SIRT: SELECTIVE INTERNAL RADIATION THERAPY

SIRT targets liver tumors

SIRT (also known as radioembolization) is a special type of radiotherapy that targets liver tumors with a high dose of radiation delivered inside the body. SIR-Spheres® Y-90 resin microspheres are a form of SIRT where millions of tiny radioactive resin ‘beads’ called microspheres are injected through a catheter into the hepatic artery that feeds liver tumors with the oxygen-enriched blood they need to grow. These resin beads are only about one third the width of a human hair. They have about the same specific gravity as a red blood cell and flow easily in the blood that is supplying the tumor.

Carried like tiny “Trojan Horses” by the same blood that the tumors require to grow, the microspheres lodge themselves in and around liver tumors where they emit a high dose of tumor-killing radiation. However, as the microspheres only emit this radiation over a small area, they can target the tumor with minimal damage to the healthy liver tissue around the tumor. The radiation destroys the tumor cells, causing the tumors to shrink. With SIR-Spheres Y-90 resin microspheres, there are millions of microspheres administered which encourages distribution of the radiation to all the liver tumors.

The microspheres irradiate the tumor for about two weeks, after which only three percent of the initial useful radiation remains. After one month, the radiation source has almost completely decayed, however, the effects of radiotherapy on cancer last much longer.

Features of SIRT

- Uses the same blood supply that feeds liver tumors to deliver radiation that can kill these tumors.
- Gives much higher doses of radiation to liver tumors over much longer periods of time than would be possible with external beam radiation.
- Delivers only a small dose of radiation to healthy liver tissue.

SIRT shrinks tumors that cannot be removed by surgery

SIRT is used to treat liver tumors that cannot be removed by surgery. The most common use is to shrink liver tumors that have spread from the colon.

In the United States SIR-Spheres Y-90 resin microspheres are the only fully FDA PMA approved microsphere for colorectal cancer that has metastasized to the liver.

What are SIR-Spheres Y-90 resin microspheres?

SIR-Spheres Y-90 resin microspheres are tiny radioactive resin beads that are used in the SIRT procedure. Each microsphere has a radioactive substance called yttrium-90 (Y-90) attached to it.

How are SIR-Spheres Y-90 resin microspheres given?

Administering SIR-Spheres Y-90 resin microspheres is a relatively short and minimally invasive procedure. After a local anesthetic is administered to the patient, a SIRT-trained interventional radiologist makes a small incision near the groin. A catheter is then inserted through the incision and guided to the hepatic artery that feeds the liver tumors. SIR-Spheres Y-90 resin microspheres are then administered through this catheter. The whole procedure may take around 60–90 minutes. After the procedure is completed, patients may be sent to have a scan to check the level of radioactivity in the liver tumors. Patients will be monitored for a few hours after the procedure and are typically discharged the same day. Most patients soon resume their normal daily activities.
SIR-Spheres Y-90 resin microspheres can extend life and can lead to potentially curative surgery

SIRT using SIR-Spheres Y-90 resin microspheres are currently given to patients that are unresponsive to chemotherapy. In this setting, the therapy has been shown to extend life, and in some cases, shrink tumors so much that they can be surgically removed. A summary of the evidence is provided below.

- SIR-Spheres Y-90 resin microspheres are used to treat liver tumors and are generally well tolerated;1,2
- SIR-Spheres Y-90 resin microspheres can treat tumors in the liver that cannot be removed by surgery;3-4
- SIR-Spheres Y-90 resin microspheres can reduce the size of liver tumors;3,6
- SIR-Spheres Y-90 resin microspheres can improve survival by approximately five months in patients with colon cancer that has spread to the liver and who have failed previous chemotherapy;2,4
- In some cases, SIR-Spheres Y-90 resin microspheres can reduce the size of tumors so much that they can be surgically removed.7-9
- Although SIR-Spheres Y-90 resin microspheres in combination with standard first-line mFOLFOX6 chemotherapy did not cause a superior OS in the studied group of patients with liver metastases from colorectal cancer, they did provide a significantly improved median OS by 4.9 months and reduced the risk of death at any given point in time by 36% when given first line in combination with standard mFOLFOX6 chemotherapy for liver-only or liver-dominant mCRC in patients with right-sided primary (RSP) tumors.10,11

Side effects are generally mild, including tiredness, loss of appetite, mild fever, stomach pain, sickness, injection site soreness and diarrhea. There is no hair loss with this treatment.

SIR-Spheres Y-90 resin microspheres have a 2A recommendation by the NCCN in the United States

In the United States, the 2017 National Comprehensive Cancer Network® (NCCN) Clinical Practice Guidelines in Oncology for colon and rectal cancer recommend the treatment with SIR-Spheres Y-90 resin microspheres as an appropriate option for patients with liver-dominant, chemotherapy resistant colorectal disease (mCRC).12,13

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