Multiple cutaneous nodules in a dog

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Signalment:
'Billy', 6.5 years old neutered male black&white Cocker Spaniel.

History:
Billy presented to the University of Edinburgh's Oncology Service for investigation of numerous, rapidly growing, cutaneous and subcutaneous nodules. The first nodule appeared six months earlier and in the 6 weeks before presentation multiple nodules had rapidly appeared and grown.

Physical examination:
On presentation Billy was bright, alert and responsive, with a body condition score of 6/9. Thoracic auscultation revealed a mild increase in bronchovesicular lung sounds. His left mandibular and right prescapular lymph nodes were enlarged and firm. He had multiple (> 90), firm nodules to masses throughout his body; they were variable in size (0.2 – 6 cm) and location (cutaneous, subcutaneous and muscular). The only location were pain could be elicited was the right hip, that was painful at extension. The rest of the general physical examination was unremarkable.

Diagnostic procedures:
Haematology revealed mild anaemia (PCV 0.356 l/l, reference interval [RI] 0.39 - 0.55) and mild thrombocytopenia (platelets 116 $x10^9$/l, RI 200 – 500). On examination of the blood smear, the anaemia appeared non-regenerative, and mild thrombocytopenia was confirmed; occasional large, round cells were noted (*Figure 1*).
The alterations observed in a comprehensive serum biochemistry profile included a mild increase in ALT (141 U/l, RI 21 – 102), moderate increase in ALP (259 U/l, RI 20 – 60), and a mild hyperproteinaemia (77.2 g/l, RI 58 – 73) due to hyperglobulinemia (45.2 g/l, RI 18 – 37). Triglycerides (2.0 mmol/l, RI 0.57 – 1.14) were also mildly increased. Other analytes (e.g. albumin, totCa, fCa) were within RI.

Fine needle aspirates from the cutaneous lesions and lymph nodes were performed and submitted for evaluation (*Figures 2 – 4)*.

Thoracic radiographs revealed a bronchointerstitial pattern, tracheobronchial lymphadenomegaly, a solitary pulmonary nodule, and a soft tissue mass caudal to the right brachium. Pelvic radiographs revealed sublumbar lymphadenomegaly and a soft tissue mass cranial to the left femur (*Figure 5*).
Abdominal ultrasound revealed hepatomegaly with ill-defined hypoechoic regions up to 1cm in diameter. Throughout the splenic parenchyma there were extensive, partially coalescing, hyperechoic nodules and striations. Within the peritoneum there were numerous cystic and hypoechoic nodules up to 1.4cm in diameter.
Imaging findings were suggestive of disseminated neoplasia.

Questions:
1) Considering the clinical presentation, the diagnostic findings, and the cytology figures, what would be your main differential diagnoses?

2) What other tests would you suggest to perform?

Figures:

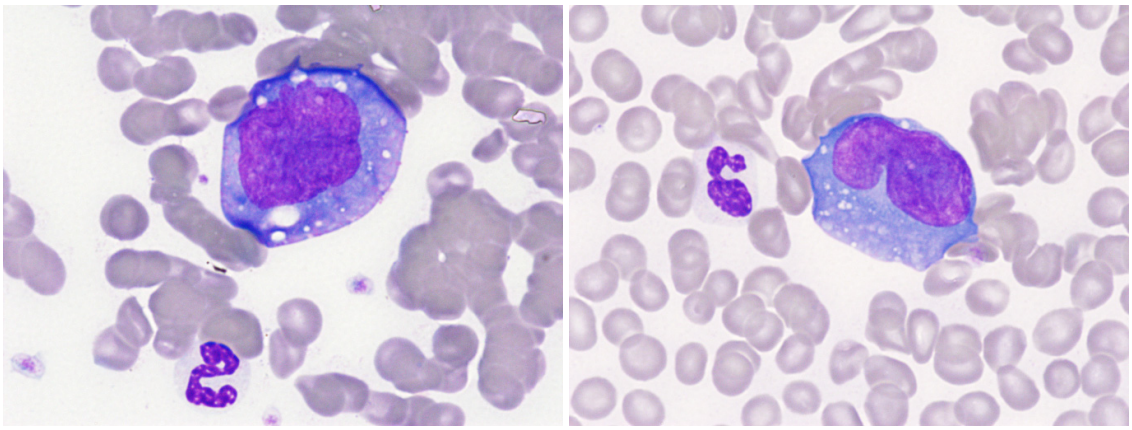

Figure 1: Blood smear, Modified Wright, 1000x magnification

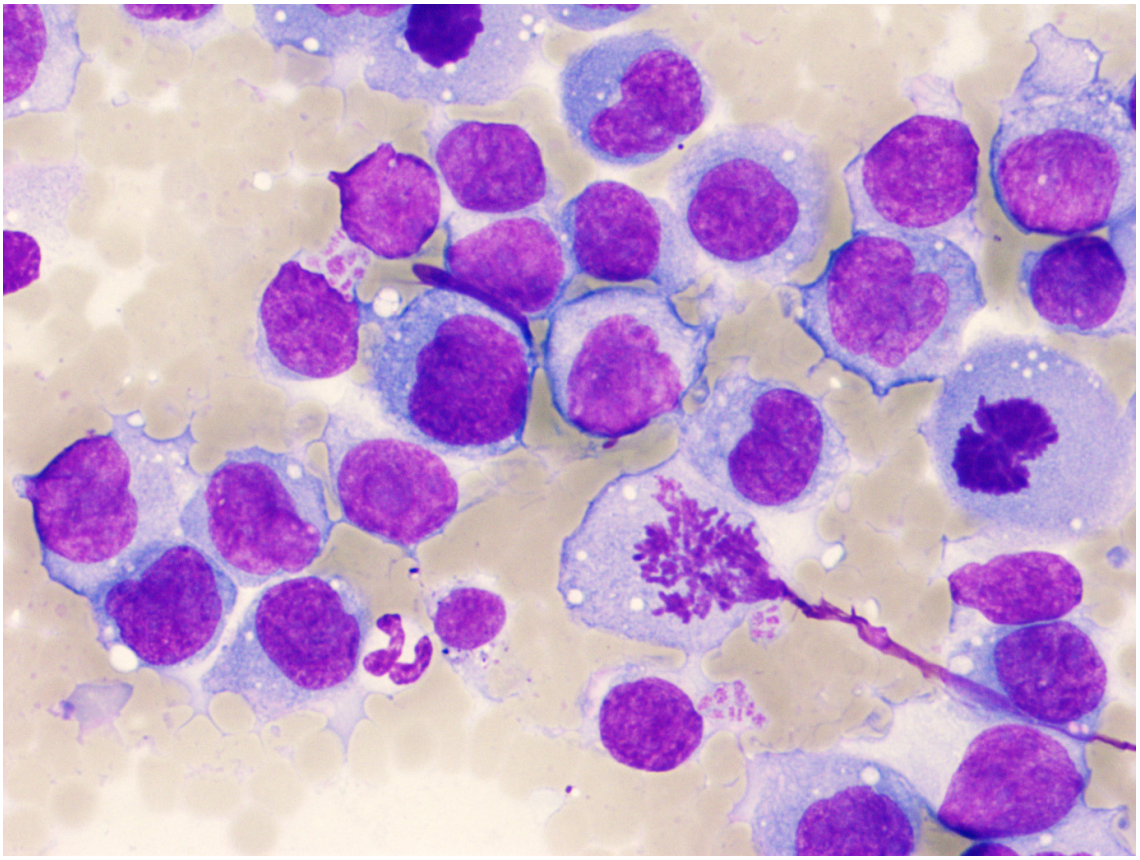

Figure 2: FNA from a cutaneous nodule, May-Grünwald Giemsa, 500x magnification

