



## ANALYSIS OF EARLY RELAPAROTOMY AFTER GASTROINTESTINAL SURGERY

Graziano Giorgio Maria Paolo, Mirko Campisi and Graziano Antonino

Department of Surgical Medical Sciences and Advanced Technologies G Ingrassia Policlinico Catania

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### ABSTRACT

**Introduction :** The term "relaparotomy" (RL) refers to the laparotomy performed within 60 days of the first operation, while the term "initial RL" refers to the laparotomy performed within 21 days of the first operation. The aim of this retrospective study is to evaluate how many RLs have been performed for complications and to analyze the reasons and results of the RL and the factors that influence the associated mortality rate

**Materials and methods:** The study was carried out from January 01.01.1999 to December 31.12.2003 retrospectively consulting 104 patients through the database and the medical records of the AOU Policlinico University of Catania. Department of surgical medical specialties II. In the selection of patients subjected to RL, the parameters analyzed were: age, sex and initial diagnosis; pre- and per-operator results; surgical procedures applied during and the complications occurred during the first operation; the results of emergency RLs and not. Mortality rates and the reasons that led to the choice of RL were also studied.

**Results:** In the period under study, RL interventions were performed in (1.4%) 104 patients out of 8000 cases of abdominal surgery. The number of male and female patients was 73 (70%) and 31 (30%), respectively. Their age was on average 65 (50-80) years. Sixty two (60%) patients were operated in emergency conditions, 23 (20%) had infections, 21 (19%) had tumors and 52 (50%) patients had co-morbidities at the time of the first surgery. (Ischemic heart disease with stent, decompensated diabetes, COPD., cerebral vasculopathies) The surgical interventions performed and examined concerned the gastrointestinal system.

**Discussion:** The incidence of urgent relaparotomy complications was 1.4% in patients undergoing abdominal / surgical surgery [2, 3, 4, 5, 6, 7, 8]. Consistent with previous studies, the RL requires the onset of complications that can be classified into 5 groups: (i) haemorrhage in the intestinal canal or abdominal cavity (ii) peritonitis that occurs in the absence or presence of a perforation (iii) mechanical or paralytic postoperative ileus (iv) (v) various complications [2, 9]. The incidence of complications requiring UAR varies depending on the characteristics of the disease of hospitalized patients and the types of surgical interventions they have received [3]. On the other hand, a surgery performed earlier than required is not without risk. In our study "Urgent requiring surgery" complications were assessed, no difference was found in terms of mortality between UAR in patients operated for malignant reasons and those in patients operated for benign reasons. Similarly, the sex, the existence of the infection, the execution of surgical interventions in urgent conditions or co-morbidities did not influence the mortality following an RL

**Conclusions:** There remains the difficulty of the decision when it is necessary to proceed to an RL without the latter aggravating the critical condition of the patient. The precociousness in the implementation of the RL if necessary reduces mortality. The right timing "that varies from patient to patient, depends in our opinion on the experience of the surgeon" is one of the factors that have reduced the mortality rate. Finally the intestinal anastomosis procedure with mechanical sutures reduced the rate of RL.

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### INTRODUCTION

The term "relaparotomy" (RL) refers to the laparotomy performed within 60 days of the first operation, while the term "initial RL" refers to the laparotomy performed within 21 days of the first operation. (1,2) The RL must manage the complications of the previous intervention, and carry out a delayed curative surgery. 2,3, complications are frequently observed after gastrointestinal system surgery and RL is often necessary to manage these complications. 2 The aim of this retrospective study is to evaluate how many RLs have been

performed for complications and analyze the reasons and results of the RL and the factors that influence the associated mortality rate.

