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Research Article

RESULTS OF LAPAROSCOPIC AND LAPAROTOMIC INTERVENTIONS FOR POSTOPERATIVE VENTRAL HERNIA

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ABSTRACT

The study is based on a clinical examination of 105 patients with postoperative ventral hernias who were operated on in the surgical department of the multidisciplinary clinic of Samarkand State Medical University for the period from 2019 to 2023. Depending on the choice of operation, patients were divided into two groups:The first group (main group) consisted of 50 patients operated on laparoscopically, the second group, the comparison group included 55 patients who underwent open (traditional) prosthetic hernioplasty. The use of the laparoscopic "ipom" technique can significantly reduce the number of early postoperative and general complications (by 3.6 times), the duration of hospitalization (from10.2 ± 1.8days before6.2 ± 0.8days), periods of temporary disability (from40.9 ± 5.6days before15.1 ± 1.8days), and also reduce the number of relapses (from 10.9% to 2.0%).

KEYWORDS

Postoperative ventral hernias, alloplasty, endovideosurgery.

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INTRODUCTION

An increase in surgical activity associated with the improvement of surgical techniques and anesthesia methods has led to an increase in the number of patients with postoperative ventral hernias (POVH) by 9-10 times over the past 25 years [7]. Every year, about 20 million hernioplasties are performed in the world, of which approximately 700 thousand are performed in the USA, about 1 million in Europe, and up to 2 thousand in Uzbekistan [4, 7, 10].

In this regard, the problem of surgical treatment of POVH remains an urgent task in abdominal surgery. These hernias take second place after inguinal hernias, and account for 20-22% of the total number of abdominal wall hernias. In approximately 50% of cases, POVH develops within the first two years after surgery, and 75% after three years [2, 5, 6].

The problem of effective treatment of POVH has not been fully resolved. Despite the large number (more than 200) of proposed methods for their surgical treatment, the rate of disease relapse remains high, amounting to 15-50%, and repeated operations are accompanied by its increase to 20-65% [1, 3, 8]. The inconsistency of assessments of the proposed methods of surgical treatment of POVH, the variety of traditional methods of hernia repair used and the emergence of new methods using various mesh implants make it difficult to choose the most rational method of plastic closure of the hernia defect. In modern conditions, various methods of tension-free hernioplasty using a variety of synthetic mesh implants are considered the operation of choice for POIG. Tension methods of hernioplasty using local tissues have practically ceased to be used due to the high frequency of relapses and remain in the arsenal of surgeons only for small POIGs [1, 9].

Since the late 1990s, the development of laparoscopic technology and the introduction of new synthetic materials have pushed surgeons to develop and introduce into practice laparoscopic methods for the treatment of POVH.

However, to this day, the following issues of laparoscopic hernioplasty remain unresolved: the rational choice of a mesh implant according to the quality/price criterion, the method of its placement and method of fixation, the problem of delimiting the mesh implant from the abdominal organs, determining the indications and contraindications for this type of plastic surgery [2] .

The purpose of the study improving the results of laparoscopic hernioplasty for postoperative ventral hernias.

METHOD

The study is based on a clinical examination of 105 patients with postoperative ventral hernias who were operated on in the surgical department of the multidisciplinary clinic of Samarkand State Medical

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University for the period from 2019 to 2023. Depending on the choice of operation, patients were divided into two groups:The first group (main group) consisted of 50 patients operated on laparoscopically, the second group, the comparison group included 55 patients who underwent open (traditional) prosthetic hernioplasty. Among the patients there were 58 men, 47 women.

The location and size of the PIH were determined using the classification proposed by the European Society of Herniology (modified and based on the classification of J. Chevrel and A. Rath) and adopted by international consensus (Belgium, October 2-4, 2008) [10].

According to this classification, the following types of POVG are distinguished:

I) By localization:

M - medial hernia (borders of the midline of the region: cranially - the xiphoid process, caudally - the pubic bone, from the side - the lateral edges of the rectus abdominis muscle):

M1 - subxiphoid hernia (from the xiphoid process to 3 cm caudally);

M2 - epigastric hernia (from 3 cm below the xiphoid process to 3 cm above the umbilical ring);

M3 - umbilical hernia (from 3 cm above to 3 cm below the umbilical ring);

M4 - infraumbilical hernia (from 3 cm below the umbilical ring to 3 cm above the pubis);

M5 - suprapubic hernia (from the pubic bone to 3 cm cranially).

