Washington State University Veterinary Hospital
Progress Report

Appetite (A)	Bowel Movement (BM)
N= normal	N= normal
F= fair	A= abnormal
P= poor	0= none
0= none	

276721 Rajah
Johnson, Michelle R.
H: (509) 426-7890 W: (509) 426-4400
Canine – Borzoi
2/12/00 F-S Gold & White

Date	A	BM	Temp	P	R	
5/23/07	N	N/A	101.5	80	panting	**Problem 1: Unilateral Epistaxis (left side)**

S: Rajah presented with a four-day history (onset 5/19) of left sided epistaxis (nosebleed). The bleeding, intermittently both frank and watery blood, appeared to begin following an impact trauma. Moderate bleeding continued for 2 hours at which time Ms. Johnson visited Dr. Jones, her referring veterinarian. No abnormal findings were found on otoscopic examination and nasal irrigation yielded only blood clots. Diagnostically, Dr. Jones ran an in-house CBC, timed clotting in a red top tube, and dosed her prophylactically with vitamin K. Medetomidine (0.4 ml) and butorphanol (0.4 ml) were given IV for pain. Abnormalities on the CBC included thrombocytopenia (102,000/uL) and eosinophilia (2,600/uL). The RTT clotted in less than 7 minutes. The bleeding continued and on 5/22 Dr. Jones recommended Ms. Johnson dose Rajah with oxmetazoline (Afrin), which caused a noticeable decrease in the epistaxis. Rajah has been healthy otherwise and is current on her vaccinations. Travel history includes a weeklong visit to northern California three and a half years ago and a year in Tennessee two and a half years ago. The three other Borzois at the home are healthy. Upon presentation Rajah seemed bright, alert and responsive.

Nice history.

O: Rajah was bright, alert and responsive upon presentation. She was in good body condition (40kg) Capillary refill time was less than 2 seconds and mucous membranes were pink and moist. Visible watery blood was present at the left nare and there was blood straining on the upper left lip and both forelimbs. Both sides of the nasal passage were patent. No pain was elicited by palpation over the maxillary bones and no swelling was present. Two sebaceous cysts and a lipoma were present lateral to the spine at approximately vertebral segment T5 and on the chest near the third sternebra respectively.

What's another physical exam finding to check in an animal with nasal discharge or bleeding? (hint: it involves the eyes).

-petechia of the sclera (coagulopathy)
-vasculitis evident on fundic exam
-retinal detachment (systemic hypertension)
-inability to retropulse eyes (space occupying mass)

Great

A: The etiologies for Epistaxis include:

1. Non-infectious
   - Trauma
   - Foreign bodies (ex. Grass or plant material)
   - Neoplasia
   - Fungal disease (*Aspergillus, Crpytococcus*)
   - Coagulopathy
   - Systemic hypertension
   - Polycythemia
   - Vasculitis
   - Hyperviscosity syndrome
2. Infectious
   - *Ehrlichia* spp.
   - Rocky Mountain spotted fever (RMSF)

Non-infectious?

My bad…

Trauma is unlikely the sole cause of Rajah's persistent epistaxis since her clotting time was normal, no hematoma occurred at the site of venipuncture, and

*** NOTE: Comments in this style record handwritten comments from Dr. R. Sellon

Comments in this style record the student's handwritten responses to Dr. Sellon's comments

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						she was given vitamin K prophylactically. Likewise, coagulopathy is an unlikely differential. Clinical signs and diagnostic results (CBC) fail to support systemic hypertension, polycythemia, vasculitis, or hyperviscosity syndrome. Rajah's clinical presentation lacks the acute systemic signs usually associated with RMSF although her travel history to Tennessee puts her at risk and she does have a thrombocytopenia. The most likely differentials in Rajah's case are neoplasia, fungal disease, and ehrlichiosis. Rajah has an increased risk of a neoplastic process due to her breed (dolichocephalic) and age (7 years). A fungal disease cannot be ruled out at this time with *Aspergillus* being the most likely causative agent. Rajah's travel history includes a year spent in Tennessee. The southwest has the highest concentration of ehrlichiosis cases in the United States. *Ehrlichia* spp. are tick-borne *Rickettsial* organisms that can cause subclinical disease with the potential to last for months to years. Ehrlichiosis is often characterized by a mild thrombocytopenia (due to consumption, immune-mediated destruction, sequestration or decreased production). **P:** • *Ehrlichia* SNAP test This test detects antibodies to two *E. canis* immunodominant proteins. Due to serologic cross reactivity this test will be falsely positive in animals previously exposed to *E. canis* or *E. chaffeensis*. A false negative will occur in animals infected with *E. ewingii* or *Anaplasma phagocytophilum* (previously *E. equi*) or when the antibody titer is less than 1:256. However, it is a valuable screening test that can rule in Ehrlichiosis but not rule out. • IFA *Ehrlichia* titer This is a much more definite test for *Ehrlichia* spp. due to increased sensitivity. The IFA titer can detect antibody levels as low as 1:40. However, this test must be sent out and takes about 48-72 hours to get back. In the interim, it would be prudent to begin Rajah on doxycycline as empirical treatment given high index of suspicion in this case for ehrlichiosis. • Rhinoscopy Examine the nasal passages for evidence of fungal plaques or neoplastic masses perpetuating the epistaxis. Delay rhinoscopy until ehrlichiosis is ruled out. • CT scan or MRI Image the nasal passages for any evidence of masses or their secondary distortion of the normal anatomy. Delay imaging until ehrlichiosis is ruled out.
						Problem 2: Thrombocytopenia **SO:** See problem 1= on repeat CBC (5/23) platelet number had dropped from

