Endoscopical and histological features in bile reflux gastritis

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Abstract

Bile reflux gastritis is due to an excessive reflux of duodenal contents into the stomach. The increased enterogastric reflux may provide the basis for increased mucosal injury. Bile reflux gastritis can appear in two circumstances: gastric resection with ablation of pylorus and primary biliary reflux due to the failure of pylorus. The aim of the study was to evaluate the endoscopical and histological changes caused by duodenal reflux on the gastric mucosa. The mucosal features were correlated with the risk factors involved in the development of bile reflux gastritis. Our study included 230 patients with alkaline reflux gastritis admitted in Medical Clinic no. 1, Emergency County Hospital Craiova. In all cases we performed an upper gastrointestinal endoscopy. Multiple biopsies were taken from gastric mucosa in 89 patients and the histological features were scored in accordance with the Sydney system. The average age of the patients with bile reflux gastritis was 58.387 years and the incidence of alkaline reflux gastritis was higher between 51 and 80 years. Reflux gastritis was noted to 138 males (60%) and 92 females (40%), ratio males/females was 1.5/1. The most frequent risk factors for bile reflux gastritis were gastric and biliary surgery. Alkaline reflux gastritis was observed in 167 cases (72.6%) after gastric surgery, consisting in gastric resection, pyloroplasty and gastroenteric-anastomosis. Gastroduodenal reflux after biliary surgery was noted in 17 cases (7.39%), 13 cases (5.69%) with cholecystectomy and four cases (1.73%) with biliary anastomosis. The average time interval from original operation to the discovery of the alkaline reflux gastritis was 14.91 years after gastric surgery and 15.29 years after biliary surgery. The commonest endoscopic alterations were: erythema of the gastric mucosa in 139 cases (64.43%), the presence of bile into the stomach in 133 cases (57.83%), the thicken of gastric folds in 22 cases (9.55%), erosions in 12 cases (5.22%), gastric atrophy in 12 cases (5.22%), petechiaes in five cases (2.17%), intestinal metaplasia one case (0.43%) and gastric polyp one case (0.43%). The histologic alterations observed from tissues collected during endoscopic examination were: chronic inflammation in 75 cases (84.06%), foveolar hyperplasia in 36 cases (40.44%), intestinal metaplasia in 31 cases (34.83%), acute inflammation in 16 cases (16.08%), Helicobacter pylori infection in 16 cases (16.08%), chronic atrophic gastritis in 12 cases (13.46%), gastric polyps in 12 cases (13.46%), dysplasia in 10 cases (11.23%), benign ulcerations in seven cases (3.04%), edema in six cases (6.74%) and neoplasia two cases (2.24%). *Conclusions.* Bile reflux gastritis was more frequent to male gender. The most frequent risk factors for alkaline reflux gastritis were gastric and biliary surgery. Reflux gastritis after gastric resection, pyloroplasty and gastroenteric-anastomosis were more frequent to male gender, while cholecystectomy and biliary anastomosis were predominantly to female gender. The average time interval from original operation to the discovery of the bile reflux gastritis was similar after gastric and biliary surgery. The commonest endoscopic alterations were: erythema of the gastric mucosa, the presence of bile into the stomach, thickens of gastric folds, erosions, gastric atrophy, petechiaes, intestinal metaplasia and gastric polyp. Acute inflammation, *Helicobacter pylori* infection, gastric polyps and benign ulcerations were more frequent in patients with bile reflux gastritis after gastric surgery, while edema and dysplasia were increased after biliary surgery.

Keywords: *endoscopic features, histologic alterations, bile reflux gastritis.*

Introduction

Bile reflux gastritis is due to an excessive reflux of bile, pancreatic and intestinal secretions into the stomach. The increased enterogastric reflux may provide the basis for increased mucosal injury. Alkaline reflux gastritis can appear in two circumstances: gastric resection with ablation of pylorus and primary biliary reflux due to the failure of pylorus.

The aim of the study was to evaluate the endoscopical and histological changes caused by duodenal reflux on the gastric mucosa. The mucosal features were correlated with the risk factors involved in the development of bile reflux gastritis.

Material and methods

We included in our study 230 patients with bile reflux gastritis admitted in Medical Clinic no. 1, Emergency County Hospital Craiova. In all cases we performed an upper gastrointestinal endoscopy.

