LESS

Original Article

Laparosc Endosc Surg Sci 2022;29(4):211-214
DOI: 10.14744/less.2022.03779

The role of preoperative MRCP in interval laparoscopic cholecystectomy after biliary pancreatitis and acute cholecystitis

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ABSTRACT

Introduction: Early or at the same hospitalization laparoscopic cholecystectomy (LC) is recommended for acute calculous cholecystitis and biliary pancreatitis. Interval cholecystectomy is planned for patients who cannot undergo early or in same hospitalization cholecystectomy. We examined the role of pre-operative magnetic resonance cholangiopancreatography (MRCP) in interval LC.

Materials and Methods: Twenty-three patients aged between 45 and 70, who underwent interval LC after biliary pancreatitis or acute cholecystitis, had no history of endoscopic retrograde cholangiopancreatography, had no abnormality in laboratory tests and underwent pre-operative MRCP in our hospital between April–June 2022, were retrospectively analyzed. Patients who did not have recurrent biliary pancreatitis/acute cholecystitis/cholangitis attacks during the waiting period but who admitted to the hospital with mild complaints such as biliary colic-nausea or asymptomatic patients were included.

Results: Fourteen patients were female and nine patients were male, mean age was 62.5 years. Thirteen patients had a history of acute cholecystitis and ten patients had a history of biliary pancreatitis. During the waiting period, five patients after acute cholecystitis and four patients after biliary pancreatitis received symptomatic treatment. All patients underwent pre-operative MRCP. Choledocholithiasis was detected in pre-operative MRCP in two patients with a history of acute cholecystitis and in three patients with a history of biliary pancreatitis. It was found that three out of five patients with choledocholithiasis received symptomatic treatment in the emergency department with mild complaints. Cystic duct anatomical variation was detected in six different patients.

Conclusion: MRCP can reduce the incidence of LC complications and conversion rates. Pre-operative use of MRCP is controversial and criteria are needed for its indication. Interval cholecystectomy and biliary colic may be among them.

Keywords: Acute cholecystitis, Biliary pancreatitis, Interval cholecystectomy, Magnetic resonance cholangiopancreatography

Introduction

Gallstones are an important health problem especially in developed countries. About 10–15% of the adult population has asymptomatic gallstones, of which 20% become symptomatic. Complications such as acute cholecystitis, cholangitis or pancreatitis may develop in 1–4% of symp-

Received: 10.10.2022 **Revision:** 10.10.2022 **Accepted:** 25.11.2022
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tomatic patients.[1] Medical history, physical examination, liver function tests, and abdominal ultrasonography (USG) are standard methods in the diagnosis of patients with suspected gallstones. Laparoscopic cholecystectomy (LC) has been used as the gold standard since 1992 in the treatment of symptomatic cholelithiasis, acute or chronic cholecystitis, biliary dyskinesia, acalculous cholecystitis, gallstone pancreatitis and gallbladder mass or polyps.[1,2]

Choledocholithiasis may be asymptomatic or present with post-operative biliary leak, recurrent biliary attack, cholangitis and pancreatitis. Routine examination of common bile duct stones with abdominal USG may not provide an accurate and definitive diagnosis. Magnetic resonance cholangiopancreatography (MRCP) is the gold standard for the diagnosis of common bile duct stones by non-invasive examination of the bile duct and pancreatic duct. A safer LC procedure can be performed with pre-operative MRCP, which enables detailed examination of the biliary tract anatomy.[3]

In the current approach, early LC for acute calculus cholecystitis and LC at the same hospitalization for biliary pancreatitis is recommended.[4-6] Interval cholecystectomy is planned for patients who cannot undergo early cholecystectomy or cholecystectomy during hospitalization due to their clinical condition.[7,8] In our study, the role of pre-operative MRCP was evaluated in patients who did not have recurrent biliary pancreatitis/acute cholecystitis/cholangitis attacks and interval LC planned.

Materials and Methods

Twenty-three patients between the ages of 45 and 70, who underwent interval LC after biliary pancreatitis or acute cholecystitis in University of Health Sciences Sisli Hamidiye Etfal Research and Training Hospital Department of General Surgery between April and June 2022, were retrospectively analyzed. Patients who did not have recurrent biliary pancreatitis/acute cholecystitis/cholangitis attacks during the waiting period but who admitted to the hospital with mild complaints such as biliary colic-nausea or asymptomatic patients were included in the study. Patients with recurrent biliary pancreatitis/acute cholecystitis/cholangitis attacks, patients with a history of endoscopic retrograde cholangiopancreatography (ERCP), patients without pre-operative MRCP and patients with abnormal laboratory tests were excluded from the study. Demographic, laboratory, operative and perioperative data of the patients were recorded. This study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

Results

Of the 23 patients, 14 were female and 9 were male, mean age was 62.5 years. There was a history of acute cholecystitis in 13 patients and biliary pancreatitis in 10 patients (Table 1). Laboratory tests and physical examination of the patients were unremarkable. None of the patients had recurrent biliary pancreatitis/acute cholecystitis/cholangitis attacks during the interval cholecystectomy. During the waiting period before interval LC, five patients after acute cholecystitis and four patients after biliary pancreatitis were given symptomatic treatment in the emergency departments due to mild complaints such as biliary colic and nausea. All patients underwent pre-operative MRCP. Common bile duct stones were detected in pre-operative MRCP in two patients with a history of acute cholecystitis and three patients with a history of biliary pancreatitis, and LC was performed to these patients after ERCP (Table 1). It was observed that three of these five patients (one patient with acute cholecystitis and two patients with biliary pancreatitis) with choledocholithiasis received symptomatic treatment in the emergency department with mild complaints such as biliary colic and nausea. Apart from these, cystic duct insertion was found anatomically variable in six patients (two patients mid-posterior and four patients low-medial). The mean operation time was 25

