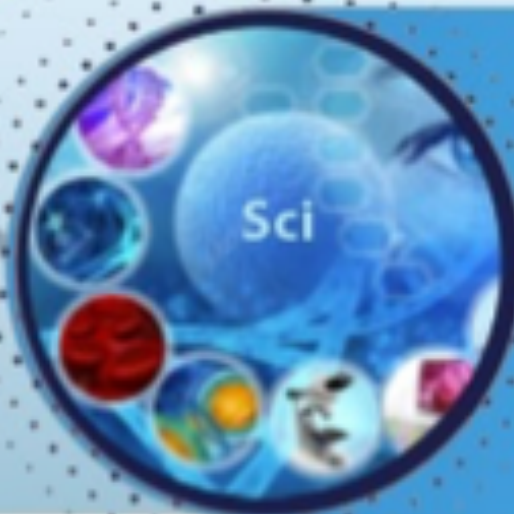




TASHKENT MEDICAL ACADEMY

100 TMA ANNIVERSARY



Journal of Educational and Scientific Medicine

Issue 2 (1) | 2023



OAK.UZ
Google Scholar

Science Citation Committee of the Cabinet
Ministry of the Republic of Uzbekistan

ISSN: 2181-3175

Minimally Invasive Decompression Interventions in the Treatment of Acute Cholecystitis in Elderly and Senile Patients

Ya. Kim Yang Jou¹

ABSTRACT

Background. This article presents information on the variant of the clinical course of acute cholecystitis in elderly and senile patients using various approaches to surgical and conservative treatment. **Material.** It is substantiated that active surgical tactics, supplemented by the implementation of minimally invasive decompression echo-controlled interventions according to the formulated indications, can significantly improve the immediate results of treatment of patients with acute cholecystitis of older age groups.

Conclusion. The use of minimally invasive decompression echo-controlled interventions is an effective and safe way to treat acute cholecystitis in patients of older age groups with high surgical and anaesthetic risk. Active surgical tactics in acute cholecystitis supplemented using minimally invasive decompression echo-controlled interventions, can significantly improve both immediate and long-term results treatment in patients with acute cholecystitis of older age groups and reduce postoperative mortality from 13.5% to 3.7%, overall mortality from 10.2% to 1.6%.

Keywords: Acute cholecystitis, elderly and senile age, minimally invasive technologies in surgery

INTRODUCTION

Acute cholecystitis is a common abdominal pathology that ranks third after acute appendicitis and acute pancreatitis in the structure of emergency surgical diseases of the abdominal organs. Patients with acute cholecystitis account for about 15% of hospitalized surgical profiles [5,8,11,14,17].

For many years, the general and postoperative mortality in patients with acute cholecystitis of the elderly and senile age does not tend to decrease and range from 8 to 33% [16,20,24,28,32,35], which is about 5-10 times

higher than in young people [4,8,16,32]. In emergency operations in patients older than 80 years, postoperative mortality exceeds 40-50%, which makes these operations extremely risky [6,7,9,10,12,13]. Based on these data, it is logical to conclude that surgical treatment is futile in elderly and senile patients with high surgical and anaesthetic risks.

The problem of treating patients with acute cholecystitis in the medical literature is devoted to many works reflecting mainly the use of modern minimally invasive and nonsurgical technologies [11,21,31]. At the same

¹ MD, PhD, Chief Surgical Consultant, Fudan University, Fudan, China

time, few studies are highlighting this problem in elderly and senile patients.

At the present stage of the development of surgery, scientific and technological progress makes it possible to revise some ideas about the surgical treatment of acute cholecystitis. The appearance in the medical arsenal of ultrasound scanning devices has changed not only the diagnosis of diseases of the biliary tract but also gave impetus to the development of a new direction - ultrasound diapeutics or navigation surgery, i.e., ultrasound surgery. This technique, developed in the 70s of the XX century, is increasingly used in surgical clinics [19,22,28]. First, we are talking about a modern minimally invasive version of the operating cholecystostomy - puncture of the gallbladder and microcholecystostomy in ultrasonic navigation. This technique was deprived of one of the main drawbacks of the surgical operation - the traumatism of the intervention [31]. This circumstance is extremely attractive for the treatment of acute cholecystitis in elderly and senile patients with severe concomitant diseases.

