

## OLGU SUNUMU

### Colovenous Fistula: A Rare Cause of Hepatic Portal Venous Gas

#### Kolovenöz Fistül: Hepatik Portal Venöz Gazın Nadir Bir Sebebi

Nazmi Özer\*, Hüseyin Kılavuz, Ahmet Şeker, Abdullah Şahin, Sinan Sözütok

**Abstract:** Hepatic portal venous gas is a rare clinical picture with high mortality. It is characterized by the accumulation of gas in the portal system on radiological examination. We presented a 74-year-old male patient on follow-up for sigmoid diverticulitis, developed progressive colovenous fistula and hepatic portal venous gas, ended with death. Diverticulitis is mainly associated with sigmoid diverticulosis. The anti-biotherapy is preferred if there is any contamination in the surrounding adipose tissue or an abscess formed adjacent to the colon wall. However, surgery is required if there is no regression in the follow-up.

Colovenous fistula is rarely encountered in the etiology of hepatic portal venous gas but should be kept in mind. A quick diagnosis, the determination of its etiology and the choice of appropriate surgical treatment, and the post-operative interventions are expected to decrease the mortality rates associated with the disease.

**Keywords:** Hepatic Portal Venous Gas, Colovenous Fistula, Diverticulitis

**Öz:** Hepatik portal venöz gaz, yüksek mortaliteye sahip, nadir bir klinik tablodur. Radyolojik incelemede portal sistemde gaz birikmesi ile karakterizedir. Sigmoid divertikülit nedeniyle izlenen, izleminde progresif kolovenöz fistül ve hepatic portal venöz gaz gelişen ve ölümle sonuçlanan, 74 yaşında erkek bir hastayı sunduk. Divertikülit esas olarak sigmoid divertikülozis ile ilişkilidir. Kolon etrafında yağ dokusunda herhangi bir kontaminasyon varsa veya kolon duvarına bitişik oluşan bir apse varsa tedavide antibiyoterapi tercih edilir. Ancak takipte gerileme yoksa cerrahi tedavi gereklidir. Kolovenöz fistül, hepatic portal venöz gaz etiyolojisinde nadir görülmekle birlikte akılda tutulması gereken tanılar arasındadır. Hastalığın hızlı tanısı, etiyolojisinin belirlenmesi, cerrahi tedavi seçimi ve ameliyat sonrası müdahale, hastalığa bağlı ölüm oranlarını azaltacaktır.

**Anahtar Kelimeler:** Hepatik Portal Venöz Gaz, Kolovenöz Fistül, Divertikülit

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#### Conflict of Interest

The authors declare that they have no conflict of interests regarding content of this article.

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#### Ethical Declaration

Informed consent was obtained from the participant and Helsinki Declaration rules were followed to conduct this study.

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## 1. INTRODUCTION

Hepatic portal venous gas (HPVG) is a rare clinical occurrence associated with a high mortality rate. It is characterized by the accumulation of gas in the portal system, that can be detected on a radiological examination. It is associated with various bowel diseases, including diffuse bowel necrosis, requiring urgent operative intervention depending on the underlying disease (1). Sigmoid diverticulitis is a common disorder in patients presenting to the emergency service; however, the condition often is not complicated in the majority and may be resolved with antibiotics (2). Colonic diverticulitis is rarely associated with the HPVG. In such cases, the HPVG in sigmoid diverticulitis is caused by two mechanisms. The gas entry into the portal system through mesenteric vessels due to mucosal erosion caused by the gas pressure in the intestinal lumen, and the gas entry produced by bacteria into the portal system due to pylephlebitis in the intra-abdominal abscesses (3-6).

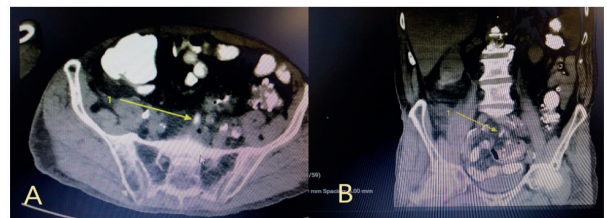
We aimed to present a 74-year-old male patient on follow-up due to sigmoid diverticulitis, developing progressive colovenous fistula during the follow-up which resulted in death.

Informed consent was obtained from the participant and Helsinki Declaration rules were followed to conduct this study.

