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Huge gangrenous gallbladder presenting as gastro-esophageal reflux disease successfully treated by laparoscopic cholecystectomy: Case report and literature review

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ABSTRACT

INTRODUCTION: Gallbladder disease is a common surgical pathology. Gallstones can remain asymptomatic or develop into an acute cholecystitis and need for surgical intervention. Significant enlargement of the gallbladder well beyond the normal volume is rare. Such “giant” gallbladders can affect feasibility of subsequent management options.

PRESENTATION OF CASE: An 80-year-old female presented to the emergency department with a two-day history of acute on chronic gastric reflux with nausea and vomiting. On examination, she had right upper quadrant abdominal pain. CT imaging identified an enormous gallbladder creating mass effect and compression on the distal stomach. She underwent successful laparoscopic cholecystectomy and was discharged from the hospital the next day, doing well. On two-week follow up, her reflux symptoms had completely resolved and she had no complaints.

DISCUSSION: Giant gallbladders are a rare entity. Our patient's case is unique in both its occurrence as well as presentation with predominant reflux symptoms secondary to mass effect by the enlarged gallbladder. Current cholecystitis grading systems do not utilize size as a means of predicting severity and risk of operative complications or difficulty of procedure. Laparoscopic cholecystectomy was a successful approach in managing this extreme pathology.

CONCLUSION: Updated classifications systems that include size and mass effect as a predictive measure are needed to better assess surgical outcomes, especially in “giant” gallbladder disease. Despite the large size and potential mass effect on surrounding structures, laparoscopic cholecystectomy can still be attempted if no other contraindications exist.

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1. Introduction

Gallbladder disease is one of the most common surgical pathologies with more than 500,000 cholecystectomies being performed using a laparoscopic technique each year [1]. Indications for laparoscopic cholecystectomy are often related to cholelithiasis and its sequelae such as acute calculous cholecystitis, choledocholithiasis, and gallstone pancreatitis [2]. Gallstones are often asymptomatic but may present as biliary colic when a stone intermittently obstructs at the level of the cystic duct. Such symptoms are typified by waxing and waning right upper quadrant pain. If the obstruction persists, continued contraction of the gallbladder against the blockage can produce an inflammatory response that constitutes

development of acute cholecystitis and need for emergent surgical intervention [3].

A gallbladder is normally 8 cm (normal range 7–10 cm) in length, 4 cm in diameter when distended, and typically holds 50 ml (normal range 30–80 ml) of bile [4]. In both acute and chronic cholecystitis, gallbladder distention due to increased intraluminal volume, pericholecystic edema, calcification or necrosis may be observed and lead to a palpable mass on examination [2]. However, enlargement of the gallbladder far past the normal physiologic volume even in disease states is rarely seen. Such “giant” gallbladder development may alter one's clinical presentation and significantly affect feasibility of subsequent management options.

We present a case of an 80-year-old female who presented to our hospital with atypical symptomatology of acute on chronic cholecystitis complicated by development of a “giant” gallbladder that was successfully managed via laparoscopic cholecystectomy. We also review the literature in regards to giant gallbladder prevalence, classification, and management options. This case was reported in line with SCARE criteria [5].

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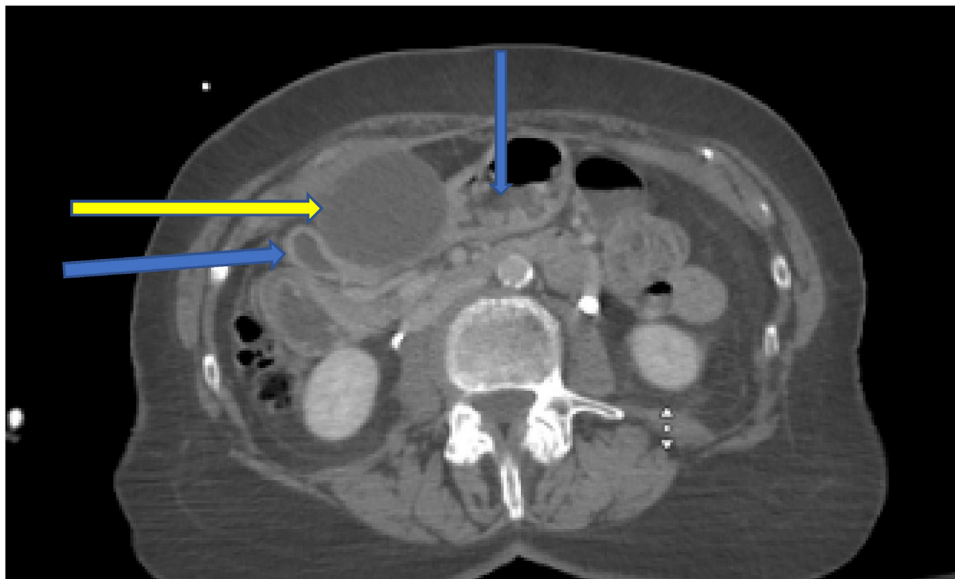


Fig. 1. CT abdomen and pelvis in the axial view showing a largely distended gallbladder causing compression/mass effect on the distal stomach (yellow arrow pointing to gallbladder, blue arrows pointing to compressed stomach).

