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Case Report

Reintervention for Postoperative Peritonitis: Indications, Etiologies and Outcomes in a Moroccan Tertiary Center - A Retrospective Study of 60 Cases

Short running title: Postoperative peritonitis reintervention

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A B S T R A C T

Introduction: Postoperative peritonitis carries high mortality, yet context-specific data from low- and middle-income countries remain scarce. We aimed to describe the indications, etiologies and outcomes of surgical reintervention for postoperative peritonitis in a Moroccan tertiary center and to explore clinical factors potentially associated with in-hospital mortality.

Methods: This retrospective study included 60 consecutive patients with intraoperatively confirmed postoperative peritonitis requiring reintervention at Ibn Rochd University Hospital, Casablanca (January 2020–December 2024). The primary outcome was in-hospital mortality. Exploratory univariate analysis (Fisher's exact test, odds ratios) examined associations between predefined clinical factors and mortality.

Results: The mean age was 44.4 years (sex ratio 1.5). Peritoneal cultures were positive in 90.0%, predominantly Gram-negative and polymicrobial (66.7%), with Escherichia coli isolated in 53.3% of patients and ESBL-producing strains in 18.5% of isolates. The mean delay to reintervention was 8.2 ± 4.6 days, guided mainly by clinico-biological criteria (66.7%). Anastomotic leakage was the leading etiology (61.7%). In-hospital mortality was 61.7% (37/60). On exploratory univariate analysis, SOFA ≥ 10 (OR 6.97; p = 0.002) and generalized peritonitis (OR 3.24; p = 0.037) were associated with higher mortality; these findings are hypothesis-generating and require confirmation.

Conclusion: Mortality exceeded 60%, driven by delayed source control and refractory septic shock. These findings underscore the need for structured postoperative surveillance and early identification of high-risk patients — particularly those with SOFA ≥ 10 and generalized peritonitis — to guide timely reintervention in resource-limited settings.

Keywords: Peritonitis; Reoperation; Anastomotic Leak; Intensive Care Units; Mortality; Morocco

Introduction

Postoperative peritonitis remains one of the most severe complications of abdominal surgery and a major cause of morbidity and mortality in surgical intensive care units[1,2]. It is defined as an intra-abdominal infection occurring after a primary abdominal procedure, most commonly due to anastomotic leakage, bowel perforation or inadequate control of the initial infectious source[3,4]. The incidence varies according to the type of surgery but may reach 6 to 7% in digestive procedures, with a prognosis often marked by prolonged intensive care stays[1,5].

Despite advances in surgical techniques, perioperative care and antimicrobial therapy, the mortality associated with postoperative peritonitis remains high, ranging from 30% to 60% worldwide, depending on patient severity and timing of source control[1,5,6]. Prognosis depends critically on the rapidity of diagnosis, the timeliness and adequacy of surgical reintervention for source control and the patient's underlying physiological reserve[5,7].

The diagnosis of postoperative peritonitis remains challenging in the early postoperative period, where clinical signs may be nonspecific or masked by analgesia, sedation or the normal systemic inflammatory response to surgery[8,9]. Biological markers such as leukocytosis and C-reactive protein are frequently used but lack specificity, while contrast-enhanced computed tomography may be difficult to interpret in the first postoperative days due to expected postoperative changes[8,10]. Consequently, the decision to perform surgical reintervention often relies on a combination of clinical, biological and radiological criteria rather than a single definitive parameter[6,7].

The importance of early source control has been emphasized by international guidelines, notably those of the World Society of Emergency Surgery (WSES), which highlight the importance of early and adequate source control combined with prompt multidisciplinary management to prevent multiple organ failure[5,6,11]. However, the majority of published data originate from high-income settings. Context-specific evidence from African countries, where patient profiles, microbiological ecology and healthcare resources may differ substantially, remains limited[12,13].

This study aimed to describe the indications, etiologies and outcomes of surgical reintervention for postoperative peritonitis in patients admitted to the Surgical Intensive Care Unit of Ibn Rochd University Hospital, Casablanca, Morocco. Specifically, we sought to characterize the clinical, biological, radiological and microbiological features at the time of reoperation, describe the main surgical etiologies and report in-hospital mortality and explore clinical profiles potentially associated with poor outcome.

Methods

Study design and setting

We conducted a retrospective observational single-center study from January 1, 2020 to December 31, 2024, in the Surgical Intensive Care Unit of Ibn Rochd University Hospital, Casablanca, Morocco. The study was designed and reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines. Ibn Rochd University Hospital is a tertiary referral center managing both elective and emergency abdominal surgical patients.

Participants and data collection

We included all consecutive adult patients (≥ 18 years) who underwent surgical reintervention for intraoperatively confirmed postoperative peritonitis following abdominopelvic surgery during the study period. Exclusion criteria were: age < 18 years, primary peritonitis, conservative management without reintervention and incomplete medical records. During the study period, 67 patients were identified with postoperative intra-abdominal infection; 7 were excluded, yielding a final cohort of 60 patients **(Figure 1)**.

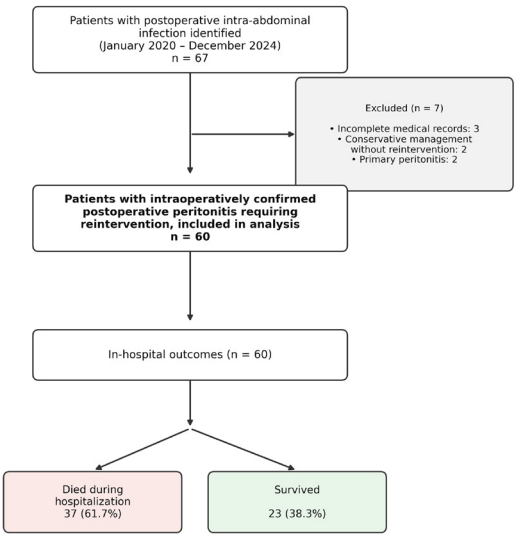

Figure 1: Flowchart of patient selection and outcomes. During the study period (January 2020 – December 2024), 67 patients with postoperative intra-abdominal infection were identified. Seven patients were excluded: 3 for incomplete medical records, 2 for conservative management without reintervention, and 2 for primary peritonitis. A total of 60 patients met the inclusion criteria and were included in the analysis, of whom 37 (61.7%) died during hospitalization and 23 (38.3%) survived. PPO: postoperative peritonitis; ICU: intensive care unit

Data were extracted from medical records using a standardized case report form. Demographic characteristics, comorbidities, clinical features at reintervention (fever, hemodynamic instability, respiratory failure organ dysfunction), laboratory parameters, imaging findings, microbiological results, surgical data and outcomes were recorded. Selection bias was reduced by including all consecutive eligible patients; however, findings apply only to the reoperated subpopulation and may not generalize to all patients with postoperative peritonitis.

Statistical methods

Descriptive statistics summarized the study population. An exploratory univariate analysis examined associations between predefined clinical factors and in-hospital mortality using Fisher's exact test and odds ratios (OR) with 95% confidence intervals. A two-sided p-value < 0.05 was considered statistically significant. Given the limited sample size (n = 60), no multivariate analysis was performed and results should be interpreted as hypothesis-generating. The APACHE II score was unavailable for 12 patients (20.0%) and procalcitonin for 16 patients (26.7%).

Ethical considerations

This study was conducted in accordance with the Declaration of Helsinki (2013 revision). Given its retrospective, non-interventional design based on anonymized archived data, the study was reviewed by the institutional research committee. In accordance with Moroccan law n° 28-13, the institutional committee confirmed that no additional ethics approval was required. Written authorization to conduct the study was obtained from the Department Head prior to any data collection. All patient data were de-identified, strict confidentiality was maintained and the requirement for informed consent was waived.

Results

Patient characteristics and clinical presentation at reintervention

During the five-year study period, 67 patients with postoperative intra-abdominal infection were identified; 7 were excluded, yielding a final cohort of 60 patients **(Figure 1)**.

The mean age was 44.4 ± 16.2 years (range, 18–78). A male predominance was observed: 36 men (60%) and 24 women (40%), ratio 1.5:1. The initial surgical procedure was performed in an emergency setting in 38 patients (63.3%) and electively in 22 patients (36.7%). The most frequent types of initial surgery were colorectal (28 patients, 46.7%), upper gastrointestinal (18 patients, 30%) and small bowel surgery (14 patients, 23.3%).

