

COLORECTAL CARCINOMA: GENERALISED OVERVIEW

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ABSTRACT

Colorectal cancer is the third most common cancer in the Western Hemisphere and the incidence increases with increasing age. Most colorectal cancers are localized with or without lymph node metastases. Up to 20% of patients present with metastatic disease, most commonly to the liver. Surgery is the only curative therapy for localized colorectal cancer and adjuvant chemotherapy is usually recommended for patients with lymph node metastases. Surgery, radiation therapy, and chemotherapy are the key components of rectal cancer therapy. Selected patients with recurrent and metastatic disease can be salvaged with surgery but chemotherapy remains the mainstay of therapy for advanced colorectal cancer. Substantial progress has been observed in the treatment of metastatic colorectal cancer in recent years.

KEYWORDS: Colorectal carcinoma, pathology, adenoma, molecular, MSI, KRAS, BRAF

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INTRODUCTION

Colorectal cancer often begins as a growth called a polyp inside the colon or rectum. Finding and removing polyps can prevent colorectal cancer. Explore the links on this page to learn more about colorectal cancer prevention, screening, treatment, statistics, research, clinical trials, and more.[1]

Colorectal carcinoma is one of the most common cancers and one of the leading causes of cancer-related death in the United States. Pathologic examination of biopsy, polypectomy, and resection specimens is crucial to appropriate patient management, prognosis assessment, and family counseling.[2] Molecular testing plays an increasingly important role in the era of personalized medicine. This review article focuses on the histopathology and molecular pathology of colorectal carcinoma and its precursor lesions, with an emphasis on their clinical relevance.[3]

PATHOPHYSIOLOGY

CRC usually does not produce symptoms in the early stages of the disease. If symptoms are present, they usually depend on the site of the primary tumor. Cancers of the proximal colon tend to grow larger before symptoms appear than those in the left colon and rectum.[4] The first symptoms of colon cancer may be iron deficiency anemia and bleeding due to abnormal vasculature in the tumor and trauma from the fecal stream. The bleeding is usually occult in the early stages. Tumors of the anus, sigmoid colon, and rectum may lead to hematochezia.[5]

DIAGNOSIS

If your signs and symptoms indicate that you could have colon cancer, your doctor may recommend one or more tests and procedures, including:

Using a scope to examine the inside of your colon (colonoscopy)

A colonoscopy uses a long, flexible, and slender tube attached to a video camera and monitor to view your entire colon and rectum. If any suspicious areas are found, your doctor can pass surgical tools through the tube to take tissue samples (biopsies) for analysis and remove polyps.[6]

Blood tests

No blood test can tell you if you have colon cancer. However, your doctor may test your blood for clues about your overall health, such as kidney and liver function tests.

Your doctor may also test your blood for a chemical sometimes produced by colon cancers (Carcinoembryonic antigen, or CEA). Tracked over time, the level of CEA in your blood may help your doctor understand your prognosis and whether your cancer is responding to treatment.[7]

MODERN APPROACHES OF THE TREATMENT

In cancer care, different types of doctors often work together to create a patient's overall treatment plan that usually includes or combines different types of treatments. This is called a multidisciplinary team. For colorectal cancer, this generally includes a surgeon, medical oncologist, radiation oncologist, and a gastroenterologist. A gastroenterologist is a doctor who specializes in the function and disorders of the gastrointestinal tract. Cancer care teams include a variety of other healthcare professionals, such as physician assistants, nurse practitioners, oncology nurses, social workers, pharmacists, counselors, dietitians, and others.[8]

Studies have shown that these various treatment approaches provide similar benefits regardless of the patient's age. However, older adults may have unique treatment challenges. Learn more about the specific effects of surgery, chemotherapy, and radiation therapy on older adults.[9] In order to tailor the treatment to each patient, all treatment decisions should consider such factors as:

The patient's other medical conditions

The patient's overall health

Potential side effects of the treatment plan

Other medications that the patient already takes

The patient's nutritional status and social support.[10]

The common types of treatments used for colorectal cancer are described below, followed by a brief outline of treatment options listed by stage. Your care plan may also include treatment for symptoms and side effects, an important part of cancer care.

Surgery

Radiation therapy

Chemotherapy

Targeted therapy

Immunotherapy

Physical, social, and emotional effects of cancer

Treatment by stage of colorectal cancer

Remission and the chance of recurrence

If treatment does not work.[11]

Surgery

Surgery is the removal of the tumor and some surrounding healthy tissue during an operation. It is often called surgical resection. This is the most common treatment for colorectal cancer. Part of the healthy colon or rectum and nearby lymph nodes will also be removed.

While both general surgeons and specialists may perform colorectal surgery, many people talk with specialists who have additional training and experience in colorectal surgery. A surgical oncologist is a doctor who specializes in treating cancer using surgery. A colorectal surgeon is a doctor who has received additional training to treat diseases of the colon, rectum, and anus. Colorectal surgeons used to be called proctologists.[12]

In addition to surgical resection, surgical options for colorectal cancer include:

Laparoscopic surgery

Some patients may be able to have laparoscopic colorectal cancer surgery. With this technique, several viewing scopes are passed into the abdomen while a patient is under anesthesia. Anesthesia is a medicine that blocks the awareness of pain. The incisions are smaller and the recovery time is often shorter than with standard colon surgery. Laparoscopic surgery is as effective as conventional colon surgery in removing the cancer. Surgeons who perform laparoscopic surgery have been specially trained in that technique.[13]

Colostomy for rectal cancer

Less often, a person with rectal cancer may need a colostomy. This is a surgical opening, or stoma, through which the colon is connected to the abdominal surface to provide a pathway for waste to exit the body. This waste is collected in a pouch worn by the patient. Sometimes, the colostomy is only temporary to allow the rectum to heal, but it may be permanent. With modern surgical techniques and the use of radiation therapy and chemotherapy before surgery when needed, most people who receive treatment for rectal cancer do not need a permanent colostomy. Learn more about colostomies.[14]

Side effects of surgery

Before surgery, talk with your healthcare team about the possible side effects from the specific surgery you will have and ask how side effects can be prevented or relieved. In general, the side effects of surgery include pain and tenderness in the area of the operation.[15]

Radiation therapy

Radiation therapy is the use of high-energy X-rays to destroy cancer cells. It is commonly used for treating rectal cancer because this kind of tumor tends to recur near where it originally started. A doctor who specializes in giving radiation therapy to treat cancer is called a radiation oncologist. A radiation therapy regimen, or schedule, usually consists of a specific number of treatments offered over a set period of time.

