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The Cutting Edge

CASE REPORT

Comminuted Femoral Fracture in a Dog

by Bryan Paterson

Sal, an 8-month-old spayed female huntaway cross was presented as a referral with a comminuted fracture of the femur following a hit by car. Sal presented approximately 4 days after the accident. X-rays showed a midshaft comminuted fracture with 4 fragments — two large fragments were separated from the shaft. (see Figure 1.)



Figure 1. X-rays taken prior to planning surgery.

cerclage wire) to allow load bearing over the cortices. Also pinning plus cerclage wire without additional support to minimise rotational forces would be risky. Two options were considered: Buttress or neutralization plating. As the proximal femur was relatively short, a plate would have to be contoured over the greater trochanter, involving elevating the vastus lateralis. Pinning/ cerclage wire plus a Kirchner external fixator. Equipment for both options was prepared prior to surgery. Sal was premedicated with ACP, Morphine, Atropine. Cephalexin was given as a perioperative antibiotic.

During surgery significant muscle contracture was noted and possible early stage muscle fibrosis making distraction very difficult. Elevating the vastus lateralis would have been risky with possible complications

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In fractures of this type, compression plating is not an option as there would be questionable stability of the fragments (whether reduced by lag screws, positional screws or

Do you need urgent blood results?

- Na⁺/ K⁺
- iCa⁺⁺
- Arterial / venous blood gases
- Activated clotting time
- CBC (incl. accurate platelet count)

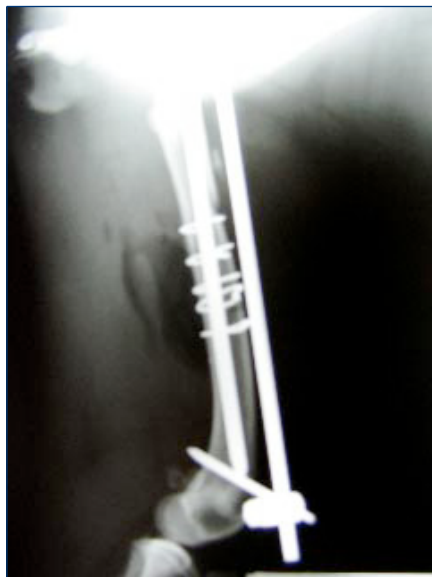
We can offer these tests with immediate turn around times. Please phone for enquiries.

re-attaching due to the fibrosis/contracture. For this reason, intramedullary pinning was used and was also a useful aid for distraction. The distal portion of the fracture was reconstructed with cerclage wire which provided good compression forces, then the fracture was reduced with a retrograde Steinman pin and a proximal cerclage wire.

Additional cerclage wires were then added at approximately 10mm intervals to ensure good reduction of the fragments. Two half pins and a Kirschner bar provided further anti-rotational stability. Good reduction and stability was achieved. (see Figures 2a and 2b.)

Sal was kept hospitalised for two days until evidence of weight bearing, then sent home with appropriate pain management and a physiotherapy programme to aid in recovery from the muscle fibrosis. Pain management involved a Durogesic Fentanyl patch plus Rimadyl for longer pain management.

Physiotherapy to resolve the muscle contracture/fibrosis would involve flexing and extending the knee 5 times in three sessions a day. Also leash walking several times a day but initially for just 5 minutes, the goal being to walk so slowly that Sal will touch his operated leg to the ground. Each week these walks would be 5 minutes longer. After 6 weeks Sal should be walking 30 minutes 2-3x daily. At 4 weeks post-op Sal would have an X-ray. If there was good healing the Kirschner apparatus could be removed. The Steinman pin should be removed in 10-12 weeks, confirmed by X-ray.



Figures 2a and 2b. Post-operative appearance of fracture repair.

WEB RESOURCES

Here are a couple of excellent websites to help with client education and hand-outs.

Veterinary Partner (<http://www.veterinarypartner.com/>)

Do you have questions about animal health, medications, therapies, surgery, behavior, or safety? Did your veterinarian suggest you visit this site to learn more about a health issue concerning your pet?

VeterinaryPartner.com is here to support your veterinarian and you in the care of your companion animals by providing reliable, up-to-date animal health information from the veterinarians and experts of the Veterinary Information Network (VIN), the world's first and largest online veterinary database and community.

Cornell University (<http://www.vet.cornell.edu/library/FreeResources.htm>)

Free Animal Health Resources Web Sites

Provided by the Veterinary Library

Look here for free Internet resources providing quality-animal-health-related information.

As always, please remember that your veterinarian is the very best person to consult with questions regarding your animal's health, especially if your animal is ill. If your concern is urgent, please be sure to contact him or her immediately.

