

Rib Tumors

Surgery Service



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Locations

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3412 E. Walton Blvd.
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(East of Fuller Rd.)
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29080 Inkster Rd.
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(248) 354-6660

Anatomy

Dogs have 13 ribs that form the supportive structure (rib cage) of the chest cavity. The ribs attach onto the breastbone and the backbones. The vital structures such as the heart and the lungs are protected by the rib cage. The muscles of the chest pull on the ribs during inspiration to increase the size of the chest cavity to pull air into the lungs. As the muscles relax, the rib chest cavity size gets smaller and air is breathed out.

Types of rib tumors

The most common type of rib tumor is osteosarcoma. This is a very malignant tumor and has a rapid spread rate (metastatic). The second most common tumor is chondrosarcoma. This tumor has a much lower metastatic potential. Other common tumors that affect the ribs include fibrosarcoma and hemangiosarcoma.

Signs

Breeds that most commonly develop rib tumors included Golden Retrievers, mix breeds, Labrador Retrievers, Bassett Hounds, Dobermans, Australian Shepherds, British Bulldog, German Short-haired Pointer, Rough coated Collie, Irish Setter, Giant Pyrenees, Rottweiler, Giant Schnauzer, Shar Pei, and Springer Spaniel. The age of dogs that develop rib tumors tends to be a bimodal distribution with affected dogs being either young (2 to 4.5 years) or older (7 to 9 years).

The most common sign of a rib tumor is a mass that is visibly or palpably present. Lameness of the forelimb may be present if the tumor is located within one of the first four ribs, is compressing the nerves to the limb, is causing mechanical interference with movement of the limb, or is invading into the muscles of the forelimb. Labored breathing may be noted if the tumor is very large and is causing collapse of the lung. If the tumor has metastasized to the inside of the chest cavity, fluid may build up in the chest, compress the lungs and cause labored breathing.

Diagnosis

The diagnosis of a rib tumor is commonly made on x-rays. Typically, the tumor will cause a portion of the rib bone to be dissolved away and/or new bone to be produced within the region of the tumor or both. Chest x-rays are used identify visible spread of the cancer to the lungs; it is important to note that microscopic spread of tumor to the lungs cannot be detected with x-rays. A CT scan may be recommended, as this test provides a better evaluation of the extent of the disease and is more sensitive to detect evidence of spread of the tumor into the lungs. A fine needle biopsy may be helpful to diagnose a rib tumor, but frequently will not ascertain the specific type of tumor that is present. Usually the entire tumor is submitted for biopsy after surgery is preformed to establish a final diagnosis. If available, a whole body nuclear bone scan is recommended prior to surgery, as roughly 16% of the rib osteosarcomas will have spread to other bones at the time of diagnosis. In preparation for surgery, preoperative blood work including a complete blood count, chemistry profile and urine testing are recommended to ensure that your pet is healthy to under go anesthesia and surgery.

Rib Tumors Continued...

The day of surgery

Please make sure that your companion has been fasted prior to surgery and that the prescribed dose of Pepcid AC has been administered. Our anesthesia and surgical team will prescribe a pain management program, both during and after surgery that will keep your companion comfortable. This may include a combination of general anesthesia, injectable analgesics, local anesthetics, oral analgesics and anti-inflammatory medication. The surgeon will contact you after the surgery to give you a progress report on your companion after the surgery.

Treatment

Surgery is the recommended treatment option for rib tumors. In addition to the rib(s) that are affected by the tumor, one unaffected rib in front and behind the tumor should be removed. If the tumor is adherent or invading into a lung lobe or the sac surrounding the heart, this tissue will also be removed. In dogs, this is generally tolerated very well. In some cases, a plastic mesh patch will be used to repair the defect in the rib cage. In most cases, a muscle (latissimus dorsi or external abdominal oblique muscle) will be used to repair the defect in the rib cage. A drainage tube is placed within the chest cavity and another drainage tube may be placed beneath the skin and muscle flap.



Results

Expected local recurrence is seen in 25% of dogs with incompletely removed tumors and 13.3% of dogs with completely removed tumors. Dogs with osteosarcoma that have elevation of the Alkaline phosphatase enzyme level on chemistry profile have a much lower median survival time (210 days versus 675 days). Chemotherapy will significantly increase the survival of dogs with rib osteosarcoma from a few months to about 9.5 months. Chondrosarcomas have a very good chance to be cured with surgery alone with median survival times exceeding 3 years. Elevation of the alkaline phosphatase enzyme level may also be seen in patients with chondrosarcomas, but does not worsen the prognosis in these cases. These tumors can spread and cause death of the patient. The grade of a chondrosarcoma generally does not correlate with the malignant potential and chemotherapy likely is of little benefit. Hemangiosarcoma generally carries a very poor prognosis regardless of treatment.

Aftercare

Following surgery, the patient will receive pain-relieving medication to ensure a comfortable recovery. Intravenous fluid therapy is administered to ensure that your companion will remain well hydrated after surgery. If needed, oxygen may also be delivered via a small tube that is placed in the nose until your companion is able to breathe well.

At home, the incision should be checked for signs of infection. Your pet should not lick the incision, as this could open the incision or cause infection. If necessary, an Elizabethan collar can be placed on your companion to prevent licking and chewing at the surgical site. The chest will be supported with a bandage for about 2 to 3 weeks after surgery. Antibiotics may be indicated after the surgery in some cases (especially if plastic mesh is used). The respiratory rate may be increased for a few weeks after surgery while the chest wall is healing. In addition, the defect in the chest wall may undulate in and out as the patient breathes, but with time this will resolve or become minimally evident. Exercise should be restricted for about 6 weeks after surgery.

Rib Tumors Continued...

References

1. Liptak JM, Kamstock, DA, Dernell WS, et al. Oncologic outcome after curative-intent treatment in 39 dogs with primary chest wall tumors (1992-2005). *Vet Surgery* 37:488-496, 2008.
2. Liptak, JM, Dernell S, Rizzo SA, et al. Reconstruction of chest wall defects after rib tumor resection: a comparison of autogenous, prosthetic and composite technique in 44 dogs. *Vet. Surg* 37:479-487, 2008.
3. Baines SJ, Lewis S, and White RAS. *Vet Record* 16:335-339, 2002.
4. Matthiesen DT, Clark GN, Orsher RJ, et al. En bloc rib resection of primary rib tumors in 40 dogs. *Vet Surg* 21:201-20, 1992.

Assessment and recommendations

Patient: _____

Date: _____

Treatment

- Surgery is recommended by a surgeon at Michigan Veterinary Specialists
- Surgery is not recommended
- Please make an appointment for a consultation with one of our oncologists

The following has been prescribed

- No medications or special diet are necessary at this time
- Narcotic: _____
- Anti-inflammatory: _____
- Other medication: _____

Exercise

- Unlimited
- Confine your pet to the house other than very short leash walks necessary for bowel movements and urination
- Restrict exercise to leash walks 10 minutes twice daily

Preparation for surgery

- Start fasting your companion at midnight before the day of surgery; water should not be withheld
- Pepcid AC 10 mg tablets: give _____ tablet(s) with water (use syringe if needed) at 6 AM on the day of surgery

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