Review article:

Spectrum of perforative peritonitis in Navi Mumbai: Analysis of 100 cases

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Abstract

Perforative peritonitis is the most common cause of emergency encountered by surgical units all over the world including India. The spectrum of etiology of perforation in asian countries differs from the western world. This study was conducted at Padmashree Dr D.Y.Patil hospital and research centre ,Navi Mumbai to highlight the spectrum of perforative peritonitis ,identify the factors influencing the mortality and morbidity and to improve the outcome. This prospective study included 100 consecutive patients of perforation studied in terms of clinical presentations, cause, site of perforation, surgical management, postoperative complications and mortality at Padmashree Dr D.Y.Patil hospital and research centre ,Navi Mumbai between January 1,2011 to May 31,2012. After establishing the diagnosis of perforative peritonitis, all patients were resuscitated and were taken for exploratory laparotomy. The most common operative finding was duodenal ulcer (55%) and appendicular perforation (16%) followed ileum (9%),intestine(9%),jejunum(5%),stomach(3%),colon(2%) and gall bladder(1%).Wound infection(10%) was the commonest complication . Overall mortality was 13%. Mortality was proportional to age, derangement of physiological parameters like hypotension, delay in surgery and as the perforation site becomes distal from duodenum to colon. Prompt resuscitation and early surgical intervention can reduce morbidity and mortality associated with peritonitis.

Keywords : Perforative peritonitis, Primary repair, Omentopexy, Management, Exploratory laparotomy

Introduction

Perforative Peritonitis is one of the commonest emergencies faced by a surgeons across the world.[1] Primary, secondary and tertiary peritonitis requires us to undertake search for underlying etiology in a particular geographical area. The spectrum of etiology of perforation in India differs from the western world.[2] Peritonitis with septicaemia is the commonest mode of presentation.[3] Till the beginning of 21st century peritonitis was considered to be a fatal condition. Despite advances in surgical techniques, antimicrobial therapy and intensive care support, management of peritonitis continues to be highly demanding, difficult and complex.[4][5] Objective of this study was to study the presentation and evaluation of various causes of acute peritonitis and complication and its relation to primary cause and analyse various causes of mortality and morbidity and the factors influencing it.

Material and methodology

This study comprises of 100 consecutive cases of acute peritonitis in a study period from January 1, 2011 to May 31, 2012 conducted by Department of General Surgery, Padmashree Dr. D. Y. Patil Medical college hospital and research center, Nerul , Navi Mumbai. A pre tested proforma was used to collect the relevant information by interviewing, clinical examination of patients, relevant investigations and treatment. Patients were enrolled as and when they presented with the following inclusion and exclusion criteria.

Inclusion criteria

In the present study all the cases which were provisionally diagnosed with acute peritonitis and subjected to relevant investigations and underwent surgery were included.

Exclusion criteria

All cases managed conservatively were excluded from this study. In this study patients in paediatric age group were also excluded as they were treated by paediatric surgeons. Patients who refused surgery were excluded.

All the patients were studied in terms of clinical presentation, cause of perforation, site of perforation, surgery performed, post operative complication and mortality. After establishing the diagnosis of perforative peritonitis, all patients were resuscitated and were taken for exploratory laparotomy. After opening the abdomen, the source of perforation was identified and repaired. With adequate procedures abdomen was washed with 3-5litres of warm normal saline and drains were placed in the abdominal cavity and the abdomen was closed in single layer using No1 loop nylon. Post operatively patients were followed with the cover of broad-spectrum antibiotics (cephalosporins + metronidazole +/- aminogly-cosides) along with fluid and electrolyte balance till discharge from hospital and reviewed in OPD for 1 month. Mortality in this study refers to death of patients in the hospital during same admission as the episode of peritonitis.

Results

A total of 100 patients were studied. Mean age of patient was 36.6 years (ranges from 15 to 74) and standard deviation was 14.8. Majority were male 81% (male 81 and female 19).Male-to-female ratio 4.2:1. Pain was present in all cases. Other symptoms were vomiting (59%), fever (52%), abdominal distension (37%), shock (22%), diarrhoea (19%) and constipation (8%). Clinical presentation varied accordingly with the cause of perforation. The most common operative finding was duodenal ulcer (55%) followed by appendicular perforation (16%). Patient with duodenal ulcer presented with short period of pain originating in the epigastrium or upper abdomen with fever and vomiting. Patient with appendicular perforation presented with history of pain arising from periumblical region and shifting to right iliac fossa or pain directly originating in right iliac fossa and spreading all over abdomen with vomiting and diarrhoea. Patient with illeal perforation presented with prolonged history of abdominal pain with fever, vomiting and distension of abdomen. Among the signs, tenderness with abdominal wall distension was universal. About 55% cases had diminished or absent bowel sounds, 34% had obliterated liver dullness. 65.5% of patient with duodenal perforation showed gas under diaphragm on erect X-ray abdomen. 14 cases (87.5%) of perforated appendix and 10 cases (18%) of duodenal perforation had no evidence of pneumoperitoneum .Whereas 6 cases (10.5%) of duodenal perforation had both dilated bowel loop and gas under diaphragm. Duration of illness till surgery was less than 24 hours in 38% while more than 24 hours in 62%. 40% of patients had anaemia, leucocytosis was present in 34% and 26% had luecopenia. 56.2% cases of perforated appendix had leucocytosis. Table No. 1.

