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## Case Study

# Sonography of Polypoid Lesions of the Gallbladder in Dog

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### Abstract

Ultrasonographic examination of a five-year-old, male, mixed-breed dog, identified gallbladder wall thickness, accompanied by intraluminal contents suggestive of polyps mass. The liver present normal structure and limits with no mass lesions was detected. A cholecystectomy was performed 1 week after initial case presentation. The gallbladder was enlarged (5 cm in diameter) with a thickened wall, intraluminal mass 2 cm in diameter. The fatty mass had a sessile attachment at the neck of the gallbladder and partial occluded the lumen.

**Keys word:** Ultrasonography, gallbladder, dog, polypoid, diagnosis

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**Data Availability:** All relevant data are within the paper and its supporting information files.

## INTRODUCTION

The function of the gallbladder is very closely related to that of the liver. When one is “sick”, it is likely to affect the other organ. Drugs that affect one can also affect the other. Therefore, it is not uncommon for both diseases to exist in the same dog. The commonest affections of gall bladder and biliary tree included cholangitis, cholecystitis, cholecystolithiasis and choledocholithiasis. Among these the incidence of cholecystolithiasis is very less as evidenced from the published veterinary literatures. The incidence of disorders restricted to the gallbladder and the biliary tree is low, when compared with the parenchymal hepatic affections that occurs in dogs<sup>1</sup>. extrahepatic biliary tract obstruction in dogs is caused most frequently by biliary carcinoma, pancreatic carcinoma, pancreatic disease and intestinal neoplasia. The biliary or intestinal inflammations are less commonly recognized in clinical practice.

In human pathology, gallbladder polyps are outgrowths of the gallbladder mucosal wall. They are usually found incidentally on ultrasonography or after cholecystectomy. When detected on ultrasonography, their clinical significance relates largely to their malignant potential. The majorities of these lesions are not neoplastic but are hyperplastic or represent lipid deposits (cholesterolosis). On the other hand, imaging studies alone are insufficiently specific to exclude the possibility of gallbladder carcinoma or premalignant adenomas. Furthermore, even benign lesions can occasionally lead to symptoms similar to those caused by gallbladder

stones. The use of ultrasonography (US) imaging technique became widespread and popular, detection of polypoid lesions of the gallbladder (PLG) has increased significantly<sup>1,2</sup>. Initial studies estimated that PLGs are found in 2.6-12.1% of cholecystectomy specimens<sup>2</sup>. In a large study of 3,608 Danish subjects, the prevalence of PLG was found to be 4.6% for men and 4.3% for women, and, similar to other studies, these lesions had a higher prevalence in the third and fifth decades of life. Currently, most agree that the average prevalence of PLG in cholecystectomy specimens is about 3-12%<sup>2</sup>. The polypoid lesion of the gall bladder rarely observed in veterinary medicine.

**Case description:** A 5 year-old, male, mixed-breed dog was referred to the veterinary surgery and imaging service at 2015. Initially presented persistence vomiting, anorexia, weakness, for 1 week. Physical examination revealed icterus mucous membranes and a slightly tensed abdomen with normal hematological profiles. Serum biochemistry abnormalities included increased liver enzyme activities, including alkaline phosphatase ( $5,360 \text{ U L}^{-1}$ , reference range  $10-140 \text{ U L}^{-1}$ ) as well as hyperbilirubinemia (total bilirubin  $5.6 \text{ mg dL}^{-1}$ , reference range  $0-0.6 \text{ mg dL}^{-1}$ ) consistent with hepatocellular damage and cholestasis with normal levels of blood urea nitrogen (10 mg) and creatinine (0.2 mg) were identified on the serum biochemical analyses. The radiographs demonstrated normal hepatic size and without hepatobiliary calcification (Fig. 1). Subsequent ultrasonographic examination identified gallbladder wall thickness (Fig. 2),



Fig. 1: Normal radiographic of hepatic and abdomen cavity

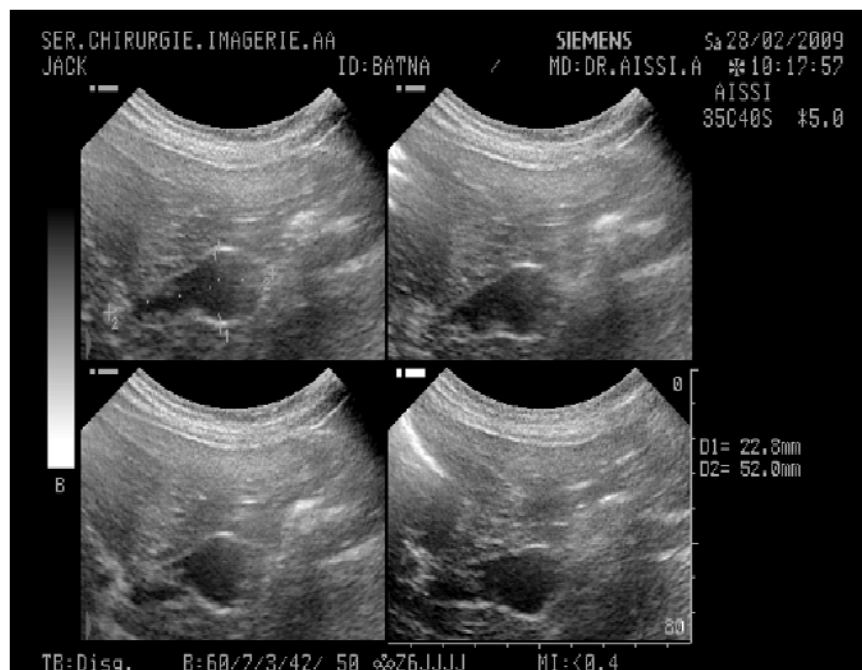


Fig. 2: Sequence of hepatic and gall bladder ultrasonography, large gall bladder (52×22 mm) with wall thickness



