

Pilot Case Series Demonstrating Unsuspected Ulceration in Perforated Ileum from Typhoid Fever

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Abstract

A recent case series of patients with suspected typhoid fever presenting with peritonitis and evidence of perforation were treated with simple closure, exteriorization of the perforated segment, and resection with ostomy formation. Resection with ostomy formation has been successful in severely advanced cases. The series has demonstrated two previously unreported features of the disease – multiple severe ulcerations throughout the distal ileum and multiple ulcerations in the cecum. Furthermore initial observation suggests a rapid return towards normal of systemic inflammatory response scores when resection was carried out.

Keywords: Typhoid; Ileum; Cecum; Prognostic score; Systemic inflammatory response score

Introduction

In some recent editions of surgical texts, typhoid enteritis almost seems relegated to the past with general improvements in clean water supplies and improved general public sanitation [1]. The early and timely treatment with antibiotics makes subsequent complications unlikely and generally easily managed. But typhoid enteritis remains a challenging multidisciplinary problem in low resource countries. Recent observations of a series of cases highlight contemporary challenges.

Early and uncomplicated typhoid enteritis may resemble clinically any of several infective enteritides with a constellation of nonspecific signs of variable abdominal discomfort, abdominal cramps, nausea, vomiting, and fever. Often these enteritides are self-limited or treated by antibiotics given at a primary care health facility. But some cases do not respond to early treatment and serious problems arise. Then it becomes useful to think of the important dimensions that guide further diagnosis and treatment.

Several reports do attest to the seriousness of typhoid fever by commenting on the significant morbidity and mortality rate. But review of many articles describing a cohort of patients with ileal perforation as an initial indicator of severe typhoid fever do not further categorize the patients. Two approaches have been used—the identification of risk factors for mortality and the development of scoring system that differentiate physiologic status. Identification of risk factors yields important information about the likelihood of mortality and length of hospitalization [2,3]. Somewhat differently there have been efforts to use prognostic scoring systems with some success. A modified Jabalpur peptic ulcer perforation score has been helpful to discriminate survivors and non-survivors of typhoid fever [4]. We have observed that these patients are sometimes systemically ill perhaps with jaundice, some respiratory failure, marginal renal function and abnormal blood counts (severe anemia, leukopenia, or thrombocytopenia). It may be that conclusions about treatment

(debridement/closure, resection, ostomy creation) may miss levels of significance when all typhoid perforations are grouped together without differentiating physiologic status.

Methodology

A pilot study series of consecutive patients admitted with suspected typhoid fever with ileal perforation admitted to the surgical service was observed over a period of two years. Surgical treatment was undertaken because of clinical signs of peritonitis and X-ray films documenting free intraperitoneal air. Treatment included debridement of the perforation and primary closure, exteriorization of the perforated ileal segment or resection of the involved ileum often involving the cecum and creation of ostomy. Resected specimens were opened at operation for inspection. Histopathologic reports were consistent with typhoid perforation. Retrospective analysis of physiologic condition was done to determine staging and relation to subsequent mortality and complication.

Results

In many low resources settings blood cultures; serum titers, pathology confirmation, and even bacteriology may be unavailable apart from externally funded research studies. Authors have documented the difficulty of accuracy of diagnosis—failing to culture salmonella from peritoneal swabs and finding ulcer edge biopsy diagnostic in only one third of cases [5]. Generally clinicians must rely on their accumulated experience to identify typhoid cases (Tables 1 and 2). This series of patients presumed typhoid fever as etiology of perforated ileum when there was no history of trauma or foreign body and the history was consistent with an inflammatory process.

There is good evidence to substantiate the common approach to peritonitis consisting of laparotomy, debridement of the perforation and primary repair [6,7]. There is consensus about the need for general supportive care including iv fluids, antibiotics, and respiratory care as needed. A small series has advised ileostomy through the site of

perforation [8]. Another small series suggests that simple closure is superior to resection [9]. Another study documented good success with simple closure or resection for multiple perforation with primary anastomosis, ostomy being reserved for the most severely sick or moribund patient [10]. Another series advocated postop irrigation to reduce hospitalization and complications of recurrent abscess [11]. Another series had suggested resection, usually with primary anastomosis [12]. The comparison between resection and simple closure has been hampered by failure to clearly document whether the physiologic condition of the patients is similar and hence there is need for further studies which categorize the patients better according to some prognostic scoring system.

