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CURRENT INSIGHTS ON GALLBLADDER MUCOCELES

Gallbladder mucocele (GBM) is a disease typically recognized in older dogs. The definition of a GBM is a mucous filled distension of the gallbladder. On histopathology gross findings are a distended gallbladder with semisolid accumulations of mucus or other secretions. Histopathologically, the gallbladder wall shows cystic mucosal hyperplasia often in combination with a lymphoplasmacytic or neutrophilic infiltrate in the gall bladder wall (cholecystitis). Transmural ischaemic necrosis may be present and can lead to gall bladder rupture.

There are several hypothesis on the etiology of GBM in dogs in veterinary literature. The first hypothesis is that chronic inflammation leads to increased mucin production and resultant hyperplasia of mucus secreting cells. Another hypothesis is that GBM is a complication of certain endocrine disorders like hyperadrenocorticism and hypothyroidism and results from decreased contraction of the gallbladder, leading to mucus accumulation.^{1,2} One study finding the odds of GBM in dogs with hyperadrenocorticism were 29 times that of dogs without hyperadrenocorticism and hypothyroidism increasing the odds by 3 times.³ The third hypothesis is that GBM can be a complication of dyslipidemias, either primary or secondary.⁴ Other hypothesis include dysmotility of the gallbladder, structural obstruction of the cystic duct or common bile duct and biliary sludge. GBM has also been linked to a mutation in the gene ACBC4⁵ and the use of imidacloprid in the Shetland sheepdog⁶.

Breed predispositions include the Shetland Sheepdog, Cocker Spaniel, Miniature Schnauzer, Pomeranian and Chihuahua. Mucoceles occur most commonly in older canine patients with a median age of 10 years.¹ Although gallbladder mucoceles are most often reported in dogs, a few case-reports exist of cats diagnosed with a mucocele^{7,8}.

A gallbladder mucocele is sometimes considered an incidental finding but it can cause serious complications like extrahepatic bile duct obstruction, (necrotizing) cholecystitis, bile peritonitis and sepsis. This means that clinical signs can vary widely. Symptomatic patients are frequently evaluated for vomiting, anorexia, lethargy, and abdominal pain.

Fever is commonly associated with bacterial cholecystitis or bile peritonitis. Icterus is apparent in approximately 40% of patients.

Routine clinicopathologic abnormalities are not able to distinguish between GBM and other hepatobiliary diseases.¹ Ultrasound findings vary widely and do not always correlate with the severity of disease. A typical stellate or kiwi-like appearance appears to be pathognomonic for advanced GBM. In the earlier stages of disease, various stages of filling of the lumen with mucus or sludge may be observed ultrasonographically making the diagnosis more challenging.⁹ The sensitivity of conventional ultrasound in diagnosing gallbladder rupture is low, ranging from 56-86%.^{10,11}

Medical and surgical therapy have been described. Surgical intervention is essential when bile peritonitis is present. A cholecystectomy is the most common curative procedure and in uncomplicated mucoceles may be performed laparoscopically.¹² Gall bladder rupture diagnosed at surgery has been identified in 21.4-60.9% of dogs with GBM.^{10,11}

Large standardized prospective studies are still lacking for medical management of GBM. Currently medical management is reserved for patients lacking clinical signs. Medical treatment most often consists of a combination of antibiotics and cholagogues. Also, low-fat diets are likely beneficial. Evaluation and treatment of concurrent endocrine diseases is advised.

The incidence of positive bacterial culture of gallbladder wall or contents in dogs with GBM at the time of surgery is inconsistent between different studies and ranges from 3% to 67%.^{13,14} Antibiotic selection should be based on culture results of bile. Therapy should be continued for a minimum of 4 to 8 weeks.

Cholagogues can only be used when there are no signs of complete biliary obstruction. Prognosis for patients with gallbladder mucoceles is highly variable. Stable patients with nonruptured mucoceles have the most favorable prognosis. GBM can remain static for long periods of time in which close monitoring is advised. Patients with septic and bile peritonitis carry the highest mortality rate. Perioperative mortality rate ranges from 7-40%.^{13,14} Prognosis is excellent for patients surviving the perioperative period.

References

1. Ettinger SJ, Feldman EC. Textbook of veterinary internal medicine-eBook. In: Elsevier health sciences; 2017:1679-1680.
2. Smalle TM, Cahalane AK, Köster LS. Gallbladder mucocoele: A review. *J S Afr Vet Assoc.* 2015;86(1):01-06.
3. Mesich M, Mayhew P, Paek M, Holt D, Brown D. Gall bladder mucoceles and their association with endocrinopathies in dogs: A retrospective case control study. *J Small Anim Pract.* 2009;50(12):630-635.
4. Kutsunai M, Kanemoto H, Fukushima K, Fujino Y, Ohno K, Tsujimoto H. The association between gall bladder mucoceles and hyperlipidaemia in dogs: A retrospective case control study. *The Veterinary Journal.* 2014;199(1):76-79.
5. Mealey KL, Minch JD, White SN, Snekvik KR, Mattoon JS. An insertion mutation in ABCB4 is associated with gallbladder mucocele formation in dogs. *Comparative hepatology.* 2010;9(1):6.
6. Gookin J, Correa M, Peters A, et al. Association of gallbladder mucocele histologic diagnosis with selected drug use in dogs: A matched case-control study. *Journal of veterinary internal medicine.* 2015;29(6):1464-1472.
7. Bennett S, Milne M, Slocombe R, Landon B. Gallbladder mucocele and concurrent hepatic lipidosis in a cat. *Aust Vet J.* 2007;85(10):397-400.
8. Woods KS, Brisson BA, Defarges AM, Oblak ML. Congenital duplex gallbladder and biliary mucocele associated with partial hepatic cholestasis and cholelithiasis in a cat. *Can Vet J.* 2012;53(3):269-273.
9. Choi J, Kim A, Keh S, Oh J, Kim H, Yoon J. Comparison between ultrasonographic and clinical findings in 43 dogs with gallbladder mucoceles. *Veterinary Radiology & Ultrasound.* 2014;55(2):202-207.
10. Pike FS, Berg J, King NW, Penninck DG, Webster CR. Gallbladder mucocele in dogs: 30 cases (2000–2002). *J Am Vet Med Assoc.* 2004;224(10):1615-1622.
11. Jaffey J, Graham A, VanEerde E, et al. Gallbladder mucocele: Variables associated with outcome and the utility of ultrasonography to identify gallbladder rupture in 219 dogs (2007–2016). *Journal of veterinary internal medicine.* 2018;32(1):195-200.
12. Mayhew PD, Mehler SJ, Radhakrishnan A. Laparoscopic cholecystectomy for management of uncomplicated gall bladder mucocele in six dogs. *Veterinary surgery.* 2008;37(7):625-630.
13. Besso J, Wrigley R, Gliatto J, Webster C. Ultrasonographic appearance and clinical findings in 14 dogs with gallbladder mucocele. *Veterinary Radiology & Ultrasound.* 2000;41(3):261-271.
14. Malek S, Sinclair E, Hosgood G, Moens NM, Baily T, Boston SE. Clinical findings and prognostic factors for dogs undergoing cholecystectomy for gall bladder mucocele. *Veterinary Surgery.* 2013;42(4):418-426.