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Ruptured Hepatic Subcapsular Hematoma as a Complication of Endoscopic Retrograde Cholangiopancreatography. A Case Report and Literature Review

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ABSTRACT

This report describes the unusual case of a 59-year-old woman who presented a subcapsular hepatic hematoma (HH) affecting liver segments VII and VIII as a complication of endoscopic retrograde cholangiopancreatography (ERCP). Due to hemodynamic instability, urgent surgical hemostasis and evacuation of the hematoma were performed. The most important clinical manifestations were acute abdominal pain and progressive anemia. The diagnosis is based on clinical findings and images, being computed tomography (CT) the gold standard for the definitive diagnosis. The patient was successfully treated and was discharged home on the 75th hospital day. During the six-month follow-up, no clinical or biochemical abnormalities were observed, and the imaging studies showed a progressive reduction in the size of the injuries. As a potentially life-threatening complication, subcapsular hepatic hematoma after ERCP must be considered in the differential diagnosis of symptomatic cases in the early period after ERCP.

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Hematoma subcapsular hepático roto como complicación de la colangiopancreatografía retrógrada endoscópica. Reporte de caso y revisión de la literatura

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RESUMEN

Este reporte describe el caso inusual de una mujer de 59 años que presentó un hematoma hepático subcapsular (HH) que afectó los segmentos hepáticos VII y VIII como complicación de una Colangiopancreatografía Retrógrada Endoscópica (CPRE). Debido a la inestabilidad hemodinámica, se realizó hemostasia quirúrgica urgente y evacuación del hematoma. Las manifestaciones clínicas más relevantes fueron dolor abdominal agudo y anemia progresiva. El diagnóstico se fundamenta en hallazgos clínicos e imagenológicos, siendo la tomografía el estándar de oro para el diagnóstico definitivo. La paciente fue tratada exitosamente y egresó al día 75 de hospitalización. Durante el seguimiento de seis meses no se observaron alteraciones clínicas ni bioquímicas, y los estudios imagenológicos evidenciaron una reducción progresiva en el tamaño de las lesiones. Como complicación potencialmente mortal, el hematoma hepático subcapsular posterior a CPRE debe considerarse en el diagnóstico diferencial de casos sintomáticos en el período temprano post-CPRE.

INTRODUCTION

Endoscopic retrograde cholangiopancreatography (ERCP) is one of the most frequent minimally invasive procedures performed for diagnosis and treatment of biliary and pancreatic disease (1,2). An ERCP complication is any unwanted event in the 30 days following ERCP that leads to hospitalization; it can be grouped into two main categories: general complications that are common in all endoscopic interventions and endoscopic retrograde cholangiopancreatography–specified complication with risks of 0.08 - 12% and mortality ranging from 0.4 - 1.4% (3).

Hepatic subcapsular hematoma (HH) is an unusual post-ERCP complication (4), of which there are few cases reported in the scientific literature (1,5). In symptomatic patients after ERCP, it should be considered a differential diagnosis because it may result in a potentially fatal outcome (1,6,7). We present the case of a middle-aged patient who develops multiple specified ERCP complications including pancreatitis and HH, which debuted as ruptured, requiring surgical management and a prolonged stay in the intensive care unit.

CASE REPORT

A 59-year-old woman who had undergone cholecystectomy for cholelithiasis 2 months prior, presented to the Emergency Department (ED) with mid-epigastric abdominal pain, a 2-week history of jaundice, tenderness to palpation of epigastric area but no peritoneal signs. Initial laboratory data revealed moderate hyperbilirubinemia (mainly direct), increased aminotransferases values, leukocytosis, and neutrophilia (Table 1). Hepatobiliary ultrasound imaging (US) showed dilated intra and extrahepatic biliary systems and secondary choledocholithiasis.

