

World Journal of *Clinical Cases*

World J Clin Cases 2021 July 6; 9(19): 4881-5351



OPINION REVIEW

- 4881** Fear of missing out: A brief overview of origin, theoretical underpinnings and relationship with mental health
Gupta M, Sharma A

REVIEW

- 4890** Molecular pathways in viral hepatitis-associated liver carcinogenesis: An update
Elpek GO
- 4918** Gastroenterology and liver disease during COVID-19 and in anticipation of post-COVID-19 era: Current practice and future directions
Oikonomou KG, Papamichalis P, Zafeiridis T, Xanthoudaki M, Papapostolou E, Valsamaki A, Bouliaris K, Papamichalis M, Karvouniaris M, Vlachostergios PJ, Skoura AL, Komnos A
- 4939** Enhancing oxygenation of patients with coronavirus disease 2019: Effects on immunity and other health-related conditions
Mohamed A, Alawna M

MINIREVIEWS

- 4959** Clinical potentials of ginseng polysaccharide for treating gestational diabetes mellitus
Zhao XY, Zhang F, Pan W, Yang YF, Jiang XY
- 4969** Remarkable gastrointestinal and liver manifestations of COVID-19: A clinical and radiologic overview
Fang LG, Zhou Q
- 4980** Liver injury in COVID-19: Known and unknown
Zhou F, Xia J, Yuan HX, Sun Y, Zhang Y
- 4990** COVID-19 and gastroenteric manifestations
Chen ZR, Liu J, Liao ZG, Zhou J, Peng HW, Gong F, Hu JF, Zhou Y
- 4998** Role of epithelial-mesenchymal transition in chemoresistance in pancreatic ductal adenocarcinoma
Hu X, Chen W
- 5007** Insights into the virologic and immunologic features of SARS-COV-2
Polat C, Ergunay K

ORIGINAL ARTICLE**Basic Study**

- 5019** SMAC exhibits anti-tumor effects in ECA109 cells by regulating expression of inhibitor of apoptosis protein family

Jiang N, Zhang WQ, Dong H, Hao YT, Zhang LM, Shan L, Yang XD, Peng CL

Case Control Study

- 5028** Efficacy of Solitaire AB stent-release angioplasty in acute middle cerebral artery atherosclerosis obliterative cerebral infarction

Wang XF, Wang M, Li G, Xu XY, Shen W, Liu J, Xiao SS, Zhou JH

Retrospective Study

- 5037** Diagnostic value of different color ultrasound diagnostic method in endometrial lesions

Lin XL, Zhang DS, Ju ZY, Li XM, Zhang YZ

- 5046** Clinical and pathological features and risk factors for primary breast cancer patients

Lei YY, Bai S, Chen QQ, Luo XJ, Li DM

- 5054** Outcomes of high-grade aneurysmal subarachnoid hemorrhage patients treated with coiling and ventricular intracranial pressure monitoring

Wen LL, Zhou XM, Lv SY, Shao J, Wang HD, Zhang X

- 5064** Microwave ablation combined with hepatectomy for treatment of neuroendocrine tumor liver metastases

Zhang JZ, Li S, Zhu WH, Zhang DF

- 5073** Clinical application of individualized total arterial coronary artery bypass grafting in coronary artery surgery

Chen WG, Wang BC, Jiang YR, Wang YY, Lou Y

Observational Study

- 5082** Early diagnosis, treatment, and outcomes of five patients with acute thallium poisoning

Wang TT, Wen B, Yu XN, Ji ZG, Sun YY, Li Y, Zhu SL, Cao YL, Wang M, Jian XD, Wang T

- 5092** Sarcopenia in geriatric patients from the plateau region of Qinghai-Tibet: A cross-sectional study

Pan SQ, Li YM, Li XF, Xiong R

- 5102** Medium-term efficacy of arthroscopic debridement *vs* conservative treatment for knee osteoarthritis of Kellgren-Lawrence grades I-III

Lv B, Huang K, Chen J, Wu ZY, Wang H

Prospective Study

- 5112** Impact of continuous positive airway pressure therapy for nonalcoholic fatty liver disease in patients with obstructive sleep apnea

Hirono H, Watanabe K, Hasegawa K, Kohno M, Terai S, Ohkoshi S

Randomized Controlled Trial

- 5126 Erector spinae plane block at lower thoracic level for analgesia in lumbar spine surgery: A randomized controlled trial
Zhang JJ, Zhang TJ, Qu ZY, Qiu Y, Hua Z

SYSTEMATIC REVIEWS

- 5135 Controversies' clarification regarding ribavirin efficacy in measles and coronaviruses: Comprehensive therapeutic approach strictly tailored to COVID-19 disease stages
Liatsos GD
- 5179 Systematic review and meta-analysis of trans-jugular intrahepatic portosystemic shunt for cirrhotic patients with portal vein thrombosis
Zhang JB, Chen J, Zhou J, Wang XM, Chen S, Chu JG, Liu P, Ye ZD

