ORIGINAL ARTICLE

Safety of laparoscopic cholecystectomy in patients older than 90 years in a private hospital in Ecuador: A case series

Seguridad de la colecistectomía laparoscópica en pacientes mayores de 90 años en un hospital privado en Ecuador: una serie de casos

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Abstract

Background: *The rate of biliary lithiasis and its complications are higher in the elderly. Some authors describe age as the main factor that significantly increases the morbidity and mortality of patients undergoing cholecystectomy.* **Objective:** *The objective of this study was to describe the safety of laparoscopic cholecystectomy, focusing on complication and conversion rates in patients older than 90 years, in a private hospital of a developing country.* **Materials and methods:** *This case-series enrolled patients older than 90 years diagnosed with acute cholecystitis using the Tokyo 2013 criteria. All included patients underwent laparoscopic cholecystectomy from January 2010 to December 2016 at Vozandes Hospital Quito-Ecuador. Frequencies and percentages and mean were reported for categorical and numerical variables, respectively.* **Results:** *We included 15 patients aged between 90 and 96 years. There were three post-operative complications, two cases of hypovolemic shock secondary to bleeding that stop without reoperation (13%) and 1 of delirium (7%). Conversion was performed in two patients (13%) due to the impossibility of visualizing the anatomical structures and obtain an adequate critical view of safety due to gallbladder phlegmon.* **Conclusion:** *Laparoscopic cholecystectomy seems to be a safe approach, with relatively low complication and conversion rates in patients older than 90 years.*

Key words: *Laparoscopic cholecystectomy. Acute cholecystitis. Elderly patient. Ecuador.*

Resumen

Antecedentes: *La tasa de litiasis biliar y sus complicaciones son mayores en los ancianos. Algunos autores describen la edad como un factor principal que aumenta significativamente la morbilidad y la mortalidad de los pacientes sometidos a colecistectomía.* **Objetivo:** *Describir la seguridad de la colecistectomía laparoscópica centrándose en su tasa de complicaciones y de conversión en pacientes mayores de 90 años, en un hospital privado de un país en desarrollo.* **Método:** *Esta serie de casos incluyó pacientes mayores de 90 años diagnosticados de colecistitis aguda según los criterios Tokio 2013. Todos fueron sometidos a colecistectomía laparoscópica entre enero de 2010 y diciembre de 2016 en el Hospital Vozandes Quito (Ecuador). Se informaron las frecuencias y los porcentajes, y la media, para las variables categóricas y numéricas, respectivamente.* **Resultados:** *Se incluyeron 15 pacientes con edades comprendidas entre los 90 y 96 años. Hubo tres complicaciones posoperatorias, dos casos de shock hipovolémico secundario a sangrado que remitieron sin reoperación (13%) y uno de*

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delirio (7%). Se realizó conversión quirúrgica en dos pacientes (13%) debido a la imposibilidad de visualizar las estructuras anatómicas y lograr una visión crítica adecuada de seguridad por flemón vesicular. **Conclusión:** *La colecistectomía laparoscópica parece ser un enfoque seguro, con unas tasas de conversión y de complicaciones relativamente bajas, en los pacientes mayores de 90 años.*

Palabras clave: *Colecistectomía laparoscópica. Colecistitis aguda. Paciente anciano. Ecuador.*

Introduction

Population's life expectancy is increasing. It is projected that by 2050, individuals aged 90 years and older will represent 2% of the population in the USA[1]. Although Ecuadorian life expectancy is lower than others (76.4 years)[2], the incidence of gallstones and its complications rise with age because of increasing lithogenicity of bile and gallbladder dysfunction[3]. By age 90 years, > 24% of men and 35% of women have gallstones[1,4].

