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Successful treatment of Post Cholecystectomy Biliary Peritonitis with Minimally Invasive Techniques - Our Experience with few cases

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Abstract

Introduction: The management of bile leaks following laparoscopic biliarysurgery has evolved with increased experience of ERCP and laparoscopy. The purpose of this study was to determine the impact of a minimally invasive procedure for managing severe biliary peritonitis cases.

Patients and Methods: Three patients with a bile leak following laparoscopic cholecystectomy/ CBD surgery were managed on a case-by-case basis. All patients were managed according to a minimally invasive protocol utilising ERC/biliary stenting and relaparoscopy .

Results: In our study, ERC + stenting was performed in all 3 cases with the main indication being a persistent bile leak. Relaparoscopy was performed in all the cases. No laparotomies were performed and there were no postoperative deaths.

Conclusions: The introduction of a minimally invasive procedures utilising ERC and re-laparoscopy offers an effective modern way for the management of bile leaks after laparoscopic cholecystectomy.

Keywords: Biliary peritonitis; ERCP; Diagnostic laparoscopy

Introduction

Laparoscopic cholecystectomy has become a gold standard in treatment of symptomatic cholelithiasis,even in patients with acute cholecystitis [1-4]. Patients who undergo laparoscopic treatment recover faster, have easier postoperative course and earlier discharge from hospital [2]. In-spite of its many advantages, population-based studies have consistently reported a higher incidence of cholecystectomyassociated bile duct injury (BDI) following laparoscopic approach (0.4% to 0.6%) over the conventional open cholecystectomy (0.1% to 0.2%) [5,6]. IBDI is a complication associated with significant perioperative morbidity and mortality, reduced long-term survival and quality of life, and high rates of subsequent litigation [7]. A leak from the cystic duct stump may occur from clip failure due to necrosis of the stump secondary to thermal injury/pressure necrosis or when clips are used in situations where ties are appropriate (acute cholecystitis) and in a significant majority from distal bile duct obstruction caused by a retained stone and resultant blow out of the cystic stump [8]. Endoscopy with sphincterotomy and stenting is the first line of treatment with a success rate greater than 90% [8], however several endoscopic techniques available, e.g. biliary stent placement, biliary sphincterotomy, and nasobiliary drainage [9-11]. In this respect, endoscopic therapy can reduce the transpapillary pressure gradient and improve the transpapillary flow, which decreases the extravasation out

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of the biliary tract. This reduction of bile leakage allows healing of duct lesion injuries without direct surgical repair. Nonetheless, if major IBDI occurs, i.e. complete dissection of the common bile duct (CBD), surgical management is required to resolve this issue [12]**. In this study we share our experience of successfuly managing few post op biliary peritonitis cases with minimally invasive techniques.**

Case Presentation

We present successful treatment of three cases presented with post op biliary peritonitis.

Case 1

A 42-year-old male presented to our hospital with complaints of yellowish discoloration of eyes for 15 days, pain in the rt upper abdomen for 7 days,with fever and chills for 2 days. Ultrasound confirmed acute calculus cholecystitis.

MRCP was also done which revealed

- Acute calculus cholecystitis with GB sludge
- GB wall edema

bile ducts were of normal size and LFT was deranged.

Pt was planned for laparoscopic cholecystectomy, upon visualisation intra operatively shows dense pericholecystic adhesions and empyema gall bladder. However laparoscopic cholecystectomy was done and pt was discharged on post op day 2 uneventfully.

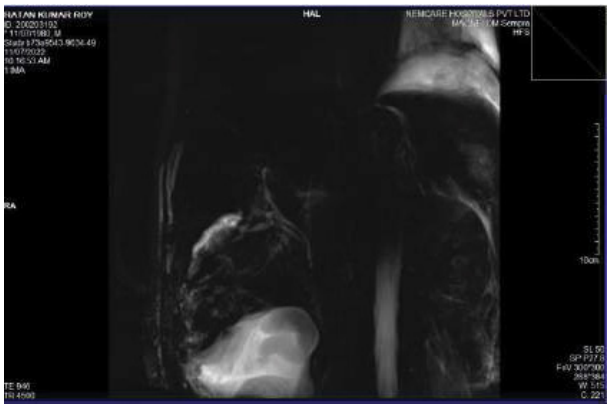
The patient was initially doing well but, on the post op day 10 he started developing generalised pain abdomen with jaundice and mild abdominal distension.

