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CONTENTS

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Editorial

Laparoscopic Sleeve Gastrectomy for the Surgical Treatment of Obesity: Is It an Easy Procedure?

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Laparoscopic sleeve gastrectomy (LSG) is currently the most performed bariatric procedure in the world. The 4th International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) Global registry report (2014-18) estimates 87,015 procedures, equal to 45.9% of all bariatric procedures. Initially performed as the first step of the duodenals witch (biliopancreatic diversion with duodenal switch (BPD-DS)), a very complex malabsorptive procedure invented by a Canadian Surgeon P. Marceau as an evolution of the BPD, invented by N. Scopinaro, an Italian surgeon, LSG established itself in the early 2000s as a stand alone procedure, especially following the observations of Michael Gagner, pioneer of bariatric surgery. Over the years LSG has grown rapidly. The reasons for this popularity are the relative technical simplicity compared to other procedures, efficacy, good quality. For these reasons there has been a real explosion of bariatric surgery: many surgeons, driven by the relative simplicity of the procedure (longitudinal gastrectomy on the guide of a probe), begun to propose this procedure. So is LSG really an effective simple procedure that is good for all patients? Absolutely not. Performing a longitudinal gastrectomy can be simple; performing a good LSG is not. The execution of an ideal LSG is essentially determined by three factors:

Adequate Background in Bariatric Surgery

Laparoscopic sleeve gastrectomy (LSG) is certainly an effective intervention, but not all obese patients can be treated with this procedure. For about two years there have been more and more reports of increased incidence of Barrett's esophagus in operated patients, and of de novo gastroesophageal reflux disease (GERD). This is probably determined by an inaccurate selection of the patient: the correlation between syntopathology and gastroscopy signs during the pre-operative study and the worsening of symptoms after surgery is now certain A surgeon must therefore have multiple treatment solutions to be able to define himself a bariatric surgeon

Adequate Training to Minimizes the Risk of Complications

Leak coming from the "new" stomach is a dramatic event, with a high risk of mortality. It is now well documented that early leaks depend mostly on surgical technique errors.

Starting from this analysis it is essential that anyone who wants to perform LSG safely must know what is the correct indication, how to correctly perform it, how to minimize the risk of complications.

In the era of Coronavirus disease 2019 (COVID-19), the use of the webinar is even more a safe and effective means to explore topics like the one we talked about.

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Case Report

Idiopathic Primary Retroperitoneal Cyst: A Case Report

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ABSTRACT

Retroperitoneal cysts are rare; they are divided into neoplastic and non-neoplastic cyst. Incidences are 1 in 5750 to 1 in 250,000. They are often asymptomatic. Lymphangioma are benign cyst whereas 95% of them are found in the neck and axilla only 1% is in the abdomen. This is a case report describing the course of management for a 30-year-old male who presented to our outpatient clinic with abdominal discomfort due to retroperitoneal cyst.

Keywords
Retroperitoneal Cyst; Ultrasound; Histopathology.

INTRODUCTION

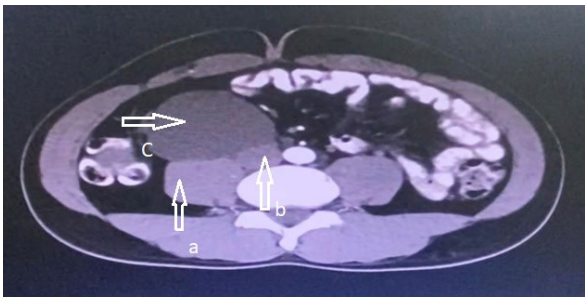
A retroperitoneal cyst is uncommon, most of the time they are discovered incidentally. Incidences are 1 in 5750 to 1 in 250,000,[1] they can be divided into benign or neoplastic cysts. Approximately, one third of patients are asymptomatic, and they are routinely discovered during a regular abdominal examination, sonography, or other imaging such as computer tomography scan (CT-scan) and magnetic resonance imaging (MRI).[2] However, sometimes they grow into considerable sizes causing pressure symptoms. An idiopathic retroperitoneal cyst may originate from kidneys, ureters, pancreas, muscles, lymphatic's, and meso-colic.[3] This is a case report describing the course of management in 30-year-old male presented with abdominal discomfort due to retroperitoneal cyst to our outpatient department.

CASE PRESENTATION

A 30-years-old male presented to surgical outpatient department, complaining of 3-months history of abdominal heaviness and discomfort. He had no previous medical or surgical history. He had normal appetite, with no weight loss nor abdominal symptoms. Upon examination vitally stable P. 78 bpm, BP 130/80 mmHg, Temperature 37.0 °C. Abdominal examination showed fullness at the right Iliac Fossa with mild tenderness.

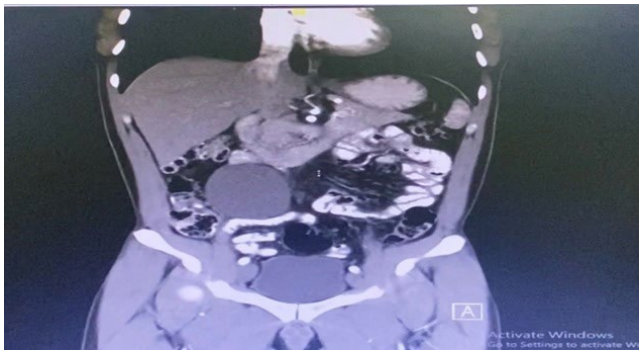
Ultrasound was done showed a 2 cm retroperitoneal mass at the right iliac fossa; thus, a CT-scan was ordered to evaluate the nature of the ultrasound finding. CT-scans showed ovoid cystic lesion located mainly at the right lumbar region, it was anterior to the distal inferior vena cava (IVC), adherent to the ascending colon and right psoas muscle (Figure 1), it exerts a mass effect on the surrounding structures and stretching of the blood vessels without local invasion (Figure 2), it measures about 5.6×6.1×7 cm. Impression a benign retroperitoneal cystic lesion.

Figure 1. *Transverse View CT-Abdomen with IV and Oral Contrast, Showing the Location of the Cyst Near*



a. Right psoas muscle. b. Inferior vena cava. c. Retroperitoneal cyst.

Figure 2. *Coronal View of the Retroperitoneal Cyst, Stretching the Ascending Colon and Vessels*



Pre-Operative Evaluation

He was admitted for an elective surgery, the appropriate investigations were order and pre-operative antibiotics were administered for the patient.

