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MEDIAN ABDOMINAL HERNIA: ETIOLOGY, MODERN DIAGNOSIS AND TREATMENT

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Abstract: This article is devoted to one of the urgent problems of herniology - surgical treatment of the primary median anterior abdominal wall. An important step towards development was the introduction and use of modern plastic material (polypropylene meshes), which made it possible to expand the indications for surgical treatment in patients with large, giant hernias and comorbidities. The use of ultrasound, CT is one of the necessary auxiliary stages in the diagnosis of median abdominal hernias, rational management of the early and late postoperative period, which helps to prevent complications and reduce the number of relapses.

Keywords: Hernias of the abdominal wall, allomaterials, diagnosis, treatment.

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СРЕДИННАЯ ГРЫЖА ЖИВОТА: ЭТИОЛОГИЯ, СОВРЕМЕННЫХ ДИАГНОСТИКИ И ЛЕЧЕНИИ

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Abstract: Данная статья посвящена одной из актуальных проблем герниологии-оперативному лечению первичных срединных передней брюшной стенки. Важным шагом на пути развития явилось внедрение и использование современного пластического материала (полипропи¬леновые сетки), что позволило расширить показания для хирургиче¬ского лечения у пациентов с большими, гигантскими грыжами и со¬путствующей патологией. Использование УЗИ, РКТ является одним из необходимых вспомогательных этапов диагностики срединных грыж живота, рационального ведения раннего и позднего послеопе¬рационного периода, что способствует предупреждению осложне¬ний и уменьшению количества рецидивов.

Keywords: грыжа передней брюшной стенки, алломатериалы, диагностика, лечение.

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ҚОРИН ЎРТА ЧИЗИҚ ЧУРРАСИ: ЭТИОЛОГИЯСИ, ЗАМОНАВИЙ ДИАГНОСТИКАСИ ВА ДАВОЛАШ

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Abstract: Ушбу мақола герниологиянинг долзарб муаммоларидан бири - қорин олд деворининг бирламчи ўрта чизиқ чурраларини хирургик даволашга бағишланган. Ривожланиш йўлидаги муҳим қадам замонавий пластик материални (полипропилен тўрларни) жорий этиш ва қўллаш бўлди, бу эса йирик, гигант чурралари ва йўлдош касаллиги бўлган беморларни хирургик даволаш учун кўрсатмаларни кенгайтириш имконини берди. УТТ, КТдан фойдаланиш қорин олд деворининг бирламчи ўрта чизиқ чурраларини ташхислашда, эрта ва кечки операциядан кейинги даврни оқилона бошқаришда зарурий ёрдамчи босқичлардан бири бўлиб, бу асоратларнинг олдини олишга ва қайталанишлар сонини камайтиришга ёрдам беради.
Keywords: қорин олд девори чурраси, алломатериаллар, дианостика, даволаш
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Epidemiology and statistics. According to various sources, every 3-5 inhabitants of the earth is a potential hernia carrier [12,16]. Abdominal hernias are observed in 5-6% of the total population [6].

In 15-20% of cases, there are median abdominal hernias, which rank second after inguinal hernias in terms of the number of hernia repair [3]. The incidence of median hernias of the anterior abdominal wall tends to increase every year. The increase in the number of hernia carriers is also associated with the aging of the population suffering from multiple organ comorbidities and metabolic disorders that contribute to the formation of hernias [18].

Primary median hernias of the abdomen include umbilical, paraumbilical, hernias of the white line of the abdomen. Most often, median hernias are observed in patients from 30-40 years old. Among median abdominal hernias, umbilical hernias make up 70-80% of cases, and are more common in women over 30 years of age. According to B.A. Barkov (1965), diastasis of the rectus abdominis muscles is - observed in 77% of patients with median hernias, mainly in young people. The frequency of combination of umbilical hernias with diastasis of the rectus abdominis muscles is observed in 60% of cases, and with paraumbilical hernias in 23% of cases [9]. Hernias of the linea alba account for 3.5% of all external abdominal hernias, more often in men aged 25-45 years [15].

