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Asthma, Feline
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Canine Infectious Respiratory Disease Complex
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Cervical Spondylomyelopathy
Cholangitis Complex of Cats
Chronic Kidney Disease
Chylothorax
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Corneal Ulceration
Cranial Cruciate Ligament Injury
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Heart Failure
Heartworm Disease
Hemangiosarcoma
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Urinary Tract Infections
Urolithiasis
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HOW-TO INSTRUCTIONS

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How to Count Respirations and Monitor
Respiratory Effort
How to Take a Pet's Temperature

Surgical and Postoperative Care

How to Assemble and Use an Elizabethan
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How to Assist a Pet That Is Unable to Rise and
Walk
How to Assist During a Cesarean Section
(C-section)
How to Care for a Dog in a Cart/Wheelie
How to Monitor Anesthetic Recovery
Postoperatively Once Home
How to Monitor a Surgical Incision During
Healing
How to Perform Range-of-Motion Exercises
How to Provide Bandage Care and Upkeep at
Home
How to Provide General Postoperative Care at
Home, Especially Lifting or Picking Up a Pet,
and Pain Control

Collecting Samples

How to Collect a Fecal Sample
How to Collect a Mucosal Swab for DNA
Analysis
How to Collect a Urine Sample
How to Monitor Blood Glucose Levels at Home

Treatment

How to Administer and Handle Insulin
How to Administer Ear Medications
How to Administer Eye Medications
How to Administer Oral Medications
How to Administer Subcutaneous Fluids
How to Apply a Cream or Ointment to the Skin
How to Bandage a Lacerated Footpad or Torn
Dewclaw
How to Bathe a Pet Using Medicated Shampoo
How to Care for a Dog After Heartworm
Adulticide Treatment
How to Deal With Incessant Coughing
How to Deal With Incessant Scratching
How to Deal With Severe, Self-Inflicted Skin
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How to Manage a Pet That Is Having Seizures	How to Syringe-Feed, Tube-Feed, or Bottle-Feed a Pet	Consent to Perform Dental Cleaning
How to Manage Acute Gastrointestinal Upset at Home	How to Use and Care for an Indwelling Feeding Tube	Consent to Perform Dental Extractions (Tooth Removal)
How to Provide Home Respiratory Therapy (Humidification, Nebulization, Coupage)	MISCELLANEOUS	Consent to Perform Echocardiography
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Behavior and Environment	Human Medications Dangerous for Pets	Consent to Perform Enucleation
How to Address Increased Vocalization (Barking)	Immunosuppressed Pet Owners: Risk-Minimization Strategies	Consent to Perform Exploratory Laparotomy
How to Change the Environment for a Pet That Is Blind	Ovariohysterectomy (Routine): Considerations and Planning	Consent to Perform Femoral Head and Neck Osteotomy
How to Change the Environment for a Pet That Is Deaf	Rabies Quarantine	Consent to Perform Fine-Needle Aspiration of Masses
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How to Clean the Skunk Scent from a Pet	Consent to Perform Arthrocentesis	Consent to Perform Radiography
How to Prevent Licking or Chewing at the Skin	Consent to Perform Bone Marrow Biopsy	Consent to Perform Splenectomy
How to Puppy-Proof a Home	Consent to Perform Bronchoalveolar Lavage (BAL)	Consent to Perform Thoracocentesis
How to Remove a Tick	Consent to Perform Castration, Canine	
How to Shave Hair Mats Safely	Consent to Perform Castration, Feline	
Nutrition	Consent to Perform Cerebrospinal Fluid Tap	
How to Change a Pet's Diet	Consent to Perform Computed Tomography (CT Scan)	
How to Effectively Induce Weight Loss in a Dog or Cat	Consent to Perform Cranial Cruciate Ligament Repair	
	Consent to Perform Cystocentesis	

SECTION I

Diseases and Disorders

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This section, Diseases and Disorders, aims to summarize the most important clinical entities in small-animal practice. These entities include specific disease syndromes and general clinical findings.

The following pages summarize several hundred of the most frequently encountered diseases and disorders. Over 100 more, which are encountered less frequently but are well recognized in veterinary practice and are equally complete and up to date, are accessible online in this same format at www.ExpertConsult.com.

