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Clinical Case of Primary Sclerosing Cholangitis on the Crohn's Disease of the Upper Gastrointestinal Parts Background

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ABSTRACT:

Inflammatory bowel disease (IBD) and primary sclerosing cholangitis (PSC) are two separate diseases, with still unclear etiologies that continue to be investigated. Clinic manifestation of IBD-PSC is different from separate clinics of these diseases. A great portion of different scientific surveys witness of connection between IBD and PSC. Still, there is no enough data to perform a large randomized trial for imaging a clear picture of the IBD-PSC connection condition. Most prevalent is a combination between primary sclerosing cholangitis and ulcerative colitis. In our clinical case, we headed with a combination of primary sclerosing cholangitis and stomach form of Crohn's disease (CD). The following clinical survey showed a rare case of primary sclerosing cholangitis with stomach's Crohn's disease combination, which was complicated by difficulties in diagnostic and correct treatment tactic selection. We tracked our patient from the beginning of first gastrointestinal symptoms in 2006 when gastric ulcer was revealed and 2014 when chronic gastric ulcer was diagnosed towards 2017 when our department visiting a patient was diagnosed rare gastric Crohn's disease form and primary sclerosing cholangitis with ulterior colitis development in 2019. Further clinical examinations of similar clinical cases will confirm or deny out the assumption of a connection between gastric Crohn's disease and primary sclerosing cholangitis.

KEYWORDS: *Crohn's disease, primary sclerosing cholangitis, gastrointestinal tract, rare pathology combination, biopsy.*

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I. INTRODUCTION:

History and Prevalence:

The first data of sclerosing cholangitis was reported by C. E. E. Hoffman in 1867, and the first detailed description of primary sclerosing cholangitis (PSC) was made by the French surgeon P. Delbet in 1924[1]. Currently, PSC implied as a chronic cholestatic heterogeneous liver disease characterized by hepatic bile ducts lesions, with further multifocal biliary constrictions[2] and development of secondary biliary cirrhosis, portal hypertension, and liver failure[3]. In the 60s of the 20th century, M. R. Smith and R. H. Loe were the first who described the PSC with inflammatory bowel disease (IBD) simultaneous[4]. A generous amount of aimed surveys confirmed a clear association between IBD and PSC[5-9]. Those patients who had Crohn's disease (CD) and ulcerative colitis (UC) were additionally suffering from PSC in 3.4% and 2.4-7.5% of cases appropriately[5-6]. While IBD with PSC is found in 22-98% of patients depending on the region[7-11].

Similar study examples:

There is evidence of differences between IBD associated with PSC and UC and CD ongoing without liver lesions by clinical, endoscopic, and morphological signs. In past years, plenty of authors hypothesized a new single nosological form of the disease[10-11], but there is not enough clear evidence base confirming its viability. One of the main features of IBD during PSC is compulsory colon involvement in the inflammation process, without limitation for CD[10-13]. There is only one mentioning of the connection between PSC and isolated lesion of the upper gastrointestinal tract during CD in world literature[13]. The following clinical observation demonstrates a rare case of PSC debut on the background of gastric Crohn's disease.

II. CASE REPORT:

Patient, B, 68 years old, retired

Observation since November 2017, when the patient comes for planned hospitalization.

Complaints during hospitalization:

- severe skin itching (7 points on a visual analog scale)
- epigastric aching pains, without irradiation arising without connection with food intake
- decreasing epigastric pain, but not stopping after taking proton pump inhibitors (PPIs) taking
- fasting nausea
- general weakness.

Anamnesis:

Considers ill since 2006, after epigastric region pain appearance. According to the patient, the gastric ulcer was diagnosed, received 1-month therapy with a positive clinical effect (medical documentation is not presented; patients do not remember drug names). After control esophagogastroduodenoscopy (EGD) in 2

months- ulcer scarring. Since then, 1-2 times per year, weak aching pains in the epigastric region disturbed, did not seek medical help, did not receive therapy.

In 2008, during preventive examinations, hemoglobin (Hb) level lowering was observing to 90-105 g/l, serum iron to 7.0 μmol/l [reference values (RV) - 11-28 μmol/l], accelerated erythrocyte sedimentation rate (ESR) up to 30-50 mm / h [RE - 2-10 mm / h]. The diagnosis of mild iron deficiency anemia has been established [D50.9]. Oral iron therapy was performed with a positive effect of Hb level increasing. Until 2014, no data on health conditions.