Operations for hernias account for almost 10–15% [15] of all surgical interventions. At the same time, in 10-17% of patients, surgery is performed on an emergency basis for infringement with a mortality rate of more than 3%. The share of early (less than a year) relapses of the disease in the surgical treatment of primary hernias of the anterior abdominal region accounts for 90% [15].

After autoplasty, relapses are observed in 10–30% of cases, and in case of their recurrence, in 44–69% of cases [22]. According to Timoshin et al . (2007) relapses in umbilical hernias in combination with diastasis of the rectus abdominis muscles are observed in 15-20% of cases with small sizes and in 30-40% with large ones. Relapses in hernias of the white line of the abdomen and para -umbilical hernias reach 20-40%.

Etiology and pathogenesis of formation of median hernias. Predisposing factors for

the formation of median hernias of the abdomen include such factors as hereditary predisposition , pregnancy, obesity or malnutrition, age, etc. Hereditary predisposition is detected in 20-25% of patients. According to various researchers, the anatomical and functional state of the anterior abdominal wall plays a significant role in the formation of median hernias, as the leading physiological mechanism in the regulation of intra-abdominal pressure [20].

Factors contributing to an increase in intra-abdominal pressure or its sharp fluctuations include: hard physical labor, difficult childbirth, difficulty urinating (prostate adenoma, phimosis, urethral strictures), prolonged cough (tuberculosis, chronic bronchitis), etc.

Congenital median hernias can form with underdevelopment of the abdominal wall in the prenatal period. It has been proven that a violation of the collagen synthesis process reduces the strength of aponeurotic tissues and can lead to the development of hernias. Importance in the pathogenesis of median abdominal hernias is given to the asynchronous occurrence of structural metabolic disorders of the aponeurosis in the form of defects in the sheaths of the rectus muscles and the white line of the abdomen. The complexity of pathogenesis in patients with giant, recurrent and repeatedly recurrent hernias is explained by the loss of full-fledged anatomical , morphological and functional properties of the anterior abdominal wall, as a result of the replacement of muscle tissue with coarse fibrous connective and adipose tissues.

Unlike a hernia of the white line of the abdomen, the condition of the rectus abdominis muscles plays the main role in the pathogenesis of diastasis of the rectus abdominis muscles. Structural and metabolic disorders occur in myocytes, which reduce functionality up to complete decompensation.

Thus, the decisive factor in the formation of median abdominal hernias are the anatomical and functional features of the muscular-aponeurotic structures of the anterior abdominal wall, associated with hereditary predisposition and low collagen content.

Classification and diagnosis of hernias. The most famous domestic classifications of hernias include the classification proposed by K.D. Toskin and V.V. Zhebrovsky (1983); classification of Voskresensky - Gorelik, which was modified by V.N.Yanov (1973).

In 1999, at the XXI International Congress of Herniologists in Madrid, a unified European classification according to the SWR system was adopted (to determine the location of the hernia, the width of the hernial orifice, and the presence of recurrence) [17, 20]. So S - indicates the localization of the hernia: median - M , lateral - L and combined - ML ; W - width of the hernia gate: W 1 - up to 5 cm, W 2 - 5-10 cm, W 3 - 10-15 cm, W 4 - over 15 cm; R - the presence of a

relapse; R 1, R 2, R 3 or more.

The modern European classification was adopted at the XXIX Congress of the European Association of Herniologists in Athens (2007) Muysoms F.E., Miserez M., Kingsnorth A.

According to it, the localization and size of the hernial protrusion were evaluated. The size of the hernia was distinguished by the width of the hernial protrusion as small, medium and large.

The most important issues in herniology are determining the size of the hernia and the degree of degenerative changes in the abdominal wall, leading to the development of complications. Clinical characteristics based on examination, palpation and measurement of the diameter of the external protrusion no longer meet the challenges of modern herniology.

