

Which Surgical Strategy in Sepsis from Retro Peritoneal Colic Perforation

Graziano Giorgio Maria Paolo*, Buffone Antonino and Graziano Antonino

Medical School University of Catania, Italy

*Corresponding author: Graziano Giorgio Maria Paolo, Department of Sciences, Medical of surgery and technology advanced "G Ingrassia" Medical School University of Catania Via S Sofia 78 Cap 95215 Catania, Italy



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ABSTRACT

Introduction: In the last decade, attention has been paid to severe abdominal infections which, due to their severity and difficulty in treatment, cause death in 30-60% of cases [1-6]. In this article the surgical strategies in abdominal infections due to colonic perforation are discussed.

Materials and Methods: The study was carried out on 12 patients from January 01.01.2015 to December 31.12.2018 consulting in retrospect the Database and medical records of 'AOU Policlino University of Catania. Department of Medical Surgical Specialties II. In the selection of patients undergoing surgery for retro peritoneal intestinal perforation n 10 cases affected the colorectal, n 2 ileum cases, Patients n 8 were male, and the remaining 4 cases were female with an average age of 62 years [7-61].

Result: Alongside the known advantages of the minimally invasive approach (20% of cases treated) such as less postoperative pain, shorter hospital stays, less morbidity, in cases of acute abdomen the possibility of avoiding at first was considered instance the laparotomy, burdened by itself with a morbidity that varies from 5 to 22% [6,62,63] and the possibility, in case of conversion, to perform a laparotomy "calibrated" to the clinical picture, in the presence of perforations from more than 24 hours, with a diameter > 1 cm, in addition to a poor performance status and / or hemodynamic instability.

Discussion: The data in the literature agree in affirming the central role of surgery in the treatment of patients with abdominal sepsis [1-6,11-13,62], but despite the progress of the last few years the mortality of these patients remains unacceptably high (30-60%) and more often than not more interventions are needed surgical procedures aimed at eradicating sepsis. The objectives of the surgical treatment were:

- a) The timely diagnosis of sepsis.
- b) The identification and elimination of all the collections.
- c) The repair or removal from the peritoneal cavity of the source of contamination ne.
- d) Closure of the abdominal wall without high tension
- e) Careful monitoring of any septic persistence or recurrence. Control of the peritoneal contamination source was obtained by resection of colonic perforation of the entire segment -ressed and the creation of an upstream enterostomy (Hartmann's intervention) which represents the most rational choice since a primary anastomosis packaged in a septic medium has a high probability of dehiscence.

Conclusion: In cases of retroperitoneal sepsis, as well as in the adequate evacuation (surgical and / or percutaneous) of the infected collections, an effective antibiotic therapy, with an adequate nutritional supply that represents the most effective therapeutic scheme, The most important success variables identified are the careful selection of patients and the availability of a medical (Intensiva therapy) and surgical team dedicated to this pathology.

Introduction

In the last decade, attention has been paid to severe abdominal infections which, due to their severity and difficulty in treatment, cause death in 30-60% of cases [1-6]. Despite the improvement of diagnostic techniques, selective antimicrobials, and an effective system for monitoring critical parameters, diffuse peritonitis remains a real challenge, due to the complexity and multifactorial nature of the functional deficits that characterize its decoration, both for the different answer that the single organism succeeds in giving to the treatment, the latter peculiarity that determines a difficult one. Framework of safe driving parameters, in the timing and monitoring of the therapeutic treatment as well as of the organism's response to it. the knowledge of the anatomy of the retroperitoneal space constitutes an essential support for the correct diagnostic and therapeutic approach to the infections that develop in it [2-4,62-65]. The pelvic retroperitoneal area is therefore divided into 4 spaces : prevesical (between pubis and bladder), retescerical (between bladder and rectum), presacral (between rectum and sacrum), bilateral perirectal From the etiological point of view, we can distinguish between primitive and secondary forms. In primitive retroperitoneal infections, the germs responsible are *Stafilococcus Aureus* strains, although streptococci [66-68], *E. Coli* [69-71], *Proteus mirabilis* [72-74], *Brucellar spp* (are isolated) are isolated [75,76].

