

Evaluation of 30 Cases of Gastrointestinal Perforations in Reference to Etiological Factors, Outcome of Early Surgical Intervention and Mortality and Morbidity

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Research Article

Abstract: Gastrointestinal perforation is an acute emergency requiring urgent surgical intervention. It is seen that with good resuscitation, early and energetic surgical intervention, thorough peritoneal toileting with normal saline, blood transfusion, maintenance of fluid and electrolytes balance, improved anesthesia, combination antibiotics are the factors which reduce the morbidity and mortality of gastro intestinal perforations. The main aim is to study the etiological pattern of gastrointestinal perforation, to assess the outcome of early surgical intervention and to evaluate morbidity and mortality in 30 cases of gastrointestinal perforation.

Keywords: Etiological Factors, Gastrointestinal Perforations.

Introduction

Gastro-intestinal perforations, a common occurrence, require emergency surgical intervention. The diagnosis of gastro-intestinal perforations is not difficult to make, however their treatment remains a formidable problem. Poor general health of the patients, shock, hypotension, old age, concurrent illness such as hypertension, tuberculosis, COPD, diabetes mellitus at the time of admission, delay in surgical intervention, site and size of the perforation and the extent of peritoneal contamination are the important factors, contributing to a significant increase in morbidity and mortality in patients of gastro-intestinal perforations. Many of these patients are under the care of quacks in the initial part of their illness, which varies from a few hours to many days. It is not uncommon to see these patients reporting in hospitals with all the features of generalised peritonitis with endotoxic shock. Peritonitis following perforation of the intestine is a common abdominal emergency(1). The important causes of perforation in our country are peptic ulcer, typhoid, appendicular, tuberculosis and amoebiasis (Nair *et al*, 1981)(2). Dickson *et al* (1964)(3) added trauma and malignancy are the commonest cause of gastrointestinal perforations. Peptic ulcer perforation as the commonest cause of gastro-intestinal perforations followed by non-traumatic ileal perforation, appendicular

perforation and penetrating trauma. Other rare causes of gastro – intestinal perforation like diverticulitis, round worm infestations, stercoral ulcer, Crohn's disease, faulty instrumentation, radiation therapy, perforation in hernial sac, spontaneous perforation of the intestine and non-specific gastro-intestinal perforations are also reported. Complications of perforative peritonitis are many such as Toxaemia, wound infection, partial wound dehiscence, burst abdomen, chest complications like severe respiratory infections, synergistic post operative bacterial gangrene of the anterior abdominal wall, faecal fistula, residual abscesses, post operative adhesive intestinal obstruction, gastric haemorrhage from the stress ulcers, prolonged gastric suction leading to marked electrolyte imbalance. The delayed complications are incisional hernia, keloid formation and stitch abscess etc. The most frequent postoperative complication of Typhoid ileal perforation is wound infection and the severe is Faecal fistula, which is a catastrophe and it significantly increases risk of death, and at the least, it requires reoperation. The study of various series reported from different parts of the world from 1963 to 1997 reveals that mortality ranges from 10% to 56%. Mortality rate was higher in patients who attended the hospital late(1). Mortality was directly related to perforation operation interval and the underlying cause of perforation (Nair *et al*, 1981)(2). There is high mortality in order people due to late presentation. Mortality can be reduced by early diagnosis, good conservative treatment and early proper definite surgery.

Aims and Objectives

1. To study the etiological patterns of gastro-intestinal perforations.
2. To assess the outcome of early surgical intervention of gastro intestinal perforations.
3. To evaluate mortality and morbidity.

Material and Methods

The Present study was conducted in department of surgery in NIMS Medical College and Hospital, Jaipur. The study included 30 patients with suspected diagnosis of Gastro intestinal perforations admitted in surgical wards of hospital.

The present study was carried out:-

- To study the etiological patterns of gastro intestinal perforations.
- To assess the outcome of early surgical intervention of gastro intestinal perforation.
- To evaluate mortality and morbidity in gastro-intestinal perforation and its comparison with literature.

Methods of Study

From the record files of the patients of gastro intestinal perforations the following plan of study was carried out and the following records were made:

1. Complete Clinical History: In each case, from clinical history salient features were recorded especially with reference to pain abdomen, vomiting, fever, constipation and any history of trauma or road side accident. Personal history in reference to intake of alcohol smoking, drug intake (NSAID), Steroids and eating habits, if taken were recorded. An effort was made to determine the cause and probable time of perforation.
2. Complete Physical Examination: In physical examination, special note was taken of general condition of patient, degree of dehydration, vital signs and peritoneal status viz tenderness, guarding and rigidity, abdominal distension, presence or absence of

bowel sounds, presence of free fluid in the peritoneum.

