

Halei M., Dzubanovskyi I., Marchuk I. Length of hospital stay analysis. Simultaneous laparoscopic surgery in treatment of combined surgical pathology of organs of abdominal cavity. *Journal of Education, Health and Sport*. 2020;10(8):598-604. eISSN 2391-8306. DOI <http://dx.doi.org/10.12775/JEHS.2020.10.08.071>
<https://apcz.umk.pl/czasopisma/index.php/JEHS/article/view/JEHS.2020.10.08.071>
<https://zenodo.org/record/4519826>

The journal has had 5 points in Ministry of Science and Higher Education parametric evaluation. § 8. 2) and § 12. 1. 2) 22.02.2019.
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The authors declare that there is no conflict of interests regarding the publication of this paper.

Received: 04.08.2020. Revised: 14.08.2020. Accepted: 31.08.2020.

Length of hospital stay analysis. Simultaneous laparoscopic surgery in treatment of combined surgical pathology of organs of abdominal cavity

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Abstract

Length of stay is one of the most evident indexes in evaluation of efficiency and expediency of treatment methods. It is useful to exploit it to compare different approach of treatment of the same pathology. Aim of our work was to analyze effectiveness of simultaneous operations for treatment surgical pathology of organs of abdominal cavity and gallstone disease. To compare the results of simultaneous treatment with results of classical treatment. We used statistics formed of 1157 patients that underwent operations in minimal invasive surgery unit of Volynian regional clinical hospital (Lutsk, Ukraine) in period of 2013-2019 years. Patients were divided into two groups. The research group (Group 1) was formed by 411 patient that underwent simultaneous laparoscopic surgery for treatment of gallstone disease and combined surgical pathology of organs of abdominal cavity. The control group (Group 2) was formed by 746 patients that underwent mono laparoscopic operation for treatment only one pathology of abdominal cavity. Groups were compared using such indexes

as length of stay, number of conversions, number of complications, time of the operation. In the result terms of hospital stay were 3.52 days in group 1 and 3.55 days in group 2. Conversion was performed in 0.48% of patients in group 1 vs. 0.4% in group 2. Number of intraoperative complications was 1.93% in research group vs 2.14% in control. Time of operation was longer in group 1 vs group 2 up to 20% due to bigger volume of operation. The difference was smaller than operation itself. There were no operations that continued longer than 2 hours. Simultaneous operations are more effective because of its` suitability for combined pathology with no need for repeat hospitalization and operation. Simultaneous operations are as safe as standard mono operation.

Key words: surgery; laparoscopy; simultaneous; gallstone disease

In modern conditions of surgical practice, combined surgical pathology is common [1]. Different combinations are met in practice quite often, among the patients who have applied with surgical pathology, such on the average 27% [2]. One of the most common surgical pathologies is the pathology of the gallbladder [3]. It is highly recommended to perform laparoscopic cholecystectomy for treatment of cholecystitis as soon as possible because of risks of complications and iatrogenic common bile duct injury that are rising with grade of cholecystitis [4]. Very often cholecystitis is diagnosed in remission stage while patient undergoes a routine examination or is treated for another illness.

The clinical study was based on the analysis of the results of simultaneous surgical treatment of patients with gallstone disease and concomitant surgical pathology within the abdominal cavity in the period from 2013 to 2019 (group 1 – 411 patients table1)

Table 1. Structure of the research group

Nosology	Number	Percent
Cholecystitis+hiatal hernia	87	21,17
Cholecystitis+inguinal hernia	15	3,65
Cholecystitis+ventral hernia	5	1,22
Cholecystitis+umbilical hernia	1	0,24
Cholecystitis+morbid obesity	1	0,24
Cholecystitis+large intestine neoplasm (D)	4	0,97
Cholecystitis+adrenal neoplasm (D)	5	1,22
Cholecystitis+liver neoplasm (D)	39	9,49
Cholecystitis+pancreas neoplasm (D)	11	2,68
Cholecystitis+abdominal adhesions	36	8,76
Cholecystitis+choledocholithiasis	207	50.36
Sum	411	100

A study of the results of surgical treatment also performed in patients who underwent only surgical treatment of only one major surgical pathology in the period from 2013 to 2019, as a control group.

