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GALLSTONE DISEASE COMPLICATED WITH MIRIZZI SYNDROME: A CLINICAL CASE

This article represents the difficulties in diagnosing and treating the patients with gallstone disease complicated by Mirizzi syndrome and obstructive jaundice. The manifestation of the disease is characterized by many clinical, laboratory and instrumental symptoms found in acute and chronic cholecystitis. Among them, it is worth noting pain in the right subcostal region, the jaundice, increased body temperature and symptoms revealed during ultrasound. However, in some patients, the disease is asymptomatic and its first manifestation may be obstructive jaundice. Because of the presence of gallstones and jaundice, they are often confused with other obstructive conditions. Preoperative diagnosis is complex and often overlooked. The difficulties in diagnosing Mirizzi syndrome, the high risk of damage to the biliary tract, as well as the wide spectrum of surgical treatment determine the relevance of this study.

A literature review has been made on the topic with the clinical situation analyzed.

A 62-year-old patient was admitted with a diagnosis of biliary tract obstruction. The patient was diagnosed with gallstone disease. As a result, gallstone disease complicated by Mirizzi syndrome was diagnosed and surgical treatment was performed.

Keywords: choledocholithiasis, Mirizzi syndrome, biliary drainage, biliary anatomy, surgery.

Introduction

Mirizzi syndrome is a severe complication of gallstone disease characterized by compression of the proximal hepaticocholedochus, formation of a stricture, or formation of a cholecystobiliary fistula. Mirizzi syndrome occurs in 0.2-5.7% of patients suffering from gallstone disease [1].

In 1948 Argentinian scientist P. L. Mirizzi described the pathological syndrome due to obstructive jaundice in patients or the occurrence of cholecystocholedocheal fistula upon the movement of stones in the common bile duct. Currently, 2 types of Mirizzi syndrome are distinguished.

Type I – compression of the hepaticocholedochus by a concretion in the neck of the gallbladder or in the bile duct.

Type II – cholecysto-choledocheal fistula in the gallbladder and common bile duct. [2].

C. McSherry et al., A. Csendes et al. and T. Nagakawa et al. McSherry (1982) classifications were made based on endoscopic retrograde cholangiopancreatography (ERCP) data [3].

Currently the most widely used classification is based upon studies of C.K. MCSHERRY and A. CSENDES ET AL.

Mirizzi syndrome is divided into four types:

Type I – compression of the hepaticocholedochus by a concretion in the neck of the gallbladder or in the bile duct.

Type II – cholecysto-choledocheal fistula, occupying less than 1/3 of the total bile duct.

Type III – cholecysto-choledocheal fistula, occupying 2/3 of the total bile duct.

Type IV is a cholecysto-choledocheal fistula that takes the entire part of the common bile duct, accompanied by destruction of the entire wall of the hepaticocholedochus [4].

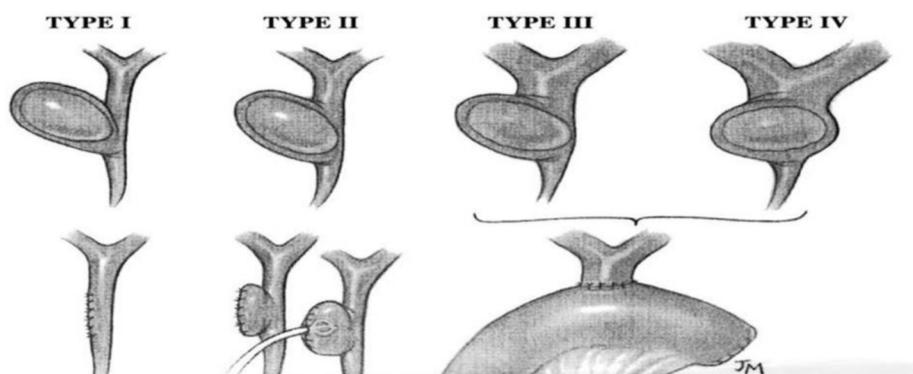


Figure 1 – Types of Mirizzi syndrome [5]

Diagnosis and treatment methods of Mirizzi syndrome are still relevant.

