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Ischemic Changes in the Mucous Membrane of the Transverse Colon as a Complication of Acute Pancreatitis

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Aim: to present a clinical case of a patient with a complicated course of acute pancreatitis.
Key points. A 31-year-old patient was admitted to the surgical department with a clinical picture of acute alcoholic pancreatitis. Signs of anemia were regarded as a consequence of gastrointestinal bleeding. Computed tomography with contrast enhancement, along with an increase in the size of the pancreas, the presence of foci of pancreatic necrosis with multiple fluid accumulations in the parapancreatic space, revealed smoothed gaustration and thickening of the walls of the predominantly transverse colon. During colonoscopy, ischemic changes of the colon mucosa were detected in a timely manner. Negative results of analysis for toxins A and B of *Clostridioides difficile* and pathogenic intestinal flora were obtained. By the means of intensive care, it was possible to achieve complete stabilization of the patient's condition, normalization of laboratory blood parameters and relief of ischemic processes in the colon wall.
Conclusion. Ischemic changes of the colon can serve as a complication of acute pancreatitis. A thorough analysis of the results of computed tomography at the first signs of colon lesion and colonoscopy contributed to the rapid detection of complications and prevention of irreversible colon ischemia.
Key words: pancreatitis, colon, ischemia
Conflict of interest: the authors declare no conflict of interest

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Ишемические изменения слизистой оболочки поперечной ободочной кишки как осложнение острого панкреатита

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Цель. Представить клиническое наблюдение пациентки с осложненным течением острого панкреатита.
Основные положения. Пациентка 31 года поступила в хирургическое отделение с клинической картиной острого алкогольно-алиментарного панкреатита. Признаки анемии были расценены как следствие желудочно-кишечного кровотечения. При компьютерной томографии с контрастным усилением наряду с увеличением размеров поджелудочной железы, наличием очагов панкреонекроза с множественными жидкостными скоплениями в парапанкреатическом пространстве, были выявлены сглаженная гаустрация и утолщение стенок преимущественно поперечной ободочной кишки. При колоноскопии были своевременно обнаружены ишемические изменения слизистой оболочки ободочной кишки. Получены отрицательные результаты анализа на токсины А и В *Clostridioides difficile* и патогенную кишечную флору. Благодаря проведению интенсивной

терапии удалось достичь полной стабилизации состояния больной, нормализации лабораторных показателей крови и купирования ишемических процессов в стенке толстой кишки.
Заключение. Ишемические изменения толстой кишки могут быть осложнением острого панкреатита. Тщательный анализ результатов компьютерной томографии при первых признаках поражения толстой кишки и выполнение колоноскопии способствовали быстрому обнаружению осложнения и предотвращению развития необратимой ишемии толстой кишки.
Ключевые слова: панкреатит, толстая кишка, ишемия
Конфликт интересов: авторы заявляют об отсутствии конфликта интересов

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The Russian Federation occupies one of the leading places in the incidence of acute pancreatitis in the world — 82 cases per 100,000 population, and the mortality rate is 2.7 deaths per 100,000 population [1].

The damaging effect of activated pancreatic enzymes and products of its autolysis is manifested primarily in the increasing dysfunction of vital organs and systems. In particular, activation of the kallikrein-kinin enzyme system with a significant vasoactive effect leads to deep microcirculation dysfunction and impaired blood rheology, as well as hemodynamic disorders [2]. Disorders of microcirculation in the basin of the ventral trunk and portal vein cause further progression of the autolytic and ultimately necrotic process in the pancreas and surrounding tissues. In parallel, systemic exposure to vasoactive and proteolytic enzymes can lead to the development of necrosis foci in various organs [3].

Due to the anatomical proximity to the pancreas in severe pancreatitis, pathological changes of the colon are quite often diagnosed, such as ischemia, perforation, fistula formation, stricture formation against the background of inflammatory infiltration [4].

Given the high mortality rate from this group of complications, it is especially important to perform timely diagnostic and therapeutic measures. Below is a clinical case of such a complication of acute pancreatitis as necrosis of the colon mucosa.

A 31-year-old patient was admitted to the emergency department in a state of moderate stun (13 points on the Glasgow coma scale). The deterioration of the patient's well-being was associated with the use of fatty foods and alcohol a day before treatment. It became known from the anamnesis that this episode occurred for the first time in the patient, and the hereditary anamnesis was not burdened.

