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EDITORIAL COMMENT

When the Stomach Rules the Heart

Dyspnea as a Neglected Complication of a Large Hiatal Hernia*

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Hiatal hernia is a common condition; its exact prevalence is uncertain because of disagreement about its definition, but some sources suggest that it is present in more than 50% of individuals older than the age of 50 years (1). Cardiologists are most commonly involved in the care of patients with hiatal hernia because of the diagnostic challenge posed by gastroesophageal reflux in the differential diagnosis of chest pain. This entity also requires attention in relation to incidental findings on chest x-ray, difficulties in the performance of transesophageal echocardiography, and external compression of the left atrium causing an apparent left atrial mass (2,3). Although an 84% prevalence of dyspnea has been reported in a previous description of paraesophageal hernia repair on pulmonary function (4), dyspnea is not widely recognized as an important presentation of hiatal hernia. Indeed, cardiologists are all too familiar with the exercise implications of the stomach ruling the heart, and dyspnea in these circumstances is often attributed to coexistent obesity, which is a commonly associated with hiatal hernia (5).

See page 1624

The perception that this diagnosis is usually considered a finding of only limited interest to cardiologists might be challenged by a paper in this issue of the *Journal* by investigators in Sydney, Australia (6). In this study, 30 patients were studied prospectively using resting and stress echocardiography, cardiac computed tomography, and respiratory function testing before and after laparoscopic repair of large hiatal hernias. Despite the presence of normal pulmonary function, 83% of these patients had exertional dyspnea, and this problem improved after surgery. Moderate to severe left atrial compression was present in 77%, and this was associated with the degree of functional impairment. Although coronary sinus compression was noted and might be expected to be associated with coronary hyperemia, this did not seem to be linked to the degree of functional disturbance. The improvement of functional class and exercise capacity after surgery was associated with resolution of cardiac compression. Indeed, the change of left atrial diameter on echocardiography was the only independent correlate of exercise capacity improvement after surgery.

A particular focus of this paper is on the mechanistic effects of hiatal hernia on dyspnea. Potential explanations include disturbances of respiratory function, diaphragmatic motility, and disturbances of ventilation and perfusion, as well as esophageal reflux causing asthma (7). The impact of hernia surgery on dyspnea matches that reported in previous work (8,9). Although there was indeed a modest improvement of pulmonary function, these tests were normal at baseline, and it seems unlikely that this was the only explanation for the functional improvements after surgery, especially as spirometry was not disturbed to the level usually associated with functional compromise. Cardiac compression by hiatal hernia has been described in individual case reports, but the mechanism of this association has not been not well defined (10–12). The results of this study provide evidence of left atrial, pulmonary venous, and coronary sinus compression by large hiatal hernias, with improvement of left ventricular and left atrial dimensions, as well as a normalization of atrial inflow velocities after surgery (6). Indeed, the resolution of cardiac compression is a mechanism that explains improvement in functional capacity in other conditions ranging from pectus excavatum to pericardial constriction (13,14). Although other factors such as exercise training can lead to improved exercise capacity, the amount of change in exercise capacity (from 75 ± 24% to 112 ± 23% predicted) was more than could be anticipated from exercise training alone. How then is the clinician to make use of this new observation? First, although the >80% prevalence of dyspnea may be inflated by the performance of complete testing in 30 of 52 operative patients (perhaps the most symptomatic patients), it would have to be concluded that dyspnea is a common symptom among individuals with large, mainly paraesophageal hiatal hernias. These hernias can be recognized by the presence of >30% of the stomach being intrathoracic, producing a significant mass effect in the chest. As a corollary to this observation, detailed evaluation for compression is not warranted in the setting of small hiatal hernias. Second, although the standard therapeutic strategy for symptoms of esophageal reflux (which is based on pharmacotherapy and behavioral change) will not be altered, the recognition of reduced exercise capacity as a complication of hiatal hernia may have a modest effect on the consideration of surgery, which is usually performed because of the failure of medical therapy or the development of complications. Extrinsic compression should certainly be considered when syncope or dyspnea are provoked by lying down, typically after a large

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meal. In this circumstance, distention of the hernial sac, as was performed in this example by fluid loading before testing, may be a valuable "stress test." Finally, this work, from 4 specialties (cardiology, gastroenterology, pulmonary medicine, and radiology) and using 4 modalities (echocardiography, computed tomography, exercise testing, respiratory function) should serve to remind us that the recognition of interactions between common conditions through multidisciplinary and multimodality investigation of problems across specialty "silos" will identify new insights (15).

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