New Hope for People With Colorectal Cancer That Has Spread to the Liver

Fred Hutch is the only center in Washington state offering high-dose chemotherapy through hepatic artery infusion.

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When physicians prescribe systemic chemotherapy, they need to strike a careful balance: the dose needs be strong enough to kill cancer cells throughout the body but not so strong that it harms healthy tissue and causes severe side effects.

Hepatic artery infusion (HAI) therapy offers a new approach for people whose colorectal cancer has spread to the liver. It allows physicians to deliver chemotherapy directly to the liver at doses up to 400 times higher than standard systemic chemotherapy with fewer side effects. Fred Hutch Cancer Center is the only place in Washington state and one of only two in the Pacific Northwest to offer HAI therapy.

“This treatment is highly effective for a patient whose colorectal cancer has spread to the liver but nowhere else,” said Rachael A. Safyan, MD, a gastrointestinal medical oncologist and medical director of the Fred Hutch/UW Medicine HAI Pump Program.

“It’s been shown to improve the chances of resection of colorectal liver metastases and improve survival,” said Safyan, an assistant professor in the Clinical Research Division at Fred Hutch and in the Division of Hematology and Oncology at the University of Washington School of Medicine. “We’re thrilled to be able to offer it to our patients.”

How HAI therapy works

For HAI therapy, a surgeon implants a small pump, about the size of a deck of cards, under the skin of the abdomen and inserts a catheter between the pump and the hepatic artery, a primary blood vessel transporting oxygenated blood to the liver.

“For some patients, surgery with a traditional open incision is the best approach,” said Jonathan G. Sham, MD, MBEE, a surgical oncologist and surgical director of the Fred Hutch/UW Medicine HAI Pump Program.

“But most of the time, we can perform robot-assisted minimally invasive surgery in which the largest incision is only 12 millimeters,” said Sham, who is chief of hepatopancreatobiliary surgery and an associate professor in the Department of Surgery at the UW School of Medicine. “This allows patients to recover and get back to their lives more quickly and start receiving medicine through the pump sooner.”

Liver tumors receive most of their blood supply from the hepatic artery, while healthy liver tissue relies more on the portal vein. Delivering chemotherapy through the hepatic artery targets tumors directly, while sparing much of the healthy liver and the rest of the body.

“The chemotherapy drug we use in HAI therapy, called floxuridine, has a short half-life, and it has near complete extraction within the liver,” said Safyan. “This is why we can deliver high concentrations to tumors in the liver while minimizing the systemic toxicity of treatment.”

Benefits include improved survival and a better chance at tumor removal

After the pump is in place, patients have clinic visits at Fred Hutch Cancer Center – South Lake Union every two weeks so the pump can be refilled. The HAI pump delivers a continuous flow of chemotherapy to the liver for two weeks, followed by a two-week rest period with saline. Patients also get chemotherapy through their port every two weeks.

HAI therapy can benefit patients in several important ways.

- If cancer has spread to the liver from the colon or rectum, surgeons may remove the tumors before or at the same time as they place an HAI pump. The goal is for hepatic artery infusions to prevent cancer recurrence in the liver. Some studies have shown this approach improves survival.

- In cases where liver tumors are too large to resect, surgeons may place a pump in hopes that infusions will shrink the tumors so removal becomes possible.

- When patients have multiple liver metastases and surgery isn’t an option, HAI therapy can still help control the cancer, relieve symptoms, extend survival and provide better quality of life.

“In patients with unresectable metastatic colorectal cancer in the liver, we see response rates of up to 80% and conversion-to-resectable rates of up to 50%,” said Sham.

Along with metastatic colorectal cancer, researchers are studying HAI therapy for use against

other cancers, such as neuroendocrine tumors and intrahepatic cholangiocarcinoma, a bile duct cancer.

HAI care is team-based

Due to the complexity of HAI therapy, it can only be performed at centers with a coordinated team of specialists.

“This treatment requires a multidisciplinary team, including surgical oncologists, medical oncologists, radiation oncologists, interventional radiologists, gastroenterologists, nuclear medicine doctors and infusion nurses. That’s why ours is one of the few programs on the West Coast,” said Sham. “Fred Hutch has the expertise to provide all aspects of care for people receiving this therapy.”

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