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EFFICIENCY ASSESSMENT OF LAPAROSCOPIC VS OPEN ALLOPLASTY FOR INCISIONAL VENTRAL HERNIAS

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Abstract

Materials and methods. During the period from 2009 to 2020 in the clinic of the Department of Surgery and Proctology of the Shupyk National Healthcare University of Ukraine, the surgical treatment of 217 patients with IVH was analysed.

The choice of laparoscopic hernioplasty or open allohernioplasty was made taking into account the size of the abdominal wall defect and the width of the rectus diastasis. By intraoperatively conducting a study during a surgery for IVH with an abdominal rectus diastasis involving approximation of the rectus muscles and measurement of IAP, it was

found that with an abdominal rectus diastasis measuring up to 5 cm IAP increases to 5.6 ± 1.3 mm Hg and the abdominal wall defect is closed without an undue tension of the supporting tissues.

Depending on the method of surgical treatment, patients were divided into 2 groups.

In group I, 109 (21.5%) patients with small and medium-sized IVH with a diastasis of up to 5 cm underwent laparoscopic allohernioplasty, in particular, 63 patients underwent laparoscopic preperitoneal alloplasty and 46 underwent laparoscopic retromuscular alloplasty.

Conclusions. For small and medium-sized IVH with an abdominal rectus diastasis of up to 5 cm, laparoscopic allohernioplasty with preperitoneal and retromuscular placement of the mesh implant and elimination of the diastasis is optimal. In comparison with open retromuscular allohernioplasty, it contributes to a significant reduction in the incidence of seroma (from 35.2% to 3.7%), postoperative wound suppuration (from 6.5% to 0%), inflammatory infiltrate (from 4.6% to 0%), chronic postoperative pain (from 6.4% to 2.6%), and recurrence of hernia (from 6.4% to 0%).

Key words: incisional ventral hernia; laparoscopic allohernioplasty, method of allohernioplasty; intra-abdominal hernioplasty.

Despite the introduction of modern laparoscopic and advanced innovative open alloplastic operations, surgical treatment of patients with incisional ventral hernias (IVH) is still rather challenging. The incidence of local wound care complications such as seroma is 30.8-60.4%, that of postoperative wound suppuration amounts to 1.5-4.8%, enterocutaneous fistula to 3%, chronic postoperative pain to 4.5-6%, and the recurrence of IVH is 10 to 25% [1, 2, 3]. One of the reasons for the unsatisfactory results of surgical IVH treatment is the inadequate choice of method – either laparoscopic hernioplasty or open allohernioplasty. In this regard, by choosing the method of allohernioplasty depending on the size of the hernia and abdominal rectus diastasis we can improve the results of treatment.

The aim of the work is to increase the effectiveness of surgical treatment of incisional ventral hernias (IVH) by optimizing the choice of laparoscopic hernioplasty and open allohernioplasty.

Materials and methods. During the period from 2009 to 2020 in the clinic of the Department of Surgery and Proctology of the Shupyk National Healthcare University of Ukraine, the surgical treatment of 217 patients with IVH was analysed. The patients' age ranged from 30 to 75 years (mean age is 54.7 ± 3.3). The study included 145 women (66.8%)

and 72 men (33.2%), without any significant difference by individual age groups ($\chi^2=0.3$; $\pi=0.84$).

According to the EHS classification (Ghent, Belgium, 2008) [8], all 217 IVH MW₁₋₂R₀. Diastasis of the rectus abdominis muscles was up to 5 cm.

Concomitant diseases included: coronary heart disease, stage 1-3 hypertension was found in 88 (40.6%), varicose leg veins in 31 (14.3%), chronic bronchitis in 20 (9.2%), diabetes in 8 (3.7%), and class II and III obesity in 119 (54.8%).

The choice of laparoscopic hernioplasty or open allohernioplasty was made taking into account the size of the abdominal wall defect and the width of the rectus diastasis. By intraoperatively conducting a study [7] during a surgery for IVH with an abdominal rectus diastasis involving approximation of the rectus muscles and measurement of IAP, it was found that with an abdominal rectus diastasis measuring up to 5 cm IAP increases to 5.6 ± 1.3 mm Hg and the abdominal wall defect is closed without an undue tension of the supporting tissues.

Depending on the method of surgical treatment, patients were divided into 2 groups.

In group I, 109 (21.5%) patients with small and medium-sized IVH with a diastasis of up to 5 cm underwent laparoscopic allohernioplasty [9], in particular, 63 patients underwent laparoscopic preperitoneal alloplasty (Ukrainian patent for utility model No. 142342 as of 25.05.2020) [10] and 46 underwent laparoscopic retromuscular alloplasty [11].

