Case report

Multidisciplinary Management of a Rare Gastrocolic Fistula Secondary to Gastric Cancer: A Case Report and Literature Review

Abstract

Gastrocolic fistula, an abnormal connection between the stomach and the colon, is a rare complication of gastric cancer. This case, involving a 65-year-old female with a three-month history of epigastric pain, foul-smelling vomiting, weight loss, and abdominal distension, exemplifies the severity of this condition. Her examination showed a soft, distended abdomen with positive bowel sounds. Labs indicated anemia, leukocytosis, thrombocytosis, and a high erythrocyte sedimentation rate (ESR). Ultrasound and computerized tomography scans revealed a hypoechoic area in the epigastric region and mass-like thickening of the distal stomach and mid-transverse colon connected through a fistulous tract, along with liver metastasis, abdominopelvic ascites, and left-sided pleural effusion. Endoscopy showed an exophytic mass with necrotic mucosa in the stomach leading to the colon. Histopathology confirmed poorly differentiated invasive gastric adenocarcinoma. A multidisciplinary team planned comprehensive management, including diagnostic laparoscopy to assess peritoneal metastases, distal gastrectomy with gastrojejunal anastomosis, and systemic chemotherapy. This case, with its rarity and complexity, underscores the crucial role of early detection and a collaborative approach in treating gastrocolic fistulas. It underlines the need for further research to improve management and patient outcomes, emphasizing the vital role of the medical community in advancing understanding of such complex conditions.

Introduction

A gastrocolic fistula is an unusual connection between the stomach and the colon, characterized by the direct passage of gastric contents into the colon, which can lead to various gastrointestinal symptoms [1]. This condition often arises as a complication of

underlying diseases such as malignancies, Crohn's disease (CD), or peptic ulcer disease (PUD) [2,3]. The exact prevalence of gastrocolic fistulas is difficult to ascertain due to their rarity and the heterogeneous nature of their causes [2]. The most common etiologies are malignancies, particularly gastric and colonic cancers, PUD, and CD [3,4].

There is no clear gender predominance; however, the condition may be more frequently reported in older adults, reflecting the age distribution of its underlying causes [5]. The pathophysiology of gastrocolic fistula involves chronic inflammation and ulceration of the gastric and colonic walls, making a fistulous pathway [6]. In cases of malignancy, the aggressive nature of the tumor can erode through the walls of the stomach and colon, creating a fistula [3,5]. Inflammatory diseases like CD contribute to fistula formation through transmural inflammation and subsequent penetration [3,7].

Genetic predispositions are particularly relevant in inflammatory bowel disease (IBD) like CD, where genetic factors contribute to disease susceptibility [2,7]. Specific genetic mutations, such as NOD2/CARD15, have been implicated in CD, potentially influencing the risk of fistula formation [2,8,9]. Gastric cancer, a common cause of gastrocolic fistula, usually has clinical features of abdominal pain and weight loss as the most frequent symptoms [10]. Genetic factors in gastric cancer include familial aggregation in approximately 10% of cases, with hereditary forms accounting for 1-3% of the global burden [10]. Hereditary diffuse gastric cancer, gastric adenocarcinoma of proximal polyposis of the stomach, and familial intestinal gastric cancer are notable, having a defined genetic basis [11].

The diagnosis is often suspected based on findings from upper endoscopy or radiographic studies but requires histologic examination of tumor tissue to establish definitively [11,12]. The staging of gastric cancer follows the American Joint Committee on Cancer TNM classification system, which helps guide therapy and predict outcomes [11]. Diagnostic evaluation of gastrocolic fistula involves a combination of endoscopic and radiological assessments [11,12]. Gastroscopy and colonoscopy are essential for visualizing the fistula and obtaining biopsy samples [12]. Imaging investigations, such as ultrasound and computerized tomography (CT) scans, provide comprehensive anatomical details and help identify the extent of the fistulous tract [12,13]. Histopathological examination is crucial in determining the underlying cause, particularly in differentiating between benign inflammatory conditions and malignancies [12,13].

