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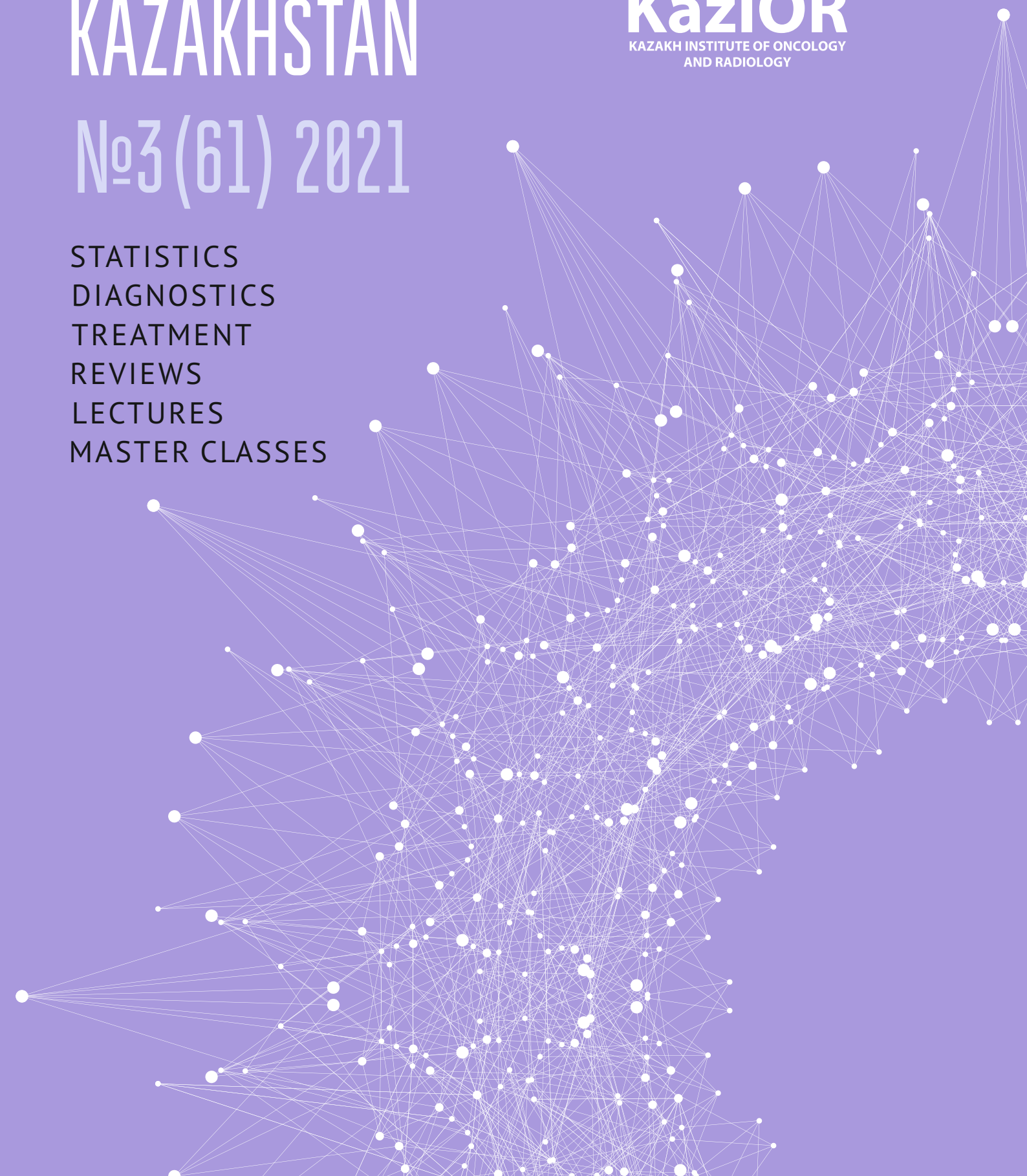

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Dear Readers!

We are glad to welcome you on the pages of the third issue of the «Oncology and Radiology of Kazakhstan» journal! We hasten to inform you that the journal is published as scheduled, articles and reviews are submitted through the website in electronic format, the editorial board makes every effort to include our edition in the list of the Committee for Control in the Sphere of Education and Science of the Ministry of Education and Science of the Republic of Kazakhstan.

Over the past period, a lot has been done to improve the quality, content, and design of our journal. The list of reviewers has been significantly expanded with domestic and foreign experts; we receive and publish manuscripts from foreign authors. Our Editorial Council and Editorial Board are comprised of well-known scientists from Kazakhstan, near and far abroad countries, who have a Hirsch index of at least 2 in Web of Science or Scopus international databases in the area of interest of the journal. Starting from issue No. 1 of 2020, each article in Russian and English versions of the journal is assigned a digital object identifier (Digital Object Identification, DOI). The journal checks the incoming manuscripts for plagiarism against domestic and international databases.

In this issue, we are glad to share the experience of specialists from Kazakhstan, Russia, and Uzbekistan on the following topics: epidemiological aspects of colorectal cancer, the potential of computed tomography in determining the scope of surgery for kidney neoplasms, minimally invasive surgical interventions for liver cancer, etc.

A Collection of Abstracts and Reports of the VIII Congress of Oncologists and Radiologists to be held on October 14-16, 2021 in Turkestan will highlight modern achievements in diagnostics, treatment, and rehabilitation of cancer patients.

Dear friends, we look forward to receiving your new manuscripts, interesting practical cases. We also thank all our authors and reviewers for their contribution to improving the quality of publications!

Take care of yourself and stay healthy!

Best regards,
Dilyara Kaidarova,
Editor-in-Chief of the «Oncology and Radiology of Kazakhstan» Journal

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M.N. TILLYASHAYKHOV[1], S.M. DJANKLICH[1], Sh.N. IBRAGIMOV[1], O.A. IMAMOV[1]

[1]Republican Specialized Scientific and Practical Medical Center of Oncology and Radiology of the Ministry of Health of the Republic of Uzbekistan (RSNPMCOR), Tashkent, Uzbekistan

Analysis of cancer incidence structure in the Republic of Uzbekistan

Relevance: *Globocan reports 19.3 million new cases of malignant neoplasms in 2020 globally. Mammary gland cancer has become the most commonly diagnosed oncological pathology, followed by lung, colon and rectum, prostate, and stomach cancers. In Uzbekistan, malignant neoplasms of the breast, stomach, cervix, lungs, and brain dominate the structure of cancer incidence.*

The study aimed *to analyze the cancer incidence trends and structure in the Republic of Uzbekistan in 2020.*

Results: *In 2020, 21976 new cancer cases were registered in Uzbekistan. The ratio of men and women newly diagnosed with cancer was 0.7:1.4. Cancers of the breast, cervix, and ovary were the most common in women; cancers of the stomach, lung, and prostate - in men. Hemoblastoses were more common at a young age, breast cancer – at working age, and stomach cancer – at old age.*

Conclusions: *The statistical information analysis showed that in 2020 the cancers of the mammary gland, stomach, and cervix were leading in the overall cancer structure, with significant differences in different age categories. This determines the need for further improvement of cancer care in Uzbekistan.*

Keywords: *Malignant neoplasms, cancer incidence, cancer incidence structure, Republic of Uzbekistan.*

Introduction: Cancer is considered the leading cause of death and one of the main obstacles to increasing life expectancy. According to Globocan, 19.3 million new cases of malignant neoplasms (MNs) and about 10.0 million deaths from MNs were registered worldwide in 2020. Almost 2.3 million new cancer cases in women were due to breast cancer. Cancers of the breast (11.7%), lung (11.4%), colorectum (10.0%), prostate (7.3%), and stomach (5.6 %) led the cancer incidence structure. Lung cancer remained the leading cause of death from cancer and caused 1.8 million deaths (18%). Other causes of death included cancers of the rectum (9.4%), liver (8.3%), stomach (7, 7%), and breast (6.9%) [1].

According to World Health Organization (WHO), in 2020, MNs were the main cause of death at the age below 70 in 112 countries, the second in frequency cause of death in 183 countries, and the third/fourth – in 23 countries [1, 2].

In general, the burden of cancer morbidity and mortality is growing rapidly worldwide. This trend reflects the annual aging of the population and demographic growth and the changing prevalence of the main risk factors for MNs. Some of these risks are associated with the level of socio-economic development [3, 4].

Strengthening public health and ensuring the upbringing of a mature and harmoniously developed young generation is one of the priority directions of the Republic of Uzbekistan state policy after gaining independence. Currently, Uzbekistan pays special attention to creating conditions for further improving the quality of medical services in all country regions. Improving and modernizing oncological care for the population is one of the main directions of further reforming the health care system and one of the most important priorities for the country's social development [5, 6].

Increasing the life expectancy of cancer patients and improving their quality of life is the most important task of the cancer service. There is an urgent need for a detailed assessment of the state of the cancer service in Uzbekistan on the total and the regions. In our opinion, such an assessment will help identify the problems of cancer care and outline the strategic and tactical ways of problem-solving for the near future.

Statistical information is the basis for the development and monitoring of the results of anti-cancer activities. This article demonstrates detailed analysis of cancer incidence in Uzbekistan.

The study aimed to analyze the cancer incidence trends and structure in the Republic of Uzbekistan in 2020.

Materials and Methods:

The object of the study was statistical data on all cases of malignant neoplasms in the Republic of Uzbekistan obtained from the reports provided by oncological institutions in the state form of accounting and reporting approved by the Ministry of Health of the Republic of Uzbekistan – No. 7 "Information on diseases of malignant neoplasms."

To calculate all indicators, we used the data of the State Statistics Committee of the Republic of Uzbekistan on the average annual population by region for 2020.

Results:

In 2020, 21,976 new cases of malignant (MN) neoplasms were detected in the Republic of Uzbekistan (of them, 9059 (41.2%) and 12917 (58.8%) in males and fe-

S.M. Djanklich – 0000-0001-9881-4149, e-mail: *saydesha@mail.ru*

males, respectively). The growth rate of this indicator was negative compared to 2019 and amounted to -12.1% (in 2019, the growth rate was positive and amounted to 5.4%). The incidence rate of malignant tumors per 100,000 population of the Republic of Uzbekistan was 64.8. Due to the difficulties in cancer cases registration during the Covid-19 pandemic, this figure in 2020 was quite low [7, 8].

In the structure of cancer incidence for 2020, the leading positions were retained by cancers of the breast, stomach, and cervix with incidence rates of 9.8; 5.1; and 4.8 per 100,000 population, respectively (Figure 1).

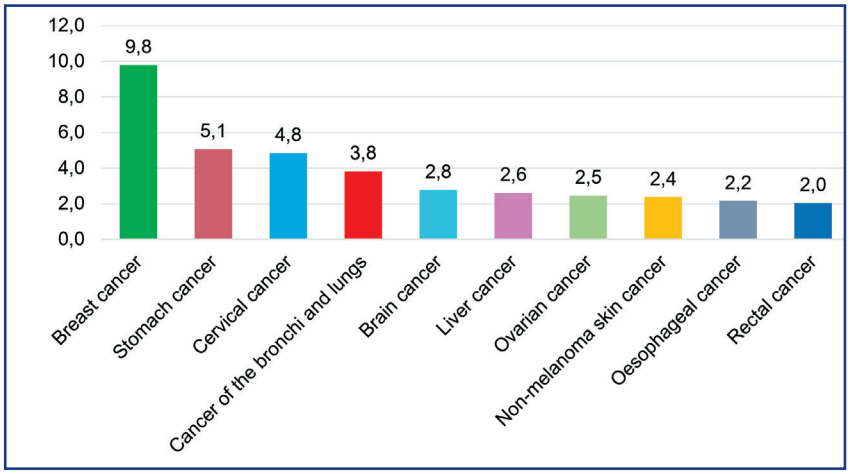

Figure 1 – The structure of cancer incidence in the Republic of Uzbekistan, 2020

The structure of female cancer incidence was as follows: breast cancer – 19.5‰, cervical cancer – 9.7‰, and ovarian cancer – 4.9‰. In males, the cancer incidence was led by the cancers of the stomach – 6.2‰, the bronchi and lungs – 5.4‰, and the prostate – 3.0‰ (Figures 2, 3).

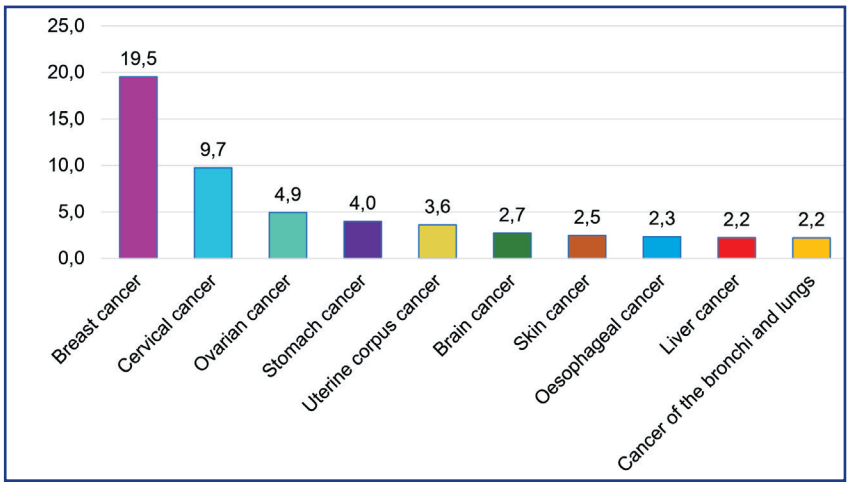

Figure 2 – The structure of female cancer incidence in the Republic of Uzbekistan, 2020

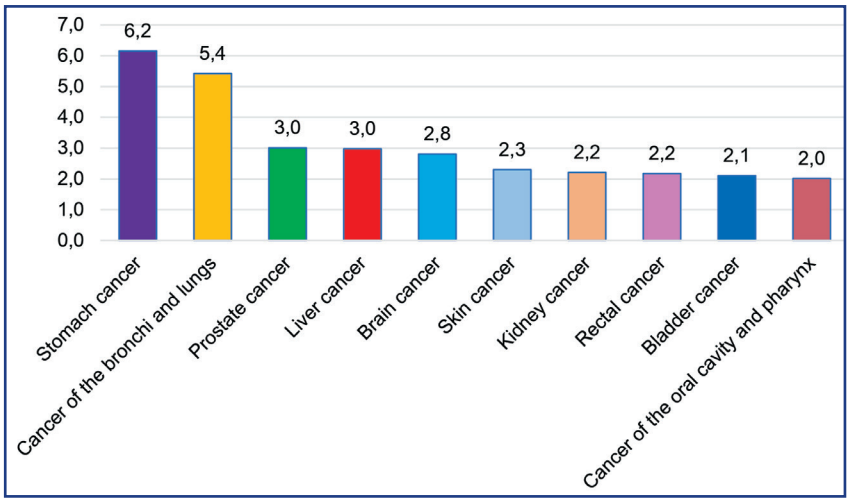

Figure 3 – The structure of male cancer incidence in the Republic of Uzbekistan, 2020

Worth noting that the proportion of MN of the digestive system in women (12.5%) was twice lower than in men (24.6%). Every 4th MN in men (11.4%) was localized in the respiratory organs; in women, the share of this MN was four times lower (3.4%). The share of MN of the head, neck, and urinary system organs in men was 2.5 times higher than in women (Figure 4).

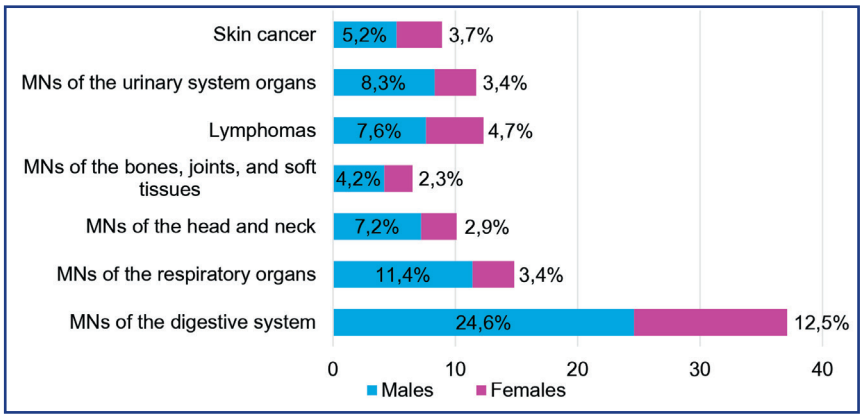

Figure 4 – Shares of malignant neoplasms of various organs and systems in men and women in Uzbekistan

The study of the incidence rate by age categories showed a constant increase in this indicator until the age of 70-74, but with a sharp decline in cancer incidence at 75+. Most likely, this indicates that in old age, the true cause of death has not been sufficiently studied (Figure 5).

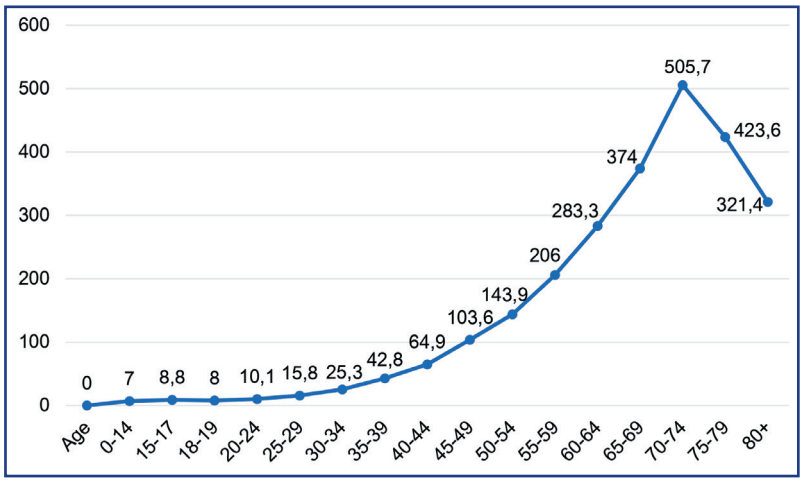

Figure 5 – Incidence rate per 100,000 population by age, 2020

The study of shares of all new cancer cases by age showed the predominance of hemoblastoses (26.%), cancers of the brain (16.3%), bones and joints (6.9%), and kidneys (5,7%) at the age below 30. At the age of 30-45, the cancers of the breast (23.5%), cervix (10,8%), and brain (8.8%) prevailed. At the age of 45-65, the cancers of the breast (18.2%), cervix (10.0%), stomach (7.6%), and lung (7.3%) were most common. In aged people, the cancers of the stomach (10.5%), lung (9.2%), and skin (8.3%) prevailed (Figures 6, 7).

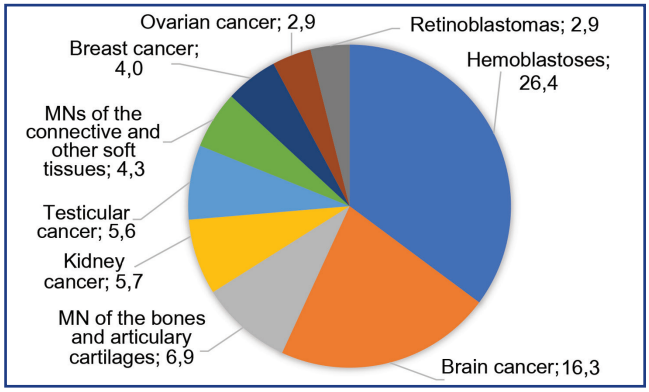

Figure 6 – Malignant neoplasms, most common at the age below 30 in Uzbekistan, 2020 (%)

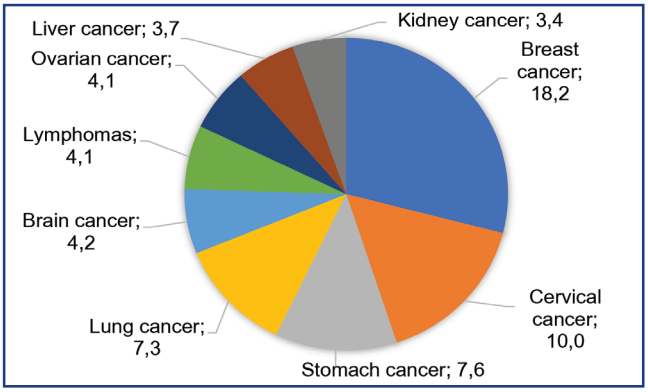

Figure 7 – Malignant neoplasms, most common at the age of 45-65 in Uzbekistan, 2020 (%)

At that, at the age of 30 to 45, brain cancer (14.3%), lymphomas (13.6%), testicular cancer (10.0%), and stomach cancer (8.0%) prevailed in males. Breast cancer (34.3%), cervical cancer (15,9%), lymphomas (6.4%), and brain cancer (6.3%) prevailed in females (Figures 8, 9).

The incidence structure at the age of 45-65 also differed by sex. In males of this age, the incidence structure was dominated by the cancers of the lung (13.5%), stomach (13.2%), and liver (6.0%); in females – the cancers of the breast (29.5%), cervix (16.3%), and ovary (6.7%). At the age of 65+, the male incidence structure was dominated by the cancers of the stomach (14.0%), lung (13,1%), and prostate (8.8%); in females – the cancers of the breast (17.8%), skin (9.4%), and cervix (7.5%). The share of skin malignancies (8.5% in men and 9.4% in women) shows their notable significance at this age (Figures 10, 11).

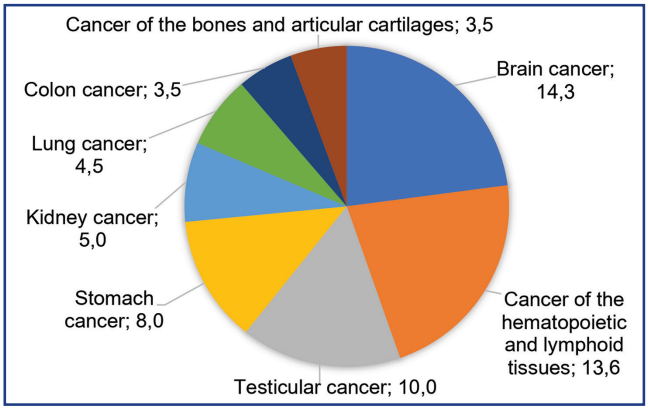

Figure 8 – Malignant neoplasms, most common in males at the age of 30-45 in Uzbekistan, 2020 (%)

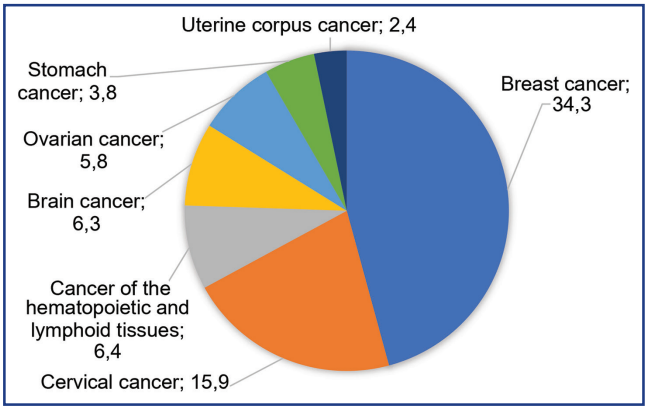

Figure 9 – Malignant neoplasms, most common in females at the age of 30-45 in Uzbekistan, 2020 (%)

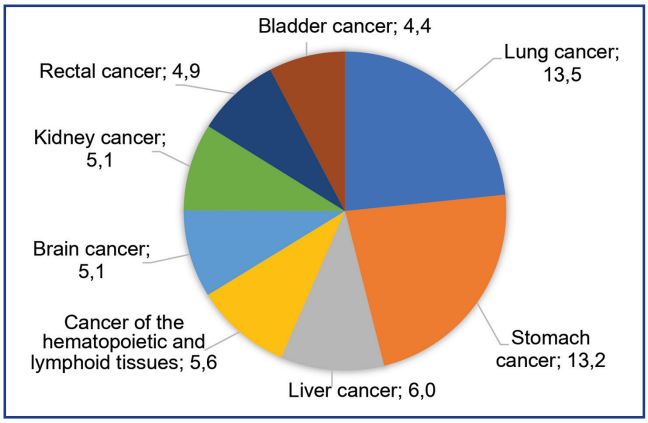

Figure 10 – Malignant neoplasms, most common in males at the age of 45-65 in Uzbekistan, 2020 (%)

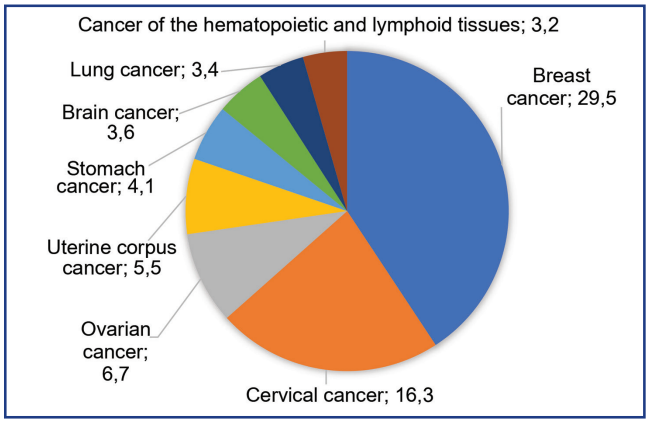

Figure 11 – Malignant neoplasms, most common in females at the age of 45-65 in Uzbekistan, 2020 (%)

The highest incidence by region of Uzbekistan per 100 000 population in 2020 was registered in the city of Tashkent (190.4), and in Bukhara (82.3) and Tashkent (70.2) regions. In turn, the lowest cancer incidence was registered in Syrdarya (35.1), Surkhandarya (44.2), and Samarkand (48.0) regions (Figure12).

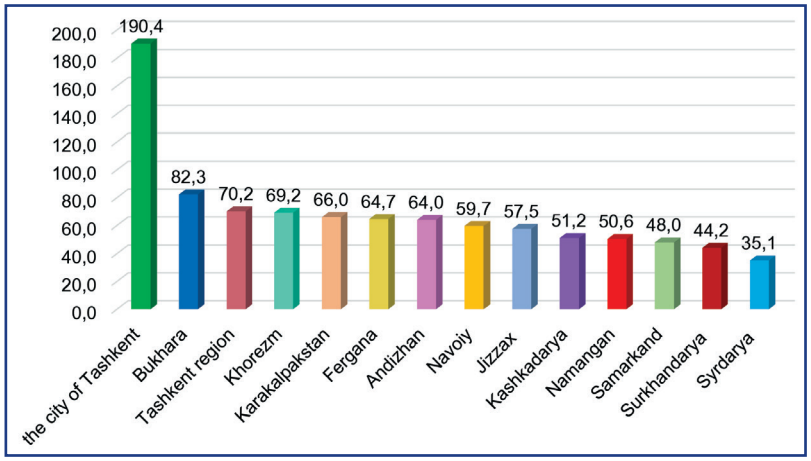

Figure 12 – Cancer incidence per 100 000 population by region of Uzbekistan, 2020

Conclusions:

The statistical information analysis showed that in 2020 the cancers of the mammary gland, stomach, and cervix were leading in the overall cancer structure, with significant differences in different age categories. In men, cancers of the stomach, lung, and prostate were most frequent; in women – cancers of the breast, cervix, and ovary. Cancer incidence in Uzbekistan was the highest at the age of 65-75; by regions – in the city of Tashkent and Bukhara and Tashkent regions. Hemoblastoses prevailed in children; lung cancer and breast cancer – in males and females aged 30-45, respectively. The obtained statistics are the main basis for developing measures aimed at improving the cancer incidence and mortality rates in the Republic of Uzbekistan.

References:

1. Sung H., Ferlay J., Siegel R.L., Laversanne M., Soerjomataram I., Jemal A., Bray F. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries // CA Cancer J Clin. – 2021. – Vol. 71. – P. 209-249. https://doi.org/10.3322/caac.21660;

2. World Health Organization (WHO). Global Health Estimates 2020: Deaths by cause, age, sex, by country and by region, 2000-2019. – 2020. // who.int/data/gho/data/themes/mortality-and-global-health-estimates/ghe-leading-causes-of-death. 11.12.2020;

3. Omran A.R. The epidemiologic transition. A theory of the epidemiology of population change // Milbank Mem. Fund Q. – 1971. – Vol. 49. – P. 509-538;

4. Gersten O., Wilmoth J.R. The cancer transition in Japan since 1951 // Demogr. Res. – 2002. – Vol. 7. – P. 271-306;

5. Postanovlenie Prezidenta Respubliki Uzbekistan. O merax po dal'nejshemu razvitiyu onkologicheskoj pomoshhi naseleniyu Respubliki Uzbekistan na 2017-2021 gody: utv. 4 aprelya 2017 goda, №PP-2866 [Resolution of the President of the Republic of Uzbekistan. On measures for the further development of cancer care for the population of the Republic of Uzbekistan for 2017-2021: appr. on April 4, 2017, No. RR-2866];

6. Postanovlenie Prezidenta Respubliki Uzbekistan. O dal'nejshem sovershenstvovanii sistemy okazaniya naseleniyu gematologicheskix i onkologicheskix uslug: utv. 27 maya 2021 goda, №PP-5130 [Resolution of the President of the Republic of Uzbekistan. On further improvement of the system of rendering hematological and oncological services to the population: appr. on May 27, 2021, No. RR-5130];

7. Gosudarstvennye vedomstvennye otchetnye formy MZ RUz "Svedeniya o zabolevaniyah zlokachestvennymi novoobrazovaniyami" – forma №7 za 2015-2019 gg. [State industry reporting forms of the Ministry of Health of the Republic of Uzbekistan "Information on diseases of malignant neoplasms" – form No. 7 for 2015-2019];

8. Tillyashajxov M.N., Ibragimov Sh.N., Dzhanklich S.M. Sostoyanie onkologicheskoj pomoshhi naseleniyu Respubliki Uzbekistan v 2019 godu. – Tashkent, 2019. – 165 s. [Tillyashaikhov M.N., Ibragimov Sh.N., Dzhanklich S.M. The state of cancer care to the population of the Republic of Uzbekistan in 2019. – Tashkent, 2019. – 165 p.].

