CASE REPORT

Rare case of hepatic haematoma following endoscopic retrograde cholangiopancreatography

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SUMMARY

Endoscopic retrograde cholangiopancreatography (ERCP) is a commonly used diagnostic and therapeutic technique but it is not free of complications. Subcapsular hepatic haematoma is a rare but potentially fatal complication. A 71-years-old male patient resorted to the emergency department 36 hours after an uneventful ERCP presenting with severe abdominal pain and haemoglobin drop. Abdominal ultrasound and CT scan diagnosed a subcapsular hepatic haematoma. The patient was haemodynamically normal and was successfully treated with a conservative management. Signs and symptoms of hepatic haematoma following ERCP are non-specific. The most common symptom is abdominal pain. Abdominal CT, ultrasound or MRI make the diagnosis. Conservative management is possible if the patient is stable, nevertheless invasive treatment such as surgery or angiographic embolisation, may be required. A low threshold of suspicion is crucial for an early diagnosis and treatment. Fatal cases have been described but most patients have a favourable outcome.

BACKGROUND

Endoscopic retrograde cholangiopancreatography (ERCP) was first described in 1968 as a diagnostic tool for direct observation of the biliary tree. It was rapidly accepted as a safe and useful minimally invasive technique to evaluate biliary and pancreatic diseases.¹⁻³ Later on, in 1974, with the introduction of sphincterotomy, ERCP was introduced as a therapeutic procedure, nowadays available worldwide.¹ Indications for ERCP are diagnosis and treatment of obstructions to the biliary tract due to choledocholithiasis and benign or malignant stenosis, Oddi sphincter dysfunctions and pancreatic diseases. It is usually performed in the ambulatory setting, with mild sedation and analgesia.¹ Nevertheless, it is not free of complications. The majority of case series report a complication rate of 2.5%–8%, and a related mortality rate of 0.3%–1%.²⁻⁵ Although pancreatitis is the most frequent complication of ERCP (1.6%–15.7%), haemorrhage following sphincterotomy (1.3%) and infection (cholangitis and cholecystitis) (<1%) may also occur.³⁻⁵ Additionally, cases of abdominal, hepatic and splenic haemorrhage or haematoma have been described.⁶ The authors present a case of a subcapsular hepatic haematoma following ERCP, an unusual

complication that can be fatal and require urgent surgical intervention.

CASE PRESENTATION

A 71-year-old male patient resorted to the emergency department presenting with sudden and intense abdominal pain in the right upper quadrant 36 hours following an uneventful ERCP procedure due to choledocholithiasis (sphincterotomy and gallstones extraction with Dormia basket). He had neither nausea nor vomiting, was haemodynamically normal and without fever. Hypertension and dyslipidaemia were the only comorbidities of the patient. He was not under anticoagulant or antiplatelet therapy. Physical examination revealed abdominal distension with tenderness in the right upper quadrant, without signs of peritoneal irritation and no Murphy's sign.

INVESTIGATIONS

Laboratory tests revealed a haemoglobin drop from 15.3 g/dL (prior to ERCP) to 10.5 g/dL and an increased C reactive protein of 6.9 mg/dL (normal <1.0 mg/dL). White cell count, total bilirubin, transaminases and amylase were normal. Abdominal X-ray was normal with no signs of pneumoperitoneum. An abdominal ultrasound showed a large subcapsular hepatic haematoma on the right lobe. For better characterisation, an abdominal CT scan was performed, and a 20x12 cm subcapsular hepatic haematoma on the right hepatic lobe was described (figure 1), without signs of active bleeding or peritoneal free fluid.

TREATMENT

Since the patient was haemodynamically normal, the surgical team decided for a conservative treatment with close surveillance and broad-spectrum antibiotic (Ertapenem 1 g/day). There was no need for blood transfusion or invasive procedures.

OUTCOME AND FOLLOW-UP

Ten days after diagnosis, the patient was asymptomatic and was discharged home. After 10 months of follow-up, he was free of symptoms and a CT scan showed a complete resolution of the haematoma (figure 2). Laparoscopic cholecystectomy was performed 1 year later, without complications.

