



**Review Article**

# Analysis of the Characteristics of Colorectal Cancer or Malignant Colorectal Tumors Transferred to Other Organs: A Population-Based Study

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**Abstract:** Advanced colorectal cancer and malignant tumors metastasize other organs, which seriously threaten human health. Such patients have a low five-year survival rate and poor quality of life. Therefore, it is necessary to study such patients. There is still a long way to go for doctors. Our study uses retrospective research methods to statistically analyze the metastasis of colorectal cancer and other organs and tissues metastasis of colorectal malignant tumors. Let's pay full attention to such patients. Because the treatment recommended by many clinicians in the later stage is different. Some doctors recommend active treatment. Some doctors recommend giving up treatment. Therefore, this study aims to make doctors pay attention to the treatment and treatment process of advanced colorectal cancer and colorectal malignant tumors metastasis of other organs in the later stage, so as to improve the survival rate of patients and improve the quality of life of patients. *Research background:* At present, colorectal cancer or colorectal malignant tumors seriously endanger human health around the world. The main reason is our insufficient understanding of colorectal cancer. We don't attach importance to health education. We have insufficient preventive measures for intestinal cancer and the promotion of risk factors, and the inadequacy of early screening for intestinal cancer, so that some patients are late tumors when colorectal cancer is found. At the same time, patients with such tumors are prone to the invasion of peripheral tissues or the transfer of tumors to surrounding tissues and organs. The survival rate of patients has been greatly reduced. *Objective:* To improve the 5-year survival rate of patients with advanced colorectal cancer or malignant colorectal tumor and improve their quality of life. Our research on this kind of patients is meaningful. *Research method:* We use retrospective research. In CNKI and PubMed public database, the number of studies and cases on the transfer of colorectal cancer or colorectal malignant tumors to other organs from 2020 to 2023 were statistically retrieved, and finally analyzed. Organs include: brain, lung, liver, pancreas, kidney, uterus, ovaries and bones. Included criteria: colorectal cancer or colorectal malignant tumors, brain metastasis, lung metastasis, liver metastasis, pancreatic metastasis, kidney metastasis, uterine metastasis, ovarian metastasis, bone metastasis. *Results:* The most common metastasis of colorectal cancer in this study is the liver (47.2%), bone (34.9%), lung (7.5%), ovarian and vagina (6.1%), brain (4.3%). Pancreas, kidneys and uterus are relatively rare, but there are still clinical reports.

**Keywords:** Stage IV Colorectal Cancer, Malignant Colorectal Tumor, Metastasis, Organs, Standardized Treatment Process, Advanced Tumor

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## 1. Introduction

The 5-year survival rate of colorectal cancer is about 91% in

phase I, 82% in phase II, about 60% in phase III, and about 12% in phase IV [1]. Colorectal cancer (CRC) is the third most common cancer among men in the world and the second most common cancer among women [2]. Thanks to the latest

systemic therapy, the life of patients with colorectal cancer can be significantly prolonged, and the incidence of brain, lung, liver, pancreas, kidney, uterus, ovarian and bone metastasis is increasing. These tumors can be metastasized by direct metastasis, blood metastasis, lymphatic metastasis, implant metastasis, etc. In order to improve the survival rate and quality of life of such patients, it is meaningful and valuable to study such patients.

### **1.1. Tumor Brain Metastasis**

The incidence of brain metastasis of colorectal cancer or malignant colorectal tumor is quite rare. Only 0.3%-9% of colorectal cancer patients can have synchronous or abnormal brain metastasis, accounting for only 4%-6% of all brain metastasis cases. In recent years, due to the improvement of radiology technology and multimode treatment of systemic diseases, the incidence of brain metastases has been increasing, which prolongs the survival rate, but also increases the risk of brain metastases. Therefore, the problem of CRC brain metastasis should no longer be ignored. Most brain transfers occur in the cerebral hemisphere (48%-58%), followed by the cerebellum (18-43%), and 23%-33% of patients have multiple lesions. Brain stem metastasis of colorectal cancer is rare. Depending on the affected brain function area, patients may complain of headache, dyskines, mental changes, nausea or vomiting, seizures, apherebral or visual impairment [3-8]. From 2020 to 2023, 583 cases of brain metastasis of colorectal cancer or malignant colorectal tumor were found in 7 documents that meet the standards in public databases such as CNKI and PubMed [9-15].