### MATERIAL AND METHODS

The study was carried out from January 01.01.1999 to December 31.12.2003, retrospectively consulting 104 patients through the database and the medical records of the AOU Policlinico University of Catania. Department of surgical medical specialties II. In the selection of patients subjected to RL, the parameters analyzed were: age, sex and initial diagnosis; pre- and per-operator results; surgical procedures applied during and the complications occurred during the first

\*Corresponding author: **Graziano Giorgio Maria Paolo**  
Department of Surgical Medical Sciences and Advanced  
Technologies G Ingrassia Policlinico Catania

operation; the results of emergency RLs and not. Mortality rates and the reasons that led to the choice of RL were also studied. The observed complications were studied determined by performing haematological and radiological examinations (CT and MRI) fig. 1,2

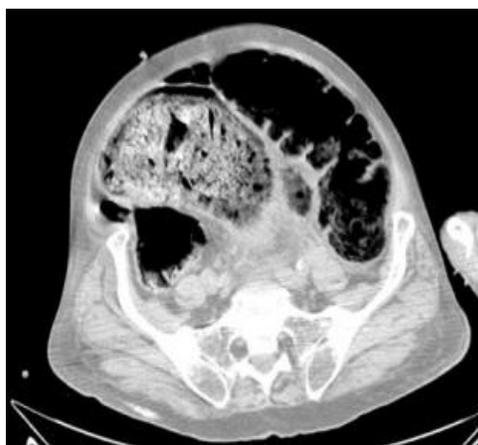


Fig 1 Rx intestinal perforation fig 2 Ct occlusion intestinal and observing the alterations of the patient's general condition or detecting the existence of blood or inflammatory material or faecal intestinal content that caused peritonitis in the postoperative period. The decision criteria for a Lap laparotomy were: a) existence of hemorrhage, b) existence of progressive peritonitis, c) existence of abscess in which the percutaneous drainage was ineffective, d) continuous contamination of the abdominal cavity of fecal content, e) existence of necrosis, f) existence of paralytic ileus resistant to medical treatment. all patients received second generation cephalosporin prophylaxis or penicillin prior to surgery and additional antibiotics were administered in the postoperative period. whose duration was on average 20 (15-25) days, and were used in accordance with the culture / antibiogram results in patients who required an RL. During the period examined, RL interventions were performed in (1.4%) 104 patients out of 8000 cases of abdominal surgery. The number of male and female patients was 73 (70%) and 31 (30%), respectively. Their age was on average 65 (50-80) years. Sixty two (60%) patients were operated in emergency conditions, 23 (20%) had infections, 21 (19%) had tumors and 52 (50%) patients had comorbidities at the time of the first surgery. (Ischemic heart disease with stent, decompensated diabetes, COPD., cerebral vasculopathies) The surgical interventions performed and examined were related to the gastrointestinal system (Table 1).

**Table 1** First surgical interventions that require RL

first laparotomy	N (%)
-Colon and rectum	25 (24.1)
-Small intestine	10 (9.61)
-Appendix	9 ( 8,.6)
-Stomach	12 ( 11.60)
-Duodenum	12 (11.60)
HPB**	8 (7,95)
-Liver	4 (3.90)
-Gall Bladder	5 (3.70)
-Pancreas	3 (2.96)
Multi-organ	2 (1.90)
Vascular	2 (1.90)
Gyneco-pathological interventions	2 (4.94)
Strangulated umbilical	4 (3.90)
Peritonitis	4 (3.90)
Spleen	2 (3.90)

\*\* Hepato-pancreatico-biliary

The most common cause of RL was intestinal repair of anastomosis (n: 39, 37.61%), and the most common reason for mortality in our series was sepsis and multi-organ failure (MOF) (Table 2).

**Table 2** RL reasons and mortality rates

RL* reason	n (%)	Mortality n (%)	Cause of Mortality	n
Intestinal content	25 (24.1)	9 (9,.80)		
- Intestinal repair site or anastomosis failure	35 (33.71)	12(12.00)	Sepsis and MOF	9
			Cardiac	2
			Respiratory	1
			Thromboemboli	2
- Intestinal perforation	10(10.0)	5 (5.00)	Sepsis and MOF	3
			Respiratory	2
Hemorrhage	12 (11.90)	4 (4,00)	Coagulopathy	2
			Hypovolemic shock	2
Intraabdominal infection or abscess	4 (4.00)	2 (2.00)	Sepsis and MOF	2
Intestinal necrosis	6 (6.00)	6 (6.00)	Thromboembolism	4
			Sepsis and MOF	2
Stomal complications	5 (5.00)	-		
Ileus	3 (3.00)	1 (0,90)	Respiratory	1

\* Urgent abdominal re-exploration.