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Figure 1 Abdominal CT showing a 20×12 cm hepatic haematoma. Coronal plane (A). Axial plane (B).

DISCUSSION

Subcapsular hepatic haematoma is a rare but potentially fatal complication following ERCP. Its real incidence is probably underestimated, and up to this date, there are less than 50 cases described (table 1).^{5 7 8} First case was described in 2000 by Ortega Deballon *et al.*⁹ The pathophysiology of this complication is unclear, but most authors believe it follows an incidental laceration of an intrahepatic vessel with the ERCP guidewire. However, there are cases of subcapsular hepatic haematoma following ERCP with no known use of a guidewire.¹⁰ Baudet *et al* considered the occurrence of hepatic contusions due to excessive traction to remove the extractor balloon from the distal biliary duct as a possible cause of hepatic haematoma, thus explaining the occurrence of such complication even when the guidewire is not used.¹¹ There are no known individual risk factors. Some authors believe the risk increases if the patient is under anticoagulant therapy; however, in only two case reports published in worldwide literature the patient was taking anticoagulants.^{12 13} No known preventive measures can be taken to minimise or to prevent this complication. Nevertheless, the authors believe that avoiding an excessively long guidewire may reduce the risk of intrahepatic haemorrhage, besides reducing patients' discomfort. In that setting, the best course of action to minimise the effects of this complication is to know that hepatic haematoma following ERCP is a possibility, suspect it and identify it promptly, and treat it accordingly.

Abdominal pain is the most frequent presenting symptom, 36 of the 44 described cases (82%). Haemoglobin drop, fever

and signs of hypovolaemic shock, such as tachycardia and hypotension may also be present.^{5 10} A right shoulder pain may be present accompanying other symptoms or, as in two cases, as a single symptom.^{8 14} The time gap between ERCP and the onset of symptoms goes from immediate to 15 days, but in most of the cases symptoms begin within the first 24 hours after procedure. Since symptoms are non-specific, and because decreasing haemoglobin or haematocrit are the only laboratory findings that may raise suspicion, diagnosis may be delayed up to 5 days. Therefore, sudden pain after ERCP should raise concern for hepatic haematoma, and doctors must have a low threshold of suspicion in order to make an early diagnosis.^{5 8 15 16} In the case presented, ERCP was performed without immediate complications. However, 36 hours after the procedure, the patient was admitted in the emergency department presenting with the most common symptom: abdominal pain in the right upper quadrant. Haemoglobin drop was also detected.

Abdominal ultrasound, CT or MRI are the methods of choice for diagnosis, and are commonly used with success.^{5 8 15–17} Nevertheless, in the case presented by González-López *et al*, an abdominal CT scan performed 24 hours following ERCP in a patient with abdominal pain showed no evidence of hepatic haematoma. Due to haemodynamic instability, a laparotomy was performed 72 hours later, finding a 2000 mL haemoperitoneum, raising the possibility of rupture of a subcapsular hepatic haematoma. The patient did not survive.³ In the case reported, both abdominal ultrasound and CT scan were performed and were concordant with the diagnosis of hepatic haematoma.

Several treatment options are possible based on patient's haemodynamic stability and clinic. A conservative treatment is preferred in cases of haemodynamic stability. Broad-spectrum antibiotics are highly recommended in conservative treatment, given the risk of haematoma infection. In 61% of described cases, antibiotics were used both as prophylaxis and treatment. Transfusion of packed red cells if necessary and an adequate pain control are also crucial. Monitoring haemoglobin levels and haematoma resolution with CT or ultrasound is highly suggested.^{2 5 13–15 18 19}

Invasive treatment is taken into account in cases of haemodynamic instability, failure of conservative treatment with deterioration of general clinical condition, haematoma infection and in cases of high risk of haematoma rupture.^{3 5 10 15 16} CT-guided percutaneous drainage and embolisation of involved vessels are suitable alternatives to surgical treatment.^{5–16} Surgery was necessary in 12 published cases.^{2 3 5 7 10 11 14 16} Surgical treatment involves an adequate drainage of the haematoma and local haemostasis with electrocauterisation and/or other haemostatic means, or packing in cases of massive haemorrhage.^{2 5 19} Follow-up with CT scan is recommended to monitor eventual appearance of a residual collection or rebleeding.² In the case presented by the authors, patient's haemodynamic stability allowed a conservative treatment, with the 10 months' follow-up CT scan showing a complete resolution of the haematoma. There was no need for surgical intervention or other invasive treatment.

