Y-90 Cancer Treatment Program

What is Radioembolization

Radioembolization is a combination of radiation therapy and a procedure called embolization to treat cancer of the liver.

Embolization is a minimally invasive treatment in which blood vessels or malformations within blood vessels are occluded, or blocked off, to prevent blood flow.

Radiation therapy is the use of a certain type of energy, called ionizing radiation, to kill cancer cells and shrink tumors. Unlike external beam therapy (EBT), in which high-energy X-ray beams generated by a machine are directed at the tumor from outside the body, radioembolization involves placing a radioactive material directly inside the body. This form of treatment is called internal radiation therapy.

In radioembolization, tiny glass or resin beads called microspheres are placed inside the blood vessels that feed a tumor in order to block the supply of blood to the cancer cells. Once these microspheres, which are filled with the radioactive isotope Yttrium Y-90, become lodged at the tumor site, they deliver a high dose of radiation to the tumor and not to normal tissues.

What are some common uses of the procedure?

Radioembolization is used to treat tumors that began in the liver or have spread, or metastasized, to the liver from another part of the body. It is a palliative treatment, which means it does not provide a cure but instead helps slow down the growth of the disease and alleviate symptoms. The procedure is an option for patients who are not candidates for other treatments, including surgery or liver transplantation.

What are the benefits vs. risks?

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 produces fewer side effects compared to standard radiation therapy.
•No surgical incision is needed—only a small nick in the skin that does not have to be stitched.
•A higher dose of radiation to the tumor is given during radioembolization than with standard external beam therapy.

Risks

•Any procedure where the skin is penetrated carries a risk of infection. The chance of infection requiring antibiotic treatment appears to be less than 1 in 1,000.
•There is a very slight risk of an allergic reaction if contrast material is injected.
•Any procedure that involves placement of a catheter inside a blood vessel carries certain risks. These risks include damage to the blood vessel, bruising or bleeding at the puncture site, and infection.
•There is a risk that the microspheres may lodge in the wrong place, putting the patient at risk for an ulcer in the stomach or duodenum. This happens in approximately two percent of patients.
•There is a risk of infection after radioembolization, even if an antibiotic has been given.
•Because angiography is part of the procedure, there is a risk of an allergic reaction to the contrast material.

