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ANDROLOGY PROBLEMS OF HERNIOTOMY IN MEN AND THEIR PHYSIOTHERAPEUTIC REHABILITATION

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Summary. The work is devoted blood-groove research testis at patients with inquinal hernia before operative treatment, and its influence on function testis. It is established that irrespective of time of disease, localisation and type, inquinal hernia causes considerable decrease in a blood-groove in testis and is accompanied by a hypostasis of a fabric of elements funiculi spermatic. Reotesticulography and ultrasonic Doppler research are informative methods of inspection of blood circulation testis at patients inquinale hernias. For 7-8 days after operation, irrespective of a way of a plastic inquinale the channel of infringement of haemodynamics in testis remain and demand the correction directed on restoration of blood circulation. Use of the developed algorithm of improvement of blood circulation testis after operation hernioplastic with

appointment electrophoresis of lidase and laser irradiation allows to improve blood circulation in testis in 3 times, and to reduce a fabric hypostasis in 1,7 times.

Key words: hernia inquinale, herniaplastic, blood circulation testis.

Congenital and acquired defects of the inguinal scrotal area are accompanied by a circulatory disorder and a physiological development of the testicle. Studies have shown that one of the factors in inguinal scrotal hernia is the compression of the cord and pterygium-like plexus vessels due to intraintestinal and intra-abdominal pressure. The compression of the blood vessels and the pressure difference in the arteries and veins create conditions under which blood flow is maintained and outflow decreases, leading to blood stagnation, the development of edema and lymphostasis. It develops an oxygen hypoxia, which becomes chronic, the temperature in the scrotum rises. The latter influences the condition of the reproductive and endocrine functions of the testis negatively [1, p. 39; 2, p. 34; 6 p. 18]. Studies of blood circulation in the testicles during inguinal hernia in men do not adequately reflect the degree of disorder in the blood of the testes, depending on the age of the patients, the type of inguinal tears and the duration of the disease [1, p. 40; 2, p.35; 8 p. 59]. Particularly in the scientific literature, the issues of comparative evaluation of the effect on the testicular blood circulation on the most commonly used plastic in the surgical treatment of inguinal hernia as well as complex therapeutic measures in the postoperative period to restore blood supply to the testes by the operation are insufficiently covered. The latter is of fundamental importance in men of active reproductive age [3, p.14; 5, p. 37; 9, p.230; 10 p. 379]. A relatively high percentage of disorders of the reproductive and androgenetic functions of the sex glands not only cause a medical, but also a social problem, forcing a more comprehensive study of the etiology, pathogenesis, and search for new treatments and prevention of infertility [4, p , 82; 7 p. 10]. Of great importance are issues related to the fertility disorder in patients with inguinal hernia, the identification of mechanisms of negative changes that occur in the testes at various stages of the disease, and the treatment. One of these factors is impaired hemodynamics during the course of the disease and its adequate recovery after surgical treatment. Rotetestography and Doppler ultrasound are very informative

methods for studying the blood circulation of the testicles in patients with inguinal hernias. Carrying out these operations on the eve of the operation gives an overview of the intensity of the blood circulation in the body - both the main and the periphery - and especially the level of microcirculation. In addition, pathogenetically sound surgical procedures can be performed on inguinal hernias [8, p. 60]. Examination of the blood circulation of the testicles at various times during the postoperative period (especially on days 7-8) to determine the early postoperative complications of blood supply to the testes allows you to prescribe physiotherapeutic preventive measures to prevent circulatory disorders of these organs.

Objective: to improve the immediate and long-term outcome of operative treatment of patients with inguinal hernia based on a blood circulation study in the testes and to optimize therapy in the early postoperative period, which aims at a sufficient restoration of blood flow in the testes, as an effective factor for rehabilitation his function.