In the literature there are basic and additional criteria in the predictive diagnosis of Mirizzi syndrome.

Main criteria:

- emergence of the disease after many years;
- a feeling of pain for more than 1 hour or more often, its location is in the upper part of the abdomen or in all parts;
- during an physical examination – pain in the upper right part of the abdomen, jaundice;
- ultrasound signs – thickening of the wall of the gallbladder and a double image;
- detection of a wedge-shaped stone in the neck of the gallbladder;
- impossibility of visualization of the inflammatory infiltrate and neck of the gallbladder.

Additional criteria:

- complaints – belching with bitter, skin itching;
- on palpation – a feeling of pain under the right rib;
- positive symptoms of Courvoisier and Boas-Svirsky;
- in the laboratory study: ALT>130.0 IU/l, AST>116.0 IU/l, ESR>17 mm/h, hyperbilirubinemia of various degrees (depending on the type of MS), increased alkaline phosphatase level.

Clinical case

Patient K.N. At the age of 62, he was admitted to the National Scientific Surgery Center named after A. N. Syzganov with complaints of pain in the epigastric region, general weakness, yellowing of the skin, changes in the color of urine, and an increase in body temperature to 37.5 at the onset of the disease.

From the medical history: the patient has been ill for three days. That day he had a sharp pain in

the epigastric region, nausea, and vomiting. At home he administered omez, ketotop with no effect. In dynamics, yellowing of the skin layer and increased general weakness were observed. On 24.05.2022 he was admitted to the regional hospital and obtained conservative treatment. On 25.05.2022 according to the multispiral computer tomography of the abdomen: a formation spread to the middle 1/3 of the choledoch, confluence, right liver core was detected, the result was cholangiocarcinoma, Klatskin's tumor III? According to laboratory research: total bilirubin is 110 mkol/l. It was not possible to make an ERCP on 26.05.2022. The patient was referred to A.N.Syzganov National Scientific Surgery Center.

Surgery history: (for many years he has been on the "D" report of the cardiologist due to heart rhythm disorders at his place of residence; he takes 2.5 mg of bisoprolol once a day). In 2013-2014 he had 3 courses of radiofrequency catheter ablation due to heart rhythm disorders.

Physical examination: the general condition of the patient is moderate. His mind is lucid. Skin surface, visible mucous membranes are clean. Peripheral lymph nodes are not enlarged. The tongue is wet, covered with white fur, the pharynx is not hyperemic. In the lungs: breathing is vesicular, no wheezing. Heart tones are slowed down, the rhythm is correct. AD – 110/70 mm Hg, heart beat rate -83/ 1 min, respiratory rate -18/ 1 min. The percussion test is negative on both sides. Urination is without obstructions, painless, 800 ml per day. Abdomen is symmetrical, soft during palpation, painful under the right rib and in the epigastric area. The liver is at the edge of the rib cage.

The results of the analysis at the time of the patient's admission.

Full blood analysis: Hemoglobin = 127.0 g/l; erythrocyte = $4.56 \cdot 10^{12}/l$; Hematocrit = 38.60%; platelets = $90.0 \cdot 10^9 / l$; leukocytes = $30.00 \cdot 10^9/l$;

segment kernel (%) = 97.2 %; monocytes (%) = 0.9%; Lymphocytes = 1.9%;

Full urine analysis: leukocytes – 5.00 / μ l, relative density 1025, reaction – acid, number of erythrocytes – 15.00 ery/ μ l.

Biochemical blood analysis: ALT = 94.80 units/l; AST=41.60 units/l; bilirubin (total) = 103.00 μ mol/l; bilirubin (direct) = 101.70 μ mol/l; glucose = 5.93 mmol/l; ionized calcium = 1.07 mmol/L; potassium = 3.6 mmol/l; creatinine = 266.00 μ mol/l; urea = 20.10 mmol/l; sodium = 135 mmol/l; total amylase = 91.0 u/l; total protein = 54.0 g/l; albumin = 33.3 mg/l; C-reactive protein = >374.01 mg/l;

