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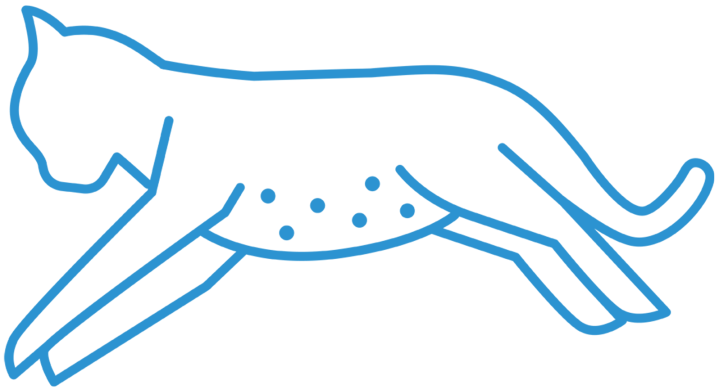

Bleeding Disorders and Hemostasis

DRIP 3

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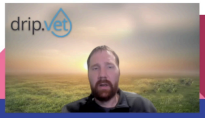
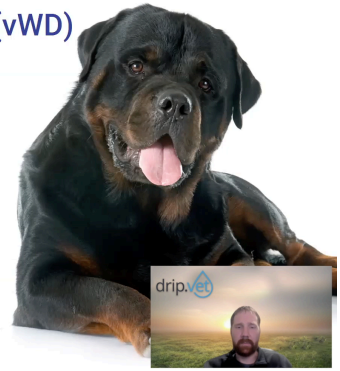
Thrombocytopathias

- Extrinsic disorders
  - von Willebrand's Disease
- Intrinsic disorders
  - Typically genetic diseases
- Acquired disorders
  - Uremia
  - Drugs



Von Willebrand's disease (vWD)

- Most common canine hereditary bleeding disorder
- May also be acquired
- vWF plays a central role in platelet adhesion



And then there's some acquired disorders as well, so things like uremia and different toxins can cause thrombocytopathia as well. Von Willebrand's disease is really probably the most common thrombocytopathia that you're going to run into. It's also the most common canine hereditary bleeding disorder. It can also be acquired, so there's, I guess, both intrinsic and then acquired von Willebrand's disease. Von Willebrand's factor plays a central role in platelet adhesion. So again, that's why it's an extrinsic disorder because it's a problem with von Willebrand's factor, not the platelet itself.

Von Willebrand's disease (vWD)

- Type I is most common and is a partial quantitative deficiency of vWF monomers
  - Dobies, Rotties, GSDs overrepresented
  - Severely affected dogs (<20% of normal levels) can bleed spontaneously

Type 1 von Willebrand's disease is the most common, and it's essentially a partial quantitative deficiency of von Willebrand's factor monomers. So it's just all of the different types of monomers are equally low essentially. So this is a disease that you'll see primarily or the type that you will primarily see in dobermans, rottweilers, German shepherd dogs. They're going to be overrepresented for type 1. And then if they are severely affected, meaning that they have less than 20% of normal levels, then they are at risk of spontaneous bleeding.

Von Willebrand's disease vWD

- Type II – disproportionate loss of high molecular weight monomers
  - Rare
  - Bleeding occurs later in life
  - German Short-haired and wire-haired pointers

Type 2 is a disproportionate loss of high molecular weight monomers, so there's both low and high molecular weight monomers. In this type, you're going to have more of the loss of these high molecular weight monomers. This is rare. Typically bleeding is going to occur a little bit later in life.

And this is very breed-specific, so this is typically just German shorthaired and German wirehaired pointers. So if you have a breed like this that is having a bleeding disorder that is affecting them later in life and there's no other obvious cause for that as far as thrombocytopenia, this will need to be on your list of differentials as well.

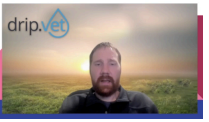
Von Willebrand's disease (vWD)

- Type III --severe quantitative deficiency
  - High mortality
  - Bleeding may anytime (birth or later in life)
  - Scotties, Shetland Sheepdogs, Chesapeake Bay Retrievers

And then type 3 is a severe quantitative deficiency. So it's a deficiency of both high and low molecular weight monomers, but basically they're essentially missing most all of them. This is unfortunately-- they tend to bleed, and they can bleed when they're very young or any time later in life. And there is a high mortality associated with this because the body just cannot form any kind of clots, so they're always at risk of bleeding. Scotties, Shetland sheepdogs, and Chesapeake Bay retrievers are going to be the breeds that are primarily affected by this type 3 von Willebrand's disease.

Von Willebrand's disease (vWD)

- Diagnosis
  - Suspicious bleeding in a known breed with normal platelet count
  - BMBT will be prolonged
    - Not specific for vWD
  - Measurement of vWF:antigen concentration is definitive diagnostic



So as far as diagnosis goes, if you have suspicious bleeding in a known breed, meaning a breed that is affected by von Willebrand's disease and they have a normal platelet count, then you should have this near the top of your list of differentials. You can perform a BMBT, so buccal mucosal bleeding time. If you did that, it would be prolonged, but this is not specific for what von Willebrand's disease. So this is a decent screening test.

If you have it and want to run that if it's normal, with the caveat that these are difficult to do well and appropriately. And you can have, I guess, what I would consider both false positives and negatives with but assuming that you can trust the results. If the BMBT is prolonged, this would be indicative that this could be von Willebrand's disease, but this is not specific for von Willebrand's disease. Definitive diagnosis is the measurement of von Willebrand's factor antigen concentration

The treatment. So this would be for a well, I guess, a nonbleeding patient. Avoidance of injury, of course, is going to be important. And then for a bleeding patient, so if they come in with an actual hemorrhage episode, then we're going to want to administer blood products that are rich in von Willebrand's factor. This could include cryoprecipitate, fresh frozen plasma, or fresh whole blood.

DDAVP is a drug that releases the intracellular stores of von Willebrand's factor from the endothelium. It does work for type 1 von Willebrand's disease, but types 2 and 3, it doesn't have much effect on that. And then again, we will talk more about the administration of some of these blood products in next month's talk.