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TRAUMATIC SPLEEN INJURIES

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Introductions: Trauma is the effect on the body of any external agents that cause anatomical and functional disorders in organs, accompanied by its local and general response [1]. Traumatic spleen injury accounts for 3.2% of all types of traumatic injuries and accounts for 50.7% of blunt abdominal trauma cases. Such injuries can occur as a result of road traffic accidents (the most common cause), domestic injuries, and sports events. Penetrating injuries, such as gunshot or stab wounds, can also damage this vital organ [2]. The third mechanism, which is extremely relevant for Ukraine today, is explosive injury, namely, during hostilities. Therefore, it is important to understand the structure of this pathology and consider possible options for its surgical treatment.

Aim: To analyze the literature sources related to traumatic spleen injury in order to determine possible variants of the clinical course of this pathology, as well as to choose the priority method of surgical treatment.

Materials and methods: A systematic review of English-language literature databases was conducted on such platforms as: PubMed, Scopus, EMBASE and Medline, using the following keywords: "spleen injury", "closed abdominal injury", "splenectomy".

Results and discussion: In order to describe what determines the clinical manifestations and the time of their appearance in splenic trauma, it is necessary to consider the main classifications of this pathology, of which there are three. First: traumatic spleen injuries are divided into open and closed. The statistical difference between them is that open injuries are often combined with traumatic injuries of the

stomach, large intestine, pancreas, and kidney. Secondly, there is a distinction between one- and two-instantaneous splenic lacerations. In a one-instantaneous rupture, both the capsule and the spleen parenchyma are damaged at the same time. In case of a two-instant rupture, the spleen parenchyma is first damaged with the formation of a subcapsular hematoma, and then the capsule ruptures with bleeding into the free abdominal cavity.

Third: spleen ruptures can be single and multiple. Multiple injuries are observed more often in case of a single-instantaneous rupture, single injuries - in case of a two-instantaneous rupture. There are also two most typical variants of the phenomenon of two-stage splenic rupture: the first variant: Phase I - a small tear of the spleen capsule and parenchyma is covered by a blood clot, cap with the formation of a subcapsular large hematoma; Phase II - in a few hours (or days, weeks, months) spontaneously or as a result of even a slight strain (sneezing, coughing, laughing, defecation, turning in bed), and after a sudden increase in pressure in the abdominal cavity, the clot breaks off with abdominal bleeding.

The second option: Phase I - the parenchyma is injured deep in the organ with the formation of a central hematoma; Phase II - as in the first variant, after a while, with an increase in intra-abdominal pressure (due to any effect on the human body), a healthy layer of parenchyma with a capsule is torn, and intra-abdominal threatening bleeding occurs.

Possible types of blood loss in spleen injury: low blood loss (0.5-10 % of CBV): such a patient may have only slight weakness, consciousness is not disturbed, blood pressure is not reduced; medium blood loss (11-20 % of CBV): this variant is characterized by severe weakness, dizziness, nausea, dry mouth, sluggish reactions, pale skin, cold extremities, rapid breathing and pulse, blood pressure decreased by 10%; severe blood loss (21-40% of CBV): the victim develops unbearable thirst, nausea, vomiting, darkening of the eyes, yawning (a sign of oxygen deprivation), tachypnea, sharp pallor of the skin and mucous membranes, acrocyanosis, sharpened facial features, hand tremors, and systolic blood pressure drops to 100-90 mm Hg. massive blood loss (41-70% of the CBV): in this case, the victim will often be

unconscious, with dead pallor of the skin, cold sweat, Cheyne Stokes breathing, sometimes convulsions, sunken eyes, indifferent gaze, systolic blood pressure not > 60 mm Hg; and fatal bleeding (70% of the CBV): comatose or terminal condition, shallow, unnoticeable breathing, cold, marbled skin, convulsions, dilated pupils, no pulse, systolic blood pressure below 50 mm Hg, bradycardia. That is why, in case of suspected splenic injury, urgent hospitalization of the patient for further examination is indicated [2, 3].

The clinical picture of spleen injury depends on the severity of the injury, the presence of concomitant injuries, i.e., combined trauma, the severity of the victim's condition, the degree of organ damage, bleeding intensity, signs and extent of acute blood loss, and the time since the injury. If we talk about the patient's complaints, first of all, it will be acute pain in the left hypochondrium. When the blood spills and irritates the peritoneum of the left subdiaphragmatic space and the terminal branches of the diaphragmatic nerve, the pain area spreads with irradiation to the left supraclavicular region, scapula, shoulder - the patient cannot take a deep breath Eleker's symptom. In case of splenic rupture with bleeding, short-term fainting and loss of consciousness are characteristic. A little later, with the accumulation of blood in the pelvis, false urges to defecate appear. Next, we examine the injured person: a grimace of pain is on his face.

The face is often pale and covered with cold sweat. As the amount of blood loss increases, the pulse rate increases, blood pressure decreases, limbs become cold, and the rapid progression of these symptoms indicates signs of hemodynamic instability. A positive symptom is the Rozanov symptom - when you try to turn the injured person on their back, they immediately try to take the previous position (due to increased pain as the blood irritates the larger surface of the peritoneum). Patients often take a forced position in bed - lying on their left side with their legs pulled up to their stomach. Sometimes traces of trauma are visible - abrasions on the skin of the lower chest and/or left hypochondrium.

