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Pyothorax: Thoracoscopic management in dogs (and cats?)

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DEFINITION/CLASSIFICATION

In Veterinary medicine pyothorax is defined by the accumulation of a septic pleural effusion. Although no clear distinctions are classically made in the nature of the effusion, clinical observations allow to observe different kind of disease from a very fluidly effusion to a much more viscous secretion, from an empty pleural cavity to a pleural space filled by a mixed of secretion reactive tissue, fibrinous clots and loculations. Historical management of such effusion was conservative with establishment of pleural drainage with or without associated pleural lavage or instillation of chemical within the pleural cavity (Saline only -Saline and antiseptic, saline and proteolytic enzymes).

Usual recommendations are to consider surgical exploration if associated lung damages were to be observed on imaging studies, if drainage is difficult to achieve due to the importance of loculation or debris preventing efficient evacuation of the pleural space, when drainage was to long.

Antibiosis is recommended in association with drainage ideally in conjunction with microbiological identification of the pathogens ‘s specific sensibility.

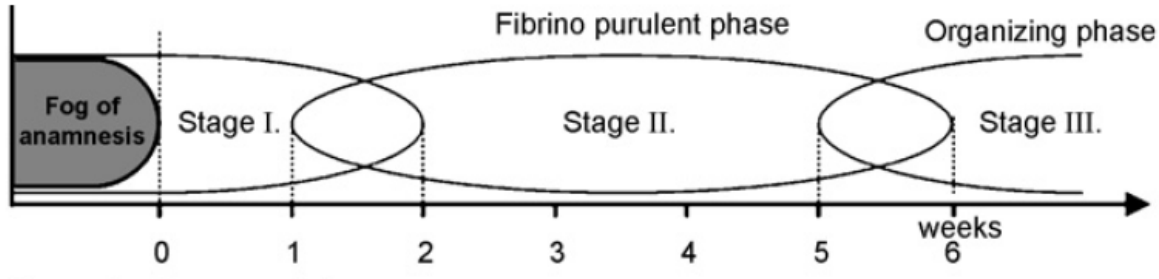
Over the last 20 years there was a shift toward earlier surgical treatment for canine when feline patients are usually more treated conservatively. One of the explanations for this difference in approach being that pyothorax in dogs are more likely to be associated with vegetal migrating foreign body when feline patients’ pleural infection might be a primary disease.

The overall prognosis for dogs is fair with 88% survival, more guarded for cats with 65% (1).

Different stages of the establishment of the empyema have been well described in human medicine (2):

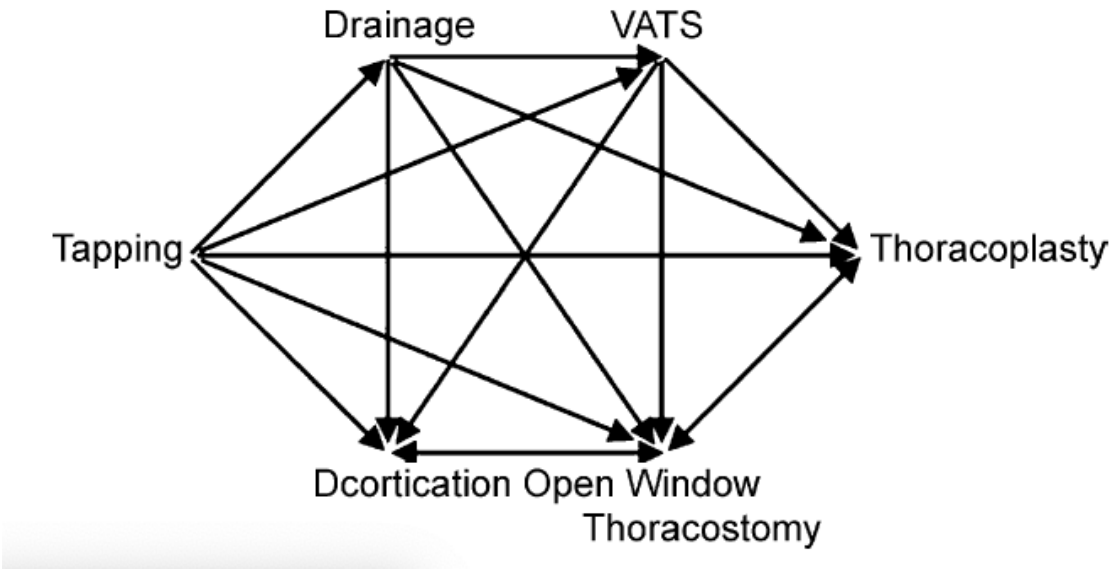
3 stages have been described; these are encompassed in a continuum of progression from dry inflammation to a full “compartmentalization” of the pleural space:

1. Early serous effusion phase (Stage I)
2. Fibrino-purulent phase (Stage II)
3. Organizing phase (Stage III)



Pyothorax surgical treatment

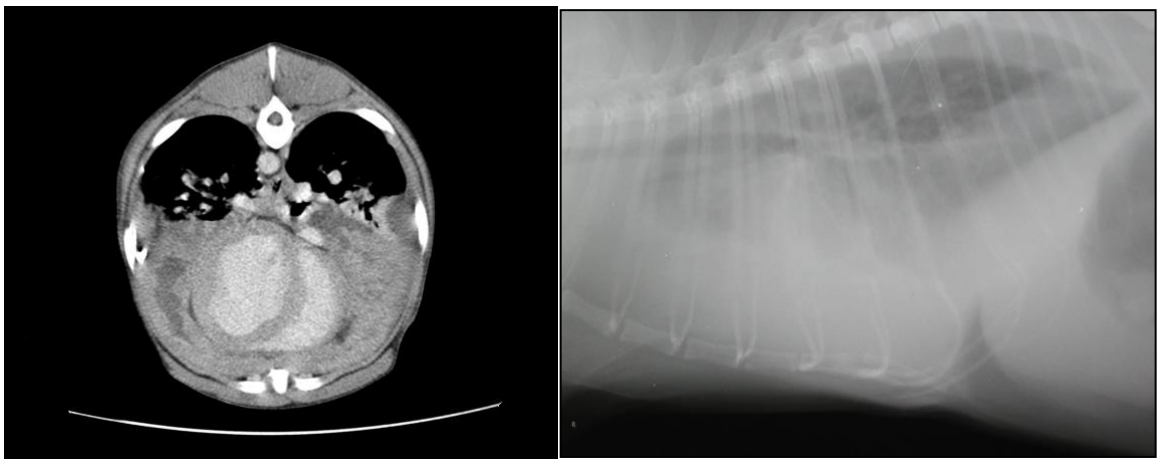
The base of treatments is simple: evacuate the pus, establish full pleural drainage, remove associated lesion if necessary.



Different treatments options/choice to manage empyema in adults (from TS Molnar). In veterinary practice Decortication (removal of the fibrinous capsule that inflammation crate around lung and which prevent its full expansion), open window thoracotomy are not surgical treatments reported in small animal surgery (2).

This is clinical experience that a vast majority of dogs are usually presented with stage II-III pyothorax possibly associated with lung abscission making them candidates for surgical exploration when cats are more likely showing with Stage I/II making them usually successfully treated with mere pleural drains (1).Alternatively all patients could be treated conservatively and decision to switch for surgical approach will be made according to the outcome/duration of drainage although clinical and economical evidences show especially in canine patients that surgical approach should be promoted (1-3).

We are suggesting a treatment based on effusion staging rather than species. Diagnostic imaging will be extremely valuable to establish staging and “drainability” of the pleural effusion based on the evidence of loculation/fibrines strands preventing correct drainage ad in assessing the efficiency of the drainage (namely is there still some fluid left when drainage is no more efficient). Contrast CT and ultrasonography are the most useful imaging tools.



