

Original Research Article

A Clinical Study of Management of Perforative Peritonitis and Its Surgical Outcome

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Abstract

Background: Secondary peritonitis presents common life-threatening conditions associated with high mortality and morbidity. Management of perforative peritonitis poses significant challenges to the treating surgeons with respect to surgical outcome thereby demanding thorough evaluation and appropriate management in such cases.

Objectives: To study the clinical profile, management of perforative peritonitis and its surgical outcomes.

Methodology: A case series study of 513 patients with Perforative Peritonitis was studied in setting of tertiary care hospital in the department of general surgery at Vijayanagara Institute of Medical Sciences, Ballari, Karnataka during the period of June 2015 to January 2018. Among the selected patients the clinical profile, etiological profile and the surgical interventions were undertaken and the outcome were noted. Appropriate descriptive statistics were used to analyse the findings and to draw the inferences. **Results:** There were 390 males and 123 females. The mean age of patients was 35.95 ± 24.87 years. Common cause of perforative peritonitis were acid peptic disease (35.7%), infectious disease (23%), trauma (13%) and malignancy (2.3%). Complication rate and mortality among the patients was 47.2% and 9.6% respectively. Elderly age, comorbid condition, infectious disease etiology and malignancy and site of perforation were the important determinants of mortality among the patients. **Conclusion:** GI perforations are one of the most common surgical emergencies. Mortality depends on the age and general condition of the patient, associated pre-operative co-morbidities, site of perforation and etiology.

Keywords: Perforative peritonitis, surgical outcome, etiology, complication, mortality

Background

Even today, secondary peritonitis presents common life-threatening conditions associated with high mortality and morbidity. Management of perforative peritonitis poses significant challenges to the treating surgeons with respect to surgical outcome thereby

demanding thorough evaluation and appropriate management in such cases. In our current study, we will be evaluating the disease to know the various clinical presentations, epidemiology, general principals of surgical management and its surgical outcomes.

Objectives

To study the clinical profile, management of perforative peritonitis and its surgical outcomes.

Methodology

Study design: A case series study design.

Study setting: The study was carried out in the setting of tertiary care hospital in the department of

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Study subjects: All patients admitted with perforative peritonitis were included in the study. A total of 513 patients with perforative peritonitis were included in the study admitted from the year 2015 to 2018.

Sampling: Non-random purposive sampling was adopted to select patients

Study period: Study was done by collecting data retrospectively from the year 2015 to 2018

Data variables: Among the selected patients socio demographic profile, the clinical profile, surgical interventions undertaken and the outcome including complications was noted. All the patients were followed for 6 months.

Analysis: The collected data with respect to various variables was entered into an excel sheet and after appropriate data filtering, the data was transferred and analysed using SPSS version 2.0. appropriate descriptive statistics was used to analyse the findings and to draw the inferences.

Ethical Clearance: Due ethical clearance for the conduct of the study was issued by Institutional Ethical Committee of Vijayanagara Institute of Medical Sciences, Ballari, Karnataka.

Results

A total of 513 patients with perforative peritonitis were included in the study. Two thirds of the patients were in the age group of 20 to 40 years age group. Majority of the patients were males (76%) compared to females (24%).

Almost every patient had pain abdomen (98.8%) and other predominant symptom were vomiting (78.2%), fever (49.9%) followed by constipation (40.9%) and abdominal distension (38.4%).

Tachycardia was observed in majority of the patients and other signs of shock such as hypotension (42.3%), low urine output (22.2%) and tachypnoea (46%) were also observed in the patients.

Presence of co-morbid conditions was assessed among the patients where in hypertension (13.1%) was the common co-morbid condition followed by

respiratory disease (9.9%), diabetes mellitus (7.2%), renal disease (5.3%) and cardiac disease (4.1%).

More than half of the patients were alcoholic (52.8%) and nearly 5% of the patients had history of NSAID abuse.

