СПИСОК ЛІТЕРАТУРИ

1. Campylobacter jejuni, an uncommon cause of splenic abscess diagnosed by 16S rRNA gene sequencing / P. Seng et al. *Int J Infect Dis*. 2014. Vol. 29. P. 238-240. DOI: https://doi.org/10.1016/j.ijid.2014.09.014

2. Cat-scratch disease presenting as a solitary splenic abscess in an elderly man / M. Nakamura et al. *BMJ Case Rep*. 2015. Vol. 2015. P. bcr2015209597. DOI: http://dx.doi.org/10.1136/bcr-2015-209597

3. Lee M. C., Lee C. M. Splenic abscess: an uncommon entity with potentially life-threatening evolution. *Can J Infect Dis Med Microbiol*. 2018. Vol. 2018. P. 8610657. DOI: https://doi.org/10.1155/2018/8610657

4. Lee W. S., Choi S. T., Kim K. K. Splenic abscess: a single institution study and review of the literature. *Yonsei Medical Journal*. 2011. Vol. 52. P. 288-292, DOI: https://doi.org/10.3349/ymj.2011.52.2.288

5. Liu Y. H., Liu C. P., Lee C. M. Splenic abscesses at a tertiary medical center in Northern Taiwan. *J Microbiol Immunol Infect.* 2014. Vol. 47. P. 104-108. DOI: https://doi.org/10.1016/j.jmii.2012.08.027

6. Retrospective Study of 75 Cases of Splenic Abscess / H. Sreekar et al. *Indian J of Surg*. 2011. Vol. 73. P. 398-402. DOI: https://doi.org/10.1007/s12262-011-0370-y

7. Splenic abscess: a review of 22 cases in a single institution / J. Llenas-García et al. *Eur J Intern Med*. 2009. Vol. 20. P. 537-539.
DOI: https://doi.org/10.1016/j.ejim.2009.04.009

8. Splenic abscess as a potential initial manifestation of quiescent infective endocarditis in a patient with bronchopneumonia / L. McOwat et al. *BMJ Case Rep*. 2015. Vol. 2015. P. bcr2014206794.
DOI: http://dx.doi.org/10.1136/bcr-2014-206794

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STAGE APPROACH IN SURGICAL TREATMENT OF ACUTE PANCREATITIS

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Ключевые слова: *острый панкреатит, малоинвазивные вмешательства, этапный подход*

Abstract. Stage approach in surgical treatment of acute pancreatitis. Kolosovych I.V., Bezrodnyi B.H., Hanol I.V., Cherepenko I.V. *The article deals with the problem of diagnosis and treatment of acute pancreatitis, which remains one of the most common surgical diseases of the abdominal cavity with a high risk of complications, the mortality rate of which reaches 5.5%, and in acute pancreatitis it varies within 40-70%. The purpose of this work is to*

