

Study of Perforation Peritonitis at a Tertiary Center of Northern Tribal Belt of Chhattisgarh

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ABSTRACT

BACKGROUND

Perforation peritonitis is one of the commonest surgical emergencies in clinical practice and often life threatening if left untreated. Post-operative complication rate is found to be high in our study, may be due to late presentation to the tertiary health center and co-morbid conditions of the patients. We wanted to evaluate the various clinical presentations, sites of perforation, surgical treatment, outcomes, postoperative complications and mortality of perforation peritonitis.

METHODS

This is an observational study conducted among referral cases in a tertiary care center- Government Medical College, Ambikapur, Chhattisgarh, and data collected included age, sex, clinical presentation, risk factors, radiological findings, operative findings and postoperative course of treated patients.

RESULTS

Out of 108 cases of perforation peritonitis studied, 80 (74.07%) were of gastric perforation, 14 (12.96%) were of duodenal perforation, 9 (8.33%) were of appendicular perforation and remaining 5 (4.62%) were of ileal perforation. Common surgery done was primary closure with omentopexy in 82 (75.92%) patients, simple primary closure was done in 16 (14.81%) patients, appendicectomy done in 9 (8.33%) patients and remaining 1 (0.92%) patient was treated with ileostomy.

CONCLUSIONS

Gastric perforation is found to be the most common cause of gastro-intestinal perforation leading to peritonitis. Gastric perforation was found to be more common than duodenal perforation. Late presentation to hospital is commonly associated with complications which could have been avoided with early diagnosis and aggressive treatment initiated in time.

KEYWORDS

Perforation, Peritonitis, Gastric, Peptic, Ulcer, Tribal, Septicaemia

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BACKGROUND

Perforation peritonitis is one of the commonest surgical emergency condition encountered in surgical practice.^{1,2} Gastrointestinal tract perforation can occur due to various causes and requires early diagnosis and prompt surgical treatment.³ Post-operative complication rate were found to be high in this tribal belt may be due to late presentation to the higher health care center and also association of patients with co morbid conditions as well as patients using mostly self-prescribe analgesics (NSAIDS).⁴ It has been also observed that patients are symptomatically treated by local health workers/practitioners leading to delay in appropriate diagnosis and treatment. Thus delayed visit to specialists and surgical health care center were associated with major complications and mortality.⁵

We wanted to evaluate the various clinical presentations, sites of perforation, surgical treatment, outcomes, postoperative complications and mortality of perforation peritonitis.

METHODS

The observational study was conducted during the period of September 2016 to December 2018 including 108 cases of perforation peritonitis that underwent laparotomy in department of surgery at Govt. Medical College & Hospital Ambikapur which is situated in northern tribal belt of Chhattisgarh. Data were recorded in detail as, age, sex, acid peptic disease, history of drug abuse, smoking and alcoholics. Clinical signs and symptoms, including duration of symptoms were recorded in details. Biochemical investigations of acute surgical conditions including electrolytes, blood urea, creatinine, and bilirubin are performed. Radiological upright abdominal x-ray was performed to confirm clinical diagnosis with simultaneous abdominal ultrasonography to rule out any other pathology in all studied cases. All cases were adequately resuscitated following the standard guidelines of treatment including thorough peritoneal lavage with normal saline and povidone iodine following the administration of antibiotics in pre and post-operative period. Detailed pre, intra and post-operative finding were recorded and analysed and kept in record.

All cases of peritonitis secondary to perforation of gastrointestinal tract were included in the study. All traumatic, post-operative and primary peritonitis were excluded.

RESULTS

Out of 108 patients of perforation peritonitis studied, 79 (73.15%) were male and 29 (26.85%) were female with male: female ratio of 2.7: 1. Overall mean age of male patients was found to be 38 years ranging from 11-80 years

as compared to mean age 37 years found in female patients ranging from 12-62 years. (Table 1).