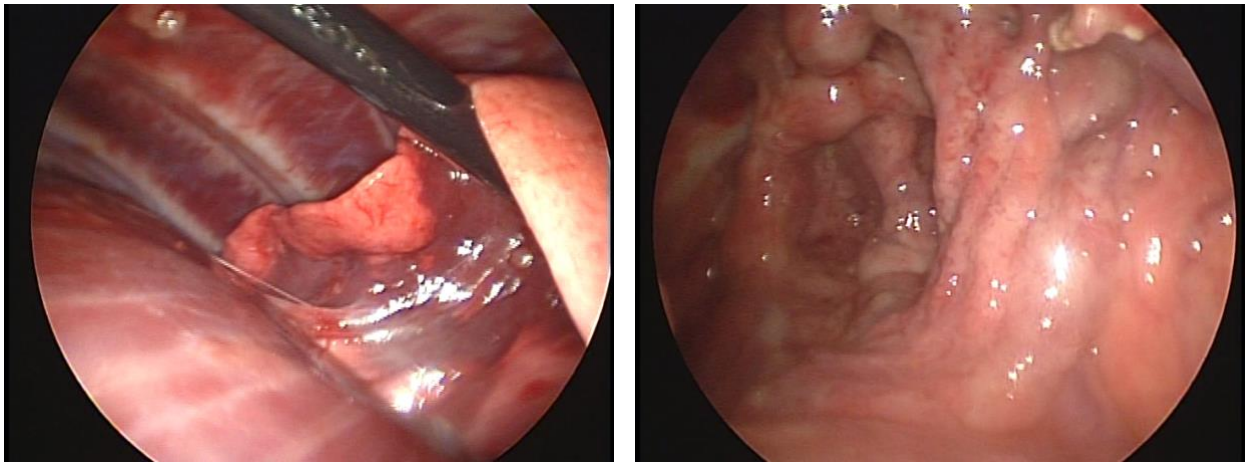
For this dog, one can compare CT vs Xray picture s and information. Contrast CT allows to see dramatic thickening of the ventral mediastinum typical from Stage III empyema and explaining

why conservative draining is usually unsuccessful.

Pyothorax surgical treatment usually required exploratory sternotomy for a thorough debridement of the ventral mediastinum and pleural space to create a large pleural space that could be successfully drained during the healing phase of the infection. It is never possible no advised to removed fibrinous changes on the plural or the lung surface. Surgery is merely to remove obvious necrotic/infected tissue and to establish efficient drainage for further medical care. Usually, drainage is necessary for 5 to 7 days postoperatively. In dos I is frequent to not identify foreign material when debriding the chest even if migrating grass awn remains the usually suspected origin of the disease and it is unclear whether this failure to find foreign material affect clinical outcome for this advance empyema (4).

Thoracoscopy has been developed to achieve similar surgical procedure than open surgery with minimizing pain, chest wall damages and better visualization. Successful access to the ventral mediastinum can be achieved with classic paraxyphoid multiport access and more recently with subxiphoid approach. With the help of advanced bipolar fusion devices full debridement of the ventral mediastinum and creation of large “drainable” pleural cavity can be achieved with minimal complication and without the surgical footprint and associated morbidity of a sternal split. The approach does not prevent extension toward chest omentalization as it has been reported in case of recurring or severely damaged chest

Overall outcome appears similar although published data are reporting small publications of dogs (5-6).



Thoracoscopic view of Canine pyothorax (dog in dorsal recumbency). Left: Evaluation of the ventral aspect of the right caudal lung lobe and its ventral aspect. Right: Evaluation of the cranial ventral mediastinum facing the thoracic inlet

There are overall no data for feline patient and surgery, this is the author experience that thoracoscopic debridement is possible when stage II-III empyema is observed like the one observed in dogs.

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