ТҰЖЫРЫМ

М.Н. Тилляшайхов[1], С.М. Джанклич[1], Ш.Н. Ибрагимов[1], О.А. Имамов[1]

[1]Өзбекстан Республикасы ДСМ Республикалық мамандандырылған онкология және радиология ғылыми-практикалық медициналық орталығы, Ташкент, Өзбекстан Республикасы

Өзбекстан Республикасындағы онкологиялық аурулардың құрылымын талдау

Өзектілігі: *Globocan мәліметтері бойынша, 2020 жылы бүкіл әлемде қатерлі ісіктердің 19,3 млн. жаңа жағдайы тіркелген. Әйелдерде сүт безі қатерлі ісігі жиі диагноз қойылған онкологиялық патологияға айналды, одан кейін өкпе қатерлі ісігі, колоректальды қатерлі ісік, қуық асты безі қатерлі ісігі және асқазан қатерлі ісігі пайда болды. Өз кезегінде Өзбекстанда онкологиялық аурулардың жалпы құрылымында сүт безі, асқазан, жатыр мойны, бронхтар мен өкпе мен мидың қатерлі ісіктері жетекші орын алады.*

Зерттеу мақсаты: *2020 жылы Өзбекстан Республикасындағы онкологиялық аурулардың тенденциялары мен құрылымын талдау.*

Нәтижелері: *Өзбекстанда 2020 жылы 21976 жаңа қатерлі ісік тіркелді. Алғаш рет анықталған ерлер мен әйелдердің арақатынасы 0,7:1,4 құрады. Сүт безінің, жатыр мойнының және аналық бездердің қатерлі ісіктері әйелдерде жиі кездесетін онкологиялық патологияға айналды, ал ерлерде асқазанның, бронхтың және өкпенің және қуық асты безінің қатерлі ісіктері жиі кездеседі. Жас кезінде гемобластоздар жиі диагноз қойылады, еңбекке қабілетті жаста – сүт безінің қатерлі ісіктері, ал егде жаста – асқазанның қатерлі ісіктері.*

Қорытындылар: *Статистикалық ақпаратты талдау 2020 жылы онкологиялық аурулардың жалпы құрылымында сүт безінің, асқазанның және жатыр мойнының қатерлі ісіктері жетекші орын алғанын көрсетті. Әр түрлі жас санатарында қатерлі ісік ауруының құрылымында айтарлықтай айырмашылықтар байқалды. Бұл Өзбекстандағы онкологиялық көмекті одан әрі жетілдіру қажеттілігін айқындайды.*

Түйінді сөздер: *қатерлі ісіктер (ҚІ), онкологиялық аурулар, онкологиялық аурулардың құрылымы, Өзбекстан Республикасы.*

АННОТАЦИЯ

М.Н. Тилляшайхов[1], С.М. Джанклич[1], Ш.Н. Ибрагимов[1], О.А. Имамов[1]

[1]Республиканский специализированный научно-практический медицинский центр онкологии и радиологии МЗ РУ, Ташкент, Республика Узбекистан

Анализ структуры онкологической заболеваемости в Республике Узбекистан

Актуальность: *По данным Globocan, в 2020 г. во всем мире было зарегистрировано 19,3 млн. новых случаев злокачественных новообразований (ЗН). Рак молочной железы у женщин стал наиболее часто диагностируемой онкологической патологией, за ним следует рак легких, колоректальный рак, рак предстательной железы и рак желудка. В свою очередь, в Узбекистане в общей структуре онкологической заболеваемости ведущие позиции занимают ЗН молочной железы, желудка, шейки матки, бронхов и легких и головного мозга.*

Цель исследования: *проанализировать тенденции и структуру онкозаболеваемости в Республике Узбекистан в 2020 г.*

Результаты: *В Узбекистане в 2020 г. зарегистрировано 21976 новых случаев ЗН. Соотношение впервые выявленных мужчин и женщинам составило 0,7:1,4. ЗН молочной железы, шейки матки и яичников стали наиболее часто диагностируемыми онкологическими патологиями у женщин, а у мужчин чаще встречались ЗН желудка, бронхов и легких и предстательной железы. В молодом возрасте чаще диагностируются гемобластозы, в трудоспособном возрасте – ЗН молочной железы, а в пожилом возрасте – ЗН желудка.*

Выводы: *Анализ статистической информации показал, что в общей структуре онкологических заболеваний в 2020 году лидирующие позиции занимали злокачественные новообразования молочной железы, желудка и шейки матки. В различных возрастных категориях в структуре онкологической заболеваемости отмечались существенные различия. Это определяет необходимость дальнейшего совершенствования онкологической помощи в Узбекистане.*

Ключевые слова: *злокачественные новообразования (ЗН), онкозаболеваемость, структура онкозаболеваемости, Республика Узбекистан.*

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A.A. KHOZHAYEV[1], D.R. KAIDAROVA[1,2], A.K. DZHAKIPBAEVA[1], K.K. SMAGULOVA[2], T.T. SADYKOVA[1,2], A.V. RUBANOVA[1], N.A. AMANBEKOV[1], A.T. KEMELZHANOV[1], A.B. TOKBAY[1]

[1]Asfendiyarov Kazakh National Medical University, Almaty, the Republic of Kazakhstan;
[2]JSC "Kazakh Institute of Oncology and Radiology," Almaty, the Republic of Kazakhstan

Epidemiology of colorectal cancer in the Republic of Kazakhstan

Relevance: *Today, colorectal cancer is one of the most important health issues in Kazakhstan and worldwide. Colorectal cancer leading positions in the general structure of oncopathologies force clinicians to develop ways to improve its statistical indicators.*

The purpose of the study *was to investigate the epidemiological aspects of colorectal cancer in the Republic of Kazakhstan in 2010-2019.*

Results: *The article presents and analyzes the epidemiological indicators of colorectal cancer in the Republic of Kazakhstan over the past decade. The incidence trends were studied considering the territorial characteristics, early detection, and neglect indicators for this type of malignant neoplasms in this country. We also analyzed the 5-year survival, one-year fatality, and mortality rates for the studied period. Comprehensive comparative analysis of these epidemiological indicators made it possible to visualize the results of many years of work to improve oncological indicators and formulate further improvement directions.*

Conclusions: *An analytical assessment of colorectal cancer statistical indicators of over a decade showed an increase in incidence, with some regions leading year to year. However, such indicators as early detection, one-year fatality, and mortality from colorectal cancer have improved.*

Keywords: *colorectal cancer (CRC), colon cancer, rectal cancer, epidemiology.*

Introduction: Colorectal cancer (CRC) is the third most common cancer, with approximately 1.36 million new cases and about 694,000 deaths per year worldwide [1]. Morbidity and mortality from CRC in the world vary greatly by geography [2]. While CRC incidence is stabilizing in parts of northern and western Europe and the United States, rates are increasing rapidly in the economically developed countries of the Asia-Pacific region such as Australia, New Zealand, Japan, Korea, and Singapore. The five-year survival rate ranges from 28% to 75% [1, 3, 4].

As noted by Onyoh et al. [5], in 2018, Asia had the highest proportion of cases of morbidity (51.8) and deaths (52.4) due to CRC per 100,000 population in the world. This growth can be attributed to economic growth, environmental factors, and the transition to a Western lifestyle. Risk factors include high consumption of red and processed meat, obesity and physical inactivity, smoking, alcohol consumption, and population aging. Japan, South Korea, Singapore, and Taiwan have launched nationwide CRC screening programs to curb the upward trend.

Kazakhstan also takes active actions aimed at CRC prevention and early diagnostics. According to Kaidarova et al., "in CRC incidence by stage, an increase was due to stages I and II share growth since 2011 when population CRC screening was introduced. This allows us to speak about a positive economic effect of screening since treatment of stages I and II of CRC costs significantly less" [6].

Materials and Methods: The authors analyzed the statistical materials of the indicators of the oncological service of the Republic of Kazakhstan for a decade, from 2010 to 2019 [7-16].

Results and Discussion: In statistical data processing and clinical protocols for diagnostics and treatment, colon cancer and rectal cancer, which constitute the concept of CRC, are viewed separately. This is due to several factors that determine the approaches to this pathology's diagnostics, treatment, and rehabilitation. A comparative analysis of trends of intensive indicators of colon and rectal cancers' incidence per 100,000 population of the Republic of Kazakhstan in 2010-2019 is provided in Figure 1.

As shown in Figure 1, the intensive colon cancer incidence rate in the analyzed period peaked in 2015 (9.8); in 2019, this indicator was 9.2. At the same time, there was a dynamic increase in rectal cancer incidence over a decade from 7.2 to 8.7 in 2019.

One of the critical indicators of oncological service effectiveness is the improvement of early cancer diagnostic indicators and a decrease in neglect. This is especially crucial for visually accessible localizations, including rectal cancer (Figure 2).

A.A. Khozhayev – 0000-0002-0499-52584, e-mail: *akhozhayev@mail.ru*
D.R. Kaidarova – 0000-0002-0969-5983
A.K. Dzhakipbaeva – 0000-0002-1647-8581

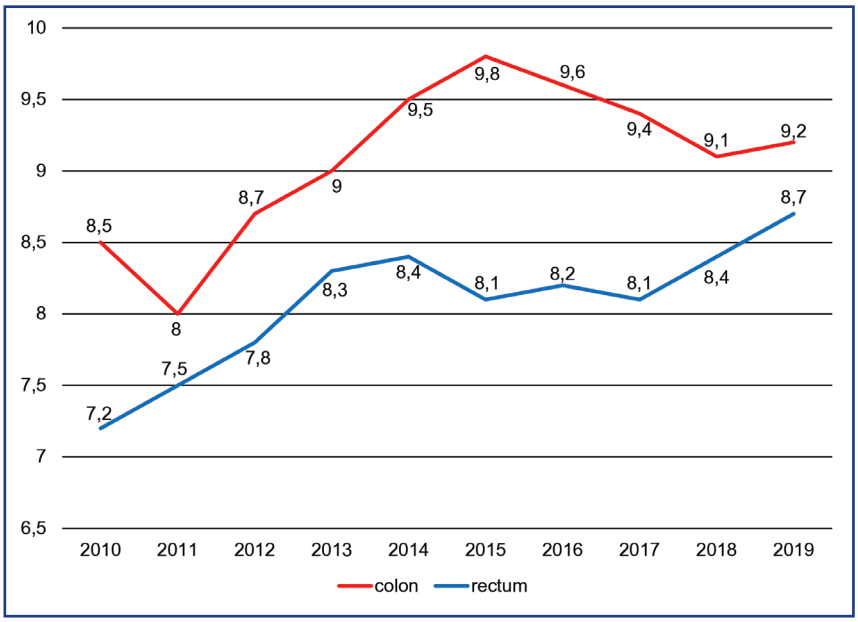

Figure 1 – Trends in intensive rates of colon and rectal cancer incidence per 100,000 population of the Republic of Kazakhstan, 2010-2019

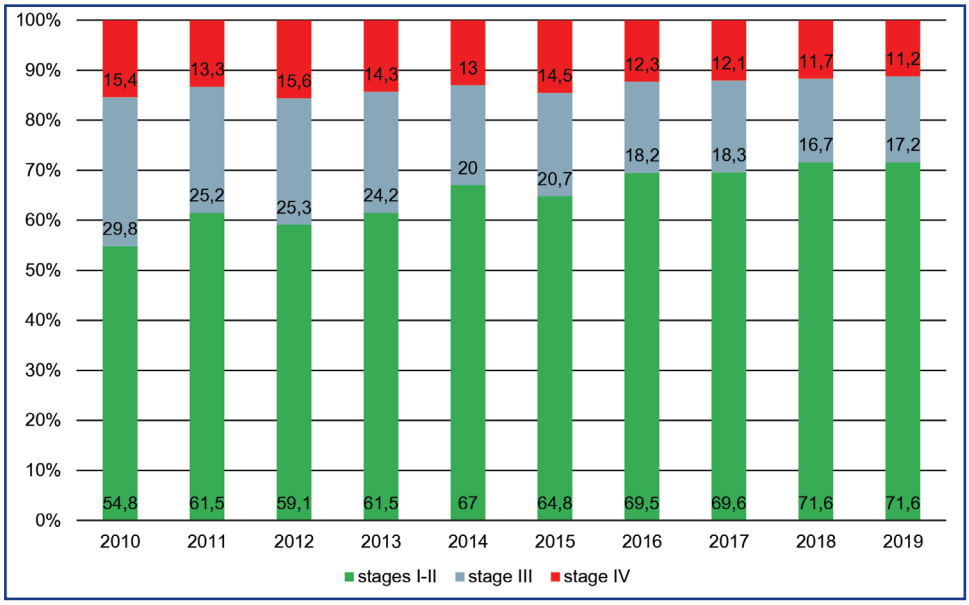

Figure 2 – The proportion of stages I-II, III, and IV among newly diagnosed rectal cancer cases among the population of the Republic of Kazakhstan, 2010-2019, in %

The analysis of the proportion of early (I and II) and advanced (III and IV) stages among newly diagnosed rectal cancer cases among the population of the Republic of Kazakhstan in 2010-2019 showed a 1.3-times increase in rectal cancer early detection, from 54.8% in 2010 to 71.6% in 2019.

The proportion of advanced cases decreased: with the locally spread stage III - from 29.8% at the beginning of the analyzed decade to 17.2% in 2019, and with the generalized stage IV - from 15.4% in 2010 to 11.2% by the end of the period.

The following figure shows the proportion of stages I-II, III, and IV among newly diagnosed colon cancer cases among the population of the Republic of Kazakhstan (in %) (Figure 3).

This diagram shows a shift in the proportions towards a decrease of stage IV cases and an increase in early stages over time. While in 2010, 18.7% of patients, that is, almost every fifth patient, were diagnosed with an advanced stage of colon cancer, this indicator decreased by 5.9%, amounting to 12.8%. The proportion of stage I and II cases increased by 26%, from 31.4% in 2010 to 57.4% in 2019. By the end of the analyzed period, colon cancer was detected early in three out of five patients.

Next, let us review the territorial rates of colon and rectal cancers incidence among the population of the Republic of Kazakhstan (crude rates per 100,000 for 2010-2014 and 2015-2019) (Figures 4 and 5).

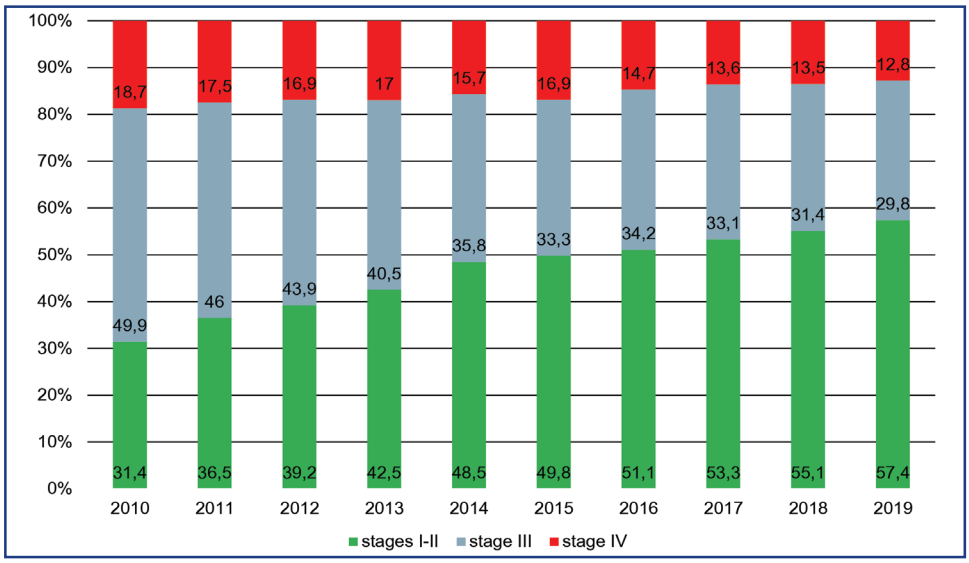

Figure 3 – The proportion of stages I-II, III, and IV among newly diagnosed colon cancer cases among the population of the Republic of Kazakhstan, 2010-2019, in %

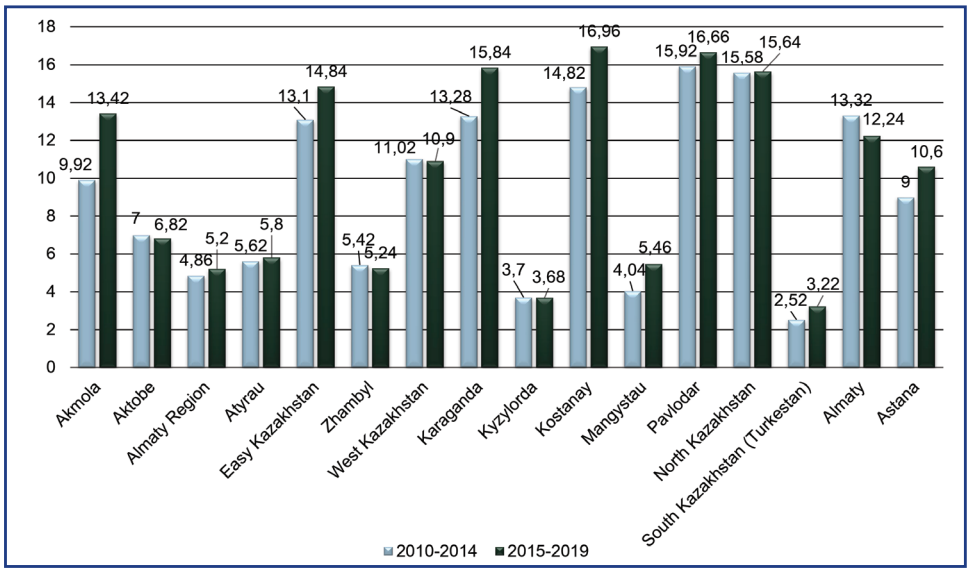

Figure 4 – Territorial rates of colon cancer incidence among the population of the Republic of Kazakhstan (crude rates per 100,000 for 2010-2014 and 2015-2019)

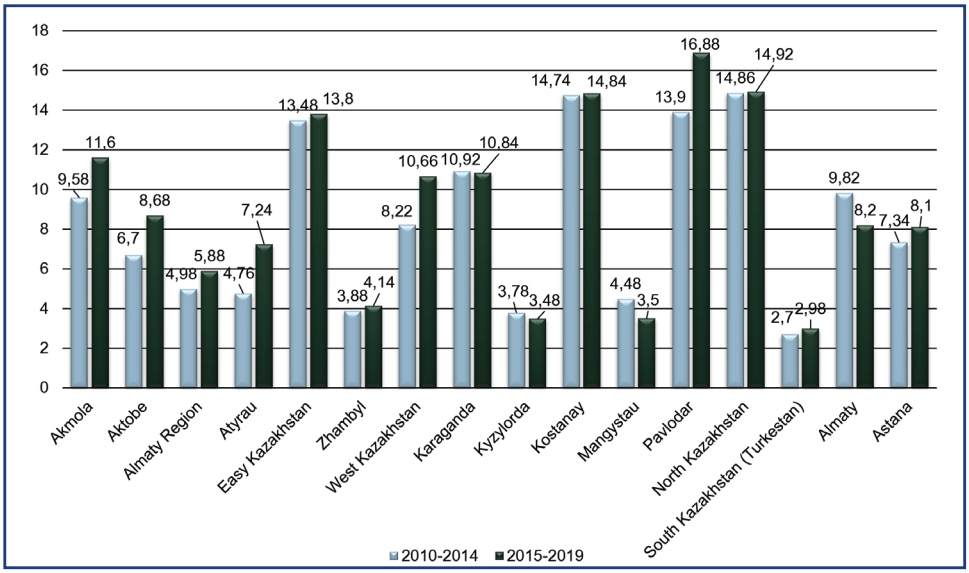

Figure 5 – Territorial rates of rectal cancer incidence among the population of the Republic of Kazakhstan (crude rates per 100,000 for 2010-2014 and 2015-2019)

Figures 4 & 5 evidence territorial differences in the large intestine cancer incidence rates. Some regions like Pavlodar, Kostanay, North Kazakhstan, and East Kazakhstan (also Karaganda region for colon cancer) led in those cancers' incidence from year to year, in 2010-2014 and 2015-2019. The lowest CRC incidence was registered in South Kazakhstan (Turkestan), Kyzylorda, and Mangystau regions (also Zhambyl region for rectal cancer).

Now, we will compare the 5-year survival of CRC patients by year during the study period (Figure 6).

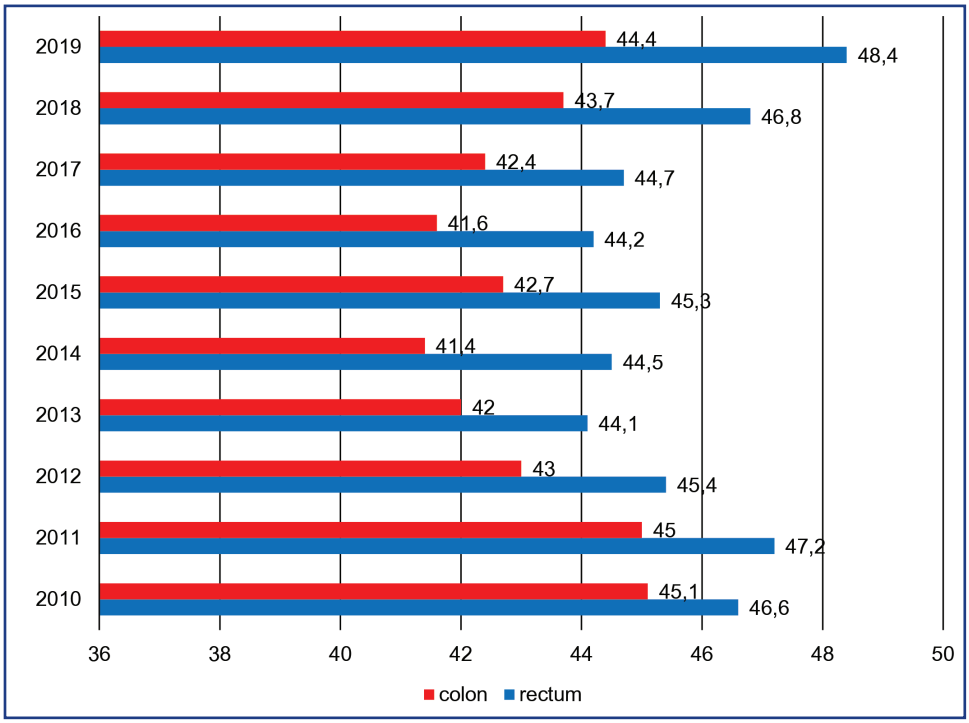

Figure 6 – Overall 5-year survival of patients with rectum and colon cancers in the Republic of Kazakhstan, 2010-2019

Data presented in Figure 6 indicates an overall 5-year survival of 48.4% in colon cancer and 44.4% in rectal cancer in 2019. These indicators are moderate on the global scale and indicate that oncologists and related specialists have to increase activity in this direction.

Besides the overall 5-year survival of CRC patients, we studied the trends in one-year mortality (Figure 7) and intensive mortality in the colon and rectal cancers over the study period (Figure 8).

Figures 7 and 8 show that the one-year mortality has decreased from 29.7 in 2010 to 19.4 in 2019 for rectal cancer and from 33.8 to 18.7 for colon cancer. We see the same trend in the intensive mortality rates – a decrease from 4.6 to 3.6 for rectal cancer and 4.9 to 3.9 for colon cancer.

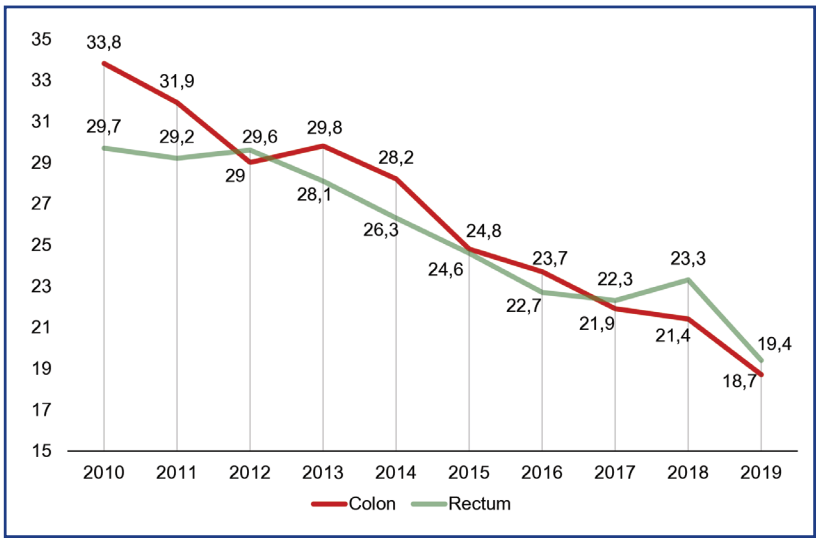

Figure 7 – Trends in one-year mortality from colon and rectal cancers in the Republic of Kazakhstan, 2010-2019 (%)

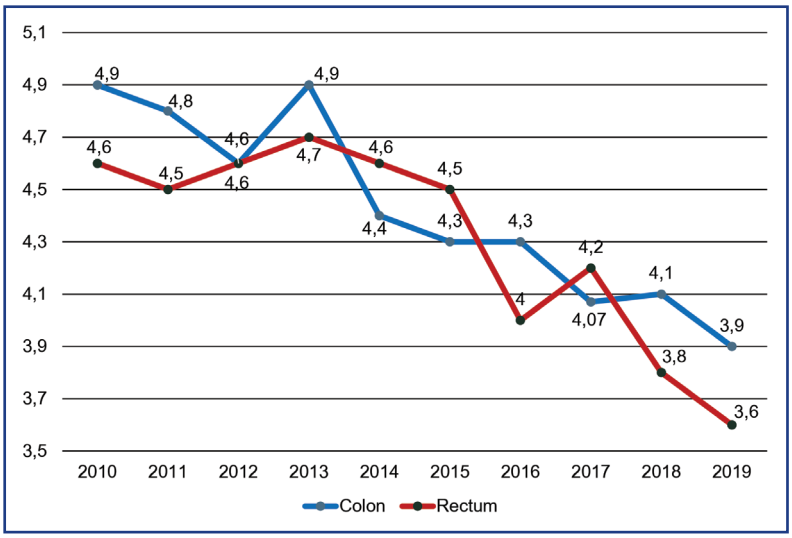

Figure 8 – Trends in intensive rates of mortality from rectal and colon cancers per 100,000 population of the Republic of Kazakhstan, 2010-2019

Conclusion: Based on the study, the authors made the following conclusions:

1. Over the past decade, the incidence of colorectal cancer has increased worldwide and in the Republic of Kazakhstan.

2. At that, early diagnostics indicators for CRC have improved: the proportion of early (stages I-II) detection of the disease has increased for both colon and rectal cancers, the latter being a visually accessible localization. In 2010-2019, this proportion increased from 54.8% to 71.6% for rectal cancer and from 31.4% to 57.4% for colon cancer.

3. Simultaneously, the share of stage IV CRC at diagnosing has decreased in 2010-2019: from 15.4% to 11.2% for rectal cancer; and from 18.7% to 12.8% for colon cancer. Notably, the proportion of stage III rectal cancer as a visually accessible localization has decreased, from 29.8% in 2010 to 17.2% in 2019.

The territorial rates of cancer incidence show that some regions lead in CRC incidence from year to year (Pavlodar, Kostanay, North Kazakhstan, East Kazakhstan regions). This urges active primary and secondary CRC prevention in these regions, more active work of specialists of other related specialties – ecologists, healthy lifestyle specialists, nutritionists, etc. At the same time, in South Kazakhstan, Kyzylorda, and Mangystau regions, CRC incidence rates are negligibly small, judging by national or global standards.

5. The overall 5-year survival rate in 2019 was 48.4% in colon cancer and 44.4% in rectal cancer. These indicators are on average level compared to other countries.

6. In addition, the annual mortality and overall mortality from the cancers of the rectum and colon are decreasing every year. The annual death rates from rectal cancer were 29.7 in 2010 and 19.4 in 2019, and 33.8 and 18.7 from colon cancer. The annual mortality rates were 4.6 and 3.6 for rectal cancer, 4.9 and 3.9 for colon cancer.

References:

1. Park S., Jee S.H. Epidemiology of Colorectal Cancer in Asia-Pacific Region. In: Kim N., Sugihara K., Liang JT. (eds). Surgical Treatment of Colorectal Cancer. Springer Singapore, 2018. – P. 3-10. https://doi.org/10.1007/978-981-10-5143-2;

2. Dekker E., Tanis P.J., Vleugels J.L.A., Kasi P.M, Wallace M.B. Colorectal cancer // Lancet. – 2019. – Vol. 394 (10207) – P. 1467-1480. https://doi.org/10.1016/s0140-6736(19)32319-0;

3. Canouï-Poitrine F., Martinez-Tapia C., Guittet L. et al. Epidemiology of Colorectal Cancer: Incidence, Survival, and Risk Factors. In: de'Angelis N., Di Saverio S., Brunetti F. (eds). Emergency Surgical Management of Colorectal Cancer. – Springer International Publishing, 2019. – P. 15-29. https://doi.org/10.1007/978-3-030-06225-5;

4. Krajewska J. Epidemiology of Colorectal Cancer. In: Fichna J. (eds) Introduction to Gastrointestinal Diseases. – Springer International Publishing, 2017. – Vol. 2. – P. 99-103. https://doi/org/10.1007/978-3-319-59885-7;

5. Onyoh E.F., Hsu W.F., Chang L.C., Lee Y.C., Wu M.S., Chiu H.M. The Rise of Colorectal Cancer in Asia: Epidemiology, Screening, and Management // Curr. Gastroenterol. Rep. – 2019. – Vol. 21(8). – P. 36. https://doi.org/10.1007/s11894-019-0703-8;

6. Kaidarova D.R., Zhylkaidarova A.ZH., Axetov A.A. i dr. Izmeneniye epidemiologicheskoy kartiny kolorektal'nogo raka v Kazakhstane posle vvedeniya skrininga // Vestnik Avitsenny. – 2018. – T. 20, № 2-3. – S. 157-164 [Kaidarova D.R., Zhylkaidarova A.Zh., Akhetov A.A. et al. Changes in the epidemiological picture of colorectal cancer in Kazakhstan after the introduction of screening // Avicenna Bulletin. – 2018. – Vol. 20, No. 2-3. – P. 157-164.]. https://doi.org/10.25005/2074-0581-2018-20-2-3-157-165 (in Russian);

7. Kaidarova D.R., Baltabekov N.T., Dushimova Z.D. et al. Pokazateli onkologicheskoj sluzhby Respubliki Kazaxstan za 2019 god: statisticheskie i analiticheskie materialy. – Almaty, 2020. – 225 s. [Kaidarova D.R., Baltabekov N.T., Dushimova Z.D. et al. Indicators of the oncological service of the Republic of Kazakhstan for 2019: statistical and analytical materials. – Almaty, 2020. – 225 p.] (in Russian);

8. Kaidarova D.R., Chingisova Zh.K., Shatkovskaya O.V. et al. Pokazateli onkologicheskoj sluzhby Respubliki Kazaxstan za 2018 god: statisticheskie i analiticheskie materialy. – Almaty, 2019. – 209 s. [Kaidarova D.R., Chingisova Zh.K., Shatkovskaya O.V. et al. Indicators of the oncological service of the Republic of Kazakhstan for 2018: statistical and analytical materials. – Almaty, 2019. – 209 p.] (in Russian);

9. Kaidarova D.R., Chingisova Zh.K., Shatkovskaya O.V. et al. Pokazateli onkologicheskoj sluzhby Respubliki Kazaxstan za 2017 god: statisticheskie i analiticheskie materialy. – Almaty, 2018. – 114 s. [Kaidarova D.R., Chingisova Zh.K., Shatkovskaya O.V. et al. Indicators of the oncological service of the Republic of Kazakhstan for 2017: statistical and analytical materials. – Almaty, 2018. – 114 p.] (in Russian);

10. Kaidarova D.R., Chingisova Zh.K., Shatkovskaya O.V. et al. Pokazateli onkologicheskoj sluzhby Respubliki Kazaxstan za 2016 god: statisticheskie i analiticheskie materialy. – Almaty, 2017. – 182 s. [Kaidarova D.R., Chingisova Zh.K., Shatkovskaya O.V. et al. Indicators of the oncological service of the Republic of Kazakhstan for 2016: statistical and analytical materials. – Almaty, 2017. – 182 p.] (in Russian);

11. Kaidarova D.R., Auezova E.T., Chingisova Zh.K. et al. Pokazateli onkologicheskoj sluzhby Respubliki Kazaxstan za 2015 god: statisticheskie i analiticheskie materialy. – Almaty, 2016. – 168 s. [Kaidarova D.R., Auezova E.T., Chingisova Zh.K. et al. Indicators of the oncological service of the Republic of Kazakhstan for 2015: statistical and analytical materials. – Almaty, 2016. – 168 p.] (in Russian);

12. Nurgaziev K.Sh., Baipeisov D.M., Auezova E.T. et. al. Pokazateli onkologicheskoj sluzhby Respubliki Kazaxstan za 2014 god: statisticheskie i analiticheskie materialy. – Almaty, 2015. – 138 s. [Nurgaziev K.Sh., Baypeisov D.M., Auezova E.T. et al. Indicators of the oncological service of the Republic of Kazakhstan for 2014: statistical and analytical materials. – Almaty, 2015. – 138 p.] (in Russian);

13. Nurgaziev K.Sh., Baipeisov D.M., Seisenbayeva G.T. et. al. Pokazateli onkologicheskoj sluzhby Respubliki Kazaxstan za 2013 god: statisticheskie i analiticheskie materialy. – Almaty, 2014. – 127 s. [Nurgaziev K.Sh., Baypeisov D.M., Seisenbayeva G.T. et. al. Indicators of the oncological service of the Republic of Kazakhstan for 2014: statistical and analytical materials. – Almaty, 2015. – 138 p.] (in Russian);

14. Nurgaziev K.Sh., Seitkazina G.D., Baipeisov D.M. et. al. Pokazateli onkologicheskoj sluzhby Respubliki Kazaxstan za 2012 god: statisticheskie i analiticheskie materialy. – Almaty, 2013. – 104 s. [Nurgaziev K.Sh., Seitkazina G.D., Baypeisov D.M. et al. Indicators of the oncological service of the Republic of Kazakhstan for 2012: statistical and analytical materials. – Almaty, 2013. – 104 p.] (in Russian);

15. Nurgaziev K.Sh., Seitkazina G.D., Baipeisov D.M. et. al. Pokazateli onkologicheskoj sluzhby Respubliki Kazaxstan za 2011 god: statisticheskie i analiticheskie materialy. – Almaty, 2012. – 108 s. [Nurgaziev K.Sh., Seitkazina G.D., Baypeisov D.M. et al. Indicators of the oncological service of the Republic of Kazakhstan for 2011: statistical and analytical materials. – Almaty, 2012. – 108 p.] (in Russian);

16. Nurgaziev K.Sh., Seitkazina G.D., Azhmagambetova A.E. et. al. Pokazateli onkologicheskoj sluzhby Respubliki Kazaxstan za 2010 god: statisticheskie i analiticheskie materialy. – Almaty, 2011. – 108 s. [Nurgaziev K.Sh., Seitkazina G.D., Azhmagambetova A.E. et al. Indicators of the oncological service of the Republic of Kazakhstan for 2010: statistical and analytical materials. – Almaty, 2011. – 108 p.] (in Russian).

ТҰЖЫРЫМ

А.А. Қожаев[1], Д.Р. Қайдарова[1,2], А.К. Жакыпбаева[1], К.К. Смагулова[2], Т.Т. Садыкова[1,2], А.В. Рубанова[1], Н.А. Аманбеков[1], А.Т. Кемелжанов[1], А.Б. Тоқбай[1]

[1]«С.Ж. Асфендияров атындағы қазақ ұлттық медицина университеті» КЕАҚ, Алматы, Қазақстан Республикасы;
[2]«Қазақ онкология және радиология ғылыми зерттеу институты» АҚ, Алматы, Қазақстан Республикасы

Қазақстан Республикасындағы колоректальды қатерлі ісіктің эпидемиологиясы

Өзектілігі. *Бүгінгі таңда колоректальды қатерлі ісік дүние жүзінінде, Қазақстан Республикасында денсаулық сақтау саласының аса маңызды мәселелерінің бірі болып табылады. Онкопатологияның жалпы құрылымында жетекші орынға ие бола отырып, ісіктердің бұл нозологиялық түрі клиницистерді статистикалық көрсеткіштерді жақсарту жолдарын жасауға мәжбүр етеді.*

Зерттеу мақсаты. *2010-2019 жж. аралығында Қазақстан Республикасындағы колоректалды қатерлі ісіктің эпидемиологиялық аспектілерін зерттеу.*

Нәтижелері. *Бұл мақалада соңғы онжылдықта Қазақстан Республикасындағы колоректальды қатерлі ісіктің эпидемиологиялық көрсеткіштері ұсынылған және талданған.*

Аумақтық ерекшеліктерді ескере отырып аурушаңдық қарқыны, біздің еліміздегі қатерлі ісіктердің осы түрінің ерте диагностикасы мен асқыну көрсеткіштері, сондай – ақ 5 жылдық өмір сүру көрсеткіштерімен, бір жылдық өлім-жітім және осы кезеңдегі өлім-жітім көрсеткіштері зерттелді.

Осы эпидемиологиялық көрсеткіштерді кешенді салыстырмалы талдау онкологиялық көрсеткіштерді жақсарту жөніндегі көп жылғы жұмыс нәтижелерін көрнекі түрде көрсетуге және оларды жетілдіру бойынша бағыттарды қалыптастыруға мүмкіндік берді.

Қорытынды. *Колоректалды қатерлі ісіктің он жылдық кезең аралығындағы статистикалық көрсеткіштерін талдап бағалағанда аурушаңдықтың өскенін, бұл ретте осы көрсеткіш бойынша жылдан жылға бірінші орын алатын өңірлер бар екенін көрсетті. Сонымен қатар, ерте диагностика көрсеткіштері жақсарып, бір жылдық өлім-жітім көрсеткіштері төмендегенін байқауға болады.*

Түйінді сөздер: *колоректальды қатерлі ісік, тоқ ішек қатерлі ісігі тік ішек қатерлі ісігі, эпидемиология.*

АННОТАЦИЯ

А.А. Хожаев[1], Д.Р. Кайдарова[1,2], А.К. Джакипбаева[1], К.К. Смагулова[2], Т.Т. Садыкова[1,2], А.В. Рубанова[1], Н.А. Аманбеков[1], А.Т. Кемелжанов[1], А.Б. Токбай[1]

[1]НАО «Казахский национальный медицинский университет им. С.Д. Асфендиярова», Алматы, Республика Казахстан;
[2]АО «Казахский научно-исследовательский институт онкологии и радиологии», Алматы, Республика Казахстан

Эпидемиология колоректального рака в Республике Казахстан

Актуальность: *На сегодняшний день колоректальный рак является одной из наиболее важных проблем здравоохранения как во всем мире, так и в Республике Казахстан. Занимая ведущие позиции в общей структуре онкопатологии, данная нозологическая форма опухолей заставляет клиницистов разрабатывать пути улучшения статистических показателей.*

Цель исследования: *Изучить эпидемиологические аспекты колоректального рака в Республике Казахстан за 2010-2019 годы.*

Результаты: *В данной статье представлены и проанализированы эпидемиологические показатели колоректального рака в Республике Казахстан за последнее десятилетие. Изучена динамика заболеваемости с учетом территориальных особенностей, показатели ранней диагностики и запущенности данного вида злокачественных новообразований в нашей стране, а также – 5-летняя выживаемость, одногодичная летальность и показатели смертности за указанный период. Комплексный сравнительный анализ данных эпидемиологических показателей позволил наглядно продемонстрировать результаты многолетней работы по улучшению онкологических показателей и сформулировать направления по их совершенствованию.*

Заключение: *Аналитическая оценка статистических показателей за десятилетний период показала, что имеется рост заболеваемости колоректальным раком, причем имеются регионы, которые из года в год первенствуют по данному показателю. В то же время улучшаются показатели ранней диагностики и снижаются одногодичная летальность и смертность от колоректального рака.*

Ключевые слова: *колоректальный рак (КРР), рак ободочной кишки (РОК), рак прямой кишки (РПК), эпидемиология.*

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K.T. SHAKEYEV[1,2], N.A.KABILDINA[2], A.M. ZHUMAKAEV[1], A.S. TOKSAMBAEVA[1], S.V. SURMIN[1], A. ELUBAYULY[1], Sh.S. NURALY[2], A.A. KOKIMOV[2]

[1]Multidisciplinary hospital No.3, Karaganda, the Republic of Kazakhstan;
[2]JSC «Karaganda Medical University,» Karaganda, the Republic of Kazakhstan

The capacity of computed tomography in preoperative determination of surgery volume in kidney tumors

Relevance: *Computed tomography allows detecting small tumors. However, surgical tactics cannot always be determined in advance.*

The purpose of the research *was to assess the capacity of computed tomography in the preoperative determination of surgery volume in kidney tumors.*

Results: *548 patients were treated for kidney neoplasms. They were divided into three groups by computed tomography based on the R.E.N.A.L. scale: with a high risk of complications – 265 patients (48.4%), medium risk – 107 (19.5%), and low risk – 176 (32.1%). All operations were performed in the planned volume depending on the identified risk group for complications and resectability of kidney neoplasms; no changes to the plan of surgical interventions were made. The preoperative assessment of the kidney angioarchitectonics and the tumor relation to the pyelocaliceal system and the organ parenchyma helped determine the surgery volume and the possibility for organ-reserving interventions in 283 patients and radical nephrectomy in 265 patients.*

Conclusion: *Such a highly informative method as computed tomography made allows early detection of small-sized kidney tumors to provide an opportunity for organ-preserving surgery and improved treatment outcome.*

Keywords: *Kidney cancer, computed tomography, nephrectomy, kidney resection.*

Introduction:

Renal neoplasms rank 8th (3.81%) in cancer incidence in the Republic of Kazakhstan. The lethality from kidney cancer is 2.6% [1].

In the US, 30 thousand new cases and 12,000 deaths from kidney cancer are annually registered. There is an annual increase in the disease: from 1.5 to 5.9% in the US; in Russia, the growth rate was up to 3.5%. In 2016, 62,700 people in the USA were diagnosed with malignant kidney tumors, and 14,240 died from this disease. Renal cell carcinomas account for nearly 90% of kidney tumors [2].

According to the statistics, kidney cancer accounts for 4-5% of cancer cases in men and less than 3% of cancer cases in women [3]. According to the observations of the Russian oncologists, more than 20,000 new cases of renal malignancies were diagnosed in three years (2015–2018), with no decreasing tendency in the incidence of this disease. Kidney cancer is the most common among all kidney malignancies. Stage I was diagnosed in 47.9% of cases, stage IV – in 19.1%. This fact shows a high informative significance of radio diagnostic methods. High mortality (15.2%) from kidney cancer is mainly due to an advanced process [4, 5].

Nephrobiopsy is a reliable diagnostic method but is not a routine in renal tumors and is not performed in all institutions. In most cases, malignancy is confirmed after renal resection or nephrectomy [3].

Renal biopsy is not a safe technique and is more common during differential diagnostics or choice of therapy in metastatic lesions (6). However, L. Marconi et al. report relatively high diagnostic accuracy of renal biopsy in renal neoplasms at 90.1% despite the biopsy-associated difficulties and possible complications, including implantation metastases [7].

Kusainova B.T. proposes to use cytology to verify benign and malignant renal neoplasms and determine the most common histological variants. This method of morphological verification is of high significance and enables intraoperative determination of further tactics and scope of surgery [8].

It is crucial to preserve the quality of life of patients after renal surgery for neoplasms. On the one hand, the desire to perform organ-preserving surgery is justified; on the other hand, the main principle of radicality sometimes brings the oncourology doctor to a dead end. Radiation examination methods can assist in choosing between surgery with a high degree of radicality and the organ-preserving option in advance, before surgery.

In Russia, the number of organ-preserving operations with malignant renal neoplasms has increased by 15.5% in recent decades [9, 10].

K.T. Shakeyev – 0000-0002-7802-1464, e-mail: *shakeev@qmu.kz*

Preservation of the adrenal cortex is not always indicated in radical nephrectomy. Only tumor localization in the superior pole with adrenal cortex invasion is an indication for adrenalectomy.

Sometimes, the tumor size requires radical nephrectomy with lymph node dissection, and the technical possibilities for organ-preserving interventions are not always considered.

It is relatively easier to remove the kidney than resect it, even with the temporarily cut-off blood flow. As a result, radical nephrectomies are more common, and the kidney incision line is controlled on the gross specimen. The incidence of unnecessary nephrectomies was still relatively high in 2015, though the share of organ-preserving operations has reached 18.9% [11].

Russian researchers have noted that nephrectomies are most common in malignant renal neoplasms, and the desire of oncourologists to perform radical operations subordinates organ-preserving surgery.

In the past, the possibility for organ-preserving surgery in renal tumors was mainly determined by vessel size and relation. Today, the R.E.N.A.L. nephrometric scale is used in clinical practice when choosing organ-preserving surgery, predicting and preventing complications (Table 1).

Table 1 – R.E.N.A.L. scale [12]

Parameters	1 point	2 points	3 points
R – Radius, cm[a]	≤4	>4, but <7	≥7
E – Exophytic/endophytic[b]	≥50 % exophytic	<50 % exophytic	Predominantly endophytic
N – Nearness, mm[c]	≥7	>4, but <7	≤4
A – Anterior/posterior[d]	front	back	another
L – Location[e]	Figure 1		

[a] The largest diameter.
[b] Nature of growth.
[c] Proximity to the collecting system or sinus.
[d] Location of tumor (does not affect the score).
[e] Position concerning the pole lines.

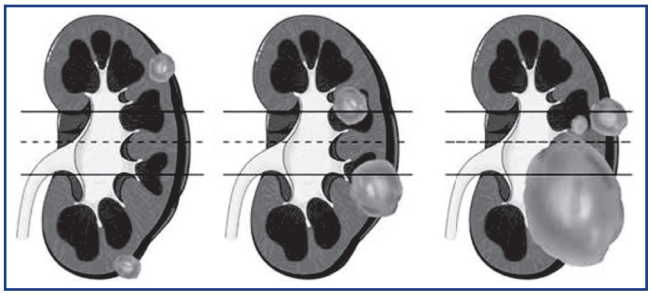
Calculations based on the scale scores are as follows: a score of 10 to 12 indicates a high risk of complications, 7 to 9 – a moderate risk, and 4 to 6 – a low risk.

A differentiated approach to choosing the scope of surgery using the R.E.N.A.L. scale reduces the number of unnecessary nephrectomies. It fine-tunes organ-preserving surgery, improving oncological and functional outcomes in patients with malignant renal neoplasms [12].

The presented schematic pictures can be used to plan the incision line and the feasibility of organ-preserving surgery in general (Figure 1) [12]. It clearly shows the location of the mass and the renal pole position without considering the vascular masses. Unnecessary nephrectomies in renal neoplasms are shown when organ-preserving surgery could have been performed. Alexeeva G.N. et al. (2018) proposed measures that fine-tune the organ-preserving surgery, improve oncological and functional outcomes of localized kidney cancer treatment. This scheme shall be widely used in clinical oncourology.

The need for radical surgery and the surgeon's desire to preserve the kidney some-times confound this dilemma. Knowing the exact position of the tumor and the vessels and other anatomical structures of the kidney allows determining the scope of surgery well in advance.

In renal malignancy surgery, nephrectomy and resection of the kidney are the main methods of renal tumor treatment. Radiation methods can detect small masses but cannot always determine the surgical tactics in advance. Preserving a kidney with cen-tral renal masses is almost always challenging, given that surgery is the only choice. There is literature evidence of unnecessary nephrectomy at the early stages of the dis-ease.



a – the tumor is located in one of the poles (1 point);
b – the tumor crosses the pole line (2 points);
c – more than 50% of the tumor is located behind the pole line, the tumor crosses the midline of the kidney, or the tumor is located between the pole lines (3 points);
h – if the tumor is adjacent to an artery and/or vein of the renal sinus (hilar tumor), add suffix "h."

Figure 1 – Kidney formation position related to the pole [12]

The rationale of organ-preserving surgery was proven in 25-years multicentre studies. Thus, among 3,457 patients with stage I and II renal neoplasms, 40% under-went nephrectomy vs. 60% of kidney resections. There was a reliable correlation be-tween glomerular filtration rate and lethality from malignant neoplasms. Antonelli et al. supported the kidney resection based

on the renal function effect on cancer treatment results. At that, each unit of glomerular filtration rate indicated the possibility of kidney preservation [13].

Tumor size matters the same as the tumor localization and its proximity to vas-cular structures. In the known literature, authors have demonstrated the feasibility and advisability of organ-preserving surgery for tumors over 6-7 cm. Thus, the median survival of patients after renal resection was higher than after nephrectomy. It should be noted that organ-preserving operations are associated with more complications due to possible bleeding from the renal parenchyma and related purulent-infectious pro-cesses. Specific technical difficulties might occur after renal resection due to possible bleeding from the renal parenchyma vessels even after temporary clamping of the renal artery. High-energy equipment does not always ensure definitive hemostasis. Only a combined use of high power, a Tachacomb plate, and stitching deliver definitive he-mostasis. However, despite frequent complications, renal resection provides a higher survival rate and better functional results than nephrectomy [14].

Surgical treatment is the primary choice in renal neoplasia. Advanced determina-tion of the scope of surgery is crucial for a favorable outcome. Such diagnostic tech-niques as morphology, renal ultrasound, and radioisotope renography have some in-formative value. However, only computerized tomography provides sufficient infor-mation about the state of the kidney and its vessels, the localization of the mass, and the relation to the pelvic ureteric segment and the surrounding organs.

The experience in treating patients with malignant renal neoplasms calls for a broader introduction of organ-preserving operations. The criteria for preferring resec-tion over nephrectomy as a radical surgical treatment in renal cancer are known.

The purpose of the research was to assess the capacity of computed tomography in the preoperative determination of surgery volume in kidney tumors.

Materials and methods:

A total of 548 surgeries (311 (56.8%) in men and 237 (43.2%) in women) for kidney neoplasms were performed at the Multidisciplinary hospital No.3 of Karaganda in 2016-2020.

We divided the patients into three groups depending on the tumor localization and size. In Group 1 (n=265, 48.4%), the patients had intrarenal tumors involving renal collar and pelvic segment. Intrarenal tumors also presented complications by portal vein thrombosis in 11 patients and tumor invasion into the adjacent organs in 13 patients.

In Group 2 (n=107, 19.5%), the tumors were located near the upper pole of the kidney and were up to 6-7 cm in size.

In Group 3 (n=176, 32.1%), the patients had neoplasms of the lower pole (n=85, 48.3%) and the kidney rib (n=91, 51.7%), with the tumor size of 2-5 cm.

All patients underwent computed tomography to determine the kidney angioarchitecture, the exact localization of the tumor, its relation to the calyx-pelvic system and blood vessels, and possible options for invasion into adjacent organs. No preoperative renal biopsy was performed in our study.

The R.E.N.A.L. scale was used to determine the feasibility of organ-preserving surgery and the development of complications. All the patients were attributed to three groups by the risk of complications according to their R.E.N.A.L. scores.

In Group 1, most tumors were localized at the center, near the vessels, or close to the kidney arteries and veins and could not be bypassed. Some patients had thrombosis of the portal and renal veins and tumor invasion into adjacent organs. Together, it was an indication for radical nephrectomy. The average size of intrarenal tumors was 7 to 12 cm. Tumor localization in the lower pole of the kidney with involvement of the calyx-lobar segment was another indication for nephrectomy (Figure 2). The below picture clearly shows the tumor location with the infiltration of the pelvic cavity, making it impossible to maintain the kidney (a series of abdominal CT scans with contrast showed an additional rounded mass measuring over 7 cm, with heterogeneous density, in the lower pole of the right kidney). This tumor was apprised as a locally disseminated tumor.

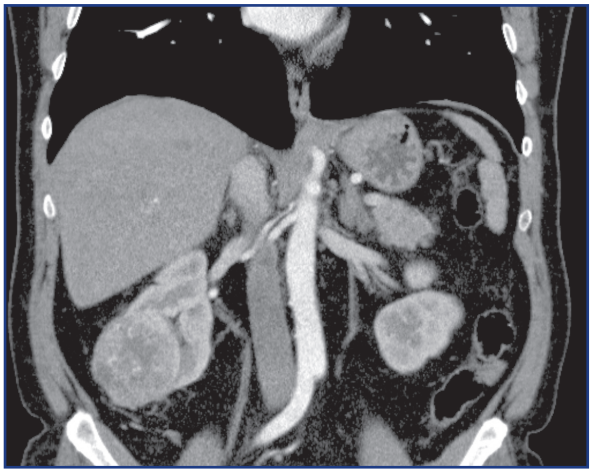


Figure 2 – Abdominal CT with the tumor in the lower pole of the right kidney, involving the calyx-pelvic segment.

In Group 2 of moderate risk, the tumors 4-5 cm in size were located in the upper pole, relatively distant from blood vessels. The R.E.N.A.L. scale for these tumors was 8 points, and they were assessed resectable. Organ-preserving surgery, with a mandatory temporary cessation of the renal blood flow, was planned (Figure 3).

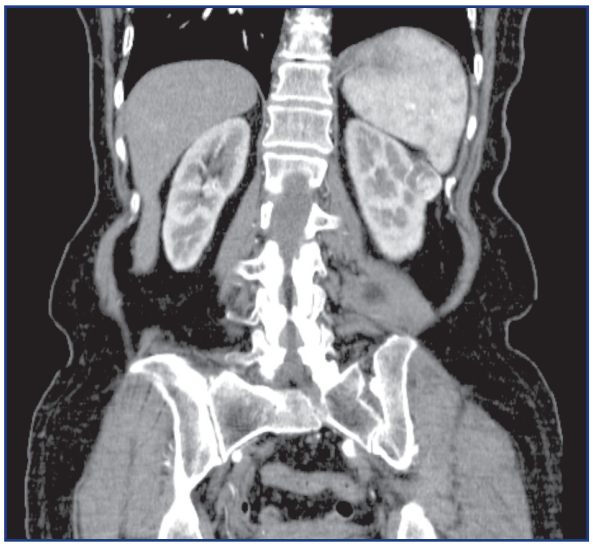


Figure 3 – Abdominal CT scan of a left kidney tumor.

In the low-risk Group 3, the renal neoplasms were up to 4 cm in size and located far from the vessels, so they were assessed resectable. The below picture shows a CT scan of a tumor along the rib of the left kidney with no connection to the portal and vessels or the pelvic system. (Contrast-enhanced CT scans of the abdomen in the frontal plane show an additional irregularly rounded, heterogeneous mass measuring up to 2.3 cm, intensely accumulating contrast, on the lateral contour of the left renal parenchyma, in the middle 1/3 of the left kidney. No involvement of the RCS is detected). This CT scan made it possible to plan the scope of surgery before the operation.

In this group, not all cases required renal vasoconstriction. Accordingly, the operation proceeded without technical difficulties, provided that high-energy equipment was used.

Results and Discussion:

In Group 1, all patients (n=265, 48.4%) with a high risk of complications and tumor nature according to the R.E.N.A.L. scale underwent radical nephrectomy. Most technical difficulties were registred in case the tumor invaded the neighboring organs: colon and mesocolon – in 7 patients, pancreas – 2, right lobe of the liver – 1. Colon resections with primary anastomoses were performed in case of colonic infiltration. No postoperative complications were registered, intestinal activity was restored. At caudal-pancreatic gland outgrowth in 2 patients, a corporocaudal resection was performed for radicality. Inferior vena cava thrombosis was observed in 9 patients, renal vein thrombosis – in 2 patients. Nephrectomy was performed with vena cava thrombectomy (Figure 4). Thrombectomies with the restoration of the defect in the vein were associated with some technical difficulties. The thrombus was 4-7 cm long. No postoperative thrombogenic complications were noted.

Figure 4 shows a right kidney with a large tumor and multiple satellite metastases in the parenchyma. A renal vein with a tumor embolus, most often in the vena cava, is visible. Histological examination of the tumor revealed a renal cell carcinoma.

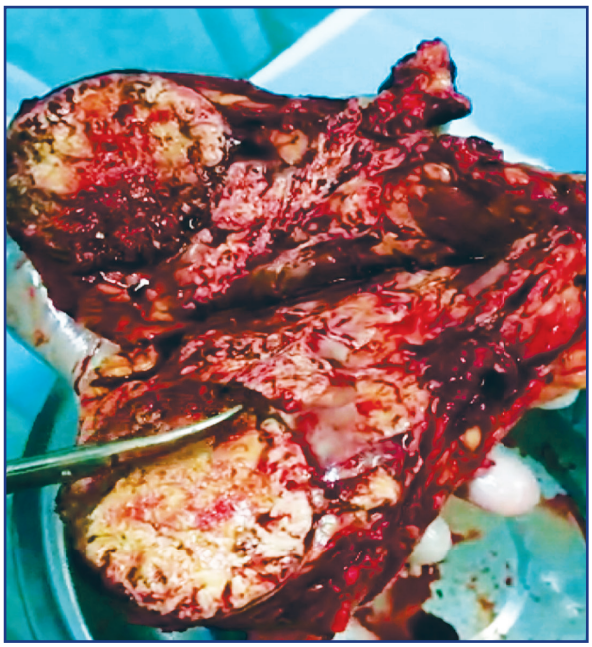


Figure 4 – Macropreparation: kidney with a tumor in the lower pole and a thrombus in the vena cava.

In 263 (48.0%) patients, organ-preserving surgery was performed. Anatomical landmarks made it possible to prevent damage to the large vessels and to predict possible atypical resection in advance. 203 (37.0%) patients underwent nephrectomy for large tumors with lesions of the calyx-pelvic system and invasion into the pararenal fat body; 39 of them underwent laparoscopic surgery.

In Group 2, 107 (19.5%) patients with a moderate risk of complications and a high possibility for organ-preserving interventions presented some intraoperative difficulties like bleeding after a segment resection and the renal blood flow opening. The event was resolved with technical difficulties using high-energy equipment – Tachacomb hemostatic plates.

In Group 3, 176 (32.1%) patients had good technical intraoperative conditions for organ-preserving surgery (Figure 5).

Figure 5 clearly shows a removed tumor with a line of healthy renal tissue, indicating the radical nature of the operation.

Probably, the small size of the tumor and its more superficial location enabled resection and kidney preservation in all patients in this group to undergo. Those 39 patients did not require the renal vessels' clamping.

Our study confirmed a high R.E.N.A.L. scale effectiveness for preoperative determination of further surgical tactics and performing organ-preserving opera-

tions with a high degree of substantiation. This scale can be recommended for wide use in clinical practice. The method allows not only to set indications for organ-preserving operations but also to justify the radical scope of surgery in locally disseminated processes and reduce the risk of subjective assessment of the scope of intervention.

Figure 5 – Resected kidney section with a tumor removed within healthy tissue

Conclusion:

The primary purpose was to assess the feasibility of using CT in presurgical diagnostics of renal neoplasms to determine the scope of surgery. Retrospective and prospective analyses of operations performed in patients with renal neoplasms revealed a correlation between the tumor nature by the R.E.N.A.L. scale and the type of surgery required. The analysis of 548 surgical interventions in patients with renal neoplasms revealed three groups depending on the risk of complications and tumor resectability according to the R.E.N.A.L. scale score.

Presurgical assessment of the kidney angioarchitecture and the tumor relation to the calyx-pelvic system and blood vessels allowed determining the scope of surgery and the possibility of preserving the kidney in advance.

The use of the R.E.N.A.L. scale to group patients in need of nephrectomy or organ-preserving surgery provided good treatment outcomes in patients with renal neoplasms.

Computed tomography has a high informative value in diagnosing kidney neoplasms and plays an essential role in determining the volume of surgical intervention. This method allows specifying indications for organ-preserving operations.

The article describes the use of the R.E.N.A.L. scale based on computed tomography data to determine the scope of surgery in kidney neoplasms. Only correctly performed calculations by this scale made it possible to determine the volume of surgery in all patients correctly. 283 patients with medium and low risk of complications and resectable tumors underwent organ-preserving surgery. The use of the R.E.N.A.L. scale provides a real opportunity to objectify the indications for nephrectomy and organ-preserving operations in patients with renal neoplasms.

References:

1. Pokazateli onkologicheskoj sluzhby Respubliki Kazaxstan za 2019 g. (statisticheskie i analiticheskie materialy) / pod red. Kajdarovoj D.R. – Almaty: Kazaxskij Nauchno-Issledovatel'skij Institut Onkologii i Radiologii, 2020. – 225 s. [Indicators of the oncological service of the Republic of Kazakhstan for 2019 (statistical and analytical materials) / ed. D.R. Kaidarova. – Almaty: Kazakh Institute of Oncology and Radiology, 2020. – 225 p.] https://onco.kz/news/pokazateli-onkologicheskoj-sluzhby-respubliki-kazahstan-za-2018-god-statisticheskie-i-analiticheskie-materialy-2/ (in Russian);

2. Motzer R.J., Jonasch E., Agarwal N., Bhayani S., Bro W.P., Chang S.S., Choueiri T.K., Costello B.A., Derweesh I.H., Fishman M., Gallagher T.H., Gore J.L., Hancock S.L., Harrison M.R., Kim W., Kyriakopoulos C., LaGrange C., Lam E.T., Lau C., Michaelson M.D., Olencki T., Pierorazio P.M., Plimack E.R., Redman B.G., Shuch B., Somer B., Sonpavde G., Sosman J., Dwyer M., Kumar R. Kidney Cancer, Version 2.2017, NCCN Clinical Practice Guidelines in Oncology // J. Natl. Compr. Canc. Netw. – Vol. 15(6). – P.804-833. https://doi.org/10.6004/jnccn.2017.0100;

3. Siegel R.L., Miller K.D., Jemal A. Cancer statistics, 2018 // CA Cancer J. Clin. – 2018. – Vol. 68(1). – P. 7-30. https://doi.org/10.3322/caac.21442;

4. Zlokachestvennye novoobrazovaniya v Rossii v 2017 godu (zabolevaemost' i smertnost') / pod red. A.D. Kaprina, V.V. Starinskogo, G.V. Petrovoj. – M.: MNIOI im. P.A. Gercena – filial FGBU «NMIC radiologii» Minzdrava Rossii, 2018. – 250 s. [Malignant neoplasms in Russia in 2017 (morbidity and mortality) / eds. A.D. Kaprin, V.V. Starinsky, G.V. Petrova. – M.: MNIOI n.a. P.A. Herzen - branch of the Federal State Budgetary Institution "National Medical Research Center of Radiology" of the Ministry of Health of Russia, 2018. – 250 p.] https://glavonco.ru/upload/pages/cancer-register/statistika_zabol_2017.pdf (in Russian);

5. Sostoyanie onkologicheskoj pomoshhi naseleniyu Rossii v 2017 godu / pod red. A.D. Kaprina, V.V. Starinskogo, G.V. Petrovoj. – M.: MNIOI im. P.A. Gercena – filial FGBU «NMIC radiologii» Minzdrava Rossii, 2018. – 236 s. [The state of public cancer care in Russia in 2017 / eds. A.D. Kaprin, V.V. Starinsky, G.V. Petrova. – M.: MNIOI n.a. P.A. Herzen – branch of the Federal State Budgetary Institution "National Medical Research Center of Radiology" of the Ministry of Health of Russia, 2018. – 236 p.] https://oncology-association.ru/wp-content/uploads/2020/09/sostoyanie_2017.pdf (in Russian);

6. EAU Guidelines on Renal Cell Carcinoma. – 2018. – 70 p. https://uroweb.org/wp-content/uploads/EAU-RCC-Guidelines-2018-large-text.pdf;

7. Marconi L., Dabestani S., Lam T.B. et al. Systematic review and meta-analysis of diagnostic accuracy of percutaneous renal tumour biopsy // Eur. Urol. – 2016. – Vol. 69(4). – P. 660-673. https://doi.org/10.1016/j.eururo.2015.07.072;

8. Kusainova B.T. Vozmozhnosti morfocitologicheskoj verifikacii opuxolej pochek // Onkologiya i radiologiya Kazaxstana. – 2012. – №1. – S.27–28 [Kusainova B.T. Possibilities of morphocytological verification of kidney tumors // Oncology and Radiology of Kazakhstan. – 2012. – No. 1. – P. 27-28]. http://oncojournal.kz/wp-content/uploads/2012/2012.1.23_07.pdf (in Russian);

9. Apolixin O.I., I.V. Chernyshev, D.A. Pavlov i dr. Tendencii razvitiya e'ndovideoxirurgii lokalizovannogo raka pochki / Mat.

XIV kongressa ROU. – Saratov, 2014. – S. 247-248 [Apolikhin O.I., Chernyshev I.V., Pavlov D.A. et al. Trends in the development of endovideosurgery of localized kidney cancer / Mat. XIV Congress of the ROU. – Saratov, 2014. – P. 247-248] (in Russian);

10. Volkova M.I., Skvorcov I.Ya., Klimov A.V., Chernyaev V.A., Komarov M.I., Matveev V.B., Peters M.V. Vliyanie ob»ema xirurgicheskogo vmeshatel'stva na funkcional'nye rezul'taty i kardiospecificheskuyu vyzhivaemost' u bol'nyx klinicheski lokalizovannym rakom pochki // Onkourologiya. – 2014. – T.10(3). – S. 22-30 [Volkova M.I., Skvortsov I.Ya., Klimov A.V., Chernyaev V.A., Komarov M.I., Matveev V.B., Peters M.V. Influence of the volume of surgical intervention on functional results and cardiospecific survival in patients with clinically localized kidney cancer // Oncourology. – 2014. – T.10 (3). – P. 22-30]. https://cyberleninka.ru/article/n/vliyanie-obema-hirurgicheskogo-vmeshatelstva-na-funktsionalnye-rezultaty-i-kardiospetsificheskuyu-vyzhivaemost-u-bolnyh-klinicheski (in Russian);

11. Alekseeva G.N., Gurina L.I., Mazalov B.V., Filippov A.G., Volkov M.V. E'ffektivnost' i bezopasnost' organosoxranyayushhix operacij pri lokalizovannom rake pochki // Onkourologiya. – 2015. – T.11(1). – S. 20-25 [Alekseeva G.N., Gurina L.I., Mazalov B.V., Filippov A.G., Volkov M.V. Efficiency and safety of organ-preserving surgeries in localized kidney cancer // Oncourology. – 2015. – T.11(1). – P. 20-25]. https://oncourology.abvpress.ru/oncur/article/view/413 (in Russian);

12. Alekseeva G.N., Pisareva L.F., Gurina L.I. Volkov M.V., Krepkix I.V., Yudin M.V. Organosoxranyayushhie operacii pri rake pochki kak sposob uluchsheniya rezul'tatov lecheniya. Obzor klinicheskix sluchaev // Tihookeanskij medicinskij žurnal. – 2018. – №1. – S. 64-66 [Alekseeva G.N., Pisareva L.F., Gurina L.I. Volkov M.V., Krepkikh I.V., Yudin M.V. Organ-preserving surgery for kidney cancer as a way to improve treatment results. Review of clinical cases // Pacific Medical Journal – 2018. – №1. – P. 64-66]. https://www.tmj-vgmu.ru/jour/article/view/212/212 (in Russian);

13. Antonelli A., Minervini A., Sandri M., Bertini R., Bertolo R., Carini M., Furlan M., Larcher A., Mantica G., Mari A., Montorsi F., Palumbo C., Porpiglia F., Romagnani P., Simeone C., Terrone C., Capitanio U. Below safety limits, every unit of glomerular filtration rate counts: Assessing the relationship between renal function and cancer-specific mortality in renal cell carcinoma // Eur. Urol. – 2018. – Vol. 74(5). – P. 661-667. https://doi.org/10.1016/j.eururo.2018.07.029;

14. Janssen M.W.W., Linxweiler J., Terwey S., Rugge S., Ohlmann C.-H., Becker F., Thomas Ch., Neisius A., Thuroff J.W., Siemer S., Stockle M., Roos F.C. Survival outcomes in patients with large (≥7cm) clear cell renal cell carcinomas treated with nephron-sparing surgery versus radical nephrectomy: Results of a multicenter cohort with long-term follow-up // PLoS One. – 2018. – Vol. 13(5). – e0196427. https://doi.org/10.1371/journal.pone.0196427.

ТҰЖЫРЫМ

К.Т. Шакеев[1,2], Н.А. Кабилдина[2], А.М. Жумакаев[1], А.С. Токсамбаева[1], С.В. Сурмин[1], А. Елубайұлы[1], Ш.С. Нұралы[2], А.А. Кокимов[2]

[1]Қарағанды қаласы №3 көпсалалы ауруханасы, Қарағанды, Қазақстан Республикасы;
[2]«Қарағанды медицина университеті», Қарағанды, Қазақстан Республикасы

Бүйрек ісіктері кезіндегі операция көлемін алдын ала анықтау үшін компьютерлік томографияның мүмкіндіктері

Өзектілігі: *компьютерлік томография көмегімен кішкентай мөлшердегі бүйректің ісіктерін анықтауға болады, бірақ емдеудің хирургиялық тактикасын әрдайым алдын-ала анықтау мүмкін емес.*

Мақсаты: *бүйрек ісіктері үшін хирургиялық араласу көлемін анықтау үшін компьютерлік томография арқылы операция алдындағы диагноздың мүмкіндіктерін бағалау.*

Нәтижелері: *бүйрек ісіктері бар 548 науқас емделді. Компьютерлік томографияны пайдалана отырып, R.E.N.A.L. шкласы негізінде үш топ бөлінді: бірінші топта асқынулардың даму қаупі жоғары– 265 науқас (48,4%), орташа қауіп деңгейі – 107 (19,5%) және төмен деңгейлі қауіп – 176 (32,1%). Операциялардың барлық жоспарланған көлемі асқынулардың және бүйрек ісіктерінің резектабельділігі қаупінің белгіленген топтарына сәйкес орындалды, бұл ретте операциялық араласулар жоспарында өзгерістер болған жоқ. Бүйрек ангиоархитектоникасын және тостағанша жүйесі мен мүше паренхимасына қатынасын операция алдындағы бағалау, операция көлемін және 283 науқаста мүше сақтайтын араласуды және 265 науқаста радикалды нефрэктомияны орындау мүмкіндігін анықтауға мүмкіндік берді.*

Қорытынды: *компьютерлік томография сияқты жоғары ақпараттық әдіс аурудың ерте кезеңдерінде шағын бүйрек ісіктерін анықтауға, ағзаны сақтау операциясын жасау және емдеу нәтижелерін жақсартуға мүмкіндік береді.*

Түйінді сөздер: *бүйрек қатерлі ісігі, компьютерлік томография, нефрэктомия, бүйрек резекциясы.*

АННОТАЦИЯ

К.Т. Шакеев[1,2], Н.А. Кабилдина[2], А.М. Жумакаев[1], А.С. Токсамбаева[1], С.В. Сурмин[1], А. Елубайұлы[1], Ш.С. Нұралы[2], А.А. Кокимов[2]

[1]КГП на ПХВ Многопрофильная больница №3, г. Караганда, Республика Казахстан;
[2]НАО «Медицинский Университет Караганды», г. Караганда, Республика Казахстан

Возможности компьютерной томографии для предоперационного определения объема операции при новообразованиях почек

Актуальность: *При помощи компьютерной томографии удается выявить новообразования почек небольших размеров, однако хирургическая тактика лечения не всегда может быть заблаговременно определена.*

Цель: *оценить возможности предоперационной диагностики посредством компьютерной томографии для определения объема оперативного вмешательства при новообразованиях почек.*

Результаты: *Было пролечено 548 больных с новообразованиями почек. Нами выделены три группы на основе шкалы R.E.N.A.L. с использованием компьютерной томографии: с высоким уровнем риска развития осложнений – 265 больных (48,4%), средним уровнем риска – 107 (19,5%) и низким уровнем риска – 176 (32,1%). Все запланированные объемы операций были выполнены согласно выделенным группам риска развития осложнений и резектабельности новообразований почки, при этом изменений в плане оперативных вмешательств не было. Предоперационная оценка ангиоархитектоники почки и отношения опухоли к чашечно-лоханочной системе и паренхиме органа позволила определить объем операции и возможность выполнения органосохраняющих вмешательств у 283 больных и радикальную нефрэктомию – у 265.*

Заключение: *Такой высокоинформативный метод, как компьютерная томография, позволяет выявить новообразования почек небольших размеров на ранних стадиях заболевания, когда имеется возможность выполнить органосохраняющую операцию и, соответственно, улучшить результаты лечения.*

Ключевые слова: *рак почек, компьютерная томография, нефрэктомия, резекция почек.*

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M.D. ZHUMAKAEV[1], K.T. SHAKEYEV[1,2], N.A. KABILDINA[2], A.M. ZHUMAKAEV[1], B.U. USEMBEKOV[1], SH.S. NURALY[2], A.A. KOKIMOV[2]

[1]Multidisciplinary hospital №3 cities of Karaganda, Karaganda, the Republic of Kazakhstan;
[2]JSC «Karaganda Medical University», Karaganda, the Republic of Kazakhstan

Surgical management of pancreatoduodenal tumors: the experience of using the developed operation technique

Relevance: The results of surgery in patients with pancreaticoduodenal cancer remain unsatisfactory. This complicates the choice of an optimal surgical technique in modern oncology.

Surgery in the pancreaticoduodenal zone is associated with complications due to anatomical and physiological features of the pancreas and technical challenges of this surgical intervention. Despite preventive actions and innovative technologies, such a traumatic operation as pancreatoduodenal resection often produces complications, though recently fewer.

This article describes a pancreaticoduodenal resection technique that reduces postoperative complication frequency and lethality in operable pancreaticoduodenal cancer.

The purpose of the study *was to assess the efficiency of an authorial pancreaticoduodenal resection technique (pancreaticojejunal invagination anastomosis) in pancreaticoduodenal cancer.*

The proposed pancreaticojejunal anastomosis-forming technique allowed reducing the postoperative complication frequency from 54.2% to 38,0% and postoperative lethality from 22.8% to 9,5%.

Conclusion: *This highly traumatic surgery is associated with postoperative complications (up to 50-70% of cases), which are quite severe and difficult to resolve and result in high fatality. The proposed pancreaticojejunal anastomosis forming technique has efficiently reduced postoperative complications and fatality to a significant extent.*

Keywords: *pancreatoduodenal cancer, pancreatoduodenal resection, malignant neoplasm of pancreas (ICD C25).*

Introduction: Pancreatoduodenal cancer is the 9th most common cancer nosology and the 4th most lethal. Despite the development of new ways of pancreatic surgery, the introduction of laparoscopic and robotic technologies, this type of surgery remains the most difficult in abdominal surgery.

These high traumatic operations are associated with postoperative complications (up to 50-70% of cases), which are rather severe and hard to resolve. The absence of these specialized centers is one of the reasons for unsatisfactory results and high mortality, reaching 10%. With a rational approach to solving such a complex problem, the authors consider it reasonable to create specialized centers for surgical care with the routing of patients with pancreatoduodenal diseases. The results of such a center (e.g., National Medical Research Center of Surgery named after A.Vishnev, Federal State Budgetary Institution. A.V. Vishnevsky National Medical Research Center) are characterized by relatively low postoperative complications (38.6%) and mortality (2.4%). In addition, a system of accreditation of specialized centers and clinics under international requirements for high-volume centers is needed [1].

Multidisciplinary and multicenter studies have demonstrated the effectiveness of new approaches and technologies. However, there are sporadic clinical observations in the literature, which are unlikely to draw definite conclusions about the efficacy of various techniques of pancreaticoduodenal resection. However, their results should be taken into account. There is no doubt that at correctly performed pancreatoduodenal resection high survival rate can be achieved in patients with non-spread pancreatic cancer. However, if complications develop, only proper management tactics allow improving the results. Thus, pancreatectomy in case of total pancreatic necrosis development allowed to achieve good results in the form of patient survival despite a long (several months) in-patient treatment [2-4].

The desire of surgeons to perform radical interventions forces them to perform radical operations, but their traumatic nature and duration cause the development of postoperative complications. Sometimes, in unusual situations, it is necessary to change the surgical tactics. Several clinical observations demonstrate prolonged survival or recovery of patients with malignant pancreatic tumors after radical surgery [5].

The surgical interventions on the pancreas (especially on the Virgin's duct) are characterized by a high traumatic effect that results in pancreatitis and pancreatic necrosis development. In its turn, pancreatic necrosis leads to purulent-inflammatory phenomena in the abdominal cavity with the development of anastomosis failure and, subsequently, abdominal sepsis and even lethal outcome [6, 7].

Preoperative antitumor treatment has a positive effect on the long-term outcome. However, it may cause

K.T. Shakeyev – 0000-0002-7802-1464, e-mail: *shakeev@qmu.kz*

immunosuppression and thus adversely affect the immediate results of surgical treatment, exacerbating the severity of postoperative complications. A comprehensive therapeutic approach, including timely surgical treatment of complications of disseminated postoperative pancreatic necrosis in the conditions of a specialized hospital, can significantly reduce mortality. Currently, there is no convincing evidence showing a positive or negative effect of postoperative pancreatic necrosis on long-term survival after radical interventions in pancreatic cancer patients [8].

Laparoscopic pancreatoduodenal resection **is an innovative technology**. Despite the complexity and traumatism of this operation, it is possible to obtain good results with the accumulation of experience. At the same time, the general incidence of complications was 35.5% of the patients, and mortality was 6%. The most frequent complication was pancreatic fistula formation; at the same time, we noted a considerable decrease of pancreatic fistula formation rate from 21% to 9.6% compared to open-access pancreatoduodenal resection [9].

Laparoscopic surgery outcomes could be compared to traditional open surgery based on literature data and the statistics of large centers which use high-tech minimally invasive interventions to operate on the pancreatoduodenal area. Khatkov et al. identified the advantages of laparoscopic and robotic interventions and obtained reasonably good results for minimally invasive surgical interventions. There was significantly less intraoperative blood loss and, importantly, a faster recovery period. It is advisable to perform laparoscopic and robotic interventions in specialized centers with surgeons with sufficient experience [10].

The most high-tech method of intervention on the pancreas is robot-assisted surgery. This technology is gradually being introduced in the CIS countries, and experience is being gained in it. It should be noted that during the period of mastering robot-assisted surgery, no significant decrease of postoperative complications rate was observed; however, with the accumulation of experience, there was a tendency to improve the results in malignant T1-T2 pancreatic tumors. It is reasonable to perform robotic technologies only in specialized centers managing patients with pancreatic neoplasms [11].

Veligotsky et al. recorded complications in 56 (27.2%) of operated patients during their observations. Formation of anastomosis on an isolated loop of jejunum allowed to decrease the incidence of postoperative pancreatitis in pancreatic stump from 31.6% to 14.1%. Another severe complication – the failure of the pancreatico-jejunal anastomosis with the formation of pancreatic fistula – was observed in 8.7% of patients. During the reconstructive stage, pancreatico-jejunal anastomosis was formed on the isolated loop of the jejunum to obtain better results. Differentiated approach to the choice of pancreatico-jejunal anastomosis formation method at pancreatoduodenal resection taking into account the diameter and state of pancreatic parenchyma contributes to reducing postoperative complications [12].

In pancreatoduodenal resection, intraluminal hypertension, the impact of pancreatic enzymes on the suture line, and the formation of pankreatico-enteric anastomosis rather than pancreatico-jejunal anastomosis can cause anastomosis failure. The effectiveness of pankreatico-enteric anastomosis has been convincingly proved in the literature, even when performed by surgeons with little experience. External drainage was effectively applied to achieve decompression. However, it necessarily required extra intervention for drainage elimination, which is a negative characteristic of the method suggested by O.I. Kit et al. There were complications in 3.4% of patients, but without lethal outcome, unlike the patients who used pancreatojejunal anastomosis. The most frequent complications included: postoperative pancreatitis – 24.5%, pancreatodigestive anastomosis failure – 7.7%, gastrostasis – 9.0%, external pancreatic fistulas – 5.2%, peritonitis – 5.8%, and hepatic-renal insufficiency – 11.6%. Such a severe complication as postoperative pancreatic necrosis was relatively less frequent – 1.9%, indicating the effectiveness of pancreatico-enteric anastomosis used by Halle-Smith et al. [13, 14].

The results of surgical interventions for pancreatic tumors depend on the method of pancreatico-jejunal anastomosis formation. The authors propose to use termino-terminal pancreatico-jejunal anastomosis. This method consists of the formation of the single-row termino-terminal pancreatico-jejunal anastomosis. The main positive results of this method in comparison with other ways of pancreatico-jejunal anastomosis formation are: the reduction of the operative intervention duration down to 170 minutes, a decrease of complications rate - repeated operations were needed in 12% of cases, general decrease of the stable disability loss - in 50% of patients and the most important one is the absence of lethality. The authors used biliary tract decompression in more than 60% of patients. In the distant period, the rate of permanent disability turned out to be 15% lower and quality of life according to MOS SF-36 and EORTC QLQ-C30 was better. Thus, the proposed method of single-row termino-terminal pancreatico-jejunal anastomosis significantly reduced the incidence of early and late complications [15, 16].

The purpose of the study was to assess the efficiency of an authorial pancreaticoduodenal resection technique (pancreaticojejunal invagination anastomosis) in pancreaticoduodenal cancer.

Material and Methods:

In 2011-2021, 56 surgical interventions for pancreatoduodenal tumors were performed at Karaganda Multiprofile Hospital №3 (Regional Oncology Center). The majority of them were the tumors of pancreas head – 41 (73.2%), carcinoma of large duodenal papilla – 5 (8.9%), tumor of extrahepatic bile duct as cholangiocarcinoma – 4 (7.1%), less often: duodenum masses – 2 (3.5%) and other tumor localizations – 4 (7.1%) (Table 1).

Таблица 1 – Частота опухолей панкреатодуоденальной зоны в группах сравнения

Nosologies	Control group (n=35)		Experimental group (n=21)	
	Abs.	%	Abs.	%
Pancreatic head cancer	24	68.57	17	80.95
Cancer of the greater duodenal papilla	3	8.57	2	9.52
Cholangiocarcinoma	3	8.57	1	4.76
Formation of the duodenum	2	5.71	–	–
Other localizations*	3	8.57	1	4.76
Total	**35**	**99.99**	**21**	**99.99**

*Other localizations were colorectal tumor with pancreatic duct infiltration - 1, cancer in the distal part of the stomach with infiltration of the gland head - 1, pancreatic tail tumor - 2. Despite the primary localization of the tumor outside the pancreas itself, these patients underwent radical surgery for the underlying disease and pancreatoduodenal resection.

The tumors were detected against the background of the main manifestation of the pathology, such as mechanical jaundice in the majority of patients, 52 (92.8%). And the level of jaundice varied from mild - in 24 (46.2%) patients to moderate - in 19 (35.5%) and severe - in 9 (17.3%) patients. Biliary hypertension was not detected in 4 patients (76.9%), in which a tumor was revealed as a diagnostic finding. After the liquidation of biliary hypertension in various technical variants, the patients underwent radical surgeries.

Considering the applied method of pancreatoduodenal resection, we singled out two groups of patients: the first group of patients in whom traditional conventional technique of pancreatoduodenal resection was carried out - 35 (62.5%), and the experimental group - 21 patients (37.5%). We used the suggested method of forming the invaginated pancreatojejunal anastomosis (copyright certificate of the Republic of Kazakhstan No. 51820) with the decompression of this zone with the help of the "lost" probe, which was set in the lumen of the Virsungal duct stump (copyright certificate of the Republic of Kazakhstan No. 21411) in the experimental group

Two patients with localization of the process in the body and tail of the pancreas underwent corpuscular resection; the postoperative period was relatively smooth, no complications were registered.

In the control group, 35 patients underwent pancreatoduodenal resections with the end-to-end pancreatojejunal anastomosis formation in a usual way.

In both groups, technical difficulties were noted intraoperatively due to the spread of the tumor process, which hampered lymph node dissection. During the operation, bleeding from the mesenteric vessels and portal vein were observed; these complications were resolved intraoperatively. We had to involve an angiosurgeon in 2 cases to perform plastic repair due to tumor invasion of large vessels.

One of the causes of pancreatojejunal anastomosis failure is intraluminal hypertension. In order to exclude the factor of hypertension in the intestinal lumen, the method of internal drainage of the pancreatic duct was developed in the oncology clinic of KSMU. At the formation of the anastomosis, a "lost" polyvinylchloride catheter, an average length of 25 cm, through which pancreatic juice enters the small intestine distal to the anastomosis, preventing exposure of the remaining part of the pancreas to the area of the sutures is established in the lumen at a depth of 2-3 cm. After complete healing of the anastomosis, the catheter fixed to the wall falls out of the lumen of the Virsungian duct stump and migrates further distally along the intestinal tract. As a result of intestinal decompression, a significant decrease of anastomosis incidence from 11.4% to 4.7% was registered in our observations; it testifies to the efficiency of the proposed method of the pancreatojejunal anastomosis formation.

The method of anastomosis formation is of great importance in anastomosis healing. The proposed invagination method of pancreatojejunal anastomosis "end-to-end" consists of the articulation between the pancreatic stump and the jejunum. The posterior row of external sutures is formed, capturing the peripancreatic and gastropancreatic ligaments, retreating 3 cm from the pancreatic stump. The posterior lip of the anastomosis is formed using a Pirogov-Mateshuk suture without capturing the mucous membrane of the small intestine and pancreatic tissue. Then sutures are applied to the anterior lip of the anastomosis. Subsequently, the intestine is wrapped over the pancreatic stump, and a series of separate anterior sutures are placed, creating an invagination. Then intestinal, gastrojejunal, and biliary-digestive sutures are formed by the traditional method.

Results:

The effectiveness criterion of the suggested method of pancreatojejunal anastomosis was the incidence of postoperative complications and the lethality rate decrease.

In order to assess more objectively, complications in three periods, intraoperative, early postoperative, and in the remote period, were taken into account (Table 2).

Table 2 shows that the most frequent and severe postoperative complications are pancreatojejunal anastomosis failure and bleeding, and in the long-term period - postoperative hernias.

Thus, in the control group, complications were observed in 19 (54.2%) patients, and the fatality rate was 22.8% (n=8). Intraoperative complications in the form

of bleeding from the mesenteric and splenic veins occurred in 3 patients (8.5%). Early complications were registered in 7 cases, pancreatojejunal anastomosis failure - in 4 patients (11.4%), other complications - in 3 patients (8.5%). Other complications were hepato-renal syndrome - in 2 patients (5.7%) and acute cerebral circulation disorder - in 1 (2.8%). Pancreatojejunal anastomosis failure was dangerous and always resulted in the development of peritonitis and severe wound complications. Late complications were registered in 9 observations, among them: anastomosis stenosis in 2 (5.7%), disease relapse in 3, postoperative hernias in 4. Two patients were operated on repeatedly because of the decompensated stenosis; at the relapse of the disease, symptomatic therapy was prescribed to the patients; 2 patients died because of the disease progression. Four patients with postoperative hernias underwent herniotomy with non-tension hernioplasty. Fatal cases in the control group occurred due to peritonitis resulting from anastomosis failure (n=3), hepatic and renal failure (n=2), cerebral circulation disorders (n=1), disease progression and cancer intoxication (n=2).

Table 2 - Frequency of postoperative complications in comparison groups after pancreatoduodenal resection

Complications	Control group (n=35)		Experimental group (n=21)	
	Абс.	%	Абс.	%
Intraoperative bleeding (vessel damage)	3	8.5	–	–
Failure of pancreatojejunal anastomosis	4	11.4	1	4.7
Mechanical jaundice	–	–	1	4.7
Anastomosis stenosis	2	5.7	–	–
Disease relapse	3	8.5	1	4.7
Postoperative intra-abdominal bleeding	–	–	2	9.5
Postoperative hernias	4	11.4	1	4.7
Abdominal abscess	–	–	1	4.7
Small bowel perforation	–	–	1	4.7
Fatalities	8	22.8	2	9.5
Others*	3	8.5	–	–
Total complications	**19**	**54.2**	**8**	**38.0**

In the experimental group, complications were noted in 8 (38.0%) patients, and the mortality rate was 9.5%.

Intraoperative complications such as damage of the vena mesenerica superior wall when performing lymph node dissection were noted in 1 patient (4.7%). The vascular suture was performed, the vein patency was not impaired. The clinical picture of jaundice, bilirubin level was 313 μmol/l in the postoperative period in 1 patient. This patient was operated on on Day 8, dilated tense choledochal infiltrate was revealed. When the stumps of the choledochal stump were removed, a large amount of dense dark bile was excreted, biliary tract patency was restored. Subsequently, the patient was discharged in satisfactory condition.

One of the most severe complications was anastomosis failure, which was observed in 1 patient and indicated relaparotomy. Bleeding on Day 3 after surgery was observed in 2 patients. The source of bleeding was the hepatic artery; final hemostasis and elimination of the defect by suturing the vessel wound were performed. The defect in the arterial vessel wall appeared rather due to the burn of the wall during mobilization and lymph node dissection. Subsequently, this patient died of wound purulent-infectious complications.

There were early complications such as small intestinal fistula - in 1 patient, subdiaphragmatic abscess - in 1, postoperative intraabdominal bleeding - in 2, perforation of the small intestine wall with the non-silicone tube complicated by peritonitis - in 1 patient. On the 8th day, the patient underwent relaparotomy, suturing of the defect, and abdominal cavity lavage, but the patient died of decompensated heart failure despite the carried therapy.

Complications developed in the long-term period in 3 patients, including a postoperative ventral hernia in 1 patient and a relapse of the disease in 1 patient, who died one year after the operation.

Complications in the form of pancreatojejunal anastomosis failure were significantly more frequent in patients with non-invasive anastomosis formation and without the use of temporary decompression drainage. Such complications occurred in 4 patients (11.4%).

Conclusions:

1. Treatment of pancreatoduodenal tumors is one of the complex problems of modern oncology because of the frequent complications and relatively high lethality.

2. As the result of the new method of operative intervention and innovative technologies introduction, the tendency to decrease complications and lethality rate at the treatment of the pancreatoduodenal zone tumors is registered.

3. One of the severe complications of pancreatoduodenal tumor treatment is pancreatojejunal anastomosis failure. This complication leads to peritonitis and more severe outcomes and mortality.

4. The use of invagination pancreatojejunal anastomosis, particularly the method of decompressive drainage of the Virsungal duct using a "lost" probe, excludes the aggressive pancreatic juice ingress into the area of the newly formed anastomosis.

5. When performing the reconstructive stage of the operation, it is advisable to use the proposed method of pancreatojejunal anastomosis, taking into account its high reliability.

6. The described method of pancreatojejunal anastomosis allows to decrease the complication rate to 38,0% and to decrease the lethality to 9,5%.

References:

1. Revishvili A.Sh., Kriger.A.G., Vishnevskij V.A., Smirnov A.V., Berelavichus S.V., Gorin D.S., Axtanin E.A., Kaldarov A.R., Raevskaya M.B., Zaxarova M.A. Aktual'nye voprosy xirurgii podzheludochnoj zhelezy // Xirurgiya. – 2018. – №9. – S. 5-14 [Revishvili A.Sh., Kriger A.G., Vishnevsky V.A., Smirnov A.V., Berelavichus S.V., Gorin D.S., Akhtanin E.A., Kaldarov A.R., Raevskaya M B., Zakharova M.A. Topical issues of pancreatic surgery // Surgery. – 2018. – Vol. 9. – P. 5-14]. https://doi.org/10.17116/hirurgua20180915 (in Russian);

2. Pavlovskij A.V., Popov S.A., Shapoval S.V., Granov D.A., Moiseenko V.E. Gastroduodenal'naya rezekciya golovki podzheludochnoj zhelezy, oslozhnivshayasya total'nym pankreonekrozom // Annaly xirurgicheskoj gepatologii. – 2015. – №20(4). – S.110-114 [Pavlovsky A.V., Popov S.A., Shapoval S.V., Granov D.A., Moiseenko V.E. Gastroduodenal resection of the head of the pancreas, complicated by total pancreatic necrosis // Annals Surgical Hepatology. – 2015. – Vol. 20 (4). – P. 110-114]. https://hepato.elpub.ru/jour/article/view/198/198 (in Russian);

3.Hartwig W., Vollmer C.M., Fingerhut A., Yeo C.J., Neoptolemos J.P., Adham M., Andrén-Sandberg A., Asbun H.J., Bassi C., Bockhorn M., Charnley R., Conlon K.C., Dervenis C., Fernandez-Cruz L., Friess H., Gouma D.J., Imrie C.W., Lillemoe K.D., Milićević M.N., Montorsi M., Shrikhande S.V., Vashist Y.K., Izbicki J.R., Büchler M.W. Extended pancreatectomy in pancreatic ductal adenocarcinoma: definition and consensus of the International Study Group for Pancreatic Surgery (ISGPS) // Surgery. – 2014. – №156 (1). – P.1-14. https://doi.org/10.1016/j.surg.2014.02.009;

4. Ryska M., Rudis J. Pancreatic fistula and postoperative pancreatitis after pancreatoduodenectomy for pancreatic cancer // Hepatobiliary Surg. Nutr. – 2014. – №3 (5). – P. 268–275. https://doi.org/10.3978/j.issn.2304-3881.2014.09.05;

5. Masui T., Kubota T., Aoki K., Nakanishi Y., Miyamoto T., Nagata J., Morino K., Fukugaki A., Takamura M., Sugimoto S., Onuma H., Tokuka A. Long-term survival after resection of pancreatic ductal adenocarcinoma with para-aortic lymph node metastasis: case report // World J. Surg. Oncol. – 2013. – №11(1). – P.195.https://dx.doi.org/10.1186%2F1477-7819-11-195;

6. Kriger A.G., Kubyshkin V.A., Karmazanovskij G.G., Svitina K.A., Kochatkov A.V., Berelavichus S.V., Kozlov I.A., Korolev S.V., Gorin D.S. Posleoperacionnyj pankreatit pri xirurgicheskix vmeshatel'stvax na podzheludochnoj zheleze // Xirurgiya. – 2012. – №4. – S.14–19 [Kriger A.G., Kubyshkin V.A., Karmazanovsky G.G., Svitina K.A., Kochatkov A.V., Berelavichus S.V., Kozlov I.A., Korolev S.V., Gorin D.S. Postoperative pancreatitis during surgical interventions on the pancreas // Surgery. – 2012. – Vol. 4. – P. 14-19]. https://www.mediasphera.ru/issues/khirurgiya-zhurnal-im-n-i-pirogova/2012/4/downloads/ru/030023-1207201243 (in Russian);

7. Bannone E., Andrianello S., Marchegiani G., Masini G., Malleo G., Bassi C., Salvia R. Postoperative acute pancreatitis following pancreaticoduodenectomy a determinant of fistula potentially driven by the intraoperative fluid management // Ann. Surg. – 2018. – Vol. 268(5). – P. 815–822. https://doi.org/10.1097/sla.0000000000002900;

8. Assifi M.M., Zhang S., Leiby B.E., Pequignot E.C., Xia B., Rosato E., Lavu H., Kennedy E.P., Yeo C.J., Berger A.C. Tumor recurrence is independent of pancreatic fistula in patients after pancreaticoduodenectomy for pancreatic ductal adenocarcinoma. J. Am. Coll. Surg. – 2013. – Vol.217 (4). – P. 621–627. https://doi.org/10.1016/j.jamcollsurg.2013.05.014;

9. Xat'kov I.E., Cvirkun V.V., Izrailov R.E., Vasnev O.S., Bajchorov M.E'., Tyutyunnik P.S., Xisamov A.A., Andrianov A.V., Mixnevich M.V. Laparoskopicheskaya pankreatoduodenal'naya rezekciya: e'volyuciya rezul'tatov 215 operacij // Annaly xirurgicheskoj gepatologii. – 2018. – №23(1). – S. 47-54 [Khatkov I.E., Tsvirkun V.V., Izrailov R.E., Vasnev O.S., Baichorov M.E., Tyutyunnik P.S., Khisamov A.A., Andrianov A.V., Mikhnevich M.V. Laparoscopic pancreatoduodenal resection: evolution of the results of 215 operations // Annals Surgical Hepatology. – 2018. – Vol. 23 (1). – P. 47-54]. https://hepato.elpub.ru/jour/article/view/277/274 (in Russian);

10. Xat'kov I.E., Cvirkun V.V., Izrailov R.E., Mixnevich M.V., Vasnev O.S., Efanov M.G., Tyutyunnik P.S., Bajchorov M.E'., Andrianov A.V., Elizarova N.I., Kazakov I.V., Van'kovich A.N. Xirurgicheskij e'tap lecheniya raka organov gepatopankreatoduodenal'noj zony tradicionnym, laparoskopicheskim i robot-assistirovannym sposobom: rezul'taty, preimushhestva, nedostatki // Annaly xirurgicheskoj gepatologii. – 2019. – №24(3). – S. 54–64 [Khatkov I.E., Tsvirkun V.V., Izrailov R.E., Mikhnevich M.V., Vasnev O.S., Efanov M.G., Tyutyunnik P.S., Baichorov M.E., Andrianov A V.V., Elizarova N.I., Kazakov I.V., Vankovich A.N. Surgical stage in the treatment of cancer of the hepatopancreatoduodenal zone in the traditional, laparoscopic and robot-assisted way: results, advantages, disadvantages // Annals of Surgical Hepatology. – 2019. – Vol. 24 (3). – P. 54-64]. https://hepato.elpub.ru/jour/article/view/500/382 (in Russian);

11. Kriger A.G., Berelavichus S.V., Kaldarov A.R., Gorin D.S., Smirnov A.V., Akhtanin Ye.A., Rayevskaya M.B., Ikramov R.Z. Robot-assistirovannyye operatsii v khirurgii podzheludochnoy zhelezy. // Annaly khirurgicheskoy gepatologii. – 2018. – №23(1). – S. 19–24 [Krieger A.G., Berelavichus S.V., Kaldarov A.R., Gorin D.S., Smirnov A.V., Akhtanin E.A., Raevskaya MB, Ikramov R.Z. Robot-assisted operations in pancreatic surgery. // Annals Surgical Hepatology. – 2018. – Vol. 23 (1). – P. 19-24]. https://hepato.elpub.ru/jour/article/view/57/44 (in Russian);

12. Veligockij N.N., Veligockij A.N., Arutyunov S.E'. Opyt 200 pankreatoduodene'ktomij ocenka razlichnyx variantov anastomozov // Annaly xirurgicheskoj gepatologii. – 2015. – №20(1). – S. 100-105 [Veligotsky N.N., Veligotsky A.N., Arutyunov S.E. Experience of 200 pancreatoduodenectomies, assessment of various variants of anastomoses // Annals Surgical Hepatology. – 2015. – Vol. 20 (1). – P. 100-105]. https://hepato.elpub.ru/jour/article/view/262/262 (in Russian);

13. Kit O.I., Gevorkyan Yu.A., Maksimov A.Yu., Maslov A.A., Snezhko A.V., Kolesnikov E.N., Kozhushko M.A., Myagkov R.E. Rezul'taty primeneniya razlichnyx pankreatodigestivnyx anastomozov pri pankreatoduodenal'noj rezekcii // Xirurgiya. – 2016. – №6. – S.43–46 [Kit O.I., Gevorkyan Yu.A., Maksimov A.Yu., Maslov A.A., Snezhko A.V., Kolesnikov E.N., Kozhushko M.A., Myagkov R.E. Results of using various pancreatodigestive anastomoses in pancreatoduodenal resection // Surgery. – 2016. – Vol. 6. – P. 43-46]. https://doi.org/10.17116/hirurgia2016643-46 (in Russian);

14. Halle-Smith J.M., Vinuela E., Brown R.M., Hodson J., Zia Z., Bramhall S.R., Marudanayagam R., Sutcliffe R.P., Mirza D.F., Muiesan P., Isaac J., Roberts K.J. A comparative study of risk factors for pancreatic fistula after pancreatoduodenectomy or distal pancreatectomy // HPB (Oxford). – 2017. – №19(8). – P. 727-734. https://doi.org/10.1016/j.hpb.2017.04.013;

15. Propp A.R., Degovcov E.N., Nikulina S.A. Sravnitel'naya ocenka neposredstvennyx i otdalennyx rezul'tatov tradicionnogo i original'nogo sposobov terminoterminal'noj pankreatoeyunostomii pri subtotal'noj rezekcii golovki podzheludochnoj zhelezy // Annaly xirurgicheskoj gepatologii. – 2020. – №25(1). – S. 38-47 [Propp A.R., Degovtsov E.N., Nikulina S.A. Comparative evaluation of immediate and long-term results of traditional and original methods of terminological pancreatojejunostomy with subtotal resection of the pancreatic head // Annals Surgical Hepatology. – 2020. – Vol. 25(1). – P. 38-47]. https://hepato.elpub.ru/jour/article/view/600/413 (in Russian);

16. Fu S.J., Shen S.L., Li S.Q., Hu W.J., Hua Y.P., Kuang M., Liang L.J., Peng B.G. Risk factors and outcomes of postoperative pancreatic fistula after pancreatico-duodenectomy: an audit of 532 consecutive cases // BMC Surg. – 2015. – №15. – P. 34. https://doi.org/10.1186/s12893-015-0011-7.

ТҰЖЫРЫМ

М.Д. Жумакаев[1], К.Т. Шакеев[1,2], Н.А. Кабильдина[2], А.М. Жумакаев[1], Б.У. Усембеков[1], Ш.С. Нуралы[2], А.А. Кокимов[2]

[1]Қарағанды қаласының №3 көпсалалы ауруханасы, Қарағанды, Қазақстан Республикасы;
[2]ҰАҚ «Қарағанды медицина университеті», Қарағанды, Қазақстан Республикасы

Панкреатодуоденальды аймақ ісіктерінің хирургиясы: операцияның әзірленген тәсілін қолдану тәжірибесі

Өзектілігі: *панкреатодуоденальды аймақтың қатерлі ісігі бар науқастарды емдеуде хирургиялық тактиканы оңтайлы таңдау қазіргі онкологияның толық шешілмеген мәселесі болып қала бермейді, бұл хирургиялық араласудың қанағаттанарлықсыз нәтижелеріне байланысты.*

Панкреатодуоденальды аймақ ісіктерінің хирургиясы асқынулармен бірге жүреді, бұл ұйқы безінің анатомиялық және физиологиялық ерекшеліктерімен және араласудың техникалық қиындықтарымен түсіндіріледі. Панкреатодуоденальды резекция сияқты травматикалық операциядан кейін және инновациялық технологиялардың алдын-алуға және енгізуге қарамастан, асқынулар жиі пайда болады, дегенмен жақында олардың төмендеу тенденциясы байқалады.

Бұл мақалада операциядан кейінгі асқынулардың жиілігін және панкреатодуоденальды аймақтың жедел қатерлі ісігіндегі өлімді азайтуға мүмкіндік беретін панкреатодуоденальды резекция әдісі сипатталған.

Мақсаты: *панкреатодуоденальды аймақтың қатерлі ісігі кезінде панкреатодуоденальды резекцияның (панкреатоюнальды инвагинациялық анастомоздың) авторлық әдісінің тиімділігін бағалау.*

Нәтижелер: *панкреатиялық анастомозды қалыптастырудың ұсынылған әдісі операциядан кейінгі асқынулардың жиілігін 54,2%-дан 38,0%-ға дейін төмендетуге және ерте кезеңдегі өлімді 22,8%-дан 9,5%-ға дейін азайтуға мүмкіндік берді.*

Қорытынды: *операцияның жоғары жарақаттануы нәтижесінде операциядан кейінгі асқынулар (жағдайлардың 50-70% дейін) және, тиісінше, жоғары өлім-жітім байқалады. Панкреатоюнальды анастомозды қалыптастырудың ұсынылған әдісі операциядан кейінгі асқынулар мен өлімнің айтарлықтай төмендеуіне байланысты жоғары тиімділікті көрсетті.*

Түйінді сөздер: *панкреатодуоденальды аймақтың қатерлі ісігі, панкреатодуоденальды резекция, ұйқы безінің қатерлі ісігі (ICD C25).*

АННОТАЦИЯ

М.Д. Жумакаев[1], К.Т. Шакеев[1,2], Н.А. Кабильдина[2], А.М. Жумакаев[1], Б.У. Усембеков[1], Ш.С. Нуралы[2], А.А. Кокимов[2]

[1]Многопрофильная больница №3 г. Караганды, г. Караганда, Республика Казахстан;
[2]НАО «Медицинский университет Караганды», г. Караганда, Республика Казахстан

Хирургия опухолей панкреатодуоденальной зоны: опыт применения разработанного способа операции

Актуальность: *В лечении пациентов с раком панкреатодуоденальной зоны оптимальный выбор хирургической тактики остается не до конца решенным вопросом современной онкологии, что обусловлено неудовлетворительными результатами оперативных вмешательств.*

Хирургия опухолей панкреатодуоденальной зоны сопровождается осложнениями, что объясняется анатомо-физиологическими особенностями поджелудочной железы и техническими сложностями вмешательства. После столь травматичной операции, как панкреатодуоденальная резекция, и несмотря на профилактику и внедрение инновационных технологий, часто возникают осложнения, хотя в последнее время имеется некоторая тенденция к их уменьшению.

В данной статье описан способ панкреатодуоденальной резекции, который позволяет снизить частоту послеоперационных осложнений и летальность при операбельном раке панкреатодуоденальной зоны.

Цель: *оценка эффективности авторского способа панкреатодуоденальной резекции (панкреатоеюнального инвагинационного анастомоза) при раке панкреатодуоденальной зоны.*

Результаты: *Предложенный способ формирования панкреатоеюнального анастомоза позволил снизить частоту послеоперационных осложнений с 54,2% до 38,0% и уменьшить летальность в раннем периоде с 22,8% до 19,5%.*

Заключение: *В результате высокой травматичности операции отмечаются достаточно грозные и трудно разрешаемые послеоперационные осложнения (до 50-70% случаев) и, соответственно, высокая летальность. Предложенный способ формирования панкреатоеюнального анастомоза показал высокую эффективность за счет значительного снижения послеоперационных осложнений и летальности.*

Ключевые слова: *рак панкреатодуоденальной зоны, панкреатодуоденальная резекция, злокачественное новообразование поджелудочной железы (МКБ С25).*

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A.B. RIABOV[1,2], *M.S. KUBIROV*[2], *A.V. KHIZHNIKOV*[3], *M.Yu. RYKOV*[4]

[1]National Medical Research Radiological Centre, Moscow, Russian Federation;;
[2]Morozov Children Municipal Clinical Hospital, Moscow, Russian Federation;
[3]Scientific and Clinical Center for Children and Adolescents of the Federal Medical and Biological Agency of Russia, Moscow, Russian Federation;
[4]Tver State Medical University, Tver, Russian Federation

Laparoscopic resections in the treatment of children with liver tumors: the first experience

Relevance: *Surgery is one of the main methods of treating patients with liver neoplasms. At that, minimally invasive surgical techniques facilitate the course of the postoperative period and rehabilitation.*

The purpose of the study *was the selection of optimal surgical treatment for children with liver tumors.*

Results: *In 2014-2020, five patients aged 3-9 years with liver tumors underwent laparoscopic resection at the Morozovskaya Children's City Clinical Hospital (Moscow, Russia). Out of 3 patients with hepatoblastomas, two patients had stage PRETEXT I, one – stage II. All patients underwent radical surgical treatment (R0); in one child(4%), the resection volume was R1. The duration of operations did not exceed 60 minutes; intraoperative blood loss was within 10 ml/kg; no intraoperative complications were registered.*

Conclusion: *Laparoscopic techniques reduce surgery time and blood loss, prevent intraoperative and postoperative complications, shorten the hospital stay, decrease enteral and drug burden, and the need for chemotherapy. They also facilitate radical surgery and early patient mobilization.*

Keywords: *pediatric oncology, surgery, laparoscopy, surgical oncology, hepatoblastoma, case report, liver, laparotomy.*

Introduction: The number of patients with neoplasms of various localizations and etiologies is increasing due to the development of imaging techniques and improved follow-up standards. Liver lesions are among the leaders in this nosology due to the primary lesion localization in the organ parenchyma and metastatic involvement. The most optimal method for treating patients with liver tumors is surgery. Modern medicine aims to reduce the trauma associated with the treatment of many diseases, for example, by developing and introducing minimally invasive surgical techniques that facilitate the postoperative period and rehabilitation. This is especially essential in pediatric practice.

For centuries, the liver has been one of the most mysterious organs, and surgical interventions on it have often been lethal [1]. This was due to a lack of knowledge about the anatomy of this organ and the pathophysiology of the disease.

In 1654, F. Glissonii described the portal vein stem architectonics – a portal triad later called "Glisson's system." In 1888, H.Rex studied the segmental liver structure. In 1898, Cantlie described an actual boundary between the lobes. In 1911, Wendel performed the first successful anatomical right-sided hemihepatectomy [2]. In Russia, the first successful liver resection was performed in 1889 in a patient with fibroma by N.V. Sklifosovsky. In 1894, M.M. Kuznetsov and V.R. Penski suggested liver sutures [3]. In 1908, an Irish surgeon S.H. Pringle invented the hepatoduodenal ligament's temporary clamping, which reduced the complication rate.

Later, techniques of liver resections were developed using the principles of preliminary ligation of the vascularly isolated elements of different liver zones (lobe, segment) or their pole ligation (fissural method), which allowed to perform more radical operations [4-6].

The first report on laparoscopic atypical liver resection for focal masses of solid nature was published in 1991 by Reich et al. [7].

A limited number of observations in pediatric patients with liver tumors urges the development of minimally invasive surgical techniques for this group of patients.

Purpose of the study: was a selection of the optimal surgical treatment for children with liver tumors.

Materials and Methods: In 2014-2020, five patients (three boys (60%) and two girls (40%)) aged 3 to 9 years with liver tumors who underwent laparoscopic resection were treated at Morozov Children's City Clinical Hospital (Moscow, Russia). Hepatoblastomas were registered in 3 (60%) patients, adenomas and hamartomas – in 1 (20%) patient each.

– Preoperative examination of the patients included:

– Determination of cancer-specific marker levels (AF, HCG);

– Ultrasound with the assessment of tumor topography and angioarchitecture;

– CT scan with intravenous contrast;

– MRI with intravenous contrast.

A.B. Riabov – 0000-0002-1037-2364,
M.S. Kubirov – 0000-0003-1308-2175,
A.V. Khizhnikov – 0000-0001-7914-651X,
M.Yu. Rykov – 0000-0002-8398-7001, e-mail: *wordex2006@rambler.ru*

Results: Hepatoblastoma was registered in stage PRETEXT I in two patients and stage II in one patient.

All patients underwent radical surgical treatment (R0); in one child (4%), the resection volume was R1.

During laparoscopic surgery, bisegmentectomy was performed in two cases and segmentectomy in three cases.

During the surgical intervention, preference was given to various modern methods of achieving hemostasis: monopolar coagulation, bipolar coagulation (including measuring tissue impedance). High-velocity water jet dissection has been used repeatedly in the experience stages of this field, but today ultrasound dissection is the preferred method.

The duration of laparoscopic operations was 30 to 60 minutes. Other results are shown in Table 1.

Table 1 – Laparoscopic surgery results in children with liver tumors

Indicators	Values
Duration of operation, min	30 – 90
The volume of blood loss, ml/kg	not more than 10
Intraoperative haemotransfusion	0 (0)
Intraoperative complications, including:	0 (0)
Lethality	0 (0)
Damage of extrahepatic biliary tract	0 (0)
Total	5

The postoperative characteristics are shown in Table 2.

Table 2 – Postoperative course in children with liver tumors after laparoscopic surgery

Indicators	Values
Duration of stay in ICU, days	1-3
Timing of patient activation (start of enteral load, verticalization)	from 1 p/o day
Duration of stay in hospital, days	5-8
Number of bed-days before chemotherapy after surgery	8
Duration of abdominal drainage, days	up to 3-4
Duration of antibiotic therapy, days	7-10
Duration of analgesia, days	1-3
Duration of fermentation, days	up to 4
Complications, n (%)	0

Discussion: CT and MRI scanning provide the most accurate assessment of the extent of tumor invasion. In addition, they can be used to perform non-invasive volumetry in patients with advanced tumor progression (PRETEXT III) and to predict possible postoperative complications.

Currently, the diagnosis can be made without morphological verification based on the level of cancer-specific markers. In two patients, the diagnosis was verified by the clinical picture. Morphological verification of the diagnosis was required in 3 cases. For this purpose, a percutaneous hepatic aspiration or "true-cut" biopsy under ultrasound navigation was used in two children, and a laparoscopic biopsy was performed in one.

An essential advantage of the laparoscopic technique is the reduced trauma and rehabilitation time and low blood loss, which undoubtedly meets all the requirements of modern surgery.

Principles of laparoscopic surgery for focal liver lesions include using specialized equipment such as a dissector and a hemostasis device and choosing the optimal volume of surgery: atypical resections of "anterior" segments (III-VI) or bisegmentectomies in relatively small focal lesions.

Resection of "complicated" segments (VII-VIII) is possible using special equipment that can change the angle of curvature of the working zone.

Today, there are several ways to classify this type of surgery depending on the resection method, volume, access, and extent.

Literature analysis shows that laparoscopic wedge resection of the liver is the most frequently performed (45%). Next in frequency are anatomic left lateral section (20%), right-sided hemihepatectomy (9%), left hemihepatectomy (7%), 19 extended right hemihepatectomies (0.7%), 3 extended left hemihepatectomies (0.1%), 18 caudal lobectomies (0.6%), 8 central resections (0.3%). These statistics have been compiled by foreign colleagues involved in the treatment of adults [7-9].

Contraindications to the laparoscopic method are cardiac defects associated with the risk of decompensation during surgical treatment in pneumoperitoneum; coagulopathies complicated by thrombosis of visceral vessels of the abdominal cavity; sub-compensated respiratory failure; excess body weight; widespread adhesions in the abdomen.

Among the presented complications, bile leakage, the possibility of massive intraoperative bleeding, and the risk of gas embolism are the most common. It is also worth pointing out the technical complexity of performing various surgical maneuvers using laparoscopy. Let us describe some of the complications in more detail.

The volume of intraoperative blood loss during laparoscopic operations is 7 times less than during open surgery. Postoperative complications of open operations were observed in 17 (51.5%) cases and required more prolonged treatment, while after using laparoscopic surgery, a complicated course was observed in 13 (35.1%) patients [10].

The duration of stay in ICU is 3–5 days for open operations and does not exceed three days for laparoscopic operations. Enteral load, verticalization of the patient in laparoscopic surgeries are possible earlier (starting from Day 1 after surgery). In the postoperative period, chemother-

apy was started on the 8th day with minimally invasive surgery, which reduces the number of bed days before post-surgery chemotherapy. Children were anesthetized in the postoperative period using combined anesthesia and prolonged epidural anesthesia. During laparoscopic liver resection, the duration of analgesia (1-3 days) and antibiotic therapy (7–10 days) was almost twice less than during laparotomy (3-5 and 12-14 days, respectively). Abdominal drainage and fermentation continued for a maximum of 4 postoperative days.

No clinical cases after laparoscopic surgery were associated with lethal outcomes, repeated surgical interventions, or blood transfusions. The main proportion of complications was fluid accumulation in the operative zone, noted in 8 (47.1%) patients. Five patients could be treated using conservative therapy, and three were treated with aspiration. Hydrothorax developed in 6 (35.3%) patients in the postoperative period. A single pleural puncture managed this complication. Lower lobe pneumonia on the side of the operation developed in 1 (5.9%) patient. Another 1 (5.9%) patient developed suppuration of the postoperative wound [11, 12].

The duration of hospital treatment ranged from 1.2 to 15.3 days. It varied by both the access method (in laparotomy – about five days, in laparoscopy – about one day after surgery) and the hospital stay (in the USA – 1.9 to 2.9 days, in Europe – 3.5 to 8.3 days, in Asia – 4.0 to 14.9 days). The average hospitalization time was four days, on average two days less than after open surgery. It should be noted that there are no data on the correlation between the volume of resection and the duration of hospital stay in the world literature [11, 12].

According to our review of the literature, the average operative time is 360 minutes. In the postoperative period, 12% of cases required observation in the intensive care unit, and one patient died from concomitant pathology. The initiation of oral analgesia and physical activity is earlier with the minimally invasive technique [13].

In the pediatric group of patients, the indications for liver resection are the presence of liver neoplasms, metastatic lesions, liver trauma, and cystic lesions.

The following cases of complications were described in the pediatric group: seroma formation (2.8%), formation of hypertrophic scar (2.8%). Infectious complications developed in 5.6% [13].

Advances in technology and improved techniques have enabled robot-assisted techniques to be applied in pediatric surgery. According to Reich et al., blood loss, complications, and postoperative mortality after robot-assisted surgery do not differ from laparoscopic surgery [7]. The disadvantages of robot-assisted techniques are the long duration of surgery and the high cost of the equipment [13].

Thus, summarizing the literature data and based on the experience and results of surgeries performed at Morozov Children's City Clinical Hospital, the laparoscopic technique should be preferred for liver resection in patients with benign masses and PRETEXT I-II hepatoblastoma. When performing liver resection by this method, it is critical to use 10-mm optics for adequate visualization, to perform preliminary volumetric marking of resection borders and monopolar dissection in the coagulation mode for parenchyma dissection, safe ligation of vascular structures using impedance bipolar coagulation techniques, continuous smoke evacuation by aspiration or through the elevated trocar valve; apply various methods of intraoperative hemostasis according to the nature and intensity of bleeding, retrieve the resectate in the endometrium without fragmentation through the mini-laparotomy access.

Minimally invasive techniques can be used to operate children with PRETEXT III hepatoblastoma, but further experience in this field and a comparative analysis of treatment outcomes are needed.

We do not recommend performing hemihepatectomy and dilated hemihepatectomy using laparoscopic technique.

Laparoscopic resection has become the gold standard for treating tumors in adult patients with HCC awaiting liver transplantation [13].

Conclusions: The use of laparoscopic techniques can reduce surgical time, reduce blood loss and prevent the development of complications intraoperatively and in the postoperative period, reduce the duration of hospital treatment, initiate early patient mobilization, enteral load, chemotherapy, reduce the drug load, and perform radical surgery.

Of course, there are indications and contraindications for each method. Laparoscopic techniques are not the standard of care for patients with liver tumors, but the results justify further studies to develop optimal treatment tactics.

References:

1. Alperovich B.I. Xirurgiya pecheni. – Tomsk: Izdatel'stvo Tomskogo universiteta, 1983. – 352 s. [Alperovich B.I. Liver surgery. - Tomsk: Tomsk University Publishing House, 1983. - 352 p.] (in Russian);

2. Wendel W. Beitrage zur Chiryrgie der Leber // Arch. Clin. Chir. – 1911. – Vol. 95. – P. 887.

3. Kuznetsov M.M., Pensky Yu.R. O sposobax rezekcii pecheni // Hirurgicheskij vestnik. – 1894. – № 12 (10-11). – S. 711-731 [Kuznetsov M.M., Penskiy Yu.R. About methods of liver resection // Surgical Bulletin. – 1894. – Vol. 12 (10-11). – P. 711-731] (in Russian);

4. Dykhno A.M. K voprosu ob obshirnyx rezekciyax pecheni // Vestnik khirurgii. – 1955. – №4. – S. 117-119 [Dykhno A.M. On the issue of extensive liver resections // Bulletin of Surgery. – 1955. – Vol. 4. – P. 117-119] (in Russian);

5. Zarivchatsky M.F., Mugatarov I.N., Kamenskikh E.D., Kosyak A.A., Gavrilov O.V., Malginov K.E., Kolevatov A.P. Profilaktika i lechenie oslozhnenij pri rezekciyax ochagovyx obrazovanij pecheni // Annaly xirurgicheskoj gepatologii. – 2013. – № 18(3). – S. 47-53 [Zarivchatsky M.F., Mugatarov I.N., Kamenskikh E.D., Kosyak A.A., Gavrilov O.V., Malginov K.E., Kolevatov A.P. Prevention and treatment of complications during resections of focal liver formations // Annals of Surgical Hepatology. – 2013. – Vol. 18 (3). – P. 47-53] (in Russian);

6. Shirabe K., Kajiyama K., Harimoto N., Tsujita E., Wakiyama S., Maehara Y. Risk factors for massive bleeding during major hepatectomy // Wld. J. Surg. – 2010. – Vol. 34 (7). – P. 1555-1562. https://www.scopus.com/record/display.uri?eid=2-s2.0-77955468017&origin=inward&txGid=89028a06d51cb6f1ee957eb5abf9d6a9;

7. Reich H., McGlynn F., DeCaprio J., Budin R. Laparoscopic excision of benign liver lesions // Obstet Gynecol. – 1991. – Vol. 78 (5 Pt 2). – P. 956-958. https://pubmed.ncbi.nlm.nih.gov/1833688/;

8. Reggiani P., Antonelli B., Rossi G. Robotic surgery of the liver: Italian experience and review of the literature // Ecancermedicalscience. – 2013. – Vol. 7. – P. 358. https://dx.doi.org/10.3332/ecancer.2013.358;

9. Cherqui D., Husson E., Hammoud R., Malassagne B., Stéphan F., Bensaid S., Rotman N., Fagniez P.L. Laparoscopic liver resections: a feasibility study in 30 patients // Ann Surg. – 2000. – Vol. 232(6). – P. 753-762. https://doi.org/10.1097/00000658-200012000-00004;

10. Chen D.X., Wang S.J., Jiang Y.N., Yu M.C., Fan J.Z., Wang X.Q. Robot-assisted gallbladder-preserving hepatectomy for treating S5 hepatoblastoma in a child: A case report and review of the literature // World J Clin Cases. – 2019. –Vol. 7(7). – P. 872-880. https://dx.doi.org/10.12998%2Fwjcc.v7.i7.872;

11. Kwon H., Lee J.Y., Cho Y.J., Kim D.Y., Kim S.C., Namgoong J.M. How to safely perform laparoscopic liver resection for children: A case series of 19 patients // J. Pediatr. Surg. – 2019. – Vol. 54(12). – P. 2579-2584. https://doi.org/10.1016/j.jpedsurg.2019.08.030;

12. Kim T., Kim D.Y., Cho M.J., Kim S.C., Seo J.J., Kim I.K. Use of laparoscopic surgical resection for pediatric malignant solid tumors: a case series // Surg. Endosc. – 2011. – Vol. 25(5). – P. 1484-1488. https://doi.org/10.1007/s00464-010-1418-y;

13. Veenstra M.A., Koffron A.J. Minimally-invasive liver resection in pediatric patients: initial experience and outcomes // HPB (Oxford). – 2016. – Vol. 18(6). – P. 518-522. https://dx.doi.org/10.1016%2Fj.hpb.2015.11.004.

ТҰЖЫРЫМ

***А.Б. Рябов*[1,2], *М.С. Кубиров*[2], *А.В. Хижников*[3], *М.Ю. Рыков*[4]**

[1]Ресей денсаулық сақтау министрлігінің «Радиология Ұлттық медициналық зерттеу орталығы» ФМБМ, Мәскеу, Ресей;
[2]«Мәскеу қаласының Денсаулық сақтау департаментінің Морозов қалалық балалар клиникалық ауруханасы» ДСМБМ, Мәскеу, Ресей;
[3]«Ресей федералды медициналық-биологиялық агенттігінің балалар мен жасөспірімдердің ғылыми-клиникалық орталығы», Мәскеу, Ресей;
[4]Ресей денсаулық сақтау министрлігінің «Тверь мемлекеттік медицина университеті» ФМБЖ КББМ Росс, Тверь, Ресей

Бауыр ісігімен ауыратын балаларды емдеудегі лапароскопиялық резекциялар: алғашқы тәжірибе

Өзектілігі: *бауыр ісіктерімен ауыратын науқастарды емдеудің негізгі әдістерінің бірі хирургиялық болып табылады. Бұл ретте аз инвазивті хирургиялық техникалар операциядан кейінгі кезеңнің өтуі мен оңалтуды жеңілдетеді.*

Зерттеу мақсаты: *бауыр ісіктерімен ауыратын балаларды емдеуде оңтайлы хирургиялық қол жетімділікті таңдау.*

Нәтижелері: *2014-2020 жылдары Морозов қалалық балалар клиникалық ауруханасында (Мәскеу, Ресей) бауыр ісіктерімен ауыратын 3-9 жас аралығындағы бес науқасқа лапароскопиялық резекция жасалды. Гепатобластомасы бар 3 пациенттің ішінен PRETEXT-тің I-сатысы 2 пациентте, PRETEXT-тің II-сатысы 1 пациентте байқалды. Барлық пациенттерге түбегейлі ота жасалып, емдеу (R0) жүргізілді, 1 (4%) балада резекция көлемі R1 құрады. Операциялардың ұзақтығы 60 минуттан аспады, интраоперациялық қан жоғалту көлемі 10 мл/кг болды, ота кезінде интраоперациялық асқынулар байқалмады.*

Қорытынды: *лапароскопиялық технологияларды қолдану операция уақытын қысқартуға, қан жоғалту көлемін азайтуға және операциядан кейінгі және операциядан кейінгі кезеңдегі асқынулардың дамуына жол бермеуге, стационарлық емдеу уақытын қысқартуға, науқасты ерте жұмылдыруды, ішек жүктемесін, химиотерапияны бастауға, дәрі-дәрмек жүктемесін азайтуға, сондай-ақ түбегейлі операцияны жүргізуге мүмкіндік береді.*

Түйінді сөздер: *балалар онкологиясы, хирургия, лапароскопия, хирургиялық онкология, гепатобластома, клиникалық жағдай, бауыр, лапаротомия.*

АННОТАЦИЯ

***А.Б. Рябов*[1,2], *М.С. Кубиров*[2], *А.В. Хижников*[3], *М.Ю. Рыков*[4]**

[1]ФГБУ «Национальный медицинский исследовательский центр радиологии» Минздрава России, Москва, Россия;
[2]ГБУЗ «Морозовская детская городская клиническая больница Департамента здравоохранения города Москвы», Москва, Россия;
[3]Научно-клинический центр детей и подростков Федерального медико-биологического агентства России, Москва, Россия;
[4]ФГБОУ ВО «Тверской государственный медицинский университет» Минздрава России, Тверь, Россия

Лапароскопические резекции при лечении детей с опухолями печени: первый опыт

Актуальность: *Один из основных методов лечения пациентов с новообразованиями печени – хирургический. При этом малоинвазивные хирургические техники облегчают течение послеоперационного периода и реабилитацию.*

Цель исследования: *Выбор оптимального хирургического доступа при лечении детей с опухолями печени.*

Результаты: *В 2014-2020 гг. в Морозовской ДГКБ (Москва, Россия) у пяти пациентов в возрасте 3-9 лет с опухолями печени была выполнена лапароскопическая резекция. Из 3 пациентов с гепатобластомами, стадия PRETEXT I отмечена у 2 пациентов, II – у 1. У всех пациентов выполнено радикальное оперативное лечение (R0), у 1 (4%) ребенка объем резекции составил R1. Длительность операций не превышала 60 минут, объем интраоперационной кровопотери не превышал 10 мл/кг, интраоперационные осложнения отмечены не были.*

Заключение: *Применение лапароскопических технологий позволяет сократить время операций, снизить объем кровопотери и предотвратить развитие осложнений как интраоперационно, так и в послеоперационном периоде, сократить сроки стационарного лечения, начать раннюю мобилизацию пациента, энтеральную нагрузку, химиотерапию, снизить лекарственную нагрузку, а также провести радикальную операцию.*

Ключевые слова: *детская онкология, хирургия, лапароскопия, хирургическая онкология, гепатобластома, клинический случай, печень, лапаротомия.*

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T.A. KURMANOV[1], A.K. DIGAY[1], SH.B. MUGALBEKOV[1], ZH.D. ZHUMAGAZIN[1], A.K. MUKAZHANOV[1], D.D. MUSTAFINOV[1]

[1]National Scientific Cancer Center, Nur-Sultan, the Republic of Kazakhstan

Laparoscopic cystectomy with lymphadenectomy and ileoconduitis creation: A case report

Relevance: *Radical cystectomy remains the «gold standard» of muscle-invasive and locally advanced bladder cancer treatment. The article describes the capacity and technique of laparoscopic cystoprostatectomy with lymphadenectomy and the creation of ileoconduitis in bladder cancer since the authors could not find publications on conducting laparoscopic cystoprostatectomy with the creation of an ileoconduitis in oncological and urological clinics in Kazakhstan by domestic specialists.*

The purpose *was to describe an attempt to reproduce the method of open radical cystectomy laparoscopically as accurately as possible.*

Results: *In the described case, the patient diagnosed with bladder cancer T2N0M0 IIst underwent surgery in the form of laparoscopic cystectomy with lymphadenectomy and the creation of ileoconduitis. This method of surgical intervention is minimally invasive, less traumatic, and ensures quick recovery in the postoperative period.*

Conclusion: *Laparoscopic execution of radical cystectomy allows preserving the advantages of minimally invasive interventions without losing the reliability of the well-proven open surgery. Currently, the implementation of such minimally invasive surgical interventions is possible in many clinics in Kazakhstan, equipped with endoscopic video equipment, if there are specialists experienced in open surgery.*

Keywords: *Cystectomy, lymphadenectomy, ileoconduitis creation.*

Introduction:

Surgery for radical cystectomies can follow open or laparoscopic approaches. Laparoscopic radical cystoprostatectomy is a minimally invasive and effective surgical procedure in treating bladder cancer [1-3]. Radical cystectomy remains the gold standard in the treatment of muscle-invasive and locally advanced bladder cancer. The article describes the possibilities and technique of laparoscopic cystoprostatectomy with lymphadenectomy and the ileoconduitis formation in bladder cancer because the authors could not find any publications on conducting laparoscopic cystoprostatectomy with the ileoconduitis formation in oncological and urological clinics in Kazakhstan by domestic specialists.

Today, the specialists of the Urology, Nephrology and Kidney Transplantation Clinic at the National Research Oncological Center (Nur-Sultan, Kazakhstan) conduct laparoscopic cystectomies with lymphadenectomy and ileoconduitis formation independently. Before, these operations were conducted only with the participation of foreign specialists.

This article describes the experience of performing laparoscopic cystoprostatectomy at the Clinic of Urology, Nephrology, and Kidney Transplantation of the National Research Oncological Center.

Patient information:

Patient M., born in 1965, diagnostics: Bladder cancer T2N0M0 II st.

From the anamnesis, it has transpired that in 2018, the bladder cancer T2N0M0 with stage II was diagnosed to this patient in the home area. The patient refused the recommended surgical treatment. He applied to the Clinic of Urology, Nephrology, and Kidney Transplantation of the National Research Oncological Center two years after the incursion of the disease, in the spring of 2020.

Diagnostics:

Ultrasound bladder dated 19.03.20: calculus and bladder tumor. During cystoscopy with biopsy, there is a definite subtotal bladder lesion with a roughly villous tumor similar to infiltrating growth, hempseed calculus. The ureteral orifices are not visualized due to the tumor. *The result of biopsies No. 361\362 dated 26.03.20*: papillary urothelial carcinoma of the bladder, G1 - first-degree anaplasia with foci of necrosis and the beginning of invasion into the submucosa. *Computerized tomography of the abdominal segment with contrast-enhanced* was performed (Figure 1). According to CT data, there are the signs characteristic of neoplasms of the bladder, bilateral expansion of the upper urinary tract, calculus of the left kidney.

Treatment:

On 26.05.2020, the patient underwent a laparoscopic cystectomy with lymph node dissection and the formation of an ileoconduitis by Bricker.

Date and time of operation: beginning: 26.05.2020 09:50 AM, completion: 26.05.2020 04:40 PM.

D.D. Mustafinov – 0000-0002-0386-343X, e-mail: *dauren_9393@mail.ru*

Diagnostics after surgery: Bladder cancer T2N0M0 IIst.

The course of the operation: under endotracheal anesthesia with artificial ventilation of the lungs in the patient's supine position, the surgical area was treated with an antiseptic three times. A Foley catheter 18 (Ch) is inserted into the bladder. A transverse skin incision up to 3 cm long was made 1 cm above the navel. The first trocar was inserted into the abdominal space. Pneumoperitoneum is up to 3 liters. Further, under visual control, a second trocar with a diameter of 10 mm was installed on the left along the lateral border of the rectus, and a trocar with a diameter of 5 mm was installed in the left iliac region. The trocar with a diameter of 5 mm was installed on the right along the lateral edge of the rectus, and the trocar with a diameter of 5 mm was installed in the right iliac region. We used VISIPORT trocars (USA). The location of the trocars is shown in Figure 2.

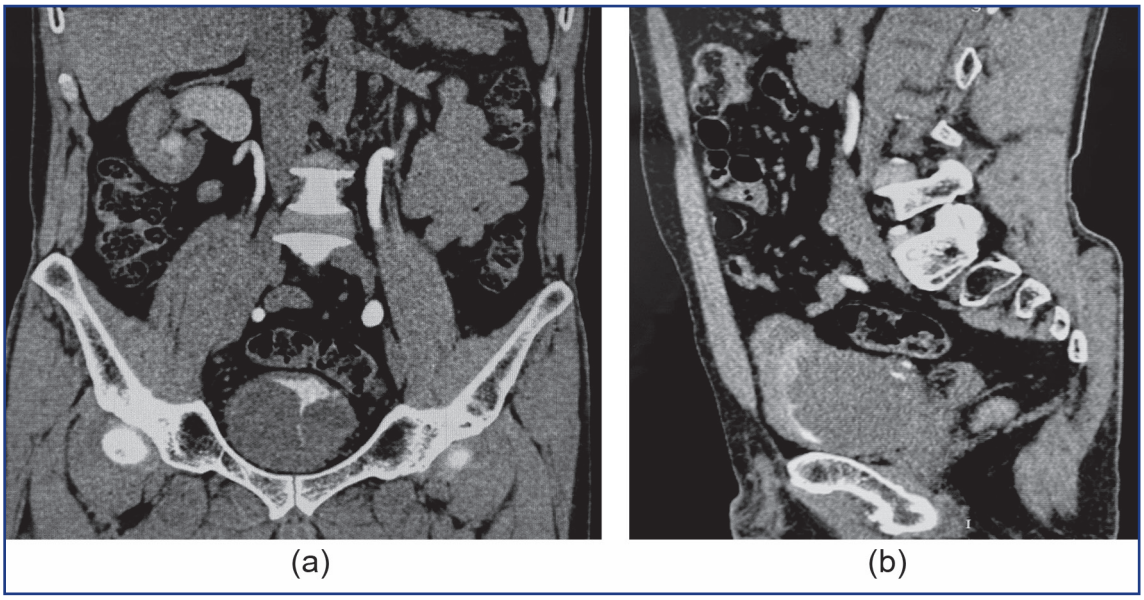

Figure1 – Computerized tomography of the abdominal segment with contrast: a) frontal view, b) lateral view (01/04/20).

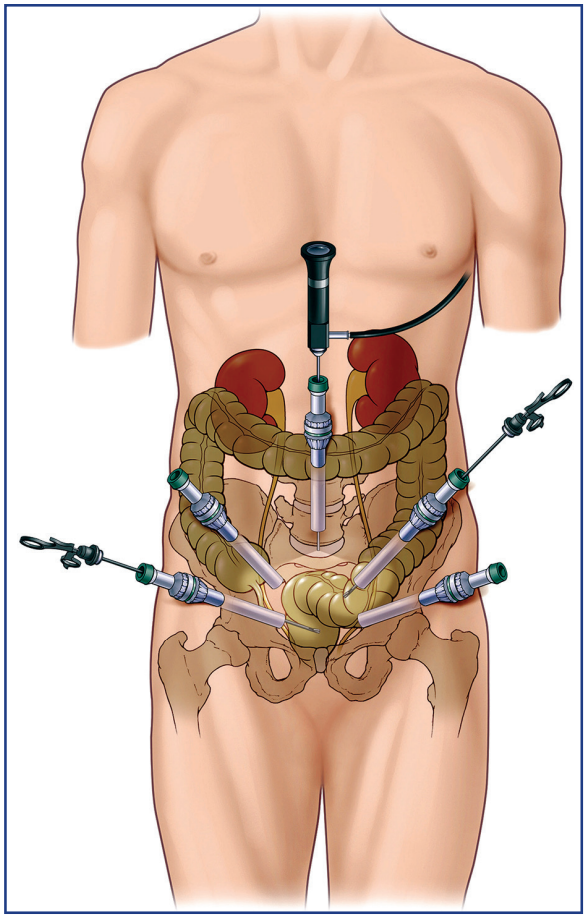

Figure 2 - Location of trocars [4]

The operating table is moved to the Trendelenburg position. There were no pathological changes during the examination of the abdominal space. The ureters were transected in the bladder entrance area; ureteral catheters were installed in the ureters, from which light urine was released in renal rhythm. The bladder was bluntly and sharply exposed from all sides using a harmonic scalpel (Johnson & Johnson, USA), the upper and lower vesical arteries were clipped. Hemostasis has been achieved. Then, the prostate was isolated from Donenville's fascia to the posterior urethra by sharp dissection. The mobilization was performed with the transection of the copulas of the prostate and the vessels passing along with them and their ligation. The seminal vesicles are mobilized from the surrounding tissues. The prostate was cut off from the posterior part of the urethra, after which the resected urethra was sutured tightly with two-layer sutures. Further, 2-sided lymphadenectomy was performed along the external, internal iliac arteries and obturator foramen of the small pelvis. Trocars are removed under visual control.

After additional treatment of the surgical area with an antiseptic, a mini-laparotomy up to 5 cm long was performed with median access. Previously mobilized for removal, the bladder and prostate were removed as en bloc into a container together with fragments of adenoid tissue.

Then a section of the twisted intestine was isolated, 15-20 cm away from the ileocecal angle, 20 cm long on the mesenterium, where the intestine was transected. The

continuity of the small bowel was restored by ileoileoanastomosis using the Endo GIA stapling apparatus (Covidien, USA) by the side-to-side method. End-to-side ureteroileoanastomoses were performed in the segment of the small bowel at the level of the small pelvis. The distal end of the segmented twisted intestine was sutured with a double-row suture. The cephalic end of the intestinal segment with ureteral stents was brought to the skin in the right iliac region. The cavity of the lesser pelvis was drained with a polyvinylchloride tube through a contraincision on the skin in the left iliac region. Hemostasis was achieved. The wounds of the anterior abdominal wall were sutured. The bandage was applied.

The duration of the operation was 410 minutes.

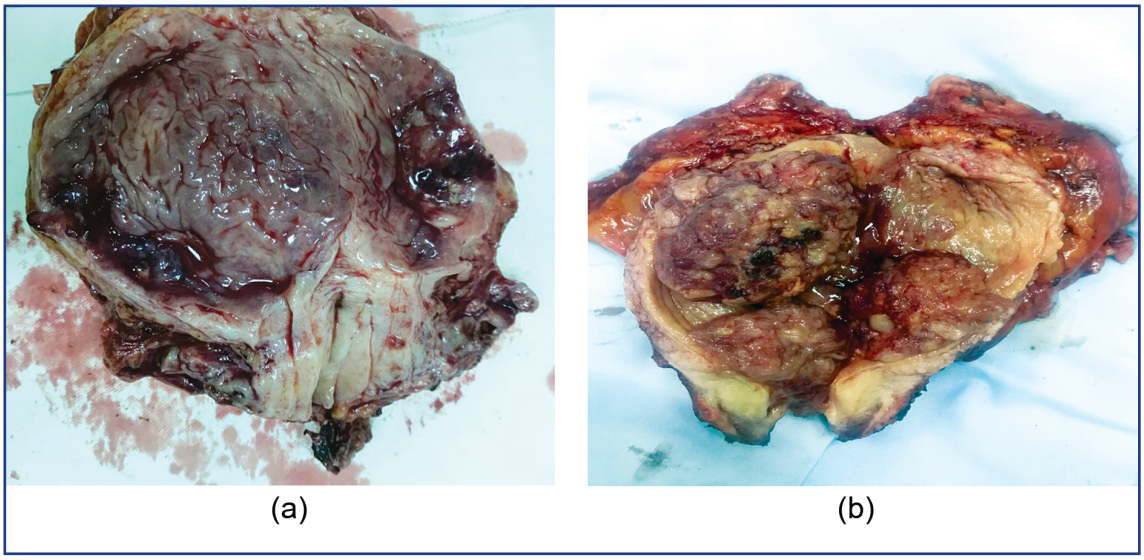

Figure 3 – Gross specimen of the removed bladder: a) bladder, b) bladder on the incision.

There is a subtotal lesion of the mucous surface of the urinary bladder on the gross specimen (Figure 3).

Results: The patient was activated on Day 3 after surgery and could move in the ward independently. Ureteral stents were removed on Day 12. Urine was excreted from ileoconduitis in a sufficient amount of 1-1.5 liters per day.

Results of diagnostic tests after treatment:

Control ultrasound investigation of the abdominal space, small pelvis of the delimited fluid was not detected in dynamic studies. No urine stasis in the upper urinary tract was registered.

Histopathological examination of the removed bladder and prostate showed the presence of papillary urothelial moderately differentiated bladder carcinoma with a focal spot of necrosis, the degree of anaplasia - G2 (M8130/3), areas of invasion into the wall to the muscle layer, nodular prostatic hyperplasia, chronic prostatitis. There are no signs of metastases in the removed pelvic lymph nodes.

The patient was discharged on Day 15 after surgery in good condition for further follow-up at the outpatient clinic at the place of residence. The result three months after surgery is shown in Figure 4.

Figure 4 – Result 3 months after surgery

The timeline of the medical case is shown in Table 1.

Table1 – The timeline of the medical case

Type of provided assistance	Period
Bladder ultrasound	26.03.2020
Cystoscopy, a biopsy of bladder for-mation	19.03.2020
CT of the abdominal segment with con-trast	01.04.2020
Laparoscopic cystectomy with lym-phadenectomy, formation of ileocon-duitis according to Bricker	26.05.2020

Conclusion:

This method of operational interventions allows in an earlier postoperative period, compared to open cystectomy, to arose the patient, thereby lessening the likelihood of flatulent distension, pulmonary engorgement, thromboembolic, and other complications and also shortens the hospital stay. Today, many clinics in Kazakhstan that possess endoscopic video equipment and specialists experienced in open surgery could perform such minimally invasive surgical interventions.

References:

1. Nosov A.K., Reva S.A., Dzhalilov I.B., Petrov S.B. Radikal'naya tsistektomiya pri rake mochevogo puzyrya: sravneniye rannikh khirurgicheskikh oslozhneniy pri laparoskopicheskoy, otkrytoy i videoassistirovannoy operatsii // Onkourologiya. – 2015. – № 11(3). – S. 71-78 [Nosov A.K., Reva S.A., Dzhalilov I.B., Petrov S.B. Radical cystectomy for bladder cancer: comparison of early surgical complications in laparoscopic, open and video-assisted surgery // Oncourology. – 2015. – Vol. 11(3). – P. 71-78] https://doi.org/10.17650/1726-9776-2015-11-3-71-78;

2. Perlin D.V., Aleksandrov I.V., Zipunnikov V.P., Shmanev A.O. Laparoskopicheskaya radikal'naya tsistektomiya // Onkourologiya. – 2018. – № 14 (1). – S. 136-141 [Perlin D.V., Aleksandrov I.V., Zipunnikov V.P., Shmanev A.O. Laparoscopic radical cystectomy // Oncourology. – 2018. – Vol. 14 (1). – P. 136-141] https://doi.org/10.17650/1726-9776-2018-14-1-136-143;

3. Tabakov A.V., Dubrovskiy V.N. Laparoskopicheskaya tsistektomiya s ortotopicheskoy enteroplastikoy mochevogo puzyrya iz mini-dostupa v lechenii bol'nykh s rakom mochevogo puzyrya // Meditsinskiy al'manakh. – 2012. – №4. – S. 59-63 [A. V. Tabakov, V. N. Dubrovsky Laparoscopic cystectomy with orthotopic bladder enteroplasty from a mini-access in treating patients with bladder cancer // Medical Almanac. – 2012. – Vol. 4. – P. 59-63] https://cyberleninka.ru/article/n/laparoskopicheskaya-tsistektomiya-s-ortototopicheskoy-enteroplastikoy-mochevogo-puzyrya-iz-mini-dostupa-v-lechenii-bolnyh-rakom;

4. Gerullis H., Kuemmel C., Popken G. Laparoscopic Cystectomy with Extracorporeal-Assisted Urinary Diversion: Experience with 34 Patients // Eur. Urol. – 2007. – Vol. 51(1). – P. 193-198. https://doi.org/10.1016/j.eururo.2006.05.049.

ТҰЖЫРЫМ

Т.А. Құрманов[1], А.К. Дигай[1], Ш.Б. Мұғалбеков[1], Ж.Д. Жұмағазин[1], А.К. Мұқажанов[1], Д.Д. Мұстафинов[1]

[1]Ұлттық ғылыми онкологиялық орталық,
Нұр-Сұлтан қ., Қазақстан Республикасы

Лимфодиссекциямен және илеокондуиттің құрылуымен лапароскопиялық цистэктомия: клиникалық жағдай

Өзектілігі: *Радикалды цистэктомия бұлшықет-инвазивті және жергілікті таралған қуықтың қатерлі ісігін емдеудің «Алтын стандарты» болып қала береді. Мақалада лимфодиссекциямен лапароскопиялық циспростатэктомияның және қуық обыры кезінде илеокондуиттің пайда болу мүмкіндіктері мен техникасы сипатталады, себебі авторлар отандық мамандардың Қазақстан аумағында онкологиялық және урологиялық клиникаларда илеокондутті құру арқылы лапароскопиялық циспростатэктомия жасау туралы жарияланымдарын таппаған.*

Зерттеу мақсаты: *лапароскопиялық нұсқада ашық радикалды цистэктомия әдісін мүмкіндігінше дәл көбейту әрекетін сипаттау.*

Нәтижелер: *Бұл мақалада қуық ісігі T2N0M0 IIst диагнозы қойылған науқастың жағдайы сипатталған. Хирургиялық араласу әдісі кімге лимфаденэктомиясы бар лапароскопиялық цистэктомия және илеокондуты құру түрінде таңдалды. Хирургиялық араласудың бұл әдісінің артықшылықтары бар: минималды инвазивтілік, операциядан кейінгі кезеңде тез қалпына келу, жарақатсыздық.*

Қорытынды: *Радикалды цистэктомияның лапароскопиялық орындалуы жақсы дәлелденген ашық операцияның сенімділігін жоғалтпай, аз инвазивті араласулардың артықшылықтарын сақтауға мүмкіндік береді. Қазіргі уақытта осындай аз инвазивті операциялық араласуларды эндобейнежабдықтармен жабдықталған Қазақстанның көптеген клиникаларында, ашық операциялар жүргізу тәжірибесі бар мамандар болған кезде орындауға болады.*

Түйінді сөздер: *цистэктомия, лимфаденэктомия, илеокондутитті құру.*

АННОТАЦИЯ

Т.А. Курманов[1], А.К. Дигай[1], Ш.Б. Мугалбеков[1], Ж.Д. Жумагазин[1], А.К. Мукажанов[1], Д.Д. Мустафинов[1]

[1]Национальный научный онкологический центр,
г. Нур-Султан, Республика Казахстан

Лапароскопическая цистэктомия с лимфодиссекцией и созданием илеокондуита: клинический случай

Актуальность: *Радикальная цистэктомия остается «золотым стандартом» лечения мышечно-инвазивного и местно-распространенного рака мочевого пузыря. В статье описываются возможности и техника лапароскопической циспростатэктомии с лимфодиссекцией и созданием илеокондуита при раке мочевого пузыря, поскольку авторы не нашли публикаций о проведении лапароскопической циспростатэктомии с созданием илеокондуита в онкологических и урологических клиниках на территории Казахстана отечественными специалистами.*

Цель: *описать попытку максимально точно воспроизвести в лапароскопическом исполнении методику открытой радикальной цистэктомии.*

Результаты: *В описанном в статье клиническом случае метод оперативного вмешательства в виде лапароскопической цистэктомии с лимфодиссекцией и созданием илеокондуита был применён у пациента с диагнозом «рак мочевого пузыря T2N0M0 IIst». Преимуществами данного метода оперативного вмешательства являются малоинвазивность, быстрое восстановление в послеоперационном периоде, меньшая травматичность.*

Заключение: *Лапароскопическое исполнение радикальной цистэктомии позволяет сохранить преимущества малоинвазивных вмешательств без потери надежности хорошо зарекомендовавшей себя открытой операции. В настоящее время выполнение таких малоинвазивных оперативных вмешательств возможно во многих клиниках Казахстана, оснащенных эндовидеооборудованием, при наличии специалистов с опытом проведения открытых операций.*

Ключевые слова: *Цистэктомия, лимфодиссекция, создание илеокондуита.*

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K.T. ZHABAGIN[1], *A.S. ZHABAGINA*[2], *A.M. RAKHMANKULOVA*[2]

[1]Semey Center for Nuclear Medicine and Oncology, Semey, the Republic of Kazakhstan;
[2]Semey Medical University NCJSC, Semey, the Republic of Kazakhstan

Indicators of the quality of life of patients with colorectal cancer: A literary review

Relevance: *GLOBOCAN estimates 1.9 million new cases of colorectal cancer (CRC) and 935,000 deaths from CRC in 2020. CRC accounts for every tenth cancer case or dying from cancer. According to the Oncological Service of the Republic of Kazakhstan (RK), in 2019, CRC ranked 5th in incidence and mortality among all cancers. With a survival time of more than five years, one of the main criteria that determine the condition of patients and the effectiveness of treatment is their quality of life (QOL). Understanding QOL parameters is essential to assess the full impact of the disease on an individual, family, and community.*

The purpose of the study *was to analyze the quality-of-life indicators in patients with colorectal cancer and validate a Kazakh variant of the EORTC QLQ-CR-2 questionnaire in RK.*

Results: *The QOL of patients with CRC globally is relatively low in its physical, mental, social, and clinical aspects. The most important factors affecting the QOL are sexual dysfunction, body dissatisfaction in ostomy patients, chronic recurrent diarrhea, symptoms of distress, and high fatigue. The patient's lifestyle, age, gender, stage of the disease, and psycho-emotional status all affect the QOL of patients with CRC. It should also be noted that CRC survivors who have been physically active report a better QOL than those who were not physically active.*

Conclusion: *The fact that no study has been conducted in the RK for the QOL of patients with CRC necessitates a survey to understand the QOL parameters in patients with CRC using the Kazakh version of the EORTC QLQ-CR-2 questionnaire. We plan to conduct such a study in the near future within the framework of grant funding for young scientists IRN AP09058432 KN MES RK and publish the results.*

Keywords: *colorectal cancer (CRC), quality of life (QOL), EORTC QLQ-CR-2, linguistic validation, malignant neoplasm.*

***Introduction*:**

Colorectal cancer (CRC) ranks third in incidence and second in mortality among other cancers [1]. In 2020, CRC accounted for more than 1.9 million new cases and 935,000 deaths, amounting to every 10th death from cancer. In countries with a transient economy, CRC incidence is four times higher, but the difference in mortality rates is insignificant to a general growth of mortality. The prevalence of colon cancer varies by nine times depending on the region, with the highest rates in the EU, Australia/New Zealand, and North America. In Hungary and Norway, colon cancer leads the cancer prevalence in men and women. Colon and rectal cancer incidence rates are generally low in many parts of Africa and South-East Asia. This determines the interest in prevention, early diagnostics, improved treatment, and rehabilitation [2].

Cancer worsens the general health of patients more than other diseases, leading to disability and early death. Modern treatment methods like chemo and radiation therapy have increased the patients' chances of recovery. However, patients' quality of life (QoL) and the duration of remission of the disease remain unsatisfactory. In the life expectancy of 5 years and more, we have to study the patients' condition using various QoL assessment methods.

The purpose of the study was to analyze the quality-of-life indicators in patients with colorectal cancer and validate a Kazakh variant of the EORTC QLQ-CR-2 questionnaire in RK.

Materials and Methods: The search for sources was carried out in the following databases: Scopus, Medline, Web of Knowledge (Thomson Reuters), PubMed, Scopus, ScienceDirect. The search depth was ten years, from 2011 to 2021. Inclusion criteria: reports of randomized and cohort studies in large populations; meta-analyzes and system reviews; articles in English and Russian. Publication criteria: articles published before 2011; unconfirmed materials, abstracts, synopses, and newspaper articles. The study included 62 articles on the topic available in full text and meeting the criteria.

Results:

Colorectal cancer

CRC ranks second in men and third in women in prevalence among other cancers. It also contributes significantly to deaths from cancer despite the permanent improvement in diagnostics and treatment methods [3].

K.T. Zhabagin – 0000-0002-4304-5132, e-mail: *kuantkan_85@mail.ru*
A.S. Zhabagina – 0000-0001-8956-6286, e-mail: *a_zhabagina@mail.ru*
A.M. Rakhmankulova – 0000-0003-3307-413X, e-mail: *dana77792@mail.ru*

Most colorectal tumors develop in a multi-stage process involving histological, morphological, and genetic changes. This allows precancerous polyps to be identified and checked early before they become cancerous in people with moderate risk of developing colorectal cancer and significantly reduce the CRC incidence [4]. Today, the CRC incidence and mortality went down due to anticancer screening. However, there is a growing number of young patients diagnosed with CRC for unknown reasons. Multiple studies show a significant role of environmental and genetic factors in CRC pathogenesis. Nutrition may also play a causal and protective role in CRC development [5]. In the development of colorectal adenocarcinoma, successive genetic and epigenetic mutations occur in specific oncogenes and/or tumor-suppressive genes in the epithelial cells of the gastrointestinal tract. These mutations cause CRC onset, progression, and metastasis. The molecular characteristics of cancer-associated mutations provide valuable information for disease prognosis and response to therapy. Therefore, early diagnostics and individual approaches to treatment, as well as a good knowledge of the molecular basis of CRC onset and progression, are critical in the treatment of this disease [6].

Quality of life of CRC patients

Despite significant studies of CRC patients' QoL, information on the QoL of patients one year after the treatment is limited. Understanding the QoL of CRC survivors is essential for assessing the overall impact of the disease on the individual, family, and society.

QoL is an important indicator in healthcare and medicine [7]. QoL definitions and measurements are subjective; this concept is not universally acknowledged. Many researchers believe that QoL includes such aspects as physical, psychological, social, emotional, sexual activities of a person, their spiritual well-being, as well as the professional or role capacities of a person.

Assessing the QoL of oncological patients carries a range of functions. E.g., the QoL value complements the objective medical assessment of treatment outcomes. QoL assessment is also important when palliative care is the main reason for medical intervention. In patients with advanced cancer, its treatment can reduce the QoL while not improving the patient's condition. Interventions to improve the QoL can reveal unaddressed emotional, social, and spiritual problems of patients and, therefore, can add to the success of palliative care. The QoL assessment is usually required to assess the impact of the disease on surviving patients. Despite the prevalence of CRC in the West, little is known about the patients' QoL and the long-term effects of cancer treatment, and long-term studies are needed to determine the QoL of CRC survivors.

In general, there are no universal forms that determine the QoL of cancer patients. It is possible to identify only some changes in the QoL of a particular group of respondents. There is no single way to determine the QoL, and every single tool to determine it has its criteria and rating scale.

QoL questionnaire

The QoL of patients is assessed using the QLQ-C30 questionnaire of the European Organization for Research and Treatment of Cancer (EORTC) on a 30-point scale (QLQ-C30 ver. 2) one year after diagnosis. The QLQ-C30 questionnaire includes five elements of a functional scale that assesses physical, emotional, cognitive, and social functioning, as well as global health data. Three symptom scales measure fatigue, pain, and nausea/vomiting, while six separate scales measure symptoms such as shortness of breath, insomnia, loss of appetite, constipation, diarrhea, and financial difficulties. High functional scores indicate good QoL, while high symptom scores indicate severe symptoms [8].

Social support decreases after CRC diagnostics and treatment in every third patient, which is a significant risk factor in restoring their QoL. Early initiation and assessment of care provided to such patients at all stages can improve recovery, which is especially important for vulnerable groups of patients in need of social support [9].

QoL indicators in CRC patients worldwide.

In Korea, they studied the correlation between physical activity and QoL of breast and colorectal cancers survivors. In total, they selected 224 patients (151 with breast cancer and 73 with rectal cancer) after cancer treatment. Their physical activity was measured using the Godin's Leisure Sports questionary and the EORTC QLQ C-30 questionary. In Korea, increased physical activity correlated with a higher QoL among breast and colorectal cancers survivors. QoL improvement shall be among the crucial strategies for improving the lives of people with cancer [10].

In China, they studied the impact of diet and physical activity on general and cancer-specific QoL, anxiety, and depression among Chinese adults surviving colon cancer. The study included 223 adults after colon cancer within one year after cancer treatment.

Linear mixed models were used to measure the intervention effects. The participants with changes in the diet noted a significant improvement in overall QoL after 12 months and in specific indicators of cancer and depression after 12 and 24 months. Physically active participants showed a significant improvement in the index of usefulness SF-6D and physical performance within six months. It was proven that nutrition interventions improve the QoL of cancer patients and colon cancer survivors [11].

Another research was conducted in nine geographically varied settlements in the States. A phone survey utilized computer methods for QoL assessment. The final model included 403 cases and 401 controls. Multiple lo-

gistic regression was shown to have a significant negative impact on survival in CRC. High prevalence of comorbidities had a significant adverse effect on general QoL regardless of the patients' condition. High comorbidity scores were associated with low QoL both among the participants and the controls [12].

Another crossover study included patients with metastatic CRC treated with Cetuximab at the medical center in the north of Taiwan. Structured questionnaires were used to measure the stress symptoms, body condition, and EGFR-related QoL in patients. Of 111 patients surveyed, 79.2% had acne, 52.2% had paronychia. Skin dryness and itching were the most common symptoms. EGFR-related QoL impairment was due to the symptoms of stress, negative body image, increased share of cumulative targeted therapy, and fever; those factors decreased the EGFR-related QoL by 66.6% [13].

In Germany, they studied the cross-correlation between physical fitness measured by the 6-minute walking distance (6MWD) test, 30 Second Chair Stand Test (30 CST), and isometric grip strength and QoL in patients with CRC (n = 71, average age – 67 ± 10 years, 63% men; stages I, II, and III – in 35, 39, and 25%, respectively). High 6MWD and 30 CST results correlated with better general health status ($p < 0.001$, $p = 0.001$, respectively), higher load ($p < 0.001$), and lower symptoms of pain and fatigue ($p < 0.001$). High 6MWD scores also correlated with a cognitive function improvement ($p = 0.005$). In the study, aerobic fitness and calf muscle strength correlated with general health status improvement, high working ability, and lower symptoms of pain and fatigue in patients with CRC [14].

Chinese researchers studied the stoma condition (permanent stoma, temporary stoma, or no-stoma) impact on psychological stress and QoL of Chinese patients with CRC in the early postoperative period. The crossover study involved 282 CRC patients 1-2 weeks after surgery.

The patients with permanent or temporary stoma reported worse body conditions and higher levels of anxiety and depression than no-stoma patients ($P < 0.05$). The stoma presence was the most decisive factor related to body image, stress, and depression ($P < 0.05$). Visual body image was shown to have an overall impact on stoma-related anxiety, depression, and QoL in patients with a permanent or temporary stoma; permanent stoma also led to a depression state of patients [15].

In Russia, 115 patients with CRC and liver metastasis were included in a QoL study (54 participants and 61 controls). Both groups were comparable in age, gender, type of surgery, and cancer differentiation status. QoL was measured using a FACT-G questionnaire with a specialized FACT-C module. The scientists concluded that the radiofrequency ablation of colorectal metastases in the liver during cytoreductive surgery provided a higher patients' QoL 3 and 6 months after surgery than atypical liver resection. Significant changes in QoL indicators depended on the dynamics of physical well-being and modular CRC indicators. No significant changes in assessing functional and emotional well-being were registered [16].

In Ghana, they selected data on QoL of patients diagnosed with CRC at Komfo Anokye Teaching Hospital (KATH) in 2009-2015 who survived till January 2017. The data included demographic parameters, clinical pathology descriptions, and QoL indicators. A significant limitation of the study was that no information about the patients' QoL before the diagnosis, as well as their age, gender, and socio-economic status, was provided [17].

A US study involved 227 patients with long-term remission of CRC. The QoL of surviving patients was nearly equal. Non-cancer-related diseases and low income influence the early-stage CRC patients' QoL. Patients who lived a long time had a high level of depression despite a higher QoL. 16% reported bowel movements three or more times a day, while 49% had chronic recurrent diarrhea. It was shown that patients with long-term remission of CRC could have a relatively high QoL, though diarrhea and depressive symptoms remain a problem [18].

In a prospective study, the changes in employment over 12 months in a group of middle-aged people (45-64 years) from Queensland, Australia, were compared to the controls with CRC. The study showed that about one-half of CRC survivors (66/148, 45%) have ceased regular or contract employment during the study period compared to 27% in the control group (79/295, $p = 0.001$). However, the participants with CRC noted significant improvements in physical well-being, functional well-being, and overall QoL during the study period. CRC patients who maintained or increased their workload for 12 months after diagnosis were found to have less workload or improvement in the functional well-being and general QoL than those retired [19].

Sexual dysfunction is another important factor influencing the QoL of people after CRC (especially rectal cancer). Health-related differences in QoL can be associated with the stoma condition (anastomosis). The rectal cancer survivors with a stoma (N = 181) or anastomosis (N = 394) from northern California and the northwest of the US were assessed using the HRQOL score for measuring functional status. The survivors with a permanent stoma operated before 2000 were more likely to become sexually inactive after surgery; they could be dissatisfied with their physical appearance, interference with personal relationships and intimacy, and have a low general HRQOL score. Surviving women with stoma often had vagina narrowing and postoperative vaginal pain that remained during the

study (≥5 years after surgery). Sexual dysfunction is a long-term consequence of CRC treatment that adds to the problems of survivors with a permanent stoma. Wide use of target actions to manage sexual dysfunction is required to improve the HRQOL scores of these survivors [20].

Conclusion:

We have found that in some countries, the QoL of CRC patients remains low in terms of physical, mental, social, clinical, and financial condition. Significant factors influencing the QoL included financial difficulties, sexual dysfunction, dissatisfaction with the patient's body with an ostomy, diarrhea, depressive symptoms, symptoms of stress, and increased fatigue. These patients also need skincare and emotional support.

Lifestyle, age, gender, stage of the disease, psychoemotional state of a person – all these influence the QoL of CRC patients. It should be noted that CRC patients who have been physically active for a long time have a better QoL than people with low physical activity. Till today, there was no survey in the Republic of Kazakhstan on the QoL of patients with CRC. This necessitates the studies to understand the QoL of patients with CRC. In the near future, we plan to conduct such a survey and share the results within the framework of grant funding for young scientists of the Republic of Kazakhstan IRN AP09058432 KN MES RK.

References:

1. Aliev S. A., Aliev E. S. Kolorektal'nyj rak: zabolevaemost', smertnost', invalidnost', nekotorye faktory riska // Vestn. hir. – 2007. – №4 [Aliev S.A., Aliev E.S. Colorectal cancer: morbidity, mortality, disability, some risk factors // Vestn. hir. - 2007. - No. 4]. https://cyberleninka.ru/article/n/kolorektalnyy-rak-zabolevaemost-smertnost-invalidnost-nekotorye-faktory-riska (in Russian);

2. Sung H., Ferlay J., Siegel R.L., Laversanne M., Soerjomataram I., Jemal A., Bray F. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries // CA Cancer J Clin. – 2021. – Vol. 71. – P. 209- 249. https://doi.org/10.3322/caac.21660;

3. Lech G., Słotwiński R., Słodkowski M., Krasnodębski I.W. Colorectal cancer tumour markers and biomarkers: Recent therapeutic advances // World J. Gastroenterol. – 2016. – Vol. 22(5). – P. 1745-1755. https://doi.org/10.3748/wjg.v22.i5.1745;

4. Simon K. Colorectal cancer development and advances in screening // Clin. Interv. Aging. – 2016. – Vol. 11. – P. 967-976. https://doi.org/10.2147/CIA.S109285;

5. Thanikachalam K., Khan G. Colorectal Cancer and Nutrition // Nutrients. – 2019. – Vol. 11(1). – P. 164. https://doi.org/10.3390/nu11010164;

6. De Rosa M., Pace U., Rega D., Costabile V., Duraturo F., Izzo P., Delrio P. Genetics, diagnosis and management of colorectal cancer (Review) // Oncol Rep. – 2015. – Vol. 34(3). – P. 1087-1096. https://doi.org/10.3892/or.2015.4108;

7. Haraldstad K., Wahl A., Andenæs R., Andersen J.R., Andersen M.H., Beisland E., Borge C.R., Engebretsen E., Eisemann M., Halvorsrud L., Hanssen T.A., Haugstvedt A., Haugland T., Johansen V.A., Larsen M.H., Løvereide L., Løyland B., Kvarme L.G., Moons P., Norekvål T.M., Ribu L., Rohde G.E., Urstad K.H., Helseth S., LIVSFORSK network. A systematic review of quality of life research in medicine and health sciences // Qual. Life Res. – 2019. – Vol. 28(10). – P. 2641-2650. https://doi.org/10.1007/s11136-019-02214-9;

8. Arndt V., Merx H., Stegmaier C., Ziegler H., Brenner H. Quality of life in patients with colorectal cancer 1 year after diagnosis compared with the general population: a population-based study // J. Clin. Oncol. – 2004. – Vol. 22(23). – P. 4829-4836. https://doi.org/10.1200/JCO.2004.02.018;

9. Haviland J., Sodergren S., Calman L., Corner J., Din A., Fenlon D., Grimmett C., Richardson A., Smith P.W., Winter J., members of Study Advisory Committee, Foster C. Social support following diagnosis and treatment for colorectal cancer and associations with health-related quality of life: Results from the UK ColoREctal Wellbeing (CREW) cohort study // Psycho-Oncology. – 2017. – №26(12). – P. 2276-2284. https://doi.org/10.1002/pon.4556;

10. Park J.-H., Lee D.H., Kim S.I., Kim N.K., Jeon J.Y. Moderate to vigorous physical activity participation associated with better quality of life among breast and colorectal cancer survivors in Korea // BMC cancer. – 2020. – Vol. 20. – no. 365. https://doi.org/10.1186/s12885-020-06819-z;

11. Ho M., Ho J.W.C., Fong D.Y.T., Lee C.F., Macfarlane D.J., Cerin E., Lee A.M., Leung S., Chan W.Y.Y., Leung I.P.F., Lam S.H.S., Chu N., Taylor A.J., Cheng K.K. Effects of dietary and physical activity interventions on generic and cancer-specific health-related quality of life, anxiety, and depression in colorectal cancer survivors: a randomized controlled trial // J. Cancer Surviv. – 2020. – Vol. 14(4). – P. 424-433. https://doi.org/10.1007/s11764-020-00864-0;

12. Pate A., Lowery J., Kilbourn K., Blatchford P.J., McNulty M., Risendal B. Quality of life and the negative impact of comorbidities in long-term colorectal cancer survivors: a population-based comparison // J. Cancer Surviv. – 2020. – Vol. 14(5). – P. 653-659. https://doi.org/10.1007/s11764-020-00876-w;

13. Chiang T.Y., Hsu H.C., Jane S.W., Chen S.C. EGFRI-associated health-related quality of life by severity of skin toxicity in metastatic colorectal cancer patients receiving epidermal growth factor receptor inhibitor target therapy // Support. Care Cancer. – 2020. – Vol. 28(10). – P. 4771-4779. https://doi.org/10.10 07/s00520-020-05321-3;

14. Soares-Miranda L., Lucia A., Silva M., Peixoto A., Ramalho R., da Silva P.C., Mota J., Macedo G., Abreu S. Physical Fitness and Health-related Quality of Life in Patients with Colorectal Cancer // Int. J. Sports Med. – 2021. – Epub ahead of print. https://doi.org/10.1055/a-1342-7347;

15. Song L., Han X., Zhang J., Tang L. Body image mediates the effect of stoma status on psychological distress and quality of life in patients with colorectal cancer // Psycho-Oncology. – 2020. – Vol. 29(4). – P. 796-802. https://doi.org/10.1002/pon.5352;

16. Kaganov O.I., Kozlov S.V. Pokazateli kachestva zhizni bol'nyh s diagnozom kolorektal'nyj rak posle citoreduktivnyh operacij // Koloproktologiya. – 2011. – №2(36). – S. 18-22 [Kaganov O.I., Kozlov S.V. Indicators of the quality of life of patients diagnosed with colorectal cancer after cytoreductive operations // Coloproctology. – 2011. – Vol. 2 (36). – P. 18-22] (in Russian);

17. Yorke J., Acheampong E., Batu E.N., Obirikorang C., Yeboah F.A., Asamoah E.A. Quality of life of colorectal cancer survivors in a Ghanaian population // BMC Res Notes. – 2019. – Vol. 12(1). – P. 781. https://doi.org/10.1186/s13104-019-4817-8;

18. Seilkhanova D.M., Shalgumbaeva G.M., Baibusinova A.Zh., Sagadieva M.M., Adilgozhina S.M., Slyamkhanova N.S. Quality of life of patients with colorectal cancer: a literature

review // Oncology and Radiology of Kazakhstan. – 2020. – Vol. 4 (58). – P. 66-71. http://oncojournal.kz/docs/archive/en/divided/58/2663-4864-2020-4-58-66-71.pdf;

19. Beesley V.L., Vallance J.K., Mihala G., Lynch B.M., Gordon L.G. Association between change in employment participation and quality of life in middle-aged colorectal cancer survivors compared with general population controls // Psycho-Oncology. – 2017. – № 26(9). – P. 1354-1360. https://doi.org/10.1002/pon.4306;

20. Sun V., Grant M., Wendel C.S., McMullen C.K., Bulkley J.E., Herrinton L.J., Hornbrook M.C., Krouse R.S. Sexual Function and Health-Related Quality of Life in Long-Term Rectal Cancer Survivors // J. Sex. Med. – 2016. – Vol. 13(7). – P. 1071-1079. https://doi.org/10.1016/j.jsxm.2016.05.005.

ТҰЖЫРЫМ

Қ.Т. Жабағин[1], А.С. Жабағина[2], А.М. Рахманкулова[2]

[1]«Семей қ. Ядролық Медицина және Онкология орталығы»,
Семей қ., Қазақстан Республикасы;
[2]КеАҚ «Семей Медицина Университеті», Семей қ., Қазақстан Республикасы

Колоректальді обыры бар науқастардың өмір сапасының көрсеткіштері: Әдеби шолу

Өзектілігі: *GLOBOCAN бағалауы бойынша 2020 жылы колоректальды обырдың (КРО) 1,9 миллион жаңа жағдайы анықталып, тоқ ішек обырынан 935,000 адам қайтыс болды, бұл онкологиялық аурудың әрбір 10 жағдайының бірі өлімге әкеліп соғады деген сөз. Қазақстан Республикасының (ҚР) онкологиялық қызметінің мәліметтері бойынша, 2019 жылы КРО барлық локализацияның арасында аурушаңдық пен өлім -жітім бойынша 5 -ші орынды иеленді. Өмір сүру ұзақтығы 5 жылдан асса, науқастардың жағдайы мен емнің тиімділігін анықтайтын негізгі критерийлердің бірі – өмір сүру сапасы. Аурудың адамға, отбасына және қоғамға толық әсерін бағалау үшін өмір сүру сапасын түсіну маңызды.*

Берілген зерттеудің мақсаты: *Колоректальды қатерлі ісікпен ауыратын науқастардың өмір сүру сапасының көрсеткіштерін зерттеу және сол арқылы ҚР EORTC QLQ-CR-2 сауалнамасының қазақша валидациясын енгізу.*

Зерттеу нәтижелері: *әлемде КРО бар науқастардың өмір сүру сапасы физикалық, психикалық, әлеуметтік және клиникалық аспектілер бойынша салыстырмалы түрде төмен. Өмір сүру сапасына әсер ететін маңызды факторлар жыныстық дисфункция, стомасы бар науқастардың өз денесіне қанағаттанбауы, созылмалы қайталанатын диарея, күйзеліс белгілері және жоғары шаршау болды. Науқастардың өмір сүру салты, жасы, жынысы, аурудың сатысы, адамның психоэмоционалды жағдайы - мұның бәрі КРО бар науқастардың өмір сүру сапасына әсер етеді. Сондай -ақ, физикалық белсенділікте болған КРО бар науқастар физикалық белсенді емес науқастарға қарағанда өмір сүру сапасы жоғары болғандығы туралы хабарлағанын атап өткен жөн.*

Қорытынды: *Бүгінгі күнге дейін ҚР-да КРО бар науқастардың өмір сүру сапасының көрсеткіші бойынша зерттеулер жүргізілген жоқ. Осыған байланысты EORTC QLQ-CR-2 сауалнамасының қазақша нұсқасын қолдана отырып, КРО бар науқастардың өмір сүру сапасын түсіну үшін зерттеу жүргізу қажет. ҚР БҒМ ҒНН AP09058432 жас ғалымдарды гранттық қаржыландыру аясында жақын арада біз осындай зерттеу жүргізуді жоспарлап отырмыз және нәтижелерімен бөлісетін боламыз.*

Түйінді сөздер: *тоқ ішек ісігі, науқастың өмір сапасы, EORTC QLQ-CR-2, лингвистикалық валидация, қатерлі ісік.*

АННОТАЦИЯ

К.Т. Жабагин[1], А.С. Жабагина[2], А.М. Рахманкулова[2]

[1]«Центр «Ядерной Медицины и Онкологии г. Семей», г. Семей, Республика Казахстан;
[2]НАО «Медицинский университет Семей», г. Семей, Республика Казахстан

Показатели качества жизни пациентов с колоректальным раком: Обзор литературы

Актуальность: *По оценкам GLOBOCAN, в 2020 году было выявлено 1,9 миллион новых случаев колоректального рака (КРР) и 935 000 случаев смерти от этого заболевания, что составляет каждый десятый случай заболеваемости и смертности от рака. По данным онкологической службы Республики Казахстан (РК), в 2019 году КРР занимал 5 место по заболеваемости и смертности среди всех локализаций. При сроках выживаемости более 5 лет, одним из главных критериев, определяющих состояние пациентов и эффективность лечения, является качество жизни (КЖ). Понимание параметров КЖ имеет важное значение для оценки полного воздействия заболевания на человека, его семью и сообщество.*

Цель исследования: *Изучить показатели качества жизни пациентов с колоректальным раком и тем самым ввести в РК казахскую валидацию опросника EORTC QLQ-CR-2.*

Результаты: *Качество жизни пациентов с КРР в мире – относительно низкое с точки зрения физических, психических, социальных, клинических аспектов. Наиболее важными факторами, влияющими на качество жизни, были сексуальная дисфункция, неудовлетворенность пациентов со стомой своим телом, хроническая рецидивирующая диарея, симптомы дистресса и высокая утомляемость. Образ жизни пациента, возраст, пол, стадия заболевания, психоэмоциональный статус человека – все это влияет на качество жизни пациентов с КРР. Также необходимо отметить, что люди, пережившие КРР, которые были физически активны, сообщили о лучшем качестве жизни, чем те, которые не были физически активны.*

Заключение: *На сегодняшний день в РК исследовании по изучению КЖ больных с КРР не проводилось. В связи с этим необходимо провести исследование для понимания качества жизни пациентов с КРР с помощью казахской версией опросника EORTC QLQ-CR-2. В ближайшее время мы планируем провести такое исследование в рамках грантового финансирования молодых ученых ИРН AP09058432 КН МОН РК и будем делиться результатами.*

Ключевые слова: *колоректальный рак, качество жизни пациентов, EORTC QLQ-CR-2, лингвистическая валидация, злокачественное новообразование.*

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M.N. TILLYASHAYKHOV[1], O.A. RAKHIMOV[1], A.A. ADILKHODJAYEV[1], S.M. DJANKLICH[1]

[1]Republican Specialized Scientific and Practical Medical Center of Oncology and Radiology of the Ministry of Health of the Republic of Uzbekistan (RSNPMCOR), Tashkent, the Republic of Uzbekistan

Epidemiological aspects of colorectal cancer in the world and the Republic of Uzbekistan: A literature review

Relevance: *GLOBOCAN 2019 reports that colorectal cancer (CRC) ranks third among mortality causes and fourth among the newly diagnosed cases in the world. CRC incidence is growing worldwide and in the Republic of Uzbekistan. Thus, in the Republic of Uzbekistan, CRC ranks 5th in the general cancer structure and 2nd in men.*

The purpose of the study *was to make an epidemiological assessment of global trends in colorectal cancer and CRC incidence in the Republic of Uzbekistan in 2018-2019.*

Results: *Global CRC incidence and mortality trends show differences depending on territories and level of economic development. Gender differences were also revealed: CRC is more often in men, with the ratio of men to women 1.25: 0.8.*

Conclusions: *The study of the oncoepidemiological situation on CRC in the Republic of Uzbekistan showed an upward trend that determines the need for further studies of territorial differences and the search for CRC occurrence factors.*

Keywords: *colorectal cancer (CRC), oncoepidemiology, Republic of Uzbekistan, incidence, mortality.*

Introduction: Malignant neoplasms (MN) have recently become one of the main issues in medicine. Their prevalence is growing worldwide, placing enormous physical, emotional, and financial stress on the population and the healthcare system. Unfortunately, countries with low and middle incomes are not always ready to meet these challenges.

According to Kachanov et al., an in-depth epidemiological analysis, taking into account anatomical localization and histological structure is possible only based on indicators of population registers, in which patient data are taken into account from the moment of the initial registration of cancer and until the patient's death [1]. Such registers are collected worldwide based on population cancer registers' data, making it possible to compare the incidence and mortality levels [1]. In terms of territorial coverage, registers can be regional, national, or global [2-5].

The purpose of the study was to make an epidemiological assessment of global trends in colorectal cancer (CRC) and CRC incidence in the Republic of Uzbekistan in 2018-2019.

Materials and Methods: The global CRC situation was analyzed based on GLOBOCAN data for 2019. In the Republic of Uzbekistan, we evaluated the incidence, trends, and annual average age of patients with CRC.

Results:

CRC global incidence and mortality

Global statistics evidence annual growth of cancer incidence. The World Health Organization (WHO) reported about 19.3 new cancer cases during 2019 and cancer mortality of nearly 10 million, with more than 2% growth to the previous year. This was 0.5% more than the global population growth [6-7].

According to global statistics, CRC accounts for 10.2% of all cancer cases. CRC ranks 3rd in incidence after lung cancer (11.6%) and breast cancer (11.6%). In mortality, CRC also ranks 3rd (8.2%) after lung cancer (18.4%) and breast cancer (9.2%).

There are three models of the incidence and mortality dynamics in CRC:

1. Western model – persistently high or decreasing incidence rate, decreasing mortality rate, a large gap between incidence and mortality rates. This model is typical for economically developed countries;

2. Eastern Europe model – a high level of incidence and mortality; both indicators are growing and differ little from each other. This model is typical for countries with a relatively high life expectancy and level of economic development;

3. Model for the countries with low and very low levels of economic development – a low level of both incidence and mortality, both indicators are almost identical in value. This could be due to the lack of access to high-quality, timely diagnostics and treatment for cancer patients in such countries [1, 8, 9].

According to L. Lebedeva, the incidence and prevalence of colon cancer in Africa and Asia is 2-5 cases per 100,000 population [9] compared to 40-45 cases per 100,000 population in Western Europe and the United

S.M. Djanklich – 0000-0001-9881-4149, e-mail: *saydesha@mail.ru*

States [10, 11]. In recent years, CRC mortality decreases in North America, New Zealand, Australia, and Northern Europe and grows in Eastern Europe by 5-15% a year [12-14].

The lifetime risk of developing colon cancer in the United States is approximately 1:20 (5%) and varies with individual risk factors [2, 4, 15].

CRC is most common in Eastern Asia, where it accounts for 39.8% of all cancer cases compared to 4.1% in Northern Europe. The highest CRC mortality is registered in Eastern Asia (36.9%), the lowest – in West Africa (1%). According to the International Agency for Research on Cancer (IARC), the highest CRC incidence is associated with the life and nutrition styles. Therefore, it remains high in North America, Japan, and Europe. Low incidence levels might be associated with untimely diagnostics and a low level of countries' economic development.

The American Cancer Society (ACS) reports the highest CRC incidence in Asia (Japan, Kuwait, and Israel) and Eastern Europe (Czech Republic, Slovenia, and Slovakia). This is due to the prevalence of risk factors (dietary habits, lifestyle, bad habits, and other predisposing factors) [2].

CRC is most common over 65 years [6, 13, 14, 16, 17]. The incidence rates grow rapidly after the age of 50, with the highest rates at the age of 55 to 75 [4, 15].

CRC incidence and mortality in the Republic of Uzbekistan

In Uzbekistan, CRC ranks 5th among all cancers, colon cancer accounting for 2.58%.

In 2019, 24 648 new cancer cases were registered in Uzbekistan, including 10511 (42.6%) cases in men and 14137 (57.4%) cases in women. The growth to 2018 was 5.4%. The prevalence of MN per 100,000 population in Uzbekistan was 74.1, or 5.4% higher than in 2018 and 29.7% higher than in 2009. By the end of 2019, the number of people with cancer was 103,063 (vs. 96,575 in 2018), or 0.3% of the national population. Of them, 59,397 (57.6%) were rural inhabitants, and 4,151 (4.0%) were below 18 y.o.

In 2019, 1,588 new CRC cases were registered in Uzbekistan, including 883 (55.6%) cases in men and 705 (44.4%) cases in women. The men to women ratio among new CRC cases was 1.25:0.8. CRC ranked 5th in the cancer incidence structure, with a prevalence of 4.8 per 100,000 population (Figure 1).

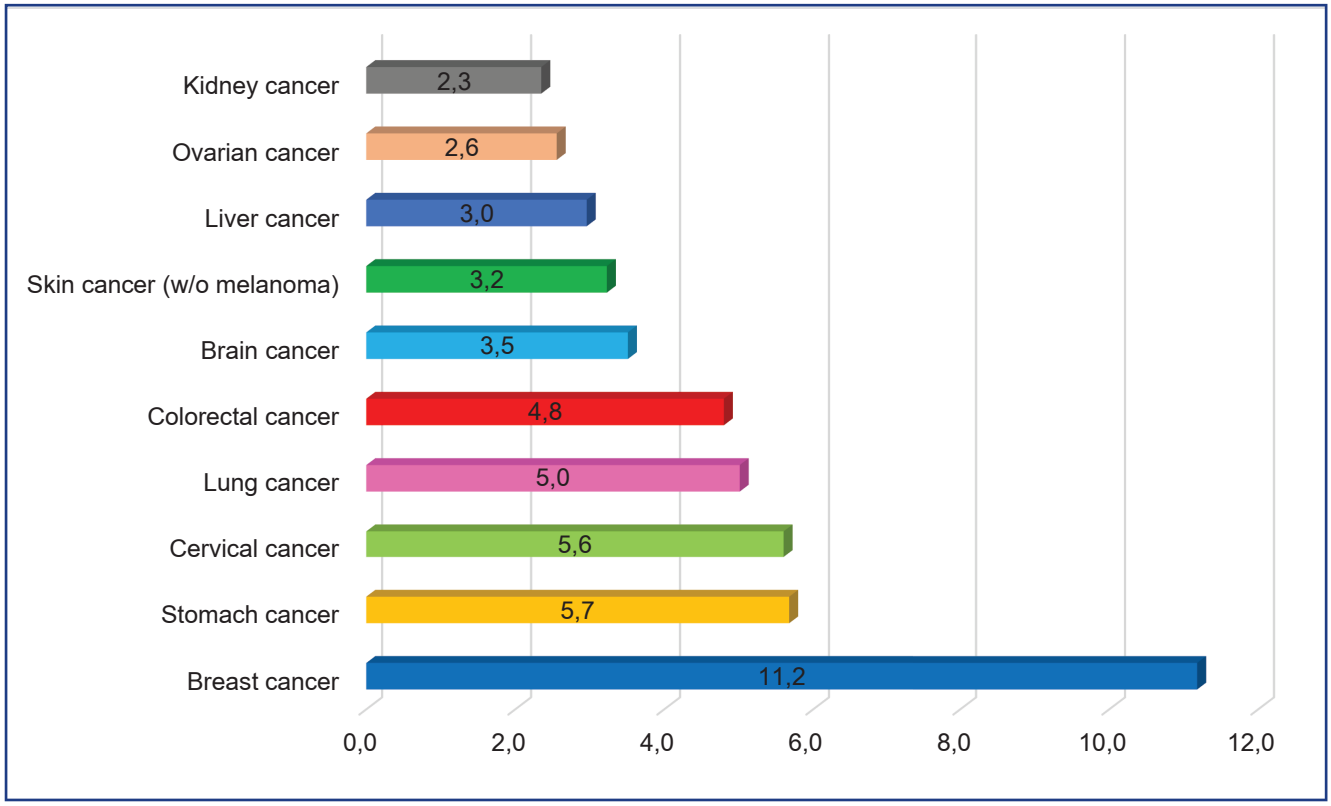

Figure 1 – Cancer incidence structure in the Republic of Uzbekistan, 2019

Notably, CRC ranks 3rd among male cancer incidence in the Republic, with the prevalence of 5.3 per 100,000 male population, second only to neoplasms of the lung and stomach. In females, its ranks 4th (4.3 per 100,000 female population) after neoplasms of the breast, cervix uteri, and ovary (Figure 2) [6, 7].

New CRC cases registered in Uzbekistan in 2019 were spread by age as follows: patients below 15

years – 0.12%, 15-17 years – 0.22%, 15-44 years – 14.3%, 45-55 years – 23.8%, 55-65 years – 28.1%, and persons over 65 years – 33.5% [6, 7]. This shows that people of working age are most susceptible to CRC incidence.

CRC localization and forms

In the US, CRC is most frequent at the age of 20-49 years and is in the Top 10 of the most common MN in men and women [2, 4, 5, 18]. In Russia, CRC occurs mainly after 50 years of age [16, 17, 19].

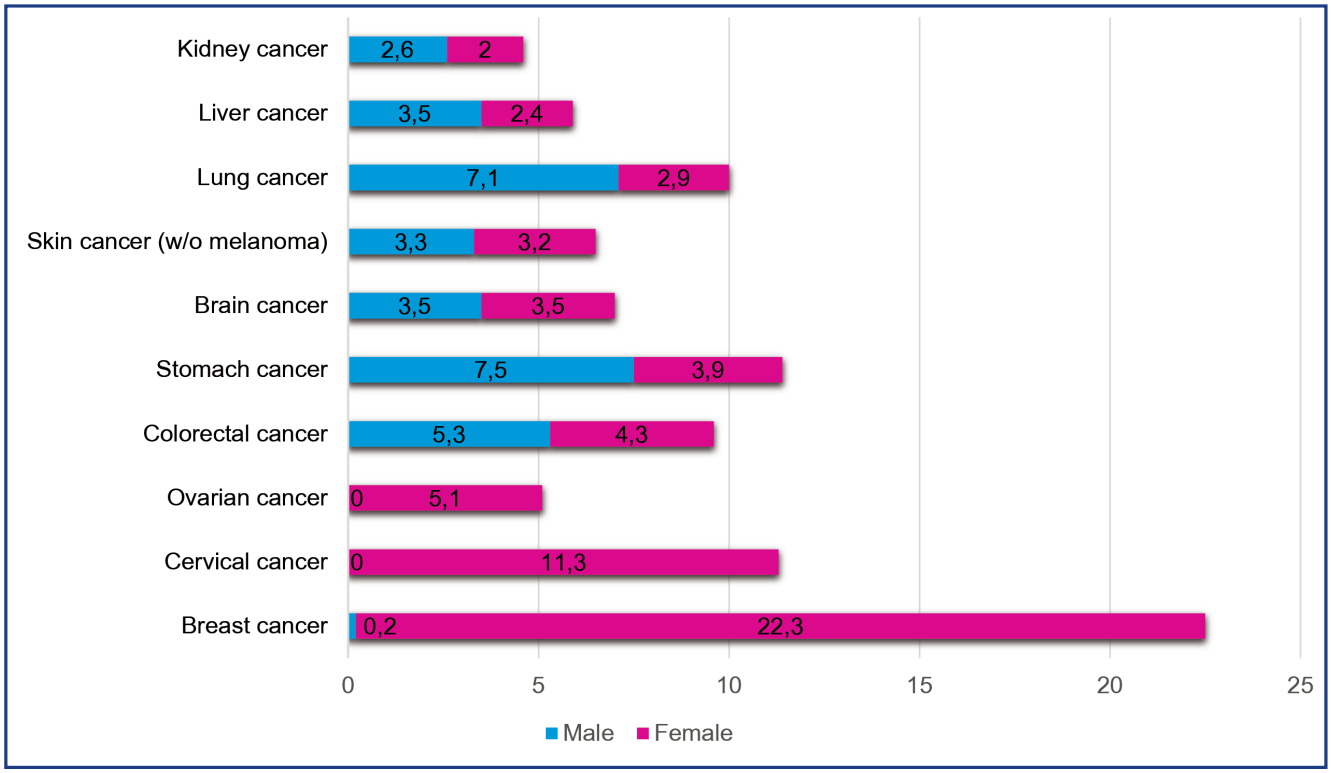

Figure 2 – Male and female cancer incidence structure in the Republic of Uzbekistan, 2019

Navruzov et al. distinguish three nosological forms of CRC: colon cancer, rectal cancer, and anal cancer [7]. According to GLOBOCAN, in 2019, colon cancer accounted for 59.3% of all new CRC cases, rectal cancer – 38.1%, and anal cancer – 2.6%; the mortality was divided as follows: colon cancer – 62.6%, rectal cancer – 35.2%, and anal cancer – 2.2%.

Fedorov et al. divide CRC on colon cancer and rectal cancer, with the men to women ratio of 1.21:1.00 [20].

Colon cancer and rectal cancer incidence ratios are equal to 2:1 in mature countries and 1:1 in developing countries [1, 8, 19].

By histological form, adenocarcinoma accounts for nearly 90% of CRC cases. Adenocarcinoma develops from adenomas (adenomatous polyps). Mucus-forming tumors, characterized by the most aggressive course, occur in 6-19% of cases; mucinous tumors are the least common [11, 12, 21].

CRC risk factors

According to some authors, the incidence and mortality rates are indicative of high or low levels of risk for colon cancer and predict life expectancy [4, 22].

Half of CRC cases depend on lifestyle and the impact of carcinogens; 5-20% of cases are determined by genetic factors.

The reasons for growing CRC incidence are closely related to the CRC risk factors. They include: age over 50, smoking, alcohol abuse, excessive consumption of red meat, low intake of whole grains, fruits, and vegetables, physical inactivity, obesity, genetic syndromes, adenomatous colon polyposis, inflammatory bowel disease, family history, previous breast cancer, or female genital organs, type 2 Diabetes Mellitus [23].

An increase in body height by every 5% increases the risk of developing CRC by 11% in women and 9% in men [14].

CRC course (complications, metastases, life expectancy)

Some authors name acute obstructive intestinal obstruction one of the most dangerous CRC complications. Its frequency makes 30-85.5% of other complications such as intestinal perforation during tumor disintegration – 0.4-27%, bleeding – 0.8-18%, tumor invasion into neighboring organs and tissues – 1.5-44%, and perifocal pyo-inflammatory processes – 5-35% [17, 19].

Metastasis is registered in 20-50% of primary CRC cases. They are most common in the liver, and only 10-25% of them are resectable. Metastasis in the lungs and peritoneum is less frequent [2, 4, 5].

SEER-Medicare database reports localized stages in 36-42% of cases, regionar metastasis – in 34-41%, and

remote metastasis – in 17-25% of patients depending on the race and gender.

Life expectancy in CRC depends on the tumor spread and metastasis. 5-year life expectancy reaches 93% with stage I CRC, goes down to 72% with stage II, does not exceed 45% with stage III, and is only 8% with stage IV [10, 14, 18]. ACS (2016) reported a 90% 5-year survival with stages I and II, 70% - with stage III, and 13% - with stage IV [2].

Conclusion:

The conducted CRC prevalence analysis shows a steady increase in incidence and mortality depending on the location and histological structure of the tumor, gender, age, and territorial characteristics. Early CRC diagnostics remains crucial considering the share of neglected cases at establishing the diagnosis. Better early diagnostics can improve the survival and quality of life in CRC.

References:

1. Kachanov D.YU., Abdullaev R.T, Dobren'kov K.V., Varfolomeeva S.R. Metodologiya raboty detskogo populyacionnogo kancer-registra // Onkogematolgiya. – 2009. –№ 4. – S. 51-60 [Kachanov D.Yu., Abdullaev R.T., Dobrenkov K.V., Varfolomeeva S.R. Methodology of the children's population cancer registry // Oncohaematology. – 2009. – No. 4. – P. 51-60] (in Russian);

2. American Cancer Society (ACS). Colorectal Cancer Facts & Figures 2014-2016. – 2016. – P. 7. https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/colorectal-cancer-facts-and-figures/colorectal-cancer-facts-and-figures-2014-2016.pdf;

3. Cancer Registry of Norway. Institute of Population-based Cancer Research. Cancer in Norway 2019 // www.kreftregisteret.no/globalassets/cancer-in-norway/2019/cin_report.pdf. 15.09.2021;

4. Public Health Wales. Bowel screening Wales // www.wales.nhs.uk/sites3/home.cfm?orgid=747. 10.02.2021;

5. Fairley T.L., Cardinez C.J., Martin J., Alley L., Friedman C., Edwards B., Jamison P. Colorectal cancer in U.S. adults younger than 50 years of age // Cancer. – 2016. – Vol. 107(5 Suppl). – P. 1153-1161. https://doi.org/10.1002/cncr.22012;

6. Tillyashajhov M.N., Ibragimov SH.N., Dzhanklich S.M. Sostoyanie onkologicheskoj pomoshchi naseleniyu Respubliki Uzbekistan v 2019 godu. – Tashkent, 2019. – 165 s. [Tillyashaikhov M.N., Ibragimov Sh.N., Dzhanklich S.M. The state of cancer care to the population of the Republic of Uzbekistan in 2019. – Tashkent, 2019. – 165 p.] (in Russian);

7. Navruzov S.N., Alieva D.A., Kulmiev E.E. Epidemiologiya kolorektal'nogo raka: mirovye tendencii, zabolevaemost' rakom obodochnoj kishki v Respublike Uzbekistan (2012-2017 g.g.) // Tazovaya hirurgiya i onkologiya. – 2020. – T. 10 (1). – S. 56-63 [Navruzov S.N., Alieva D.A., Kulmiev E.E. Epidemiology of colorectal cancer: global trends, the incidence of colon cancer in the Republic of Uzbekistan (2012-2017) // Pelvic surgery and oncology. – 2020. – T. 10 (1). – P. 56-63]. https://10.17650/2686-9594-2020-10-1-56-63 (in Russian);

8. Zlokachestvennye novoobrazovaniya v Rossii v 2015 godu (zabolevaemost' i smertnost') / pod red. A.D. Kaprina, V.V. Starinskogo, G.V. Petrovoj. – M.: MNIOI im. P.A. Gercena - filial FGBU «NMIRC» Minzdrava Rossii, 2017. – ill. – 250 s. [Malignant neoplasms in Russia in 2015 (morbidity and mortality) / eds. A.D. Kaprin, V.V. Starinsky, G.V. Petrova. – M.: MNIOI n.a. P.A. Herzen – the branch of the Federal State Budgetary Institution "NMIRC" of the Ministry of Health of Russia, 2017. – ill. – 250 p.] (in Russian);

9. Lebedeva L.N., Val'kov M.YU., Asahin S.M., Korotov D.S., Krasil'nikov A.V. Epidemiologiya raka obodochnoj kishki: obzor literatury // Vestnik Rossijskogo nauchnogo centra rentgenoradiologii Minzdrava Rossii. – 2016. – T. 16, № 1. – S. 5 [Lebedeva L.N., Valkov M.Yu., Asakhin S.M., Korotov D.S., Krasilnikov A.V. Colon cancer epidemiology: a literature review // Bulletin of the Russian Scientific Center for Roentgenoradiology of the Ministry of Health of Russia. – 2016. – Vol. 16(1). – P. 5] https://elibrary.ru/item.asp?id=26931580 (in Russian);

10. NHS bowel cancer screening (BCSP) programme. Bowel cancer screening: programme overview, 2015-2021 . 10.02.2021;

11. Mogoantă S.S., Vasile I., Totolici B., Neamțu C., Streba L., Busuioc C.J., Mateescu G.O. Colorectal cancer – clinical and morphological aspects // Rom. J. Morphol. Embryol. – 2014. – Vol. 55(1). – P. 103-110. https://pubmed.ncbi.nlm.nih.gov/24715173/;

12. Scottish bowel screening programme // www.bowelscreening.scot.nhs.uk/about-the-screening-programme;

13. WHO Mortality Database //www.who.int/data/data-collection-tools/who-mortality-database. 25.06.2021;

14. Wirén S., Häggström C., Ulmer H., Manjer J., Bjørge T., Nagel G., Johansen D., Hallmans G., Engeland A., Concin H., Jonsson H., Selmer R., Tretli S., Stocks T., Stattin P. Pooled cohort study on height and risk of cancer and cancer death // Cancer Causes Control. – 2014. – Vol. 25(2). – P. 151-159. https://doi.org/10.1007/s10552-013-0317-7.

15. GBD 2015 Risk Factors Collaborators. Global, regional, and national comparative risk assessment of 79 behavioral, environmental and occupational, and metabolic risks or clusters of risks, 1990-2015: a systematic analysis for the Global Burden of Disease Study 2015 // Lancet. – 2016. – Vol. 388(10053). – P. 1659-1724. https://doi.org/10.1016/S0140-6736(16)31679-8;

16. Aliev F.Sh., Desyatov E.N., Krutskih A.G., Aliev V.F., Lejmanchenko P.I. Epidemiologiya kolorektal'nogo raka: mirovye i regional'nye tendencii // Medicinskaya nauka i obrazovanie Urala. – 2016. – № 4. – S. 125-128 [Aliev F.Sh., Desyatov E.N., Krutskikh A.G., Aliev V.F., Leimanchenko P.I. Epidemiology of colorectal cancer: global and regional trends // Med. Science Education Urals. – 2016. – No. 4. – P. 125-128] (in Russian);

17. Guseinova Z.K., Tajzhanova D.Zh., Tauesheva Z.B., Mandybaeva M.K., Holoshenko A.O. CHastota rasprostranennosti i skrining diagnostika kolorektal'nogo raka // Mezhdunarodnyj zhurnal prikladnyh i fundamental'nyh issledovanij. – 2015. – № 3-2. – S. 190-197 [Guseinova Z.K., Taizhanova D.Zh., Tauesheva Z.B., Mandybaeva M.K., Kholoshenko A.O. Prevalence and screening diagnostics of colorectal cancer // Int. J. Applied Basic Res. – 2015. – No. 3-2. – P. 190-197] (in Russian);

18. Osipov V.A., Abdulaev M.A., Avdeev A.M. i dr. Rezul'taty hirurgicheskogo lecheniya bol'nyh kolorektal'nym rakom, oslozhnennym kishechnoj neprohodimost'yu i krovotecheniem // Vestnik SPbGU. Seriya 11. Medicina. – 2014. – № 3. – S. 104-117 [Osipov V.A., Abdulaev M.A., Avdeev A.M. et al. Results of surgical treatment of patients with colorectal cancer complicated by intestinal obstruction and bleeding // Bulletin of St. Petersburg State University. Series 11. Medicine. – 2014. – No. 3. – P. 104-117] (in Russian);

19. Denisenko V.L., Gain YU.M. Oslozhneniya kolorektal'nogo raka: problemy i perspektivy // Novosti hirurgii. – 2011. – № 1. – S. 103-111 [Denisenko V.L., Gain Yu.M. Complications of colorectal cancer: problems and prospects // News of surgery. – 2011. – No. 1. – P. 103-111] (in Russian);

20. Fedorov V. E., Podelyakin K. A. Epidemiologicheskie aspekty kolorektal'nogo raka // Medicinskij al'manah. – 2017. – №4 (49). – S. 145-148 [Fedorov V.E., Podelyakin K.A. Epidemiological aspects of colorectal cancer // Medical Almanac. – 2017. – No. 4 (49). – P. 145-148] https://elibrary.ru/item.asp?id=30114702;

21. Northern Ireland bowel screening programme // www.nidirect.gov.uk/articles/bowel-cancer-screening. 10.02.2021;

22. Fleming M., Ravula S., Tatishchev S.F, Wang H.L. Colorectal carcinoma: Pathologic aspects // J. Gastrointest. Oncol. – 2012. – Vol. 3(3). – P. 153–173. https://dx.doi.org/10.3978%2Fj.issn.2078-6891.2012.030;

23. Kaidarova D., Nasrytdinov T., Jumanov A., Kuzikeev M., Turesheva A., Gusainov S., Turkpenova I. The analysis of colorectal cancer morbidity and mortality in Kazakhstan, 2012-2016 // Oncology and Radiology of Kazakhstan. – 2019. – Vo. 53(3). – P. 3-6. http://oncojournal.kz/docs/archive/en/divided/journal_oncology_radiology_in_Kazakhstan_2019_03en-5-8.pdf

ТҰЖЫРЫМ

***М.Н. Тилляшайхов*[1], *О.А. Рахимов*[1], *А.А. Адилходжаев*[1], *С.М. Джанклич*[1]**

[1]Өзбекстан Республикасы Денсаулық сақтау министрлігінің Республикалық мамандандырылған онкология және радиология ғылыми-практикалық медициналық орталығы, Ташкент, Өзбекстан Республикасы

Әлемдегі және Өзбекстан Республикасындағы колоректальды обырдың эпидемиологиялық аспектілері: Әдеби шолу

Өзектілігі: *GLOBOCAN компаниясының 2019 жылғы мәліметтеріне сәйкес, колоректальды қатерлі ісік (CRR) өлім-жітім бойынша үшінші және әлемдегі диагнозы қойылған жаңа жағдайлардың саны бойынша төртінші орында тұр. Колоректалды қатерлі ісік сырқаты бүкіл әлемде де, Өзбекстан Республикасында да тұрақты өсуін жалғастыруда. Мәселен, 2019 жылы Өзбекстанда колоректалды қатерлі ісік жалпы онкологиялық аурулар құрылымында 5-ші орында болса, ерлер арасында 2-ші орынды иеленді.*

Зерттеудің мақсаты: *2018-2019 жылдары Өзбекстан Республикасында колоректалды қатерлі ісіктің және колоректалды қатерлі ісік ауруының әлемдік үрдістеріне онкоэпидемиологиялық бағалау жүргізу.*

Нәтижелері: *Колоректальды қатерлі ісікпен сырқаттанушылық және осы сырқаттан болатын өлім-жітімнің әлемдік үрдістері аумақтар мен экономикалық даму деңгейіне байланысты айырмашылықтарды көрсетеді. Сондай-ақ, жыныстық сипаттамалардың болуы да көрініс табады: Мысалы, колоректалды қатерлі ісік ерлер арасында жиі кездеседі, сырқаттанған ерлер мен әйелдердің қатынасы 1,25: 0,8 құрайды.*

Қорытынды: *Өзбекстан Республикасындағы колоректальды қатерлі ісік бойынша онкоэпидемиологиялық жағдайды зерттеу аурудың көбею тенденциясын көрсетті. Бұл аумақтық айырмашылықтарды одан әрі зерттеуді және колоректалды қатерлі ісіктің пайда болу факторларын іздеу қажеттілігін анықтайды.*

Түйінді сөздер: *колоректальды қатерлі ісік (КРР), онкоэпидемиология, Өзбекстан Республикасы, сырқаттанушылық, өлім-жітім.*

АННОТАЦИЯ

***М.Н. Тилляшайхов*[1], *О.А. Рахимов*[1], *А.А. Адилходжаев*[1], *С.М. Джанклич*[1]**

[1]Республиканский специализированный научно-практический медицинский центр онкологии и радиологии Министерства здравоохранения Республики Узбекистан (РСНПМЦОиР), Ташкент, Республика Узбекистан

Эпидемиологические аспекты колоректального рака в мире и Республике Узбекистан: Обзор литературы

Актуальность: *Согласно данным GLOBOCAN за 2019 год, колоректальный рак (КРР) является третьим по смертности и четвертым по количеству диагностированных новых случаев в мире. Заболеваемость КРР неуклонно растет как во всем мире, так и в Республике Узбекистан. Так, в 2019 году в Узбекистане КРР занимал 5 место в структуре общей онкологической заболеваемости и 2 место – у мужчин.*

Цель исследования: *провести онкоэпидемиологическую оценку мировых тенденций колоректального рака и заболеваемости КРР в Республике Узбекистан в 2018-2019 гг.*

Результаты: *Мировые тенденции заболеваемости и смертности от КРР демонстрируют различия в зависимости от территорий и уровня экономического развития. Показано наличие половых особенностей: КРР чаще возникает у мужчин, соотношение заболевших мужчин и женщин составляет 1,25:0,8.*

Выводы: *Изучение онкоэпидемиологической ситуации по КРР в Республике Узбекистан показало, что заболеваемость КРР имеет тенденцию к увеличению. Это определяет необходимость дальнейших исследований территориальных различий и поиска факторов возникновения КРР.*

Ключевые слова: *колоректальный рак (КРР), онкоэпидемиология, Республика Узбекистан, заболеваемость, смертность.*