Did you check B.P.?

No

What PE findings might you see in an animal w/ ↑ BP?

-PU/PD
-Retinal detachment
-Systolic murmur
-Neuro signs: seizure, collapse, syncope

great

Good

Great

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102,000u/L to 40,000/uL over the course of 5 days.

A: There are four basic mechanisms of thrombocytopenia:

- Decreased platelet production
  Causes include:
  - Myelophthisis
  - Drug-induced megakaryocytic hypoplasia
  - Idiopathic bone marrow aplasia
- Increased platelet consumption
  Causes include:
  - DIC
  - Endotoxemia
- Increased platelet destruction
  Causes include:
  - Immune mediated thrombocytopenia
  - Drug induced thrombocytopenia
  - Neoplasia
  - Tick-borne diseases
- Increased platelet sequestration
  Causes include:
  - Splenic torsion
  - Hepatomegaly

How does endotoxemia cause thrombocytopenia?

At 11pm the pathophysiology made sense, but in the light of day it doesn't have much strength.

Ha!

One more mechanism (kind of a lame one, admittedly): What is it?

Hemorrhage.

In light of Rajah's history and clinical condition it is critical to rule out tick-borne disease first. Ehrlichiosis is the leading differential given Rajah's travel history, unilateral epistaxis and degree of thrombocytopenia. Other differentials to consider include myelophthisis and immune mediated thrombocytopenia.

Myelophthisis is a less likely differential given the absence of pancytopenia. Neutrophils have a very short half-life in circulation so one would expect neutropenia to proceed or coincide with the thrombocytopenia, but there is no evidence of other circulatory cell abnormalities beyond the platelets. Immune mediated thrombocytopenia is a diagnosis of exclusion and thus should remain on the differential list. Many of the other causes of thrombocytopenia are ruled out by Rajah's healthy systemic condition save her persistent epistaxis.

Some would say that tick-borne dz, drug-induced destruction, and neoplasia-induced destruction can all be called ITP, just secondary rather than primary.

P:

- IFA titer for Ehrlichia

Based on Rajah's presentation, history, and diagnostics to date ehrlichiosis should be ruled out first before further, potentially more invasive, diagnostics. See problem 1 for a more complete description of this test and its benefits and drawbacks.

- Bone marrow aspirates

The absence of pancytopenia is not sufficient to rule out myelophthisis

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						or other bone marrow abnormalities. It would be prudent to consider sampling the marrow to look for a strong regenerative response and rule out causes of decreased production. • Thoracic and abdominal radiographs Various neoplastic conditions can cause thrombocytopenia. Survey radiographs would be a cheap first imaging option to look for anatomical abnormalities including neoplasia that might be contributing to the decreased platelets.
						Problem 3: Sebaceous Cysts **SO:** See problem 1- the sebaceous cysts located bilaterally, adjacent to the spinal at the level of the T5 vertebral body are both approximately one and a half centimeters in diameter. They were both diagnosed by fine needle aspirate by Dr. Jones. Rajah has had two similar cysts on her hind limbs removed in 2005 during her spay. **A:** Sebaceous cysts are non-malignant bumps up to an inch in size and are filled with keratin. **P:** Ensure Dr. Jones has measured and recorded the location of the sebaceous cysts so they can be monitored on future visits. Recommend to Ms. Johnson she plan to remove or drain the cysts to prevent infection.
				Great.		**Problem 4: Lipoma** **SO:** See problem 1- the lipoma is located on the chest in the area of the third sternebra and is approximately 4 centimeters in diameter. It was diagnosed by fine needle aspirate by Dr. Jones. **A:** Lipomas are benign, fatty tumors surrounded by a fibrous capsule that isolates their contents from the surrounding fat. Lipomas are non-painful but can get large enough to inhibit mobility depending on location or cause discomfort because of sheer size. **P:** Ensure Dr. Jones has measured and recorded the location of the lipoma so it can be monitored for change on future visits. It is important to track the growth of lipomas so they can be surgically removed, if indicated, prior to their becoming so large that surgical treatment causes significant morbidity. *Student Signature*

