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Hostile Abdomen, A Review of the Current Literature

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ABSTRACT

The patient with a hostile abdomen is a challenge, where the abdominal cavity is open, with the edges retracted, healed and compacted into a single block of fibrous tissue that does not allow its adequate dissection or separation, carrying a high risk of injury to the intestinal loops. and appearance of concomitant fistulas. The term catastrophic abdomen was used for the first time in 1937 by Abell I, describing a dramatic post-surgical condition, involving the presence of intestinal leakage in an open abdomen with severe adhesions, having a high associated mortality.

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INTRODUCTION

The hostile abdomen is defined as a situation where the abdominal cavity is open, with retracted edges, healed and compacted, in a single block of fibrous tissue that does not allow its adequate dissection or separation.1

Being the consequence of multiple interventions, the purpose is to be able to carry out an adequate emergency control of life-threatening pathologies such as secondary peritonitis, active bleeding, severe pancreatitis, anastomotic leak or the use of damage control surgical techniques, open abdomen for management of compartment syndrome, abdominal sepsis, Crohn's or peritoneal carcinomatosis.1,2

Any peritoneal injury activates the inflammatory cascade, angiogenesis, peritoneal fibroblastic activity, and fibrin and collagen condensation. Consequently, fibrous bands are formed between organs and tissues, being more frequent between intestinal loops and the abdominal wall. This represents a problem in the face of a subsequent laparotomy or laparoscopy due to the performance of extensive adhesiolysis that prevents adequate exposure, the main complication being inadvertent enterotomy with an incidence of 20%, surgical times are prolonged, there is blood loss, sepsis and adhesions, among other complications.3

The history of abdominopelvic surgery conditions the presence of adhesions in a period of 5-10 years, associated with high cost in relation to hospital readmissions; around 67 million in the UK are due to chronic abdominal pain, intestinal obstruction and infertility. In addition to representing difficulty, not only in the exposure of the cavity but, extending the average surgical time to release these adhesions, which fluctuates between 1 to 240 minutes, the anesthesia time is prolonged as well as the hospital stay. Despite the importance of this entity, only 14.4% of physicians report adhesion formation as a complication and only 10% record it in the informed consent. Due to the aforementioned medical-surgical impact, associated with high morbidity and mortality, the difficulty of its therapeutic approach, and the need to know the complexity of the events that lead to its establishment, a review of the current literature on management in these cases is of vital importance 4.

PATHOPHYSIOLOGY

A hostile abdomen is usually the consequence of multiple surgical interventions (>2), secondary peritonitis, severe acute pancreatitis, anastomotic leak, ostomies, staged management of abdominal trauma, decompressive laparostomy, Crohn's disease, peritoneal carcinomatosis, or extensive radiotherapy. There are biological agents capable of developing this entity, such as Mycobacterium tuberculosis, which causes peritoneal tuberculosis, which in severe cases manifests as a hostile abdomen. There are factors involved in the genesis of peritoneal adhesions that culminate in a hostile abdomen and that can present from the first

surgical event such as: external agents (talcum powder, sutures, textiles, drains, prosthetic materials, etc.), surgical technique (management of tissues, excessive use of electro-coagulation, abundant bleeding, prolonged surgical time, use of bio-adhesives etc).5,6,7

DIAGNOSIS

The main criteria that help in the prediction of a hostile abdomen include data from the history. From a clinical point of view, the hostile abdomen is a surgical catastrophe. The patient frequently presents altered intestinal transit (intestinal occlusion), abdominal pain, signs of abdominal sepsis, and anastomotic leaks, which is why surgical intervention is frequently indicated.7

The diagnosis of hostile abdomen can be suspected from the pre-surgical clinical evaluation, however, most of the times it is a trans-operative diagnosis. The surgeon's subsequent evolution depends to a large extent on the decision-making that the surgeon makes at that moment. Within cabinet studies, abdominal X-rays can show data of intestinal occlusion with air-fluid levels and dilated loops. Abdominal tomography with oral contrast can reveal thickening of the wall of the intestinal loops and the mesentery, interposed or diffuse loops with areas of partial stenosis in various segments of the intestine, retractile mesenteritis, and even in severe cases calcifications in the peritoneum. 8