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improve the results of surgical treatment of patients with acute pancreatitis. The results of treatment of 112 patients with acute pancreatitis, who were hospitalized in the procedure of ambulance in the Department of Surgery No. 2 of the Bogomolets National Medical University in 2009-2019 period are analyzed. Severe disease course was observed in 83 (74.1%) patients, moderate – in 29 (25.9%) patients. In the early phase of the disease, endoscopic operations were performed in 44 (39.3%) patients, and laparotomy was performed in 12 (10.7%) patients with advanced purulent peritonitis. In the late phase 15 (13.4%) patients underwent laparotomy, necrsequestrectomy, abdominization of the pancreas, drainage of the abdominal cavity and retroperitoneal space, 36 (32.1%) patients were treated with ultrasound-guided puncture treatments. In the case of progression of the disease and ineffective drainage under ultrasound control, 5 (4.5%) patients were treated with retroperitoneoscopically assisted necrsequestrectomy, combined laparoscopic and retroperitoneoscopically assisted necrsequestrectomy was performed in 3 (2.7%) patients, and in 2 (1.8%) patients – open laparotomy, abdominization, necrsequestrectomy, drainage of the abdominal cavity and retroperitoneal space. The surgical intervention in the late phase of the disease was 21±4.2 days from the onset of the disease. A stage approach in the treatment of acute pancreatitis was applied in 80 (71.4%) patients in the main group. The comparison group consisted of 32 (28.6%) patients who underwent laparotomy and laparoscopic interventions in the early and late periods of the disease without prior use of endoscopic interventions or drainage operations under ultrasound control. In the main group the length of stay in the hospital was 21,3±4,2 days, in the comparison group – 48.2±5.3 days respectively. In 42 (95.5%) patients who underwent endoscopic surgery, a positive clinical effect, rapid regression of symptoms of acute pancreatitis was achieved. In two (4.5%) patients who underwent endoscopic interventions, the disease progressed with the development of an abscess of the omental pouch, they underwent puncture drainage under ultrasound control. When using puncture drainage operations under ultrasound control in 26 (72.2%) patients, a positive result was achieved, the abscess cavity decreased by 63±6.2% within 7 days. In 10 (27.8%) patients due to the progression of the disease, the following stage of treatment was performed: retroperitoneoscopically assisted necrsequestrectomy (5 (13.9%) patients), combined laparoscopic and retroperitoneoscopically assisted necrsequestrectomy (3 (8.3%) patients), and open laparotomy, abdominization, necrosequestrectomy, drainage of the abdominal cavity and retroperitoneal space (2 (5.6%) patients). Complications in the main group developed in two (2.5%) patients, the mortality rate was 2.5% (two patients). In the comparison group, complications developed in 8 (25%) patients, the mortality rate was 18.8% (6 patients). The use of minimally invasive endoscopic interventions, draining surgeries under ultrasound control followed by combined laparoscopic and retroperitoneoscopically-assisted necrsequestrectomy or open laparotomy reduces the length of hospital stay of patients from 48.2±5.3 days (comparison group) to 21.3±4.2 days (main group) ($p<0.0001$, $t=28.346$) and the number of complications by 22.5% ($p=0.0002$, $\chi^2=14.104$, CI 9.2333-39.7022). The use of a stage approach in the surgical treatment of acute pancreatitis reduces mortality by 16.3% ($p=0.0026$, $\chi^2=9.058$, CI 4.6571-32.9639).

Реферат. Этапный подход в хирургическом лечении острого панкреатита. Колосович И.В., Безродный Б.Г., Ганоль И.В., Черепенко И.В. *Статья посвящена проблеме диагностики и лечения острого панкреатита, который остается одним из самых распространенных хирургических заболеваний органов брюшной полости с высоким риском развития осложнений, летальность при которых достигает 5,5%, а при остром панкреатите тяжелой степени - варьирует в пределах 40-70%. Целью работы является улучшение результатов хирургического лечения больных острым панкреатитом. Проанализированы результаты лечения 112 больных острым панкреатитом, которые были госпитализированы в порядке скорой помощи в клинику кафедры хирургии № 2 Национального медицинского университета имени А.А. Богомольца в период с 2009 по 2019 год. Тяжелое течение заболевания наблюдался у 83 (74,1%) пациентов, средней тяжести у 29 (25,9%) пациента. В ранней фазе заболевания у 44 (39,3%) были выполнены эндоскопические операции, у 12 (10,7%) больных на фоне распространенного гнойного перитонита были выполнена лапаротомия. В поздней фазе – у 15 (13,4%) пациентов была выполнена лапаротомия, некрсеквестректомия, абдоминизация поджелудочной железы, дренирование брюшной полости и забрюшинного пространства, у 5 (4,5%) пациентов – лапароскопическое раскрытие сальниковой сумки, некрсеквестректомия, дренирование брюшной полости, у 36 (32,1%) пациентов применялись пункционные методы лечения под УЗИ контролем с различных доступов. В случае прогрессирования заболевания и неэффективности дренирования под УЗИ контролем, у 5 (4,5%) пациентов была применена ретроперитонеоскопично – ассистированная некрсеквестректомия, комбинированная лапароскопическая и ретроперитонеоскопично – ассистированная некрсеквестректомия у 3 (2,7%) пациентов, и у 2 (1,8%) пациентов открытая лапаротомия, абдоминизация, некрсеквестректомия, дренирование брюшной полости и забрюшинного пространства. Срок выполнения оперативных вмешательств в поздней фазе заболевания составлял 21±4,2 суток от начала заболевания. Этапный подход в лечении острого панкреатита был применен у 80 (71,4%) пациентов, вошедших в основную группу. Группу сравнения составили 32 (28,6%) больных, которым выполнялись лапаратомные и лапароскопические вмешательства в раннем и позднем периодах заболевания без предварительного применения эндоскопических вмешательств или дренирующих операций под УЗИ контролем. Так, в основной группе длительность пребывания в стационаре составляла 21,3±4,2 дня, соответственно в группе сравнения – 48,2±5,3 дня. У 42 (95,5%) больных, которым были выполнены эндоскопические операции, достигнуто клинического эффекта, быстрого регресса симптомов острого панкреатита. У двух (4,5%) пациентов, которым были выполнены эндоскопические вмешательства,*

