

Colorectal Cancer in the Sakha Republic – Oncopathologist's Review

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ABSTRACT

Colorectal cancer (CRC) is an oncopathology with a large share in the world's morbidity and mortality. In developed countries with a high level of medicine, over the past decades, there has been a decrease in mortality rates from colorectal cancer, which is due to the introduction of screening programs at the state level and early surgical treatment. It is important to note that there is no national screening program in the Russian Federation. The prevalence of this pathology in the region, coupled with climatic, ecological, and social conditions, determine the relevance of studying this problem. However, scientific work on the study of colon cancer in the region is mainly of a clinical and epidemiological nature. The study of the morphology and morphogenesis of tumors is extremely important, both theoretically and practically. In the conditions of rapidly developing medicine, the role of a pathologist, in particular an oncopathologist, implies more responsibility and becomes more difficult. The authors carried out a retrospective analysis of 813 protocols of intravital pathological examination of biopsy and surgical materials with diagnoses of colon adenocarcinoma, completed on the basis of the pathological department of the Republican Hospital No. 1 – National Center of Medicine from 2016 to 2019. The authors have studied several characteristics of colorectal cancer in the Republic of Sakha (Yakutia). Problems were identified at the preanalytical and analytical stages of the study of biopsy and surgical material.

Keywords: Colorectal cancer, oncopathology, Sakha Republic

1. INTRODUCTION

The problem of colorectal cancer (hereinafter CRC) is acute in modern medicine due to the high annual morbidity and mortality. According to estimates of foreign and domestic researchers, as a result of an increase in the population and an aging population, the number of newly diagnosed cases will increase both in developed and developing countries. In world medicine, about three new cases of this pathology are diagnosed every minute with a significant variability of distribution among countries of the world, and in general it ranks third in morbidity and second in mortality. The highest incidence rates are observed in Europe, North America, Japan, Australia and New Zealand, low in Africa, South and Central America and

South-Central Asia, while the incidence of CRC in men is significantly higher than in women [1–4]. According to a number of scientists, regions of the planet with low morbidity and mortality rates may reflect a low prevalence of risk factors for colon cancer, but it can also reflect short life expectancy [5–8].

CRC has a significant share in oncological pathology of the Russian Federation (hereinafter RF) and the Sakha Republic (hereinafter SR) in particular. In the RF, the incidence of colon cancer (C18) was 45,277 cases in 2019, or 16.07 per 100 thousand of the population, in the SR it was 141 cases, or 11.92 per 100 thousand of the population; cancer of the rectum and rectosigmoid region (C19–C20) in the RF was 31,785 cases in 2019, or 11.80 per 100 thousand of the

population; in the SR it was 129 cases, or 10.21 per 100 thousand of the population. In general, across the country and in the region, there is an annual increase in the incidence and mortality rates from CRC [9].

Analysis of foreign and domestic literature showed that the modern concept in the diagnosis and treatment of colorectal cancer has a multidisciplinary approach – close cooperation of doctors of different specialties will determine the optimal treatment regimen for each patient. The main tasks of a pathologist are: 1) morphological verification of the diagnosis; 2) definition/clarification of the stage of the process; 3) audit of the quality of work of other specialists. To solve these problems, postmortem examination of surgical material obtained for CRC should be standardized.

The aims of the study were analyzing the pathomorphological features of colorectal cancer in residents of the SR, characterizing the pathological findings, and identifying the main problems and errors in the work of pathologists and clinicians, in order to improve the quality of diagnosis and treatment.

2. MATERIALS AND METHODS

The authors carried out a retrospective analysis of the data of a continuous sample on the number of newly diagnosed cases of colorectal cancer according to the data of the pathological department of Republican Hospital No. 1 (NCM). We have analyzed 813 protocols of intravital pathological examination of biopsy and surgical material and we have identified 602 cases of newly diagnosed colon adenocarcinoma for the period from 2016 to 2019. Processing and design of materials was carried out using Microsoft Office software suite: Excel, Word.

3. RESULTS

In the analyzed 602 cases for the specified period, women constituted 55.41 % (n = 333), men – 44.59 % (n = 268) (Figure 1).