BASIC INFORMATION

Definition

A brief explanation of the meaning of this disease or disorder

Synonyms

Where appropriate, other terms used interchangeably to name this disease or disorder

Epidemiology

SPECIES, AGE, SEX

The typical signalment of affected individuals

GENETICS, BREED PREDISPOSITION

Information regarding possible hereditary factors

RISK FACTORS

Elements that might predispose a patient to this disease or disorder

CONTAGION AND ZOOONOSIS

Important information regarding infectious spread of certain diseases

GEOGRAPHY AND SEASONALITY

Features that would help to raise or lower the clinician's index of suspicion for a disease or disorder, based on environment and timing of occurrence

ASSOCIATED DISORDERS

Entities that often occur simultaneously with this disease or disorder

Clinical Presentation

DISEASE FORMS/SUBTYPES

If applicable, the different variants of a disease a clinician should consider

HISTORY, CHIEF COMPLAINT

The information provided by the owner (history), together with the primary reason for seeking veterinary attention (chief complaint)

PHYSICAL EXAM FINDINGS

The relevant abnormalities—or, if important, relevant normal findings—associated with the disease/disorder

Etiology and Pathophysiology

The mechanisms and pathways according to which the disease or disorder begins and then evolves

DIAGNOSIS

Diagnostic Overview

This segment is a brief summary that states what is appropriate to achieve a functional clinical diagnosis in most cases of the disorder. The goal of the Diagnostic Overview is to give direction to the reader/practitioner for applying the information provided subsequently. The result is diagnostic guidance, rather than just a list of possible diagnostic tests.

Differential Diagnosis

Other diseases or disorders that may mimic the one under discussion. When appropriate, the reader may be directed to concise lists of differentials in Section III of the text.

Initial Database

A summary of basic clinical tests that are appropriate when this disease/disorder might be present. These are largely tests that should be accessible in most outpatient clinics or facilities.

Advanced or Confirmatory Testing

Diagnostic tests that are performed if the initial database is insufficient for establishing the diagnosis. Some of these tests may be performed easily in any clinic or hospital, whereas others may require referral to a specialty center.

TREATMENT

Treatment Overview

Like the Diagnostic Overview, this section summarizes the goals and priorities of treatment. The purpose is to offer guidance in the application of treatment information.

Acute General Treatment

Those forms of treatment that are instituted promptly, either because treatment is simple or because of immediate need

Chronic Treatment

When necessary, ongoing treatment typically provided at home

Nutrition/Diet

Alterations in food intake or food type that may assist in treatment

Behavior/Exercise

Information pertaining to deliberate changes in physical activity (increase, decrease, or new) and any forms of treatment related to behavioral modifications

Drug Interactions

Relevant information regarding incompatibility of medications commonly used in the treatment of the disease/disorder. This section by necessity is perhaps one of the least comprehensive; the reader is advised to seek information from clinical pharmacology sources to assist in identifying potential or real problems.

Possible Complications

Selected, recognized problems that may occur as a result of the disease process alone or as a complication of treatment

Recommended Monitoring

Methods the practitioner should use for ensuring that treatment and/or resolution of the disease or disorder is proceeding as expected

PROGNOSIS & OUTCOME

The expected evolution of the disease or disorder, with or without treatment.

PEARLS & CONSIDERATIONS

Comments

Single items of counterintuitive observations, pitfalls to avoid, and other important points that don't readily fit into other categories

Prevention

Methods to avoid recurrence or reduce occurrence of new cases

Technician Tips

This segment provides information relevant to nursing care and the role of the veterinary technician in managing cases of this disease/disorder.

Client Education

This section points out key features of the disease or disorder that can improve the client's understanding of the disorder or patient care.

SUGGESTED READING

Every disease and disorder has at least one recommended bibliographic source for additional consultation. In most cases, there are others in the online version of this book at www.ExpertConsult.com.

RELATED CLIENT EDUCATION SHEETS

In many chapters, the practitioner is directed to useful client information handouts available from the online edition of the text. This includes information regarding specific disorders, a variety of "How To" sheets that help explain at-home care, as well as documents designed to both provide a simplified explanation of commonly performed procedures and to serve as a printable form that can be signed by the client to document informed consent.

Abortion, Spontaneous (Dog)

BASIC INFORMATION



Definition

The expulsion of one or more fetuses before full-term pregnancy is uncommon; in the dog, resorption is more common.

