

Subcapsular Hepatic Hematoma After Endoscopic Retrograde Cholangiopancreatography

A Case Report and Review of Literature

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Abstract: Endoscopic retrograde cholangiopancreatography (ERCP) is one of the most frequently performed procedures for the diagnosis and treatment of biliary-pancreatic diseases. ERCP-related complications total around 2.5% to 8%, with a mortality rate ranging from 0.5% to 1%. An exceptional ERCP complication is subcapsular hepatic hematoma, and few cases are reported worldwide.

We present the case of a 52-year-old woman with a history of recurring upper abdominal pain and a clinical and ultrasonographic diagnosis of obstructive jaundice due to common bile duct stones. After 2 difficult endoscopic biliary procedures, common bile duct stones clearance was obtained. Post-ERCP course was symptomatic with upper abdominal pain and anemia with hemodynamic instability.

CT scan demonstrated a 15 cm × 11 cm subcapsular hepatic hematoma filled with air and liquid on the surface of the right hepatic lobe. The patient was successfully treated with the embolization of a small branch of right hepatic artery angiographically identified as the cause of bleeding.

Subcapsular hepatic hematoma after ERCP is a rare complication that must be taken into account in the differential diagnosis of symptomatic cases after ERCP. Its diagnosis is based on clinical and laboratory data and especially on imaging (ultrasound, CT, or MRI). Treatment is often conservative but, in some cases, embolization or percutaneous drainage or surgery may be necessary.

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Abbreviations: CT = computed tomography, ERCP = endoscopic retrograde cholangiopancreatography.

INTRODUCTION

Nowadays, endoscopic retrograde cholangiopancreatography (ERCP) is one of the minimally invasive most frequently performed procedures in the diagnosis and treatment of biliary-pancreatic diseases. If performed by experienced professionals, complications related to this total around 2.5% to

8%, with a mortality rate ranging from 0.5% to 1%.^{1,2} An exceptional ERCP complication is represented by subcapsular hepatic hematoma. Since 2000, when subcapsular hepatic hematoma was first described,³ world literature has not reported more than 20 cases.^{2–19} In this case report, we describe: a further rare case of subcapsular hepatic hematoma manifested only with abdominal pain as first symptom, in accordance with most clinical presentations of similar cases already described; an analysis of the possible pathophysiological mechanism and a review of present research literature.

CASE PRESENTATION

We introduce the case of a 52-year-old woman with a history of recurring upper abdominal pain; the last episode required hospitalization after a diagnosis of obstructive jaundice by common bile duct stones. The patient presented jaundice, increase of cholestasis indices, hyperbilirubinemia (mainly direct), ultrasonographic finding of numerous gallstones, and ectasia of the common bile duct to the distal portion, where several gallstones were observed. She had a negative personal history for noteworthy medical and surgical diseases, previous surgery, hemostasis disorders or spontaneous bleeding. Her laboratory tests showed white blood cells $4.5 \times 1,000/\mu\text{L}$ ($4\text{--}10 \times 1,000/\mu\text{L}$), red blood cells $4.03 \times \text{million}/\mu\text{L}$ ($4.3\text{--}5.5 \times \text{million}/\mu\text{L}$), hemoglobin 12.9 g/dL ($12.5\text{--}15.5 \text{ g/dL}$), platelets $192 \times 1,000/\mu\text{L}$ ($150\text{--}450 \times 1,000/\mu\text{L}$), bilirubin 6.9 mg/dL ($0.3\text{--}1.2 \text{ mg/dL}$), aspartate aminotransferase 144 U/L ($2\text{--}40 \text{ U/L}$), alanine aminotransferase 164 U/L ($4\text{--}49 \text{ U/L}$), prothrombin time ratio 1.02 ($0.8\text{--}1.2$), international normalized ratio 1.02 ($0.8\text{--}1.2$), and activated partial thromboplastin time ratio 1.16 ($0.8\text{--}1.2$). As a preliminary procedure to subsequent laparoscopic cholecystectomy, the patient underwent a biliary drainage by endoscopic biliary sphincterotomy performed on a 0.035 inch diameter, 450 cm length straight-tip guidewire (producer brand). This rather complicated procedure led to the extraction of multiple small common bile duct stones, but the clearance could not be completed because of respiratory problems in patient that allowed only the placement of a nasobiliary tube. On the first day, a transnasobiliary tube cholangiography was performed; as a result, in addition to the tube's endpoint, located in an intrahepatic branch of the right lobe, another 2 massive common bile duct stones were detected. On the second day, a second endoscopic operational procedure was performed and it turned out difficult too; through this procedure, a complete clearance of common bile duct was achieved. At 24 hours from this procedure, patient began complaining of intense mainly upper abdominal pain, radiating to the right shoulder region, with no peritonism or other signs or symptoms, and pain medication was not working; laboratory tests revealed 2.1 g/dL bilirubin (1.6 direct g/dL), aspartate aminotransferase 73 U/L ($2\text{--}40 \text{ U/L}$), alanine aminotransferase

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FIGURE 1. CT scan of upper abdomen showing a subcapsular hepatic hematoma (hypodense area indicated by the arrows) in which is present a source of active bleeding (circle). CT=computed tomography.