Intra-Operative

A mid-line incision was done. The retroperitoneal mass was obvious at right iliac fossa region, with right ureter passing anteriorly. Mobilization of the right colon towards the midline (Cat tell-Braasch maneuvre), exposing the retroperitoneal mass, and carefully separating it from the right ureter, right psoas muscle and IVC. The retroperitoneal cyst was removed completely (Figures 3 to 6).

Figure 3. *Intra-Operative Finding of the Retroperitoneal Cyst and the Right Ureter Passing Anteriorly*

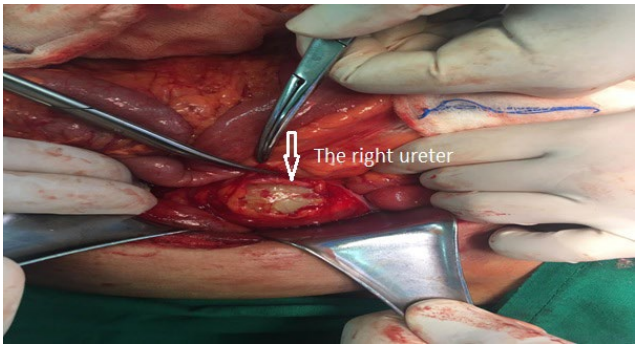


Figure 4. *Delivering the Retroperitoneal Cyst*

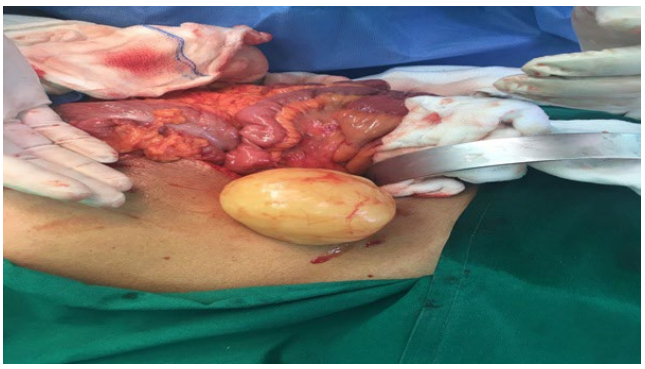


Figure 5. *Retroperitoneal Cyst Bed Clear of Any Remint*

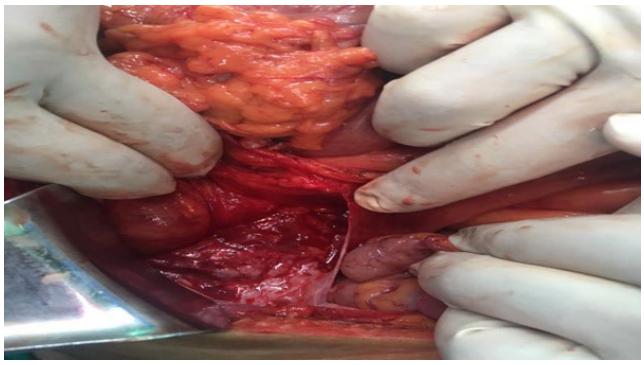
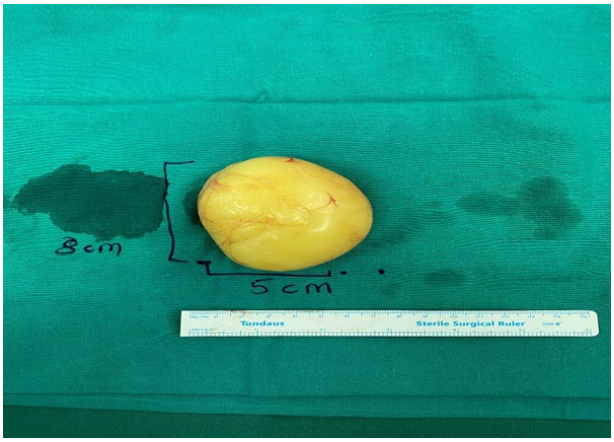


Figure 6. *Retroperitoneal Cyst Removed Completely*



Post-Operative Follow-up

Patient stayed four days in the ward due to post-operative ileus which was treated, conservatively later discharged home to be followed in surgical outpatient department after fourteen days. On first visit, he was doing well, no complaint and normal bowel habit and appetite, examination wound was clean. Histopathology result showed grossly well-circumscribed soft pale-yellow cystic mass measures about 7×6×5 cm cut section yield a thin creamy-yellowish fluid, no solid areas or papillae were seen. Microscopically it consists of loose fibrous connective tissue with few dispersed aggregates lymphocytes and some mononuclear cells, On immunostaining it showed lymphatic/chylous origin. Impression Retroperitoneal benign cyst.

DISCUSSION

Retroperitoneal cystic lesions are uncommon presentation. They are divided into neoplastic and non-neoplastic cystic lesion. Neoplastic lesions include cystic lymphangioma, mucinous cysto-ad-

enoma, cystic teratoma, cystic mesothelioma, mullerian cyst, epidermoid cyst, tailgut cyst, bronchogenic cyst, pseudomyxoma retroperitoneal, and perianal mucinous carcinoma. non-neoplastic cysts are pancreatic pseudocyst, non-pancreatic pseudocyst, lymphocele, urinoma, and hematoma.[4] Based on the previous histological it appears that the patient had a benign lymphangioma.

Although idiopathic lymphocele cysts are thought to be of unknown aetiology, 12-24% of patients with a radical lymphadenectomy, or renal transplant may develop lymphangioma.[4] It is also suggested to be congenital rather than acquired tumours. After birth they may become markedly enlarge due to the collection of fluid and the holding of the space. They have no gender preference and occur in more during childhood rather than adulthood. 95% of lymphangioma are in the head, neck, and axilla, only 1% are discovered in abdominal retroperitonum.[5,6]

Lymphatic cysts are subdivided into those formed in the lymphatics returning from the intestine and known as chylous cysts, and those arising in the lymphatic field behind the peritoneum and not connected with the intestine and are analogous in their origin, to the single cystic lymphangioma seen in the head and neck.[3] They are unilocular or multilocular cysts containing clear or milky fluid and lined with a single layer of flattened endothelium. One third of patients are asymptomatic, but cysts with considerable size may cause local compressing affect leading to stretching of vessels, adjacent organs, oedema, and subsequent thromboembolic complications.[7,8]

Diagnosis of retroperitoneal cyst is challenging they are often diagnosed by chance in CT-scan or MRI, the most characteristics is large tumour containing uncomplicated fluid with or without septa. In CT-scan they appear large and thin walled in MRI usually demonstrate signal changes of fluid filled cyst.[9]

