

# Laparoscopic Cholecystectomy for Large/Giant Gallstones: Case Report and Brief Review of Literature.

Anup Shrestha (✉ [anup.10281028@gmail.com](mailto:anup.10281028@gmail.com))

Chitwan Medical College

**Shachee Bhattarai**

Chitwan Medical College

**Shreya Shrestha**

Chitwan Medical College

**Manoj Chand**

Chitwan Medical College

**Abhishek Bhattarai**

Chitwan Medical College

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## Case Report

**Keywords:** Large/Giant gallstone, Cholecystectomy, open, Laparoscopic

**Posted Date:** June 14th, 2021

**DOI:** <https://doi.org/10.21203/rs.3.rs-618682/v1>

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# Abstract

**Background** Gallstones disease (GSD) is the most common biliary pathology. GSD is one of the common surgical problems in which lead people admit to the hospital in Nepal. Its prevalence is found to be 4.87%. The size of a gallstone is important, as giant/large gallstones have a higher risk of complications and present technical difficulties during laparoscopic cholecystectomy (LC). Open cholecystectomy is preferred in most cases with giant gallstones. With the availability of experienced laparoscopic surgeons and modern laparoscopic equipment LC is also feasible in large/giant gallstones. In this case report, we report 2 cases of one large and one giant gallstone each which were successfully done laparoscopically.

**Case Presentation** *Case 1* A 51 years old female presented with 5 months history of intermittent right upper quadrant colicky pain related to fatty food with no significant past medical and surgical history.

Ultrasound abdomen showed normal gallbladder with multiple gallstones, largest measuring approximately 4cms. She was planned for elective LC. The gallbladder was removed out after extension of the infra-umbilical incision. On the cut section, we found multiple gallstones with one large gallstone measuring 4\*3.3\*3 cm and weighted 23.2 gm. Her post-operative period was uneventful. *Case 2* A 39 years old female, known case of hypertension under calcium channel blocker(CCB) and angiotensin receptor blocker(ARBs) presented with 5 months history of intermittent right upper quadrant colicky pain related to fatty foods with non-significant surgical history. Ultrasound abdomen showed a normal gallbladder with a single large gallstone (approximately 4.7 cm). Elective LC was performed and the gallbladder was removed out after extension of infraumbilical incision. On the cut section, we found a single giant gallstone measuring 5\* 3\*2.8 cm and weighted 24.7 gm. Her post-operative period was uneventful.

**Conclusion** Large/giant gallstones are associated with a high risk of complications and cholecystectomy is warranted in symptomatic and asymptomatic patients. Even for large/giant gallstones, LC appears to be the treatment of choice over open cholecystectomy and should be performed by an experienced laparoscopic surgeon, taking into consideration the possibility of conversion to open in case of inability to expose the anatomy and any intraoperative technical difficulties.

## Background

GSD is the most common biliary pathology.<sup>1</sup>The estimated effect of 10–15% of the population in Western societies.<sup>1</sup>The exact etiology is not known but it is suggested that super saturation of bile because of a defect in lipid metabolism is the main factor. They are asymptomatic in the majority of cases (>80%). Approximately 1–2% of asymptomatic patients will develop symptoms requiring surgery. LC is the gold standard for GSD and it is one of the most common operations performed by general surgeons.<sup>2</sup>

GSD is a major public health problem in many countries and is also a significant cause of morbidity in Nepal<sup>1</sup>. GSD is one of the common surgical problems in the Nepalese population and its prevalence is found to be 4.87%. The ratio between males and females was 1:2.<sup>3</sup>The highest prevalence was found to be in Morang (6.45) and lowest in Achham (2.44).<sup>3</sup>

The size of a gallstone is important, as giant/large gallstones have a higher risk of complications and higher technical difficulties during laparoscopic cholecystectomy. Gallstones > 3 cm are called large gallstones and they carry a higher risk for gallbladder cancer. Gallstones > 5 cm are called giant gallstones and they are very rare with only very few cases reported in the literature.<sup>4</sup>In this case report which is first from Nepal, we report 2 cases of one large and one giant gallstone each which were successfully done laparoscopically, and also review the literature.

## Case 1

A 51 years old female presented to the surgical outpatient department at our institution with 5 months history of intermittent right upper quadrant colicky pain related to fatty food, not radiating, and not associated with fever or jaundice. There was no history of chronic illnesses, hemolytic disease, and previous surgeries.

On examination, vital signs and abdominal examination were unremarkable. Investigations showed that white blood cells count and liver function tests were all within normal limits. Ultrasound of the abdomen showed a normal gallbladder with multiple gallstones, the largest measuring approximately 4cm with no features of acute cholecystitis or choledocholithiasis.