заболевание прогрессировало с развитием абсцесса сальниковой сумки, им было выполнено пункционное дренирование под УЗИ контролем. При применении пункционных дренирующих операций под УЗИ контролем у 26 (72,2%) пациентов достигнут положительный результат, полость абсцесса уменьшалась на 63±6,2% в течение 7 дней. У 10 (27,8%) пациентов в связи с прогрессированием заболевания, как следующий этап лечения, было выполнено: ретроперитонеоскопично-ассистированная некрсеквестректомия (у 5 (13,9%) пациентов), комбинированная лапароскопическая и ретроперитонеоскопично-ассистированная некрсеквестректомия (у 3 (8,3%) пациентов) и открытая лапаротомия, абдоминизация, некрсеквестректомия, дренирование брюшной полости и забрюшинного пространства (у 2 (5,6%) пациентов). Осложнения в основной группе возникли у двух (2,5%) пациентов, показатель летальности составил 2,5% (двое пациентов). В группе сравнения осложнения возникли у 8 (25%) пациентов, показатель летальности составил 18,8% (6 пациентов). Использование малоинвазивных эндоскопических вмешательств, дренирующих операций под УЗИ контролем с последующим применением комбинированной лапароскопической и ретроперитонеоскопично-ассистированной некрсеквестректомии или открытой лапаротомии уменьшает продолжительность пребывания пациентов в стационаре с 48,2±5,3 дня (группа сравнения) до 21,3±4,2 дня (основная группа) ($p<0,0001$, $t=28.346$) и количество возникновения осложнений на 22,5% ($p=0,0002$, $\chi^2=14.104$, ДІ 9.2333-39.7022). Применение этапного подхода в хирургическом лечении острого панкреатита уменьшает летальность на 16,3% ($p=0,0026$, $\chi^2=9.058$, ДІ 4.6571-32.9639).

