Gastrointestinal Perforations - Our Experience
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Citation

Abstract

Background and Objectives: Perforative peritonitis is one of the most common surgical emergencies in India. Gastrointestinal perforations include gastro-duodenal, small bowel, appendicular and colorectal perforations.
To study the incidence of various types of gastrointestinal perforations and complications associated with it.
To study the management of patients with postoperative leaks in our setup.

Methodology: Retrospective study analyzing the case files of all the operated cases of gastrointestinal perforations over the last 9 years from September 2001 to August 2010 by open procedure. A total number of 369 cases was studied.
All cases with perforative peritonitis, whether spontaneous, infective, traumatic or of neoplastic pathology, were included in the study.

Results: Gastrointestinal perforations were common at the age of 30-50 years; 82% were males. From July to October (rainy seasons) every year a higher number of perforations was noticed; 40% of patients had duodenal, 34% had ileal, 11% appendicular, 6% gastric, 6% jejunal and 3% had colonic perforations. Abdominal pain (100%) and vomiting (81%) were the most common symptoms while tachycardia (50%) and tachypnea (42%) were common signs; 15-20% presented late with features of shock.
Simple closure of perforation was done in the majority (66%) of patients and showed good results; 79 patients had a postoperative leak in our study period. The majority of these patients had small-bowel perforation due to infective pathology. Conservative management of them had better outcome and low mortality.
Wound infection (30%) was the major postoperative complication followed by pneumonia (21%) and anastomotic leak (21%). Risk factors were elderly patients, late presentation, poor general condition (shock) and other co-morbid conditions. Postoperative complications were more frequent in patients with one or more risk factors. Mortality rate was 13.8%, the most common cause being septicemic shock.
Mortality depends on the general condition of the patient, condition of the bowel, degree of peritoneal contamination and associated pre-operative co-morbid risk factors.

Conclusion: Gastrointestinal perforations are one of the most common surgical emergencies. Duodenal perforations are most common. Ileal perforations secondary to enteric fever (typhoid) have highest morbidity and mortality. Most of the anastomotic leaks can be treated conservatively. Mortality depends on the general condition of the patient and associated pre-operative co-morbidities.

INTRODUCTION

This study was done as a retrospective analysis of past data of the most common surgical emergency, that of gastrointestinal (GI) perforation in a tertiary care hospital in Bangalore, India. GI perforation is a complete penetration of the wall of the stomach, small intestine or large bowel, resulting in intestinal contents flowing into the abdominal cavity. Perforation of the intestines results in the potential for bacterial contamination of the abdominal cavity (a condition known as peritonitis). GI perforations include gastro-duodenal, small-bowel, appendicular and colorectal perforations. Our study aims at a glance of the causes of perforation in a city of southern India – Bangalore.

AIMS AND OBJECTIVES

1) To study the incidence of various gastrointestinal perforations in Surgical 1st Unit, Bowring & LadyCurzon Hospital. Bangalore, Karnataka, India.
2) To study the rates of various complications of gastrointestinal perforations.

MATERIALS & METHODS

Retrospective study analyzing the case files of all the operated cases of gastrointestinal perforations over the last 9 years in surgical unit I from September 2001 to August 2010 by open procedure. A total number of 369 cases was studied.

INCLUSION CRITERIA

All patients following a clinical diagnosis of perforation peritonitis and adequate resuscitation underwent exploratory laparotomy in emergency setting. The pathology was sought for and treated with closure, resection with anastomosis or stoma formation. On table, thorough lavage was given and closure of the abdominal cavity done. Follow-up of these patients for morbidity and mortality was done.

RESULTS

GI perforations were common in the age group of 30-50 years; with more than 84% being < 50 years of age; 82% were males. Co-morbidities were mainly in the form of respiratory disease (10%) followed by hypertension and diabetes mellitus (7% each) (Table 1).

Figure 1

Table 1: Pre operative data of patients

<table>
<thead>
<tr>
<th>Age [Years]</th>
<th>No of cases (n = 369) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50 years</td>
<td>310 (84)</td>
</tr>
<tr>
<td>&gt;50 years</td>
<td>59 (16)</td>
</tr>
</tbody>
</table>

Sex

| Male     | 302 (82) |
| Female   | 67 (18)  |

Pre-existing co-morbid conditions

| Respiratory disease | 27 (10) |
| Cardiac disease    | 11 (3)  |
| Renal disease      | 19 (5)  |
| Malignancy         | 15 (4)  |
| Hypertension       | 26 (7)  |
| Diabetes mellitus  | 27 (7)  |

Seasonal variation was noted; every year a higher number of perforations was noticed in July to October (rainy seasons) (Chart 1).

Abdominal pain (100%) and vomiting (81%) were the most common symptoms while tachycardia (50%) and tachypnea (42%) were common signs; 15-20% presented late with features of shock. (Table 2)

Figure 3

Table 2: Signs and symptoms on presentation

<table>
<thead>
<tr>
<th>Signs and symptoms</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>369 (100)</td>
</tr>
<tr>
<td>Vomiting</td>
<td>298 (81)</td>
</tr>
<tr>
<td>Abdominal Distension</td>
<td>269 (75)</td>
</tr>
<tr>
<td>Fever</td>
<td>188 (51)</td>
</tr>
<tr>
<td>Constipation</td>
<td>173 (47)</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>48 (13)</td>
</tr>
<tr>
<td>Tachycardia (pulse &gt;100/minute)</td>
<td>155 (42)</td>
</tr>
<tr>
<td>Tachypnea (RR&gt;20/minute)</td>
<td>191 (52)</td>
</tr>
<tr>
<td>Hypotension (systolic BP&lt;100 mmHg)</td>
<td>55 (15)</td>
</tr>
<tr>
<td>Urine output (&lt;30 ml/h)</td>
<td>68 (19)</td>
</tr>
</tbody>
</table>

