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Research Letter

A case of ovarian cancer present with acute respiratory distress: Spontaneous rupture of diaphragm

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Spontaneous diaphragmatic rupture is one of the rarest surgical emergencies, with less than 30 cases worldwide, and only two cases associated with ovarian cancer [1–4]. Spontaneous diaphragmatic hernia may occur when intra-abdominal contents extend into the thoracic cavity through a defect in the diaphragm, usually after a sudden increase in intra-abdominal pressure [5]. A 55-year-old woman without a significant past medical history experienced poor appetite and general weakness for one week. She presented to our hospital complaining of lower abdominal pain that lasted for several days. She denied gastrointestinal symptoms such as diarrhea, nausea or vomiting. Transvaginal ultrasound was performed and revealed a 10-cm pelvic cystic tumor with solid part and intra-tumor blood flow, with moderate ascites. Laboratory examinations revealed elevated cancer antigen levels: CA-125, CA-153, and CA-199 (773.5, 125.6, and 3070.2 U/mL, respectively). Based on clinical suspicion of ovarian cancer, she was admitted for further evaluation and underwent whole abdomen computed tomography. At admission, her vital signs were stable, with no signs of fever, shortness of breath, or chest discomfort. However, sudden onset of dyspnea was noted; her vital signs included temperature: 36.4 °C; blood pressure: 124/89 mmHg; heart rate: 85 beats/min, respiratory rate: 22 breaths/min, and blood oxygen saturation: 91–92%. Physical examination revealed significant accessory

muscle use, no wheezing, no stridor, no jugular venous distention, normal heart sounds, and diminished breath sounds in the left lung field. Blood gas analysis revealed respiratory acidosis. Chest radiography revealed a collapsed left lung with trachea deviation to the right side, revealing left-side tension pneumothorax (Fig. 1). Due to respiratory distress, the patient was intubated and transferred to intensive care unit (ICU). A left-side pigtail catheter was inserted, after consultation by a chest doctor, this was followed by nasogastric tube insertion. At the intensive care unit, follow-up chest radiography revealed that the nasogastric tube tip was placed in the intrathoracic stomach (Fig. 2). After her vital signs stabilized, computed tomography (CT) was performed, revealing significant intrathoracic stomach occupying the left chest, secondary to diaphragmatic rupture (Fig. 3). The following day, the patient received combined diaphragm repair and debulking surgery for ovarian cancer. During the operation, a 5 × 5-cm diaphragmatic defect was identified and repaired, followed by total abdominal hysterectomy, bilateral salpingo-oophorectomy, pelvic lymph node dissection and omentectomy. The pathology showed a 10 × 10 × 8-cm right ovarian adenocarcinoma with right fallopian tube involvement, endometrioid type, with ER and PR positivity, FIGO stage IIB. There was no metastatic lesion found at the defect of diaphragm. The patient had an uneventful postoperative course, received adjuvant chemotherapy, and has survived without the disease for 2 years.

A spontaneous diaphragmatic rupture without any apparent history of trauma is a rare condition and is difficult to diagnose. Its association with gynecological cancer is unclear. Chest radiographs are diagnostic in only 25%–50% of cases in non-traumatic settings; an estimated 66% of spontaneous diaphragmatic ruptures are missed on initial presentation [6]. However, common radiographic findings include an elevated left hemi-diaphragm, blunting of the costophrenic angle, distortion of the diaphragmatic borders, curling

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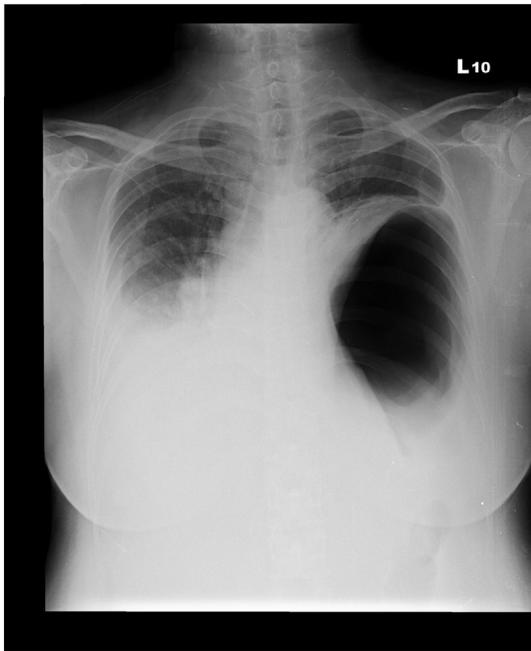


Fig. 1. Chest radiography showed trachea deviation to the right side with intrathoracic stomach, mimicking a left-side tension pneumothorax.