It is very difficult to objectively determine the true tolerance to the upcoming operation in elderly and senile patients, based only on the results of a clinical examination using a limited arsenal of instrumental methods [33]. Therefore, it is in elderly and senile patients that it is necessary to use methods that allow you to safely delay the radical operation, and use the time obtained to protect as much as possible from the upcoming surgical intervention or it is argued to refrain from it with a high degree of surgical and anaesthetic risk.

In recent years, several reports have appeared in the medical literature on the effectiveness of the use of diapeutic techniques in acute cholecystitis [28]. However, even now the issues of choosing indications for these measures in groups of surgical patients remain debatable. The long-term results of the use of such treatment methods remain practically unexplored.

Thus, in the gerontological surgery of acute cholecystitis, unresolved questions remain, and the unsatisfactory results of the treatment of these patients explain the relevance of further research.

MATERIAL AND METHODS

The study was based on the analysis of the results of the treatment of 1458 patients with acute cholecystitis who were treated in the surgical departments of our clinic in 2006-2021 years, and 47.9% (699) of them were people whose age exceeded 65 years. By the purpose and objectives of the study, the results of the treatment of patients of older age groups were stud-

ied. In their work, when determining the age category of the patient, they used the classification of the World Health Organization (2012).

All patients of the older age groups had concomitant diseases, with a predominance of the pathology of the cardiovascular system, mainly atherosclerotic genesis; there were no significant differences like the concomitant pathology in the observation groups ($p>0.05$).

To assess the severity of patients and determine the prognosis in our study, the APACHE II and POSSUM systems were used. Computer standards were used, calculating the values of APACHE II in points and POSSUM in percentage.

During the study, a method of a low-invasive decompression method of treatment of patients with acute cholecystitis was developed and implemented. Accordingly, three groups of patients were formed. The study groups were formed prospectively, as diapeutic techniques were mastered. The main group consisted of 113 patients in the treatment of which minimally invasive diapeutics were used. methods of treatment. The first comparison group was represented by operated patients. Indications for surgical treatment were delivered in 198 patients. In the second comparison group, there were 388 non-operated patients. There were no significant differences in age and sex composition in the observation groups ($p>0.05$). During clinical active vity, there were changes in surgical tactics corresponding to the accumulation of experience in the use of minimally invasive decompression echocontrolandrudable interventions. Since 2010, we have been able to obtain clear clinical indications for measures for acute cholecystitis in patients of older age groups. This circumstance made it possible to distinguish clinical periods of observation. The first clinical period included 2006-2009 and was characterized by the introduction of diapeutical techniques in the clinic with the haphazardness of their use. The second clinical period included 2010-2022 and was characterized using the developed algorithm for the treatment of older patients with acute cholecystitis.

Clinical and laboratory diagnosis of acute cholecystitis was performed according to generally accepted criteria. Despite the importance of the most thorough collection of complaints and anamnesis, we believed that ultrasound was crucial in the diagnosis of the disease.

RESULTS

The results of surgical treatment in the first comparison group. 163 patients of older age groups were operated on, and all of them had destructive inflammation of the gallbladder in different stages of

development. The prescription of the disease ranged from 5 hours to 7 or more days. Only 17.9% of patients were hospitalized within 6 hours from the onset of the disease. In 36.1% of patients, the prescription of the disease was 6-24 hours, and 46.0% of patients were admitted to surgery. The department was later than 24 hours after the development of acute cholecystitis. At the same time, the history of cholelithiasis with past attacks of acute cholecystitis was traced in 155 (95%) people. The average period of stone storage was 4.5 years, and the proportion of patients suffering from cholelithiasis for more than 10 years was 46.8%. These circumstances predetermined the presence of pronounced pathomorphological changes in the perivesical region. The choice of treatment tactics was determined by the pathomorphological form of acute cholecystitis, the presence of its complications and the degree of surgical and anaesthetic risk.

It was considered an indication for performing an emergency operation with the failure of conservative treatment within 24 hours. The failure of conservative treatment meant a persistent pain syndrome and intoxication syndrome (leukocytosis, fever) with persistent ultrasound signs of destructive cholecystitis. Of the 163 persons, 56.4 per cent were operated on an emergency basis, 39.8 per cent on an urgent basis and 3.7 per cent on a delayed period.

