CLINICAL IMAGE

Intercostal lung herniation mimicking retroperitoneal bleeding in a patient with obstructive sleep apnea treated with continuous positive-pressure ventilation

Paweł Koźlik[1], Andżelika Siwiec[2], Joanna Kosałka-Węgiel[1,2], Piotr Łoboda[3], Mamert Milewski[1]

1 2nd Department of Internal Medicine, Jagiellonian University Medical College, Kraków, Poland
2 Rheumatology Department, University Hospital, Kraków, Poland
3 Radiology Unit, University Hospital in Kraków, Jagiellonian University Medical College, Kraków, Poland

Here, we report a case of a 69-year-old man who developed intercostal lung herniation, possibly due to excessive cough reflex in the course of infectious chronic obstructive pulmonary disease (COPD) exacerbation. As a current smoker with bullous emphysema, morbid obesity, obstructive sleep apnea (OSA), heart failure with preserved ejection fraction, coronary artery disease presenting as stable angina and hypertension, he was treated with a continuous positive airway pressure (CPAP) ventilator at 13 cm H_2O with the device's comfort feature intended to decrease CPAP by 3 cm H_2O during exhalation.

The patient presented to the emergency department because of dyspnea that started to gradually worsen 2 weeks earlier, accompanied by excessive cough with purulent sputum and subsequent acute pleuritic pain in the right subcostal space and the right flank, along with an episode of "tearing sensation" in the chest wall.

The physical examination showed periumbilical and right flank bruising matching the Grey–Turner and Cullen signs (despite no history of recent abdominal pain or signs of gastrointestinal bleeding) and a palpable soft mass over the right eighth intercostal space between axillary lines. Apart from that, reducible umbilical hernia, signs of bronchitis (rhonchi and expiratory wheezing), pulmonary congestion (fine crackles at the lung bases, consistent with the chest radiogram), yet no subcutaneous emphysema were observed.

Further workup showed mild respiratory failure (arterial blood pO_2 level of 55 mm Hg with no acidosis or carbon dioxide retention), elevated concentrations of C-reactive protein (60 mg/l; reference range <5 mg/l), procalcitonin (0.11 ng/ml; reference range <0.05 ng/ml), fibrinogen (5.1 g/l; reference range, 1.8–3.5), and D-dimer (1100 mg/l; reference range <500 mg/l), peripheral blood eosinophilia of 300 cells/μl (reference range, 40–450 cells/μl), amylase activity within reference range, and no anemia in the serial blood cell count.

Abdominal sonography and radiography were unremarkable for pancreatic or gastrointestinal pathology. Chest wall sonography revealed an irregular, diffuse collection of fluid (32 × 22 mm) over the soft mass, which seemed to be connected to the right pleural cavity and change size and depth during respiration.

Pulmonary embolism and rib fractures were excluded based on initial computed tomography (CT) angiography. Right lung herniation through the eighth intercostal space was seen on initial CT only retrospectively (FIGURE 1A), following more evident findings including right pleural effusion and a shallow fluid collection in the chest wall adjacent to the hernia, which were noted on follow-up high-resolution CT performed after successful treatment of COPD and exacerbated heart failure with preserved ejection fraction (FIGURE 1B-1C). Herniation remained invisible on subsequent plain radiograms.

The patient is being periodically followed up to evaluate whether the herniated lung needs surgical treatment, and CPAP treatment was discontinued.

Acquired intercostal lung herniation is a rare condition of traumatic, pathologic, or spontaneous origin.[1] Reported scenarios include past chest wall trauma (which may precede clinical

Correspondence to:
Paweł Koźlik, MD, 2nd Department of Internal Medicine, Jagiellonian University Medical College, ul. Skawińska 8, 31-066 Kraków, Poland, phone: +48 12 430 53 14, email: pawelkozlik89@gmail.com
Received: May 1, 2020.
Revision accepted: June 2, 2020.
Published online: June 4, 2020.
Pol Arch Intern Med. 2020; 130 (9): 799-800
doi:10.20452/pamw.15417

