ARTICLE
Analysis of 87 Cases of laparoscopic Choledochotomy with Primary Suture
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ABSTRACT
To investigate the feasibility and clinical effect of laparoscopic choledochotomy for primary suture of bile duct. Methods: There were 190 cases of cholecystolithiasis with choledocholithiasis. They were randomly divided into endoscopic group and open group. In the endoscopic group, 87 patients underwent laparoscopic choledocholithotomy and primary bile duct suture. A total of 103 patients in open group were treated with open bile duct incision and T tube drainage. The operative time, intraoperative blood loss, postoperative ventilation time, hospital stay and postoperative complications were compared between the two groups. Results: The length of hospital stay, the amount of bleeding during operation and the time of postoperative ventilation were less than those in open group. The operation time was longer than that in open group, P <0.01. There were 0 cases of postoperative incision infection, 2 cases of bile leakage and 1 case of residual stone in endoscopic group. The incidence of complications was 5.7%. The open group was 5, 3, 3 and 10.7% respectively. Comparison of complications between the two groups, P<0.01. Conclusion: Select the right case strictly, Laparoscopic and choledochoscopy combined with cholecystolithiasis is effective, safe and minimally invasive, short hospitalization time and less complications.

1. Introduction
Gallstone with choledocholithiasis is more common in clinic, the incidence rate is 10%~18%^{[1]}. In the past, open cholecystectomy plus common bile duct exploration and T tube drainage were performed in many cases. But the traditional operation has the disadvantages of large trauma, long hospitalization time, long T tube carrying time, and need secondary hospitalization treatment. With the development of minimally invasive surgery, new requirements for minimally invasive treatment of choledocholithiasis are put forward. Laparoscopic common bile duct exploration (LCBDE) has the advantages of small trauma, quick recovery, less complications and no damage to papillary sphincter function^{[2]}. From July 2015 to July 2016,190 cases of cholecystolithiasis complicated with choledocholithiasis were treated by laparoscopy and laparotomy.

2. Clinical data
2.1 General Information
Of 190 patients, Male 109, 81 women, Age 26~83, Average age 56.3±17.4 years. All of them were confirmed by

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color Doppler ultrasound or magnetic resonance imaging. Imaging data showed cm,0.8–2.4 diameter of common bile duct Average cm,1.4 Liver function showed total bilirubin mean 29.6±16.2 umol/L. Of all the patients, 42 had hypertension. With 38 cases of diabetes, the basic diseases were well controlled before operation.

2.2 Diagnostic Methods

The diagnosis of cholecystolithiasis with choledocholithiasis was confirmed by B ultrasound and CT or MRCP examination. Inclusion criteria: have the clinical symptoms and signs of cholecystolithiasis with choledocholithiasis; diagnosis of cholecystolithiasis with choledocholithiasis by B ultrasound, CT or MRI pancreatic bile duct imaging; normal or mild abnormal liver biochemical indicators. Exclusion criteria: severe cardiopulmonary disease, acute severe cholangitis, acute pancreatitis, intrahepatic cholelithiasis, choledochal and duodenal neoplasms, cirrhotic portal hypertension, and previous upper abdominal open surgery, with other surgical contraindications.

2.3 Methodology

2.3.1 Surgical Procedure

Three-hole or four-hole puncture and insertion of laparoscopic instruments were performed in the endoscopic group. Dissecting the gallbladder triangle. Identify the relationship, Conventional cholecystectomy is placed on the right liver. After the puncture confirmed the choledochus, Two traction lines at the anterior wall of the common bile duct, From the inferior foramen of the xiphoid process and from the puncture sheath of the right foramen of the abdominal wall, Cut the anterior wall of the common bile duct between the two leads about 1-1.5 cm (depending on the size of the preoperative MR stone). To remove bile, The choledochoscope was inserted through the puncture of the sword process, Take all the choledocholithiasis and Oddis sphincter. No residual stones, No tumor, Oddis sphincter works well, the stone net basket smoothly into the duodenum. The bile duct incision was sutured with 4-0 absorbable suture. 1.5-2 mm, needle 2 mm. margin After the suture, To observe the bile leakage in the bile duct incision, There’s a leak, plus eight words, routine spraying of biological protein glue on bile duct wall incision. A peritoneal drainage tube was routinely placed in a Winslow hole, From the right ventral orifice, External fixation, Take out the gallbladder, Routine surgery. The open-abdominal group was treated with traditional open-abdominal surgery: after general anesthesia, the right upper abdominal subcostal oblique incision was taken for routine cholecystectomy + the common bile duct was cut to take stone + T tube drainage.

2.3.2 Observation Index

The operation time, intraoperative blood loss, postoperative ventilation time, hospitalization time and postoperative complications were compared between the two groups.

2.3.3 Statistical Methods

Using SPSS13.0 statistical software. Measurement data expressed in x ± s using t tests; counting data using x² Inspection. P ≤0.05 was statistically significant.

