

## Subcapsular hepatic haematoma of the right lobe following endoscopic retrograde cholangiopancreatography: Case report and literature review

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### Abstract

Sub capsular hepatic haematoma is a rare complication after endoscopic retrograde cholangiopancreatography (ERCP). Exact pathological mechanism is still unclear and few reports are nowadays available in literature. We report the case of a 58-year-old woman with recurrent episodes of upper abdominal pain, nausea and vomiting. On the basis of laboratory exams, abdomen ultrasound and magnetic resonance imaging she was diagnosed with a common bile duct stone. Endoscopic biliary sphincterotomy was performed. On the following day the patient complaint severe abdominal pain with rebound and hemodynamic instability. A computed tomography scan reveal a 14 cm × 6 cm × 19 cm sub-capsular hepatic haematoma on the right lobe that was successfully managed via percutaneous embolization. Sub capsular liver haematoma is a rare life threatening complication after ERCP that should be managed according to patients' haemodynamic and clinic.

**Key words:** Endoscopic guidewire; Endoscopic retrograde cholangiopancreatography; Abdominal pain; Subcapsular hepatic hematoma; Embolization

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**Core tip:** Hepatic hematoma is a rare and potentially life threatening complication after endoscopic retrograde cholangiopancreatography (ERCP). Despite its severity, only few cases are described in current literature. The paper describe the management of a huge right lobe

hepatic hematoma following ERCP. An exhaustive literature analysis is made considering, signs and symptoms at presentation, time of presentation, diagnosis, and treatment. Awareness of this potential complication, high level of suspicion and prompt treatment are at the basis of better outcomes in such patients.

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## INTRODUCTION

Endoscopic retrograde cholangiopancreatography (ERCP) is a minimally invasive procedure for diagnosis and treatment of biliary and pancreatic disease. Complications occur in 2.5%-8% of cases with mortality rates ranging from 0.5%-1.0%<sup>[1]</sup>. Pancreatitis, cholangitis, perforation, and bleeding as a result of papillotomy are the most frequently described complications<sup>[2-3]</sup>. Sub capsular hepatic haematoma is a rare and potential life threatening condition<sup>[4]</sup>. We report the unusual case of a sub capsular hepatic haematoma after ERCP presenting with abdominal pain and hypotension.

## CASE REPORT

A 58-year-old woman with recurrent episodes of upper abdominal pain was diagnosed with common bile duct stone by abdomen ultrasound and magnetic resonance imaging. She was admitted for ERCP and sphincterotomy. A proper drainage of the common bile duct was performed without complications. 12 h after the procedure the patient complaint a sudden abdominal pain with tenderness and rebound in the upper right quadrant without fever. Laboratory tests revealed a normal white blood cell count ( $7.44 \times 10^9$ /L) and haemoglobin level (13.3 g/dL) with a slightly increased C-reactive protein (14.3 mg/dL). Total bilirubin, transaminases and amylases were within normal limits. Abdomen plain film was normal without signs of pneumoperitoneum. On the basis of such symptoms the patient was closely monitored. On the following 12 h she gradually develops hypotension (95/50 mmHg) and tachycardia (115 bpm) with a progressive haemoglobin decrease (8.6 g/dL). Urgent abdomen computed tomography (CT) scan demonstrated a large subcapsular hepatic haematoma of the right hepatic lobe supported by three peripheral parenchymal lacerations with contextual active bleeding and compression of the right and middle

hepatic vein (Figure 1). On the basis of laboratory, clinical, and hemodynamic parameters the patient was urgently managed with percutaneous embolization of some small peripheral vessels on the sixth and seventh segment.

The post procedural course was uneventful with restoration of normal haemoglobin levels after transfusion (12.9 g/dL). Six days after embolization an abdomen CT scan shows the stability of the hematoma and the patient was discharged home.

## DISCUSSION

Sub capsular hepatic haematoma is a rare and potentially life threatening complication after ERCP. Probably underestimated, only few cases are nowadays reported in literature and the exact pathological mechanism is unclear (Table 1). Accidental puncture of a peripheral intrahepatic biliar tree with consensual laceration of a small parenchymal vessels by endoscopic guide wire, may explain the phenomenon<sup>[2-4]</sup>.