At the time of suspected reintervention, fever (≥ 38 °C) was present in 45 patients (75.0%), abdominal pain in 42 (70.0%) and purulent or digestive discharge through drains in 28 (46.7%). Hemodynamic instability was present in 26 patients (43.3%) and respiratory failure in 30 (50.0%). The mean SOFA score at ICU admission was 8.5 ± 3.2 (range, 3–16). The APACHE II score was available in 48 patients (80.0%), with a mean value of 17.6 ± 6.1.

Comorbidities included smoking (25.0%), hypertension (20.0%), diabetes (16.7%), active malignancy (15.0%), obesity (13.3%), chronic pulmonary disease (11.7%) and others. Neoadjuvant therapy history was reported in 13.3%, chronic corticosteroid use in 10.0% and inflammatory bowel disease in 6.7%. Details are provided in **(Table 1)**.

Laboratory and imaging findings

Biological abnormalities reflected severe sepsis. Hyperleukocytosis was found in 40 patients (66.7%), with a mean leukocyte count of 16.8 ± 6.4 × 109/L. Mean C-reactive protein was 218 ± 92 mg/L (86.7% exceeding 100 mg/L). Procalcitonin (measured in 73.3%) showed a mean of 14.6 ± 11.2 ng/mL. Anemia was present in 73.3%, thrombocytopenia in 33.3% and coagulation disorders in 43.3%. Metabolic acidosis was documented in 40.0% and hyperlactatemia (lactate > 2 mmol/L) in 46.7%, with levels > 4 mmol/L in 16.7%. Hypoalbuminemia affected 83.3% of patients.

Abdominal imaging was performed preoperatively in all 60 patients. Abdominal CT was performed in 42 patients (70.0%), showing free or loculated intraperitoneal fluid in 88.1%, free intraperitoneal gas in 57.1%, localized abscess in 42.9%, contrast extravasation consistent with anastomotic leakage in 35.7% and bowel wall thickening with mesenteric fat stranding in 50.0%. In 3 patients (7.1%), findings were inconclusive.

Table 1: Patient characteristics and clinical presentation at reintervention (n = 60).

Characteristic	Value (n = 60)
Demographic characteristics	
Age (years), mean ± SD	44.4 ± 16.2
Range	18–78
Sex — Male, n (%)	36 (60.0)
Sex — Female, n (%)	24 (40.0)
Male-to-female ratio	1.5 : 1
Setting and type of initial surgery, n (%)	
Emergency initial surgery	38 (63.3)
Elective initial surgery	22 (36.7)
Colorectal surgery	28 (46.7)
Upper gastrointestinal surgery	18 (30.0)
Small bowel surgery	14 (23.3)
Clinical presentation at reintervention, n (%)	
Fever (≥ 38 °C)	45 (75.0)
Abdominal pain	42 (70.0)
Purulent or digestive discharge through drains	28 (46.7)
Surgical wound infection	20 (33.3)
Hemodynamic instability (MAP < 65 mmHg and/or vasopressor support)	26 (43.3)
Respiratory failure (mechanical ventilation or PaO_2/FiO_2 < 300 mmHg)	30 (50.0)
Severity indices, mean ± SD (range)	
SOFA score	8.5 ± 3.2 (3–16)
APACHE II score*	17.6 ± 6.1 (6–32)

*APACHE II available for 48/60 patients (80.0%). Data are presented as mean ± standard deviation, range, or number (percentage). APACHE II: Acute Physiology and Chronic Health Evaluation II; MAP: mean arterial pressure; PaO_2/FiO_2: ratio of arterial oxygen partial pressure to fractional inspired oxygen; SOFA: Sequential Organ Failure Assessment.

Microbiological findings and reintervention timing

Peritoneal cultures were positive in 54 patients (90.0%). Infection was polymicrobial in 36 cases (66.7%) and monomicrobial in 18 (33.3%). Escherichia coli was identified in 32 patients (53.3%), Klebsiella pneumoniae in 14 (23.3%), Enterobacter spp. in 8 (13.3%) and Pseudomonas aeruginosa in 6 (10.0%). Gram-positive cocci were identified in 26 patients (43.3%), mainly Enterococcus spp. in 16 (26.7%). Anaerobes were identified in 12 patients (20.0%) and Candida spp. in 10 (16.7%). Among Enterobacterales isolates (n = 54), ESBL production was documented in 10 isolates (18.5%).

