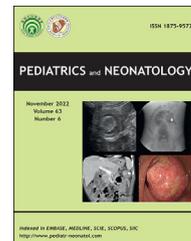


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## Images

# Pneumoperitoneum point-of-care ultrasound findings

Victor Sartorius <sup>a,\*</sup>, Daniele De Luca <sup>a,b</sup>

<sup>a</sup> Division of Pediatrics and Neonatal Critical Care, “Antoine Béclère” Medical Centre, Paris Saclay University Hospitals, APHP, Clamart, France

<sup>b</sup> Physiopathology and Therapeutic Innovation Unit-INSERM U999, Paris Saclay University, Le Plessis Robinson, France

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An extremely preterm male neonate (26 weeks; 675 g) was admitted to our intensive care unit. On Day 7 of life, he presented with clinical signs of necrotizing enterocolitis (NEC), which worsened after 1 week. Point-of-care ultrasound is our first line imaging technique<sup>1</sup>; therefore, an abdominal scan was immediately performed by a fellow neonatologist with a microlinear “hockey stick” high-frequency (15 MHz) probe.

A large *pneumoperitoneum* (Fig. 1 and supplementary video) appeared as follows:

Supplementary video related to this article can be found at <https://doi.org/10.1016/j.pedneo.2022.05.002>

- hyperechogenic peritoneal line (the interface between the parietal *peritoneum* and free intraperitoneal air) also called “enhanced peritoneal stripe sign;”
- continuous horizontal lines representing artifacts due to peritoneal line reverberation generated by free air;
- a “gut point” from which the parietal *peritoneum* sliding stops and horizontal lines appears.

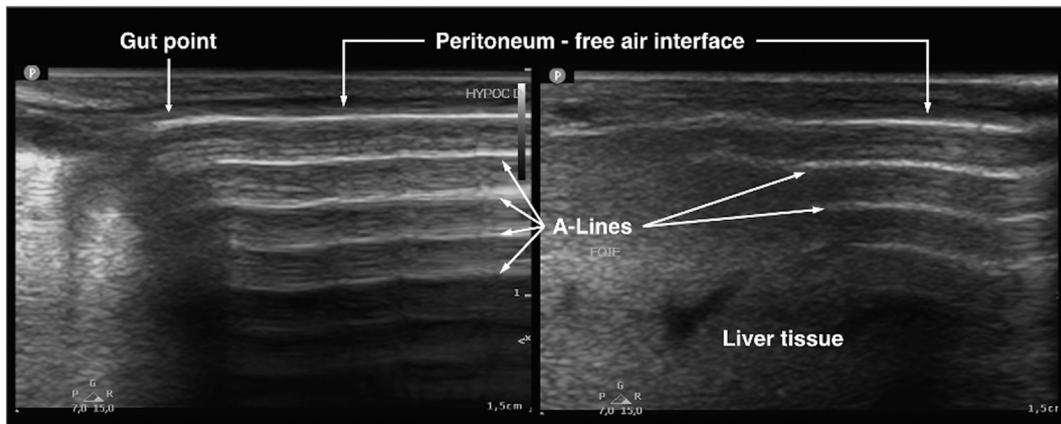
*Pneumoperitoneum* is an NEC complication that is associated with negative outcomes. The point-of-care ultrasound algorithms to critically manage ill neonates include screening for intra-abdominal fluid; however, nothing is suggested for air detection.<sup>2</sup> At present, plain abdominal radiography and ultrasound are two bedside tests that are used to confirm clinical intestinal perforation suspicion. The use of ultrasound for the prognostic evaluation of patients with NEC is widespread,<sup>3</sup> although their accuracy has not been formally compared yet in neonates. However, clear ultrasound descriptions of *pneumoperitoneum* aspects in preterm neonates are scanty. Thus, differentiating intraluminal from free intraperitoneal air might be challenging, particularly in the smallest neonates and those with abdominal distension. In this illustrative case, the association of the aforementioned signs and the presence of free air between the liver and the abdominal wall (Fig. 1 and supplementary video) facilitated the diagnosis, which was then surgically confirmed. Therefore, such a description can be didactically valuable. Moreover, it could promote the use of ultrasound as a diagnostic adjunct for NEC.<sup>4</sup>

\* Corresponding author. Service de Pédiatrie et Réanimation Néonatale, Hôpital A. Béclère, GHU Paris Saclay, APHP, 157 rue de la Porte de Trivaux, 92140, Clamart, France.

E-mail address: [victor.sartorius@aphp.fr](mailto:victor.sartorius@aphp.fr) (V. Sartorius).

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**Figure 1** Ultrasound appearance of *pneumoperitoneum* in an extremely preterm neonate. A hyperechogenic peritoneal line is visible at the interface between the parietal *peritoneum* and free intraperitoneal air. Continuous horizontal lines are observed, which represent the peritoneal line reverberation generated by the free intra-abdominal air. A “gut point” is a point from which the parietal *peritoneum* sliding stops and the horizontal lines appear. These signs are similar to the lung ultrasound features of a thoracic air leak: A-lines and the absence of pleural sliding.

## Parental consent

Written parental consent for publication of the manuscript, the images and the video was obtained and can be provided.

## Declaration of competing interest

Authors have no conflict of interest to declare

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