Advances in Video-Assisted Thoracic Surgery, Thoracoscopy

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KEYWORDS

• Thoracoscopy • Video-assisted thoracic surgery • Pericardectomy
• Lung lobectomy • Pleural • One-lung ventilation • Pneumothorax

KEY POINTS

- Patient selection is critical, and general and specific contraindications exist.
- Anesthetic management can be challenging and may require an anesthesiologist if one-lung ventilation (OLV) is to be used.
- Elective and emergent conversion may be necessary, and the operating surgeon must be willing to convert if patient safety or the success of the surgery is in question.
- Perioperative management is similar to cases undergoing planned thoracotomy.

PERICARDIAL EFFUSION AND NEOPLASIA

Pathologic pericardial effusion can result from malignancy, infectious, or idiopathic etiologies. Among malignant causes, hemangiosarcoma of the right auricular appendage is most common, but aortic body chemodectoma and diffuse mesothelioma are also seen. Malignant pericardial effusion is diagnosed in about 70% and idiopathic pericardial effusion is seen in about 20% to 30% of dogs presenting for pathologic pericardial effusion.[1,2] When the volume of effusion becomes significant, a reduction in end diastolic volume and cardiac output results, a condition referred to as cardiac tamponade. One of the most commonly performed video-assisted thoracic surgery (VATS) procedures in dogs is pericardectomy.[2–6] The objective of pericardectomy is to excise enough pericardium to eliminate tamponade and to obtain a histologic diagnosis of the patient's condition (**Table 1**).

The surgeon must decide how much pericardium to excise when considering pericardectomy. In palliative cases, such as those associated with neoplastic effusions, a 4×4 cm pericardial window seems to be adequate unless right auriculectomy is being

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Table 1
VATS indications and contraindications

Indications	Contraindications
Pericardial effusion and neoplasia	Lack of training and instrumentation
Cranial mediastinal mass resection	Unstable patient
Pulmonary neoplasia	Lack of anesthetic support
Pulmonary blebs and bullae	Large masses or lesions
Chylothorax	—
Vascular ring anomaly	—

considered.[2,3,6,7] With presumed idiopathic cases, a complete pericardioscopic evaluation is necessary to reduce the chance of a missed diagnosis and a larger pericardectomy is indicated.[2,8] Because masses are common on the right auricle and heart base (Fig. 1), the surgeon must have adequate experience and understanding of the pericardial anatomy before performing pericardoscopy, auriculectomy, or epicardial biopsy.[6,7]

The combination of a pericardial window and pericardial fillet has recently been described.[9] The pericardial fillet facilitates exposure of most of the intrapericardiac anatomy without the need for subphrenic pericardectomy.[9] Pericardial fillet is performed by creating several individual incisions, from ventral to dorsal toward the phrenic nerves, following excision of an approximate 4 × 4 cm apical window (Fig. 2). The orientation of the window (and fillet if performed) is likely not as important as performing a thorough pericardioscopic assessment. This is particularly important in presumed idiopathic cases, because it is possible for small nodules and masses to be identified on endoscopy around the heart base (Fig. 3) in dogs with a preoperative negative echocardiogram.[2,8] In this scenario, some dogs are tentatively diagnosed with an idiopathic pericardial effusion. If a representative epicardial (Fig. 4) sample is not obtained during pericardioscopy and/or if the pericardial sample obtained is not representative of the underlying disease, then a missed diagnosis and lost opportunity for disease-specific medical therapy occurs.

Right auricular mass resection in combination with pericardectomy has recently been described in nine dogs.[6] One dog died during surgery from hemorrhage but eight

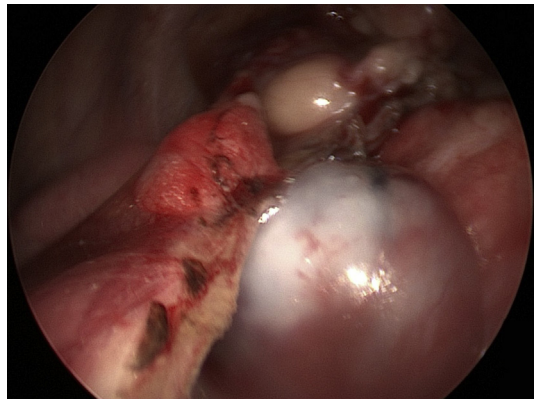

Fig. 1. Intraoperative image of a large chemodectoma originating from the heart base in a dog undergoing VATS pericardectomy.