

Percutaneous cholecystostomy: A curative treatment modality for elderly & high ASA score acute cholecystitis patients

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ABSTRACT

BACKGROUND: Acute cholecystitis (AC) is a common emergency seen by general surgeons. Optimal treatment is laparoscopic cholecystectomy (LC); however, in cases where surgery cannot be performed due to high risk of morbidity and mortality, such as in elderly patients with comorbid diseases, other treatment modalities may be used. Percutaneous cholecystostomy (PC) is one alternative method to treat AC. PC can be used to provide drainage of the gall bladder and control infection. Subsequently, interval cholecystectomy can be performed when there are better conditions. Presently described is experience and results with PC in high risk, elderly patients with AC.

METHODS: Medical records of all consecutive patients who underwent PC between January 2011 and January 2014 were identified. Tokyo Guidelines were used for definitive diagnosis and severity assessment of AC. Senior surgeon elected to perform PC based on higher risk-benefit ratio due to comorbidity, age, or duration of symptoms. All PC procedures were performed by the same interventional radiologist under local anesthesia with ultrasonographic guidance.

RESULTS: Total of 40 PC procedures were performed during the study period. Of those, 22 (55%) were male and 18 were (45%) were female, with median age of 70.5 years (range: 52–87 years). All of the patients had American Society of Anesthesiologists classification of either 3 or 4. Success rate of PC was 100% with complication rate of 2.5% (n=1). One patient was operated on shortly after PC procedure due to bile peritonitis complication. PC drains were kept in place for 6 weeks. Total of 16 patients (40%) had surgery following removal of PC drain. In 3 (18.8%) cases, conversion from LC was required. Remaining 23 (57.5%) patients did not have subsequent operation after drain removal. No disease recurrence was observed in follow-up.

CONCLUSION: When elderly patients present in emergency setting with AC and LC cannot be performed due to comorbid disease or poor general condition, PC can be performed safely. After removal of PC drain, LC may be performed with acceptable conversion rate of 18.8%.

Keywords: Acute cholecystitis; ASA score; cholecystostomy; elderly.

INTRODUCTION

Acute cholecystitis (AC) is a disease seen frequently in gen-

eral surgery practice. It is a surgical disease treated by cholecystectomy whenever possible. In young and healthy patients, laparoscopic cholecystectomy (LC) has become optimal treatment procedure.^[1]

Cholecystectomy procedure has 10% operative mortality even in low operative risk patients. This rate increases 3-fold with high operative risk, elderly (65 years and older) patients.^[2,3] LC is preferred surgical technique for AC, but rate of conversion from LC to open cholecystectomy is high (11% to 28%)^[4] compared with elective LC (5%)^[5] in general population.

Percutaneous cholecystostomy (PC) has been described as

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safe alternative treatment option for AC in elderly or critically ill patients. A Cochrane Review published with a small, retrospective patient population analyzed the safety and efficacy of PC in elderly and critically ill patients. PC seemed promising according to results of this review, with success rate of 91% and procedure-related mortality of 0.4%. Overall mortality was found to be around 12.7% and overall complication rate was approximately 6.2%.^[6]

Presently described is a retrospective review and follow-up of prospectively collected data for patients who underwent PC for acute calculous cholecystitis in our hospital between January 2011 and January 2014.

MATERIALS AND METHODS

Medical records of all consecutive patients who underwent PC between January 2011 and January 2014 were identified. Study was reviewed and approved by institutional review board at Umraniye Training and Research Hospital. Tokyo Guidelines were criteria used for definitive diagnosis and severity assessment of AC.

