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Study of spectrum of Perforative peritonitis: A prospective study of 300 cases

Dr. Sandesh Kumar Shrivastava[1], Dr. UC Singh[2*]
[1, 2] Associate Professor, Department of Surgery, BRD Medical College Gorakhpur, Uttar Pradesh, India
[*]Corresponding author: Dr. UC Singh

Abstract
Background: Perforative peritonitis (PP) is one of the commonest surgical emergencies in Asian countries and India. The PP aetiology in Asian countries remains different from Western countries.
Aims and Objectives: The study was aimed at highlighting the spectrum of PP as encountered by us at BRD Medical College Gorakhpur.
Materials and methods: Three hundred patients who were admitted in surgical ward of BRD Medical College, Gorakhur were studied from September 2015 to October 2016. All the subjects of this cohort were diagnosed with PP.
Results: In this study 300 cases of PP were included, this cases accounts for 25% of total surgical abdominal emergency admissions. With 44% cases of duodenal perforation was the commonest reported cause of PP. Morbidity and mortality were directly associated to the time period between emergence and surgical intervention and most importantly the amount of contamination in peritoneal cavity. Other interpreters were co-morbid situations, site of perforation, post-operative complications and older age of the patient. Mortality rate was 14%, highest in duodenal perforation and least in appendicular perforations.
Conclusion: Better understanding of aetiological factors, prompt medical facilities and good postoperative care needs are essential improve the outcome reduce mortalities.

Keywords: duodenal perforation, surgical emergencies, surgical intervention, appendicular perforations

Introduction

Peritonitis is usually infectious and often life-threatening. It's caused by leakage or a hole in the intestines, such as from a burst appendix. Even if the fluid is sterile, inflammation can occur [1, 2].

Acute, primary or spontaneous peritonitis is mainly caused due to an infection by a single organism in which no detectable source or enduring contamination can be confirmed. Therefore, surgical intervention is not useful [3].

Secondary or surgical peritonitis caused by an injury or lesions of the gastrointestinal tract, the biliary system, pancreas and genitourinary tract. Therefore surgical therapy can be applied in this case [4, 5].

Tertiary peritonitis occurs after the treatment of surgical peritonitis either due to failure of the host inflammatory response or due to the super infection. Perforation can develop in the gastrointestinal tract like stomach, duodenum, jejunum, ileum, large intestine and rectum. Oesophageal perforation advances to the mediastinitis. Commonest site it is the duodenum where it is known as the peptic ulcer. Most common infection causing microbial flora are aerobic organisms and most of anaerobic organisms [6].

Causes of perforation includes chronic inflammation due to H Pylori, NSAIDs, stress, smoking, alcohol, tea or coffee consumption, by trauma, illnesses as appendicitis, ulcer disease etc.

Primary stage persists for 2 to 24 hrs and it is regarded as initial response of peritoneal cavity, mesothelial cells to peritoneal contaminated fluid, related to the tachycardia. Symptoms include increase in temperature by 1 to 2 °F, abdominal pain, rigidity and nausea and vomiting may be present. In case the source of bacterial contamination gets closed (due to natural means or surgical intervention) then disease will not advance further and begins to resolve. If it is not resolved then will leads to secondary stage.

Secondary stage remains for 2-12 hrs and characterised by deterioration of patient's health, disproportionately higher pulse than the temperature.

Final tertiary stage lasts for 12 to 36 hrs and it is characterised by irreversible damage with septic shock. Patients may not show symptoms for several hours between the initial chemical peritonitis and the later bacterial peritonitis. Bacteria stimulate inflammatory cell influx, with mental and visceral localisation to form a phlegmon which may resolve or progress to abscess formation.

To avoid the mortality perforations emergency needs to be managed surgically which is a formidable problem. Age, poor health status, septic shock, delayed surgical, site and pathology of perforation/infection and peritoneal contamination are few of the important factors predicting mortality and morbidity. Further death could be due to septicaemia, myocardial failure, vascular collapse, anoxia, and cerebral oedema.