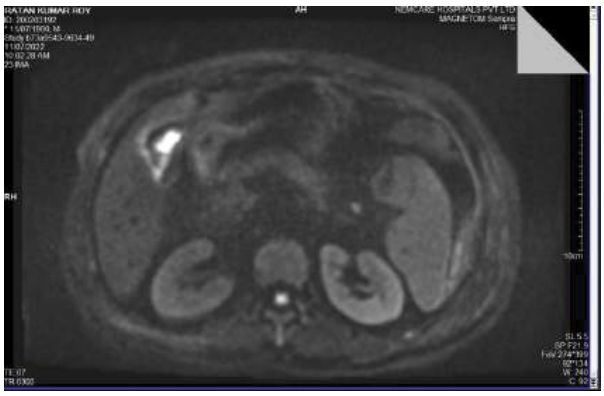
CT abdomen was done and it revealed

- Post cholecystectomy status with collection in GB fossa
- Dilated proximal small bowel loops likely adynamic ileus
- Large peri-splenic collection 500-700ml extending to left perihepaic space
- Collection in pelvis
- Omental stranding and left sided pleural effusion

MRCP revealed

- Perihepatic bilioma and small collection in GB fossa CHD & CBD are collapsed





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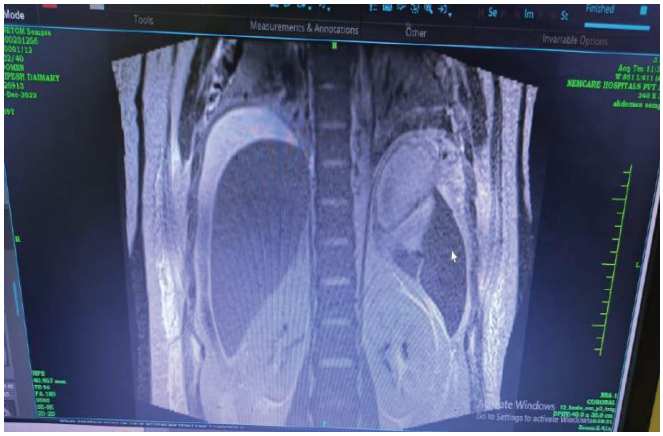
Treatment

As the bile leak was persistant treatment options were discussed with gastroenterologist and ERCP was planned ERCP showed a distal CBD calculus, removal of stone along with stent placement is done and also pig tail catheter was placed (usg guided).

Later pt was taken to OT on next day and diagnostic laparascopy with peritoneal toileting and intraabdominal drain placement was done. Pt was discharged post ERCP day 5 and intraabdominal drain removed on OPD follow up.

Case 2

A 39 year old gentleman post laparoscopic cholecystectomy post op day-3, (done in a periphery pvt hospital) presented to our hospital emergency in a semi conscious state, not obeying commands,hemodynamically unstable, with features of shock and AKI, with RT and foley's in-situ. On initial assessment he was grossly icteric, BP=97/51 mmhg, HR=130 bpm, RR=21/min, RBS=144 mg/dL. He was resuscitated in an emergency and later shifted to ICU where he was started with I.V Antibiotics, Inotropic support,pain management and other supportive medications. He underwent MRCP which revealed biliary intra abdominal collections.



The next day (post op day 4) pigtail catheter was inserted and 600ml bilious fluid was drained and sample was sent for culture and sensitivity. After pigtail insertion, he was shifted for ERCP and CBD stenting under GA the same day. (Lipase=1215 IU/L, Amylase=570 IU/L).