Nosology	Number	Percent
Cholecystitis	144	21,11
Hiatal hernia	163	23,9
Inguinal hernia	27	3,96
Ventral hernia	11	1,6
Umbilical hernia	3	0,44
Morbid obesity	5	0,73
Large intestine neoplasm (D)	4	0,59
Adrenal neoplasm (D)	8	1,17
Liver neoplasm (D)	79	11,58
Pancreas neoplasm (D)	22	3,22
Abdominal adhesions	60	8,79
Choledocholithiasis	220	32,26
Sum	746	100

It is important to note that in study only data from patients with benign neoplasms was used. In case when histological analysis indicated malignant tumor such patient was excluded from research.

For hiatal hernia in all cases laparoscopic Toupet fundoplication with cruroraphy was performed.

For inguinal hernia in all cases laparoscopic transabdominal periperitoneal alohernioplasty was performed.

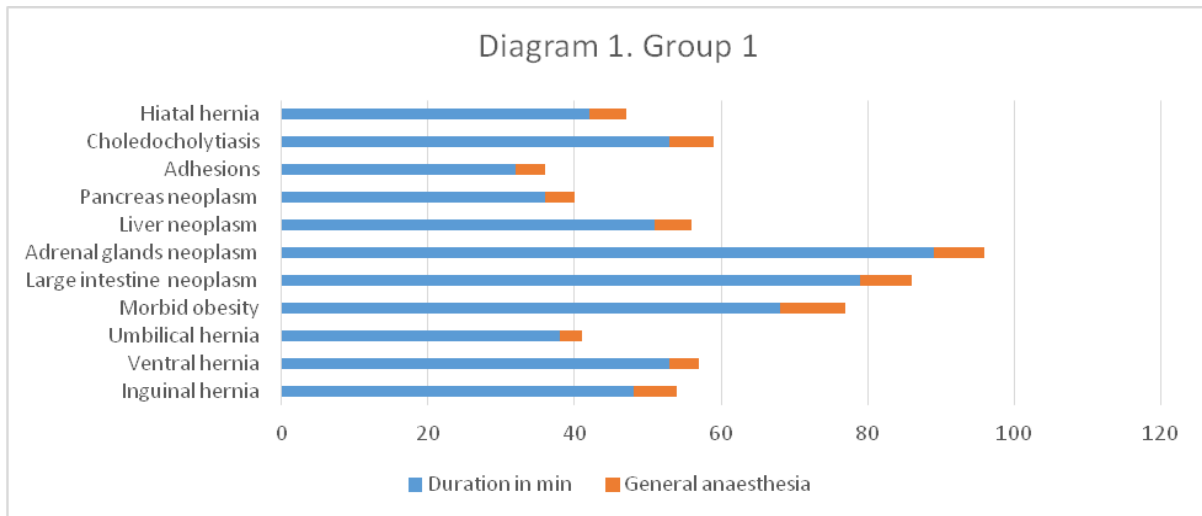
For ventral and umbilical hernia in all cases alohernioplasty was performed.

For morbid obesity in all cases laparoscopic sleeve resection was performed.

For large intestine neoplasm laparoscopic hemicolectomy (right in all cases) was performed.

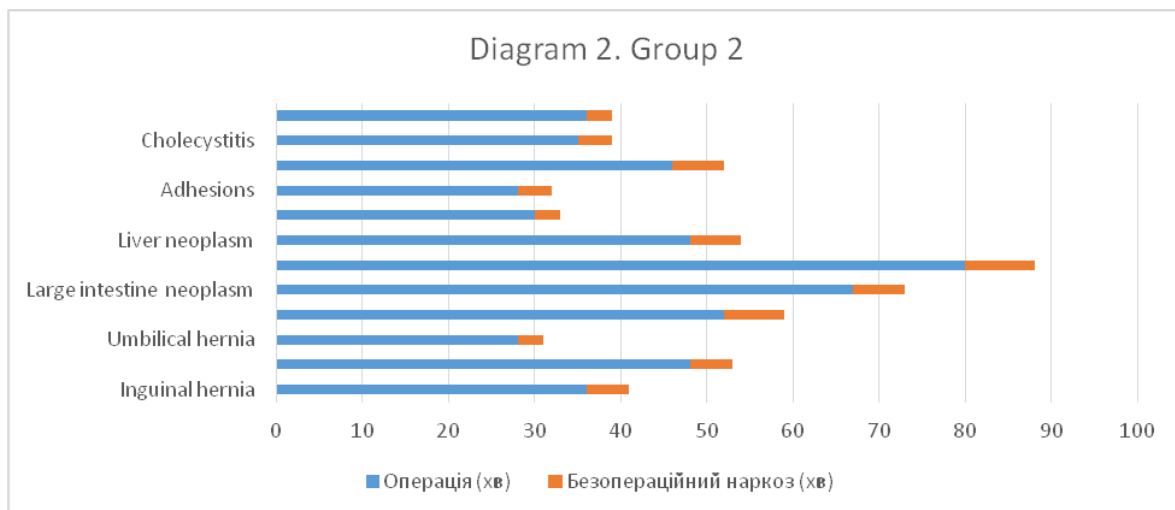
After analysis and comparison of data, it was noticed that the time of surgery, one of the most important indicators of the effectiveness of the method, was expected to increase in the group of simultaneous surgery, compared with the control group. However, it should be noted that the time increased insignificantly, and, accordingly, did not increase the level of associated postoperative non-surgical complications. The duration of surgery did not exceed 2 hours which is safe for patient [5]. In turn, the total time of anesthesia, including the period of non-surgical anesthesia (intubation-extubation) increased accordingly, and also slightly, in the group of simultaneous surgery, compared with the group of control surgery. The duration of