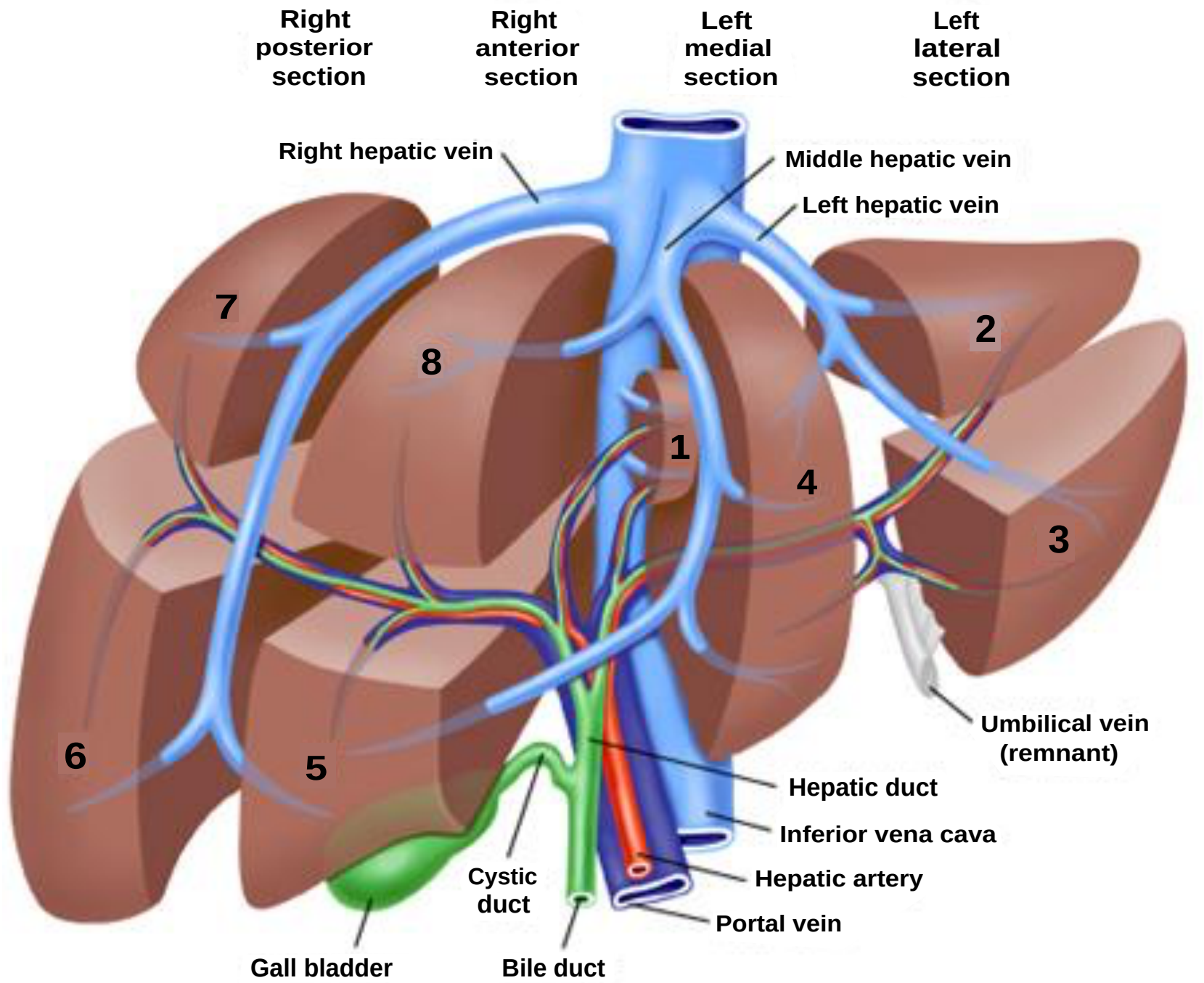
How Does the Procedure work ?