Coagulogram: prothrombin time (sec) = 13.7 sec.; Prothrombin index = 70.60 %; MNO = 1.20; thrombin time = 13.8 sec.; APTV=27.90 sec.; Fibrinogen = 8.17 g/l;

Determination of blood gases and electrolytes with additional tests (lactate, glucose, carboxyhemoglobin) in the analyzer: cHCO_3^- (P, st), c = 20.00 mmol/l; FIO_2 = 21000; P_2 = 47 mm Hg; CO_2 = 32.8 mm Hg. pH = 7.379; tab = 11.6 g/l; O_2 = 77.0%; Na^+ = 136 mmol/l; Cl^- = 106 nmol/l; Ca^{++} = 0.65 mmol/l; k^+ = 2.7 mmol/l; Glucose = 5.7 mmol/l; Lactate = 1.5 mmol/l; co_2 , c = 12.30 rev% ; p50 , c = 30.5 mm Hg, cbase (Ecf), c = -5,300 mmol/l; PCO_2 (t), c = 32.8 mm Hg; Htc (c) = 35.8%; FO_2Hb = 75.3%; FCOHb

= 1.3%; FMetHb = 0.9 %; Hb = 22.5%; Bilirubin = 80.00 μ mol/l; pH(T),c = 7.38%; pO_2 (T),c = 47.10 mm Hg;

Determination of alpha-fetoprotein (AFP) in blood serum by EIA method: AFP= 0.53 IU/ml; (n=0-5.8 IU/ml).

Detection of tumor antigen (CA 19-9) in blood serum by EIA method (27.05.2022): CA 19-9 = 539.5 U/ml; (n=0-34 IU/ml).

EIA for hepatitis B, C: negative.

Figure 2 MRI of the abdominal cavity: signs of choledocholithiasis, cholangioectasia. Virsungectasia. Abdominal ultrasound: echo image of biliary hypertension with distal blockage in the confluence. Gallbladder function is not determined. Choledoch walls are thickened, the image may correspond to Klatskin's tumor. A formation with dimensions of 3.4*3.5*3.6 was detected in the left part of the liver. In the distal region of the choledochus, the walls are unevenly thickened, cavities are not defined.

Electrocardiogram: description of pathological waves heart beat rate – 130; conclusion-levocardiogram. Sinus tachycardia. Shortening of the PQ interval. Left ventricular hypertrophy. Diffuse myocardial changes.

X-ray results: No new focal shadows were detected. C-shaped scoliosis in the thoracic spine.

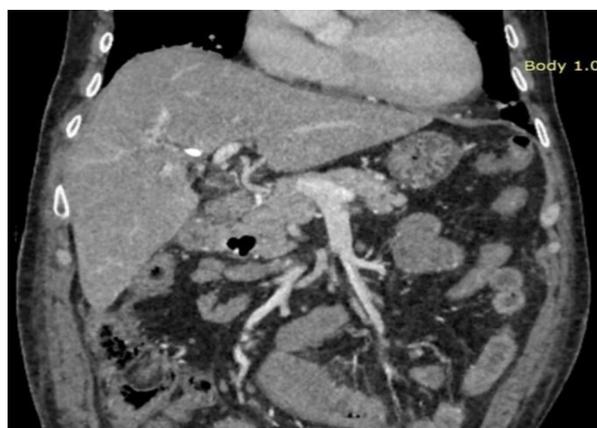


Figure 2 – MRI of the abdominal cavity: signs of choledocholithiasis, cholangioectasia. Virsungectasia

Magnetic resonance cholangiopancreatography (MRCP): a formation in the lower 1/3 of the choledochus that has spread to the right duct (Klatskin tumor, type III A). Intrahepatic biliary hypertension. MR-signs of diffuse compaction of the liver parenchyma, cystic formation of the left part. Chronic cholecystitis. Diffuse pancreatic changes (chronic atrophic pancreatitis). Chronic bilateral pyelonephritis with simple cysts according to Bosniak I in both kidneys. Intrahepatic bile ducts are visualized, expanded (par-

tial and segmental). The confluence of bile ducts is deformed by the type of bifurcation. The right lobe is up to 1.0 cm, the left one is up to 1.2 cm. Confluence block appears due to the intrahepatic biliary duct and the common hepatic duct extending into the intrahepatic right lobular duct. A round 1.1 cm diameter concretion is visualized in the middle 1/3 of the choledoch. The size of the gall bladder is 3.8*1.2 cm, the amount of bile is small, the wall is uniform, unchanged. The follicular core is not visualized. The

lower 1/3 of the choledoch is deformed, 0.3 cm in the intrapancreatic part. The length of choledoch from bifurcation to the Vaterov papilla is 9 cm.

