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Analysis of the Effectiveness of the Complex of Surgical Methods for the Treatment of Acute Calculous Cholecystitis in Elderly and Senile Patients

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Abstract

The nature of the complex surgical treatment of acute calculous cholecystitis in elderly and senile patients, under the conditions of gradation age analysis, made it possible to identify a number of theoretical patterns. Firstly, it is the dependence of the degree of complexity of surgical intervention on the severity of the course of acute calculous cholecystitis. In most cases, it is not reliable. Secondly, this peak value in this rank was presented among patients with moderate severity of acute calculous cholecystitis. Thirdly, the ranking of patients in this subgroup between mild and severe severity of the course of the disease does not allow achieving compliance with the planned type of surgical intervention. This is confirmed by a high level of conversion cases and an increase in the share of the degree of complexity. It seems to us that confirmation of this conclusion is possible only under the condition of an objective assessment of the results of the complex of surgical methods for the treatment of acute calculous cholecystitis in elderly and senile patients. In particular, the analysis of complications and mortality in this category of patients is of interest. But we will talk about this in our next publications.

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INTRODUCTION

Acute cholecystitis is one of the most common acute surgical diseases of the abdominal organs.

In 2006, the Tokyo Conciliation Commission adopted international standards for the examination and treatment of acute cholecystitis and acute cholangitis (Tokyo Guidelines). In 2013, these standards were revised and supplemented. The adoption of these recommendations allowed more successful treatment of cholecystitis [15].

As epidemiological studies show, diseases of the gastrointestinal tract tend to increase. According to statistics, in Europe and the United States, 15–20% of the population suffer from cholelithiasis [1,4] and are the cause of the largest number of hospitalizations. Among all diseases of the gastrointestinal tract, cholelithiasis also occupies the position of one of the costliest diseases of the digestive system for health care [8,14].

The main risk factors for cholelithiasis include: advanced age, female gender, pregnancy, postmenopausal estrogen intake, a high-calorie diet rich in easily digestible carbohydrates and poor in fiber, overweight or obesity, hereditary predisposition [1-6].

The problem of acute calculous cholecystitis in elderly and senile patients remains relevant. An increase in the incidence of cholelithiasis is accompanied by an increase in the frequency of its complicated forms. Obstructive jaundice is a frequent and unfavorable complication of cholelithiasis and its consequences of choledocholithiasis [7-15].

The erased clinical picture, the lack of order between the well-known data and the data observed in the real situation in elderly and senile patients is the main stumbling block that creates difficulties in achieving the effectiveness of treatment methods in this group of patients [1-6].

In this regard, the purpose of our study was to evaluate the effectiveness of a complex of surgical methods for the treatment of elderly and senile patients with acute calculous cholecystitis.

MATERIAL AND METHODS

The paper presents the data of a comprehensive examination and treatment of 102 patients with acute calculous cholecystitis of elderly and senile age who were treated at the clinic of the Bukhara regional branch of the emergency medical care center.

The division of patients into age categories was carried out according to WHO recommendations from 1992. At the same time, the category of elderly patients included categories from 60 to 74 years old, and the category of elderly patients - from 75 to 89 years old.

A total of 69 (67.6%) patients were elderly, while 33 (32.4%) patients were senile.

There were 2 times more female patients than males (64.6% and 35.4%, respectively), which corresponds to the general world statistics on this disease. A similar characteristic was also noted among patients in both the control group and the main group.

The severity of acute calculous cholecystitis in elderly and senile patients was assessed according to the 2018 Tokyo Guidelines.

Along with general clinical methods, the complex of examination of patients with acute calculous cholecystitis in elderly and senile patients included the following mandatory diagnostic key elements: clinical examination, assessment of the comorbidity index using the Charlson method, assessment of the physical status of patients according to the scale of the American Association of Anesthesiologists, laboratory tests, instrumental research methods.

