



Non-Tension Hernioplasty for Pinched Ventral Hernia

S.H. Zokhidova

Samarkand State Medical University

I.H. Khomidova

Samarkand State Medical University

ABSTRACT

The main causes of anterior abdominal wall suture inconsistency and hernia recurrence are excessive traumatization of the wound defect margins with their excessive forced rapprochement, insufficient adaptation of the tissues under stitching and increased intra-abdominal pressure that leads to high diaphragm position and decreased lung excursion, hypoventilation and hypoxia, which in its turn aggravates bowel paralysis and progressive increase of intra-abdominal pressure [1, 5].

Keywords:

anterior abdominal wall, pulmonary excursion, intra-abdominal pressure, postoperative ventral hernia

Introduction. The treatment of postoperative ventral hernias is caused by a large number of recurrences, which occur in 10-60% [10], and according to some authors, reach 85% [1]. The lethality after herniotomy for large and giant hernias varies from 12 to 21% [7]. In this connection, in recent years, the search for methods of hernia gate closure without tensioning own tissues, in which intra-abdominal pressure increase is excluded [2, 7]. Moreover, in case of extensive abdominal wall defects, dystrophic changes of muscular-aponeurotic layer, obesity, manual closure of wound margins is not only technically difficult, unreliable, but also fraught with complications. The most frequent is thread puncture, which causes the necessity of repeated tissue punctures with deep capture of large masses. Low efficiency of many methods of surgery in hernias (up to 65.3%) necessitates improvement of operative technique and finding new possibilities of abdominal wall defects closure by means of autoalloplastic materials [3].

Large size POVGs pose a serious problem when performing emergency abdominal surgeries. Traditional ways of suturing the abdominal wall lead to increased intra-abdominal pressure and

development of ACS (Abdominal Compartment Syndrome) in this connection. ACS has a negative impact on the work of organs and systems of the body: cardiac output is reduced, pulmonary ventilation is limited, kidney function and blood supply of internal organs is depressed. The presence of intra-abdominal hypertension has a negative impact on the postoperative period, leading primarily to respiratory disorders, prolonged bowel paresis, high risk of thromboembolic complications, and in the long term to hernia recurrence [10].

Objective: To study the results of abdominal wall plasty with polypropylene mesh in patients with pinched postoperative ventral hernia.

Methods: the results of treatment of 299 patients aged 28 to 79 years old operated on for postoperative hernioplasty of impinged ventral hernia using different methods of hernioplasty were analyzed. All patients depending on a hernioplasty method were divided into two groups representative for age, sex and concomitant diseases; in 189 patients of the main group alloplasty with the mesh polypropylene implant was performed, in 110 patients of the control group autoplasty was carried out. There were 240 women (80.26%)

and 59 men (19.75%). POVG formation was most often preceded by hepatopancreoduodenal and gynecological surgeries.

The data on the nature and size of POVG (classification of K.D. Toskin, V.V. Zhebrovsky) are presented in the table. Extensive and giant hernias, which usually cause considerable distress to the patients and are characterized by the multicompartiment hernial sac, were observed in 275 (91.97%) patients. Up to 6 hours after the impingement, 29 (15.35%) patients in the main group and 19 (17.28%) in the control group were admitted, up to 12 hours 70 (37.04%) and 35 (31.82%), 62 (32.81%) and 40 (36.37%) respectively, and after 24 hours 28 (14.82%) and 16 (14.55%). In recent years we have been using the classification of J.P.Chevrel, A.M.Rath (SWR-classification) [9], which was recognized at the 21st International Congress of Herniologists in Madrid (1999) as the most reasonable. According to this classification, postoperative hernias are classified according to three parameters of localization, herniotomy gate width, and presence of recurrence: by localization: medial (M), lateral (CL), combined (ML); by herniotomy gate width: W1 (to 5 cm), W2 (5-10 cm), W3 (10-15 cm), W4 (over 15 cm); by recurrence rate: R1, R2, R3, R4 and more. The hernia index was determined using the following formula: $Z = PG \times 100 PJ$, where: Z - hernia index, PG - hernia density, PJ - abdominal density.

