

# Mesh migration into stomach following diaphragmatic hernia repair: a rare complication

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**ABSTRACT:** Mesh erosion and migration are considered the gravest of complications of mesh repairs. To the best of our knowledge, mesh erosion and migration into the stomach following a mesh repair of adult diaphragmatic hernia has yet to be reported in the literature. A case of mesh eroding into the stomach, after a prosthetic repair of an adult diaphragmatic hernia, is presented here because of its rarity.

**KEYWORDS:** Adult diaphragmatic hernia, mesh migration, gastric erosion

## INTRODUCTION

Adult-onset diaphragmatic hernias are an uncommon entity. Surgical closure by open laparotomy, thoracotomy or minimal access surgery is the mainstay of treatment, with prosthetic repair being advocated due to high recurrence following primary repairs [1]. However, complications have been noted with prosthetic meshes, namely adhesions, erosion and migration with possibly life-threatening sequelae. We present a case of a patient with an erosion and migration of a composite mesh into the fundus of the stomach detected 9 years after the previous laparoscopic repair of an adult-onset diaphragmatic hernia.

## CASE REPORT

A 39-year-old female, with no known co-morbidities or history of trauma, presented with a sudden onset of left upper abdominal pain and breathlessness 9 years ago. On evaluation, she was diagnosed as a case of left posterolateral diaphragmatic hernia, for which she underwent an emergency laparoscopic repair with a polypropylene composite mesh. She had a smooth post-operative course and remained asymptomatic for more than 5 years postoperatively. She presented to us with complaints of upper abdominal burning pain, early satiety and gas bloat after meals with progressive increase in severity for the past 3 years.

An upper GI endoscopy at our center showed the mesh eroding into the fundus of the stomach (Fig. 1). Contrast-enhanced computed tomography (CECT) of the chest and abdomen showed a 1×1.6-cm defect in the posterolateral left hemidiaphragm with herniation of intra-abdominal fat causing basal focal atelectasis. A small portion of the fundus of the stomach was noted to be entrapped in a soft tissue thickening between the diaphragm and spleen with few metal-density foci within the presumably eroded mesh with no leakage of the contrast material (Fig. 2).

After adequate preoperative optimization and anaesthesia fitness, the patient was planned for surgery.

## Operative findings and procedure

Exploratory laparotomy showed dense adhesions between the



Fig.1. Upper GI endoscopy showing mesh eroding into the fundus.

spleen, diaphragm, stomach and the previous laparoscopic scar. A large defect was noted in the posterior wall of the gastric fundus with almost the entire mesh and metallic tacks eroding into it, with a small defect in the left hemidiaphragm measuring approximately 1×2 cm behind the eroded mesh. The rest of the abdomen was normal.

The stomach was dissected away from the diaphragm with meticulous adhesiolysis. The eroded mesh was explanted from the stomach and excised (Fig. 3, 4). The diaphragmatic defect was repaired with figure-of-8 sutures using no. 1 Prolene (Ethicon, Somerville, New Jersey, USA) and covered by a pedicled omentoplasty. The fundus was repaired in 2 layers using 3-0 Vicryl (Ethicon, Somerville, New Jersey, USA) and 3-0 Mersilk (Ethicon, Somerville, New Jersey, USA) respectively. A drain was placed in the left subdiaphragmatic space and the laparotomy wound was closed in layers.

## Post-operative course

The patient's post-operative course was uneventful. She was started on oral liquids on postoperative day 3 and full oral diet on post-

