



Chemoembolization

Cancer treatment straight to the liver

Tumors need a blood supply to grow. Chemoembolization delivers chemotherapy straight into the tumor, delivering a high local dose while also blocking the blood supply.

This brochure explains how chemoembolization works, how to prepare for the procedure, what to expect during and after the procedure, and typical follow-up care.

Chemoembolization works against cancer in two ways. First, it puts a high-strength dose of chemotherapy straight into the tumor. Secondly, it limits the blood supply to the tumor. The tumor needs a blood supply to grow.

With X-ray guidance, a small tube (catheter) is placed into an artery in the groin. The catheter's tip is advanced into the artery in the liver that supplies blood to the tumor. Chemotherapy is sent through the catheter into the tumor, mixed with a material that embolizes (blocks) the flow of blood to the cancer tissue.

When is chemoembolization used?

Chemoembolization is most useful in the treatment of patients with liver cancer. It can also be used to treat cancer that started in another area of the body but has spread to the liver (metastasized). Some treatments will cure the original site of the cancer, but will be unable to treat the site of metastasis. When this happens, localized liver chemoembolization can help with treatment of the tumor.

The goal of chemoembolization is to reduce the size of liver tumors. This can improve or eliminate symptoms and may improve a patient's chance of being selected for liver transplantation. Obtaining a true cure with chemoembolization is uncommon, but it does occur in some cases. Depending upon the number and type of tumors, chemoembolization may be used as the sole treatment, or may be used with other treatment options such as surgery or radiation.

The liver is unique because it has two blood supplies – an artery and a large vein. A normal liver gets most of its blood from the vein and a much smaller amount of its blood from the artery. When a tumor grows in the liver, however, the tumor gets most of its blood supply from the artery and almost none from the vein. Chemotherapy injected into the artery attacks the tumor. Because the liver gets most of its blood supply from the vein, the healthy part of the liver is spared.

Chemoembolization is most helpful for patients with disease limited to the liver. Some success has been shown with patients whose cancer has spread from other areas.

Patients with certain kidney diseases, coronary artery disease, liver failure, or allergies to X-ray dye may not be candidates for this procedure.

Tumors, like all tissues, depend on a supply of oxygen and nutrients carried by the blood. Once the blood supply is blocked by embolization and the chemotherapy begins to work, the tumor breaks down.

How should I prepare for the procedure?

After you are referred for chemoembolization, you will have a visit with the interventional radiologist (the doctor who will be doing the procedure). You will have blood drawn at the hospital or your doctor's office. These lab tests will help us know how your liver and kidneys are working. They will also let the doctors know if your blood is clotting normally. If you have a history of coronary artery disease, you will also have a heart scan.

After the consult, you will be advised by your regular doctor or by the interventional radiologist if there are changes needed in your medication routine. As always, make sure that all your doctors are aware of all the medications, herbs, and supplements that you take regularly, especially those like Coumadin, Plavix, or aspirin that affect your blood's ability to clot.

What will I experience during and after the procedure?

On the day of the procedure, you will check in to the hospital. Before the procedure, you will be given medications to prevent stomach upset and pain. You will also be given medications that will make you feel relaxed and sleepy, but for the most part, you will remain awake for the procedure. You may feel slight pressure when the catheter is inserted, but no serious discomfort. Most patients stay in the hospital for one night after the procedure.

Most patients experience some side effects after chemoembolization. This is called *post-embolization syndrome*, and consists of pain, nausea, and fever. Pain is the most common side effect. Pain occurs because there is no longer a blood supply to the tumor. Most often, the pain of post-embolization syndrome is effectively treated with oral pain medications. Fevers normally may occur for up to a week after the procedure.

After an overnight stay in the hospital, you will go home with prescriptions for antibiotics and medication for pain and nausea. Fatigue and loss of appetite are common for two weeks and may last longer. In general, these are all signs of a normal recovery. It is important to let your doctor know right away if your pain suddenly worsens or if the nature of your pain changes, if your fever suddenly becomes higher than it had been, or you notice any other unusual changes. Most patients can resume their normal activities within a week.

Often, there is more than one tumor being treated. In these cases, we perform a series of three chemoembolizations at intervals of one month. They are not all done during the same procedure because it is physically hard on the body to embolize large volumes of tumor.

CT scans will be performed the day after each chemoembolization to evaluate the distribution of chemotherapy material within the liver, and then again three months after the last treatment to determine how much the tumors ultimately shrink. Most patients continue to have CT or MRI imaging every three to six months to see if and when any new tumors arise in the liver.

Chemoembolization can be repeated many times over the course of many years, as long as it remains technically possible and you continue to be healthy enough to tolerate repeat procedures.

What chemotherapy drugs are used?

The answer to this question depends on the type of tumor being treated. For hepatocellular carcinoma, we generally use a drug called doxorubicin. For other tumors, we use a mixture of doxorubicin, mitomycin, and cisplatin.

Do these drugs have side effects?

Because we deliver the chemotherapy drugs together with an agent that blocks blood flow, the drugs are absorbed into the system very slowly. This reduces, but does not entirely eliminate, the temporary side effects that people often associate with chemotherapy. The most common side effect is nausea, which is more likely to occur when the triple-drug regimen is used. More severe side effects are unusual, but can occur in some cases.

- Doxorubicin in large doses can damage the heart. In fact, it is recommended that no patient receive more than about 500 mg of doxorubicin over his or her lifetime. Each round of chemotherapy uses 50 mg.
- Mitomycin can cause numbness or tingling in the fingers and toes, as well as weakness and fatigue. In some cases, it can cause temporary loss or thinning of the hair. It can also cause decreased kidney function.
- Cisplatin can cause ringing in the ears, hearing difficulty, and problems with balance. It can also temporarily reduce the production of certain types of blood cells. This can, in turn, increase your risk of bleeding and infection.

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