The mean delay to reintervention was 8.2 ± 4.6 days (range, 2–22). Reintervention occurred within the first 5 postoperative days in 18 patients (30.0%), between days 6–10 in 26 (43.3%) and after day 10 in 16 (26.7%). The decision to reoperate was based on clinical and biological criteria in 40 patients (66.7%), radiological indication in 15 (25.0%) and clinical grounds alone in 5 (8.3%). The most frequently prescribed empirical regimen was imipenem ± vancomycin (28 patients, 46.7%), followed by piperacillin-tazobactam (22 patients, 36.7%). Secondary antibiotic adaptation was performed in 70.0% and empirical therapy was adequate in 75.0%. Details are provided in **(Table 2)**.

Table 2: Microbiological findings and antimicrobial management.

Parameter	Value
Peritoneal fluid culture results (n = 60)	
Positive cultures	54 (90.0%)
Sterile cultures	6 (10.0%)
Polymicrobial infection (n = 54)	36 (66.7%)
Monomicrobial infection (n = 54)	18 (33.3%)
Gram-negative bacilli (patient level)	
Escherichia coli	32 (53.3%)
Klebsiella pneumoniae	14 (23.3%)
Enterobacter spp.	8 (13.3%)
Pseudomonas aeruginosa	6 (10.0%)
Gram-positive cocci	
Enterococcus spp.	16 (26.7%)
Coagulase-negative staphylococci	6 (10.0%)
Anaerobes	
Bacteroides fragilis and other anaerobes	12 (20.0%)
Fungi	
Candida spp. (predominantly C. albicans)	10 (16.7%)
Resistance patterns	
ESBL-producing Enterobacterales (n = 54 isolates)	10 (18.5%)
Diagnostic and therapeutic delays (mean ± SD)	
Suspicion → imaging	12 ± 6 hours
Suspicion → antibiotics	8 ± 4 hours
Reintervention indication, n (%)	
Clinical and biological criteria	40 (66.7%)
Radiological indication	15 (25.0%)
Clinical grounds alone	5 (8.3%)
Empirical antibiotic regimen, n (%)	
Imipenem ± vancomycin	28 (46.7%)
Piperacillin-tazobactam	22 (36.7%)
Other regimens	10 (16.7%)
Secondary antibiotic adaptation	42 (70.0%)
Antibiotic adequacy, n (%)	
Adequate empirical therapy	45 (75.0%)
Inadequate empirical therapy	15 (25.0%)

Data are expressed as number of patients (percentage) unless otherwise specified. ESBL: extended-spectrum β-lactamase.

Surgical findings and outcomes

Intraoperative findings revealed generalized peritonitis in 34 patients (56.7%) and localized peritonitis in 26 (43.3%). Anastomotic leakage was the leading etiology (37 patients, 61.7%), followed by iatrogenic bowel injury (8 patients, 13.3%), ischemic bowel necrosis (6 patients, 10.0%), intra-abdominal abscess (5 patients, 8.3%) and fascial dehiscence (4 patients, 6.7%).

Peritoneal lavage and surgical drainage were performed in all patients. Additional procedures included takedown of anastomosis with stoma (22 patients, 36.7%), primary suture repair (10 patients, 16.7%), segmental bowel resection with anastomosis (8 patients, 13.3%) and bowel resection with stoma (12 patients, 20.0%). A damage-control strategy with temporary abdominal closure was adopted in 14 patients (23.3%).

In-hospital mortality was 61.7% (37 of 60 patients). Death occurred within the first 7 days after reintervention in 14 of 37 deceased patients (37.8%), most frequently attributed to refractory septic shock.

On exploratory univariate analysis, SOFA ≥ 10 at ICU admission was significantly associated with higher mortality (84.6% vs. 44.1%; OR 6.97, 95% CI 1.97–24.62; p = 0.002), as was generalized peritonitis (73.5% vs. 46.2%; OR 3.24, 95% CI 1.10–9.58; p = 0.037). A trend toward higher mortality was observed with serum lactate > 4 mmol/L (90.0% vs. 56.0%; OR 7.07, 95% CI 0.83–60.11; p = 0.073) and Candida spp. isolation (80.0% vs. 58.0%; OR 2.90, 95% CI 0.56–15.05; p = 0.291), though these did not reach statistical significance. Results are presented in **(Table 3)**.