### **1.2. Tumor Lung Metastasis**

Pulmonary metastasis is quite common in colorectal cancer or malignant colorectal tumors. Second, the rate of lung metastasis is 10-22% [16]. In addition to the clinical manifestations of colorectal cancer, there are also respiratory symptoms. Clinically, pulmonary nodules can be found in patients. Some patients may have clinical manifestations such as obstructive pneumonia, fever, pulmonary space occupancy, hemoptysis, etc [17-27]. From 2020 to 2023, 1001 cases of lung metastasis of colorectal cancer or malignant colorectal tumor were retrieved in 16 documents that meet the standards in public databases such as CNKI and PubMed [28-32].

### **1.3. Tumor Liver Metastasis**

Liver metastasis is very common in colorectal cancer or malignant colorectal tumors, ranking first, with a liver metastasis rate of 36%-81% during autopsy. In nearly half of clinical patients with colorectal cancer or malignant colorectal tumors, colorectal cancer liver metastasis (CRLM) can be observed. Due to the anatomically determined drainage through the portal vein, the liver is the most common side of distant metastasis of CRC [33, 34]. Left colon cancer or malignant colorectal tumors are easy to transfer to the left liver [35-45]. Right half colon cancer or malignant large intestine tumor is easy to metastasize to the right liver [46-56]. When

colorectal cancer or large intestine malignant tumors have liver metastasis, intestinal tumor symptoms and jaundice, fever, fatigue, poor nano, and even liver discomfort symptoms may occur. Touch the enlargement of the liver or the mass. From 2020 to 2023, 6,340 cases of colorectal cancer or malignant colorectal tumors were found in public databases such as CNKI and PubMed in 30 documents that meet the standards [57-64].

### **1.4. Tumor Pancreatic Metastasis**

Pancreatic metastasis in colorectal cancer or malignant colorectal tumors is also clinically studied in the form of individual cases. When pancreatic metastasis occurs in colorectal cancer or malignant colorectal tumor, painless obstructive jaundice, poor jaundice, wasting, accompanied by intestinal tumor symptoms can occur. From 2020 to 2023, 0 cases of colorectal cancer or malignant colorectal tumor pancreatic metastasis were found in 0 documents that meet the standards in public databases such as CNKI and PubMed. Our expanded search scope is that there are 4 documents from 2018 to 2019, and 2 articles meet the standards, all of which are case reports, with 2 cases [65, 66]. This shows that pancreatic metastasis occurs clinically in colorectal cancer or malignant colorectal tumors.

### **1.5. Tumor Kidney Metastasis**

In the case of kidney metastasis in colorectal cancer or malignant colorectal tumors, some studies show that the incidence of CRC metastasis to kidney is about 10% [67]. Clinically, patients can develop painless hematuria, pain in the kidney area, contact mass, and symptoms of intestinal tumors. From 2020 to 2023, 0 cases of colorectal cancer or malignant colorectal tumors were retrieved in public databases such as CNKI and PubMed. Our expanded search scope is that from 2016 to 2018, there were two documents, two documents that met the standards, and four cases [68, 69]. This shows that there is also clinical renal metastasis of colorectal cancer or malignant colorectal tumors.

### **1.6. Tumor Uterine Metastasis**

When colorectal cancer or malignant colorectal tumors cause uterine metastasis, the patient can show abnormal vaginal secretions, vaginal bleeding, and the abdomen can reach the mass. From 2020 to 2023, 0 cases of uterine metastasis of colorectal cancer or malignant colorectal tumors were retrieved in public databases such as CNKI and PubMed. We have expanded the scope of retrieval by retrieving 1 document in 2018, one document that meets the standards, and 1 case reported as a case [70]. This shows that uterine metastasis also exists in the clinical practice of colorectal cancer or malignant colorectal tumors.