What's Your Diagnosis? - Coughing Dog

A 2½-year-old male neutered Bearded Collie/Labrador cross was presented for acute onset of coughing that had been present for 24 hrs. The dog remained quite bright and was eating normally. The coughing occurred in paroxysms and was harsh with a terminal gag and retch — no obvious material was expectorated.

On physical examination the respiratory rate was slightly elevated with a mild increase in bronchovesicular tones. No wheezes or crackles could be auscultated. The rectal temperature was 40.5C.

Question 1.

What differential diagnoses would you consider for this presentation?

Question 2.

What diagnostic tests would you run to further investigate this dog's cough?

Screening chest x-rays (lateral and ventrodorsal views) were done 48 hours later, after a poor response to oral trimethoprim sulphonamides, that were prescribed for a possible acute infectious tracheobronchitis. (see Figure 1.)

Figure 1. Lateral chest X-ray.



Question 3.

Describe the radiographic abnormalities you can see (I appreciate this is always challenging from printed/electronic media) and list the differential diagnoses you are considering.

Question 4.

What further diagnostic tests might you run?

Drug Profile: Clopidogrel bisulfate (Plavix®)

Clopidogrel is a platelet aggregation inhibitor that is being investigated for use in cats with thromboembolic disease, primarily associated with hypertrophic cardiomyopathy. It may also improve hind limb circulation by way of a vasomodulating effect secondary to inhibiting the release of serotonin from platelets.

Clopidogrel selectively and irreversibly (for the lifespan of the platelet) binds the surface ADP-receptors (not allowing ADP to bind), which subsequently inhibits activation of the IIb/IIIa glycoprotein complex. Without activation of this complex the platelet is unable to bind fibrinogen or release other compounds (serotonin, calcium, thrombospondin) necessary to promote platelet aggregation and primary haemostasis. This mechanism of action is different to that of aspirin and thus can be co-administered but with heightened risk of bleeding.

In humans clopidogrel is rapidly absorbed after oral administration with a bioavailability of 50% — food does not affect absorption and may reduce the incidence of vomiting when given to cats.

The following drug interactions have either been reported in people or are theoretical concerns:

Aspirin — increased risk of bleeding but many human patients take both at the same time.

Heparin — appears safe to use with both unfractionated and low-molecular weight versions.

NSAIDs — increased risk of bleeding, clopidogrel may interfere with metabolism.

Phenytoin — clopidogrel may interfere with metabolism.

The recommended dose rate in cats is 18.75 mg (1/4 of a 75mg tablet) PO; ONCE daily. At this dose the approximate cost to the client would be \$3.00 per day.

What's Your Diagnosis? - Answers

Question 1.

- Acute infectious tracheobronchitis (kennel cough)
- Inhaled foreign body
- Bacterial bronchopneumonia (blood borne or secondary to aspiration)
- Rodenticide poisoning
- Bronchitis, primary or metastatic neoplasia and fungal infection are all possible but would be considered unlikely due to the peracute onset of symptoms.

Question 2.

CBC (including a blood smear) and screening chest xrays would be an excellent starting point for further investigation. If the dog is a hunting dog or exercises in high risk areas for inhaled foreign bodies then GA and tracheoscopy should also be strongly considered. The owners declined initial diagnostic testing

and opted for a treatment trial with oral trimethoprim-sulphonamide antibiotic.

Question 3.

There is a marked alveolar pattern in the cranio-ventral lung fields with air-bronchograms seen. There is slight scalloping of the lung lobes and a fissure line present indicating a small amount of free pleural fluid. The coughing was about the same in severity but the dog was systemically unwell with a poor appetite and was very subdued.

Question 4.

An ACT or full coagulation panel, endoscopy, transtracheal wash or bronchoalveolar lavage, thoracic cavity ultrasound examination with centesis and cytology. We elected to perform a CBC and ACT as our first tests — the ACT result was 506s

(normal 90-120s) and the dogs HCT was 32% with a platelet count of 70.

CASE DISCUSSION

A diagnosis of acute rodenticide poisoning was made. The alveolar lung pattern was consistent with pulmonary haemorrhage. The fever was likely to be secondary to an intense inflammatory reaction and release of cytokines induced by haemorrhage into the alveolar tissues. This case highlights the ever present risk of rodenticide toxicity to dogs and cats in our area.

Further questioning of the owners elucidated that rat bait was present on the property but in a place supposedly inaccessible to the dog. Rodenticide poisoning was not initially considered as a possible cause for this dogs coughing because the clinical signs were not classical in presentation.

I have recently diagnosed a cat with severe haematuria secondary to rodenticide toxicity — again an unusual presentation for this poisoning. This reiterates the need for us to continually bear in mind this differential diagnosis even in the absence of a typical clinical presentation.

Our new iSTAT machine has been excellent in allowing a rapid and accurate diagnosis for these cases. It can be run in a bed-side manner and only requires 0.1ml of whole blood.