Table 1. Laboratory values during hospitalization

	ED	24 h Post ERCP	Day 2 Post ERCP	Day 3 Post ERCP	OR	Day 2 Post-op	Day 4 Post-op
Hemoglobin (g/dL)	11.4	9	8.2	9.3	7.9	8.2	7.9
Leukocytes (x10³/?L)	16.1	10.4	9.64	20	19.4	14.86	9.68
CRP (mg/dL)	~	297.2	~	~	~	~	~
Amylase (U/L)	~	1248	617	133	~	89	~
Total bilirubin (mg/dL)	2.69	~	2.81	~	~	~	~
Direct bilirubin (mg/dL)	2.45	~	2.79	~	~	~	~
Alkaline phosphatase (U/L)	~	80	~	~	~	136	~
AST (U/L)	210.2	~	56	42.2	~	44.2	~
ALT (U/L)	327.1	~	150.8	64.7	~	37.4	~

~: Not reported
Abbreviations: ED: Emergency department; OR: Operating room ERCP: Endoscopic retrograde cholangiopancreatography; CRP: C Reactive Protein; AST: Aspartate aminotransferase; ALT: Alanine aminotransferase

Source: Author's own work

The patient was identified as being at high risk for choledocholithiasis, necessitating an ERCP for treatment. The procedure, which involved a biliary sphincterotomy, was conducted by an experienced endoscopist. Cannulation of the main bile duct with a 0.035-inch hydrophilic guide wire with a sphincterotome was achieved without complications. An endoscopic biliary sphincterotomy was performed with an endocut current type, and a Fogarty catheter was inserted through the guidewire to extract one stone. A post-sphincterotomy bleeding was observed and treated with the injection of dilute epinephrine into and around the sphincterotomy site. No residual stones were observed at the controlled cholangiography, and a good outflow of contrast dye through the duodenum was documented at the end of the endoscopic intervention with no additional complications reported.

Immediately after the procedure, the patient experienced sudden and severe abdominal pain in the right upper quadrant. New laboratory exams reported a sudden increase in serum amylase concentrations, so a diagnosis of post-ERCP pancreatitis (PEP) was made. Over the next 72 hours, the patient experienced progressively worsening abdominal pain. The hemoglobin level declined from 11.4 g/dL to 7.9 g/dL. Transfusion of packed red blood cells, intravenous opioids, crystalloids, antibiotics, and proton pump inhibitors were administered.

An abdominal ultrasound revealed a large 14 cm x 10 cm subcapsular hematoma affecting liver segments VII and VIII. The patient's hemodynamic instability (manifested as hypotension and tachycardia) prompted an immediate laparotomy (Figure 1), during which a rupture of the HH was discovered. Intraoperatively, 700 mL of hemoperitoneum and ruptured subcapsular hematoma affecting the right lobe of the liver were identified, accompanied with leaking bleeding and necrotizing pancreatitis. Damage control and packaging of the patient were successfully performed. Postoperatively, the patient was admitted to the intensive care unit; after receiving 3 units of packed red blood cells, she maintained hemodynamic stability and was submitted to a new surgical approach 48 h after the first procedure to remove abdominal packing and after external abdominal drainage. After surgery the patient had isolated fever peaks and a new contrast-enhanced CT scan showed a pancreatic abscess (Figure 2). Drainage guided by interventional radiology was successfully performed. The abdominal drain was removed on the 12th postoperative day.

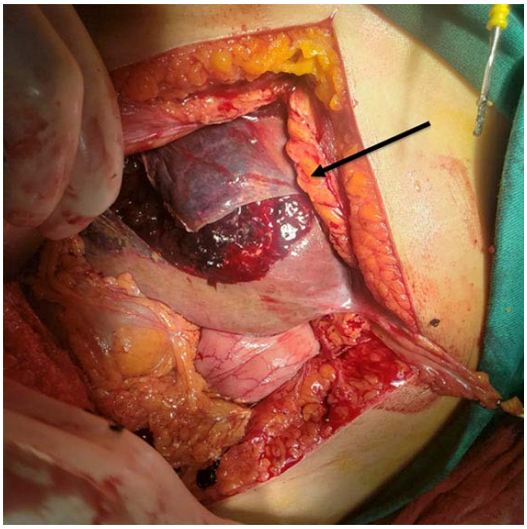

Figure 1. The laparotomy findings revealed a 110 × 80 mm ruptured subcapsular hematoma with oozing bleeding affecting the right lobe of the liver (black arrow) and the presence of hemoperitoneum

