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A Case of a 15-Year Old with Perforated Gallbladder Type II Secondary to Acute Acalculous Cholecystitis, Severe Secondary to Typhoid Fever with Bile Peritonitis, in Sepsis

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ABSTRACT

Typhoid fever is one of the most common enteric fever in low to middle income countries. In the pediatric population, it is a rare cause of acalculous cholecystitis in which one of the dreaded complication is gall bladder perforation. This was a case of a 15-year-old male with 1-month history of intermittent undocumented fever, anorexia and weight loss. The patient presented with signs of pancytopenia and abdominal examination revealed acute abdomen. Patient was optimized and prepared for surgery. Intraoperative findings revealed Type II gall bladder perforation with bile peritonitis, and patient underwent exploratory laparotomy, cholecystectomy, lavage, Jackson-Pratt drain. The sepsis eventually resolved postoperatively, and the patient was discharged. Preoperative diagnosis in patients with gall bladder perforation is often challenging and sophisticated, due to its rarity. However, it should be considered as one of the differential diagnoses in pediatric patients presenting with atypical history of abdominal pain.

At present, there are no specific guidelines in the management of complications such as gall bladder perforation in patients with typhoid fever. Therefore, early diagnosis and immediate surgical intervention of gall bladder perforation are of prime importance in the successful outcomes of these patients, given the high morbidity and mortality associated with this condition.

KEYWORDS: Acute Acalculous Cholecystitis, Bile Peritonitis, Pediatric Surgery, Perforated Gallbladder, Sepsis, Type II Perforated Gallbladder, Typhoid Fever

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INTRODUCTION

Typhoid fever is a global burden, and is one of the most common enteric infection especially in low- to middle-income countries, which is mainly caused by Salmonella typhi, that is usually found in an environment with poor sanitation and limited supply of clean drinking water. It accounts for nearly 27 million cases worldwide and 200,000 deaths per year (1).

Typhoid fever is one of the predisposing factors for developing acalculous cholecystitis. In patients, presenting with acute cholecystitis, only 5-10% accounts for acalculous cholecystitis. Cholecystitis complicated by typhoid fever has a reported incidence of 2.8% with only 1.7% being acalculous in nature (5). Gallbladder perforation (GBP) is a rare but a dreaded complication of acalculous cholecystitis, especially in patients with typhoid fever, with an incidence rate of 2-11% and a mortality rate ranging from 12-16% (2, 4). Diagnosis of this condition preoperatively is extremely difficult, but it should be considered in patients with typhoid fever given the associated morbidity and mortality.

In the Philippines, there has been no known published documentation of type II perforated gallbladder secondary to acalculous cholecystitis associated with enteric fever, especially in a pediatric patient. Moreover, there are no specific guidelines for the management of gallbladder perforation of typhoid fever due to its rarity.

SIGNIFICANCE OF THE STUDY

In the pediatric population, gallbladder perforation secondary to acalculous cholecystitis associated enteric fever is a rare entity with an incidence of 5.9% (3). In the Philippines, there

has been no report of a case of type II gallbladder perforation secondary to acalculous cholecystitis in a pediatric patient with typhoid fever. Internationally, there has been < 15 cases reported in the literature regarding GBP in the pediatric population. Hence, this study can contribute to the medical literature, in addition to, sharing our experiences with this case to the surgical community, especially in the section of pediatric surgery. This will aid surgeons especially in the low- to middle-income countries that may encounter this type of dilemma, with regards to the diagnosis, surgical course and management of this case at our local setting.

CASE PRESENTATION

This was a case of a 15-year-old male with 1-month history of intermittent undocumented fever, anorexia and weight loss. Five days prior to admission, patient had persistence of symptoms in addition to periumbilical pain, which migrated to right quadrant after 2 days. The worsening and persistence of symptoms, prompted consult. Physical examination findings showed the patient to be awake, disoriented, febrile (Tmax 39C), and tachycardic (120s bpm). The chest findings revealed equal chest expansion, with rales at the right lung field, and the abdominal findings showed flat, normoactive bowel sounds, direct and rebound tenderness on all quadrants with involuntary guarding, which is consistent with acute abdomen. The differential diagnoses for this case were acute complicated appendicitis vs perforated typhoid ileitis. Initial blood workup revealed leukopenia, neutrophilia, with severe thrombocytopenia, in addition to, procalcitonin of 73.10 which indicates bacterial sepsis. Typhidot revealed a result of negative IgM and positive IgG, which is suggestive of a previous or chronic infection with typhoid fever. Abdominal x-ray was taken which showed non-distended bowel loops, with normal gas pattern and air at the rectal vault, no pneumoperitoneum was noted. Further imaging was not requested since it would have not changed the management for this patient. The family was apprised for immediate surgical intervention, and the patient was prepared for surgery once initial resuscitation was sufficient. The patient underwent exploratory laparotomy, cholecystectomy, lavage, Jackson-Pratt drain.

