Laparoscopic management of gallstone complications

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Abstract

Introduction: Common bile ducts stones are very common diseases in Vietnam and Southeast Aisa. The pathogenesis of the stone is associated with biliary tract infection and intestinal parasiti. The aim of study is to evaluate the results of treatment of gallstone complications by laparoscopis cholecystomy, open the bile duct for gravel, Kehr drainage.

Material and Methods: Prospective study patients with complicated choledocholithiasis were treated with emergency laparoscopic choledocotomy in the first 24 hours. From May 2013 to May 2018.

Results: 83patients, no cases have been converted to open choledocotomy. The mean operation time was 90,75 minutes. There was no intraoperative complication. Postoperative complication consisde of 1 mild infection of umbilical port and 1 mild subhepatic fluid collection. Three cases were treated medically. There was no mortality. The mean hospital stay were 8.72 days.

Conclusion: Laparoscopis cholecystomy, open the bile duct for gravel, Kehr drainage to treat gallstone complications was safe procedure with short hospital lenght stay.

I. Introduction

Cholelithiasis is a common disease in Vietnam, as well as other South-east Asian countries. The pathogenesis of this disease is associated with biliary tract infection and intestinal parasites. Gallstones often occurs in the common bile duct, common hepatic duct, left and right hepatic ducts, and sometimes the gallbladder. Gallstones often cause many complications, such as cholecystitis, cholecystolysis, peritoneal secretion, peritonitis, biliary tract hemorrhage, liver necrosis, biliary tract infection, acute pancreatitis and renal failure. The disease often presents with Charcot's triad – abdominal pain, fever and jaundice [1],[2],[3].

Previously, complicated cholelithiasis was treated surgically such as cholecystectomy, opening the bile duct to remove the stones, and Kerh (T tube) drainage. Nowadays, it can be treated with minimally invasive procedures, such as endoscopic retrograde cholangiopancreatography (ERCP) or percutaneous biliary drainage. However, for complicated cholelithiasis with multiple stones, big stone or failure with ERCP, endoscopic cholecystectomy, open the bile duct for gravel and Kehr's drainage is a suitable method used by many authors [1],[5],[6],[8],[13].

Laparoscopic surgery has many advantages compared with the conventional surgery. Endoscopic cholecystectomy, opening the bile duct for gravel and Kehr's drainage have been used to treat complicated cholelithiasis in many centers across the country, for example, Viet Duc Hospital (Hanoi), Hue Central Hospital (Hue), Ho Chi Minh City University of Medicine and Pharmacy Hospital, Cho Ray Hospital (Ho Chi Minh City)... However in the Central Highlands, not many hospitals have implemented this method to treat the complicated cholelithiasis. The research " Laparoscopic management of gallstone complication" was conducted aiming to assess the result of this method in the treatment complicated cholelithiasis [1],[5],[7].

II. Subjects and method

Subjects: 83 patients diagnosed the complicated cholelithiasis treated with laparoscopic surgery at Hoang Anh Gia Lai University of Medicine and Pharmacy Hospital, from May 2013 to May 2018.

Method: Prospective study

Indication: The patients was diagnosed the gallstone complication based on:

Clinical signs: Bile colic, sudden onset, lasting several hours, location of pain is often the right upper quadrant or epigastric, spread to the right shoulder or back bone associated with vomiting, sweating. The pain maintains from 12 to 24 hours, then appeared symptoms of fever and jaundice. The urine is dark, and no feces or silver color associated with itching. Clinical examination in triangle push-Rivet Chauffard much pain, gallbladder distended with painful liver enlargement [1],[4],[8],[9],[13].

Abdominal ultrasonography: This is a very useful tool to detect gallstones. It allows to observe dirrectly the gallstones as well as its number, size and location. It also helps to see indirect images of enlarged intra- and extrahepatic biliary tract, distended gallbladder or thickened of the gallbladder wall [1],[4],[6].

Computed tomography and hepatic MRI: These tests provide the shape and the size of these stones, with the image of the intra- and extrahepatic biliary tracts. This is also useful to diagnose in obese patients or when ultrasonography is unable to provide an accurate result.