Synonyms

Fetal loss, pregnancy wastage, miscarriage

Epidemiology

SPECIES, AGE, SEX

Sexually mature, intact, female dog

GENETICS, BREED PREDISPOSITION

- Inbreeding (inbreeding coefficient > 0.25): early embryonic death, conceptus resorption
- Brachiocephalic breeds (high-risk pregnancy)

RISK FACTORS

- Advanced maternal age
- History of previous pregnancy loss (e.g., recurrent hypoluteoidism)
- Malnutrition (pregnancy ketosis)
- Endocrinopathies (hypothyroidism, hypoluteoidism, diabetes mellitus, hyperadrenocorticism)
- Infections (e.g., *Brucella canis*, *Listeria monocytogenes*, *Streptococcus canis* [Lancefield groups C, L, and M], *Escherichia coli*, *Campylobacter* sp., *Leptospira* sp., *Salmonella* sp., *Mycoplasma*, *Chlamydia* sp., canine herpesvirus 1 [CHV-1], canine parvovirus 1 [minute virus of canines], bluetongue virus, canine distemper virus, canine adenovirus [infectious hepatitis], *Leishmania infantum*, *Toxoplasma gondii*, *Borrelia burgdorferi*, *Ehrlichia* spp., *Anaplasma* spp.)
- Unsolicited treatment with an endocrine disruptor, embryotoxic or teratogenic compounds (e.g., itraconazole, griseofulvin, plant toxins, insecticides, corticosteroids, polyester textiles)
 - The risk to the fetus is a result of the ability of a drug or toxin to reach the fetal circulation and produce toxic effects in the fetus. Special awareness is necessary during the organogenesis period (i.e., until day 20 of pregnancy in dogs and cats).
- Inadequate vaccination or deworming programs

CONTAGION AND ZOOONOSIS

- *B. canis* is zoonotic.
 - Venereal transmission is significant in the dog. Contact with infected canine blood and vaginal secretions is important for human infection.
- *Salmonella* sp. and *Leptospira* sp. also have zoonotic potential.
- CHV-1 and minute virus of canines: transmission occurs through direct aerosol contact or contact with aborted fetuses and/

or placentas. Male-to-female venereal contact is not a significant means of transmission.

GEOGRAPHY AND SEASONALITY

- Canine brucellosis: endemic in parts of North and South America and China
 - Although previously eradicated in Europe, sporadic cases have been reported since 2011.
- CHV-1: worldwide; serologic prevalence of 60%-80%
- Tick-borne diseases in spring and summer

ASSOCIATED DISORDERS

Vaginal discharge, depression, lethargy

Clinical Presentation

HISTORY, CHIEF COMPLAINT

- Pregnant bitch whelps prematurely with live or dead pups, or no pups are born at term.
- Abnormal vulvar discharge (bloody, purulent) during pregnancy, fever, or signs of abdominal pain may be reported by owner.
- Usually abortion is unnoticed by the owner because the dam may consume the fetuses and aborted tissues.
- Death of one or more fetuses may occur, whereas the remainder may continue to develop normally.
- Late-term abortions (between gestational days 45 and 59) are typical of *B. canis*.

PHYSICAL EXAM FINDINGS

- Often unremarkable
- Vulvar discharge that is purulent, hemorrhagic, greenish, blackish, or malodorous may indicate pregnancy complications that could lead to abortion. Normal vulvar discharge in pregnant bitches is clear to mucoid or pink-tinged and odorless.
- In late-term abortion, abdominal contractions, and expulsion of one or several fetuses may be observed.

Etiology and Pathophysiology

- Canine pregnancy requires normal luteal function throughout its duration.
 - Inadequate luteal function (hypoluteoidism) may cause resorption or abortion at any stage but generally occurs between days 25-35 post breeding.
 - Any toxin or hormone that induces endogenous release of prostaglandin F-2 alpha (PGF2a) and subsequent luteolysis may cause abortion, including bacterial toxins (e.g., coliforms, *Staphylococcus* sp.) and adrenergic agonists (e.g., phenylephrine).
- Fetal survival requires normal placental function and placental relaxin production.
 - Circulating relaxin concentration increases from day 26 and is detectable by relaxin assays from day 30 after mating.

- Relaxin declines rapidly after the death of all fetuses but may remain elevated for some days.

- Pathogens that influence placental function (e.g., herpesvirus placentitis) may cause abortion.
- Cases of unexplained pregnancy loss or abortion may be caused by an inadequate uterine environment and not a primary infection.
- In dogs, fetal resorption is more common than abortion.
- Fetal mummification occurs when the fetus dies during the last third of pregnancy (i.e., after day 45-50) in a noninfected uterine environment after skeletal calcification has taken place.
- Fetal death due to infectious and noninfectious causes may give different clues. Infections often show characteristic gross microscopic lesions that reveal the causative agent (typically herpesvirus). The noninfectious causes may be more difficult to elucidate due to the variety of mechanisms involved (e.g., toxins, hypoluteoidism).