### **1.7. Tumor Ovarian and Vaginal Metastasis**

When ovarian and vaginal metastasis occurs in colorectal cancer or malignant colorectal tumors, the rate of ovarian metastasis of colorectal cancer is 3%-14%. Clinically, patients

can manifest as vaginal secretions abnormalities, vaginal bleeding, and abdominal masses. The global prevalence of ovarian metastasis in colorectal cancer or malignant colorectal tumors is only 2.7% [71]. The incidence of ovarian metastasis (OM-CRC) of colorectal cancer is low, malignant, difficult to diagnose, and there is still a lack of uniform standard for treatment. Regarding its above characteristics, OM-CRC has attracted more and more attention from clinical workers. In recent years, most scholars have explored its clinical characteristics with a view to summarizing and discovering its new diagnostic and treatment strategies. When colorectal cancer metastasizes the ovary, the prognosis of the patient is poor, and most of them die within one year. From 2020 to 2023, 818 cases of ovarian and vaginal metastasis of colorectal cancer or malignant colorectal tumors were retrieved in public databases such as CNKI and PubMed [72-77].

### 1.8. Tumor Bone Metastasis

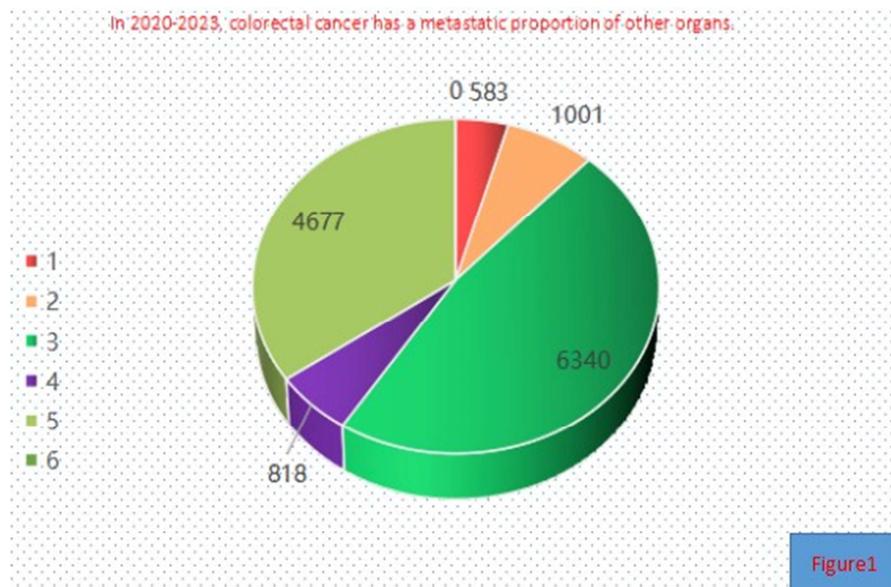
When bone metastasis occurs in colorectal cancer or malignant colorectal tumor, in addition to intestinal tumor manifestations, patients can also have pain, discomfort and swelling in the bone area, and osteolytic manifestations can be seen in imaging. Bone metastases account for 6%-10% of such patients. When patients have bone metastases, they are often combined with liver and lung metastases, and simple bone metastases account for 1%-2%. Colon cancer has a lower bone metastasis rate than rectal cancer, and the right half colon cancer is easy to metastasize to the long bone of the limbs [78-88]. From 2020 to 2023, 4,677 cases of bone metastasis of colorectal cancer or malignant colorectal tumors were found in 16 documents that meet the standards in public databases such as CNKI and PubMed [89-93].