Results and discussion. Ultrasound in the main group patients was performed in the area of the hernial bulge or the suspected hernial gates and in symmetrical areas of the abdominal wall. Abdominal wall thinning (muscular and aponeurotic tissues) was observed above the hernia gate. In 45 patients with loop impingement, sonograms showed altered abdominal wall, hernia sac (in the form of masses of different echocompaction). If there was gas in the intestine, in 36 patients the intestinal wall adjoining the hernia sac was visualized, behind it there was an "acoustic shadow" due to reflection of ultrasound waves at the Tissue-Gas border. If there was liquid content in the intestinal lumen (in 31), both

intestinal walls were determined. If transudate-"hernia water"-accumulated in the hernia sac (28), there was an echonegative band between the parietal peritoneum ("hernia sac") and the intestinal wall on the sonogram.

The condition of the impinged intestine on the echograms could be determined by the thickness and structural changes of the wall. In all patients the area of the defect in the aponeurosis exceeded 30 cm². Sharp thinning edges of the hernia gate and their heterogeneous structure were indicative of degenerative changes in the abdominal wall. During the operation, signs of acute intestinal obstruction were found in 45 (23,8%) patients; widespread peritonitis in 16 (8,5%) patients. The greater omentum was in herniotic sac in 42 (22,3%) patients, greater omentum and small intestine in 75 (39,7%), large intestine - in 12 (6,3%) patients. Necrotic omentum was resected in 38 (20,1%) patients, small intestine - in 15 (7,9%) patients. After that the condition of the hernia sac was visually assessed. All patients had serous inflammation phenomena: edema, infiltration of the walls, absence of pus and fibrin in the herniotic fluid. Therefore, endoprosthesis of the abdominal wall was considered to be possible, which was indicated due to the large size of the hernia and degenerative changes of the abdominal wall. Nadaponeurotic plasty (onlay technique) of the abdominal wall was performed in 152 (80,43%) patients with postoperative ventral and in 24 (12,7%) patients with inguinal hernias using polypropylene endoprosthesis, and in 13 (6,9%) patients with inguinal hernias - Lichtenstein herneoplasty.

To diagnose intra-abdominal hypertension and prevent ACS, we determined the pressure in the bladder lumen after its catheterization. In 39 (20.6%) out of 189 patients with POVH the intra-abdominal pressure exceeded 35 mm Hg. In this situation, surgical intervention without adequate preoperative preparation and the use of non-standard technical methods is often accompanied by the development of ACS. The most important point of preoperative preparation in this category of patients should be the identification of the main link of ACS intra-abdominal hypertension and assessment

of circulatory, respiratory, liver, kidney, etc. Starting from the second day the patients of the main group continued to receive laser therapy by one session for 5-7 days. Pulse repetition rate for Milta apparatus -5000 gi, Uzor 1500 gi, Impulse 100-500 Hz. The mode of action on the wound was remote. The head of the terminal was 1 cm from the irradiated surface (alloplasty zone). Laser exposure time and the number of exposure zones depended on the postoperative wound length from 120 to 240 seconds. Pulse power for the Impulse 100 device was set to 10 W. One of the objectives of our study was the development of optimal combinations of lasers. Carbon dioxide CO₂-laser was used intraoperatively, characterized by a high bactericidal and hemostatic effect due to the formation of a compact zone of coagulation necrosis and thrombi in the vessels due to intense vaporization. The study of the morphology of tissues included in the hernia zone as well as the evaluation of the effect of infrared laser radiation on the anterior wall in patients with impinged hernias by methods of light and electron microscopy showed that the types of laser effects of the Impulse 100 and the widely known Milta devices used by us have not the same effect on the tissues studied. Impulse 100 affects the epidermis to a greater extent, while Milta causes positive shifts mainly in the dermis, stimulating the function of fibroblasts, intensifying collagen formation. The effect of both apparatuses on muscle fascias is the same. It consists in stimulation of fibroblasts and strengthening of collagen formation, and in muscles - in thickening of myocytes and changes indicating intensification of specific functions of fibroblasts on muscle surface, i.e., participating in formation and functioning of muscle fascia. What both Impulse 100 and Milta have in common are marked changes in microvessels, indicating stimulation of microcirculation.

