

**CASE STUDY****Post colonoscopy ischemic colitis: a case and literature review**

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**ABSTRACT**

Ischemic colitis is the most common form of intestinal ischemia and is more common in the elderly and among individuals with risk factors for ischemia. Ischemic colitis is a rare complication of colonoscopy. The predisposing conditions for developing ischemic colitis following colonoscopy are connective tissue disease, advanced age and cardiovascular disease. Ischemic colitis may rarely occur following a colonoscopy without these risk factors. The data collection of 22 case of ischemic colitis (21 cases in previous reports and one case in our case) were reviewed. Here, we report a case of ischemic colitis after a routine colonoscopy in patient without risk factors for ischemia.

**Conclusion:** Colonoscopy could be induced ischemic colitis, that should be brought to attention of gastroenterologist.

**Keywords:** Ischemic colitis, Colonoscopy

## Introduction

Ischemic colitis is the most common form of intestinal ischemia and most often affecting older adults, however younger patients may also be affected (1). Ischemic colitis accounts for 1 in 1000 hospitalizations (2). It is an inflammatory state, which manifests by diarrhea, abdominal pain and lower gastrointestinal bleeding (2). Common predisposing factors for ischemic colitis are major vascular occlusion, small vessel disorder, shock, some medications, colonic obstructions and hematologic disorders (2).

A 25-year-old man, presented to our hospital complaining of intermittent diarrhea since two years ago. The patient had been totally well in past two years and was under no medication. His symptoms got worse last month. He had no history of coagulopathy or embolic risk factors and a body mass index (BMI) of 23 kg/m<sup>2</sup>. On admission his initial blood pressure was 110/80 mmHg and his heart rate was 82 beats per minute, his respiratory rate and body temperature were 18 per minutes and 37.3°C respectively. The other physical examinations were unremarkable.

Laboratory tests were within normal limits and imaging were normal. The patient was prepared for the colonoscopy with a 4L split dose of polyethylene glycol. When scope was moving to cecum no abnormal findings were detected, however, we noticed the evidence of sub epithelial hemorrhages from sigmoid through hepatic flexure while withdrawing the scope and other parts of colon were intact.

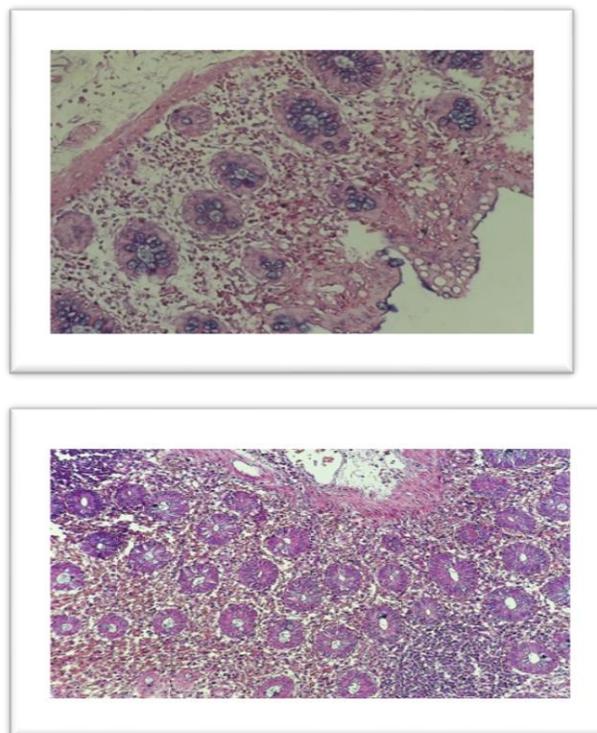
### Biopsy findings:

Microscopic examination demonstrated mild atrophy and sloughing of surface epithelium which are nonspecific findings. By contrast, crypts were hyper proliferative. Mucosal hemorrhage and lamina propria edema were present. No increased inflammatory infiltrates was present. No necrotizing phlebitis and thrombi were seen.

However, very few cases have been reported following endoscopic examinations until now. Despite the fact that ischemic colitis due to uncomplicated colonoscopy is a rare condition early diagnosis of the post colonoscopy ischemic colitis helps in better management of patients as well as avoiding malpractice.

