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Article

Tactical Aspects of Surgical Treatment of Postoperative Ventral Hernias

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Abstract: According to modern literature data, after laparotomy, postoperative hernias appear in 5-14% of patients. With the increase in the number of reoperations, especially among older people, the frequency of postoperative ventral hernias increases from year to year. We observed 135 patients who underwent surgery for postoperative ventral hernias. Of these, there were 25 men and 110 women. Without tension hernioplasty using the " inlay " method was performed in 21 patients, and " onlay " in 101 patients. Hernioplasty with local tissues - muscular- aponeuratic duplication in 13 patients.

Keywords: Ventral hernia, " Inlay ", " Onlay " , Tension , Hernioplasty

1. Introduction

Surgical treatment of postoperative ventral hernias of the anterior abdominal wall is one of the pressing problems of clinical surgery. According to modern statistics, after laparotomy, postoperative hernias appear in 5-14% of patients. Due to the increase in the volume and number of surgical interventions in the abdominal cavity, the increase in the number of reoperations, especially among older people, the frequency of postoperative ventral hernias is increasing from year to year.

Closing defects of the anterior abdominal wall with local tissue using traditional methods does not always give favorable results. Especially when large defects of the anterior abdominal wall are eliminated by local tissues and, with tension , an intra-abdominal defect develops comportamental syndrome . After such operations, about 30-60% of cases experience recurrent hernias.

Everyone knows that in recent years, endoprostheses have been used to eliminate large hernia defects of the anterior abdominal wall. by the tension method. After these surgical treatments, the relapse rate decreased by 6-10%.

Purpose of the study. Introduction of more effective methods of plastic surgery of the anterior abdominal wall during surgical treatment after surgical ventral hernias.

2. Materials and Methods

In the methodology of your article "'Problems of Treatment of Postoperative Ventral Hernia', the clinical evaluation and the surgical management of the postoperative ventral hernia are stressed by using a comparative approach to the different surgical techniques. To assess efficacy of multiple surgical methods, (a) tension and (b) tension-free hernioplasty, using "inlay" and "onlay" techniques, 25 men and 110 women were patients

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of a cohort of 135 patients. The study population was categorized based on age, gender and associated comorbidities, and exhibited obesity, cardiovascular diseases and diabetes as significant prevalence. Clinical, laboratory, and imaging techniques as well as special measures like spirometry and echocardiography were combined with comprehensive preoperative assessments in order to tailor surgical interventions. All of these postoperative outcomes were meticulously recorded and analyzed including complication rate, length of stay in the hospital, and hernia recurrence. Preventative strategies including preoperative adaptation measures and intraoperative precision techniques were combined to reduce complications of seroma formation, wound suppuration and intra abdominal hypertension. The results of the comparative analysis confirmed superiority of tension free "onlay" hernioplasty in reducing complications and recurrence rates and validated 'onlay' as a mode of choice. The demonstration of this robust methodological framework highlights the critical need for patient specific approaches in optimizing outcomes in hernia surgery.

3. Results

Table 1. Distribution of patients by gender and age

Gender and age	22-45		46-65		Over 66		Total	
Men	8	6.0 %	13	9.6 %	4	thirty %	2 5	1 8.5 %
Women	28	2 0.7 %	7 7	56.8%	5	3.7%	1 10	8 1.5 %
Total	36	2 6.6 %	90	60.6%	9	6.7 %	13 5	100%

From the data presented in the table it is clear that out of 13 5 patients, 2 5 were men and 1 10 women. From 22 to 45 years old there were 36 patients (26.6 %), 46-65 years old the number of patients was 90 (6.6 %) , patients aged 66 and older 9 (6.8%). Mostly women suffered from postoperative ventral hernias (1 10 (8 1.5 %). The data presented indicate that in women, primary diseases (cholelithiasis , umbilical hernia, gynecological diseases) are more often observed and are often subject to surgical intervention.

We use the classification that was adopted by the XXI International Congress of Herniologists in Madrid (ChevrelJ.P . , RathA.M .) and the SWR classification, adopted in 2006 at the V Conference of Surgeons “Current Issues of Herniologists ”, Moscow

In the proposed classifications, mainly 3 processes are considered necessary:

S - localization of hernia; average size of hernia (M), lateral (L) and mixed (LM)

W - width of the hernial orifice : W 1 to 5 cm, W 2 5-10 cm, W 3 11-15 cm, W 4 over 15 cm.