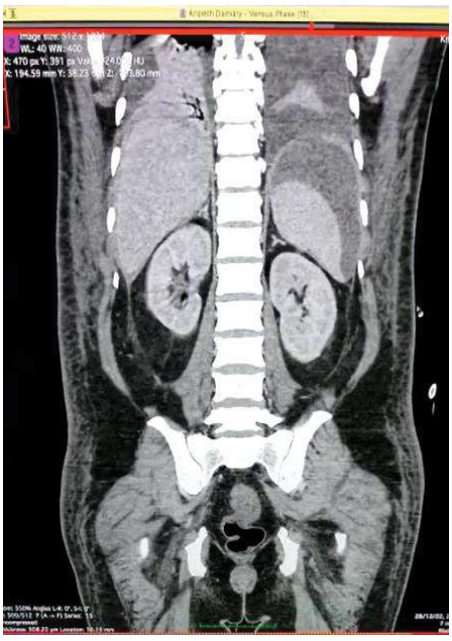
The next day (post op day 5) he underwent diagnostic laparoscopy with peritoneal toileting and three intra abdominal drain placement (1st in morrison pouch, 2nd in Right paracolic gutter, 3rd in Left paracolic gutter) under GA, and bile sample was sent for culture and sensitivity.

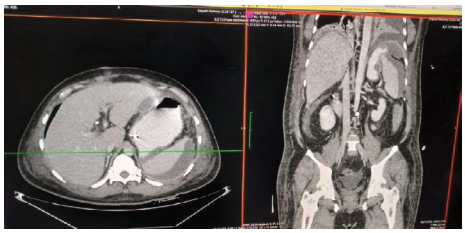
Pt was recovering well and was off ionotropic support and ventilator/NIV support however on day 4 post diagnostic lavage, pt had fever On POD5, CXR revealed pleural effusion and pneumonia was being worked upon.

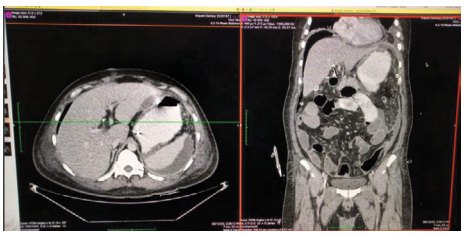
Drain Output

	Drain-1 (ml)	Drain-2 (ml)	Drain-3 (ml)
POD2	250	100	100
POD3	500	50	50
POD4	1250	50	50
POD5	1300	75	50
POD6	100	50	25

He underwent CECT whole abdomen with oral contrast which revealed enlarged liver (approx 197mm), peri splenic collection (14*4.5 cm), small collection in GB fossa (5*2.5 cm), pancreas were normal in size, position and parenchymal attenuation, distended loops of ileum and jejunum, bilateral pleural effusion with L>R, mild free fluid and free air in peritoneal cavity, drainage tubes were seen in GB fossa, pelvic and peri splenic regions and no extra luminal leakage of orally administered contrast.







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On POD7, HRCT thorax revealed Left pleural effusion 700-900mL, with left hydropneumothorax, right sided pleural effusion 100-150 mL, complete atelectasis of left lower lobe and partial atelectasis of left upper lobe. Left sided ICD was planned (i/v/o pleural effusion) and it resulted in dry tap with suspicion of fluid pocket to be on posterior side and therefore left sided drain placement was done under CT guidance.

NCCT Abdomen with rectal contrast was done which revealed leakage of rectal contrast from hepatic flexure of colon into hepatorenal pouch, in addition to the findings of NCCT whole abdomen with oral contrast.

He underwent laparotomy with lavage and ileostomy under high risk under GA. On POD1 of laparotomy and ileostomy he was extubated and put on NIV at inspiratory pressure of 10 cmH_2O and expiratory pressure of 5cmH_2O.

On POD2, USG W/A was done which revealed a small collection in the left paracolic gutter of around 50 mL and prominent spleen.

On POD4, NIV was removed and he was put on nasal prong trial and he was shifted to wards from ICU.

Drain Output

	Drain-1	Drain-2	Drain-3
POD1	250	100	100
POD2	200	100	100
POD3	50	25	25
POD4	-	-	-
POD5			

Case 3

A 40 year female, presented to our health facility on 30/08/2022 with complaints of pain in the abdomen for a month, not a/w nausea/vomiting. She was investigated with significant blood and radiological tests (USG W/A & ERCP) and was diagnosed with chronic calculous cholecystitis with choledocholithiasis. She underwent Laparoscopic cholecystectomy with CBD exploration with CBD stenting with T-tube insertion under GA.