In October 2014, emergency hospitalization connected with an abdominal pain syndrome (epigastric spasms) arising from a background of expressed general weakness and bodyweight decreasing of 5 kg per month. After inspection following data are revealed: mild anemia (Hb= 116 g/l), accelerated ESR (44 mm/h), lowering serum iron (6 μmol/l). Levels of serum vitamin B12, folate, transaminase activity, cholestasis markers within the RV, C-reactive protein (CRP) - 1 mg/l [RV = 0-5 mg/l]. According to the EGD: “Antrum mucosa is hyperemic, swollen. A linear under fibrin ulcer, 0.5 × 0.9 cm in size, is visualized on the front wall. Duodenum mucosa is not changed. The rapid urease test is negative. Ultrasound examination of the abdominal cavity organs and colonoscopy inspection revealed no evidence of pathological changes.

2014 Diagnose and treatment:

Considering everything above, the following diagnoses were concluded: "Chronic gastric ulcer, exacerbation: antrum ulcer [K25.7]. Iron deficiency anemia, mild form [D50.9]." The treatment was carried out with PPIs medications, bismuth subsalicylate, oral iron medications, antacids with a positive clinical and endoscopic effect: the symptoms were stopped, according to EGD in 4 weeks - “the absence of inflammatory changes in the gastric and duodenum mucosa; the antrum scar 0.3 × 0.5 cm in size”. Discharged for outpatient treatment: PPI (omeprazole) - 40 mg/day, oral iron preparations for 2 months. Normalization of Hb level in 2 months. Well-being for the next three years was satisfactory.

New-shape disease aggravation:

In October 2017, epigastric pain with no connection with food intake was appeared again, general weakness, nausea, skin itching (7 points on the visual analog scale). Taking Omeprazole at a dose of 40 mg/day was not accompanied by a positive clinical effect. Planned hospitalization in the therapeutic department was conducted.

Objectively:

- The general condition is satisfactory. Body temperature 36.6 C. Bodyweight 83 kg, body mass index 24 kg/m2.

- The skin is dry, healthy in color with multiple skin excoriations. Oral mucosa is not changed.
- Heart percussion borders are not shifted. The heartbeat is rhythmic; the tones are clear. The heart rate is 80 beats per minute—arterial blood pressure- 120/70 mm Hg.
- Percussion borders of the lungs are within normal limits. The vesicular breathing, no wheezing. Respiratory rate- 18 per minute.
- During the superficial palpation, the abdomen is soft and painless. With deep abdomen palpation- pain in the epigastric region and sensitivity in the Shofar's zone are felt. The size of the liver, according to bimanual examination, is 9 × 8 × 9 cm, with a smooth, elastic, painless edge. Spleen inaccessible for palpation.
- The tonicity of the colon is not changed; palpation is painless. Daily stool, according to Bristol Stool Scale (1997) - type 3, without pathological impurities. Urination is regular, painless.

Laboratory indicators:

- Hemogram values within the RV; ESR - 40 mm/h;
- increased activity of aspartate aminotransferase (AST) to 2N (from now on N is the multiplicity of the RV upper boundary), alanine aminotransferase (ALT) to 3N, alkaline phosphatase (ALP) to 10N, γ -glutamyltransferase (GGT) up to 12N;
- C- reactive protein, total bilirubin, vitamin B12, serum folates - correspond to RE.
- Fecal calprotectin increased - 158 μg/g (RV - less than 50 μg/g).
- Serological indicators: Ig A (ASCA IgA) and IgG (ASCA IgG) antibodies for Saccharomyces cerevisiae in titers of less than 1:20 each (RV - less than 1:20), perinuclear antineutrophilic cytoplasmic antibodies (ANCA) in titer 1: 160 (RV - less than 1: 40), IgG antibodies class to Helicobacter pylori - 0.5 U/ml (correspond to RV).

Esophagogastroduodenoscopy examination:

According to EGD (Figure 1):

1. The gastric mucosa is edematous, hyperemic; foci are subatrophied.
2. In the antrum along the front wall, a deep ulcerative irregular shaped defect 0.7 cm in diameter with perifocal edema and convergence of folds;
3. There is an 0.5x0.7 cm aphthous ulcer, multiple erosions under fibrin.
4. Along the back wall of the gaster - a deep 0.5x1.2 cm linear-shaped ulcerative defect under fibrin.
5. The mucous membrane of the esophagus and duodenum are not changed.

