

YTTRIUM RADIOEMBOLIZATION

What is radioembolization ?

Radioembolization is the administration of ionizing into the liver, with the intent to kill cancer cells and shrink tumors. Radioembolization involves placing the radioactive material, yttrium 90, directly inside the body.

In radioembolization, tiny beads called microspheres are placed into the blood vessels within the liver. These tiny microspheres are coated with the radioactive isotope, yttrium 90. The microspheres become lodged at the tumor site, delivering a high dose of radiation and blocking blood supply to the tumor.

Radioembolization is used to treat tumors originating in the liver, and tumors that have spread to the liver from another part of the body. The goal of this therapy is to help slow down the growth of the tumor and to alleviate symptoms. The procedure is a good option for patients who cannot have chemotherapy or surgery to treat their disease.

How is the procedure performed?

Using X-ray imaging and contrast, or X-ray dye, to visualize the blood vessels, the interventional radiologist inserts a long thin plastic tube called a catheter through the femoral artery, which is in the crease of the leg, and advances it to the blood vessels in the liver. The radiation coated microspheres are placed through the catheter into the blood vessels supplying the liver tumor. Once the microspheres are at the tumor site, they deliver a high dose of radiation directly to the cancer cells and block the flow of blood to the tumor, which starves the tumor. You will be given a sedative during procedure so that you are comfortable.

There are 2 primary blood vessels that provide blood to the liver. Normal liver tissue receives approximately 75% of the blood supply from the portal vein and about 25% from the hepatic artery and its branches. When a tumor grows in the liver, it receives almost all of its blood supply from the hepatic artery. The radioactive microspheres are delivered through the hepatic artery, which will treat the cancer tissue, while the healthy tissue will continue to get the majority of its blood supply from the portal vein.

The radiation from the yttrium 90 will decrease quickly, but the tiny microspheres will remain in place. Once delivered, they will not move or migrate to other parts of the body. The yttrium 90 is administered in two doses, or “fractions”. The first fraction will be given to the half of the liver with the largest tumor burden. The 2nd fraction will be given to the other half of the liver approximately 4 weeks later. If the tumor is only present in one half of the liver, you may only require one dose of Y-90.

What is a mesenteric mapping?

On a separate day, prior to administration of the Y-90 material, the interventional radiologist will perform an angiogram, which evaluates the arteries that feed the liver. At this time, arteries to other organs in the abdomen, like the stomach and the small bowel, will be occluded with tiny platinum coils. This prevents delivery of Y-90 to healthy tissue outside of the liver. At the end of this procedure, a nuclear medicine tracer is injected through the catheter and a short nuclear medicine scan will be performed. This allows the interventional radiologist to measure the treatment dose to the liver and to make sure that radiation is not delivered outside of the targeted area.

What happens after the procedure?

You will be at the hospital for approximately 6-8 hours on the day of the mesenteric mapping, but will be allowed to go home following recovery from the procedure. Most patients will stay in the hospital one night following administration of the Y-90 dose so that any side effects can be treated with medications.

We will arrange for blood work and see you in clinic 2-3 weeks following each dose of Y 90. During this visit we will address any concerns and evaluate your tolerance of the treatment. As a safety for caution for those around you, during the week following year radial embolization, we will ask you to follow some rules. You should not sleep in the same bed as your partner, use public transportation that requires you to sit next to another person for more than 2 hours, or be in close contact with pregnant women, children, or pets.

We assess your response to treatment approximately two months following your last Y-90 dose. This will allow for any post-procedure inflammation to subside and the radioembolization to treat the cancer. We will continue to monitor your response to treatment every 2-3 months as needed.

What are the benefits and risks of the procedure?

Benefits:

- For patients with inoperable tumors, radioembolization can extend lives from months to years and improve quality of life. In some cases, it may allow for more curative options such as surgery or liver transplantation.
- Radioembolization often produces fewer side-effects compared to other treatments like radiation therapy or chemo embolization.
- No surgical incision or general anesthesia is needed. You will go home with of Band-Aid on your femoral artery.

Risks:

- There is a risk of infection or bleeding any time the skin is broken.
- There is a slight risk of allergic reaction to the contrast or sedation used during the procedure.
- There are rare risks of injury to the blood vessels, or bruising at the puncture site.
- There is a rare risk of kidney injury with contrast use. This is more likely if you do not have normal kidney function.
- There is a risk of injury or infection in the liver after radioembolization.
- There is a risk of radioactive material damaging other organs such as the pancreas, bowel, or stomach.
- There is a very rare risk of liver failure with radioembolization.