Source: Author's medical image archive

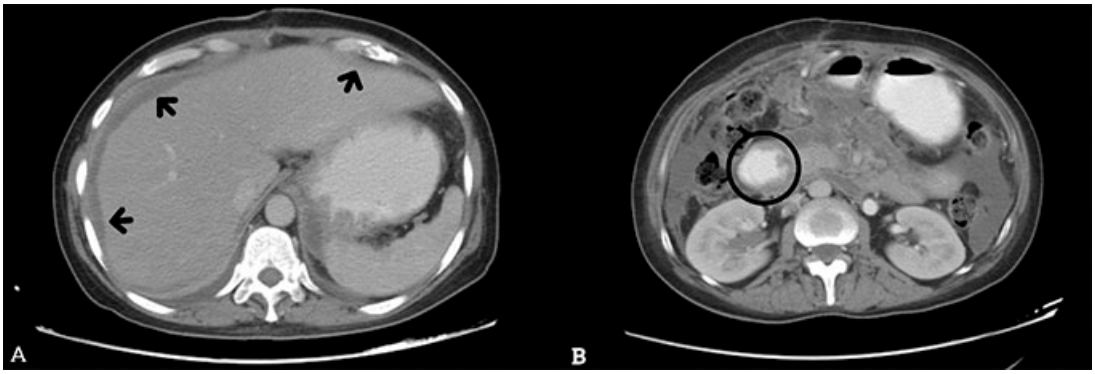

Figure 2. Postoperative computed tomography scan (CT)
A. CT scan showing a diffusely enlarged liver, associated with a subcapsular collection of heterogeneous echogenicity (black arrows). Additionally, it shows a capsule that enhances after contrast administration, with a thickness of 1.5 cm

B. CT scan showing pancreatic collections (black circle) and perihepatic collection with thick wall and hyperdense in this single phase, hypodense content, measuring 87.6 x 48.4 x 22.6 mm (L x AP x T) for an estimated volume of 50.2 mL

Source: Clinic's image database

She was extubated on the 10th postoperative day and was referred to general ward, then she was discharged home on the 75th hospital day. During the six-month follow-up no clinical or biochemical abnormalities were observed, and the imaging studies showed a progressive reduction in the size of the injuries.

DISCUSSION

ERCP is one of the most frequently minimally invasive procedures performed for diagnosis and treatment of biliary and pancreatic disease (1,5,8–12), and it has become the treatment of choice for management of biliary tract diseases (1,8,9,13) . However, ERCP benefits should be weighed against a higher potential for serious complications (3,14,15).

An ERCP complication is any unwanted event within 30 days following ERCP that leads to hospitalization (3); they occur in about 5 - 10% of ERCPs and can be grouped in two main categories: general complications common to all endoscopic interventions, and ERCP specific complications (see Table 2) (1,3,8–11,15–19).

Table 2. Frequency of general and specific ERCP complications

General	Frequency (%)
Cardiopulmonary compromise	1.3-16
Sedation side effects	0.1
Contrast allergy	Rare; the exact incidence is unknown because definite diagnosis is not possible in most cases
Specific	Frequency (%)
Pancreatitis	1-7
Impaction of the extraction basket	0.8-6
Bleeding	0.3-2
Biliary sepsis	1.6
Acute cholangitis	1.4
Duodenal perforation	1
Air embolism	0.8 (only 26 cases in literature)
Cholecystitis	0.5
Death	0.2-0.5
Subcapsular hepatic hematoma	0.37
Intrapancreatic stent fracture	0.2
Zenker's diverticulum perforation	0.2
Pneumothorax and pneumoperitoneum	0.03
Duodenal papilla hematoma	0.03
Splenic injury	0.006
Pneumothorax, pneumoperitoneum, and subcutaneous emphysema	Only 20 cases in literature
Gallstone ileus	Only 4 cases in literature

Source: Table created based on references 8, 14–16, and 34–37

Vandervoort *et al.* reported different variables statically associated with an increased risk of post-ERCP pancreatitis. Access papillotomy (20%), multiple cannulation attempts (14.9%), sphincterotome (13.1%) to achieve cannulation, multiple pancreatic injections (12.3%), and the use of a guidewire (10.2%) were variables reflecting a technically difficult cannulation and increasing the risk of specific complications (2,6,20,21). The papillotomy performed during ERCP in this case report could have been an important risk factor in the development of the post-ERCP pancreatitis.