DIAGNOSIS



Diagnostic Overview

- Pregnancy diagnosis (pp. 816 and 819)
- Abortion should be suspected when the pregnancy is previously confirmed and the bitch later presents nonpregnant or expelled fetuses have been observed.
- A diagnostic approach is outlined on p. 1396.

Differential Diagnosis

- Pseudocyesis (overt false pregnancy)
 - Abdominal ultrasound examination after day 25 to confirm pregnancy status
- Vaginal discharge due to vaginitis or metritis (pyometra)
 - Abdominal ultrasound recommended
- Induced abortion (p. 819)

Initial Database

- Serologic testing and/or polymerase chain reaction (PCR) of affected dam
 - *B. canis*
 - CHV-1 (p. 466)
- Virus or bacterial isolation from microbial cultures of fetuses, placenta, milk, or vaginal secretions
 - For *B. canis*, blood culture with bacteriologic isolation provides a definitive diagnosis 5 weeks after exposure, but repeated samples may be necessary.
 - For acute CHV-1 infections, viral isolation from infected tissues is possible for 2-3 weeks.
- Necropsy of fetus (e.g., subcapsular hemorrhages in the kidneys are pathognomonic for CHV-1) and visual inspection of placenta

- Histologic examination of fetal organs, liver, spleen, thymus, kidneys, adrenals, intestines, stomach, heart, lung, thymus, and brain
- Serum progesterone level of dam must be > 2 ng/mL (6 nmol/L) to sustain pregnancy.
 - Concentrations below this threshold for more than 48 hours are diagnostic of hypoluteoidism.
 - Low progesterone level may also occur secondary to fetal death. Other causes of fetal death (e.g., genetic) should be ruled out.
- Thyroid hormone analyses: Subclinical hypothyroidism may be aggravated to a clinically significant disease during periods of stress (e.g., pregnancy) (p. 525).
- Routine laboratory testing: CBC and serum biochemistry profile
 - Normal hematocrit values in pregnant bitches are lower (30%-35%) than in nonpregnant bitches in diestrus (45%-55%) because of an increase in plasma volume.
 - Mild, mature neutrophilia is normal in pregnant bitches, but pronounced neutrophilia, immature neutrophils, or monocytosis is abnormal.

Advanced or Confirmatory Testing

- Ultrasonography may reveal fetal death (absence of a fetal heartbeat or movement) before onset of abortion.
- Contact diagnostic laboratories for further recommendations for specific pathogens.
- Toxicology of organs and/or blood is needed when a specific toxin or drug is suspected.

TREATMENT

Treatment Overview

- Acute supportive care of the bitch (e.g., intensive treatment of an infection) is the main aim of treatment since the prognosis for saving the current pregnancy is poor.
- *B. canis* infection
- With hypoluteoidism, progesterone supplementation may be attempted to prevent abortion of remaining fetuses. This preemptive approach has been effective in bitches that have aborted from hypoluteoidism in previous pregnancies.

Acute General Treatment

- Supportive: intravenous fluids (e.g., lactated Ringer's solution) if fever is present
- Broad-spectrum antibiotics safe for use during pregnancy: empirical pending culture and sensitivity results (if clinically feasible). For specific antimicrobial treatment of brucellosis, see web chapter.
 - Amoxicillin (22 mg/kg PO q 8h)
 - Pivampicillin (30 mg/kg PO q 12h)
 - Cephalexin or cefadroxil (20 mg PO q 8-12h)
 - Enrofloxacin (5 mg/kg SQ, IM, or PO q 24h) recommended for *B. canis* but may be teratogenic.

- Trimethoprim/sulfadiazine (15 mg/kg PO q 12h) may be teratogenic.

Chronic Treatment

- Hormone replacement with confirmed cases of hypoluteoidism should be discontinued at least 2 days before expected term (i.e., 62-63 days after the luteinizing hormone surge) to allow for normal parturition. Hormone replacement options include
 - Progesterone in oil 2 mg/kg IM q 48h
 - Altrenogest 0.09 mg/kg PO q 24h
 - Micronized progesterone (Prometrium 10 mg/kg PO q 24h; or Utrogestan 5 mg/kg PO q 8h)
- If antibiotics are used in *B. canis*-infected dogs, antibiotic treatment should be continued for at least 4 weeks, based on culture and sensitivity results and clinical state.