Intraoperative findings (Figure 1) revealed serous drain at the subhepatic, splenic and pelvic recesses, which was collected for cell cytology. The small bowels were dilated, with unremarkable bowel run. The liver was smooth. There was bilious drain contained by the omentum at the right upper quadrant, with perforation of the gallbladder at the anterior mid-portion of the body with patchy necrosis. Splenomegaly was also noted. Postoperatively, there was a resolution of sepsis and severe thrombocytopenia with improvement of the sensorium. Eventually after completion of antibiotics, patient was discharged, and was advised for follow-up checkup after 1 week on an outpatient basis.

On gross pathologic examination showed dark tan, with a dull external surface and an extensively eroded mucosa of gallbladder fragments measuring 7.3 x 3.3 cm with a wall thickness of 0.4 cm. No stones were noted. On microscopic examination (Figure 2-3) showed sections of gallbladder tissue with an extensively eroded mucosa with focal areas showing a portion of the lining simple columnar epithelium. The supporting stroma is extensively infarcted and hemorrhage. Abscess and necrosis are also observed. The cytology smears are highly cellular, composed mostly of mesothelial cells, admixed with mixed inflammatory cells. The cellular elements are suspended in an eosinophilic background. The final histopathologic findings revealed extensive transmural infarction and hemorrhage of the gallbladder, with bile and peritoneal fluid are negative for malignancy.

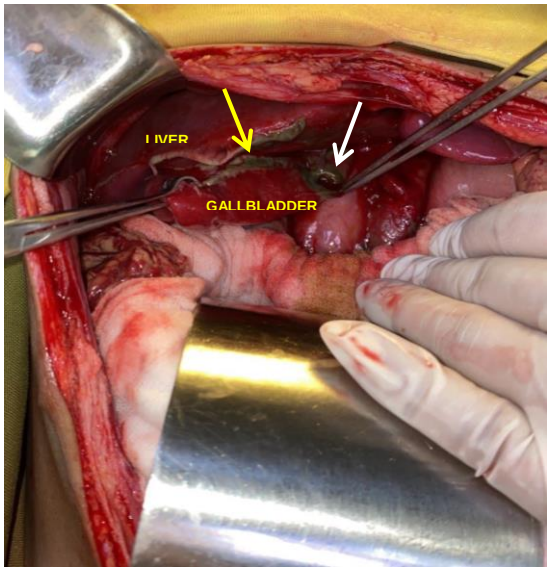

Figure 1: Intraoperative findings showed perforation of the gallbladder at the anterior mid-portion of the body (white arrow), with patchy necrosis (yellow arrow)

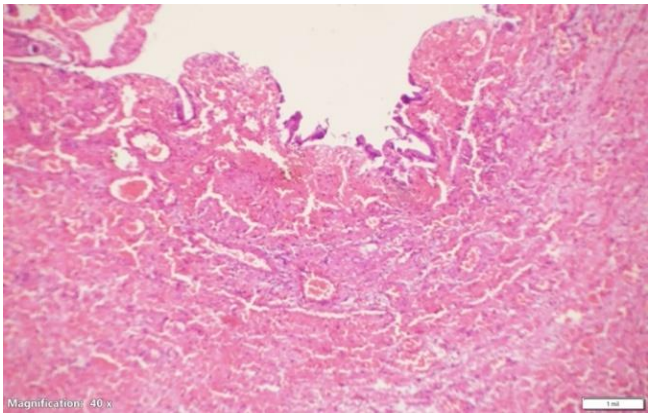

Figure 2: Microscopic features of gallbladder perforation (GBP) at low-power objectification (LPO) field