Diagnosis of symptomatic cholelithiasis was established and the patient was admitted for elective LC under general anesthesia. At surgery, she was placed in the supine position and with open Hasson's technique a 10 mm infra umbilical camera port was inserted and pneumoperitoneum was created. One 10 mm working epigastric port with 2 additional supporting ports was inserted under vision.

After entering the peritoneal cavity, there were dense adhesions between the greater omentum and gallbladder (body and fundus) which were released with the help of electro-cautery. The gallbladder was distended with a short cystic duct. The gallbladder wall was thick and the gallstone occupied almost the entire Hartmann's pouch which caused grasping of the gallbladder by non-traumatic forceps difficult.

After the achievement of a critical view of safety, the clipping of the cystic artery and duct was done. A drain was placed in the subhepatic region. Then the gallbladder was dissected from the cystic plate, put in an improvised endo bag (sterile glove), and removed out after extension of the infra umbilical incision. On the cut section, we found multiple gallstones with one large gallstone measuring 4\*3.3\*3 cm and weighted 23.2 gm (Fig. 1). Post-operative course was uneventful and the drain was removed on the second post-operative day. The patient was discharged on the third postoperative day. The histopathological report showed chronic follicular cholecystitis and no evidence of malignancy.

## Case 2

A 39 years old female presented to the surgical outpatient department at our institution with a 5 months history of intermittent right upper quadrant colicky pain related to fatty foods, not radiating, and not associated with fever or jaundice. There was a past medical history of hypertension for which she was under CCB and ARBs. There was no history of hemolytic disease. She had no history of previous abdominal surgeries.

On examination, her vital signs and abdominal examination were unremarkable. Investigations showed that white blood cells count and liver function tests were all within normal limits. Ultrasound of the abdomen showed a normal gallbladder with a single large gallstone (approximately 4.7 cm) and no features of acute calculus cholecystitis or choledocholithiasis.

The patient was diagnosed with symptomatic cholelithiasis and was admitted for elective LC under general anesthesia. At surgery, she was placed in the supine position and with open Hasson's technique a 10 mm infra umbilical camera port was inserted and pneumoperitoneum was created. One 10 mm working epigastric port with 2 additional supporting ports was inserted under vision. Intraoperatively, there were some adhesions between the gallbladder and duodenum which were released. The gallbladder wall was thick and the gallstone occupied almost all of Hartmann's pouch which rendered grasping the gallbladder difficult.

After achieving the critical view of safety and clipping the cystic artery and duct was done and the gallbladder was dissected from the cystic plate. It was put in an endo bag and removed out after the extension of the infraumbilical incision. On the cut section, we found a single giant gallstone measuring 5\* 3\*2.8 cm and weighted 24.7 gm (Fig. 2). The postoperative course was uneventful and the patient was discharged on the second postoperative day. The histopathological report showed chronic cholecystitis with pyloric metaplasia and no evidence of malignancy.

## Discussion

The case report of the largest gallstone removed by LC was reported by Singh et al. which was 12.8 cm in diameter.<sup>5</sup>Few other reports have been reported for giant gallstones.<sup>6,7</sup> We report two cases of patients with large/giant gallstones. In the first case, gallstone measured 4\*3.3\*3 cm and weighted 23.2 gm and in the second case, gallstone measured 5\* 3\*2.8 cm and weighted 24.7 gm. To the best of our knowledge, this is the only case report of large/giant gallstones reported till now in the literature in Nepal. Both cases were laparoscopically managed, and their postoperative courses were uneventful with no complications. Both patients were followed up after two weeks, where they had no active complaints.

As for demographics, gallstones are more common in women, especially during their fertile years, probably due to increased estrogen levels which may increase cholesterol in the bile and decreased gallbladder movement, resulting in gallstone formation.<sup>8</sup>Our case reports are in agreement, as both the cases are female. In terms of age, the frequency of gallstones increases with age, escalating after 40

years of age to become 4–10 times more likely.<sup>8</sup> Our first patient is 51 years old whereas the second patient is 39 years old, slightly younger than other reports. Gallstones are prevalent in developed nations, but less in the developing populations that still consume traditional diets. North Americans have the highest cholelithiasis rates, South Americans also have high prevalence, intermediate prevalence rates occur in Asians and Black Americans, and sub-Saharan Black Africans have the lowest frequencies.<sup>8</sup> Gallstone disease is one of the common surgical problems in the Nepalese population and its prevalence was found to be 4.87%. The highest prevalence was found to be in Morang (6.45) and lowest in Achham (2.44).<sup>3</sup>

As for presentation, 60–80% of gallstones are asymptomatic frequently found during routine abdominal ultrasonography.<sup>9</sup> Symptomatic gallstones may present as biliary pain, cholecystitis, or biliary obstruction depending on location.<sup>10</sup> In agreement, our cases presented as biliary colic. Gallstones can also present as gallstone ileus by migrating through a fistula between gallbladder and duodenum or small/large bowel especially in large gallstones causing bowel obstruction.<sup>11</sup> Our two cases of large gallbladder stones did not exhibit migration.