From the data presented, the use of modern minimally invasive technologies was limited by the severity of morphological changes in the gallbladder and perivesical region. Minimally invasive operations were possible only in 15.3% of operated patients. The conversion rate was 44.4%. Such features indicated that open cholecystectomy was performed only in severe patients with an unfavourable operating situation - the presence of a paravesical infiltrate or abscess. It was the nature of morphological changes in acute cholecystitis in patients of older age groups that technically did not allow the operation to be performed in any minimally invasive way. Complications of the majority were registered in 38 patients. Was observed in half of the patients and was mixed. The development of acute bleeding gastroduodenal ulcers always indicated an unfavourable prognosis.

Thus, surgical treatment of patients with acute cholecystitis of older age groups was accompanied by a significant postoperative mortality rate (13.5%) and the incidence of postoperative complications (23.3%).

The results of the use of minimally invasive echo-controlled operations in the main group.

In the main group, 113 elderly and senile people with acute cholecystitis were observed. The average age of

the patients was 74.6 years. All patients had severe comorbidities. Only 3 patients (3.3%) were admitted to the clinic with the first attack of acute cholecystitis. The prescription of the disease with cholelithiasis was more than 3 years in almost all patients (88.2%). In 16 people (17.9%) cholecystitis attacks have been noted for more than 10 years. The term of admission to the hospital from the onset of the disease was 4.7 days.

In all patients with acute cholecystitis, the undoubted clinical effect was obtained immediately after the intervention: there was a decrease in pain, normalized body temperature, improved laboratory parameters, and positive ultrasound dynamics appeared. In 2 patients, there was an "unblocking" of the gallbladder with the complete elimination of bladder hypertension. directly in the process of puncture debridement. Another 2 patients needed to perform a second puncture of the gallbladder to improve their condition. Repeated punctures led to an improvement in both patients, but one of them was operated on. The operation was performed during the period of mastering the technique when there was no confidence in its effectiveness. Comprehensive control of the effectiveness of treatment was evaluated using the criterion scale APACHE II. The visual manifestation of the effectiveness of drainage and a positive prognostic sign included an increase in the daily flow rate of bile through drainage to 100-150 ml and the normalization of its visual characteristics. Usually, during the first day, there was an unblocking of the gallbladder with discharge through the drainage of bile instead of pus or inflammatory exudate.

Clinical, laboratory and sonographic signs of relief of acute cholecystitis were achieved within 3-6 days. Drainage from the gallbladder cavity was removed after visual sanitation of bile and improvement of the general condition of patients for 4-5 days after performing percutaneous transhepatic minicholecystostomy.

It was considered echo-controlled minimally invasive decompression of the gallbladder in acute cholecystitis not indicated in the absence of liquid contents in the bladder, in the case of tight filling of its cavity with stones, as well as with a wrinkled bladder, which was detected by ultrasound examination.

Puncture of the gallbladder was technically difficult in the presence of a dense perivesical infiltrate. However, only in one observation, this reason did not allow to complete the manipulation. During our study, there was only one case of intra-abdominal bleeding in a patient of old age with cirrhosis of the liver. In 3 people, vagal reactions were observed - arterial hypertension, bradycar-

dia, and nausea after performed manipulations. They were eliminated by drug therapy.

The mortality rate in the main group was 1.1%. Two failures in performing a gallbladder puncture were noted (2.2%). Both failures occurred during the period of mastering the technique. In 3 previously "untouchable" patients, after performing minimally invasive echo-controlled interventions, the condition improved, which allowed them to perform a planned operation within six months after the initial hospitalization.

We were able to trace the long-term results of treatment in up to 5 years in this observation group from the observed patients.

Thus, the use of sonographically controlled minimally invasive technologies in the treatment of acute cholecystitis made it possible for elderly and senile patients with high operative and anaesthetic risk to achieve relief of the acute inflammatory process and avoid life-threatening emergency surgery in such a situation.

Analysis of the nearest treatment results

The period 2006-2009 was characterized by the unsystematic periodic use of echo-controlled interventions in patients with acute cholecystitis. During this period, 215 patients of older age groups with acute cholecystitis II and III of clinical and sonographic classes were treated. Of these, 110 were operated on. 20 patients died. Postoperative mortality was 18.2%. At the same time, 47 people were treated with minimally invasive echo-controlled technologies. Among them, only one patient died because of a serious complication followed by surgery. The experience gained during this period in the use of minimally invasive echo-controlled interventions made it possible to change the treatment tactics and required the development of certain criteria that allow refusing to perform emergency and urgent operations. To develop an objective criterion that allows judging the tolerability of the operation, a mathematical analysis of the indicators of the APACHE II and POSSUM criterion scales in 110 operated patients was performed.