On the basis of these criteria, definitive diagnosis of AC requires at least 1 local sign of inflammation in the right upper quadrant combined with at least 1 systemic sign of inflammation. If these clinical signs are present and AC is suspected, predefined set of radiological (ultrasonographic, computed tomographic scan, or hepatobiliary scan) findings suffices to establish diagnosis of AC.^[7]

All patients were hospitalized, nothing was given per oral, and antibiotic (third-generation cephalosporin) was administered. After sufficient resuscitation, anesthesiology and other consultations related to comorbid diseases were held. The American Society of Anaesthesiology (ASA) score of the patients was calculated and reported on anesthesiology preoperative evaluation forms.^[8]

PC was performed due to either comorbidity, age, or duration of symptoms. Decision to perform PC procedure was made by a senior surgeon based on risk-benefit ratio. All PC procedures were performed by the same interventional radiologist under local anesthesia with ultrasonographic guidance using 8-F pigtail catheter and Seldinger technique for transhepatic cholecystostomy.

Records of study participants were subsequently reviewed for baseline patient characteristics, baseline procedural factors, and procedural outcomes. Baseline patient characteristics were those recorded at time of presentation for AC, before initiation of antibiotics, and included age and ASA class. Procedural factors included type of treatment for AC (PC alone, PC with interval LC, or LC alone), and severity of AC (Grade I: mild, Grade II: moderate, and Grade III: severe) as per Tokyo criteria for assessment of AC.

Interval LC was defined as LC performed 6 weeks after PC drainage. Drain was checked by the radiologist via ultrasound and then removed if AC had healed. Patients were informed about LC procedure and possible risks of disease recurrence after drain removal. All patients were advised to have interval LC because it is known as the gold standard of treatment for AC at present. Some patients who had PC agreed to have interval LC operation, but some declined, acknowledging awareness of all risk factors with written consent form.

All records were updated and patients were followed-up.

RESULTS

Total of 40 PC procedures were performed at Umraniye Training and Research Hospital during the study period. Of those, 22 (55%) were male and 18 were (45%) were female, with median age of 70.5 years (range: 52–87 years). All of the patients who had PC performed had ASA classification of 3 or 4.

Table I. Tokyo Guidelines for assessment

Tokyo guidelines diagnostic criteria of AC

Clinical manifestations	
Local symptoms & signs	Murphy's Right upper quadrant (RUQ) tenderness and/or pain RUQ palpable mass
Systemic signs	Fever Leucocytosis High C-reactive protein level
Imaging findings	Confirmation with ultrasound (US) and/or sintigraphy
Diagnosis	Presence of; one local sign or symptom, one systemic sign and confirmation by imaging findings

Table 2. American Society of Anaesthesiology risk index

American Society of Anaesthesiology (ASA) Risk Index Classification	
Classification	Physical condition of the patient
ASA 1	Normal, healthy
ASA 2	Mild systemic disease with out functional limitation
ASA 3	Severe systemic disease with functional limitation
ASA 4	Life-threatening severe systemic disease
ASA 5	Not expected to survive operation
ASA 6	Brain death
ASA E	Emergency surgery

(www.asahq.org)

Success rate of PC was 100%, and complication rate was 2.5 % (n=1). One of 40 patients (2.5%) was operated on shortly after PC due to bile peritonitis that developed as complication of percutaneous intervention. There was no procedure-related mortality.

PC drains were kept in place for 6 weeks. After 6 weeks, drains were checked and then removed by the radiologist if AC had healed. All patients were followed-up.

Total of 16 (40%) of 40 patients underwent subsequent surgery after removal of PC drain. LC was performed in 13 (81.2%) cases. Three (18.8%) patients had conversion to open surgery during LC due to perioperative technical difficulties (difficulty in exposing Calot's Triangle, intra-abdominal adhesions due to inflammation caused by drain, etc.).

Twenty-three (57.5%) of the 40 patients whose drain was removed after 6 weeks did not have operation. After receiving detailed information, these 23 patients either did not want to undertake risk of LC procedure or risks related to general anesthesia. They were taken under follow-up for median of 17.4 months. None of these 23 (57.5%) patients were admitted to any hospital for recurrent biliary disease or symptoms, and no recurrence of AC was seen during follow-up period.