Multiple biopsies were taken from gastric mucosa in 89 patients and the histological features were scored in accordance with the Sydney system. Three endoscopical parameters were evaluated: the presence of bile into the stomach, erythema of the gastric mucosa with or without of erosions, and the presence of risk factors in the most cases (gastric or biliary surgery).

Results

The average age of the patients with bile reflux gastritis was 58.387 years and the incidence of alkaline reflux gastritis was higher between 51 and 80 years.

Reflux gastritis was noted to 138 males (60%) and 92 females (40%). Males/females ratio was 1.5/1 (Figure 1).

We showed that bile reflux gastritis was more frequent to male gender between 40 and 60 years, and the ratio males/females became similar after 60 years (Figure 2).

Alcohol consumption were registered in 103 cases (44.78%), and 104 patients drank coffee every day. 116 patients (50.46%) were smokers, and 66 from these smoked more than 20 cigarettes/day.

51 patients (22.17%) included in our study were treated with non-steroidal anti-inflammatory drugs.

We used blood antibody test, stomach biopsy and urea breath test to detect *Helicobacter pylori* infection. The urea breath test was done in 25 cases and in eight cases (32%) was positive.

In 89 cases we performed stomach biopsy and *Helicobacter pylori* infection was relieved to 16 patients (17.98%). Blood antibody test was done to 51 patients and it was positive in 28 cases (54.9%).

The most frequent risk factors for bile reflux gastritis were gastric and biliary surgery. Alkaline reflux gastritis was observed in 167 cases (72.6%) after gastric surgery, consisting in gastric resection, pyloroplasty and gastroenteric anastomosis.

In patients with gastric resection Billroth I reconstructions were performed in 121 cases (52.6%) and Billroth II in 33 cases (14.35%). Gastroduodenal reflux after biliary surgery was noted in 17 cases (7.39%), 13 cases (5.69%) with cholecystectomy and four cases (1.73%) with biliary anastomosis.

The average time interval from original operation to the discovery of the bile reflux gastritis was 14.91 years after gastric surgery and 15.29 years after biliary surgery.

The others risk factors for duodenogastric reflux were: refractory ascites in two cases (0.86%), diabetes mellitus one case (0.43%), postpapillary intestinal obstruction one case (0.43%) and duodenal ulcer one case (0.43%). We registered one case with biliary gastropathy to patients with acute pancreatitis, but we cannot establish a certain causal relationship.

In 46 cases (20%) we do not noted any risk factors for bile reflux gastritis.

The most frequent symptoms were pyrosis, early satiety, midepigastric pain unresponsive to antiacids and aggravated by eating, and bilious vomiting.

The commonest endoscopic alterations were: erythema of the gastric mucosa in 139 cases (64.43%), the presence of bile into the stomach in 133 cases (57.83%), the thicken of gastric folds in 22 cases (9.55%), erosions in 12 cases (5.22%), gastric atrophy in 12 cases (5.22%), petechiaes in five cases (2.17%), intestinal metaplasia one case (0.43%) and gastric polyp one case (0.43%) (Figures 3–5).

Table 1 – ***Endoscopic aspects in bile reflux gastritis***

Endoscopic aspects	No. of cases	%
Erythema of the gastric mucosa	139	64.43
Presence of bile into the stomach	133	57.83
Thicken of gastric folds	22	9.55
Erosions	12	5.22
Gastric atrophy	12	5.22
Petechiaes	5	2.17
Intestinal metaplasia	1	0.43
Gastric polyp	1	0.43

The histologic alterations observed from tissues collected during endoscopic examination were: chronic inflammation in 75 cases (84.06%), foveolar hyperplasia in 36 cases (40.44%), intestinal metaplasia in 31 cases (34.83%), acute inflammation in 16 cases (16.08%), *Helicobacter pylori* infection in 16 cases (16.08%), chronic atrophic gastritis in 12 cases (13.46%), gastric polyps in 12 cases (13.46%), dysplasia in 10 cases (11.23%), benign ulcerations in seven cases (7.86%), edema in six cases (6.74%) and two cases of neoplasia (2.24%) (Figures 6–11).

Table 2 – ***Histological changes in patients with bile reflux gastritis***

Histological changes	No. of cases	%
Chronic inflammation	75	84.06
Foveolar hyperplasia	36	40.44
Intestinal metaplasia	31	34.83
Acute inflammation	16	16.08
Helicobacter pylori infection	16	16.08
Chronic atrophic gastritis	12	13.46
Gastric polyps	12	13.46
Dysplasia	10	11.23
Benign ulcerations	7	7.86
Edema	6	6.74
Neoplasia	2	2.24

The histological features were scored in accordance with the Sydney system and the results are indicated in Table 3.