There are four documented cases of death following this complication.^{3 7 12 14} Therefore, despite the low incidence, it is the authors' opinion that all surgeons must be aware of this complication and must be able to identify it promptly, ensuring a better patient outcome.

Figure 2 Abdominal CT revealing a complete resolution of the hepatic haematoma.

Table 1 Literature review, by publication year, of hepatic haematoma after ERCP cases

Year	Authors	Sex/age	ERCP	Symptoms	Onset (after ERCP)	Diagnosis/ time gap*	Localisation/size	Rupture	Treatment	ATB	Death
2000	Ortega Deballon <i>et al</i> ⁶	M/81	NA	Abdominal pain	NA	NA	NA	NA	Percutaneous drainage	NA	No
2002	Poon C-M <i>et al</i> ¹⁰	F/79	Sphincterotomy+biliary stent placement	Abdominal pain+hypotension	IM	CT, NA	NA/8 cm	No	Conservative management	NA	No
2004	Horn and Peña ⁶	F/88	Biliary stent placement	Abdominal pain+Hb drop	48 hours	CT, NA	NA	No	Conservative management	Yes	No
2004	Chi KD <i>et al</i> ¹⁴	F/43	Biliary stent placement	Abdominal pain	5 hours	NA	NA	Yes	Angiographic embolisation	Yes	No
2004	Bhandarkar DS <i>et al</i> ¹⁴	F/64	Gallstones removal	Abdominal pain+fever	10 days	CT, NA	NA	No	Percutaneous drainage	Yes	No
2006	Ertugrul I <i>et al</i> ¹⁴	M/41	Biliary stent placement	Abdominal pain+fever	48 hours	CT, 48 hours	Right lobe/7.8x4.1 cm	No	Conservative management	Yes	No
2007	Priego P <i>et al</i> ¹⁴	F/30	Sphincterotomy	Abdominal pain+hypotension	IM	CT, NA	Right lobe/4.7x10x11 cm	No	Surgery	Yes	No
2007	Petit-Laurent F <i>et al</i> ¹⁴	M/92	Sphincterotomy+gallstones removal	Abdominal pain+fever	48 hours	US+CT, 48 hours	NA	NA	Percutaneous drainage	NA	NA
2007	Bhati CS <i>et al</i> ¹⁴	F/51	Sphincterotomy	Abdominal pain+hypotension	IM	CT, NA	Right lobe/10x13 cm	Yes	Percutaneous drainage	NA	No
2007	Del Rosi M <i>et al</i> ¹⁴	F/28	Sphincterotomy+gallstones removal+biliary stent placement	Abdominal pain+hypotension +Hb drop	48 hours	US+CT, NA	NA/12x16 cm	No	Conservative management	Yes	No
2007	Papachristou GI <i>et al</i> ¹⁴	M/69	Balloon dilatation+biliary stent placement	Abdominal pain+right shoulder pain+Hb drop	48 hours	CT, NA	NA	No	Conservative management	NA	NA
2008	McArthur KS <i>et al</i> ¹⁴	M/71	Sphincterotomy+gallstones removal	Abdominal pain	12 hours	CT, 12 hours	Right lobe/5x3 cm	No	Conservative management	Yes	No
2008	De La Serna-Higuera C <i>et al</i> ^{14 16}	F/71	Sphincterotomy+gallstones removal	Abdominal pain	48 hours	US+CT, 72 hours	Right lobe/14x8x5 cm	No	Conservative management	Yes	No
2008	Cárdenas A <i>et al</i> ^{14 16}	M/54	Sphincterotomy+biliary stent placement	Abdominal pain+Hb drop	24 hours	CT, NA	NA	No	Conservative management	Yes	No
2008	De Mayo G T <i>et al</i> ¹⁴	M/96	Sphincterotomy+biliary stent placement	Right shoulder pain	4 hours	CT, NA	Right lobe/17x13x5 cm	No	Conservative management	Yes	No