For histological examination, pieces of a macropreparation of the gallbladder were fixed in neutral formalin, Carnoy's fluid and embedded in paraffin. Sections were stained with hematoxylin and eosin according to Van Gieson. Light microscopy and morphometry were carried out on a trinocular microscope sample XSZ -20 (PRC) with an optical resolution of 4 to 400 with a direct digital electronic attachment.

The complexity of laparoscopic cholecystectomy and the need for conversion were assessed according to simplified criteria by V.V. Zvyagintsev.

Postoperative complications were assessed according to the classification of surgical complications using the Clavien-Dindo method.

RESULTS AND DISCUSSION

Surgical methods for the treatment of acute calculous cholecystitis in elderly and senile patients included the choice of surgery between laparoscopic cholecystectomy, minilaparotomy cholecystectomy, or open cholecystectomy. Of course, preference was given to laparoscopic methods of surgery, but if this intervention was difficult to perform, a conversion was made with its completion by minilaparotomy cholecystectomy or open cholecystectomy. Accordingly, when analyzing the results of surgical methods of treatment, we took into account only the final variants of the interventions performed.

In 73.5% of cases, the removed gallbladder was destructive (Table 1). At the same time, among the elderly patients, the phlegmonous nature of the gallbladder lesion was predominant (26.5%), while among the elderly patients it was gangrenous (19.6%). The ratio between non-destructive and destructive forms of gallbladder lesions in patients with acute calculous cholecystitis of elderly and senile age was exactly 1:2.8.

Table 1

The nature of the distribution of elderly and senile patients depending on the pathomorphological changes in the gallbladder

Gallbladder changes	AGE CATEGORIES				TOTAL	
	Elderly		Senile			
	n	%	n	%	n	%
Empyema	3	2,9	2	2,0	5	4,9
Catarrhal	18	17,6	4	3,9	22	21,6
Phlegmonous	27	26,5	7	6,9	34	33,3
Gangrenous	21	20,6	20	19,6	41	40,2
TOTAL	69	67,6	33	32,4	102	100

In 2 (1.96%) patients with acute gangrenous calculous cholecystitis, the presence of an emphysematous gallbladder was stated.

All patients were operated on. Laparoscopic cholecystectomy was performed in 58.8% of cases, minilaparotomy cholecystectomy in 27 (26.5%) patients and open cholecystectomy in 15 (1.7%) patients. A significant numerical superiority in the use of laparoscopic cholecystectomy was noted among elderly patients

(45.1%).

The minimum number was noted in relation to open cholecystectomy in senile patients (5.9%). Minilaparotomy cholecystectomies were performed almost in the same number among both elderly and senile patients (13.7% and 12.7%, respectively).

In order to conduct an objective assessment of the results of treatment of patients with acute calculous cholecystitis in the elderly and senile age, we conducted an assessment depending on the severity of the course of the disease.

The majority (82.6%) of patients with mild acute calculous cholecystitis had catarrhal and phlegmonous cholecystitis (Table 2). All of them were among elderly patients. In the subgroup of patients of senile age, there was only 1 patient with gallbladder empyema. Gallbladder empyema among elderly patients was detected in 3 (75%) patients.

It should be noted that, despite the relatively mild severity of the disease, in this subgroup of patients, destructive forms of acute calculous cholecystitis were detected in 39.1% of cases. This, in turn, leads to the need sometimes to change the operational method due to the emergence of technical difficulties. On this side of the problem, we will present our reasoning later.

Table 2

The nature of the distribution of elderly and senile patients, depending on the pathomorphological changes in the gallbladder with mild severity of acute calculous cholecystitis

Gallbladder changes	AGE CATEGORIES				TOTAL	
	Elderly		Senile			
	n	%	n	%	n	%
Empyema	3	75	1	25	4	17,4
Catarrhal	10	100	0	0	10	43,5
Phlegmonous	9	100	0	0	9	39,1
Gangrenous	0	0	0	0	0	0
TOTAL	22	95,65	1	4,35	23	100

In the subgroup of patients with mild acute calculous cholecystitis, as well as in the general group, laparoscopic cholecystectomy prevailed by a significant margin, which were performed in 82.6% of patients (Table 3).

