

## SPECIFIC FEATURES OF DIAGNOSTIC AND TREATMENT TACTICS IN PATIENTS WITH CRUSHED ABDOMINAL HERNIAS WITHOUT RESECTION OF A HOLLOW ORGAN

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### ABSTRACT

**The purpose of the work** is to analyze the results of the use of optimized diagnostic and therapeutic tactics in patients with strangulated abdominal hernias without resection of the hollow organ.

**Materials and methods:** The work is based on the analysis of the results of surgical treatment of 665 patients with strangulated abdominal hernias without resection of the hollow organ, who were divided into 2 groups depending on the features of the diagnostic and treatment tactics. Unlike the patients of group 1, the following diagnostic tactics were used in group 2: substantiated laparoscopic diagnosis of abdominal organs; mandatory biochemical assessment of hernia water; mandatory intraoperative instrumental assessment of the state of the strangulated organ; expansion of indications for the use of laparoscopic interventions and components of the comprehensive Fast track program; substantiated complex prevention of malignancy. The clinical diagnostic algorithm included laboratory, instrumental and biochemical research methods.

**Results:** The use of priority diagnostic and therapeutic tactics in the patients of group 2 allowed to increase the number of laparoscopic hernioplasty by 49.34%, the number of allohernioplasty by 18.62%, among which the "Sublay" technique was preferred for strangulated ventral hernias. This was accompanied by a decrease in the pain syndrome on the VAS scale during the four days of observation, both during coughing and at rest, and amounted to only  $2.21 \pm 0.29$  points on the fourth day when at rest. In addition, and after 12 months, the patients of group 2 observed a better recovery according to the SF-36 questionnaire, which amounted to  $76.77 \pm 6.63$  points for the assessment of the general state of health,  $70.81 \pm 5.86$  points for the assessment of physical functioning,  $68.88 \pm 5.37$  points for the assessment of role functioning due to physical condition,  $68.03 \pm 5.92$  points for the assessment of role functioning due to emotional state, and social activity was characterized by  $72.82 \pm 5.52$  points.

### Conclusions

1. The proposed diagnostic and treatment tactics in the patients of group 2 with strangulated abdominal hernias without resection of a hollow organ, in contrast to patients in group 1, made it possible to increase the number of laparoscopic operations to 227 (66.37%) in contrast to 55 (17.03%) in the first group, which was accompanied by a decrease in pain syndrome on the VAS scale on the fourth day when coughing from  $4.35 \pm 0.38$  points to  $2.97 \pm 0.43$  points.

2. The expansion of indications for the use of laparoscopic operations in patients of group 2, in contrast to patients of group 1, led to a decrease in the postoperative complications by 10.48% and the postoperative mortality by 2.29% and was characterized by better postoperative rehabilitation according to the assessment of the patients' condition after 12 months according to the SF-36 questionnaire..

**Keywords:** strangulated abdominal hernia, laparoscopic operations, allohernioplasty

## INTRODUCTION

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Modern requirements for surgical herniology encourage the constant search and implementation of various principles and approaches in the treatment of patients with abdominal hernias – a disease that still worries a considerable number of patients both mature and, especially, elderly and senile [1]. The achievements of the last decades of planned hernia surgery are characterized by a considerable number of extraordinary and significant gains from improving the tactics of treating patients, taking into account the quality of the plastic material itself to eliminate not only the hernia defect of the abdominal wall, but also the complex correction of structural changes in the parahernial area – to the choice of a rational and pathogenetically justified minimally invasive approach with maximum preservation of tissues and structures not only of the abdominal wall, but also the possibility of low-traumatic adhesiolysis or simultaneous surgery [2].

However, the implementation of surgical priorities in urgent hernia surgery raises many debatable issues, which, depending on the state level of provision of urgent surgical operations, the mentality of timely seeking emergency medical care, the round-the-clock and internationally recognized use of clinical protocols and guidelines, taking into account the individual characteristics of the patient's condition, professional and economic provision of the intervention itself, especially at night, today remain far from a possible single solution to the urgent problem of surgical treatment of strangulated abdominal hernias [3].

*The purpose of the work* is to analyze the results of the use of optimized diagnostic and therapeutic tactics in patients with strangulated abdominal hernias without resection of the hollow organ.

