

## Definition:

A disease where the immune system attacks the platelets severely reducing their numbers. This reduces the ability for the blood to clot

## Signs:

General unwellness with a fever and bleeding, often showing bruising on the skin

## Advice:

Most of the time a cause is not found (70%). The known causes can include cancer or infection. Treatment is difficult and often not effective

## OVERVIEW

- “Platelets” and “thrombocytes” are names for the normal cell fragments that originate in the bone marrow and travel in the blood as it circulates through the body; platelets act to “plug” tears in the blood vessels and to stop bleeding
- The range for normal platelet counts in dogs and cats – is 200,000/ $\mu$ l to 500,000/ $\mu$ l of blood (although reference ranges can vary in different medical laboratories)
- “Thrombocytopenia” is a low platelet count, indicating a small number of platelets are present in the circulating blood
- Thrombocytopenia is graded in severity (Grades 1-4) with 4 being the most severe
- Also known as “IMT”
- “Primary immune-mediated thrombocytopenia” is destruction of platelets by the immune system, with no identifiable cause
- Secondary immune-mediated low platelet count (thrombocytopenia)—antibodies (proteins produced by the immune system in response to a specific antigen) are produced in response to certain triggers, such as infectious diseases, cancer, vaccinations or medications; the antibodies are directed against the platelets and result in premature destruction of the platelets, thus decreasing platelet numbers

## GENETICS

- Frequently recognized in particular dog breeds and is often familial (runs in certain families or lines of dogs), suggesting a strong genetic influence

## **SIGNALMENT/DESCRIPTION OF PET**

### **Species**

- Dogs
- Rare (or rarely diagnosed) in cats

### **Breed Predilections**

- Cocker spaniels, poodles, Old English sheepdogs, and Irish setters, but any breed can be affected

### **Mean Age and Range**

- Mostly middle-aged dogs
- Dogs—mean age, 5 years; reported age range is 4 months–15 years
- Cats—mean age, 6 years; range, 8 months–12 years

### **Predominant Sex**

- Female dogs (spayed or intact) are more likely to have immune-mediated low platelet count (thrombocytopenia) than males

## **SIGNS/OBSERVED CHANGES IN THE PET**

- Dogs—sudden (acute) onset of bleeding (known as “hemorrhage”), bleeding primarily on visible areas of body (known as “surface hemorrhage”); lack of appetite (known as “anorexia”), sluggishness (lethargy), weakness
- Long-term (chronic) blood loss due to immune-mediated low platelet counts (thrombocytopenia) is very rare
- Cats—sluggishness (lethargy), lack of appetite (anorexia), and bleeding, primarily on visible areas of body (surface hemorrhage)
- Some cases have no clinical signs and the low platelet counts have been found on routine health examinations or presurgical bloodwork
- Nose bleed (known as “epistaxis”); bleeding from the moist tissues of the body (known as “mucosal hemorrhages”)
- Small, pinpoint areas of bleeding (known as “petechiae”); bruises or purplish patches, due to bleeding (known as “ecchymoses”) in the moist tissues of the body or in the skin
- Bleeding in or around the eyes, bleeding into the ear flap (known as “aural hematoma”)
- Black, tarry stools due to the presence of digested blood (known as “melena”); bloody stools (known as “hematochezia”); vomiting blood (known as “hematemesis”)
- Pale gums and moist tissues of the body (known as “mucous membrane pallor”) due to blood loss, low red-blood cell counts (known as “anemia”), or hemorrhagic shock (where the blood volume has decreased through bleeding to the point that circulation or flow of blood is unable to sustain the body) leading to collapse
- Heart murmur if anemia

- Difficult breathing (known as “dyspnea”) and coughing due to bleeding in the respiratory tract
- Excess bleeding when blood drawn for sampling (venipuncture), or from wounds
- Nervous system signs (rare) due to bleeding into the central nervous system
- Blood in the urine (known as “hematuria”)
- Excess bleeding during the female dog’s heat (estrus)
- Fever and mildly enlarged lymph nodes (known as “lymphadenomegaly”) are unusual
- Occasionally an enlarged spleen (known as “splenomegaly”) may be detected on physical examination

## RISK FACTORS

- May be preceded by a stressful event or vaccination within the last month (rarely reported); certain drugs

## CAUSES

- Unknown

## TREATMENT

### HEALTH CARE

- Uncomplicated cases with low bleeding risk and good owner compliance may be treated as outpatients
- Pets with severely low platelet counts have very high risk of bleeding and warrant strict refinement (such as cage rest)
- Intensive nursing care may be needed based on patient signs, such as moderate-to-severe bleeding; low blood volume (known as “hypovolemia”); central nervous system signs
- Transfusion of platelet-containing products, such as fresh whole blood, platelet-rich plasma, or fresh frozen plasma , platelet concentrate in pets with severe bleeding; less useful in IMT
- Transfusion of packed red-blood cell or fresh whole blood to correct blood loss anemia
- Low blood volume (hypovolemia) can be managed by administration of crystalloids (fluids that contain electrolytes [chemical compounds, such as sodium, potassium, chloride] necessary for the body to function, crystalloids generally are similar to the fluid content [plasma] of the blood and move easily between the blood and body tissues; example is lactated Ringer's solution)
- The veterinarian will apply precautions for injections and blood sampling to reduce bleeding
- Discontinue any medications that might be associated with the condition