3. Investigation: From the record files, routine investigations like Hemoglobin, Bleeding Time, Clotting Time, TLC, DLC, Complete urine examination were noted down, Biochemical investigations like blood urea, serum electrolytes, S. Bilirubin were noted as per record from the files. X ray erect view abdomen and X ray chest findings were also noted down. Ultrasound abdomen If available in the record files was noted for consideration.

Management

Recording of Management were basically divided into 3 parts

- 1)Pre-operative- Resuscitative measures out to correct fluid and electrolyte loss, control of sepsis, number of blood transfusions if given in anemic patients and those in shock, presence of fever, type of antibiotics given were recorded from the files.
- 2)Operative: From the operative notes, details of surgical procedure like type of incision made, the site, size and number of the perforations, pathological condition of the gut, procedure done, weather closure done in single layer or double layer or double layer, type of suture material used was noted if they were available in record. Biopsy report if available was noted down for consideration.
- 3)Post operative: Various post operative complications like- fever, superficial wound infection, wound dehiscence, faecal fistula, etc., mortality and cause of deaths were recorded and compared with those in literature.

Observation and Discussion

Table 1: Etiology

Etiology	Sex	Age (years)							Total	% incidence
		0-10	11-20	21-30	31-40	41-50	51-60	61-70		
Typhoid	M-12 F-1	0	2	7	0	3	1	0	13	43.13
Peptic Ulcer	M-10 F-0	0	1	3	2	2	2	0	10	33.13
Blunt Trauma	M-4 F-0	0	1	1	1	1	0	0	4	13.33
Appendicular	M-1 F-1	0	0	0	1	0	1	0	2	6.67
Tubercular	M-0 F-1	0	1	0	0	0	0	0	1	3.33
Total		1	6	11	3	6	3		30	

In the present study the maximum number of patients were in 2nd and 3rd decades of life. Singh and Singh (1975)(4), Nair (1981)(2), Vaidyanathan (1986)(5) and Baid and Jain(1) showed maximum incidence in 2nd

and 3rd decades. The youngest in this series was a male of 18 years of age. Keusch also observed that typhoid ileal perforations was less common under 5 years of age. In this study no case was less than 5 years as in Table 1.

Table 2: Site and Number of Perforations

Number	Single	two	>two	Total
Site	No. of cases	No. of cases	No. of cases	
Stomach (pre pyloric)	1	-	-	1
Duodenum (1 st part)	9	-	-	9

Jejunum	1	-	-	1
Ileum	14	1	1	16
Appendicular	2	-	-	2
Asc colon	1	-	-	1
Total	28	1	1	30

In the present study perforation was single in 92.30% cases and 2 perforations in only one case. However Purohit and Singh and Singh (1975)(4) reported single perforation in all the cases. Vaidyanathan (1986)(5) reported single perforation in 93.3% cases. Dandapat (1991)(6) reported single perforation in 72.7% cases. Mock (1992) reported single perforation in 78.5% cases. In our series mortality was nil in patients of enteric perforation. In the present study about 92.30% cases the perforation was present within 6” of ileocaecal region in the terminal ileum and in 7.7% cases within 12” of

ileocaecal region. Shah (1967)(7) reported that perforation was within 6” of ileocaecal region in 77% cases and within 12” of ileocaecal valve in only 8% cases, Singh and Singh (1975)(4) and an (1986) reported that all the perforations were within last 12” of the terminal ileum. Dandapat (1991)(6) reported that all the perforations were within 18 inches of the ileocaecal value except one which was 3 ft above the value. This is because of involvement of Payer’s patches in ileum, which become hyperemic and hyperplastic and later on necrose, ulcerate and are sloughed.

Table 3: Operative Procedures in Different Aetiologies

Aetiology	Operative procedures	No. of cases	No. of deaths
Typhoid perforations	a)Primary closure of perforation in 2 layers and drainage	7	
	b) Resection and end to end anastomosis	1	-
	c) primary closure and ileostomy	5	
Peptic ulcer perforation	Closure of perforation in single layer with omental patch	10	-
Blunt trauma abdomen	Closure of perforation in 2 layers	3	1
	Resection and ileostomy	1	
Appendicular	Appendicectomy	2	-
Tubercular perforation	Primary closure	1	-

In all the cases primary closure of perforation was done after taking a piece from perforation for histopathology. Primary closure was done in all cases except in 1 case where resection and anastomosis was done because of poor condition of ileum and iliostomy was done in 5 cases. Peritoneal cavity was drained in all the cases.

