

Liver Tumors



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Liver Tumors

City of Hope is a new model of cancer center. Here, medical research and clinical care are joined, speeding the application of scientific discoveries to newer, more effective patient treatments. As a Comprehensive Cancer Center — the highest designation given by the National Cancer Institute — City of Hope is widely regarded as a leader in cancer prevention, treatment and education.

From breakthroughs in basic biology to smarter technologies for diagnosis and therapy, progress at City of Hope is accelerated by the need to offer more positive outcomes to patients everywhere. Our research innovations become advances in clinical care as quickly as possible, because people battling cancer and other serious diseases need better options — now.

A Vital Organ

The liver is an organ located in the upper right side of the abdomen. Composed of a large right lobe and smaller left lobe, the liver has many important functions. It converts or “biotransforms” nutrients into forms that the body can use. It filters waste from the blood, so that it can be excreted from the body. It helps digest fats from the foods we eat. And it stores a form of sugar called glycogen, which is used for energy.

When the liver is affected by a disease, any one of these vital functions can be compromised.

The liver is made up of several different types of cells, and several types of malignant (cancerous) and benign (noncancerous) tumors can arise in it. These tumors can have different causes, and may be treated differently.

City of Hope specializes in research designed to improve the care of patients with many kinds of cancer. Our Liver Tumor Program, active since the early 1980s, takes a multidisciplinary approach that keeps us at the forefront of diagnosis and treatment of liver disease.

Our program encompasses all aspects of care, including prevention, early diagnosis and effective treatment. In addition, through our active clinical trials research program, we can often provide patients with access to promising new anticancer drugs and technologies that are not available at other hospitals or medical centers.

Primary and Secondary Tumors

A tumor that originates in the liver is called a primary liver cancer. Other names for this kind of cancer are hepatocellular carcinoma or hepatoma. These tumors arise directly from liver cells.

Even more frequent than primary liver cancers are secondary (metastatic) tumors. These arise when cancer cells from other areas of the body metastasize (spread) to the liver and begin to grow there.

Primary Tumors: Risk Factors

Hepatocellular carcinoma is not common in the United States; however, it ranks as the fourth most common cancer worldwide. These primary liver tumors arise much more often in Africa, the Middle East and Asia.

While the exact cause of primary liver cancer is unknown, major risk factors include:

- Chronic viral hepatitis B and/or hepatitis C infection
- Chronic alcohol abuse

- Cirrhosis (buildup of scar tissue in the liver)
- Exposure to toxins
- Anabolic steroid usage
- Family history of both hepatitis and liver cancer
- Certain metabolic disorders such as hemochromatosis

Symptoms

Some of the major symptoms of a primary liver tumor include:

- Abdominal pain or tenderness, especially in the right upper portion, under the rib cage
- An enlarged abdomen
- Easy bruising or bleeding
- Jaundice (yellow discoloration of skin and/or eyes)

Secondary (Metastatic) Liver Tumors: Risk Factors

Secondary, or metastatic, liver tumors begin as primary cancers in other organs, such as the colon, rectum, pancreas, stomach, lung or breast. Because the liver is supplied with nutrient-rich blood from the intestines, cancers affecting the gastrointestinal tract may spread to the liver.

Liver metastases may already be present at the time that a primary cancer is diagnosed in another part of the body. Or, they may arise months or even years after a person has been treated for a primary tumor.

Symptoms

Liver metastases often have no noticeable symptoms. In many cases the disease is detected by routine blood tests. However, major symptoms, if present, can include:

- Unexplained weight loss
- Pain, usually in the right upper portion of the abdomen
- Jaundice (yellow discoloration of skin and/or eyes)

Diagnosing Liver Tumors

A variety of different tests and procedures may be used to detect and diagnose liver tumors, including:

- Physical exam and history

This involves checking for enlarged liver or lymph nodes, along with a history of the patient's health habits, past illnesses and treatments.

- Complete blood count

In this test, blood samples are drawn and checked for the different cell types as well as hemoglobin (the component in the red blood cell that carries oxygen from the lungs to the tissues).

- Serum tumor marker tests

These blood tests can determine whether certain substances are being released into the blood by organs, tissues, or tumor cells.

- CT or CAT (computerized axial tomography) scan

This procedure uses a computer connected to an X-ray machine to obtain detailed pictures of areas inside the body. A dye ("contrast material") may be used to help visualize organs or tissues more clearly.

- MRI (magnetic resonance imaging)

This procedure creates a series of detailed pictures of areas inside the body, using the combination of a powerful magnet, radio waves, and computer imaging.

- PET (positron emission tomography) scan

This scan is used to identify malignant cells even before an actual "lump or bump" can be detected

in a physical exam, or on CAT or MRI scans. First, a small amount of radionuclide glucose (sugar) is injected into a vein, and then the scan begins. Because cancer cells divide more rapidly than normal cells, they take up more glucose and appear brighter in the scan.

- Ultrasound

High-energy sound waves (ultrasound) are bounced off internal tissues or organs to create an image called a sonogram. Ultrasound may be used to obtain an image of the liver, spleen and other organs.