Comparison group II included 108 (15.1%) patients who underwent open retromuscular allohernioplasty [1].

Laparoscopic preperitoneal alloplasty essentially involved trocar insertion in the anterolateral wall of the decollement, followed by making an incision in the parietal peritoneum 5 cm from the edge of the defect and mobilizing it around the perimeter of the defect from the posterior aponeurotic walls of the abdomen. The edges of the defect were sutured with transfascial sutures. A lightweight polypropylene mesh of the appropriate size was placed on the preperitoneal surface and fixed with a ProTack herniostapler.

The efficiency of the chosen method of laparoscopic hernioplasty and open allohernioplasty was evaluated by taking into account the frequency of local postoperative complications (seroma, postoperative wound infection, inflammatory infiltrate in the abdominal wall, chronic postoperative pain and recurrence).

Results and Discussion

Immediate and long-term results of the comparison of the surgical treatment of IVH in patients of group I and group II are presented in Table.1.

Table 1

Immediate and long-term results of surgical treatment of small- and medium-sized incisional ventral hernias with an abdominal rectus diastasis of up to 5 cm.

Groups	Complications										
	Immediate						Long-term				
	Seroma		Suppuration		Inflammatory infiltrate		Groups	Chronic postoperative pain		Recurrence	
I (n = 109)	Abs.	%	Abs.	%	Abs.	%	I (n = 78)	Abs.	%	Abs.	%
	4	3.7	0	0	0	0		2	2.6	0	0
II (n = 108)	38	35.2	7	6.5	5	4.6	II (n = 78)	5	6.4	5	6.4

As can be seen from the results, laparoscopic preperitoneal and retromuscular alloplasty of IVH with transfascial sutures in group I patients has significant advantages.

Reduction of seroma incidence from 35.2% to 3.7%, decrease of suppuration from 6.5% to 0% and of inflammatory infiltrates from 4.6% to 0% when using laparoscopic preperitoneal and retromuscular allohernioplasty is achieved by reducing the area of dissection and reducing damage to blood and lymphatic vessels in comparison with the technique of open retromuscular allohernioplasty.

Long-term results were studied for 1-36 months by conducting subsequent examinations and surveying 78 patients of group I and 78 patients of comparison group II. Chronic abdominal pain within 6-8 months after the surgery was found in 5 (6.4%) patients of comparison group II and in 2 (2.6%) of group I patients and was eliminated by prescribing physiotherapy procedures and nonsteroidal anti-inflammatory drugs. Cases of hernia recurrence were detected in 5 (6.4%) patients of comparison group II, whereas in group I no cases of hernia recurrence were detected.

Given the results of surgical treatment of small and medium-sized IVH with an abdominal rectus diastasis of up to 5 cm using laparoscopic preperitoneal and retromuscular alloplasty with transfascial suturing of the edges of the defect (group I patients) and open retromuscular allohernioplasty (comparison group II), it can be argued that both immediate and long-term results were significantly better in group I patients. 9.5 decrease of seroma

formation, 6.5 reduction of postoperative wound suppuration, and 4.6 decrease of chronic infiltrates in patients of group I compared with group II is due to minimizing the area of dissection of abdominal wall tissues, much lesser subcutaneous tissue mobilization from aponeurosis, less damage to blood and lymphatic vessels. This reduces the likelihood of mesh-related tissue infection.

Long-term results of surgical treatment of small and medium-sized IVH with an abdominal rectus diastasis of up to 5 cm also attest to the superiority of laparoscopic preperitoneal and retromuscular allohernioplasty with transfascial suturing of the defect edges in comparison with open retromuscular alloplasty, as the likelihood of wound-care complications, mesh migration and, hence, recurrence of IVH is significantly lower.

Conclusions

For small and medium-sized IVH with an abdominal rectus diastasis of up to 5 cm, laparoscopic allohernioplasty with preperitoneal and retromuscular placement of the mesh implant and elimination of the diastasis is optimal. In comparison with open retromuscular allohernioplasty, it contributes to a significant reduction in the incidence of seroma (from 35.2% to 3.7%), postoperative wound suppuration (from 6.5% to 0%), inflammatory infiltrate (from 4.6% to 0%), chronic postoperative pain (from 6.4% to 2.6%), and recurrence of hernia (from 6.4% to 0%).

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Declarations.

Conflict of interest None.

Ethical approval Not applicable.

Human and animal rights Not applicable.

Informed consent Not applicable.