Some authors describe age as the main factor that increases the morbidity and mortality of patients undergoing surgery for acute cholecystitis[5]. Besides that, elderly patients have a reduced physiological capacity, which, associated with their comorbidities, make surgeons reluctance to perform cholecystectomy in these patients[1]. Despite that, laparoscopic cholecystectomy is currently considered the gold standard in the treatment of acute cholecystitis in the elderly[6]. Laparoscopic cholecystectomy can be safely performed in many patients of up to 85 years, as previously demonstrated[7]. However, the optimal management of acute cholecystitis in patients older than 90 years is less clear. Few studies have evaluated the safety of patients older than 90 years after cholecystectomy, but most of these studies included a mix population, patients ≥ 65 years[8] and only one of them was done in a developing country[6]. Our aim is to assess the safety of the laparoscopic cholecystectomy in patients older than 90 years with acute cholecystitis and its complications, in a tertiary center of a developing country.

Materials and methods

This retrospective study included patients aged 90 years and older with acute cholecystitis who underwent laparoscopic cholecystectomy in Vozandes Hospital Quito-Ecuador between January 2010 and December 2016. The diagnosis of acute cholecystitis and its grade was established by using the Tokyo 2013 criteria[9]. Patients with Grade III cholecystitis, in whom the systemic organ failure was transient and recovered quickly were included in the study. However, those cases when the systemic organ failure was persistent (> 9 days) underwent percutaneous cholecystectomy and were excluded from the study. Moreover, cases with choledocolithiasis and malignant neoplasm of the gallbladder and extrahepatic bile ducts were excluded from the study. The variables examined were sex, comorbidities, time between diagnosis and surgery, the risk of perioperative morbidity using the American Society of Anesthesiologists (ASA) score, Tokyo severity, rate of conversion to open surgery and its reasons, post-operative complications and mortality, and length of hospital stay.

Pre-operative studies, such as hepatobiliary ultrasound, blood test, chest X-ray, and electrocardiogram, were performed. The statistical software SPSS version 12 was used as an instrument for data collection and for statistical analysis. For categorical variables, frequencies and percentages were reported. For the numerical variables, the mean was used.

Results

Fifteen patients aged between 90 and 96 years were included in the study. About 53% of patients were men and 60% of patients had ASA III. Blood tests showed a mean leukocytes of 29 334 and a mean pre-operative hemoglobin of 14.43 g/L. Grade II cholecystitis was found in 8 (53%) patients, whereas Grade III cholecystitis in 4 (27%). Only 5 (33%) patients had a delayed surgery (surgery performed after 7 days). This was necessary to stabilize these patients.

Regarding the post-operative variables, there were only three post-operative complications: hypovolemic shock secondary to bleeding that stop without reoperation in 2 patients (13%) and delirium in 1 patient (7%). The conversion rate of laparoscopic cholecystectomy to open surgery was 13% (2 patients). The reason for conversion was the impossibility of visualizing the anatomical structures and obtains an adequate critical view of safety due to gallbladder phlegmon in two patients. There were no cases of

inability to create pneumoperitoneum. The mean surgical time was 98.3 min. Finally, all patients were discharged after a mean length of hospital stay of 7.2 days (Tables 1-2).

Table 1. General characteristics

Variables	
Overall population, n (%)	15 (100)
Age, mean (years)	92.3
Sex, n (%)	
Female	7 (47)
Male	8 (53)
Comorbidities, n (%)	
Cardiovascular disease	9 (60)
Pulmonary disease	4 (27)
Chronic renal insufficiency	0 (0)
Diabetes	2 (13)
Pre-operative test, mean	
Leukocytes (x10 9/ml)	29 334
Hemoglobin (g/L)	14.42
ASA, n (%)	
II	3 (20)
III	9 (60)
IV	3 (20)
Cholecystitis severity, n (%)	
I	3 (20)
II	8 (53)
III	4 (27)
Time between diagnosis and surgery, days	
< 7 days	10 (67)
> 7 days	5 (33)
Operative time, mean (min)	98.3
Conversion, n (%)	
Yes	2 (13)
No	13 (87)
Reason for conversion, n (%)	
Inability to create pneumoperitoneum	0 (0)
Intraoperative bleeding	0 (0)
Improper display of structures	2 (13)
Post-operative complications, n (%)	
Hypovolemic shock	2 (13)
Delirium	1 (7)
Mortality	0 (0)
Length of hospital stay, mean (days)	7.2