Operative data

The most common finding was perforated duodenal ulcer (55%), perforated appendix (16%) followed by ileal perforation (9%). Out of the 9 cases of illeal perforation, 3 were due to illeocecal tuberculosis. Peritonitis secondary to intestinal gangrene was found in 9 cases, 4 case were secondary to volvulus and strangulation around fibrotic bands, 3 cases were secondary to strangulated hernia, 2 cases were secondary to

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volvulus around Meckel's diverticulum. 2 cases were of colonic perforation both secondary to malignancy. 5 cases were of jejunal perforation, all subsequent to blunt trauma abdomen. Rare cause of perforative peritonitis was gall bladder perforation. Highest number of perforation was duodenum (55%), appendix (16%), ileum (9%), intestine (9%), jejunum (5%), stomach (3%), colon (2%) and gall bladder (1%). Duodenal ulcer perforation were closed by omentopexy (98.1%), one case of sealed perforation was treated by peritoneal toilet only. Gastric perforation was managed by primary repair (3%). Appendicectomy were performed in 16 cases (16%). Jejunal and ileal perforation by primary repair (14%), one case of colonic perforation underwent resection of gangrenous part and stoma formation (1%) and one case resection and anastomosis. E.coli was predominant organism in the aspirate culture (35%), followed by B.fragilis (12%). In 27 cases aspirate was sterile. Relook laparotomies were performed in cases of wound dehiscence (3%). Table No. 2.

Postoperative Complications

Wound infection was the commonest complication seen in 10% of cases out of which 8 cases of duodenal perforation, 1 case each of appendicular perforation and colon. Fecal fistula was seen in 7 cases, 4 cases were in illeal perforation and all patients expired. Prolonged paralysis was seen 3% cases, and was managed with Ryle's tube aspiration and electrolyte management. 3 cases developed burst abdomen. 13% of cases had persistent septicaemia managed with antibiotics, fluid and blood transfusion. 2 case developed acute renal failure and required dialysis, 5 cases developed pneumonia. Overall mortality was 13%. 8 patient died of septicaemia and MODS. Mortality in ileal perforation (44%), jejunal perforation (20%) and duodenal (7.2%).Group of patients in whom onset of symptoms was present more than 24 hours before surgery .Case fatality of this group was 16%. Mean age patients who died was 51.5 +/- 12years. Mean age of survivors 31.3 +/- 12.8 years. 5 out of 22 patient with hypotension expired (27.3%). Table No. 3.

Discussion

Perforative peritonitis is a significant surgical emergency in a country like India.[6] It is common in a young age group. [7][8] In our study the mean age was 36.6 years. Males (81%) were the majority of patients, with male-to-female ratio 4.2:1 other studies [8],[9] conferred to our findings. Large bowel perforation is more in western countries.[10].[11],[12] Gastro-duodenal perforation is the most common cause of peritonitis in most studies in the eastern hemisphere ranging from 25% to 81%.[12],[13],[14],[15],[16] In our series, 55% cases were due to duodenal perforation which is consistent with other studies.[2],[10],[18],[19],[20],[21],[22] 2nd most common cause in our series was appendicular perforation which was not consistent with another study[23] where illeal perforation was 2nd most common cause of peritonitis. 1 case of gall bladder perforation was noted in our series and it is uncommon in other case series.[6] Proper resuscitation , fluid management under good antibiotic cover and simple closure with omentopexy decreased mortality in our series which is comparable to other series.[8][20] None of the cases of gastric perforation were secondary to gastric carcinoma. In other series perforated peptic ulcer had high incidence of malignancy.[24] In tropical country like India small bowel is most common site for perforation[6],[8] as was for our series. 9% of cases in our study were illeal perforation due to tuberculosis and typhoid which are common in Indian setup.[6][8] Colorectal perforation is a rare case of perforative peritonitis[8] seen in 2% patients. Malignancy as a cause of