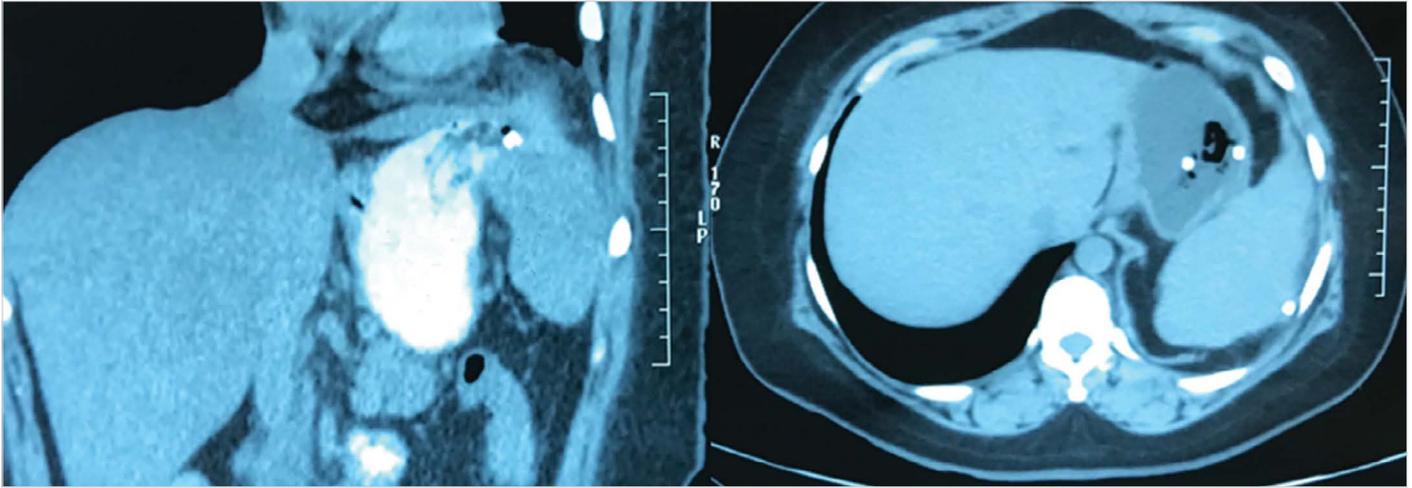


Fig. 2. CECT abdomen showing the stomach entrapped between spleen and diaphragm with foreign body and metal density foci.



Fig. 3. Mesh being removed from the stomach.



Fig 4. Excised mesh

perative day 5. Patient was discharged on the 10th post-operative day. On subsequent follow-up the patient had minimal discharge from the drain site, which stopped subsequently. The patient is currently completely relieved of her previous symptoms and continues to take normal diet.

## DISCUSSION

Adult presentations of congenital diaphragmatic hernias (CDH) are exceedingly rare, often detected accidentally on imaging, or occasionally presenting with breathlessness and upper abdominal pain following trivial blunt abdominal trauma. The two major types of CDH are Bochdalek hernia with a posterolateral defect and Morgagni-Larrey hernia presenting with an anteromedial defect [2, 3]. A diaphragmatic hernia, once detected, should be operated.

Use of a mesh to reinforce the repair is debatable. Shah et al. have described a primary repair of Morgagni hernia in children using

transfascial sutures [4]. Papanikolau et al. have also described an open technique of sutured repair of Morgagni hernia in adults [5]. In larger defects a mesh may be required to buttress the suture line or as a bridge between the two leaflets [1].

Wadhwa et al. have described the use of polypropylene mesh for reinforcement of diaphragmatic hernia in 6 patients with favorable results [6]. However, Davoodabadi et al. showed dense adhesions in 60% of subjects after diaphragmatic repair of rabbits with polypropylene mesh which decreased to 0% when a pedicled omental graft was fixed over the mesh [7].

Dense adhesion formation and erosion into the viscera due to prosthetic meshes has been described for ventral abdominal hernias on multiple instances. Gandhi et al. described the erosion of a polypropylene mesh into the caecum, 14 years after the initial hernia surgery [8]. Bostanci et al. have described a case with migration and erosion of a composite mesh with enterocutaneous fistula formation [9]. Nelson et al. have also described a case of migration of a composite mesh into the sigmoid colon following

ventral hernia repair [10]. To the best of our knowledge, mesh migration into the stomach following diaphragmatic hernia repair has not been reported in the literature.

Multiple complications have been reported with the use of tackers in the diaphragm in the study by Kockerling et al., with grave and life-threatening consequences [11].

Our patient had a previous diaphragmatic reinforcement with a composite mesh and Protacks (Medtronic, Covidien) with the fundus of the stomach trapped between the spleen and the diaphragmatic surface and the mesh and tacks migrating into the stomach. One plausible hypothesis which may be considered, is that due to the adhesions between the mesh and the stomach, the fundus got entrap-

ped between the spleen and the diaphragm. Likewise, the erosion might have occurred due to either the direct erosion from the polypropylene in the mesh or due to the embedding of the metallic tacks into the fundal wall. After complete excision of the mesh, the residual diaphragmatic defect was repaired with polypropylene suture and a pedicled omentoplasty as described by Davoodabadi et al. [7].

## CONCLUSION

Erosion of a mesh into the stomach is an unreported complication of diaphragmatic hernia mesh repair. The possibility of erosion and migration of a mesh should be considered in symptomatic patients undergoing mesh repair of diaphragmatic hernias.

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