2009	Yriberry Urena S <i>et al</i> ¹⁴	F/46	Sphincterotomy+gallstones removal	Hb drop	48 hours	CT, NA	NA	NA	Surgery	NA	No
2009	Revuelto Rey J <i>et al</i> ¹⁰	NA/41	Sphincterotomy+gallstones removal	Hb drop	NA	CT, NA	NA/13x9x11 cm	No	Conservative management	Yes	No
2009	Nari GA <i>et al</i> ¹⁵	F/15	NA	Abdominal pain+fever+Tq	NA	US+CT, NA	Right lobe/135x49x35 mm	No	Conservative management	Yes	No
2011	Baudet JS <i>et al</i> ¹¹	F/69	Sphincterotomy+gallstones removal	Abdominal pain+fever	48 hours	US+CT, NA	Right lobe/16x6.5x21 cm		Angiographic embolisation+surgery	Yes	No
2011	Del Pozo D <i>et al</i> ¹³	F/76	Sphincterotomy+gallstones removal	Abdominal pain	6 hours	CT, 5 days	NA	No	Conservative management	Yes	No
2011	Pérez-Legaz J <i>et al</i> ²	F/72	Sphincterotomy+gallstones removal	Abdominal pain+hypotension+Tq	2 hours	CT, NA	Right lobe (V and VI)/8 cm	Yes	Surgery	NA	No
2011	Saa R <i>et al</i> ¹⁴	M/92	Sphincterotomy	Upper GI haemorrhage	24 hours	Angio-CT	Left lobe (peripheral)	NA	Percutaneous drainage+surgery	NA	Yes
2012	Orellana F <i>et al</i> ⁸	M/49	Biliary stent replacement	Abdominal pain+hypotension +tachycardia	2 hours	CT, NA	50% of the total hepatic volume	Yes	Angiographic embolisation+peritoneal drainage	NA	No
2012	Orellana F <i>et al</i> ⁸	F/55	Biliary stent replacement	Abdominal pain+right shoulder pain	NA	CT, NA	30% of the total hepatic volume	No	Conservative management	NA	No
2012	Orellana F <i>et al</i> ⁸	NA/96	Biliary stent placement	Right shoulder pain	4 hours	CT, NA	Right lobe/17x13x5 cm	No	Conservative management	Yes	No
2012	Bartolo Rangel EF <i>et al</i> ⁷	F/66	Sphincterotomy+gallstones removal	Hypotension+Tq	NA	Chest X-ray, NA	NA	Yes	Surgery	NA	Yes
2013	Oliveira Ferreira A <i>et al</i> ¹²	M/84	Sphincterotomy+gallstones removal	Abdominal pain+Hb drop	10 days	CT, NA	Right lobe/9x10 cm	No	Percutaneous drainage	Yes	Yes
2013	Fei BY <i>et al</i> ¹⁷	M/56	Sphincterotomy+gallstones removal	Fever	2 hours	CT, 4 days	Right lobe/13x6 cm	No	Percutaneous drainage	Yes	No
2013	Patil M <i>et al</i> ¹⁴	M/50	Sphincterotomy+gallstones removal	Abdominal pain	48 hours	US+CT, NA	Right lobe/5x3 cm	No	Percutaneous drainage	Yes	No
2014	Klímová K <i>et al</i> ^{14 16}	M/52	Sphincterotomy+gallstones removal	Abdominal pain+haemoglobin drop	6 hours	CT, NA	Right lobe/19x17.8x6.9 cm	No	Angiographic embolisation+surgery	Yes	No
2014	Yoshii S <i>et al</i> ¹⁴	M/86	Gallstones removal	Abdominal pain	30 hours	CT, NA	NA	No	Conservative management	Yes	No
2014	Carica S A <i>et al</i> ¹⁴	F/37	Sphincterotomy+gallstones removal	Abdominal pain	72 hours	MRI, NA	12.4x9.3 cm	No	Percutaneous drainage	Yes	No
2015	Zizzo M <i>et al</i> ¹⁶	F/52	Sphincterotomy+gallstones removal	Abdominal pain+hypotension	24 hours	CT, NA	Right lobe/15x11 cm	No	Angiographic embolisation	Yes	No