Surgical excision is the treatment of choice, it is important to remove the cyst completely to prevent recurrence. When treating the large retroperitoneal cyst, laparotomy is the best choice, allowing better access preventing spillage and having to leave part of the cyst behind. Minimal invasive procedure also has a similar outcome; however larger cysts had to be aspirated prior to removal allowing better excision and permit mobilization. This has been described by Yagihashi et al[9] they suggested using a normal aspiration needle may allow spillage, thus they developed a new with a designed double balloon catheter (SAND) for aspiration to minimalize cyst constant into the retroperitoneal cavity. This balloon was developed for benign ovarian cysts.[10] Another method was mentioned is an extraperitoneal approach, it prevents blood loss and leads to a quicker recovery, this was described in a retrospective analysis of eight patient over with hydronephrosis due to lymphatic cysts, upon which all patients underwent successful operations, with no reported recurrance.[11]

CONCLUSION

Idiopathic cysts which arise from the retroperitoneal compartment are rare; they are often asymptomatic, however with overgrowth they may present with obstructive symptoms. They are difficult to predict or detect pre-operatively; thus, they are found in routine ultrasound, CT-scans, or MRI. Surgical excision is the main choice of treatment, several approaches were described in the literature and successful result were obtained.

CONSENT

The authors have received written informed consent from the patient

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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Case Report

A Clonorchis Sinensis in the Gallbladder: A Rare Case in Kuwait

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ABSTRACT

Clonorchis Sinensis is an important foodborne pathogen. It is actively transmitted in far-East countries and Asia, especially in China. It enters the biliary system *via* ingestion of infected cysts. It is exceedingly rare to encounter such a presentation in the Middle East, particular in Kuwait. The presence of liver fluke in the biliary system may lead to adverse complications. We are presenting a case report describing quite an unusual gallbladder finding in a 55-year-old Chinese lady.

Keywords
Clonorchis sinensis; Gallbladder; Acute cholecystitis; Liver fluke.

INTRODUCTION

Clonorchis Sinensis (Chines or oriental liver fluke) is an important foodborne pathogen and a cause of liver disease. It was first described in 1874 by a British physician, James McConnell, at the medical college hospital in Calcutta, India.

It is considered an active infection in countries such as Korea, Russia, Vietnam, and China. Most infections (about 85%) occur in China.[1]

The parasite passes in three lifecycles in different hosts: initially, the freshwater snail, the intermediate host, freshwater fish, the second intermediate host, and finally, in mammals or humans as a definitive host.

An estimate of 19 million people is infected, and 1.5-2 million show symptoms and complications. However, these incidences have been declining.[2,3]

We present a 55-year-old Chinese lady with four days history of acute right upper quadrant pain caused by the gallbladder infected with the *C. Sinensis* parasite. It is exceedingly rare in Kuwait.

CASE PRESENTATION

A 55-year-old lady, admitted through our surgical outpatient department, complaining of 3-years history of the right upper quadrant pain that increased significantly in the last four-days.

The patient has no background history of any medical illness. However, she had a previous caesarean section. She described the pain as colicky, starting at the right upper and epigastric region, and radiating to the right shoulder. This pain is aggravated by fatty meals and relieved either with painkillers or spontaneously upon resting.

Upon examination, she was vitally stable: Pulse 88 bpm, BP 120/88 mmHg, and temperature 37.5 °C. Abdominal examination: mild upper abdominal pain with negative murphy's sign. Laboratory blood test was routine, including renal and liver profile. We ordered Ultrasound, and the result was: one linear echogenic focus without acoustic shadowing (dead worm) and echogenic gallbladder calculus (Figure 1). The patient was booked for laparoscopic cholecystectomy.

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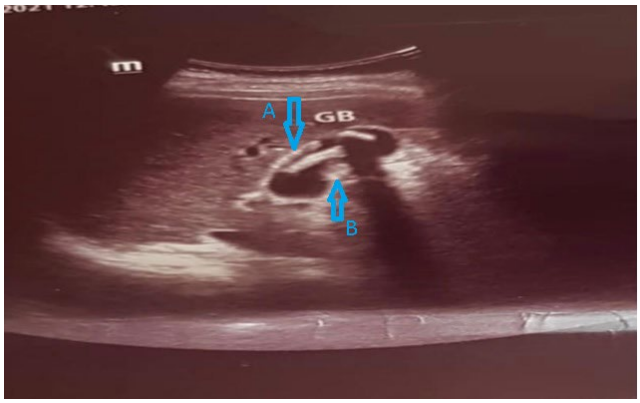
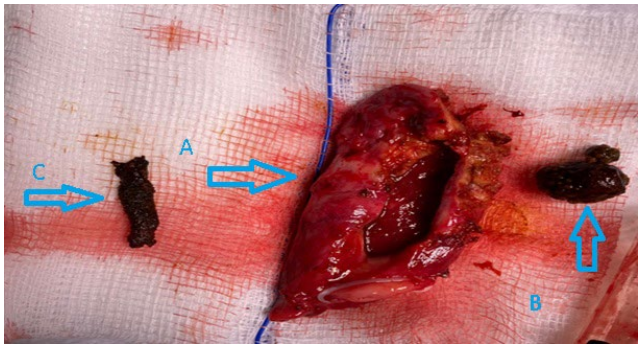
Figure 1. *Linear Echogenic Focus without Acoustic Shadowing Showing: A. (Dead worm) and Echogenic.* **B.** *Gallbladder Calculus.*



Intra-Operative Finding

Acutely inflamed gallbladder with thick wall and a complex anatomy. Cholecystectomy was done laparoscopically, with a drain fixed. The gallbladder was removed and opened, which showed stones and a dead worm (Figure2).

Figure 2. A. *Inflamed Gallbladder with Thick Wall.* **B.** *Multiple Pigmented Stones.* **C.** *Clonorchis Sinensis (Chinese or oriental worm)*



Post-Operative Course

The patient stayed in the ward for four days on broad-spectrum antibiotics (Tazocin 4.5 gm, metronidazole 500 mg intravenous); we removed the drain after reaching a minimal amount. The parasitology report: liver fluke supp. *C. Sinensis* (Albendazole 10 mg/kg/day for 7-days) was started before discharge, after discussing the case with a microbiologist. The first surgical outpatient department (OPD) visit was uneventful. She was doing well, tolerating diet and no abdominal pain, and the wounds were clean. Her histopathology report indicated acute cholecystitis. Stone's analysis showed the presence of *C. Sinensis* eggs.

DISCUSSION

Clonorchis Sinensis species pass through different intermittent hosts until finally settling in mammals and humans. A suitable water snail initially ingests them, later released into the water as cercariae.