In secondary retroperitoneal infections are due to direct contamination by contiguous structures, mainly due to gastrointestinal diseases (Crohn's disease, diverticulitis, pancreatitis, colon cancer) or renal disease. from post-traumatic pathologies, post-operative infections, iatrogenic maneuvers (eg duodenal perforation during CPRE), coagulopathy or anticoagulant therapy, osteomyelitis. The most commonly isolated germs are Gram negative and anaerobic of gastrointestinal origin, such as *E. Coli* and *Bacteroides Fragilis* (1. a bacterial peritonitis,) is evaluated with a currently most used system which is the APACHE II (Acute Physiologic and Chronic Health Score) of Knaus [76-79] which has a great predictive value. In 1997 Ohmann [1] and Peritonitis Study Group proposed a new prognostic model (Prognostic Peritonitis Model, PPM), in the end identifying patients with an unfavorable outcome and a high risk of infectious complications. the classification system of the severe forms involves the evaluation of the anatomic-physiological parameters, the extension of the process, the nature of the contamination, highlighting the differences in the charge and in the bacterial contaminant stipe, the presence of associated tissue necrosis, as well as the persistence of a continuous source of contamination. Finally, these data are associated with the evaluation of the nutritional status, the immune status and the time between the pathogenic insult and the therapy. This complex data acquisition provides the surgeon with the elements to select patients who require more aggressive treatment. In this article, surgical strategies in abdominal infections due to colonic perforation with sepsis are discussed.

Materials and Methods



Figure 1: CT Treo Peritoneal Abscess.



Figure 2: Echography Retroperitoneal Abscess.

The study was carried out on 12 patients from January 01.01.2015 to December 31.12.2018 in retrospective consultation of the Database and the medical records of the AOU Polyclinic University of Catania. Department of Medical Surgical Specialties II. In the selection of patients undergoing surgery for retro peritoneal intestinal perforation n 10 cases affected the colorectal, n 2 ileum cases, Patients n 8 were male, and the remaining 4 cases were female with an average age of 62 years [7-61] retroperitoneal infections, especially in primitive forms, have often been characterized by a considerable diagnostic delay (2weeks on average). Unspecified symptoms and non-specific signs were fever, tenderness, asthenia, leukocytosis. Only in the most advanced phases accompanied by the development of masses, and the rapid deterioration of the general conditions do they constitute an important alarm bell. In 5% of cases, the clinical onset was a full-blown septic shock with the presence of a MOF. From the diagnostic point of view, the advent of new imaging techniques has revolutionized the approach

to retroperitoneal infections: ultrasound (Figure 2) and computed tomography, as well as having a specificity of 77%, a sensitivity of 100% and a diagnostic accuracy around 88% [74], are particularly suitable for the study of retrofascial musculature and the renal compartment (Figures 1 & 2).

The information on the morphology and on the relationships with the adjacent structures were fundamental for the planning of the surgical strategy to adopt; of utmost importance was the taking of samples for culture tests, with the consequent administration of targeted antibiotic therapy. magnetic resonance, particularly suitable for studying the bone compartment of the retroperitoneum, was also able to make a differential diagnosis with hematomas (Figure 3). The objectives of the treatment were:



Figure 3: CT Intraparenchymal Abscess.

- a) Intensive support for the restoration and stabilization of the peripheral circulation with the attainment of an adequate tissue oxygenation.
- b) Adequate nutritional support, initially centralized but as soon as possible enteral.
- c) Careful selection and administration of antimicrobial agents.
- d) Early and aggressive surgical treatment in order to: Control the source of infection. Evacuate the purulent material and necrotic tissues. Decompress the abdomen; recurrent infection. In the treatment of retro peritoneal infections, percutaneous drainage under radiological guidance combined with adequate antibiotic therapy was preferred as the patient's first approach. the indications to perform a laparoscopy in case of acute abdomen were:
 - 1) The cases in which the diagnosis was not possible with less invasive methods or remain doubtful.
 - 2) The need to obtain a rapid diagnosis (always when this is not possible with non-invasive diagnostic procedures).
 - 3) When a diagnosis is made there is the possibility of a laparoscopic treatment.

