Adenocarcinoma of the transverse colon and gastrocolic fistula in a patient with situs inversus totalis: A case report

Nathalia Emanuelle Gasparini Magalhães Rodrigues

ABSTRACT

Introduction: Situs solitus is the normal position of thoracic and abdominal organs in the human body. Situs inversus is a mirror image of situs solitus. Situs ambiguous is an intermediate arrangement between both. Situs inversus is a rare condition, and usually does not cause any symptoms when isolated. There are a lot of case reports addressing situs inversus totalis (SIT) associated with cancer. However, the relation between both remains unclear. Gastrocolic fistula (GCF) is also a rare condition, and adenocarcinoma of the transverse colon is its most common cause in the Western world.

Case Report: Herein, we report a case of a 61-year-old male with situs inversus totalis associated with adenocarcinoma of the transverse colon and gastrocolic fistula.

Conclusion: The relation between SIT and cancer remains unclear. More studies are necessary to demonstrate it. In contrast, the relation between cancer and GCF is well defined, being the adenocarcinoma of the transverse colon the most common cause of GCF in the Western world.
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Keywords: Adenocarcinoma of the transverse colon, Gastrocolic fistula, Situs inversus totalis, Situs solitus

INTRODUCTION

The term situs means site, position. The normal position of thoracic and abdominal organs in the human body is referred to as situs solitus. Situs inversus is a mirror image of situs solitus. Situs ambiguus is an intermediate arrangement between both. Situs inversus is a rare condition, presented in 0.01% of the population [1, 2]. It can be classified as situs inversus with levocardia or dextrocardia. Levocardia refers to a cardiac apex pointed to the left, and dextrocardia a cardiac apex pointed to the right [2]. Situs inversus combined with dextrocardia is called situs inversus totalis (SIT).

Situs inversus totalis can be an isolated condition, or be associated with other diseases. Congenital heart defects occur in 3–5% of patients, being transposition of the great vessels the main condition [1, 2]. Primary ciliary dyskinesia occurs in about 25% of patients, being Kartagener syndrome the main diagnosis [1–3]. As an isolated condition, generally does not cause any symptoms.

Many cases of SIT associated with cancer have been reported in the literature; however, SIT is not itself a premalignant condition [4]. Herein, we report a case of
SIT associated with adenocarcinoma of the transverse colon and gastrocolic fistula.

CASE REPORT

A 61-year-old male arrived at our emergency department complaining of abdominal pain for the last 30 days. The pain was poorly localized and characterized. It worsened in the 24 hours prior to seeking medical care. Patient was also complaining of chronic bloody diarrhea, mostly melena. Had only one episode of bright red blood per rectum, and one episode of vomit (digested food with no blood), both occurring in the 24 hours prior to seeking medical care. Patient uses ethanol and tobacco chronically. He was admitted for investigation. On admission laboratory examinations showed hemoglobin 3.5 g/dl and hematocrit 11.2%. The patient was immediately submitted to blood transfusion. During hospitalization, abdominal computed tomography scan showed situs inversus with signs of dextrocardia, an expansive, concentric and mucosal lesion located in the gastric antrum, left urinary tract calculus and left hydronephrosis (Figure 1). The first upper endoscopy showed an infiltrative lesion in the gastric antrum. The patient presented hematemesis followed by hemodynamic decompensation eight days after upper endoscopy. He was resubmitted to an upper endoscopy, which revealed a gastrocolic fistula, and was maintained with a nasogastric tube draining fecaloid secretion. Gastric infiltrative lesion was biopsied in the first upper endoscopy; the results were released nine days later and showed an ulcerated and well differentiated adenocarcinoma of the gastric antrum, with tubular pattern. Colonoscopy revealed an infiltrative and circumferential lesion in the transverse colon, occupying 90% of its lumen (Figure 2). After diagnostic investigation, patient was submitted to resection of the gastric antrum, cecum, ascendant colon and transverse colon – 2/3 of its extension (Figure 3A–B). It was made an anastomosis between the terminal ileum and the distal transverse colon, and a Roux-en-Y anastomosis to connect stomach and intestine (Figure 4). The patient presented good recovery in the postoperative period. Histopathologic examination of the resected portion showed adenocarcinoma of the transverse colon penetrating the gastric wall, and gastritis. Two out of twelve examined lymph nodes from the surrounding fat tissue were affected. Postoperative histopathology did not show adenocarcinoma of the gastric antrum.