It is well known that a foreign body left in the wound, in this case a mesh endoprosthesis, itself increases the probability of infection development. Hernia impingement serves as an additional risk factor for this complication. Therefore, we developed a set of preventive measures:

- 1) before and during the operation, as well as in the postoperative period, all patients receive antibiotic prophylaxis - intravenous injection of 1-2 g of II-III generation cephalosporin;
- 2) the hernia sac is necessarily dissected as a source of possible infection of the wound;
- 3) to remove serous hemorrhagic exudate in ventral postoperative hernias a Redon drainage is set;
- 4) 5-7 sessions of laser therapy are carried out in the postoperative period.

The immediate and long-term results of treatment were studied in the patients of the main and control groups. There were no complications in the immediate postoperative period in the main group patients. In the control group 23 (20,91%) patients had complications related to the surgical wound (16 patients had seroma, 5 patients had wound suppuration, 2 patients had ligature fistulas). Removal of the mesh implant was not required in any case. There were no lethal outcomes in the main group, 5 (4.55%) patients died in the control group due to disseminated purulent peritonitis (3) and pulmonary embolism (2).

No recurrences of the disease were observed in the patients in the main group in the long term after surgery (1 to 3 years). In the control group recurrences of the disease occurred in 15 (13,64%) patients, 13 (86,67%) of them within the first year, in 2 (13,33%) - 3 years after operation. The duration of hospitalization in the main group patients was 10,5±1,5, in the control group - 18,8±1,0 bed days. Thus, untension hernioplasty at impinged hernia allows not only avoiding postoperative complications of the disease relapse, but also reducing the patients' hospitalization period, and decreasing postoperative mortality.

Literature

1. Belokonev V.I., Esmeikin I.M., Kovaleva Z.V. et al. Compartment Syndrome in a patient with giant postoperative ventral hernia and a way to eliminate it *Herniology* 2006; 2 (10): P 29-31
2. Belosludtsev D.N., Potapov N.V. Klimova O.Yu.
2. The use of carbon implants in the treatment of postoperative and

- recurrent hernias Modern approaches to the development and clinical application of effective dressings, suture materials polymeric implants Proceedings of the 4th International Conference M 2001, 299-300 11
3. Derugina M.S. Method of plasty of extensive defects of anterior abdominal wall. Surgery 2001, 3 52-54 4 Egiev V.N. Non-tension hernioplasty, Edited by V.N.Egiev M Medpraktika 2002; 148
 4. 4 Izmailov S.G., Lazarev V.M., Beschastanov V.V. et al. Treatment of postoperative ventral hernias by apparatus method under control of intra-abdominal pressure. Her-niology 2004; 4:36-40
 5. Sazhin V.P., Klimov D.E., Yurishev V.A. et al. Non-tensioned hernioplasty in large postoperative ventral hernias complicated by impingement and acute adhesive intestinal obstruction. Herniology (Hernias) 2006; 2 (10): 34-36.
 6. Toskin K.D., Zhebrovsky V.V. Hernias of the abdominal wall M Medicine 1990; 45-49 8. Bendavid R.H. The shouldice technigue a canon in hernia repair Canad J Surg 1997, 40(3): 199-205 9 Chevrel J.P., Rath A.M. Classification of incisional hernias of the abdominal wall Hernia 2000, 4(1): 1-7 10.
 7. Munegato G., Brandolese R. Respiratory physiopathology in surgical repair to large incisional hernias of the abdominal wall J Amer Call Surg 2001, 192 (3): 298-304