

Experience in the surgical management of cholelithiasis in the Surgery Service I of the Ruiz y Paez University Hospital Complex

Experiencia en el manejo quirúrgico de la colelitiasis en el Servicio de Cirugía I del Complejo Hospitalario Universitario Ruiz y Páez

Samuel Mauricio Yary-Maestracci,* Carlos Luis Tovar-Thomas,‡
Luisa M Cesin-de León,§ Karla Gabriela Vargas Bort,¶ Anna Carolina Alvarado,||
Henry Ramón García Palma||

Keywords:

Surgical management, cholelithiasis, biliary tract lithiasis.

Palabras clave:

Manejo quirúrgico, colelitiasis, litiasis de vías biliares.

* General practitioner. Mejillones

Community Hospital. Antofagasta, Chile.

‡ Assistant Specialist in General Surgery of the Venezuelan Institute of Social Security. Uypar Hospital, Puerto Ordaz, Bolívar State, Venezuela.

§ Specialist in General Surgery. Chief of Service,

Complejo Hospitalario Universitario Ruiz y Páez, Ciudad Bolívar, Bolívar State, Venezuela.

¶ Occupational physician.

|| Attending physician.

Department of Surgery. School of Health

ABSTRACT

Objective: to determine the experience in the surgical management of cholelithiasis or biliary tract lithiasis in the Surgery Service I of the Ruiz y Paez University Hospital Complex from January 2017 to October 2019. **Material and methods:** this was a prospective, field, analytical, cross-section study. **Results:** the most frequent postoperative diagnosis was cholelithiasis with 70.20% of cases; in 65.38% of patients, clips were used as surgical management of cholelithiasis, and the total number of patients with laparoscopic cholecystectomy was 89.10%. The most common approach to the abdominal cavity was pneumoperitoneum insufflation through the Veress needle plus conventional trocars, having 80.45%. Most patients had a hospital stay between 24 to 48 hours with 83.01%; 94.60% of patients with laparoscopic cholecystectomy (n = 278) had no complications; surgical mortality associated with biliary pathology only occurred in one patient with laparoscopic cholecystectomy performance, represented by 0.32% of the total. **Conclusions:** surgical experience in laparoscopic surgery makes this operative technique the best alternative in treating acute gallbladder disease due to the lower risk of complications and shorter recovery rate.

RESUMEN

Objetivo: Determinar la experiencia en el manejo quirúrgico de la colelitiasis o litiasis de vías biliares en el Servicio de Cirugía I del Complejo Hospitalario Universitario Ruiz y Páez, de enero de 2017 a octubre de 2019. **Material y métodos:** Fue un estudio de tipo prospectivo, de campo, analítico y de corte transversal. **Resultados:** El diagnóstico postoperatorio más frecuente fue colelitiasis con 70.20% de casos, en 65.38% de los pacientes se emplearon clips como manejo quirúrgico de la colelitiasis, el total de pacientes con colecistectomía laparoscópica fue de 89.10%, el abordaje a la cavidad abdominal más común fue en pacientes con insuflación de neumoperitoneo a través de aguja de Veress más trocares convencionales, que tuvo el 80.45%; la mayoría de los pacientes tuvieron una estancia hospitalaria entre 24 a 48 horas con 83.01%; 94.60% de los pacientes con colecistectomía laparoscópica (n = 278) no presentaron complicaciones; la mortalidad quirúrgica asociada con patología biliar sólo se presentó en un paciente con realización de colecistectomía laparoscópica, representado por 0.32% del total. **Conclusiones:** La experiencia quirúrgica en cirugía laparoscópica hace que esta técnica operativa sea la mejor alternativa en el tratamiento de la enfermedad vesicular de curso agudo por menor riesgo de complicaciones y tasa de recuperación en menor tiempo.



How to cite: Yary-Maestracci SM, Tovar-Thomas CL, Cesin-de León LM, Vargas BKG, Alvarado AC, García PHR. Experience in the surgical management of cholelithiasis in the Surgery Service I of the Ruiz y Paez University Hospital Complex. Cir Gen. 2021; 43 (2): 97-106. <https://dx.doi.org/10.35366/106720>

Sciences “Dr. Francisco Battistini Casalta”.
 Universidad de Oriente,
 Núcleo Bolívar,
 Germania Avenue.
 Ruiz y Paez University
 Hospital Complex.
 Ciudad Bolívar, Bolívar
 State, Venezuela.