Apart from the simple closure following alternative operations are available to a surgeon:

1. Simple closure with ileo-transverse anastomosis
2. Deliberated ileal fistula formation
3. Resection of most affected part with end to end anastomosis or ileoransverse anastomosis
4. Wedge excision of affected segment

5. Simple closure after excision of the sero muscular layer surrounding the perforation

6. Closure of the perforation with omental graft

The reason for adopting alternative procedure is that the surgeons are still striving hard to reduce further the mortality of enteric perforations. In 1972 Mulligan wrote “At operation it seems rational in future to do more than merely repair the perforation,” The main argument in favour of larger magnitude of surgery stems from the possibility of post operative leakage from the sutured site after simple closure or reperforation. Such a mishap is supposed to be due to friable ileal wall and hence the cause for resection of the affected segment, itself. In this study 1 patient developed post operative leakage or fistula.

Table 4: Perforation Operation Interval

Perforation operation interval (hours)	No. of cases	% of total
<24	26	86.6
49-72	3	10
73-96	-	-
>120	1	3.33
Total	30	

In the present study motility rate was nil due to early required surgical intervention done within 24 hours of admission. So lesser the perforation – operation interval better are chances of survival. This concept I was

also observed by other workers viz {(Nair, 1981(2); Swadia, 1979(8); Singh, 1975(4); Vaidyanathan,1986(5)}. Other authors like Swadia (1979)(8) reported that the incidence of leakage was quite

low and, (the possibility of reperforations seems remote. That apart there is no surety against leakage from the suture line of the anastomosis performed after resection of the part of diseased ileum having multiple typhoid ulcers. In fact, Parsad *et al* (1975)(9) reported that in their series of 15 cases treated by simple closure with ileo-transverse anastomosis, 2 had leakage from the anastomotic line and not from the closed perforation, as is usually claimed. It appears that the dangers of reperforation after simple closure have been unduly exaggerated. It is important to use non-absorbable a traumatic suture for closure of perforation because catgut often gets loosened and broken inside the inflamed peritoneal cavity (Parsad, 1975)(9). Careful and gentle handling of the inflamed intestines further reduced the operative trauma and ensured a leak proof closure (Vaidyanathan, 1986)(5). In an average adult, peritoneal membrane has a surface area of 22,000 square cms. It is certainly true that peritoneal fluid contains a large number of mononuclear cells providing an excellent barrier against ineffective process. But once a large amount of intestinal contents start pouring out into the peritoneal cavity, the defences of the peritoneum crumble against the onslaught of toxic material. Now the peritoneum, with a rich network of lymphatics and capillaries lying

beneath, provides a vast avenue for absorption of toxins. This aggravates the systemic toxemia of typhoid perforation. There is early return of peristaltic sounds if the perforation operation interval is less.

Table 5: Duration of Naso Gastric Aspiration (days)

Naso gastric aspiration (days)	No. of cases
1	0
2	0
3	0
4	6
5	16
6	6
7	2
8	0
9	0
10	0
Total	30

In the present study naso-gastric aspiration was carried out in all the patients post operatively. The time of removal of Ryle’s tube depended upon two factors i.e. return of peristalsis and passage of flatus. Naso-gastric was continued for 4 days in 6 patients, for 5 days in 16 patients, for 6 days in 6 patients, for 7 days in 2 patients, this is shown in table 5.

Table 6: Post Operative Complications

Aetiology Complications	typhoid	Peptic ulcer	Blunt trauma	Appendicitis	TB	total	%age
Supf. Wound infection	5	1	1	0	0	7	23.33
Wound dehiscence	2	1	1	0	1	5	16.6
Fever	11	3	0	0	1	15	50.0
Faecal fistula	1	0	0	0	1	2	6.66
Re-operation	1	0	0	0	0	1	3.33
Cardiac failure	0	0	1	0	0	1	3.33
Death	0	1	1	0	0	2	6.66

In the present study out of 30 cases of gastro-intestinal perforations, post-operative complications occurred in 17 cases (56.6%), fever was the most common complication occurring in 15 patients (50%). Superficial wound infection was seen in 7 no.of cases, wound dehiscence occurred in 5 patients (16.6%). Post operative Faecal fistula (2), Re-operation in 1 case and Cardiac failure in 1 case.

The major cause of death in early post operative period was toxemia and late morbidity was from wound complications. Vaidyanathan (1986)(5) reported two types of morbidity and mortality.

