

Case Report

A Case of Ischemic Colonic Stenosis of the Splenic Flexure

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Abstract : Ischemic colitis is characterized by lesions arising from colonic ischemia. The treatment of choice is surgery, and resection of the affected segment is often life saving. This study presents a case of segmental ischemic colonic stenosis of the splenic flexure. A 70-year-old woman was admitted to our hospital with abdominal pain and distension. Physical examination revealed mild tenderness of the left-upper abdomen but no peritoneal signs. A computed tomography scan demonstrated a thickening of the splenic flexure of the colon with active inflammation. A gastrografin enema revealed a 5-cm-long tight stricture at the left transverse colon, which suggested a subileus. Surgery for segmental ischemic colonic stenosis was performed because the stricture did not respond to treatment. Pathological examination revealed features typical of ischemic colitis, including ulceration and segmental colonic stenosis of the splenic flexure, but revealed no evidence of tumors, lymph node swelling, or vascular disorder.

Key words : stenosis, ischemic colitis, splenic flexure

Introduction

Ischemic colitis is the most common ischemic injury of the gastrointestinal tract. It is caused by the decrease or cessation of blood perfusion in the colon wall, which results in ischemic changes in the colon wall. Although it can occur at any age, approximately 90% of patients are over 60 years of age¹⁾. Ischemia can cause abdominal pain, diarrhea, hematochezia, stools with mucous and blood, and other uncharacteristic symptoms, making diagnosis at an early stage difficult²⁻⁵⁾. We present a case of segmental ischemic colonic stenosis of the splenic flexure, due to cryptogenic ischemic colitis.

Case Report

A 70-year-old woman without a medical history was admitted to our hospital for abdominal pain and abdominal distension. On the day of admission, her vital signs were normal except for her body temperature, which was 37.2°C. Physical examination revealed mild

tenderness of the left upper abdomen but no peritoneal signs. Initial laboratory test results were abnormal as follows: white blood cell count (WBC), 4,800 cells / μL (normal range: 4,000 cells / mm^3 - 9,000 cells / μL); hemoglobin, 14.7 g / dL (normal range: 12.0 - 16.0 g / dL); platelet count, 195×10^3 cells / μL (normal range: 150×10^3 - 350×10^3 cells / μL); and C-reactive protein (CRP), 0.2 mg / dL (normal range: < 0.2 mg / dL). The results for the electrolytes and coagulation tests were normal. The patient did not have a significant medical history. Abdominal radiography showed intestinal distension with some air-fluid levels in the central abdomen. Computed tomography (CT) scans demonstrated a thickening of the colon with active inflammation, and no evidence of lymph node swelling (Fig. 1). Colonoscopy findings demonstrated an edematous mucosa and cicatrization with contact bleeding and ulceration, revealing segmental stenosis of the mucosa extending at the splenic flexure (Fig. 2). The rectum and sigmoid colon appeared to be free from disease. Biopsy samples of colonoscopy revealed inflammatory cell infiltration and hemorrhage in the mucosa. The patient was diagnosed with subileus and ischemic colonic stenosis of the splenic flexure. The initial management was conservative with intravenous hyperalimentation and intravenous antibiotics. Colonoscopy performed 2 weeks after admission revealed no changes to the stenosis. A gastrografin enema revealed a 5-cm-long tight stricture at the left transverse colon (Fig. 3). As the initial treatment proved unsuccessful, a colectomy for segmental ischemic colonic stenosis of the splenic flexure was performed. Pathological examination of the lumen of the resected specimen revealed features typical of ischemic colitis, including ulceration and segmental ischemic colonic stenosis of the splenic flexure (Fig. 4), but revealed no evidence of vascular disorder or inflammatory bowel disease (IBD).

The origin of the ulceration and stenosis was due to cryptogenic ischemic colitis without vascular disorder or IBD. A conservative surgical option was preferred to avoid an extensive bowel resection, and a segmental resection was performed with a functional end-to-end anastomosis. The postoperative course was uneventful with clinical and biological parameters of inflammation returning to normal within 7 days. There was no recurrence 3 months after surgery.

Discussion

Ischemic colitis is a well-recognized clinical phenomenon, although its precise etiology remains unclear. It may manifest with a wide spectrum of severity, ranging from mild, transient mucosal erosion to fibrous scarring with stricture formation and even transmural infarction. Some cases are caused by acute macrovascular mesenteric occlusion due to surgical trauma⁶⁾, thromboembolism⁷⁻⁹⁾, or atherosclerosis¹⁰⁾. Ischemic colitis typically develops spontaneously without signs of major vascular occlusion, and healthy intestine is present elsewhere in the tract. Isolated case reports have described the development of ischemic colitis in conjunction with mild allergy, hypertension, rectal prolapse, acute pancreatitis, sickle cell crisis, colon cancer, systemic lupus erythematosus, amyloidosis, anticardiolipin antibody syn-