Management of gastrocolic fistula is tailored to the underlying cause and the patient's overall condition [13,14]. Surgical intervention is often required, particularly in malignancy cases or when conservative management fails [12-14]. The surgical approach may include resectioning the affected gastric and colonic segments and fistula repair [12-14]. Medical management, including nutritional support and treatment of

underlying conditions like CD, is also critical [14]. Pharmacological therapy may involve antibiotics, immunosuppressants, biologics for IBD, and chemotherapy for malignancies [14].

Gastrocolic fistulas are more commonly associated with malignancies and IBD, such as CD [12-14]. This case is worth reporting due to its rarity and the complexities involved in diagnosing and managing a gastrocolic fistula secondary to gastric cancer, a combination seldom encountered in clinical practice. It highlights the importance of early recognition, comprehensive diagnostic workup, and a multidisciplinary approach for optimal patient outcomes. This report aims to contribute to the limited literature on this condition, providing insights and potentially guiding future cases.

Case Presentation

A 65-year-old female presented with a three-month history of epigastric pain, foul-smelling vomiting, significant weight loss, and abdominal distension. On clinical examination, her abdomen was soft, distended, and mildly tender upon deep palpation, with positive bowel sounds and no visceromegaly. Systemic examination findings were unremarkable, with the respiratory system (normal vesical breathing+ no additional sound), cardiovascular system (S1+S2+ 0), and central nervous system (Glasgow coma scale 15/15) all within normal limits. Table *1* depicts an overview of the patient's key investigation results.

Table 1: Overview Of Different Laboratory Investigations Of The Patient

Parameter	Value	Normal Range
Hemoglobin	8.5 g/dl	13.8 to 17.2 g/dL (males), 12.1 to 15.1 g/dL (females)
Total Leukocyte Count (TLC)	17,000 /µL	4,000-11,000 cells/µL
Platelets	553,000 /µL	150,000-450,000 cells/µL
Erythrocyte Sedimentation Rate (ESR)	135 mm/hr	0-22 mm/hr
Blood Sugar Random (BSR)	87 mg/dL	<140 mg/dL
HBsAg	Negative	Negative
Anti-HCV	Negative	Negative

Anti-HIV	Negative	Negative
HbA1c	6.59%	4.0%-5.6%

Hemoglobin (Hb), Total leukocyte count (TLC), Erythrocyte Sedimentation Rate (ESR), Blood Sugar Random (BSR)

An ultrasound (USG) of the abdomen identified a well-defined hypoechoic area in the epigastric region, measuring 9.1 x 6.1 cm, with globulated margins and internal multiple crept and calcifications, with liver parenchymal changes. A non-contrast-enhanced abdomen and pelvis CT showed gross mass-like thickening of the distal stomach and midportion of the transverse colon, connected through a thick fistulous tract indicative of a gastric fistula. Endoscopic examination via gastroscopy revealed a normal esophagus with a competent lower esophageal sphincter (LES) at 38 cm. The stomach displayed an exophytic mass with hyperemic erythematous friable mucosa at the pre-pyloric area, including two openings containing necrotic mucosa with hard slough, leading to colonic mucosa. The pylorus had a normal opening, and the duodenum displayed normal mucosa in D1 and D2. Biopsies were taken from the exophytic mass/fistulous tract and the gastric mucosa. A colonoscopy, limited due to patient discomfort and inadequate preparation, reached the transverse colon. Examination of the anal canal, rectum, sigmoid colon, descending colon, splenic flexure, transverse colon, and hepatic flexure showed normal mucosa. However, the exact point of fistulous communication could not be identified. Figure *1* demonstrates the gastrocolic fistula, directly tracing a path from the gastric mucosa to the colonic mucosa.

