

BASIC INFORMATION

Description

Bullous lung disease is the formation of contained or confined pockets of air and fluid in one or more portions of the lungs. These pockets ultimately form cysts (bullae) that are air-filled and surrounded by normal lung tissue.

When bullous lesions rupture, air escapes into the chest cavity (pneumothorax), which decreases the ability of the lungs to expand. The presence of a large number of cysts within the lungs may also affect normal lung function.

Causes

Bullous cysts can be congenital (present at birth), but most often they are acquired lesions. Inflammation, emphysema, trauma, and unknown factors (idiopathic) can result in their formation. Sometimes a lung fluke (parasite), *Paragonimus kellicotti*, forms inflammatory lesions that become air-filled cysts. Bullae may develop when air enters the central portion of an abscess or tumor in the lung. Large, deep-chested breeds of dogs, such as sight hounds, are predisposed to idiopathic bullous lung disease.

Clinical Signs

Some affected animals have a history of chronic bronchitis, prior chest trauma, or other lung diseases. Significant leakage of air into the chest cavity can cause severe respiratory distress, with increased respiratory rate and effort, cyanosis (blue gums from lack of oxygen), and collapse. Occasionally, bullae are found as incidental lesions on chest x-rays, and the animal has no clinical signs.

Diagnostic Tests

Routine laboratory tests and chest x-rays are often recommended to investigate potential causes of the respiratory distress. Chest x-rays may show one or more air-filled cystic structures in the lungs. Free air in the chest and lung collapse are indicative of pneumothorax. Animals in severe distress often require therapy, such as removal of the free air, before x-rays and other tests can be performed.

If fluid is also present in the chest cavity, it may be withdrawn and analyzed. Sometimes fluke eggs may be found when the fluid is examined microscopically. Direct aspiration of a bulla with a needle is not recommended, because it can lead to significant escape of air from the cyst and pneumothorax.

TREATMENT AND FOLLOW-UP

Treatment Options

Pneumothorax is usually treated as an emergency, with aspiration of air via a syringe and needle (thoracocentesis). If air accumulates quickly after withdrawal of large amounts by thoracocentesis, insertion of a chest tube is necessary to allow more effective evacuation of the air. If air continues to leak or large amounts of air accumulate, the chest tube may be hooked to a continuous suction device.

Some cystic lesions heal spontaneously after several days. As the bullae scar over, the leakage of air begins to subside. If the pneumothorax does not resolve within 48-72 hours or if evacuation efforts do not keep up with leakage of air, open chest surgery is done. It is usually necessary to enter the chest cavity through the sternum (breast bone), so that lung lobes on both sides of the chest can be inspected for bullae. A portion of a lung lobe or an entire lobe (containing one or several bullae) may need to be removed. In instances in which multiple, intact cysts are present throughout the lungs, the surfaces of the lungs may be rubbed with a rough piece of surgical gauze so that they subsequently stick to the lining of the chest wall (pleurodesis). Pleurodesis is an attempt to obliterate the space into which air can escape if a bulla ruptures in the future.

Follow-up Care

Careful monitoring of respiration, heart rate, blood pressure, lung sounds, color of the gums, and blood oxygen levels is done after surgery. Chest tubes usually remain in place until all air leakage stops. The chest tubes must be carefully monitored to ensure that they are working well and that no air is leaking around or into the tube and back into the chest.

X-rays are repeated to monitor the presence or absence of air in the chest. Most animals remain in the hospital at least 24 hours after chest tube removal, so that they can be closely monitored. The incision is usually rechecked and sutures removed 10-14 days after surgery. X-rays may be obtained again at that time.

Prognosis

It is possible for more bullae to form in different areas of the lung in the future, so x-rays are periodically taken to monitor for their development. If bullae are found on x-rays in the future, no treatment may be recommended unless pneumothorax recurs. One in every eight animals develops a recurrence of a pneumothorax after surgical treatment.