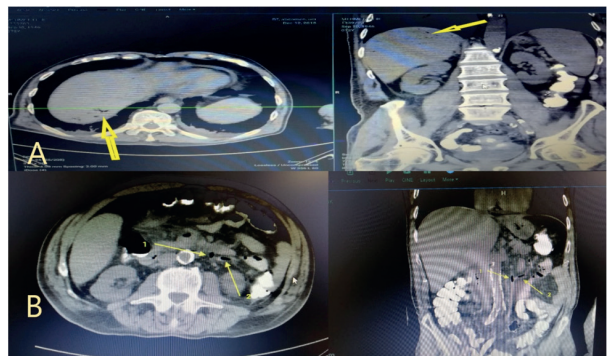
## 2. CASE REPORT

A 74-year-old male patient applied to the emergency department for abdominal pain. His physical examination revealed a slight tenderness in the left lower quadrant, with no signs of localized peritonitis. The WBC was 14900 / ml, serum CRP level 168 mg / L, and other laboratory findings were within normal levels. The computed tomography showed an increase in wall thickening and linear density at the sigmoid colon level, which might be significant for diverticulitis. The patient was admitted to the general surgery clinic. Intravenous fluid and antibiotic treatment (ceftriaxone 2 g / day and metronidazole 1 g / day) were begun. On the first day of hospitalization, examination findings regressed, and oral food intake was allowed. On the third day, his general condition abruptly deteriorated. The laboratory results were, WBC 19900 / ml, CRP 240 mg / L, platelet 24.000 / ml, BUN: 127 mg / dl, Cre: 1.78 mg / dl, ALT 961 U / L, and AST 2852 U / L. Urgently (oral + rectal opaque) contrast-enhanced abdominal CT was performed to the patient. IV contrast was not preferred due to renal failure. The CT scan revealed diffuse diverticular images in the sigmoid colon, wall thickening in the rectosigmoid region, gas densities in the intrahepatic and extrahepatic portal vein branches,

and the migration of contrast material originated from the rectum into the vessel lumen (Figures 1-2). An emergency laparotomy was performed for him because the septic condition was secondary to the colovenous fistula. Laparotomy revealed no free fluid and perforation in the abdomen. Multiple diverticula were seen in the sigmoid colon, at the left half of the transverse colon, descending colon and sigmoid colon meso appeared highly edematous. Left hemicolectomy + anterior resection and colostomy with Hartmann's procedure was performed. Dopamine and noradrenaline infusion was begun following hypotension. In the intensive care unit in the postoperative period, the patient suffered a cardiac arrest at the 5th hour. The patient was considered as dead, not responding to resuscitation.



**Figure 1:** Arrow 1 in axial (A) and coronal (B) sections shows the passage of the contrast material from the rectum to the superior rectal vein.



**Figure 2:** In axial and coronal sections, gas in intrahepatic (A) and extrahepatic (B) portal vein branches.

## 3. DISCUSSION

HPVG is a clinical entity firstly described by Wolfe and Evans in an infant with necrotizing enterocolitis in 1955(7). Although the mechanism of HPVG has not been fully understood, it occurs by the entry of intestinal gas into the vessels through the mucosal layer (through the damaged mucosa) due to increased intraluminal pressure or by producing large amounts of gas as a result of the proliferation of anaerobic bacteria in the intestine(3-6).

HPVG is a rare complication secondary to diverticulitis (8). Diverticulitis is mainly associated with sigmoid

diverticulosis. The antibiotic therapy is preferred if there is any contamination in the surrounding adipose tissue or an abscess formed adjacent to the colon wall. However, surgery is required if there is no regression in the follow-up.

Although HPVG is frequently seen in severe conditions such as acute mesenteric ischemia, it can also occur in intestinal obstruction, enteritis, ulcer perforation, necrotizing pancreatitis, Crohn's disease, ulcerative colitis, intraabdominal abscess, abdominal trauma, abdominal surgery, and endoscopic procedures (9). HPVG shows nonspecific symptoms and signs such as pain, nausea, diarrhea, vomiting, abdominal distension, and peritoneal irritation (10). If these symptoms are not detected early, the diagnosis may be delayed and fatal. The diagnosis of HPVG is usually made by plain abdominal radiography, ultrasonography, color doppler imaging, and CT (11). We established the diagnosis with an oral-rectal contrast-enhanced abdominal CT examination. Currently, CT is the best diagnostic method due to its high sensitivity and specificity to HPVG, current investigations into underlying diseases or abdominal pathology, ease of application, and speed (12-13). Although its mortality rate was 75% in the years when HPVG was first described, it decreased to 39%, owing to the development of diagnostic methods and advances in treatment, but it is still critical (14).

The necessity for surgical intervention to HPVG varies according to the presence of intestinal necrosis and mechanical obstruction, and in cases without obstruction or necrosis, the patient may be followed up by administering conservative treatment (15). We operated the patient due to intestinal necrosis and fistula formation. Although we have not been late for the operation, the patient died from diagnostic delay and multi-organ failure.

#### 4. CONCLUSION

Colovenous fistula is rarely seen in the etiology of HPVG, but it is among the diagnoses to be kept in mind. The quick diagnosis of disease, the determination of its etiology, the choice of surgical treatment, and the post-operative intervention will decrease the mortality rates associated with the disease.

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