L - lateral hernia (limits of the lateral surface area: cranially - the edges of the costal arches; caudally - the inguinal areas, medially - the lateral edges of the rectus abdominis muscle, laterally - the lumbar region):

L1 - hypochondrium (from the anterior edge and horizontal line 3 cm above the umbilical ring);

L2 - flank (on the side of the rectus muscle 3 cm above and below the umbilical ring):

L3 - iliac region (between the horizontal line 3 cm below the umbilical ring and the groin area);

L4 - lumbar region (latero-dorsal part from the anterior axillary line).

Various defects in the anterior abdominal wall caused by one incision are considered as one hernia, two or more different surgical incisions are considered as two or more hernias.

II). According to the size of the hernial orifice:

W1 <4 cm; W2 ≥ 4-10 cm; W3 ≥ 10 cm. The width of the hernia defect is defined as the greatest horizontal distance in cm between the lateral edges

hernia defect on both sides. In the case of multiple defects, the width of the hernia is measured between the most transversely located edges of the most laterally located defects on the same side. The length of the hernia defect is defined as the greatest vertical distance in cm between the most cranial and most caudal edges of the hernia defect. In the case of multiple hernia defects from one incision, the length is measured between the most cephalad defect and the most caudal defect.

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III). By adjustability:

1. Reducible, with or without obstruction; 2. Irreversible, with or without obstruction.

IV). Based on the presence of symptoms:

1. Asymptomatic; 2. Symptomatic.

In terms of age composition, body mass index, presence of concomitant pathology, location, size and area of the hernia defect, both groups of patients did not differ significantly from each other (Table 1).

Table 1.
Distribution of patients between study groups

Sign		Laparoscopic hernioplasty (n=50)	Open hernioplasty (n=55)
floor	husband	26	32
	wives	24	23
Average age (years)		52.7±3.2	56.1±5.3
Average period of occurrence of POVG (years)		0.7±0.1	0.9±0.2
Body mass index (kg/m2)		32.1 ± 1.2	30.2 ± 2.3
Presence of concomitant pathology (abs., %)	Diseases of the heart and blood vessels	8	9
	Lung diseases	5	6
	Kidney diseases	2	2
	Gastrointestinal diseases	4	6
	Diabetes	3	4
Distribution of POVG according to the EOG classification of 2008 (abs., %)	M – medial hernia	M (45): M1-1; M2-17; M3-19; M4-7; M5-1	M (47): M1-2; M2-20; M3-18; M4-5; M5-2
	L – lateral hernia	L(5): L1-2; L2-1; L3-1; L4-1	L(8): L1-3; L2-2; L3-2; L4-1
	W – size of the hernial orifice	W1 - 4; W2 - 35; W3 - 11	W1 - 4; W2 - 39; W3 - 12

POIG in patients of both groups arose after the following previous operations: after cholecystectomy, suturing of a perforated gastric or duodenal ulcer, gastric resection for complications of gastric or duodenal ulcer (perforated ulcer, gastrointestinal bleeding, gastric outlet stenosis) from the traditional upper midline laparotomy access - in 40 patients, after midline surgical approaches for acute surgical pathology and injuries of the abdominal organs - in 21, lower midline incisions for gynecological diseases - in 15, lumbotomy approaches for urolithiasis - in 13, cesarean section for obstetrics – in 13, appendectomy

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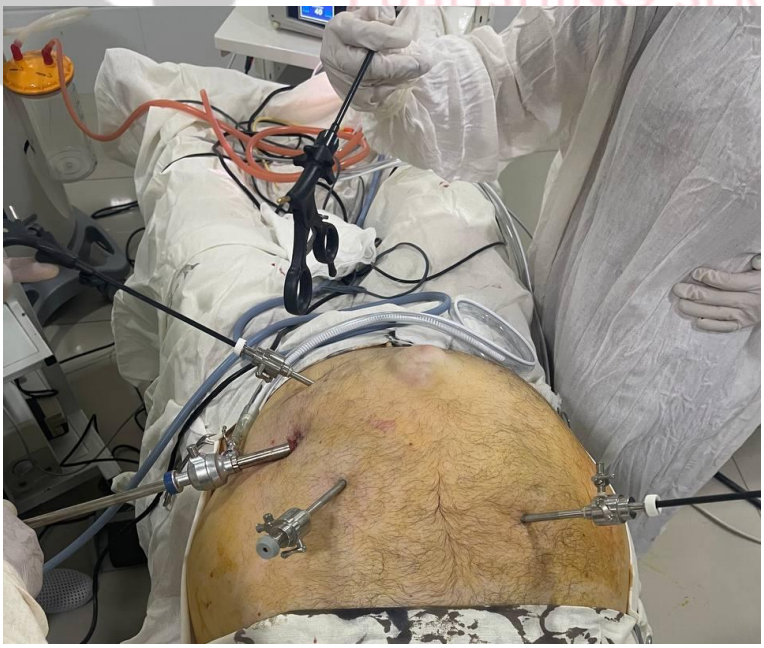
from a typical approach – in 3 patients. The occurrence of POVH in patients was observed within a period of 2 months to 4 years after the last previous operation.