Diseases of the pancreas remain one of the most pressing problems of modern medicine. According to epidemiological data from world studies, there is a general trend of growth of this pathology, which annually affects 8.2 – 10 people per 100 thousand population. This fact is associated with increased alcohol consumption, deteriorating environmental situation, reduced food quality and overall standard of living [4]. Acute pancreatitis occupies a leading place among the diseases of the pancreas. A specific feature of pancreatitis in young people is the high risk of complications, with mortality which reaches 5.5%, and in severe acute pancreatitis it varies from 40 to 70% [5]. In addition, this course of acute pancreatitis is the most dangerous in the case of open surgery, as the mortality rate is from 12% to 56% [6]. Therefore, minimally invasive methods of treatment under the control of imaging methods and methods of video-assisted retroperitoneal necrosequestrectomy (retroperitoneal debridement with video assistance (RDVA)) are currently preferred. The effectiveness of these techniques is approximately 50-60% with a complication rate of 30-40% and a mortality rate of 10% [3]. With this in mind, there have been recent studies of a stage approach [1]. However, it should be noted that the location of mini-invasive interventions in infected pancreatic necrosis needs to be clarified, and there are many factors that do not allow to compare the effectiveness of the methods used (different diagnostic approaches, small number of observations in study groups, different severity and concomitant pathology, different experience in operating surgeons).

Thus, at present, there are no direct recommendations for determining the effectiveness of percutaneous drainage and the terms as for open surgery in case of its ineffectiveness, and data confirming the difference in results when using different types of interventions need further clarification.

The aim is to improve the results of surgical treatment of patients with acute pancreatitis by introducing a stage approach to treatment using puncture drainage techniques and combined laparoscopic and retroperitoneoscopic assisted necrosequrectomy.

MATERIALS AND METHODS OF RESEARCH

We analyzed the results of treatment of 112 patients with acute pancreatitis, who were hospitalized in the order of ambulance in the clinic of the Department of Surgery N 2 of O.O. Bogomolets National Medical University over the the period from 2009 to 2019. There were 68 men (60.7%), 44 (39.3%) women. By age, patients were distributed as follows: young people (up to 44 years) – 11%, middle-aged (44 to 60 years) – 68%, the elderly (after 60 years) – 21%. The study used the classifications of the International Association of Pancreatology (Kochin, India, 2011) and the Acute Pancreatitis Classification Working Group (2012). Severe course of the disease was observed in 83 (74.1%), moderate – in 29 (25.9%) patients. Individuals with acute pancreatitis of mild severity were not included in the study. Moderate pancreatitis was characterized by the presence of transient organ failure, local or systemic complications in the absence of organ failure and peripancreatic fluid collection that caused constant abdominal pain, leukocytosis and fever. Severe acute pancreatitis was characterized by transient or persistent organ failure, and as a predictor systemic inflammatory response syndrome during hospitalization or persistent systemic inflammatory response syndrome 48 hours after was used. The systemic inflammatory response syndrome was determined by generally accepted criteria [2]. Re-assessment of the severity of the condition was performed in 24, 48 hours and 7 days since the moment of hospitalization.

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According to the etiological factor, acute destructive pancreatitis of biliary etiology was in 52 (46.4%) patients, of alcoholic etiology – in 60 (53.6%) patients. Indications for laparotomy in the early phase of the disease was widespread purulent peritonitis, usually on the background of the fulminant course of the disease with the development of severe general intoxication and multiple organ failure, according to these indications, laparotomies were performed in 12 (10.7%) patients treated over the period from 2009 to 2012. In the late phase of the disease, surgeries were performed in the case of the development of purulent-septic complications: infectioning of necrosis with the formation of abscesses (sequesters) of the pancreas and development of phlegmon of the retroperitoneal tissue. Namely, 15 (13.4%) patients underwent laparotomy, necresequrectomy, pancreas abdominization, drainage of the abdominal cavity and retroperitoneal space, 5 (4.5%) patients underwent laparoscopic opening of the omental sac, necresequrectomy, drainage of the abdominal cavity. In general, preference was given to mini-invasive interventions and puncture methods under ultrasound control from different approaches, which were performed in 36 (32.1%) patients. The duration of surgery in the late phase of the disease was 21±4.2 days from the onset of the disease.

