BOWEL OBSTRUCTION AS A RESULT OF ISCHEMIC COLITIS:
REVIEW OF LITERATURE WITH CONTRIBUTION OF ONE CASE REPORT

The ischemic colitis is comparatively rare disease. In most of the cases it has indistinctive clinical picture and its diagnosis requires persistence in performing of the diagnostic procedures. In very rare cases it can manifest with some of its complications, mucous membrane hemorrhage or subileus symptoms. We present a case of a male patient at the age of 64, who was operated on the occasion of intestinal obstruction, which developed as a result of ischemic colitis in the sigmoid colon region, complicated with stenosis. The consequent two-step surgery led to patient's health recovery in the three-year period of follow-up.

B. KOROUKOV 1,
I. TERZIEV2,
R. PANCHEV 1

1 Department of Surgery
2 Department of General and Clinical Pathology
University Multi-Profile Hospital for Active Treatment “Tsaritsa Yoanna - ISUL”, Bulgaria

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Introduction

The ischemic colitis is a disease, which is a result of acute or chronic disturbance in the blood supply of colon with consequent inflammatory changes in its wall. It was described as a term in medicine for the first time in 1960s by Boley (Boley et al., 1963) and Marston (Marston et al., 1966). Several major studies, related to the disease, found the frequency - 5-10/100 000. It is found most frequently in women and in patients above the age of 65 years (Guttormson and Bubrick, 1989; Klempnauer et al. 1997; Longo et al., 1997). Although the modern diagnostic options allow the disease diagnosis in the early phases of its development, it, even though rarely, manifests with some of the occurred complications (hemorrhage or stenosis), which require emergency surgical intervention. This is the first report registered in our clinic of visceral surgery specialised in emergency surgery the last 20 years.

Case report

Medical history data: G.H.A., at the age of 64, was admitted to the Clinic of Gastroenterology on the occasion of intestinal colics throughout the abdomen, intestinal rumbling, abdominal distention, sporadic vomiting. The complaints started about two weeks ago - patient’s appetite decreased since then; intestinal passage, even though with disturbed rhythm, is present. Patient was hospitalized on the occasion of more frequent complaints during the last several days, with a view to diagnosis specification and treatment. Patient had similar complaints of much milder grade several times in the last 10 years, with gradual increase of their intensity. Concomitant diseases: Chronic ischemic heart disease, angina pectoris, arterial hypertension, chronic pulmonary obstructive disease.

Admission diagnosis: Suspected neoplasm process of large intestine. Suspected Crohn’s disease. At the consequent irigography, which was performed due to technical inability of performing colonoscopy, a section with length of about 3-4 cm was found in the medial third of sigmoid colon, through which contrast material passed as a thin thread. Conclusion: Sigmoid cancer (carcinoma). Patient was prepared on a planned basis for surgical treatment. On the third day after the performed irigography, on the occasion of intensifying pains and passage interruption, confirmed by physical and X-rays examination, patient was prepared for surgery with diagnosis of acute intestinal obstruction.
Intraoperative findings: In the region of rectum and sigmoid colon was found a stenotic section, along about 6-7 cm of the large intestine, with hard consistence and massive adhesions in the pelvic floor, engaging not only the altered intestinal segment, but also the entire sigmoid colon. Proximally to the obstruction were found distended and edematous large and small intestines. Single enlarged lymph nodes were found along superior rectal artery. Resection of rectum and sigmoid colon was performed by the Hartmann's operation.

Four to five diverticula were found at incision of resected sample. The stenotic section of rectum of about 6-7 cm was presented by a cartilaginous wall with depth of 0.5-0.7 cm, not originating from the mucous membrane, with macroscopic picture of sarcoma - lymphoma (Figure 1 and 2).

