SAJEM EMERGENCY MEDICINE JOURNAL

Image in ER

# A Case of Hepatic Portal Venous Gas in a Neonate with Necrotizing Enterocolitis

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## ABSTRACT

Hepatic portal venous gas is a rare entity which is associated with many conditions such as hypertrophic pyloric stenosis, necrotizing enterocolitis, mesenteric ischemia, intestinal obstruction, etc. In this case report, we discuss a 2-day old neonate who presented with abdominal distension. Radiological workup shows hepatic portal venous gas along with free air in between bowel loops and pneumatosis intestinalis concerning for necrotizing enterocolitis. The neonate was admitted to the pediatric intensive care unit for further management.

## KEYWORDS

Hepatic portal venous gas, Necrotizing enterocolitis, Pneumatosis intestinalis.

## INTRODUCTION

Necrotizing enterocolitis is one of the most devastating conditions in premature infants. [1] Preterm neonates and usage of formula milk are two of the potential risk factors for development. [2] Apart from clinical presentation ranging from nonspecific signs to signs of peritonitis, radiological findings in such cases include pneumatosis intestinalis, hepatobiliary air or pneumoperitoneum. [3] Treatment options include conservative management with antibiotics or surgical intervention which is associated with worse prognosis. Hepatic portal venous gas is seen in some cases and is considered to be an ominous sign.

## CASE SUMMARY

A 2-day-old neonate presented to the emergency department with a history of abdominal distention. He was unable to tolerate orally and had a grossly distended abdomen with generalized tenderness on examination. Rest of the systemic examination was unremarkable. Baseline and relevant investigations were sent. His workup also included radiological evaluation as shown in Figure 1 and 2

X-Ray AP view of the abdomen demonstrated multiple linear branching lucencies in the right upper quadrant at the expected location of the liver. Lucencies were extending up to the outer margin of the liver concerning for extensive portal venous gas. Additionally, the air was seen between multiple gas-filled dilated featureless bowel loops representing free air. The bubbly appearance of the bowel wall represents pneumatosis intestinalis. Findings were concerning for necrotizing enterocolitis. The infant was admitted in PICU for further investigations and management of his condition.

## DISCUSSION

Hepatic portal venous gas (HPVG), the presence of gas within the portal vein and its branches is a rare finding first described by Wolfe and Evens in infants with necrotizing enterocolitis (NEC). [4]

This radiological finding requires close monitoring and frequent reassessments, which are crucial for further management as the etiology ranges from potentially lethal causes requiring prompt surgical intervention such as ischemia, intra-abdominal abscesses and inflammatory bowel disease to benign ones including iatrogenic causes such as a result of umbilical vein catheterization. [5]

Diagnostic imaging modalities range from plain radiological imaging to ultrasonography, color Doppler flow imaging and CT scan with the latter being gold standard having a high sensitivity and an added benefit of detecting the underlying pathology. [6] Gas in the portal venous system usually appears in the peripheral branches of the portal vein, within 2 cm of the liver capsule and can be distinguished from pneumo-bilia, where it is found centrally in the biliary tree, and from pneumoperitoneum, where it is found outside the liver capsule.

HPVG alone in itself is not an absolute indication for surgery with the treatment depending mainly on the underlying disease. [6] Those not requiring surgical intervention can be followed with serial imaging within 1-2 days. The progno-

sis is related to the pathology itself and is not influenced by the presence of HPVG which previously mandate surgical intervention but now is being managed conservatively as well. [7]

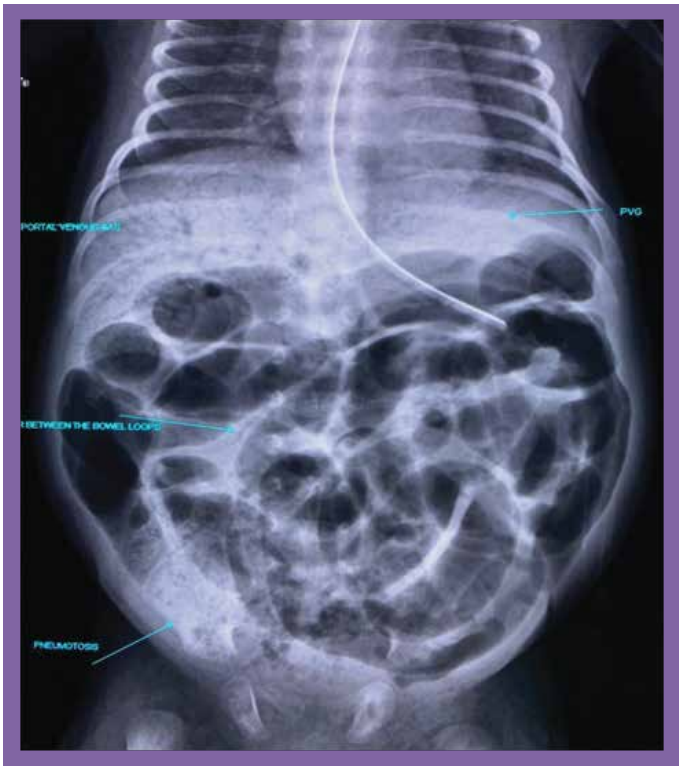


**Figure 1: Air seen in portal venous system in right hypochondrium**

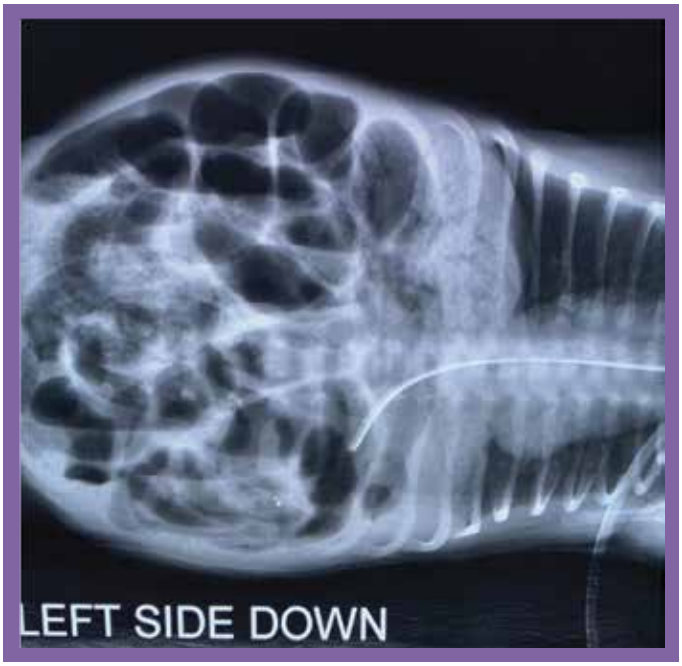


**Figure 2: Distended bowel loops**

**ACKNOWLEDGEMENT**

The author would like to thank Dr. Nausheen Siddiqui for her valuable support in this case.

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