## MATERIALS AND METHODS

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This paper analyzes the results of surgical treatment of 665 patients with strangulated abdominal hernias without resection of the hollow organ, who were treated in the surgical clinics of the Kyiv City Clinical Emergency Hospital from

2015 to 2021. Depending on the peculiarities of the diagnostic and treatment tactics, patients were divided into 2 groups – 1 group (323 patients) comparison and 2 (342 patients) main group. In the patients of group 2, in contrast to group 1, the following diagnostic and treatment tactics were used: a) justified need for laparoscopic diagnosis of the organs of the abdominal cavity with intra-abdominal assessment of the state of the strangulated organ); b) mandatory intraoperative assessment of hernia water using Rivalt's test, Moritz's reaction, ethanol test; c) mandatory intraoperative (intra-abdominal laparoscopic (or open) instrumental assessment of the state of the strangulated organ; d) mandatory use of justified components of the complex Fast track program (with the exception of objective contraindications); e) expansion of indications for the use of laparoscopic interventions (in the absence of previous surgical interventions or the presence of a sonographic "window"; under the condition of effective endoscopic probe decompression of the proximal part of the small intestine; if sonographic preoperative and intraoperative monitoring is possible; in case of peritonitis according to MPI  $\leq$  21 points; when the intraoperative ICP level does not exceed 12 mmHg; when the severity of multiple organ failure according to the MODS scale is  $\leq$  5 points; with sufficient (over 100 operations) experience of laparoscopic interventions on the organs of the abdominal cavity by the operating surgeon and all members of the surgical team); g) mandatory justified prevention of adhesions by using a combined mixture of carboxyperitoneum with defensal and an anesthetic; if adhesions were present, they were stratified and separated with the help of VCHEZ.

During the work, the moral and ethical norms of bioethics were observed in accordance with the rules of ICH/GCP, the Helsinki Declaration of Human Rights (1964), the Convention of the Council of Europe on Human Rights and Biomedicine (1997), as well as the current legislation of Ukraine. The clinical diagnostic algorithm included laboratory, instrumental and biochemical research methods.

Statistical data processing was carried out using methods of variable statistics on a personal computer "Pentium® Dual-Core CPU E6500" using the software "Microsoft Office Professional 2013" and "LibreOffice Calc" based on "Microsoft Windows 10 Pro".

## RESULTS AND DISCUSSION

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The differences in diagnosis and treatment tactics in patients with strangulated abdominal hernias were also characterized by a different structure of surgical interventions (Table 1). Despite the commonly used principles and approaches in hernia surgery according to the personal experience and literary sources [4], nevertheless, the peculiarities of the localization of the hernia defect (inguinal-femoral localization, primary ventral or postoperative hernia) and the state of the abdominal wall create prerequisites for a separate rethinking of individual components of the surgical doctrine.

The improvement of diagnostic and treatment tactics in the patients of group 2, in contrast to the patients of group 1, made it possible to increase the number of surgical operations with the use of synthetic transplants. In the patients of group 2 with strangulated inguinal hernias without resection of the hollow organ, 183 laparoscopic allohernioplasty procedures (LAP) were performed, of which 42 patients had resection of the altered band of the cap, and another 32 patients underwent Lichtenstein allohernioplasty. Whereas in the patients of group 1 with strangulated inguinal hernias, the vast majority – 127 patients had Lichtenstein allohernioplasty, and only 48 patients had the LAP technique used for inguinal plastic surgery.

In our opinion, the justified intraoperative laparoscopy is of particular importance in the complex diagnosis of patients with strangulated hernias of the esophageal opening of the diaphragm, which in 7 patients of the 2 group allowed, in the absence of indications for resection of the hollow organ, to perform laparoscopic hernioplasty with fundoplication (5 patients - Nissen fundoplication, 2 patients - Dor fundoplication). While in 6 patients of group 1, in the treatment of a strangulated diaphragmatic hernia, surgical intervention was performed through a laparotomy approach without a previous laparoscopic evaluation regarding the possibility of performing a minimally invasive intervention.

And although in both groups of patients with strangulated ventral hernias without resection of the hollow organ, preference was given to allohernioplasty, but significant differences between groups do occur. Almost half – 44 patients of the

first group with strangulated ventral hernias underwent laparotomy autohernioplasty. Laparotomy allohernioplasty in group 1 was applied to 46 patients, of which for 26 patients the “Sublay” method was used, for 16 patients the “Onlay” method was used, and for 4 patients the “Inlay” method was used.