External-beam radiation therapy. External-beam radiation therapy uses a machine to deliver X-rays to where the cancer is located. Radiation treatment is usually given 5 days a week for several weeks. It may be provided in the doctor's office or at the hospital.[16]

Therapies using medication

The treatment plan may include medications to destroy cancer cells. Medication may be given through the bloodstream to reach cancer cells throughout the body. When a drug is given this way, it is called systemic therapy. Medication may also be given locally, which is when the medication is applied directly to the cancer or kept in a single part of the body.

The types of medications used for colorectal cancer include

Chemotherapy

Targeted therapy

Immunotherapy.[17]

Chemotherapy

Chemotherapy is the use of drugs to destroy cancer cells, usually by keeping the cancer cells from growing, dividing, and making more cells.

A chemotherapy regimen, or schedule, usually consists of a specific number of cycles given over a set period of time. A patient may receive 1 drug at a time or a combination of different drugs given at the same time.[18]

Many drugs are approved by the U.S. Food and Drug Administration (FDA) to treat colorectal cancer in the United States. Your doctor may recommend 1 or more of them at different times during treatment. Sometimes these are combined with targeted therapy drugs (see “Targeted therapy” below).

Capecitabine (Xeloda)

Fluorouracil (5-FU)

Irinotecan (Camptosar)

Oxaliplatin (Eloxatin)

Trifluridine/tipiracil (Lonsurf).[19]

Side effects of chemotherapy

Chemotherapy may cause vomiting, nausea, diarrhea, mouth sores, or neuropathy, which is tingling or numbness in feet or hands. However, medications to prevent these side effects are available. Because of the way drugs are given, these side effects are less severe than they have been in the past for most people. In addition, patients may be unusually tired or fatigued, and there is an increased risk of infection. Major hair loss is an uncommon side effect with many of the drugs used to treat colorectal cancer, although it is more common with chemotherapy regimens that include irinotecan.[20]

Targeted therapy

Targeted therapy is a treatment that targets the cancer’s specific genes, proteins, or the tissue environment that contributes to cancer growth and survival. This type of treatment blocks the growth and spread of cancer cells and limits damage to healthy cells.

Not all tumors have the same targets. To find the most effective treatment, your doctor may run tests to identify the genes, proteins, and other factors in your tumor. This helps doctors better match each patient with the most effective treatment whenever possible. In addition, research studies continue to find out more about specific molecular targets and new treatments directed at them. These drugs are becoming more important in the treatment of colorectal cancer. Learn more about the basics of targeted treatments.[21]

Side effects of targeted therapies

Talk with your doctor about the possible side effects of a specific medication and how they can be managed. The side effects of targeted treatments can include a rash on the face and upper body, which can be prevented or reduced with various treatments. Find out more about skin reactions to targeted therapies.[22]

Immunotherapy

Immunotherapy uses the body's natural defenses to fight cancer by improving your immune system’s ability to attack cancer cells.

Checkpoint inhibitors are an important type of immunotherapy used to treat colorectal cancer. Learn more about the basics of immunotherapy.

Pembrolizumab (Keytruda). Pembrolizumab targets PD-1, a receptor on tumor cells, preventing the tumor cells from hiding from the immune system. Pembrolizumab is used to treat unresectable or metastatic colorectal cancers that have a molecular feature called microsatellite instability (MSI-H) or mismatch repair deficiency (dMMR) (see Diagnosis). Unresectable means surgery is not an option.

Nivolumab (Opdivo). Nivolumab is used to treat people who are 12 or older and have MSI-H or dMMR metastatic colorectal cancer that has grown or spread after treatment with chemotherapy with a fluoropyrimidine (such as capecitabine and fluorouracil), oxaliplatin, and irinotecan.

Dostarlimab (Jemperli). Dostarlimab is a PD-1 immune checkpoint inhibitor. It may be used to treat recurrent or metastatic colorectal cancers that have dMMR.[23]

Side effects of immunotherapies

Different types of immunotherapy can cause different side effects. The most common side effects of immunotherapy may include fatigue, rash, diarrhea, nausea, fever, muscle pain, bone pain, joint pain, abdominal pain, itching, vomiting, cough, decreased appetite, and shortness of breath. Immunotherapy can increase the risk of inflammation in different organs in your body. Talk with your doctor about possible side effects of the immunotherapy recommended for you and what symptoms to watch for.[24]

Physical, emotional, and social effects of cancer

Cancer and its treatment cause physical symptoms and side effects, as well as emotional, social, and financial effects. Managing all of these effects is called palliative care or supportive care. It is an important part of your care that is included along with treatments intended to slow, stop, or eliminate the cancer.[25]

CONCLUSION

Colon cancer is a common malignancy that causes a significant number of deaths. However, it is potentially preventable through screening and highly curable with surgery alone when diagnosed at an early stage. Modern chemotherapy continues to improve survival for patients with more advanced stages.

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