

Typhoid perforation of the gut

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Summary

One-hundred consecutive patients with typhoid perforation of the gut admitted in the same surgical unit of the University Hospital have been studied. The cases were diagnosed on the basis of history, clinical examination, exploratory findings, histopathological examination, Widal test and blood culture. Forty-six patients had perforation in the second week of fever. Sixty-one patients presented 48-96 hr after perforation. All the patients were subjected to surgery, 16 under local anaesthesia. Mortality rate increased from 25% to 83% as the duration between perforation and operation increased.

KEY WORDS: metronidazole, peritonitis, laparotomy.

Introduction

The most dreaded complication of typhoid fever is intestinal perforation. Our University Hospital situated in the eastern part of India drains a large rural population. An uncomplicated case of typhoid fever is cared for at the primary health services level but once surgical complications occur, the patient is referred to the hospital because of ensuing high morbidity and mortality. The patients often present in a late stage of the disease.

Material and methods

In a prospective study from January 1978 to December 1982, 204 cases of gastrointestinal perforation were admitted to the same general surgical unit. One-hundred and eight cases were of typhoid aetiology but eight cases are not included in this study as the patients succumbed immediately after admission without any specific treatment. The other perforations were: duodenal ulcers (58) appendix (9), amoebiasis (8), trauma (6), tuberculosis of the small bowel (4), worm infestation of the small bowel (3), gastric ulcer (2), carcinoma of the colon (3), gangrenous intestine (2) and gastric cancer perforation (1). The following account deals with 100 patients with intestinal perforation due to typhoid fever.

Results

The peak incidence for age was in the third decade (44) followed by the second decade (22). The youngest patient was 4 years old and oldest 56. The male to female ratio was 11.5:1. The peak incidence (34) was in the summer rainy season, i.e. in July and August. Seventy-four patients presented between May and September (summer season) and 26 between October and April (winter season).

Acute or subacute abdominal pain with abdominal distension and constipation was taken as the approximate time of perforation. Forty percent of perforations occurred between 11 to 15 days of fever. A history of steroid intake before hospital admission was present in 36 patients. Thirty-eight patients had either enemas, suppositories or laxatives for bowel movement. Examination revealed features of toxæmia in 33 patients. Liver dullness was masked in only 10 and free gas under the diaphragm in plain skiagram of the abdomen carried out in all cases was seen in 34 patients only. Seventy-four patients had polymorphonuclear leucocytosis. Widal test was positive in 58 patients (*S. typhi* 'O' titre more than 1/80 or there was serial rising titre). Blood culture revealed *Salmonella typhi* in 34 cases. Both blood culture and Widal test were positive in 18 cases. In the remainder the diagnosis was made on the clinical and operative findings with histology in eight cases.

After pre-operative resuscitation* all the patients were operated on, 84 under general anaesthesia and 16 under local anaesthesia because of poor general condition. Eighty-one patients had a single perforation of the ileum while in 12 cases there were multiple perforations of the ileum. Seven patients had the sealed perforation. In 83 patients, the perforation was closed in two layers with an omental patch; seven patients in association with closure had intestinal bypass. Three patients had resection of the bowel while, in seven, only peritoneal lavage was done. In

*The antibiotics used in 1978 and 1979 were gentamicin or chloramphenicol alone or with ampicillin. In 1980-2, intravenous metronidazole was added.

all cases, saline lavage was done intraoperatively. Histopathological examination was carried out on the three resected specimens and the edge of perforation in nine cases which showed evidence of mononuclear infiltration and non-specific inflammation.

Postoperative complications encountered were wound infection in 74 patients, septicaemia in 44, gaped wound in 42, paralytic ileus in 22, respiratory complications in 18, burst abdomen in 10, bed sores in eight, subphrenic abscess in five, faecal fistula in four and intestinal obstruction in two patients. Eight patients had to be re-explored for suspicion of re-perforation, abscess formation and intestinal obstruction of which four died. In all, 47 of the 100 patients died. Mortality in relation to duration of perforation is shown in Table 1. In initial years when metronidazole intravenous solution was not available, mortality was 65% but with the use of metronidazole intravenous solution both pre- and post-operatively, the mortality fell to 35%.

