

# PRIMARY IMMUNE-MEDIATED LOW PLATELET OR THROMBOCYTE COUNT (THROMBOCYTOPENIA)

## BASICS

### 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 generally 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
- “Primary immune-mediated thrombocytopenia” is destruction of platelets by the immune system, with no identifiable cause
- Secondary immune-mediated low platelet count (thrombocytopenia) involves antibodies (proteins produced by the immune system in response to a specific antigen) that are dependent on or are initiated by non-platelet antigens (substances that induce sensitivity or immune response)

### GENETICS

- Genetic susceptibility is suggested by high number of cases seen in several breeds

### SIGNALMENT/DESCRIPTION of ANIMAL

#### Species

- Common in dogs
- Rare in cats

#### Breed Predislection

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

#### Mean Age and Range

- Mostly middle-aged dogs
- Reported age range is 4 months to 17 years

#### Predominant Sex

- Twice as common in females (spayed or intact) than in males

### SIGNS/OBSERVED CHANGES in the ANIMAL

- Some cases have no clinical signs and the low platelet counts have been found on pre-surgical blood work
- Lack of appetite (known as “anorexia”), sluggishness (lethargy), weakness; may or may not have signs of bleeding
- Nose bleed (known as “epistaxis”); bloody stools (known as “hematochezia”); bleeding from the moist tissues of the body (known as “mucosal hemorrhages”)
- Small, pinpoint areas of bleeding (known as “petechia”); 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, blindness
- Black, tarry stools due to the presence of digested blood (known as “melena”); vomiting blood (known as “hematemesis”)
- Pale gums and moist tissues of the body (known as “mucous membrane pallor”)
- Nervous system signs
- Fever, enlarged liver and spleen (known as “hepatosplenomegaly”), and enlarged lymph nodes (known as “lymphadenomegaly”) are unusual

### CAUSES

- Unknown

### RISK FACTORS

- May be preceded by a stressful event

## TREATMENT

### HEALTH CARE

- Uncomplicated cases with mild signs, low bleeding risk and good owner compliance may be treated as outpatients
- Patients with platelet counts less than 20,000/ $\mu$ l have very high risk of bleeding and warrant strict refinement (cage rest)
- Intensive nursing care may be needed based on patient signs, low blood volume (known as “hypovolemia”), central nervous system signs
- Low blood volume (hypovolemia) or low red-blood cell count (known as “anemia”) 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); colloids (fluids that contain larger molecules that stay within the circulating blood to help maintain circulating blood volume, examples are dextran and hetastarch); or packed red-blood cell or whole-blood transfusions

- Platelet transfusions have limited use; mainly used to stabilize bleeding in the central nervous system (brain and spinal cord) or to support unavoidable surgery

#### ACTIVITY

- Patients with platelet counts less than 20,000/ $\mu\text{l}$  have very high risk of bleeding and warrant strict confinement (cage rest)
- Strict rest is important to minimize bleeding

#### SURGERY

- Increased risk of bleeding in dogs with platelet counts of less than 30,000/ $\mu\text{l}$
- 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

### 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—prednisone or prednisolone or dexamethasone
- **Vincristine is a chemotherapy drug; it** often is added only for cases that do not respond to steroid treatment
- **In one study, starting vincristine with prednisone at presentation decreased the time for platelets to exceed 40,000/ $\mu\text{l}$  and hospitalization time by 2 days each without observed side effects**
- Adding other medications to decrease the immune response (known as "immunosuppressive medications," such as cyclophosphamide, azathioprine, danazol, cyclosporine) with steroids for initial treatment in dogs has not been demonstrated to be more effective than steroids alone or in combination with vincristine
- **Sucralfate (medication that forms a protective barrier over the ulcer)** and antacids can be administered, if stomach ulcers are suspected
- Cats usually respond well to steroids (prednisone or prednisolone) at doses that decrease the immune response (immunosuppressive doses)

### FOLLOW-UP CARE

#### PATIENT MONITORING

- Perform platelet counts daily to every few days, until platelet numbers exceed 50,000/ $\mu\text{l}$ , then weekly until platelet numbers normalize
- Platelet counts should be performed weekly or every 2 weeks during the period of gradually tapering medications

#### PREVENTIONS AND AVOIDANCE

- Use modified-live (MLV) vaccines judiciously—role of MLV vaccines in recurrence of immune-mediated thrombocytopenia is uncertain
- Minimize stress that may initiate recurrence

#### POSSIBLE COMPLICATIONS

- Death from hemorrhagic shock (where the blood volume has decreased through bleeding to the point that circulation or blood flow is unable to sustain the body) or central nervous system bleeding
- Ulcers of the stomach and/or intestines
- Opportunistic infections (infection caused by a organism that usually does not cause disease, but is able to cause disease because the animal's body and/or immune system has been weakened by some other disease process)
- Approximately 20% of dogs with primary immune-mediated low platelet count (thrombocytopenia) also have immune-mediated hemolytic anemia; "immune-mediated hemolytic anemia" is the destruction of red-blood cells by the immune system, which allows the release of hemoglobin (the compound in the red-blood cells that carries oxygen to the tissues of the body)

#### EXPECTED COURSE AND PROGNOSIS

- For primary immune-mediated thrombocytopenia, platelet counts usually will increase to 50,000/ $\mu\text{l}$  to 100,000/ $\mu\text{l}$  by 7 to 10 days of starting steroid treatment
- Some dogs never achieve normal platelet counts and require long-term (chronic) maintenance treatment
- Failure to respond to treatment should prompt reconsideration of the diagnosis
- Approximately 50% of dogs experience only one episode of immune-mediated low platelet counts (thrombocytopenia)
- The mortality rate for dogs is approximately 30%

## 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 is important to minimize bleeding
- Patients that develop severe bleeding, seizures, or changes in mental status should be hospitalized
- Unnecessary medications and nonsteroidal anti-inflammatory drugs (NSAIDs) should be avoided