anesthesia did not exceed 2 hours, so there was no increase in anesthesia risks (diagram 1 and 2) [6].



In all cases in group 1 simultaneous laparoscopic cholecystectomy was performed. The duration of operation in group 1: $48 \pm 2,11$; $53 \pm 2,34$; $38 \pm 1,97$; $68 \pm 3,07$; $79 \pm 3,81$; $89 \pm 3,98$; $51 \pm 2,22$; $36 \pm 1,48$; $32 \pm 1,25$; $53 \pm 2,38$; $42 \pm 2,03$; $45 \pm 2,1$ ($p=0,048$ – t-test).

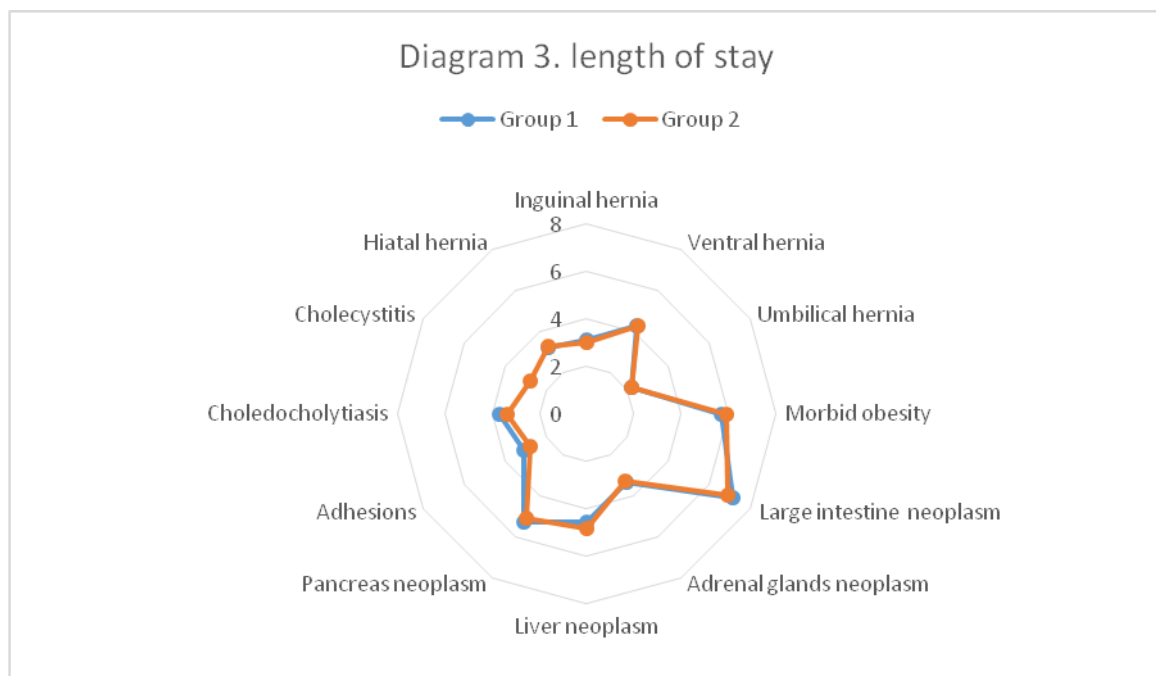
The duration of operation in group 2: $36 \pm 1,42$; $48 \pm 2,41$; $28 \pm 1,08$; $52 \pm 3,04$; $67 \pm 3,47$; $80 \pm 4,02$; $48 \pm 2,26$; $30 \pm 1,11$; $28 \pm 1,07$; $46 \pm 2,43$; $35 \pm 1,88$; $36 \pm 1,97$ ($p=0,034$ – t-test).



