

Technique for laparoscopic choledochoduodenostomy

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Abstract

Three patients underwent laparoscopic choledochoduodenostomy for the treatment of obstructive jaundice. One had benign cause but the other two had malignant causes of obstruction. The mean operative time of solely choledochoduodenostomy was 96.67 minutes. On the basis of open procedure, our two techniques under laparoscopic control are to be suggested ; (1) After cystic duct has been tied and the gallbladder is freed from its bed, the gallbladder is then pulled upward and cephalad direction. Its greatest use is in better exposure of common bile duct and duodenum., (2) Regarding posterior row of side - to - side choledochoduodenostomy, tying a single knot at the apex of the choledochotomy and the medial portion of the duodenostomy should be recommended before a continuous suturing is made along the posterior and anterior walls of this anastomosis.

บทคัดย่อ

Technique for laparoscopic choledochoduodenostomy

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ผู้ป่วย 3 คนได้รับการผ่าตัด laparoscopic choledochoduodenostomy เพื่อรักษาอาการดีซ่าน เนื่องจากการอุดตันทางเดินน้ำดี (obstructive jaundice) ผู้ป่วยหนึ่งราย มีสาเหตุมาจากนิ่วในทางเดินน้ำดี, อีกสองรายมีสาเหตุมาจากมะเร็งในทางเดินน้ำดี เวลาที่ใช้ในการผ่าตัด เฉลี่ยประมาณ 96.67 นาที มีข้อเสนอแนะในการใช้วิธีผ่าตัดแบบนี้คือ (1) หลังจากผูก cystic duct ให้เลาะถุงน้ำดีออกจากตับ เพื่อใช้ถุงน้ำดีเป็นตัวสำหรับดึงไปทางด้านบนและคล้อยไปทางด้านหลัง เพื่อที่จะเห็น common bile duct และ duodenum ได้ชัดเจน (2) ในช่วงที่ทำผ่าตัด side to side choledochoduodenostomy, ทางด้านแนวหลังให้เย็บและผูก ทางด้านยอดบนของ choledochotomy และด้านในของ duodenostomy ก่อนที่จะทำการเย็บทางแนวด้านหน้าและด้านหลังของรอยต่อ

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Introduction

Undoubtedly, laparoscopic cholecystectomy has been the treatment of choice for gallstones and related complications¹. 10 % to 15 % of patients with cholelithiasis have concomitant choledocholithiasis^{2,3}. Although the best treatment of choledocholithiasis is to perform preoperative endoscopic sphincterotomy and stone extraction⁴, some cases with numerous stone or markedly dilated duct are usually fail to achieve ductal clearance due to its pathology⁵. Both of these problems suggest an underlying biliary motility disorder⁶. On this occasion, choledochoduodenostomy under laparoscopic control has been usually recommended for benign strictures of the distal bile duct or unremovable stones. Side-to-side choledochoduodenostomy is a safe and easy to perform operation which carries very lower morbidity, mortality and recurrent rate of choledocholithiasis⁷.

Surgical technique

The patient is put on the supine position with tilted 30° upward on the right side. The site and size of ports for camera and necessary instruments are demonstrated on Fig. 1a for cholecystectomy and on Fig. 1b for choledochoduodenal anastomosis. Standard laparoscopic cholecystectomy is performed in the same procedure except disconnection of cystic duct. Freeing from its bed, the gallbladder is then tracted upward and cranially (Fig. 2). With regard to this technique, we could expose the duct and duodenum. After Kocher maneuver, the anterior wall of the duodenum could be folded over the common bile duct (CBD) under little tension. Our technique is to utilize the existing vertical incision in the common bile duct in its distal third and make a longitudinal incision in the lateral wall of duodenum. With interrupted sutures at the apex of choledochotomy and the medial portion of the duodenostomy prior

