(1,5). Asymptomatic bitches serve as the primary source of the parasite. After ingestion, the first-stage larvae migrate through the intestinal wall and travel to the right atrium via the lymphatics or the portal-hepatic-caval circulation. From the right side of the heart, the larvae enter pulmonary capillaries and alveoli, and then migrate to the tracheobronchial tissue at the carina. All 5 larval stages of *O. osleri* develop in the canine lung. After a prepatent period of 10 to 21 wk, the female worm deposits embryonated eggs into the tracheal lumen and these then hatch into first-stage larvae (1–5). Within 2 to 3 mo, the parasite stimulates a granulomatous host response, producing a nodular lesion (1). Each nodule contains a mass of coiled worms surrounded by a thin fibrous wall and adjacent infiltration of lymphocytes and plasma cells (1).

Clinical signs of *O. osleri* tracheobronchitis are variable, and not all animals that develop nodules are symptomatic. The most common clinical sign recognized is a chronic nonproductive cough that is often exacerbated by exercise. In some dogs, bronchial and tracheal inflammation can induce airway hyper-responsiveness and bronchospasm, resulting in wheezing, exercise intolerance, and, occasionally, respiratory distress. (4,6,7). Rarely, bacterial pneumonia, pneumothorax, or pneumomediastinum may occur.

A number of diagnostic tests are available to veterinarians attempting to diagnose *O. osleri* tracheobronchitis. Routine fecal flotation rarely detects *O. osleri* larvae. The Baermann sedimentation technique will intermittently detect swallowed first-stage larvae in the feces, but larval immaturity and poor motility may contribute to poor yield (5). Thoracic radiographs are often normal, although in 1 study, nodules were radiographically visible in the region of the tracheal bifurcation in 7 of 20 dogs (8). Eosinophilic inflammation of tracheal washings, reported to be indicative of allergic or parasitic tracheobronchitis (4), was not present in any of the 4 dogs reported here. Examination of sputum, caudal pharyngeal mucus, or tracheal washings can often detect the presence of first-stage larvae or ova (4,5,7,8). The definitive diagnosis of *O. osleri* infection is most consistently made by visualizing tracheal nodules upon bronchoscopy and identifying larvae in bronchial brushings or nodule biopsies (4,5,7,8).

A number of different treatment protocols have been recommended for dogs with *O. osleri* tracheobronchitis. Protocols using diethylcarbamazine, levamisole, thiacetarsamide, thiabendazole, fenbendazole, and albendazole have been reported as having variable success (4,6–11). Some of these drugs require a prolonged course of treatment in order to produce clinical remission, increasing the risk of adverse effects.

Ivermectin administered repetitively at high doses (2000 µg/kg BW, weekly for 8 treatments) has been recommended for the treatment of *O. osleri* tracheobronchitis (4). The 4 dogs reported herein were treated with PO or SC administration of 200 to 400 µg/kg BW of ivermectin. All dogs responded quickly to initial treatment, but 3 of the 4 dogs required administration of multiple doses of ivermectin to achieve long-term resolution of clinical signs.

Ivermectin appears to be a safe and effective treatment for *O. osleri* tracheobronchitis in dogs. Although none of the dogs in this report had bronchoscopy to assess resolution of their tracheal nodules following ivermectin administration, their clinical improvement was dramatic, and their owners were reluctant to permit further diagnostic evaluation. Long-term follow-up studies of infected dogs posttherapy with other anthelmintics have shown that a clinical cure is possible without complete regression of the nodules (6), but dogs with very large granulomatous nodules may have a slower clinical response to therapy. None of the dogs in this report had any detectable adverse reaction either to ivermectin administration or to the antigen load of dying worms. As a result of the clinical response observed in these 4 dogs, the dose of ivermectin which is currently recommended at the WCVM for confirmed *O. osleri* tracheobronchitis is 400 µg/kg BW, SC, of ivermectin every 3 wk for 4 treatments. CVJ

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CORRECTION

Clinical mastitis in dairy cattle in Ontario: Frequency of occurrence and bacteriological isolates

Sargeant JM, Scott HM, Leslie KM, Ireland MJ, Bashiri A.

Can Vet J 1998; 39: 33–38

On page 37, line 10 in the 4th complete paragraph, reference is made to "Gram-negative *Staphylococcus*." This should have read "Coagulase-negative *Staphylococcus*." The authors apologize for this error.