At the initial examination, the patient's condition was regarded as severe, there were pronounced phenomena of systemic inflammatory response syndrome (14 points on the APACHE II scale).

Laboratory blood tests showed a high level of inflammatory markers (C-reactive protein — 140 mg/l, procalcitonin — 21.48 ng/ml), a pronounced violation of the hemostasis system (APTT — 114.7 sec, prothrombin — 64 %, antithrombin III deficiency — 58.4 %), hematocrit to 30.4 %. Pancreatic amylase indices were increased was 227.8 units/l, lipase 369.7 units/ml, urine amylase was 1721 units/l. The patient also had anemia of moderate severity — the hemoglobin level was 88 g/l. Upon admission, there were negative results of analysis for toxins A and B of *Clostridioides difficile* and pathogenic intestinal flora.

During ultrasound examination, the intrahepatic biliary ducts were not dilated. The gallbladder was reduced, of the usual structure, anechoic. Pathological changes in the choledochus were not determined. The contours of the pancreas in the tail area were fuzzy, smooth, the echostructure was diffusely heterogeneous with a zone of reduced echogenicity without clear contours mainly in the tail area. Tissue infiltration with the presence of a narrow layer of free fluid up to 4 mm thick was detected in the omentum bag (mainly in the body area). Uniform thickening of the walls of the ascending and transverse colon up to 6 mm was noted due to all layers.

CT scan of the abdominal organs with contrast enhancement was performed. There was an increase in the size of the pancreas (head — 39 mm, body — 31 mm, tail — 33 mm), the presence of foci of pancreatic necrosis with multiple fluid accumulations in the parapancreatic space, their spread to the area of the small omentum and lateral channels (grade E according to Balthazar). The colon, mainly transverse colon, was with smoothed gaustration, thickened due to the submucosal layer by the wall. Fragmentary contrast of the mucous membrane was also observed, especially pronounced in the proximal and middle third of the transverse colon, which served as the basis for performing colonoscopy (Fig. 1A, B).

A colonoscopy revealed deformation and narrowing of the lumen of the transverse colon. The mucous membrane of the ascending and transverse colon was hyperemic and edematous with multiple irregular discharge ulcers with a coating of fibrin and areas of ischemic changes (Fig. 2A, B). A biopsy

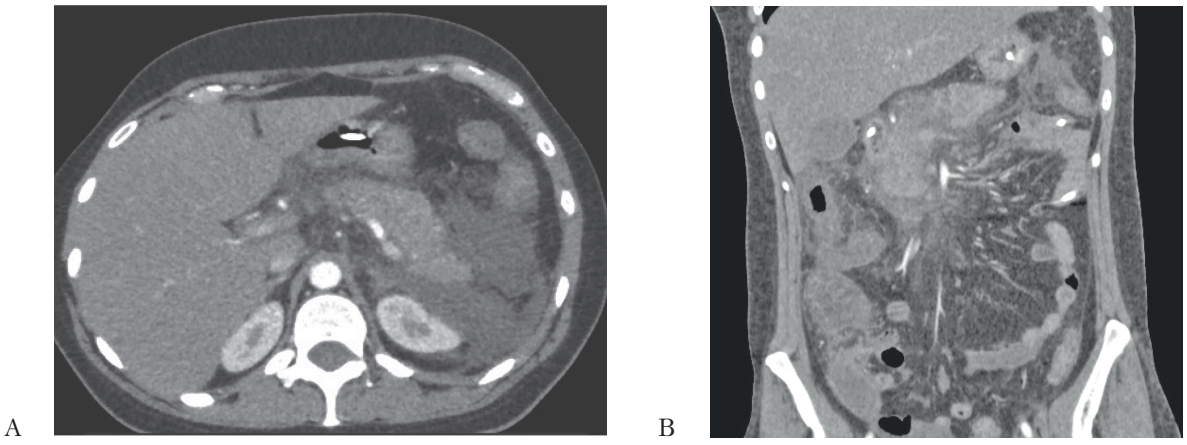

Fig. 1A, B. CT scan of the abdominal organs at admission to the hospital. Signs of pancreatitis in the form of an increase in the size of the pancreas, the contours are fuzzy, areas of hypoperfusion are determined in the structure of the pancreas — zones of pancreatic necrosis, the main pancreatic duct is not expanded. In the parapancreatic fiber with the spread into the lateral channels and interstitial, effusion is determined in a significant amount

