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## Diagnosics and Treatment of Acute Biliary Pancreatitis.

**Vladimir Fedorovich Kulikovsky\*, Andrey Leonidovich Iarosh, Alexander Valentinovich Soloshenko, Alexander Aleksandrovich Karpachev, Sergey Pavlovich Francev, Sergey Borisovich Nikolaev, Alexander Mihailovich Mishustin, Ekaterina Pavlovna Bitenskaya, Yurii Yurievich Vlasuk, and Marina Alexandrovna Kolesnikova.**

Federal State Autonomous Educational Institution of Higher Professional Education, Belgorod State National Research University, 85, Pobedy St., Belgorod, 308015, Russia.

### ABSTRACT

The authors have suggested a new diagnostic algorithm to be applied in case of impacted bile duct stone of major duodenal papilla, based on prognosis of acute pancreatitis according to results of analysis of biochemical bile markers. The usage of this algorithm in 32 patients with impacted bile duct stone of major duodenal papilla allowed reducing frequency of development of severe acute pancreatitis (from 60,3% to 38,1%) and its complications (pancreatic and peripancreatic fat necrosis – from 22,6% to 18,8%; acute fluid collections – from 32,4% to 25%),  $p < 0,05$ .

**Keywords:** Acute biliary pancreatitis, choledocholithiasis, major duodenal papilla, amylase, lipase, predictor.

*\*Corresponding author*

## INTRODUCTION

Common bile duct stones may cause major duodenal papillary obstruction. In this case quick pressure increase in pancreatic duct occurs, and in most cases acute pancreatitis develops, which is one of the most severe complications of choledocholithiasis [1-4]. Intensity of pathomorphological changes in pancreas depend on many factors. Apart from stone's size and form, determinative role belongs to anatomical peculiarities of common bile duct and pancreatic duct [5-7]. However, while analyzing modern literature, we didn't find any authoritative investigations regarding frequency, character and projected development of acute pancreatitis in patients with impacted bile duct stone of major duodenal papilla [5-10].

Earlier we had determined that bile  $\alpha$ -amylase and lipase ( $< 110$  u/l and  $600$  u/l, respectively) in patients with impacted bile duct stone of major duodenal papilla are diagnostic markers of acute pancreatitis [1]. This phenomenon formed the basis of new algorithm of diagnostics and treatment of patients with impacted bile duct stone of major duodenal papilla, which was offered by us. Effectiveness of this algorithm is to be assessed in this work.

## THE METHOD

We have analyzed treatment plans of patients with impacted bile duct stone of major duodenal papilla. Elderly and senium-aged people prevailed, i.e., 60-74 and 75-89 years old, respectively, which equaled 71,9 % of total number of ill people (23 persons). Average time from the disease manifestation was  $2,35 \pm 0,47$  days. Pain syndrome was detected in 30 patients (93,8%), feverescence – in 9 patients (28,1%), biliousness in 23 patients (71,9%). All the patients were examined with application of the complex of laboratory and instrumental studies, the algorithm of which was developed by us. At echography concrements of gall bladder was detected in 27 patients (84,38%), and signs of acute cholecystitis were demonstrated by 31 patient (96,88% -  $12,21 \pm 1,61$  mm). Changes of pancreas, typical for acute pancreatitis (swelling, hypoechogenity, outlines' turbidity) were observed in 12 patients (37,5%), of whom 7 patients (37,5%) demonstrated dilatation of major pancreatic duct. Acute fluid collections were present in 3 patients (6,25%).

**Table 1. Biochemical serum markers of patients with impacted bile duct stone of major duodenal papilla**

Index, measuring units	Parameters
A-amylase, u/l	$986,61 \pm 156,51$
Lipase, u/l	$661,21 \pm 161,21$
Bilirubin total, $\mu\text{mol/L}$	$95,4 \pm 16,77$
Alkaline phosphatase, u/l	$234,27 \pm 69,91$

According to suggested algorithm, all the patients with impacted bile duct stone of major duodenal papilla had endoscopic papillosphincterotomy. After obstruction elimination, an aspiration of bile from bile duct is performed for determination of  $\alpha$ -amylase and lipase in it. Also additional data of clinical, laboratory and instrumental methods are assessed, the main aim of which is detection of patients with signs of acute pancreatitis. Thus, at this stage the patients are divided into two groups. The first group consists of patients with the signs of acute pancreatitis, and the second group consists of individuals with no signs of acute pancreatitis. All patients with symptoms of acute pancreatitis are submitted to complex treatment according to generally accepted medical standards, including the usage of external endoscopic drainage of pancreatic duct.

The patients from the second groups (who didn't demonstrate symptoms of acute pancreatitis at the time of application to the hospital) had bile biochemical markers analyzed. We have detected that patients with bile  $\alpha$ -amylase and lipase levels of more than  $110$  u/l and  $600$  u/l, respectively, demonstrate higher occurrence of severe acute pancreatitis and its complications (acute fluid collections, pancreatic and peripancreatic fat necrosis) than that of the patients with bile  $\alpha$ -amylase and lipase levels, which are lower than these values (87,93 % and 11,36 %, respectively,  $p < 0,05$ ) [1]. In this respect these patients should undergo a course of standard treatment with the usage of external endoscopic drainage of pancreatic duct.