CASE REPORT

- 5191 Myelodysplastic syndrome transformed into B-lineage acute lymphoblastic leukemia: A case report
Zhu YJ, Ma XY, Hao YL, Guan Y
- 5197 Imaging presentation and postoperative recurrence of peliosis hepatis: A case report
Ren SX, Li PP, Shi HP, Chen JH, Deng ZP, Zhang XE
- 5203 Delayed retroperitoneal hemorrhage during extracorporeal membrane oxygenation in COVID-19 patients: A case report and literature review
Zhang JC, Li T
- 5211 Autologous tenon capsule packing to treat posterior exit wound of penetrating injury: A case report
Yi QY, Wang SS, Gui Q, Chen LS, Li WD
- 5217 Treatment of leiomyomatosis peritonealis disseminata with goserelin acetate: A case report and review of the literature
Yang JW, Hua Y, Xu H, He L, Huo HZ, Zhu CF
- 5226 Homozygous deletion, c. 1114-1116del, in exon 8 of the *CRPPA* gene causes congenital muscular dystrophy in Chinese family: A case report
Yang M, Xing RX
- 5232 Successful diagnosis and treatment of jejunal diverticular haemorrhage by full-thickness enterotomy: A case report
Ma HC, Xiao H, Qu H, Wang ZJ
- 5238 Liver metastasis as the initial clinical manifestation of sublingual gland adenoid cystic carcinoma: A case report
Li XH, Zhang YT, Feng H
- 5245 Severe hyperbilirubinemia in a neonate with hereditary spherocytosis due to a *de novo* ankyrin mutation: A case report
Wang JF, Ma L, Gong XH, Cai C, Sun JJ

- 5252** Long-term outcome of indwelling colon observed seven years after radical resection for rectosigmoid cancer: A case report
Zhuang ZX, Wei MT, Yang XY, Zhang Y, Zhuang W, Wang ZQ
- 5259** Diffuse xanthoma in early esophageal cancer: A case report
Yang XY, Fu KI, Chen YP, Chen ZW, Ding J
- 5266** COVID-19 or treatment associated immunosuppression may trigger hepatitis B virus reactivation: A case report
Wu YF, Yu WJ, Jiang YH, Chen Y, Zhang B, Zhen RB, Zhang JT, Wang YP, Li Q, Xu F, Shi YJ, Li XP
- 5270** Maintenance treatment with infliximab for ulcerative ileitis after intestinal transplantation: A case report
Fujimura T, Yamada Y, Umeyama T, Kudo Y, Kanamori H, Mori T, Shimizu T, Kato M, Kawaida M, Hosoe N, Hasegawa Y, Matsubara K, Shimojima N, Shinoda M, Obara H, Naganuma M, Kitagawa Y, Hoshino K, Kuroda T
- 5280** Infliximab treatment of glycogenosis Ib with Crohn's-like enterocolitis: A case report
Gong YZ, Zhong XM, Zou JZ
- 5287** Hemichorea due to ipsilateral thalamic infarction: A case report
Li ZS, Fang JJ, Xiang XH, Zhao GH
- 5294** Intestinal gangrene secondary to congenital transmesenteric hernia in a child misdiagnosed with gastrointestinal bleeding: A case report
Zheng XX, Wang KP, Xiang CM, Jin C, Zhu PF, Jiang T, Li SH, Lin YZ
- 5302** Collagen VI-related myopathy with scoliosis alone: A case report and literature review
Li JY, Liu SZ, Zheng DF, Zhang YS, Yu M
- 5313** Neuromuscular electrical stimulation for a dysphagic stroke patient with cardiac pacemaker using magnet mode change: A case report
Kim M, Park JK, Lee JY, Kim MJ
- 5319** Four-year-old anti-N-methyl-D-aspartate receptor encephalitis patient with ovarian teratoma: A case report
Xue CY, Dong H, Yang HX, Jiang YW, Yin L
- 5325** Glutamic acid decarboxylase 65-positive autoimmune encephalitis presenting with gelastic seizure, responsive to steroid: A case report
Yang CY, Tsai ST
- 5332** Ectopic opening of the common bile duct into the duodenal bulb with recurrent choledocholithiasis: A case report
Xu H, Li X, Zhu KX, Zhou WC
- 5339** Small bowel obstruction caused by secondary jejunal tumor from renal cell carcinoma: A case report
Bai GC, Mi Y, Song Y, Hao JR, He ZS, Jin J
- 5345** Brugada syndrome associated with out-of-hospital cardiac arrest: A case report
Ni GH, Jiang H, Men L, Wei YY, A D, Ma X

ABOUT COVER

Editorial Board Member of *World Journal of Clinical Cases*, Fan-Bo Meng, MD, PhD, Chief Doctor, Deputy Director, Professor, Department of Cardiology, China-Japan Union Hospital of Jilin University, Changchun 130000, Jilin Province, China. mengfb@jlu.edu.cn

AIMS AND SCOPE

The primary aim of *World Journal of Clinical Cases (WJCC, World J Clin Cases)* is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

INDEXING/ABSTRACTING

The *WJCC* is now indexed in Science Citation Index Expanded (also known as SciSearch®), Journal Citation Reports/Science Edition, Scopus, PubMed, and PubMed Central. The 2020 Edition of Journal Citation Reports® cites the 2019 impact factor (IF) for *WJCC* as 1.013; IF without journal self cites: 0.991; Ranking: 120 among 165 journals in medicine, general and internal; and Quartile category: Q3. The *WJCC*'s CiteScore for 2019 is 0.3 and Scopus CiteScore rank 2019: General Medicine is 394/529.

RESPONSIBLE EDITORS FOR THIS ISSUE

Production Editor: Yan-Xia Xing, Production Department Director: Yun-Xiaoqian Wu, Editorial Office Director: Jin-Lai Wang.