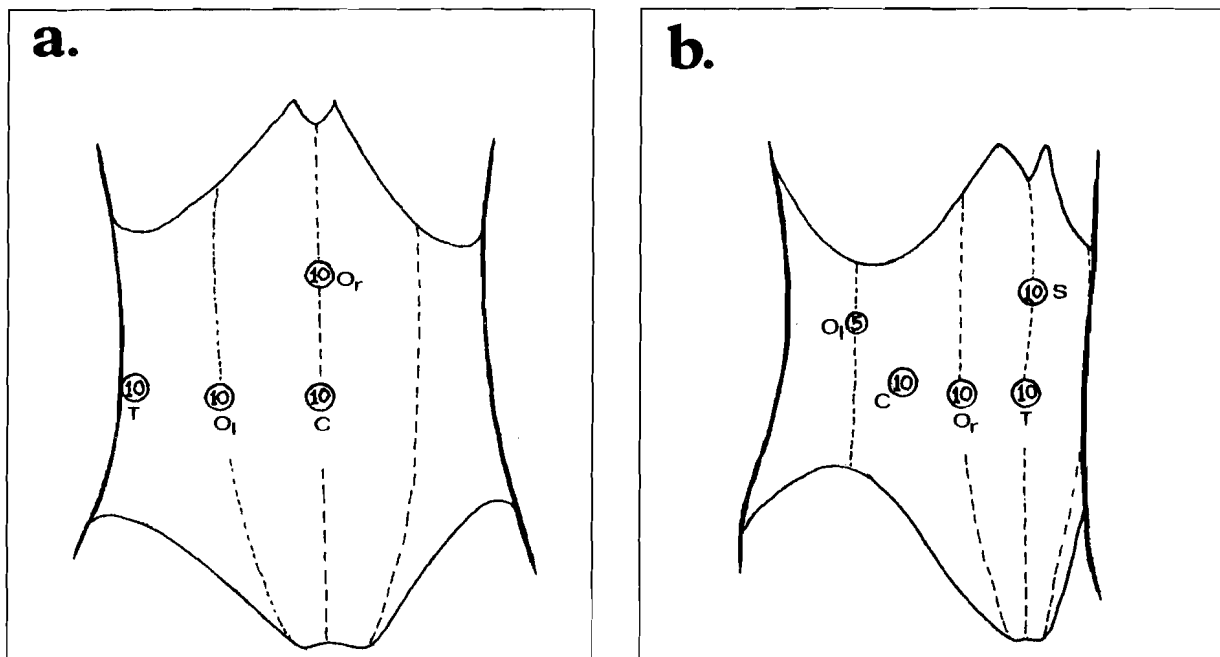


Fig. 1. The sitse of ports are shown, a. sites of port performing a cholecystectomy. b. sites of port performing a choledochoduodenostomy. C = camera port., O = two - O are two - handed operators, l = left and r = right, T = traction of the gallbladder, S = assisted instruments : suction, grasper.

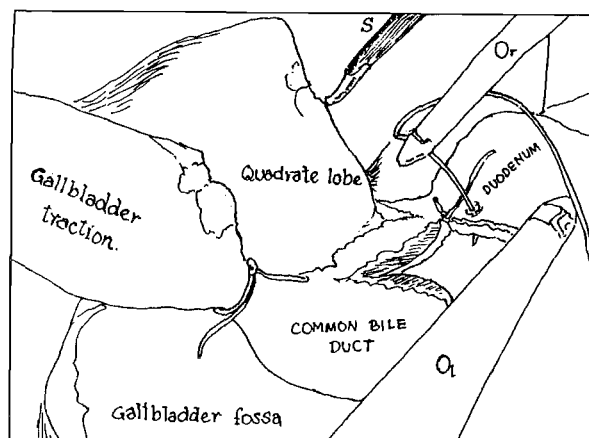
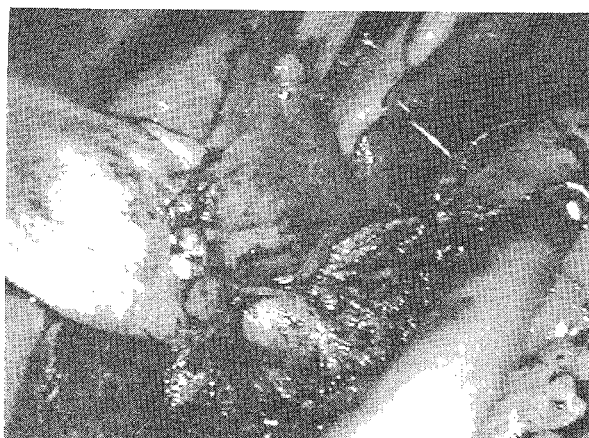


Fig. 2. The highlight of personal technique : Gallbladder traction during performing an anterior row of the anastomosis.

to running a continuous 2-0 silk suture along to inner posterior layer, we have found, however, a better visualization of the apex after starting a continuous suture laterally. The size of anastomosis is 2.0 to 2.5 cm. It is helpful in these procedures to place the 0° camera in the anterior axillary port, using the lateral umbilical port as well as mid - axillary port, for

suturing. The standard subxiphoid port is placed for suction or retraction instrument. The umbilical port is placed by the grasper for traction the gallbladder in an upward and cephalad direction (Fig. 1b). Perhaps, small stones are brought from the common duct to the lumen of duodenum. Following completion of the inner layer, the duodenum is rolled on top of the bile duct and a final outer anterior layer of continuous size 2-0 silk suture is placed to make a watertight anastomosis (Fig. 2). A radiovac drain is in place.



Fig. 3. Postoperative retrograde cholangiogram in Patient 1 revealed minimal leakage of contrast media from the posterior row of the anastomosis.

