Patients with unresectable primary or metastatic liver tumors traditionally have few good treatment options. Chemotherapy and targeted drugs can reduce tumor burden and extend the lives of some patients modestly. However, a minimally invasive interventional radiology procedure can significantly increase that benefit in some cases.

Selective internal radiation therapy, also known radioembolization, uses Yttrium-90 (Y-90) microspheres in a targeted treatment of these tumors. Interventional radiologists can implant the radiation-emitting spheres in liver tumors to shrink them. The technique may even keep or place some patients in operable status.

“As a center for liver surgery and transplant, and a hospital active in treating liver cancer and liver disease, we have found Y-90 an important advance to offer our patients,” said Lourdes interventional radiologist Joseph Broudy, MD. “In patients with primary liver cancer, this treatment can serve as a bridge to transplantation. For these patients and those with liver metastases—particularly from colorectal cancer—it can prolong survival and improve quality of life.”

Spheres Coalesce Within Tumor

The interventional team uses a transfemoral catheter to access the hepatic artery—the primary blood supply for liver tumors. (The portal vein supplies most of the blood to normal liver parenchyma.) Using fluoroscopic guidance, the specialists map the hepatic arterial system and isolate the hepatic vasculature to prevent the microspheres from depositing in the gastrointestinal tract.

The millions of radioactive microspheres that the radiologists then slowly infuse have a density similar to that of human blood cells. At an average diameter of 32 microns, they flow to the distal arterioles of the tumor surface but are too large to pass through the capillary bed. Thus, they become permanently implanted within the tumor. Once implanted, each sphere delivers radiation over a short distance of approximately 2.5 millimeters, a field that provides broad tumor coverage while sparing most nearby healthy liver tissue. Procedure time is brief, and patients normally go home on the same day.

Killing Cancer with Fewer Unwanted Effects

The tumoricidal effect of radioembolization is mostly due to radiation rather than to tumor ischemia. The Lourdes cancer team sometimes uses Y-90 in tandem with other treatments such as chemotherapy. Patients may undergo repeat treatments if needed.

“Y-90 has fewer side effects than other types of treatment and allows a much larger dose of radiation delivery to the tumor compared to external beam radiation,” said Dr. Broudy. “Following treatment, the Y-90 radiation decays, delivering most of its radiation in about 10 days, and completely after about 30 days. The microspheres remain in the liver without problem.”

Tumor resection is an option for some liver cancer patients; however, the tumors must meet certain criteria. In addition, for primary liver cancer patients at the appropriate stage, organ transplant offers the best chance of a cure, but tumor size can become a difficult issue during the sometimes extended wait for a donor organ. Patients with metastatic disease may also become resistant or intolerant to chemotherapy. For individuals in these circumstances, Y-90 can offer a bridge to transplantation, improve survival or symptoms and serve as an alternative to chemotherapy.

Y-90 can extend length and quality of life for certain patients or help some reach an operable point.
Mammography is valuable in detecting breast cancer early. And now, an important new advance is making this test more sensitive and specific. Three-dimensional (tomosynthesis) mammography gives views of the breast from multiple angles.

In seconds, the X-ray unit sweeps in an arc around the breast taking roughly a dozen images. These views permit the radiologist a more complete examination of the breast on the mammogram. “Screening with breast tomosynthesis improves accuracy and reduces false-positive rates,” said Kathleen V. Greatrex, MD, Chief of the Division of Breast Imaging at Lourdes Health System. “We like to use it for women with dense breast tissue, including younger women, or others with strong family history. But we make it available to anyone who needs to get screened.”

Standard mammography flattens breast tissue, sometimes hiding suspect lesions. For breast tomosynthesis, though, the technician applies only a small amount of pressure to the breast—just enough to keep the breast in a stable position. Assembled images of the breast offer a clear, highly focused three-dimensional survey.

Studies reveal significant results for 3-D mammography:

• Increases rate of detection of invasive and other breast cancers, thus reducing false negatives

• Reduces false positives and, thus, decreases unnecessary call-backs for a diagnostic mammogram, while increasing the positive predictive value of call-backs and biopsies

“For any woman who needs breast screening should consider 3-D mammography, which I believe will become the new standard of care—one that will ultimately reduce costs and detect more cancers earlier when treatment options are better,” said Dr. Greatrex.