A biopsy sample was taken [2 from the body of the gaster, 2 from the antrum, 1 from the corner of the stomach, 3 from ulcer defect- according to the Operative Link for Gastritis Assessment guidelines (2008).

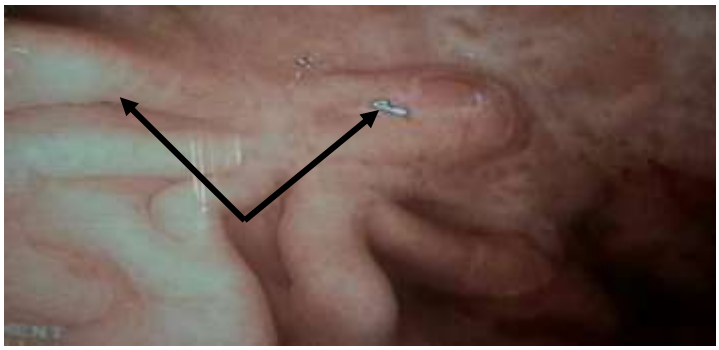


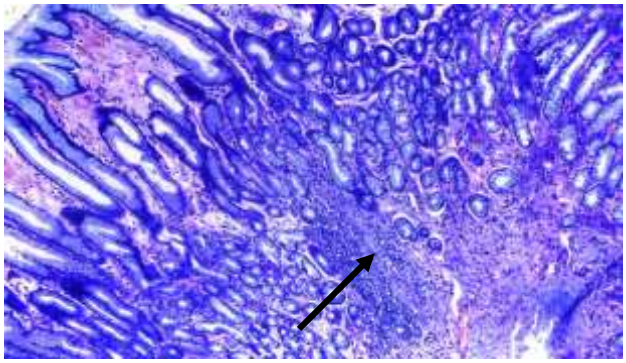
Fig. 1: Results of patient's B. EGD (antrum mucosa). Ulcer defect with perifocal edema and convergence of folds

Histological examination:

Morphological study of the antrum mucosa (Figure 2):

1. A picture of chronic inflammation, scanty focal mononuclear infiltration of the mucosal lamina propria.
2. Focal round-cell infiltrates in the basal parts of the pyloric glands.
3. Inflammatory infiltration of the mucosa (ulcer epithelization), lamina propria fibrosis, mucosal hyperplasia of the integumentary epithelium.
4. Helicobacter pylori are not detected.
5. There are no granulomas.

A.



B.

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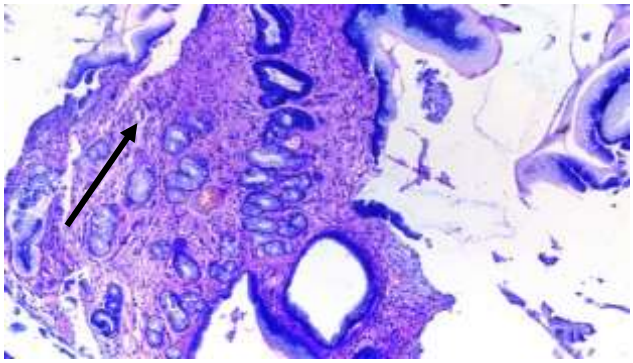

Fig.2: The results of a histological examination of the patient's

B. antrum mucosa (Romanovsky - Giemsa stain, m × 100)

A - focal infiltrate of the lamina propria basal sections, B - intermediate stroma fibrosis

Gastrointestinal fluoroscopy data:

Upper GI showed:

1. The gastric mucosa is hydropic; the antrum folds are unevenly thickened;
2. A deep recess is visualized along the front wall of the antrum, a marginal filling defect with a clear, uneven, serrated contour of about 0.8 cm;
3. Another recess measuring 0.5x0.7 is visualized 4 cm more proximal then previous;
4. Along the posterior wall, there is a deep linear shape recess characterized by a filling defect with a clear, uneven, serrated contour, 0.5 x 1.2 cm in size.
5. The contrast evacuation is retarded.
6. There are no stenosis signs.
7. The esophagus and duodenum mucosa is not changed.

Colonoscopy:

There are no ileal pathological changes after colonoscopy.

Magnetic resonance imaging (MRI) findings:

According to MR enterography (3 weeks after starting therapy):

1. The wall of the antrum is unevenly thickened towards the pyloric canal up to 7 mm. The folds of the antral mucosa are deformed, the relief is blurred.
2. Inflammatory changes in the surrounding fatty tissue are not detected.
3. A horizontal and ascending part of the duodenum is filled with contrast agent. Their contours are smooth and clear.

