

Anastomosis dehiscence of gastrointestinal tract and digestive fistulas

Deiscência de anastomoses do tracto gastrointestinal e fístulas digestivas

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ABSTRACT

The loss of integrity of an anastomosis, is still a common complication that results in high mortality rates. Several techniques have been developed in intestinal anastomosis, either with handmade sutures as mechanicals, but still with a high prevalence of dehiscence and fistula. Gastrointestinal fistulas are defined by anomalous ducts which communicate with the gut other structure of the body, which may be a hollow intra-abdominal viscera, abdominal cavity, skin, or any other underlying organ. Fistulas usually derive from surgical complications, but may also be a result of some pathological inflammatory process. Sometimes fistulas can have high severity which results in prolonged hospitalization, as well as organic and emotional disorders for the patient. The purpose of this article is to review the literature on the gastrointestinal fistula subject, focusing on etiology, pathophysiology, classification, diagnosis, current therapy and prognosis.

Key-words: Digestive fistulas. Review. Definition. Pathophysiology. Therapy.

RESUMO

A perda da integridade de uma anastomose digestiva é ainda hoje uma complicação frequente que implica em altas taxas de letalidade. Várias técnicas de anastomose intestinal têm sido desenvolvidas, tanto com suturas manuais como mecânicas, porém ainda com um percentual de deiscência e fístulas proporcionalmente alto. Fístulas digestivas se definem por ductos anômalos que comunicam o tubo digestivo com outra estrutura do organismo, que pode ser uma víscera oca intra-abdominal, cavidade abdominal, pele ou qualquer outro órgão subjacente. As fístulas geralmente derivam de complicações de intervenções cirúrgicas, mas podem também ser resultado de

algum processo inflamatório patológico. Algumas vezes as fístulas podem apresentar alta gravidade o que resulta em internações hospitalares prolongadas, bem como transtornos de caráter orgânico e emocional para o paciente. O objetivo deste artigo é revisar a literatura sobre o tema, enfocando etiologia, fisiopatologia, classificação, diagnóstico e terapêutica atual.

Palavras-chave: Fístulas digestivas. Revisão. Definição. Fisiopatologia. Tratamento.

INTRODUCTION

Dehiscence of anastomoses are the most feared complications in postoperative surgery of the digestive tract¹. Consist of a structural defect of the intestinal wall, near the site of suture, presenting a communication between intra and extraluminal spaces. When the dehiscence is followed by formation of communication between two adjacent organs or between the organ and the external environment, we call digestive fistula (DF).²

Relatively infrequent, it can be associated with a diverse spectrum of presentation ranging from peritonitis and sepsis with radiological findings only, associated with minimal symptoms. A more detailed definition encompasses clinical findings (pain, peritonitis, positive biochemical markers, fever, tachycardia), radiological findings showing fluid collections or containing gas and intraoperative findings^{1,3,4,5}. The fistulas can affect any part of the gastrointestinal tract, with an incidence of 1-19%, occurring most commonly in esophageal and rectal anastomoses, as compared to other portions⁶⁻⁸. The DF is associated with high morbidity and mortality, resulting in longer hospital stays and costs and greater risk of re-operations and permanent stoma^{4,6}. The purpose of this article is to review the literature on the subject, focusing on etiology, pathophysiology, classification, diagnosis, prognosis and current therapy.

METHODOLOGY

References for this article were selected by searching in database sites using Medline, PubMed and Up to Date, using the following key words: *digestive fistulas, gastrointestinal fistulas, review*. Articles in English and Portuguese language published in the last 10 years, about fistulas and whose access to the full text was free were included. Of these, we selected articles that exposed definition, risk factors, classification, diagnosis and treatment of digestive fistulas. Articles in other languages and time greater than 10 years were excluded.

ETIOLOGY AND RISK FACTORS

The anastomotic leakage has a multifactorial etiology, linking intrinsic patient factors and intraoperative factors, which include the technique and experience of the surgeon (Table 1). Among the patient-related factors, are nutritional status, steroid use, obesity, smoking, alcoholism, cardiovascular disease, scores of American Society of Anesthesia (ASA) > 3, emergency surgery, male gender, advanced age, prior radiation,

rectal/anal anastomosis and primary disease of the digestive tract, such as Crohn's disease and diverticulitis¹.