It is easy to notice the increase in the time of operations in the study (group 1) group compared with the control. Such data are absolutely expected, because it is logical that a larger volume of surgery (additional cholecystectomy) requires more time. The average duration of operations in the group of vertical (sleeve) gastrectomy (+16 minutes), TAPP for

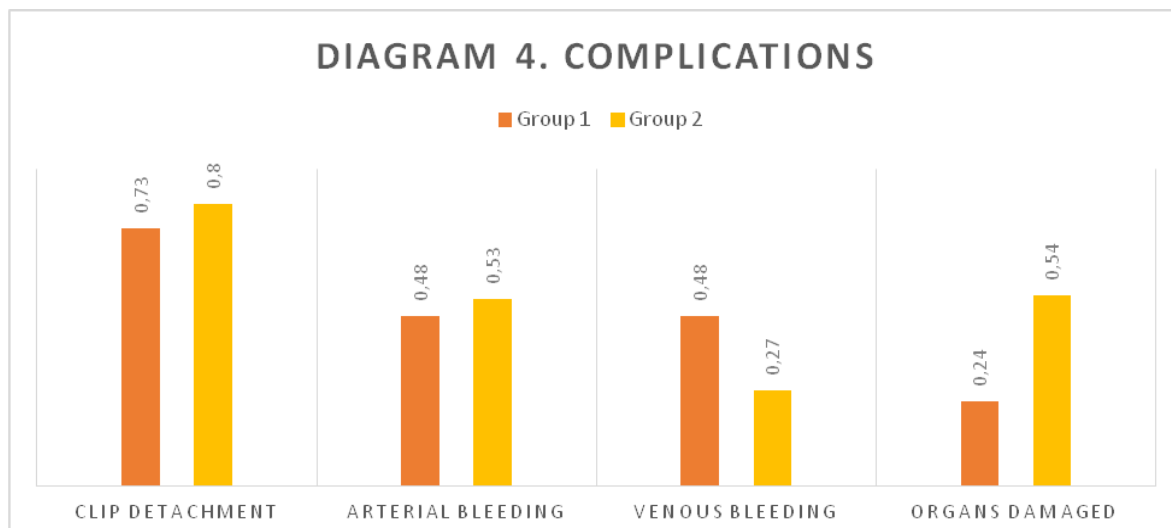
inguinal hernia and hemicolectomy (+12 minutes in both subgroups) increased the most. The average increase in transaction time was 19.83%.

The analysis of the received data, systematization of data on subgroups is carried out. The patient's readiness for discharge was determined objectively, using the form PT-RHDS (READINESS FOR HOSPITAL DISCHARGE SCALE) [7], provided there are no medical contraindications to discharge. This is a questionnaire that relies on the patient's well-being. The short form includes 8 points with a numerical expression from 0 to 10, where 0 is the lowest value and 10 is the absolute value. Modern ERAS protocols fully support early discharge confirming the reduction of postoperative morbidity, mortality, inappropriate economic costs [8]. We encouraged patients for early discharge when no danger was seen. Terms of discharge shown in diag.3.



In the group of simultaneous laparoscopic surgical interventions (group 1) 2 (0.48%) conversions were performed, in the group of conventional laparoscopic surgical interventions - 3 (0.4%). According to the results of the Mann-Whitney U-test, no statistically significant differences between the studied groups in the level of conversions were found ($p = 0.985$).

Number of complication did not differ significantly ($p=0.856$) (diag.4). There were 3 clip detachments in group 1 and 6 in group 2, 2 arterial bleeding in group 1 and 4 in group 2, 2 venous bleeding in group 1 and 2 in group 2, 1 case of organs damage in group 1 and 4 in group 2.



Terms of hospital stay did not differ in subgroups. Also number of complications is similar in both groups. Conversion number is also similar in both groups. Duration of operation is bigger in research group due to the bigger volume but is smaller than cholecystectomy itself. This data allow us to affirm about safety and effectivity of simultaneous operations. This strategy allows to avoid repeat hospitalization and operation.

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