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perfortive peritonitis is relatively rare in case series in India[8] when compared to studies in the west,[26],[27]we report a single case of perforative peritonitis due to malignancy. In our series pain abdomen(100%), vomiting(59%) and bowel disturbance(27%) were comparable to other series.[17] Abdominal tenderness and rigidity were elicited in all cases, and bowel sounds were absent / diminished in 55 % cases. All this finding were seconded in another study.[25] Laboratory findings in our study revealed anemia, leucocytosis and leucopenia in 30%, 24% and 16% respectively similar to another study.[25] 56% of perforated appendix in our study had leucocytosis. Pneumoperitoneum has been demonstrated in 50-80% in various series[6] and was 49% in our study. E.coli (35%) was the most common of peritoneal aspirate culture which was comparable to other studies.[17],[28] Wound infection was the commonest complication (10%), similar to other series. [8],[17],[25] Pelvic abscess, burst abdomen , duodenal fistula and prolonged paralytic ileus was observed in 4%, 3%, 3%& 2% patients respectively. Relook laparatomy have a role in perforative peritonitis[29] as seen in our study where 2% cases underwent redo surgery, intestinal stoma with tension suturing. Mortality in perforative peritonitis is high ranging between 6 to 27%. [23],[30] In our study the overall mortality is 13%. High mortality depends on the site of perforation. Various studies show different mortality – gastric perforation 36%,[31] enteric perforation [32] and colorectal perforation 17.5%.[33] Mortality in our case series was low (13%) may be due to omentopexy with Graham's patch in cases of gastroduodenal perforation. Death rate from duodenal perforation was 7.2% whereas no death was reported from perforated gastric ulcer which was less compared to other study.[34] Only 2 cases colonic perforation was present so mortality cannot be considered. Factors affecting to high mortality and complication are advanced age, late presentation, delay in treatment, septicaemia and other comorbidity. In our study mean age of patient expired was 50.6 years which was comparable to another study.[35] Case fatality rate (16%) was noticed in patients presenting after 24 hours of onset of symptoms compared to patients presenting within 24 hours of onset of symptoms (0.8%). In our study the patient in 10 patients died of septicaemia and multi organ failure. 7 (31.8%) out of 22 hypotensive patients succumbed in the post operative period.

Conclusion

In conclusion, perforative peritonitis remains a significant surgical challenge with high mortality in morbidity. Spectrum of perforative peritonitis in India differs from the west. Duodenal perforation is the commonest cause of perforative peritonitis. Wound infection is the commonest post operative complication. Overall mortality was 13%, with mortality being proportional to age, derangement of physiological parameters like hypotension, delay in surgery and as the site of perforation becomes distal from duodenum to colon. Aggressive and prompt resuscitation and early surgical intervention reduces mortality and morbidity associated with perforative peritonitis.

Table 1 Preoperative data

SL No.	Variable	No of cases	Percentage (%)
1	Age (years)		
	15-25	38	38
	26-35	23	23
	36-45	16	16
	46-55	20	20
	56-65	1	1
	>66	2	2
2	Sex		
	Male	81	81
	Female	19	19
3	Symptoms and signs		
	Pain	100	100
	Vomiting	59	59
	Diarrhoea	19	19
	Constipation	8	8
	Distension	37	37
	Fever	52	52
	Tachycardia	58	58
	Hypotension	22	22
	Tenderness	100	100
	Rigidity	100	100
	Obliteration of liver dullness	34	34
	Absent/diminished bowel sounds	55	55
4	Laboratory values		
	Anaemia	30	30
	Leucoytosis	24	24
	Leucopenia	16	16
5	Radiological findings		
	Pneumoperitoneum	49	49
	Air fluid level	11	11
	Obliteration of psoas shadow/preperitoneal fat line or generalised haze	40	40
6	Duration of illness		
	More than 24 hours	60	60
	Less than 24 hours	40	40

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Table 2 Operative data

Sl No.	Variable	No. Cases	Percentage (%)
1	Cause of perforation		
	Duodenum	55	55
	Appendix	16	16
	Illeal	9	9
	Gastric	3	3
	Jejunum	5	5
	Intestine	9	9
	Colon	2	2
	Gall bladder	1	1
2	Peritoneal fluid culture		
	Sterile	27	27
	E.coli	35	35
	Mixed	10	10
	B.fragilis	12	12
	Staphylococcus	7	7
	Pseudomonas	6	6
	Klebsiella	3	3
3	Surgical procedure		
	Closure with omental patch (omentopexy)	54	54
	Primary repair	17	17
	Resection and anastomosis	10	10
	Peritoneal toilet	1	1
	Stoma formation	1	1
	Cholecystectomy	1	1
	Appendicectomy	16	16
4	Redo surgery		
	Stoma formation	1	1
	Tension suturing	1	1

Table 3 Post operative complications.

SL No.		Duodenal perforation		Appendicular perforation		Illeal perforation		Others		Total	
1	**Complications**	No.	%	No	%	No	%	No	%	No	%
	Wound infection	8	14.5	1	1	0	0	1	50	10	10
	Fecal fistula	0	0	0	0	4	44.4	3	15	7	7
	Pelvic abscess	3	5.4	0	0	0	0	1	5	4	4
	Duodenal fistula	2	3.6	0	0	0	0	0	0	2	2
	Burst abdomen	1	1.8	0	0	1	11.1	1	5	3	3
	Paralytic ileus	1	1.8	0	0	0	0	2	10	3	3
2	Mortality	4	7.2	0	0	4	44	5	11.1	13	13

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