Indices have been described for the preoperative detection of a hostile abdomen and thus predict the incidence of transoperative complications given its inherent surgical difficulty. The criteria they use are based on preoperative findings (anamnesis) and intraoperative findings (adhesions), however these indices have not been used systematically in worldwide surgical practice.8

The factors that predispose to suture dehiscence and subsequent enterocutaneous fistula or enteroatmospheric are as follows: level of anastomosis or suture, being related to a greater risk in sites of greater bacterial flora and less vascularity; emergency resection, hypoxia, vasoconstriction, disease pulmonary disease, cardiovascular disease, diabetes mellitus, long-term use of systemic corticosteroids, excessive suture line tension and asymmetry in the distal anastomotic or suture points. The classification and the treatment of these fistulas or leaks will depend on the debit considering: low output < 500 ml/24hr, high output > 500 ml/24hr.1,2,3,6

The Björck classification of the open abdomen is a strategy to determine the degree of adhesions in the abdominal cavity and position their complexity in four degrees from simple to more complex scenarios to prevent further deterioration and take appropriate actions for their management (Table 1).

Bjorck's classification 2009 (Table 1)	
Grade	Description
1A	Clean without adhesions
1B	Contaminated without adhesions
2A	Clean with fixed adhesions
2B	Contaminated with fixed adhesions
3	Complicated open abdomen, with fistula in formation
4	Frozen open abdomen, adhesions firm and intestines, impossible to close, with or without fistula.

Treatment

The management of the hostile abdomen requires a deep knowledge of the potential complications that can occur during poorly controlled evolutionary stages, such as intestinal failure, peritonitis, sepsis, abscess formation, enterocutaneous and enteroatmospheric fistulas, prolonged use of parenteral nutrition, syndrome short bowel disease as a result of multiple resections, recurrent intestinal occlusion, and high costs of care.9

For the management of the open abdomen, we propose three objectives for the use of these indications: anatomical, physiological and logistic. The indications Anatomical features refer to the inability to unite the facial edges, including the soft tissue defects. Physiological indications are related to characteristics of systemic dysfunction. Logistic indications involve any anticipated abdominal reoperation while preserving the fascia. These categories occur as a single reason or in any combination.9,10

In this understanding, the management of this type of patient should be directed by a multidisciplinary team in the Intensive Care Unit (ICU) having the experience to face this surgical challenge, individually and comprehensively. The pillars of treatment in the presence of a hostile abdomen are based on timely hemodynamic stabilization, initiation of

empirical antimicrobial therapy, adequate nutrition, and timely control of the infectious source using open abdomen management, together with temporary closure techniques to allow multiple abdominal revisions, reduce ongoing trauma to the abdominal wall, and control all of the above complications.9,10

Once the acute phase is over, before thinking about reoperating with the intention of restoring gastrointestinal continuity or correcting abdominal wall defects, it is necessary for the patient to be in optimal hemodynamic, metabolic, nutritional conditions and in the absence of infection accompanied by a adequate support and follow-up by psychology and nutrition, as well as a complete imaging diagnosis to approach the diagnostic suspicion more precisely, prior to definitive surgery for complications of the hostile abdomen.10,11

Consider a careful peripheral approach to the adhesion process, en bloc isolation of the adhered loops, avoiding intestinal injury above all without leaving aside the possibility of making definitive stomas. Surgical decisions depend on intraoperative findings, goal setting that benefits the patient, risk minimization, and performed in experienced hands. However, because it is a pathology of great complexity, high mortality, and its presentation not recognized at the time as a hostile abdomen, it is difficult to describe it as such.12

The presence of an important defect in the abdominal wall as an expected result, secondary to fascial retraction, should indeed be jointly repaired as a final step, with multiple options; component separation technique, artificial mesh prosthesis or autologous tissue with pedicled or microvascular flaps, which must be individually adapted. 13

CONCLUSIONS

The catastrophic abdomen or hostile abdomen is a surgical entity of great importance due to the loss of the different spaces between the organs of the abdominal cavity and the structures of the abdominal cavity. These alterations produce large anatomical changes due to a severe adhesion syndrome. The catastrophic abdomen is a challenge for surgeons to manage because apart from extensive knowledge, the support of other specialties is also required to combat this entity.

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