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## In Response to the Article “Usefulness of Ultrasound Examinations in the Diagnostics of Necrotizing Enterocolitis”. Pol J Radiol, 2015; 80: 1-9

### Authors' Contribution:

- A** Study Design
- B** Data Collection
- C** Statistical Analysis
- D** Data Interpretation
- E** Manuscript Preparation
- F** Literature Search
- G** Funds Collection

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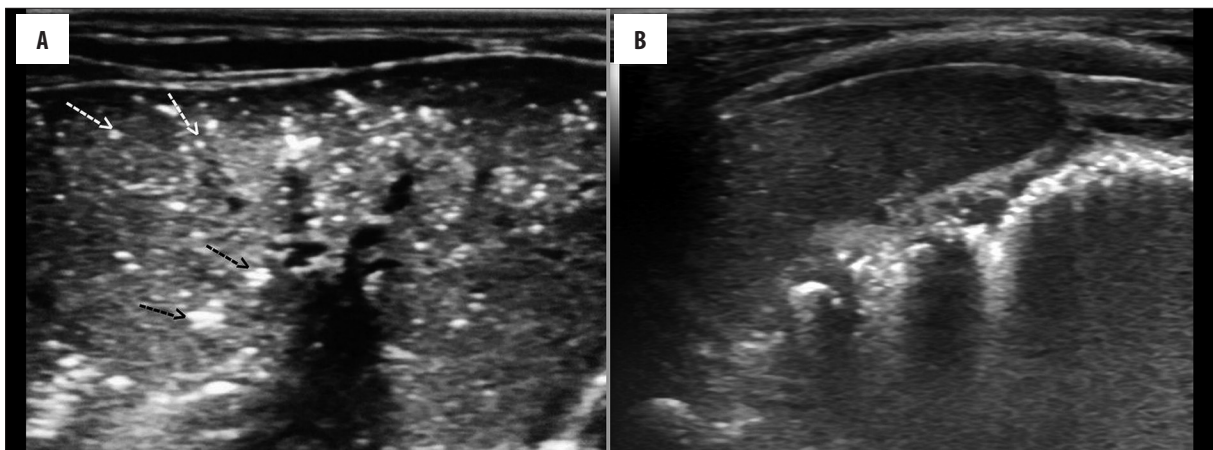
Dear Editor,

The article by Staryszak et al. [1] provided excellent information on the role of ultrasound (US) in diagnosis of necrotizing enterocolitis (NEC). As the author rightly stated, plain radiography is still the initial investigation, while ultrasound can diagnose this disease when radiographs are equivocal.

Here we present a case of a neonate with NEC, with an emphasis on portal venous gas. A 21-day-old neonate born at full term with normal vaginal delivery presented with poor feeding and vomiting. An abdominal US was ordered with a clinical suspicion of hypertrophic pyloric stenosis.

It revealed foci of free air within the peritoneal cavity and air within the walls of the small bowel loops (Figure 1). Hepatopetal movement of air bubbles was also seen within the main portal vein and its major branches (Video 1). Liver parenchyma showed multiple echogenic foci suggesting trapped air within small portal branches. That prompted confirmation of the findings with an abdominal radiograph which showed typical features of NEC including pneumatosis intestinalis and pneumoperitoneum (Figure 2). The radiograph however failed to demonstrate hepatic portal venous gas (HPVG).

HPVG in a neonate usually results from hypoperfusion of the bowel loops leading to ischemia and necrosis. The



**Figure 1.** (A) Transverse US image through the left lobe of the liver demonstrates portal venous gas in the form of discrete punctate echogenic foci (white arrows) and echogenic irregular patches without posterior acoustic shadowing (black arrow). (B) Longitudinal US image through the left upper quadrant shows intramural foci of air within small bowel loops suggestive of pneumatosis intestinalis.