Cholecystectomy from minilaparotomy laparotomic access was performed in 2 elderly patients. Another 2 patients underwent cholecystectomy from upper median laparotomy. The decision to perform this type of operation was the presence of a pronounced adhesive process in the area of cicatricle deformity of the gallbladder neck, which was detected at the beginning of the operation by a minimally invasive method.

Table 3

The nature of the volume of surgical interventions performed in elderly and senile patients with mild severity of the course of acute calculous cholecystitis

TYPE OF OPERATION	AGE CATEGORIES				TOTAL	
	Elderly		Senile			
	n	%	n	%	n	%
Laparoscopic cholecystectomy	18	94,7	1	5,3	19	82,6
Mini cholecystectomy	2	100	0	0	2	8,7
Open cholecystectomy	2	100	0	0	2	8,7
TOTAL	22	95,65	1	4,35	23	100

The nature of the distribution of the level of complexity of cholecystectomy in the group of patients with mild severity of acute calculous cholecystitis showed that operations with I and II degrees of complexity prevailed (65.2% and 26.1%, respectively).

Difficulties III degree during cholecystectomy occurred in 2 patients due to the presence of dense subhepatic infiltrate, necrosis of the gallbladder walls with its fragmentation. However, technical difficulties can fundamentally affect the possibility of using laparoscopic cholecystectomy.

An analysis of the frequency of cholecystectomy of varying complexity depending on the duration of the disease in patients with acute calculous cholecystitis of mild severity showed that the safest time for performing cholecystectomy within the first 72 hours from the onset of the disease should be considered the maximum allowable.

With moderate severity of the course of acute calculous cholecystitis, destructive forms of the gallbladder were diagnosed to a greater extent (69.8%) (table 4). From the general group, the gangrenous form of acute calculous cholecystitis was predominant (44.2%).

In terms of age, 24 (55.8%) patients were elderly and 19 (44.2%) were senile. We deliberately focus on this phenomenon, which differs from the mild severity of the course of the disease, where the absolute predominant number of patients was the elderly. At the same time, the gangrenous form of acute calculous cholecystitis, which is one of the characteristic criteria for the moderate severity of the course of the disease, was predominant in both elderly and se-

nile patients.

Table 4

The nature of the distribution of elderly and senile patients depending on the pathomorphological changes in the gallbladder with moderate severity of acute calculous cholecystitis

Gallbladder changes	AGE CATEGORIES				TOTAL	
	Elderly		Senile			
	n	%	n	%	n	%
Empyema	0	0	1	100	1	2,3
Catarrhal	8	66,7	4	33,3	12	27,9
Phlegmonous	5	45,5	6	54,5	11	25,6
Gangrenous	11	57,9	8	42,1	19	44,2
TOTAL	24	55,8	19	44,2	43	100

In second place in terms of frequency of occurrence in the subgroup of elderly patients were lesions of the gallbladder in the form of acute catarrhal cholecystitis (8 cases). Retrospectively, it can be stated that all of them were in this subgroup of patients with a moderate severity of the disease due to a stormy clinical picture and a high level of leukocytosis. At the same time, phlegmonous forms of acute calculous cholecystitis were registered in the same number among senile patients. It should be noted here that due to the blurring of the clinical picture, cases with more severe forms of gallbladder damage turned out to be in this degree of severity of the course of the disease. Accordingly, they were the basis for the formation of a number of postoperative complications.

Gallbladder empyema was diagnosed only in 1 patient of senile age. Among elderly patients, gallbladder empyema was not observed.

When analyzing the volume of surgical interventions performed in patients with moderate severity of acute calculous cholecystitis, a total of 43 surgical interventions were performed (Table 5).

As in the general group and in the previous analyzed subgroup, in this case, among the prevailing ones were patients who underwent laparoscopic cholecystectomy (58.1%). However, this figure was 24.5% less than among patients with mild severity of acute calculous cholecystitis.

