



Gallbladder Collapse: Has Its Incidence Increased?

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Abstract: Introduction: perforation of the gallbladder is infrequent due to prompt and expeditious diagnosis and treatment of biliary pathology. Objective: to report the experience of diagnosis and treatment in patients with gallbladder bladder in a second-level health care hospital. Method: a descriptive, retrospective, longitudinal and observational study was carried out, with a descriptive statistical analysis in patients with gallbladder and/or biliperitoneum after cholecystectomy, emergency or scheduled. Results: 101 patients who underwent cholecystectomy, of which 82 were women, representing 81.18 %, and only 18 men, representing 18.82 %, with a male/female ratio of 1:5. The mean age was 53 years. Gallbladder cholecyst occurred in 12 patients, 11.88 %, 7 more with biliperitoneum 6.93 %, 5 patients with residual choledocholithiasis 4.95 %, and two with persistent jaundice 1.98 %. Discussion: an incidence of gallbladder perforation of 2 to 11 % is reported. Patients with acute cholecystitis, especially elderly people with diabetes and vascular disease, are particularly vulnerable due to microangiopathy, compromised immune response, and delayed perception of symptoms. Emergency, robotic or conventional laparoscopic cholecystectomy is indicated, as

opposed to only gallbladder drainage guided by endoscopic ultrasound or cholecystostomy. **Conclusions:** gallbladder cholecystectomy is such a complex complication that it is reflected in high morbidity with transcendental sequelae and with a high mortality increasing its incidence exponentially. Since the delay in diagnosis and treatment secondary to a lack of infrastructure, supplies, directed health policies and correct regulations.

Keywords: Colasco, Acute cholecystitis, Biliperitoneum, Cholecystectomy, Cholecystostomy, Biliary pathology, Endoscopic ultrasound.

INTRODUCTION

Colasco is a medical term that in its etymology has a meaning from Greek roots: cholē = bile and askos = bag, wineskin or sac, says that it is something that collects fluid in the abdomen. In short, free biliary fluid in the cavity or biliperitoneum or biliary peritonitis. [1] The international and national medical literature mentions that perforation of the gallbladder is nowadays infrequent, due to the advantage of a prompt and expeditious diagnosis and treatment of patients with biliary pathology. It has been documented that its incidence is less than 1% of patients already surgically treated for gallstones. And it is such a scenario that the patient faces being life-threatening. [2] Is cholasco a rare complication? Other literature documents 2% to 11% of patients with cholecystitis, and many cases are not diagnosed before surgery, and a mortality rate as high as 12% to 16% is reported. [3] Some case series of yesteryear report mortality of up to 50%, so a three-type classification published by Niemeier in 1934 was proposed, but it has not transcended in time, since it has no useful advantage. [2, 4]

Gallbladder perforation is common in gallbladder vesicles but can also occur in acute alithiasic cholecystitis. The pathophysiological explanation is when a stone occludes the lumen of the bile duct and/or cystic, which consequently leads to biliary stasis and distension of the gallbladder with consequent increased pressure and impaired circulation in the gallbladder, and in conjunction with bacterial colonization and infection, causing necrosis and perforation of the gallbladder. [5] Explained with the following text where atherosclerosis of the cystic artery and microvascular disease can lead to gallbladder ischemia and gangrenous transformation occurring in 30% of patients, there is not even evidence of gallbladder stones. [6, 7] In Mexico, an exponential growth in the incidence of biliary and pancreatic pathology has been observed, reaching the first place in terms of the frequency of surgical care. In the outpatient clinic, in the emergency room, and in hospitalization, and not to mention the increase in morbidity/mortality, which is not reflected in the results that are reported. And without reliable statistics by public institutions, by state, or throughout the country. [8, 9]

It should be noted that the gallbladder and its surrounding organs are organs with certain special characteristics, which make it a challenge for any competent surgeon with the appropriate resources for it.