DISCUSSION

In the literature, mortality rate for elderly patients who have LC is higher than mortality rate seen in the younger patients.^[2,3] Conversion to open cholecystectomy rate is also higher^[4,5] in these patients. In this group of patients, PC can be used as treatment of choice and may be an alternative to surgery in some selected cases.

In the present study, we followed patients who presented at our clinic with AC and were treated with PC. Our success rate in performing PC was 100%. There was 1 complication (2.5%) after PC in which the patient had bile peritonitis diagnosed in the ward during follow-up period. General medical

condition of our PC patients reflects comorbidities seen in elderly population. Patients had comparable mean age (70.5 years) to those reported in the literature (68.1 years).^[6]

Sixteen (40%) of 40 patients underwent LC operation 6 weeks after removal of PC drain. In our PC group, rate of conversion from laparoscopic to open surgery during interval LC procedure was 18.8% (3 of 16), which is similar to what has been reported in the literature.^[9,10] Median follow-up period for the 23 patients not operated on was 17.4 months.

A Cochrane Review of small number of patients in retrospective patient population analyzed the safety and efficacy of PC in elderly and critically ill patients. PC seemed promising, with success rate of 91% and procedure-related mortality rate of 0.4%.^[6] There are other, similar randomized controlled studies in the literature. One conducted by radiologists analyzing PC as treatment modality for AC reported that only 1 (5.2%) of 19 patients had recurrent biliary symptoms. Another study was performed at Seoul National University Hospital in South Korea between 2000 and 2011 with 183 patients, 60 of whom were reviewed retrospectively. Recurrent AC was observed in 7 high-risk patients (11.7%). The remaining patients (88.3%) were managed successfully with PC alone.^[11]

Wang et al. reported 1-year recurrence rate of 9.2% in 184 cases in which PC was performed. It was observed that in cases with complicated AC or with elevated white blood cell count ($\geq 18\ 000/\mu\text{L}$), recurrence was much more common.^[12] In another study, performed by Popowicz et al., which compared 71 cases from 2 different time periods (2003 and 2008), recurrence rate of AC was reported to be 28%.^[13] Also, Yeo et al. reported readmission rate of 6.8% in their study consisting of 103 cases. LC was performed in 81% and conversion rate was 15% in that study.^[14]

In a retrospective study comprising 53 PC patients from between 2000 and 2010 with median age of 74 years and ASA

score of 3 or 4, 18 patients underwent cholecystectomy after PC. Six (33%) of those 18 patients underwent LC and remaining 12 (67%) patients required conversion to open cholecystectomy.^[15] Conversion to open surgery in our study was necessary in 3 (18.8%) of 16 LC patients due to perioperative technical difficulties. Majority of the patients, 13 of 16 (81.2%), were successfully operated on laparoscopically.

In reports that have favored PC as definitive treatment modality, such as study of Bala et al. conducted with 257 PC patients with age ≥ 75 from 10-year period, high alkaline phosphatase level and history of coronary artery disease were found to be predictors of PC as definitive treatment modality in those high-risk AC cases.^[16] Furthermore, PC was reported to have lower complication rate, and 96% of cases had symptomatic relief after the procedure in a retrospective study conducted with 104 patients. PC alone was the only definitive treatment for 70% of the cases.^[17]

These results are similar to those of our study. Twenty-three (57.5%) patients who did not have further surgery did not have any recurrent disease or symptoms during follow-up period.