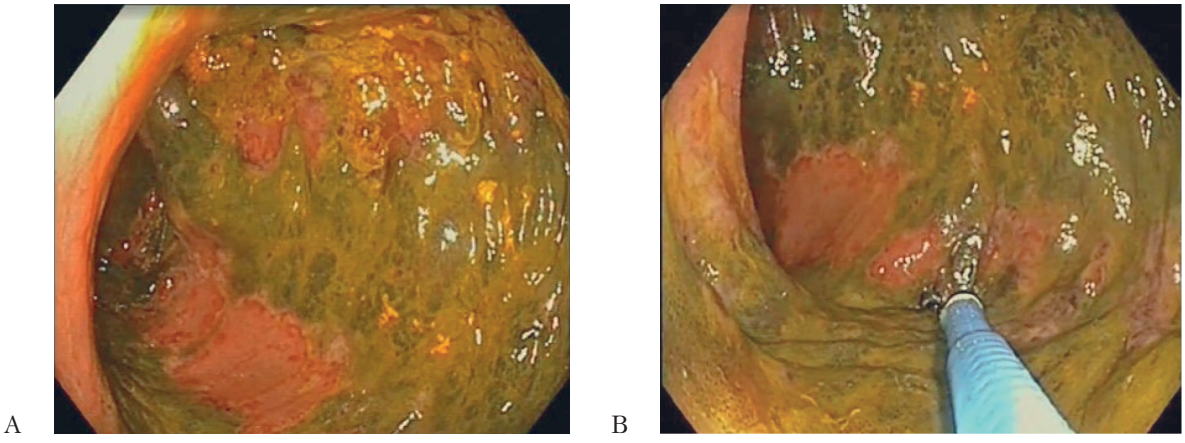

Fig. 2A, B. Colonoscopy. View of the mucous membrane of the transverse colon upon admission to the hospital. Multiple drain ulceration and areas of ischemic changes

was performed. The mucous membrane of the sigmoid and descending colon was pink and smooth, the vascular pattern was clearly defined. No pathological changes of the rectum were detected.

Histological examination of the biopsy material from the area of the transverse colon lesion revealed pronounced tissue edema with extensive areas of ulceration and hemorrhages. The superficial epithelium and the epithelium of the glands were represented by high prismatic and goblet cells. Also, diffuse inflammatory infiltration with necrosis sites was determined (Fig. 3A–D).

According to esophagogastroduodenoscopy, no significant changes in the esophagus, stomach and duodenum were detected.

Considering the absence of clinical, laboratory and instrumental signs of irreversible pathological changes in the colon, it was decided to refrain from surgical intervention.

Complex therapeutic measures were carried out: infusion therapy and transfusion of erythrocyte mass, carbopenem class antibiotics, anticoagulant therapy (heparin 25 IU / kg / hour with transfer to enoxiparin 0.6 ml 2 times a day), correction of nutritional status. It was possible to achieve complete stabilization of the patient's condition and normalization of laboratory blood parameters. On the 12th day after admission, the patient was transferred to the ward from the intensive care unit in a satisfactory condition.

According to the control endoscopic examination, the decrease of inflammatory phenomena and complete epithelization of the ulcerative defect of the