1. The high anatomical variety of the area, estimated at up to 53%. [10]
2. The exponential inflammatory process given by its chronicity, meagre diagnosis and consequently treatment. [11]

3. Competent human resources, supplies, and hospital infrastructure have a direct impact on the correct and quality care of the patient. [12, 13, 14]
4. Other scenarios such as severe obesity, previous surgery, underlying liver disease, unexpected bleeding, etc. [15]

Other observations by the authors that make biliary disease, which become a real risk and influence the natural history of the disease, are specific to the gallbladder with respect to its anatomy and physiology. Explaining its chronicity, its incidence, and even its complications. [16] Biliary pathology involves liver, gallbladder, duodenal, pancreatic, or bile duct diseases; however, differential diagnoses should be suspected with systemic sepsis or even with hematological entities. [17, 18] In Mexico, the high incidence of gallstone formation affects more than 14% of the general population and is 4:1 higher in women than in men. This is due to a combination of high incidence of obesity, genetic predisposition of the Latin American population, and diets in the idiosyncrasy of being abundant, unique in refined fats and carbohydrates. that cholecystectomy is frequent throughout the world and varies according to the regions. [19] The surgeon's overconfident attitude, the excessive use of the laparoscopic approach, and the lack of post-cholecystectomy sequelae are sufficient evidence that this procedure is associated with a greater burden of gastrointestinal symptoms, erroneously attributed to a biliary disease for which a cholecystectomy was performed by mistake, profit, or just by simple practice. [20]

OBJECTIVE

To report the experience of diagnosis and treatment in patients with biliary pathology of colascos specifically, in the General Hospital, which is a second-level health care hospital of the Ministry of Health of Mexico City.

METHOD

It is a descriptive, retrospective, longitudinal and observational study, with a descriptive statistical analysis in patients who present gallbladder and/or biliperitoneal colascos after cholecystectomy, in whom they underwent surgery or reoperated, urgently, by partial cholecystectomy and/or after emergency or scheduled surgery from July 2025 to July 2026, at the "Dr. Rubén Leñero" General Hospital of the Ministry of Health of Mexico City.

The variables of sex, age, types of cholecystectomies, types of surgical approach, variants of partial cholecystectomies, days of hospital stay, number of surgeries, surgical time, complications of surgery, morbidity and mortality were identified.

RESULTS

A total of 101 patients who underwent cholecystectomy and biliperitoneal reoperation were identified, of which 82 were women, representing 81.18%, and only 18 men, representing 18.82%, with a male/female ratio of 1:5. The mean age was 53 years, ranging from 17 to 78 years and bimodal presentation of 38 and 61 years. These patients were all elected, high-priority, or emergency surgeries or referred to by other hospitals. Surgical approaches were by conventional surgery or laparoscopy.

Of the 101 patients, gallbladder cholasco data were collected in 12 individuals (11.88%), 7 cases with biliperitoneum 6.93%, 5 patients with residual choledocholithiasis (4.95%), and two patients with persistent jaundice (1.98%). **See Table 1.**

Table 1: Patients With Various Diagnoses Due To Complications Of Hepatobiliary Pathology

Diagnosis	No. / %	No. of Surgeries	Treatment
Biliperitoneum	7/6.93	2-5	Surgical/ErCP
Residual Cholidocholithiasis	5/4.95	2-3	ERCP
Persistent Jaundice	2/1.98	2	ERCP
Vesicular Colasco	12/11.88	2-3	Surgical
Vesicular Cancer	1/0.99	2	Paliation
Total	27/26.73	2	ERCP/Surgical

The information is gathered that together is visualized in an average of 26% of complicated hepatobiliary pathology, however the subject of study of this manuscript is detailed to 19 patients representing 19% of this entity, where biliperitoneum and gallbladder colasco were included exclusively. The remaining three diagnoses in a context of sequelae, one of them for liver cirrhosis, in second place gallbladder cancer and the third for unspecified pancreatic tumor. The range of surgeries performed in each patient ranged from 1 to 5 surgeries, with an average of 2. The support of ERCP (endoscopic retrograde cholangiography) as a diagnostic and therapeutic instrument was fundamental, offering a solution in most patients, avoiding a new surgical intervention. The cases with gallbladder cholasco were in its entirety as well as the patients who presented with biliperitoneum underwent emergency surgery. Performing various procedures, ranging from total cholecystectomy, cholecystostomy, restorative subtotal cholecystectomy or even only abscess drainage, bile drainage, cavity lavage and then the study protocol and/or ERCP or definitive surgical management is carried out. **See Table 2.**