Materials and Methods

For this study we have selected a cohort of 300 patients who were admitted in surgical ward of BRD Medical College, Gorakhpur. All the subjects of this cohort were diagnosed

with PP. This study ran for a period of 12 months from September 2015 to October 2016.

For all subjects a detailed clinical history was recorded, clinical examinations including routine investigations like haemogram, renal and liver function tests were conducted. For all subject radiogram of chest in erect position was done as the first radiological diagnostic investigation. In the subjects where gas was not demonstrated, but perforation was suspected, air was insufflated through Ryle's tube into the stomach and then the chest radiogram was conducted (which recorded the free gas) followed by abdominal ultrasound. Only in case of diagnostic dilemma CT scan was done. The subjects were resuscitated till the clinical condition were adequate for surgery, the criterion of resuscitation were adequate urine output, normal values of BUN, creatinine and electrolytes. After resuscitation entire cohort was subjected to emergency exploratory laparotomy.

During surgery peritoneal cavity was serially explored in all quadrants using the standard midline incision.

Surgical procedure was carried out as per the aetiology, site and pathology of perforation. Peritoneal cavity was carried washed out and drain was left in peritoneal cavity until the contamination drained out.

Patients who underwent conservative management had improved clinically prior to surgery and those who died prior to surgery were excluded from the cohort group.

Results

Cohort group comprise of 252 males (84%) and 48 were females (16%), with male to female ratio of 5.25:1. The mean age was 42.5 years which ranged from 15-70 years. Majority of patients and 30% were from age group 21-30 years. Least number of patients was from age group 71-80 (2%). Mean hospital stay was of 13 days.

Commonest aetiology in cohort was duodenal perforation, in 44% patients and peptic ulcer perforation was the commonest cause with first part of duodenum being the commonest site. 97% subject presented with abdominal pain as chief complaint associated with fever, vomiting, site of pain being epigastrium in 62%, right hypochondrium 28%, lower abdomen 9% and all over the abdomen in 8%.

The co-morbid conditions were alcohol consumption 67%, smoking 53%, NSAID intake 21% and tuberculosis 5%. There were no co-morbid conditions in 26% patients.

Deranged renal and liver function tests were common biochemical abnormality.

94% patients had abnormal finding on chest radiograph in form of gas under diaphragm.

Ultrasound of abdomen revealed free fluid in 60%, dilated clumped bowel loops in 20%, perforated appendix in 3%.

CT was done in 42subjects and small bowel was the commonest finding, perforation in 30 patients, other findings were bowel strictures and appendicular perforation.

Common site for perforation was duodenum in 140 (46%) patients out of which first part was involved in 98%, followed by Ileum in 80 (26%), stomach in (15%) patients. Appendix (10), Meckel's diverticulum (10), fallopian tube (10) and large bowel (4) were other sites.

Intraoperatively findings like the amount of peritoneal free fluid and its nature was noted. Contamination was categorized as mild, moderate or severe. Mild contamination with seropurulent fluid, observed in 98 (33%) subjects, moderate in 112 (38%) and severe contamination having of bile stained or feculent fluid with fibrin and pus flakes was observed in 90 (29%) patients. In cases with moderate to severe contamination post-operative ventilatory support was provided (80).

Overall mortality was 13% (80 patients).Duodenal perforation carried maximum mortality (30 patients). This was due to comorbid conditions, severe contamination, more perforation-operation interval, and old age.

The commonest complications were wound infection (20%), burst abdomen (20%), ARDS (10%), and pneumonia (10%). In cases with extensive contamination, faecal fistula and anastomotic leak were seen. Commonest time interval for occurrence of complication was 10-15 days seen in 120 patients.

Commonest Histopathological diagnosis was acute inflammation (63%) followed by tuberculosis (16%), typhoid (8%). Colonic adenocarcinoma in 3%patient mandated re-operation as also in cases of anastomotic leak which failed to respond to conservative management.