Since 2009, the clinic has been using minimally invasive endoscopic interventions at the early hospital stage in accordance with the etiopathogenetic approach to the treatment of acute pancreatitis of biliary etiology. In 44 (39.3%) cases endoscopic operations were performed with the aim of internal decompression of the duct system and restoring the passage of bile and pancreatic juice into the duodenum. Indications were: acute cholangitis, choledocholithiasis, mechanical jaundice, papillitis, dilation of the common bile duct (regardless of the presence of concrements in it according to ultrasound). In the case of cicatricial stenotic papillitis, cholangitis and choledocholithiasis, endoscopic papillosphincterotomy was performed with revision of the duct system and extraction of concrements. This technique was used in 10 (8.9%) patients. In other cases (with functional muscle spasm and the absence of gross scarring of the walls of the biliary tract) the following techniques were performed: cannulation in 6 (5.6%) patients, mechanical (balloon) – in 5 (4.5%) cases, pharmacological (with myogenic antispasmodics) dilatation of the distal ducts and large duodenal papilla – in 11 (9.8%) patients. In the presence of residual choledocholithiasis in the presence of external drainage of the choledochus, we proposed a technique of papillotomy under the control of choledochoscopy using a flexible choledochoscope (utility patent N 135693 "Method of surgical treatment of biliary pancreatitis"). This type of surgery was performed in 12 (10.7%) patients. In case of disease progression and inefficiency of drainage under ultrasound control, in 5 (4.5%) patients retroperitoneoscopic-assisted necrosequestrectomy was performed, combined laparoscopic and retroperitoneoscopically-assisted necroquevestrectomy – in 3 (2.7%) patients, and open laparotomy, necrosequectomy, drainage of the abdominal cavity and retroperitoneal space – in 2 (1.8%) patients.

Statistical analysis was performed using Statistica 10 (Serial Number: STA999K347150-W) and MEDCALC® (open access Internet resource, https://www.medcalc.org/calc/).

Data were compared between groups using Student's paired t-test for unrelated samples. Comparison of indicators in dynamics – Student's t-test for related samples. The study found no data with an abnormal distribution. To compare the incidence of traits in unrelated samples, the “n-1” xi-square test ($\chi 2$) was used as recommended by Campbell (2007) and Richardson (2011). The confidence intervals (CIs) given in the paper were constructed for a confidence level of p=95%.

RESULTS AND DISCUSSION

A stage approach in the treatment of acute pancreatitis was used by us in 80 (71.4%) patients included in the main group. The comparison group consisted of 32 (28.6%) patients who underwent laparotomy and laparoscopic interventions in the early and late periods of the disease without prior use of endoscopic interventions or drainage operations under ultrasound control. A comparative analysis of the length of hospital stay of patients and the percentage of postoperative complications in the early and late periods between patients of the main group and the comparison group was performed. Thus, in the main group the duration of hospital stay was 21.3±4.2 days, in the comparison group – 48.2±5.3 days respectively. In 42 (95.5%) patients who underwent endoscopic interventions, a positive clinical effect, rapid regression of symptoms of acute pancreatitis was achieved. In two (4.5%) patients who underwent endoscopic interventions, the disease progressed with the development of an abscess of the omental sac, they underwent puncture drainage under ultrasound control. Purulent-septic complications were not observed in the long term. When using puncture drainage interventions under ultrasound control, a positive result was achieved in 26 (72.2%) patients, the abscess cavity decreased by