The second host is the freshwater fish which allow them to develop into metacercaria. It is finally consumed by mammals or humans, who settle as the definitive host. The metacercaria exocyst in the duodenum ascends to the biliary system, but rarely into the gallbladder and pancreatic duct, *via* the ampulla of water.[2]

The *C. Sinensis* feed on the bile and biliary system epithelium, causing chronic inflammation, which leads to many conditions. These conditions range from mild to a rather maleficent presentation, namely Cholelithiasis, Pyogenic Cholangitis, Obstructive Jaundice, Acute Cholecystitis, Pancreatitis, and Cholangiocarcinoma.[4-7]

Several studies were describing the relationship between parasite infection to stone formation. Qiao et al[4] concluded in their research that all gallbladder infected with the parasite contained eggs in their stones (incredibly pigmented).

Another study described the relation between *C. Sinensis* infection and developing intra-hepatic stones 4.[8]

On the other hand, a case report explained that acute cholecystitis occurred in a 68-year-old male patient. He was found to have a necrotising gallbladder without gallstones. The liver flukes were the only aetiology.[9]

Most presentation of the parasitic infection in the gallbladder are mostly asymptomatic or mild. Unfortunately, there is no definitive blood test to diagnose the condition. The patient can present with normal complete blood count and liver function, and carry the liver fluke.

Stool analysis may be a valuable tool to detect eggs in the faeces of an infected patient. Therefore, testing patients who recently travelled or coming from endemic countries can be a good option.

Chronic parasitic infection increases the incidences of the biliary tract and gallbladder malignancy. It was described in the literature in 1900 and 1956 that several predisposing factors may lead to such complication. The increased desquamation in the epithelium and peri-ductal fibrosis is directly related to the presence of the parasite, leading to the formation of carcinoma.[10]

On the other hand, due to the high concentration of bile in the gallbladder, which increases the rate of worm death, gallbladder cancer is rare. It is also rare due to the type of stones developed because of the presence of the parasite, which is pigmented.[11]

Radiological examinations are essential in detecting the parasite in the biliary tree. Ultrasonography is sensitive to see intra-hepatic dilatation and periductal echogenicity, and floating material in the gallbladder. Computer tomography (CT-scan) and magnetic resonance imaging (MRI) with enhanced dynamic con-

trast can detect the presence and the movement of the parasite.[12]

Management of *C. Sinensis* infected gallbladder is cholecystectomy, followed by drugs to eradicate any ruminant parasite or eggs present. Antibiotics such as triclabendazole, praziquantel, bithionol, albendazole, levamisole, and mebendazole are taken according to protocol. Our patient received albendazole 10 mg/kg/day for 7-days.

CONCLUSION

Clonorchis Sinensis infection is a common presentation in far East and Asian countries. It is exceedingly rare in Middle East countries, especially in Kuwait. However, many patients traveling from and into endemic countries may encounter this parasite. Therefore, listing this disease in our differential is essential to avoid adverse complication and early management.

INSTITUTIONAL BOARD PERMISSION

Yes.

CONSENT

The authors have received written informed consent from the patient.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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Case Series

Acute Mesenteric Ischemia in Severe Coronavirus (COVID19): Cases Report of 3 Patients

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ABSTRACT

Background
Coronavirus disease 2019 (COVID-19) is a respiratory disease with pulmonary infection, but some patients experiment gastrointestinal symptoms, in the literature only few cases of mesenteric ischemia in patients with severe COVID-19 infections have been described.

Cases
We present 3 cases of patient with severe COVID-19, with gastrointestinal manifestation in which bowel lesion was observed and which took benefits from bowel resections. No evidence available conclusively demonstrated a thrombotic or embolic event in our cases, therefore a precise knowledge of the mechanism of bowel lesion in COVID-19 patients is essential. Clinical managing patients with COVID-19 whom manifest gastrointestinal symptomatology should be aware of the mesenteric ischemia involvement.

Conclusion
In conclusion, patients infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) may show atypical presentations, such as gastrointestinal symptoms, precise knowledge of the mechanism of bowel lesion in COVID-19 patients are essential.

Keywords
COVID-19; Mesenteric ischemia; Severe coronavirus.

INTRODUCTION

The Coronavirus disease 2019 (COVID-19) pandemic, also known as the coronavirus pandemic, is an ongoing global pandemic of COVID-19, caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2).[1]

There is no longer any need to prove that COVID-19 is a respiratory disease with pulmonary manifestation. However, a rising number of evidence support that COVID-19 related coagulopathy and has reached other systems. Although efforts to recognize and manage SARS-CoV-2 infections have focused primarily on respiratory complications, some patients with COVID-19 infection may experience gastrointestinal manifestation from this disease.[2-4]

A recent study reports the involvement of mesenteric ischemia in some patients with COVID-19 and gastrointestinal symptoms.[5] To our knowledge, only six cases have of mesenteric ischemia associated with COVID-19 have been reported.[6-11] The present report describes 3 cases of mesenteric ischemia events in previous symptomatic individuals with confirmed severe COVID-19.

CASES

Case 1

We report the case of a 66-years-old woman Ms. B, who was referred to our institution for asthenia, anorexia, cough, dyspnoea associated with fever which she had experienced for the preceding 2-days, but no pre-existing symptoms of gastrointestinal disease. Her viral polymerized chain reaction (PCR) test for SARS-CoV-2

returned positive 4 days ago and her husband and child were recently diagnosed positively at COVID-19. Clinical examination revealed crackling sound on the lungs, electrocardiogram was normal. On arrival, her oxygen saturations were 91% on room air. Laboratory studies demonstrated an increased C-reactive protein (61 mg/L), Fibrinogen (4.74 g/L), Procalcitonin (0.11 ug/L) and a mild thrombocytopenia (117×10^9 /L). D-dimer levels, brain natriuretic peptide (BNP), troponin I, renal function and liver function were normal.

On day 1, she was transferred to the intensive care unit (ICU) for worsening hypoxic respiratory failure and was intubated. On hospital day 30, the patient was still in the intensive care unit, under intubation and 2 mg/hours of noradrenaline, in front of septic shock associated to a pronounced abdominal distension with a melena, an abdominal computerized tomography (CT) was made. Transversal CT scan image showed bowel dilatation and slices showed an hypodensity and an enhancement of the wall of part of the small bowel, with a permeable coeliac trunk, mesenteric superior and inferior vein (Figure 1).