Here, we present a case of ischemic colitis following a routine colonoscopy in a young patients with no risk factor, review the literature, analyze the data collection and discuss about preventive measures.

### Case report

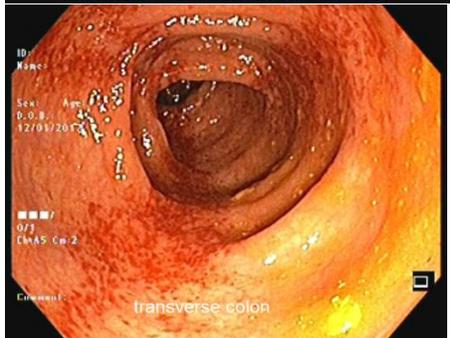
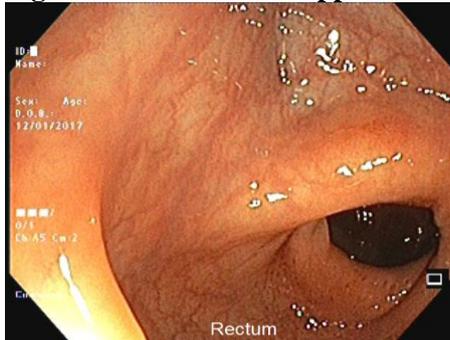


**Fig.1 & 2: Characteristic attenuated and partially detached villous epithelium, mucosal hemorrhage and edema**

We closely observed his conditions and vital signs with bowel rest, intravenous fluids and empirical antibiotics for 72 hours. He recovered uneventfully and was discharged on the 4<sup>th</sup> hospital day without complications. We followed up in the outpatient department by colonoscopy. The final diagnosis was diarrhea predominant irritable bowel syndrome.



**Fig.3 : normal mucosal appearance of colon**



**Fig. 4: Sub-epithelial hemorrhage from sigmoid through hepatic flexure while withdrawing the scope**

### Discussion

Ischemic colitis is the most common reason for intestinal ischemia representing more than 50% of cases with gastrointestinal ischemia.

The first case of ischemic colitis after colonoscopy was reported by Wheeldon et al. in 1990. Rather than a specific vascular lesion, it seems to be an acute insult resulting in self-limiting compromise in the intestinal blood flow, which is inadequate to meet the metabolic demands of the colon(3). Clinically, ischemic colitis manifests as a spectrum of injuries from transient self-limited ischemia involving the mucosa and sub-mucosa, to acute fulminant ischemia with trans luminal infarction (4). Relatively low blood flow of colon compared with the rest of the gastrointestinal tract predisposes it to ischemia (4).

There are numerous conditions that result in ischemic colitis. The most common mechanism includes hypotension from sepsis or impaired left ventricular function or arrhythmia that causes decreased cardiac output and hypovolemia from dehydration or hemorrhage, resulting in a compromise in systemic perfusion and triggering a reflex mesenteric vasoconstriction (5).

Numerous drugs are known to cause ischemic colitis including antihypertensive agents, diuretics, non-steroidal anti-inflammatory drugs, pseudoephedrine, cocaine, etc. Predisposing factors in young adults include vasculitis, abdominal surgery, oral contraceptives, hypercoagulable states, colonic obstruction and strenuous physical activities (5). None of these risk factors were present in our case.

The left colon is affected in approximately 75% of patients and splenic flexure is the most common site and is involved in one quarter of patients (6). In our patient left colon and transverse colon ischemia developed.