Nutrition/Diet

A good-quality maintenance diet is recommended for bitches with lost pregnancies (p. 816). Puppy food should be continued for bitches undergoing treatment with remaining live fetuses.

Behavior/Exercise

Controlled physical activity is recommended during pregnancy. Avoid exposure to new dogs, extensive travel, or abrupt changes in the dam's environment.

Drug Interactions

Glucocorticoids are unpredictably abortifacient drugs in dogs.

Possible Complications

For hypoluteoidism, hormone replacement therapy is recommended only if the whelping date is known, as failure to discontinue supplementation at the appropriate time may cause prolonged gestation, fetal death, and lactation failure. In addition, supplementation with progesterone analogs (i.e., altrenogest) before sexual differentiation of the fetus (before day 45) is not recommended because of potential masculinization of female fetuses.

Recommended Monitoring

- If suspicious of impending abortion, serum progesterone concentrations should be monitored weekly. Frequent monitoring of fetal viability with abdominal ultrasonography can be valuable.
- If abnormal vaginal discharge is observed during gestation, abdominal ultrasonography should be used to assess fetal viability, and supportive therapy should be initiated.

PROGNOSIS & OUTCOME

- Prognosis is poor for maintaining pregnancy once signs of impending abortion occur.
- Bitches with hypoluteoidism may experience recurrent abortion.
- For causes of abortion other than hypoluteoidism usually there are no problems in

subsequent pregnancies (exceptions: *B. canis* and occasionally recrudescing herpesvirus infections).

PEARLS & CONSIDERATIONS

Comments

- Abortion is uncommon in the bitch; embryonic death with fetal resorption or mummification is more common.
- Most cases of canine abortion go unnoticed by the owner as the bitch may consume the aborted tissues.
- Infectious agents, notably viruses (CHV-1) or specific bacteria (*B. canis*), are the most common causes of canine abortion.
- The diagnosis of abortion should prompt a search for an underlying cause.

Prevention

- A CHV-1 vaccine (i.e., Eurican Herpes 205) is available in Europe. Vaccination should be given 1 month before anticipated estrus, followed by vaccination within 8 days after mating. If titers are below 1:128 at mid-pregnancy, a third vaccination may be given 10 days before parturition.
- Isolate pregnant bitches from showing or performing dogs during pregnancy, especially if herpesvirus or brucellosis is endemic in the area.
- Maintain an adequate vaccination and deworming program.
- Bitches with hypoluteoidism may experience recurrent abortion, and mating of these increases risk.
- Breeding dogs should be screened for *B. canis* and, if positive, should not be bred.

Technician Tips

An understanding of normal pregnancy, preventative measures for breeding animals, and pregnancy emergencies that require veterinary attention is essential. Ability to recognize abnormal vaginal discharge, signs of discomfort in pregnant females, and high-risk pregnancies is also important.

Client Education

- Pregnancy diagnosis should be made in bitches at day 25-30 after breeding using abdominal ultrasonography or a serum relaxin test (pp. 816 and 1378).
- Regular medical evaluation of breeding dogs with appropriate vaccinations and regular deworming
- Genetic counseling to avoid inbreeding
- Screen breeding pair for brucellosis.

SUGGESTED READING

Lamm CG, et al: Clinical approach to abortion, stillborn, and neonatal death in dogs and cats. *Vet Clin North Am Small Anim Pract* 42:501-513, 2012.

AUTHOR: Wenche K. Farstad, DVM, Dr. scient., PhD, DECAR

EDITOR: Michelle A. Kutzler, DVM, PhD, DACT

Abscess, Cat Bite

Client Education Sheet 

BASIC INFORMATION

Definition

Focal pocket of purulent material located in the subcutaneous tissue of a cat due to a bite wound from another cat

Epidemiology

SPECIES, AGE, SEX

Cats of any age and either sex (more common in male cats)

RISK FACTORS

- Intact male
- Outdoor cat
- Multi-cat household

CONTAGION AND ZONOSIS

- Feline immunodeficiency virus (FIV): transmission is mainly via bite wounds.
- Humans can develop severe cellulitis from cat bite wounds.