2. Case presentation

An 80-year-old female presented to our hospital's emergency department with a 2-day history of nausea and vomiting with worsening of her chronic reflux. The physical examination revealed right upper quadrant abdominal pain. Review of systems was significant for a chronic history of severe, progressive gastroesophageal reflux not relieved with over-the-counter medications.

On presentation, she was afebrile but had laboratory investigation significant for a leukocytosis of 24.5 (range 3.6–11.0) and mild AST elevation (46; range 10–40). CT of the abdomen revealed severe distention of the gallbladder with compression and mass effect on the distal stomach. Findings were also consistent for acute cholecystitis (Figs. 1–3). Subsequent right upper quadrant ultrasound showed gallbladder distention without gallstones, pericholecystic fluid, or biliary ductal dilatation. Her common bile duct was of a normal caliber of 3 mm. The patient was started on intravenous hydration and antibiotics and taken to the operating room for laparoscopic cholecystectomy.

Intra-operative exploration revealed a massively enlarged gangrenous gallbladder with adhesions to the anterior abdominal wall. The gallbladder extended over the stomach creating a large mass effect on surrounding structures (Figs. 4 and 5). Laparoscopic drainage of the gallbladder produced a total of 500 mls of bilious fluid. After careful dissection of the numerous adhesions, cholecystectomy was successfully performed. Final gallbladder measurements were 12 cm × 6 cm × 6 cm. Pathologic examination confirmed acute hemorrhagic and gangrenous cholecystitis.

Her overall postoperative course was unremarkable. Her pain was well controlled and she was able to tolerate an oral diet the next day. Her leukocytosis had improved and she was subsequently discharged on postoperative day one. On her two-week postoperative follow up, she reported feeling well without complications. Interestingly, she also reported complete resolution of her severe reflux symptoms at that time.

3. Discussion

The current literature is limited regarding the prevalence of “giant” gallbladders, likely due to the complexity in the develop-

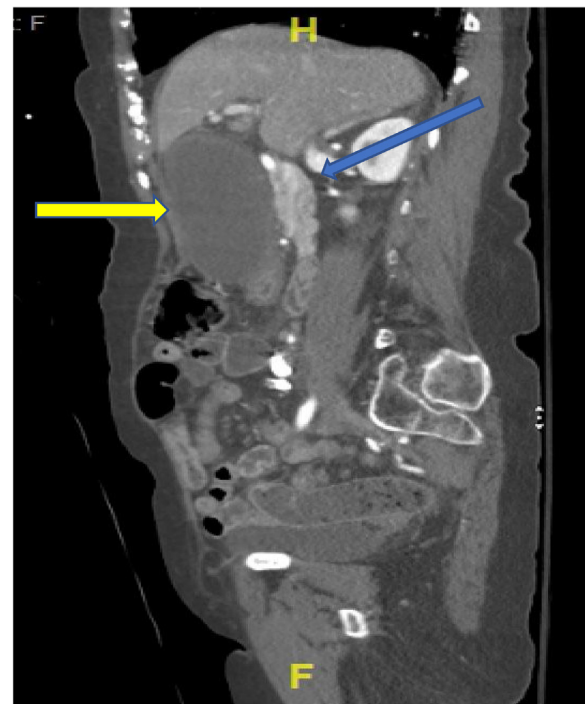


Fig. 2. CT abdomen and pelvis in the sagittal view showing a large gallbladder causing compression on the distal stomach (yellow arrow pointing to gallbladder, blue arrow pointing to stomach).

ment of such a large intraluminal volume as seen in our patient. The pathogenesis of giant gallbladder development is unknown, but has been hypothesized to be secondary to progressively increasing intraluminal pressure caused by a check valve action, sometimes called a ball valve, with a gallstone [6–8]. Such a mechanism would allow for chronic accumulation of intraluminal fluid without routine drainage resulting in progressive enlargement. The typical progression of acute cholecystitis is often too rapid and severe to allow for such significant development without subsequent rupture [2]. Additionally, the rarity of “giant” gallbladders may stem from the lack of clear, consistent criteria to classify a gallbladder as

