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Clinical Research

Comparative Multicenter Analysis of the Early Postoperative Complications Causes in Emergency Abdominal Surgery

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Abstract

Results of a multicenter study of the frequency of re-interventions after emergency abdominal operations in various segments of the surgical service presented. Study included three groups, where the first group consisted of patients operated at the V.Vahidov Republican Specialized Center of Surgery (252 patients), the second group - 176 patients treated in regional and urban health care clinics, and the third group - 77 patients operated on in the district hospitals. The main goal of this research was statistical evaluation of the frequency of repeated interventions in the various clinics of the Republic in the last years depending on the pathology and hence the nature and complexity of the primary operation. The analysis showed, that in a multilevel system of surgical care in the Republic on the district, regional and city levels dominates the spectrum of "ordinary" general surgical interventions - 99.7% and 94.9%, respectively, in turn, at the Republican Center 48.8% of interventions are the complex high-tech and specialized operations. Stratified analysis of the relaparotomy rate in district hospitals showed that, after general surgery operations average frequency of repeated surgery was 2.78%, and after the high-tech operations reaching 5.65%; at the level of city and regional institutions - 2.18% ($p<0.001$ for regional group) and 3.82% ($p<0.001$), respectively, and after the special operations reaches 22.23%; at the Republican Center an average frequency of reinterventions after general surgical operations was 1.86% ($p<0.001$ compared to the other groups), after the high-tech operations - 3.29% ($p<0.001$) and after a specialized operations - 21.72% ($p<0.01$ compared with groups of city and regional institutions). IJBM 2012; 2(2):128-131.

Introduction

In modern surgery in the structure of all operations the abdominal surgery is still dominated. Recent achievements in diagnosis, surgical techniques and tactics have substantially improved the quality and range of performed interventions. Despite this, surgeons when performing operations on the abdominal organs are still often have to solve problems that have not uniquely answers. As a result, there are many tactical and technical errors allowed with the development of postoperative complications, leading to repeated surgical procedures [1, 5]. Often, a situation exacerbated by unreasonable use of modern broad possibilities of intensive care and resuscitation. This may lead to abrupt change of the clinical signs of postoperative complication, obscure acute signs; remove usual signs of disaster in the abdominal cavity, level shifts in homeostasis [2-4]. Early diagnosis and rational treatment policy for complications, arising after abdominal surgery, remains one of the most difficult tasks of clinical surgery, justifying the need for structural analysis of unsatisfactory results of laparotomy at all levels of surgical services, which would determine the methodological directions for the development of standardized tactics of these patients.

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Material and methods

To conduct a multicenter study into the analysis included results of the treatment of 505 patients in 16 hospitals, which were divided into 3 groups. Into the group I (National level) included 252 patients who were observed in V. Vakhidov Republican Specialized Center of Surgery (RSCS) at all abdominal surgery departments for the period from 1976 to 2008. Into the group II (city and regional level) included 176 patients who were observed in 5 different clinics, providing the main surgical care in urban and regional level for 2000-2008. Into the group III (district hospitals) included 77 patients who were observed in 10 district hospitals of the Republic of Karakalpakstan for 2000 -2008.The mean age of patients was 50.24±15.08 years in group I, 44.32±18.14 years in group II, and 34.43±16.61 years in group III. In the structure of the

Table 1
Distribution of patients according to primary emergency disease.

