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Associazione Italiana di Patologia Veterinaria

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When moderate to marked anaemia continues to be non regenerative after an adequate interval (3 - 5 days in general) bone marrow analysis may be indicated. If bone marrow analysis is undertaken it is best to obtain blood for CBC and film analysis, bone marrow aspirate for cytology (morphology) and a core biopsy for histology (cellularity) within a short time interval. Ideally all three should be analyzed together and by the same individual. If this is not possible then the haematology/ cytology should be interpreted in conjunction with the histology report and histopathologist if practical.

Anaemias of chronic disease are usually normocytic and normochromic and of mild to moderate severity. In many cases the cause of the chronic disease can be identified by haematology, biochemistry and microbiology tests. Renal disease is a common cause, and levels of erythropoietin could be measured, but usually these are low and stimulus to erythropoiesis in the bone marrow is reduced leading to the chronic anaemia. Anaemias of inflammatory disease are frequently accompanied by a leucocytosis (inflammatory response). This would be reflected in the bone marrow by increased leucopoiesis and an increased M:E ratio with possible increased iron stores and sequestration. In anaemias associated with viral disease (e.g FeLV, parvo), PCR analysis can be performed on bone marrow where the virus may be sequestered. Anaemias associated with parasites may be haemolytic, severe and regenerative, preregenerative or less commonly non regenerative. In some of these, bone marrow analysis particularly cytology may be very helpful. In histoplasma organisms can often be found in bone marrow aspirates. In Leishmania bone marrow often containes increased numbers of macrophages and organisms can also be found. With Ehrlichia and Toxoplasma, organisms are less commonly found. If the cause of the anaemia is red cell aplasia, bone marrow core and aspirate are indicated. Underlying conditions such as myelofibrosis, fat deposition and necrosis can only be definitively diagnosed on histology of an adequate core biopsy. Aplasia due to drug toxicity can be determined by a treatment history, discontinuation of the therapy and supportive care (e.g blood transfusion ) until the haematopoietic progenitor cells recover. In immune mediated haemolytic anaemias which are persistently non regenerative bone marrow analysis may indicate that the target cells are those usually not entering the peripheral circulation.

If haematopoietic neoplasia is diagnosed by the presence of abnormal cells in the peripheral blood, bone marrow aspirate cytology will provide a morphological diagnosis of abnormal cell type. This can be further confirmed by immunphenotyping (FACS analysis) of blood and bone marrow aspirates or immunohistochemistry of core biopsy sections. Other neoplasms which may infiltrate the bone marrow and suppress erythropoiesis by producing specific factors and/or displacement of normal haematopoietic cells can be identified and the degree of infiltration estimated best by core biopsy histology.

Complete bone marrow analysis is a valuable tool in both diagnosis and monitoring of many different types of anaemia.