Seventy-five per cent of the patients had pneumoperitoneum and 36% had air-fluid levels on X-rays; 3% of them had serum creatinine of >1.7 and 45% had dyselectrolytemia. (Table 3)

Figure 4

Table 3: Preoperative Data

<table>
<thead>
<tr>
<th>Investigations</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumoperitoneum on chest X-ray</td>
<td>277 (75)</td>
</tr>
<tr>
<td>Air-fluid levels on abdomen X-ray</td>
<td>126 (36)</td>
</tr>
<tr>
<td>Hypotension (Na&lt;130 mEq/L)</td>
<td>107 (29)</td>
</tr>
<tr>
<td>Hypokalemia (K&lt;2.5 mEq/L)</td>
<td>59 (16)</td>
</tr>
<tr>
<td>Blood Urea &gt;45 mg/dl</td>
<td>80 (22)</td>
</tr>
<tr>
<td>Serum Creatinine &gt;1.5 mg/dl</td>
<td>48 (13)</td>
</tr>
</tbody>
</table>

On laparotomy, gastroduodenal perforations accounted for 46%, of which 41% were due to acid peptic disease; 39% of perforations were in the small bowel, of which 34% were in the ileum due to typhoid; 11% were appendicular and 4%
were colonic, of which 3% were traumatic. In the order of frequency, 40% of patients had duodenal, 34% had ileal, 11% appendicular, 6% gastric, 5% jejunal and 4% had colonic perforations. Appendicular perforations were common in patients presenting late.

Colonic perforations were uncommon but associated with high mortality. The number of traumatic perforations has increased in the last few years, probably due to increased incidence of RTA’s. (Table 4)

**Figure 5**
Table 4: Operative data

Preoperative Data: The total number of cases was 369, of which 310 less than 50 years of age, and there was a male preponderance (302 cases).

**ROUTINE PREPERATIVE INVESTIGATIONS**

**ROUTINE INVESTIGATIONS**

Complete blood count with ESR, platelet count, RFT, LFT, RBS, serum electrolytes.

**RADIOLOGICAL INVESTIGATION**

Erect X-ray of the abdomen, chest X-ray, abdominal ultrasonography, CECT of the abdomen.

Peritoneal Fluid Aspiration (with or without USG guidance).

**OPERATIVE DATA**

The cases operated underwent simple closure in 66% (244), resection with anastomosis in 11% (45), gastrectomies 2% (7) in cases of gastric malignancies, resection with diversion procedures in 9% (33), right hemicolectomy in 1% (4) and appendicectomy in 11% (40). Simple closure of perforation showed good results. (Table 5)

**Figure 6**
Table 5: Operative data

**POSTOPERATIVE COMPLICATIONS**

Wound infection (30%) was the major post-operative complication followed by pneumonia (21%) and anastomotic leak (21%). (Table 6)

**Figure 7**
Table 6: Postoperative Complications

The majority of the patients with leaks had small-bowel perforation due to infective pathology. (Table 7) Conservative management in these patients had better outcome and low mortality. (Table 8)

Risk factors were: elderly patients, late presentation, poor general condition (shock) and other co-morbid conditions. Post-operative complications were more frequent in patients with one or more risk factors.

Mortality rate was 13.8%, the most common cause being septicemic shock.

Mortality depends on the general condition of the patient, condition of the bowel, degree of peritoneal contamination and associated pre-operative co-morbid risk factors.

**Figure 8**
Table 7: Leak rates following surgery
DISCUSSION

Perforation peritonitis is a frequently encountered surgical emergency in tropical countries like India, most commonly affecting young men in the prime of life as compared to the studies in the West (1) where the mean age is between 45 and 60 years. In the majority of cases the presentation to the hospital is late with well-established generalized peritonitis with purulent/fecal contamination and varying degree of septicemia. The signs and symptoms are typical and it is possible to make a clinical diagnosis of peritonitis in all patients. The perforations of proximal gastrointestinal tract were six times as common as perforations of distal gastrointestinal tract as has been noted in earlier studies from India which is in sharp contrast to studies from developed countries like United States (2), Greece (3), and Japan (4) which revealed that distal gastrointestinal tract perforations were more common. Not only the site but the etiological factors also show a wide geographical variation. Khanna et al. (5) from Varanasi studied 204 consecutive cases of gastrointestinal perforation and found that over half of them (108 cases) were due to typhoid. They also had perforations due to duodenal ulcer (58), appendicitis (9), amoebiasis (8) and tuberculosis (4). These figures show the importance of infection and infestation in the third world which is also reflected in the high incidence of typhoid perforation in our study. At the other end of the spectrum, Noon et al. (6) from Texas studied 430 patients of gastrointestinal perforation and found 210 cases to be due to penetrating trauma, 92 due to appendicitis and 68 due to peptic ulcer.
The above studies show us the variations in the various studies from all over the world. In our study, the perforations were mainly gastroduodenal and in the small bowel. Large bowel perforations are uncommon in the Indian scenario. We had a mortality of 13.8% in the 9 years of our study, which is comparable to the other studies available. Ours is a tertiary referral centre and so we have this high number of cases from a single unit.

**CONCLUSION**

GI perforations are one of the most common surgical emergencies.

Duodenal perforations are most common.

Ileal perforations have the highest morbidity and mortality.

Most of the anastomotic leaks can be treated conservatively.

Mortality depends on the general condition of the patient and associated pre-operative co-morbidities.

**References**

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