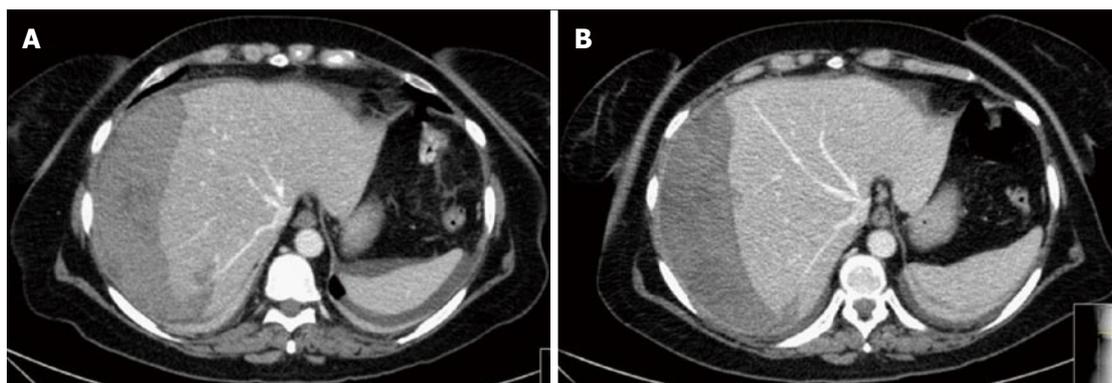
Sudden abdominal pain whenever associated with hypotension and tachycardia after ERCP should raise the suspicion of intrahepatic bleeding with Glisson's capsule distension. Different symptoms are described in literature: abdominal pain (91%), anemia (39.1%), hypotension (39.1%), fever (21.7%) and peritonism (13%) (Table 1). Laboratory tests did not provide major indicators of the development of a sub capsular hepatic haematoma, except for a decrease in the haemoglobin level<sup>[1]</sup>. Imaging modalities (ultrasound and CT) are the gold standard for diagnosis and surveillance of this emergent complication<sup>[9,15]</sup>.

In the present case symptoms and signs started 12 h after the procedure with an early diagnosis and prompt treatment. Aspecific symptoms with a late onset from ERCP may occur with consequent delayed diagnosis and treatment (range 2-144 h) (Table 1).

Different treatment modalities are proposed in literature based on haemodynamic and clinics. The role of imaging in the assessment dimension and of ab extrinsic compression on hepatic vein is an important detail that should kept in mind whenever approaching such patients.

In stable patients with a limited, peripheral and non-compressive haematoma, a conservative management with prophylactic antibiotics should be suggested. Serial haemoglobin controls and abdomen CT verification is advisable<sup>[19]</sup>. Percutaneous drainage under CT guide and US should be proposed in case of abscess formation and fever<sup>[1]</sup>.

Whenever hemodynamic instability is present with active bleeding and contrast extravasation, an immediate radiological or surgical approach should be taken into account. Minimally invasive radiological selective peripheral vessels embolization shows high success rates<sup>[21]</sup>. Surgical management should be reserved in case of general condition deterioration,



**Figure 1** Urgent abdomen computed tomography scan. A: Hepatic subcapsular hematoma of the right lobe (14 cm × 6 cm × 19 cm) with peripheral parenchymal laceration. Ab-extrinsic compression of the right and middle hepatic vein with perisplenic free fluid; B: Six days after radiological selective embolization: note the stability of the haematoma dimension with disappearance of perisplenic free fluid.

**Table 1** Subcapsular hepatic haematoma following endoscopic retrograde cholangiopancreatography: Review of the literature