NAME OF JOURNAL

World Journal of Clinical Cases

ISSN

ISSN 2307-8960 (online)

LAUNCH DATE

April 16, 2013

FREQUENCY

Thrice Monthly

EDITORS-IN-CHIEF

Dennis A Bloomfield, Sandro Vento, Bao-Gan Peng

EDITORIAL BOARD MEMBERS

<https://www.wjgnet.com/2307-8960/editorialboard.htm>

PUBLICATION DATE

July 6, 2021

COPYRIGHT

© 2021 Baishideng Publishing Group Inc

INSTRUCTIONS TO AUTHORS

<https://www.wjgnet.com/bpg/gerinfo/204>

GUIDELINES FOR ETHICS DOCUMENTS

<https://www.wjgnet.com/bpg/GerInfo/287>

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH

<https://www.wjgnet.com/bpg/gerinfo/240>

PUBLICATION ETHICS

<https://www.wjgnet.com/bpg/GerInfo/288>

PUBLICATION MISCONDUCT

<https://www.wjgnet.com/bpg/gerinfo/208>

ARTICLE PROCESSING CHARGE

<https://www.wjgnet.com/bpg/gerinfo/242>

STEPS FOR SUBMITTING MANUSCRIPTS

<https://www.wjgnet.com/bpg/GerInfo/239>

ONLINE SUBMISSION

<https://www.f6publishing.com>

Ectopic opening of the common bile duct into the duodenal bulb with recurrent choledocholithiasis: A case report

Hao Xu, Xin Li, Ke-Xiang Zhu, Wen-Ce Zhou

ORCID number: Hao Xu 0000-0001-6459-1063; Xin Li 0000-0002-8898-9938; Ke-Xiang Zhu 0000-0003-4272-5221; Wen-Ce Zhou 0000-0002-0529-7777.

Author contributions: Xu H wrote the manuscript and acquired patient information; Li X and Zhu KX performed the literature review and follow-up; Zhou WC revised the manuscript; all authors have read and approved the final manuscript.

Supported by The Key Research and Development Program of Gansu, No. 17YF1FA128; and Lanzhou Science and Technology Bureau Innovation and Entrepreneurship Talent Program, No. 2017-RC-37.

Informed consent statement: Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Conflict-of-interest statement: The authors declare that they have no conflict of interest.

CARE Checklist (2016) statement: The authors have read the CARE Checklist (2016), and the manuscript was prepared and revised according to the CARE Checklist (2016).

Hao Xu, Ke-Xiang Zhu, Wen-Ce Zhou, The Fourth Department of General Surgery, The First Hospital of Lanzhou University, Lanzhou 730000, Gansu Province, China

Xin Li, The First Clinical Medical School of Lanzhou University, Lanzhou University, Lanzhou 730000, Gansu Province, China

Corresponding author: Wen-Ce Zhou, MD, PhD, Professor, Surgeon, The Fourth Department of General Surgery, The First Hospital of Lanzhou University, Donggang West Road No. 1 Lanzhou 730000, Gansu Province, China. zhouwc129@163.com

Abstract

BACKGROUND

Ectopic opening of the common bile duct is a condition with low incidence. Patients with an ectopic common bile duct opening have a high incidence of common bile duct stones and acute cholangitis. Patients with atypical symptoms and imaging findings are easily misdiagnosed; moreover, it is difficult to retrieve stones by endoscopic retrograde cholangiopancreatography, and common bile duct stones are prone to postsurgical recurrence.

CASE SUMMARY

A 45-year-old male patient presented with "intermittent upper abdominal pain and elevated liver enzymes for 1 wk". Transabdominal ultrasound indicated dilation of the common bile duct and the presence of stones. Magnetic resonance imaging showed that the common bile duct was dilated with stones and that its opening was ectopic. Endoscopic retrograde cholangiopancreatography revealed an abnormal opening of the common bile duct into the duodenal bulb and the presence of common bile duct stones. Laparoscopic extrahepatic choledochectomy and hepatoenteric anastomosis were performed. After surgery, the patient recovered well and was discharged. The patient has been followed up for 2 years since the operation. He has not experienced stone recurrence, and his liver function and quality of life are good.

CONCLUSION

Improved understanding of ectopic opening of the common bile duct is needed for clinicians to provide patients with appropriate treatment.

Key Words: Ectopic opening of the common bile duct; Choledocholithiasis; Cholangiojejunostomy; Treatment; Laparoscopic surgery; Case report

Open-Access: This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

Manuscript source: Unsolicited manuscript

Specialty type: Medicine, research and experimental

Country/Territory of origin: China

Peer-review report's scientific quality classification

Grade A (Excellent): 0
Grade B (Very good): 0
Grade C (Good): C, C, C
Grade D (Fair): 0
Grade E (Poor): E

Received: February 28, 2021

Peer-review started: February 28, 2021

First decision: April 14, 2021

Revised: April 22, 2021

Accepted: May 20, 2021

Article in press: May 20, 2021

Published online: July 6, 2021

P-Reviewer: Cocca S, Contini S, Karakus OZ, Villarejo-Campos P

S-Editor: Ma YJ

L-Editor: Filipodia

P-Editor: Yuan YY



©The Author(s) 2021. Published by Baishideng Publishing Group Inc. All rights reserved.