The presentation of a subcapsular hepatic hematoma as a complication after an ERCP was first reported in 1993 by W. C. Wu, whose patient presented a concomitant splenic avulsion (22), followed by Deballon *et al.* in 2000 (23), and then by K. D. Chi and T. L. Horn in 2004 (24,25). Since these firsts cases up to the present date, there has been an augmenting number of reports of this

complication, with more than 60 of them reported in the literature. This suggests it is not so rare an event, like it was thought to have been at first, but more of an underdiagnosed one. It has been suggested by some authors that it could be associated with the lack of image monitoring after an ERCP added to the patients not presenting symptomatology of the entity (11,16,18,26).

Similarly, with the case reported here, the events that lead to the apparition of a subcapsular hepatic hematoma are usually unclear, unexpected, and unnoticed (16,18). Two main hypotheses have been presented. The first hypothesis is of the accidental lesion of the hepatic blood vessels after the perforation of an intrahepatic bile duct by the metallic guide (11,12,16,18,24,27); the second one is that the traction force exerted with the balloon on the bile duct when trying to remove a retained calculus would cause the rupture of bile ductules and vessels, as well as the consequent bleeding (1,2,6,7,10,16,18,19,26,28,29).

The initial onset of symptoms can widely range from 2 hours to 15 days after the ERCP. The peak incidence for the initial manifestations is at 48 hours (40.7%), and in 77.8% of the reported cases, the onset of symptoms occurred within the 48 hours after the procedure (1,26). The most prevalent manifestations are acute abdominal pain (83.3 - 87%) and anemia (28.6 - 56.7%), although patients may often present hypotension (28.3%), fever (18.3 - 19%), and right shoulder pain (13.1%) (1,2,7,11,16,18,26,30). As described in previous literature reports, the initial symptom in our case was right upper quadrant pain, typically occurring shortly after awakening from the procedure followed by a marked drop of hemoglobin levels detected in the following hours.

The diagnosis is based on clinical manifestations, laboratory findings and CT and US imaging (31). The apparition of sudden right upper quadrant pain and an important drop in hemoglobin causing anemia after hours or days from the ERCP makes for a presumptive diagnosis. Ultrasonography, CT, and magnetic resonance are all useful to characterize the hepatic damage, although a CT scan is the gold standard to obtain a final diagnosis (1,7,9–12,18,19,26,32).

Management of HH depends on the patient's clinical status (16,31). The conservative treatment is indicated in most cases of hemodynamically stable patients, as the hematoma can be contained by a Glisson's capsule (1). Conservative therapy consists of the infusion of intravenous fluids, replacement of blood products, serial monitoring of hemoglobin, serial function tests, repeated physical examinations, bed rest, and observation in an intensive care unit setting. Re-imaging the liver by computed tomography or liver scan can be done to monitor progression of a hematoma.

Octreotide can also be used to potentially help decrease bleeding. Based on the literature, it is recommended that prophylactic antibiotics be administered since there is a substantial risk of infection of the hematoma. (5,7,9–12,16,18,19,24,25,27,29). Invasive treatment is considered in patients with hemodynamic instability, failure of conservative treatment, hematoma infection or in cases of high-risk hematoma rupture (1,2,10–12,16,18). In the case reported here, surgical management was considered due to clinical deterioration, hemodynamic instability, and abdominal CT findings. Surgical therapy included drainage of the hematoma followed by hemostasis.

Alternatives to surgery not considered in our case include selective or super selective embolization of a brand of the hepatic artery or percutaneous drainage; using ultrasonic or CT guidance are valid alternatives to surgery (19). Embolization also may be an effective method of controlling refractory bleeding (10,16,18,24).

Zizzo reported that 47.6% of patients were treated conservatively, 23.8% of patients were treated with percutaneous drainage, 23.8% of patients were treated with embolization, and 19% of patients required surgery (11). Although the global results are good and no long-term complications have been described, an estimated 9% mortality rate has been reported (5,11,19,33).

CONCLUSIONS

Hepatic hematoma is an unusual post-ERCP complication, of which there are few cases reported in the scientific literature. One hypothesis about its cause is explained by the rupture of small intrahepatic vessels and the biliary tract caused by the guidewire. In symptomatic patients after ERCP, it should be considered as a differential diagnosis because it may result in a fatal outcome. The most frequent clinical presentation includes abdominal pain, anemia, hypotension, and fever. A high index of suspicion is crucial for achieving an early diagnosis and initiating timely treatment. While conservative measures are often sufficient for self-limited hematomas, cases involving large hematomas or a risk of hemodynamic shock may require surgical intervention or percutaneous embolization.

