

# ULTRASOUND DIAGNOSIS

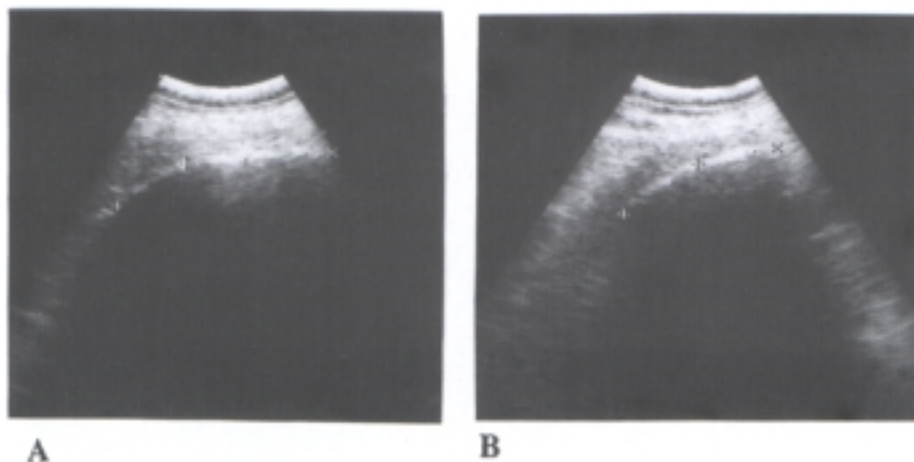
**Phiwipha Kamonrat\***

## **History :**

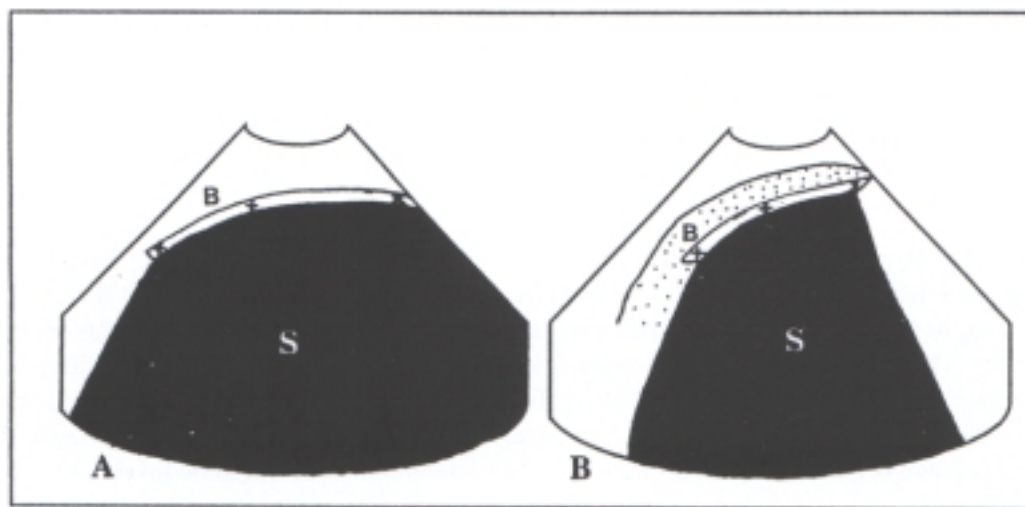
A six-year-old, intact, male, Golden Retriever was presented at the Chulalongkorn University, Small Animal, Veterinary Teaching Hospital with a two-week history of anorexia and chronic vomiting. The clinical signs of vomiting had subsided after symptomatic treatment by the referring veterinarian but the dog still had a poor appetite. The investigation data base consisted of a complete blood count, a serum biochemistry profile, urinalysis, and radiographic evaluation of the abdomen. The only abnormal clinical parameter was leukocytosis ( $2.45 \times 10^4$  white blood cells/ $\mu\text{l}$ ). Abdominal radiographs revealed a focal, soft tissue mass in mid-ventral abdomen. The dog was referred so that this abdominal mass could be investigated by ultrasonography.

