Diyala Journal of Medicine

CASE REPORT
Published: 25 December 2024
DOI: 10.26505/djm.v27i2.1230

Successful Laparoscopic Cholecystectomy of Giant Gallstone – A Case Report Study

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Abstract

Background: Gallstone diseases are the most common biliary pathologies. They are very frequent in the Western world, where the approximate incidence is about 10–15%. Laparoscopic cholecystectomy is the method of choice for treating gallstone disease. The conversion rate of laparoscopic to open surgical procedures is estimated to be about 4%- 5%. Gallstone size is important since large/giant gallstones are more liable for technical difficulties during laparoscopic interventions.

Objective: The aim is to present the rare case of a giant gallstone removed laparoscopically.

Case presentation: A female of 53 years old presented to the private clinic for on-and-off signs and symptoms of gallstone diseases throughout the previous 3 years; investigation revealed a large gallbladder stone (4 cm in maximum diameter). Laparoscopic cholecystectomy has been performed for an adhesive gallbladder without the need for conversion to the open classical method and without complications; the gallstone size measured after retrieval was about 4 cm in length.

Conclusion: Giant or large gallstones carry a significant risk of complications. Even in these challenging cases, laparoscopic cholecystectomy is regarded as the preferred treatment option over open cholecystectomy. Highly skilled and experienced laparoscopic surgeons should perform the procedure to ensure successful outcomes. The possibility of converting to an open procedure in case of failure to expose the clear anatomy and any intraoperative technical difficulties should be considered.

Keywords: Giant gallstone, gallstone disease, large gallstone, laparoscopic cholecystectomy.

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Received: 03 January 2024
Accepted: 11 March 2024
Published: 25 December 2024

Introduction

Gallstone diseases are the most common biliary pathologies. (1) It is very frequent in the Western world (2), where the approximate incidence is about 10–15% (1), and at a time the prevalence in the East is increasing (2). The Caribbean, particularly Trinidad and Tobago, is no exception, as is found at the San Fernando Hospital, where many laparoscopic cholecystectomies are performed annually (3). More than 80% of gallstone cases are asymptomatic, and only about 1–2% of those without symptoms will develop clinical features necessitating surgical interventions. (4) Morang and Achham recorded the peak and minimum prevalence between females and males by a rate of (6.45% vs. 2.44%), respectively (5). The exact etiology of gallstone disease is

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idiopathic, but it is found that defects in lipid metabolism due to supersaturation of bile are the main cause (4).

An abnormality in the normal relationships between the major constituents of bile—bile acids, phospholipids, and cholesterol—resulted in the formation of gallstones. The first step of gallstone formation is saturation, followed by crystallization, and finally, the growth of the stones. Cholesterol-saturated vesicles are formed due to a high index of cholesterol saturation, which will initiate the cholesterol monohydrate crystals nucleation, forming the core of the cholesterol stone, and no studies suggest the difference between the pathogenesis of the formation of giant gallstones and regular-sized cholesterol stones (4). Laparoscopic cholecystectomy is the method of choice for the treatment of gallstone disease (4, 6), which is one of the commonest operations performed by general surgeons worldwide, and it can be performed in up to 96% of the cases; the frequency of conversion from laparoscopic to open cholecystectomy is nearly 4%-5%. Gallstone size is important since giant/large gallstones have more complication risks and technical difficulties during laparoscopic cholecystectomy (6). Gallstones more than 3 cm are known as large gallstones and carry more risks of gallbladder malignancy. Very rarely, gallstones reach a size of more than 5 cm, which are known as giant gallstones (6, 7). Classical open cholecystectomy may even be considered by some surgeons for giant gallstones (6). In the literature, only very few cases with such sizes were reported. (7) In this study, which can be considered as the first case recorded in our city (Erbil, Kurdistan Region, Iraq), we present a case of a large gallstone in which a successful operation was performed for her laparoscopically. For the comparison, a review of the literature has been done too. Therefore, **t**he aim of this case report study is to present the largest gallstone and the first case recorded in the literature retrieved laparoscopically in Erbil city and the Kurdistan region of Iraq.