## 2. Objective

For patients with colorectal cancer or malignant colorectal tumors in phase IV, the number is gradually increasing clinically. We are also becoming more and more difficult in treatment. The 5-year survival rate of such patients is only about 12%. Most of them die within one year and their quality of life is extremely poor. We do not have a standardized treatment process for such patients clinically, because some patients give up treatment, and they are afraid that patients and money will be lost in the process of patient treatment. Some scholars also have the same idea, so when communicating patients' condition, they always deal with doctor-patient communication with the idea of hospice care and abandonment. The treatment process of such patients is different in clinical treatment, so it is necessary to standardize the treatment process of such patients. In order to improve the 5-year survival rate of patients and improve the quality of life of patients, our research is necessary and meaningful.

## 3. Research Methods and Data

This study adopts retrospective research methods. Statistics in CNKI and PubMed public databases. The number of studies and cases retrieving the transfer of colorectal cancer or colorectal malignant tumors to other organs from 2020 to 2023 are analyzed. Inclusion criteria: From 2020 to 2023, colorectal cancer or malignant colorectal tumors are transferred to other organs, including brain, lung, liver, pancreas, kidney, uterus, ovaries, bone, etc. Exclusion criteria: animal experimental research, comprehensive study, guidelines for disease treatment, expert consensus.



1.tumor brain metastasis 583/13419。 2.tumor lung metastasis 1001/13419。 3.tumor liver metastasis 6340/13419。 4. tumor ovarian and vaginal metastasis 818/13419。 5.tumor bone metastasis 4677/13419。 6.tumor pancreas, kidney ,uterine metastasis 0/13419。

Figure 1. In 2020-2023, colorectal cancer has a metastatic proportion of other organs.

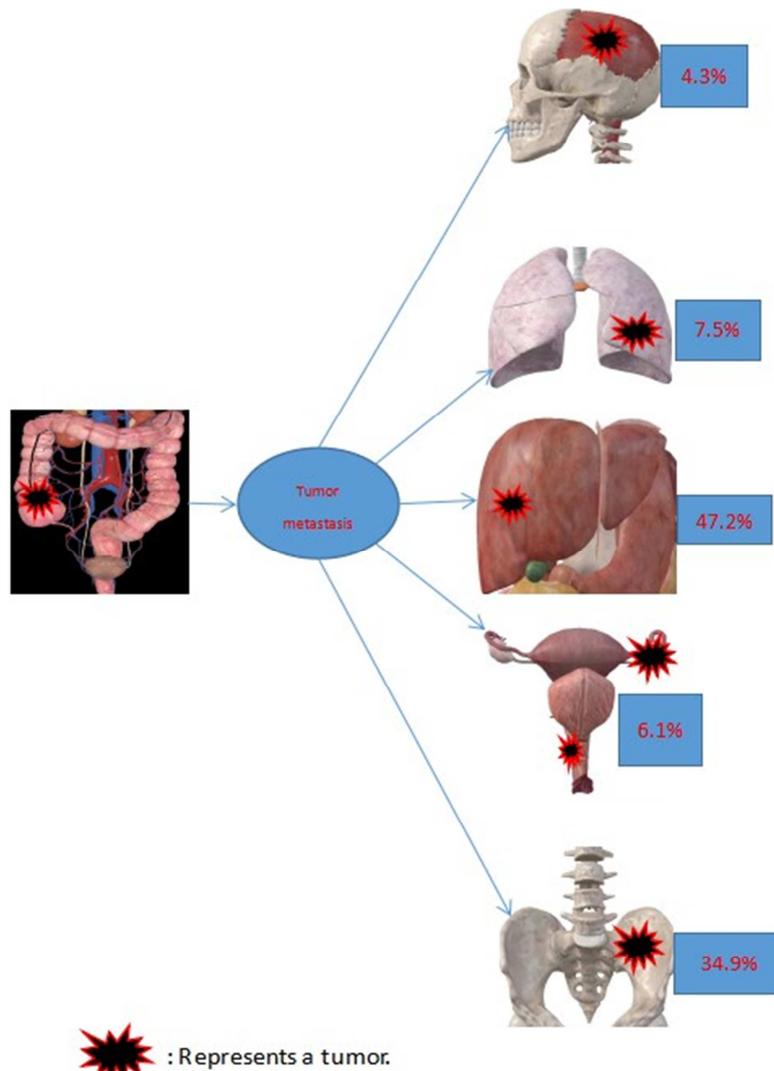


Figure 2. Percentage of colorectal cancer transferred to other organs.

