

ORIGINAL ARTICLE

A Rare Complication of Typhoid Fever: Perforated Gallbladder in ChildrenIMTIAZ AHMED¹, MUHAMMAD AKBAR², ROOMAN QURESHI³, IQRA ASLAM⁴, ALI HASHAM⁵, ASMA MEMON⁶¹Assistant Professor Pediatric Surgery, Liaquat University of Medical Health Sciences, Jamshoro Sindh²Assistan Professor Department of Surgery, Liaquat University of Medical Health Sciences, Jamshoro³Senior Registrar Department of Paediatrics, Bilawal Medical College, LUMHS Jamshoro^{4,5}Resident Pediatric Surgery, Liaquat University of Medical Health Sciences, Jamshoro⁶Resident Pediatric Surgery, Liaquat University of Medical Health Sciences, Jamshoro Senior RegistrarCorrespondence to: Imtiaz Ahmed, Email: driq00@gmail.com**ABSTRACT****Background:** Gall bladder perforation is a rare complication in the pediatric age group secondary to enteric fever and a definitive diagnosis is necessary to deal with the management. Preoperative diagnosis of gallbladder perforation is challenging and demanding in most cases diagnosed intraoperatively. Our study aims to evaluate the pattern of presentation, investigation, and complication.**Methods:** A descriptive case series was carried out in our pediatric department of surgery at Liaquat University Hospital Hyderabad Sindh Pakistan from January 2016 to December 2021. Data were analyzed regarding age, clinical presentation, investigation, surgical procedure, site of perforation, complication, and outcome.**Results:** Eleven patients were managed in five years. The patient's ages ranged from 6 years to 12 years old child of 9.19 years was the mean age of presentation. The fundus and body was the commonest site of perforation and was diagnosed intraoperatively. The presenting feature was fever, abdominal pain with distension, vomiting, constipation, and a sign of peritonism. The gallbladder perforation was managed by cholecystectomy in 10 patients and partial in one due to difficult dissection. In our series, zero mortality, and all eleven patients were symptom-free in the postoperative outpatient department clinic.**Conclusion:** In Perforated gallbladder patients early and aggressive management improves mortality and morbidity but represents a special diagnostic and surgical challenge.**Keywords:** Typhoid Fever, Perforated Gallbladder, Acalculous Cholecystitis.**INTRODUCTION**

Typhoid fever is a common infection in many developing countries with substandard sanitation and the unavailability of clean drinking water. Worldwide reported cases is nearly 27 million, with two lac deaths per year, developing countries like Indonesia in 2007 basic health research reported highest incidence in East Java with 0.3-3% prevalence.^{1,2} Perforated gallbladder is a complication of enteric fever which is a rare entity,³ about 3% to 10% reported incidence of the perforated gallbladder in typhoid fever.⁴ Salmonella typhi is a causative agent of Typhoid fever, is a bacterial infection that can penetrate epithelial cells, and give rise to injury to the wall of the gallbladder which causes perforation.⁵ Perforation of the gallbladder in the pediatric age group is a very rare condition in pediatric surgical practice.^{6,7} In adults practice episode of acute calculous cholecystitis has been reported.^{6,7} In children, acalculous gallbladder perforation in enteric fever is very rare.^{6,7} Mortality rate is high due to difficult preoperative diagnoses.⁷

METHODS

This descriptive case series was carried out at the department of pediatric surgery, Liaquat University Hospital Hyderabad, Sindh Pakistan, from January 2016 to December 2021. Eleven patients with the diagnosis of enteric fever who were managed during this period were included in the study.

RESULTS

A total of eleven patients, nine male and two females 6 to 12 years of age group (mean 9.19), with gallbladder perforation, the main presenting feature was fever and abdominal pain, (in eleven), right iliac fossa pain (in four), abdominal distension (in seven), vomiting (in three) and a sign of peritonism in seven patients.

Total leucocyte count was raised in all patients, ranging from 11000 to 20000 mean was 14500. Typhi dot was positive in seven cases, hemoglobin levels ranged from 6 to 11g/dl. Abdominal x-rays of erect posture show fluid levels in seven patients, and ultrasonography shows mild to moderate amount pelvic collection in five patients.

The provisional diagnosis preoperatively was a perforated appendix in four patients, and enteric perforation in seven patients. Four patients had a Lanz incision and seven patients had a

laparotomy with a right supraumbilical incision. The gallbladder was perforated from the fundus in seven bodies in three, one had multiple perforations and ten patients underwent complete cholecystectomy, and one with partial cholecystectomy due to difficult dissection caused by severe adhesion and inflammation. The postoperative recovery period was uneventful in our case series. A drain was removed on the third postoperative day and the patient was discharged on the seventh postoperative day. Two patients developed wound infection postoperatively. All patients were followed in the outpatient department at regular intervals for six months.