According to the American College of Surgeons, obesity is the major risk factor for wound dehiscence. Prospective studies showed that anastomotic dehiscence occurred in 33% of obese patients, compared with 15% of non-obese in colorectal surgery with less than 5cm away from the anal verge. Smoking is responsible for microvascular disease, can cause secondary ischemia, favoring wound dehiscence. The alcohol worsens nutritional status. A multivariate analysis of dehiscence in 1417 colonic resections showed that ASA scores between 3 and 5 associated with emergency procedures are risk factors for its occurrence. Importantly, comorbidities such as diabetes mellitus, hypertension and cardiovascular disease, interfere with the ASA score and affect the microcirculation.¹

Among the intraoperative risk factors are prolonged operative time, blood loss, use of vasopressors and drain, proximal diversion and the local blood supply. The use of drains has been a subject of controversy for years. It is believed that they play an important role in draining fluids peri-anastomotic, thereby reducing the formation of abscesses, however, are associated with high incidence of dehiscence⁹. The consensus in general leave the discretion of the surgeon's decision to use them or not. In relation to the use of vasopressors, the contraindication is given by virtue of causing vasoconstriction in the microcirculation, affecting the blood supply. In addition, it has been reported that the use of non-steroidal anti-inflammatory postoperatively, replacing simple analgesics, is associated with higher incidence of this complication. Recent clinical and animal studies show that the effect of these drugs becomes detrimental to the healing process, whose inflammation is necessary and of importance in the early post-surgical. Furthermore, it is known that they have potential to attack the gastrointestinal mucosa and have anticoagulant effect¹⁰.

Table 1 – Risk factors for anastomotic fistula

Patient factors	Nutritional status (malnutrition / obesity)	
	Steroid use	
	Smoking	
	Alcoholism	
	CVD	
	ASA score > 3	
	Emergency surgery	
	Male	
	Age	
	Prior Radiation	
	Anastomotic rectal / anal	
	Primary disease of the digestive tract (ex. Crohn / Diverticulitis)	
	<hr/>	
	Intraoperative factors	Prolonged surgery
Blood loss		
Drain use		
Vasopressors		
Proximal deviations		
Local blood supply		

ASA, American Society of Anesthesiologists

As for proximal diversion, data not yet statistically validated show that the incidence of dehiscence are minor compared to those patients who have not undergone enterostomy deviations². Like dehiscence, fistulas present as risk factors for its emergence whole factor that interferes with the organ vascularization and disrupt the normal healing process.

CLASSIFICATION

The intestinal fistulas can be classified according to the flow for 24 hours: high (greater than 500 mL), moderate (between 200 and 500 ml) and low (less than 200 ml). This classification is able to determine the patient's prognosis and differentiate treatment. They may also be classified according to their anatomic location and etiology (Table 2)¹¹.

Table 2 – Classification of intestinal fistulae

Debt of drainage in 24 h	Anatomical location	Etiology
High >500 ml	Internal	Primary - Type I
Moderate 200 – 500 ml	External	Secondary – Type II
Low <200 ml		

The anatomical classification based on which gastrointestinal segment the fistula originated, may have direct communication with the skin (external) or with others adjacent organs (internal).¹¹ Concerning etiology, the fistulas are classified into Type I or Primary fistulas resulting from an underlying disease affecting the gastrointestinal wall. Secondary or Type II are the result of the assault on the previously intact body wall, mainly represented by fistulas resulting from surgery with anastomotic dehiscence.¹²

Crohn's disease is one of the responsible for the onset of type I fistulas, one third of enterocutaneous fistulas secondary to it. The terminal ileum is the least affected part of the gastrointestinal tract. The inflammatory process that affects the entire wall thickness promotes the emergence of an ulcer that later evolve into the formation of an abscess, which, upon rupture, creates the path of the fistula, either inside or adjacent viscera for skin.¹² The diverticular disease when complicated, gives rise to colon-bladder fistulas from the communication between the sigmoid colon and bladder¹². Colorectal tumors can develop fistulas to nearby organs such as bladder, vaginal canal, skin and even other bowel.¹² In postoperative colorectal surgery, fistulas are secondary to dehiscence of anastomoses, ranging from 0.5 to 30%¹³.