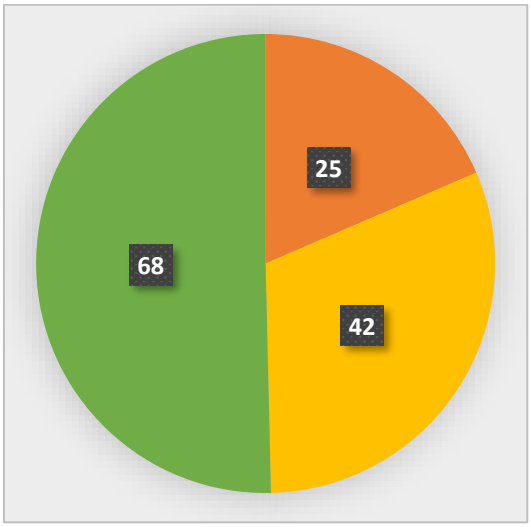
R - presence of relapse (R 0, R 1, R 2)

Table 2. Distribution of patients according to the width of the hernia orifice of postoperative ventral hernias

Hernial orifice width	Number of patients	%
W 1 to 5cm	9	6.5 %
W 2 6-10cm	24	17.7%
W 3 11-15cm	83	6 1.5 %
W 4 16cm and above	19	14.2%
Total	13 5	100%

93 patients (6 8.8 %) with postoperative ventral hernias were operated on for the first time, the remaining 42 (3 1.2 %) patients were operated on with recurrent hernias. These patients came to the clinic from different medical institutions.

Distribution of patients according to the formation of the period of postoperative ventral hernias



The diagram shows that hernias formed within a year after surgery in 25 (18.5%), from 1 to 3 years in 42 (31.2 %), and more than 4 years in 68 (50.3 %) patients .

When choosing a surgical method for treating patients with postoperative ventral hernias, concomitant diseases are of great importance. As shown in Table No. 3, out of 13 5 patients, 74 (5 4 , 8 %) had concomitant diseases. In the preoperative period, he conducted clinical studies and special preoperative preparations. Of the concomitant diseases, obesity was often determined in 31 (42%), diseases of the cardiovascular system in 16 (21.6%), diabetes mellitus in 10 (13.5%), gynecological diseases in 9 (12%), the remaining 8 (10.8%) patients had chronic diseases of the hepatobiliary zone and respiratory tract.

Table 3. Distribution of patients with postoperative ventral hernias according to concomitant pathologies

Accompanying illnesses	Identified	%
Angina pectoris, atherosclerotic cardiosclerosis, hypertension	16	21.7%
Obesity	31	41.8 %
Cholelithiasis , chronic calculous cholecystitis , chronic pancreatitis	6	8.1%
Chronic obstructive bronchitis	2	2.7%
Diabetes	10	13.7 %
Gynecological diseases (uterine fibroids, ovarian cyst)	9	12 %
Total comorbidities	74	5 4.8 %

of the anterior abdominal wall , hernial protrusions were found in 97 (71.8 %) patients. Severe pain in the area of postoperative scars was detected in 15 (11.1 %) patients. Recurrent abdominal pain and bloating in 31 (2-3 %). During the examination, 31 (23%) patients were found to be overweight (grades I and II), of which 2 4 had grades III and IV obesity.

All examined patients were divided into 3 groups. The first group included 13 (9.6%) patients who were operated on using the traditional method of tension hernioplasty using muscular aponeurotic duplication . In the second group, 21 (15.5%) patients underwent non -tension hernioplasty using allotransplantation using the " inlay " method. The third group included 101 patients (75%), they underwent plastic surgery of the anterior

abdominal wall using " onlay " allotransplantation protrusions in the supine and standing position, the size of the hernia defect of the anterior abdominal wall, the reduction of the hernial contents and the state of development of subcutaneous fatty tissue were determined in patients . All patients underwent traditional clinical, laboratory, and instrumental examination methods. The patients underwent endoscopy, irrigoscopy , computed tomography of the chest and abdomen.

The special research method included: determination of intra-abdominal pressure, spirometry, echocardiography, and, if necessary, MSCT.

In the clinic, for large and giant hernias in the preoperative period, there are opportunities for a more in-depth examination of the cardiovascular system and respiratory system.

In the preoperative period, we believe it is necessary to take the following measures:

1. In order to prevent the postoperative period from increasing intra-abdominal pressure (i.e., intra- abdominal compartment syndrome), it is necessary to thoroughly clean the gastrointestinal tract , completely prevent colic during bowel movements and urination, so that there is no excessive straining.
2. Perform certain training to adapt the increase in intra-abdominal pressure, cardiovascular system, and respiratory system. Breathing exercises and application of an elastic bandage to the abdomen are required. Such activities are repeated throughout the day , for 10-12 days, and the effectiveness of these activities is re-determined.
3. Correction of all concomitant diseases (diabetes mellitus, hypertension, condition of the cardiovascular system, etc.)
4. Prevention of suppuration of postoperative wounds. The skin of the surgical field is treated with antiseptic solutions, and the chambers are quartzed .

Comprehensive prevention of postoperative complications is carried out at all stages of treatment and examination. At the hospital stage, it is necessary to take adaptation measures against increased intra-abdominal pressure, correct concomitant diseases, normalize body weight, strict diet, and prepare the intestines for surgery.

At the surgical stage, in order to prevent injury to soft tissues, hernioplasty is performed using a precision method. During the operation, preventive measures are taken for the cardiovascular , respiratory system, intestinal paresis, thromboembolic complications, wound suppuration, bleeding from the gastrointestinal tract.