4. Along the small bowel mesentery, single lymph nodes up to 9 mm are visualized, without hyper intensive signal.

5. After intravenous contrast agent (Gadodiamide) administration, an accumulation of it by the affected stomach wall is observed (increased signal intensity from the antrum).

6. The boundary between the affected and unaffected zone is clearly defined.

7. Other changes in the GI tract are not observed.

MR enterography conclusion: low activity Crohn's disease with antral lesions, inflammatory form (Figure 3).

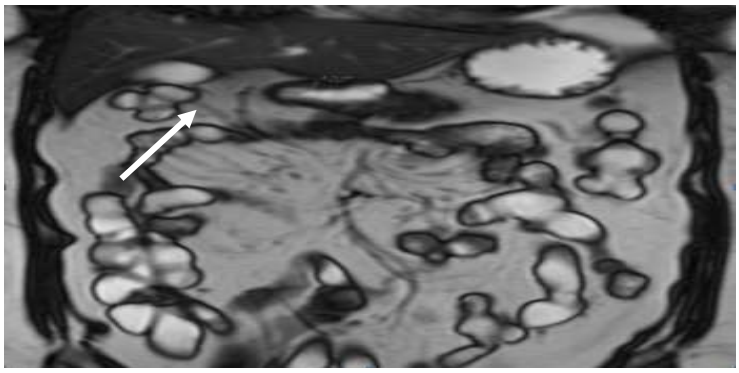

Fig.3: Results of MR enterography of patient B. Uneven antrum thickening

The following diagnoses were concluded: “Crohn’s disease with upper gastrointestinal tract lesions (erosive gastritis), inflammatory form, mild course, low systemic activity [K50.8].”

Primary sclerosing cholangitis suspicion:

Due to the presence of cholestasis laboratory and clinical signs, PSC diagnosis was suggested. Patient B. was also examined for liver diseases:

- markers of viral hepatitis (HBsAg, anti-HBc Ab-total, anti-HCV Ab) were not detected;
- ferritin, transferrin saturation percentage, ceruloplasmin, copper in blood and copper in daily urine - within the limits of RE;
- antinuclear and antimitochondrial antibodies were not detected
- no pathological changes in the liver, bile ducts, pancreas, and spleen during transabdominal ultrasonography
- no defects in portal blood flow parameters during the Doppler ultrasound
- Magnetic resonance cholangiopancreatography (MRCP) also showed no signs of pathological changes.

By PSC suspicion, and due to the absence of reliable signs of the disease during MRCP- liver biopsy was performed according to the recommendations of the European Association for the Study of the Liver (EASL) and the European Society for Gastrointestinal Endoscopy (ESGE) (2017)[14].

Liver biopsy:

Morphological biopsy samples examination (hematoxylin-eosin staining, trichrome staining):

1. Small portal tracts without significant stromal fibrosis and pathological cell infiltration.
2. The bile ducts are not present in all portal tracts.
3. The biliary epithelium is minimally reactively proliferated, without intraepithelial cell infiltration and with the visible border lamina preservation.
4. Part of the bile ducts have signs of distinct periductal fibrosis.
5. There are no periportal necroinflammatory changes.
6. There are no signs of ductal or intracellular cholestasis.

Thus, histologically specific PSC characteristic was detected - periductal fibrosis (Figure 4).

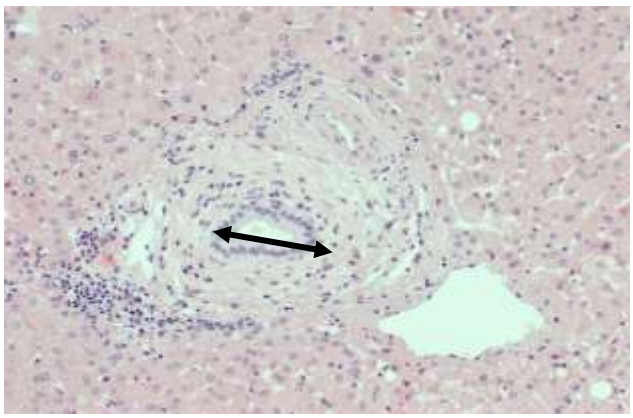

Fig.4: The results of a histological examination of the liver punctate (Hematoxylin-eosin stain, m. × 200). Periductal fibrosis

III. Diagnosis&Treatment:

All of conducted clinical, laboratory, and instrumental examination helped us to put a diagnosis:

1. Crohn's disease with upper gastrointestinal tract lesions (erosive gastritis), inflammatory form, mild course, low systemic activity [K50.8].
2. Primary sclerosing cholangitis of the small ducts [K83.0].