The values of the APACHE II system scores were ranked. In each rank of the values, the number of operated patients and the number of deaths were determined. Thus, histograms were constructed, and conjugation tables were obtained for calculating the Chi-square criterion. The calculation of a significant difference in mortality between the categories of values of the APACHE II scale made it possible to choose the necessary criterion for the possibility of surgical treatment of elderly and senile patients with high operating rooms and anaesthetic risk. Statistical analysis of the lethality between the indi-

vidual ranks of the APACHE II scale using the Chi criterion and the coefficient of contingency did not show a significant difference ($p > 0.05$). However, when combining ranks, a significant difference in mortality appeared between the APACHE II indicators - 10-17 and more than 18 points ($p = 0.012$). Comparison of mortality in groups of values of the APACHE II scale less than 18 points and more than 18 points showed the presence of a significant difference in results ($p < 0.01$). Therefore, it is the severity of the patient's condition of 18 points or more on the APACHE II scale that is an objective criterion, allowing to consider the operational risk in acute destructive cholecystitis without peritonitis to exceed the indications for surgery.

Similarly, the risk of death of surgical treatment was calculated on the POSSUM scale. Statistical analysis of mortality using the Chi-criterion and the coefficient of contingency considering the criteria of the POSSUM scale showed a significant difference in the immediate results of treatment between the categories of patients with a risk of less and more than 32% ($p < 0.05$). Analysis in the categories of patients with an operational risk of death of 33-50% and more than 50% has a higher degree of confidence in the difference ($p < 0.01$). Thus, it is the value of the risk of death on the POSSUM scale of more than 50% that is critical in the choice of treatment tactics for older patients with acute destructive cholecystitis without peritonitis.

Since 2010, the performance of drainage has been considered indicated for acute cholecystitis in patients of older age groups with high operating and anesthesiological risk. The criterion for selecting patients for their use was considered the criterion for determining the severity of the condition and prognosis of APACHE II and POSSUM. When assessing the severity of the patient's condition by more than 18 points on the APACHE II scale and more than 50% of the risk of death on the scale POSSUM considered surgical treatment to be excessively dangerous and resorted to percutaneous transhepatic micro cholecystostomy.

In the period 2010-2013 yy. 66 patients of older age groups with acute cholecystitis II and III of clinical and sonographic classes were treated in the surgical departments of the clinic. In connection with an objective assessment of the severity of patients and a differentiated approach to the choice of surgical tactics, the nature of therapeutic measures in this period has changed.

There was noletality in the main group in the II period at all, as well as no serious complications after minimally invasive decompression interventions. Postopera-

tive mortality in the group with high surgical and anaesthetic risk was reduced from 13.5% to 1.7% ($p < 0.05$). The main result of the introduction of minimally invasive diapaetic interventions was a significant decrease in overall mortality in acute destructive cholecystitis in patients of older age groups from 10.2% to 1.45% ($p < 0.05$). In addition, with a balanced determination of the indications for cholecystectomy in an emergency manner in this category of patients, we managed to achieve an almost fivefold reduction in postoperative mortality.

Analysis of long-term treatment results

Analysis of long-term results of treatment of patients with acute cholecystitis of older age groups showed a significant difference in the duration and quality of life of patients of clinical observation groups. A mathematical analysis of the long-term results of treatment of patients with acute cholecystitis of older age groups using contingency criteria was carried out.

During the first year, there are significant differences in the survival of patients of the main group and group I comparison for both criteria ($p < 0.01$). Survival rates during the year were 92.8% and 84%, respectively.

After five years of follow-up, there are significant differences in survival using both criteria ($p < 0.05$) but causes of death not related to surgical pathology are the same for clinical surveillance groups.

CONCLUSION

Surgical treatment of patients with acute cholecystitis of older age groups, which meets the standards of active tactics, is accompanied by a total mortality rate of 10.2% and a postoperative mortality rate of 13.5%; the frequency of postoperative complications reaches 23.3%. Indication for performing minimally invasive echo-controlled decompression of the gallbladder in patients of older age groups is the presence of acute destructive cholecystitis II or III clinical and sonographic class with high operating and anesthesiological risk - exceeding the severity of the condition on the APACHE II scale above 18 points; the risk of death is more than 50% on the POSSUM scale.