Result

Alongside the known advantages of the minimally invasive approach (20% of cases treated) such as less postoperative pain, shorter hospital stays, less morbidity, in cases of acute abdomen the possibility of avoiding in the first instance the laparotomy, weighed down by of a morbidity that varies from 5 to 22% and the possibility, in the case of conversion, of performing a laparotomy "calibrated" to the clinical picture, in the presence of perforations for more than 24 hours, with a diameter > 1 cm, in addition to a poor performance status and / or hemodynamic instability, were the factors that indicated for an "open" approach (9 cases equal to 80%), "free" colic perforations rarely gave indications to a laparoscopic surgical treatment. The only cases in which colonic perforations during colonoscopy may have been indicated. Percutaneous drainage (5 cases equal to 45%) was suitable in the approach of the abscess forms, located in the perirenal and retro fascial compartment, constituting in these cases a valid and effective alternative to more invasive surgical procedures.

A further advantage of percutaneous drainage was the possibility of determining, through the evacuation of most of the purulent component, an improvement in the septic picture in unstable and high-risk patients; in these conditions, more aggressive surgical therapies were performed with greater probability of success and lower operating risks. Surgery in retroperitoneal sepsis, the highly contaminating transperitoneal pathway, is not very effective, it has been avoided. The preferential routes of access have been those extraperitoneal, on the right or left side with possible muscle section. In our experience on retroperitoneal septic processes, or colonic perforations, the lombotomy sec. Fey with removal of the XI or XIIth coast allowed a wide exposure both of the upper portion of the retroperitoneum, towards the diaphragm, and of the lower one, towards the small pelvis. the evacuation of the necrotic-purulent material was complete. at the end of the intervention, they positioned themselves in the residual cavity of the drains in a sloping position both inlet and outlet; in order to carry out continuous washing to clean the back cavity. extraperitoneal access was effective, in addition to the primitive forms, also in the perirenal ones, in the flows from necrotic-hemorrhagic pancreatitis, in duodenal perforations during endoscopic maneuvers, in the form's secondary to osteomyelitis, postraumatic, from hematoma superinfection. In secondary forms of perforations - colic or ileal (Crohn's disease, diverticulitis, neoplasms, acute appendicitis) - and in intestinal anastomotic dehiscences, intraperitoneal time was required for the treatment of the primary source of infection with macrophages exposed to the action of bacterial toxins, reflects the magnitude of the peritoneal contamination, to which a higher mortality was correlated. Metabolic, respiratory and immunological imbalances constitute the pathogenetic substrate of the - organ (Multiple Organ Failure, MOF) present in 20% of the observed cases, with a sequential impairment of the functionality of different organs and systems, which undoubtedly represents the most important cause of death in patients with severe abdominal sepsis admitted

to the wards intensive care. In an attempt to avoid the unfavorable outcome by correcting the hemodynamic response and supporting the function of the various organs, an adequate nutritional regime was introduced, initially parenteral but as soon as possible enteral, aimed at satisfying the high energy requirements and reduce the effects of calorie-protein malnutrition quickly established.

On average after 20 days it was possible to replace the parenteral with the enteral one which has an important role in maintaining the integrity of the barrier and the intestinal immune system the diet was enriched with arginine, glutamine and omega-3 fatty acids, which represent important factors of trophism of the intestinal mu-thing. in the therapeutic options the spectrum of the various antibiotics, the dosage and the modalities of administration, the drug-dynamics, and above all their effectiveness in the comparisons of the germs more often involved in the abdominal infectious process was taken into consideration. The choice (Table 1) took into account the clinical characteristics of the individual patient, of the pathology leading to abdominal sepsis, also taking into consideration that the possible presence of resistant germs and the potential side effects of anti-microbials.

Table 1: Scheme of empirical therapy in severe peritonitis.