Case Presentation

A female of 53 years old presented to the private clinic with a 3-year history of intermittent right upper abdominal pain, colicky in nature, aggravated by fatty meals, radiating to the right shoulder area, associated with epigastric fullness and dyspepsia but no jaundice or fever. Symptomatic review of other related systems was insignificant; past medical, past surgical, drug, family, and socioeconomic histories were negative for related conditions apart from the history of CBD stone retrieval by ERCP before one month. Physical examination and vital signs with abdominal examination were normal. Hematological investigations revealed normal CBC, liver function, renal function, and blood sugar tests. Normal gallbladder wall thickness with a single large gallstone measuring about 33 mm was the result of an ultrasound scan of the abdomen and pelvis without clear ultrasound features of acute infections of the gallbladder or CBD stone; hence the case was diagnosed as a symptomatic gallstone. The need for surgery, complications of the operation, and risks of general anesthesia and drugs were discussed with the patient and accompanied personnel in addition to the dangers of neglecting the treatment and particularly surgical intervention. After the decision of the operation, for the aim of

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elective laparoscopic cholecystectomy, consent was taken, and the patient was admitted. After the patient had been fully prepared, general anesthesia was used for the procedure with endotracheal intubation. The patient was put in a supine position, and the Veress needle technique operation started. A 10 mm supra umbilical port for the camera was inserted, and carbon dioxide created pneumoperitoneum. Another 10 mm working epigastric port and two additional 5 mm supporting ports (on the right side of the abdomen) were inserted under camera vision control. After entrance to the intra-abdominal cavity, thick adhesions were observed between the gallbladder (fundus and body) on one side and the greater omentum on the other; adhesiolysis by unipolar electrocautery was performed. Mild distension of gallbladder with an acceptable cystic duct length observed. The gallbladder wall was tough at the neck. It made it difficult to work with non-traumatic grasper forceps and other laparoscopic instruments because the gallstone occupied the infundibulum, neck, and all of Hartmann's pouch area, with most of the lower part of the body of the gallbladder. After obtaining the critical view of safety, the clipping of both the cystic artery and cystic duct was done, the gall bladder was dissected from the cystic plate and its bed, trial of the gall bladder retrieval with its large containing stone was done throughout the epigastric 10 mm port site but failed, For facilitating the stone and gallbladder extraction, the epigastric port incision was enlarged to a size of about 2 cm. With the aid of sponge forceps and finger manipulation, the gallbladder was extracted to the outside. Following taking out of the specimen and good hemostasis, the pneumoperitoneum was evacuated, and then the fascia was closed primarily with a poly filament and absorbable suture, and skin suturing was done via monofilament and non-absorbable suture material. A drain was placed in the gallbladder bed region and fixed, the wounds were closed, and finally, dressing was done after cleaning the area with normal saline. Total operation time was 45 minutes. After the procedure was finished, the gallbladder was opened to assess the gallstone size, and it measured approximately 4 cm in maximum dimension length (Figure 1), but it was not weighted. The patient passed smoothly and had an uneventful recovery and post-operative period as well. The procedure ended without the need to convert to the open method; recovery was uneventful without any intra- or postoperative complications. On the first postoperative day (about 20 hours after the procedure), the patient was discharged from the hospital with instructions for oral fluid intake and medication usage and an appointment for drain removal; two days later, the drain was minimally containing serosanguinous fluid and then removed. One week after the operation, port site stitches were removed, and the wounds were clean.

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Figure (1): giant gall stone removed.

Discussion

The laparoscopic cholecystectomy of the largest gallstone removed, which was 12.8 cm in maximum diameter, was reported by Singh et al. (8); few giant gallstones were reported by other studies. (9,10), a length of 16.8 cm gallstone removed by classical cholecystectomy incision is regarded as the largest gallstone ever removed in the emergency setting (11). Two giant cases of gallstones were reported in Nepal (4*3.3*3 cm and 5*3*2.8 cm) with weights of 23.2 gm. and 24.7 gm., respectively, during June 2021. (12) Meanwhile we did an operation on a giant/large gallstone; the gallstone measured about 4 cm in maximum dimension. Regarding sex incidence of gallstones, it is more common among female populations. (13) Our operated case goes with these criteria since the case was female. One of the presentations of gallstones may be with small bowel obstruction via cholecysto-duodenal fistula formation, causing gallstone ileus, particularly when the stone is large and lodged in the distal ileum. (14) However, the size of the gallbladder stone in this study was large but did not irritate the gallbladder wall to cause necrosis, fistula formation, or migration. The best option for managing symptomatic gallstones is laparoscopic cholecystectomy. However, open cholecystectomy has been mentioned as the procedure of choice by some authors for giant gallstones; the reason behind this idea was the technical difficulties associated with large-sized stones that may cause challenges to the surgeon during the operative procedure of laparoscopic cholecystectomy. (15) In the agreement with others, our opinion is that; for patients with giant/large gallstones, laparoscopic cholecystectomy performed in the experienced hands still is the best initial approach, providing that failure to expose the clear anatomy and technical difficulties necessitates conversion to open classical operation. (9) We followed all the steps necessary for a routine laparoscopic