An immediate surgical exploration was done by laparotomy, in peri-operative it was observed at the distal ileum ischemic, non-necrotic lesion with a patchy distribution (Figure 2). A multidisciplinary decision was made with the intensive care unit team to practice the resection of 100 cm of bowel. The pathologist analysis concluded to ulcerative colitis lesion associated with ischemic bowels lesion, limited to the mucosa, the vessels of the below mucosa showed an aspect of vasculitis, with no evidence of thrombotic events.

Case 2

The second one, Mr. B 60-years-old men who consult the ER for dyspnoea, tachypnoea associated with fever (39.6 °C). The patient was schizophrenic, actually stable with Haloperidol therapy. The clinical examination found a seesaw breathing, crackling sound on the lungs no pre-existing symptoms of gastrointestinal disease, the polymerase chain reaction (PCR) COVID-19 test was positive. On arrival, his oxygen saturations were 95% on room air. Laboratory studies demonstrated an increased C-reactive protein (91 mg/L), lymphopenia (0.72×10^9 /L), D-Dimer (1819 ng/mL), Glomerular filtration rate (59.8 mL/min/1,73 m^2) a hepatic cytolysis with liver transaminases alanine aminotransferase (ALT) (228 U/L), aspartate aminotransferase (AST) (115 U/L), N-terminal pro-b-type natriuretic peptide (NT-proBNP) (470 ng/L) troponin I (0.957 ug/L).

The patient was admitted in conventional COVID-19 unit, with empiric antibiotic therapy. On the day 1 in the hospital, the patient was tachypnoeic, a 68 mmHg of Pa_{O2} on 12 L/min O_2 under a high concentration mask, the patient was transferred to the ICU for worsening hypoxic respiratory failure, intubated and sedated.

On hospitalization day 27, the patient presented a severe sepsis with hyperlactatemia (1.8 mmol/L) on Noradrenalin 1 mg/h associated to an abdominal distension, CT scan showing no dilatation, but a slice of peritoneal fluid with compartmentalization in the pouch of Douglas with a permeability of the abdominal vessels and no pneumoperitoneum. A surgical exploration was made, it was found an abundant purulent discharge on the peritoneal cavity, and a perforation of the bowels at 3.70 m of the duodenal-jejunal angle and at 1 meter of the ileo-caecal junction associated with false membrane and inflammatory large momentum next to the perforation. The resection of the perforated bowel

Figure 1. *CT Scan Showing Hypodensity and Un-enhancement of the Wall of Part of the Small Bowel (black narrow)*

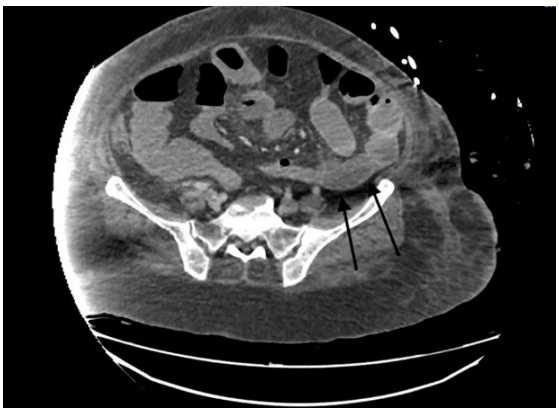
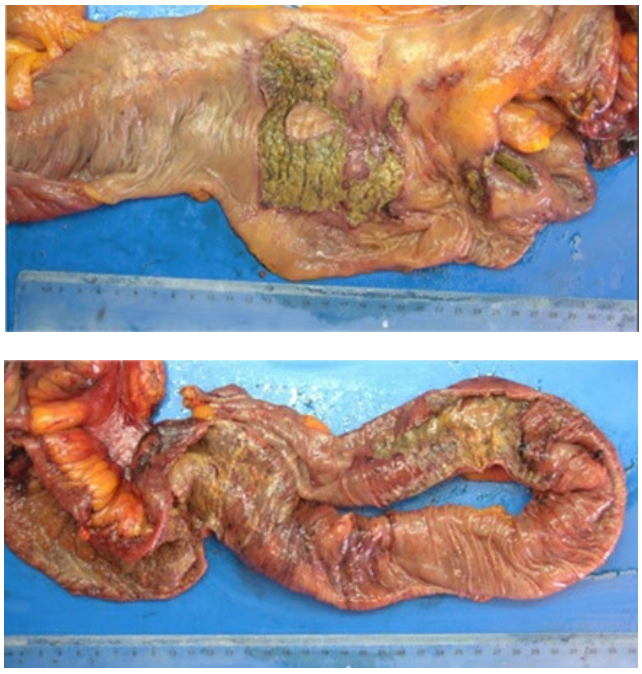
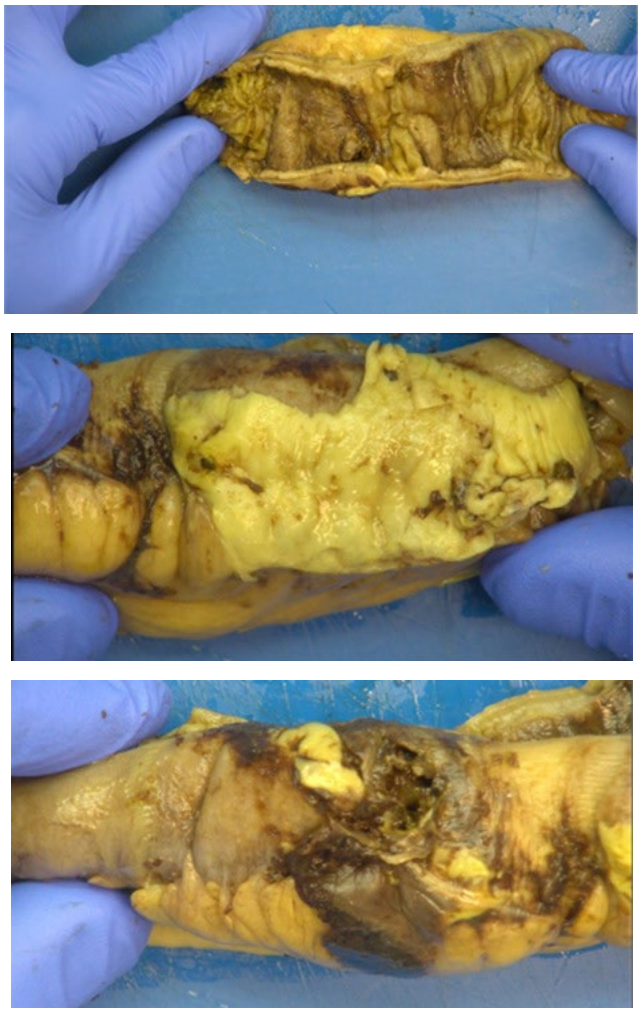


Figure 2. *Macroscopic Appearances of the Surgical Specimen of Bowel Resection*



was practiced and a double ileo-stormy was made, the analysis of the peritoneal discharge sample concluded about the presence of coagulase negative staphylococci (CoNS), analysis of the surgical specimen (Figure 3) revealed the presence of a bowel wall inflammation and ulcerous area. On post-operative day 3, the patient was in septic shock with acute fever, an increased C-reactive protein (166 mg/L) and a rising Lactatemia (7.9 mmol/L). He received 11 mg/hours of Noradrenaline, the CT scan was non-contributory and explorative surgery was made, bowels with macroscopic normal aspect were observed, no sign of inflammatory lesion was found in peri-operative. However, a layer of intraperitoneal effusion could be seen and has been taken in the Douglas pouch.