Case report

Patient 1

A 39 - year - old woman with a history of chronic intermittent abdominal pain was admitted in our department for investigation of acute cholangitis. Ultrasonographic study revealed 3 cm CBD with multiple large stones. Endoscopic retrograde cholangiopancreatography (ERCP) showed dilated CBD with stone impaction at the middle part of the duct. On October 31, 1995, laparoscopic cholecystectomy was performed with difficulty due to chronic inflammation. After completion of cholecystectomy, we performed a choledochoduodenostomy under laparoscopic

control. She had biliary leakage via drain and fistula was demonstrated on retrograde cholangiogram (Figure 3). The fistula was spontaneously closed on postoperative day 7.

Patient 2

A 54 - year - old woman had a history of acute cholangitis for two months. Computer tomography revealed 4 cm CBD with two large stones located at the proximal and distal bile duct. Unsuccessful ERCP was due to narrowing duodenal lumen. Laparoscopic cholecystectomy and biopsy of nodular mass on the gallbladder wall. Since we had benign chronic inflammation as a result of frozen section choledochoduodenostomy was then performed under laparoscopic control for the treatment of obstructive jaundice. Her postoperative condition was unevenful. She refused to have further operation done for removing the CBD due to some discredited adenocarcinoma found from the CBD pathology. Three months later, she presented with a clinical of duodenal obstruction with patency of choledochoduodenostomy.

Patient 3

A 50 - year - old woman presented with a history of one - month obstructive jaundice. Physical examination revealed an ill - defined mass at her epigastrium. Serum alkaline phosphatase was 3177 U/L, and serum total bilirubin level was 34.9 mg % Computer tomography study revealed 4-cm mass at the head of pancreas, causing the biliary obstruction. Bilateral intrahepatic dilatation were found and common bile duct was 2.8 cm in diameter. Multiple liver metastasis were also demonstrated in both lobes of the liver. She had laparoscopic cholecystectomy and choledochoduodenostomy

performed without any complication. Her post-operative course was uneventful.

Discussion

With the advent of laparoscopic cholecystectomy and its wide acceptance by many surgeons, the problem of managing choledocholithiasis has taken on a new perspective^{2,4}. Although the modality of ERCP with or without sphincterotomy has played a major role of preoperative treatment of CBD stones during the era of laparoscopic intervention, sometimes opening the CBD for diagnosis of definite treatment of a given CBD disease is necessary⁷. These patients with a difficult approach to the sphincter include patients with prior gastric surgery, a difficulty sphincter cannulation, and a sphincter sitting high in a duodenal diverticulum^{2,5}. It should again be the responsibility of general surgeon to handle these problems with minimally invasive surgical approaches.

A choledochoduodenostomy is one of necessity for a surgeon to choose this option, if indicated. In order to perform any procedures on the CBD that is currently being done open, a laparoscopic surgeon should follow the same principle of surgery. As a result of retrospective reviews, several authors have suggested that more than five stones or a CBD greater than 1.5 cm in diameter are reasonable indication⁶⁻⁹.

As in an open procedure, a laparoscopic choledochoduodenostomy is an anastomosis between a vertical incision of the CBD and a longitudinal incision of the duodenum¹⁰. With an adequate visualization of the anterior surface of the CBD by traction upward and cephalad direction of the gallbladder, we properly access to these two inverted T-shape incisions. Whereas

someone grasped the cystic duct and elevated it resulting in adequate exposure of anastomotic area¹⁰. Using the gallbladder as a traction is extremely helpful and greatly speed the procedure because we enable to stabilize the operating site by fixation with the holder of grasper. Moreover, most cases with chronic benign obstruction of the CBD usually have a thick and fibrotic gallbladder, utilizing a strong and firm traction. After completion of Kocher maneuver, the anterior wall of the duodenum can be folded over the CBD, rendering construction of anastomosis without tension.

Suturing at the apex of choledochotomy and the medial portion of duodenostomy is considerably difficult since starting a suturing process on either lower lateral wall of choledochotomy would hide this vulnerable point, resulting in leakage postoperatively as shown in Patient 1 (Fig. 3). Therefore, it is helpful to perform suturing this first stitch prior to suturing process the inner posterior row of this anastomosis.

In the near future, gastroenterologists refer difficult cases to surgeons, particularly those cases with difficult ERCP or very large impacted stones¹¹. This complex problems involved in handling CBD stones will be treated by a multitude of new procedures as well as new techniques. The extension of these principles to laparoscopic surgery includes intraoperative cholangiogram, laparoscopic choledochotomy with formal CBD exploration and bypass procedure. Laparoscopic choledochoduodenostomy is one of standard procedures which is necessary for general surgeons to improve their skills to perform in a

safe and efficacious manner. This method has been utilized by some authors¹² in cases of malignant obstruction especially in severely debilitated elderly patients. However, the advantages to patients are obvious, but we need to acquire the laparoscopic skills to perform the same procedures on the CBD as open technique.

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