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Giant Gallstone Ileus With Concomitant Mesenteric Torsion and Severe Acute Kidney Injury in an Elderly Woman: A Case Report

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Abstract

Gallstone ileus is an uncommon mechanical cause of small bowel obstruction. It typically results from a gallstone migrating through a cholecystoenteric fistula and impacting at the ileocecal valve, the narrowest point of the small bowel. Jejunal impaction occurs in a minority of cases and is considered atypical.

We report a 74-year-old woman with poorly controlled type 2 diabetes mellitus who presented with a 5-day history of generalized abdominal pain, nausea, and vomiting. On admission, she already had stage three acute kidney injury (AKIN III) and moderate hypo-osmolar hyponatremia, both attributable to prolonged vomiting and volume depletion. Nasogastric decompression yielded approximately 2,600 mL of fecaloid material, and contrast-enhanced computed tomography demonstrated pneumobilia together with an ectopic intraluminal foreign body, prompting a diagnosis of intestinal obstruction secondary to gallstone ileus. Exploratory laparotomy revealed a stone measuring approximately 10x8x6 centimeters impacted in the ileum, 200 centimeters distal to the ligament of Treitz, along with incidental 180° mesenteric torsion without vascular compromise. Enterolithotomy with primary two-layer closure and an incidental appendectomy were performed without takedown of a cholecystoenteric fistula, given the patient's age and comorbidities. A postoperative abdominal ultrasound obtained to investigate a second episode of worsening renal function unexpectedly described an absent gallbladder attributed to prior surgery, a detail that had not been captured on admission and raises the possibility of unrecognized post-cholecystectomy gallstone ileus. Renal function trended toward baseline, and the patient was discharged on postoperative day four with outpatient follow-up arranged.

This case brings together three uncommon features: a giant ileum gallstone, concurrent mesenteric torsion, and severe acute kidney injury at presentation, and illustrates how imaging can surface surgical history that an elderly patient may not report accurately.

Categories: General Surgery, Emergency Medicine, Geriatrics
Keywords: acute kidney injury, case report, cholecystoenteric fistula, enterolithotomy, gallstone ileus, jejunal obstruction, mesenteric torsion, post-cholecystectomy gallstone ileus

Introduction

Intestinal obstruction accounts for a substantial share of surgical admissions for acute abdominal pain; adhesions, hernias, and neoplasms account for the great majority of small bowel obstructions [1]. Gallstone ileus sits far down that list. It follows the erosion of a large gallstone through the wall of a chronically inflamed gallbladder into an adjacent hollow viscus, most often the duodenum, creating a cholecystoenteric fistula through which the stone migrates distally until it lodges at a point too narrow to pass [2,3]. The ileocecal valve and distal ileum account for the majority of impactions because of the comparatively small luminal diameter at that level; jejunal involvement occurs far less often and is generally regarded as atypical [4,5].

Diagnosis is frequently delayed because symptoms are vague, intermittent, and easily mistaken for other causes of obstruction, particularly in elderly patients who may not report a clear history of biliary disease [3,6]. Computed tomography has become the diagnostic study of choice, with sensitivity above 90% for identifying Rigler's triad, pneumobilia, an ectopic gallstone, and dilated bowel loops proximal to the point of obstruction [2,3]. Management remains individualized. Enterolithotomy alone is favored in frail or high-risk patients, while a one-stage procedure that also addresses the fistula and gallbladder is reserved for those who can tolerate a longer operation [1,2,7].

A less appreciated variant, gallstone ileus occurring in patients who have already undergone cholecystectomy, is rarer still. Fewer than 30 such cases have been described, arising from a stone left behind at the time of surgery, a persistent or recurrent fistula, or migration of a stone through the bile duct

[8,9]. We report a case that combines several unusual features in a single patient: a giant gallstone, an incidental 180° mesenteric torsion discovered at laparotomy, severe acute kidney injury (AKI) present on admission, and sonographic evidence of a prior cholecystectomy that had not been disclosed in the clinical history.