TABLE 1. Mortality in relation to duration of perforation before surgery

Less than 24 hr	2/8 (25%)
24-48 hr	8/20 (40%)
48-72 hr	18/41 (44%)
72-96 hr	12/20 (60%)
96 hr-10 days	5/6 (83%)
More than 10 days	2/5 (40%)

Discussion

Osler (1935) found an incidence of 3.1% of typhoid perforation in 34,916 cases. History of a remittent type of fever, and headache for a few days followed by abdominal pain and features of peritonitis are suggestive of typhoid perforation. Steroid therapy, very commonly prescribed by private practitioners to bring down the temperature, is a common drug abuse and was found in 36 cases. Further to prescribe enemas or laxatives for bowel movement may be dangerous as 38 patients complained of severe pain in the abdomen following it.

Many textbooks stress that typhoid perforation usually occurs in the third week of fever while many reports find that it occurs in the first week (Olurin, Ajavi and Bohrer, 1972). In our experience the maximum incidence of typhoid perforation was in the second week from 11-15 days in confirmation of the report of Bhansali (1967). The leucocytosis we encountered in contrast to other series (Bhansali, 1967; Karmarkar, Triwedi and Bhalerao, 1972; Chouhan and Pande, 1982) is probably because of late presentation leading to bacterial contamination and septicaemia.

Plain skiagram of the abdomen in the erect posture revealed free gas under the diaphragm in only 34 cases in contrast to other series, such as Bhansali (1967) who found it in 20 out of 29 cases. The reason for a small incidence of pneumoperitoneum may be the presentation a week after perforation allowing re-absorption of gas from peritoneal cavity. The ultimate diagnosis of typhoid perforation depends upon culture of *Salmonella typhi* in free peritoneal fluid and histopathological examination (Olurin *et al.*, 1972). In the absence of culture and histology, diagnosis depends on history of fever followed by abdominal pain and features of peritonitis and on exploration, perforation at the anti-mesenteric border of the terminal ileum within two feet of the ileocaecal region along with inflamed swollen Peyer's patches and usually the rest of the bowel looks normal.

The treatment of typhoid perforation has always remained a challenging topic. Huckstep (1960) advocated conservative treatment with chloramphenicol and the Oschner-Sherren regimen. Huckstep (1962) managed 15 cases by the same regimen and found an only 27% mortality. He advised surgical intervention in two situations only: sudden perforation occurring in a convalescent patient observed within 6 hr of perforation as these are better surgical risk cases, and perforation leading to complications such as abscess and adhesions causing obstruction.

In contrast, Franklin (1963) favours a surgical approach as closure of perforation eliminates continuous contamination and peritoneal toilet gradually lessens toxæmia enhancing the recovery of the patient. Modern antibiotics, modern anaesthesia, better blood transfusion facilities and better surgical techniques have swung the pendulum in favour of surgical intervention rather than conservative therapy. In the series of Olurin *et al.* (1972), the mortality was 79% in conservative treatment and 31% in operated cases.

As patients with typhoid perforation are poor surgical risk cases, a simple closure in two layers with an omental patch is the quickest and best technique (Dickson and Cole, 1964). Resection of the bowel should be withheld (Mulligan, 1972) unless the bowel is so oedematous that sutures cut through or if there are multiple perforations. Closure of perforation and intestinal bypass is an alternative technique in cases of multiple perforations and caecal perforations.

The complication rate is never as high in other intestinal perforations as in typhoid perforations (Bhansali, 1967). The mortality increases as the perforation operation interval increases. Archampong (1969) found a mortality rate of 13.3% if operation was performed within 24 hr of perforation; increasing to 76% if operation was delayed for more

than 5 days. In our patients, we also had a similar trend except in patients who had perforation for more than 10 days, as then the patient had already passed the critical period and was not septicaemic because of the massive use of antibiotics. Metronidazole has revolutionized the outcome of typhoid perforation in our patients. Patients without the use of metronidazole had a mortality of 65% decreasing to 35% with use of metronidazole albeit a not statistically significant difference.

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