The use of active surgical tactics in patients of older age groups, including the performance of minimally invasive decompression echo-controlled interventions for certain indications, can reduce postoperative mortality to 3.7% and overall mortality to 1.6%. Long-term results in patients with acute cholecystitis of older age groups are significantly better after treatment with minimally invasive decompression echo-controlled interventions.

Ethics approval and consent to participate - All patients gave written informed consent to participate in the study.

Consent for publication - The study is valid, and recognition by the organization is not required. The author agrees to open the publication

Availability of data and material - Available
Competing interests - No

Financing - Self

Competing interests - No

REFERENCES

1. A combination of diabetes mellitus and acute purulent-destructive lung diseases solving the problems of diagnosis and treatment / A.O. Okhunov, Sh.A. Khamdamov // Journal World Bulletin of Public Health (WBPH)-2023 - Volume 19, P. 127-135.
2. Altered Kupffer cell function in biliary obstruction / R.M. Minter [et al.] // Surgery. 2005. Vol. 138 (2). P. 236-245.
3. Analysis of actual healthcare costs of early versus interval cholecystectomy in acute cholecystitis / C.H.M. Tan [et al.] // J. Hepatobiliary Pancreat. Sci. 2014. URL: [http://online-library.wiley.com/journal/10.1002/\(ISSN\)1868-6982/earlyview](http://online-library.wiley.com/journal/10.1002/(ISSN)1868-6982/earlyview)
4. Assessing clinical outcomes of patients with acute calculous cholecystitis in addition to the Tokyo grading: a retrospective study / W.C. Cheng [et al.] // Kaohsiung J. Med. Sci. 2014. Vol. 30 (9). P. 459-465.
5. Bacterial adherence to human gallbladder epithelium / S. Sakurai [et al.] // Surgery Today. 2007. Vol. 22. № 6. P. 504-507.
6. Bone R.C., Grodzin C.J., Balk R.A. Sepsis: A New hypothesis for Pathogenesis of the Disease Process // Chest. 2007. № 1. P. 235-243.
7. Cerra F. Multiple Organ Failure Syndrome // Hosp. Pract. 2009. Vol. 25. P. 169-176.
8. De Palma G.D., Catanzano C. Stenting or surgery for treatment of irretrievable common bile duct calculi in elderly patients // Amer. J. Surg. 1999. Vol. 178 (5). P. 390-393.
9. Differential diagnosis of necrotizing fasciitis / A.O. Okhunov, D.N. Korikhonov // British Medical Journal-2023-Volume 3-Issue 1-Pages 67-74.
10. Differentiated approaches to the diagnosis and treatment of acute lung abscesses in patients who have had COVID-19 / A.O. Okhunov, Sh.A. Bobokulova // British Medical Journal - 2023 - Volume 3, Issue 1, Pages 134-143.
11. Etiological factors leading to purulent mediastinitis / A.O. Okhunov, K. Kh. Boboev // World Bulletin of Public Health-2023-Volume 18-Pages 118-125.
12. Etiology and pathogenesis of primary purulent mediastinitis / A.O. Okhunov, K.Kh. Boboev // British Medical Journal - 2023 - Volume 3 - Issue 1 - Pages 144-154.