Continued

Table 1 Continued

Year	Authors	Sex/age	ERCP	Symptoms	Onset (after ERCP)	Diagnosis/ time gap*	Localisation/size	Rupture	Treatment	ATB	Death
2015	González-López R <i>et al</i> ³	F/30	Sphincterotomy+biliary stent placement	Abdominal pain+Hb drop	NA	Exploratory laparotomy (1), 72 hours	Right lobe	Yes	Packing+damage control surgery	NA	Yes
2016	Solmaz A <i>et al</i> ⁴⁹	M/52	Sphincterotomy+gallstones removal	Abdominal pain+right shoulder and back pain	6 hours	CT, NA	Right lobe/14×6.7 cm	No	Conservative management	Yes	No
2016	García Tamez A <i>et al</i> ¹⁰	F/25	Sphincterotomy+gallstones removal	Abdominal pain+Hb drop	12 hours	US, 3 days	NA	Yes	Surgery (packing+2nd laparotomy 48 hours later)	Yes	No
2016	Zappa MA <i>et al</i> ⁵	F/58	Sphincterotomy	Abdominal pain+hypotension+fever	12 hours	CT, 24 hours	Right lobe/14 ×6×19 cm	No	Angiographic embolisation	NA	No
2016	Zela P <i>et al</i> ⁴	F/47	Sphincterotomy+biliary stent placement	Abdominal pain	10 days	US, NA	NA	Yes	Conservative management	Yes	No
2016	Servide MJ <i>et al</i> ⁴⁴	M/83	NA	Abdominal pain	15 days	CT	NA	No	Conservative management	NA	No
2016	Kisaoğlu A <i>et al</i> ⁴⁴	F/34	Sphincterotomy+gallstones removal	Incidental finding	–	US	Left lobe, 5.7×4.4 cm	NA	Conservative management	NA	No
2016	Kilic A <i>et al</i> ⁴	F/69	Sphincterotomy+gallstones removal	Abdominal pain+fatigue + hypotension	18 hours	US+CT	Right lobe, 4×2 cm	No	Surgery+percutaneous drainage (1 month later, due to haematoma recurrence)	NA	No
2016	Florini M <i>et al</i> ⁸	F/47	Sphincterotomy+gallstones removal	Abdominal pain+fever	8 hours	CT, NA	Left lobe	NA	Percutaneous drainage	Yes	No
2016	Cuvalle C <i>et al</i> ⁴⁴	M/78	Sphincterotomy+biliary stent placement	Abdominal pain+right shoulder pain+Hb drop+hypotension	1 hour	CT, NA	NA	No	Surgery	NA	No
2017	Corazza LR <i>et al</i> ⁴⁴	F/55	Sphincterotomy+gallstones removal	Abdominal pain+Hb drop	2 hours	CT, NA	Right lobe, NA	No	Surgery	Yes	No
2017	Current Case	M/74	Sphincterotomy+gallstones removal	Abdominal pain+Hb drop	36 hours	US+CT, 2 hours	Right lobe, 20×12 cm	No	Conservative management	Yes	No

*Time gap from symptoms onset to diagnosis.

ATB, antibiotics; ERCP, endoscopic retrograde cholangiopancreatography; F, female; GI, gastrointestinal; Hb, haemoglobin; IM, immediate; M, male; NA, non-available; Tq, tachycardia; US, ultrasound.

Learning points

- ▶ Hepatic haematoma is a rare complication following endoscopic retrograde cholangiopancreatography and has non-specific symptoms.
- ▶ Cross-sectional imaging is usually enough for diagnosis.
- ▶ Conservative treatment is preferred in cases of haemodynamic stability but invasive methods, such as surgery, may be necessary.
- ▶ Although fatal cases have been described, most patients have a favourable outcome.
- ▶ Doctors must have a low threshold of suspicion in order to make an early diagnosis.

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