Laboratory examination: Including the blood count, liver function, coagulation factors, blood culture as well as biliary culture are done procedurally [2],[4],[7],[8].

Time to surgery: from the onset of the first symptom to 24h [1],[4],[6].

Variables measured during the surgery: biliary tract infection, duration of the surgery, intraoperative complications, the rate and the reason for changing to open surgery.

Variables measured after the surgery: postoperative complications, length of hospital stay, death, following up after discharge from hospital.

The data was then analyzed by biostatistics software

III. Results

Demographics:

Table 1: Distribution of patients, by sex

Sex	N	Rate (%)
Male	37	44.6
Female	46	55.4
Total	83	100

Youngest patient was at 21-year-old and the oldest at 85-year-old. Average age was 51.25 years old.

Clinical features

Table 2: Signs and symptoms

Sign and symptoms	N	Rate (%)
Liver pain	54	65.1
Fever	52	62.6
Jaundice	44	53.0

Laboratory features

Table 3: Laboratory features

Features	N	Rate (%)
Increased bilirubin	62	74.7
Increased liver enzyme	34	50,0
Prothrombine > 70%	57	68.7
White blood cell > 12G/L	74	89.2

Ultrasonography features

Table 4: Location of gallstones

Location	N	Rate (%)
Common bile duct only	11	13,3
Common bile duct and gallbladder	72	86.7
Common bile duct, gallbladder and intrahepatic duct	32	38,6
Common bile duct and intrahepatic duct	13	15,7
Intra hepatic duct	5	6,0

MRI features

Table 5: MRI features

Location	N	Rate (%)
Common bile duct only	11	13.3
Common bile duct and gallbladder	72	86.7
Common bile duct, gallbladder and intra hepatic duct	32	38.6
Common bile duct and intrahepatic duct	13	15.7
Intrahepatic duct	5	6.0

Duration of surgery

The average duration of a surgery was 90.75 minutes, ranging from 70 to 180 minutes.

Complications

Table 6: Intraoperative complications/accident

Intraoperative complications	N	Rate (%)
Bleeding	8	9.6
Hepatic encapsular fluid	1	1.2
Total	83	100

Duration of stay

Table 7: Hospitalization stay

Length stay	N	Rate (%)
< 7 days	11	13.3
7 – 14 days	70	84.3
> 14 days	2	2.4
Total	83	100

Average length stay was 8.72 days

Following after discharged

The completing removal of gallstones through Kehr's drainage was 70/83, or in 84.3%. Remaining gallstone was 13/83 (15.67%)

Table 8: Outcome after discharged

Results	N	Rate (%)
Good	76	91.6
Moderate	5	6.0
Poor	2	2.4
Total	83	100

IV. Discussions

Some common issues due to complicated cholelithiasis.

In table 4 shows the rate of common bile duct stones only 13.3%, the majority of cases (86.7%) was gallstones in the common bile duct and associated gallbladder stones while combined with stones in common hepatic duct was in 15.7%. According to other authors as Dang Viet Dung, Le Quang Anh Tuan, Le Loc, Kiriyama, Berthou, the rate of gallstone alone located in the common bile duct was in 6.8%, 17.30%, 13.28%, 9.17% and 8.72% respectively. Our findings were similar to those of these authors in both national and international. This was a key feature which we can decide whether to perform cholecystectomy or not For the complicated cholelithiasis, the cholecystectomy was indicated if gallbladder stones size were larger than 10mm, or multiple stones, or associated with cholecystitis, peritoneal secretion, gallbladder necrosis [3],[5],[7],[9],[13].