In the main group of patients who underwent laparoscopic hernioplasty using the "ipom" method (Laparoscopic Intra Peritoneal Onlay Mesh), composite mesh implants "Physiomesh" or "Prosid" (Ethicon) were used. All laparoscopic operations were performed under general anesthesia using a Karl Shorz video complex. The main working instruments for laparoscopic prosthetic hernioplasty were: ultrasonic scalpel "Harmonic" (Ethicon) and 5 mm endoscopic herniostapler "ProTack™" (Covidien).

Surgical intervention was performed according to standard techniques.

Stage I – insertion of the first trocar in conditions of POVH, as far as possible from the hernia, in an area free from adhesions. Typically, entry into the free abdominal cavity was carried out in the left hypochondrium or in the left iliac region using a special optical trocar "Visiport™" (Covidien) or under visual control using the Hasson technique.

Stage II of the operation - after the introduction of the first trocar with optics and revision of the abdominal cavity, 2 or 3 working trocars were introduced. The sites for trocar insertion in patients with POIG are not standardized and were chosen where it was more convenient and safe. At the same time, we tried to observe the principle of interaction of two laparoscopic instruments at an angle to each other of at least 45° (Fig. 1).



Rice. 1. Places for installing 10 mm and 5 mm trocars for the laparoscope and working instrument

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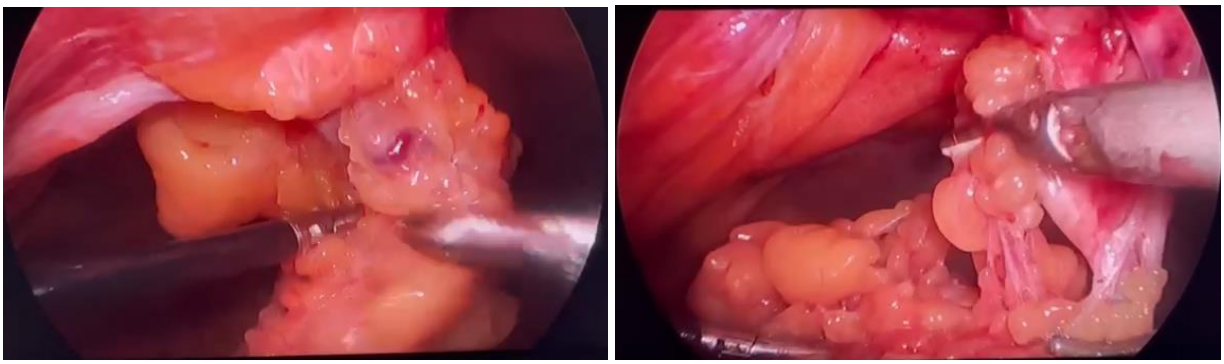
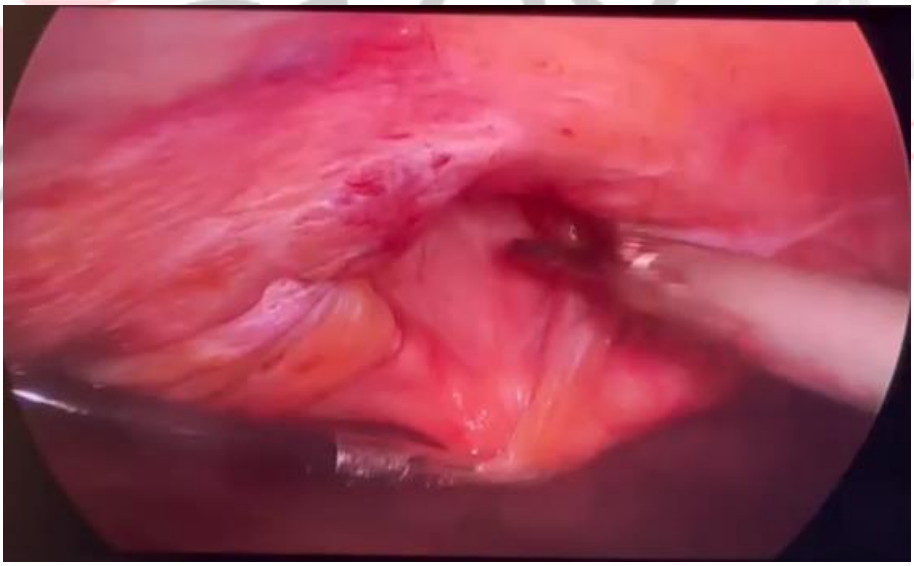
Stage III was adhesiolysis. Separation of adhesions between the hernial sac, anterior abdominal wall and nearby organs was performed using endoscissors or an ultrasonic scalpel "Harmonic" (Ethicon) (Fig. 2).



