

Postoperative Peritonitis after Abdominal Surgery: Epidemiological, Clinical and Therapeutic Aspects

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Abstract: **Introduction:** Postoperative peritonitis is a serious complication occurring after abdominal surgery, usually digestive. Like all diseases associated with care, its prognosis is often severe, marked by high morbidity, prolonged stays in intensive care and in hospital, and potentially serious sequelae. **Material and Methods:** This is a retrospective study of patients operated on in the visceral surgical emergency department with a passage to the visceral surgical emergency department for postoperative peritonitis from January 2021 to November 2022. **Results:** From January 2021 to November 2022 we operated 1493 patients including 14 postoperative peritonitis, i.e. 0.9%. Among the 14 patients: 4 were women (28.6%) and 10 were men (71.4%) with a sex ratio of 2.5. Occlusions were the dominant pathology. The multivariate analysis showed a significant relationship between age, delay before consultation and the occurrence of complications. **Conclusion:** PPO still have a high mortality but which continues to decrease thanks to an effective medical and surgical management.

Keywords: Postoperative peritonitis, sepsis, abdominal, reintervention.

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INTRODUCTION

Postoperative peritonitis is a severe complication resulting from abdominal surgery, usually digestive. Like all healthcare-associated conditions, its prognosis is constantly severe, marked by high morbidity, prolonged stay in intensive care and hospital, and potentially serious sequelae [1]. They pose a double problem: their recognition and their treatment. The diagnosis should be considered in any patient who does not have a typical postoperative course. The management of postoperative peritonitis is often complex and difficult, requiring close collaboration between the surgeon, intensivist, biologist, and radiologist. Diagnosis must be early, but often difficult to establish due to nonspecific signs that are difficult to interpret in the context of the postoperative period, based on clinical, radiological, and laboratory criteria. Contrast-enhanced CT scan is the radiological examination of choice. Treatment is primarily surgical and must be as effective as possible from the outset. Anastomotic dehiscence or leakage is the main etiology [2, 3].

OBJECTIVE

Analyze the epidemiological, clinical, and paraclinical characteristics of postoperative peritonitis in relation to the literature data. Identify key elements in the diagnosis and management of postoperative peritonitis through our cases and literature data.

MATERIALS AND METHODS

This is a retrospective study of patients operated on in the emergency visceral surgery department with a stay in the emergency visceral surgery intensive care unit for postoperative peritonitis from 2021 to November 2022.

Inclusion Criteria: We included all patients operated on urgently or on the program for postoperative peritonitis admitted to the emergency visceral surgery department during the study period with a confirmed diagnosis in the operating room and on bacteriological examinations, patients operated on initially at the maternity ward of the hospital and then taken over by our team for postoperative peritonitis.

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Exclusion Criteria: We excluded from the study patients with postoperative peritonitis who were initially operated on privately and then admitted to the department, patients under 16 years of age, patients who died suspected of postoperative peritonitis and were not taken over, incomprehensible records, and patients with intra-abdominal abscesses drained by radiology.

- Data were directly entered and coded on Excel and analyzed using SPSS software
- Ethical considerations: required approvals were obtained prior to data collection

RESULTS

From January 2021 to November 2021, we operated on 1493 patients, among whom 14 had postoperative peritonitis, representing a rate of 0.9% of the 14 patients, 4 were women (28.6%) and 10 were

men (71.4%), with a sex ratio of 2.5. The age of the patients ranged from 27 to 72 years, with an average of 42 years. Most of our patients were between 27 and 47 years old. Tobacco use and diabetes were the main comorbidities in this case series. Obstruction was the dominant pathology in our series, followed by perforated peptic ulcer, cesarean section, and others. Abdominal pain was present in all patients with PPO. Fever was present in 64.3% and absent in 35.7%. 92% of our patients underwent drainage and 7% did not. Most patients presented with postoperative ileus, accounting for 71.4% (table1, 2, 3, 4).

Univariate analysis found no significant relationship between the different parameters. Multivariate analysis: Found a significant relationship between age, delay before consultation, and the occurrence of complications.

Table1: Characteristic of the 14 patients

Characteristic	Total N = 14
Age	42 (27-72)
Male gender	10
Socre ASA ≥2	2
Diabetes	2
Previous abdominal surgery	2
Cancer	1
Inflammatory diseases	2
Average time to consultation	4j
Emergencies	12
Scheduled	2

Table2: Characteristic of initial interventions

Characteristic	Total N = 14
Supramesocolic surgery	
Ulcer perforation	02
Cholecystectomy	01
Submesocolic surgery	
Bowel resection with anastomosis	4
Subtotal colectomy + anastomosis	1
Sigmoidal resection + stoma	2
Hartman	1
Hartman recovery	1
Caesarean section	2

Table3: Summary of postoperative clinical, biological and radiological signs

Characteristic	Total N = 14
- Abdominal pain	14
- Fever	8 (64.3%)
- Heart rate M	103 batt/min
- Driange	13 (92,3%)
- Post-operative Ileus	10 (71.4%)
- Evisceration	2
- Digestive fistula	1
- Sepsis	6
- Renal failure	4
- Respiratory failure	2

Characteristic	Total N = 14
- Septic shock	4
- WBC \geq 10000	5
- Average Crp	242
- Average time to recovery	5j
- Abdominal scan	8