Charcot's triad – abdominal pain, fever and jaundice is useful in diagnosis of complicated cholelithiasis, with accounting for 50 to 70% of cases, and highly recommended in the Guideline Tokyo 2013. The triad helps classifying the severity degrees, especially it's associated with severe systematic infection symptoms or laboratory exam such as white blood cell counts more than 11G/L and bilirubin is higher than 1.5 times. Beside that ultrasonography was also valuable in diagnosis of biliary tract diseases. In Table 4, the common bile duct and gallbladder stones were detected by ultrasonography in 86.7 % of cases. Additionally tt was a non-invasive method. In our series, the ultrasonography was taken twice for each patients as recommended by other authors. Preoperative MRI to see the bile ducts combined with ultrasonography could make the diagnose in 100%. The combination of these procedures helped us to choose the surgical approach to choledochotomy for gravel [1],[9],[13].

Cholecdochotomy for gravel.

Complicated cholelithiasis requireed to provide the intensive care due to it could be quickly developed the complications such as renal failure, multiple organ failure and eventually, death. For critical care, the maintain fluid and electrolytes balance, appropriate antibiotic used along with biliary drainage were compulsory. Percutaneous biliary drainage and emergency endoscopic retrograde cholangiopancreatography (ERCP) were recommended to perform within the first 48 hours, which helps improving the patient condition. However, these required sufficient equipment and skilled physicians. We have performed percutaneous biliary drainage in 4 of 83 patients, under ultrasonography guidance. It's safe and effective. There are some major medical centers performed ERCP on emergency. Almost authors agreed that this procedure could be applied for stones located in the lower part of common bile duct only, and the size is smaller than 2cm, no cholecystitis associated. This was valuable procedure for those with pancreatitis caused by lodging stone in the sphincter of Oddi [1],[3],[7].

The main advantages for opening the bile duct is to allow us to reduce quickly the biliary tract pressure, easy to rearch and to remove the stone using common surgical instruments such as Randall to irrigate the biliary tract to clearn the stones while combined with intraoperative lithotripsy. In the report of Dang Viet Dung shows that 93.2% of stone was taken out, in Le Loc report was 91.0%, the successful rate of Gigot was in 93% and Berthou in 97%. In our series, it was in 84.3%. However, when performing this method, we could not touch the biliary tract to check the stones up. This inconvenience could be resolved by intraoperative biliary endoscopy. We opened the bile duct vertically, above the duodenum, and a Kehr as big as 18F – 22F put into. For such as serious cases we tried to short the surgical duration as much as possible. Some authors recommended removing the stones through cystic duct and closing the common bile duct, which would reduce the length of stay and complications of Kehr's drainage. However we have no cases like this because we wanted to

create the shortest, straightest and the best Kehr's drainage, and the stones could be removed through the Kehr's tunnel in 3 weeks after operation, and it keeps the patients safe for those with severe complications [3],[5],[9],[10].

Results and complications.

Our average duration of surgery was 90.75 minutes, ranging from 70 minutes to 180 minutes. The average length of surgery, according to Le Loc was 135 minutes, Dang Viet Dung was 168.30 minutes, Aawsaj was 132.45 minutes, Isla was 152.40 minutes. High priority is to take the stone obstructed out and to restore the flow of bile for the case of infection. Long duration to remove the stones could cause the aggravating infection. Furthermore, the surgery duration long would increase the anesthesia duration for patients, and put them at high risks, especially for the elderly patients or those in the severe group from the beginning. [3],[5],[8],[12].

No mortality was in our series, the rate of remaining stones was in 15.67%. In It was 6,8% in report of Dang Viet Dung, Le Loc in 9%, Gigot was 4%, Aawaj was 3.4%, Geidie was in 6.47%. For complicated cholelithiasis, the operation time prolonged was unnecessary. In our series there were higher than others because the stones were removed through Kehr's tunnel after 3 weeks for those with leftover stones on cholangiography. This ensured the safety for our patients [3],[5],[8],[10],[11].

V. Conclusions

Laparoscopic cholecystectomy, opening the bile duct for gravel and Kehr's drainage in treatment of complicated cholelithiasis are safe and effective procedures.

The rate of complete stone removal was 70/83 or in 84.33%, an average duration of surgery was 90.75 minutes, intra- and postoperative complication rate were low. There was a good outcome in cases of combination removing stone through Kehr's tunnel.

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