87 U/L (4–49 U/L), C-reactive protein 9.15 mg/dL (0–0.5 mg/dL), other parameters were within normal limits (including serum amylase). At 36 hours the clinical picture progressed to hemodynamic shock with hypotension, anuria, and hemoglobin levels declining from 11.7 to 8.4 g/dL (12.5–15.5 mg/L). She was treated with transfusion of packed red blood cells and plasma, as well as intravenous administration of crystalloids and antibiotics.

Urgent computed tomography (CT) scan demonstrated a 15 cm × 11 cm subcapsular hepatic hematoma filled with air and liquid on the surface of the right hepatic lobe (Figures 1 and 2). Urgent angiography was performed with evidence of active bleeding starting from a small branch of right hepatic artery, which was selectively embolized. The postembolization course was regular and hemodynamically stable, without fever, without abdominal pain, and the resumption of normal hemoglobin values during the following week. During a follow-up abdominal CT, performed 10 days after embolization, a marked reduction of hematoma was observed (Figure 3).

DISCUSSION

A clinically significant bleeding complication associated with ERCP and sphincterotomy records an approximately 2% rate, according to the different cases, although an endoscopically

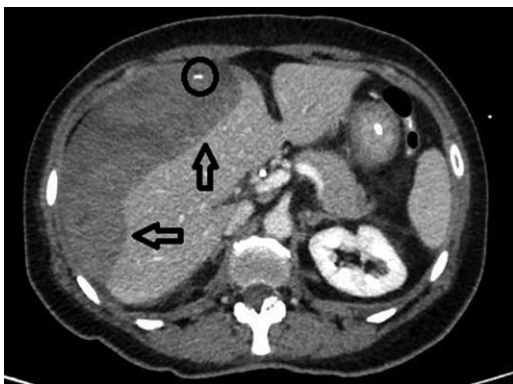


FIGURE 2. CT scan of middle abdomen showing a subcapsular hepatic hematoma on the surface of the right lobe of liver (hypodense area indicated by the arrows) in which is present a source of active bleeding (circle). CT=computed tomography.

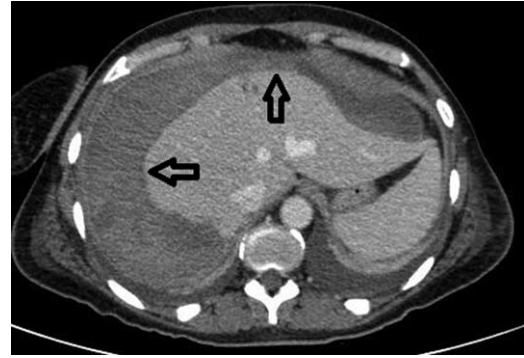


FIGURE 3. CT scan of upper abdomen showing a reduction of subcapsular hepatic hematoma (hypodense area indicated by the arrows), mainly on the surface of the right lobe of liver. There are no sources of active bleeding. CT=computed tomography.

visible but not clinically detectable bleeding is more commonly detected, ranging from 10% to 30% of all sphincterotomies.^{19,20} By skilled experienced hands, bleeding or hematoma associated with ERCP and involving liver, spleen, intestinal wall, or abdominal cavity turn out to be an extremely rare but potentially serious event which requires prompt recognition and treatment. Subcapsular hepatic hematoma represents an exceptional event, of which world literature described 21 cases (Table 1). Etiology was not completely clarified, although, in accordance with most authors,^{2,19} subcapsular hepatic hematoma would rather seem the result of small-caliber intrahepatic vessels breaking which is determined by guide wire during endoscopy procedure; hereafter, blood filtration through nip parenchymal liver in centrifugal direction and the presence of a solid capsule would complete pathophysiology. This would justify the presence of air in the hematoma and frequent infections due to the use of a guide wire with a nonsterile technique. After a detailed analysis of worldwide studies and, particularly, in our case, we too came to the conclusion that subcapsular hepatic hematoma stems from accidental puncture by guidewire of intrahepatic biliary tree and resulting breakage of small caliber intrahepatic vessels.

