

ORIGINAL REPORT

Preoperative factors associated with technical difficulties of laparoscopic cholecystectomy in acute cholecystitis[☆]



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KEYWORDS

Cholecystectomy;
Laparoscopic;
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Cholecystitis, acute

Abstract

Objective: To identify preoperative factors associated with surgical time and conversion of the laparoscopic cholecystectomy (LC) to open surgery in subjects with acute cholecystitis (AC).

Method: We developed a cross-sectional study that included 99 subjects older than 17 years with definitive diagnosis of AC who had undergone to LC. Preoperative variables such as clinical data, laboratory markers and ultrasound findings as wall thickness, the size of the major calculus and the presence of: perivesicular fluid, multiple cholelithiasis, biliary mud or microlithiasis were registered. We consider indirect measures of technical difficulties of LC the total surgical time and the need for conversion to open surgery. We used the square chi and Mann–Whitney *U* test to establish the correlation between preoperative variables and the technical difficulties of LC. We build ROC curves of the variables with significant statistical association ($p \leq 0.05$ and 95% confidence interval) to determine the cut-off points of better sensitivity and specificity to predict conversion of LC to open surgery.

Results: A gallbladder wall thickness ≥ 6 mm detected by ultrasound has a sensitivity of 87.5% and a specificity of 62.6% with OR 11.71 (95%CI: 1.38–99; $p = 0.008$) for predict conversion to open surgery. There was no relationship between surgical time and the preoperative evaluated variables.

Conclusion: The gallbladder wall thickness detected by the ultrasound is associated with the need of conversion of LC to open surgery in subjects with AC, furthermore this finding could warn the surgeon on the complexity with a particular patient.

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PALABRAS CLAVE

Colecistectomía laparoscópica;
 Conversión a cirugía abierta;
 Ultrasonido;
 Colecistitis aguda

Factores prequirúrgicos asociados con dificultades técnicas de la colecistectomía laparoscópica en la colecistitis aguda

Resumen

Objetivo: Identificar en pacientes con colecistitis aguda (CoA) los factores preoperatorios asociados con el tiempo quirúrgico y con la conversión de colecistectomía laparoscópica (CL) a cirugía abierta.

Método: Se realizó un estudio transversal que incluyó 99 pacientes mayores de 17 años con diagnóstico definitivo de CoA tratados con CL. Se registraron variables prequirúrgicas, como datos clínicos, valores de laboratorio y hallazgos ecográficos como el grosor de la pared de la vesícula, el volumen vesicular y la presencia de: líquido perivesicular, coledocistitis múltiple o barro biliar. Se consideraron medidas indirectas de dificultad técnica de la CL, el tiempo quirúrgico empleado y la necesidad de conversión a cirugía abierta. Se utilizaron las pruebas de ji-cuadrado o U de Mann-Whitney para establecer la relación entre las variables prequirúrgicas y aquellas indicativas de dificultad técnica. Se construyeron curvas ROC (Receiver Operating Characteristic) de las variables con asociación estadística significativa ($p \leq 0,05$ e intervalo de confianza del 95%) para determinar los puntos de corte de mejor rendimiento para predecir la conversión de CL a cirugía abierta.

Resultados: Un grosor de la pared vesicular ≥ 6 mm detectado por ultrasonido tiene una odds ratio de 11,71 (IC95%: 1,38-99; $p = 0,008$), con una sensibilidad del 87,5% y una especificidad del 62,6% para predecir la conversión a cirugía abierta. No hubo relación entre el tiempo quirúrgico y las variables prequirúrgicas evaluadas.

Conclusión: El grosor de la pared de la vesícula biliar detectado por ultrasonido se asocia con la necesidad de conversión de la CL a cirugía abierta en pacientes con CoA.

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Introduction

Acute cholecystitis (AC) is the acute inflammatory process of the gallbladder wall that is secondary to lithiasis in 95 per cent of the cases.^{1,2} According to the 2013 Tokyo guidelines for the management of cholangitis and AC,³ the concomitant presence of local inflammatory signs in the upper right abdominal quadrant; the signs of systemic inflammatory response; and the typical AC imaging findings are considered definitive diagnosis of AC.

The initial approximation image in cases of diagnostic suspicion of AC is the ultrasound scan (US). The diagnosis of AC through an ultrasound scan is based on the combination of ultrasound findings, given that there is no pathognomonic sign.⁴ The findings typically described in AC are the presence of an impacted gallstone or peri-gallbladder fluid; overdistended gallbladder; thickening or flow increase of the gallbladder wall; and the positive sonographic Murphy sign.⁴ The concomitance of several of these ultrasound findings reaches an 88 per cent sensitivity and an 80 per cent specificity in the diagnosis of AC.⁵

The treatment of choice for the management of AC is the laparoscopic cholecystectomy (LC) procedure, since there is less postoperative pain: hospital stays are shorter and is more cost-effective compared to open surgery.^{6,7} One of the setbacks of LC compared to open surgery is the higher risk of biliary duct injury;⁸ as a matter of fact, avoiding the appearance of iatrogenic lesions is the main reason for LC to open surgery conversion.⁸⁻¹¹

The conversion rate from LC to open surgery ranges from 5 per cent to 29.4 per cent,^{12,13} and it is based on

two (2) types of conditions: those non-associated with the patient, such as the surgeon's experience, and patient-inherent conditions, such as the significant inflammation of the gallbladder bed that increases the difficulty to identify or dissect anatomical structures. Defining the impact of these conditions prior to the LC is the first step to be able to establish strategies aimed at reducing the conversion rate of LC to open surgery in all hospitals.¹³

The goal of this work was to identify, in patients with AC, the preoperative factors associated with an extended surgical time, or conversion from LC to open surgery.

Method

After obtaining authorization from the hospital ethics committee, one observational, analytical and retrospective study was conducted, which is why no informed consent was required.

Patients

The medical histories of all the patients who underwent LC procedures in our center between September 15th, 2015 through October 15th, 2016 were reviewed. The following were defined as inclusion criteria: being over 17 years of age, and having a definitive diagnosis of AC according to the 2013 Tokyo guidelines for the management of cholangitis and AC^{3,14} (Table 1). Those individuals who underwent intra-operative cholangiography procedures were excluded, since this procedure involves extra surgical time non-associated

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