

# The Timing of Laparoscopic Cholecystectomy for Patients with Acute Biliary Pancreatitis

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**ABSTRACT Objective:** To explore the feasibility and timing of laparoscopic cholecystectomy (LC) for patients with acute biliary pancreatitis (ABP). **Methods:** Clinical information of 38 patients with ABP treated by LC were retrospectively studied. **Results:** The 38 patients initially received non-surgical conservative treatment for 3~15d, and then were treated by LC when the clinical symptoms and signs nearly disappeared, and urinary amylase and serum amylase levels almost returned to normal. The operating time ranged from 30min to 90min (mean 60min) without conversion and serious complications. And the 38 cases showed no recurrence during postoperative follow-up of 6 months to 56 months. **Conclusions:** The treatment of ABP by LC is feasible and effective when the patients' clinical symptoms and signs nearly disappear, and urinary amylase and serum amylase levels almost return to normal. Patients with ABP constitutes 50%~70%<sup>[1]</sup> of acute pancreatitis cases in China. Treatment of gallstones depends on the severity of pancreatitis and whether the patient has obstructive jaundice and cholangitis. For the treatment of non-obstructive biliary pancreatitis, it is still controversial that whether the early definitive surgery should be performed. The 38 patients with ABP treated by LC (Feb., 2004-Apr., 2009) achieved satisfactory effect in our hospital. Details are as follows.

**Key words:** Pancreatitis/Surgery; Cholecystectomy, Laparoscopy; The Timing of surgery

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## 1 Clinical information

### 1.1 General information

The ages of 38 patients (25 men, 13 women) ranged from 22 to 68 (mean 45.0±11.5). All the cases were first seizures, and the courses of disease prior to admission were 5~82h (mean 16±12.1). All patients suffered from pain in the upper abdomen, nausea, vomiting and abdominal distention, etc. 21 patients had fever, with 17 patients' temperature above 38°C and 6 patients' temperature above 39.5°C. All showed tenderness of upper abdomen, with 27 bearing mild or moderate rebound tenderness and abdominal rigidity; 10 had jaundice; 13 indicated Murphy sign. 28 had history of gallstones; 9 had hypertension.

### 1.2 Auxillary examinations

Serum amylase: 120~3600u/L, urinary amylase: 860~9600u/L; AST: 30~310u/L, ALT: 28~320u/L; 10 patients were being accompanied with jaundice(26.3%); 14 patients were WBC > 15×10<sup>9</sup>/L; 18 patients were high level of glucose (47.4%). Imaging examinations: gallstones were confirmed by trans abdominal ultrasonography. Abdominal CT suggested swelling of tail and body of pancreas with even density, and a small amount of hydrops surrounding the pancreas was found in 13 cases. MRCP had been performed for all patients before surgery, and the results showed: mildly enlarged pancreas; slightly expanded pancreatic

duct; no or slightly dilated common bile duct; no obvious stones or obstruction in the common bile duct.

### 1.3 Diagnostic criteria

All cases meet the diagnostic criteria by surgical pancreatic group of Chinese Medical Association (CMA) in 1997 as follows: I. the history of gallstones and/or occurrence of biliary colic prior to onset of illness; II. tenderness, muscle tones and rebound tenderness; III. Obviously raised levels of urinary amylase and serum amylase; IV. STB > 40u/L; or AKP > 225u/L or ALT > 75u/L; V. Ultrasonography and CT showed gallstones, cholangiolithiasis with obstruction, choledochectasia and acute pancreatitis; VI. Other reasons to cause pancreatitis (alcoholic, hypercalcemia, hyperlipidemia, trauma, etc.) can be excluded. According to the APACHE II scale scores after admission to hospital, mild or severe pancreatitis can be distinguished (Severe pancreatitis: ≥ 8; mild pancreatitis: < 8). Among the 38 patients, 32 were mild, and 6 were severe.

### 1.4 Treatment

**1.4.1 Routine treatment** Once admitted, patients firstly got conservative treatment as follows: being inhibited from drinking water; gastrointestinal decompression; usage of antibiotics which is able to penetrate blood-pancreas barrier; using drugs to inhibit secretion of pancreatic juice and activity of pancreatin; improving microcirculation, maintaining balance of water and electrolytes; symptomatic and supportive treatment, and taking pancreatitis-clearing decoction (Chinese medicine).

