Laparoscopic management of gall bladder perforation secondary to typhoid-induced acalculous cholecystitis: A rare entity

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INTRODUCTION

Enteric fever is a commonly encountered clinical scenario in India with an estimated prevalence of laboratory-confirmed typhoid and paratyphoid among individuals with fever across all hospital studies was 9.7% and 0.9%, respectively. *Salmonella* infection can lead to spectrum of medical conditions such as gastroenteritis (m/c), enteric fever (typhoid and paratyphoid), chronic carrier state, bacteraemia and localised infections.[1]

Complications of typhoid fever can be divided into medical complications (endocarditis, myocarditis, pericarditis, pneumonia, pleural effusion, pancreatitis, meningitis, orchitis, arterial or venous thrombosis and embolism) and surgical complications (intestinal haemorrhage, intestinal perforation, cholecystitis, osteomyelitis and abscesses). Surgical complications of typhoid fever are less common and usually involve intestine than the gall bladder. With the emergence of more virulent and drug-resistant forms of *Salmonella* infection, we may encounter rarer complications of typhoid fever such as acalculous cholecystitis and gall bladder perforation.[2]

Gall bladder perforation as a sequel of typhoid-induced acalculous cholecystitis is a rare clinical encounter, reported sparsely in literature. Here, we discuss a case wherein successful laparoscopic management of typhoid-induced gall bladder perforation was performed. A 24-year-old female presented with a history of 5 days of fever and acute pain in the abdomen for 2 days. Computed tomography scan suggested gall bladder perforation which was confirmed on diagnostic laparoscopy. Laparoscopic cholecystectomy with peritoneal lavage was performed. The patient did well postoperatively and was discharged on post-operative day 4 after drain removal. One should be aware about the possibility of gall bladder perforation as a sequel of acalculous cholecystitis in typhoid fever. Minimal access surgery techniques can be applied for confirming the diagnosis as well as the definitive treatment.

Keywords: Gall bladder perforation, laparoscopy, minimal access surgery, typhoid

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and usually occurs at the fundus of gall bladder. Acalculous gall bladder perforation occurs due to ischaemic necrosis of gall bladder wall with inflammation and may even involve the body or neck of gall bladder. Common predisposing factors for acalculous cholecystitis include infections, trauma, and immunosuppression (e.g., corticosteroids, malignancy and systemic diseases such as diabetes mellitus and atherosclerotic heart disease).[3]

**CASE REPORT**

A 24-year-old female presented to our hospital with a 5-day history of fever, vomiting, decreased appetite and malaise and a 2-day history of acute pain in abdomen and abdominal distension. There was no significant medical history or any previous surgery. On presenting to our hospital, she was febrile with 102°F, pulse rate was 102/min, blood pressure was 112/68 and respiratory rate was 20/min. On general physical examination, she had no pallor, icterus or lymphadenopathy. Abdominal examination revealed soft abdomen with tenderness and guarding present in the upper abdomen. Her blood investigations revealed increased leucocyte count (17.08 × 103/mm³) with neutrophilia, low platelet count (149 × 103/mm³), increased prothrombin index (18.2 test/13.5 normal), normal lipase and amylase levels and insignificant liver function tests (bilirubin [T] – 0.50 mg/dl and [D] – 0.25 mg/dl, serum glutamic oxaloacetic transaminase – 29.6 U/l, serum glutamic pyruvic transaminase – 15.3 U/l, alkaline phosphatase – 136.8 U/l and gamma-glutamyltransferase – 55 U/l). Ultrasound abdomen showed distended gall bladder with wall thickening with normal common bile duct, suggestive of acalculous cholecystitis. No abnormality was detected on chest X-ray.

Blood culture was positive for *Salmonella typhi* with sensitivity to ampicillin, cefixime, chloramphenicol, cotrimoxazole and ceftriaxone. In view of peritoneal signs not explained by ultrasonography, computed tomography (CT) scan was planned. Contrast-enhanced CT scan revealed a small area of discontinuity in the wall of distended thickened gall bladder with resultant pericholecystic fluid which was contiguously tracking along the porta and in the left subcapsular hepatic region.

A diagnosis of gall bladder perforation was made, and the patient was taken up for diagnostic laparoscopy. It revealed purulent collection and flakes in Morrison’s space, gastrohepatic region and along falciform ligament; and gastric adhesions with anterior abdominal wall and left lobe of the liver. On adhesiolysis, gall bladder was found to be perforated anteriorly with multiple ischaemic and necrotic areas posteriorly on the neck of gall bladder [Figure 1]. She underwent laparoscopic cholecystectomy with peritoneal lavage [Figure 2]. No gallstone was found either in gall bladder or peritoneal cavity. Postoperatively, the patient was managed with culture sensitive antibiotics, pain killers and intravenous fluids, followed by oral intake on post-operative day 2. The subhepatic drain was removed on post-operative day 4, and the patient was discharged in satisfactory condition.

**DISCUSSION**

Typhoid-induced acalculous cholecystitis is a rare entity. Delay in diagnosing a case of acalculous cholecystitis may progress to necrosis, gangrene or perforation, further increasing the morbidity and mortality. As in our case, gall bladder perforation with generalised peritonitis is classified as Type I perforation, as per Niemeier classification.[4] To the best of our knowledge, there has been no published report of successful laparoscopic management of gall bladder perforation secondary to typhoid-induced acalculous cholecystitis.

Acalculous cholecystitis has also been described secondary to thermal injury or comorbid conditions such as immunocompromised state, malignancy and diabetes mellitus. However, very few cases of acalculous cholecystitis secondary to typhoid infection, further complicated by gall bladder perforation, have been described. Most of these cases are found intraoperatively during exploratory laparotomy.[5]

Ultrasonography is the initial investigation of choice to assess the gall bladder pathology. In our case, the USG was suggestive of acalculous cholecystitis, while the patient had peritoneal signs which prompted us to plan a CT scan of the abdomen, revealing a perforated gall bladder. Having a low threshold to perform CT abdomen, if ultrasonography is inconclusive and does not correlate the clinical findings may benefit in these cases. CT can help pick up a pathology early in its course and potentially decrease the associated morbidity, by instituting timely management.[6]

We chose diagnostic laparoscopy to evaluate the intra-abdominal pathology, as well as treat it using minimal access surgery (MAS), if feasible. In our case, we were able to perform the procedure laparoscopically, and the patient did well postoperatively. MAS tools provide the advantage of fast recovery after surgery, less post-operative pain, better cosmesis and shorter hospital stay. Technical challenges of laparoscopy in
intra-abdominal viscus perforation cases include the requirement of good surgical skills, achieving adequate peritoneal lavage and poor endovision in view of acute inflammation, unclear anatomy and decreased working space because of ileus. One should have a low threshold of conversion to open surgery in these cases.\textsuperscript{[7]}

Gall bladder perforation secondary to acalculous cholecystitis is a rare entity and should be kept as a differential while evaluating abdominal pain after enteric fever. Minimally invasive techniques can be applied for confirming the diagnosis as well as the definitive treatment.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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