Disease	Group 1		Group 2		Group 3	
Duodenal ulcer	28	11.1%	24	13.6%	5	6.5%
Gastric ulcer	14	5.6%	6	3.4%	3	3.9%
Mallory–Weiss syndrome	2	0.8%	3	1.7%	-	-
Stomach cancer	8	3.2%	4	2.3%	-	-
Operated stomach disease	13	5.2%	4	2.3%	-	-
Acute appendicitis	4	1.6%	39	22.2%	23	29.9%
Acute cholecystitis	40	15.9%	13	7.4%	4	5.2%
Adhesive disease	17	6.7%	20	11.4	20	26.0%
Small intestine cancer	1	0.4%	2	1.1%	2	2.6%
Mesenteric arteries thrombosis	2	0.8%	6	3.4%	-	-
Meckel's diverticulum	-	-	1	0.6%	2	2.6%
Crohn's Disease	3	1.2%	-	-	-	-
A tumor of the colon	13	5.2%	21	11.9%	1	1.3%
Incarcerated hernia	6	2.4%	7	4.0%	-	-
Main duodenal papilla tumor	1	0.4%	-	-	-	-
Pancreatic cancer	18	7.1%	4	2.3%	-	-
Hepaticocholedochus cancer	3	1.2%	-	-	-	-
Postcholecystectomy syndrome	42	16.7%	1	0.6%	-	-
Acute pancreatitis	6	2.4%	2	1.1%	1	1.3%
Choledochal cyst	1	0.4%	-	-	-	-
Echinococcosis of the abdominal cavity	10	4.0%	1	0.6%	-	-
Portal hypertension	13	5.2%	1	0.6%	-	-
Abdominal injury	7	2.8	17	9.7%	16	20.8%
Total	252	100.0%	176	100.0%	77	100.0%

disease, which required an emergency operation was dominated pathology of the stomach and duodenum, intestines and organs of hepatopancreatobiliary zone.

All performed primary operations according to complexity were divided into the following types:

1. General surgery operations: appendectomy, traditional cholecystectomy, palliative treatment of peptic ulcer complications (perforation closure and cessation of bleeding), treatment of intestinal obstruction (excision of adhesions, removal of the stoma, bypass anastomoses), emergency surgery for injuries of the abdominal cavity without resection technologies use, the Paciora's operation, uncomplicated forms of echinococcosis of the abdominal cavity, traditional hernioplasty. In other words, there are interventions, which do not require specific surgical instruments, expansion of the proposed intervention volume, prolonged intensive care measurements and, accordingly, specific profile professionals.
2. High-tech surgery operations: a radical treatment of complications of peptic ulcer disease (gastric resection), calculous cholecystitis complicated by obstructive jaundice, laparoscopic cholecystectomy and appendectomy, imposition of bypass holedochoduodenostomy and cholecystoenterostomy, total separation of gastroesophageal collector, external drainage of bile ducts in the postcholecystectomy syndrome, surgery for acute pancreatitis. This type of operation performance depends on two components, one side is the surgical, diagnostic, and anesthetic equipment, resuscitation clinic, and on the other hand - qualification of surgeon.
3. The operations performed mainly in the Republican Specialized centers: the radical treatment of tumors of the gastrointestinal tract (gastrectomy, hemicolectomy), reconstructive surgery on the bile ducts, and reconstructive surgery on the stomach in diseases of operated stomach. This type of

operations are typical for the Republican (National) level of surgical service, it concerns severe category of patients and depends on the specialization and qualification of the surgeon, adequate diagnostic, surgical equipment and special tools, dynamic monitoring capabilities, qualified anesthesiology and intensive care services.

Results and Discussion

Among the various intra-abdominal postoperative complications that required re-execution of the operation, revealed some differences in the studied groups. The major part of the group I consisted of patients with post-operative peritonitis - 31.3% (79 patients) and bleeding (75 patients) - 29.7%), whereas in groups II and III the main complications were peritonitis and intestinal obstruction (Table 2).

In Table 3 presented the character of relaparotomy performed. Depending on the surgical service level, reoperations in studied groups also differed in complexity.

In the group of city and regional level the characteristic of the primary operations divided as follows: general surgery has reached 85.2%, 13.1% of high-tech, and the most complex operations carried out in only 2 (1.7%) patients. In the district level group, these indicators were distributed to 96.1% (74 patients), 3.9% (3 patients) and 0%, respectively. In contrast to groups II and III in

Table 2
The structure of the main causes requiring reoperations performance.

