



## LAPAROSCOPY IN DIAGNOSIS AND TREATMENT OF EMERGENCY DISEASES OF ABDOMINAL ORGANS.

(Literature review).

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**Abstract:** *As part of general scientific and technical progress, the constant introduction of new technologies makes them an integral part of a particular field of medicine. A modern trend in the development of surgery is to reduce the invasiveness and trauma of surgical interventions. In connection with the development of surgical technologies, one of the main tasks in surgery is to minimize surgical trauma and the subsequent reduction in the number of postoperative complications and mortality, as well as the duration of inpatient treatment of patients while maintaining the quality of surgical care. This goal in abdominal surgery can be achieved with the wide and widespread introduction of endoscopic technologies into everyday practice. Today, emergency surgery can no longer be imagined without laparoscopy. In many complex cases, laparoscopy remains indispensable, as it allows for a direct visual assessment of the pathological process, to identify its prevalence, to perform a targeted biopsy and to conduct instrumental palpation. Particular difficulties arise when abdominal symptoms are latent or the acute symptoms of the disease are sharply expressed in polarity.*

**Key words:** *Diagnostic laparoscopy; laparoscopic cholecystectomy*



In the development of medicine, there is an important tendency to reduce the trauma of various methods of diagnosis and treatment of many diseases. The requirements of today in surgery are not only the performance of high-tech operations, but also the achievement of a high level of rehabilitation after these interventions. Despite the availability of modern clinical and laboratory, radiological, CT, CT, MRI and ultrasound diagnostics, the issues of differential diagnosis of acute surgical diseases remain complex. This is obvious in the case of erased abdominal symptoms or a sharply expressed polarity of disease symptoms. Improvement in diagnosis and treatment has become possible due to the rapid development of laparoscopic technologies, which in the sixties of the twentieth century were strictly prohibited "in acute abdomen" [11, 26, 28, 29]. The widespread use of laparoscopy in the treatment of major urgent diseases of the abdominal organs allows for the correct diagnosis to be made in the shortest possible time and with a high degree of reliability, the treatment tactics to be outlined, the percentage of unjustified laparotomies to be reduced, and the possibility of postoperative wound complications and hernias to be excluded [27,49,56].

Currently, due to the development of surgical technologies, one of the main tasks in surgery is to minimize surgical trauma and the subsequent reduction in the number of postoperative complications and mortality, as well as the duration of inpatient treatment of patients while maintaining the quality of surgical care. This goal in abdominal surgery can be achieved with the widespread and widespread introduction of endoscopic technologies into everyday practice. The patient's desire to experience as little suffering as possible contributed to the development of minimally invasive methods, which include endovideosurgery [2]. Laparoscopy is currently the method of choice for the treatment of various surgical pathologies, as it promotes less trauma and shorter rehabilitation periods, and rapid restoration of working capacity. Improvement of laparoscopic technology contributes to the expansion of indications for choosing this particular surgical approach. Diagnostic laparoscopy is widely used for the differential diagnosis of acute surgical pathology [4,37,38, 45, 77]. Today, laparoscopic techniques



are used in acute appendicitis, perforated gastric and duodenal ulcers, acute cholecystitis, strangulated hernias of the anterior abdominal wall, acute pancreatitis, intestinal obstruction, acute gynecological diseases, as well as in victims with abdominal trauma [6,8,9,12,13,16,17,23,31,32, 41, 43]. Unlike laparoscopic cholecystectomy, appendectomy using laparoscopic techniques has not yet become the "gold standard" in the treatment of acute appendicitis. The main reason for this, apparently, is the continuing disagreement over many years in determining the indications and contraindications for this operation, as well as in views regarding all stages of laparoscopic appendectomy (LAE) [15,29,33,47]. In case of perforated duodenal ulcer, suturing is a frequently used operation. The operation itself is not pathogenetic in nature and often results in relapses. Achievements of modern pharmacotherapy of ulcer disease allow us to take a new look at this method of operation, especially in the laparoscopic version [34,50,54,61,69].

