

# My Experience with CyberKnife RadioSurgery

## Dr Sue Cancer Vet

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In my last post, I introduced CyberKnife RadioSurgery, a type of stereotactic radiosurgery (SRS). This is the radiation unit we have at my specialty hospital, the Animal Specialty Center in Yonkers NY. I want to tell you a little bit more about my own experience with this new technology, but first, a quick recap on what this machine actually does.

CyberKnife, or SRS, can conform to the tumor: a radiologist can program its beams to closely follow the edges of the tumor, making it very accurate and much less likely to damage healthy tissue in the area around the tumor. It has multiple beams, and the robotic arm that holds the machine can position it in many more treatment angles. This combination of more beams and more positions means it treats with millimeter to sub-millimeter accuracy. This is why less normal tissue is radiated, a higher dose of radiation is delivered to the tumor, and fewer treatments (1 or 3 total) are needed. Fewer treatments means fewer trips to the hospital (conventional radiation treatments require fifteen to twenty sessions) and much lower risks from the required anesthesia.

CyberKnife RadioSurgery is used INSTEAD of surgery, when traditional surgery with a scalpel blade is impossible or would cause unacceptable side effects to the patient, or when surgery is refused (like an amputation for bone osteosarcoma). CyberKnife can also be used if conventional radiation has failed.

So what tumors have we treated and what are some of our experiences at Animal Specialty Center?

We treated our first case on March 7, 2008 and we have treated over 600 cases since then.

Brain tumors account for about 50% of our cases, with meningiomas the most common type. After we had performed enough radiosurgeries to analyze them from a statistical standpoint, we did a study looking at 63 cases (53 dogs and 10 cats). The overall median survival time was about 15.5 months. This compares favorably to other treatment options, including radiation, conventional surgery, and surgery with radiation. That's good news. Even better news is that we had very minimal side effects and fewer treatments to get these results.

The second most common tumor type we treat at Animal Specialty Center is tumors in the nasal and/or sinus cavity. To date we have treated over 125 cases. In a study just published in early 2014, we reported the results of 19 of those dogs, the median survival time was 13 months. This is comparable to conventional radiation, but, again, with very few side effects. (With the 15 to 20 conventional treatments, there is more radiation burning and inflammation to the mucosa lining of the nose and mouth.) Early side effects were rare and mild – this is huge compared to the side effects seen with conventional radiation..

The third most common tumor type we have treated is bone tumors. We have treated over 60 cases to date. The outcomes haven't been as uniform across the board, but for dogs with osteosarcoma in the limbs, we are seeing better survival times in "good candidates" – patients with enough bone structure left that they are not close to fracture. For CyberKnife radiation to really help save a limb, there had to be enough bone structure intact to keep the leg from fracturing. What hasn't changed is that chemotherapy after CyberKnife is just as important as chemotherapy after amputation to delay metastasis and for long term survival.

Finally we have treated various other tumors including oral tumors (best for ones of the upper jaw or maxilla), spinal cord tumors, thyroid carcinomas, prostatic carcinomas, and a non-surgical anal

sac adenocarcinoma. I am excited that we have treated so many more cases since our first two studies, and we look forward to publishing more data as we go forward.

Based on my experience, CyberKnife RadioSurgery, or stereotactic radiosurgery (SRS) is the treatment of choice for brain tumors and nasal tumors. The precision involved in radiosurgery is amazing, and we can treat our patients in 1 or 3 treatments (done on consecutive days). That means five times less anesthesia, five times fewer trips to the hospital, and fewer side effects. And the results are comparable to traditional radiation therapy. Like you, I want dogs and cats with cancer to live longer and live well. CyberKnife definitely accomplishes that.

I feel so fortunate to be part of the CyberKnife team at ASC. We were the first to offer this to pets, and it will be great as this becomes more commonly available at other clinics around the country.

Live longer, live well

Dr Sue