Ultrasonography is the method most often used to detect cholelithiasis and cholecystitis (90–95% specificity and sensitivity), can detect and accurately assess stone size as small as 2 mm, show thickening of the gallbladder wall, and should be routine.<sup>12</sup> Ultrasonography has advantage e.g. lack of ionizing radiation, noninvasiveness, option of performing a bedside examination, relatively low cost and ability to evaluate adjacent organs.<sup>12</sup> For our two patients, abdominal ultrasonography showed the size of the giant gallstones, with measurements close to the actual size found after surgery. Such accurate pre-operative assessment of a giant gallstone alerts the surgeon to any potential difficulty of the procedure and the possibility of conversion to open cholecystectomy. This allows the surgeon to be prepared and to explain the potential rates of complications to the patient.<sup>6</sup> We were prepared in terms of surgical instruments and settings for a possible conversion to open at any point during the surgery.

Most gallstone patients remain asymptomatic and can be managed with watchful waiting.<sup>10</sup> Asymptomatic gallstones > 3cm are at higher risk to develop gallbladder cancer and hence preventive LC is warranted.<sup>13</sup> For symptomatic gallstones, LC has become the management of choice. For giant gallstones, some authors believe open cholecystectomy is the choice, given the technical difficulties related to the stone's large size that could be confronted during the laparoscopic approach.<sup>14</sup> However, in line with others, we believe that even with giant gallstones, LC performed by an experienced laparoscopic surgeon is still the best initial approach, unless technical difficulties and inability to expose the anatomy warrants conversion to open cholecystectomy.<sup>6</sup> We used the laparoscopic approach for our patients without the need for conversion, there were no intra- or postoperative complications, and recovery was uneventful.

Giant gallstones could cause result in severe inflammation, adhesions, and thickening of the gallbladder wall, where adhesions are an important reason for the conversion of laparoscopic to open

cholecystectomy. In addition, giant gallstones make it difficult to grasp the gallbladder with laparoscopic instruments and expose the anatomy of Calot's triangle.<sup>15</sup> We faced the same difficulties in our two cases, where the main challenge was to release the adhesions between the gallbladder and surrounding structures and to hold the thickened and inflamed gallbladder wall by the laparoscopic grasper before starting dissection.

Another consideration is the size and manner of retrieval of the gallbladder out of the abdomen after cholecystectomy. A recent systematic review of umbilical vs epigastric port retrieval showed that umbilical port retrieval may be associated with less post-operative pain in patients undergoing LC compared with epigastric port retrieval, and might also be associated with shorter gallbladder retrieval time.<sup>16</sup> We retrieved the gallbladder through the umbilical approach in both cases, after infraumbilical extension of the wound. There was no delay in retrieval time, patients had mild tolerated post-operative pain and no wound infection. In terms of the manner of retrieval, for our cases, the gallbladder was put in an endo bag before taking it out of the abdomen to prevent spillage of bile or wound infection, in line with a recent meta-analysis that found that the wound infection rate was less in patients who underwent retrieval of the gallbladder using a bag vs without (4.2% vs % 5.9%)<sup>17</sup>

This case report has limitations. Information on the composition of the each of stones would have been beneficial for the better understanding of the pathophysiology. Despite this, this case report has strengths, as to the best of our knowledge, this is the only case report of large/giant gallstone reported till now in literature from Nepal.

## Conclusion

Large/giant gallstones are associated with a high risk of complications and LC is warranted in symptomatic and asymptomatic patients. Even for large/giant gallstones, LC appears to be the treatment of choice over open cholecystectomy and should be performed by experienced laparoscopic surgeons, taking into consideration the possibility of conversion to open in case of inability to expose the anatomy and any intraoperative technical difficulties.

## Abbreviations

LC Laparoscopic Cholecystectomy

GSD Gallstone Disease

CCB Calcium Channel Blocker

ARBs Angiotensin Receptor Blockers

## Declarations

## Consent for publication

Written informed consent was obtained from the patient or patient's legal guardians for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

## Competing interests

The authors declare that they have no competing interests to disclose.

## Funding details

No funding was required for the study.

## Author's Contributions

Anup Shrestha and Shachee Bhattarai did the main manuscript writing and literature review. Dr. Shreya Shrestha did the final manuscript editing and design. Manoj Chand collected pictures and did language editions and manuscript reviews, Dr. Abhishek Bhattarai did the study concept, literature review, and was the main operative surgeon in both cases. All the authors approved the final manuscript.

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## Figures



**Figure 1**

Multiple gallstones with a large stone with measuring scale



**Figure 2**

Single giant stone extracted with measuring scale