Ref.	Indication for ERCP	ERCP	Onset of symptoms	Symptoms	Diagnosis	Dimension	Treatment	Death
Ortega Deballon <i>et al</i> <sup>[5]</sup>	Common bile duct stone	NA	NA	Abdominal pain	NA	NA	Percutaneous drainage	No
Horn <i>et al</i> <sup>[6]</sup>	Pancreatic adenocarcinoma	Cytologic brushing over a 0.035-inch guidewire + biliary stent	48 h	Abdominal pain/anemia	48 h; CT scan	NA (right lobe)	Conservative	No
Chi <i>et al</i> <sup>[7]</sup>	Pancreatic cancer	Biliary stent placement over a guidewire	NA	Abdominal pain	NA	NA	Embolization	No
Ertugrul <i>et al</i> <sup>[8]</sup>	Hilar cholangiocarcinoma	Biliary stent placement over a guidewire	48 h	Abdominal pain/fever	48 h; CT scan	7.8 cm × 4.1 cm (right lobe)	Conservative	No
Priego <i>et al</i> <sup>[9]</sup>	Common bile duct stone	Spincterotomy over a guidewire	NA	Abdominal pain/hypotension/peritonism	NA; CT scan	4.7 cm × 10 cm × 11 cm (right lobe)	Surgery (Haematoma evacuation)	No
Petit-Laurent <i>et al</i> <sup>[10]</sup>	Common bile duct stone	Spincterotomy over a guidewire	48 h	Abdominal pain/fever	48 h; US/CT scan	NA	Percutaneous drainage	No
Bhati <i>et al</i> <sup>[11]</sup>	Common bile duct stone	Spincterotomy over a guidewire	NA	Abdominal pain/hypotension	NA; CT scan	10 cm × 13 cm (right lobe)	Percutaneous drainage	No
Mc Arthur <i>et al</i> <sup>[12]</sup>	Common bile duct stone	Spincterotomy over a 0.035-ich guidewire + biliary stent	12 h	Abdominal pain/leucocytosis	12 h; CT scan	5 cm × 3 cm (right lobe)	Conservative	No
De La Serna-Higuera <i>et al</i> <sup>[13]</sup>	Common bile duct stone	Spincterotomy over a 0.035-ich guidewire	48 h	Abdominal pain/leucocytosis	72 h; abdomen US/ CT scan	14 cm × 8 cm × 5 cm (right lobe)	Conservative	No
Cárdenas <i>et al</i> <sup>[14]</sup>	bile leak after liver transplantation	Spincterotomy over a guidewire + biliary plastic stent positioning	24 h	Abdominal pain/anemia	NA; CT scan	NA	Conservative	No
Nari <i>et al</i> <sup>[15]</sup>	Acute biliary pancreatitis	NA	NA	Fever/Abdominal pain	NA; CT scan	NA (right lobe)	Conservative	No
Revuelto Rey <i>et al</i> <sup>[16]</sup>	Common bile duct stone	Spincterotomy	6 h	Anemia	6 hours; CT scan	13 cm × 9 cm × 11 cm (right lobe)	Conservative	No
Baudet <i>et al</i> <sup>[17]</sup>	Common bile duct stone	Spincterotomy over a 0.035-ich guidewire	24 h	Abdominal pain/anemia/fever/hypotension	36 h; abdomen US/CT scan	16 cm × 6 cm, 5 cm × 21 cm (right lobe S6-7-8)	Embolization/surgery (haematoma evacuation)	No
Pérez-Legaz <i>et al</i> <sup>[18]</sup>	Common bile duct stone	Spincterotomy	2 h	Abdominal pain/anemia/hypotension/peritonism	2 h; CT scan	8 cm (S5-6)	Surgery (electrocoagulation)	No
Del Pozo <i>et al</i> <sup>[19]</sup>	Common bile duct stone	Spincterotomy over a 0.035-ich guidewire	6 h	Abdominal pain	5 d; CT scan	NA, Right lobe	Conservative	No
Orellana <i>et al</i> <sup>[4]</sup>	Periampullary tumor	Biopsies + biliary plastic stent	4 h	Abdominal pain	4 h; CT scan	17 cm × 13 cm × 5 cm (right lobe)	Conservative	No

