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# Chronic and acute cholecystitis: review and current status in our setting

## *Colecistitis crónica y aguda, revisión y situación actual en nuestro entorno*

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**Keywords:**
Cholecystitis, lithiasis, gallstones, cholecystectomy, laparoscopy, cholelithiasis, conversion.

***Palabras clave:***
*Colecistitis, litiasis, cálculo biliar, colecistectomía, laparoscopia, colelitiasis, conversión.*

**ABSTRACT**

**Objective:** To analyze the prevalence of cholecystectomy, the various preoperative diagnoses, and the surgical management depending on severity, as well as the characteristics of the population with cholecystitis at the *Hospital Central del Estado de Chihuahua*. **Material and methods:** Between July 2016 and July 2017, we conducted a cross-sectional, retrospective study of 355 hospitalized patients who underwent emergency or elective cholecystectomy in the Department of Surgery of the *Hospital Central del Estado de Chihuahua*. **Results:** During the study period, 355 patients underwent cholecystectomy: 305 (87.64%) were laparoscopic or minimally invasive cholecystectomies –of these, 11 (3.1%) were converted to open surgery–, and 43 (12.36%) underwent scheduled open cholecystectomy with a traditional open technique. Seven patients were excluded due to incomplete information on over 20% of the study variables. The average age at disease presentation was 41 years. Most patients were female (280, or 80.45%), while 68 were male (19.55%). **Conclusions:** In most cases, the decision on the type of surgical approach hinges on the technology of the available surgical material, the surgeons' skill and experience, the extent of complications of cholecystitis and the possible benefits of one option over the other, individualized to each patient.

***RESUMEN***

***Objetivo:*** *Analizar la prevalencia de la colecistectomía, sus diferentes diagnósticos preoperatorios y el manejo quirúrgico dependiendo de la gravedad y las características de la población que padece colecistitis en el Hospital Central del Estado de Chihuahua.* ***Material y métodos:*** *Entre julio de 2016 y julio de 2017 se estudiaron, transversal y retrospectivamente, 355 pacientes internados e intervenidos de colecistectomía tanto electiva como de urgencia en el Servicio de Cirugía del Hospital Central del Estado de Chihuahua.* ***Resultados:*** *Durante el periodo de este estudio, 355 pacientes fueron sometidos a colecistectomía: 305 (87.64%) fueron colecistectomías laparoscópicas o de mínima invasión —de éstas, 11 (3.1%) se convirtieron a cirugía abierta— y 43 (12.36%) pacientes fueron intervenidos de colecistectomía abierta de primera intención con técnica tradicional a cielo abierto. Se excluyeron siete pacientes por información incompleta en más del 20% de las variables. El promedio de edad de presentación de la enfermedad fue de 41 años. Del total de pacientes, la mayoría fue del sexo femenino: 280 (80.45%); del sexo masculino fueron 68 pacientes (19.55%).* ***Conclusiones:*** *La mayoría de los casos por los cuales se decide el tipo de abordaje quirúrgico reside en la tecnología del material quirúrgico del que se dispone, la experiencia y habilidades de los cirujanos, el grado de complicación de la colecistitis y los posibles beneficios de uno con respecto al otro, lo que individualiza a cada paciente.*

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## INTRODUCTION

Cholecystectomy is defined as the surgical medical procedure whose purpose is the removal of the gallbladder. It consists in safely separating this organ from its blood vessels, the common bile duct and the liver. The surgical technique used depends on each surgeon.[1-3]

In 1990, Gutiérrez et al. performed the first laparoscopic cholecystectomy in Mexico,[2] and since then, this technique has exponentially grown.[4,5] In the first nine years of experience with laparoscopic surgery at the Ministry of Health *Hospital General de México* (a tertiary care hospital in Mexico City), 7,323 cholecystectomies were performed; out



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of these, only 3,394 started out using the laparoscopic technique (46.34%).[6,7] On the other hand, in a private facility such as the ABC Hospital in Mexico City, the percentage of complete surgical excision was over 90%.[8] By 2005, open cholecystectomies were still a routine procedure (74.8%). On average, Mexican surgeons performed 84 cholecystectomies per year: 63 were open and 21 were laparoscopic, averaging seven cholecystectomies per month.[9] However, by 2009, cholecystitis had become the fourth cause of hospital admission overall and the fourth cause of surgical hospital discharges, with 29,866 hospital discharges.[10] There is currently no exact census on the number of cholecystectomies performed in Mexico; in the U.S., over 700,000 cholecystectomies are performed every year, most of them laparoscopic, with a cost of 6.5 billion dollars a year.[11-18]

Although it is one of the most frequent disease entities, there are many uncertainties on cholecystitis, whose physiopathogenic relevance and severity range from mild to very severe. It is known to be closely associated with gallstones. The recurrence of episodes of cholecystitis is quite high, so the treatment of choice in these cases is surgical removal of the gallbladder.

## MATERIAL AND METHODS

Between July 2016 and July 2017, we conducted a cross-sectional, retrospective study on 355 patients, ages 16 to 87, that were hospitalized and underwent emergency or elective cholecystectomy in the Department of Surgery at the *Hospital Central del Estado* in the city of Chihuahua, Mexico.

The records on surgeries performed in this hospital during the study period were reviewed in the hospital's archives. Several variables were obtained from each patient's records, including name, age, sex, preoperative diagnosis, postoperative diagnosis, and surgery duration. Data obtained were corroborated with the postoperative notes in the SiHO® system, and a database was created in Excel®. Data were classified and then tabulated in tables and graphs to carry out their statistical analysis.

Cases with no available information were excluded, as well as those lacking over 20% of the required data and those in whom surgical gallbladder removal was cancelled.