---

\* Department of Surgery, Faculty of Veterinary Science, Chulalongkorn University, Bangkok 10330, Thailand.



**Figure 1** Sagittal (A) and transverse (B) ultrasonographic images of the duodenum of a six-year-old Golden Retriever in dorsal recumbency. The curvilinear, echogenic border (between electronic calipers) with acoustic shadowing was created by a foreign body located within the duodenum. Horizontal and vertical markings indicate centimeters.



**Figure 2** Schematics of the relative position of the structures scanned in figure 1. B- curvilinear, echogenic border; S- acoustic shadowing.

### Ultrasonographic Findings

Real-time ultrasonographic images were obtained using a 5.0 MHz electronic sector transducer. With sagittal (fig. 1A and 2A) and transverse (fig. 1B and 2B) scans, a 3 by 6 cm mass was found in the lumen of the distal segment of the descending duodenum. This mass ultrasonographically showed a curvilinear, echogenic border with a strong uniform acoustic shadow. Segmental dilation, with an accumulation of ingesta proximal to this mass, was noted. The finding was consistent with mechanical obstruction and all other aspects were within normal limits.

### Diagnosis

Ultrasonographic diagnosis - A duodenal foreign body.

### Comments

Ultrasonographic together with radiography provides a definitive diagnosis of the presence and location of foreign materials within the gastrointestinal tract, particularly when the foreign material is radio lucent. The ultrasonographic appearance arising from foreign objects of different composition varies depending on its tendency to transmit or attenuate the ultrasound beam (Tidwell and Penninck, 1992). Those objects that transmit the sound beam are more accurately represented, whereas objects that attenuate the beam produce accurate shadowing beyond their echogenic, initial surface. These echogenic, shadowing borders are differentiated from luminal gas by the fact that they are lodged away from the mucosal surface and maintain their characteristic shape even when surrounded by intraluminal fluid. In addition, the acoustic shadowing produced by a soft tissue-bone or soft tissue-foreign body interface is "clean", whereas the shadowing produced by a soft tissue-gas interface is "dirty" from the reverberation artifacts occurring within the shadow (Laing, 1983). Objects having irregular shapes are difficult to identify ultrasonographically, unless they cause complete obstruction with a large accumulation of fluid or ingesta, proximal to the obstruction site (Penninck, 1995).

Increased gastrointestinal activity demonstrated by ultrasonography is responsible for mechanical obstruction or irritation, whereas decreased gastrointestinal activity is associated with functional and chronic mechanical ileus (Penninck, 1995). Segmental dilation usually represents mechanical ileus while generalized dilation, with less distinction of the bowel, is suggestive of functional ileus. Mechanical ileus, ascites, lymphadenopathy and pancreatitis detected in some patients causes additional ultrasonographic changes indicative of a gastrointestinal foreign body. In this dog, a large mango seed was surgically removed from the duodenum.

Increased gastrointestinal activity demonstrated by ultrasonography is responsible for mechanical obstruction or irritation, whereas decreased gastrointestinal activity is associated with functional and chronic mechanical ileus (Penninck, 1995). Segmental dilation usually represents mechanical ileus while generalized dilation, with less distinction of the bowel, is suggestive of functional ileus. Mechanical ileus, ascites, lymphadenopathy and pancreatitis detected in some patients causes additional ultrasonographic changes indicative of a gastrointestinal foreign body. In this dog, a large mango seed was surgically removed from the duodenum.

### References

- Laing, F.C. 1983. Commonly encountered artifacts in clinical ultrasound. *Semin. Ultrasound.* 4: 27-43.
- Penninck, D.G. 1995. Ultrasonography of the Gastrointestinal Tract. In: *Veterinary Diagnosis Ultrasound.* T.G. Nyland and J.S. Mattoon (eds.) Philadelphia: W.B. Saunders Company. P. 125-140.
- Tidwell, A.S. and Penninck, D.G. 1992. Ultrasonography of gastrointestinal Foreign bodies. *Vet. Radiol. Ultrasound.* 3: 160-169.