Table 2

Morbidity of Patients with Cholasco and/or Complications of Hepatobiliary Pathology	Number/%
Healthcare-associated pneumonia	4 /16
Urinary tract infection	3 /12
Uremic syndrome	1 /04
Acute renal failure	1 /04
Seroma	5 /20
Biliary leakage	15 /60
Surgical wound infection	6 /24
Choledocholithiasis	8 /32
Jaundice	2/08
Eventration	2/08
Elevation of pancreatic enzymes by ERCP	3/12

With regard to morbidity, the one with the highest incidence in this study is biliary leakage, which is included in a series of diagnoses or sequelae or consequences of the surgical technique, the underlying pathology or the iatrogenic evolution of the disease itself and/or the patient, covering up to 60% of the total study, in a second term the complication or sequelae is choledocholithiasis both trans operative vs residual choledocholithiasis and reaches 32% of the total morbidity reported; and in third place the infection of the surgical wound with a percentage of 24%. It should be remembered that the disease itself is a severe complication of another disease and the initial parameters are no longer basal either for its prevalence or for its incidence, since it impacts the same patient and may have one or more morbidities at the same time already pre-established.

Biliary leakage is caused by various entities from the beginning and/or after-sequel, they are listed in the following list in **Table 1**. However, it is colasco, which in international and national literature is reported as having a low incidence, in our work the incidence occupies the first place. That is why the objective of this study is where the cause that stands out is the delay in diagnosis due to lack of initial medical expertise in private medicine/family medicine/emergency admission services/emergency service, etc. Which condition one to a torpid and/or fatal perforation of the gallbladder organ and everything that this scenario entails.

Pneumonia occurred in 16% as shown in **Table 2** and 6 patients were reported to have been managed in the intensive therapy support service. Three of them are due to pneumonia and the rest are due to cholangitis.

Biliary fistulas, wrongly named as such, since a perforation or disruption of the bile duct, is not a fistula is the name that has been adopted to biliary perforation. [21]

Of the 17 patients with biliary leakage, 13 were tried to resolve with surgical intervention, however all had already had previous surgery on the gallbladder, bile duct and liver, of these 5 cases were resolved with ERCP and use of stents, achieving a discharge from the same hospital and with elective readmission for removal of the stent months later. Three deaths were reported, two due to pneumonia associated with health care and one due to septic shock due to cholangitis. Adjusted mortality reached 11.11%. The variety of morbidity increases greatly because they are patients who come from the emergency department with intermittent fasting, jaundice, hydro electrolyte imbalance, dehydration, etc.

In two patients, 3 and 5 times each were reoperated in order to control abdominal sepsis due to chemical peritonitis and purulent peritonitis, which was one of the deaths documented as cholangitis. The surgeries performed on the pio cholecyst were performed according to findings, as a result there was bile in the cavity with ranges from 300 to 2800 milliliters, due to the time of evolution, or the time from the first surgery to the diagnosis of suffering from biliperitoneum. It should be noted that damage control surgery is performed in 70% of the cases due to the severity of the patient or hemodynamic instability. With the drainage of the bile fluid was the priority and the washing of the cavity as a second action, the third objective is to maintain a set of drains from the entire cavity that after 10 days a fistulous tract is formed. It is a decision-making to carry out the correct thing regarding what was found, such as gallbladder lysis or necrosis of. The whole gallbladder in 2 cases, biliary leakage due to partial cholecystectomy still fenestrated, leakage of the cystic remnant and the possibility of performing a trans operative cholangiography (to

observe the morphology of the bile duct with X-rays or dynamic fluoroscopy) [22] is essential when the resource is available, which is not available in this surgical center. This study allows the resolution of the etiology of biliary leakage in the trans operative period or a correct palliation for a definitive surgery or an endoscopic study. 8 cases of gallbladder "rendez-vous" without complications have been documented, in addition, two patients have been referred to other hospitals to perform SpyGlass DS II, these cases were not included in this study.