Table 3 – ***Statistical analysis of histological changes in patients with bile reflux gastritis***

Histological changes	Total	Biliar	Gastric	P	TTEST
Foveolar hyperplasia	0.5281	0.3333	0.5405	0.5161	0.5696
Edema	0.0899	0.3333	0.0811	*0.0001*	0.4851
Acute inflammation	0.2697	0.0000	0.2973	NS	*0.0005*
Chronic inflammation	1.0562	0.8333	1.0811	0.2292	0.2199
Smooth muscle fibers	0.0000	0.0000	0.0000	NS	NS
Vasodilatation	0.0000	0.0000	0.0000	NS	NS
HP infection	0.2360	0.0000	0.2162	NS	*0.0008*
Epithelial lesions	0.0225	0.0000	0.0000	NS	NS
Atrophy	0.2932	0.0000	0.2297	NS	0.0002
Metaplasia	0.4494	0.8333	0.3919	0.4028	0.2151
Dysplasia	0.1685	0.5000	0.1622	*0.0432*	0.3719
Polyp	0.1461	0.0000	0.1486	NS	*0.0018*
Benign ulcerations	0.0787	0.0000	0.0811	NS	*0.0133*
Neoplasia	0.0225	0.0000	0.0270	NS	0.1587

Discussions

The endoscopic diagnosis was based on using a combination of three endoscopical criterions: standing out of the biliar reflux, erythema of the gastric mucosa associated or not associated with erosions and also the association for the most part of the cases with the presence of a favorable element (gastric or biliar surgery intervention). But, in practice the endoscopic diagnosis of this form of gastritis was broken by the accuracy absence of the used criterions.

So the presence for significant time of bile into the stomach may be a strong argument for bile's role as an etiopatogenically element in aggression of the gastric mucosa, because this is not adjusted to the biliar juice's pH and to its chemical components.

But, the presence of the biliar reflux at the examination time it may be because of throw up effort during the endoscopies and it's not necessary correlated straight with the generally presence of the bile into the stomach.