The anterior abdominal wall, mainly of the left half, is limited or not involved in the act of breathing. In percussion, we are interested in three main symptoms, such

as: in the left hypochondrium along the left lateral canal above the site of blood accumulation, the sound is muffled - de Kerwen's symptom. This is a late sign of intra-abdominal bleeding. According to various data, the minimum amount of blood that can be determined by percussion can be from 500 to 1000 ml. The size of the spleen is increased due to blood clots around it, and when the body position is changed, the zone of dull sound does not mix - Pitts-Bellens symptom. Within 1-2 hours after the trauma, the abdomen may be distended due to flatulence - the Heinecke-Lejar symptom.

During palpation, the following symptoms can be observed: positive Weinert's symptom (a very informative sign, especially in children) - a doctor tries to grasp the child lying down in the lumbar region with his fingers and carefully conducts a comparative palpation of the right and left hypochondrium with the first fingers: on the right, the doctor's fingers converge, while on the left, due to pain, stiffness, and often elastic swelling (blood clots around the spleen), it is impossible to do so. Positive abdominal symptom of Kuhlenkampff is a localized abdominal pain, but not tense, soft. When pressing on the lower part of the sternum, pain occurs along the left half of the rib arch - the Hedry symptom.

The injured also have mildly positive symptoms of peritoneal irritation: Mendel's, Rozdolsky's, and Shchotkin-Blumberg's. It is important to note that it is clinically very difficult to recognize a subcapsular or central splenic hematoma (corresponding to phase I of the rupture). In such victims, the main method of diagnosis is ultrasound examination (US) and dynamic observation. Spleen injury is manifested by clinical signs of internal bleeding when the capsule of the organ suddenly ruptures (phase II). Clinical signs of spleen injury are non-pathognomonic, they can be observed in case of bleeding into the abdominal cavity from other organs (liver) or rupture of blood vessels [4, 5].

When considering the issue of surgical treatment of this pathology, the literature distinguishes 4 main periods of this process. However, I believe that they can be divided into 2 main types of 2 periods, namely: splenectomy with subsequent autotransplantation of spleen tissue (type I) and organ-preserving surgery with

subsequent non-surgical treatment (type II). In my personal opinion, type II treatment is much more suitable for patients, as spleen preservation (not even the whole organ) has a number of advantages.

First, with the accumulation of experience in splenectomies, the results of treatment and spleen function began to be thoroughly studied. The long-term results of such interventions have shown that there are much more complications in the longer term than in the postoperative period. In the early period after splenectomy, patients already show signs of hyposplenism: coagulopathy, increased sensitivity to surgical infection with purulent and inflammatory complications. In the first 4 days, the number of T- and B-lymphocytes decreases, the level of immunoglobulins of classes M and G increases, and the concentration of CEC almost doubles. After splenectomy, at different times, almost one in five of the operated patients has some symptoms of post-splenectomy symptom complex as a result of immunological homeostasis disorders.

The risk of hypo- or asplenism is maximum in the first 2 years after splenectomy and persists throughout life, which is why most of the patients who had their spleens removed in childhood do not live more than 50 years. There is only one possible conclusion: splenectomy leads to a serious, life-threatening immunodeficiency. Manifestations of post-splenectomy syndrome are divided into early and late. Early manifestations are thrombotic complications: from minor microcirculatory disorders to large-vessel thromboembolism (hence, the risk of thrombotic complications increases after splenectomy: DVT, myocardial infarction). It is also a significant probability due to reduced protection against infectious diseases, especially in the first 2 years after surgery.

Late manifestations of the post-splenectomy syndrome include asthenic syndrome in the form of a clinical symptom complex: general weakness, dizziness, decreased vitality, performance, mental and emotional lability, sleep disturbance, appetite, and in children, reduced intellectual abilities.

Also, anti-infective and anti-tumor immunity is suppressed: after splenectomy, there is a pronounced tendency for recurrent infections, and there is a lifelong risk of

severe macroorganism infection. Post-splenectomy sepsis can occur in a few days, months, and even years. It can be concluded that in the surgery of a damaged spleen, removal of the entire organ is excessive radicalism, which even contradicts the humane principles of surgery.

However, in our time, most surgeons still resort to this method, for two main reasons: due to the imperfection of the technique of performing organ-preserving operations and the low level of theoretical training and insufficient qualifications of mainly emergency surgeons, underestimation and even ignoring the physiological role of the spleen as one of the most important organs of our body [6, 7].

Conclusions: Thus, traumatic spleen injury is an extremely urgent problem for Ukraine today as a type of war injury. The clinical picture of this pathology depends on the severity of the injury, the presence of concomitant injuries, the severity of the victim's condition, the degree of organ damage, bleeding intensity, signs and extent of acute blood loss, and the time since the injury, which should always be taken into account by surgeons. Of the two main types of treatment for spleen injuries, the best is to preserve this organ to avoid loss of its vital functions and improve the quality of life of operated patients.

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