Core Tip: Ectopic opening of the common bile duct into the duodenal bulb is very rare. Patients with an ectopic common bile duct opening have a high incidence of common bile duct stones and acute cholangitis. Furthermore, patients with atypical symptoms and imaging findings are easily misdiagnosed. This report describes a case of ectopic opening of the common bile duct into the duodenal bulb with recurrent choledocholithiasis. This report is expected to provide experience for the diagnosis and treatment of this condition by describing the clinical data of this patient with an ectopic opening of the common bile duct into the duodenal bulb.

Citation: Xu H, Li X, Zhu KX, Zhou WC. Ectopic opening of the common bile duct into the duodenal bulb with recurrent choledocholithiasis: A case report. *World J Clin Cases* 2021; 9(19): 5332-5338

URL: <https://www.wjgnet.com/2307-8960/full/v9/i19/5332.htm>

DOI: <https://dx.doi.org/10.12998/wjcc.v9.i19.5332>

INTRODUCTION

The ends of the normal pancreatic duct and the common bile duct open together through the duodenal papilla into the dorsal medial wall of the middle descending part of the duodenum, and an opening into the middle portion of the nondescending segment is considered an ectopic opening. Studies have shown that the incidence of ectopic bile duct opening is 2%-23%, including openings into the stomach, pyloric duct, and duodenum; openings into the duodenum are more common in the lower corner or horizontal part of the duodenum. An opening in the duodenal bulb is a very rare location[1-6]. Due to the lack of specificity of the clinical manifestations of ectopic opening of the common bile duct into the duodenal bulb, lack of understanding by clinicians, and drawbacks of imaging examinations such as computed tomography, missed diagnosis or misdiagnosis of ectopic opening of the common bile duct often occurs[3,4]. Cases of ectopic opening of the common bile duct into the duodenal bulb are often found incidentally when patients undergo endoscopic retrograde cholangiopancreatography (ERCP) due to common bile duct stones or stenosis of the end of the common bile duct[2-6]. Here, we report a case of ectopic opening of the common bile duct into the duodenal bulb with recurrent choledocholithiasis. This report is expected to provide experience for the diagnosis and treatment of this disease through the clinical data of a patient with ectopic opening of the common bile duct into the duodenal bulb. The patient provided informed consent for publication of this case.

CASE PRESENTATION

Chief complaints

A 45-year-old man was admitted to the hospital with a chief complaint of intermittent upper abdominal pain and elevated liver enzymes for 1 wk.

History of present illness

Four years prior, the patient underwent cholecystectomy along with common bile duct exploration and stone removal at a local hospital for the treatment of gallbladder stones and common bile duct stones. One week prior, the patient had intermittent upper abdominal pain and discomfort. The local hospital found abnormal liver enzyme levels.

History of past illness

The patient denied a previous history of diseases such as hypertension or diabetes.

Personal and family history

The patient denied a history of smoking, tuberculosis, or alcohol or drug use. No

family members had similar diseases.

Physical examination

There was no overall yellowing of the skin and sclera. Mild tenderness was observed on deep palpation of the right upper abdomen. There was no rebound pain or muscle tension throughout the abdomen.

Laboratory examinations

Laboratory examinations conducted after this admission showed the following: Alanine aminotransferase: 543 IU/L (normal: < 49 IU/L); aspartate aminotransferase: 213 IU/L (normal: < 49 IU/L); alkaline phosphatase: 194.9 IU/L (normal: < 125 IU/L); gamma glutamyl transpeptidase: 511.6 IU/L (normal: < 69 IU/L); direct bilirubin: 7.1 $\mu\text{mol/L}$ (normal: < 6.8 $\mu\text{mol/L}$); indirect bilirubin: 19.3 $\mu\text{mol/L}$ (normal: < 19 $\mu\text{mol/L}$); and carbohydrate antigen 19-9: 42.4 U/mL (normal: < 27 U/mL). Other laboratory tests were normal.

Imaging examinations

Transabdominal ultrasound indicated dilation of the common bile duct and the presence of stones. Magnetic resonance imaging showed that the common bile duct was dilated with stones, was severely angled, and did not merge normally with the pancreatic duct (Figure 1). ERCP revealed an abnormal opening of the common bile duct into the duodenal bulb and the presence of common bile duct stones (Figure 2).

FINAL DIAGNOSIS

Following the imaging and laboratory examinations, the diagnoses were common bile duct stones along with ectopic opening of the common bile duct and acute cholangitis.

TREATMENT

Considering the patient's repeated episodes of common bile duct stones along with the ectopic opening of the common bile duct, recurrent abdominal pain and acute cholangitis, the common bile duct stones could not be completely resolved with ERCP. After communicating with the patient and family members, laparoscopic extrahepatic common bile duct resection and hepatoenteric anastomosis were performed (Figure 3).

OUTCOME AND FOLLOW-UP

After the operation, the patient recovered well and was discharged. The patient has been followed up for 2 years since the operation. He has not experienced stone recurrence, and his liver function and quality of life are good.