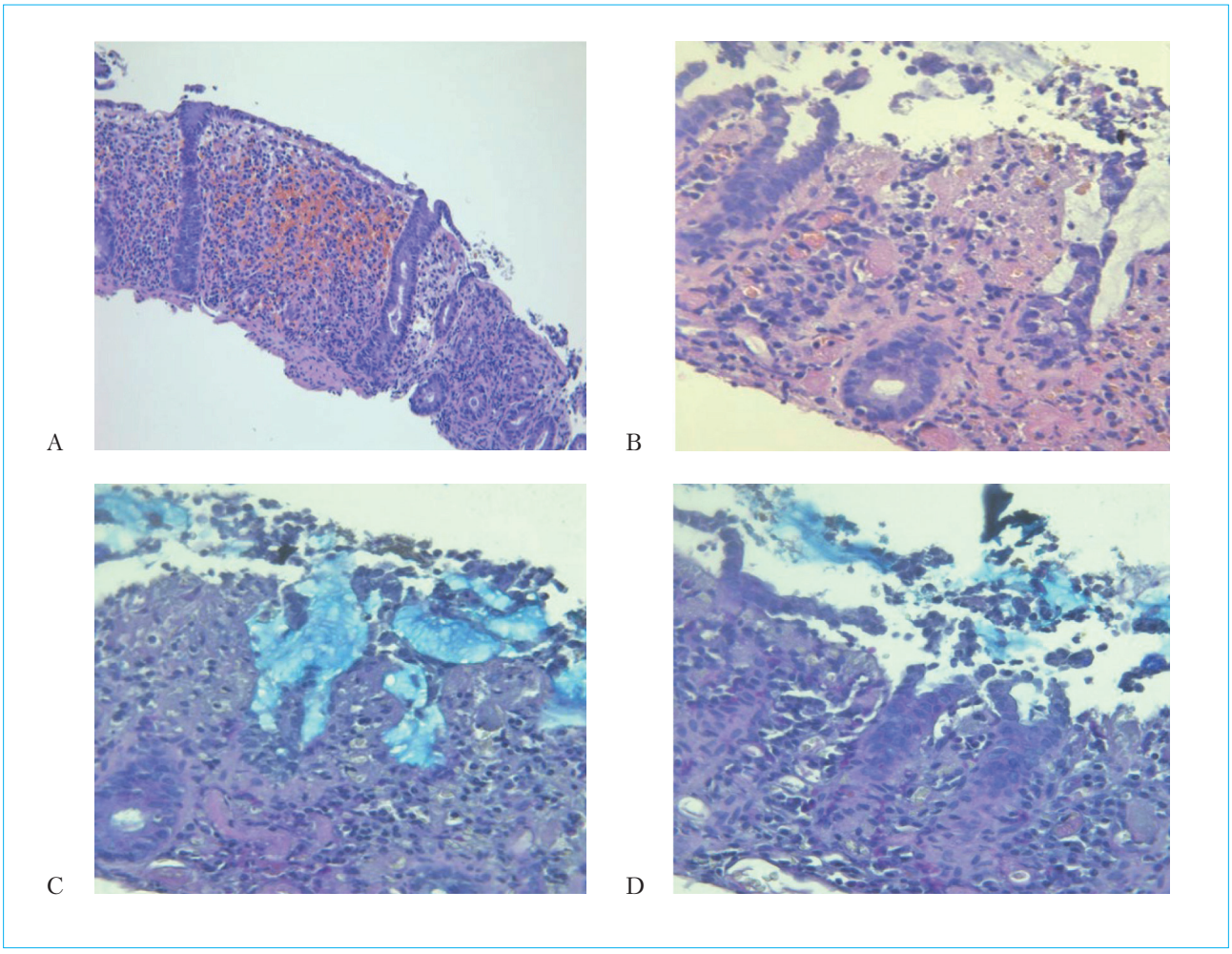

Fig. 3. Histological examination of biopsies of the transverse colon: A, B — color hematoxylin and eosin, ×200 (A), ×400 (B); C, D — PAS reaction in combination with alcyan blue, ×400. Fragments of the colon mucosa with superficial necrosis, inflammatory infiltration, destruction of part of the crypts with the "exit" of mucus to the surface (acid mucopolysaccharides are colored blue with PAS reaction in combination with alcyan blue — C) and the disappearance of goblet cells in deep sections of the mucous membrane (negative PAS reaction in combination with alcyan blue — D)

mucous membrane of the transverse colon were noted (Fig. 4).

During the control CT, a decrease in the size of the pancreas was noted (head — 20 mm, body — 21 mm, tail — 18 mm), the contours were clearly defined, the structure of the pancreas became more homogeneous, the main pancreatic duct was not expanded. In the parapancreatic tissue, an insignificant amount of effusion was noted with a decrease in effusion in the lateral channels and interstitial (Fig. 5A, B).

Therefore, according to the examination and observation data, a clinical diagnosis was formulated in the clinic:

The main disease: Acute alcoholic-alimentary pancreatitis of severe degree.