Out of 108 patients 75 (69.44%) were associated with positive history of co-morbid risk factors like acid peptic disease, tobacco chewing & smoking in 40 (37.03%), alcoholics in 27 (25.00%) and drug abuse found in 20 (18.51%), (Table 2). Most common presenting symptom was abdominal pain observed in all cases. Other symptoms observed were constipation in 89 (82.40%), abdominal distention in 80 (74.07%) and nausea & vomiting in 30 (27.77%). Radiological findings on x-ray shown free gas in all cases and abdominal ultrasonography revealed collection in 62 (57.40%) cases (Table 3). In biochemical investigations increased level of bilirubin detected in 37.96%, urea in 64.81%, creatinine in 30.55% and altered electrolyte (Na/K) values found in 75% cases (Table 3).

Most commonly found intra-operative finding was gastric perforation in 80 (74.07%) cases, followed by duodenal perforation in 14 (12.96%), appendicular perforation in 9 (8.33%) and ileal perforation in 5 (4.62%) cases. No colonic perforation was observed in studied cases (Table 4). Primary closure with omentopexy was done in 82 (75.92%) cases which includes 68 cases of gastric perforation and all 14 cases of duodenal perforations. Surgical procedure as primary closure was done in remaining 16 (14.81%) which includes 12 cases of gastric and 4 cases of ileal perforation. Primary closure performed instead of omentopexy due to unhealthy omentum. Ileostomy was performed in 1 (0.92%) case of ileal perforation who presented late with unhealthy and large ileal perforation. (Table 4). Appendectomy was done in 9 (8.33%) cases encountered as appendicular perforation.

Age Groups (Yrs.)	No. of Cases	Male	Female
0 - 10	-	-	-
11 - 20	15 (13.88%)	11 (10.18%)	4 (13.79%)
21 - 30	31 (28.70%)	23 (21.29%)	7 (24.14%)
31 - 40	15 (13.88%)	12 (11.11%)	3 (10.34%)
41 - 50	29 (26.88%)	21 (19.44%)	9 (31.03%)
> 50	18 (16.66%)	12 (11.11%)	6 (20.69%)
Total	108	79 (73.15%)	29 (26.85%)

Table 1. Distribution of Cases According to Age and Sex

Characteristics	Site of Perforation				Total
	Gastric (n= 80)	Duodenal (n= 14)	Appendicular (n= 9)	Ileal (n= 5)	
Risk factors					
Acid Peptic disease	61	14			75 (69%)
Tobacco/Smoking	29	4	2	5	40 (37%)
Alcohol	14	7	3	3	27 (25%)
Drug abuse	9	5	3	3	20 (19%)
Symptoms					
Abdominal pain	80	14	9	5	108 (100%)
Constipation	68	9	7	5	89 (82%)
Abdominal distension	57	14	4	5	80 (74%)
Nausea & Vomiting	11	8	7	4	30 (28%)
Sign					
Tenderness	80	14	9	5	108 (100%)
Tachycardia	70	12	5	5	92 (85%)
Dehydration	71	9	-	5	85 (79%)
Guarding	56	10	9	5	81 (75%)
Absent bowel sound	59	9	9	-	77 (71%)
Rigidity	53	8	6	5	72 (67%)
Fever	10	7	5	5	27 (25%)
Shock	8	2	-	3	13 (12%)

Table 2. Distribution of Patients According to Risk Factors, Symptoms and Signs

Findings		Site of Perforation								Total
		Gastric (80)		Duodenal (14)		Appendicular (9)		Ileal (5)		
		Male	Female	Male	Female	Male	Female	Male	Female	
Serum										
Bilirubin	Deranged	19 (23.75%)	7 (8.75%)	5 (35.71%)	2 (14.29%)	1 (11.11%)	1 (11.11%)	4 (80%)	1 (20%)	40 (37.04%)
Urea	Deranged	41 (51.25%)	14 (17.50%)	8 (57.14%)	2 (14.29%)	-	1 (11.11%)	3 (60%)	1 (20%)	70 (64.81%)
Creatinine	Deranged	19 (23.75%)	6 (7.50%)	4 (28.57%)	1 (7.14%)	-	-	2 (40%)	1 (20%)	33 (30.56%)
Na/K	Deranged	58 (72.50%)	13 (16.25%)	8 (57.14%)	1 (7.14%)	-	-	-	1 (20%)	81 (75%)
Ultrasonography										
Collection in Peritoneal cavity	Present	39 (48.75%)	9 (11.25%)	5 (35.71%)	3 (21.43%)	2 (22.22%)	-	3 (60%)	1 (20%)	62 (57.41%)
Radiological										
X-ray erect abdomen shows free gas	Present	59 (73.75%)	21 (26.25%)	11 (78.57%)	3 (21.43%)	5 (55.56%)	4 (44.44%)	4 (80%)	1 (20%)	108 (100%)

