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FELINE HEMATOLOGY

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5th Annual Feline Practitioners Seminar
Cornell Univ
8/6-9/93

FELINE HEMATOLOGY
Inherited and Acquired Bleeding Disorders

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I. Normal Hemostasis

hemostasis is the net result of interactions between 4 forces

1. blood vessel 2. platelets 3. clotting cascade 4. fibrinolysis

II. Bleeding Disorders

in each case, a defect in one component is primary cause of bleeding

A. Blood vessel disorders:

normal vessel = large vessel bleed (trauma, erosion, invasion)

abnormal vessel = small vessel bleed (vasculitis, fragile vessel)

B. Platelet disorders:

defect in platelet number or platelet function

a. thrombocytopenia

↓ production = bone marrow disease

↑ sequestration = splenomegaly

↑ destruction = immune mediated

b. platelet dysfunction

inherited = uncommon (Persian, Oriental Shorthair)

acquired = secondary to systemic process (uremia, hyperproteinemia, liver failure, drugs)

C. Clotting factor disorders:

inherited deficiencies are usually single factor defects

a. hemophilia A or B (Factor VIII or Factor IX deficieny)

males affected, long aPTT screening test, any breed

b. Factor XII deficiency - normal in vivo hemostasis

males and females affected, long aPTT, no clinical signs

c. dysfibrinogenemia (deficiency or dysfunction of fibrinogen)

males and females affected, long aPTT, PT, and TCT

d. prothrombin group deficiency (all vitamin K dependent factors)

Devon Rex, males and females affected,long aPTT and PT, responds to oral vitamin K administration

acquired deficiencies usually involve multiple factors

a. vitamin K responsive disorders - long aPTT and PT

rodenticide toxicity, biliary obstruction, GI disease

b. failure of factor production - long aPTT, PT, TCT

severe liver disease - acute necrosis, portosystemic shunts,

c. factor depletion/consumption - long aPTT, PT, TCT

DIC secondary to neoplasia, sepsis

D. Fibrinolytic disorders

premature clot lysis, inhibitors of coagulation

seen in association with DIC

GUIDELINES
Characterization of Bleeding Disorders based on Presenting Signs

I. Acute Blood Loss

single anatomic site, single episode → large vessel

multiple sites, multiple episodes → clotting factor deficiency (DIC)

II. Petechiae → thrombocytopenia

III. Mucosal bleed

platelet count normal → vessel disorder or platelet dysfunction

abnormal metabolic profile, drug history → platelet dysfunction

IV. Organ Failure

vasculitis, DIC

GUIDELINES
Ancillary Tests for Definitive Diagnosis of Bleeding Disorders

I. Vessel Disorders

large vessel → radiography, ultrasound, CT scan, exploratory (contrast)

small vessel → serology, biopsy

II. Platelet Disorders

thrombocytopenia → platelet count, bone marrow aspirate, splenic ultrasound/aspirate/biopsy, serology

platelet dysfunction → metabolic profile, drug history, bleeding time test

III. Coagulation Factor Disorders

clotting screen results:

long aPTT → hemophilia, Factor XII deficiency

long aPTT and PT → vitamin K responsive

long aPTT, PT, TCT → fibrinogen deficiency, liver failure, DIC

Remember:

Guidelines are not Absolute Rules

FELINE HEMATOLOGY
Transfusion Medicine

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I. Donor Selection

ideal donors = male, ≥ 10 lb, docile

blood type and screen for FeLV, FIV, Hemobartonella (FIP, toxo)

II. Blood Collection

anticoagulants for long term (≥ 4 wk) storage:

acid citrate dextrose (ACD), 1 part ACD: 5 parts blood

citrate phosphate dextrose (CPD), 1 part CPD: 9 parts blood

volume - 50 to 60 ml per collection

frequency - q.1 month

sedation - low dose ketamine, diazepam

do not use acepromazine, barbiturates

III. Feline Blood Groups

ALL TYPE B CATS HAVE ANTIBODIES AGAINST TYPE A RED CELLS

strong agglutination reaction is detectable in crossmatch

Type B recipient given Type A cells → acute transfusion reaction

Type B queen bred to Type A tom → neonatal hemolysis in Type A kittens

frequency of Type B highest in exotic breeds: British shorthair, Rex cats, Abyssinian, Somali, Persian, Himalayan

IV. Crossmatching Protocol

1. prepare 0.5 ml of serum (or plasma) from recipient and donor
2. collect 1 ml of whole blood (EDTA or citrate) from recipient and donor
3. centrifuge whole blood to settle red cells, remove plasma
4. wash red cells in saline (add 1-2 ml 0.9% saline, mix gently centrifuge, aspirate and discard supernatant)
5. repeat wash
6. make 4% red cell suspension (0.1 ml red cells + 2.4 ml saline or 1 drop red cells + 20 drops saline)
7. set up crossmatch tubes:

Major crossmatch - 0.1 ml (4 drops) donor red cell suspension

+

0.1 ml (4 drops) recipient serum

Minor crossmatch - 0.1 ml recipient red cell suspension

+

0.1 ml donor serum

Recipient control - 0.1 ml recipient cell suspension

+

0.1 ml recipient serum

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8. mix tubes gently, incubate 15 minutes at room temperature (can incubate duplicates at 4° C, 37° C)
9. centrifuge and check for hemolysis = incompatible
10. resuspend cells and check for agglutination = incompatible