Improvement of diagnosis and tactics in the patients of group 2 with strangulated ventral hernias, in contrast to group 1, made it possible to expand the indications for the use of allohernioplasty, because autohernioplasty and autoraphia were used in only 6 patients. When performing allohernioplasty, the “Sublay” method was preferred – 58 patients, and the presence of certain social and clinical prerequisites became the basis for the use of the “Onlay” method in 8 patients, and in another 2 patients the “Inlay” method was used.

According to the literature sources [5], laparoscopic allohernioplasty in patients with strangulated ventral hernias, taking into account the condition of the patients during hospitalization, the severity of the sebaceous process in the abdominal cavity, needs further rethinking to expand the indications for its wider implementation in urgent ventral hernia surgery. In 6 patients of the first group with a strangulated ventral hernia without resection of the hollow organ, laparoscopic allohernioplasty was performed, while in the patients of the 2nd group, it was used in 33 patients.

The expansion of indications for the use of the Fast track technology at the current stage is observed in various areas of abdominal surgery, which creates prerequisites for their implementation in emergency hernia surgery, especially in patients with strangulated abdominal hernias without resection of a hollow organ. Implementation of the Fast track technology took place in 55 (17.03%) patients of the first group and in 227 (66.38%) patients of the 2nd group. Special differences can occur depending on the localization of the strangulated abdominal hernia, the volume of the surgical injury, technological and professional support of the entire paraoperative treatment process.

Comfort and quality during the postoperative period in patients who were operated on for hernias according to literary sources [6] is often evaluated by using various scales, among which the VAS scale is preferred. The analysis of the comparative assessment of the pain reaction between the first and second groups of the data presented in Table 2 revealed significant benefits

**Table 1.** Peculiarities of surgical interventions in patients with strangulated abdominal hernias without resection of a hollow organ

| List and volume of surgical interventions    | The first group<br>323 | The second group<br>342 |
|--|------------------------|-------------------------|
| Laparoscopic allohernioplasty LAP            | 48/26                  | 183/42                  |
| Herniotomy, allohernioplasty (Liechtenstein) | 127/7                  | 20/12                   |
| Herniotomy, autohernioplasty                 | /45                    | 20/13                   |
| Laparoscopic allohernioplasty                | 6                      | 33/2                    |
| Laparoscopic hernioplasty and fundoplication | -                      | 7                       |
| Laparoscopic autohernioplasty                | 1                      | 4                       |
| Laparotomy allohernioplasty "Onlay"          | 16/2                   | 8/2                     |
| Laparotomy allohernioplasty "Sublay"         | 26/3                   | 58/18                   |
| Laparotomy allohernioplasty "Inlay"          | 4                      | 2/1                     |
| Laparotomy autohernioplasty                  | 44/13                  | 4/3                     |
| Laparotomy hernioplasty and fundoplication   | /6                     | -                       |
| Laparotomy autoraphia                        | -                      | /2                      |
| In total                                     | 323                    | 342                     |

Note: total number of operations/operation with resection of the band of the cap.

from the use of improved diagnostic and therapeutic tactics in the patients of the second group. After all, when analyzing the pain reaction in the patients of group 2, in contrast to the patients of group 1, both at rest and when coughing, its manifestations are likely and significantly smaller during at least four days of observation in the postoperative period. This testifies to the effectiveness of expanding indications in patients with strangulated abdominal hernias to the use of the proposed treatment tactics, which are based on the basic principles of minimally invasive interventions with the justified use of Fast track technologies.

In clinical practice, according to the literature data [7], to analyze the results of surgical treatment of patients with various urgent pathologies, the analysis of postoperative complications according to the Clavien-Dindo scale (2004) is

