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Case Report

Gastrocolic fistula in Crohn's disease: A case report and review of the literature ☆,☆☆

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ABSTRACT

Gastrointestinal fistulas constitute a rare type of abdominal fistula and an uncommon complication in the setting of Crohn's disease. In this case presentation we study the treatment of a gastrointestinal fistula between the transverse colon and the stomach in a patient with Crohn's disease and present a review of the available literature. A 53-year-old female patient with history of Crohn's disease presented to the Emergency Department of our Hospital due to reported abdominal pain and clinical symptoms of incomplete ileus with no other specific symptoms. Imaging investigation included plain radiography and computed tomography of the abdomen and revealed mural thickening of the transverse colon for an approximately 10 cm long segment, with the possible presence of gastrocolic fistula. During the exploratory laparotomy, an inflammatory mass was found in the middle of the transverse colon and the communication with the stomach was confirmed. Excision of the affected part of the transverse colon and cuneiform resection of the stomach in the area of the fistula was performed. The patient presented smooth and uncomplicated postoperative period and was discharged on the 10th postoperative day. Gastrointestinal fistulas are an uncommon complication of Crohn's disease, often with an intense clinical manifestation from the upper and lower digestive tract. Surgical treatment, either open or laparoscopic, of gastrointestinal fistulas due to Crohn's disease is the "gold-standard" method, both to control the disease and avoid further complications.

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Abbreviations: CT scan, computed tomography scan; MRI, magnetic resonance imaging; US, ultrasound; GC fistulas, gastrocolic fistulas.

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Background

Gastrointestinal fistulas are currently a rare complication of Crohn's disease, appearing often with a noisy clinical expression from the upper and lower digestive tract. Associated symptoms include vomiting with fecal contents, defecation with indigestible food, and weight loss. However, as in our patient, there are many cases of these fistulas with no obvious clinical symptoms. Gastrointestinal fistulas are nowadays a scarce manifestation of Crohn's disease, which is typically diagnosed in a presymptomatic stage, thanks to the widespread availability of multidetector computed tomography (CT). Nevertheless, their difficult diagnosis remains the main cause increasing the morbidity and in some cases, even the mortality of these patients.

Case presentation

A 53-year-old female patient was referred to emergency department due to paroxysmal abdominal pain, with deterioration during the last 24 hours with concomitant bowel disorders, including diarrheas. The patient's vital signs were unremarkable, with an arterial blood pressure 126/85 mmHg, SpO₂ = 96%, and HR of about 90-95/min. The patient's past medical history included the diagnosis of Crohn's disease 11 years ago. The disease was treated conservatively with budesonide for approximately the last 10 years. Clinical examination revealed mild flatulence and reduced bowel sounds. Blood laboratory tests values were all within the normal range (Table 1). The patient subsequently underwent an abdominal X-ray in an upright position, which revealed air-fluid levels raising suspicion of incomplete ileus. The patient was also referred for abdominal multidetector computed tomography (MDCT). The scan was performed before and after the intravenous administration of 100 mL of iodinated contrast, with image acquisition during the portal venous phase. No oral contrast was administered. The scan revealed focal areas of wall thickening in the transverse colon and the lower aspect of the stomach, in keeping with skip lesions found in Crohn disease. Supportive findings of the diagnosis included fat stranding adjacent to the affected parts of the gastrointestinal tract and reactive lymph nodes. Note was also made of fibrous soft tissue bands connecting the abnormal parts of the transverse colon and the transverse colon with the juxtapositioned stomach, raising suspicion of a colo-colic and a gastrocolic fistulous tract. No abscess formation or free intraperitoneal air was present (Fig. 1). Based on the CT findings, the differential diagnosis of a gastrocolic (GC) fistula was indicated. Subsequently, the patient underwent colonoscopy, which was not diagnostic due to severe narrowing and thickening of the transverse colon area. Even though, it reported stenosis in the intestinal lumen of the transverse colon, it did not allow the further promotion of the endoscope. As a consequence, the patient was transferred urgently to the operating room, and an exploratory laparotomy was performed. The intraoperative findings confirmed the initial diagnosis of gastrocolic communication. An area of intense inflammation with concomitant ad-

hesions was observed in the area of the gastrocolic ligament, confirming the imaging examinations. The anatomical structures of the area were prepared, which finally showed clear communication through a fistula, which started from the final part of the body of the stomach, ending in the middle of the transverse colon. Therefore, the "inflammatory mass" of the transverse colon was excised and an end-to-end anastomosis was made, and even more, a wedged gastric resection at the area of the fistula was held as well (Fig. 2). The postoperative period was uncomplicated and the patient was discharged the tenth postoperative day. The pathological report revealed the involvement of the transverse colon by Crohn's disease without the development of any neoplasm, and also confirmed the existence of the gastrocolic connection.