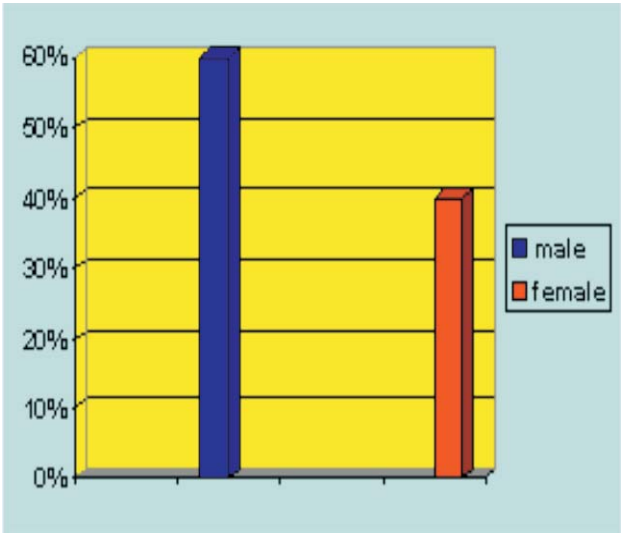

Figure 1 – ***Bile reflux gastritis distribution according to gender***

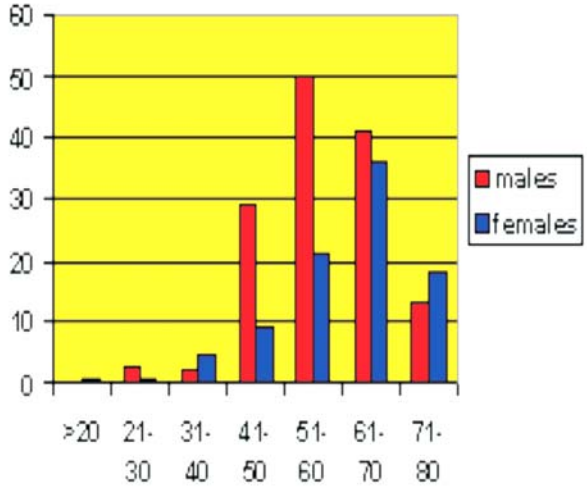

Figure 2 – ***Bile reflux gastritis distribution according to age***

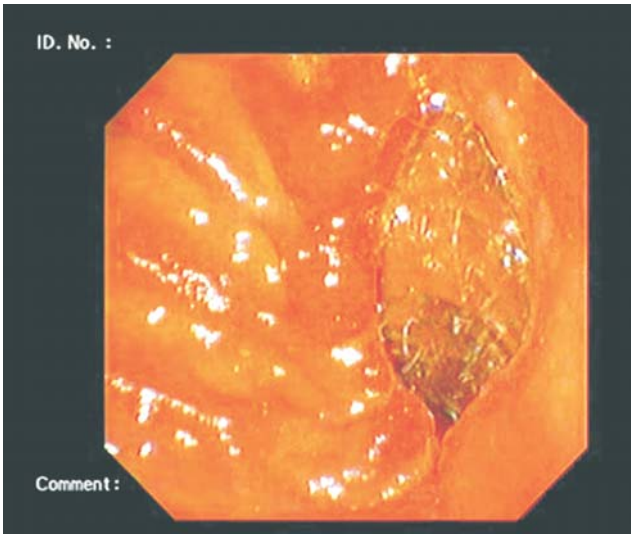

Figure 3 – ***Endoscopical aspect of bile reflux gastritis in Billroth II reconstruction***

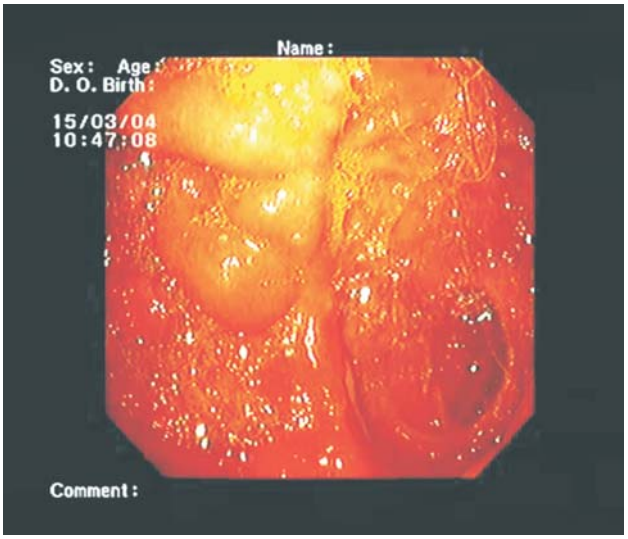

Figure 4 – ***Endoscopical aspect of bile reflux gastritis in gastric resection with Billroth I anastomosis***