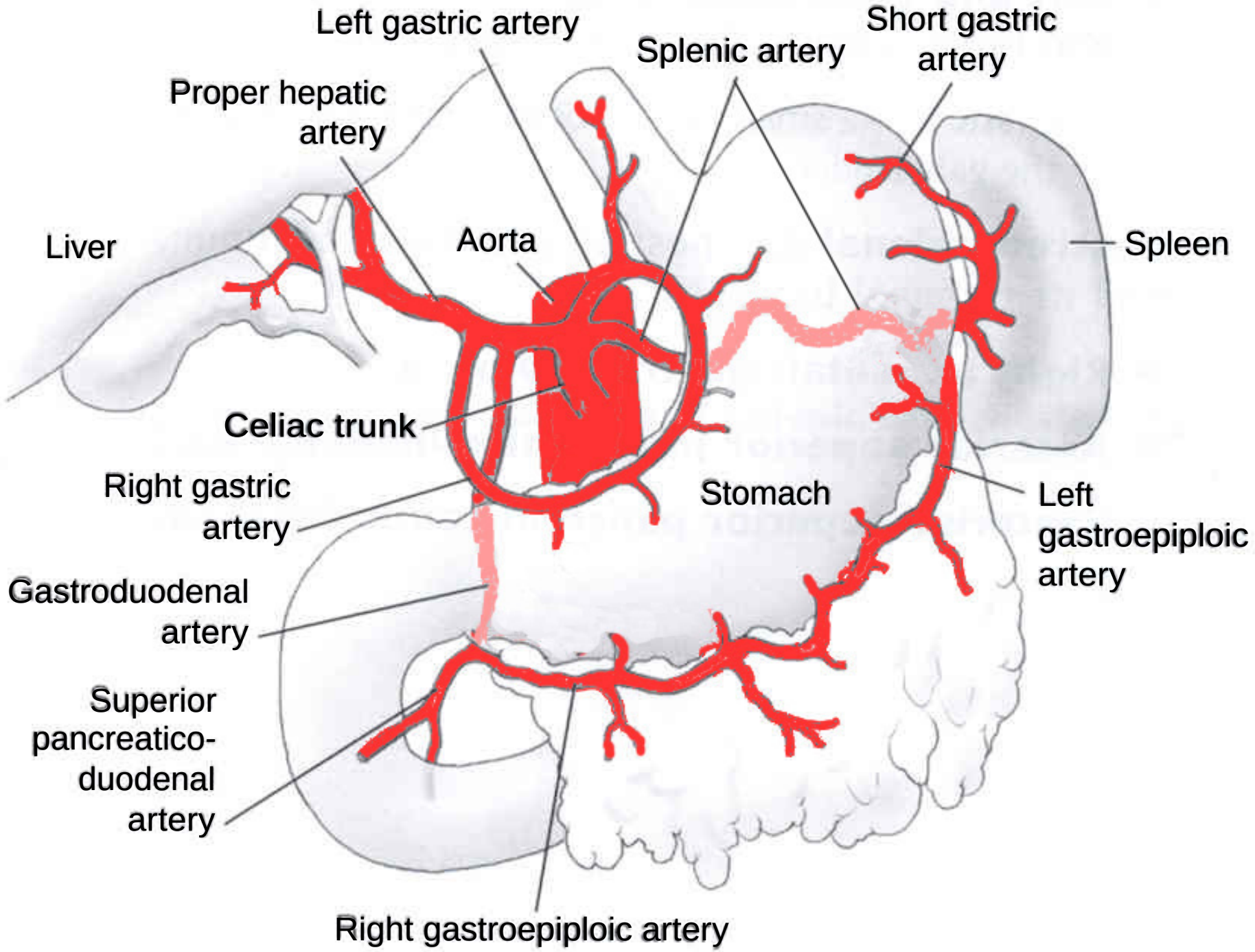
Using x-ray imaging and a contrast material to visualize the blood vessels, the interventional radiologist inserts a catheter through the skin into a blood vessel and advances it to the treatment site. The radiation-filled microspheres, or glass beads, are then inserted through the catheter and advanced to the blood vessels supplying the tumor with blood.

Once the microspheres lodge at the tumor site, they deliver a high dosage of radiation directly to the cancer cells. The microspheres will block the flow of blood to the tumor, depriving the diseased cells of the oxygen and nutrients needed to grow.

There are two primary blood vessels that bring blood to the liver. Normal liver tissue receives about 75 percent of its blood supply from the portal vein and about 25 percent 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. Because radioactive microspheres are delivered through the hepatic artery, they reach the tumor very directly while sparing most of the healthy liver tissue.

The radiation from Yttrium-90 continually decreases over a two-week period and disappears after 30 days. The tiny microspheres remain in the liver without causing any problems.


Right posterior section
Right anterior section
Left medial section
Left lateral section
Right hepatic vein
Middle hepatic vein
Left hepatic vein
7
8
1
4
2
3
6
5
Umbilical vein (remnant)
Hepatic duct
Inferior vena cava
Hepatic artery
Portal vein
Cystic duct
Gall bladder
Bile duct


Left gastric artery
Splenic artery
Short gastric artery
Proper hepatic artery
Liver
Aorta
Spleen
Celiac trunk
Right gastric artery
Stomach
Left gastroepiploic artery
Gastroduodenal artery
Superior pancreatico-duodenal artery
Right gastroepiploic artery

Program Began in March of 2015

- 2015: 26 patients were treated
- 2016: 47 patients were treated
- 2017: 21 patients under treatment as of May