

Investigation of the immunostimulatory response to high intensity focused ultrasound in dogs with naturally-occurring solid tumors

Purpose

To determine if the application of high-intensity focused ultrasound (HIFU) can stimulate an anti-tumor immune response in dogs diagnosed with solid tumors.

Background

Solid tumors (soft tissue sarcomas, carcinomas, and mast cell tumors) are some of the most common tumors in dogs. Surgery has traditionally been the most effective therapy, although complete tumor removal isn't always possible. In some cases, a tumor may be surgically removed, but it could still recur at the surgical site or in a distant site like lymph node or lung.

Successful treatment can sometimes include radiation therapy and/or chemotherapy. All of these treatments carry potential side effects.

Because of the limitations of current treatment, immunotherapy is an active area of research. We are investigating the use of high-intensity focused ultrasound (HIFU), which uses precisely-targeted heating as a non-invasive means to destroy cancer cells. The use of HIFU has been shown in humans to activate the immune system, leading to more effective destruction of cancer cells. We are testing whether focused ultrasound will also activate the immune system in dogs with solid tumors, enhancing the current approach to treatment.

Eligibility

- Cytologically confirmed diagnosis of carcinoma, soft tissue sarcoma, or mast cell tumor
- Solid tumors that have invaded the surrounding bone (e.g. jaw or sinus tumors)
- Lesion size and location targetable using focused ultrasound
- Expected survival over 4 weeks without treatment

Exclusion

- Solid tumors inside the chest or abdominal cavity
- Prior radiation therapy or surgery within the past three weeks
- Corticosteroids or other immune modulating therapies within the past three weeks

Study Design

To determine whether your dog is eligible for the study, a complete physical exam, lab work, and a biopsy-confirmed diagnosis are required. Depending on the location of the tumor, we will recommend appropriate diagnostic imaging. The cost of these procedures is typically \$700-1,200 and is not covered by the study.

Once enrolled, your dog will undergo a CT scan, a surgical biopsy, the HIFU treatment, and a surgery to remove the tumor. HIFU treatment will be performed on Day 0 (Generally Monday). HIFU will be applied to the tumor under general anesthesia. Your dog will be hospitalized under 24 hour monitoring until Friday of the same week. Blood samples will be collected daily to assess your pet's immune response and definitive surgery to remove the tumor will take place on Friday. Your dog will then recover in the ICU and will be discharged as is standard for patients.

Your pet will need to return to the Veterinary Teaching Hospital 2 weeks after the definitive surgery for recheck and suture removal. At the recheck visit, your pet will have a physical exam, and additional diagnostics if indicated.

Compensation

The cost of the required screening procedures is typically \$700-1,200 and is not covered by the study. Once the pretreatment evaluation is performed at your cost, the study will cover the expenses for the subsequent lab-work, CTs, tumor biopsy and histopathology, the HIFU treatment, the cost of the hospital stay and associated costs, the cost of surgery and the cost of the scheduled recheck visit. The typical average cost of surgical resection of a tumor in our hospital is \$3,000 to \$5,000. You are responsible for any other clinical fees associated with medical complications of the HIFU therapy or other medical problems.

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