TREATMENT OF POSTOPERATIVE VENTRAL HERNIAS IN ELDERLY PATIENTS

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ABSTRACT — Postoperative ventral hernias in most cases occur in elderly patients who have previously undergone surgery. Treatment of that category of patients is complicated by the presence of comorbidities such as ischemic heart disease. The age-related involution of collagen formation and connective tissue dysplasia leads not only to atrophy of the musculoaponeurotic layer of the anterior abdominal wall but also to dysplasia of the striated cardiac tissue which aggravates the course of coronary heart disease forming additional anomalies of the heart. Therefore, such category of patients are in the high anesthetic risk and require thorough preoperative and postoperative means.

KEYWORDS — postoperative ventral hernia, coronary heart disease, connective tissue dysplasia.

Recently, there has been a worldwide trend of growing scientific interest in patients of older age groups [12] which not surprising because life expectancy has increased significantly in the last decade. According to Rosstat the percentage of elderly people is steadily increasing. The average age of Russian population was 72.1 years in 2016, and in the first half of 2017 it grew up to 72.5 years which also leads to a quantitative increase of surgical operations performed on patients of elderly and senile age groups. According to World Health Organization (WHO) classification of older people are considered to be aged from 60 to 74 years old, the old age is the period from 75 to 89 years, over 90 years old are long-lived. In this regard, postoperative ventral hernias (POVH) in patients over 60 years are becoming increasingly important. However, this category of patients is difficult due to the involutional changes in the functioning of systems and organs, a large number of concomitant chronic pathologies, and the presence of several diseases causes the development of the syndrome of mutual aggravation. All this affects the quality of life of patients, and this is especially important in the postoperative recovery period. Therefore, individual assessment of the state of health should be carried out as well as social adaptation and the indicators of quality of life should be measured during the rehabilitation period [2, 5].

Although age is not a contraindication to surgery decrease in the adaptive capacity of the body increases the risk of both early complications in the postoperative period and the risk of anesthesia requiring more careful preparation and long-term care after and lots of surgeons refuse to operate such patients. [7]. Age features in the form of a violation of the morphogenesis of the connective tissue form additional minor anomalies of the heart.

The valvular prolapses and additional chords are attributed to the small anomalies of the heart; they disrupt the rhythm of the heart. This is especially important to take into account in patients with ischemic disease, since the risk of hemodynamic disturbances is high and, as a result, the risk of sudden death increases [6, 11]. There is also an acute issue in the choice of anesthesia, as even a brief anesthesia enhances mental disorders that are not taken into account by anesthesiologists. And for large and giant ventral hernias, considerable time is required for the operation [10].

The formation of hernias of the anterior abdominal wall and recurrences is determined by a multifactorial mechanism. The factors contributing to the formation of hernias include the healing of postoperative wounds through suppuration, ascites, obesity and smoking. And in the study of Klinka and Junge [13]. It was proved that the formation of hernias is associated with the pathology of collagen synthesis. It was also noted that most often hernias occur in patients with dysplastic disorders in the connective tissue (hemorrhoids, varicose veins, perineal tears, congenital dislocation of the thigh, aortic aneurysm, mitral valve prolapse, pneumosclerosis, bladder or small bowel diverticulosis, kidney cysts, Ehlers–Danlos syndrome) [13, 14].

The main component of connective tissue is collagen. Aging is a slowdown and a violation of its synthesis. At the beginning of the 20th century the well-known physiologist A.A. Bogomolets said that connective tissue has its own age. It is known that a change in the metabolism of the connective tissue leads to the formation of collagen fibers with a

predominance of type III collagen. Collagen type III reduces the possible stretching force, due to the chaotic arrangement of the fibers. Normally, this type of collagen is contained in the first days of wound regeneration, and then type I collagen predominates, which is stronger and more dense in structure and forms dense scar tissue.

However, it is also noted that such replacement takes place not only during the formation of a connective tissue scar, but also in the dead liver tissue cells, artery walls, ligaments and muscles during aging of the body, by reducing the enzymes necessary for structuring [1, 3, 8]. Therefore, even with hernias of small size (up to 5 cm) in patients of elderly and senile age there is a high risk of recurrence.