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5/29/07	Q	n/a	-	-	-	**Problem 1: Severe thrombocytopenia** **S:** Rajah had her platelets checked by Dr. Jones on Friday 5/25 following the negative results of her IFA *Ehrlichia* titer. Her platelets had declined from 41,000/ul on Wednesday (5/23) to 33,000/ul. Ms. Johnson monitored Rajah over the weekend for signs of spontaneous bleeding and returned to WSU today, Tuesday (5/29) for further diagnostics. Rajah's epistaxis has resolved and she has been quiet but otherwise healthy. A full physical exam was not completed. There was no excessive bleeding at the site of venipuncture nor petechiation or other signs of primary hemostatic failure. **O:** Rajah's weight was steady at 40 kg. Her CRT was less than 2 seconds and her mucous membranes were pink and moist. A repeat CBC and chemistry panel was completed. Rajah's platelet level had declined to 12,000/ul and was characterized by an increased MPV and large platelets. There were no abnormalities on the chemistry panel. Abdominal ultrasounds and thoracic radiographs were unremarkable. A *Babesia* PCR was submitted to the University of North Carolina's laboratory to rule it out as an infectious cause of the thrombocytopenia. These results are pending and expected in 14 days. Cytology of a bone marrow aspirate taken from the right humerus was interpreted as megakaryocytic hyperplasia based on the increased number of basophilic megakaryoctyes. The myeloid and erythroid lines appeared to be maturing normally and there was no evidence of lymphoma. **A:** In light of the fact that infectious diseases have been ruled out (save Babesia which is pending), the bone marrow cytology is normal, and Rajah is clinically normal save her thrombocytopenia, the working diagnosis is immune mediated thrombocytopenia (IMT). There are two types of IMT: primary and secondary. Causes of secondary IMT include: neoplasia, drug reactions, DIC or septicemia. Rajah has no history of drug administration and if either DIC or septicemia were the underlying cause you would expect Rajah to be systemically ill and have additional abnormalities on her laboratory work. Neoplasia is unlikely given our clean radiographs, unremarkable abdominal ultrasound and normal bone marrow aspiration and cytology. The working diagnosis at this point, given the diagnostic results ruling out the majority of causes, is immune mediated thrombocytopenia of unknown origin. **P:** • Immunosuppressive drug therapy Empirical treatment with prednisone (1-2 mg/kg BID), azothioprine (1mg/kg/day) should be initiated. A positive result to treatment would manifest as a rebound in platelets numbers in 5-7 days. The earliest platelet rebounds are seen in 3 days but it can occur as late as 7-10 days. Famotidine (Pepcid AC) or ranitidine (Zantac) is recommended as a dose of 2 tablets/day because of an increased risk of gastrointestinal ulceration while on prednisone. Future tapering of the immunosuppressive is dependent on

What are some differences between ranitidine & famotidine?

Ranitidine:
-sulfur odor
-↑ LES pressure
-↑ gastric motility

Famotidine:
-fewer drug interactions
-may suppress acid longer
-no alteration of LES pressure
-no effect on gastric motility

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						response to treatment and should be discussed with Dr. Jones or Dr. Mills. • Recheck platelet and red blood cell levels Platelet levels should be rechecked at 5-7 days for signs of improvement. Regular reassessment is indicated at an interval dependent on clinical response to treatment and owner's and Drs. Jones' or Mills' preference. The RBC level should also be assessed to ensure a concurrent anemia does not develop as this is a potentially more life threatening condition than the thrombocytopenia.
						Problem 2: Sebaceous Cysts **SO:** See 5/23 SOAP- they have not been reassessed. **A:** Sebaceous cysts are non-malignant bumps up to an inch in size and are filled with keratin. **P:** Problem is inactive. This finding was included on the discharge sent to Dr. Jones and Dr. Mills and will be addressed by them.
						Problem 3: Lipoma **SO:** See 5/23 SOAP- they have not been reassessed **A:** Lipomas are benign, fatty tumors surrounded by a fibrous capsule that isolates their contents from surrounding fat. Lipomas are non-painful but can get large enough to inhibit mobility depending on location or cause discomfort because of sheer size. **P:** Problem is inactive. This finding was included on the discharge sent to Dr. Jones and will be addressed by him. Great. *Student Signature*