The complexity of the bile duct and gallbladder complications lies in a series of factors that will be analyzed later, the important thing that this study exposes is that the variety or diversity of results make it difficult to standardize management or treatment. Two cholecystostomies have been performed, one case for severe thrombocytopenia and the second for septic shock with hemodynamic uncontrol. The use of plastic stents or partially covered SEMS and sphincterotomy is carried out in 74% of patients and their subsequent removal with a new ERCP, there was no reported migration or any complication in its removal with a variable time of 3, 4 or even 6 months due to external factors. The days of hospital stay were averaged in 11 days with ranges of 5 to 28 days; three patients were candidates for management in intensive care for pneumonia associated with health care with an average stay of 4 days and range of 2 to 8 days. Follow-up was reported in the outpatient clinic for a period of 6 months on average.

DISCUSSION

Gallbladder perforation is a life-threatening complication of acute cholecystitis, the association between the presence of gallstones and the incidence of cholecystitis gangrenous. An incidence of gallbladder perforation of 2% to 11% has been reported among patients with acute cholecystitis, [23, 24] In addition, Gallbladder perforation and gallstone effusion are common during laparoscopic cholecystectomy, occurring in up to 40% and 6% to 10% of cases, respectively. Most retained stones remain asymptomatic, with 2.3% to 8.5% of patients presenting with intra-abdominal abscess, granuloma formation, abdominal wall sinus, fistula, or a mass that mimics malignancy. They may migrate to extra-abdominal locations years later, causing chronic chest wall pathology. [25]

Regarding the diagnosis, the clinical picture and complete physical examination are essential, whether or not an acute abdomen is detected by a surgeon and whether it presents data of systemic inflammatory response, so expertise and/or experience are crucial for its correct diagnostic suspicion. [26] With tenderness in the epigastric region and right hypochondrium with Murphy's present sign, it is pathognomonic, with a clinical conclusion, which is confirmed by laboratory and cabinet studies. [27] The gold standard for confirming the diagnosis of hepatobiliary pathology is ultrasound, which is the best study with a sensitivity and specificity greater than 90% of cases, for diagnosis [28] and sometimes to complement treatment. [29]

Acute cholecystitis in patients with multiple comorbidities and advanced malignancies presents unique diagnostic and therapeutic challenges. Contrast ultrasound has established itself as a valuable tool for the diagnosis of complicated cholecystitis, and the orientation of interventional procedures, [30] such as ultrasound-guided endoscopic drainage of the gallbladder, have emerged as viable alternatives; [31] On the other hand,

computed tomography is not the method of choice to evaluate this pathology, however, the greatest use of this method is the study of complications of acute cholecystitis, such as emphysematous cholecystitis, hemorrhagic forms, perforation, cholangitis and biloperitoneum, or collections for vesicular, among others. [32] Perforated necrotizing cholecystitis is a life-threatening complication of acute cholecystitis, especially in frail elderly patients, in whom atypical presentations may delay diagnosis. [33] Laboratory tests showed leukocytosis, elevated inflammatory markers, and acute-on-chronic renal dysfunction. Contrast-enhanced computed tomography revealed perforated necrotizing cholecystitis with a large 13 × 3.4 cm loculated pericholecystic abscess. [34] Necrotizing/gangrenous cholecystitis, characterized by gallbladder ischemia and wall necrosis, represents a serious complication that occurs in approximately 2-30% of cases. Reported rates in older populations range from approximately 18-29%, particularly among older male patients with diabetes and cardiovascular disease. [35]