As a preventive measure of relapse, it is necessary to use an implant with stacking on no less than 5 cm wider than the edges of the hernia gate, to use the elastic properties of the implant and better sprouting of the connective tissue in the first stages of scar formation. At the same time, modern requirements for implants are a decrease in the volume of a foreign body in the tissues over time [9, 15].

Dysplasia of the connective tissue is polysystemic lesion in the human body. If there is at least one concomitant disease that develops as a result of dysplasia, patients have a high chance of recurrence of the hernia in the future [4].

The aim of our study was to analyze the risks of recurrence of postoperative ventral hernias, taking into account the age-related anatomy and associated diseases in elderly and senile patients. Taking into account the risks, develop the optimal method of hernioplasty in this category of patients.

MATERIALS AND METHODS

The study included 34 patients of elderly and senile age with comorbid diseases, of varying degrees of manifestation, operated on for the administration of POVH of various sizes. Patients were distributed by gender and age, 21 women (61.8%, Table 1). All patients were divided into 2 groups: 1st group included patients operated on with a modified mesh implant, 2d group patients were operated on with a standard-shaped mesh implant.

In both groups we used implant (Progrip™ from Covidien, France) that does not require additional fixation to the tissues. This type of implant is fixed to the tissues using micro-hooks of polylactic acid, which are resolved within 15 months after the operation. During this period of time the mesh implant reliably grows into tissues and provides protection against relapse.

All patients were operated on in a planned manner, the presence of concomitant diseases in the compensation stage was a prerequisite. This category of patients was carefully examined in the preoperative period. All patients underwent standard preoperative examination as a preparation for surgery: EKG (22), ultrasound examination of vessels (17) and abdominal organs (20), computer tomography of abdominal organs (8) and chest (1), abdominal radiography (5), spirometry (4), esophagogastroduodenoscopy (4).

Concomitant diseases that were caused by connective tissue dysplasia were the following: arrhythmias caused by small heart defects, lower limb varicose veins, pneumosclerosis, chronic obstructive pulmonary disease (COPD), and kidney cysts. (Table 2).

Two patients from the second group with a standard implant had a recurrent postoperative ventral hernia. One of the patients had a history of pneumosclerosis, another according to EKG had mitral valve prolapse related to minor heart defects. In both cases there were diseases associated with disorders of collagen metabolism. Most likely the hernia recurrence in the late postoperative period was associated with implant placement and dysplasia of the connective tissue served as a complicating factor.

Two patients felt foreign body sensation that can be due due to the increase in body mass index and the increase of intra-abdominal pressure in the postoperative period.

DISCUSSION AND CONCLUSIONS

Thus, this implant meets all the requirements that apply to modern types of implant:

1. Lightweight material is used which is partially absorbed over time.
2. Less allergenic than other implants.
3. The seamless technique of implanting the endoprosthesis excludes additional trauma to the tissues including the nerves which most often causes discomfort and foreign body sensation in patients in the postoperative period.
4. The use of this implant reduces the duration of the operation by an average of 15–20 minutes due to self-fixation to the tissues that is important aspect especially in elderly patients.

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Table 1. *Gender and age classification*

	1st group, modeled by Progrip™		2nd group, Progrip™		Total
	60 to 74 years old	Above 75 years old	60 to 74 years old	Above 75 years old	
Women	8	4	7	2	21 (61,8%)
Men	4	1	7	1	13 (38,2%)
Total	12	5	14	3	34 (100%)

Table 2. *Concomitant diseases*

Concomitant diseases	1st group	2d group	Total
Coronary heart disease	17	17	34
Hypertonic disease	15	15	30
Arrhythmias	10	12	22
Diabetes	1	3	4
Obesity	15	9	24
Lower limb varicose veins	9	8	17
Hypothyroidism	1	0	1
Pneumosclerosis	7	2	9
Cholelithiasis	1	0	1
Oncology	6	3	9
COPD	2	2	4
Kidney cysts	2	2	4
Peptic ulcer of a stomach / duodenum	0	4	4
Prostate hyperplasia	0	2	2
Pancreatitis	1	1	2

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