- Laparoscopy

This is a surgical procedure used to examine internal organs by direct visualization. Small incisions are made in the abdominal wall, and a thin, lighted tube called laparoscope is inserted. During the procedure, the surgeon can inspect the abdominal organs and insert other instruments to take tissue samples for a biopsy (examination of cells under a microscope).

Biopsy

Tissue samples may be obtained in other ways beside laparoscopy. One method, called fine-needle aspiration or needle biopsy, involves inserting a thin needle into the liver during an X-ray or ultrasound procedure, and taking samples of cells.

Gathering Intelligence

Biopsy results help doctors decide which treatment options are likely to be most effective.



Treating Liver Tumors

At City of Hope, our goal is to ensure that treatments are effective and comprehensive, and provided in a setting of care and compassion. Our surgeons, medical oncologists, radiation

oncologists, and interventional radiologists work together as a team to provide combined treatments with maximum benefits.

Surgical Procedures

Patients with liver tumors often require some form of surgery to remove the affected tissue. When appropriate, minimally invasive surgical techniques may be possible. These require only small incisions to accommodate thin, flexible laparoscopic instruments, similar to performing a biopsy.

Laparoscopic surgery offers results comparable to open surgery, but with less pain, reduced loss of blood, faster recovery, shorter hospital stays and a lower risk of post-operative complications.

City of Hope surgeons are also highly skilled in robotic-assisted surgery, using the most advanced *da Vinci*® S Surgical System. This system provides excellent results in complex and delicate operations. A surgeon directs and controls the movements of a specially designed robot, equipped with a camera and miniature surgical tools. At the same time, a sophisticated computerized imaging system provides real-time three-dimensional views of the surgical area, with better visualization than can be achieved with the surgeon's eye alone.

Types of surgery used to treat liver cancer include:

- Partial Hepatectomy

This involves removing the area of the liver where a tumor exists, along with a margin of the healthy tissue around it. The remaining liver tissue can regenerate, restoring liver function.

- Cryoablation and Radiofrequency Ablation (RFA)

These treatments involve targeting and destroying tumors with either cold (cryoablation) or heat (RFA), using specially designed equipment.

- Total Hepatectomy and Liver Transplant

In certain cases, the entire liver may be removed, and then replaced with a healthy donated liver.

- Infusion Pump Placement

Infusion pumps provide a continuous supply of anticancer drugs to combat liver tumors.

Refining Surgery

City of Hope surgeons are pioneers in liver infusion pump placement.



Radiation Therapy

Radiation therapy uses high-energy X-rays and other types of radiation to destroy cancer cells.

City of Hope was the first in the western U.S. to provide treatment for liver cancer using helical TomoTherapy®. This advanced radiation therapy system combines two technologies, precision spiral CT scanning and intensity modulated radiation therapy, which allows doctors to match the highest dose of radiation to fit the exact shape of the tumor. The system not only provides more effective and potentially curative treatment, it reduces the unwanted exposure of normal tissues and reduces potential complications.

In cases where liver cancer cannot be removed by surgery, patients may receive localized internal radiation treatment using radioactive Yttrium-90 labeled microspheres. These are infused into the affected area, destroying the tumor but leaving most of the healthy tissue relatively unaffected.

Chemotherapy

Chemotherapy drugs destroy cancer cells by interfering with their growth and multiplication. There are several methods by which these cancer-fighting medicines are delivered. Some involve an infusion of drugs into a vein or central line. Others utilize interventional radiology, in which substances are injected directly into the liver through a thin tube (catheter) or needle, and then guided into the correct area by the use of X-ray imaging.

- Chemoembolization

This type of local chemotherapy is used to treat tumors that have spread to the liver. An anticancer drug mixed with a substance that embolizes (blocks) blood vessels is injected into the hepatic artery. As the artery is blocked off, the drug is trapped near the tumor, for maximum effect.

- Percutaneous Ethanol Injection

In this cancer treatment, a small needle is used to inject ethanol (alcohol) directly into a tumor to kill cancer cells.

Supportive Care

All of our patients also have access to the Sheri & Les Biller Patient and Family Resource Center, which offers a wide array of support and educational services. Patients and loved ones may work with a coordinated group of social workers, psychiatrists, psychologists, patient navigators, pain management specialists and spiritual care providers at the center, as well as participate in programs such as music therapy, meditation and many others.

Research and Clinical Trials

City of Hope has long been a leader in liver cancer research. Today, we conduct multiple clinical trials of new drugs and advanced treatment strategies aimed at improving treatments and outcomes for patients with liver tumors. As a patient at City of Hope, you may qualify to participate in a test of these promising new investigational therapies.

To Become a Patient

For more information, or to become a patient at City of Hope, please call 800-826-HOPE or visit us at www.cityofhope.org.

Providing New Hope

City of Hope works to move scientific discoveries rapidly from the laboratory to the clinic, benefiting patients everywhere.



Support the Search

City of Hope's breakthroughs are made possible by the generous donations of compassionate, committed people like you: Individuals who value the way we speed the translation of laboratory research into practical results. We are proud of the support that enables us to innovate and inspire.

Help accelerate the pace of progress against cancer at City of Hope. Join our worldwide network of donors who fuel new discoveries leading to treatments that save lives everywhere. To arrange a donation, please call 800-544-3541.