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Ablation

Irreversible electroporation using a NanoKnife

Radioemolization

Ablation, NanoKnife, and radioembolization can kill or shrink liver metastases while keeping nearby tissue and organs safe.

Ablation for Liver Metastases

An interventional radiologist may do a percutaneous (per-kyoo-TAY-nee-us) [ablation](#) for liver metastases. Percutaneous (through the skin) ablation is a minimally invasive procedure that kills cancer cells without surgery.

Ablation for treating liver metastases targets only the tumor and a small margin of normal tissue right around the tumor. This method helps reduce side effects and the risk of the cancer coming back. You do not need to stay in the hospital to have this procedure.

We often recommend ablation only if you have 3 or fewer liver tumors, each smaller than 3 cm in size.

There are a few types of ablation procedures for liver metastases. They kill cancer cells in different ways. Whether we choose heat, cold, or other methods depends on the size, location, and shape of the tumor.

What are the types of ablation for liver metastases?

Treating liver metastases with thermal ablation

There are several kinds of thermal (related to temperature) ablation.

Radiofrequency ablation uses high-energy radio waves delivered by special needles placed right into the tumor. This kills the cancer cells with heat.

Microwave ablation uses microwaves delivered by a special needle that creates high heat, killing the tumor.

Cryoblation kills cancer cells by freezing them. This type of ablation is also called cryotherapy or cryosurgery.

Other types of thermal ablation use lasers or focused ultrasound waves to kill tumor cells.

Treating liver cancer with irreversible electroporation and a NanoKnife

It's hard to treat some liver metastases with thermal (heating or cooling) ablation. That's because they're near bile ducts or blood vessels. Instead, your interventional radiologist may use a method called irreversible electroporation (ee-LEK-troh-por-AY-shun).

Irreversible electroporation (IRE) uses short electrical pulses to punch holes in cancer cell membranes. This damage to cancer cells kills the tumor.

The instrument used for this procedure is called a NanoKnife®. This method cannot treat as large an area as thermal ablation. But it can be used when a tumor is near a bile duct or blood vessel. It does not harm them.

Ablation and surgery for liver metastases

MSK surgeons often do ablation along with liver surgery to resect metastases. This approach lets us remove tumors that other hospitals may consider inoperable (it cannot be operated on). For example, we use this approach for metastases that are in both sides of the liver.

Benefits of ablation for liver metastases

Ablation may:

- Lower the chances of cancer coming back if there is liver metastases we cannot completely remove.

- Help you live longer if metastases comes back after surgery, chemotherapy, or both.

- Be a good option instead of surgery for people who are too sick to have an operation.

What to expect during a liver ablation procedure

You will get anesthesia (medicine to make you sleep) before your ablation.

Your interventional radiologist will do this procedure through a small nick in your skin. They will put special needles through an incision (cut) in your skin. These needles deliver the treatment right to the tumor.

An ablation procedure often takes about 2 to 3 hours.

Your interventional radiologist will use imaging to guide the needle into the tumor. Imaging can include:

- Fluoroscopy (real-time X-rays)

- [Computed tomography](#) (CT) scan

- [Magnetic resonance imaging](#) (MRI) scan

- [Ultrasound](#)

MSK sometimes uses a positron emission tomography (PET) computed tomography (CT) scan to target liver tumors. This imaging technology can make ablation even more accurate.

MSK researchers are looking at ways to sample tumor tissue for biomarkers, which are early markers of disease. These biomarkers may help MSK liver metastases experts predict how well ablation will work.

Radioembolization (SIRT) for liver metastases

Our interventional radiologists are experts in radioembolization (RAY-dee-oh-EM-boh-lih-ZAY-shun), also known as [selective internal radiation therapy](#) (SIRT).

Radioembolization is a type of radiation therapy. Radioembolization is sometimes a good treatment for people with liver metastases.

SIRT is best for people with:

- Liver metastases.
- Liver metastases that surgery cannot remove.
- Tumors that keep growing or do not respond to chemotherapy.

Radioembolization can sometimes shrink tumors so much they can be removed with surgery or ablation.

Research shows that doing SIRT along with chemotherapy may control liver metastases for longer periods of time. It's also safe for people who already had several treatments for liver metastases.

How is SIRT done?

Your interventional radiologist will thread a small catheter (thin flexible tube) in your hepatic artery. Then, they will inject (put) tiny radioactive beads (loaded with yttrium-90 or Y90) in the catheter. These beads deliver a very high dose of radiation directly to the tumor's blood supply.

SIRT delivers internal radiation therapy very close to the liver tumor over a few days. Because the beads are very close to the tumors, the radiation only affects the area near the tumor. The beads do not harm the part of the liver that does not have a tumor. That liver tissue gets blood from the portal vein.

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