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# Efficacy of Acute Laparoscopic Cholecystectomy for Acute Calculous Cholecystitis Regardless the Length of Symptoms

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## ABSTRACT

***Introduction:*** *Although early acute laparoscopic cholecystectomy with in 72 hours is considered a method of choice for acute calculous cholecystitis, controversy still persists concerning its indication in case of prolonged symptoms.*

***Materials and Methods:*** *Prospectively run data of the patients operated on for acute calculous cholecystitis over the period of three years in the tertiary referral center was analyzed. Acute surgery was performed regardless the length of the symptoms provided that no prohibitive surgical factors were present. Only patients with histopathologically confirmed acute cholecystitis were included into the study. Analyzed parameters included age, gender, pre-operative CRP level, time interval onset of symptoms-surgery, operating time, intraoperative and postoperative complications, conversion rate, hospital stay, readmission, and reoperation rate. Analysis was performed on the intention-to-treat basis.*

***Results:*** *One hundred and fifty-seven consecutive patients, of whom 90 were female and 67 male, underwent acute cholecystectomy. One hundred and thirty laparoscopic procedures were performed (83%) with 15 conversions (11.5%). Mean age was 59.15 ± 13.33 years (range, 24-83), pre-operative CRP was 57.04 ± 80.84 mg/L (range, 0.6-455), interval onset of symptoms-operation was 81.92 ± 81.12 hours (range, 5-336), and operating time was 84.47 ± 35.35 minutes (range, 35-270). Ten intraoperative complications, including three bleedings from the liver bed, five gallbladder perforations, one bile duct injury, one arrhythmia and 4 postoperative complications, including one haemoperitoneum, one subhepatal connection, one transitory intestinal obstruction, and one port site abscess occurred. Mean hospital stay was 6.48 ± 4.00 days (range, 3-26). Although one reoperation was necessary, there was no readmission.*

***Conclusion:*** *Acute laparoscopic cholecystectomy for acute calculous cholecystitis seems to be effective in experienced centers regardless the length of symptoms.*

***Key words:*** *Laparoscopy, cholecystectomy, cholecystitis, acute, treatment outcome, complications*

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## INTRODUCTION

Acute calculous cholecystitis represents the most common complication of gallstone disease. Relatively high prevalence of the pathology underlines the importance of optimal therapeutic management. Although primary conservative treatment may be justified in selected cases, the principal therapeutic approach is the surgical removal of the inflamed organ by cholecystectomy.

Despite proven superiority of primary surgical approach compared to conservative management for the majority of cases, acute cholecystectomy has not gained complete

acceptance in everyday practice[1]. Based on population studies, as many as 41% of the patients with acute cholecystitis are being discharged without surgery upon primary admission, thus being subjects to interval cholecystectomy during the secondary admission on elective basis[2].

Laparoscopic cholecystectomy in acute cholecystitis is a presumably more difficult procedure compared to elective cholecystectomy due to acute inflammatory changes in the operating field. It is mainly the fear of increased risk for perioperative complications, higher conversion rates and longer operative times preventing quicker acceptance of the technique. The issue of proper timing of surgical intervention still remains controversial. While early laparoscopic cholecystectomy within 72 hours from onset of the symptoms is considered the optimal indication, there is no consensus concerning the patients with prolonged symptoms[1]. Nevertheless, some limited data suggest that laparoscopic surgical management may also provide favorable results following the interval of 72 hours in experienced centers[3-5].

The aim of the study was to assess the efficacy of acute laparoscopic cholecystectomy for acute calculous cholecystitis in the tertiary referral center with the policy to opt for laparoscopic procedure regardless the time interval from onset of the symptoms.

## MATERIALS and METHODS

Prospectively run data of the patients operated on for acute calculous cholecystitis over the period of three years was analyzed to assess the results of acute surgical treatment. Minimum pre-operative work-up included history and physical examination, investigation of inflammatory markers including C-reactive protein (CRP) and white blood cell count (WBC) and abdominal ultrasonography. Histopathological examination confirming the diagnosis of acute cholecystitis was the criterion to be included into the study.

Primary surgical treatment was indicated regardless the length of the symptoms provided there were no general contraindications to surgery detected. Acute cholecystectomy was performed as early as possible after the clinical diagnosis was set. Laparoscopic procedure was considered a method of choice except for defined contraindications which included diffuse peritonitis, detected common bile duct stones after failure of endoscopic clearance, confirmed biliodigestive fistula, severe coagulopathy, and general contraindications of pneumoperitoneum.