An increased dose of IPP was prescribed - rabeprazole 80 mg/day, bismuth preparation, alginic acid, ursodeoxycholic acid (UDCA) 1250 mg/day (15 mg/kg body weight).

IV. Results of treatment:

After 1-month starting therapy, clinical and endoscopic CD remission was achieved, skin itch severity decreased to 2 points, cholestasis markers activity lowering: ALP - 3 N, GGT - 4 N, normalization of transaminases.

During the outpatient stage, UDCA therapy was continued at the previous dosage; rabeprazole lowers to 20 mg per day (permanent use). Cholestasis laboratory markers (ALP, GGT) returned to normal values within 3 months from the start of UDCA administration. The patient was examined with control of laboratory markers, MRCP, EGD, FCS annually. Clinical and endoscopic CD remission remained. Skin itching was absent.

Colitis accession:

In November 2019, diarrhea first appeared (stool up to 3-4 times a day, type 6 by Bristol Stool scale, without pathological impurities). The examination revealed ESR acceleration (35 mm/h), CRP elevation(15 mg/l), fecal calprotectin (400 μg/g). During EGD, the antrum scar was determined.

Colonoscopy results:

FCS was performed (Figure 5):

1. Examined 15 cm of ileum mucosa without features.
2. The part of colon mucosa from the caecum to the middle of the ascending colon is sharply edematous, hyperemic, with multiple erosions and aphthous 0.4 - 0.5 cm in diameter. The vascular pattern was not observed. The contact bleeding was minimal.
3. The colon mucosa from the distal ascending colon half to the rectum part is pale pink, slightly edematous with single small erosions and aphthous up to 0.3-0.4 cm diameter. The vascular pattern is preserved. No bleeding.

FCS conclusion: Crohn's disease, colitis. A simple endoscopic score of CD activity (SES-CD) is 9 points (normal endoscopic activity).

A multi-zone biopsy was performed (2 biopsy samples from each examined part of the large intestine).

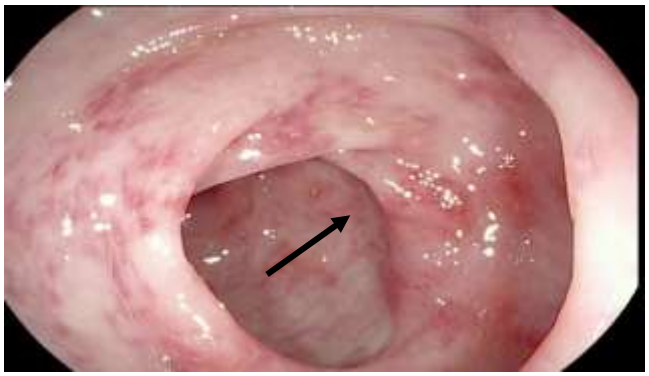

Fig.5: FCS results (caecum mucosa). Aphth-like changes

Colon biopsy:

Morphological study of the colon mucosa (hematoxylin-eosin stain, Romanovsky-Giemsa stain):

1. All changes of the colon are identical in its different parts; the caecum part is the most inflamed.
2. The superficial epithelium is partially flattened, erosion areas covered by mucus are detected, the focal leukocytes migration to the epithelium is determined.
3. The focal architectonics crypts disturbance is visualized.
4. The stroma of the lamina propria is moderately edematous, fibrosis.
5. Infiltrate represented by macrophages and lymphocytes is distributed unevenly, penetrates the deeper layers of the mucosa, its density is increased.
6. The vessels are unequally full-blooded.
7. Mucus formation is preserved.
8. There are no granulomas.

Conclusion: Crohn's disease, an inflammatory form.

MR enterography was performed - no signs of the small intestine lesions.

V. The final diagnoses and treatment:

Following diagnose was concluded:

1. Crohn disease: colitis, upper gastrointestinal tract lesions (stomach), inflammatory form, mild course, low systemic activity [K50.8].
2. Primary sclerosing cholangitis of the small ducts [K83.0].

