphragm where the contrast-enhanced chest CT scan shows poor enhancement of the herniated gastric fundus. This finding is suggestive of the presence of strangulation in the herniated bowel. Choosing a transthoracic approach in such a case may not provide the surgeon with a wide enough operative field for the resection of strangulated bowel.

Admittedly, multiplanar reformatted images are not performed on routine CT scans, but when a high index of suspicion of diaphragmatic rupture is attained on the basis of history or chest radiography, then this modality should be used.

The key message though is that SRD remains a real and potentially life-threatening condition if missed or misdiagnosed. It should thus be paramount in the mind of any clinician reviewing a patient who has epigastric pain or dyspnea after an apparently in-

nocuous Valsalva maneuver or contemplating tube thoracostomy in a questionable pneumothorax or pleural effusion.

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Reply to the Editor:

We appreciate the comments expressed by Drs Bello and Sarkar regarding our recently published review article on spontaneous rupture of the diaphragm (SDR).¹ Challenges of this topic include the extreme rarity of the condition, preponderance of literature based on case reports, and low index of suspicion.

We partially agree with Bello and Sarkar that plain chest radiograph can easily be misinterpreted as pneumothorax that requires tube thoracostomy; hollow organ injury has so far been described twice (7%) in this rare clinical scenario.^{2,3} It must be noted, however, that in the majority