Table 3. Investigative Parameters Observed in Various Patients of Perforations Peritonitis

Site of Perforation	Simple Closure (n= 16)		Omentopexy (n= 82)		Appendicectomy (n= 9)		Ileostomy (n= 1)	
	Male	Female	Male	Female	Male	Female	Male	Female
Gastric (80)	10 (12.50%)	2 (2.50%)	49 (61.25%)	19 (23.75%)	-	-	-	-
Duodenal (14)	-	-	11 (78.57%)	3 (21.43%)	-	-	-	-
Appendicular (9)	-	-	-	-	5 (55.56%)	4 (44.44%)	-	-
Ileal (5)	3 (60%)	1 (20%)	-	-	-	-	1 (20%)	-
Colonic	-	-	-	-	-	-	-	-

Table 4. Different Sites of Perforation Found Intraoperatively & Surgical Procedures Performed

Complications		Site of Perforation								Total
		Gastric (80)		Duodenal (14)		Appendicular (9)		Ileal (5)		
		Male	Female	Male	Female	Male	Female	Male	Female	
Wound infections	Yes	22 (22.50%)	7 (8.75%)	3 (21.43%)	1 (7.14%)	1 (11.11%)	1 (11.11%)	2 (40%)	1 (20%)	38 (35.19%)
Chest complications	Yes	5 (6.25%)	5 (6.25%)	3 (21.43%)	1 (7.14%)	-	-	2 (40%)	1 (20%)	17 (15.74%)
Septicaemia	Yes	5 (6.25%)	2 (2.50%)	3 (21.43%)	1 (7.14%)	1 (11.11%)	-	1 (20%)	1 (20%)	14 (12.96%)
Burst abdomen	Yes	3 (3.75%)	2 (2.50%)	1 (7.14%)	1 (7.14%)	-	-	1 (20%)	-	8 (7.41%)
Leak/ Fistula	Yes	1 (1.25%)	-	-	-	-	-	1 (20%)	-	2 (1.85%)
Death	Yes	4 (44.44%)	2 (1.9%)	1 (0.9%)	2 (1.9%)	-	-	1 (0.9%)	-	10 (9.26%)

Table 5. Various Complications Observed during Post-Operative Period

Post-operatively commonly encountered complications were wound infection in 38 (35.18%) cases, followed by chest infection in 17(15.74%), septicaemia in 14(12.96%), wound dehiscence in 8 (7.40%) and leak/fistula in 2 (1.85%) cases (Table 5). Most complications were observed in cases of gastric perforations and who had been associated with co-morbid risk factors. Faecal fistula developed in two cases, one in gastric perforation and other in ileal perforation treated as simple closure and both these cases presented late with septic condition and shock with adhesions. In 10 (9.26%) patients, complications were turned out to be fatal causing multiorgan failure and ultimately culminating into death (Table 5).

DISCUSSION

Perforation peritonitis is common surgical condition and complication rate is found to be high in this tribal belt of northern Chhattisgarh may be due to late presentation to the higher health care center. In the present study of 108 patients 79 were male and 29 were female. The male: female ratio was 2.7:1. Overall mean age of male patients was found to be 38 years ranging from 11-80 years and as compared to mean age 37 years found in female patients ranging from 12-62 years. Predominant age group encountered in males was 21 to 30 years which found to be young as compared to females where predominantly middle age group between 41 to 50 years was observed. Higher frequency in males was also observed in similar studies done on perforation peritonitis.^{6,7,8} The common encountered age group between 41-50 years in some studies, is also observed in case of females in the present study.^{9,10} Perforation was

found to be common in males between 35-45 yrs. of age group and in case of females older age group between 40 to 65 years is observed in a study which is quite similar to the present study.⁶