The patient has a mild attack (Harvey-Bradshaw), a chronic recurrent CD.

Mesalazine- 4 g/day was added to existed therapy; clinical endoscopic remission was achieved.

Considering the progressive CD course with a frequent change of its localization, high complications risks from associated pathologies (ducts strictures, cholangiocarcinoma, colorectal cancer, and others), the patient is shown life-long monitoring by a gastroenterologist with annual laboratory markers monitoring, MRCP, EGD, FCS.

VI. DISCUSSION:

The main peculiarity of the clinical case is the rareness of PSC and CD combination with initial localization in the stomach. Due to the lack of such combination descriptions through the world literature, the experience of the upper gastrointestinal tract CD in patients without PSC and colitis was used.

Chronology of CD evolution:

CD became a separate nosological unit in 1932 after work B. Crohn et al., Who thoroughly outline the clinical picture of small bowel disease terminal parts[15]. In further exploration was shown that the inflammatory process could affect all gastrointestinal tract. In 1949 first evidence of gastric Crohn's disease appeared[16].

CD is a cyclic gastrointestinal disease that can affect all parts of the gastrointestinal tract featured by an initial inflammation of mucous membranes with further complication development. The etiology of CD is unknown[17]. World CD incidence is 3-20 people per 100000[18]. Mostly, CD affects the small intestine (30–50% of patients), in 0.5–4% of patients, the stomach and duodenum are involved in the process[17,19].

Crohn’s disease features and peculiarities of CD course in patient B:

Diagnosis and treatment criteria of CD are regulated by European Crohn and Colitis Organization (ECCO)[17,21] and by local Russian Gastrointestinal Society (RGA)[22]. Nevertheless, there is no "gold standard" of gastroduodenal zone CD administration. Due to the low prevalence of the disease and, as a result- unavailability of randomized trials conduction. The diagnosis is based on a comprehensive analysis of the clinical picture, visualization methods, and the results of a histological examination (multi-zone biopsy, surgical material).

The main specific in gastric CD diagnostic is the absence or low severity of clinical symptoms in uncomplicated forms[16-18]. Epigastric pain, nausea, weight loss are found in 4% of patients and are caused by peptic ulcers and/or stenosis[18].

The low and blurred clinic and the presence of nonspecific signs of the disease are main causes of long-term diagnosis verification in patient B. DC was suspected due to refractory course of the disease, etiological factor absence and the presence of endoscopic signs: aphthous and linear ulcerative defects opposed the round ones while peptic ulcer; severe edema, thickening of the folds of the antrum mucosa[23].

One-third of patients with upper tract CD have no fistulas and strictures[23]. We suggest that a patient's favorable course was conditioned by the "special phenotype" of CD and PSC association, which usually proceeds without complications development[13].

Diagnosis of upper gastrointestinal tract CD is often hampered by the absence of specific morphological signs[17,24]. Granulomas detection helps during CD differential diagnosis, by limiting to a few granuloma-proliferating diseases[24]. Despite the fact that granulomas are no CD/PSC[13] association markers and inherent only for 3-24% CD patients[17,24].

During the patient's B. morphological study of gastric biopsy specimens, chronic inflammation without clear nosological affiliation was observed. The focal distribution of inflammatory infiltrate in the mucous membrane can be considered relatively specific for CD[23-25]. Due to the deficiency of markers during the biopsy, the diagnosis should be based on endoscopic and x-ray examination[17,21]. X-ray diagnostic showed an inflammatory form of gastric CD inpatient B.[17,21]: mucosa ulceration, uneven thickening of the folds, intramural ulcers, antrum fissures have confirmed the diagnosis. MRI data (irregular thickening of the antrum mucosa, folds deformation, a distinct border between the affected and non-affected walls), in combination with a previous examination, finally establish it. The effect of a 3-week therapy explains the absence of gastric ulcers during MR enterography before the study.

The issue of serological tests diagnostic significance in patients with associated pathology is controversial. Antibody estimation can be used as an additional method of CD diagnostic[17]. Still, by diagnostic of IBD/PSC combined pathology, evaluation pANCA and ASCA have no diagnostic value[26]. pANCA presented in 25-85% patients with PSC[26,27], with no correlation between those patients who have PSC as a sole disorder and with those where PSC and IBD combination occurred.