Fig. 3: Transhepatic ultrasonograms of gall bladder with large mass (Polyp), without a distal acoustic shadowing

accompanied by intraluminal contents suggestive of polyps mass. The liver present normal structure and limits with no mass lesions detected (Fig. 3).

**3D-ultrasonography:** After exact tracing of gall bladder and mass structures B-real ultrasonography (2D), 3D image acquisition was performed as a volume of data with

nearly immediate reconstruction and simultaneous display of sectional anatomy in three orthogonal planes (sagittal plane, transverse or coronal plane). Finally a 3D rotating animation of the gall bladder structures at the desired angle could be reconstructed for better visualization and recognition of different parts of mass with gall bladder (Fig. 4).

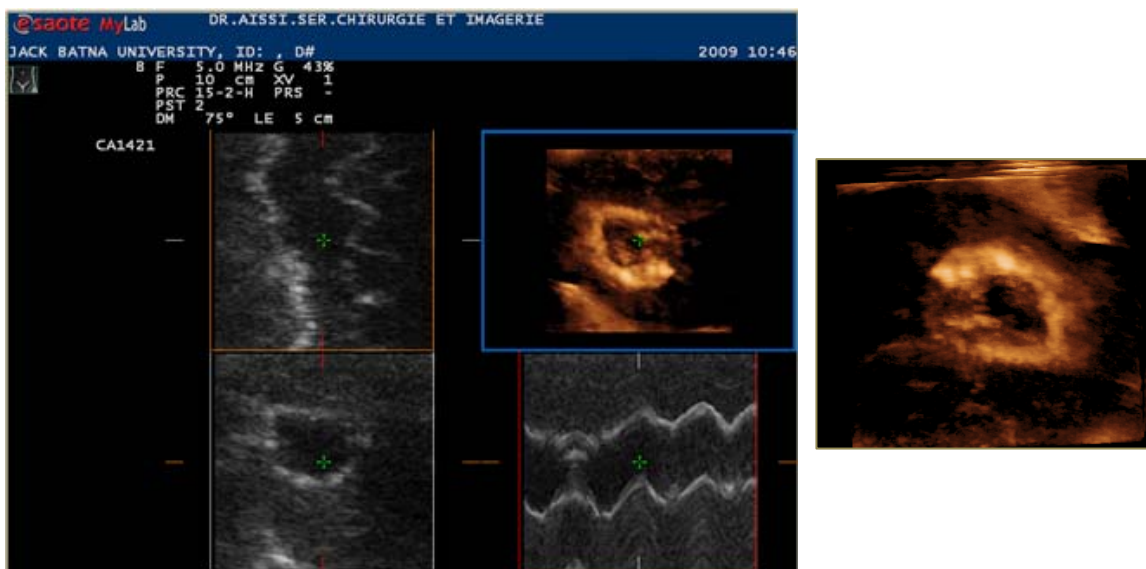


Fig. 4: Three dimension (3D) reconstitution of gall bladder and intraluminal mass (polyp)

**Treatment:** On the basis of these findings, a cholecystectomy was performed 1 week after initial case presentation. The gallbladder was enlarged (5 cm in diameter) with a thickened wall; intraluminal mass 2 cm in diameter. The fatty mass had a sessile attachment at the neck of the gallbladder and partial occluded the lumen. An exploratory laparotomy performed at the time of cholecystectomy surgery did not identify other abdominal lesions. Microscopically the mass was composed of fatty tissue (cholesterol polyp).

## DISCUSSION

The cause of most gall bladder disease is not well defined in the dog. Many dogs with gall bladder disease have some sort of underlying metabolic or hormonal problem<sup>3,4</sup>. hypothyroidism (low thyroid hormone levels) and hyperadrenocorticism (excessive steroid hormone levels) both are associated with an increased risk of developing a biliary disease<sup>5,6</sup>.

These are very rare tumors that account for less than even 1.5% of all canine tumors. However, secondary hepatobiliary tumors are more common and occur 2.5 times more frequently than primary ones<sup>1,2</sup>.

In human, medicine gallbladder polyps have been observed in 0.004-13.8% of resected gallbladder<sup>7,8</sup> and in 1.5-4.5% of gallbladders assessed by ultrasonography<sup>1,8</sup>. In one report, no association was observed between the presence of polyps and the patient's age, sex, weight, number of pregnancies, use of exogenous female hormones or any other

risk factors that are generally believed to be associated with gallstones<sup>8,9</sup>. Gall bladder polypoid lesion has very rarely been reported in dog and domestic animal.

## CONCLUSION

Vesicular polyps sometimes grow inside the gall bladder, where they protrude from the mucous membrane of the inner wall. The polyps are of variable size, with a certain range of 1 cm in diameter or even more.

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