Antibiotic	Dosages
Metronidazole 500 mg e.v.	Every 6 h + Cephalosporins of 3 rd gen Variable depending on the drug
Amoxicillin / ac. clavulanico 2,2 g e.v	Every 8
Piperacillin / tazobactam 4.5 g e.v	Every 8 h
Fluoroquinolone	S Variable depending on the drug
Imipenem 500 mg e.v	Every 6 h / 1 g every 8 h
Meropenem 1 g e.v	Every 8 h
Tigecycline + ev	Anti-Pseudomonas drug 100 mg e.v. the 1st dose then 50 mg e.v. every 12 h
Ceftriaxone 2 g e.v	Every 24 h
Ceforaxime 2 g e.v	Every 8 hours
Cefepime 2 g e.v	Every 12 h + Metronidazole 500 mg e.v. every 6 h

Discussion

The literature data agree in affirming the central role of surgery in the treatment of patients with abdominal sepsis [80-86], but despite the progress of recent years mortality of these patients it remains unacceptably high (30-60%) and more often than not more surgical interventions aimed at eradicating sepsis are required. The objectives of the surgical treatment are:

- The timely diagnosis of sepsis.
- The identification and elimination of all the collections.
- The repair or removal from the peritoneal cavity of the source of contamination.
- Closure of the abdominal wall without high tension.

e) Careful monitoring of any septic persistence or recurrence [87-89,7-9] The control of the peri-tonal source of contamination is was obtained by the resection of colonic perforation of the interested segment and the creation of an upstream enterostomy (Hartmann's intervention which represents the most rational choice since a primary anastomosis packaged in a septic medium has a high probability of dehiscence [10-14].

A different attitude was instead adopted if the lesion is dependent on the small intestine: after the re-section of the perforated tract (also considering the time elapsed between the onset of the lesion and laparotomy,) it was possible to package a direct anastomosis, with a low risk of dehiscence [15-19]. The direct suture represents a choice between therapists [20-25]. Linked to the complete cleansing of the abdominal cavity from the spilled substances (bile, enteric juice, food, faeces) and from the branches of fibrin, with intra-operative pe-ritoneal lavage [26-30]. in order to reduce the quantity of bacteria and foreign substances, without interfering in the local defense mechanisms [31-35].

With the addition of antibiotics and antiseptics to the washing solution they do not improve the results in patients receiving an appropriate systemic antimicrobial treatment [36-40]. Eradicating the source of sepsis with the intervention represents therefore also in our experience the central moment of the therapy [41-45] the need to carry out further interventions significantly reduces the survival rate: This shows in our opinion how the complete cleansing of the cavity abdominal prurulent material represents the therapeutic pivot in these patients the important role of surgery in breaking the vicious circle that characterizes the natural history of sepsis [46-51] is represented by the most used strategies which are: a) relaparotomy b) continuous postoperative peritoneal lavage c) open surgical wound (laparostomy). Codest relaparotomy are technically more difficult, burdened by high morbidity The use of relaparotomy [52-56], in which the new surgical exploration is carried out when indicated by the instrumental and/or clinical diagnostic data, implies, a surgical rescue attempt when by now the specific defense mechanisms of the patient are severely worn down, with imminent appearance of MOF [57-61]. In these cases, the chances of survival are low, not exceeding 24% [90-95]. Clinical studies have shown that the technique of continuous washing of the peritoneal cavity through inlet and outlet drains, repeated for 4-72 hours [96-101]. there is no evidence that there are any beneficial harmful effects of irrigation against which this type of treatment was limited only to cases of severe acute pancreatitis [102-112] carried out only in initial infectious processes with confined collections or whose short-term results were not significant [113-116].

Conclusion

In cases of retroperitoneal sepsis, as well as in the adequate evacuation (surgical and/ or percutaneous) of the infected collections, an effective antibiotic therapy, with an adequate nutritional supply represents the most effective therapeutic scheme. In the presence of complications, especially in critical

patients with high score APACHE II. although we do not yet have safe guide parameters in defining the extent of infection in the timing and in the selection of patients who require more aggressive and early surgical treatment in order to control the source of infection. The most important success variables are the careful selection of patients and the availability of a medical (Intensiva therapy) and surgical team dedicated to this pathology, which due to its complexity and multi-factorial nature represents a very demanding challenge.

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Conflict of Interest

No conflict of interest.

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