The mortality rate after UAR \* was found to be 38.70% (n: 104). The urgent Relaparotomy ( UAR \*) was conducted twice or more in 14 (13.00%) patients., and the average number of re-explorations was 1.00. The mortality rate was 38.70% (n: 104). Table 3 describes patient demographics and mortality statistics. Table 3

**Table 3** Patient demographics and features of surgical interventions

		n (%)	Mortality n (%)
Sex	Male	73 (70.00)	27 (26.00)
	Female	31 (30.00)	12 (12.00)
Surgery	Urgent	73 (71.00)	34 (32.80)
	Elective	31 (29.00)	5 (5.00)
Infection in first operation	Yes	23 (22.00)	9 (9.90)
	No	81 (78.00)	30 (28.00)
Tumor	Yes	21 (19.00)	6 (5,70)
	No	83 (79.00)	33 (32.00)
Accompanying disease	Yes	52 (50.00)	14 (13.00)
	No	52 (50.00)	25 (23,80)
Number of UARs*	One	73 (71.00)	12 (11.00)
	Multiple	31 (30.00)	37 (36.00)

\* Urgent abdominal re-explorations

Mortality rates after UAR in the Gastro Intestinal surgery (n: 45/104, 38.70%) were significantly higher than those in other

types of surgical interventions (n: 59/104, 22.1%). Likewise, mortality and sepsis / MOF-dependent mortality rates that occurred after UAR were significantly higher in patients undergoing gastro-intestinal surgery than those who received other types of surgery. The mean age of patients who died after the initial UAR was 63 (range 55-71), while that of surviving patients was 65 (range 45-85). The mean interval between the first operation and the UAR and the average hospitalization time was 13.5 (interval 7-20) and 41 (range 14-68) days, respectively.

## DISCUSSION

The incidence of urgent relaparotomy for complications was 1.4% in patients undergoing abdominal surgery [3, 4, 5, 6, 7, 8]. Consistent with previous studies, the RL requires the onset of complications that can be classified into 4 groups: a) haemorrhage in the intestinal canal or abdominal cavity b) peritonitis that occurs in the absence or presence of a perforation c) mechanical or paralytic postoperative ileus d) various complications. The incidence of complications requiring UAR varies depending on the characteristics of the disease, hospitalization and the types of surgery they received. The RL have been reported to control the release of intestinal contents in the abdominal cavity (repair anastomosis: n: 34/81, 41.97%, and intestinal perforation: n: 8/81, 9.87%). Other common causes were hemorrhage (18.51%); and infection or intra-abdominal abscess (9.87%). Regardless of their incidence, these complications had in common a life-threatening nature. Thus, immediate diagnosis of complications and urgent interventions with the execution of RL can save many lives. But Despite early detection and therapeutic progress, mortality rates after UAR are still high, ranging between 3% and 38.70% depending on the severity of complications (9, 10, 11, 12, 13). One of the most important factors affecting mortality rates in UAR is the need for RL. In our study, we have seen that. Another important factor affecting mortality is the organ on which relaparotomy is performed. Consistent with this vision, in our clinical study the mortality rate is higher in gastrointestinal surgery interventions, and in particular for septic complications. Although different surgical centers report different values, there is a common consensus such as (14, 15, 16, 17, 18), immediate diagnosis (ideally within the first 36 hours of operation) and early surgical intervention accompanied by the removal of the local infectious process, improve the metabolic problems [19, 20, 21, 22]. However, determining the focus of sepsis may not be possible in all cases. Mulier *et al*, showed the existence of residual peritonitis in 9% and 41% of cases. results may partly explain why sepsis persists as a result of reexaminations conducted for the treatment of infectious complication. In our study, the most common cause of mortality was found with MOF secondary to sepsis (n: 35, 33, 71%). The mortality rate after a single RL event was 11.6%, respectively, against multiple interventions, which was 36.00%, confirming the positive correlation between the number of RLs and mortality rate. This increase in mortality rate following multiple RL can be caused by residual infections, inadequately treated previous complications or new complications following RL and reduction of patient's reserves. (23, 24, 25, 26) This hypothesis is supported by the fact that mortality rates are higher in older patients who have the highest mortality rates and this depends in our opinion on the etiology, but not on the number of RL. R surgery for the