The report follows the CARE guidelines for case report writing [10].

Case Presentation

A 74-year-old woman with a history of poorly controlled type 2 diabetes mellitus presented to the emergency department with a 5-day history of diffuse abdominal pain accompanied by nausea and vomiting. She denied hypertension, malignancy, thyroid disease, prior hospitalizations or transfusions, and did not use alcohol or tobacco.

On initial evaluation, her vital signs were blood pressure 100/70 mmHg, heart rate 92 beats per minute, respiratory rate 19 breaths per minute, and oxygen saturation 98% on room air. She was alert and hemodynamically stable. Her abdomen was semi-globose due to adipose panniculus, mildly depressible, with diffuse tenderness to superficial and deep palpation throughout the colonic frame, decreased peristalsis, and no signs of peritoneal irritation. A 14Fr nasogastric tube, which drained minimally, was placed initially in the Emergency Room.

Initial laboratory studies revealed hemoglobin 10.8 g/dL, hematocrit 33.1%, white blood cell count 11.6 $\times 10^3/\mu L$ with 75.4% neutrophils, platelets 278 $\times 10^3/\mu L$, glucose 134 mg/dL, urea 227 mg/dL, blood urea nitrogen 106 mg/dL, creatinine 1.81 mg/dL, sodium 130 mmol/L, potassium 3.2 mmol/L, chloride 85.6 mmol/L, calcium 7.8 mg/dL, albumin 3.0 g/dL, prothrombin time 11.8 seconds, and INR 1.0. Arterial blood gas showed pH 7.49, pCO2 33 mmHg, pO2 71 mmHg, and bicarbonate 25.1 mmol/L, a pattern consistent with hypochloremic, hypokalemic metabolic alkalosis from prolonged vomiting (Table *1*). A 14Fr Foley catheter was placed, which had no urine output for about 6 hours. She was concurrently diagnosed with stage three acute kidney injury by AKIN criteria [11] and moderate hypo-osmolar hyponatremia, both attributed to volume depletion.

Parameter	Reference range	(Admission)	(POD 2)	(POD 3)	Trend/Interpretation
Creatinine, mg/dL	0.6-1.0	1.81	0.98	2.34	Markedly elevated on admission, improved postoperatively, then rose again on POD 3 (second AKI episode)
Blood urea nitrogen, mg/dL	7-18	106	62	63.0	Elevated throughout, most marked on admission
Urea, mg/dL	14.9-38.5	227.4	133	133.8	Parallels BUN trend
Sodium, mmol/L	136-145	130	142	139	Hyponatremia on admission, normalized postoperatively
Potassium, mmol/L	3.5-5.1	3.2	3.2	3.2	Persistent mild hypokalemia
Chloride, mmol/L	98-107	85.6	104.7	104.5	Marked hypochloremia on admission, normalized postoperatively
Calcium, mg/dL	8.6-10.2	7.8	7.6	8.4	Mild hypocalcemia throughout
Phosphorus, mg/dL	2.5-4.5	3.7	2.3	3.0	Within or near normal range
Magnesium, mg/dL	1.8-2.4	2.5	2.0	1.8	Mildly elevated on admission, normalized
Albumin, g/dL	3.5-5.2	3.0	2.7	2.4	Progressive hypoalbuminemia
Arterial pH	7.35-7.45	7.49	not repeated	not repeated	Metabolic alkalosis on admission
pCO2, mmHg	35-45	33	not repeated	not repeated	Partial respiratory compensation
pO2, mmHg	80-100	71	not repeated	not repeated	Mild hypoxemia
Bicarbonate, mmol/L	22-26	25.1	not repeated	not repeated	Upper-normal, consistent with alkalosis

TABLE 1: Comparative table of blood work at admission, POD 2, and POD 3

Comparative table with laboratory normal ranges and findings on admission and postoperative days (PODs) 2 and 3.