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cholecystectomy, the removal of the gallbladder from its bed in the fossa done successfully. A study done for 68 cases in Iraq (16) for fundus-first laparoscopic cholecystectomy, because of adhesions and difficulties in Calot triangle identification, mean hospital stay was between more than two days and up to 1 week; this was not in line with our case report study in which only 20 hr. was the time for this stay and the patient was discharged the morning after the surgery; this may be due to fewer adhesions, fewer difficulties facing us, and less bleeding risk in our case in comparison to the study mentioned in which surgeries had been done on difficult cases with obscured Calot triangles. In regards to the operation time for the procedure, it was more than 70 minutes in some cases and up to 2 hr. in other cases recorded by Azhy M. (17). In our view, recording a shorter operation time (45 min.) in our present case is also due to the same reasons mentioned above for shorter hospital stay. The Kocher (classical right subcostal incision) is well known for its relevant complications, particularly splinting on inspiration and increased postoperative pain that results in atelectasis of the base of the lung. That is why, for specimen retrieval, the decision was made to enlarge the epigastric port incision instead of conversion to a classical or minimum subcostal incision to prevent or at least reduce the potential complications of the open incision. This proved more beneficial because the patient had a smooth postoperative period and was discharged from the hospital on the first postoperative day. The size and method of extraction of the gallbladder from the abdomen after cholecystectomy is another consideration. In a recent systematic review regarding the extraction through the epigastric vs. umbilical port, it was found that epigastric port retrieval may be associated with more postoperative pain in patients undergoing laparoscopic cholecystectomy in comparison to the umbilical port retrieval and might also be associated with longer gallbladder retrieval time. (18) However, the gallbladder retrieval in our case was done through the epigastric port site because we had no studies regarding this comparison. Secondly, we think that this short period is not considered important for an operation lasting at least half an hour. In addition, we believe that enlarging and extending the epigastric port has less risk for future port site hernia in comparison to the supra- or infra-umbilical port site incision, and this may be explained by more pressure of the bowel and visceral organs on the peri-umbilical wounds rather than in comparison to the epigastric wounds. Regarding the method of extraction, in our case, the gallbladder was taken out without using an endo bag, which is usually used to prevent spillage of bile and wound infection. Our method is not in line with a recent meta-analysis that showed a lower wound infection rate in patients who underwent gallbladder retrieval by the use of a bag vs. without using the bag (4.2% vs. 5.9%) (19). our explanations for not using the endo bag are, first, the bag is not present in most of the hospitals in our city; on the other hand, this can be regarded as one of the limitations of our study. Secondly, again, we have no local studies or data confirming a higher wound infection rate in those cases with no use of the bag in comparison to those using a bag, and thirdly, usually, we will use such a method for a huge number of small stones to prevent spillage of the stones to

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inside the peritoneal cavity so as not to waste more time for finding and removing small stones for the aim of avoiding micro abscess formation. In addition, we believe that using such bags for large stones is unnecessary. Our study has a strong point since, up to our best information, this is the only giant/large gallstone case reported in the literature in Erbil, Iraq, till now, which was retrieved laparoscopically. However, Xu et al. detailed the laparoscopic retrieval of a 9.5-cm gallstone, and Becerra et al. reported the removal of a 16.8-cm gallstone via classical cholecystectomy incision in the emergency setting (11). From the literature to date, our gallstone appears to be the largest removed laparoscopically; meanwhile, a stone size of 4*3.3*3 cm and 5*3*2.8 cm gallstones were removed laparoscopically in Nepal (20).