Table no. 01:

Clinical profile of the patients (n=513)			
Parameter		Frequency	Percent
Etiology			
	Acid peptic disease	183	35.7
	Trauma	67	13.1
	Malignancy	12	2.3
	Obstruction	57	11.1
	Typhoid	83	16.2
	Tuberculosis	33	6.4
	Not defined	78	15.2
Perforation site			
	Gastric	24	4.7
	Duodenal	185	36.1
	Jejunal	71	13.8
	Ileal	85	16.6
	Appendicular	107	20.9
	Large bowel	41	8.0
Investigative findings			
	Pneumoperitoneum on xray	477	93.0
	Air fluid level on xray(>4)	87	17.0
	Dyselectrolytemia	241	47.0
	Raised leucocyte count >14k	426	83.0
	Raised renal function tests	213	41.5
	Low hemoglobin	65	12.7

The underlying etiology of the perforative peritonitis among the patients was evaluated and it was observed that acid peptic disease was the common cause accounting for 35.7% of the patients, followed by typhoid (16.2%), trauma (13.1%), obstruction (11.1%) and tuberculosis (6.4%). Malignancy accounted for 2.3% of the cases in our study. In about 15% of the cases the etiology was not defined.

The commonest site of perforation was found to be duodenum accounting for 36.1% of the cases followed by appendicular (20.9%), Ileum (16.6%), Jejunal (13.8%), large bowel (8%) and gastric (4.7%).

After stabilizing the patients' operative management was done where in Grahams modified patch repair

was done in 35.7%, appendectomy in 20.9%, simple closure of the perforation was done in 19.9%, resection and anastomosis was done in 10.5% and resection and diversion was done in 9.4% of the patients. Billroth 1 operative procedure was done in one case and Billroth 2 procedure was done in 18 cases.

Table no. 02:

Surgical outcome among the patients (n=513)			
Outcome		Frequency	Percent
	Complication	242	47.2
	Mortality	49	9.6
	Recovered	222	43.3
Type of complication (n=242)			
	Wound infection	78	32.2
	Dyselectrolemia	21	8.7
	Respiratory complication	57	23.6
	Abdominal collection	25	10.3
	Obstruction	34	14.0
	Burst abdomen	13	5.4
	Anastomotic leak	14	5.8

All the patients were followed up for a period of 6 months and the surgical outcome of the patients was assessed where in the mortality rate among the patients was at 9.6% and the rate of complication was at 47.2% and remaining 43.3% of the patients recovered completely. Among the complications wound infection (32.2%) and respiratory complication (23.6%) were common, followed by abdominal collection (10.3%), Obstruction (14%), dyselectrolemia (8.7%), burst abdomen (5.4%) and anastomotic leak (5.8%).

Table no. 02:

Factors influencing mortality among the patients				
Variable		N	Mortality	P Value
age group				
	<20 years	45	3(6.6%)	0.71
	20-40 years	345	26(7.5%)	0.02
	40-60 years	67	8(11.9%)	0.47
	>60 years	56	12(21.4%)	0.0013
Sex				
	Male	390	40(10.2%)	0.32
	Female	123	9(7.3%)	
Etiology				
	Acid Peptic Disease	183	14 (7.6%)	0.27
	Trauma	67	1 (1.4%)	0.013
	Malignancy	12	2 (16.6%)	0.64

Cont... Table no. 02:

	Obstruction	57	5 (8.7%)	0.83
	Typhoid	83	4 (4.8%)	0.14
	Tuberculosis	33	11 (33%)	<0.001
	not defined	78	12 (15.3%)	0.05
Pre-existing medical condition				
	Hypertension	67	2 (2.9%)	0.06
	diabetes mellitus	37	2 (5.4%)	0.58
	respiratory disease	51	9 (17.6%)	0.03
	cardiac disease	21	2 (9.5%)	0.99
	renal disease	27	4 (14.81%)	0.5
	No disease	310	30 (9.6%)	0.9
Site				
	Gastric	24	4 (16.6%)	0.37
	Duodenal	185	10 (5.4%)	0.016
	Jejunal	71	4 (5.6%)	0.32
	Ileal	85	22 (25.8%)	<0.001
	Appendicular	107	1 (0.93%)	<0.001
	large bowel	41	8 (19.55%)	0.023
Operative procedures				
	Simple closure	102	23 (22.5%)	<0.001
	Grahams modified patch repair	183	10 (5.4%)	0.019
	Resection with anastomosis	54	11 (20.3%)	0.004
	Appendectomy	107	1 (0.9%)	<0.001
	Resection with diversion	48	3 (6.2%)	0.6
	Billroth 1	1	0 (0.0%)	>0.99
	Billroth 2	18	2 (11.1%)	>0.99

The mortality was high among elderly patients (21.4%) and 40-60 years age groups (11.9%) compared to rest of the age groups and this difference in the mortality rates was found to be statistically significant. Male patients had higher mortality (10.2%) compared to females (7.3%).

Patients with Tuberculosis (33%), Malignancy (16.7%) and ill-defined etiology (15.3%) had higher mortality rates compared to other etiology and this difference in the mortality rates with respect to etiology was found to be statistically significant.

Patients with co-morbid condition of respiratory disease (17.6%) and renal disease (14.8%) had higher mortality rates compared to other co-morbid conditions and this was found to be statistically significant.

Site of perforation as an influencing factor of mortality was assessed; it was found that patients with Ileum (25.8%) and large bowel (19.5%) had higher mortality compared to other sites. Patients with appendicular perforation had the lowest mortality (0.93%). This difference in the mortality rates with respect to the site of perforation was found to be statistically significant.

Patients who underwent simple closure (22.5%) and resection and anastomosis (20.3%) had higher mortality rates compared to patients who underwent other operative procedures. Patients who underwent appendectomy had the least mortality (0.93%). This difference in the mortality rates with respect to the type of operative procedures was found to be statistically significant.

Discussion

One of the most common surgical emergencies is perforation peritonitis. It is commonly seen in a younger age group in the tropical countries (mean age in our study was 37.8 years) as compared to the studies in the West.^{1,2}

More commonly the perforations involve the proximal part of the gastrointestinal tract,^{3,4} this being in contrast to studies from the western countries, where perforations are common in the distal part.^{5,6} Etiological factors also show a wide geographical variation. According to a study from India, infections formed the most common cause of perforation peritonitis.⁷ In our study 23% of the cases were due to typhoid and tuberculosis. In contrast to this, Noon et al.⁸ from Texas in their study reported only 2.7% cases due to infections. Also studies from the west have shown that around 15–20% cases are due to malignancy,^{9,10} this being in stark

contrast to our study where malignancy was ascertained to be the cause of perforation peritonitis in only 3% of the cases. This shows that malignancy is not a common cause of perforation peritonitis in our setup as compared to our western counterparts.

In our study; surgical outcome of the patients was assessed where in the mortality rate among the patients was at 9.6% and the rate of complication was at 47.2% and remaining 43.3% of the patients recovered completely. [Table 05] Among the complications wound infection (32.2%) and respiratory complication (23.6%) were common, followed by abdominal collection (10.3%), Obstruction (14%), dyselectrolyemia (8.7%), burst abdomen (5.4%) and anastomotic leak (5.8%).

The rates of common complications were comparable with other studies in India and neighbouring countries.¹¹⁻¹⁶(table no. 04).