Analyzing data in previous report cases, 86% cases report abdominal pain as first clinical expression, often associated with anemia (28.6%) and fever (19%). The onset of these only symptoms, in association with immediate or subsequent hypotension, should suggest the presence of subcapsular hepatic hematoma. However, in agreement with most authors, the incidence of this complication might be underestimated, as most patients might show no symptoms and instrumental post-ERCP monitoring is uncommon.^{4,19} Under no circumstances can laboratory tests be considered major indicators of subcapsular hepatic hematoma, with the exception of a decrease in hematocrit and hemoglobin levels; on the other hand, instrumental investigations such as ultrasound, CT, or magnetic resonance imaging are to be considered diagnostic methods.¹⁹ Most cases are treated conservatively, this represents treatment choice in the case of a patient who is persistently hemodynamically stable. In such cases, we recommend the use of prophylactic antibiotics, given the risk of infected hematoma.¹⁷ Surgical treatment should be taken into account in case of deterioration of general clinical conditions, hemodynamic instability, infected hematoma, or high risk of hematoma breakage.¹⁷ This treatment consists in draining hematoma, hemostasis if possible, and follow-up by CT, in order to monitor progress.¹⁹ A viable alternative to surgical treatment is represented by selective or superselective embolization of

TABLE 1. Patient Characteristics From the Reports of Subcapsular Hepatic Hematoma Post-ERCP

Author	Age	Sex	Indication for ERCP	Guidewire	On-Set	First Symptom	Treatment	ATB
Ortega Deballon et al, 2000 ³	81	M	Common bile duct stone	NA	NA	Pain	Percutaneous drainage	Yes
Horn et al, 2004 ⁴	88	F	Pancreatic cyst	Yes	48 hrs	Pain/anemia	Observation	Yes
Chi et al, 2004 ⁵	43	F	Pancreatic cancer	Yes	NA	Pain	Embolization	Yes
Ertugrul et al, 2006 ⁶	41	M	Cholangio-carcinoma	Yes	48 hrs	Fever/pain	Observation	Yes
Priego et al, 2007 ⁷	30	F	Obstructive jaundice	NA	NA	Pain	Surgery	Yes
Petit-Laurent et al, 2007 ⁸	98	M	Common bile duct stone	Yes	NA	NA	Percutaneous drainage	NA
Bhati et al, 2007 ⁹	51	F	Common bile duct stone	Yes	NA	Pain/hypotense	Percutaneous drainage	NA
McArthur et al, 2008 ¹⁰	71	M	Common bile duct stone	Yes	12 hrs	Pain/leucocytosis	Observation	Yes
De La Serna-Higuera et al, 2008 ¹¹	71	F	Common bile duct stone	Yes	48 hrs	Pain/leucocytosis	Observation	Yes
Cárdenas et al, 2008 ¹²	54	F	Common bile duct stone	Yes	24 hrs	Pain/anemia	Observation	Yes
Nari et al, 2009 ¹³	15	F	Bile leak postliver transplant	NA	NA	Fever/pain	Observation	Yes
Revuelto et al, 2010 ¹⁴	41	M	Biliary pancreatitis	NA	6 hrs	Pain	Observation	Yes
Baudet et al, 2011 ¹⁵	69	F	Common bile duct stone	Yes	24 hrs	Pain/fever/anemia	Embolization/surgery	Yes
Pérez-Legaz et al, 2011 ¹⁶	72	F	Common bile duct stone	Yes	2 hrs	Pain/anemia	Surgery	NA
Del Pozo et al, 2011 ¹⁷	NA	NA	Common bile duct stone	Yes	5 days	Pain/anemia	Observation	Yes
Orellana et al, 2012 ¹⁸	96	M	Common bile duct stone	Yes	4 hrs	Pain	Observation	Yes
	49	M	Periampullary tumor	Yes	2 hrs	Pain/hypotense	Embolization	NA
	55	F	Biliary stent occlusion	Yes	NA	Pain	Observation	NA
Fei et al, 2013 ²	56	M	Gallbladder cancer	Yes	2 hrs	Fever	Percutaneous drainage	Yes
Klimová et al, 2014 ¹⁹	54	M	Common bile duct stone	Yes	6 hrs	Anemia/pain/hypotense	Embolization/surgery/percutaneous drainage	Yes
Current report	52	F	Main pancreatic duct stone	Yes	24 hrs	Pain	Embolization	Yes

M, male; F, female; NA, not available; hrs, hours; ATB, antibiotics. ERCP = endoscopic retrograde cholangiopancreatography.

involved vessels or percutaneous drainage of hematoma. In the cases reported, (Table 1) with reference to the needs of different kinds of treatment in some cases, 47.6% patients were treated conservatively, 23.8% patients with percutaneous drainage, 23.8% patients with embolization, and 19% patients required surgery. In our case, hemodynamic stability regained only with infusion therapy and angiographic findings of active bleeding led us to choose treatment by embolization, with resolution of clinical picture. To conclude subcapsular hepatic hematoma after ERCP is a rare and alarming complication that must be known and taken into account in the differential diagnosis of symptomatic cases after ERCP. Its diagnosis is based on clinical data (abdominal pain, anemia, hypotension, and fever), laboratory data (decrease in hematocrit and hemoglobin levels), and especially on imaging (ultrasound, CT, or magnetic resonance imaging).^{7,13} Treatment is often conservative but, in some cases, embolization or percutaneous drainage or surgery turn out to be necessary.

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