Niemeier in 1934 determined that the incidence of this pathology was 1 to 4% and that gallbladder cholangitis or gallbladder perforation has been classified since ancient times into three types and are currently described as:

- Type 1: Free Drilling
- Type 2: Abscess perforation
- Type 3: chronic perforation with cholecystoenteric fistula.
- Type 4: Can be modified to include the formation of cholecystobiliary fistulas. [36, 37, 38]

Elderly patients with diabetes and vascular disease are particularly vulnerable due to microangiopathy, compromised immune response, and delayed symptom perception. [39] Since they present with minimal systemic inflammatory response and a palpable mass that mimicked gallbladder dropsy, highlighting the well-documented but under-recognized phenomenon of attenuated inflammatory response in frail, elderly, and diabetic individuals. [40] Or as gallbladder torsion compromising blood supply due to cystic artery torsion, leading to ischemia, necrosis, and potentially serious complications, such as biliary peritonitis or gangrenous gallbladder perforation. [41] Subtle clues on computed tomography or contrast-enhanced ultrasound, such as focal gallbladder wall discontinuity, are key to early identification. A staged approach focused on interventional drainage, supported by a multidisciplinary team. [42] Pneumoperitoneum is a clinically significant and diagnostically important finding that often indicates perforation of a hollow organ within the gastrointestinal tract. However, there are also less common etiologies, such as perforation of the distal esophagus, gallbladder, or bile ducts, resulting from inflammatory diseases, trauma, or iatrogenic lesions. [43] Percutaneous transhepatic gallbladder drainage specifically diagnosed by transcatheter cholangiography confirms leakage of contrast from the gallbladder fundus into the subcapsular cavity and provides decompression of the subcapsular cavity. [44]

With regard to the treatment of gallbladder cholecystitis or gallbladder perforation, several modalities have been postulated that are inconclusive to date, where optimal treatment routes remain undefined, to distinguish patients who require urgent intervention from those who are suitable for conservative or delayed treatment. [45] The optimal management of acute cholecystitis with contained gallbladder perforation remains unclear,

and percutaneous drainage is traditionally considered the treatment of choice due to safety concerns, inflammatory process, infectious process, chemical effect, and hemodynamic instability. Echoendoscopy-guided gallbladder drainage is a safe, technically feasible, and clinically effective option in selected patients with acute cholecystitis, even in the presence of a gastric ulcer. **See Figure 1. [46]**



Figure 1: Endoscopic image of transduodenal gallbladder drainage with purulent bile outflow. Image taken from: Auriemma F, Leone R, Paduano D, Franchellucci G, Gentile C, Mangiavillano B. Management of acute cholecystitis with contained perforation with endoscopic ultrasound-guided gallbladder drainage. *Endoscopy*. 2026 Sep;58(S 04):E769-E770. doi: 10.1055/a-2869-7038. [47]

ERCP with successful removal of gallstones, followed by endoscopic ultrasound-guided gallbladder drainage using a self-expanding metal stent placed between the gallbladder and duodenal bulb. A 7 Fr $\times$ 5 cm double-pigtail plastic stent was inserted. [47, 48] In the pediatric population, laparoscopic cholecystectomy is the primary surgical approach in 84% of cases, while open cholecystectomy is documented in 1% due to complications or anatomy. Of the laparoscopic cases, 4.8% were converted to open, most commonly due to intraoperative findings, perforation, or significant adhesions. [49] Gallbladder perforation occurs in 1.9%, biliary abscess in 1.4%, and bile leakage in 0.8% of all patients. [50]

Acute peritonitis is defined as a brutal and diffuse inflammation of the peritoneal serosa of bacterial or chemical origin. The surgical service is effective, depending on the pathology, the terrain, and the operator's experience in a laparotomy or celioscopy. Rigorous hemostasis is necessary for a blood collection in a septic environment that exposes the risk, where the etiology of a gallbladder perforation is of two types: infectious and chemical, with surgical management or incipient drainage coupled with antibiotic adjuvant, it may yield a better result. [51] See Figure 2.



