The coughing dog with a heart murmur

Coughing is a frequent clinical problem in small animal practice and may be an important indicator of disease, an innate defence mechanism and a perpetuating feature of disease.

The initiating cause of coughing is the activation of sensory receptors, which may be rapidly adapting (stretch) receptors (RARs) and augmented by bronchial C-fibres. These receptors are primarily found in the large and transitional airways and are predominantly sensitive to mechanical stimulation, but also to chemical stimuli. Pulmonary C-fibres are considered sparse in small animal species.

The main cause of coughing therefore tends to be pathologies that either perform a mechanical or chemical irritant effect within the airways, though cough may also occur with parenchymal and pleural space disorders.

Cardiogenic pulmonary oedema is often cited as a cause of cough, and indeed in those dogs presenting with fulminating pulmonary oedema with accumulation of large amounts of pink-tinged oedema fluid within larger airways, this may be a prominent clinical feature. However, in the majority of dogs with pulmonary oedema causing alveolar flooding, cough receptor excitation would not be an expected feature, with tachypnoea/hyperpnoea (‘breathlessness’) being a more consistent feature.

Myxomatous mitral valve disease

The most common acquired cardiac disease associated with development of pulmonary oedema is myxomatous mitral valve disease (MMVD). Heart murmurs consistent with MMVD may be identified in 3.54% of all dogs examined in UK first opinion clinics (Mattin et al., 2015), and the prevalence of heart murmurs in dogs, especially in small breed dogs, increases with age.

In one study, 24% of dogs aged nine to 12, and 37% of dogs aged 13 and over, were found to have murmurs consistent with MMVD (Detweiler and Patterson, 1965) and in some breeds, notably the Cavalier King Charles spaniel, prevalence in dogs older than eight years of age may become very high indeed.

However, mitral valve disease is typically characterised by a very long pre-clinical period, and only a minority of patients with asymptomatic MMVD in most longitudinal studies progress to a point where symptoms of congestive heart failure develop. Thus, the typical busy small animal clinician will encounter many dogs with heart murmurs consistent with MMVD who will not be (and might never be within their lifetimes) in congestive heart failure. When patients with such murmurs present with cough, clinicians are presented with a diagnostic dilemma as to how relevant the finding of a heart murmur typical of MMVD may be.

Studies have shown that the presence of congestive heart failure is not significantly associated with coughing in dogs with MMVD, but that radiographic evidence of airway disease and left atrial enlargement is (Ferasin et al., 2013).

In some studies, the presence of coughing may be, in part, due to presence of...