Discussion

This retrospective study analyzed 60 consecutive patients who underwent surgical reintervention for postoperative peritonitis at a Moroccan tertiary center. The main findings were: (i) a high in-hospital mortality of 61.7%, with more than one third of deaths occurring within the first seven postoperative days; (ii) anastomotic leakage as the leading etiology, guided mainly by clinico-biological criteria; (iii) a microbiological profile dominated by Gram-negative bacilli with clinically relevant rates of ESBL production and Candida spp. isolation; and (iv) increasing use of damage-control surgery in hemodynamically unstable patients.

Table 3: Exploratory univariate analysis of factors associated with in-hospital mortality.

Factor	Deaths (n=37)	Survivors (n=23)	OR [95% CI]	p
SOFA ≥ 10	22	4	6.97 [1.97–24.62]	**0.002***
SOFA < 10	15	19	Ref.	—
RRT — Yes (n = 16)	13	3	3.61 [0.90–14.48]	0.076
RRT — No (n = 44)	24	20	Ref.	—
Candida spp. — Yes (n = 10)	8	2	2.90 [0.56–15.05]	0.291
Candida spp. — No (n = 50)	29	21	Ref.	—
Polymicrobial — Yes (n = 36)	25	11	2.27 [0.78–6.62]	0.177
Polymicrobial — No (n = 24)	12	12	Ref.	—
Emergency initial surgery (n = 38)	26	12	2.17 [0.74–6.38]	0.179
Elective initial surgery (n = 22)	11	11	Ref.	—
Generalized peritonitis (n = 34)	25	9	3.24 [1.10–9.58]	**0.037***
Localized peritonitis (n = 26)	12	14	Ref.	—

Lactate > 4 mmol/L (n = 10)	9	1	7.07 [0.83–60.11]	0.073
Lactate ≤ 4 mmol/L (n = 50)	28	22	Ref.	—

Data are presented as absolute counts. OR: odds ratio; CI: confidence interval; Ref.: reference category. *Statistically significant ($p < 0.05$, Fisher's exact test). RRT: renal replacement therapy; SOFA: Sequential Organ Failure Assessment.

Mortality and prognostic indicators

The mortality rate of 61.7% exceeds those reported in most European referral centers[1,6,14]. This discrepancy is likely attributable to higher baseline severity, delayed source control and infrastructure constraints.

The mean SOFA score of 8.5 ± 3.2 and APACHE II of 17.6 ± 6.1 indicate advanced organ dysfunction at ICU admission. A SOFA ≥ 10 was significantly associated with mortality (OR 6.97; $p = 0.002$), consistent with previous studies, though this association remains hypothesis-generating. The mean delay to reintervention of 8.2 ± 4.6 days exceeds those reported in high-income settings, allowing progression from localized infection to systemic sepsis and irreversible organ damage.

The early mortality peak - 37.8% within the first seven days - strongly suggests that source control was achieved at a stage when organ failure had already become irreversible in a substantial proportion of patients. This reinforces the critical importance of reducing diagnostic and therapeutic delays. The need for repeat reinterventions (23.3% second, 8.3% third) and the high rate of nosocomial pneumonia (30.0%) further illustrate the difficulty of achieving definitive source control[15-17].

Diagnostic challenges and clinico-biological criteria

The decision to reoperate was driven primarily by clinical and biological deterioration in 66.7% of cases, with radiological findings as the main indication in only 25.0%. This reliance reflects the diagnostic limitations of imaging in the postoperative abdomen and the reality of limited or delayed access to CT in our setting.

Inflammatory biomarkers were markedly elevated. Although isolated absolute values lack specificity postoperatively, their kinetic trajectory provides a more reliable signal of ongoing sepsis. Serum lactate, elevated above 4 mmol/L in 16.7% of patients, served as an additional marker of tissue hypoperfusion to guide the urgency of reoperation. The absence of statistical significance for serum lactate > 4 mmol/L (OR 7.07; $p = 0.073$) is more likely attributable to insufficient statistical power given the small subgroup size (n = 10) than to a true absence of clinical effect and this association warrants further investigation in larger cohorts.