Table 4: Observation during the procedure and the act performed

Characteristic	Total N = 14
Average time to reintervention	160 min (50-390)
Transfusion	4
Generalized peritonitis	13
Cause of peritonitis	
Gastric perforation	2
Perforation of the bowel	2
Loose anastomosis or suture	5
Biliary fistula	1
Uterine suture loosening	1
Colonic stomal retraction	1
Evisceration	1
Pancreatic necrosis flow	1
Purulent parietal-colonic gutter collection	1
Procedure	
Resection + Double Stoma (Greaves / Colonic)	7
Gastric suture	2
Necrosectomy	1
Hartman	2
Closure of the cystic duct	1

DISCUSSION

It is difficult to assess the incidence of different etiologies of PPO due to the variability in recruitment of patients and hospitals as well as changes in patient management over time. The most common cause of PPO is fistula or anastomotic leak [2, 3]. The prevalence of anastomotic leaks has been reported to range from 0.5% to 21% after colonic or rectal resection [4]. Other causes include digestive or biliary perforation due to an unnoticed peroperative injury, abscesses resulting from septic surgery, or unrelated conditions such as perforated gastric or duodenal ulcers or acute perforated cholecystitis. It should be noted that in 10% of cases the cause is unknown or not found. This study included 14 patients with a mortality rate of 35.7% and a complication rate of 50%. Postoperative mortality mostly occurred soon after reintervention, with 40% of patients dying within 48 hours and 60% within the first 10 days. Therefore, the most important objective of managing these patients is controlling the initial sepsis and its consequences. This involves an effective reintervention to control the septic source, which should be definitive and intensive resuscitation to address organ failure. We identified two factors associated with complications: age and a long delay before consultation. Predictive factors for mortality frequently reported in the literature are numerous, mainly including sex, age, delay before consultation, initial surgery, peroperative transfusion, therapeutic delay between symptom onset

and reintervention, and length of stay in the ICU and intubation time. The significance of each factor varies depending on the study. In the study by Bensignor T., Lefevre J. H., *et al.*, [5], four risk factors for mortality were identified: ASA2 score greater than 2, supramesocolic origin, multiple organ failure, and peroperative transfusion. Advanced age was a risk factor for complications in the multivariate analysis. The study by Martinez-Casas *et al.*, on PPO also showed that advanced age was a predictive factor for mortality [6]. Sex did not affect mortality and morbidity in postoperative peritonitis in univariate and multivariate analyses, which is consistent with the findings of Bensignor T., Lefevre J. H., *et al.*, in a cohort of 191 patients, who found no significant association between sex and mortality or morbidity [5].

The delay before consultation was a factor of complications, explained by the fact that the Moroccan population tolerates pain and only seeks medical help when their condition worsens, as well as poorly organized pre-hospital care systems. Initial tumor or septic surgery is a factor often reported in the literature, representing an independent risk factor for mortality in cases of postoperative peritonitis (PPO). In Torer *et al.*'s study, the mortality rate was significantly higher when the initial surgery was dictated by neoplastic pathology [2]. Marzougui *et al.*, also found similar results [7]. Perioperative transfusion was not a factor of

morbidity or mortality in their study. However, Bensignor T. Lefevre J. H *et al.*'s study showed that perioperative transfusion was a risk factor for mortality, and numerous studies have shown the relationship between perioperative transfusion and the occurrence of anastomotic fistulas as well as increased mortality [8, 9]. The average time to re-intervention in their study was four days, and the morbidity and mortality rate was higher when the delay between the onset of symptoms and surgical intervention was longer. Delay in surgical treatment increases the likelihood of visceral failures and worsens the prognosis of patients. In Bohnen *et al.*'s study of 176 cases of secondary peritonitis, there was a significant correlation between the mortality of postoperative peritonitis and therapeutic delay [10]. In their study, the number of re-interventions was not a predictive factor for morbidity or mortality in the univariate and multivariate analyses. However, Launey Y *et al.*'s study showed that in the multivariate analysis, the number of re-interventions represented a risk factor for mortality [11]. Their surgical management during re-interventions was quite aggressive with a significant rate of stomas. Half of the anastomoses were dismantled in case of anastomotic fistula, and 56% of the patients had a stoma. However, this aggressive management is justified as it allows for the definitive treatment of the septic source, reducing the risk of further re-interventions. The importance of controlling the septic source during the first intervention to avoid a second intervention is the primary objective, as demonstrated by Mullier and Koperna. Patients who could not have a complete recovery either had an incomplete recovery, with a colostomy in place, or had a progression of their neoplastic pathology, making the continuity problem secondary [12]. In general, re-intervention for anastomotic fistula is a risk factor for definitive stoma, unlike conservative treatment, either medical or through drainage. The reasons for this behavior are, on the one hand, that patients and surgeons become reluctant after the initial surgery's complication, and on the other hand, re-intervention for recovery may pose certain technical difficulties. The risk of PPO recurrence during recovery is, therefore, low (7/117; 6%). The recovery of digestive continuity is associated with low morbidity and mortality, especially if it concerns the closure of an ileostomy. Recoveries after Hartmann are more at risk of early complications, as shown by Fauno & Coll [13]. The Hartmann intervention is a risk factor for non-recovery. For patients identical to those in their study, i.e., those re-operated for symptomatic fistula, Maggiori & Coll showed that the risk of definitive stoma in rectal surgery is 36%, but it reaches 100% in the case of Hartmann intervention [14]. A conservative treatment is therefore more appropriate to avoid a definitive stoma. Aggressive treatment of anastomotic fistulas with dismantling of the anastomosis, if necessary, thus makes it possible to definitively treat the source of sepsis, a recognized survival factor, and does not

contraindicate a secondary restoration of continuity, even in the case of Hartman's intervention.

CONCLUSION

Postoperative peritonitis is still a source of high mortality, but it continues to decrease in comparison with earlier series thanks to current medical and surgical management.

Conflict of Interest: none

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