	Biliary stent occlusion	Stent exchange	2 h	Abdominal pain/hypotension	2 h; CT scan	Hepatic hematoma covering the 50% of the total hepatic volume + hemoperitoneum	Embolization of the right epatic artery + peritoneal drainage under CT guidance under CT guidance	No
	Biliary stent dysfunction in a patient affected by gallbladder cancer with consensual malignant biliary obstruction	Biliary plastic stent exchange	NA	Abdominal pain	NA, CT scan	Hepatic hematoma covering the 30% of the total hepatic volume	Conservative	No
Fei <i>et al</i> <sup>[11]</sup>	Common bile duct stone	Spincterotomy over a 0.035-ich guidewire	2 h	Fever	6 d; CT scan	13 cm × 6 cm (right lobe)	Percutaneous drainage	No
Klímová <i>et al</i> <sup>[20]</sup>	Wirsung stone	NA	6 h	Abdomial pain/anemia/hypotension	NA	Right lobe	Embolization/surgery/percutaneous drainage	No
Zizzo <i>et al</i> <sup>[21]</sup>	Common bile duct stone	Spincterotomy over a 0.035-ich guidewire	24 h	Abdominal pain/hypotension/anemia	36 h; CT scan and angiography	15 cm × 11 cm (right lobe)	Embolization	No
González-López <i>et al</i> <sup>[22]</sup>	Iatrogenic benign stenosis following laparoscopic cholecistectomy	Spincterotomy + Pneumatic dilation + biliary stent positioning	24 h	Abdominal pain/anemia/hypotension/peritonism	72 h; CT scan	NA (right lobe)	Surgery (damage control and packing)	Yes
Present case 2015	Common bile duct stone	Spincterotomy over a 0.035-ich guidewire	12 h	Abdominal pain/hypotension/anemia	24 h; CT scan	14 cm × 6 cm × 19 cm (right lobe)	Embolization	No

haemodynamic instability with signs of consensual peritoneal and free abdominal fluid<sup>[9]</sup>. Surgical approach consist in hematoma evacuation, local haemostasis with electrocoagulation or haemostatic devices, or packing in case of massive haemorrhage<sup>[22]</sup>. Literature data are in favour with a conservative treatment (43.5%), percutaneous embolization (26%), drainage (17.4%) and surgical management (13%) as a first line treatment. Failure of the first approach occur in 3 different cases (13%) without severe consequences (Table 1). Sudden rupture of the haematoma with consequent haemoperitoneum is a dreaded complications with high risk of mortality if misdiagnosed. González-López *et al*<sup>[22]</sup> report the case of a 30 years-old patient with Glisson's capsule rupture and consequent haemoperitoneum with consequent hypotension and signs of peritonism. The patients was surgically managed with electrocautery and packing without success.

Sub capsular liver haematoma is a rare and potentially life threatening complication following ERCP. Conservative treatment will be sufficient in most hemodinamically stable patients with no signs of super infection or abscess formation. Selective embolization is adequate in case of peripheral small vessels bleeding determining hemodynamic instability. Surgical approach is advisable in case of rupture risk, signs of peritonism and free abdominal fluid. Serial follow up CT scan are essential for dimension monitoring. We recommend that for legal purposes this potential risk should be addressed in the preoperative informed consent.

## COMMENTS

### Case characteristics

A 58-year-old woman with recurrent episodes of upper abdominal pain was diagnosed with common bile duct stone by abdomen ultrasound and magnetic resonance imaging and admitted for endoscopic retrograde cholangiopancreatography (ERCP) and sphincterotomy.

### Clinical diagnosis

Hemodynamic instability, hypotension, and tachycardia were consistent with a post-procedural bleeding.

### Differential diagnosis

Papillary bleeding after ERCP is one of the most common complications after the procedure. Splenic rupture, intrahepatic hematoma and visceral abdominal vessels rupture, related to instrumental looping with excessive traction, are exceptionally responsible for such situation.

### Laboratory diagnosis

Laboratory tests did not provide major indicators in development of sub capsular hepatic haematoma.

### Imaging diagnosis

Abdominal ultrasound and computed tomography (CT) scan are necessary for differential diagnosis.

### Pathological diagnosis

A large sub capsular hepatic haematoma of the right lobe with active bleeding was evident on CT scan.

### Treatment

On the basis of laboratory, clinical, and hemodynamic parameters the patient was urgently managed with percutaneous embolization of some small peripheral vessels.

### Related reports

Probably underestimated, hepatic hematoma following ERCP is an extremely rare complication with few cases reported in current literature.

### Experiences and lessons

Hepatic hematoma is a rare, potentially life threatening complication after ERCP. Awareness of such event is fundamental for early detection, diagnosis and treatment.

### Peer-review

This report describe our experience in the management of a large hepatic hematoma after ERCP with an exhaustive literature review. Symptoms and signs at presentation, diagnosis, and management are reviewed in accordance to published literature. Limited number of literature reported cases is the major weakness of this study. Further studies are necessary to investigate the mechanism of injury and appropriate management of such complication.

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