63±6.2% within 7 days. The approach through gastrocolic ligament (in 8 (22.2%) patients) was used in the following cases: absence of an acoustic window in other areas (flatus, vascular structures) and inability to identify anatomical structures; central necrosis of a gland to control a course of a disease and, further, performance of interventions in stabilization of a patient's condition; location of collections near the anterior surface of the gland when it is impossible to establish drainage through retroperitoneal accesses; necrosis of the head of the pancreas. Speaking about left (used in 21 (58.3%) patients) and right (used in 7 (19.4%) patients) lateral approaches, it is important to note that we used the most direct path to the fluid collection, puncturing closer to the median axillary lines, because in the event of pneumatosis of the intestine and the presence of gas in the retroperitoneal space, the risk of entering the abdominal cavity with the risk of peritonitis development increases. We used the left lateral approach for infected necrosis of the tail and body of the pancreas and phlegmons of the retroperitoneal tissue located on the left. The right approach – in case of necrosis of the head (if there is an acoustic window) and, accordingly, phlegmons of retroperitoneal tissue located on the right. In both cases, the ascending and descending colon were bypassed posteriorly. Drainage was washed with saline every 4-6 hours, change of drainage was carried out 7 days after or in the presence of reduced outflow. The effectiveness of drainage was evaluated in the presence of an improvement in the clinical picture and laboratory parameters in the first 72 hours after drainage. In 10 (27.8%) patients due to disease progression, as the next stage of treatment, the following techniques were performed: retroperitoneal-assisted necrosequrectomy (in 5 (13.9%) patients), combined laparoscopic and retroperitoneoscopically-assisted necrosequrectomy – (in 3 (8.3%) patients) and open laparotomy, necresequrectomy, drainage of the abdominal cavity and retroperitoneal space – (in 2 (5.6%) patients). Complications occurred in two (2.5%) patients, namely: one (1.3%) patient developed external pancreatic fistula, which closed unaided 19 days after, another (1.3%) patient developed bleeding during the puncture, which was an indication for laparotomy. The mortality rate in the main group was 2.5% (two patients), these were elderly patients. The immediate causes of their death were acute cardiovascular, respiratory and hepato-renal failure.

In the comparison group, complications occurred in 8 (25%) patients, of which two (6.3%) patients developed the phenomenon of mechanical jaundice against the background of compression of the biliary tract by necrotic masses, in three (9.8%) patients – the phenomenon of diffuse purulent peritonitis against the background of disease progression (laparotomy, drainage of the omental sac and abdominal cavity were performed on these patients in the early period of the disease the day before). In two (6.3%) patients in the postoperative period there was arosive bleeding, in one (3.1%) patient – external pancreatic fistula which required repeated surgical treatment (previously these patients underwent laparotomy, necrosevestrectomy, abdominalization of the pancreas, drainage of the abdominal cavity and retroperitoneal space). In our opinion, in the case of performing early laparotomies for widespread peritonitis, especially against the background of severe intoxication and multiorgan failure, one can not be limited to sanitation and drainage of the abdominal cavity, omental sac. In all cases, there is a mandatory external decompression of the extrahepatic bile ducts, abdominization of the pancreas and drainage of the retroperitoneal space, even in the absence of parapancreatic infiltration during surgery. The mortality rate in the comparison group was 18.8% (6 patients). The main factor that led to mortality was the fulminant course of the disease with the development of multiple organ failure. Most often, these were patients who were admitted to the hospital a few days after the onset of the disease, almost in terminal condition, as well as elderly patients with severe comorbidities. The immediate cause of their death was the progression of destructive changes in the parenchyma of the gland and the retroperitoneal space with the subsequent increase in multiorgan failure.

CONCLUSIONS

1. Taking into account the international medical and diagnostic protocols for the management of patients with acute pancreatitis, the stage approach is pathogenetically justified.
2. When using percutaneous drainage under ultrasound control in two patients (2.5%) local complications developed: external pancreatic fistula and postoperative bleeding.
3. The use of minimally invasive endoscopic interventions, drainage operations under ultrasound control, followed by the use of combined laparoscopic and retroperitoneoscopic-assisted necrosequrectomy or open laparotomy reduces the length of hospital stay from 48.2±5.3 (comparison group) up to 21.3±4.2 days (main group) ($p<0.0001$, $t=28.346$).
4. The use of a stage approach in the surgical treatment of acute pancreatitis has reduced the

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incidence of local and systemic complications by 22.5% (p=0.0002, $\chi 2$=14.104, CI 9.2333-39.7022), and postoperative mortality by 16.3% p=0.0026, $\chi 2$=9.058, CI 4.6571-32.9639).