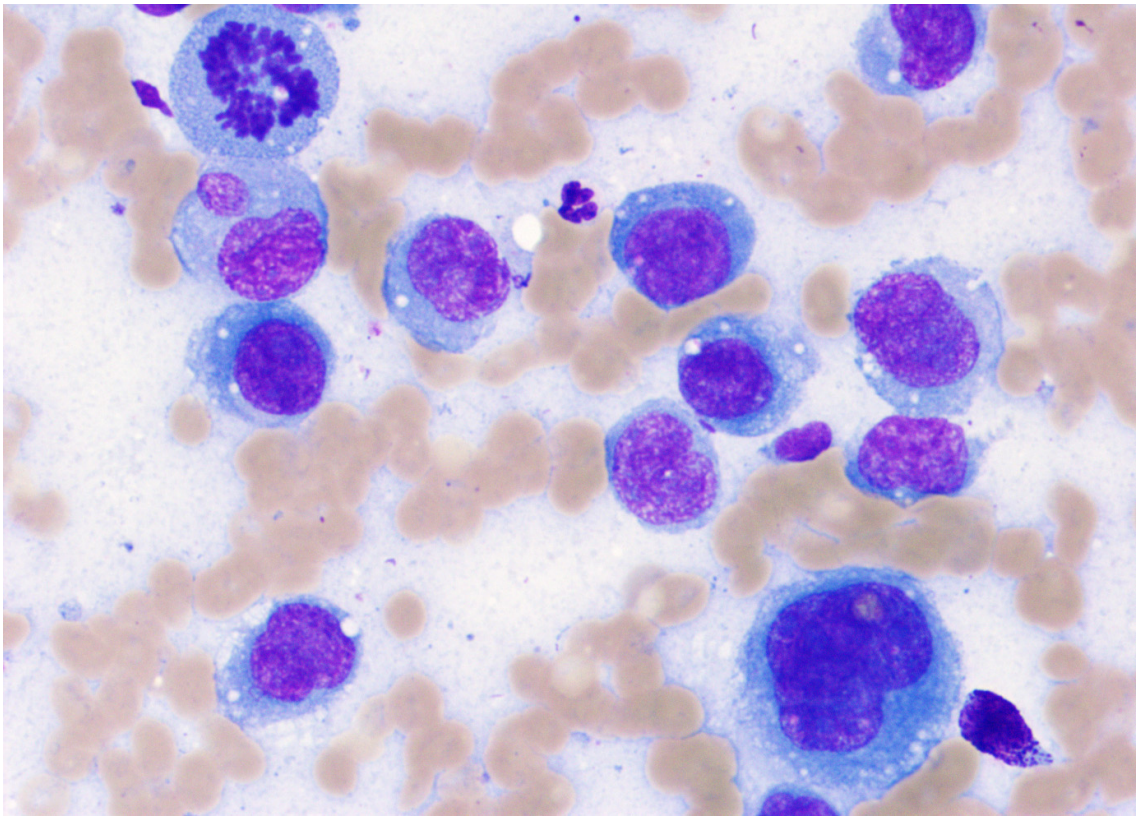

Figure 3: FNA from a cutaneous nodule, May-Grünwald Giemsa, 500x magnification

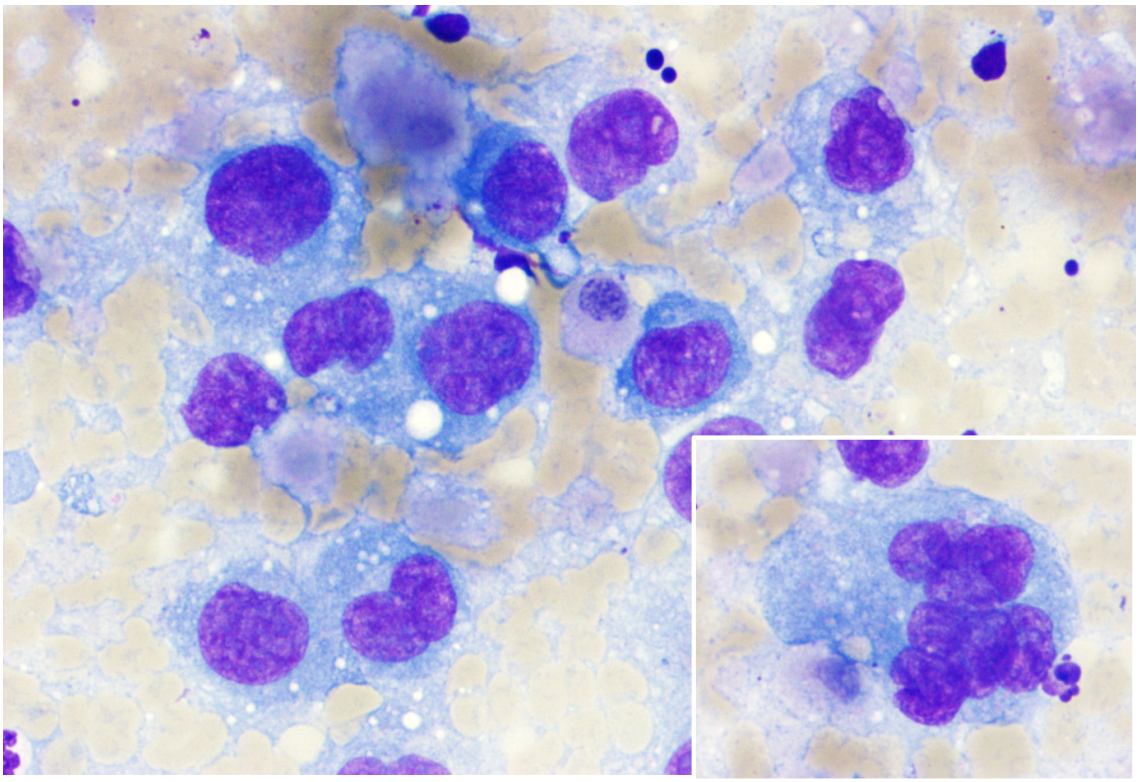

Figure 4: FNA from the left