

## A Rare Complication of ERCP

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**Cite this article as:** Gökbulut V, Ödemiş B, Öztürk Ö, et al. A rare complication of ERCP. *Turk J Gastroenterol.* 2022;33(4):365-367.

### QUESTION

A 66-year-old female patient was admitted to the emergency department with complaints of abdominal pain, nausea, vomiting, and jaundice lasting for 1 week. Physical examination revealed sensitivity in the right upper quadrant and epigastrium. The laboratory values revealed high aminotransferases, alkaline phosphatase, gamma-glutamyltransferase, total bilirubin, and direct bilirubin levels. Biliary dilatation and choledochal stones were observed in ultrasonography. In endoscopic retrograde cholangiopancreatography (ERCP), choledochol stones were removed and a biliary stent in the common bile duct for remaining bile duct stones and a pancreatic stent for pancreatic prophylaxis were placed. When ERCP was performed to remove the pancreatic stent after 3 days, we saw that the biliary stent had dropped. Therefore, we wanted to place the biliary stent again. After several trials to cannulate choledochus, the guidewire went toward the liver hilus and when given a contrast agent, it disappeared in a few seconds (Figure 1). The treatment was terminated immediately and the patient underwent abdominal tomography (Figure 2).



**Figure 1.** Under the scopy the contrast of the kidney pelvis to be seen filtered.

### ANSWER

#### Portal Air Embolism

It was seen that the contrast agent was infiltrated through the renal pelvis 2-3 minutes after administration (Figure 1). Abdominal tomography showed that the portal vein periphery was filled with air (Figure 2). We thought that air embolism developed as a result of portal vein laceration. The patient was sent to the intensive care unit. The patient's consciousness was clear and her vital signs were stable. The patient was taken to the left lateral decubitus trendelenburg position. Oxygen inhalation and broad-spectrum antibiotic treatment were initiated. The patient was directed to hyperbaric oxygen therapy within 6 hours after gas embolism occurred and treated by using US Navy Treatment (Figure 3).<sup>1</sup> After the hyperbaric oxygen therapy, control abdominal tomography revealed resorption of all air in the periphery of the portal vein (Figure 4).

In this report, we present a case of portal vein air embolism which is one of the rare complications of ERCP and can be treated with hyperbaric oxygen therapy. Air in the portal vein is a rare complication of ERCP. It can be seen at a rate of 1/6000-8000 after ERCP.<sup>2-3</sup> Most of these patients have pancreatic adenocarcinoma.<sup>3</sup> It usually develops after precut and/or conventional sphincterotomy.<sup>4</sup> This complication may be caused by laceration of a small portal vein or direct trauma to the papillae.<sup>3</sup> In



**Figure 2.** Portal vein periphery is observed to be filled with air.

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Received: July 25, 2019 Accepted: September 17, 2019 Available Online Date: April 25, 2022

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DOI: 10.5152/tjg.2020.19549

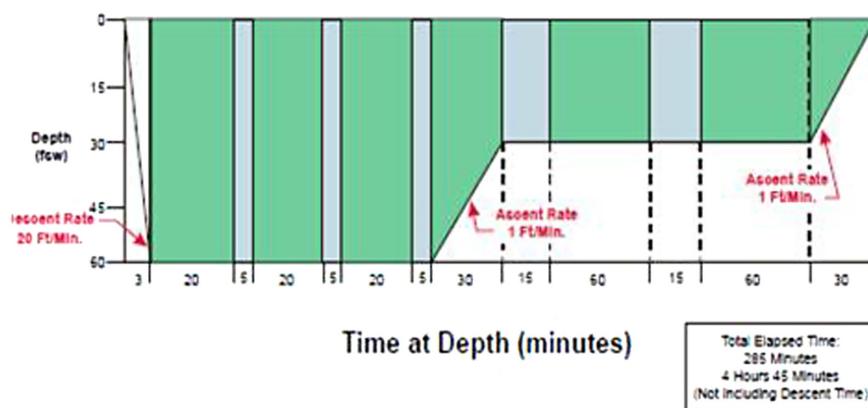


Figure 3. Hyperbaric oxygen therapy according to the US Navy scheme.

our case, wire-guided cannulation was performed after sphincterotomy. There was no bleeding after catheter withdrawal. In the ERCP procedure, filling the portal vein with air carries potential risks such as bleeding, sepsis and thrombosis, and air embolism.<sup>3</sup> In the literature, fatal cerebral and pulmonary air and/or bile embolism cases associated with portal and hepatic vein trauma due to ERCP and sphincterotomy have been reported. However, isolated portal vein cannulation has not been reported to cause mortality or serious morbidity. The portal venous air can pass through the portal vein into the systemic circulation through the right ventricle and pulmonary circulation. Hypotension, tachypnea, hypocapnia, and pulmonary edema may be seen in venous air embolism. Treatment options depend on the severity of the disease. Hyperbaric oxygen therapy, high oxygen inhalation, proper positioning of the patient (left side decubitus and trendelenburg position), and aspiration of air from the right ventricle via the pulmonary artery catheter can be applied.<sup>5</sup>

Hyperbaric oxygen therapies are recommended in cases of arterial and venous gas embolism because it reduces mortality and the rate of permanent sequelae. A short interval (<6 hour) between embolism and hyperbaric treatment is associated with a better outcome.<sup>6</sup> Hyperbaric oxygen therapy reduces bubble size in accordance with the Boyle's law at 3 Atmosphere absolute (ATA), bubble volume is reduced by about two-thirds. Hyperoxia increases the diffusion gradient with the embolized gas, moving gas into solution where it can be metabolized.<sup>7</sup>

As a result, in such cases when embolism is detected, the patient must be consulted as soon as possible for hyperbaric oxygen therapy and treatment must be started within 6 hours.

**Informed Consent:** Informed consent was obtained from the patient who participated in this study.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept – V.G., B.Ö., Ö.Ö.; Design – V.G.; Supervision – V.G., Ö.Ö., S.A.; Resource – V.G.; Materials – V.G., B.Ö., Ö.Ö., S.A.; Data Collection and/or Processing – V.G., B.Ö.; Analysis and/or Interpretation – V.G.; Literature Search – V.G.; Writing – V.G.; Critical Reviews – V.G., B.Ö.

**Declaration of Interests:** No conflict of interest was declared by the authors.

**Funding:** The authors declared that this study has received no financial support.

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Figure 4. The resorption of all air in the periphery of the portal vein.

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