

# ULTRASOUND DIAGNOSIS

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## **History**

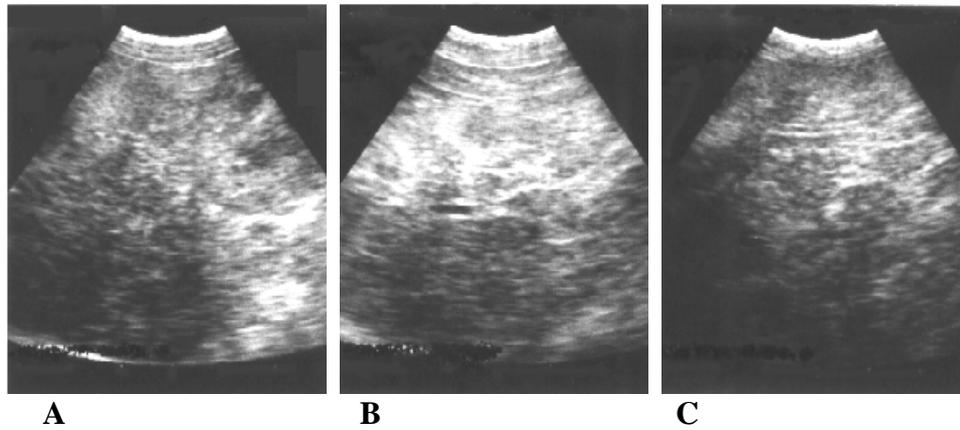
A fourteen-year-old, intact, female, cross-bred dog was presented at Chulalongkorn University, Small Animal, Veterinary Teaching Hospital showing inappetance, vomiting and diarrhoea. The dog had recently been treated for a heart disease. Physical examination was unremarkable apart from moderate pain on palpation of the cranial abdomen. The initial data that was gathered consisted of a complete blood count, a serum biochemistry profile and radiographic evaluation of the abdomen. Abnormal clinical values included elevation of serum ALT (376 units), ALP (5,421 units), BUN (37.7 mg%), and albumin (6.3 g%). Survey abdominal radiographs showed hepatomegaly. An abdominal ultrasonography was performed to obtain more specific information.

## **Ultrasonographic Findings**

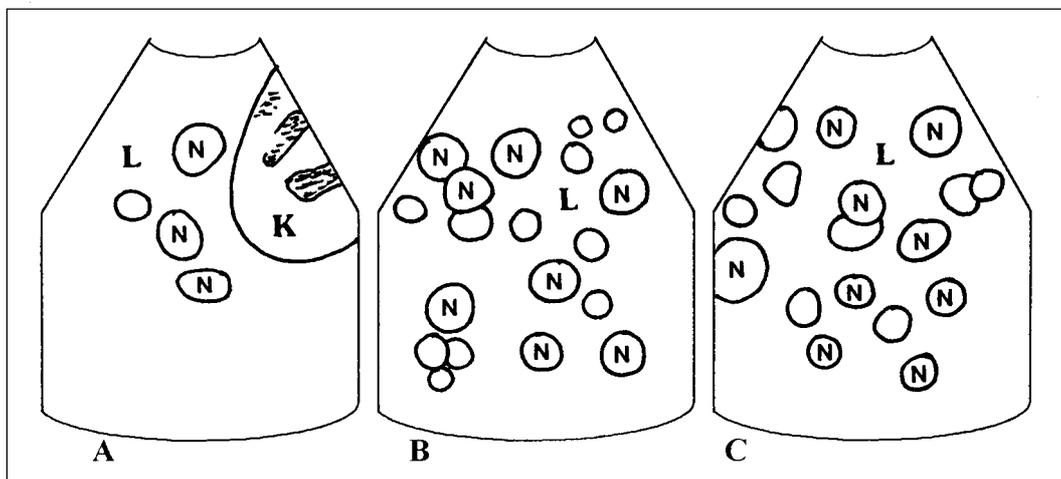
Real-time ultrasonographic images were obtained using a 5.0 MHz electronic sector transducer. Sagittal and transverse scans of the liver showed enlargement that was diffusely isoechoic relative to the spleen and hyperechoic relative to the kidneys (fig. 1A and 2A). Numerous, well-defined, hypoechoic nodules of various sizes, 0.5-1.5 cm in diameter, were present throughout the hepatic parenchyma (fig. 1B, 2B, 1C and 2C). The spleen and kidneys appeared normal. Ultrasound-guided needle biopsy samples were obtained from three nodules which enabled the histological confirmation of hepatic nodular hyperplasia.

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**Figure 1** Transhepatic ultrasonograms of a fourteen-year-old, female dog, in dorsal recumbency. Parenchymal echogenicity of the hepatic lobe was diffusely hyperechoic relative to the right kidney (A). Distinct, multiple hypoechoic nodules were scattered along the midline (B) and on the left lateral aspect (C) of the liver. Vertical markings indicate centimeters.



**Figure 2** Schematics of the relative position of the structures scanned in figure 1. L-hyperechoic liver; K-kidney; N-nodules.

## Comments

Ultrasonography can be an important adjunct to historical, clinical and laboratory examination in the diagnosis of hepatic disease (Vörös et al., 1991). Diffuse parenchymal hepatic disease appears ultrasonographically, as a change in hepatic echogenicity, when compared with the spleen or renal cortex. A limitation of hepatic ultrasonography includes the non-specific nature of observed abnormalities. A diffuse increase in the echogenicity may occur as a result of fatty change, fibrosis (cirrhosis) or steroid hepatopathy, while a diffuse decrease may occur, in association with congestion, suppurative hepatitis, and lymphoma (Biller et al., 1992).

Ultrasonographic features of hepatic nodular hyperplasia are focal echogenic changes, ranging from homogeneous hypoechoic, isoechoic, moderately hyperechoic to complex lesions (Nyland et al., 1995). Differential diagnosis for any of these ultrasonographic lesions include haematomas, abscesses, necrosis, primary and metastatic hepatic

neoplasia. An ultrasound-guided biopsy is a useful technique assisting a definitive diagnosis although the microscopic appearance may be non-diagnostic. The principle value of needle liver biopsy is to rule out neoplasia or other diseases, rather than to confirm nodular hyperplasia.

## References

- Biller D.S., Kantrowitz B. and Miyabayashi T. 1992. Ultrasonography of diffuse liver disease: a review. *J. Vet. Int. Med.* 6(2): 71-76.
- Nyland T.G., Mattoon J.S. and Wisner E.R. 1995. Ultrasonography of the liver. In: *Veterinary Diagnostic Ultrasound*. T.G. Nyland and J.S. Mattoon (eds.). Philadelphia: W.B. Saunders Company. 52-73.
- Vörös K., Vrabély T., Papp L., Horváth L. and Karsai F. 1991. Correlation of ultrasonographic and pathological findings in canine hepatic disease. *J. Small Anim. Pract.* 32(12): 627-634.