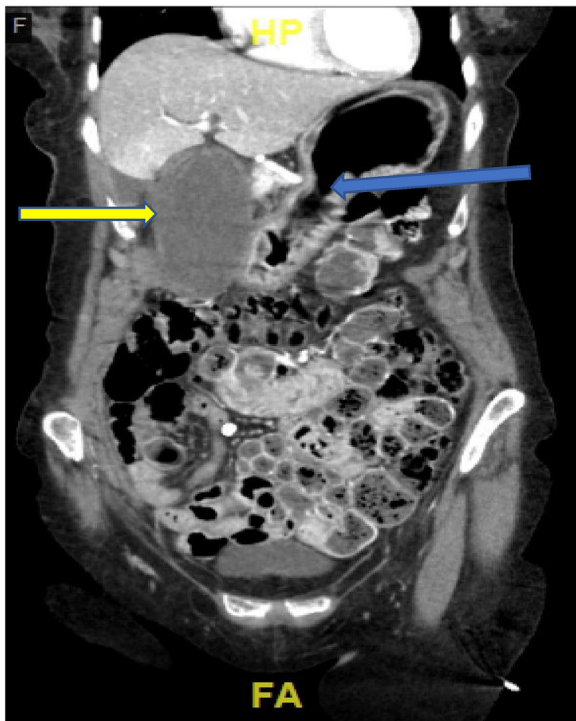


Fig. 3. CT abdomen and pelvis in the coronal view showing a large gallbladder causing compression on the distal stomach (yellow arrow pointing to gallbladder, blue arrow pointing to stomach).

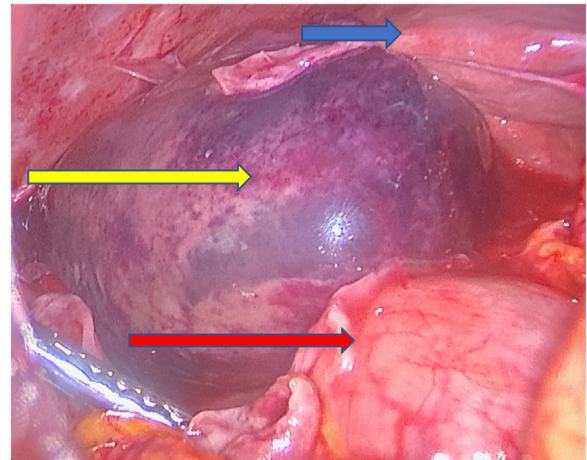


Fig. 5. Intraoperative findings of a gangrenous and necrotic gallbladder (yellow arrow) seen extending over the distal stomach causing mass effect (red arrow pointing to stomach, blue arrow pointing to the edge of the liver).

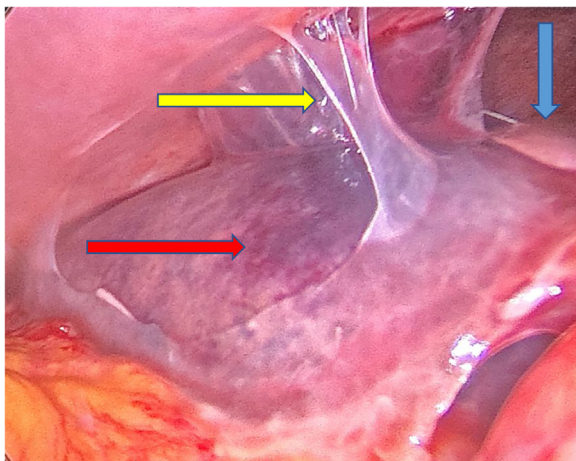


Fig. 4. Intraoperative findings of a gangrenous and necrotic gallbladder (red arrow) with adhesions to the anterior abdominal wall, (yellow arrow pointing to adhesions, blue arrow pointing to the edge of the liver).

being “giant”, making reporting of cases heterogeneous. Kuznetsov et al. have proposed that a giant gallbladder is one that encompasses a volume of 1.5 L [6]. However, this is not a universally accepted definition and may not adequately capture giant gallbladders that do not meet this volume criteria but still cause significant mass effect and complicate management. For example, approximately 500cc were drained from our patient’s gallbladder, but its overall size and associated mass effect warranted classification as “giant”. Other reports have documented dimensional parameters for determination of giant gallbladder incidence [8–13]. Ranges from 18 cm × 4 cm as reported by Maeda et al. to as high as 43 × 21 × 20 cm as reported Panero et al. have been alluded to as qualifying size in the past [9,13]. Since no volumetric or measured size criteria have been established, inclusion of overall mass effect as a contributing

factor in classification may be necessary, since all previously documented cases of giant gallbladders have presented with either a palpable mass in unexpected quadrants (i.e., iliac fossa) or enlargement of the abdomen [11,12]. This as well is a distinguishing factor from typical acute or chronic cholecystitis development. Overall, a complete consideration of the estimated size, volume contents, and associated space-occupying impact of the gallbladder should be used when assessing criterion for “giant” gallbladder incidence. Our reported case suggests that the above can be achieved with an intraluminal volume less than 1.5 L and nearly equivocal overall size compared to previous cases (i.e 12 × 6 × 6 cm). Hence, giant gallbladder criteria should encompass those with size and volume measurements as seen in our presented case.