Complication: Parapancreatitis with fluid accumulations. Infiltrative-ulcerative changes of the mucous membrane of the caecum, ascending and transverse

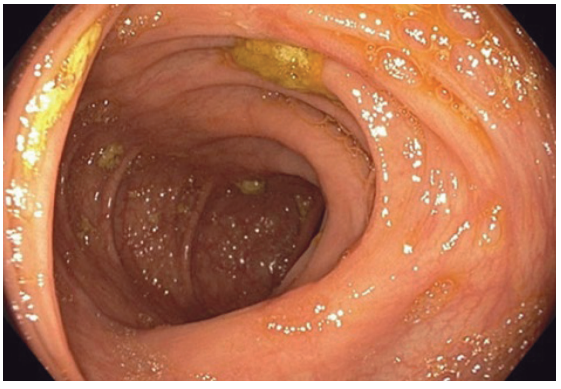

Fig. 4. According to the control endoscopic examination, the decrease of inflammatory phenomena and complete epithelization of the ulcerative defect of the mucous membrane of the transverse colon were noted

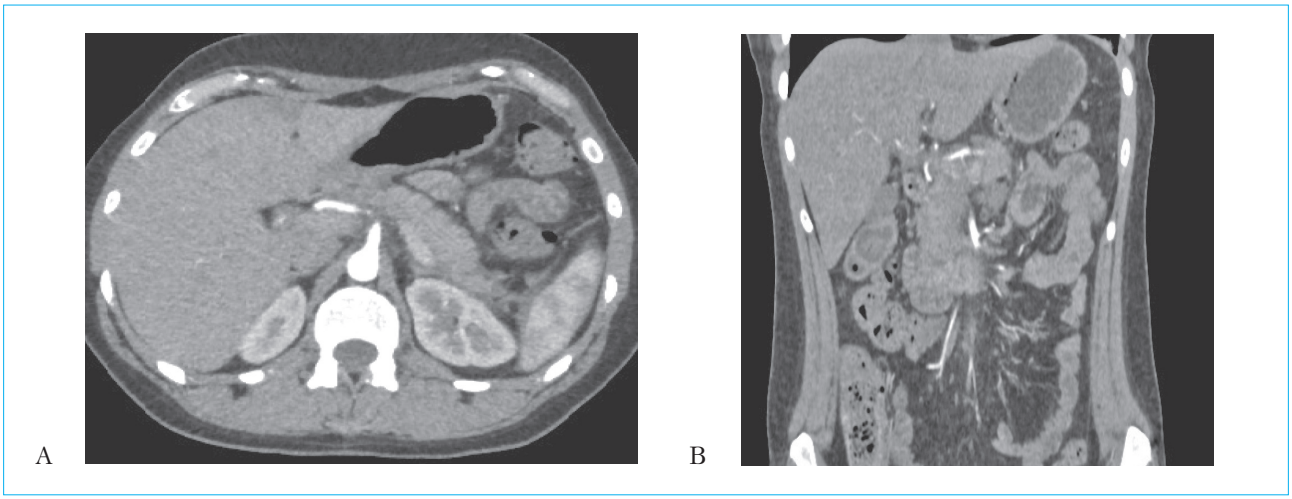

Рис. 5A, B. CT scan of the abdominal organs a month after discharge from the hospital

colon. Intestinal bleeding in past. Posthemorrhagic anemia of moderate severity. Systemic inflammatory reaction syndrome.

The patient was discharged from the hospital in a satisfactory condition. The duration of hospitalization was 16 days.

Discussion

It is believed that ischemic disorders of the colon are a fairly rare complication of acute pancreatitis and, as a rule, the treatment tactics of this group of patients are not reflected in clinical recommendations.

Ignoring possible changes in the colon in pancreatitis can lead to serious consequences. A retrospective analysis of autopsy data from 48 patients with acute pancreatitis revealed ischemic lesions of the small and large intestine in 27 % of cases and were accompanied by severe necrotic changes, but the diagnosis was confirmed endoscopically only in 1 case [4].

S.R. Mohammed et al. analyzed literature data and the incidence of colon lesions in pancreatitis (usually severe) was estimated at 15 %. Colon necrosis was associated with a mortality rate of more than 50 %. Involvement of the colon in the process is a deadly condition, the early diagnosis of which is very difficult [5].

Conclusion

This clinical case clearly shows that when verifying acute pancreatitis, a targeted analysis of computed tomography and colon changes is necessary. The revealed changes may become the basis for a colonoscopy. Timely detection of acute pathology of the colon against the background of acute pancreatitis can prevent severe surgical complications and contribute to achieving a good result of conservative treatment.

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