Table 1: Sex distribution of patients

| Sex | Frequency (n) | Percent |
|--------|---------------|---------|
| Male | 09 | 81.1 |
| Female | 02 | 18.1 |
| Total | 11 | 100% |

Table 2: Frequency of complication Wound infection

| Wound infection | Frequency | Percent |
|-----------------|-----------|---------|
| Yes | 2 | 18.1 |
| No | 9 | 81.1 |
| Total | 11 | 100.0 |

DISCUSSION

Prolonged history of enteric fever in the pediatric age group gives a clinical suspicion of the perforated gallbladder in the endemic region or it should be a differential diagnosis. A key factor in reducing mortality and morbidity is early diagnosis and early surgical intervention with complete cholecystectomy is the treatment of choice with a good outcome. In our series patients presented with abdominal pain, fever, pain in the right iliac fossa, vomiting, anemia, and leukopenia, all indicative of typhoid infection. Roslyn et al. observed that in the older age group, perforation of the gallbladder is more common.⁸ Obstructive Cholelithiasis raised intraluminal pressure cause perforation commonly in the elderly.^{8,9} In the acute infectious phase of enteric fever, viral influenza, and pneumonia, in children patients is usually related to acalculous cholecystitis perforation most likely results from severe inflammation uncontrolled infection with thrombosis of blood vessels in the immune-compromised state.^{10,11,9} Detection of gallbladder perforation by ultrasound and Ct lack

specificity.^{7,12} Achieving good results cholecystectomy is the treatment of choice in the perforated gallbladder.^{6,7,13} Antibiotics covered in typhoid fever are given for seven days in uncomplicated cases and complicated cases, for seven to fourteen days depending on the condition of the patients.^{7,14} Antibiotics covered in our series were given for seven days.

Gallbladder or common bile duct perforation causes biliary peritonitis and is rarely reported in children's age group as compared to the adult group, with little data or case studies published with a scarcity of the problem in the pediatric age group. Gallbladder perforation is less common than common bile duct perforation in the pediatric age group.^{15, 16,17,18,19}

Preoperative diagnosis of peritonitis caused by biliary perforation is a difficult one, some studies highlighted a few cases where a preoperative diagnosis was made feasible.^{20, 21, 22, 23} However in our eleven patients of case series four patients diagnose with preoperatively perforated appendicitis and seven were enteric perforation. All out to be enteric gallbladder perforation. In developing countries typhoid fever is common, and due to substandard sanitation, unhygienic conditions manifest systemic illness.

Surgical option in the management of gallbladder perforation is cholecystectomy, partial cholecystectomy, and tube cholecystostomy, preferred option is cholecystectomy, sometimes dense adhesion or inflammation rises difficulty in identifying structures. In acute conditions of biliary perforation, numerous studies exhibit victorious insertion of drains by ultrasound/CT guided.^{24, 25}

Postoperative complications of gall bladder perforations are wound infection, wound dehiscence, prolonged ileus, ligation of common bile duct during cholecystectomy, etc.^{21,24,26,23} Postoperative recovery in our case series was uneventful.

Zero mortality rate reported in some recent studies.^{21, 24, 25} In our case series there is no mortality rate due to early intervention. One of the main bases of reduced mortality rate is early surgical intervention with good intensive care facilities.

CONCLUSION:

In pediatric age group with a prolonged history of typhoid fever gives a high clinical suspicion of the perforated gallbladder, especially in the endemic region or it should be a differential diagnosis. A key contributing factor in reducing mortality and morbidity is early diagnosis and early surgical intervention with complete cholecystectomy is the treatment of choice with a good outcome.

REFERENCES

1. M.N. Malik, T. Mahmood, A. Tameez Ud Din, et al. Gallbladder perforation secondary to enteric fever: an interesting case of acute abdomen *Cureus*, 11 (4) (April 22, 2019), 10.7759/cureus.4516 e4516 View PDF Google Scholar
2. P. Dewi Ni Made Diah, R.K. Illahi, D. Lyrwati Cost effectiveness analysis of chloramphenicol, ceftriaxone and cefixime use in pediatric typhoid fever patient *Pharmaceutical Journal of Indonesia*, 5 (1) (2019), pp. 53-59 View in Scopus Google Scholar