DISCUSSION

An ectopic opening of the common bile duct is more commonly located in the distal end of the descending duodenum and is rarely present in the duodenal bulb. The duodenal papilla is mostly located in the middle 1/3 of the descending segment of the duodenum (accounting for approximately 66% of cases), with 27% of cases in the lower 1/3 of the descending segment, and approximately 3% of cases in the upper 1/3 of the descending segment. Only 4% of cases are near the horizontal segment of the duodenum[7]. Sezgin *et al*[3] reported 11 cases of ectopic opening, of which 3 cases opened into the third segment of the duodenum. There is no consensus on the cause of ectopic opening of the common bile duct. Li *et al*[8] proposed that an ectopic distal hepatic diverticulum in the early embryonic stage can lead to abnormal fusion.

The clinical manifestations of an ectopic common bile duct opening are nonspecific and easily missed[8]. In recent years, magnetic resonance cholangiopancreatography has been used to identify a portion of the duodenal papilla and abnormal bile duct confluence. The advantages of this technique are noninvasiveness, a simple and safe operation, the absence of complications, and lack of pain in patients. It is not necessary



Figure 1 Endoscopic retrograde cholangiopancreatography images. A: The ectopic opening of the common bile duct into the duodenal bulb (white arrow); B: Injection of contrast medium through the ectopic opening of the common bile duct with acute angulation (orange arrow); C: Indwelling nasal bile duct after endoscopic treatment (orange arrow).

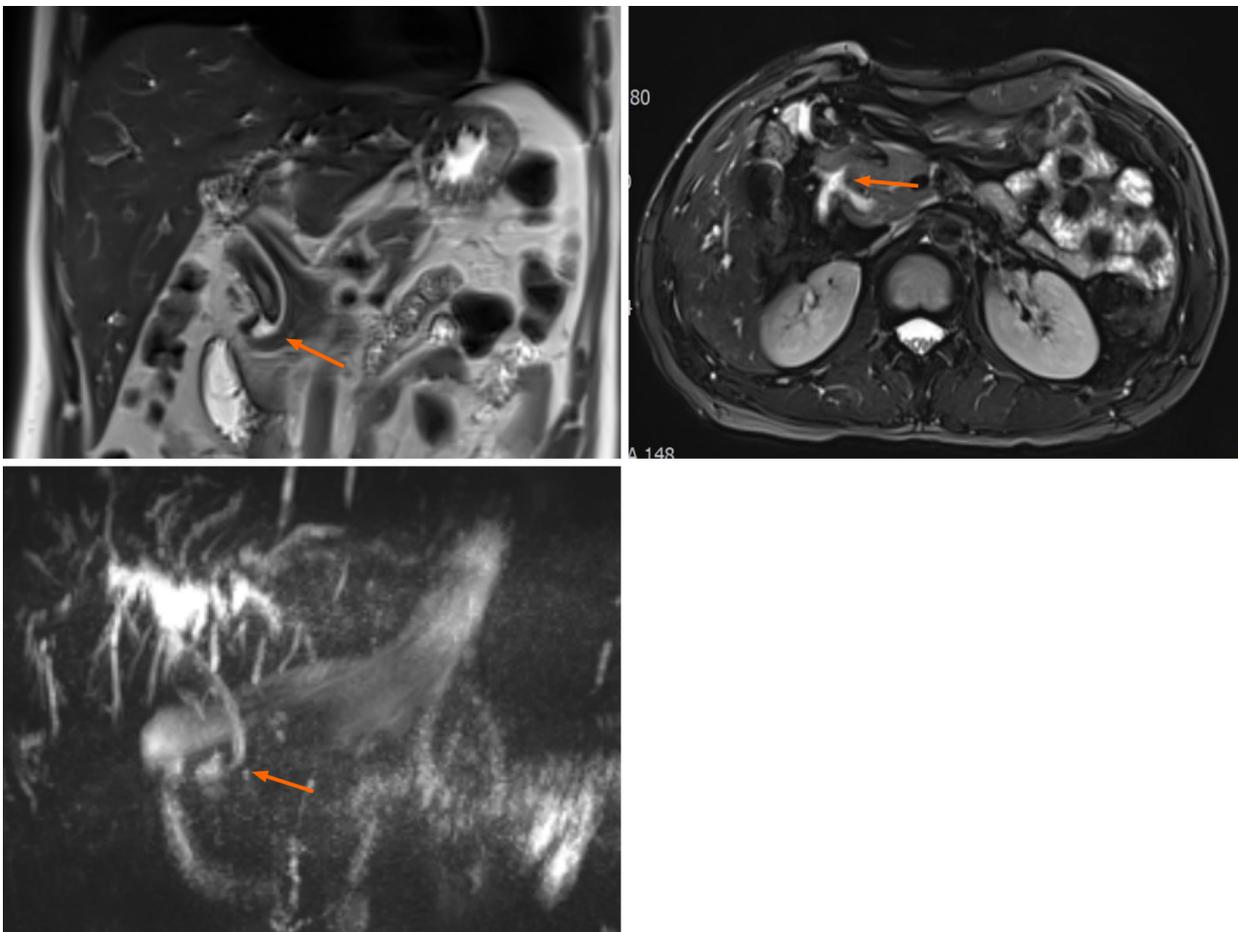


Figure 2 Magnetic resonance imaging findings. Magnetic resonance imaging showed a hook-shaped change at the lower end of the common bile duct, which merged into the lower posterior wall of the duodenal bulb. The orange arrow shows the hook shape.

