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Original Research Article

Evaluation of Prognostic Factors in Perforative Peritonitis for Final Outcome at a Tertiary Care Centre: An Observational Study

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Abstract

Background: Perforative peritonitis is one of the most common surgical emergencies in developing countries and is associated with considerable morbidity and mortality despite advances in surgical techniques, antimicrobial therapy, and intensive care. Early identification of prognostic factors is essential for prompt intervention and improved survival.

Objectives: To evaluate prognostic factors influencing morbidity and mortality in patients with Perforative peritonitis and to assess their impact on final clinical outcomes at a tertiary care centre.

Methods: This prospective observational study included 60 patients with perforative peritonitis who underwent surgical management at Dr. S.N. Medical College and Hospital, Jodhpur. Demographic characteristics, duration of symptoms, comorbidities, anatomical site of perforation, laboratory parameters, postoperative complications, length of hospital stay, and final outcomes were analyzed. Statistical analysis was performed using the chi-square test, with a p-value <0.05 considered statistically significant.

Results: Gastroduodenal perforation was the most common site (51%), followed by appendicular (31%) and ileal perforations (8%). Delayed presentation beyond 24 hours, presence of comorbidities, anemia, and prolonged hospital stay were significantly associated with increased postoperative complications and mortality. Severe sepsis, wound infection, and pulmonary complications were more frequent among patients presenting late and those with low hemoglobin levels.

Conclusion: Perforative peritonitis continues to be associated with substantial morbidity. Early presentation, timely surgical intervention, correction of anemia, and appropriate management of comorbid conditions are critical for improving outcomes. Early identification of high-risk patients can significantly reduce postoperative complications and mortality.

Keywords: Perforative peritonitis, Prognostic factors, Hospital stay, Postoperative complications, Mortality.

Introduction

Perforative peritonitis is a life-threatening surgical condition resulting from perforation of a hollow viscus, leading to contamination of the peritoneal cavity and subsequent systemic inflammatory response. It accounts for a significant proportion of emergency laparotomies in developing countries and remains a major surgical challenge due to delayed presentation and associated sepsis [1]. Despite improvements in diagnostic modalities, antimicrobial therapy, anesthesia, and critical care, morbidity and mortality rates remain high, particularly in resource-limited settings [2]. Clinical outcomes in perforative peritonitis are influenced by multiple factors, including patient age, duration of symptoms prior to presentation, site of perforation, presence of comorbidities, nutritional status, and severity of peritoneal contamination [3]. Upper gastrointestinal perforations are more frequently encountered in tropical regions, whereas lower gastrointestinal perforations predominate in Western populations [4]. In the Indian context, gastroduodenal perforations, ileal perforations commonly related to enteric fever, and appendicular perforations constitute the majority of cases encountered in routine surgical practice [5]. Early surgical intervention has been consistently shown to reduce mortality, while delays exceeding 24 hours are associated with significantly poorer outcomes [6]. Additional factors such as hemodynamic instability, anemia, and underlying systemic illnesses further contribute to postoperative

morbidity and mortality [7]. Although several prognostic scoring systems have been developed to stratify risk in perforative peritonitis, their applicability varies across different populations and healthcare settings [8]. Identification of locally relevant prognostic factors is therefore essential for optimizing patient management and efficient utilization of healthcare resources [9]. The present study was undertaken to evaluate prognostic factors affecting morbidity and mortality in perforative peritonitis and to correlate these factors with final outcomes at a tertiary care centre.

Materials and Methods: This study was conducted within the Department of General Surgery at Dr S.N. Medical College and Hospital Jodhpur. A total of 60 patients diagnosed with perforative peritonitis and undergoing emergency laparotomy were included in the study.

Inclusion Criteria

- Of either sex.
- More than 18 years of age.
- Patients presenting with acute abdomen with pneumoperitoneum on X-rays and/or CT scan, USG.
- Patient presenting with acute abdomen and perforation diagnosed intraoperatively.

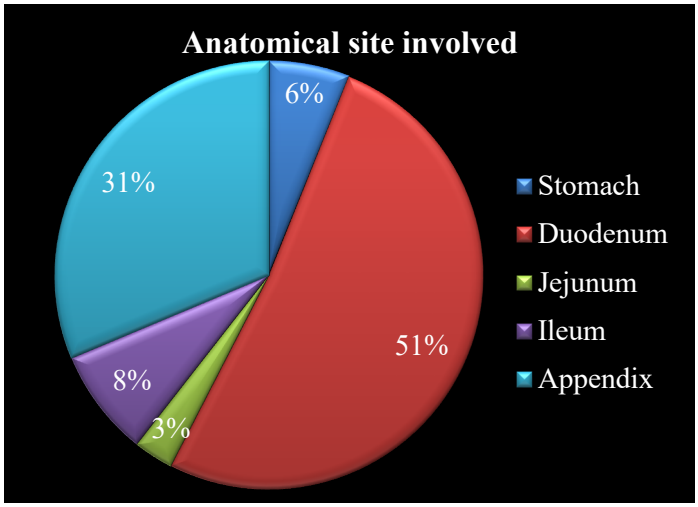
Exclusion Criteria

- Peritonitis resulting from trauma.
- Primary peritonitis.
- Post-operative peritonitis.

