

CHYLOTHORAX

BASICS

OVERVIEW

- “Chylo-“ refers to chyle; “thorax” refers to the chest
- “Chyle” is a milky to slightly yellow fluid composed of lymph and fats taken up from the intestines and eventually transferred to the circulation through the thoracic duct; “lymph” is a watery fluid that contains white-blood cells that travels through lymphatic vessels—it transports lymphocytes (a type of white-blood cell) and fats from the small intestines to the blood stream; the “thoracic duct” is the main lymph vessel of the body—it crosses the chest near the spine, and empties into the venous circulation
- “Chylothorax” is an accumulation of chyle in the space between the chest wall and lungs (known as the “pleural space”)
- “Lymphangiectasia” is defined as the dilation of the lymphatic vessels; it results from blockage or obstruction of the lymphatic vessels
- Lymphangiectasia in the chest (known as “thoracic lymphangiectasia”)—tortuous, dilated lymphatic vessels found in many animals with accumulation of chyle in the space between the chest wall and lungs (chylothorax)
- Inflammation of the tissue lining the chest cavity and covering the lungs characterized by the development of scar tissue (known as “fibrosing pleuritis”)—condition in which thickening of the tissue lining the chest cavity and covering the lungs (known as the “pleura”) leads to constriction of the lung lobes; when severe, it results in marked restriction of breathing; may be caused by any long-term (chronic) build-up of inflammatory fluid in the space between the chest wall and lungs (known as “pleural exudate”), but is most commonly associated with accumulation of chyle (chylothorax) or accumulation of pus (known as “pyothorax”)

GENETICS

- Unknown

SIGNALMENT/DESCRIPTION of ANIMAL

Species

- Dogs and cats

Breed Predilections

- Dogs—Afghan hounds and shiba inus
- Cats—Asian breeds (such as the Siamese and Himalayan) appear to have a higher number of cases than other breeds

Mean Age And Range

- Any age may be affected
- Afghan hounds—develop when middle-aged
- Shiba inus—develop when young (less than 1 to 2 years of age)
- Cats—old animals may be more likely to develop condition than young cats; may indicate an association with cancer

Predominant Sex

- None identified

SIGNS/OBSERVED CHANGES in the ANIMAL

- Vary, depending on the underlying cause, rapidity of fluid accumulation, and volume of fluid
- Usually not exhibited until marked impairment of breathing
- Many patients appear to have condition for prolonged periods before diagnosis; they probably reabsorb the milky fluid (chyle) at a rate that prevents obvious breathing impairment
- Difficulty breathing (known as “dyspnea”) or coughing; coughing may have been present for months before examination
- Rapid breathing (known as “tachypnea”)
- Depression
- Lack of appetite (known as “anorexia”) and weight loss
- Exercise intolerance
- Muffled heart and lung sounds detected when listening to the chest with a stethoscope (known as “auscultation”)
- Increased lung sounds, particularly in the lung fields near the animal’s back
- Pale gums and moist tissues of the body (known as “mucous membranes”)
- Bluish discoloration of the skin and moist tissues (mucous membranes) of the body caused by inadequate oxygen levels in the red-blood cells (known as “cyanosis”)
- Irregular heartbeats (known as “arrhythmias”)
- Heart murmur
- Detectable pulses in the jugular veins in association with right-sided heart failure
- Decrease in the ability to gently compress the front part of the chest—common in cats with a mass in the front of the mediastinum and fluid build-up in the space between the chest wall and lungs (known as “pleural effusion”); the “mediastinum” is the center portion of the chest that contains the heart and other organs (except for the lungs)

CAUSES

- Unknown cause (so called “idiopathic chylothorax”)—most patients
- Masses in the front of the mediastinum (the center portion of the chest that contains the heart and other organs [except for the lungs])—mediastinal lymphoma (lymphoma is a type of cancer that develops from lymphoid tissue, including lymphocytes, a type of white-blood cell formed in lymphatic tissues throughout the body); thymoma (tumor that arises from the thymus)
- Heart disease—disease of the heart muscle (known as “cardiomyopathy”); fluid build-up between the heart and the sac surrounding the heart (known as “pericardial effusion”); heartworm infection; heart birth defects
- Nodular lesions caused by infection with a fungus (known as “fungal granulomas”)
- Blood clots in veins
- Congenital (present at birth) abnormality of the thoracic duct (the main lymph vessel of the body)
- Heart surgery

