

Large Hiatus Hernia: Time for a Paradigm Shift

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Abstract

Laparoscopic Large Hiatal Hernia (LHH) repair remains a challenge despite three decades of ongoing attempts at improving surgical outcome. Its rarity and complexity, coupled with suboptimal initial approach that is usually best suited for small symptomatic hernia has contributed to unacceptable higher failure rates.

Keywords: Laparoscopic large hiatal hernia • Cruroplasty

Introduction

The history of the hiatus hernia and its repair is rich and eventful. It took nearly half of a century between its first description in 1853 and a reported case of elective open repair in 1919. About seven decades later the first laparoscopic hiatal hernia repair was undertaken by Dallemagne in 1991. Shortly after, in 1992, Cusher performed a repair for a large hiatus hernia, and a year later mesh reinforcement of laparoscopic paraesophageal hernia was described. Over the last three decades the laparoscopic approach to large hiatal/paraesophageal hernia repair has become increasingly ubiquitous. However, whilst repair of small symptomatic sliding hiatal hernia has been well described and has yielded good outcomes the same cannot be said of Large Hiatal Hernia (LHH). Its rarity and complexity, coupled with suboptimal technical approach that is usually best suited for small defects have contributed to unacceptably high failure rates. Moreover, the range of confounders present in published series on LHH makes it difficult to reach any meaningful conclusion and also to draw relevant comparisons across various series.

Patients with large hiatus hernia who present acutely need careful assessment. If they are fit to undergo an operation, then it needs to be offered. There is evidence to show that a simple conservative approach in such symptomatic patients has a risk of mortality of 16%. However, there is also a 16% risk of death associated with acute intervention. This is due to the significant complications that those patients present with (perforation with mediastinitis, aspiration), which leads to significant physiological compromise perioperatively. In addition, these patients are generally elderly with significant comorbidities. So, is there a way of improving on the mortality of those who need urgent intervention? There may be a role for a sub-acute staged approach for those who are not in an immediate organ threatening situation. The delayed strategy includes decompression, restoration of physiological deficits, institution of enteral nutrition, careful anaesthetic evaluation and referring the patient to an experienced team of laparoscopic surgeons for the repair. There are a few factors intrinsic to laparoscopic LHH repair that make the endeavor fraught with risks. The operation itself can be prolonged, which in turn can have adverse effect on respiratory and cardiovascular system of those patients who often have underlying co-morbidities such as obstructive airways disease or cardiomyopathy. Mediastinal dissection with the risk of pleural breach causing a pneumothorax or pericardial injury can be poorly tolerated intra- or post-operatively.

The left lateral lobe overhangs the esophageal hiatus and requires mechanical retraction to enable safe hiatal hernia repair. The presence of an enlarged fatty left lobe makes the repair of a LHH even more challenging and hazardous. Firstly, the prolonged retraction of the enlarged left lateral lobe can lead to injury and ischemia. Secondly, it obscures the large hiatus and right crus. Dissection becomes more difficult with higher risk of inadvertent trauma to the liver. It also compromises the view required for safe mediastinal dissection, especially should the pneumoperitoneum need to be reduced or in the setting of a pneumothorax. The repair phase is also harder especially whilst suturing of the stomach to the diaphragm and right crus during a Dor anterior fundoplication.

In anticipation of this problem the senior assesses the size of the left lateral lobe with Computed Tomography imaging (CT-imaging), especially in patients with BMI>30 who are at risk of liver steatosis. In case of hepatomegaly the patient is given a very-low-calorie replacement diet of Optifast for one or two weeks preoperatively, which has been associated with significant left lobe shrinkage in the author's experience. Luminal anatomy is assessed with a gastroscopy. The length of the esophagus is measured by assessing the position of the gastroesophageal junction with respect to the crural impression. This is often inaccurate due to anatomical contortion and lack of appreciation of the elasticity of the esophagus, which is best noted intraoperatively. The mucosa is assessed for Barrett's changes, which can be present in up to 13% of those patients. Strictures and esophagitis are also noted as they may predict the presence of a shortened esophagus. Cameron's ulcers are looked for, usually at the level of the crura which causes pressure related mucosal ulcerations. In the acute setting gastroscopy is useful to assess mucosal viability in equivocal cases, and help inserting a feeding nasojejunal tube in case a staged delayed approach to repair is entertained.