- 13.Expression of bacterial beta-glucuronidase in human bile: an in vitro study / J.W. Leung, Y.L.Liu, P.S. Leung [et al.] // *Gastrointest. Endosc.* 2001. Vol. 54, № 3. P. 346-350.
- 14.Factors predicting mortality in emergency abdominal surgery in the elderly / N. Fukuda [et al.] // *World J. Emerg. Surg.* 2012. Vol. 7. P. 12.
- 15.Gram-positive cocci are associated with the formation of completely pure cholesterol stones / K. Manabu [et al.] // *Amer. J. Gastroenterol.* 2002. Vol. 97, №1. P. 83-88.
- 16.Hoffman A., Hohenberger W.Die acute Cholezystitis in der chirurgischer Intensivtherapie // *Chir. Praxis.* 1998. Vol. 53. P. 411-419.
- 17.How to treat acute purulent-destructive lung diseases if they are sequels to Covid-19? Problems and ways to solve them / Sh. A. Bobokulova, Sh. A. Khamdamov, D. N. Korikxonov, et al. // *Journal of Education & Scientific Medicine-2023 - 1(1)-P.47-55.*
- 18.Jarvinen H.J., Hastbacka J. Early cholecystectomy for acute cholecystitis: a prospective randomized study // *Ann. Surg.* 1980. Vol. 191. P. 501-505.
- 19.Kaneko K., Ando H., Seo T. Bile infection contributes to intrahepatic calculi formation after excision of choledochal cysts // *Pediatr. Surg. Int.* 2005. Vol. 21 (1). P. 8-11.
- 20.Laparoscopic cholecystectomy in acute cholecystitis: support for an early interval surgery / A. Croo [et al.] // *Acta Gastroenterol. Belg.* 2014. Vol. 77 (3). P. 306-311.
- 21.Management of acute cholecystitis in critically ill patients: a contemporary role for cholecystostomy and subsequent cholecystectomy / B.C. Morse [et al.] // *Amer. J. Surg.* 2010. Vol. 76. P. 708-712.
- 22.Nedev P.I., Uchikov A.P. Surgical treatment of necrotizing pancreatitis and complicated forms of cholecystopancreatitis // *Folia Med. (Plovdiv).* 2003. Vol. 45 (2). P. 5-8.
- 23.New approaches to improve autodermaplasty results / F.M. Abdurakhmanov, Sh.A. Khamdamov, D.A. Korikxonov, A.O. Okhunov // *Journal of Education & Scientific Medicine-2023-Volume 2-Issue 1-Pages 22-27.*
- 24.New approaches to treating lung abscesses as COVID-19 sequels / A.O. Okhunov, Sh.A. Bobokulova - *Journal World Bulletin of Public Health – 2023 - Volume 19, P.101-107.*
- 25.Optimal Time for Early Laparoscopic Cholecystectomy for Acute Cholecystitis / S.N. Zafar [et al.] // *JAMA Surg.* 2014.*JAMA Surg.* 2015. Vol. 150(2). P. 129-136
- 26.Percutaneous cholecystostomy is an effective treatment option for acute calculous cholecystitis: a 10-year experience / J. Kirkegard, T. Horn, S.D. Christensen [et al.] // *Scand. J. Surg.* 2015. URL: <http://sjs.sagepub.com/content/early/2015/01/07/1457496914564107.long>
- 27.Possibilities of modern physical methods of antiseptics in the treatment of acute lung abscesses in patients with diabetes mellitus / Sh.A. Khamdamov, F.M. Abdurakhmanov, Sh.A. Bobokulova, et al. // *Journal of Education & Scientific Medicine – 2023 - Volume 1 – Issue 1 – Pages 37-46.*
- 28.Purulent-destructive lung diseases, pathogenesis and modern principles and treatment / Sh. A. Khamdamov, Sh. A. Bobokulova, D.N. Korikxonov, K. Kh. Boboev, A.O. Okhunov, F.M. Abdurakhmanov // *Journal of Education and Scientific Medicine- 2023-Volume 2-Issue 1-Pages 57-66.*
- 29.Role of percutaneous transhepatic gallbladder aspiration in the early management of acute cholecystitis / S. Komatsu, T. Tsukamoto, T. Iwasaki [et al.] // *J. Dig. Dis.* 2014. Vol. 15, №. 12. P. 669-675.
- 30.Safety of early laparoscopic cholecystectomy for patients with acute cholecystitis undergoing antiplatelet or anticoagulation therapy: a singleinstitution experience / T. Noda [et al.] // *Hepatogastroenterology.* 2014. Vol. 61 (134). P. 1501-1506.
- 31.Some ways to optimize diagnostic methods of necrotizing soft tissue diseases / A.O. Okhunov, D.N. Korikxonov // *World Bulletin of Public Health (WBPH) – 2023 - Volume 19 – Pages 230-235.*
- 32.Timing of laparoscopic cholecystectomy for mild and moderate acute cholecystitis / T. Yoh [et al.] // *Hepatogastroenterology.* 2014. Vol. 61 (134). P. 1489-1493.
- 33.Value of Modified Possum Scoring System on Predicting Operation Risk in Elderly NSCLC Patients / R. Wang [et al.] // *Chin. J. Lung Cancer.* 2014. Vol. 17. P. 669-673.
- 34.Ways to achieve positive results of dermaplasty in patients with diabetic foot syndrome / A.O. Okhunov, F.M. Abdurakhmanov // *British Medical Journal – 2023 - Volume 3 – Issue 1 – Pages 92-98.*
- 35.What do you need to know about the origin of purulent mediastinitis? / K.Kh.Boboev, D.N. Korikxonov, A.O. Okhunov // *Journal of Education & Scientific Medicine -2023-Volume 2 – Issue 1 – Pages 15-21.*