3. Gali BM, Ali N, Agbese GO, Duna VD, Dawha SD, Ismai GI, Mohammed M: Gallbladder perforation complicating typhoid fever: report of two cases. *Niger J Med*. 2011, 20:181-183.
4. Singh M, Kumar L, Singh R, Jain AK, Karande SK, Saradna A, Prashanth U: Gallbladder perforation: a rare complication of enteric fever. *Int J Surg Case Rep*. 2014, 5:73-75. 10.1016/j.ijscr.2013.12.004
5. Menendez A, Arena ET, Guttman JA, Thorson L, Vallance BA, Vogl W, Finlay BB: Salmonella infection of gallbladder epithelial cells drives local inflammation and injury in a model of acute typhoid fever. *J Infect Dis*. 2009, 200:1703-1713. 10.1086/646608
6. Roslyn J.B., Usuttil R.W. Perforation of gallbladder: a frequently mismanaged condition. *Am J Surg*. 1979;137:307-312.
7. Menakuru S.R., Kaman L., Behera A. Current management of gall bladder perforations. *ANZ J Surg*. 2004;74:843-846.
8. Roslyn J.J., Thompson J.E., Darvin H. Risk factors for gallbladder perforation. *Am J Gastroenterol*. 1987;82:636-640.
9. Essenhugh D.M. Perforation of the gall-bladder. *Br J Surg*. 1968;55:175-178.
10. Jaramillo Samaniego J.G. Acalculous acute cholecystitis during the course of typhoid fever in children. *Rev Gastroenterol Peru*. 2001;21(January-March (1));36-41.
11. Babb R.R. Acute acalculous cholecystitis: a review. *J Clin Gastroenterol*. 1992;15:238-241.
12. Martinaz A., Cancers J., Perez C. Postoperative acute cholecystitis: sonographic diagnosis. *Eur J Radiol*. 1985;5:35.
13. Ugwa B.T., Yiltok S.J., Kidmas A.T., Opaluwa A.S. Typhoid intestinal perforation in north central Nigeria. *West Afr J Med*. 2005;24:1-6.
14. Sanchez-Vargas F.M., Abu-El-Haija M.A., Gomez-Duarte O.G. Salmonella infections: an update on epidemiology, management, and prevention. *Travel Med Infect Dis*. 2011;9(November (6)):263-277.
15. Kim HJ, Park SJ, Lee SB, Lee JK, Jung HS, Choi CK, et al. A case of spontaneous gallbladder perforation. *Korean J Intern Med* 2004;19:128-31.
16. Marwah S, Sen J, Goyal A, Marwah N, Sharma JP. Spontaneous perforation of the common bile duct in an adult. *Ann Saudi Med* 2005;25:58-9.
17. Kasat LS, Borwankar SS, Jain M, Naregal A. Spontaneous perforation of extrahepatic bile duct in an infant. *Pediatr Surg Int* 2001;17:463-4.
18. Moore T, Cameron R. Spontaneous perforation of the extrahepatic biliary tract in infancy and childhood: Review of 77 operatively managed cases. *Pediatr Surg* 1986;1:205-9.
19. Wang AJ, Wang TE, Lin CC, Lin SC, Shih SC. Clinical predictors of severe gallbladder complications in acute acalculous cholecystitis. *World J Gastroenterol* 2003;9:2821-3.
20. Ong CL, Wong TH, Rauff A. Acute gallbladder perforation-a dilemma in early diagnosis. *Gut* 1991;32:956-8.
21. Abdur-Rahman OL, Adeniran OJ, Nasir AA. Outcome of acalculous cholecystitis from typhoid in Nigerian children. *J Natl Med Assoc* 2009;101:717-9
22. Carubelli CM, Abramo T.J. Abdominal distension and shock in an infant. *Am J Emerg Med* 1999;17:342-4.
23. Goldberg D, Rosenfeld D, Underberg-Davis S. Spontaneous biliary perforation: Biloma resembling a small bowel duplication cyst. *J Pediatr Gastroenterol Nutr* 2000;31:201-3.
24. Saxena V, Basu S, Sharma CL. Perforation of the gallbladder following typhoid fever-induced ileal perforation. *Hong Kong Med J* 2007;13:475-7
25. vanSonnenberg E, D'Agostino HB, Casola G, Hoyt DB, Lurie A, Varney RR. Gallbladder perforation and bile leakage: Percutaneous treatment. *Radiology* 1991;178:687-9.
26. Pandey A, Gangopadhyay AN, Kumar V. Gallbladder perforation as a complication of typhoid fever. *Saudi J Gastroenterol* 2008;14:213.