Extraluminal anatomy is best assessed with an upper abdominal/chest CT with oral. The extent of mediastinal involvement is appreciated on the coronal slices. The size of the hernial sac, cranio-caudal extent of the hernia and relationship to the pericardium and lungs can be objectively appreciated and calculated. The contents of the sac are also noted and would commonly contain the stomach and omentum. The transverse colon can be present which poses no great issue. However, the presence of the spleen, tail of pancreas or even the left lateral lobe of the liver increase the complexity of the operation and may well require a multidisciplinary approach to management. The location of the splanchnic vessels, especially left gastric and splenic arteries, should be carefully noted as any distortion of the anatomy could cause inadvertent injury especially during posterior dissection at the level of the crura. The axial view of the abdominal CT is also useful in assessing intercrural distance, which would predict the likelihood of needing mesh reinforcement. In the acute setting an emergency Computed Tomography (CT) assesses for volvulus, ischemia and perforation. Mediastinal dissection for LHH is likely to cause pleural breach and pneumothorax that may significantly affect ventilation/oxygenation although its magnitude cannot be predicted. It should be avoided, especially in patients with concomitant lung disease. If left unrecognized this could lead to hypotension from reduced venous return with the need for inotropic support. This may also have serious adverse effect in those with cerebrovascular disease or mesenteric vascular disease.

Collis Gastroplasty (CG) is performed in the setting of a LHH repair whenever a Shortened Esophagus (SE) is diagnosed. This entity has been defined by Barrett in 1950 as a situation where the esophageal length is insufficient to allow the Gastroesophageal Junction (GEJ) to lie below the diaphragm by 2 cm–3 cm. There are some conditions that predispose to the shortened esophagus such as long esophageal stricture, extensive Barrett's changes, or grade 3 or grade 4 esophagitis. These have been mostly prevented by the widespread use of proton pump inhibitors prior to hiatal repair. However, the technique is employed more than expected and there is great variability in reporting of CG, ranging from 0% to 80%. Even across series from the same institutions the rate of Collis has varied in time.

Cruroplasty is a crucial step in the reconstructive phase of the hiatal hernia repair.

Posterior cruroplasty is the traditional method used and involves approximation of the crura behind the esophagus. Sometimes an additional anterior cruroplasty may be required to prevent additional posterior reinforcement from causing sigmoid deformity of the esophagus, thus causing dysphagia. Interrupted non absorbable sutures such as Ethibond have been favored for cruroplasties. More recently some surgeons have experimented with running barbed sutures (V-Loc Covidien or Stratafix Ethicon) with good result. The potential advantage is that the tensile strength afforded by the running suture is spread more evenly across the crural pillars.

However, in the presence of a very wide crural defect it may sometimes not be possible to perform satisfactory cruroplasties due to excess tension after crural apposition. In addition, the quality of the pillars is poor, made of attenuated muscle fibers with very little fascia. In those situations, relaxing lateral incisions to allow better medialization of the crura are often used and the resulting defects reinforced with mesh. This can reduce the tension on the crura by 50%. A right-sided incision should be favored and if a left-sided one is performed then a permanent mesh should be used as reinforcement. However, the repeated stress from about 20,000 diaphragmatic movements a day can easily disrupt the repair. Hence additional mesh reinforcement is often required. The Society of American Gastroenterological Endoscopic Surgeons (SAGES) guidelines from 2015 is equivocal in its recommendation regarding the role of mesh in hiatal hernia

repair, reiterating the lack of strong evidence on its usefulness. However, it recognized that there may be a benefit in mesh reinforcement in LHHs in terms of decreased short term recurrence rate. The European Association of Endoscopic Surgeons (EAES) consensus guideline echoed the guarded suggestion but recommending the selective use of the mesh in those patients with large crura and large hiatal defect.

Conclusion

In summary, we suggest a careful evaluation and selection of all patients with a LHH. The latter should be evaluated endoscopically and with a CT chest. Those with a large fatty left lateral lobe should undergo a routine preoperative optifast regime. We undertake a careful and meticulous surgical approach to such patients. This includes systematic excision of the hernia sac and extensive mediastinal extra-saccular dissection to allow full mobilization of the GEJ back into the abdomen, thus avoiding an unnecessary Collis gastroplasty, which has associated morbidity. We advise posterior cruroplasty with biosynthetic mesh reinforcement in a U-shaped configuration, away from the esophagus. The prosthesis is then preferentially fixed with non-traumatic fibrin glue. We favor an anterior partial Dor fundoplication with esophagopexy. We recommend that all patients undergo a cardiac echo the next day. Upon discharge a selective follow up regimen is put in place.