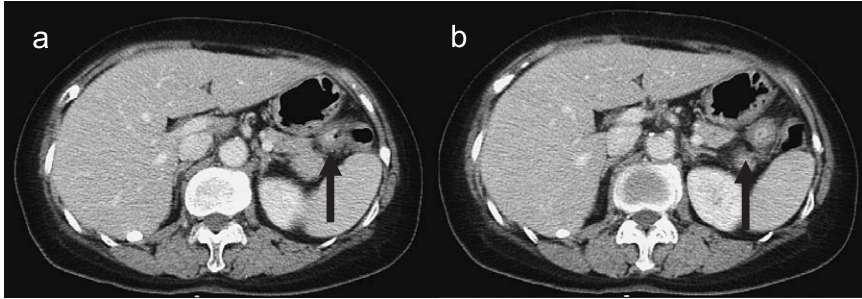


Fig. 1. Computed tomography
CT demonstrated a thickening of colon with an active inflammation (a) and no evidence of lymph node swelling (b).

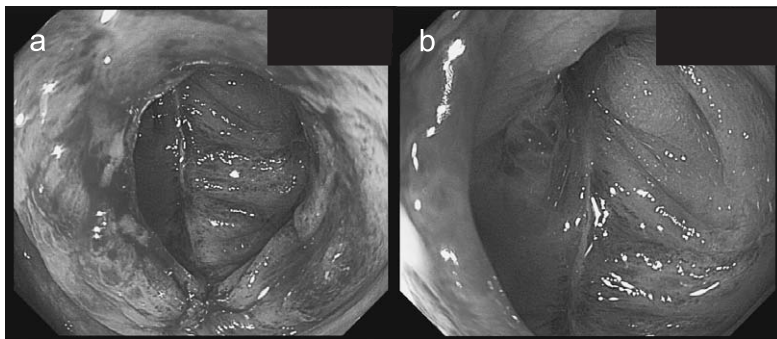


Fig. 2. Colonoscopy
Colonoscopic findings demonstrated an edematous mucosa and a cicatrization with contact bleeding and ulceration (a), which revealed a segmental stenosis of the mucosa extending at the splenic flexure (b).



Fig. 3. Gastrografin enema
A gastrografin enema revealed a 5 cm tight stricture at left transverse colon (arrow).



Fig. 4. Resected specimen
A lumen of resected specimen showed a segmental ischemic colon stenosis in connection with ulceration of ischemic colitis.

drome, Buerger's disease, and Kawasaki syndrome¹¹⁻¹³). Other case reports have described associations between the development of ischemic colitis and the use of some agents (such as progesterone, ergotamine derivatives, nonsteroidal anti-inflammatory drugs, and danazol)¹⁴, intravenous vasopressin therapy¹⁵, renal transplantation¹⁶, chronic intermittent peritoneal dialysis¹⁷, cocaine abuse, snake bite, and marathon running¹¹). Clinical presentation is usually acute, with abrupt onset of cramping abdominal pain, abdominal distension, and bloody diarrhea. There may be local signs of peritoneal irritation over the affected segment, and if mucosal ulceration is present, bacterial invasion may also occur. However, manifestations vary widely, from severe pain with transmural infarction and early perforation to mild abdominal pain and only slight tenderness¹⁸). Non-characteristic symptoms make it extremely difficult to distinguish between colitis, chronic ulcerative colitis, intestinal parasitosis, and even early colon tumors.

The diagnosis of ischemic colitis in our patient was established by colonoscopy and abdominal CT. This diagnosis was confirmed by colonoscopic examination and biopsy. As the local lumen was narrow, biopsies were performed to rule out malignant disease, other inflammatory diseases, and non-specific intestinal diseases. The results showed hyperplasia of the fibrous connective tissue in the biopsied sample. Therefore, it is believed that the narrowing of the lumen was closely related to hyperplasia of the fibrous connective tissue. Pathologically, hyperplasia of fibrous connective tissue reflects long-term ischemia. However, histological examination revealed no evidence of carcinoma.

Generally, major arterial or venous branches are easily detected by arterial or venous phase CT. Three-dimensional (3D) angiography based on multidetector-row computed tomography (3D-CT angiography) was able to sufficiently evaluate the anatomy of colonic arteries and communication between colonic marginal arteries. This information is useful in preoperative planning for vascular dissection and additional microvascular anastomosis¹⁹). Arterial and venous phase CT revealed that the patient in this study had a normal superior mesenteric artery (SMA), inferior mesenteric artery (IMA), splenic artery, proximal superior mesenteric vein (SMV), inferior mesenteric vein (IMV), and splenic vein. Ischemic colitis is induced by poor blood supply to the colon wall, which results in ischemic change.