In 18 patients, the started laparoscopic cholecystectomy was completed by laparotomy. In 25.6% of cases, minilaparotomy cholecystectomy and in 16.3% - open cholecystectomy. In general, this was 24.5% more than in the previous analyzed subgroup of patients.

Thus, the preoperative assessment of the condition of patients in almost half of the cases did not coincide with the planned methods of surgery. Technical difficulties and the occurrence of intraoperative complications contributed to an increase in the proportion of surgical intervention trauma. All this, in turn, served as the basis for both the formation of postoperative complications and the more severe course of the entire postoperative period.

When analyzing the distribution of the nature of surgical interventions by the age category of patients, it was stated that laparoscopic cholecystectomy prevailed among patients (68%), which was 2 times more than among senile patients. Meanwhile, cases of conversion of laparoscopic cholecystectomy were more frequent (1.6 times) among senile patients. Moreover, in 7 patients of senile age they ended with minilaparotomy cholecystectomy, and in 4 patients with open cholecystectomy.

Table 5

The nature of the volume of surgical interventions performed in elderly and senile patients with moderate severity of the course of acute calculous cholecystitis

TYPE OF OPERATION	AGE CATEGORIES				TOTAL	
	Elderly		Senile			
	n	%	n	%	n	%
Laparoscopic cholecystectomy	17	68,0	8	32,0	25	58,1
Mini cholecystectomy	4	36,4	7	63,6	11	25,6
Open cholecystectomy	3	42,9	4	57,1	7	16,3
TOTAL	24	55,8	19	44,2	43	100

Thus, laparoscopic cholecystectomy operations in patients with moderate severity of acute calculous cholecystitis were impossible in almost half of the cases. A large proportion of discrepancies in plans when performing one or another variant of the operation indicates a low reliability of the preoperative assessment of the general condition of patients, identifying the degree of local inflammatory reaction with its subsequent generalization.

Analysis of the distribution of the level of complexity of cholecystectomy in patients with moderate severity of acute calculous cholecystitis showed that operations with III and IV degrees of complexity prevailed (25.6% and 44.2%, respectively).

Only 24% of laparoscopic cholecystectomy was grade I. In 68% of cases they were grades III and IV. Among minilaparotomy cholecystectomy, the complexity was grade IV in almost

half of the cases. As for open cholecystectomy, the complexity of the situation was noted in 71.5% of cases of IV degree.

Thus, summing up the analysis of treatment methods in this subgroup of patients, I would like to note that there were significant cases of conversion of laparoscopic cholecystectomy. In fact, laparoscopy in this category of patients has become diagnostic in almost half of the cases. The discrepancy between the preoperative prognosis of the pathomorphological structure of the gallbladder, the blurring of the clinical picture of complications of acute calculous cholecystitis, contributed to the emergence of "force majeure" circumstances requiring a change in surgical techniques. This, in turn, once again confirms the need to use more objective methods for assessing the manifestation and development of the inflammatory response in patients, both elderly and senile.

As we have already stated, in 36 patients with acute calculous cholecystitis, a severe course of the disease was diagnosed. Of these, 63.9% of cases were elderly patients and 36.1% - senile (table 6).

Pathological picture of the gallbladder in 100% of cases was destructive. Gangrenous gallbladders (61.1%) prevailed over phlegmonous (38.9%) almost 2 times.

At the same time, in elderly patients, almost all cases were phlegmonous (92.9%), while more than half of patients with gangrenous form of acute calculous cholecystitis were diagnosed in senile patients. The level of dispersion of clinical cases was not only in the percentage ratio between the age categories of patients, but also in the absolute number.