Figure 2: Laparoscopic view of the surgical field; arrow indicates necrotic gallbladder. Image taken from: Al-Zaher S, Almonte Hidalgo GA. Clinically Silent Gangrenous Cholecystitis: A Case Report of Two-Week Survival Following Spontaneous Gallbladder Perforation Without Intervention. *Cureus*. 2025 Nov 4;17(11): e96101. doi: 10.7759/cureus.96101. [54]

Contrary to the previous treatment mentioned above, the use of cystic duct embolization combined with chemical ablation of the gallbladder appears to be a viable and effective minimally invasive option for acute cholecystitis in nonsurgical patients, with a high long-term success rate. However, late recurrence is possible. However, clinical success was defined as resolution of symptoms without recurrence. [52] That the use of single-port surgery is underlying vesicular disease initially, focusing on its technical challenges, where gallbladder perforation occurred most frequently in the laparoscopic group. Where, single-port robotic cholecystectomy and single-port laparoscopic cholecystectomy are feasible and safe surgical techniques. However, single-port robotic cholecystectomy has clinical advantages, primarily less postoperative pain and less need for analgesics than the laparoscopic technique. [53]

However, atypical presentations of gallbladder perforation, especially if asymptomatic, often delay its recognition and treatment, increasing the risk of adverse outcomes. An emergency laparoscopic cholecystectomy is then indicated, revealing perforation of the gallbladder in the middle part with extensive gallstone effusion and purulent drainage, confirming gangrenous cholecystitis [54] Consequently, management strategies included cholecystectomy in 13%, cholecystostomy in 17%, guided drainage in 24%, and antibiotics alone in 46%. Management varies by type: type III usually requires emergency surgery, while type I can be approached electively. However, the optimal strategy for type II remains controversial, with debate between conservative and surgical approaches. [54, 55] Since some patients are not candidates for surgery due to advanced age, multiple comorbidities, or poor physiological reserve, gallbladder drainage is required, which is most performed by transhepatic percutaneous gallbladder drainage. [25] As the use of robotic cholecystectomy increases, its value remains poorly defined for complex elective cholecystectomy due to technical difficulty as mentioned in previous text. However, it is now known that robotic surgery in complicated gallbladder surgical pathology could provide clinical advantages, maximizing patient benefit and resource efficiency. [56]

On the other hand, 2,800 patients who underwent cholecystectomy were documented, and 1,600 of these were acute cholecystectomies. And 82 patients, representing 5% of acute cholecystectomies, underwent cholecystostomy. The morbidity of the cholecystostomy procedure was 12%, with removal of the cholecystostomy performed 8 weeks after drain insertion. [57] Hemorrhagic cholecystitis with hemobilia is a rare disease associated with high morbidity and mortality rates if perforation and necrosis occur. They are difficult to diagnose clinically and can be life-threatening. Emergency cholecystectomy in the elderly (>70 years) is associated with high complication and mortality rates; therefore, the decision whether to perform surgery should be carefully weighed and directed towards a more conservative management. [58] Conservative treatment should be chosen, considering that the surgical risk-benefit profile favors this approach: she was administered intravenous antibiotics and a soft diet on the fifth day. She was discharged on day 7 in stable condition, with the recommendation to perform a delayed cholecystectomy. [59]

CONCLUSIONS

Gallbladder cholangitis is such a complex complication that it is reflected in high morbidity with transcendental sequelae and with high mortality and that its incidence has increased exponentially. Due to the delay in diagnosis and treatment for the most frequent surgical pathology in Mexico; this is secondary to a lack of infrastructure, supplies, directed health policies and correct regulations. In addition to the absence of research protocols, current clinical practice guidelines that are in accordance or acclimatized to the reality of the country. And consequently, the lack of competence of decision-makers in the surgical field to make the difference between life and death.

Conflict of Interest

The authors stated that they had no potential conflicts of interest regarding the research, authorship, and/or publication of this article.

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