Rice. 2. Stage separation of adhesions between the anterior abdominal wall and liver using an ultrasonic scalpel "Harmonic" (Ethicon)

Stage IV – identification of the aponeurosis defect, determination of the true size of the hernial orifice, selection of a mesh implant of the appropriate size (Fig. 3).



Rice. 3. General view of the defect of the aponeurosis of the anterior abdominal wall after separation of the adhesions

Stage V – cutting out and modeling the mesh implant (if necessary), marking the hernial orifice and points of fixation of additional ligatures, stitching the edges of the mesh implant with 2 or 4 ligatures for its intra-abdominal straightening and pressing to the anterior

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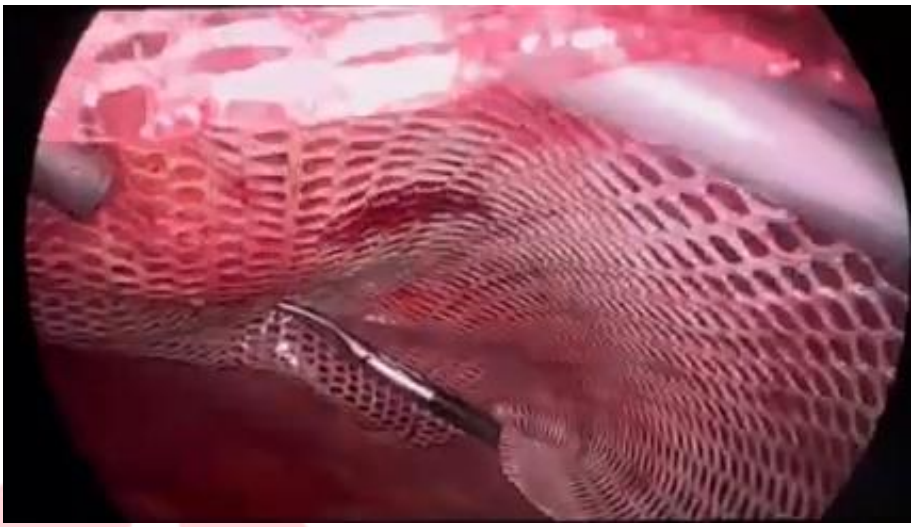
abdominal wall before final fixation with an endoherniostapler.



Rice. 4. Final fixation of the mesh implant to the anterior abdominal wall using an endoherniostapler

Stage VI – insertion of a mesh implant into the abdominal cavity, straightening and pressing it to the anterior abdominal wall using ligatures tied along the edges of the implant, final fixation using an endoherniostapler (Fig. 4). The number of fixation staples depended on the size of the hernia defect, the volume of the hernia sac and the size of the mesh implant (usually after 3-4 cm).

Stage VII - control of hemostasis, desufflation of gas, removal of trocars and suturing of 10 mm punctures of the anterior abdominal wall, application of intradermal absorbable sutures to the skin incisions and aseptic dressings.

Open prosthetic hernioplasty (comparison group) was performed under general anesthesia or epidural anesthesia, which depended on the location and size of the PIH. When performing prosthetic hernioplasty using a laparotomic approach (comparison group), a Prolene mesh implant (Ethicon) of the appropriate size was used in all patients. In this case, the mesh implant was fixed with a polypropylene thread to the aponeurosis using the "onlay" method (supra-neurotic location) in 16 patients, and the "inlay" method (subaponeurotic, preperitoneal location) in 39 patients. All patients underwent active aspiration of wound exudate for 1-3 days.

Patients in both groups, in addition to analgesics (Ketorolac 50 mg/ml, intramuscularly 2 ml 2 times a day, or Ketoprofen 30 mg/ml, intramuscularly 1 ml 2 times a day) and infusion therapy, received standard anticoagulant and antibacterial drugs. The active regimen was prescribed by the end of the first day of

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the postoperative period with mandatory banding. In addition to limiting physical activity, wearing a bandage was recommended for patients in the main group for 1 month, and for patients in the comparison group for 3-4 months after surgery.