MATERIALS AND RESEARCH METHODS A complex clinical examination was performed in the dynamics of 229 patients of various ages with acquired unilateral hernia treated for this pathology in our clinic during 2012-2017. The age of respondents was between 18 and 81 years. In all patients, the volume of herniotomy and plasticity of the inguinal canal was mainly operated on a tension-free basis with alloplastic material. The examination was performed by means of rheotesculography (RTG) and Doppler ultrasound (USD): on the eve of the operation 7-8 days after the operation (at the time the patient was discharged from the hospital for outpatient treatment), after 1-2.5 months (after end of outpatient treatment) rehabilitation), 2 years after surgical inguinal hernioplasty. In order to optimize the testicular blood circulation after inguinal hernioplasty in the postoperative period, physiotherapy was prescribed and performed: electrophoresis of the lidase (EL) and low temperature laser irradiation (LTLI).

RESULTS OF RESEARCH AND ITS DISCUSSION A preliminary blood circulation study in patients with unilateral inguinal hernia showed that all men had a blood supply to the testes compared to normal subjects. According to the rheoteskulography, the testes blood filling index decreased from 0.26 ± 0.15 to 0.15 ±

0.09 ($p < 0.001$), the tissue resistance of the spermatic cord elements - from 210.6 ± 47.9 (ohms) to 167 4 ± 50.7 (ohms) ($p < 0.001$); According to ultrasound data: The resistance index (IR) increased from 0.72 ± 0.07 to 0.90 ± 0.07 ($p < 0.001$), the pulsation index (PI) dropped from 1.78 ± 0.06 to 1 50 ± 0 , 19 ($p < 0.001$), the maximum systolic velocity (Vmax sist) - from 25.1 ± 5.4 (cm / s) to 13.6 ± 4.2 (cm / s) ($p < 0.001$)) minimal diastolic velocity (Vmin diast) - from 2.6 ± 0.8 (cm / s) to 1.1 ± 0.5 (cm / s) ($p < 0.001$). Significant abnormalities of circulatory parameters in large oblique inguinal hernias: Reduction of the blood filling rate of the testis to 0.15 ± 0.12 ($p < 0.001$), basic tissue resistance of the elements of the spermatic cord to 163.2 ± 56.1 (ohms) <0.001), PI - to 1.68 ± 0.07 ($p < 0.001$), Vmax sist - to 16.0 ± 5.5 (cm / s) ($p < 0.001$), Vmin diast - to 1.1 ± 0.5 (cm / s) ($p < 0.001$), IR increase to 0.94 ± 0.04 ($p < 0.001$), and long-term inguinal hernia (IR = 0.332, $p < 0.05$). Similar fluctuations were noted in the early postoperative period (7-8 days after surgery). Thus, after postempski plastification of the inguinal canal, blood flow to the testis increases in comparison to the preoperative period: the blood filling of the testis decreases from 0.14 ± 0.06 to 0.11 ± 0.06 ($p < 0.001$), the base tissues Resistance of seed elements to the cord - from 167.4 ± 50.7 (ohms) to 145.6 ± 28.2 (ohms) ($p < 0.001$), the IR level increases from 0.91 ± 0.07 to 0 , 94 ± 0.03 ($p < 0.001$), PI decreases from 1.69 ± 0.24 to 1.55 ± 0.17 ($p < 0.001$), Vmax sist - from 17.1 ± 7.5 (cm / s) to 14.5 ± 3.9 (cm / s) ($p < 0.001$), Vmin diast - from 1.3 ± 0.7 (cm / s) to 1.2 ± 0.6 (cm / s) ($p < 0.001$); in contrast, after the Lichtenstein operation, the testes blood filling index increased from 0.12 ± 0.07 to 0.16 ± 0.06 ($p < 0.001$), the tissue resistance of the spermatic cord elements - from 147.7 ± 36.7 (ohms)) to 159.3 ± 26.1 (ohms) ($p < 0.001$), the IR level decreased from 0.91 ± 0.07 to 0.89 ± 0.07 ($p < 0.001$), the PI increased from 1.55 ± 0.17 to 1.58 ± 0.22 ($p < 0.001$), Vmax sist - from 14.5 ± 3.9 (cm / s) to 14.8 ± 4.1 (cm / s) ($p < 0.001$) Vmin diast - from 1.2 ± 0.6 (cm / s) to 1.4 ± 0.5 (cm / s) ($p < 0.001$). The incidence of ischemic orchitis after surgery with Postempski was 18.2 ± 5.2%, after surgery with Lichtenstein - 4.6 ± 2.2% ($\chi^2 = 5.55$, $p = 0.018$). Two years after the Postempski operation, the testicular blood filling index at spawning with the preoperative period dropped from 0.14 ± 0.06 to 0.10 ± 0.05 ($p < 0.001$), the basic tissue resistance of the spermatic cord elements - of 167. 4 ± 50.7 (Ω) to 126.5 ± 39.6

