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Assessment of Bleeding Disorders in Cats and Dogs

Introduction

Spontaneous bleeding following surgery or trauma is relatively common in dogs but rare in cats. Any tests of primary or secondary coagulation may be abnormal during an episode of bleeding because of consumption, loss or clotting. Therefore, stabilization of the patient with at least several days without clinical evidence of bleeding is recommended prior to further testing to investigate the cause of the bleeding.

The type of bleeding may help determine if a primary haemostatic defect (involving platelets, platelet function or the vascular wall) or a secondary haemostatic defect (involving coagulation factors) is more likely.

Clinical Manifestation of Bleeding	Most likely type of haemostatic defect
Petechiae or ecchymoses (vaginal, preputial, ear, oral mucus membranes, sparsely haired skin)	Primary
Oozing blood from gums or at sites of venipuncture	Primary
Bleeding or oozing involving mucous membranes (urinary system, vulva, vagina, epistaxis, oral)	Primary
Haematoma formation; ecchymoses sometimes may occur.	Secondary
Bleeding into tissues/muscles and/or joint cavities	Secondary

Please note that *Angiostrongylus vasorum* can cause bleeding disorders with an array of changes in both primary and secondary coagulation parameters (and some dogs can have bleeding tendencies without any changes in these parameters).

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Investigation of Primary Haemostasis:

The most common problems with primary haemostasis are von Willebrand's disease, thrombocytopaenia (immune mediated or due to platelet loss or consumption or approximately 7-10 days following modified live viral vaccinations) or congenital/inherited thrombopathy. Decreased platelet function may also occur with some drugs.

Tests used to assess primary haemostasis are:

- **Full Blood Count with platelet count** - to determine if thrombocytopaenia is present. Spontaneous haemorrhage may occur with platelet counts < 20,000-50,000/ul. Haemorrhage may occur with trauma with less marked decreases in platelet counts.

- **Examination of peripheral blood film** - to determine if there is platelet clumping that may cause a false decrease in platelet count, to confirm thrombocytopaenia, to determine if large form platelets consistent with increased platelet turnover are present.

- **Buccal Mucosal Bleeding Time (BMBT)** – BMBT > 4 minutes in dogs and cats is abnormal and may reflect thrombocytopaenia, decreased platelet function and/or vascular wall abnormality (collagen defect or vasculitis). A special device for BMBT is required and is available from the laboratory supply by request. See below for BMBT Procedure.

- **vonWillebrand Factor (VWF) Assay** – decreased VWF may predispose to spontaneous bleeding or bleeding with trauma, particularly if very low (VWF < 35%). Bleeding may also occur with less marked decreases in VWF (VWF < 75%).

- **Thromboelastography or other platelet function testing** (referral needed to a facility with this instrumentation since immediate evaluation is required).

INVESTIGATION OF SECONDARY HAEMOSTASIS

Tests used to assess Secondary Haemostasis include:

- **Prothrombin Time (PT)** - evaluates the common and extrinsic pathways of coagulation
- **Activated Thromboplastin Time (APTT)** - evaluated the common and intrinsic pathways of coagulation.
- **Coagulation Factor Testing** – if abnormal results are obtained for PT and/or APTT, then specific factor testing may be required to determine the factors that may be defective or deficient. Please call our internal medicine consultants for advice on further testing (option1, then option 2).
- **D-dimer** – reflects fibrinolysis that may occur with disseminated intravascular coagulation (DIC) or localised clotting, thrombosis or thromboembolism. Is more specific for clot breakdown than FDPs.

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- **Antithrombin III (AT III)** – this coagulation factor inhibitor may be decreased with consumption or loss with bleeding or with protein-losing nephropathy (PLN). Low ATIII may predispose to thrombosis.

Please view our directory for more information regarding sample requirements, prices and turn around times for the tests mentioned above.

Patient Side Testing

Buccal Mucosal Bleeding Time (BMBT)

A prolonged BMBT may reflect thrombocytopaenia, decreased platelet function (VWD or other thrombopathy) or vascular wall abnormality. BMBT is not prolonged with coagulation factor defects or deficiencies. BMBT may be prolonged during an episode of active or very recent haemorrhage due to consumption or loss of platelets. Testing should be conducted after the bleeding patient has been stabilized and there are at least several days free from clinical bleeding.

Materials

- Surgicutt®: This device produces an incision of standard length and depth. It is supplied in a sterile pack and can be triggered once only. These are available from the laboratory upon request. (option1, then option 1 again).
- Stop watch.
- Filter paper.
- Gauze bandage (5 cm width).

Method

Chemical restraint may not be needed in compliant dogs and cats, but sedation or anaesthesia may be needed for less docile patients.

- Position the patient in lateral recumbency. Use a length of gauze around the maxilla to fold the lip back and produce moderate engorgement of the mucosal surface (Figure 1 overleaf). In cats that do not tolerate handling of the lip/mouth, a shaved area on the upper medial thigh or ventrolateral abdomen may also be suitable sites.
- Remove Surgicutt® from the blister pack and remove the brown safety clip. *Do not push the trigger or touch the blade slot.* The cutting blade is now exposed to air and should be used quickly to maintain sterility.
- Position the device vertically on the buccal mucosa avoiding any obvious superficial vessels. Hold firmly but avoid excessive pressure.
- Depress the trigger and simultaneously start the timer. Remove the Surgicutt® approximately 1 second after triggering.
- At 15 seconds blot the flow of blood with filter paper placed 1-3 mm below the incision without touching the Surgicutt® wound.
- Blot in a similar manner every 15 seconds until blood no longer stains the filter paper. Stop timer.

BMBT should be less the 4 min in dogs and cats.

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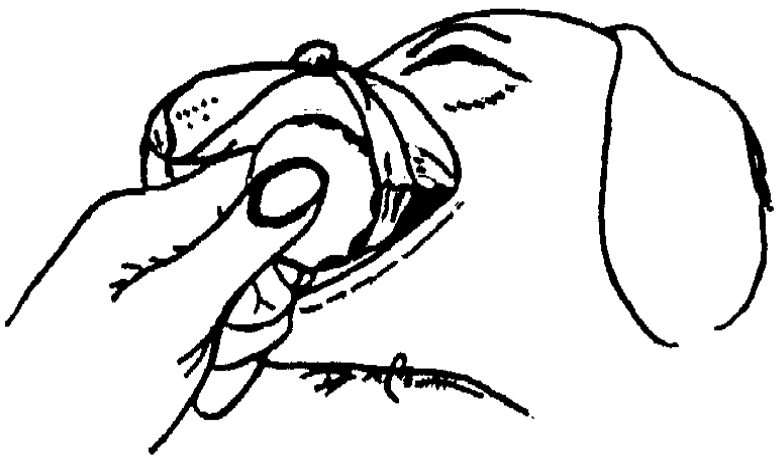

Figure 1

If you have any questions about the most appropriate tests to be submitted for investigation of a bleeding patient, please contact our Clinical Pathologists or Internal Medicine Specialists for advice at 00800 1234 3399 Option1, then option 2.