Received: 04/08/2020
 Accepted: 12/15/2021

INTRODUCTION

The patient suffering from acute cholecystitis usually goes to the emergency services, where a clinical, laboratory, and ultrasound evaluation is performed. Once the diagnosis is established, the patient should be hospitalized, an intravenous line should be placed to administer solutions to maintain water and electrolyte balance, analgesics, oral feeding should be suspended, and a nasogastric tube should be placed if associated with vomiting and ileus due to pain. Antibiotics treat infectious complications and prevent surgical wound infections; the classic scheme combines ampicillin and gentamicin. In diabetic patients, metronidazole is used for anaerobes, associated with ciprofloxacin which is eliminated by the biliary route.¹ This association is helpful if there is associated cholangitis. The definitive treatment of acute cholecystitis is surgical by laparoscopic or conventional cholecystectomy.^{1,2}

The indication for surgical treatment will depend on the time elapsed, the evolution of cholecystitis, and the operative risk. Surgical therapy within the first three days of the onset of the clinical picture is advisable for all patients in operability conditions.^{1,3}

Early emergency cholecystectomy can be performed like elective cholecystectomy since the alterations of the gallbladder hilum allow recognition of the elements. The initial edema of the process contributes to facilitating vesicular dissection.^{4,5} After a week of evolution, this procedure is more challenging to perform due to hypervascularization and fibrosis of the gallbladder, which, together with the firm adhesions to neighboring organs, form a tumor or inflammatory plastron makes the removal of the gallbladder technically difficult, with the possibility of causing a lesion in the biliary tract due to the distortion of the biliary anatomy.⁶⁻¹⁰

The importance of the diagnosis, medical treatment, and surgical alternatives of acute cholecystitis is a source of great controversy, especially since the 60s when Essehig popularized early surgical treatment. Years later, these guidelines for its management were better directed by multiple authors, and in different media, as in our hospital since 1975.¹⁰⁻¹³

Currently, there are very few detractors of early surgery, convinced of the benefits of surgical treatment performed within the first 72 hours of the onset of acute symptoms, to find the gallbladder inflammation in the edema phase and that dissection is performed with minimal difficulty, as opposed to the progression that this may have towards degrees of greater surgical difficulty, such as the gangrenous phase or organized inflammation.^{14,15}

With the advent of laparoscopic surgery or video surgery in 1987, cholecystectomy was considered the “golden operation” of this new technique; however, acute gallbladder disease was initially a contraindication to be performed with it. The progress in implementing modern equipment and instruments, and the surgical experience in laparoscopic surgery, make this operative technique a new alternative in treating acute gallbladder disease.¹⁶⁻¹⁸ About the cholecystectomy technique, the laparoscopic route is increasingly used, which has been possible due to the more excellent experience of the surgical centers. When laparoscopic cholecystectomy began, acute cholecystitis was a contraindication due to the risk of injuring the biliary tract to the high number of conversions. Nevertheless, the conventional approach is still helpful in many places where the necessary experience, equipment, and instruments are unavailable.^{19,20}

Generally, the gallbladder is distended and does not allow its apprehension. No time should be wasted and go directly to the puncture and partial evacuation of its contents. This allows better manipulation and the possibility of performing a vesicular cholangiography. Ideally, a total cholecystectomy should be performed. Still, a Pribram-style partial cholecystectomy should be performed in unfavorable anatomical conditions, leaving a vesicular cap to fulgurate the mucosa and avoid hepatic bleeding.^{21,22} When it is impossible to recognize the elements of the hepatic hilum, another recourse is to perform a partial cholecystectomy leaving a distal part of the bassinet drained to the outside. Treating complicated acute cholecystitis (such as free perforation to the peritoneal cavity, sepsis, and intestinal obstruction due to biliary ileus) requires urgent surgery.²¹⁻²³

Cholecystectomy is a valuable procedure in patients at high operative risk because it allows vesicular drainage with the consequent improvement of the clinical picture. Percutaneous transhepatic cholecystectomy is performed under local anesthesia, by puncture, following the Seldinger technique guided by ultrasound or computed tomography. A pigtail catheter is placed, which temporarily or definitively resolves this severe condition, with a morbidity of 35% and a mortality of 21%. The tube must be left in place for a prolonged period (about two months or more) until the inflammatory process has subsided. It happens with some frequency that little bile drains during the first few days due to the embedded calculus, and when the inflammation decreases, the calculus is mobilized and allows bile drainage. The procedure's mortality is high due to patient conditions and not the procedure itself. Morbidity is low, the main complications being hemorrhage and coleperitoneum.^{24,25}

There is considerable controversy about the timing of laparoscopic cholecystectomy for acute cholecystitis. Although early open cholecystectomy does not involve an increase in morbidity or mortality over late cholecystectomy, it increases the risks of additional complications from gallstones; there is concern about increased morbidity rates in laparoscopic cholecystectomy performed as an emergency procedure and about the increased rate of conversion to open procedure during the acute phase. Although one of the main reasons for conversion in early laparoscopic cholecystectomy is inflammation obscuring the view of Calot's triangle, fibrotic adhesions are the main reason for conversion in the late treatment group. Severe inflammation is also one of the leading causes of bile duct injury. There are reports that hospital stay is more extended for early cholecystectomy.²⁶⁻²⁹

