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WHETHER TO EXPECT ADDITIONAL POSITIVE CHANGES FOLLOWING GALLSTONE REMOVAL IN THE MOTOR-EVACUATORY FUNCTION OF THE GALLBLADDER WITH INITIALLY SATISFACTORY EJECTION FRACTION BEFORE CHOLECYSTOLITHOTOMY

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Key words: asymptomatic cholecystolithiasis, motor-evacuatory function of the gallbladder, laparoscopic cholecystolithotomy

Impaired motor function of the gallbladder is considered by leading scientists as one of the pathogenetic mechanisms of gallstone formation [3]. Absolute priority of the gallbladder motor-evacuatory function assessment has been shown as to the choice of further surgical tactics for asymptomatic cholecystolithiasis treatment. Most experts tend to make a decision not to remove the gallbladder, but to preserve the organ, in patients with asymptomatic cholecystolithiasis and emptying function ranging from 40% to 80% of the initial gallbladder volume. Additional sonographic criteria for the advisability and feasibility of laparoscopic cholecystolithotomy are as follows: single stones with a diameter of 0.5 - 2.0 cm, easily movable in the gallbladder cavity; gallbladder dimensions - length of not more than 80 mm, width of not more than 40 mm; gallbladder wall thickness 1-2 mm; gallbladder volume up to 70 cm^3. Compliance with the above selection criteria helps to avoid the development of intra- and postoperative complications, enables improved short- and long-term results of surgical treatment for asymptomatic cholecystolithiasis as well as prevents recurrence rate of gallstones after cholecystolithotomy [1].

However, the question remains uncertain, whether to expect additional positive changes following gallstone removal in the motor-evacuatory function of the gallbladder with initially satisfactory ejection fraction before cholecystolithotomy.

The aim was to study the changes in gallbladder ejection fraction in patients with asymptomatic cholecystolithiasis before and after laparoscopic cholecystolithotomy.

Material and methods. A total of 33 patients with asymptomatic cholecystolithiasis were enrolled in the study after signing an informed consent to participate. The vast majority of patients were females (82%, n = 27), aged from 23 to 54 years, with a mean age of 48 ± 11.9 years, the remaining 18% were males (n = 6), aged from 25 to 58 years, with a mean age of 46.2 ± 12.4 years. All the patients underwent abdominal ultrasound examination before and after laparoscopic cholecystolithotomy on devices "Philips" No

MA2540R. Sonographic measurements of the gallbladder shape, size, contours, wall thickness were performed. The number and size of gallstones as well as motor-evacuatory gallbladder function were assessed. The smallest volume of the gallbladder was considered as the residual volume (GB-RV). The gallbladder ejection fraction (GB-EF) was calculated by the formula: GB-EF = (1-GB-RV [ml] / GB-NV [ml]) x 100%, where GB-EF is the gallbladder ejection fraction, GB-NV - gallbladder native volume, GB-RV - gallbladder residual volume. Normal gallbladder volume was considered within 50-70 ml, normal postprandial gallbladder emptying - at least 50%, maximum gallbladder volume return in about 1.5-2 hours after contraction [2]. Statistical analysis of the data was performed using the software package STATISTICA version 6.0 (StatSoft, Tulsa, OK., U.S.A.).

Results of the study. Based on the ultrasound and general clinical examination findings, all the patients were diagnosed with asymptomatic cholecystolithiasis without any signs of acute inflammation. The number of gallstones and morphological changes in the gallbladder walls were comparable: 90.9% (n = 30) patients had 1 stone; 9.1% (n = 3) - 2-3 stones. None of the patients had more than 3 stones in the gallbladder cavity. Gallbladder wall thickness did not exceed 2 mm in 78.8% (n = 26) of patients, and 2-3 mm in 21.2% (n = 7) of patients.

Dynamic ultrasound examination of the hepatobiliary system showed significantly improved motor-evacuatory gallbladder function in the postoperative period as compared to preoperative values (Tables 1, 2).

Table 1. Linear and volumetric parameters of the gallbladder in cholecystolithiasis patients before and after cholecystolithotomy, (M ± SD)

Indicator, unit of measure	Fasting, n=33	Meal-stimulated, n=33	p	Fasting, n=33	Meal-stimulated, n=33	p
	Before surgery			After surgery		
Gallbladder length, mm	73,0±2,3	70,8 ±2,2	0,0001	73,7±1,8	71,1 ±2,0	0,0001
Gallbladder width, mm	29,2±1,0	20,0±0,9	0,0001	29,1±1,0	17,6±0,7	0,0001
Gallbladder volume, ml	32,5±2,2	14,8±1,3	0,0001	32,6±2,1	11,6±0,9	0,0001

Table 2. Gallbladder ejection fraction and duration of "latent period" before and after cholecystolithotomy

Indicator, unit of measure	Before cholecystolithotomy, n=33	After cholecystolithotomy, n=33	p
Gallbladder ejection fraction, %	54,5±2,1	64,4±2,9	0,0001
Latent period, min	15,6±2,5	8,3±1,7	0,001

A significant increase in the gallbladder ejection fraction from 54.5 ± 2.1% to 64.4 ± 2.9% (p = 0.0001) and a shorter duration of the "latency period" from 15.6 ± 2.5 min to 8, 3 ± 1.7 min (p = 0.001) were revealed.

The obtained results were indicative of the improved motor-evacuatory gallbladder function in patients with asymptomatic cholecystolithiasis and an initial gallbladder ejection fraction of over 50% after laparoscopic organ-sparing surgery - cholecystolithotomy. Gallstone removal contributed to an additional almost 10 percentage point increase in the gallbladder ejection fraction.

Conclusions.

1. All patients with asymptomatic cholecystolithiasis (number of gallstones within 1-3 with the maximum diameter up to 2 cm) should undergo preoperative sonographic assessment of gallbladder motor-evacuatory function when planning surgical procedures.

2. Laparoscopic cholecystolithotomy is not only possible, but also advisable in case of preoperative gallbladder ejection fraction values of over 50%, since it allows the organ to be preserved with additional significant positive changes in the motor-evacuatory function after gallstone removal.

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