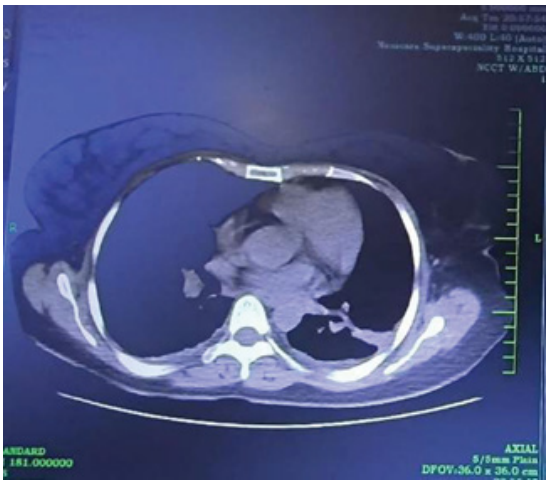
The course of hospitalisation post op was uneventful and she was discharged with t-tube in situ on POD -5.

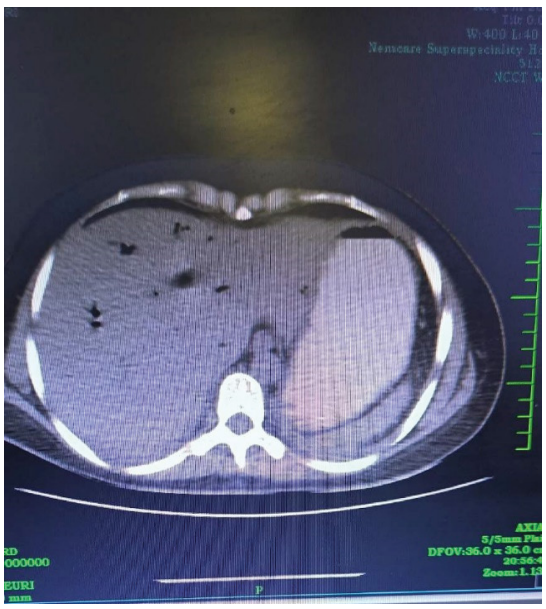
She presented to emergency In the evening after one month post surgery, in a hemodynamically stable state with complaints of pain in the abdomen for the last 5 days, which was radiating to the back, associated with multiple episodes of vomiting, and one episode of loose stool.

On initial assessment at arrival T=98 F, HR=84 bpm, BP=110/70 mmhg, RR=22/min, pain score- 5, no icterus,on P/A she had mild tenderness in the epigastrium, and BS were heard. Rest of the GPE and systemic examination were found normal. She underwent relevant investigations for further assessment.

NCCT scan of abdomen with oral contrast revealed dilated CBD (14mm) with mild bilobar Intrahepatic biliary radicle dilatation and pneumobilia with air collection in gastrohepatic ligament insinuating into GB fossa-?leakage from biliary tree. She was provisionally diagnosed as bile leak with peritonitis and was planned for ERCP with stent placement with pigtail drainage of abdominal collection, and was simultaneously empirically started on I.V Antibiotics.

Under USG guidance, two percutaneous drains were placed in perihepatic space and left paracolic gutter for bile drainage. ERCP performed, revealed dilated CBD with IHBRD with probable leak from cystic duct stump, and she underwent 7Fx7cm double pigtail stent placement in CBD till RHD. The procedure was tolerated well by the patient with intra and post intervention period being uneventful.





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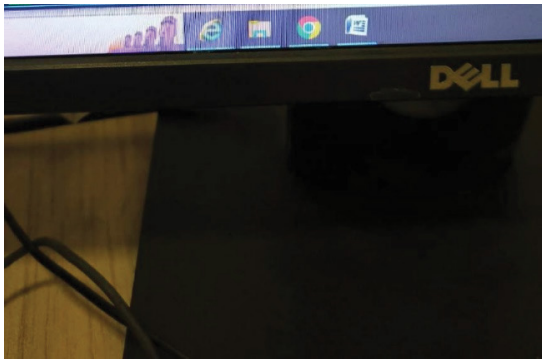