On reassessment by the surgical team, the nasogastric tube was exchanged for a larger-caliber tube (18Fr), which drained approximately 2,600 mL of fecaloid material, and a diagnosis of mechanical intestinal obstruction was made. Contrast-enhanced abdominal computed tomography demonstrated pneumobilia together with an ectopic intraluminal foreign body, findings consistent with gallstone ileus. Nevertheless, there was no gallbladder visible on CAT nor a fistula, though there was a zone of probable mesenteric torsion (Figure *1*, Figure *2*). The patient was started on intravenous fluids, broad-spectrum antibiotics, and analgesia, and was protocolized for emergency surgery; a central venous catheter was placed, and blood products were cross-matched in the shock unit.

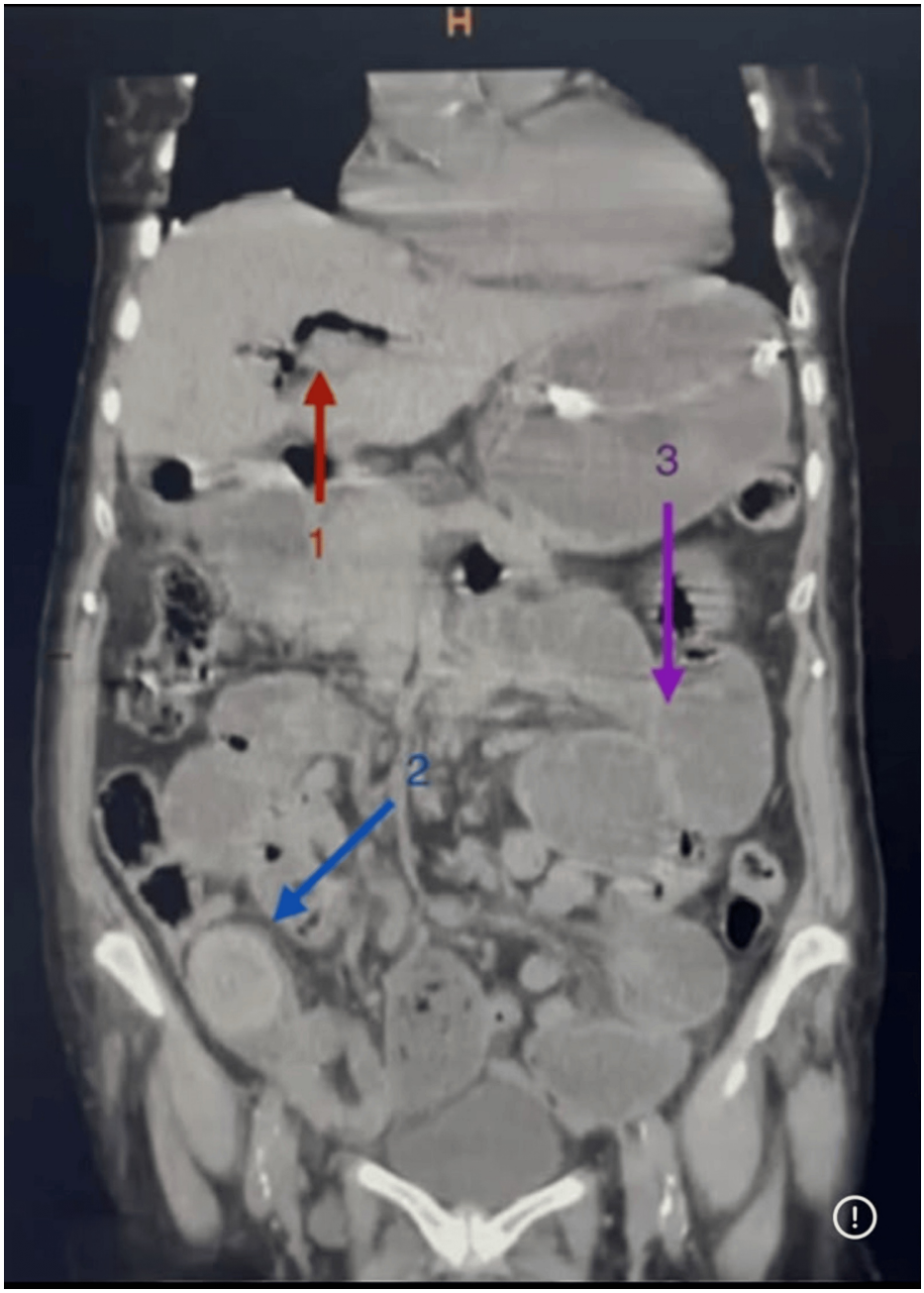


FIGURE 1: Abdominal CT

1. The red arrow marks intrahepatic air (neumobilia). 2. The blue arrow marks the gallstone in the ileum and distension of the ileum (Rigler's triad). 3. The purple arrow marks the apparent zone of mesenteric torsion of 180 degrees.

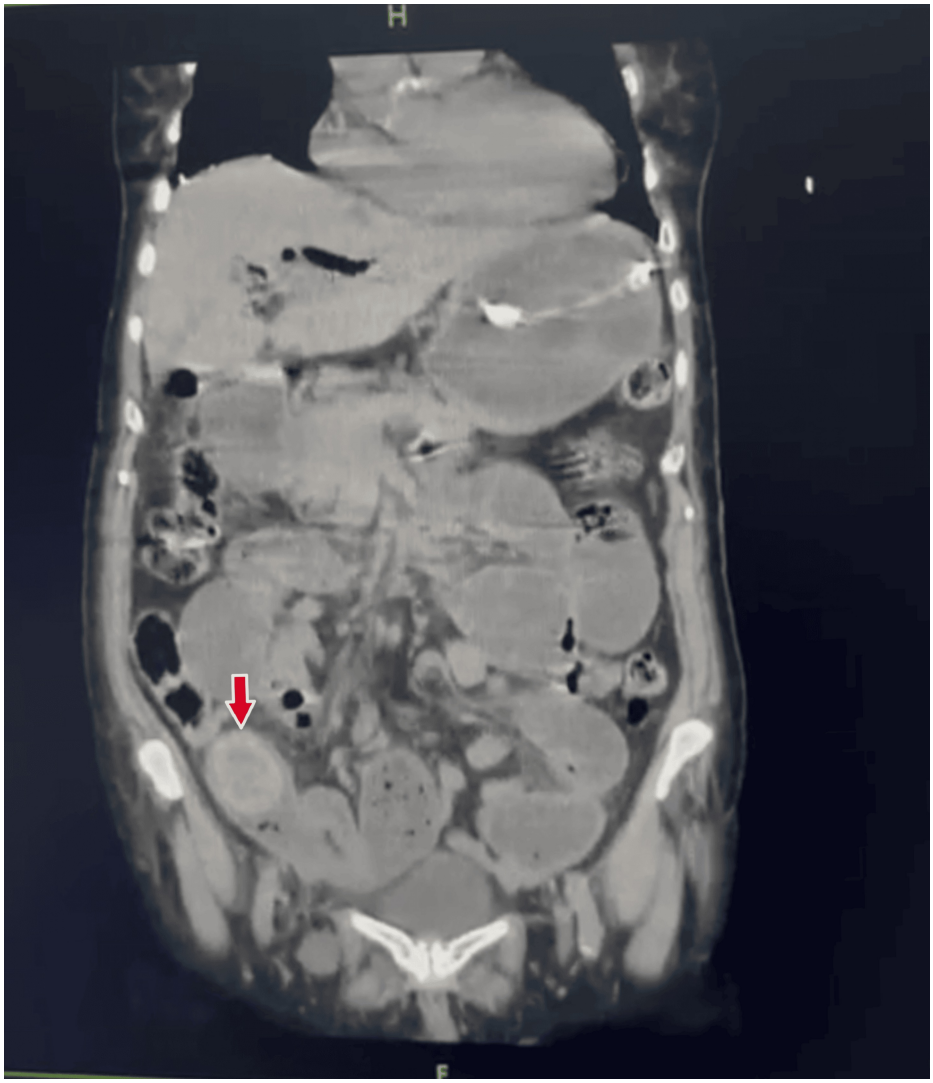


FIGURE 2: Abdominal CT (axial view)

The red arrow with white outline points to a 10x8x6 cm gallstone.