Data Collection: Clinical data including demographic details, duration of symptoms, comorbidities, clinical signs, laboratory parameters (including hemoglobin levels), radiological findings, intraoperative findings, postoperative complications, duration of hospital stay, and final outcomes were recorded.

Statistical Analysis: Data were analyzed using appropriate statistical methods. Categorical variables were compared using the chi-square test. A p-value <0.05 was considered statistically significant.

Results: A total of 60 patients admitted to the surgical ward of Dr. S.N. Medical College and Hospital with peritonitis secondary to hollow viscus perforation were studied.



Graph 1: Anatomical sites of perforation

The most common anatomical site of perforation was gastroduodenal (51%), followed by appendicular (31%), ileal (8%), jejunal (3%), and gastric perforation (6%).

Table 1: Association of Hospital Stay with Age, Time of Presentation, and Comorbidities

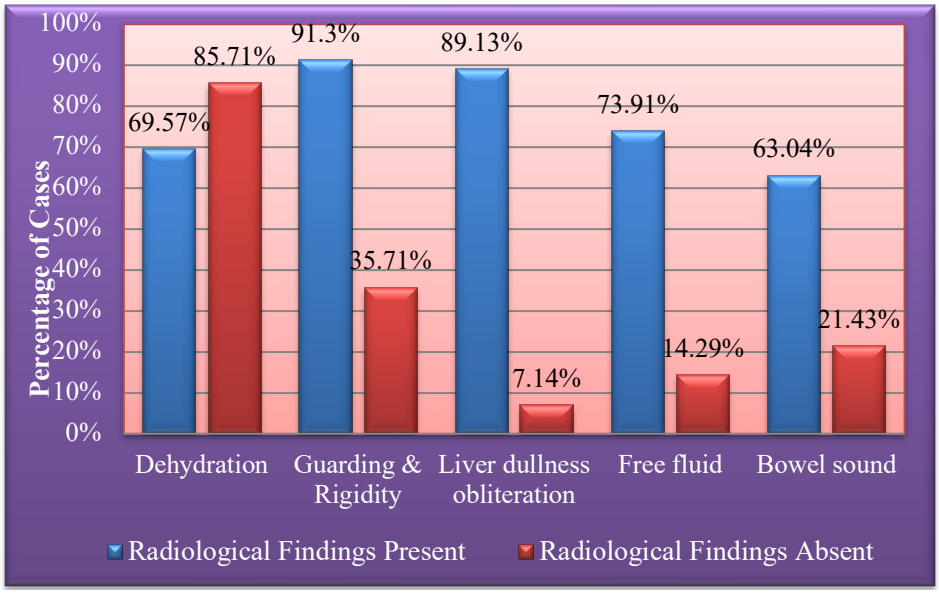
Parameters		Hospital Stay			P-value
		<5 days	5 – 10 days	>10 days	
Age	≤20	04	01	00	x^2=6.024
	21 - 30	06	00	00	d.f.=8
	31 - 40	08	01	02	p=0.644
	41 - 50	06	03	01	
	>50	22	03	03	
Time of presentation	<24 hrs	25	01	00	x^2=6.943
	2 – 3 days	15	02	02	d.f.=4
	>3 days	20	05	04	p=0.139
Comorbidity	Yes	02	03	03	x^2=14.23
	No	44	05	03	d.f.=2, p=0.0008

Age and time of presentation showed no statistically significant association with hospital stay (p>0.05). However, the presence of comorbidities was significantly associated with prolonged hospital stay (p=0.0008).

Table 2: Impact of Hospital Stay and Comorbidities on Perforation Peritonitis Outcomes

Parameters		Outcome		Total	P-value
		Expired	Recovered		
Hospital Stay	<5 days	02	44	46	0.427
	5 - 10 days	00	08	08	0.572
	>10 days	00	06	6	0.631
Comorbidity	Yes	01	07	08	0.250
	No	01	51	52	

No statistically significant association was observed between duration of hospital stay and mortality. Although mortality was slightly higher in patients with comorbidities, this association was not statistically significant (p=0.250).