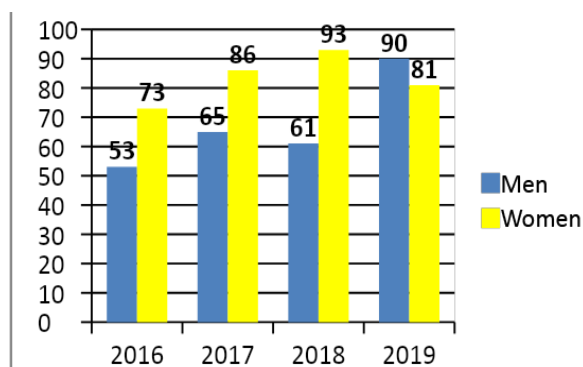


Figure 1. Detection of CRC in the Republic of Sakha (Yakutia) for 2016–2019

In adenocarcinoma of the colon, the average age was 64.45±11.85 and 65.91±11.64, in men and women, respectively. In adenocarcinoma of the rectum, the mean age was 63.46±10.24 and 62.29±12.27 in men and women, respectively.

Adenocarcinomas of the colon were more common in elderly people, both in men and women, which confirms the data of epidemiological studies of foreign and domestic authors (Table 1).

According to literature data, tumors of the right half of the colon are more often observed in women, and much more often in the elderly, while tumors of the left half of the colon are more common in young people. The data obtained confirm the gender-age characteristics of tumors of the proximal and distal colon (Table 2).

Table 1. Gender and age distribution of patients with CRC

Age	Men		Women		Total	
	n	%	n	%	n	%
<30	3	1.12 %	2	0.60 %	5	0.83 %
30–34	2	0.75 %	2	0.60 %	4	0.67 %
35–39	5	1.87 %	6	1.80 %	11	1.83 %
40–44	7	2.61 %	8	2.40 %	15	2.50 %
45–49	9	3.36 %	15	4.50 %	24	3.99 %
50–54	16	5.97 %	35	10.51 %	51	8.49 %
55–59	32	11.94 %	40	12.01 %	72	11.98 %
60–64	55	20.52 %	53	15.92 %	108	17.97 %
65–69	56	20.90 %	47	14.11 %	103	17.14 %
> 70	83	30.97 %	125	37.54 %	208	34.61 %
Total	268	100 %	333	100 %	601	100 %

Table 2. Sex and age distribution in two sections of the colon

Age	Right Colon				Left Colon			
	Men		Women		Men		Women	
	n	%	n	%	n	%	n	%
<30	0	0 %	1	1.09 %	3	1.42 %	1	0.42 %
30–34	1	1.69 %	0	0 %	1	0.47 %	2	0.83 %
35–39	1	1.69 %	1	1.09 %	4	1.90 %	5	2.08 %
40–44	2	3.39 %	1	1.09 %	5	2.37 %	7	2.92 %
45–49	4	6.78 %	1	1.09 %	5	2.37 %	14	5.83 %
50–54	4	6.78 %	8	8.70 %	12	5.69 %	27	11.25 %
55–59	7	11.86 %	8	8.70 %	25	11.85 %	32	13.33 %
60–64	10	16.95 %	14	15.22 %	45	21.33 %	39	16.25 %
65–69	12	20.34 %	7	7.61 %	46	21.80 %	40	16.67 %
> 70	18	30.51 %	51	55.43 %	65	30.81 %	73	30.42 %
Total	59	100 %	92	100 %	211	100 %	240	100 %

The most common histological variant is common adenocarcinoma of varying degrees of differentiation, followed by adenocarcinoma with mucus formation. However, these data should be revised and ranked in accordance with the new requirements and classification of colon cancer (Table 3).

Table 3. Histological form of CRC.

Histological form	Absolute number of cases	%
Highly differentiated adenocarcinoma	90	21.08 %
Moderately differentiated adenocarcinoma	252	59.02
Poorly differentiated adenocarcinoma	15	3.51 %
Signet ring cell carcinoma cancer	2	0.47 %
Undifferentiated cancer	1	0.23 %
Mucous adenocarcinoma		4.4519 %
Poorly differentiated adenocarcinoma with mucus formation	2	0.47 %
Moderately differentiated adenocarcinoma with mucus formation	31	7.26 %
Highly differentiated adenocarcinoma with mucus	8	1.87 %
Adenomas and polyps with dysplasia and adenocarcinoma growth	7	1.64 %

We studied 272 cases of surgical material of the colon and rectum, most of which showed infiltrative growth through all layers into the fatty tissue of the mesentery, greater omentum, mesorectum, as well as into neighboring organs, which corresponds to the pT4 stage.