to use contrast agents, but cases of missed diagnoses and misdiagnoses can occur. Ordinary gastroscopy, especially duodenoscopy, carefully conducted under endoscopy and negative pressure suction applied to observe the bile outflow can confirm the location of the duodenal papilla[9]. If the nipple in the middle of the descending part of the duodenum cannot be located, the possibility of a near ectopic opening should be considered, and exploration should be continued deep into the horizontal section. If the nipple opening is still not located, the lens should be slowly withdrawn to the duodenal bulb while searching. ERCP is the gold standard for the diagnosis of ectopic

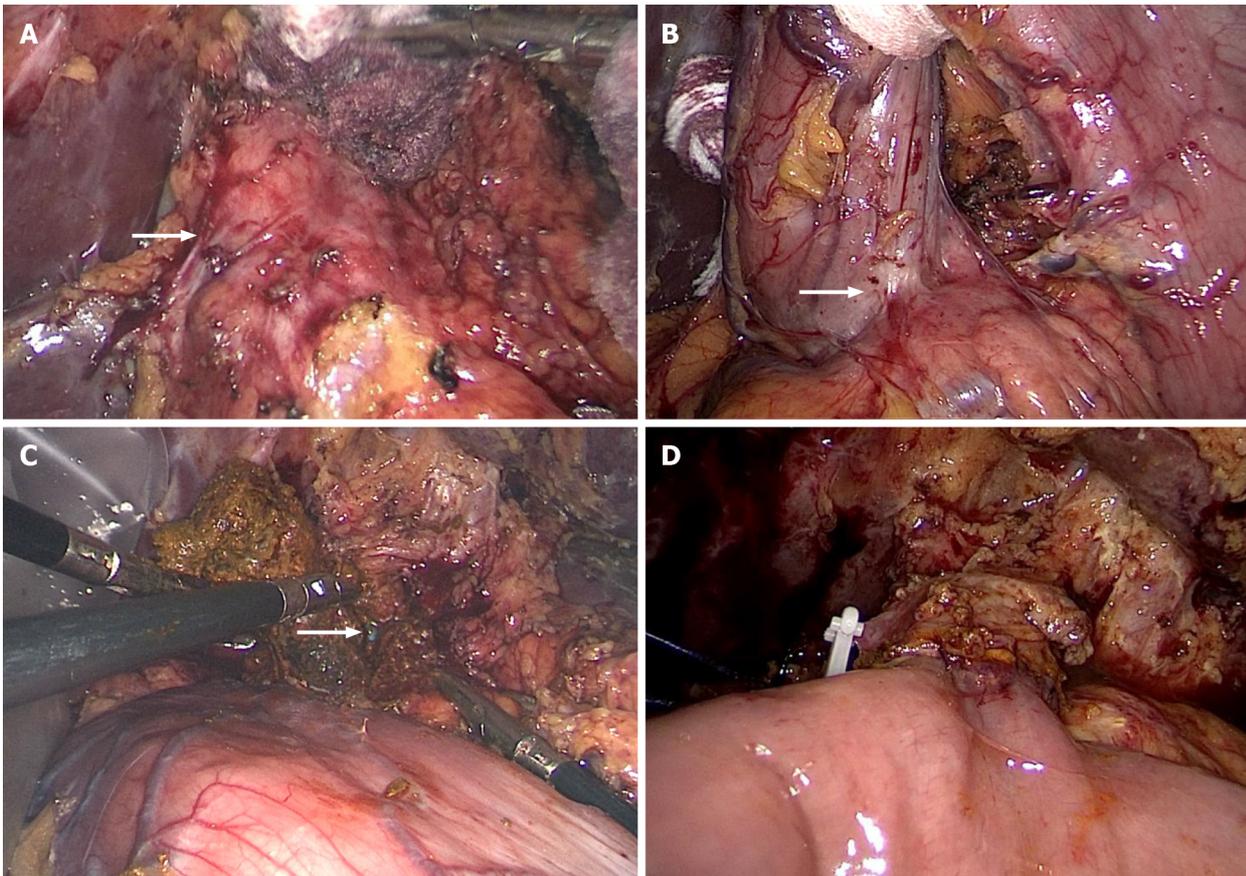


Figure 3 Surgical procedure. A: Dissection of the extrahepatic bile duct (white arrow); B: Superficial common bile duct under the pylorus, which exhibited an ectopic opening into the duodenal bulb (white arrow); C: After incising the common bile duct and removing the stone, the nasal bile duct in the common bile duct was visible (white arrow); D: Excision of the extrahepatic bile duct and complete cholangiojejunostomy.

opening of the common bile duct[10-12]. However, ERCP is not ideal for diagnosing cases of ectopic opening into the third segment of the duodenum.

ERCP treatment can be attempted for patients with an ectopic common bile duct opening and common bile duct stones. However, when the ectopic opening is in the duodenal bulb, local deformation and stenosis often occur, which are prone to cause bleeding and perforation. In addition, when ERCP examination or Oddi sphincterotomy is performed, because the opening is located at the level of the duodenum, it is difficult to locate the large papilla of the duodenum and perform intubation, which leads to failure of the operation[13,14].