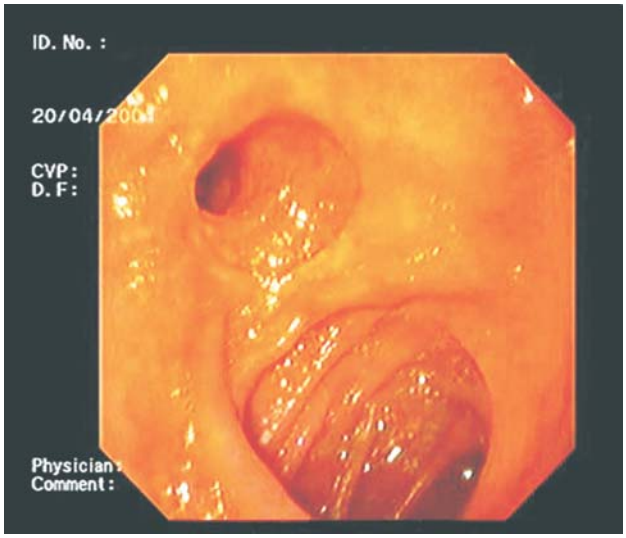

Figure 5 – ***Bile reflux gastritis in choledocho–duodeno anastomosis***

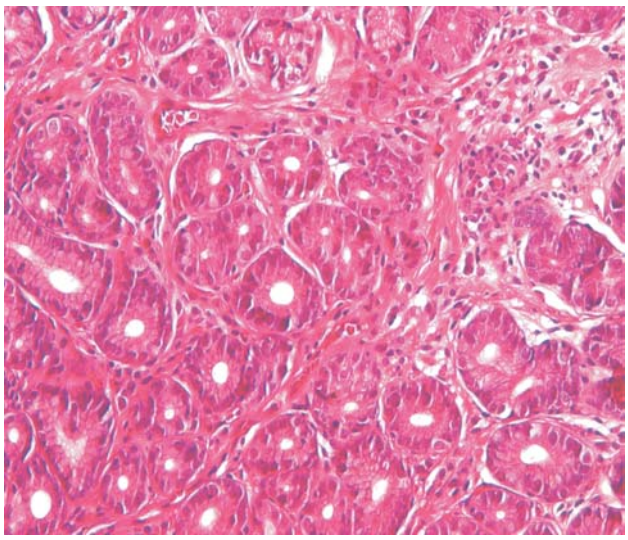

Figure 6 – ***Chronic atrophic gastritis. Low interstitial inflammation and periglandular fibrosis***

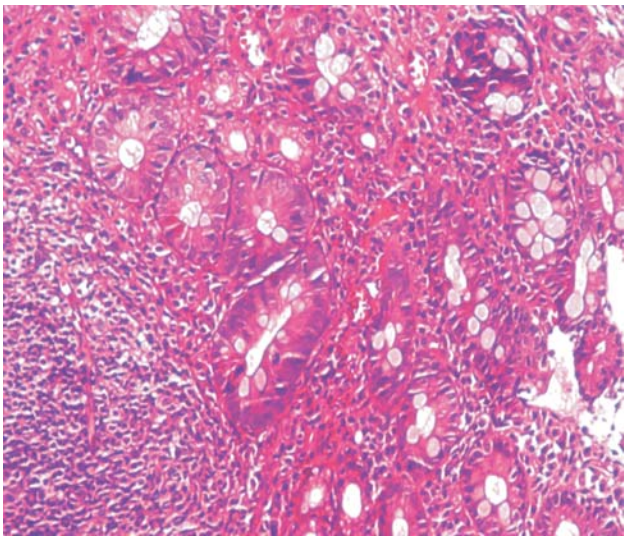

Figure 7 – ***Intestinal metaplasia. Extensive areas of intestinal metaplasia with high degree of inflammation***