GEOGRAPHY AND SEASONALITY

Greater occurrence during warmer months (roaming cats)

ASSOCIATED DISORDERS

- Severe cellulitis
- Skin necrosis
- Osteomyelitis

Clinical Presentation

HISTORY, CHIEF COMPLAINT

- Painful swelling
- Crusted, dried discharge interpreted as matted hair
- Lethargy, inappetence

PHYSICAL EXAM FINDINGS

- Palpation: abscess may be well-circumscribed or broad-based and difficult to identify (e.g., cellulitis)
- Fever, dehydration, depression
- Draining tract with purulent material
- Open wound with presence of necrotic tissue
- Swollen and/or painful subcutis (focal or regional)

Etiology and Pathophysiology

- The bite punctures or lacerates skin and underlying tissue.
- Bacteria from oral cavity, hair, skin, and surrounding environment are injected into the subcutaneous tissue.
 - *Pasteurella multocida*, *Streptococcus*, and *Staphylococcus* spp. are most common.
 - Anaerobes

- Associated problems include cellulitis, draining tract, necrosis of overlying skin and osteomyelitis of underlying bone (rare). Fistula formation from bite perforation of hollow organ can occur (e.g., rectum).

DIAGNOSIS

Diagnostic Overview

Diagnosis relies on history, physical exam findings, and results of aspirate cytology. Additional testing is aimed at identifying the extent and complications of the abscess and injury.

Differential Diagnosis

Depends on the site of abscess

- Foreign body abscess
- Penetrating foreign body
- Anal sac abscess
- Salivary mucocele

Initial Database

- Complete blood count: normal, or changes consistent with sepsis
- Radiographs: if distal extremity; osteomyelitis possible
- FIV testing: indicated for all cats with bite wounds, since this is the main route of transmission for FIV (p. 325).
- Fine-needle aspiration and cytologic evaluation of abscess contents: to confirm septic inflammation if clinical features alone are ambiguous

Advanced or Confirmatory Testing

- Bacterial culture and susceptibility: often unnecessary with adequate surgical drainage and an otherwise stable patient; considered if the patient is systemically ill (other than fever) and/or fails to respond to treatment
- Consider feline leukemia virus serologic testing if not already performed.

TREATMENT

Treatment Overview

Drainage of the abscess and antibiotic therapy are the cornerstones of treatment and are successful in the vast majority of cases.

Acute General Treatment

- Surgically lance and drain abscess, flush with sterile saline or lactated Ringer's solution, and establish ongoing drainage. If necrotic tissue present, debride the wound.

- Antibiotic therapy is typically initiated.
 - Cephalexin 22 mg/kg PO q 12h, *or*
 - Cefovecin 8 mg/kg SQ once, *or*
 - Amoxicillin ± clavulanic acid 10-20 mg/kg PO q 12h
- Resolution of an abscess should occur within 5 days of effective therapy.
- Castration or ovariectomy may decrease roaming and aggression.

Possible Complications

- Progressing cellulitis and necrosis of tissue due to inadequate debridement or improper antibiotic use (p. 907)
- Dehiscence of surgically closed wound
 - Avoid primary closure of an infected wound
 - Inadequate wound debridement
- Non-healing wound
 - High incidence in the axillary and inguinal regions (pocket wounds)
 - Biopsy and culture and susceptibility should be performed (mycobacteria, L-form bacteria may complicate wound healing).
 - Consider surgical referral of cats with pocket wounds.

PROGNOSIS & OUTCOME

- Excellent if proper therapy provided
- Guarded if cellulitis or tissue necrosis develops and/or a non-healing wound develops

PEARLS & CONSIDERATIONS

Comments

Do not close bite wounds primarily. Allow them to heal by second intention.

Technician Tips

Perform a wide clip and sterile prep before the abscess is lanced and drained.

SUGGESTED READING

Norsworthy GD, et al: The feline patient, ed 4, Ames, IA, 2011, Wiley-Blackwell, pp 44-45.

AUTHOR: Otto I. Lanz, DVM, DACVS

EDITOR: Elizabeth A. Swanson, DVM, MS, DACVS

Abscess, Lung

Client Education
SheetDiseases and
Disorders

BASIC INFORMATION



Definition

A localized collection of exudate due to supuration of lung tissue, resulting in pulmonary cavitation

Synonym

Pulmonary abscess

Epidemiology

SPECIES, AGE, SEX

Dog and cat (more common), any age, either sex

GENETICS, BREED PREDISPOSITION

May be more common in hunting dogs due to field work

RISK FACTORS

Foreign body inhalation

GEOGRAPHY AND SEASONALITY

Inhalation of plant foreign body (e.g., grass awn) in endemic area (p. 398)

ASSOCIATED DISORDERS

Hypertrophic osteopathy (p. 508)

- Reported in dogs with chronic pulmonary abscessation
- Causes slowly progressive lameness
- May be associated with pyothorax that develops secondary to the lung abscess
- May be associated with spontaneous pneumothorax