- A. Death in the early post operative period from toxemia and septic shock.
- B. Late morbidity and mortality from wound complications and focal suppuration.

Kachroo (1984) reported that factors responsible for reduction in mortality and morbidity are better

understanding pathology for reduction in mortality are better understanding pathology and fluid and electrolyte balance, advances in anesthesia and in antibiotic therapy. Swadia (1979)(8) reported two important factors which help to achieve lower mortality rate i.e. early diagnosis and avoiding indiscriminate use of corticosteroids. Parsad (1975)(9) reported the cause of high mortality as reperforation, toxemia and server peritonitis and post operative chest complications. Shah (1967)(7) reported that toxemia, interval between perforation and operation, proper supportive measures, use of chloramphenicol in preperforation stage are the factors which determine the mortality. Dickson and Cole (1964)(3) reported toxemia as the major cause of death followed by reperforation, subphrenic abscess, burst abdomen and cardiac arrest at operation.

Table 7: Hospital Stay of Patients Who Survived

Hospital stay (days)	No. of cases	%age
7-14	16	57.14
15-21	6	21.42
22-28	4	14.28
29-35	1	3.57
36-42	1	3.57
Total	28	100

The average hospital stay of the patients who survived are between 7-14 days in 16 cases, between 15-21 days in 6 cases, between 22-28 days in 4 cases and between 29-35 days in 1 case, between 36-42 days in 1 case. Maximum hospital stay was 39 days and minimum 7 days his shown in Table 25. The cause of death was aggravated toxemia in 1 case and cardiac failure in the other.

Results

Prospective study of 30 cases of gastro intestinal perforations admitted in the surgery department NIMS Medical College and Hospital Jaipur was done. Enteric perforations were found the commonest cause of gastro intestinal perforations, which accounted for 43.13% of total. This was followed by Peptic ulcer perforations (33.33%), traumatic perforation (13.33%) appendicular perforation (6.67) and tubercular perforation accounted for (3.33%). Typhoid fever is a major disease in our country, which have not yet attained high public health standards. Perforation usually take place in 2nd – 3rd week of the illness with gradual history of prolonged and continuous fever followed by severe pain in abdomen, were the most important features in diagnosis. Widal test was positive in 100% cases of typhoid perforation but free air under the right dome of diaphragm was present in 84.61% of cases of typhoid perforations. Surgery was the standard treatment for typhoid perforation. Typical operative findings i.e. single, oval perforation on the antimesenteric border in the terminal ileum gave further clue to the diagnosis. The basic concept was the simultaneous dual attack on the typhoid pathology with third generation cephalosporins. Laparotomy with simple closure of the perforation in two layers was the surgical procedure of choice in typhoid perforations. The mortality rate in typhoid perforations was nil and fever was the common post operative complications. Morbidity and mortality increased with the increase in perforation operation interval. Early exploration, blood transfusions, maintenance of fluids and electrolytes and combination Antibiotics decreased the mortality. A high mortality from typhoid toxemia appeared to be inevitable and this disease can only be realistically tackled by public health measures. Tubercular perforation was suspected in those cases where there was previous history of subacute attacks of intestinal obstruction and coexistent chest

lesion. Surgery was the treatment of choice. Suturing of perforation should be supplement by entero anastomosis to bypass a manifest or impending obstruction. Simple closure of the peptic ulcer perforation with omental patch was the surgical treatment opted in this study. Definite surgery like pyloroplasty and truncal vagotomy should be performed by only a surgeon experienced in this field. Mortality and morbidity was decreased with early surgical intervention. History of trauma and clinical findings were important in making the diagnosis in the absence of pneumoperitoneum in blunt injury cases. A high index of suspicion is must for early diagnosis to reduce morbidity and mortality associated with such injuries. Appendicular perforation of the small intestine was seen in 6.66% cases. Metronidazole was given to all the patients to combat anaerobic infection. Biopsy from the, edge of the perforation was studied histopathologically. There was characteristic mononuclear cell infiltration along with macrophages in all cases of enteric perforations. Aggregation of epitheloid cells with multinucleate giant cells confirm the pathology of tubercular perforations. The overall mortality was 6.66% in this study and complications were wound infection, pyrexia, partial wound dehiscence, burst abdomen, and cardiac failure.

Conclusion

From this study it is concluded that good resuscitation, early and energetic surgical intervention, thorough peritoneal toileting with normal saline, blood transfusion, maintenance of fluid and electrolytes balance, improved anaesthesia, combination antibiotics, including metronidazole are the factors which reduce the morbidity and mortality of gastro intestinal perforations.

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