For assessment of effectiveness of suggested algorithm (main group), obtained treatment results were compared with the group that consisted of 102 patients with impacted bile duct stone of major duodenal papilla (control group), who were treated by us without application of this algorithm [1].

**THE MAIN PART**

**Control group**

During post-operation period positive dynamics was observed in 46 patients (45,1%). This was characterized by pain disappearance, reduction of a-amylase, lipase, bilirubin total and alkaline phosphatase blood levels, regression of signs of affection of pancreas and surrounding tissues at echography. Laparoscopic cholecystectomy was made for the majority of patients on the 3<sup>rd</sup> day. 56 (54,9%) patients showed negative dynamics. This was characterized by worsening of clinical and laboratory markers on the 1<sup>st</sup> and 2<sup>nd</sup> days after the operation. In 23 patients (22,6%) patches of pancreatic and peripancreatic fat necrosis were formed. In 33 cases acute fluid collections were detected in peritoneal omental sac, in 8 patients (7,8%) these patches were detected in free abdominal cavity. 4 patients (3,9%) on the 17<sup>th</sup>-23<sup>rd</sup> days suppurative-septic complications were observed. Thus, in this group of patients (control group) acute pancreatitis was established in 78 patients (76,47 %). Mild acute pancreatitis was diagnosed at 31 patient (39,7%), severe acute pancreatitis was found in 47 patients (60,3%). 4 persons died (3,9 %).

**The main group**

From the total number of patients with impacted bile duct stone of major duodenal papilla at the time of their application to the hospital, signs of acute pancreatitis were detected in 12 cases. The other 20 patients didn't show signs of acute pancreatitis, which was an indication for analysis of biochemical bile markers. 8 patients had increased values of bile a-amylase and lipase (< 110 u/l and 600 u/l, respectively). Thus, at the time of application to the hospital 20 patients (62,5 %) had a diagnosis of acute gallstone pancreatitis. In the course of the treatment 22 persons (68,8%) demonstrated positive dynamics. This was characterized by pain disappearance, reduction of a-amylase, lipase, bilirubin total and alkaline phosphatase blood levels, regression of signs of affection of pancreas and surrounding tissues at echography. Laparoscopic cholecystectomy was made for the majority of patients on the 3<sup>rd</sup> day. 10 (31,2%) patients showed negative dynamics. This was characterized by worsening of clinical and laboratory markers on the 1<sup>st</sup> and 2<sup>nd</sup> days after the operation. In 6 patients (18,8%) patches of pancreatic and peripancreatic fat necrosis were formed. In 8 cases (25%) acute fluid collections were detected in peritoneal omental sac, in 2 patients (6,25%) these patches were detected in free abdominal cavity. One patient (3,1%) on the 9<sup>th</sup> day omental abscess was formed. Thus, in this group of patients (control group) acute pancreatitis was established in 21 patients (65,6 %). Mild acute pancreatitis was diagnosed in 13 patient (61,9%), severe acute pancreatitis was found in 8 patients (38,1 %).

**Table 2: Distribution of patients according to severity of pancreatitis and presence of complications**

Parameter	Control group (n=102)		Main group (n=32)		P
	Number of persons	%	Number of persons	%	
mild acute pancreatitis	31	39,7	13	61,9*	0,01
severe acute pancreatitis	47	60,3	8	38,1*	0,01
pancreatic and peripancreatic fat necrosis	23	22,6	6	18,8*	0,01
acute fluid collections	33	32,4	8	25*	0,01
abscesses	4	3,9	1	3,1	0,06
lethality	4	3,9	1	3,1	0,06

## CONCLUSION

The results that had been earlier obtained by us show that bile a-amylase and lipase in patients with impacted bile duct stone of major duodenal papilla are reliable predictors of development of acute biliary pancreatitis. Patients with bile a-amylase and lipase levels of more than 110 u/l and 600 u/l, respectively, occurrence of severe acute pancreatitis and its complications (acute fluid collections, pancreatic and peripancreatic fat necrosis) are higher than that of the patients with bile a-amylase and lipase levels, which are lower than these values. Thus, basing on increase of a-amylase and lipase bile levels one may make prognosis regarding severity of acute pancreatitis even in cases when clinical and laboratory symptoms are not evident.

We have presented new diagnostic algorithm that should be used in case of impacted bile duct stone of major duodenal papilla, based on prognosis of acute pancreatitis per results of analysis of biochemical bile markers. Researches have shown that offered diagnostic and treatment algorithm allows avoiding tactical mistakes, based on subjective assessment of patient's state, as well as on results of laboratory and instrumental studies, and to reveal illness at the earliest stages of acute pancreatitis, caused by ampullary obstruction by gallstone, and to timely put on medications so that severe complications are avoided.

## CONCLUSIONS

Suggested diagnostic algorithm at impacted bile duct stone of major duodenal papilla, based on prognosis of acute pancreatitis per results of analysis of biochemical bile markers allows reducing occurrence of severe acute pancreatitis (from 60,3% to 38,1%) and its complications (pancreatic and peripancreatic fat necrosis – from 22,6% to 18,8%; acute fluid collections – from 32,4% to 25%),  $p < 0,05$ .

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