Discussion

PP is a common surgical emergency. The relative incidence of various types of perforations is variable. [1, 2] In India, peptic ulcer perforation is the commonest followed by enteric, tubercular, appendicular, traumatic and malignant perforations [3].

The average age of the deceased was 44years, with an almost equal age of occurrence for males (44 years) and females (43 years) in study by Murthy. The average age group of the deceased was (41-50). The highest incidence occurred in (31-40) category and > 60 years category, which comprised of 23% each. The lowest incidence occurred in (11-20) year's category, which comprised of 1.7% [4].

In study by Gopal Singh, average age of patients was 49 years. Male to female ratio was 4.7:1.1. Jhobta concluded that mean age was 36.8 years with majority of patients being males (84%), 16% were in the age group of more than 50 years [5].

In our study, 84% patients were males with maximum in 20-40 age groups which is the young and working population which is subjected to stress and lifestyle changes and hence probably higher incidence.

Perforations occur more frequently among men than women. This is believed to be due to the lifestyles and risk factors that contribute to the ulceration and later perforation of the gastrointestinal tract. These factors included cigarette smoking, consumption of foods and beverages containing caffeine, alcohol abuse and physical stress. Men are more prone to these effects and so the ratio favours men in our study.

The per for at ions of proximal gastrointestinal tract were six times as common as distal tract as has been noted in earlier studies from India, which is in sharp contrast to studies from developed countries which revealed that distal perforations were more common, due to life style and food habits. Colonic pathology is thus more predominant and pathological perforations more common [5].

In case of abdominal cavity, a perforation in supracolic

compartment as a duodenal perforation can lead to tracking of contaminant fluid along paracolic gutter into infracolic compartment which can mimic some other perforation as ruptured appendix or acute appendicitis. Also in cases of duodenum, caecum, in view of retroperitoneal location and fixity to abdominal wall, contamination may not spread through peritoneal cavity and hence presentation of a "sealed off perforation can occur with patient haemodynamically stable. Whereas, in cases of ileum and distal colon, in view of mobility, contaminating fluid can spread giving rise to severe sepsis and these perforations are not sealed off. Also, morbidity is more as microbial flora are more heavily populated.

Not only the site but aetiological factors also show a wide geographical variation. Khanna *et al*. from Varanasi found that over half of perforations were due to typhoid. Study also showed perforations due to duodenal ulcer, appendicitis, amoebiasis and tuberculosis. These figures show the importance of infection and infestation in the third world but our study did not show this trend as the area of study included city zone [6].

At the other end of the spectrum, Noon *et al*. from Texas found more cases to be due to penetrating trauma, appendicitis and to peptic ulcer. This shows the importance of trauma in developed countries [7].

Study by Bose from PGIMER Chandigarh, may be due to high speed road traffic accidents on national highway near Chandigarh [8]. There is a strong correlation between consumption of drugs for 5 or more days and perforation occurrence. In retrospective view, 52% patients consumed these drugs [9].

Although the surgical options are many - from simple closure to definitive acid reducing procedures - it has been our experience that simple closure of the perforation or closure using a pedicled omental patch gives good results, even in large perforations upto 3 cm diameter [10].

The mortality rate of these perforations varies from 4 - 11% and is higher in the elderly, with concomitant disease, preoperative shock, larger size of the perforation, delay in presentation

Operation [11].

Ileal perforation was next common type in our study seen in 40 patients. This can be due to two most common causes i.e. tuberculosis and typhoid. Tubercular perforation is common in India though rare in developed countries [12].

Gall bladder perforations are rare due to earlier presentation as acute episode of acalculous cholecystitis, early ultrasound diagnosis of gall stones and early cholecystectomy, this is a rare occurrence. Common causes of perforation are acute calculous and acalculous cholecystitis, trauma and malignancy [13].

The laparoscopic approach for the management of appendicular peritonitis is safe and effective and does not result in any specific complication. Advantages include the high quality of laparoscopic exploration, a very low incidence of septic complications, and a comfortable postoperative recovery [14].