At present, the problem of recurrent common bile duct stones after surgery has not been resolved. The recurrence of stones seriously affects the quality of life of patients, and elderly individuals experience more harm due to physical frailty and weakened immunity[15]. Some scholars[16] have shown that a common bile duct diameter ≥ 15 mm is a risk factor for stone recurrence after endoscopic stone removal. Bile duct dilatation can promote cholestasis and bacterial infection, which are potential risk factors for the recurrence of stones[15-17]. If chronic inflammation and fibrosis of the bile duct are present, the elasticity of the tube wall is lost, and even if the stone is removed, bile duct dilation will continue to exist. Bile duct stenosis can directly lead to cholestasis and easily formed stones. Under normal circumstances, the extrahepatic bile duct is only slightly curved and is similar to a straight line. Factors such as a history of biliary surgery can cause the bile duct to bend or even form an angle. An angle in the common bile duct can cause cholestasis and bile duct dilation. A smaller angle results in slower flow of bile, a longer bile-emptying time, and a higher concentration of bile. This in turn increases the cholesterol saturation in the bile, and the contraction of the bile duct decreases, making it impossible to exclude supersaturated bile, which easily causes stone recurrence[17-19]. Ectopic opening of the common bile duct will change the angulation of the common bile duct, which will increase the recurrence rate of bile duct stones and the incidence of acute cholangitis after surgery [20-22]. If the bile duct path is too long or too short and bile duct confluence abnormalities or congenital bile duct cysts are present, altered angulation of the bile

duct may be related to a combined functional abnormality of the sphincter of Oddi.

Due to the existence of the duodenal papillary sphincter and the relative negative pressure in the duodenal cavity, it is difficult for digestive juice to flow back into the common bile duct under normal circumstances, and thus, the incidence of common bile duct stones and cholangitis is very low. In patients with an ectopic common bile duct, due to the lack of sphincter function and absence of negative pressure in the cavity, especially in the case of ectopic opening of the common bile duct into the duodenal bulb or near the gastric pylorus, high pressure in the stomach after eating can cause digestive juice and food residue to easily flow back into the common bile duct. This can cause recurrent cholangitis and the recurrence of common bile duct stones, resulting in uncomfortable symptoms. In the present case, cholangitis and common bile duct stones recurred. Laboratory tests showed abnormal liver enzyme and bilirubin levels. During ERCP, the common bile duct was incidentally found to have an ectopic opening into the duodenal bulb. The patient had undergone cholecystectomy and common bile duct exploration in the past, and common bile duct stones and acute cholangitis occurred again 4 years later, which was considered. In view of the anatomical variation associated with this condition, the fundamental solution is to perform extrahepatic bile duct resection and cholangioenterostomy to eliminate the structural basis of common bile duct stones.

CONCLUSION

Ectopic opening of the common bile duct is relatively rare in clinical practice; clinicians have insufficient experience in diagnosing and treating this anomaly, and it is easy to miss or misdiagnose. Therefore, it is necessary to raise awareness of this condition in clinical work. At the same time, for patients with difficult stone retrieval by ERCP, postoperative stone recurrence and recurrence of acute cholangitis, attention should be given to etiological treatment, such as controlling biliary tract infection, improving biliary motility, and removing biliary obstruction while removing stones. Treating both symptoms and root causes can effectively solve the problem of recurrence of stones after surgery.

ACKNOWLEDGEMENTS

We sincerely thank the ERCP Diagnosis and Treatment Center and the Department of Radiology in our hospital for providing information.

REFERENCES

- 1 Peng YC, Chow WK. Ectopic papilla of Vater in duodenum bulb: A hospital-based study. *Medicine (Baltimore)* 2019; **98**: e14642 [PMID: 30813203 DOI: 10.1097/MD.00000000000014642]
- 2 Disibeyaz S, Parlak E, Cicek B, Cengiz C, Kuran SO, Oguz D, Güzel H, Sahin B. Anomalous opening of the common bile duct into the duodenal bulb: endoscopic treatment. *BMC Gastroenterol* 2007; **7**: 26 [PMID: 17610747 DOI: 10.1186/1471-230x-7-26]
- 3 Sezgin O, Altıntaş E, Uçbilek E. Ectopic opening of the common bile duct into various sites of the upper digestive tract: a case series. *Gastrointest Endosc* 2010; **72**: 198-203 [PMID: 20493479 DOI: 10.1016/j.gie.2010.02.012]
- 4 Saritas U, Senol A, Ustundag Y. The clinical presentations of ectopic biliary drainage into duodenal bulb and stomach with a thorough review of the current literature. *BMC Gastroenterol* 2010; **10**: 2 [PMID: 20064279 DOI: 10.1186/1471-230X-10-2]
- 5 Parlak E, Dişibeyaz S, Cengiz C, Çiçek B, Ozin Y, Kacar S, Saşmaz N, Sahin B. Ectopic opening of the common bile duct and duodenal stenosis: an overlooked association. *BMC Gastroenterol* 2010; **10**: 142 [PMID: 21129223 DOI: 10.1186/1471-230X-10-142]
- 6 Hekimoğlu K, Ustundag Y, Saritas U. Ectopic openings of the bilio-pancreatic ducts in the stomach in an elderly case presenting with choledocholithiasis and acute cholangitis. *J Gastrointest Liver Dis* 2008; **17**: 238-239 [PMID: 18568154 DOI: 10.1007/s11749-008-0116-8]
- 7 Han X, Li Z, Zhang W. The relative analysis between duodenal papilla ectope and pancreaticobiliary maljunction. *Linchuang Fangshexue Zazhi* 2008; **27**: 1050-1052
- 8 Li L, Yamataka A, Wang YX, Wang DY, Wang K, Li ZX, Shimizu T, Yamashiro Y, Zhang JZ, Lane GJ, Miyano T. Anomalous pancreatic duct anatomy, ectopic distal location of the papilla of Vater and congenital biliary dilatation: a new developmental triad? *Pediatr Surg Int* 2003; **19**: 180-185 [PMID: 12698266 DOI: 10.1007/s00383-002-0914-0]