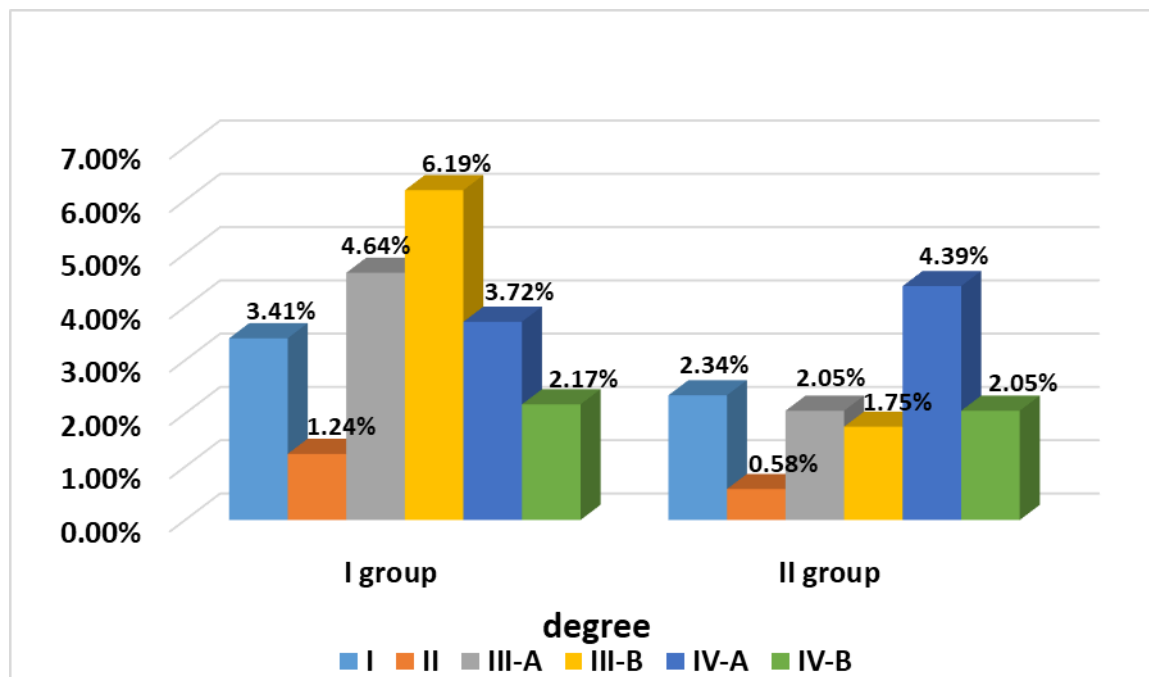
most often used, which is reflected in our material (Figure 1). A comparison of the consequences of using different diagnostic and treatment tactics in the patients of groups 1 and 2 with strangulated abdominal hernias revealed significant differences in the structure of various postoperative complications. III degree complications were most often observed in patients of group 1 – 35 (10.84%), with a total number of 83 (25.69%) complications with mortality in 14 (4.34%) patients.

The use of priority tactics in the patients of group 2 led to a decrease in both the structure in terms of the degree of complications and the total number, because they had only 52 (15.21%) complications, among which complications of the IV degree prevailed – 22 (6.43%). which in 7 (2.05%) patients ended fatally.

**Table 2.** *Assessment of the pain reaction according to the VAS scale in patients with strangulated abdominal hernias without resection of the hollow organ (scores)*

| The condition of the patient | Term after surgery (days) | 1 group 323        | 2 group 342                   |
|------------------------------|---------------------------|--------------------|-------------------------------|
| When at rest                 | 6 hrs                     | <b>8.25</b> ± 0.66 | <b>7.03</b> ± 0.48 p**        |
|                              | 12                        | <b>8.69</b> ± 0.70 | <b>7.66</b> ± 0.68 p*         |
|                              | 18                        | <b>7.81</b> ± 0.60 | <b>6.55</b> ± 0.54 p*         |
|                              | 24                        | <b>6.77</b> ± 0.47 | <b>5.54</b> ± 0.43            |
|                              | 36                        | <b>5.96</b> ± 0.49 | <b>4.63</b> ± 0.34 p*         |
|                              | 48                        | 5.19 ± 0.46        | <b>3.78</b> ± <b>0.34</b>     |
|                              | 72                        | 4.29 ± 0.36        | 3.18 ± <b>0.44</b> p*         |
|                              | 96                        | 3.51 ± 0.35        | 2.21 ± <b>0.29</b> p**        |
| When coughing                | 6 hrs                     | <b>8.91</b> ±0.73  | <b>7.48</b> ± <b>0.6</b> p*   |
|                              | 12                        | <b>9.33</b> ±0.70  | <b>7.96</b> ± <b>0.61</b> p*  |
|                              | 18                        | <b>8.81</b> ±0.60  | <b>7.18</b> ± <b>0.61</b>     |
|                              | 24                        | <b>8.04</b> ±0.67  | <b>6.05</b> ± <b>0.48</b> p*  |
|                              | 36                        | <b>6.93</b> ±0.52  | <b>5.31</b> ± <b>0.40</b>     |
|                              | 48                        | 6.09±0.46          | <b>4.61</b> ± <b>0.58</b> p** |
|                              | 72                        | 5.20±0.4           | 3.97 ± <b>0.45</b>            |
|                              | 96                        | 4.35±0.38          | 2.97 ± <b>0.43</b> p*         |

Note: 1) Probability coefficient  $p^* < 0.05$ ;  $p^{**} < 0.01$ ; 2) p – probability in comparison with the data of the 1st group.