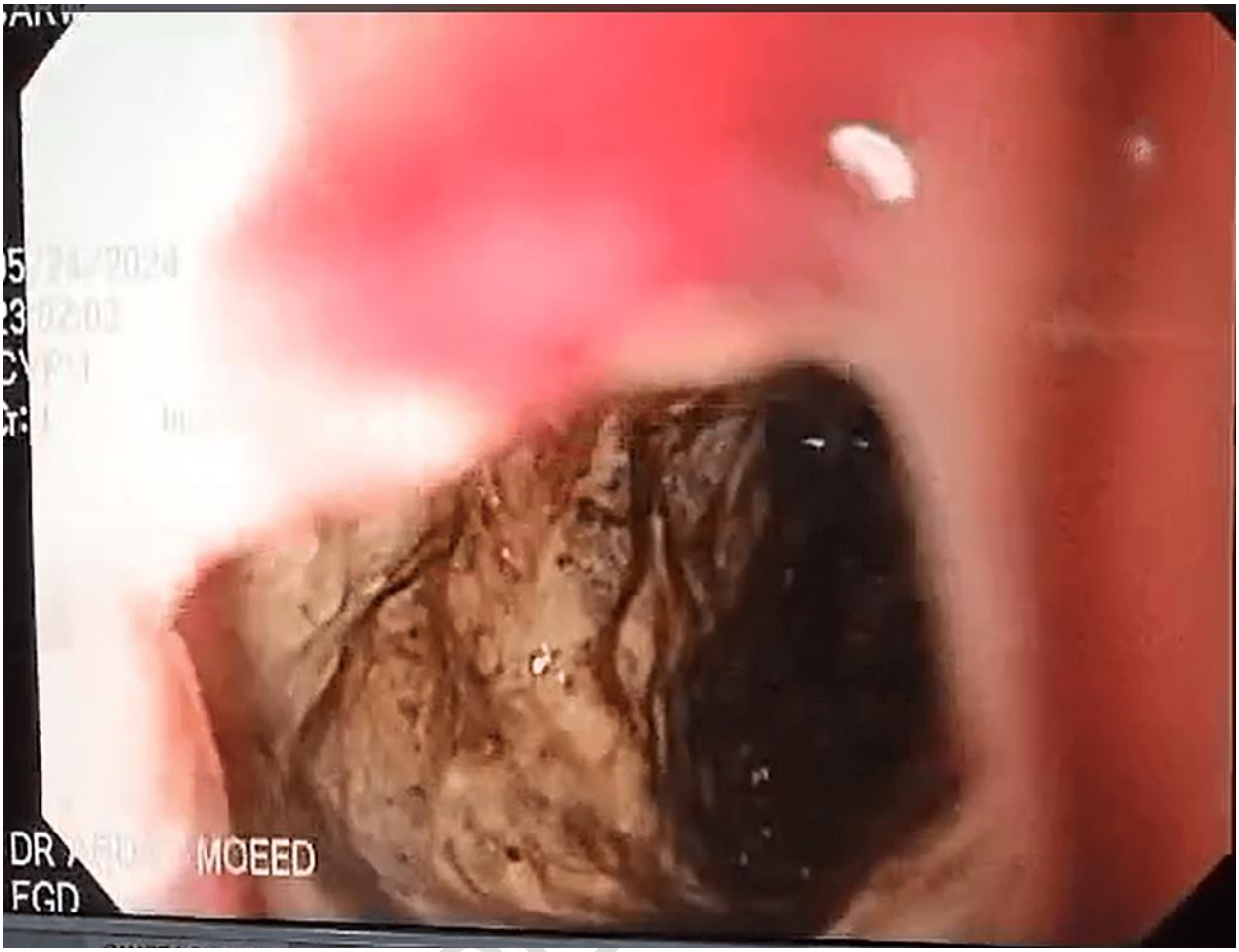

Figure 1: Endoscopic Visualization of Gastric Mucosa Traversing Directly to Colonic Mucosa

Histopathological analysis of the exophytic mass revealed features consistent with poorly differentiated gastric adenocarcinoma, while a gastric mucosa biopsy showed inflammatory changes. Figure *2* shows signet ring cell adenocarcinoma from a biopsy taken from the stomach's exophytic mass.

