

# Acute acalculous cholecystitis and gall bladder perforation induced by *Salmonella enterica* serovar typhi

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## Abstract

*Salmonella* Typhi is a causative agent of enteric fever, which is an ongoing public health problem in urban areas of the Kathmandu valley in Nepal. It is estimated that approximately 5 % of people in an endemic enteric fever area may asymptotically carry *Salmonella* Typhi in the gall bladder. Here we describe a rare clinical manifestation of chronic *Salmonella* carriage. A 40 year old male resident of Kathmandu underwent an emergency cholecystectomy for acute cholecystitis and gall bladder perforation. No stone was identified but *Salmonella* Typhi was cultured from the gall bladder.

**Key Words:** Acalculous cholecystitis, perforation, *Salmonella* Typhi.

## Case Report

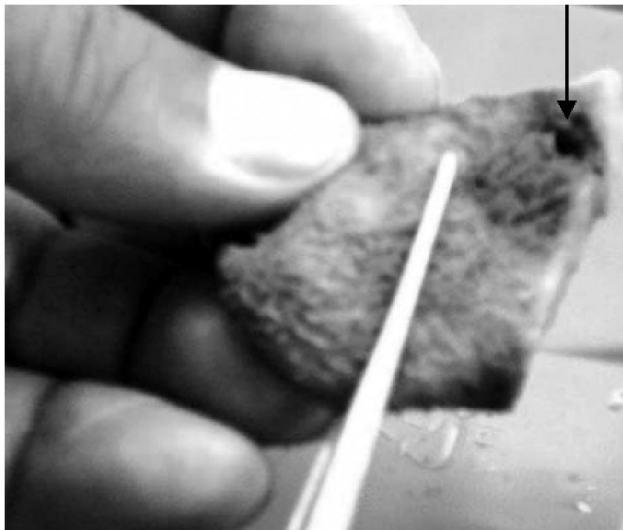
A 40 year old male laborer working in a carpet factory in the Patan area of Kathmandu, Nepal, presented at the Emergency room of Patan Hospital with severe epigastric discomfort. He was fully conscious with a blood pressure of 140/100 mmHg and a pulse rate of 96 bpm. On admission the patient described the pain as a mild burning sensation, but later the same day it progressed to a pricking pain localized to the epigastric region. There was no radiation of the pain, no vomiting and most significantly, no fever or other symptoms associated with a systemic *Salmonella* Typhi infection. The patient explained that he had experienced such discomfort on an intermittent basis for up to two years prior to this admission. The patient had not sought medical attention for the condition and “self treated” by lying down and attempting to sleep in the hope that the pain would subside. Three weeks prior to admission, he had fever with chills which he self treated with oral amoxicillin for 7 days. An abdominal examination revealed generalized guarding but no organomegaly. Murphy’s sign was positive.

His peripheral-white blood cell count was  $20.5 \times 10^3 / \text{mm}^3$  with 91% neutrophils. An abdominal X-Ray showed features consistent with sub-acute intestinal obstruction and there was no free gas seen in the abdominal cavity. No gall stones were seen. A nasogastric tube was passed, intravenous fluids and analgesia administered and the patient carefully monitored overnight. Subsequent abdominal examination revealed generalized tenderness and board-like rigidity. A presumptive diagnosis of peritonitis was made. He was treated with intravenous ceftriaxone (1 g) and metronidazole (750 mg) and was prepared for an exploratory laparotomy.

Operative findings revealed a 10mm<sup>2</sup> perforation in the gall bladder wall (Fig. 1), which was partially obscured by the duodenum. On examination, the gall bladder revealed no gall stones and the common bile duct was neither blocked nor distended. Due to the perforation in the gall bladder wall the patient’s peritoneal cavity was flooded with bilious fluid and debris (Fig. 2). A cholecystectomy was performed and the abdominal cavity was thoroughly lavaged. The histopathological examination of the gall bladder



**Fig. 1:** Acutely inflamed gallbladder.



**Fig. 2:** Perforation in the gallbladder (marked by the black arrow).

demonstrated acute on chronic cholecystitis (Fig. 1). *Salmonella* Typhi was isolated from the bile taken from the gall bladder and the peritoneal cavity. Five days post cholecystectomy the patient was discharged in good health and continued on a course of azithromycin (1g/day for 4 days).

This case illustrates that the organisms that cause enteric fever (*Salmonella* serovars Typhi and Paratyphi A) in endemic areas, such as Nepal, can present with such serious and potentially life threatening complications. In this case, a patient with acalculous cholecystitis probably triggered

by a chronic *Salmonella* Typhi infection, presented with a perforation of the gall bladder wall. Asymptomatic gall bladder carriage of *Salmonella* Typhi and Paratyphi A is common in high transmission endemic regions.<sup>1</sup> A recent study involving of patients undergoing cholecystectomy at Patan Hospital revealed that *Salmonellae* Typhi or Paratyphi A were cultured from the bile of 4.5% (22/404) of patients.<sup>2</sup> Acute acalculous cholecystitis comprises 5 - 10 % of all cases of acute cholecystitis and can be caused by *Salmonella* Typhi infection.<sup>3,4</sup> This atypical form of cholecystitis is associated with morbidity and a higher mortality rate when compared to more common calculous cholecystitis. Acute acalculous cholecystitis is associated with patients on mechanical ventilation, those receiving total parenteral nutritional and patients with polytrauma.<sup>7-10</sup>

Organisms that cause enteric fever are spread by the fecal - oral route and humans are the only known reservoir of the disease. Enteric fever is rampant in Nepal.<sup>5</sup> Drastic improvements in water supply and sanitation is unlikely in the near future and as unplanned urbanization continues, the disease continues to spread. Our patient did not have any evidence of suffering from enteric fever in the past.

*Salmonella* Typhi is known to persist in the gallbladder of some carriers for a prolonged and ill defined period of time. Despite adequate treatment, organisms are able to survive within the niche of the gall bladder. This can lead to chronic asymptomatic shedding and transmission to other people and in rare cases like this patient can lead to severe complications. Access to clean water and sanitation, vaccination, identification of people who are chronic carriers and effective treatment of those with acute infections would help break the cycle of transmission.

## Conclusions

Acute acalculous cholecystitis leading to gall bladder perforation is an important complication of enteric fever and doctors in endemic regions and those managing patients who return from travel to such areas should be aware of this potentially life threatening presentation.

## Funding

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