Analyzed parameters included age, gender, pre-operative CRP level, time interval between the onset of symptoms and surgery (in hours), operating time (in minutes-from skin incision to skin suture), intraoperative complications, conversion rate, postoperative complications, length of hospital stay (days), need for readmission and/or reoperation. Analysis was performed on the intention-to-treat basis.

## RESULTS

One hundred and fifty-seven consecutive patients, of whom 90 were female and 67 male, underwent acute cholecystectomy for acute calculous cholecystitis regardless the length of the symptoms in over three years period. Mean age of the patients was 59.15 ± 13.33 years (range, 24-83), pre-operative CRP level was 57.04 ± 80.84 mg/L (range, 0.6-455), and time interval between the onset of the symptoms and surgery was 81.92 ± 81.12 hours (range, 5-336).

One hundred and thirty patients (83%) underwent acute laparoscopic cholecystectomy with 11.5% conversion rate (15 patients). Reasons for conversion are summarized in Table 1.

Mean operating time was 84.47 ± 35.35 minutes (range, 35-270). Intraoperative complications included major bleeding from the liver bed in 2.3% (3 patients), gallbladder perforation in 3.8% (5 patients), bile duct injury in 0.7% (1 patient), and severe arrhythmia in 0.7% (1 patient) of the patients. In case of bile duct injury, the operation was undertaken due to failed conservative treatment after two weeks of symptoms. Complete trans-section of common hepatic duct was detected during surgery, confirmed by intra-operative cholangiography and primarily repaired by Roux-en-Y hepatico-jejunal anastomosis.

***Table 1. Reasons for conversion of acute laparoscopic cholecystectomy***

| Reason | Number of patients | % |
|---|---|---|
| Unclear anatomy | 12 | 80.05 |
| Inflammation in Callot`s triangle | 11 | 73.3 |
| Severe necrotizing cholecystitis | 1 | 6.65 |
| Cholecystogastric fistula | 1 | 6.65 |
| Bile duct injury | 1 | 6.65 |
| Severe arrhythmia | 1 | 6.65 |

Four major complications occurred in the postoperative period (3%), consisting one haemoperitoneum due to bleeding from duodenal serosa, one subhepatic collection, one transitory intestinal obstruction, and one abscess at the port site. Reoperation rate was 0.7% (1 patient-bleeding from the duodenal serosa) and there was no readmission and mortality. Mean hospital stay was 6.48 ± 4.00 days (range, 3-26).

## DISCUSSION

Policy to indicate acute laparoscopic cholecystectomy in patients with acute calculous cholecystitis regardless the length of the symptoms may be a matter of discussion. It is obvious that acute inflammation in the operating field makes any surgical procedure more complex, thus imposing higher potential for complications, bile duct injuries being the most cumbersome[6]. Traditional concept of interval laparoscopic cholecystectomy within four to twelve weeks after conservative treatment is based on the assumption that acute inflammation would resolve, thus making the surgical procedure less risky. Nevertheless, such an approach faces at least three principal problems: possible failure of conservative treatment, risk of recurrent symptoms/complications in the interval to definitive surgery, and increased overall costs.

Conservative treatment may probably fail more frequently than anticipated. Meta-analysis of five randomized trials comparing acute versus interval laparoscopic cholecystectomy for acute cholecystitis has revealed cumulative risk of 17.5%[5]. As prolonged inflammatory process not responding to antibiotic therapy progressively worsens, it is not surprising that subsequent emergency laparoscopic cholecystectomy due to local or systemic inflamatory complications may require conversion in up to 45%[7]. Furthermore, the risk of recurrent symptoms and/or complications within the interval to surgery is described to be increasing progressively with the time-being as high as 14% within six weeks, 19% within twelve weeks and 29% within one year after successful completion of conservative treatment[2]. This data explains the observation that 2.4 admissions are necessary on average for the completion of interval laparoscopic cholecystectomy for acute cholecystitis compared to single admission in case that primary surgical approach is chosen[8]. Obviously, prolonged overall hospital stay is linked with increased overall costs.

