

Interventional Radiology at Virginia Mason

Working Together for Better Outcomes

RADIO FREQUENCY ABLATION

Radio frequency is a type of electrical energy that has been used in medical procedures for decades. At the most basic level, this electrical energy is used to create heat. The heat is created in a specific location, at a specific temperature for a specific period of time and ultimately results in the death of unwanted tissue.

During a Radio frequency procedure (RFA), the physician uses ultrasound or computed tomography (CT) to place a probe directly into the target tissue. Several small, curved electrodes (like an umbrella) are deployed from the end of the probe into the tissue. Using a Radiofrequency generator, with the desired temperatures set, a carefully controlled amount of energy is allowed to flow through the electrodes into the target tissue. This energy at the exposed tip causes ionic agitation and friction causing heat. This heat cooks the tumor and leads to cell death and coagulation necrosis, if hot enough (above 50 degrees C). This tissue is gradually replaced by fibrosis and scar tissue. Over the coming months, the treated tissue shrinks in volume. If there is local recurrence, it occurs at the margin and in some cases may be retreated.

Tiny thermometers are incorporated into the tips of the electrodes to allow continuous monitoring of tissue temperature and the power is automatically adjusted so the temperature remains constant.

Depending on the power applied and the resistance of the tissues, heat decreased rapidly at a specific distance from the electrode tip, limiting the ablation size. The size of the ablated area is determined largely by the size of the probe, the temperature of the tissue and the duration of time the energy is applied. There is a sharp boundary between dead tissue and unaffected surrounding tissue. Thus unwanted tissue can be ablated without much sacrifice of surrounding normal tissue.

WHAT IS AN RFA PROCEDURE LIKE?

Your physician can tell you what to expect before and after the procedure. There are three different ways that a RFA may be performed, and each has different benefits, limitations and applicability.

OPTIONS

One option is a percutaneous approach. A needle-sized electrode is passed directly through the skin and guided into place. This requires only light conscious sedation and you can usually go home the same day. This is considered a minimally invasive procedure.

Another option is a laproscopic approach. With this approach, the surgeon makes a few small incisions in the abdomen, through which the necessary instruments are passed in order to treat the target tissue. This is also a minimally invasive approach, although general anesthesia is necessary. Patients typically go home the next day.

A third option is the open approach. This is what most people probably think of when they think of an operation. An incision is made in the area to be treated and the surgeon can directly visualize the tumor before and during treatment. This requires general anesthesia and a slightly longer recovery.

BENEFITS

- Reduction of the size or elimination of tumors
- Minimally invasive - usually done on an out patient basis
- Highly effective – can be used on tumors up to 7 cm in size
- Can be used repeatedly for recurring or new tumors
- Few complications or side effects

RISKS

- Low grade fevers for a few days following the procedure
- Very low risk of skin burns, bleeding, fluid accumulation, injury to adjacent structures and infection

WHAT TREATMENT IS BEST FOR ME?

RFA can be used alone or in combination with other cancer treatments. Treatment choice depends on the type and size of tumors, their number and location, the severity of the disease and your general health. Your doctor will help you decide which treatment is for you.