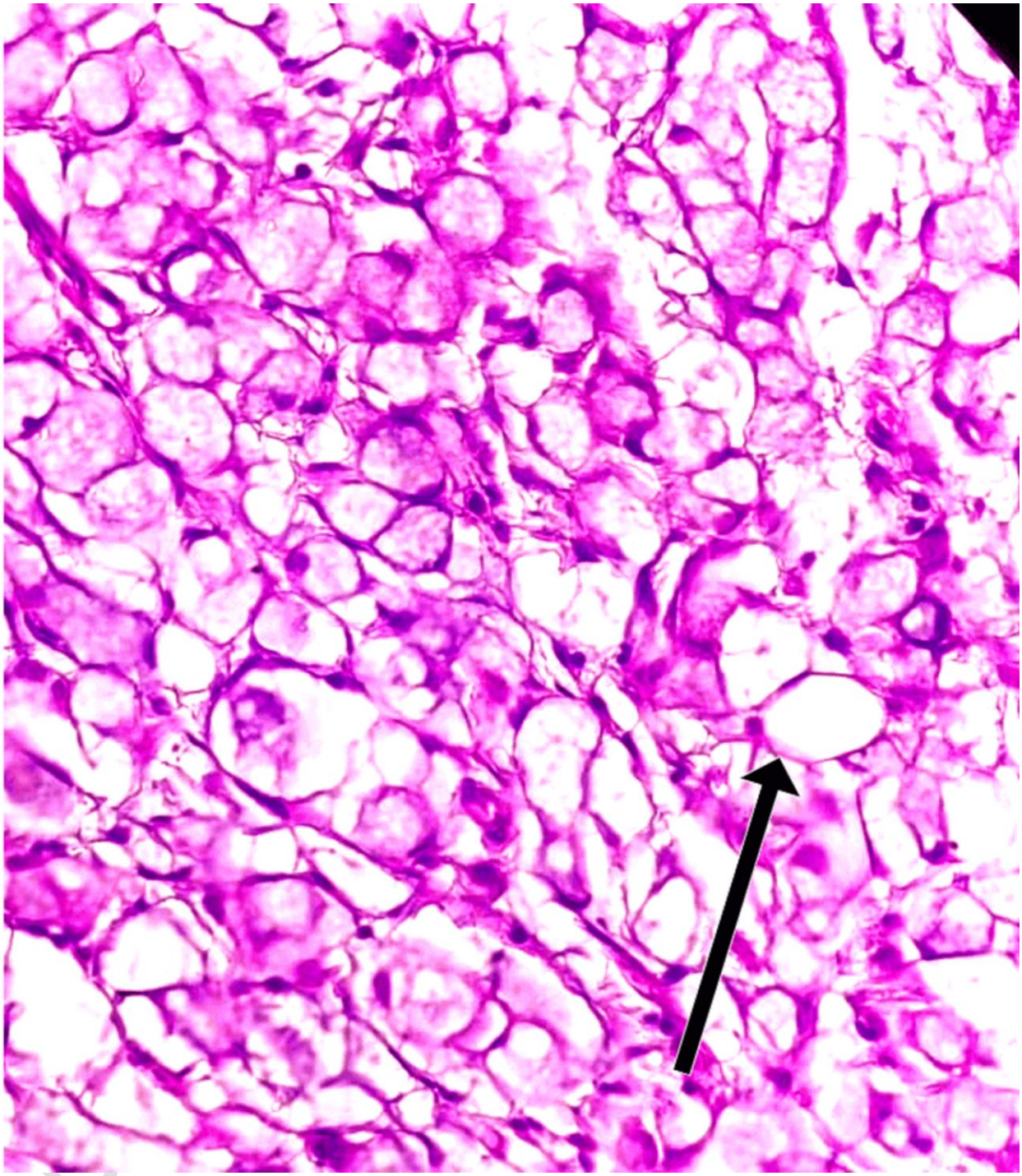

Figure 2: Signet Ring Cell Adenocarcinoma.
The black arrow indicates the signet ring cell.

The patient underwent further imaging, including a CT of the chest, abdomen, and pelvis (CTCAP) with IV contrast, that showed additional findings of liver metastases,

abdominopelvic ascites, and left-sided pleural effusion with bilateral pulmonary nodules. Figure *3* shows the gastric mass indicated by the arrow.