Discussion and conclusions

To our knowledge, Crohn's disease is an inflammatory bowel disease, which is characterized by discontinuous lesions in any part of the gastrointestinal tract and importantly affects the gastrointestinal tract in a transmural pattern. The pathogenesis of the disease remains unclear [1]. Cumulative lesions lead to complications of the disease, the most important of which are stenosis, abscess, and fistula formation [2]. In general, fistulas are defined as abnormal communications between 2 epithelialized surfaces. They usually involve the intestine with another viscera. In the majority, they are a result of a complication of abdominal surgery (75%-85%). On the other hand, fistulas may automatically result from inflammation, in about 15%-25% of cases. In both cases, they are associated with increased morbidity and even mortality. Fistulas are classified, firstly according to their anatomy, in internal and external fistulas, depending on whether or not, they have contact with the external environment. Fistulas are also classified according to their physiology, in terms of the amount of their supply. In particular, those with a total supply of under 200 mL/d are termed "low-flow" fistulas, the "middle flow" fistulas have a supply between 200 mL and 500 mL per day, and finally, fistulas with a total supply per day more than 500 mL, are considered high flow fistulas. Moreover, the final classification of fistulas is causal, and particularly, they are classified into iatrogenic, inflammatory (including Crohn's disease), radiotherapy-caused, etc. Gastric fistulas are of iatrogenic etiology in a percentage of 85% of cases, and the majority of them concern cases of peptic ulcer and its treatment. Other causes of gastric fistulas are malignancies, inflammation, and ischemia [3]. Gastrointestinal fistulas are divided into 2 main categories, congenital and acquired. The latter are divided into internal, external, and complex fistulas [4]. Crohn's disease fistulas are mostly internal (20%-35%), except for the perianal Crohn's disease [2]. They are mainly ileo-sigmoid, due to the most common location of the disease in the terminal ileum, and demonstrate the transmural pattern of inflammation characterizing Crohn's disease [5]. In detail, fistula formation starts with ulcers on the intestinal mucosa, which gradually expand transversely, resulting in inflammation and adhesion of the intestine to neighboring structures, ultimately creating abscesses and micro-perforations that finally lead to

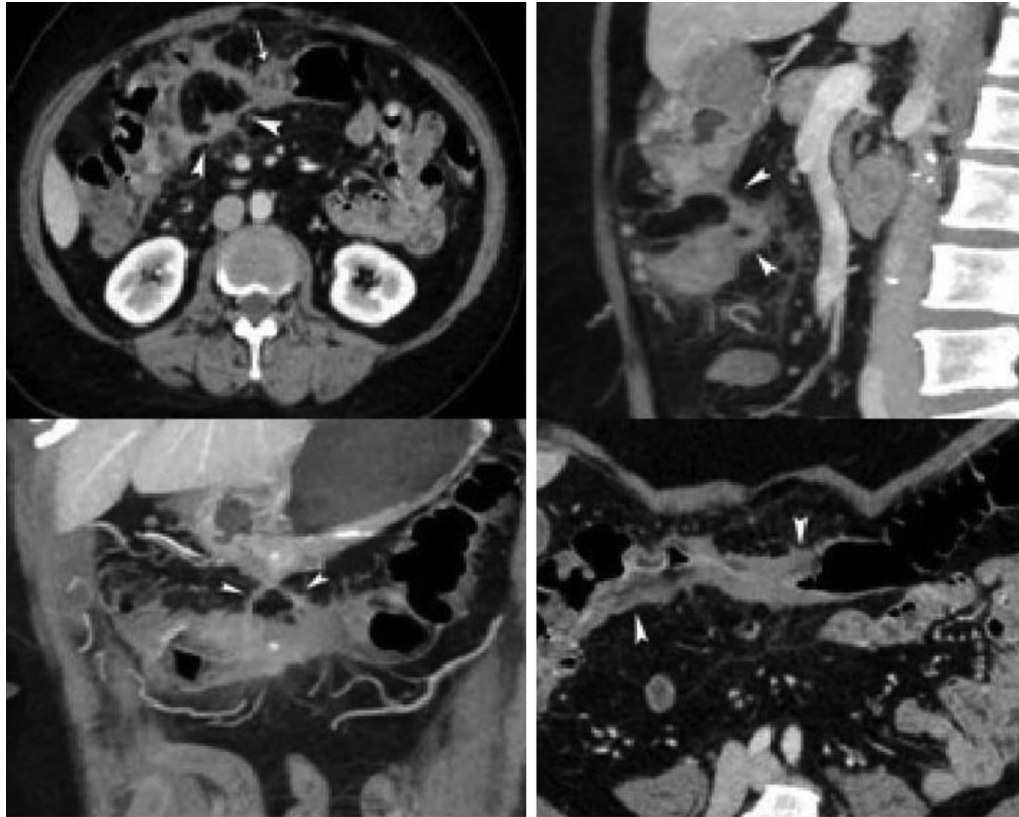


Fig. 1 – Multidetector computed tomography findings of the gastrocolic fistula. Axial image (A) showing the focal abnormal area of the transverse colon (arrow) with a soft tissue density strand connecting its ends (arrowheads). Sagittal thick maximum intensity projection image (B) showing a soft tissue band connecting the inferior aspect of the stomach and the mesenteric aspect of the abnormal transverse colon (arrowheads). Note the adjacent lymph nodes, the mesenteric hyperemia and the mesenteric fat stranding. Coronal thick maximum intensity projection image (C) showing the wall thickening of the stomach and transverse colon (skip lesions—asterisks) and the soft tissue bands connecting the inflamed parts of the gastrointestinal tract, in keeping with fistula (arrowheads). Curved multiplanar reconstruction image (D) reconstructed to assess the full extent of the transverse colon skip lesion (arrowheads). Note the wall thickening with submucosa loedema.