Type of complication	Group I (n=252)		Group II (n=176)		Group III (n=77)		Total (n=505)	
Intra-abdominal bleeding	49	19.4%	13	7.4%	5	6.5%	67	13.3%
Bleeding into the lumen of the gastrointestinal tract	26	10.3%	17	9.7%	6	7.8%	49	9.7%
Acute pancreatitis	8	3.2%	5	2.8%	2	2.6%	15	3.0%
Obstructive jaundice	3	1.2%	2	1.1%			5	1.0%
Ileus	48	19.0%	49	27.8%	27	35.1%	124	24.6%
Peritoneal cavity abscesses	32	12.7%	7	4.0%	7	9.1	46	9.1%
Peritonitis	79	31.3%	77	43.8%	30	39.0%	186	36.8%
Eventration	7	2.8%	6	3.4%	-	-	13	2.6%

Table 3
Type of reoperations performed

Type of reoperation	Group I		Group II		Group III		Total (n=505)	
Excision of adhesions	25	9.9%	27	15.3	20	26.0%	72	14.3%
Opening the abscess and cleaning of the abdominal cavity	33	13.1%	4	2.3%	5	6.5%	42	8.3%
Stoma imposition	7	2.8%	34	19.3%	14	18.2%	55	10.9%
Isolated cleaning of the abdominal cavity	17	6.7%	29	16.5%	10	13.0%	56	11.1%
Stop the bleeding	70	27.8%	27	15.3%	11	14.3%	108	21.4%
Failure of sutures closure	37	14.7%	20	11.4%	6	7.8%	63	12.5%
Resection of stomach	3	1.2%	-	-	-	-	3	0.6%
Resection of the intestine	13	5.2%	13	7.4	7	9.1%	33	6.5%
Biliodigestive anastomoses	1	0.4%	2	1.1%	-	-	3	0.6%
Opening the omental bursa, sequestrectomy	8	3.2%	5	2.8%	2	2.6%	15	3.0%
The elimination of eventration	8	3.2%	6	3.4%	-	-	14	2.8
External drainage of choledoch	23	9.1%	5	2.8	1	1.3%	29	5.7%
Hemicolectomy	2	0.8%	2	1.1%	-	-	4	0.8%
Recovery of hepaticocholedochus	3	1.2%	-	-	-	-	3	0.6%
Reconstructive surgery on the stomach	2	0.8%	2	1.1%	-	-	4	0.8%
Appendectomy	-	-	-	-	1	1.3%	1	0.2%
Total	252	100.0%	176	100.0%	77	100.0%	505	100.0%

RSCS general surgical operations has amounted to only 40.5% (102 patients), high-tech - 38.1% and the type of operations performed predominantly in specialized centers - 21.4%.

The overall mortality rate after reoperations depending on the complexity of the primary operation was as follows. In Group I, after general surgical interventions mortality rate was 37.3%, after the high-tech operations - 57.3% and after the most complex types of operations - 48.1%.In group II, these indicators were as 48.0%, 47.8% and 66.7%, and in group III - 27.0% and 33.3% respectively. In group III mortality rate was the lowest, but it need to attract the attention once again to a different category of interventions performed and also more mature age of patients in groups I and II. It should be noted that despite the slight difference in mortality rates between groups I and II, the structure of operations in RSCS was more complex, but the tactics undertaken in these situations was wrong, i. e., an increase of primary surgery volume was unnecessary and result to various complications that required reoperation, and led to mortality. Among the main reasons that led to death in the study groups, the frequency of multiple organ failure was 22.6% in group I, 27.8% - in group II and 18.2% - in group III. Development of acute heart failure has led to mortality of 13.1%, 7.4% and 2.6% patients respectively. In other cases, the cause of a fatal outcome were bronchopulmonary complications (7.1%, 10.8% and 6.5%), myocardial infarction (1.6%, 1.1% and 0%), pulmonary embolism - (1.6%, 0.6% and 0%) and acute failure of cerebral circulation (1.2%, 0.6% and 0%).

Conclusions

In the structure of all intra-abdominal complications, which required the relaparotomy performance the main part form peritonitis - 36.8%, bleeding - 23.0%, an acute intestinal obstruction - 24.6%, 15.4% in the remaining cases were limited abdominal abscesses in 9.1% of cases, acute pancreatitis - 3.0%, eventration - 2.6% and obstructive jaundice in 1.0% of patients. In the structure of mortality after reoperation on the proportion of postoperative peritonitis in RSCS accounts for 31.1%, in regional and city hospitals - 56.5% and district hospitals - 52.4%; bleeding - 36.1%, 15.3% and 14.3%, respectively; intestinal obstruction - 15.1%, 15.3% and 23.8%.

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