ETHICS STATEMENT

This research did not receive any specific grant from funding agencies of the public, private, or not-for-profit sectors. The work has been approved by the appropriate ethics committees. The patient gave informed consent for the publication.

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CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest concerning this article.

REFERENCES

1. Caroço TV, Louro JM, Coelho MI, Costa-Almeida CE. Rare case of hepatic haematoma following endoscopic retrograde cholangiopancreatography. BMJ Case Rep [Internet]. 2018 Apr 18;bcr-2017-222638. https://doi.org/10.1136/bcr-2017-222638
2. Segura-Gago GP, León-Quispe DA, Nivin-Huerta JJ, Baldera-Guayambal JO. Hematoma subcapsular hepático posterior a colangiopancreatografía retrógrada endoscópica. Reporte de caso y revisión de la literatura. Rev Gastroenterol Peru [Internet]. 2022 Mar 31;42(1):48-52. https://doi.org/10.47892/rgp.2022.421.1325
3. Hormati A, Alemi F, Mohammadbeigi A, Sarkeshikian SS, Saeidi M. Prevalence of Endoscopic Retrograde Cholangiopancreatography Complications and Amylase Sensitivity for Predicting Pancreatitis in ERCP Patients. Gastroenterol Nurs [Internet]. 2020 Sep;43(5):350-4. https://doi.org/10.1097/SGA.0000000000000473
4. Azab M, Bharadwaj S. Subcapsular Hepatic Hematoma After Endoscopic Retrograde Cholangiopancreatography (ERCP). Am J Gastroenterol [Internet]. 2020 Oct;115(1):S694-S694. https://doi.org/10.14309/01.ajg.0000707896.23541.6b
5. Zappa MA, Aiolfi A, Antonini I, Musolino CD, Porta A. Subcapsular hepatic haematoma of the right lobe following endoscopic retrograde cholangiopancreatography: Case report and literature review. World J Gastroenterol [Internet]. 2016;22(17):4411. https://doi.org/10.3748/wjg.v22.i17.4411
6. Díaz-Alcázar MDM, Martín-Lagos Maldonado A, Ruiz-Escolano E. Subcapsular hepatic hematoma as a complication of ERCP: what do we know about its etiology? Rev Esp Enferm Dig [Internet]. 2021;113(2):149-50. https://doi.org/10.17235/reed.2020.7154/2020
7. D'Ovidio V, Bruno G, Sodani G, Lucidi C, Bazuro ME. Intraparenchymal hepatic hematoma following endoscopic retrograde cholangiopancreatography: Risk factors and

conservative approach in acute management. Hepatobiliary Pancreat Dis Int [Internet]. 2021 Jun;20(3):293-5. https://doi.org/10.1016/j.hbpd.2020.09.004