### 4. Results

There are 76 studies that meet the requirements, and 5 studies that have been expanded. The number of cases that meet the requirements was 13,419, and the number of cases that were expanded to be retrieved was 7. We use percentages for discussion and research. The results of this study show that the most common blood metastasis of colorectal cancer or malignant colorectal tumors is still the liver (47.2%). The number of metastases of tumors such as bone (34.9%), lungs (7.5%), implant metastases ovaries and vagina (6.1%), and brain (4.3%) gradually increased. See Figures 1 and 2. Intestinal tumors cause pancreatic, kidney, uterine and other metastases, but there are still clinical reports.

### 5. Conclusion

From the results of this study, we can learn that colorectal cancer or malignant colorectal tumors are transferred to other organs; the liver is still the most common. Intestinal tumors gradually increase

the number of organ metastases such as bone, lungs, brain and ovaries. Such a result may be the reason why patients do not pay attention to their disease status, resulting in simultaneous tumor metastasis when diagnosing the tumor. It may also be that the survival rate of patients has been significantly improved after using systemic treatment technology for such patients, and the course of the disease has become longer, which eventually causes patients to have heterosexual metastasis during disease treatment. Our analysis of the number of cases from 2020 to 2023 shows that although the number of cases of tumor transfer to the pancreas, uterus and kidney is zero, it does not mean that there is no possibility of such tumor metastasis clinically. We have expanded the search scope of the public database. We found that there are studies on the transfer of colorectal cancer to the pancreas, kidneys, uterus and other organs, mainly published in the form of case reports. Therefore, the transfer of colorectal cancer to other organs also exists clinically.

For patients with colorectal cancer or malignant colorectal tumors, they have a therapeutic analysis when the tumor is transferred to other organs. Whether the intestinal tumor is simultaneous or heterosexual, active surgical treatment is

recommended when the patient's cardiopulmonary function is good. When the patient's cardiopulmonary function is poor, non-surgical treatment is recommended; it includes new adjuvant treatment/transformation therapy and palliative treatment. If the patient cannot tolerate radiochemotherapy, it is recommended to maintain treatment. The criteria for the suitability of such patients for surgical resection have been evolving. It should be judged mainly from the following data: the primary focus of colorectal cancer can or has been radically removed. According to the organ anatomy basis and scope of tumor metastasis, the tumor metastasis can be completely (R0) removed; and sufficient functional organ tissue is required to be retained. The patient's general condition is allowed, and there is no exctable or damaged metastatic metastatic disease.

Due to our systemic treatment, the survival rate of patients with colorectal cancer or malignant colorectal tumors has gradually increased, resulting in a gradual increase in the rate of tumor metastasis. For patients with colorectal cancer or malignant colorectal tumors transferred to other organs, there are currently two treatment methods for tumors at its metastasis: exctable treatment and non-rectable treatment. It is agreed that patients with colorectal cancer or malignant

colorectal tumors transferred to other organs should actively undergo radical tumor resection + tumor reduction + heat perfusion chemotherapy even if there is metastasis. Later, it will be treated individually according to the patient's situation. Whether such a patient chooses a new adjuvant radiotherapy and chemotherapy before surgery depends on the pathological type and gene of the patient's tumor. If the new adjuvant radiotherapy treatment is effective before the operation, the preoperative tumor can be reduced in stages and the prognosis is good. If the preoperative adjuvant radiotherapy is ineffective, the condition will be further aggravated during the treatment, and the tumor can be further metastasized and invasive, and the prognosis of such patients is even worse. Finally, patients with colorectal cancer or malignant colorectal tumors with other organ metastasis can be treated by surgery after evaluating the patient's physical condition. Some patients who are in poor physical condition and cannot be treated surgically choose individualized treatment.

