Pyothorax in Dogs: Treatment and Outcome
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**Key Points:**
- Base antimicrobial use in dogs with pyothorax on culture and susceptibility data.
- Diagnostic imaging often plays an important role in guiding case management.
- Favorable treatment effects have been documented with pleural lavage and surgery.

Pyothorax is a potentially recurrent condition that results in systemic illness. Treatment is intended to eliminate infection, improve ventilation, and minimize recurrence. Decision-making challenges presented to the clinician dealing with the dog with pyothorax relate to both work-up and therapy, i.e., what imaging modality is most appropriate and when is surgery indicated?

Various reports of canine pyothorax are available; many contain quite small case numbers. Compilation of data from reports of canine pyothorax cases since 2000 identified 188 dogs from 16 studies. Data reported in each study ranged from focused to more comprehensive. Cytologic data were presented in 7 studies, revealing filamentous bacteria in 32 of 120 dogs (27%), sulfur granules in 18 of 49 dogs (37%), and an inconsistency between cytologic and microbiologic findings regarding bacterial presence in 46 of 92 dogs (50%). Microbiologic data from 14 studies revealed that the 10 most commonly isolated bacteria were: *E. coli* (n = 35), *Bacteroides* (33), *Pasteurella* (30), *Fusobacterium* (29), *Peptostreptococcus* (29), *Actinomyces* (27), *Streptococcus* (22), *Staphylococcus* (20), *Prevotella* (17), and *Nocardia* spp. (15). Five bacterial species and over 50% of isolates from this top-ten list were obligate anaerobic bacteria. While different empirical antimicrobial regimens were recommended in 10 studies, culture and susceptibility testing results prompted a change in antimicrobial use in nearly 35% of dogs.

Sixty percent (n = 113) of 188 dogs received medical therapy only, while 38% (n = 71) had surgery (2% [n = 4] were euthanatized or died prior to treatment). Medical management consisted of systemic antimicrobials (n = 113, 100%) and thoracostomy tube placement (n = 88, 78%), with tube placement being bilateral in 51%, unilateral in 41%, or unspecified in 8% of dogs, pleural lavage (n = 74, 65%), or thoracocentesis or one-time tube drainage (n = 22, 19%). Surgical treatment, consisting of thoracotomy with excision of affected tissue and open pleural lavage, was provided via median sternotomy (n = 56, 79%), lateral thoracotomy (n = 11, 16%), an unspecified approach (n = 3, 4%), or thoracoscopically (n = 1, 1%). Identification of a definitive or probable cause of pyothorax was reported in 10 studies, being documented in 42 of 157 dogs (27%).

The finding of mediastinal or pulmonary lesions or evidence of a foreign body or fluid encapsulation on imaging studies, or the isolation of *Actinomyces* spp. from pleural fluid suggests the need for surgical intervention. Median sternotomy enables exploration of the entire thoracic cavity and provides excellent access to the ventral mediastinum. The utility of thoracoscopic surgery in the management of canine pyothorax is largely unreported.

Long-term survival in 14 studies ranged from 58% to 100%, with medically-treated dogs having an overall 77% survival rate and surgically-treated dogs a 71% survival rate. Factors positively influencing survival included surgery and pleural lavage. Information regarding long-term recurrence was available in 106 of 188 dogs (56%). Reported recurrence rates ranged from 0% to 23%; overall rates were 5% for medically-treated and 18% for surgically-treated dogs.
References: