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**INVESTIGAÇÃO DAS INTERAÇÕES ENTRE DOENÇAS ENDÓCRINAS E O
SISTEMA BILIAR DE CÃES**

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2025**

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INVESTIGAÇÃO DAS INTERAÇÕES ENTRE DOENÇAS ENDÓCRINAS E O SISTEMA
BILIAR DE CÃES

Dissertação apresentada ao Programa de Pós- graduação em Ciências Veterinárias da Universidade Federal de Uberlândia como requisito parcial à obtenção do título de mestre em Ciências Veterinárias.

Área de concentração: Clínica Médica
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INVESTIGAÇÃO DAS INTERAÇÕES ENTRE DOENÇAS ENDÓCRINAS E O SISTEMA BILIAR DE CÃES

RESUMO

Alterações ultrassonográficas da vesícula biliar, como lama biliar, mucocele, colecistite e colelitíase, são frequentemente identificadas em cães, especialmente na presença de endocrinopatias. A dissertação é composta por dois capítulos integrados. O objetivo é ampliar o conhecimento sobre o tema e contribuir para a aplicação dos achados na prática clínica. O primeiro capítulo apresenta uma revisão sistemática sobre o tratamento da mucocele de vesícula biliar, destacando as abordagens terapêuticas e suas limitações. A tomada de decisão pela colecistectomia ainda carece de diretrizes específicas, tornando a escolha pelo procedimento muitas vezes subjetiva. A cirurgia preventiva é amplamente utilizada, mas pode expor cães a riscos desnecessários. O tratamento medicamentoso pode ser uma alternativa viável quando há monitoramento rigoroso, embora a escassez de estudos comparativos limite sua recomendação. O segundo capítulo realiza uma análise descritiva das alterações ultrassonográficas observadas nas vesículas biliares de cães endocrinopatas, bem como determinar se existe uma relação significativa destes achados com doenças endócrinas, dados epidemiológicos, achados clínicos e/ou clínico-patológicos que justificassem seu tratamento. Os achados indicam que a lama biliar, embora comum, não apresentou correlação com dislipidemias, enquanto a mucocele esteve associada à hipertrigliceridemia. Além disso, foi observada a presença de ALT elevada e linfopenia em cães com lama biliar, mas nenhuma alteração vesicular se mostrou um marcador confiável para endocrinopatias. Esses resultados sugerem que o diagnóstico e o monitoramento dessas doenças não devem se basear exclusivamente nos achados ultrassonográficos biliares.

Palavras-chave: Endocrinopatias; mucocele; ultrassonografia; lama biliar.

INVESTIGATION OF THE INTERACTIONS BETWEEN ENDOCRINE DISEASES AND THE BILIARY SYSTEM IN DOGS

ABSTRACT

Ultrasonographic changes in the gallbladder, such as biliary sludge, mucocele, cholecystitis, and cholelithiasis, are frequently identified in dogs, especially in the presence of endocrinopathies. This dissertation is composed of two integrated chapters. The aim is to expand knowledge on the topic and contribute to the application of findings in clinical practice. The first chapter presents a systematic review of the treatment of gallbladder mucocele, highlighting therapeutic approaches and their limitations. The decision-making process for cholecystectomy still lacks specific guidelines, making the choice for the procedure often subjective. Preventive surgery is widely used, but it can expose dogs to unnecessary risks. Medical treatment may be a viable alternative when there is rigorous monitoring, although the scarcity of comparative studies limits its recommendation. The second chapter conducts a descriptive analysis of the ultrasonographic changes observed in the gallbladders of dogs with endocrinopathies, aiming to determine whether there is a significant relationship between these findings and endocrine diseases, epidemiological data, clinical findings, and/or clinical-pathological findings that would justify their treatment. The results indicate that biliary sludge, although common, did not show a correlation with dyslipidemia, while mucocele was associated with hypertriglyceridemia. Additionally, elevated ALT levels and lymphopenia were observed in dogs with biliary sludge, but no gallbladder changes proved to be a reliable marker for endocrinopathies. These results suggest that the diagnosis and monitoring of these diseases should not be based solely on ultrasonographic biliary findings.

Keywords: Endocrinopathies; mucocele; ultrasonography; biliary sludge.

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CONSIDERAÇÕES GERAIS

1. INTRODUÇÃO

Mucocele da vesícula biliar trata-se de uma síndrome biliar extra-hepática comum em cães com taxas de mortalidade variando de 7 a 45% (Jaffey, et al., 2019). Apesar de sua relevância clínica, há lacunas de conhecimento relacionado à escolha e à eficácia das abordagens terapêuticas, tanto medicamentosas quanto cirúrgicas. Não há, até o momento, publicações baseadas em evidências que consolidem as informações disponíveis sobre o tratamento da mucocele, o que reforça a necessidade de uma revisão sistemática para avaliar criticamente os dados existentes e fornecer embasamento para futuras decisões clínicas.

Paralelamente, a vesícula biliar frequentemente é afetada por alterações em cães portadores de endocrinopatias, como diabetes mellitus, hipercortisolismo e hipotireoidismo (Aicher et al., 2019; Aguirre et al., 2007; Saunders; Thornton; Burchell, 2017). No entanto, o impacto dessas condições endócrinas nas alterações ultrassonográficas da vesícula biliar, particularmente em um contexto local, ainda é pouco explorado. Avaliar a casuística do hospital onde este estudo foi conduzido não apenas fornece uma visão específica da prevalência e das características das alterações em cães com endocrinopatias, mas também ajuda a identificar padrões que podem melhorar o manejo clínico desses pacientes.

A presente dissertação foi estruturada em dois capítulos que abordam essas lacunas de forma integrada. O primeiro capítulo, que traz uma revisão sistemática sobre o tratamento da mucocele de vesícula biliar, buscou consolidar as evidências disponíveis, destacando as abordagens terapêuticas mais eficazes e suas limitações. Já o segundo capítulo, realiza uma análise descritiva das alterações ultrassonográficas observadas nas vesículas biliares de cães diagnosticados com endocrinopatias, bem como determinar se existe uma relação significativa destes achados com doenças endócrinas, dados epidemiológicos, achados clínicos e/ou clínico-patológicos que justificassem seu tratamento. Essa abordagem conjunta tem como objetivo promover o conhecimento acerca do assunto e auxiliar na aplicação dos achados clínicos na prática hospitalar.

CAPÍTULO 1

2 ARTIGO

ABORDAGENS TERAPÊUTICAS NA MUCOCELE DA VESÍCULA BILIAR CANINA: UMA REVISÃO BASEADA EM EVIDÊNCIAS

Resumo

A mucocele da vesícula biliar é uma afecção comum em cães, caracterizada pelo acúmulo excessivo de muco espesso, podendo levar à obstrução, ruptura da vesícula biliar e, conseqüentemente, alta taxa de mortalidade. Apesar da relevância clínica, a escolha do tratamento ideal permanece controversa, devido à escassez de diretrizes padronizadas e evidências consolidadas sobre a eficácia das diferentes abordagens terapêuticas. Este estudo teve como objetivo realizar uma revisão sistemática da literatura para avaliar as opções de tratamento disponíveis para a mucocele biliar em cães, com ênfase na sobrevida e nos desfechos clínicos associados às intervenções médicas e cirúrgicas. A pesquisa foi conduzida em bases de dados indexadas, utilizando critérios de inclusão rigorosos baseados na diretriz PRISMA. Foram analisados dez estudos que abordaram diferentes modalidades terapêuticas. Os dados indicam que, embora a cirurgia seja o tratamento preferencial para casos avançados, ainda não há um consenso sobre o momento ideal para a intervenção. No entanto, o manejo clínico pode ser uma alternativa viável para pacientes assintomáticos, desde que acompanhados por um monitoramento rigoroso. Essa variação nos critérios de indicação reforça a necessidade de diretrizes mais objetivas para orientação de decisão clínica e otimização do manejo da mucocele biliar em cães.

Palavras-chave: Cães, colecistectomia, endocrinopatias, manejo clínico, revisão sistemática, vesícula biliar.

Introdução

A mucocèle da vesícula biliar é um distúrbio biliar comum em cães caracterizado pela secreção excessiva de muco espesso que pode resultar em obstrução e ruptura da vesícula, com potencial risco de morte. A hipocinesia da vesícula tem sido proposta como um fator que contribui para sua formação e progressão, no entanto, a causa específica da estase biliar, assim como opções de tratamento viáveis para resolver o processo de dismotilidade, permanecem desconhecidas^{1, 2}.

Dentre as causas mais comuns de hipocinesia em humanos, destacam-se obesidade, hiperglicemia, hipotireoidismo, hipertrigliceridemia, colecistite acalculosa, gravidez e deficiência de vitamina D¹. Já os cães afetados, geralmente apresentam doenças endócrinas e/ou hipertrigliceridemia e hipercolesterolemia concomitantes^{3, 4}. Algumas raças puras são descritas com maior predisposição da ocorrência, incluindo o Pastor de Shetland, o Cocker Spaniel Americano, o Chihuahua, o Lulu da Pomerânia e o Schnauzer Miniatura⁵. Tais associações, indicam que fatores genéticos e metabólicos podem influenciar na patogênese da doença⁶. Os sinais clínicos são inespecíficos, podendo incluir vômito, letargia, anorexia, dor abdominal e icterícia. O diagnóstico é tipicamente realizado por ultrassonografia abdominal⁷.

A definição de critérios para a escolha do tratamento ideal ainda é controversa, com escassez de informações sobre opções médicas eficazes para resolver ou diminuir a progressão da mucocèle. A terapia medicamentosa com ácido ursodesoxicólico (AUDC) tem sido amplamente reconhecida por sua capacidade de aumentar a fluidez da bile e normalizar a secreção biliar. No entanto, de forma contraditória, esse efeito colerético pode elevar o volume biliar, resultando em aumento da pressão na parede da vesícula biliar já comprometida, o que, por sua vez, aumenta o risco de ruptura. Apesar da falta de consenso, a prescrição de AUDC tem sido justificada como uma terapia inicial na ausência de evidências de obstrução biliar completa detectadas por ultrassonografia⁸. Outros estudos indicam que a colecistectomia é considerada a terapia padrão-ouro para a mucocèle canina⁷. No entanto, devido à falta de consenso sobre o momento adequado para sua realização, a decisão de optar pela terapia cirúrgica muitas vezes é postergada ou descartada, em razão do elevado índice de mortalidade no período pós-cirúrgico, resultante de complicações associadas ao procedimento⁹.

Diretrizes para humanos já estabelecem critérios que definem o momento em que a intervenção cirúrgica deve ser considerada emergencial¹⁰. Contudo, na medicina veterinária, ainda

não há consenso sobre o momento ideal para intervir antes que o quadro progrida para uma emergência, o que reforça a necessidade de estudos que estabeleçam critérios objetivos para a tomada de decisão cirúrgica.

Diante desta problemática, este trabalho tem como objetivo revisar sistematicamente as evidências disponíveis na literatura sobre as várias modalidades de tratamento da mucocele canina, com foco na busca de opções terapêuticas e na definição do momento mais apropriado para a intervenção cirúrgica, a fim de construir uma base sólida de pesquisa e disseminar informações mais robustas e adequadas para a prática clínica.

Materiais e métodos

A revisão sistemática foi construída de acordo com partes selecionadas da diretriz PRISMA 2020 (*Preferred Reporting Items for Systematic Reviews and Meta-Analyses*)¹¹, que fornece recomendações para elaboração de revisões sistemáticas e metanálise.

Pesquisa bibliográfica

Foram utilizadas duas bases de dados do meio eletrônico [Pubmed e BVS (Biblioteca Virtual em Saúde)] e foram pesquisados artigos científicos em língua inglesa e portuguesa publicados nos 20 últimos anos (2004 a setembro de 2024). A pesquisa sistemática foi realizada usando termos predefinidos “gallbladder AND mucocele”; “vesícula biliar AND mucocele”. Após a obtenção dos resultados, foi realizada a seleção da espécie de interesse, limitando-se a estudos realizados em cães. Todas as duplicatas presentes em ambas as bases de dados foram removidas na seleção dos artigos. As referências foram integradas na plataforma Zotero (<https://www.zotero.org/>), seguindo um processo de seleção de artigos em três etapas: leitura dos títulos, análise dos resumos e palavras-chave, e leitura completa.

Seleção de artigos

Foram incluídos artigos com número amostral mínimo de 20 casos que abordassem modalidades de tratamento e sobrevida dos animais. Como critério de exclusão, foram removidos

artigos escritos em outros idiomas que não Português/Inglês; referentes a outras espécies; que contenham erratas ou que estivessem fora do tema definido; publicados apenas como resumos; relatos de casos anedóticos isolados ou revisões de literatura; estudos com baixo número amostral; e que abordassem somente informações sobre histologia, técnica cirúrgica ou procedimento anestésico. Os dados foram extraídos de forma independente por duas pesquisadoras da equipe (A.K.M.S. e H.D.B.C.), cada uma conduzindo a leitura e a coleta de informações separadamente até o momento da inclusão na revisão. Os dados extraídos foram comparados e discutidos em conjunto para identificar e resolver possíveis discrepâncias, garantindo a precisão e a concordância na seleção final.

Resultados

As buscas nas bases de dados renderam 458 artigos, sendo 174 registros encontrados na base PubMed e 284 na base BVS. Dentre esses registros, foram removidos 225 por serem publicados fora do período de interesse e/ou em idiomas diferentes, além de 94 registros duplicados entre as bases de dados. Dos 139 registros restantes, a leitura dos títulos levou à exclusão de 59 estudos por serem relatos de caso (n=20), doenças não relacionadas (n=8), avaliação histológica (n=6), estudo em outras espécies (n=5), ou revisões de literatura (n=5), técnicas cirúrgicas e/ou procedimentos anestésicos (n=13) e outros (n=2).

Com isso, 80 registros foram selecionados para leitura dos resumos. Desses, 28 foram excluídos por razões semelhantes, como estudos que abordavam doenças não relacionadas (n=3), revisão de literatura (n=3), errata (n=1), estudos em humanos (n=8), descrição de técnicas cirúrgicas e anestésicas (n=4), tamanho amostral insuficiente (n=4) e resumos expandidos (n=1).

Após a leitura completa dos 52 artigos restantes, 42 foram removidos por tratarem de temas distintos do foco da revisão, como etiopatogenia (n=25), métodos diagnósticos (n=11), tratamento in vitro (n=1), cultura da bile (n=3) e outros (n=2). Assim, ao final do processo de triagem, 10 estudos foram considerados elegíveis para a revisão, contendo informações sobre o tempo de sobrevivência dos pacientes de acordo com os tratamentos empregados para mucocele biliar em cães (Figura 1).

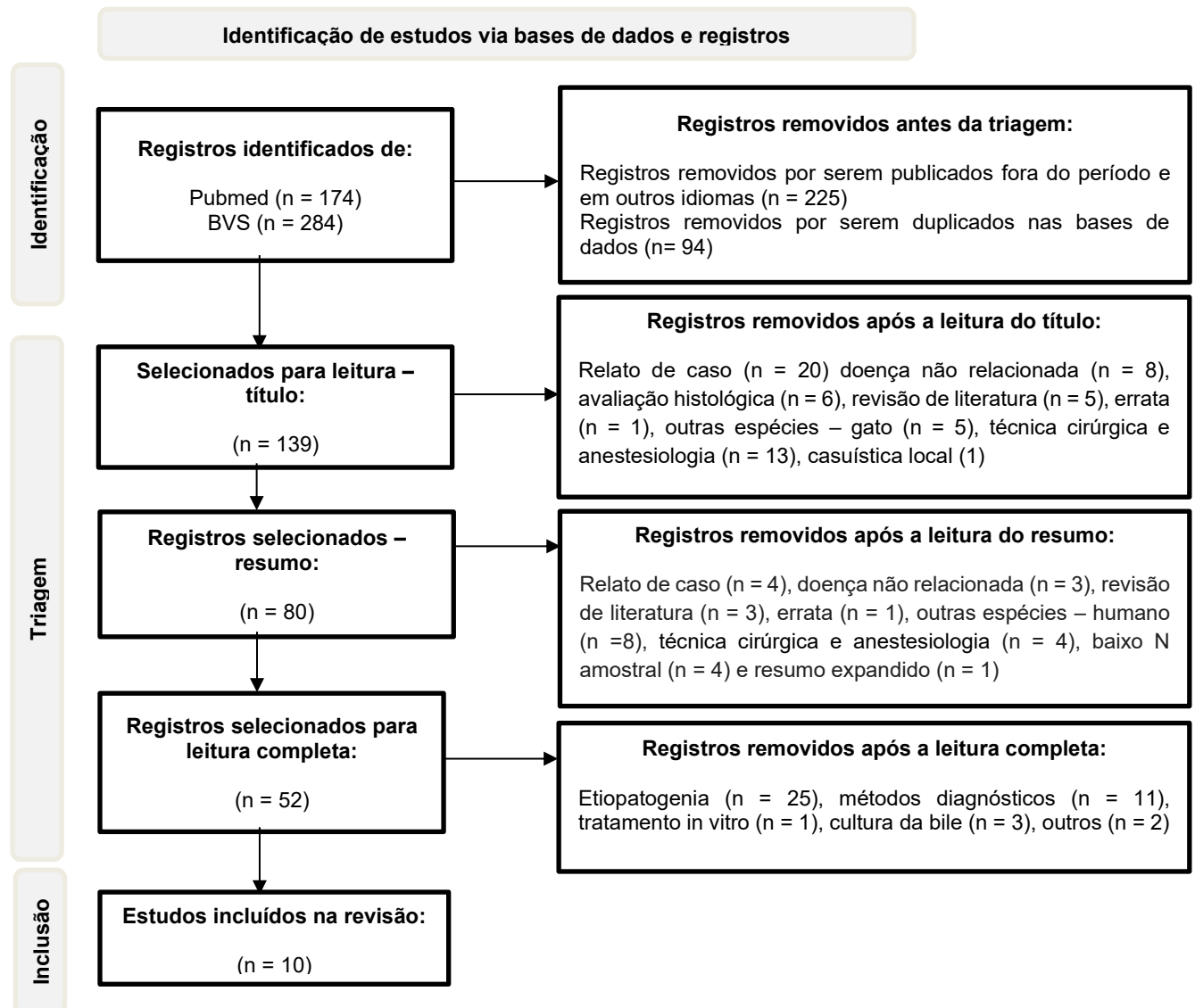


Figura 1: Fluxograma baseado na diretriz PRISMA 2020¹¹, com resultados da busca bibliográfica com inclusão e exclusão de artigos sobre o tratamento de mucocele de vesícula biliar em cães nos últimos 20 anos.

Todos os estudos revisados consistiram em análises retrospectivas, com amostras variando de 22 a 1.194 cães. A duração dos estudos oscilou entre 1 e 1.823 dias, abrangendo desde avaliações pós-operatórias imediatas até análises de sobrevida a longo prazo. As taxas de sobrevida após colecistectomia variou de 39% a 96%, sendo a menor taxa observada em cirurgias não eletivas, quando o paciente já apresentava alterações clínicas importantes. Estudos que abordaram a sobrevida com tratamento medicamentoso indicaram sobrevida inferior em comparação à

abordagem cirúrgica, variando de 42%¹² a 78%¹³. Em estudos que avaliaram cães subclínicos, as taxas de sobrevida chegaram a 94%¹⁴, enquanto em casos com sinais clínicos, a sobrevida foi inferior, alcançando 89%¹⁵. As características dos grupos de pacientes e detalhes de cada artigo estão presentes na Tabela 1.

Tabela 1: Características dos dez estudos selecionados para a revisão sistemática sobre o tratamento de mucocele de vesícula biliar em cães, com objetivo de comparar a sobrevida dos diferentes tratamentos empregados.

AUTOR	TÍTULO	DESENHO DO ESTUDO	TIPO DE TRATAMENTO	TAMANHO DA AMOSTRA	DURAÇÃO DO ESTUDO	CARACTERÍSTICAS DOS PACIENTES	SOBREVIDA
Aguirre et al., 2007	Gallbladder disease in Shetland Sheepdogs: 38 cases (1995-2005)	Retrospectivo	Medicamentoso: 7 cães (Dieta severamente restrita em gordura se hipertrigliceridêmicos, AUDC (10 a 15 mg/kg [4,5 a 6,8 mg/lb], VO, dividido em 2 doses/d) e Same (20 mg/kg [9,1 mg/lb], VO, com o estômago vazio) Cirurgia: 23 cães Não tratados: 8 cães	38 cães	180 dias – medicamentoso 2556 dias – cirurgia	Raças representadas: Pastor de Shetland. Características da população: Há dados de apenas 25 cães – 10 machos (6 castrados e 4 intactos) e 15 fêmeas (todas castradas). Idade média de 10,9 anos e peso médio de 10,4 kg.	Medicamentoso: 42% Cirurgia: 39% Não tratados: 0%
Amsellem et al., 2006	Long-term survival and risk factors associated with biliary surgery in dogs: 34 cases (1994-2004)	Retrospectivo	Cirurgia biliar	34 cães	404 ± 552 dias.	Raças representadas: Cocker Spaniel (33,3%), Beagle (13,3%), Sem raça definida (53,3%) e outras raças. Características da população: 17 machos (15 castrados e 2 intactos) e 16 fêmeas (14 castradas e 2 intactas). Peso médio de 16,7 kg (4,7 a 28,7 kg). Sem idade média.	66%
Friesen et al., 2021	Clinical findings for dogs undergoing elective and nonelective cholecystectomies for gall bladder mucoceles	Retrospectivo	Colecistectomia	121 cães	1-18 dias	Raças representadas: Sem raça definida (15%), Cocker Spaniel (12%), Pastor de Shetland (7%), Schnnauzer Miniatura (7%), Bicho Frisé (7%), Beagle (6%), Dachshund (5%), Pomerânia (5%), Chihuahua (5%), Poodle Toy (5%), Yorkshire Terrier (4%), Pinscher miniatura (3%), Terrier de Cairn (1,5%), Terrier Escocês (1,5%) e outros. Característica da população: 62 machos (53 castrados e 9 intactos) e 59 fêmeas (58 castradas e 1 intacta). Sem idade e peso médio.	Com sinais clínicos: 77% Subclínico: 94%
Galley et al., 2022	Factors affecting survival in 516 dogs that underwent cholecystectomy for the treatment of gallbladder mucocele	Transversal e retrospectivo	Colecistectomia	516 cães	14 dias	Categorias Raciais: Pastoreio (13,5%), cão de caça (10%), toy (23%), não esportivo (7%), esportivo (8,5%), terrier (11%), trabalhadores (1%), mestiços (26%) Características da população: 222 machos (204 castrados e 18 intactos) e 294 fêmeas (280 castradas e 14 intactas). Com idade média de 11 anos (9 a 12 anos), peso médio de 9,7kg (6,7 a 15,4 kg)	83,3% - Cães com ruptura da vesícula biliar e cultura biliar positiva tiveram 2,74 e 3,10 vezes mais probabilidade de morrer
Jaffey et al., 2019	Effect of clinical signs, endocrinopathies, timing of surgery, hyperlipidemia, and hyperbilirubinemia on outcome in dogs with gallbladder mucocele	Retrospectivo	Colecistectomia	1194 cães	8 dias	Raças representadas: Sem raça definida (16%), com raça definida (84%), sendo as mais comuns: Pastor de Shetland, Cocker Spaniel, Schnnauzer miniatura, Bichon Frisé, Beagle, Pomerânia, Border Terrier, Chihuahua e Shih Tzu. Características da população: 582 machos (496 castrados e 86 intactos) e 612 fêmeas (546 castradas e 66 intactas). Com idade média de 10 anos (2 a 17 anos). Sem peso médio.	85%

Jaffey et al., 2022	Ultrasonographic patterns, clinical findings, and prognostic variables in dogs from Asia with gallbladder mucocele	Retrospectivo multicêntrico	Colecistectomia	85 cães	Até a alta hospitalar	<p>Raças representadas: Sem raça definida (9%), com raça definida 91%, sendo os mais comuns: Chihuahua (10,6%), Maltês (9,3%), Poodle toy (9,3%), Pomerania (8,8%), Schnnauzer Miniatura (5,6%) e Shetland sheepdog (5,6%).</p> <p>Características da população: 112 machos (78 castrados e 34 intactos) e 104 fêmeas (88 castradas e 16 intactas). Idade média de 11 anos (9 a 13 anos) e peso médio de 5,1 kg (3,4 a 8,5kg). A idade de 1 cão não foi registrada. Apenas 85 foram para cirurgia.</p>	Com sinais clínicos: 89% Subclínico: 93%
Parkanzky et al., 2019	Long-term survival of dogs treated for gallbladder mucocele by cholecystectomy, medical management, or both	Retrospectivo	<p>Medicamentoso: 33 cães (30/33 receberam AUCD em dosagens variando de 4,8 a 20 mg/kg e frequência de dose variando de q12h a q24h, e 20/33 receberam Same (dosagem não descrita) Colecistectomia: 46 cães</p> <p>Ambos: 10 cães</p>	89 cães	14-1823 dias	<p>Raças representadas: Sem raça definida (9%), Cocker Spaniels (8%), Shetland Sheepdogs (7%), Bichon Frises (7%), Jack Russell Terriers (7%), West Highland White Terriers (6%), Yorkshire Terriers (6%), Pomeranians (4%), Labrador Retrievers (4,5%), Schnnauzers Miniatura (4,5%), Poodles Miniatura (4,5%), Pugs (4,5%), Beagles (2%), Collies (2%), Golden Retrievers (2%), Lhasa Apsos (2%), Maltês (2%) e várias outras raças representadas por 1 cão cada (18%)</p> <p>Características da população: 45 machos (42 castrados e 3 intactos) e 44 fêmeas (41 castradas e 3 intactas). Idade média de 10,8 anos (7,6 a 14 anos). Sem peso médio.</p>	Medicamentoso: 1340 dias Colecistectomia: 1823 dias
Pike et al., 2004	Gallbladder mucocele in dogs: 30 cases (2000–2002)	Retrospectivo	<p>Colecistectomia: 23 cães</p> <p>Eutanásia sem tratamento: 6 cães</p> <p>Medicamentoso: 1 cão (coleréticos e antimicrobianos)</p>	30 cães	± 425 dias	<p>Raças representadas: Cocker Spaniels (30%), Collie (13,3%), Terrier (10%), Poodles Miniatura (6,7%), Schnnauzer Miniatura (6,7%), sem raça definida (10%), Dachshund (3,3%), e outros em menor quantidade – Siberiano Husky, Beagle, Pastor Alemão, Lulu da Pomerânia, Bichon Frisé e Keeshond.</p> <p>Características da população: 14 machos e 16 fêmeas (todos castrados). Idade média de 10 anos (3 a 15 anos) e peso médio de 15,4 kg.</p>	Colecistectomia: 78%
Rossanese et al., 2022	Long-Term Outcome after Cholecystectomy without Common Bile Duct Catheterization and Flushing in Dogs	Retrospectivo	Colecistectomia sem cateterização do ducto biliar	82 cães	180 dias	<p>Raças representadas: Border Terrier (32%), Schnnauzer Miniatura (8,5%), Mestiço (8,5%), Cocker Spaniel (6%), Bichon Frisé (6%), Jack Russell Terrier (6%), Chihuahua (5%), Yorkshire Terrier (3,6%), Labrador Retriever (3,6%), Beagle (3,6%) e outros.</p> <p>Característica da população: 41 machos (32 castrados e 9 intactos) e 41 fêmeas (38 castradas e 3 intactas). Com idade média de 9 anos (4 a 14 anos) , peso médio de 10 kg (3,7 a 31,8 kg) e média da condição corporal de 5/9 (variação de 3/9 a 9/9).</p>	96%
Worley; Hottinger; Lawrence, 2004	Surgical management of gallbladder mucoceles in dogs: 22 cases (1999-2003)	Retrospectivo	Cirurgia biliar	22 cães	1 a 1.023 dias	<p>Raças representadas: Shetland Sheepdog (n = 18%), Lhasa Apso (14%), Dachshunds (9%), Cocker Spaniel (9%), Poodle (4,5%), Schnnauzer miniatura (4,5%), Beagle (4,5%), Bichon Frisé (4,5%) e sem raça definida (32%).</p> <p>Características da população: 8 machos (todos castrados) e 14 fêmeas (13 castradas e 1 intacta). Idade média de 11,4 anos (7 a 15 anos). Sem peso médio.</p>	68% no pós-operatório imediato

Abreviações: AUCD: Ácido Ursodexocólico; Same: S-adenosil-L-metionina.

Houve predomínio de fêmeas castradas em todos os trabalhos analisados. Em relação às raças mais frequentemente relatadas estão os Pastores de Shetland, Cocker Spaniels e os cães sem raça definida. Estas só não foram relatadas no trabalho de Galley et al¹⁶, os quais optaram por agrupar as raças em categorias gerais como "toy", "pastoreio", "cão de caça", sem especificá-las. A idade média variou entre 9 e 11 anos na maioria dos estudos, exceto nos artigos de Amsellem et al¹⁷ e Friesen et al¹⁴, os quais não fizeram menção à idade.

Os principais sinais clínicos relatados nos estudos incluídos foram letargia, anorexia/hiporexia e vômito. Embora sua frequência tenha variado entre os trabalhos, esses achados estiveram consistentemente entre os mais relevantes, sendo observados em até 87% dos pacientes no estudo de Pike et al¹³ para vômito e letargia, e em 78,3% para anorexia. Em contrapartida, outros sinais clínicos, como dor abdominal, pirexia, poliúria, polidipsia e icterícia, foram relatados com menor frequência.

Dentre os achados laboratoriais, destacaram-se o aumento da atividade da fosfatase alcalina (FA), alanina aminotransferase (ALT) e gama glutamiltransferase (GGT) (7/10). Apesar da frequência variável entre os diferentes estudos, esses parâmetros apresentaram aumentos mais expressivos acometendo até 100% de pacientes com o aumento de FA, 90% para ALT e 88% para GGT⁹. Também foi observada hiperlipidemia, que acometeu cerca de 90,8% dos pacientes, hipercolesterolemia encontrada em 55,4%, e hipertrigliceridemia foi identificada em 48,3% dos cães¹⁸. Elevação da bilirrubina total em cerca de 77% dos casos⁹. No hemograma, as principais alterações incluíram leucocitose e neutrofilia, com frequências de 42% e 73%, respectivamente⁹.

A ultrassonografia foi consistentemente utilizada como padrão ouro para o diagnóstico, sendo empregada em todos os estudos analisados (10/10). Entre os principais achados ultrassonográficos observados em pacientes com mucocele (7/10), destacam-se o padrão em "kiwi", ruptura da vesícula biliar, derrame abdominal, distensão do ducto biliar comum e/ou da vesícula biliar (6/7). A presença de lama biliar foi observada em três desses estudos (3/10).

Nos estudos revisados, a escolha do tratamento cirúrgico baseou-se principalmente na interpretação individual de cada caso, considerando múltiplos fatores ao mesmo tempo, como a presença de sinais clínicos, alterações em exames físicos e laboratoriais, além dos achados ultrassonográficos (7/10). Em contraste, apenas um trabalho relatou que as decisões terapêuticas foram tomadas anteriormente em consulta, sem critérios padronizados (1/10) e, dois outros avaliaram exclusivamente pacientes submetidos previamente à cirurgia, sem descrever os critérios

utilizados para a indicação do procedimento (2/10). Esses resultados ressaltam a ausência de protocolos unificados para a indicação cirúrgica, destacando a necessidade de critérios mais objetivos para melhorar as decisões de tratamento.

Discussão

Apesar dos avanços na compreensão da mucocele da vesícula biliar em cães, a definição do tratamento mais adequado ainda permanece incerta. Esta revisão sistemática, ao avaliar publicações dos últimos 20 anos, evidencia a divergência nas condutas terapêuticas e a ausência de conclusões nos trabalhos que uniformize os critérios para a indicação da intervenção cirúrgica. A falta de padrões entre os estudos analisados reforça a necessidade da tomada de decisão clínica e levanta questionamentos sobre a necessidade de diretrizes mais bem estabelecidas.

A determinação do momento ideal para submeter pacientes à cirurgia não pode ser efetivamente definida. Entretanto, observamos que estudos como os de Aguirre et al¹² e Worley, Hottinger e Lawrence⁹, os quais optaram pela cirurgia apenas em pacientes com sinais clínicos agudos (vômito, anorexia, icterícia e letargia) relataram que as taxas de sobrevida foram menores às taxas de animais subclínicos, devido à complicações associadas. Ademais, embora as taxas gerais de sobrevivência não tenham sido explicitamente declaradas, Jaffey et al¹⁸ relataram menor sobrevida em cães com sinais clínicos, especialmente os da raça Pomerânia e portadores de hipercortisolismo. Esses resultados sinalizam que sinais clínicos e comorbidades específicas podem influenciar os desfechos de pacientes com mucocele, sugerindo que a escolha do momento para a cirurgia é um fator crucial, mas que ainda carece de definição clara na literatura.

Além disso, Aguirre et al¹² e Worley, Hottinger e Lawrence⁹ sugeriram a possibilidade de que intervenções cirúrgicas eletivas realizadas precocemente, antes do surgimento de complicações graves como infarto ou necrose da parede da vesícula, colecistite séptica ou peritonite biliar, poderiam contribuir para a redução da incidência de complicações para a melhora dos desfechos clínicos. Embora essa hipótese seja promissora, ainda não há evidências conclusivas que comprovem essa relação, sendo necessários estudos prospectivos adicionais para validar essa abordagem. Assim, considera-se que, quanto mais avançados os sinais clínicos, menor a taxa de sobrevida, reforçando a necessidade de investigar o momento ideal para a intervenção cirúrgica precoce. Nota-se, que a intervenção cirúrgica precoce pode ser uma estratégia vantajosa,

especialmente considerando os riscos associados às complicações tardias, mas é fundamental que estudos clínicos prospectivos sejam realizados para fornecer dados concretos sobre o momento ideal para sua indicação.

Em relação ao sexo e estado reprodutivo, quatro estudos incluíram a análise de correlação com doenças da vesícula biliar^{12, 16, 19, 13}. Todos os trabalhos relataram a ausência de diferenças estatisticamente significativas entre os sexos ou entre animais intactos e castrados, indicando que essas variáveis não parecem influenciar diretamente a ocorrência ou a progressão da doença.

Ao analisar as raças e sua correlação, dos quatro estudos que abordaram esse aspecto, três relataram predisposições específicas, com destaque para as raças Cocker Spaniel¹³, Pomerânia¹⁸ e Shetland Sheepdog¹². Esses achados sugerem que fatores genéticos ou características próprias dessas raças, como metabolismo lipídico ou anatômico, podem contribuir para a predisposição¹⁸. A causa de morte mais comum nos Pomerânias foi hipoxemia e hipotensão refratária, possivelmente associadas à traqueomalácia, uma condição frequente na raça. A maioria dos óbitos ocorreu por parada cardiopulmonar de etiologia desconhecida, dificultando o estabelecimento de um padrão específico¹⁸. Por outro lado, no estudo de Galley et al¹⁶, não foram identificadas diferenças significativas em relação à predisposição racial. Isso pode indicar limitações na amostragem, diferenças regionais ou menor influência da raça na doença. São necessários mais estudos para entender melhor a relação entre raça, fatores ambientais ou outros demais fatores na predisposição às doenças da vesícula biliar.

A influência da idade foi abordada em seis estudos, dos quais quatro identificaram uma relação direta entre o aumento da idade e a maior chance de mortalidade em pacientes com mucocèle^{15, 16, 17, 18}. Em um deles, foi relatado que cada ano adicional de idade aumentava as chances de morte hospitalar em 43% quando considerado isoladamente como fator de risco¹⁵. Esse achado reforça a vulnerabilidade de cães idosos, possivelmente devido à maior chance de doenças associadas e redução na capacidade de recuperação pós-operatória. Por outro lado, Parkanzky et al¹⁹ não encontrou associação significativa entre idade e mortalidade, enquanto Worley, Hottinger e Lawrence⁹ não identificaram nenhum preditor de mortalidade. Tais discrepâncias indicam que, embora a idade seja um fator relevante, outros elementos como comorbidades, gravidade da doença e manejo clínico, também interferem.

A sobrevida nos pacientes que foram para cirurgia variou, destacando que a intervenção cirúrgica eletiva foi melhor quando comparada com a não eletiva. Jaffey et al¹⁵ observaram que a

taxa de alta hospitalar foi mais elevada em animais subclínicos (93%) em comparação com aqueles que apresentavam com sinais clínicos ao momento da cirurgia (89%), estando de acordo com outros autores^{14, 18, 19}. Esses resultados sugerem que a escolha do momento ideal para a intervenção pode influenciar positivamente os desfechos clínicos, reforçando a importância de uma avaliação criteriosa antes de optar pela cirurgia. Cães com ruptura da vesícula biliar e cultura biliar positiva, apresentaram risco de morte 2,74 e 3,10 vezes maior, respectivamente, no período de 14 dias após a colecistectomia¹⁶. A ausência de intervenção foi associada a uma mortalidade absoluta (100%), reforçando a inviabilidade do não tratamento, conforme relatado por Aguirre et al¹² e por Jaffey et al¹⁵, no qual os animais com sinais clínicos, 28% não foram para cirurgia, dos quais 32% não sobreviveram até a alta hospitalar.

O tratamento medicamentoso foi descrito em dois estudos^{12, 19}, sendo baseado no uso do AUDC e S-adenosil-L-metionina (SAME). Jaffey et al¹⁵ descreveram que alguns pacientes tiveram o tratamento medicamentoso, mas não especificaram quais foram utilizados em sua abordagem terapêutica. A ausência dessas informações nos trabalhos apresentados limita a possibilidade de comparar as abordagens terapêuticas usada entre eles, demonstrando falta de investigações sobre tratamentos alternativos à cirurgia. A justificativa do tratamento terapêutico utilizado, foi em casos que os tutores dos animais se recusaram a realizar a cirurgia ou àqueles com ausência de sinais clínicos^{12, 19}. Essa restrição contribui a percepção de que o tratamento medicamentoso é uma abordagem secundária ou de menor relevância, demonstrando uma preferência tendenciosa pelo tratamento cirúrgico como padrão terapêutico.

As opções medicamentosas para o manejo incluem estratégias multifatoriais, como o uso de dietas restritas em gordura e fármacos hepatoprotetores. O AUDC tem sido largamente recomendado em dosagens variando de 10 a 15 mg/kg/dia, BID¹², ou uma faixa mais ampla de 4,8 a 20 mg/kg, BID ou SID¹⁹. O uso do SAME também faz parte do protocolo terapêutico, com uma dose de 20 mg/kg administrada em jejum¹², no entanto, no trabalho de Parkanzy et al¹⁹ a dosagem e sua administração não foram documentadas ou descritas nos registros dos pacientes. Tais autores ressaltam a necessidade de monitoramento contínuo da doença, baseado no retorno mensal ou bimestral do paciente para exames ultrassonográficos abdominais, permitindo a avaliação do estado da vesícula biliar. Caso a terapia medicamentosa não seja eficaz ou haja progressão da doença, a intervenção cirúrgica torna-se necessária. No entanto, não há uma descrição clara sobre o tempo ideal de espera antes da realização da cirurgia.

A taxa de sobrevida dos pacientes tratados com medicação mostrou-se variável entre os estudos analisados. Aguirre et al¹² relataram uma taxa de sobrevida de 42% em um período de seis meses de acompanhamento. Em contrapartida, Jaffey et al¹⁵ monitoraram seis cães com sinais clínicos que não foram submetidos à cirurgia por um período médio de 7 a 365 dias; desses, apenas um faleceu devido à pancreatite aguda logo após o diagnóstico, resultando em uma taxa de sobrevida de 83%. Já Parkanzky et al¹⁹, compararam a sobrevivência a longo prazo de cães tratados com colecistectomia, terapia medicamentosa ou ambos, e o risco de morte em dias do grupo medicamentoso foi quatro vezes maior que o de tratamento cirúrgico. Tais achados, enfatizam a necessidade de critérios bem estabelecidos para a escolha de qual tratamento empregar, considerando o quadro clínico e o risco-benefício de cada abordagem.

A maioria dos procedimentos cirúrgicos eletivos foi realizada em decorrência da falha do tratamento medicamentoso, embora não tenham sido detalhados os protocolos terapêuticos utilizados, a duração do tratamento nem a forma de monitoramento realizada. No estudo de Pike et al¹³, dos 23 cães sintomáticos submetidos à cirurgia, três haviam sido previamente tratados com antimicrobianos e coleréticos sem resposta clínica, porém sem especificação dos medicamentos, dosagens e intervalos empregados. Esses dados destacam a necessidade de maiores detalhes dos tratamentos médicos nos estudos, a fim de compreender melhor sua eficácia e impacto nas decisões cirúrgicas.

Apenas Parkanzky et al¹⁹ compararam as taxas de sobrevida entre cães que receberam tratamento clínico sem sucesso antes da cirurgia, aqueles submetidos diretamente à colecistectomia, e os tratados exclusivamente com medicação. Os resultados indicaram que a chance de morte nos animais que passaram por cirurgia após a falha do tratamento medicamentoso foi 14 vezes maior. Dessa forma, é possível que o aumento da mortalidade possa estar relacionado a progressão ou a não resolução do quadro, ou até mesmo a presença de uma doença concomitante, sendo justificável considerar que pacientes são encaminhados para cirurgia em estágios mais avançados e críticos da mucocele, apresentem maior risco de complicações^{15, 19}.

Levando isto em consideração, casos de mucocele de vesícula biliar com os sinais clínicos agudos, cujas complicações como inflamação severa ou ruptura da vesícula biliar podem impactar negativamente a taxa de sobrevida do paciente^{14, 15}, têm a intervenção cirúrgica como única alternativa viável. Por outro lado, pacientes assintomáticos cujo diagnóstico foi realizado incidentalmente por ultrassonografia, o manejo inicial com terapia medicamentosa pode ser uma

abordagem apropriada¹². Essa estratégia requer acompanhamento do paciente para monitorar a evolução da doença e encaminhar para cirurgia antes do surgimento de sinais clínicos ou da progressão significativa do quadro¹⁴.

Os estudos analisados apresentam taxas de sobrevida muito variáveis e não possuem dados robustos sobre o momento ideal para realizar a colecistectomia. No estudo de Worley, Hottinger e Lawrence⁹, o tempo médio entre o início dos sinais clínicos e a colecistectomia foi de aproximadamente 8 dias, resultando em uma taxa de sobrevida de 68%, inferior à média geral. Resultado semelhante foi relatado por Amsellem et al¹⁷, que encontrou uma taxa de sobrevivência de 66%. A ausência de critérios objetivos torna a decisão entre realizar a cirurgia ou optar pelo manejo conservador altamente variável entre os profissionais, dificultando o estabelecimento de um consenso sobre o momento ideal para a intervenção cirúrgica. Além disso, a falta de clareza quanto à duração do tratamento medicamentoso e ao limite seguro para postergar a cirurgia contribui para a indefinição no manejo desses casos. Sobre tais considerações, Parkanzky et al¹⁹ refletem que a antecipação cirúrgica no paciente que já está com tratamento terapêutico, poderia diminuir os riscos associados a cirurgias realizadas tardiamente, melhorando o prognóstico e reduzindo as taxas de mortalidade elevadas.

A principal limitação deste estudo é que os trabalhos analisados exploram taxas de mortalidade e as estratégias de tratamento de forma retrospectiva, com pouca padronização. Geralmente, a indicação da cirurgia baseia-se no risco percebido pelo clínico, o que gera um viés de seleção. Além disso, a inclusão de estudos que abordam de forma principal o tratamento medicamentoso foi limitada devido ao pequeno número de artigos que exploram essa abordagem, dificultando uma comparação adequada entre abordagens terapêuticas e cirúrgicas. A escassez de pesquisas focadas no manejo conservador reflete a preferência por intervenções cirúrgicas na prática clínica, resultando em uma maior disponibilidade de dados sobre esse tipo de tratamento. Além disso, há uma notável carência de informações sobre o uso de medicações usadas no Brasil para o tratamento da mucocele. Diante disso, novos estudos são necessários para preencher tais lacunas. É importante realizar pesquisas prospectivas, duplo cegas e controladas por placebo e com protocolos padronizados para comparar tratamentos cirúrgicos e conservadores, a fim de identificar critérios objetivos para o momento ideal da cirurgia, de forma a reduzir a variabilidade entre os profissionais e melhorar os resultados. Além disso, mais estudos sobre o tratamento medicamentoso são essenciais para definir limites seguros.

Conclusões

A tomada de decisão pela colecistectomia em cães com mucocele de vesícula biliar ainda é marcada pela subjetividade e pela falta de evidências específicas que orientem o momento adequado para a intervenção. Sem diretrizes, a escolha pela cirurgia preventiva continua sendo uma prática comum, mas potencialmente arriscada, que pode expor cães a procedimentos desnecessários. O tratamento medicamentoso pode ser uma opção válida desde que acompanhado de monitoramento rigoroso, no entanto, a falta de estudos limita a comparação entre os diferentes tratamentos, evidenciando a necessidade de estudos prospectivos controlados e diretrizes que possam comparar e guiar o tratamento da forma mais segura, promovendo intervenções verdadeiramente baseadas em evidências.

Referências

1.

Jaffey JA, Matheson J, Shumway K, Pacholec C, Tarini Ullal, Van L, et al. Serum 25-hydroxyvitamin D concentrations in dogs with gallbladder mucocele. PLoS ONE [Internet]. 2020 Dec 16 [cited 2025 Feb 26];15(12):e0244102–2. Available from: <https://doi.org/10.1371/journal.pone.0244102>

2.

Kesimer M, Cullen J, Cao R, Radicioni G, Mathews KG, Seiler G, et al. Excess Secretion of Gel-Forming Mucins and Associated Innate Defense Proteins with Defective Mucin Un-Packaging Underpin Gallbladder Mucocele Formation in Dogs. Chin WC, editor. PLOS ONE [Internet]. 2015 Sep 28 [cited 2025 Feb 26];10(9):e0138988. Available from: <https://doi.org/10.1371/journal.pone.0138988>

3.

Mesich L, Mayhew PD, Paek M, Holt DE, Brown DC. Gall bladder mucoceles and their association with endocrinopathies in dogs: a retrospective case-control study. Journal of Small Animal Practice [Internet]. 2009 Dec 1 [cited 2025 Feb 26];50(12):630–5. Available from: <https://doi.org/10.1111/j.1748-5827.2009.00811.x>

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 [Internet]. 2013 Oct 26 [cited 2025 Feb 26];199(1):76–9. Available from: <https://doi.org/10.1016/j.tvjl.2013.10.019>

5.

Allerton F, Swinbourne F, Barker L, Black V, Kathrani A, Tivers M, et al. Gall bladder mucoceles in Border terriers. *Journal of Veterinary Internal Medicine* [Internet]. 2018 Aug 5 [cited 2025 Feb 26];32(5):1618–28. Available from: <https://doi.org/10.1111/jvim.15249>

6.

Gookin JL, Mathews KG, Cullen J, Seiler G. Qualitative metabolomics profiling of serum and bile from dogs with gallbladder mucocele formation. *PLoS ONE* [Internet]. 2018 Jan 11 [cited 2025 Feb 26];13(1):e0191076–6. Available from: <https://doi.org/10.1371/journal.pone.0191076>

7.

Smalle TM, Cahalane AK, Köster LS. Gallbladder mucocele: A review. *Journal of the South African Veterinary Association* [Internet]. 2015 Dec 9 [cited 2025 Feb 26];86(1). Available from: <https://doi.org/10.4102/jsava.v86i1.1318>

8.

Saunders H, Thornton LA, Burchell R. Medical and surgical management of gallbladder sludge and mucocele development in a Miniature Schnauzer. *International Journal of Veterinary Science and Medicine* [Internet]. 2017 Apr 20 [cited 2025 Feb 26];5(1):75–80. Available from: <https://doi.org/10.1016/j.ijvsm.2017.01.002>

9.

Worley DR, Hottinger HA, Lawrence HJ. Surgical management of gallbladder mucoceles in dogs: 22 cases (1999–2003). *Journal of the American Veterinary Medical Association* [Internet]. 2004 Nov 1 [cited 2025 Feb 26];225(9):1418–22. Available from: <https://doi.org/10.2460/javma.2004.225.1418>

10.

Pisano M, Allievi N, Gurusamy K, Borzellino G, Cimbanassi S, Boerna D, et al. 2020 World Society of Emergency Surgery updated guidelines for the diagnosis and treatment of acute calculus cholecystitis. *World Journal of Emergency Surgery* [Internet]. 2020 Nov 5 [cited 2025 Feb 26];15(1). Available from: <https://doi.org/10.1186/s13017-020-00336-x>

11.

Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* [Internet]. 2021 Mar 29 [cited 2025 Feb 26];n71–1. Available from: <https://doi.org/10.1136/bmj.n71>

12.

Aguirre AL, Center SA, Randolph JF, Yeager AE, Keegan AM, Harvey HJ, et al. Gallbladder disease in Shetland Sheepdogs: 38 cases (1995–2005). *Journal of the American Veterinary Medical Association* [Internet]. 2007 Jul 1 [cited 2025 Feb 26];231(1):79–88. Available from: <https://doi.org/10.2460/javma.231.1.79>

13.

Pike FS, Berg J, King NW, Penninck DG, Webster CRL. Gallbladder mucocele in dogs: 30 cases (2000–2002). *Journal of the American Veterinary Medical Association* [Internet]. 2004 May 1 [cited 2025 Feb 26];224(10):1615–22. Available from: <https://doi.org/10.2460/javma.2004.224.1615>

14.

Friesen SL, Upchurch DA, Hollenbeck DL, Roush JK. Clinical findings for dogs undergoing elective and nonelective cholecystectomies for gall bladder mucoceles. *Journal of Small Animal Practice* [Internet]. 2021 Feb 15 [cited 2025 Feb 26];62(7):547–53. Available from: <https://doi.org/10.1111/jsap.13312>

15.

Jaffey JA, Kreisler R, Shumway K, Lee Y, Lin C, Durocher-Babek LL, et al. Ultrasonographic patterns, clinical findings, and prognostic variables in dogs from Asia with gallbladder mucocele. *Journal of Veterinary Internal Medicine* [Internet]. 2022 Feb 15 [cited 2025 Feb 26];36(2):565–75. Available from: <https://doi.org/10.1111/jvim.16384>

16.

Galley. Factors affecting survival in 516 dogs that underwent cholecystectomy for the treatment of gallbladder mucocele. *The Canadian veterinary journal = La revue veterinaire canadienne* [Internet]. 2022 [cited 2025 Feb 26];63(1). Available from: <https://pubmed.ncbi.nlm.nih.gov/34975169/>

17.

Amsellem PM, Seim HB, MacPhail CM, Bright RM, Twedt DC, Wrigley RH, et al. Long-term survival and risk factors associated with biliary surgery in dogs: 34 cases (1994–2004). *Journal of the American Veterinary Medical Association* [Internet]. 2006 Nov 1 [cited 2025 Feb 26];229(9):1451–7. Available from: <https://doi.org/10.2460/javma.229.9.1451>

18.

Jaffey JA, Pavlick M, Webster CR, Moore GE, McDaniel KA, Blois SL, et al. Effect of clinical signs, endocrinopathies, timing of surgery, hyperlipidemia, and hyperbilirubinemia on outcome in dogs with gallbladder mucocele. *The Veterinary Journal* [Internet]. 2019 Jul 31 [cited 2025 Feb 26];251:105350–0. Available from: <https://doi.org/10.1016/j.tvjl.2019.105350>

19.

Parkanzky M, Grimes J, Schmiedt C, Secrest S, Bugbee A. Long-term survival of dogs treated for gallbladder mucocele by cholecystectomy, medical management, or both. *Journal of Veterinary Internal Medicine* [Internet]. 2019 Sep [cited 2025 Feb 26];33(5):2057–66. Available from: <https://doi.org/10.1111/jvim.15611>

ANEXO 1 - NORMAS DA REVISTA
(Topics in Companion Animal Medicine)

About the journal

Aims and scope

As of January 2018, *Topics in Companion Animal Medicine* is no longer solely publishing solicited special themed issues. Please feel free to submit your research for the Editor-in-Chief's consideration.

Published quarterly, *Topics in Companion Animal Medicine* is a peer-reviewed veterinary scientific journal dedicated to providing practitioners with the most recent advances in companion animal medicine. The journal publishes high quality original clinical research focusing on important topics in companion animal medicine. *Topics in Companion Animal Medicine* also features comprehensive review articles on topics of clinical interest, short communications, case reports/case series, and timely editorials addressing issues of interest to companion animal practitioners.

Article types

Case Reports. These are an opportunity to publish an interesting case or case series which you have encountered. Authors are asked to submit an interesting case or clinical lesson for consideration. If it is accepted then it will be sent on to an expert who will write an accompanying piece providing a critique or further information concerning the situation.

Case report articles should follow CARE guidelines.

The format should be to start with a brief introduction followed by an account of what happened or was observed. A discussion section should then be included.

Length: 500-800 words, 12 references, 1 figure/box/table.

Letters to the Editor: Use sections and subheadings to lead your reader through the discussion.

Length: 750-800 words, 12 references, 1 figure/box/table.

Short Communications Should present a personal viewpoint on a research-related topic, rather than a review of a topic.

Length: 2500-3500 words: This limit does not include text in boxes, abstract, references, tables or figure legends. Figures: Should always have a short, explanatory title to preface the legend.

Legends must fully explain the figure without reference to the text.

Original Articles (clinical trials) welcome all areas of airway management from anesthesia, critical care, and emergency medicine in- and outside of hospitals, to teaching and training issues in airway management, as well as emerging concepts and ideas about equipment for airway management in human or manikin studies, as long as the authors can demonstrate their clinical or educational relevance of the issues investigated and described in their articles with the final aim to improved safe patient care.

Clinical Trial Registration should be given in Methods section; CONSORT flow chart should be present; method of randomization should be stated if in case of randomized controlled trial(s). Length: 3500 words: this limit does not include text in boxes, tables, figure legends abstract or references

Systematic Review Articles constitute a literature review or a narrative review of a particular area and can be clinical or concentrate on a basic science topic.

Systematic reviews should follow PRISMA guidelines.

Abstract: 500 words; briefly explain the necessary background and summary of the review article.

Peer review

This journal follows a single anonymized review process. Your submission will initially be assessed by our editors to determine suitability for publication in this journal. If your submission is deemed suitable, it will typically be sent to a minimum of two reviewers for an independent expert assessment of the scientific quality. The decision as to whether your article is accepted or rejected will be taken by our editors.

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- have been written by family members or colleagues.
- relate to products or services in which they have an interest.

Any such submissions will be subject to the journal's usual procedures and peer review will be handled independently of the editor involved and their research group. Read more about [editor duties](#).

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All authors should have made substantial contributions to all of the following:

1. The conception and design of the study, or acquisition of data, or analysis and interpretation of data.
2. Drafting the article or revising it critically for important intellectual content.
3. Final approval of the version to be submitted.

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All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence or bias their work. Examples of potential competing interests include:

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The [Declaration of Interests tool](#) should always be completed.

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Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Authors should ensure their work uses inclusive language throughout and contains nothing which might imply one individual is superior to another on the grounds of:

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- gender
- race
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- culture
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We recommend avoiding the use of descriptors about personal attributes unless they are relevant and valid. Write for gender neutrality with the use of plural nouns ("clinicians, patients/clients") as default. Wherever possible, avoid using "he, she," or "he/she."

No assumptions should be made about the beliefs of readers and writing should be free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions.

These guidelines are meant as a point of reference to help you identify appropriate language but are by no means exhaustive or definitive.

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There is no single, universally agreed-upon set of guidelines for defining sex and gender. We offer the following guidance:

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- Definitions of sex and/or gender applied should be explicitly stated to enhance the precision, rigor and reproducibility of the research and to avoid ambiguity or conflation of terms and the constructs to which they refer.

We advise you to read the [Sex and Gender Equity in Research \(SAGER\) guidelines](#) and the [SAGER checklist](#) (PDF) on the EASE website, which offer systematic approaches to the use of sex and gender information in study design, data analysis, outcome reporting and research interpretation.

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Definitions of sex and/or gender

We ask authors to define how sex and gender have been used in their research and publication.

Some guidance:

- Sex generally refers to a set of biological attributes that are associated with physical and physiological features such as chromosomal genotype, hormonal levels, internal and external anatomy. A binary sex categorization (male/female) is usually designated at birth ("sex assigned at birth") and is in most cases based solely on the visible external anatomy of a newborn. In reality, sex categorizations include people who are intersex/have differences of sex development (DSD).
- Gender generally refers to socially constructed roles, behaviors and identities of women, men and gender-diverse people that occur in a historical and cultural context and may vary across societies and over time. Gender influences how people view themselves and each other, how they behave and interact and how power is distributed in society.

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Manuscripts must include a statement that all procedures were performed in compliance with relevant laws and institutional guidelines and have been approved by the appropriate institutional committee(s). The statement should contain the date and reference number of the ethical approval(s) obtained.

Manuscripts must also include a statement that the privacy rights of human subjects have been observed and that informed consent was obtained for experimentation with human subjects.

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- organs and/or tissues were not sourced from executed prisoners or prisoners of conscience.

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All animal experiments should comply with [ARRIVE \(Animal Research: Reporting of In Vivo Experiments\) guidelines](#).

Studies should be carried out in accordance with [Guidance on the operation of the Animals \(Scientific Procedures\) Act 1986](#) and associated guidelines, [EU Directive 2010/63 for the protection of animals used for scientific purposes](#) or the [NIH \(National Research Council\) Guide for the Care and Use of Laboratory Animals](#) (PDF) or those of an equivalent internationally recognized body.

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Writing and formatting

File format

We ask you to provide editable source files for your entire submission (including figures, tables and text graphics). Some guidelines:

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Abstract

You are required to provide a concise and factual abstract which does not exceed 250 words. The abstract should briefly state the purpose of your research, principal results and major conclusions.

Some guidelines:

- Abstracts must be able to stand alone as abstracts are often presented separately from the article.
- Avoid references. If any are essential to include, ensure that you cite the author(s) and year(s).
- Avoid non-standard or uncommon abbreviations. If any are essential to include, ensure they are defined within your abstract at first mention.

Keywords

You are required to provide 1 to 7 keywords for indexing purposes. Keywords should be written in English. Please try to avoid keywords consisting of multiple words (using "and" or "of").

We recommend that you only use abbreviations in keywords if they are firmly established in the field.

Highlights

You are encouraged to provide article highlights at submission.

Highlights are a short collection of bullet points that should capture the novel results of your research as well as any new methods used during your study. Highlights will help increase the discoverability of your article via search engines. Some guidelines:

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Graphical abstract

You are encouraged to provide a graphical abstract at submission.

The graphical abstract should summarize the contents of your article in a concise, pictorial form which is designed to capture the attention of a wide readership. A graphical abstract will help draw

more attention to your online article and support readers in digesting your research. Some guidelines:

- Submit your graphical abstract as a separate file in the online submission system.
- Ensure the image is a minimum of 531 x 1328 pixels (h x w) or proportionally more and is readable at a size of 5 x 13 cm using a regular screen resolution of 96 dpi.
- Our preferred file types for graphical abstracts are TIFF, EPS, PDF or MS Office files.

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Math formulae

- Submit math equations as editable text, not as images.
- Present simple formulae in line with normal text, where possible.
- Use the solidus (/) instead of a horizontal line for small fractional terms such as X/Y.
- Present variables in italics.
- Denote powers of e by exp.
- Display equations separately from your text, numbering them consecutively in the order they are referred to within your text.

Tables

Tables must be submitted as editable text, not as images. Some guidelines:

- Place tables next to the relevant text or on a separate page(s) at the end of your article.
- Cite all tables in the manuscript text.
- Number tables consecutively according to their appearance in the text.
- Please provide captions along with the tables.
- Place any table notes below the table body.
- Avoid vertical rules and shading within table cells.

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Figures, images and artwork

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- Text graphics may be embedded in the text at the appropriate position. If you are working with LaTeX, text graphics may also be embedded in the file.

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CAPÍTULO 2

3 ARTIGO

DESVENDANDO MITOS: O QUE OS ACHADOS DE VESÍCULAS BILIARES REALMENTE REVELAM?

Resumo

Objetivos

Este estudo avaliou as alterações ultrassonográficas na vesícula biliar de cães com hipercortisolismo, hipotireoidismo e diabetes mellitus, determinando sua relação com dislipidemias e outros achados clínico-laboratoriais. Nossa hipótese era de que cães endocrinopatas apresentariam maior predisposição a alterações biliares, especialmente lama biliar e mucocele.

Métodos

Trata-se de um estudo retrospectivo observacional conduzido a partir de prontuários de cães atendidos no Hospital Veterinário da Universidade Federal de Uberlândia entre 2021 e 2024. Foram analisados 29 cães com endocrinopatias e 29 cães controle pareados por idade, sexo e raça. A análise incluiu parâmetros epidemiológicos, bioquímicos e ultrassonográficos. Os dados foram analisados por estatística descritiva e regressão logística para identificar fatores associados às alterações biliares.

Resultados

Este estudo, de maneira inédita, desmistifica achados ultrassonográficos de vesículas biliares como preditores das principais endocrinopatias causadoras de hiperlipidemias. Com exceção da mucocele, que se apresentou em cães com hipertrigliceridemia, nenhuma outra anormalidade de vesícula biliar, incluindo lama biliar – em qualquer grau, apresentou-se correlata a qualquer dado epidemiológico, clínico ou laboratorial preditor.

Significância Clínica

Os resultados sugerem que a lama biliar, frequentemente encontrada em cães saudáveis, não deve ser interpretada isoladamente como indicativa de endocrinopatia ou dislipidemia.

Introdução

Entre as mais graves alterações vesícula biliar em cães, destacam-se a colelitíase, a colecistite e, sobretudo, a mucocele (Teixeira, Aicher e Duarte, 2024). Embora lama biliar já tenha sido descrita como um achado incidental (Butler et al., 2022), sua frequente identificação em exames ultrassonográficos de rotina e a falta de consenso do que representa, tem levantado alguns questionamentos.

A patogênese da formação de mucocele ainda permanece desconhecida, mas sabe-se que está associada à hiperplasia mucinosa cística e à discinesia da vesícula biliar, sugerindo uma possível associação com a lama biliar (Aguirre et al., 2007; Pike et al., 2004; Tsukagoshi et al., 2011), já que é formada a partir de estase biliar e alterações da composição biliar. Além disso, no caso da mucocele, a dislipidemia e as endocrinopatias causadoras de hiperlipidemia (Kutsunai et al., 2014; Mesich et al., 2009) têm se destacado como um dos fatores de grande relevância, uma vez que o excesso de lipídios leva à retenção de bile e compromete a motilidade da vesícula biliar, aumentando em aproximadamente três vezes o risco de desenvolvimento dessa condição (Kutsunai et al., 2014).

Mesmo que a presença de lama biliar em cães saudáveis ao longo de um ano não pareça estar associada a anormalidades bioquímicas ou ultrassonográficas significativas na vesícula biliar (DeMonaco et al., 2016), o raciocínio de que lama biliar possa dar origem à mucocele e, que esta por sua vez, está relacionada com hiperlipidemia (hipercortisolismo, hipotireoidismo e diabetes mellitus), tem gerado dúvidas sobre as condutas a serem tomadas diante do achado de lama biliar em cães e, inclusive, propostas de tratamentos medicamentosos e ou mesmo cirúrgicos para lama biliar.

Este estudo teve como objetivo realizar uma análise descritiva das alterações ultrassonográficas observadas nas vesículas biliares de cães diagnosticados com hipercortisolismo, hipotireoidismo e diabetes mellitus, bem como determinar se existe uma relação significativa destes achados com doenças endócrinas, dados epidemiológicos, achados clínicos e/ou clínico-patológicos que justificassem seu tratamento. Hipotetizamos que cães endocrinopatas, bem como portadores hiperlipidemia teriam maiores chances de apresentar alterações vesicais biliares.

Materiais e métodos

Desenho de estudo e critérios de inclusão

Este estudo de caso-controle, foi conduzido a partir do levantamento de prontuários eletrônicos de pacientes caninos atendidos no Setor de Endocrinologia do Hospital Veterinário da Universidade Federal de Uberlândia (UFU), no período de janeiro de 2021 a agosto de 2024. Inicialmente, foram considerados elegíveis os pacientes caninos portadores de hipercortisolismo (HC), diabetes mellitus (DM) e hipotireoidismo, diagnosticados segundo os critérios estabelecidos por Behrend et al, 2013, Behrend et al., 2018 e Lathan 2023, respectivamente.

Busca de prontuários médicos

Um total de 923 prontuários de atendimentos endocrinológicos foram levantados. Foram excluídas 755 fichas que apresentavam doenças não endócrinas, duplicidade de registros devido a retornos ou diagnósticos de endocrinopatias não incluídas no estudo. Assim, 168 prontuários atenderam aos critérios de elegibilidade estabelecidos. Desses, 83 referiam-se a cães com diabetes mellitus (49%), 50 com hipercortisolismo (30%), e 35 com hipotireoidismo (21%). Entre os critérios de exclusão considerou-se prontuários de animais que já estavam sob terapia endócrina específica ao chegarem ao hospital (n=97), uso de hipolipemiantes (n=7), uso de dieta hipocalórica (n=8), ausência de ultrassonografia no momento do diagnóstico (n=13), uso de colerético (p.ex. ácido ursodesoxicólico) (n=5) e diagnóstico de doença realizado de modo diferente do pré-estabelecido pelos critérios de inclusão (n=2).

Após seleção, o grupo de caninos endocrinopatas constitui-se de 29 animais, sendo estes 15 de cães portadores de diabetes mellitus (51%), 11 de hipercortisolismo (38%) e três de hipotireoidismo (10%).

A partir da seleção dos animais endocrinopatas, selecionou-se um grupo controle composto de 29 caninos não portadores de endocrinopatias, pareado de acordo com o sexo, raça e idade, atendidos no Hospital Veterinário dentro do mesmo período do estudo. Os motivos de atendimento desses pacientes foram diversos: nove cães (31%) compareceram para consultas de rotina (*check up*), sete (24%) para investigação de sintomas leves/inespecíficos (p.ex., vômito e hiporexia), e cinco (17%) devido a outras manifestações clínicas, incluindo a presença de nódulos. Além disso, quatro cães (14%) apresentaram suspeita de endocrinopatia posteriormente descartada, e outros quatro (14%) apresentavam obesidade. Embora a obesidade seja uma condição metabólica, não foi

critério de exclusão, pois os cães obesos do grupo controle não apresentavam endocrinopatias diagnosticadas. Isso garantiu um grupo comparativo mais representativo, sem comprometer a validade do estudo.

Dados extraídos

Os dados de todos os caninos foram tabulados, sendo coletadas variáveis referentes a idade (anos), sexo (macho ou fêmea), estado reprodutivo (inteiro/a ou castrado/a), raça, peso (kg) e escore de condição corporal (1 a 9), parâmetros clínicos laboratoriais hematológicos e bioquímicos sanguíneos [hemograma, proteína total plasmática, ureia, creatinina, alanina aminotransferase (ALT), fosfatase alcalina (FA), triglicérides e colesterol], e avaliações ultrassonográficas das vesículas biliares, todos realizados no momento do diagnóstico, antes da instituição de qualquer terapia específica para a causa do atendimento.

Diagnóstico realizado

As ultrassonografias das vesículas biliares foram realizadas no Serviço de Diagnóstico por Imagem do HV-UFU por equipe especializada, sendo avaliadas quanto ao formato, volume, conteúdo, repleção da vesícula e dilatação de ducto biliar. O conteúdo da vesícula biliar foi classificado em cinco grupos: Grupo 0 – sem lama: bile uniformemente hipocócica, sem sedimento; Grupo 1 – lama leve: sedimento hiperecoico dependente da gravidade ocupando < 50% da vesícula biliar; Grupo 2 – lama moderada: sedimento hiperecoico dependente da gravidade ocupando 51-75%; Grupo 3 – lama acentuada >75% sedimento hiperecoico biliar; e Grupo 4 -mucocele de vesícula biliar (Cook; Jambhekar; Dylewski, 2016).

Análise de dados

A análise estatística foi conduzida utilizando o software estatístico R. Inicialmente, foi realizada a análise descritiva para caracterização das variáveis, apresentando-se quando pertinente, a quantidade de parcelas analisadas (n) para cada variável, bem como os valores de média e desvio padrão ou mediana e intervalo mínimo-máximo para as variáveis paramétricas e não paramétricas, respectivamente. A normalidade e a homogeneidade de variâncias dos dados foram verificadas pelos testes de Shapiro-Wilk e de Levene, respectivamente. Dependendo dos resultados, foram utilizados o teste t para comparações entre dois grupos independentes paramétricos ou o teste U de

Mann-Whitney para variáveis não paramétricas. Para investigar as relações entre as variáveis, modelos de regressão logística binária foram construídos empregando variáveis preditoras (alterações ecocardiográficas de vesícula biliar; dados epidemiológicos; achados clínicos e laboratoriais) e os diferentes desfechos (presença de endocrinopatias; lama biliar, mucocele, colecistite e colelitíase). Para evitar estimativas de máxima verossimilhança propensas a viés devido ao n amostral pequeno, foram empregados modelos de regressões logísticas penalizados para máxima verossimilhança, proposto por Firth (1993). Para análise de risco, a razão de chances (OR) e o intervalo de confiança (95%) foram calculados a partir dos modelos desenvolvidos para cada variável preditora. Os resultados foram considerados significativos quando o p-valor < 0,05. Este trabalho foi aprovado pelo Comissão de Ética na Utilização de Animal da UFU (Processo CEUA SEI n.23117.047475/2024-33).

Resultados

Os caninos endocrinopatas incluídos no estudo tratavam de 19 fêmeas (13 castradas e 6 inteiras) e 10 machos (7 castrados e 3 inteiros), cujo escore de condição corporal (ECC) predominante variou entre 7 e 9 (65,5%). A maioria dos cães incluídos no estudo eram adultos a idosos, com 7 a 11 anos de idade (58,6%), seguida de cães geriátricos com idade acima de 12 anos (27,5%). Os cães sem raça definida foram os mais prevalentes (n=13; 45%), seguidos dos cães da raça Shih-Tzu (n=9; 31%). As demais raças apareceram em menor frequência, incluindo Poodle e Lhasa Apso, com dois cães cada (7%), além de Spitz Alemão, Maltês e Yorkshire Terrier, com um representante cada (3%).

Conteúdos anormais na vesícula biliar foram encontrados em 62% dos cães do grupo controle (n=18) e em 75% dos cães endocrinopatas (n=22). A distribuição dessas alterações foi mais frequente nos pacientes hipercortisolêmicos, seguido pelos diabéticos e hipotireoideos (81%, 80% e 66%, respectivamente).

Nos cães com HC, as únicas alterações encontradas foram a presença de lama biliar e a identificação de uma concreção. A lama biliar foi a alteração mais prevalente, observada em nove animais (82%). Dentre esses, quatro (36,3%) apresentaram lama leve, dois (18,1%) tinham lama moderada e três (27,2%) exibiam lama acentuada. Já a concreção foi identificada em um único animal, medindo aproximadamente $2,02 \times 1,54$ cm, sem sinais de obstrução biliar.

No grupo com DM, as principais alterações identificadas foram a presença de lama biliar, dilatação do ducto cístico e suspeita de colecistite. A lama biliar foi a mais prevalente, encontrada em 11 animais (73,3%), sendo classificada como leve em quatro (26,6%), moderada em cinco (33,3%) e acentuada em dois (13,3%). Em dois casos, a lama leve estava associada à dilatação do ducto cístico. Além disso, três cães foram suspeitos de colecistite, dos quais dois apresentavam lama moderada e um, lama acentuada.

Entre os três cães com hipotireoidismo, a única alteração detectada foi a presença de lama biliar e suspeita de colecistite. Um animal (33,3%) não apresentou alterações ultrassonográficas na vesícula biliar, enquanto outro (33,3%) foi identificado com lama leve. O terceiro cão (33,3%) teve diagnóstico de suspeita de colecistite associada à mucocele, sem evidências de obstrução das vias biliares.

No grupo controle, a principal alteração observada foi a presença de lama biliar, identificada em 17 animais (65,4%). Desses, seis (23,1%) apresentaram lama leve, cinco (19,2%) tinham lama moderada e seis (23,1%) exibiram lama acentuada. Entre os casos de lama leve, um apresentava concreção, enquanto um dos cães com lama acentuada também apresentou dilatação do ducto cístico. Além disso, um animal (3,8%) foi diagnosticado com colelitíase. Por outro lado, 11 cães (42,3%) não apresentaram alterações ultrassonográficas na vesícula biliar.

As tabelas 1 e 2 trazem, respectivamente, as variáveis hematológicas e bioquímicas séricas dos caninos pertencentes ao grupo de endocrinopatas e ao grupo controle pareado.

Tabela 1. Variáveis hematológicas dos caninos pertencentes ao grupo de endocrinopatas e ao grupo controle pareado.

	ENDOCRINOPATAS	CONTROLES	VALOR DE REFERÊNCIA
Hematócrito (%)	(n=29) 46,55 (8,10-66,30)	(n=27) 47,0 (6,28-62,00)	37-55
CHCM (g/dL)	(n=29) 34,05 (1,59-36,30) a	(n=27) 33,0 (1,03-35,80) b	31-35
Leucócitos totais (x10³/uL)	(n=29) 12,40 (6,80-31,70) a	(n=28) 7,80 (4,40-13,90) b	6,0-17,0
Neutrófilos (cél/uL)	(n=29) 10184 (3900-30432) a	(n=28) 5425 (2156-9452) b	3000-11500
Monócitos (cél/uL)	(n=29) 644 (0-2120) a	(n=28) 231 (0-1148) b	150-1350
Linfócitos (cél/uL)	(n=29) 1325 (181-7072)	(n=28) 1512 (396-3090)	1000-4800
Plaquetas (x10³/uL)	(n=28) 466,60±182,90 a	(n=27) 354,20±169,80 b	200-500

Legenda: CHCM, concentração de hemoglobina corpuscular média. Dados não paramétricos estão representados por mediana (máx-min) e os paramétricos por média±desvio padrão.

O número de pacientes (n) em cada grupo varia devido à ausência de determinados exames laboratoriais em alguns prontuários, resultando em uma amostra menor para algumas variáveis analisadas.

*Letras diferentes na mesma linha representam variáveis bioquímicas séricas que se diferem significativamente ($p < 0,05$) entre os grupos estudados.

Tabela 2. Variáveis bioquímicas séricas dos caninos pertencentes ao grupo de endocrinopatas e ao grupo controle pareado.

	ENDOCRINOPATAS	CONTROLES	VALOR DE REFERÊNCIA
Colesterol (mg/dL)	(n=22) 278 (125,10-765) a	(n=29) 197 (93,10-618) b	135-270
Triglicerídeos (mg/dL)	(n=22) 153 (20-1627) a	(n=29) 75 (27-1293) b	20-112
Albumina (mg/dL)	(n=25) 3,66 (0,66-5,17)	(n=29) 3,58 (0,55-4,58)	2,6-3,3
PT (g/dL)	(n=15) 7,55 (6,30-12,29)	(n=28) 6,83 (5,57-10,48)	5,4-7,1
Creatinina (mg/dL)	(n=28) 0,88 (0,41-3,67)	(n=29) 0,93 (0,36-2,54)	0,5-1,5
Ureia (mg/dL)	(n=26) 48,40 (21,6-299,70)	(n=29) 34,60 (12,30-91,10)	15-45
FA (U/L)	(n=28) 369,30 (63-2117) a	(n=29) 122 (21,70-914) b	20-156
ALT (U/L)	(n=28) 98,50 (25-928) a	(n=29) 60 (14-393) b	21-102

Legenda: PT, proteína total; FA, fosfatase alcalina; ALT, alanina aminotransferase. Dados não paramétricos estão representados por mediana (máx-min) e os paramétricos por média±desvio padrão. O número de pacientes (n) em cada grupo varia devido à ausência de determinados exames laboratoriais em alguns prontuários, resultando em uma amostra menor para algumas variáveis analisadas.

*Letras diferentes na mesma linha representam variáveis bioquímicas séricas que se diferem significativamente ($p<0,05$) entre os grupos estudados.

A análise comparativa entre os grupos demonstrou que, dentre as variáveis hematológicas, os cães do grupo de endocrinopatias apresentaram valores significativamente superiores de leucócitos totais e neutrófilos ($p<0,0001$), monócitos ($p=0,0003$) e plaquetas ($p=0,0149$) em relação ao grupo controle. Além disso, a concentração de hemoglobina corpuscular média (CHCM) também apresentou diferença estatisticamente significativa ($p=0,0174$). Entre os parâmetros bioquímicos, as concentrações de colesterol ($p<0,0001$) e triglicerídeos ($p=0,0026$) foram significativamente superiores às do controle. As atividades de FA e ALT também foram mais elevadas ($p=0,0002$ e $p=0,0382$ respectivamente).

As tabelas 3 e 4 trazem, respectivamente, as variáveis hematológicas e bioquímicas séricas dos caninos pertencentes ao grupo de endocrinopatas e ao grupo controle pareado de acordo com os achados das vesículas biliares.

Tabela 3. Variáveis hematológicas de caninos com endocrinopatias e ao grupo controle pareado de acordo com os achados das vesículas biliares.

	LAMA BILIAR		MUCOCELE		COLECISTITE		COLELITÍASE		VALOR DE REFERÊNCIA
	Ausente	Presente	Ausente	Presente	Ausente	Presente	Ausente	Presente	
HT (%)	(n=18) 46,04±10,0	(n=39) 45,83±5,88	(n=55) 46,0±7,38	(n=2) 42,90±6,93	(n=53) 46,08±7,49	(n=4) 43,50±4,70	(n=56) 45,86±7,39	(n=1) 48,00±NaN	37-55
CHCM (g/dl)	(n=18) 33,73±1,28	(n=39) 33,49±1,45	(n=55) 33,55±1,37	(n=2) 33,80±2,55	(n=53) 33,59±1,38	(n=4) 33,27±1,73	(n=56) 33,61±1,36	(n=1) 31,00±NaN	31-35
Leucócitos totais (x10³/uL)	(n=18) 8,75 (5,90-22,1)	(n=39) 9,30 (4,40-31,70)	(n=55) 9,20 (4,40-31,70)	(n=2) 13,70 (6,80-20,60)	(n=53) 9,00 (4,40-31,70)	(n=4) 10,30 (6,80-23,00)	(n=56) 9,25 (4,40-31,70)	(n=1) 6,60 (6,60-6,60)	6,0-17,0
Neutrófilos (cél/uL)	(n=18) 6258 (3666-14981)	(n=39) 6720 (2156-30432)	(n=55) 6600 (2156-30432)	(n=2) 8319 (4896-11742)	(n=53) 6552 (2156-30432)	(n=4) 7635 (4896-20240)	(n=56) 6660 (2156-30432)	(n=1) 5544 (5544-5544)	3000-11500
Monócitos (cél/uL)	(n=18) 303 (0-1266)	(n=39) 396 (0-2120)	(n=55) 348 (0-2120)	(n=2) 857 (272-1442)	(n=53) 338 (0-2120)	(n=4) 552 (272-1720)	(n=56) 369 (0-2120)	(n=1) 0 (0-0)	150-1.350
Linfócitos (cél/uL)	(n=18) 1750a (1003-7072)	(n=39) 1197b (181-6592)	(n=55) 1485 (181-7072)	(n=2) 4010 (1428-6592)	(n=53) 1512 (181-7072)	(n=4) 1168 (460-1428)	(n=56) 1497 (181-7072)	(n=1) 396 (396-396)	1.000-4.800
Plaquetas (x10³/uL)	(n=17) 353,52± 162,62	(n=39) 448,38± 192,33	(n=54) 417,51± 180,92	(n=2) 475,50± 440,53	(n=52) 417,07± 186,76	(n=4) 452,25± 224,92	(n=55) 423,29± 187,24	(n=1) 216,00± NaN	200-500

Legenda: CHCM, concentração de hemoglobina corpuscular média, HT; hematócrito; NaN, dados perdidos. Dados não paramétricos estão representados por mediana (máx-min) e os paramétricos por média±desvio padrão.

O número de pacientes (n) em cada grupo varia devido à ausência de determinados exames laboratoriais em alguns prontuários, resultando em uma amostra menor para algumas variáveis analisadas.

*Letras diferentes na mesma linha representam variáveis bioquímicas séricas que se diferem significativamente (p<0,05) dentro de um mesmo achado de alteração de vesícula biliar.

Tabela 4. Variáveis bioquímicas séricas de caninos com endocrinopatia e ao grupo controle pareado de acordo com os achados das vesículas biliares.

	LAMA BILIAR		MUCOCELE		COLECISTITE		COLELITÍASE		VALOR DE REFERÊNCIA
	Ausente	Presente	Ausente	Presente	Ausente	Presente	Ausente	Presente	
Colesterol (mg/dL)	(n=15) 219 (114-481)	(n=36) 254 (93,10-765)	(n=49) 239 (93,10-765)	(n=2) 354 (224-483)	(n=48) 233 (93,10-765)	(n=3) 275 (224-295)	(n=50) 240 (93,10-765)	(n=1) 160 (160-160)	135-270
Triglicerídeos (mg/dL)	(n=15) 106 (41-604)	(n=36) 91,50 (20-1627)	(n=49) 92a (20-1452)	(n=2) 1116b (604-1627)	(n=48) 93,50 (27-1627)	(n=3) 274 (20-604)	(n=50) 98 (20-1627)	(n=1) 90 (90-90)	20-112
Albumina (mg/dL)	(n=16) 3,82±0,46	(n=39) 3,53±0,63	(n=54) 3,62±0,64	(n=1) 3,36±NaN	(n=52) 3,64±0,60	(n=3) 3,12±0,31	(n=54) 3,64±0,58a	(n=1) 2,39±NaNb	2,6-3,3
PT (g/dL)	(n=14) 6,87 (6,07-10,50)	(n=29) 7,14 (5,57-12,30)	(n=43) 7,09 (5,57-12,30)	(n=0) NaN NaN	(n=42) 7,12 (5,57-12,30)	(n=1) 6,64 (6,64-6,64)	(n=42) 7,12 (5,57-12,30)	(n=1) 5,63 (5,63—5,63)	5,4-7,1
Creatinina (mg/dL)	(n=18) 0,85 (0,36-2,54)	(n=39) 0,94 (0,41-3,67)	(n=55) 0,86 (0,36-3,67)	(n=2) 1,90 (1-2,79)	(n=53) 0,86 (0,36-3,67)	(n=4) 0,97 (0,63-2)	(n=56) 0,89 (0,36-3,67)	(n=1) 1,08 (1,08-1,08)	0,5-1,5
Ureia (mg/dL)	(n=17) 38,50 (12,30-96,50)	(n=38) 46,10 (20,60-300)	(n=54) 41,80 (12,30-300)	(n=1) 165 (165-165)	(n=52) 41,70 (12,30-300)	(n=3) 78,30 (41,80-161)	(n=54) 41,80 (12,30-300)	(n=1) 44,90 (44,90-44,90)	15-45
FA (U/L)	(n=18) 203 (57-914)	(n=39) 218 (21,70-2117)	(n=55) 204 (21,70-2.117)	(n=2) 578 (65-1.090)	(n=53) 218 (21,70-1.845)	(n=4) 125 (63-2.117)	(n=56) 211 (21,70-2.117)	(n=1) 54 (54-54)	20-156
ALT (U/L)	(n=18) 51a (14-393)	(n=39) 93b (28-928)	(n=55) 84 (14-928)	(n=2) 147 (44-250)	(n=53) 84 (14-928)	(n=4) 70,50 (44-406)	(n=56) 85 (14-28)	(n=1) 28 (28-28)	21-102

Legenda: PT, proteína total; FA, fosfatase alcalina; ALT, alanina aminotransferase.; NaN, dados perdidos. Dados não paramétricos estão representados por mediana (máx-min) e os paramétricos por média±desvio padrão.

O número de pacientes (n) em cada grupo varia devido à ausência de determinados exames laboratoriais em alguns prontuários, resultando em uma amostra menor para algumas variáveis analisadas.

*Letras diferentes na mesma linha representam variáveis bioquímicas séricas que se diferem significativamente ($p < 0,05$) dentro de um mesmo achado de alteração de vesícula biliar.

A análise comparativa das variáveis laboratoriais revelou diferenças relevantes entre os grupos com e sem alterações ultrassonográficas da vesícula biliar. Caninos com lama biliar (67%) apresentaram maior atividade da enzima ALT ($p=0,027$) e menor contagem linfocitária ($p=0,011$) em comparação aos cães sem lama biliar. Dentre os pacientes, 38% ($n=22$) possuíam níveis acima do intervalo de referência ideal, enquanto 60% ($n=34$) dentro do intervalo de referência, bem como para linfócitos, com 25% ($n=14$) abaixo, 72% ($n=41$) dentro e 3% ($n=2$) acima.

Embora o achado de mucocele ($n=2$) e colelitíase ($n=1$) tenha sido muito reduzido, níveis médios de triglicérides foram significativamente mais elevados nos cães com mucocele em relação aos cães sem a condição ($p=0,038$), sendo que destes últimos 30% ($n=6$) apresentam níveis triglicérides acima e 70% ($n=14$) dentro do intervalo de referência para a espécie. Além disso, o cão com colelitíase apresentou concentração sérica de albumina inferior aos cães sem colelitíase ($p=0,038$), estando estes 3% ($n=2$) abaixo, 70% ($n=38$) dentro e 27% ($n=15$) acima do intervalo de normalidade para cães. Não foram observadas diferenças significativas nas variáveis de cães com e sem endocrinopatias com colecistite ($n=4$).

Dentre os achados laboratoriais, trombocitose ($> 500 \times 10^3/\mu\text{L}$) e linfopenia (< 1000 céls/ μL) foram identificados como possíveis preditores para presença de lama biliar [OR 20,71; IC 95%: 2,46–2712,05; $p<0,01$ e OR 4,35; IC 95%: 1,10–24,53; $p=0,04$, respectivamente). Por outro lado, linfocitose ($> 4,80$ céls $\times 10^3/\mu\text{L}$) foi associada à presença de mucocele (OR 27,0, IC 95%: 1,54–597,62; $p=0,03$) e nenhuma alteração laboratorial foi identificada como preditora de colelitíase ou colecistite.

Discussão

Este estudo, de maneira inédita, desmistifica achados ultrassonográficos de vesículas biliares como preditores das principais endocrinopatias causadoras de hiperlipidemias. Com exceção da mucocele, que se apresentou em cães com hipertrigliceridemia, nenhuma outra anormalidade de vesícula biliar, incluindo lama biliar – em qualquer grau, apresentou-se correlata a qualquer dado epidemiológico, clínico ou laboratorial preditor. Ao analisar as apresentações das variáveis hematológicas dos caninos participantes do estudo percebe-se que, embora os valores estejam dentro do intervalo de referência para a espécie, existe a manifestação de leucocitose por neutrofilia, sem desvio à esquerda e monocitose nos endocrinopatas. Esse padrão que é

característico de um leucograma de estresse, pode ser justificado pela maior representatividade de cães com hipercortisolismo, principalmente doença endócrina correlata a este perfil hematológico (Behrend et al, 2013). Além disso, o aumento no valor das plaquetas, quando comparado ao grupo controle, também é compatível com o hipercortisolismo (Behrend et al, 2013), reforçando essa associação, visto que essa foi a endocrinopatia predominante no estudo.

Dentre as variáveis bioquímicas, foram observados aumentos das atividades de enzimas típicas de doenças endócrinas, como ALT, FA, bem como de colesterol e triglicérides (Behrend et al., 2013; Behrend et al., 2018; Lathan, 2023), com os três últimos superando os valores de referência. Embora a ALT esteja dentro do intervalo de referência, seu valor encontra-se próximo ao limite superior e apresentou aumento quando comparada ao grupo controle, o que a torna uma enzima relevante na avaliação de doenças endócrinas. Em cães endocrinopatas, as atividades de ALT e FA estão significativamente elevadas, refletindo estresse hepático (Tinted, et al., 2023). Além disso, é comum observar alterações no metabolismo lipídico, com níveis elevados de triglicérides e colesterol (Xenoulis, Steiner, 2010; Xenoulis, Steiner, 2015). Esses achados corroboram estudos anteriores, que indicam que distúrbios endócrinos agravam as anormalidades no metabolismo lipídico e no perfil hepático (Kim et al., 2025, Tinted, et al., 2023).

A presença de lama biliar foi a alteração ultrassonográfica mais frequente, tanto em cães com endocrinopatias quanto no grupo controle. No entanto, não houve uma correlação direta entre a presença de lama biliar e a presença de endocrinopatias, sugerindo que esse achado pode estar mais relacionado a fatores inespecíficos como a idade avançada (Cook; Jambhekar; Dylewski, 2016), do que a distúrbios endócrinos específicos. Essa associação com a idade foi reforçada pelos nossos resultados, uma vez que a maioria dos pacientes avaliados tinha entre 7 e 11 anos.

A prescrição de ácido ursodesoxicólico tem sido recomendada para o tratamento da mucocele de vesícula biliar, sendo estendida sua utilização ao manejo da lama biliar (Saunders; Thornton; Burchell, 2017). No entanto, é fundamental considerar as particularidades de cada paciente, uma vez que muitos cães permanecem assintomáticos, e a resolução espontânea da condição pode ocorrer em alguns casos. Além disso, nem toda lama biliar progride para a formação de mucocele, o que ressalta a importância de uma avaliação criteriosa antes da instituição do tratamento (DeMonaco et al., 2016).

O aumento da ALT em cães com lama biliar pode indicar estresse hepatocelular associado à bile espessa e à possível redução do esvaziamento vesicular, como já descrito em estudos

anteriores (Tsukagoshi et al., 2011), podendo também estar associado às condições subjacentes, como alterações hepáticas.

Embora a mucocele tenha sido um achado raro na população estudada, sendo descrita apenas em um paciente com DM e um hipotireoideo, cães com essa condição apresentaram níveis significativamente mais elevados de triglicédeos, estando de acordo com a literatura, que associa a dislipidemia ao desenvolvimento dessa alteração vesicular (Kutsunai et al., 2014). Em relação à colelitíase, apenas um animal apresentou esse achado, no entanto, foi observado níveis séricos reduzidos de albumina, o que pode estar associado a um processo inflamatório crônico.

Mesmo que haja tendências em se considerar que alterações no metabolismo lipídico possam influenciar na formação de diversas alterações biliares, a presença de lama biliar não apresentou correlação significativa com os níveis séricos de triglicédeos, nem de colesterol, contrariando essa hipótese. Embora seja amplamente aceito que a hiperlipidemia possa comprometer a motilidade da vesícula biliar e predispor à formação de mucocele (Kutsunai et al., 2014), a ausência de uma relação entre lama biliar e hiperlipidemia sugere que mecanismos fisiopatológicos distintos possam estar envolvidos nesses processos. Esse achado é corroborado por Cook, Jambhekar e Dylewski (2016), que, ao avaliar achados ultrassonográficos e clínicos de vesículas biliares, também não encontrou correlação entre as concentrações de colesterol e FA e a presença de lama biliar, reforçando a complexidade dos fatores envolvidos na sua formação.

Dessa forma, os dados obtidos reforçam a necessidade de novas investigações sobre os fatores predisponentes da lama biliar, especialmente no contexto de endocrinopatias, para determinar se há outros biomarcadores ou condições que possam desempenhar um papel mais relevante na sua gênese. Considerando também que o trabalho de Mesich et al. (2009) identificou uma relação significativa entre mucocele e doenças endócrinas, mas sem esclarecer completamente os mecanismos envolvidos, é essencial aprofundar a pesquisa para entender se a lama biliar pode ser um estágio inicial no desenvolvimento da mucocele ou se representa um fenômeno independente influenciado por fatores sistêmicos distintos.

A principal limitação do estudo foi o reduzido número amostral, o que pode impactar nos resultados e limitar o uso para a população canina em geral. Além disso, trata-se de um estudo retrospectivo, sujeito a vieses na coleta de dados, uma vez que as informações dependem da precisão e padronização dos registros médicos e exames realizados. Diante disso, estudos prospectivos com número amostral maior são necessários para confirmar as tendências observadas

e aprofundar a compreensão da relação entre as alterações de vesículas biliares e as endocrinopatias.

Embora a lama biliar seja frequentemente identificada, sua relação com dislipidemias não foi confirmada, sugerindo que outros fatores possam influenciar sua formação. A mucocele, por outro lado, manteve sua associação com hipertrigliceridemia, reforçando a necessidade de atenção a esse perfil metabólico. Nenhuma alteração de vesícula biliar foi identificada como preditor para presença de endocrinopatias, assim como nenhum dado epidemiológico ou clínico. Diante disso, estudos prospectivos com amostras maiores são essenciais para esclarecer a relevância clínica dessas alterações e definir estratégias de manejo mais fundamentadas em evidências.

Referências

- Aguirre, A.L., Center, S.A., Randolph, J.F., Yeager, A.E., Keegan, A.M., Harvey, H.J. and Erb, H.N. (2007). Gallbladder disease in Shetland Sheepdogs: 38 cases (1995–2005). *Journal of the American Veterinary Medical Association*, [online] 231(1), pp.79–88. doi:<https://doi.org/10.2460/javma.231.1.79>.
- Behrend, E., Holford, A., Lathan, P., Rucinsky, R. and Schulman, R. (2018). 2018 AAHA Diabetes Management Guidelines for Dogs and Cats*. *Journal of the American Animal Hospital Association*, [online] 54(1), pp.1–21. doi:<https://doi.org/10.5326/jaaha-ms-6822>.
- Behrend, E.N., Kooistra, H.S., Nelson, R., Reusch, C.E. and Scott-Moncrieff, J.C. (2013). Diagnosis of Spontaneous Canine Hyperadrenocorticism: 2012 ACVIM Consensus Statement (Small Animal). *Journal of Veterinary Internal Medicine*, [online] 27(6), pp.1292–1304. doi:<https://doi.org/10.1111/jvim.12192>.
- Butler, T., Bexfield, N., Dor, C., Fantaconi, N., Heinsoo, I., Kelly, D., Kent, A., Pack, M., Spence, S.J., Ward, P.M., Watson, P. and McCallum, K.E. (2022). A multicenter retrospective study assessing progression of biliary sludge in dogs using ultrasonography. *Journal of Veterinary Internal Medicine*, [online] 36(3), pp.976–985. doi:<https://doi.org/10.1111/jvim.16423>.
- Cook, A.K., Jambhekar, A.V. and Dylewski, A.M. (2016). Gallbladder Sludge in Dogs: Ultrasonographic and Clinical Findings in 200 Patients. *Journal of the American Animal Hospital Association*, [online] 52(3), pp.125–131. doi:<https://doi.org/10.5326/jaaha-ms-6282>.
- DeMonaco, S.M., Grant, D.C., Larson, M.M., Panciera, D.L. and Leib, M.S. (2016). Spontaneous Course of Biliary Sludge Over 12 Months in Dogs with Ultrasonographically Identified Biliary

Sludge. *Journal of Veterinary Internal Medicine*, [online] 30(3), pp.771–778.
doi:<https://doi.org/10.1111/jvim.13929>.

Firth, D. (1993). Bias reduction of maximum likelihood estimates. *Biometrika*, [online] 80(1), pp.27–38. doi:<https://doi.org/10.1093/biomet/80.1.27>.

Kim, T.-W., Kang, M.-H. and Park, H.-M. (2025). Lipid Metabolism Alterations in Hyperlipidemic Dogs with Biliary Tract or Endocrine Diseases. *Animals*, [online] 15(2), pp.256–256. doi:<https://doi.org/10.3390/ani15020256>.

Kutsunai, M., Kanemoto, H., Fukushima, K., Fujino, Y., Ohno, K., & Tsujimoto, H. (2014). The association between gall bladder mucoceles and hyperlipidaemia in dogs: A retrospective case control study. *The Veterinary Journal*, 199(1), 76–79. doi:10.1016/j.tvjl.2013.10.019

Lathan, P. (2022). Laboratory Diagnosis of Thyroid and Adrenal Disease. *Veterinary Clinics of North America Small Animal Practice*, [online] 53(1), pp.207–224.
doi:<https://doi.org/10.1016/j.cvsm.2022.08.005>.

Mesich, M.L.L., Mayhew, P.D., Paek, M., Holt, D.E. and Brown, D.C. (2009). Gall bladder mucoceles and their association with endocrinopathies in dogs: a retrospective case-control study. *Journal of Small Animal Practice*, [online] 50(12), pp.630–635.
doi:<https://doi.org/10.1111/j.1748-5827.2009.00811.x>.

Pike, F.S., Berg, J., King, N.W., Penninck, D.G. and Cynthia (2004). Gallbladder mucocele in dogs: 30 cases (2000–2002). *Journal of the American Veterinary Medical Association*, [online] 224(10), pp.1615–1622. doi:<https://doi.org/10.2460/javma.2004.224.1615>.

Saunders, H., Thornton, L.A. and Burchell, R. (2017). Medical and surgical management of gallbladder sludge and mucocele development in a Miniature Schnauzer. *International Journal of Veterinary Science and Medicine*, [online] 5(1), pp.75–80.
doi:<https://doi.org/10.1016/j.ijvsm.2017.01.002>.

Teixeira, F., Aicher, K. and Duarte, R. (2024). Nutritional Factors Related to Canine Gallbladder Diseases—A Scoping Review. *Veterinary Sciences*, [online] 12(1), p.5.
doi:<https://doi.org/10.3390/vetsci12010005>.

Tinted, N., Pongcharoenwanit, S., Ongvisespaibool, T., Wachirodom, V., Jumnansilp, T., Buckland, N., Chuchalernporn, P., Soontarak, S., Pairor, S., Steiner, J.M., Thengchaisri, N., Assawarachan, S. N. (2023). Serum Bile Acids Concentrations and Liver Enzyme Activities after Low-Dose Trilostane in Dogs with Hyperadrenocorticism. *Animals*, [online] 13(20), pp.3244–3244. doi:<https://doi.org/10.3390/ani13203244>.

Tsukagoshi, T., Ohno, K., Tsukamoto, A., Fukushima, K., Takahashi, M., Nakashima, K., Fujino, Y. and Tsujimoto, H. (2011). Decreased gallbladder emptying in dogs with biliary sludge or

gallbladder mucocele. *Veterinary Radiology & Ultrasound*, [online] 53(1), pp.84–91. doi:<https://doi.org/10.1111/j.1740-8261.2011.01868.x>.

Xenoulis, P.G. and Steiner, J.M. (2010). Lipid metabolism and hyperlipidemia in dogs. *The Veterinary Journal*, [online] 183(1), pp.12–21. doi:<https://doi.org/10.1016/j.tvjl.2008.10.011>.

Xenoulis, P.G. and Steiner, J.M. (2015). Canine hyperlipidaemia. *Journal of Small Animal Practice*, [online] 56(10), pp.595–605. doi:<https://doi.org/10.1111/jsap.12396>.

ANEXO 2 - NORMAS DA REVISTA (*Journal of Small Animal Practice (JSAP)*)

Before you start

Authors are advised to review the following instructions carefully when preparing manuscripts. Failure to conform to these guidelines may result in the manuscript being returned.

Journal of Small Animal Practice (JSAP) covers veterinary medicine and surgery relating to dogs, cats and other companion animals. The target audience is primarily veterinarians in all types of small animal practice, including academic and other referral practice.

Authors should particularly note the following:

- Preference is given to reports on studies on prospectively, or previously-collected, data that were subject to analytical methods formalised prior to acquisition or retrieval of that data. This priority will be given to studies with a pre-planned protocol whether the results are inconclusive or not.
- JSAP offers assistance in designing, running and analysing clinical research projects – see **Study Design and Protocol – CRAG**.
- Reports on outcomes of series of cases treated by novel methods will be accepted for review and do not necessarily require extensive statistical analysis.
- Review articles are usually commissioned by the Editor but non-commissioned reviews may be considered provided they add materially to the current published literature, either by the inclusion of different or extra studies and/or by the conclusions drawn.
- Traditional case reports are **rarely accepted**. Reports of single or small numbers of cases will be considered if the case(s) are exceptional, or the report contributes materially to the published literature; these criteria will be strictly applied.
- The work described in any paper or case report should conform to the UK legal framework pertaining to animal welfare, ethics and data protection. See below for more details.

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Study Design and Protocol- The Clinical Research Assessment and Guidance (CRAG) Panel

The CRAG panel is an initiative by JSAP to provide assistance in designing, running and analysing clinical research projects. The hope is that this will ease the path to publication for primary care veterinarians and house officers who wish to undertake high quality small animal clinical research. The concept is that an individual or group can come up with the idea for a clinical study and then work with the CRAG panel to refine the methodology so that the project will be feasible and likely to come up with reliable answers.

Upon approval of the study design and analysis plan there will be an assumption that - if the study is carried out according to the approved protocol - the finished article will be accepted for publication (following an accelerated peer-review process). It is hoped that the expectation of acceptance for publication would be a weight off the mind of those in specialist training programs

intent on timely completion of their credentials. The panel also welcomes enquiries from practitioners who are interested in initiating or collaborating on research projects.

The CRAG panel currently consists of Professor Nick Jeffery, Professor Richard Mellanby of the University of Edinburgh, Professor Lauren Trepanier of the University of Wisconsin-Madison and Dr Rachel Dean who is Director of Clinical Research and Excellence in Practice at VetPartners.

If you would like to discuss ideas or submit a protocol to the CRAG panel please contact the [Editor-in-Chief](#). A series of questions that you may wish to consider in advance is available [here](#).

Read [Scaling the CRAG to smooth the path to publication in JSAP](#)

Welfare and Ethical Considerations

All material published in JSAP must adhere to high ethical and welfare standards. The work described in any paper or case report should conform to the UK legal framework pertaining to animal welfare, ethics and data protection. Prior to acceptance of a manuscript, the authors must certify that all relevant legal and ethical requirements have been met with regards to the humane treatment of animals described in the study. Where required, the author(s) must specify in the Materials and Methods the ethical review committee approval process and the international, national, and/or institutional guidelines followed. Manuscripts and authors that fail to meet these requirements and studies that involve unnecessary pain, distress, suffering, or lasting harm to animals will not be considered for review. The Editor retains the right to reject manuscripts on the basis of any of the above welfare, legal, ethical or clinical concerns; in case of doubt prior to submission authors should contact the [Editor-in-Chief](#).

JSAP is a member of the [Committee on Publication Ethics \(COPE\)](#). Note this journal uses iThenticate's CrossCheck software to detect instances of overlapping and similar text in submitted manuscripts. Read Wiley's Top 10 Publishing Ethics Tips for Authors [here](#). Wiley's Publication Ethics Guidelines can be found [here](#).

Publications by the Editor, Associate Editors or Editorial Board members

At JSAP, the Editor, Associate Editors and Editorial Board members are never involved in editorial decisions about their own original research articles, review articles and case reports. The Editor, Associate Editors, Editorial Board members and other editorial staff (including peer reviewers) will withdraw from discussions about submissions where any circumstances might prevent him/her offering unbiased editorial decisions. In particular, when editorial decisions are required about peer reviewed articles where the Editor, Associate Editors, or Editorial Board member is an author or is acknowledged as a contributor, the affected Editor or Editorial Board member will exclude themselves and are not involved in the publication decision. When Editors are presented with papers where their own interests may impair their ability to make an unbiased editorial decision

(e.g. when it originates from the Editor's own institution), decisions about the papers are deputised to a suitably qualified individual.

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Submission

Please ensure that you have read these guidelines before submitting your contribution. Please note that submission implies that the content has not been published or concurrently submitted for publication elsewhere except as a brief abstract in the proceedings of a scientific meeting or symposium, or as a preprint on a preprint server.

Once the submission materials have been prepared in accordance with the Author Guidelines, manuscripts should be submitted online via Research Exchange at <https://wiley.atyponrex.com/journal/JSAP>.

For technical help with the submission system, please review Wiley's Research Exchange Author Help Documents or contact submissionhelp@wiley.com.

Data

Protection:

By submitting a manuscript to or reviewing for this publication, your name, email address, and affiliation, and other contact details the publication might require, will be used for the regular operations of the publication, including, when necessary, sharing with the publisher (Wiley) and partners for production and publication. The publication and the publisher recognize the importance of protecting the personal information collected from users in the operation of these services, and have practices in place to ensure that steps are taken to maintain the security, integrity, and privacy of the personal data collected and processed. You can learn more at <https://authorservices.wiley.com/statements/data-protection-policy.html>.

Preprint

Policy:

JSAP will consider for review articles previously available as preprints on non-commercial servers such as ArXiv, bioRxiv, psyArXiv, SocArXiv, engrXiv, etc. Authors may also post the submitted version of a manuscript to non-commercial servers at any time. Authors are requested to update any pre-publication versions with a link to the final published article.

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Manuscript Categories

JSAP currently publishes the following types of articles:

Original Articles

Original

Article:

Whilst there is no specified maximum length for original articles, it is expected that authors will be concise. It is expected that original articles will be between 3000 and 5000 words in total (excluding abstract and references). They may contain up to 30–40 references. For further information about layout, format and style, please see below. JSAP is predominantly a clinical journal; however, we do occasionally publish laboratory and animal research, but only where there

is a clear clinical focus. We also occasionally publish articles describing quality improvement exercises or audit cycles.

Each paper should comprise the following sections:

Title – the title should clearly report the content of the article. For original research currently at JSAP we accept both declarative and descriptive titles. We encourage authors that present results of focused original researches with solid results to provide a declarative title (e.g. “The use of thermometer protective sheets provides reliable measurement of rectal temperature”, available at: <https://onlinelibrary.wiley.com/doi/abs/10.1111/jsap.13119>). Case series should have descriptive titles, and should report the number of cases together with the dates of inclusions at the end of the title, after a colon (e.g. “Clinical findings, neurological manifestations and survival of dogs with insulinoma: 116 cases (2009-2020)”, available at: <https://onlinelibrary.wiley.com/doi/10.1111/jsap.13318>)”

Structured Summary – concise, <250 words, divided, under separate headings, into Objectives, Methods, Results, and Clinical Significance, i.e. a brief (2 sentence) statement explaining the impact of the work on small animal primary care or referral clinical practice. The Summary should not contain P values, but should report measures of treatment (or disease) effect size (e.g. relative risk, odds ratio, difference in means) with 95% confidence intervals, if available. The Summary should not contain non-standard abbreviations or acronyms.

Introduction– concise description of closely related work which has led up to the current study plus statement of rationale and objectives. A typical introduction should include 3-4 paragraphs, including the objectives.

Materials and Methods – clear description of experimental and statistical methods and procedures (in sufficient detail to allow others to reproduce the work, or provision of references that contain appropriate method descriptions). The Materials and methods section should include the following subheadings when applicable: study design and inclusion criteria, outcomes, treatment(s) administered (or diagnostic(s) performed) – this subheading can be named with the actual name of the treatment or the diagnostic technique, statistical analysis (or data analysis). Materials and methods of case series should include the following subheadings when applicable: study design and inclusion criteria, medical record search, data extracted, treatment(s) administered (or diagnostic(s) performed) – this subheading can be named with the actual name of the treatment or the diagnostic technique, data analysis (if performed).

Results – stated concisely, and in logical sequence, with tables or figures as appropriate. Avoid duplication between tables, figures and text. The Results section of original research should report reasons for inclusion and exclusion of patients that resulted in the final population analysed, results of primary outcomes and secondary outcomes. The use of subheadings is encouraged. P values should never be reported in the text without associated measures of treatment (or disease) effect size (e.g. difference in means, odds ratios, relative risk) and their 95% confidence intervals. For case series, the following subheadings are suggested when applicable: patient inclusion, signalment and anamnesis, reasons for presentation, physical examination findings, clinicopathologic analyses (i.e. results of blood work), diagnostic imaging findings, diagnosis, clinical management (i.e. treatment administered), treatment(s)(this subheading may have a title that reflect the treatment

itself), outcomes, pathological findings (i.e. results of necropsies or histopathology). Expansion or collapse of these subheadings is possible depending on the focus of the case series.

Discussion – concise and focused with emphasis on new and important implications of the results and how these relate to other studies. A typical discussion is composed by 4-6 paragraphs, including one paragraph on limitations, one paragraph on generalisability and one conclusive paragraph.

PetSavers

Article:

Papers that report studies funded by the BSAVA's charitable division, [PetSavers](#)

Case

Reports

Traditional

case

reports:

There is limited space available for inclusion of traditional case reports in JSAP. Reports of one to three cases will be considered for publication in JSAP as case reports if they are exceptionally unusual or the report contributes materially to the literature. For four or more cases that have something in common authors should present the information as original articles.

A case report should not exceed ~1500 words and must comprise:

Title – descriptive title clearly highlighting that the report include one, two or three cases

Summary (maximum 150 words).

Introduction – brief overview of the subject. In case of the description of a treatment, the report must state whether this is the only case (or cases) treated by the institution (or the individual doctor) with that approach and how that has been ensured (e.g. medical record search).

Case history (histories if more than one case) – containing clinical detail. If two or three cases are included, results should be provided for each individual animal in a separated fashion (e.g. Case 1, Case 2, Case 3).

Discussion – describing the importance of the report and its novel findings.

To be considered for publication in JSAP a single case report must:

- Describe a substantially novel presentation (ideally including clear pathological diagnosis); or
- Describe a technique or treatment that would substantially alter management and prognosis of the described condition (in this case ideally more than one case should be reported); or
- Be the undisputable first clinical report or first case(s) of diseases in a particular location where epidemiology is a factor (e.g. Ebola in a dog in the UK).

In their cover letter authors should indicate how their report fulfils one (or more) of these criteria.

Challenging

case

narrative:

The content of these reports will follow those of traditional case reports but also include

interpolated commentary describing the rationale for decision-making at all stages and may include Q&A components as part of the explanation of choices made during case management.

Images in small animal practice: Some cases may best be reported as “Images in small animal practice”. This article category will fit onto a single printed page of the journal. These reports are limited to 300 words in length, with no references and no abstract. There should be a single image, though this can be composed of multiple panels (an image with 2 panels is ideal, however a maximum of 4 panels is permitted). The authors should provide a word count for the text at the start of the article. Articles that exceed the word count or do not fit the guidelines will be rejected.

Typical images are high quality images of a lesion, or images that highlight the important clinical aspects of the case. Alternatively, the image can be a graph or table(s) illustrating a specific point about the type of case the authors are highlighting, e.g. illustrating changes in blood sugar levels, or survival curves etc. Look for examples of this format in a recent issue of the JSAP. Particularly striking images may be published on the front cover of the journal issue for that month.

Other

Articles

If you would like to discuss topics for any of these article types please contact the [Editor-in-Chief](#).

Reviews:

JSAP welcomes both narrative and systematic reviews of potential interest to our readers, provided they add materially to the current published literature, either by the inclusion of different or extra studies and/or by the conclusions drawn. Even a narrative review should be a structured assessment of the literature and should include a description of how articles have been selected, and a full search strategy if appropriate. It would also need some analysis and comment, not just a listing of the literature and reporting the results. It should also include an analysis of the quality of the literature. Review articles would usually be up to 6000 words of text, plus references. When submitting a review please choose the appropriate article type:

- Review: A narrative review.
- Systematic Review: A systematic review.

Mini

Reviews:

Mini-reviews are designed to provide a brief assessment of the scientific evidence and practical recommendations on important or controversial subjects. They are typically around 2000 words plus references. They may appear as a series focusing on a particular topic. This category includes [WSAVA Capsule Reviews](#).

Editorials:

Editorials are written or commissioned by the editorial team. Our editorials focus on specific topics pertaining to the JSAP, to small animal practice in general, or to articles published in the same issue.

Letters

to

the

Editor:

Letters describing original material items of interest, or replies to previously published material,

may be published in JSAP and may be peer-reviewed prior to publication. Letters commenting on recently published papers will be considered and the authors of the original paper will be invited to respond. Letters are limited to 300 words.

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Preparing your Submissions

Wiley has a range of resources for authors preparing manuscripts for submission available [here](#). In particular, we encourage authors to consult Wiley's best practice tips on [Writing for Search Engine Optimization](#).

Article	Preparation	Support
Wiley Editing Services offers expert help with English Language Editing, as well as translation, manuscript formatting, figure illustration, figure formatting, and graphical abstract design – so you can submit your manuscript with confidence.		

Also, check out our resources for [Preparing Your Article](#) for general guidance about writing and preparing your manuscript.

Cover sheet:

Any author wishing to make a submission must send a covering letter with their manuscript, emphasising the particular reason(s) why the report should be considered for publication.

Authorship:

The journal follows the [ICMJE definition of authorship](#), which indicates that authorship be based on the following 4 criteria:

- Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
- Drafting the work or revising it critically for important intellectual content; AND
- Final approval of the version to be published; AND
- Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

In addition to being accountable for the parts of the work he or she has done, an author should be able to identify which co-authors are responsible for specific other parts of the work. In addition, authors should have confidence in the integrity of the contributions of their co-authors. All those designated as authors should meet all four criteria for authorship, and all who meet the four criteria should be identified as authors. Those who do not meet all four criteria should be acknowledged. These authorship criteria are intended to preserve the status of authorship for those who deserve credit and can take responsibility for the work. The criteria are not intended for use as a means to disqualify colleagues from authorship who otherwise meet authorship criteria by denying them the opportunity to meet the second or third criteria. Therefore, all individuals who meet the first criterion should have the opportunity to participate in the review, drafting, and final approval of the manuscript.

JSAP recognises the importance of collaborative work in generating large case numbers and will look favourably on larger author groups where multi-centre work is being presented.

Author Name Changes:
In cases where authors wish to change their name following publication, Wiley will update and republish the paper and redeliver the updated metadata to indexing services. Our editorial and production teams will use discretion in recognizing that name changes may be of a sensitive and private nature for various reasons including (but not limited to) alignment with gender identity, or as a result of marriage, divorce, or religious conversion. Accordingly, to protect the author's privacy, we will not publish a correction notice to the paper, and we will not notify co-authors of the change. Authors should contact the journal's Editorial Office with their name change request.

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In accordance with [Wiley's Best Practice Guidelines on Research Integrity and Publishing Ethics](#) and the [Committee on Publication Ethics' guidance](#), the *Journal of Small Animal Practice* will allow authors to correct authorship on a submitted, accepted, or published article if a valid reason exists to do so. All authors – including those to be added or removed – must agree to any proposed change. To request a change to the author list, please complete the [Request for Changes to a Journal Article Author List Form](#) and contact either the journal's editorial or production office, depending on the status of the article. Authorship changes will not be considered without a fully completed Author Change form. [Correcting the authorship is different from changing an author's name; the relevant policy for that can be found in [Wiley's Best Practice Guidelines](#) under "Author name changes after publication."]

Conflict of interest:

Authors are required to disclose any possible conflict of interest, this may include financial support including consultancies, speaker's fees; any gift, income, funding or other material benefit, unsolicited or otherwise, from a commercial company or individual, even if it was not restricted to the project described in the submission. If in doubt, please ask the editor for guidance about declaring a possible conflict. If the author does not have a conflict of interest, please include the following statement: 'No conflicts of interest have been declared'.

Acknowledgements:

Contributions from anyone who does not meet the criteria for authorship should be listed, with permission from the contributor, in an Acknowledgments section. See section on Authorship for more detail. Financial and material support should also be mentioned. Thanks to anonymous reviewers are not appropriate.

Title page:

A title page is required for all manuscript types. This must contain the title of the paper, names and qualifications of all authors, affiliations and full mailing address including e-mail addresses, and contact telephone number of corresponding author. In addition, details of any acknowledgements

should be given on the title page. The title page must also contain details of the source(s) of support in the form of grants, equipment, drugs or all of these.

Manuscripts:

Manuscripts should be headed with the full title, which should describe accurately the subject matter. JSAP operates a system of double-blinded review and so **author details must not** be included within the manuscript. Authors should avoid including within the manuscript the name of the institution at which the work was performed and initials of the authors; institution names must be removed from illustrations to maintain anonymity.

Manuscripts must be double-spaced for the purpose of peer reviewing.

Authors should refer to the EQUATOR guidelines <http://www.equator-network.org/> to ensure inclusion of appropriate information.

Keywords:

Keywords are required for all articles. Authors can provide up to six keywords for publication during the submission process. These should be different from those used in the title and reflect the manuscript content. Keywords will help your article to be discovered via online searches – many students and researchers looking for information online will use search engines, and by optimising your article for search engines you will increase the chance of someone finding it. This in turn will make it more likely to be viewed and/or cited in another work. Authors may benefit from referring to Wiley's best practice tips on [Writing for Search Engine Optimization](#).

Terminology:

All units of measurement should be given in the metric system or in SI units. Temperatures should be in °C.

Drugs should be referred to by Recommended International Non-Proprietary Name, followed by proprietary name and manufacturer in brackets when first mentioned, e.g., fenbendazole (Panacur; Intervet).

Anatomical terminology should conform to the nomenclature published in the *Nomina Anatomica Veterinaria* (1983) 3rd edn. Eds R. E. Habel, J. Frewein and W. O. Sack. World Association of Veterinary Anatomists, Ithaca, New York.

English usage:

Writing should conform to UK English, and acceptable English usage must be presented within the manuscript. Where abbreviations are used, the word or phrase must be given in full on the first occasion. Abstracts should not contain any abbreviations or acronyms. If you are not a native English speaker, it is recommended that you have your manuscript professionally edited before

submission. [Wiley Editing Services](#) can greatly improve the chances of a manuscript being accepted. Offering expert help in English language editing, translation, manuscript formatting, and figure preparation, Wiley Editing Services ensures that the manuscript is ready for submission.

Length:

Please see the Manuscript Categories section above for information on the expected number of words for different types of article. Authors should indicate the word count at the beginning of the manuscript.

Statistical analysis:

Authors must describe the rationale for statistical testing; for prospective studies this will be clearly apparent and inseparable from the research question. For analysis of retrospective data the rationale and hypothesis must be clearly stated, along with the pre-defined study question and analytical methods. Authors should consider whether statistical analysis aids in interpretation of data and is not necessarily required in any but prospective studies.

Tables:

These should be limited to those containing data important to understanding and interpreting results and reducing or clarifying the text. Type each table (single line spacing) into a separate document and upload as separate files. Tables should be numbered consecutively in the order of the first citation in the text – please ensure each table is cited in the text.

Legends should be included with the table document. Legends should be concise but comprehensive – the table, legend, and footnotes must be understandable without reference to the text. Give each column a short or abbreviated heading. Place explanatory material in footnotes, not in the heading. All abbreviations must be defined in footnotes. Footnote symbols: †, ‡, §, ¶, should be used (in that order) and *, **, *** should be reserved for P-values. Statistical measures such as SD or SEM should be identified in the headings.

Figures:

All illustrations (line drawings, photographs, and photomicrographs) are classified as figures. The minimum number of figures necessary to clarify the text should be included and should contain only essential data. Figures should be numbered using Arabic numerals, and cited in consecutive order in the text – please ensure each figure is cited in the text. Figures must not be submitted within the manuscript (main document) file, but must be uploaded as separate files, with the figure number incorporated in the file name.

If your figure has a caption, it should not be condensed into the figure. Captions should be selectable text. Captions are different from figure legends. Figure legends should be included at the end of the manuscript. Legends should be concise but comprehensive – the figure and its legend

must be understandable without reference to the text. Include definitions of any symbols used and define/explain all abbreviations and units of measurement.

Supporting information:

Supporting information is information that is not essential to the article, but provides greater depth and background. It is hosted online and appears without editing or typesetting. It may include tables, figures, videos and datasets. [Click here](#) for Wiley’s FAQs on supporting information.

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Guidelines for Images

Although authors are encouraged to send the highest-quality figures possible, for peer-review purposes, a wide variety of formats, sizes, and resolutions are accepted.

[Click here](#) for the basic figure requirements for figures submitted with manuscripts for initial peer review, as well as the more detailed post-acceptance figure requirements.

General

considerations:

The purpose of an image in a scientific publication is to demonstrate a feature that cannot be as effectively described with text. Select images that illustrate the point you are trying to make. Images should be cropped to a level that focuses on the illustrated feature, while still including a minimum of features that allow anatomical region identification for the reader. Images should be presented in the colour scale they were originally obtained. For most diagnostic imaging modality images, this will be a greyscale image without any colour hue. The label of an image should not exactly replicate the text passage it was indexed in, but should be more specific than the text.

Graphs:

To ensure high-quality reproduction, symbols should be clear and even throughout and of sufficient size, that when reduced for publication, each item will still be legible. Letters, numbers and titles belong in the legends for illustrations, not on the illustrations themselves. However, the A, B, C legends will be transposed onto image by typesetters. When symbols, arrows, numbers or letters are used to identify parts of the illustrations, identify and explain each one clearly in a key. Symbols and arrows identifying specific structures must “touch” these structures, and not be beside them. The symbol size should be sufficiently big to display well on a 4” x 3” format.

Where possible, dot plots (jittered if necessary) are preferred to box-and-whisker or bar charts, especially when animal number is <30.

Checklist for authors:

- Area of interest (particularly when arrowed!) is visible on printed image
- Arrows used to point out areas of interest if unusual or difficult to see
- Image is of sufficient size to clearly show lesion – normally recommend image at least 1.5-2 column width
- Radiographs and other diagnostic images correctly orientated (standard viewing orientation e.g. DV images presented with left on right side etc)

- Radiographs presented greyscale (not colour tinted)
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