Conflict of interest. The authors declare no conflict of interest.

REFERENCES

1. Goltsov VR, Savello VE, Bakunov AM, Dymnikov DA, Kurochkin DM, Batig EV. [Purulent-Necrotic Parapancreatitis: the Evolution of Views on Treatment]. Annaly khirurgicheskoy gepatologii = Annals of HPB Surgery. 2015;20(3):75-83. Russian. doi: https://doi.org/10.16931/1995-5464.2015375-83
2. Komarov MP. [Acute pancreatitis]. Adapted evidence-based clinical setting]. Kyiv: State Expert Center of the Ministry of Health of Ukraine; 2016:53. Ukainian.
3. Dronov OI, Kovahlska IO, Burmich KS, Gorlach AI, Zadorozhna KO, Tsymbalyuk RS, Kovalenko AP, Shvets YuP, Chermak II. [Combined laparoscopically and retroperitoneoscopically assisted pancreatonecrsequestrectomy]. Klinichna khirurhiya. 2016;12:3-5. Ukainian. Available from: https://hirurgiya.com.ua/-index.php/journal/issue/download/114/12-2016
4. Popov AV, Mineev DA, Ershova AI, Popova NN. [Early diagnosis of mild acute pancreatitis]. Khirurgiia. 2016;(7):11-17. doi: https://doi.org/10.17116/hirurgia2016711-17
5. Wroński M, Cebulski W, Witkowski B, Jankowski M, Kluciński A, Krasnodębski IW, Słodkowski M. [Comparison between minimally invasive and open surgical treatment in necrotizing pancreatitis]. J Surg Res. 2017 Apr;210:22-31. Epub 2016 Nov 2. doi: https://doi.org/10.1016/j.jss.2016.10.022.
6. Lichi Ke, Junhua Li, Peihong Hu, Lianqun W, Haiming C,Yaping Z. [Percutaneous Catheter Drainage in Infected Pancreatitis Necrosis: a Systematic Review]. Indian J Surg. 2016;78(3):221-228. doi: https://doi.org/10.1007/s12262-016-1495-9

СПИСОК ЛІТЕРАТУРИ

1. Гнойно-некротический парапанкреатит: эволюция взглядов на тактику лечения / В. Р. Гольцов и др. *Анналы хирургической гепатологии*. 2015. Т. 20, № 3. С. 75-83. DOI: https://doi.org/10.16931/1995-5464.2015375-83
2. Гострий панкреатит. Адаптована клінічна настанова, заснована на доказах / під ред М.П. Комаров та ін. Київ: «Державний експертний центр МОЗ України», 2016. 53 с.
3. Комбінована лапароскопічно та ретроперитонеоскопічно асистована панкреатонекрсеквестректомія / О. І. Дронов та ін. *Клінічна хірургія*. 2016. № 12. С. 3-5. URL: https://hirurgiya.com.ua/index.php/-journal/issue/download/114/12-2016
4. Попов А. В., Минеев Д. А., Ершова А. И., Попова Н. Н. Ранняя диагностика легкого острого панкреатита. *Хирургия*. 2016. № 7. С. 11-17. DOI: https://doi.org/10.17116/hirurgia2016711-17
5. Comparison between minimally invasive and open surgical treatment in necrotizing pancreatitis / M. Wroński et al. *J Surg Res*. 2017. Vol. 210. P. 22-31. DOI: https://doi.org/10.1016/j.jss.2016.10.022. Epub 2016 Nov 2.
1. Percutaneous Catheter Drainage in Infected Pancreatitis Necrosis: a Systematic Review / Lichi Ke et al. *Indian J Surg*. 2016. Vol. 78, No. 3. P. 221-228. DOI: https://doi.org/10.1007/s12262-016-1495-9

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