### 1.4.2 Operative treatment

**1.4.2.1 The proper time of surgery:** I. when symptoms of pancreatitis nearly disappear, such as fever, vomiting (probably being ac-

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companies with slight localized tenderness, but without muscle tone or rebounded tenderness), and when the anus had evacuated and defecated; II. When liver function returned to normal; III. when urinary amylase and serum amylase levels decreased to normal, or they were not more than twice of upper limit; IV. ultrasonography and CT showed that swelling of the pancreas relieved obviously or disappeared.

1.4.2.2 Operative method The operations were done under general anesthesia by three-port or four-port technique. Liver, gallbladder, common bile duct, pancreas and its surroundings, adhesions and exudation of peritoneal cavity were observed before the surgery. An antegrade and retrograde approach were combined to remove the gallbladder. The common bile duct was firstly occluded to prevent stones from dropping into it. Then cystic duct was cut off after ampulla was definitely confirmed and the relationship between cystic duct and common bile duct were identified. And drainage tubes of peritoneal cavity was placed when necessary. The pancreas was treated according to the severity of pancreatic. If imaging before surgery showed obvious swelling of pancreas, bleeding and necrosis, excessive exudation of its surroundings in celiac exploration, and omentum saponification, the gastrocolic ligament should be opened; exudation in omental bursa was sucked to reveal pancreas completely and the capsule of pancreas was opened to decompress, then necrotic tissue was cleaned; pancreas was donched by a large amount of physiological saline and multi-hole drainage ducts was put in superior and inferior margins and tail of pancreas, left and right paracolic sulci, pelvic cavity, omental foramen, etc. 14 patients with the diameter of common bile duct above 9 mms by ultrasonography, or with extension of common bile duct and thicker cystic duct were suspected with obstruction of bile duct. There was no obvious obstruction when intraoperative cholangiography (IOC) or laparoscopic trans-cystic common bile duct exploration (LTCCBDE).

## 2 Results

The patients' symptoms were almost eliminated, with their WBC  $< 12 \times 10^9/L$  and their urinary and serum amylase levels nearly reduced to normal (no more than twice of upper limit), After 3~15d (mean  $8 \pm 3.1d$ ) of conservative treatment, then all received LC successfully. For the 14 cases which were suspected with obstruction of bile duct, 12 cases which underwent intraoperative cholangiography (IOC) and 2 underwent laparoscopic trans-cystic common bile duct exploration (LTCCBDE), none showed obvious evidence of obstruction. There was no conversion to open, and the amount of bleeding was about 20~125ml. The mean operating time was 60 (range 30-90) minutes. Postoperative hospital stay was 7~13d without severe complications. 2 patients with serious celiac adhesions suffering from bile leakage after surgery recovered by conservative treatment. There was none of recurrence in follows-ups of 6~56 months after surgery.

## 3 Discussion

ABP is the most common kind of acute pancreatitis, and gallstones are the important trigger of ABP. (The pathogenesis of acute biliary pancreatitis is attributed to the gallstones passing the common channel of bile duct and pancreatic duct, which causes edema and spasm of Oddi and reflux of bile and duodenal content into the pancreatic duct activating pancreatic enzymes.) Early surgery has been advocated for ABP with biliary obstruction and cholangitis, but the patient without biliary obstruction should be given conservative treatment of internal medicine for AP, and then be treated for biliary problem after relief. However, it is still controversial that whether non-obstructive ABP should undergo early definitive surgery, and there are various viewpoints on the timing of operation for non-obstructive biliary pancreatitis, including early, delayed and late surgery. Kelly<sup>[2]</sup>, et al. reported that 84%~94% of ABP patients' gallstones spontaneously passed from Oddi sphincter to bowels, thus delayed surgery can avoid unnecessary exploratory surgery of biliary duct. Zaide Wu reported that it's better to do the surgery after 2~4 weeks of conservative treatment<sup>[3]</sup>. But there are some domestic scholars<sup>[4]</sup> claimed the operation should be performed within 3 days after the onset of illness. However, Sanabria, et al.<sup>[5]</sup> reported there was no difference between early and delayed surgery in operation time, complicating common bile duct calculi, death and time of post-operative hospitalization, and there was no recurrence of pancreatitis in follow-ups. We have found that the timing of the surgery needn't be limited too strictly, and the choice of the case and individualization of operative time are the keys to guarantee the success and safety of the surgery. In our study, after 3~15d of conservative treatment for the 38 patients, their symptoms of pancreatitis were almost eliminated (probably accompanying with localized slight tenderness, but without muscle tones or rebound tenderness), with no fever, no vomiting, defecation or wind of anus, normal liver function, normal urinary amylase and serum amylase levels. And if ultrasonography and CT showed that swelling of the pancreas had relieved obviously or disappeared, surgery could be done. The reasons are as follows: there is no obvious inflammation of pancreas or gallbladder; despite edema of gallbladder and its surroundings, it's easier to separate adhesions and circumvolution. Therefore, surgical difficulty is reduced; the recovery time is shortened; the incidence of recurrent attacks of ABP and hospital expenses are also decreased. However, if deferring the time of operation was emphasized too much, it will increase the rate of recurrence and readmission of ABP. Hua Qiao, et al.<sup>[6]</sup> reported that relapse rate of ABP reaches the highest point within 6~8 weeks after the first onset, and the more times it recurs, the more possibility of the severe pancreatitis will be developed.