Above mentioned arguments against interval laparoscopic cholecystectomy would be of limited relevance in case that interval surgery would offer significant benefits over primary surgical treatment. Nevertheless, based on the available evidence, there is no significant difference between acute and interval laparoscopic cholecystectomy for acute cholecystitis in terms of operating time, conversion rate and number of complications, including the risk of bile duct injury. Extensive population study analyzing one million patients undergoing cholecystectomy for acute cholecystitis has concluded that laparoscopic approach results in lower morbidity and mortality rates compared to open surgery, even in the setting of conversion[9]. Therefore, the concept of primary surgical approach represented by acute laparoscopic cholecystectomy appears to be justified, which is also reflected in international guidelines and recommendations[1].

Although it is obvious that optimal indication for acute laparoscopic cholecystectomy in acute cholecystitis is as early after the onset of symptoms as possible, there is some data available that the time factor may not be a prohibitive parameter for surgery in case that sufficient expertise is available[3,4]. Presented treatment outcomes in our serie of one hundred and thirty consecutive patients with acute calculous cholecystitis treated by laparoscopic cholecystectomy regardless the length of symptoms in the tertiary referral center are favourably comparable to the results accross the literature[7,9]. Acute laparoscopic cholecystectomy thus appears to by highly effective in experienced hands despite prolonged symptoms and particularly complex referral patient population. Nevertheless, further prospective randomized trials with sufficient power are needed to confirm this assumption.

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## ARAŞTIRMA-ÖZET

### Taşlı Kolesistitte Semptomların Süresinden Bağımsız Olarak Gerçekleştirilen Acil Laparoskopik Kolesistektominin Etkinliği

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***Giriş:*** *Akut kolesistitte erken (ilk 72 saatte) dönemde yapılan acil laparoskopik kolesistektomi tercih edilen bir yöntem olmasına karşın belirti süresi uzamış hastalarda acil laparoskopik cerrahinin etkinliği hala tartışmalıdır.*

***Gereç ve Yöntem:*** *Üçüncü basamak referans hastanesinde prospektif olarak oluşturulan veri bankasından 3 yıllık sürede akut kolesistit nedeniyle gerçekleştirilen acil kolesistektomiler incelemeye dahil edildi. Belirtilerin süresinden bağımsız olarak acil cerrahi için kontrendikasyon oluşturacak hastalığı olmayan tüm hastalara kolesistektomi gerçekleştirildi. Çalışmaya patolojik olarak kolesistit tanısı konulan hastalar dahil edildi. Çalışma dahilinde incelenen parametreler: yaş, cinsiyet, preoperatif CRP, belirtilerin başlangıcından cerrahiye kadar geçen süre, operasyon süresi, intraoperatif-postoperatif komplikasyonlar, hastanede kalış süreleri, hastaneye tekrar başvuru ve reoperasyon oranları. Analiz için tedavi amacı temel alınmıştır.*

***Bulgular:*** *Toplamda 157 hastaya acil kolesistektomi gerçekleştirildi. Hastaların 90'ı kadın 67'si erkekti. Toplamda 130 laparoskopik girişim yapıldı (%83) ve 15 olguda açığa dönüş gerçekleşti (%11.5). Hastaların ortalama yaşı 59.15 ± 13.33 (24-83), preoperatif CRP 57.04 ± 88.84 mg/L (0.6-455) idi. Semptomların başlamasından operasyona kadar geçen süre 81.92 ± 81.12 saat (5-336), ortalama operasyon süresi 84.47 ± 35.35 dakika (35-270) idi. On intraoperatif komplikasyon gözlendi [karaciğer yatağından kanama (n= 3), safra kesesi perforasyonu (n= 5), safra yolu yaralanması (n= 1), aritmi (n= 1)]. Dört postoperatif komplikasyon gözlendi [hemoperitoneum (n= 1), subhepatik koleksiyon (n= 1), geçici ileus (n= 1), trokar bölge apsesi (n= 1)]. Ortalama hastanede kalış süresi 6.48 ± 4.00 gün (3-26) olarak bulundu. Hastalardan birinde reoperasyon gözlendi ve hastada tekrar hastaneye başvuru olmadı.*

***Sonuç:*** *Deneyimli merkezlerde; akut taşlı kolesistitte belirtilerin süresinden bağımsız olarak uygulanacak acil laparoskopik kolesistektomi etkin bir yöntem gibi görünmektedir.*

***Anahtar Kelimeler:*** *Laparoskopi, kolesistektomi, kolesistit, akut, tedavi sonucu, komplikasyonlar*

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