- 9 **Lu QL**, Lin F, Duan HQ, Liu H. Clinical effects of endoscopic retrograde cholangiopancreatography on the treatment of acute biliary pancreatitis. *Xiandai Yiyuan Zazhi* 2014; **14**: 90-92
- 10 **Amano Y**, Takahashi M, Oishi T, Kumazaki T. MR cholangiopancreatography of double common bile duct with ectopic drainage into stomach. *J Comput Assist Tomogr* 2002; **26**: 141-142 [PMID: 11801920 DOI: 10.1097/00004728-200201000-00024]
- 11 **Krstic M**, Stimec B, Krstic R, Ugljesic M, Knezevic S, Jovanovic I. EUS diagnosis of ectopic opening of the common bile duct in the duodenal bulb: a case report. *World J Gastroenterol* 2005; **11**: 5068-5071 [PMID: 16124069 DOI: 10.3748/wjg.v11.i32.5068]
- 12 **Muhammedoglu B**. Ectopic Opening of the Common Bile Duct into the Duodenal Bulb: Diagnosis and Therapeutic Management and Considerations for Timing of Surgery and Duration of Follow-up After Initial Endoscopic Retrograde Cholangiopancreatography. *Surg Laparosc Endosc Percutan Tech* 2019; **29**: 399-404 [PMID: 31246750 DOI: 10.1097/SLE.0000000000000695]
- 13 **Takikawa T**, Kanno A, Masamune A, Hongo S, Yoshida N, Nakano E, Miura S, Hamada S, Kume K, Kikuta K, Hirota M, Shimosegawa T. Ectopic Opening of the Common Bile Duct Accompanied by Choledochoceles and Pancreas Divisum. *Intern Med* 2016; **55**: 1097-1102 [PMID: 27150861 DOI: 10.2169/internalmedicine.55.6240]
- 14 **Hong J**, Pan W, Zuo W, Wang A, Zhu L, Zhou X, Li G, Liu Z, Liu P, Zhen H, Zhu Y, Ma J, Yuan J, Shu X, Lu N, Chen Y. Efficacy and safety of therapeutic ERCP in patients with ectopic papilla of Vater. *Medicine (Baltimore)* 2020; **99**: e18536 [PMID: 31895789 DOI: 10.1097/MD.00000000000018536]
- 15 **Cheon YK**, Lehman GA. Identification of risk factors for stone recurrence after endoscopic treatment of bile duct stones. *Eur J Gastroenterol Hepatol* 2006; **18**: 461-464 [PMID: 16607138 DOI: 10.1097/00042737-200605000-00001]
- 16 **Song ME**, Chung MJ, Lee DJ, Oh TG, Park JY, Bang S, Park SW, Song SY, Chung JB. Cholecystectomy for Prevention of Recurrence after Endoscopic Clearance of Bile Duct Stones in Korea. *Yonsei Med J* 2016; **57**: 132-137 [PMID: 26632393 DOI: 10.3349/ymj.2016.57.1.132]
- 17 **Seo DB**, Bang BW, Jeong S, Lee DH, Park SG, Jeon YS, Lee JI, Lee JW. Does the bile duct angulation affect recurrence of choledocholithiasis? *World J Gastroenterol* 2011; **17**: 4118-4123 [PMID: 22039327 DOI: 10.3748/wjg.v17.i36.4118]
- 18 **Wu LY**, Wang SH, Jia GF, Zhu LS, Ling MD, Wang XX, Shan H. Risk factors for recurrent common bile duct stones after endoscopic sphincterotomy. *Zhonghua Xiaohuabing Yu Yingxiang Zazhi* 2015; **5**: 5-9
- 19 **Strnad P**, von Figura G, Gruss R, Jareis KM, Stiehl A, Kulaksiz H. Oblique bile duct predisposes to the recurrence of bile duct stones. *PLoS One* 2013; **8**: e54601 [PMID: 23365676 DOI: 10.1371/journal.pone.0054601]
- 20 **Zeng AX**, Liu BY, Zeng DH. Relationship between duodenal papilla ectopic and recurrent bile duct stones postoperative. *Xiandai Yiyuan Zazhi* 2015; 32-33
- 21 **Lee SS**, Kim MH, Lee SK, Kim KP, Kim HJ, Bae JS, Seo DW, Ha HK, Kim JS, Kim CD, Chung JP, Min YI. Ectopic opening of the common bile duct in the duodenal bulb: clinical implications. *Gastrointest Endosc* 2003; **57**: 679-682 [PMID: 12709696 DOI: 10.1067/mge.2003.210]
- 22 **Taş A**, Kara B, Ölmez S, Yalçın MS, Öztürk NA, Saritas B. Retrospective analysis of cases with an ectopic opening of the common bile duct into duodenal bulb. *Adv Clin Exp Med* 2018; **27**: 1361-1364 [PMID: 30062869 DOI: 10.17219/acem/69691]



Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-3991568
E-mail: bpgoffice@wjgnet.com
Help Desk: <https://www.f6publishing.com/helpdesk>
<https://www.wjgnet.com>