Laparoscopic cholecystectomy is the gold standard treatment to prevent from recurrence of ABP<sup>[7]</sup>. But there are still some

points to pay attention to: I. Strictly choosing a case according to the standard, and performing a preoperative MRCP as soon as possible to exclude obstruction of bile duct. MRCP was performed before surgeries for all patients in our group, and during the operation, there was no obstruction of bile duct; II. Rational conservative treatment before surgery is necessary, because doing the surgery too early will increase the risk of changing into hemorrhagic necrotizing pancreatitis, and doing it too late will increase the possibility of recurrence; III. During the operation, if surgeons find obstruction of bile duct, intraoperative cholangiography (IOC) or laparoscopic trans-cystic common bile duct exploration (LTC-CBDE)<sup>[8]</sup> should be performed based on the situation to avoid relapse. 14 patients with the diameter of common bile duct above 9 mms by ultrasonography, or with extension of common bile duct and thicker cystic duct in the group were suspected with obstruction of bile duct. There was no obvious obstruction when we were performing intraoperative cholangiography (IOC) or laparoscopic trans-cystic common bile duct exploration (LTCCBDE). There was no recurrence of ABP by follow-ups after surgery; IV. If the inflammation of tissues is severe, we should examine Calot's triangle carefully, and we can place drainage tubes to observe that whether there are postoperative complications of bleeding, bile leakage, etc. in peritoneal cavity. 2 patients in our group who have serious celiac adhesions with bile leakage after surgery recovered by conservative treatment.

In conclusion, for the ABP patients, if we can select the cases carefully, and handle the necessary perioperative treatment, it's feasible and effective to do early LC.

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# 急性胰腺炎患者腹腔镜胆囊切除术的时机研究

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**摘要** 目的 探讨急性胰腺炎腹腔镜胆囊切除术的有效性及时机。方法 分别对患有急性胰腺炎而进行腹腔镜胆囊切除的 38 例患者的临床信息进行了研究。结果 首先对 38 例病人进行了 3~15 天非手术的保守治疗, 当临床症状和表征基本消失, 血、尿中的淀粉酶接近正常水平时, 进行胆囊切除。手术时间为 30 分钟到 90 分钟(平均时间 60 分钟), 手术中无转化和严重并发症症状发生。对这 38 例病人随访 6 到 56 周后无复发现象发生。结论 当临床症状和表征基本消失, 血、尿中的淀粉酶接近正常水平时, 急性胰腺炎腹腔镜切除术是有效且可行的。在中国患有急性胰腺炎的患者中, 进行腹腔镜胆囊切除的占 50%~70%<sup>[1]</sup>。胆结石治疗取决于患者胰腺炎的严重性, 及患者是否患有梗阻性黄疸。对于非梗阻性胰腺炎的患者, 早期是否要进行明确的手术治疗尚无定论。我院患有急性胰腺炎的 38 例患者进行腹腔镜胆囊切除术(2004 年 2 月到 2009 年 4 月之间)后取得了满意的效果。详情如下。

**关键词** 胰腺炎 / 手术 胆囊切除术 腹腔镜 手术时机

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