She underwent exploratory laparotomy through a supra-infraumbilical midline incision under balanced general anesthesia. Intraoperative findings included approximately 50 mL of inflammatory peritoneal fluid, a 180° mesenteric torsion without compromise of bowel vascularity, and a gallstone measuring approximately 10x8x6 cm impacted within the ileum lumen, 200 cm distal to the ligament of Treitz and 220 centimeters proximal to the ileocecal valve, with marked proximal bowel distension (Figure *3*). A 6 cm enterotomy was performed at the site of impaction, and the stone was extracted; the enterotomy was closed primarily in two layers with 3-0 PDS, using Connell and Mayo sutures for the mucosal layer and Lambert sutures for the seromuscular layer. An incidental retrograde appendectomy was performed, and a half-Penrose drain was placed toward the pelvic cavity. The abdominal wall was closed by planes with a continuous number-1 polypropylene suture for the aponeurosis, interrupted 2-0 polyglactin sutures for the subcutaneous tissue, and 2-0 nylon Sarnoff sutures for the skin. No cholecystectomy or fistula takedown was performed. Total operative time was 180 minutes, blood loss was minimal, and no transfusions were required. The patient left the operating room hemodynamically stable, breathing spontaneously with supplemental oxygen and without vasoactive support.

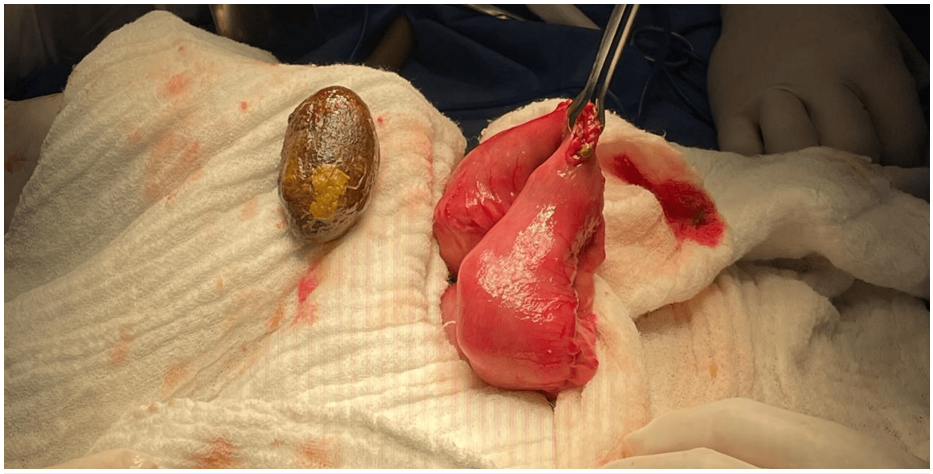


FIGURE 3: Gallbladder stone 10 x 8 x 6 cm approximately, next to ileum with entherolitothomy.

On the first postoperative day, the patient remained hemodynamically stable with an uneventful early recovery. Her C-reactive protein was 122.77 mg/L. By the second postoperative day, her creatinine had improved to 0.98 mg/dL, hemoglobin was 9.9 g/dL, and liver enzymes and bilirubin were within normal limits. On the third postoperative day, she reported no pain, nausea, or vomiting. Her vital signs were blood pressure 119/64 mmHg, heart rate 79 beats per minute, and capillary glucose 199 mg/dL. The surgical wound, approximately 15 cm along the midline, was well-approximated without dehiscence, infection, or active bleeding. The Penrose drain yielded a scant amount of serohematic fluid, and the Foley catheter a scant amount of turbid urine of 400 mL in 16 hours. Repeat laboratory studies that same day, however, showed that creatinine had risen again to 2.34 mg/dL, with a white blood cell count of $15.63\times10^3/\mu L$, prompting a nephrology consultation. A second episode of acute kidney injury was diagnosed, and intravenous fluids were adjusted accordingly.

