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Pediatrics and Neonatology xxx (xxxx) xxx

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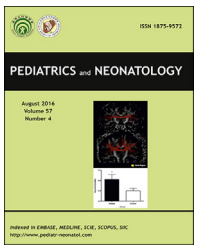

Letter to the Editor

A prompt diagnosis of late-onset congenital diaphragmatic hernia with Point of Care Ultrasound (POCUS) in a Pediatric Emergency Department

Dear Editor:

An 11-month-old boy presented to the pediatric emergency department (PED) of a spoke hospital after a 1-day history of fussiness, inconsolable crying, and two vomits. Upon admission, he appeared alert, yet pale and fussy. Physical examination revealed mild abdominal tenderness and a palpable mass in the left lower quadrant. A few hours later, drowsiness and oral intake refusal appeared. The laboratory test results were normal. A chest X-ray (CXR) revealed a left lower consolidation with possible effusion (Fig. 1,a). Moreover, abdominal ultrasound showed a large gastric shadow and dilated small intestinal loops with hydro-air levels.

Upon admission, the patient, who had been promptly referred to our tertiary care PED, was in a good clinical condition and had no pathological findings on pulmonary auscultation. A lung point-of-care ultrasound (LUS) conducted by an emergency pediatrician, using a high frequency (7—15 MHz) linear transducer, with the patient placed in both the supine and sitting positions to scan all the chest walls, revealed a bowel with active peristalsis in the left emithorax as well as partial absence of the part of the affected hemidiaphragm and partial absence of the pleural line; therefore, the most likely diagnosis was congenital diaphragmatic hernia (CDH) (Fig. 1,b).

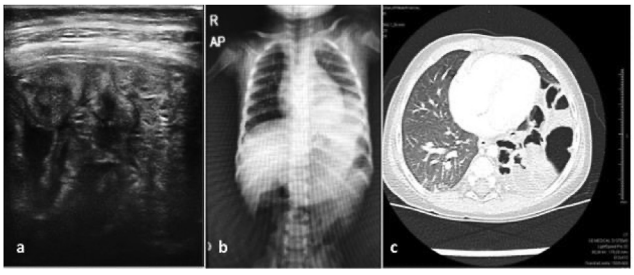

Figure 1 (a) CXR on admission: a left lower consolidation and possible effusion, (b) POCUS: bowel loops under the ribs instead of normal lung, and (c) Chest CT: bowel herniation in the left hemithorax.

Computed tomography (CT) scan (Fig. 1,c) and exploratory laparotomy were performed. The left CDH was confirmed and mainly repaired during surgery. The postoperative period was uneventful and the patient was discharged from the hospital 8 days later.

1. Discussion

CDH is a diaphragmatic congenital defect (incidence of 1 in 3000 live births) with a wide range of anatomical and clinical manifestations. During fetal development, CDH leads to a lack of distinction between the abdominal and thoracic cavities.[1] Furthermore, the most common localization site (75%—90% of cases) is the posterolateral left side. CDH is diagnosed either during pregnancy or shortly after birth, and it causes life-threatening severe respiratory distress. The clinical diagnosis of late-presenting CDH (5%—25% of cases) is difficult due to its insidious onset.[2] A prompt diagnosis is crucial to prevent impaired development of children and life-threatening conditions, including small bowel strangulation and cardiorespiratory arrest.[3] Late-presenting CDH should be suspected in cases of unexplained acute or chronic respiratory or gastrointestinal symptoms as well as in cases showing abnormal CXR findings. In case of suspicion of late-presenting CDH, CXR is recommended, but it should be noted that late-presenting CDH may have normal CXR prior to the clinical onset because the spleen or liver may temporarily occlude the diaphragmatic defect. To confirm the diagnosis, a CT scan is recommended. When a prompt surgical repair is

https://doi.org/10.1016/j.pedneo.2021.05.010

Please cite this article as: A.G. Delmonaco, M. Genisio, F. Scottoni et al., A prompt diagnosis of late-onset congenital diaphragmatic hernia with Point of Care Ultrasound (POCUS) in a Pediatric Emergency Department, Pediatrics and Neonatology, https://doi.org/10.1016/j.pedneo.2021.05.010

made, prognosis is usually favorable.[4] Our case demonstrates an unusual bedside LUS diagnosis of late-presenting CDH.[5] As the child was in a very good clinical condition upon admission, further invasive assessments were not recommended. LUS was performed to further investigate the left lower consolidation seen on CXR, allowing us to make an early diagnosis of a potentially fatal condition. Due to its availability at infants' bedside, LUS is particularly useful for recognizing missed prenatal diagnoses, preventing improper treatment and potentially enhancing prognosis.

Acknowledgement

No grant was received for this study. Informed consent was obtained from all individual participants (children's parents) included in the study.

Ethical approval

All procedures performed in this study were in accordance with the ethical standards of the Institutional and National Research Committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Declaration of competing interest

All authors declare that they have no conflict of interest.

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