### ACTIVITY

- Pets with severely low platelet counts have very high risk of bleeding and warrant strict

refinement (such as cage rest)

- Restrict activity when moderate to severe reduction in counts,

## DIET

- Avoid hard foods (they may trigger bleeding gums)

## SURGERY

- High risk of bleeding in dogs with severely low platelet counts (thrombocytopenia)
- Pet may require extensive transfusions before, during, and after surgery
- Surgical removal of the spleen (known as “splenectomy”) is an option for cases that do not respond to medical treatment; discuss the risks and benefits of surgery with your pet's veterinarian; controversial

## MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all-inclusive

- Steroids—prednisolone or rarely, dexamethasone
- Antibiotics if infection or tick-borne disease is suspected
- Gastrointestinal protectants (such as sucralfate [medication that forms a protective barrier over a gastrointestinal ulcer] and proton pump inhibitors (such as omeprazole) to prevent or treat gastrointestinal ulcers
- Acute management in dogs—other immune system suppressing agents added if prednisolone fails; vincristine is a chemotherapy drug; may be administered in combination with prednisolone
- Vincristine or human immunoglobulins in combination with prednisone has led to a more rapid increase in platelet count
- Other immunosuppressive drugs (drugs that decrease the immune response)—mycophenolate, cyclosporine, azathioprine, leflunomide; chlorambucil (cats)
- Once the platelet count is in the normal range, the initial dose of prednisone will be tapered slowly over approximately 6 months, if no relapse occurs

## FOLLOW-UP CARE

### PATIENT MONITORING

- Check packed cell volume (PCV, a means of measuring the percentage volume of red-blood cells

as compared to the fluid volume of blood) 2–3 times a day in pets with severe bleeding (risk of life-threatening gastrointestinal bleeding)

- Perform platelet counts daily until platelet counts are greater than 50,000/ $\mu\text{L}$ ; then every few days, until platelet counts normalize
- Platelet counts should be performed every 1–3 weeks during the period of gradually tapering medications
- Complete blood count (CBC) and serum biochemistry profile every 2–4 weeks
- Bacterial culture of the urine and urinalysis every 4–6 weeks, due to risk of secondary infections

## PREVENTION AND AVOIDANCE

- Use vaccines judiciously—role of vaccines in recurrence of immune-mediated thrombocytopenia is uncertain
- Minimize stress that may initiate recurrence

## POSSIBLE COMPLICATIONS

- Excessive bleeding can be fatal; sudden death may occur due to bleeding into the central nervous system or in the pericardial sac (the sac that surrounds the heart)
- Side effects of medications, such as gastrointestinal ulceration
- Medication-induced excessive levels of steroids in the body (known as “iatrogenic hyperadrenocorticism” or “iatrogenic Cushing's syndrome”)
- Opportunistic infections (infection caused by a organism that usually does not cause disease, but is able to cause disease because the pet's body and/or immune system has been weakened by some other disease process)
- Decreased production of blood cells and platelets by the bone marrow (known as “bone marrow suppression”)

## EXPECTED COURSE AND PROGNOSIS

- Platelet counts usually will increase to greater than 50,000/ $\mu\text{L}$  a few days after starting treatment (average 5 days)
- Vincristine or human immunoglobulins in combination with prednisone has led to a more rapid increase in platelet count
- Few dogs never achieve normal platelet counts
- Failure to respond to treatment will prompt reconsideration of the diagnosis
- Five of 19 dogs (26%) relapsed after 19–286 days (median time to relapse, 66 days); causes for relapse were dose reduction of prednisone, lack of owner follow through with treatment plan, or both

- If relapses occur a second immunosuppressive drug should be added, a more gradual tapering is advised, leaving the animal on an alternating daily regimen possibly for the rest of its life
- 84-97% of dogs survived during the first 14 days; prognosis seems favourable with intensive therapy, including blood- or platelet-containing products or both, if needed
- Mortality rate in cats is 15%

## KEY POINTS

- “Platelets” and “thrombocytes” are names for the normal cell fragments that originate in the bone marrow and travel in the blood as it circulates through the body; platelets act to “plug” tears in the blood vessels and to stop bleeding
- “Thrombocytopenia” is a low platelet count, indicating a small number of platelets are present in the circulating blood
- “Primary immune-mediated thrombocytopenia” is destruction of platelets by the immune system, with no identifiable cause
- Strict rest (such as cage rest) is important to minimize risk of bleeding
- The owner's willingness and ability to follow directions for the care of the pet are vital
- Risk of recurrence and complications should be understood

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