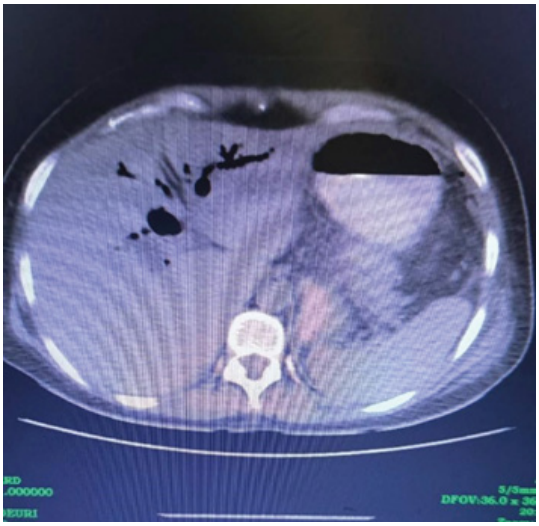

Discussion

Bile leakage after laparoscopic cholecystectomy accounting for 0.2%-2% may cause intra-abdominal collection, fistula formation or life threatening biliary peritonitis in case of large amounts. It usually comes from the cystic duct stump due to misplacement of the clips, common bile duct injury and from accessory duct or small bile ducts of gallbladder bed, i.e. Luschka's duct. Diagnosis and treatment of bile leak from an aberrant bile duct may be delayed [13]. Other issues such as bowel injury, pleural effusion, multiple pockets of collection etc may further complicate the case and hamper its recovery.

Clinical manifestations of bile leak include persistent abdominal tenderness, generalized malaise and anorexia. Bile leak after surgery resulting in intraperitoneal bile collection is typically not contaminated by bacteria and usually does not result in severe bile peritonitis [14]. **However in our case all the patients came to us with biliary peritonitis and septic shock.**

Ultrasonography (US) and computed tomography (CT) cannot reliably distinguish bile from other postoperative fluid collections. Magnetic resonance (MRI) imaging with hepatobiliary agents and MRI cholangiopancreatography provide anatomic and functional information that allows for prompt diagnosis and excludes any other concomitant complications [15]. Once diagnosed as biliary peritonitis, regular radiological assessment should be done to determine the further course of action (pig tail catheter insertion, ercp with stenting, diagnostic laparoscopy with lavage and drain placement). Three golden rule that we have followed in our cases, namely **a)** high level of suspicion for biliary peritonitis for pt presenting with acute abdomen (following gallbladder and bile duct surgeries) and its prompt diagnosis (MRCP/ usg guided aspiration of bile from intraabdominal collection).

b) Control of bile leak at source (urgent ERCP/PTBD)

c) Establish and maintain adequate drainage of intraabdominal biliary collection (usg guided pigtail drainage/ diagnostic laparoscopy and lavage with drain placement).

Have significantly reduced morbidity/mortality, reduced duration of hospital stay and less financial burden to pt. The second and third steps of management can be interchanged depending upon the pts condition. In our cases all of them have undergone pigtail drainage before ercp stenting and diagnostic laparoscopy.

Endoscopic retrograde cholangiopancreatography (ERCP) and percutaneous transhepatic cholangiography (PTC) can identify a continuing bile leak, provide exact anatomical diagnosis and, at the same time, allow for treatment of injury by appropriately decompressing or dilating the biliary tree. Endoscopic treatment at ERCPwith stent and sphincterotomy is very useful in treating pts with biliary peritonitis with success rate greater than 90% [16]. The median time for resolution of the leak was 3 days (range 1-39 days) Kaffes and colleagues reported that stent insertion alone for postcholecystectomy bile leak is superior to sphincterotomy alone, because fewer patients required additional intervention (particularly surgery) to control the leak.

Conclusion

Major bile duct injury following cholecystectomy can be devastating to the patient and needs prompt diagnosis and timely surgical intervention but leakage from gallbladder bed, duct of Luschka or accessory bile duct needs only conservative treatment and mostly leads to disappearance of leak without any residual effect. For draining bile upto 200ml/24hrs, adequate drainage and supportive care can suffice. However persistent drainage of bile more than 200ml, additional procedure like ERCP with papillotomy and CBD stenting accelerates recovery. Diagnostic laparoscopy and lavage with drain placement is a key adjunct to tackle pt with severe sepsis. With the use of minimally invasive techniques, the need for laparotomy has been evaded adding to fast recovery and less morbidity to pt.

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