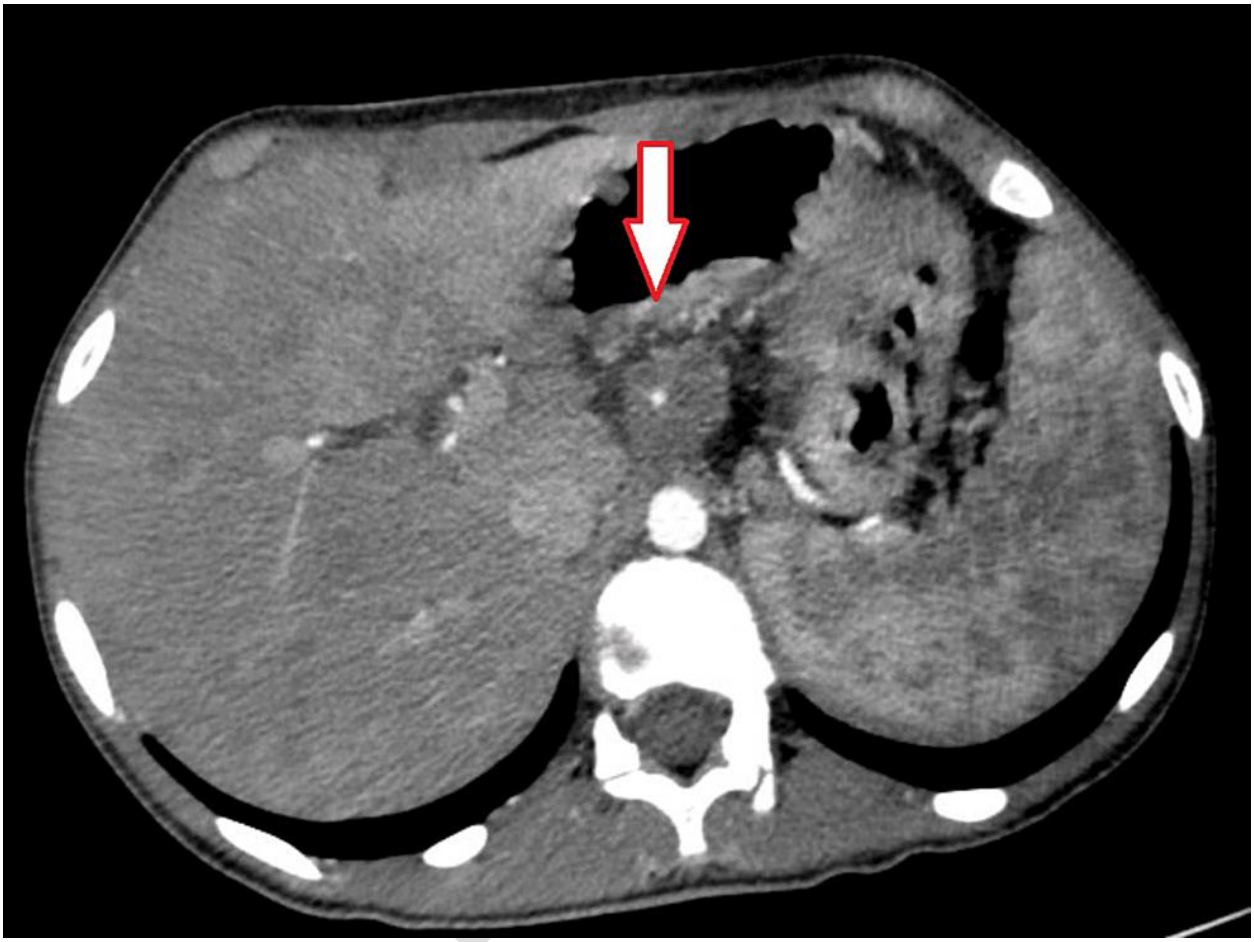

Figure 3: Contrast-enhanced CTCAP showing gastric mass indicated by the arrow.