**Discussion**

The factors leading to ischemia of colon are grouped in the following classification:
- Diseases of cardiovascular system: Arterial hypertension and its vascular complications, rhythm heart disturbances, occlusive diseases - arterial and venous micro-thromboses and embolisms
- Large intestinal mechanical obstruction, which includes tumors, adhesions, volvulus, diverticula
- Status after hypercoagulation: Protein C and S deficiency, antithrombin III deficiency
- Vasculitides: Systematic lupus erythematoses, polyarteritis nodosa, rheumatoid arthritis, etc.
- Shock: Septic, hemorrhagic and hypovolemic shock
- Surgical interventions: Ectomies of aneurysms, aortic surgery, coronary bypass surgery, large intestinal surgery, gynecological operations
- Other reasons: Hemodialysis, intraabdominal inflammatory diseases, aortic dissection, traumas, administration of several medications, which lead to ischemia of the large intestine.

Histology: 2406-10 wall of large intestine, ulceration of mucous membrane, manifested fibrosis of submucosa membrane and muscular coat. Hyalinization of the walls of arterioles in the submucosa membrane and serosa. The picture corresponds to the one of ischemic colitis in the stage of stenosis. The post-operation period passed with no deviations and patient was discharged on the 10th post-operation day.

The intestinal continuity recovered six months later.
intestinal wall: antihypertensive drugs, diuretics, estrogens, oral contraceptives, non-steroid anti-inflammatory drugs, digoxin, vasopressin, etc.

Part of authors reported of 2 to 4 times higher frequency in patients with irritable colon or chronic obstructive pulmonary disease (Cole et al., 2002; Davis et al., 2003).

The blood supply of gastrointestinal tract must be sufficient for maintaining its structural and functional integrity. All episodes of vascular insufficiency, acute or chronic, lead to different kinds of consequences - early or late. Owing to the collateral blood supply of the greater part of the gastrointestinal tract through the artery of Drummond, most of the ischemic attacks remain clinically unnoticed and undeveloped.

The collateral communication, however, is absent in about 5% of people, and in more than 50% it is insufficiently developed (Griffiths, 1956; Sonneland, Anson, and Beaton, 1958). Subject to ischemic attacks due to its double blood supply is the splenic flexure. Another similar zone is the distal sigmoid colon, supplied on one hand by the inferior sigmoid arteries, and on the other hand by the superior rectal artery (Sonneland, Anson, and Beaton, 1958). The ascending colon is also subject to ischemic attacks - in cases of absence or insufficient development of the artery of Drummond (Gandhi et al., 1996; Landreneau and Fry, 1990).

Most classifications of intestinal ischemia in literature are based on the main ethiological factors. Two are the main mechanisms leading to intestinal ischemia.

The first mechanism is due to reduced blood perfusion of the intestinal wall, most frequently in patients with cardiovascular diseases and in conditions of continuous shock, caused by different factors, leading to hypotension in the splenic circulation and intestinal ischemia.

The second mechanism involves the occlusive diseases of the blood vessels, supplying with blood the intestines - ateroma, microthromboses and embolisms, leading to decreased perfusion and to intestinal ischemia.

The colonic ischemia is almost always present, provided that there is no collateral blood circulation, and in combination with one or both mechanisms.

The vascular insufficiency can be acute or chronic, with fast or slow development, localized or diffuse.

Depending on the cause and time duration of the disturbed intestinal blood circulation, the pathophysiological ischemia is subdivided in three groups:

- Transmural engagement
- Mural engagement – changes between mucosa membrane and muscular coat
- Mucous engagement.

In the cases of transmural engagement, most frequently are involved the small intestine and ascending colon by the mechanism of thrombosis and embolism of the superior mesenteric artery. Extensive intestinal sections are engaged. This is an acutely developing condition, leading to necrosis of the intestinal wall with a following peritonitis, requiring surgical intervention.

The mural and mucous engagement most frequently are factors for reduced blood perfusion, than for occlusion of the blood vessels supplying the intestines. That mechanism of development can engage every part of the intestines, and most frequently the pathological changes are segmented unlike the transmural engagement. The colon and mostly the zones with double blood supply as the left flexure and distal sigmoid colon are engaged in most of the cases. The mural and mucous engagement in 50% of patients is a reversible process with no late consequences or changes in the intestinal wall. In the rest of patients, the process is irreversible with progression and development of intestinal strictures in 10-15% or chronic segmented colitis in 20-25% of them.