Among patients who underwent CT, inconclusive findings occurred in only 7.1%, comparing favorably with the 15–20% false-negative rate reported in the literature. However, contrast extravasation consistent with anastomotic leakage was identified in only 35.7%, confirming the limited sensitivity of CT for this diagnosis.

Microbiological profile and antimicrobial implications

The microbiological findings are broadly consistent with the established ecology of postoperative intra-abdominal infections, with Gram-negative bacilli accounting for 60.7% of all isolates. The prevalence of E. coli at the patient level (53.3%) was higher than the ~40% reported in comparable series and the polymicrobial rate (66.7%) suggested extensive contamination.

The ESBL rate among Enterobacterales (18.5%) is consistent with temporal trends and risk factors identified in previous studies. No carbapenem-resistant isolates were identified in our series, which is reassuring but must be interpreted with caution given the small sample.

The isolation of Candida spp. in 16.7% of patients is noteworthy. Although the association with mortality did not reach statistical significance (OR 2.90; $p = 0.291$), the mortality rate among Candida-positive patients (80.0% vs. 58.0%) is clinically meaningful and consistent with the prognostic weight attributed to fungal peritonitis; the lack of significance likely reflects the small subgroup (n = 10).

Empirical antibiotic therapy was adequate in 75.0% of patients and secondary adaptation was performed in 70.0% of cases. These data support empirical regimens with broad Gram-negative coverage, including carbapenems where ESBL prevalence is significant and early antifungal therapy in high-risk patients.

Surgical strategy and timing of source control

The on-demand relaparotomy approach, used in 66.7% of cases, aligns with the RELAP trial, which showed comparable mortality to a planned strategy with fewer relaparotomies and lower costs. However, the mean delay to reintervention of 8.2 days suggests that clinical reassessment could be accelerated.

Anastomotic leakage predominated (61.7%) and the high stoma rate (36.7%) reflects the preference for definitive source control in generalized peritonitis. Damage-control surgery was used in 23.3% of patients, supporting its role as a rescue option in hemodynamically unstable patients.

Timely source control is a key determinant of outcome. The 8.2-day mean delay in our cohort is substantially longer than intervals typically reported in European series (< 5 days). This delay reflects a combination of factors: the insidious clinical presentation in sedated or intubated ICU patients, the absence of 24-hour CT availability, limited ICU bed turnover and a conservative institutional culture. Both diagnostic delay (time to confirmatory imaging, averaging 12 ± 6 hours, largely due to absence of 24-hour CT access) and decisional delay (time from imaging to surgical decision) represent modifiable targets. Taken together with the early mortality peak, the 8.2-day delay emerges as the single most important modifiable factor in our cohort: reducing this interval is likely to have a greater impact on survival than any pharmacological intervention. Implementing standardized postoperative surveillance protocols with predefined reoperation triggers should be the priority.

Implications for resource-limited settings

Our findings carry three principal implications. First, the reliance on clinico-biological criteria for reoperation decisions underscores the need for structured surveillance protocols - integrating serial biomarkers (CRP, procalcitonin, lactate) and SOFA scoring - especially where CT access is limited.

Standardized nursing surveillance protocols should include systematic monitoring of vital signs, drain output and wound assessment every 4–6 hours. Prioritized access to the CT scanner for postoperative patients with suspected complications and multidisciplinary daily rounds should be established to accelerate diagnostic assessment.

Second, the microbiological profile - with an ESBL rate of 18.5% and Candida spp. isolation in 16.7% - supports the adoption of institutional antibiograms and locally adapted empirical antibiotic protocols. In settings with documented ESBL prevalence, initial regimens including a carbapenem should be considered for patients with risk factors for resistance, with de-escalation guided by culture results. Empirical antifungal therapy should be considered in patients with Candida risk factors.

Third, the mortality gap with European series highlights the impact of specific structural barriers: the absence of 24-hour CT scanner availability, limited ICU bed capacity, shortage of microbiological laboratory resources and the lack of formalized antimicrobial stewardship programs. Targeted investment in these areas — particularly round-the-clock imaging access, multidisciplinary postoperative review teams and laboratory infrastructure — may help reduce mortality in comparable healthcare systems.