An abdominal ultrasound was obtained on the first postoperative day to further evaluate the kidneys since the findings on the bloodwork, incidentally noted that the gallbladder was absent, attributed to a prior surgical history that had not been captured on admission; no collection was seen in the gallbladder fossa, the common bile duct measured 7.3 mm, and the liver, pancreas, and spleen were otherwise unremarkable. Both kidneys were echogenic with caliectasis and ureteral dilation, and the bladder was markedly distended (713 mL), a finding attributed to probable Foley catheter dysfunction. Increased renal parenchymal echogenicity raised the possibility of underlying chronic nephropathy in addition to the acute injury. At discharge, on POD 4, the last laboratory results were creatinine 2.34 mg/dL, blood urea nitrogen (BUN) 63 mg/dL, urea 133.8 mg/dL, Na 139 mmol/L, K 3.2 mmol/L, Cl 104.5 mmol/L, Ca 8.4 mg/dL, P 3.0 mg/dL, Mg 1.8 mg/dL, Albumin 2.4 g/dL (Table *1*). The nephrology service was consulted, which stated that intrahospital treatment was not necessary. Follow-up consultations with the nephrology service were recommended for further treatment.

The patient's renal function and clinical status improved over the following days. She was discharged on postoperative day four (hospital day five overall) with blood pressure 138/70 mmHg, heart rate 79 beats per minute, temperature 35.5 °C, and oxygen saturation 94%, tolerating oral intake and ambulating without assistance. She was discharged on oral cephalexin, paracetamol, and ketorolac as needed, with instructions for daily wound care and Penrose drain monitoring, a two-week follow-up appointment in the general surgery clinic, and suture removal planned at 15 days at her nearest primary care clinic. Histopathological analysis of the appendectomy specimen was pending at the time of writing.

Discussion

This case brings together several individually uncommon features that are reported together. Gallstone ileus itself accounts for only 1-4% of mechanical bowel obstructions, though the proportion rises considerably among elderly patients, in whom it may represent up to a quarter of all obstructive episodes [1,3]. The classic mechanism to present a fistula, either gallbladder-stomach, gallbladder-duodenum, or gallbladder-ileum, involves a large gallstone eroding through a chronically inflamed gallbladder wall into an adjacent segment of bowel, most commonly the duodenum, and then migrating distally until it reaches a point of relative luminal narrowing [2]. The distal ileum and ileocecal valve are the most frequent sites of impaction; jejunal involvement is considerably less common and tends to produce a more proximal, earlier-onset obstruction than the typical ileal presentation [4,5].

The stone recovered from this patient, approximately 10x8x6 cm, is considerably larger than the 2-3 cm

threshold generally cited as sufficient to obstruct the bowel [8,12]. Stones of this size are uncommonly reported and typically require a correspondingly larger enterotomy, as in this case. The concurrent finding of a 180° mesenteric torsion without vascular compromise [13] is not a recognized association with gallstone ileus; it more plausibly reflects a coincidental anatomical event related to the markedly distended, heavy loop of bowel proximal to the impacted stone rather than a mechanistically linked process, though a contribution from chronic partial obstruction favoring gradual mesenteric rotation cannot be excluded.

Preoperative diagnosis relied on the combination of a fecaloid nasogastric outpout through a nasogastric tube and computed tomography showing intestinal dilation and air-fluid levels with an ectopic intraluminal density, two of the three components required of Rigler's triad. Abdominal computed tomography carries a sensitivity above 90% for this combination of findings and remains the diagnostic study of choice when gallstone ileus is suspected [2,3]. Once the diagnosis is confirmed, the extent of surgery is debated. Simple enterolithotomy, without cholecystectomy or fistula repair, is associated with lower perioperative mortality and is generally preferred in older patients with significant comorbidities, whereas a one-stage procedure addressing the fistula in the same operation is reserved for patients who can tolerate the additional operative time [1,4,7]. Given this patient's age and poorly controlled diabetes, limiting the operation to enterolithotomy was the appropriate choice.