treatment of an intra-abdominal septic focus is due to a multiorganic insufficiency. The studies included our confirmation that the early diagnosis after the first abdominal surgery and the management by early RL of the intraperitoneal sepsis decreases the MOF (multi-organic insufficiency present in 20% of cases) The mortality rate after re-exploration in cases where it was identified the treatment-resistant sepsis was 38.70%, this incidence although high suggests that the surgeon should consider performing an RL [27, 28, 29, 30, 31]. the earlier on the other hand, although there is no unanimous consensus on when and how to intervene on the septic complications of abdominal operations. Literature data states that performing a UAR "with the right timing" [32, 33, 34, 35]. Mortality rates were reduced in cases immediately diagnosed undergoing UAR Desiaterik *et al*. And Zavermyi *et al*, [36, 37]. However, because "right timing" varies from patient to patient, "the surgeon's experience" is one of the factors that reduce the mortality rate. Another case that requires an RL is the postoperative haemorrhage. These hemorrhages may come from either the incision line or may present as upper or lower intestinal gastro bleeding. Postoperative hemorrhage rate following abdominal surgery with mortality was 4%. Postoperative follow-up was needed to determine the origin of intraperitoneal hemorrhages. I This was the result of adequate and appropriate preoperative preparation and early detection of patients with a risk of bleeding. Although the mortality rate was somewhat higher than the averages reported in the literature However, the bleeding in these cases were caused by technical errors (such as inadequate haemostasis) in the first operation. Also in the postoperative minor hemorrhage that although could be followed conservatively. To avoid recurrent blood transfusions due to long-lasting bleeding that may develop disseminated intravascular coagulopathy. We preferred to implement an RL.

The mortality rate in postoperative hemorrhages was 4% a depending on the delays in the diagnosis. and in geriatric patients. Abundant bleeding after coagulopathy has been found in ONLY ONE exitus Patient Another obstructive cause of adhesions, [38, 39, 40]. The risk of adhesions exists throughout life after laparotomy. The percentage of ileum obstructions following abdominal operations was 0.90%. in patients who developed intestinal obstruction an immediate diagnosis, and the implementation of a RL with a decompression are effective in treatment. However, the difficulty of deciding when to operate patients remains. Ellozy *et al*. They suggested that since 87% of obstructions of the postoperative small intestine can be reversed by gastric nasal decompression, the wait will be useful. In our study, 3 cases (0.90%) were diagnosed with early postoperative ileus obstruction. The obstruction was resolved following RL. On the other hand, a surgery performed earlier than required is not without risks. In our study, "urgent requiring surgical interventions" were assessed, a difference in mortality among UARs was not found in patients operated for malignant reasons and those in patients operated for benign reasons. In the same way, sex, the existence of the infection, the execution of surgical interventions in urgent conditions or co-morbidities did not influence mortality following an RL.

## CONCLUSION

The most effective way to reduce rates of UAR and mortality is to "avoid possible complications during the first surgery" in the first instance. In the RL we did not notice any difference between malignant or benign disease in terms of mortality. The difficulty of deciding when it is necessary to proceed with an RL remains without the latter aggravating the patient's critical condition. The precociousness in the implementation of the RL if necessary reduces mortality. The right timing "that varies from patient to patient, depends in our opinion on the experience of the surgeon" is one of the factors that have reduced the mortality rate. Finally the intestinal anastomosis procedure with mechanical sutures reduced the rate of RL.

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