(Ω) ($p < 0.001$), the IR level increased from 0.91 ± 0.07 to 0.93 ± 0.06 ($p < 0.001$) , PI dropped from 1.69 ± 0.24 to 1.49 ± 0.24 ($p < 0.001$), Vmax sist - from 17.1 ± 7.5 (cm / s) to 13.1 ± 7.4 (cm) / s) ($p < 0.001$) remains at the same level Vmin diast - 1.3 ± 0.7 (cm / s) ($p < 0.001$). After the Lichtenstein operation during this time, the testes blood filling rate increased from 0.12 ± 0.07 to 0.17 ± 0.06 ($p < 0.001$) compared to the preoperative period, the basic tissue resistance of the spermatic cord elements - 147.7 ± 36.7 (ohms) to 169.5 ± 22.1 (ohms) ($p < 0.001$), the IR level drops from 0.91 ± 0.07 to 0.79 ± 0.4 ($p < 0.001$), PI increases from 1.55 ± 0.17 to 1.71 ± 0.17 ($p < 0.001$), Vmax sist - from 14.5 ± 3.9 (cm / s) to 20.0 ± 6.5 (cm) / s) ($p < 0.001$), Vmin diast - from 1.2 ± 0.6 (cm / s) to 1.8 ± 0.6 (cm / s) ($p < 0.001$). In the late postoperative period (2 years), the incidence of testicular atrophy after postempski surgery was 30.8 ± 9.1% and after surgery according to Lichtenstein 12.0 ± 6.5% ($p = 0.05$).

The results obtained required the use of measures to adequately restore the circulating blood of the testes on the side of the surgical procedure. Considering the unsatisfactory data on testicular blood supply in the early postoperative period after hernioplasty, physiotherapy was prescribed to restore the testicle circulation: lidar electrophoresis and low temperature laser irradiation (irradiated areas in the outer ring of the inguinal canal, postoperative wound and postoperative Scar). In order to prevent circulatory disturbances in the testicles and edema of the elements of the spermatic cord after inguinal hernioplasty operations, electrophoresis with Lidaza (64 units) in acidic humps of the scrotal skin in the epididymis area was performed by 10-15 procedures (duration of interventions is 15-20 minutes) used. In order to restore blood circulation in the testes in the postoperative period, NTLI was strictly perpendicular to the scrotum at 0.3-0.4 m for 10-15 sessions (duration of 1 to 5 min), the lower edge of the postoperative wound in the projection of the outer ring of the inguinal canal and prescribed postoperative scar. The results obtained were compared with the blood circulation indices of the testis of the control group - 50 persons and with the indices of patients with inguinal hernia who did not receive the indicated treatment - 30 patients.