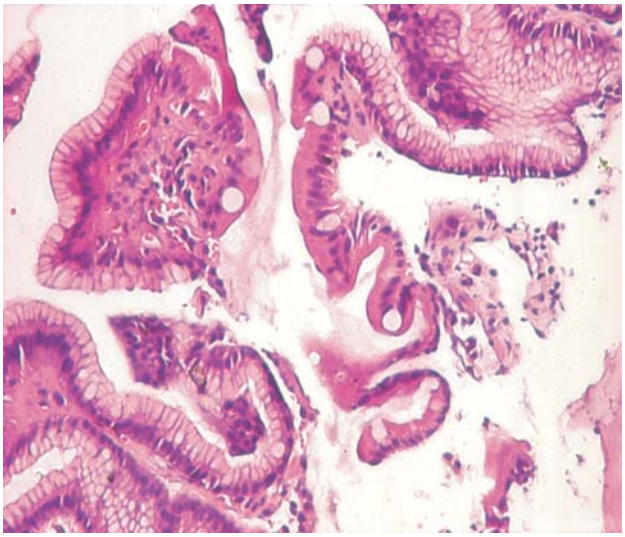

Figure 8 – ***Intestinal metaplasia. Isolated areas of intestinal metaplasia***

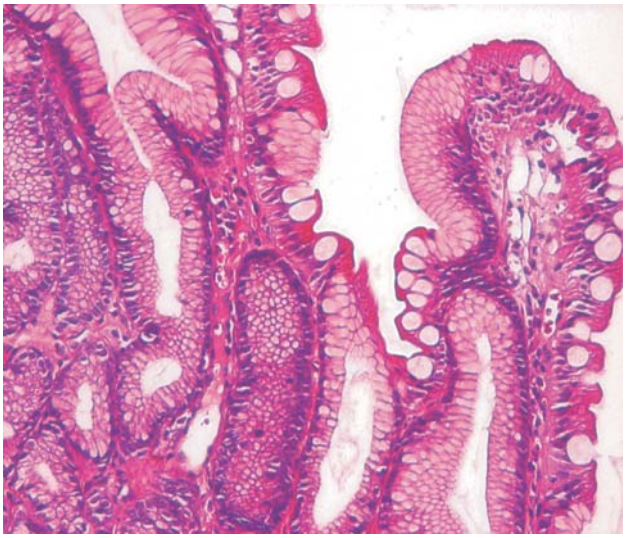

Figure 9 – ***Metaplasia. Isolated metaplasia of glandular epithelium***

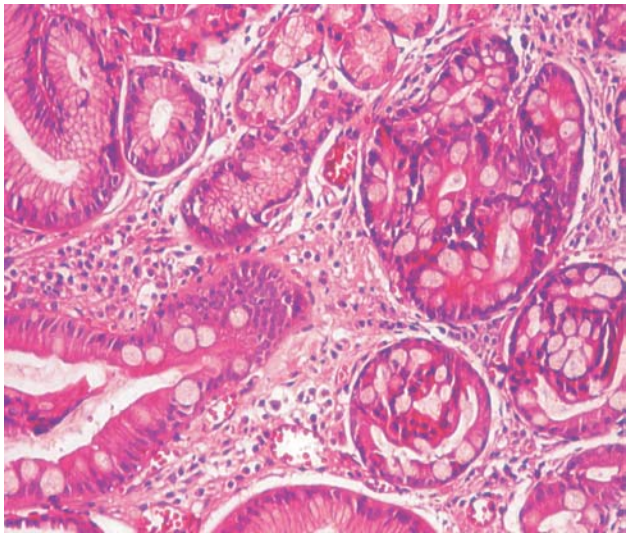

Figure 10 – ***Metaplasia. Isolated metaplasia of glandular epithelium and mild inflammation of the lamina propria***

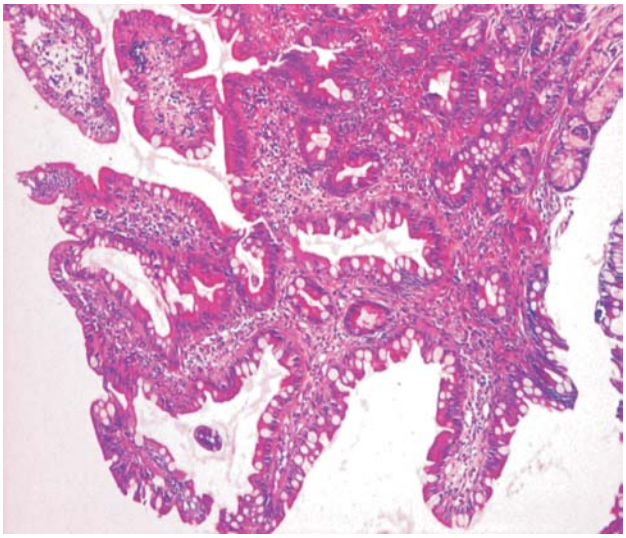

Figure 11 – ***Metaplasia. Inflammation and metaplasia of glandular epithelium***

The only certain reason which proves the generally or meaningful presence of bile into the stomach is represented by the bilimetry data method witch was not possible during my study. At his time also, erythema of the gastric mucosa, may be inducted by a lot of etiopatogenically elements, Helicobacter pylori infections being the frequent between all. Other way in the most cases bile reflux gastritis is superficial nonerosive gastritis form although there are cases associated with erosion and/or haemorrhages.

Finally, the presence of a favorable element is debatable; if at those patients who have gastric resection, pyloroplasty or gastroenteric anastomosis the presence for a long time of bile in contact with gastric mucosa it seems to be obviously we cannot say the same about the biliar surgery intervention. In these cases, duodenogastric reflux is caused by the abnormal motility and asincron coordination between gastric kinetic and the evacuation of bile (bila's permanently evacuation in case biliar derivations or cholecystectomy because of absence of bile accumulations between meals). In this case, the pylorus preservation as duodeno-gastric antireflux barrier could be an argument against reflux gastritis at least for a part of patients. A part of patients with bile reflux gastritis doesn't present none visible favorable factor [1–6].

With all limits of the endoscopical exam concerning the diagnostic of bile reflux gastritis we could not use another category foe diagnostic's criterions. In accordance with data the histological exam has not absolute specification for diagnostic because these histological changes may be find out also in other types of gastritis, preponderantly in that inducted by nonsteroidal anti-inflammatory drugs.

