

Diaphragmatic perforation after electrocautery-assisted lumen-apposing metal stent placement for refractory perisplenic abscess

Dear Editor,

EUS-guided drainage represents a first-line minimally invasive modality for the treatment of pancreatic and peri-pancreatic fluid collections (PFC). Lumen-apposing metal stents (LAMS) have improved treatment outcomes in the management of PFC, and are associated with lower morbidity and mortality compared to the surgical approach.^[1] However, significant adverse events remain, including stent migration,^[1-3] pneumothorax, pneumoperitoneum, perforation, infection, and bleeding.^[4] We describe an unusual and previously unreported complication of LAMS placement – diaphragmatic perforation, with empyema.

A 71-year-old male presented with acute peritonitis due to anastomotic leaks from a recent left hemicolectomy for his stage IIa proximal sigmoid adenocarcinoma. Reintervention consisted of an ileostomy and insertion of drains, including one at the height of the pancreatic tail. This resulted in pancreatic trauma and a persistent PFC, as revealed by a 12 cm × 2.7 cm intra-abdominal collection extending from the left diaphragm to the pelvis on 1-month follow-up computed tomography (CT) scan [Figure 1]. EUS-guided cyst-gastrostomy was performed by deploying a 15 mm × 10 mm LAMS, using the Hot Axios™ electrocautery-assisted delivery system (Boston Scientific Corporation), with no fluoroscopy and with no wire guidance. There was instantaneous drainage of pus and no evidence of immediate complications.

Approximately 24 h after discharge, the patient developed shortness of breath and fever, and was readmitted with septic shock and empyema. CT scan showed communication between the extra

gastric flange of the AXIOS stent, the PFC, and possibly the left pleural space [Figures 2 and 3]. A pleural chest tube was inserted, and the patient was stabilized and sent for surgical exploration. After opening the abdominal wall, the LAMS was in direct contact with the abdominal surface of the diaphragm. An orifice was identified in the diaphragm, compatible with a perforation induced by the stent delivery system. The stent was removed, the abscesses were drained, and the diaphragmatic and gastric orifices were closed. Lung decortication was performed 2 days later, and the patient was



Figure 1. Multiple communicating intra-abdominal collections with internal fluid density and capsular ring enhancement after IV contrast administration localized mainly in the perisplenic/left subphrenic and retroperitoneal regions. IV: Intravenous

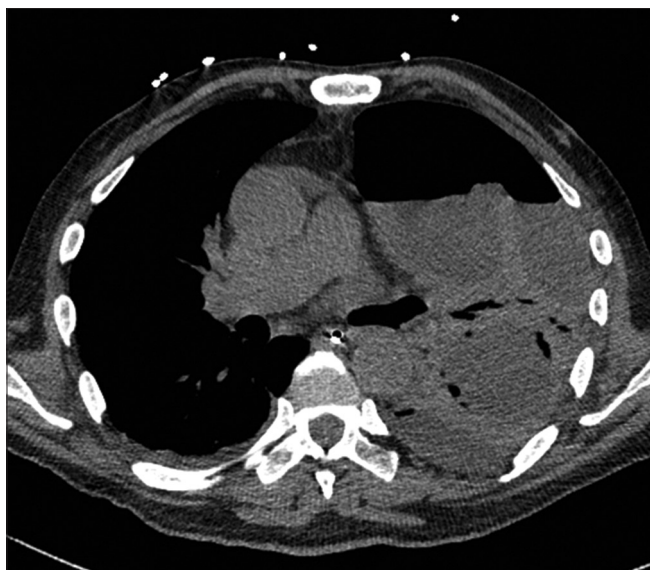


Figure 2. Complex left loculated hydropneumothorax

admitted to the intensive care unit for postoperative surveillance and stabilization.

To our knowledge, this is the first report of diaphragmatic perforation due to trauma by the catheter of a LAMS deployment system. Due to the shape of the collection, the space between the gastric wall and the diaphragm was limited. The tip of the delivery system is quite rigid, but as the stent is deployed, the exposed end becomes more flexible. Here, it is possible that chronic subphrenic inflammation decreased diaphragm flexibility, making it more fragile to any pressure from the delivery system. The use of fluoroscopy and/or wire guidance might have helped avoid this complication. The forward deployment technique, whereby the catheter is introduced only minimally, and the stent is deployed directly by pushing it out, may have avoided contact between the delivery catheter and the diaphragm. Thus, we believe the risk of diaphragmatic perforation should be considered when placing LAMS in proximity to the subphrenic space, and modifications of the deployment technique may be required.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.



Figure 3. The proximal end of the Axios can be seen inside the stomach, while air can be seen exiting its distal end in the left subphrenic region, appearing to be in communication with the left costophrenic recess

Financial support and sponsorship

Nil.

Conflicts of interest

Anand V. Sahai is an Honorary Editor-in-Chief of the journal. This article was subject to the journal's standard procedures, with peer review handled independently of the editor and his research group.

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Received: 2021-12-31; **Accepted:** 2022-08-01;
Published online: 2022-12-01

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Quick Response Code: 	Website: www.eusjournal.com
	DOI: 10.4103/EUS-D-22-00001

How to cite this article: Sene PM, Esmail E, Vandebroucke-Menu F, Diakité AT, Liu Chen Kiow J, Sahai AV. Diaphragmatic perforation after electrocautery-assisted lumen-apposing metal stent placement for refractory perisplenic abscess. *Endosc Ultrasound* 2022;11:522-4.
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