8. Orellana F, Irarrazaval J, Galindo J, Balbontin P, Manríquez L, Plass R, et al. Subcapsular hepatic hematoma post ERCP: a rare or an underdiagnosed complication? Endoscopy [Internet]. 2012 Apr 4;44(S 02):E108-9. https://doi.org/10.1055/s-0031-1291493
9. Fei BY, Li CH. Subcapsular hepatic haematoma after endoscopic retrograde cholangiopancrea-tography: An unusual case. World J Gastroenterol [Internet]. 2013;19(9):1502-4. https://doi.org/10.3748/wjg.v19.i9.1502
10. Díaz-Rubia L, García-Verdejo F, Moya-Sánchez E. Subcapsular hepatic hematoma as an unusual complication after performing ERCP in a patient with cholangiocarcinoma. RAPD Online [Internet]. 2019;42(5):185-7. Available from: https://dialnet.unirioja.es/servlet/articulo?codigo=7134220
11. Zizzo M, Lanaia A, Barbieri I, Zaghi C, Bonilauri S. Subcapsular Hepatic Hematoma After Endoscopic Retrograde Cholangiopancreatography. Medicine (Baltimore) [Internet]. 2015 Jul;94(26):e1041. https://doi.org/10.1097/MD.0000000000001041
12. Nari GA, Preciado-Vargas J, Rosendo-Ballesteros N. Una rara complicación de la CPRE: el hematoma subcapsular hepático. Cir Esp [Internet]. 2009 Apr;85(4):261-2. https://doi.org/10.1016/j.ciresp.2008.04.002
13. Anderson MA, Fisher L, Jain R, Evans JA, Appalaneni V, Ben-Menachem T, et al. Complications of ERCP. Gastrointest Endosc [Internet]. 2012 Mar;75(3):467-73. https://doi.org/10.1016/j.gie.2011.07.010
14. Loperfido S, Angelini G, Benedetti G, Chilovi F, Costan F, De Berardinis F, et al. Major early complications from diagnostic and therapeutic ERCP: a prospective multicenter study. Gastrointest Endosc [Internet]. 1998 Jul;48(1):1-10. https://doi.org/10.1016/S0016-5107(98)70121-X
15. Johnson KD, Perisetti A, Tharian B, Thandassery R, Jamidar P, Goyal H, et al. Endoscopic Retrograde Cholangiopancreatography-Related Complications and Their Management Strategies: A "Scoping" Literature Review. Dig Dis Sci [Internet]. 2020 Feb 2;65(2):361-75. https://doi.org/10.1007/s10620-019-05970-3
16. del Moral-Martínez M, Delgado-Maroto A, Cervilla-Sáez de Tejada ME, Casado-Caballero FJ, Salmerón-Escobar FJ. Hepatic hematoma after ERCP: two new case reports. Rev Española Enfermedades Dig [Internet]. 2017;109(6):470-3. https://doi.org/10.17235/reed.2017.4237/2016
17. Manoharan D, Srivastava DN, Gupta AK, Madhusudhan KS. Complications of endoscopic retrograde cholangiopancreatography: an imaging review. Abdom Radiol [Internet]. 2019 Jun 27;44(6):2205-16. https://doi.org/10.1007/s00261-019-01953-0
18. Sommariva C, Lauro A, Pagano N, Vaccari S, D'Andrea V, Marino IR, et al. Subcapsular Hepatic Hematoma Post-ERCP: Case Report and Review of the Literature. Dig Dis Sci [Internet]. 2019 Aug 13;64(8):2114-9. https://doi.org/10.1007/s10620-019-05679-3
19. Klímová K, Padilla-Suárez C, González-Asanza C, Matilla-Peña A, Cos-Arregui E, Alonso AH. Subcapsular Hepatic Hematoma after ERCP: A Case Report and Revision of Literature. Cas Rep Clin Med [Internet]. 2014;03(03):161-6. https://doi.org/10.4236/crcm.2014.33039
20. Vandervoort J, Soetikno RM, Tham TCK, Wong RCK, Ferrari AP, Montes H, et al. Risk factors for complications after performance of ERCP. Gastrointest Endosc [Internet]. 2002 Nov;56(5):652-656. https://doi.org/10.1016/S0016-5107(02)70112-0
21. Chandrasekhara V, Khashab MA, Muthusamy VR, Acosta RD, Agrawal D, Bruining DH, et al. Adverse events associated with ERCP. Gastrointest Endosc [Internet]. 2017 Jan;85(1):32-47. https://doi.org/10.1016/j.gie.2016.06.051
22. Wu WC, Katon RM. Injury to the liver and spleen after diagnostic ERCP. Gastrointest Endosc [Internet]. 1993;39(6):824-7. https://doi.org/10.1016/S0016-5107(93)70278-3
23. Ortega-Deballon P, Fernández-Lobato R, García-Septiem J, Nieves-Vázquez MA, Marínez-Santos C, Moreno-Azcoita M. Liver hematoma following endoscopic retrograde cholangiopancreatography (ERCP). Surg Endosc [Internet]. 2000;14(8):767-8. https://www.doi.org/10.1007/s004640040001
24. Chi KD, Waxman I. Subcapsular Hepatic Hematoma after Guide Wire Injury During Endoscopic Retrograde Cholangiopancreatography: Management and Review. Endoscopy [Internet]. 2004 Nov;36(11):1019-21. https://doi.org/10.1055/s-2004-825861

