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Popular Article

Pericardial Effusion in Domestic Animals

Ravindra Jadav*, Anand Parikh, Keshav, Birth Patel, Vishal Kotwal and David Suresh
Assistant Professor, M.B Veterinary College, Dungarpur, Rajasthan
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Excessive fluid filling of the pericardial cavity is known as pericardial effusion, a rare but potentially fatal clinical disease seen in several animals. Cardiac function may then be impaired, leading to insufficient or reduced cardiac output. The onset, severity and extent of clinical signs are determined by the amount of fluid present in the pericardial space and the rate at which it fills up. Rapid filling will cause more severe and acute clinical signs, whereas slow and progressive filling may cause more subtle signs as the heart can eventually compensate. Pericardial effusion can have a variety of reasons, depending on the species. When the intrapericardial pressure equals or surpasses the right atrial pressure, cardiac tamponade occurs, compromising the heart's pumping capacity and hemodynamic stability. In order to assess the pericardial fluid, pericardiocentesis may need to be done as a life-saving emergency procedure or as a diagnostic treatment.

Pathogenesis

The outermost fibrous pericardium and the parietal and visceral layers of the serous pericardium make up the pericardium. The parietal and visceral layers of the serous pericardium are separated by the pericardial gap. A little quantity of fluid is normally present in the pericardial space; aberrant accumulation of fluid in the pericardial space leads to pathologic pericardial effusion. The accumulation of fluid causes the pericardium to become too big for it to stretch, the volume and pressure inside the pericardial space to keep rising and reduced diastolic filling in the heart compromises cardiac performance. When the intrapericardial pressure reaches or surpasses the right atrial pressure, cardiac tamponade, a type of cardiogenic shock occurs. Venous return, ventricular filling, stroke volume and cardiac output are all hampered by cardiac tamponade.



Causes of Pericardial Effusion (By Species)

Heart tumours, right-sided heart failure, atrial rupture, coagulopathy (toxicity from rodenticides), bacterial infections, and idiopathic pericardial effusion are among the conditions that affect dogs.

It includes infectious feline peritonitis and congestive heart failure in cats. Equine influenza, equine viral arteritis, septicemia, lung infection extension from bacteria, neoplasia, and idiopathic (most common) infections are among the conditions that affect horses. It involves the ingestion and penetration of foreign objects in cattle, such as hardware illness or traumatic reticuloperitonitis/pericarditis.

Clinical Signs

Fever, anorexia, depression, weight loss, dyspnea, abdominal distension in small animals, peripheral edoema in large animals and colic in horses are examples of non-specific signs that may be present. On the other hand, there are also clinical signs that include attenuated heart sounds (muffled due to effusion around the heart), jugular vein distension (from increased right atrial pressure), poor peripheral pulse quality, elevated heart and respiratory rate, hepatomegaly and possibly ascites.

Diagnosis

Based on the following clinicopathologic findings: pulsus paradoxus (exaggeration of the normal inspiratory decrease in systolic blood pressure), pre-renal azotemia, elevated coagulation parameters (if effusion related to rodenticide toxicity) and anaemia (secondary to blood loss or chronic disease).

Radiography

Thoracic radiography may show the following in small animals: hepatomegaly or diminished abdominal detail (due to ascites), pleural effusion, enlargement of the caudal vena cava and enlargement of the cardiac silhouette (rounded look). Thoracic radiography in cattle might show the presence of metallic foreign objects and fluid and gas accumulation in the pericardium.

Electrocardiography

A pattern of alternating change in the amplitude of the R wave, sinus tachycardia, ventricular premature contractions, low voltage QRS complexes and electrical alternans may be observed.



Echocardiography

When fluid looks anechoic in the pericardial space, it is the gold standard for diagnosing pericardial effusion.

Pericardiocentesis

In cases where neoplasia is the predominant cause of pericardial effusion, the fluid is often hemorrhagic and infrequently may neoplastic cells.

Treatment

In small animals, cardiac tamponade should be treated right away by pericardiocentesis. Ventricular premature complexes, coronary artery laceration and unexpected death are examples of complications.

Chemotherapy and pericardiectomy are the recommended treatments for idiopathic pericardial effusion, provided that the underlying aetiology of the effusion is a curable tumour. The treatment for idiopathic cases in horses involves inserting an indwelling chest tube into the pericardial sac, draining and lavage of the pericardial space and then locally infusing antibiotics.

Conclusion

Pericardial effusion is a relatively common form of acquired cardiovascular disease in dogs, is uncommon in cattle, and is rare in cats. In dogs, cases most commonly involve middle-aged, predominantly male, large breeds. Pericardial disease is so crucial, however, not so common in clinic.

References

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