The diagnosis of colorectal cancer in the early stages cannot be considered satisfactory, since the incidence of tumor detection is extremely low. At the time of diagnosis by oncologists and pathologists, the majority of patients show generalization of the tumor process.

In accordance with the current TNM classification, at least 12 lymph nodes must be examined. The main problem of the morphological service of the SR is that often pathologists do not find lymph nodes in the adipose tissue, or they are found in insufficient quantities (Table 4).

Table 4. Level of invasion of the colon tumor according to surgical material.

Invasion rate	Number of cases	Stage pT
Growth within the mucosa	7 (1.64 %)	pTis
Growth in the submucosa	6 (1.41 %)	pT1
Growth in the muscular membrane	54 (12.65 %)	pT2
Growth in the subserous or serous membrane	12 (2.81 %)	pT3
Through all layers into adipose tissue	335 (78.45 %)	pT4a
Germination into adjacent organs and structures	13 (3.04 %)	pT4b

Table 5. Number of lymph nodes found on the clipping of the surgical material for colon adenocarcinomas.

Number of lymph nodes detected	Number of cases	%
1–5	159	37.24 %
6–11	49	11.48 %
12 or more	11	2.58 %
Number of lymph nodes not specified	17	3.98 %
No lymph nodes detected, presence of adipose tissue	181	42.39 %
Lymph nodes were found due to the absence of adipose tissue	10	2.34 %

The integrity of the fascia is not assessed on the excision of the surgical material of the rectum with mesorectum and the lateral edge of the resection is not stained at the stage of excision, since the quality of the performed mesorectumectomy is an independent predictor of development local recurrence [10, 11].

At the analytical stage and in the conclusion, the presence of tumor budding and evaluation of the degree of malignancy according to a two-stage system — low and high grade, are not noted, which is recommended according to new changes in the classification of malignant epithelial tumors [12]. The presence of perivascular, peri-intraneural invasion and tumor emboli in the vessels is not observed in all cases.

Weak level of interaction between medical institutions and pathological departments leads to errors in filling out the definition part of medical documentation and the protocol part of morphological studies.

Main problems are:

1) Full name is not always indicated, together with date of birth and place of registration of the patient, which complicates the process of routing and registration;

2) Lack of a unified electronic archive of the conclusions of pathological studies, as well as a unified medical network between medical institutions for the rapid exchange of all necessary information complicates the work of all services involved in diagnosis and treatment;

3) Referral diagnosis often does not indicate the level of lymph node dissection, which is extremely important at the stages of cutting, studying microslides, and making a pathological report;

4) Republican Hospital No. 2 (NCM) is the largest medical unit in the region, where almost all biopsy and surgical material from all over the republic is sent. In view of the colossal volume of work against the background of a lack of qualified personnel, problems of logistics, storage and fixation of materials, and brief study time, it becomes difficult to comply with clinical guidelines and pathomorphological assessment protocols. As a result, errors and shortcomings in the pathological findings are often noted.

4. CONCLUSION

The results of our study show that in the studied region, CRC is a pathology with an increasing rate in morbidity, which is directly related to the problems of the widespread prevalence of precancerous diseases, insufficient level of screening at the polyclinic stage, environmental pollution, dietary habits in difficult conditions of the northern climate and of course, population's mentality in relation to their health and medical workers.

In solving this problem, an interdisciplinary approach is required — from workers in the medical and scientific sphere to organizers and managers of the sphere of state administration. Currently, the Republic of Sakha (Yakutia) is actively building the Oncological Center in Yakutsk, which will give a tremendous impetus to the development of healthcare and science in the region.

Further in-depth study of this pathology, taking into account ethnic and molecular-genetic and territorial characteristics, the active introduction of foreign protocols for the pathomorphological assessment of surgical treatment will improve the quality of the provided oncological care in the republic.

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