**Figure 1.** Peculiarities of postoperative complications in patients who were operated on for strangulated abdominal hernias without resection of the hollow organ according to the Clavien-Dindo scale (2004)

**Table 3.** Results of the assessment of the quality of life in the postoperative period (12 months) in patients who were operated on for strangulated abdominal hernias without resection of the hollow organ according to the SF-36 questionnaire

| Indicators                                  | Before the operation | 1 group<br>323 | 2 group<br>342 |
|---|----------------------|----------------|----------------|
| General state of health                     | 42.56±4.67           | 64.7±4.71      | 76.77±6.63 p*  |
| Physical functioning                        | 47.69±4.77           | 62.03±5.14     | 70.81±5.86 p*  |
| Role functioning due to physical condition  | 44.28±4.42           | 58.20±4.87     | 68.88±5.37 p*  |
| Role functioning due to emotional condition | 21.66±3.11           | 55.92±5.18     | 68.03±5.92 p** |
| Social activity                             | 56.42±5.2            | 61.09±6.62     | 72.82±5.52 p*  |
| Viability                                   | 65.07±6.8            | 77.37±8.65     | 82.66±8.2      |
| Mental health                               | 55.48±32.63          | 68.46±32.98    | 73.15±6.58     |

Note: 1) Probability coefficient  $p^* < 0.05$ ;  $p^{**} < 0.01$ ; 2) p – probability in comparison with the data of the 1st group.

The quality and comfort of life in the long term after operations depended on the presence of complaints about adverse manifestations in the

area of surgical intervention. The results of the evaluation of the quality of life in the postoperative period (12 months) were analyzed in patients

who were operated on for strangulated abdominal hernias without resection of the hollow organ according to the SF-36 questionnaire (Table 3). Their comparison between groups 1 and 2 significantly, and often probably, differed. It should be noted that the consequences of the postponed surgical intervention in both groups of patients compared to the state of physical and mental compliance before the surgical intervention were fundamentally different and indicate the need for state regulation of the planned treatment of patients with abdominal hernias of various localizations, because the urgency of the intervention increases not only the risk of various complications, but also the risk of a fatal outcome.

The obtained results of the assessment of the quality of life of the patients of group 1, who were operated on for hernias of the abdomen according to the SF-36 questionnaire, show that after 12 months, the assessment of their general state of health was  $64.7 \pm 4.71$  points, physical functioning was  $62.03 \pm 5.14$  points, role functioning due to physical condition was estimated at  $58.20 \pm 4.87$  points, role functioning due to emotional condition was estimated at  $55.92 \pm 5.18$  points, social activity was  $61.09 \pm 6.62$  points, which was probably inferior when compared with patients of the 2nd group. After all, their assessment of the quality of life in the postoperative period according to the SF-36 questionnaire based on the criteria of the general state of health was even  $76.77 \pm 6.63$  points, physical functioning increased to  $70.81 \pm 5.86$  points, role functioning due to physical condition increased to  $68.88 \pm 5.37$  points, role functioning due to emotional state increased to  $68.03 \pm 5.92$  points, social activity was  $72.82 \pm 5.52$  points.

Thus, the implementation of improved tactics in the patients of group 2, in contrast to the patients of group 1, led not only to disagreements regarding the choice of minimally invasive surgical interventions, but was also accompanied by a decrease in the negative consequences of the treatment of patients with strangulated abdominal hernias.

## CONCLUSIONS

1. The proposed diagnostic and treatment tactics in the patients of group 2 with strangulated

abdominal hernias without resection of a hollow organ, in contrast to the patients in group 1, made it possible to increase the number of laparoscopic operations to 227 (66.37%) in contrast to 55 (17.03%) in the first group, which was accompanied by a decrease in pain syndrome on the VAS scale on the fourth day when coughing from  $4.35 \pm 0.38$  points to  $2.97 \pm 0.43$  points.

2. The expansion of indications for the use of laparoscopic operations in the patients of group 2, in contrast to the patients of group 1, led to a decrease in postoperative complications by 10.48% and postoperative mortality by 2.29% and was characterized by better postoperative rehabilitation according to the assessment of the patients' condition after 12 months according to the SF-36 questionnaire.

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