CTCAP: CT scan of the chest, abdomen and pelvis

The multidisciplinary team (MDT) formulated a comprehensive management plan. Initially, a diagnostic laparoscopy was performed to explore peritoneal metastases, followed by a distal gastrectomy with gastrojejunal anastomosis to manage symptoms and improve the patient's quality of life. Post-surgery, systemic chemotherapy was planned to address any residual disease. The regimen was FOLFOX, consisting of oxaliplatin (85 mg/m²) and leucovorin (400 mg/m²) on day 1, followed by 5-fluorouracil (5-FU) (400 mg/m² bolus and 2400 mg/m² continuous infusion over 46 hours), repeated every 2 weeks. Post-operative complications included infection, bleeding, and nutritional deficiencies. Infections were managed with broad-spectrum antibiotics, bleeding required blood transfusions, and nutritional deficiencies were addressed with appropriate nutritional support. The outcome for the patient involved significant

symptom relief, including reduced pain, vomiting, and weight loss, leading to an improved quality of life. While the primary goal of palliative surgery was symptom management, the combination with systemic chemotherapy also contributed to prolonged survival. However, the risk of recurrence and metastasis remained, requiring ongoing monitoring and treatment. The patient provided informed written consent. She was fully informed about the report's purpose and the use of her details and images. Written consent was provided, ensuring adherence to ethical guidelines. This report emphasizes the difficulties in diagnosing and managing the conditions associated with gastrocolic fistula, a rare but severe complication of conditions such as CD and gastric cancer. Gastrocolic fistula should be considered in patients presenting with chronic gastrointestinal symptoms and significant weight loss. Early diagnosis and multidisciplinary management are critical for improving patient outcomes. Further studies and case reports are essential to enhance the understanding of treatment strategies for this condition.

Discussion

Gastrocolic fistula, an abnormal connection between the stomach and the colon, is a rare but severe condition characterized by a direct passage of gastric contents into the colon, leading to gastrointestinal symptoms such as diarrhea, weight loss, and feculent vomiting [1]. This discussion reviews the various etiologies of gastrocolic fistula, including CD, tuberculosis (TB), PUD, colorectal cancer (CRC), and gastric cancer [2-5]. Diabetes mellitus and smoking elevate the risk of cardiovascular diseases, colorectal cancer, and complications such as gastrocolic fistula [6-8].

CD is a significant cause of gastrocolic fistulas [2]. Chronic and transmural inflammation in CD can lead to fistula formation, extending through all layers of the intestinal wall, creating a tract that connects different parts of the gastrointestinal tract [2]. Genetic predispositions, including mutations in the NOD2/CARD15 gene, increase the susceptibility to CD and the subsequent risk of fistula formation [2,4]. Managing gastrocolic fistulas in CD involves medical and surgical approaches, with biologics and immunosuppressants essential in preventing inflammation and recurrence [2].

Gastrointestinal TB is another notable cause of gastrocolic fistulas, especially in regions with high TB prevalence [5]. TB can damage any viscera of the digestive tract, with the ileocecal region being the most commonly involved [5]. The formation of a gastrocolic fistula in TB patients results from caseating granulomas and ulceration that penetrate the gastric and colonic walls [5]. Diagnosis is confirmed through imaging studies, endoscopy, and histopathological examination revealing acid-fast bacilli [5]. Treatment

of TB-related fistulas includes anti-TB therapy and surgical intervention when necessary [5].

Historically, PUD was a leading cause of gastrocolic fistulas due to chronic erosion of the stomach lining by gastric acid, eventually penetrating through the wall to create a fistula with the colon [1,3]. The advent of effective medical therapies, including PPIs and antibiotics for Helicobacter pylori eradication, has significantly reduced the incidence of PUD-related fistulas [1,3]. However, when they do occur, patients often present with upper abdominal pain, hematemesis, and melena [1,3]. Management includes addressing the underlying ulcer disease, surgical fistula repair, and H. pylori eradication [1,3].

CRC can lead to the formation of gastrocolic fistulas, particularly when the tumor invades adjacent structures [7]. The aggressive nature of the cancer can cause direct erosion into the stomach, forming a fistula [2,7]. Symptoms include rectal bleeding, altered bowel habits, abdominal pain, and weight loss [2,7]. Diagnosis is typically made through colonoscopy, biopsy, and imaging studies [2,7]. Management involves surgical resection of the tumor and fistula, often followed by adjuvant chemotherapy or radiation therapy, depending on the cancer stage [2,7].