Only about 30% of laparoscopic cholecystectomies in the United States are performed during acute cholecystitis. Only 20% of surgeons in the United Kingdom perform laparoscopic cholecystectomy during acute cholecystitis. Three previous meta-analyses related to the topic were identified.²⁹ Two of these included open and laparoscopic cholecystectomy for comparison. The first

had only two trials. The second meta-analysis included three trials. Both meta-analyses included a Chandler et al. trial examining two different early treatment surgical strategies. The most recent meta-analysis by Lau and his team also had three studies. One was the study by Serralta et al. in which allocation was based on surgeon experience and, consequently, cannot be considered a randomized trial. However, none of the three meta-analyses found a significant difference in morbidity between early and late laparoscopic cholecystectomy in patients with acute cholecystitis.³⁰⁻³³

Given all that has been argued and considering the high incidence of this problem, the lack of relevant statistical information in the region, as well as the repercussions from the biopsychosocial point of view that patients may present, and the absence of this type of work in the area, it was decided to conduct this research to analyze the surgical management of patients with this diagnosis who attended the Surgery Service of the Complejo Hospitalario Universitario Ruiz y Paez, Venezuela. It was decided to carry out this research to analyze the surgical management of the gallbladder in patients with this diagnosis who attended the Surgery Service of the Complejo Hospitalario Universitario Ruiz y Paez, Venezuela, to evaluate the complications of the different surgical techniques used and to be able to use laparoscopic cholecystectomy as the gold standard in our health center.

MATERIAL AND METHODS

Type of Study: prospective, field, analytical and cross-sectional study.

Universe: represented by all patients attended at the Surgery Service I Complejo Hospitalario Universitario Ruiz y Paez, Venezuela, from January 2017 to October 2019.

Sample: was represented by all patients with a diagnosis of biliary tract lithiasis who met the inclusion criteria.

Inclusion criteria: 1) patients of both sexes with a diagnosis of biliary tract lithiasis who underwent surgery; 2) patients who voluntarily agreed to participate in the study through a signed consent form.

Exclusion criteria: patients with other digestive tract pathologies other than biliary tract lithiasis, chronic pathologies that could affect the natural evolution of the disease, and those who did not agree to participate voluntarily in the study through a signed consent form.

Procedures: to obtain the desired information for the research, it was necessary to comply with the following activities: patients were given a signed consent form to approve their participation in the study.

An instrument was then created and completed with the data obtained from each patient who was part of the study. The instrument, elaborated by the researcher, allowed recording of the necessary data for the research work using an interrogation, a physical evaluation of the patient, and surgical findings during the procedure. The variables to be included during the research were to compare the series' characteristics and surgical results and to know the therapeutic efficacy of conventional and laparoscopic cholecystectomy. Postoperative diagnosis, the material used in surgical management, abdominal cavity approach technique, postoperative hospital stay, macroscopic surgical findings, postoperative complications, surgery performed by specialist or resident, and surgical mortality were evaluated.

Statistical management: the SPSS statistical package for Windows, version 22.0, was used

for the statistical management of the study results, and the data were processed with descriptive statistics and presented in single- and double-entry simple frequency tables with numbers and percentages. The chi-square test (χ^2) was used with a p-value < 0.05 to consider a statistically significant relationship between the variables.

RESULTS

The total number of patients with laparoscopic cholecystectomy was 89.10% (n = 278), the most common abdominal cavity approach used was by Veress needle (n = 251), followed by Hasson trocar in 8.65% (n = 27); while conventional cholecystectomy was performed in 10.90% of patients (n = 34), in them the subcostal transverse incision was used in 8.33% (N = 26) and the Kocher incision in 2.57% (N = 8) (Table 1).

When evaluating the relationship between hospital stay and type of surgery, it was obtained that in patients with conventional cholecystectomy, it was 10.90% (n = 34). The most common length of stay was an average of 72 hours with 7.05% (n = 22), followed by longer than 72 hours with 2.88% (n = 9); while in patients with laparoscopic cholecystectomy was 89.10% (n = 278), the most common hospital stay time was an average of 48 hours 82.05% (n = 256), followed by 48 to 72 hours 5.45% (n = 17); it is noteworthy that all patients

Table 1: Distribution according to the abdominal cavity approach technique in conventional and laparoscopic cholecystectomy in patients with bile duct lithiasis. N = 312.