Usage of drains in surgeries for perforative peritonitis is a matter of personal preference. Placing drains in the peritoneum does not improve outcome in uncomplicated perforated appendicitis [15].

The routine use of drains was found to be neither safe nor effective inpatients of perforated duodenal ulcer treated by omental patch closure [16].

Overall mortality has now decreased due to better understanding of pathophysiology, wide use of better pre-operative resuscitation measures, better antibiotics, safer anaesthesia, early patent reporting and better post-operative management in intensive care set up as required [17].

Conclusion

Based on the 1 year log study at BRD Medical College we noted that the duodenal perforation is the most common followed by terminal ileum and gastric which corresponds to the literature. Treatments are vary from surgeon to surgeon but for common perforations of duodenum, ileum and stomach, primary closure with omental re-enforcement is the preferred option. Drain insertion post procedure is not always useful and is not frequently observed in our study. The success rate of procedures mainly depends on co-morbid pre-existing conditions and also post-operative care of the patient.

Based on the observation of this study we can conclude that the better understanding of aetiological factors, prompt medical facilities and good postoperative care needs are essential improve the outcome reduce mortalities.

References

1. Gopal Singh, Sharma RK. Arun Gupta-Gastrointestinal perforations-a prospective study of 342 cases. Gastroenterology today. 2006; 10(4):167-170.
2. Banerjee JC, Bhattacharya PB. A Handbook of Tropical Diseases with treatment and prescription, 6th ed.Sec 3, Ch.1 p 220-229,Academic publishers, Calcutta, 1960.
3. Dandapatt MC, Mukherjee LM, Mishra SB. Are view of 340 cases. Ind J Surg. 1991; 53(5):189-93.
4. Murthy OP, Fan LY, Siang TL. Fatal gastrointestinal perforations in sudden death cases in last 10 years at UMMC Malaysia-Internet Journal of Medical Update, 2007, 2(1).
5. Jhobta RS, Kaushik R. Spectrum of perforation peritonitis in India- review of 504 consecutive cases- World Journal of Emergency Surgery. 2006; 1:26.
6. Khanna AK, Mishra MK. Typhoid perforation of the gut - Postgraduate Medical Journal. 1984; 60:523.
7. Noon GP, Beall AC, Jorden GL. Clinical evaluation of peritoneal irrigation with antimicrobial solution. Surgery. 1967; 67:73.
8. Bose SM, Kumar A, Chaudhary A. Factors affecting mortality in small intestinal perforation. Indian Journal of Gastroenterology. 1986; 5(1):261-63.
9. Ofman JJ, Maclean CH, *et al*. Analysis of severe upper gastrointestinal tract. Assesment of conventional radiology. Radiol Clin North Am. 1992; 30:405-11.
10. Alam MM. Incidence of duodenal ulcer and its surgical management in a teaching hospital in Bangladesh. Trop Doc. 1995; 25:67-8.
11. Siu WT, Leong HT, Law BK. Laparoscopic repair for perforated peptic ulcer: a randomized controlled trial. Ann Surg. 2002; 235:313-9.
12. Prakash A. Ulcero-constrictive lesions of bowel-Indian J

Surg. 1975; 37:383.
13. Isch JH, Finneran JC. Perforation of gall bladder-Am Journal of Gastroent. 1971; 55:4518.
14. Steinberg B. Infections of the peritoneum. New York: Paul B, Hoeber Inc,1944. 29 Rangarajan M, Palanivelu C-Laparoscopic surgery for perforation of Meckel's diverticulum-Singapore Med J. 2007; 48(4):102.
15. Navez D Mutter. Laparoscopic management of acute peritonitis-British Journal of Surgery.
16. Tander B, Bulut M. Utility of peritoneal drains inchildren with uncomplicated perforated appendicitis- Pediatric Surgery International, 2003, 19(17).
17. Pai D, Sharma A, Gupta A. Role of drains inperforated duodenal ulcer patients-A Prospective controlled study-ANZ Journal of Surgery. 1999; 69(3):210-13.