RISK FACTORS

- Unknown

TREATMENT

HEALTH CARE

- Patients with difficulty breathing (dyspnea) with suspected fluid build-up between the chest wall and lungs (pleural effusion)—immediate medical procedure to tap the chest (known as “thoracocentesis”); removal of even small amounts of pleural effusion may improve breathing markedly
- Identify and treat the underlying cause, if possible
- Medical management—usually outpatient with intermittent procedures to tap the chest (thoracocentesis), as necessary to prevent difficult breathing (dyspnea)
- Chest tubes—placed in patients with suspected chylothorax secondary to trauma (very rare), with rapid fluid accumulation, or after surgery
- Unsuccessful medical management (try 2 to 3 months)—consider surgery
- Patients may become debilitated if procedures to tap the chest (thoracocentesis) are performed frequently; attention to diet is important
- Chest taps (thoracocentesis)—perform under sterile conditions to reduce the risk of introducing infection into the chest; antibiotics generally are unnecessary if sterile technique is used

ACTIVITY

- Patients usually will restrict their own exercise as the fluid volume in the space between the chest wall and lungs increases or if they develop fibrosing pleuritis (inflammation of the tissue lining the chest cavity and covering the lungs characterized by the development of scar tissue)

DIET

- Low-fat diet—may decrease the amount of fat in the fluid build-up in the space between the chest wall and lungs (pleural effusion), which may improve the patient’s ability to resorb fluid from the chest cavity; not a cure; may help in management
- Medium-chain triglycerides—once thought to be absorbed directly into the system of veins that carry blood from the abdominal organs to the liver (known as the “portal system”), bypassing the thoracic duct (the main lymph vessel of the body); recent information shows that medium-chain triglycerides actually are transported via the thoracic duct of dogs; therefore, they are less useful than previously believed

SURGERY

Thoracic Duct Ligation and Surgical Removal of Part of the Sac Around the Heart (known as “Pericardectomy”)

- Recommended in patients that do not respond to medical management
- The thoracic duct (the main lymph vessel of the body) usually has multiple branches in the back part of the chest, where the surgical procedure to “tie off” or “ligate” the thoracic duct is performed; failure to ligate all branches results in continued fluid build-up in the space between the chest wall and lungs (pleural effusion)
- Injection of methylene blue dye greatly facilitates visualization and complete ligation of all branches of the thoracic duct
- Thickening of the sac around the heart (known as the “pericardium”)—perform surgical removal of part of the sac around the heart (known as a “pericardectomy”) simultaneously with tying off or ligation of the thoracic duct

Other Surgical Considerations

- Thoracic duct ligation not successful—may consider procedures in which the flow of lymph is shunted into another part of the body
- Extensive fibrosing pleuritis (inflammation of the tissue lining the chest cavity and covering the lungs characterized by the development of scar tissue)—makes surgery harder, but does not appear to affect prognosis, if fluid build-up can be stopped

MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

- Rutin, a bioflavonoid—complete resolution of fluid build-up (effusion) appears to occur in some patients; further study is required to determine whether resolution occurs spontaneously or in response to this therapy
- Somatostatin (octreotide [Sandostatin®]), an inhibitory hormone—a naturally occurring substance that inhibits secretions of the stomach, jejunum (middle section of the small intestines), pancreas and inhibits secretion of bile by the liver; prolongs movement of food and fluids through the stomach and intestines (known as “gastrointestinal transit time”), and stimulates water absorption in the intestines; resolution of fluid build-up (pleural effusion) has occurred in dogs and cats with chylothorax of unknown cause (idiopathic chylothorax) treated with octreotide

FOLLOW-UP CARE

PATIENT MONITORING

- Monitor closely for difficulty breathing (dyspnea); perform procedures to tap the chest (thoracocentesis) as needed
- Resolution (spontaneously or following surgery)—periodically re-evaluate for several years to detect recurrence

POSSIBLE COMPLICATIONS

- Fibrosing pleuritis (inflammation of the tissue lining the chest cavity and covering the lungs characterized by the development of scar tissue)—most common serious complication of long-term (chronic) disease
- Decreased ability to develop a normal immune response (known as “immunosuppression”)—caused by decreased number of lymphocytes; “lymphocytes” are a type of white-blood cell that are formed in lymphatic tissues throughout the body; lymphocytes are involved in the immune process—may develop in patients undergoing repeated and frequent procedures to tap the chest (thoracocentesis)
- Low levels of sodium in the blood (known as “hyponatremia”) and high levels of potassium in the blood (known as “hyperkalemia”)—documented in affected dogs undergoing multiple procedures to tap the chest (thoracocentesis)

EXPECTED COURSE AND PROGNOSIS

- May resolve spontaneously or after surgery
- Untreated or long-term (chronic) disease—may result in severe fibrosing pleuritis (inflammation of the tissue lining the chest cavity and covering the lungs characterized by the development of scar tissue) and persistent difficulty breathing (dyspnea)
- Euthanasia—frequently performed in patients that do not respond to medical management or surgery

KEY POINTS

- No treatment will stop the fluid build-up (effusion) in all patients with chylothorax of unknown cause (idiopathic chylothorax)
- The condition may resolve spontaneously in some patients after several weeks or months