Surgical technique	Cholecystectomy				Total	
	Conventional		Laparoscopic			
	n	%	n	%	N	%
Veress needle	0	0.00	251	80.45	251	80.45
Hasson trocar	0	0.00	27	8.65	27	8.65
Subcostal transverse incision	26	8.33	0	0.00	26	8.33
Kocher incision	8	2.57	0	0.00	8	2.57
Total	34	10.90	278	89.10	312	100.00

Statistical value 21.023, critical value 27.621, p = 0.01 (significant), gl (degrees of freedom) 4.

Table 2: Distribution according to postoperative hospital stay between conventional and laparoscopic cholecystectomy in patients with biliary tract lithiasis. N = 312.

Hospital stay (h)	Cholecystectomy				Total	
	Conventional		Laparoscopic			
	n	%	n	%	N	%
< 24	0	0.00	2	0.64	2	0.64
24 a 48	3	0.96	256	82.05	259	83.01
48 a 72	22	7.05	17	5.45	39	12.50
> 72	9	2.88	3	0.96	12	3.85
Total	34	10.90	278	89.10	379	100.00

Statistical value 13.259, critical value 16.114, $p = 0.021$ (significant), gl (degrees of freedom) 4.

who lasted less than 24 hours belonged to this group (Table 2).

In relation to the macroscopic surgical findings in surgery for biliary tract lithiasis in the patients under study, there was evidence of: scleroatrophic gallbladder in 5.45% ($n = 17$), peritoneal adhesions in 27.24% ($n = 85$), adhesions of Calot's triangle in 11.54% ($n = 36$), calculi larger than 0.5 cm in 60.58% ($n = 189$) and smaller than 0.5 cm in 39.42% ($n = 123$), dilated common bile duct in 3.52% ($n = 11$) and wall thickness less than 4 mm in 57.05% ($n = 178$) and greater than or equal to 4 mm in 42.95% ($n = 134$) (Table 3).

In patients with laparoscopic cholecystectomy ($n = 278$), 94.60% ($n = 263$) had no complications. Compared to patients who underwent conventional cholecystectomy ($n = 34$), 58.82% ($n = 20$) had no postoperative complications. The prevailing complication was subhepatic abscess in 14.71% ($n = 5$), followed by surgical site infection in 11.76% ($n = 4$), biliary fistula and bile duct injury with 5.88% ($n = 2$) each, and bleeding of the gallbladder bed in 2.94% ($n = 1$). Surgical mortality associated with patients with cholelithiasis or bile duct lithiasis only occurred in one patient who underwent laparoscopic cholecystectomy, representing 0.32% ($n = 1$) of the total, caused by the most common complication: subhepatic abscess (Table 4).

DISCUSSION

The most frequent postoperative diagnosis in the patients of this study was cholelithiasis, with 70.20% of cases, followed by calculous hydrocholecystitis (10.26%) and calculous pycholecystitis (8.01%). This data correlates with that described by Castro and collaborators³⁴ in their research to characterize the operated patients and identify the factors associated with the complications of acute cholecystitis in the Rafael Uribe Clinic of Cali (Colombia), where the postoperative diagnosis in 53.7% of the cases was vesicular lithiasis, followed by hydrocholecystitis (22%) and piocholecystitis (20.4%). They concluded that in the operative findings of this group of patients, it was found, as expected, that the most frequent was the presence of calculi inside the gallbladder, single or multiple, since it is a known fact that the primary etiology of cholecystitis is calculi.

In 65.38% of the patients, clips were used for surgical management of the artery and cystic duct continued with 0 silk ligation (16.35%) and 2-0 silk ligation (10.26%), and 0 polyglycolic acid ligation (8.01%). Data are consistent with a meta-analysis published by Portela and his team³⁵ to evaluate the economic impact of recovery in laparoscopic cholecystectomy performed at "Gustavo Aldereguía Lima" University Hospital, Cienfuegos, with a total of 180 operated patients. In 85% of the cases,

clips were used; among its benefits, it was described as an easy procedure to perform, it respects the principles of safe surgery, it does not need autoclave sterilization, and only the high-level disinfection policy attributable to the endoscopic instruments is applied.

Of the total number of patients with laparoscopic cholecystectomy (89.10%), the

most common approach to the abdominal cavity was in patients with pneumoperitoneum insufflation through the Veress needle plus conventional trocars in 80.45%, followed by the Hasson trocar approach in 8.65%. In comparison, in patients with conventional cholecystectomy (10.90%), the subcostal transverse incision was used in 8.33%, and the

Table 3: Distribution according to macroscopic surgical findings in surgery for biliary tract lithiasis.

Surgical findings		n	%
Scleroatrophic gallbladder	Yes	17	5.45
	No	295	94.55
Peritoneal adhesions	Yes	85	27.24
	No	227	72.76
Calot's triangle adhesions	Yes	36	11.54
	No	276	88.46
Calculi (cm)	< 0.5	123	39.42
	≥ 5	189	60.58
Dilated common bile duct	Yes	11	3.52
	No	301	96.48
Wall thickness (mm)	≥ 4	134	42.95
	< 4	178	57.05

Table 4: Distribution according to postoperative complications of conventional and laparoscopic cholecystectomy.

