

Katu's Tail Episode

On Sunday January 27, coming out of the basement from folding laundry, I heard the uproar in the kennel. Having just left it less than 5 minutes, before I ran back. The dog in the next run had Katu's tail pulled through the fence. The tail was scrapped up, but otherwise looked okay. I took Katu to the shop the following morning, clipped the hair off the tail and cleaned it with H₂O₂ (hydrogen peroxide). He was given Baytril for several days. His attitude and appetite remained normal; his tail would come up a bit further every day. I continued to check his tail morning and evening.

On Wednesday, February 6 I took him to the shop for routine grooming. He was bathed I didn't mess with the tail, only did a visual. There was still scabbing. Apparently he worried at it all Thursday...perhaps the bath the day before loosened up the scabs. The lower 2" of his tail was dangling. The following morning he went to Golden Animal Hospital for partial tail amputation (and a dental and a neuter while he was 'under').

22.7 mg Baytril (Enrofloxacin)- 1 SID for 7 days was prescribed.

He was injected with Antisedan, atropine and Dormitor. Antisedan reverses the effect of Dormitor.

Dormitor is a new injectable alpha-2 agonist being marketed by Pfizer. The drug is used as a sedative-analgesic. According to Pfizer, Dormitor is a more selective, and thus more effective, alpha-2 agonist than older alpha-2 agonists, such as xylazine. Dormitor can be given IV or IM, with IV route giving a more rapid response (3-5 minutes vs. 5-10 minutes for IM administration). The sedative effect of Dormitor is about 3 hours, with the analgesic effects being about 90 minutes.

Antisedan, an alpha-2 antagonist, competitively inhibits medetomidine and provides a rapid, predictable reversal of Dormitor. Generally, reversal occurs within 5-10 minutes of administration of Antisedan. Side effects of Dormitor include bradycardia, peripheral vasoconstriction, and occasional vomiting.

We have used Dormitor/Antisedan on a limited basis at SouthPaws. The drug seems to be useful for minor diagnostic and clinical procedures not requiring general anesthesia, but where chemical restraint would provide better control than manual restraint and where fast recovery times are wanted. Typically, this includes bandage changes, oral exams, skin testing and such. We avoid the bradycardia side effect by adding a small amount of glycopyrrolate to the Dormitor upon administration. Pfizer suggests that Dormitor be avoided in the face of renal, cardiac, or liver disease or in other severely debilitated dogs.

Uses of Bayril

This medication may be used in either dogs or cats to combat different types of infections, especially those involving *Pseudomonas*. Enrofloxacin is also active against *Staphylococci*, and thus is commonly used for skin infections. Fluoroquinolones act by deactivating bacterial enzymes necessary for the transcription of DNA. DNA is very tightly coiled in order to fit inside a cell. Segments to be used must be uncoiled by an enzyme called DNA gyrase. The fluoroquinolone antibiotic deactivates DNA gyrase making the reading of DNA impossible. The bacterial cell dies. Mammalian DNA gyrase is of a completely different shape and remains unharmed.

The full scoop on Baytril

Enrofloxacin (Baytril)

(for veterinary information only)

Brand Name: Baytril

Available in 22.7 mg, 68 mg, and 136 mg tablets

Background

Until penicillin came on the scene in the 1940s, our efforts to combat bacterial infection were largely ineffective. As different antibiotics were developed, different types of bacteria were conquered, yet one bacterial species remained seemingly invincible: *Pseudomonas aeruginosa*. Eventually antibiotics (the aminoglycoside class) were developed that could kill *Pseudomonas* but they

were available only as injectable products and had potential to cause significant kidney damage if used too long. With these kinds of side effects and the ability to treat *Pseudomonas* limited to hospitalized patients (where injections could be given regularly), the battle with *Pseudomonas* was far from won.

A major breakthrough was the development of the fluoroquinolone class of antibiotics (including enrofloxacin, its counterpart for human use ciprofloxacin, and several others). These medications are active against many bacterial types including *Pseudomonas*. They are available as tablets and are not associated with the serious side effects that plagued the aminoglycoside group.

Fluoroquinolones act by deactivating bacterial enzymes necessary for the transcription of DNA. DNA is very tightly coiled in order to fit inside a cell. Segments to be used must be uncoiled by an enzyme called DNA gyrase. The fluoroquinolone antibiotic deactivates DNA gyrase making the reading of DNA impossible. The bacterial cell dies. Mammalian DNA gyrase is of a completely different shape and remains unharmed.

Uses of this Medication

This medication may be used in either dogs or cats to combat different types of infections, especially those involving *Pseudomonas*. Enrofloxacin is also active against *Staphylococci*, and thus is commonly used for skin infections.