Gastric cancer is one of the most common malignancies associated with gastrocolic fistulas [11]. The pathogenesis involves the tumor eroding through the gastric wall into the colon [12]. Patients with gastric cancer often present with weight loss, abdominal pain, nausea, and vomiting [13,14]. The diagnosis is confirmed through endoscopic biopsy and imaging studies, with staging following the TNM classification system [13,14]. The management of gastric cancer with a gastrocolic fistula typically requires a multidisciplinary approach, including surgical resection, chemotherapy, and radiation therapy [14]. The prognosis depends on the stage at diagnosis and the disease's extent [14].

Gastrocolic fistula, though rare, presents significant diagnostic and therapeutic challenges [1,2]. The condition's diverse etiologies require a comprehensive diagnostic approach, including endoscopy, imaging studies, and histopathological examination [1-5]. Management strategies must be tailored to the underlying cause and the patient's overall condition, often necessitating surgical intervention and multidisciplinary care [1-5].

Future research should further elucidate the pathophysiological mechanisms underlying gastrocolic fistulas, particularly in different etiologies. Extensive case studies and clinical

trials are needed to develop standardized management protocols and explore novel therapeutic options. Advancements in minimally invasive surgical techniques and targeted medical therapies promise to improve the prognosis of patients with gastrocolic fistulas. Enhanced genetic studies could also provide insights into predispositions and pave the way for personalized medicine approaches in conditions like CD and gastric cancer [11].

Comparing our presented case with similar cases from the literature provides valuable insights into the management and outcomes of gastrocolic fistulas due to different underlying etiologies [12-14]. Sugi et al. (2023) reported a case of a 68-year-old man with a gastrocolic fistula caused by transverse colon cancer [4]. Compared to our study, the patient had features of anorexia, weight loss, and vomiting of fecal matter [4]. The management involved an en-bloc surgical resection without neoadjuvant chemotherapy, and notably, no recurrence or metastasis was reported 1-year post-surgery [4]. This contrasts with our case, where the patient had liver metastases and required systemic chemotherapy post-surgery [4]. This difference underscores the varying prognosis based on the primary cancer type and the presence of metastasis at diagnosis [4].

Mansour et al. (2022) discussed gastrocolic fistulas as extraordinary gastrointestinal fistulas, emphasizing their rarity and the diagnostic challenges due to often late presentation [1]. They highlighted the importance of considering malignant diseases as a cause, particularly in Eastern countries where gastric cancer is a common etiology [1]. This perspective aligns with our case, where the patient's gastric adenocarcinoma led to the development of the fistula [1]. However, the presence of advanced disease with liver metastases in our patient highlights the aggressive nature and poor prognosis associated with gastric cancer-related gastrocolic fistulas [1].

LIMITATIONS

This case report on a gastrocolic fistula due to gastric cancer details the clinical, diagnostic, and management aspects but has limitations. Its findings, based on a single case, lack generalizability. Comprehensive studies are necessary for firmer conclusions on treatment and outcomes. The absence of genetic analysis and a short follow-up period omits insights into genetic factors and long-term prognosis, including recurrence or metastasis. The report must fully explore different management practices or their outcomes across healthcare settings. It emphasizes the importance of early detection and a multidisciplinary approach for optimal patient outcomes, suggesting that personalized care based on the disease's origin and severity is essential. Future in-

depth research could help overcome these limitations and enhance patient care for gastrocolic fistulas.

Conclusions

This case of a 65-year-old female with a gastrocolic fistula secondary to gastric cancer underscores the diagnostic and therapeutic challenges of this rare condition, highlighting the necessity of comprehensive diagnostic investigations and a multidisciplinary approach to management. Future research should focus on elucidating pathophysiological mechanisms, improving diagnostic accuracy, and developing standardized management protocols, while advancements in minimally invasive surgery and targeted therapies offer hope for better outcomes. Enhanced genetic and molecular studies could lead to personalized treatment strategies. Clinicians should remain highly vigilant for gastrocolic fistulas in patients with chronic gastrointestinal symptoms and significant weight loss, and management should involve a multidisciplinary team to address complex needs. Individualized treatment plans tailored to the patient's condition and close postoperative monitoring are essential, alongside patient education and support. Early diagnosis and coordinated care are crucial, and ongoing research and case reporting are vital to improving the understanding and management of this complex condition.

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