Complications	Cholecystectomy			
	Conventional		Laparoscopic	
	n	%	n	%
Did not present	20	58.82	263	94.60
Subhepatic abscesses	5	14.71	9	3.24
Operative site infection	4	11.76	3	0.72
Bleeding of the vesicular bed	1	2.94	3	1.17
Bile duct injury	2	5.88	0	0.00
Biliary fistula	2	5.88	0	0.00
Total	34	100.00	278	100.00
Mortality	0	0.00	1	0.32
Yes	34	10.90	277	88.78
No	0	0.00	1	0.32
Total	34	10.90	278	89.10

Kocher incision in 2.57%. Data described by Galloso and his group,³⁶ in the publication of an article on the basic and specialized instruments in the video laparoscopic cholecystectomy performed at Provincial Hospital "Docente Julio R. Alfonso Medina", Matanzas, Cuba, in which they describe that the Veress needle is used to approach the abdomen blindly and introduce the CO₂, and thus perform the pneumoperitoneum, which facilitates the surgical intervention in a 4:1 ratio, it has a particular device so that when perforating the aponeurosis the tip of the needle is retracted, avoiding injury to the anatomical structures of the abdominal cavity, allowing the boom and implementation of this technique between 80 and 85% of cases.

On the other hand, most patients had a mean hospital stay of 24 to 48 hours with 83.01%, continuing between 48 to 72 hours in 12.50%, more than 72 hours in 3.85%, and, finally, less than 24 hours in 0.64%. Similar data to those obtained by Cordero and colleagues³⁷ in their study to observe the association of the type of cholecystectomy with the time of post-surgical hospital stay in the Emergency Department, General Hospital of Boca del Río, Veracruz, Mexico, where 54.1% had a post-surgical stay between 24 to 48 hours, 18.6% less than 24 hours and 14.3% between 48 to 72 hours, thus reporting that the reduction of the hospital stay favors the rapid reintegration of the patient to his daily activities, determined by several factors, mainly by the presence of nosocomial infections, postoperative complications and the type of surgery used. Likewise, in the study by Estepa and collaborators³⁸ on cholecystectomy in the surgical treatment of gallbladder lithiasis, most patients operated, 141 (95.9%), had a stay of fewer than 48 hours.

About the macroscopic surgical findings in surgery for biliary tract lithiasis in the study patients, there was evidence of scleroatrophic gallbladder in 5.45%, peritoneal adhesions in 27.24%, adhesions of Calot's triangle in 11.54%, calculi larger than 0.5 cm in 60.58% and smaller than 0.5 cm in 39.42%, dilated common bile duct in 3.52%, and wall thickness less than 4 mm in 57.05% and greater than or equal to 4 mm in 42.95%. Data partially related to the

results of Pizarro,³⁹ to determine the prevalence and risk factors associated with conversion from laparoscopic cholecystectomy to conventional cholecystectomy in the Surgery Service of the Central Hospital of the Peruvian Air Force, an association was found with the thickness of the gallbladder wall greater than or equal to 4 mm in 43.7% of patients with gallbladder lithiasis, scleroatrophic gallbladder in 5.7%, adhesions in 27.6% during the transoperative period. Gomez and his team,⁴⁰ in their research to evaluate the size of the bile duct in patients with gallbladder pathology, demonstrated that the average size of the common bile duct during cholecystectomy can be found slightly dilated in 15 to 22.5% of cases.

Montalvo and his group⁴¹ in their research to know the frequency of gallbladder lesions, through the definitive study of pathological anatomy, about the number of patients with gallbladder lithiasis (184 cases), when reviewing the size of the stones, they reported from 0.1 to 0.5 cm in 82 patients (46%), from 0.6 to 1.0 cm in 46 patients (25%) and from 1.0 to 2.0 cm in 27 patients (15%).

Álvarez and collaborators⁴² quote what Steven Strasberg already described in 2002 about difficult laparoscopic cholecystectomy that Calot's triangle is a surgical plane delimited by the cystic duct, the main biliary tract, and the free edge of the hepatic segment IVb, indicating that one of the most frequent causes of conversion to open surgery found in the scientific literature are dense adhesions in Calot's triangle (12.3%), concluding that, given how aberrant the anatomy of the biliary tract can be, there is no better way to ensure the integrity of the biliary tract than a meticulous and very gentle dissection of the elements of Calot's triangle. The surgeon must provide the anatomical repairs or perform a cholangiography before ligating or clipping the vascular structures. One of the requirements to achieve the critical view of safety is that Calot's triangle must be perfectly cleaned of fat and fibrous tissue without it being necessary to expose the common bile duct.