Primary or secondary pancreatic fistulas most commonly occur in pancreatic tumors, pancreatitis and occasionally by blunt or penetrating abdominal trauma¹⁴. The necrotizing pancreatitis is linked to the formation of fistulas by direct damage to the distal pancreatic duct with formation of distal stenosis, which can lead to increased intraluminal pressure by accumulation of digestive fluid, or performing procedures such as percutaneous or transgastric drainage of pseudocysts. Necrosectomy is also capable of producing damage to small intestine and colon with subsequent fistula formation¹². Refined technique of the various types of pancreatic anastomosis

(pancreatoduodenostomy, pancreatojejunostomy and pancreatogastrostomy) aims to prevent the suture dehiscence and fistula related to surgery, because of its high morbidity and mortality.¹⁵ Anastomosis that allows the escape of pancreatic enzymes out of the lumen is directly and indirectly linked to local and systemic damage as peritonitis, leukocytosis, increased serum amylase, fever, sepsis and organ dysfunction¹⁴.

DIAGNOSIS AND TREATMENT

The diagnosis is early clinical, the first 5 to 10 days, and additional tests can help in the differential diagnosis. The most used image contrast exams are radiography and computed tomography (CT), with an accuracy of 93% and 94%, respectively. However, both having a sensitivity of only 50%⁶. Therefore, the false-negative results must be considered as a possibility. In cases where no sepsis is found, the fistulography is an important test to determine the origin of the fistula, as yet undiscovered, documenting intestinal continuity and verify the presence of distal obstruction⁹.

The best treatment is prevention of complications with any surgical procedure. Intraoperative risk factors and factors related to the patient intervention is possible and better control to avoid deiscences⁶. As a general rule, the type I fistulas require resection of the diseased segment, while the type II fistulas have potential spontaneous closure as conservative treatment¹². Conservative treatment for late dehiscence and low output fistulas includes adequate percutaneous drainage replacement of fluids and electrolytes, nutritional support and antibiotic therapy for patients with signs of systemic or local inflammation with pain². About a third of enterocutaneous fistulas will close spontaneously with care¹¹.

The insertion of a catheter allows control of debt and exchange, in the case of fistula, catheter progressively smaller caliber with treatment, follows the path of healing and the evolution of the case. The choice of the route of administration of the diet depends on the location of the dehiscence or fistula. Importantly, enteral nutrition should be initiated as soon as possible in patients with a risk factor for fistula, since it constitutes a protective factor¹⁶. For early anastomotic dehiscence and great debt fistulas, the surgical management is the best option. Surgery give a definitive diagnosis and institute treatment before a new complication develops.

PROGNOSIS

The main causes of morbidity following the dehiscence and intestinal fistulae are malnutrition, electrolyte disturbance and sepsis. Nutritional problems are present in more than half of patients and significant loss of bile secretions, pancreatic and/or intestinal exerts considerable impact on treatment outcome.² Fistulas of the small intestine have higher rates of mortality and complications compared with colonic fistulas, due to greater debt and association with sepsis and malnutrition¹². Patients who develop wound dehiscence postoperatively present lower functional outcomes to other patients undergoing digestive surgeries with losses in their quality of life. Some patients progress to sepsis, others require ostomies, sometimes permanent, when

further surgery is indicated. For patients with intestinal fistulae, the mortality rate varies from 6% to 48%, according to each case¹⁶.

The patient care should be individualized according to the underlying disease, age, comorbidities and treatment response. It requires a lot of dedication and time commitment of the multidisciplinary team to ensure the best results when treating.¹⁴

CONCLUSION

Digestive fistulas have multifactorial etiology and can affect any part of the gastrointestinal tract. They are expected to have diverse manifestations among patients, since these can also have varying comorbidities. Thus, these factors hinder the cohesion of measures in a rigid protocol, able to cover all diversities. Therefore, digestive fistulas is a vast field of research to improve, not only the diagnosis and treatment, but especially its prevention.

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