Fig. 2 – Macroscopic view of the excised areas. (A) Excised part of the stomach_ external stoma of the fistula, (B) excised part of the stomach_ internal stoma of the fistula, (C) en bloc excised “inflammatory mass.”

the appearance of the fistula [6]. Gastric fistulas, especially in Crohn's disease, are extremely rare. In particular, Greinstein et al. reported that gastrocolic fistulas in Crohn's patients account for 0.8% of ileitis cases and 0.6% of Crohn's colitis cases [7]. Gastrocolic fistulas in patients with Crohn's disease are reported for the first time in 1937, by Barden and his colleagues, at Mayo Clinic. They were originally associated exclusively with ulcerative colitis. An exception is the reference of a gastrointestinal fistula in a Crohn's disease patient in 1948, which, however, concerned only the duodenal area [8]. Since Crohn's disease was first described in 1960, by Lockhart-Mummery and Morson, who defined the granulomatous colitis as a distinct entity, fistulas in the setting of Crohn's disease had been considered a secondary affection. Therefore, all cases that were previously classified as ulcerative colitis were, in fact, undiagnosed Crohn's disease [9]. It is worth noting that fistulas in Crohn's patients can occur even in areas that are not infected by the disease yet [5].

The classic triad of gastrointestinal fistula symptoms includes diarrheas or bowel movements with indigestible food, stinky wheezes and vomiting with intestinal content, and also weight loss and electrolyte disorders. These symptoms, however, occur only in 30% of the patients with gastrocolic fistulas. In addition, both diarrheas, weight loss, and nontypical abdominal pain are present in half of the patients with Crohn's disease and are thus nonspecific. Therefore, it is impossible to diagnose the existence of this type of fistula only based on the clinical presentation and examination of the patients [6]. A randomized clinical trial compared the imaging with the intraoperative findings, including computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound (US). The study concluded that all these methods had equivalent diagnostic accuracy and that a combination of methods is required for a more accurate diagnosis of these fistulas [10,11]. Although endoscopy is not a diagnostic method for fistulas, it is necessary to assess and estimate the overall extent of the disease and it is always required [11].

Traditionally, the reference method for diagnosis of fistulas in the setting of Crohn's disease has been fluoroscopic studies, namely barium enema. Nowadays, CT is the mainstay for both pre- and postoperative assessment of patients with Crohn's disease [12]. CT can directly image a fistula if positive oral contrast is administered, as is the case in CT enterography technique. Alternatively fistulous tracts can be outlined by air of fecal material. Even if no oral contrast agent is administered, CT can raise suspicion and occasionally diagnose fistulas by visualizing soft-tissue bands connecting adjacent intestinal loops or organs, as it was the case in the patient presented. Magnetic resonance enterography is another technique currently available for the diagnosis of fistulas, discarding the need for ionizing radiation and nephrotoxic contrast agent necessary in CT [13].

In conclusion, from the first reference of gastrocolic fistula in patients with Crohn's disease, in 1937 as already mentioned, there has been an increase in the discovery of such structures, probably due to the improvement of imaging methods, which lasted until about the 1990s, where they are described from them on, only exceptional. This is probably happening due to the earlier diagnosis of Crohn's disease [14] so that it does not manage to give symptoms primarily owing to the presence of

the fistula (Table 2). In general, fistulas are a serious complication of Crohn's disease. Gastrocolic fistulas are a rare manifestation of it. Nonetheless, vague clinical suspicion and accurate imaging investigations should guide to early diagnosis and treatment. Accordingly, more studies are required for modern diagnostic approaches that can lead to the early preoperative diagnosis of these fistulas and improve the prognosis of the patients [15].

Author's contributions

AM and GT were the chief investigators, wrote the manuscript, and collected the majority of the data. VR assisted in the diagnosis through imaging methods, collected the imaging data and revised manuscript draft. DK collected some additional data for the study. EK corrected the manuscript for its scientific basis. AM and DP were the surgeons who conducted the surgery. AM as the director of the Department of Surgery and provided his permission for this study. All authors have read and approved the final manuscript.

Patient consent

Written informed consent was obtained from the patient for the publication of this case report and any accompanying images.

Availability of data and materials

The data that support the findings of this study are available on request from the corresponding author AM.

Ethics approval and consent to participate

Not applicable.

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