The results of surgical treatment were assessed based on the clinical picture, local status and ultrasound examination in the postoperative period for up to 2 years. The immediate results of operations in patients with POIG were assessed according to the following criteria: postoperative local complications; general complications; duration of taking analgesics; duration of inpatient treatment; periods of temporary disability. Long-term results of operations and quality of life were assessed using a questionnaire - the SF-36 questionnaire, filled out by patients 2 years after surgery. The 36 questionnaire items were grouped into eight groups, characterizing: physical functioning, i.e. ability to withstand physical activity; role physical functioning, which reflects the impact of physical condition on daily activities; pain intensity and impact of pain on daily activities; general health; general activity, energy; social functioning; role-emotional functioning, which characterizes the influence of the emotional state on everyday activities; mental health. The first 4 groups of questions of this scale characterized the patients' assessment of their physical health, and the 5-8 groups of questions reflect the main parameters of mental health.

RESULTS AND DISCUSSION

The general results of surgical treatment of patients with POVH are presented in Table 2.

Table 2.

Results of surgical treatment of patients with POVH

Sign		Laparoscopic hernioplasty (n=50)	Open hernioplasty (n=55)
Operation duration (min.)		85.4 ± 8.4*	102.4 ± 9.7
Activation time for patients after surgery (hours)		10.2 ± 1.2*	27.4 ± 1.8
Duration of taking analgesic drugs (days)		3.6 ± 1.5*	5.4 ± 1.8
Postoperative local complications (abs.,%)	- seroma	4 (8.0%)*	14 (25.4%)
	- hematoma	1 (2.0%)*	6 (10.9%)
	- infiltrate	1 (2.0%)*	3 (5.4%)
	- suppuration	-	1 (1.8%)
General complications (abs., %)		1 (2.0%)*	6 (10.9%)
Duration of inpatient treatment (days)		6.2 ± 0.8*	10.2 ± 1.8
Duration of temporary disability (days)		15.1 ± 1.8*	40.9 ± 5.6
Recurrence of hernia abs., %		1 (2.0%)	6 (10.9%)

*Note: * - differences between groups are statistically significant (P < 0.05).*

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The average duration of laparoscopic hernioplasty was85.4 ± 8.4min., which turned out to be less than with open hernioplasty -102.4 ± 9.7min. ($p < 0.05$). We associate the reduction in operation time with laparoscopic access with the absence of the following stages, standard for open hernioplasty: 1) incision of the skin and subcutaneous tissue, 2) wide detachment of subcutaneous tissue from the aponeurosis along the entire perimeter of the hernial orifice, 3) thorough hemostasis along the course of the hernial sac and hernial orifice, 4) manual fixation of the mesh using interrupted or continuous sutures, 5) layer-by-layer suturing of the skin wound.

Postoperative local wound complications were detected in 6 patients (12.0%) of the main group, while in the comparison group they were recorded in 24 (43.6%), which is 3.6 times more than in the main group. All wound complications were eliminated by conservative measures and puncture methods under ultrasound guidance. The results obtained confirm the minimal trauma of the endovideosurgical approach to performing hernioplasty and demonstrate a reduction in the incidence of postoperative local complications by 31.6% compared to similar results in patients operated on by laparotomy. In our opinion, this is directly related to minimizing the size of the surgical approach and reducing the area of the wound surface, the absence of lymphorrhea and tissue exudation, the absence of a postoperative cavity between the skin and the aponeurosis, as well as the location (intraperitoneal) of the mesh implant during laparoscopic hernioplasty.

CONCLUSIONS

- The supraponeurotic placement of the mesh implant using the "onlay" method is associated with a large number of wound complications (grays, hematomas, infiltrates, purulent complications) and a high risk of relapse of POIG.
- With the "inlay" technology, the risk of developing wound complications and the likelihood of relapse of POIG is significantly lower, but this method is more technically complex and is not always possible.
- The use of the laparoscopic "ipom" technique can significantly reduce the number of early postoperative and general complications (by 3.6 times), the duration of hospitalization (from10.2 ± 1.8days before6.2 ± 0.8days), periods of temporary disability (from40.9 ± 5.6days before15.1 ± 1.8days), and also reduce the number of relapses (from 10.9% to 2.0%).
- In modern conditions, the method of laparoscopic hernioplasty can be recommended as the operation of choice in patients with PVH.

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