Table 1. Distribution of patients according to first diagnosis at admission and gender

	Number of female patients	Number of male patients
Total number of patients	14	9
Acute cholecystitis	8	5
Common bile duct stones in MRCP preoperatively	1	1
Biliary pancreatitis	6	4
Common bile duct stones in MRCP preoperatively	2	1

min longer in patients with anatomical variation compared to other patients, and the mean operation time was calculated as 90 min. All patients were discharged on the 1st post-operative day without any complications.

Discussion

Acute cholecystitis and biliary pancreatitis are common medical conditions. 2018 Tokyo guidelines are used in the diagnosis and treatment of acute cholecystitis.[4] The timing of cholecystectomy differs in patients presenting with acute cholecystitis, and in the literature, "early" cholecystectomy is defined variably as cholecystectomy performed within 3, 7, or 10 days from the onset of symptoms. 2013 Tokyo guidelines recommended surgery to be performed within 72 h of the onset of symptoms. The updated 2018 Tokyo guideline states that performing cholecystectomy in patients, who have passed more than 72 h, have positive results, and early cholecystectomy is recommended in low-risk patients with acute calculous cholecystitis, regardless of the time passed after onset of symptoms.[4] The 2016 World Society of Emergency Surgery guidelines emphasized the recommendation for cholecystectomy within 10 days of symptom onset.[5] For patients with mild pancreatitis, cholecystectomy can usually be safely performed within 7 days after recovery and at the same hospitalization.[6]

There are studies in the literature suggesting routine common bile duct examination to rule out choledocholithiasis in patients with symptomatic cholelithiasis. In a prospective study involving patients undergoing LC for acute or chronic calculous cholecystitis, patients were divided into two groups.[3] In the first group, 45 patients underwent surgery after MRCP, and in pre-operative MRCP, two patients (4%) had asymptomatic common bile duct stone and two patients (4%) had anatomical variation of the cystic duct. In the second group, 55 patients underwent LC without pre-operative MRCP and post-operative complications were seen in a total of four patients including residual stone, post-operative bile leakage, jaundice, and pancreatitis. One patient with bile leakage was evaluated as an undetectable accessory cystic duct and the bile leakage closed spontaneously. The other patient had choledocholithiasis and ERCP was performed.[3] In other two studies, asymptomatic common bile duct stones were detected in 4% and 6% of patients who underwent routine MRCP before cholecystectomy, and MRCP was recommended as a screening method before LC.[9,10] However, Jendresen et al. reported that asymptomatic common bile duct stones were seen in less than 1% and did not recommend MRCP as a routine examination.[11] In our study, common bile duct stones were seen at a rate of 21%. Even if there is no patient with recurrent biliary pancreatitis/acute cholecystitis/cholangitis in interval cholecystectomy, there were patients who received symptomatic treatment with complaints such as biliary colic and nausea. The fact that it does not include only asymptomatic patients with choledocholithiasis may explain this rate. The referral of patients, who are generally predicted to have difficult cholecystectomy, to our hepatopancreatobiliary surgery department and the small size of our study group may be other factors.

In a prospective study with 402 patients who underwent cholecystectomy for cholecystitis and pancreatitis, routine pre-operative MRCP was performed and anatomical variations of the biliary tract were detected in 105 patients (26%).[12] Similarly, in our study, six of 23 patients had anatomical cystic duct variation.

The conversion rate in patients who underwent LC has been reported to be 5–10% in different studies.[13] Since the anatomical variations of the bile ducts that may cause difficult cholecystectomy or conversion to open surgery were revealed by pre-operative MRCP in our study, all operations were completed laparoscopically with an acceptable prolonged operation time.

Conclusion

MRCP is the gold standard non-invasive diagnostic method for the diagnosis of choledocholithiasis and biliary anatomical variations. Pre-operative MRCP can reduce the incidence of LC complications and conversion rates as it reduces the incidence of residual stones in the biliary tract and reveals the biliary tract anatomy in detail. Pre-operative routine use of MRCP is controversial and criteria are needed for its indication. Interval cholecystectomy and biliary colic may be among these criteria. Prospective and randomized studies with large size study groups are needed.

Disclosures

Ethichs Committee Approval: Sisli Hamidiye Etfal Research and Training Hospital (Date: 18.10.2022, Number: 2164).

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

Authorship Contributions: Concept – S.Ö.; Design – S.Ö., M.A.U.; Supervision – S.Ö., M.A.U.; Materials – S.Ö.; Data collection and/or processing – S.Ö., M.T.; Analysis and/ or interpretation – S.Ö., S.G.; Literature search – S.Ö., M.A.U., S.G.; Writing – S.Ö., M.A.U., M.T.; Critical review – S.Ö., M.A.U., M.T., S.G.

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