In our study majority cases were associated with positive history of acid peptic disease 69.4%, other risk factors included were tobacco chewing & smoking in 37%, alcohol in 25%, drug abuse in 18.5% cases (Table-2). 60 cases of perforation peritonitis reported in a study show positive history of smoking and alcoholics with occasional use of NSAIDs in 43 males while 8 female were associated with using only NSAIDs and 9 cases were not found to be associated with risk factors⁶. Similar study of 180 cases of perforation using NSAIDs was also shown association with gastric perforation in 24 cases while remaining duodenal perforation is sequel of peptic acid disease.⁸

In a report of 227 patients studied revealed predominant presentation with acute abdomen (100%), followed by abdominal distention (88%), constipation (84%), vomiting (64%), and fever (34%).¹¹ Other study of 93 cases also presented commonly with signs and symptom of pain in abdomen (100%) cases, followed by abdominal distention (33%), vomiting (54%), fever (40%), constipation (34%) and shock (8%).¹² The significant presenting symptoms including abdominal pain, constipation, abdominal distention, vomiting and fever were recorded in present study are typical of peritonitis. Abdominal distention was strongly associated in cases with gastric perforation and fever in case of ileal perforation.

In the investigations, erect X-Ray chest or abdomen, revealed free gas under dome of diaphragm are diagnostic feature of perforation peritonitis which were also found in 82% patients of 227 studied cases and none of the patients

with appendicular perforation show any evidence of free gas under dome of diaphragm.¹¹ Pneumoperitoneum was present in 71.81% patients and in contrast no free gas observed in cases of appendicular perforation.¹² Similarly other study show pneumoperitoneum in 67 (72%) cases out of 93,¹³ while in present study all cases of perforation peritonitis show free gas under dome of diaphragm. In most of the cases with appendicular perforation free gas under diaphragm were not found. In present study all 9 cases of appendicular perforations showed free gas under dome of diaphragm may be due majority of patients presented late to the hospital.

In present study gastric perforation observed was 74.07% which is more common than duodenal perforation found in similar previous study.¹² There is some variations observed in previous studies where duodenal perforation found to be the commonest cause of perforation.^{8,11,13} Gastro-duodenal perforation was commonest site of perforation followed by appendicular and ileal perforation in our study which is constant with previous studies.^{7,12} In contrast some studies also show small bowel perforation as the commonest site.^{10,14,15}

The region is tribal belt, with less health awareness amongst the people, and also the symptomatic treatment given by local health-workers without arriving at conclusive diagnosis and also delayed presentation to the tertiary health care center may cause the higher complication rate. Major complication observed in our study was found to be wound infection in 37.03% cases, which is also reported in previous studies ranging from 36-40%.^{7,13,16} In contrast, one study reports low wound infection rate of 12% in patients.¹⁵ Other complications noticed related with respiratory in 18.51% cases, septicaemia in 13.88% cases, wound dehiscence in and leak 1.85% patients in present study. In a study of 76 cases in south east Nigeria pulmonary infection was reported in 13.2% cases.¹⁶ Sepsis is noted in 4% and respiratory complications in 3% cases¹⁵. 32-35% cases reported as respiratory complications in some studies.^{7,13}

Septicaemia (13.88%), was found to be main cause of organ failure turned out to be fatal in our study. In other studies also with delayed presentation to hospital resulted in septicaemia and thus survival rate is found to be reduced.^{17,18} Overall mortality rate was low 7.4% in present series of study of 108 cases, which was also noticed in previous studies.^{7,9,11,13} In contrast mortality rate is 15-30% is observed various other studies.^{12,18}

CONCLUSIONS

Perforation peritonitis is one of the commonest surgical emergencies in this northern tribal belt of Chhattisgarh and gastric perforation is found to be most common followed by duodenal perforation. Commonest risk factors seen were acid peptic disease, tobacco chewing & smoking, alcohol and drugs abuse. Late presentation to higher health care center causing delayed diagnosis and treatment resulted in varying degree of complications and in some cases turned out to be

fatal. To avoid such complications, awareness programs are required to be done amongst high risk populations to avoid the risk factors like alcohol, drug abuse, & tobacco chewing and smoking. It is also needed to improve health care facilities in remote areas making accurate diagnosis early to avoid dreadful complications.

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