Conclusion

This study found that even for giant/large gallstones, laparoscopic cholecystectomy is the best treatment option compared with open cholecystectomy and should be performed by surgeons with valuable experience with laparoscopic surgeries. Any intraoperative technical difficulties, in combination with the possibility of conversion to open cholecystectomy in case of inability to obtain clear anatomy, should be taken into consideration.

Recommendations

In spite of technical difficulties for surgery of giant gallstones, laparoscopic cholecystectomy is feasible.

Ethical Clearance

The Ethical Approval Committee at the college of General Medicine, Koya University, approved this case report study. (Document no. 2024STB818).

Source of Funding

The current study is funded by our charges with no other funding sources elsewhere.

Conflicts of Interest: Non

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Diyala Journal of Medicine

CASE REPORT
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DOI: 10.26505/djm.v27i2.1230

نجاح عملية منظاريه لاستئصال كيس صفراء مع حصوة كبيرة, تسجيل حالة نادرة

سامان طاهر برزنجي[1]

الملخص

خلفية الدراسة: أمراض حصوات المرارة هي أكثر أمراض القنوات الصفراوية شيوعًا. وهي شائع جدًا في العالم الغربي حيث تبلغ نسبة الإصابة التقريبية حوالي ١٠-١٥٪ ويتزايد انتشارها في الشرق. استئصال المرارة بالمنظار هو الطريقة المفضلة لعلاج مرض حصوات المرارة والتي تعد واحدة من أكثر العمليات الجراحية شيوعًا التي يقوم بها الجراحون في جميع أنحاء العالم؛ معدل حدوث التحويل من استئصال المرارة بالمنظار إلى استئصال المرارة المفتوحة هو ما يقرب من ٤٪ -٥٪. يعد حجم حصوة المرارة أمرًا مهمًا، نظرًا لأن حصوات المرارة الكبيرة العملاقة تكون أكثر عرضة للصعوبات الفنية أثناء التدخلات بالمنظار.

عرض الحالة: مريضة تبلغ من العمر ٥٣ سنة قدمت إلى العيادة الخارجية الخاصة بشكوى من الاعراض والعلامات أمراض حصوات المرارة طوال ٣ سنوات سابقة، أظهرت الفحوصات وجود حصوات مرارة كبيرة (٤ سم)، وتم إجراء استئصال المرارة بالمنظار دون الحاجة للتحويل لفتح الطريقة الكلاسيكية ودون حدوث اي تعقيدات او مضاعفات.

المرضى والطرائق: مريضة تبلغ من العمر ٥٣ سنة قدمت إلى العيادة الخارجية الخاصة بشكوى من الاعراض والعلامات أمراض حصوات المرارة طوال ٣ سنوات سابقة، أظهرت الفحوصات وجود حصوات مرارة كبيرة (٤ سم)، وتم إجراء استئصال المرارة بالمنظار دون الحاجة للتحويل لفتح الطريقة الكلاسيكية ودون حدوث اي تعقيدات او مضاعفات.

الاستنتاجات: حصوات المرارة الكبيرة أو العملاقة يزيد من خطر حدوث مضاعفات، ومن الضروري استئصال المرارة بالمنظار في المرضى الذين لا يعانون من أعراض. حتى بالنسبة للحصوات المرارية الكبيرة العملاقة، وجد أن استئصال المرارة بالمنظار هو العلاج المفضل بدلاً من استئصال المرارة المفتوحة ويجب إجراؤه بواسطة جراحين بالمنظار ذوي خبرة، مع الأخذ في الاعتبار إمكانية التحويل إلى الفتح في حالة عدم القدرة على كشف التشريح والصورة الواضحة في القنوات الصفراوية المجاورة وأي صعوبات فنية أثناء العملية. حالتنا المذكورة هي أكبر حصوات المرارة من حيث الحجم التي تم الإبلاغ عنها في الأدبيات المسترجعة بالمنظار في مدينة أربيل وإقليم كردستان العراق.

الكلمات المفتاحية: حصوات المرارة العملاقة، مرض حصوات المرارة، حصوات المرارة كبيرة الحجم، استئصال المرارة بالمنظار.

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تاريخ استلام البحث: ٣ كانون الثاني ٢٠٢٤

تاريخ قبول البحث: ١١ اذار ٢٠٢٤

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