Figure 3. *Macroscopic Appearance of the Surgical Specimen of Bowel Resection*

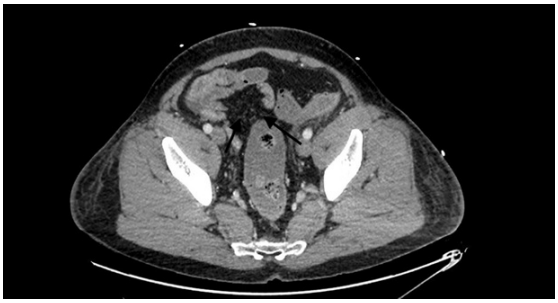


Case 3

The third Mr. A 63-years-old man patient, dyspnoeic for 3-days, without fever. On arrival, his oxygen saturations were 45% on room air, 55% after 5 L of O_2 (lunettes). The clinical examination found a seesaw breathing, crackling sound on the lungs, no pre-existing symptoms of gastrointestinal disease, and the PCR COVID-19 test was positive. Laboratory studies demonstrated an increased C-reactive protein (114 mg/L), lymphopenia (0.58×10^9/L), D-Dimer (1296 ng/mL) NT-proBNP (295 ng/L), lactate (1 mmol/L) troponin I level, renal function and liver function was normal.

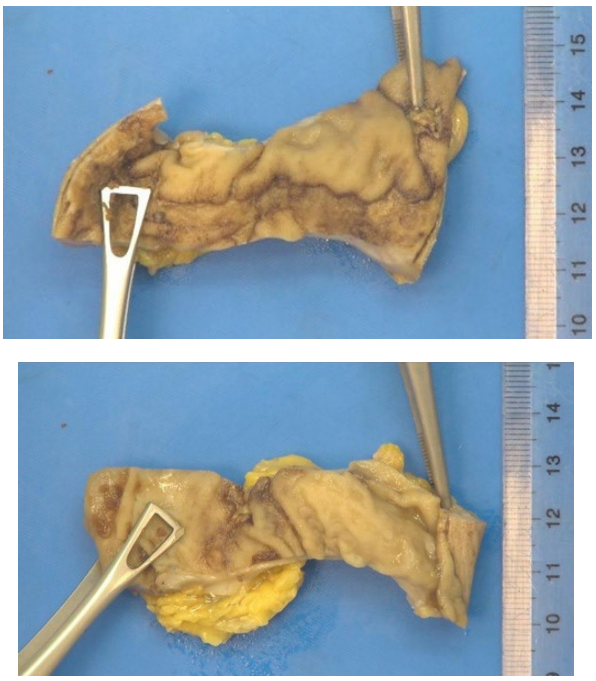
The patient was intubated and admitted in ICU on day 1, and on day 4 in front of a septic patient with an abdominal distention, an abdominal CT scan showed a distension of sigmoid colon with an infiltration of fat, (Figure 4) a clear mesenteric vessel was noted, and an important gastric dissension was described too. At day 7 (24th of May), a sigmoidoscopy was practiced and showed at 30 cm of the anal margin on 5 centimetre a large and deep ulcer with erythematosus aspect, the biopsy result of this lesion concluded to colitis ulcers necrosis looking like ischemia lesion.

Figure 4. *CT Scan Showing a Distension of Sigmoid Colon with an Infiltration of Fat (black narrow)*



Therefore, on day 9 of hospitalization, a surgical exploration was made by laparotomy, an abundant serous discharge was observed on the peritoneal cavity, no ischemia lesion was observed in the colon, and his macroscopic aspect look healthy, however, in front of the sigmoidoscopic result a left colectomy was made with

Figure 5. *Macroscopic Appearance of the Surgical Specimen of Colectomy*



a terminal left colostomy. The pathologist observation (Figure 5) of the surgical specimen of colectomy showed an ulcerative area on 2 cm with inflammatory aspect, it was observed a hyalin aspect with endothelial inflammation on the small mesenteric vessel around. The aftermath of surgery was therefore simple: the patient was extubated on day 2 from surgery, getting back slowly to eat and noradrenaline was progressively stopped. On postoperative day 4 (30th of May), the patient described an acute abdominal pain and an abdominal tenderness was clinically found, the patient was intubated for worsening hypoxic respiratory failure extracorporeal membrane oxygenation (ECMO) laboratory studies show a decreasing hemoglobinemia 7.1 g/dL, a rising hyperlactatemia (9 mmol/L) the patient was under 9 mg/hours of Noradrenaline and a surgical exploration was made, an important hemoperitoneum was observed and evacuated essentially localized next to the colectomy area, the peritoneal cavity was explored and no more lesion was observed with a normal macroscopic bowel aspect, haemostasis was made, the abdominal cavity was washed and drained, and the hypothesis of a lesion of the sigmoid artery during the first intervention was made in front of the macroscopic aspect found in this area.

DISCUSSION

With the cases of our patients, no evidence available has conclusively demonstrated thrombotic or embolic events in large gastrointestinal vessels eg., veinous or arterial mesenteric vessels by radiologic or pathologist analysis. Nevertheless, pathologist has showed necrotic, colitis, inflammatory aspect of bowel with endothelial inflammatory of the small vessels.

The exact mechanism and pathway of gastrointestinal lesion in severe COVID-19 patients are not known yet, Arshad Hussain Parry et al[12] has exposed four possible mechanisms, in isolation or in varying combinations who could account for this complication in severe COVID-19. First coagulation disorder induced by systemic inflammation state (hypercoagulability), endothelial activation, hypoxia and immobilization may lead to mesenteric vascular thrombosis Preliminary pathological evidence has shown bowel necrosis with small vessel thrombosis involving the submucosal arterioles, thereby pointing to an in-situ thrombosis of small mesenteric vessels rather than an embolic event.