Discussion

Cholecystectomy is the most common general surgery procedure performed in elderly patients due to the high incidence of gallstones[1]. Unfortunately, the comorbidities and the age of these patients have limited the therapeutic options, as it is showed in a study reported that < 25% of patients who met criteria for elective cholecystectomy underwent cholecystectomy[10]. This contrasts with our findings, as all the patients underwent laparoscopic cholecystectomy, despite its age and comorbidities.

The optimal moment to perform a cholecystectomy is not well defined for this population. Comorbidities presented in very old patients may require prior stabilization that will delay the intervention. Therefore, taking the recommendations for younger patients[11,12], we tried to performed early laparoscopic cholecystectomy, whenever it was possible, since it is associated with fewer complications, shorter hospital stay, faster physiological post-operative, and cost reduction[6,13]. In our study, 5 of our patients present a significant delay for more than a week due to comorbidities.

Tokyo guidelines[9] do not consider advanced age as a risk factor per se; however, they emphasize the tendency of older patients to develop severe acute cholecystitis[13]. This is in line with our study, as the majority of our patients had Grades II–III acute cholecistitis. On the other hand, the ASA score greater than or equal to III is a risk factor that triggers complications and even death in elderly patients[14]. In our study, more than 80% of patients had ASA III – IV and all the complication happened in these patients. Moreover, the surgical time has been described by many authors as a post-operative risk factor; a cholecystectomy lasting more than 100 min increases the probability of complications by 6 times compared to a shorter duration[15]. In our study, the mean intraoperative time was less (98.3 min), which may explain the low rate of post-operative complications.

It has been shown that the patient's age, male sex, the degree of cholecystitis, and the prolonged interval between the appearance of symptoms and the surgical intervention are related to a greater probability of conversion to laparotomy, due to difficult intervention[16]. In our study, the conversion to open surgery occurs in two patients, and its reason for conversion was the impossibility to visualize anatomical structures and obtain an adequate critical view of safety due to gallbladder phlegmon. Our conversion rate (13%) is in accordance with the literature[17], showing that advanced age entails a little risk of conversion to an open procedure.

Our study is limited mainly by its retrospective nature. Furthermore, our numbers were small, and therefore, the possibility of type II error cannot be ruled out; therefore, larger studies should evaluate this approach. Among the strong points of the study, we can name that this is the first study done in a tertiary center in a developing country.

Table 2. Characteristics stratified by cholescystitis severity

Variables	Delay of surgery		ASA score			Comorbidities				Conversion		Post-operative complications	
Cholecystitis severity	< 7 days (n)	> 7 days (n)	II (n)	III (n)	IV (n)	Cardiovascular disease (n)	Pulmonary disease (n)	Chronic kidney disease (n)	Diabetes (n)	Yes (n)	No (n)	Yes (n)	No (n)
I	3	0	1	2	0	3	1	0	1	0	3	0	3
II	5	3	2	6	0	5	1	0	2	2	6	2	6
III	2	2	0	1	3	3	2	1	0	0	4	1	3
Total	10	5	3	9	3	11	4	1	3	2	13	3	12

Conclusion

Cholecystectomy is the most common general surgery procedure performed in elderly patients and the choice of therapeutic options should not be limited neither by the age per se, nor by the disease severity. Based in recent advances in laparoscopic techniques, perioperative care improvement and based on the results obtained in this study, we believe that laparoscopic cholecystectomy is a valid option in patients over 90 years of age due its relatively low rate of complications and conversion. Larger studies should evaluate this approach, as the population's life expectancy is increasing.

Conflicts of interest

The authors declare have they any conflicts of interest.

Ethical disclosures

Protection of human and animal subjects. The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki).

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors have obtained the written informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

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