Graph 2: Correlation between clinical sign and radiological findings

A strong correlation was observed between clinical signs of peritonitis and radiological evidence of pneumoperitoneum, supporting the importance of combined clinical-radiological assessment.

Table 3: Relation of Site of Perforation with Post-Operative Outcome and Complication

Post-Operative Complications	Gastroduodenal	Ileal	Caecal	Appendicular
No. of Patient	28	26	1	05
Wound Infection	28	23	05	04
Wound Dehiscence	02	06	00	00
Severe Sepsis/MODS	02	03	00	00
Pulmonary Complication	05	02	00	00
Leak/Fistula	02	00	00	00
Outcome/Mortality	00	02	00	00

P value 0.001

Gastroduodenal and ileal perforations were associated with higher rates of wound infection, wound dehiscence, and sepsis. Mortality was observed only in ileal perforation cases. The association was statistically significant (p=0.001).

Table 4: Distribution of Sample by Outcome

Age	Outcome		Total	P-value
	Expired	Recovered		
<20 Years	00	05	05	0.664
21– 40 Years	01	16	17	0.489
>40 Years	01	37	38	0.690

No statistically significant association was found between age groups and mortality (p>0.05).

Table 5: Relation of Blood Hemoglobin Level with Post-Operative Outcome and Complications

Post-Operative Complications	< 10 mg%	≥ 10mg%	P-value
No. of Patient	11	49	
Wound Infection	10	35	0.061
Wound Dehiscence	03	05	0.153
Severe Sepsis/MODS	00	05	0.03
Pulmonary Complication	04	03	0.017
Leak/Fistula	00	02	0.495
Outcome/Mortality	02	00	0.035

Patients with hemoglobin <10 g/dL had significantly higher rates of pulmonary complications, sepsis, and mortality. Mortality was significantly associated with anemia (p=0.035).

Table 6: Relation of Duration of Presentation with Post-Operative Outcome and Complication

Post-Operative Complications	≤ 24 hrs	> 24 hrs	P-value
No. Of Patient	15	45	
Wound Infection	12	33	0.009
Wound Dehiscence	01	07	0.065
Severe Sepsis/MODS	01	04	0.007
Pulmonary Complication	01	06	0.667
Leak/Fistula	00	02	0.406
Outcome/Mortality	00	02	0.006

Patients presenting after 24 hours had significantly higher rates of wound infection, sepsis, and mortality. Delay in presentation was strongly associated with adverse outcomes (p<0.01).

Discussion

Perforative peritonitis continues to be a major contributor to emergency surgical morbidity and mortality in developing countries [10]. In the present study, gastroduodenal perforation was the most common etiology, consistent with findings reported in other Indian studies [11].

Delay in presentation beyond 24 hours emerged as a significant prognostic factor and was associated with higher rates of postoperative complications and mortality. Similar observations have been reported in previous studies, highlighting the critical importance of early diagnosis and timely surgical intervention [12].

Delayed presentation often leads to advanced peritoneal contamination, systemic sepsis, and organ dysfunction, adversely affecting outcomes. Anemia was identified as an important predictor of poor outcome, with significantly higher rates of sepsis, pulmonary complications, and mortality observed in patients with low hemoglobin levels. Reduced hemoglobin levels impair tissue oxygenation and compromise immune response, increasing susceptibility to infection and multi-organ dysfunction [13]. The presence of comorbidities was associated with prolonged hospital stay, reflecting delayed recovery and increased postoperative care requirements. This finding is in agreement with previous studies that have identified comorbid illnesses as significant contributors to postoperative morbidity [14]. Ileal perforations were associated with higher mortality compared to other perforation sites, likely due to severe fecal contamination and delayed presentation, as reported in earlier literature [15]. Although age alone did not demonstrate a statistically significant association with mortality in this study, elderly patients frequently presented with additional risk factors that indirectly influenced outcomes [16]. Overall, the findings of this study underscore the multifactorial nature of outcomes in perforative peritonitis and emphasize the importance of early diagnosis, aggressive resuscitation, prompt surgical management, and meticulous postoperative care.

Conclusion

Perforative peritonitis remains a major surgical emergency associated with significant morbidity. Delayed presentation, anemia, presence of comorbidities, and site of perforation have a substantial impact on postoperative outcomes. Early diagnosis, timely surgical intervention, optimization of physiological parameters, and intensive postoperative monitoring are essential for reducing complications and mortality. Identification of high-risk patients at admission can significantly improve survival and facilitate better utilization of healthcare resources at tertiary care centres.

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