As a result, it was determined that PC can be used as life-saving procedure for severely ill, high ASA score patients with comorbidities when early cholecystectomy cannot be performed, which is consistent with the literature. After removal of PC drain, patients may safely be followed and may not experience further symptoms, recurrence of AC, or have need for interval LC surgery.^[17,18]

Conclusion

In emergency settings when elderly patients present with AC, surgery may not be possible immediately due to accompanying comorbid diseases or poor general condition. PC can be easily and safely performed in all patient groups under local anesthesia with low complication rate and can be treatment of choice. In our series, conversion rate of 18.8% in LC procedure following removal of PC drain was determined to be reasonable rate and was similar to that in the current literature. The 57.5% of patients who were followed nonoperatively did not have recurrent disease or symptoms. PC alone can be curative treatment for AC without further need for additional surgery in future. Longer follow-up period study and prospective randomized trials would contribute to further analysis of end results of PC procedure in high risk elderly AC patients.

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ORJİNAL ÇALIŞMA - ÖZET

Perkütan kolesistostomi: Yaşlı ve yüksek ASA skorlu akut kolesistitli hastalarda küratif tedavi yöntemi

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AMAÇ: Akut kolesistit (AC) genel cerrahların sık karşılaştığı acillerdendir. En uygun tedavi laparoskopik kolesistektomidir (LK); ancak yüksek morbidite ve mortalite riski nedeniyle cerrahi uygulanamayan hastalarda diğer tedavi yöntemleri uygulanabilir. Perkütan kolesistostomi (PK) bu alternatif yöntemlerden biridir. Yaşlı ve komorbid hastalıkları olan hastalarda acil cerrahi yapılamadığı durumlarda bu yöntem kullanılabilir. Safra kesesinin drenajı ile enfeksiyon kontrol altına alınmaktadır. Perkütan kolesistostomi sonrasında, kolesistektomi daha uygun ve elektif koşullarda yapılabilir. Bu çalışmada yüksek riskli, yaşlı akut kolesistiti olan hastalardaki perkütan kolesistostomi deneyimlerimiz sunuldu.

GEREÇ VE YÖNTEM: Ocak 2011 ve ocak 2014 arasında hastanemizde PK uygulanmış tüm hastaların tıbbi kayıtları incelendi. Çalışmamıza hastanemiz kurulu tarafından onay verildi. Akut kolesistit tanısı ve derecelendirmesi için Tokyo ölçütleri kullanıldı. Perkütan kolesistostomi uygulama nedenleri; komorbiditeler, yaş veya semptomların süresi idi. Hastalara PK uygulama kararı kıdemli cerrah tarafından kar-zarar oranına bakılarak verildi. Tüm PK uygulamaları aynı girişimsel radyolog tarafından lokal anestezi ile ultrasonografi eşliğinde yapıldı.

BULGULAR: Toplam 40 PK işlemi belirtilen çalışma süresinde hastanemizde yapıldı. Hastaların 22'si (55%) erkek ve 18'i (45%) kadın; ortalama yaş 70.5 (dağılım, 52–87 yıl) idi. Perkütan kolesistostomi uygulanan hastaların tümünün ASA değeri 3 veya 4 olarak değerlendirildi. Perkütan kolesistostomi uygulamasının başarı oranı %100 ve komplikasyon oranı da 2.5% (n=1) idi. Drenler altı hafta yerinde tutuldu. Toplam 40 hastanın 16'sı (40%) takiplerinde dren çekildikten sonra ameliyat edildi. Ameliyatlardan sadece üçünde (18.8%) laparoskopiden açığa dönüldü. Kalan 23 (%57.5) hasta ise drenlerin çekilmesinden sonara ameliyat edilmeden takip edildi ve takiplerinde herhangi bir hastalık nüksü olmadı.

TARTIŞMA: Acil koşullarda AC ile gelen yaşlı, eşlik eden hastalıkları olan ve kötü genel durumu olan hastalarda LK yapılamadığında PK güvenli bir şekilde uygulanabilir. Drenin çekilmesi sonrasında uygun olan hastalarda LK kabul edilebilir %18.8 açığa dönme oranları ile elektif koşullarda yapılabilir.

Anahtar sözcükler: Akut kolesistit, ASA skoru; kolesistostomi; yaşlı.

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