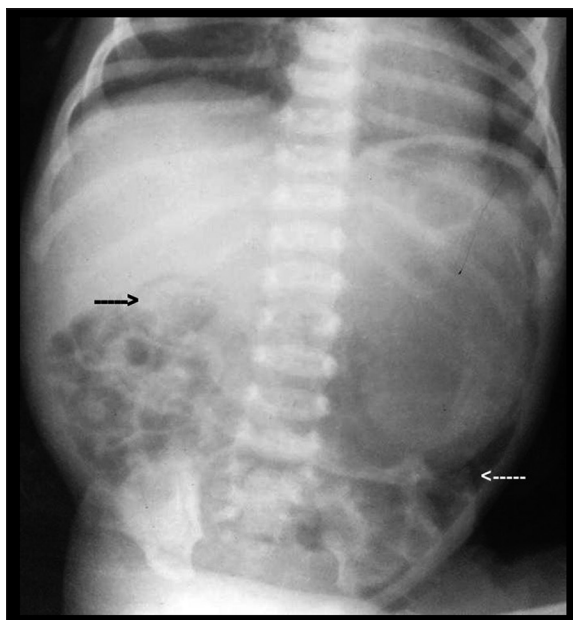


**Video 1.** Transverse US scan through the left lobe of the liver shows hepatopetal movement of air bubbles in the left branch of the portal vein.

common causes are peri- or postnatal asphyxia, sepsis, polycythemia, in utero cocaine exposure, respiratory distress syndrome, congenital heart disease etc. Use of umbilical catheters and exchange transfusion are also the causes of portal venous gas [2].

Before the advent of US and computed tomography, anteroposterior supine and cross-table lateral radiographs of the abdomen were the modalities of choice for demonstration of portal venous gas [3]. In a large series it was found that only 33% of cases with NEC demonstrated HPVG on abdominal radiographs and its presence did not itself mandate an operative intervention [4].

On US, HPVG can be seen either as highly echogenic particles or poorly defined echogenic patches in the hepatic parenchyma. The US-detected HPVG may even precede the radiographic abnormalities [5]. It was found that HPVG on US is a good modality to differentiate between NEC and



**Figure 2.** Supine anteroposterior radiograph of a 21-day-old neonate shows pneumatosis intestinalis (black arrow) and pneumoperitoneum (white arrow).

other acquired neonatal intestinal diseases including spontaneous intestinal perforation [6]. HPVG should be differentiated from pneumobilia which is centrally located, while HPVG is also seen peripherally within 2 cm of the liver capsule. CT scan can be useful in equivocal cases [7].

To conclude, US is a useful adjunct in imaging of suspected cases of NEC, which can better demonstrate HPVG in addition to the findings seen on abdominal radiographs.

## References:

1. Staryszak J, Stopa J, Kucharska-Miąsik I et al: Usefulness of ultrasound examinations in the diagnostics of necrotizing enterocolitis. *Pol J Radiol*, 2015; 80: 1–9
2. Abboud B, El Hachem J, Yazbeck T, Doumit C: Hepatic portal venous gas: Physiopathology, etiology, prognosis and treatment. *World J Gastroenterol*, 2009; 15(29): 3585–90
3. Kirks DR, O'Byrne SA: The value of the lateral abdominal roentgenogram in the diagnosis of neonatal hepatic portal venous gas (HPVG). *Am J Roentgenol Radium Ther Nucl Med*, 1974; 122(1): 153–58
4. Sharma R, Tepas JJ III, Hudak ML et al: Portal venous gas and surgical outcome of neonatal necrotizing enterocolitis. *J Pediatr Surg*, 2005; 40(2): 371–76
5. Merritt CR, Goldsmith JP, Sharp MJ: Sonographic detection of portal venous gas in infants with necrotizing enterocolitis. *Am J Roentgenol*, 1984; 143(5): 1059–62
6. Bohnhorst B, Kuebler JF, Rau G et al: Portal venous gas detected by ultrasound differentiates surgical NEC from other acquired neonatal intestinal diseases. *Eur J Pediatr Surg*, 2011; 21(1): 12–17
7. Yarze JC, Markowitz DM: Distinguishing between hepatic portal vein gas and pneumo(aero)bilia. *Liver Transpl*, 2007; 13(10): 1476; author reply 1477