Splenic Imaging - by Chris Warman

Diagnostic imaging of the spleen becomes of interest when a patient presents with abdominal distention, a palpable abdominal mass, anomalies of the red blood cell series, a cardiac arrhythmia without apparent primary cardiac structural pathology and as part of tumor staging. Ultrasound and radiology are the imaging modalities most commonly utilized to evaluate the spleen in veterinary medicine.

Ultrasound is far more informative than radiology in the assessment of splenic anatomy and pathology. Ultrasound allows the clinician to evaluate size, shape, location, splenic parenchymal sonographic architecture and vascular supply with ease. Ultrasound is sensitive to subtle changes in splenic parenchymal architecture and readily detects small mass lesions that would not be apparent on survey radiographs. The splenic vasculature can also be readily evaluated without the need to resort to contrast studies. Ultrasound also has the distinct advantage of being able to evaluate abdominal structures, including the spleen, in the face of severe peritoneal effusion. The loss of serosal detail as a result of free abdominal fluid limits the diagnostic value of radiology when peritoneal effusion is present. Radiology however can be of significant diagnostic value so long as the clinician is aware of the limitations of this imaging modality. In order to accurately radiographically evaluate the spleen, it is important to recognize certain key points.

Figure 1
A triangular soft tissue radiopacity in the cranial left quadrant on the ventrodorsal image is the typical finding in a normal cat and dog.

- The head of the spleen (dorsal aspect) is relatively immobile, fixed by the gastrosplenic ligament to the greater curvature of the stomach.
- The body and tail of the spleen are very mobile and are easily displaced. This mobility of the body and tail ultimately means the location of the spleen and shape of the spleen can be extremely variable on abdominal radiographs of the canine patient.

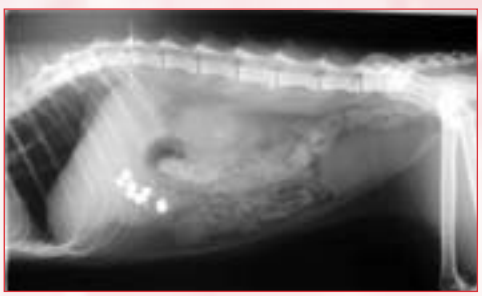

Figure 2
The right recumbent lateral image of a feline patient failing to reveal a splenic shadow dorsal to the ventral abdominal wall.

- The spleen reveals a relatively stable shape and location in two areas in the normal canine patient. In the ventrodorsal view of the abdomen the spleen is identified as a triangular, radiopaque structure relative to the surrounding abdominal fat, lying lateral or caudal-lateral to the gastric fundus. In the right recumbent lateral radiograph the body and tail of the spleen also reveals a triangular shaped pattern immediately dorsal to the ventral abdominal wall. The position of the spleen in lateral recumbency is dependent upon hepatic size and gastric distention. The more caudally displaced the spleen becomes in this position the larger it appears. The increase in size is largely a feature of object-film distance distortion. In the left recumbent lateral radiograph the spleen is frequently difficult to identify and may not reveal the typical triangular shape identified in the right dependent lateral radiograph. In the left recumbent lateral radiograph, particularly if the spleen is small, the spleen summates with intestinal structures and identification of the spleen can be somewhat challenging. In the left recumbent lateral radiograph the spleen needs to cross the left midline of the abdomen to be readily identified.
- A mass effect within the spleen results in displacement of local abdominal structures. A mass effect within the head of the spleen will result in caudal displacement of the left kidney and small bowel displacement both caudally and to the right in the ventrodorsal view. A mass within the head of the spleen will result in ventral displacement of the colon and ventral-caudal displacement of small bowel in the lateral radiograph. A mass lesion within the tail of the spleen may result in medial displacement of the proximal duodenum and ascending colon in the ventrodorsal view. Similar displacement may occur with generalized splenomegaly. A mass effect in the body and the tail of the spleen will result in caudal and dorsal displacement of the small bowel on lateral radiographs.

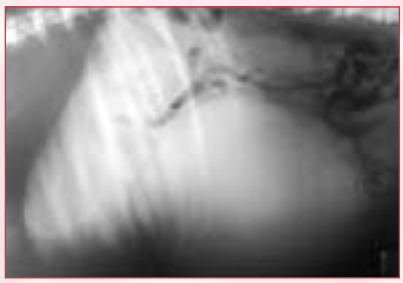

Figure 3
A large mid abdominal mass, resulting in significant intestinal displacement in a canine patient. The mass can be considered almost certainly splenic in origin.

- The most common cause of a mid abdominal mass in canine patients is a splenic lesion.
- The feline patient reveals less variability in splenic shape and positioning.
- The spleen is frequently difficult to identify in lateral radiographs of the cat abdomen unless it is enlarged.
- The spleen is best identified in the feline patient in the ventrodorsal image. The spleen in the cat, as with the dog, is identified as a triangular radiopacity in the left cranial abdomen adjacent the gastric fundus.