Crohn's disease signs developed only after a few years of gastric damages and PSC existing, so the clinical picture became similar to PSC/IBD association. Possibly, rare data of gastric CD with PSC combination in world literature due to the problematic isolated gastroduodenal CD verifying as well as difficult PSC diagnosing via the absence of typical IBD signs and cholangiographic changes[35]. We suggest the obligate presence of colitis in the PSC / IBD descriptions can be associated with the late diagnostic.

The specificity of the patient's B. disease course was in an increasing prevalence of lesions due to CD progression. It can be explained by the combined pathology presence, which mostly characterized by colon involvement in the inflammatory process[5,13]. The asymptomatic colitis with endoscopic disease activity, the predominance of right-sided intestinal lesions observed inpatient B. - are signs of “special IBD phenotype” during PSC[5].

Primary sclerosing cholangitis features:

Segmental strictures of the extra- and intrahepatic ducts detected by MRCP are PSC markers. The absence of cholangiography changes complicated PSC diagnostic; consequently, a liver biopsy was performed with its further morphological study. Classically, in the most significant part of patients, cholangiography shows PSC signs, but occasionally biopsy can be the last instance in PSC verifying[28-30]. Mostly, liver biopsy is proposed for PSC of small ducts diagnosing (20-28% of patients)[28,30]. Morphologically, PSC is a combination of lymphocytic infiltration with fibrosing pericholangitis of the bile ducts[29,30]. Remote PSC sign is decreasing of bile ducts number[29]. Periductal fibrosis of the interlobular bile ducts is a rare event 17-50% of all biopsy samples[28-30]. During a morphological study of the patient's B[36]. liver biopsy, the diagnosis was based on periductal fibrosis and interlobular bile ducts lowering combination.

Associated pathology (CD+PSC) therapy:

Specific treatment of associated diseases does not currently exist. Treatment is provided due to CD consensus (ECCO, 2016; 2020; RGA, 2017)[17,22,31], as well as the management of patients with PSC (American College of Gastroenterology (ACG) - 2015 and other gastroenterological organizations)[28,30].

Recommendations for the gastroduodenal CD treatment are based on case series and clinical experience. Every single case must be strictly individualized, and all decisions for such patients are made by the physician[31]. If HP infection is detected, eradication of this infection is probably necessary. Drug therapy for mild non-structuring non-penetrating CD form with the gastroduodenal zone damaging includes only PPI[17]. PPI monotherapy is symptomatic but has no impact on the inflammation process[17]. The question of maintenance therapy remains open. Systemic glucocorticosteroids and tumor necrosis factor-α antibodies are used for remission induction in moderate and severe CD attack[17]. There are no described cases of biological therapy usage of such patients.

According to the mild course and remission achievement in our case, schemes above remained reserve.

Despite the non-recommended status of 5-ASA as induction and maintenance therapy in patients with CD lesions of the colon, patient B. get the remission condition after mesalazine intake[17,31]. RGA recommends 5-ASA for the treatment of mild CD colitis and maintenance therapy. Mesalazine choice was motivated by peculiarities of intestinal damage during PSC, characterized by a mild course of the disease distinguishing it from the classical form of a CD. 5-ASA is effective for remission achieving in patients with CD and PSC, as well as have an antitumor effect[32]. Furthermore, glucocorticosteroids have no sufficient impact on the PSC course and are associated with plenty of side effects[28,30].

PSC treatment also appears as a serious problem. There is no single drug studied to be effective in PSC treatment nowadays. UDCA only improves laboratory parameters of patients but has no impact on the patient's survival. In some cases, UDCA aggravates the survival of the patients[28,30,33]. At the same time, UDCA

considered being the potentially antitumor agent with reducing cholangiocarcinoma and colorectal cancer development[34]. The sole way of PSC treatment is liver transplantation[28,30].

VII. CONCLUSION:

Primary sclerosing cholangitis can develop as a separate disorder on the gastroduodenal form of Crohn's disease background. Herewith, there is a tendency of the distribution of inflammatory processes all over the gastrointestinal tract, including the last parts of the colon. In this case, the low-symptom course, the absence of specific morphological signs of CD (such as granulomas), the mild course of the disease without strictures development, and penetration, which does not require the immunosuppressive therapy administration, distinguished CD / PSC association from the classical CD forms.

Further clinical examinations of similar clinical cases will confirm or deny out the assumption of a connection between gastric Crohn's disease and primary sclerosing cholangitis.

CONFLICTS OF INTEREST:

The authors declare no conflicts of interest.

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