submandibular lymph node, May-Grünwald Giemsa, 500x magnification

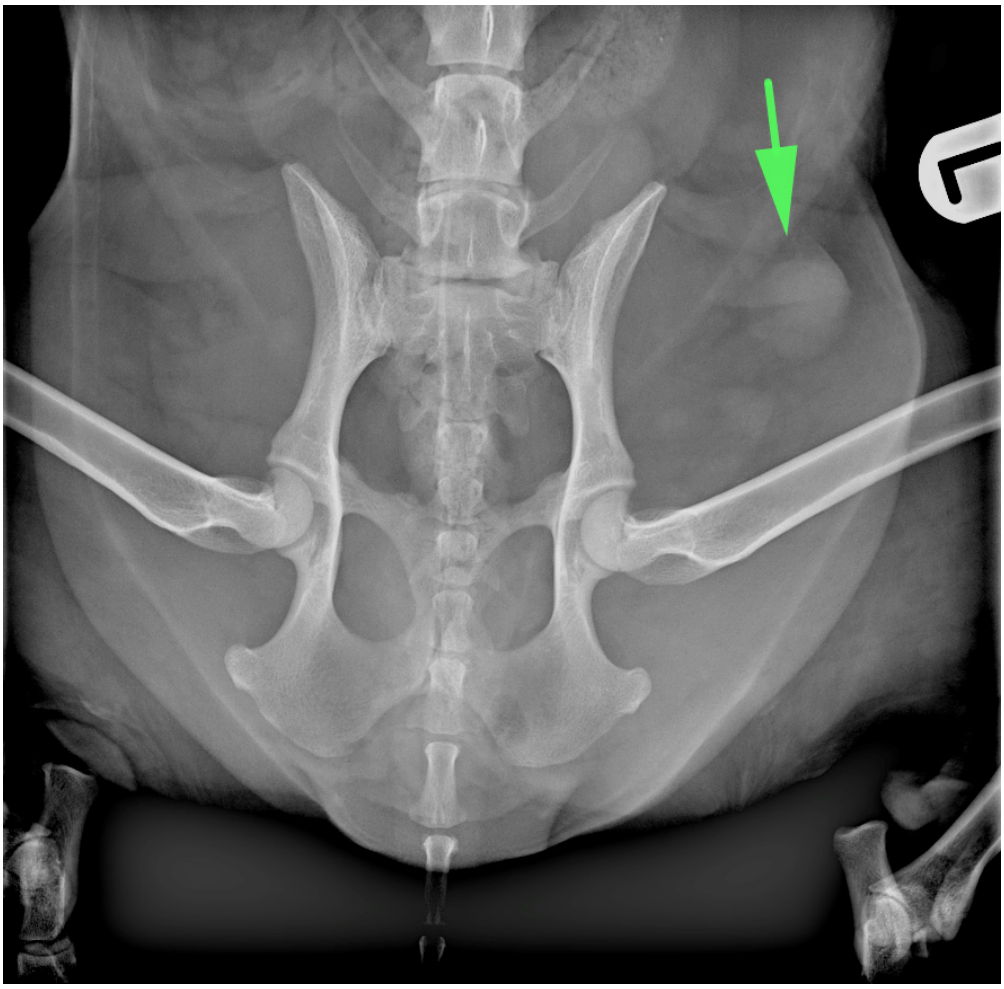

Figure 5:

Pelvic radiograph: a nodule is visible within the soft tissues cranial to the left femur (arrow).