Diagnosis of colonic ischemia is confirmed by colonoscopy and/or barium enema. One potent treatment is to vasodilate the surrounding blood vessels to recover the blood supply. This acts to resolve the ischemia of the colon wall by reducing clinical manifestations, restoring colon wall function, and preventing colon wall necrosis, which occurs when local ischemia develops into general ischemia⁴). Nongangrenous ischemic colitis usually requires only conservative therapy, including repeated careful assessment, pain control, and fluid replacement, and it is associated with a good prognosis. It may lead to the sequelae of persistent segmental colitis or colonic strictures, occasionally requiring surgery. Urgent surgery and high morbidity and mortality rates are hallmarks of the gangrenous type of ischemic colitis²⁰). Although the patient in this study is currently doing well after surgery,

we believe she requires a long-term follow-up period and prompt recognition of persistent disease.

Reference

- 1) Binns JC and Isaacson P: Age-related changes in the colonic blood supply: their relevance to ischaemic colitis. *Gut* **19**: 384-390 (1978)
- 2) Liu BY and Liu QM: Etiological factors and pathogenesis of ischemic enterocolitis. *Shijie Huaren Xiaohua Zazhi* **9**: 1424-1425 (2001) (in Chinese)
- 3) Shi SS: Diagnosis of ischemic enterocolitis. *Shijie Huaren Xiaohua Zazhi* **9**: 1425-1426 (2001) (in Chinese)
- 4) Wei ZB, Zhou YX and Liu N: The diagnosis and treatment of intestine function disorder during ischemic enterocolitis. *Shijie Huaren Xiaohua Zazhi* **9**: 1428-1429 (2001) (in Chinese)
- 5) Greenwald DA and Brandt LJ: Colonic ischemia. *J Clin Gastroenterol* **27**: 122-128 (1998)
- 6) Menegaux F, Tresallet C, Kieffer E, Bodin L, Thabut D and Rouby JJ: Aggressive management of nonocclusive ischemic colitis following aortic reconstruction. *Arch Surg* **141**: 678-682 (2006)
- 7) Saegesser F, Loosli H, Robinson JW and Roenspies U: Ischemic diseases of the large intestine. *Int Surg* **66**: 103-117 (1981)
- 8) Schroeder T, Christoffersen JK, Andersen J, Bille S, Gravgard E, Kimose HH, Lorentzen J, Ostri P and Buchardt Hansen HJ: Ischemic colitis complicating reconstruction of the abdominal aorta. *Surg Gynecol Obstet* **160**: 299-303 (1985)
- 9) Hwang JB, Choi SO and Park WH: Shock-associated nonocclusive ischemic colitis in an infant: a very rare complication of incarcerated inguinal hernia. *J Pediatr Gastroenterol Nutr* **41**: 474-476 (2005)
- 10) Scharff JR, Longo WE, Vartanian SM, Jacobs DL, Bahadursingh AN and Kaminski DL: Ischemic colitis: spectrum of disease and outcome. *Surgery* **134**: 624-630 (2003)
- 11) Alapati SV and Mihas AA: When to suspect ischemic colitis. Why is this condition so often missed or misdiagnosed? *Postgrad Med* **105**: 177-180, 183-184, 187 (1999)
- 12) Izbicki JR, Schneider CG and Kastl S: Partielle Ischämien Okklusive und nichtokklusive Darmischämie, ischämische Kolitis, systemischer Lupus erythematodes. *Chirurg* **74**: 413-418 (2003)
- 13) Chiu HH, Chen CM, Mo LR and Chao TJ: Gastrointestinal: ischemic colitis associated with colon cancer. *J Gastroenterol Hepatol* **20**: 1458 (2005)
- 14) Frossard JL, Spahr L, Queneau PE, Armenian B, Bründler MA and Hadengue A: Ischemic colitis during pregnancy and contraceptive medication. *Digestion* **64**: 125-127 (2001)
- 15) Schmitt W, Wagner-Thiessen E and Lux G: Ischaemic colitis in a patient treated with glypressin for bleeding oesophageal varices. *Hepatogastroenterology* **34**: 134-136 (1987)
- 16) Adamec M, Matia I, Janousek L, Fronek J, Bachleda P, Lácha J and Viklický O: Renal transplantation in patients with abdominal aortic aneurysm--a new surgical approach. *Transpl Int* **17**: 647-650 (2004)
- 17) Koren G, Aladjem M, Militiano J, Seegal B, Jonash A and Boichis H: Ischemic colitis in chronic intermittent peritoneal dialysis. *Nephron* **36**: 272-274 (1984)
- 18) Scowcroft CW, Sanowski RA and Kozarek RA: Colonoscopy in ischemic colitis. *Gastrointest Endosc* **27**: 156-161 (1981)
- 19) Oya S, Miyata K, Yuasa N, Takeuchi E, Goto Y, Miyake H, Nagasawa K, Omori K and Kobayashi Y: Clinical utility of three-dimension angiography constructed by MDCT for esophageal reconstruction using colon interposition. *Jpn J Gastroenterol Surg* **42**: 708-713 (2009) (in Japanese)
- 20) Watanabe M, Hasegawa H and Kitajima M: Pathophysiology and diagnosis of ischemic colitis. *J Jpn Surg Soc* **100**: 347-351 (1999) (in Japanese)