The mucous membrane has edematous microscopical appearance, with hemorrhages and superficial necroses; in the initial stages at the places of engagement it is thin, and
consequently, on the basis of inflammatory changes in it, the wall becomes thickened. Additionally, the ischemic attack acts in septic environment complicating the inflammatory process, which develops in the intestinal wall.

The clinical manifestation is non-specific and varies, depending on the type of disturbed blood supply, velocity of occurring of the ischemic accident, the adequacy of the collateral circulation and the concomitant patient’s diseases.

The clinical course of the ischemic colitis is divided in two major groups of patients with gangrene form (15-20%) and patients with non-gangrene form (80-85%). In the non-gangrene form the lesions can be transient and reversible, and can progress to chronic and non-reversible stenosis (10-15%) or chronic segmented colitis (20-25%) (Gandhi et al., 1996; Guttormson and Bubrick, 1989).

In the beginning, the clinical manifestations in most of patients are non-specific and start with moderate abdominal pain from the engaged by ischemia part of intestines. The pain has fluctuating pattern, with no radiation, and is also accompanied in most of the cases by diarrhea. Clear blood or data for melena is found in the stools up to 24 hours later. The bleeding is due to superficial necroses in the mucous membrane of the engaged part. It is minimal and has no hemodynamic manifestations. The late manifestations of ileus pattern, in subsided initial inflammation and developed fibrous changes, can include nausea, intestinal distension and painful peristalsis with overcoming pattern.

In 15% of patients, the engagement can include the whole depth of the wall - transmural engagement - which leads to necrosis of the whole wall and development of peritonitis.

Although in most of the cases the laboratory tests are within the norm, severe ischemia accompanied by many necroses can be laboratorial manifested by leukocytosis and metabolic acidosis.

<table>
<thead>
<tr>
<th>TABLE 1. INDICATIONS FOR SURGICAL TREATMENT</th>
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<td>Acute ischemia</td>
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<tr>
<td>Peritonitis</td>
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<tr>
<td>Pneumoperitoneum</td>
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<tr>
<td>Intestinal gangrene, proved by endoscopy</td>
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<tr>
<td>Presence of diarrhea, rectorrhagia or</td>
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<td>protein losing enteropathy for more than</td>
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<td>14 days</td>
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The diagnosis ischemic colitis depends on the specific clinical manifestations of the disease and the sensitivity of the applied diagnostic methods.

- Anteroposterior X-rays - it is non-specific and has great diagnostic value for the diagnosis specification of the disease. Sometimes, at the anteroposterior X-rays can be found some non-specific signs as loss of haustration and dilation of colon
- Iriography - it registers the indirect changes as ulcers and sulci on the mucous membrane, edema and strictures
- The computed tomography is one of the methods, that enable the determination of the colonic hypoperfusion (Balthazar et al., 1999; Jones et al., 1982)
- Abdominal echography and endolumen echography - they enable differentiating of the inflammatory from ischemic stenoses of the intestinal lumen (Teefey et al., 1996)
- Colonoscopy is the most precise and sensitive method for the disease identification. It allows visualization and taking of biopsy of the significant mucous membrane changes. Some of the non-specific changes are erythema, edema, superficial necroses, easy vulnerability of the mucous membranes and strictures (Church, 1995; Hourmand-Ollivier et al., 2003)
Angiography - it allows identification of the sites with blood supply disturbance of the mesenterial circulation.

At the disease onset, most of the cases of mild ischemic attacks of colon remain unnoticed. In the later stages of the disease, the treatment is mainly surgical, while already developed complications, namely and most frequently stenoses of colon (Table 1).

Conclusion

This case report refers to a chronic process which in the course of ten years has repeatedly aggravated under the form of ordinary colitis. The progress of the process gradually resulted in the beginning of stenosis of an intestinal segment with the beginning of an acute intestine obstruction, which led to the emergency operation. The present announcement refers to a case of extremely rare complication of rarely occurring illness, ischemic colitis, and should be made a part of the knowledge of every surgeon. There is a need of summarized information from similar announcements in order to better understand the frequency and nature of this illness.

References


Cole, J., Cook, S., Miller, D et al., The risk of colonic ischemia among patients with irritable bowel syndrome, Digestive Disease Week 2002: A91 (Abstract 726)