DISCUSSION

The genetic cause of SIT is unclear. There is evidence of microdeletion of chromosome sub-band 2q37.3 as a cause of it [5], as well as balanced reciprocal translocation t(5;11)(q32;q24.2) [6], UVRAG gene abnormalities [7],...
Deficiency of the KIF3 complex (an intracellular motor protein) prevents transportation of N-cadherin and β-catenin (cell-adhesion factors) to the cell surface. This process is linked both to SIT and the development and progression of cancer [8].

Our patient was diagnosed with SIT, adenocarcinoma of the transverse colon and gastrocolic fistula (GCF). He was not submitted to genetic testing. According to Galiatsatos et al. [9], 41 cases of malignancy in patients with situs abnormalities were reported in English literature from 1980–2005. Most cases (73%) were of single malignancies in patients with SIT. Nine cases (22%) were of cancer in patients with situs ambiguous, and only one, aside from the case reported by Galiatsatos et al. [9], was of multiple tumors in the same individual. Regarding the association between SIT and GCF, there are no previous reported cases when searching in the PubMed database.

Gastrocolic fistula is a rare complication of both benign and malignant conditions. The most common cause of GCF used to be benign peptic ulcer. However, with the advance of H2 antagonists and proton pump inhibitors, and the decreased necessity to use surgery to treat it, this scenario has changed. Nowadays, in the Western world, the most common cause of GCF is adenocarcinoma of the transverse colon, with an incidence of 0.3–0.4% in operated cases [10–12]. In the Eastern world, the most common cause is adenocarcinoma of the stomach.

There are two theories regarding the development of a fistula. The first one says the tumor invades the gastrocolic omentum directly from the originating organ. The second one says an ulcer provokes a surrounding inflammatory peritoneal reaction leading to the adherence and fistulation between the two organs [10–13].

Gastrocolic fistula was identified in our patient by means of an upper endoscopy. Most authors say barium enema is the most sensitive test for detecting GCF, because it is able to create a pressure in the lumen of the colon, which is essential for moving the barium through the fistula into the stomach [11, 13, 14]. The ability of barium enema in determining the primary malignant location is low. Immunohistochemical staining is important at this point, in determining the primary malignant lesion and formulating the postoperative chemotherapy scheme [14]. Upper endoscopy and colonoscopy are good for visualizing the fistula opening and taking biopsy samples for histopathology examination. The CT scan is useful in both delineating the fistula and identifying the underlying etiology.

Regarding the treatment of GCF, surgical approaches have changed over time, from second and third-stage surgeries to the current one-stage en bloc resection [13]. The previous approaches included colostomy to improve the patient’s nutritional status and minimize mortality. The advance of enteral and parenteral nutritional support and intensive care medicine has made the one-stage procedure the favored approach in minimizing mortality [14]. Our patient had one-stage procedure with no intraoperative complications linked to the different surgical approach required for a patient with SIT.

Despite all improvement regarding the treatment, most patients have a poor prognosis and long-term survival has rarely been reported [14]. Our patient has now survived for one year and four months.

**CONCLUSION**

We decided to present this case because there are no previous reports in the literature connecting situs inversus totalis (SIT), adenocarcinoma of the transverse colon, and gastrocolic fistula (GCF). Furthermore, both SIT and GCF are rare conditions. The relation between SIT and cancer remains unclear. In contrast, the relation between cancer and GCF is well defined, being the adenocarcinoma of the transverse colon the most common cause of GCF in the Western world. Gastrocolic fistula usually needs...
radical en bloc resection to be treated; nevertheless, most patients have a poor prognosis and long-term survival has rarely been reported.

Acknowledgements
I am thankful to Marcelo de Melo Andrade Coura, MD, Celso de Paiva Melo, MD, Lucia Kimiko Makigussa, MD, and Daniel Henrique Porto Almeida, MD for their assistance in improving the manuscript.

Author Contributions
Nathalia Emanuelle Gasparini Magalhães Rodrigues – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor
The corresponding author is the guarantor of submission.

Conflict of Interest
Authors declare no conflict of interest.

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