Moreover, elevated levels of von Willebrand Factor have been reported in severe COVID-19. von Willebrand Factor is released from Weibel-Palade bodies in response to endothelial damage. Vascular endothelium expresses angiotensin converting enzyme 2, the target receptor for SARS-CoV-2, which can possibly explain the endothelial cell tropism of SARS-CoV-2 and subsequent endothelial dysfunction or damage with resultant vascular thrombosis.

In addition, expression of angiotensin converting enzyme 2 on enterocytes of small bowel, the target receptor for SAR-Cov-2, may result in intestinal tropism and direct bowel damage. Finally, shock or hemodynamic compromise which is commonly associated with severe COVID-19 pneumonia may lead to a non-occlusive mesenteric ischemia.

All our patient were sedated, intubated, in shock with catecholamines and the lesion observed associated to gastrointestinal symptomatology could be ischemic lesion causes by low flow, more than that we know that patient in care unit (ICU) with ischemic colitis are often under-diagnosed, since the parallel co-morbidities and the nonspecific nature of symptoms that mimic almost any abdominal pathology, can mislead the doctor. Moreover, sedated, or ventilated patients can mask many of the characteristic features of ischemic colitis and make the diagnosis challenging.[13]

CONCLUSION

In conclusion, patients infected with SARS-CoV-2 may show atypical presentations, such as gastrointestinal symptoms, precise knowledge of the mechanism of bowel lesion in COVID-19 patients is essential. Treating clinicians must be aware of the hypercoagulable state of COVID-19 patients and judicious use of prophylactic anticoagulation in hospitalized patients should be considered in regard to intensity of thromboprophylaxis to reduce the morbidity and mortality associated with this disorder.

INSTITUTIONAL BOARD PERMISSION

The study is approved by the institutional review board.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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Case Report

A Unique and Rare Presentation of Obstructed Choledochal Cyst in an Adult: A Case Report

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ABSTRACT

Choledochal cysts in adults are rare congenital abnormalities. Approximately 80% are found in childhood. Thus, their presentation in adults is always associated with complications, such as stone formation, inflammation and malignancies. The pathophysiology of this disease is yet uncertain. There are different types of choledochal cysts. Diagnosis can be challenging clinically; however, imaging techniques, such as ultrasound, magnetic resonance cholangiopancreatography (MRCP) and computed tomography (CT), can be helpful. We found several procedures performed in the extant literature, such as choledochoduodenostomy and choledocho-jejunostomy submucosal excision of the cyst; however, the best surgical option is excision with hepaticojejunostomy. We discuss the unusual presentation of a 33-year-old female patient with an obstructed choledochal cyst, despite having undergone a drainage procedure in childhood.

Keywords
Choledochal cyst; Hepato-jejunal anastomosis; Biliary system anomaly; Choledochal cyst in adults.

INTRODUCTION

A choledochal cyst is the unusual dilatation of the bile duct with intra- or extra-hepatic dilatation.[1] The incidence of choledochal cysts is one in 100,000-150,000 live births in the West. They are more prevalent in females than males, occurring at a ratio of 3-4:1.[2] Eighty percent of cases are diagnosed in childhood; therefore, cases in adulthood are always associated with complications. Choledochal cysts are associated with many complications, such as stone formation, secondary biliary cirrhosis, cholangitis, cyst rupture, obstructive jaundice and malignancy (cholangiocarcinoma).[3] This case study presents a rare case of a female with obstructive jaundice due to a choledochal cyst that was drained in childhood.

CASE PRESENTATION

A 33-year-old female Sri Lankan patient presented to our surgical casualty, complaining of four-days of sharp abdominal pain, mainly in the epigastric region and radiating to the back, associated with anorexia, vomiting and nausea. The patient mentioned having darker urine and pale stool. She had a background history of undergoing a previous surgical procedure when she was four years old but could not recall the type of procedure. Upon examination (pulse 90 beats per minute, temperature 37 °C, blood pressure 90/70 mmHg), we determined that she was jaundiced, with a laparotomy scar and mild tenderness at the epigastric region. Initial investigations revealed an increase in white blood cells (WBC) 26×109, haemoglobin (Hb) 9.7 and platelets (Plts) 298. The liver profile showed alkaline phosphatase (ALP) 168, alanine aminotransferase (ALT) 138, aspartate aminotransferase (AST) 430, gamma glutamyl transferase (GGT) 139, total bilirubin 60, direct bilirubin 30 and amylase 1170. The kidney profile showed creatinine (Cr) 50, potassium (K) 3.5 and sodium (Na) 135.

The chest and abdomen X-rays were unremarkable. The abdomen ultrasound showed interstitial pancreatitis with a normal gallbladder. The patient was resuscitated with intravenous fluids and antibiotics (piperacillin-tazobactam and metronidazole). Due to her uncertain history, the surgical team ordered a computed tomography (CT) scan for the abdomen and pelvis, which showed

a choledochal cyst (Type I) and acute cholecystitis (Figure 1). A magnetic retrograde cholangiopancreatography (MRCP) also was ordered, which showed distal common bile-duct (CBD) stones and dilated intra- and extra-hepatic radicles with a choledochal cyst (Type Ib) (Figure 2). The patient underwent endoscopic retrograde cholangiopancreatography (ERCP). The patient's previous drainage procedure for a congenital choledochal cyst has caused a blockage, resulting in her current symptoms. The case was discussed with the hepatobiliary team, who decided on a choledochal cyst and cholecystectomy with hepatic-jejunostomy and jejuno-jejunostomy.

INTRA-OPERATIVE

The hepatobiliary team elected to proceed with a laparotomy. Extensive adhesiolysis was performed due to severe adhesions from the patient's previous surgery. The team worked to identify the choledochal cyst and the old cholecystojejunostomy, which was obstructed by gallstones and sludge. The cyst was carefully dissected from the porta hepatis: the hepatic artery and portal vein. The surgical team performed *en bloc* excisions of the choledochal cyst, gallbladder and segmental jejunal with stent removal (Figure 3). A Roux-En-Y (three-ducts anastomosis) jejuno-jejunostomy and a Hutson Russel loop at the right upper quadrant were made. Two drains were placed at the anastomosis and pelvis.

POST-OPERATIVE

The patient's post-operative recovery on the ward was uneventful. She continued taking antibiotics while hospitalised and did not experience any bile leakage from her drains. After five-days, the patient was discharged and resumed a regular diet. The drains were removed, and her liver profile was normal. The first outpatient visit after 14-days was unremarkable. The patient tolerated a regular diet with no abdominal pain, fever or changes in bowel habits. The wound was clean, and the patient's histopathology result showed acute cholecystitis and a choledochal cyst.