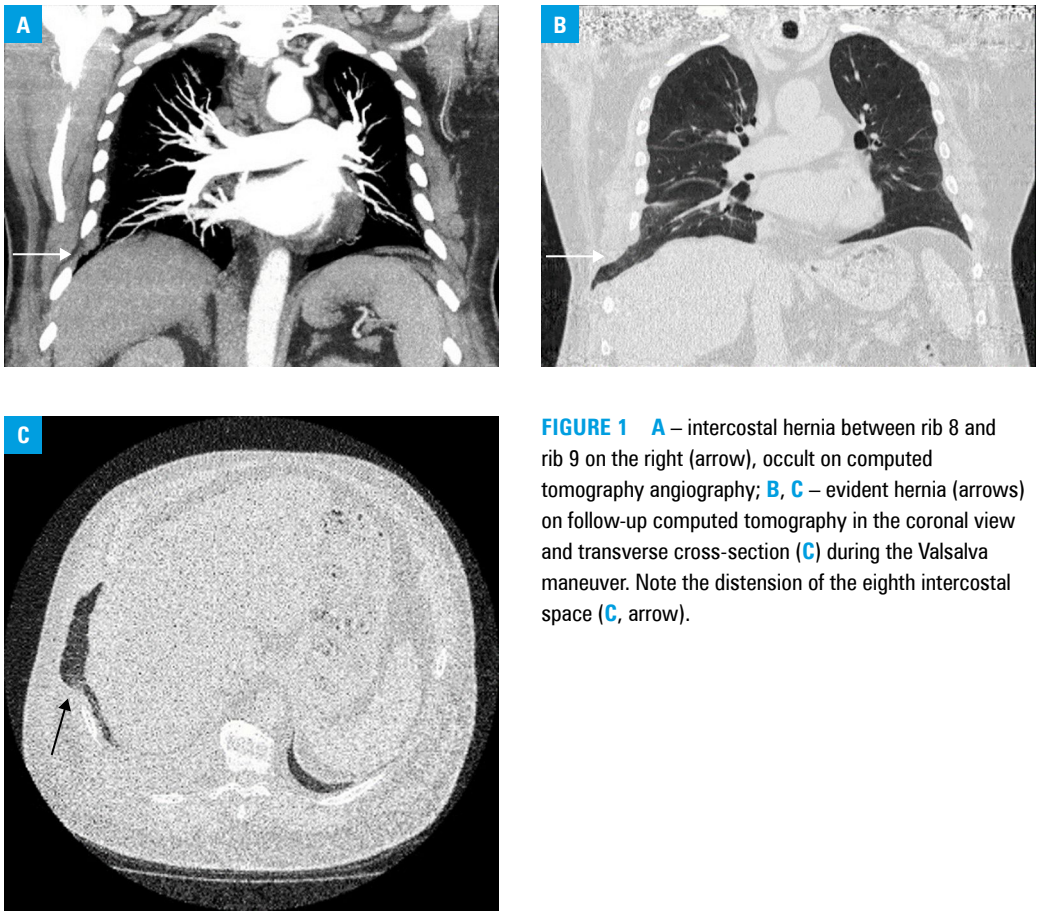

FIGURE 1 **A** – intercostal hernia between rib 8 and rib 9 on the right (arrow), occult on computed tomography angiography; **B**, **C** – evident hernia (arrows) on follow-up computed tomography in the coronal view and transverse cross-section (**C**) during the Valsalva maneuver. Note the distension of the eighth intercostal space (**C**, arrow).

symptoms for years) and thoracic surgery (frequently minimally invasive, followed by inadequate wound closure).[2] Reports of nontraumatic, nonsurgical cases implicate the demographics of a male septuagenarian with COPD exacerbation and obesity.[3] The postulated mechanism of the disease includes excessive cough and sudden elevations of intrathoracic pressure in the setting of weak intercostal muscles.[2] Our report indicates an association with OSA (possibly through obesity and decreased chest wall compliance resulting in increased strain). Furthermore, while CPAP has been reported to alleviate chronic cough in patients with OSA,[4] its use during coughing fits may further increase intrathoracic pressure.[5]

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

HOW TO CITE Koźlik P, Siwiec A, Kosałka-Węgiel J, et al. Intercostal lung herniation mimicking retroperitoneal bleeding in a patient with obstructive sleep apnea treated with continuous positive-pressure ventilation. Pol Arch Intern Med. 2020; 130: 799-800. doi:10.20452/pamw.15417

REFERENCES

1 Detorakis EE, Androulidakis E. Intercostal lung herniation – the role of imaging. J Radiol Case Rep. 2014; 8: 16-24.

2 Weissberg D. Lung hernia – a review. Adv Clin Exp Med. 2013; 22: 611-613.

3 Maeda T, Sato R, Luthe SK, et al. Spontaneous intercostal lung hernia. Am J Med. 2017; 130: e399-e400.

4 Sundar KM, Daly SE, Willis AM. A longitudinal study of CPAP therapy for patients with chronic cough and obstructive sleep apnoea. Cough. 2013; 9: 19.

5 Lehmann CJ, Daftary AS, Machogu EM. Apical lung herniation associated with continuous positive airway pressure in a 4-year-old girl. J Clin Sleep Med. 2016; 12: 1565-1566.