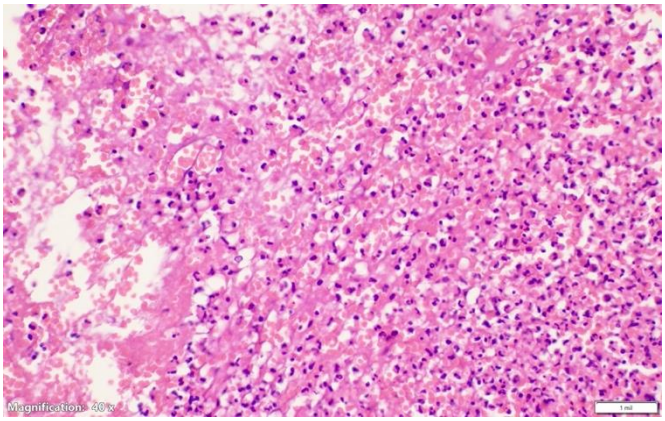

FIGURE 3: Microscopic features of gallbladder perforation (GBP) at high-power objectification (HPO) field

CASE DISCUSSION

Gallbladder perforation is a rare and potentially life-threatening complication of cholecystitis, especially in patients with typhoid fever, which is caused by Salmonella typhii, a gram-negative bacteria, which may also cause an acute acalculous cholecystitis (1, 4). Typhoid fever is an acute illness characterized by fever, anorexia, nausea, vomiting, at times constipation and bloody diarrhea along with hepatosplenomegaly and pancytopenia (1). It involves the reticuloendothelial system, which includes the bone marrow, liver, and spleen. Salmonella has the tendency to damage the gallbladder wall which eventually leads to perforation, due to its ability to invade the gallbladder epithelial cells (4).

Gallbladder perforation is more frequently seen in elderly male patients, whereas it is a rare entity in children which is usually seen in association with typhoid fever. Perforation of the gallbladder can occur as early as 2 days or after a few weeks, from the onset of acute cholecystitis (2). The pathophysiologic basis of gallbladder perforation usually results from the occlusion of the cystic duct often caused by a calculus, which causes rise of the intraluminal pressure due to retained intraluminal secretion. The most common sites for perforation is the fundus, followed by the body, since their location is in the most distal part with regards to the blood supply. Ischemia of the gall bladder wall due to severe inflammation and acalculous cholecystitis can lead to spontaneous GBP, which is seen in this case. The most common predisposing factors to GBP are infections, malignancy, trauma, drugs (corticosteroids), and systemic diseases such as diabetes mellitus and atherosclerotic heart disease (2). For this patient, sepsis secondary to typhoid fever in association with acalculous cholecystitis were the predisposing factor for GBP.

The diagnostic workup for these cases include, abdominal x-rays, ultrasonography and computerized tomography (CT) scan (1, 3-4). Abdominal x-rays are not always helpful since it may not always reveal pneumoperitoneum (2). Ultrasound and CT scan may demonstrate abdominal fluid but lack specificity to diagnose gallbladder perforation. Ultrasound findings for acute acalculous cholecystitis, shows findings of gallbladder thickening (>3.5mm), distension, pericholecystic fluid and positive sonographic Murphy sign (2, 4). At times, it can also be seen in GBP, although these findings may be non-specific. The "HOLE" sign is the only reliable sign of GBP, in which a defect in the gallbladder can visualized. The sensitivity of CT scan in detecting GBP and biliary calculi has been reported to be 88% and 89%, respectively. GBP can also be detected by diagnostic peritoneal lavage, retrograde cholangiography, and HIDA scan (2).

Early intervention and optimal critical care are vital to improve the overall outcomes of patients with gall bladder perforation. For patients with acute acalculous cholecystitis, conservative management with antibiotics and fluid therapy may be useful. But in patients with gallbladder perforation, aside from medical management, prompt surgical intervention by performing cholecystectomy along with peritoneal lavage to manage peritonitis usually leads to successful outcomes (1). In uncomplicated cases, antibiotics such as fluoroquinolones or ceftriaxone are given for a period of 5-7 days, whereas in complicated cases, treatment is given for 14-21 days (4).

CONCLUSION

Typhoid fever is one of the rare etiologic entity for acute acalculous cholecystitis. In pediatric population with typhoid fever, gall bladder perforation is a dreaded complication. Preoperative diagnosis is difficult, and late presentation in patients may become a pitfall because of its difficulty to distinguish from other causes of peritonitis such as acute complicated appendicitis or typhoid ileitis, which are more common causes of acute abdominal pain in children. Early diagnosis accompanied with early surgical intervention such as cholecystectomy, peritoneal lavage and drain is an important step in the management of sepsis caused by gall bladder perforation, especially in the pediatric population. Despite its rarity, prompt diagnosis and intervention should be considered in the course and management of these patients.

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