Existing methods of radiation diagnostics provide valuable information about the parameters of the median hernia and the condition of the anterior abdominal wall. *Ultrasound examination* (ultrasound) is effective in determining the parameters of hernial protrusion in carriers of small and medium hernias. Difficulties arise in the study of patients with median hernias of large and giant sizes due to the limitation of the scanning area.

According to Kemezh Yu.V. [2,9] X-ray computed tomography in combination with hernioabdominometry makes it possible to study the state of the abdominal wall, the parameters of the hernial protrusion, and its contents. It is possible to quantitatively and qualitatively evaluate the parameters of muscular aponeurotic structures in the form of measuring the thickness of muscles and structural features (increase or decrease in the density of muscle tissue), to conduct a comparative characteristic of paired structures, etc.

The variety of shapes, sizes and localizations of median hernias of the anterior abdominal wall for many years forced surgeons to create, modify and put into practice an increasing number of different classifications.

Surgical treatment of median hernias. Currently , more than 30 methods and modifications of hernioplasty for primary median hernias are known, which are performed not only with the help of local tissues, but also with the use of plastic - material of various origins. However, there is no optimal approach in the treatment of patients with median hernias of the anterior abdominal wall [7,8,17].

Foreign and domestic surgeons describe in detail the types and methods of plasty with local tissues - aponeurotic, musculoaponeurotic and muscle plasty. The method of fascial-aponeurotic plastics was proposed in 1886 by Meidl. Its essence lies in the fact that with the help of this method the most accurate restoration of the anatomical relationships of the tissues of the abdominal wall is possible. Among the methods of muscular aponeurotic plastics, the methods according to Sapezhko

K.M., Mayo and Napalkov are most widely used.

The methods of muscle plastics include those methods in which the rectus muscles stand out from their sheaths and are sewn together with bare edges. These include: the Gersuny method (1893), Schaefter way (1896), Pozzi way (1980), etc. As autologous tissues, the wide fascia of the thigh is used (V.A. Opel, 1914), A.S. Pimenov , E.V. Burkova (1951), as a suture material, or as a patch in the formation of the anterior wall of the sheath of the rectus muscles. However, the use of autologous tissues for plasty of large musculoaponeurotic defects is associated with additional trauma and the inability to obtain a full-fledged material of large size. Transplantation of grafts on a pedicle, which ensures their good implantation, significantly lengthens the operation and does not exclude the possibility of the formation of new defects and other complications at the site of the tissues taken for patchwork. Autodermal plasty is not widely used in clinical practice, since the skin requires long preparation and processing, and according to E.P.Rudina, A.V.Bogdanova, P.V.Shevchenko (1991) in 27.2% of cases leads to relapse. Allogeneic tissues (alloplasty), borrowed from another person, more often from human corpses, xenogenic tissues (xenoplasty), taken from animals, are used in herniological practice to a limited extent. This is due to the fact that the implantation of allogeneic and, especially, xenogenic tissues is always accompanied by a reaction of transplantation immunity, leading to the death of these tissues. Therefore, this factor is the main barrier preventing the widespread use of foreign biological materials in clinical practice.

The most important stage in the development of surgery for hernias of the anterior abdominal wall is associated with the use of synthetic endoprostheses . The first description of this technique was given by Phelps in 1894, using silver wire rings for hernioplasty. Since the mid 1940s, synthetic materials (polyethylene) began to be used, and in the 1960s they were actively introduced into surgical - practice. Later, the passion for prosthetics was replaced by a period of restraint towards such interventions due to a large number of relapses and postoperative complications. [4,5,10,11]. Over the past 15-20 years, synthetic prostheses of a completely new generation have been created that do not cause rejection and other specific complications. One of the promising materials is *polyvinylidene fluoride* (PVDF), which is widely used for the manufacture of suture material and endoprostheses [14]. This polymer has a high biological inertness , strength, and resistance to infection. Endoprostheses made of PVDF are more elastic than those made of polypropylene. According to the biological inertness of PVDF, mesh endoprostheses are close to film-porous endoprostheses made of polytetrafluoroethylene, but they are significantly superior in resistance to infection and reliability of integration in tissues [19].