The use of the laparoscopic method in emergency abdominal surgery improves the quality of diagnosis and treatment, reduces the number of postoperative complications and mortality, and shortens the treatment period for patients. Despite a wide range of noninvasive research methods, the diagnosis of acute surgical diseases of the abdominal organs in some cases is very difficult [42,57,58,60]. In this situation, the use of laparoscopy allows for a timely diagnosis and determination of surgical tactics [62,64,67]. The particular value of the method lies in the possibility of transition from diagnostic manipulations to therapeutic ones. Performing surgical interventions from a laparoscopic approach allows for a number of important advantages compared to the traditional - laparotomic one. Among the most significant, it is necessary to note: low trauma, precision of isolation of anatomical structures, high-quality visual control of all stages of the operation, reduction of postoperative pain and intestinal paresis. In addition, it is important to reduce the number of postoperative wound complications and the incidence of peritoneal adhesive disease, reduce the length of hospital stay, and achieve a good cosmetic result [10,11,30,70,72,74].



Laparoscopic surgery originates from endoscopy, a method of examining the cavities of the human body, the founder of which is considered to be the Persian physician Avicenna (Ibn Sina). He created the first instruments for rectoscopy and examination of the uterine cavity [19]. In 1806, the Italian scientist PH. Bozzini first used an endoscope as a light source for examining the lumen of the rectum, uterine cavity and urinary bladder, in which a candle was used [20], and almost 50 years later in Paris A. Desormeaux presented his model of an endoscope, where the light source was a gas lamp, and the light was reflected using a silver mirror. Endoscopic lighting remained a significant problem until Thomas Edison invented the incandescent lamp in 1880. This discovery helped Max Nitze and Leiter improve the cystoscope and use a light bulb as a light source. Subsequently, Brenner designed a cystoscope with an additional channel through which it was possible to introduce fluid and even install a urethral catheter. And finally, in 1889, Boisseau de Rocher separated the optical part and the light source in the cystoscope. From this period, the active introduction and use of endoscopy as a diagnostic method began, and the foundations for the development of therapeutic endoscopy appeared [57]. In 1901, G. Kelling (Germany) in an experiment on dogs for the first time examined the abdominal cavity with a cystoscope, after preliminary insufflation of air. The founder of laparoscopic surgery in Russia is the Russian gynecologist from Petrograd, Professor Dmitry Oskarovich Ott, who performed the world's first ventroscopy in 1901. His students are G.N. Serezhnikov and V.P. Jacobson - in 1907 used ventroscopy to diagnose ectopic pregnancy and genital tuberculosis [58].

In 1910, the Swedish surgeon Hans Christian Jakobaeus began performing laparoscopy in humans to diagnose intra-abdominal syphilis, tuberculosis, liver cirrhosis, and malignant tumors. It was G. Jakobaeus who introduced the term "laparoscopy." The surgeon was the first to successfully dissect adhesions during thoracoscopy [7]. In 1920, the Chicago physician Oxdorff invented and introduced into practice a trocar for inserting laparoscopic instruments with an automatic valve



preventing gas loss. An important stage in the subsequent development of laparoscopic surgery was the invention in 1918 by the German surgeon O. Goetze of an automatic needle for performing pneumoperitoneum. In 1924, Richard Zollikofer from Switzerland proposed using carbon dioxide to create pneumoperitoneum, since it eliminates the possibility of intra-abdominal explosions, unlike nitrogen and air, and is quickly adsorbed by the peritoneum. A significant stage in the development of laparoscopy is associated with the discoveries and achievements of the German gastroenterologist Heinz Kalk, the founder of the German laparoscopic school. In 1928, Kalk developed a technique for laparoscopic puncture biopsy of the liver, and by 1929 he designed a laparoscope with a special lighting system and a viewing angle of 135°, a trocar with a working channel for the instrument. This invention accelerated the development of therapeutic laparoscopy [8]. In the period from 1923 to 1962, H. Kalk and his students developed and modified equipment and research methods, the principles of which are used today. The first laparoscopic manipulations were mostly performed without the preliminary creation of an “air cushion.” Therefore, damage to the intestines and large vessels was a major problem until the advent of the safety needle and syringe for gas delivery.