A detailed clinical history was obtained from every patient as well as a thorough physical examination, laboratory tests (including blood count, liver function tests, glucose) and a hepatobiliary and pancreatic ultrasound.

## RESULTS

During the study period, 355 patients underwent cholecystectomy. Out of these, 305 (87.64%) were laparoscopic or minimally invasive procedures, 11 of which (3.1%) were converted into open surgeries (five due to difficulties for hemostasis, three due to uncertainty regarding complete dissection, two due to multiple adhesions and one resulting from a failed attempt to explore the biliary tract). Forty-three patients (12.36%) underwent a scheduled open cholecystectomy using the traditional technique. Seven patients were excluded because their information on over 20% of the required variables was incomplete. The study therefore included a total of 348 patients undergoing cholecystectomy.

The average age was 41, with a mode of 27 years and a median of 40 years.

Out of the total study population, most patients were female (280, or 80.45%), and 68 (19.55%) were male.

The various preoperative diagnoses recorded are shown in *Table 1*.

The mean duration of surgery could not be established due to the lack of reliable data in the recorded information. Complications were not considered in this study.

## DISCUSSION

The indications for cholecystectomy include a wide variety of conditions, from biliary colic to cancer of the gallbladder. They include all kinds of symptomatic gallstone disease, such as jaundice, acute lithiasic cholecystitis, exacerbated chronic lithiasic cholecystitis, cholecystolithiasis, choledocholithiasis and biliary pancreatitis. Other causes, not resulting from calculi, lead to a minority of

**Table 1: Patients undergoing cholecystectomy: gender, age group, diagnosis and treatment.**

| Variable<br>Age group | Male | Female | Total |
|---|---|---|---|
| 15-25 | 5 | 52 | 57 |
| 26-35 | 9 | 68 | 77 |
| 36-45 | 16 | 71 | 87 |
| 46-55 | 19 | 43 | 62 |
| 56-65 | 10 | 32 | 42 |
| 66-75 | 5 | 8 | 13 |
| 76-85 | 3 | 6 | 9 |
| 86-90 | 0 | 1 | 1 |
| **Diagnoses** | | | |
| Acute cholecystitis | 0 | 9 | 9 |
| Acute cholecystitis with gallstones | 3 | 22 | 25 |
| Chronic cholecystitis with gallstones | 16 | 57 | 73 |
| Acalculous cholecystitis | 1 | 0 | 1 |
| Cholecystolithiasis | 26 | 137 | 163 |
| Gallbladder hydrops | 5 | 17 | 22 |
| Purulent cholecystitis | 11 | 25 | 36 |
| Necrotic hemorrhagic cholecystitis | 1 | 0 | 1 |
| Gallbladder dyskinesia | 0 | 2 | 2 |
| Gallbladder polyp | 0 | 1 | 1 |
| Choledocholithiasis | 3 | 10 | 13 |
| Emphysematous cholecystitis | 0 | 1 | 1 |
| Enterobiliary fistula | 1 | 0 | 1 |
| **Treatment** | | | |
| Laparoscopic cholecystectomy | 55 | 250 | 305 |
| Open cholecystectomy | 12 | 20 | 32 |
| Converted cholecystectomy | 0 | 11 | 11 |
| Total | 348 | | |

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cholecystectomies, i.e., gallbladder polyps, gallbladder dyskinesia, and acalculous cholecystitis.[2,19-21]

Close to 95% of biliary tract diseases are related to gallstones, a disease representing the first cause for cholecystectomies. There are no reliable overall statistics on the incidence of cholelithiasis, its clinical presentation and the outcomes of its different treatments in Mexico.[22] Statistics reported by public healthcare institutions have suggested a prevalence of 14.3%;[23] it undoubtedly depends on patient age, sex, racial factors and lifestyle. It is a common disease in this country, with a ratio of three females for every man, and presenting at an average age of 37 years. At least 25% of all females and 20% of males will have gallstones at some point in their lives.[22]

Of all electively performed cholecystectomies, only 5% are converted into an open procedure. However, in emergency procedures, this percentage shows a two-to five-fold increase, with a conversion rate of 10 to 30%.[3,24-27] Such decision should be made in a timely manner, to protect the patient from severe transoperative injury, and should be considered sound surgical judgment and, therefore, not a failure.

In most cases, the decision on the type of surgical approach hinges on the technology of the available surgical material, the experience and skill of the surgeons, the extent of complications arising from the cholecystitis and the possible benefits of one option over the other, individualized to each patient.

In our setting, among the patient population of the *Hospital Central del Estado*, a large percentage (46.83%) of cholecystectomies were the result of cholecystolithiasis; 20.97% were due to chronic cholecystitis with gallstones; 10.34% to purulent cholecystitis; 7.18% to acute cholecystitis with gallstones; 6.32% to gallbladder hydrops; 3.73% to choledocholithiasis, and the rest were due to other causes mentioned in *Table 1*.

## CONCLUSION

The decision on the type of surgical approach hinges on the technology of the available surgical material, the experience and skill of the surgeons, the extent of complications arising from the cholecystitis and the possible benefits of one option over the other, individualized to each patient.

We intend to prevent the more serious stages of the disease (gallbladder hydrops or purulent cholecystitis) and attempt to carry out most surgeries as minimally invasive

procedures, which will in turn promote a faster and more favorable recovery, a shorter hospital stay, and decreased morbidity, as well as a significant reduction in costs to the institution. However, there are still patients who do not fit this ideal framework, so it is important to emphasize on timely treatment, preventing risk factors, discouraging self-medication, and requesting care from properly certified medical professionals for diagnostic and therapeutic purposes.

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