In patients with laparoscopic cholecystectomy (n = 278), 94.60% had no complications. The most common complication in this group was a subhepatic abscess in

3.24%, then bleeding of the gallbladder bed in 1.08%, infection of the operative site in 0.72%, and bile duct injury in 0.00%. Compared to the patients who underwent conventional cholecystectomy (n = 34), 58.82% had no adverse effects. The prevailing complication was a subhepatic abscess in 14.71%, followed by surgical site infection in 11.76%, biliary fistula and bile duct injury with 5.88% each, and bleeding of the gallbladder bed in 2.94%. Data that partially correlate with the research of Cordero and his group³⁷ indicate that post-surgical complications are a cause of concern at the hospital level; those that occur through laparoscopic cholecystectomy can also occur in open cholecystectomy, but their frequency varies. This study found that the prevalence of postoperative complications in patients undergoing laparoscopic cholecystectomy (4.7%) was significantly lower than in those undergoing conventional cholecystectomy (12.6%). For the conventional group, surgical wound infection showed the highest prevalence (50%), followed by urinary tract infection (18.7%), while in the laparoscopic cholecystectomy group, only one complication occurred.

Data that correlate with the study by García and Ramírez,⁴³ that compared the laparoscopic cholecystectomy technique against the open cholecystectomy technique in acute gallbladder pathology, at the General Hospital "Dr. Darío Fernández Fierro", ISSSTE, Mexico City, Mexico. In the group analysis for patients undergoing laparoscopic cholecystectomy, the following results were obtained: in the post-surgical length of stay, the mean was 2.15 days with a minimum of one day and a maximum of five days of post-surgical hospital stay: 12 (23%) patients required one day of post-surgical stay, 27 (52%) needed two days, nine (17%) three days, one (4%) two days and only three (6%) stayed five days. For patients who underwent open cholecystectomy, the results were as follows: for the postoperative length of stay, the mean was 3.8 days with a minimum of one day and a maximum of six days of postoperative hospital stay; two (3%) patients required one day of postoperative stay, 20 (33%) needed two days, 25 (42%) three days, eight (13%) four days,

while five patients stayed more than five days, due to surgical wound infection in three cases and two due to evisceration. Similarly, Estepa and colleagues³⁸ state that the average hospital stay for laparoscopic cholecystectomy is 1.6 versus 4.3 days for open cholecystectomy, while Garcia showed that the length of hospital stay is longer among postoperative patients for open versus laparoscopic cholecystectomy (p = 0.0038).

In a study on the complications of biliary surgery at the Hospital Universitario Marqués de Valdecilla, Santander, it is difficult to establish an absolute mortality figure for each biliary surgery procedure. Still, taking cholecystectomy as a reference, mean values for the open procedure concerning the laparoscopic approach are 0-1.8 versus 0-0.5% each, respectively; however, these will depend on several factors, mainly the presence of comorbidities in the patient.⁴⁴

CONCLUSIONS

The most frequent postoperative diagnosis in patients under study was vesicular lithiasis.

Clips were used for surgical management of cholelithiasis in most patients.

In patients with laparoscopic cholecystectomy, the most common approach to the abdominal cavity used was the Veress needle and, in conventional surgery, the transverse subcostal incision.

Most patients had a hospital stay of 24 to 48 hours.

About the macroscopic surgical findings in surgery for biliary tract lithiasis in the patients under study, the most significant results were peritoneal adhesions, stones larger than 0.5 cm, and wall thickness less than 4 mm.

Complications of laparoscopic cholecystectomy were categorized as minor complications, which can also occur in open cholecystectomy, but their frequency varies, being higher in the second group.

Hospital stay was longer in patients with conventional cholecystectomy compared to the laparoscopic surgery group, with statistical significance between variables.

As the study period elapsed, a higher frequency of laparoscopic surgeries performed

by second and third-year postgraduate residents became evident.

Surgical mortality associated with biliary pathology is infrequent and mainly associated with the patient's comorbidities.