Side Effects

At approximately ten times the recommended dose vomiting and diarrhea may be seen with this medication. At normal doses, this should not be seen. Dogs with *Pseudomonas* ear infections require very high doses of enrofloxacin and nausea may indeed become a problem.

In immature dogs (less than 8 months of age) damage to joint cartilage can occur. This phenomenon is only seen in growing dogs and does not seem to be a problem in cats. It is preferable not to use this medication in puppies unless the severity of the infection present warrants it.

The use of enrofloxacin can produce crystals in urine. These crystals may show up on a laboratory test thus it is important to be aware of this side effect.

See retinal damage below regarding the recently described feline retinal problem associated with enrofloxacin at higher doses.

Interactions with other Drugs

[Sucralfate](#) (a medication used to treat stomach ulcers) may bind enrofloxacin and prevent it from entering the body. These medications should be given at least 2 hours apart if they are used together.

[Theophylline](#) (an airway dilator) blood levels may be higher than usual if this medication is used concurrently with enrofloxacin. The dose of theophylline may need to be reduced.

If enrofloxacin is used with oral cyclosporine (an immunosuppressive medication used for inflammatory bowel disease), the kidney damaging properties of cyclosporine may become worse.

Medications or supplements containing iron, zinc, magnesium or aluminum will bind enrofloxacin and prevent absorption into the body. Such medications should be separated from enrofloxacin by at least 2 hours.

Concerns and Cautions

Enrofloxacin tablets are enteric coated to hide the drug's naturally bitter taste. If the tablets are crushed for some reason, the bitter taste is more readily apparent. Crushing tablets to put in an animal's food is unlikely to be an effective way to administer enrofloxacin. Recently, Bayer has manufactured an alternative called a flavor-tab that is much more palatable than the purple-colored enteric coated tablets. The tan colored flavor-tabs are more easily crushed and mixed in food.

Pseudomonas infections are especially common in ears. In this location, especially high doses of enrofloxacin are needed to clear this infection. Expect to give a lot of pills and be prepared for expense.

Enrofloxacin has toxic properties in humans. It is for veterinary use only.

Enrofloxacin should not be used in pregnant, or nursing pets or in immature dogs unless the severity of the infection warrants it.

Enrofloxacin may lower the seizure threshold (meaning that it can facilitate seizures). This is not a problem for normal animals but fluoroquinolones are best not used in animals with known seizure disorders.

Retinal damage has been seen in cats when higher doses (such as might be used to treat a *Pseudomonas* ear infection) are used. This reaction is not common even with very high doses, but there is no way to predict which cats will react. Blindness, temporary or permanent, can result. This reaction has only been reported with enrofloxacin and not with other fluoroquinolones, as it is theorized that the biochemical structure of enrofloxacin leads to especially high concentrations in the feline eye (in other words, this reaction is theoretically possible with any fluoroquinolones but enrofloxacin is especially predisposed to causing this reaction).

We periodically receive questions about the urinary crystals that can be produced with the use of enrofloxacin. Two chief questions are generally asked.

1) Might enrofloxacin contribute to the development of struvite crystals and thus exacerbate [feline lower urinary tract disease \(FUS\)](#)?

The answer is probably not. The urinary crystals that have been associated with feline lower urinary tract disease are generally struvite or oxalate crystals, not crystals made out of enrofloxacin. Further, the relationship between crystals and feline lower urinary tract disease is controversial as are the assorted treatments commonly prescribed for the symptoms of this condition. There is simply no universally accepted treatment for this condition and the condition is felt to have many possible causes. Enrofloxacin crystals are an unusual finding and it is unknown how they might fit into this syndrome were they to occur in a given patient.

2) What references do we have that enrofloxacin causes urinary crystals?

Not only does enrofloxacin cause crystals; entire bladder stones can be formed out of enrofloxacin. Granted, a urinary stone composed of enrofloxacin is somewhat unusual but it is important to realize that enrofloxacin crystals might be found in a urine sample of a patient on enrofloxacin and that these crystals should be recognized as such.

Iatrogenic Disorders of the Urinary Tract--Treating our Treatments.

ACVIM 1999, C.A. Osborne, D.J. Polzin, J. P. Lulich, S.J. Ross, F. Jacob, A. C. O'Keefe.

Pharmacologic Treatment of Uroliths -- Cause or Cure.

ACVIM 1998, C. Osborne, J. Lulich, et. al.

Drug-Induced Urolithiasis

Osborne, C.A., Lulich, J.P., Bartges, J.W. et al.

Veterinary Clinics of North America Small Animal Practice 29[1]:251-66, xiv 1999 Jan.

It is our policy not to give dosing information over the Internet.

Date Published: 1/1/2001

Date Reviewed/Revised: 12/04/2003