To date, several methods have been proposed for the location of the endoprosthesis in the surgical treatment of hernias in the anterior abdominal wall. According to the classification of V.N. Egieva (2002), distinguish:

-tension methods of plastics (without formation and with the formation of - duplication) ;

-tension-free plasty methods (laying the mesh over or under the aponeurosis without suturing it);

-combined methods (suturing the aponeurosis with the mesh above or below it);

-laparoscopic plasty methods (with a preperitoneal location of the endoprosthesis , with an intra-abdominal location of the endoprosthesis - a combination of laparoscopy with non-tension plasty).

The main disadvantage of this classification is the limitation in the use of plastics by other materials.

Despite the accumulated experience and improvement of surgical techniques, the recurrence rate in this disease reaches 40%. Patients with large and giant hernias represent a problematic category of patients for the surgeon and anesthesiologist. The introduction of plasty with synthetic endoprostheses made it possible to solve the problem of abdominal compartment syndrome, improve immediate and long-term results of treatment, as well as indicators of the quality of life of operated patients [13,17]. The main methods for closing an abdominal defect with a mesh are onlay, inlay, sublay [13,20].

Abdominal wall plasty technologies with endoprostheses : *"onlay", over the layer* - complete adaptation of the muscular-aponeurotic layers of the abdominal wall with strengthening of the plasty zone with a mesh explant located over the aponeurosis in the subcutaneous fat; "*inlay*" , *inside a layer*, *nesting* - technology of plasty, providing for the preservation of diastasis of the hernial orifice (according to the well-known terminology "non-tension plasty"). In this case, the mesh can be located on the aponeurosis, under the aponeurosis on the peritoneum or abdominal cavity, along the edge of the hernial ring between the liss hernial sac; *"sublay", under the layer* - a method of placing the implant in the depth of the muscular-aponeurotic layer, under the muscle (surmuscular) or subaponeurotic (on the peritoneum), with full adaptation of the edges of the hernial orifice; *"intraab dominal" - inside the abdominal cavity* , with complete adaptation of the hernial orifice or from their adaptation (*laparoscopic* technique) [8,13] .

Sublay technique can be performed in two versions - sublay preperitoneal (SPP) and sublay retromuscular (SRM). Many researchers put intraperitoneal plasty (IPOM) in the first place. online mesh). Leading clinics in Western Europe prefer the SRM technique. The method of retromuscular implantation is much more

complicated than IPOM. The choice of grid application method remains a matter of debate. The search for new materials for plastics continues. There are few experimental works in which the SRM method has been studied, their results are ambiguous [13,21]. It is not possible to clearly assess the advantages and disadvantages of retromuscular plasty, to determine the optimal type of endoprosthesis for this intervention.

Compared to traditional methods, laparoscopic *transabdominal preperitoneal hernioplasty* (TAPP) leads to a decrease in pain in the postoperative period, a reduction in the recovery time from several weeks to several days, and a decrease in the recurrence rate to 1-4%. Disadvantages of laparoscopy hernioplasty: high cost; complexity of technical implementation; possible serious complications such as damage to the bladder and intestines, bleeding, adhesive obstruction of the intestines, erosion of the mesh into the bladder and intestines [1,14].

Thus, a wide variety of methods for the surgical treatment of primary median hernias of the anterior abdominal wall indicates the lack of effectiveness of these methods, the dissatisfaction of surgeons with the immediate and long-term results of surgical treatment, and the importance of this problem.

Currently, in the surgical treatment of primary median hernias, it is necessary to adhere to an individual differentiated approach when choosing a method of anterior abdominal wall plasty. This approach should take into account the hernia etiopathogenesis, hernia parameters, the condition of the abdominal wall tissues, the age of the patient, the presence or absence of concomitant diseases.

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