REFERENCES

- Ibáñez L, Escalona A, Devaud N, Montero P, Ramirez E, Pimentel F. Laparoscopic cholecystectomy: 10-year experience at the Pontificia Universidad Católica de Chile. *Rev Chil Cir.* 2010; 59: 10-15.
- Halpin V. Acute cholecystitis. *BMJ Clin Evid.* 2014; 2014: 0411.
- Sekimoto M, Takada T, Kawarada Y, Nimura Y, Yoshida M, Mayumi T. Need for criteria for the diagnosis and severity assessment of acute cholangitis and cholecystitis: Tokyo Guidelines. *J Hepatobiliary Pancreat Surg.* 2009; 14: 11-14.
- Ambe P, Weber S, Christ H, Wassenberg D. Cholecystectomy for acute cholecystitis. How time-critical are the so called "golden 72 hours"? Or better "golden 24 hours" and "silver 25-72 hour"? A case control study. *World J Emerg Surg.* 2014; 9: 60-67.
- Campanile F, Pisano M, Coccolini F, Catena F, Agresta F, Ansaloni L. Acute cholecystitis: WSES position statement. *World J Emerg Surg.* 2014; 189: 58.
- Fuentes I, López T, Papuzinski A, Zúniga C. Early and late laparoscopic cholecystectomy for acute cholecystitis. Relationship in hospital stay. *Dr. Gustavo Fricke Hospital, Chile 2011. Rev ANACEM.* 2013; 7: 60-63.
- Papi C, Catarci M, D'Ambrosio L, Gili L, Koch M, Grassi G. Timing of cholecystectomy for acute calculous cholecystitis: a meta-analysis. *Am J Gastroenterol.* 2014; 99: 147-155.
- Beckman I, Dash N, Sefczek RJ, Lupetin AR, Anderson JS, Diamond DL, et al. Ultrasonographic findings in acute acalculous cholecystitis. *Gastrointest Radiol.* 1985; 10: 387-389.
- Gurusamy K, Rossi M, Davidson B. Cholecystostomy for high-risk surgical patients with acute calculous cholecystitis. *Rev Esp Cir.* 2013; 68: 205-509.
- Winbladh A, Gullstrand P, Svanvik J, Sandstrom P. Systematic review of cholecystostomy as a treatment option in acute cholecystitis. *BPH.* 2009; 11: 183-193.
- Cao A, Eslick G, Cox M. Early cholecystectomy is superior to delayed cholecystectomy for acute cholecystitis: A metaanalysis. *J Gastrointest Surg.* 2015; 19: 848-857.
- Oymaci E, Ucar A, Yakan S, Carti E. Determination of optimal operation time for the management of acute cholecystitis: a clinical trial. *Prz Gastroenterol.* 2014; 9: 147-152.
- Lizana C. Video laparoscopic cholecystectomy. 250 cases. *Rev Chil Cir.* 2011; 43: 285-291.
- Cifti F, Abdurrahman I, Girgin S. The outcome of early laparoscopic surgery to treat acute cholecystitis: A single-center experience. *Int J Clin Exp Med.* 2015; 8: 4563-4568.
- Ambe PC, Kaptanis S, Papadakis M, Weber SA, Zirngibl H. Cholecystectomy vs. percutaneous cholecystostomy for the management of critically ill patients with acute cholecystitis: a protocol for a systematic review. *Syst Rev* 2015; 4: 77.
- Minutolo V, Arena M, di Stefano B. Laparoscopic cholecystectomy in the treatment of acute cholecystitis: Comparison of outcomes and costs between early and delayed cholecystectomy. *Eur Rev Med Pharmacol Sci.* 2014; 18: 40-46.
- Kortram K, van Ramshorst B, Bollen TL, Besselink MG, Gouma DJ. Acute cholecystitis in high-risk surgical patients: percutaneous cholecystostomy versus laparoscopic cholecystectomy (CHOCOLATE trial): study protocol for a randomized controlled trial. *Trials.* 2012; 13: 7.
- Parshad R, Kolla S, Aggarwal S, Kumar A, Kumar R. Early versus delayed laparoscopic cholecystectomy for acute cholecystitis: a prospective randomized trial. *Surg Endosc.* 2011; 18: 1323-1327.
- Gutt C, Encke J, Koninger J, Harnoss J, Weigand K. Acute cholecystitis: early versus delayed cholecystectomy, a multicenter randomized trial (ACDC study, NCT00447304) *Ann Surg.* 2013; 258: 385-391.
- Zehetner J, Degnera E, Olasky J, Mason R, Drangsholt S. Laparoscopic cholecystectomy in patient with acute cholecystitis and failed conservative management: a matched-pair analysis. *Surg Laparosc Endosc Tech.* 2014; 24: 523-527.
- Chang Y, Ahn Y, Jang J, Kang M, Kwon W. Percutaneous cholecystostomy for acute cholecystitis in patients with high comorbidity and re-evaluation of treatment efficacy. *Surgery.* 2010; 155: 615-622.
- Shostrom V, Simorov A, Ranade A, Parcells J. Emergent cholecystostomy is superior to open cholecystectomy in extremely ill patients with cholecystitis: a large multicenter outcome study. *Am J Surg.* 2013; 206: 935-940.
- Suárez L. Surgical treatment of acute cholecystitis by laparoscopic cholecystectomy. *Rev Chil Cir.* 2010; 46: 69-74.
- Mansour JC, Yopp AC. Percutaneous cholecystostomy: the challenges of cohort analysis. *J Surg Res.* 2014; 190: 417-418.
- de Mestral C, Gomez D, Haas B, Zagorski B, Rotstein O. Cholecystostomy: a bridge to hospital discharge but not delayed cholecystectomy. *J Trauma Acute Care Surg.* 2013; 74: 175-179.
- Sanjay P, Mittapalli D, Marioud A, White R. Clinical outcomes of a cholecystostomy for acute cholecystitis: a multicentre analysis. *HPB.* 2013; 15: 511-516.
- Abi-Haidar Y, Sanchez V, Williams SA, Itani KM. I am revisiting percutaneous cholecystostomy for acute cholecystitis based on a 10-year experience. *Arch Surg.* 2012; 147: 416-422.
- Anderson JE, Inui T, Talamini MA, Chang DC. Cholecystostomy offers no survival benefit in patients with acute acalculous cholecystitis and severe sepsis and shock. *J Surg Res.* 2014; 190: 517-521.
- Ozsan I, Yodas O, Karabuga T, Yildirim U, Cetin H. Early laparoscopic cholecystectomy with continuous pressurized irrigation and dissection in acute cholecystitis. *Gastroenterol Res Pract.* 2015; 734: 927-931.
- Yoh T, Okamura R, Nobuto Y, Wada S, Nakamura Y, Kato T. Timing of laparoscopic cholecystectomy for mild and