Table 6

The nature of the distribution of patients of elderly and senile age, depending on the pathomorphological changes in the gallbladder with a severe degree of severity of the course of acute calculous cholecystitis

Gallbladder changes	AGE CATEGORIES				TOTAL	
	Elderly		Senile			
	n	%	n	%	n	%
Empyema	0	0	0	0	0	0
Catarrhal	0	0	0	0	0	0
Phlegmonous	13	92,9	1	7,1	14	38,9
Gangrenous	10	45,4	12	54,5	22	61,1
TOTAL	23	63,9	13	36,1	36	100

It should be noted that, both in elderly and senile patients, we have not identified cases with empyema and catarrhal gallbladder.

In 44.4% of cases, the planned laparoscopic cholecystectomy was completed without conversion. However, in 55.6% of cases, surgical treatment had to be transferred to minilaparotomy cholecystectomy (38.9%) or open cholecystectomy (16.7%). Table 7 presents information on the nature of the volume of surgical interventions performed in the group of patients with severe severity of the course of acute calculous cholecystitis. 63.9% were elderly patients and 36.1% - senile.

To a greater extent, conversions ended with minilaparotomy cholecystectomy (38.9%), and to a greater extent among elderly patients (57.1%). Meanwhile, the completion of conversion by open cholecystectomy prevailed among elderly patients more significantly than with minilaparotomy cholecystectomy (66.7%). In this case, there is a repetition of the cases stated above, in particular, the blurring of the clinical picture and the complexity of the surgical intervention has a certain dependence on the age category of patients. Apparently, this aspect characterizes exactly the patients of elderly and senile age.

Table 7

The nature of the volume of surgical interventions performed in elderly and senile patients with severe severity of the course of acute calculous cholecystitis

TYPE OF OPERATION	AGE CATEGORIES				TOTAL	
	Elderly		Senile			
	n	%	n	%	n	%
Laparoscopic cholecystectomy	11	68,75	5	31,25	16	44,4
Mini cholecystectomy	8	57,1	6	42,9	14	38,9
Open cholecystectomy	4	66,7	2	33,3	6	16,7
TOTAL	23	63,9	13	36,1	36	100

The nature of the distribution of the level of complexity of surgical interventions performed in patients with severe course of acute calculous cholecystitis shows the predominance of IV degree of complexity. The prevailing difficulty was when performing laparoscopic cholecystectomy (33.3%). At the same time, among laparoscopic cholecystectomy, 25% of cases fell on the III degree of complexity of surgical intervention. It is noteworthy that I and II degrees of complexity laparoscopic cholecystectomy in patients with severe severity of the course of acute calculous cholecystitis was not noted by us.

Among surgical interventions with minilaparotomy cholecystectomy, III degree of complex-

ity prevailed (42.9%). To a lesser extent, there were patients with IV degree of complexity (2 times less than degree 3). Single cases of I and II degree of complexity of the minilaparotomy cholecystectomy operation were in the same proportion.

An even half of open cholecystectomy was grade III. The remaining operations of this volume fell on the I and II degree of the operation.

In general, it should be noted that the largest number of operations were of a complex degree (80.55%). Often, of course, this was associated with destructive changes in the gallbladder, as in the previous case. However, the presence of technical difficulties of I and II degrees indicates that the predominant nature of such changes is associated to a greater extent with the preoperative severity of the patients' condition.

CONCLUSION

Thus, the nature of the complex surgical treatment of acute calculous cholecystitis in elderly and senile patients, under the conditions of gradation age analysis, made it possible to identify a number of theoretical patterns.

Firstly, it is the dependence of the degree of complexity of surgical intervention on the severity of the course of acute calculous cholecystitis. In most cases, it is not reliable.

Secondly, this peak value in this rank was presented among patients with moderate severity of acute calculous cholecystitis.

Thirdly, the ranking of patients in this subgroup between mild and severe severity of the course of the disease does not allow achieving compliance with the planned type of surgical intervention. This is confirmed by a high level of conversion cases and an increase in the share of the degree of complexity.

It seems to us that confirmation of this conclusion is possible only under the condition of an objective assessment of the results of the complex of surgical methods for the treatment of acute calculous cholecystitis in elderly and senile patients. In particular, the analysis of complications and mortality in this category of patients is of interest. But we will talk about this in our next publications.

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