Table no. 04:

Comparison of post-op complications with other studies Author					
Study series	Wound infection (%)	Wound dehiscence (%)	Pulmonary complications (%)	Electrolyte imbalance (%)	Septi-caemia (%)
Thammegowda K etal[11](N=369)	30	12	21	19	16
PrajaktVPatil,etal[12](N=150)	20	20	20	-	-
Shyamkumargupta,etal[13](N=400)	16	3.5	6	4	3
Memon AA, et al[14] (N=311)	10.2	4.5	-	6.7	10.6
ShahidaPAfridi etal [15] (N=300)	42	26	20	-	20
RajenderSJhobta[16] (N=504)	25	9	28	17	18
Presentstudy (N=513)	32.3	-	23.6	8.7	-

The overall mortality due to perforation peritonitis ranges between 6 and 27%.¹⁷ The mortality rate in our study was 9.6%. Comparison of mortality rates with respect to other studies has been shown below.¹¹⁻¹(table no. 05).

Table no. 05:

Comparison of mortality rates with other studies		
Study	Year	Mortality (%)
Thammegowda K etal[11](N=369)	2001-2010	13.8
PrajaktVPatil,etal[12](N=150)	2006	13

Cont... Table no. 05:

Shyamkumargupta,etal[13](N=400)	2006-2008	6
Memon AA, et al[14] (N=311)	2008-2010	16.7
ShahidaPAfridi etal [15] (N=300)	2008	10.6
RajenderSJhobta[16] (N=504)	2006	10
Ramachandra ML, et al[18]. (N=50)	2003-2004	14
Nuhu ali, etal[19]. (N=153)	2010	26.1
Present study (N=513)	2013-2016	9.6

The mortality was high among elderly patients (21.4%) and 40-60 years age groups (11.9%) compared to rest of the age groups and this difference in the mortality rates was found to be statistically significant. Male patients had higher mortality (10.2%) compared to females (7.3%). Results were similar to study conducted by Parwez Sajad Khan et al,²⁰ and Rajender Singh Jhobta et al.¹⁶

Patients with Tuberculosis (33%), Malignancy (16.7%) and ill-defined etiology (15.3%) had higher mortality rates compared to other etiology and this difference in the mortality rates with respect to etiology was found to be statistically significant. Patients with co-morbid condition of respiratory disease (17.6%)

and renal disease (14.8%) had higher mortality rates compared to other co-morbid conditions and this was found to be statistically significant. Study done by NBG Prasad et al,²¹ also gave similar results.

Site of perforation as an influencing factor of mortality was assessed; it was found that patients with Ileum (25.8%) and large bowel (19.5%) had higher mortality compared to other sites. Patients with appendicular perforation had the lowest mortality (0.93%). This difference in the mortality rates with respect to the site of perforation was found to be statistically significant. These study results are in consonance with other studies done elsewhere.^{20,22,23} (table no. 06).

Table no. 06:

Comparison of site of perforation and Mortality with other studies				
Study series	Tripathi et al. ²² N=160)	Khan S et al. ²⁰ (N=54)	Rao DCM et al. ²³ (N=46)	Present study. (N=513)
Gastroduodenal	15.0%	38.8%	56.5%	40.7%
Small bowel	35.6%	25.9%	39.1%	30.4%
Appendicular	10.0%	11.1%	4.3%	20.8%
Colorectal	NA	7.4%	0.0%	7.9%
Mortality	23.7%	NA	26.1%	9.6%

Patients who underwent simple closure (22.5%) and resection and anastomosis (20.3%) had higher mortality rates compared to patients who underwent other operative procedures. Patients who underwent appendectomy had the least mortality (0.93%). This difference in the mortality rates with respect to the type of operative procedures was found to be statistically significant.

Peritonitis is one of the commonest surgical emergencies in our country. Despite advancements

in surgical techniques, anti-microbial therapy and intensive care, management of peritonitis continues to be highly demanding, complex and its outcome is mainly determined by the age of the patient, site of perforation, etiology, comorbid conditions and the type of surgical procedure done.

Conclusion

GI perforations are one of the most common surgical emergencies. Duodenal perforations are most common. Ileal perforations have the highest morbidity

and mortality. Mortality depends on the age and general condition of the patient, associated pre-operative comorbidities, site of perforation and etiology.

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