Operative Techniques in Thoracic and Cardiovascular Surgery

Management of Midesophageal or Epiphrenic Diverticulum

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Midesophageal diverticula are usually pulsion diverticula and are the result of mucosal and submucosal layers herniating through the muscle wall. They are related to the broader category of epiphrenic diverticulum in regard to etiology, workup, and treatment. There has been a fair amount of controversy regarding the indications for treatment owing to early published literature suggesting extremely high complication rates, including 20% leak rates, associated with open or minimally invasive repairs.[1,2] It has also been unclear as to the true underlying motor disorder (s) contributing to high intraluminal pressure and to the development of the diverticulum, leading to different surgical approaches. Most surgeons will approach treatment when patients present with symptoms, including dysphagia and aspiration, or when size of the diverticulum increases more than 5 cm. Our institutional practice has been to perform a left thoracotomy, diverticulectomy with a long esophagomyotomy distally through the gastroesophageal junction onto the stomach, and then a partial fundoplication. The goal with this approach is to address not only the diverticulum but also the potential causes of increased intraluminal pressure to prevent the development of new diverticula in the future.[3]

Preoperative Preparation

Although operative technique has a large effect on patient outcomes, a significant factor not often accounted for is preoperative patient preparation. After standard evaluation studies, including endoscopy and barium esophagogram, asking patients to walk up to 3 miles daily, as well as smoking cessation for at least 4 weeks prior to surgery, can be beneficial. The surgeon can improve postoperative outcomes by maximizing the physical conditioning of the patient through aggressive pulmonary rehabilitation before surgery.

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Technical Concerns

Many have expressed concern about a high leak rate after diverticulectomy. To minimize leaks, we use standard tissue staplers that place multiple rows of staples across the neck of the diverticulum and then oversew the mobilized muscle layers over the staple line. Our myotomy is performed on the contralateral side of the diverticulum. We favor a thoracotomy approach, as we can address multiple levels of diverticula, from a true epiphrenic location to the midesophagus at the level of the aortic arch and perform a long myotomy and fundoplication. Laparoscopic approaches are limited by the ability to address higher diverticula and to perform long myotomies. Thoracoscopic approaches may be limited in their ability to visualize lower diverticula and then perform a fundoplication.

Operative Techniques (Figs. 1-13)

An epidural may be placed before induction to control postoperative pain. After induction of satisfactory general endotracheal anesthesia with a single-lumen endotracheal tube, a flexible esophagoscope is introduced through the cricopharyngeus sphincter. The endoscopic findings should be noted, including the location and size of the diverticulum(a) and the level of the gastroesophageal junction. The tightness of the gastroesophageal junction and the amount of pressure required to advance the endoscope into the stomach should be noted. Any retained contents within the diverticulum should be suctioned. The esophagoscope should then be removed to allow for patient positioning. The anesthesiologist then places a single- or double-lumen endotracheal tube depending on surgeon's preference and a 16-F nasogastric drainage tube.

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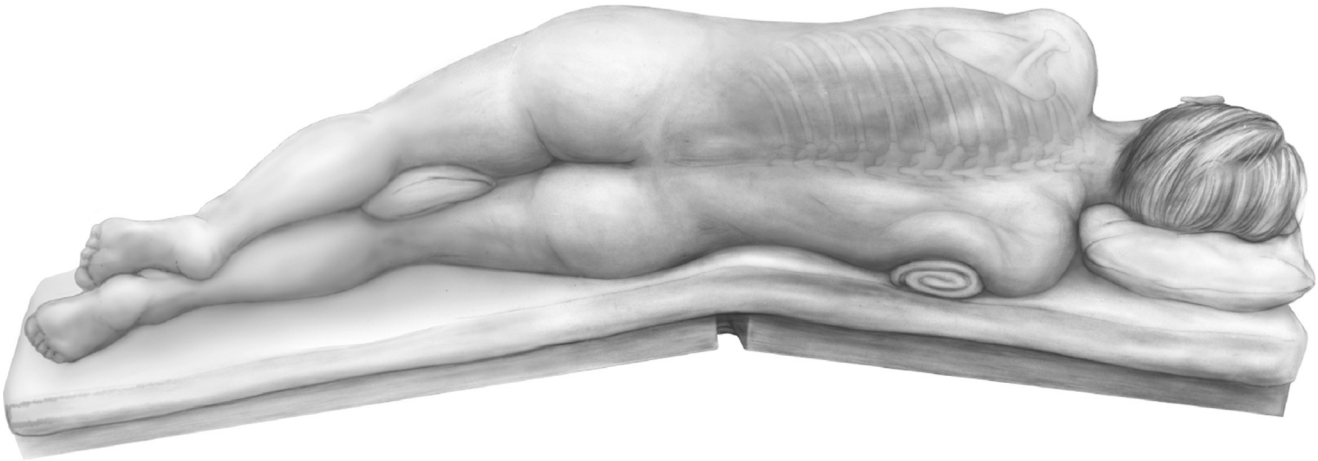

Figure 1 (A) The patient is positioned in the right lateral decubitus position with the left side up with an axillary roll placed 2-3 fingerbreadths below the axilla.