The bile reflux gastritis was more frequently at old ages, this fact has been explained by the developed incidence of gastric surgery interventions in the history of those patients as risk factors for duodeno-gastric reflux. Most of subjects with alkaline reflux gastritis were male sex. That was because the incidence of gastric surgery, that means gastroenteric anastomosis at the male (107 vs. 47 for gastric resection and 10 vs. 1 for gastroenteric anastomosis) [7–10].

The female predomination was noticed at the cases with cholecystectomy (12 vs. 1) and biliary anastomoze (3 vs. 1), biliar pathology being frequently at female, and in cases without favorable factors (24 vs. 16) [11–16].

The changes of gastric mucosa may be inducted by a variety of etiopatogenically elements, the *Helicobacter pylori* infection being most frequently. The infection presence was almost 33% in the urea breath test and stomach biopsy, so from that reason is possible to exist a superpose between groups with chronic superficial gastritis and with bile reflux gastritis [17–24].

Most frequently risk factors for alkaline reflux gastritis at studied pattern were gastric surgery interventions and those from biliar sphere. Gastric surgery interventions were predominant for male and the biliary for female. The changes of gastric mucosa were noticed more fore patients with gastric resection and Billroth I anastomosis and less to Billroth II reconstructions. The ratio seems to reflect the option rather for technical surgery than a real propensity for Billroth I anastomosis for lesions appearance of bile reflux gastritis.

On the average from the surgery interventions to endoscopic diagnostic was similar for gastric and also for biliary interventions. Other favorable elements for bile reflux gastritis were low incidence: refractory ascites (in two cases – possible thru delayed gastric emptying and increased of the abdominal pressure), diabetes mellitus (one case – thru abnormal motility = gastric dysfunction), postpapillary intestinal obstruction (one case) and duodenal ulcer (one case), possible thru abnormal motility too. We registered one case with biliary gastropathy to patients with acute pancreatitis, but we cannot establish a certain causal relationship. At a low percent of patients, it does not identify risk factors, which is determinate by the incompetence of pylorus [21].

Symptoms were not typical. Most of patients has presented pyrosis, early satiety, midepigastric pain unresponsive to antacids and aggravated by eating, and bilious vomiting.

The main endoscopical signs to patients with bile reflux gastritis were: erythema of the gastric mucosa, presence of bile into the stomach, thickens of gastric pleats, erosions, gastric atrophy.

The endoscopical lesions standed out are not typically for the bile reflux gastritis, they can be stand out in any other circumstance. So the presences of the biliar refluxat the examinations may be owned throw up effort during endoscopia and it is not necessary directly correlated with permanent presence of bile into the stomach. Also, erythema of the gastric mucosa may be induced by a variety of etiopatogenically elements, especially *Helicobacter pylori* infection. Though in the most cases bile reflux gastritis is a form of nonerosive chronic superficial gastritis there are other circumstances associated with erosions and/or hemorrhages [5, 8].

The histological changes standed out were: chronic inflammation, foveolar hyperplasia, intestinal metaplasia, acute inflammation, *Helicobacter pylori* infection, chronic atrophic gastritis, gastric polyps, dysplasia, benign ulcerations, edema and neoplasia [25–27].

The comparable analyses of the histological changes to groups after gastric surgery interventions and interventions in biliar sphere show us the predominance of acute inflammation, *Helicobacter pylori* infection, polyps and benign ulcerations to those patients with gastric resection, pyloroplasty, and gastroenteric-anastomosis, and a high frequency of edema and dysplasia to those with cholecystectomy and biliary anastomosis.

Conclusions

Bile reflux gastritis was more frequent to male gender. The most frequent risk factors for alkaline reflux gastritis were gastric and biliary surgery. Reflux gastritis after gastric resection, pyloroplasty and

gastroenteric-anastomosis were more frequent to male gender, while cholecystectomy and biliary anastomosis were predominantly to female gender.

The average time interval from original operation to the discovery of the bile reflux gastritis was similar after gastric and biliary surgery. The commonest endoscopic alterations were: erythema of the gastric mucosa, the presence of bile into the stomach, thickens of gastric folds, erosions, gastric atrophy, petechiaes, intestinal metaplasia and gastric polyp.

Acute inflammation, *Helicobacter pylori* infection, gastric polyps and benign ulcerations were more frequent in patients with bile reflux gastritis after gastric surgery, while edema and dysplasia were increased after biliary surgery.

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