The importance of adequate classification of giant gallbladder development pertains to its subsequent management and associated complications. Currently, there is no widely used, validated grading system for cholecystitis, let alone cholecystitis with “giant” features. One grading system, the Parkland Grading Scale for Cholecystitis (PGS), has shown promising consistency in assessment of acute cholecystitis severity. With the PGS, gallbladder appearance on laparoscopy is rated on a severity scale of 1–5 based on multiple gross findings such as hyperemia, adhesion formation, distention, perforation, or necrosis. Prospective analyses have found that increased severity of grading is significantly associated with increased difficulty of surgery, conversion rates, length of the operation, and incidence of post-operative bile leak [14]. Notably, gallbladder size is not an included characteristic indicative of such complications. It is likely that gallbladder size may not play a major role in disease severity for most cholecystitis cases. However, dimensional differences are significant in those cases seemingly “giant” and may be important for consideration in even enlarged but sub-giant gallbladder disease. As seen in our patient’s case, the massive size of the gallbladder resulted in significant anatomical distortion and widespread adhesion development. Such features were inherently concerning for associated intra- and post-operative complication development due to the increased difficulty in dissection and removal. In the case of sub-giant dimensions, significantly enlarged gallbladders have the potential of complicating management to varying degrees compared to our patient’s case. On this basis, we propose the need for an updated grading system that accounts for large gallbladder size for accurate assessment of disease severity and associated management complications.

Due to the size of this patient’s gallbladder, we initially questioned the feasibility of performing a cholecystectomy via a

laparoscopic approach. While previous studies with giant gallbladders were performed via open approach [6–8,13], we show that despite a large gallbladder size, attempts can still be made to perform the cholecystectomy laparoscopically, if possible. One study was also successful using the standard four-port laparoscopic cholecystectomy for management of a large gallbladder [15]. However, this gallbladder was long and extended into the right iliac fossa. Additionally, the gallbladder in their case report was not gangrenous or necrotic, providing a sturdier specimen for dissection decreasing the risk of accidental entrance into the gallbladder. Despite the high severity grade and massive size, we demonstrate laparoscopy to be a successful approach for management of “giant” gallbladder disease without significant peri-operative complications.

Our presented case is unique not only in its incidence, but in its presentation. To our knowledge, this is the first case report of a gallbladder’s size creating such significant mass effect to cause gastric obstruction resulting in symptoms of reflux. While our patient did experience the more common acute symptoms of pain and fever two days prior to her presentation to our center, the chronic development of reflux predominated her symptomatology. It is likely that the progressive enlargement of her gallbladder was chronic in nature, with a sudden development of acute cholecystitis occurring only two days prior to when she began experiencing pain. Our intraoperative findings of the gallbladder fundus extending over the stomach, along with resolution of the patient’s reflux after her surgery further demonstrated the extent of her mass effect from the size of the gallbladder and likelihood of chronic development. Her presenting leukocytosis and intraoperative appearance of a necrotic gallbladder support development of an acute infection within the context of a chronic pathology. Our laparoscopic approach was successful, decreasing the risk of morbidity from an open approach and allowing for her discharge on postoperative day one without complications.

4. Conclusion

Development of “giant” gallbladder is an extremely rare phenomenon with very few cases reported in the literature. Current acute cholecystitis grading systems do not utilize gross gallbladder size as a means of predicting severity and risk of perioperative complications. Updated classifications systems that include size as a predictive measure may be needed to better assess surgical outcomes in both “giant” gallbladder disease as well as all variations in large, sub-giant gallbladder size. Despite the large size and potential mass effect on surrounding structures, laparoscopic cholecystectomy can still be attempted if no other contraindications exist.

Declaration of Competing Interest

The authors report no declarations of interest.

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Ethical approval

This report was conducted in compliance with ethical standards. Informed written consent has been obtained and all identifying information is omitted.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

AE, EM, KK, DB, MM Conception of study, acquisition of data, analysis and interpretation of data, drafting the article, and revision of article. DB, MM – Management of case.

AE, EM, KK, DB, MM – Approval of the final version for submission.

DB – Operative Surgeon.

Registration of research studies

This is a case report study.

Guarantor

Dessy Boneva.
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Provenance and peer review

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