Strengths

This study provides one of the few comprehensive descriptions of postoperative peritonitis in a North African setting, contributing data from an underrepresented region. The dual-level microbiological analysis adds granularity absent from many comparable series. Detailed reporting of reintervention indications, surgical procedures and damage-control utilization aligns with STROBE recommendations.

Limitations

Several limitations must be acknowledged. First, the retrospective, single-center design restricts generalizability and introduces risk of selection and information bias. Second, the inclusion of only reoperated patients constitutes a significant selection bias: patients who died before reaching the operating room and those managed conservatively were excluded and the true burden of postoperative peritonitis at our institution may be higher than reported. Third, the sample size of 60 patients limits statistical power: the exploratory univariate analysis may fail to detect true associations (type II error), confidence intervals are wide and no multivariate analysis could be performed, precluding adjustment for potential confounders. Fourth, the APACHE II score was unavailable for 20.0% of patients and procalcitonin for 26.7%; if patients with incomplete data were systematically more severe, the reported severity may underestimate the true burden. Finally, the absence of a comparator group limits the ability to draw causal inferences about the factors driving the observed mortality.

Conclusion

Postoperative peritonitis requiring surgical reintervention remains associated with high mortality in our setting, with the prolonged delay to reintervention (8.2 days) identified as the single most important modifiable factor. On exploratory univariate analysis - to be considered hypothesis-generating - SOFA score ≥ 10 and generalized peritonitis were significantly associated with in-hospital mortality. Anastomotic leakage was the predominant etiology and clinico-biological criteria guided the decision to reoperate in the majority of cases. The microbiological profile was characterized by Gram-negative predominance with clinically relevant rates of ESBL-producing organisms and Candida spp.

Three key clinical implications emerge: (i) structured postoperative surveillance protocols incorporating serial biomarker monitoring and systematic organ dysfunction scoring should be implemented to reduce diagnostic delays; (ii) empirical antimicrobial regimens should be adapted to local resistance patterns, with early consideration of antifungal therapy in high-risk patients; and (iii) early identification of patients with high SOFA scores and generalized peritonitis may help prioritize resources and guide timely intervention decisions. A multidisciplinary approach involving surgeons, intensivists and clinical microbiologists is critical in resource-limited settings.

What Is Known About this Topic

Postoperative peritonitis is a severe complication of abdominal surgery with reported mortality ranging from 22% to 55% in high-income centers, driven by the severity of sepsis and the timeliness of source control;

The on-demand relaparotomy strategy is preferred over planned relaparotomy based on the RELAP trial, which demonstrated comparable mortality with significantly reduced healthcare utilization;

Gram-negative bacilli, particularly Escherichia coli, are the predominant pathogens in postoperative peritonitis, with a worldwide trend toward increasing rates of multidrug-resistant organisms, including ESBL-producing Enterobacterales.

What this Study Adds

In a Moroccan tertiary center, in-hospital mortality following reintervention for postoperative peritonitis reached 61.7%; on univariate analysis, SOFA ≥ 10 (OR 6.97; p = 0.002) and generalized peritonitis (OR 3.24; p = 0.037) were significantly associated with mortality, while 37.8% of deaths occurred within the first seven days, underscoring the impact of delayed source control;

Clinico-biological criteria guided the decision to reoperate in 66.7% of cases, underscoring the central role of clinical surveillance and serial biomarker monitoring when access to CT imaging is limited or delayed;

The microbiological profile revealed an ESBL rate of 18.5% among Enterobacterales and Candida spp. isolation in 16.7% of patients, supporting the need for locally adapted empirical antimicrobial strategies that account for both bacterial resistance and fungal risk.

Competing Interests

The authors declare no competing interests.

Authors' Contributions

SL: data collection, critical revision of the manuscript. KZ: data collection, manuscript drafting. OTJ: data collection, critical revision of the manuscript. LB: data collection, critical revision of the manuscript. SC: data collection, critical revision of the

manuscript. AM: supervision, critical revision of the manuscript. MAB: supervision, critical revision of the manuscript. All authors have read and approved the final version of the manuscript.

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