Depending on the condition of the patients and for a small defect of up to 4 centimeters , the edges of the aponeurosis were sutured and laid on top with an allograft using the " onlay " method.

14 patients were operated on in this manner. The remaining 87 patients underwent non-tension (attension) hernioplasty . When suturing For the allograft, it is advisable to place sutures at least 2 cm further from the edge of the aponeurosis.

It is necessary to place a drainage tube into the subcutaneous tissue and organize aspiration of fluids. The postoperative wound is sutured with interrupted sutures, preferably with an intradermal suture in women , so that there is no rough postoperative scar.

The results of the effectiveness of hernioplasty for patients with postoperative ventral hernias, depending on the method of hernioplasty , are studied according to the following criteria: the frequency of postoperative complications, the average bed-days of hospital stay of patients and relapses after surgery.

Postoperative relapses were studied by filling out special questionnaires.

Table 4. Comparative study of postoperative complications

No .	**Types of complications**	**Control group**	**Comparison group**	**Comparison group**	
		Plastic surgery of the anterior	**Alloplastic "Inlay"**	**Alloplastic " onlay "**	**Total n-135**

		abdominal wall using local tissues n-13	n -21	n- 10 1	
1.	**Post-operation seroma**	2	1	2	5
2.	**Post-operational infiltration**	1	-	1	2
3.	**Postoperative suppuration - tion wound**	2	1	2	5
4.	**Intra-abdominal - nal hypertension syndrome**	2	-	-	2(1
	Total	**7**	**2**		**14**

The appearance of seroma and wound suppuration after hernioplasty are the most common complications. In our observations, after " inlay " surgery it was canceled in 2 patients, and " onlay " in 4 patients, after plastic surgery with local tissues in 4 patients. We believe that with the " onlay " method, soft tissues are less injured and wounds become less suppurated.

Intra-abdominal hypertension syndrome is more often observed with tension musculoaponeurotic plasty with the formation of duplication.

Table 5. Comparative analysis of the effectiveness of treatment of the examined patients

	Signposts	**Control group n-13**		**Comparison group**			
				Alloplasty "inlay" n-21		**Alloplasty " onlay " 101**	
		Qty	**%**	**Qty**	**%**	**Qty**	**%**
1.	**Average bed days after surgery**	7.4	3.2%	5.2	2.6%	5.2	3.2%
2.	**Postoperative complications**	75	3.8%	2	9.5%	5	4.9%
3.	**Hernia recurrence**	4	33.3%	2	0.5%	5	17.3%

Thus, a comparative analysis revealed , depending on the state of concomitant diseases of postoperative ventral hernias, atension allotransplantation using the " onlay " method is considered more effective.

4. Discussion

The results of this study demonstrate notable trends in the demographics and characteristics of patients with postoperative ventral hernias. Women represented a majority of the cases (81.5%), with most patients aged between 46–65 years (60.6%). A significant portion of patients presented hernias within the first three years post-surgery (49.7%). The findings suggest that women, due to primary conditions like cholelithiasis and gynecological diseases, are more susceptible to surgical interventions leading to hernias. Additionally, obesity and cardiovascular diseases were the most prevalent

comorbidities, observed in 41.8% and 21.7% of patients, respectively, emphasizing the importance of addressing these factors preoperatively.

The study also highlights the efficacy of different surgical methods in treating postoperative ventral hernias. Among the techniques evaluated, the “onlay” method of hernioplasty proved advantageous due to its lower rates of postoperative complications and recurrences compared to the “inlay” method and tension hernioplasty. Notably, the incidence of intra-abdominal hypertension and wound suppuration was reduced with non-tension approaches, suggesting that minimizing soft tissue trauma is critical. These findings align with previous recommendations for using non-tension techniques for large hernial orifices, ensuring a balance between structural integrity and patient recovery.

The comparative analysis of postoperative outcomes underscores the need for comprehensive preoperative and intraoperative care. Patients with concomitant diseases benefit from tailored preoperative preparation, including management of obesity and respiratory exercises to mitigate intra-abdominal pressure. Post-surgical complications such as seroma, infiltration, and hernia recurrence were notably less frequent with the “onlay” method, which also showed reduced hospital stay durations. Therefore, optimizing surgical techniques and addressing comorbidities are crucial in improving treatment outcomes and reducing recurrence rates in patients with postoperative ventral hernias.

5. Conclusion

These findings highlight the increasing problem of postoperative ventral hernias including high prevalence in women and older people, together with high co morbidity rates of obesity, cardiovascular diseases, and diabetes. Comparative analysis showed tension free "onlay" hernioplasty had superior outcomes than other methods, with lower rates of postoperative complications, lower stays in the hospital and lower rates of recurrence. These findings underscore the fundamental relevance of personalized surgical planning and a thorough preoperative preparation to maximize patient outcomes. This study has implications for developing standardized protocols of post operative ventral hernia management and minimally invasive and tension free techniques. Future needs in hernioplasty research should include long-term outcomes of these surgical interventions, the role of advanced biomaterials in hernioplasty & the role of tailored rehabilitation programs to improve postoperative recovery & quality of life for patients.

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