A quantitative assessment of the rheological testimony indices suggests that the use of Lidaza electrophoresis improves blood flow in the testes and increases the tissue

swelling of the spermatic cord by 2.8-fold - by 65.6 ± 8.4% and by 1, 7 times - reduced 78.1 ± 7.5% of cases more frequently compared to patients who did not receive treatment ($p < 0.05$). The purpose of NTLO (according to the re-testing data) is to increase the blood flow to the testicle and to increase the swelling of the tissue of the elements of the spermatic cord 3.4 times - by 73.3 ± 8.1% and 1.8 times - to reduce 60.0 ± 8, 9% of cases more frequently compared to patients who did not receive treatment ($p < 0.05$). This is confirmed by the data from dynamic ultrasound research: According to Lidza's electrophoresis, the resistance index drops to 0.74 ± 0.02 ($p < 0.05$). As a result, the ripple index increases to 1.76 ± 0.09 ($p < 0.05$), Vmax sist. - up to 24.5 ± 6.6 cm / s ($p < 0.05$) i Vmin diast. - up to 2.4 ± 1.3 cm / s ($p < 0.05$) (a strong direct correlation was found: $\chi^2 = 60.00$, $p < 0.001$). This indicates an increase in testicular blood filling, improved blood flow and venous outflow. After NTLO, the ripple index level increases to 1.77 ± 0.14 due to a decrease in the resistance index to 0.73 ± 0.02 ($p < 0.05$); Vmax is sist. - up to 24.2 ± 4.2 cm / s and Vmin diast. - up to 2.4 ± 0.4 cm / s ($\chi^2 = 100.0$ $p < 0.001$), which also indicates an improvement in the blood supply to the testicle, an increase in the blood circulation and a venous outflow.

Improvement of the blood supply to the testicle following unrestrained hernioplasty surgery in patients who have undergone an EL or NTLO course is confirmed by ultrasound data. After EL, therefore, a decrease in IR is detected. Due to this, the PI level increased, Vmax sist. and Vmax diast. (a strong direct correlation was found: $\chi^2 = 60.00$, $p < 0.001$). This indicates an improvement in the blood supply to the testicle, increased blood flow and venous outflow. After NTLO, the level of due increases due to a decrease in the IR level, Vmax sist. and Vmax diast. (A strong direct relationship was found: $\chi^2 = 100.0$ $p < 0.001$), indicating improvement in testicular blood supply, increased blood circulation and venous drainage.

Based on the data obtained, an algorithm was developed to improve the blood supply to the testicle after operative treatment of inguinal hernia. The determination of circulating blood in the testicular parenchyma on the side of the disease by each proposed method provides information on the extent of its injury and also serves as the starting point for comparison with indicators in the postoperative period. The surgical

intervention method is chosen by the surgeon with preference to unrestrained hernia. Visual observation and additional determination of circulatory status in the testis parenchyma using rheography or ultrasound for 7-8 days gives rise to the extent of impairment due to ongoing edema in the surgical site. An additional appointment in the early postoperative period of EL and NTLI makes it possible to improve the blood supply of the testicle and to reduce the swelling of the tissue of the elements of the spermatic cord after inguinal hernioplasty.

CONCLUSIONS Regardless of the period of existence, localization and type, the inguinal hernia causes a significant decrease in the blood supply of the testis and is accompanied by a swelling of the tissue of the elements of the spermatic cord. 7-8 days after the operation, regardless of the sculptures of the inguinal canal, hemodynamic disorders continue in the testes and must be corrected to restore the blood supply. The developed algorithm for prescribing lidz electrophoresis treatment and cryogenic laser irradiation to improve the blood circulation in the testes in the early postoperative period makes it possible to improve the blood supply level in the testes, the swelling of the tissue of the elements of the spermatic cord after inguinal hernioplasty and the appearance of reduce ischemic orchitis. The positive results obtained create conditions for the further rehabilitation of the testicular function in the late postoperative period, which is of particular importance in the treatment of men of active reproductive age.

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ЕМПІРИЧНЕ ДОСЛІДЖЕННЯ ІНТЕЛЕКТУАЛЬНОГО КОМПОНЕНТУ ТА ОСОБЛИВОСТЕЙ САМОСПРИЙНЯТТЯ ОБДАРОВАНИХ УЧНІВ ЮНАЦЬКОГО ВІКУ

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