3. Results

Both groups were successful, No cases of death or conversion to laparotomy. Length of hospitalization (10.30±2.40) d, operative time (120.35±17.15) min, intraoperative bleeding (15.20±7.50), postoperative ventilation (31.50±8.20) h: The open group was (17.30±5.60) d, operative time (89.50±12.35) min, intraoperative blood loss (80.50±20.30), postoperative ventilation time (48.52±10.46), P <0.01. See the table below. There were 0 cases of postoperative incision infection, 2 cases of bile leakage and 1 case of residual stone in endoscopic group. The incidence of complications was 5.7%(3/87); 5.3, 5.3 and 10.7%(11/103) in the open group; Comparison of complications between the two groups, P <0.01.

Table 1. Comparison of the two surgical methods (x ± s)

|                  | Endoscopic group | Open abdomen |
|------------------|------------------|--------------|
| Hospital stay (d) | 10.3±2.40        | 17.30±5.60   |
| Duration of surgery (min) | 120.35±17.15 | 89.50±12.35  |
| Intraoperative bleeding (ml) | 15.20±7.50 | 80.50±20.30  |
| Postoperative ventilation time (d) | 31.50±8.20 | 48.52±10.46  |
| P values         | <0.01            | <0.01        |

4. Discussion

Gallstone with choledocholithiasis is a common clinical disease. Most primary hospitals deal with this disease by open cholecystectomy + choledochotomy, exploration and lithotomy, and T drainage. This procedure has been the gold standard for the treatment of this disease, the operation is safe and reliable, can effectively drain the infected bile, reduce bile duct pressure, prevent bile leakage, and facilitate the postoperative treatment of residual stones. But after all, open surgery trauma, patient pain, postoperative recovery is slow, and the retention of T tube will
also lead to bile loss, water and electrolyte balance disorder, biliary retrograde infection and other complications. Patients with poor compliance may even have problems such as T tube shedding and rupture due to the long time of indwelling T tube, and patients need to be hospitalized again for T tube angiography or choledochoscopy, which increases the pain of patients and increases the cost of medical treatment. The results also showed that the bleeding volume, ventilation time and hospitalization time were significantly higher than those of endoscopic surgery.

With the development of minimally invasive surgery, the treatment of cholecystolithiasis with choledocholithiasis has changed from open cholecystectomy and choledocholithotomy to multi-mirror combined minimally invasive method [1]. These include a variety of combinations of laparoscopy, choledochoscopy and duodenoscopy. The common combinations were: 1 Laparoscopic cholecystectomy (LC) combined with retrograde cholangiopancreatoscopy (ERCP)+Oddis sphincterotomy (EST); ERCP+EST stone removal during 2 LC operation; 3 LC+laparoscopic common bile duct exploration (LCBDE). An indwelling T tube drainage or a primary suture; There are even three-mirror combined treatment of cholecystolithiasis with choledocholithiasis.

During the past 30 years, with the development of EST technique, more and more complications have been recognized. His recent complications include acute pancreatitis, acute cholangitis, gastrointestinal bleeding, duodenal perforation, etc. The long-term complications are mainly surgery to cut off the Oddis sphincter, resulting in permanent loss of its function, resulting in intestinal fluid reflux to the pancreaticobiliary duct, increase the recurrence rate of choledocholithiasis [4] And even bile duct epithelium [5]. Therefore, EST clinical selection should be careful.

Laparoscopic cholecystectomy plus common bile duct exploration is the best method to treat cholecystolithiasis secondary choledocholithiasis with minimally invasive technique. There are two treatment methods after LC+LCBDE, one is indwelling T tube drainage, the other is bile duct primary suture. After laparoscopic indwelling T tube also has its drawbacks, that is, sinus formation is difficult, prone to bile leakage after extubation, the need for emergency surgery again. The incidence of postoperative complications was significantly higher than that of patients with bile duct suture [6] and the indwelling T tube drainage after laparoscopic surgery is also contrary to the minimally invasive concept of endoscopy. Therefore, on the basis of selecting suitable patients, the first stage bile duct suture was adopted.

It is self-evident that endoscopic surgery is less traumatic and faster than traditional open surgery, regardless of intraoperative bleeding, hospital stay, postoperative ventilation time, endoscopic surgery is better than open surgery. And in terms of complications, our study showed that the incidence of postoperative complications was significantly higher in the endoscopic group of 3 cases and the open group of 11 cases. The results showed that laparoscopic cholecystectomy plus choledochal exploration and bile duct primary suture did not increase the incidence of postoperative complications and had obvious advantages in minimally invasive surgery.

Hence, we believe that for suitable cases, laparoscopic cholecystectomy plus common bile duct exploration, bile duct primary suture will replace open cholecystectomy plus common bile duct exploration, T tube drainage as a new standard for the treatment of cholecystolithiasis with common bile duct stones.

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