Many reports attest to the efficacy of chloramphenicol, ceftriaxone, and ciprofloxacin [13]. A good comparative review suggests fluoroquinolones are preferred antibiotics [14]. Some studies have suggested an important difference in the most severely ill patients according to the time of antibiotic delivery [15]. But clinicians need to be aware of the development of resistance to antibiotics which has been observed since the 1990s [16]. Antibiotic susceptibility testing is encouraged [17]. Other studies have made us aware of co-infection with HIV and the problem of bacteremic patients suffering from non-typhoid antibiotic resistant salmonella [18].

Unfortunately most reports include the observations of many complications including leakage from the closure, new perforation,

significant GI bleeding, recurrent abscess, fistula formation, and multisystem organ failure [19]. Complications of typhoid infection have included severe GI hemorrhage. Sometimes this may resolve or abate under general antibiotic therapy. It may require operative intervention [20]. Several studies suggest a mortality rate of about 8%, half of the deaths caused by ongoing sepsis [21]. In some studies, the mortality was much higher especially when there were multiple perforations [22]. Other complications include jaundice with variable signs of hepatitis [23,24] and cholecystitis with perforation of the gall bladder [25].

Initial Operative Therapy	No. Cases	Jabalpur Score	Reoperation for Bleeding/Secondary Perforation	Death within 30 days
		(mean scores)		
Debridement, closure	15	3	3	2
Exteriorized ileum perforation	7	3	2	0
Resection terminal ileum; ostomy	16	>7	0	4

Table 1: Initial perforation and complication rate.

	Number Cases	Additional ulcerations (mean number lesions)	Cecal ulceration (presence)
Ileum resection	4	5	---
Ileum resection with cecum	12	10	7

Table 2: Intra-operative inspection resected specimen.

Discussion

Our own observations at operation have demonstrated two previously undiscussed issues-multiple ulcerations throughout the distal ileum and ulcerations in the cecum. While there may be only 1-2 perforations evident from the outside of the bowel wall, a resected ileal-cecal specimen often has shown 5-15 deep ulcerations when opened and carefully inspected. Somewhat surprisingly, cecal ulceration has been very common although rarely commented on in the literature. It has been postulated that these additional deep ulcerations may be responsible for ongoing systemic inflammatory response and the reason for ongoing sepsis when the more obvious 1 or 2 perforations are primarily closed. The rationale for this would be ongoing systemic inflammatory response due to translocation of bacteria in the areas of mucosal ulceration. We found that some of the severely sick patients who had Jabalpur scores in a range previously associated with non-survivors were able to be salvaged by resection of ileum with or without cecal resection. In retrospect we think there was more rapid resolution of general sense of illness, with fewer complications, with less multisystem organ failure. Further clarification of the rate of normalization of systemic inflammatory response scores awaits additional research.

The Jabalpur score system provides for a rather easy categorization of patient physiologic condition and yet may be still only a partial assessment. Some of the very sick patients also exhibited changes in

hematologic parameters, liver enzyme and bilirubin levels, renal function parameter levels despite adequate fluid resuscitation, and neurologic changes. Those abnormalities were noted but were not the initial focus of the observations in this study. They need to be considered in future research.

Conclusion

An observational study of patients treated for typhoid ileum perforation demonstrated a better than expected survival when severely ill patients were treated by resection therapy with ostomy formation. Two unsuspected features were observed in operative resected specimens, namely multiple deep perforations throughout the ileum and ulcerations in the cecum. An apparent more rapid resolution of systemic inflammation scores was noted although this requires additional study since it was not part of the design of the initial observations. It will be the subject of additional investigation. The observations also corroborate the understanding that improved documentation of physiologic staging may be needed to more accurately discriminate the benefits of different operative strategies. The Jabalpur score is helpful but in the case of typhoid perforations may need to be further expanded to include additional factors such as hematologic changes, hepatic function/injury, renal function, and neurologic assessment.

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