For patients with colorectal cancer or malignant colorectal tumors, they have a treatment process of tumor transfer to other organs. See Figure 3.

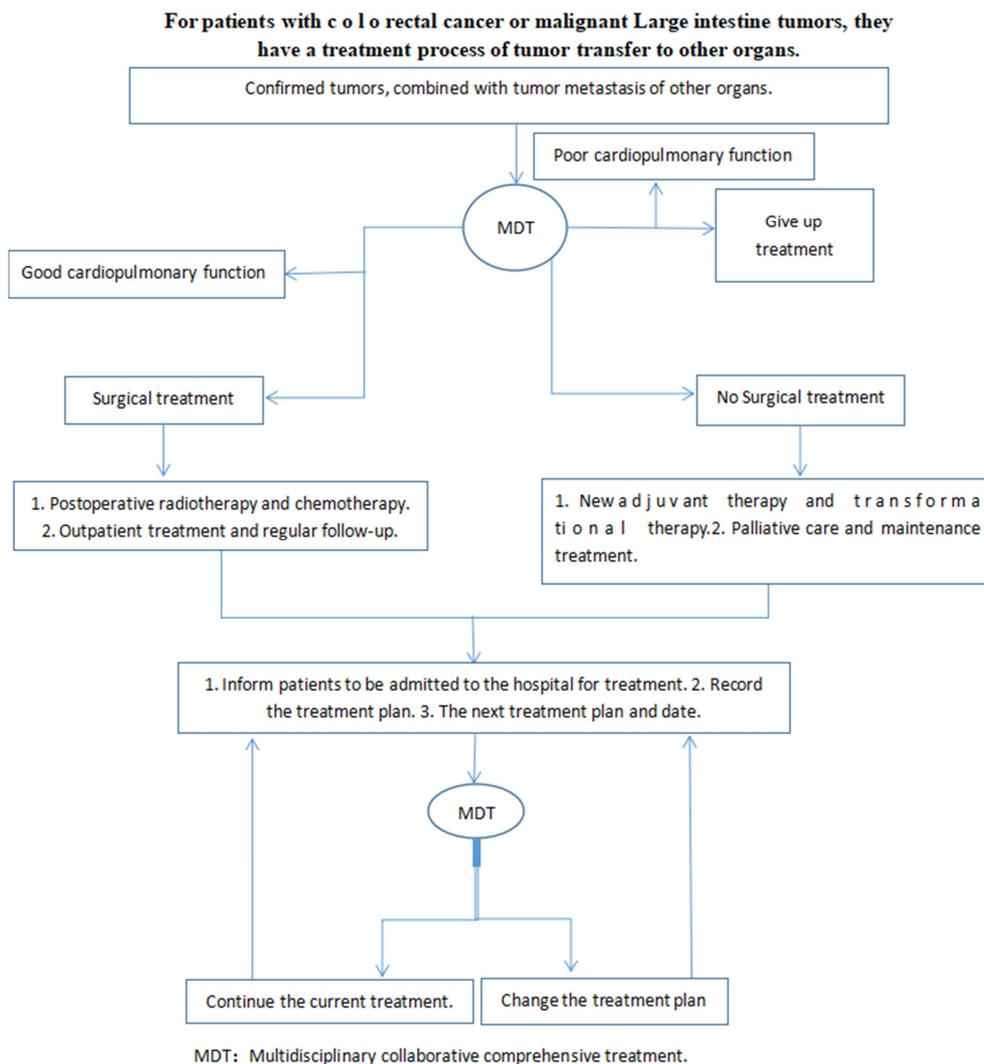


Figure 3. For patients with colorectal cancer or malignant Large intestine tumors, they have a treatment process of tumor transfer to other organs.

## Solemn Declaration

All authors of this study have no conflict of interest. All the data in this study come from public databases, so I am grateful to public databases such as CNKI and PubMed. There are no ethical-related problems in this research data.

- 1) Liu Chao: Write papers, collect, statistics and analyze data.
- 2) Linda Chiuman (MD; PHD), Professor: Guide the writing of papers and reviewing materials.

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