Clinical Presentation

HISTORY, CHIEF COMPLAINT

- Chronic, progressive respiratory signs: cough, increased respiratory effort
- Acute dyspnea or respiratory decompensation: rupture of abscess resulting in pneumothorax or pyothorax

- Nonspecific signs of illness (anorexia, weight loss) with fever

PHYSICAL EXAM FINDINGS

- Poor body condition
- Fever may be present, but absence does not rule out the diagnosis.
- Thoracic auscultation
 - \pm Loud bronchovesicular sounds or crackles
 - Muffled heart/lung sounds if pyothorax or pneumothorax
- Tachypnea or dyspnea

Etiology and Pathophysiology

- Foreign body migration
- Pneumonia (primary bacterial, fungal, aspiration)
- Parasitic infestation (*Paragonimus*)
- Primary pulmonary neoplasia

DIAGNOSIS



Diagnostic Overview

The diagnosis is suggested based on patient signalment, history, and physical examination findings. Confirmation requires 1) thoracic radiographs to demonstrate the pulmonary mass and 2) ultrasound to help differentiate abscess from neoplasia. Computed tomography (CT) scanning may be necessary to help confirm the diagnosis, determine extent of disease, and direct surgical intervention. Foreign bodies may be located in sites distant from the abscess and can be diagnosed with CT.

Differential Diagnosis

Other possible masses in the pulmonary parenchyma:

- Neoplasia
- Cyst
- Granuloma
- Parasitic nodules

Initial Database

- Complete blood count: possible neutrophilic leukocytosis with or without a left shift; anemia (usually mild, nonregenerative) possible with chronic abscessation
- Survey thoracic radiographs
 - Mass within pulmonary parenchyma; cavitation/gas in the lesion is pathognomonic.
 - Consolidated lung lobe may result from chronic abscessation.
 - \pm Pneumothorax
 - Pleural effusion (if pyothorax)
- Analysis of pleural effusion, if present (pp. 1164 and 1343)
 - Cytologic evaluation
 - Aerobic and anaerobic bacterial culture and susceptibility testing

Advanced or Confirmatory Testing

CT scan

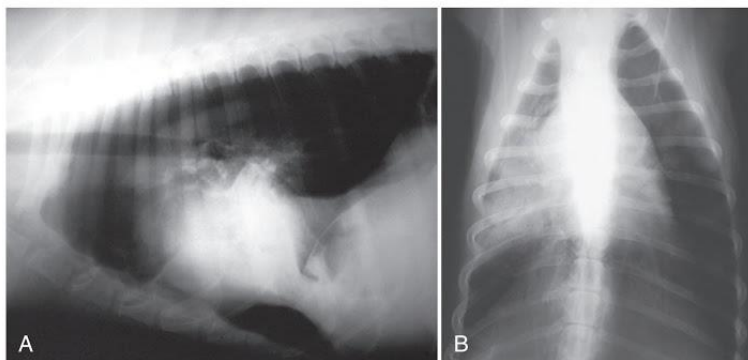
- Assess involvement of other intrathoracic structures; superior visualization compared to radiographs, especially when pleural effusion is present.
 - Additional pulmonary involvement
 - Mediastinal abscess
 - Pleural involvement
 - Presence of foreign material and migration to distant sites
- Assess if lesion is amenable to surgical resection.
- Possibly identify cause of abscess.
- Rule out other causes of pulmonary mass.

TREATMENT



Treatment Overview

Surgical resection of the affected lung lobe(s) and culture-directed, long-term antimicrobial therapy generally is the treatment of choice.



ABSCESS, LUNG Thorax of a dog with a lung abscess. **A**, Lateral radiograph shows that the abscessed lung area is the right middle lobe, which overlies the cardiac silhouette in this projection. **B**, In the dorsoventral thoracic view, opacities of the right middle lobe suggest extensive consolidation consistent with lung abscess. (Courtesy Dr. Richard Walshaw.)

Acute and Chronic Treatment

- Correction of fluid and electrolyte deficits
- Respiratory system support if needed
 - Oxygen supplementation (p. 1146)
 - Thoracentesis (p. 1164) may be required if associated with pneumothorax or pyothorax.
- Antimicrobial therapy
 - Empirical therapy active against aerobic and anaerobic bacteria: second-generation cephalosporin (e.g., cefoxitin 22 mg/kg IV q 6h), amoxicillin (± clavulanic acid) 10-20 mg/kg PO q 12h
 - Definitive antimicrobial therapy should be based on results of aerobic and anaerobic bacterial culture and sensitivity testing (minimum treatment duration: 4 weeks).
- Thoracotomy for removal of affected lung lobe and treatment of pyothorax, if present (p. 857)

Possible Complications

- Depends on cause
- Chronic pneumonia
 - Abscesses in other lung lobes
 - Failure to resolve associated pyothorax (e.g., failure to entirely remove inciting cause, such as foreign body that migrated outside the removed lung lobe or resected tissue)

- Care must be taken during surgical manipulation of the affected lung to avoid exudate entrance into other airways and the endotracheal tube.

Recommended Monitoring

- Survey thoracic radiographs
- At completion of antibiotic therapy
 - Periodically (q 3 months initially)

PROGNOSIS & OUTCOME

- Depends on the cause
- If associated with sepsis and severe systemic illness: guarded to poor
 - If an otherwise stable patient: fair, provided complete excision is possible
 - Non-neoplastic abscessation is associated with a better prognosis than neoplastic abscess.

PEARLS & CONSIDERATIONS

Comments

- Important to determine the underlying cause for optimal treatment.

- Medical treatment is needed to stabilize the patient. Ideally, antimicrobial choice is based on culture and susceptibility testing as early in the course of disease as possible.
- Surgical removal of the affected lobe is required to obtain definitive diagnosis and to remove the source of chronic infection.

Technician Tips

Knowledge of and experience in working with thoracostomy tubes is important in the post-operative management of patients who have undergone a thoracotomy.

SUGGESTED READING

Monnet E: Lungs. In Johnston SA, et al, editors: *Veterinary surgery: small animal*, ed 2, St. Louis, 2017, Elsevier, pp 1983-1999.

AUTHOR: MaryAnn G. Radlinsky, DVM, MS, DACVS
EDITOR: Elizabeth A. Swanson, DVM, MS, DACVS

Abscess, Oral

Client Education Sheet

BASIC INFORMATION

Definition

Abscess that develops in the soft tissues caudodorsal to the pharynx and dorsal or lateral to the esophagus

Epidemiology

SPECIES, AGE, SEX

- Most common in young dogs and cats
- No sex predisposition

RISK FACTORS

- Stick chewing
- Playing fetch with sticks
- Feeding chicken bones
- Fish hook or sewing needle ingestion
- Bite wound

CONTAGION AND ZOOONOSIS

If from a bite wound of unknown origin, transmission of rabies from a wild animal should be considered.

Clinical Presentation

HISTORY, CHIEF COMPLAINT

- History of risk factors (see above) is common.
- Nonspecific complaints: lethargy, inappetence
- Dysphagia
- Ptyalism
- Reluctance to move head and neck

- Pain on opening of the mouth
- Pawing at the mouth

PHYSICAL EXAM FINDINGS

- Fever ±
- Depression or lethargy
- Ptyalism
- Halitosis
- Dyspnea
- Painful on manipulation of head and neck or when opening the mouth
- Punctures or granulomatous lesions on oral mucosa
- Palpable swelling caudal to the mandible
- Draining tract in the cranial cervical region

Etiology and Pathophysiology

- Penetrating trauma contaminates the retropharyngeal area with bacteria.
- Rapid healing of the pharyngeal tissue leads to a walled-off abscess that develops quickly.
- May be presence of foreign body

DIAGNOSIS

Diagnostic Overview

Diagnosis is based on patient signalment, history, and physical examination. Confirmation requires demonstration that the soft tissue mass in the neck is an abscess. Ultrasound

examination with cytologic analysis of fine-needle aspirates strengthens the diagnosis.

Differential Diagnosis

- Inflammation/cellulitis
- Lymphadenopathy
- Neoplasia (lymphoma, metastatic disease, carotid body tumor)
- Pharyngeal salivary mucocele

Initial Database

- Complete blood count: leukocytosis, left shift possible
- Cervical radiographs
 - Soft tissue mass in the pharyngeal region
 - Ventral deviation of the larynx or esophagus
 - Radiopaque foreign body
- Thoracic radiographs
 - Check for thoracic involvement
- Cervical ultrasound
 - Identify the foreign body or abscess.
 - Obtain ultrasound-guided aspirate for cytology.
- Bacterial culture and susceptibility
 - Aerobic and anaerobic cultures (*Actinomyces* spp., *Nocardia* spp.)

Advanced or Confirmatory Testing

- Contrast radiology: if a draining tract is present, to identify foreign body and extent of abscess