The beginning of therapeutic laparoscopy is associated with the name of C. Fervers, who in 1933 performed the dissection of adhesions using electrocoagulation; at that time, the electrosurgical knife and cauterizing instrument proposed in 1926 by the American doctor W. Bovi were already widely used. Dissection of adhesions in the abdominal cavity using a urethral cystoscope was first performed by C. Fervers in 1933. He described a rare complication - a gas explosion in the abdominal cavity at the time of cauterization of adhesions [10]. In 1936, the Swiss obstetrician-gynecologist P. E. Boesch performed the first laparoscopic sterilization of a woman in history. In 1938, the Hungarian surgeon Janos Veress created a version of the needle with a spring, which has survived to this day almost unchanged. The Veress needle was originally developed to create a pneumothorax. Later, it was also used for gas insufflation into the abdominal





cavity, which reduced the number of intestinal and large vessel injuries [9]. One of the key problems in the development of laparoscopy was the lack of reliable and effective methods for stopping bleeding. In 1941, F.H. Power and A.C. Barnes [11] introduced high-frequency electric current for hemostasis, and this was a powerful impetus to the development of operative laparoscopy, which was followed by the introduction of electrocoagulation technology: monopolar (Powers and Barnes, 1941) and bipolar (Rioux and Clouter, 1974) coagulation [11]. Important events in the history of laparoscopy were the use (H. Kalk, W.Y. Lee, Royer, F.J. Rosenbaum) of laparoscopic cholecystocholangiography and cholangiography [4, 11]. The puncture of the gallbladder through its wall in the area of the fundus was first proposed by W.Y. Lee in 1942. Subsequently, this method was used by many authors, but was accompanied by a significant number of complications due to bile leakage through the puncture hole. In 1955, F.J. Rosenbaum began to perform a puncture of the gallbladder under the control of a laparoscope through the liver parenchyma, which made it possible to significantly reduce the number of complications. However, the above-mentioned authors used a puncture of the gallbladder only for diagnostic purposes, filling it with contrast agents [5]. In the period from 1930 to 1970, further development of diagnostic and operative laparoscopy is associated with such scientists as: A.M. Aminev, U.A. Aripov, V.V. Vakhidov, G.A. Orlov, A.S. Loginov, G.I. Lukomskoy, Yu.V.

Berezov. The further development of laparoscopy was steadily connected with the improvement of laparoscopic equipment. In 1954, the English physicist-optician Hopkins developed a device capable of transmitting an image via flexible glass fiber. In 1964, the Karl Storz company created the first extracorporeal light source with transmission of the light flux to the laparoscope using fiber optics. Laparoscopy was used as a diagnostic method until the 1960s, and only in the 1960s and 1970s did laparoscopy become widely used in surgery. Dynamic laparoscopy, laparoscopic drainage of the abdominal cavity, various types of organostomy (cholecystostomy, gastrostomy, colonostomy, etc.) have become widely used in clinical practice for the



treatment of acute surgical and gynecological diseases, but they have acquired particular importance in the treatment of acute cholecystitis and mechanical jaundice [18,21,36,39,46,77]. The most common indication for laparoscopic cholecystostomy is the failure of conservative therapy in acute obstructive cholecystitis and mechanical jaundice in patients with high surgical risk. [3,63,65,71,75,78,80]. Peritonitis served as a contraindication to the use of laparoscopic cholecystostomy in these patients. The use of laparoscopic sanitation decompression of the gallbladder in combination with conservative therapy was effective in 80-95% of patients, which allowed the authors to reduce postoperative mortality in patients with increased surgical risk to 1.6-5%. The subsequent development of surgical (therapeutic) laparoscopy is associated with the name of the outstanding German surgeon, gynecologist and engineer from Kiel K. (K. Semm).

However, at present there are ambiguous opinions about the indications and contraindications for laparoscopy in acute diseases of the abdominal organs. This circumstance requires the development of clear recommendations for the use of laparoscopic technologies in emergency surgery.

**Thus, standardization of the use of diagnostic and therapeutic laparoscopy** is becoming one of the priority tasks of modern surgery. Therefore, studies aimed at improving the results of surgical treatment of patients with acute surgical diseases of the abdominal organs by improving diagnostic and therapeutic laparoscopy are relevant for solving the above problems and improving the results of surgical treatment of patients with acute surgical diseases.

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