- moderate acute cholecystitis. *Hepatogastroenterology*. 2009; 61: 1489-1493.
31. Velasco A, López K, Guzmán S, Llanos O. Experience in the laparoscopic treatment of acute cholecystitis. *Rev Chil Cir*. 2015; 47: 148-152.
 32. Del Castillo M, Alvarado R. Acute cholecystitis: comparative study of 3 medical-surgical alternatives. *Rev Gastroenterol Per*. 2008; 17: 24-28.
 33. López J, Iribarren O, Hermosilla R, Fuentes T, Astudillo E, López N. Surgical resolution of acute cholecystitis: does the time of evolution influence? *Rev Chil Cir*. 2016; 69: 129-134.
 34. Castro F, Galindo J, Bejarano M. Complications of acute cholecystitis in emergency operated patients. *Rev Colomb Cir*. 2008; 23: 16-21.
 35. Portela T, Rodríguez Y, Hernández G, Blázquez N, Sanfiel Y. Benefit of clip retrieval in laparoscopic cholecystectomy. *Rev Cub Cir*. 2012; 19: 21-23.
 36. Galloso Cueto GL, Lantigua Godoy A, Carballo Casas S. Basic and specialized instruments in video laparoscopic cholecystectomy. *Rev Med Electron*. 2012; 34: 81-94.
 37. Cordero R, Pérez K, García A. Postoperative hospital stay time in patients after conventional and laparoscopic cholecystectomy. *Rev Médica Univ Veracruzana*. 2015; 15: 7-14.
 38. Estepa J, Santana T, Estepa J. Conventional open cholecystectomy in the surgical treatment of gallbladder stones. *Medisur*. 2015; 13: 24-26.
 39. Pizarro Jáuregui GA. Prevalence and risk factors associated with conversion from laparoscopic cholecystectomy to conventional cholecystectomy in the surgery service of the Central Hospital F.A.P. in the period from January to December 2017 [Thesis]. Lima, Peru: Ricardo Palma University; 2018. p. 81 (Multigraph).
 40. Gómez Zuleta MA, Ruíz Morales OF, Otero Rengino WA. What is the normal size of the common bile duct? *Rev Colomb Gastroenterol*. 2017; 32: 99-106.
 41. Montalvo E, Kurt S, Pulido A, Vázquez R, Basurto E. Anatomic pathology findings in a clinical series of cholecystectomy. *Cir Gen Mex*. 2013; 35: 114-120.
 42. Álvarez L, Esmeral M, García M, Toro D, Rojas O. Difficult laparoscopic cholecystectomy, management strategies. *Rev Colomb Cir*. 2013; 28: 186-195.
 43. García J, Ramírez F. Laparoscopic versus open emergency cholecystectomy. *Cir Gen*. 2012; 34: 174-178.
 44. Casanova R. Complications of biliary surgery. *Rev Esp Cir*. 2011; 69: 31-33.

Ethical considerations: Data privacy. By the protocols established in our work center, it is stated that the protocols on patient data privacy have been followed and patient anonymity preserved.

Funding: No financial support was received for this work.

Disclosure: None of the authors have a conflict of interest in the conduct of this study.

Correspondence:

Samuel Mauricio Yary-Maestracci, MD

E-mail: samuelyary@hotmail.com