25. Horn TL, Peña LR. Subcapsular hepatic hematoma after ERCP: case report and review. Gastrointest Endosc [Internet]. 2004 Apr;59(4):594-6. https://doi.org/10.1016/S0016-5107(04)00013-6
26. Pivetta LGA, da Costa-Ferreira CP, de Carvalho JPV, Konichi RYL, Kawamoto VKF, Assef JC, et al. Hepatic subcapsular hematoma post-ERCP: Case report and literature review. Int J Surg Case Rep [Internet]. 2020;72:219-28. https://doi.org/10.1016/j.ijscr.2020.05.074
27. De la Serna-Higuera C, Fuentes-Coronel A, Rodríguez-Gómez SJ, Martín-Arribas MI. Hematoma hepático subcapsular secundario al empleo de una guía hidrofílica durante una colangiopancreatografía retrógrada endoscópica. Gastroenterol Hepatol [Internet]. 2008 Apr;31(4):266-7. https://doi.org/10.1157/13117920
28. De la Maza-Ortiz J, García-Mulas S, Ávila-Alegría JC, García-Lledó J, Pérez-Carazo L, Merino-Rodríguez B, et al. Subcapsular hepatic haematoma after endoscopic retrograde cholangiopancreatography. A rare complication with high morbidity and mortality. Gastroenterol Hepatol [Internet]. 2019 Jan;42(1):23-7. https://doi.org/10.1016/j.gastre.2019.01.003
29. Baudet JS, Arguiñarena X, Redondo I, Tadeo E, Navazo L, Mendiz J, et al. Hematoma hepático subcapsular. Una rara complicación de la CPRE. Gastroenterol Hepatol [Internet]. 2011 Feb;34(2):79-82. https://doi.org/10.1016/j.gastrohep.2010.11.002
30. Fernández-Gordón Sánchez FM., Cudero-Quintana L, Algara-San Nicolás M, Álvarez-Nava Torrego T, Marín-Gabriel JC, Cabrera-González M, et al. Hepatic subcapsular hematoma post-endoscopic retrograde cholangiopancreatography requiring embolization. Rev Esp Enfer Dig [Internet]. https://doi.org/10.17235/reed.2022.9342/2022
31. Khrais A, Ali A, Choi C, Verma S. Post-Endoscopic Retrograde Cholangiopancreatography (ERCP) Subcapsular Hepatic Hematoma. Cureus [Internet]. 2022 Nov 20;14(11):2-5. https://doi.org/10.7759/cureus.31691
32. Rey-Cháves CE, Benitez E, Gutierrez-Infante F, Sabogal-Olarte JC. Hematoma subcapsular hepático post - CPRE: reporte de caso y revisión de la literatura. Rev Colomb Gastroenterol [Internet]. 2021 Apr 21;36(Supl 1):59-62. https://doi.org/10.22516/25007440.575
33. Imperatore N, Micheletto G, Manes G, Redaelli DG, Reitano E, de Nucci G. Systematic review: Features, diagnosis, management and prognosis of hepatic hematoma, a rare complication of ERCP. Dig Liver Dis [Internet]. 2018 Oct;50(10):997-1003. https://doi.org/10.1016/j.dld.2018.07.010
34. Alvarado-González A, Hernández-Cortés JT, Manilla-Orendain AÁ, Chávez-Ayala A, Lerma-Alvarado RM, Arteaga-Villalba LR, et al. Colangiopancreatografía retrógrada endoscópica intraoperatoria como opción segura y eficaz para tratamiento de coledocolitiasis. Rev Mex Cir Endos [Internet]. 2016;17(3):132-8. Available from: https://www.medigraphic.com/pdfs/endosco/ce-2016/ce163d.pdf
35. Finsterer J, Stöllberger C, Bastovansky A. Cardiac and cerebral air embolism from endoscopic retrograde cholangio-pancreatography. Eur J Gastroenterol Hepatol [Internet]. 2010 Oct;22(10):1157-62. https://doi.org/10.1097/MEG.0b013e32833c5459
36. Farnik H, Weigt J, Malfertheiner P, Grützmann A, Gossner L, Friedrich-Rust M, et al. A multicenter study on the role of direct retrograde cholangioscopy in patients with inconclusive endoscopic retrograde cholangiography. Endoscopy [Internet]. 2013 Dec 18;46(01):16-21. https://doi.org/10.1055/s-0033-1359043
37. Chavalitdhamrong D, Donepudi S, Pu L, Draganov PV. Uncommon and rarely reported adverse events of endoscopic retrograde cholangiopancreatography. Dig Endosc [Internet]. 2014 Jan 30;26(1):15-22. https://doi.org/10.1111/den.12178