DISCUSSION

Choledochal cysts are rare biliary system abnormalities; however, in recent years, incidences of choledochal cysts have increased from 1:128,000 to 1:38,000.[4] Nevertheless, they are primarily found in children rather than in adults. Various theories have described the aetiology of choledochal cysts, but none are specific. The most accepted theory is the presence of an anomalous junction between the pancreatic and the bile duct (APBDJ) outside the duodenal wall. The abnormal pancreatic bile-duct junction is located 1 cm proximal to where the CBD reaches the ampulla of Vater.[5,6] The anomalous pancreatic bile-duct junction allows the reflux of pancreatic enzymes, which enter the biliary system, leading to inflam-

Figure 1. *CT Scan of the Abdomen and Pelvis, Showing the Choledochal Cyst*

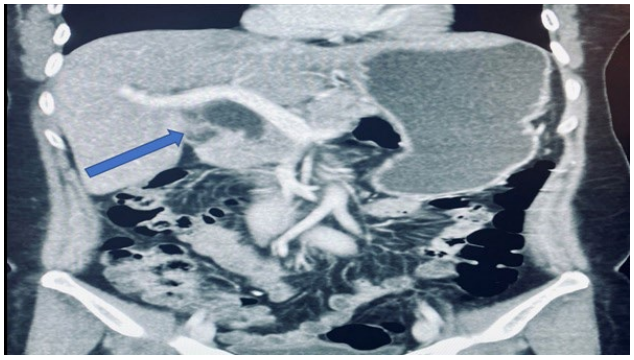


Figure 2. *Magnetic Resonance Cholangiopancreatography Highlighting a Type Ib Choledochal Cyst*

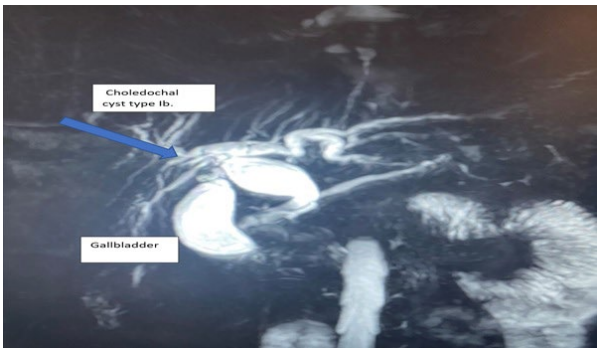
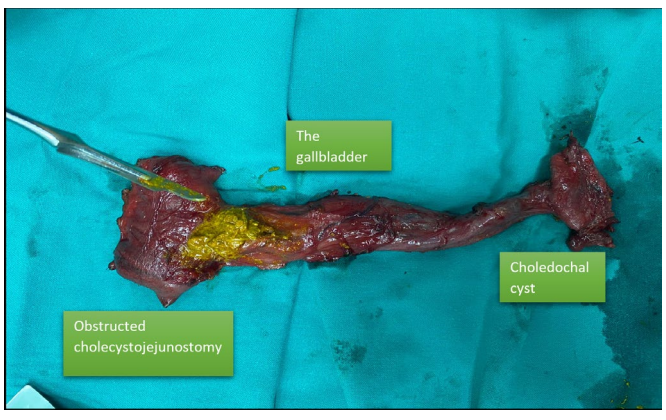


Figure 3. *En Bloc Resection of the Gallbladder, Choledochal Cyst and an Obstructed Cholecystojejunostomy*



mation, damage, dilatation, and cyst formation predisposition. The first systematic classification of choledochal cysts, presented in Alonso-Lej et al[7] described four types of cysts (I-VI). This classification system was later modified by Todani and colleagues, who added a fifth type due to intrahepatic dilatation referred to as caroli disease.[4,8] Between 50 to 80% of cases present with Type I, according to Todani's classification of choledochal cysts, and it is the most prevalent presentation.[9] It is associated with 80% of other hepatobiliary pathologies, such as intrahepatic lithiasis, pancreatitis, acute cholecystitis and malignant neoplasm. Patients with choledochal cysts are 20 times more likely to develop cholangiocarcinoma than the general population. Other neoplastic diseases have also been reported, such as neuroendocrine tumours.[4,10]

The most common presentation of a choledochal cyst is abdominal pain. The classic triad of abdominal pain, jaundice and a palpable abdominal mass occur in fewer than 20% of cases.[11] A retrospective study of 14 adults revealed different symptoms, including three biliary infections, three instances of pancreatitis, two abdominal pain and one painless jaundice. Three patients also had cysts identified during laparoscopic cholecystectomies, and two had incidental findings from CT scans.[12] Therefore, it is hard to diagnose a choledochal cyst symptomatically.

Bile-duct cysts are diagnosed *via* imaging techniques, such as ultrasound, CT, MRCP and ERCP. An abdominal ultrasound is an initial investigation to evaluate the presence of a dilated bile duct and gallbladder stones.[13] MRCP is the gold standard of choice for diagnosis, as it is a non-invasive technique that does not require any ionising contrast.[14]

Once the diagnosis is confirmed, the bile-duct cysts must be removed surgically to prevent future complications. Surgical resection depends on the type of choledochal cyst. Type I cysts need resection and reconstruction of the bile duct with a hepaticojejunostomy (also known as a Roux-en-Y procedure). Type II cysts can usually be excised, and the defect in the CBD can be sutured on a T-tube. Type III cysts can be partially excised and opened into the duodenum using either a trans-duodenal sphincteroplasty or endoscopic sphincterotomy.[15] Type VI and V cysts require a multiple disciplinary team approach (endoscopy, intervention radiology and surgery) and a possible partial hepatectomy.[16] In our case report, the patient underwent a drainage procedure as a child; thus, due to incomplete excision of the cyst, the patient developed an obstruction, leading to her current situation.

CONCLUSION

Choledochal cysts are extremely rare pathologies in adults because they mainly appear in childhood. They may present with ambiguous signs and symptoms; diagnosing such a disease is challenging and requires careful investigation. Treatments for this disease are diverse; however, resection and hepaticojejunostomy remain the best bilioenteric therapeutic options. Awareness of this congenital abnormality and familiarity with its potential complications can lead to better outcomes. We recommend referring those patients to hepatobiliary specialists to follow the appropriate therapeutic management to avoid future complications and have better prognoses.

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DISCLOSURE

None.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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