Whether to perform an incidental appendectomy during an unrelated laparotomy remains debated as well. Current consensus guidelines do not recommend routine incidental appendectomy in patients older than 50 years, reflecting the declining incidence of appendicitis with age relative to the added operative risk [12]. In this case, the appendectomy was performed retrograde during an already open abdomen. Since the undisclosed or unknown surgical history of the patient was taken into consideration, removal of the appendix was chosen to avoid another possible acute abdomen etiology.

The severity of this patient's AKI deserves comment. She met AKIN stage three criteria on presentation, alongside moderate hypo-osmolar hyponatremia and a hypochloremic, hypokalemic metabolic alkalosis, all consistent with several days of vomiting and third-space fluid sequestration proximal to a complete small bowel obstruction [14]. Her renal function improved substantially by the second postoperative day, only to worsen again by the third, prompting a repeat nephrology consultation (Table *1*). This fluctuating course is not unusual in elderly surgical patients recovering from a pre-renal insult superimposed on perioperative fluid shifts, and the postoperative finding of increased renal echogenicity on ultrasound raises the additional possibility of underlying chronic kidney disease that pre-dated this admission. The nephrology service was consulted, and they recommended follow-up with their service after discharge.

Perhaps the most notable aspect of this case is the discrepancy between the admission history, in which the patient denied any prior hospitalization or surgery, and both the abdominal computed tomography (CAT) as well as postoperative ultrasound described an absent gallbladder, attributed to prior surgical history. This finding would place the case within the rare category of post-cholecystectomy gallstone ileus, a condition reported as less common in incidence and arising through mechanisms that include a stone inadvertently left behind at the original operation, a fistula that persisted or recurred after cholecystectomy, or migration of a stone through the ampulla of Vater [8,9,15]. We were unable to independently confirm the timing or nature of any prior cholecystectomy from the records available at the time of writing since the surgery was not performed in our hospital; therefore, no records of this surgery could be found. This could not be clarified with the patient, as she either did not know her clinical history accurately or, when asked again, changed the type of surgery performed or changed the date of surgery. Her family did not know those details accurately either. Regardless of the precise mechanism, the discrepancy is a reminder that elderly patients, particularly those with remote or forgotten surgeries, may not reliably report their own surgical history, and that imaging findings dismissed as incidental can carry real diagnostic weight.

This report has the usual limitations of a single retrospective case description. Baseline renal function prior to this admission was not available, which limits precise staging of the acute kidney injury; the gallbladder history could not be corroborated with an operative report from any prior procedure; and follow-up beyond the immediate postoperative period was not available at the time of writing.

Conclusions

Gallstone ileus should remain in the differential diagnosis of bowel obstruction in elderly patients even when the presentation is atypical, as in this patient with a giant stone, an incidental mesenteric torsion, and severe acute kidney injury at presentation. Enterolithotomy alone was sufficient to resolve the obstruction and was an appropriate choice given her age and comorbidities. The unexpected ultrasound finding of an absent gallbladder, unsupported by the reported surgical history, is a reminder that imaging can reveal clinically important information that a frail elderly patient may not recall or report accurately, and that such findings warrant active follow-up rather than dismissal as incidental.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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Acquisition, analysis, or interpretation of data: Arturo A. Flores Morales, Andrea E. Miramontes Reynoso, Ricardo Y. Topete De Robles, Antonio G. Ramos Ramirez , Carolina Hernandez Muñoz

Drafting of the manuscript: Arturo A. Flores Morales, Andrea E. Miramontes Reynoso, Ricardo Y. Topete De Robles, Antonio G. Ramos Ramirez , Carolina Hernandez Muñoz

Critical review of the manuscript for important intellectual content: Arturo A. Flores Morales, Andrea E. Miramontes Reynoso, Ricardo Y. Topete De Robles, Antonio G. Ramos Ramirez , Carolina Hernandez Muñoz

Supervision: Arturo A. Flores Morales

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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