Figure 3 Fistulocholangiography: partial liver ducts are contrasted. At the level of the terminal part of the choledochus, the shadow of the concretion is determined.

After the patient had been fully prepared for the surgery he was diagnosed with Obstruction

of bile ducts. Klatskin tumor? Obstructive jaundice.

On May 27, 2022 a percutaneous-hepatic cholangiostomy was performed at the A.N. Syzganov National Hospital. 1000 ml of bile was secreted per day through percutaneous cholangiostomy drainage. In dynamics, total bilirubin decreased from 103 $\mu\text{mol/l}$ to 87.10 $\mu\text{mol/l}$.



Figure 3 – Fistulocholangiography: partial liver ducts are contrasted. At the level of the terminal part of the choledochus, the shadow of the concretion is determined

After decompression of the bile ducts, until the bilirubin level returned to normal, it was decided that he be discharged to outpatient treatment.

Release status

The general condition is satisfactory. His mind is lucid. The skin, yellow mucous membranes are clean. Peripheral lymph nodes were not enlarged. No visible swelling. The tongue is wet, covered with white fur, the pharynx is not hyperemic. In the lungs: breathing is vesicular, no wheezing sound. Heart tones are silent, rhythm is normal. ABP – 110/75 mm Hg. Heart beat rate is 78 / 1 min, respiratory rate is 17/ 1 min. Abdomen is of the correct shape, symmetrical, soft during palpation, moderate pain in the right hypochondrium, epigastrium. The liver is at the edge of the rib cage. The percussion symptom is negative on both sides. Urination is unobstructive, painless. 1000 ml of bile was drained by percutaneous-hepatic cholangiostomy.

Due to obstructive jaundice and coagulopathy, the patient's treatment was corrected (bilirubin decreased to 23 $\mu\text{mol/l}$), the patient was admitted to the center for radical surgery on 28.06.2022.

Preoperative diagnosis: Klatskin's tumor?, choledocholithiasis? Obstructive jaundice. Additional diagnosis: CHD. Angina pectoris Grade II. Arterial hypertension 2 degree. CHF.

Surgery – Laparotomy. Adhesiolysis, cholecystectomy, choledochotomy, cito biopsy. Hepatico-

choledochus resection, hepaticojejunoanastomy with Rou's loop, drainage of the small pelvic cavity and the iliac cavity.

During the surgery examination a clear adhesive process was detected in the abdominal cavity. The size of the liver is not increased, liquid discharge is revealed in the projection of the left part. Choledochus is 1.0 cm. A cholecystectomy was performed on the neck, with choledochal mobilization from the surrounding tissues, a total resection of the liver core was performed. Due to the identification of a suspected sealing area on the back wall of the choledochus it was decided to do a cito!biopsy. Pathological conclusion: the morphological appearance is characteristic of chronic cholecystitis. Lymph node tissue is characteristic of reactive follicular hyperplasia. Choledochus was opened from the level below confluence, a 1.1 cm concretion was removed from the middle 1/3 of the choledochus, and the right and left lobes were examined. 30 cm from Treitz's ligament to the small intestine was cut, the ileum was mobilized, an "end-to-side" small intestine-small intestine anastomosis was placed 80 cm via the Ru-ligament. Hepaticojejunoanastomy was performed by a continuous suture along the Ru ligament with an atraumatic PDS 5.0 suture. From the right side (under the anastomosis) and into the lower pelvis, a drainage tube was placed through a contraperture incision, layered sutures were placed, and an aseptic bandage was applied.