Barium studies show non-specific findings which include mucosal thumb printing, gas filled bowel loops, a peristaltic colon, colonic mural thickening and empty bowel but they

are present in many other infective or inflammatory colitis conditions. The most common findings of ischemic colitis in abdominal computed tomography are segmental circumferential wall thickening of affected colon (6). In contrast to other case reports this one has limited differential diagnosis, because we noticed the changes while we were performing colonoscopy. Chemical colitis is one of them. It's the condition that caused by administration of chemical agents (usually glutaraldehyde). The clinical presentations are the same with our patient, but the pathologic features show superficial crypt destruction and a necrotizing pseudomembrane over it and fibrinopurulent exudate which are different from the pathologic findings of our case (7). Of course there are no pathognomonic histological findings in glutaraldehyde induced colitis. The abnormalities are similar to those seen in acute ischemic colitis. Endoscopic findings include severe acute (most probably severe ulceration and necrosis), mucosal lesions, edema, hyperemia, and mucosal friability, but in our case we had only subepithelial hemorrhage. We could exclude chemical colitis according to endoscopic view and pay attention to this issue that this patient had first case in the endoscopy ward, and we did colonoscopy on that. Colonoscopy is modality of choice to diagnose ischemic colitis. Findings that favor ischemic colitis are segmental areas of injury, abrupt transition between normal and affected mucosa, rectal sparing and rapid resolution of mucosal changes on serial colonoscopy (6, 8). From microscopic point of view superficial mucosal necrosis with sparing of deeper crypts, hemorrhage into the lamina propria, pseudomembranous, hyalinization of the lamina propria, intravascular platelet thrombi and necrosis are histologic changes in acute ischemic colitis (9). Hallmarks of ischemic bowel are necrotizing phlebitis and thrombi formation in colectomy specimen but in our case due to nature of specimen (which was endoscopic biopsy) were not identifiable. Other findings were compatible with microscopic diagnosis of ischemic colitis. An issue deserves attention regarding the differential diagnosis of ischemic colitis such as *E. coli* O157:H7 colitis and chemical / iatrogenic colitis is that they could be histologically indistinguishable. Chemical colitis and infectious colitis may reveal

congestion and hemorrhage in mucosa, micro thrombi, necrosis and sloughing of superficial mucosa and even may form pseudomembrane. Therefore biopsy findings should be interpreted in proper clinical settings (10).

Treatment depends on the severity of ischemia. In the absence of gangrene or perforation, supportive care is usually adequate. Patients should be treated with bowel rest, adequate intravenous hydration and empirical antibiotics (9, 11).

According to analysis, ischemic colitis induced following colonoscopy may be associated with the following mechanisms:

1. Hypovolemia: Hypovolemia due to so much intestinal preparation without adequate replacement could be induced excessive loss of intestinal liquid and subsequently may give rise to intestinal ischemia.
2. Excessive gas injection and prolonged time of colonoscopy: Excessive gas injection increase the diameter of the colon thus decreasing blood supply to the colon wall and subsequently induced colon ischemia. The colonic intraluminal pressure of 30-40 mmHg results in reversible circulatory compromises, however, if the intraluminal pressure rises above 50 mmHg, irreversible damages may occur (9, 11).
3. Bowel spasms: In the patients with excessive mental stress (especially in patient who have Irritable Bowel Syndrome) may have excessive intestinal movement and colon wall spasms that give rise to vasoconstriction and induced colon ischemia. This mechanism is more consistent with our patient.

Ischemic colitis following uncomplicated colonoscopy is rare, but the presence of prior history of intra-abdominal surgery, tortuous colon, longer procedure time or other risk factors of ischemia result in higher incidence of post colonoscopy ischemic colitis (10, 12).

#### **Preventive measures**

Based on analysis and our experience ischemic colitis following colonoscopy may be reduced by following procedures:

1. Colonoscopy should be performed under anesthesia especially in patients who have Irritable Bowel Syndrome, to reduce intestinal muscle spasms.

2. Blood volume should be supplemented during preparation for prevention of hypovolemia and hypotension.
3. Gas injection should be minimized during colonoscopy and excessive gas should be suctioned as much as possible when retracting the scope.
4. Maneuver should be gentle and appropriate force should be maintained when retracting the hook, because we believe that repeated trauma due to scope movements predispose the patient to ischemia.

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5. The duration colonoscopy should be as short as possible.

### Conclusion

We need to pay more attention to reduce colonoscopy procedure timing, hyperinflation and hyperextension and we should check the risk factors for ischemia and supply sufficient fluid to prevent the risk of ischemia before bowel preparation.

### Conflict of interests

Authors declare no conflict of interests.