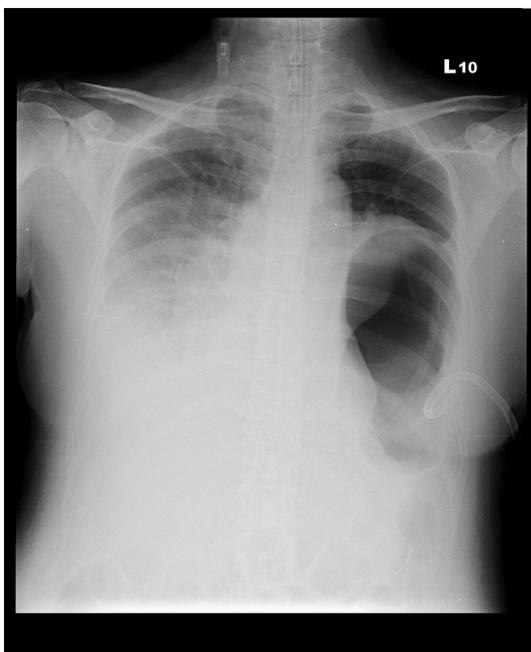


Fig. 2. Follow-up chest radiography showed intrathoracic stomach with nasogastric tube, the pigtail catheter was placed in the pleural cavity.

of a gastric tube into the thorax, mediastinal shift, or the presence of air-filled gastrointestinal structures in the left hemi-thorax [6]. Only two cases of spontaneous diaphragmatic rupture were found with ovarian cancer [2,4]. The common etiology was the diaphragmatic tissue weakening secondary to cancer metastasis. Bobbio et al. reported a 43-year-old woman who presented with right chest pain and was diagnosed with endometriosis-related spontaneous diaphragmatic rupture. The invasiveness of

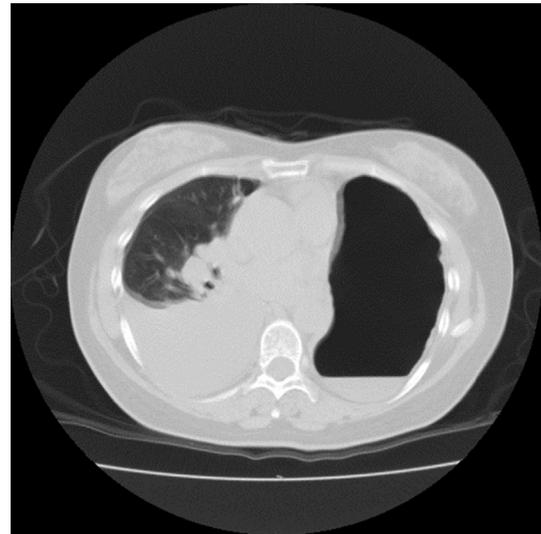


Fig. 3. Computed tomography (lung window) showed the stomach is herniated at the left lower mediastinum secondary to diaphragmatic defect.

endometriosis tissue could have caused diaphragm fragility, leading to its complete rupture without traumatic events [7].

The present case showed no signs trauma, and diaphragm metastasis was not found in the pathology report. A cancer patient presenting with acute onset of respiratory distress and unilateral breath sounds in a non-traumatic setting frequently has differential diagnoses of spontaneous pneumothorax, pleural effusion, pneumonia, or obstructive airway. A spontaneous diaphragmatic rupture is usually not considered during the initial evaluation in such patients. The most accurate imaging modality is CT, and its accuracy ranges from 50% to 78% [8]. The only treatment option for spontaneous diaphragmatic rupture is surgery. Nasogastric tube decompression of the gastrointestinal tract and supplemental oxygen can be used to alleviate symptoms until a definitive operative management is performed [9]. In summary, spontaneous diaphragmatic rupture occurring in a patient with ovarian cancer without trauma is an extremely rare event and is most typically secondary to tumor metastasis to the diaphragm, causing tissue weakening. Careful evaluation of a non-traumatic cancer patient with respiratory distress is crucial to avoid misdiagnosis and unnecessary medical procedures.

Conflicts of interest

The authors declare no conflict of interest.

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Informed consent

Informed consent was obtained prior to this study.

References

- [1] Ghidirim G, Mishin I, Condratsky E, Zastavitsky G. Spontaneous diaphragmatic rupture: case report and literature review. *Chirurgia (Bucur)* 2013;108:99–101.
- [2] Kahramanoglu I, Turan H, Altinpulluk EY, Mammadov Z, Bese T, Arvas M, et al. Cytoreductive surgery followed by hyperthermic intraperitoneal chemotherapy for recurrent ovarian cancer with incidental Bochdalek hernia and post-operative bilateral thalamic infarct: a case report. *Case Rep Oncol* 2017;10:265–71.
- [3] Losanoff JE, Edelman DA, Salwen WA, Basson MD. Spontaneous rupture of the diaphragm: case report and comprehensive review of the world literature. *J Thorac Cardiovasc Surg* 2010;139:e127–8.
- [4] Wolfe M, Wilkinson-Ryan I, Hagemann AR, Thaker PH. A case of ovarian cancer metastases causing a symptomatic paraesophageal hernia. *Am J Obstet Gynecol* 2014;211. 568.e1-2.
- [5] Darocki MD, Medak AJ. Spontaneous diaphragmatic hernia. *Clin Pract Cases Emerg Med* 2018;2:244–6.
- [6] Sandstrom CK, Stern EJ. Diaphragmatic hernias: a spectrum of radiographic appearances. *Curr Probl Diagn Radiol* 2011;40:95–115.
- [7] Bobbio A, Regnard J-F, Alifano M, Triponez F. Endometriosis-related spontaneous diaphragmatic rupture. *Interact Cardiovasc Thorac Surg* 2010;11:485–7.
- [8] Eren S, Kantarci M, Okur A. Imaging of diaphragmatic rupture after trauma. *Clin Radiol* 2006;61:467–77.
- [9] Kearney PA, Rouhana SW, Burney RE. Blunt rupture of the diaphragm: mechanism, diagnosis, and treatment. *Ann Emerg Med* 1989;18:1326–30.