Postoperative diagnosis: Gallstone disease. Chronic calculous cholecystitis. Choledocholithia-

sis. Mirizzi syndrome type II. Additional diagnosis: CHD. Angina pectoris Grade II. Arterial hypertension 2 degree. CHF.

In the postoperative period, antibacterial, detoxification, symptomatic treatment was carried out. After normalization of the function of all organs and systems he was transferred from the intensive care unit to the surgical department. In the first days after the surgery 800-900 ml of bile was secreted by percutaneous-hepatic cholangiostomy. Subsequently, the percutaneous-hepatic cholangiostomy was lifted on the seventh day after bowel function had returned to normal.

Tests at discharge:

Common blood test: Hemoglobin = 94.0 g/l; Erythrocytes = $3.59 \cdot 10^{12}/l$; Hematocrit = 30.80 %; Average volume of erythrocytes = 85.8 fl; average amount of hemoglobin in erythrocytes = 26.2 pg; Average concentration of hemoglobin in erythrocytes = 305 g/dL; Average volume of erythrocytes (CV) = 138.0 %; Platelets = $419.0 \cdot 10^9/l$; Distribution of platelets by volume (Anisocytosis of thrombocytes) = 10.3 fl; average volume of platelets = 8.9 fl; Leukocytes = $6.90 \cdot 10^9/l$; Segment nuclear (%) = 66.0 %; Segment nuclear (abs. number) = $4.80 \cdot 10^9/l$; Eosinophils = $1.9 \cdot 10^9/l$; Monocytes (%) = 7.6 %; Monocytes (abs. number) = $0.50 \cdot 10^9/l$; Lymphocytes = 23.5%; Lymphocytes (abs. number) = $1.60 \cdot 10^9/l$; Rod-shaped = 1 %;

Biochemical blood analysis: ALT = 53.70 units/l; AST = 38.00 U/l; Bilirubin (total) = 8.00 $\mu\text{mol}/l$; Bilirubin (direct) = 6.20 $\mu\text{mol}/l$; Glucose = 4.82 mmol/l; Ionized calcium = 1.21 mmol/l; Potassium = 3.4 mmol/l; Creatinine = 48.00 $\mu\text{mol}/l$; Urea = 2.30 mmol/l; Sodium = 136 mmol/l; Total amylase = 46.0 U/l; Total sugar = 48.1 g/l;

Due to the improvement of the general condition of the patient, based on the results of the last examination, on 20.07.2022, the patient was discharged home with treatment recommendations and a drainage tube.

After 3 months, the patient underwent a comprehensive check-up at A.N.Syzganov National Medical Center, his condition was satisfactory.

Results and Conclusions

The presented clinical case and literature review resulted in the following conclusions:

1. It is necessary to carry out a complete set of diagnostic measures for early diagnosis of possible rare cases and complications during the examination and treatment of patients with acute surgical diseases of the hepatopancreatoduodenal organs;

2. Diagnosis of Mirizzi syndrome is complex and requires additional examinations;

3. Consideration of basic and additional criteria for preliminary diagnosis of Mirizzi syndrome (clinical, instrumental and laboratory);

4. One can suspect Mirizzi syndrome by paying attention to the presence of several signs in the ultrasound examination of the abdomen in patients with gallstone disease:

*"мыжылған" (сморщенный) кейіптегі өт қабы мен бауырдың оң бөліктік өт өзегінің кеңеюі;

* Enlargement of the intrahepatic bile ducts, mostly in the right part of the liver, with the location of a large concretion located in the Hartmann's pouch close to the hepatocholedochus;

* inflammatory infiltrate in the area of the gall bladder neck and the possibility of its detection (good visualization) is low.

5. When Mirizzi syndrome is suspected, it is mandatory to perform MRCP.

6. During obstructive jaundice, a 2-stage surgery is performed. Stage 1 – drainage and decompression of the bile ducts, stage 2 – radical surgery.

Diagnosing Mirizzi syndrome in the preoperative period is very difficult for surgeons and ultrasound doctors. Its solution is the selection of adequate treatment-diagnostic tactics and prevention of complications like obstructive jaundice, calculous cholecystitis or biliary stricture disorders during surgeries for choledocholithiasis.

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